CHARTER TOWNSHIP OF YPSILANTI BOARD OF TRUSTEES

Supervisor

BRENDA L. STUMBO

Clerk

KAREN LOVEJOY ROE

Treasurer

LARRY J. DOE

Trustees

STAN ELDRIDGE
HEATHER JARRELL ROE
MONICA ROSS WILLIAMS
JIMMIE WILSON, JR.

June 18, 2019

Work Session – 5:00 p.m.
Regular Meeting – 7:00 p.m.

Ypsilanti Township Civic Center
7200 S. Huron River Drive
Ypsilanti, MI 48197

DEPARTMENTAL REPORTS

YPSILANTI TOWNSHIP FIRE DEPARTMENT
MONTHLY REPORT

APRIL 2019

Fire Department staffing levels are as follows:

1 Fire Chief	3 Shift Captains	19 Fire Fighters
1 Fire Marshal	3 Shift Lieutenants	1 Clerk III / Staff Support

All fire department response personnel are licensed as Emergency Medical Technicians by the State of Michigan Public Health. During the month, the fire department responded to 327 requests for assistance. Of those requests, 193 were medical emergency service calls, with the remaining 134 incidents classified as non-medical and/or fire related.

Department activities for the month of April, 2019:

1) The Public Education Department participated in the following events:
   a) Fire Safety & Truck Demonstration at Erickson Elementary
   b) Fire Safety & Truck Demonstration at Dorothy's Discovery Day Care
   c) Car Seat fittings for U of M Buckle Up program

2) Fire fighters attended 7 neighborhood watch meetings

3) Fire fighters received training in the following areas:
   a) Washtenaw County Tech Rescue Team
   b) Washtenaw County HazMat

The Fire Marshal had these activities / events for the month of April, 2019:

1) Fire Investigations: 1
2 Building Inspections: 18
3) Site Plan Reviews: 8
4) Occupancy Certificates: 6
5) Burn Permits: 1
6) Court Appearances: 1
7) Take apparatus to Greenville, MI for repairs
8) Meetings: 3
9) Classes: 1 (week long)

The Fire Chief attended these meetings / events for the month of April, 2019:

1) WAMAA
2) Hampton Inn Site Review
3) Civil Service Commission meeting
4) Township planning meeting for Chippewa Hills
5) HVA Fire Dispatch meeting
6) Fire Dispatch Feasability meeting
7) HazMat Authority Board meeting
8) Assessment Prep meeting with EMPCO
9) Township Development meeting with Chippewa Hills owner
10) Photographer meeting
11) EMS Commission meeting
12) Kiwanis Club meeting
13) Allie Brothers
14) Villa at Parkridge Tour with City of Ypsilanti Firefighters
15) Job Analysis forms for Officer Testing
16) Follow up – Fire Investigation
17) Site Inspection – Chippewa Hills

There was 0 injuries and 0 deaths reported this month for civilians.

There was 0 injuries and 0 deaths reported this month for fire fighters.

This month the total fire loss, including vehicle fires, is estimated at ***$81,200.00.*** All occurred at the following locations:

	DATE OF LOSS	ADDRESS	ESTIMATED LOSS
1)	04/04/2019	7872 Thornhill Drive	$ 0.00 (cooking)
2)	04/04/2019	Whittaker @ Textile	$ 5,000.00 (vehicle)
3)	04/08/2019	9419 Bemis	$ 0.00 (trash / rubbish)
4)	04/13/2019	2675 Burns	$ 0.00 (cooking)
5)	04/13/2019	3226 S Grove	$ 60,000.00 (building)
6)	04/18/2019	2769 Golfside #105	$ 10,500.00 (building)
7)	04/19/2019	1355 E Cross #7	$ 5,200.00 (building)
8)	04/21/2019	48571 S Service Drive	$ 0.00 (Mutual Aid – Van Buren Twp)
9)	04/25/2019	1900 Tyler	$ 0.00 (cooking)
10)	04/27/2019	2931 Roundtree #C4	$ 500.00 (cooking)

Respectfully submitted,

Rhonda Bates, Clerical Support Staff
Charter Township of Ypsilanti Fire Department

Attachment: Image Trend Incident Type Report (Summary): 04/01/2019 – 04/30/2019

Ypsilanti Township - Incident Type Report (Summary)
monthly

Basic Incident Type Code And Description (FD1.21)	Total Incidents	Total Incidents Percent of Incidents	Total Property Loss	Total Content Loss	Total Loss	Total Loss Percent of Total
Incident Type Category (FD1.21): 1 - Fire						
100 - Fire, other	1	0.31%				
111 - Building fire	4	1.22%	55000.00	20700.00	75700.00	93.23%
113 - Cooking fire, confined to container	3	0.92%	0.00	500.00	500.00	0.62%
118 - Trash or rubbish fire, contained	1	0.31%				
131 - Passenger vehicle fire	1	0.31%	2500.00	2500.00	5000.00	6.16%
142 - Brush or brush-and-grass mixture fire	1	0.31%				
150 - Outside rubbish fire, other	2	0.61%	0.00	0.00	0.00	0.00%
151 - Outside rubbish, trash or waste fire	1	0.31%				
160 - Special outside fire, other	1	0.31%				
	Total: 15	**Total: 4.59%**	**Total: 57500.00**	**Total: 23700.00**	**Total: 81200.00**	**Total: 100.00%**
Incident Type Category (FD1.21): 2 - Overpressure Rupture, Explosion, Overheat (No Fire)						
251 - Excessive heat, scorch burns with no ignition	1	0.31%				
	Total: 1	**Total: 0.31%**	**Total: 0.00**	**Total: 0.00**	**Total: 0.00**	**Total: 0.00%**
Incident Type Category (FD1.21): 3 - Rescue & Emergency Medical Service Incident						
300 - Rescue, EMS incident, other	11	3.36%				
311 - Medical assist, assist EMS crew	9	2.75%				
321 - EMS call, excluding vehicle accident with injury	155	47.40%				
322 - Motor vehicle accident with injuries	6	1.83%				
323 - Motor vehicle/pedestrian accident (MV Ped)	1	0.31%				
324 - Motor vehicle accident with no injuries.	10	3.06%				
331 - Lock-in (if lock out , use 511)	1	0.31%				
	Total: 193	**Total: 59.02%**	**Total: 0.00**	**Total: 0.00**	**Total: 0.00**	**Total: 0.00%**
Incident Type Category (FD1.21): 4 - Hazardous Condition (No Fire)						
412 - Gas leak (natural gas or LPG)	1	0.31%				
424 - Carbon monoxide incident	2	0.61%				
440 - Electrical wiring/equipment problem, other	1	0.31%				
444 - Power line down	4	1.22%				
445 - Arcing, shorted electrical equipment	2	0.61%				
	Total: 10	**Total: 3.06%**	**Total: 0.00**	**Total: 0.00**	**Total: 0.00**	**Total: 0.00%**
Incident Type Category (FD1.21): 5 - Service Call						
500 - Service call, other	1	0.31%				
520 - Water problem, other	1	0.31%				
531 - Smoke or odor removal	2	0.61%				
550 - Public service assistance, other	2	0.61%				
551 - Assist police or other governmental agency	2	0.61%				
554 - Assist invalid	2	0.61%				
561 - Unauthorized burning	2	0.61%				
	Total: 12	**Total: 3.67%**	**Total: 0.00**	**Total: 0.00**	**Total: 0.00**	**Total: 0.00%**
Incident Type Category (FD1.21): 6 - Good Intent Call						
611 - Dispatched and cancelled en route	76	23.24%				
651 - Smoke scare, odor of smoke	2	0.61%				
	Total: 78	**Total: 23.85%**	**Total: 0.00**	**Total: 0.00**	**Total: 0.00**	**Total: 0.00%**
Incident Type Category (FD1.21): 7 - False Alarm & False Call						
700 - False alarm or false call, other	4	1.22%				
710 - Malicious, mischievous false call,	1	0.31%				

Basic Incident Type Code And Description (FD1.21)	Total Incidents	Total Incidents Percent of Incidents	Total Property Loss	Total Content Loss	Total Loss	Total Loss Percent of Total
other						
715 - Local alarm system, malicious false alarm	1	0.31%				
733 - Smoke detector activation due to malfunction	1	0.31%				
735 - Alarm system sounded due to malfunction	4	1.22%				
736 - CO detector activation due to malfunction	4	1.22%				
745 - Alarm system activation, no fire - unintentional	1	0.31%				
746 - Carbon monoxide detector activation, no CO	2	0.61%				
	Total: 18	**Total: 5.50%**	**Total: 0.00**	**Total: 0.00**	**Total: 0.00**	**Total: 0.00%**
	Total: 327	**Total: 100.00%**	**Total: 57500.00**	**Total: 23700.00**	**Total: 81200.00**	**Total: 100.00%**

Charter Township of Ypsilanti
Hydro Station

7200 S. Huron River Drive
Ypsilanti, MI 48197
Phone: (734) 544.3690
Fax: (734) 544.3626

www.ytown.org

Date: June 4, 2019
To: **Clerk's Office**
CC: **Brenda Stumbo, Supervisor**
From: Michael Saranen, Hydro Operation Manager

Subject: Departmental Report (activities in May 2019)

Activities:

Ford Lake Dam

General Operation Summary:
The Hydro Station continues to operate safely and continues to get routine safety inspections and preventive maintenance. Operators had 14 after hour call-ins for May.

The month of May was considerably wet, heavy rain on May 1 caused the hydro to temporary exceed the lake level guidelines for about 16 hours. Approximately 3" rain fell just in a few hours.

With all the rain, the hydro was able to set a new record for monthly generation going back to 1994.

Average precipitation for the month of May is around 3.1", this year it was about 5" and production for the month above average due to rain.

Regulatory:

For 2019-

- update DSSMP (waiting on Spillway Assessment)
- DSSMR, **Filed**
- Owners Dam Safety Program Review
- EAP Functional Exercise – Scheduled for July
- EAP annual update and test
- EAP Training
- Part 12- recommendation plan (waiting on Spillway Assessment)
- WQ Report (monitoring season starts June 1)
- Nuisance Plant Plan Report
- Wildlife Plan Report
- Historical Activity Report
- Gate Certification
- Security Review
- FERC Annual Safety inspection (scheduled in July)

- Spillway Assessment (received final Report, preparing to file with FERC)

- Annual DEQ Lake Operation Monitoring Report- Complete, filed with FERC

Projects:

Concrete Maintenance (moving forward)

Repair small areas concrete damaged from exposure to ice and road salt. Repair exterior stairs and hand railing.

River Coordination (No New Information)

Van Buren Twp. and French Landing Dam are considering lowering Belleville Lake in the fall of 2019. It will be important to look at the possible effects to the Hydro Station and the operations if Belleville Lake is to be lowered. VBT held a public meeting on 2/28 to discuss permitting process and activities long and shoreline that require permits. No date has been set as of yet. A feasibility study is currently be done to determine impacts of a drawdown. There is a chance the study may conclude a drawdown is not desirable.

Operation Summary

2019	**May**	**YTD**	**5 Year Ave.**
Precipitation total (inches)	5.00	17.00	30.2
Days Online	31	146.9	357.1
Generation MWH (estimated)	1,589.194	5,810.836	9,530.5
Generation MWH **lost** (estimated)*	0	733.170	422.9
After Hour Call In			
Water levels	14	32	32.4
Mechanical/Electrical	0	2	4.0
Other	0	0	4.2
Totals	14	34	41.0

Recent History	**2014**	**2015**	**2016**	**2017**	**2018**
Precipitation total (inches)	34.3	25.3	29.6	27.3	34.6
Days Online	355.0	345.0	359.5	362.0	364.2
Generation MWH (estimated)	9,746.0	7,723.0	8,803.4	10,744.9	10,635.0
Generation MWH **lost** (estimated)*	643.2	419.1	229.8	269.6	552.9
After Hour Call In					
Water levels	43	32	31	26	30
Mechanical/Electrical	7	1	4	5	3
Other	15	1	2	3	0
Totals	67	34	37	34	33

[1] Preliminary totals from weather underground

*losses related to scheduled & unscheduled maintenance and water quality discharges.

Gate Spilling Summary:

Releasing water from the sluice gates is primary to maintain lake level when flow exceeds the powerhouse. At certain times, we can use the gates to help keep the lake mixing to maintain oxygen levels (effectiveness depends on a number of factors) at the bottom of the lake.

The water quality monitoring begins on June 1st and will end on September 30th; operators monitor the water quality conditions and take readings as outline in the WQ Plan. The hydro discharges from the bottom gates to maintain run of river and/or help with water quality in Ford Lake. The Federal License requires we pass water with a minimum of 5mg/l of dissolved oxygen all the time. Therefore, spilling from the bottom gates in the summer for improving the lake is not always possible.

Sluice Gate Usage Summary:

Current Year	Current Year	Current Year	Current Year	Prior Year
2019	Days Spilled	Lost KWh*	Lost $*	Lost $*
January	.4	0	0	0
February	2.3	0	0	0
March	18.5	0	0	0
April	13.9	0	0	0
May	27	0	0	0
June				6,466
July				3,461
August				0
September				0
October				0
November				0
December				0
Totals	62.1	0	$ 0	$ 9,927

*estimated losses from diverting water away from generators for the **purpose improving WQ**.

Sargent Charles Dam

This dam continues to get routine safety inspections and appropriate maintenance.

The Sargent Charles Dam received a 5 year inspection conducted by the State of Michigan. A formal report was received, the report list items to continue doing and new items to address. The department is working on addressing those items.

WASHTENAW COUNTY
OFFICE OF THE SHERIFF

2201 Hogback Road ◆ Ann Arbor, Michigan 48105-9732 ◆ OFFICE (734) 971-8400 ◆ FAX (734) 973-4624 ◆ EMAIL sheriffinfo@ewashtenaw.org

JERRY L. CLAYTON
SHERIFF

MARK A. PTASZEK
UNDERSHERIFF

To: Brenda Stumbo, Ypsilanti Township Supervisor
From: Nancy Hansen, Police Services Lieutenant
Cc: Mike Radzik, Ypsilanti Township Police Administrator & Ypsilanti Township Board
Chad Teets, WCSO Police Services Commander
Date: June 7, 2019
Re: May 2019 Police Services Monthly Report

SUMMARY:
In May 2019, there were 3672 calls for service in Ypsilanti Township. A 5% decrease in calls for service as compared to May 2018.

OPERATIONS
During May 2019, Patrol Operations responded to calls for service, conducted traffic enforcement and community engagement duties in pursuit of our total policy philosophy.

One area of concern during May was the increase of larcenies, several of which included larcenies from unlocked vehicles. Statistically we had an 18% increase compared to May of 2018 (66 this year / 56 last year).

These are crimes of opportunity where the perpetrator simply tries the vehicle door handle to see if it is unlocked and then steals whatever is inside.

To deter this crime, patrol staff are conducting additional neighborhood checks during the overnight hours based on crime data analysis. In addition, specific undercover patrols are taking place and we have apprehended individuals engaged in this crime. However, the random nature of this crime makes it challenging to predict future occurrence.

A locked vehicle is the best deterrent.

YOUTH INITIATIVE
The Sheriff's Office continues to partner with courts, probation and social services to ensure that there is accountability beyond Sheriff's Office contact with the offenders that are consistently involved in crimes. From a year to date perspective, comparing 2019 to the same period in 2018, you can see our runaway incidents are down; however, other juvenile complaints are up 35%:

Juvenile Runaways are down 16%
Juvenile Offenses and Complaints are up 35%

COMMUNITY ACTION TEAM
The purpose of the CAT team is to respond to situations involving or with a nexus of drugs, guns or violence. The team focuses on the timely assessment and response to tips they receive from our community and community problems identified through crime pattern analysis.

CAT collaboration with the Michigan Department of Correction in reference to parole compliance contributes to effective monitoring and management of parolees who live in our community. Timely and efficient response to tips regarding parolee misconduct combined with regular unannounced home visits are expected by the parolees that reside in Ypsilanti Township and surrounding areas.

For any violent crime tips related to guns, gang activity or violence in general please call 734-661-9034.

NIXLE
As a reminder for residents they can sign up for "Up-to-the-minute updates" from the Washtenaw County Sheriff's Office by email or cell phone at www.nixle.com

VACATION WATCH
Also available to residents is the ability to sign up for house checks if they are going out of town for a period of time. The house watch form can be found at https://www.washtenaw.org/1743/House-Watch

NEW FACES
The Sheriff's Office is hiring! During the month of May 2019, we have hired 4 new Deputy Sheriff's. We continue to hire highly qualified, motivated and diverse people that are committed to pursuing our mission: Creating public safety, providing quality service and building strong, sustainable communities.

If you are interested in joining us in serving your community in Police Services, Corrections, Communications, Emergency Services or Community Corrections please check us out at

https://www.washtenaw.org/1124/Sheriff

We have rewarding career opportunities available for those seeking a profession with a greater purpose.

JERRY L. CLAYTON
SHERIFF

YPSILANTI TOWNSHIP MONTHLY POLICE SERVICES DATA
May 2019

Incidents	Month 2019	Month 2018	% Change	YTD 2019	YTD 2018	% Change
Traffic Stops	855	876	-2%	3874	4321	-10%
Citations	560	597	-6%	2351	2626	-10%
Drunk Driving (OWI)	13	7	86%	30	31	-3%
Drugged Driving (OUID)	1	5	-80%	25	32	-22%
Calls for Service Total	3672	3870	-5%	16313	17447	-6%
Calls for Service *(Traffic stops and non-response medicals removed)*	2440	2596	-6%	10631	11183	-5%
Robberies	11	3	267%	22	13	69%
Assaultive Crimes	93	68	37%	333	325	2%
Home Invasions	16	9	78%	51	48	6%
Breaking and Entering's	3	6	-50%	11	20	-45%
Larcenies	66	56	18%	249	183	36%
Vehicle Thefts	8	7	14%	43	35	23%
Traffic Crashes	84	77	9%	441	457	-4%
Medical Assists	61	74	-18%	288	298	-3%
Animal Complaints *(ACO Response)*	50	59	-15%	177	172	3%

In/Out of Area Time	Month *(minutes)*	YTD *(minutes)*
Into Area Time	567	5826
Out of Area Time	6251	16116
Investigative Ops (DB)	33455	116745
Secondary Road Patrol	334	2769
County Wide	697	3691

+ = Positive Change
- = Negative Change

	Hours Accum.	Hours Used	Balance
Banked Hours	708	557.75	3854.75

Report CLEAR-008 Summary of Offenses
All Offenses that were Attempted or Completed
For the Month of May

	Classification	May/2019	May/2018	% Change
09001	MURDER/NONNEGLIGENT MANSLAUGHTER (VOLUNTARY)	0	0	-
09002	NEGLIGENT HOMICIDE/MANSLAUGHTER (INVOLUNTARY)	0	0	-
09004	JUSTIFIABLE HOMICIDE	0	0	-
09005	DEATH INVOLVING USE OF FORCE BY LAW ENFORCEMENT	0	0	-
09006	IN-CUSTODY DEATH	0	0	-
10001	KIDNAPPING/ABDUCTION	0	0	-
10002	PARENTAL KIDNAPPING	0	0	-
11001	SEXUAL PENETRATION PENIS/VAGINA -CSC IST DEGREE	5	4	25.0%
11002	SEXUAL PENETRATION PENIS/VAGINA -CSC 3RD DEGREE	0	1	-100.0%
11003	SEXUAL PENETRATION ORAL/ANAL -CSC IST DEGREE	0	0	-
11004	SEXUAL PENETRATION ORAL/ANAL -CSC 3RD DEGREE	0	0	-
11005	SEXUAL PENETRATION OBJECT -CSC IST DEGREE	0	1	-100.0%
11006	SEXUAL PENETRATION OBJECT -CSC 3RD DEGREE	0	0	-
11007	SEXUAL CONTACT FORCIBLE -CSC 2ND DEGREE	3	2	50.0%
11008	SEXUAL CONTACT FORCIBLE -CSC 4TH DEGREE	1	1	0%
12000	ROBBERY	11	3	266.7%
13001	NONAGGRAVATED ASSAULT	74	60	23.3%
13002	AGGRAVATED/FELONIOUS ASSAULT	42	38	10.5%
13003	INTIMIDATION/STALKING	17	5	240.0%
20000	ARSON	0	0	-
21000	EXTORTION	0	1	-100.0%
22001	BURGLARY -FORCED ENTRY	24	22	9.1%
22002	BURGLARY -ENTRY WITHOUT FORCE (Intent to Commit)	5	3	66.7%
23001	LARCENY -POCKETPICKING	1	0	100.0%
23002	LARCENY -PURSESNATCHING	0	1	-100.0%
23003	LARCENY -THEFT FROM BUILDING	24	19	26.3%
23004	LARCENY -THEFT FROM COIN-OPERATED MACHINE/DEVICE	0	0	-
23005	LARCENY -THEFT FROM MOTOR VEHICLE	54	48	12.5%
23006	LARCENY -THEFT OF MOTOR VEHICLE PARTS/ACCESSORIES	6	2	200.0%
23007	LARCENY -OTHER	20	14	42.9%
24001	MOTOR VEHICLE THEFT	12	10	20.0%
24002	MOTOR VEHICLE, AS STOLEN PROPERTY	7	1	600.0%
24003	MOTOR VEHICLE FRAUD	0	1	-100.0%
25000	FORGERY/COUNTERFEITING	7	4	75.0%
26001	FRAUD -FALSE PRETENSE/SWINDLE/CONFIDENCE GAME	11	13	-15.4%
26002	FRAUD -CREDIT CARD/AUTOMATIC TELLER MACHINE	19	13	46.2%
26003	FRAUD -IMPERSONATION	0	0	-
26004	FRAUD -WELFARE FRAUD	0	0	-
26005	FRAUD -WIRE FRAUD	2	1	100.0%
26007	FRAUD - IDENTITY THEFT	12	25	-52.0%
26008	FRAUD - HACKING/COMPUTER INVASION	0	0	-
27000	EMBEZZLEMENT	6	2	200.0%

Report CLEAR-008 Summary of Offenses
All Offenses that were Attempted or Completed
For the Month of May

	Classification	May/2019	May/2018	% Change
28000	STOLEN PROPERTY	7	3	133.3%
29000	DAMAGE TO PROPERTY	48	49	-2.0%
30001	RETAIL FRAUD -MISREPRESENTATION	0	2	-100.0%
30002	RETAIL FRAUD -THEFT	13	28	-53.6%
30003	RETAIL FRAUD -REFUND/EXCHANGE	0	0	-
30004	ORGANIZED RETAIL FRAUD	0	0	-
35001	VIOLATION OF CONTROLLED SUBSTANCE ACT	8	24	-66.7%
35002	NARCOTIC EQUIPMENT VIOLATIONS	4	7	-42.9%
36001	SEXUAL PENETRATION NONFORCIBLE -BLOOD/AFFINITY	0	0	-
36002	SEXUAL PENETRATION NONFORCIBLE -OTHER	0	0	-
37000	OBSCENITY	0	0	-
39001	GAMBLING- BETTING/WAGERING	0	0	-
39002	GAMBLING- OPERATING/PROMOTING/ASSISTING	0	0	-
39003	GAMBLING -EQUIPMENT VIOLATIONS	0	0	-
39004	GAMBLING -SPORTS TAMPERING	0	0	-
40001	COMMERCIALIZED SEX -PROSTITUTION	0	0	-
40002	COMMERCIALIZED SEX -ASSISTING/PROMOTING PROSTITUTION	0	1	-100.0%
40003	HUMAN TRAFFICKING - PURCHASING PROSTITUTION	0	0	-
51000	BRIBERY	0	0	-
52001	WEAPONS OFFENSE- CONCEALED	3	8	-62.5%
52002	WEAPONS OFFENSE -EXPLOSIVES	0	0	-
52003	WEAPONS OFFENSE -OTHER	3	2	50.0%
64001	HUMAN TRAFFICKING - COMMERCIAL SEX ACTS	0	0	-
64002	HUMAN TRAFFICKING - INVOLUNTARY SERVITUDE	0	0	-
72000	ANIMAL CRUELTY	1	2	-50.0%
Total for Group A		**450**	**421**	**6.9%**
01000	SOVEREIGNTY	0	0	-
02000	MILITARY	0	0	-
03000	IMMIGRATION	0	0	-
09003	NEGLIGENT HOMICIDE -VEHICLE/BOAT	0	0	-
14000	ABORTION	0	0	-
22003	BURGLARY - UNLAWFUL ENTRY (NO INTENT)	1	0	100.0%
22004	POSSESSION OF BURGLARY TOOLS	0	0	-
26006	FRAUD -BAD CHECKS	6	3	100.0%
36003	PEEPING TOM	0	0	-
36004	SEX OFFENSE -OTHER	0	1	-100.0%
38001	FAMILY -ABUSE/NEGLECT NONVIOLENT	9	8	12.5%
38002	FAMILY -NONSUPPORT	0	0	-
38003	FAMILY -OTHER	1	0	100.0%
41001	LIQUOR LICENSE -ESTABLISHMENT	0	0	-
41002	LIQUOR VIOLATIONS -OTHER	2	3	-33.3%
42000	DRUNKENNESS	1	0	100.0%

Report CLEAR-008 Summary of Offenses
All Offenses that were Attempted or Completed
For the Month of May

	Classification	May/2019	May/2018	% Change
48000	OBSTRUCTING POLICE	19	14	35.7%
49000	ESCAPE/FLIGHT	0	0	-
50000	OBSTRUCTING JUSTICE	28	25	12.0%
53001	DISORDERLY CONDUCT	2	3	-33.3%
53002	PUBLIC PEACE -OTHER	0	1	-100.0%
54001	HIT and RUN MOTOR VEHICLE ACCIDENT	6	4	50.0%
54002	OPERATING UNDER THE INFLUENCE OF LIQUOR OR DRUGS	24	30	-20.0%
55000	HEALTH AND SAFETY	6	7	-14.3%
56000	CIVIL RIGHTS	0	0	-
57001	TRESPASS	3	4	-25.0%
57002	INVASION OF PRIVACY -OTHER	0	2	-100.0%
58000	SMUGGLING	1	1	0%
59000	ELECTION LAWS	0	0	-
60000	ANTITRUST	0	0	-
61000	TAX/REVENUE	0	0	-
62000	CONSERVATION	0	0	-
63000	VAGRANCY	0	0	-
70000	JUVENILE RUNAWAY	6	8	-25.0%
73000	Miscellaenous Criminal Offense	0	0	-
73000	MISCELLANEOUS CRIMINAL OFFENSE	8	4	100.0%
75000	SOLICITATION	0	0	-
77000	CONSPIRACY (ALL CRIMES)	0	0	-
Total for Group B		**123**	**118**	**4.2%**
2800	JUVENILE OFFENSES AND COMPLAINTS	69	51	35.3%
2900	TRAFFIC OFFENSES	43	52	-17.3%
3000	WARRANTS	72	82	-12.2%
3100	TRAFFIC CRASHES	248	390	-36.4%
3200	SICK / INJURY COMPLAINT	270	287	-5.9%
3300	MISCELLANEOUS COMPLAINTS	1406	1606	-12.5%
3400	WATERCRAFT COMPLAINTS / ACCIDENTS	1	13	-92.3%
3500	NON-CRIMINAL COMPLAINTS	2392	2199	8.8%
3600	SNOWMOBILE COMPLAINTS / ACCIDENTS	0	0	-
3700	MISCELLANEOUS TRAFFIC COMPLAINTS	2805	2481	13.1%
3800	ANIMAL COMPLAINTS	232	275	-15.6%
3900	ALARMS	336	445	-24.5%
Total for Group C		**7874**	**7881**	**-0.1%**
2700	LOCAL ORDINANCES - GENERIC	0	0	-
4000	HAZARDOUS TRAFFIC CITATIONS / WARNINGS	10	22	-54.5%
4100	NON-HAZARDOUS TRAFFIC CITATIONS / WARNINGS	0	0	-
4200	PARKING CITATIONS	0	7	-100.0%
4300	LICENSE / TITLE / REGISTRATION CITATIONS	0	2	-100.0%
4400	WATERCRAFT CITATIONS	0	0	-

Report CLEAR-008 Summary of Offenses
All Offenses that were Attempted or Completed
For the Month of May

	Classification	May/2019	May/2018	% Change
4500	MISCELLANEOUS A THROUGH UUUU	16	16	0%
4600	LIQUOR CITATIONS / SUMMONS	0	0	-
4700	COMMERCIAL VEHICLE CITATIONS	0	0	-
4800	LOCAL ORDINANCE WARNINGS	0	0	-
4900	TRAFFIC WARNINGS	3	4	-25.0%
Total for Group D		**29**	**51**	**-43.1%**
5000	FIRE CLASSIFICATIONS	1	1	0%
5100	18A STATE CODE FIRE CLASSIFICATIONS	1	2	-50.0%
Total for Group E		**2**	**3**	**-33.3%**
6000	MISCELLANEOUS ACTIVITIES (6000)	107	93	15.1%
6100	MISCELLANEOUS ACTIVITIES	0	0	-
6100	MISCELLANEOUS ACTIVITIES (6100)	667	686	-2.8%
6200	ARREST ASSIST	0	0	-
6300	CANINE ACTIVITIES	13	5	160.0%
6500	CRIME PREVENTION ACTIVITIES	21	39	-46.2%
6600	COURT / WARRANT ACTIVITIES	0	3	-100.0%
6700	INVESTIGATIVE ACTIVITIES	32	17	88.2%
Total for Group F		**840**	**843**	**-0.4%**
Total for All Groups		**9318**	**9317**	**0.0%**

Report CLEAR-008 Summary of Offenses
All Offenses that were Attempted or Completed
Year to Date Through May

	Classification	2019	2018	% Change
09001	MURDER/NONNEGLIGENT MANSLAUGHTER (VOLUNTARY)	1	1	0%
09002	NEGLIGENT HOMICIDE/MANSLAUGHTER (INVOLUNTARY)	0	1	-100.0%
09004	JUSTIFIABLE HOMICIDE	0	0	-
09005	DEATH INVOLVING USE OF FORCE BY LAW ENFORCEMENT	0	0	-
09006	IN-CUSTODY DEATH	0	0	-
10001	KIDNAPPING/ABDUCTION	1	1	0%
10002	PARENTAL KIDNAPPING	1	0	100.0%
11001	SEXUAL PENETRATION PENIS/VAGINA -CSC IST DEGREE	21	21	0%
11002	SEXUAL PENETRATION PENIS/VAGINA -CSC 3RD DEGREE	3	4	-25.0%
11003	SEXUAL PENETRATION ORAL/ANAL -CSC IST DEGREE	5	3	66.7%
11004	SEXUAL PENETRATION ORAL/ANAL -CSC 3RD DEGREE	1	0	100.0%
11005	SEXUAL PENETRATION OBJECT -CSC IST DEGREE	0	2	-100.0%
11006	SEXUAL PENETRATION OBJECT -CSC 3RD DEGREE	0	0	-
11007	SEXUAL CONTACT FORCIBLE -CSC 2ND DEGREE	13	7	85.7%
11008	SEXUAL CONTACT FORCIBLE -CSC 4TH DEGREE	7	12	-41.7%
12000	ROBBERY	24	15	60.0%
13001	NONAGGRAVATED ASSAULT	292	306	-4.6%
13002	AGGRAVATED/FELONIOUS ASSAULT	168	141	19.1%
13003	INTIMIDATION/STALKING	64	48	33.3%
20000	ARSON	3	3	0%
21000	EXTORTION	3	2	50.0%
22001	BURGLARY -FORCED ENTRY	78	99	-21.2%
22002	BURGLARY -ENTRY WITHOUT FORCE (Intent to Commit)	18	21	-14.3%
23001	LARCENY -POCKETPICKING	1	0	100.0%
23002	LARCENY -PURSESNATCHING	0	1	-100.0%
23003	LARCENY -THEFT FROM BUILDING	89	93	-4.3%
23004	LARCENY -THEFT FROM COIN-OPERATED MACHINE/DEVICE	12	0	100.0%
23005	LARCENY -THEFT FROM MOTOR VEHICLE	179	136	31.6%
23006	LARCENY -THEFT OF MOTOR VEHICLE PARTS/ACCESSORIES	26	16	62.5%
23007	LARCENY -OTHER	76	56	35.7%
24001	MOTOR VEHICLE THEFT	55	56	-1.8%
24002	MOTOR VEHICLE, AS STOLEN PROPERTY	16	6	166.7%
24003	MOTOR VEHICLE FRAUD	1	2	-50.0%
25000	FORGERY/COUNTERFEITING	14	21	-33.3%
26001	FRAUD -FALSE PRETENSE/SWINDLE/CONFIDENCE GAME	64	84	-23.8%
26002	FRAUD -CREDIT CARD/AUTOMATIC TELLER MACHINE	64	77	-16.9%
26003	FRAUD -IMPERSONATION	0	0	-
26004	FRAUD -WELFARE FRAUD	0	0	-
26005	FRAUD -WIRE FRAUD	12	4	200.0%
26007	FRAUD - IDENTITY THEFT	63	150	-58.0%
26008	FRAUD - HACKING/COMPUTER INVASION	2	1	100.0%

Report CLEAR-008 Summary of Offenses
All Offenses that were Attempted or Completed
Year to Date Through May

	Classification	2019	2018	% Change
27000	EMBEZZLEMENT	13	8	62.5%
28000	STOLEN PROPERTY	14	12	16.7%
29000	DAMAGE TO PROPERTY	178	166	7.2%
30001	RETAIL FRAUD -MISREPRESENTATION	3	6	-50.0%
30002	RETAIL FRAUD -THEFT	60	108	-44.4%
30003	RETAIL FRAUD -REFUND/EXCHANGE	1	1	0%
30004	ORGANIZED RETAIL FRAUD	0	0	-
35001	VIOLATION OF CONTROLLED SUBSTANCE ACT	41	107	-61.7%
35002	NARCOTIC EQUIPMENT VIOLATIONS	15	41	-63.4%
36001	SEXUAL PENETRATION NONFORCIBLE -BLOOD/AFFINITY	0	0	-
36002	SEXUAL PENETRATION NONFORCIBLE -OTHER	0	1	-100.0%
37000	OBSCENITY	1	2	-50.0%
39001	GAMBLING- BETTING/WAGERING	0	0	-
39002	GAMBLING- OPERATING/PROMOTING/ASSISTING	0	0	-
39003	GAMBLING -EQUIPMENT VIOLATIONS	0	0	-
39004	GAMBLING -SPORTS TAMPERING	0	0	-
40001	COMMERCIALIZED SEX -PROSTITUTION	0	1	-100.0%
40002	COMMERCIALIZED SEX -ASSISTING/PROMOTING PROSTITUTION	0	1	-100.0%
40003	HUMAN TRAFFICKING - PURCHASING PROSTITUTION	0	0	-
51000	BRIBERY	0	0	-
52001	WEAPONS OFFENSE- CONCEALED	14	27	-48.1%
52002	WEAPONS OFFENSE -EXPLOSIVES	0	0	-
52003	WEAPONS OFFENSE -OTHER	11	6	83.3%
64001	HUMAN TRAFFICKING - COMMERCIAL SEX ACTS	0	0	-
64002	HUMAN TRAFFICKING - INVOLUNTARY SERVITUDE	0	0	-
72000	ANIMAL CRUELTY	2	4	-50.0%
Total for Group A		**1730**	**1881**	**-8.0%**
01000	SOVEREIGNTY	1	2	-50.0%
02000	MILITARY	0	0	-
03000	IMMIGRATION	0	0	-
09003	NEGLIGENT HOMICIDE -VEHICLE/BOAT	0	0	-
14000	ABORTION	0	0	-
22003	BURGLARY - UNLAWFUL ENTRY (NO INTENT)	6	5	20.0%
22004	POSSESSION OF BURGLARY TOOLS	0	0	-
26006	FRAUD -BAD CHECKS	9	12	-25.0%
36003	PEEPING TOM	0	0	-
36004	SEX OFFENSE -OTHER	5	4	25.0%
38001	FAMILY -ABUSE/NEGLECT NONVIOLENT	31	22	40.9%
38002	FAMILY -NONSUPPORT	0	0	-
38003	FAMILY -OTHER	1	2	-50.0%
41001	LIQUOR LICENSE -ESTABLISHMENT	0	0	-

Report CLEAR-008 Summary of Offenses
All Offenses that were Attempted or Completed
Year to Date Through May

	Classification	2019	2018	% Change
41002	LIQUOR VIOLATIONS -OTHER	5	18	-72.2%
42000	DRUNKENNESS	2	0	100.0%
48000	OBSTRUCTING POLICE	63	71	-11.3%
49000	ESCAPE/FLIGHT	4	3	33.3%
50000	OBSTRUCTING JUSTICE	100	81	23.5%
53001	DISORDERLY CONDUCT	17	8	112.5%
53002	PUBLIC PEACE -OTHER	1	2	-50.0%
54001	HIT and RUN MOTOR VEHICLE ACCIDENT	24	26	-7.7%
54002	OPERATING UNDER THE INFLUENCE OF LIQUOR OR DRUGS	131	142	-7.7%
55000	HEALTH AND SAFETY	25	28	-10.7%
56000	CIVIL RIGHTS	0	0	-
57001	TRESPASS	6	24	-75.0%
57002	INVASION OF PRIVACY -OTHER	1	2	-50.0%
58000	SMUGGLING	4	1	300.0%
59000	ELECTION LAWS	0	0	-
60000	ANTITRUST	0	0	-
61000	TAX/REVENUE	0	0	-
62000	CONSERVATION	0	0	-
63000	VAGRANCY	1	0	100.0%
70000	JUVENILE RUNAWAY	34	43	-20.9%
73000	Miscellaenous Criminal Offense	0	0	-
73000	MISCELLANEOUS CRIMINAL OFFENSE	14	17	-17.6%
75000	SOLICITATION	1	0	100.0%
77000	CONSPIRACY (ALL CRIMES)	0	0	-
Total for Group B		**486**	**513**	**-5.3%**
2800	JUVENILE OFFENSES AND COMPLAINTS	237	196	20.9%
2900	TRAFFIC OFFENSES	179	212	-15.6%
3000	WARRANTS	389	414	-6.0%
3100	TRAFFIC CRASHES	1635	2298	-28.9%
3200	SICK / INJURY COMPLAINT	1286	1253	2.6%
3300	MISCELLANEOUS COMPLAINTS	6087	6954	-12.5%
3400	WATERCRAFT COMPLAINTS / ACCIDENTS	8	17	-52.9%
3500	NON-CRIMINAL COMPLAINTS	11325	11046	2.5%
3600	SNOWMOBILE COMPLAINTS / ACCIDENTS	0	0	-
3700	MISCELLANEOUS TRAFFIC COMPLAINTS	12745	11284	12.9%
3800	ANIMAL COMPLAINTS	917	909	0.9%
3900	ALARMS	1709	1819	-6.0%
Total for Group C		**36517**	**36402**	**0.3%**
2700	LOCAL ORDINANCES - GENERIC	0	0	-
4000	HAZARDOUS TRAFFIC CITATIONS / WARNINGS	104	97	7.2%
4100	NON-HAZARDOUS TRAFFIC CITATIONS / WARNINGS	2	4	-50.0%

Report CLEAR-008 Summary of Offenses
All Offenses that were Attempted or Completed
Year to Date Through May

	Classification	2019	2018	% Change
4200	PARKING CITATIONS	21	34	-38.2%
4300	LICENSE / TITLE / REGISTRATION CITATIONS	9	13	-30.8%
4400	WATERCRAFT CITATIONS	0	0	-
4500	MISCELLANEOUS A THROUGH UUUU	81	59	37.3%
4600	LIQUOR CITATIONS / SUMMONS	1	0	100.0%
4700	COMMERCIAL VEHICLE CITATIONS	0	0	-
4800	LOCAL ORDINANCE WARNINGS	0	0	-
4900	TRAFFIC WARNINGS	33	20	65.0%
Total for Group D		**251**	**227**	**10.6%**
5000	FIRE CLASSIFICATIONS	2	2	0%
5100	18A STATE CODE FIRE CLASSIFICATIONS	8	8	0%
Total for Group E		**10**	**10**	**0%**
6000	MISCELLANEOUS ACTIVITIES (6000)	443	376	17.8%
6100	MISCELLANEOUS ACTIVITIES	0	0	-
6100	MISCELLANEOUS ACTIVITIES (6100)	2643	2655	-0.5%
6200	ARREST ASSIST	0	0	-
6300	CANINE ACTIVITIES	69	78	-11.5%
6500	CRIME PREVENTION ACTIVITIES	122	201	-39.3%
6600	COURT / WARRANT ACTIVITIES	5	4	25.0%
6700	INVESTIGATIVE ACTIVITIES	106	86	23.3%
Total for Group F		**3388**	**3400**	**-0.4%**
Total for all Groups		**42382**	**42433**	**-0.1%**

Charter Township of Ypsilanti
7200 S. HURON RIVER DRIVE•YPSILANTI, MI 48197

WORK SESSION AGENDA
CHARTER TOWNSHIP OF YPSILANTI
TUESDAY, JUNE 18, 2019

5:00pm

CIVIC CENTER
BOARD ROOM
7200 HURON RIVER DRIVE

1. AGENDA REVIEW ..... SUPERVISOR STUMBO
2. OTHER DISCUSSION ..... BOARD MEMBERS

REVIEW AGENDA

A. SUPERVISOR STUMBO WILL REVIEW BOARD MEETING AGENDA

OTHER DISCUSSION

A. BOARD MEMBERS HAVE THE OPPORTUNITY TO DISCUSS ANY OTHER PERTINENT ISSUES

Charter Township of Ypsilanti

7200 S. HURON RIVER DRIVE•YPSILANTI, MI 48197

SUPERVISOR BRENDA STUMBO • CLERK KAREN LOVEJOY ROE • TREASURER LARRY DOE
TRUSTEES: STAN ELDRIDGE • HEATHER JARRELL ROE • MONICA ROSS WILLIAMS •
JIMMIE WILSON, JR.

REGULAR MEETING AGENDA

TUESDAY, JUNE 18, 2019
7:00 P.M.

1. CALL TO ORDER

2. PLEDGE OF ALLEGIANCE AND INVOCATION

4. PUBLIC COMMENTS

5. CONSENT AGENDA

   A. MINUTES OF THE MAY 21, 2019 WORK SESSION AND REGULAR MEETING

   B. STATEMENTS AND CHECKS

      1. STATEMENTS AND CHECKS FOR JUNE 4, 2019 IN THE AMOUNT OF $565,667.62
      2. STATEMENTS AND CHECKS FOR JUNE 18, 2019 IN THE AMOUNT OF $659,334.45
      3. CHOICE HEALTH CARE DEDUCTIBLE ACH EFT FOR MAY 2019 IN THE AMOUNT OF $50,462.70
      4. CHOICE HEALTH CARE ADMIN FEE FOR APRIL 2019 IN THE AMOUNT OF $1,105.50

   C. MAY 2019 TREASURER'S REPORT

6. ATTORNEY REPORT

   A. GENERAL LEGAL UPDATE

OLD BUSINESS

1. 2ND READING OF RESOLUTION 2019-06, PROPOSED ORDINANCE 2019-486, AN ORDINANCE AMENDING ARTICLE XXVII OF THE ZONING ORDINANCE TO ADD THE CONDITIONAL REZONING TEXT AMENDMENTS
   (FIRST READING HELD AT THE MAY 7, 2019 REGULAR MEETING)

NEW BUSINESS

1. 1st READING OF RESOLUTION 2019-27, PROPOSED ORDINANCE 2019-488, AN ORDINANCE AMENDING THE CODE OF ORDINANCES, CHARTER TOWNSHIP OF YPSILANTI, CHAPTER 30, ARTICLE II ENTITLED FIRE PREVENTION CODE BY THE ADOPTION OF THE 2018 EDITION OF THE INTERNATIONAL FIRE PREVENTION CODE

2. 1ST READING OF RESOLUTION 2019-26, PROPOSED ORDINANCE 2019-487, AMENDING THE ZONING ORDINANCE TO ADD ARTICLE XI-A ECORSE RD. FORM BASED DISTRICT TO ENACT FORM BASED ZONING AND UPDATED USES AND TO REZONE ECORSE RD. TO BE CONSISTENT WITH THE ARTICLE XI-A ZONING ORDINANCE LANGUAGE

3. REQUEST TO APPROVE A BORDER TO BORDER TRAIL AGREEMENT FOR BRIDGE RD. TO SNOW RD. AND THE GROVE RD. TRAIL SEGMENT WITH THE WASHTENAW COUNTY PARKS AND RECREATION COMMISSION

4. RESOLUTION 2019-28, SUPPORT FOR THE IRON BELLE TRAIL IN THE CHARTER TOWNSHIP OF YPSILANTI

5. REQUEST TO AWARD THE LOW BID FOR THE GROVE ROAD PATHWAY EXTENSION PROJECT TO BEST ASPHALT IN THE AMOUNT OF $371,747.50 WITH A 10% CONTINGENCY AMOUNT OF $36,752.50 FOR A TOTAL AMOUNT OF $408,500.00 TO BE BUDGETED IN LINE ITEM #212-970-000-997-007 CONTINGENT UPON APPROVAL OF THE BUDGET AMENDMENT

6. REQUEST TO APPROVE AGREEMENT WITH OHM FOR CONSTRUCTION SERVICES FOR THE PHASE I GROVE RD. PATHWAY FROM BRIDGE RD TO SNOW RD IN THE AMOUNT OF $33,500.00 TO BE BUDGETED IN LINE ITEM #212-970-000-997-007 CONTINGENT UPON APPROVAL OF THE BUDGET AMENDMENT

7. REQUEST TO APPROVE AGREEMENT WITH OHM FOR PROFESSIONAL ENGINEERING DESIGN SERVICES FOR THE PHASE II GROVE RD BORDER TO BORDER PATHWAY FROM SNOW RD. TO RAWSONVILLE RD. IN THE AMOUNT OF $47,900.00 TO BE BUDGETED IN LINE ITEM #212-970-000-997-007 CONTINGENT UPON APPROVAL OF THE BUDGET AMENDMENT

8. REQUEST TO APPROVE AGREEMENT WITH OHM FOR GEOTECHNICAL SERVICES IN RELATION TO THE CIVIC CENTER POND IN THE AMOUNT OF $6,850.00 BUDGETED IN LINE ITEM #101-956-000-801-000

9. RESOLUTION 2019-29, ABANDONED TAX DELINQUENT PROPERTY

10. RESOLUTION 2019-30, PURCHASE TAX FORECLOSED PROPERTY LOCATED AT 641 GREENLAWN IN THE AMOUNT OF $24,974.00 BUDGETED IN LINE ITEM 101-950-000-969-011 FROM THE 2019 WASHTENAW COUNTY TREASURER LIST OF TAX FORECLOSED PROPERTIES UNDER THE RIGHT OF FIRST REFUSAL

11. REQUEST TO APPROVE EQUIPMENT LEASE AGREEMENT WITH THE AMERICAN CENTER FOR MOBILITY FOR THE USE OF AN YPSILANTI TOWNSHIP FIRE TRUCK

12. REQUEST TO WAIVE THE FINANCIAL POLICY AND ACCEPT THE LOW QUOTE FOR PURCHASE OF A NEW STOCK SPARTAN FIRE ENGINE FROM ZAHNEN COMPANIES IN THE AMOUNT OF $515,000.00 BUDGETED IN LINE ITEM #206-970-000-979-000

13. REQUEST TO APPROVE RESOLUTION ESTABLISHING AUTHORIZED SIGNATORIES FOR MERS CONTRACTS AND SERVICE CREDIT PURCHASE APPROVALS

14. REQUEST APPROVAL OF THE 2019 L-4029

15. REQUEST APPROVAL OF AGREEMENT WITH WASHTENAW COMMUNITY COLLEGE FOR EXTENSION CENTER OFFERINGS FOR THE PERIOD OF JULY 1, 2019 TO JUNE 30, 2020

16. REQUEST APPROVAL OF AGREEMENT WITH THE NATIONAL KIDNEY FOUNDATION FOR ENHANCE FITNESS CLASSES AT THE COMMUNITY CENTER FOR 2020

17. REQUEST TO SET A PUBLIC HEARING DATE OF TUESDAY, JULY 2, 2019 AT APPROXIMATELY 7:00PM FOR TWO PRIVATE ROAD VARIANCES

18. REQUEST TO SET A PUBLIC HEARING DATE OF TUESDAY, JULY 16, 2019 AT APPROXIMATELY 7:00PM FOR THE CREATION OF STREETLIGHT SPECIAL ASSESSMENT DISTRICT #217 AMBERLY GROVE SUBDIVISION #2

19. REQUEST TO SCHEDULE A SPECIAL TOWNSHIP BOARD WORK SESSION AND BOARD MEETING ON TUESDAY, JULY 2, 2019 AT 5:00PM AND 7:00PM RESPECTIVELY

20. BUDGET AMENDMENT #10

AUTHORIZATIONS AND BIDS

1. REQUEST TO SEEK SEALED BIDS FOR THE INSTALLATION OF A CONCRETE SLAB AT THE HYDRO STATION

2. REQUEST TO SEEK SEALED BIDS FOR SHORE STABILIZATION ISSUES IN TWO AREAS OF FORD LAKE PARK

3. REQUEST TO SEEK SEALED BIDS FOR THE CONSTRUCTION AND INSTALLATION OF A NEW GENERATOR AT THE LAW ENFORCEMENT CENTER

OTHER BUSINESS

PUBLIC COMMENTS

CONSENT AGENDA

CHARTER TOWNSHIP OF YPSILANTI
MINUTES OF THE MAY 21, 2019 WORK SESSION MEETING

Clerk Lovejoy Roe called the meeting to order at approximately 5:01 p.m. in the Ypsilanti Township Civic Center Board Room, 7200 S. Huron River Drive, Ypsilanti Township.

Clerk Lovejoy Roe stated Supervisor Stumbo has had a death in her family and will not be at the meeting tonight. She asked to remember her and her family in your prayers.

Members Present: Clerk Lovejoy Roe and Treasurer Doe
Trustees: Stan Eldridge, Heather Jarrell Roe,
Jimmie Wilson, Jr. and Monica Ross-Williams

Members Absent: Supervisor Stumbo

Legal Counsel: Wm. Douglas Winters

Clerk Lovejoy Roe stated that there were representatives here for particular agenda items and asked to allow their items to be taken up first. She said the first was Washtenaw County Parks and Recreation and after that presentation, we would hear from YCUA.

NEW BUSINESS

7. **REQUEST TO APPROVE SKATE PARK AGREEMENT BETWEEN YPSILANTI TOWNSHIP AND WASHTENAW COUNTY BY THE WASHTENAW COUNTY PARKS AND RECREATION PARKS COMMISSION**

Megan Bonfiglio, Washtenaw County Parks and Recreation and Trevor Staples, Tony Hawk Foundation presented an overview regarding the skate park.

Mr. Staples explained the benefits of offering a skate park in Ypsilanti Township. He said its' a competitive sport and relatively inexpensive. He said he has been involved in skateboarding for many years and was the lead advocate for the Ann Arbor Skate Park. He said skateboarding makes its debut as an Olympic sport at the 2020 Olympics. Mr. Staples stated after the Olympics, the interest in skate boarding would increase drastically. He said he is still skateboarding at 51 years

old and for many skateboarders it is a lifestyle that you will be involved in for most of your life.

Megan Bonfiglio stated we all know the benefits of recreation. She said we are facing a childhood obesity epidemic. Ms. Bonfiglio said skateboarding and action sports are something that would benefit communities. She said there has been a push for more casual recreation. She said organized sports are more expensive. She said they estimate there are approximately 15 million skateboarders in North America.

Trevor Staples said Mauricio Mejia; a high school student in Ypsilanti Township contacted the Parks Commission asking about the possibility for a skate park in Ypsilanti Township. He said the Tony Hawk Foundation offers technical support and some funding. Mr. Staples stated the larger matching grants were from the Ralph C. Wilson Jr. Foundation and Washtenaw County Parks and Recreation.

Megan Bonfiglio said they looked for a suitable location and found Ypsilanti Township Community Center property to have everything they were looking for. She said when they sent bids out to prospective skate park builders they received seven proposals. She said their advisory committee included input from the skate community, and they selected which proposal they wanted to move forward with. She said the build team had great understanding of the project, good creativity and approach to this project, had a robust community engagement process, experience and expertise in skate park design. Ms. Bonfiglio stated it was very important in their office for the design team to have experience with environmental design. She said they would like to highlight the skate park as a storm water and green infrastructure park. She said they recommended New Line Skate Parks, which is a Canadian company that has offices in the United States. She said they were committed in working with the community and will meet in person at least four times engaging with the community and us. She said they would take the ideas and come up with a design, tweaking it until they have final approval. Ms. Bonfiglio stated New Line Skate Parks will do the design and they will construct the Skate Park. She said that Washtenaw County Parks would oversee all the construction work as the Construction Manager and once

completed they will turn the skate park over to Ypsilanti Township. She said New Line would also design a maintenance schedule for Ypsilanti Township.

Trevor Staples said that he would be helping the township with programing for the park once it is up and running. He said the Ralph C. Wilson Jr. Foundation is interested in helping fund programming after skate parks are built.

Mr. Staples stated on June 21, 2019 they are having International Go Skateboarding Day Weekend. He said he would like to highlight Ypsilanti Township with a ceremonial groundbreaking celebration at the site for the Ypsilanti Township Skate Park. He said they will have a weekend of events but would like to begin in Ypsilanti Township**.**

1. **RESOLUTION 2019-23, APPROVAL OF THE SRF CONTRACT WITH AUTHORIZING NOTICE FOR THE YCUA WASTEWATER TREATMENT PLANT IMPROVEMENTS SRF BOND SALE**

Tom Colis, Attorney with Miller Canfield, stated the Resolution authorizes approval of the contract between YCUA, Ypsilanti City and Ypsilanti Township. He said this contract would provide the financing and the construction by YCUA for the improvements at the YCUA Wastewater Treatment Plant. He said it provides for a share of the cost, between Ypsilanti City and Ypsilanti Township based on usage. He said while the contract states shared cost, the contract municipalities would cover more than 60% of the cost of the improvements through the contract communities rates and charges. Mr. Colis stated that although the contract states the Township would fund a portion of these improvements it would only be necessary if the rates and charges fall short of the cost. He said they do not anticipate that happening. He said this Resolution includes authorizing a notice in the newspaper regarding this Bond Sale.

Scott Westover, YCUA Engineer Manager, explained the improvements that would be made at the Wastewater Treatment Plant.

WORK SESSION AGENDA

1. **RECREATIONAL MARIJUANA ACT NEXT STEPS DISCUSSION**
   ……BOARD MEMBERS

Clerk Lovejoy Roe stated the Township adopted the opt out Resolution at the last board meeting regarding Recreational Marijuana Act. Clerk Lovejoy Roe said the discussion tonight would be whether the Board supports Attorney Winters and Dick Carlisle, Planning Consultant, working together investigating which of the six marijuana businesses allowed under the Recreational Marijuana Act should be located in Ypsilanti Township. She said with Dick Carlisle's expertise in zoning he would be able to help with the correct locations for these businesses if the board decides to allow them.

Trustee Ross-Williams stated she would like Attorney Winters and Mr. Carlisle to look into safety issues regarding employees in marijuana facilities. She said she would like them to speak with residents in business districts to get their opinion on whether they would want these businesses near their neighborhoods. Trustee Ross-Williams would like them to include in their investigations what the average wage employees make in marijuana facilities.

Trustee Wilson, Jr. stated he was glad we were moving forward with this agenda item.

Trustee Jarrell Roe stated she would like to suggest community engagement and a possible survey sent to our residents.

Attorney Winters stated the LARA rules should be coming out in 30-45 days and reminded the Board of the sunset provision being June 30, 2020. He said he would like to know what community benefits these businesses would provide to their employees. He said the township had a living wage ordinance but that it has not been used or updated for some time. He said Ypsilanti Township was the first community to pass the Living Wage Ordinance but it fell by the way side and we have not kept up with it. He said Amazon pays a minimum wage of $15.00 per

hour and that would be an example of what we should expect from these businesses if they were to come into the Township.

Clerk Lovejoy Roe stated she agreed that employees at these businesses should be paid a fair wage with benefits.

Trustee Ross-Williams stated she would like owners of these businesses to have some direct connection to Ypsilanti Township. She said she would like residents to be considered first if becoming an employer or employee.

PUBLIC HEARING

A. **7:00PM – RESOLUTION 2019-25, CREATION OF SECURITY CAMERA SPECIAL ASSESSMENT DISTRICT #074 FOR THE CLIFFS CONDOS**
(PUBLIC HEARING SET AT THE APRIL 16, 2019 REGULAR MEETING)

Clerk Lovejoy Roe explained the Public Hearing tonight was for one camera at the Cliffs Condos. She said it is in proper form. Clerk Lovejoy Roe said she has received several emails in support of the camera and one opposed.

CONSENT AGENDA

A. **MINUTES OF THE MAY 7, 2019 WORK SESSION AND REGULAR MEETING**

B. **STATEMENTS AND CHECKS**

1. **STATEMENTS AND CHECKS FOR MAY 21, 2019 IN THE AMOUNT OF $825,638.38**
2. **CHOICE HEALTH CARE DEDUCTIBLE ACH EFT FOR APRIL 2019 IN THE AMOUNT OF $60,984.67**
3. **CHOICE HEALTH CARE ADMIN FEE FOR MARCH 2019 IN THE AMOUNT OF $1,106.00**

C. APRIL 2019 TREASURER'S REPORT

ATTORNEY REPORT

A. GENERAL LEGAL UPDATE

Attorney Winters stated he had sent a graph regarding neighborhood stabilization to the Board. He said it is interesting to see all the avenues we use in working toward stabilizing neighborhoods in Ypsilanti Township.

Attorney Winters stated there has been a temporary slow-down regarding Forbes Cleaners. He said the funding was an issue and was needed to complete the entire mediation and clean up. He said he received an email today from Mary Miller stating the contractors are planning to install the vapor mitigation system in three houses located at 928, 936, and 944 Davis St. He said Ms. Miller is estimating the additional investigation would not be completed until December 2019.

Attorney Winters stated the demolition of Thurston and Kettering Schools had been completed.

Attorney Winters stated the County should be signing the contract with OHM to begin the work on the Re-Imagine Washtenaw sidewalk project.

Trustee Jarrell Roe stated she was disappointed that the Washtenaw County Treasurer who is not following the law by sending us the list of the tax foreclosed houses in Ypsilanti Township by March 31, 2019. She said because of this we did not have the right of first refusal for purchasing these houses, as we have been able to do for the past several years, which has helped with neighborhood stabilization. Trustee Jarrell Roe stated it was not acceptable that the Township of Ypsilanti continues to be treated differently than other townships in Washtenaw County.

Clerk Lovejoy Roe stated she has never seen anything so difficult to complete than the Re-Imagine Washtenaw project. She said we were improving peoples' property and we were providing the funds to do it and we still had difficulty

getting these businesses to get on board with the project. She said this project was for constructing sidewalks in front of their property, at no charge to the property owner, so people could utilize the sidewalk and get to the businesses, residences, and bus stops safely. She said the project would not have moved forward if it were not for the work of Nathan Vaughn and Attorney Winters.

NEW BUSINESS

1. **RESOLUTION 2019-23, APPROVAL OF THE SRF CONTRACT WITH AUTHORIZING NOTICE FOR THE YCUA WASTEWATER TREATMENT PLANT IMPROVEMENTS SRF BOND SALE**

Clerk Lovejoy Roe explained the improvements for the Wastewater Treatment Plant and said this issue was addressed by YCUA earlier.

2. **REQUEST TO APPROVE THE MASTER DEED, BYLAWS AND ELEVATIONS FOR THE MAJESTIC LAKES ESTATES CONDOMINIUM PHASE OF THE MAJESTIC LAKES PLANNED DEVELOPMENT**

3. **REQUEST TO APPROVE THE MASTER DEED, BYLAWS AND ELEVATIONS FOR THE MAJESTIC PONDS CONDOMINIUM PHASE OF THE MAJESTIC LAKES PLANNED DEVELOPMENT**

4. **REQUEST TO APPROVE THE SECOND AMENDMENT TO MASTER DEED AND ASSOCIATED EXHIBITS OF THE VILLAGE AT MAJESTIC LAKES CONDOMINIUM PHASE OF THE MAJESTIC LAKES PLANNED DEVELOPMENT**

Mike Radzik, OCS Director stated agenda items #2 and #3 were the same. He said the request was for approval of the original Master Deed and By-laws. He said he spoke with Mark Roepuck, Lombardo Homes and Attorney Winters and they decided to modify the Master Deed. He said he would send a written copy of the

modification to Clerk Lovejoy Roe. He said the change had to do with the HOA wording regarding the leasing restrictions and needed to be included in the approvals tonight.

Mike Radzik, OCS Director stated agenda item #4 was an amendment to the Master Deed and it adds Phase II. He said he would like the new language as recommended for agenda items #2 and #3 to be added to agenda item #4 regarding the leasing restrictions.

5. **REQUEST TO APPROVE AMENDED AGREEMENT WITH WASHTENAW COUNTY FOR SUBAWARD OF FEDERAL FINANCIAL ASSISTANCE FOR THE PROPOSED BUS STOP SHELTER AT SCHOONER COVE AND S. HURON RIVER DR.**

Clerk Lovejoy Roe explained the agreement regarding the Bus Stop Shelter.

6. **REQUEST TO APPROVE AN AMENDED AGREEMENT WITH OHM FOR ADDITIONAL WORK TO THE PATHWAY FOR THE SCHOONER COVE BUS STOP IN THE AMOUNT OF $6,110.00 TO BE BUDGETED IN LINE ITEM #101-970-000-974-100 CONTINGENT UPON APPROVAL OF THE BUDGET AMENDMENT**

7. **REQUEST TO APPROVE SKATE PARK AGREEMENT BETWEEN YPSILANTI TOWNSHIP AND WASHTENAW COUNTY BY THE WASHTENAW COUNTY PARKS AND RECREATION PARKS COMMISSION**

Attorney Winters stated the property that will be used for the Skate Park was property that was purchased by the Board in 1980. He said although the Board at that time did not think this property would be used for a Skate Park but they did believe that it would be incorporated into the Townships' Recreation Plan. Attorney Winters stated this was witness to the fact that what the Board does today would have an impact on future generations, as it was 40 years ago that this property was purchased for the future of Ypsilanti Township.

8. **REQUEST TO APPROVE CHANGE ORDER #1 IN THE AMOUNT OF $715.00 AND THE PROPOSAL TO CONDUCT A SUBSURFACE INVESTIGATION AT 1150 MIDWAY IN THE AMOUNT OF $5,570.00 WITH AKT PEERLESS IN A TOTAL AMOUNT OF $6,825.00 TO BE BUDGETED IN LINE ITEM #212-212-000-801-300 CONTINGENT UPON APPROVAL OF THE BUDGET AMENDMENT**

Clerk Lovejoy Roe stated this change order also involves the Skate Park property.

9. **REQUEST OF MIKE RADZIK, OCS DIRECTOR FOR AUTHORIZATION TO SEEK LEGAL ACTION IF NECESSARY TO ABATE PUBLIC NUISANCE FOR PROPERTY LOCATED AT 2358 RAVINEWOOD AVE., 5940 ELLIS RD., AND 2830 E. MICHIGAN AVE. IN THE AMOUNT OF $30,000.00 BUDGETED IN LINE ITEM #101-950-000-801-023**

10. **REQUEST TO APPROVE AGREEMENT WITH THE WASHTENAW COUNTY ROAD COMMISSION FOR LOCAL ROAD DUST CONTROL IN THE AMOUNT OF $5,847.93 BUDGETED IN LINE ITEM #212-212-000-818-006**

Clerk Lovejoy Roe stated we do this every year and it is in the budget.

11. **RESOLUTION 2019-24, AMENDED 2019 DESIGNATION OF DEPOSITORIES**

Treasurer Doe stated that Key Bank has taken property tax payments in the past but they have decided not to continue. He said they were trying to find another institution on the west side of the township so residents did not have to come to the Civic Center to make tax payments. He said most banks do not want to take the payment any longer. Treasurer Doe stated the Washtenaw Credit Union agreed to take the tax payments so we needed to add them to the designation of depositories resolution.

12. **BUDGET AMENDMENT #9**

Clerk Lovejoy Roe explained what was in Budget Amendment #9.

AUTHORIZATION AND BIDS

1. **REQUEST OF MIKE RADZIK, OCS DIRECTOR TO AWARD THE LOW BID FOR THE GENERATOR REPLACEMENT AT THE LAW ENFORCEMENT CENTER TO CUMMINS INC. IN THE AMOUNT OF $83,767.00 TO BE BUDGETED IN LINE ITEM #266-301-000-971-001 CONTINGENT UPON APPROVAL OF THE BUDGET AMENDMENT**

Mike Radzik, OCS Director explained the purchase and the installation for the Generator at the Law Enforcement Center.

Trustee Eldridge questioned the cost for OHM Professional Services. He asked if they could provide a break down for the $38,700.00. He said the cost seems very high for overseeing the installation of a generator. He said it also seems like we are duplicating a service. Mike Radzik stated he would share the contract with Trustee Eldridge.

Treasurer Doe asked Mr. Radzik if the Sheriff would help with the cost of this project. Mr. Radzik said he had not contacted anyone from the Sheriffs' Office but he planned on contacting them when he finds the appropriate department to reach out to. Treasurer Doe asked what might be an approximate cost for the installation. Elliott Smith, OHM stated an approximate cost would be about $150,000.00. Treasurer Doe confirmed it would cost about $150,000.00 to install an $87,000.00 generator.

Trustee Jarrell Roe stated that we just spent a lot of money to re-open the Holmes Road Law Enforcement facility. She said she knew it was about our safety but stated this should be a joint effort with the Sheriffs' department.

Mr. Radzik stated he understood what was being asked but in our contract with the Sheriff's Department, it states that if we want their officers to report to work in our jurisdiction we are required to provide a suitable facility for them. He said he knows that they do other training there and does agree that it would be fair for them to help fund this.

Trustee Ross-Williams questioned the cost for installation. Elliott Smith, OHM said the cost included hook up of the generator, transfer switch, plumbing, the slab the generator sits on, foundation for the slab, and the warranty. He said for a generator that would be the standard cost for installation.

Treasurer Doe still questioned the cost for installation being $150,000.00

Mr. Radzik stated that the generator would go on an 8-inch thick concrete slab. He said our building officials insisted on installing footings because of the size and weight. Mr. Radzik said this was a very large piece of machinery. He said when he spoke with Stan Tec about the project they told him to plan on it costing approximately $250,000.00 to $300,000.00. He said the OHM estimate was a little less and their hourly rates were better than Stan Tec. Mr. Radzik said that in the end we could leave the existing generator there and hope for the best. He said the old generator is 75 Kilowatts and about 40 years old. He said the engineers stated we needed a minimum of 300 Kilowatts to run the generator for an extended period.

Treasurer Doe stated he was not arguing the need for the generator but was questioning the cost for installing it.

Clerk Lovejoy Roe stated she recalled years ago they had looked into a generator for the Civic Center and decided against it, since it would cost over $200,000.00 at that time.

Mr. Radzik stated that some of the cost was for the sound package. He said the natural gas generator was quieter but it was about double the cost for the diesel generator. He said they went with the diesel for that reason but also if there was a natural disaster it may be hard to get natural gas but diesel fuel could be delivered. He said they needed the sound package to meet the zoning code in Ypsilanti Township.

Trustee Jarrell Roe asked what the exact cost was for the sound package and whether we needed to worry about a zoning code violation during a natural disaster. Mr. Radzik stated he would get the exact cost for Trustee Jarrell Roe.

2. **REQUEST OF MIKE RADZIK, OCS DIRECTOR TO APPROVE A PROFESSIONAL SERVICES CONTRACT WITH OHM ADVISORS FOR PROCUREMENT, DELIVERY AND INSTALLATION OF THE REPLACEMENT GENERATOR AT THE LAW ENFORCEMENT CENTER IN THE AMOUNT OF $38,700.00 TO BE BUDGETED IN LINE ITEM #260-301-000-971-001 CONTINGENT UPON APPROVAL OF THE BUDGET AMENDMENT**

3. **REQUEST FOR AUTHORIZATION TO WAIVE THE FINANCIAL POLICY AND SEEK THREE QUOTES FOR REPAIR OF THE ROOF ON THE CIVIC CENTER MAINTENANCE GARAGE AND AUTHORIZE THE THREE FULL TIME OFFICIALS TO SELECT THE VENDOR AND ENTER INTO A CONTRACT FOR THE PROJECT**

Clerk Lovejoy Roe stated the roof is leaking right now and that is why the request to waive the financial policy was being made, so they could get the quotes sooner and get the roof repaired.

Treasurer Doe estimated the cost to be about $20,000.00

The Work Session adjourned at 6:33 p.m.

Respectfully Submitted,

Karen Lovejoy Roe, Clerk
Charter Township of Ypsilanti

CHARTER TOWNSHIP OF YPSILANTI
MINUTES OF THE MAY 21, 2019 REGULAR BOARD MEETING

Clerk Lovejoy Roe called the meeting to order at approximately 7:00 p.m. in the Ypsilanti Township Civic Center Board Room, 7200 S. Huron River Drive, Ypsilanti Township. The Pledge of Allegiance was recited followed by a moment of silent prayer.

Clerk Lovejoy Roe asked to remember in prayers Supervisor Stumbo and her family in the passing of a family member.

Members Present: Clerk Lovejoy Roe, Treasurer Doe
Trustees: Stan Eldridge, Heather Jarrell Roe
Jimmie Wilson, Jr., and Monica Ross-Williams

Members Absent: Supervisor Stumbo

Legal Counsel: Wm. Douglas Winters

PUBLIC HEARING

A. **7:00PM – RESOLUTION 2019-25, CREATION OF SECURITY CAMERA SPECIAL ASSESSMENT DISTRICT #074 FOR THE CLIFFS CONDOS**
(PUBLIC HEARING SET AT THE APRIL 16, 2019 REGULAR MEETING)

Clerk Lovejoy Roe declared the Public Hearing Opened at 7:01p.m.

Karen Hanson, Township Resident asked if after this 3-year contract is up and they wanted to raise the rate could the residents opt out.

Clerk Lovejoy Roe stated the board works for residents and they would look for a more competitive rate. She said with a request of your Association you could bring it to the Board and they could reverse the decision.

William Johnston, Township Resident asked how many cameras there were in the Township and how the decision was made on where to install cameras.

Clerk Lovejoy Roe stated there were about 50 cameras in neighborhoods. She said your Association at the Cliffs told the Board where they wanted the camera to be placed. Clerk Lovejoy Roe said although they do not prevent crime, when a crime is committed, Sheriffs' Department personnel views the tape to get the information off the tape to help solve the crime.

Michael Radzik, OCS Director stated the camera's video feed was not monitored live. He said when a crime is committed or an incident of interest for law enforcement they use it as an investigative tool. Mr. Radzik said the Sheriffs' Department could go back to approximate day and time and get information off the video. He said that Comcast is used and they wanted a longer-term contract but we asked for a shorter contract and they reduced the price for their service because this was becoming a very competitive business, so that will keep the rates down.

Khurum Sheikh, Township Resident stated the Cliffs on the Point II requested the cameras. He said they had a homicide last year in the complex and they looked for different things to do to make the community safer. He said Cliffs on the Point has four cameras and now with this additional camera it would help and he gladly endorses it.

Clerk Lovejoy Roe read the following emails she received:

Michael and Mary Brown are in strong support of the camera
Crystal Foley-Seifert is in support of the camera
Nancy Hooper and Tim Glaea are in support of the camera
John and Eileen Klink are in support of the camera

Richard and Janice Gala are not in support of the camera (attached)

Clerk Lovejoy Roe closed the Public Hearing at 7:13p.m.

A motion was made by Clerk Lovejoy Roe, supported by Trustee Eldridge to Approve Resolution 2019-25, Creation of Security Camera Special Assessment District #074 for the Cliffs Condos (see attached).

Jarrell Roe	**Yes**	**Eldridge**	**Yes**	**Ross-Williams**	**Yes**
Lovejoy Roe	**Yes**	**Doe**	**Yes**	**Wilson**	**Yes**

The motion carried unanimously.

PUBLIC COMMENTS

Arloa Kaiser, Township Resident stated she would encourage the residents to write letters to Clerk Lovejoy Roe in support of receiving the grant for the improvements at Loonfeather Park.

Jo Ann McCollum, Township Resident stated she appreciated all the work that was done on getting the Skate Park. She thanked Supervisor Stumbo and Clerk Lovejoy Roe in getting the light on Onadaga. She thanked Trustee Ross-Williams and the Neighborhood Watch Coordinator, Crystal Campbell for coming to the West Willow Association Meeting and explaining about the Marijuana Ordinance and why the Township opted out at this time. She said she sent an email to Trustee Wilson and he did not respond so she read the email to the entire board. She said she was concerned with the video interview that he was in and stated he had first voted yes to opt out on the Marijuana Resolution and then he voted no not to opt out at the 2nd reading. She said she was confused by his response. She said when Trustee Wilson was at the board meeting he did not have much to say about the Marijuana Resolution but during the interview he had a lot to say. She said she would expect him to voice the reasons at the board meeting rather than during an interview. She said Trustee Wilson voted yes on the Nexus Pipeline because he said it was best for the residents but when he voted no on the Marijuana Resolution he said it was

what the residents want. Ms. McCollum stated she votes people in office because she expects them to do the best for residents. She said she was highly offended when Trustee Wilson laughed and agreed with the Interviewer when he said the church congregation says one thing and votes another. She said it shows a lack of respect for this group of people. Ms. McCollum said she could respect Trustee Wilsons' point of view and decision to not want to opt out of the Marijuana Ordinance however, she could not respect his lack of regard to the church congregation.

Khurum Sheikh, Township Resident stated his whole community would like Gault Village to have some good businesses and he knew at one time there was talk about a restaurant going in on Ford Lake. He said if anyone has influences on making that happen it would be appreciated.

CONSENT AGENDA

A. **MINUTES OF THE MAY 7, 2019 WORK SESSION AND REGULAR MEETING**

B. **STATEMENTS AND CHECKS**

1. **STATEMENTS AND CHECKS FOR MAY 21, 2019 IN THE AMOUNT OF $825,638.38**
2. **CHOICE HEALTH CARE DEDUCTIBLE ACH EFT FOR APRIL 2019 IN THE AMOUNT OF $60,984.67**
3. **CHOICE HEALTH CARE ADMIN FEE FOR MARCH 2019 IN THE AMOUNT OF $1,106.00**

C. **APRIL 2019 TREASURER'S REPORT**

A motion was made by Treasurer Doe, supported by Trustee Ross-Williams to Approve the Consent Agenda.

The motion carried unanimously.

ATTORNEY REPORT

A. **GENERAL LEGAL UPDATE** - presented at the Work Session

NEW BUSINESS

1. **RESOLUTION 2019-23, APPROVAL OF THE SRF CONTRACT WITH AUTHORIZING NOTICE FOR THE YCUA WASTEWATER TREATMENT PLANT IMPROVEMENTS SRF BOND SALE**

A motion was made by Clerk Lovejoy Roe, supported by Treasurer Doe to Approve Resolution 2019-23, the SRF Contract with Authorizing Notice for the YCUA Wastewater Treatment Plant Improvements SRF Bond Sale.

The motion carried unanimously.

2. **REQUEST TO APPROVE THE MASTER DEED, BYLAWS AND ELEVATIONS FOR THE MAJESTIC LAKES ESTATES CONDOMINIUM PHASE OF THE MAJESTIC LAKES PLANNED DEVELOPMENT TO INCLUDE THE CHANGE OF THE MASTER DEED ARTICLE VIII, SECTION B-6 TO READ THE MODIFICATION OF LEASING RESTRICTIONS TO ONLY BE MORE RESTRICTIVE THAN OTHERWISE REQUIRED IN THE DEVELOPMENT AGREEMENT AND BYLAWS**

A motion was made by Clerk Lovejoy Roe, supported by Trustee Eldridge to Approve the Master Deed, Bylaws and Elevations for the Majestic Lakes Estates Condominium Phase of the Majestic Lakes Planned Development to Include the Change of the Master Deed Article VIII, Section B-6 to Read the Modification of Leasing Restrictions to only be More Restrictive than Otherwise Required in the Development Agreement and Bylaws.

Mark Roepuck, Development Coordinator, Lombardo Homes stated he had reviewed the language with changes with Mike Radzik, OCS Director and he was in agreement with the changes.

The motion carried unanimously.

3. **REQUEST TO APPROVE THE MASTER DEED, BYLAWS AND ELEVATIONS FOR THE MAJESTIC PONDS CONDOMINIUM PHASE OF THE MAJESTIC LAKES PLANNED DEVELOPMENT TO INCLUDE THE CHANGE OF THE MASTER DEED ARTICLE VIII, SECTION B-6 TO READ THE MODIFICATION OF LEASING RESTRICTIONS TO ONLY BE MORE RESTRICTIVE THAN OTHERWISE REQUIRED IN THE DEVELOPMENT AGREEMENT AND BYLAWS**

A motion was made by Clerk Lovejoy, supported by Treasurer Doe to Approve the Master Deed, Bylaws and Elevations for the Majestic Ponds Condominium Phase of the Majestic Lakes Planned Development to Include the Change of the Master Deed Article VIII, Section B-6 to Read the Modification of Leasing Restrictions to only be More Restrictive Than Otherwise Required in the Development Agreement and Bylaws .

Mark Roepuck, Development Coordinator, Lombardo Homes stated he was in agreement with the changes.

The motion carried unanimously.

4. **REQUEST TO APPROVE THE SECOND AMENDMENT TO MASTER DEED AND ASSOCIATED EXHIBITS OF THE VILLAGE AT MAJESTIC LAKES CONDOMINIUM PHASE OF THE MAJESTIC LAKES PLANNED DEVELOPMENT TO INCLUDE THE CHANGE OF THE MASTER DEED ARTICLE VIII, SECTION B-6 TO READ THE MODIFICATION OF LEASING RESTRICTIONS TO ONLY BE MORE RESTRICTIVE THAN OTHERWISE REQUIRED IN THE DEVELOPMENT AGREEMENT AND BYLAWS**

A motion was made by Clerk Lovejoy Roe, supported by Trustee Jarrell Roe to Approve the Second Agreement to Master Deed and Associated Exhibits of the Village at Majestic Lakes Condominium Phase of the Majestic Lakes Planned Development to Include the Change of the Master Deed Article VIII, Section B-6 to Read the Modification of Leasing Restrictions to only be More Restrictive Than Otherwise Required in the Development Agreement and Bylaws.

Mark Roepuck, Development Coordinator, Lombardo Homes stated he was in agreement with the changes.

The motion carried unanimously.

5. **REQUEST TO APPROVE AMENDED AGREEMENT WITH WASHTENAW COUNTY FOR SUBAWARD OF FEDERAL FINANCIAL ASSISTANCE FOR THE PROPOSED BUS STOP SHELTER AT SCHOONER COVE AND S. HURON RIVER DR.**

A motion was made by Trustee Jarrell Roe, supported by Treasurer Doe to Approve the Amended Agreement with Washtenaw County for Subaward of Federal Financial Assistance for the Proposed Bus Stop Shelter at Schooner Cove and S. Huron River Dr. (see attached).

The motion carried unanimously.

6. **REQUEST TO APPROVE AN AMENDED AGREEMENT WITH OHM FOR ADDITIONAL WORK TO THE PATHWAY FOR THE SCHOONER COVE BUS STOP IN THE AMOUNT OF $6,110.00 TO BE BUDGETED IN LINE ITEM #101-970-000-974-100 CONTINGENT UPON APPROVAL OF THE BUDGET AMENDMENT**

A motion was made by Treasurer Doe, supported by Trustee Jarrell Roe to Approve an Amended Agreement with OHM for Additional Work to the Pathway for the Schooner Cove Bus Stop in the Amount of $6,110.00 to be Budgeted in Line Item #101-970-000-974-100 Contingent upon Approval of the Budget Amendment (see attached).

The motion carried unanimously.

7. **REQUEST TO APPROVE SKATE PARK AGREEMENT BETWEEN YPSILANTI TOWNSHIP AND WASHTENAW COUNTY BY THE WASHTENAW COUNTY PARKS AND RECREATION PARKS COMMISSION**

A motion was made by Trustee Jarrell Roe, supported by Trustee Wilson to Approve the Skate Park Agreement Between Ypsilanti Township and Washtenaw County by the Washtenaw County Parks and Recreations Parks Commission (see attached).

The motion carried unanimously.

8. **REQUEST TO APPROVE CHANGE ORDER #1 IN THE AMOUNT OF $715.00 AND THE PROPOSAL TO CONDUCT A SUBSURFACE INVESTIGATION AT 1150 MIDWAY IN THE AMOUNT OF $5,570.00 WITH AKT PEERLESS IN A TOTAL AMOUNT OF $6,825.00 TO BE BUDGETED IN LINE ITEM #212-212-000-801-300 CONTINGENT UPON APPROVAL OF THE BUDGET AMENDMENT**

A motion was made by Treasurer Doe, supported by Trustee Wilson to Approve the Change Order #1 in the Amount of $715.00 and the Proposal to Conduct a Subsurface Investigation at 1150 Midway in the Amount of $5,570.00 with AKT Peerless in a Total Amount of $6,825.00 to be Budgeted in Line Item #212-212-000-801-300 Contingent Upon Approval of the Budget Amendment (see attached).

The motion carried unanimously.

9. **REQUEST OF MIKE RADZIK, OCS DIRECTOR FOR AUTHORIZATION TO SEEK LEGAL ACTION IF NECESSARY TO ABATE PUBLIC NUISANCE FOR PROPERTY LOCATED AT 2358 RAVINEWOOD AVE., 5940 ELLIS RD., AND 2830 E. MICHIGAN AVE. IN THE AMOUNT OF $30,000.00 BUDGETED IN LINE ITEM #101-950-000-801-023**

A motion was made by Trustee Jarrell Roe, supported by Trustee Eldridge to Approve the Request of Mike Radzik, OCS Director for Authorization to Seek Legal Action if necessary to Abate Public Nuisance for Property Located at 2358 Ravinewood Ave., 5940 Ellis Rd., and 2830 E. Michigan Ave. in the Amount of $30,000.00 Budgeted in Line Item #101-950-000-801-023.

The motion carried unanimously.

10. **REQUEST TO APPROVE AGREEMENT WITH THE WASHTENAW COUNTY ROAD COMMISSION FOR LOCAL ROAD DUST CONTROL IN THE AMOUNT OF $5,847.93 BUDGETED IN LINE ITEM #212-212-000-818-006**

A motion was made by Trustee Ross-Williams, supported by Trustee Eldridge to Approve the Agreement with the Washtenaw County Road Commission for Local Road Dust Control in the Amount of $5,847.93 Budgeted in Line Item #212-212-000-818-006 (see attached).

The motion carried unanimously.

11. **RESOLUTION 2019-24, AMENDED 2019 DESIGNATION OF DEPOSITORIES**

A motion was made by Treasurer Doe, supported by Trustee Ross-Williams to Approve Resolution 2019-24, Amended 2019 Designation of Depositories (see attached).

The motion carried unanimously.

12. BUDGET AMENDMENT #9

A motion was made by Clerk Lovejoy Roe, supported by Treasurer Doe to Approve Budget Amendment #9 (see attached).

Trustee Jarrell Roe stated she does not support the law enforcement increase for the generator.

Trustee Ross-Williams said she had questions about the cost of the generator installation.

The motion carried unanimously.

AUTHORIZATION AND BIDS

1. **REQUEST OF MIKE RADZIK, OCS DIRECTOR TO AWARD THE LOW BID FOR THE GENERATOR REPLACEMENT AT THE LAW ENFORCEMENT CENTER TO CUMMINS INC. IN THE AMOUNT OF $83,767.00 TO BE BUDGETED IN LINE ITEM #266-301-000-971-001 CONTINGENT UPON APPROVAL OF THE BUDGET AMENDMENT**

Trustee Jarrell Roe stated she does not support the Township funding this entire project without the Sheriffs' Department contributing to the cost. She said that one year and six days ago the board authorized not to exceed $25,000.00 to re-open our Holmes Road Law Enforcement Center. She said she was grateful for that but if we include what was being asked for us to approve now it would mean the Township has spent about $300,000.00 in the last year for our law enforcement buildings. She said she expects the Washtenaw County Sheriffs' Department to help with this cost. She said we still have two deputy positions that we budgeted for in 2018 that have not been filled by the Sheriffs' Department.

Trustee Ross-Williams stated she would like to offer a friendly amendment to this request to seek funds from the Washtenaw County Sheriff to help with the cost of this project.

Clerk Lovejoy Roe stated this request was to purchase it and the concern was to help get funds to complete the project. She said she would not want to purchase it if we do not have the funds to install it. She said when we are spending this type of money we should have full board support.

Treasurer Doe stated we should set up a meeting with the County and see what piece of this they should contribute funds for. He said we should ask the Sheriffs' Department if they need or want this new generator.

Mr. Radzik said we couldn't get parts for the old generator and said he has not asked the Sheriff what he would want to replace it with.

Clerk Lovejoy Roe stated that if we don't get help paying for it then we would have to scale down on what type of unit the Sheriff would need to just keep certain things up and running in case of an outage.

Trustee Eldridge stated that we are taking a gamble that a natural disaster will not happen until we get all the information that should have been brought to the board with this request. He said this has put the board in a bad position if something happens before it was presented to the board again. He said he does not support tabling it but does have questions on the cost. He said to keep this building functional we will have to put in a new generator. Trustee Eldridge said if we table it now we will not be doing what we were elected to do and that is to make decisions that will benefit the community should something happen. He said he thinks we should purchase it and then inter into a dialog that in future purchases the County would have to put in money.

Mike Radzik stated he would hope they could get the County to contribute in this project. He said this generator would automatically turn on within 10 or 12 seconds when the power goes off. He said one reason it was so expensive was the HAV system provides heating and cooling if there were a long-term outage. He said we could go with less but it was decided that this was an important and critical infrastructure for the safety of our community and we should get the full extent for stand-by power.

Trustee Eldridge stated that when he was with the Police Department in the City of Ypsilanti the whole area had a brown out and the generator they had was not sufficient and because of this the computers were breaking down.

Mike Radzik stated that the 14B Court has a generator but when the power would go out it would keep some hall lights on and maybe one outlet.

Clerk Lovejoy Roe stated she thought that was the type of generator the Civic Center had and it only provided minimal lighting and no heat or air conditioning.

Trustee Jarrell Roe stated she appreciated Trustee Eldridge and Mike Radzik for their work in law enforcement, but she would not be pressured to vote on this if they do not know if the County would help share some of the cost. She said she was not willing to compromise the safety of our residents but she was elected to be fiscally responsible and she believes spending $300,000.00 in a matter of a year was not being responsible.

Trustee Ross-Williams said she was clarifying that she could not ask for an amendment so we could mitigate with the County for their help in paying some of the installation cost.

Clerk Lovejoy Roe stated that the request was for the purchasing of the generator. She said we would still purchase it but the amendment would be to ask the County to help share the cost.

A motion was made by Treasurer Doe, supported by Trustee Wilson to Approve the Request of Mike Radzik, OCS Director to Award the Low Bid for the Generator Replacement at the Law Enforcement Center to Cummins Inc. in the Amount of $83,767.00 to be Budgeted in Line Item #266-301-000-971-001 Contingent upon Approval of the Budget Amendment.

A Friendly Amendment was made by Trustee Ross-Williams, supported by Trustee Eldridge to ask the Washtenaw County, Washtenaw County Sheriff, and Washtenaw County Emergency Management Organization to share in the cost of the purchase of the generator and the cost for installation.

The motion for the Amendment carried. Trustee Jarrell Roe voted no.

The original motion for the Purchase of the Generator carried. Trustee Jarrell Roe voted no.

2. **REQUEST OF MIKE RADZIK, OCS DIRECTOR TO APPROVE A PROFESSIONAL SERVICES CONTRACT WITH OHM ADVISORS FOR PROCUREMENT, DELIVERY AND INSTALLATION OF THE REPLACEMENT GENERATOR AT THE LAW ENFORCEMENT CENTER IN THE AMOUNT OF $38,700.00 TO BE BUDGETED IN LINE ITEM #260-301-000-971-001 CONTINGENT UPON APPROVAL OF THE BUDGET AMENDMENT**

A motion was made by Trustee Jarrell Roe, supported by Trustee Ross-Williams to Approve the Request of Mike Radzik, OCS Director to Approve a Professional Services Contract with OHM Advisors for Procurement, Delivery and Installation of the Replacement Generator at the Law Enforcement Center in the Amount of $38,700.00 to be Budgeted in Line Item #260-301-000-971-001 Contingent Upon Approval of the Budget Amendment (see attached).

An Amendment was made by Trustee Eldridge, supported by Trustee Ross-Williams to have an itemized bill from OHM.

The motion for the Amendment carried unanimously.

The original motion for Professional Service Contract with OHM carried. Trustee Jarrell Roe and Trustee Ross-Williams voted no.

3. **REQUEST FOR AUTHORIZATION TO WAIVE THE FINANCIAL POLICY AND SEEK THREE QUOTES FOR REPAIR OF THE ROOF ON THE CIVIC CENTER MAINTENANCE GARAGE AND AUTHORIZE THE THREE FULL TIME OFFICIALS TO SELECT THE VENDOR AND ENTER INTO A CONTRACT FOR THE PROJECT**

A motion was made by Trustee Jarrell Roe supported by Trustee Eldridge to Approve the Request for Authorization to Waive the Financial Policy and Seek Three Quotes for Repair of the Roof on the Civic Center Maintenance Garage and Authorize the Three Full time Officials to Select the Vendor and Enter into a Contract for the Project.

The motion carried unanimously.

A motion was made by Treasurer Doe supported by Trustee Wilson to Adjourn.

The motion carried unanimously.

The meeting was adjourned at approximately 8:02PM.

Respectfully Submitted,

Brenda L. Stumbo, Supervisor
Charter Township of Ypsilanti

Karen Lovejoy Roe, Clerk
Charter Township of Ypsilanti

CHARTER TOWNSHIP OF YPSILANTI

RESOLUTION 2019-25

CREATION OF NEIGHBORHOOD CAMERA SPECIAL ASSESSMENT DISTRICT #074 CLIFFS CONDOS

WHEREAS, at the request of your Homeowner's Association, the Township Board of the Charter Township of Ypsilanti proposes to install a security camera to be located at the southwest corner of Grove Rd. and Cliffs Dr.; and

WHEREAS, Ypsilanti Township has paid for the purchase and installation of the security camera; and

WHEREAS, the Township Board proposes the creation of a special assessment district consisting of 245 parcels known as Cliffs Condos, which will be benefited to defray the operation and maintenance cost of the security cameras; and

WHEREAS, the Township Board has solicited *Requests for Proposals* for the proposed project describing the security camera improvements, the proposed location of said improvements and estimated costs; and

WHEREAS, Conti Corporation, a video security company, licensed by the State of Michigan, prepared and submitted proposed plans to install, operate and maintain security cameras in public areas located within the boundaries of Cliffs Condos, which consists of 245 parcels with the following estimated costs:

• Costs for purchase and installation of 1 security camera (paid for by Ypsilanti Township):	$4,908.09
• Total Annual Residents' Cost for maintenance and operation of security cameras: (First three years)	$6,900.72
• Annual cost per parcel	$ 9.39
• Monthly cost per parcel	$ .78

WHEREAS, the plans, estimates of cost and proposed special assessment district were filed with the Township Clerk for public examination and notice of the public hearing upon the same was published and mailed in accordance with the law and statute provided as shown by affidavits pertaining thereto on file with the Township Clerk; and

WHEREAS, in accordance with the aforesaid notices, a hearing was held on the ***21st*** day of ***May***, ***2019*** commencing at approximately ***7:00pm*** and all persons given the opportunity to be heard in the matter; and

WHEREAS, as a result of the foregoing, the Township Board believes the project to be in the best interests of the Township and of the district proposed to be established therefore;

NOW, THEREFORE, BE IT HEREBY RESOLVED as follows:

1. That this Township Board does hereby approve the plans for public security cameras as prepared and presented by the Township's licensed security system contractor and its annual estimate of costs for the operation and maintenance thereof.
2. That this Township Board creates a special assessment district located within the boundaries of Cliffs Condos with the district to be known as Cliffs Condos Neighborhood Camera Special Assessment District No. 074 within which the costs of the operation and maintenance of the security cameras shall be assessed according to benefits.
3. That on the basis of the foregoing, this Township Board does hereby direct the Supervisor and Assessing Officer to make a special assessment roll in which shall be entered and described all the parcels of land to be assessed with the names of the respective owners thereof if known, and a total amount to be assessed against each parcel of land which amount shall be the relative portion of the whole sum to be

levied against the parcels of land in the special assessment district as the benefit to the parcel of land bears to the total benefit to all the parcels of land in the special assessment district. When the same has been completed, the Supervisor or Assessing Officer shall affix thereto her certificate stating that it was made pursuant to this resolution and that in making such assessment roll, she has, according to her best judgment, conformed in all respects to the directions contained in this resolution and the applicable state statutes.

4. When the special assessment roll has been prepared and filed in the office of the Township Clerk, before said assessment roll has been confirmed, the Township Board shall appoint a time and place when it will meet, review and hear any objections to the assessment roll.
5. If the special assessment roll is confirmed, the Township Board intends to hold a public hearing once each year in future years, on or before September 30, to reassess property in the special assessment district for the costs in the next year, and will provide notice of such hearing in such a manner as prescribed by law.
6. That all resolutions and parts of resolutions insofar as they conflict with the provisions of the within resolution be and the same are hereby rescinded.

I, Karen Lovejoy Roe, Clerk of the Charter Township of Ypsilanti, County of Washtenaw, State of Michigan hereby certify the above resolution is a true and exact copy of Resolution No. 2019-25 approved by the Charter Township of Ypsilanti, Board of Trustees assembled at a Regular Meeting held on May 19, 2019.

Karen Lovejoy Roe

Karen Lovejoy Roe, Clerk
Charter Township of Ypsilanti

OFFICE OF COMMUNITY & ECONOMIC DEVELOPMENT
Collaborative solutions for a promising future

415 W. Michigan Avenue
Ypsilanti, MI 48197

734.544.6748 (P)
734.544.6749 (F)

www.ewashtenaw.org/oced
twitter@WashtenawOCED

facebook.com/washtenawoced
www.opportunitywashtenaw.org

May 20, 2019

CR # 51091

Supervisor Brenda Stumbo
Charter Township of Ypsilanti
7200 S. Huron River Drive
Ypsilanti, MI 48197

Dear Supervisor Stumbo,

Washtenaw County wishes to amend the contract with Ypsilanti Township for *Schooner Cove Bus Shelter design and bidding assistance*. Corporation Counsel has indicated that this amendment could be accomplished by a letter signed by both of us. If this amendment is agreeable to you, please sign and return all copies of this letter. You will receive an executed copy of this letter upon completion.

Accordingly, I hereby amend the *Agreement for Subaward of Federal Financial Assistance* between Washtenaw County and Ypsilanti Township dated December 5, 2018 and CR# 51091 as follows:

Amend ARTICLE I – REQUIRED DATA ELEMENTS to increase the contract dollar amount and include the 2017 grant funds as follows:

Subrecipient Name (must match registered name in DUNS)	Charter Township of Ypsilanti
Subrecipient DUNS Number	
Federal Award Identification Number (FAIN)	$15,246 - B-16-UC-26-006 $5,164 - B-17-UC-26-006
Federal Award Date (the date when the federal award is signed by the authorized official of the federal awarding agency)	2016 – September 1, 2016 2017 – October 19, 2017
Subaward Period of Performance (start and end date)	November 1, 2018 – December 31, 2019
Amount of Federal Funds Obligated by this Agreement	$20,410.00
Total Amount of Federal Funds Obligated to the Subrecipient	$20,410.00
Total Amount of the Federal Award	2016 – $1,858,189.00 2017 - $1,846,861.00

OFFICE OF COMMUNITY & ECONOMIC DEVELOPMENT
Collaborative solutions for a promising future

415 W. Michigan Avenue
Ypsilanti, MI 48197

734.544.6748 (P)
734.544.6749 (F)

www.ewashtenaw.org/oced
twitter@WashtenawOCED

facebook.com/washtenawoced
www.opportunitywashtenaw.org

Amend ARTICLE II – Scope of Services as follows:

The Subrecipient will agree to use Washtenaw Urban County 2016-2017 and **2017-2018** CDBG funds for the eligible costs of design and bidding for a bus stop enhancement project at Schooner Cove Boulevard and S. Huron River Drive in the Charter Township of Ypsilanti. Design includes a bus bay (pull out) at the northeast corner of Schooner Cove Boulevard and S. Huron River Drive, improvements to existing storm water management system and adjacent asphalt pathway, addition of a pedestrian crosswalk to access the bus stop from the south side of Huron River Drive, **preparation of a temporary easement needed for construction, and rehabilitation of north and south pathways (an additional 350 feet and 255 feet beyond original scope, respectively)**. The contract will be paid for with 2016-2017 and **2017-2018** Urban County CDBG funding, ***not to exceed Twenty Thousand Four Hundred Ten Dollars and Zero Cents ($20,410.00)***, in accordance with the budget in Attachment B.

Amend ARTICLE V – TERM as follows:

This agreement begins on November 1, 2018 and ends on **December 31, 2019**, with an option to extend an additional 6 months. No costs eligible under this agreement shall be incurred by the Subrecipient before or after these dates, except with prior written approval of the County.

Amend Attachment A – SCOPE AND LOCATION OF SERVICES & PROJECT TIMELINE: NARRATIVE DESCRIPTION/SCOPE OF WORK as follows:

WASHTENAW COUNTY will contract with the TOWNSHIP for the eligible costs of design and bidding for a bus stop enhancement project at Schooner Cove and S. Huron River Drive in the Charter Township of Ypsilanti. These activities will be paid for with 2016 **and 2017** CDBG funding in accordance with the budget in Attachment B.

Amend Attachment B –PROJECT BUDGET as follows:

SUMMARY OF TERMS now states:
The COUNTY agrees to pay to or on behalf of the **TOWNSHIP** an amount not to exceed **Sixteen Thousand Five Hundred Dollars and Zero Cents ($20,410.00) from 2016-2017 and 2017-2018 CDBG Funds** according to the budget below:

OFFICE OF COMMUNITY & ECONOMIC DEVELOPMENT
Collaborative solutions for a promising future

415 W. Michigan Avenue
Ypsilanti, MI 48197

734.544.6748 (P)
734.544.6749 (F)

www.ewashtenaw.org/oced
twitter@WashtenawOCED

facebook.com/washtenawoced
www.opportunitywashtenaw.org

PROJECT BUDGET:

Schooner Cove Bus Stop Enhancement Project DESIGN/BIDDING ASSISTANCE Budget	
REVENUE SOURCE(S):	**TOTAL**
Grant Amounts CDBG (2016) - allocation	$15,246
CDBG (2017) - allocation	$5,164
Total Revenues	**$20,410**
PROGRAM EXPENSES	**TOTAL**
Personnel, Taxes & Fringe Benefits	
Consultant & Contractual Fees	**$20,410**
Total Expenditures	**$20,410**

All other terms and conditions remain the same as in the original contract.

ATTEST:

Lawrence Kestenbaum DATE
County Clerk/Register

APPROVED FOR CONTENT:

Teresa Gillotti DATE
OCED Director

WASHTENAW COUNTY (Pass-Through Entity)

Gregory Dill DATE
County Administrator

CHARTER TOWNSHIP OF YPSILANTI (Subrecipient)

Brenda Stumbo
Supervisor

Karen Lovejoy Roe
Clerk
May 22, 2019

Original: Clerk
Contractor
cc: Department
Purchasing

ARCHITECTS. ENGINEERS. PLANNERS.

OHM Advancing Communities®

May 17, 2019

Ms. Brenda Stumbo
Township Supervisor
Charter Township of Ypsilanti
7200 S. Huron River Drive
Ypsilanti, MI 48197

RE: **Schooner Cove Bus Stop – Budget Amendment Request**
Originally Approved on August 21, 2018

Dear Ms. Stumbo:

The Grove St. Pathway Extension originally consisted of constructing a bus loading zone, shelter pad, crosswalk across South Huron River Drive, and reconstructing and extending a pathway along the south side of South Huron River Drive.

OHM has been in communication with the Community of Economic Development Department of Washtenaw County and they have deemed enough funds to extend and enhance the current designed project beyond the original scope. The additional work would add additional rehabilitation of the north pathway another 350 feet and would also extend the rehabilitation of the south pathway 255 feet. Please refer to the attachment for a map of the project.

The initial proposal of this project did not include the rehabilitation of this additional section. Since OHM is preparing bid documents for the original sections, it was thought that combining all sections into one project would be more efficient and cost effective. Although the design tasks will remain the same, there is additional effort to include the additional scope of the project. Tasks 1-3 from the original proposal are requested to be amended as outlined below. Task 4 (Bidding) remains unchanged.

In order to complete the construction and rehabilitation treatments to the additional pathway segments, we are requesting a budget amendment not to exceed the amount of **$6,110.00**. The reconstruction of the existing pathways, east of Big Pine Drive and along South Huron River Drive, adds approximately six (6) stations (570 feet) to the project. This will add around 2-3 additional sheets to the plan set. OHM also had to gather additional TOPO and prepare permits in accordance with the WCRC to include this additional section. The table below illustrates the additional time required to remove and replace the existing pathway in comparison to the original time required.

Task	Additional Effort
Task 1: Design Survey/ROW Identification/Base Drawings	25 hours
Task 2: Engineering Drawing Design	14 hours
Task 3: Specifications and Final Bid Package Assembly	5 hours
Task 4: Bidding	-

OHM Advisors
34000 PLYMOUTH ROAD
LIVONIA, MICHIGAN 48150
T 734.522.6711
F 734.522.6427
OHM-Advisors.com

This will amend the previously approved budget from $14,300.00 to $20,410.00. The table below illustrates how the amendment will contribute to each task necessary.

	Original	Amended Budget
Task 1: Design Survey/Geotechnical Investigation/ ROW Identification	$4,900.00	$8,460.00
Task 2: Engineering Drawing Design	$3,900.00	$5,850.00
Task 3: Specifications and Final Bid Package Assembly	$2,900.00	$3,500.00
Task 4: Bidding	$2,600.00	$2,600.00
Total	**$14,300.00**	**$20,410.00**

We appreciate the opportunity to work with the Township on this project and we believe this pathway extension and rehabilitation will positively impact this area of South Huron River Drive and the surrounding neighborhoods.

If you have any questions or comments, please don't hesitate to contact me at (734) 522-6711 or at matt.parks@ohm-advisors.com.

Sincerely,
OHM Advisors

Matthew D. Parks, P.E.

Encl: Project Map

cc: Karen Lovejoy-Roe, Township Clerk
Lisa Garrett, Township Deputy Clerk
Larry Doe, Township Treasurer
Doug Winters, Township Attorney
Phil Maly, OHM Advisors

P:\0000_0100\0098180040_Schooner_Cove_Bus_Stop\PM\Proposal\Amendment Proposal\SchoonerCoveAdditionalPathway_Budget Amendment Request_2019-05-17.docx

AKTPEERLESS

22725 Orchard Lake Road
Farmington, Michigan 48336
T (248) 615-1333

CHANGE ORDER

APRIL 18, 2019

Project Information	
AKT PEERLESS PROJECT NUMBER:	14118f
AKT PEERLESS PROPOSAL NUMBER:	PF-24352
PROJECT ADDRESS:	1150 Midway Road, Ypsilanti, MI

Description of Activity
The Client has requested a meeting with regard to the Phase I ESA. Discussions/correspondence beyond the 1 hour after report allowance in the original proposal have been conducted as well. This change order represents the cost of the correspondence and attending the requested meeting (assuming meeting is no longer than 1 hour).

Category	Cost
Senior Project Manager Time	$640
Mileage Expense	$75
Change Order Total	**$715**

AKT Peerless will conduct this work in accordance with Terms and Conditions previously agreed upon for this project.

This work order proposal was submitted by:

Mary C. Hoeh, CHMM
AKT Peerless
Senior Project Manager – Group Leader

This proposal accepted by:

Brenda L. Stumbo / Karen Lovejoy Roe
Ypsilanti Township
May 22, 2019

DATE: May 22, 2019

AKTPEERLESS

22725 Orchard Lake Road
Farmington, MI 48336
T 248-615-1333
www.aktpeerless.com

April 22, 2019

Sara Jo Shipley
Charter Township of Ypsilanti
7200 South Huron River Drive
Ypsilanti, Michigan 48197

Subject: Proposal to Conduct a Subsurface Investigation
1150 Midway Road, Ypsilanti Township, Michiagn
Proposal No. PF-24367

Ms. Shipley:

AKT Peerless is pleased to present its proposal to complete a subsurface investigation at 1150 Midway Road, Ypsilanti Township, Michigan.

AKT Peerless will implement work immediately and will provide a summary report within two to three weeks following the completion of the field work. The report timeline assumes that analytical data will be received within 5-7 business days following the field work. AKT Peerless' estimated lump sum cost to complete the proposed scope of work is $5,570.

Any other unexpected or extraordinary concerns that become apparent during the assessment may require a revision in the scope of work and cost and could delay the project. AKT Peerless will notify you of any concerns or necessary changes in the proposed scope of work.

For your convenience, this proposal is presented in a form that can be accepted as an agreement. To accept this proposal, please sign the signature page and return a copy to me.

We look forward to working with you on this project. If you have any questions or require additional information, please contact me at 517-930-3725 or via email at hoehm@aktpeerless.com.

Sincerely,

AKT PEERLESS

Mary C. Hoeh, CHMM
Group Leader

Enclosure

Soil samples collected in the field will be visually examined in accordance with the Unified Soil Classification System, ASTM D-2488. As appropriate, soil samples collected in the field will be screened for volatile organic compounds (VOCs) using a portable organic vapor meter/photoionization detector (OVM/PID). To ensure accurate VOC screening, the quantity of the soil, temperature, and headspace volume will be kept as constant as possible. The OVM/PID will be calibrated prior to mobilization to the site.

Strict decontamination procedures will be followed during the completion of investigation activities by AKT Peerless personnel to reduce the potential for cross-contamination. All drilling and down-hole sampling equipment will be decontaminated prior to first use onsite, and thereafter between uses, using a high-temperature, high-pressure spray washer, and/or a vigorous wash in an Alconox solution, followed by a tap water rinse, and a distilled water rinse.

All samples will be collected in precleaned glass jars and stored following U.S. EPA Publication SW-846 Method 5035/ASTM D4547-91, final version of March 26, 1998, Testing Methods for Evaluating Solid Waste. This publication includes guidelines for the Soil Sample Collection and Methanol Preservation for Volatile Analysis. The samples will be transported to a laboratory under chain-of-custody documentation in an ice-cooled container.

Report

After completing the site investigation, AKT Peerless will prepare a report that will include a summary of field activities, analytical results, discussion of procedures/methodologies and a site map with sampling locations. The report will be delivered via email in electronic format. Should hard copies be requested, a cost of $75.00 per copy will be incurred.

Fees

AKT Peerless estimates the fees and expenses for this project will be $5,570. All subcontracted services and outside project costs will be billed at a cost plus 15 percent. The estimated costs to provide the services described in this proposal are shown in the table below.

Estimated Cost

ACTIVITY	COST
PROFESSIONAL SERVICES	
Project Management	$560
Field Activities	$1,740
Report Preparation	$1,550
PROJECT COSTS	
Laboratory Analyses	$1,295
Field Supplies and Expenses	$425
TOTAL	**$5,570***

* Costs include standard turnaround time for the laboratory. Should any obstacles to sampling or other hindrances to the work be encountered that would require additional fees, AKT Peerless will contact the Client prior to incurring such fees.

Limitations

If the Client chooses to alter the proposed scope of work, the Client's Advisors shall advise AKT Peerless, and AKT Peerless shall propose alterations to the scope of work and related fees. The Client's Advisors will authorize AKT Peerless in writing to conduct more or less work than defined in this proposal.

AKT Peerless will provide these services using its commercially reasonable best efforts consistent with the level and skill ordinarily exercised by members of the profession currently practicing under similar conditions.

Drilling costs presented in this proposal assume that there will be no significant obstructions and delays (e.g., encountering cement rubble or boulders, sandy soil heaving into the augers, and inclement weather). If delays occur, AKT Peerless will notify the Client's Advisors immediately, and AKT Peerless will revise the scope of work and fees appropriately.

This proposal and the associated cost estimate are valid for 30 days. After 30 days have elapsed, AKT Peerless reserves the right to alter the scope of work and estimated cost. Changes in the scope of work and the estimated price would be dependent on potential changes in the amount of available site information, regulatory requirements, seasons, economic conditions, etc. If necessary, AKT Peerless will provide an altered scope of work and the associated price estimate for approval prior to initiating project activities.

This proposal, including: descriptive material, pricing, discussion of proposed methods to be used or implemented by AKT Peerless, and related information set forth herein are confidential; these items constitute trade secrets of and are proprietary to AKT Peerless. AKT Peerless is submitting this information for informational purposes only, based on the express understanding that it will be held in strict confidence; will not be disclosed, duplicated, or used, in whole or in part, for any purpose other than the evaluation of this information; and will not, in any event, be disclosed to third parties, without prior written consent of AKT Peerless.

Terms and Conditions

By signing this proposal, the Client agrees to the terms and conditions presented in Appendix A. AKT Peerless will prepare and render invoices for work performed to date on a monthly basis. All invoices shall be payable within thirty (30) days of invoice date.

.

AKTPEERLESS

PROPOSAL ACCEPTANCE FOR

Subsurface Investigation
1150 Midway Road, Ypsilanti Township, Michigan

This proposal submitted by:

Mary C. Hoeh, CHMM
Group Leader

Proposal submitted on: April 22, 2019

Please authorize the proposal by executing below:

Proposal amount: **$5,570**

Client contact:
Sara Jo Shipley
Charter Township of Ypsilanti
7200 South Huron River Drive
Ypsilanti, Michigan 48197

AKT Peerless Proposal No. PF-24367

Acceptance:	**Charter Township of Ypsilanti**	
Print Name:	Brenda L. Stumbo	Karen Lovejoy Roe
Title	Supervisor	Clerk
Date	May 22, 2019	

AKTPEERLESS

Appendix A

Terms and Conditions

AKTPEERLESS

AKT PEERLESS
TERMS AND CONDITIONS

The following Terms and Conditions govern the services (referred to herein as "work" or "services") to be performed by AKT Peerless ("**we**", "**us**", "**our**", "**AKT Peerless**" or "**Consultant**") for you ("**you**", "**your**" or "**Client**"). By accepting the proposal or authorizing all, or any portion, of the work to be performed by Consultant, Client shall be deemed to accept these terms and conditions, as if set forth in full, in the proposal to which these terms and conditions apply (when accepted, the proposal and these Terms and Conditions constitute the "Agreement" (hereinafter, this "**Agreement**").

1. **Performance**: Consultant will provide advice, consultation and other environmental services to Client in a manner consistent with the level of care and skill ordinarily exercised by members of Consultant's profession currently practicing under similar conditions and in the same locality. Consultant shall use commercially reasonable best efforts to comply with all federal, state, and local statutes, codes, laws and administrative regulations relating specifically to the services to be performed by Consultant, including, but not limited those related to environmental, fire, safety and health matters. Finally, it is Consultant's obligation to have marked by appropriate utility companies the location of all underground utilities or improvements.

AKT Peerless prides itself in rapid responses to client inquiries. Therefore, we make extensive use of e-mail and facsimile machines to communicate with our clients. We will communicate with you via the e-mail address and/or facsimile number on file for you. In the case of facsimiles, please let us know if you would like us to call first before faxing. At present, AKT Peerless does not use any encryption programs for our outgoing e-mail. All written, telephone, facsimile or email communication between the Client and AKT Peerless shall not be considered unwanted commercial speech (e.g. "spam") unless written notification is provided.

2. **Client Cooperation**: Client shall use commercially reasonable best efforts to cooperate fully with Consultant in meeting Consultant's responsibilities herein. Such cooperation shall include but shall not be limited to providing: 1) access to the real estate, buildings or other property, 2) such surveys and other records concerning the subject matter of the project, and 3) all communications with regulatory agencies and other parties that may have an interest related to the project as may be in Client's possession or under its control. Client shall provide Consultant with a written description of all information required to enable Consultant to perform its services, including documents, data and other information concerning the presence of any hazardous, radioactive, toxic, irritant, pollutant or otherwise dangerous substances or conditions that Client knows or has reason to believe may be located at, on or under the property. Consultant shall not be liable for any incorrect advice, judgment, recommendation, finding, decision or conduct based upon any inaccurate or incomplete information supplied, or withheld, by Client, or errors or incorrect statements of governmental agencies or third parties relied on by Consultant. Client agrees to provide an on-site contact to identify utilities and improvements. Client acknowledges that, in the event any subsurface investigation is required, it is inevitable that some damage or destruction to the current property conditions shall occur. Repair of concrete and/or surface structures is not included as part of this proposal and Consultant shall have no liability to repair same, except as may be specifically set forth in the proposal.

3. **Payment**: The Client agrees to pay Consultant for all services and expenses, according to this agreement, through the termination or completion date, plus all interest, and expenses or costs incurred for early termination as set forth below and all costs of collections, including reasonable attorney fees. Any work requested hereunder, either in the proposal or subsequent change orders will be performed at the prices agreed to in the proposal and/or according to the provisions of the Consultant's standard rate schedule. If requested, prior to performing any services AKT Peerless may require a retainer ("Retainer"). AKT Peerless shall hold the Retainer and apply it to the final invoice from AKT Peerless to the Client (with any excess left over, immediately returned to the Client). Consultant reserves the right to amend the rate schedule in advance of any future work. Client understands that outside services contracted and paid for by Consultant which are included in the proposal will be billed to the

Client at cost plus fifteen percent (15%). All invoices submitted to Client shall be payable within thirty (30) days of issuance by Consultant. Any payment not received within that period will bear interest at the rate of one and one half percent (1.5%) per month thereafter. Client agrees that it shall pay Consultant at Consultant's then prevailing rate for all time spent on behalf of Client in preparation for any court, administrative, or other legal proceedings arising out of the services provided under this Agreement, whether or not Consultant is subpoenaed to appear at such proceeding by Client or any third party. In the event that payment is not received by Consultant on any invoice within thirty (30) days of the issuance of the invoice, Consultant may then, by written termination notice to Client, terminate this Agreement (and any other existing contracts between Client and Consultant) and apply any existing Retainer to outstanding invoices without incurring any liability to Client; such termination by Consultant shall be effective immediately upon Consultant's issuance of the termination notice. Any objection to any invoice must be made by the Client, in writing, within ten (10) business days after the invoice is issued by Consultant, or the objection shall be deemed waived.

4. **Termination**: In addition to any other rights of Consultant to terminate this Agreement, Consultant may terminate this agreement if, in its sole discretion, it believes that any request from Client may violate applicable professional standards, law, or regulations and the parties are unable to reach a satisfactory resolution of the issue. Additionally, this agreement may be terminated by either party upon thirty (30) days written notice, unless such termination shall irreparably harm either party. In the event that Client terminates this agreement prior to the completion of Consultant's work, Client agrees to pay Consultant for the work that has been performed through the date of termination and for efforts that are expended by Consultant to wrap up its work in a professional, businesslike manner (including, without limitation, costs and fees for demobilizing from a site, for proper handling and disposal of samples, for organization of files and reports and the like) and in addition, Client shall pay Consultant an additional amount equaling ten percent (10%) of the agreed initial estimated price, as a reimbursement for loss of opportunity. In no event shall any payment pursuant to this section 4 exceed the original agreement amount by ten percent (10%).

5. **Indemnification:** Client shall defend, indemnify, and hold harmless Consultant, its subcontractors, and their respective officers, directors, shareholders, members, attorneys, agents and employees from and against any and all liability, claims, demands, lawsuits, losses, damages, penalties, expenses and costs, including reasonable attorney fees ("**Damages**"), whether direct, indirect or consequential: that arise as a result of Client's negligence, gross negligence, or willful misconduct. All claims brought against Consultant, relating to the services provided by Consultant or otherwise, whether based upon contract, tort, statute or otherwise, must be brought within one (1) year from completion of the contracted services or they shall be forever barred. The Client acknowledges that Consultant has neither created nor contributed to the creation or existence of any hazardous, radioactive, toxic, irritant, pollutant or otherwise dangerous substance or condition at the real estate as to which Client has requested Consultant's services.

Consultant agrees to defend, indemnify, and hold harmless Client, its subcontractors, and their respective officers, directors, shareholders, members, attorneys, agents and employees from and against any and all Damages, whether direct, indirect, or consequential arising out of, or in any way connected with Consultant's negligence, gross negligence or willful misconduct in the performance of services under this Agreement.

In addition to the other limitations contained in this section 5 and elsewhere in these Terms and Conditions, a party's obligation to the other hereunder shall be limited to the party's relative fault among all persons or entities that may have contributed to or caused the Damages at issue, as determined by a court of competent jurisdiction or as the allocation of fault may otherwise be agreed by the parties.

The Client understands that its incentive services involve incentive programs, not entitlement programs, and, as such, approval of any incentive benefit is not guaranteed. Strict compliance with the applicable incentive legislation is needed in order to even qualify for consideration by the applicable government agency. This compliance is the responsibility of the Client. Tax increment finance tables involve projected revenue that is highly dependent on post-development taxable values determined through the normal assessment process. The Client

agrees to indemnify and hold harmless AKT Peerless from all claims, losses, expenses, fees including reasonable attorney fees, costs, and judgments that may be asserted against the Client arising out of this Agreement, or the Client's application and/or qualification for incentive programs (provided, however, this indemnity shall not apply to claims arising out of the gross negligence of AKT Peerless or it employees or agents). The Client is strongly encouraged to seek legal advice, at the Client's own expense, on all legal matters or questions that may arise regarding these incentives and to have any documents prepared by AKT Peerless for submission to any federal, state or municipal government or agency reviewed by competent legal counsel before submission. The Client is strongly encouraged to seek accounting services, at the Client's own expense, on all tax matters or questions that may arise regarding these incentives and to consult with the Client's accountant prior to submission of any tax forms. In no event shall the liability of AKT Peerless under this Agreement for any claim whatsoever exceed amounts paid by Client to AKT Peerless for the particular task giving rise to such claim. Further, in the event AKT Peerless is successful in obtaining governmental incentives for Client, they require strict compliance after approval of same to obtain their benefits. Certain failures to comply on an ongoing basis can terminate or limit the availability of the full benefits received, require repayment or have negative tax consequences. AKT Peerless assumes no liability for post award actions of Client.

6. **Insurance and Limitations of Liability**: Consultant and its subcontractors shall procure and maintain at its own expense, during the term of this Agreement, the following insurance, with limits of liability at least as set forth below, and upon such terms and conditions as are customary in the industry:

(a) Comprehensive general liability insurance in the amount of $1,000,000 combined per occurrence and $2,000,000 combined per aggregate;

(b) Professional liability (errors and omissions) insurance in the amount of $1,000,000 combined per occurrence and $2,000,000 combined aggregate limit;

(c) Pollution liability insurance in the amount of $1,000,000 per occurrence and $2,000,000 aggregate;

(d) Automobile liability insurance in the amount of $1,000,000 combined single limit for bodily injury for property damage; and

(e) Workers' Compensation insurance complying with the laws of the state(s) in which Consultant's services are performed hereunder.

Notwithstanding anything contained herein to the contrary, Consultant's liability to Client for any claimed Damages arising out of or in any way related to this Agreement or the services provided by Consultant shall be limited to the amounts available under the above insurance policies. However, in no event shall the liability of AKT Peerless for any redevelopment incentive or tax credit service under this Agreement for any claim whatsoever exceed amounts paid by Client to AKT Peerless for the particular task giving rise to such claim. Consultant will not be responsible for any claims arising out of the negligence, gross negligence, or willful misconduct by Client or by any person or entity not under the direct control of Consultant. In no event shall Consultant have any liability for any claims (whether based upon contract or tort) for any loss of business opportunity, profits or any special, incidental, consequential or punitive damages. In the event Client perceives that it has suffered any Damages as a result of the services provided by Consultant or in any way arising out of or related to this Agreement, Client agrees to provide Consultant with reasonable notice of and an opportunity to cure the claimed Damages, prior to or within ten (10) days of discovery of same. Failure to so provide said notice and opportunity to cure shall act as an absolute bar to any recovery for any Damages. Unless an emergency otherwise dictates, Consultant shall have no more than thirty (30) days after receiving notice as provided herein to cure any defect for which Client provides notice hereunder, unless such cure requires additional time to implement or complete, in which case Consultant shall be provided a commercially reasonable amount of time to complete the cure. Failure by Consultant to cure any defect as provided herein shall in no event bar or preclude any defense to which Consultant may otherwise be entitled. Finally, Consultant shall have no liability or obligation to Client for Damages greater than the minimum requirements as set forth under the applicable state law and the most cost effective and reasonable remedy provided thereunder in consideration of all relevant facts.

Consultant shall not be liable to Client for failure to comply with the terms of Section 1 unless such non-compliance is due to the negligence, gross negligence, or intentional misconduct of Consultant. Client acknowledges that Consultant has made no representations, express or implied, and no warranty or guarantee is included or intended in any report, opinion, or document regarding the results to be achieved upon completion of the services except as set forth herein. In the case of incentives work, Client understands that the decision to grant any incentives is wholly that of the applicable governmental agencies.

7. **Confidentiality**: Consultant shall retain as confidential all information, samples and data furnished to it by Client or collected by it during the course of the work performed under the Agreement or any amendment thereto. Such information shall not be disclosed to any third party except as directed by Client or as required by law, regulation or court order. Prior to making any disclosure required by law, regulation or court order, Consultant shall notify client of the obligation to make such disclosure and provide Client with a reasonable opportunity to lawfully challenge the need to make such disclosure. Any such challenge shall be performed at Client's sole cost and expense, including but not limited to any payments to Consultant for its time spent assisting in such challenge. Consultant shall retain all reports generated for a period of three (3) years after completion of any project. Client authorizes Consultant to destroy any file or retain portions thereof, in the discretion of Consultant after said time. Any samples obtained by a Consultant under this Agreement will be discarded within thirty (30) days after laboratory analyses unless another time period is mutually agreed to in writing.

8. **Final Product:** Client acknowledges that any environmental report is merely a "snapshot" of the subject property at the time the investigation was performed and any material change in the use or condition of the property shall directly terminate any further obligation of Consultant for the accuracy of the report. In no event shall this report be relied on for more than one-hundred eighty (180) days after the date of issuance. If at any time after the issuance of the final report, Client becomes aware of any information previously unknown that would materially alter the findings or conclusions contained therein, Client agrees to immediately provide Consultant with same and allow Consultant to revise the report accordingly, except that Consultant shall not be required to make such revisions if such information was withheld by Client in violation of this Agreement. Client further understands that the failure to discover hazardous, radioactive, toxic, irritant, pollutant, petroleum or otherwise dangerous substances, products, or conditions does not guarantee that these materials do not exist at the property, and that hazardous materials may later be found on such a site. Client agrees that Consultant is not responsible for any failure to detect or clean up the presence of hazardous materials unless: (1) the failure to detect same is caused by Consultant's negligence, gross negligence or willful misconduct; and (2) Client suffers Damages as a result. Client agrees that any Damages related to said failure shall be further limited by the provisions of this Agreement.

All tax increment finance projections and other incentive related documents shall be supplied in paper or printable document file (PDF) format. The source documents are considered work product and will only be released at the sole discretion of AKT Peerless. If source documents are released, it is under a one (1) month license only to the Client who shall not modify, alter, copy or distribute the source documents without the expressed written permission of AKT Peerless and shall destroy or return the source documents and all copies to AKT Peerless upon expiration of the license.

AKT Peerless ordinarily retains client files for a reasonable period of time after the conclusion of a matter. If requested, AKT Peerless will provide these files to you (excluding our notes and other work products) at the conclusion of the matter upon your request. If you do not request the files, after a reasonable period of time, unless you advise us in writing to the contrary, we shall be free to dispose of them. If you request that we turn our files over to you or to another firm and you have not fully satisfied all of your obligations to us under this agreement, including the payment of all fees and costs, we shall be entitled to hold the files as security for performance of those obligations.

9. **Lien**: In order to secure repayment of the amounts required hereunder, Consultant hereby notifies client that it intends to utilize any rights it may have under Michigan's Construction Lien Act (MCLA 570.1101 *et seq*) or

such similar provision which may be in force in the jurisdiction where the work under the Agreement is performed. Client further agrees to execute and deliver to Consultant any and all documents necessary and/or grants Consultant power of attorney to execute and record on their behalf all documents in order to comply with the requirements of the Act.

10. **Changes**: The parties acknowledge that neither this Agreement nor any proposal may be modified except upon written agreement by both parties. If changes occur in the project, or events are discovered during Consultant's work, these events may require alterations to the scope of work. If such changes are required by changes in the statutes, regulations, governmental authorities or the interpretations thereof, this agreement and proposal shall therefore be amended to incorporate those changes and the compensation to Consultant shall be adjusted accordingly. If the Client alters the scope of work proposed by Consultant, Consultant shall have no liability whatsoever for any Damages based upon the final product, if in the performance of the Consultant's original proposal; the claimed defect could have been discovered. Client further acknowledges that the costs in the proposal are merely estimates. These estimates are made by Consultant on the basis of its experience, qualifications, and professional judgment, but are estimates and not guaranteed.

11. **Delays**: Consultant shall use commercially reasonable best efforts in performing the services under this agreement. However, Consultant shall not be responsible for any delay or failure to perform its services if there is any failure to provide or delay in providing Consultant with necessary access to the properties, documentation, information, materials or contractors retained by Client or its representatives, or due to any act of God, labor trouble, fire, inclement weather, act of governmental authority or the failure to gain cooperation of any necessary third party or any other act beyond the control of Consultant. In the event said events do occur, then the time for Consultant's for completion of this Agreement shall be extended by a commercially reasonable period under the circumstances. If any delay is caused by either the acts or omissions of Client or by any third party (including Governmental agencies) Consultant shall be entitled to additional compensation, based upon standard rates, for the additional efforts required in obtaining said approvals, documentation or access.

12. **Reliance and Reliance Letters**: The services performed and issuance of any report which is to be generated is for the sole benefit of Client and no other individual or entity may therefore rely on same without the express written permission of Consultant. Consultant acknowledges that, from time to time, Client may require that Consultant issue to Client's financial institution or other third party a Reliance Letter. Consultant agrees, at no additional cost, to provide same, so long as it is subject to these Terms and Conditions and that said request is made within one hundred eighty (180) days of the final report. Client agrees that it shall provide a copy of these Terms and Conditions to its financial institution or other third party and that the financial institution shall accept same and shall acknowledge that any such reliance shall be effective only as to the condition of the property on the date the final report was written. Consultant shall not be required to provide reliance on any report older than 180 days. In the event that Consultant does agree to provide a Reliance Letter, the party seeking reliance must agree in writing to be bound by these Terms and Conditions. Any reliance shall only be as of the date the report was published. For reliance requests based upon these reports, Consultant's liability for any and all Damages in any way related to the services provided by Consultant, either directly or indirectly, whether by agreement or otherwise, shall be limited to the cost of the services provided by Consultant hereunder. In accepting this limitation, Client and any other relying party shall acknowledge that ASTM E-1527, Section 4.6, states that any Phase I Environmental Site Assessment older than one hundred eighty (180) days is no longer valid and therefore acknowledges that this reduced limitation of liability is reasonable.

2019 YPSILANTI TOWNSHIP AGREEMENT

THIS AGREEMENT, made and entered into this 22nd day of May, 2019, by and between the Township Board of Ypsilanti Township, Washtenaw County, parties of the first part and the Board of Washtenaw County Road Commissioners, parties of the second part.

WHEREAS, the parties of the first part desire that certain improvements be made upon the local roads in the Township of Ypsilanti, and

WHEREAS, proper authority is provided to the parties of the agreement under the provisions in Act 51 of Public Acts of 1951 as amended,

IT IS NOW THEREFORE AGREED, the parties of the second part will accomplish the improvements as specified herein, all in accordance with the standards of the parties of the second part.

1. **Dust Control (497-11-108):**
   Work to include placement of three (3) solid applications of contract brine on all certified local gravel/limestone roads within the township. Estimated 65,340 gallons @ $0.179 per gallon.
   Estimated cost of contract brine: **$ 11,695.86**

AGREEMENT SUMMARY

2019 LOCAL ROAD PROGRAM	
Dust Control	$ 11,695.86
Less WCRC Conventional Matching Funds	$ 5,847.93
ESTIMATED AMOUNT TO BE PAID BY YPSILANTI TOWNSHIP UNDER THIS AGREEMENT DURING 2019:	**$ 5,847.93**

FOR YPSILANTI TOWNSHIP:

Brenda L. Stumbo, Supervisor May 22, 2019

Witness Lisa Stanfield May 22, 2019

Karen Lovejoy Roe, Clerk May 22, 2019

Witness Lisa Stanfield May 22, 2019

FOR WASHTENAW COUNTY ROAD COMMISSION:

Douglas E. Fuller, Chair

Witness

Sheryl Soderholm Siddall, Managing Director

Witness

CHARTER TOWNSHIP OF YPSILANTI

RESOLUTION NO. 2019-24

AMENDED DESIGNATION OF DEPOSITORIES FOR 2019

NOW THEREFORE, BE IT RESOLVED that Bank of Ann Arbor-Ypsilanti Office, Comerica Bank, Charter One, Ann Arbor State Bank, Fifth Third Bank, Chase Bank, P&C Bank, United Bank & Trust, Fidelity Bank, Huntington National Bank, Key Bank, TCF Bank and Washtenaw Federal Credit Union and their successors be designated depositories for all Charter Township of Ypsilanti funds and securities for the 2019 calendar year.

I, Karen Lovejoy Roe, Clerk of the Charter Township of Ypsilanti, County of Washtenaw, State of Michigan hereby certify the above resolution is a true and exact copy of Resolution No. 2019-24 approved by the Charter Township of Ypsilanti, Board of Trustees assembled at a Regular Meeting held on May 21, 2019.

Karen Lovejoy Roe

Karen Lovejoy Roe, Clerk
Charter Township of Ypsilanti

CHARTER TOWNSHIP OF YPSILANTI
2019 BUDGET AMENDMENT #9 (REVISED 5/20/19)

May 21, 2019

AMOUNTS ROUNDED UP TO THE NEAREST DOLLAR

101 - GENERAL OPERATIONS FUND

Total Increase $46,410.00

Request to increase budget for Special Election scheduled in August. This will be funded by an Appropriation of Prior Year Fund Balance.

Revenues:	**Reimbursement for Elections**	**101-000-000-686.000**	**$40,300.00**
		Net Revenues	**$40,300.00**
Expenditures:	**APPOINTED OFFICIALS**	**101-215-000-704.000**	**$27,000.00**
	REG OVERTIME	**101-215-000-709.000**	**$5,000.00**
	OFFICE SUPPLIES - ELECTIONS	**101-215-000-740-010**	**$7,000.00**
	TRAVEL - ELECTIONS	**101-215-000-860.010**	**$200.00**
	EQUIPMENT RENTAL/LEASING	**101-215-000-941.000**	**$1,100.00**
		Net Expenditures	**$40,300.00**

* **Request to increase budget for OHM professional engineering design for a bus stop at Schooner Cove and South Huron River Drive . This is for the amended increase to the original CDBG funds of $14,300 making the total for the project $21,410. This will be funded by a Community Development Block Grant (CDBG) through Washtenaw County.**

Revenues:	**FEDERAL GRANTS - CDBG**	**101-000-000-522.000**	**$6,110.00**
		Net Revenues	**$6,110.00**
Expenditures:	**CDBG PROJECT - CAPITAL OUTLAY**	**101-970-000-974.100**	**$6,110.00**
		Net Expenditures	**$6,110.00**

* ***Budget amendment change request by Clerk Roe on 5/20/19. She received a new CDBG amount dated 5/17/19.***

206 - FIRE FUND

Total Increase $74,405.00

Request to increase the budget for wages and fringes effected by the Fire Contract approved at the April 2, 2019 meeting. This will be funded by an Appropriation of Prior Year Fund Balance.

Revenues:	**Prior Year Fund Balance**	**206-000-000-699.000**	**$74,405.00**
		Net Revenues	**$74,405.00**
Expenditures:	**SALARIES OFFICERS**	**206-206.000-705.002**	**$14,272.00**
	SALARY - PERMANENT WAGES	**206-206.000-706.000**	**$24,589.00**
	SALARIES PAY OUT-PTO&SICKTIME	**206-206.000-708.004**	**($6,455.00)**
	FIRE FIGHTER FOOD ALLOWANCE	**206-206.000-708.206**	**($3,500.00)**
	SALARY - CONTRACTUAL OVERTIME	**206-206.000-709.002**	**$5,448.00**
	HEALTH INSURANCE	**206-206.000-719.000**	**$6,673.00**
	EMPLOYEE PAID HEALTH CONTRA	**206-206.000-719.003**	**$20,378.00**
	RETIREMENT HEALTH CARE SAVINGS	**206-206.000-876.100**	**$13,000.00**
		Net Expenditures	**$74,405.00**

CHARTER TOWNSHIP OF YPSILANTI
2019 BUDGET AMENDMENT #9 (REVISED 5/20/19)

May 21, 2019

212 - BIKE, SIDEWALK, REC, ROADS GENERAL FUND (BSRII)

Total Increase $8,435.00

Request to increase the budget $8,435 for the professional services of AKT Peerless to perform Environmental Testing at the future site of the Skate Park located at 1150 Midway Road. This will be funded by reimbursement from a Grant provided by the Washtenaw County Brownfield Authority.

Revenues:	**County Grant - Park**	**212-000-000-540.100**	**$8,435.00**
		Net Revenues	**$8,435.00**
Expenditures:	**Prof Serv - Skate Park**	**212-212-000-801.300**	**$8,435.00**
		Net Expenditures	**$8,435.00**

266 - LAW ENFORCEMENT FUND

Total Increase $122,467.00

Request to increase the budget for the purchase and installation of a generator at $83,767 and OHM professional service at $38,700 for the LEC Building located on Huron Street. This will be funded by an Appropriation of Prior Year Fund Balance.

Revenues:	**Prior Year Fund Balance**	**266-000-000-699.000**	**$122,467.00**
		Net Revenues	**$122,467.00**
Expenditures:	**Capital Outlay**	**266-301-000-971.001**	**$122,467.00**
		Net Expenditures	**$122,467.00**

Motion to Amend the 2019 Budget (#9) REVISED 5/20/19

Move to increase the General Fund budget by $46,410 to $10,084,556 and approve the department line item changes as outlined.

Move to increase the Fire Fund budget by $74,405 to $6,476,990 and approve the department line item changes as outlined.

Move to increase the Bike, Sidewalk, Rec, Roads, General Fund II budget by $8,435 to $1,672,548 and approve the department line item changes as outlined.

Move to increase the Law Enforcement Fund budget by $122,467 to $7,802,624 and approve the department line item changes as outlined.

February 11, 2019

Mr. Michael Radzik
Police Administrator/Director
Charter Township of Ypsilanti
7200 S. Huron River Drive
Ypsilanti, MI 48197

RE: Proposal for Law Enforcement Center Generator Replacement Assistance
Design and Construction Services

Dear Mr. Radzik:

Thank you for the opportunity to submit this proposal to provide professional engineering design and construction services for the Township. As you know, the Township is interested in replacing the existing 45 KW generator at the Law Enforcement Center with a 300 KW diesel generator. In this proposal, we have outlined the scope and clarifications necessary to seek bids and provide construction services for the Township to address the generator replacement.

PROJECT UNDERSTANDING

In December 2018, our office entered into an agreement with the Township to provide professional design services for a generator replacement at the Law Enforcement Center. In that agreement, OHM Advisors proposed to deliver final plans and bidding documents to secure bids from contractors to provide and install a 300 KW diesel generator. At the time plans and bidding documents were ready for Township review, our office received direction to bid out the procurement of the generator separately from the generator installation. This proposal encompasses the work required to revise the existing bid package and prepare two (2) final plans and bidding documents, administer and assist with the award of both contracts, provide as-needed construction services for each, and assist with project close-outs.

ASSUMPTIONS/CLARIFICATIONS

- The Township Building Department will inspect the construction.
- All other tasks added to the scope below can be conducted at an hourly rate or as negotiated between the Township and OHM Advisors (OHM). Additional work will not be conducted prior to Township authorization.

OHM Advisors
34000 PLYMOUTH ROAD
LIVONIA, MICHIGAN 48150
T 734.522.6711
F 734.522.6427
OHM-Advisors.com

SCOPE

Our scope of professional services includes the following tasks:

Task 1 –Bid Package Assembly & Bidding for Generator Procurement Contract

- Modify existing bid package to only include contract documents and technical specifications for the generator procurement.
- Provide opinion of cost.
- Assist the Owner in the construction bidding/contracting process including: distributing bidding documents on BidNet Direct (formerly MITN) and issuing pre-construction addenda.
- Attend bid opening and review all received bid packages for completeness. OHM will also provide a technical review of each bid to ensure all generator requirements are met.
- Provide bid tabulation that includes OHM's technical evaluation of each bid, and a recommendation of award to the Owner.
- Attend one (1) meeting with the Owner to review bid tabulation and the technical evaluation.

Task 2 –Bid Package Assembly & Bidding for Generator Installation Contract

- Modify existing bid package to only include contract documents and technical specifications for the generator installation. This will also include incorporating the specifications of the generator from the awarded procurement contract into the installation contract.
- Provide opinion of construction cost.
- Attend a total of two (2) meetings with the Owner to review preliminary and final documents prior to bidding.
- Assist the Owner in the construction bidding/contracting process including: distributing bidding documents on BidNet Direct (formerly MITN), conducting a pre-bid meeting, and issuing pre-construction addenda.
- Attend mandatory pre-bid meeting.
- Attend bid opening and review all received bid packages for completeness.
- Provide bid tabulation to the client and recommendation of award to the Owner.

Task 3 – Construction Administration & Field Observation for Each Contract

Construction administration services will begin immediately following the award of a contract to a contractor. OHM will provide organized information to outline the progress of each contract from contractor initiation to completion of final punch list items.

- Coordination, scheduling, and conducting of two (2) preconstruction meetings. The Owner will provide a single point of contact for this project.
- Assist with coordination and delivery of the generator and appurtenances with the Owner and Contractor.
- Monitor, evaluate, and provide administrative action to achieve timely processing of shop drawings and product submittals.
- Provide timely responses to field questions, Request for Information (RFI's), Change Order requests, and field memos.
- Attend two (2) progress meetings and record meeting notes.
- Provide as-needed construction inspection (OHM estimates two (2) days of inspection for electrical work).
- Perform as-needed site visits to evaluate the contractor's progress and verify the contractor's request for payments (OHM estimates two (2) site visits).
- Review contractor payments as work is completed.

Task 4 – Project Close-out and Review of As Built Plans / O&M Manual

Project close-out services will begin immediately following when the contractor has identified substantial completion.

- Perform a final site walk through and prepare and distribute a final punch list.

- Ensure contractor has provided all requested operation and maintenance manuals for equipment provided and Owner Training was completed.
- Review as-built plans in accordance with the specifications and follow up with the contractor to incorporate inspector notes and equipment information on the plans.
- Follow up on final documents as required in the contract to be delivered by the contractor to the Township.
- Finalize final contract paperwork necessary to close out the contract and recommend final acceptance to the Township.

COMPENSATION AND SCHEDULE

The above-mentioned services will be performed on an hourly not-to-exceed basis in accordance with the attached Standard Terms & Conditions for a fee broken down by project as follows. The fees below are based on our 2019 Hourly Rates. OHM Advisors will invoice the Charter Township of Ypsilanti for the above stated services on a monthly basis.

Design Tasks	**Fee**
Task 1	$7,900.00
Task 2	$7,500.00
Task 3	$16,600.00
Task 4	$6,700.00

The total fee is estimated to be $38,700.00. Task 3 is based on two (2) days of inspection and two (2) site visits over the anticipated 4-weeks of construction of this project. Full-time inspection is not provided unless otherwise requested. Additional items not outlined in this proposal can added on a Time & Material basis (hourly).

ACCEPTANCE

If this proposal is acceptable to you, a signature on the enclosed copy of this letter and initials on the contract terms and conditions will serve as our authorization to proceed.

Thank you for giving us the opportunity to present this proposal to you. We look forward to working with you throughout this project.

OHM ADVISORS CONSULTANT		Charter Township of Ypsilanti CLIENT
_____	(Signature)	Brenda L. Stumbo / Karen Lovejoy Roe
Matthew D. Parks, P.E.	(Name)	Brenda L. Stumbo / Karen Lovejoy Roe
Principal in Charge	(Title)	Supervisor / Clerk
_____	(Date)	May 22, 2019

ytown.org
A community of opportunity

Charter Township of Ypsilanti

ACCOUNTING DEPT

7200 S. Huron River Drive
Ypsilanti, MI 48197
Phone: (734) 484-3702
Fax: (734) 484-5154

STATEMENTS AND CHECKS

JUNE 4, 2019 BOARD MEETING

ACCOUNTS PAYABLE CHECKS -	$	347,598.74
HAND CHECKS -	$	218,068.88
CREDIT CARDS PURCHASES -	$	0.00
GRAND TOTAL -	**$**	**565,667.62**

CHECK NUMBERS 182025 - 182057

HAND Checks

Bank AP AP

Check Date	Check	Vendor Name	Amount
05/15/2019	182025	COMCAST CABLE	6,579.53
05/15/2019	182026	COMCAST CABLE	333.85
05/16/2019	182027	14-B DISTRICT COURT	290.00
05/16/2019	182028	KEYBANK	5,000.00
05/16/2019	182029	LONG'S AUTOMOTIVE INC	656.78
05/17/2019	182030	COMCAST CABLE	106.85
05/17/2019	182031	COMCAST CABLE	234.85
05/17/2019	182032	COMCAST CABLE	106.85
05/17/2019	182033	COMCAST CABLE	39.98
05/17/2019	182034	COMCAST CABLE	134.55
05/17/2019	182035	COMCAST CABLE	146.85
05/17/2019	182036	COMCAST CABLE	106.85
05/17/2019	182037	COMCAST CABLE	141.85
05/17/2019	182038	GUARDIAN ALARM	476.61
05/17/2019	182039	VERIZON WIRELESS	256.59
05/17/2019	182040	VERIZON WIRELESS	2,064.04
05/17/2019	182041	WASTE MANAGEMENT	31,401.44
05/17/2019	182042	WASTE MANAGEMENT	1,643.13
05/17/2019	182043	WASTE MANAGEMENT	107,740.26
05/17/2019	182044	WASTE MANAGEMENT	43,182.60
05/17/2019	182045	WASTE MANAGEMENT	4,535.59
05/17/2019	182046	WASTE MANAGEMENT	843.22
05/17/2019	182047	WASTE MANAGEMENT	614.90
05/17/2019	182048	WASTE MANAGEMENT	262.45
05/17/2019	182049	WINDSTREAM	433.19
05/21/2019	182050	MICHIGAN CAT	166.48
05/21/2019	182051	MLIVE MEDIA GROUP	1,367.65
05/21/2019	182052	YPSILANTI COMMUNITY	1,984.00
05/22/2019	182053	GORDON FOOD SERVICE INC.	126.06
05/21/2019	182054	YPSILANTI COMMUNITY SCHOOLS - YP	4,438.18
05/23/2019	182055	CHELSEA BRODFUEHRER	1,611.95
05/23/2019	182056	RHETT REYES	783.00
05/23/2019	182057	YSHELU JOHNSON	258.75

AP TOTALS:

Total of 33 Checks:	218,068.88
Less 0 Void Checks:	0.00
Total of 33 Disbursements:	218,068.88

A/P checks

Check Date	Check	Vendor Name	Amount
Bank AP AP			
06/04/2019	182058	A.F. SMITH ELECTRIC	374.76
06/04/2019	182059	AAATA	504.20
06/04/2019	182060	AARON SIEGFRIED	450.00
06/04/2019	182061	AKT PEERLESS ENVIRONMENT SERV.	2,150.00
06/04/2019	182062	ALL COURT FABRICS	2,321.76
06/04/2019	182063	ALL PRO EXERCISE	504.89
06/04/2019	182064	ALLEGRA PRINTING AND IMAGING	430.00
06/04/2019	182065	ALLIED, INC.	293.73
06/04/2019	182066	AMAZON CAPITAL SERVICES	9,986.32
06/04/2019	182067	ANN ARBOR CLEANING SUPPLY	532.91
06/04/2019	182068	ANN ARBOR WELDING SUPPLY CO	637.88
06/04/2019	182069	ANTHONY SCOTT	30.00
06/04/2019	182070	APOLLO FIRE EQUIPMENT CO.	1,992.00
06/04/2019	182071	AUTO VALUE YPSILANTI	905.86
06/04/2019	182072	BENJAMIN DEMOND	92.00
06/04/2019	182073	CANZANO CONTRACTING CORPORTATION	2,000.00
06/04/2019	182074	CARLISLE/WORTMAN ASSOCIATES	2,312.50
06/04/2019	182075	CARSON FOWLER	60.00
06/04/2019	182076	CASSANDRA KELLY	60.00
06/04/2019	182077	CDW GOVERNMENT INC	1,935.94
06/04/2019	182078	CENTRON DATA SERVICES	3,898.00
06/04/2019	182079	CHARLES POPE	334.20
06/04/2019	182080	CHELSEA BRODFUEHRER	1,333.85
06/04/2019	182081	CINCINNATI TIME SYSTEMS	719.70
06/04/2019	182082	CLARE MILLER	40.00
06/04/2019	182083	COLD CUT KRUISE	89.40
06/04/2019	182084	COURT INNOVATIONS INC	540.00
06/04/2019	182085	CRYSTAL FLASH, INC.	4,179.07
06/04/2019	182086	DAWN FARM	7,437.50
06/04/2019	182087	DC HYDRAULICS INC.	70.44
06/04/2019	182088	DETROIT LEGAL NEWS	184.00
06/04/2019	182089	DISPUTE RESOLUTION CENTER	1,875.00
06/04/2019	182090	DUNHAM'S SPORTING GOODS	50.00
06/04/2019	182091	EASTERN OIL COMPANY	998.00
06/04/2019	182092	FEDERAL EXPRESS CORPORATION	147.62
06/04/2019	182093	FERGUSON ENTERPRISES, INC.	70.32
06/04/2019	182094	FIBER LINK	273.00
06/04/2019	182095	GLOBAL EQUIPMENT COMPANY	1,429.45
06/04/2019	182096	GOOSEWORKS, LLC	400.00
06/04/2019	182097	GRAINGER	275.33
06/04/2019	182098	GRIFFIN PEST SOLUTIONS	93.00
06/04/2019	182099	HEISLEY SERVICES	84.64
06/04/2019	182100	HOME DEPOT	667.87
06/04/2019	182101	JOEL ROBERTS	1,608.00
06/04/2019	182102	KAREN LOVEJOY ROE	61.36
06/04/2019	182103	KEVIN HARRISON	65.00
06/04/2019	182104	LANGUAGE LINE SERVICES	190.97
06/04/2019	182105	LAWRENCE HENDRICKS	45.00
06/04/2019	182106	LIFELOC	70.00
06/04/2019	182107	LISA GODO	476.00
06/04/2019	182108	LOOKING GOOD LAWNS	5,696.00
06/04/2019	182109	LOWE'S	150.26
06/04/2019	182110	MARK HAMILTON	1,750.00
06/04/2019	182111	MARQUETIA HUMES	100.00
06/04/2019	182112	MASA	315.00
06/04/2019	182113	MAYA EL-AMIN	72.00
06/04/2019	182114	MICHAEL BODARY	90.00
06/04/2019	182115	MICHIGAN LINEN SERVICE, INC.	1,198.65
06/04/2019	182116	MICHIGAN RECREATION & PARK	755.00
06/04/2019	182117	MICHIGAN STATE DEPT. OF TREASURY	30,378.14
06/04/2019	182118	NAPOLEON BEE SUPPLY	455.14
06/04/2019	182119	NEXT INTERNATIONAL, INC.	60,871.00
06/04/2019	182120	NFPA	55.40
06/04/2019	182121	OFFICE EXPRESS	1,486.47
06/04/2019	182122	OKINAWAN KARATE CLUB	465.50
06/04/2019	182123	ORCHARD, HILTZ & MCCLIMENT INC	16,646.50
06/04/2019	182124	PARK ATHLETIC SUPPLY	480.00
06/04/2019	182125	PARKER ALLEN	120.00
06/04/2019	182126	PARKWAY SERVICES, INC.	540.00
06/04/2019	182127	PEPSI BEVERAGES COMPANY	384.62
06/04/2019	182128	PGA OF AMERICA	561.00
06/04/2019	182129	PITTSFIELD CHARTER TOWNSHIP	490.00
06/04/2019	182130	PRINTING SYSTEMS	398.90
06/04/2019	182131	PRIORITY ONE EMERGENCY	153.97
06/04/2019	182132	RAND ROBINSON	90.00
06/04/2019	182133	RHETT REYES	756.00
06/04/2019	182134	ROCCO LEONE	80.00
06/04/2019	182135	ROSE PEST SOLUTIONS	175.00

Check Date	Check	Vendor Name	Amount
06/04/2019	182136	S.E.M.M.I.A.	200.00
06/04/2019	182137	SAM'S CLUB DIRECT	542.52
06/04/2019	182138	SAXON INC.	118.13
06/04/2019	182139	SIGNS BY TOMORROW	216.00
06/04/2019	182140	SOUTHEASTERN EQUIPMENT CO.	1,044.08
06/04/2019	182141	SPARTAN DISTRIBUTORS	112,050.07
06/04/2019	182142	SPARTAN DISTRIBUTORS	603.75
06/04/2019	182143	SPEARS FIRE & SAFETY SERVICE	1,627.55
06/04/2019	182144	TAMMIE KEEN	51.50
06/04/2019	182145	TARGET INFORMATION	243.39
06/04/2019	182146	TERRY CONDIT	180.00
06/04/2019	182147	THOMAS REUTERS	3,669.48
06/04/2019	182148	TODD BARBER	2,875.00
06/04/2019	182149	TONI STEVENSON	30.00
06/04/2019	182150	UNIFIRST CORPORATION	137.52
06/04/2019	182151	UNIVERSITY TRANSLATORS	542.48
06/04/2019	182152	VAN BUREN STEEL & FABRICATING	718.45
06/04/2019	182153	VERIZON CONNECT NWF, INC.	758.00
06/04/2019	182154	VICTORY LANE	255.52
06/04/2019	182155	VISHNU PATCHEAK	20.00
06/04/2019	182156	W.J. O'NEIL COMPANY	3,350.64
06/04/2019	182157	WASHTENAW COMMUNITY COLLEGE#	2,554.18
06/04/2019	182158	WASHTENAW COUNTY SHERIFF'S OFFICE	24.00
06/04/2019	182159	WASHTENAW COUNTY TREASURER#	5,387.02
06/04/2019	182160	WASHTENAW COUNTY TREASURER#	631.39
06/04/2019	182161	WASHTENAW COUNTY TREASURER#	6,141.00
06/04/2019	182162	WASHTENAW INTERMEDIATE	4,040.25
06/04/2019	182163	WEINGARTZ	841.69
06/04/2019	182164	WISAM HIRZALLAH	26.00
06/04/2019	182165	WOLVERINE FREIGHTLINER	1,587.73
06/04/2019	182166	YPSILANTI ACE HARDWARE	46.52
06/04/2019	182167	YPSILANTI COMMUNITY	4,559.24
06/04/2019	182168	YPSILANTI COMMUNITY SCHOOLS - WR	9,792.12
06/04/2019	182169	YPSILANTI DISTRICT LIBRARY	2,348.52
06/04/2019	182170	YPSILANTI TOWNSHIP PETTY CASH	104.23
06/04/2019	182171	YSHELU JOHNSON	258.75
06/04/2019	182172	ZAID HIRZALLAH	26.00

AP TOTALS:

Total of 115 Checks:	347,598.74
Less 0 Void Checks:	0.00
Total of 115 Disbursements:	347,598.74

ytown.org
A community of opportunity

Charter Township of Ypsilanti

ACCOUNTING DEPT

7200 S. Huron River Drive
Ypsilanti, MI 48197
Phone: (734) 484-3702
Fax: (734) 484-5154

STATEMENTS AND CHECKS

JUNE 18, 2019 BOARD MEETING

ACCOUNTS PAYABLE CHECKS -	$	287,061.09
HAND CHECKS -	$	366,613.18
CREDIT CARD PURCHASES-	$	5,660.18
GRAND TOTAL -	**$**	**659,334.45**

Clarity Health Care Deductible –

ACH EFT - $ 50,462.70 (MAY)
ADMIN FEE - $ 1,105.50 (APRIL)

CHECK NUMBERS 182208 - 182312

A/P checks

Check Date	Check	Vendor Name	Amount
Bank AP AP			
06/18/2019	182208	A.F. SMITH ELECTRIC	240.00
06/18/2019	182209	AARON SIEGFRIED	120.00
06/18/2019	182210	ACCUSHRED LLC	65.00
06/18/2019	182211	ALERT ALL	934.15
06/18/2019	182212	ALLEN EDWIN HOMES	3,000.00
06/18/2019	182213	ALLSHRED SERVICES	550.00
06/18/2019	182214	AMAZON CAPITAL SERVICES	920.89
06/18/2019	182215	ANN ARBOR CLEANING SUPPLY	256.50
06/18/2019	182216	ANTHONY PYROZHENKO	39.00
06/18/2019	182217	ANTHONY SCOTT	15.00
06/18/2019	182218	APOLLO FIRE EQUIPMENT CO.	498.00
06/18/2019	182219	APPLIED IMAGING	9,252.60
06/18/2019	182220	ASHLEI HYTER	100.00
06/18/2019	182221	AUTO VALUE YPSILANTI	225.86
06/18/2019	182222	B2 RESTORATION	800.00
06/18/2019	182223	BARR ENGINEERING COMPANY	8,880.50
06/18/2019	182224	BENJAMIN DEMOND	48.00
06/18/2019	182225	BRANDON VAUGHN	10.00
06/18/2019	182226	CAMPBELL TITLE AGENCY OF MICHIGAN	2,350.00
06/18/2019	182227	CARLISLE/WORTMAN ASSOCIATES	13,541.03
06/18/2019	182228	CARMEN FOWLER	20.00
06/18/2019	182229	CARSON FOWLER	30.00
06/18/2019	182230	CASSANDRA KELLY	30.00
06/18/2019	182231	CHELSEA BRODFUEHRER	1,514.10
06/18/2019	182232	CLARE MILLER	30.00
06/18/2019	182233	COLD CUT KRUISE	99.30
06/18/2019	182234	CONTI	3,851.18
06/18/2019	182235	CRYSTAL FLASH, INC.	3,786.44
06/18/2019	182236	DAN KIMBALL	64.17
06/18/2019	182237	DAYLAN JACKSON	15.00
06/18/2019	182238	DEPARTMENT OF TREASURY	392.20
06/18/2019	182239	DONNA ZAHN	100.00
06/18/2019	182240	EASTERN MICHIGAN UNIVERSITY	2,100.00
06/18/2019	182241	EMERGENCY VEHICLE SERVICES	10,658.23
06/18/2019	182242	EMPCO, INC.	7,402.76
06/18/2019	182243	FRIENDS OF RUTHERFORD POOL	5,000.00
06/18/2019	182244	GAME TIME	3,301.05
06/18/2019	182245	GARY STAFFORD	20.00
06/18/2019	182246	GOLF COURSE SUPERINTENDENTS	400.00
06/18/2019	182247	GOOSEWORKS, LLC	1,000.00
06/18/2019	182248	GORDON FOOD SERVICE INC.	567.54
06/18/2019	182249	GOVERNMENTAL CONSULTANT SERVICES	3,023.50
06/18/2019	182250	GRAINGER	85.05
06/18/2019	182251	GREG LAROCK	1,784.00
06/18/2019	182252	HERKIMER RADIO SERVICE	896.43
06/18/2019	182253	HOME DEPOT	1,197.64
06/18/2019	182254	IPS DRUG TESTING	80.00
06/18/2019	182255	KADEN KUMPELIS	40.00
06/18/2019	182256	KBK LANDSCAPING, INC	1,522.50
06/18/2019	182257	LANGUAGE LINE SERVICES	245.84
06/18/2019	182258	LANSING SANITARY SUPPLY, INC	193.31
06/18/2019	182259	LARDNER ELEVATOR COMPANY	225.00
06/18/2019	182260	LAWRENCE HENDRICKS	45.00
06/18/2019	182261	LOOKING GOOD LAWNS	8,313.00
06/18/2019	182262	LOWE'S	69.33
06/18/2019	182263	MARIALANA BRANCH	60.00
06/18/2019	182264	MARK HAMILTON	1,750.00
06/18/2019	182265	MAYA EL-AMIN	22.00
06/18/2019	182266	MCCULLY'S EDUCATIONAL RESOURCE CTR	138.00
06/18/2019	182267	MCLAIN AND WINTERS	133,944.66
06/18/2019	182268	MENARDS, INC.	159.96
06/18/2019	182269	MESSENGER PRINTING	391.09
06/18/2019	182270	MICHIGAN LINEN SERVICE, INC.	869.30
06/18/2019	182271	MICHIGAN TOWNSHIP ASSOC.**	6,898.94
06/18/2019	182272	MICHIGAN URGENT CARE ANN ARBOR	545.00
06/18/2019	182273	MUNICIPAL CODE CORPORATION	588.36
06/18/2019	182274	NFPA	68.90
06/18/2019	182275	NORTH AMERICAN CONSTRUCTION ENTERPR	1,000.00
06/18/2019	182276	OFFICE EXPRESS	1,693.09
06/18/2019	182277	PARK ATHLETIC SUPPLY	489.80
06/18/2019	182278	PARKER ALLEN	73.00
06/18/2019	182279	PARKWAY SERVICES, INC.	130.00
06/18/2019	182280	PEPSI BEVERAGES COMPANY	305.58
06/18/2019	182281	PRINTING SYSTEMS	116.08
06/18/2019	182282	PRIORITY ONE EMERGENCY	199.93
06/18/2019	182283	PRIORITY SYSTEMS	157.34
06/18/2019	182284	PUBLIC SAFETY CENTER	464.95
06/18/2019	182285	RAND ROBINSON	90.00

Check Date	Check	Vendor Name	Amount
06/18/2019	182286	RESIDEX, LLC	2,728.94
06/18/2019	182287	RHETT REYES	459.00
06/18/2019	182288	ROBERT THOMASON	60.00
06/18/2019	182289	S & S ASSOCIATES, INC	772.11
06/18/2019	182290	SAM'S CLUB DIRECT	209.68
06/18/2019	182291	SHRADER TIRE & OIL	891.25
06/18/2019	182292	SITEONE LANDSCAPE SUPPLY, LLC	55.78
06/18/2019	182293	SOUTHERN COMPUTER WAREHOUSE	1,879.47
06/18/2019	182294	SOUTHSIDE BAPTIST	143.00
06/18/2019	182295	SPARTAN DISTRIBUTORS	143.40
06/18/2019	182296	SPARTAN DISTRIBUTORS	603.75
06/18/2019	182297	STANTEC	6,513.46
06/18/2019	182298	STAPLES* - ACCOUNT #1026071	262.98
06/18/2019	182299	STERICYCLE INC	211.95
06/18/2019	182300	TERRY CONDIT	60.00
06/18/2019	182301	TODD BARBER	2,775.00
06/18/2019	182302	TRANSUNION RISK & ALTERNATIVE	75.00
06/18/2019	182303	TRAVIS ERBY	126.00
06/18/2019	182304	TRUGREEN	1,990.00
06/18/2019	182305	UNIFIRST CORPORATION	119.38
06/18/2019	182306	UNIVERSITY TRANSLATORS	686.58
06/18/2019	182307	VICTORY LANE	154.57
06/18/2019	182308	WASHTENAW COUNTY LEGAL NEWS	285.00
06/18/2019	182309	WASHTENAW COUNTY TREASURER#	4,360.00
06/18/2019	182310	WEINGARTZ	365.31
06/18/2019	182311	WILLIS FEED MILL	6.50
06/18/2019	182312	WOLVERINE FREIGHTLINER	11,017.90

AP TOTALS:

Total of 105 Checks:	287,061.09
Less 0 Void Checks:	0.00
Total of 105 Disbursements:	287,061.09

CHECK NUMBERS 182173 - 182207

Hand Checks

Check Date	Check	Vendor Name	Amount
Bank AP AP			
05/31/2019	182173	PNC EQUIPMENT FINANCE, LLC	7,032.07
05/31/2019	182174	BLUE CROSS BLUE SHIELD OF MI	172,259.80
05/31/2019	182175	BLUE CROSS BLUE SHIELD OF MI	36,511.56
06/03/2019	182176	AT & T	177.56
06/03/2019	182177	AT & T	35.42
06/03/2019	182178	CLEAR RATE COMMUNICATIONS, INC	843.44
06/03/2019	182179	COMCAST CABLE	136.85
06/03/2019	182180	COMCAST CABLE	116.38
06/03/2019	182181	COMCAST CABLE	214.90
06/03/2019	182182	COMCAST CABLE	106.85
06/03/2019	182183	COMCAST CABLE	181.62
06/03/2019	182184	DEARBORN NATIONAL LIFE INSURANCE	4,795.90
06/03/2019	182185	DELTA DENTAL PLAN OF MICHIGAN	13,039.48
06/03/2019	182186	LONG'S AUTOMOTIVE INC	105.47
06/03/2019	182187	VISION SERVICE PLAN	3,197.38
06/03/2019	182188	WEX BANK	1,222.90
06/04/2019	182189	PREMIER SAFETY & SERVICE	5,645.30
06/05/2019	182190	BRANDON VAUGHN	20.00
06/05/2019	182191	COMCAST BUSINESS	1,239.00
06/05/2019	182192	COMCAST CABLE	39.98
06/05/2019	182193	COMCAST CABLE	106.85
06/05/2019	182194	COMCAST CABLE	6,579.53
06/05/2019	182195	CONSTELLATION NEW ENERGY	14,756.06
06/05/2019	182196	DTE ENERGY**	65,288.64
06/05/2019	182197	YPSILANTI COMMUNITY	1,586.15
06/06/2019	182203	AAATA	5.85
06/06/2019	182204	MICHIGAN STATE DEPT. OF TREASURY	30,370.92
06/06/2019	182205	WASHTENAW COMMUNITY COLLEGE#	4.60
06/11/2019	182206	FERGUSON ENTERPRISES, INC.	417.21
06/11/2019	182207	UNITED STATES POSTMASTER	575.51

AP TOTALS:

Total of 30 Checks:	366,613.18
Less 0 Void Checks:	0.00
Total of 30 Disbursements:	366,613.18

CHECK REGISTER FOR CHARTER TOWNSHIP OF YPSILANTI
CHECK NUMBERS 45 - 45

Credit Cards

Check Date	Check	Vendor Name	Description	Amount
Bank CARDS COMERICA COMMERICAL CARD				
06/18/2019	45(E)	COMERICA BANK	PARTS	28.56
			OPERATING SUPPLIES AND FOOD AND BEVERAGE	269.16
			PASSPORT POSTAGE WEEK OF 5-27-19	76.95
			PASSPORT POSTAGE WEEK OF 5-20-19	168.15
			PASSPORT POSTAGE WEEK OF 5-13-19	65.70
			POSTAGE FOR PASSPORTS WEEK OF 5-6-19	58.80
			REGISTRATION FOR MONICA ROSS WILLIAMS FO	91.00
			REGISTRATION FOR MTA PROFESSIONAL TRUSTE	329.00
			2019 BCOC EDUCATIONAL SYMPOSIUM	517.79
			HARD DRIVES	243.79
			RUSTIC BATHROOM PICTURE	24.90
			BASKET ORGANIZER FOR TOILET PAPER	45.95
			WHITEWASH TRASH CAN	113.00
			LODGING (3 ROOMS/2 NIGHTS/5 PERSONS) FOR	699.75
			TOILET TISSUE HOLDER	53.02
			2019 I.A.A.I ARSON SCHOOL IN TRAVERSE CI	1,575.00
			BEE SUPPLIES	455.14
			BEE SUPPLIES	79.50
			PORTEUS KIOSKSOFTWARE	580.00
			COMPOST POS SOFTWARE UPGRADE	149.00
			BASKET FOR PAPER TOWELS IN NEW BATHROOM	36.02
				5,660.18

CARDS TOTALS:

Total of 1 Checks:	5,660.18
Less 0 Void Checks:	0.00
Total of 1 Disbursements:	5,660.18

OFFICE OF THE TREASURER
LARRY J. DOE

MONTHLY TREASURER'S REPORT
MAY 1, 2019 THROUGH MAY 31, 2019

Account Name	Beginning Balance	Cash Receipts	Cash Disbursements	Ending Balance
101 - General Fund	7,288,188.66	1,355,032.07	1,835,727.64	6,807,493.09
101 - Payroll	224,837.40	964,324.12	931,641.46	257,520.06
101 - Willow Run Escrow	144,034.92	122.33	0.00	144,157.25
206 - Fire Department	5,206,327.48	12,264.90	433,873.46	4,784,718.92
208 - Parks Fund	30,648.36	58.52	205.51	30,501.37
212 - Roads/Bike Path/Rec/General Fund	1,407,474.24	10,579.61	15,916.14	1,402,137.71
226 - Environmental Services	3,186,102.66	5,027.93	242,521.18	2,948,609.41
230 - Recreation	209,696.13	29,088.52	77,078.11	161,706.54
236 - 14-B District Court	245,617.41	148,914.16	148,621.83	245,909.74
244 - Economic Development	69,320.20	133.19	0.00	69,453.39
248 - Rental Inspections	176,567.58	36,745.65	27,327.36	185,985.87
249 - Building Department Fund	1,318,011.82	89,056.50	76,314.09	1,330,754.23
250 - LDFA Tax	251,490.77	484.34	0.00	251,975.11
252 - Hydro Station Fund	411,945.70	30,875.94	29,003.96	413,817.68
266 - Law Enforcement Fund	7,283,265.34	14,760.04	571,146.93	6,726,878.45
398 - LDFA 2006 Bonds	18,288.27	35.32	0.00	18,323.59
584 - Green Oaks Golf Course	141,596.54	93,272.93	88,716.17	146,153.30
590 - Compost Site	759,710.11	63,012.47	38,116.62	784,605.96
595 - Motor Pool	211,043.59	22,014.78	7,404.09	225,654.28
701 - General Tax Collection	135,825.96	11,622.76	63,358.81	84,089.91
703 - Current Tax Collections	62,159.98	12,565.99	24,876.34	49,849.63
707 - Bonds & Escrow/GreenTop	1,653,714.59	55,823.25	19,682.75	1,689,855.09
708 - Fire Withholding Bonds	113,428.51	96.33	0.00	113,524.84
893 - Nuisance Abatement Fund	90,136.35	767.04	1,175.84	89,727.55
GRAND TOTAL	**30,639,432.56**	**2,956,678.69**	**4,632,708.29**	**28,963,402.96**

ATTORNEY REPORT

GENERAL LEGAL UPDATE

OLD BUSINESS

CHARTER TOWNSHIP OF YPSILANTI

RESOLUTION 2019-06
(In Reference to Ordinance 2019-486)

AMENDING ARTICLE XXVII OF THE ZONING ORDINANCE TO ADD THE CONDITIONAL REZONING TEXT AMENDMENTS

***Whereas*,** Section 3405 of the Michigan Zoning Enabling Act, PA 110 of 2006, as amended, authorizes a property owner, or their authorized representative, to voluntarily offer conditions to the rezoning of their property as a means to provide a voluntary mechanism for an applicant to self-limit their request; and

***Whereas*,** the Township Planning Consultants recommended updates to the zoning ordinance to specify the process and circumstances for conditional rezonings under the Michigan Zoning Enabling Act; and

***Whereas*,** the Township Planning Consultants have recommended amendments to the Charter Township of Ypsilanti's (Township) Planning Commission (Commission) to the Township's Zoning Code; and

***Whereas*,** at its regularly scheduled meeting held April 9, 2019, the Commission recommended approval of the Planning Consultant's proposed amendments to the Township's Zoning Code to the Township Board to update Article XXVII – Changes and Amendments to specify the process and circumstances for conditional rezonings,

***Whereas*,** proposed Ordinance No. 2019-486 has revised the current existing Ordinance in such a fashion as to incorporate the above changes recommended; and

***Whereas*,** the Charter Township of Ypsilanti Board of Trustees (Board) agrees with the request of the Planning Commission;

***Now Therefore, Be it resolved*,** that the Charter Township of Ypsilanti Board of Trustees does hereby approve Ordinance No. 2019-486 as attached, by amending Article XXVII of the Township's Zoning Code as noted, replacing it with proposed Ordinance No. 2019-486, which ordinance reflects the suggestions and input of the Township's Planning Consultant as recommended by the Commission.

CHARTER TOWNSHIP OF YPSILANTI

PROPOSED ORDINANCE 2019-486

AN ORDINANCE AMENDING ARTICLE XXVII OF THE ZONING ORDINANCE TO ADD THE CONDITIONAL REZONING TEXT AMENDMENTS

The Charter Township of Ypsilanti hereby ordains that the Ypsilanti Township Zoning Code, adopted May 18, 1994, shall be amended as follows:

SECTION 1. AMENDMENT TO TOWNSHIP ZONING ORDINANCE ARTICLE XXVII: Township Zoning Ordinance Article XXVII, "Changes and Amendments" by amending Section 2701 "Initiation of amendments", and adding Section 2705 "Conditional amendment of the official zoning map", as follows:

Sec. 2701. - Sec. 2701. - Initiation of amendments:

The township board may from time to time, on recommendation from the planning commission, amend, supplement or change the district boundaries or the regulations herein, or subsequently established herein. Amendments to the provisions of this ordinance (i.e. ordinance text amendment) may be initiated by the township board, the planning commission or by petition from one or more residents or property owners of the township. An amendment to the official zoning map (i.e. rezoning) may be initiated by the township board, the planning commission or by the owner or owners of the property that is the subject of the proposed amendment. All proposed amendments to the provisions of this ordinance or the official zoning map shall be referred to the planning commission for public hearing and recommendation to the township board, prior to consideration thereof by the township board pursuant to the authority and procedure established in Act. No. 184 of the Public Acts of Michigan of 1943 (MCL 125.271 et seq.) Act No. 110 of the Public Acts of Michigan of 2006 (MCL 125.3101 et seq.), as amended.

Sec. 2705. – Conditional amendment of the official zoning map:

The Township Board shall have the authority to place conditions on an amendment to the official zoning map, commonly referred to as a conditional rezoning, provided the conditions have been voluntarily offered in writing by the applicant and are acceptable to the Township Board. In exercising its authority to consider a conditional rezoning, the Township is also authorized to impose the following limitations:

(a) An owner of land may voluntarily offer written conditions relating to the use and/or development of land for which a conditional rezoning is requested. This offer may be made either at the time the application for conditional rezoning is filed, or additional conditions may be offered at a later time during the conditional rezoning process as set forth below.

(1) The owner's offer of conditions may not authorize uses or developments not permitted in the requested zoning district. The owner's offer of conditions shall bear a reasonable and rational relationship to the property for which the conditional rezoning is requested.

(2) A conditional rezoning that would also require approval of a conditional use, variance or site plan under the terms of this ordinance shall not be effective until approval for a conditional use, variance or site plan is ultimately granted in accordance with the provisions of this ordinance.

(b) The offer of conditions may be amended during the process of conditional rezoning consideration, provided that any amended or additional conditions are entered voluntarily by the owner and confirmed in writing. An owner may withdraw in writing all or part of its offer of conditions any time prior to final rezoning action of the Township Board, provided that, if such withdrawal occurs subsequent to the Planning Commission's public hearing on the original rezoning request, then the

rezoning application shall be referred back to the Planning Commission for a new public hearing with appropriate notice and a new recommendation.

(c) The procedure for consideration of Conditional Rezoning request by the Planning Commission and Township Board shall be the same as provided in Section 2702 for all other requests for amendments to the official zoning map. The following additional information shall also be required:

(1) A Conditional Rezoning request shall be initiated by the submission of a proposed Conditional Rezoning Agreement. A Conditional Rezoning Agreement shall include the following:

a. A written statement prepared by the applicant that confirms the Conditional Rezoning Agreement was proposed by the applicant and entered into voluntarily.

b. A written statement prepared by the applicant that confirms that the property shall not be used or developed in a manner that is inconsistent with conditions placed on the rezoning.

c. A list of conditions proposed by the applicant.

d. A time frame for completing the proposed improvements.

e. A legal description of the land.

f. A Sketch Plan in sufficient detail to illustrate any specific conditions proposed by the applicant.

(2) The Notice of Public Hearing on a Conditional Rezoning request shall include a general description of the proposed agreement being considered. A review of the proposed agreement shall be conducted at the public hearing.

(3) A Conditional Rezoning may be approved upon the criteria set forth in Sec. 2704 and a finding and determination that all of the following are satisfied:

a. The conditions, proposed development, and/or proposed use of the land are designed or proposed for public health, safety, and welfare purposes.

b. The conditions, proposed development and/or proposed use are not in material conflict with the Master Plan, or, if there is material conflict with the Master Plan, such conflict is due to one of the following:

i. A change in Township policy since the Master Plan was adopted.

ii. A change in conditions since the Master Plan was adopted.

iii. An error in the Master Plan.

c. The conditions, proposed development and/or proposed use are in accordance with all terms and provisions of the zoning district to which the land is to be rezoned, except as otherwise allowed in the Conditional Rezoning Agreement.

d. The conditions, proposed development and/or proposed use shall insure compatibility with adjacent uses of land.

(d) Upon approval by the Township Board of a Conditional Rezoning request and a Conditional Rezoning Agreement, as provided by this Section, the Zoning Map shall be amended to reflect a new zoning classification along with a relevant designation that will provide reasonable notice of the Conditional Rezoning Agreement.

(e) A Conditional Rezoning Approval shall expire following a period of time from the effective date of the rezoning established by the Township Board, unless progress has been diligently pursued and substantial completion has occurred in accordance with permits issued by the Township.

(1) In the event the conditional rezoning expires, the rezoning and the Conditional Rezoning Agreement shall be void and of no effect.

(2) If the Conditional Rezoning becomes void, no development shall be undertaken and no permits for development shall be issued until such time as a new zoning district classification of the property has become effective as a result of one or both of the following actions that may be taken:

a. The property owner seeks a new rezoning classification for the property; and/or

b. The Township initiates a new rezoning request for the property to a reasonable district classification, in accordance with the conventional rezoning procedure.

(f) Recording. A Conditional Rezoning Approval shall not become effective until the Conditional Rezoning Agreement is recorded with the Washtenaw County Register of Deeds and a certified copy of the Agreement is filed with the Township Clerk.

(g) Violation of Conditional Rezoning Agreement. If development and/or actions are undertaken on or with respect to the property in violation of the Conditional Rezoning Agreement, such development and/or actions shall constitute a violation of this ordinance and deemed a nuisance per se. In such case, the Township may issue a stop work order relative to the property and seek any other lawful remedies. Until curative action is taken to bring the property into compliance with the Conditional Rezoning Agreement, the Township may withhold, or, following notice and an opportunity to be heard, revoke permits and certificates, in addition to or in lieu of such other lawful action to achieve compliance.

SECTION 3. SEVERABILITY. In the event that any one or more sections, provisions, phrases or words of this ordinance shall be found to be invalid by a Court of competent jurisdiction, such holding shall not affect the validity nor the enforceability of the remaining sections, provisions, phrases or words of this Ordinance unless expressly so determined by a Court of competent jurisdiction.

SECTION 4. PUBLICATION. This ordinance shall be published in a newspaper of general circulation as required by law.

SECTION 5. EFFECTIVE DATE: This ordinance shall become effective upon publication in a newspaper of general circulation as required by law.

SECTION 6. REPEAL: All Ordinances or parts of Ordinances in conflict herewith are hereby repealed.

I, Karen Lovejoy Roe, Clerk of the Charter Township of Ypsilanti, County of Washtenaw, State of Michigan hereby certify approval of the first reading of Proposed Ordinance No. 2019-486 by the Charter Township of Ypsilanti Board of Trustees assembled at a regular meeting held on May 7, 2019. The second reading is scheduled to be heard on June 18, 2019.

Karen Lovejoy Roe

Karen Lovejoy Roe, Clerk
Charter Township of Ypsilanti

CHARTER TOWNSHIP OF YPSILANTI

OFFICE OF COMMUNITY STANDARDS

Building Safety • Planning & Zoning • Ordinance Enforcement • Police Services

---

To: Karen Lovejoy Roe, Clerk

From: Charlotte Wilson, Planning and Development Coordinator

Re: **1st Reading of Resolution 2019-06, Proposed Ordinance 2019-487, amending Article 27 of the Zoning Ordinance to add the conditional rezoning text amendments.**

Copy: McLain & Winters, Township Attorneys

Date: April 24th, 2019

Please be advised that the Planning Commission recommended approval of the proposed changes to Article 27 to add the conditional rezoning text amendments. The enclosed packet includes the following components:

1. Planning Commission meeting minutes and amended recommendation 4/9/19
2. Planning Commission meeting minutes and recommendation 1/22/19
3. Planning Commission staff report 4/5/19
4. Memo from Carlisle/Wortman Associates and proposed text amendments 12/13/18
5. Recommended motion language 1/22/19
6. Resolution and proposed text amendments 1/31/19

Please be further advised that on April 9th, 2019 the Planning Commission made the following recommendation to the Township Board:

A motion was made by Commissioner Krieg, supported by Commissioner Richie to amend the recommendation of approval to the Township Board of Trustees made on January 22, 2019 to read as follows: I move to recommend approval to the Township Board of Trustees to add the proposed conditional rezoning text amendment to Article XXVII. The motion passed unanimously.

I respectfully request that you place this information packet and recommendation for approval on the **May 7th, 2019** Board of Trustees meeting agenda for its consideration. Please contact me with questions or concerns.

Carlisle | Wortman
ASSOCIATES, INC.

117 NORTH FIRST STREET SUITE 70 ANN ARBOR, MI 48104 734.662.2200 734.662.1935 FAX

TO: Charlotte Wilson, Planning and Zoning Coordinator
Mike Radzik, Director of Community Services

FROM: Richard K. Carlisle, AICP

DATE: December 13, 2018

RE: Conditional Rezoning Amendment

Pursuant to our meeting with the Planning Commission, I have revised the amendment to the Zoning Ordinance for conditional rezonings. This is now ready for the Planning Commission to conduct its public hearing.

Please let me know if you have any questions.

Yours Truly,

CARLISLE/WORTMAN ASSOC., INC.
Richard K. Carlisle, PCP, AICP
President

Cc: Dennis McClain, Township Attorney

ARTICLE XXVII. - CHANGES AND AMENDMENTS

Sec. 2701. - Initiation of amendments:

The township board may from time to time, on recommendation from the planning commission, amend, supplement or change the district boundaries or the regulations herein, or subsequently established herein. Amendments to the provisions of this ordinance (i.e. ordinance text amendment) may be initiated by the township board, the planning commission or by petition from one or more residents or property owners of the township. An amendment to the official zoning map (i.e. rezoning) may be initiated by the township board, the planning commission or by the owner or owners of the property that is the subject of the proposed amendment. All proposed amendments to the provisions of this ordinance or the official zoning map shall be referred to the planning commission for public hearing and recommendation to the township board, prior to consideration thereof by the township board pursuant to the authority and procedure established in ~~Act. No. 184 of the Public Acts of Michigan of 1943 (MCL 125.271 et seq.)~~ Act No. 110 of the Public Acts of Michigan of 2006 (MCL 125.3101 et seq.), as amended.

(Ord. No. 2003-327, 1-20-04)

Sec. 2702. - Application procedure:

An amendment to this ordinance text or the official zoning map shall be initiated by submission of a completed application on a form supplied by the community and economic development director, including an application fee, which shall be established by resolution of the township board. Amendments initiated by the township board or planning commission do not require an application or fee.

(a) In the case of an amendment to the official zoning map, the application shall be accompanied by the following:

(1) The name and address of the owner of the subject property and a statement of the applicant's interest in the subject property, if not the owner in fee simple title;

(2) A legal description and street address of the subject property;

(3) A written description of how the requested rezoning satisfies the requirements identified in section 2703;

(4) A site analysis plan, the scale of which shall be no less than one inch = 200 feet and includes the following information:

a. A title indicating the nature of the rezoning request, the applicant's name and the site address or general location;

b. A legend indicating the owner of record, the engineer, surveyor or drafter, as applicable, the date of submission, scale and north arrow;

c. A boundary survey of the subject property;

d. The location of existing site boundary lines, buildings, structures or other improvements, parking areas, driveways, points of ingress and egress for the site and adjacent parcels;

e. The location, width and names of existing streets and public or private easements adjacent to the site;

f. The location of existing and proposed man-made features, including but not limited to drainage or utility structures or improvements;

g. The location of existing natural features, including but not limited to the location of existing drainage courses, regulated floodplains or wetlands and other relevant information the planning commission has determined to be necessary and essential to making an informed recommendation to the township board; and

h. Existing and proposed zoning classification(s) of the site and adjacent parcels.

(Ord. No. 2003-327, 1-20-04)

Sec. 2703. - Amendment procedure—Public hearing and notice:

(a) Upon certification by the community and economic development department that the application for amendment is complete, the item shall be scheduled before the planning commission to set a public hearing.

(b) In all cases of a text amendment or rezoning of individual or multiple properties, the planning commission shall conduct a public hearing to present the request and to receive comments. Notice of the hearing shall be given in accordance with the requirements of Section 103 of the Michigan Zoning Enabling Act, Act 110 of 2006, as amended. An affidavit of mailing shall be maintained.

(c) If an individual property or several adjacent properties are proposed for rezoning, the township shall give separate notice for each property for which approval is being considered. Such notice shall be consistent with the notice required by paragraph (b) above.

(d) A sign shall be placed on the subject property to inform the public that a request for rezoning has been filed, and to indicate the location of information regarding the

request. The sign shall be placed in a conspicuous location where it is readable from the public road, not less than 15 days prior to the date the application will be considered for approval. The sign shall meet the following requirements:

(1) The sign shall be three feet by three feet in area, painted white with black lettering.

(2) The sign shall state "This property petitioned for rezoning from XX to XX" with four-inch tall block letters. The sign shall also state "If you have any questions call the Charter Township of Ypsilanti Community Development Department at 734-485-3943" and indicate the rezoning identification number assigned by the township with two-inch tall block letters.

(e) Following the public hearing, the planning commission shall identify and evaluate factors relevant to the petition and the criteria in this article and shall make its recommendation to the township board.

(f) The community and economic development department shall forward a copy of the application, planning commission recommendation and minutes of the public hearing to the township board and request the township clerk to place the application on the agenda of the next regularly scheduled meeting of the township board.

(g) Following receipt of the findings and recommendation of the planning commission, the township board shall consider the proposed amendment. The township board shall conduct two readings on the proposed amendment. The township board then shall approve or deny the amendment, based on the criteria contained in this article.

(Ord. No. 2003-327, 1-20-04; Ord. No. 2008-386, 10-7-08)

Sec. 2704. - Criteria for amendment of the official zoning map:

In considering any petition for an amendment to the official zoning map, the planning commission and township board shall consider the following criteria in making its findings, recommendations and decision:

(a) Consistency with the goals, policies and future land use map of the Charter Township of Ypsilanti Master Plan, including any sub-area or corridor plans. If conditions have changed since the master plan was adopted, the rezoning may be found to be consistent with recent development trends in the area.

(b) Compatibility of the site's physical, geological, hydrological and other environmental features with all uses permitted in the proposed zoning district compared to uses permitted under current zoning.

(c) Evidence the applicant cannot receive a reasonable return on investment through developing the property with at least one of the uses permitted under the current zoning.

(d) The compatibility of all uses permitted in the proposed zoning district with surrounding uses and zoning in terms of land suitability, impacts on the environment, density, nature of use, traffic impacts, aesthetics, infrastructure and potential influence on property values compared to uses permitted under current zoning.

(e) The capacity of township utilities and services sufficient to accommodate all the uses permitted in the requested district without compromising the "health, safety and welfare" of the township.

(f) The capacity of the street system to safely and efficiently accommodate the expected traffic generated by uses permitted in the requested zoning district. A traffic impact study in accordance with the requirements of the township traffic impact study ordinance shall be provided if the proposed rezoning district permits uses that could generate 100 or more directional trips during the peak hour, or at least 1,000 more trips per day than the majority of the uses that could be developed under the current zoning, as determined by the community and economic development department.

(g) The apparent demand for the types of uses permitted in the requested zoning district in the township, and surrounding area, in relation to the amount of land in the township, and surrounding area, currently zoned and available to accommodate the demand.

(h) The boundaries of the requested zoning district are sufficient to meet the dimensional regulations for the zoning district listed in article XX, schedule of regulations.

(i) If a rezoning is appropriate, the requested zoning district shall be more appropriate from the township's perspective than another zoning district.

(j) The requested rezoning will not create an isolated and unplanned spot zone.

(k) The request has not previously been submitted within the past one year, unless conditions have changed, or new information has been provided.

(l) Other criteria as determined by the planning commission or township board which would protect the health and safety of the public, protect public and private investment in the township, and enhance the overall quality of life in Charter Township of Ypsilanti.

(Ord. No. 2003-327, 1-20-04)

Sec. 2705. – Conditional amendment of the official zoning map:

The Township Board shall have the authority to place conditions on an amendment to the official zoning map, commonly referred to as a conditional rezoning, provided the conditions have been

voluntarily offered in writing by the applicant and are acceptable to the Township Board. In exercising its authority to consider a conditional rezoning, the Township is also authorized to impose the following limitations:

(a) An owner of land may voluntarily offer written conditions relating to the use and/or development of land for which a conditional rezoning is requested. This offer may be made either at the time the application for conditional rezoning is filed, or additional conditions may be offered at a later time during the conditional rezoning process as set forth below.

(1) The owner's offer of conditions may not authorize uses or developments not permitted in the requested ~~new~~ zoning district. The owner's offer of conditions shall bear a reasonable and rational relationship to the property for which the conditional rezoning is requested.

(2) ~~Any use or development proposed as part of an offer of conditions~~A conditional rezoning that would also require ~~special use~~ approval of a conditional use, variance or site plan under the terms of this ordinance shall not be effective until ~~may only be commenced if special use~~ approval for a conditional use, variance or site plan ~~such use or development~~ is ultimately granted in accordance with the provisions of this ordinance.

~~(3) Any use or development proposed as part of an offer of conditions that would require a variance under the terms of this ordinance may only be commenced if a variance for such use or development is ultimately granted by the Zoning Board of Appeals in accordance with the provisions of this ordinance.~~

~~(4) Any use or development proposed as part of an offer of conditions that would require site plan approval under the terms of this ordinance may only be commenced if site plan approval for such use or development is ultimately granted in accordance with the terms of this ordinance.~~

(b) The offer of conditions may be amended during the process of conditional rezoning consideration, provided that any amended or additional conditions are entered voluntarily by the owner and confirmed in writing. An owner may withdraw in writing all or part of its offer of conditions any time prior to final rezoning action of the Township Board, provided that, if such withdrawal occurs subsequent to the Planning Commission's public hearing on the original rezoning request, then the rezoning application shall be referred back to the Planning Commission for a new public hearing with appropriate notice and a new recommendation.

(c) The procedure for consideration of Conditional Rezoning request by the Planning Commission and Township Board shall be the same as provided in Section 2702 for all other requests for amendments to the official zoning map. ~~and the requirements of said Sections shall be applicable to Conditional Rezoning in addition to t~~The following additional information shall also be required:

(1) A Conditional Rezoning request shall be initiated by the submission of a proposed Conditional Rezoning Agreement. A Conditional Rezoning Agreement shall include the following:

a. A written statement prepared by the applicant that confirms the Conditional Rezoning Agreement was proposed by the applicant and entered into voluntarily.

b. A written statement prepared by the applicant that confirms that the property shall not be used or developed in a manner that is inconsistent with conditions placed on the rezoning.

c. A list of conditions proposed by the applicant.

d. A time frame for completing the proposed improvements.

e. A legal description of the land.

f. A Sketch Plan in sufficient detail to illustrate any specific conditions proposed by the applicant.

(2) The Notice of Public Hearing on a Conditional Rezoning request shall include a general description of the proposed agreement being considered. A review of the proposed agreement shall be conducted at the public hearing.

(3) A Conditional Rezoning may be approved upon the criteria set forth in Sec. 2704 and a finding and determination that all of the following are satisfied:

a. The conditions, proposed development, and/or proposed use of the land are designed or proposed for public health, safety, and welfare purposes.

b. The conditions, proposed development and/or proposed use are not in material conflict with the Master Plan, or, if there is material conflict with the Master Plan, such conflict is due to one of the following:

i. A change in Township policy since the Master Plan was adopted.

ii. A change in conditions since the Master Plan was adopted.

iii. An error in the Master Plan.

c. The conditions, proposed development and/or proposed use are in accordance with all terms and provisions of the zoning district to which the land is to be rezoned, except as otherwise allowed in the Conditional Rezoning Agreement.

d. The conditions, proposed development and/or proposed use shall insure compatibility with adjacent uses of land.

(d) Upon approval by the Township Board of a Conditional Rezoning request and a Conditional Rezoning Agreement, as provided by this Section, the Zoning Map shall be amended to reflect a new zoning classification along with a relevant designation that will provide reasonable notice of the Conditional Rezoning Agreement.

(e) A Conditional Rezoning Approval shall expire following a period of time from the effective date of the rezoning established by the Township Board, unless progress has been diligently pursued and substantial completion has occurred in accordance with permits issued by the Township.

(1) In the event the conditional rezoning expires, the rezoning and the Conditional Rezoning Agreement shall be void and of no effect.

(2) If the Conditional Rezoning becomes void, no development shall be undertaken and no permits for development shall be issued until such time as a new zoning district classification of the property has become effective as a result of one or both of the following actions that may be taken:

a. The property owner seeks a new rezoning classification for the property; and/or

b. The Township initiates a new rezoning request for the property to a reasonable district classification, in accordance with the conventional rezoning procedure.

(f) Recording. A Conditional Rezoning Approval shall not become effective until the Conditional Rezoning Agreement is recorded with the Washtenaw County Register of Deeds and a certified copy of the Agreement is filed with the Township Clerk.

(g) Violation of Conditional Rezoning Agreement. If development and/or actions are undertaken on or with respect to the property in violation of the Conditional Rezoning Agreement, such development and/or actions shall constitute a violation of this ordinance and deemed a nuisance per se. In such case, the Township may issue a stop work order relative to the property and seek any other lawful remedies. Until curative action is taken to bring the property into compliance with the Conditional Rezoning Agreement, the Township may withhold, or, following notice and an opportunity to be heard, revoke permits and certificates, in addition to or in lieu of such other lawful action to achieve compliance.

CHARTER TOWNSHIP OF YPSILANTI
PLANNING COMMISSION
MINUTES OF THE JANUARY 22, 2019 REGULAR MEETING

Chair Jason Iacoangeli called the regular meeting to order at 6:31 pm in the Ypsilanti Township Civic Center Board Room 7200 S. Huron River Drive, Ypsilanti Township.

Commissioners Present: Chair Jason Iacoangeli and Commissioners Gloria Peterson, Bill Sinkule, Stan Eldridge, Sally Richie, Laurence Krieg and Muddasar Tawakkul

Commissioners Absent: None

Others in Attendance: Megan Mason-Minock, Carlisle-Wortman Associates; Elliot Smith, OHM; Charlotte Wilson, Planning and Development Coordinator

1. CALL TO ORDER

2. ROLL CALL

3. APPROVAL OF THE DECEMBER 11, 2018 REGULAR MEETING MINUTES

A motion was made by Commissioner Krieg supported by Commissioner Eldridge to approve the minutes of the December 11, 2018 Regular Meeting. The motion carried unanimously.

4. APPROVAL OF AGENDA

A motion was made by Commissioner Eldridge supported by Commissioner Sinkule to approve the agenda. The motion carried unanimously.

5. PUBLIC HEARINGS AND PLAN REVIEW

A. PRELIMINARY SITE PLAN AND SPECIAL LAND USE – GROUP 10 MANAGEMENT – 2169 WASHTENAW AVENUE – TO CONSIDER THE PRELIMINARY SITE PLAN AND SPECIAL LAND USE PERMIT FOR THE CONSTRUCTION OF A 5,400 SQUARE FOOT GAS STATION AND CONVENIENCE STORE LOCATED AT 2169 WASHTENAW AVENUE, PARCEL K-11-06-478-001.

Charlotte Wilson, Planning and Zoning Coordinator said the site is zoned B-3, General Business, is .71 acres and currently vacant. In addition to the store there would be 8 gas pumps. There would be no auto repair onsite. Per Section 306 the proposed use is principally permitted subject to Special Conditions which are outlined in Section 1829 of the Township Zoning Ordinance. The proposed would require a Special Land Use permit as outlined in Section 2119 of the Zoning Ordinance. The public notice was published on January 3, 2019. The project received preliminary site plan approval on December 16, 2015 but since it has expired the applicant resubmitted their application. South, east and west of the property is Master Planned Urban Commercial Corridor and zoned B-3, General Business and all the uses are commercial. North of the property is the City of Ypsilanti and the use is commercial.

Carlisle-Wortman Associates reviewed the preliminary site plan and Special Land Use permit and in a November 12, 2018 letter recommended approval with the following conditions: reduce parking requirements by reducing building size or providing more parking or obtain a waiver from the Planning Commission and confirming the ability to reduce lighting from 11 pm to sunrise. OHM recommended approval in a November 16, 2018 letter. Ypsilanti Community Utilities Authority recommended approval in a September 6, 2018 letter with minor comments related to detailed engineering. Washtenaw County Water Resources offered comments related to detailed engineering in a January 16, 2019 letter. Washtenaw County Road Commission stated the plans meet technical approval in a November 16, 2018 letter. Michigan Department of Transportation offered preliminary approval and the applicant would need to obtain a

permit. Ypsilanti Township Fire Department recommended approval in a November 13, 2018 letter.

She pointed out that motions for approval should be separate, one for the preliminary site plan and one for the Special Land Use permit. One public comment was received via email from the property owner to the east.

Megan Masson-Minock, Carlisle-Wortman Associates said the proposed size of the store is large compared to surrounding stores which are between 2,600 and 1,200 square feet. She also highlighted that this parcel has been designated as a node in the "Re-imagine Washtenaw Corridor" plan which promotes buildings being placed at the hard corner. The corner has also been identified as a "super stop" location for the AAATA. The applicant said the gas station would not meet the vision of the improvement plan and the building could not be placed at the hard corner because the gas pumps need the visibility. The applicant would not be able to place the bus pull off lane on Washtenaw Avenue because that would remove access from that road. The applicant also provided details on why they could not meet the corridor improvement study in a memo dated October 31, 2018. She stated the Commission had to decide whether or not to grant a parking waiver. Based on the size of the store they are deficient in 6 parking spaces. She said there are three options to meet the parking requirements: a) reduce the parking requirement by reducing the building size, b) provide more parking onsite or c) seek a parking waiver. The applicant chose to pursue the waiver. There will be pedestrian access to the site and the applicant asked the Commission to count each space at the gas pumps towards the overall site requirement. The Ordinance does not recognize pump spaces as parking spaces.

She stated one outstanding item from their review was exterior lighting. Section 2110, subsection ii, item I states all business exterior lighting fixtures be turned off between 11 pm and sunrise unless used for security purposes or the business is open past 11 pm. She said there was no indication that lights would be turned off or if they would meet the exception in the Ordinance. She said Carlisle-Wortman recommends approval for both preliminary site plan and Special Land Use with the conditions of parking and exterior lighting.

Commissioner Sinkule asked why the super stop was not on the site plan.

Ms. Masson-Minock stated because the applicant could not meet the requirements. She continued that there is little in the Ordinance that could enforce meeting requirements along the corridor and recommended that be looked into during the Ordinance update.

Commissioner Iacoangeli said he had serious concerns about the design. He said the building's location on the lot would look like a brick wall when facing it from the CVS. He said the idea that the pumps needed to be visible is false in an urban environment and believed the building could go at the hard corner and the pumps could go where the proposed building was on the site plan. He said that there would be a lot of pedestrian traffic due to the bus stop and the residential neighborhood to the south and having the building at the corner would allow greater walkability.

Commissioner Krieg said he has worked with the "Re-Imagine Washtenaw" committee for 11 years and the plan is a long-term project and he believed that if the Commission were to approve the gas station it would set the plans back. He said that he would not approve the design because it did not meet the purpose of the 2014 Corridor Improvement Study, he believed it would not be compatible with future land uses in the area and that it would not contribute any necessary functions or contribute to the Township's growth.

Commissioner Sinkule asked if the Commission had to approve the plans because they were approved in 2015.

Ms. Masson-Minock stated the Township attorney would be best suited to answer that question and said Carlisle-Wortman were not part of the 2015 review.

Commissioner Iacoangeli said that because the original site plan expired, the plans in front of the Commission would be treated as brand new.

Commissioner Peterson asked where parking would be located.

Ms. Masson-Minock stated it was in front of the building and wrapped around.

Commissioner Richie commented that the gas station would not fit the vision. She asked why the site plan could not be changed to better fit. She said the intersection was one of the busiest in the county and the pumps should not have to be visible. She said she would vote no.

Commissioner Tawakkul asked how long the parcel has been vacant and if the applicant has been the owner since then.

Ms. Masson-Minock said approximately 2 years.

The applicant responded yes from the audience.

Commissioner Tawakkul asked if the Commission was stating as a body they do not want a gas station at that site at all or if they were stating that they would like a gas station but it would need to meet all criteria.

Commissioner Iacoangeli said he did not mind the gas station but it had to meet all criteria. He said that if the Commissioners were not comfortable making a decision because the attorney was not present, he would be fine with a motion to table.

Elliot Smith, OHM Advisors said his office confirmed that all past approval letters that had contingencies had been addressed before issuing their letter. He said they recommended approval from an engineering standpoint.

Scott Tousignant, Boss Engineering, 3121 E. Grand River, Howell MI said the only changes made to the new plan was increasing the sidewalk width to 8 feet and canopy light levels. He said they went back to all of the agencies and have either gotten approval or are close to getting approval. He said they were prepared to add a row of shrubs to the south side of the building along the property line and to improve the aesthetics on the building. He justified fewer parking spaces with the claim there would be pedestrian use. He agreed that the AAATA bus lane created issues and worked with Michigan Department of Transportation to get approved for a right turn only in and out access point on Washtenaw Avenue.

Jack Knowles, Group 10 Management stated he was surprised at the comments because in 2015 they received unanimous approval. They have built several gas stations and 5,400 square feet is in the middle in terms of size. He said the design and materials are an improvement over the station that was there previously and what is in the area. He added most business is at the gas pumps and people leave their vehicles at the pump when going inside the store which would free up parking spaces for others. He said the bus stop would not work for any business at that corner since it would take away Washtenaw Avenue access. He said building at the hard corner would be a problem because people want “easy in/out” to access the pumps.

Commissioner Richie asked why the store size could not be reduced to add parking and why the plan could not be reversed.

Mr. Knowles said they have worked with the Township to include as much criteria as they could. He said the Master Plan is a guide and there needs to be flexibility.

Commissioner Richie said it would be possible for it to be built differently to meet all the criteria.

Commissioner Eldridge asked why they didn’t build when originally approved.

Mr. Knowles said projects were delayed and someone lost track of timelines.

Commissioner Eldridge said it did not matter what way the building faced, someone would face a large back wall. He said the parcel had been vacant for longer than 3 years, closer to 6-7 years and he would vote to approve.

Commissioner Krieg said the goal is to make Washtenaw Avenue a walkable area and he does not think people would want to have a cup of coffee at a gas station if they were walking. He said gas stations are 100% designed for vehicles.

Mr. Knowles said every business on Washtenaw Avenue is vehicle dependent and they tried to make their plan fit the criteria by widening the sidewalk.

Commissioner Eldridge reminded the Commissioners that the gas station at Washtenaw Avenue and Cornell was torn down recently and rebuilt and the store portion was not moved to the front of the parcel. He said this location was part of "Re-Imagine Washtenaw" and that there have been diversions from the vision. He asked if there were any alternatives that would add 6 parking spaces.

Ms. Masson-Minock said the applicant was clear they would like to maintain the size of the building and to obtain a parking waiver.

Commissioner Eldridge asked about the lighting.

Ms. Masson-Minock said they needed to know if the lights would be turned off at 11 pm and if not, the reason(s) why.

Mr. Knowles said the station would be open 24 hours so the lights would be on all night.

Commissioner Eldridge asked if there would be interior and exterior security cameras.

Mr. Knowles said yes and they would provide tapes to law enforcement as needed.

Commissioner Eldridge said he agreed that the proposed super stop should be installed prior to Hewitt Road for safety and traffic reasons.

Commissioner Richie questioned why the Commissioners would grant a parking waiver since Mr. Knowles said the area and gas station was vehicle dependent.

Mr. Knowles said they feel parking spaces are sufficient based on their past experience but if parking was that big of a concern he would reduce the building size.

The public hearing opened at 7:26 pm

Commission Tawakkul asked if the neighboring property owner who emailed comments responded after they received the requested documentation.

Ms. Wilson said no, the owner wanted his comments included in that evening's meeting.

Commissioner Eldridge recalled that in 2015 the applicant tried to enter into an agreement for extra parking but neighboring property owners were uninterested.

Mr. Knowles confirmed and said to his knowledge that has not changed.

The public hearing closed at 7:28 pm

Commissioner Krieg said he wanted the Township attorney's input on whether they had to approve the plans because they were approved in 2015 and suggested tabling the discussion.

Commissioner Eldridge said he opposed this.

A motion was made by Commissioner Eldridge to approve the Preliminary Site Plan for construction of a 5,400 square foot gas station and convenience store for a site zoned B-3, General Business located at 2169 Washtenaw Avenue, Parcel K-11-06-478-001 with the following conditions:

1. **All exterior lighting be turned off at any time the store would be closed for business, if it remains a 24 hour business acceptable lighting would be approved.**
2. **Applicant shall obtain applicable Washtenaw County Water Resources Commission, Washtenaw County Road Commission and Michigan Department of Transportation permits and all video interior and exterior camera systems be made available to law enforcement should they need them and that it be a 45 day system.**

And to approve the request of a Special Land Use permit for construction of a 5,400 square foot gas station and convenience store for a site zoned B-3, General Business located at 2169 Washtenaw Avenue, Parcel K-11-06-478-001.

Commissioner Iacoangeli said he wanted to split the motions into 2 separate votes and vote on the Special Land Use permit first. Commissioner Eldridge approved.

A motion was made by Commissioner Eldridge, supported by Commissioner Tawakkul to approve the request of a Special Land Use permit for construction of a 5,400 square foot gas station and convenience store for a site zoned B-3, General Business located at 2169 Washtenaw Avenue, Parcel K-11-06-478-001.

The motion failed as follows:

Richie: No Krieg: No Eldridge: Yes Peterson: Yes Sinkule: No Tawakkul: Yes Iacoangeli: No

Once the Special Land Use motion failed, Commissioner Eldridge withdrew his motion for preliminary site plan approval.

Commissioner Peterson said she would be open to tabling the discussion to try and work with the applicant and obtain the attorney's input.

Commissioner Iacoangeli said that if the applicant is going to return for preliminary site plan, staff could put them on the next available agenda and tabling would not be necessary.

Mr. Knowles said that because the plan approval was dependent on obtaining a land use permit the project was dead.

Commissioner Eldridge asked if the applicant had to wait one year to resubmit since they were denied. If so, the only option would be to reconsider at that evening's meeting or the next.

Ms. Wilson said the applicant could resubmit within one year if something changed.

Commissioner Peterson asked on whose end.

A discussion followed.

Commissioner Eldridge reiterated his understanding that a reconsider motion would have to be made at the meeting or the next otherwise the applicant had to wait a year.

Commissioner Krieg explained why he voted no to the applicant. He suggested the applicant become familiar with what the ReImagine Washtenaw study looks like and perhaps they could consider submitting an application for a more harmonious business.

Commissioner Tawakkul asked if the Commission was considering rescinding the motion so a motion could put forth to table.

Commissioner Iacoangeli said they voted no because they did not think the gas station was harmonious with the use.

Commissioner Krieg said he thought a motion to reconsider would be out of place. He thought tabling could work because the Commission only voted on one motion.

Commissioner Iacoangeli disagreed and said they needed to move on.

Commissioner Peterson asked for confirmation that Commissioner Iacoangeli said if the applicant made changes they could come back.

Commissioner Iacoangeli said if there was a significant change the staff could make a determination on whether or not to bring it back.

B. **ZONING ORDINANCE AMENDMENT –** TO CONSIDER THE PROPOSED CHANGES TO ARTICLE XXVIII TO ADD THE CONDITIONAL REZONING TEXT AMENDMENTS.

Ms. Masson-Minock highlighted some changes that were made. On pages 4-5, Section 2705, Item A, the numbers 1, 2, 3 and 4 were collapsed together. Item C was updated in terms of the procedure for consideration of a Conditional Rezoning. She said the next step would be a recommendation to the Township Board.

Commissioner Tawakkul asked if any of the recommendations from the Economic Steering Committee were taken into account.

Ms. Masson-Minock said yes.

Commissioner Krieg said the revisions in Section 2705 were helpful and removed one of the biggest parts of confusion.

Commissioner Richie agreed it was more user-friendly.

A motion was made by Commissioner Krieg, supported by Commissioner Richie to recommend approval to the Township Board of Trustees the proposed changes to Article XXVIII to add the Conditional Rezoning Text Amendments.

The motion carried unanimously.

6. OLD BUSINESS

None

7. NEW BUSINESS

A. **MASTER PLAN –** TO PROVIDE INPUT ON THE MASTER PLAN UPDATES AND PROCESS.

Ms. Masson-Minock said another Master Plan Workshop is scheduled for February 14-16, 2019 and a flyer will be emailed out in the following week. On February 14, 2019 there will be an Open Studio from 12pm-8pm and on February 15, 2019 from 9pm-6pm. On February 16, 2019 there will be a free pancake breakfast with Township leadership and a panel discussion.

Commissioner Krieg said “Neighborhoods, Jobs and Places” was confusing.

ZONING ORDINANCE AMENDMENT - TO PROVIDE INPUT ON THE PROPOSED ECORSE ROAD ZONING DISTRICT TEXT AMENDMENTS.

Ms. Masson-Minock stated they met with Neighborhood Watch from Oaklawn/Hawthorne and there were concerns about townhouses, the modern building designs and business owners not being able to expand. Opinions were mixed on whether auto repair business and sales should be allowed. Residents would like more small businesses and a family friendly area on Ecorse Road. Sara Jo Shipley, Economic Business Director met with business owners and they saw value in diversity along the corridor. They worry that their businesses were being limited.

She said they want to alter the zoning concept to bring the scale down. Instead of 3 story buildings, make them 1-2 stories. They also want to delay the schedule by at least one month to allow for more conversations with business owners and residents.

Commissioner Tawakkul asked the average age of the businesses on Ecorse Road.

Ms. Masson-Minock said there is a mix of generational and newer.

Commissioner Eldridge said many are 15 years or older.

8. OPEN DISCUSSION FOR ISSUES NOT ON THE AGENDA

A. CORRESPONDENCE RECEIVED

Michigan Association of Planning

B. PLANNING COMMISSION MEMBERS

Commissioner Richie said at the Fairfield Inn's corner where pine trees are located there was a previous discussion where they agreed to re-landscape that area. She asked if that was still going to happen.

Ms. Wilson said she would look into it and report back.

Commissioner Krieg gave an update on Washtenaw Avenue Bus Rapid Transit (BRT) Light. A study was completed and AECOM is almost ready to go out and compete for grants. He also said AAATA locates bus stops after intersections because the Transportation Research Board's guidelines say it is safer.

Commissioner Richie said she did not think the Township had any say in super stop bus locations.

Commissioner Eldridge said he believed AAATA makes the suggestions but it is up to the property owner.

Commissioner Krieg said when Re-Imagine consultants suggested super stops it was for a general idea of an area. He said there are several bodies that need to approve the location and the Township is one of them. AAATA suggests locations but everyone involved has to approve including the Township.

C. MEMBERS OF THE AUDIENCE

None

9. TOWNSHIP BOARD REPRESENTATIVE REPORT

Commissioner Eldridge mentioned recycle and trash would be delayed one day due to freezing temperatures.

10. ZONING BOARD OF APPEALS REPRESENTATIVE REPORT

None

11. TOWNSHIP ATTORNEY REPORT

None

12. PLANNING DEPARTMENT REPORT

Ms. Wilson said the report was included in the Commissioner's packets.

13. OTHER BUSINESS

None

A motion was made by a Commissioner Peterson, supported by Commissioner Eldridge to adjourn the meeting. The motion carried unanimously.

The meeting was adjourned at approximately 8:10pm

Respectfully submitted,

Laura Gough
OCS Clerk

Reviewed and approved,

Laurence J. Krieg
Secretary of the Planning Commission

CHARTER TOWNSHIP OF YPSILANTI

OFFICE OF COMMUNITY STANDARDS

Building Safety • Planning & Zoning • Ordinance Enforcement

TO: Ypsilanti Township Planning Commission

FROM: Charlotte Wilson, Planning and Development Coordinator

DATE: April 5th, 2019

SUBJECT: Request to amend the recommendation of approval to the Township Board of Trustees regarding the Conditional Rezoning Text Amendments to correct a typographical error.

At the January 22nd, 2019 Planning Commission meeting, the following motion was recorded:

> *A motion was made by Commissioner Krieg, supported by Commissioner Richie to recommend approval to the Township Board of Trustees the proposed changes to Article XXVIII to add the Conditional Rezoning Text Amendments.*
>
> *The motion carried unanimously.*

Due to a Roman numeral typographical error, the Article of amendment should have been printed as Article 27 (XVII), not Article 28 (XVIII). The public notice had the correct Article listed and, therefore, no additional public hearing is required. Staff requests that the Planning Commission amends the recommendation of approval to accurately reflect the correct Article.

***Suggested Motions**: The following suggested motions are intended to assist the Commission in making the desired motion of their choice. The Commission may utilize, add or reject any motion and/or conditions suggested herein as they deem appropriate.*

Motion to amend the recommendation of approval:

"I move to amend the recommendation of approval to the Township Board of Trustees made on January 22nd, 2019 to read as follows:

I move to recommend approval to the Township Board of Trustees to add the proposed Conditional Rezoning Text Amendments to Article XXVII (27)."

Respectfully submitted,

Charlotte Wilson, AICP
Planning and Development Coordinator

CHARTER TOWNSHIP OF YPSILANTI
PLANNING COMMISSION
MINUTES OF THE APRIL 9, 2019 REGULAR MEETING

Chair Jason Iacoangeli called the regular meeting to order at 6:30 pm in the Ypsilanti Township Civic Center Board Room 7200 S. Huron River Drive, Ypsilanti Township.

Commissioners Present: Chair Jason Iacoangeli and Commissioners Gloria Peterson, Bill Sinkule, Stan Eldridge, Sally Richie, Laurence Krieg and Muddasar Tawakkul

Commissioners Absent: None

Others in Attendance: Angela King, Township Attorney; Megan Mason-Minock, Carlisle-Wortman Associates; Charlotte Wilson, Planning and Development Coordinator

1. CALL TO ORDER

2. ROLL CALL

3. APPROVAL OF THE JANUARY 22, 2019 REGULAR MEETING MINUTES

A motion was made by Commissioner Peterson supported by Commissioner Krieg to approve the minutes of the January 22, 2019 Regular Meeting. The motion carried unanimously.

4. APPROVAL OF AGENDA

A motion was made by Commissioner Eldridge supported by Commissioner Sinkule to approve the agenda. The motion carried unanimously.

5. PUBLIC HEARINGS AND PLAN REVIEW

6. OLD BUSINESS

A. ZONING ORDINANCE AMENDMENT – TO AMEND THE RECOMMENDATION OF APPROVAL TO THE TOWNSHIP BOARD OF TRUSTEES REGARDING THE CONDITIONAL REZONING TEXT AMENDMENTS TO CORRECT A TYPOGRAPHICAL ERROR

Charlotte Wilson, Planning and Zoning Coordinator said at the January 22, 2019 Planning Commission meeting the board recommended approval to amend Article XXVIII to add conditional rezoning text amendments. This was supposed to be in Article XXVII and the error was due to a Roman numeral typographic error. Staff requests the Planning Commission amend the recommended motion of approval to accurately reflect the corrected Article.

A motion was made by Commissioner Krieg, supported by Commissioner Richie to amend the recommendation of approval to the Township Board of Trustees made on January 22, 2019 to read as follows: I move to recommend approval to the Township Board of Trustees to add the proposed conditional rezoning text amendment to Article XXVII. The motion passed unanimously.

7. NEW BUSINESS

A. ZONING ORDINANCE AMENDMENT – TO PROVIDE INPUT ON THE PROPOSED ECORSE ROAD ZONING DISTRICT TEXT AMENDMENTS.

Megan Masson-Minock, Carlisle-Wortman Associates said this meeting would be a work session for a proposed zoning district for Ecorse Road. There will be a Public Hearing at the next meeting in April 2019 and if it is recommended it would go to the Township Board of Trustees for a work session and at least two readings. She said this would be the approach used for all other Township corridors such as Washtenaw, East

Michigan, Huron, etc. She said the amendments came out of the Placemaking Plan that was done in 2018. Ecorse Road would move to form based zoning and other changes would be made including additional striping in the turn lane, on street parking and streetscape which includes trees, landscaping and lighting. She stated the minimum rear setback requirement would change to 10 feet from 20 feet which would enable parking along the rear or sides of buildings.

She said there were also proposed changes in the uses. These include removing auto sales and auto repair (current businesses would be able to remain but no new businesses would be approved).

Commissioner Richie asked for clarification about on street parking locations.

Ms. Masson-Minock said many of the lots are shallow which makes parking difficult. She said they were considering a road diet and creating on street parking areas to help the area redevelop.

She then gave a slideshow presentation detailing the steps one would take to determine design and use per zoning type including non-conforming structures.

Commissioner Iacoangeli asked if detached single family homes could be built.

Ms. Masson-Minock stated no, only attached, in order to make the area more walkable. Any single family homes currently on Ecorse Road could remain.

Commissioner Krieg asked for clarification on height limits for the site types.

Ms. Masson-Minock said Type A is minimum single story and maximum two stories, Type B is minimum single story and maximum two stories with three stories allowed if there was a bonus like a courtyard, and Type C is minimum single story and maximum three stories. Single story height would be 14 feet and two story properties would be 30 feet.

Commissioner Richie asked if one had a legal non-conforming use and the owner sells the property, would the non-conforming use run with the land.

Ms. Masson-Minock stated yes. However if the owner abandons the use then the non-conforming status can fall off.

She asked the Commissioners if any changes would be necessary for the Public Hearing. There were none.

B. MASTER PLAN - TO PROVIDE INPUT ON THE MASTER PLAN UPDATES AND PROCESS.

Ms. Wilson said the Master Plan reveal went well and there were positive comments. She said the Master Plan adoption is in the writing process and she will send it to the Commissioners for review when it is ready.

The categories resulting from the Master Plan project are neighborhoods, jobs and places. Neighborhoods have a strong sense of identity, jobs would be focused on economic development and revitalizing corridors and places would be focused on creating places to connect the Township. She shared the Master Plan vision and mission statements. She said the goals and objectives would be very specific in each category so those in charge of implementation are held accountable.

The future land use map would move towards a more mixed use and Ms. Wilson gave a brief presentation on some map details. A discussion followed between the Commissioners, Ms. Wilson and Ms. Masson-Minock. Ms. Masson-Minock said the map as presented was not in final form and if the Commissioners had suggestions or changes they should let her know.

Ms. Masson-Minock said the Economic Development department would work with a corridor's zoning to recruit retailers and investments. A discussion followed regarding individual corridors and their zoning designations. She said in the future they would need to decide if corridors should have traditional based zoning or form based zoning.

She discussed catalyst projects, which are projects that have an urgency to them as they will make things happen. These include the Zoning Ordinance, healthy neighborhoods, Wiard Road connection near the American Center for Mobility, open space and agricultural preservation and social and cultural presence. Healthy neighborhoods would be concentrated on preserving neighborhoods with increased safety, infrastructure investment, healthy food access, healthy environments, easy access to all forms of transportation, job creation and educational opportunities. Regarding the Wiard Road connection, there is no north/south connection between Wiard Road and East Michigan Avenue which cuts off neighborhoods and land parcels. She said this project is going to be difficult to get approved but it is vitally important. She then discussed open space and agricultural preservation and said this will be difficult as well due to the way the Township has been zoned. She said this will have to be done in partnership with others to preserve land because it is not something that can be accomplished with zoning alone. Social and cultural presence is already in the Township, it just needs to be focused. Residents are upset that media narrative is always negative and want it changed. She suggested public arts, cultural events and increased good public spaces as ways to accomplish this.

She told the Commissioners they are drafting the Master Plan and it should be finished by end of April 2019 so it can be brought to them in May 2019. Per state law the plan will need to available for review by adjoining communities for either 61 or 63 days and during that time it would also be discussed with the community at neighborhood watch meetings and public meetings. Once a Public Hearing was completed the Commissioners could then recommend approval to the Board of Trustees. The process should be done by end of summer 2019 or early fall 2019.

Commissioner Krieg asked if there were plans with the City of Ypsilanti to coordinate plans or ideas.

Ms. Mason-Minock stated the City is working with the Township on Ecorse Road zoning and a joint corridor improvement agency. Throughout the Master Plan process the City Planner has given her opinion and there are partnership opportunities with the catalyst projects as well. She said she was a part of the City's Master Plan process 6 years ago and is cognizant of that.

8. OPEN DISCUSSION FOR ISSUES NOT ON THE AGENDA

A. CORRESPONDENCE RECEIVED

Michigan Association of Planning

B. PLANNING COMMISSION MEMBERS

Commissioner Krieg said his term as a member of the Ann Arbor Area Transportation Authority (AAATA) Board ends at the end of the month.

C. MEMBERS OF THE AUDIENCE

None

9. TOWNSHIP BOARD REPRESENTATIVE REPORT

Commissioner Eldridge said recreational marijuana continues to be a discussed issue. The first reading occurred one week ago so the Township could opt out while waiting to see what the regulations imposed by the state would be.

Angela King, Township Attorney, said this has to do with the business aspect of the marijuana industry, not the individual use. Individual use is not affected by opting out.

10. ZONING BOARD OF APPEALS REPRESENTATIVE REPORT

Commissioner Iacoangeli said at the last meeting Conditional Use Permits were issued for fireworks sales.

Attorney King stated the Township recently adopted an ordinance which restricts when fireworks can be used.

11. TOWNSHIP ATTORNEY REPORT

None

12. PLANNING DEPARTMENT REPORT

Ms. Wilson said the report was included in the Commissioner's packets. She added that Hampton Inn Suites had a pre-construction meeting on April 2, 2019 and they are ready to begin construction with a June 2020 opening date.

13. OTHER BUSINESS

None

A motion was made by a Commissioner Peterson, supported by Commissioner Sinkule to adjourn the meeting. The motion carried unanimously.

The meeting was adjourned at approximately 8:21pm

Respectfully submitted,

Laura Gough
OCS Clerk

Revised and approved,

Laurence J. Krieg
Secretary of the Planning Commission

NEW BUSINESS

CHARTER TOWNSHIP OF YPSILANTI

RESOLUTION 2019-27
(In Reference to Ordinance 2019-488)

Adoption of the 2018 Edition of the
International Fire Prevention Code

Whereas, the Charter Township of Ypsilanti Board of Trustees recognizes the need for a modern, up-to-date fire code addressing conditions hazardous to life and property from fire and explosion hazards; the storage, handling and use of hazardous substances and materials; and the use and occupancy of buildings and premises; and

Whereas, the International Fire Code, 2018 Edition, is designed to meet these needs through model code regulations that safeguard public health and safety; and

Whereas, the International Fire Code, 2018 Edition, is fully compatible with the Michigan Building Code, Michigan Residential Code, Michigan Rehabilitation Code and the International Property Maintenance Code.

Whereas, the Township Fire Department recommends adoption of Ordinance 2019- 488.

Now Therefore,

Be it resolved, that the Charter Township of Ypsilanti Board of Trustees hereby adopts by reference attached Ordinance No. 2019-488 amending the Code of Ordinances of the Charter Township of Ypsilanti, Article II, Fire Prevention Code.

CHARTER TOWNSHIP OF YPSILANTI

PROPOSED ORDINANCE NO. 2019-488

An Ordinance Amending the Code of Ordinances,
Charter Township of Ypsilanti, Chapter 30, Article II
Entitled Fire Prevention Code by Adoption of the
2018 Edition of the International Fire Prevention Code

The Charter Township of Ypsilanti hereby **Ordains** that Chapter 30 of the Code of Ordinances for Ypsilanti Township, Article II entitled Fire Prevention Code is hereby amended as follows:

DELETE in its entirety the current Article II entitled Fire Prevention Code (Sections 30-26 through 30-31, inclusive).

ADD the following new provision:

A. Adoption by Reference.

A certain document, copies of which are on file with the office of the Township Clerk and the Bureau of Fire Prevention, being marked and designated as the "***International Fire Code, 2018 Edition, International Code Council***," is adopted by reference, including Appendix Chapters A through N, and all references therein printed – except those section and appendices herein amended, deleted or added. This document shall be known and may be cited as the "***Fire Prevention Code of the Charter Township of Ypsilanti***," regulating and governing conditions hazardous to life and property from the standpoint of fire and explosion and for defining the scope of authority of the chief of the fire department and the bureau of fire prevention.

B. Purpose of Article.

The purpose of this article is to provide for the prevention of fires and the protection of persons and property from exposure to the dangers of fire and explosion; to authorize the investigation of fires and the discovery of crime or other offenses in relation thereto; to require the razing, repair and alterations of building, and the clearing and improvement of premises which constitute a fire hazard or a menace to the peace, security or safety of persons or property; to control the use and occupancies of such premises; to provide for the transportation, use and storage of inflammable liquids, compressed gases, and corrosive liquids; to prohibit the use of certain fire extinguishers and fire extinguishing agents; to provide for the administration of this article; and to fix penalties for violation of the provisions of this article.

C. Code Available for Public Use and Inspection.

Complete printed copies of the ***Fire Prevention Code*** of the Charter Township of Ypsilanti and supplements, therein adopted, are available for public use and inspection at the office of the Township Clerk and at the office of the Bureau of Fire Prevention.

D. References in Code.

References in the ***Fire Prevention Code*** of the Charter Township of Ypsilanti and supplements to the word "*state*" shall mean the State of Michigan; reference to the word "*municipality*" shall mean the Township of Ypsilanti; references to the term "*corporation counsel*" shall be held to mean the attorney for the township; reference to the term "*bureau of fire prevention*" shall mean the township fire department; and reference to the term "*fire official*" shall be held to mean the chief of the fire department or his authorized designee.

E. ***Code Revisions***.

The following sections of the International Fire Code, 2018 Edition, International Code Council, are hereby revised.

Section 101.1 - insert Charter Township of Ypsilanti

Section 110.4 **–** delete in its entirety and replace with the following provision:

Section 110.4 Persons who shall violate a provision of this code or shall fail to comply with any of the requirements thereof or who shall erect, install, alter, repair or do work in violation of the approved construction documents or directive of the code official, or of a permit or certificate used under the infraction, and shall be subject to a fine as follows:

a. The fine for any first violation of Article II shall be $100.00.

b. The fine for any violation which the violator has, within the past two years, been found in violation of once before, shall be $250.00.

c. The fine for any violation which the violator has, within the past two years, been found in violation of twice before, shall be $500.00.

The imposition of one penalty for any violation shall not excuse the violations or permit it to continue. All such persons shall be required to correct or remedy such situation or defects within a reasonable time, and, when not otherwise specified, each act or violation and every day upon which such violation shall occur shall constitute a separate offense.

The application of the penalties of this section shall not be held to prevent the enforced removal of prohibited conditions by injunctive or other relief.

Each day that a violation continues after due notice has been served shall be deemed a separate violation.

Section 112.4 – insert $100 or more than $500

Section 901.2 – Fire Sprinkler Plan Submittal (Added to read)

All fire sprinkler plans shall be submitted to the *fire official* for review. The *fire official* may request review of the sprinkler plans by a third party. The third party shall be included on a list of companies approved by the Charter Township of Ypsilanti Fire Prevention Bureau. The Charter Township of Ypsilanti Fire Prevention Bureau shall witness

all required tests and field inspections of all fire sprinkler systems.

a. A list of approved companies will be available in the Fire Prevention Bureau and the Office of Community Standards.

b. No company will be allowed to review its own plans.

Section 906.1. - <u>Residential Fire Extinguisher Requirements Rental Units</u>. *2015 Property Maintenance Code language (Added to read)

a. It shall be the responsibility of the owner(s) of single family and multiple family rental units to provide each living unit with a portable fire extinguisher.

b. The fire extinguisher shall have a minimum 1A-10BC rating or higher, and shall be mounted in a readily accessible location within each dwelling unit. Each extinguisher shall be tagged to include a maintenance and inspection record and must be operable at all times.

c. It shall be the owner's responsibility to maintain the extinguisher in accordance with NFPA 10, and such maintenance shall include, but is not limited to, recharging the extinguisher of the unit which was discharged when attempting to extinguish a documented fire. For the purpose of this section, a documented fire shall mean any fire that the Ypsilanti Township Fire Department has responded to and/or has a record of. In all other cases it shall be the responsibility of the resident to recharge the extinguisher.

d. The resident of a single family or multiple family rental unit shall be responsible to advise the building owner, or his designated agent, whenever a required fire extinguisher is missing, damaged, discharged or in need of service.

e. Anyone tampering with, damaging or interfering with the effectiveness of a fire extinguisher shall be in violation of this code.

Section 907.2 - <u>Minimum Smoke Detection Requirements Rental Units</u>. *2015 Property Maintenance Code language (Added to read)

a. Each apartment, suite, or sleeping area of every single or multiple dwelling units shall be provided with a minimum of one smoke detector capable of sensing visible or invisible products of combustion.

b. The smoke detector shall be approved or listed by recognized or independent testing laboratories and, when actuated, shall provide an alarm suitable to warn the occupants within the individual dwelling unit.

c. A minimum of one smoke detector shall be located in the immediate area of all sleeping quarters.

d. All single family and multiple dwelling units, including duplexes, shall comply with this section.

e. It shall be the responsibility of the owner(s) of each rental unit to install and maintain in operating condition smoke detectors in each dwelling unit as herein provided.

f. All devices, combination of devices and equipment required herein are to be installed in conformance with the Michigan Building and Residential Codes and this section.

g. At least one smoke detector shall be installed to protect each sleeping area. A sleeping area is defined as the area or areas of the family living unit in which the bedrooms or sleeping rooms are located. When bedrooms ordinarily used for sleeping are separated by other used areas, such as kitchens or living rooms, but not bathrooms or closets, they shall be considered as separate sleeping areas for the purpose of this section.

F. Geographic Limits Referred to in Certain Sections of the Code.

The geographic limits referred to in certain sections of the 2018 International Fire Code are hereby established as follows:

Section 5704.2.9.6.1 (geographic limits in which the storage of Class I and Class II liquids in above-ground storage tanks outside of buildings is prohibited): *Storage of greater than 50 gallons is prohibited within 50 feet of a structure.*

Section 5706.2.4.4 (geographic limits in which the storage of Class I and Class II liquids in above-ground ground storage tanks is prohibited): *Amend to add the following language:*

a. *An above ground storage tank shall not be erected less than 300 feet (92 meters) from any of the following:*
   - *i. a mineshaft.*
   - *ii. an air escape shaft for a mine.*
   - *iii. a school*
   - *iv. a church*
   - *v. a hospital*
   - *vi. a theater*
   - *vii. assembly occupancies for 50 or more persons.*

b. *The above ground storage tank, loading operation, or unloading operation shall not be installed closer than 25 feet (7.6 meters) plus 1 inch (25 millimeters) per 1,000 volts, measured horizontally from the nearest conductor or power lines, except that a service entrance and service line may be closer than 25 feet (7.6 meters), but shall not be over a tank loading or unloading area.*

Section 5806.2 (geographic limits in which the storage of flammable cryogenic fluids in stationary containers is prohibited): *Amend to add the following language:*

a. *Stationary containers with storage greater than 45 gallons is prohibited within 50 feet of the following:*

i. Places of public assembly
ii. Non-ambulatory patient areas

b. Stationary containers with storage greater than 45 gallons is prohibited within 15 feet of the following:

i. Combustible materials such as paper, leaves, weeds, dry grass or debris exposure hazards

c. Stationary containers with storage greater than 45 gallons is prohibited within 10 feet of the following:

ii. Air intakes

c. Stationary containers with storage greater than 45 gallons is prohibited within 5 feet of the following:

i. Lot lines

Section 6104.2 (geographic limits in which the storage of liquefied petroleum gas is restricted for the protection of heavily populated or congested areas): *Amend to add the following language:*

For the protection of heavily populated and congested areas, the maximum aggregate capacity of any installation of liquefied petroleum gas shall not exceed a water capacity of 2,000 gallons within 50 feet (15.2 meters) of a structure.

G. Rights and Remedies are Cumulative.

The rights and remedies provided herein are cumulative and in addition to any other remedies provided by law.

H. Severability Clause.

That if any section, subsection, sentence, clause or phrase of this ordinance is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this ordinance. The Charter Township of Ypsilanti hereby declares that it would have passed this ordinance, and each section, subsection, clause or phrase thereof, irrespective of the fact that any one or more sections, subsection, sentences, clauses or phrases by declared unconstitutional.

I. Publication.

This Ordinance shall be published in a newspaper of general circulation as required by law.

J. Effective Date.

This Ordinance shall be effective upon publication in a newspaper of general circulation as required by law.

CHARTER TOWNSHIP OF YPSILANTI

RESOLUTION 2019-26
(In Reference to Ordinance 2019-487)

A Resolution Amending the Zoning Ordinance of the Charter Township of Ypsilanti to add Article XI–A – Ecorse Road Form Based District to enact form-based zoning and updated uses and to rezone Ecorse Road to be consistent with the Article XI-A Zoning Ordinance language.

Whereas, the Charter Township of Ypsilanti adopted the Ecorse Road/East Michigan Avenue Placemaking Plan in 2018; and

Whereas, changes to the zoning on Ecorse Road are key to the implementation of that plan; and

Whereas, the Township Planning Consultants have recommended amendments to the Charter Township of Ypsilanti's (Township) Planning Commission (Commission) to the Township's Zoning Code; and

Whereas, at its regularly scheduled meeting held April 23, 2019, the Commission recommended approval to the Ypsilanti Township Board of the Planning Consultant's proposed amendments to the Township's Zoning Code to the Township Board to add Article XI–A – Ecorse Road Form Based District to enact form-based zoning and updated uses; and

Whereas, at its regularly scheduled meeting held April 23, 2019, the Commission recommended approval to the Ypsilanti Township Board of the Planning Consultant's proposed amendments to Ypsilanti Township's Zoning Map to be consistent with the recommended addition to the Township's Zoning Code to the Township Board to add Article XI–A – Ecorse Road Form Based District to enact form-based zoning and updated uses; and

Whereas, proposed Ordinance No. 2019-487 has revised the current existing Ordinance in such a fashion as to incorporate the above changes recommended; and

Whereas, the Charter Township of Ypsilanti Board of Trustees (Board) agrees with the request of the Planning Commission;

Now Therefore,

Be it resolved, that the Charter Township of Ypsilanti Board of Trustees does hereby approve Ordinance No. 2019-487 as attached, by amending the Zoning Ordinance to include Article XI-A of the Township's Zoning Code as noted, with proposed Ordinance No. 2019-487, which ordinance reflects the suggestions and input of the Township's Planning Consultant as recommended by the Commission.

CHARTER TOWNSHIP OF YPSILANTI

PROPOSED ORDINANCE 2019-487

Amending the Zoning Ordinance of the Charter Township of Ypsilanti to add Article XI–A – Ecorse Road Form Based District to enact form-based zoning and updated uses and to rezone Ecorse Road to be consistent with the Article XI-A Zoning Ordinance language.

SECTION 1. AMENDMENT TO TOWNSHIP ZONING ORDINANCE TO ADD ARTICLE XI-A:

ARTICLE XI – A ECORSE ROAD FORM BASED DISTRICT (ERFB)

SECTION 1140 - GENERAL INTENT AND PURPOSE

A. **Intent**. The **ECORSE ROAD FORM BASED DISTRICT (ERFB)** is intended to implement the vision established by the Township Master Plan and the E. Michigan Avenue and Ecorse Road Placemaking Plan, to transform the Ecorse Road corridor into a vibrant, dynamic area through placemaking and the attraction of new investment. The Ecorse Road Form Based District allows for the consolidation and creative redevelopment of parcels.

Development of buildings and sites, including retrofitting and redevelopment of existing sites and buildings, can include residential, retail, office, and service uses. Uses designed to support the residents and local workers are also encouraged, such as mixed-use developments with small scale retail or restaurant uses incorporated with housing units. The redeveloped corridor will help diversify the Township housing and commercial stock and incorporate architecturally interesting buildings.

Consolidation of parcels in the District is encouraged in order to provide for a quality and consistent development pattern. Incentives include additional building forms and more permitted uses.

B. **Purpose.** The general purpose of these regulations is as follows:

a. Promote new investment opportunities by allowing a wide range of potential uses and techniques to expand the employment and economic base.
b. Ensure that development is of human scale, primarily pedestrian-oriented, and designed to create attractive streetscapes and pedestrian spaces.
c. Ensure that development is designed for all modes of transportation.
d. Promote mixed-use development.
e. Ensure reasonable transition between higher intensity development and adjacent neighborhoods.
f. Improve mobility options and reduce the need for on-site parking by encouraging all modes of transportation, through shared parking, and through on-street parking.
g. Provide predictable development approval process.
h. Encourage lot consolidation to provide for larger consistent developable sites.

C. **Factors for Regulation.** These regulations are based on two (2) significant factors: site context and building features.

1. Site context is derived from existing and desired characteristics of an area and recognizes the inherent conditions of the areas where these regulations are applied. Regulated sites types are organized by shape, size, orientation and location.

2. Building feature addresses the manner in which buildings and structures relate to their lots, surrounding buildings, and street frontage. The shape of the building, the land area to volume ratio, and the orientation of the building has a significant impact upon the character of an area. Building

form standards control height, placement, building configuration, parking location, and building transparency applicable to the site context.

SECTION 1141 - APPLICABILITY AND ORGANIZATION

A. Applicability.

1. Any new use or expansion of existing use that requires site plan review shall comply with the requirements of this Article and other applicable requirements of this Ordinance.

2. The requirements of this Article shall not apply to:

   a. Continuation of a permitted use within an existing structure.

   b. Changes of use within existing structures that do not require increased parking.

   c. Normal repair and maintenance of existing structures that do not increase its size or parking demand.

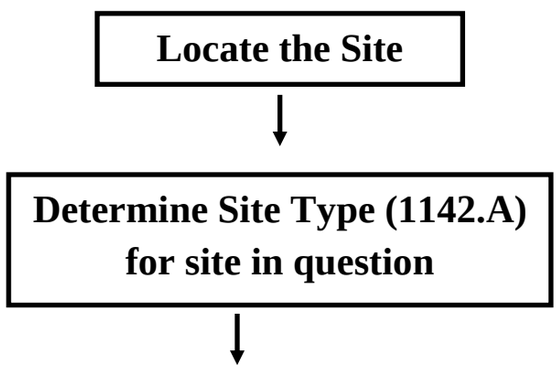
B. Regulating Plan. The Ecorse Road Form Based District shall be governed by a Regulating Plan that is specific to the area.

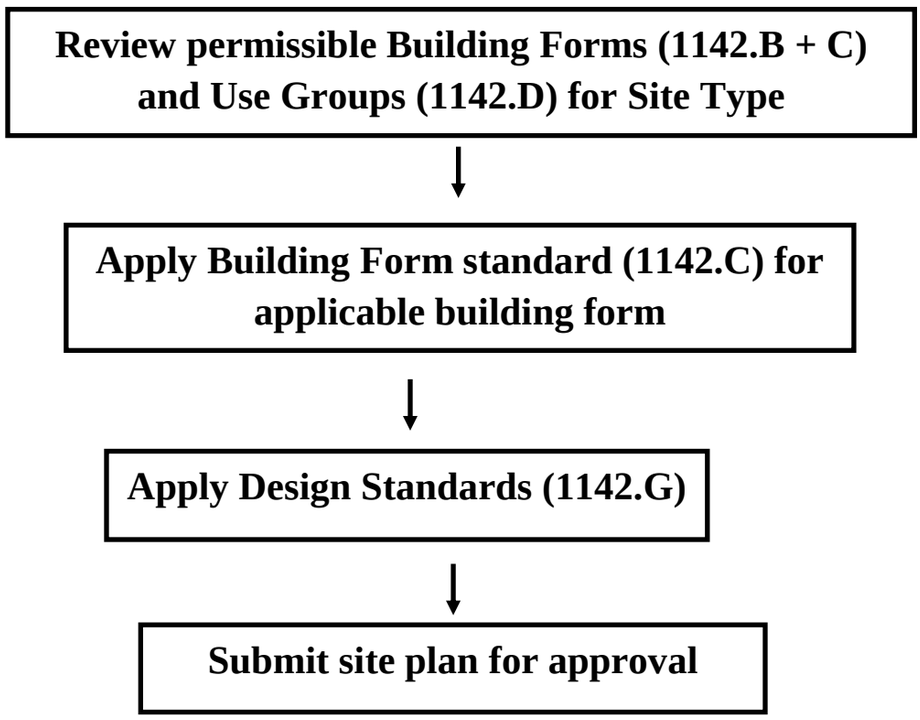
1. The Regulating Plan based on the site type determines building form and allowable use for each property within a form-based district

2. The Regulating Plan is based on three (3) factors: Site Type; Building Form; and Use Group.

   a. **Site Types.** Site Types, as set forth in Section 1142.A, are determined by street orientation, lot size, lot configuration, location, and relationship to neighboring sites. Site type provides the basis for building forms and authorized use groups.
   b. **Building Form Standards and Types**. Building form standards and types, set forth in Section 1142.B + C, establish the parameters for building form, height, and placement, and are specifically applied to each district based upon the regulating plan.
   c. **Authorized Use Groups**. Authorized land uses are organized by use groups. Authorized use groups, as set forth in Section 1142.D, are specifically applied to each District based upon the regulating plan.

3. The steps to determine the regulations that apply to a specific property within a form-based district are as follows:
   a. Find the site in question on the regulating plan map
   b. Identify the site type for the site in question. Sites will be classified Site Type A, B, or C.
   c. Consult the Use Groups and Building Forms Permitted table in which the site is located. The table will identify if a use group or building form is permitted, permitted with conditions, or not permitted for the site type and street type combination of the site in question.
   d. Follow the regulations for the chosen building form when designing the development application. Building form regulations are established in Section 1142.B and 1142.C.
   e. Follow the design standards as listed in Section 1142.G.
   f. Obtain site plan approval or special use approval for the chosen building form and use, as appropriate.





C. **Design Standards**. General design standards, set forth in Section 11.42.G, are supplementary to other requirements of the Ordinance. Generally, the design standards regulate building placement, parking orientation, landscaping, and other site design requirements.

D. **Modification of District Boundaries**. Any modification to the boundaries of any form-based district shall require rezoning, in accordance with the provisions of Article XXVII, Changes and Amendments.

E. **Modification of Regulating Plan**. Specific building form, use group, and design standards applied within each Regulating Plan are based upon the designation of site type. Any modification of site type may be determined by the Planning Commission, notice and after conducting a public hearing in accordance with Sec. 2703.

The Planning Commission shall consider the following in making a determination to modify a site type or street type designation:

1. The applicant's property cannot be used for the purpose permitted in the form-based district.

2. Area has been added to or deleted from the subject property in question, requiring the modification.

3. The proposed modification and resulting development will not alter the essential character of the area.

4. The proposed modification meets the intent of the district.

5. Existing streets have been improved and/or new streets constructed that may result in the modification of a specific site type.

6. Modification to the Regulating Plan is in conformance to the Master Plan and Placemaking Plan.

F. **Nonconformities**. Nonconformities shall be regulated in accordance with Article XXII of the Zoning Ordinance.

SECTION 1142 - STANDARDS

A. **Site Types**

1. **Site Type A** (neighborhood residential or mixed-use sites)

Site Type A is composed of lots one-half (0.5) acre or smaller and is reserved primarily for residential use and for smaller non-residential use which is compatible with a residential setting. Site Type A is generally located in areas which serve as a transition between the Ecorse Road and neighboring residential areas. The building form selected for these sites must consider both the front elevation that fronts on the street but also the rear/side elevation that is adjacent to residential in order to maintain compatibility with adjacent uses.

2. **Site Type B** (neighborhood commercial/office or mixed-use sites)

   Made up mostly of lots between one-half (0.5) and one (1) acre in area, the Site Type B category may include free standing single-use sites developed for commercial and office uses serving the surrounding neighborhood or mixed-use developments. Size and character may vary based on the unique characteristic of each parcel. Small retail and food-service uses would often be found in this category, as well as small single or multi-tenant commercial or office buildings.

3. **Site Type C** (Community commercial/office and mixed-use sites)

   The sites in Site Type C are mostly larger than one (1) acres in area. Site Type C size and character may vary based on the unique characteristic of each parcel. This category can include free standing single-use or mixed-use developments that are designed to serve a broader community-wide market.

B. Building Form Standards.

1. The ERFC district permit a series of building forms, dependent on the site context. The building forms, set forth in 1142.C, are designated within the district location based on the regulating plan. Building forms are classified in the following manner:

   a. Permitted Building Forms. These building forms are permitted as of right in the locations specified.

   b. Prohibited Building Forms. Building forms that are not identified as permitted in the locations specified are prohibited.

   c. Exceptions: For all building forms in all locations, awnings, signs, other projections (architectural projections, bay windows, etc.) may project beyond the required building line by up to 5 feet. Projections will be reviewed by the Township to ensure public safety.

2. The regulating plan dictates the site type for each individual property in the district. Building forms are identified within each district as permitted or not permitted based upon the site type.

3. Non-Residential Development Height, Setback, and Greenbelt Provisions when adjacent to any Residentially Zoned or Used Property.

   a. Setback and Greenbelt:

      i. Site Type A and B. The following setback and greenbelt shall be provided for any parcel zoned Site Type A or B that is adjacent to a residentially zoned or used parcel.

         a. When a parcel is abutting or adjacent to a residentially zoned or used parcel without an intervening constructed alley or street, the building setback from the property line of the residentially zoned or used parcel shall be no less than the height of the building on the parcel zoned ERFB.

         b. When a parcel is abutting or adjacent to a residentially zoned or used parcel without an intervening alley or street, a minimum 10-foot landscaped greenbelt shall be maintained from the property line of the residentially zoned or used parcel. The greenbelt shall be

landscaped and screened with a solid fence or decorative wall up to six feet in height erected parallel to any common lot line, with a ten-foot wide planting strip along the base of the wall or fence that consists of one evergreen tree and one canopy tree per 30 lineal feet along the property line.

c. The Planning Commission may deviate from these setback and greenbelt provisions in the course of its site plan review process; however, the Planning Commission shall not permit a setback or greenbelt that is less than required in the building form. In the review of the deviation, the Planning Commission shall consider the standards as set forth in Section 1142.B..3.b.

ii. Site Type C. The following setback and greenbelt shall be provided for any parcel zoned Site Type C that is adjacent to a residentially zoned or used parcel.

a. When a property is abutting or adjacent to a residentially zoned or used parcel without an intervening alley or street, the setback from the property line of the residentially zoned or used parcel shall be no less than 1.5 times the height of the building on the non-residential parcel.

b. When a property is abutting or adjacent to a residentially zoned or used parcel without an intervening alley or street, a minimum 20-foot landscaped greenbelt shall be maintained from the property line of the residentially zoned or used parcel. The greenbelt shall be landscaped in accordance with Section 2108.C.

c. The Planning Commission may deviate from these setbacks and greenbelt provisions in the course of its site plan review process; however, the Planning Commission shall not permit a setback or greenbelt that is less than required in the building form. In the review of the deviation, the Planning Commission shall consider the standards set forth in Section 1142.B.3.b.

b. Deviation Standards:

i. Height, setback, and greenbelt deviations may be granted by the Planning Commission if the following is found:
   a. The deviation shall not adversely impact public health, safety, and welfare.
   b. The deviation shall maintain compatibility with adjacent uses.
   c. The deviation shall be compatible with the Master Plan and in accordance with the goals and objectives of the Master Plan and any associated subarea and corridor plans.
   d. The deviation shall not adversely impact essential public facilities and services, such as: streets, pedestrian or bicycle facilities, police and fire protection, drainage systems, refuse disposal, water and sewage facilities, and schools.
   e. The deviation shall be in compliance with all other zoning ordinance standards.
   f. The deviation shall not adversely impact any on-site or off-site natural features.

C. Building Form Types

Table 1142a-1 Building Form A.1		
Building Form A.1: Small, generally single-purpose buildings for residential. Typically situated on a smaller lot, adjacent to single family residential.		
Building Height		
Minimum 1 story, 14-foot height, **Maximum** 2 stories, 28-foot height (Site type A & B), **Max:** 2 stories, 38-foot height (Site type C)		
Building Placement		
Front Yard: 10-foot required build-to line [1] 75% of the building façade must meet the required build-to line, while up to 25% of the façade can be setback to allow for architectural consideration.	**Side Yard:** No minimum side setback **If provided**, minimum 5 feet. For corner lots, side street yard, minimum 5 feet.	**Rear Yard:** Minimum 10-foot rear setback
Lot		
Impervious Surface: Maximum 80% **Access and circulation:** Driveways may access the site from any side, pedestrian pathways must be provided from the right-of-way.	**Parking location:** Parking shall be located in a side or rear yard; when located in a side yard and abutting the required build-to line adjacent to the right-of-way, parking shall be screened with a minimum 30-inch masonry wall on the required build-to line, or within 5 feet of the required build-to line, provided that a landscape treatment is added between the wall and the required build-to line.	
[1] The Planning Commission may adjust the required build-to line to a maximum of 30 feet beyond the property line for projects incorporating a permanent space for an outdoor café, public space, or a cross access drive with an adjacent parcel. Outdoor cafés or public spaces must be developed as part of the primary building and must incorporate a permanent wall or landscaping area along the required build-to line.		

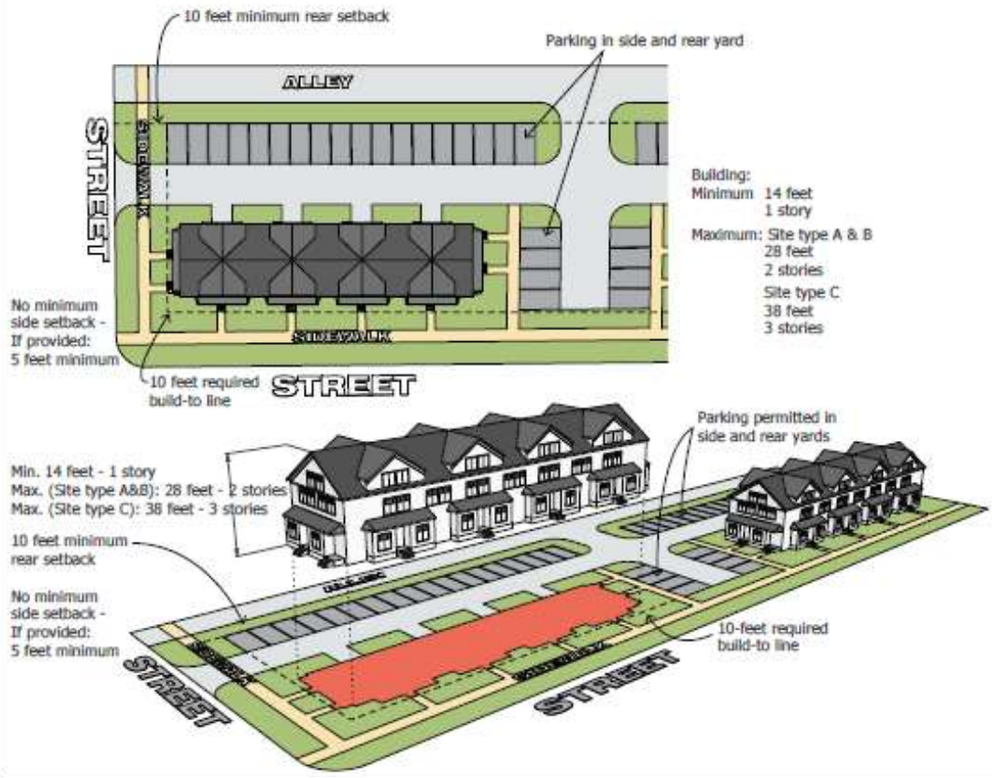


Table 1142a-2 Building Form A.2		
Building Form A.2: Small, generally single-purpose buildings for retail, office, restaurant, or service uses. Typically situated on a smaller lot within the district. Adjacent to single-family residential.		
Building Height		
Minimum 1 story, 14-foot height, **Maximum** 2 stories, 30-foot height		
Building Placement		
Front Yard: 10-foot required build-to line [1] 75% of the building façade must meet the required build-to line, while up to 25% of the façade can be setback to allow for architectural consideration	**Side Yard:** No minimum side setback If provided, minimum 5 feet For corner lots, side street yard, minimum 5 feet.	**Rear Yard:** Minimum 10-foot rear setback
Lot		
Impervious Surface: Maximum 80% **Access and circulation:** Driveways may access the site from any side, pedestrian pathways must be provided from the right-of-way.	**Parking location:** Parking shall be located in a side or rear yard; when located in a side yard and abutting the required build-to line adjacent to the right-of-way, parking shall be screened with a minimum 30-inch masonry wall on the required build-to line, or within 5 feet of the required build-to line, provided that a landscape treatment is added between the wall and the required build-to line.	
[1] The Planning Commission may adjust the required build-to line to a maximum of 30 feet beyond the property line for projects incorporating a permanent space for an outdoor café, public space, or a cross access drive with an adjacent parcel. Outdoor cafés or public spaces must be developed as part of the primary building and must incorporate a permanent wall or landscaping area along the required build-to line.		

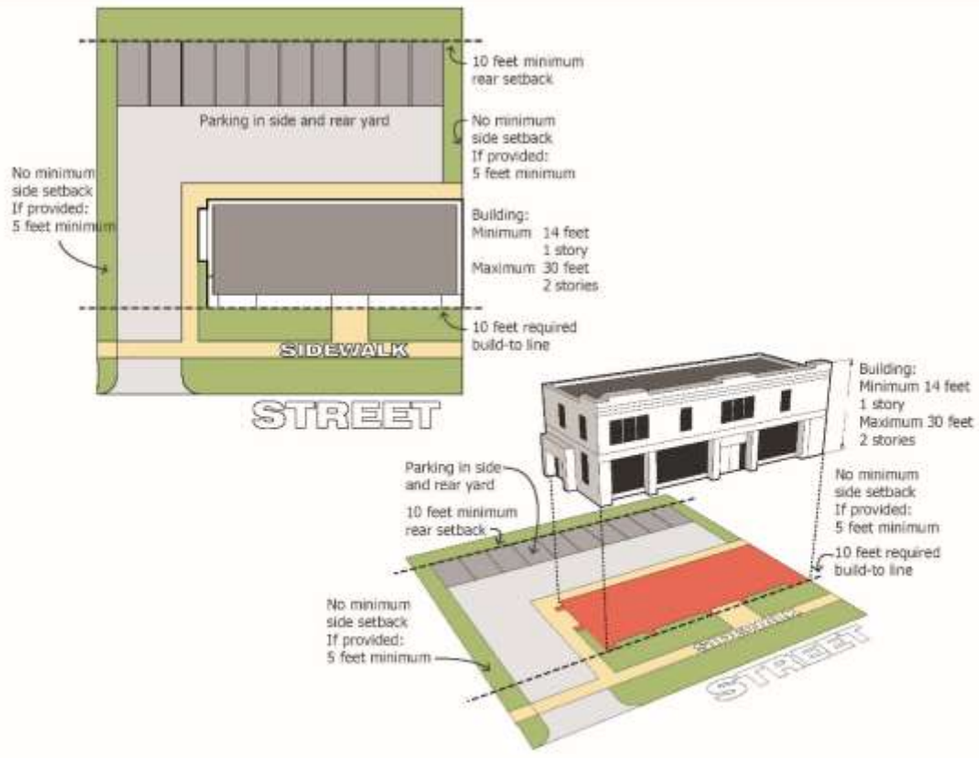


Table 1142a-3 Building Form B		
Building Form B: Small, generally single-purpose buildings for retail, office, restaurant, or service uses. Typically situated in an out lot of a larger classification building form, or on a smaller, more remote site location within the district.		
Building Height		
Minimum 1 story, 14-foot height, **Maximum** 2 stories, 28-foot height (Site type B), Max: 3 stories, 38 foot height (Site type C)		
Building Placement		
Front Yard: 10-foot required build-to line [1] 75% of the building façade must meet the required build-to line, while up to 25% of the façade can be setback to allow for architectural consideration	**Side Yard:** No minimum side setback If provided, minimum 5 feet	**Rear Yard:** Minimum 10-foot rear setback
Lot		
Impervious Surface: Maximum 80% **Access and circulation:** Driveways may access the site from any side, pedestrian pathways must be provided from the right-of-way.	**Parking location:** Parking shall be located in a side or rear yard; when located in a side yard and abutting the required build-to line adjacent to the right-of-way, parking shall be screened with a minimum 30-inch masonry wall on the required build-to line, or within 5 feet of the required build-to line, provided that a landscape treatment is added between the wall and the required build-to line.	
[1] The Planning Commission may adjust the required build-to line to a maximum of 30 feet beyond the property line for projects incorporating a permanent space for an outdoor café, public space, or a cross access drive with an adjacent parcel. Outdoor cafés or public spaces must be developed as part of the primary building and must incorporate a permanent wall or landscaping area along the required build-to line.		

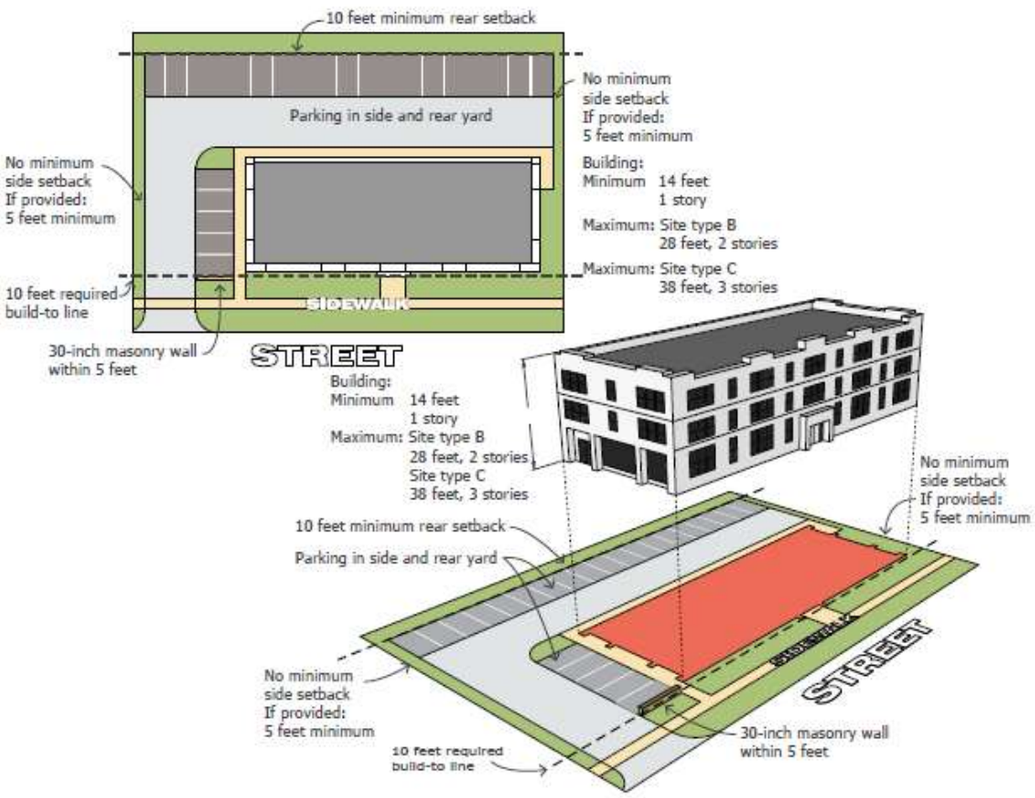
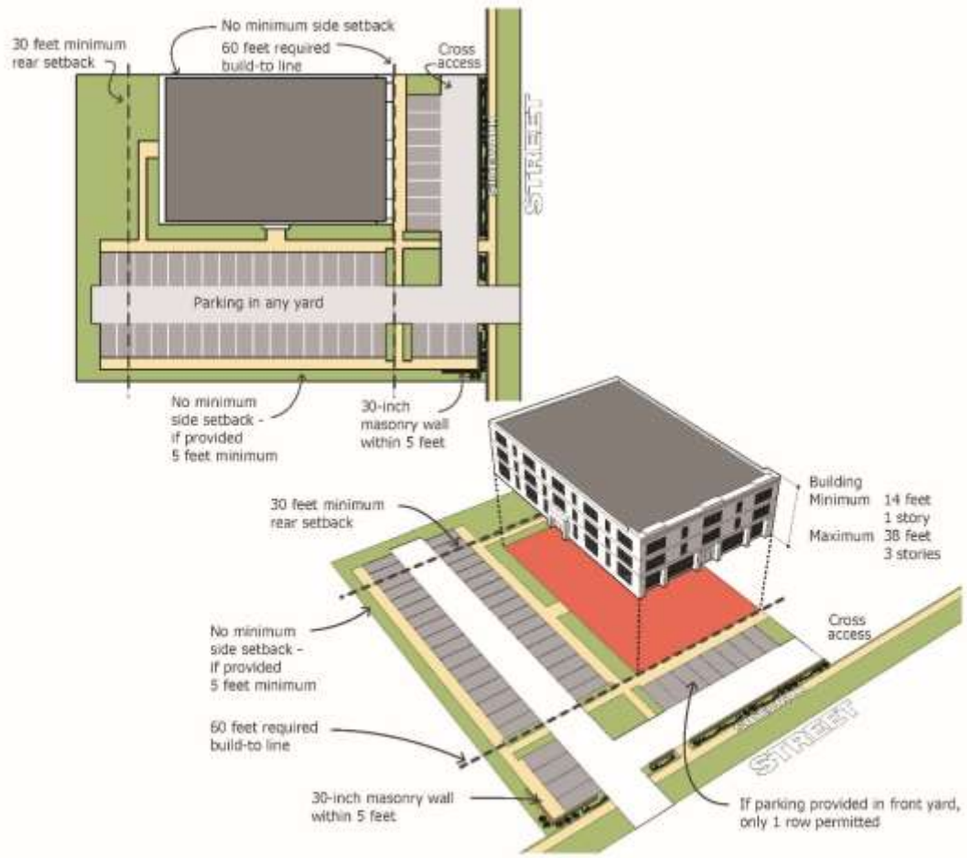


Table 1142a-4 Building Form C		
Building Form C: Single or multiple-tenant buildings for retail, restaurant, office, service, or residential uses. This category also includes multiple-tenant development, although it requires a second story to encourage a mix of use.		
Building Height		
Minimum 1 story, 14-foot height, **Maximum** 3 stories, 38-foot height, Ground floor 14-foot minimum height		
Building Placement		
Front Yard: Maximum 60-foot required build-to line.	**Side Yard:** No minimum side setback If provided, minimum 5 feet	**Rear Yard:** Minimum 30-foot rear setback
Lot		
Impervious Surface: Maximum 80% **Access and circulation:** Driveways may access the site from any side, pedestrian pathways must be provided from the right-of-way.	**Parking location:** Parking may be located in any yard; when located in a front or side yard adjacent to the primary building and abutting the right-of-way, parking shall be screened with a minimum 30-inch masonry wall on the required build-to line, or within 5 feet of the required build-to line, provided that a landscape treatment is added between the wall and the required build-to line; if parking is provided in the front yard only 1 row is permitted	



D. Authorized Use Groups.

1. Authorized uses are categorized by use groups as set forth in Table 1142.D. Use groups generally contain similar types of uses in terms of function, character, and intensity.

2. Use groups are designated in locations within each district based on the regulating plan. Use groups are classified in the following manner:

   a. Permitted Use Groups. These use groups are permitted as of right in the locations specified.

   b. Special Use Groups. These use groups are permitted after review and approval by the Planning Commission, in accordance with the procedures set forth in Section 2119 and the standards in this Ordinance.

   c. Prohibited Use Groups. These use groups not indicated as permitted are prohibited in the locations specified.

d. Uses permitted in all locations within the District. Public parks and essential public services are permitted by right in all locations.

e. Similar Uses. If a use is not listed but is similar to other uses within a use group, the Zoning Administrator may make the interpretation that the use is similar to other uses within a use group.

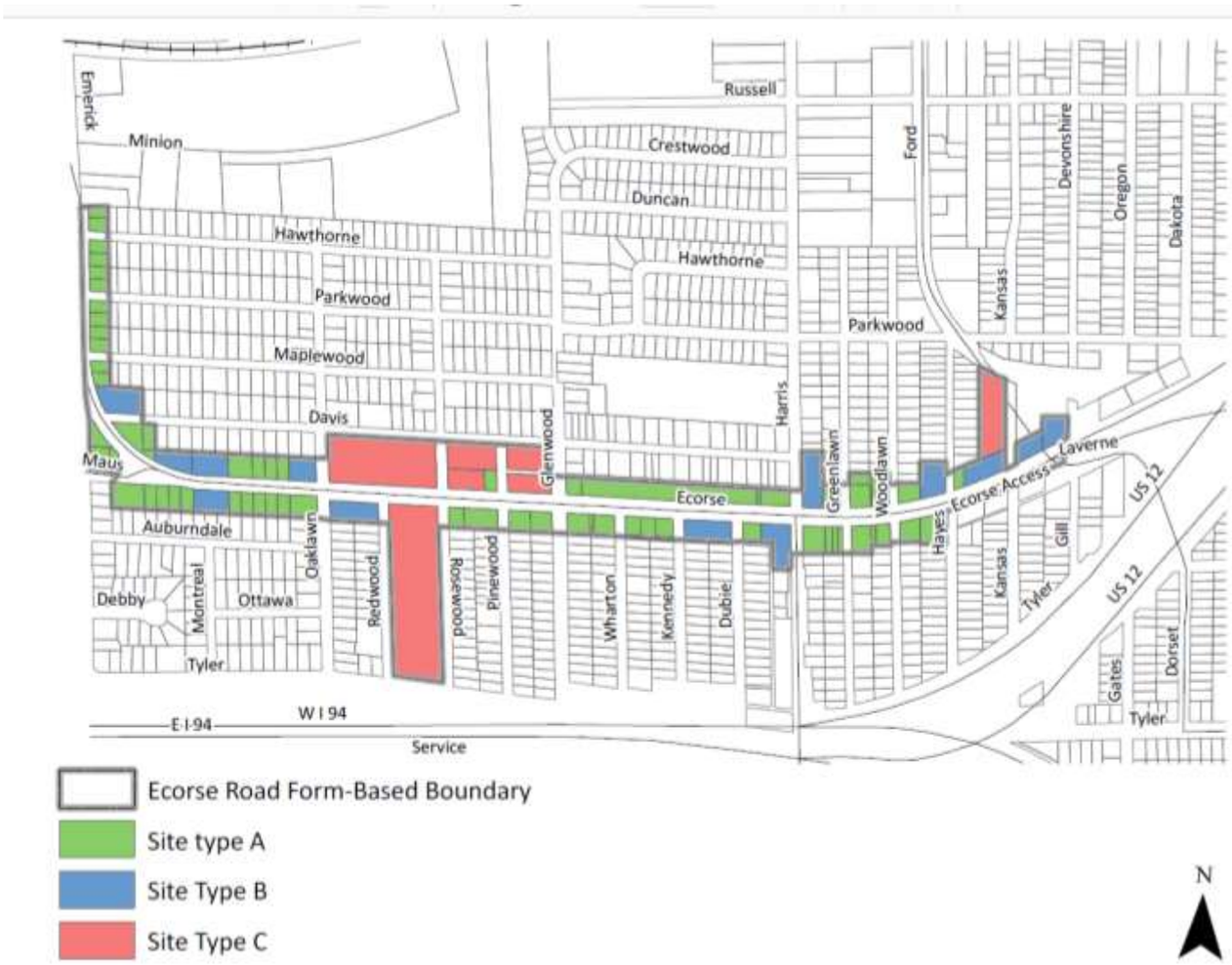
The Zoning Administrator may also make the determination whether the use is permitted as of right, permitted in upper stories only, or permitted as a special use. The Zoning Administrator may obtain a recommendation from the Planning Commission as to whether or not the proposed use is similar to a use permitted as of right, permitted in upper stories only, or permitted as a special use.

Table 1142.D
Use Groups by Category

Use Group 1 **Residential Uses:**
One-Family detached and attached dwellings, subject to regulations in Section 1801
Two-Family dwellings
Use Group 2 **Misc. Residential / Related Uses:**
Multiple-Family dwellings
Live/Work units
Child care centers, subject to regulations in Section 1861
Bed and Breakfast, subject to regulations in Section 1808

Use Group 3 **Office / Institutional:**
Civic Buildings
General office
Professional and medical office
Primary/secondary schools (private)
Publicly owned/operated office and service facilities
Veterinary clinics or veterinary hospitals, subject to regulations in Section 1820 and Section 1821, respectively
Use Group 4 **Retail, Entertainment, and Service Uses:**
Financial institutions
General retail
Food use without a drive-through
Personal services
Business services
Use Group 5 **Misc. Uses:**
Commercial kennels / pet day care
Medical Clinics and Hospitals
Technology centers / office research / data center
Funeral homes
Senior assisted/independent living
Group day care homes, subject to regulations in Section 1861
Lodging
Places of Worship
Fitness, gymnastics, and exercise centers
Theatres and places of assembly
Indoor commercial recreation establishments
Use Group 6 **Automotive Uses:**
Automobile car wash, subject to conditions in Section 1833
Gasoline service station, subject to conditions in Section 1829

E. Ecorse Road Form Based Code District Regulating Plan



F. Ecorse Road Form Based Code District Regulating Plan Table

Site Type	Building Form		Use Group	
Site Type: A	Permitted Building Form	A1, A2	Permitted Use Group	1, 2, 3, 4
			Special Use Group	—
Site Type: B	Permitted Building Form	A1, A2, B	Permitted Use Group	2, 3, 4
			Special Use Group	6
Site Type: C	Permitted Building Form	B, C	Permitted Use Group	2, 3, 4
			Special Use Group	5, 6

G. Design Standards. In addition to standards set forth in this Ordinance, all proposed development shall comply with the standards set forth herein.

1. **Pedestrian/Non-Motorized Access**

a. **Intent.** To ensure that site layout and building design provides safe and convenient pedestrian and bicycle access both to and within a site and between adjacent sites.

b. **Standards**

i. A pedestrian connection shall provide a clear connection between the primary street upon which the building fronts and the building. Connection may include pavement striping.

ii. Pedestrian access shall be clearly identified from parking areas and all entrances to a building.

iii. Where appropriate, sidewalks fronting the public right-of-way should be designed to accommodate space for activities such as outdoor dining.

iv. All sites shall provide a bike rack for at least two (2) bicycles within fifty (50) feet of the building entrance.

2. **Building Placement and Orientation**

a. **Intent.** To require building placement that provides a strong visual and functional relationship with its site, adjacent sites, and the primary street upon which the site is located. Ensure consistency within sites and to adjacent sites to provide distinct building groups which exhibit similar orientation, scale, and proportion.

b. **Standards**

i. Setbacks and building orientation shall reinforce a consistent pattern of siting.

ii. Primary building entrances shall be located so that they are easily identifiable with convenient public access.

iii. Buildings should enhance street corners through the use of prominent architectural or site features.

3. **Parking Placement, Orientation, and Screening**

a. **Intent.** To provide a circulation system that efficiently moves vehicles in a well-defined manner, while reducing the visual impact of parking areas and mitigating conflict between pedestrians, bicycles, and automobiles.

b. **Standards**

i. Required Parking. Off-street parking shall be provided for a principal use erected, altered, or expanded after the effective date of this Ordinance in accordance with the standards set forth in Sec. 2104.

a. The Form Based districts are intended to encourage pedestrian and friendly design and compact mixed-use developments. Applicants are encouraged to consider the provisions for shared parking and flexibility in application set forth in Sec. 2104.

b. The placement and design of parking areas and structures shall foster safe pedestrian access and circulation and clearly identifiable public access and visitor parking. Pedestrian access shall be provided between all parking areas and public building entrances. .

ii. **Location**

a. When parking is located in a side yard (behind the front building line) but fronts on the required building line, no more than twenty-five (25) percent of the total site's linear feet along the required building line or sixty (60) feet, whichever is less, shall be occupied by parking.

b. For a corner lot, no more than twenty-five (25) percent of the site's cumulative linear feet along the required building lines or sixty (60) feet, whichever is less, shall be occupied by parking. The building shall be located in the corner of the lot adjacent to the intersection.

c. Where off-street parking is visible from a street, it should be screened in accordance with the standards set forth in 2108.

4. **Architectural Design and Building Materials**

a. **Intent.** To create a character for the form-based district that encourage the greatest amount of visual interest, architectural consistency, and high-quality material use. The standards are not intended to limit imagination, innovation, or variety.

b. **Architectural Design Standards**

i. **Building Massing and Scale**

a. Rooflines and pitches shall be proportionate to nearby structures so as to provide transition or mitigation of significant changes to scale. Variety in massing can occur though step-backs as a building ascends upward

b. Buildings shall maintain a consistent street wall with the longest edge of the buildings oriented parallel to the roadway, where possible.

c. Buildings within the same development shall be designed to provide a unified and easily identifiable image. Methods to achieve this include using similar architectural styles and materials, complementary roof forms, signs, and colors.

ii. Façade Variation.

a. Façade articulation or architectural design variations for building walls facing the street are required to ensure that the building is not monotonous in appearance, using the following architectural techniques: Building wall offsets (projections and recesses); cornices, varying building materials or pilasters used to break up the mass of a single building; staggering of vertical walls; recessing of openings; providing upper-level roof overhangs; contrasting compatible building materials; use of variety and rhythm of window and door openings; use of horizontal and vertical architectural elements, use of horizontal bands of compatible colors; and providing changes in roof shape or roof-line.

b. Materials shall be selected for suitability to the type of buildings and the architectural design in which they are used.

c. Material selection shall be consistent with architectural style in terms of color, shades, and texture, however monotony shall be avoided.

5. **Transparency**

a. **Intent.** The first floors of all buildings shall be designed to encourage and complement pedestrian-scale activity and crime prevention techniques. It is intended that this be accomplished principally by the use of windows and doors arranged so that active uses within the building are visible from or accessible to the street, and parking areas are visible to occupants of the building.

b. **Transparency Standards.** These standards apply only to buildings with non-residential uses on the ground floor:

1. Façade transparency shall be defined as the use of glass or transparent material that provides from the building exterior a view into the building of interior habitation and human scale.

Signs covering windows, and the use of tinted, reflective or opaque glass do not meet the definition of façade transparency.

2. The first floors of all buildings shall be designed to encourage and complement pedestrian-scale activity and crime prevention techniques. It is intended that this be accomplished principally by the use of windows and doors arranged so that active uses within the building are visible from or accessible to the street, and parking areas are visible to occupants of the building. The first floor of any front façade facing a right-of-way shall be no less than fifty (50) percent windows and doors, and the minimum transparency for facades facing a parking area shall be no less than thirty (30) percent of the façade.

3. First-floor transparency is measured between two and eight feet above the first-floor elevation.

4. Nothing shall be placed on or inside window to reduce transparency less than the 50% requirement.

5. For multiple tenant buildings, the minimum transparency requirement must be met by each suite or tenant.

6. **Landscaping**

a. **Intent.** To incorporate appropriate landscaping to enhance visual appearance, provide transitions between properties, and screen unsightly areas

b. **Landscaping Standards.**

1. In addition to the standards set forth in Sec. 2108, the following standards shall be met.

2. Landscaping shall conform and incorporate existing landscape and topographic features.

3. Landscaping within courtyards, patios, and pedestrian realm may include hardscape and softscape materials.

4. Landscaping shall maintain adequate sight lines for visual safety, visibility and efficient security.

5. Landscaped areas, including landscaped parking islands and medians, shall be separated from vehicular and pedestrian encroachment by curbs and raised planting areas.

8. **Loading and Storage Areas**

a. **Intent.** To ensure that loading, storage, and other building utility features are designed to be a part of the overall building as so to reduce the visual impact

b. **Standards**

1. **Utilities and Mechanical Screening**

a. Utility structures located between the building and the public right-of-way shall be screened as set forth in Article XXI. Screening may include walls, fencing, or landscaping that is consistent with the character and materials of the development.

b. Trash enclosures shall be placed adjacent to the rear wall of corresponding buildings or shall be located away from portions of the site which are highly visible from public roadways or private properties with dissimilar improvements. Trash

enclosures shall be screened as set forth in Article XXI with walls, fencing or landscaping that are consistent with the character and materials of the development.

2. **Loading**

   a. Service areas shall be designated by markings and/or signage to delineate them from pedestrian access and limit conflicts between service/delivery vehicles and patrons (e.g. pedestrians, bicyclists and transit users).

   b. Loading and service areas shall be located on the sides or rears of the buildings.

   c. Loading and service areas shall be screened from the public right-of-way with the use of fencing, landscaping, or walls.

SECTION 4. PUBLICATION. This ordinance shall be published in a newspaper of general circulation as required by law.

SECTION 5. EFFECTIVE DATE: This ordinance shall become effective upon publication in a newspaper of general circulation as required by law.

SECTION 6. REPEAL: All Ordinances or parts of Ordinances in conflict herewith are hereby repealed.

CHARTER TOWNSHIP OF YPSILANTI

OFFICE OF COMMUNITY STANDARDS

Building Safety • Planning & Zoning • Ordinance Enforcement • Police Services

To:	Karen Lovejoy Roe, Clerk
From:	Charlotte Wilson, AICP, Planning and Development Coordinator
Re:	**Request to approve the 1st Reading of Resolution 2019-26, Proposed Ordinance 2019-487, amending the Zoning Ordinance to add Article XI–A – Ecorse Road Form Based District to enact form-based zoning and updated uses and to rezone Ecorse Road to be consistent with the Article XI-A Zoning Ordinance language.**
Copy:	McLain & Winters, Township Attorneys
Date:	June 7th, 2019

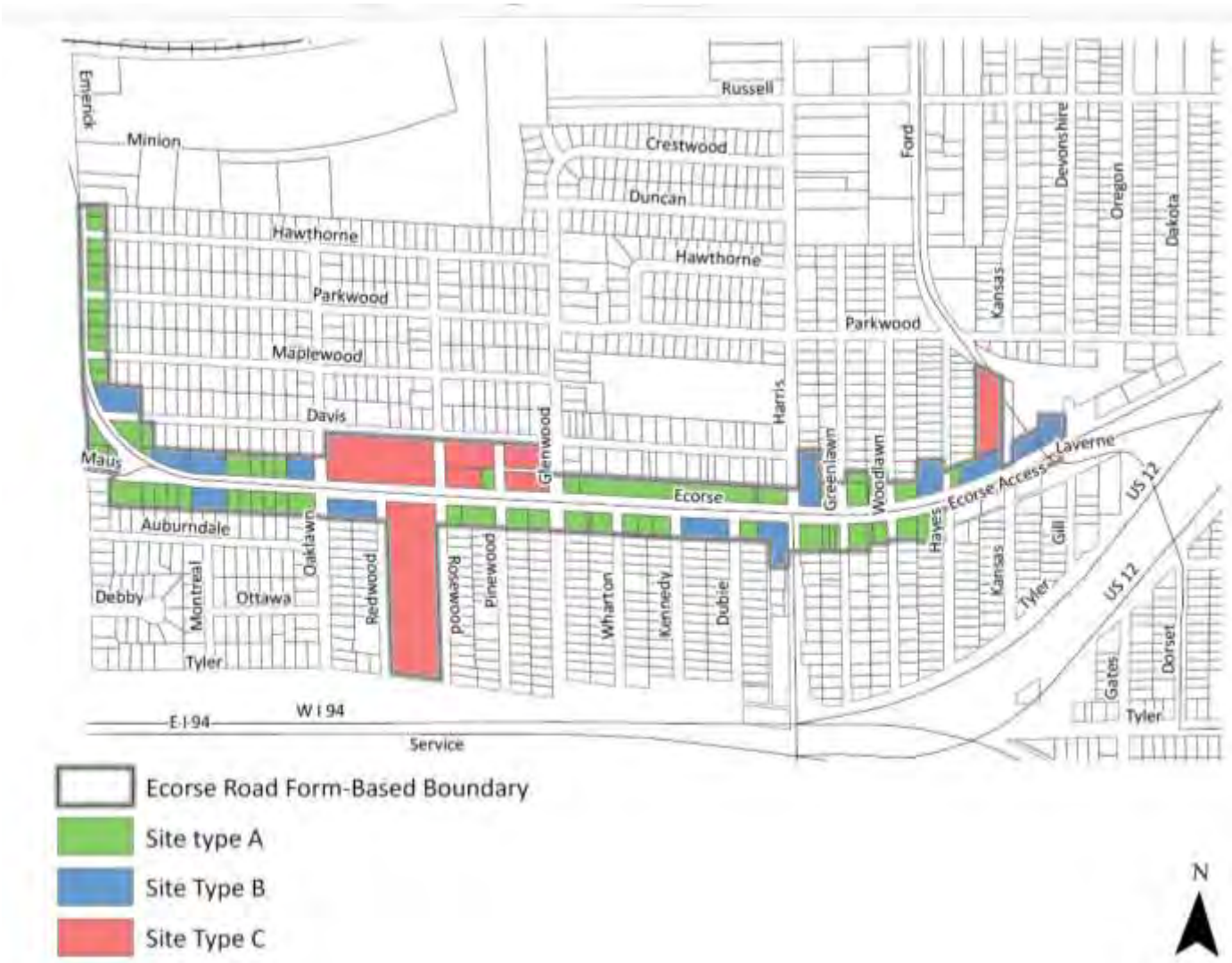
Please be advised that the Planning Commission recommended approval of the proposed amendments to the Township's Zoning Code to the Township Board to add Article XI–A – Ecorse Road Form Based District to enact form-based zoning and updated uses and to rezone Ecorse Road to be consistent with the Article XI-A Zoning Ordinance language.

Please be further advised that on April 23rd, 2019 the Planning Commission made the following recommendations to the Township Board:

A motion was made by Commissioner Sinkule, supported by Commissioner Krieg to recommend approval to Ypsilanti Township Board of Trustees to add the proposed Ecorse Road form based district text amendments as Article 11-A of the Zoning Ordinance.
The motion carried as follows:
Peterson: Yes Tawakkul: Yes Sinkule: Yes Krieg: Yes Iacoangeli: Yes

A motion was made by Commissioner Krieg, supported by Commissioner Sinkule to recommend the rezoning of Ecorse Road to be consistent with the Zoning Ordinance language.
The motion carried as follows:
Peterson: Yes Tawakkul: Yes Sinkule: Yes Krieg: Yes Iacoangeli: Yes

While the motions for recommendation of adoption of Article XI-A to the Zoning Ordinance and rezoning of Ecorse Road were made separately, Resolution 2019-26 and Ordinance 2019-487 address both of these motions. The rezoning map is shown in Section 1142.A. E. Ecorse Road Form Based Code District Regulating Plan and below:



The enclosed packet includes the following components:

1. Planning Commission meeting minutes 4/9/19
2. Planning Commission meeting minutes and recommendation 4/23/19
3. Planning Commission packet 4/23/19
4. Resolution and ordinance 6/7/19

I respectfully request that you place this information packet and recommendation for approval on the **June 18th, 2019** Board of Trustees meeting agenda for its consideration. Please contact me with questions or concerns.

CHARTER TOWNSHIP OF YPSILANTI
PLANNING COMMISSION
MINUTES OF THE APRIL 9, 2019 REGULAR MEETING

Chair Jason Iacoangeli called the regular meeting to order at 6:30 pm in the Ypsilanti Township Civic Center Board Room 7200 S. Huron River Drive, Ypsilanti Township.

Commissioners Present: Chair Jason Iacoangeli and Commissioners Gloria Peterson, Bill Sinkule, Stan Eldridge, Sally Richie, Laurence Krieg and Muddasar Tawakkul

Commissioners Absent: None

Others in Attendance: Angela King, Township Attorney; Megan Mason-Minock, Carlisle-Wortman Associates; Charlotte Wilson, Planning and Development Coordinator

1. CALL TO ORDER

2. ROLL CALL

3. APPROVAL OF THE JANUARY 22, 2019 REGULAR MEETING MINUTES

A motion was made by Commissioner Peterson supported by Commissioner Krieg to approve the minutes of the January 22, 2019 Regular Meeting. The motion carried unanimously.

4. APPROVAL OF AGENDA

A motion was made by Commissioner Eldridge supported by Commissioner Sinkule to approve the agenda. The motion carried unanimously.

5. PUBLIC HEARINGS AND PLAN REVIEW

6. OLD BUSINESS

A. ZONING ORDINANCE AMENDMENT – TO AMEND THE RECOMMENDATION OF APPROVAL TO THE TOWNSHIP BOARD OF TRUSTEES REGARDING THE CONDITIONAL REZONING TEXT AMENDMENTS TO CORRECT A TYPOGRAPHICAL ERROR

Charlotte Wilson, Planning and Zoning Coordinator said at the January 22, 2019 Planning Commission meeting the board recommended approval to amend Article XXVIII to add conditional rezoning text amendments. This was supposed to be in Article XXVII and the error was due to a Roman numeral typographic error. Staff requests the Planning Commission amend the recommended motion of approval to accurately reflect the corrected Article.

A motion was made by Commissioner Krieg, supported by Commissioner Richie to amend the recommendation of approval to the Township Board of Trustees made on January 22, 2019 to read as follows: I move to recommend approval to the Township Board of Trustees to add the proposed conditional rezoning text amendment to Article XXVII. The motion passed unanimously.

7. NEW BUSINESS

A. ZONING ORDINANCE AMENDMENT – TO PROVIDE INPUT ON THE PROPOSED ECORSE ROAD ZONING DISTRICT TEXT AMENDMENTS.

Megan Masson-Minock, Carlisle-Wortman Associates said this meeting would be a work session for a proposed zoning district for Ecorse Road. There will be a Public Hearing at the next meeting in April 2019 and if it is recommended it would go to the Township Board of Trustees for a work session and at least two readings. She said this would be the approach used for all other Township corridors such as Washtenaw, East

Michigan, Huron, etc. She said the amendments came out of the Placemaking Plan that was done in 2018. Ecorse Road would move to form based zoning and other changes would be made including additional striping in the turn lane, on street parking and streetscape which includes trees, landscaping and lighting. She stated the minimum rear setback requirement would change to 10 feet from 20 feet which would enable parking along the rear or sides of buildings.

She said there were also proposed changes in the uses. These include removing auto sales and auto repair (current businesses would be able to remain but no new businesses would be approved).

Commissioner Richie asked for clarification about on street parking locations.

Ms. Masson-Minock said many of the lots are shallow which makes parking difficult. She said they were considering a road diet and creating on street parking areas to help the area redevelop.

She then gave a slideshow presentation detailing the steps one would take to determine design and use per zoning type including non-conforming structures.

Commissioner Iacoangeli asked if detached single family homes could be built.

Ms. Masson-Minock stated no, only attached, in order to make the area more walkable. Any single family homes currently on Ecorse Road could remain.

Commissioner Krieg asked for clarification on height limits for the site types.

Ms. Masson-Minock said Type A is minimum single story and maximum two stories, Type B is minimum single story and maximum two stories with three stories allowed if there was a bonus like a courtyard, and Type C is minimum single story and maximum three stories. Single story height would be 14 feet and two story properties would be 30 feet.

Commissioner Richie asked if one had a legal non-conforming use and the owner sells the property, would the non-conforming use run with the land.

Ms. Masson-Minock stated yes. However if the owner abandons the use then the non-conforming status can fall off.

She asked the Commissioners if any changes would be necessary for the Public Hearing. There were none.

B. MASTER PLAN - TO PROVIDE INPUT ON THE MASTER PLAN UPDATES AND PROCESS.

Ms. Wilson said the Master Plan reveal went well and there were positive comments. She said the Master Plan adoption is in the writing process and she will send it to the Commissioners for review when it is ready.

The categories resulting from the Master Plan project are neighborhoods, jobs and places. Neighborhoods have a strong sense of identity, jobs would be focused on economic development and revitalizing corridors and places would be focused on creating places to connect the Township. She shared the Master Plan vision and mission statements. She said the goals and objectives would be very specific in each category so those in charge of implementation are held accountable.

The future land use map would move towards a more mixed use and Ms. Wilson gave a brief presentation on some map details. A discussion followed between the Commissioners, Ms. Wilson and Ms. Masson-Minock. Ms. Masson-Minock said the map as presented was not in final form and if the Commissioners had suggestions or changes they should let her know.

Ms. Masson-Minock said the Economic Development department would work with a corridor's zoning to recruit retailers and investments. A discussion followed regarding individual corridors and their zoning designations. She said in the future they would need to decide if corridors should have traditional based zoning or form based zoning.

She discussed catalyst projects, which are projects that have an urgency to them as they will make things happen. These include the Zoning Ordinance, healthy neighborhoods, Wiard Road connection near the American Center for Mobility, open space and agricultural preservation and social and cultural presence. Healthy neighborhoods would be concentrated on preserving neighborhoods with increased safety, infrastructure investment, healthy food access, healthy environments, easy access to all forms of transportation, job creation and educational opportunities. Regarding the Wiard Road connection, there is no north/south connection between Wiard Road and East Michigan Avenue which cuts off neighborhoods and land parcels. She said this project is going to be difficult to get approved but it is vitally important. She then discussed open space and agricultural preservation and said this will be difficult as well due to the way the Township has been zoned. She said this will have to be done in partnership with others to preserve land because it is not something that can be accomplished with zoning alone. Social and cultural presence is already in the Township, it just needs to be focused. Residents are upset that media narrative is always negative and want it changed. She suggested public arts, cultural events and increased good public spaces as ways to accomplish this.

She told the Commissioners they are drafting the Master Plan and it should be finished by end of April 2019 so it can be brought to them in May 2019. Per state law the plan will need to available for review by adjoining communities for either 61 or 63 days and during that time it would also be discussed with the community at neighborhood watch meetings and public meetings. Once a Public Hearing was completed the Commissioners could then recommend approval to the Board of Trustees. The process should be done by end of summer 2019 or early fall 2019.

Commissioner Krieg asked if there were plans with the City of Ypsilanti to coordinate plans or ideas.

Ms. Mason-Minock stated the City is working with the Township on Ecorse Road zoning and a joint corridor improvement agency. Throughout the Master Plan process the City Planner has given her opinion and there are partnership opportunities with the catalyst projects as well. She said she was a part of the City's Master Plan process 6 years ago and is cognizant of that.

8. OPEN DISCUSSION FOR ISSUES NOT ON THE AGENDA

A. CORRESPONDENCE RECEIVED

Michigan Association of Planning

B. PLANNING COMMISSION MEMBERS

Commissioner Krieg said his term as a member of the Ann Arbor Area Transportation Authority (AAATA) Board ends at the end of the month.

C. MEMBERS OF THE AUDIENCE

None

9. TOWNSHIP BOARD REPRESENTATIVE REPORT

Commissioner Eldridge said recreational marijuana continues to be a discussed issue. The first reading occurred one week ago so the Township could opt out while waiting to see what the regulations imposed by the state would be.

Angela King, Township Attorney, said this has to do with the business aspect of the marijuana industry, not the individual use. Individual use is not affected by opting out.

10. ZONING BOARD OF APPEALS REPRESENTATIVE REPORT

Commissioner Iacoangeli said at the last meeting Conditional Use Permits were issued for fireworks sales.

Attorney King stated the Township recently adopted an ordinance which restricts when fireworks can be used.

11. TOWNSHIP ATTORNEY REPORT

None

12. PLANNING DEPARTMENT REPORT

Ms. Wilson said the report was included in the Commissioner's packets. She added that Hampton Inn Suites had a pre-construction meeting on April 2, 2019 and they are ready to begin construction with a June 2020 opening date.

13. OTHER BUSINESS

None

A motion was made by a Commissioner Peterson, supported by Commissioner Sinkule to adjourn the meeting. The motion carried unanimously.

The meeting was adjourned at approximately 8:21pm

Respectfully submitted,

Laura Gough
OCS Clerk

Revised and approved,

Laurence J. Krieg
Secretary of the Planning Commission

CHARTER TOWNSHIP OF YPSILANTI

OFFICE OF COMMUNITY STANDARDS

Building Safety • Planning & Zoning • Ordinance Enforcement

TO: Ypsilanti Township Planning Commission

FROM: Charlotte Wilson, AICP, Planning and Development Coordinator

DATE: April 16th, 2019

SUBJECT: Request to make a recommendation to the Township Board of Trustees regarding the proposed Ecorse Road Form Based District Zoning Ordinance Amendments.

As you are aware, we have been working with Carlisle/Wortman Associates and Sara Jo Shipley to create a form based zoning district for Ecorse Road. As part of the process, multiple meetings have been held with the surrounding neighborhood and business owners on Ecorse Road. The resulting draft zoning amendments and memo from the April 9th, 2019 Planning Commission presentation are attached.

The anticipated schedule for review and adoption of this zoning district is:

- April 9th - Planning Commission Work Session on draft district
- April 23rd – Planning Commission Public Hearing
- April/May – Planning Commission Recommendation
- May – Township Board Work Session & First Reading
- June– Township Board Second Reading

On April 9th, Carlisle/Wortman gave a short presentation on the draft district. On April 23rd, the presentation will be given again followed by a public hearing and a motion to table, recommend approval, or recommend denial.

***Suggested Motions**: The following suggested motions are intended to assist the Commission in making the desired motion of their choice. The Commission may utilize, add or reject any motion and/or conditions suggested herein as they deem appropriate.*

Motion to make a recommendation:

Approval: *"I move to recommend approval to the Township Board of Trustees to add the proposed Ecorse Road Form Based District Text Amendments as Article XI (11) – A of the Zoning Ordinance."*

Denial: *"I move to recommend denial to the Township Board of Trustees to add the proposed Ecorse Road Form Based District Text Amendments as Article XI (11) – A of the Zoning Ordinance."*

Table: *"I move to table recommendation to the Township Board of Trustees to add the proposed Ecorse Road Form Based District Text Amendments as Article XI (11) – A of the Zoning Ordinance to consider the comments presented by the Planning Commission during discussion of the agenda item."*

Respectfully submitted,

Charlotte Wilson, AICP
Planning and Development Coordinator

Carlisle | Wortman
ASSOCIATES, INC.
117 NORTH FIRST STREET SUITE 70 ANN ARBOR, MI 48104 734.662.2200 734.662.1935 FAX

MEMORANDUM

To: **Charter Township of Ypsilanti Planning Commission**

From: **Benjamin Carlisle, AICP and Megan Masson-Minock, AICP**

Subject: **Draft Ecorse Road Form Based District Zoning Amendment**

Date: **April 3, 2019**

As you are aware, we have been working with Charlotte Wilson and Sara Jo Shipley to create a form based zoning district for Ecorse Road. As part of the process, multiple meetings have been held with the surrounding neighborhood and business owners on Ecorse Road. The resulting draft zoning amendments are attached.

The anticipated schedule for review and adoption of this zoning district is:

- April 9th - Planning Commission Work Session on draft district
- April 23rd – Planning Commission Public Hearing
- April/May – Planning Commission Recommendation
- May – Township Board Work Session & First Reading
- June– Township Board Second Reading

On April 9, we will give a short presentation on the draft district as well as answer questions and take suggestions. In the meanwhile, do not hesitate to contact either of us with any questions or comments. We look forward to meeting with you on Tuesday, April 9!

Sincerely,

Benjamin R. Carlisle, AICP

Megan A. Masson-Minock, AICP

Attachment: Draft Zoning Amendments Article XI – Ecorse Road Form Based District

ARTICLE XI - A – ECORSE ROAD FORM BASED DISTRICT (ERFB)

SECTION 1140 - GENERAL INTENT AND PURPOSE

A. **Intent**. The **ECORSE ROAD FORM BASED DISTRICT (ERFB)** is intended to implement the vision established by the Township Master Plan and the E. Michigan Avenue and Ecorse Road Placemaking Plan, to transform the Ecorse Road corridor into a vibrant, dynamic area through placemaking and the attraction of new investment. The Ecorse Road Form Based District allows for the consolidation and creative redevelopment of parcels.

Development of buildings and sites, including retrofitting and redevelopment of existing sites and buildings, can include residential, retail, office, and service uses. Uses designed to support the residents and local workers are also encouraged, such as mixed-use developments with small scale retail or restaurant uses incorporated with housing units. The redeveloped corridor will help diversify the Township housing and commercial stock and incorporate architecturally interesting buildings.

Consolidation of parcels in the District is encouraged in order to provide for a quality and consistent development pattern. Incentives include additional building forms and more permitted uses.

B. **Purpose.** The general purpose of these regulations is as follows:

a. Promote new investment opportunities by allowing a wide range of potential uses and techniques to expand the employment and economic base.
b. Ensure that development is of human scale, primarily pedestrian-oriented, and designed to create attractive streetscapes and pedestrian spaces.
c. Ensure that development is designed for all modes of transportation.
d. Promote mixed-use development.
e. Ensure reasonable transition between higher intensity development and adjacent neighborhoods.
f. Improve mobility options and reduce the need for on-site parking by encouraging all modes of transportation, through shared parking, and through on-street parking.
g. Provide predictable development approval process.
h. Encourage lot consolidation to provide for larger consistent developable sites.

C. **Factors for Regulation.** These regulations are based on two (2) significant factors: site context and building features.

1. Site context is derived from existing and desired characteristics of an area, and recognizes the inherent conditions of the areas where these regulations are applied. Regulated sites types are organized by shape, size, orientation and location.

2. Building feature addresses the manner in which buildings and structures relate to their lots, surrounding buildings, and street frontage. The shape of the building, the land area to volume ratio, and the orientation of the building has a significant impact upon the character of an area. Building form standards control height, placement, building configuration, parking location, and building transparency applicable to the site context.

SECTION 1141 - APPLICABILITY AND ORGANIZATION

A. Applicability.

1. Any new use or expansion of existing use that requires site plan review shall comply with the requirements of this Article and other applicable requirements of this Ordinance.

2. The requirements of this Article shall not apply to:

   a. Continuation of a permitted use within an existing structure.

   b. Changes of use within existing structures that do not require increased parking.

   c. Normal repair and maintenance of existing structures that do not increase its size or parking demand.

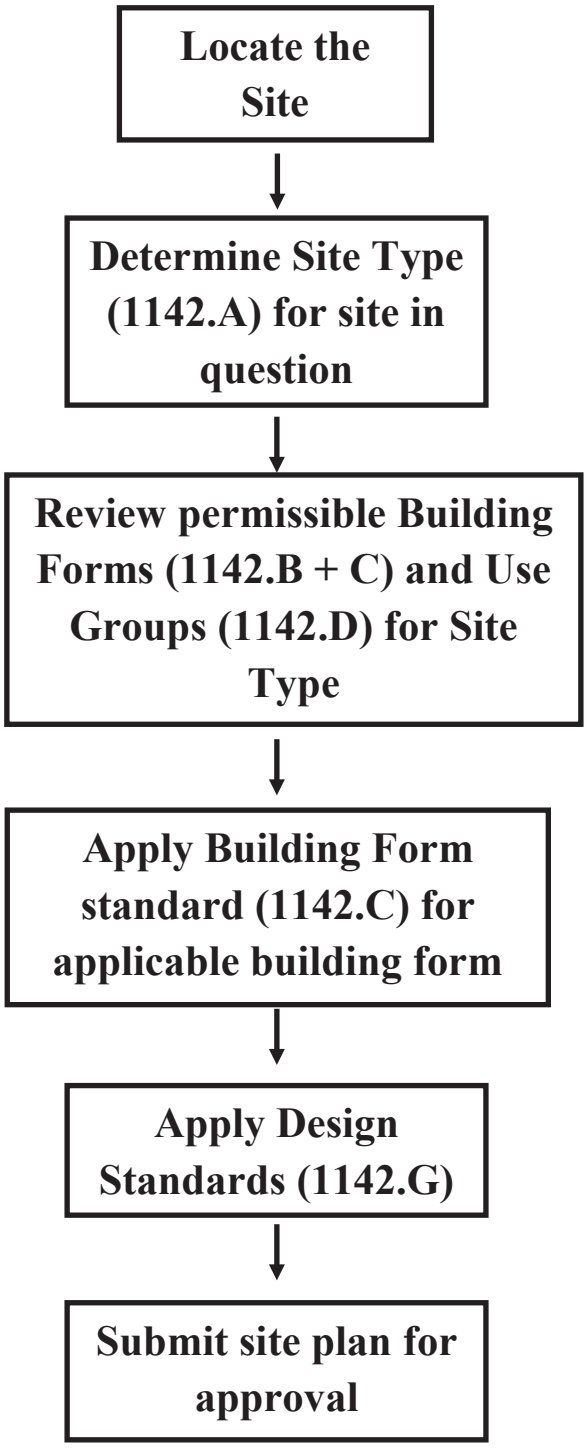
B. Regulating Plan. The Ecorse Road Form Based District shall be governed by a Regulating Plan that is specific to the area.

1. The Regulating Plan based on the site type determines building form and allowable use for each property within a form-based district

2. The Regulating Plan is based on three (3) factors: Site Type; Building Form; and Use Group.

   a. **Site Types.** Site Types, as set forth in Section 1142.A, are determined by street orientation, lot size, lot configuration, location, and relationship to neighboring sites. Site type provides the basis for building forms and authorized use groups.
   b. **Building Form Standards and Types**. Building form standards and types, set forth in Section 1142.B + C, establish the parameters for building form, height, and placement, and are specifically applied to each district based upon the regulating plan.
   c. **Authorized Use Groups**. Authorized land uses are organized by use groups. Authorized use groups, as set forth in Section 1142.D, are specifically applied to each District based upon the regulating plan.

3. The steps to determine the regulations that apply to a specific property within a form-based district are as follows:
   a. Find the site in question on the regulating plan map
   b. Identify the site type for the site in question. Sites will be classified Site Type A, B, or C.
   c. Consult the Use Groups and Building Forms Permitted table in which the site is located. The table will identify if a use group or building form is permitted, permitted with conditions, or not permitted for the site type and street type combination of the site in question.
   d. Follow the regulations for the chosen building form when designing the development application. Building form regulations are established in Section 1142.B and 1142.C.
   e. Follow the design standards as listed in Section 1142.G.
   f. Obtain site plan approval or special use approval for the chosen building form and use, as appropriate.



C. **Design Standards**. General design standards, set forth in Section 11.42.G, are supplementary to other requirements of the Ordinance. Generally, the design standards regulate building placement, parking orientation, landscaping, and other site design requirements.

D. **Modification of District Boundaries**. Any modification to the boundaries of any form-based district shall require rezoning, in accordance with the provisions of Article XXVII, Changes and Amendments.

E. **Modification of Regulating Plan**. Specific building form, use group, and design standards applied within each Regulating Plan are based upon the designation of site type. Any modification of site type may be determined by the Planning Commission, notice and after conducting a public hearing in accordance with Sec. 2703.

The Planning Commission shall consider the following in making a determination to modify a site type or street type designation:

1. The applicant's property cannot be used for the purpose permitted in the form-based district.

2. Area has been added to or deleted from the subject property in question, requiring the modification.

3. The proposed modification and resulting development will not alter the essential character of the area.

4. The proposed modification meets the intent of the district.

5. Existing streets have been improved and/or new streets constructed that may result in the modification of a specific site type.

6. Modification to the Regulating Plan is in conformance to the Master Plan and Placemaking Plan.

F. **Nonconformities**. Nonconformities shall be regulated in accordance with Article XXII of the Zoning Ordinance.

SECTION 1142 - STANDARDS

A. Site Types

1. **Site Type A** (neighborhood residential or mixed-use sites)

   Site Type A is composed of lots one-half (0.5) acre or smaller and is reserved primarily for residential use and for smaller non-residential use which is compatible with a residential setting. Site Type A is generally located in areas which serve as a transition between the street and neighboring residential areas. The building form selected for these sites must consider both the front elevation that fronts on the street but also the rear/side elevation that is adjacent to residential in order to maintain compatibility with adjacent uses.

2. **Site Type B** (neighborhood commercial/office or mixed-use sites)

   Made up mostly of lots mostly between one-half (0.5) and one (1) acre in area, the Site Type B category may include free standing single-use sites developed for commercial and office uses serving the surrounding neighborhood or mixed-use developments. Size and character may vary based on the unique characteristic of each parcel. Small retail and food-service uses would often be found in this category, as well as small single or multi-tenant commericl or office buildings.

3. **Site Type C** (Community commercial/office and mixed-use sites)

The sites in Site Type C are mostly larger than one (1) acres in area. Site Type C size and character may vary based on the unique characteristic of each parcel. This category can include free standing single-use or mixed-use developments that are designed to serve a broader community-wide market.

B. Building Form Standards.

1. The ERFC district permit a series of building forms, dependent on the site context. The building forms, set forth in 1142.C, are designated within the district location based on the regulating plan. Building forms are classified in the following manner:

   a. Permitted Building Forms. These building forms are permitted as of right in the locations specified.

   b. Prohibited Building Forms. Building forms that are not identified as permitted in the locations specified are prohibited.

   c. Exceptions: For all building forms in all locations, awnings, signs, other projections (architectural projections, bay windows, etc.) may project into the required building line by up to 5 feet. Projections will be reviewed by the Township to ensure public safety.

2. The regulating plan dictates the site type for each individual property in the district. Building forms are identified within each district as permitted or not permitted based upon the site type.

3. Non-Residential Development Height, Setback, and Greenbelt Provisions when adjacent to any Residentially Zoned or Used Property.

   a. Setback and Greenbelt:

      i. Site Type A and B. The following setback and greenbelt shall be provided for any parcel zoned Site Type A or B that is adjacent to a residentially zoned or used parcel.

         a. When a parcel is abutting or adjacent to a residentially zoned or used parcel without an intervening constructed alley or street, the building setback from the property line of the residentially zoned or used parcel shall be no less than the height of the building on the parcel zoned ERFB.

         b. When a parcel is abutting or adjacent to a residentially zoned or used parcel without an intervening alley or street, a minimum 10-foot landscaped greenbelt shall be maintained from the property line of the residentially zoned or used parcel. The greenbelt shall be landscaped and screened with a solid fence or decorative wall up to six feet in height erected parallel to any common lot line, with a ten-foot wide planting strip along the base of the wall or fence that consists of one evergreen tree and one canopy tree per 30 lineal feet along the property line.

c. The Planning Commission may deviate from these setback and greenbelt provisions in the course of its site plan review process; however, the Planning Commission shall not permit a setback or greenbelt that is less than required in the building form. In the review of the deviation, the Planning Commission shall consider the standards as set forth in Section 1142.B..3.b.

ii. Site Type C. The following setback and greenbelt shall be provided for any parcel zoned Site Type C that is adjacent to a residentially zoned or used parcel.

a. When a property is abutting or adjacent to a residentially zoned or used parcel without an intervening alley or street, the setback from the property line of the residentially zoned or used parcel shall be no less than 1.5 times the height of the building on the non-residential parcel.

b. When a property is abutting or adjacent to a residentially zoned or used parcel without an intervening alley or street, a minimum 20-foot landscaped greenbelt shall be maintained from the property line of the residentially zoned or used parcel. The greenbelt shall be landscaped in accordance with Section 2108.C.

c. The Planning Commission may deviate from these setbacks and greenbelt provisions in the course of its site plan review process; however, the Planning Commission shall not permit a setback or greenbelt that is less than required in the building form. In the review of the deviation, the Planning Commission shall consider the standards set forth in Section 1142.B.3.b.

b. Deviation Standards:

i. Height, setback, and greenbelt deviations may be granted by the Planning Commission if the following is found:
   a. The deviation shall not adversely impact public health, safety, and welfare.
   b. The deviation shall maintain compatibility with adjacent uses.
   c. The deviation shall be compatible with the Master Plan and in accordance with the goals and objectives of the Master Plan and any associated subarea and corridor plans.
   d. The deviation shall not adversely impact essential public facilities and services, such as: streets, pedestrian or bicycle facilities, police and fire protection, drainage systems, refuse disposal, water and sewage facilities, and schools.
   e. The deviation shall be in compliance with all other zoning ordinance standards.
   f. The deviation shall not adversely impact any on-site or off-site natural features.

C. Building Form Types

Table 1142a-1 Building Form A.1		
Building Form A.1: Small, generally single-purpose buildings for residential. Typically situated on a smaller lot, adjacent to single family residential.		
Building Height		
Minimum 1 story, 14-foot height, **Maximum** 2 stories, 28-foot height (Site type A & B), **Max:** 2 stories, 38-foot height (Site type C)		
Building Placement		
Front Yard: 10-foot required build-to line [1] 75% of the building façade must meet the required build-to line, while up to 25% of the façade can be setback to allow for architectural consideration.	**Side Yard:** No minimum side setback **If provided**, minimum 5 feet. For corner lots, side street yard, minimum 5 feet.	**Rear Yard:** Minimum 10-foot rear setback
Lot		
Impervious Surface: Maximum 80% **Access and circulation:** Driveways may access the site from any side, pedestrian pathways must be provided from the right-of-way.	**Parking location:** Parking shall be located in a side or rear yard; when located in a side yard and abutting the required build-to line adjacent to the right-of-way, parking shall be screened with a minimum 30-inch masonry wall on the required build-to line, or within 5 feet of the required build-to line, provided that a landscape treatment is added between the wall and the required build-to line.	
[1] The Planning Commission may adjust the required build-to line to a maximum of 30 feet beyond the property line for projects incorporating a permanent space for an outdoor café, public space, or a cross access drive with an adjacent parcel. Outdoor cafés or public spaces must be developed as part of the primary building and must incorporate a permanent wall or landscaping area along the required build-to line.		

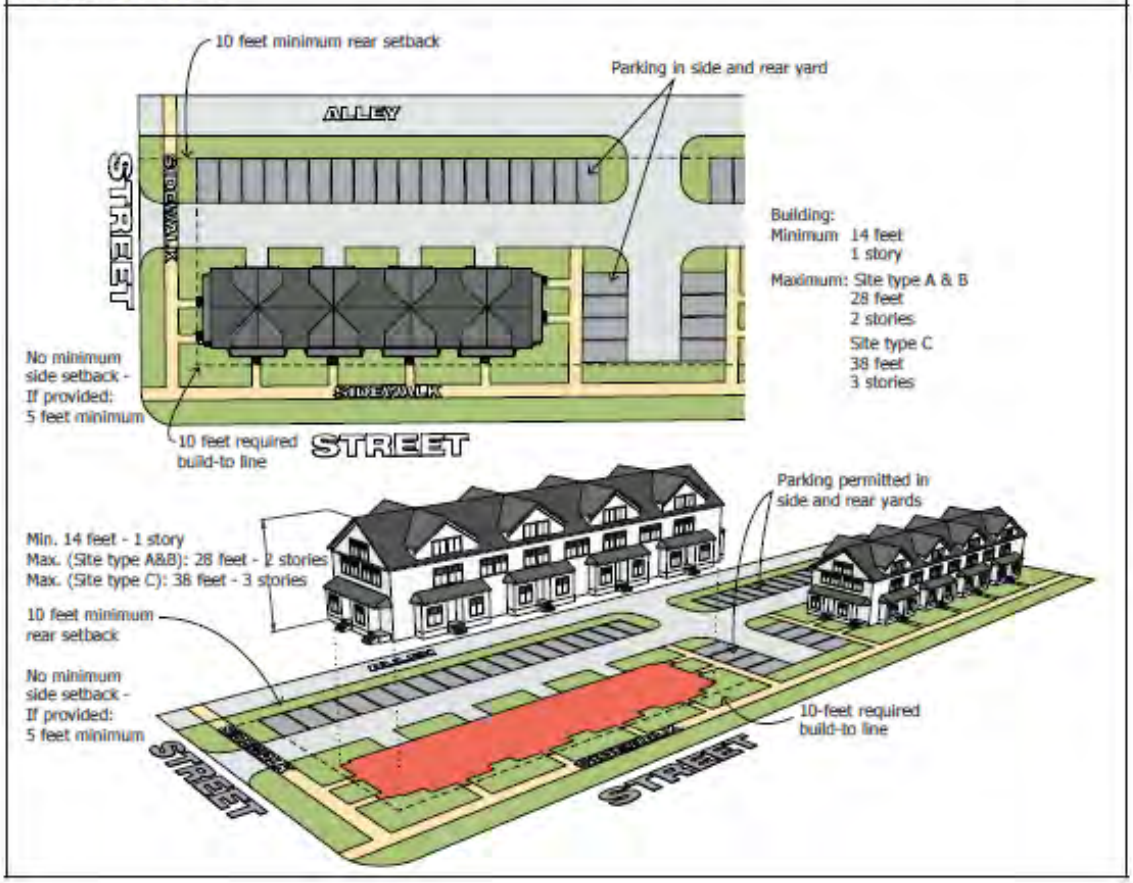


Table 1142a-2
Building Form A.2

Building Form A.2: Small, generally single-purpose buildings for retail, office, restaurant, or service uses. Typically situated on a smaller lot within the district. Adjacent to single-family residential.

Building Height

Minimum 1 story, 14-foot height, **Maximum** 2 stories, 30-foot height

Building Placement

Front Yard: 10-foot required build-to line [1] 75% of the building façade must meet the required build-to line, while up to 25% of the façade can be setback to allow for architectural consideration	**Side Yard:** No minimum side setback If provided, minimum 5 feet For corner lots, side street yard, minimum 5 feet.	**Rear Yard:** Minimum 10-foot rear setback

Lot

Impervious Surface: Maximum 80% **Access and circulation:** Driveways may access the site from any side, pedestrian pathways must be provided from the right-of-way.	**Parking location:** Parking shall be located in a side or rear yard; when located in a side yard and abutting the required build-to line adjacent to the right-of-way, parking shall be screened with a minimum 30-inch masonry wall on the required build-to line, or within 5 feet of the required build-to line, provided that a landscape treatment is added between the wall and the required build-to line.

[1] The Planning Commission may adjust the required build-to line to a maximum of 30 feet beyond the property line for projects incorporating a permanent space for an outdoor café, public space, or a cross access drive with an adjacent parcel. Outdoor cafés or public spaces must be developed as part of the primary building and must incorporate a permanent wall or landscaping area along the required build-to line.

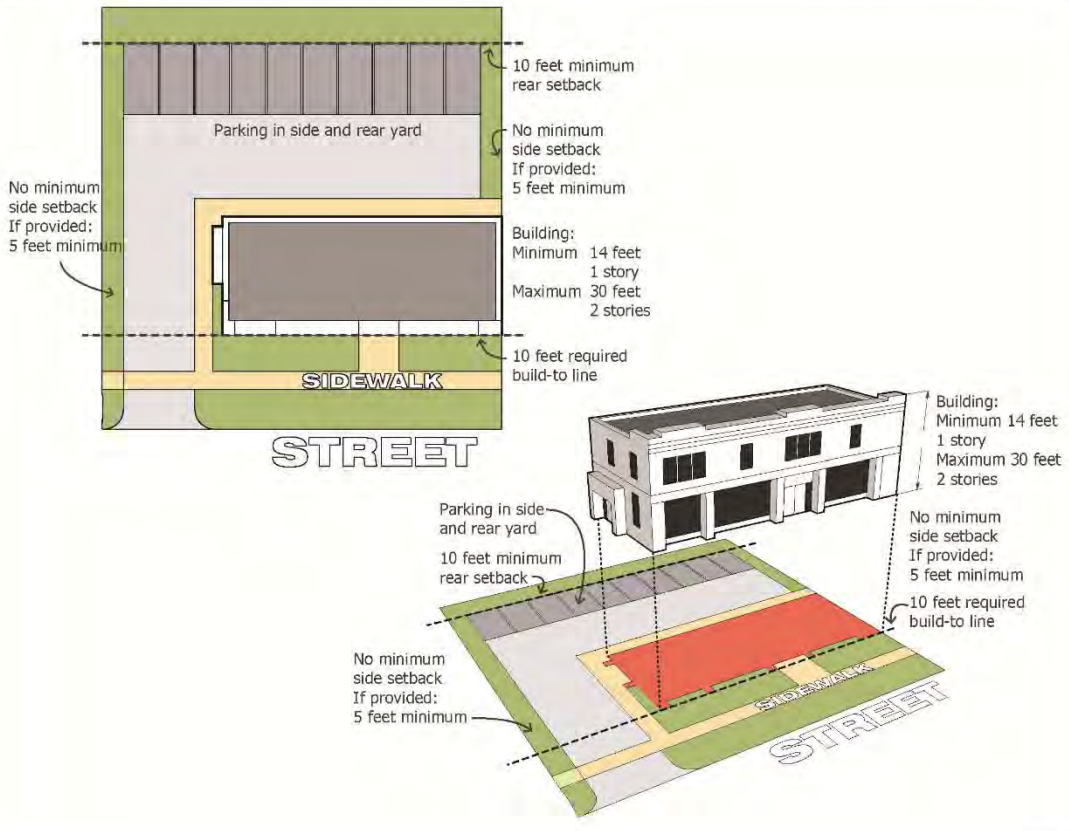


Table 1142a-3 Building Form B		
Building Form B: Small, generally single-purpose buildings for retail, office, restaurant, or service uses. Typically situated in an out lot of a larger classification building form, or on a smaller, more remote site location within the district.		
Building Height		
Minimum 1 story, 14-foot height, **Maximum** 2 stories, 28-foot height (Site type B), Max: 3 stories, 38 foot height (Site type C)		
Building Placement		
Front Yard: 10-foot required build-to line [1] 75% of the building façade must meet the required build-to line, while up to 25% of the façade can be setback to allow for architectural consideration	**Side Yard:** No minimum side setback If provided, minimum 5 feet	**Rear Yard**: Minimum 10-foot rear setback
Lot		
Impervious Surface: Maximum 80% **Access and circulation:** Driveways may access the site from any side, pedestrian pathways must be provided from the right-of-way.	**Parking location:** Parking shall be located in a side or rear yard; when located in a side yard and abutting the required build-to line adjacent to the right-of-way, parking shall be screened with a minimum 30-inch masonry wall on the required build-to line, or within 5 feet of the required build-to line, provided that a landscape treatment is added between the wall and the required build-to line.	
[1] The Planning Commission may adjust the required build-to line to a maximum of 30 feet beyond the property line for projects incorporating a permanent space for an outdoor café, public space, or a cross access drive with an adjacent parcel. Outdoor cafés or public spaces must be developed as part of the primary building and must incorporate a permanent wall or landscaping area along the required build-to line.		

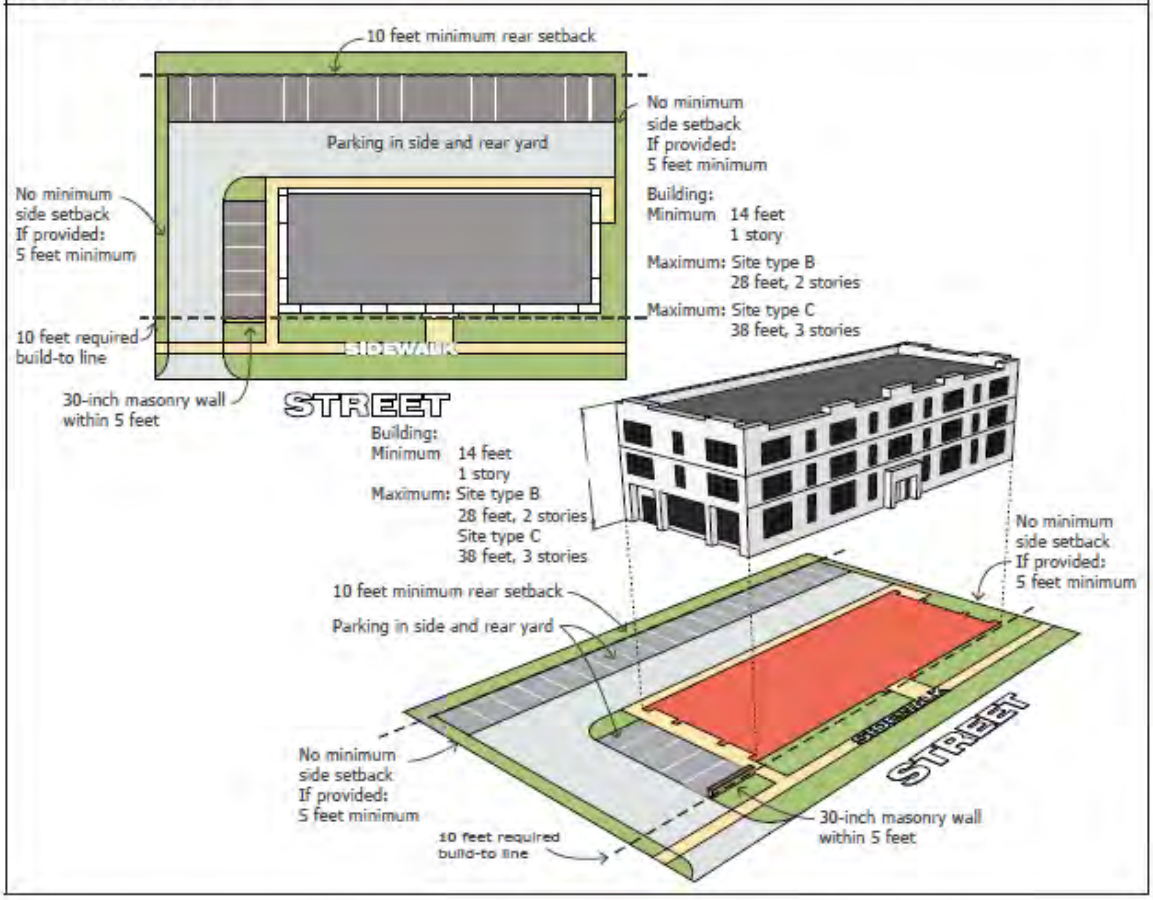
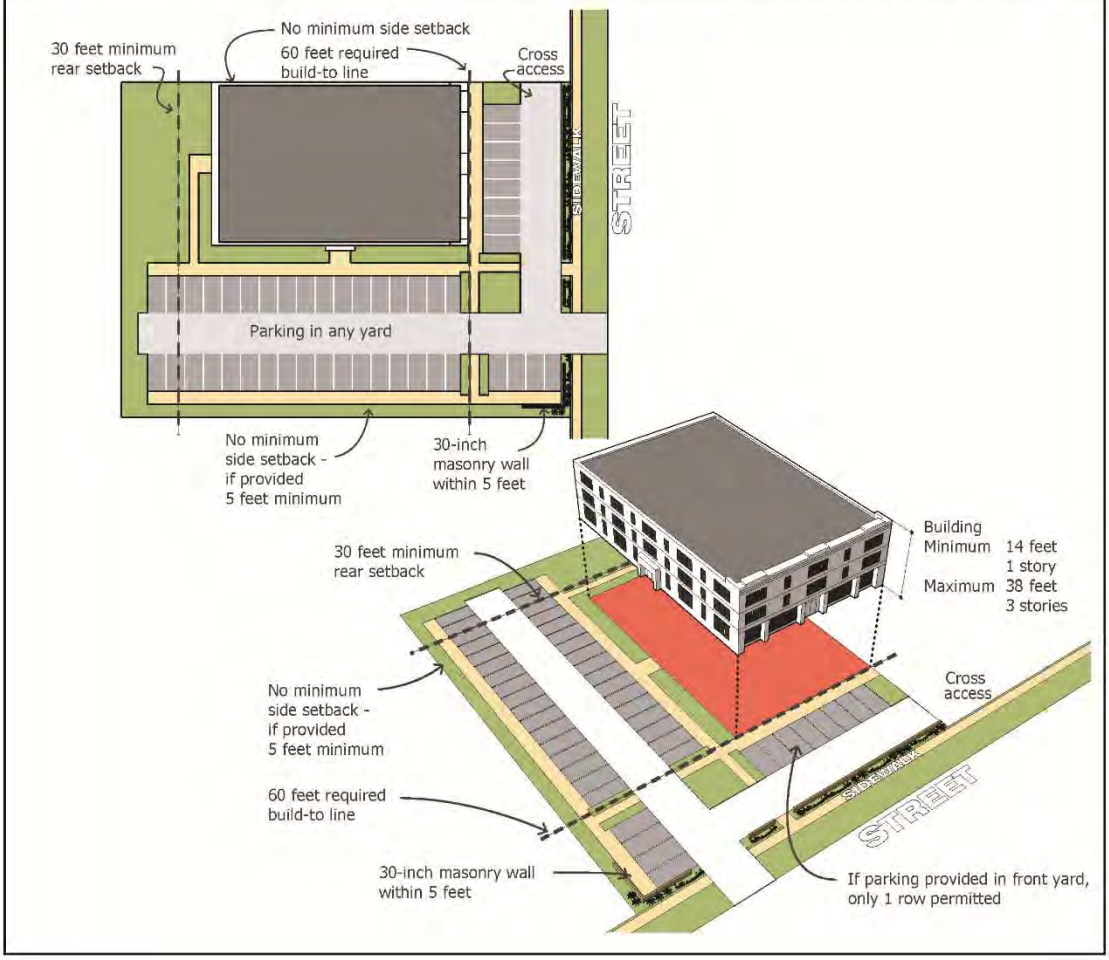


Table 1142a-4 Building Form C		
Building Form C: Single or multiple-tenant buildings for retail, restaurant, office, service, or residential uses. This category also includes multiple-tenant development, although it requires a second story to encourage a mix of use.		
Building Height		
Minimum 1 story, 14-foot height, **Maximum** 3 stories, 38-foot height, Ground floor 14-foot minimum height		
Building Placement		
Front Yard: Maximum 60-foot required build-to line.	**Side Yard:** No minimum side setback If provided, minimum 5 feet	**Rear Yard:** Minimum 30-foot rear setback
Lot		
Impervious Surface: Maximum 80% **Access and circulation:** Driveways may access the site from any side, pedestrian pathways must be provided from the right-of-way.	**Parking location:** Parking may be located in any yard; when located in a front or side yard adjacent to the primary building and abutting the right-of-way, parking shall be screened with a minimum 30-inch masonry wall on the required build-to line, or within 5 feet of the required build-to line, provided that a landscape treatment is added between the wall and the required build-to line; if parking is provided in the front yard only 1 row is permitted	



D. Authorized Use Groups.

1. Authorized uses are categorized by use groups as set forth in Table 1142.D. Use groups generally contain similar types of uses in terms of function, character, and intensity.

2. Use groups are designated in locations within each district based on the regulating plan. Use groups are classified in the following manner:

   a. Permitted Use Groups. These use groups are permitted as of right in the locations specified.

   b. Special Use Groups. These use groups are permitted after review and approval by the Planning Commission, in accordance with the procedures set forth in Section 2119 and the standards in this Ordinance.

   c. Prohibited Use Groups. These use groups not indicated as permitted are prohibited in the locations specified.

   d. Uses permitted in all locations within the District. Public parks and essential public services are permitted by right in all locations.

   e. Similar Uses. If a use is not listed but is similar to other uses within a use group, the Zoning Administrator may make the interpretation that the use is similar to other uses within a use group.

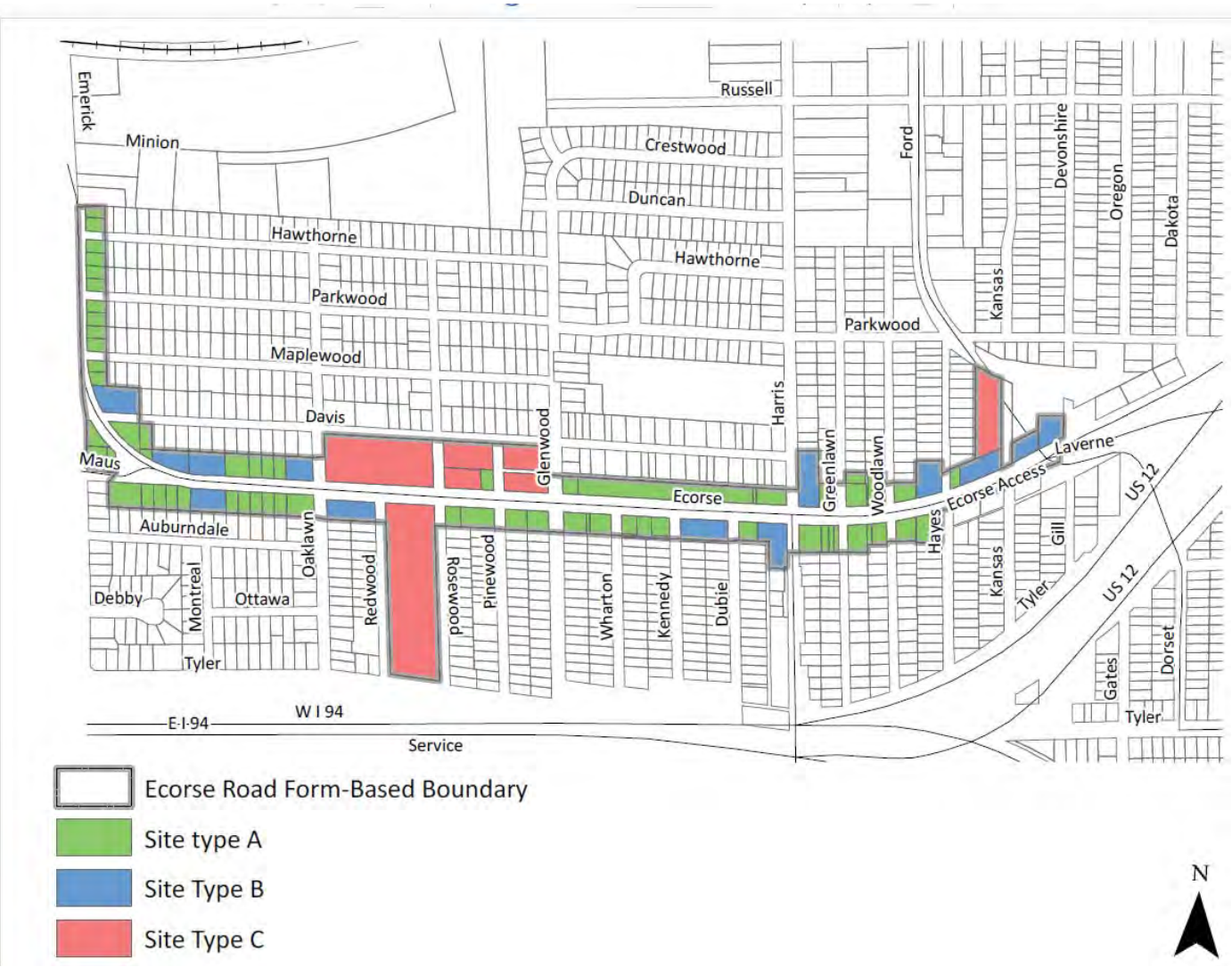
      The Zoning Administrator may also make the determination whether the use is permitted as of right, permitted in upper stories only, or permitted as a special use. The Zoning Administrator may obtain a recommendation from the Planning Commission as to whether or not the proposed use is similar to a use permitted as of right, permitted in upper stories only, or permitted as a special use.

Table 1142.D
Use Groups by Category

Use Group 1 **Residential Uses:**
One-Family detached and attached dwellings, subject to regulations in Section 1801
Two-Family dwellings
Use Group 2 **Misc. Residential / Related Uses:**
Multiple-Family dwellings
Live/Work units
Child care centers, subject to regulations in Section 1861
Bed and Breakfast, subject to regulations in Section 1808

Use Group 3 **Office / Institutional:**
Civic Buildings
General office
Professional and medical office
Primary/secondary schools (private)
Publicly owned/operated office and service facilities
Veterinary clinics or hospitals, subject to regulations in Section 1820 and Section 1821, respectively
Use Group 4 **Retail, Entertainment, and Service Uses:**
Financial institutions
General retail
Food use without a drive-through
Personal services
Business services
Use Group 5 **Misc. Uses:**
Commercial kennels / pet day care
Hospitals
Technology centers / office research / data center
Funeral homes
Senior assisted/independent living
Group day care homes, subject to regulations in Section 1861
Lodging
Places of Worship
Fitness, gymnastics, and exercise centers
Theatres and places of assembly
Indoor commercial recreation establishments
Use Group 6 **Automotive Uses:**
Automobile car wash, subject to conditions in Section 1833
Gasoline service station, subject to conditions in Section 1829

E. Ecorse Road Form Based Code District Regulating Plan



F. Ecorse Road Form Based Code District Regulating Plan Table

Site Type	Building Form		Use Group	
Site Type: A	Permitted Building Form	A1, A2	Permitted Use Group	1, 2, 3, 4
			Special Use Group	—
Site Type: B	Permitted Building Form	A1, A2, B	Permitted Use Group	2, 3, 4
			Special Use Group	6
Site Type: C	Permitted Building Form	B, C	Permitted Use Group	2, 3, 4
			Special Use Group	5, 6

G. Design Standards. In addition to standards set forth in this Ordinance, all proposed development shall comply with the standards set forth herein.

1. **Pedestrian/Non-Motorized Access**

a. **Intent.** To ensure that site layout and building design provides safe and convenient pedestrian and bicycle access both to and within a site and between adjacent sites.

b. **Standards**

i. A pedestrian connection shall provide a clear connection between the primary street upon which the building fronts and the building. Connection may include pavement striping.

ii. Pedestrian access shall be clearly identified from parking areas and all entrances to a building.

iii. Where appropriate, sidewalks fronting the public right-of-way should be designed to accommodate space for activities such as outdoor dining.

iv. All sites shall provide a bike rack for at least two (2) bicycles within fifty (50) feet of the building entrance.

2. **Building Placement and Orientation**

a. **Intent.** To require building placement that provides a strong visual and functional relationship with its site, adjacent sites, and the primary street upon which the site is located. Ensure consistency within sites and to adjacent sites to provide distinct building groups which exhibit similar orientation, scale, and proportion.

b. **Standards**

i. Setbacks and building orientation shall reinforce a consistent pattern of siting.

ii. Primary building entrances shall be located so that they are easily identifiable with convenient public access.

iii. Buildings should enhance street corners through the use of prominent architectural or site features.

3. **Parking Placement, Orientation, and Screening**

a. **Intent.** To provide a circulation system that efficiently moves vehicles in a well-defined manner, while reducing the visual impact of parking areas and mitigating conflict between pedestrians, bicycles, and automobiles.

b. **Standards**

i. Required Parking. Off-street parking shall be provided for a principal use erected, altered, or expanded after the effective date of this Ordinance in accordance with the standards set forth in Sec. 2104.

a. The Form Based districts are intended to encourage pedestrian and friendly design and compact mixed-use developments. Applicants are encouraged to consider the provisions for shared parking and flexibility in application set forth in Sec. 2104.

b. The placement and design of parking areas and structures shall foster safe pedestrian access and circulation and clearly identifiable public access and visitor parking. Pedestrian access shall be provided between all parking areas and public building entrances. .

ii. **Location**

a. When parking is located in a side yard (behind the front building line) but fronts on the required building line, no more than twenty-five (25) percent of the total site's linear feet along the required building line or sixty (60) feet, whichever is less, shall be occupied by parking.

b. For a corner lot, no more than twenty-five (25) percent of the site's cumulative linear feet along the required building lines or sixty (60) feet, whichever is less, shall be occupied by parking. The building shall be located in the corner of the lot adjacent to the intersection.

c. Where off-street parking is visible from a street, it should be screened in accordance with the standards set forth in 2108.

4. **<u>Architectural Design and Building Materials</u>**

a. **Intent.** To create a character for the form-based district that encourage the greatest amount of visual interest, architectural consistency, and high-quality material use. The standards are not intended to limit imagination, innovation, or variety.

b. **Architectural Design Standards**

i. **Building Massing and Scale**

a. Rooflines and pitches shall be proportionate to nearby structures so as to provide transition or mitigation of significant changes to scale. Variety in massing can occur though step-backs as a building ascends upward

b. Buildings shall maintain a consistent streetwall with the longest edge of the buildings oriented parallel to the roadway, where possible.

c. Buildings within the same development shall be designed to provide a unified and easily identifiable image. Methods to achieve this include

using similar architectural styles and materials, complementary roof forms, signs, and colors.

ii. Façade Variation.

a. Façade articulation or architectural design variations for building walls facing the street are required to ensure that the building is not monotonous in appearance, using the following architectural techniques: Building wall offsets (projections and recesses); cornices, varying building materials or pilasters used to break up the mass of a single building; staggering of vertical walls; recessing of openings; providing upper-level roof overhangs; contrasting compatible building materials; use of variety and rhythm of window and door openings; use of horizontal and vertical architectural elements, use of horizontal bands of compatible colors; and providing changes in roof shape or roof-line.

b. Materials shall be selected for suitability to the type of buildings and the architectural design in which they are used.

c. Material selection shall be consistent with architectural style in terms of color, shades, and texture, however monotony shall be avoided.

5. **Transparency**

a. **Intent.** The first floors of all buildings shall be designed to encourage and complement pedestrian-scale activity and crime prevention techniques. It is intended that this be accomplished principally by the use of windows and doors arranged so that active uses within the building are visible from or accessible to the street, and parking areas are visible to occupants of the building.

b. **Transparency Standards**

1. Façade transparency shall be defined as the use of glass or transparent material that provides from the building exterior a view into the building of interior habitation and human scale. Signs covering windows, and the use of tinted, reflective or opaque glass do not meet the definition of façade transparency.

2. The first floors of all buildings shall be designed to encourage and complement pedestrian-scale activity and crime prevention techniques. It is intended that this be accomplished principally by the use of windows and doors arranged so that active uses within the building are visible from or accessible to the street, and parking areas are visible to occupants of the building. The first floor of any front façade facing a right-of-way shall be no less than fifty (50) percent windows and doors, and the minimum transparency for facades facing a parking area shall be no less than thirty (30) percent of the façade.

3. First-floor transparency is measured between two and eight feet above the first-floor elevation.

4. Nothing shall be placed on or inside window to reduce transparency less than the 50% requirement.

5. For multiple tenant buildings, the minimum transparency requirement must be met by each suite or tenant.

6. **Landscaping**

a. **Intent.** To incorporate appropriate landscaping to enhance visual appearance, provide transitions between properties, and screen unsightly areas

b. **Landscaping Standards.**

1. In addition to the standards set forth in Sec. 2108, the following standards shall be met.

2. Landscaping shall conform and incorporate existing landscape and topographic features.

3. Landscaping within courtyards, patios, and pedestrian realm may include hardscape and softscape materials.

4. Landscaping shall maintain adequate sight lines for visual safety, visibility and efficient security.

5. Landscaped areas, including landscaped parking islands and medians, shall be separated from vehicular and pedestrian encroachment by curbs and raised planting areas.

8. **Loading and Storage Areas**

a. **Intent.** To ensure that loading, storage, and other building utility features are designed to be a part of the overall building as so to reduce the visual impact

b. **Standards**

1. **Utilities and Mechanical Screening**

a. Utility structures located between the building and the public right-of-way shall be screened as set forth in Article XXI. Screening may include walls, fencing, or landscaping that is consistent with the character and materials of the development.

b. Trash enclosures shall be placed adjacent to the rear wall of corresponding buildings or shall be located away from portions of the site which are highly visible from public roadways or private properties with dissimilar improvements. Trash enclosures shall be screened as set forth in Article XXI with walls, fencing or landscaping that are consistent with the character and materials of the development.

2. **Loading**

   a. Service areas shall be designated by markings and/or signage to delineate them from pedestrian access and limit conflicts between service/delivery vehicles and patrons (e.g. pedestrians, bicyclists and transit users).

   b. Loading and service areas shall be located on the sides or rears of the buildings.

   c. Loading and service areas shall be screened from the public right-of-way with the use of fencing, landscaping, or walls.

ECORSE ROAD REZONING

Ypsilanti Township 2040

www.ypsilantitownship2040.com

A New Vision for Ecorse

Ypsilanti Township 2040

www.ypsilantitownship2040.com

Now

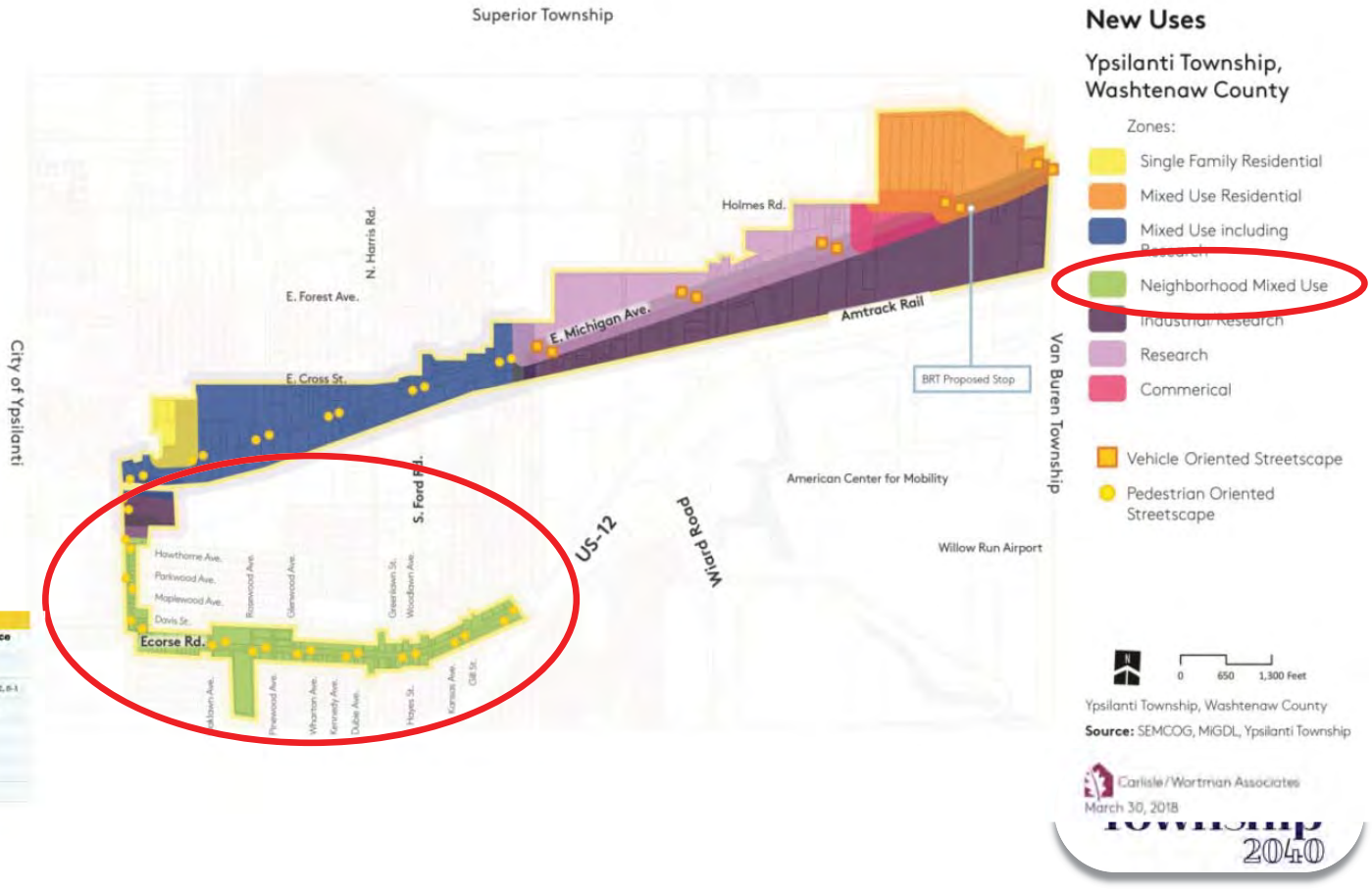
After

Changes on Ecorse

A New Vision for Ecorse

- Neighborhood Mixed Use Strategies:
  - Infill and redevelopment
  - 21st style development
  - Allow for mix of uses
  - Road and streetscape improvements

- Zoning is an action for implementation



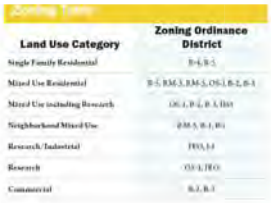
Strategy 1: Implement a New Zoning Strategy

Action 1: Amend the zoning to mirror the future land use plan.

Ecorse Road and E. Michigan Avenue will require unique zoning strategies to best ensure existing undesirable land uses can be contained and desired uses can be stimulated. Current zoning permits a number of uses and development that does not reflect the desired corridor vision. To promote redevelopment and stimulate reinvestment along the corridor, the zoning should be amended to provide flexibility to create a system of development incentives that entice transformative development. The development flexibility must provide a benefit to the developer and the community.

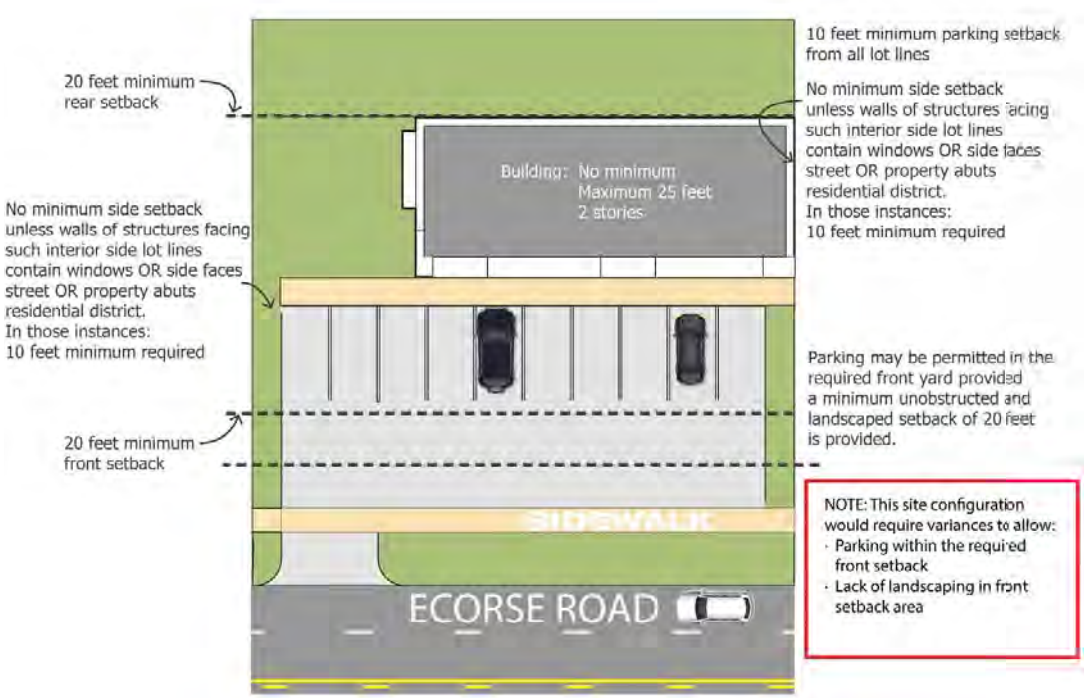
The proposed zoning strategies for E. Michigan Avenue include the following:

- E. Michigan Avenue from Ecorse Road to June Street should be zoned for a mix of uses including commercial, office, multiple-family, and research. The mixed use zoning will provide opportunities to create a greater variety of desired residential and commercial in an area with potential for greater walkability.
- On the south side of E. Michigan Avenue from June Street to Rawsonville Road, the zoning should be geared toward research to fight industrial uses due to the existing land use pattern and large lots. However, industrial uses should be limited to clean uses that do not require outside storage. Many of the existing land uses should be contained,

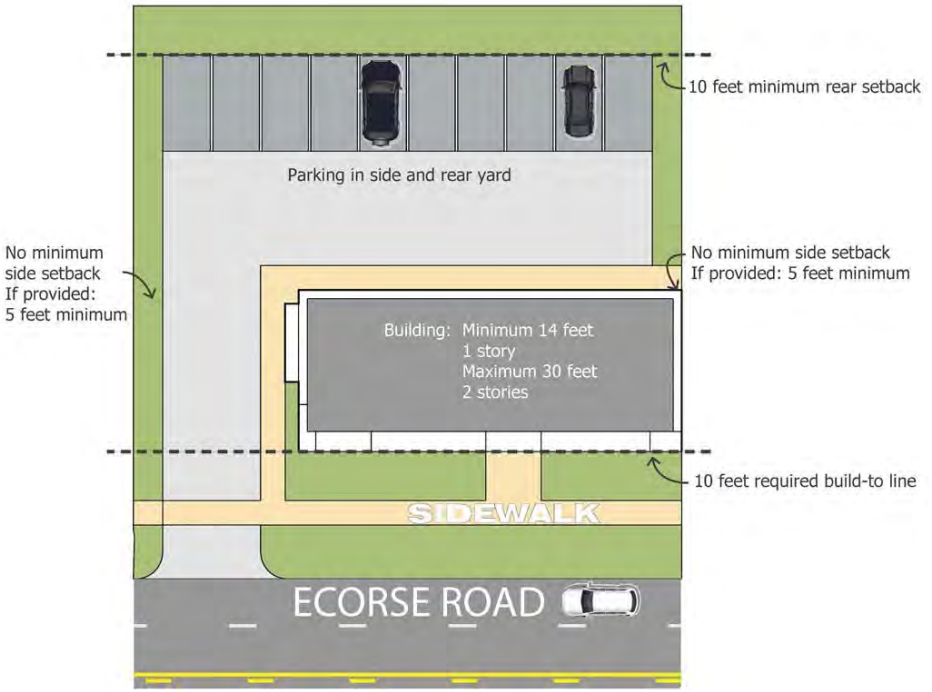


Land Use Category	Zoning Ordinance District
Single Family Residential	R-4, R-5
Mixed Use Residential	R-5, RM-3, RM-5, OS-1, B-2, B-3
Mixed Use including Research	OS-1, B-2, B-3, IRO
Neighborhood Mixed Use	RM-5, B-1, B-2
Research/Industrial	IRO, I-1
Research	OS-1, IRO
Commercial	B-2, B-3

www.ypsilantitownship2040.com



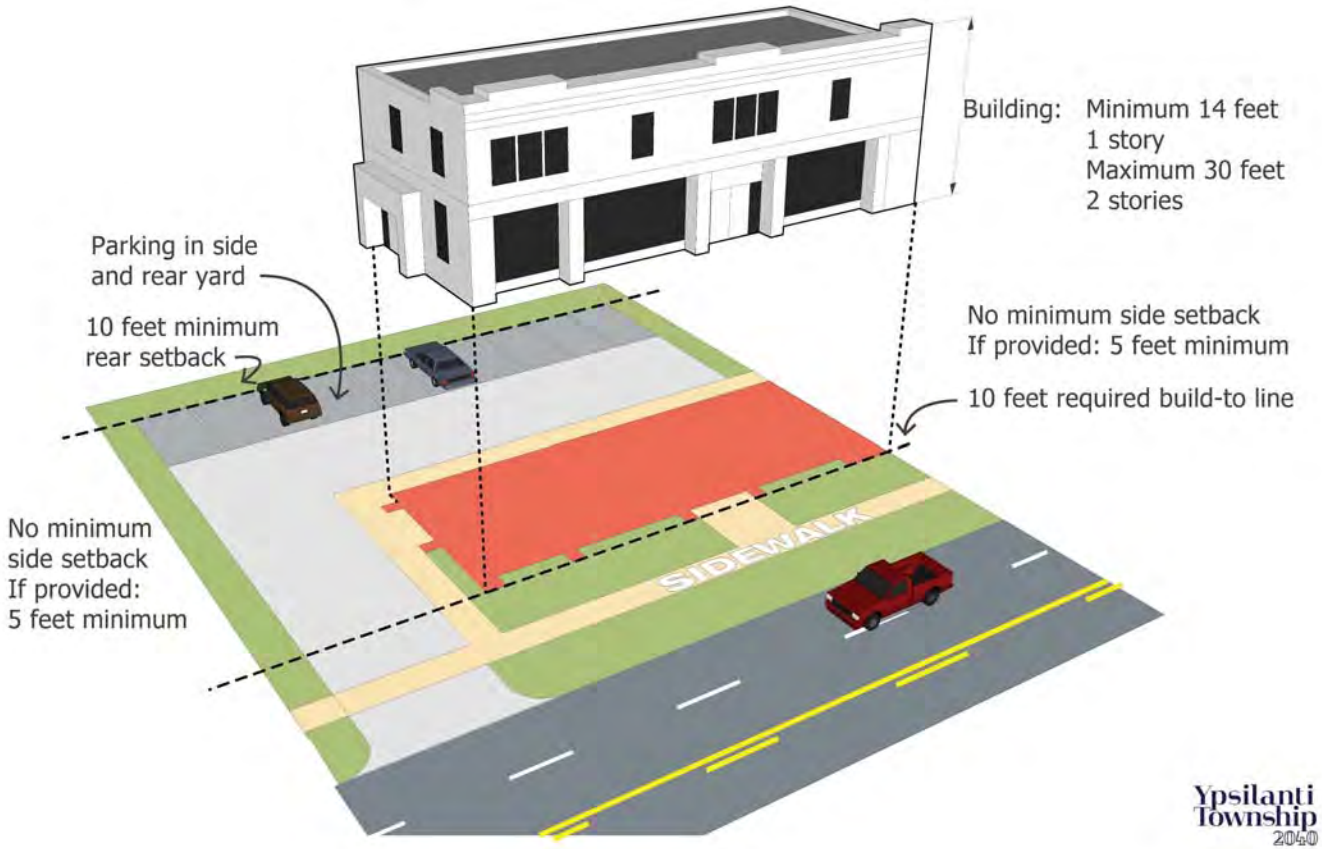
Current B-3 Zoning



Proposed Form Based Zoning

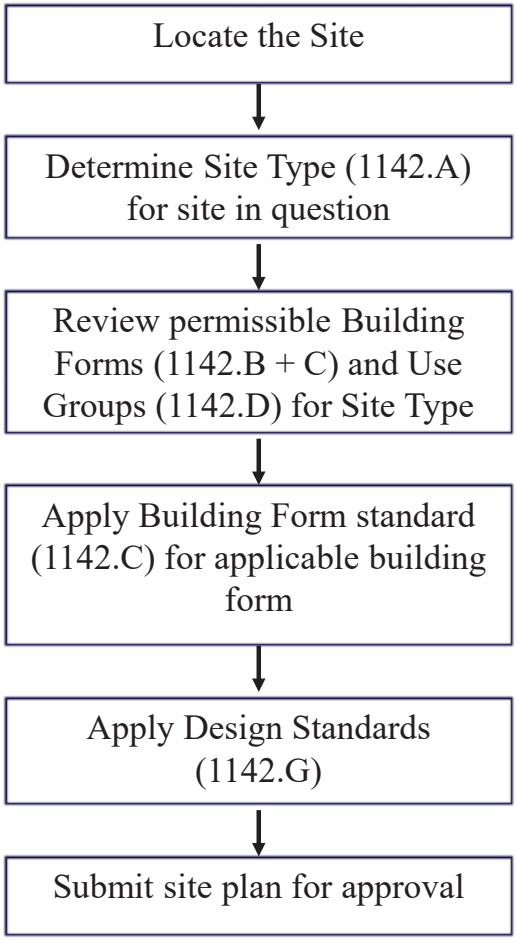
Ypsilanti Township 2040

Acceptable Uses	Current Zoning	Proposed Zoning
Commercial / Retail	✓	✓
Personal Services	✓	✓
Child Care / Day Care	✓	✓
Bank	✓	✓
Office (General & Medical)	✓	✓
Food Use (w/out drive-through)	✓	✓
Multiple Family	✗	✓
Mixed Use	✗	✓
Gas Station / Car Wash	Special Use	Special Use on larger sites (+0.5 acres)
Auto Sales	Special Use	✗
Auto Repair	Special Use	✗



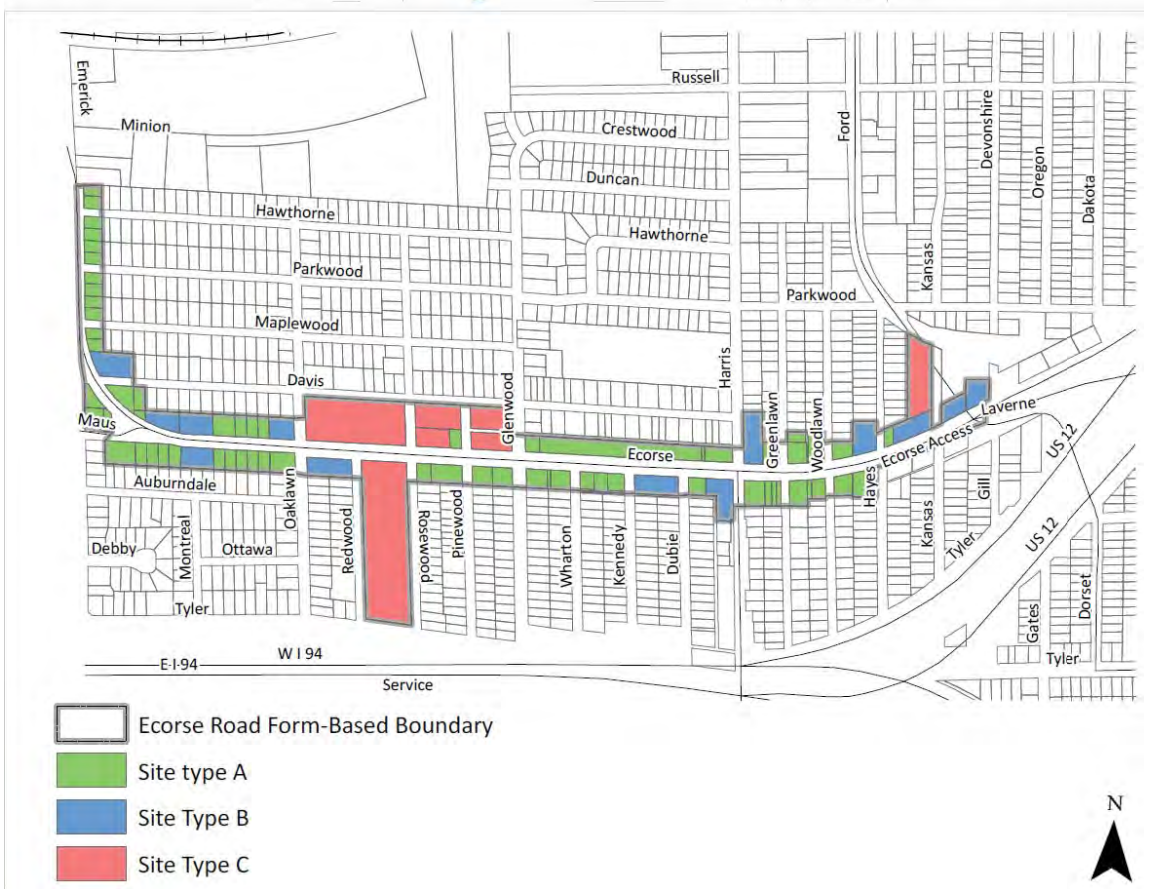
Ypsilanti Township 2040

Steps to Determine Design & Use



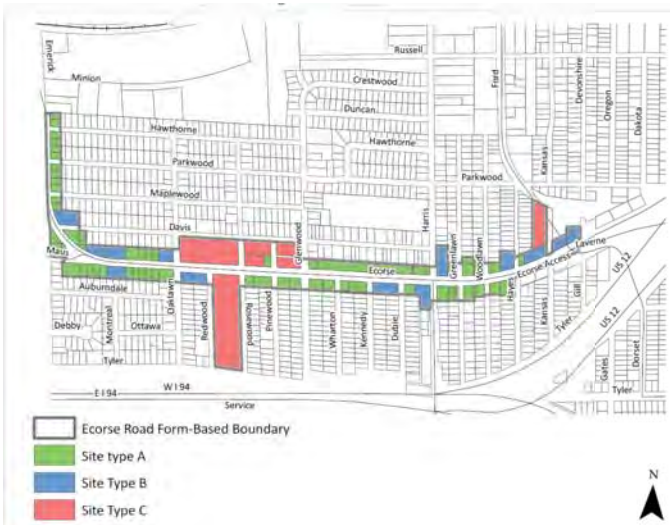
Steps to Determine Design & Use

- Locate the Site
- ↓
- Determine Site Type (1142.A) for site in question
- ↓
- Review permissible Building Forms (1142.B + C) and Use Groups (1142.D) for Site Type
- ↓
- Apply Building Form standard (1142.C) for applicable building form
- ↓
- Apply Design Standards (1142.G)
- ↓
- Submit site plan for approval



Steps to Determine Design & Use

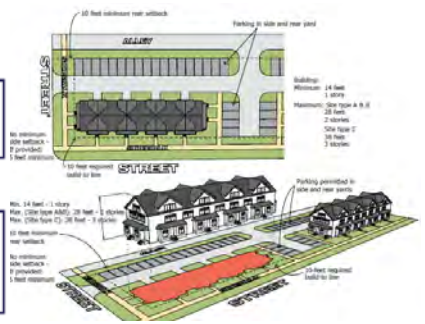
- Locate the Site
- ↓
- Determine Site Type (1142.A) for site in question
- ↓
- Review permissible Building Forms (1142.B + C) and Use Groups (1142.D) for Site Type
- ↓
- Apply Building Form standard (1142.C) for applicable building form
- ↓
- Apply Design Standards (1142.G)
- ↓
- Submit site plan for approval



Site Type	Building Form		Use Group	
Site Type: A	Permitted Building Form	A1, A2	Permitted Use Group	1, 2, 3, 4
			Special Use Group	—
Site Type: B	Permitted Building Form	A1, A2, B	Permitted Use Group	2, 3, 4
			Special Use Group	6
Site Type: C	Permitted Building Form	B, C	Permitted Use Group	2, 3, 4
			Special Use Group	5, 6

Steps to Determine Design & Use

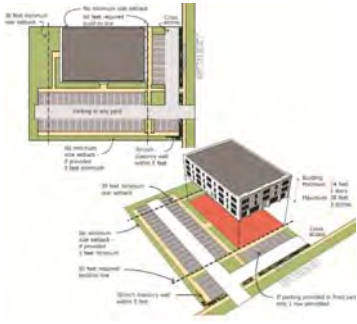
- Locate the Site
- ↓
- Determine Site Type (1142.A) for site in question
- ↓
- Review permissible Building Forms (1142.B + C) and Use Groups (1142.D) for Site Type
- ↓
- Apply Building Form standard (1142.C) for applicable building form
- ↓
- Apply Design Standards (1142.G)
- ↓
- Submit site plan for approval



A1

A2

B

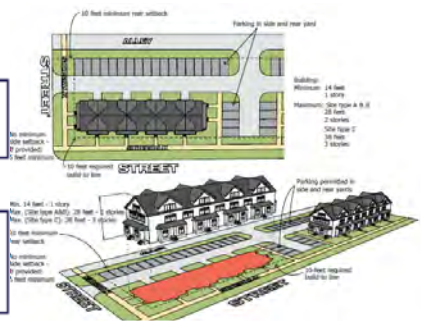


C

Site Type	Building Form		Use Group	
Site Type: A	Permitted Building Form	A1, A2	Permitted Use Group	1, 2, 3, 4
			Special Use Group	—
Site Type: B	Permitted Building Form	A1, A2, B	Permitted Use Group	2, 3, 4
			Special Use Group	6
Site Type: C	Permitted Building Form	B, C	Permitted Use Group	2, 3, 4
			Special Use Group	5, 6

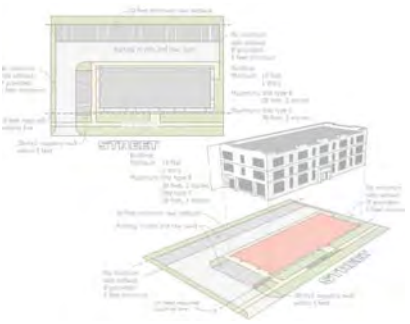
Steps to Determine Design & Use

- Locate the Site
- Determine Site Type (1142.A) for site in question
- Review permissible Building Forms (1142.B + C) and Use Groups (1142.D) for Site Type
- Apply Building Form standard (1142.C) for applicable building form
- Apply Design Standards (1142.G)
- Submit site plan for approval



A1

A2

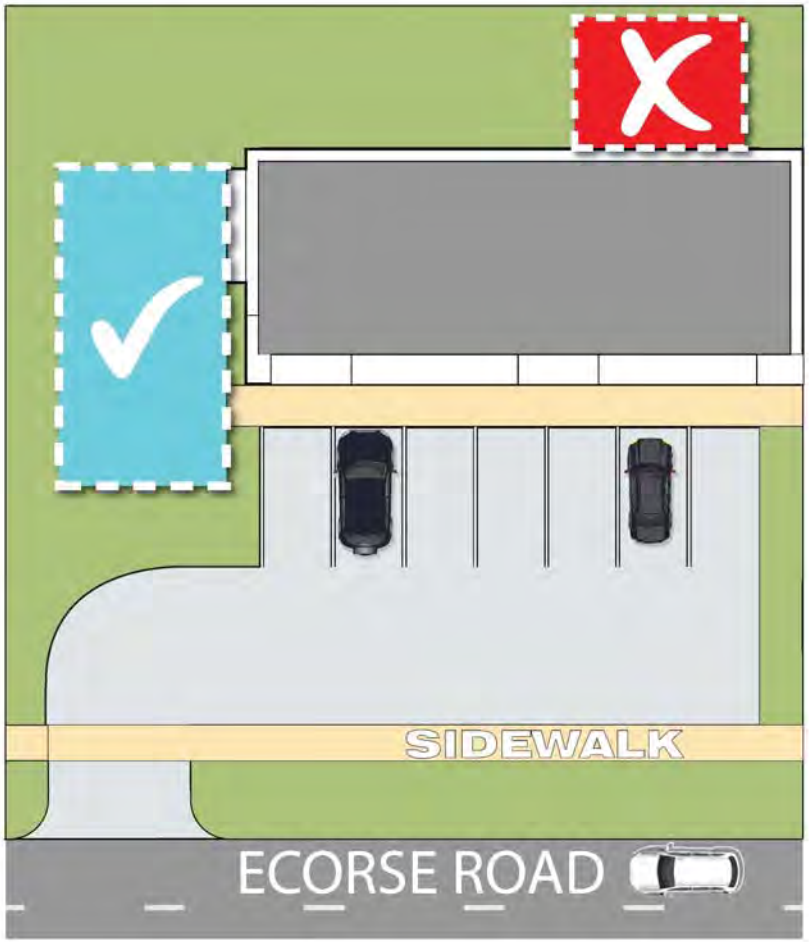


B

C

Site Type	Building Form		Use Group	
Site Type: A	Permitted Building Form	A1, A2	Permitted Use Group	1, 2, 3, 4
			Special Use Group	—
Site Type: B	Permitted Building Form	A1, A2, B	Permitted Use Group	2, 3, 4
			Special Use Group	6
Site Type: C	Permitted Building Form	B, C	Permitted Use Group	2, 3, 4
			Special Use Group	5, 6

Non-Conforming Structures



Class A Nonconforming Designation Possible

Questions/Suggestions/Edits

CHARTER TOWNSHIP OF YPSILANTI
PLANNING COMMISSION
MINUTES OF THE APRIL 23, 2019 REGULAR MEETING

Chair Jason Iacoangeli called the regular meeting to order at 6:30 pm in the Ypsilanti Township Civic Center Board Room 7200 S. Huron River Drive, Ypsilanti Township.

Commissioners Present: Chair Jason Iacoangeli and Commissioners Gloria Peterson, Bill Sinkule, Laurence Krieg and Muddasar Tawakkul

Commissioners Absent: Commissioners Sally Richie and Stan Eldridge

Others in Attendance: Denny McLain, Township Attorney; Megan Masson-Minock, Carlisle-Wortman Associates; Charlotte Wilson, Planning and Development Coordinator

1. CALL TO ORDER

2. ROLL CALL

3. APPROVAL OF THE APRIL 9, 2019 REGULAR MEETING MINUTES

A motion was made by Commissioner Krieg supported by Commissioner Peterson to approve the minutes of the April 9, 2019 Regular Meeting. The motion carried unanimously.

4. APPROVAL OF AGENDA

A motion was made by Commissioner Sinkule supported by Commissioner Peterson to approve the agenda. The motion carried unanimously.

5. PUBLIC HEARINGS AND PLAN REVIEW

A. ZONING ORDINANCE AMENDMENT - TO MAKE A RECOMMENDATION TO THE TOWNSHIP BOARD OF TRUSTEES REGARDING THE PROPOSED ECORSE ROAD FORM BASED DISTRICT ZONING ORDINANCE AMENDMENTS.

Charlotte Wilson, Planning and Development Coordinator, said if the Planning Commission recommended approval, the Township Board would have two readings before they approve or deny. She gave an overview of the project and said the goal is to have a mixed-use corridor that is pedestrian friendly.

Commissioner Krieg said he hoped changing to form based zoning might make the approval process more streamlined and easier for potential new businesses.

Ms. Wilson said that they are also hoping to streamline the development processes with the Zoning Ordinance overhaul that will take place over the next 1.5 years. She said they are currently pursuing Redevelopment Ready as well.

The public hearing opened at 6:42 pm

Alita Westman said she was concerned about traffic congestion from the new hotels and the American Center for Mobility and the possible road diet on Ecorse Road. She said she was concerned about putting parking in the rear of businesses because in her opinion that is treating seniors like second-class citizens.

James Morrison, 601 Rosewood, said he lives by George School and is concerned about what might be built there if and when the school is closed.

The public hearing closed at 6:48 pm

Commissioner Krieg asked if they were going to go through the Ordinance language or just if they were only discussing the map.

Ms. Wilson said the motion is for both the language and map as the proposed ordinance included both the text amendments and map amendments.

Commissioner Krieg said he had some minor concerns when approving the language. Section 1142 Standards, Site Type A, the second sentence is not clear whether the term “street” is limited to Ecorse Road or if it was more general.

Megan Masson-Minock, Carlisle-Wortman Associates said they could change the language to say Ecorse Road.

Commissioner Krieg said under Site Type B the first sentence should have one “mostly” removed and at the end of the same paragraph the word “commercial” is misspelled. Next, Section B, Building Forms Standards, under #1, heading C in line two under exceptions, the sentence should be changed to “beyond the building line” as opposed to “into the building line”. Also on page 12, table 1142D, “hospitals” appears twice.

Ms. Masson-Minock stated in use Group 3 veterinary is supposed to be an adjective to describe both clinics and hospitals. She said they could add medical clinics and hospitals to Group 5 to make it clearer.

Commissioner Krieg said he had concerns regarding the 50% building transparency requirement on ground floors and does not think that it should be required due to privacy and security reasons.

Ms. Masson-Minock said that language was for non-residential buildings and they could clarify it.

A motion was made by Commissioner Krieg, supported by Commissioner Sinkule that the section Ms. Masson-Minock referenced be specifically limited to non-residential buildings in the way in which Ms. Masson-Minock recommended or suggested. The motion carried unanimously.

A motion was made by Commissioner Sinkule, supported by Commissioner Krieg to recommend approval to Ypsilanti Township Board of Trustees to add the proposed Ecorse Road form based district text amendments as Article 11-A of the Zoning Ordinance.

The motion carried as follows:

Peterson: Yes Tawakkul: Yes Sinkule: Yes Krieg: Yes Iacoangeli: Yes

A motion was made by Commissioner Krieg, supported by Commissioner Sinkule to recommend the rezoning of Ecorse Road to be consistent with the Zoning Ordinance language.

The motion carried as follows:

Peterson: Yes Tawakkul: Yes Sinkule: Yes Krieg: Yes Iacoangeli: Yes

6. OLD BUSINESS

7. NEW BUSINESS

A. MASTER PLAN AND FUTURE LAND USE MAP – TO PROVIDE INPUT ON THE MASTER PLAN AND FUTURE LAND USE MAP.

Ms. Masson-Minock gave a brief overview of the map for the residents in attendance. She brought a printout of the map to mark up with the Commissioners’ input.

Commissioner Krieg said after looking the map over he was happy with the way it is and does not have any suggested changes.

Commissioner Iacoangeli agreed.

Commissioner Sinkule said at the previous meeting Commissioner Eldridge asked why Washtenaw Avenue was labeled neighborhood and not regional.

Ms. Masson-Minock said because of the smaller parcels. She suggested they look at the parcel sizes along the corridor and make adjustments as needed. It may end up being a combination of regional and neighborhood.

Commissioner Krieg asked for clarification on regional and neighborhood in terms of legal language and types of development.

Ms. Masson-Minock stated larger buildings would be in a regional corridor but all would be built to service the street and designs would be planned and zoned with pedestrians, cyclists and vehicles in mind.

Commissioner Sinkule asked about a grey area around Gault Village Shopping Center.

Ms. Masson-Minock stated that should be black and it has a special area plan.

Commissioner Sinkule said he believed it would be difficult to keep some of the agricultural areas in the southern portion of the Township due to future development.

Ms. Masson-Minock said farmland preservation will not be done by zoning alone.

Commissioner Krieg asked if they were both talking about open space preservation or agricultural preservation.

Ms. Masson-Minock said the approach would be the same for both. Agriculture would be for active farms only.

Commissioner Iacoangeli stated farmland preservation is difficult and he is comfortable leaving the agricultural preservation district in the map. He said it would be helpful to scale the special area plans to make them more apparent.

Commissioner Sinkule asked what the difference was between yellow and blue areas.

Ms. Masson-Minock said yellow is single-family, blue is multiple-family condominiums.

8. OPEN DISCUSSION FOR ISSUES NOT ON THE AGENDA

A. CORRESPONDENCE RECEIVED

None

B. PLANNING COMMISSION MEMBERS

None

C. MEMBERS OF THE AUDIENCE

None

9. TOWNSHIP BOARD REPRESENTATIVE REPORT

None

10. ZONING BOARD OF APPEALS REPRESENTATIVE REPORT

None

11. TOWNSHIP ATTORNEY REPORT

None

12. PLANNING DEPARTMENT REPORT

Included in meeting packet

13. OTHER BUSINESS

None

A motion was made by a Commissioner Peterson, supported by Commissioner Sinkule to adjourn the meeting. The motion carried unanimously.

The meeting was adjourned at approximately 7:34 pm

Respectfully submitted,

Laura Gough
OCS Clerk

Revised and approved,

Laurence J. Krieg
Secretary of the Planning Commission

BORDER-TO-BORDER TRAIL

BRIDGE ROAD TO SNOW ROAD, GROVE ROAD TRAIL SEGMENT

AGREEMENT

This Agreement ("Agreement"), is entered into as of the ___ day of _____, 2019, and memorializes and confirms certain verbal commitments and understandings previously made by the Charter Township of Ypsilanti, a public body corporate, with offices at 7200 Huron River Drive, Ypsilanti, Michigan 48197 ("**TOWNSHIP**") and the Washtenaw County Parks and Recreation Commission, a public entity, with offices at 2230 Platt Road, Ann Arbor, Michigan 48104 (the "**WCPARC**").

1.0 ACKNOWLEDGMENTS

1.1 The parties desire to cooperate in the planning, funding, design, construction and development of the Border-to-Border/Iron Belle Trail Segment, a non-motorized trail ("Trail") segments that are approximately 0.5 miles in length running generally adjacent to the south side of Grove Road, between Bridge Road and Snow Road in the Ypsilanti Township (the "**Project**").

1.2 The WCPARC and the TOWNSHIP may apply for additional funding, such as Iron Belle Trail grants from the Michigan Department of Natural Resources for the Project.

1.3 The Project is to be located within the Grove Road right of ways and land owned by the TOWNSHIP.

1.4 TOWNSHIP shall be the OWNER of the trail upon final acceptance of construction

1.5 TOWNSHIP shall operate, maintain, and repair the Project in accordance with non-motorized trail maintenance standards applied throughout the TOWNSHIP.

NOW, THEREFORE, in exchange for their mutual promises as set forth herein the parties agree as follows:

2.0 FUNDING AND RESPONSIBILITIES OF THE PARTIES

2.1 Project Costs and Funding

2.1.1 The TOWNSHIP shall be responsible for all design project costs for this trail segment, estimated at $42,000. The TOWNSHIP shall also be responsible for the design cost the trail segments, from North Hydro Park to Grove and along the north side of Grove Road, from Snow Road to Rawsonville Road, the design work is estimated at $50,000, the Construct of this trail segment will be funded by WCPARC, and is planned for 2020. The cost for construction phase and construction engineering will be fully the responsibility of the WCPARC, less any funds the WCPARC secures from any other private or public funding sources.

2.1.2 Design Phase: TOWNSHIP will entered into a Contract with OHM (Township Engineer) for engineering services consisting of design/preliminary engineering, securing the required permits, and performing the project administration of the Project up to the construction phase. CITY may terminate the design phase of the Project at any time and provide written notice to WCPARC.

2.1.3 Construction Phase: TOWNSHIP will award the construction contract to the approved lowest bid that is a contractor, WCPARC shall be responsible construction engineering and may hire a consultant to serve as the Project Engineer and perform all construction engineering services. These services shall include without limitation inspection; office technician; construction surveying; materials testing and inspection; and generating contractor pay estimates; and providing other construction contract documentation in accordance with MDOT guidelines, standard practices and procedures.

2.1.5 During the construction phase the Project Engineer shall consult with WCPARC and TOWNSHIP regarding any items which may result in an increase to the estimated construction cost. WCPARC will be responsible for any and all actual and necessary construction and Project costs to complete the scope of the Project which WCPARC approved during the design phase. WCPARC shall also pay any additional construction costs incurred due to unforeseen field conditions or payment of field measured unit priced contract items.

2.2 WCPARC Responsibilities

2.2.1 In cooperation with TOWNSHIP, WCPARC will oversee the Project in accordance with MDOT standards and requirements. TOWNSHIP will enter into the necessary contract(s) with the Contractor relating to the Project; coordinate the preparation of construction documents with the TOWNSHIP; secure the required easements or right-of-way for the Project; execute the necessary construction contract(s) for the Project; and WCPARC will administer the Project during construction in accordance with WCPARC's and MDOT's guidelines and standard practices and procedures.

2.3 TOWNSHIP Responsibilities

2.3.1 Project Payments to TOWNSHIP: WCPARC shall promptly make payment upon receipt of invoices issued by TOWNSHIP for construction of the project as described herein.

2.3.2 TOWNSHIP shall be the OWNER of the trail upon final acceptance of construction

2.3.3 TOWNSHIP shall operate, maintain, and repair the Project in accordance with non-motorized trail maintenance standards applied throughout the TOWNSHIP.

AGREEMENT SUMMARY

TRAIL CONSTRUCTION (WCPARC B2B MILLAGE FUNDS)	$145,000
TRAIL CONSTRUCTION (2017 CONNECTING COMMUNITY FUNDS)	$125,000
TRAIL CONSTRUCTION (MDNR GRANT)	$135,000
TRAIL DESIGN (TOWNSHIP)	$ 92,000
PROJECT TOTAL	**$497,000**

IN WITNESS WHEREOF, the parties have set their hands to this Agreement the day and year here written.

WASHTENAW COUNTY PARKS AND RECREATION COMMISSION

Dated: _____, 2019

_____
By: Coy Vaughn
Its: Director

THE CHARTER TOWNSHIP OF YPSILANTI

Dated: _____, 2019

_____
By: Brenda Stumbo
Its: Township Supervisor

Dated: _____, 2019

_____
By:

MEMORANDUM

TO: Washtenaw County Parks and Recreation Commission

FROM: Coy P. Vaughn, Director

DATE: June 11, 2019

RE: **Ypsilanti Township, Grove Road B2B Participation Agreement**

Background

The Washtenaw County Parks and Recreation Commission has been working to complete the Border-to-Border Trail (B2B) within Washtenaw County for the past 20 years. During that time, the route along Grove Road turned south at Bridge Road and then went east on Textile. Recent proposed changes to the B2B/Iron Belle Trail (IBT) alignment on section of trail (part of this meeting's agenda) modify the route to follow Bridge Road south to North Hydro Park, traverse the Township Park to make use of existing facilities, and then proceed east and north to meet back up with Grove Road before heading east along Grove Road, until the intersection of Grove Road and Rawsonville Road, at which point is start of the Van Buren Township segment of the Iron Belle Trail. This change is necessary achieve a coordinated regional connection for the Iron Belle Trail with Wayne County based on the preferred alignment in Van Buren Township.

Discussion

In conjunction with the new B2B/IBT alignment, WCPARC proposes to partner with the Charter Township of Ypsilanti to construct segments of this trail along the south side of Grove Road from Bridge Road to Rawsonville Elementary School. The segment in front of the Rawsonville Elementary was awarded 2017 Connecting Community Funds, so this new project will complement the 2017 awarded project. The design work has been completed by the Township and they have received construction bids on the project. The Township is prepared to approve the bids and approve the cost sharing agreement between both agencies to construct this path segment in 2019. As part of the agreement, the Township will direct their Township Engineer (OHM) to design a new trail to connect the existing trails in North Hydro Park to the new, proposed 2019 construction along Grove Road. Further OHM will be directed to design a new trail along the north side of Grove Road to Rawsonville Road, the border with Wayne County. It is anticipated that the design work by OHM could be constructed in 2020 under a separate agreement.

Recommendation

Based upon staff review, it is my recommendation that the Commission approve the attached agreement between the Charter Township of Ypsilanti and Washtenaw County Parks and Recreation Commission.

Attachments

MEMORANDUM

TO: Washtenaw County Parks and Recreation Commission

FROM: Coy P. Vaughn, Director

DATE: June 11, 2019

RE: **Border-to-Border/Iron Belle Trail Route Change, Ypsilanti Township**

Background

In the fall of 2018, the Huron Waterloo Pathways Initiative (HWPI) received an Iron Belle Trail planning grant in collaboration with WCPARC, MDNR, Ypsilanti Township, Huron-Clinton Metroparks, City of Belleville and Van Buren Township. HWPI hired PEA Consultants, Inc. to evaluate various trail alignments from eastern Washtenaw County in Ypsilanti Township through Van Buren Township, the City of Belleville, and connecting to Lower-Huron Metropark's existing trail network. After analyzing numerous alignments, meeting with various Township, County and City staff, holding multiple public meetings and gathering public input, a preferred alignment was recommended for Ypsilanti, Van Buren Townships and in the City of Belleville. The Charter Township of Van Buren and the City of Belleville has since adopted the preferred alignment, and the Charter Township of Ypsilanti has scheduled the adoption of this trail alignment at their June 18th Board meeting.

Discussion

The proposed Border-to-Border/Iron Belle Trail route change in eastern Ypsilanti Township is recommended to achieve a coordinated regional connection with Wayne County based on the preferred alignment in Van Buren Township. In Washtenaw County, it makes use of planned construction projects, existing Hydro Park facilities (Ypsilanti Township) and connects to Rawsonville Elementary School. Adopting the proposed change to the Iron Belle Trail route will expand funding opportunities for this segment beyond local sources (Road/Trails Millage) to include the State of Michigan MDNR Iron Belle Trail funds and Ralph Wilson Foundation. One project on this segment is scheduled to be constructed in 2019 and the goal of connecting to the Wayne County border in 2020 is achievable.

The original route followed Bridge Road south from Grove Road, then east on Textile Road to the intersection of Textile Road/Huron River Drive and Rawsonville Road. The new trail alignment follows Bridge Road south to North Hydro Park, enters the Township Park, and then proceeds east and north to meet back up with Grove Road; then proceeds easterly along Grove Road, until the intersection of Grove Road and Rawsonville Road, at which point is start of the Van Buren Township segment of the Iron Belle Trail.

Recommendation

Based upon staff review, it is my recommendation that the Commission approved the Resolution for the Border-to-Border/Iron Belle Trail Route Change, Ypsilanti Township.

Attachments

CHARTER TOWNSHIP OF YPSILANTI

RESOLUTION 2019-28

A RESOLUTION OF SUPPORT FOR THE IRON BELLE TRAIL IN THE CHARTER TOWNSHIP OF YPSILANTI

WHEREAS, the Charter Township of Ypsilanti recognizes the importance of providing a range of outdoor recreational opportunities to meet the needs of residents; and,

WHEREAS, the Charter Township of Ypsilanti desires to advance the quality of local recreational opportunities by providing facilities that are universally accessible to residents and guests; and,

WHEREAS, the State of Michigan Department of Natural Resources is promoting the Iron Belle Trail which comprises of a hiking route and bicycling route extending from the far western tip of the Upper Peninsula to Belle Isle in Detroit.

WHEREAS, the State of Michigan Department of Natural Resources has designated a portion of the hiking trail route to be in the Charter Township of Ypsilanti; and,

WHEREAS, an engineering firm, PEA, Inc, has evaluated several alternate routes for the Iron Belle Trail to run through the Charter Township of Ypsilanti in an alignment study with the purpose of connecting the Washtenaw County portion of the route with the Lower Huron Metropark in Wayne County; and,

WHEREAS, the Charter Township of Ypsilanti has held an informational meeting regarding the alignment study at Ypsilanti Township Hall on April 11, 2019 and received feedback from residents regarding the potential routes of the trail; and,

THEREFORE, be it resolved that the Charter Township of Ypsilanti supports to further advance the Iron Belle Trail planning and design efforts within the Township; and,

THEREFORE, be it further resolved that the Charter Township of Ypsilanti endorses the route in the eastern half of the Township which extends south from the intersection of Bridge Road and Grove Road to North Hydro Park, then thru North Hydro Park and back north to Grove Road, then extending east along Grove Road, to the intersection of Grove Road and Rawsonville Roads in Washtenaw County; and, **THEREFORE,** be it further resolved that the Charter Township of Ypsilanti recognizes that as the trail planning and design efforts continue, it may be necessary to make modifications to the route of the trail; and,

THEREFORE, be it further resolved that any deviations from the above described route will brought back before the Charter Township of Ypsilanti Board of Trustees for further review and consideration.

Iron Belle Trail

Washtenaw to Wayne

Route Scoring System

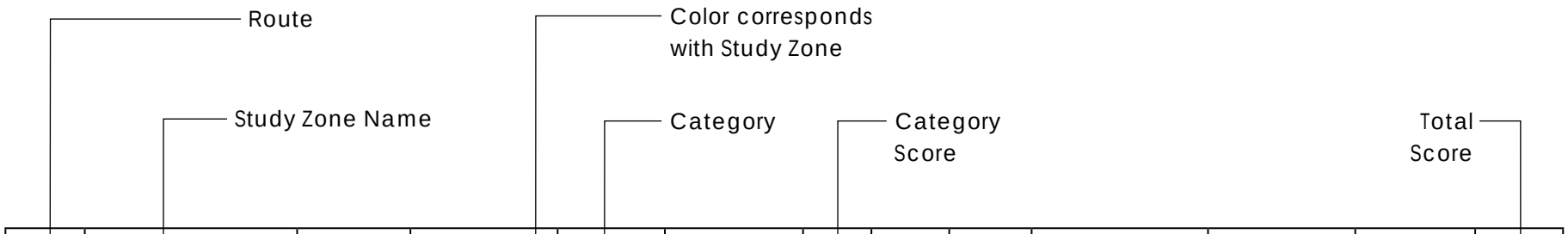
Each preliminary route was evaluated according to how well it satisfies a set of planning criteria that is important to the Iron Belle Trail's development. A 100-point system was formulated, with each category typically having a maximum value of 10 points. The *"Property Acquisition"* category was weighted more heavily due to its critical importance to the feasibility of the project. *"Accessibility"* was divided into two separate 5 point categories because of the diversity of the evaluation criteria.

The scores for each category were tabulated to develop a composite score for each route. The scoring system provides empirical data rating for each segment of trail.

Each category below was evaluated based on the results of site analysis, stakeholder input and professional judgment.

Categories

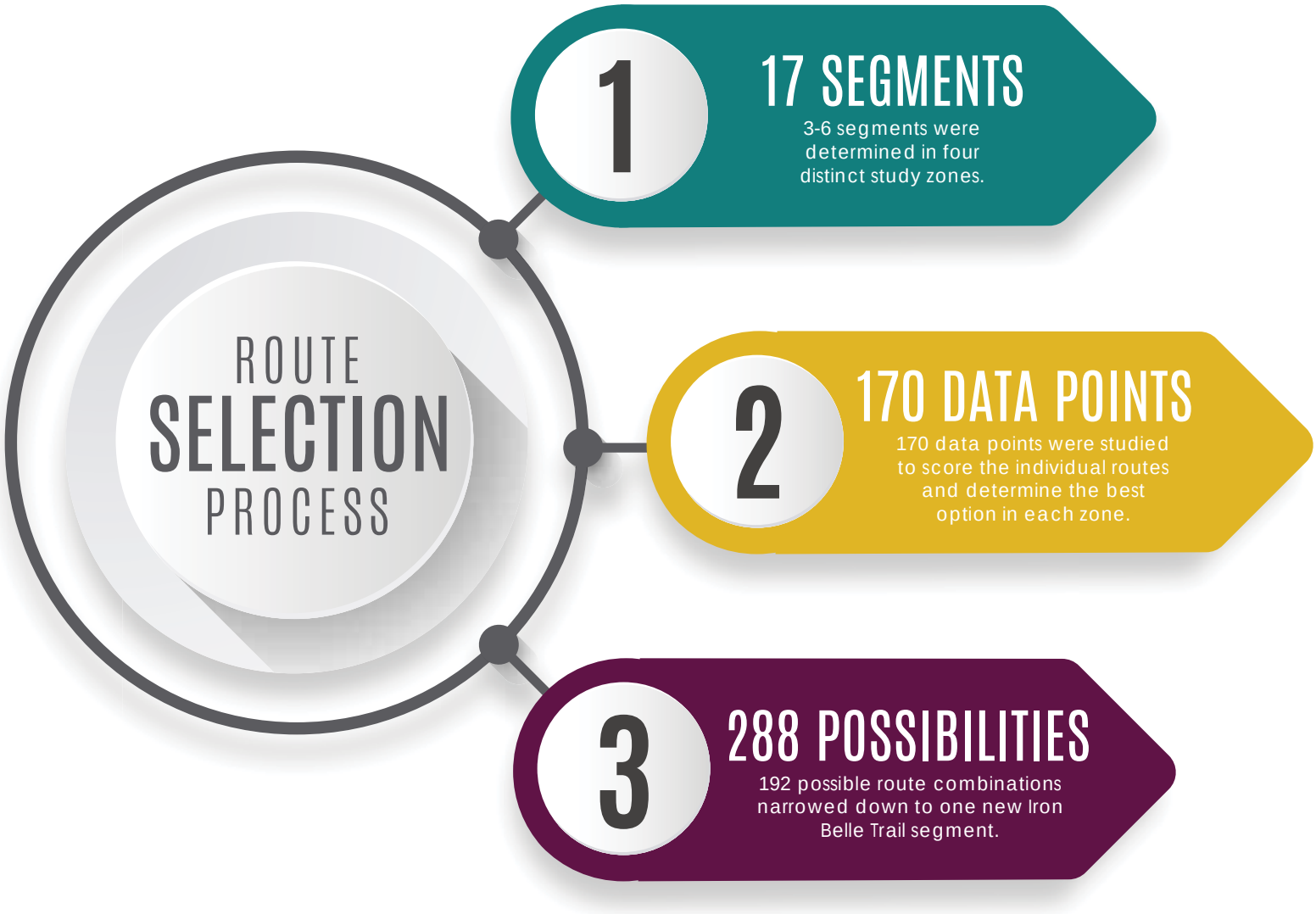
1. Residential Accessibility *(5 points)*
2. Commercial or Institutional Accessibility *(5 Points)*
3. Trailhead Opportunities *(10 Points)*
4. Connectivity *(10 Points)*
5. Recreation Opportunities *(10 Points)*
6. Safety *(10 Points)*
7. Scenic Variety *(10 Points)*
8. Viability of Long Term Maintenance *(10 Points)*
9. Feasibility of Development *(10 points)*
10. Property Acquisition Feasibility (20 Points)



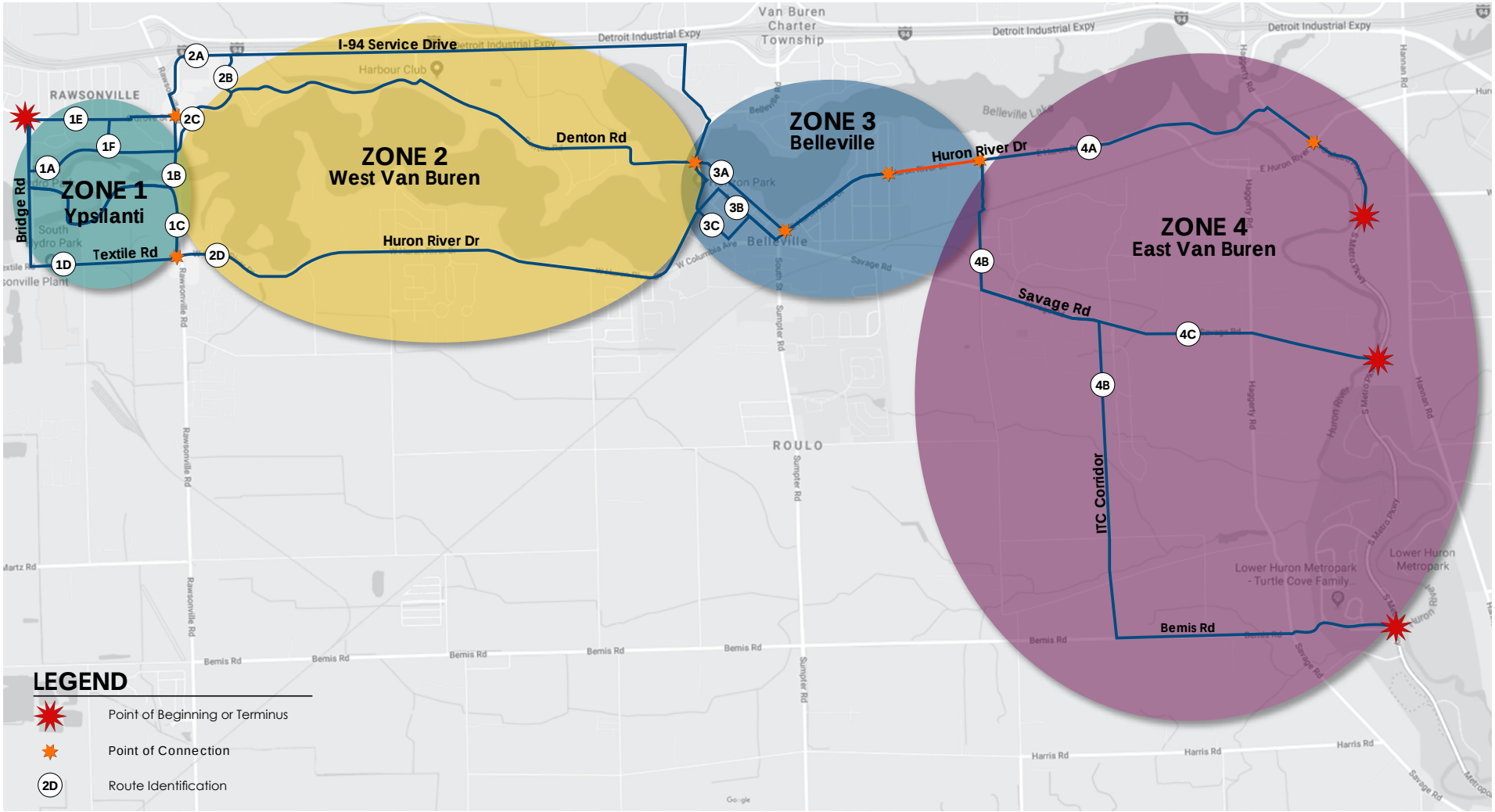
Rte #	Route Description	Residential Access	Commercial Access	Trailhead Opp.	Connectivity	Rec Opp	Safety	Scenic Variety	Viability of Long Term Maint	Feasibility of Development	Property Acquisition Feasibility	TOTAL SCORE
1	**Hydro Park**											
1A	North of Huron River	5	5	8	10	5	6	7	9	7	20	**82**

Route Scoring Category Descriptions

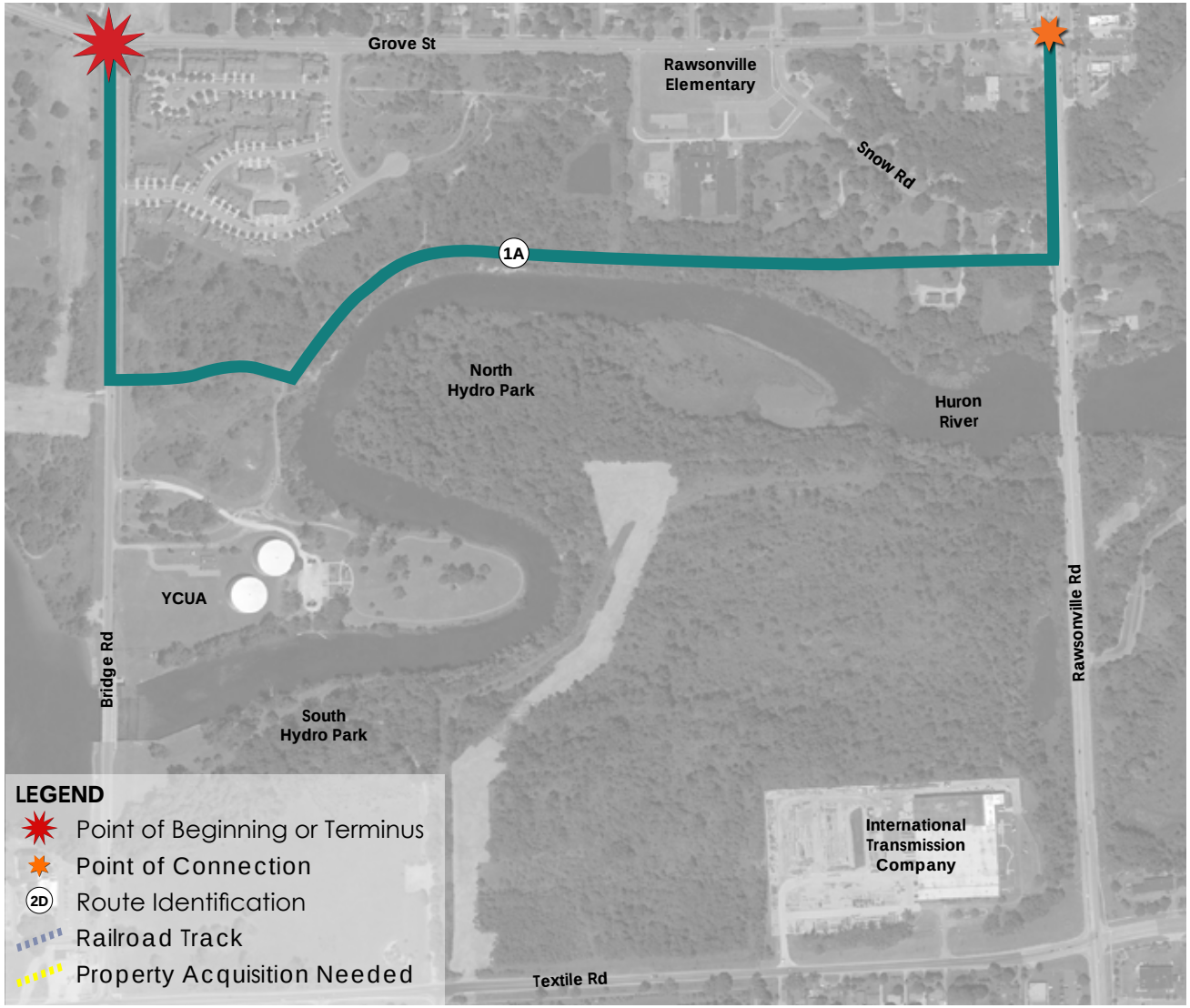
1. **Residential Accessibility**
   A measure of how accessible the trail will be to residential properties.
   (1= low density residential near the trail, 5 = easy access to high density residential areas)
2. **Commercial Accessibility**
   A measure of how accessible the trail will be to commercial or institutional places of interest such as local restaurants, stores, churches or schools.
   (1= access to low density of commercial properties, 5 = access to high density of commercial properties)
3. **Trailhead Opportunities**
   A measure of how many opportunities exist for users to access the trail via a suitable trailhead location(s). This may include existing or potential trailhead locations, including available land for future parking, signage, restrooms and other amenities.
   (1= limited trailhead opportunities, 10 = quality trailhead opportunities)
4. **Connectivity**
   A measure of how many opportunities exist for links to existing pathways, sidewalks, regional trails or potential regional trails.
   (1= limited connection opportunities, 10 = quality connection opportunities)
5. **Recreation Opportunities**
   A measure of potential connections to other non-pathway related recreation opportunities such as fishing areas, kayaking, existing or proposed parks.
   (1= limited connection to recreation areas, 10 = quality connections to recreation areas)
6. **Safety**
   A measure of route safety in terms of interaction with vehicular traffic as well as public visibility of the trail section. Secluded or isolated areas are perceived as less safe to users.
   (1= significant safety concerns – potentially unsafe, 10 = limited safety concerns – very safe)
7. **Scenic Variety**
   A measure of visual quality along the route as well as diversity of landscape character. Both attractive scenery and landscape diversity are desirable.
   (1= poor scenic quality, 10 = attractive scenery with diversity)
8. **Viability of Long-Term Maintenance**
   A measure of potential long-term maintenance cost liabilities. Facilities such as boardwalks have a higher long-term maintenance cost than a paved pathway. Additional amenities such as fences, railings, retaining walls, bollards, etc. pose a potential for increasing long-term maintenance costs.
   (1= significant maintenance costs, 10 = minimal maintenance costs)
9. **Feasibility of Development**
   A measure of the ease of development in terms of technical challenges of the land. Obstacles to development may include steep slopes, natural features such as wetland, floodplains, streams or rivers, railroads or high traffic roads.
   (1 = abundant obstacles, 10 = minimal obstacles)
10. **Property Acquisition Feasibility**
    A measure of the quantity of easements or land acquisition that may be required for development of the trail. The most significant obstacle to implementation is property ownership. Easement acquisition for trails on private property is often difficult and can be an insurmountable obstacle to development.
    (1 = abundant obstacles, 10 = minimal obstacles)


ROUTE
SELECTION
PROCESS
1
17 SEGMENTS
3-6 segments were determined in four distinct study zones.
2
170 DATA POINTS
170 data points were studied to score the individual routes and determine the best option in each zone.
3
288 POSSIBILITIES
192 possible route combinations narrowed down to one new Iron Belle Trail segment.

Route Options Map



Zone 1 Route A



Route Description

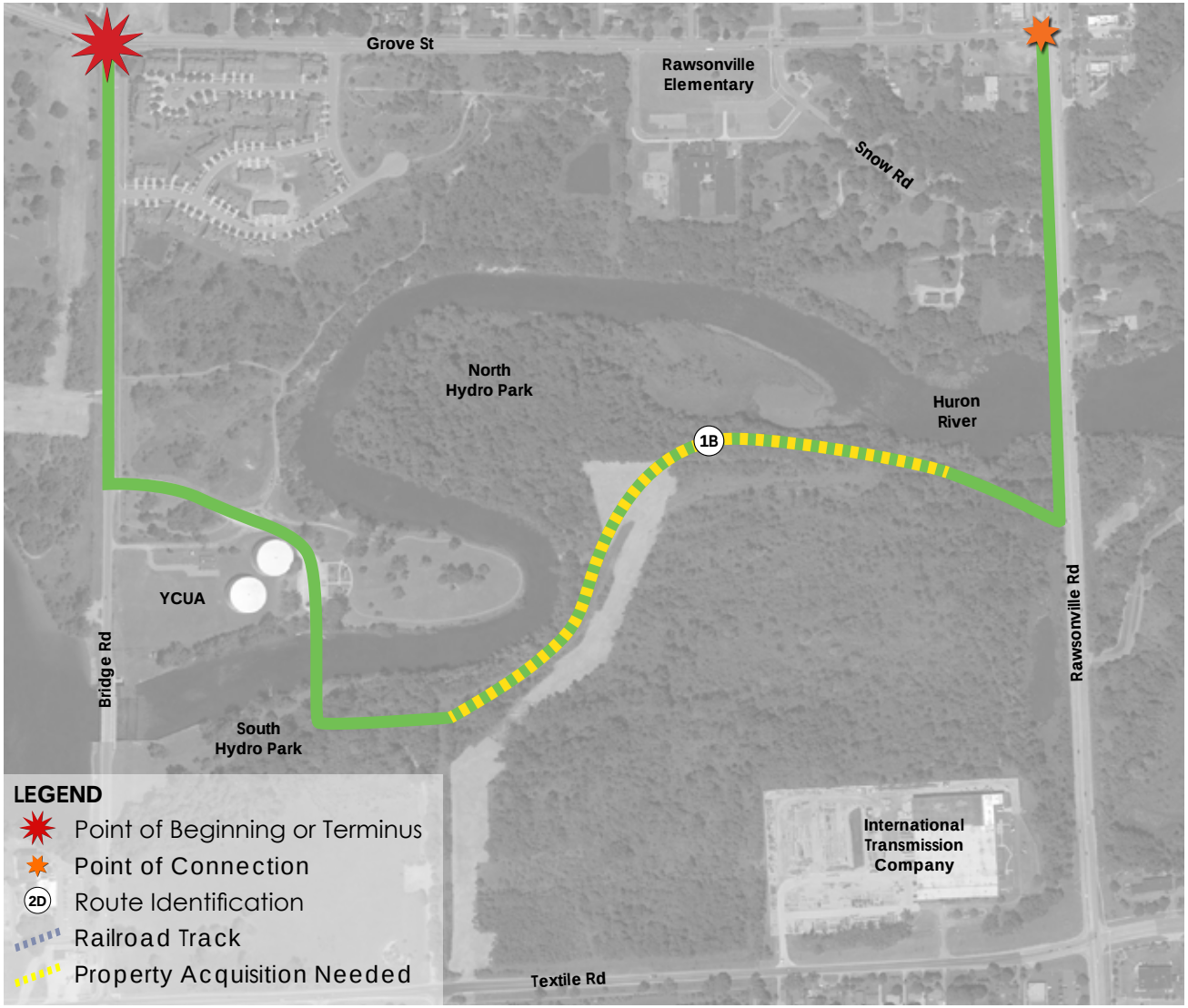
Travels down Bridge Rd from the existing Iron Belle Trail, through Hydro Park and terminating at Rawsonville Rd.

Notes

- Connects to existing Iron Belle Trail.
- Passes neighborhood at Grove St and Bridge St and could have a spur connecting to the elementary school.
- The connection through Hydro Park creates trailhead opportunities, recreational access and varying views along the Huron River.
- There may be some safety concerns with the seclusion along the river.
- Route travels through a park, optimal for maintenance.
- No known property acquisitions would be needed.

Rte #	Route Description	Residential Access	Commercial Access	Trailhead Opp.	Connectivity	Rec Opp	Safety	Scenic Variety	Viability of Long Term Maint	Feasibility of Development	Property Acquisition Feasibility	TOTAL SCORE
1	**Hydro Park**											
1A	North of Huron River	5	5	8	10	5	6	7	9	7	20	**82**

Zone 1 Route B



Route Description

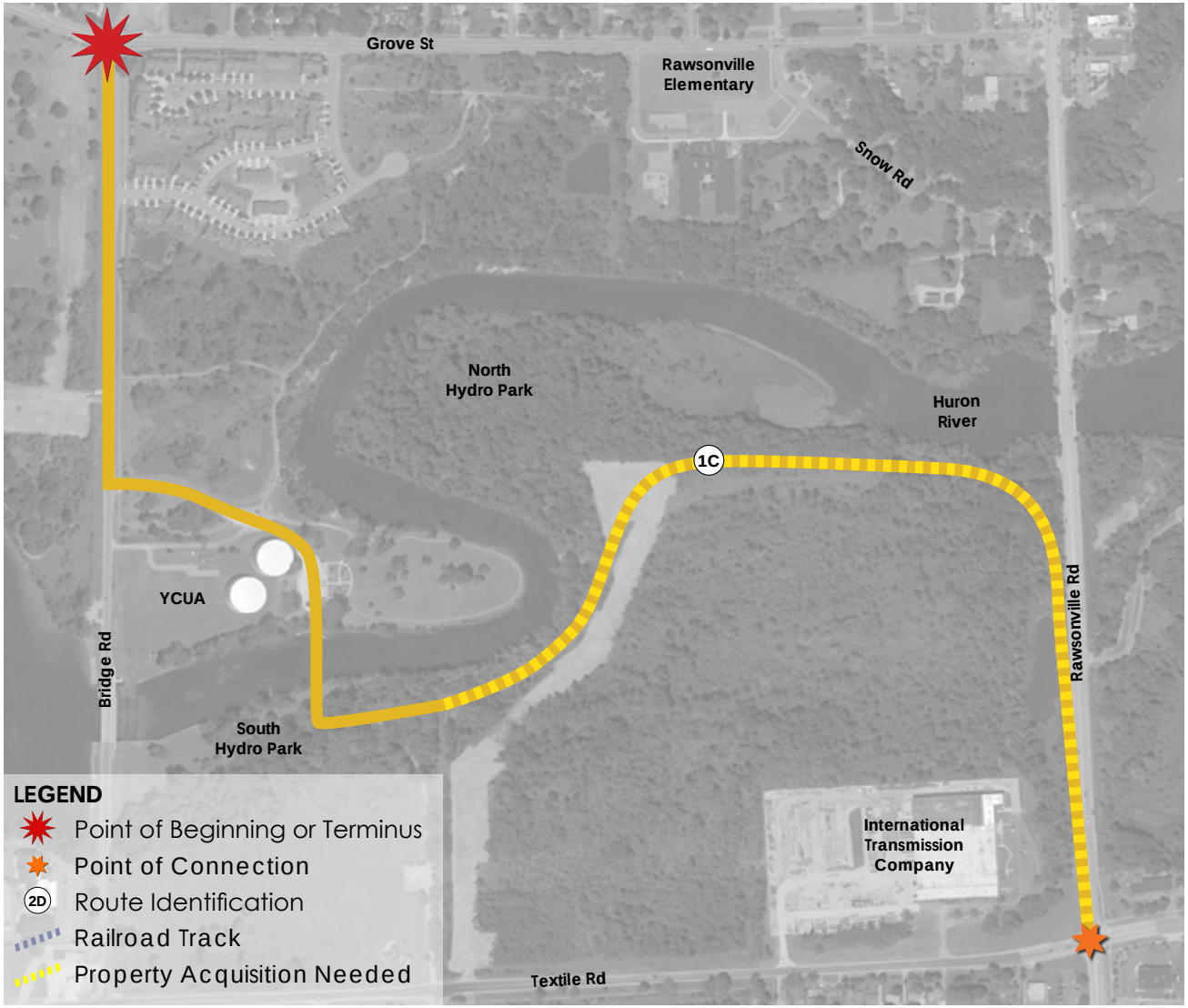
Travels down Bridge Rd from the existing Iron Belle Trail, through Hydro Park, crossing the Huron River and following along the Huron River to Rawsonville Rd, heading north on Rawsonville Rd.

Notes

- Connects to existing Iron Belle Trail.
- Passes neighborhood at Grove St and Bridge St.
- Optimal trailhead and recreation opportunities going through Hydro Park.
- Varying views through the park and along the Huron River.
- There may be some safety concerns with the feeling of seclusion along the river.
- Route travels through a park, optimal for maintenance.
- Building a bridge would add significant cost to the project.
- Norfolk & Western Railway property acquisition necessary, however money has already been set aside to achieve this.

Rte #	Route Description	Residential Access	Commercial Access	Trailhead Opp.	Connectivity	Rec Opp	Safety	Scenic Variety	Viability of Long Term Maint	Feasibility of Development	Property Acquisition Feasibility	TOTAL SCORE
1	**Hydro Park**											
1B	Through N Hydro Park, Crossing Huron River, following the river, North on Rawsonville	3	5	10	10	10	7	10	8	5	18	**86**

Zone 1 Route C



Route Description

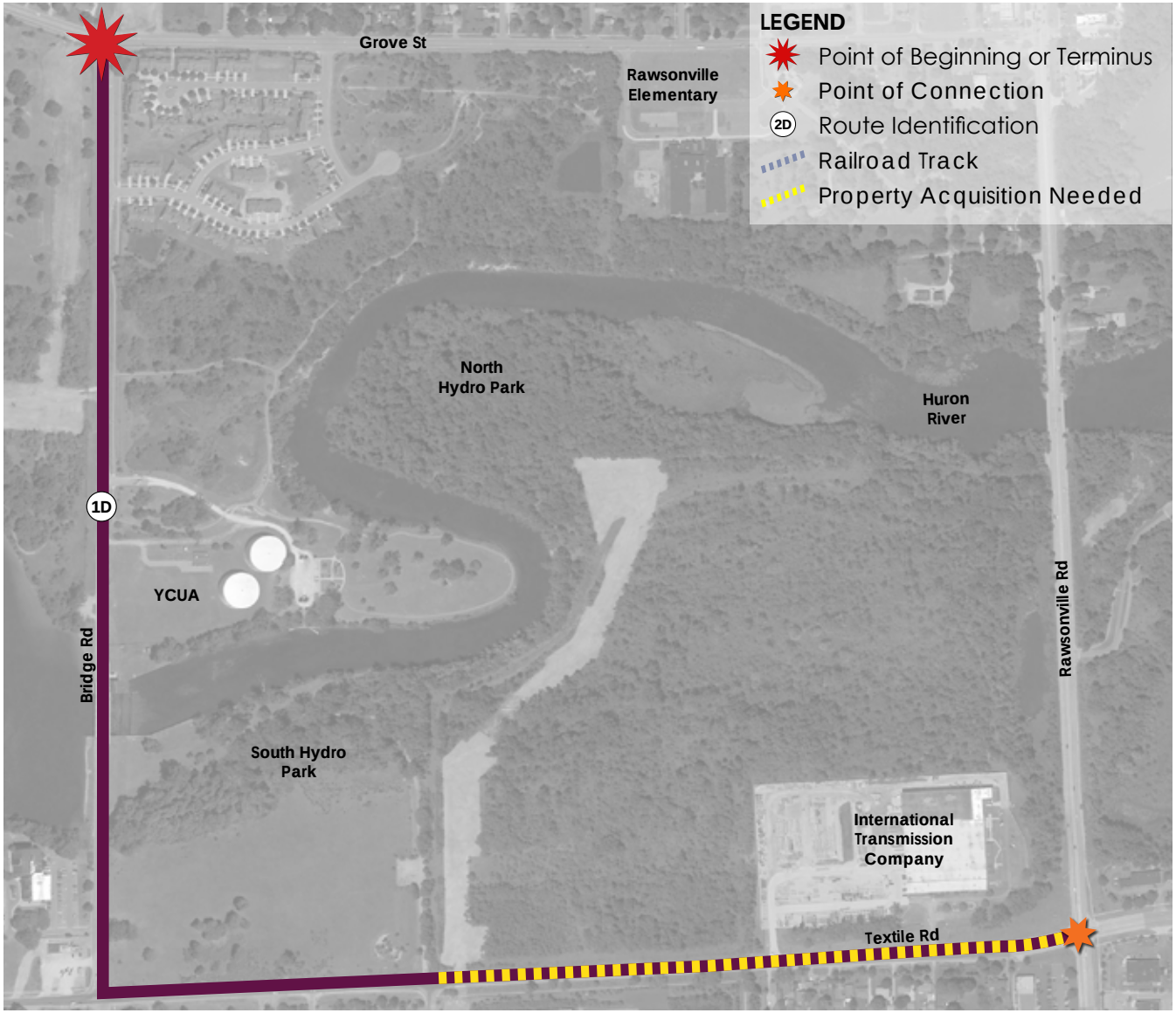
Travels down Bridge Rd from the existing Iron Belle Trail, through Hydro Park, crossing the Huron River and following the old road through to the intersection of Rawsonville Rd and Textile Rd.

Notes

- Connects to existing Iron Belle Trail.
- Passes neighborhood at Grove St and Bridge St.
- Optimal trailhead and recreation opportunities going through the park.
- Varying views through Hydro Park and along the Huron River.
- There may be some safety concerns with the feeling of seclusion along the river.
- Route travels through a park, optimal for maintenance.
- Building a bridge would add significant cost to the project.
- Norfolk & Western Railway and ITC property acquisition necessary, however money has already been set aside to achieve this.

Rte #	Route Description	Residential Access	Commercial Access	Trailhead Opp.	Connectivity	Rec Opp	Safety	Scenic Variety	Viability of Long Term Maint	Feasibility of Development	Property Acquisition Feasibility	TOTAL SCORE
1	**Hydro Park**											
1B	Through N Hydro Park, Crossing Huron River, following the river, ending at Rawsonville and Textile intersection	3	5	10	10	10	7	7	8	5	16	**81**

Zone 1 Route D



Route Description

Travels down Bridge Rd from the existing Iron Belle Trail, turns east onto Textile Rd and terminates at Rawsonville Rd.

Notes

- Connects to existing Iron Belle Trail.
- Passes neighborhood at Grove St and Bridge St.
- Does not take advantage of existing pathway or river views within Hydro Park.
- Interesting views of the dam.
- Loud traveling along the road.
- Norfolk & Western Railway and ITC property acquisition necessary, however money has already been set aside to achieve this.

Rte #	Route Description	Residential Access	Commercial Access	Trailhead Opp.	Connectivity	Rec Opp	Safety	Scenic Variety	Viability of Long Term Maint	Feasibility of Development	Property Acquisition Feasibility	TOTAL SCORE
1	**Hydro Park**											
1C	Bridge Rd to Textile Rd	3	2	6	10	5	10	3	10	10	16	**75**

Zone 1 Route E

Route Description

Travels down Grove St from the existing Iron Belle Trail, on the south side, crossing to the north side at Snow Rd and terminating at Rawsonville Rd.

Notes

- Connects to existing Iron Belle Trail.
- Existing bike lane on north side of Grove St from Bridge Rd to Snow Rd.
- Existing sidewalk on south side of Grove St from Bridge Rd to Rawsonville Elementary.
- Passes several single family neighborhoods and an elementary school. Would connect to businesses on Rawsonville.
- Passes neighborhood at Grove St and Bridge St and could have a spur connecting to the elementary school.
- Takes advantage of existing infrastructure.
- Misses opportunity of connecting the park along the trail, no good places for a trailhead.

Rte #	Route Description	Residential Access	Commercial Access	Trailhead Opp.	Connectivity	Rec Opp	Safety	Scenic Variety	Viability of Long Term Maint	Feasibility of Development	Property Acquisition Feasibility	TOTAL SCORE
1	**Hydro Park**											
1E	Grove St	5	5	2	10	5	10	3	10	10	18	**78**

Zone 1 Route F

Route Description

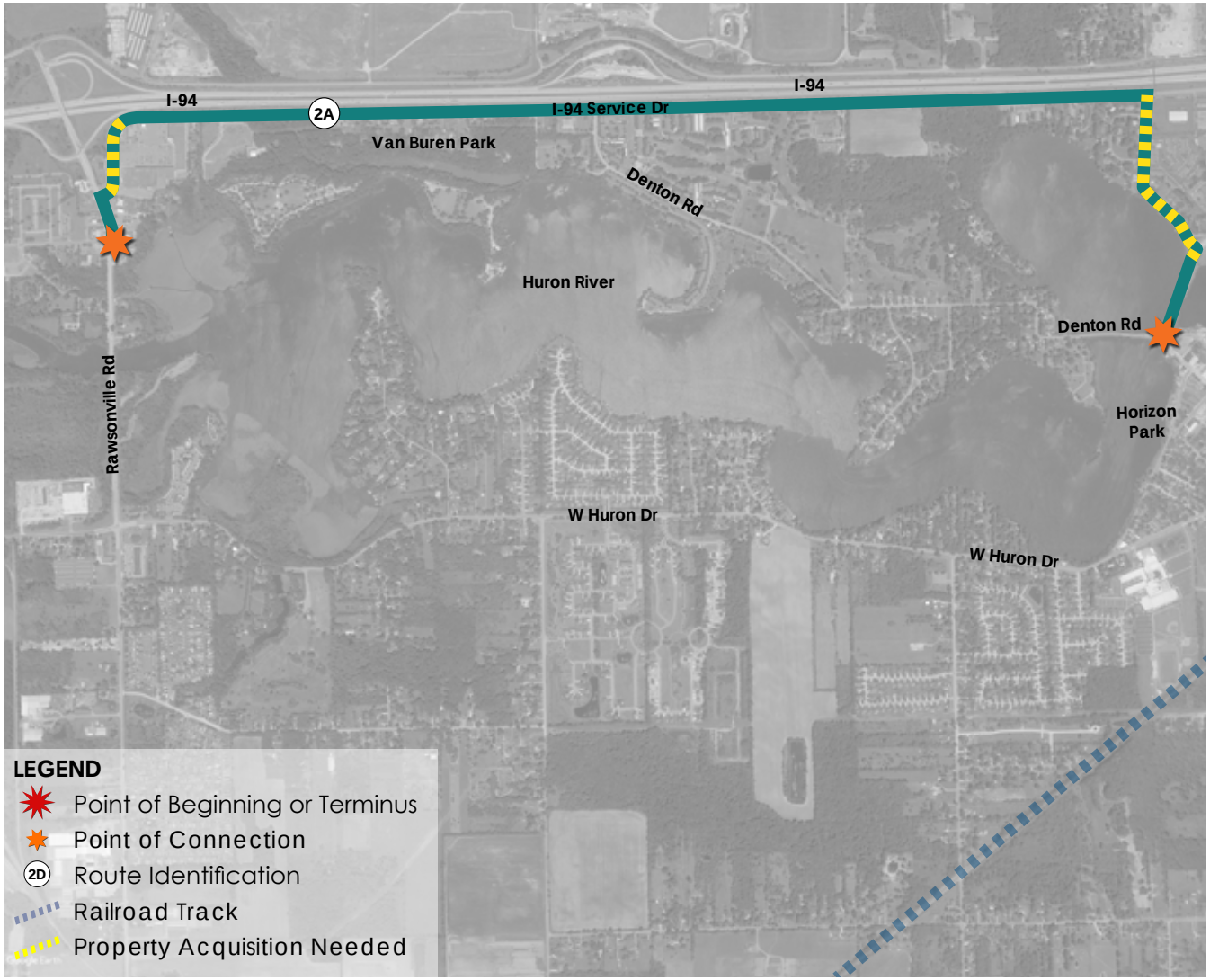
Travels down Bridge Rd from the existing Iron Belle Trail, through Hydro Park along the north side of the river, connecting back to Grove St at Rawsonville Elementary. Crossing Grove St at Snow Rd and terminating at Rawsonville Rd.

Notes

- Connects to existing Iron Belle Trail.
- Existing sidewalk on south side of Grove St from Bridge Rd to Rawsonville Elementary.
- Passes single family neighborhoods and an elementary school. Would connect to businesses on Rawsonville.
- Connection through Hydro Park provides trailhead and recreation opportunities as well as views over the Huron River.
- Some perceived safety concerns feeling secluded along river.
- Takes advantage of existing infrastructure.

Rte #	Route Description	Residential Access	Commercial Access	Trailhead Opp.	Connectivity	Rec Opp	Safety	Scenic Variety	Viability of Long Term Maint	Feasibility of Development	Property Acquisition Feasibility	TOTAL SCORE
1	**Hydro Park**											
1F	Rawsonville Rd to Hydro Park, following Huron River to Rawsonville Elementary, back to Grove St	5	5	8	10	10	6	7	9	10	18	**88**

Zone 2 Route A



Route Description

Travels north on Rawsonville Rd, turning east along the I-94 Service Dr, then turns south on Quirk Rd and into downtown Belleville.

Notes

- Passes shops and restaurants.
- Passes both single family and multi-family developments.
- Trailhead could be located in Van Buren Park.
- Connects to bridge over I-94.
- Trail crosses several driveways, making it dangerous for pedestrians and bikers.
- Traveling along the expressway provides loud road noise and lacks views.
- Properties on Quirk Rd own to center line, those along Huron River Dr own over the road to the water, acquisitions needed. Acquisitions needed on homes and some businesses on Rawsonville Rd.

Rte #	Route Description	Residential Access	Commercial Access	Trailhead Opp.	Connectivity	Rec Opp	Safety	Scenic Variety	Viability of Long Term Maint	Feasibility of Development	Property Acquisition Feasibility	TOTAL SCORE
2	**Rawsonville Rd to Downtown Belleville**											
2A	Rawsonville Rd to I-94 Service Dr to Quirk Rd to Belleville Rd	5	5	10	8	5	1	1	3	2	8	**48**

Zone 2 Route B

Route Description

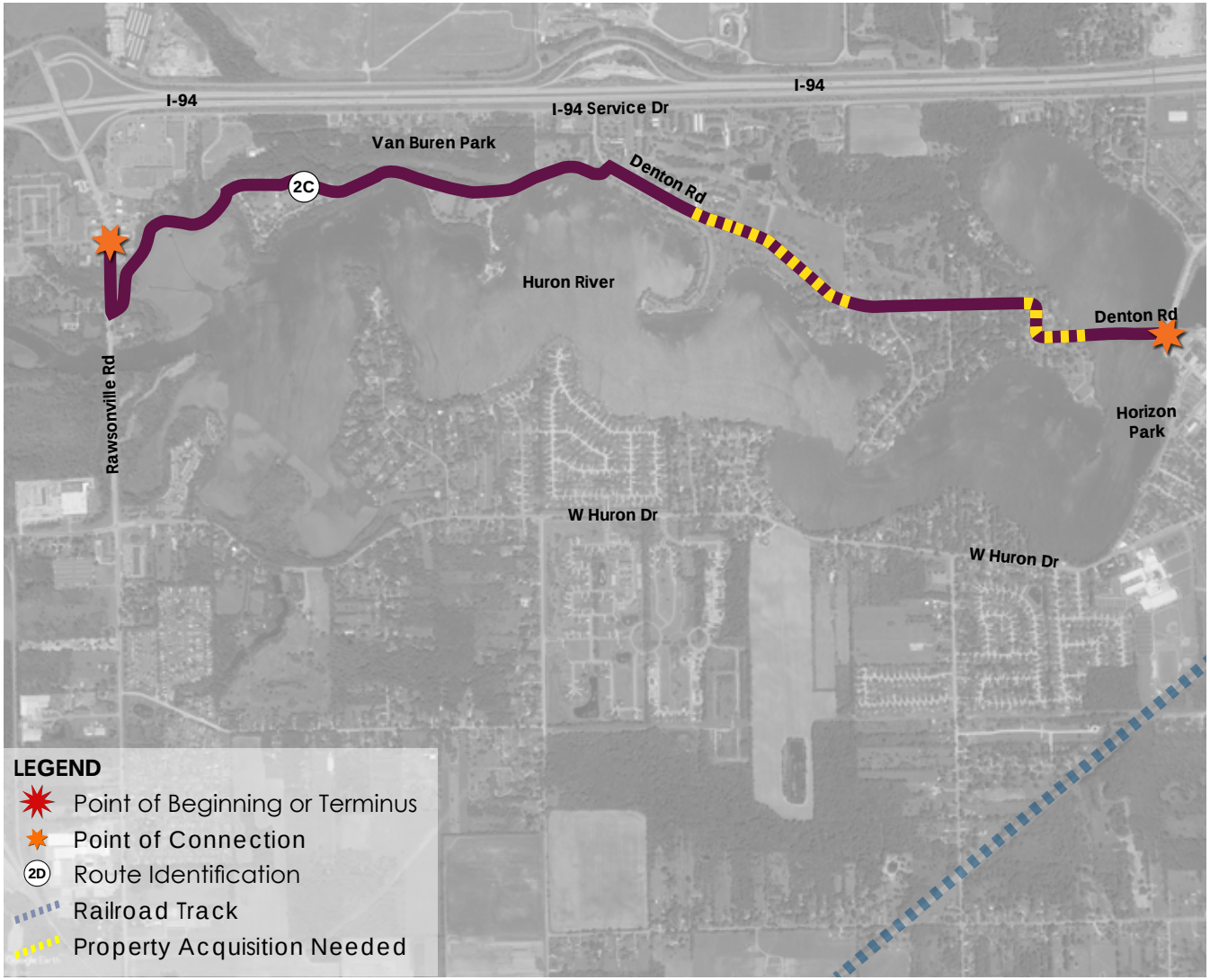
Travels north up Rawsonville Rd, turning east onto the I-94 Service Dr, then heading through Van Buren Park, connecting to Denton Rd and heading into downtown Belleville.

Notes

- Passes shops and restaurants.
- Passes both single family and multi-family developments.
- Trailhead could be located in Van Buren Park.
- Runs through Van Buren Park, creating optimal recreation opportunities and varying views of the woods and river.
- Trail crosses several driveways along Rawsonville Rd, making it dangerous for pedestrians and bikers. Some secluded areas going through the park.
- Route travels through a park, optimal for maintenance.
- Acquisitions needed on homes and some businesses on Rawsonville. Golf course and homes in neighborhood on Denton own to centerline of road.

Rte #	Route Description	Residential Access	Commercial Access	Trailhead Opp.	Connectivity	Rec Opp	Safety	Scenic Variety	Viability of Long Term Maint	Feasibility of Development	Property Acquisition Feasibility	TOTAL SCORE
2	**Rawsonville Rd to Downtown Belleville**											
2B	Rawsonville Rd to I-94 Service Drive to Van Buren Park to Downtown Belleville	5	4	10	10	10	4	10	9	6	8	**76**

Zone 2 Route C



Route Description

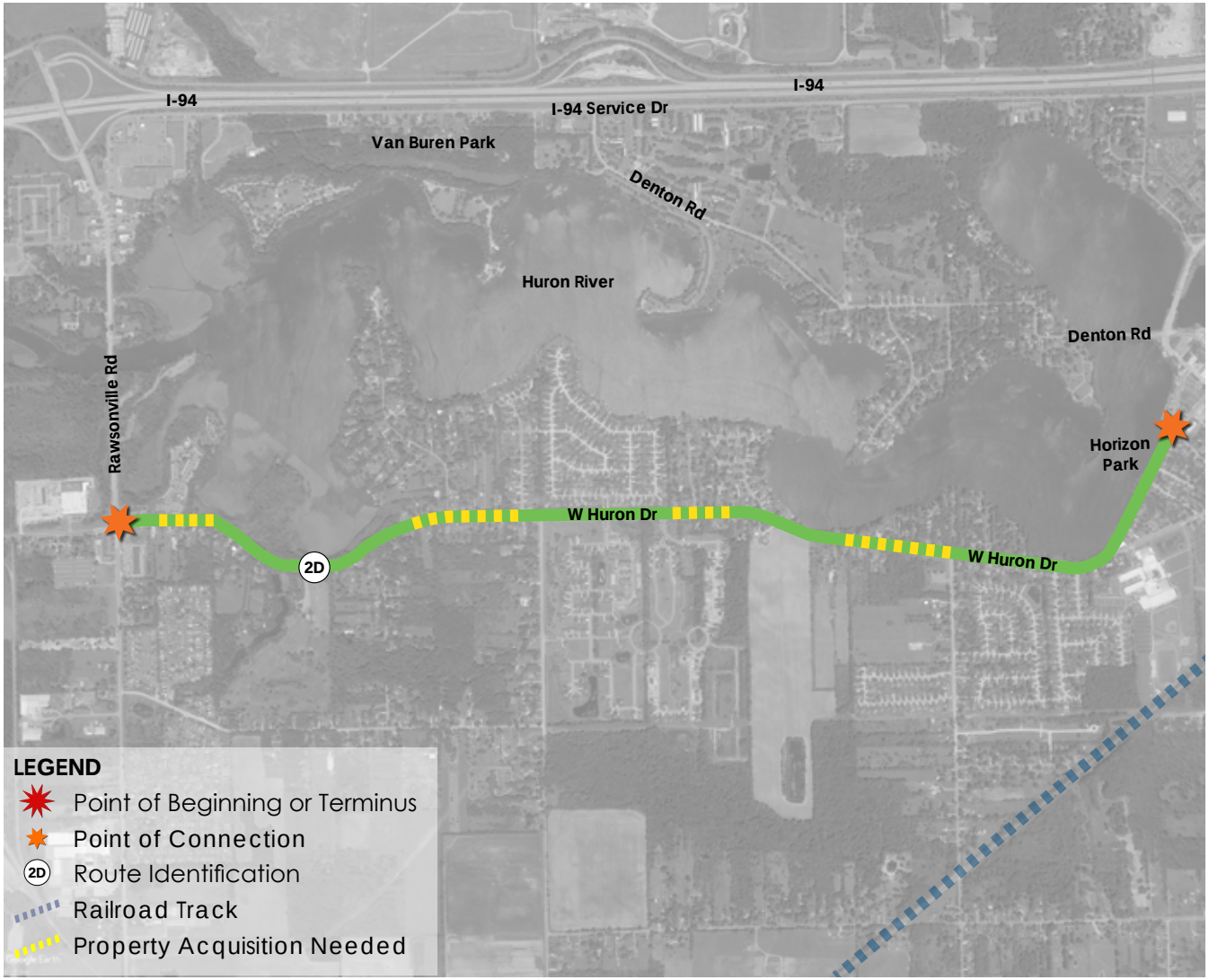
Travels from Rawsonville Rd through Van Buren Park, connecting to Denton Rd and heading into downtown Belleville.

Notes

- Passes shops and restaurants.
- Travels through both single family and multi-family developments.
- Trailhead could be located in Van Buren Park.
- Runs through Van Buren Park, creating optimal recreation opportunities and varying views of the woods and river.
- Route travels through a park, optimal for maintenance.
- Homes and water access located behind the commercial district could pose a potential issue.
- Acquisitions needed on homes and some businesses on Rawsonville. Golf course and homes in neighborhood on Denton own to centerline of road.

Rte #	Route Description	Residential Access	Commercial Access	Trailhead Opp.	Connectivity	Rec Opp	Safety	Scenic Variety	Viability of Long Term Maint	Feasibility of Development	Property Acquisition Feasibility	TOTAL SCORE
2	**Rawsonville Rd to Downtown Belleville**											
2C	Rawsonville Rd to Van Buren Park to Downtown Belleville	5	3	10	5	10	8	10	7	6	4	**68**

Zone 2 Route D



Route Description

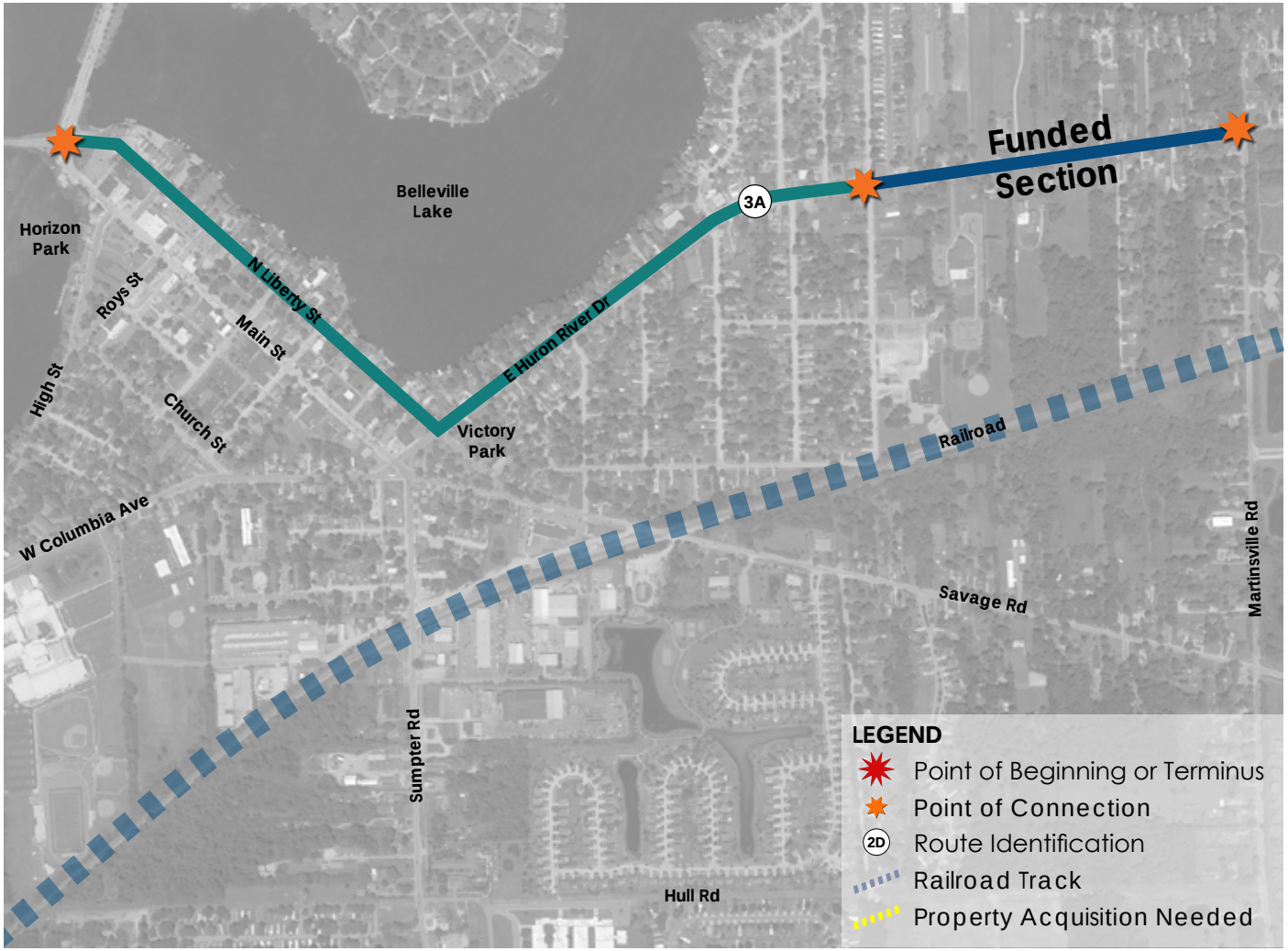
Travels from Rawsonville Rd through Van Buren Park, connecting to Denton Rd and heading into downtown Belleville.

Notes

- Connections to commercial establishments in downtown Belleville and at Rawsonville and W Huron Dr.
- Passes both single family and multi-family developments.
- Views along the river.
- Trail crosses driveways along W Huron River Dr.
- Narrow bridge crossing on W Huron River Dr could make it difficult to add the trail.
- Property acquisition needed at Lake Point Village and several additional single family homes along both sides of the road. Less acquisitions would be required on the south side of the road, however this would involve additional road crossings, more safety issues and less scenic variety.

Rte #	Route Description	Residential Access	Commercial Access	Trailhead Opp.	Connectivity	Rec Opp	Safety	Scenic Variety	Viability of Long Term Maint	Feasibility of Development	Property Acquisition Feasibility	TOTAL SCORE
2	**Rawsonville Rd to Downtown Belleville**											
2D	Rawsonville Rd to Huron River Dr to High St	5	4	2	3	4	6	7	6	6	10	**53**

Zone 3 Route A



Route Description

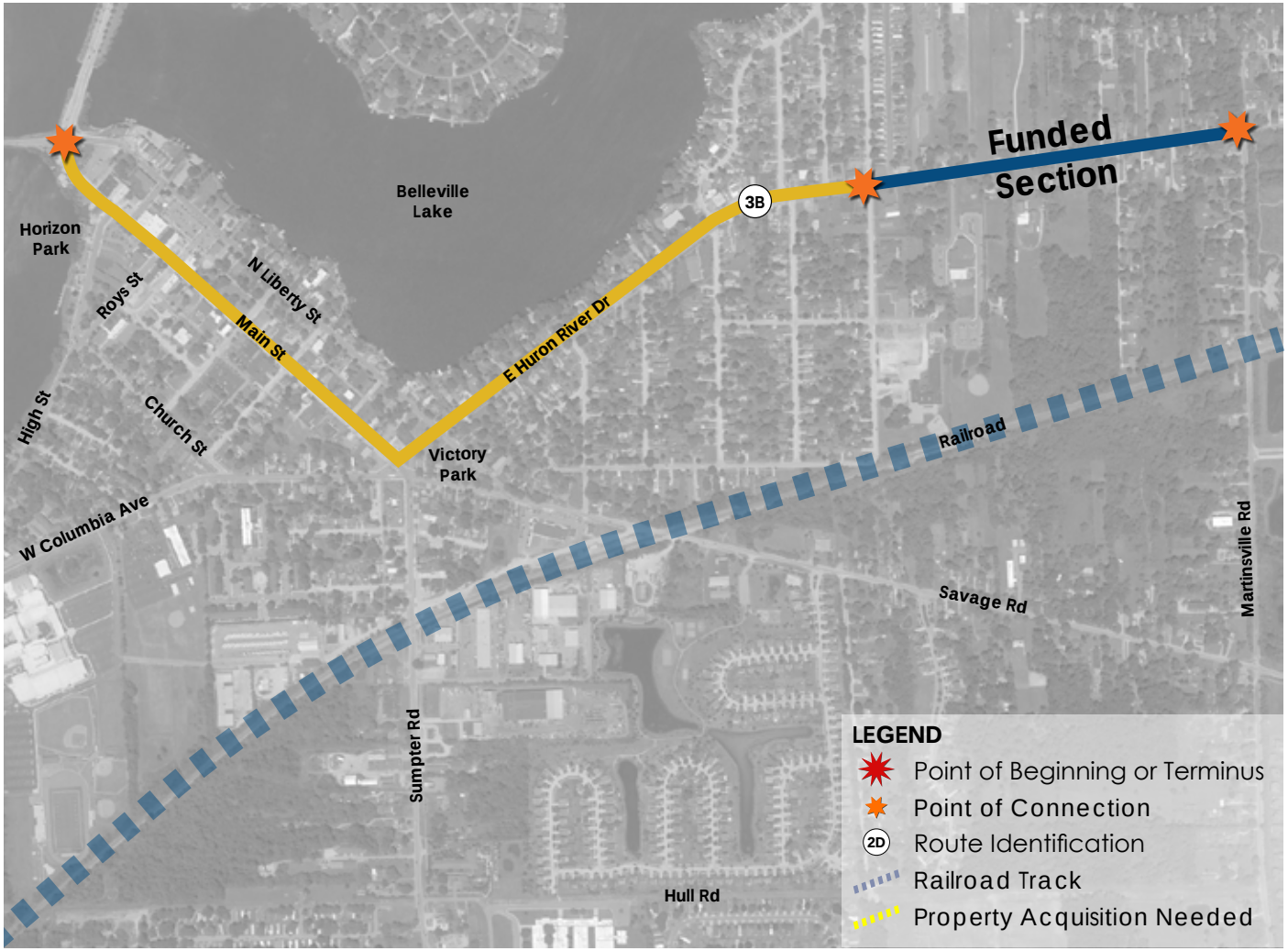
Begin at the northwest corner of Belleville at the Denton Rd bridge, heading straight down Liberty St and turning east down E Huron River Dr. Ends at funded section of Iron Belle Trail.

Notes

- Passes parallel to Main St. Close to commercial but not optimal.
- Travels down residential streets.
- Connects to Victoria Park.
- Almost all residential views, some views of Belleville Lake.
- Could use the sidewalk for pedestrians and build a sharrow for cyclists.
- Roads and sidewalks would be maintained by the City of Belleville.
- Taking advantage of existing sidewalks and creating a sharrow results in no property acquisition in Belleville. E Huron River Dr ROW is large enough to accommodate path until funded section.

Rte #	Route Description	Residential Access	Commercial Access	Trailhead Opp.	Connectivity	Rec Opp	Safety	Scenic Variety	Viability of Long Term Maint	Feasibility of Development	Property Acquisition Feasibility	TOTAL SCORE
3	Belleville											
3A	N Liberty St to Huron River Dr	5	4	7	5	7	7	5	8	10	20	**78**

Zone 3 Route B



Route Description

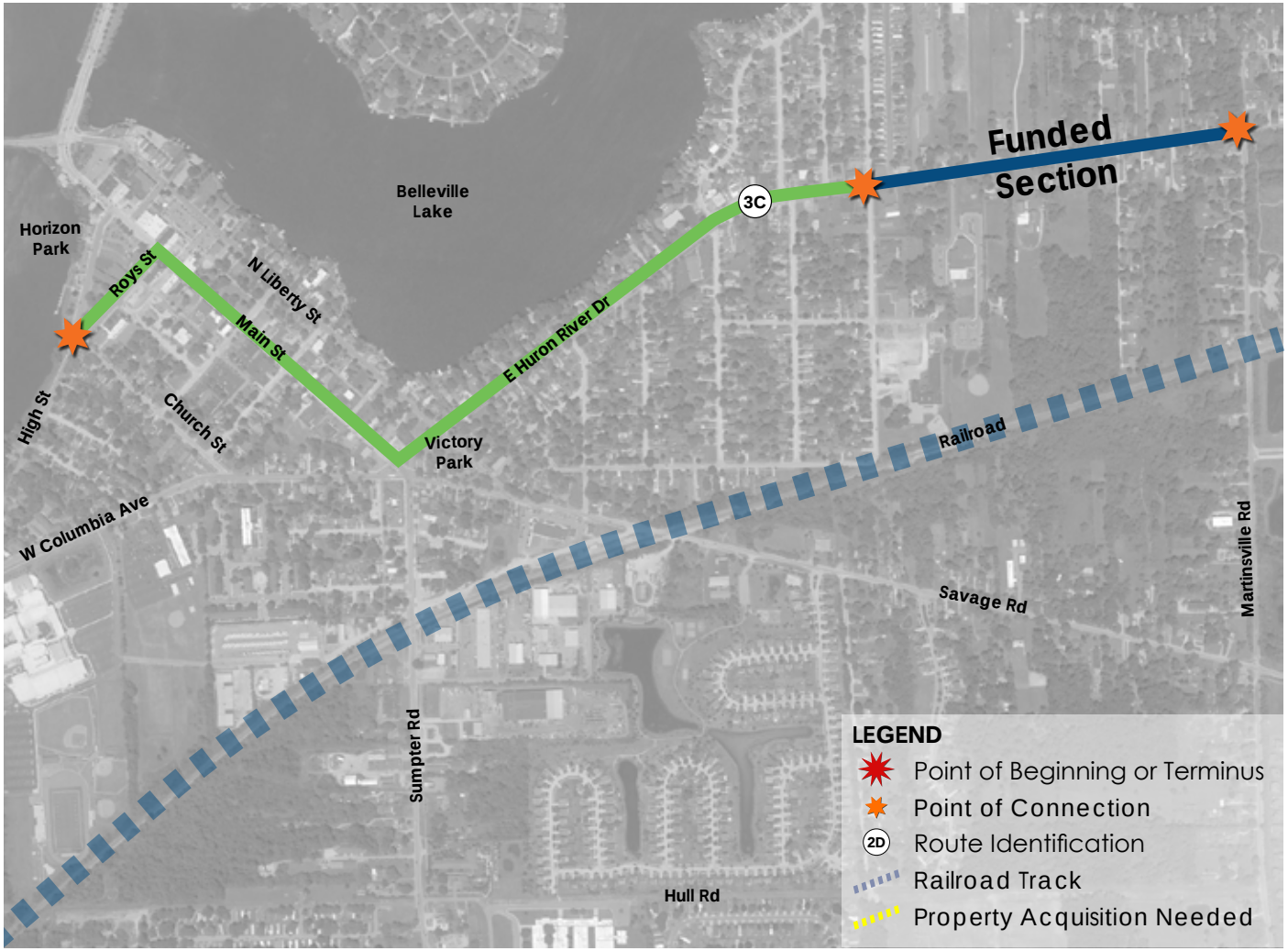
Begins in the northwest corner of Belleville at the Denton Rd bridge, heading straight down Liberty St and turning east down E Huron River Dr. Ends at funded section of Iron Belle Trail.

Notes

- Optimal access to shops and restaurants on Main St.
- Travels down residential streets.
- Connects to Victoria Park.
- Could use the sidewalk for pedestrians and build a sharrow for cyclists, resulting in a loss of parking.
- Roads and sidewalks would be maintained by the City of Belleville.
- Taking advantage of existing sidewalks and creating a sharrow results in no property acquisition in Belleville. E Huron River Dr ROW is large enough to accommodate path until funded section.

Rte #	Route Description	Residential Access	Commercial Access	Trailhead Opp.	Connectivity	Rec Opp	Safety	Scenic Variety	Viability of Long Term Maint	Feasibility of Development	Property Acquisition Feasibility	TOTAL SCORE
3	Belleville											
3B	High St to Main St	4	5	7	5	7	5	8	10	6	20	**77**

Zone 3 Route C



Route Description

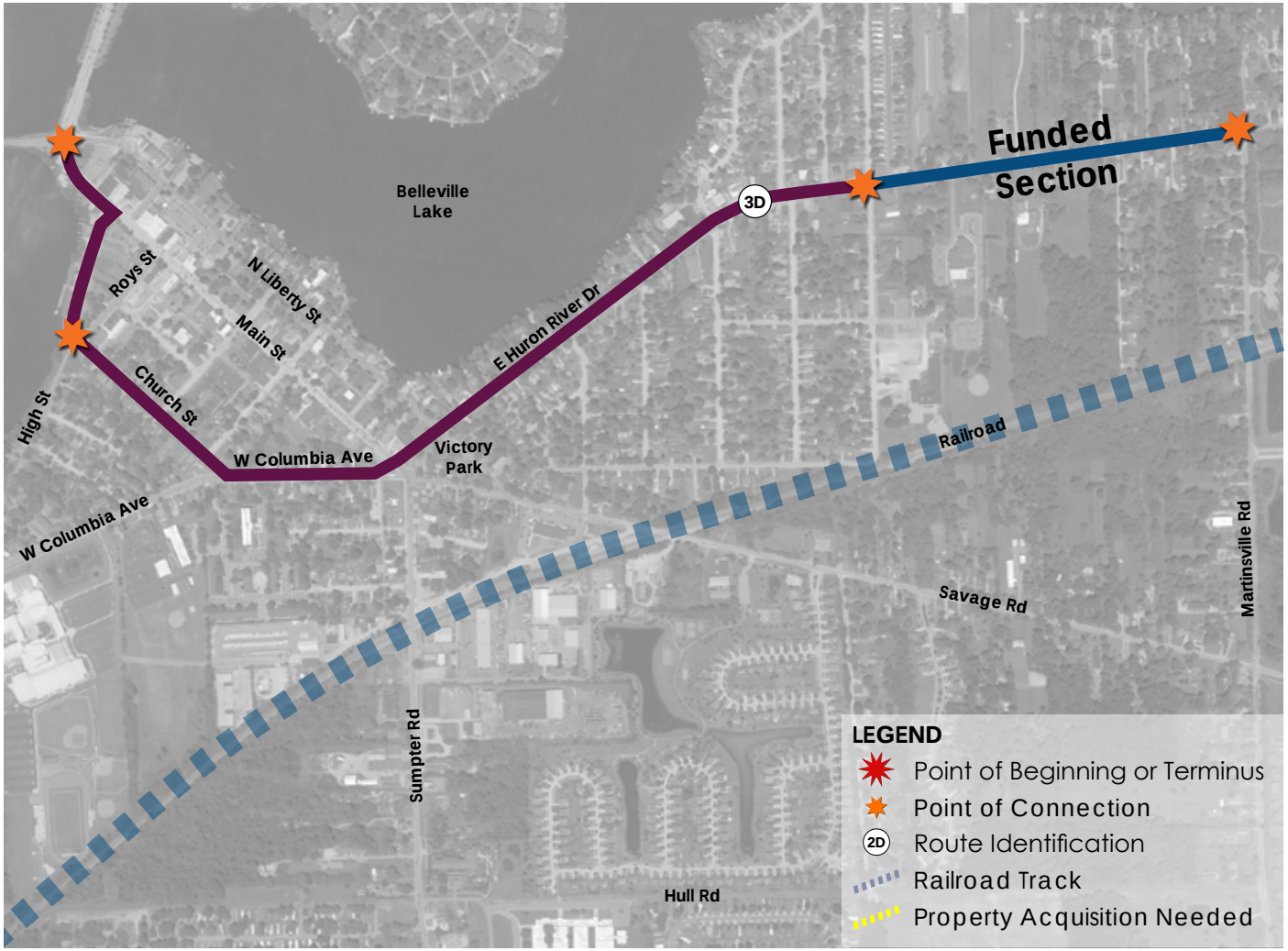
Travels from the connection at High St, heads down Roys St to Main and connecting to E Huron River Dr. Ends at funded section of Iron Belle Trail.

Notes

- Passes parallel to Main St. Close to commercial but not optimal.
- Travels down residential streets.
- Connects to Victoria Park and Horizon Park, potential for a water trail connection.
- Could use the sidewalk for pedestrians and build a sharrow for cyclists, resulting in a loss of parking.
- Roads and sidewalks would be maintained by the City of Belleville.
- Taking advantage of existing sidewalks and creating a sharrow results in no property acquisition in Belleville. E Huron River Dr ROW is large enough to accommodate path until funded section.

Rte #	Route Description	Residential Access	Commercial Access	Trailhead Opp.	Connectivity	Rec Opp	Safety	Scenic Variety	Viability of Long Term Maint	Feasibility of Development	Property Acquisition Feasibility	TOTAL SCORE
3	Belleville											
3C	Church St to Second St to Main St	4	5	10	5	10	5	8	10	6	20	**83**

Zone 3 Route D



Route Description

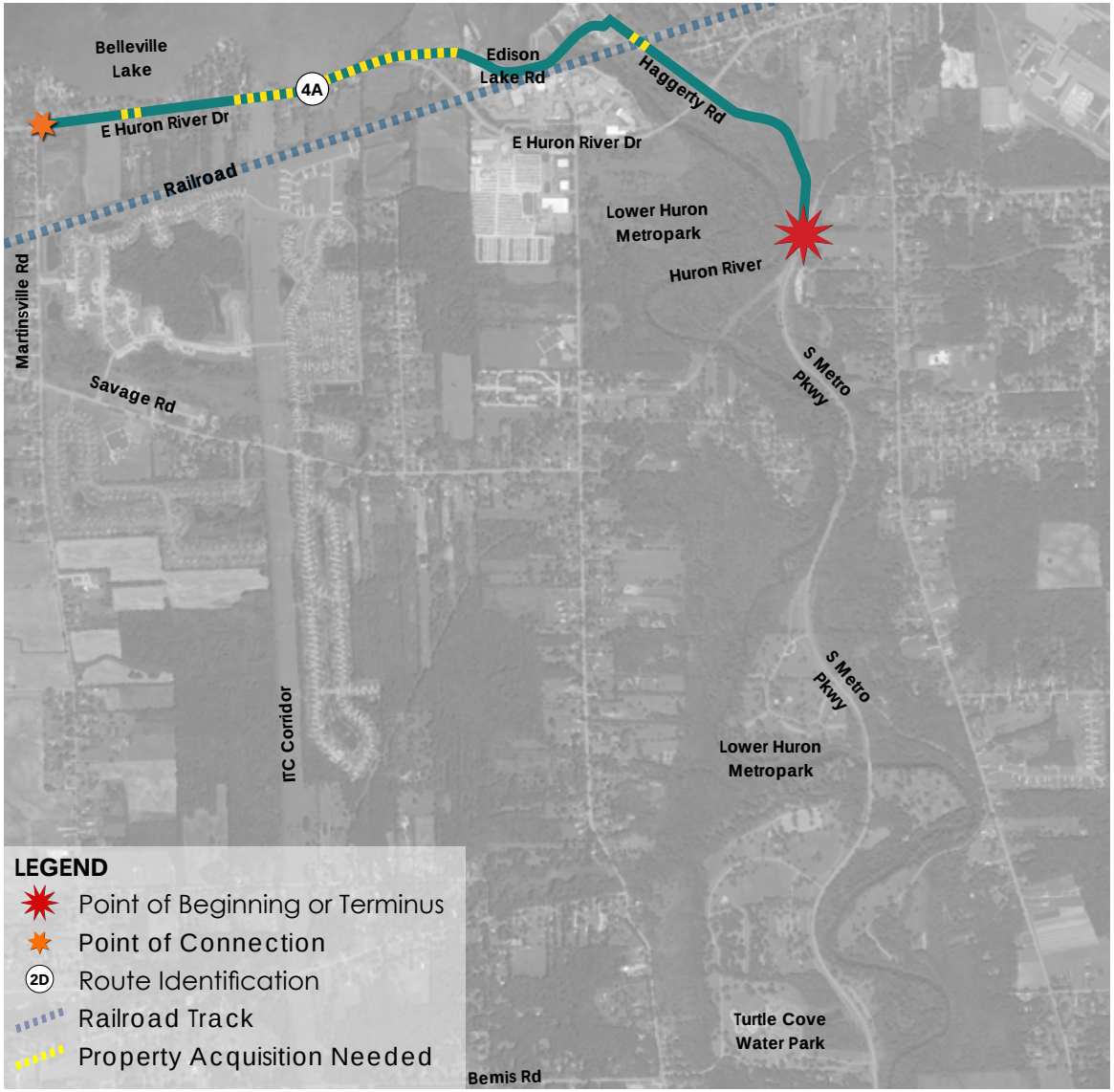
Begins in the northwest corner of Belleville at the Denton Rd bridge, heading down High Street, turning Southeast on Church St, turning east on W Columbia and connecting to E Huron River Dr. Ends at funded section of Iron Belle Trail.

Notes

- Passes parallel to Main St. Close to commercial but not optimal.
- Travels down residential streets.
- Connects to Victoria Park and Horizon Park, potential for a water trail connection.
- Could use the sidewalk for pedestrians and build a sharrow for cyclists.
- Roads and sidewalks would be maintained by the City of Belleville.
- Taking advantage of existing sidewalks and creating a sharrow results in no property acquisition in Belleville. E Huron River Dr ROW is large enough to accommodate path until funded section.

Rte #	Route Description	Residential Access	Commercial Access	Trailhead Opp.	Connectivity	Rec Opp	Safety	Scenic Variety	Viability of Long Term Maint	Feasibility of Development	Property Acquisition Feasibility	TOTAL SCORE
3	Belleville											
3D	Main St to High St to Church St to Columbia Ave to E Huron River Dr	5	4	10	5	10	9	10	8	10	20	**91**

Zone 4 Route A



Route Description

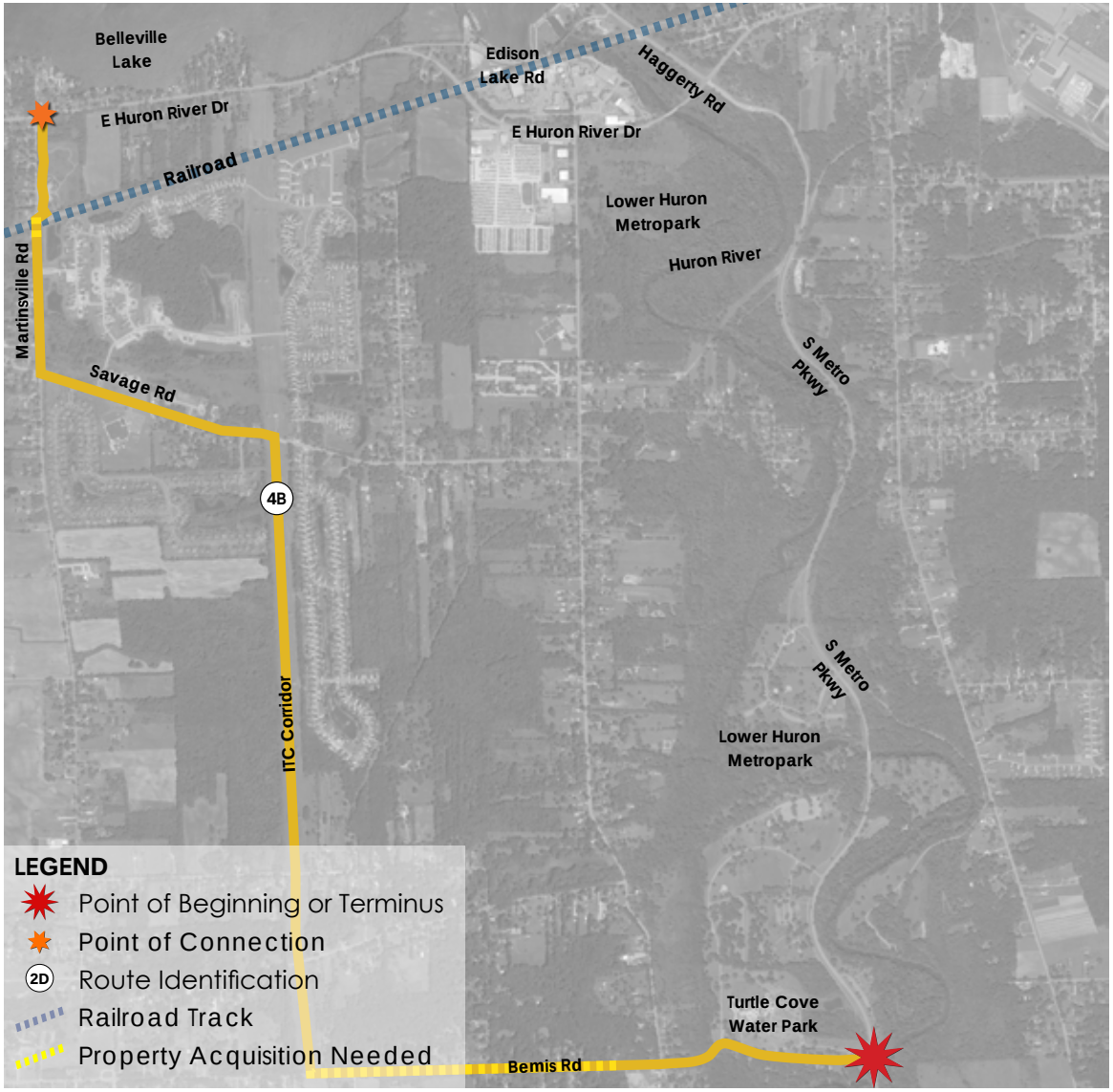
Starts at funded section of the Iron Belle Trail, continuing east down E Huron River Dr. The route turns northeast down Edison Lake Road, where it dead ends and takes advantage of an existing bridge. The trail would connect to Haggerty Rd and head south into Huron Metro Park.

Notes

- Passes single family homes along E Huron River Dr.
- Passes Sandy's Marina.
- Trailhead possibilities at Lower Huron Metro Park and Riggs Heritage Park.
- Connects to Metro Park trail system, potential to connect to I-275 Metro Trail.
- Recreation opportunities at Riggs Heritage Park and Lower Huron Metropark; fishing at the bridge over Belleville Lake.
- Views along the lake and through the park.
- Railroad crossing at Haggerty Rd could impede development.
- Railroad property acquisition for crossing. Single family homes that own property to centerline of road on E. Huron River Dr, many could be bypassed by crossing to north side of street at ITC corridor. Property on Edison Lake Rd is undeveloped, so acquisition may not be difficult.

Rte #	Route Description	Residential Access	Commercial Access	Trailhead Opp.	Connectivity	Rec Opp	Safety	Scenic Variety	Viability of Long Term Maint	Feasibility of Development	Property Acquisition Feasibility	TOTAL SCORE
4	**East Van Buren**											
4A	Huron River Dr to Edison Lake Rd to Lower Huron Metro Park	2	3	10	10	10	6	8	8	7	8	**72**

Zone 4 Route B



Route Description

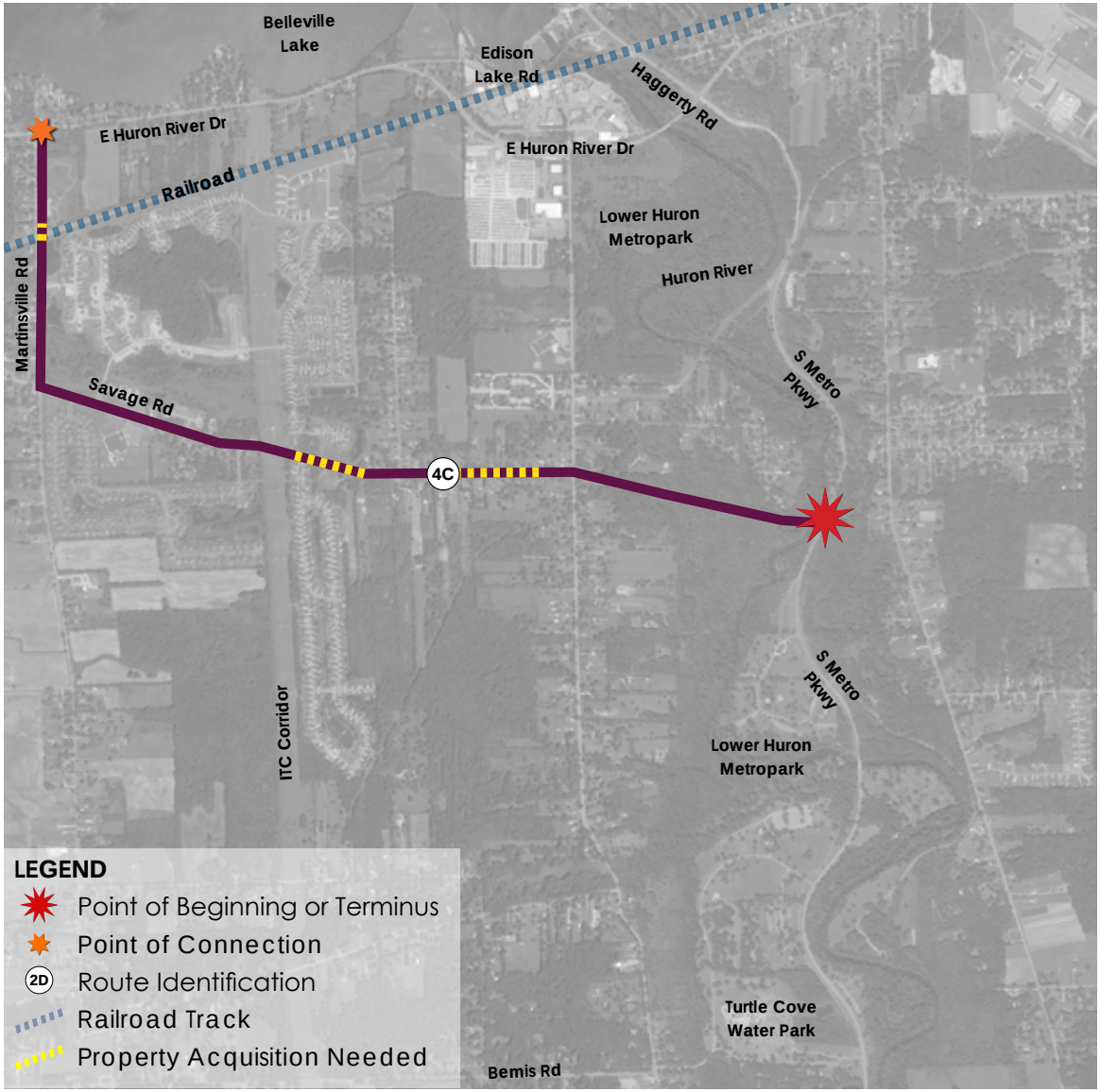
Starts at funded section of the Iron Belle Trail, then heads south down Martinsville Rd, turning southeast on Savage Rd and picking up the ITC corridor. The route would continue south until Bemis Rd, then turn east and connect to the south entrance of Huron Metro Park by Turtle Cove Water Park.

Notes

- Passes single family subdivisions and homes.
- Trailhead possibilities at Lower Huron Metro Park and Riggs Heritage Park.
- Connects to Metro Park trail system.
- Recreation opportunities at Riggs Heritage Park and Lower Huron Metro Park.
- Maintenance along a dirt road, ITC corridor and rural single family homes on Bemis Rd not realistic.
- Railroad crossing at Martinsville Rd and ITC restrictions could impede development.
- The Lower Huron Metro Park entrance at Turtle Cove gets congested with vehicles in the summer, creating more automobile interaction for trail users, as well as potential wait times to get into the park.
- Railroad property acquisition for crossing. Most Bemis Rd single family homes own to the center line.

Rte #	Route Description	Residential Access	Commercial Access	Trailhead Opp.	Connectivity	Rec Opp	Safety	Scenic Variety	Viability of Long Term Maint	Feasibility of Development	Property Acquisition Feasibility	TOTAL SCORE
4	East Van Buren											
4B	Huron River Dr to Martindale Rd to Savage Rd to ITC Corridor to Lower Huron Metro Park	4	4	10	6	8	7	7	4	3	8	**61**

Zone 4 Route C



Route Description

Starts at funded section of the Iron Belle Trail, then heads south down Martinsville Rd, turning southeast on Savage Rd, ending in the middle of Lower Huron Metro Park.

Notes

- Passes single family subdivisions and homes.
- Trailhead possibilities at Lower Huron Metro Park and Riggs Heritage Park.
- Connects to Metro Park trail system.
- Recreation opportunities at Riggs Heritage Park and Lower Huron Metro Park.
- Maintenance along a dirt road not realistic. The amount of boardwalk necessary to go through this section of the park would be cost prohibitive and create additional maintenance.
- Railroad crossing at Martinsville Rd could impede development.
- Railroad property acquisition for crossing and some Savage Rd single family homes own to the center line.

Rte #	Route Description	Residential Access	Commercial Access	Trailhead Opp.	Connectivity	Rec Opp	Safety	Scenic Variety	Viability of Long Term Maint	Feasibility of Development	Property Acquisition Feasibility	TOTAL SCORE
4	East Van Buren											
4C	Huron River Dr to Martindale Rd to Savage Rd	5	4	8	8	6	7	6	2	3	12	**61**

Final Route

Rte #	Route Description	Residential Access	Commercial Access	Trailhead Opp.	Connectivity	Rec Opp	Safety	Scenic Variety	Viability of Long Term Maint	Feasibility of Development	Property Acquisition Feasibility	TOTAL SCORE
1	**Hydro Park**											
1F	Rawsonville Rd to Hydro Park, following Huron River to Rawsonville Elementary, back to Grove St	5	5	8	10	10	6	7	9	10	18	**88**
2	**Rawsonville Rd to Downtown Belleville**											
2B	Rawsonville Rd to I-94 Service Drive to Van Buren Park to Downtown Belleville	5	4	10	10	10	4	10	9	6	8	**76**
3	**Belleville**											
3D	Main St to High St to Church St to Columbia Ave to E Huron River Dr	5	4	10	5	10	9	10	8	10	20	**91**
4	**East Van Buren**											
4A	Huron River Dr to Edison Lake Rd to Lower Huron Metro Park	2	3	10	10	10	6	8	8	7	8	**72**

TOTAL **327/400**

Connecting People, Parks and Destinations

HYDRO PARK

Cycling
Hiking
Picnicking
Pavilion Rental
Fishing
Kayaking | Canoeing

VAN BUREN PARK

Cycling
Hiking
Picnicking
Play Structures
Fishing
Swimming
Basketball
Volleyball
Community Garden
Sledding Hill
Concessions

HORIZON PARK

Picnicking
Boardwalk
Kayaking | Canoeing

VICTORY PARK

Picnicking
Boardwalk
Kayaking | Canoeing
Victory Station Rental

RIGGS HERITAGE PARK

Cycling
Hiking
Picnicking
Pavilion Rental

LOWER HURON METROPARK

Cycling
Hiking
Picnicking
Shelter Rental
Cross Country Skiing
Ice Skating
Snow Shoeing
Turtle Cove Family Aquatic Center
Canoeing | Kayaking
Basketball
Volleyball
Softball
Fishing
Geocaching
Play Structures

Typical Character of Sidewalk and Sharrow in Belleville

Typical Pathway in Van Buren Township

May 24, 2019

Mr. Mike Radzik
Township Office of Community Standards Director
7200 South Huron River Drive
Ypsilanti Township, MI 48197

RE: Recommendation of Award
Grove Road Pathway Extension Project

Dear Mr. Radzik:

Sealed bids for the Grove Road Pathway Extension project were received and publicly read aloud at 2:00 p.m. on Monday May 20, 2019 at the Charter Township of Ypsilanti Civic Center. Three (3) prospective contractors obtained plans and specifications for the project. Proposals were received from three (3) bidders with as-checked results ranging from $371,747.50 to $430,150.50. The engineer's final estimate for the project was approximately $356,000.00.

The low bid was received from Best Asphalt, located at 6334 N. Beverly Plaza, Romulus, MI 48174 in the amount of $371,747.50. In reviewing their bid, all required information, including bond surety, statement of qualifications, and subcontractors listing, has been provided.

It is felt that Best Asphalt and their subcontractors are capable of performing the work based on past experiences, referenced projects, and information provided with the statement of qualifications in the bid package. **Based on the submitted information, it is recommended that the Grove Road Pathway Extension work be awarded to Best Asphalt of Romulus, MI in the amount of $371,747.50. We also recommend a 10% contingency to help cover unforeseen issues or additional work that may be determined in the field. This results in a total recommended construction budget of about $408,500.00.**

Should there be any questions, please contact this office at (734) 522-6711.

Sincerely,

OHM Advisors,

Matthew D. Parks

Encl. Bid Tab

cc: Brenda Stumbo, Township Supervisor
Karen Lovejoy Roe, Township Clerk
Larry Doe, Township Treasurer
Doug Winters, Township Attorney
Elliot Smith, OHM Advisors
File

OHM Advisors
34000 PLYMOUTH ROAD
LIVONIA, MICHIGAN 48150
T 734.522.6711
F 734.522.6427
OHM-Advisors.com

Tabulation of Bids Received on 5/20/19
Grove Street Pathway Extensions
Charter Township of Ypsilanti, Washtenaw County, Michigan
OHM Job No.: 0098-18-0020

Item No.	Description	Estimated Quantity		Best Asphalt 6334 N. Beverly Plaza Romulus, MI 48174 Phone: (734) 729-9440 Unit Price	Amount	The LaSalle Group, Inc. 30375 Northwestern Hwy. Farmington Hills, MI 48334 Phone: (734) 394-0650 Unit Price	Amount	Fonson Company, Inc. 744 Whitmore Lake Rd. Brighton, MI 48116 Phone: (810) 217-4528 Unit Price	Amount
	CATEGORY 1 - Division I								
1)	Mobilization, Max. 5%, Div. I	1	LSUM	$9,600.00	$9,600.00	$10,454.50	$10,454.50	$6,200.00	$6,200.00
2)	Traffic Maintenance and Control, Div. I	1	LSUM	$12,000.00	$12,000.00	$15,000.00	$15,000.00	$13,200.00	$13,200.00
3)	Audio Video Route Survey, Div. I	1	LSUM	$3,000.00	$3,000.00	$1,925.00	$1,925.00	$925.00	$925.00
4)	Erosion Control, Inlet Protection, Fabric Drop	8	Ea	$100.00	$800.00	$200.00	$1,600.00	$150.00	$1,200.00
5)	Silt Fence	719	Ft	$1.50	$1,078.50	$2.50	$1,797.50	$3.50	$2,516.50
6)	Pavt, Rem	1506	Syd	$10.00	$15,060.00	$6.00	$9,036.00	$9.25	$13,930.50
7)	Sidewalk, Rem	18	Syd	$18.00	$324.00	$30.00	$540.00	$22.50	$405.00
8)	Curb and Gutter, Conc, Rem	60	Ft	$10.00	$600.00	$15.00	$900.00	$10.00	$600.00
9)	Remove and Reset Salvaged Sign	5	Ea	$100.00	$500.00	$400.00	$2,000.00	$190.00	$950.00
10)	Adjust Irrigation Valve	5	Ea	$100.00	$500.00	$500.00	$2,500.00	$270.00	$1,350.00
11)	Adjust Drainage/Utility Structure	7	Ea	$300.00	$2,100.00	$1,000.00	$7,000.00	$525.00	$3,675.00
12)	Adjust Drainage/Utility Structure, Additional Depth	6	Ft	$500.00	$3,000.00	$300.00	$1,800.00	$385.00	$2,310.00
13)	Subgrade Undercut, Type II (Modified)	59	Cyd	$112.00	$6,608.00	$70.00	$4,130.00	$88.00	$5,192.00
14)	Subgrade Undercut, Type II (Special)	59	Cyd	$89.00	$5,251.00	$73.50	$4,336.50	$87.00	$5,133.00
15)	Shared Use Path, Aggregate Base, 6 inch	1815	Syd	$14.50	$26,317.50	$12.50	$22,687.50	$23.20	$42,108.00
16)	Shared Use Path, Grading	22	Sta	$2,100.00	$46,200.00	$2,650.00	$58,300.00	$1,790.00	$39,380.00
17)	Shared Use Path, HMA 13A, 3 inch	1815	Syd	$21.00	$38,115.00	$25.00	$45,375.00	$23.40	$42,471.00
18)	Hand Patching	2	Ton	$350.00	$700.00	$200.00	$400.00	$500.00	$1,000.00
19)	Concrete Curb and Gutter, Detail F4	60	Ft	$50.00	$3,000.00	$45.00	$2,700.00	$40.00	$2,400.00
20)	Sidewalk, Conc, 6 inch	44	Sft	$10.00	$440.00	$13.00	$572.00	$13.25	$583.00
21)	Sidewalk Ramp, Conc, 6 inch	186	Sft	$15.00	$2,790.00	$11.00	$2,046.00	$18.00	$3,348.00
22)	Detectable Warning Surface	28	Ft	$50.00	$1,400.00	$80.00	$2,240.00	$40.00	$1,120.00
23)	Pavt Mrkg, Ovly Cold Plastic, 24 inch, Stop Bar	24	Ft	$34.00	$816.00	$35.00	$840.00	$33.30	$799.20
24)	Turf Establishment, Div. I	22	Sta	$400.00	$8,800.00	$350.00	$7,700.00	$955.00	$21,010.00
25)	WCRC Permit/Inspection Allowance	3400	Dlr		$3,400.00		$3,400.00		$3,400.00
26)	SESC Permit/Inspection Allowance	2600	Dlr		$2,600.00		$2,600.00		$2,600.00
	SUBTOTAL Category 1 (Items 1-26):				$195,000.00		$211,880.00		$217,806.20
	CATEGORY 2 - Division II								
27)	Mobilization, Max. 5%, Div. II	1	LSUM	$6,500.00	$6,500.00	$7,459.00	$7,459.00	$3,750.00	$3,750.00
28)	Traffic Maintenance and Control, Div. II	1	LSUM	$5,000.00	$5,000.00	$15,000.00	$15,000.00	$8,500.00	$8,500.00
29)	Audio Video Route Survey, Div. II	1	LSUM	$2,000.00	$2,000.00	$1,925.00	$1,925.00	$925.00	$925.00
30)	Erosion Control, Inlet Protection, Fabric Drop	5	Ea	$100.00	$500.00	$200.00	$1,000.00	$150.00	$750.00
31)	Silt Fence	326	Ft	$1.50	$489.00	$2.25	$733.50	$3.50	$1,141.00
32)	Pavt, Rem	171	Syd	$10.00	$1,710.00	$6.00	$1,026.00	$11.50	$1,966.50
33)	Sidewalk, Rem	11	Syd	$18.00	$198.00	$30.00	$330.00	$24.00	$264.00
34)	Curb and Gutter, Conc, Rem	121	Ft	$10.00	$1,210.00	$15.00	$1,815.00	$9.50	$1,149.50
35)	Pavt Mrkg, Rem	19	Ft	$10.00	$190.00	$10.00	$190.00	$8.00	$152.00
36)	Remove and Reset Salvaged Sign	1	Ea	$100.00	$100.00	$400.00	$400.00	$190.00	$190.00
37)	Adjust Drainage/Utility Structure	2	Ea	$300.00	$600.00	$1,000.00	$2,000.00	$550.00	$1,100.00
38)	Adjust Drainage/Utility Structure, Additional Depth	2	Ft	$500.00	$1,000.00	$300.00	$600.00	$380.00	$760.00
39)	Subgrade Undercut, Type II (Modified)	39	Cyd	$112.00	$4,368.00	$70.00	$2,730.00	$88.00	$3,432.00
40)	Subgrade Undercut, Type II (Special)	39	Cyd	$89.00	$3,471.00	$73.50	$2,866.50	$87.00	$3,393.00
41)	Driveways, Aggregate Base, 6 inch	134	Syd	$25.00	$3,350.00	$16.00	$2,144.00	$14.50	$1,943.00
42)	Shared Use Path, Aggregate Base, 6 inch	996	Syd	$14.50	$14,442.00	$12.50	$12,450.00	$22.00	$21,912.00
43)	Shared Use Path, Grading	13	Sta	$2,100.00	$27,300.00	$2,650.00	$34,450.00	$2,075.00	$26,975.00
44)	HMA 13A, 4 inch	996	Syd	$21.00	$20,916.00	$25.00	$24,900.00	$23.40	$23,306.40
45)	Shared Use Path, HMA 13A, 3 inch	134	Syd	$76.00	$10,184.00	$35.00	$4,690.00	$29.80	$3,993.20
46)	Hand Patching	5	Ton	$350.00	$1,750.00	$200.00	$1,000.00	$500.00	$2,500.00
47)	Concrete Curb and Gutter, Detail F4	121	Ft	$50.00	$6,050.00	$45.00	$5,445.00	$40.00	$4,840.00
48)	Sidewalk, Conc, 6 inch	1578	Sft	$10.00	$15,780.00	$13.00	$20,514.00	$10.00	$15,780.00
49)	Sidewalk Ramp, Conc, 6 inch	191	Sft	$15.00	$2,865.00	$11.00	$2,101.00	$19.00	$3,629.00
50)	Detectable Warning Surface	21	Ft	$50.00	$1,050.00	$80.00	$1,680.00	$40.00	$840.00
51)	Pavt Mrkg, Ovly Cold Plastic, 12 inch, Crosswalk	17	Ft	$19.00	$323.00	$18.00	$306.00	$17.80	$302.60
52)	Pavt Mrkg, Ovly Cold Plastic, 24 inch, Stop Bar	160	Ft	$9.50	$1,520.00	$9.00	$1,440.00	$8.90	$1,424.00
53)	Sign, Type B Permanent	11	Sft	$11.00	$121.00	$25.00	$275.00	$65.00	$715.00
54)	Post, Steel, 3 lb	24	Ft	$20.00	$480.00	$20.00	$480.00	$25.00	$600.00
55)	Turf Establishment, Div. II	14	Sta	$400.00	$5,600.00	$350.00	$4,900.00	$1,600.00	$22,400.00
	SUBTOTAL Category 2 (Items 27-55):				$139,067.00		$154,850.00		$158,633.20
	CATEGORY 3 - Division III - School Drive								
56)	Mobilization, Max. 5%, Div. III	1	LSUM	$500.00	$500.00	$2,640.50	$2,640.50	$1,500.00	$1,500.00
57)	Erosion Control, Inlet Protection, Fabric Drop	1	Ea	$100.00	$100.00	$200.00	$200.00	$150.00	$150.00
58)	Silt Fence	217	Ft	$1.50	$325.50	$2.50	$542.50	$3.50	$759.50
59)	Pavt, Rem	783	Syd	$11.00	$8,613.00	$6.00	$4,698.00	$8.00	$6,264.00
60)	Pavt Mrkg, Rem	10	Ft	$18.00	$180.00	$10.00	$100.00	$8.00	$80.00
61)	Subgrade Undercut, Type II (Modified)	14	Cyd	$60.00	$840.00	$70.00	$980.00	$88.00	$1,232.00
62)	Subgrade Undercut, Type II (Special)	14	Cyd	$60.00	$840.00	$73.50	$1,029.00	$87.00	$1,218.00
63)	Driveways, Aggregate Base, 6 inch	822	Syd	$7.50	$6,165.00	$20.00	$16,440.00	$21.00	$17,262.00
64)	HMA 13A, 4 inch	822	Syd	$23.50	$19,317.00	$35.00	$28,770.00	$29.80	$24,495.60
65)	Pavt Mrkg, Ovly Cold Plastic, Thru Arrow Sym	2	Ea	$400.00	$800.00	$400.00	$800.00	$375.00	$750.00
	SUBTOTAL Category 3 (Items 56-65)				$37,680.50		$56,200.00		$53,711.10
	TOTAL BID AMOUNT:				$371,747.50		$422,930.00		$430,150.50

\\ohm\dfs\Corporate\Projects\0000_0100\0098180020_Grove_St_Pathway_Extension\PM\[Bid Tab 0098-18-0020.xls]bidtab_abc

June 7, 2019

Ms. Brenda Stumbo
Township Supervisor
Charter Township of Ypsilanti
7200 S. Huron River Drive
Ypsilanti, MI 48197

RE: Grove Road Pathway Extension – Bridge Road to Snow Road
Proposal for Construction Services

Dear Ms. Stumbo:

OHM Advisors is pleased to submit this proposal for construction services for the Grove Road Pathway Extension project in the Charter Township of Ypsilanti. This project includes new pathway across the Rawsonville School property (Connecting Communities funded), additional rehabilitation of the Rawsonville Elementary School entrance, and rehabilitation of the existing path in front of the Rivergrove Subdivision (potential funding pending).

PROJECT UNDERSTANDING

This project was originally bid in September of 2018; however, it was decided to rebid this again in 2019 due to various factors. We understand a portion of this pathway is included in the Washtenaw County Parks and Recreation Commission's (WCPARC) "Connecting Communities" pathway/sidewalk initiative and that the Township is currently working with the County to receive additional funds for this project. The design and construction of this pathway is being performed in partnership with WCPARC, the Charter Township of Ypsilanti, and the Van Buren School system.

OHM Advisors has coordinated with the Van Buren School system, which included two (2) meetings held on July 11, 2018 and March 20, 2019, resulting in the proposed removal and replacement of their main drive, at their own expense. OHM, as part of this scope, will continue coordination with the School system and conduct a third meeting to finalize the agreement and temporary easement.

OHM Advisors has also been coordinating with DTE on our previous design due to the addition of a new vault located on the southwest corner of Grove Road and Snow Road. This coordination has been necessary to ensure the new pathway design avoids conflicts with both the existing and proposed vaults. Coordination has also been critical to aid DTE's awareness of the proposed pathway location. Plan revisions, as well as coordination, have occurred over the past several months to ensure there is no conflict with the updated bid package or potential conflict with construction of the proposed DTE vault.

OHM Advisors has also been collaborating with the Township throughout the application process for the WCPARC's Connecting Communities Grant and the Border-to-Border (B2B) Grant.

For the project, construction services will be a collaborative effort in conjunction with WCPARC and G2 Consulting Group (G2). OHM Advisors will be responsible for the construction services, including construction engineering, staking and layout, and coordination with WCPARC who will be inspecting and providing limited contract administration. OHM will coordinate with our subconsultant, G2, whom will be responsible for the material and compaction testing, as well as mix design review.

SCOPE

Task 1 – Re-Bid Project and Coordination with WCPARC, DTE, and Van Buren Schools

In order to re-bid the project, OHM Advisors prepared a revised contract book and a revised set of plans for the bidding process. In good faith, OHM has coordinated with Van Buren Schools as well as DTE to modify the design. In addition, OHM also secured new permits with the Washtenaw County Road Commission (WCRC). OHM provided bidding services along with a recommendation of award and moved forward to scheduling meetings with Rawsonville School representatives.

Task 2 – Construction Layout

OHM Advisors will provide construction survey layout services for the placement of the new pathway. This will include initial placement of the stakes per phase and, if removed by the contractor, one (1) additional staking per phase. Note that this project is phased so we anticipate several site visits to stake each phase.

Task 3 – Construction Engineering and Coordination with WCPARC

OHM Advisors will provide construction engineering services for this project. Construction engineering services will include but are not limited to:

- Assistance with and attendance at one (1) pre-construction meeting.
- Advising the Township or its designated representative during construction.
- Reviewing shop drawings and material certification provided by the contractor.
- Answering Requests for Information (RFIs) from the contractor.
- Resolving construction conflicts (i.e. mismarked utilities, interpretation of the contract documents, etc.).
- As needed construction administration assistance limited to WCPARC requests for change orders and estimates.
- Coordination with Van Buren Schools.
- Bi-weekly progress meetings after construction commences.
- All onsite project inspection will be provided by WCPARC and has not been included in this scope of services.

Task 4 – Materials Testing

G2 Consulting Group will provide testing as required. Material testing services include but are not limited to:

- Proof-rolling observation for applicable subbases.
- Density testing for subbases and asphalt pavement.
- Concrete testing.

FEE

OHM Advisors proposes to provide the above outlined professional construction services on an Hourly – Not to Exceed basis, in accordance with our 2019 Rate Schedule. Invoices will be sent monthly as work is performed.

Design & Rebidding	**Task 1** - Re-Bid Project Prep	$ 8,950.00
CE Services	**Task 2** - Construction Layout	$ 6,500.00
	Task 3 - Construction Engineering	$ 9,300.00
	Task 4 - G2 Services (Materials Testing)	$ 8,800.00
TOTAL		**$33,550.00 (Hourly - Not to Exceed)**

Note that the layout, construction engineering, and materials testing represents approximately 6% of the estimated construction costs. The WCPARC will perform observation and construction administration, which is typically 6 – 8%.

Overall, construction engineering services, staking, materials testing, and construction observation is approximately 15% of the overall project construction cost.

DELIVERABLES

A final pay estimate and final acceptance letter will be issued upon project completion as well as copies of the inspection reports (with sketches) for record information.

ACCEPTANCE

If this proposal is acceptable to you, a signature on the enclosed copy of this letter and initials on the contract terms and conditions will serve as our authorization to proceed.

Thank you for giving us the opportunity to present this proposal to you. We look forward to working with you throughout this project.

OHM ADVISORS CONSULTANT		Charter Township of Ypsilanti CLIENT
_____	(Signature)	_____
Matthew D. Parks, P.E.	(Name)	Ms. Brenda Stumbo
Principal in Charge	(Title)	Township Supervisor
_____	(Date)	_____
	(Signature)	_____
	(Name)	Ms. Karen Lovejoy Roe
	(Title)	Township Clerk
	(Date)	_____

June 7, 2019

Ms. Brenda Stumbo
Township Supervisor
Charter Township of Ypsilanti
7200 S. Huron River Drive
Ypsilanti, MI 48197

RE: Proposal for Grove Road Border-to-Border Pathway
Professional Engineering Design Services

Dear Ms. Stumbo:

Thank you for the opportunity to submit this proposal to provide Professional Engineering Design Services for the Grove Road Border-to-Border Pathway. This pathway is part of the Washtenaw County Parks and Recreation Commission's (WCPARC) "Border-to-Border (B2B)" pathway/sidewalk initiative. The design and construction of this pathway is being performed in partnership with the Charter Township of Ypsilanti (Township) and the Washtenaw County Parks and Recreation Commission (WCPARC).

This proposal provides key personnel and project manager contact information as well as project understanding, deliverables, schedule, and fee estimation.

PROJECT UNDERSTANDING

The project consists of connecting the pathways at the border of Ypsilanti Township and Van Buren Township, along with an additional pathway that connects pedestrian traffic from Grove Road to the North Hydro Park. The soon to be constructed pathway along Grove Road has recently been selected to become part of the official Border-to-Border (B2B) route.

For the Grove Road B2B pathway, a concrete sidewalk will be constructed at the end of the existing path at the east corner of Rawsonville Elementary School (to be constructed this summer) and extend north across Grove Road and include new pedestrian push-button controls. The existing sidewalk along the north side of Grove Road, from Margery to Nancy Street, will be removed and replaced to conform to current ADA standards as well as potentially widened where possible. A proposed 6-foot wide concrete pathway will be designed from Margery Street to Rawsonville Road with improvements to the Margery intersection. Other existing sidewalk in the north approaches approximate to Rawsonville will also be removed and replaced dependent on ADA compliance and condition of the pavement.

The North Hydro Park path will be constructed from the existing dead-end path within the Park and will connect to the existing pathway on the south side of Grove Road, between Woodale Avenue and the Rawsonville Elementary School main entrance (being rehabilitated this summer). This portion of pathway will be a 10-foot wide asphalt path and will be accompanied with three proposed design concepts.

All pathway design will comply with the current guidelines for pathway construction including the American Association of State Highway Transportation Official's (AASHTO) Guide for the Development of Bicycle Facilities

(where applicable), applicable sections of the Americans with Disabilities Act (ADA), the National Asphalt Pavement Association (NAPA) Standards, and local Ordinances.

OHM Advisors has previously assisted with neighboring Grove Road pathway projects as well as with various application assistance efforts. We offer the following scope of services for the completion of the design of this project.

SCOPE

Task 1 – Design Survey/ROW Identification

OHM Advisors will begin Design Survey upon authorization to proceed. The focus will be to identify critical areas where obtaining temporary or permanent easements could save construction cost as well as areas that may require additional design efforts. Tasks to be accomplished include:

- **Control:** Establish horizontal and vertical control
- **Right-of-Way:** Obtain property boundary and ROW information and tie to project control.
- **Topographic Survey:** Obtain all necessary existing physical features, such as sidewalk, structure inventory, trees, etc., and elevations to provide information for preparing plans, with a focus on meeting all ADA requirements.

Task 2 – Engineering Drawing Design

The data gathered in Task 1, along with the conceptual sketches provided during the Design Survey process, will allow us to create a set of design drawings and aerial maps. These drawings and maps will be further developed to show the pathway location. Preliminary design, as well as pedestrian signal design at Snow Road and Grove Road, will be completed at this time. For the pathway at North Hydro Park, three (3) conceptual designs will be proposed for the Township's consideration. The conceptual designs will offer the Township varying degrees of park "experience" and service. The three concepts have been discussed with Mr. Doug Winters who has previously authorized OHM to prepare a Request for Proposal (RFP) for the Rivergrove site. The concepts will take into careful consideration of the previously approved Planned Development plan and either try to avoid proposed infrastructure or "re-imagine" the parcel as a future trailhead to the eastern most leg of the B2B system and Hydro Park. A kick-off meeting will be held to confirm the three concepts prior to final design work commencing.

The plans will include any notes and details necessary for specific design elements as well as cross-sections of the path. These documents will serve as the plans for the project and allow bidders to recognize the overall scope of work. Additionally, these plans will also be reviewed with the Township for feedback with a second meeting. If easements are needed, they will be discussed at this time. Any plan revisions discussed at the meeting will be incorporated into the drawings for the final bid package. This design is assuming two (2) contingency easements will need to be obtained. Additional easements can be prepared for $950 each.

Geotechnical information will also be gathered at this stage and will be performed by G2 Consulting Group (G2). We anticipate that two soil borings will need to be obtained for the North Hydro Park area, and another two soil borings will be needed for the B2B pathway.

Task 3 – Specifications and Final Bid Package Assembly

In order to develop the necessary specifications, OHM will follow the Charter Township of Ypsilanti Engineering Standards and Design Specifications. These specifications will reference contractual items, specifically special instructions to bidders, supplemental specifications, and a method of payment for the contractor to follow. The bid package will require the necessary bonding, prevailing wage information, and insurance requirements as well as a bid form that will allow the Township to assess bids on a same class comparison. After completion of the design, the Township will be provided with two (2) hard copies of the package for review along with an updated final engineer's

opinion of probable cost. Final adjustments to the package will then be made based on Township comments prior to advertising and bidding. OHM will also assist and submit for permits, including an SESC permit and WCRC permit, as part of this task.

Task 4 – Bidding

The final bid package will be provided to the Township to be posted on BidNet Direct (formerly the Michigan Inter-governmental Trade Network). OHM can hold an onsite pre-bid conference with potential bidders if requested by the Township. OHM will address any questions and/or any Requests for Information (RFI) received by the bidding contractors during the bid phase. OHM will hold a bid opening at the Township on the date specified in the bid documents. Bids received will be read aloud, tabulated, and reviewed. A letter of recommendation will then be provided to the Township for their use in awarding the project.

DELIVERABLES

Task	Deliverable
Task 2	Engineering Design Plans and Three Concept Plans
Task 3	Final Bidding Package with Chosen Concept Plan
Task 4	Recommendation of Award Letter

KEY PERSONNEL

This project team has been specifically selected to best meet the technical aspects of the design and facilitate coordination with the Township. G2 Consulting Group will offer geotechnical services. Below is a list of key personnel and their role on this project.

Project Team Members	Role on Project	Specific Duties
Matthew Parks, PE	Project Manager	Management, Utility Coordination, & Public Liaison
Elliot Smith	Lead Design Engineer	Concepts, Design Development, ADA Issues, & QA/QC
Phil Maly	Construction Engineer	QA/QC
Andrew Schripsema, PE, PS	Surveyor	Design Survey (Control, Topography, & Right-of-Way)
G2 Consulting Group	Geotechnical Engineer	Soils Report Development

ASSUMPTIONS/CLARIFICATIONS

- The design will be limited to the pathway and hard surface around the proposed conceptual routes only. This design will not incorporate any improvements to Grove Road, or potential "park enhancements" on the Rivergrove property beyond the pathway, or other work outside limits not previously mentioned.
- Any additional tasks outside of the above scope of services can be conducted at an hourly rate or as negotiated between the Township and OHM Advisors. Additional work will not be conducted prior to Township written authorization.
- No construction phase services are included in the proposal. The Township can inspect and administer this project with their staff or OHM can submit a proposal under separate cover for consideration upon request. In general, small projects like this require approximately 12-15% of the overall construction cost to administer construction services. This can change based on the level of service provided.
- Any meetings in addition to the meetings outlined in the above scope are not included in the scope of services but can be attended upon request. Time spent for these meetings will be charged on an hourly basis.

FEE

OHM Advisors will invoice the Charter Township of Ypsilanti for the above stated services on an hourly not-to-exceed basis, in accordance with our 2019 Rate Schedule. Invoices will be sent monthly as work is performed.

Design Tasks	**Design Fee**
Task 1	$13,250.00
Task 2	$18,250.00
Task 3	$12,650.00
Task 4	$3,750.00
Total	**$47,900.00**

The total fee is estimated to be $47,900.00. Additional services can be provided on an hourly basis, as requested.

ACCEPTANCE

If this proposal is acceptable to you, a signature on the enclosed copy of this letter and initials on the contract terms and conditions will serve as our authorization to proceed.

Thank you for giving us the opportunity to present this proposal to you. We look forward to working with you throughout this project.

OHM ADVISORS CONSULTANT		Charter Township of Ypsilanti CLIENT
_____	(Signature)	_____
Matthew D. Parks, P.E.	(Name)	Ms. Brenda Stumbo
Principal in Charge	(Title)	Township Supervisor
_____	(Date)	_____
	(Signature)	_____
	(Name)	Ms. Karen Lovejoy Roe
	(Title)	Township Clerk
	(Date)	_____

June 7, 2019

Ms. Brenda Stumbo
Township Supervisor
Charter Township of Ypsilanti
7200 S. Huron River Drive
Ypsilanti, MI 48197

RE: Civic Center Pond Research
Proposal for Geotechnical Services

Dear Ms. Stumbo:

We are pleased to submit a proposal to provide geotechnical services for the Township's Civic Center pond. We understand that the Township desires to perform maintenance and improvements to the existing pond. After discussions with Township staff, it is understood the Township would like the following modifications to the pond: create a 20-foot wide embankment along the building for lawn mowing, configure fountain(s), add peninsula to access fountain, add valve at the pond's outlet, stabilize pond bans with natural stone, waterproof the building wall adjacent to the pond, provide bentonite seal, and place quality topsoil.

It is our recommendation that geotechnical services be provided prior to designing the pond improvements project. This will ensure that the improvements can be completed and within the Township's budget. OHM Advisors will work in conjunction with G2 Consulting Group (G2) to provide six (6) borings with a depth of 20-feet as well as one (1) additional sample at 12-1/2-feet near the bottom of the pond. These services will be provided using a truck rig to access the borings. G2 will provide a full geotechnical report with recommendations including the suitability of existing soils for use as an impermeable earthen berm and assessment of need for liner if sand layers present deeper within the pond. OHM will help coordinate the borings, review the geotechnical report provided by G2, and provide a recommendation on how to proceed. This fee also includes a meeting to review the findings and discuss next steps.

FEE

OHM Advisors will invoice the Charter Township of Ypsilanti for the above stated services as a lump sum fee. The total fee is estimated to be $6,850.00. Additional services can be provided on a time and material basis, as requested.

ACCEPTANCE

If this proposal is acceptable to you, a signature on the enclosed copy of this letter and initials on the contract terms and conditions will serve as our authorization to proceed.

Thank you for giving us the opportunity to present this proposal to you. We look forward to working with you throughout this project.

OHM ADVISORS	Charter Township of Ypsilanti
CONSULTANT	CLIENT

OHM Advisors®
34000 PLYMOUTH ROAD
LIVONIA, MICHIGAN 48150
T 734.522.6711
F 734.522.6427
OHM-Advisors.com

_____	(Signature)	_____
Matthew D. Parks, P.E.	(Name)	Ms. Brenda Stumbo
Principal in Charge	(Title)	Township Supervisor
_____	(Date)	_____
	(Signature)	_____
	(Name)	Ms. Karen Lovejoy Roe
	(Title)	Township Clerk
	(Date)	_____

OHM Advisors®
34000 PLYMOUTH ROAD
LIVONIA, MICHIGAN 48150
T 734.522.6711
F 734.522.6427
OHM-Advisors.com

CHARTER TOWNSHIP OF YPSILANTI

RESOLUTION 2019-29

Abandoned Tax Delinquent Property

Whereas, the Charter Township of Ypsilanti Board of Trustees has determined that parcels of abandoned tax delinquent property exist; and

Whereas, abandoned tax delinquent property contributes to crime, blight, and decay with Ypsilanti Township; and

Whereas, the certification of tax delinquent abandoned property as certified abandoned property will result in the accelerated forfeiture and foreclosure of certified abandoned property under the general property tax act and return abandoned property to productive use more rapidly, therefore reducing crime, blight, and decay within Ypsilanti Township.

Now Therefore, Be It Resolved, that the Charter Township of Ypsilanti Board of Trustees hereby notifies residents and owners of property within Ypsilanti Township that abandoned tax delinquent property will be identified and inspected; and may be certified abandoned property subject to accelerated forfeiture and foreclosure under the general property tax act.

I, Karen Lovejoy Roe, Clerk of the Charter Township of Ypsilanti, County of Washtenaw, State of Michigan hereby certify the above resolution is a true and exact copy of Resolution No. 2018-13 approved by the Charter Township of Ypsilanti, Board of Trustees assembled at a Regular Meeting held on June 19, 2018.

Karen Lovejoy Roe

_____

Karen Lovejoy Roe, Clerk
Charter Township of Ypsilanti

CHARTER TOWNSHIP OF YPSILANTI

RESOLUTION 2019-30

Authorizing the Charter Township of Ypsilanti to Exercise its "First Right of Refusal" and to Purchase from Washtenaw County Treasurer Catherine McClary Acting in her Capacity as the Foreclosing Governmental Unit Under the Authority of the General Property Tax Act the Real Properties Described Herein Located In Ypsilanti Township, Michigan

WHEREAS, on or about ***March 31, 2019*** Washtenaw County Treasurer Catherine McClary, Acting in her capacity as the ***Foreclosing Governmental Unit*** (FGU) under the Authority of the ***General Property Tax Act*** (GPTA) foreclosed upon certain properties in the Washtenaw County Circuit Court due to delinquent real property taxes.

The ***"List of Tax Foreclosed Properties"*** for ***2019*** last revised on ***June 4, 2019*** (See Exhibit 1) was received by Ypsilanti Township Clerk ***Karen Lovejoy Roe*** on ***June 5, 2019*** from Washtenaw County Treasurer McClary which contained *inter alia* the following Ypsilanti Township properties which set forth the amount of unpaid delinquent taxes and are described as follows:

641 Greenlawn

Parcel No.: ***K-11-11-362-032***
Minimum Bid: ***$24,974.00***
Legal Description:
THAT PART OF LOTS 94 & 95 LYING NLY. OF HWY. RIGHT OF WAY & LOT 96 EASTLAWN SUBDIVISION.

WHEREAS, the Court of Appeals for the State of Michigan in an unanimous decision released for publication on ***April 5, 2011*** entitled ***"City of Bay City vs Bay County Treasurer"*** held that under the GPTA that ***". . . the determination of a proper purpose for the purchase of tax-delinquent property is a legislative function, vesting such determinations as arose in this case with Plaintiff's council.***

Furthermore, because MCL 211.78(m)(1) creates a mandatory legal duty on Defendant's part to sell the property to Plaintiff granting him no discretion to decide not to sale such property, the statute does not empower a county treasurer . . . to make an independent determination as to a municipality's professed 'public' purpose" a copy of the Court of Appeals decision being attached hereto and incorporated by reference and labeled Exhibit 2; and

WHEREAS, from 2007 through 2018 Ypsilanti Township has seen over 3,000 foreclosures which make up approximately thirty-three (33%) of all foreclosures that have occurred during this time period in Washtenaw County even though the Township's population is only fifteen (15%) of the County's total population; and

WHEREAS, this unprecedented record number of foreclosures in Ypsilanti Township resulted in a significant loss of tax revenue to the Township while also having a direct and negative effect upon the residential property values Township wide; and

WHEREAS, this record number of foreclosures in the Township destabilized a number of residential streets located within the Township's residential subdivisions and greatly contributed to a number of residential neighborhoods becoming predominantly rental properties which further contributed to the destabilization of residential properties; and

WHEREAS, the Charter Township of Ypsilanti in an effort to stabilize the Township's existing residential neighborhoods entered into a partnership with Habitat for Humanity for acquiring and rehabilitating residential properties located in the Township for homeowner occupancy which has resulted in increased neighborhood stabilization and has prevented further deterioration of existing residential subdivisions throughout the Township while also resulting in the increase of property values and the tax base in the Township; and

WHEREAS, Habitat has notified the Township of its desire to acquire additional residential properties in the Township for rehabilitation and resale to homeowners which further promotes the Township Board's stated policy of neighborhood stabilization; and

WHEREAS, the Ypsilanti Township Board of Trustees has determined and hereby finds that the exercise of its ***"First Right of Refusal"*** to acquire the above listed properties constitutes a ***"Public Purpose"*** as set forth in the Court of Appeals case entitled ***"City of Bay City vs Bay County Treasurer"*** since it is imperative that in order for the Township to achieve its stated public purpose of neighborhood stabilization and to prevent further deterioration of residential property values that the Township continues in its ongoing efforts with Habitat for Humanity to increase homeownership by acquiring residential properties in the Township for resale to Habitat who will rehabilitate said properties that in turn will be resold to persons for homeownership as opposed to being utilized as rental/investment properties; and

WHEREAS, the Township has been advised by the Washtenaw County Treasurer's Office that the minimum bid price for the aforementioned listed property totals ***$24,974;***

NOW, THEREFORE THE YPSILANTI CHARTER TOWNSHIP BOARD OF TRUSTEES HEREBY RESOLVES AS FOLLOWS:

1. That the Township hereby finds and determines that the exercise of its ***"First Right of Refusal"*** pursuant to the General Property Tax Act as further defined in the Court of Appeals case entitled ***"City of Bay City vs Bay County Treasurer"*** to purchase the properties hereinabove listed located in the Township of Ypsilanti, Washtenaw County, State of Michigan, constitutes a ***"Public Purpose"*** since it is imperative that in order for the Township to achieve its stated public

purpose of neighborhood stabilization and to prevent further deterioration of residential property values that the Township continues in its ongoing efforts with Habitat for Humanity to increase homeownership by acquiring residential properties in the Township for resale to Habitat who will rehabilitate said properties that in turn will be resold to persons for homeownership as opposed to being utilized as rental/investment properties.

2. That the Township hereby notifies Washtenaw County Treasurer Catherine McClary Acting in her Capacity as the Foreclosing Governmental Unit that the Township desires to purchase the above listed property under the Township's ***"First Right of Refusal"*** for the minimum bid of ***$24,974.***

3. That the Township authorizes the payment of ***$24,974.00*** for the purpose of acquiring the above listed property pursuant to the Township's ***"First Right of Refusal"*** for the ***"Public Purpose"*** as defined herein.

http://www.auction.com/washtenaw

List of Tax Foreclosed Properties
Auctions will start on 7/19, 8/23, 10/4/2019
Washtenaw County, Michigan

Please note: The Treasurer has the right to withdraw any property on this list prior to the auction. Please contact the office for up to date information.

All bidding is done online. Please read the terms and conditions before bidding, found on washtenaw.org/auction .

All attempts were made for accuracy and proof-reading. Please report any errors you may find to taxes@washtenaw.org

Catherine McClary, CPFO, CPFIM
Washtenaw County Treasurer

Phone: 734-222-6600
Fax: 734-222-6632
Email: taxes@washtenaw.org

Parcel Identification Number	Address and Municipality	Auction Date	2019 Assessed Value x 2**	Minimum Bid***	Legal Description
K -11-11-362-032	641 Greenlawn Charter Township of Ypsilanti	**7/19/2019**	**$ 115,400**	**$ 24,974**	THAT PART OF LOTS 94 & 95 LYING NLY. OF HWY. RIGHT OF WAY & LOT 96 EASTLAWN SUBDIVISION.
K -11-27-200-007	8212 Thornhill Charter Township of Ypsilanti	**7/19/2019**	**$ 20,200**	**$ 4,344**	UNPLATTED PORTION OF PARTRIDGE CREEK SUB III DESC AS: BEG AT NE COR PARTRIDGE CREEK SUBDIVISION III, TH S 88-16-17 W 702.96 FT TO POB, TH CONT S 88-16-17 W 137.61 ALG E/W LN, TH S 31-02-14 W 159.80, TH N 82-30-13 E 153.41, TH N 31-02-14 E 131.59 TO POB. CONT .4866 AC \-

** Per Michigan Constitution, assessed value shall not exceed 50% of true cash value (Article 9, Section 3).

*** Includes all delinquent taxes, interest, penalties, fees, costs, expenses and 2019 Summer Taxes.

http://www.auction.com/washtenaw

List of Tax Foreclosed Properties
Auctions will start on 7/19, 8/23, 10/4/2019
Washtenaw County, Michigan

Please note: The Treasurer has the right to withdraw any property on this list prior to the auction. Please contact the office for up to date information.

All bidding is done online. Please read the terms and conditions before bidding, found on washtenaw.org/auction .

All attempts were made for accuracy and proof-reading. Please report any errors you may find to taxes@washtenaw.org

Catherine McClary, CPFO, CPFIM
Washtenaw County Treasurer

Phone: 734-222-6600
Fax: 734-222-6632
Email: taxes@washtenaw.org

Parcel Identification Number	Address and Municipality	Auction Date	2019 Assessed Value x 2**	Minimum Bid***	Legal Description
K -11-33-100-013 K -11-33-100-014 K -11-33-100-015	7873 Shire 7874 Shire 7470 Whittaker Charter Township of Ypsilanti	**7/19/2019**	**$ 141,000**	**$ 9,352**	PARCEL OF LAND LOCATED IN PT ON THE NE 1/4 OF SEC 33, T3S, R7E, YPSILANTIL TWP, WASH CO, MI, DESC AS BEG AT PT DIST N 00-34-16 W 16.50 FT, TH S 88-03-51 W 496.66 FT TO THE POB, TH S 88-03-51 W 255.67 FT, TH N 47-09-42 W 462.82 FT, TH N 88-03-51 E 584.35 FT, TH S 01-56-09 E 325.97 FT TO POB, CONT 3.14 AC SPLIT ON 01/29/2002 FROM K -11-33-100-010; PARCEL OF LAND LOCATED IN PT ON THE NE 1/4 OF SEC 33, T3S, R7E, YPSILANTIL TWP, WASH CO, MI, DESC AS BEG AT PT DIST N 00-34-16 W 16.50 FT , TH S 88-03-51 W 371.66 FT TO THE POB, TH S 88-03-51 W 125.00 FT, N 01-56-09 W 325.97 FT, TH N 88-03-51 E 26.00 FT, TH N 78-52-51 E 100.29 FT, TH S 01-56-09 E 341.98 FT TO POB. CONT .95 AC SPLIT ON 01/29/2002 FROM K -11-33-100-010; PARCEL OF LAND LOCATED IN PT ON THE NE 1/4 OF SEC 33, T3S, R7E, YPSILANTIL TWP, WASH CO, MI, DESC AS BEG AT PT DIST N 00-34-16 W 16.50 FT TO THE POB, TH S 88-03-51 W 371.66 FT, TH N 01-56-09 W 341.98 FT, TH N 78-52-51 E 112.45 FT, TH N 88-03-51 E 267.90 FT, TH S 00-43-16 E 360.00 FT TO POB, CONT 3.08 AC SPLIT ON 01/29/2002 FROM K -11-33-100-010;
K -11-36-200-015	10075 Martz Charter Township of Ypsilanti	**7/19/2019**	**$ 63,800**	**$ 12,850**	YP#36-8H E 1/2 OF SW 1/4 OF SW 1/4 OF NW 1/4 SEC 36 T3S-R7E 5.00 AC.

** Per Michigan Constitution, assessed value shall not exceed 50% of true cash value (Article 9, Section 3).
*** Includes all delinquent taxes, interest, penalties, fees, costs, expenses and 2019 Summer Taxes.

Positive
As of: June 10, 2014 4:58 PM EDT

City of Bay City v. Bay County Treasurer

Court of Appeals of Michigan
April 5, 2011, Decided
No. 294556

Reporter: 292 Mich. App. 156; 807 N.W.2d 892; 2011 Mich. App. LEXIS 609

CITY OF BAY CITY, Plaintiff/Counterdefendant-Appellant, v BAY COUNTY TREASURER, Defendant/Counterplaintiff-Appellee.

Subsequent History: As Amended December 22, 2011

Prior History: [***1] Bay County Circuit Court. LC No. 08-003598-CZ.

Core Terms

public purpose, properties, moot, expeditiously, convey, trial court, municipalities, efficiently, foreclosing, township, village, purchase the property, mandatory, parcels, legal duty, constitutes, conditions, tax-foreclosed, unambiguous, argues, governmental unit, selling property, settlement offer, delinquent, elected, parties, legislative function, defendant argues, speculative, mandamus

Case Summary

Procedural Posture

Plaintiff city appealed an order from the Bay County Circuit Court (Michigan), which, following a bench trial, denied the city's request for declaratory and mandamus relief to require defendant county treasurer to convey a tax-foreclosed property to the city.

Overview

The county named its treasurer as the foreclosing governmental unit for purposes of *MCL 211.78m(1)*. The city informed the treasurer that it wished to purchase the foreclosed property, along with certain other parcels, and sent a check to the treasurer in the correct amount. The treasurer determined that he was not obligated to sell unless he was satisfied that the property would serve a public purpose by generating tax revenue efficiently and expeditiously. While the appeal was pending, the treasurer offered to settle the suit by conveying the property to the city. The court determined that the offer to settle, which had not been accepted, did not render the case moot because a party could not unilaterally render a case moot by changing the status quo during the appeal. The court held that the treasurer lacked discretionary authority to impose conditions on a public purpose that were not found within the clear and unambiguous language of *MCL 211.78m(1)*, which created a mandatory legal duty on the treasurer's part to sell the property to the city. The determination of a public purpose for the city's purchase of tax-foreclosed property was a legislative function of the city.

Outcome

The court reversed the trial court.

LexisNexis® Headnotes

Civil Procedure > ... > Justiciability > Mootness > Real Controversy Requirement

HN1 A party can not obliterate an opponent's appeal, on the basis of mootness, by so changing the status quo during the appeal that they can then argue it is impossible to return to the situation that existed when the appeal was filed. A party's strategic choice not to cut its losses by settling does not make a lawsuit moot. A desire for a favorable precedent will not prevent a case from becoming moot, but the fact that such a desire figures in the decision not to abandon or settle a suit does not make the suit moot. This reasoning is persuasive where a defendant has offered a settlement, but a full and complete settlement has yet to be reached and there continues to be, though with an offer of settlement on the table, an ongoing controversy. A defendant may not unilaterally render a case moot by changing the status quo during the appeal.

Civil Procedure > ... > Writs > Common Law Writs > Mandamus

Civil Procedure > Appeals > Standards of Review > Abuse of Discretion

Civil Procedure > Appeals > Standards of Review > De Novo Review

HN2 A trial court's decision regarding a writ of mandamus is reviewed for an abuse of discretion. A trial court abuses its discretion when its decision falls outside the range of reasonable and principled outcomes. However, whether the defendant had a clear legal duty to perform and whether the plaintiff had a clear legal ***right*** to the performance of that duty are questions of law, which are reviewed de novo. Similarly, the appellate court

reviews de novo the legal question of the interpretation of a statute.

Civil Procedure > ... > Writs > Common Law Writs > Mandamus

HN3 Mandamus is appropriate where (1) the plaintiff has a clear legal ***right*** to the performance of the specific duty sought, (2) the defendant has a clear legal duty to perform, (3) the act is ministerial, and (4) no other legal or equitable remedy exists that might achieve the same result.

Tax Law > ... > Real Property Taxes > Collection of Tax > Tax Deeds & Tax Sales

HN4 See *MCL 211.78m(1)*.

Tax Law > ... > Real Property Taxes > Collection of Tax > Tax Deeds & Tax Sales

HN5 *MCL 211.78m(1)* clearly and unambiguously provides that if the state elects not to purchase tax-foreclosed property under its ***right of firstrefusal***, a city, village, or township may purchase the property for a public purpose.

Governments > Legislation > Interpretation

HN6 If the language in a statute is clear and unambiguous, a court assumes that the legislature intended its plain meaning, and the statute must be enforced as written. A court may read nothing into an unambiguous statute that is not within the manifest intent of the legislature as derived from the words of the statute itself. Similarly, a court should not judicially legislate by adding language to the statute.

Governments > Legislation > Interpretation

Tax Law > ... > Real Property Taxes > Collection of Tax > Tax Deeds & Tax Sales

HN7 The determination of what constitutes a public purpose is primarily the responsibility of the legislature, and the concept of public purpose has been construed quite broadly in Michigan . Accordingly, it is not for the courts to read into *MCL 211.78m(1)* restrictions or conditions on what constitutes a public purpose that are not within the language of the statute itself and which essentially usurp the legislature's authority to determine what constitutes a public purpose.

Tax Law > ... > Real Property Taxes > Collection of Tax > Tax Deeds & Tax Sales

HN8 The determination of public purpose is an essentially legislative function. The review of an action of the legislature for compliance with the law is an essentially judicial function. The language of *MCL 211.78m(1)* contemplates no discretionary or decision-making role for any executive body. Indeed, the role of the foreclosing governmental unit (FGU) in a city's purchase of property is essentially administrative, as well as mandatory: If property is purchased by a city, village, township, or county under this subsection, the FGU shall convey the property to the purchasing city, village, township, or county within 30 days. The statute's use of the word "shall" indicates a mandatory act, not a permissive one. The determination of a proper purpose for the purchase of tax delinquent property is a legislative function, vesting such determinations with the city's council. Furthermore, because *MCL 211.78m(1)* creates a mandatory legal duty on the FGU's part to sell the property to the municipality, granting no discretion to decide not to sell such property, the statute does not empower the FGU to make an independent determination as to the municipality's professed public purpose. Pursuant to *MCL 211.78m*, the selling of property is a mandatory act by the FGU, not a discretionary one.

Judges: Before: FORT-HOOD, P.J., and BORRELLO and STEPHENS, JJ.

Opinion by: STEPHEN L. BORRELLO

Opinion

[894]** **[*157]** BORRELLO, J.

Plaintiff appeals as of ***right*** the trial court's order denying its claim to declaratory and **[*158]** mandamus relief following a bench trial. For the reasons set forth in this opinion, we reverse.

I. FACTS

The relevant facts are largely undisputed. Under the current statutory tax-foreclosure scheme, the state of Michigan has a ***right of firstrefusal*** to purchase any tax-foreclosed properties in the state. *MCL 211.78m(1)*. If the state declines to purchase a property, the city, village, or township within whose limits the property is located may purchase it "for a public purpose." *Id.* The price of purchase (referred to as the "minimum bid") is set at what the minimum bid would be if the property were being auctioned off, which is determined by adding all taxes, interest, and fees owed on the property, so that the foreclosing governmental unit (FGU) breaks even on the property. *MCL 211.78m(11)*. Before 1999, the state administered the tax-foreclosure scheme in every Michigan county. In 1999, the Legislature passed Public Act 123, which allowed counties to "opt-in" and replace the **[***2]** state as the FGU, administering foreclosures within their jurisdictions. *MCL 211.78(3)*, as amended by 1999 PA 123. On December 14, 2004, Bay County elected to name its treasurer, defendant, as its FGU.

Starting in 2005, defendant, as the FGU, began foreclosing on properties, but plaintiff did not seek to purchase any

foreclosed properties until 2008. In 2008, defendant foreclosed on 16 parcels within plaintiff's limits. Plaintiff informed defendant that it wished to purchase four of the parcels and forwarded a check to defendant in the amount of the total of the minimum bids for the four parcels. Defendant determined **[**895]** that he was not obligated to sell the parcels to plaintiff unless he was satisfied that plaintiff would be returning the property to a position in which the property would **[*159]** generate tax revenue. Following defendant's determination, officials of plaintiff and Bay County met to discuss the issue and come to an understanding, but they were not able to reach an agreement. On August 22, 2009, plaintiff filed this action against defendant for declaratory and mandamus relief. Plaintiff sought a declaration that its stated public purpose for the parcels **[***3]** was valid and a writ of mandamus directing defendant to transfer title to the parcels.

The properties sought by plaintiff were located at 105 West Thomas, 1216 Park Avenue, 606 Wilson, and 1906 Broadway. In its complaint, plaintiff stated its public purpose was "to reduce the number of vacant tax reverted properties within [plaintiff]'s limits thereby minimizing the real and present dangers they present and to remove certain blighted conditions present on the subject properties" and that, through redevelopment of the properties, plaintiff "will ensure a healthy and growing tax base."

Both parties moved for summary disposition, with plaintiff arguing that there were only two conditions placed on the conveyance of property: that plaintiff tenders the purchase price to the FGU and that plaintiff has a public purpose for the property. Plaintiff argued it was undisputed that both of these requirements were fulfilled; hence, defendant had a clear legal duty to convey the properties, and plaintiff had a clear legal ***right*** to the performance of that duty. Defendant argued he had a statutory duty "to confirm that the municipality wants the requested property for a public purpose and that the **[***4]** municipality will be able to accomplish that purpose efficiently and expeditiously." He asserted that plaintiff had no public purpose for the Park Avenue, Broadway, and West Thomas properties, and that plaintiff would not be able to achieve its public purpose for the Wilson property **[*160]** efficiently and expeditiously. The trial court denied both parties' motions, and the case went to a bench trial.

At trial, defendant testified that it was unclear that plaintiff had a public purpose for the properties. Stephen Black, plaintiff's Deputy City Manager of Community Development, testified that plaintiff sought to acquire the Broadway property in order to tear down the building thereon and use the land as a parking lot for the adjacent property, which the city already owned. The Park Avenue property, according to Black, presented health and safety issues because it was "severely impacted by cat urine." Black said that foreclosure of the West Thomas property presented an opportunity to eliminate a multi-family home, noting that multi-family homes generate complaints in single-family areas. The city planned to either demolish the home or redevelop it. Defendant testified that the West Thomas property **[***5]** was a single-family, not a multi-family, dwelling. As for the Wilson property, Black testified it was a vacant lot that the city was considering conveying to Habitat for Humanity for it to build a new home.

The trial court found for defendant with respect to the Wilson and Broadway parcels, and for plaintiff with respect to the Park Avenue and West Thomas parcels. The parties agreed that, pending appeal, defendant would not "auction, sell, or otherwise dispose of" the Park Avenue, West Thomas, and Wilson properties and that it would not convey the Park Avenue and West Thomas properties to plaintiff. Plaintiff agreed not to seek the Broadway property.

[896]** Because defendant did not appeal the decision with respect to the Park Avenue and West Thomas properties, and because plaintiff agreed not to pursue its claim to the Broadway property, the only property at issue in this appeal is the Wilson property.

[*161] II. MOOTNESS

Defendant argues on appeal that this claim is moot because he has offered to settle the suit by conveying the Wilson property to plaintiff. According to defendant, this removes any case or controversy between the parties. Defendant also argues that this does not fall into the mootness **[***6]** exception "carved out for those situations where . . . the issue is of public significance and likely to recur while also likely to evade judicial review." Defendant argues that it is speculative whether plaintiff will seek to purchase tax-foreclosed property from defendant again and that even if it does, it is only speculative that defendant will refuse to convey the property, and that even if both of these things occur, there will be opportunity for judicial review of the issue at that time.

Plaintiff denies the assertion that there is no case or controversy between the parties. Plaintiff argues that an offer to settle does not render a case moot unless the offer is accepted, and plaintiff has not accepted defendant's offer to convey the property in question. Plaintiff also notes that defendant has not conceded the legal points at issue in this case. Regarding the mootness exception for cases involving issues of public significance that recur but are likely to evade judicial review, plaintiff points out that, although it did not purchase any tax-foreclosed properties

in 2009, it has regularly purchased tax-foreclosed properties in the past and certainly will do so in the future. [***7] And plaintiff argues that, if defendant's settlement offer renders the issue moot, there is a possibility that the issue will evade judicial review because defendant could simply convey the property every time plaintiff challenges its ***refusal*** to do so.

In *MGM Grand Detroit, LLC v Community Coalition for Empowerment, Inc, 465 Mich 303; 633 NW2d 357 (2001)*, the Detroit City Council passed an ordinance [*162] allowing the plaintiff to use a specified site to build a casino. *Id. at 311-312* (CAVANAGH, J., dissenting). The defendant conducted a petition drive in an attempt to refer the ordinance, but the city clerk denied the petition on the ground that the ordinance was exempt from referendum. *Id. at 312*. The plaintiff sought a declaratory judgment that the ordinance was in fact exempt from referendum. *Id.* After the trial court granted the plaintiff's motion for summary disposition, the plaintiff went ahead with its casino construction, although the defendant had filed a claim of appeal with this Court. *Id. at 312-313*. Our Supreme Court addressed the issue of mootness in light of these developments. Justice CAVANAGH's dissent, which Justice KELLY joined, concluded that the defendant could not have [***8] the relief it sought, because even if the referendum were allowed and the ordinance defeated, the casino would remain as an allowed, prior nonconforming use of the land. *Id. at 313-314*. The majority rejected this conclusion, holding that ***HN1*** "a party can not [sic] obliterate an opponent's appeal, on the basis of mootness, by so changing the status quo during the appeal . . . that [it] can then argue it is impossible to return to the situation that existed when the appeal was filed." *Id. at 307*.

This case presents the reverse situation—defendant seeks to render the appeal moot not by making it impossible [**897] for plaintiff to have the relief it seeks, but by giving plaintiff that relief. In *Bd of Ed of Oak Park & River Forest High Sch Dist 200 v Ill State Bd of Ed, 79 F3d 654, 659 (CA 7, 1996)*, the Seventh Circuit of the United States Court of Appeals held that a party's "strategic choice [not to 'cut its losses' by settling] does not make [a] lawsuit moot. A desire for a favorable precedent will not prevent a case from becoming moot, but the fact that such a desire figures in the decision not to abandon or settle a suit does not *make* the suit moot." (Citations [*163] omitted; emphasis in original.) Relative [***9] to the issues presented in this case, we find the reasoning of the Seventh Circuit persuasive. Here, defendant has offered a settlement. We note that a full and complete settlement has yet to be reached and there continues to be, though with an offer of settlement on the table, an ongoing controversy.

Additionally, as plaintiff notes, even if it received the Wilson property, this would only satisfy the mandamus claim. Plaintiff also sought a declaratory judgment that its "stated public purpose is a valid public purpose under the laws of the State of Michigan." Because defendant will not and cannot give plaintiff such a declaration, there is still a controversy that this Court may decide. Although the nature of the action by which defendant seeks to render this case moot differs from that in *MGM Grand Detroit*, that case did hold that a defendant may not unilaterally render a case moot "by . . . changing the status quo during the appeal." *MGM Grand Detroit, 465 Mich at 307*. Similarly, the fact that plaintiff has not accepted defendant's offer to settle the suit by conveying the property to plaintiff because it desires a favorable precedent does not render the case moot. *Bd of Ed of Oak Park & River Forest High Sch Dist 200, 79 F3d at 659*. [***10] Accordingly, we hold that the issues presented in this case are not rendered moot by defendant's offer of settlement.

III. PUBLIC PURPOSE UNDER *MCL 211.78m(1)*

Plaintiff argues that *MCL 211.78m* requires it to have a public purpose to purchase the Wilson property and that it sought the property to build a new home, which qualifies as economic development and therefore is a public purpose. Plaintiff further contends that defendant refused to convey the property because he did not believe that the public purpose could be accomplished [*164] "'efficiently' and 'expeditiously.'" According to plaintiff, the statute only requires a public purpose and not these additional conditions. Conversely, defendant argues that the intent of *MCL 211.78m* will not be carried out unless properties are purchased by municipalities for a public purpose that can be efficiently and expeditiously carried out. Defendant points out that in other contexts, Michigan courts have interpreted "public purpose" to be more than just a speculative idea or a future possibility and that without a requirement of a detailed plan that can be expeditiously carried out, the "public purpose" [***11] requirement is illusory. According to the trial court, plaintiff's "proposal [regarding the Wilson property] does not promote the prosperity and general welfare of the residents of Bay City" and was "too speculative to constitute a proper public purpose."

HN2 "A trial court's decision regarding a writ of mandamus is reviewed for an abuse of discretion." *Casco Twp v Secretary of State, 472 Mich. 566, 571; 701 N.W.2d 102 (2005)*. A trial court abuses its discretion when its decision falls outside the range of reasonable and principled outcomes. *Maldonado v Ford Motor Co, 476 Mich 372, 388; 719 NW2d 809 (2006)*. However, "whether defendant had a clear legal duty to perform and whether plaintiff [**898] had a clear legal ***right*** to the performance of that duty . . . are questions of law, which this Court reviews de novo." *Carter v Ann Arbor City*

Attorney, 271 Mich App 425, 438; 722 NW2d 243 (2006). Similarly, this Court reviews de novo the legal question of the interpretation of a statute. People v Moore, 470 Mich 56, 61; 679 NW2d 41 (2004); Robertson v DaimlerChrysler Corp, 465 Mich 732, 739; 641 NW2d 567 (2002).

In Tuggle v Dep't of State Police, 269 Mich App 657, 668; 712 NW2d 750 (2006), this Court [***12] held that ***HN3*** mandamus [*165] is appropriate where (1) the plaintiff has a clear legal ***right*** to performance of the specific duty sought, (2) the defendant has a clear legal duty to perform, (3) the act is ministerial, and (4) no other legal or equitable remedy exists that might achieve the same result. See also Lickfeldt v Dep't of Corrections, 247 Mich App 299, 302; 636 NW2d 272 (2001); Delly v Bureau of State Lottery, 183 Mich App 258, 260-261; 454 NW2d 141 (1990).

MCL 211.78m(1) provides, in relevant part:

> ***HN4*** Not later than the ***first*** Tuesday in July, immediately succeeding the entry of judgment under section 78k vesting absolute title to tax delinquent property in the foreclosing governmental unit, this state is granted the ***right of firstrefusal*** to purchase property at the greater of the minimum bid or its fair market value by paying that amount to the foreclosing governmental unit if the foreclosing governmental unit is not this state. If this state elects not to purchase the property under its ***right of firstrefusal***, a city, village, or township may purchase for a public purpose any property located within that city, village, or township set forth in the judgment and subject to sale under [***13] this section by payment to the foreclosing governmental unit of the minimum bid. . . .

At trial, defendant seemingly conceded that plaintiff stated a public purpose for purchasing the Wilson property. On appeal, however, he argues that plaintiff's public purpose was unclear. He claims that plaintiff sought to obtain the properties "in order to minimize a 'real and present danger' and to remove 'blighted conditions on the subject properties.'" But according to the complaint, plaintiff sought the property "to reduce the number of vacant tax reverted properties within Bay City's limits thereby minimizing the real and present dangers they present and to remove certain blighted conditions present on the subject properties." [*166] And the resolution passed by plaintiff authorizing it to acquire the properties reads, in relevant part, as follows:

> **Whereas**, the City of Bay City desires to acquire selected tax-reverted properties for the purpose of stimulating private investment through the redevelopment of each property; and
>
> **Whereas**, by improving and selling the various parcels, these economic development efforts will ensure a healthy and growing tax base . . . .

Thus, plaintiff demonstrated [***14] a public purpose beyond minimizing dangers and abating blight. Cf. Kelo v City of New London, 545 U.S. 469, 484; 125 S. Ct. 2655; 162 L. Ed. 2d 439 (2005) (rejecting the argument that economic development does not qualify as a public use in an eminent domain case and stating that "[p]romoting economic development is a traditional and long-accepted function of government").

However, defendant argues that the statutory scheme requires that the identified public purpose be capable of being efficiently and expeditiously carried out. Plaintiff asserts that the trial court's conclusion that plaintiff's plan to construct [**899] a new home on the Wilson property was too "speculative to constitute a proper public purpose" essentially incorporates the requirements that a public purpose must be executed efficiently and expeditiously. The terms "efficiently," "expeditiously," and "speculative" are not found in MCL 211.78m(1).***HN5*** The statute clearly and unambiguously provides that if the "state elects not to purchase the property under its ***right of firstrefusal***, a city, village, or township may purchase" the property "for a public purpose." MCL 211.78m(1). ***HN6*** If the language in a statute is clear and unambiguous, [***15] this Court assumes that the Legislature intended its plain meaning, and the [*167] statute must be enforced as written. Roberts v Mecosta Co Gen Hosp, 466 Mich 57, 63; 642 NW2d 663 (2002). This Court "may read nothing into an unambiguous statute that is not within the manifest intent of the Legislature as derived from the words of the statute itself." *Id.* Similarly, this Court should not "judicially legislate by adding language to the statute." Empire Iron Mining Partnership v Orhanen, 455 Mich 410, 421; 565 NW2d 844 (1997). In Advisory Opinion on Constitutionality of 1976 PA 295 & 1976 PA 297, 401 Mich 686, 696; 259 NW2d 129 (1977), our Supreme Court stated that ***HN7*** "the determination of what constitutes a public purpose is primarily the responsibility of the Legislature, and . . . the concept of public purpose has been construed quite broadly in Michigan." Accordingly, it is not for the courts to read into MCL 211.78m(1) restrictions or conditions on what constitutes a public purpose that are not within the language of the statute itself and that essentially usurp the Legislature's authority to determine what constitutes a public purpose.

We note that while MCL 211.78m(1) does not contain any **[***16]** language requiring the property to be purchased for a public purpose that can be carried out efficiently and expeditiously, such language is found in MCL 211.78(1):

> The legislature finds that there exists in this state a continuing need to strengthen and revitalize the economy of this state and its municipalities by encouraging the efficient and expeditious return to productive use of property returned for delinquent taxes. Therefore, the powers granted in this act relating to the return of property for delinquent taxes constitute the performance by this state or a political subdivision of this state of essential public purposes and functions.

The reference to "efficient and expeditious return to productive use" in this legislative finding is not a constraint on the public purpose identified by a city, **[*168]** village, or township purchasing tax-delinquent property under MCL 211.78m(1). Rather, it is a statement of the purposes of the tax-reversion statutory scheme. Due to the perception of the Legislature that the existing statutory provisions addressing reverted properties were inefficient, the Legislature revamped the General Property Tax Act in 1999 PA 123 in order to effectuate "the efficient **[***17]** and expeditious return to productive use of property returned for delinquent taxes."[1] This is the **[**900]** public purpose of the GPTA, not the public purpose of a city, village, or township purchasing tax-delinquent property.[2]

It is not the prerogative of this Court to "judicially legislate by adding language to [a] statute." *Orhanen*, 455 Mich at 421. In this case, the trial court essentially imposed a constraint on what constitutes a public purpose that is not found within the language of MCL 211.78m(1). Plaintiff's stated purpose was to improve and sell the property. Whether it could do so efficiently and expeditiously was relevant to plaintiff's ability to carry out its purpose, but was not relevant to **[*169]** the question whether plaintiff was purchasing the property "for a public purpose" as required by MCL 211.78m(1).

We hold that the trial court erred in finding for defendant with respect to the Wilson property by adding conditions on a "public purpose" that are not found within the clear and unambiguous language of MCL 211.78m(1). Given the evidence presented, including defendant's admission at trial that plaintiff had stated a public purpose, there was no basis for the trial court to find in favor of defendant regarding the Wilson property. Because the trial court added language to the statute to arrive at its conclusions, it abused its **[***19]** discretion in denying mandamus relief to plaintiff.

IV. COUNTY TREASURER'S AUTHORITY TO MAKE AN INDEPENDENT ASSESSMENT OF PUBLIC PURPOSE UNDER MCL 211.78m(1)

Plaintiff argues that MCL 211.78m(1) gives no authority to defendant to question plaintiff's determination of public purpose. According to plaintiff, such a determination is traditionally considered a legislative function, and is thus properly left to plaintiff, as a legislative body. Plaintiff contends that unless the statute says otherwise, the power to review plaintiff's decision lies in the courts, the body that traditionally reviews actions for their consistency with the laws. Finally, plaintiff argues that the proper course of action would be for defendant to obey the statute's command that it sell the property to plaintiff. If it later becomes evident that plaintiff does not have a public purpose for the property, a party with standing could bring suit to challenge the purchase of the property.

Conversely, defendant argues that it does not usurp the function of the courts for an FGU to review a municipality's determination of public purpose. Defendant **[*170]** contends that if the courts can review the FGU's determination, judicial review **[***20]** is still possible. Additionally, defendant argues that he is in the best position to determine which properties to allow municipalities to purchase at the minimum bid and which properties to put to public auction to best manage and maintain the integrity of the delinquent tax revolving fund.

As noted above, MCL 211.78m(1) requires property purchased by a municipality under the statute to be purchased "for a public purpose." The statute does not, however, specify who makes the determination whether a purpose constitutes a public purpose, nor does it specify what body, if any, may review that determination.

---

[1] The legislative analysis prepared for 1999 PA 123 states that the then current "tax delinquent property reversion process takes about six years to complete." House Legislative Analysis, HB 4489, July 23, 1999, p 1. In order to address this delay in returning tax-delinquent property to tax-current status, while still honoring the ***rights*** of property owners, the legislation revamping the tax-reversion process was proposed. *Id.*, p 2. While the use of legislative analysis has been criticized as being unpersuasive in terms of statutory construction, such analyses do have probative value in certain circumstances, see, e.g., *Kinder Morgan Michigan, LLC v City of Jackson*, 277 Mich App 159, 170; 744 NW2d 184 (2007), and continue to be cited in cases involving statutory interpretation, see, e.g., *Bush v Shabahang*, 484 Mich 156, 174 n 29; 772 NW2d 272 (2009).

[2] In some ways, this is an example of the classic fallacy of equivocation. The term "public purpose" is being used in two **[***18]** different, albeit related, ways in MCL 211.78(1) and MCL 211.78m(1).

[901]** Although defendant claims that the statute empowers him to review plaintiff's determination of public purpose, he makes no argument in support of this assertion. His argument, instead, is that it will benefit the entire county if he is allowed to decide which properties are sold to municipalities and which go to auction. But this argument does not relate to the question of public purpose—instead, defendant's argument is that he should have general discretion to sell or not sell properties to municipalities on the basis of what most benefits the county.

Plaintiff argues that **[***21]** its council is the proper body to determine whether there is a public purpose, because it consists of "'the elected representatives of the people.'" *Horton v Kalamazoo, 81 Mich App 78, 81; 264 NW2d 128 (1978)*, quoting *Gregory Marina, Inc v Detroit, 378 Mich 364, 394; 144 NW2d 503 (1966)*. Defendant points out that he is also an elected representative, elected by a larger constituency than plaintiff's council.

[*171] More to the point, however, is plaintiff's separation of powers argument. As noted previously in this opinion, our Supreme Court has stated that "the determination of what constitutes a public purpose is primarily the responsibility of the Legislature." *1976 PA 295, 401 Mich at 696*; accord *Gregory Marina, Inc, 378 Mich at 394-395* (T. M. KAVANAGH, C.J.) (noting that determination of public purpose is a legislative, not a judicial, question); *Advisory Opinion on Constitutionality of 1986 PA 281, 430 Mich 93, 129-130; 422 NW2d 186 (1988)* (stating that Michigan has "recognized a liberal version of the public purpose doctrine"). ***HN8*** The determination of public purpose is an essentially legislative function, see *MCL 211.78*, and plaintiff's council is a legislative body. The review **[***22]** of an action of the Legislature for compliance with the law is an essentially judicial function. The language of the portion of the statute at issue contemplates no discretionary or decision-making role for any executive body. Indeed, the FGU's role in a city's purchase of property is essentially administrative, as well as mandatory: "If property is purchased by a city, village, township, or county under this subsection, the [FGU] *shall convey* the property to the purchasing city, village, township, or county within 30 days." *MCL 211.78m(1)* (emphasis added). The statute's use of the word "shall" indicates a mandatory act, not a permissive one. *People v Francisco, 474 Mich 82, 87; 711 NW2d 44 (2006)*.

In keeping with precedent, we hold that the determination of a proper purpose for the purchase of tax-delinquent property is a legislative function, vesting such determinations as arose in this case with plaintiff's council. Furthermore, because *MCL 211.78m(1)* creates a mandatory legal duty on defendant's part to sell the property to plaintiff, granting him no discretion to decide not to sell such property, the statute does not **[*172]** empower a county treasurer such as defendant to make **[***23]** an independent determination as to a municipality's professed "public purpose." Pursuant to *MCL 211.78m*, the selling of property is a mandatory act by defendant, not a discretionary one. For these reasons, the trial court erred to the extent it implicitly held that defendant had a ***right*** to review plaintiff's determination of public purpose, and it abused its discretion by denying plaintiff mandamus relief.

Reversed and remanded. No costs are awarded to either party, a public question being involved. *MCR 7.216(A)(7)* and *MCR 7.219(A)*.

/s/ Stephen L. Borrello

/s/ Karen M. Fort-Hood

/s/ Cynthia Diane Stephens

Charter Township of Ypsilanti
"Placing Residents First"

Office (734) 544-4225
Fire Chief (734) 544-4110
Fire Marshal (734) 544-4107
Fax (734) 544-4195

FIRE DEPARTMENT
222 SOUTH FORD BOULEVARD
YPSILANTI, MICHIGAN 48198-6067

June 7, 2019

Charter Township of Ypsilanti
Supervisor Brenda Stumbo and Trustee Board
7200 S. Huron River Drive

Dear Madam Supervisor and Trustee Board,

In service to the Township, I am requesting for the June 18, 2019 Township board meeting to present the following item(s) for consideration:

1) Authorization to approve a vehicle/driver lease proposal from Intertek on the ACM site to use a Charter Township of Ypsilanti fire truck supplied with a Firefighter driver for test research of emergent response truck on driverless vehicles.

   Attached you will find a lease agreement based on the MDOT Schedule C – Equipment Rental Rates (hourly), Average Firefighter OT hourly rate ($45.89) from Human Resources, specified duration/term of Intertek research, and Certificates of Liability Insurance in the amount of $1,000,000 for both auto and general liability to move forward this lease agreement.

Thank You,

Eric Copeland, Fire Chief Ypsilanti Township

Equipment Lease Agreement

This contract agreement for Equipment Lease ("Lease") between _Ypsilanti Township_ (the "Lessor") and _ACM_____ ("Lessee") is made and entered into upon the following date: _06/18_/2019 with an expiration date of 06_/18_/2022__. The following described equipment shall be Leased by Lessor to Lessee:

American Center for Mobility

_____

2701 Airport Dr.

_____

Ypsilanti, MI. 48198

_____

1. The monthly MDOT truck rental rate as determined by MDOT equipment rental rates Schedule C, Line # 12.307, Fire Truck - 41,000 minimum G.V.W.R. @ $53.87 Rate per Hour
2. Report 375, 12/31/2018.
3. Hourly Driver Rate for equipment operation to be $45.89

Usage Description:
Fire truck/FF driver lease on as needed basis hourly, FT @ $53.87 hourly / FF @ $45.89 hourly 4 hr. minimum not to exceed 10 hours daily, with a 48-hour advanced notice until year 2022 or with annual renewal clause. Fire truck/Driver to drive on ACM facility Freeway loop, Urban Arterial, Planet M Blvd, and 6x6 intersection

3. The Lessee assumes and will bear the entire risk of loss and damage to the Equipment from any and all causes whatsoever. No loss or damage to the Equipment or any part thereof will the Lessee not be responsible for under the terms of this Lease Agreement which is in full effect and force until the expiration date stated above has been reached. In the event that there is loss or damage to Equipment of any kind, Lessee will at Lessor's option: Place the Equipment in good repair, condition and working order or replace the Equipment with the same in good repair and working condition or pay the Lessor the full replacement cost of the Equipment.

4. The Lessee shall continuously maintain and pay for all risk insurance against the loss of and damage to the Equipment for nothing less than the full replacement cost of the Equipment and naming the Lessor as the loss payee. Along with public liability and property damage insurance with the limits approved by Lessor and naming the Lessor as named insured and loss payee. The purchased insurance will be with a

company that is reasonably acceptable to Lessor. Lessee will provide to Lessor at least a thirty day advance written notice of any cancellation, change or modification and will provide primary coverage for the protection of Lessee and Lessor without any consideration of any additional coverage that may be carried by Lessor for protection against similar risks. Lessee will provide Lessor with an original copy of the policy or certificate as evidence for the purchase of previously discussed required Equipment insurance. Lessee hereby appoints Lessor as Lessee's attorney with power and authority to make any claims, receive payments and endorsing any documents, checks and or drafts that are necessary to secure payments that are due under the above required insurance policy.

5. If Lessee fails to maintain the previously discussed insurance policy or to pay fees, assessments, charges and taxes all previously specified in this Lease, Lessor has the right to pay any fees that are due. In such an event the cost will be repayable to Lessor with the very next payment and any failure to repay the amount due shall carry with it a penalty of ten percent per annum for failure to pay any installment as discussed in this Lease Agreement.

6. Neither this Lease nor anything related to this Lease is assignable or transferable by any operation of law. If Lessee is determined to be insolvent, or if a writ of attachment or execution is levied on the Equipment and is not released or paid within ten days or if a receiver is appointed to take possession or control of the Equipment, then the Lessor may exercise any one of the following remedies that are set forth in Section 12 of this Lease Agreement and this Lease at the option of the Lessor without prior notice may be terminated and the Equipment will not be treated as an asset of the Lessee after Lease termination.

7. If the Lessor requests any documents that are necessary to protect the interest of the Lessor in the operation of the Equipment then the Lessee will provide the needed documents.

8. The Lessee will not assign the Equipment Lease Agreement for the above mentioned Equipment without the prior written consent of the Lessor.

9. If there is any part of this Agreement that is not valid it will not cause any other part to be invalid or unenforceable.

PREVAILING WAGE PROVISION (ORDINANCE NO. 69)
(IF APPLICABLE) _____

LIVING WAGE ORDINANCE (IF APPLICABLE) _____

BONDS: (IF PROJECT IS OVER $25,000.00)

PERFORMANCE-LABOR-MATERIAL BOND-(IF REQUIRED) _____
GUARANTEES COMPANY WILL DO THE JOB CORRECTLY.
AMOUNT EQUAL TO THE AMOUNT OF THE CONTRACT
SOMETIMES CALLED LABOR & MATERIALS BOND

MAINTENANCE –GUARANTEE BOND-(IF REQUIRED) _____

AMOUNT EQUAL TO THE AMOUNT OF THE CONTRACT

PAYMENT BOND (IF REQUIRED)-GUARANTEES CONTRACTOR _____

WILL PAY SUBCONTRACTORS AND SUPPLIERS.
AMOUNT EQUAL TO THE AMOUNT OF THE CONTRACT

BID BOND (IF REQUIRED)-GUARANTEES PRICE OF PROJECT. _____
USUALLY 5% OF THEIR BID. SOMETIMES CALLED A

"SURETY BOND".

Applicable Law

This contract shall be governed by the laws of the State of Michigan in _Ypsilanti Township, Washtenaw County and any applicable Federal Law.

James Rollison Date 6/13/2019

Signature of ACM Operations Manager, James Rollison

_____ Date_____

Signature of Ypsilanti Township Supervisor

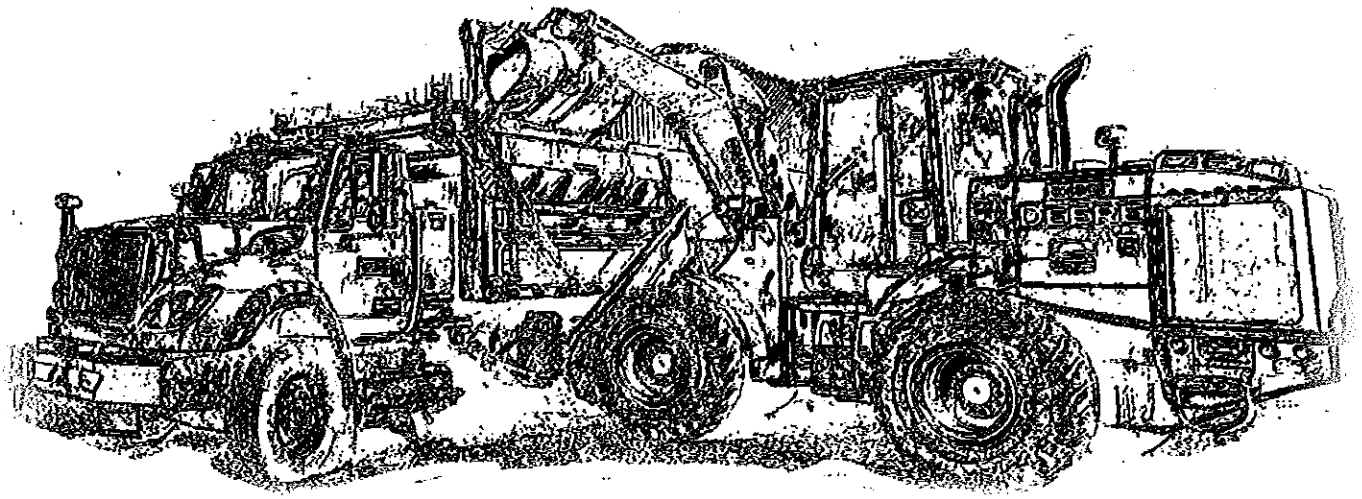
_____ Date_____

Signature of Ypsilanti Township Clerk

MDOT
Michigan Department of Transportation

Equipment Rental Rates

Schedule C



REPORT 375

Effective January 1 through December 31, 2018

Equipment Rental Rates (Schedule C)
Report 375

EFFECTIVE JANUARY 1, 2018

THROUGH

DECEMBER 31, 2018

Hourly equipment rental rates are based on the following data reported by County Road Commissions on the county equipment questionnaires:

1. Expenses: Direct repair, indirect repair and storage, operating and depreciation.

2. Hours of equipment operation.

These rates were computed by using 2016 actual expenses of County Road Commissions, plus a factor for estimated increased costs between 2016 and 2018.

Counties possessing a State Trunk Line Maintenance Contract will be reimbursed at these rates. However a county may elect to use a modified rate for reimbursement, in accordance with subsection 15(F) of the contract.

Table for Computing Equipment Depreciation

5 Year Depreciation

10.100, 10.200, 12.300, 12.301, 12.302, 12.303, 12.304, 12.305, 12.306, 12.307, 12.400, 12.501, 12.502, 12.503, 12.504, 31.100, 31.400, 62.500, 63.420, 63.430, 63.500, 63.510, 63.550, 63.554, 63.560, 63.565, 63.570, 63.575, 63.600, 63.700, 63.701, 63.702, 63.801, 63.802, 81.110, 81.120, 81.130, 81.251, 81, 252, 81.253, 81.254, 81.255, 81.256, 81.257, 81.258, 81.261, 81.262, 82.110, 82.119, 82.120, 82.121, 82.122 82.128, 82.130, 82.140, 95.350

Calendar Year Month	Fiscal Year 10/1 – 9/30 Month	Month	Year of Purchase	Depreciation Years				
				2nd Year	3rd Year	4th Year	5th Year	6th Year
January	October	1	33.00%	27.00%	20.00%	13.00%	7.00%	0.00%
February	November	2	30.25%	27.50%	20.58%	13.59%	7.50%	0.58%
March	December	3	27.50%	28.00%	21.17%	14.16%	8.00%	1.17%
April	January	4	24.75%	28.50%	21.75%	14.75%	8.50%	1.75%
May	February	5	22.00%	29.00%	22.33%	15.34%	9.00%	2.33%
June	March	6	19.25%	29.50%	22.92%	15.91%	9.50%	2.92%
July	April	7	16.50%	30.00%	23.50%	16.50%	10.00%	3.50%
August	May	8	13.75%	30.50%	24.08%	17.09%	10.50%	4.08%
September	June	9	11.00%	31.00%	24.67%	17.66%	11.00%	4.67%
October	July	10	8.25%	31.50%	25.25%	18.25%	11.50%	5.25%
November	August	11	5.50%	32.00%	25.83%	18.84%	12.00%	5.83%
December	September	12	2.75%	32.50%	26.42%	19.41%	12.50%	6.42%

8 Year Depreciation

All other equipment not listed in 5 year depreciation schedule.

Calendar Year Month	Fiscal Year 10/1 – 9/30 Month	Month	Year of Purchase	Depreciation Years							
				2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	8th Year	9th Year
January	October	1	22.00%	19.00%	17.00%	14.00%	11.00%	8.00%	6.00%	3.00%	0.00%
February	November	2	20.17%	19.25%	17.16%	14.25%	11.25%	8.25%	6.17%	3.25%	0.25%
March	December	3	18.33%	19.50%	17.34%	14.50%	11.50%	8.50%	6.33%	3.50%	0.50%
April	January	4	16.50%	19.75%	17.50%	14.75%	11.75%	8.75%	6.50%	3.75%	0.75%
May	February	5	14.67%	20.00%	17.66%	15.00%	12.00%	9.00%	6.67%	4.00%	1.00%
June	March	6	12.83%	20.25%	17.84%	15.25%	12.25%	9.25%	6.83%	4.25%	1.25%
July	April	7	11.00%	20.50%	18.00%	15.50%	12.50%	9.50%	7.00%	4.50%	1.50%
August	May	8	9.17%	20.75%	18.16%	15.75%	12.75%	9.75%	7.17%	4.75%	1.75%
September	June	9	7.33%	21.00%	18.34%	16.00%	13.00%	10.00%	7.33%	5.00%	2.00%
October	July	10	5.50%	21.25%	18.50%	16.25%	13.25%	10.25%	7.50%	5.25%	2.25%
November	August	11	3.67%	21.50%	18.66%	16.50%	13.50%	10.50%	7.67%	5.50%	2.50%
December	September	12	1.83%	21.75%	18.84%	16.75%	13.75%	10.75%	7.83%	5.75%	2.75%

MDOT Equipment Code	*Equipment Description*	*Rate per Hour*
10.000	**AUTOMOTIVE**	
10.100	Car or station wagon (passenger type)	$11.75
10.200	Bus – 5,400 G.V.W. Minimum	$14.55
11.000	**TRAILERS (Flat Bottom Type)**	
11.100	Under 2 tons	$7.60
11.101	2 tons minimum	$8.84
11.102	6 tons minimum	$10.47
11.103	10 tons minimum	$18.25
11.104	15 tons minimum	$21.22
11.105	25 tons minimum	$23.72
12.000	**TRUCKS**	
	Conventional only. Gas or diesel powered without optional accessories or attachments. Classified by G.V.W.R. (Gross Vehicle Weight Rating), assigned & printed by the manufacturer on the Vehicle Certification.	
12.300	Under 10,500	$9.09
12.301	10,500 minimum	$14.32
12.302	16,000 minimum	$17.25
12.303	19,500 minimum	$19.31
12.304	23,000 minimum	$22.62
12.305	26,000 minimum	$32.14
12.306	33,000 minimum	$51.68
12.307	41,000 minimum	$53.87
	All-Wheel Drive Only. Gas or Diesel powered without optional accessories or attachments. Classified by G.V.W.R. (Gross Vehicle Weight Rating), assigned by the manufacturer on the Vehicle Certification Label.	
12.400	Under 20,000	$11.73
12.401	20,000 minimum	$22.09
12.402	35,000 minimum	$46.83
12.403	40,000 minimum	$49.62
12.404	43,000 minimum	$53.73
12.405	51,000 minimum	$69.67
12.410	Multipurpose 4 WD truck/tractor	$28.61

MDOT Equipment Code	*Equipment Description*	*Rate per Hour*
	Tandem only. Gas or diesel powered without optional accessories or attachments. Classified by G.V.W.R. (Gross Vehicle Weight Rating), assigned and printed by the manufacturer on the Vehicle Certification Label.	
12.501	Under 41,000	$48.99
12.502	41,000 minimum	$54.94
12.503	49,000 minimum	$55.30
12.504	57,000 minimum	$57.87
12.507	Tri-Axle gas or diesel without optional accessories	$82.33
12.508	Quad-Axle gas or diesel without optional accessories	$52.29
13.100	Camper body, pickup mounted	$0.37
13.200	Portable hydraulic dump box (for pickup trucks)	$0.97
13.400	Enclosed van trailer	$4.15
14.100	Super haul body	$2.56
14.125	Dump box liner	$1.58
14.200	Hydraulic hook loader	$4.28
20.000	**BITUMINOUS DISTRIBUTORS AND KETTLES**	
	Distributor tank with motorized pump, heater, distributor bar (not including truck or tractor)	
20.201	400 gallon minimum capacity	$15.78
20.202	1,000 gallon minimum capacity	$25.83
20.203	2,500 gallon minimum capacity	$49.32
	Bituminous Kettles - Hand Operated, Spray Assembly for Joint and Crack Filling, (trailer mounted)	
20.401	Under 80 gallon capacity	$7.71
20.402	80 gallon minimum capacity	$9.29
20.403	165 gallon minimum capacity	$11.79
20.404	225 gallon minimum capacity	$15.18
20.405	300 gallon minimum capacity	$15.73
20.406	500 gallon minimum capacity	$16.05
20.520	Blower-starter (including compressor)	$3.76
20.601	Hot rubber kettle	$16.13
20.700	Lance (for blowing clean and heating crack prior to filling)	$3.32
21.000	**HEATERS**	

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 6/17/2019

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: Phillip Anderson	
Meadowbrook Insurance Agency 26255 American Drive Southfield MI 48034	PHONE (A/C, No, Ext): 248-358-1100	FAX (A/C, No):
	E-MAIL ADDRESS:	

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Lexington Insurance Company	19437
INSURER B : Federal Insurance Co.	20281
INSURER C : QBE Insurance Corporation	39217
INSURER D : National Union Fire Insurance Company	19445
INSURER E :	
INSURER F :	

INSURED: AMERCEN-01
American Center for Mobility
860 Willow Run Airport
Ypsilanti MI 48198

COVERAGES **CERTIFICATE NUMBER:** 1386347821 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY	Y	Y	013811472	11/4/2018	11/4/2019	EACH OCCURRENCE	$ 1,000,000
	[ ] CLAIMS-MADE [X] OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 100,000
							MED EXP (Any one person)	$
							PERSONAL & ADV INJURY	$ 1,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$ 2,000,000
	[ ] POLICY [ ] PRO-JECT [ ] LOC						PRODUCTS - COMP/OP AGG	$ 2,000,000
	[ ] OTHER:							$
B	**AUTOMOBILE LIABILITY**	Y		73605863	11/4/2018	11/4/2019	COMBINED SINGLE LIMIT (Ea accident)	$ 1,000,000
	X ANY AUTO						BODILY INJURY (Per person)	$
	[ ] OWNED AUTOS ONLY [ ] SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	X HIRED AUTOS ONLY X NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	$
								$
C	[ ] **UMBRELLA LIAB** X OCCUR			MQSX0000595101	11/4/2018	11/4/2019	EACH OCCURRENCE	$ 5,000,000
	X **EXCESS LIAB** [ ] CLAIMS-MADE						AGGREGATE	$ 5,000,000
	[ ] DED [ ] RETENTION $							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N						[ ] PER STATUTE [ ] OTH-ER	
	ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? [ ] **(Mandatory in NH)**	N / A					E.L. EACH ACCIDENT	$
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$
							E.L. DISEASE - POLICY LIMIT	$
D	D&O/EPLI			019043276	8/30/2018	8/30/2019		5,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

RE: Rental Fire Trucks to be used for testing purposes on American Center for Mobility's Campus
The Charter Township of Ypsilanti and its past, present, and future elected officials and members are named as Additional Insured with respect to General Liability and Automobile Liability Insurance with respect to the services provided under this contract. In the event of cancellation, change in coverage, or non-renewal of coverage, a 60 day notice (except ten days for non-payment) will be given to the certificate holder.

CERTIFICATE HOLDER

The Charter Township of Ypsilanti
7200 S. Huron River Drive
Ypsilanti MI 48197

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 6/17/2019

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: Phillip Anderson
Meadowbrook Insurance Agency 26255 American Drive Southfield MI 48034	PHONE (A/C, No, Ext): 248-358-1100 FAX (A/C, No): E-MAIL ADDRESS:

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Lexington Insurance Company	19437
INSURER B : Federal Insurance Co.	20281
INSURER C : QBE Insurance Corporation	39217
INSURER D : National Union Fire Insurance Company	19445
INSURER E :	
INSURER F :	

INSURED	AMERCEN-01
American Center for Mobility 860 Willow Run Airport Ypsilanti MI 48198	

COVERAGES **CERTIFICATE NUMBER:** 1207166649 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY [ ] CLAIMS-MADE [X] OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: [ ] POLICY [ ] PRO-JECT [ ] LOC [ ] OTHER:	Y	Y	013811472	11/4/2018	11/4/2019	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000,000 $ 100,000 $ $ 1,000,000 $ 2,000,000 $ 2,000,000
B	AUTOMOBILE LIABILITY X ANY AUTO [ ] OWNED AUTOS ONLY [ ] SCHEDULED AUTOS X HIRED AUTOS ONLY X NON-OWNED AUTOS ONLY	Y		73605863	11/4/2018	11/4/2019	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 1,000,000 $ $ $
C	[ ] UMBRELLA LIAB [X] OCCUR X EXCESS LIAB [ ] CLAIMS-MADE [ ] DED [ ] RETENTION $			MQSX0000595101	11/4/2018	11/4/2019	EACH OCCURRENCE AGGREGATE	$ 5,000,000 $ 5,000,000
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y / N [ ] (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N / A					[ ] PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ $ $
D	D&O/EPLI			019043276	8/30/2018	8/30/2019		5,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

RE: Rental Fire Trucks to be used for testing purposes on American Center for Mobility's Campus
The Ypsilanti Township Fire Department is named as an Additional Insured with respects to General Liability and Automobile Liability. In the event of cancellation, a 60 day notice (except ten days for non-payment) will be given to the certificate holder.

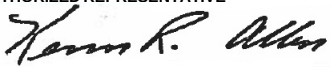
CERTIFICATE HOLDER

Ypsilanti Township Fire Department
222 S. Ford Blvd.
Ypsilanti MI 48198

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE



Charter Township of Ypsilanti
"Placing Residents First"

Office (734) 544-4225
Fire Chief (734) 544-4110
Fire Marshal (734) 544-4107
Fax (734) 544-4195

FIRE DEPARTMENT
222 SOUTH FORD BOULEVARD
YPSILANTI, MICHIGAN 48198-6067

June 7, 2019

Charter Township of Ypsilanti
Supervisor Brenda Stumbo and Trustee Board
7200 S. Huron River Drive

In service to the Township, I am requesting at the June 18, 2019 Township Board regular meeting to present the following item(s) for consideration:

Authorization to accept the Spartan ER – Zahnen Companies bid proposal for a new stock unit fire/rescue engine **SO# 518025** for $515,000 budgeted in line 206-970-000-979-000 CAPITAL OUTLAY FIRE APPARATUS in FY 2019 - FIRE FUND 206. See attachments:

- 2019 Engine Replacement - PowerPoint
- Spartan ER Bid Proposal
- Spartan S-180 / Model #2106-04 Customer View Specifications
- Spartan S-180 / Model #2106-04 Chassis Spec / photos

The new fire engine will replace the current Engine 14-4 housed at the Textile Rd fire station. The new stock unit truck will required lettering, graphics, equipment, and some re-fabrication of storage, hose and tools compartments. The installation of communication equipment, compartment storage tracking and a pump-compartment heater are included in the total cost of the proposal. This proposal is under budget and delivery is in 3-4 months.

The Fire Chief & Truck Committee members will utilize a PowerPoint presentation.

Thank You,

Eric Copeland
Fire Chief

ERC;

Bid Proposal

Gentlemen / Ladies: *On June 5, 2019*

The undersigned is prepared to manufacture for you, upon an order being placed by you, for final acceptance by ***Spartan ER*** *at its main office in Brandon, South Dakota, the apparatus and equipment herein named and for the following prices:*

One (1) *Spartan Metro-Star EMFD Custom Chassis with a Flat Roof.*
One (1) *Tubular Aluminum body with a 1000-gallon poly booster tank.*
One (1) *1500 GPM Waterous single stage pump.*
All equipment specified in the bid packet.

TOTAL DELIVERED PRICE: $515,000.00
Stock Unit SO# 518025
Subject to Prior Sale

Note: No State, Federal or local taxes are included.
Note: Discounts are listed in the bid packet.

Said apparatus and equipment are to be built and shipped in accordance with the specifications hereto attached, delays due to strikes, war or other causes beyond our control not preventing, within ***90 to 120*** *calendar days after receipt of this order and the acceptance thereof at our offices at Brandon, South Dakota, and to be delivered to you at,*

The Ypsilanti Township Michigan Fire Department.

The specifications herein contained shall form a part of the final contract, and are subject to changes desired by the purchaser, provided such alterations are interlined prior to the acceptance by the company of the offer to purchase, and provided such alterations do not materially affect the cost of the construction of the apparatus.

Unless accepted within ***30*** *days from this date, the right is reserved to withdraw this proposal.*

SPARTAN ER

*By*_____
Michael R Zahnen

*907 7th Avenue North * Brandon, South Dakota, 57005 * Phone: (605) 582-4000 * Fax: (605) 582-4001*

2019

Engine Replacement

A. CURRENT FIRE DEPARTMENT FLEET LISTING
B. FACTORS OF REPLACEMENT
C. COMMITTEE RESEARCH: Truck Specifications, Type, Size, Etc.
D. STOCK TRUCK SPECIFICATIONS, COST SUMMARY and COMPARABLES
E. COMMITTEE RECOMMENDATION

Fire Department Vehicle Fleet

YEAR	MAKE	MODEL	DESIGNATION	PLATE	AGE
2015	Spartan	Gladiator	Frontline E14-1	044x446	3yrs
2008	Crimson	Gladiator	Frontline E14-3	044x445	11yrs
2008*	Crimson	Gladiator	Frontline E14-4	044x446	11yrs
1999	American LaFran	Pumper	Reserve E14-5	044x448	20yrs
1999	American LaFran	Telesquirt	Reserve L14-1	044x447	20yrs
1990** * replacement ** retirement	Spartan	Pumper	Reserve E14-2	044x444	29yrs

2008 Crimson “Gladiator” Engine 14-4

Replacement Factors/Indicators

- Use: type / no.# / area of responses annually
    * largest response area for travel distances
    * limited water supply areas
    * rise in response calls

- Annual Maintenance & Legacy (aging) Costs
    * 12 - 15 year frontline shelf life expectancy
    * Increased responses = Increased wear & tear, upkeep

Committee Research

Specifications development basis:

- Response and Performance objectives
- Equipment and Staff use
- Size and Weight
- Storage capacity

Considerations included:

- Construction features
- Engineering
- Warranty
- Maintenance
- Delivery time*

Committee Research Specifications

- Allison Transmission
- Cummins Diesel Engine (450 hp)
- Waterous Pump (1500 gpm)
- UPF Water Tank (1000 gallon*)
- Heavy Duty (Air Ride) Suspension (47,000+/- lb. GVW) Independent front @ 20,000 lbs. - Rear 27,000 lbs.
- Braking: 4 wheel disc brakes
- Compartment storage - 250 cu/ft. minimum
- Equipment List: Pump compartment heater, Thermal Imaging Camera, battery operated tools - lights, fans, saws and fabricated EMS compartment in cab*.

Vendor Truck Specifications

- Stock item - pre-constructed available on 1st come 1st served basis.

- Meets Truck Committee base Specifications:
  - > 450 HP Diesel engine
  - > 4 passenger / full tilt cab
  - > 250 cu/ft compartments
  - > 750 - 1000 gl water tank
  - > 1500 GPM Pump
  - > Size: 32 ft length/10 ft width
  - > 45,000 GVM
  - > Warranties

Stock Truck Cost Summary

Stock unit SO# 518025 MetroStar EMFD $447,500

Equipment: TFT Monitor Package w/pistol grip nozzle, LED flashlights w/charger, PPV fan, battery operated portable scene lights and saws, booster hose, wireless headsets (4), TFT PIV valves w/caps, Thermal Imaging Camera, Pac Trac tool board, generator, etc. $50,000

Modifications: Install Cab dog-house console and pump compartment heater, add (2) duplex receptacles, mount Pac Trac tool boards in compartments, fabricate rear cab EMS compartment, Lettering/Striping/Graphics (Rosie), installation of Department VIU, computer mount, radios, antennas, Knox Box, pump heater, final inspection trip for two (2) people. $17,500

Costs: Stock unit + Equipment + Modifications **$515,000**

Stock Truck Cost Summary

TOTAL COST = $515,000

Stock unit
Cost: $447,500

- Stock unit SO# 518025 MetroStar EMFD

Equipment
Cost: $50,000

- TFT Monitor Package w/pistol grip nozzle
- LED flashlights w/charger
- PPV fan
- Battery operated portable scene lights and saws
- Booster hose,
- Wireless headsets (4)
- TFT PIV valves w/caps
- Thermal Imaging Camera
- Pac Trac tool board
- Generator, etc.

Modifications
Cost: $17,500

- Install Cab dog-house console and pump compartment heater
- Add (2) duplex receptacles,
- Mount Pac Trac tool boards in compartments
- Fabricate rear cab EMS compartment
- Lettering/Striping/Graphics (Rosie)
- Installation of Department VIU, computer mount, radios, antennas, Knox Box, pump heater,
- final inspection trip for two (2) people.

Comparable Cost Summary (HGACby.com)

VENDOR	TRUCK	EQUIPMENT	MODIFICATIONS	TOTAL COST
E- One Code: FS17HE04	Cyclone $463,200 4dr, aluminum cab & body, *1250gpm mid pump	Static - $50,000	Static - $17,500 plus upgrade charges.	$530,700
Pierce Code: FS17TC07	Dash CF $559,450 4dr, aluminum cab & body, *1250gpm mid pump	Static - $50,000	Static - $17,500 plus upgrade charges.	$576,950
Smeal Code: FS17ZC04	MetroStar $453,605 4dr, aluminum cab & body, *1250gpm mid pump	Static - $50,000	Static - $17,500 plus upgrade charges.	$521,005

Committee Recommendation

Information gathered based on annual response data, geographic and topographic limitations, maintenance & service contracts, total costs, warranty schedules and staff input the Truck Committee recommends authorizing acceptance of Spartan ER bid proposal for purchase of a stock unit Fire Engine / Pumper available June 15th 2019.

Committee Members:

Fire Chief Eric Copeland

Fire Marshal Dan Kimball

Brouillette

Fire Captain Fred Anstead

Firefighter Steve Hubbard

Firefighter David

MODEL

The chassis shall be a Metro Star model. The cab and chassis shall include design considerations for multiple emergency vehicle applications, rapid transit and maneuverability. The chassis shall be manufactured for heavy duty service with the strength and capacity to support a fully laden apparatus, one hundred (100) percent of the time.

MODEL YEAR

The chassis shall have a vehicle identification number that reflects a 2019 model year.

COUNTRY OF SERVICE

The chassis shall be put in service in the country of United States of America (USA).

The chassis will meet applicable U.S.A. federal motor vehicle safety standards per CFR Title 49 Chapter V Part 571 as clarified in the incomplete vehicle book per CFR Title 49 Chapter V Part 568 Section 4 which accompanies each chassis. Spartan Chassis is not responsible for compliance to state, regional, or local regulations. Dealers should identify those regulations and order any necessary optional equipment from Spartan Chassis needed to be in compliance with those regulations.

CAB AND CHASSIS LABELING LANGUAGE

The cab and chassis shall include the applicable caution, warning, and safety notice labels with text to be written in English. All applicable exterior caution, warning, and safety notice labels shall be in a decorative chrome bezel.

APPARATUS TYPE

The apparatus shall be a pumper vehicle designed for emergency service use which shall be equipped with a permanently mounted fire pump which has a minimum rated capacity of 750 gallons per minute (3000 L/min). The apparatus shall include a water tank and hose body whose primary purpose is to combat structural and associated fires.

VEHICLE TYPE

The chassis shall be manufactured for use as a straight truck type vehicle and designed for the installation of a permanently mounted apparatus behind the cab. The apparatus of the vehicle shall be supplied and installed by the apparatus manufacturer.

VEHICLE ANGLE OF APPROACH PACKAGE

The angle of approach of the apparatus shall be a minimum of 8.00 degrees.

NFPA1901 Angle of Approach definition:
"To determine the angle of approach, place a thin steel strip against the front of the tires where they touch the ground or stretch a tight string from one front tire to the other at the front where they touch the ground. Determine the lowest point (component or equipment) on the vehicle forward of the front tire that would make the smallest angle of approach. Hang a plumb bob from the lowest point and mark the point on the ground where the point of the plumb bob touches. Measure the vertical distance from the ground to the point where the plumb bob was hung (distance *V*). Measure the horizontal distance from the plumb bob point to the steel strip or string running from front tire to front tire (distance *H*). Divide the vertical distance by the horizontal distance. The ratio of *V/H* is the tangent of the angle of approach. If the ratio is known, the angle of approach can be determined from a table of trigonometric functions of angles or from a math calculator. The standard requires a minimum angle of approach of 8.00 degrees: since the tangent of 8.00 degrees is 0.1405, if *V* divided by *H* is 0.1405 or larger, the angle of approach is 8.00 degrees or greater."

AXLE CONFIGURATION

The chassis shall feature a 4 x 2 axle configuration consisting of a single rear drive axle with a single front steer axle.

GROSS AXLE WEIGHT RATINGS FRONT

The front gross axle weight rating (GAWR) of the chassis shall be 20,000 pounds.

This front gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

GROSS AXLE WEIGHT RATINGS REAR

The rear gross axle weight rating (GAWR) of the chassis shall be 26,000 pounds.

This rear gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

PUMP PROVISION

The chassis shall include provisions to mount a drive line pump in the middle of the chassis, behind the cab, more commonly known as the midship location. Chassis driveline pump provisions shall include an interlock feature for automatic setting of the park brake when the

vehicle is shifted into pump mode while the transmission is in neutral and the transmission output speed translates to less than 1 mph. When the conditions are met the driver side parking brake valve shall activate. Once shifted to road mode the condition for electric automatic brake engagement is no longer present and the driver's parking brake control valve shall function normally.

WATER & FOAM TANK CAPACITY

The chassis shall include a carrying capacity of 750 gallons (2839 liters) to 1250 gallons (4732 liters). The water and/or foam tank(s) shall be supplied and installed by the apparatus manufacturer.

CAB STYLE

The cab shall be a custom, fully enclosed, EMFD model with a 10.00 inch raised roof over the driver, officer, and crew area, designed and built specifically for use as an emergency response vehicle by a company specializing in cab and chassis design for all emergency response applications. The cab shall be designed for heavy-duty service utilizing superior strength and capacity for the application of protecting the occupants of the vehicle. This style of cab shall offer up to eight (8) seating positions.

The cab shall incorporate a fully enclosed design with side wall roof supports, allowing for a spacious cab area with no partition between the front and rear sections of the cab. To provide a superior finish by reducing welds that fatigue cab metal; the roof, the rear wall and side wall panels shall be assembled using a combination of welds and proven industrial adhesives designed specifically for aluminum fabrication for construction.

The cab shall be constructed using multiple aluminum extrusions in conjunction with aluminum plate, which shall provide proven strength and the truest, flattest body surfaces ensuring less expensive paint repairs if needed. All aluminum welding shall be completed to the American Welding Society and ANSI D1.2-96 requirements for structural welding of aluminum.

All interior and exterior seams shall be sealed for optimum noise reduction and to provide the most favorable efficiency for heating and cooling retention.

The cab shall be constructed of 5052-H32 corrosion resistant aluminum plate. The cab shall incorporate tongue and groove fitted 6061-T6 0.13 & 0.19 inch thick aluminum extrusions for extreme duty situations. A single formed, one (1) piece extrusion shall be used for the "A" pillar, adding strength and rigidity to the cab as well as additional roll-over protection. The cab side walls and lower roof skin shall be 0.13 inch thick; the rear wall and raised roof skins shall be 0.09 inch thick; the front cab structure shall be 0.19 inch thick.

The exterior width of the cab shall be 94.00 inches wide with a minimum interior width of 88.00 inches. The overall cab length shall be 137.10 inches with 60.00 inches from the centerline of the front of the axle to the back of the cab.

The cab interior shall be designed to afford the maximum usable interior space and attention to ergonomics with hip and legroom while seated which exceeds industry standards. The crew cab floor shall be flat across the entire walking area for ease of movement inside the cab.

The cab shall offer an interior height of 57.50 inches from the front floor to the headliner and a rear floor to headliner height of 65.00 inches in the raised roof area, at a minimum. The cab shall offer an interior measurement at the floor level from the rear of the engine tunnel to the rear wall of the cab of 57.88 inches. All interior measurements shall include the area within the interior trimmed surfaces and not to any unfinished surface.

The cab shall include a driver and officer area with two (2) cab doors large enough for personnel in full firefighting gear. The front doors shall offer a clear opening of 40.25 inches wide X 53.50 inches high, from the cab floor to the top of the door opening. The cab shall also include a crew area with up to two (2) cab doors, also large enough for personnel in full firefighting gear. The rear doors shall offer a clear opening of 32.25 inches wide X 61.00 inches high, from the cab floor to the top of the door opening.

The cab shall incorporate a progressive two (2) step configuration from the ground to the cab floor at each door opening. The progressive steps are vertically staggered and extend the full width of each step well allowing personnel in full firefighting gear to enter and exit the cab easily and safely.

The first step for the driver and officer area shall measure approximately 11.50 inches deep X 31.13 inches wide. The intermediate step shall measure approximately 8.50 inches deep X 32.50 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 11.00 inches.

The first step for the crew area shall measure approximately 11.50 inches deep X 20.44 inches wide. The intermediate step shall measure approximately 10.25 inches deep X 22.75 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 12.80 inches.

OCCUPANT PROTECTION

The vehicle shall include the Advanced Protection System™ (APS) which shall secure belted occupants and increase the survivable space within the cab. The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and

rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

The system components shall include:

- Driver steering wheel airbag
- Driver dual knee air bags (patent pending) with energy management mounting (patent pending) and officer knee airbag.
- Large driver, officer, and crew area side curtain airbags
- APS advanced seat belt system - retractor pre-tensioners tighten the seat belts around the occupants, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries
- Heavy truck Restraints Control Module (RCM) - receives inputs from the outboard sensors, selectively deploys APS systems, and records sensory inputs immediately before and during a detected qualifying event
- Integrated outboard crash sensors mounted at the perimeter of the vehicle - detects a qualifying front or side impact event and monitors and communicates vehicle status and real time diagnostics of all critical subsystems to the RCM
- Fault-indicating Supplemental Restraint System (SRS) light on the driver's instrument panel

Frontal impact protection shall be provided by the outboard sensors and the RCM. In a qualifying front impact event the outboard sensors provide inputs to the RCM. The RCM activates the steering wheel airbag, driver side dual knee airbags (patent pending), officer side knee airbag, and advanced seat belts for each occupant in the cab.

Rollover, side impact, and ejection mitigation shall be provided by the outboard sensors and the RCM. In qualifying rollover or side impact events the outboard sensors provide inputs to the RCM. The RCM activates the side curtain airbags and advanced seat belts for each occupant in the cab. The RCM measures roll angle, lateral acceleration, and roll rate to determine if a rollover event or side impact event is imminent or occurring.

In the event of a qualifying offset or other non-frontal impact, the RCM shall determine and intelligently deploy the front impact protection system, the side impact protection system, or

both front and side impact protection systems based on the inputs received from the outboard crash sensors.

CAB FRONT FASCIA

The front cab fascia shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick aluminum plate which shall be an integral part of the cab.

The cab fascia will encompass the entire front of the aluminum cab structure from the bottom of the windshield to the bottom of the cab and shall be the "Classic" design.

The front cab fascia shall include two (2) molded plastic modules on each side accommodating a total of up to four (4) Hi/Low beam headlights and two (2) turn signal lights or up to four (4) warning lights. A chrome plated molded plastic bezel shall be provided on each side around each set of four lamps.

FRONT GRILLE

The front fascia shall include a box style, 304 stainless steel front grille 44.45 inches wide X 33.50 inches high X 1.50 inches deep. The grille shall include a minimum free air intake of 732.00 square inches. The upper portion of the grille shall be hinged to provide service access behind the grille.

CAB UNDERCOAT

There shall be a rubberized undercoating applied to the underside of the cab that provides abrasion protection, sound deadening and corrosion protection.

CAB SIDE DRIP RAIL

There shall be a drip rail along the top radius of each cab side. The drip rails shall help prevent water from the cab roof running down the cab side.

CAB PAINT EXTERIOR

The cab shall be painted prior to the installation of glass accessories and all other cab trim to ensure complete paint coverage and the maximum in corrosion protection of all metal surfaces.

All metal surfaces on the entire cab shall be ground by disc to remove any surface oxidation or surface debris which may hinder the paint adhesion. Once the surface is machine ground a high quality acid etching of base primer shall be applied. Upon the application of body fillers and

their preparation, the cab shall be primed with a coating designed for corrosion resistance and surface paint adhesion. The maximum thickness of the primer coat shall be 2.00 mils.

The entire cab shall then be coated with an intermediate solid or epoxy surfacing agent that is designed to fill any minor surface defects, provide an adhesive bond between the primer and the paint and improve the color and gloss retention of the color. The finish to this procedure shall be a sanding of the cab with 360 grit paper followed by sealing the seams with SEM brand seam sealer.

The cab shall then be painted the specific color designated by the customer with an acrylic urethane type system designed to retain color and resist acid rain and most atmospheric chemicals found on the fire ground or emergency scene. The paint shall have a minimum thickness of 2.00 mils, followed by a clear top coat not to exceed 2.00 mils. The entire cab shall then be baked at 180 degrees for one (1) hour to speed the curing process of the coatings.

CAB PAINT MANUFACTURER

The cab shall be painted with PPG Industries paint.

CAB PAINT PRIMARY/LOWER COLOR

The primary/lower paint color shall be PPG FBCH 926234 red.

CAB PAINT WARRANTY

The cab and chassis shall be covered by a limited manufacturer paint warranty which shall be in effect for ten (10) years from the first owner's date of purchase or in service or the first 100,000 actual miles, whichever occurs first.

CAB PAINT INTERIOR

The visible interior cab structure surfaces shall feature a medium gray Spar-Liner spray on bedliner coating which shall mold to each surface of the cab interior. The Spar-Liner shall be environmentally friendly and chemically resistant.

CAB ENTRY DOORS

The cab shall include four (4) entry doors, two (2) front doors and two (2) crew doors designed for ease of entering and egress when outfitted with an SCBA. The doors shall be constructed of extruded aluminum with a nominal thickness of 0.13 inch. The exterior skins shall be constructed of 0.13 inch aluminum plate.

The doors shall include a double rolled style automotive rubber seal around the perimeter of each door frame and door edge which ensures a weather tight fit.

All door hinges shall be hidden within flush mounted cab doors for a pleasing smooth appearance and perfect fit along each side of the cab. Each door hinge shall be piano style with a 0.38 inch pin and shall be constructed of stainless steel.

CAB ENTRY DOOR TYPE

All cab entry doors shall be barrier clear design resulting in exposed lower cab steps. The doors shall provide approximately 32.00 inches of clearance from the ground to the bottom of the door so cab doors may be opened un-hindered by most obstacles encountered, such as guard rails along interstate highways.

Entry doors shall include Pollak mechanical plunger style switches for electrical component activation.

CAB INSULATION

The cab ceiling and walls shall include 1.00 inch thick foam insulation. The insulation shall act as a barrier absorbing noise as well as assisting in sustaining the desired climate within the cab interior.

LH MID EMS COMPARTMENT

The cab shall include an interior clear area provision for the side curtain crew airbag mounting to account for a compartment located in the middle of the wall to be installed by the body builder. The clear area shall extend from the cab 'B' pillar to the standard rear door location above the left side wheel well. The provision allows appropriate airbag selection for clear airbag deployment and adequate protection and ejection mitigation.

RH MID EMS COMPARTMENT

The cab shall include an interior clear area provision for the side curtain crew airbag mounting to account for a compartment located in the middle of the wall to be installed by the body builder. The clear area shall extend from the cab 'B' pillar to the standard rear door location above the right side wheel well. The provision allows appropriate airbag selection for clear airbag deployment and adequate protection and ejection mitigation.

CAB STRUCTURAL WARRANTY

Summary of Warranty Terms:

THE FOLLOWING IS SUMMARY OF WARRANTY TERMS FOR INFORMATION ONLY. THE ACTUAL LIMITED WARRANTY DOCUMENT, WHICH IS ATTACHED TO THIS OPTION, CONTAINS THE COMPLETE STATEMENT OF THE SPARTAN MOTORS USA LIMITED WARRANTY. SPARTAN'S RESPONSIBILITY IS TO BE ACCORDING TO THE TERMS OF THE COMPLETE LIMITED WARRANTY DOCUMENT.

The cab structure shall be warranted for a period of ten (10) years or one hundred thousand (100,000) miles which ever may occur first. The warranty period shall commence on the date the vehicle is delivered to the first end user.

CAB TEST INFORMATION

The cab shall have successfully completed the preload side impact, static roof load application and frontal impact without encroachment to the occupant survival space when tested in accordance with Section 4 of SAE J2420 COE Frontal Strength Evaluation Dynamic Loading Heavy Trucks, Section 5 of SAE J2422 Cab Roof Strength Evaluation Quasi –Static Loading Heavy Trucks and ECE R29 Uniform Provisions Concerning the Approval of Vehicles with regard to the Protection of the Occupants of the Cab of a Commercial Vehicles Annex 3 Paragraph 5.

The above tests have been witnessed by and attested to by an independent third party. The test results were recorded using cameras, high speed imagers, accelerometers and strain gauges. Documentation of the testing shall be provided upon request.

ELECTRICAL SYSTEM

The chassis shall include a single starting electrical system which shall include a 12 volt direct current multiplexing system, suppressed per SAE J551. The wiring shall be appropriate gauge cross link with 311 degree Fahrenheit insulation. All SAE wires in the chassis shall be color coded and shall include the circuit number and function where possible. The wiring shall be protected by 275 degree Fahrenheit minimum high temperature flame retardant loom. All nodes and sealed Deutsch connectors shall be waterproof.

MULTIPLEX DISPLAY

The multiplex electrical system shall include a Weldon Vista IV display which shall be located on the left side of the dash in the switch panel. The Vista IV shall feature a full color LCD display screen which includes a message bar displaying the time of day and important messages requiring acknowledgement by the user which shall all be displayed on the top of the screen in the order they are received. There shall be eight (8) push button virtual controls, four (4) on each side of the display for the on-board diagnostics. The display screen shall be video ready for back-up cameras, thermal cameras, and DVD.

The Vista IV display shall offer varying fonts and background colors. The display shall be fully programmable to the needs of the customer and shall offer virtually infinite flexibility for screen configuration options.

MULTIPLEX DISPLAY SPECIAL LAYOUT

The Vista display and control screen shall be configured specifically for the requirements of the S180 Model 2106 and 2112. The dimmer and scene light switches shall be located on the main menu screen. The air horn selector and dome light switches shall be located on the secondary menu screen.

Note: Activation additions and deletions to the base S-180 models listed above shall be programed per best practices.

LOAD MANAGEMENT SYSTEM

The apparatus load management shall be performed by the included multiplex system. The multiplex system shall also feature the priority of sequences and shall shed electrical loads based on the priority list specifically programmed.

DATA RECORDING SYSTEM

The chassis shall have a Weldon Vehicle Data Recorder (VDR) system installed. The system shall be designed to meet NFPA 1901 and shall be integrated with the Weldon Multiplex electrical system. The following information shall be recorded:

- Vehicle Speed
- Acceleration
- Deceleration
- Engine Speed
- Engine Throttle Position
- ABS Event
- Seat Occupied Status
- Seat Belt Status
- Master Optical Warning Device Switch Position
- Time
- Date

Each portion of the data shall be recorded at the specified intervals and stored for the specified length of time to meet NFPA 1901 guidelines and shall be retrievable by connecting a laptop computer to the VDR system.

ACCESSORY POWER

The electrical distribution panel shall include two (2) power studs. The studs shall be size #10 and each of the power studs shall be circuit protected with a fuse of the specified amperage. One (1) power stud shall be capable of carrying up to a 40 amp battery direct load. One (1) power stud shall be capable of carrying up to a 15 amp ignition switched load. The two (2) power studs shall share one (1) #10 ground stud. A 150 amp master switched and manually resettable breaker protected power and ground stud shall be provided and installed on the chassis near the left hand battery box for body connections.

AUXILIARY ACCESSORY POWER

An auxiliary six (6) position Blue Sea Systems 5025 blade type fuse panel shall be installed behind the switch panel. The fuse panel shall be protected by a 40 amp fuse. The panel shall be capable of carrying up to a maximum 40 amp battery direct load.

EXTERIOR ELECTRICAL TERMINAL COATING

All terminals exposed to the elements will be sprayed with a high visibility protective rubberized coating to prevent corrosion.

ENGINE

The chassis engine shall be a Cummins L9 engine. The L9 engine shall be an in-line six (6) cylinder, four cycle diesel powered engine. The engine shall offer a rating of 450 horse power at 2100 RPM and shall be governed at 2200 RPM. The torque rating shall feature 1250 foot pounds of torque at 1400 RPM with 543 cubic inches (8.9 liters) of displacement.

The L9 engine shall feature a VGT™ Turbocharger, a high pressure common rail fuel system, fully integrated electronic controls with an electronic governor, and shall be EPA certified to meet the 2017 emissions standards using cooled exhaust gas recirculation and selective catalytic reduction technology.

The engine shall include an engine mounted combination full flow/by-pass oil filter with replaceable spin on cartridge for use with the engine lubrication system. The engine shall include Citgo brand Citgard 500, or equivalent 15W40 CK-4 low ash engine oil which shall be utilized for proper engine lubrication.

A wiring harness shall be supplied ending at the back of the cab. The harness shall include a connector which shall allow an optional harness for the pump panel. The included circuits shall

be provided for a tachometer, oil pressure, engine temperature, hand throttle, high idle and a PSG system. A circuit for J1939 data link shall also be provided at the back of the cab.

CAB ENGINE TUNNEL

The cab interior shall include an integrated engine tunnel constructed of 5052-H32 Marine Grade, 0.19 of an inch thick aluminum. The tunnel shall be a maximum of 41.50 inches wide X 25.50 inches high.

DIESEL PARTICULATE FILTER CONTROLS

There shall be two (2) controls for the diesel particulate filter. One (1) control shall be for regeneration and one (1) control shall be for regeneration inhibit.

ENGINE PROGRAMMING HIGH IDLE SPEED

The engine high idle control shall maintain the engine idle at approximately 1250 RPM when engaged.

ENGINE HIGH IDLE CONTROL

The vehicle shall be equipped with an automatic high-idle speed control. It shall be pre-set so when activated, it will operate the engine at the appropriate RPM to increase alternator output. This device shall operate only when the master switch is activated and the transmission is in neutral with the parking brake set. The device shall disengage when the operator depresses the brake pedal, or the transmission is placed in gear, and shall be available to manually or automatically re-engage when the brake is released, or when the transmission is placed in neutral. There shall be an indicator on the Vista display and control screen for the high idle speed control.

ENGINE PROGRAMMING ROAD SPEED GOVERNOR

The engine shall include programming which will govern the top speed of the vehicle.

AUXILIARY ENGINE BRAKE

A compression brake, for the six (6) cylinder engine shall be provided. A cutout relay shall be installed to disable the compression brake when in pump mode or when an ABS event occurs. The engine compression brake shall activate upon 0% accelerator when in operation mode and actuate the vehicle's brake lights.

The engine shall utilize a variable geometry turbo (VGT) as an integrated auxiliary engine brake to offer a variable rate of exhaust flow, which when activated in conjunction with the compression brake shall enhance the engine's compression braking capabilities.

AUXILIARY ENGINE BRAKE CONTROL

An engine compression brake control device shall be included. The electronic control device shall monitor various conditions and shall activate the engine brake only if all of the following conditions are simultaneously detected:

- A valid gear ratio is detected.
- The driver has requested or enabled engine compression brake operation.
- The throttle is at a minimum engine speed position.
- The electronic controller is not presently attempting to execute an electronically controlled final drive gear shift.

The compression brake shall be controlled via an off/low/medium/high virtual button on the Vista display and control screen. The multiplex system shall remember and default to the last engine brake control setting when the vehicle is shut off and re-started.

ELECTRONIC ENGINE OIL LEVEL INDICATOR

The engine oil shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal. The warning shall activate in a low oil situation upon turning on the master battery and ignition switches without the engine running.

FLUID FILLS

The front of the chassis shall accommodate fluid fill for the engine oil through the grille. This area shall also accommodate a check for the engine oil. The transmission, power steering, and coolant fluid fills and checks shall be under the cab. The windshield washer fill shall be accessible through the front left side mid step.

ENGINE DRAIN PLUG

The engine shall include an original equipment manufacturer installed oil drain plug.

ENGINE WARRANTY

The Cummins engine shall be warranted for a period of five (5) years or 100,000 miles, whichever occurs first.

REMOTE THROTTLE HARNESS

An apparatus interface wiring harness for the engine and transmission pump interlocks shall be supplied with the chassis. The harness shall include a connector for connection to a chassis pump panel harness supplied by the body builder and shall terminate in the left frame rail behind the cab for connection by the body builder. The harness shall include circuits deemed for a pump panel and shall contain circuits for a hand throttle, and a multiplexed gauge. Separate circuits shall also be included for a pump control switch, "Pump Engaged" and "OK to Pump" indicator lights, open compartment ground, start signal, park brake ground, ignition signal, master power, clean power, customer ignition, air horn solenoid switch, high idle switch and high idle indicator light. The harness shall contain interlocks that will prevent shifting to road or pump mode unless the transmission output speed translates to less than 1 mph and the transmission is in neutral. The shift to pump mode shall also require the park brake be set.

ENGINE PROGRAMMING REMOTE THROTTLE

The engine ECM (Electronic Control Module) discreet wire remote throttle circuit shall be turned off for use with a J1939 based pump controller or when the discreet wire remote throttle controls are not required.

ENGINE PROGRAMMING IDLE SPEED

The engine low idle speed will be programmed at 750 rpm.

ENGINE FAN DRIVE

The engine cooling system fan shall incorporate a thermostatically controlled, Horton clutched type fan drive.

When the clutched fan is disengaged it shall facilitate improved vehicle performance, cab heating in cold climates, and fuel economy. The fan clutch design shall be fail safe so that if the clutch drive fails the fan shall engage to prevent engine overheating due to the fan clutch failure.

ENGINE COOLING SYSTEM

There shall be a heavy-duty aluminum cooling system designed to meet the demands of the emergency response industry. The cooling system shall have the capacity to keep the engine properly cooled under all conditions of road and pumping operations. The cooling system shall be designed and tested to meet or exceed the requirements specified by the engine and transmission manufacturer and all EPA requirements. The complete cooling system shall be mounted to isolate the entire system from vibration or stress. The individual cores of the

cooling system shall be mounted in a manner to allow expansion and contraction at various rates without inducing stress into the adjoining cores.

The cooling system shall utilize a charge air cooler to radiator serial flow package that provides the maximum cooling capacity for the specified engine as well as serviceability. The main components shall include a surge tank, an air to air charge air cooler bolted to the front of the radiator, recirculation shields, a shroud, a fan, and required tubing.

The radiator shall be a down-flow design constructed with aluminum cores, plastic end tanks, and a steel frame. The radiator shall be equipped with a drain cock to drain the coolant for serviceability.

The cooling system shall include a one piece injection molded polymer fan with a three (3) piece fiberglass fan shroud.

The cooling system shall be equipped with a surge tank that is capable of removing entrained air from the system. The surge tank shall be equipped with a low coolant probe and rearward oriented sight glass to monitor the level of the coolant. The surge tank shall have a dual seal cap that meets the engine manufacturer's pressure requirements, and allows for expansion and recovery of coolant into a separate integral expansion chamber.

All radiator tubes shall be formed from aluminized steel tubing. Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting performance.

The charge air cooler shall be a cross-flow design constructed completely of aluminum with cast tanks. All charge air cooler tubes shall be formed from aluminized steel tubing and installed with silicone hump hoses and stainless steel “constant torque” style clamps meeting the engine manufacturer’s requirements.

The radiator and charge air cooler shall be removable through the bottom of the chassis.

ENGINE COOLING SYSTEM PROTECTION

The engine cooling system shall include a recirculation shield designed to act as a light duty skid plate below the radiator to provide additional protection for the engine cooling system from light impacts, stones, and road debris. The skid plate shall be painted to match the frame components.

ENGINE COOLANT

The cooling package shall include Extended Life Coolant (ELC). The use of ELC provides longer intervals between coolant changes over standard coolants providing improved performance. The coolant shall contain a 50/50 mix of ethylene glycol and de-ionized water to keep the coolant from freezing to a temperature of -34 degrees Fahrenheit.

Proposals offering supplemental coolant additives (SCA) shall not be considered, as this is part of the extended life coolant makeup.

ELECTRONIC COOLANT LEVEL INDICATOR

The instrument panel shall feature a low engine coolant indicator light which shall be located in the center of the instrument panel. An audible tone alarm shall also be provided to warn of a low coolant incident.

ENGINE PUMP HEAT EXCHANGER

A single bundle type coolant to water heat exchanger shall be installed between the engine and the radiator. The heat exchanger shall be designed to prohibit water from the pump from coming in contact with the engine coolant. This shall allow the use of water from the discharge side of the pump to assist in cooling the engine.

COOLANT HOSES

The cooling systems hose shall be formed silicone hose and formed aluminized steel tubing and include stainless steel constant torque band clamps.

ENGINE AIR INTAKE

The engine air intake system shall include an ember separator air intake filter which shall be located behind the right hand side headlamp. This filter ember separator shall be designed to protect the downstream air filter from embers, using a combination of unique flat and crimped metal screens packaged in a corrosion resistant heavy duty galvanized steel frame. This multilayered screen shall be design traps embers and allows them to burn out before passing through the pack.

The engine air intake system shall also include a stainless steel air cleaner mounted to the frame and located beneath the cab on the right side of the vehicle. The air cleaner shall utilize a replaceable filter element designed to prevent dust and debris from being ingested into the engine. The air cleaner housing and connections in the air intake system shall be designed to mitigate water intrusion into the system during severe weather conditions.

The air intake system shall also include a restriction indicator light in the warning light cluster on the instrument panel, which shall activate when the air cleaner element requires replacement.

AIR INTAKE PROTECTION

A light duty skid plate shall be supplied for the engine air intake system below the right front side of the cab. The skid plate shall provide protection for the air intake system from light impacts, stones, and road debris. The skid plate shall be painted to match the frame components.

ENGINE EXHAUST SYSTEM

The exhaust system shall include an end-in end-out horizontally mounted single module after treatment device, downpipe from the charge air cooled turbo. The single module shall include four temperature sensors, diesel particulate filter (DPF), urea dosing module (UL2), and a selective catalytic reduction (SCR) catalyst to meet current EPA standards. The selective catalytic reduction catalyst utilizes a diesel exhaust fluid solution consisting of urea and purified water to convert NOx into nitrogen, water, and trace amounts of carbon dioxide. The solution shall be mixed and injected into the system through the between the DPF and SCR.

The system shall utilize 0.07 inch thick stainless steel exhaust tubing between the engine turbo and the DPF. Zero leak clamps seal all system joints between the turbo and DPF.

The single module after treatment through the end of the tailpipe shall be connected with zero leak clamps. The discharge shall terminate horizontally on the right side of the vehicle ahead of the rear tires.

The exhaust system after treatment module shall be mounted below the frame in the outboard position.

DIESEL EXHAUST FLUID TANK

The exhaust system shall include a molded cross linked polyethylene tank for Diesel Exhaust Fluid (DEF). The tank shall have a capacity of six (6) usable gallons and shall be mounted on the left hand side of the chassis frame behind the batteries below the frame.

The DEF tank shall be designed with capacity for expansion in case of fluid freezing. Engine coolant, which shall be thermostatically controlled, shall be run through lines in the tank to help prevent the DEF from freezing and to provide a means of thawing the fluid if it should become frozen.

The tank fill tube shall be routed under the rear of the cab with the fill neck and splash guard accessible in the top rear step.

ENGINE EXHAUST ACCESSORIES

An exhaust temperature mitigation device shall be shipped loose for installation by the body manufacturer on the vehicle. The temperature mitigation device shall lower the temperature of the exhaust by combining ambient air with the exhaust gasses at the exhaust outlet.

ENGINE EXHAUST WRAP

The exhaust tubing between the engine turbo and the diesel particulate filter (DPF) shall be wrapped with a thermal cover in order to retain the necessary heat for DPF regeneration. The exhaust wrap shall also help protect surrounding components from radiant heat which can be transferred from the exhaust.

TRANSMISSION

The drive train shall include an Allison model EVS 3000 torque converting, automatic transmission which shall include electronic controls. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing.

The transmission shall include two (2) internal oil filters and Castrol TranSynd™ synthetic TES 295 transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.

The transmission gear ratios shall be:

1st	3.49:1
2nd	1.86:1
3rd	1.41:1
4th	1.00:1
5th	0.75:1
6th	0.65:1 (if applicable)
Rev	5.03:1

TRANSMISSION MODE PROGRAMMING

The transmission, upon start-up, will automatically select a four (4) speed operation. The fifth speed over drive shall be available with the activation of the mode button on the shifting pad.

TRANSMISSION FEATURE PROGRAMMING

The Allison Gen V-E transmission EVS group package number 127 shall contain the 198 vocational package in consideration of the duty of this apparatus as a pumper. This package shall incorporate an automatic neutral with selector override. This feature commands the transmission to neutral when the park brake is applied, regardless of drive range requested on the shift selector. This requires re-selecting drive range to shift out of neutral for the override.

This package shall be coupled with the use of a split shaft PTO and incorporate pumping circuits. These circuits shall be used allowing the vehicle to operate in the fourth range lockup while operating the pump mode due to the 1 to 1 ratio through the transmission, therefore the output speed of the engine is the input speed to the pump. The pump output can be easily calculated by using this input speed and the drive ratio of the pump itself to rate the gallons of water the pump can provide.

A transmission interface connector shall be provided in the cab. This package shall contain the following input/output circuits to the transmission control module. The Gen V-E transmission shall include prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance.

Function ID assignment	Description	Wire
Inputs		
C 142	PTO Request	
J	Fire Truck Pump Mode (4th Lockup)	122 / 123
Outputs		
C 145 (4th)	Range Indicator	
G 130	PTO Enable Output	
103	Signal Return	

TRANSMISSION SHIFT SELECTOR

An Allison pressure sensitive range selector touch pad shall be provided and located to the right of the driver within clear view and easy reach. The shift selector shall have a graphical Vacuum Florescent Display (VFD) capable of displaying two lines of text. The shift selector shall provide mode indication and a prognostic indicator (wrench symbol) on the digital display. The prognostics monitor various operating parameters and shall alert you when a specific maintenance function is required.

ELECTRONIC TRANSMISSION OIL LEVEL INDICATOR

The transmission fluid shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal.

TRANSMISSION PRE-SELECT WITH AUXILIARY BRAKE

When the auxiliary brake is engaged, the transmission shall automatically shift to second gear to decrease the rate of speed assisting the secondary braking system and slowing the vehicle.

TRANSMISSION COOLING SYSTEM

The transmission shall include a water to oil cooler system located in the cooling loop between the radiator and the engine. The transmission cooling system shall meet all transmission manufacturer requirements. The transmission cooling system shall feature continuous flow of engine bypass water to maintain uninterrupted transmission cooling.

TRANSMISSION DRAIN PLUG

The transmission shall include an original equipment manufacturer installed magnetic transmission fluid drain plug.

TRANSMISSION WARRANTY

The Allison EVS series transmission shall be warranted for a period of five (5) years with unlimited mileage. Parts and labor shall be included in the warranty.

PTO LOCATION

The transmission shall have two (2) power take off (PTO) mounting locations, one (1) in the 8:00 o'clock position and one (1) in the 4:00 o'clock position.

DRIVELINE

All drivelines shall be heavy duty metal tube and equipped with Spicer 1710 series universal joints. The shafts shall be dynamically balanced prior to installation to alleviate future vibration. In areas of the driveline where a slip shaft is required, the splined slip joint shall be coated with Glide Coat®.

MIDSHIP PUMP / GEARBOX

A temporary jackshaft driveline shall be installed by the chassis manufacturer to accommodate the mid-ship split shaft pump as specified by the apparatus manufacturer.

MIDSHIP PUMP / GEARBOX MODEL

The midship pump/gearbox provisions shall be for a Waterous CSUC20 pump.

MIDSHIP PUMP GEARBOX DROP

The Waterous pump gearbox shall have a "C" (medium length) drop length.

MIDSHIP PUMP RATIO

The ratio for the midship pump shall be 2.27:1.

MIDSHIP PUMP LOCATION C/L SUCTION TO C/L REAR AXLE

The midship pump shall be located so the dimension from the centerline of the suction to the centerline of the rear axle is 99.50 inches.

PUMP SHIFT CONTROLS

One (1) air pump shift control panel shall be located on the left hand side of the engine tunnel, integrated with the shifter pod. The following shall be provided on the panel: a three (3) position control lever; an engraved PUMP ENGAGED identification light; and an engraved OK TO PUMP identification light. The pump shift control panel shall be black with a yellow border outline and shall include pump instructions. An instruction plate describing the transmission shift selector position used for pumping shall be provided and located so it can be read from the driver's position per NFPA **16.10.1.3**. The road mode shall be selected when the control lever is in the forward position and pump mode shall be selected when the control lever is in the rearward position.

The control lever center position shall exhaust air from both pump and road sides of the pump gear box shift cylinder.

PUMP SHIFT CONTROL PLUMBING

Air connections shall be provided from the air supply tank to the pump shift control valve and from the pump shift control valve to the frame mounted bracket. The frame mounted bracket shall include labeling identifying the pump and road connection points with threaded 0.25 inch NPT fittings on the solenoid for attaching the customer installed pump. The air supply shall be pressure protected from service brake system.

FUEL FILTER/WATER SEPARATOR

The fuel system shall have a Fleetguard FS1098 fuel filter/water separator as a primary filter. The fuel filter shall have a drain valve.

A water in fuel sensor shall be provided and wired to an instrument panel lamp and audible alarm to indicate when water is present in the fuel/water separator.

A secondary fuel filter shall be included as approved by the engine manufacturer.

FUEL LINES

The fuel system supply and return lines installed from the fuel tank to the engine shall be black textile braided lines which are reinforced with braided high tensile steel wire. The fuel lines shall be connected with reusable steel fittings.

FUEL SHUTOFF VALVE

There shall be two (2) fuel shutoff valves which shall be installed, one (1) in the fuel draw line at the primary fuel filter and one (1) in the fuel outlet line at the primary fuel filter to allow the fuel filters to be changed without loss of fuel to the fuel pump.

A third fuel shutoff valve shall be installed in the fuel draw line, near the fuel tank to allow maintenance to be performed with minimal loss of fuel.

ELECTRIC FUEL PRIMER

Integral to the engine assembly is an electric lift pump that serves the purpose of pre-filter fuel priming.

FUEL COOLER

An aluminum cross flow air to fuel cooler shall be provided to lower fuel temperature allowing the vehicle to operate at higher ambient temperatures. The fuel cooler shall be located behind the rear axle.

FUEL TANK

The fuel tank shall have a capacity of sixty-eight (68) gallons and shall measure 35.00 inches in width X 17.00 inches in height X 29.00 inches in length.

The baffled tank shall have a vent port to facilitate venting to the top of the fill neck for rapid filling without "blow-back" and a roll over ball check vent for temperature related fuel expansion and draw.

The tank is designed with dual draw tubes and sender flanges. The tank shall have 2.00 inch NPT fill ports for right or left hand fill. A 0.50 inch NPT drain plug shall be centered in the bottom of the tank.

The fuel tank shall be mounted below the frame, behind the rear axle. Two (2) three-piece strap hanger assemblies with “U” straps bolted midway on the fuel tank front and rear shall be utilized to allow the tank to be easily lowered and removed for service purposes. Rubber isolating pads shall be provided between the tank and the upper tank mounting brackets. Strap mounting studs through the rail, hidden behind the body shall not be acceptable.

FUEL TANK MATERIAL AND FINISH

The fuel tank shall be constructed of 12 gauge aluminized steel. The exterior of the tank shall be powder coated black and then painted to match the frame components.

All powder coatings, primers and paint shall be compatible with all metals, pretreatments and primers used. The cross hatch adhesion test per ASTM D3359 Method B, results to be 5B minimum. The pencil hardness test per ASTM D3363 shall have a final post-curved pencil hardness of H-2H. The direct impact resistance test per ASTM D2794, results to be 5B minimum.

Any proposals offering painted fuel tanks with variations from the above process shall not be accepted. The film thickness of vendor supplied parts shall also be sufficient to meet the performance standards as stated above.

FUEL TANK STRAP MATERIAL

The fuel tank straps shall be constructed of ASTM A-36 steel. The fuel tank straps shall be powder coated black and then painted to match the frame components if possible.

FUEL TANK FILL PORT

The fuel tank fill ports shall be provided with two (2) left fill ports located one (1) in the forward position and one (1) in the middle position and the right fill port located in the middle position of the fuel tank.

A 1.50 inch diameter hole shall be provided in the left and right frame rails for vent hose routing provisions. The holes shall be located adjacent to the fuel tank and 5.13 inches up from the bottom of each rail.

FUEL TANK SERVICEABILTY PROVISIONS

The chassis fuel lines shall have additional length provided so the tank can be easily lowered and removed for service purposes. The additional 8.00 feet of length shall be located above the fuel tank and shall be coiled and secured. The fuel line fittings shall be pointed towards the right side (curbside) of the chassis.

FUEL TANK DRAIN PLUG

A 0.5 inch NPT magnetic drain plug shall be centered in the bottom of the fuel tank.

FRONT AXLE

The front axle shall include an independent front suspension (IFS) offering superior ride and improved handling.

The suspension shall utilize fully independent double wishbone arms with carrier and kingpin for optimized scrub radius. Air springs are tuned for ride and help reduce suspension weight. The IFS reduces turn radius with improved wheel cut over beam axles. The hydraulic damper shall feature rebound control to ensure the maximum load stability and superior driver comfort. The IFS system shall improve handling and offer better braking because of improved ground to tire ratio. This design shall allow for independent adjustment of the vehicle's alignment settings.

Proposals offering independent front axles comprised of torsion bar style suspensions shall not be considered.

FRONT AXLE WARRANTY

The front axle shall be warranted by Tuthill for three (3) years or 150,000 miles, which ever comes first. Details of the Tuthill warranty are provided on the PDF document attached to this option.

FRONT WHEEL BEARING LUBRICATION

The front axle wheel bearings shall be lubricated with oil. The oil level can be visually checked via clear inspection windows in the front axle hubs.

FRONT SHOCK ABSORBERS

Two (2) Koni shock absorbers shall be provided and installed as part of the front suspension system. Each shock shall deliver improved road handling and durability.

FRONT SUSPENSION

The independent front suspension (IFS) system shall improve handling and offer better braking because of improved ground to tire ratio. Lower spring rates and independent wheel travel shall reduce the shock within the wheel and feedback throughout the axle. Increased roll stiffness reduces chassis lean in cornering. The suspension travel of the IFS shall be approximately 6.50 inches, providing 3.00 inches jounce and 3.50 inches rebound of the suspension. This feature shall offer a smoother ride for personnel and sensitive equipment. The IFS front axle shall be rated between 18,000 and 20,000 pounds.

Proposals offering independent front axles comprised of torsion bar style suspensions shall not be considered.

STEERING COLUMN/ WHEEL

The cab shall include a Douglas Autotech steering column which shall include a seven (7) position tilt, a 2.25 inch telescopic adjustment, and an 18.00 inch, four (4) spoke steering wheel located at the driver's position. The steering wheel shall be covered with black polyurethane foam padding.

The steering column shall contain a horn button, self-canceling turn signal switch, four-way hazard switch and headlamp dimmer switch.

ELECTRONIC POWER STEERING FLUID LEVEL INDICATOR

The power steering fluid shall be monitored electronically and shall send a signal to activate an audible alarm and visual warning in the instrument panel when fluid level falls below normal.

POWER STEERING PUMP

The hydraulic power steering pump shall be a Vickers V20F and shall be gear driven from the engine. The pump shall be a fixed displacement vane type. The power steering system shall include an oil to air passive cooler.

FRONT AXLE CRAMP ANGLE

The chassis shall have a front axle cramp angle of 53-degrees to the left and right.

POWER STEERING GEAR

The power steering gear shall be a TRW model TAS 85/RCS 85.

CHASSIS ALIGNMENT

The chassis frame rails shall be measured to insure the length is correct and cross checked to make sure they run parallel and are square to each other. The front and rear axles shall be laser aligned. The front tires and wheels shall be aligned and toe-in set on the front tires by the chassis manufacturer.

REAR AXLE

The rear axle shall be a Meritor model RS-25-160 single drive axle. The axle shall include precision forged, single reduction differential gearing, and shall have a fire service rated capacity of 27,000 pounds.

The axle shall be built of superior construction and quality components to provide the rugged dependability needed to stand up to the fire industry's demands. The axle shall include rectangular shaped, hot-formed housing with a standard wall thickness of 0.63 of an inch for extra strength and rigidity and a rigid differential case for high axle strength and reduced maintenance.

The axle shall have heavy-duty Hypoid gearing for longer life, greater strength and quieter operation. Industry-standard wheel ends for compatibility with both disc and drum brakes, and unitized oil seal technology to keep lubricant in and help prevent contaminant damage will be used.

REAR AXLE DIFFERENTIAL LUBRICATION

The rear axle differential shall be lubricated with oil.

REAR AXLE WARRANTY

The rear axle shall be warranted by Meritor for two (2) years with unlimited miles under the general service application. Details of the Meritor warranty are provided on the PDF document attached to this option.

REAR WHEEL BEARING LUBRICATION

The rear axle wheel bearings shall be lubricated with oil.

VEHICLE TOP SPEED

The top speed of the vehicle shall be approximately 68 MPH +/-2 MPH at governed engine RPM.

REAR SUSPENSION

The single rear axle shall feature a Reyco 79KB vari-rate, self-leveling captive slipper type parabolic five (5) leaf spring pack suspension with 57.50 inch X 3.00 inch springs. The suspension shall also utilize one (1) adjustable and one (1) fixed torque rod.

The rear suspension capacity shall be rated from 21,000 to 26,000 pounds.

REAR RIDE HEIGHT ADJUSTMENT

The rear ride height shall be increased 1.00 inch by the addition of one (1) 1.00 inch thick spacer installed between the springs and the axle. This spacer shall be in addition to any spacers that are normally provided for the specific chassis configuration and may cause the frame to not be level when loaded to the rated capacity of the axles.

FRONT TIRE

The front tires shall be Michelin 365/70R-22.5 20PR "L" tubeless radial XZA highway tread.

The front tire stamped load capacity shall be 21,000 pounds per axle with a speed rating of 75 miles per hour when properly inflated to 125 pounds per square inch.

REAR TIRE

The rear tires shall be Michelin 12R-22.5 16PR "H" tubeless radial XDN2 all-weather tread.

The rear tire stamped load capacity shall be 27,120 pounds per axle with a nominal speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch.

The Michelin Intermittent Service Rating maximum load capacity shall be 29,020 pounds per axle with a maximum speed of 75 miles per hour when properly inflated to 120 pounds per square inch.

The Michelin Intermittent Service Rating maximum speed capacity shall match the nominal speed rating.

The Michelin Intermittent Service Rating limits the operation of the emergency vehicle to no more than fifty (50) miles of continuous operation under maximum recommended payload, or without stopping for at least twenty (20) minutes. The emergency vehicle must reduce its speed to no more than 50 MPH after the first fifty (50) miles of travel.

REAR AXLE RATIO

The rear axle ratio shall be 5.13:1.

TIRE PRESSURE INDICATOR

There shall be electronic chrome LED valve caps which shall illuminate with a red LED when tire pressure drops 8psi provided. The valve caps are self-calibrating and set to the pressure of the tire upon installation.

FRONT WHEEL

The front wheels shall be Alcoa hub piloted, 22.50 inch X 10.50 inch polished aluminum wheels. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts. The wheels shall feature one-piece forged strength and shall include Alcoa's Dura-Bright® finish with XBR technology as an integral part of the wheel surface. Alcoa Dura-Bright® wheels keep their shine without polishing. Brake dust, grime and road debris are easily removed by simply cleaning the wheels with soap and water.

REAR WHEEL

The rear wheels shall be Alcoa hub piloted, 22.50 inch X 8.25 inch LvL One™ aluminum wheels with a polished outer surface and Alcoa Dura-Bright® wheel treatment with XBR® technology as an integral part of the wheel. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

BALANCE WHEELS AND TIRES

All of the wheels and tires, including any spare wheels and tire assemblies, shall be dynamically balanced.

WHEEL TRIM

The front wheels shall include stainless steel lug nut covers and stainless steel baby moons. The baby moons shall have cutouts for oil seal viewing when applicable.

The rear wheels shall include stainless steel lug nut covers and band mounted spring clip stainless steel high hats.

The lug nut covers, baby moons, and high hats shall be RealWheels® brand constructed of 304L grade, non-corrosive stainless steel with a mirror finish. Each wheel trim component shall meet D.O.T. certification.

BRAKE SYSTEM

A rapid build-up air brake system shall be provided. The air brakes shall include a two (2) air tank, three (3) reservoir system with a total of 4152 cubic inch of air capacity. A floor mounted treadle valve shall be mounted inside the cab for graduated control of applying and releasing the brakes. An inversion valve shall be installed to provide a controlled service brake application during the unlikely event of primary air supply loss. All air reservoirs provided on the chassis shall be labeled for identification.

The rear axle spring brakes shall automatically apply in any situation when the air pressure falls below 25 PSI and shall include a mechanical means for releasing the spring brakes when necessary. An audible alarm shall designate when the system air pressure is below 60 PSI.

A four (4) sensor, four (4) modulator Anti-lock Braking System (ABS) shall be installed on the front and rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel. A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. The ABS system shall automatically disengage the auxiliary braking system device when required. The speedometer screen shall be capable of reporting all active defaults using PID/SID and FMI standards.

Additional safety shall be accommodated through Automatic Traction Control (ATC) which shall be installed on the single rear axle. The ATC system shall apply the ABS when the drive wheels loose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces. The ATC light shall illuminate during excessive wheel slip and ATC is operational.

A virtual style switch shall be provided and properly labeled “mud/snow”. When the switch is pressed once, the system shall allow a momentary wheel slip to obtain traction under extreme mud and snow conditions. During this condition the ATC light shall blink continuously notifying the driver of activation. Pressing the switch again shall deactivate the mud/snow feature.

FRONT BRAKES

The front brakes shall be Bendix ADB 22X disc brakes with 17.00 inch vented rotors.

REAR BRAKES

The rear brakes shall be Meritor EX225 Disc Plus disc brakes with 17.00 inch vented rotors.

PARK BRAKE

Upon application of the push-pull valve in the cab, the rear brakes will engage via mechanical spring force. This is accomplished by dual chamber rear brakes, satisfying the FMVSS parking brake requirements.

PARK BRAKE CONTROL

A Meritor-Wabco manual hand control push-pull style valve shall operate the parking brake system. The control shall be yellow in color.

The parking brake actuation valve shall be mounted in the switch panel. A horiztonal orientation guard shall be installed over the parking brake control to prevent accidental application or release.

AIR DRYER

The brake system shall include a Wabco System Saver 1200 air dryer with an integral heater with a Metri-Pack sealed connector. The air dryer incorporates an internal turbo cutoff valve that closes the path between the air compressor and air dryer purge valve during the compressor "unload" cycle. The turbo cutoff valve allows purging of moisture and contaminants without the loss of turbo boost pressure. The air dryer shall be mounted behind the battery box on the left hand side.

FRONT BRAKE CHAMBERS

The front brakes shall be provided with type 24 brake chambers as supplied with the independent front suspension axle.

REAR BRAKE CHAMBERS

The rear axle shall include TSE 24/30 H.O.T. (High Output Technology) brake chambers shall convert the energy of compressed air into mechanical force and motion. This shall actuate the brake camshaft, which in turn shall operate the foundational brake mechanism forcing the brake pads against the brake rotor.

AIR COMPRESSOR

The air compressor provided for the engine shall be a Wabco® SS318 single cylinder pass-through drive type compressor which shall be capable of producing 18.7 CFM at 1200 engine RPMs. The air compressor shall feature a higher delivery efficiency translating to more air delivery per horsepower absorbed. The compressor shall include an aluminum cylinder head which shall improve cooling, reduce weight and decrease carbon formation. Superior piston and bore finishing technology shall reduce oil consumption and significantly increasing the system component life.

AIR GOVERNOR

An air governor shall be provided to control the cut-in and cut-out pressures of the engine mounted air compressor. The governor shall be calibrated to meet FMVSS requirements. The air governor shall be located on the air dryer bracket on the left frame rail behind the battery box.

AUXILIARY AIR RESERVOIR

One (1) auxiliary air reservoir with a 2084 cubic inch capacity shall be installed on the chassis to act as an additional reserve supply to the air system for air horn, air tool, or other non-service brake use. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

MOISTURE EJECTORS

A heated, automatic moisture ejector with a manual drain provision shall be installed on the wet tank of the air supply system. The reservoir located above the fuel tank shall have a manual cable actuation drain valve installed with an actuation pull cable routed to the nearest accessible location under the chassis. Manual pet-cock type drain valves shall be installed on all remaining reservoirs of the air supply system.

AIR SUPPLY LINES

The air system on the chassis shall be plumbed with color coded reinforced nylon tubing air lines. The primary (rear) brake line shall be green, the secondary (front) brake line red, the parking brake line orange and the auxiliary (outlet) will be blue.

Brass compression type fittings shall be used on the nylon tubing. All drop hoses shall include fiber reinforced neoprene covered hoses.

AUXILIARY AIR CONNECTION

An auxiliary air line shall be plumbed off the auxiliary air tank and routed inside the cab terminating under the center dash area.

AIR TANK SPACERS

There shall be spacers included with the air tank mounting. The spacers shall move the air tanks 3.00 inches inward towards the center of the chassis. This shall provide clearance between the air tanks and the frame for body U-bolt clearance.

REAR AIR TANK MOUNTING

If a combination of wheel base, air tank quantity, or other requirements necessitate the location of one or more air tanks to be mounted rear of the fuel tank, these tank(s) will be mounted parallel to frame.

WHEELBASE

The chassis wheelbase shall be 184.00 inches.

REAR OVERHANG

The chassis rear overhang shall be 47.00 inches.

FRAME

The frame shall consist of double rails running parallel to each other with cross members forming a ladder style frame. The frame rails shall be formed in the shape of a "C" channel, with the outer rail measuring 10.25 inches high X 3.50 inches deep upper and lower flanges X 0.38 inches thick with an inner channel of 9.44 inches high X 3.13 inches deep and 0.38 inches thick. Each rail shall be constructed of 110,000 psi minimum yield high strength low alloy steel. Each double rail section shall be rated by a Resistance Bending Moment (RBM) minimum of 3,213,100 inch pounds and have a minimum section modulus of 29.21 cubic inches. The frame shall measure 35.00 inches in width.

Proposals calculating the frame strength using the “box method” shall not be considered.

Proposals including heat treated rails shall not be considered. Heat treating frame rails produces rails that are not uniform in their mechanical properties throughout the length of the rail. Rails made of high strength, low alloy steel are already at the required yield strength prior to forming the rail.

A minimum of seven (7) fully gusseted 0.25 inch thick cross members shall be installed. The inclusion of the body mounting, or bumper mounting shall not be considered as a cross member. The cross members shall be attached using zinc coated grade 8 fasteners. The bolt heads shall be flanged type, held in place by distorted thread flanged lock nuts. Each cross member shall be mounted to the frame rails utilizing a minimum of 0.25 inch thick gusset reinforcement plates at all corners balancing the area of force throughout the entire frame.
.
Any proposals not including additional reinforcement for each cross member shall not be considered.

All relief areas shall be cut in with a minimum 2.00 inch radius at intersection points with the edges ground to a smooth finish to prevent a stress concentration point.

The frame and cross members shall carry a lifetime warranty to the original purchaser. A copy of the frame warranty shall be made available upon request.

Proposals offering warranties for frames not including cross members shall not be considered.

FRAME WARRANTY

Summary of Warranty Terms:

THE FOLLOWING IS SUMMARY OF WARRANTY TERMS FOR INFORMATION ONLY. THE ACTUAL LIMITED WARRANTY DOCUMENT, WHICH IS ATTACHED TO THIS OPTION, CONTAINS THE COMPLETE STATEMENT OF THE SPARTAN MOTORS USA LIMITED WARRANTY. SPARTAN'S RESPONSIBILITY IS TO BE ACCORDING TO THE TERMS OF THE COMPLETE LIMITED WARRANTY DOCUMENT.

The frame and cross members shall carry a limited lifetime warranty to the original purchaser. The warranty period shall commence on the date the vehicle is delivered to the first end user.

MISCELLANEOUS FRAME OPTIONS

The frame shall include hole patterns which shall be specific to Spartan ER body mounting.

REAR TOW DEVICE

The frame rails shall contain (6) holes per frame in a pattern specified for mounting Spartan ER tow eyes at the rear of the frame.

FRAME PAINT

The frame rails shall be hot dip galvanized prior to assembly and attachment of any components. The components that shall be galvanized shall include:

- Main frame "C" channel or channels

The frame parts which are not galvanized shall be powder coated prior to any attachment of components. Parts which shall be powder coated shall include but are not limited to:

- Steering gear bracket
- Front splayed rails and fish plates
- Bumper extensions
- Cross members
- Cross member gussets
- Fuel tank mounting brackets
- Fuel tank straps (unless material/finish is specified in 3130 subcat)
- Air tanks (unless color coded tanks are specified in 3205 subcat)
- Air tank mounting brackets
- Exhaust mounting brackets
- Air cleaner skid plate
- Radiator skid plate
- Battery supports, battery trays and battery covers

Other non-galvanized under carriage components which are received from the suppliers with coatings already applied shall include but are not limited to:

- Suspension components
- Front and rear axles

All powder coatings, primers and paint used on the non-galvanized components shall be compatible with all metals, pretreatments and primers used. The cross hatch adhesion test per ASTM D3359 shall not have a fail of more than ten (10) squares. The pencil hardness test per ASTM D3363 shall have a final post-curved pencil hardness of H-2H. The direct impact resistance test per ASTM D2794 shall have an impact resistance of 120.00 inches per pound at 2 mils.

REAR MUD FLAP

The unit shall be equipped with a temporary wooden fender and mud flap assembly for transport to the body manufacturer.

FRONT BUMPER

The chassis shall be equipped with a severe duty front bumper constructed from structural steel channel. The bumper material shall be 0.38 thick ASTM A36 steel which shall measure 12.00 inches high with a 3.05 inch flange and shall be 99.00 inches wide with angled front corners.

The bumper shall be primed and painted as specified.

FRONT BUMPER EXTENSION LENGTH

The front bumper shall be extended approximately 21.00 inches ahead of the cab.

FRONT BUMPER PAINT

The front bumper shall be painted the same as the lower cab color.

FRONT BUMPER TRIM

The bumper shall include a reflective tape chevron with red and yellow stripes.

FRONT BUMPER APRON

The 21.00 inch extended front bumper shall include an apron constructed of 0.19 inch thick embossed aluminum tread plate.

The apron shall be installed between the bumper and the front face of the cab affixed using stainless steel bolts attaching the apron to the top bumper flange.

FRONT BUMPER COMPARTMENT CENTER

The front bumper shall include a compartment in the bumper apron located in the center between the frame rails which may be used as a hose well. The compartment shall be constructed of 0.13 inch 5052-H32 grade aluminum and shall include drain holes in the bottom corners to allow excess moisture to escape. The compartment shall be the full size of available space in the apron from the cab fascia to the bumper and 38.00 inches wide X 10.88 inches deep. The clear opening shall be 37.75 inches wide. The compartment shall include a cover constructed of 0.19 inch thick bright embossed aluminum tread plate.

FRONT BUMPER COMPARTMENT COVER HARDWARE

The front bumper compartment cover(s) shall include gas cylinder stays which shall hold the cover open. Each cover shall be held in the closed position via a D-ring style latch.

MECHANICAL SIREN

The front bumper shall include an electro mechanical Federal Q2B™ siren, which shall be streamlined, chrome-plated and shall produce 123 decibels of sound at 10.00 feet. The Q2B™ siren produces a distinctive warning sound that is recognizable at long distances. A unique clutch design provides a longer coast down sound while reducing the amp draw to 100 amps. The siren shall measure 10.50 inches wide X 10.00 inches high X 14.00 inches deep. The siren shall include a pedestal mount to surface mount on a horizontal surface.

MECHANICAL SIREN LOCATION

The siren shall be pedestal mounted on the bumper apron on the furthest outboard section of the bumper on the driver side.

AIR HORN

The chassis shall include two (2) Grover brand Stutter Tone air horns which shall measure 24.50 inches long with a 6.00 inch round flare. The air horns shall be trumpet style with a chrome finish.

AIR HORN LOCATION

The air horns shall be recess mounted in the front bumper face, one (1) on the right side of the bumper in the outboard position relative to the right hand frame rail and one (1) on the left side of the bumper in the outboard position relative to the left hand frame rail.

AIR HORN RESERVOIR

Two (2) air reservoirs, with a 1200 cubic inch capacity each, shall be installed on the chassis to act as a supply tank for operating air horns. The reservoirs shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system. Each of the two tanks will supply air to one horn independent of the other horn.

ELECTRONIC SIREN SPEAKER

There shall be two (2) Cast Products Inc. model SA4301, 100 watt speakers provided. Each speaker shall measure 6.20 inches tall X 7.36 inches wide X 3.06 inches deep. Each speaker shall include a flat mounting flange which shall be polished aluminum.

ELECTRONIC SIREN SPEAKER LOCATION

The two (2) electronic siren speakers shall be located on the front bumper face outboard of the frame rails with one (1) on the right side and one (1) on the left side in the inboard positions.

FRONT BUMPER TOW HOOKS

Two (2) heavy duty tow hooks, painted to match the frame components, shall be installed below the front bumper in the forward position, bolted directly to the underside of each chassis frame rail with grade 8 bolts.

CAB TILT SYSTEM

The entire cab shall be capable of tilting approximately 45-degrees to allow for easy maintenance of the engine and transmission. The cab tilt pump assembly shall be located on the right side of the chassis above the battery box.

The electric-over-hydraulic lift system shall include an ignition interlock and red cab lock down indicator lamp on the tilt control which shall illuminate when holding the "Down" button to indicate safe road operation.

It shall be necessary to activate the master battery switch and set the parking brake in order to tilt the cab. As a third precaution the ignition switch must be turned off to complete the cab tilt interlock safety circuit.

Two (2) spring-loaded hydraulic hold down hooks located outboard of the frame shall be installed to hold the cab securely to the frame. Once the hold-down hooks are set in place, it shall take the application of pressure from the hydraulic cab tilt lift pump to release the hooks.

Two (2) cab tilt cylinders shall be provided with velocity fuses in each cylinder port. The cab tilt pivots shall be 1.90 inch ball and be anchored to frame brackets with 1.25 inch diameter studs.

A steel safety channel assembly, painted safety yellow shall be installed on the right side cab lift cylinder to prevent accidental cab lowering. The safety channel assembly shall fall over the lift cylinder when the cab is in the fully tilted position. A cable release system shall also be provided to retract the safety channel assembly from the lift cylinder to allow the lowering of the cab.

CAB TILT LIMIT SWITCH

A cab tilt limit switch shall be installed. The switch will effectively limit the travel of the cab when being tilted. The limit adjustment of the switch shall be preset by the chassis manufacturer to prevent damage to the cab or any bumper mounted option mounted in the

cab tilt arc. Further adjustment to the limit by the apparatus manufacturer shall be available to accommodate additional equipment.

CAB TILT CONTROL RECEPTACLE

A 25.00 foot cab tilt control harness shall be provided on the right side of frame just behind the cab. This harness shall consist of an 8.00 foot harness connected to the tilt pump and a 17.00 foot extension harness with a six (6) pin Deutsch connector with cap for mounting in a compartment in the body.

The remote control pendant shall include 20.00 feet of cable with a mating Deutsch connector. The remote control pendant shall be shipped loose with the chassis.

CAB TILT LOCK DOWN INDICATOR

The cab dash shall include a message located within the dual air pressure gauge which shall alert the driver when the cab is unlocked and ajar. The alert message shall cease to be displayed when the cab is in the fully lowered position and the hold down hooks are secured and locked to the cab mounts.

In addition to the alert message an audible alarm shall sound when the cab is unlocked and ajar with the parking brake released.

CAB WINDSHIELD

The cab windshield shall have a surface area of 2825.00 square inches and be of a two (2) piece wraparound design for maximum visibility.

The glass utilized for the windshield shall include standard automotive tint. The left and right windshield shall be fully interchangeable thereby minimizing stocking and replacement costs.

Each windshield shall be installed using black self locking window rubber.

GLASS FRONT DOOR

The front cab doors shall include a window which is 27.00 inches in width X 26.00 inches in height. These windows shall have the capability to roll down completely into the door housing. This shall be accomplished manually utilizing a crank style handle on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use.

There shall be an irregular shaped fixed window which shall measure 2.50 inches wide at the top, 8.00 inches wide at the bottom X 26.00 inches in height, more commonly known as “cozy glass” ahead of the front door roll down windows.

The windows shall be mounted within the frame of the front doors trimmed with a black anodized ring on the exterior.

GLASS TINT FRONT DOOR

The windows located in the left and right front doors shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

GLASS REAR DOOR RH

The rear right hand side door shall include a window which is 27.00 inches in width X 26.00 inches in height. This window shall roll up and down manually utilizing a crank style handle on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use.

GLASS TINT REAR DOOR RIGHT HAND

The window located in the right hand side rear window shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

GLASS REAR DOOR LH

The rear left hand side door shall include a window which is 27.00 inches in width X 26.00 inches in height. This window shall roll up and down manually utilizing a crank style handle on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use.

GLASS TINT REAR DOOR LEFT HAND

The window located in the left hand side rear door shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

GLASS SIDE MID RH

The cab shall include a window on the right side behind the front and ahead of the crew door which shall measure 16.00 inches wide X 26.00 inches high. This window shall be fixed within this space and shall be rectangular in shape. The window shall be mounted using self locking window rubber. The glass utilized for this window shall include a green automotive tint unless otherwise noted.

GLASS TINT SIDE MID RIGHT HAND

The window located on the right hand side of the cab between the front and rear doors shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

GLASS SIDE MID LH

The cab shall include a window on the left side behind the front door and ahead of the crew door and above the wheel well which shall measure 16.00 inches wide X 26.00 inches high. This window shall be fixed within this space and shall be rectangular in shape. The window shall be mounted using self locking window rubber. The glass utilized for this window shall include a green automotive tint unless otherwise noted.

GLASS TINT SIDE MID LEFT HAND

The window located on the left hand side of the cab between the front and rear doors shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

CLIMATE CONTROL

A ceiling mounted combination defroster and cabin heating and air conditioning system shall be located above the engine tunnel area. The system covers and plenums shall be of severe duty design made of aluminum which shall be coated with a customer specified interior paint. The design of the system's covers shall provide quick access to washable air intake filters as well as easy access to other serviceable items.

The air delivery plenums provide targeted airflow directly to the vehicle occupants. Six (6) adjustable louvers will provide comfort for the front seat occupants and ten (10) adjustable louvers will provide comfort for the rear crew occupants.

The system shall be capable of producing up to 12 FPM of air velocity at all occupant seating positions. Separate front and rear blower motors shall be of brushless design and shall be

controlled independently. It shall be capable of reducing the interior cabin air temperature from 122˚ F (+/- 3˚ F) to 80˚ F in thirty minutes with 50% relative humidity and full solar load as described in SAE J2646.

The system shall also provide heater pull up performance which meets or exceeds the performance requirements of SAE J1612 as well as defrost performance that meets or exceeds the performance requirements of SAE J381.

A gravity drain system shall be provided that is capable of evacuating condensate from the vehicle while on a slope of up to a 13% grade in any direction.

The air conditioning system plumbing shall be a mixture of custom bent zinc coated steel fittings and Aeroquip flexible hose with Aeroquip EZ-Clip fittings.

The overhead heater/defroster plumbing shall include an electronic flow control valve that re-directs hot coolant away from the evaporator, via a bypass loop, as the temperature control is moved toward the cold position.

Any component which needs to be accessed to perform system troubleshooting shall be accessible by one person using basic hand tools. Regularly serviced items shall be replaceable by one person using basic hand tools.

*****Spartan Motors Inc. recommends that the overall climate system performance be based off third-party testing in accordance to Society of Automotive Engineering standards as a complete system.***

Individual component level BTU ratings is not an accurate indicator of the performance capability of the completed system. System individual component BTU ratings:

- Air conditioning evaporator total BTU/HR: 82,000
- Air conditioning condenser total BTU/HR: 59,000
- Heater coil total BTU/HR: 98,000

Performance data specified is based on testing performed by an independent third-party test facility using a medium four-door 10" Raised roof Gladiator chassis equipped with an ISL engine.

CLIMATE CONTROL DRAIN

The climate control system shall include a gravity drain for water management. The gravity drain shall remove condensation from the air conditioning system without additional mechanical assistance.

CLIMATE CONTROL ACTIVATION

The heating, defrosting and air conditioning controls shall be located on the center dash panel in the upper left hand side, in a position which is easily accessible to the driver. The climate control shall be activated by a rotary switch.

HVAC OVERHEAD COVER PAINT

The overhead HVAC cover shall be painted with a multi-tone silver gray texture finish.

A/C CONDENSER LOCATION

A roof mounted A/C condenser shall be installed centered on the cab forward of the raised roof against the slope rise.

A/C COMPRESSOR

The air-conditioning compressor shall be a belt driven, engine mounted compressor. The compressor shall be compatible with R134-a refrigerant.

*****Spartan Motors Inc. recommends that the overall climate system performance be based off third-party testing in accordance to Society of Automotive Engineering standards as a complete system.***

Individual component level ratings are not an accurate indicator of the performance capability of the completed system.
Refrigerant Compressor displacement: 19.1 cubic inches per revolution.

UNDER CAB INSULATION

The underside of the cab tunnel surrounding the engine and the underside of the entire cab floor shall be lined with multi-layer insulation, engineered for application inside diesel engine compartments. In addition, the insulation on the underside of the cab floor shall have an expanded metal overlay to assist in retaining the insulation tight against the cab and the insulation inside the tunnel shall have a removable aluminum overlay installed to protect the insulation and assist in retaining the insulation tight against the engine tunnel surfaces.

The insulation shall act as a noise barrier, absorbing noise thus keeping the decibel level in the cab well within NFPA recommendations. As an additional benefit, the insulation shall assist in sustaining the desired temperature within the cab interior.

The engine tunnel insulation shall measure approximately 0.75 inch thick including a vertically lapped polyester fiber layer, a 1.0 lb/ft² PVC barrier layer, an open cell foam layer, and a moisture and heat reflective foil facing reinforced with a woven fiberglass layer. The foil surface acts as protection against moisture and other contaminants. The insulation shall meet or exceed FMVSS 302 flammability test.

The cab floor insulation shall measure 0.56 inch thick including a 1.0#/sf PVC barrier and a moisture and heat reflective foil facing, reinforced with fiberglass strands. The foil surface acts as protection against moisture and other contaminants. The insulation shall meet or exceed FMVSS 302 flammability test.

The insulation shall be cut precisely to fit each section and sealed for additional heat and sound deflection. The insulation shall be held in place by 3 mils of acrylic pressure sensitive adhesive and aluminum pins with hard hat, hold in place fastening heads.

INTERIOR TRIM FLOOR

The floor of the cab shall be covered with a multi-layer mat consisting of 0.25 inch thick sound absorbing closed cell foam with a 0.06 inch thick non-slip vinyl surface with a pebble grain finish. The covering shall be held in place by a pressure sensitive adhesive and embossed treadplate trim that shall wrap 2" horizontally and vertically. All exposed seams shall be sealed with silicone caulk matching the color of the floor mat to reduce the chance of moisture and debris retention.

INTERIOR TRIM

The cab interior shall include trim on the front ceiling, rear crew ceiling, and the cab walls. It shall be easily removable to assist in maintenance. The trim shall be constructed of insulated vinyl over a hard board backing.

REAR WALL INTERIOR TRIM

The rear wall of the cab shall be trimmed with vinyl.

HEADER TRIM

The cab interior shall feature header trim over the driver and officer dash constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum.

TRIM CENTER DASH

The main center dash area shall be constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum plate. There shall be four (4) holes located on the top of the dash near each outer edge of the electrical access cover for ventilation. The center dash electrical access cover shall include a gas cylinder stay which shall hold the cover open during maintenance.

TRIM LH DASH

The left hand dash shall be constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum plate for a perfect fit around the instrument panel. For increased occupant protection the extreme duty left hand dash utilizes patent pending break away technology to reduce rigidity in the event of a frontal crash. The left hand dash shall offer lower vertical surface area to the left and right of the steering column to accommodate control panels.

TRIM RH DASH

The right hand dash shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick aluminum plate and shall include a glove compartment with a hinged door and a Mobile Data Terminal (MDT) provision. The glove compartment size will measure 14.00 inches wide X 6.38 inches high X 5.88 inches deep. The MDT provision shall be provided above the glove compartment.

ENGINE TUNNEL TRIM

The cab engine tunnel shall be covered with a multi-layer mat consisting of 0.25 inch closed cell foam with a 0.06 inch thick non-slip vinyl surface with a pebble grain finish. The mat shall be held in place by pressure sensitive adhesive. The engine tunnel mat shall be trimmed with anodized aluminum stair nosing trim for an aesthetically pleasing appearance.

POWER POINT DASH MOUNT

The cab shall include a dual universal serial bus (USB) charging receptacle in the cab dash offset to the right hand side below the center switch panel to provide a power source for USB chargeable electrical equipment. The dual USB receptacle shall include two ports and shall be capable of up to a 5 Volt 2.1 amp output. Port 1 is optimized for fast charging at 1 amp. Port 2 is optimized for fast charging up to 2.1 amps, when used individually. The receptacles shall be wired battery direct.

AUXILIARY POWER POINT ENGINE TUNNEL

The cab interior shall include a universal serial bus (USB) charging receptacle to provide a power source for USB chargeable electrical equipment. The dual USB receptacle shall include two ports and shall be capable of up to a 5 Volt 2.1 amp output. Port 1 is optimized for fast

charging at 1 amp. Port 2 is optimized for fast charging up to 2.1 amps, when used individually. The receptacles shall be wired battery direct. The receptacle shall be located in the mirror control switch panel in the extreme duty dash near the transmission shift module on the tunnel.

STEP TRIM

Each cab entry door shall include a three step entry. The first step closest to the ground shall be constructed of polished 5052 H32 aluminum Grip Strut® grating with angled outer corners. The grating shall allow water and other debris to flow through rather than becoming trapped within the stepping surface. The lower step shall be mounted to a frame which is integral with the construction of the cab for rigidity and strength. The middle step shall be integral with the cab construction and shall be trimmed in 0.08 inch thick 3003-H22 embossed aluminum tread plate.

STEP TRIM KICKPLATE

The cab steps shall include a kick plate in the rise of each step. The risers shall be trimmed in 3003-H22 bright aluminum tread-plate which is 0.07 inch thick.

UNDER CAB ACCESS DOOR

The cab shall include an access door in the left crew step riser constructed of aluminum tread plate with a push and turn latch. The under cab access door shall provide access to the diesel exhaust fluid fill.

INTERIOR DOOR TRIM

The interior trim on the doors of the cab shall consist of an aluminum panel constructed of Marine Grade 5052-H32 0.13 of an inch thick aluminum plate. The door panels shall include a painted finish.

CAB DOOR TRIM REFLECTIVE

In accordance with the current standards of NFPA, the body builder shall provide 96.00 square inches of reflective material on the interior of each cab door.

INTERIOR GRAB HANDLE "A" PILLAR

There shall be two (2) rubber covered 11.00 inch grab handles installed inside the cab, one on each “A” post at the left and right door openings. The left handle shall be located 7.88 inches above the bottom of the door window opening and the right handle shall be located 2.88

inches above the bottom of the door window opening. The handles shall assist personnel in entering and exiting the cab.

INTERIOR GRAB HANDLE FRONT DOOR

Each front door shall include one (1) ergonomically contoured 9.00 inch cast aluminum horizontal grab handle which shall be located at the upper-most center of the door panel, and one (1) 9.00 inch vertical grab handle which shall be located outboard of the paddle latch at the center of the door panel. Each handle shall feature a DA sand finish and assist personnel entering and exiting the cab.

INTERIOR GRAB HANDLE REAR DOOR

A DA sanded cast aluminum assist handle shall be provided on the inside of each rear crew door. A 30.00 inch long handle shall extend horizontally the width of the window just above the window sill. The handle shall assist personnel in exiting and entering the cab.

INTERIOR SOFT TRIM COLOR

The cab interior soft trim surfaces shall be gray in color.

INTERIOR TRIM SUNVISOR

The header shall include two (2) sun visors, one each side forward of the driver and officer seating positions above the windshield. Each sun visor shall be constructed of Masonite and covered with padded vinyl trim.

INTERIOR FLOOR MAT COLOR

The cab interior floor mat shall be gray in color.

CAB PAINT INTERIOR

The inner door panel surfaces shall feature a medium gray Spar-Liner spray on bedliner coating.

HEADER TRIM INTERIOR PAINT

The metal surfaces in the header area shall feature a medium gray Spar-Liner spray on bedliner coating.

TRIM CENTER DASH INTERIOR PAINT

The entire center dash and any accessory pods attached to the dash shall feature a medium gray Spar-Liner spray on bedliner coating.

TRIM LEFT HAND DASH INTERIOR PAINT

The left hand dash shall feature a medium gray Spar-Liner spray on bedliner coating.

TRIM RIGHT HAND DASH INTERIOR PAINT

The right hand dash shall feature a medium gray Spar-Liner spray on bedliner coating.

DASH PANEL GROUP

The main center dash area shall include three (3) aluminum removable panels located one (1) to the right of the driver position, one (1) in the center of the dash and one (1) to the left of the officer position. The panels shall be coated with a black texture finish. The center panel shall be within comfortable reach of both the driver and officer.

SWITCHES CENTER PANEL

The center dash panel shall include no rocker switches or legends.

SWITCHES LEFT PANEL

The left dash panel shall include three (3) switches. Two (2) of the switches shall be rocker type and the left one (1) shall be the windshield wiper/washer control switch.

A rocker switch with a blank legend installed directly above shall be provided for any position not designated by a specific option. The non-designated switches shall be two-position, black switches with a green indicator light. Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have backlighting provided.

SWITCHES RIGHT PANEL

The right dash panel shall six (6) rocker switch positions in a three (3) over three (3) switch configuration.

A rocker switch with a blank legend installed directly above shall be provided for any position without a switch and legend designated by a specific option. The non-specified switches shall be two-position, black switches with a green indicator light. Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have backlighting provided.

SEAT BELT WARNING

A Weldon seat belt warning system, integrated with the Vehicle Data Recorder system, shall be installed for each seat within the cab. The system shall provide a visual warning indicator in the Vista display and control screen(s), an indicator light in the instrument panel, and an audible alarm.

The warning system shall activate when any seat is occupied with a minimum of 60 pounds, the corresponding seat belt remains unfastened, and the park brake is released. The warning system shall also activate when any seat is occupied, the corresponding seat belt was fastened in an incorrect sequence, and the park brake is released. Once activated, the visual indicators and audible alarm shall remain active until all occupied seats have the seat belts fastened.

SEAT MATERIAL

The Bostrom Firefighter seats shall include a covering of extra high strength, wear resistant fabric made of durable Durawear Plus™ ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Durawear Plus™ meets or exceeds specification of the common trade name Imperial 1800. The material meets FMVSS 302 flammability requirements.
If applicable, Theatre style seats located in the cab shall be high strength, wear resistant fabric made of durable ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Common trade names for this material are Imperial 1200 and Durawear.

SEAT COLOR

All seats supplied with the chassis shall be gray in color. All seats shall include red seat belts.

SEAT BACK LOGO

The seat back shall include the “Spartan” logo. The logo shall be centered on the standard headrest of the seat back and on the left side of a split headrest.

SEAT DRIVER

The driver's seat shall be an H.O. Bostrom 500 Series Firefighter Sierra model seat. The seat shall feature eight-way electric positioning. The eight positions shall include up and down, fore and aft with 8.00 inches of travel, back angle adjustment and seat rake adjustment. The seat shall feature integral springs to isolate shock.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt, automatic retractor and buckle as an integral part of the seat assembly. The ABTS feature shall also include the RiteHite™ shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 35.00 inches measured with the seat height adjusted to the lowest position of travel.

This model of seat shall have successfully completed the static load tests set forth by FMVSS 207, 209, and 210 in effect at the time of manufacture. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity.

The materials used in construction of the seat shall also have successfully completed testing with regard to the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK DRIVER

The driver's seat shall include a standard seat back incorporating the all belts to seat feature (ABTS). The seat back shall feature a contoured head rest.

SEAT MOUNTING DRIVER

The driver's seat shall be installed in an ergonomic position in relation to the cab dash.

OCCUPANT PROTECTION DRIVER

The driver's position shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

The driver's seating area APS shall include:

- Advanced seat belt system - retractor pre-tensioner tightens the seat belt around the driver, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

- Large side curtain airbag - protects the driver's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the driver in a qualifying event by covering the window and the upper portion of the door.

- Dual knee airbags (patent pending) with energy management mounting (patent pending) - protects the driver's lower body from dangerous surface contact injuries, acceleration injuries, and from intrusion as well as locks the lower body in place so the upper body shall be shall be slowed by the load limiting seat belt.

Steering wheel airbag - protects the driver's head, neck, and upper torso from contact injuries, acceleration injuries, and contact points with intrusive surfaces as a result of a collision.

SEAT OFFICER

The officer's seat shall be a H.O. Bostrom 500 Series Sierra seat model. The seat shall feature a tapered and padded seat, and cushion. The seat shall be mounted in a fixed position.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant. The ABTS feature shall also include the RiteHite™ shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK OFFICER

The officer's seat back shall include an IMMI brand SmartDock® Gen 2 hands-free self contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

SEAT MOUNTING OFFICER

The officer's seat shall offer a special mounting position which is approximately 2.50 inches rearward of the standard location offering increased leg room for the occupant. The front face of the officer's under seat storage box shall be modified 8.13 inches rearward for floor storage below the seat eliminating the under seat storage compartment and access door.

OCCUPANT PROTECTION OFFICER

The officer's position shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

The officer's seating area APS shall include:

- Advanced seat belt system - retractor pre-tensioner tightens the seat belt around the officer, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

- Large side curtain airbag - protects the officer's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the officer in a qualifying event by covering the window and the upper portion of the door.

Knee airbags - protects the officer's lower body from dangerous surface contact injuries, acceleration injuries, and from contact points with intrusive surfaces as a result of a collision as well as locks the lower body in place so the upper body shall be slowed by the load limiting seat belt.

POWER SEAT WIRING

The power seat or seats installed in the cab shall be wired directly to battery power.

SEAT BELT ORIENTATION CREW

The crew position seat belts shall follow the standard orientation which extends from the outboard shoulder extending to the inboard hip.

SEAT FORWARD FACING OUTER LOCATION

The crew area shall include two (2) forward facing outboard seats, which include one (1) located next to the outer wall of the cab on the left side of the cab and one (1) located next to the outer wall on the right side of the cab.

SEAT CREW FORWARD FACING OUTER

The crew area shall include a seat in the forward facing outer position which shall be a H.O. Bostrom 500 Series Firefighter model seat. The seat shall feature a tapered and padded seat, and cushion. The seat shall be mounted in a fixed position. The seat and cushion shall be hinged and compact in design for additional room. The seat shall include a “Fold and Hold” feature so that the cushion shall remain in the seated position and simply touched to flip up.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant. The ABTS feature shall also include the RiteHite™ shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.

The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of

seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK FORWARD FACING OUTER

The crew area seat backs shall include an IMMI brand SmartDock® Gen 2 hands-free self contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

SEAT MOUNTING FORWARD FACING OUTER

The forward facing outer seat shall be mounted inboard from the side wall for additional clearance facing the front of the cab.

OCCUPANT PROTECTION FFO

The forward facing outer seat position(s) shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

Each forward facing outer seating position APS shall include:

- APS advanced seatbelt system - retractor pre-tensioners tighten the seat belts around

each occupant, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

Side curtain airbag - protects each occupant's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to each occupant in a qualifying event by covering the windows and walls adjacent to each seating position with an airbag custom designed for each cab configuration.

SEAT FORWARD FACING CENTER LOCATION

The crew area shall include one (1) forward facing center crew seat located directly behind the engine tunnel in the center of the cab.

SEAT CREW FORWARD FACING CENTER

The forward facing center seat shall be a H.O. Bostrom 500 Series Firefighter model seat. The seat shall feature a tapered and padded seat, and cushion. The seat shall be mounted in a fixed position. The seat and cushion shall be hinged and compact in design for additional room. The seat shall include a "Fold and Hold" feature so that the cushion shall remain in the seated position and simply touched to flip up.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant. The ABTS feature shall also include the RiteHite™ shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.

The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in

FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK FORWARD FACING CENTER

The crew area seat backs shall include an IMMI brand SmartDock® Gen 2 hands-free self contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

OCCUPANT PROTECTION FFC

The forward facing center seat position(s) shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

Each forward facing center seating position APS shall include:

- APS advanced seatbelt system - retractor pre-tensioners tighten the seat belts around each occupant, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

Side curtain airbag - provides ejection mitigation protection to each occupant in a qualifying event by covering the windows and walls adjacent to crew seating with an airbag custom designed for each cab configuration.

SEAT FRAME FORWARD FACING

The forward facing center seating positions shall include an enclosed style seat frame located and installed at the rear wall. The seat frame shall measure 62.38 inches wide X 12.38 inches high X 20.00 inches deep. The seat frame shall be constructed of Marine Grade 5052-H32 0.19 inch thick aluminum plate. The forward corners of the bench shall be chamfered 45-degrees X 4.00 inches.

SEAT FRAME FORWARD FACING STORAGE ACCESS

There shall be two (2) access points to the storage area centered on the front of the seat frame. Each access point shall be covered by a hinged door to allow access for storage in the seat box.

SEAT MOUNTING FORWARD FACING CENTER

The forward facing center seats shall be installed facing the front of the cab.

CAB FRONT UNDERSEAT STORAGE ACCESS DOOR

The left under seat storage area shall have a solid aluminum hinged door with non-locking latch.

SEAT COMPARTMENT DOOR FINISH

All underseat storage compartment access doors shall feature a medium gray Spar-Liner spray on bedliner coating.

WINDSHIELD WIPER SYSTEM

The cab shall include a dual arm wiper system which shall clear the windshield of water, ice and debris. There shall be two (2) windshield wipers; each shall be affixed to a radial arm. The wiper motor shall be activated by an intermittent wiper control located within easy reach of the driver's position.

ELECTRONIC WINDSHIELD FLUID LEVEL INDICATOR

The windshield washer fluid level shall be monitored electronically. When the washer fluid level becomes low the yellow "Check Message Center" indicator light on the instrument panel shall illuminate and the message center in the dual air pressure gauge shall display a "Check Washer Fluid Level" message.

CAB DOOR HARDWARE

The cab entry doors shall be equipped with exterior pull handles, suitable for use while wearing firefighter gloves. The handles shall be made of aluminum with a chrome plated finish.

The interior exit door handles shall be flush paddle type with a black finish, which are incorporated into the upper door panel.

All cab entry doors shall include locks which are keyed alike. The door locks shall be designed to prevent accidental lockout.

DOOR LOCKS

The cab entry doors shall include a Controller Area Network (CAN) based electronic door lock system which shall include two (2) external keypads, one (1) located on the left side next to the front grab handle and one (1) on the right side next to the front grab handle. There shall be one (1) red rocker switch provided on the inside of each front cab entry door to actuate the cab door locks. Each door lock may also be manually actuated from the inside of the cab by means of a red knob located on the paddle handle of the respective door. The electronic door lock system shall include four (4) key fobs for actuation with buttons for cab entry door locks and for compartment door locks.

When the doors are unlocked using the external keypad or the key fobs the interior dome lights shall illuminate and remain on for a period of twenty (20) seconds. The interior dome safety feature shall require the interior lighting power to be battery direct.

Wiring shall also be provided for up to four (4) exterior cab compartments and up to four (4) body compartments.

GRAB HANDLES

The cab shall include one (1) 18.00 inch three-piece knurled aluminum, anti-slip exterior assist handle, installed behind each cab door. The assist handle shall be made of extruded aluminum with a knurled finish to enable non-slip assistance with a gloved hand.

POWER DOOR LOCK COMPARTMENT ACTIVATION

The power door lock feature shall include activation for exterior compartment door locks through the key fob and keypads.

REARVIEW MIRRORS

Retrac Aerodynamic West Coast style dual vision mirror heads model 613305 shall be provided and installed on each of the front cab doors.

The mirrors shall be mounted via 1.00 inch diameter tubular stainless steel arms to provide a rigid mounting to reduce mirror vibration.

The mirrors shall measure 8.00 inches wide X 19.00 inches high and shall include an integral convex mirrors installed in the mirror head below the flat glass to provide a wider field of vision. The flat and convex mirrors shall be motorized with remote horizontal and vertical adjustment. The control switches shall be mounted within easy reach of the driver. The flat and convex mirrors shall be heated for defrosting in severe cold weather conditions.

The mirrors shall be constructed of a vacuum formed chrome plated ABS plastic housing that is corrosion resistant and shall include the finest quality non-glare glass.

REARVIEW MIRROR HEAT SWITCH

The heat for the rearview mirrors shall be controlled through a rocker switch on the dash in the switch panel.

EXTERIOR TRIM REAR CORNER

There shall be an overlay of 3003-H22 aluminum tread plate which shall be 0.07 inches thick on the outside corners at the back of the cab. The overlay shall wrap 1.00 inches forward on the sides of the cab and 12.00 inches inboard on the rear wall.

CAB FENDER

Full width wheel well liners shall be installed on the extruded cab to limit road splash and enable easier cleaning. Each two-piece liner shall consist of an inner liner 16.00 inches wide made of vacuum formed ABS composite and an outer fenderette 5.00 inches wide made of polished aluminum.

CAB EXTERIOR FRONT & SIDE EMBLEMS

The cab shall include three (3) Spartan emblems. There shall be one (1) installed on the front air intake grille and one (1) emblem on each of the cab sides. The cab shall also include one (1) Advanced Protection System shield emblem on each front door.

IGNITION

A master battery system with a keyless start ignition system shall be provided. Each system shall be controlled by a one-quarter turn Cole Hersee switch, both of which shall be mounted to

the left of the steering wheel on the dash. A chrome push type starter button shall be provided adjacent to the master battery and ignition switches.

Each switch shall illuminate a green LED indicator light on the dash when the respective switch is placed in the "ON" position.

The starter button shall only operate when both the master battery and ignition switches are in the "ON" position.

BATTERY

The single start electrical system shall include six (6) Harris BCI 31 925 CCA batteries with a 210 minute reserve capacity and 4/0 welding type dual path starter cables per SAE J541.

BATTERY TRAY

The batteries shall be installed within two (2) steel battery trays located on the left side and right side of the chassis, securely bolted to the frame rails. The battery trays shall be coated with the same material as the frame.

The battery trays shall include drain holes in the bottom for sufficient drainage of water. A durable, non-conducting, interlocking mat made by Dri-Dek shall be installed in the bottom of the trays to allow for air flow and help prevent moisture build up. The batteries shall be held in place by non-conducting phenolic resin hold down boards.

BATTERY BOX COVER

Each battery box shall include a stainless steel cover which protects the top of the batteries. Each cover shall be coated the same as the frame and shall include flush latches which shall keep the cover secure as well as a chrome handle for convenience when opening.

BATTERY CABLE

The starting system shall include cables which shall be protected by 275 degree F. minimum high temperature flame retardant loom, sealed at the ends with heat shrink and sealant.

BATTERY JUMPER STUD

The starting system shall include battery jumper studs. These studs shall be located in the forward most portion of the driver's side lower step, 8.00 inches apart. The studs shall allow the vehicle to be jump started, charged, or the cab to be raised in an emergency in the event of battery failure.

ALTERNATOR

The charging system shall include a 320 amp Leece-Neville 12 volt alternator. The alternator shall include a self-exciting integral regulator.

STARTER MOTOR

The single start electrical system shall include a Delco brand starter motor.

BATTERY CONDITIONER

A Kussmaul Auto Charge 40 LPC battery conditioner shall be supplied. The battery conditioner shall provide a 40 amp output for the chassis batteries and a 15 amp output circuit for accessory loads. The battery conditioner shall be mounted in the cab in the LH rear facing outer seating position.

BATTERY CONDITIONER DISPLAY

A Kussmaul battery conditioner display shall be supplied. The battery conditioner display shall be mounted in front of the left side door just below the windshield.

AUXILIARY AIR COMPRESSOR

A Kussmaul Pump 12V air compressor shall be supplied. The air compressor shall be installed behind the driver's seat. The air compressor shall be plumbed to the air brake system to maintain air pressure. The air compressor shall include an auto drain as an extra precaution to prevent moisture from entering the air system. The automatic moisture drain shall be plumbed into the system between the auxiliary air compressor pump and the air tanks.

ELECTRICAL INLET LOCATION

An electrical inlet shall be installed on the left hand side of the cab ahead of the front door in the mid position.

ELECTRICAL INLET

A Kussmaul 20 amp super auto-eject electrical receptacle shall be supplied. It shall automatically eject the plug when the starter button is depressed.

A single item or an addition of multiple items must not exceed the rating of the electric inlet that it’s connected to.

Amp Draw Reference List:
Kussmaul 1000 Charger - 3.5 Amps
Kussmaul 1200 Charger - 10 Amps
Kussmaul 35/10 Charger - 10 Amps
1000W Engine Heater - 8.33 Amps
1500W Engine Heater - 12.5 Amps
120V Air Compressor - 4.2 Amps

ELECTRICAL INLET CONNECTION

The electrical inlet shall be connected to the battery conditioner.

ELECTRICAL INLET COLOR

The electrical inlet connection shall include a yellow cover.

HEADLIGHTS

The cab front shall include four (4) rectangular LED headlamps with separate high and low beams mounted in bright chrome bezels.

FRONT TURN SIGNALS

The front fascia shall include two (2) Whelen model M6 4.00 inch X 6.00 inch amber LED turn signals which shall be installed in a chrome housing above and outboard of the front warning and head lamps.

HEADLIGHT LOCATION

The headlights shall be located on the front fascia of the cab directly below the front warning lights.

SIDE TURN/MARKER LIGHTS

The sides of the cab shall include two (2) LED round side marker lights which shall be provided just behind the front cab radius corners.

MARKER AND ICC LIGHTS

In accordance with FMVSS, there shall be five (5) LED cab marker lamps designating identification, center and clearance provided. These lights shall be installed on the face of the cab within full view of other vehicles from ground level.

HEADLIGHT AND MARKER LIGHT ACTIVATION

The headlights and marker lights shall be controlled via a virtual button on the Vista display. The headlamps and markers lamps shall illuminate to 100% brilliance when the ignition switch is in the "On" position.

The dash lights shall only have a dim setting for night and a bright setting for day which shall be controlled with a virtual dimmer control on the Vista display. The last button state selected before master power is turned off for the will be held in memory, and they will return to that state when master power is turned back on providing button selection was made at least fifteen (15) seconds prior to shut down.

GROUND LIGHTS

Each door shall include a Tecniq T44 LED ground light mounted to the underside of the cab step below each door. The lights shall include a polycarbonate lens, a housing which is vibration welded and LEDs which shall be shock mounted for extended life. The ground lighting shall be activated by the opening of the door on the respective cab side as well as through a virtual button on the Vista display and control screen.

LOWER CAB STEP LIGHTS

The middle step located at each door shall include a recess mounted 4.00 inch round LED light which shall activate with the opening of the respective door.

INTERMEDIATE STEP LIGHTS

The intermediate step well area at each door shall include an LED light within a chrome housing. The Egress step lights shall provide visibility to the step well area for the first step exiting the vehicle. The Egress step lights shall activate with Entry step lighting.

UNDER BUMPER LIGHTS

There shall be two (2) 4.00 inch round LED NFPA compliant ground lights mounted under the bumper. The lights shall include a polycarbonate lens, a housing which is vibration welded, and LEDs which shall be shock mounted for extended life. The under bumper ground lighting shall be interlocked with the park brake and the marker light activation.

ENGINE COMPARTMENT LIGHT

There shall be a LED NFPA compliant light mounted under the engine tunnel for area work lighting on the engine. The light shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life. The light shall activate automatically when the cab is tilted.

LIGHTBAR PROVISION

There shall be one (1) light bar installed on the cab roof. The light bar shall be provided and installed by Spartan Chassis. The light bar installation shall include a lowered mounting that shall place the light bar just above the junction box and wiring to a control switch on the cab dash.

CAB FRONT LIGHTBAR

The lightbar provisions shall be for one (1) Whelen brand Freedom IV LED lightbar mounted centered on the front of the cab roof. The lightbar shall be 72.00 inches in length. The lightbar shall feature twelve (12) red LED light modules and two (2) clear LED light modules. The entire lightbar shall feature a clear lens. The clear lights shall be disabled with park brake engaged. The cable shall exit the lightbar on the right side of the cab.

LIGHTBAR SWITCH

The light bar shall be controlled by a virtual button on the Vista display and control screen. This button shall be clearly labeled for identification.

FRONT SCENE LIGHTS

The front of the cab shall include two (2) Whelen Pioneer model PCH2 contour roof mount scene lights installed on the brow of the cab.

Each 150 watt lamp head shall incorporate a 12 volt DC Super-LED combination flood/spot light installed in a die-cast aluminum housing. Each lamp head shall use a collimator/metalized redux spot/flood reflector assembly with Proclera™ silicone optics and a clear non-optic polycarbonate lens. The lens/reflector assembly shall utilize a liquid injected molded silicone gasket to be resistant to water, moisture, dust, and other environmental conditions. The PCH2 shall be vibration resistant. The Pioneer PC boards shall be conformal coated for additional protection. Each combination flood/spot light lamp head shall draw 13.0 amps in spotlight mode and generate 17,750 lumens total. Each lamp head shall measure 4.25 inches in height X 14.00 inches in width. The lamp heads and brackets shall be powder coated white.

FRONT SCENE LIGHTS ACTIVATION

The front scene lighting shall be activated by a virtual button on the Vista display and control screen and a lighted momentary rocker switch on the dash.

FRONT SCENE LIGHT LOCATION

There shall be two (2) scene lights mounted to the front brow of the cab inboard of the outer front marker lights.

SIDE SCENE LIGHTS

The cab shall include two (2) Whelen model Pioneer PCH2 semi-recess mount lights installed one (1) on each side of the cab.

Each 150 watt lamp head shall incorporate a 12 volt DC Super-LED combination flood/spot light installed in a die-cast aluminum housing. Each lamp head shall use a collimator/metalized redux spot/flood reflector assembly with Proclera™ silicone optics and a clear non-optic polycarbonate lens. The lens/reflector assembly shall utilize a liquid injected molded silicone gasket to be resistant to water, moisture, dust, and other environmental conditions. The PCH2 shall be vibration resistant. The Pioneer PC boards shall be conformal coated for additional protection. Each combination flood light lamp head shall draw 13.0 amps in spotlight mode and generate 17,750 lumens total. Each lamp head shall measure 4.25 inches in height X 14.00 inches in width. Each lamp head shall be mounted within a semi-recess housing featuring a chrome flange which shall measure 7.92 inches in height X 17.17 inches in width. The lamp heads and brackets shall be powder coated white.

SIDE SCENE LIGHT LOCATION

The scene lighting located on the left and right sides of the cab shall be mounted rearward of the cab “B” pillar in the 10.00 inch raised roof portion of the cab between the front and rear crew doors.

SIDE SCENE ACTIVATION

The scene lights shall be activated by two (2) virtual buttons on the Vista display and control screen(s), one (1) for each light and by opening the respective side cab doors. The right side scene light shall be activated by a lighted momentary rocker switch located in the switch panel.

REAR SCENE LIGHTS

The vehicle shall include wiring for multiplex activated rear scene lighting for body builder installed scene lights and body builder installed multiplex output.

REAR SCENE LIGHT ACTIVATION

The rear scene lights shall be activated via a virtual button on the Vista display and control screen, a lighted momentary rocker switch on the dash labeled “REAR SCENE LTS”, and when the transmission is placed in reverse.

INTERIOR OVERHEAD LIGHTS

The cab shall include a two-section, red and clear Weldon LED dome lamp located over each door. The dome lamps shall be rectangular in shape and shall measure approximately 7.00 inches in length X 3.00 inches in width with a black colored bezel. The red portion of each lamp shall be activated via the multiplex display. The clear portion of each lamp shall be activated by opening the respective door and via the multiplex display. The virtual button shall be a multilevel switch that cycles red, clear and off. Both the red and clear portion can also be activated by individual push lenses on each lamp.

An additional two-section, red and clear Weldon LED dome lamp shall be provided over the engine tunnel which can be activated by individual switches on the lamp.

DO NOT MOVE APPARATUS LIGHT

The front headliner of the cab shall include a flashing red Whelen Ion LED light clearly labeled "Do Not Move Apparatus". In addition to the flashing red light, an audible alarm shall be included which shall sound while the light is activated.

The flashing red light shall be located centered left to right for greatest visibility.

The light and alarm shall be interlocked for activation when either a cab door is not firmly closed or an apparatus compartment door is not closed, and the parking brake is released.

MASTER WARNING SWITCH

A master switch shall be included, as a virtual button on the Vista display and control screen which shall be labeled “E Master” for identification. The button shall feature control over all devices wired through it. Any warning device switches left in the “ON” position when the master switch is activated shall automatically power up.

HEADLIGHT FLASHER

An alternating high beam headlight flashing system shall be installed into the high beam headlight circuit which shall allow the high beams to flash alternately from left to right.

Deliberate operator selection of high beams will override the flashing function until low beams are again selected. Per NFPA, these clear flashing lights will also be disabled "On Scene" when the park brake is applied.

HEADLIGHT FLASHER SWITCH

The flashing headlights shall be activated through a virtual button on the Vista display and control screen.

INBOARD FRONT WARNING LIGHTS

The cab front fascia shall include two (2) Whelen M6 Super LED front warning lights in the left and right inboard positions. The lights shall feature multiple flash patterns including steady burn. The lights shall be mounted to the front fascia of the cab within a chrome bezel. The warning lights shall be set to emit the "TripleFlash 75" in/out flash pattern.

INBOARD FRONT WARNING LIGHTS COLOR

The warning lights mounted on the cab front fascia in the inboard positions shall be red with a clear lens.

OUTBOARD FRONT WARNING LIGHTS

The cab front fascia shall include two (2) Whelen M6 Super LED front warning lights in the left and right outboard positions. The lights shall feature multiple flash patterns including steady burn. The lights shall be mounted to the front fascia of the cab within a chrome bezel. The warning lights shall be set to emit the "TripleFlash 75" in/out flash pattern.

OUTBOARD FRONT WARNING LIGHTS COLOR

The warning lights mounted on the cab front fascia in the outboard position shall be red with a clear lens.

BUMPER FACE WARNING LIGHT

The front bumper face shall include two (2) Whelen M6 series 4.31 inch tall X 6.75 inch wide Super LED® warning lights located between the frame rails in the right and left side outboard positions. The warning lights shall feature multiple flash patterns including steady burn. The

lights shall be surface mounted within a chrome bezel. The warning lights shall be set to flash “TripleFlash 75” in/out flash pattern.

BUMPER FACE WARNING LIGHT COLOR

The warning lights in the bumper shall be red with a clear lenses.

FRONT WARNING SWITCH

The front warning lights shall be controlled through a virtual control on the Vista display and control screen. This switch shall be clearly labeled for identification.

INTERSECTION WARNING LIGHTS

The chassis shall include two (2) Whelen M6 series Super LED intersection warning lights, one (1) each side. The lights shall feature multiple flash patterns including steady burn. The lights shall be set to flash “TripleFlash 75” I/O flash pattern.

INTERSECTION WARNING LIGHTS COLOR

The intersection lights shall be red with a clear lens.

INTERSECTION WARNING LIGHTS LOCATION

The intersection lights shall be mounted centered front to rear on the flat portion of the side of the bumper tail.

SIDE WARNING LIGHTS

The cab sides shall include two (2) Whelen M6 Super LED warning lights, one (1) on each side. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the sides of the cab within a chrome bezel. The light shall be programmed to emit the "TripleFlash 75” in/out flash pattern.

SIDE WARNING LIGHTS COLOR

The warning lights located on the side of the cab shall be red with clear lens.

SIDE WARNING LIGHTS LOCATION

The warning lights on the side of the cab shall be mounted over the front wheel well directly over the center of the front axle.

AUXILIARY SIDE WARNING LIGHTS

The cab sides shall include two (2) Whelen series M6 Super LED 4.00 inch X 6.00 inch warning lights, one (1) each side, which shall feature multiple flash patterns including steady burn. The warning lights shall be set to flash “TripleFlash 75” in/out flash pattern.

AUXILIARY SIDE WARNING LIGHTS COLOR

The auxiliary warning lights located on the side of the cab shall be red with clear lens.

AUXILIARY SIDE WARNING LIGHTS LOCATION

The auxiliary warning lights on the side of the cab shall be mounted above the front doors.

SIDE AND INTERSECTION WARNING SWITCH

The side warning lights shall be controlled through a virtual button on the Vista display and control screen. This button shall be clearly labeled for identification.

TANK LEVEL LIGHTS

There shall be two (2) FRC MaxVision water level light strips surface mounted vertically, one (1) on each side of the cab centered between the rear cab doors and the rear corners of the cab.

The light strips shall feature four (4) colors of LED lights to indicate the fluid level of a tank. The colors from top to bottom shall be green, blue, amber, and red.

REAR WARNING LIGHTS

The cab shall have a Whelen TACTL5 Traffic Advisor control head installed and wired in the header above the driver. The control head shall be mounted in the driver’s side header inboard of the radio position.

The power to the control head shall be ignition switched and activation dependent upon the state of the controllers switched position upon ignition.

Wiring provisions shall be provided routed to the rear of the frame for installation of up to eight (8) individual traffic advisor warning lights rated at no more than one (1) amp each.

INTERIOR DOOR OPEN WARNING LIGHTS

The interior of each door shall include one (1) 15.87 inch long X 0.73 inch tall amber Weldon LED warning light. The light shall be located on the upper portion of the door frame to be visible when a person is standing in front of the door while entering or exiting the cab. Each light shall activate with a scrolling directional flash pattern which moves from inside to outside when the door is in the open position. This shall serve as a warning to oncoming traffic.

SIREN CONTROL HEAD

A Whelen 295HFSC9 electronic siren control head shall be provided. The siren head shall feature a 200-watt output, wail, yelp, manual siren, and hands free operation which shall allow the operator to turn the siren on and off from the horn ring if a horn/siren selector switch option is also selected. The siren shall be mounted to protrude through the center panel of the cab dash in the lower section centered from left to right in the panel.

HORN BUTTON SELECTOR SWITCH

A virtual button on the Vista display and control screen shall be provided to allow control of the electric horn or the air horn from the steering wheel horn button. The horn button selection shall default to the air horn each time the Vista screen power is cycled off and on. The electric horn shall sound when the selector switch is in either position to meet FMCSA requirements.

AIR HORN ACTIVATION

The air horn activation shall be accomplished by the steering wheel horn button for the driver and a momentary rocker switch on the switch panel. An air horn activation circuit shall be provided to the chassis harness pump panel harness connector.

MECHANICAL SIREN ACTIVATION

The mechanical siren shall be actuated by a Linemaster model SP491-S81 foot switch mounted in the front section of the cab for use by the driver and a momentary rocker switch in the switch panel on the dash. A red momentary siren brake rocker switch shall be provided in the switch panel on the dash. A virtual button for the siren brake shall be provided on the Vista display.

The siren shall only be active when master warning switch is on to prevent accidental engagement.

BACK-UP ALARM

An ECCO model 575 backup alarm shall be installed at the rear of the chassis with an output level of 107 dB. The alarm shall automatically activate when the transmission is placed in reverse.

INSTRUMENTATION

An ergonomically designed instrument panel shall be provided. Each gauge shall be backlit with LED lamps. Stepper motor movements shall drive all gauges. The instrumentation system shall be multiplexed and shall receive ABS, engine, and transmission information over the J1939 data bus to reduce redundant sensors and wiring.

A twenty eight (28) icon lightbar message center with integral LCD odometer/trip odometer shall be included. The odometer shall display up to 999,999.9 miles. The trip odometer shall display 9,999.9 miles. The LCD message center screen shall be capable of custom configuration by the users for displaying certain vehicle status and diagnostic functions.

The instrument panel shall contain the following gauges:

One (1) three-movement gauge displaying vehicle speed, fuel level, and Diesel Exhaust Fluid (DEF) level. The primary scale on the speedometer shall read from 0 to 100 MPH, and the secondary scale on the speedometer shall read from 0 to 160 KM/H. The scale on the fuel and DEF level gauges shall read from empty to full as a fraction of full tank capacity. Red indicator lights in the gauge and an audible alarm shall indicate low fuel or low DEF at 1/8th tank level.

One (1) three-movement gauge displaying engine RPM, and primary and secondary air system pressures shall be included. The scale on the tachometer shall read from 0 to 3000 RPM. The scale on the air pressure gauges shall read from 0 to 150 pounds per square inch (PSI) with a red line zone indicating critical levels of air pressure. Red indicator lights in the gauge and an audible alarm shall indicate low air pressure.

One (1) four-movement gauge displaying engine oil pressure, coolant temperature, voltmeter, and transmission temperature shall be included. The scale on the engine oil pressure gauge shall read from 0 to 100 pounds PSI with a red line zone indicating critical levels of oil pressure. A red indicator light in the gauge and audible alarm shall indicate low engine oil pressure. The scale on the coolant temperature gauge shall read from 100 to 250 degrees Fahrenheit (°F) with a red line zone indicating critical coolant temperatures. A red indicator light in the gauge and audible alarm shall indicate high coolant temperature. The scale on the voltmeter shall read from 9 to 18 volts with a red line zone indicating critical levels of battery voltage. A red indicator light in the gauge and an audible alarm shall indicate high or low system voltage. The low voltage alarm shall indicate when the system voltage has dropped below 11.8 volts for more than 120 seconds in accordance with the requirements of NFPA 1901. The scale on the transmission temperature gauge shall read from 100 to 300 degrees °F with a red line zone

indicating critical temperatures. A red indicator light in the gauge and an audible alarm shall indicate a high transmission temperature.

The light bar portion of the message center shall include twenty-eight (28) LED backlit indicators. The lightbar shall be split with fourteen (14) indicators on each side of the LCD message screen. The lightbar shall contain the following indicators and produce the following audible alarms when supplied in conjunction with applicable configurations:

RED INDICATORS

Stop Engine - indicates critical engine fault
Air Filter Restricted - indicates excessive engine air intake restriction
Park Brake - indicates parking brake is set
Seat Belt - indicates a seat is occupied and corresponding seat belt remains unfastened
Low Coolant - indicates critically low engine coolant
Cab Tilt Lock - indicates the cab tilt system locks are not engaged.

AMBER INDICATORS

Malfunction Indicator Lamp (MIL) - indicates an engine emission control system fault
Check Engine - indicates engine fault
Check Transmission - indicates transmission fault
Anti-Lock Brake System (ABS) - indicates anti-lock brake system fault
High exhaust system temperature – indicates elevated exhaust temperatures
Water in Fuel - indicates presence of water in fuel filter
Wait to Start - indicates active engine air preheat cycle
Windshield Washer Fluid – indicates washer fluid is low
DPF restriction - indicates a restriction of the diesel particulate filter
Regen Inhibit-indicates regeneration of the DPF has been inhibited by the operator
Range Inhibit - indicates a transmission operation is prevented and requested shift request may not occur.
SRS - indicates a problem in the supplemental restraint system
Check Message - indicates a vehicle status or diagnostic message on the LCD display requiring attention.

GREEN INDICATORS

Left and Right turn signal indicators
ATC - indicates low wheel traction for automatic traction control equipped vehicles, also indicates mud/snow mode is active for ATC system
High Idle - indicates engine high idle is active.
Cruise Control - indicates cruise control is enabled

OK to Pump - indicates the pump is engaged and conditions have been met for pump operations
Pump Engaged - indicates the pump transmission is currently in pump gear
Auxiliary Brake - indicates secondary braking device is active

BLUE INDICATORS
High Beam indicator

AUDIBLE ALARMS
Air Filter Restriction
Cab Tilt Lock
Check Engine
Check Transmission
Open Door/Compartment
High Coolant Temperature
High or Low System Voltage
High Transmission Temperature
Low Air Pressure
Low Coolant Level
Low DEF Level
Low Engine Oil Pressure
Low Fuel
Seatbelt Indicator
Stop Engine
Water in Fuel
Extended Left/Right Turn Signal On
ABS System Fault

BACKLIGHTING COLOR

The instrumentation gauges and the switch panel legends shall be backlit using white LED backlighting.

RADIO

A Jensen radio with weather band, AM/FM stereo receiver, and four (4) speakers shall be installed in the cab. The radio shall include rear RCA input pigtail connector, satellite radio capability, and a covered front auxiliary mini stereo input with iPod ready front and rear USB inputs. The radio shall be installed in the left hand overhead position. The speakers shall be installed inside the cab with two (2) speakers recessed within the headliner of the front of the cab just behind the windshield and two (2) speakers on the upper rear wall of the cab.

There shall also be an auxiliary port installed for use with an Mp3 player or smart phone. The auxiliary port shall be located in the right hand switch panel.

AM/FM ANTENNA

A small antenna shall be located on the left hand side of the cab roof for AM/FM and weather band reception.

CAMERA

An Audiovox Voyager heavy duty rearview camera system shall be supplied. The system shall include one (1) box shaped camera shall be installed in the body to afford the driver a clear view to the rear of the vehicle.

The camera shall be wired to a single Weldon Vista display. The rear camera display shall activate when the vehicle's transmission is placed in reverse. The camera system display can also be activated through the Vista display panel.

CAB EXTERIOR PROTECTION

The cab face shall have a removable plastic film installed over the painted surfaces to protect the paint finish during transport to the body manufacturer.

FIRE EXTINGUISHER

A 2.50 pound D.O.T approved fire extinguisher with BC rating shall be shipped loose with the cab.

DOOR KEYS

The cab and chassis shall include a total of four (4) door keys for the manual door locks.

DIAGNOSTIC SOFTWARE OCCUPANT PROTECTION

Diagnostic software for the Spartan Advanced Protection System shall be available for free download from the Spartan Chassis website to Spartan authorized dealers and service centers, as well as the vehicle owner.

The software has been validated to be compatible with the following RP1210 interface adapters:

- Dearborn Group DPA4 Plus

- Noregon Systems JPRO® DLA+
- Cummins INLINE5
- Cummins INLINE6
- NexIQ™ USB-Link™

The software and adapter utilize the SAE J1939-13 heavy duty nine (9) pin connector which is located below the driver's side dash to the left of the steering column.

WARRANTY

Summary of Warranty Terms:

THE FOLLOWING IS SUMMARY OF WARRANTY TERMS FOR INFORMATION ONLY. THE ACTUAL LIMITED WARRANTY DOCUMENT, WHICH IS ATTACHED TO THIS OPTION, CONTAINS THE COMPLETE STATEMENT OF THE SPARTAN MOTORS USA LIMITED WARRANTY. SPARTAN'S RESPONSIBILITY IS TO BE ACCORDING TO THE TERMS OF THE COMPLETE LIMITED WARRANTY DOCUMENT.

The chassis manufacturer shall provide a limited parts and labor warranty to the original purchaser of the custom built cab and chassis for a period of twenty-four (24) months, or the first 36,000 miles, whichever occurs first. The warranty period shall commence on the date the vehicle is delivered to the first end user.

CHASSIS OPERATION MANUAL

The chassis operation manual shall be contained in an on board USB digital storage device. The chassis operation manual shall be accessible through a USB port provided in the OBD diagnostic panel.

ENGINE AND TRANSMISSION OPERATION MANUALS

The following manuals specific to the engine and transmission models ordered will be included with the chassis in the ship loose items:

(1) Hard copy of the Engine Operation and Maintenance manual with CD

(1) Digital copy of the Transmission Operator's manual

(1) Digital copy of the Engine Owner's manual

CAB/CHASSIS AS BUILT WIRING DIAGRAMS

The cab and chassis wiring schematics and option wiring diagrams shall be contained in an on board USB digital storage device. The cab and chassis wiring schematics and option wiring diagrams shall be accessible through a USB port provided in the OBD diagnostic panel.

WARNING AND IMFORMATION LABELS

All warning and informational labels (non-vendor specific) shall be provided in appropriate locations to alert the operator of potential hazards and operating instructions.

NO FINAL INSPECTION

There shall be no Final- Inspection unless otherwise specified.

NFPA 1901

The apparatus and product orientation of the vehicle will be provided per NFPA 1901-2016 revision.

MAXIMUM OVERALL LENGTH REQUIREMENT

The Apparatus specified shall be constructed as detailed and shall NOT exceed a Maximum Overall Length of 32'-4".

MAXIMUM OVERALL HEIGHT REQUIREMENT

The Apparatus specified shall be constructed as detailed and shall NOT exceed a Maximum Overall Height of 10-2''.

MAXIMUM WHEEL BASE REQUIREMENT

The Apparatus specified shall be constructed with a wheel base of 184".

CHASSIS REQUIRED LABELING

Signs that state "Occupants must be seated and belted when apparatus is in motion" shall be provided.

They shall be visible from each seating position.

There shall be a lubrication plate mounted inside the cab listing the type and grade of lubrication used in the following areas on the apparatus and chassis:

- Engine oil
- Engine Coolant
- Transmission Fluid
- Pump Transmission Lubrication Fluid
- Drive Axle Lubrication Fluid
- Generator Lubrication Fluid (where applicable)
- Tire Pressures

APPARATUS INFORMATION LABEL

There shall be a high-visibility label installed in a location clearly detectable to the driver while in the seated position.

The label shall indicate the following specified information.

Overall Height (feet and inches)
Overall Length (feet and inches)
Overall GVWR (tons or metric tons)

APPARATUS STABILITY (CG) CALCULATED STABILITY

Vehicle stability or roll stability shall be presented by methods of calculations or measurements per NFPA 1901, current edition. The calculated or measured center of gravity (CG) shall be no higher than 80 percent of the rear axle track width.

The manufacture shall utilize supplied documents and information detailing specific equipment and locations for purposes of calculating CG. If no such information is supplied the manufacture shall estimate approximate equipment loads based upon the vehicle configuration for such calculations in correspondence with NFPA 1901, current edition, required loadings.

Upon acceptance of the vehicle, a signed manufacture written certification shall be supplied with the fire apparatus before delivery.

HELMET RESTRAINTS

All NFPA required helmet restraints will be supplied and installed by the Fire Department prior to the truck being placed into service.

MUD FLAPS

Heavy-duty rubber mud flaps shall be installed behind the rear wheels. The mud flaps shall be black rubber type and be bolted in place.

CAB TILT PENDANT CONTROL

There shall be a cab tilt pendant control provided and installed on the right side of the apparatus. The pendant shall be accessible through a hinged door secured with a push button style latch on the passenger's side pump panel. The cab tilt door shall open towards the rear of body.

There shall also be a cab tilt instruction plate located as close as possible to the control pendant for ease of operation.

HEAT EXCHANGER

A supplementary heat exchanger cooling system shall be provided with the chassis and shall be complete to the discharge side of the fire pump through the engine compartment, without intermixing, for absorption of excess heat. The heat exchanger shall be adequate in size to maintain the temperature of the coolant in the pump drive engine not in excess of the engine manufacturer's temperature rating under all pumping conditions.

Appropriate drains shall be provided to allow draining the heat exchanger to prevent damage from freezing. A manual shut-off valve shall be supplied at the pump operator's position.

FUEL FILL DOOR

There shall be an aluminum fuel fill assemblies located on the apparatus body accessing the chassis supplied fuel tank. The assemblies shall be located in the upper area of the rear wheel on the left and right side.

The fuel fill assemblies will have a brushed aluminum door. There shall be a drain in each fuel fill assembly to allow over flow to drain on the back side of the apparatus body. The fuel fill cap shall be removable, manufactured of plastic materials, green in color and equipped with a tether.

The fuel fill cap shall be labeled "DIESEL FUEL". The stainless steel fuel fill neck shall have a 3/8" inside diameter vent line installed from the top of the fuel tank to the fill tube.

SIDE MOUNT PUMP CONTROL MODULE

The pump control module shall be a self-supported structure mounted independently from the body and chassis cab. The pump module frame shall be constructed entirely of 6061-T6 aluminum extrusions and 5052-H32 aluminum plate. The pump module design shall allow normal frame deflection through isolation mounts without imposing stress on the pump

module structure or side running boards. The pump module support shall bolt directly to the chassis frame web.

VIBRA-TORQUE™ PUMP MODULE MOUNTING SYSTEM

The entire pump module assembly shall be mounted so that it "floats" above the chassis frame rails exclusively with Vibra-Torq™ torsion isolator assemblies to reduce the vibration and stress providing an extremely durable pump module mounting system.

The pump module substructure shall be mounted above the frame to allow independent flexing to occur between the body and the chassis. Each assembly shall be mounted to the chassis frame rails with steel, gusseted mounting brackets. Each bracket shall be powder coated for corrosion resistance. Each pump compartment mount bracket shall be mounted to the side chassis frame flange with two 5/8"-UNC Grade 5 HHCS.

Each assembly shall have a two-part rubber vibration isolator. The isolator shall be of a specific durometer to carry the necessary loads of the pump module, apparatus body, equipment, tank, water, and hose. The quantity of mounts utilized shall correspond directly to the anticipated weight being supported. Certain assemblies shall also incorporate a torsion spring. Helical coil springs shall be incorporated into specific mounts in tandem with the rubber isolators to minimize the stress absorbed by the body caused from chassis frame rail flexing.

There shall be no welding to the chassis frame rail sides, web or flanges, or drilling of holes in the top or bottom frame flanges between axles. All pump module to chassis connections shall be bolted so that in the event of an accident, the body shall be easily removable from the truck chassis for repair or replacement.

Because of the constant vibration and twisting action that occurs in chassis frame rails and suspension, the torsion mounting system is required to minimize the possibility of premature pump module structural failures. The Vibra-Torque™ mounting system shall have a lifetime warranty.

PUMP COMPARTMENT WORK LIGHT

One (1) 24.00 inch model On Scene Access series LED tube light shall be installed inside the pump compartment module to illuminate the plumbing and piping components.

There shall be a rocker switch located on the operator's pump panel, within an Innovative Controls 6-switch chrome bezel, to activate the pump panel lights and the pump compartment work light.

PUMP MODULE PANELS

The driver's side panels shall consist of a removable lower panel fastened with mechanical fasteners, a removable middle operator's panel fastened with mechanical fasteners, and a removable diamond plate panel above the operator's panel.

The officer's side panels shall consist of a removable upper diamond plate panel and two, removable lower panels. The lower removable panel shall be fastened with mechanical fasteners. Above the lower panel shall be a removable access panel to provide ease of entrance for service and maintenance. The upper & middle panel shall be attached to the module frame utilizing push button latching devices.

OPERATOR'S GAUGE PANEL

The operator gauge panel shall be located on the left (driver) side main pump module.

PUMP PANEL & OPERATOR'S PANEL FINISH

The pump module panels and the operator's panel shall be brushed stainless steel finish.

SOFT SUCTION HOSE STORAGE

There shall be a recessed cavity on the right and left side of the pump compartment module integrated into the side panel to store a roll of 25' of 5" suction hose. The cavity shall be approximately 12" wide x 17.5" high and 12.5" deep. The floor area shall have a slight taper downward so assist in restraining the hose and notched as required for exhaust configurations. Drain holes shall be provided in the rear corners. The interior shall be sprayed with bed liner type coating.

There shall be aircraft style seat belt buckle retention devices installed on each soft suction hose storage compartment.

SIDE MOUNT PUMP PANEL LIGHTING

Illumination shall be provided for viewing controls, switches, gauges and instructional labels necessary for proper operation of the apparatus and equipment installed.

The side pump panels shall be illuminated by OnScene "Access" LED tube lights installed within gusseted reinforced embossed aluminum diamond plate steps. The steps shall serve as light sheilds and shall be a minimum of 8" deep and have a handrail incorporated into the step. The steps shall be mounted with 3/8" bolts.

Two (2) 18" lights mounted on the drivers side above the gauge panel which shall cover the full width of the pump house. Two (2) 18" lights mounted on the officers side above the main pump access panel which shall cover the full width of the pump house.

PUMP PANEL SWITCHING

There shall be a rocker switch located on the operator's pump panel, within an Innovative Controls 6-switch black bezel, to activate all four (4) pump panel lights and the interior pump panel work light. One light on the driver's side and one light on the passenger's side pump module shall be activated by "pump engagement". The lights shall also activate when the pump is engaged and it is okay to operate.

SIDE MOUNT PUSH-PULL VALVE CONTROLS

The valves shall be controlled from a panel mounted Innovative Controls quarter-turn locking type T-handle push-pull assembly shall be installed. The ergonomically designed handle shall be chrome-plated with name plate insertion recess area.

A .75 inch (19.05mm) diameter hardcoat anodized aluminum control rod and housing shall, together with a stainless spring steel locking mechanism, eliminate valve drift. Teflon impregnated bronze bushings in both ends of the rod housing shall minimize rod deflection, never need lubrication, and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated panel-mounting bezel. The valve operating mechanism will indicate the position of the valve at all times.

RUNNING BOARDS

Running boards shall be installed on each side of the pump compartment module. The running boards shall be constructed of .1875 inch embossed aluminum diamond plate. Each shall be a minimum of approximately 12.00 inches deep by the width of the module.

The running boards shall have a 1.25 inch upward bend on the inside edge to act as a kick plate.

The aluminum diamond plate shall meet recommendations for slip resistant surfaces at the time of proposal.

The running boards shall be attached to a frame mounted outrigger support structure. Each running board to have a 3.00 inch downward bend on the front face with a 1.50 inch underside return for superior strength.

APPARATUS LABELING

The apparatus shall be descriptively tagged with color coded Innovative controls labels. The labels shall be applied near apparatus features that require a user function description. Wherever necessary, the labels shall be color coded to differentiate controls and their respective functions to simplify and clarify complex configurations.

VERBIAGE TAG BEZEL ASSEMBLIES

Innovative Controls verbiage tag bezels shall be installed. The bezel assemblies will be used to identify apparatus components. These tags shall be designed and manufactured to withstand the specified apparatus service environment and shall be backed by a warranty equal to that of the exterior paint and finish. The verbiage tag bezel assemblies shall include a chrome-plated panel-mount bezel with durable easy-to-read UV resistant polycarbonate inserts featuring the specified verbiage and color coding. These UV resistant polycarbonate verbiage and color inserts shall be subsurface screen printed to eliminate the possibility of wear and protect the inks from fading. Both the insert labels and bezel shall be backed with 3M permanent adhesive, which meets UL969 and NFPA standards.

SAFETY MESSAGE BEZEL ASSEMBLIES

Innovative Controls safety message bezels shall be installed. The bezel assemblies will be used to identify, instruct, or warn the operators. These tags shall be designed and manufactured to withstand the specified apparatus service environment and shall be backed by a warranty equal to that of the exterior paint and finish. The safety message bezel assemblies shall include a chrome-plated panel-mount bezel with durable easy-to read UV resistant polycarbonate inserts featuring ANSI safety standard graphics or custom graphics. These UV resistant polycarbonate graphic inserts shall be subsurface screen printed to eliminate the possibility of wear and protect the inks from fading. Both the graphic insert labels and bezel shall be backed with 3M permanent adhesive, which meets UL969 and NFPA standards.

PRESSURE GOVERNOR

The Pressure Governing System shall be installed on the pump panel. The PSG allows for pump pressure control and throttle control.

PRESSURE RELIEF VALVE

A Task Force Tips model #A18XX pressure relief valve shall be provided. The valve shall have an easy to read adjustment range from 90 to 300 PSI with 90, 125, 150, 200, 250 and 300 PSI adjustment settings and an "OFF" position. Pressure adjustments shall be made utilizing a 1/4" hex key, 9/16" socket or 14mm socket.

For corrosion resistance the cast aluminum valve shall be a hardcoat anodized with a powder coat interior and exterior finish. The valve shall meet (NFPA) 1901, Standard for Automotive Fire Apparatus, requirements for pump inlet relief valves. The unit shall be covered by a five year warranty. The valve shall be preset at 125 PSI (860 kPa) suction inlet pressure. The valve shall be installed inside the pump compartment where it will be easily accessible for future adjustment. The excess water shall be plumbed to the atmosphere via the unloader pipe and shall dump on the opposite side of the pump operator.

For normal pumping operations, the relief valve shall not be capped and there shall be a placard stating "DO NOT CAP" installed.

U.L. TEST PORTS

One (1) set of U.L. testing ports with plugs shall be provided on the pump panel for testing of the vacuum and pump pressures.

WATER TANK LEVEL GAUGE

A Fire Research TankVision model WLA300-A00 tank indicator kit shall be installed on the operator's panel.

The kit shall include an electronic indicator module, a pressure sensor, and a 20' sensor cable. The indicator shall show the volume of water in the tank on nine (9) easy to see super bright LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be waterproof, manufactured of aluminum, and have a distinctive blue label.

The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, and a datalink to connect remote indicators. Low water warnings shall include flashing LEDs at 1/4 tank, down chasing LEDs when the tank is almost empty, and an output for an audio alarm.

The indicator shall receive an input signal from an electronic pressure sensor. The sensor shall be mounted from the outside of the water tank near the bottom. No probe shall place on the interior of the tank. Wiring shall be weather resistant and have automotive type plug-in connectors.

WATER TANK LEVEL GAUGE CAB MOUNTED

The tank level gauges shall be wired to the master tank level gauge via FRC Tankvision datalink.

AIR HORN BUTTON

There shall be an air horn activation rocker switch installed on the pump operator's gauge panel within an Innovative Controls 6-switch black bezel. The air horn rocker switch shall be a red weather resistance type and labeled “AIR HORN”.

PUMP COMPARTMENT TOP OVERLAY

The top of the pump compartment shall be overlaid with materials of a non-slip .1875 inch embossed aluminum diamond plate, meeting the minimum NFPA standard requirements for slip resistance.

There shall be yellow reflective tape installed on the top of the pump module to meet NFPA 1901.

MIDSHIP PUMP

The pump shall have a capacity of 1500 gallons per minute, measured in U.S. Gallons. The pump shall be a Waterous model CSUC20, single stage midship pump.

The pumps impellers shall be bronze with double suction inlets, accurately balanced (mechanically and hydraulically), of mixed flow design with reverse-flow, labyrinth-type, wear rings that resist water bypass and loss of efficiency due to wear. The impeller shall have flame plated hub to assure maximum pump life and efficiency despite the presence of abrasive particles, such as fine sand, in the water being pumped. The wear rings shall be bronze and easily replaceable to restore original pump efficiency and eliminate the need for replacing the entire pump casing due to wear.

Pump casing shall be close grained gray iron, bronze fitted and horizontally split in two sections for easy removal of entire impeller assembly, including wear rings, without disturbing setting of pump in chassis or pump piping. The pump, for ease and rapid servicing in the future, shall have the separable impeller shaft which allows true separation of transmission or pump without disassembly or disturbing the other component. This shall be accomplished by using a two piece shaft. This feature will allow field service to accomplish in much less time since each component (pump or transmission) can be repaired independently. The impeller shaft shall be stainless steel, accurately ground to size and polished. Shaft shall be supported at each end by ball type oil grease lubricated bearings. Sleeve bearings or bushings will not be acceptable. The bearings shall be protected from water at each end of the impeller shaft.

The discharge manifold shall be cast as an integral part of the pump body assembly and shall provide at least three full 3.50 inch openings for ultimate flexibility in providing various discharge outlets for maximum efficiency, and shall be located as follows: one outlet on the

right side of the pump body, one outlet on the left side of the pump body, and one outlet directly on top of the pump discharge manifold.

The entire pump shall be cast, manufactured and tested at the pump manufacturer's factory. The pump transmission housing shall be high strength aluminum, three pieces and horizontally split. Power transfer to the pump shall be through a Morse Hy-Vo drive chain. Chain shall be pressure lubricated through oil pump. Chain sprockets shall be cut from carbonized, hardened alloy steel. Spur gears will not be acceptable.

The drive shafts shall be 2.35" in diameter, made of hardened and ground alloy steel. All shafts shall be ball bearing supported. Case shall be designed to eliminate the need of water cooling.

The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 600 PSI. A certificate documenting this test shall be provided with the completed apparatus. The pump shall be fully tested at the pump manufacturer's factory to the performance requirements as outlined by the latest (NFPA) 1901, Standard for Automotive Fire Apparatus. Pump shall be free from objectionable pulsation and vibration.

The pump shall be the Class "A" type and shall deliver the percentage of rated discharge at pressures indicated below.

100% of rated capacity at 150 PSI net pump pressure.
100% of rated capacity at 165 PSI net pump pressure.
70% or rated capacity at 200 PSI net pump pressure.
50% of rated capacity at 250 PSI net pump pressure.

PUMP SEALS

The pump shall be equipped with maintenance free mechanical shaft seals that shall not require manual adjustment. The seal size, type, component materials, and housing configuration shall be specifically designed for the pump application and rated operating parameters as specified.

AIR PRIMER SYSTEM

The priming system shall be a Trident Emergency Products compressed air powered high efficiency, multi-stage, venturi based Air Prime System.

All wetted metallic parts of the priming system are to be of brass and stainless steel construction. A single panel mounted control will activate the priming pump and open the priming valve to the pump.

The primer shall be mounted above the pump impeller so that the priming line will automatically drain back to the pump. The primer shall also automatically drain when the panel control actuator is not in operation. The inlet side of the primer shall include a brass 'wye' type strainer with removable stainless steel fine mesh strainer to prevent entry of debris into the primer body.

The system shall employ an 80 PSI (5.5 bar) pressure protection valve, located on the chassis auxiliary air tank.

The primer shall be covered by a five (5) year parts warranty.

6.0" STEAMER INLETS

Two (2) 6.00 inch (150.00 mm) steamer inlets shall be provided, one (1) on the left side and one (1) on the right side.

Each inlet shall have a chrome plated long handle chrome vented caps and die cast zinc screens designed to provide cathodic protection for the pump. The caps shall be National Standard Thread with long handles.

PUMP COOLING LINE

There shall be a 3/8" (.375) inch line run from the pump to the water tank to assist in keeping the pump water from overheating. There shall be brass fittings used on pump cooler. A manual 1/4 turn 3/8" ball valve with a rectangular handle shall be supplied on the operator's panel.

PUMP ANODES

Two (2) pump anodes shall be installed in plumping system of the apparatus, to prevent damage from galvanic corrosion within the pump system. There shall be one (1) anode on the intake side and one (1) on the discharge side.

MASTER PUMP DRAIN

The pump shall be equipped with a Master Pump drain to allow draining of the lower pump cavities, volute and selected water carrying lines and accessories. The drain shall have an all brass body with a stainless steel return spring.

The drain valve control shall be mounted in the lower left hand corner of the driver side pump panel and identified as MASTER DRAIN.

MANUAL DRAINS

All 2.0 inch (50.80 mm) or larger discharge outlets shall be equipped with a .75 inch 90° lift handle ball valve drain.

All drains for 2" and larger valves will be on the driver's side, except for the right side master and #2 discharge, which will be located on the right side.

VALVES

All valves shall be of a heavy duty design capable of bi-directional flow and incorporate a self-locking ball feature and full flow optimizing characteristics that reduce the operational force required for actuation.

The valves shall be Akron 8000 series.

The valves shall be of a self-adjusting dual seat design requiring no lubrication or regular maintenance. The valve shall meet or exceed NFPA standard requirements.

PLUMBING

All plumbing and piping shall be of 304 stainless steel or flexible type piping. All inlet and outlet plumbing 3.00 inch (77 mm) and smaller shall be plumbed with either stainless steel piping or synthetic reinforced rubber hose blended with high tensile strength cord for maximum performance in tight bend applications.

Secondary plumbing such as small diameter drain lines shall be stainless steel, brass or hose. Where chassis and module flexing or vibration may damage or loosen piping or where a coupling is required for servicing, the piping shall be equipped with Victaulic or rubber type couplings.

All lines shall drain through the master drain valve or shall be equipped with individual drain valves. All individual drain lines for discharges shall be extended to the point where they shall drain below the chassis frame rails. All water carrying drain lines shall be of flexible polypropylene type tubing.

MANIFOLDS

Plumbing manifold bodies shall be ductile cast iron or stainless steel. The suction inlets shall include removable die cast zinc screens designed to provide cathodic protection for the pump, therefore reducing deterioration within the pump.

TANK FILL

One (1) 2.00 inch (50 mm) pump to tank fill line shall be installed from the discharge manifold directly to the booster tank.

TANK TO PUMP

A 3.50 inch (89 mm) Waterous valve shall be installed.

TANK TO PUMP CHECK VALVE

There shall be a tank to pump check valve, conforming to NFPA standard requirements to prevent water from back flowing at an excessive rate if the pump is being supplied from a pressurized source.

The check valve shall be mounted as an integral part of the pump suction extension. A hole up to .25 inch (6.35 mm) is allowable in the check valve to release steam or other pressure buildup so that the void between the vale and check valve may drain of water that could be subject to freezing.

2.5" LEFT SIDE INLET

There shall be one (1) 2.50 inch (65 mm) gated suction inlet with .75 inch (19 mm) bleeder installed on the left side of the apparatus.

INTAKE PLUMBING

The plumbing shall consist of 2.50 inch (65 mm) piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

INTAKE TERMINATION

The termination shall include the following components:

One (1) 2.50 inch (65 mm) NST swivel female straight adapter with screen

One (1) 2.50 inch (65 mm) self-venting plug, secured by a cable

2.5" LEFT SIDE DISCHARGE

There shall be one (1) 2.50 inch (65 mm) gated discharge installed on the left side of the apparatus. The discharge shall be controlled with a rack & sector control with a rod bezel.

2.5" SIDE DISCHARGE PLUMBING

The plumbing shall consist of 2.50 inch (65 mm) piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

DISCHARGE TERMINATION

The discharge termination shall include the following components:

One (1) 2.50 inch (65 mm) Male NST adapter

One (1) 2.50 inch (65 mm) NST female swivel by male with 30 degree polished elbow

One (1) 2.50 inch (65 mm) female self-venting cap, secured by a cable

2.5" RIGHT SIDE DISCHARGE

There shall be one (1) 2.50 inch (65 mm) gated discharge installed on the right side of the apparatus.

2.5" SIDE DISCHARGE PLUMBING

The plumbing shall consist of 2.50 inch (65 mm) piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

DISCHARGE TERMINATION

The discharge termination shall include the following components:

One (1) 2.50 inch (65 mm) Male NST adapter

One (1) 2.50 inch (65 mm) NST female swivel by male with 30 degree polished elbow

One (1) 2.50 inch (65 mm) female self-venting cap, secured by a cable

3.0" RIGHT SIDE DISCHARGE

There shall be one (1) gated 3.00 inch (77 mm) discharge installed on the right side of the apparatus.

3.0" SIDE DISCHARGE PLUMBING

The plumbing shall consist of 3.00 inch (77 mm) piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

DISCHARGE TERMINATION

The discharge termination shall include the following components:

One (1) 3.00 inch (77 mm) NST X 4" (100) Straight adapter

One (1) 4.00 inch (100 mm) NST female by 5.00 inch (127 mm) Storz with 30 degree elbow

One (1) 5.00 inch (127 mm) Storz cap, secured by a cable

2.5" LEFT REAR DISCHARGE

There shall be one (1) 2.50 inch (65 mm) discharge located on the left side at the rear of the vehicle.

REAR DISCHARGE PLUMBING

The plumbing shall consist of 2.50 inch (65 mm) piping and shall be plumbed from the right hand discharge manifold, and shall incorporate a manual drain control installed below the pump area for ease of access.

DISCHARGE TERMINATION

The discharge termination shall include the following components:

One (1) 2.50 inch (65 mm) Male NST adapter

One (1) 2.50 inch (65 mm) NST female swivel by male with 30 degree polished elbow

One (1) 2.50 inch (65 mm) female self-venting cap, secured by a cable

3.0" DECK GUN DISCHARGE

There shall be a 3.00 inch (77 mm) deck gun discharge provided.

DECK GUN PIPING

The deluge waterway shall be plumbed with 3.00 inch (77 mm) piping that terminates in the center location at the top of the pump compartment module.

The plumbing shall be drained with an auto-drain located at the lowest point of the waterway plumbing if required.

EXTEND-A-GUN

There will be a Task Force Tips 18.00 inch (457 mm) manual Extenda-Gun installed on the deluge pipe.

If the Extenda-Gun is not properly stowed and the transmission is placed into drive or reverse mode with the parking brake released, it shall activate the hazard light in the cab to alert the crew.

CROSSLAYS

Two (2) crosslays hose beds shall be located in the upper portion of the pump compartment, toward the front. The crosslay area shall span the entire width of the pump compartment module. Slotted aluminum flooring shall be provided for the hose bed area for drainage.

CROSSLAY CAPACITY

The crosslays shall each have capacity for 200 foot of 1.75 inch (45 mm) double jacket fire hose. The ends of the crosslay dividers shall be cut at a 62 degree angle to provide room for the hand holes cut into the crosslay cover ends.

DISCHARGE PLUMBING

The plumbing shall consist of 2.00 inch (50 mm) piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

DISCHARGE TERMINATION

The discharge termination shall include the following components:

One (1) 2.00 inch (50 mm) NPT x 1.50 inch (38 mm) NST chrome plated brass chiksan swivel

The use of a swivel shall allow hose payout to either side of the pump compartment.

FOAM CAPABLE

The following discharges shall be foam capable: (2) 2" crosslays, front bumper discharge, and hose reel.

2.5" CROSSLAY DISCHARGE

One (1) additional crosslay hose bed shall be provided.

The crosslay shall have capacity for 200 feet of 2.50 inch (65 mm) double jacket fire hose.

DISCHARGE PLUMBING

The plumbing shall consist of 2.50 inch (65 mm) piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

DISCHARGE TERMINATION

The discharge termination shall include the following components:

One (1) 2.5" x 2.5" NST chrome plated brass chiksan swivel

The use of a swivel shall allow hose payout to either side of the pump compartment.

CROSSLAY COVER

A .188 inch (4.76 mm) aluminum diamond plate crosslay cover shall be provided. The cover shall be installed to provide a solid surface over all bays. The cover shall be hinged with full length piano hinge. When opened, the tread plate cover shall rest upon rubber bumpers or an equivalent type protective to eliminate marring or scratching of other apparatus body work.

There shall be hand holes cut in each end of the crosslay cover.

CROSSLAY SIDE COVERS

The crosslay hose bed area shall have a cover installed at each end of the crosslay area by the Dealership prior to the apparatus being placed into service.

LED CROSSLAY HOSEBED LIGHT

One (1) On Scene LED 60" Walkway series waterproof light shall be installed in an anodized aluminum housing on the front of the body to illuminate the crosslay area.

CROSSLAY LIGHT ACTIVATION

The crosslay light shall be activated with the pump "Panel Lights" switch.

FRONT BUMPER DISCHARGE

One (1) 1.50 inch (38 mm) front bumper discharge outlet shall be provided.

FRONT BUMPER DISCHARGE PLUMBING

The front bumper discharge plumbing shall consist of 2.00 inch (50 mm) piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

Auto-drain(s) shall be installed in the discharge piping at the lowest point of the plumbed system.

FRONT BUMPER DISCHARGE TERMINATION

The discharge termination shall include the following components:

One (1) 2.00 inch (50 mm) NPT x 1.50 inch (38 mm) NST polished stainless steel chiksan swivel.

The use of a swivel shall allow hose payout to either side of the apparatus.

The front bumper discharge shall be mounted on top of the gravel shield of the front bumper extension. There shall be a rubber bump stop to the front bumper discharge for contact point. The discharge shall be placed to the right of the hose well. The hosewell lid shall be notched on the passenger's side.

BOOSTER HOSE REEL

There shall be one (1) Hannay electric rewind booster reel with automatic brake installed on the apparatus. The reel shall have a capacity of 200 foot (60 m) of 800 psi (55 BAR) booster hose.

There shall be a manual rewind device provided. A manual crank shall be mounted adjacent to booster reel.

The reel shall be model number EPF28-25-26-RT, 12V, standard assembly, electric rewind right hand side, manual rewind horizontal orientation, inlet shall be 1.0” with a 90 degree swivel.

REEL FINISH

The hose reel specified shall be steel and painted the standard silver utilized by Hannay.

HOSE REEL VALVE

The reel shall be plumbed to the pump with a 1.50 inch quarter turn Akron 8815 ball valve and 1.50 inch high pressure hose and couplings.

The valve shall be controlled from the operator's panel. with a push pull control.

REWIND ACTIVATION

An electric rewind switch shall be mounted on the side wall in the B1 compartment. The switch shall have a weather resistant rubber cover and label denoting its function.

The switch shall be labeled "REEL REWIND" with a Innovation Control bezel.

The circuit breaker for the electric rewind shall be of the manual reset type and be located within easy reach of the operator.

HOSE REEL LOCATION

The hose reel shall be mounted on the floor of the Rear Center, B-1 compartment toward the rear and left of the compartment to maximize storage space for the nozzle and other accessories.

BOOSTER REEL GAUGE

A discharge gauge shall be included for the booster reel, the discharge gauges shall be specified in the specification.

BOOSTER HOSE

The booster hose shall be provided and installed by the Dealership prior to the apparatus being placed into service.

HOSE ROLLER GUIDES

There will be stainless steel hose roller guides provided and installed inside of the B1 compartment, in a vertical orientation to protect the apparatus and allow ease of deployment on the booster reel.

DISCHARGE GAUGES

An Innovative Controls 2.50 inch (65 mm) gauge shall be supplied for reading the pressure of each discharge greater than 1.50 inches (38 mm) in diameter, unless otherwise specified.

GAUGE SCALE

Each gauge shall be marked for reading a discharge pressure of 0-400 PSI.

GAUGE FACE COLOR

Each gauge shall have black markings on a white face.

BEZELS FOR 2.5" DISCHARGE GAUGES

There shall be a deluxe bezel supplied around each of the 2.50 inch (65 mm) discharge pressure gauges. The bezels shall be constructed from chrome-plated zinc with large, easily identifiable recessed labels for color-coding and verbiage.

FOAMPRO 1600

There shall be a fully automatic electronic direct injection foam proportioning system furnished and installed on the apparatus. The system shall be capable of Class A foam concentrate. The proportioning operation shall be based on an accurate direct measurement of water flows with no water flow restriction. The foam system shall be installed in accordance with the manufacturer's recommendations. The foam system shall have a 12 volt, 1/3 horsepower electric positive displacement foam concentrate pump with a rated capacity of .01 to 1.7 GPM with operating pressures up to 400 psi.

The system shall be manufactured by the Fire Research Corporation and be model FoamPro 1600.

The system shall be equipped with a control module. It shall be installed on the pump operators panel and enable the pump operator to perform the following functions:
- Activate the foam system
- Change foam concentrate proportioning rates from .1% to 1%
- Flash a "low concentrate" warning light when the foam concentrate tank runs low. In two (2) minutes if foam concentrate is not added to tank, the foam concentrate pump shall be deactivated.

FOAM SYSTEM TESTING

The apparatus foam system shall be tested and the Foam Flow meter shall be certified by the manufacturer prior to delivery.

FOAM TANK

One (1) 20 gallon foam tanks with square hinged lids, equipped with a hold down devices shall be installed and plumbed with non-corrosive piping to the foam system. The fill towers shall be approximately 8.00 inch by 8.00 inch.

A label shall be affixed to the foam tank fill indicating: “WARNING” Class A (or B) foam tank fill, do not mix brands or types of foam.

Foam tank shall be integral with the booster water tank provided

SYSTEM PLUMBED TO 1 TANK

The system shall be supplied by a single foam tank. There shall be a 1/4 turn valve located at the tank for serviceability.

SINGLE 1" TANK DRAIN

There shall be a 1.00 inch quarter turn drain valve installed for drainage of the foam tank. The valve shall be installed in the pump house with a drain line extended to the side running board.

An additional 1" quarter turn drain valve shall be installed at the outlet of the foam tank port to allow for service of the foam system with out having to drain the foam tank.

FOAM TANK LEVEL GAUGE

There shall be one (1) Fire Research TankVision WLA360-A00 LED electronic foam level gauge located on the pump operator's control panel. This level gauge utilizes ultra-bright LEDs for sunlight readability, and two wide-viewing lenses for 180 degrees of clear viewing. There shall be a "Class A" label installed.

VIBRA-TORQUE™ BODY MOUNTING SYSTEM

The entire body module assembly shall be mounted to the chassis frame rails exclusively with Vibra-Torq™ torsion isolator assemblies to reduce the vibration and stress providing an extremely durable body mount.

The body substructure shall be mounted above the frame to allow independent flexing to occur between the body and the chassis. Two (2) assemblies shall be mounted to the chassis frame

rails with steel, gusseted mounting brackets. Each bracket shall be painted for corrosion resistance. Each body mount bracket shall be mounted to the side chassis frame flange with two 5/8”-UNC Grade 5 HHCS.

The rear assemblies shall have a two-part rubber vibration isolator. Certain assemblies shall also incorporate a torsion spring. Helical coil springs shall be incorporated into specific mounts in tandem with the rubber isolators to minimize the stress absorbed by the body caused from chassis frame rail flexing.

There shall be no welding to the chassis frame rail sides, web or flanges, or drilling of holes in the top or bottom frame flanges between axles. All body to chassis connections shall be bolted so that in the event of an accident, the body shall be easily removable from the truck chassis for repair or replacement.

Because of the constant vibration and twisting action that occurs in chassis frame rails and suspension, the torsion mounting system is required to minimize the possibility of premature body structural failure. The Vibra-Torque™ body mounting system shall have a lifetime warranty.

COMPARTMENT VENTILATION

To allow for proper air circulation and flow, each compartment shall have a venting route. The venting locations shall be determined by "best-fit" locations for each body style configuration. The vents will be integrated on the compartment interior walls.

COMPARTMENTATION

The following compartments shall be supplied on the apparatus:

Compartment "L1"

There shall be one (1) full height compartment ahead of the rear wheels on the left side of the apparatus with interior dimensions of the following:

The upper portion shall be approximately 37.75 inches (958.85 mm) wide by 39.00 inches (990.60 mm) high by 12.50 inches (317.50 mm) deep.

The lower portion shall be approximately 37.75 inches (958.85 mm) wide by 33.00 inches (838.20 mm) high by 26.00 inches (660.40 mm) deep.

Clear door opening dimensions shall be 29.70" (754.38 mm) wide by 63.10" (1602.74 mm) high.

Compartment "L2"

There shall be one (1) compartment over the rear wheels on the left side of the apparatus with interior dimensions of the following:

The upper portion shall be approximately 68.00 inches (1727.20 mm) wide by 39.00 inches (990.60 mm) high by 12.50 inches (317.50 mm) deep.

The lower portion shall be approximately 68.00 inches (1727.20 mm) wide by 8.00 inches (203.20 mm) high by 25.75 inches (660.40 mm) deep.

Clear door opening dimensions shall be 65.50" (1663.70 mm) wide by 38.10" (967.74 mm) high.

Compartment "L3"

There shall be one (1) full height compartment behind the rear wheels on the left side of the apparatus with interior dimensions of the following:

The upper portion shall be approximately 46.75 inches (1187.45 mm) wide by 39.00 inches (990.60 mm) high by 12.50 inches (317.50 mm) deep.

The lower portion shall be approximately 46.75 inches (1187.45 mm) wide by 33.00 inches (838.20 mm) high by 26.00 inches (660.40 mm) deep.

Clear door opening dimensions shall be 41.70" (1059.18 mm) wide by 63.10" (1602.74 mm) high.

Compartment "R1"

There shall be one (1) full height compartment ahead of the rear wheels on the right side of the apparatus with interior dimensions of the following:

The upper portion shall be approximately 37.75 inches (958.85 mm) wide by 39.00 inches (990.60 mm) high by 12.50 inches (317.50 mm) deep.

The lower portion shall be approximately 37.75 inches (958.85 mm) wide by 33.00 inches (838.20 mm) high by 26.00 inches (660.40 mm) deep.

Clear door opening dimensions shall be 29.70" (754.38 mm) wide by 63.10" (1602.74 mm) high.

In cases of chassis driven exhaust clearances issues, the rear lower back portion of the compartment shall be notched to accommodate. This notch may be approx. 6.00 inches deep x

6.00 inches high x 6.00 inches long. This may be reduced as required to allow for a minimal intrusion as possible.

Compartment "R2"

There shall be one (1) compartment over the rear wheels on the right side of the apparatus with interior dimensions of the following:

The upper portion shall be approximately 68.00 inches (1727.20 mm) wide by 39.00 inches (990.60 mm) high by 12.50 inches (317.50 mm) deep.

The lower portion shall be approximately 68.00 inches (1727.20 mm) wide by 8.00 inches (203.20 mm) high by 25.75 inches (660.40 mm) deep.

Clear door opening dimensions shall be 65.5" (1663.70 mm) wide by 38.1" (967.74 mm) high.

Compartment "R3"

There shall be one (1) full height compartment behind the rear wheels on the right side of the apparatus with interior dimensions of the following:

The upper portion shall be approximately 46.75 inches (1187.45 mm) wide by 39.00 inches (990.60 mm) high by 12.50 inches (317.50 mm) deep.

The lower portion shall be approximately 46.75 inches (1187.45 mm) wide by 33.00 inches (838.20 mm) high by 26.00 inches (660.40 mm) deep.

Clear door opening dimensions shall be 41.70" (1059.18 mm) wide by 63.10" (1602.74 mm) high.

FORMED BODY DESIGN CONSTRUCTION

The apparatus body shall be a formed sheet metal design, which serves as the compartment enclosures and supporting substructure of the body. The substructure and enclosures shall work in unison to provide maximum storage that supports and protect the contents contained within.

BODY CONSTRUCTION

The body substructure and compartments shall utilize a combination of huck bolting and welding methods.

The huck bolt systems utilized in either body or substructure shall be .3125 inch (7.94 mm) or .375 inch (9.53 mm) diameter stainless steel fasteners for maximum shear and tension strength. Other system of fasteners that do not consist of stainless steel shall NOT be acceptable.

In combination with the huck bolt system, strictly monitored welding procedures shall be instituted. To ensure maximum joint strength, any welding zones shall be welded together utilizing American Welding Standard (A.W.S), Certified welding procedures.

Due to the engineered combination of specifically chosen materials, no dissimilar metals shall be used in the body and its supporting substructure without being separated by a sufficient corrosion and electrolysis inhibitor. This shall consist of isolation pads and structural adhesives.

Absolutely no dissimilar metals shall be used in the body and its supporting substructure without being separated by Eck®, which prevents corrosion by providing a barrier between dissimilar metals, sealing out moisture and absorbing energy created by a dissimilar metal reaction.

BODY STRUCTURE

The supporting tank and compartment substructure shall be manufactured from corrosion resistant 3CR12 stainless steel material. The supporting material shall be engineered from 7 gauge stainless steel material to provide both high strength and corrosion resistance for longevity of the apparatus body. The use of black carbon steel materials that have been painted or coated to try to prevent corrosion shall not be expectable.

BODY COMPARTMENTS

The formed sheet metal compartments shall utilize a 0.125 inch (3.18 mm) thick 5052-H32 aluminum alloy to provide maximum strength and durability. Each compartment sheet and enclosure shall be fabricated in a manor to provide proper sheet alignment and weld location application. The body shall consist of multiple pre-engineered compartment assemblies that shall be combined to create a series of body combinations. In the event of body damage, these assemblies shall allow for easier disassembly and assembly through the use of common tools and materials.

COMPARTMENT TOPS AND EXTERIOR HOSE BED WALL

The exterior compartment tops and outer hose bed walls shall consist of .125 inch (3.18 mm) embossed aluminum diamond plate material to provide both strength and pleasing appearance. The hose bed walls shall be embossed aluminum diamond plate to the outward face while incorporating an additional smooth aluminum interior wall sheet to form the hose

bed area. The use of interior and exterior hose bed wall sheets shall provide an enclosed section for strength integrity, wire routing, etc. Single hose bed wall sheet construction shall NOT be acceptable.

COMPARTMENT FLOORS

The body compartments shall be enclosed with aluminum sheet metal as specified above. The compartment floors shall have a 1.00 inch (25.40 mm) lip downward at the door opening side of the compartment. This lip shall integrate with a structural member on the bottom edge and form a “sweep-out” compartment. This design shall also allow for a structural flush fitting door frame and a complete door/weather seal.

COMPARTMENT LOAD CAPACITY

Each compartment shall have a minimum of one additional structural compartment floor support hat section centered on the underside of the compartment floor. This additional member shall be integral with compartment assemblies of each area. Each compartment must be designed, and analyzed to carry a working load of:

Full depth side compartment: 500 pounds (226.80 kg) per compartment
Half depth side compartment: 375 pounds (170.10 kg) per compartment
Rear center compartment: 500 pounds (226.80 kg)

REAR COMPARTMENT

The following compartment shall be supplied on the apparatus:

Compartment "B1":

There shall be one (1) compartment installed at the rear of the apparatus with a R·O·M Series IV roll up door.

The interior dimensions of this compartment shall be approximately 41.50 inches (1054.10 mm) wide by 39.50 inches (1003.30 mm) high by 33.63 inches (844.55 mm) deep.

Clear door opening dimensions shall be 33.50" (850.90 mm) wide by 31.80" (807.72 mm) high.

DOOR OPEN INDICATOR

The rear compartment roll up door shall have an integral door open indicator magnet in the lift bar. If the bar is not properly closed and the transmission is shifted out of neutral with the parking brake released, it shall activate the "Do Not Move Apparatus Light" in the cab to alert the crew.

ROLL-UP DOOR PROTECTOR

There shall be a protective cover installed under the rear compartment door roll to protect the door in the rolled up position.

ROLL-UP DOOR PROTECTOR FINISHING

The cover shall be fabricated of smooth aluminum and of Natural finish.

ROLL-UP DOOR CONSTRUCTION

All horizontal and vertical side compartment doors shall be roll-up style doors.

SIDE AND REAR COMPARTMENT DOORS

A R•O•M Corporation Series IV roll-up shutter door shall be installed. Each shutter slat, track, bottom rail, and drip rail shall be constructed from anodized 6063 T6 aluminum.

Shutter slats shall feature a double wall extrusion 0.315 inches thick with a concave interior surface to minimize loose equipment jamming the shutter door closed. Shutter slats shall feature an interlocking end shoe to prevent side to side binding of the shutter door during operation. Slats must have interlocking joints with an inverted locking flange. Slat inner seal shall be a one piece PVC extrusion; seal design shall be such to prevent metal to metal contact while minimizing dirt and water from entering the compartment.

Shutter door track shall be one piece design with integral overlapping flange to provide a clean finished look without the need of caulk. Door track shall feature an extruded Santoprene rubber double lip low profile side seal with a silicone co-extruded back to reduce friction during shutter operation.

Shutter bottom rail shall be a one piece double wall extrusion with integrated finger pull. Finger pull shall be curved upward with a linear striated surface to improve operator grip while operating the shutter door. Bottom rail shall have a smooth contoured interior surface to prevent loose equipment from jamming the shutter door. Bottom rail seal shall be made from Santoprene; it will be a double “V” seal to prevent water and debris from entering compartment. Bottom rail lift bar shall be a one piece “D” shaped aluminum extrusion with linear striations to improve operator grip during operation. Lift bar shall have a wall thickness of

0.125 inches. Lift bar shall be supported by no less than two pivot blocks; pivot blocks shall be constructed from Type 66 Glass filled reinforced nylon for superior strength. Bottom rail end blocks shall have incorporated drain holes which will allow any moisture that collects inside the extrusion to drain out.

Shutter door shall have an enclosed counter balance system. Counter balance system shall be 4.00 inches in diameter and held in place by 2 heavy duty 18 gauge zinc plated plates. Counter balance system shall have 2 over-molded rubber guide wheels to provide a smooth transition from vertical track to counter balance system.

SIDE COMPARTMENT DOOR/TRACK/TRIM WET PAINTED

The side compartment doors, track, and trim shall be aluminum finish and wet painted to color match the apparatus body.

REAR COMPARTMENT DOOR/TRACK/TRIM WET PAINTED

The rear compartment door, track and trim shall be aluminum finish and wet painted to color match the apparatus body.

ROLL-UP DOOR PROTECTORS

There shall be a protective cover installed under each body side compartment door roll to protect the door in the rolled up position.

ROLL-UP DOOR PROTECTORS FINISHING

Each cover shall be fabricated of smooth aluminum and of Natural finish.

ROLL-UP DOOR ASSIST STRAPS

There shall be nylon straps installed on the both left and right side body side, 'high side' compartment doors, to assist in closing the door. The strap shall be attached to each door and shall be permanently mounted to the rearward wall with footman loops using nutserts, half way between the top and bottom of the compartment.

DOOR OPEN INDICATOR

Each roll up door shall have an integral door open indicator magnet in the lift bar.

If the bar is not properly closed and the transmission is shifted out of neutral with the parking brake released, it shall activate the "Do Not Move Apparatus Light" in the cab to alert the crew.

COMPARTMENT LIGHTING

Two (2) OnScene Access LED tube lights shall be installed in each body compartment.

The tube lights shall be full height along the forward side of the door framing and shall be maximum length available to fit the opening.

The light in each compartment shall be on a separate circuit, turning on only those lights that have open compartment doors. The lights shall not be tied into the park brake control.

HOSE STORAGE

A hosebed shall be provided that meets the minimum NFPA storage requirements. The hosebed shall have slotted 1/4" .25 inch (6.35 mm) aluminum flooring installed to allow drainage through the tank cavity to the ground below.

The aluminum flooring shall be manufactured in discrete sections to allow for easy removal and outstanding stability. The area shall be free of sharp edges to protect the hose when loaded or distributed.

HOSEBED BULKHEAD

There shall be a bulkhead divider installed directly behind the water and foam fill towers.

HOSEBED FINISH

The apparatus hosebed interior walls shall be incorporated with a brushed stainless steel overlay material.

HOSEBED DIVIDER WITH HAND CUTOUT

There shall be a full height adjustable hose bed divider provided and installed in the hose bed area of the apparatus body.

The divider shall be fabricated of 1/4" .25 inch (6.35 mm) thick aluminum plate with a double sided reinforcement, (the sheet shall be secured via an extrusion at the base and forward vertical edge of the sheet) and attached to the adjustable slide rails. The rear of the divider shall have a radius to provide a smooth corner and a hand cut out to aid in access to the hose bed area. Hose payout shall be unobstructed by the divider.

There shall be a total of (2) provided and installed in the hose bed.

HOSEBED RISER

A 15.00 inch (381.00 mm) hosebed riser made from the same material as the body shall be provided in order to increase the hosebed capacity.

CATWALKS

Catwalks shall be provided over the top of the compartments. The catwalks shall be manufactured with .125 inch (3.18 mm) embossed aluminum diamond plate material.

The outboard edge shall be bent downward at a 90 degree angle and over the compartments on both sides.

A FRAME HOSE BED COVER

There shall be an A-Frame double door cover furnished and installed on the apparatus for the hose bed.

The covers shall be fabricated of 1/8" .125 inches (3.18 mm) embossed aluminum diamond plate material with full length two-piece stainless steel piano hinges.

Each cover shall be capable of being opened independently.

The covers shall be full length of the hose bed storage area, from rear of the apparatus to the bulkhead wall.

There shall be a mechanical hold open device to hold each cover in the open position at the front of the hosebed covers.

To aid in opening and closing the covers, there shall be (2) 18" grab handles at the front of the covers, one each side. Additionally there shall be two (2) 18" grab handles per cover, installed at the back of the "A-Frame" tube structure, one on each side of the hosebed area.

If the cover is not properly closed and the transmission is placed into drive or reverse mode with the parking brake released, it shall activate the hazard light in the cab to alert the crew.

The covers shall not be a walking surface.

REAR HOSE BED COVER

The cover that extends down over the rear of the hose bed shall be supplied and installed by the Dealership prior to the apparatus being placed into service.

HOSE BED COVER LIGHTING

Four (4) OnScene "Access" LED tube light shall be mounted to the underside of each hose bed cover, two each cover of approx.. 48.00 inches each, evenly spaced from front to back.

The lights on each side shall be on a separate circuit and activate only when their respective side covers are opened.

DUNNAGE AREA

A vertical bulkhead shall be installed at the front of the hosebed area, just behind the water tank fill tower, forming a storage area that is separated from the hosebed. The dunnage area interior side walls shall be incorporated with a brushed stainless steel overlay material.

The rear face of the bulkhead shall serve as a mounting surface for the hosebed dividers, resulting in the ability to move any hosebed divider across the entire width of the hosebed.

UPF POLY TANK III

The booster tank shall be constructed of PT3™ polypropylene material. This material shall be a non-corrosive stress relieved thermoplastic and UV stabilized for maximum protection. The booster and/or foam tank shall be of a specific configuration and is so designed to be completely independent of the body and compartments.

All joints and seams shall be fused using nitrogen gas as required and tested for maximum strength and integrity. The tank construction shall include PolyProSeal™ technology wherein a sealant shall be installed between the plastic components prior to being fusion welded. This sealing method will provide a liquid barrier offering leak protection in the event of a weld compromise. The top of the booster tank is fitted with removable lifting assembly designed to facilitate tank removal. The transverse and longitudinal swash partitions shall be manufactured of a minimum of 3/8" PT3™ polypropylene. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with NFPA 1901, current edition. The walls shall be welded to the floor of the tank providing maximum strength as part of the tank's unique Full Floor Design™. Tolerances in design allow for a maximum variation of .125 on all dimensions.

WATER FILL TOWER AND COVER

The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of .50 inch (12.7 mm) PT3™ polypropylene. The fill tower shall be blue in color indicating that it is a water-only fill tower. The tower shall be located in the left front corner of the tank unless otherwise specified by the tank manufacturer to the purchaser. The tower shall have a .25 inch (6.4 mm) thick removable polypropylene screen and a PT3™

Polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid. Inside the fill tower there shall be a combination vent/overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with a minimum I. D. of 4.00 inch (100 mm) that is designed to run through the tank, and shall be piped to discharge water behind the rear wheels as required in NFPA 1901, current edition, so as to not interfere with rear tire traction.

The tank cover shall be constructed of .50 inch (12.7 mm) thick PT3™ polypropylene and UV stabilized, to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary. The tank cover(s) shall be flush or recessed 3/8" from the top of the tank and shall be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2.00 inch (50 mm) minimum polypropylene dowels spaced a maximum of 40.00 inch (1016 mm) apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowels shall accommodate the necessary lifting hardware.

MOUNTING

The UPF Poly-Tank® III shall rest on the body cross members in conjunction with such additional cross members, spaced at a distance that would not allow for more than 530 square inches of unsupported area under the tank floor. In cases where overall height of the tank exceeds 40.00 inch (1016 mm), cross member spacing must be decreased to allow for not more than 400 square inches of unsupported area. The tank must be isolated from the cross members through the use of hard rubber strips with a minimum thickness and width dimension of .25 inch (6.4 mm) x 1.00 inch (25 mm) and a Shore A Hardness of approximately 60 durometer. The rubber must be installed so it will not become dislodged during normal operation of the vehicle. Additionally, the tank must be supported around the entire bottom outside perimeter and captured both in the front and rear as well as side to side to prevent tank from shifting during vehicle operation.

A picture frame type cradle mount with a minimum of 2.00 inch (50 mm) x 2.00 inch (50 mm) x .25 inch (6.4 mm) mild steel, stainless steel, or aluminum angle shall be provided or the use of corner angles having a minimum dimension of 4.00 inch (100 mm) x 4.00 inch (100 mm) x 4.00 inch (100 mm) by 6.00 inch (150 mm) high are permitted for the purpose of capturing the tank.

Although the tank is designed on a free floating suspension principle, it is required that the tank have adequate vertical hold down restraints to minimize movement during vehicle operation. If proper retention has not been incorporated into the apparatus hose floor structure, an optional mounting restraint system shall be located on top of the tank, half way between the front and the rear on each side of the tank. These stops can be constructed of steel, stainless steel or aluminum angle having minimum dimensions of 3.00 inch (77 mm) x 3.00 inch (77 mm) x .25 inch (6.4 mm) and shall be approximately 6.00 inch (150 mm) to 12.00 inch (304.80 mm) long. These brackets must incorporate rubber isolating pads with a minimum thickness of .25 inch and a hardness of 60 durometer affixed on the underside of the angle. The angle should then be bolted to the body side walls of the vehicle while extending down to rest on the top outside edge of the upper side wall of the tank. Hose beds floors must be so designed that the floor slat supports extend full width from side wall to side wall and are not permitted to drop off the edge of the tank or in any way come in contact with the individual covers where a puncture could occur. Tank top must be capable of supporting loads up to 200 lbs. per sq. foot when evenly distributed. Other equipment such as generators, portable pumps, etc. must not be mounted directly to the tank top unless provisions have been designed into the Poly-Tank® III for that purpose. The tank shall be completely removable without disturbing or dismantling the apparatus structure. The tank must be designed and fabricated by a tank manufacturer that is ISO 9001:2008 certified. The ISO certification must be to the current standard in effect at the time of the design and fabrication of the tank.

TANKNOLOGY™ TAG

A tag shall be provided with the apparatus paperwork and contain pertinent information including a QR code readable by commercially available smart phones. The information contained on the tag shall include the capacity of the water and foam(s), the maximum fill and pressure rates, the serial number of the tank, the date of manufacture, the tank manufacturer, and contact information. The QR code will allow the user to connect with the tank manufacturer for additional information and assistance.

TANK CAPACITY

The tank shall be 1000 gallons (3785 liters) in capacity.

FILL TOWER

The fill opening shall be approximately 14.00 inches (355.60 mm) x 14.00 inches (355.60 mm).

The tower will have a .25 inch (6.35 mm) thick removable poly material screen and hinged type cover that will open if the tank is filled at an excess rate. There shall be a removable .25 inch (6.35 mm) thick poly material screen to prevent debris from falling into the tank.

The fill tower shall have a 6.00 inch (152.40 mm) overflow that will discharge underneath the tank, behind the rear wheels. The overflow shall terminate above the tank water level when filled to the rated capacity.

LADDER STORAGE

The ground ladders shall be stored within a compartment installed on the right side of the apparatus booster tank, with ladders lying on their side. There shall be storage for two (2) pike poles and a slot for a back board integrated into the compartment. There shall be a non-metal ladder stop to prevent metal to metal contact. There shall be non-metallic guides installed for ladders to slide on.

All items shall be stored in their own independent section to allow one item to be removed without disturbing another.

The compartment and door shall be fabricated of 1/8" .125 inch (3.18 mm) smooth aluminum.

The door shall be vertically hinged and provided with two push button style latches and a chrome handle centered between the push button latches.

If the door is not properly closed and the transmission is shifted out of neutral with the parking brake released, it shall activate the "Do Not Move Apparatus light" in the cab to alert the crew.

GROUND LADDERS

The following ground ladders shall be provided by the manufacturer:

-One (1) Duo-Safety 24 foot (7 m) two (2) section aluminum extension ladder, model 900A.

-One (1) Duo-Safety 14 foot (4 m) aluminum roof ladder with folding hooks, model 775A.

-One (1) Duo-Safety 10 foot (3 m) aluminum attic ladder, model 585A.

BODY OVERLAYS – FRONT/REAR

The entire front face of the apparatus body shall have aluminum diamond plate overlays installed. The entire rear face of the apparatus body shall have raw aluminum overlays installed for the installation of chevron striping.

All overlay materials shall be coated with 3M adhesive sealant on the back portion to provide an insulating barrier between dissimilar metals.

WHEEL WELL ROLL-OUT DRAWER

There shall be a roll-out drawer installed in the compartment located above the rear wheel on the left side of the body in the L-2 compartment.

The drawer shall be approximately 25" deep x 62.75" wide with 2" tall sides and have a 300.00 pound (136.08 kg) capacity.

The drawer shall incorporate locking slides actuated by an Austin Hardware (FDR-L001-xxxxx) front drawer release lift handle at the forward face of the drawer.

SCBA COMPARMENT BIN

There shall be an eight (8) place air bottle compartment bin provided in the lower portion of the compartment located above the wheel well area on the right side in the R-2 compartment.

The interior surface of each SCBA storage tube shall be lined with a coating of gray speedliner. The application of speedliner shall aid to minimize any damage caused to the canisters while stored in the holders.

The NFPA required SCBA bottle straps shall be mounted deeper in the compartment so the bottles do not hit the door when the door is closed.

OVERWHEEL SHELVING

One (1) shelf 66.25 inch wide x 11.50 inch deep x 2.00 inch high shall be provided in the driver's side wheel well compartment as part of the assembly.

The shelf shall be .19 inch (4.76 mm) smooth aluminum with a formed 2.00 inch (50.80 mm) lip on the front and back. The side mounting brackets shall be integral with the shelving to form the sides.

One (1) shelf 66.25 inch wide x 11.50 inch deep x 2.00 inch high shall be provided in the officer's side wheel well compartment as part of the assembly.

The shelf shall be .19 inch (4.76 mm) smooth aluminum with a formed 2.00 inch (50.80 mm) lip on the front and back. The side mounting brackets shall be integral with the shelving to form the sides.

COMPARTMENT UNISTRUT

Vertically mounted Unistrut shall be installed in ALL compartments of the apparatus body to

accommodate mounting shelves, trays, and other miscellaneous equipment items as specified.

SHELVING

The shelving shall be made out of 3/16" .190 inch (4.83 mm) smooth aluminum sheet material with a formed 2 inch (50.80 mm) lip on the front and back.

The side mounting brackets shall be integral with the shelving to form the sides. The shelving shall be vertically adjustable.

The following shelving shall be provided:

UPPER HALF DEPTH SHELVING

A full width x half depth shelf shall be provided and installed in the upper compartment(s) specified.

There shall be a total quantity of three (3) provided.

One (1) shall be located in the L-3 compartment.

One (1) shall be located in the R-1 compartment.

One (1) shall be located in the R-3 compartment.

SHELF DEPTH MODIFICATION

The shelf specified above shall be reduced in depth by 1.00 inch (25.40 mm) for installation of wall mount tool boards.

FULL DEPTH SHELVING

A full width x full depth shelf shall be provided and installed in the compartment(s) as specified.

There shall be a total quantity of one (1) provided.

One (1) shall be located in the L-1 compartment.

SHELF AND TRAY FINISH

Any shelf or roll-out tray installed shall have a dual-action sanded finish applied on the front and side faces.

WHEEL WELL PANELS

The body panel area around the wheel well on each side of the body shall be painted the same color as the rest of the body

SIDE RUB RAILS

The bottom edge of the body compartments shall be protected with rub rails to absorb minor damage while protecting the body. The rear rub rails shall be full length to the end of the tailboard.

The rub rails shall be fabricated of brightly anodized aluminum channel. The rub rails shall be bolted in place with stainless steel bolts and shall be spaced away from the body with .50 inch (12.70 mm) nylon spacers to help prevent the collection of water and debris. Each rub rail section shall be easily removable and replaced should it become damaged.

REAR RUB RAILS

The rearward edge of the rear step shall be trimmed with rub rails to absorb minor damage while protecting the body.

The rub rails shall be fabricated of brightly anodized aluminum channel. The rub rails shall be bolted in place with stainless steel bolts and shall be spaced away from the body with .50 inch (12.70 mm) nylon spacers to help prevent the collection of water and debris. Each rub rail section shall be easily removable and replaced should it become damaged.

RUB RAIL RETRO-REFLECTIVE STRIPING

One inch retro-reflective Diamond Grade striping shall be applied to the length of each rub rail section making the perimeter of the apparatus more readily visible.

STRIPE COLOR

The reflective striping shall be red in color.

DOOR SILL TRIM PLATES

Brushed stainless steel door sill plates shall be installed at the bottom of each body compartment door opening.

VERTICAL OVERLAY TRIM PLATES

Full height brushed stainless steel vertical overlay trim plates shall be installed on the back outer rear corners of the body compartment.

FENDERETTES

Two (2) polished aluminum fenderettes shall be provided and installed on body rear wheel well openings, one (1) each side. Rubber welting shall be provided between the body and the crown to seal the seam and restrict moisture from entering. A dielectric barrier shall be provided between the fender crown fasteners (screws) and the fender sheet metal to resist deterioration.

REAR TAILBOARD

The rear tailboard shall be fabricated of the same materials as used in the apparatus body. The tailboard shall be an independent assembly fastened to the rear body structural framing to provide body protection and a solid rear stepping platform.

The rear of the apparatus body shall be vertical in design - otherwise known as a 'flat-back'. On the rear body surface, a sign shall be attached that states: "DO NOT RIDE ON REAR STEP, DEATH OR SERIOUS INJURY MAY RESULT."

The rear tailboard and body shall be constructed such that the angle of departure shall be no less than 8 degrees at the rear of the apparatus when fully loaded (Per NFPA 1901, current edition).

REAR TAILBOARD STEP

The rear tailboard shall be approximately 17.5 inches deep and shall incorporate a .125 embossed aluminum diamond plate overlay.

The stepping area shall span the width of the apparatus, overlapping the perimeter of the structural tailboard framework.

The embossed diamond plate material shall meet the minimum NFPA standard requirements for slip resistance.

INTERMEDIATE REAR STEP

One (1) upper rear fixed intermediate step approximately 53.375 inch wide x 10.00 inch deep shall be provided above the rear compartment to be used as a stepping area when loading or deploying hose. The step shall be designed with integrated grab handles and hand holes.

The step shall be fabricated of embossed aluminum diamond plate material.

The step shall be mounted on the flat back of the apparatus with gusset-type mounting and shall be mounted with 3/8" bolts.

The step shall extend from ladder compartment to left side hosebed wall and shall protect the rear discharge.

INTERMEDIATE STEP LIGHTING

Sufficient lighting light shall be installed to illuminate the stepping areas as provided.

The light shall be directed towards and positioned above the stepping surface.

There shall be an On-Scene Access 38" LED tube light installed below the intermediate step to illuminate below the step.

STEP LIGHT ACTIVATION

The step lights shall be activated when the park brake is set.

FOLDING STEP

Innovative Controls illuminated folding step(s) shall be installed on the body as required per NFPA. The top of the stepping surface shall have a knurled finish and an LED light that illuminates the stepping surface. An additional light shall be provided on the step mounting bracket to illuminate the area under the step.

The steps shall be mounted with 3/8" bolts.

The following steps shall be installed:

ILLUMINATED FOLDING STEPS

Three (3) illuminated folding steps shall be installed on the left front vertical face of the body.

STEP LIGHT ACTIVATION

The step lights shall be activated when the park brake is set.

10" HANDRAILS

One (1) handrail constructed of knurled Aluminum tubing shall be installed to assist in climbing the steps according to NFPA 1901, current edition. There shall be a 2.00 inch minimum clearance between the bracket and the body.
Location: Front edge of catwalk, angled at approximately 30 degrees.

ILLUMINATED FOLDING STEPS

Three (3) illuminated folding steps shall be installed on the right front vertical face of the body.

STEP LIGHT ACTIVATION

The step lights shall be activated when the park brake is set.

10" HANDRAILS

One (1) handrail constructed of knurled Aluminum tubing shall be installed to assist in climbing the steps according to NFPA 1901, current edition. There shall be a 2.00 inch minimum clearance between the bracket and the body.

Location: Front edge of catwalk, angled at approximately 30 degrees.

ILLUMINATED FOLDING STEPS

Two (2) illuminated folding steps shall be installed on the right rear vertical face of the body.

STEP LIGHT ACTIVATION

The step lights shall be activated when the park brake is set.

HANDRAILS

Two (2) full height vertical handrails shall be mounted, one (1) on each side of the rear center compartment area of the rear of the apparatus. The vertical rear of body handrails shall be mounted with offset stanchions.

One (1) 50" horizontal hand rail shall be installed above the intermediate step.

Two (2) 20" vertical handrails shall be installed on the pump house, (1) each side.

REAR TOW EYES

There shall be two (2) rear tow eyes installed on the rear sub frame support structure, one each side. The location of the tow eyes shall be below the rear center compartment. The tow eyes shall be manufactured of 1.00 inch plate steel that is bolted to the chassis frame rail with a minimum of 6 grade 8 bolts.

PAINT SPECIFICATIONS

All bright metal fittings, if unavailable in stainless steel, shall be heavily chrome plated.

Critical body and sub-frame area which cannot be primed after assembly shall be pre-painted.

All welded metal surfaces shall be ground to a smooth surface prior to a degreasing and high pressure, high temperature phosphatizing process. The entire surface shall be sprayed with a non-chromate sealing compound to prevent formulation of stains or flash rust on previously phosphatized parts.

The paint applied to the apparatus shall be PPG Industries Delta® brand, applied throughout a multi-step process including at least two coats of each color and clear coat finish.

The coating shall be an infra-red, baked air dried. The coatings shall provide full gloss finished suitable for application by high-pressure airless or conventional low pressure air atomizing spray.

The coatings shall not contain lead, cadmium or arsenic. The polyisocyanate component shall consist of only aliphatic isocyanates, with no portion being aromatic isocyanates in character. The solvents used in all components and products shall not contain ethylene glycol mono-ethyl ethers or their acetates (commercially recognized as cello solves), nor shall they contain any chlorinated hydrocarbons. The products shall have no adverse effects on the health or nor present any unusual hazard to personnel when used according to manufacturer's recommendations for handling and proper protective safety equipment, and for its intended use.

The coating system, as supplied and recommended for application, shall meet all applicable federal, state and local laws and regulations now in force or at any time during the courses of the bid.

The manufacturer shall supply (upon request) for each product and component of the system, a properly complete OSHA "Material Data Safety Sheet".

The following documents of the issue in effect on the date of the invitation to quote form a part of this document to the extent specified herein:

Federal Standards: Number 141A and 141B paint, varnish, lacquer and related material: methods of inspection, sampling, and testing.
Military Standard: MIL-C 83486B Coating, Urethane, Aliphatic Isocyanates, for Aerospace applications. Industry Methods and Standards: ASTM Method of Analysis (American Society for testing and Materials), BMS 10-72A (Boeing Material Specifications).

The coating will meet the following test performance properties as a minimum standard. (See PDF).

The entire exterior body structure (excluding roll-up doors) shall receive the primer coats and the finish coats. The apparatus body, will be painted in a down draft type paint booth to reduce dust, dirt or impurities in the finish paint. The painted surfaces shall have a finish with no runs, sags, craters, pinholes or other defects.

The apparatus shall be painted the lower cab color.

SPEEDLINER COMPARTMENT FINISH

The compartment interiors shall be coated with bed liner type spray.

COMPARTMENT FINISH COLOR

The Color shall be Medium Gray.

LOW-VOLTAGE ELECTRICAL SYSTEM

The apparatus shall be equipped with a Weldon Logic Controlled, Low-Voltage (12v) Electrical System compliant with the latest revision of the NFPA 1901 guideline.

The system shall be capable of performing total load management, load management sequencing, and load shedding via continuous monitoring of the low-voltage electrical system. In addition, the system shall be capable of switching loads (like operating as an emergency warning lamp flasher) eliminating the dependency on many archaic electrical components such as conventional flasher modules. The system shall also incorporate provisions for future expansion or modification.

The low-voltage electrical system shall be designed to distribute the placement of electrical system hardware throughout the apparatus thereby enabling a smaller, optimized wire harness. The programmable, logic controlled system shall eliminate redundant electrical hardware such as harnesses, circuit boards, relays, circuit breakers, and separate electrical or interlock subsystems and associated electronics for controlling various electrical loads and inputs.

As-built electrical system drawings and a vehicle-specific reference of I/O shall be furnished in the delivery manuals. These drawings shall show the electrical system broken down into separate functions, or small groups of related functions. Drawings shall depict circuit numbers, electrical components and connectors from beginning to end. A single drawing for all electrical circuits installed by the apparatus builder shall not be accepted.

LED PERIMETER LIGHTS

There shall be six (6) LED underbody perimeter lights installed on the apparatus. One (1) under each side at the front of the body, one (1) under each side at the rear of body, and one (1) each side under the rear tailboard. The lights shall be positioned to provide illumination to the immediate ground area around the apparatus body.

The lights shall be of the same manufacturer, model, and type as the ground perimeter lights installed on the cab/chassis.

PERIMETER LIGHTS ACTIVATION

The underbody perimeter lights shall be activated with activation of the chassis ground lights.

LED DOT LIGHTING

There shall be seven (7) lights located on the rear of the vehicle. Three (3) of the lights shall be mounted on the upper rear face of the body just below the hosebed area in a cluster for use as identification lamps. Two (2) lights shall be located outboard on the upper rear, one each side for use as clearance lamps and two (2) lights in the rearmost position of the side rubrail on the tailboard facing the side, for use as rear side marker lamps.

The lights shall be Weldon brand 9186-1500 series LED red markers

DOT ADDITIONAL MARKER LIGHTS

There shall be two (2) amber LED intermediate turn signals/intermediate marker lights installed in the rub rail, forward of the rear wheel well, one (1) each side.

The lights shall be Weldon brand 9186-1500 series LED amber markers/turn.

INTERMEDIATE TURN SIGNALS

The intermediate amber side marker lights installed in the rub rail, forward of the rear wheel well, shall flash when their respective side turn signal is activated. The lights shall return to

steady burn when turn signal is deactivated.

UPPER LIGHTING PACKAGE

The following NFPA lighting package, manufactured by Whelen, shall be supplied and installed in the upper areas of the vehicle.

UPPER REAR WARNING LIGHTS/ZONE C

There shall be two (2) Whelen L31 beacons, one each side , with 360 degree super LED lights installed at the rear upper outboard corners on top of a box fabricated of Treadbrite at the rear of the apparatus. The beacons shall have red LED's and clear lenses.

There shall be two (2) Whelen M6 AC warning lights with Amber LEDs and clear lenses installed, one each side, centered on the back of the fabricated Treadbrite box. The flash pattern shall be programmed "TripleFlash 75 in/out.

UPPER ZONE C WARNING ACTIVATION

The upper zone C beacon and warning light shall activate with the master warning switch.

LOWER LED WARNING LIGHTING

The following NFPA lighting package, manufactured by Whelen, shall be supplied and installed in the lower areas of the vehicle.

LOWER ZONE B&D:

There shall be four (4) Whelen model M6 series LED lights with chrome bezels, two (2) each side, provided and installed with the apparatus.

SIDE WARNING LIGHTS FLASH

The flash pattern to be "TripleFlash 75 in/out".

SIDE WARNING LIGHTS COLOR

The lower side warning lights mounted on the side positions shall be red with clear lenses.

SIDE WARNING LIGHTS LOCATION

The warning lights on the side of the apparatus shall be mounted at the rear wheel panel location, forward of the rear axle, and at the rear tailboard location.

AUXILIARY WARNING LIGHTS UPPER ZONE B&D

There shall be four (4) auxiliary Whelen model WIONSMCR LED red lights with clear lenses installed two (2) each side.

One (1) shall be installed in front and one (1) behind the rear axle on the upper body sides.

These four (4) lights shall be installed in the upper section of the side compartment header (catwalk flange) centered above the forward and rearmost compartments.

The flash pattern shall be programmed to an NFPA compliant flash pattern.

SIDE WARNING LIGHTS FLASH

The lower front lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors.

SIDE WARNING LIGHTS COLOR

The lower side warning lights mounted on the side positions shall be red with clear lenses.

LOWER ZONES B&D CAST ALUMINUM LIGHT HOUSING WITH PAINTED INSERT

A cast aluminum light housing with painted outward facing inserts, shall be installed for the rearmost warning light in zones B&D. The housing will ensure the light is mounted as far rearward as possible.

The inserts shall be painted to color match the body.

LOWER SIDE WARNING LIGHT ACTIVATION

The lower side warning lights shall activate through the master warning switch.

LOWER ZONE C:

There shall be two (2) Whelen model M9 series Super-LED lights with chrome bezels, one (1) each side, on provided and installed on the rear of the body.

REAR WARNING LIGHTS FLASH

The flash pattern to be "TripleFlash 75 in/out".

REAR WARNING LIGHTS COLOR

The lower rear warning lights mounted at the rear shall be red with clear lenses.

REAR WARNING LIGHT ACTIVATION

The rear lower warning lights shall be activated by the master warning switch, and individually switched by a virtual switch on the vista screen in the cab by a "lower rear warning lights" switch.

LED REAR TAIL LIGHT ASSEMBLY

There shall be Whelen M9-Series Super LED rear tail light assemblies provided and installed with the apparatus, one (1) each side at the rear.

The following shall be installed in the order as specified from top to bottom:

1- Warning light called out above
1 - Whelen #M9BTT LED series red brake light
1 - Whelen #M9T LED series amber turn signal light
1 - Whelen #M9 BUW LED clear backup light

MOUNTING FLANGES

There shall be individual chrome bezels provided for each light of the tail light assembly.

BACKUP LIGHTS

The backup lights shall illuminate when the apparatus is placed in reverse.

REAR TRAFFIC ADVISOR

Directional arrowstick shall consist of (8) Whelen model WIONSMCA with amber LEDs and clear lenses, and shall be mounted on the rearward face of the A Frame hosebed covers.

The controller shall be located and installed in the Chassis.

REAR VIEW CAMERA SYSTEM

The chassis provided camera shall be surface mounted under the intermediate step, on the center rear of the apparatus body for maximum viewing capability.

SIDE SCENE LIGHTING

Two (2) Whelen Pioneer PFS2 with flood and spotlight, housing shall be powder-coated white.

The scene lights shall be located on the side of the body, one (1) on each side, at the rear corner of the body side walls.

The Light shall be mounted in the side of the treadbrite box which also houses the upper rear warning light on the rear face of the box.

The treadplate box shall be as short as possible from the catwalk to the top of the scene light and shall be as wide as the catwalk.

SCENE LIGHT ACTIVATION

The side scene lights shall be individually activated at 3 locations; at the Vista, rocker switch in the officer switch panel and the rocker switch at the pump panel within an Innovative Controls 6-switch chrome bezel.

REAR SCENE LIGHTING

There shall be two (2) scene lights installed at the rear body panels, one (1) on each side.

The scene lights shall be Whelen model #M9LZC 12 volt scene lights with chrome bezels. The lights shall offer LED directional lighting from 2 to 40-degrees with internal and external optics.

SCENE LIGHT ACTIVATION

The rear scene lights shall be activated at (3) locations: from Vista screen, officer rocker switch, pump panel rocker switch within an Innovative Controls 6-switch chrome bezel, and shall be activated when the transmission is shifted into reverse.

The switch shall be labeled as follows:

Rear Scene

REFLECTIVE STRIPING

The reflective stripe applied to the outside perimeter of the chassis and apparatus as directed

by the Fire Department shall be applied by the Dealership prior to the truck being placed into service.

REAR RETRO-REFLECTIVE CHEVRON STRIPING

The rear of body (excluding rear door) shall be equipped with Diamond Grade, retro-reflective striping in a chevron pattern, sloping downward and away from the centerline of the vehicle at an angle of 45-degrees.

The stripe shall be 6.00 inch (152.40 mm) wide alternating in colors in compliance with the current edition of NFPA 1901, current edition.

RETRO-REFLECTIVE CHEVRON STRIPING

Diamond Grade retro-reflective chevron striping shall be applied to the front bumper.

CHEVRON COLORS

The retro-reflective chevron striping shall be red and fluorescent yellow-green in color.

BODY LETTERING

The lettering shall be provided and installed on each side of the apparatus body as directed by the Fire Department by the Dealership.

LICENSE PLATE BRACKET

A Cast Products, model LP0005-1-C, cast aluminum open bottom license plate bracket shall be installed on the apparatus.

The bracket shall incorporate a clear LED (WL0501) light to illuminate the license plate to meet DOT requirements.

NFPA LOOSE EQUIPMENT

The Fire Department shall be responsible to provide all NFPA loose equipment.

GENERAL WARRANTY

The manufacturer shall provide a two (2) year warranty from the date of delivery.

In the case of a commercial chassis being used, the warranty on the chassis, engine,

transmission, tires, storage batteries, generators, electrical lamps and other devices subject to deterioration is limited to the warranty of the manufacturer thereof and adjustments for the same are to be made directly with the manufacturer by the customer.

STRUCTURAL BODY WARRANTY

A structural Aluminum body warranty shall be provided by the apparatus manufacturer for products of its manufacture to be free from defects in material and workmanship, under normal use and service, for a period of ten (10) years.

PAINT WARRANTY

A Prorated Paint Warranty shall be provided by the apparatus manufacturer for products of its manufacture to be free from defects in material and workmanship, under normal use and service, for a period of ten (10) years.

PUMP WARRANTY

Waterous Company shall provide a limited manufacturer's pump warranty with total protection package (TTP-5) to be free from defects in material and workmanship, under normal use and service, for a period of five (5) years from the date placed into service.

PLUMBING WARRANTY

A Stainless Steel Plumbing/Piping warranty shall be provided by the apparatus manufacturer for products of its manufacture to be free from defects in material and workmanship, under normal use and service, for a period of ten (10) years from the date of delivery.

TANK WARRANTY

A lifetime tank warranty shall be provided by the tank manufacturer, UPF.

MULTI-PLEXED ELECTRICAL WARRANTY

A four (4) year limited (V-MUX) multiplex system warranty, of Weldon Technologies, Inc., shall be provided by the apparatus manufacturer, for parts and labor, while under normal use and service, against mechanical, electrical and physical defects from the date of installation.

The warranty shall exclude: sensors, shunt interface modules, serial or USB kits, transceivers, cameras, GPS, and electrical display screens, which shall be limited to a period of one (1) time a year repair for parts and labor from the date of installation. Please see the official warranty document in the appendix (attached) for specific details.

LOW-VOLTAGE ELECTRICAL SYSTEM PERFORMANCE TESTING

The apparatus low-voltage electrical system will be tested and certified. Tests shall be performed when the air temperature is between 0°F and 110°F (–18°C and 43°C). The three tests defined in NFPA shall be performed in the order in which they appear. Before each test, the batteries shall be fully charged until the voltage stabilizes at the voltage regulator set point and the lowest charge current is maintained for 10 minutes. Failure of any of these tests shall require a repeat of the sequence.

Reserve Capacity Test:

The engine shall be started and kept running until the engine and engine compartment temperatures are stabilized at normal operating temperatures and the battery system is fully charged.

The engine shall be shut off and the minimum continuous electrical load shall be activated for 10 minutes.

All electrical loads shall be turned off prior to attempting to restart the engine. The battery system shall then be capable of restarting the engine. Failure to restart the engine shall be considered a test failure of the battery system.

Alternator Performance Test at Idle:

The minimum continuous electrical load shall be activated with the engine running at idle speed.

The engine temperature shall be stabilized at normal operating temperature.

The battery system shall be tested to detect the presence of battery discharge current. The detection of battery discharge current shall be considered a test failure.

Alternator Performance Test at Full Load:

The total continuous electrical load shall be activated with the engine running up to the engine manufacturer's governed speed.

The test duration shall be a minimum of 2 hours.

Activation of the load management system shall be permitted during this test.

An alarm sounded by excessive battery discharge, as detected by the system required in NFPA 13.3.4, or a system voltage of less than 11.8 V dc for a 12 V nominal system or 23.6 V dc for a 24 V nominal system, for more than 120 seconds, shall be considered a test failure.

Low Voltage Alarm Test:

Following the above test, a Low Voltage Alarm Test will be performed in the manner prescribed.

With the engine shut off, the total continuous electrical load shall be activated and shall continue to be applied until the excessive battery discharge alarm activates.

The battery voltage shall be measured at the battery terminals.

The test shall be considered a failure if the alarm has not yet sounded 140 seconds after the voltage drops to 11.70V for a 12 V nominal system or 23.4 V for a 24 V nominal system.

The battery system shall then be able to restart the engine. Failure to restart the engine shall be considered a test failure.

Certification Documentation:

At the time of delivery, the manufacturer shall provide the following documentation:

(1) Documentation of the electrical system performance tests.
(2) A written electrical load analysis, including the following:
(a) The nameplate rating of the alternator.
(b) The alternator rating under the conditions specified above.
(c) Each of the component loads specified that make up the minimum continuous electrical load.
(d) Additional electrical loads that, when added to the minimum continuous electrical load, determine the total continuous electrical load.
(e) Each individual intermittent electrical load.

PUMP CERTIFICATION AND TESTING

The apparatus upon completion will be tested and certified by Underwriters Laboratories, Inc. The certification tests will follow the guide lines outlined in NFPA 1901, current edition, "Standard for Fire Apparatus".

There shall be multiple tests performed by the contractor and Underwriter's Laboratories when the apparatus has been completed. The manufacturer shall provide the completed Test Certificate(s) to the purchaser at time of delivery. The inspection services of Underwriters Laboratories are available to all bidders on an equal basis; therefore, no third party certification

of testing results shall be acceptable.

The pump shall be capable of delivering the following:

(1) One hundred percent of rated capacity at 150 psi (1000 kPa) net pump pressure.

(2) Seventy percent of rated capacity at 200 psi (1400 kPa) net pump pressure.

(3) Fifty percent of rated capacity at 250 psi (1700 kPa) net pump pressure.

The pump shall be tested after the pump and all its associated piping and equipment have been installed on the apparatus.

The tests shall include at least the pumping test, the pumping engine overload test, the pressure control system test, the priming device tests, and the vacuum test.

A test plate shall be provided at the pump operator's panel that gives the rated discharges and pressures together with the speed of the engine as determined by the certification test for each unit, the position of the parallel/series pump as used, and the governed speed of the engine as stated by the engine manufacturer on a certified brake horsepower curve. The plate shall be completely stamped with all information at the factory and attached to the vehicle prior to shipping.

Pumping Test:

The test site shall be adjacent to a supply of clear water at least 4 ft. (1.2 m) deep, with the water level not more than 10 ft. (3 m) below the center of the pump intake, and close enough to allow the suction strainer to be submerged at least 2 ft. (0.6 m) below the surface of the water when connected to the pump by 20 ft. (6 m) of suction hose.

Tests shall be performed when conditions are as follows:

(1) Air temperature: 0°F to 110°F (−18°C to 43°C)

(2) Water temperature: 35°F to 90°F (2°C to 32°C)

(3) Barometric pressure: 29 in. Hg (98.2 kPa), minimum (corrected to sea level)

Engine-driven accessories shall not be functionally disconnected or otherwise rendered inoperative during the tests.

The following devices shall be permitted to be turned off or not operating during the pump test:

(1) Foam pump
(2) Winch
(3) Windshield wipers
(4) Four-way hazard flashers
(5) Compressed air foam system (CAFS) compressor

All structural enclosures, such as floorboards, gratings, grilles, and heat shields, not provided with a means for opening them in service shall be kept in place during the tests.

All test gauges shall meet the requirements for Grade A gauges as defined in ASME B40.100, *Pressure Gauges and Gauge Attachments*, and shall be at least size 31⁄2 perASMEB40.100. The pump intake gauge shall have a range of 30 in. Hg (100 kPa) vacuum to zero for a vacuum gauge, or 30 in. Hg (100 kPa) vacuum to a gauge pressure of 150 psi (1000 kPa) for a compound gauge. The discharge pressure gauge shall have a gauge pressure range of 0 psi to 400 psi (0 kPa to 2800 kPa). All pilot gauges shall have a gauge pressure range of at least 0 psi to 160 psi (0 kPa to 1100 kPa). All gauges shall be calibrated in the month preceding the tests using a dead-weight gauge tester or a master gauge meeting the requirements for Grade 3A or 4A gauges, as defined in ASME B40.100, *Pressure Gauges and Gauge Attachments*, that has been calibrated within the preceding year.

The engine speed–measuring equipment shall consist of a nonadjustable tachometer supplied from the engine or transmission electronics, a revolution counter on a checking shaft outlet and a stop watch, or other engine speed–measuring means that is accurate to within ± 50 rpm of actual speed.

The pump shall be subjected to a 3 hour pumping test from draft consisting of 2 hours of continuous pumping at rated capacity at a minimum of 150 psi (1000 kPa) net pump pressure, followed by 1⁄2 hour of continuous pumping at 70 percent of rated capacity at a minimum of 200 psi (1400 kPa) net pump pressure and 1⁄2 hour of continuous pumping at 50 percent of rated capacity at a minimum of 250 psi (1700 kPa) net pump pressure and shall not be stopped until after the 2 hour test at rated capacity, unless it becomes necessary to clean the suction strainer.

Pumping Engine Overload Test:

The apparatus shall be subjected to an overload test consisting of pumping rated capacity at 165 psi (1100 kPa) net pump pressure for at least 10 minutes.

This test shall be performed immediately following the pumping test of rated capacity at 150 psi (1000 kPa).

The capacity, discharge pressure, intake pressure, and engine speed shall be recorded at least three times during the overload test.

Pressure Control System Test:

The pressure control system on the pump shall be tested as follows:

(1) The pump shall be operated at draft, delivering rated capacity at a discharge gauge pressure of 150 psi (1000 kPa).

(2) The pressure control system shall be set in accordance with the manufacturer's instructions to maintain the discharge gauge pressure at 150 psi (1000 kPa) ±5 percent.

(3) All discharge valves shall be closed not more rapidly than in 3 seconds and not more slowly than in 10 seconds.

(4) The rise in discharge pressure shall not exceed 30 psi (200 kPa) and shall be recorded.

(5) The original conditions of pumping rated capacity at a discharge gauge pressure of 150 psi (1000 kPa) shall be reestablished.

(6) The discharge pressure gauge shall be reduced to 90 psi (620 kPa) by throttling the engine fuel supply, with no change to the discharge valve settings, hose, or nozzles.

(7) The pressure control system shall be set according to the manufacturer's instructions to maintain the discharge gauge pressure at 90 psi (620 kPa) ±5 percent.

(8) All discharge valves shall be closed not more rapidly than in 3 seconds and not more slowly than in 10 seconds.

(9) The rise in discharge pressure shall not exceed 30 psi (200 kPa) and shall be recorded.

(10) The pump shall be operated at draft, pumping 50 percent of rated capacity at a discharge gauge pressure of 250 psi (1700 kPa).

(11) The pressure control system shall be set in accordance with the manufacturer's instructions to maintain the discharge gauge pressure at 250 psi (1700 kPa) ±5 percent.

(12) All discharge valves shall be closed not more rapidly than in 3 seconds and not more slowly than in 10 seconds.

(13) The rise in discharge pressure shall not exceed 30 psi (200 kPa) and shall be recorded.

Priming System Tests:

With the apparatus set up for the pumping test, the primer shall be operated in accordance with the manufacturer's instructions until the pump has been primed and is discharging water. This test shall be permitted to be performed in connection with priming the pump for the pumping test.

The interval from the time the primer is started until the time the pump is discharging water shall be noted. The time required to prime the pump shall not exceed 30 seconds if the rated capacity is 1250 gpm (5000 L/min) or less. The time required to prime the pump shall not exceed 45 seconds if the rated capacity is 1500 gpm (6000 L/min) or more.

An additional 15 seconds shall be permitted in order to meet the requirements of NFPA 16.13.5.3 and 16.13.5.4 when the pump system includes an auxiliary 4 in. (100 mm) or larger intake pipe having a volume of 1 ft3 (0.03 m3) or more.

Vacuum Test:

The vacuum test shall consist of subjecting the interior of the pump, with all intake valves open, all intakes capped or plugged, and all discharge caps removed, to a vacuum of 22 in. Hg (75 kPa) by means of the pump priming system.

At altitudes above 2000 ft. (600 m), the vacuum attained shall be permitted to be less than 22 in. Hg (75 kPa) by 1 in. Hg (3.4 kPa) for each 1000 ft. (305 m) of altitude above 2000 ft. (610 m).

The vacuum shall not drop more than 10 in. Hg (34 kPa) in 5 minutes.

The primer shall not be used after the 5 minute test period has begun and the engine shall not be operated at any speed greater than the governed speed during this test.

Water Tank–to–Pump Flow Test:

A water tank–to–pump flow test shall be conducted as follows:

(1) The water tank shall be filled until it overflows.

(2) All intakes to the pump shall be closed.

(3) The tank fill line and bypass cooling line shall be closed.

(4) Hose lines and nozzles for discharging water at the rated tank-to-pump flow rate shall be connected to one or more discharge outlets.

(5) The tank-to-pump valve(s) and the discharge valves leading to the hose lines and nozzles shall be fully opened.

(6) The engine throttle shall be adjusted until the required flow rate −0/+5 percent is established.

(7) The discharge pressure shall be recorded.

(8) The discharge valves shall be closed and the water tank refilled.

(9) The bypass line shall be permitted to be opened temporarily, if needed, to keep the water temperature in the pump within acceptable limits.

(10) The discharge valves shall be reopened fully and the time noted.

(11) If necessary, the engine throttle shall be adjusted to maintain the discharge pressure recorded as noted in 16.13.7.1(7).

(12) When the discharge pressure drops by 10 psi (70 kPa) or more, the time shall be noted and the elapsed time from the opening of the discharge valves shall be calculated and recorded.

Volume Discharge Calculation:

The volume discharged shall be calculated by multiplying the rate of discharge in gallons per minute (liters per minute) by the time in minutes elapsed from the opening of the discharge valves until the discharge pressure drops by at least 10 psi (70 kPa).

Other means shall be permitted to be used to determine the volume of water pumped from the tank such as a totalizing flowmeter, weighing the truck before and after, or refilling the tank using a totalizing flowmeter.

The rated tank-to-pump flow rate shall be maintained until 80 percent of the rated capacity of the tank has been discharge.

Engine Speed Advancement Interlock Test

The engine speed advancement interlock system shall be tested to verify that engine speed cannot be increased at the pump operator's panel unless there is throttle-ready indication.

If the apparatus is equipped with a stationary pump driven through split-shaft PTO, the test shall verify that the engine speed control at pump operator's panel cannot be advanced when either of the following conditions exists:

A. The chassis transmission is in neutral, the parking brake is off, and the pump shift in the driving compartment is in the road position.

B. The chassis transmission has been placed in the position for pumping as indicated on the label provided in the driving compartment, the parking brake is on, and the pump shift in the driving compartment is in the road position.

If the apparatus is equipped with a stationary pump driven through a transmission mounted PTO, front-of-engine crankshaft PTO, or engine flywheel PTO, the test shall verify that the engine speed control on the pump operator's panel cannot be advanced when either of the following conditions exists:

(1) The chassis transmission is in neutral, the parking brake is off, and the pump shift status in the driving compartment is disengaged.

(2) The chassis transmission is in any other gear other than neutral, the parking brake is on, and the pump shift in the driving compartment is in the "Pump Engaged" position.

If the apparatus is equipped with a pump driven by the chassis engine designed for both stationary pumping and pump-in-motion, the test shall verify that the engine speed control at pump operator's panel cannot be advanced when either of the following conditions exists:

(1) The chassis transmission is in neutral, the parking brake is on, and the pump shift status in the driving compartment is disengaged.

(2) The chassis transmission is in any other gear other than neutral, the parking brake is on, and the pump shift in the driving compartment is in the "Pump Engaged" or the "OK to Pump In-Motion" position.

If the apparatus is equipped with a stationary pump driven through transfer case PTO, the test shall verify that the engine speed control on the pump operator's panel cannot be advanced when either of the following conditions exists:

(1) The chassis transmission is in neutral, the transfer case is in neutral, the parking brake is off, and the pump shift in the driving compartment is in the road position.

(2) The chassis transmission is in neutral, the transfer case is engaged, the parking brake is off, and the pump shift in the driving compartment is in the road position.

(3) The chassis transmission has been placed in the position for pumping as indicated on the label provided in the driving compartment, the parking brake is on, and the pump shift in the driving compartment is in the road position.

S-180 PUMPER | MODEL 2106

CHASSIS SPECS

- Spartan Metro Star EMFD 10” Raised Roof
- Seating Capacity 5
- Cummins ISL 450 HP Engine
- Allison 3000 EVS Transmission
- Extreme Duty Interior
- Advanced Protection System
- Independent Front Suspension
- Axles: 20,000 Front, 24,000 Rear
- 21” Front Bumper Extension
- 184” Wheelbase
- Advanced Climate Control
- Rear View Backup Camera
- Side Scene Lighting
- 53° Cramp Angle
- Michelin Tires
- Severe Duty Front Bumper
- Dual Grover Brand Stutter Air Horns
- Q2B

PUMP AND PLUMBING SPECS

- Waterous CSU 1500 GPM
- FRC InControl Pressure Governor
- FoamPro 1600 Foam System
- 1000 Gallon Water Tank
- 20 Gallon Foam Tank
- TFT Extenda-Gun on Deluge Riser
- UPF Water Tank

- Pre-Connects
  - (2) 1-3/4” Crosslays
  - (1) 2-1/2” Crosslay
  - 1-1/2” Front Trashline
- Discharges
  - (1) 2-1/2” Left, Right and Rear
  - (1) LDH Discharge Right, Deck Gun

BODY SPECS

- High Strength Aluminum Body
- Vibra-Torque Body Mounting System
- ROM Series IV-Roll Up Doors
- Door Protection Shields
- SCBA Bottle Storage for (8)
- Spar Liner Compartment Finish
- OnScene LED Compartment Lighting
- Whelen LED Lighting Package
- Booster Reel
- Treadplate Hose Bed Covers w/Integral Arrowstick Traffic Direction Lights
- Ladder Storage for 24’, 14’, 10’ Attic Ladder, Backboard, Two std Pikes and a “D” Handle Trash Hook
- Wheelwell Roll-out Drawer
- 17” Deep Rear Tailboard
- Intermediate Step w/Integral Handhold
- Whelen Pioneer Side Scene Lighting

WALK AROUND


F-1


SPARTAN


SPARTAN


SPARTAN
SPARTAN

DRIVER SIDE
BODY & PUMP FEATURES


SPARTAN
DANGER


CROSSLAY 1
CROSSLAY 2
2.5 CROSSLAY
MASTER DISCHARGE
DECK GUN
TANK FILL
LEFT REAR DISCHARGE
DISCHARGE 2
HOSE REEL
DISCHARGE 1
WARNING
PRIMER FIRE PUMP
ENGINE COOLER
PUMP COOLER
FRONT BUMPER DISCHARGE
WATEROUS
DANGER
SERIOUS INJURY OR DEATH COULD OCCUR IF INLET IS SUPPLIED BY PRESSURIZED SOURCE WHEN THE VALVE IS CLOSED!
TANK TO PUMP


DISCHARGE 1
DISCHARGE 1
WARNING
FOAMPRO
OPERATING INSTRUCTIONS
SYSTEM
STATUS
FOAM
PRIMER
FIRE PUMP
TRIDENT
AIR PRIME
PUSH TO PRIME
ENGINE COOLER
PUMP COOLER
FRONT BUMPER DISCHARGE
TANK TO PUMP
WATEROUS
DANGER
SERIOUS INJURY OR DEATH COULD OCCUR IF INLET IS SUPPLIED BY PRESSURIZED SOURCE WHEN THE VALVE IS CLOSED!
OPEN
CLOSED
AUX INTAKE
WARNING
FOAM MANIFOLD BLEEDER
AUX INTAKE BLEEDER
DISCHARGE 1 BLEEDER
LEFT REAR BLEEDER
MASTER DRAIN


SPARTAN


SPARTAN

REAR BODY FEATURES


SPARTAN


SPARTAN


REEL
REWIND

OFFICER SIDE
BODY & PUMP FEATURES


SPARTAN


2.5 CROSSLAY
CROSSLAY 2
CROSSLAY 1
CAB TILT
MASTER DISCHARGE
DISCHARGE 2


DISCHARGE 2 BLEEDER
MASTER DISCHARGE BLEEDER
2.5 CROSSLAY BLEEDER
CROSSLAY 2 BLEEDER
CROSSLAY 1 BLEEDER
FRONT BUMPER DISCHARGE BLEEDER


SPARTAN
MICHELIN

CAB INTERIOR


PUMP IN DRIVE
Allison
FRONT
REAR


876.0 Miles
28.9 Eng Hours
CDD
START
OPERATION


Rear Auxiliary
HIGH
OFF
LOW
LEFT
RIGHT
SPLIT
FLASH
WHELEN
TRAFFIC ADVISOR
POWER
FUNCTION
DIRECTION INDICATOR
WARNING
Vehicle Height: 10' 0"
Vehicle Length: 32' 2"
Vehicle Width: 9' 7"
Do not move
apparatus if open
warning light is


SPARTAN
SPARTAN
SPARTAN

THANK YOU

Human Resource Department

7200 S. Huron River Drive
Ypsilanti, MI 48197
Phone: (734) 484-0065
Fax: (734) 484-5160
ytown.org

MEMORANDUM

TO: Charter Township of Ypsilanti Board of Trustees

FROM: Karen Wallin, HR Department

DATE: June 7, 2019

RE: **"Resolution Establishing Authorized Signatories for MERS Contracts and Service Credit Purchase Approvals"**

MERS recently hired an internal Legal Auditor to review their processes and compliance requirements.

One of the concerns that has been brought forth from the audit is that MERS doesn't have anything in writing as to who are authorized signatories from each municipality. As a result, the Human Resource Department was recently notified by Sue Feinberg, our MERS representative that we need to establish a list of authorized signatories for all MERS documents. The attached "Resolution Establishing Authorized Signatories for MERS Contracts and Service Credit Purchases Approvals" authorizes individuals holding particular job duties to the listed as authorized signatories.

It is being recommended that the Township Supervisor, Township Clerk and Human Resource Representative be approved as authorized signatories.

Your consideration in this matter is appreciated. Should you have any questions, please feel free to me.

Resolution Establishing Authorized Signatories for MERS Contracts and Service Credit Purchase Approvals

1134 Municipal Way Lansing, MI 48917 | 800.767.MERS (6377) | Fax 517.703.9711 www.mersofmich.com

This Resolution is entered into under the provisions of 1996 PA 220 and the Municipal Employees' Retirement System of Michigan ("MERS") Plan Document, as each may be amended.

This resolution applies to reporting unit(s) #_____ of the participating municipality listed below.

WHEREAS, _____ ("Employer") is a participating municipality with the Municipal Employees' Retirement System of Michigan ("MERS") and has adopted one or more retirement, insurance, investment or other post-employment benefit products administered by MERS;

WHEREAS, MERS requires signatures of an authorized representative of the Employer to execute contracts with MERS, the entry of which is authorized by the governing body and permitted under the applicable MERS Plan Document(s);

WHEREAS, the Employer wishes to designate certain job position(s), the holder(s) of which may sign MERS' contracts relating to the adoption, amendment and termination of MERS' products, and defined benefit service credit purchase approvals on behalf of Employer to implement decisions and actions of the governing body;

WHEREAS, this Resolution is not intended to apply to MERS forms or any other MERS document except as specifically mentioned herein,

Therefore, the Governing Body resolves:

The holders of the following job position(s) are hereby *Authorized Officials* that can sign: (1) MERS Adoption Agreements, Resolutions, Participation Agreements, Administrative Services Agreements, Withdrawal Agreements and any other contracts between MERS and the Employer with respect to Employer's participation in any MERS-administered product and any amendments and addendums thereto, and (2) MERS Defined Benefit service credit purchase approvals:

1. _____

Optional additional job positions:

2. _____
3. _____

This Resolution may be revoked in writing or amended by the Governing Body at any time, provided that it will not be effective until such writing or amended Resolution is received by MERS. The Governing Body agrees that MERS may rely upon this Resolution as conferring signing authority upon the holders of the above job position(s) to bind Employer with respect to MERS.

Adopted at a regular/special meeting of the Governing Body on _____, 20_____.

Authorized signatory: _____

Name: _____

Title: _____

Michigan Department of Treasury
614 (Rev. 02-19)

ORIGINAL TO: County Clerk(s)
COPY TO: Equalization Department(s)
COPY TO: Each township or city clerk

L-4029

2019 Tax Rate Request (This form must be completed and submitted on or before September 30, 2019)

MILLAGE REQUEST REPORT TO COUNTY BOARD OF COMMISSIONERS

Carefully read the instructions on page 2.

This form is issued under authority of MCL Sections 211.24e, 211.34 and 211.34d. Filing is mandatory; Penalty applies.

County(ies) Where the Local Government Unit Levies Taxes	2019 Taxable Value of ALL Properties in the Unit as of 5-28-19
Washtenaw	**TV 1,406,630,502 (TV minus Renaissance Zone 1,380,345,226)**
Local Government Unit Requesting Millage Levy	For LOCAL School Districts: 2019 Taxable Value excluding Principal Residence, Qualified Agricutlural, Qualified Forest, Industrial Personal and Commercial Personal Properties.
Charter Township of Ypsilanti	

This form must be completed for each unit of government for which a property tax is levied. Penalty for non-filing is provided under MCL Sec 211.119. The following tax rates have been authorized for levy on the 2019 tax roll.

(1) Source	(2) Purpose of Millage	(3) Date of Election	(4) Original Millage Authorized by Election Charter, etc.	(5) ** 2018 Millage Rate Permanently Reduced by MCL 211.34d "Headlee"	(6) 2019 Current Year "Headlee" Millage Reduction Fraction	(7) 2019 Millage Rate Permanently Reduced by MCL 211.34d "Headlee"	(8) Sec. 211.34 Truth in Assessing or Equalization Millage Rollback Fraction	(9) Maximum Allowable Millage Levy *	(10) Millage Requested to be Levied July 1	(11) Millage Requested to be Levied Dec. 1	(12) Expiration Date of Millage Authorized
Allocated	Gen Op	N/A	1.1160	1.0167	.9899	1.0064	1.0000	1.0064		1.0064	N/A
Voted	Fire Prot	11/8/16	3.1250	3.0962	.9899	3.0649	1.0000	3.0649		3.0649	2020
Voted	Fire Cap	5/8/18	.5000	.5000	.9899	.4949	1.0000	.4949		.4949	2022
Voted	Sld Waste	11/8/16	2.1550	2.1351	.9899	2.1135	1.0000	2.1135		2.1135	2020
Voted	Police	11/8/16	5.9500	5.8952	.9899	5.8356	1.0000	5.8356		5.8356	2020
Voted	Rec/BP	11/8/16	1.0059	.9966	.9899	.9865	1.0000	.9865		.9865	2020
PA345	FPen/HC	N/A						1.3300		1.3300	N/A

Prepared by	Telephone Number	Title of Preparer	Date
Javonna Neel	**(734) 484-3702**	**Accounting Director**	**6/18/19**

CERTIFICATION: As the representatives for the local government unit named above, we certify that these requested tax levy rates have been reduced, if necessary to comply with thestate constitution (Article 9, Section 31), and that the requested levy rates have also been reduced, if necessary, to comply with MCL Sections 211.24e, 211.34 and, for LOCAL school districts which levy a Supplemental (Hold Harmless) Millage, 380.1211(3).

	Signature	Print Name	Date
☒ Clerk ☐ Secretary		**Karen Lovejoy Roe**	**6/18/19**
☐ Chairperson ☒ President		**Brenda L. Stumbo**	**6/18/19**

** Under Truth in Taxation, MCL Section 211.24e, the governing body may decide to levy a rate which will not exceed the maximum authorized rate allowed in column 9. The requirements of MCL 211.24e must be met prior to levying an operating levy which is larger than the base tax rate but not larger than the rate in column 9.*

**** IMPORTANT:** See instructions on page 2 regarding where to find the millage rate used in column (5).

Local School District Use Only. Complete if requesting millage to be levied. See STC Bulletin 3 of 2019 for instructions on completing this section.

Total School District Operating Rates to be Levied (HH/Supp and NH Oper ONLY)	Rate
For Principal Residence, Qualified Ag, Qualified Forest and Industrial Personal	
For Commercial Personal	
For all Other	

ytown.org
A community of opportunity

Charter Township of Ypsilanti

Recreation Department/
Community Center

2025 East Clark Road
Ypsilanti, MI 48198
Phone: (734) 544-3807
Fax: (734) 544-3888
50 & Beyond: (734) 544-3838
www.ytown.org

Memorandum

TO: Ypsilanti Township Board of Trustees

CC: Javonna Neel

FROM: Angie Verges, Recreation Services Manager

DATE: June 7, 2019

RE: Board Agenda Item: Contract Renewal with Washtenaw Community College

The Recreation Department has collaborated with Washtenaw Community College (WCC) the past three years, beginning fall 2016, to offer ESL and GED classes at the Ypsilanti Township Community Center. We would like to continue this partnership. Attached is the contract from WCC to continue offering classes at our facility for the 2019-2020 school year.

There is one change to the contract this year, an additional day of room usage was added. WCC will use room 301 (three evenings per week) in addition to use of room 103 (daily). As noted in the contract, payment to us will increase from $16,000.00 to $18,000.00.

Please place this item on the June 18, 2019 Township Board meeting agenda for review/approval.

WASHTENAW COMMUNITY COLLEGE & YPSILANTI TOWNSHIP COMMUNITY CENTER
AGREEMENT FOR EXTENSION CENTER OFFERINGS

This agreement is made by and between **Washtenaw Community College,** hereinafter called the **College** and the Charter Township of Ypsilanti Community Center, Ypsilanti, Michigan hereinafter called the **Center**.

The College and the Center desire to be partners in providing college programs to the residents of the College service area, in particular, Ypsilanti Township, thereby giving added dimension to the programs and services already available to the people of the community, with input from the Center staff and other community leaders. The Center desires to make this program available to the people of the College service area and Ypsilanti Township area by providing facilities and support for said college programs; therefore, it is deemed advisable to establish certain rules, regulations, and financial determinations so that the respective roles of the College and the Center can be delineated for the accomplishment of these purposes.

Therefore, be it mutually agreed in considerations of the promises to each other as follows:

The College agrees:

- To provide all instructional personnel and direct administrative services necessary for conducting quality educational programs.
- To provide classroom and technical equipment necessary to conduct classes.
- To promote enrollment for the college courses by providing appropriate publicity through local media.
- To schedule college courses at those times, days and evenings, in compliance to a mutually agreed upon calendar. A calendar of course dates and times must be arranged through the Center's Director prior to the start of each new class session.
- To make adequate prior arrangements and communications for course time and date changes due to unforeseen circumstances.
- To follow reasonable practices relating to the proper use and care of the Center properties and facilities.
- To conclude all classes no later than 8:00 p.m.
- To adhere to the current applicable Center's Rules and Regulations as stated in the following:
    - Smoking, the use of any alcoholic beverage and/or drug, other than those expressly prescribed by a physician for medical purposes, is prohibited.
    - The use of open flames, such as lighted candles, are strictly prohibited.
    - Any form of gambling or game of chance, unless expressively permitted by law and subject to the approval and issuance of special permits is prohibited on the premises.

- A Building Attendant and/or Custodian will be on duty during all hours of building operation and groups must guarantee responsiveness to the directives of all department staff. Accidents and damage, no matter how trivial must be reported to Department staff immediately.
- Property of the Community Center shall not be removed from the facility at any time.
- Groups shall not use, remove or disturb any supplies, bulletin boards or any other items in the Community Center. Some items may be moved or placed out of sight with advanced Department approval and must be returned to the original location at completion of use.
- Groups shall be restricted to the room(s) assigned, except for use of restrooms and common areas. Use of facilities outside the building is restricted to the parking facilities unless granted prior Department approval.
- Placement of posters, banners, decorations, etc. may be permitted upon prior Department approval.
- The Community Center is not responsible for equipment or supplies brought in by groups, but will work collaboratively with the College to ensure safety and security of the rented space.
- The Charter Township of Ypsilanti assumes no responsibility, financial or otherwise, for accidents or injuries sustained by individual or groups of individuals while using the facilities.
- The Charter Township of Ypsilanti assumes no responsibility for damage or theft of personal items.
- The Township & organization using township buildings shall refrain from using Styrofoam products for use in Township Building (Charter Township of Ypsilanti Resolution 89-16)

<u>The Center agrees:</u>

- To provide a designated classroom at the Center (Room 103), Monday-Friday, and (Room 301) on Monday, Tuesday, and Wednesday evenings starting in the fall 2019 semester per the mutually agreed upon calendar.

- To allow persons to register for the college courses in accordance with the College's non-discrimination, Open Door Policy.

- To provide an on-site employee for the purpose of opening and closing the buildings and classrooms where College classes are conducted.

- To provide custodial and maintenance services for the facilities and grounds used by the College programs.

- To make classrooms physically accessible to the students and to see that the classrooms are kept open for College classes in a timely manner.

- To provide security and safety arrangements for college faculty and students similar to those provided to the employees and participants of the Center.

- In addition to the mutually agreed upon calendar that recognizes the Center's furloughs and planned closures, on certain school days, the Center may be closed due to inclement weather. On these days, College classes may not meet.

General Provisions:

- For the duration of this contract, this agreement covers use of the permanent space (Room 103) and the use of (Room 301) Monday, Tuesday & Wednesday evenings from 5-8 pm. Orientation, entry assessment, advising, counseling sessions, and staff professional development will generally be conducted between 9:00am-8:00pm, Monday-Friday based upon the mutually agreed calendar.

- It shall be the individual responsibility of each of the parties to carry and maintain its own insurance of public liability and property damage.

- The Center and the College further agree to negotiate any changes that may be deemed necessary as a result of changed circumstances and to amend the contract through mutual agreement at any time during the said contract period.

- The School and the College agree to be bound by the provisions of this operating agreement for the period July 1, 2019 through June 30, 2020 for the total sum of $18,000.00 derived from the 2019-20 Adult Transitions/Washtenaw Intermediate School District (WISD) Section 107 Grant Budget. The total sum will be paid in two equal installments of $9000 by October 22, 2019 and January 31, 2020 and will be made payable to the Charter Township of Ypsilanti.

Responsible College Administrator Bonnie Truhn, Adult Transitions Manager
College Area/Office Adult Basic Education FOAPAL:

William L. Johnson — Date
WCC Vice President & Chief Financial Officer

Township Supervisor/Designee — Date
Charter Township of Ypsilanti

ytown.org
A community of opportunity

Charter Township of Ypsilanti

Recreation Department/
Community Center

2025 East Clark Road
Ypsilanti, MI 48198
Phone: (734) 544-3807
Fax: (734) 544-3888
50 & Beyond: (734) 544-3838
www.ytown.org

Memorandum

TO: Ypsilanti Township Board of Trustees

CC: Javonna Neel

FROM: Angie Verges, Recreation Services Manager

DATE: June 7, 2019

RE: Board Agenda Item: Contract with the National Kidney Foundation – Enhance Fitness

The Recreation Department has collaborated with the National Kidney Foundation (NKFM) past ten years, to offer Enhance Fitness at the Ypsilanti Township Community Center. Enhance Fitness is an exercise program for Seniors at various fitness levels. We would like to continue this partnership. Attached is the contract from NKFM to continue offering classes at our facility for 2020.

There is no cost for us to offer the Enhance Fitness program. However, we are asked to sign an agreement this year because NKFM has requested grant funding for our location. The funding they have requested will be used to replaced weights or other equipment needed for the program.

Please place this item on the June 18, 2019 Township Board meeting agenda for review/approval. Debbie Aue can answer any questions in my absence, pertaining to this agreement.

Ypsilanti Township Recreation Department

Program: Enhance®Fitness

VENUE ACCESS AGREEMENT

This Venue Access Agreement ("Agreement") is dated as of the date below and is by and between The National Kidney Foundation of Michigan ("NKFM") and the Ypsilanti Township Recreation Department ("Owner"). Owner acknowledges and agrees that the person that signs this Agreement on Owner's behalf is Owner's authorized representative and NKFM's primary contact for purposes of this Agreement.

1. Venue. Owner hereby grants to NKFM the right to use the venue described in Exhibit A ("Venue"), during the time periods listed in Exhibit A and such other time periods as the parties may otherwise agree, for the purposes described in Exhibit A. Owner shall comply with the protocols and requirements described in Exhibit B, as may be updated from time to time by NKFM, and shall deliver the Venue and all related furniture, fixtures and equipment in good, clean, safe and secure order and condition.

2. Term and Termination. The term of this Agreement shall begin on the date listed below and shall continue for one year. Notwithstanding the foregoing, either party may terminate this Agreement at any time and for any or no reason upon ten (10) days' prior written notice to the other party. For the avoidance of doubt, the Exhibits to this Agreement shall remain in full force and effect throughout the initial term and any renewal term of this Agreement unless otherwise amended in accordance with this Agreement.

3. Equipment, Utilities, Janitorial Services and Laws. Owner shall provide NKFM use of the furniture, fixtures and equipment located in the Venue and the building in which the Venue is situated, as well as such other furniture, fixtures and equipment that are described in Exhibit B. Owner shall also provide the Venue with heat, air conditioning, cold and hot water and electricity for lighting and operation, as well as janitorial services, including trash removal. Owner shall comply with all applicable laws in connection with this Agreement and represents and warrants that it has the full right, power and authority to enter into, grant the rights and licenses and otherwise perform its obligations under this Agreement.

4. Confidentiality. All non-public, confidential or proprietary information of NKFM, its related persons or entities or its program participants is confidential and may not be disclosed or copied by Owner at any time unless authorized by NKFM in writing.

5. Financial Obligations and Liability.

(a) The parties shall comply with their financial and other obligations described in Exhibit C, which may be updated from time to time by the parties.

(b) Owner shall indemnify, defend and hold NKFM and its officers, directors, employees, agents, related persons and entities, contractors, affiliates, successors and assigns, as well as all program participants, against any and all losses, damages, liabilities, claims, actions, judgments, settlements, interest, awards, penalties, fines, costs and expenses of whatever kind, including reasonable attorney fees, relating to, arising out of or resulting from (i) bodily injury, death of any person or damage to or theft of real or tangible personal property resulting from Owner's acts or omissions or those of Owner's personnel, agents, representatives, contractors, related persons or

entities (collectively "Owner's Personnel"); (ii) breach of this Agreement by Owner or Owner's Personnel; or (iii) a claim arising out of or occurring in connection with the negligence or willful misconduct of the Owner or the Owner's Personnel.

(c) NKFM shall indemnify, defend and hold Owner and its officers, directors, employees, agents, related persons and entities, contractors, affiliates, successors and assigns, against any and all losses, damages, liabilities, claims, actions, judgments, settlements, interest, awards, penalties, fines, costs and expenses of whatever kind, including reasonable attorney fees, relating to, arising out of or resulting from (i) bodily injury, death of any person or damage to or theft of real or tangible personal property resulting from NKFM's acts or omissions or those of NKFM's personnel, agents, representatives, contractors, related persons or entities (collectively, "NKFM Personnel"); (ii) breach of this Agreement by NKFM or NKFM Personnel; or (iii) a claim arising out of or occurring in connection with the negligence or willful misconduct of NKFM or the NKFM Personnel.

(d) IN NO EVENT WILL NKFM BE LIABLE TO OWNER, ANY OWNER'S PERSONNEL OR TO ANY THIRD PARTY FOR (i) ANY LOSS OF USE, REVENUE OR PROFIT OR LOSS OF DATA OR CONSEQUENTIAL, INCIDENTAL, DIRECT, INDIRECT, EXEMPLARY, SPECIAL OR PUNITIVE DAMAGE OR (ii) AGGREGATE DAMAGES IN EXCESS OF $10,000, REGARDLESS OF WHETHER ANY SUCH DAMAGE ARISES OUT OF BREACH OF CONTRACT, TORT (INCLUDING NEGLIGENCE) OR OTHERWISE OR WHETHER ANY SUCH DAMAGE WAS FORESEEABLE OR WHETHER OR NOT NKFM HAD BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

6. Insurance. At all times during the term of this Agreement and for a period of two (2) years thereafter, Owner shall maintain commercial general liability insurance coverage with limits no less than $1,000,000 per occurrence and $2,000,000 in the aggregate, including bodily injury and property damage, which policy will include contractual liability coverage insuring the activities of NKFM under this Agreement. Such insurance policy shall waive any right of subrogation of the insurers against NKFM, provide that such insurance be primary insurance and any similar insurance in the name of and/or for the benefit of NKFM shall be excess and non-contributory and name NKFM and its related persons and entities as additional insureds.

7. Intellectual Property. As between NKFM and Owner, NKFM is and shall be the sole and exclusive owner of (a) all right, title and interest in and to the program that it operates in connection with the Venue and any and all copyrights, trademarks, logos, patents, trade secrets, information, documents, data, know-how, methodologies and other materials and intellectual property rights (collectively, "Intellectual Property") related thereto; and (b) all Intellectual Property developed or acquired by NKFM prior to or independently of this Agreement. Nothing in this Agreement shall, by implication, estoppel or otherwise, grant Owner any rights in any of the foregoing, including, without limitation, any trademarks or logos, and Owner shall refrain from using the NKFM or program names or logos, or any other NKFM Intellectual Property, without first obtaining NKFM's prior written consent.

8. Miscellaneous. This Agreement, including its exhibits, constitutes the sole and entire agreement between the parties with respect to the subject matter contained herein and supersedes all prior and contemporaneous understandings, agreements, representations and warranties regarding such subject matter. All notices and other communications under this Agreement must be in writing and addressed to the other party at its address set forth below. If any provision of this Agreement is found by a court of competent jurisdiction to be invalid, illegal or unenforceable, such invalidity, illegality or

unenforceability shall not affect any other term or provision of this Agreement or invalidate or render unenforceable such term or provision in any other jurisdiction. Upon a determination that any term or provision is invalid, illegal or unenforceable, the parties shall negotiate in good faith to modify this Agreement to effect the original intent of the parties as closely as possible. Except as set forth above, no amendment to or modification of this Agreement is effective unless it is in writing, identified as an amendment to this Agreement and signed by each party. No waiver by any party of any of the provisions of this Agreement shall be effective unless explicitly set forth in writing and signed by the party so waiving. No failure to exercise or delay in exercising any right, remedy, power or privilege arising from this Agreement shall operate or be construed as a waiver thereof, nor shall any single or partial exercise preclude any other or further exercise. This Agreement and all matters arising out of or relating to this Agreement is governed by and is to be construed in accordance with the laws of the State of Michigan, without regard to the conflict of laws provisions thereof. This Agreement may be executed in counterparts, each of which is deemed an original, but all of which together are deemed to be one and the same agreement. The provisions of this Agreement that, by their nature, survive its expiration or termination, including, without limitation, Sections 4, 5, 6 and 7, shall so survive. A signed copy of this Agreement delivered by facsimile, email or other means of electronic transmission is deemed to have the same legal effect as delivery of an original signed copy of this Agreement.

[SIGNATURE PAGE FOLLOWS]

Ypsilanti Township Recreation Department

Program: Enhance®Fitness

This agreement shall be effective on July 1, 2019 and terminates June 30, 2020. This agreement will automatically renew annually, unless either party needs to make changes or decides to terminate the agreement. It is understood by both parties that at anytime this agreement may be terminated by written notification from either party to the other.

National Kidney Foundation of Michigan

Signature: _____

Name: Charlene Cole

Title: Vice President NKFM

Address: 1169 Oak Valley Drive, Ann Arbor, MI 48108

Ypsilanti Township Recreation Department

Signature: _____

Name: Brenda Stumbo

Title: Ypsilanti Township Supervisor

Address: 2025 E. Clark Road, Ypsilanti, MI 48198

Signature: _____

Name: Karen Lovejoy Roe

Title: Ypsilanti Township Clerk

Address: 2025 E. Clark Road, Ypsilanti, MI 48198

Ypsilanti Township Recreation Department
Program: Enhance® Fitness

EXHIBIT A

VENUE, TIME PERIODS, PURPOSE

Venue Description:
Ypsilanti Township Recreation Department, 2025 E. Clark Road, Ypsilanti, MI 48198

Phone Number:
Office 734-544-3838

Program Contact People:
Debbie Aue, daue@ytown.org

Angie Verges, averges@ytown.org

Purpose:
Operation of the EnhanceFitness Program.

Room where the EnhanceFitness Program will take place:
Gym

Square Footage:
62' x 26' = 1612 sq. ft.

Days/Times of the Week for EnhanceFitness Classes:
5 Classes*/week:
Monday, Wednesday, Friday 10:30 – 11:30am
Tuesday, Thursday (EF Lite) 10:30 – 11:30am*
1 hour each session with 15 minutes before and after for set up/take down.

* The number of days/week that classes may be offered will be dependent on funding.

Ypsilanti Township Recreation Department

Program: Enhance®Fitness

EXHIBIT B

OWNER REQUIREMENTS

- Provide an ADA accessible facility large enough to hold an Enhance®Fitness (EF) class for participants.
- Provide a chair for every participant to use during an EF class.
- Maximum number of participants in class will be: 50
- Provide an Automated External Defibrillator (AED) Machine in a location accessible to NKFM EF Instructor.
- Have a First Aid Kit available and accessible to EF instructors.
- Owner shall keep equipment cart in secure office (includes weights, CPR mask, and lockbox).
- Owner shall lock the office where equipment kept at the end of the day.
- As agreed upon between NKFM and Owner, Owner shall be responsible for loss or theft of equipment from the cart.
- Communicate with participants.
- When deemed necessary, by NKFM staff, manage the confidential collection of waivers, attendance, participant demographic data, fitness checks and health and income information as required by NKFM.
- Follow HIPAA requirements at all times when managing the collection of confidential participant information.
- Recruit participants to attend EF classes, which is inclusive for all adults with varying fitness abilities, including those with intellectual and developmental disabilities and those in wheelchairs.
- Discuss sustainability plan with NKFM, if funding was to change.
- Actively and diligently offer and promote NKFM's services and the EF program, subject to Section 7 of the Agreement.
- Carry out its obligations under the Agreement and otherwise act with a high degree of professionalism, due diligence, care and efficiency.
- Not in any manner represent that it has any ownership in NKFM's intellectual property or that of the EF program.
- Not at any time do, or cause to be done, any act or thing in any way impairing or tending to impair, or challenge the validity of, any part of NKFM's intellectual property or that of the EF program.
- Ensure that the NKFM and EF logos appear on all Owner materials that are relevant to promoting the EF program in the community. This includes brochures, promotional materials, and resource materials, as well as recognition in all media materials such as news releases, public service announcements, online and social media, and event listings.

Ypsilanti Township Recreation Department

Program: Enhance® Fitness

EXHIBIT C

FINANCIAL OBLIGATIONS

Renewing an EnhanceFitness (EF) at Ypsilanti Township Recreation Department at 5 classes/week:
Value: $14,800
Cost to Ypsilanti Township Recreation Department (Owner): $Zero.

Owner agrees to:

- Host **five** EF classes per week for 49-50 weeks per year.
    - No EF classes will be held during the 2-3 week period of the winter holidays. (Verify holiday dates with EF Coordinator by October 1st).
- Notify NKFM in a timely manner if classes must be cancelled or postponed for any reason.
- Notify NKFM the first of the calendar year for annual scheduled closures, such as holidays, voting, other events.
- Assist with secure storage of EF participant donations until they can be sent to NKFM.

The National Kidney Foundation of Michigan (NKFM) agrees to:

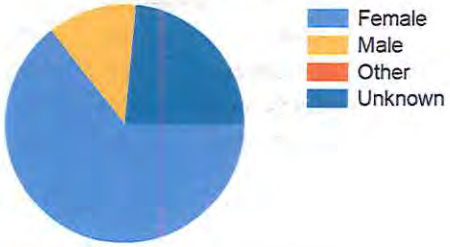
- Schedule, pay, and provide oversight to NKFM EF Instructors as funding is available.
- Provide NKFM EF Staff Coordinator support (~1 day/month).
- Provide data management and reports.
- Obtain EF license from Sound Generations.
- Includes training/mentoring of new EF Instructors, if needed.
- Collect participant donations to help sustain the program.
- Seek grant funding to aid in the sustainability of the program.
- Obtain liability insurance.

Demographic Profile

Includes participants with attendance between 10/1/2008 - 4/30/2019

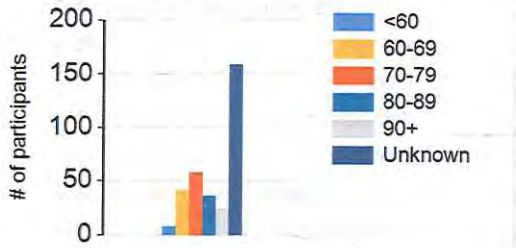
Total # of Participants with Attendance: 326

Participant Gender



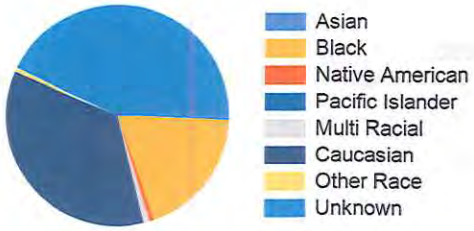
Gender		
Female	210	64%
Male	39	12%
Other	0	0%
Unknown	77	24%

Participant Age



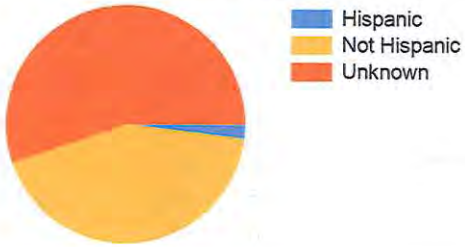
Age		
< 60	8	2%
60-69	41	13%
70-79	58	18%
80-89	36	11%
90+	24	7%
Unknown	159	49%

Participant Race



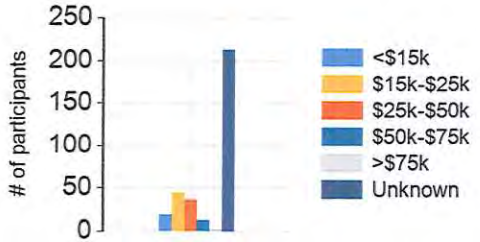
Race		
Asian	2	1%
Black	62	19%
Native American	2	1%
Pacific Islander	0	0%
Caucasian	115	35%
Other	2	1%
Multi-Racial	3	1%
Unknown	140	43%

Participant Ethnicity



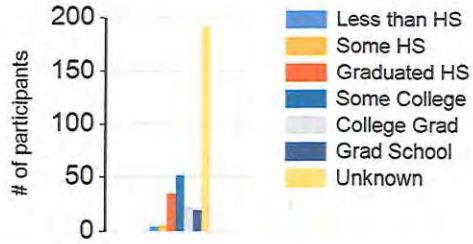
Ethnicity		
Hispanic/ Latino	6	2%
Non-Hispanic/ Latino	140	43%
Unknown	180	55%

Participant Income



Income		
<$15k	18	6%
$15k-24,999	44	13%
$25k-49,999	36	11%
$50k-74,999	12	4%
>$75k	3	1%
Unknown	213	65%

Participant Education



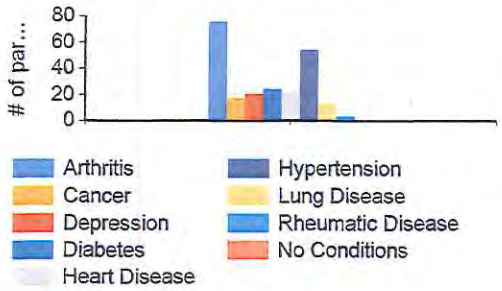
Education		
<High School	4	1%
Some High School	5	2%
High School Grad	34	10%
Some College	51	16%
College Grad	22	7%
Graduate School	19	6%
Unknown	191	59%

Demographic Profile

Includes participants with attendance between 10/1/2008 - 4/30/2019

Total # of Participants with Attendance: 326

Chronic Diseases



Chronic Conditions (NKFM)

Total with Health History:	*260*	
Arthritis	75	29%
Cancer	17	7%
Depression	20	8%
Diabetes	24	9%
Heart Disease	21	8%
Hypertension	54	21%
Lung Disease	13	5%
Rheumatic Dis.	3	1%
No Conditions	0	0%

Household

Household

Alone	64	20%
with one other	59	18%
with 2+ others	23	7%
with Children	11	3%

Identify as...

having difficulty speaking English	1	0%
having difficulty understanding English	1	0%
speaking a language other than English at home	8	2%
having a disability	35	11%
being an immigrant	1	0%
being a U.S. veteran	6	2%

Marital Status

Single	10	3%
Partnered	1	0%
Married	41	13%
Separated	0	0%
Divorced	30	9%
Widowed	24	7%
Unknown	220	67%

Insurance

Medicare	35	11%
Medicaid	4	1%
Private	27	8%

SET PUBLIC HEARING DATE

REQUEST TO SET A PUBLIC HEARING DATE OF
TUESDAY, JULY 2, 2019 AT APPROXIMATELY 7:00PM
FOR TWO PRIVATE ROAD VARIANCES

SET PUBLIC HEARING DATE

REQUEST TO SET A PUBLIC HEARING DATE OF TUESDAY, JULY 16, 2019 AT APPROXIMATELY 7:00PM FOR THE CREATION OF STREETLIGHT SPECIAL ASSESSMENT DISTRICT #217 AMBERLY GROVE SUBDIVISION #2

REQUEST TO SCHEDULE A SPECIAL TOWNSHIP BOARD WORK SESSION AND BOARD MEETING ON TUESDAY, JULY 2, 2019 AT 5:00PM AND 7:00PM RESPECTIVELY

CHARTER TOWNSHIP OF YPSILANTI
2019 BUDGET AMENDMENT #10

June 18, 2019

AMOUNTS ROUNDED UP TO THE NEAREST DOLLAR

101 - GENERAL OPERATIONS FUND

Total Increase $6,115.00

Request to increase budget for PTO payouts at 75% of the hours requested. This will be funded by an Appropriation of Prior Year Fund Balance.

Revenues:	**Prior Year Fund Balance**	**101-000-000-699.000**	**$803.00**
		Net Revenues	**$803.00**
Expenditures:	**Salaries Pay Out - PTO & Sick**	**101-201-000-708.004**	**$746.00**
	FICA	**101-201-000-715.000**	**$57.00**
		Net Expenditures	**$803.00**

Request to increase budget for the purchase and installation of a cameras the Cliffs. This will be funded by an Appropriation of Prior Year Fund Balance.

Revenues:	**Prior Year Fund Balance**	**101-000-000-699.000**	**$5,312.00**
		Net Revenues	**$5,312.00**
Expenditures:	**Neighborhood Camera System**	**101-970-000-972.000**	**$5,312.00**
		Net Expenditures	**$5,312.00**

212 - BIKE, SIDEWALK, REC, ROADS GENERAL FUND (BSRII)

Total Increase $489,950.00

Request to increase budget for the Grove Road Path - Border to Border Trail (B2B) Project. This project is part of the Iron Belle Trail planning grant in collaboration with the Washtenaw County Parks and Recreation Commission (WCPARC), the Michigan Department of Natural Resources (MDNR), the Huron Waterloo Pathways Initiative (HWPI), Van Buren Schools, and The Charter Township of Ypsilanti. The total project for 2019 is $489,950 (Best Asphalt $408,500 and OHM $81,450). This will be funded by grant funds of $393,100, a contribution from Van Buren School of $40,000 and an appropriation of prior year fund balance of $56,850.

Revenues:	**County Grant - Connecting**	**212-000-000-540-200**	**$393,100.00**
	Contribution - Local School	**212-000-000-581.500**	**$40,000.00**
	Prior Year Fund Balance	**212-000-000-699.000**	**$56,850.00**
		Net Revenues	**$489,950.00**
Expenditures:	**Capital Outlay - Pathway**	**212-970-000-997.007**	**$489,950.00**
		Net Expenditures	**$489,950.00**

Motion to Amend the 2019 Budget (#10)

Move to increase the General Fund budget by $6,115 to $10,090,671 and approve the department line item changes as outlined.

Move to increase the Bike, Sidewalk, Rec, Roads, General Fund II budget by $489,950 to $2,162,498 and approve the department line item changes as outlined.

AUTHORIZATIONS AND BIDS

Charter Township of Ypsilanti
Hydro Station

7200 S. Huron River Drive
Ypsilanti, MI 48197
Phone: (734) 544.3690
Fax: (734) 544.3626

www.ytown.org

MEMORANDUM

TO: Board of Trustees

FROM: Michael Saranen, Hydro Power & Safety Coordinator

DATE: June 7, 2019

RE: **Authorization to go out to bid for concrete slab for the Hydro Station**

The Hydro Station is need to have a small concrete slab for a propane tank foundation.

The existing block foundation is not suitable for the site. The new concrete slab/foundation will have better weight disbursement and deter animals from burrowing under the tank.

I am requesting authorization to go out to bid for the concrete slab/foundation.

I am estimating the cost to be between $7,000 and $9,000. This is a scheduled project for 2019 under the Hydro Fund 252.

A recommendation will be brought back to the Board for consideration if required per purchasing policy at a later meeting.

Please place this request on the next available Board Agenda under Bids and authorizations.

Charter Township of Ypsilanti
Hydro Station

7200 S. Huron River Drive
Ypsilanti, MI 48197
Phone: (734) 544.3690
Fax: (734) 544.3626

www.ytown.org

MEMORANDUM

TO: Construction Company

FROM: Michael Saranen, Hydro Power & Safety Coordinator

DATE: June 7, 2019

RE: **Proposal for Concrete Slab for Hydro Station**

The Charter Township of Ypsilanti is seeking proposals to construct a concrete slab/foundation for a 1,000 gallon propane tank at the Hydro Station.

Back Ground
The Hydro has an existing propane tank with underground service to supply propane to the standby generator. The existing block support is insufficient to support the tank under the site conditions.

Specifications
- Prepare site for concrete slab
- Slab design
  - Withstand tank weight with propane of 7,000 lbs.
  - Slab dimension - 3 ft wide by 15 ft long with a minimum thickness of 6”.
  - Reinforced
  - 18” deep rat wall along perimeter
- Finish grade with top soil and seed
- Clean up

Work Schedule
- Work days, Monday – Friday, no holidays.
- Hours - 7am to 4pm

Qualifications

Contractor has:

- Michigan based offices
- has experience in concrete construction, flat work and foundation design

Contractor will provide if hired:

- Provide insurance documents meeting Twp. requirements listing the Twp. as additionally insured. As written, wording must read:

  > "…The Charter Township of Ypsilanti and its past, present, future elected officials, trustees, appointment commissioners and boards, agents, and employees shall be named as "additional named insured" on the General Liability policy with respect to the services provided under this contract."

- Provide a W-9 tax form

Proposal to be submitted in a seal envelope to:

Charter Township of Ypsilanti
Clerk's Office
7200 S. Huron River
Attention: **Proposal for Concrete Slab for Hydro Station**

Submittal deadline July 12th, 2019 at 9:30 am

Bid opening July 12th, 2019 at 9:30 am

Request for information can be directed to Michael Saranen at 734 368-4169.

Providing a proposal does not guarantee any work from the Twp. The Twp. holds the right to reject any and all proposals.

Charter Township of Ypsilanti
Hydro Station

7200 S. Huron River Drive
Ypsilanti, MI 48197
Phone: (734) 544.3690
Fax: (734) 544.3626

www.ytown.org

MEMORANDUM

TO: Board of Trustees

FROM: Michael Saranen, Hydro Power & Safety Coordinator

DATE: June 7, 2019

RE: **Authorization to Go Out for Bid for Sealed Proposals from Qualified Firms to Address Slope Stabilization Issues.**

The Twp. is in need of addressing slope stabilization concerns at 2 sites within Ford Lake Park.

I am planning a phased approached to address this sites. In phase 1, investigate the site to identify the cause(s) of the instability and provide solutions for the Twp. to consider. Phase 2, prepare engineering design and construction documents for Phase 3. Phase 3 Funding, Bidding and Construction.

I am requesting authorization to go out for bid to seek proposals from firms with back ground in slope stabilization around high energy sites (wave action from the lake). I have reached out the Huron River Watershed Council for companies that have experience in this area.

I do not have a good idea of the cost phase 1 at this time, but I feel this may exceed $7,500.

A recommendation and funding information will be brought back to the Board for consideration at a later meeting.

Please place this request on the next available Board Agenda under Bids and Authorizations.

Charter Township of Ypsilanti
Hydro Station

7200 S. Huron River Drive
Ypsilanti, MI 48197
Phone: (734) 544.3690
Fax: (734) 544.3626

www.ytown.org

MEMORANDUM

TO: Engineering Firm

FROM: Michael Saranen, Hydro Power & Safety Coordinator

DATE: June 7, 2019

RE: **RFP for "Opinion of Cost" for Shoreline Stabilization Sites (PHASE 1)**

The Charter Township of Ypsilanti is seeking sealed proposals from firms to assist the Twp. in slope stabilization options at 2 areas within the Ford Lake Park located in Ypsilanti Twp. on Ford Lake.

Site 1
Ford Lake Park

Site 2

The scope of this Phase 1 RFP includes 3 components; Engineering Report, Cost of Opinion Report and Grant Funding Opportunities (Phase 1 Report).

Phase 1 Report;

Engineering

- Site inspection
- **Investigate cause of instability/failure**
- Recommendation(s) (at least 2)
    - Detail each recommendation, the action, equipment, materials and vegetation needed

Cost Opinion

- Provide cost estimates on each recommendation listed in the Engineering Report

Grant Opportunities

- Identify Grants as possible funding sources

Deliverables

- Once the receipt to proceed (either by memo or receipt of Purchase Order), the firm will;
    - Within 3 months, deliver;
        - (1) Phase 1 Report for Ford Lake Park for each site.

Qualifications

Firm has:

- Michigan based offices
- has experience in slope design/remediation on high energy sites.
- Has grant writing and oversite management staff

Frim will provide <u>if hired</u>:

- Provide insurance documents meeting Twp. requirements listing the Twp. as additionally insured. As written, wording must read:

    > "…The Charter Township of Ypsilanti and its past, present, future elected officials, trustees, appointment commissioners and boards, agents, and employees shall be named as "additional named insured" on the General Liability policy with respect to the services provided under this contract."

- Provide a W-9 tax form

RFP to be submitted in a seal envelope to:

Charter Township of Ypsilanti
Clerk's Office
Attention: **RFP for "Opinion of Cost" for Shoreline Stabilization Sites (PHASE 1)**

7200 S. Huron River Dr.
Ypsilanti, Mil48197

Submittal Deadline July 12th, 2019 at 9:00 am

Bid Opening July 12th, 2019 at 9:00am

Request for information can be directed to Michael Saranen at 734 368-4169.

Providing a proposal does not guarantee any work from the Twp. The Twp. holds the right to reject any and all proposals.

CHARTER TOWNSHIP OF YPSILANTI

OFFICE OF COMMUNITY STANDARDS

Building Safety • Planning & Zoning • Ordinance Enforcement • Police Services

To: Karen Lovejoy Roe, Clerk

From: Michael Radzik, OCS Director

Re: Request to authorize advertisement for sealed bids for construction and installation of a 300KW diesel standby power generator and associated appurtenances at the Law Enforcement Center.

Copy: McLain & Winters, Township Attorneys

Date: June 10, 2019

The Board of Trustees previously authorized OHM Advisors to assist the Township with preparation and publication of bids to purchase a replacement generator at the Law Enforcement Center. The purchase contract was previously awarded to Cummins, Inc. and the order to build the machine has been placed.

Now OHM has prepared the enclosed advertisement for bids, bid specifications and installation plans for construction and installation of the generator and associated appurtenances. I am requesting permission to publish the documents and obtain sealed bids which will be presented to the Board with a recommendation in August.

Please place this item on the next available meeting agenda for consideration. Please contact me with questions or to discuss details.

Enclosures: OHM Generator Installation Plans
OHM Generator Installation Contract & Advertisement

CONTRACT DOCUMENTS
FOR
LAW ENFORCEMENT CENTER – GENERATOR INSTALLATION

CHARTER TOWNSHIP OF YPSILANTI
MICHIGAN

OHM ADVISORS

34000 Plymouth Road
Livonia, Michigan 48150
0098-18-0063

June 19, 2019

TABLE OF CONTENTS

ADVERTISEMENT FOR BIDS

LAW ENFORCEMENT CENTER – GENERATOR INSTALLATION
Charter Township of Ypsilanti
Michigan

Sealed Bids for the construction of the Law Enforcement Center – Generator Installation will be received by Charter Township of Ypsilanti, at the office of the Township Clerk at 7200 S Huron River Dr., Ypsilanti, Michigan until 10:00 am local time on July 9, 2019, at which time the Bids received will be publicly opened and read.

The Project consists of installing a 300KW diesel generator and associated appurtenances at the Law Enforcement Center.

The Issuing Office for the Bidding Documents is the office of the ENGINEER, Orchard, Hiltz, & McCliment, Inc. (d.b.a. OHM Advisors), 34000 Plymouth Road, Livonia, Michigan 48150.

Bidding Documents may be examined at the following locations after June 19, 2019 at 10:00 am:

- The office of the ENGINEER
- Dodge Data & Analytics, www.dodgeproducts.constuction.com
- The Construction Association of Michigan (CAM),www.cam-online.com
- CMD Group, www.cmdgroup.com
- Charter Township of Ypsilanti, 7200 S Huron River Dr., Ypsilanti, Michigan 48197.

Bidding Documents may be obtained after June 19, 2019 at 10:00 am from the Issuing Office on BidNet Direct website (formerly MITN). Neither Owner nor ENGINEER will be responsible for full or partial sets of Bidding Documents, including Addenda if any, obtained from sources other than the Issuing Office. Bidders should direct correspondence to the ENGINEER.

Bid security shall be furnished in accordance with the Instructions to Bidders. Bid security in the form of a Bid Bond for a sum no less than 5% of the amount of the Bid will be required with each Bid. Bids shall be enclosed in sealed envelopes plainly marked with the project name and the name of the bidder.

No bid may be withdrawn for a period of **60** calendar days after the scheduled closing time for receipt of the Bids. This time period may be extended by mutual agreement of the Owner and any Bidder or Bidders. The OWNER reserves the right to accept any or all Bids and award the contract to other than the lowest bidder, to waive any irregularities or informalities or both; to reject any or all Bids; and in general to make the award of the Contract in any manner deemed by the OWNER, in its sole discretion, to be in the best interest of the OWNER.

A mandatory pre-bid conference will be held at 2:00 pm local time on June 27, 2019 at the Law Enforcement Center at 1501 S Huron St, Ypsilanti, MI 48197 48197-9112. Bidders that fail to attend will be unable to bid on the project.

Michael Radzik, Police Administrator/Director
Charter Township of Ypsilanti

INSTRUCTIONS TO BIDDERS

ARTICLE 1 – DEFINED TERMS

1.1 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. *Issuing Office* – The office from which the Bidding Documents are to be issued.

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

2.1 Complete sets of the Bidding Documents may be obtained from the Issuing Office in the number and format stated in the advertisement or invitation to bid.

2.2 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

2.3 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

3.1 To demonstrate Bidder's qualifications to perform the Work, after submitting its Bid and within five days of Owner's request, Bidder shall submit (a) written evidence establishing its qualification such as financial data, previous experience, and present commitments, and (b) the following additional information:

A. Evidence of Bidder's authority to do business in the state where the Project is located.
B. Bidder's state or other contractor license number, if applicable.
C. Subcontractor and Supplier qualification information; coordinate with provisions of Article 12 of these Instructions, "Subcontractors, Suppliers, and Others.

3.2 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.

3.3 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.

3.4 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

ARTICLE 4 – SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

4.1 Site and Other areas

A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional

lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

4.2 Existing Site Conditions

A. Subsurface and Physical Conditions; Hazardous Environmental Conditions
   1. The Supplementary Conditions identify:
      a. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site.
      b. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
      c. reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.
      d. Technical Data contained in such reports and drawings.
   2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.
   3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.

B. Underground Facilities: Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site are set forth in the Contract Documents and are based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.

C. Adequacy of Data: Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 5.03, 5.04, and 5.05 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 5.06 of the General Conditions.

4.3 Site Visit and Testing by Bidders

A. Bidder may schedule a site visit by contacting Mike Radzik.

B. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site.

C. Bidder shall comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operation, security, liability insurance, and applicable safety programs.

D. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

4.4 Owner's Safety Program

A. Site visits and work at the Site may be governed by an Owner safety program. As the General Conditions indicate, if an Owner safety program exists, it will be noted in the Supplementary Conditions.

4.5 Other Work at the Site

A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

ARTICLE 5 – BIDDER'S REPRESENTATIONS

5.1 It is the responsibility of each Bidder before submitting Bid to:

A. examine and carefully study the Bidding Documents, and any data and reference items identified in the Bidding Documents;

B. visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;

C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work;

D. consider the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs;

E. agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;

F. become aware of the general nature of the work to be performed by Owner and others at the Sire that relates to the Works as indicated in the Bidding Documents;

G. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;

H. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work, and;

I. agree that the submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 6 – PRE-BID CONFERENCE

6.1 A pre-bid conference will be held at the time and location stated in the invitation or advertisement to bid. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are required to attend and participate in the conference. Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

ARTICLE 7 – INTERPRETATIONS AND ADDENDA

7.1 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all parties recorded as having received the Bidding Documents. Questions received less than seven days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarification will be without legal effect.

7.2 Addenda may be issued to clarify, correct, supplement, or change the Bidding Documents.

ARTICLE 8 – BID SECURITY

8.1 A Bid must be accompanied by Bid security made payable to Owner in an amount of 5 percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid Bond (on the form included in the Bidding Documents) issued by a surety meeting in the requirements of Paragraphs 6.01 and 6.02 of the General Conditions.

8.2 The Bid Security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract Documents, furnished the required contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults.

8.3 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Contract or 60 plus one days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.

8.4 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within seven days after the Bid opening.

ARTICLE 9 – CONTRACT TIMES

9.1 The number of days within which, or the dates by which, Milestones are to be achieved and the Work is to be substantially completed and ready for final payment are set forth in the Agreement.

ARTICLE 10 – LIQUIDATED DAMAGES

10.1 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 11 – SUBSTITUTE AND "OR-EQUAL" ITEMS

11.1 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or "or-equal" items. In cases in which the Contract allows the Contractor to request that Engineer authorize the use of a substitute or "or-equal" item of material or equipment, application for such acceptance may not be made to and will not be considered by Engineer until after the Effective Date of the Contract.

ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS

12.1 A Bidder shall be prepared to retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of the Work if required by the Bidding Documents (most commonly in the Specifications) to do so. If a prospective Bidder objects to retaining any such Subcontractor, Supplier, or other individual or entity, and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.

12.2 Subsequent to the submittal of the Bid, Owner may not require the Successful Bidder or Contractor to retain any Subcontractor, Supplier, or other individual or entity against which Contractor has reasonable objection.

12.3 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, or other individuals or entities. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.06 of the General Conditions.

ARTICLE 13 – PREPARATION OF BID

13.1 The Bid Form is included with the Bidding Documents.

A. All blanks in the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.

B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, the Bidder may enter the words “No Bid” or “Not Applicable.”

13.2 A Bid by a corporation shall be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation shall be shown.

13.3 A Bid by a limited liability company shall be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.

13.4 A Bid by an individual shall show the Bidder’s name and official address.

13.5 A Bid by a joint venture shall be executed by an authorized representative of each joint venture in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.

13.6 All name shall be printed in ink below the signatures.

13.7 The Bid shall contain an acknowledgement of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.

13.8 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.

13.9 The Bid shall contain evidence of Bidder’s authority and qualifications to do business in the state where the Project is located, or Bidder shall covenant in wiring to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder’s state contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 14 – BASIS OF BID

14.1 *Unit Price*

A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.

B. The “Bid Price” (sometimes referred to as the extended price) for each unit price Bid item will be the product of the “Estimated Quantity” (which Owner or its representative has set forth in the Bid Form) for the item and the corresponding “Bid Unit Price” offered by the Bidder. The total of all unit price Bid items will be the sum of these “Bid Prices”, such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.

C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

ARTICLE 15 – SUBMITTAL OF BID

15.1 With each copy of the Bidding Documents, a Bidder is furnished one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be

completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 7 of the Bid Form.

15.2 A Bid shall be received no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall be enclosed in a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid shall be addressed to the Clerk's Office, Charter Township of Ypsilanti, 7200 S. Huron River Dr., Ypsilanti, MI 48197.

15.3 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID

16.1 A Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

16.2 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 16.01 and submit a new Bid prior to the date and time for the opening of Bids.

16.3 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, the Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.

ARTICLE 17 – OPENING OF BIDS

17.1 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternatives, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

18.1 All Bids will remain subject to acceptance for the period of the stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 19 – EVALUTION OF BIDS AND AWARD OF CONTRACT

19.1 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible. If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, then the Owner will reject the

Bid as nonresponsive; provided that Owner also reserves the right to waive all minor informalities not involving price, time, or changes in the Work.

19.2 Evaluation of Bids

A. In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

19.3 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.

19.4 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

ARTICLE 20 – BONDS AND INSURANCE

20.1 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the Agreement (executed by Successful Bidder) to Owner, it shall be accompanied by required bonds and insurance documentation.

ARTICLE 21 – SIGNING OF AGREEMENT

21.1 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder shall execute and deliver the required number of counterparts of the Agreement (and any bonds and insurance documentation required to be delivered by the Contract Documents) to Owner. Within ten days thereafter. Owner shall deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

ADDITIONAL ARTICLES

Articles 1 through 21 of these Suggested Instructions to Bidders for Construction Contracts, when used as intended with the other EJCDC construction related documents, address the basic subject matter required for Instructions to Bidders on most projects. However, it is often necessary to supplement the Instructions to Bidders with additional articles addressing:

1. prevailing wage rates statements required by Laws and Regulations, funding agencies, or appropriate reference thereto;

2. purchasing by Owner and subsequent assignment of procurement contracts to Contractor;

3. Owner's special tax exemption; or

4. intended use of partnering.

Examples of some supplementary articles are presented in Articles 22 and 23.

ARTICLE 22 – SALES AND USE TAXES

22.1 Owner is exempt from Michigan state sales and use taxes on materials and equipment to be incorporated in the Work. (Exemption No. 38-6007433). Said taxes shall not be included in the Bid. Refer to Paragraph SC-7.09 of the Supplementary Conditions for additional information.

ARTICLE 23 – CONTRACTS TO BE ASSIGNED – NOT USED

ARTICLE 24 – WAGE RATES

24.1 The Davis-Bacon and Related Acts apply to contractors and subcontractors performing on federally funded or assisted contracts in excess of $2,000 for construction, alteration, or repair (including painting and decorating).

24.2 Davis-Bacon and Related Act contractors and subcontractors must pay their laborers and mechanics employed under the contract no less than the locally prevailing wages and fringe benefits for corresponding work on similar projects in the area. The Davis-Bacon Act directs the Department of Labor to determine such locally prevailing wage rates.

24.3 The Davis-Bacon Act prevailing wage provisions apply to the “Related Acts,” under which federal agencies assist construction projects through grants, loans, loan guarantees, and insurance.

24.4 The Charter Township of Ypsilanti wages apply to contractors and subcontractors performing on contracts with the Township.

24.5 Contractors and subcontractors must pay their laborers and mechanics employed under the contract no less than the wages and fringe benefits detailed in the Ypsilanti Charter Township, Michigan Code of Ordinances (Code 1975, § 13-1; Ord. No. 99-213, §§ 2-8, 5-4-99).

ARTICLE 25 – DISADVANTAGED BUSINESS ENTERPRISE

25.1 The Contractor shall comply will all applicable requirements pursuant to 49CFR Part 26 in the administration of this contract. These requirements are incorporated by reference.

25.2 Section 103.01 of the Department’s “2012 Standard Specifications” as modified by the Department’s “Recurring Special Provision” 100-C-151B “Disadvantaged Business Enterprise Procedure and Good Faith Efforts (Revised 05- 23-11)” comprises the Disadvantaged Business Enterprise (DBE) Special Provisions, and are hereby incorporated in their entirety, as if fully set forth herein, mutatis mutandis.

25.3 The project seeks to maximize DBE (disadvantaged business enterprise) participation in the execution of this work. The inclusion of DBEs is strongly encouraged, as it will be an important criteria, in the overall evaluation considerations.

END OF SECTION 00 21 13

00 41 00 - BID FORM

Law Enforcement Center – Generator Installation

0098-18-0063

ARTICLE 1 – BID RECIPIENT

1.1 This Bid is submitted to:

Charter Township of Ypsilanti, 7200 S Huron River Dr., Ypsilanti, Michigan 48197

1.2 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER'S ACKNOWLEDGEMENTS

2.1 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER'S REPRESENTATIONS

3.1 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

Addendum No.	**Addendum, Date**
_____	_____
_____	_____
_____	_____
_____	_____

B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that

have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

E. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.

F. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.

G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.

I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.

J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.1 Bidder certifies that:

A. The Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;

B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;

C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and

D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.1.D:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (C) to deprive Owner of the benefits of free and open competition;

3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and

4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

ARTICLE 5 – BASIS OF BID

5.1 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

Item	Description	Estimated Quantity		Unit Price	Amount
1	Mobilization, Max. 5%	1	LSUM	$	$
2	Audio Video Route Survey	1	LSUM	$	$
3	General Site and Electrical Demolition	1	LSUM	$	$
4	Silt Fence	150	FT	$	$
5	Project Earthwork	1	LSUM	$	$
6	Remove Tree	1	EA	$	$
7	Remove and Replace Fence	20	FT	$	$
8	Aggregate Base Course, 21AA, 6"	146	SYD	$	$
9	Aggregate Base Course, MDOT Class II Sand, 12"	16	SYD	$	$
10	Concrete Pavement - Non-Reinf., 6"	146	SYD	$	$
11	Concrete Slab - Reinf., 12"	16	SYD	$	$
12	3" Topsoil, Seeding Mix Type THM, and Mulch	100	SYD	$	$
13	Project Cleanup	1	LSUM	$	$
14	Generator, 300KW diesel with Service Entrance ATS and 600 gallon sub-base fuel tank, Installed	1	LSUM	$	$
15	Distribution Panel, Raceway and Wiring	1	LSUM	$	$
16	Excavation, Trenching and Backfill	1	LSUM	$	$
17	Pavement Striping	1	LSUM	$	$

18				$	$
19	Termination, RS485	8	EA	$	$
20	Termination, #14 AWG	36	EA	$	$
21	Termination, #12 AWG	24	EA	$	$
22	Termination, #8 AWG	12	EA	$	$
23	Termination, #4 AWG	12	EA	$	$
24	Termination, #1 AWG	12	EA	$	$
25	Termination, #250 kcmil	24	EA	$	$
26	Termination, #350 kcmil	24	EA	$	$
27	Wiring, RS485	2	C.L.F	$	$
28	Wiring, #14 AWG	12	C.L.F	$	$
29	Wiring, #12 AWG	0.2	C.L.F	$	$
30	Wiring, #8 AWG	0.5	C.L.F	$	$
31	Wiring, #4 AWG	0.5	C.L.F	$	$
32	Wiring, #1 AWG	0.5	C.L.F	$	$
33	Wiring, #250 AWG	0.5	C.L.F	$	$
34	Wiring, #350 AWG	1.2	C.L.F	$	$
35	Conduit, 3/4"	200	LF	$	$
36	Conduit, 1"	100	LF	$	$
37	Conduit, 1 1/2"	100	LF	$	$
38	Conduit, 3"	100	LF	$	$
39	Conduit, 3" RGS	400	LF	$	$
40	Conduit, 1" RGS	300	LF	$	$
41	Wiring, #12 AWG	3	C.L.F	$	$
42	Wiring, #10 AWG	3	C.L.F	$	$
43	Wiring, #1 AWG	4	C.L.F	$	$

44	Wiring, #350 KCMIL	6	C.L.F	$	$
45	Distribution panel, 600A MLO	1	EA	$	$
46	Distribution circuit breakers, 400A	2	EA	$	$
47	Distribution circuit breakers, 100A	4	EA	$	$
			Total:		$

Bidder acknowledges that (1) each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and (2) estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

Total of Lump Sum and Unit Price Bids = Total Bid Price $ _____

ARTICLE 6 – TIME OF COMPLETION

6.1 Bidder agrees that the Work will be substantially complete on or before September 30, 2019, and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before November 30, 2019.

6.1 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 – ATTACHMENTS TO THIS BID

7.1 The following documents are submitted with and made a condition of this Bid:

A. Required Bid security;

B. List of Proposed Subcontractors;

C. List of Proposed Suppliers;

D. List of Project References;

E. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids;

F. Contractor's License No.;

G. Required Bidder Qualification Statement with supporting data; and

ARTICLE 8 – DEFINED TERMS

8.1 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 9 – BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

_____

By:
[Signature] _____

[Printed name] _____
(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:
[Signature] _____

[Printed name] _____

Title: _____

Submittal Date: _____

Address for giving notices:

_____

_____

_____

Telephone Number: _____

Fax Number: _____

Contact Name and e-mail address: _____

_____

Bidder's License No.: _____
(where applicable)

END OF SECTION 00 41 00

BID BOND

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER (Name and Address):

SURETY (Name, and Address of Principal Place of Business):

OWNER (Name and Address):
Charter Township of Ypsilanti
7200 S Huron River Dr.
Ypsilanti, Michigan 48197

BID
Bid Due Date: July 9, 2019
Description (Project Name— Include Location): Law Enforcement Center – Generator Installation

BOND
Bond Number:
Date:
Penal sum _____ $ _____
(Words) (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

BIDDER	SURETY
_____ (Seal)	_____ (Seal)
Bidder's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	By: _____
Signature	Signature (Attach Power of Attorney)
_____	_____
Print Name	Print Name
_____	_____
Title	Title
Attest: _____	Attest: _____
Signature	Signature
Title	Title

Note: Addresses are to be used for giving any required notice.
Provide execution by any additional parties, such as joint venturers, if necessary.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond, Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
    a. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
    b. All Bids are rejected by Owner, or
    c. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

SUBCONTRACTOR LISTING

Bidder submits to use the following subcontractors for performance of the work in accordance with Article 12 of the Instructions to Bidders.

Note to Bidder: List all work you propose to sublet on this Contract. Include each subcontractors name, address, phone, fax and e-mail address. Also include a description of work to be performed by subcontractor. For example: restoration, landscaping, lighting, signage, bore and jack, etc. List approximate dollar value of the subcontract.

NAME, ADDRESS & PHONE NO. OF SUBCONTRACTOR	DESCRIPTION OF WORK	APPROXIMATE DOLLAR VALUE OF SUBCONTRACT
_____	_____	$ _____
_____		
_____		
Phone: _____		
FAX: _____		
E-mail _____		
_____	_____	$ _____
_____		
_____		
Phone: _____		
FAX: _____		
E-mail _____		

		$

Phone:

FAX:

E-mail

		$

Phone:

FAX:

E-mail

		$

Phone:

FAX:

E-mail

QUALIFICATIONS STATEMENT

THE INFORMATION SUPPLIED IN THIS DOCUMENT IS CONFIDENTIAL TO THE EXTENT PERMITTED BY LAWS AND REGULATIONS

1. SUBMITTED BY:

Official Name of Firm: _____

Address: _____

_____

_____

2. SUBMITTED TO: _____

3. SUBMITTED FOR: _____

Owner: _____

Project Name: _____

_____

_____

TYPE OF WORK: _____

_____

_____

4. CONTRACTOR'S CONTACT INFORMATION

Contact Person: _____

Title: _____

Phone: _____

Email: _____

5. AFFILIATED COMPANIES:

Name: _____

Address: _____

_____

_____

6. TYPE OF ORGANIZATION:

☐ SOLE PROPRIETORSHIP

Name of Owner: _____

Doing Business As: _____

Date of Organization: _____

☐ PARTNERSHIP

Date of Organization: _____

Type of Partnership: _____

Name of General Partner(s): _____

_____

_____

☐ CORPORATION

State of Organization: _____

Date of Organization: _____

Executive Officers:

- President: _____

- Vice President(s): _____

_____

_____

- Treasurer: _____

- Secretary: _____

☐ LIMITED LIABILITY COMPANY

State of Organization: _____

Date of Organization: _____

Members: _____

_____

_____

_____

☐ JOINT VENTURE

Sate of Organization: _____

Date of Organization: _____

Form of Organization: _____

Joint Venture Managing Partner

- Name: _____

- Address: _____

_____

_____

Joint Venture Managing Partner

- Name: _____

- Address: _____

_____

Joint Venture Managing Partner

- Name: _____

- Address: _____

_____

7. LICENSING

Jurisdiction: _____

Type of License: _____

License Number: _____

Jurisdiction: _____

Type of License: _____

License Number: _____

8. CERTIFICATIONS CERTIFIED BY:

Disadvantage Business Enterprise: _____

Minority Business Enterprise: _____

Woman Owned Enterprise: _____

Small Business Enterprise: _____

Other (_____): _____

9. BONDING INFORMATION

Bonding Company: _____

Address: _____

_____

Bonding Agent: _____

Address: _____

_____

_____

Contact Name: _____

Phone: _____

Aggregate Bonding Capacity: _____

Available Bonding Capacity as of date of this submittal: _____

10. CONSTRUCTION EXPERIENCE:

Current Experience:

List on **Schedule A** all uncompleted projects currently under contract (If Joint Venture list each participant's projects separately).

Previous Experience:

List on **Schedule B** all projects completed within the last 5 Years (If Joint Venture list each participant's projects separately).

Has firm listed in Section 1 ever failed to complete a construction contract awarded to it?

☐ YES ☐ NO

If YES, attach as an Attachment details including Project Owner's contact information.

Has any Corporate Officer, Partner, Joint Venture participant or Proprietor ever failed to complete a construction contract awarded to them in their name or when acting as a principal of another entity?

☐ YES ☐ NO

If YES, attach as an Attachment details including Project Owner's contact information.

Are there any judgments, claims, disputes or litigation pending or outstanding involving the firm listed in Section 1 or any of its officers (or any of its partners if a partnership or any of the individual entities if a joint venture)?

☐YES ☐ NO

If YES, attach as an Attachment details including Project Owner's contact information.

11. EQUIPMENT:

MAJOR EQUIPMENT:

List on **Schedule C** all pieces of major equipment available for use on Owner's Project.

I HEREBY CERTIFY THAT THE INFORMATION SUBMITTED HEREWITH, INCLUDING ANY ATTACHMENTS, IS TRUE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

NAME OF ORGANIZATION: _____

BY: _____

TITLE: _____

DATED: _____

NOTARY ATTEST:

SUBSCRIBED AND SWORN TO BEFORE ME

THIS _____ DAY OF _____, 20___

NOTARY PUBLIC - STATE OF _____

MY COMMISSION EXPIRES:_____

REQUIRED ATTACHMENTS

1. Schedule A (Current Experience).
2. Schedule B (Previous Experience).
3. Schedule C (Major Equipment).
4. Evidence of authority for individuals listed in Section 7 to bind organization to an agreement.
5. Additional items as pertinent.

SCHEDULE A

CURRENT EXPERIENCE

Project Name	Owner's Contact Person	Design Engineer	Contract Date	Type of Work	Status	Cost of Work
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				

SCHEDULE B

PREVIOUS EXPERIENCE (Include ALL Projects Completed within last 5 years)

Project Name	Owner's Contact Person	Design Engineer	Contract Date	Type of Work	Status	Cost of Work
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				

SCHEDULE B

PREVIOUS EXPERIENCE (Include ALL Projects Completed within last 5 years)

Project Name	Owner's Contact Person	Design Engineer	Contract Date	Type of Work	Status	Cost of Work
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				

SCHEDULE C - LIST OF MAJOR EQUIPMENT AVAILABLE

ITEM	PURCHASE DATE	CONDITION	ACQUIRED VALUE

NOTICE OF AWARD

Date of Issuance:

Owner: Owner's Contract No.:

Engineer: Engineer's Project No.:

Project: Contract Name:

Bidder:

Bidder's Address:

TO BIDDER:

You are notified that Owner has accepted your Bid dated [_____] for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

_____ .

[describe Work, alternates, or sections of Work awarded]

The Contract Price of the awarded Contract is: $_____ *[note if subject to unit prices, or cost-plus]*

[ ] unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award, or has been transmitted or made available to Bidder electronically. *[revise if multiple copies accompany the Notice of Award]*

☐ a set of the Drawings will be delivered separately from the other Contract Documents.

You must comply with the following conditions precedent within 15 days of the date of receipt of this Notice of Award:

1. Deliver to Owner [____] counterparts of the Agreement, fully executed by Bidder.
2. Deliver with the executed Agreement(s) the Contract security *[e.g., performance and payment bonds]* and insurance documentation as specified in the Instructions to Bidders and General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any):

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within ten days after you comply with the above conditions, Owner will return to you one fully executed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner**:**

Authorized Signature

By:

Title:

Copy: Engineer

AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

THIS AGREEMENT is by and between _____ ("Owner") and _____ ("Contractor").

Owner and Contractor hereby agree as follows:

ARTICLE 1 – WORK

1.1 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows: Installation of a 300KW diesel generator and associated appurtenances at the Law Enforcement Center.

ARTICLE 2 – THE PROJECT

2.1 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: Law Enforcement Center – Generator Installation

ARTICLE 3 – ENGINEER

3.1 The Project was designed by _____.

3.2 The Owner has retained _____ ("Engineer") to act as Owner's representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 – CONTRACT TIMES

4.1 *Time of the Essence*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.2 *Contract Times*: *Dates*

A. The Work will be substantially completed on or before September 30, 2019, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before November 30, 2019.

4.2 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.1 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the times specified in Paragraph 4.2 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the

actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. Substantial Completion: Contractor shall pay Owner $_____ for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.2.A above for Substantial Completion until the Work is substantially complete.

2. Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner $_____ for each day that expires after such time until the Work is completed and ready for final payment.

3. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive and will not be imposed concurrently.

ARTICLE 5 – CONTRACT PRICE

5.1 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents the amounts that follow, subject to adjustment under the Contract:

A. For all Unit Price Work, an amount equal to the sum of the extended prices (established for each separately identified item of Unit Price Work by multiplying the unit price times the actual quantity of that item):

Unit Price Work					
Item No.	**Description**	**Unit**	**Estimated Quantity**	**Unit Price**	**Extended Price**
Total of all Extended Prices for Unit Price Work (subject to final adjustment based on actual quantities)					$

The extended prices for Unit Price Work set forth as of the Effective Date of the Contract are based on estimated quantities. As provided in Paragraph 13.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer.

B. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

ARTICLE 6 – PAYMENT PROCEDURES

6.1 *Submittal and Processing of Payments*

A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions

6.2 *Progress Payments*; *Retainage*

A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on a monthly schedule during performance of the Work, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.

6.3 Final Payment

A. Upon final completion and acceptance of the Work in accordance with Paragraph 15.06 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 15.06.

ARTICLE 7 – CONTRACTOR'S REPRESENTATIONS

7.1 In order to induce Owner to enter into this Contract, Contractor makes the following representations:

A. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.

B. Contractor has visited Site, conducted a thorough, alert visual examination of the Site and adjacent area, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to the existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

E. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (3) Contractor's safety precautions and programs.

F. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

J. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

ARTICLE 8 – CONTRACT DOCUMENTS

8.1 *Contents*

A. The Contract Documents consist of the following:

1. This Agreement (pages 1 to ___, inclusive).
2. Performance bond (pages 1 to 3, inclusive).
3. Payment bond (pages 1 to 3, inclusive).
4. Maintenance and Guarantee bond (pages 1 to 3, inclusive).
5. Other bonds.
   a. ___ (pages ___ to ___, inclusive).
6. General Conditions (pages 1 to 65, inclusive).
7. Supplementary Conditions (pages ___ to ___, inclusive).
8. Specifications as listed in the table of contents of the Project Manual.
9. Drawings (not attached but incorporated by reference) consisting of ___ sheets with each sheet bearing the following general title: ___ **[or]** the Drawings listed on the attached sheet index.
10. Addenda (numbers ___ to ___, inclusive).
11. Exhibits to this Agreement (enumerated as follows):
    a. Contractor's Bid (pages ___ to ___, inclusive).
12. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
    a. Notice to Proceed.
    b. Work Change Directives.
    c. Change Orders.

d. Field Orders.

B. The documents listed in Paragraph 8.1.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 8.

D. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

ARTICLE 9 – MISCELLANEOUS

9.1 *Terms*

A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

9.2 *Assignment of Contract*

A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party hereto of any rights under or interest in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

9.3 *Successors and Assigns*

A. Owner and Contractor each binds itself, its successors. Assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

9.4 *Severability*

A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

9.5 *Contractor's Certifications*

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 9.5:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process or in the Contract execution;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to

establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on _____ (which is the Effective Date of the Contract).

OWNER:	CONTRACTOR:
_____	_____
By: _____	By: _____
Title: _____	Title: _____
	(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)
Attest: _____	Attest: _____
Title: _____	Title: _____
Address for giving notices:	Address for giving notices:
_____	_____
_____	_____
_____	_____
	License No.: _____ *(where applicable)*

(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

NOTICE TO PROCEED

Owner:	Owner's Contract No.:
Contractor:	Contractor's Project No.:
Engineer:	Engineer's Project No.:
Project:	Contract Name:
	Effective Date of Contract:

TO CONTRACTOR:

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on [_____, 20__]. *[see Paragraph 4.01 of the General Conditions]*

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work shall be done at the Site prior to such date. In accordance with the Agreement, [the date of Substantial Completion is _____, and the date of readiness for final payment is_____] ***or*** [the number of days to achieve Substantial Completion is _____, and the number of days to achieve readiness for final payment is _____].

Before starting any Work at the Site, Contractor must comply with the following:

[Note any access limitations, security procedures, or other restrictions]

Owner**:**

Authorized Signature

By:

Title:

Date Issued:

Copy: Engineer

PERFORMANCE BOND

CONTRACTOR *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER *(name and address)*:

CONSTRUCTION CONTRACT
Effective Date of the Agreement:
Amount:
Description *(name and location)*:

BOND
Bond Number:
Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:
Amount:
Modifications to this Bond Form: ☐ None ☐ See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL	**SURETY**
_____ *(seal)*	_____ *(seal)*
Contractor's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	**By:** _____
Signature	Signature *(attach power of attorney)*
_____	_____
Print Name	Print Name
_____	_____
Title	Title
Attest: _____	**Attest:** _____
Signature	Signature
_____	_____
Title	Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after:

3.1 The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

3.2 The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

3.3 The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

7.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

7.2 additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

7.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

14. Definitions

14.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

14.2 Construction Contract: The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

14.3 Contractor Default: Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

14.4 Owner Default: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

14.5 Contract Documents: All the documents that comprise the agreement between the Owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

16. Modifications to this Bond are as follows:

PAYMENT BOND

CONTRACTOR *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER *(name and address)*:

CONSTRUCTION CONTRACT
Effective Date of the Agreement:
Amount:
Description *(name and location)*:

BOND
Bond Number:
Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:
Amount:
Modifications to this Bond Form: ☐ None ☐ See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL	**SURETY**
_____ *(seal)*	_____ *(seal)*
Contractor's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	**By:** _____
Signature	Signature *(attach power of attorney)*
_____	_____
Print Name	Print Name
_____	_____
Title	Title
Attest: _____	**Attest:** _____
Signature	Signature
_____	_____
Title	Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.

4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.

5. The Surety's obligations to a Claimant under this Bond shall arise after the following:

   5.1 Claimants who do not have a direct contract with the Contractor,

      5.1.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

      5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).

   5.2 Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).

6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.

7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

   7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

   7.2 Pay or arrange for payment of any undisputed amounts.

   7.3 The Surety's failure to discharge its obligations sunder Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

9. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.

11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. **Definitions**

    16.1 **Claim:** A written statement by the Claimant including at a minimum:

        1. The name of the Claimant;
        2. The name of the person for whom the labor was done, or materials or equipment furnished;
        3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
        4. A brief description of the labor, materials, or equipment furnished;
        5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
        6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
        7. The total amount of previous payments received by the Claimant; and
        8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

    16.2 **Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

    16.3 **Construction Contract:** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

    16.4 **Owner Default**: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

    16.5 **Contract Documents:** All the documents that comprise the agreement between the Owner and Contractor.

17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

18. Modifications to this Bond are as follows:

MAINTENANCE AND GUARANTEE BOND

KNOW ALL MEN BY THESE PRESENTS, That we _____ (contractor name), as Principal, and _____, as Surety, are held and firmly bound unto Charter Township of Ypsilanti, 7200 S Huron River Dr., Ypsilanti, Michigan 48197, as Owner, in the sum of _____ DOLLARS and _____ CENTS ($ _____) good and lawful money of the United States of America, to be paid to said Charter Township of Ypsilanti, its legal representatives and assigns for which payment well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, and each and every one of them jointly and severally, firmly by these presents.

Sealed with our seals and dated this _____ day of _____ A.D. 20 _____ .

WHEREAS, the above named Principal has entered into a certain written Contract with Charter Township of Ypsilanti dated this ____ day of _____ A.D. 20 _____ , wherein the said Principal covenanted and agreed to follows, to-wit: TO CONSTRUCT THE WORK IN ACCORDANCE WITH THE SPECIFICATIONS, CONTRACT DOCUMENTS AND DRAWINGS TITLED: Law Enforcement Center – Generator Installation.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that by and under said Contract, the above named Principal has agreed with the Charter Township of Ypsilanti that for a period of two years from date of payment of Final Estimate, to keep in good order and repair any defect in all work done under said Contract either by the Principal or his Subcontractors, or his material suppliers, that may develop during said period due to improper materials, defective equipment, workmanship or arrangements, and any other work affected in making good such imperfections, shall also be made good all without expense to the OWNER, excepting only such parts or part of said work as may have been disturbed without consent or approval of the Principal after final acceptance of the work, and that whenever directed to do so by the OWNER by notice served in writing, either personally or by mail, on the Principal at _____, (contractor city state zip) OR _____ legal representatives, or successors, or on the Surety at _____ WILL PROCEED at once to make such repairs as directed by said OWNER; and in case of failure so to do within one week from the date of service of such notice, or within reasonable time not less than one week, as shall be fixed in said notice, then the said OWNER shall have the right to purchase such materials and employ such labor and equipment as may be necessary for the purpose, and to undertake, do and make such repairs and charge the expense thereof to, and receive same from, said Principal or Surety. If any repair is necessary to be made at once to protect life and property, then and in that case, the said OWNER may take immediate steps to repair or barricade such defects without notice to the

CONTRACTOR. In such accounting the said OWNER shall not be held to obtain the lowest figures for the doing of the work, or any part thereof, but all sums actually paid therefore shall be charged to the Principal or Surety. In this connection the judgment of the OWNER is final and conclusive. If the said Principal for a period of two year(s) from the date of payment of Final Estimate, shall keep said work so constructed under said Contract in good order and repair, excepting only such part or parts of said work which may have been disturbed without the consent or approval of said Principal after final acceptance of same, and shall whenever notice is given as hereinbefore specified, at once proceed to make repair as in said notice directed, or shall reimburse said OWNER for any expense incurred by making such repairs, should the Principal or Surety fail to do as hereinbefore specified, and shall fully indemnify, defend and save harmless the said Owner and Orchard, Hiltz & McCliment, Inc. from all suits and actions for damages of every name and description brought or claimed against it for, or on account of, any injury or damage to person or property received or sustained by any party or parties, by or from any of the acts or omissions or through the negligence of said Principal, servants, agents or employees, in the prosecution of the work included in said Contract, and from any and all claims arising under the Workman's Compensation Act, so-called, of the State of Michigan, then the above obligation shall be void, otherwise to remain in full force and effect.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed by their respective authorized officers this _____ day of _____ A.D., 20 _____.

Signed, Sealed and Delivered
In the Presence of:

Signature	Signature
Name	Name
	Principal
Signature	Signature
Name	Name
	Surety

EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

Contractor's Application for Payment No.

	Application Period:	Application Date:
To (Owner):	From (Contractor):	Via (Engineer):
Project:	Contract:	
Owner's Contract No.:	Contractor's Project No.:	Engineer's Project No.:

Application For Payment

Change Order Summary

Approved Change Orders		
Number	Additions	Deductions
TOTALS		
NET CHANGE BY CHANGE ORDERS		

1.	**ORIGINAL CONTRACT PRICE**		$
2.	**Net change by Change Orders**		$
3.	**Current Contract Price (Line 1 ± 2)**		$
4.	**TOTAL COMPLETED AND STORED TO DATE (Column F total on Progress Estimates)**		$
5.	**RETAINAGE:**		
	a. X _____	**Work Completed**	$
	b. X _____	**Stored Material**	$
	c.	**Total Retainage (Line 5.a + Line 5.b)**	$
6.	**AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5.c)**		$
7.	**LESS PREVIOUS PAYMENTS (Line 6 from prior Application)**		$
8.	**AMOUNT DUE THIS APPLICATION**		$
9.	**BALANCE TO FINISH, PLUS RETAINAGE (Column G total on Progress Estimates + Line 5.c above)**		$

Contractor's Certification

The undersigned Contractor certifies, to the best of its knowledge, the following:
(1) All previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with the Work covered by prior Applications for Payment;
(2) Title to all Work, materials and equipment incorporated in said Work, or otherwise listed in or covered by this Application for Payment, will pass to Owner at time of payment free and clear of all Liens, security interests, and encumbrances (except such as are covered by a bond acceptable to Owner indemnifying Owner against any such Liens, security interest, or encumbrances); and
(3) All the Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

Contractor Signature

By:	Date:

Payment of: $ _____
(Line 8 or other - attach explanation of the other amount)

is recommended by: _____ _____
(Engineer) (Date)

Payment of: $ _____
(Line 8 or other - attach explanation of the other amount)

is approved by: _____ _____
(Owner) (Date)

Approved by: _____ _____
Funding or Financing Entity (if applicable) (Date)

Progress Estimate - Lump Sum Work

Contractor's Application

For (Contract):	Application Number:
Application Period:	Application Date:

			Work Completed		E	F		G
A		B	C	D	Materials Presently Stored (not in C or D)	Total Completed and Stored to Date (C + D + E)	% (F / B)	Balance to Finish (B - F)
Specification Section No.	Description	Scheduled Value ($)	From Previous Application (C+D)	This Period				
	Totals							

Progress Estimate - Unit Price Work

Contractor's Application

For (Contract):

Application Number:

Application Period:

Application Date:

A					B	C	D	E	F		
Item		Contract Information									
Bid Item No.	Description	Item Quantity	Units	Unit Price	Total Value of Item ($)	Estimated Quantity Installed	Value of Work Installed to Date	Materials Presently Stored (not in C)	Total Completed and Stored to Date (D + E)	% (F / B)	Balance to Finish (B - F)
	Totals										

Stored Material Summary

Contractor's Application

For (Contract):								Application Number:			
Application Period:								Application Date:			
A		B	C		D		E		F		G
Bid Item No.	Supplier Invoice No.	Submittal No. (with Specification Section No.)	Storage Location	Description of Materials or Equipment Stored	Stored Previously		Amount Stored this Month ($)	Subtotal Amount Completed and Stored to Date (D + E)	Incorporated in Work		Materials Remaining in Storage ($) (D + E - F)
					Date Placed into Storage (Month/Year)	Amount ($)			Date (Month/ Year)	Amount ($)	
				Totals							

CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner:	Owner's Contract No.:
Contractor:	Contractor's Project No.:
Engineer:	Engineer's Project No.:
Project:	Contract Name:

This [preliminary] [final] Certificate of Substantial Completion applies to:

☐ All Work ☐ The following specified portions of the Work:

Date of Substantial Completion

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work shall be as provided in the Contract, except as amended as follows: *[Note: Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.]*

Amendments to Owner's responsibilities: ☐ None

☐ As follows

Amendments to Contractor's responsibilities: ☐ None

☐ As follows:

The following documents are attached to and made a part of this Certificate: *[punch list; others]*

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract.

EXECUTED BY ENGINEER:	RECEIVED:	RECEIVED:
By: _____	By: _____	By: _____
(Authorized signature)	Owner (Authorized Signature)	Contractor (Authorized Signature)
Title: _____	Title: _____	Title: _____
Date: _____	Date: _____	Date: _____

CONTRACTOR'S AFFIDAVIT

STATE OF MICHIGAN)

)SS.

COUNTY OF _____)

The undersigned, _____(contractor name) hereby represents that on _____ , 20_____ he (it) was awarded a Contract by Charter Township of Ypsilanti hereinafter called the OWNER, to construct Installation of 300KW diesel generator and associated appurtenances at the Law Enforcement Center in accordance with the terms and conditions of Contract No. 0098-18-0063; and the undersigned further represents that the subject work has now been accomplished and the said Contract has now been completed.

The undersigned hereby warrants and certifies that all of his (its) indebtedness arising by reason of said Contract has been fully or satisfactorily secured, and that all claims from subcontractors and others for labor and material used in accomplishing the said project, as well as all other claims arising from performance of said Contract, have been fully paid or satisfactorily secured. The undersigned further agrees that if any such claim should hereafter arise, he (it) shall assume responsibility for same immediately upon request to do so by the OWNER.

The undersigned, for a valuable consideration, receipt of which is hereby acknowledged, does further hereby waive, release and relinquish any and all claims or right of lien which the undersigned now has or may hereafter acquire upon the subject premises for labor and material used in accomplishing said project owned by the OWNER.

This affidavit is freely and voluntarily given with full knowledge of the facts on this _____ day of _____ , 20_____ .

_____

Contractor

By: _____

Title _____

Subscribed and sworn to before me, a Notary Public in and for _____ County, Michigan, on this _____day of _____, 20 _____ .

Notary Public:

My Commission expires: _____

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

EJCDC®
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

Issued and Published Jointly by

ACEC
AMERICAN COUNCIL OF ENGINEERING COMPANIES

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

National Society of Professional Engineers®

<%Owner Name%>
<%Project Name%> #<%Project Number%>

These General Conditions have been prepared for use with the Agreement Between Owner and Contractor for Construction Contract (EJCDC® C-520, Stipulated Sum, or C-525, Cost-Plus, 2013 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other.

To prepare supplementary conditions that are coordinated with the General Conditions, use EJCDC's Guide to the Preparation of Supplementary Conditions (EJCDC® C-800, 2013 Edition). The full EJCDC Construction series of documents is discussed in the Commentary on the 2013 EJCDC Construction Documents (EJCDC® C-001, 2013 Edition).

National Society of Professional Engineers

1420 King Street, Alexandria, VA 22314-2794

(703) 684-2882

www.nspe.org

American Council of Engineering Companies

1015 15th Street N.W., Washington, DC 20005

(202) 347-7474

www.acec.org

American Society of Civil Engineers

1801 Alexander Bell Drive, Reston, VA 20191-4400

(800) 548-2723

www.asce.org

NOTE: EJCDC publications may be purchased at www.ejcdc.org, or from any of the sponsoring organizations above.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

TABLE OF CONTENTS

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.

3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

5. *Bidder*—An individual or entity that submits a Bid to Owner.

6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.

7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.

8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.

9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.

10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer

has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. ("CERCLA"); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. ("RCRA"); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.

13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.

14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .

15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.

16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.

17. *Cost of the Work*—See Paragraph 13.01 for definition.

18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.

19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.

20. *Engineer*—The individual or entity named as such in the Agreement.

21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.

22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.

23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.

26. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.

27. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.

28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.

29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.

32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or "RPR" includes any assistants or field staff of Resident Project Representative.

33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.

34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals and the performance of related construction activities.

35. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

37. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.

38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.

39. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.

40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.

42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.

43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.

44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.

45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

46. *Unit Price Work*—Work to be paid for on the basis of unit prices.

47. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 *Terminology*

A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives*:

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.

C. *Day*:

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*:

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

a. does not conform to the Contract Documents; or

b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).

E. *Furnish, Install, Perform, Provide*:

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Contractor’s Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.

C. *Evidence of Owner’s Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Initial Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

2.06 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.

B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.

C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or

computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.

C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.

D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.

E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

3.02 *Reference Standards*

A. Standards Specifications, Codes, Laws and Regulations

1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*:

1. *Contractor's Verification of Figures and Field Measurements*: Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict,

error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents*: If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*:

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:

a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.

B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.

C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

A. Contractor and its Subcontractors and Suppliers shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or

2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to such date.

4.03 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.

B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.

C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;

2. abnormal weather conditions;

3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and

4. acts of war or terrorism.

D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.

E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.

G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*:

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.

2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part

by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

B. *Removal of Debris During Performance of the Work*: During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning*: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading of Structures*: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;

2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and

3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

A. *Notice by Contractor*: If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or

2. is of such a nature as to require a change in the Drawings or Specifications; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. *Engineer's Review*: After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Possible Price and Times Adjustments*:

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;

b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,

c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:

a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or

b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or

c. Contractor failed to give the written notice as required by Paragraph 5.04.A.

3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.

4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

5.05 *Underground Facilities*

A. *Contractor's Responsibilities*: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;

b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;

c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and

d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.

B. *Notice by Contractor*: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after

becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

C. *Engineer's Review*: Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

D. *Owner's Statement to Contractor Regarding Underground Facility*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.

E. *Possible Price and Times Adjustments*:

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

    a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;

    b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;

    c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and

    d. Contractor gave the notice required in Paragraph 5.05.B.

2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.

3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and

2. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.

D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.

E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.

H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.H shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.

B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.

D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.

E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.

F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

6.02 *Insurance—General Provisions*

A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.

B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is

maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.

F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.

G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.

H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.

I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.

J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Contractor's Insurance*

A. *Workers' Compensation*: Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.

2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).

3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).

4. Foreign voluntary worker compensation (if applicable).

B. *Commercial General Liability—Claims Covered*: Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:

1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.

2. claims for damages insured by reasonably available personal injury liability coverage.

3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

C. *Commercial General Liability—Form and Content*: Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:

1. Products and completed operations coverage:

a. Such insurance shall be maintained for three years after final payment.

b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.

2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.

3. Broad form property damage coverage.

4. Severability of interest.

5. Underground, explosion, and collapse coverage.

6. Personal injury coverage.

7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.

8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

D. *Automobile liability*: Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.

E. *Umbrella or excess liability*: Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.

F. *Contractor's pollution liability insurance*: Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result

of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.

H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.

I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:

1. include at least the specific coverages provided in this Article.

2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.

3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.

4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.

5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.

J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

6.04 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

6.05 *Property Insurance*

A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."

2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.

3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.

4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).

5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).

6. extend to cover damage or loss to insured property while in transit.

7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.

8. allow for the waiver of the insurer's subrogation rights, as set forth below.

9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.

10. not include a co-insurance clause.

11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.

12. include performance/hot testing and start-up.

13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.

B. *Notice of Cancellation or Change*: All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.

C. *Deductibles*: The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.

D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.

E. *Additional Insurance*: If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.

F. *Insurance of Other Property*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

6.06 *Waiver of Rights*

A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.

D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

6.07 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the

policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.

B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and

guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.04 *"Or Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.

1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;

3) it has a proven record of performance and availability of responsive service; and

4) it is not objectionable to Owner.

b. Contractor certifies that, if approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times; and

2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.

C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.

E. *Treatment as a Substitution Request*: If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer considered the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 *Substitutes*

A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.

1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.

2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

a. shall certify that the proposed substitute item will:

1) perform adequately the functions and achieve the results called for by the general design,

2) be similar in substance to that specified, and

3) be suited to the same use as that specified.

b. will state:

1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,

2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and

3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.

c. will identify:

1) all variations of the proposed substitute item from that specified, and

2) available engineering, sales, maintenance, repair, and replacement services.

d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.

B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.

C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.

F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 *Concerning Subcontractors, Suppliers, and Others*

A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.

B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.

C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.

D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.

E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.

F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.

G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.

I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.

J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.

K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.

L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.

N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

O. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor

2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 *Permits*

A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work

7.09 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.10 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.12 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.

D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.13 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

7.14 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or

exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.16 *Shop Drawings, Samples, and Other Submittals*

A. *Shop Drawing and Sample Submittal Requirements*:

1. Before submitting a Shop Drawing or Sample, Contractor shall have:

a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

B. *Submittal Procedures for Shop Drawings and Samples*: Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

1. *Shop Drawings*:

a. Contractor shall submit the number of copies required in the Specifications.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to

provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples*:

   a. Contractor shall submit the number of Samples required in the Specifications.

   b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Other Submittals*: Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.

D. *Engineer's Review*:

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.

3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.

5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.

6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.

7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

E. *Resubmittal Procedures*:

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.

3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal;

6. the issuance of a notice of acceptability by Engineer;

7. any inspection, test, or approval by others; or

8. any correction of defective Work by Owner.

D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.

B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

7.19 *Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.

B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop

Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 *Other Work*

A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.

C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

8.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:

1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;

2. an itemization of the specific matters to be covered by such authority and responsibility; and

3. the extent of such authority and responsibilities.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.

C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.

D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9 – OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

9.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.

B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.

C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.

B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during

or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Project Representative*

A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.

B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.

C. Engineer's authority as to Change Orders is set forth in Article 11.

D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.07 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

10.09 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.

1. *Change Orders*:

a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.

b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.

2. *Work Change Directives*: A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an

adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. *Field Orders*: Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 *Owner-Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.03 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

11.04 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.

B. An adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on

the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).

C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01.C.2.a and 11.01.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.

B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

11.06 *Change Proposals*

A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under

the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures*: Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.

2. *Engineer's Action*: Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

3. *Binding Decision*: Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

B. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders covering:

1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;

3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and

4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12 – CLAIMS

12.01 *Claims*

A. *Claims Process*: The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:

1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;

2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and

3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.

B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.

D. *Mediation*:

1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.

2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim

submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.

E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.

F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.

G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:

1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.

B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable

thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

    a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

    b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

    c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

    d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

    e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

    f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes

other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded*: The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*: When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

13.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances*: Contractor agrees that:

1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

13.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.

E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;

2. there is no corresponding adjustment with respect to any other item of Work; and

3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

14.02 *Tests, Inspections, and Approvals*

A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;

3. by manufacturers of equipment furnished under the Contract Documents;

4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and

5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to

cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.

B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. *Notice of Defects*: Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.

E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

A. Engineer has the authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.

C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.

2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will

include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

A. *Basis for Progress Payments*: The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

B. *Applications for Payments*:

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. *Review of Applications*:

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

a. the Work has progressed to the point indicated;

b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and

c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or

b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

a. to supervise, direct, or control the Work, or

b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or

e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.

6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:

a. the Work is defective, requiring correction or replacement;

b. the Contract Price has been reduced by Change Orders;

c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*:

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner*:

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:

a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;

c. Contractor has failed to provide and maintain required bonds or insurance;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;

e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;

f. the Work is defective, requiring correction or replacement;

g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

h. the Contract Price has been reduced by Change Orders;

i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;

j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;

k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;

l. there are other items entitling Owner to a set off against the amount recommended.

2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount

remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

15.03 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.

2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*:

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of

inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents;

   b. consent of the surety, if any, to final payment;

   c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

   d. a list of all disputes that Contractor believes are unsettled; and

   e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Application and Acceptance*:

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.

D. *Payment Becomes Due*: Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation,

including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 *Waiver of Claims*

A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

15.08 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. correct the defective repairs to the Site or such other adjacent areas;

2. correct such defective Work;

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);

2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;

3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or

4. Contractor's repeated disregard of the authority of Owner or Engineer.

B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:

1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and

2. enforce the rights available to Owner under any applicable performance bond.

C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.

D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses,

and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.

G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and

3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for

expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

A. *Disputes Subject to Final Resolution*: The following disputed matters are subject to final resolution under the provisions of this Article:

1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and

2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.

B. *Final Resolution of Disputes*: For any dispute subject to resolution under this Article, Owner or Contractor may:

1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or

2. agree with the other party to submit the dispute to another dispute resolution process; or

3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18 – MISCELLANEOUS

18.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 *Computation of Times*

A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

18.07 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

SECTION 00 73 00 – SUPPLEMENTARY GENERAL CONDITIONS

These Supplementary General Conditions amend or supplement the Standard General Conditions of the Construction Contract and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary General Conditions is the same as the address system in the General Conditions; with the prefix "SC" added thereto.

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

SC-1.01.A. Defined Terms

Delete the period at the end of paragraph 1.01.A and add the following language:

; except where the terms "Architect," "Engineer," and "Contractor" are proceeded by an adjective, the term shall then be understood to refer to the entity described by the combination of the two words.

SC-1.01.A.8. *Change Order*

Add the following language at the end of the last sentence of Paragraph 1.01.A.8:

The Change Order form to be used on this Project is EJCDC C-941. Agency approval is required before Change Orders are effective.

SC-1.01.A.48. Add the following language at the end of the last sentence of Paragraph 1.01.A.48:

The term "Work Change Directive" shall be understood to refer to a "Work Order". A Work Change Directive cannot change Contract Price or Contract Times without a subsequent Change Order.

SC-1.01.A.49. Add the following new Paragraph after Paragraph 1.01.A.48:

49. Abnormal Weather Conditions – Conditions of extreme or unusual weather for a given region, elevation or season as determined by Engineer. Extreme or unusual weather that is typical for a given region, elevation or season should not be considered Abnormal Weather Conditions.
50. Architect – The individual or entity named as Architect or Engineer in the Agreement
51. General Contractor – The Contractor as defined in Paragraph 1.01.A.16.
52. Manufacturer – An individual or entity that manufactures, assembles or fabricates products.
53. Products – Systems, materials, manufactured units, equipment, components and accessories used in the Work.

ARTICLE 2 – PRELIMINARY MATTERS

SC-2.01 *Delivery of Bonds and Evidence of Insurance*

Add the following language at the end of the last sentence of Paragraph 2.01.A:

Contractor shall not start any work at the Site prior to Contractor delivering the required certificates and other evidence of insurance.

SC-2.01 *Evidence of Contractor's Insurance*

Add the following language at the end of the last sentence of Paragraph 2.01.B:

Facsimile, telegraphic, oral or other electronically transmitted Bond will not be considered. Attorneys-in-fact who execute the Bonds on behalf of the Surety shall affix to each Bond a certified and current copy of the power of attorney.

SC-2.01 *Evidence of Owner's Insurance*

Add the following language at the end of the last sentence of Paragraph 2.01.C:

Contractor shall not start any work at the Site prior to Owner delivering the required certificates and other evidence of insurance.

SC-2.02 *Copies of Documents*

Delete Paragraph 2.02.A in its entirety and insert the following in its place:

Engineer (Acting as Owner's agent) shall furnish to Contractor one set of Drawings and Project Manual in electronic portable document format. Hard copies will be furnished upon request at the cost of preparation, reproduction and shipping.

SC-2.03 *Preliminary Schedules*

Add the following language at the end of the last sentence of Paragraph 2.03.A.1:

; identifying the critical path for completing the Work, and identifying when all Subcontractors will be utilized, and taking into consideration any limitations on Working Hours;

SC-2.03 Delete Paragraph 2.03.A.3 in its entirety and insert the following in its place:

a preliminary schedule of values for all of the Work, subdivided into component parts in sufficient detail to serve as the basis for progress payments during construction. The schedule of values shall be broken out by trade and split between materials and labor. Prices shall include an appropriate amount of overhead and profit applicable to each item of Work.

ARTICLE 3 –DOCUMENTS: INTENT, REQUIREMENTS, REUSE

SC-3.04 Add the following new paragraph immediately after paragraph 3.04.B:

Owner shall be entitled to deduct from the Contract Price amounts paid to Engineer for Engineer to evaluate and respond to Contractor's requests for information, where such information was available to Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor-prepared coordination drawings, or prior Project correspondence or documentation.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

SC-4.01 Modify the third sentence to read: “In no event will the Contract Times commence to run later than the ninetieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.”

SC-4.03 Add the following paragraph immediately after paragraph 4.03.A:

During the progress of the work, the Contractor may encounter section line, fractional section line, and property controlling corner monuments. Insofar as is known, such public land survey corners and property monuments have been indicated on the plans. The Contractor shall be responsible for complying with the requirements of Michigan Public Act 34. Specifically, he shall be responsible for notifying the county surveyor before removing a public land survey corner monument for construction activities. In addition, if construction time constraints will result in the public land survey corner monument being removed for more than one year, then the Contractor shall arrange to have a temporary corner monument set until the permanent one can be re-established. The costs of removing and replacing public land survey corner monuments, as well as setting temporary corner monuments shall be the responsibility of the Contractor unless pay items are provided in the bid form for these tasks. The Contractor shall not remove any such monument until the Engineer has witness points as reference for resetting of such monuments. After referencing has been done and suitable permanent sketches prepared, the Engineer will give permission to the Contractor for removal of the monument. Monuments and monument boxes shall be reset only after all backfilling has fully settled.

The Contractor shall protect and preserve all monument points, property corners, grade stakes, line and reference points. Where stakes and markers are disturbed or removed due to operations under this Contract, the Contractor shall be charged at invoice cost by the Engineer for replacing the points. Care shall be exercised by the Contractor when operating near the markers, as any carelessness in operations will also cause a time delay to the schedule due to additional stakeout time required to replace reference points, lines, etc.

The Contractor shall accurately locate the work from reference points established by the Engineer along the surface of the ground and line of work.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

SC-5.01 Add the following new paragraph immediately after paragraph 5.01A:

Prior to the start of construction, the Contractor shall verify with the Owner that any required easements have been obtained. The Contractor shall keep his work operations within these easements and shall be responsible for complying with any easement conditions that are shown on the plans or stated in the Contract documents.

SC-5.02 Add the following paragraph immediately after paragraph 5.02.A:

The Contractor’s operations in public streets or alleys shall be confined to as small a space as practicable, so as not to cause undue inconvenience to the public or abutting properties, and shall be subject to the approval of the Engineer.

Where the Contractor wishes to work on or stockpile materials on nearby properties, it will be his responsibility to contact the property owner for permission. Upon request, the Contractor shall provide a copy of written permission from any affected property owner. The Owner will not become involved with any such agreements and will not be held responsible for any damages that the Contractor may cause to private property. The Contractor shall not be compensated for restoration of private properties and stockpile areas unless said areas were within the original project limits.

SC-5.03 Add the following new paragraph immediately after paragraph 5.03.B:

C Any geotechnical information that was prepared for this project is included in Document 00 31 32 – Geotechnical Data. This information, if provided, is given to bidders as an aid in determining the character of the soil and groundwater conditions. The Owner does not guarantee that the ground encountered during construction will conform to the borings. Bidders should secure such other information as they consider necessary to check and supplement the above data.

SC-5.05 Add the following paragraph to 5.05.A:

3. If a public line and/or customer service line is damaged by Contractor, Contractor shall give verbal notice within one (1) hour and written notice within 24 hours to the Owner and Engineer.

ARTICLE 6 – BONDS AND INSURANCE

SC-6.02 Insurance –General Provisions:

Add the following new paragraphs immediately after paragraph 6.02.B:

C. All Bonds and insurance required by the Contract Documents to be purchased and maintained by Contractor shall be obtained from surety or insurance companies that are authorized to transact business in Michigan and are classified at not lower than the following:

1. Best's Key Rating Guide, current edition:
    a. Rating Classification: B+
    b. Financial Size Category: Class IX

D. OWNER may require the surety to obtain reinsurance for any portion of the risk that exceeds 10% of the surety's capital and surplus. For bonds exceeding $100,000, the surety must also hold a certificate of authority from the U.S. Secretary of the Treasury or have obtained reinsurance from a reinsurer that is authorized as a reinsurer in Michigan and holds a certificate of authority from the U.S. Secretary of the Treasury.

SC-6.03 Contractor's Liability Insurance

Add the following to the end of paragraph 6.03 G:

Additional insureds under this paragraph shall include the following:

a. The Charter Township of Ypsilanti and its employees and agents;
b. Orchard, Hiltz & McCliment, Inc. and its owners, agents, and employees.

Delete paragraph 6.03.I.4 in its entirety and insert the following in its place:

6. remain in effect at least until the end of the correction period and at all times thereafter when Contractor may be correcting removing or replacing defective Work in accordance with paragraph 15.08; and

Add the following new paragraphs immediately after paragraph 6.03.I.5:

8. not be written on a claims-made basis
9. be issued by insurers who endorse the policies to reflect that, in the event of payment of any loss or damages, subrogation rights under these Contract Documents will be waived by the insurer with respect to claims against Owner or Engineer.

Add the following new paragraphs immediately after paragraph 6.03:

The limits of liability for the insurance required by paragraph 6.03 of the General Conditions shall provide coverage for not less than the following amounts or greater required by Laws or Regulations:

1. Workers' Compensation, and related coverage under paragraphs 6.03 of the General Conditions:

a. State:	Statutory	
b. Employer's Liability:	$100,000	Each accident
	$500,000	Disease – Policy Limit
	$100,000	Disease – Each Employee

2. Contractor's General Liability under paragraph 6.03 of the General Conditions, which shall include completed operations and product liability coverage and eliminate any exclusion with respect to property under the care, custody and control of Contractor:
   a. General Aggregate $2,000,000
   b. Each Occurrence
   c. (Bodily Injury and Property Damage) $1,000,000
   d. Property Damage liability insurance shall provide Explosion, Collapse and Underground (XCU) coverage where applicable.
   e. Contractual liability coverage shall be included in accordance with paragraph 6.03 of the General Conditions.

3. Automobile Liability under paragraph 6.03 of the General Conditions (including hired and non-owned vehicles):

a. Bodily Injury:	
Each Person	$1,000,000
Each Accident	$1,000,000
b. Property Damage:	
Each Accident	$1,000,000
c. Combined Single Limit:	
Each Accident	$1,000,000
d. MCS 90 Endorsement on Vehicle Insurance:	Statutory

4. Provide Umbrella Liability coverage under the following conditions, providing coverage for not less than the indicated amounts:
   a. The carrier shall agree to the underlying policies

b. Coverage shall be at least as broad as that in the covered policies
c. Shall cover Contractor's Liability Insurance and Automobile Liability Insurance
d. Coverage Limit:

Each Occurrence:	$3,000,000
Products Completed Operations Aggregate	$3,000,000
Other Aggregate	$3,000,000

Limits are for the term of the program. Products Completed Operations Aggregate limits apply as a single limit for the full term.

5. Provide Owner's and Contractor's Protective (OCP) Liability Insurance in the principal name of Owner to protect against claims for damages because of bodily injury or death, and for property damage caused by the Contractor, Subcontractors, and anyone engaged, employed, or contracted with on their behalf, including coverage for costs of defense from all such claims, with limits of liability for bodily injury including death not less than $1,000,000 per occurrence and $3,000,000 aggregate limit. Limits of liability for property damage shall not be less than $1,000,000 per occurrence and $3,000,000 aggregate limit. The named insured shall be Owner, its board members, individual employees and agents, the Engineer and its owners, agents, and employees. The Township must be provided copies of the actual policies of insurance described in the certificate and the OCP binder.

SC-6.05 Property Insurance

Add the following language at the end of paragraph 6.05.A.1:

Additional insureds under this paragraph shall include the following:
a. Orchard, Hiltz & McCliment, Inc.

Add the following language immediately after paragraph 6.05.A.2

and shall also include flood, start-up and testing, offsite storage, and boiler and machinery insurance;

Add the following new paragraph immediately after paragraph 6.05.A.13:

8. be issued by an insurer who endorses the policy to reflect that, in the event of payment of any loss or damages, subrogation rights under these Contract Documents will be waived by the insurer with respect to claims against the Owner or Engineer.

SC-6.06 Waiver of Rights

Delete paragraph 6.06.B in its entirety.
Delete paragraph 6.06.C in its entirety

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

SC-7.06 Add the following subsection P:

P. Contractor shall pay each Subcontractor under this Contract for satisfactory performance of its contract no later than ten (10) Calendar Days from the Contractor's receipt of payment from Owner. Contractor shall return retainage payments to each Subcontractor within 10 Calendar Days after the Subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval from Owner.

SC-7.08 Add the following language at the end of paragraph 7.08.A:

Additional provisions regarding permits and licenses are included in the General Requirements.

SC-7.08 Add the following paragraph immediately following paragraph 7.08.A:

B. The Contractor is responsible for obtaining all permits, including making all arrangements for inspection and payment of all governmental charges and inspection fees necessary for the commencement of Work as indicated by the following. Owner will assist with permit coordination when necessary; however, will not be responsible for any charges unless indicated below.
   1. Charter Township of Ypsilanti Building Department permit
      a. For structural, building, mechanical, and electrical permits
      b. Contractor to pay permit fees and post bonds and insurance
   2. Charter Township of Ypsilanti Engineering Department permit
      a. For utility and site permits
      b. Contractor to pay permit fees and post bonds and insurance

SC-7.10 Delete the last sentence of paragraph 7.10

SC-7.13 Add the following language to the end of paragraph 7.13.A:

At a minimum, the safety representative will be certified in personal protective equipment, hazard communication, demolition and blasting, excavation, hand and power tools, welding and cutting, cranes, derricks, hoists, conveyors, scaffolding, confined space, CPR and first aid.

Add the following subsection B:

In the event there is an accident involving injury to any individual or damage to any property on or near the Work, Contractor shall provide to Owner and Engineer verbal notification within one hour and written notification within twenty-four hours of the event and shall be responsible for recording the location of the event and the circumstances surrounding the event through photographs, interviewing witnesses, obtaining medical reports, police accident reports and other documentation that describes the event. Copies of such documentation shall be provided to Owner and Engineer, within forty-eight hours of the event.

SC-7.17 Add the following new paragraph immediately after Paragraph 7.17.A:

The Contractor, as a condition precedent to final payment, shall execute a guarantee to the Owner warranting for a period of two (2) years from date of final payment to keep in good order and repair any defect in all the work done under the Agreement, either by the Contractor, his subcontractors, or material suppliers, that may develop during said period due to improper materials, defective equipment, improper materials workmanship, or arrangements, and any other work affected in making good such imperfections shall also be made good, all without expense to the Owner, and Contractor shall execute, in favor

of the Owner the attached Maintenance and Guarantee Bond. When specifications call for a guarantee period greater than one (1) year, Contractor shall provide such longer guarantee period.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

SC-11.01 Add the following new paragraph 4 after 11.01 A.3:

4. upon receipt of a change order, Contractor shall promptly proceed with the change in the Work involved.

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

SC-13.03 Add the following paragraph immediately after paragraph 13.03.E.1:

2. Contractor's overhead, profit, and related costs for products and equipment order by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum.

SC-13.03 Delete paragraph 13.03.E.1 in its entirety and insert the following in its place:

1. the total cost of a particular item of Unit Price Work amounts to 10% or more of the Contract Price and the variation in the quantity of that particular item of Unit Price Work performed by Contractor differs by more than 25% from the estimated quantity of such item indicated in the Agreement;

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION CORRECTION PERIOD

SC-15.01. Add the following paragraph immediately after paragraph 15.01.B.3:

4. Contractor shall indicate on the Application for Payment the amounts which are due to Owner from Contractor in accordance with the Contract Documents and which amounts Owner may deduct from the progress payment

SC-15.01.D Delete paragraph 15.01.D.1 and replace with the following:

1. Thirty days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 15.01.C) become due, and when due will be paid by Owner to Contractor.

SC-15.01.C Add the following new paragraphs immediately after 15.01.C.6.e:

f. Contractor has incurred liability for other costs in accordance with Contract Documents

g. Contractor's failure to maintain record documents in accordance with paragraph 7.11

ARTICLE 16– SUSPENSION OF WORK AND TERMINATION

SC-16.04 Modify paragraph 16.04.B by deleting the phrase "Owner has failed for 30 days to pay Contractor any sum finally determined to be due." and replace with "Owner fails for 60 days to pay Contractor any sum finally determined to be due."

ARTICLE 18 – MISCELLANEOUS

SC-18.10 Add paragraph 18.10:

SC-18.10 – Liquidated Damages

A. If the Contractor fails to Substantially Complete the Work within the Contract Time, or extension of time granted by the Owner, then the Contractor will pay to the Owner the amount for liquidated damages as specified in the Agreement for each calendar day that the Contractor is in default after the time stipulated in the Contract Documents. The liquidated damages charged shall be deducted from the Contractor's progress payments and/or retained amount.

B. The Contractor will not be charged with liquidated damages or any excess cost when the delay in Substantial Completion of the Work is due to the following and the Contractor has given written notice of such delay within seven (7) calendar days to the Owner or Engineer.

   1. To any preference, priority or allocation order duly issued by the Owner;

   2. To unforeseeable causes beyond the control and without fault or negligence of the Contractor, including but not limited to, acts of God, or of the public enemy, acts of the Owner, acts of another Contractor in the performance of a Contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather and;

   3. To any delays of Subcontractors occasioned by any of the causes specified in Items A and B of this Article.

END OF SECTION 00 73 00

SECTION 01 10 00 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Project information.
   2. Work covered by Contract Documents.
   3. Work under separate contracts.
   4. Access to site.
   5. Coordination with occupants.
   6. Work restrictions.
   7. Specification and drawing conventions.
   8. Miscellaneous provisions.

B. Related Requirements:
   1. Section 01 12 00 “Multiple Contract Summary”.
   2. Section 01 29 00 “Payment Procedures”.

1.2 PROJECT INFORMATION

A. Project Identification: Law Enforcement Center – Generator Installation
   1. Project Location: 1501 S Huron St, Ypsilanti, MI 48197 48197-9112

B. Owner: Charter Township of Ypsilanti, 7200 S Huron River Dr., Ypsilanti. MI
   1. Owner's Representative: Michael Radzik, Police Administrator/ Director

C. Engineer OHM Advisors, 34000 Plymouth Rd., Livonia, MI 48150 Phone Number: 734-522-6711.
   1. A contractor has been engaged for this Project to install the equipment and materials that was procured under a separate contract and to serve as the Project's general contractor.

D. Project Coordinator for Multiple Contracts: Matt Parks P.E., matt.parks@ohm-advisors.com, has been appointed by Owner to serve as Project coordinator.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:
   1. Installation of a 300KW diesel generator and associated appurtenances as shown on the drawings for the Law Enforcement Center.

B. Type of Contract.
   1. The generator will be purchased under a separate, coordinated, concurrent contract, “Law Enforcement Center – Generator Replacement” contract. The generator will be installed under this contract “Law Enforcement Center – Generator Installation”. See Section 01 12 00 "Multiple Contract Summary" for a description of work included under each of the multiple contracts and for the responsibilities of Project coordinator.

1.4 WORK UNDER SEPARATE CONTRACTS

A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under separate contracts.

B. Subsequent Work: Owner has awarded a separate contract for the procurement and delivery of the generator and associated appurtenances. Delivery of equipment and materials will depend on successful completion of preparatory work under this Contract.

C. Refer to Section 01 12 00 Multiple Contract Summary.

1.5 ACCESS TO SITE

A. General: Contractor shall have limited use of Project site for construction operations as indicated by requirements of this Section.

B. Use of Site: Limit use of Project site to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
   1. Limits: Confine construction operations to the Law Enforcement Center.
   2. Driveways, Walkways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
      a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
      b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Contractor shall not operate heavy equipment on any side street within the project area without permission from the Engineer, Owner, and authority having jurisdiction.

1.6 COORDINATION WITH OCCUPANTS

A. Full Owner Occupancy: Owner will occupy site and existing building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.
   1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
   2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

1.7 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.
   1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 8:00 a.m. to 5:00 p.m., Monday through Friday, unless otherwise indicated.

1.8 SUGGESTED SEQUENCE OF WORK

A. In general, it is the intention and understanding that the Contractor shall have control over the sequence and order of execution of the Work to be done under the Contract and over the method(s) accomplishing the results. Engineer may make such reasonable requirements as necessary for the proper and effective protection of work partially or wholly completed, and to these requirements, Contractor shall conform.

B. Refer to Section 01 12 00 Multiple Contract Summary for coordination between Contracts.

1.9 SPECIFICATION CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
   1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
   2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
   3. Electrical Technical Specifications provided in Appendix A are for reference only. The technical specifications provided in Appendix A are in reference to the Contract that will be entered into by the Owner and another Contractor to install the generator and associated appurtenances.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

1.10 MISCELLANEOUS PROVISIONS

A. All workers employed by the Contractor that will enter the project site shall undergo a background investigation prior to commencement of the work.

B. Contractor shall install the generator and associated appurtenances as shown on the Drawings in a way that does not jeopardize the quality and performance of the equipment and materials being installed under this contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 10 00

SECTION 01 12 00 - MULTIPLE CONTRACT SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes a summary of each contract, including responsibilities for coordination and temporary facilities and controls.

B. Specific requirements for Work of each contract are also indicated in individual Specification Sections and on Drawings.

C. Related Requirements:

1. Section 011000 "Summary" for the Work covered by the Contract Documents, restrictions on use of Project site, coordination with occupants, and work restrictions.
2. Section 013100 "Project Management and Coordination" for general coordination requirements.

1.3 DEFINITIONS

A. Permanent Enclosure: As determined by Engineer, the condition at which roofing is insulated and weathertight; exterior walls are insulated and watertight; and openings are closed with permanent construction or substantial temporary closures equivalent in weather protection to permanent construction.

B. Generator Procurement Contract: Refers to the Contract that was entered into by the Township and Contractor under “Law Enforcement Center – Generator Replacement #0098-18-0060” contract to procure and deliver the generator and associated appurtenances for the Law Enforcement Center.

C. Generator Installation Contract: Refers to the “Law Enforcement Center – Generator Installation #0098-18-0063” contract specified herein.

1.4 PROJECT COORDINATOR

A. Project coordinator shall be responsible for coordination between the Generator Procurement Contract and Generator Installation Contract.

B. Scheduling Consultant: Owner has retained the following scheduling consultant to coordinate the scheduling activities of the multiple contracts, to prepare overall Project schedule, and to monitor and update Project schedule periodically; each Contractor shall cooperate with and coordinate its scheduling activities with Owner's scheduling consultant:

1. Matt Parks, P.E., email: matt.parks@ohm-advisors.com, phone: (248) 444-8984

1.5 PROJECT COORDINATOR RESPONSIBILITIES

A. Project coordinator shall perform Project coordination activities for the two (2) contracts, including, but not limited to, the following:

1. Provide typical overall coordination of the Work.
2. Coordinate product selections for compatibility.
3. Provide overall coordination of temporary facilities and controls.
4. Coordinate, schedule, and approve delivery of equipment in accordance with the installation schedule.
5. Coordinate construction and operations of the Work with work performed by each Contract.
6. Prepare coordination drawings in collaboration with each contractor to coordinate work by more than one contract.
7. Coordinate sequencing and scheduling of the Work.
8. Provide quality-assurance and quality-control services specified in Section 014000 "Quality Requirements."
9. Coordinate completion of interrelated punch list items.
10. Collect record Specification Sections from contractors, collate Sections into numeric order, and submit complete set.
11. Coordinate preparation of operation and maintenance manuals if information from more than one contractor is to be integrated with information from other contractors to form one combined record.

1.6 GENERAL REQUIREMENTS OF CONTRACTS

A. Extent of Contract: Unless the Agreement contains a more specific description of the Work of each Contract, requirements indicated on Drawings and in Specification Sections determine which contract includes a specific element of Project.

1. Unless otherwise indicated, the work described in this Section for each contract shall be complete systems and assemblies, including products, components, accessories, and installation required by the Contract Documents.
2. Supplying the generator, associated appurtenances, and all other work specified in the contract documents shall be the work under the Generator Procurement Contract.
3. Installing the generator, associated appurtenances, and all other work specified in the contract documents shall be the work under the Generator Installation Contract.

B. Substitutions: Each contractor shall cooperate with other contractors involved to coordinate approved substitutions with remainder of the work.

1. Project Coordinator shall coordinate substitutions.

1.7 GENERATOR PROCUREMENT CONTRACT

A. Work of the Generator Procurement Contract includes, but is not limited to, the following:
1. Supply the materials specified in the contract documents, including but not limited to: engine generator, diesel engine, unit-mounted cooling system, unit-mounted control and monitoring, outdoor enclosure, and associated appurtenances.
2. Delivery of materials to the Project site.

3. Storage and protection of materials, if necessary.
4. Operation and maintenance documentation for supplied materials.

1.8 GENERATOR INSTALLATION CONTRACT

A. Work of the Generator Installation Contract includes, but is not limited to, the following:

1. Remaining work not identified as work under other contracts.
2. Construction and installation of materials specified in the contract documents, including but not limited to: installation of generator and associated appurtenances.
3. Site work as specified in the contract documents.
4. Site conduit installation.
5. Construction of a concrete pad and driveway.
6. Testing and system start-up.
7. Landscape.
8. Turf restoration.
9. Pavement restoration.
10. Operation and maintenance manual assembly.
11. Record drawings.

B. Temporary facilities and controls in the Generator Installation Contract include, but are not limited to, the following:
1. Temporary toilet fixtures, wash facilities, and drinking water facilities.
2. Plumbing and electrical connections to existing systems and temporary facilities and controls furnished.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 12 00

SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:
   1. Section 01 60 00 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.2 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1.3 ACTION SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Substitution Request Form: Use CSI Form 13.1A.
   2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
      a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
      b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
      c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
      d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
      e. Samples, where applicable or requested.
      f. Certificates and qualification data, where applicable or requested.
      g. List of similar installations for completed projects with project names and addresses and names and addresses of engineers and owners.
      h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
      i. Research reports evidencing compliance with building code in effect for Project.
      j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
      k. Cost information, including a proposal of change, if any, in the Contract Sum.
      l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.

m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within **seven** (7) days of receipt of a request for substitution. Engineer will notify Contractor of acceptance or rejection of proposed substitution within fifteen (15) days of receipt of request, or seven (7) days of receipt of additional information or documentation, whichever is later.
4. Design Professional may determine in each case which of the revision forms in "Forms of Acceptance" Subparagraph below is appropriate for incorporating a Contractor's substitution requests into the Contract Documents. See the Evaluations in Section 01 26 00 "Contract Modification Procedures" for discussion of contract modification methods and forms.
    a. Forms of Acceptance: Change Order, Work Change Directive, or Field Order.
    b. Use product specified if Engineer does not issue a decision on use of a proposed substitution within time allocated.

1.4 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than fifteen (15) days prior to time required for preparation and review of related submittals.
    1. Conditions: Engineer will consider Contractor's request for substitution when the following conditions are satisfied:
        a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
        b. Requested substitution will not adversely affect Contractor's construction schedule.
        c. Requested substitution has received necessary approvals of authorities having jurisdiction.
        d. Requested substitution is compatible with other portions of the Work.
        e. Requested substitution has been coordinated with other portions of the Work.
        f. Requested substitution provides specified warranty.
        g. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Engineer will consider requests for substitution if received within 60 days after commencement of the Work.
    1. Conditions: Engineer will consider Contractor's request for substitution when the following conditions are satisfied:
        a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Engineer for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
        b. Requested substitution does not require extensive revisions to the Contract Documents.

c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
d. Requested substitution will not adversely affect Contractor's construction schedule.
e. Requested substitution has received necessary approvals of authorities having jurisdiction.
f. Requested substitution is compatible with other portions of the Work.
g. Requested substitution has been coordinated with other portions of the Work.
h. Requested substitution provides specified warranty.
i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 25 00

SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

1.2 MINOR CHANGES IN THE WORK

A. Engineer will issue Field Orders, authorizing changes in the Work, not involving adjustment to the Contract Sum or the Contract Time

1.3 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Engineer will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
   1. Work Change Proposal Requests issued by Engineer are not instructions either to stop work in progress or to execute the proposed change.
   2. Within 10 days, when not otherwise specified after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
      a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
      b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
      c. Include costs of labor and supervision directly attributable to the change.
      d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
      e. Quotation Form: Use CSI Form 13.6D, "Proposal Worksheet Summary," and Form 13.6C, "Proposal Worksheet Detail." or forms acceptable to Engineer.

B. Contractor-Initiated Work Change Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Engineer.
   1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
   2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
   3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
   4. Include costs of labor and supervision directly attributable to the change.
   5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

6. Comply with requirements in Section 01 25 00 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Work Change Proposal Request Form: Use CSI Form 13.6A, "Change Order Request (Proposal)," with attachments CSI Form 13.6D, "Proposal Worksheet Summary," and Form 13.6C, "Proposal Worksheet Detail." or a form acceptable to Engineer.

1.4 ADMINISTRATIVE CHANGE ORDERS

A. Allowance Adjustment: See Section 01 21 00 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.

B. Unit-Price Adjustment: See Section 01 22 00 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Work Changes Proposal Request, Engineer will issue a Change Order for signatures of Owner and Contractor on a Change Order form provided by the Engineer.

1.6 WORK CHANGE DIRECTIVE

A. Work Change Directive: Engineer may issue a Work Change Directive on EJCDC Document C-940. Work Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
   1. Work Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Work Change Directive.
   1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 26 00

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
   1. Coordination drawings.
   2. Requests for Information (RFIs).
   3. Project meetings.

B. Related Requirements:
   1. Section 01 73 00 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
   2. Section 01 12 00 “Multiple Contract Summary” for coordination of installation of the materials.

1.2 DEFINITIONS

A. RFI: Request from Contractor seeking information required by or clarifications of the Contract Documents.

1.3 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design with 24 hours of receipt of bids. Use CSI Form 1.5A or similar. Include the following information in tabular form:
   1. Name, address, and telephone number of entity performing subcontract or supplying products.
   2. Number and title of related Specification Section(s) covered by subcontract.
   3. Drawing number and detail references, as appropriate, covered by subcontract.

1.4 GENERAL COORDINATION PROCEDURES

A. Refer to Section 01 12 00 “Multiple Contract Summary” for more information on coordination between contractors.

B. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
   1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
   2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
   3. Make adequate provisions to accommodate items scheduled for later installation.

C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of Contractor's construction schedule.
   2. Preparation of the schedule of values.
   3. Installation and removal of temporary facilities and controls.
   4. Delivery and processing of submittals.
   5. Progress meetings.
   6. Preinstallation conferences.
   7. Project closeout activities.
   8. Startup and adjustment of systems.

E. Coordination with Owner and other contractors: The Owner, utility companies, and commercial or private owners may have construction projects occurring within or adjacent to the project limits during the life of this contract. Coordinate construction with all such projects that may be ongoing in the vicinity. Where the Contractor's work affects the operation of the Owner's utilities, coordinate work with the Owner. Contact Owner's representative. Give at least 48 hours of notice to the Owner in order to schedule activities such as valve operation, hydrant operation, sewer and structure cleanout, and similar items of work. No claim for extra compensation or adjustments in the contract prices will be allowed on account of delay or failure of others to complete the work scheduled.

1.5 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
   1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
      a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
      b. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Engineer indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:
   1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid.
   2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings.
   3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
   4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
   5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door

floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.

6. Review: Engineer will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility.

1.6 REQUESTS FOR INFORMATION (RFIs)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
   1. Engineer will return RFIs submitted to Engineer by other entities controlled by Contractor with no response.
   2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
   1. Project name.
   2. Project number.
   3. Date.
   4. Name of Contractor.
   5. Name of Engineer
   6. RFI number, numbered sequentially.
   7. RFI subject.
   8. Specification Section number and title and related paragraphs, as appropriate.
   9. Drawing number and detail references, as appropriate.
   10. Field dimensions and conditions, as appropriate.
   11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
   12. Contractor's signature.
   13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
   14. Space for Engineer’s response.

C. RFI Forms: AIA Document G716 or soft-ware generated form with substantially the same content as indicated above, acceptable to Engineer.

D. Engineer’s Action: Engineer will review each RFI, determine action required, and respond. Allow seven working days for Engineer’s response for each RFI. RFIs received by Engineer after 1:00 p.m. will be considered as received the following working day.
   1. The following RFIs will be returned without action:
      a. Requests for approval of submittals.
      b. Requests for approval of substitutions.
      c. Requests for coordination information already indicated in the Contract Documents.
      d. Requests for adjustments in the Contract Time or the Contract Sum.
      e. Requests for interpretation of Engineer’s actions on submittals.
      f. Incomplete RFIs or inaccurately prepared RFIs.
   2. Engineer’s action may include a request for additional information, in which case Engineer 's time for response will date from time of receipt of additional information.
   3. Engineer’s action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 01 26 00 "Contract Modification Procedures."
      a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Engineer in writing within 10 days of receipt of the RFI response.
   4. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.7 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
   1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Engineer of scheduled meeting dates and times.
   2. Agenda: Entity responsible for conducting meeting with prepare the meeting agenda. Distribute the agenda to all invited attendees.
   3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

B. Preconstruction Conference: Engineer will schedule a preconstruction conference before starting construction, at a time convenient to Owner and Contractors.
   1. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
   2. Agenda: Discuss items of significance that could affect progress, including the following:
      a. Tentative construction schedule.
      b. Phasing.
      c. Critical work sequencing and long-lead items.
      d. Designation of key personnel and their duties.
      e. Procedures for processing field decisions and Change Orders.
      f. Procedures for RFIs.
      g. Procedures for testing and inspecting.
      h. Procedures for processing Applications for Payment.
      i. Distribution of the Contract Documents.
      j. Submittal procedures.
      k. Preparation of record documents.
      l. Use of the premises
      m. Use of existing building if Contractor will need access to a building.
      n. Work restrictions.
      o. Working hours.
      p. Owner's occupancy requirements.
      q. Responsibility for temporary facilities and controls.
      r. Procedures for moisture and mold control.
      s. Procedures for disruptions and shutdowns.
      t. Construction waste management and recycling.
      u. Parking availability.
      v. Office, work, and storage areas.
      w. Equipment deliveries and priorities.
      x. First aid.
      y. Security.
      z. Progress cleaning..
   3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Progress Meetings: Conduct progress meetings as-needed.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00

SECTION 01 32 33 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for the following:
   1. Preconstruction photographs.
   2. Periodic construction photographs.

B. Related Requirements:
   1. Section 01 77 00 "Closeout Procedures" for submitting photographic documentation as Project Record Documents at Project closeout.

1.2 INFORMATIONAL SUBMITTALS

A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each [**photograph**] [**video recording**]. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.

B. Digital Photographs: Submit unaltered, original, full-size image files within three days of taking photographs.
   1. Digital Camera: Minimum sensor resolution of 8 megapixels.
   2. Identification: Provide the following information with each image description in file metadata tag:
      a. Name of Project.
      b. Name and contact information for photographer.
      c. Date photograph was taken.
      d. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.

C. Construction Photographs: Submit [**two**] <**Insert number**> prints of each photographic view within [**seven**] <**Insert number**> days of taking photographs.
   1. Format: 8-by-10-inch smooth-surface matte prints on single-weight, commercial-grade photographic paper; [**mounted on linen or card stock to allow a 1-inch-wide margin and**] [**enclosed back to back in clear plastic sleeves that are**] punched for standard three-ring binder.
   2. Identification: On back of each print, provide an applied label or rubber-stamped impression with the following information:
      a. Name of Project.
      b. Name and contact information for photographer.
      c. Name of Engineer.
      d. Name of Contractor.
      e. Date photograph was taken if not date stamped by camera.
      f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
      g. Unique sequential identifier keyed to accompanying key plan.

1.3 QUALITY ASSURANCE

A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three years.

1.4 USAGE RIGHTS

A. Obtain and transfer copyright usage rights from photographer to Owner for unlimited reproduction of photographic documentation.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

A. Digital Images: Provide images in JPG format, with minimum size of 8 megapixels.

PART 3 - EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS

A. Photographer: Engage a qualified photographer to take construction photographs.

B. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
   1. Maintain key plan with each set of construction photographs that identifies each photographic location.

C. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
   1. Date and Time: Include date and time in file name for each image.
   2. Field Office Images: Maintain one set of images accessible in the field office at Project site, available at all times for reference. Identify images in the same manner as those submitted to Engineer.

D. Preconstruction Photographs: Before commencement of excavation or commencement of demolition, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Engineer.
   1. Flag excavation areas and construction limits before taking construction photographs.
   2. Take a minimum of 20 photographs to show existing conditions adjacent to property before starting the Work. Additional photographs may be required depending upon the extent and variety of existing conditions.
   3. Take a minimum of 20 photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.

E. Periodic Construction Photographs:
   1. Take a minimum of 20 photographs monthly, coinciding with the cutoff date associated with each Application for Payment for each major area of Work.
   2. Select vantage points to show status of construction and progress since last photographs were taken.
   3. Coordinate locations and vantage points with Engineer prior to each session

F. Final Completion Construction Photographs: Take color photographs after date of Substantial Completion for submission as Project Record Documents. Engineer will inform photographer of desired vantage points.

G. Additional Photographs: Engineer may request photographs in addition to periodic photographs specified. Additional photographs will be paid for by Change Order and are not included in the Contract Sum [**or in the allowance for construction photographs**].

1. Three days' notice will be given, where feasible.
2. In emergency situations, take additional photographs within 24 hours of request.
3. Circumstances that could require additional photographs include, but are not limited to, the following:
   a. Special events planned at Project site.
   b. Immediate follow-up when on-site events result in construction damage or losses.
   c. Photographs to be taken at fabrication locations away from Project site. These photographs are not subject to unit prices or unit-cost allowances.
   d. Substantial Completion of a major phase or component of the Work.
   e. Extra record photographs at time of final acceptance.
   f. Owner's request for special publicity photographs.

END OF SECTION 01 32 33

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. Related Requirements:
   1. Section 01 78 23 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
   2. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
   3. Section 01 79 00 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Engineer’s responsive action.

B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTALS SCHEDULE

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Engineer and additional time for handling and reviewing submittals required by those corrections.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Engineer's Digital Data Files: Electronic copies of digital data files of the Contract Drawings will not be provided by Engineer for Contractor's use in preparing submittals.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
   1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
   2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
      a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer’s receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 15 days for review of each resubmittal.

D. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
   1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
   2. Name file with submittal number or other unique identifier, including revision identifier.
      a. File name shall use Specification Section number followed by a decimal point and then a sequential number (e.g., Submittal 06 10 00.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., Submittal 06 10 00.01.A).
   3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Engineer.
   4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner**,** containing the following information:
      a. Project name.
      b. Date.
      c. Name and address of Engineer.
      d. Name of Construction Manager.
      e. Name of Contractor.
      f. Name of firm or entity that prepared submittal.
      g. Names of subcontractor, manufacturer, and supplier.
      h. Category and type of submittal.
      i. Submittal purpose and description.
      j. Specification Section number and title.
      k. Specification paragraph number or drawing designation and generic name for each of multiple items.
      l. Drawing number and detail references, as appropriate.
      m. Location(s) where product is to be installed, as appropriate.
      n. Related physical samples submitted directly.
      o. Indication of full or partial submittal.
      p. Transmittal number**,** numbered consecutively.
      q. Submittal and transmittal distribution record.
      r. Other necessary identification.
      s. Remarks.
   5. Metadata: Include the following information as keywords in the electronic submittal file metadata:
      a. Project name.
      b. Number and title of appropriate Specification Section.
      c. Manufacturer name.
      d. Product name.

E. Options: Identify options requiring selection by Engineer.

F. Deviations: Identify deviations from the Contract Documents on submittals.

G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
   1. Note date and content of previous submittal.
   2. Note date and content of revision in label or title block and clearly indicate extent of revision.

3. Resubmit submittals until they are marked with approval notation from Engineer 's action stamp.

H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Engineer 's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements:

CHOOSE one of the two and delete the other. Not all projects have a Project Web site.

1. Submit electronic submittals via email as PDF electronic files.
   a. Engineer will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
2. Action Submittals: Submit four paper copies of each submittal unless otherwise indicated. Engineer will return one copy.
3. Informational Submittals: Submit two paper copies of each submittal unless otherwise indicated. Engineer will not return copies.
4. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
   a. Provide a digital signature with digital certificate on electronically-submitted certificates and certifications where indicated.
   b. Provide a notarized statement on original paper copy certificates and certifications where indicated.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:
   a. Manufacturer's catalog cuts.
   b. Manufacturer's product specifications.
   c. Standard color charts.
   d. Statement of compliance with specified referenced standards.
   e. Testing by recognized testing agency.
   f. Application of testing agency labels and seals.
   g. Notation of coordination requirements.
   h. Availability and delivery time information.
4. For equipment, include the following in addition to the above, as applicable:
   a. Wiring diagrams showing factory-installed wiring.
   b. Printed performance curves.
   c. Operational range diagrams.
   d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
5. Submit Product Data before or concurrent with Samples.
6. Submit Product Data in the following format:
   a. PDF electronic file.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
   1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
      a. Identification of products.
      b. Schedules.
      c. Compliance with specified standards.
      d. Notation of coordination requirements.
      e. Notation of dimensions established by field measurement.
      f. Relationship and attachment to adjoining construction clearly indicated.
      g. Seal and signature of professional engineer if specified.
   2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches. Text shall be readable on the size of the drawing provided.
   3. Submit Shop Drawings in the following format:
      a. PDF electronic file.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
   1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
   2. Identification: Attach label on unexposed side of Samples that includes the following:
      a. Generic description of Sample.
      b. Product name and name of manufacturer.
      c. Sample source.
      d. Number and title of applicable Specification Section.
   3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
   4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
      a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
      b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
   5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
      a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Engineer will return submittal with options selected.
   6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
      a. Number of Samples: Submit three sets of Samples. Engineer will retain two Sample sets; remainder will be returned.
         1) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
   1. Submit product schedule in the following format:
      a. PDF electronic file.

F. Coordination Drawings Submittals: Comply with requirements specified in Section 01 31 00 "Project Management and Coordination."

G. Contractor's Construction Schedule: Comply with requirements specified in Section 01 32 00 "Construction Progress Documentation."

H. Application for Payment and Schedule of Values: Comply with requirements specified in Section 01 29 00 "Payment Procedures.

I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 01 40 00 "Quality Requirements."

J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 01 77 00 "Closeout Procedures."

K. Maintenance Data: Comply with requirements specified in Section 01 78 23 "Operation and Maintenance Data."

L. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of Engineer s and owners, and other information specified.

M. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

N. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

O. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

P. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

Q. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

R. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

S. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

T. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.

U. Schedule of Tests and Inspections: Comply with requirements specified in Section 01 40 00 "Quality Requirements."

V. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

W. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

X. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

Y. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.

B. Project Closeout and Maintenance Material Submittals: See requirements in Section 01 77 00 "Closeout Procedures."

C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 DESIGN PROFESSIONAL'S ACTION

A. General: Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or revisions required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action, as follows:
   1. Approved.
   2. Rejected.
   3. Approved as Noted
   4. Revise and Resubmit.
   5. Submit Specified Item.

6. Acknowledge Receipt.

C. Informational Submittals: Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Submittals not required by the Contract Documents may not be reviewed and may be discarded or returned to Contractor marked “Not Required For Review.”

END OF SECTION 01 33 00

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
   1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
   2. Requirements for Contractor to provide quality-assurance and -control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
   3. Specific test and inspection requirements are not specified in this Section.

1.2 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Engineer.

C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
   1. Laboratory Mockups: Full-size physical assemblies constructed at testing facility to verify performance characteristics.

D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.

G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
   1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.3 REGULATORY

A. Public Agency Requirements: It is the intention of these specifications to construct all work in accordance with the applicable requirements of the Owner, the contract specifications, and the contract drawings. Where there is a conflict between any of the aforementioned specifications, and the permit requirements for the agency having jurisdiction, the more restrictive shall govern.

1.4 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Engineer for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Engineer for a decision before proceeding.

1.5 INFORMATIONAL SUBMITTALS

A. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

1.6 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
   1. Date of issue.
   2. Project title and number.
   3. Name, address, and telephone number of testing agency.
   4. Dates and locations of samples and tests or inspections.
   5. Names of individuals making tests and inspections.
   6. Description of the Work and test and inspection method.
   7. Identification of product and Specification Section.
   8. Complete test or inspection data.
   9. Test and inspection results and an interpretation of test results.

10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting tests and inspections specified in other Sections. Include the following:
   1. Name, address, and telephone number of representative making report.
   2. Statement on condition of substrates and their acceptability for installation of product.
   3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
   4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
   5. Other required items indicated in individual Specification Sections.

C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.7 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
   1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
   1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.

2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

H. Manufacturer's Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
   1. Contractor responsibilities include the following:
      a. Provide test specimens representative of proposed products and construction.
      b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
      c. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
      d. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups; do not reuse products on Project.
   2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Engineer**,** with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
   1. Build mockups in location and of size indicated or, if not indicated, as directed by Engineer.
   2. Notify Engineer seven days in advance of dates and times when mockups will be constructed.
   3. Demonstrate the proposed range of aesthetic effects and workmanship.
   4. Obtain Engineer’s approval of mockups before starting work, fabrication, or construction.
      a. Allow seven days for initial review and each re-review of each mockup.
   5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
   6. Demolish and remove mockups when directed unless otherwise indicated.

1.8 QUALITY CONTROL

A. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
   1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
      a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
   2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
   3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
   4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
   5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

B. Manufacturer's Field Services: Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports.

C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

D. Testing Agency Responsibilities: Cooperate with Engineer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
   1. Notify Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
   2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
   3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
   4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
   5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
   6. Do not perform any duties of Contractor.

E. Associated Contractor Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
   1. Access to the Work.
   2. Incidental labor and facilities necessary to facilitate tests and inspections.
   3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
   4. Facilities for storage and field curing of test samples.
   5. Delivery of samples to testing agencies.
   6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
   7. Security and protection for samples and for testing and inspecting equipment at Project site.

F. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
   1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.9 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Conducted by a qualified testing agency as required by authorities having jurisdiction, as indicated in individual Specification Sections and as follows:
   1. Notifying Engineer and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
   2. Submitting a certified written report of each test, inspection, and similar quality-control service to Engineer with copy to Contractor and to authorities having jurisdiction.
   3. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
   4. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
   5. Retesting and re-inspecting corrected work.
   6. <**Insert requirements**>.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
   1. Date test or inspection was conducted.
   2. Description of the Work tested or inspected.
   3. Date test or inspection results were transmitted to Engineer.
   4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Engineer reference during normal working hours.
   1. Submit log at project closeout as part of the project record documents.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
   1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 73 00 "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 40 00

SECTION 01 42 00 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Engineer’s action on Contractor's submittals, applications, and requests, "approved" is limited to Engineer's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Engineer. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
   1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."

B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.
   1. AABC - Associated Air Balance Council; www.aabc.com.
   2. AAMA - American Architectural Manufacturers Association; www.aamanet.org.
   3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
   4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
   5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
   6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
   7. ABMA - American Boiler Manufacturers Association; www.abma.com.
   8. ACI - American Concrete Institute; (Formerly: ACI International); www.abma.com.
   9. ACPA - American Concrete Pipe Association; www.concrete-pipe.org.
   10. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
   11. AF&PA - American Forest & Paper Association; www.afandpa.org.
   12. AGA - American Gas Association; www.aga.org.
   13. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
   14. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
   15. AI - Asphalt Institute; www.asphaltinstitute.org.
   16. AIA - American Institute of Architects (The); www.aia.org.
   17. AISC - American Institute of Steel Construction; www.aisc.org.
   18. AISI - American Iron and Steel Institute; www.steel.org.
   19. AITC - American Institute of Timber Construction; www.aitc-glulam.org.
   20. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
   21. ANSI - American National Standards Institute; www.ansi.org.
   22. AOSA - Association of Official Seed Analysts, Inc.; www.aosaseed.com.
   23. APA - APA - The Engineered Wood Association; www.apawood.org.
   24. APA - Architectural Precast Association; www.archprecast.org.
   25. API - American Petroleum Institute; www.api.org.
   26. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
   27. ARI - American Refrigeration Institute; (See AHRI).
   28. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
   29. ASCE - American Society of Civil Engineers; www.asce.org.
   30. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
   31. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
   32. ASME - ASME International; (American Society of Mechanical Engineers); www.asme.org.
   33. ASSE - American Society of Safety Engineers (The); www.asse.org.
   34. ASSE - American Society of Sanitary Engineering; www.asse-plumbing.org.
   35. ASTM - ASTM International; www.astm.org.
   36. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
   37. AWEA - American Wind Energy Association; www.awea.org.
   38. AWI - Architectural Woodwork Institute; www.awinet.org.
   39. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.
   40. AWPA - American Wood Protection Association; www.awpa.com.
   41. AWS - American Welding Society; www.aws.org.
   42. AWWA - American Water Works Association; www.awwa.org.
   43. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.

44. BIA - Brick Industry Association (The); www.gobrick.com.
45. BICSI - BICSI, Inc.; www.bicsi.org.
46. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.org.
47. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
48. BWF - Badminton World Federation; (Formerly: International Badminton Federation); www.bissc.org.
49. CDA - Copper Development Association; www.copper.org.
50. CEA - Canadian Electricity Association; www.electricity.ca.
51. CEA - Consumer Electronics Association; www.ce.org.
52. CFFA - Chemical Fabrics and Film Association, Inc.; www.chemicalfabricsandfilm.com.
53. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
54. CGA - Compressed Gas Association; www.cganet.com.
55. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
56. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
57. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
58. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
59. CPA - Composite Panel Association; www.pbmdf.com.
60. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
61. CRRC - Cool Roof Rating Council; www.coolroofs.org.
62. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
63. CSA - Canadian Standards Association; www.csa.ca.
64. CSA - CSA International; (Formerly: IAS - International Approval Services); www.csa-international.org.
65. CSI - Construction Specifications Institute (The); www.csinet.org.
66. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
67. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.cti.org.
68. CWC - Composite Wood Council; (See CPA).
69. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
70. DHI - Door and Hardware Institute; www.dhi.org.
71. ECA - Electronic Components Association; (See ECIA).
72. ECAMA - Electronic Components Assemblies & Materials Association; (See ECIA).
73. ECIA - Electronic Components Industry Association; www.eciaonline.org.
74. EIA - Electronic Industries Alliance; (See TIA).
75. EIMA - EIFS Industry Members Association; www.eima.com.
76. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
77. ESD - ESD Association; (Electrostatic Discharge Association); www.esda.org.
78. ESTA - Entertainment Services and Technology Association; (See PLASA).
79. EVO - Efficiency Valuation Organization; www.evo-world.org.
80. FCI - Fluid Controls Institute; www.fluidcontrolsinstitute.org.
81. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.
82. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
83. FM Approvals - FM Approvals LLC; www.fmglobal.com.
84. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
85. FRSA - Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; www.floridaroof.com.
86. FSA - Fluid Sealing Association; www.fluidsealing.com.
87. FSC - Forest Stewardship Council U.S.; www.fscus.org.
88. GA - Gypsum Association; www.gypsum.org.
89. GANA - Glass Association of North America; www.glasswebsite.com.
90. GS - Green Seal; www.greenseal.org.
91. HI - Hydraulic Institute; www.pumps.org.
92. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
93. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).

94. HPVA - Hardwood Plywood & Veneer Association; www.hpva.org.
95. HPW - H. P. White Laboratory, Inc.; www.hpwhite.com.
96. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
97. IAS - International Accreditation Service; www.iasonline.org.
98. IAS - International Approval Services; (See CSA).
99. ICBO - International Conference of Building Officials; (See ICC).
100. ICC - International Code Council; www.iccsafe.org.
101. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
102. ICPA - International Cast Polymer Alliance; www.icpa-hq.org.
103. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
104. IEC - International Electrotechnical Commission; www.iec.ch.
105. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
106. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
107. IESNA - Illuminating Engineering Society of North America; (See IES).
108. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
109. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
110. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.okstate.edu.
111. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
112. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
113. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
114. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
115. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.
116. ISO - International Organization for Standardization; www.iso.org.
117. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
118. ITU - International Telecommunication Union; www.itu.int/home.
119. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
120. LMA - Laminating Materials Association; (See CPA).
121. LPI - Lightning Protection Institute; www.lightning.org.
122. MBMA - Metal Building Manufacturers Association; www.mbma.com.
123. MCA - Metal Construction Association; www.metalconstruction.org.
124. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
125. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
126. MHIA - Material Handling Industry of America; www.mhia.org.
127. MIA - Marble Institute of America; www.marble-institute.com.
128. MMPA - Moulding & Millwork Producers Association; www.wmmpa.com.
129. MPI - Master Painters Institute; www.paintinfo.com.
130. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
131. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
132. NACE - NACE International; (National Association of Corrosion Engineers International); www.nace.org.
133. NADCA - National Air Duct Cleaners Association; www.nadca.com.
134. NAIMA - North American Insulation Manufacturers Association; www.naima.org.
135. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
136. NBI - New Buildings Institute; www.newbuildings.org.
137. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
138. NCMA - National Concrete Masonry Association; www.ncma.org.
139. NEBB - National Environmental Balancing Bureau; www.nebb.org.
140. NECA - National Electrical Contractors Association; www.necanet.org.
141. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
142. NEMA - National Electrical Manufacturers Association; www.nema.org.
143. NETA - InterNational Electrical Testing Association; www.netaworld.org.

144. NFHS - National Federation of State High School Associations; www.nfhs.org.
145. NFPA - National Fire Protection Association; www.nfpa.org.
146. NFPA - NFPA International; (See NFPA).
147. NFRC - National Fenestration Rating Council; www.nfrc.org.
148. NHLA - National Hardwood Lumber Association; www.nhla.com.
149. NLGA - National Lumber Grades Authority; www.nlga.org.
150. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
151. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
152. NRCA - National Roofing Contractors Association; www.nrca.net.
153. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
154. NSF - NSF International; www.nsf.org.
155. NSPE - National Society of Professional Engineers; www.nspe.org.
156. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
157. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
158. NWFA - National Wood Flooring Association; www.nwfa.org.
159. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
160. PDI - Plumbing & Drainage Institute; www.pdionline.org.
161. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); www.plasa.org.
162. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
163. RFCI - Resilient Floor Covering Institute; www.rfci.com.
164. RIS - Redwood Inspection Service; www.redwoodinspection.com.
165. SAE - SAE International; www.sae.org.
166. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
167. SDI - Steel Deck Institute; www.sdi.org.
168. SDI - Steel Door Institute; www.steeldoor.org.
169. SEFA - Scientific Equipment and Furniture Association (The); www.sefalabs.com.
170. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
171. SIA - Security Industry Association; www.siaonline.org.
172. SJI - Steel Joist Institute; www.steeljoist.org.
173. SMA - Screen Manufacturers Association; www.smainfo.org.
174. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
175. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
176. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
177. SPIB - Southern Pine Inspection Bureau; www.spib.org.
178. SPRI - Single Ply Roofing Industry; www.spri.org.
179. SRCC - Solar Rating & Certification Corporation; www.solar-rating.org.
180. SSINA - Specialty Steel Industry of North America; www.ssina.com.
181. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
182. STI - Steel Tank Institute; www.steeltank.com.
183. SWI - Steel Window Institute; www.steelwindows.com.
184. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
185. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
186. TCNA - Tile Council of North America, Inc.; www.tileusa.com.
187. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.
188. TIA - Telecommunications Industry Association (The); (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
189. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
190. TMS - The Masonry Society; www.masonrysociety.org.
191. TPI - Truss Plate Institute; www.tpinst.org.
192. TPI - Turfgrass Producers International; www.turfgrasssod.org.
193. TRI - Tile Roofing Institute; www.tileroofing.org.
194. UL - Underwriters Laboratories Inc.; www.ul.com.

195. UNI - Uni-Bell PVC Pipe Association; www.uni-bell.org.
196. USAV - USA Volleyball; www.usavolleyball.org.
197. USGBC - U.S. Green Building Council; www.usgbc.org.
198. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
199. WASTEC - Waste Equipment Technology Association; www.wastec.org.
200. WCLIB - West Coast Lumber Inspection Bureau; www.wclib.org.
201. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
202. WDMA - Window & Door Manufacturers Association; www.wdma.com.
203. WI - Woodwork Institute; www.wicnet.org.
204. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.
205. WWPA - Western Wood Products Association; www.wwpa.org.

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.
1. DIN - Deutsches Institut fur Normung e.V.; www.din.de.
2. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
3. ICC - International Code Council; www.iccsafe.org.
4. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.

D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.
1. COE - Army Corps of Engineers; www.usace.army.mil.
2. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
3. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
4. DOD - Department of Defense; www.quicksearch.dla.mil.
5. DOE - Department of Energy; www.energy.gov.
6. EPA - Environmental Protection Agency; www.epa.gov.
7. FAA - Federal Aviation Administration; www.faa.gov.
8. FG - Federal Government Publications; www.gpo.gov.
9. GSA - General Services Administration; www.gsa.gov.
10. HUD - Department of Housing and Urban Development; www.hud.gov.
11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; www.eetd.lbl.gov.
12. OSHA - Occupational Safety & Health Administration; www.osha.gov.
13. SD - Department of State; www.state.gov.
14. TRB - Transportation Research Board; National Cooperative Highway Research Program; The National Academies; www.trb.org.
15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
16. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
17. USDJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.
18. USP - U.S. Pharmacopeial Convention; www.usp.org.
19. USPS - United States Postal Service; www.usps.com.

E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list.
1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
2. DOD - Department of Defense; Military Specifications and Standards; Available from DLA Document Services; www.quicksearch.dla.mil.
3. DSCC - Defense Supply Center Columbus; (See FS).
4. FED-STD - Federal Standard; (See FS).

5. FS - Federal Specification; Available from DLA Document Services; www.quicksearch.dla.mil.
    a. Available from Defense Standardization Program; www.dsp.dla.mil.
    b. Available from General Services Administration; www.gsa.gov.
    c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org/ccb.
6. MILSPEC - Military Specification and Standards; (See DOD).
7. USAB - United States Access Board; www.access-board.gov.
8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).

F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.
1. CBHF; State of California; Department of Consumer Affairs; Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation; www.bearhfti.ca.gov.
2. CCR; California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; www.calregs.com.
3. CDHS; California Department of Health Services; (See CDPH).
4. CDPH; California Department of Public Health; Indoor Air Quality Program; www.cal-iaq.org.
5. CPUC; California Public Utilities Commission; www.cpuc.ca.gov.
6. MDEQ; Michigan Department of Environmental Quality; www.michigan.gov/deq
7. MDOT; Michigan Department of Transportation; www.michigan.gov/mdot
8. ODOT; Ohio Department of Transportation; www.dot.state.oh.us
9. Ohio EPA: Ohio Environmental Protection Agency; www.epa.state.oh.us
10. SCAQMD; South Coast Air Quality Management District; www.aqmd.gov.
11. TFS; Texas A&M Forest Service; Sustainable Forestry and Economic Development; www.txforestservice.tamu.edu.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 42 00

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Requirements:
   1. Section 01 10 00 "Summary" for work restrictions and limitations on utility interruptions.

1.2 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Engineer, testing agencies, and authorities having jurisdiction.

B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

C. Water Service: Pay Water Service use charges for water used by all entities for construction operations.

D. Electric Power Service from Existing System: Electric power from Owner’s existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

E. Electric Power Service: pay electric power service use charges for electricity used by all entities for construction operations.

If needed, insert use-charge requirements for other utilities needed for construction operations.

1.3 INFORMATIONAL SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

1.4 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch-OD line posts and 2-7/8-inch-OD corner and pull posts, with 1-5/8-inch-OD top rails.

B. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch-OD line posts and 2-7/8-inch-OD corner and pull posts, with 1-5/8-inch-OD top and bottom rails. Provide galvanized-steel bases for supporting posts.

C. Wood Enclosure Fence: Plywood, 6 feet high, framed with four 2-by-4-inch rails, with preservative-treated wood posts spaced not more than 8 feet apart.

2.2 TEMPORARY FACILITIES

A. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.
   1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
   1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

Retain one of two "Water Service" paragraphs below. Delete second paragraph if facilities are unavailable or if their use is not permitted even if available.

C. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

D. Water Service: The Contractor shall not make a connection to any public water main or fire hydrant without first obtaining the necessary permit and/or meter from the Owner. Existing public water systems shall be operated and controlled by the Owner. All valves shall be operated exclusively by the Owner's personnel.

E. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

Delete "Toilets" Subparagraph below if facilities are unavailable or if their use is not permitted even if available. Indicate location of Owner's existing toilets in Section 01 10 00 "Summary" or show on Drawings.

1. Toilets: Use of Owner's existing toilet facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

F. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

G. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

H. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.

CHOOSE H or I

I. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
   1. Install electric power service overhead unless otherwise indicated.

Retain subparagraph below if Owner is willing to permit use of building's existing electric service.

Get confirmation from Client/Owner before keeping statement below

2. Connect temporary service to Owner's existing power source, as directed by Owner.

J. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
   1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

K. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line for each field office.
   1. Provide additional telephone lines for the following:
      a. Provide a dedicated telephone line for each facsimile machine in each field office.
   2. At each telephone, post a list of important telephone numbers.
      a. Police and fire departments.
      b. Ambulance service.
      c. Contractor's home office.
      d. Contractor's emergency after-hours telephone number.

e. Engineer 's office.
f. Engineers' offices.
g. Owner's office.
h. Principal subcontractors' field and home offices.

3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

Retain "Electronic Communication Service" Paragraph below if applicable.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

Review first subparagraph below with Owner's insurance carrier. Revise to suit Project.

1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
2. Maintain support facilities until Engineer schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

Retain "Temporary Roads and Paved Areas" Paragraph below if temporary roads and paved areas are not indicated or anticipated to be in same location as permanent roads or paved areas.

B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas within construction limits indicated on Drawings.
1. Provide dust-control treatment that is nonpolluting and non-tracking. Reapply treatment as required to minimize dust.

C. Temporary Use of Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.
1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
2. Prepare subgrade and install subbase and base for temporary roads and paved areas according to Section 31 20 00 "Earth Moving."

D. Traffic Controls: Comply with requirements of authorities having jurisdiction.
1. General
a. Protect existing site improvements to remain including curbs, pavement, and utilities.
b. Maintain access for fire-fighting equipment and access to fire hydrants.
c. During the course of construction, make provisions to maintain access for emergency vehicles at all times. Where possible and when directed by the Engineer, all streets must be left open to traffic at the end of each working day. Traffic maintenance and control as defined in this section shall be considered as included in the unit bid prices or lump sum bid prices that are given in the Bid Form.
d. All work for maintaining traffic and control shall be in accordance with Section 812 of the 2012 MDOT Standard Specifications for Construction and the current edition of the Michigan Manual of Uniform Traffic Control Devices (MMUTCD). The Contract shall also comply with work zone sign requirements as described in Public Act 315 of 2003.
e. Conduct operations and use equipment in such a manner that traffic will be maintained throughout the entire length of the project. When conditions are such as to warrant

variations from this requirement, the procedure to be followed shall be approved by the Engineer prior to such procedure being put into effect.

f. Furnish, erect and maintain all barricades, signs and lights as required according to the current edition of the MMUTCD. Notify concerned parties such as local police department, local fire department, and school officials if a road closure and/or detour will be in effect. Notify the same parties when the road has been reopened.
g. Once work on a particular utility is begun, the Contractor must continue his work to completion. Owner will not permit random movements of work operations among the project area that tend to confuse traffic patterns.
h. Protect existing site improvements to remain including curbs, pavement, and utilities.
i. Comply with requirements of authorities having jurisdiction.

2. Provisions for Local Traffic
   a. During the progress of the work, accommodate both local vehicular and pedestrian traffic along the roads.
   b. Maintain access to all residences and businesses except as noted on the plans or as directed by the Engineer. The use of maintenance aggregate to maintain access shall be as approved by the Engineer.
   c. The Contractor's truck and equipment operations on public streets shall be governed by all local traffic ordinances and regulations of the local fire and police departments, the Owner, and the Michigan Department of Transportation.
3. Existing Warning and Regulatory Signs
   a. Wherever possible, all existing signs on this project are to be preserved and maintained as incidental to the project.
   b. Where it is not possible to preserve existing traffic control signs and street name signs, they shall be removed, temporarily reset and maintained by the Contractor. Upon completion of the project, reset traffic control signs and street name signs in the proper position.
   c. In cases where new signs are called for, place in accordance with the requirements outlined elsewhere in the plans or technical specifications.
   d. Any new or existing signs damaged by the Contractor shall be replaced in kind by him at no additional cost to the Owner.
4. Lane Closures and Detours
   a. Any lane closures or detours shall be approved by the Owner and the appropriate governing agency, and shall meet their specifications and standards as well as those of the MMUTCD. Where there are conflicts, the more restrictive shall apply. Provide proper lighting for any type of closure that occurs during twilight or darkness.
5. Construction Signs and Barricades
   a. Warning signs and barricades configurations shall meet the requirements of the MMUTCD, the Owner, and the Michigan Department of Transportation.
   b. The Contractor shall not begin any operation on the project until all required signs and barricades have been set.
   c. All signs to be used during twilight or darkness shall be reflectorized, in good condition, with two continuous flashing lights.
   d. The construction site shall at all times be maintained and left in a clean, neat, and safe condition, including any construction signing.
   e. After working hours, cover or remove signs that are not appropriate so that motorists will not be confused. Remove and replace or cover (where practical) existing traffic signs that may conflict with the proposed construction.
6. Flag Control
   a. Provide traffic regulators (flaggers) as necessary to protect the vehicular and pedestrian traffic and the work within the work zone areas.

DISCUSS parking provisions below with client before editing section below. Choose one or the other option in E.

E. Parking: [Provide temporary] [Use designated areas of Owner's existing] parking areas for construction personnel.

F. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
   1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
   2. Remove snow and ice as required to minimize accumulations.

G. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
   1. Identification Signs: Provide Project identification signs as indicated on Drawings.
   2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.

If required, insert a list of necessary signs and add Project-specific provisions such as special graphics and special lighting. See Evaluations.

      a. Provide temporary, directional signs for construction personnel and visitors.
   3. Maintain and touchup signs so they are legible at all times.

Retain one of two "Waste Disposal Facilities" paragraphs below. See Evaluations.

H. Waste Disposal Facilities: Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."

I. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 01 73 00 "Execution."

J. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
   1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

C. Temporary Erosion and Sedimentation Control: Comply with authorities having jurisdiction and requirements specified in Section 31 10 00 "Site Clearing."
   1. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been placed.
   2. If a soil erosion control permit is required on this project, adhere to the specific conditions of the project permit. Where the permit is issued in the name of the Contractor, and requires that a bond be posted, the Contractor shall include in his bid the permit fee, inspection fee, and bond expenses.
   3. The Engineer shall have full authority to require compliance with the soil erosion control requirements and may order suspension of the Work if measures are not adequate or a problem develops requiring additional soil erosion control measures, any ordered suspension of the Work shall not be grounds for Contractor’s claims for “down time” or “lost time.”

D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

E. Tree and Plant Protection: Comply with requirements specified in Section 01 56 39 "Temporary Tree and Plant Protection."

F. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

G. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

H. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weather-tight enclosure for building exterior.
   1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

I. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire prevention program.
   1. Prohibit smoking in construction areas.
   2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
   3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
   4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.5 MOISTURE AND MOLD CONTROL

A. Contractor's Moisture Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect materials from water damage and keep porous and organic materials from coming into prolonged contact with concrete.

C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
   1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
   2. Keep interior spaces reasonably clean and protected from water damage.
   3. Discard or replace water-damaged and wet material.
   4. Discard, replace, or clean stored or installed material that begins to grow mold.
   5. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.

D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
   1. Control moisture and humidity inside building by maintaining effective dry-in conditions.

2. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.6 OPERATION, TERMINATION, AND REMOVAL

"Supervision" Paragraph below is important if allowances for metered use of temporary facilities have been established.

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.
   1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
   1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
   2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."
   3. Remove temporary paving not intended for integration into permanent paving. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.

END OF SECTION 01 50 00

SECTION 01 56 39 - TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.

1.2 DEFINITIONS

A. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.

B. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction,

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:
   1. Include plans, elevations, sections, and locations of protection-zone fencing and signage, showing relation of equipment-movement routes and material storage locations with protection zones.

C. Samples: For each type of the following:
   1. Organic Mulch: Sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch.
   2. Protection-Zone Fencing: Assembled Samples.
   3. Protection-Zone Signage: Full-size Samples.

D. Tree Pruning Schedule: Written schedule detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.

1.4 INFORMATIONAL SUBMITTALS

A. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.

B. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.

C. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.

1.5 QUALITY ASSURANCE

A. Arborist Qualifications: Certified Arborist as certified by ISA, licensed arborist in jurisdiction where Project is located, current member of ASCA, or registered Consulting Arborist as designated by ASCA.

1.6 FIELD CONDITIONS

A. The following practices are prohibited within protection zones:
   1. Storage of construction materials, debris, or excavated material.
   2. Moving or parking vehicles or equipment.
   3. Foot traffic.
   4. Erection of sheds or structures.
   5. Impoundment of water.
   6. Excavation or other digging unless otherwise indicated.
   7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

B. Do not direct vehicle or equipment exhaust toward protection zones.

C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Backfill Soil: Planting soil of suitable moisture content and granular texture for placing around tree; free of stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth.
   1. Mixture: Well-blended mix of [**two parts stockpiled soil to one part planting soil**] <**Insert requirement**>.
   2. Planting Soil: Planting soil <**Insert drawing designation**> as specified in [**Section 32 91 13 "Soil Preparation"**] [**Section 32 91 15 "Soil Preparation (Performance Specification)."**]

B. Organic Mulch: Free from deleterious materials and suitable as a top dressing for trees and shrubs, consisting of one of the following:
   1. Type: [**Shredded hardwood**] [**Ground or shredded bark**] [**Wood and bark chips**] <**Insert mulch type**>.

C. Protection-Zone Fencing: Fencing fixed in position and meeting one of the following requirements:
   1. Chain-Link Protection-Zone Fencing: Galvanized-steel fencing fabricated from minimum 2-inch opening, 0.148-inch-diameter wire chain-link fabric; with pipe posts, minimum 2-3/8-inch-OD line posts, and 2-7/8-inch-OD corner and pull posts; with 1-5/8-inch-OD top rails and 0.177-inch-diameter bottom tension wire; with tie wires, hog ring ties, and other accessories for a complete fence system.
      a. Height: 48 inches.
   2. Plywood Protection-Zone Fencing: Plywood framed with four 2-by-4-inch rails, with 4-by-4-inch preservative-treated wood posts spaced not more than 96 inches apart.
      a. Height: 48 inches.
   3. Wood Protection-Zone Fencing: Constructed of two 2-by-4-inch horizontal rails, with 4-by-4-inch preservative-treated wood posts spaced not more than 96 inches apart, and lower rail set halfway between top rail and ground.
      a. Height: 48 inches.
   4. Plastic Protection-Zone Fencing: Plastic construction fencing constructed of high-density extruded and stretched polyethylene fabric with 2-inch maximum opening in pattern and supported by tubular or T-shape galvanized-steel posts spaced not more than 96 inches apart. High-visibility orange color.

a. Height: 48 inches.

5. Gates: Swing access gates matching material and appearance of fencing, to allow for maintenance activities within protection zones.

D. Protection-Zone Signage: Shop-fabricated, rigid plastic or metal sheet with attachment holes prepunched and reinforced; legibly printed with nonfading lettering.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

3.2 PREPARATION

A. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

B. Tree-Protection Zones: Mulch areas inside tree-protection zones and other areas indicated. Do not exceed indicated thickness of mulch.

1. Apply [**2-inch**] [**4-inch**] <**Insert dimension**> uniform thickness of organic mulch unless otherwise indicated. Do not place mulch within 6 inches of tree trunks.

3.3 PROTECTION ZONES

A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones in a manner that will prevent people from easily entering protected areas except by entrance gates.

1. Chain-Link Fencing: Install to comply with ASTM F 567 and with manufacturer's written instructions.
2. Posts: Set or drive posts into ground one-third the total height of the fence without concrete footings. Where a post is located on existing paving or concrete to remain, provide appropriate means of post support acceptable to Architect.
3. Access Gates: Install where indicated.

B. Protection-Zone Signage: Install protection-zone signage in visibly prominent locations in a manner approved by Architect.

C. Maintain protection zones free of weeds and trash.

D. Maintain protection-zone fencing and signage in good condition as acceptable to Architect and remove when construction operations are complete and equipment has been removed from the site.

3.4 EXCAVATION

A. General: Excavate at edge of protection zones and for trenches indicated within protection zones according to requirements in Section 31 20 00 "Earth Moving" unless otherwise indicated.

B. Trenching within Protection Zones: Where utility trenches are required within protection zones, excavate under or around tree roots by hand or with air spade, or tunnel under the roots by

drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning.

C. Do not allow exposed roots to dry out before placing permanent backfill.

3.5 ROOT PRUNING

A. Prune tree roots that are affected by temporary and permanent construction. Prune roots as shown on Drawings and as follows:
   1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
   2. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
   3. Cover exposed roots with burlap and water regularly.
   4. Backfill as soon as possible according to requirements in Section 31 20 00 "Earth Moving."

B. Root Pruning at Edge of Protection Zone: Prune tree roots by cleanly cutting all roots to the depth of the required excavation.

C. Root Pruning within Protection Zone: Clear and excavate by hand or with air spade to the depth of the required excavation to minimize damage to tree root systems. If excavating by hand, use narrow-tine spading forks to comb soil to expose roots. Cleanly cut roots as close to excavation as possible.

3.6 CROWN PRUNING

A. Prune branches that are affected by temporary and permanent construction. Prune branches as directed by arborist.
   1. Prune to remove only injured, broken, dying, or dead branches unless otherwise indicated. Do not prune for shape unless otherwise indicated.
   2. Do not remove or reduce living branches to compensate for root loss caused by damaging or cutting root system.
   3. Pruning Standards: Prune trees according to ANSI A300 (Part 1) and as indicated on Drawings.

B. Cut branches with sharp pruning instruments; do not break or chop.

C. Do not paint or apply sealants to wounds.

D. Chip removed branches and [spread over areas identified by Architect] [stockpile in areas approved by Architect] [dispose of off-site] <Insert requirement>.

3.7 REGRADING

A. Lowering Grade: Where new finish grade is indicated below existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

B. Raising Grade: Where new finish grade is indicated above existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

C. Minor Fill within Protection Zone: Where existing grade is 2 inches or less below elevation of finish grade, fill with backfill soil. Place backfill soil in a single uncompacted layer and hand grade to required finish elevations.

3.8 FIELD QUALITY CONTROL

A. Inspections: Engage a qualified arborist to direct plant-protection measures in the vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare inspection reports.

3.9 REPAIR AND REPLACEMENT

A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or to be relocated that are damaged by construction operations, in a manner approved by Architect.
   1. Perform repairs of damaged trunks, branches, and roots within 24 hours according to arborist's written instructions.
   2. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Architect.

B. Excess Mulch: Rake mulched area within protection zones, being careful not to injure roots. Rake to loosen and remove mulch that exceeds a [**2-inch**] [**4-inch**] <**Insert dimension**> uniform thickness to remain.

3.10 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove excess excavated material, displaced trees, trash, and debris and legally dispose of them off Owner's property.

END OF SECTION 01 56 39

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

B. Related Requirements:
   1. Section 01 25 00 "Substitution Procedures" for requests for substitutions.

1.2 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
   1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
   2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
   3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.3 ACTION SUBMITTALS

A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Engineer will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
      a. Form of Approval: As specified in Section 01 33 00 "Submittal Procedures."
      b. Use product specified if Engineer does not issue a decision on use of a comparable product request within time allocated.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 01 33 00 "Submittal Procedures." Show compliance with requirements.

1.4 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:
   1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
   2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
   3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
   4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:
   1. Store products to allow for inspection and measurement of quantity or counting of units.
   2. Store materials in a manner that will not endanger Project structure.
   3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
   4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
   5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
   6. Protect stored products from damage and liquids from freezing.

1.6 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
   1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
   2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
   1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
   2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
   3. Refer to other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 01 77 00 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
   1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
   2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
   3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
   4. Where products are accompanied by the term "as selected," Engineer will make selection.
   5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

B. Product Selection Procedures:
   1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
   2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
   3. Products:
      a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
      b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
   4. Manufacturers:
      a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
      b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.
   5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

C. Visual Matching Specification: Where Specifications require "match Engineer 's sample", provide a product that complies with requirements and matches Engineer 's sample. Engineer 's decision will be final on whether a proposed product matches.
   1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 01 25 00 "Substitution Procedures" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Engineer from manufacturer's full range" or similar phrase, select a product that complies with requirements. Engineer will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration: Engineer will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Engineer may return requests without action, except to record noncompliance with these requirements:
   1. Evidence that the proposed product does not require revisions to the Contract Documents that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
   2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
   3. Evidence that proposed product provides specified warranty.
   4. List of similar installations for completed projects with project names and addresses and names and addresses of Engineer s and owners, if requested.
   5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00

SECTION 01 73 00 - EXECUTION

1.1 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
   1. Construction layout.
   2. Field engineering and surveying.
   3. Installation of the Work.
   4. Cutting and patching.
   5. Coordination of Owner-installed products.
   6. Progress cleaning.
   7. Starting and adjusting.
   8. Protection of installed construction.

B. Related Requirements:
   1. Section 01 10 00 "Summary" for limits on use of Project site.
   2. Section 01 77 00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.2 INFORMATIONAL SUBMITTALS

A. Certificates: Submit certificate signed by either a land surveyor or professional engineer certifying that location and elevation of improvements comply with requirements.

B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.3 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
   1. Structural Elements: When cutting and patching structural elements, notify Engineer of locations and details of cutting and await directions from Engineer before proceeding. Shore, brace, and support structural element during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
   2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
   3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety
   4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Engineer's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
   1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Engineer for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
   1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
   2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
   3. For protection of underground utilities in Michigan, contact “MISS DIG” at 1-800-482-7171 a minimum of three (3) working days prior to excavating. This does not relieve the Contractor of the responsibility of notifying utility owners who may not be part of the “MISS DIG” alert system.
   4. Where any utility, water, sewer, gas, telephone or any other public or private utilities are encountered, the Contractor must provide adequate protection for them, and he will be held responsible for any damages to such utilities arising from his operations.
   5. When it is apparent that construction operations may endanger the foundation of any utility, conduit, or support of any structure, the Contractor shall notify the utility owner of this possibility, and he shall take such steps as may be required to provide temporary bracing or support of conduits or structures.
   6. In all cases where permits or inspection fees are required by utilities in connection with changes to or temporary support of their conduits, the Contractor shall secure permits and pay all inspection fees.
   7. When it is necessary in order to carry out the Work that a pole, telephone or electric, be moved to a new location or moved and replaced after construction, the Contractor shall arrange for moving such pole or poles and the lines thereof, and shall pay any charges.
   8. Where it is the policy of any utility owner to make his own repairs to damaged conduit or other structures, the Contractor shall cooperate to the fullest extent with the utility owner and shall see that his operations interfere as little as possible with the utility owner’s operations.
   9. Sump Pump Discharge Pipe: Any discharge pipe from sump pumps or yard drains encountered on this project, whether or not shown on the plans, which discharges to existing ditches and/or storm sewers or across public or private easements, shall be maintained, replaced, or reconnected as necessary. Bulkheads shall be placed only as approved by the Engineer. Sump pump connections shall be made to the storm drain pipe by a coring method as approved by the Engineer. The Contractor shall use adequate measures to prevent soil erosion, sedimentation, and/or ponding when connecting

discharge pipes to existing or proposed ditches. This work shall be considered as incidental to the cost of the project.

10. Existing Sewer Facilities: Existing sewers or drains may be encountered along the line of work. In all such cases, the Contractor shall perform his operation in such a manner that sewer service will not be interrupted. He shall, at his own expense, make all temporary provisions to maintain sewer service (both dry weather and storm flows).
11. Unless otherwise indicated on the plans, the Contractor shall replace, at his own expense, any disturbed sewer or drain, or relay same at a new grade to be established by the Engineer such that sufficient clearance for the sewer will be provided.
12. Existing Water Facilities: Where existing water mains and/or water services are encountered in the work, they shall be maintained in operation. They shall be relayed if necessary using the class of pipe and fittings standard to the Owner of the main.
13. Existing Drains: Drainage through existing sewers, ditches and drains shall be maintained at all times during construction, and all nearby gutters shall be kept open for drainage.
14. Maintenance of services as described above shall be considered as incidental to the project cost unless pay items have been included in the bid form for this work.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
   1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
   2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
   3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Engineer according to requirements in Section 01 31 00 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Engineer promptly.

B. The Engineer will provide construction staking. The staking shall consist of horizontal and/or vertical control staking for the construction. The Contractor is responsible for providing a written request for staking to the Engineer at least seventy-two hours in advance of starting the work. Staking requests should be sent to the attention of the OHM Survey Department. The Contractor shall carefully preserve all stakes set by the Engineer. In the case of willful or careless destruction, the Engineer shall provide the re-staking and the Contractor shall be charged with the resulting expense and shall be responsible for delays and errors caused by unnecessary loss or disturbance of the stakes. The expense for re-staking will be entered as a deduction on pay estimates and the resulting amount retained by the Owner for payment of re-staking.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Engineer.

3.4 FIELD ENGINEERING

A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
   1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
   2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
   1. Make vertical work plumb and make horizontal work level.
   2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
   3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
   1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Engineer.
   2. Allow for building movement, including thermal expansion and contraction.
   3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
   1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

C. Temporary Support: Provide temporary support of work to be cut.

D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

E. Adjacent Occupied Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
   1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
   3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
   4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
   5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
   6. Proceed with patching after construction operations requiring cutting are complete.

H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
   1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
   2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
   3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
   4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
   5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather-tight condition and ensures thermal and moisture integrity of building enclosure.

I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
   1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
   2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80℉.
   3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
   1. Remove liquid spills promptly.
   2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 DUST CONTROL

A. Maintain haul roads, detour roads, other public or private roads, driveways and parking lots in a dust free condition for the duration of the Contract.

B. Control dust by application of dust control materials and application methods as approved and as directed by the Engineer.

C. Dust control materials shall be applied as often as is necessary to control dust. Neglect of dust control will not be tolerated.

D. Should the Contractor be negligent of his duties in providing dust control, the Owner may, with or without notice cause the same to be done and deduct the cost of such work from any monies due or to become due to the Contractor under the Contract. Cost of providing dust control shall be considered incidental to the Work.

3.9 STREET CLEANING

A. Haul roads, detour roads, other public or private roads, driveways and parking lots will be kept clean and swept at regular intervals to maintain cleanliness.

B. Trucks hauling excavated material, cement, sand, stone or other loose materials from or to the site shall be tightly covered so that no spillage will occur on the adjacent streets. Before trucks start away from the site, their loads shall be trimmed and covered.

C. If, in the judgment of the Owner, adequate cleanup efforts are not being expended, including but not limited to, roadway, driveway and drainage maintenance, and removal of surplus materials, further construction shall be halted and work forces directed to the cleanup activity until proper order is restored. Should the Contractor continue to be negligent of his duties in maintaining proper street cleanliness, the Owner will take necessary steps to perform such cleaning and shall charge the Contractor for all costs.

3.10 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: Comply with qualification requirements in Section 01 40 00 "Quality Requirements"

3.11 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

C. Provide and maintain weather protection and heating at Contractor’s expense to properly protect the Work under construction from damage if the weather conditions require. This work shall include all windbreaks, insulation cover, land other necessary measures required to provide protection from freezing. Continue to provide weather protection and heating as necessary until such time as the Owner takes over the facility.

END OF SECTION 01 73 00

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for the following:
   1. Salvaging nonhazardous demolition and construction waste.
   2. Recycling nonhazardous demolition and construction waste.
   3. Disposing of nonhazardous demolition and construction waste.

B. Related Requirements:
   1. Section 31 10 00 "Site Clearing" for disposition of waste resulting from site clearing and removal of above- and below-grade improvements.

1.2 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.3 PERFORMANCE REQUIREMENTS

A. General: Achieve end-of-Project rates for salvage/recycling of 50 percent by weight of total non-hazardous solid waste generated by the Work. Facilitate recycling and salvage of materials.

1.4 ACTION SUBMITTALS

A. Waste Management Plan: Submit plan within [**7**] [**30**] <**Insert number**> days of date established for [**commencement of the Work**] [**the Notice to Proceed**] [**the Notice of Award**].

1.5 INFORMATIONAL SUBMITTALS

A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Include the following information:
   1. Material category.
   2. Generation point of waste.
   3. Total quantity of waste in tons.
   4. Quantity of waste salvaged, both estimated and actual in tons.

5. Quantity of waste recycled, both estimated and actual in tons.
6. Total quantity of waste recovered (salvaged plus recycled) in tons.
7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.

C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

G. Qualification Data: For waste management coordinator.

1.6 QUALITY ASSURANCE

A. Waste Management Coordinator Qualifications: Experienced firm, with a record of successful waste management coordination of projects with similar requirements.

B. Waste Management Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination."

1.7 WASTE MANAGEMENT PLAN

A. General: Develop a waste management plan according to ASTM E 1609 and requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis.[**Distinguish between demolition and construction waste.**] Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of [**demolition**] [**site-clearing**] [**and**] [**construction**] waste generated by the Work. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.

4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan.[**Coordinator shall be present at Project site full time for duration of Project.**]

C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
   1. Distribute waste management plan to everyone concerned within [**three**] <**Insert number**> days of submittal return.
   2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
   1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
   2. Comply with Section 01 50 00 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

A. Salvaged Items for Reuse in the Work:
   1. Clean salvaged items.
   2. Pack or crate items after cleaning. Identify contents of containers.
   3. Store items in a secure area until installation.
   4. Protect items from damage during transport and storage.
   5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

B. Salvaged Items for [**Sale**] [**and**] [**Donation**]: [**Permitted**] [**Not permitted**] on Project site.

C. Salvaged Items for Owner's Use:
   1. Clean salvaged items.
   2. Pack or crate items after cleaning. Identify contents of containers.

3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area [**on-site**] [**off-site**] [**designated by Owner**].
5. Protect items from damage during transport and storage.

3.3 RECYCLING [**DEMOLITION**] [**AND**] [**CONSTRUCTION**] WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Receivers and Processors: List below is provided for information only; available recycling receivers and processors include, but are not limited to, the following:
   1. <**Insert names and telephone numbers of local recycling receivers and processors of recyclable materials**>.

C. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall [**accrue to Owner**] [**accrue to Contractor**] [**be shared equally by Owner and Contractor**].

D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
   1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
      a. Inspect containers and bins for contamination and remove contaminated materials if found.
   2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
   3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
   4. Store components off the ground and protect from the weather.
   5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

3.4 RECYCLING DEMOLITION WASTE

A. Asphalt Paving: Grind asphalt to maximum [**1-1/2-inch**] [**4-inch**] size.

B. Asphalt Paving: Break up and transport paving to asphalt-recycling facility.

C. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
   1. Pulverize concrete to maximum [**1-1/2-inch**] [**4-inch**] size.

D. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
   1. Pulverize masonry to maximum [**3/4-inch**] [**1-inch**] [**1-1/2-inch**] [**4-inch**] size.
   2. Clean and stack undamaged, whole masonry units on wood pallets.

E. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.

F. Metals: Separate metals by type.
   1. Structural Steel: Stack members according to size, type of member, and length.
   2. Remove and dispose of bolts, nuts, washers, and other rough hardware.

G. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.

H. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.

I. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.

J. Metal Suspension System: Separate metal members including trim, and other metals from acoustical panels and tile and sort with other metals.

K. Carpet[**and Pad**]: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
   1. Store clean, dry carpet[**and pad**] in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.

L. Carpet Tile: Remove debris, trash, and adhesive.
   1. Stack tile on pallet and store clean, dry carpet in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.

M. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.

N. Conduit: Reduce conduit to straight lengths and store by type and size.

3.5 RECYCLING CONSTRUCTION WASTE

A. Packaging:
   1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
   2. Polystyrene Packaging: Separate and bag materials.
   3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
   4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Wood Materials:
   1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
   2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

C. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.
   1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

3.6 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
   1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.

2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Burning: Burning of waste materials is permitted only at designated areas on Owner's property, provided required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.

D. Disposal: Remove waste materials and dispose of at designated spoil areas on Owner's property.

E. Disposal: Remove waste materials from Owner's property and legally dispose of them.

3.7 SAMPLE FORMS

END OF SECTION 01 74 19

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
   1. Substantial Completion procedures.
   2. Final completion procedures.
   3. Warranties.
   4. Final cleaning.
   5. Repair of the Work.

B. Related Requirements:
   1. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.
   2. Section 01 79 00 "Demonstration and Training" for requirements for instructing Owner's personnel.

1.2 ACTION SUBMITTALS

A. Product Data: For cleaning agents.

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.3 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

C. Field Report: For pest control inspection.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.5 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
   1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include soccupancy permits, operating certificates, and similar releases.

2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Engineer Label with manufacturer's name and model number where applicable.
    a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Engineer 's signature for receipt of submittals.
5. Submit test/adjust/balance records.
6. Submit sustainable design submittals not previously submitted.
7. Submit changeover information related to Owner’s occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
    1. Advise Owner of pending insurance changeover requirements.
    2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner’s personnel of changeover in security provisions.
    3. Complete startup and testing of systems and equipment.
    4. Perform preventive maintenance on equipment used prior to Substantial Completion.
    5. Instruct Owner’s personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 01 79 00 "Demonstration and Training."
    6. Advise Owner of changeover in heat and other utilities.
    7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
    8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
    9. Complete final cleaning requirements, including touchup painting.
    10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, that must be completed or corrected before certificate will be issued.
    1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
    2. Results of completed inspection will form the basis of requirements for final completion.

1.6 FINAL COMPLETION PROCEDURES

A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:
    1. Submit a final Application for Payment according to Section 01 29 00 "Payment Procedures."

2. Certified List of Incomplete Items: Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report and warranty.
5. Instruct Owner’s personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings and manufacturer’s startup reports.
6. Submit operation and maintenance data. Refer to Section 01 78 23 “Operation and Maintenance Data” for more information.

B. Inspection: Submit a written request for final inspection to determine acceptance. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
   1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.7 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use CSI Form 14.1A or similar type form.
   1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
   2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
   3. Submit list of incomplete items in one of the following formats:
      a. MS Excel electronic file. Engineer will return annotated copy.
      b. PDF electronic file. Engineer will return annotated copy.

1.8 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner’s rights under warranty.

B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
   1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
   2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
   3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
   4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
   1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
      a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
      b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
      c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
      d. Remove tools, construction equipment, machinery, and surplus material from Project site.
      e. Remove snow and ice to provide safe access to building.
      f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
      g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
      h. Sweep concrete floors broom clean in unoccupied spaces.
      i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
      j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
      k. Remove labels that are not permanent.
      l. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
      m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
      n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
      o. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
      p. Leave Project clean and ready for occupancy.

C. Pest Control: Comply with pest control requirements in Section 01 50 00 "Temporary Facilities and Controls." Prepare written report.

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
   1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
   2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
      a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
   3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
   4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 01 77 00

SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
   1. Operation and maintenance documentation directory.
   2. Emergency manuals.
   3. Operation manuals for systems, subsystems, and equipment.
   4. Product maintenance manuals.
   5. Systems and equipment maintenance manuals.

1.2 CLOSEOUT SUBMITTALS

A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
   1. Engineer will comment on whether content of operations and maintenance submittals are acceptable.
   2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

B. Format: Submit operations and maintenance manuals in the following format:
   1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Engineer.
      a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
      b. Enable inserted reviewer comments on draft submittals.
   2. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Engineer will return one copy.

C. Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before equipment installation or commencing demonstration and training; whichever is earliest. Engineer will return copy with comments.
   1. Correct or revise each manual to comply with Engineer's comments. Submit copies of each corrected manual within 15 days of receipt of Engineer's comments and prior to equipment installation or commencing demonstration and training.

PART 2 - PRODUCTS

2.1 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information.

B. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
   1. Title page.
   2. Table of contents.

3. Manual contents.

C. Title Page: Include the following information:
   1. Subject matter included in manual.
   2. Name and address of Project.
   3. Name and address of Owner.
   4. Date of submittal.
   5. Name and contact information for Contractor.
   6. Name and contact information for Construction Manager.
   7. Name and contact information for Engineer.
   8. Name and contact information for Commissioning Authority.
   9. Names and contact information for major consultants to the Engineer that designed the systems contained in the manuals.
   10. Cross-reference to related systems in other operation and maintenance manuals.

D. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

E. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

F. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
   1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
   2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

G. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
   1. Binders: Heavy-duty, three-ring, vinyl-covered, post-type binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
      a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
   2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
   3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
   4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
      a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
      b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual,

insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

5. Include drawings and photographs of equipment.

2.2 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
   1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
   2. Performance and design criteria if Contractor is delegated design responsibility.
   3. Operating standards.
   4. Operating procedures.
   5. Operating logs.
   6. Wiring diagrams.
   7. Control diagrams.
   8. Piped system diagrams.
   9. Precautions against improper use.
   10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:
   1. Product name and model number. Use designations for products indicated on Contract Documents.
   2. Manufacturer's name.
   3. Equipment identification with serial number of each component.
   4. Equipment function.
   5. Operating characteristics.
   6. Limiting conditions.
   7. Performance curves.
   8. Engineering data and tests.
   9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:
   1. Startup procedures.
   2. Equipment or system break-in procedures.
   3. Routine and normal operating instructions.
   4. Regulation and control procedures.
   5. Instructions on stopping.
   6. Normal shutdown instructions.
   7. Seasonal and weekend operating instructions.
   8. Required sequences for electric or electronic systems.
   9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.3 PRODUCT MAINTENANCE MANUALS

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Product Information: Include the following, as applicable:
   1. Product name and model number.
   2. Manufacturer's name.
   3. Color, pattern, and texture.
   4. Material and chemical composition.
   5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
   1. Inspection procedures.
   2. Types of cleaning agents to be used and methods of cleaning.
   3. List of cleaning agents and methods of cleaning detrimental to product.
   4. Schedule for routine cleaning and maintenance.
   5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

2.4 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
   1. Standard maintenance instructions and bulletins.
   2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
   3. Identification and nomenclature of parts and components.
   4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
   1. Test and inspection instructions.
   2. Troubleshooting guide.
   3. Precautions against improper maintenance.
   4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
   5. Aligning, adjusting, and checking instructions.
   6. Demonstration and training video recording, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

B. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

C. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

D. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
   1. Do not use original project record documents as part of operation and maintenance manuals.

E. Comply with Section 01 77 00 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01 78 23

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:
   1. Record Drawings.
   2. Record Specifications.
   3. Record Product Data.

B. Related Requirements:
   1. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.2 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:
   1. Number of Copies: Submit two sets of marked-up record prints.
   2. Number of Copies: Submit copies of record Drawings as follows:
      a. Initial Submittal:
         1) Submit PDF electronic files of scanned record prints and one set(s) of file prints.
         2) Engineer will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
      b. Final Submittal:
         1) Submit PDF electronic files of scanned record prints and **three** set(s) of prints.
         2) Print each drawing, whether or not changes and additional information were recorded.

B. Record Product Data: Submit one paper copy and one annotated PDF electronic files and directories of each submittal.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised Drawings as modifications are issued.
   1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
      a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
      b. Record data as soon as possible after obtaining it.
      c. Record and check the markup before enclosing concealed installations.
   2. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
   3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
   4. Note Addenda, Construction or Work Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Engineer. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
   1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
   2. Format: **DWG**, Version 2018, **Microsoft Windows** operating system.
   3. Format: Annotated PDF electronic file with comment function enabled.
   4. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
   5. Refer instances of uncertainty to Engineer for resolution.
   6. Engineer will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.

C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
   1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
   2. Format: Annotated PDF electronic file with comment function enabled.
   3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
   4. Identification: As follows:
      a. Project name.
      b. Date.
      c. Designation "PROJECT RECORD DRAWINGS."
      d. Name of Engineer.
      e. Name of Contractor.

2.2 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
   1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
   2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
   3. Note related Change Orders and record Drawings where applicable.

B. Format: Submit record Product Data as annotated PDF electronic file or scanned PDF electronic file(s) of marked-up paper copy of Product Data.

2.3 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous record submittals as PDF electronic file or scanned PDF electronic file(s) of marked-up miscellaneous record submittals.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Engineer's reference during normal working hours.

END OF SECTION 01 78 39

SECTION 01 79 00 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
   1. Demonstration of operation of systems, subsystems, and equipment.
   2. Training in operation and maintenance of systems, subsystems, and equipment.
   3. Demonstration and training video recordings.

1.2 INFORMATIONAL SUBMITTALS

A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
   1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

1.3 CLOSEOUT SUBMITTALS

A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.
   1. At completion of training, submit complete training manual(s) for Owner's use prepared and bound in format matching operation and maintenance manuals and in PDF electronic file format on compact disc or USB.

1.4 QUALITY ASSURANCE

A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.

B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 01 40 00 "Quality Requirements," experienced in operation and maintenance procedures and training.

1.5 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

B. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Engineer.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
   1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
      a. System, subsystem, and equipment descriptions.
      b. Performance and design criteria if Contractor is delegated design responsibility.
      c. Operating standards.
      d. Regulatory requirements.
      e. Equipment function.
      f. Operating characteristics.
      g. Limiting conditions.
      h. Performance curves.
   2. Documentation: Review the following items in detail:
      a. Emergency manuals.
      b. Operations manuals.
      c. Maintenance manuals.
      d. Project record documents.
      e. Identification systems.
      f. Warranties and bonds.
      g. Maintenance service agreements and similar continuing commitments.
   3. Emergencies: Include the following, as applicable:
      a. Instructions on meaning of warnings, trouble indications, and error messages.
      b. Instructions on stopping.
      c. Shutdown instructions for each type of emergency.
      d. Operating instructions for conditions outside of normal operating limits.
      e. Sequences for electric or electronic systems.
      f. Special operating instructions and procedures.
   4. Operations: Include the following, as applicable:
      a. Startup procedures.
      b. Equipment or system break-in procedures.
      c. Routine and normal operating instructions.
      d. Regulation and control procedures.
      e. Control sequences.
      f. Safety procedures.
      g. Instructions on stopping.
      h. Normal shutdown instructions.
      i. Operating procedures for emergencies.
      j. Operating procedures for system, subsystem, or equipment failure.
      k. Seasonal and weekend operating instructions.
      l. Required sequences for electric or electronic systems.
      m. Special operating instructions and procedures.
   5. Adjustments: Include the following:
      a. Alignments.
      b. Checking adjustments.
      c. Noise and vibration adjustments.
      d. Economy and efficiency adjustments.
   6. Troubleshooting: Include the following:

a. Diagnostic instructions.
b. Test and inspection procedures.

7. Maintenance: Include the following:
   a. Inspection procedures.
   b. Types of cleaning agents to be used and methods of cleaning.
   c. List of cleaning agents and methods of cleaning detrimental to product.
   d. Procedures for routine cleaning
   e. Procedures for preventive maintenance.
   f. Procedures for routine maintenance.
   g. Instruction on use of special tools.
8. Repairs: Include the following:
   a. Diagnosis instructions.
   b. Repair instructions.
   c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
   d. Instructions for identifying parts and components.
   e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 01 78 23 "Operation and Maintenance Data."

3.2 INSTRUCTION

A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.

B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
   1. Engineer will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
   2. Owner will furnish Contractor with names and positions of participants.

C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
   1. Schedule training with Owner, through Engineer, with at least seven days' advance notice.

D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

3.3 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

A. General: Engage a qualified commercial videographer to record demonstration and training. Record each training session separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
   1. At beginning of each training module, record each chart containing learning objective and lesson outline.

B. Video Recording Format: Provide high-quality color video recordings with menu navigation in format acceptable to Engineer.

END OF SECTION 01 79 00

SECTION 02 41 19 - SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Demolition and removal of selected portions of building or structure.
   2. Demolition and removal of selected site elements.
   3. Salvage of existing items to be reused or recycled.

1.2 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and set safely aside on site for Owner to pick up.

C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 INFORMATIONAL SUBMITTALS

A. Predemolition Photographs or Video: Submit before Work begins.

1.4 FIELD CONDITIONS

A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

B. Notify Engineer of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

C. Storage or sale of removed items or materials on-site is not permitted.

D. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1.5 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 PEFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Engineer.

D. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs and preconstruction videotapes
   1. Comply with requirements specified in Section 01 32 33 "Photographic Documentation."

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
   1. Comply with requirements for existing services/systems interruptions specified in Section 01 10 00 "Summary."

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
   1. Arrange to shut off indicated utilities with utility companies.
   2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
   3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.
      a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
      b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
      c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
      d. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and set aside in safe place on site for pick up by Owner.
   4. Demolition includes, but is not limited to:
      a. 12 EA, Termination, #8 AWG
      b. 12 EA, Termination, #4 AWG
      c. 12 EA, Termination, #1 AWG

d. 24 EA, Termination, #250 kcmil
e. 24 EA, Termination, #350 kcmil
f. 4.5 C.L.F., Wire, THW-THWN-THHN removed from wiring trough, #350 kcmil
g. 1.5 C.L.F., Wire, THW-THWN-THHN removed from wiring trough, #1 AWG
h. 4.0 C.L.F., Wire, THW-THWN-THHN removed from conduit generator, #3/0 AWG
i. 1.0 C.L.F., Wire, THW-THWN-THHN removed from conduit generator, #6 AWG
j. 1 EA, Automatic transfer switch, 200A
k. 1 EA, Diesel generator, 45kW with fuel tank
l. 1 EA, Generator enclosure
m. 1 EA, Distribution Panel section, 600A

3.3 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
   1. Comply with requirements for access and protection specified in Section 01 50 00 "Temporary Facilities and Controls."

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

D. Brace utility poles against any movement.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
   1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
   2. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
   3. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
   4. Dispose of demolished items and materials promptly. Comply with requirements in Section 01 74 19 "Construction Waste Management and Disposal."

B. Removed and Salvaged Items:
   1. Clean salvaged items.
   2. Pack or crate items after cleaning. Identify contents of containers.
   3. Store items in a secure area until pick up by Owner.

C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be salvaged, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them.
   1. Do not allow demolished materials to accumulate on-site.
   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
   3. Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.6 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 02 41 19

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
   1. Foundation walls.
   2. Slabs-on-grade.

B. Related Sections:
   1. Division 31 Section "Earth Moving" for drainage fill under slabs-on-grade.
   2. Division 32 Section "Concrete Paving" for concrete pavement and walks.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
   1. Indicate amounts of mixing water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

D. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork.
   1. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and reshoring installation and removal.

E. Material Test Reports: For the following, from qualified testing agency, indicate compliance with requirements:
   1. Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

F. Material Certificates: For each of the following, signed by manufacturers:
   1. Cementitious materials.
   2. Admixtures.

3. Form materials and form-release agents.
4. Steel reinforcement and accessories.
5. Fiber reinforcement.
6. Waterstops
7. Curing compounds.
8. Floor and slab treatments.
9. Bonding agents.
10. Adhesives.
11. Vapor retarders.
12. Semirigid joint filler.
13. Joint-filler strips.
14. Repair materials.

G. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Testing Agency Qualifications: An independent agency, approved by Owner, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

F. Concrete Testing Service: By Contractor. Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Damaged steel reinforcement surfaces will be rejected from the project site.

B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

1.7 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
   1. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301 (ACI 301M).
   2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
   3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

B. Hot-Weather Placement: Comply with ACI 301 (ACI 301M) and as follows:
   1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
   2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
   1. ACI 301 (ACI 301M).
   2. ACI 117 (ACI 117M).

2.2 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
   1. Plywood, metal, or other approved panel materials.
   2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
      a. High-density overlay, Class 1 or better.
      b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
      c. Structural 1, B-B or better; mill oiled and edge sealed.
      d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.
   3. Overlaid Finnish birch plywood.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

D. Pan-Type Forms: Glass-fiber-reinforced plastic or formed steel, stiffened to resist plastic concrete loads without detrimental deformation.

E. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.

F. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch minimum.

G. Rustication Strips: Wood, metal, PVC, or rubber strips for ease of form removal.

H. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
   1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

I. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
   1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
   2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.
   3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.3 STEEL REINFORCEMENT

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 60 percent.

B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
   1. Epoxy-Coated Reinforcing Bars: ASTM A 775/A 775M, epoxy coated, with less than 2 percent damaged coating in each 12-inch bar length.

C. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.

D. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.

E. Deformed-Steel Welded Wire Reinforcement: ASTM A 497/A 497M, flat sheet.

F. Galvanized-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from galvanized-steel wire into flat sheets.

G. Epoxy-Coated Welded Wire Reinforcement: ASTM A 884/A 884M, Class A coated, Type 1, deformed steel.

H. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice.

2.4 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.

B. Epoxy-Coated Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, ASTM A 775/A 775M epoxy coated.

C. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating; compatible with epoxy coating on reinforcement and complying with ASTM A 775/A 775M.

D. Zinc Repair Material: ASTM A 780/A 780M.

E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
3. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.

2.5 CONCRETE MATERIALS

A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

B. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
1. Portland Cement: ASTM C 150, Type I (min. 6 sacks per cu. yd. for 4,000 psi conc.) Supplement with the following:
   a. Fly Ash: ASTM C 618, Class C.
   b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
2. Blended Hydraulic Cement: ASTM C 595, Type IS, portland blast-furnace slag cement.

C. Normal-Weight Aggregates: ASTM C 33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
1. Maximum Coarse-Aggregate Size: 1 inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

D. Lightweight Aggregate: ASTM C 330, 3/4-inchnominal maximum aggregate size.

E. Water: ASTM C 94/C 94M and potable.

F. Air-Entraining Admixture: ASTM C 260.

G. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

H. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C 494/C 494M, Type C.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Boral Material Technologies, Inc.; Boral BCN
      b. Euclid Chemical Company (The); and RPM company; Eucon CIA.
      c. Grace Construction Products, W. R. Grace & Co.; DCI.
      d. Sika Corporation; Sika CNI.

2.6 WATERSTOPS

A. Self-Expanding Rubber Strip Waterstops: Manufactured rectangular or trapezoidal strip, bentonite-free hydrophilic polymer modified chloroprene rubber, for adhesive bonding to concrete, 3/8 by 3/4 inch.

2.7 VAPOR RETARDERS

A. Plastic Vapor Retarder: ASTM E 1745, Class C. Include manufacturer's recommended adhesive or pressure-sensitive tape.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Fortifiber Corporation; Moistop Plus.
      b. Raven Industries Inc.; Dura Skrim 8.
      c. Reef Industries, Inc.; Griffolyn Type- 85.
      d. Stego Industries, LLC; Stego Wrap, 10 mils.

B. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D 448, Size 57, with 100 percent passing a 1-1/2-inchsieve and 0 to 5 percent passing a No. 8sieve.

C. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a 3/8-inchsieve, 10 to 30 percent passing a No. 100 sieve, and at least 5 percent passing No. 200 sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates.

2.8 FLOOR AND SLAB TREATMENTS

A. Slip-Resistive Emery Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive, crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials with 100 percent passing a No. 4sieve.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Anti-Hydro International, Inc.; Emery.
      b. Lambert Corporation; EMAG-20.
      c. Metalcrete Industries; Metco Anti-Skid Aggregate.

B. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. ChemMasters; Chemisil Plus.
      b. Euclid Chemical Company (The), an RPM company; Euco Diamond Hard.
      c. Metalcrete Industries; Floorsaver.

2.9 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Axim Italcementi Group, Inc.; CATEXOL CimFilm.
      b. ChemMasters; SprayFilm.
      c. Euclid Chemical Company (The), an RPM company; Eucobar.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
      b. ChemMasters; Safe-Cure Clear.
      c. Euclid Chemical Company (The), an RPM company; Kurez W VOX; TAMMSCURE WB 30C.

F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, nondissipating.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Anti-Hydro International, Inc.; AH Clear Cure WB.
      b. ChemMasters; Safe-Cure & Seal 20.
      c. Euclid Chemical Company (The), an RPM company; Aqua Cure VOX; Clearseal WB 150.

G. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, 18 to 25 percent solids, nondissipating.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. ChemMasters; Safe-Cure Clear.
      b. Dayton Superior Corporation; Safe Cure and Seal (J-19).
      c. Euclid Chemical Company (The), an RPM company; Diamond Clear VOX; Clearseal WB STD.

H. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. ChemMasters; Spray-Cure & Seal Plus.
      b. Euclid Chemical Company (The), an RPM company; Super Diamond Clear; LusterSeal 300.
      c. Metalcrete Industries; Seal N Kure 30.

I. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. ChemMasters; Polyseal WB.
      b. Euclid Chemical Company (The), an RPM company; Super Diamond Clear VOX; LusterSeal WB 300.
      c. Meadows, W. R., Inc.; Vocomp-30.

d. Metalcrete Industries; Metcure 30.

2.10 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 per ASTM D 2240.

C. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
   1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.11 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inchand that can be feathered at edges to match adjacent floor elevations.
   1. Cement Binder: ASTM C 150, Portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
   2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
   3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
   4. Compressive Strength: Not less than 4000 psiat 28 days when tested according to ASTM C 109/C 109M.

2.12 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
   1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
   1. Fly Ash: 25 percent.
   2. Combined Fly Ash and Pozzolan: 25 percent.
   3. Ground Granulated Blast-Furnace Slag: 50 percent.
   4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
   5. Silica Fume: 10 percent.
   6. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
   7. Combined Fly Ash or Pozzolans, Ground Granulated Blast-Furnace Slag, and Silica Fume: 50 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

C. Water-soluble chlorides are <u>not</u> permitted.

D. Admixtures: Use admixtures according to manufacturer's written instructions.
   1. Use water-reducing admixture in concrete, as required, for placement and workability.
   2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
   3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
   4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.13 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Footings and Slabs: Proportion normal-weight concrete mixture as follows:
   1. Minimum Compressive Strength: 4000 psi at 28 days.
   2. Maximum Water-Cementitious Materials Ratio: 0.46.
   3. Slump Limit: 4 inches plus or minus 1 inch.
   4. Air Content: 5 percent, plus or minus 1.0 percent at point of delivery for 1-1/2-inchnominal maximum aggregate size. Do not allow air content of troweled finished floors to exceed 3 percent.

B. Grade Beam: Proportion normal-weight concrete mixture as follows:
   1. Minimum Compressive Strength: 4500 psi at 28 days.
   2. Maximum Water-Cementitious Materials Ratio: 0.46.
   3. Slump Limit: 4 inches high-range water-reducing admixture or plasticizing admixture the slump can be increased to 8 inches.
   4. Air Content: 5 percent, plus or minus 1.0 percent at point of delivery for 1-1/2-inchnominal maximum aggregate size.
   5. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 1-inch3/4-inchnominal maximum aggregate size.

2.14 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.15 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M, and furnish batch ticket information.
   1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
   1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
   2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd.
   3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
   1. Class B, 1/4 inchClass C, 1/2 inchClass D, 1 inchfor rough-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
   1. Install keyways, reglets, recesses, and the like, for easy removal.
   2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete. Do not chamfer exposed concrete below brick veneer.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.3 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.
   1. Leave formwork for grade beam slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
   2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 VAPOR RETARDERS

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
   1. Lap joints 6 inches and seal with manufacturer's recommended tape.

B. Bituminous Vapor Retarders: Place, protect, and repair bituminous vapor retarder according to manufacturer's written instructions.

C. Granular Course: Cover vapor retarder with granular fill, moisten, and compact with mechanical equipment to elevation tolerances of plus or minus 3/4 inch.
   1. Place and compact a 1/2-inch-thick layer of fine-graded granular material over granular fill.

3.5 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
   1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
   1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.6 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
   1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
   2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
   3. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
   4. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
   5. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
   6. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
   1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
   2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
   1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
   2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Division 07 Section "Joint Sealants," are indicated.
   3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.7 WATERSTOP INSTALLATION

A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.

B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.8 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Engineer.

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
   1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
   1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
   2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
   3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
   1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
   2. Maintain reinforcement in position on chairs during concrete placement.
   3. Screed slab surfaces with a straightedge and strike off to correct elevations.
   4. Slope surfaces uniformly to drains where required.
   5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
   1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
   2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
   3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

G. Hot-Weather Placement: Comply with ACI 301 and as follows:
   1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
   2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.9 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
   1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with minimal seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
   1. Apply to concrete surfaces exposed to public view.

3.10 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Re-straighten, cut down high spots, and fill low spots. Repeat float passes and re-straightening until surface is left with a uniform, smooth, granular texture.
   1. Apply float finish to surfaces to receive trowel finish and to be covered with fluid-applied or sheet waterproofing.

C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and re-straighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
   1. Apply a trowel finish to surfaces exposed to view.
   2. Finish surfaces to the following tolerances, according to ASTM E 1155, for a randomly trafficked floor surface:
      a. Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.
      b. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.
      c. Specified overall values of flatness, F(F) 30; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 15; for suspended slabs.
      d. Specified overall values of flatness, F(F) 45; and of levelness, F(L) 35; with minimum local values of flatness, F(F) 30; and of levelness, F(L) 24.
   3. Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.-long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/8 inch.

D. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated. While concrete is still plastic, slightly scarify surface with a fine broom.
   1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

E. Broom Finish: Apply a broom finish to exterior concrete pads, and elsewhere as indicated.
   1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Engineer before application.

3.11 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

3.12 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
   1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
      a. Water.
      b. Continuous water-fog spray.
      c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
   2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
      a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
   3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
      a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.13 LIQUID FLOOR TREATMENT APPLICATION

A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.

1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
2. Do not apply to concrete that is less than [**three**] [**seven**] [**14**] [**28**] days' old.
3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.

B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller according to manufacturer's written instructions.

3.14 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
1. Defer joint filling until concrete has aged at least three month(s). Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semi-rigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.15 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Engineer. Remove and replace concrete that cannot be repaired and patched to Engineer's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part Portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
2. Repair defects on surfaces exposed to view by blending white Portland cement and standard Portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before

proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
   1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
   2. After concrete has cured at least 14 days, correct high areas by grinding.
   3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
   4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
   5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
   6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish for blending with adjacent finished concrete. Cure in same manner as adjacent concrete.
   7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Engineer's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.16 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Testing and Inspecting: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

C. Inspections:
   1. Steel reinforcement placement.
   2. Headed bolts and studs.
   3. Verification of use of required design mixture.
   4. Concrete placement, including conveying and depositing.

5. Curing procedures and maintenance of curing temperature.
6. Verification of concrete strength before removal of shores and forms from beams and slabs.

D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
   1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
   2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.
      a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
   3. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
   4. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173/C 173M, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
   5. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
   6. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's placement of each concrete mixture.
   7. Compression Test Specimens: ASTM C 31/C 31M.
      a. Cast and field cure two sets of two standard cylinder specimens for each composite sample.
   8. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
      a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
   9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
   10. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
   11. Test results shall be reported in writing to Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
   12. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as sole basis for approval or rejection of concrete.
   13. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Engineer.
   14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

15. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

E. Measure floor and slab flatness and levelness according to ASTM E 1155 within 48 hours of finishing.

3.17 PROTECTION OF LIQUID FLOOR TREATMENTS

A. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

END OF SECTION 03 30 00

SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Building wires and cables rated 600 V and less.
2. Connectors, splices, and terminations rated 600 V and less.
3. Sleeves and sleeve seals for cables.
4. Division 26 Section "Control Voltage Electrical Power Cables" for cabling used for control circuits.

1.03 DEFINITIONS

A. EPDM: Ethylene-propylene-diene monomer rubber.

B. NBR: Acrylonitrile-butadiene rubber.

1.04 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Qualification Data: For testing agency.

C. Field quality-control test reports.

1.05 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.01 CONDUCTORS AND CABLES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Alcan Products Corporation; Alcan Cable Division.
2. American Insulated Wire Corp.; a Leviton Company.
3. General Cable Corporation.
4. Senator Wire & Cable Company.
5. Southwire Company.
6. Other acceptable manufacturers as approved by the Engineer.

2.02 Aluminum and Copper Conductors

A. Comply with NEMA WC 70/ICEA S-95-658.

B. Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN or XHHW.

2.03 CONNECTORS AND SPLICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AFC Cable Systems, Inc.
2. Hubbell Power Systems, Inc.
3. O-Z/Gedney; EGS Electrical Group LLC.
4. 3M; Electrical Products Division.
5. Tyco Electronics Corp.
6. Other acceptable manufacturers as approved by the Engineer

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

C. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.
1. Material: Tin plated copper.
2. Type: One hole up through 4/0, Two hole for conductors larger, all with long barrels.
3. Termination: Compression

2.04 SLEEVES SEALS

A. See specification 26 05 44 – Sleeves and Sleeve Seals for Electrical raceways and cables.

PART 3 - EXECUTION

3.01 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper; stranded.

B. Branch Circuits: Copper; stranded.

3.02 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Service Entrance: Type XHHW-2, single conductors in raceway.

B. Exposed Feeders: Type XHHW-2, single conductors in raceway.

C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Type XHHW-2, single conductors in raceway.

D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.

E. Exposed Branch Circuits, Including in Crawlspaces: Type XHHW-2, single conductors in raceway.

F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN or XHHW-2, single conductors in raceway.

G. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.

H. Class 1 Control Circuits: Type THHN-THWN or XHHW, in raceway.

I. Class 2 Control Circuits: Type THHN-THWN or XHHW, in raceway or Power-limited tray cable, in raceway.

3.03 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal conduits within the main building in finished walls, ceilings, and floors, unless otherwise indicated. Exterior conduits shall be buried except around areas of concrete tanks.

B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

E. Support cables according to Division 26 Section "Hangers and Supports for Electrical Systems."

F. Identify and color-code conductors and cables according to Division 26 Section "Identification for Electrical Systems."

3.04 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.05 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07 Section "Penetration Firestopping."

B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.

C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

D. Rectangular Sleeve Minimum Metal Thickness:

1. For sleeve rectangle perimeter less than 50 inchesand no side greater than 16 inches thickness shall be 0.052inch
2. For sleeve rectangle perimeter equal to, or greater than, 50 inchesand 1 or more sides equal to, or greater than, 16 inches thickness shall be 0.138inch

E. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.

F. Cut sleeves to length for mounting flush with both wall surfaces.

G. Extend sleeves installed in floors 2 inches above finished floor level.

H. Size pipe sleeves to provide 1/4-inchannular clear space between sleeve and cable unless sleeve seal is to be installed

I. Seal space outside of sleeves with grout for penetrations of concrete and masonry and with approved joint compound for gypsum board assemblies.

J. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and cable, using joint sealant appropriate for size, depth, and location of joint according to Division 07 Section "Joint Sealants."

K. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at cable penetrations. Install sleeves and seal with firestop materials according to Division 07 Section "Penetration Firestopping."

L. Aboveground Exterior-Wall Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Size sleeves to allow for 1-inchannular clear space between pipe and sleeve for installing mechanical sleeve seals.

M. Underground Exterior-Wall Penetrations: Install cast-iron "wall pipes" for sleeves. Size sleeves to allow for 1-inchannular clear space between cable and sleeve for installing mechanical sleeve seals.

3.06 SLEEVE-SEAL INSTALLATION

A. Install to seal underground exterior-wall penetrations.

B. Use type and number of sealing elements recommended by manufacturer for cable material and size. Position cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.07 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Division 07 Section "Penetration Firestopping."

END OF SECTION 26 05 19

SECTION 26 05 23 - CONTROL-VOLTAGE ELECTRICAL POWER CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Low-voltage control cabling.
   2. Control-circuit conductors.
   3. RS-485 cabling.
   4. Identification products.

1.3 DEFINITIONS

A. EMI: Electromagnetic interference.

B. IDC: Insulation displacement connector.

C. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control and signaling power-limited circuits.

D. Open Cabling: Passing telecommunications cabling through open space (e.g., between the studs of a wall cavity).

E. RCDD: Registered Communications Distribution Designer.

F. UTP: Unshielded twisted pair.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Qualification Data: For qualified layout technician, installation supervisor, and field inspector.

C. Source quality-control reports.

D. Field quality-control reports.

E. Maintenance Data: For wire and cable to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Flame-Spread Index: 25 or less.
   2. Smoke-Developed Index: 50 or less.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Test cables upon receipt at Project site.

PART 2 - PRODUCTS

2.1 PATHWAYS

A. Conduit and Boxes: Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems." Flexible metal conduit shall not be used. Sealtight conduit may be used for final connections to devices where flexibility is required.
   1. Outlet boxes shall be no smaller than 2 inches wide, 3 inches high, and 2-1/2 inches deep.

2.2 LOW-VOLTAGE CONTROL CABLE

A. Paired Cable: NFPA 70, Type CMG.
   1. One pair, twisted, No. 16 AWG, stranded (19x29) tinned-copper conductors.
   2. PVC insulation.
   3. Shielded.
   4. PVC jacket.
   5. Flame Resistance: Comply with UL 1581.

B. Paired Cable: NFPA 70, Type CMG.
   1. One pair, twisted, No. 18 AWG, stranded (19x30) tinned-copper conductors.
   2. PVC insulation.
   3. Shielded.
   4. PVC jacket.
   5. Flame Resistance: Comply with UL 1581.

C. Multi-Pair Cable
   1. 1 Pair, 16 AWG
   2. 19x29 Strands
   3. Tinned Copper
   4. Twisted Pair
   5. PE Insulation
   6. PVC Jacket

2.3 RS-485 CABLE

A. Standard Cable: NFPA 70, Type CMG.

   1. Paired, [**one pair**] [**two pairs**], twisted, No. 22 AWG, stranded (7x30) tinned-copper conductors.
   2. PVC insulation.
   3. Unshielded.
   4. PVC jacket.
   5. Flame Resistance: Comply with UL 1685.

B. Plenum-Rated Cable: NFPA 70, Type CMP.

1. Paired, [**one pair**] [**two pairs**], No. 22 AWG, stranded (7x30) tinned-copper conductors.
2. Fluorinated ethylene propylene insulation.
3. Unshielded.
4. Fluorinated ethylene propylene jacket.
5. Flame Resistance: NFPA 262.
   <Double click to insert sustainable design text for lead content.>

2.4 CONTROL-CIRCUIT CONDUCTORS

A. Class 1 Control Circuits: Stranded copper, Type THHN-THWN or Type XHHN, in raceway, complying with UL 83 or UL 44.

B. Class 2 Control Circuits: Stranded copper, Type THHN-THWN, in raceway or Type XHHN, in raceway, complying with UL 83 or UL 44.

C. Class 3 Remote-Control and Signal Circuits: Stranded copper, Type TW or Type TF, complying with UL 83.

2.5 IDENTIFICATION PRODUCTS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Brady Corporation.
2. HellermannTyton.
3. Kroy LLC.
4. Panduit Corp.

B. Comply with UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

C. Comply with requirements in Division 26 Section "Identification for Electrical Systems."

2.6 SOURCE QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to evaluate cables.

B. Cable will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 INSTALLATION OF PATHWAYS

A. Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems" for installation of conduits and wireways.

B. Install manufactured conduit sweeps and long-radius elbows if possible.

C. Pathway Installation in Equipment Rooms:
1. Install metal conduits with grounding bushings and connect with grounding conductor to grounding system.

3.2 INSTALLATION OF CONDUCTORS AND CABLES

A. Comply with NECA 1.

B. General Requirements for Cabling:
   1. Terminate all conductors; no cable shall contain un-terminated elements. Make terminations only at indicated outlets, terminals, and cross-connect and patch panels.
   2. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
   3. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Install lacing bars and distribution spools.
   4. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
   5. Cold-Weather Installation: Bring cable to room temperature before de-reeling. Heat lamps shall not be used for heating.
   6. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.

C. Installation of Control-Circuit Conductors:
   1. Install wiring in raceways. Comply with requirements specified in Division 26 Section "Raceway and Boxes for Electrical Systems."

D. Separation from EMI Sources:
   1. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:
      a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches.
      b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches.
      c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches.
   2. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:
      a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches.
      b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches.
      c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches.
   3. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:
      a. Electrical Equipment Rating Less Than 2 kVA: No requirement.
      b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches.
      c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches.
   4. Separation between Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches.
   5. Separation between Cables and Fluorescent Fixtures: A minimum of 5 inches.

3.3 CONTROL-CIRCUIT CONDUCTORS

A. Minimum Conductor Sizes:
   1. Class 1 remote-control and signal circuits, No 14 AWG.
   2. Class 2 low-energy, remote-control, and signal circuits, No. 16 AWG.
   3. Class 3 low-energy, remote-control, alarm, and signal circuits, No 12 AWG.

3.4 GROUNDING

A. For low-voltage wiring and cabling, comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems."

3.5 IDENTIFICATION

A. Identify system components, wiring, and cabling according to TIA/EIA-606-A. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections.

C. Tests and Inspections:
   1. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.

D. Document data for each measurement. Print data for submittals in a summary report that is formatted using Table 10.1 in BICSI TDMM as a guide, or transfer the data from the instrument to the computer, save as text files, print, and submit.

E. End-to-end cabling will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

END OF SECTION 26 05 23

SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes grounding and bonding systems and equipment.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency and testing agency's field supervisor.

B. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: Certified by NETA.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:
   1. Stranded Conductors: ASTM B 8.
   2. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.

3. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

2.3 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

C. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

D. Beam Clamps: Mechanical type, terminal, ground wire access from four directions, with dual, tin-plated or silicon bronze bolts.

E. Cable-to-Cable Connectors: Compression type, copper or copper alloy.

F. Conduit Hubs: Mechanical type, terminal with threaded hub.

G. Straps: Solid copper, copper lugs. Rated for 600 A.

H. Tower Ground Clamps: Mechanical type, copper or copper alloy, terminal two-piece clamp.

I. U-Bolt Clamps: Mechanical type, copper or copper alloy, terminal listed for direct burial.

2.4 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel; 5/8 by 96 inches.

B. Ground Plates: 1/4 inch thick, hot-dip galvanized.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

B. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Connections to Structural Steel: Welded connectors.

3.2 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:

1. Feeders and branch circuits.
2. Three-phase motor and appliance branch circuits.
3. Flexible raceway runs.

3.3 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

B. Tests and Inspections:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.

C. Grounding system will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

E. Report measured ground resistances that exceed the following values:

1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
4. Power Distribution Units or Panelboards Serving Electronic Equipment: 1 ohm(s).
5. Substations and Pad-Mounted Equipment: 5 ohms.

F. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 26 05 26

SECTION 26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Hangers and supports for electrical equipment and systems.

1.03 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. IMC: Intermediate metal conduit.

C. RMC: Rigid metal conduit.

1.04 PERFORMANCE REQUIREMENTS

A. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.

B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

C. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of three times the applied force.

1.05 SUBMITTALS

A. Product Data: For the following:

1. Steel support systems.
2. Nonmetallic support systems.

B. Shop Drawings: Show fabrication and installation details and include calculations for the following:

1. Conduit hangers.

2. Trapeze hangers. Include Product Data for components.

3. Steel slotted channel systems. Include Product Data for components.
4. Nonmetallic slotted channel systems. Include Product Data for components.
5. Equipment supports.

1.06 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.01 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Allied Tube & Conduit.
b. Cooper B-Line, Inc.; a division of Cooper Industries.
c. ERICO International Corporation.
d. GS Metals Corp.
e. Thomas & Betts Corporation.
f. Unistrut; Tyco International, Ltd.
g. Wesanco, Inc.

2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
3. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
4. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
5. Channel Dimensions: Selected for applicable load criteria.

B. Nonmetallic Slotted Support Systems: Structural-grade, factory-formed, glass-fiber-resin channels and angles with 9/16-inchdiameter holes at a maximum of 8 inches o.c., in at least 1 surface.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Allied Tube & Conduit.
b. Cooper B-Line, Inc.; a division of Cooper Industries.
c. Fabco Plastics Wholesale Limited.
d. Seasafe, Inc.

2. Fittings and Accessories: Products of channel and angle manufacturer and designed for use with those items.
3. Fitting and Accessory Materials: Same as channels and angles, except metal items may be stainless steel.
4. Rated Strength: Selected to suit applicable load criteria.

C. Raceway and Cable Supports: As described in NECA 1 and NECA 101.

D. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

E. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

F. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; hot dip galvanized.

G. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.

    a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

        1) Hilti Inc.
        2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
        3) MKT Fastening, LLC.
        4) Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.

2. Mechanical-Expansion Anchors: Insert-wedge-type, stainless steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.

    a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

        1) Cooper B-Line, Inc.; a division of Cooper Industries.
        2) Empire Tool and Manufacturing Co., Inc.
        3) Hilti Inc.
        4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
        5) MKT Fastening, LLC.

3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
6. Toggle Bolts: All-steel springhead type.
7. Hanger Rods: Threaded steel.

2.02 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

PART 3 - EXECUTION

3.01 APPLICATION

A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.

B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4-inchin diameter.

C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.

1. Secure raceways and cables to these supports with two-bolt conduit clamps.

D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inchand smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

3.02 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.

C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lbs

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to concrete inserts.
3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. To Existing Concrete: Expansion anchor fasteners.
5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
6. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts or Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69 or Spring-tension clamps.
7. To Light Steel: Sheet metal screws.
8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panel boards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.

E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.03 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Comply with installation requirements in Division 05 Section "Metal Fabrications" for site-fabricated metal supports.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

C. Field Welding: Comply with AWS D1.1/D1.1M.

3.04 CONCRETE BASES

A. Construct concrete bases of dimensions indicated but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.

B. Use 3000-psi 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Division 03 Section "Cast-in-Place Concrete."

C. Anchor equipment to concrete base.

1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor bolts to elevations required for proper attachment to supported equipment.
3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.05 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils

B. Touchup: Comply with requirements in Division 09 painting Sections for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.

C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 26 05 29

SECTION 26 05 33 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

1.3 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. ENT: Electrical nonmetallic tubing.

C. EPDM: Ethylene-propylene-diene monomer rubber.

D. FMC: Flexible metal conduit.

E. IMC: Intermediate metal conduit.

F. LFMC: Liquidtight flexible metal conduit.

G. LFNC: Liquidtight flexible nonmetallic conduit.

H. NBR: Acrylonitrile-butadiene rubber.

I. RNC: Rigid nonmetallic conduit.

1.4 SUBMITTALS

A. Product Data: For conduit, fittings, boxes, hinged-cover enclosures, and cabinets.

B. Shop Drawings: For the following raceway components. Include plans, elevations, sections, details, and attachments to other work.

1. Custom enclosures and cabinets.

C. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:

1. Structural members in the paths of conduit groups with common supports.
2. Process piping items and structural features in the paths of conduit groups with common supports.

D. Qualification Data: For professional engineer and testing agency.

E. Source quality-control test reports.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AFC Cable Systems, Inc.
2. Alflex Inc.
3. Allied Tube & Conduit; a Tyco International Ltd. Co.
4. Anamet Electrical, Inc.; Anaconda Metal Hose.
5. Electri-Flex Co.
6. Manhattan/CDT/Cole-Flex.
7. Maverick Tube Corporation.
8. O-Z Gedney; a unit of General Signal.
9. Wheatland Tube Company.

B. Rigid Steel Conduit: ANSI C80.1.

C. Aluminum Rigid Conduit: ANSI C80.5.

D. IMC: ANSI C80.6.

E. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit

1. Comply with NEMA RN 1.
2. Coating Thickness: 0.040-inch minimum.

F. EMT: ANSI C80.3.

G. FMC: Zinc-coated steel, Aluminum, Zinc-coated steel or aluminum.

H. LFMC: Flexible steel conduit with PVC jacket.

I. Fittings for Conduit (Including all Types and Flexible and Liquidtight), EMT, and Cable: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.

1. Fittings for EMT: Steel, set-screw type.
2. Coating for Fittings for PVC-Coated Conduit: Minimum thickness, 0.040-inch with overlapping sleeves protecting threaded joints.

J. Joint Compound for Rigid Steel Conduit or IMC: Listed for use in cable connector assemblies, and compounded for use to lubricate and protect threaded raceway joints from corrosion and enhance their conductivity.

2.2 NONMETALLIC CONDUIT AND TUBING

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AFC Cable Systems, Inc.
2. Anamet Electrical, Inc.; Anaconda Metal Hose.
3. Arnco Corporation.
4. CANTEX Inc.
5. CertainTeed Corp.; Pipe & Plastics Group.
6. Condux International, Inc.
7. ElecSYS, Inc.
8. Electri-Flex Co.
9. Lamson & Sessions; Carlon Electrical Products.
10. Manhattan/CDT/Cole-Flex.
11. RACO; a Hubbell Company.
12. Thomas & Betts Corporation.

B. RNC: NEMA TC 2, Type EPC-40-PVC, unless otherwise indicated.

C. Fittings for RNC: NEMA TC 3; match to conduit or tubing type and material.

2.3 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
2. EGS/Appleton Electric.
3. Erickson Electrical Equipment Company.
4. Hoffman.
5. Hubbell Incorporated; Killark Electric Manufacturing Co. Division.
6. O-Z/Gedney; a unit of General Signal.
7. RACO; a Hubbell Company.
8. Robroy Industries, Inc.; Enclosure Division.
9. Scott Fetzer Co.; Adalet Division.
10. Spring City Electrical Manufacturing Company.
11. Thomas & Betts Corporation.
12. Walker Systems, Inc.; Wiremold Company (The).
13. Woodhead, Daniel Company; Woodhead Industries, Inc. Subsidiary.

B. Sheet Metal Outlet and Device Boxes: NEMA OS 1.

C. Cast-Metal Outlet and Device Boxes: NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.

D. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

E. Cast-Metal Access, Pull, and Junction Boxes: NEMA FB 1, galvanized, cast iron with gasketed cover.

F. Hinged-Cover Enclosures: NEMA 250, Type 1 Gasketed, with continuous-hinge cover with flush latch, unless otherwise indicated.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

2. Nonmetallic Enclosures: Plastic.

G. Cabinets:

1. NEMA 250, Type 1 gasketed, galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet where required for freestanding equipment.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Comply with the following indoor applications, unless otherwise indicated:

1. Exposed, dry, Not Subject to Physical Damage: Rigid galvanized steel conduit.
2. Exposed and Subject to Physical Damage: Rigid galvanized steel conduit.
3. Concealed in Ceilings and Interior Walls and Partitions: Rigid steel conduit, IMC, or EMT.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
5. Damp or Wet Locations: PVC coated rigid galvanized steel conduit.
6. Corrosive environment: Use only non-metallic boxes, raceways and fittings EPC-40-PVC, with stainless fasteners.
7. Underground within buildings: Use only EPC-40-PVC.
8. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4X, stainless steel in damp or wet locations.

B. Minimum Raceway Size: 3/4-inchtrade size.

C. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.
2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with that material. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer.

D. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.

E. Do not install aluminum conduits in contact with concrete.

3.2 INSTALLATION

A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.

B. Install conduit parallel or perpendicular to building structural members. Raceways above radius corridors shall follow the path of the corridor.

C. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

D. Complete raceway installation before starting conductor installation.

E. Support raceways as specified in Division 26 Section "Hangers and Supports for Electrical Systems."

F. Install no more than the equivalent of three 90-degree bends in any conduit run except for communications conduits, for which fewer bends are allowed.

G. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

H. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.

I. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where otherwise required by NFPA 70.
3. Retain paragraph and subparagraphs below unless locations for expansion fittings for PVC conduits are indicated on Drawings.

4. Install fitting(s) that provide expansion and contraction for at least 0.00041-inch per foot of length of straight run per degree F of temperature change.
5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at the time of installation.

J. Flexible Conduit Connections: Use maximum of 72 inches of flexible conduit for recessed and semi-recessed lighting fixtures, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

1. Use LFMC in damp or wet locations subject to severe physical damage.
2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.

3.3 PROTECTION

A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 26 05 33

SECTION 26 05 43 - UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Rigid nonmetallic duct.
   2. Flexible nonmetallic duct.

1.3 DEFINITIONS

A. Direct Buried: Duct or a duct bank that is buried in the ground, without any additional casing materials such as concrete.

B. Duct: A single duct or multiple ducts. Duct may be either installed singly or as component of a duct bank.

C. GRC: Galvanized rigid (steel) conduit.

D. Trafficways: Locations where vehicular or pedestrian traffic is a normal course of events.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include duct, conduits, and their accessories, including elbows, end bells, bends, fittings, and solvent cement.
   2. Include underground-line warning tape.

B. Shop Drawings:

   1. Precast or Factory-Fabricated Underground Utility Structures:

      a. Include plans, elevations, sections, details, attachments to other work, and accessories.
      b. Include duct entry provisions, including locations and duct sizes.
      c. Include reinforcement details.
      d. Include grounding details.
      e. Include joint details.

   2. Factory-Fabricated Handholes and Boxes Other Than Precast Concrete:
      a. Include duct entry provisions, including locations and duct sizes.

b. Include cover design.
c. Include grounding details.

1.5 INFORMATIONAL SUBMITTALS

A. Product Certificates: For concrete and steel used in precast concrete handholes, as required by ASTM C 858.

B. Source quality-control reports.

C. Field quality-control reports.

1.6 FIELD CONDITIONS

A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions, and then only after arranging to provide temporary electrical service according to requirements indicated:

1. Notify Engineer and Owner no fewer than five days in advance of proposed interruption of electrical service.
2. Do not proceed with interruption of electrical service without Engineer's and Owner's written permission.

B. Ground Water: Assume ground-water level is 36 inches below ground surface unless a higher water table is noted on Drawings.

PART 2 - PRODUCTS

2.1 RIGID NONMETALLIC DUCT

A. Underground Plastic Utilities Duct: Type EPC-40-PVC RNC, complying with NEMA TC 2 and UL 651, with matching fittings complying with NEMA TC 3 by same manufacturer as duct.

B. Listed and labeled as defined in NFPA 70, by a nationally recognized testing laboratory, and marked for intended location and application.

C. Solvents and Adhesives: As recommended by conduit manufacturer.

2.2 FLEXIBLE NONMETALLIC DUCTS

A. HDPE Duct: Type EPEC-40 HDPE, complying with NEMA TC 7 and UL 651A.
1. Listed and labeled as defined in NFPA 70, by a nationally recognized testing laboratory, and marked for intended location and application.

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate layout and installation of duct, duct bank, manholes, handholes, and boxes with final arrangement of other utilities, site grading, surface features as determined in the field with the owner. Notify Engineer if there is a conflict between areas of excavation and existing structures or archaeological sites to remain.

B. Clear and grub vegetation to be removed, and protect vegetation to remain according to Section 31 10 00 "Site Clearing." Remove and stockpile topsoil for reapplication according to Section 31 10 00 "Site Clearing."

3.2 UNDERGROUND DUCT APPLICATION

A. Stub-ups: EPC-40-PVC RNC, bellow grade, transitioned to rigid galvanized steel above grade.

3.3 UNDERGROUND ENCLOSURE APPLICATION

A. Handholes and Boxes for 600 V and Less:

1. Units in Roadways and Other Deliberate Traffic Paths: Precast concrete. AASHTO HB 17, H-20 structural load rating.
2. Units in Driveway, Parking Lot, and Off-Roadway Locations, Subject to Occasional, Nondeliberate Loading by Heavy Vehicles: Polymer concrete, Tier 15 structural load rating.
3. Cover design load shall not exceed the design load of the handhole or box.

3.4 EARTHWORK

A. Excavation and Backfill: Comply with Section 31 20 00 "Earth Moving," but do not use heavy-duty, hydraulic-operated, compaction equipment.

B. Restoration: Replace area after construction vehicle traffic in immediate area is complete.

C. Restore surface features at areas disturbed by excavation, and re-establish original grades unless otherwise indicated. Replace removed sod immediately after backfilling is completed.

3.5 DUCT AND DUCT-BANK INSTALLATION

A. Sealing: Provide temporary closure at terminations of duct with pulled cables. Seal spare duct at terminations. Use sealing compound and plugs to withstand at least 15-psig hydrostatic pressure.

B. Pulling Cord: Install 200-lbf-test nylon cord in empty ducts.

C. Direct-Buried Duct and Duct Bank:
1. Where open cut trenching is approved, the following requirements apply.

a. Excavate trench bottom to provide firm and uniform support for duct. Comply with requirements in Section 31 20 00 "Earth Moving" for preparation of trench bottoms for pipes less than 6 inches in nominal diameter.
b. Width: Excavate trench a maximum of 12” wide.
c. Depth: Install top of duct at least 36 inches below finished grade unless otherwise indicated.
d. Install duct with a minimum of 3 inches between ducts for like services and 6 inches between power and communications duct.

2. Elbows: Install manufactured duct elbows for stub-ups, at building entrances, and at changes of direction in duct direction unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.

a. Couple RNC duct to GRC with adapters designed for this purpose, and encase coupling with 3 inches of concrete.
b. Stub-ups to Outdoor Equipment: Extend concrete-encased GRC horizontally a minimum of 60 inches from edge of base. Install insulated grounding bushings on terminations at equipment.

1) Stub-ups shall be flush with finished floor and minimum 3 inches from conduit side to edge of slab.

D. Underground-Line Warning Tape: Bury nonconducting underground line specified in Section 26 05 53 "Identification for Electrical Systems" no less than 12 inches above all concrete-encased duct and duct banks and approximately 12 inches below grade. Align tape parallel to and within 3 inches of centerline of duct bank. Provide an additional warning tape for each 12-inch increment of duct-bank width over a nominal 18 inches. Space additional tapes 12 inches apart, horizontally.

3.6 INSTALLATION OF HANDHOLES AND BOXES OTHER THAN PRECAST CONCRETE

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting duct, to minimize bends and deflections required for proper entrances. Use box extension if required to match depths of duct, and seal joint between box and extension as recommended by manufacturer.

B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.

C. Elevation: In paved areas and trafficways, set cover flush with finished grade. Set covers of other hand holes 1 inch above finished grade.

D. Install hand holes and boxes with bottom below frost line, 42” below grade.

E. Field cut openings for duct according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.7 GROUNDING

A. Ground underground ducts and utility structures according to Section 26 05 26 "Grounding and Bonding for Electrical Systems."

3.8 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Demonstrate capability and compliance with requirements on completion of installation of underground duct, duct bank, and utility structures.

B. Correct deficiencies and retest as specified above to demonstrate compliance.

C. Prepare test and inspection reports.

3.9 CLEANING

A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of duct until duct cleaner indicates that duct is clear of dirt and debris. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.

END OF SECTION 26 05 43

SECTION 26 05 44 - SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
2. Sleeve-seal systems.
3. Sleeve-seal fittings.
4. Grout.
5. Silicone sealants.

B. Related Requirements:

1. Section 07 84 13 "Penetration Firestopping" for penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 SLEEVES

A. Wall Sleeves:

1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.

B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inchminimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

C. Sleeves for Rectangular Openings:

1. Material: Galvanized sheet steel.
2. Minimum Metal Thickness:

a. For sleeve cross-section rectangle perimeter less than 50 inches and with no side larger than 16 inches thickness shall be 0.052 inch
b. For sleeve cross-section rectangle perimeter 50 inches or more and one or more sides larger than 16 inches thickness shall be 0.138 inch

2.2 SLEEVE-SEAL SYSTEMS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Advance Products & Systems, Inc.
b. CALPICO, Inc.
c. Metraflex Company (The).
d. Pipeline Seal and Insulator, Inc.
e. Proco Products, Inc.

2. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
3. Pressure Plates: Carbon steel.
4. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements.

2.3 SLEEVE-SEAL FITTINGS

A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Presealed Systems.

2.4 GROUT

A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.

B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

C. Design Mix: 5000-psi 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

2.5 SILICONE SEALANTS

A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.

B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

A. Comply with NECA 1.

B. Comply with NEMA VE 2 for cable tray and cable penetrations.

C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:

1. Interior Penetrations of Non-Fire-Rated Walls and Floors:

    a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 07 92 00 "Joint Sealants."
    b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.

2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
3. Size pipe sleeves to provide 1/4-inchannular clear space between sleeve and raceway or cable unless sleeve seal is to be installed.
4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches above finished floor level. Install sleeves during erection of floors.

D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:

1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.

E. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inchannular clear space between pipe and sleeve for installing mechanical sleeve seals.

F. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inchannular clear space between raceway or cable and sleeve for installing sleeve-seal system.

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.

B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.3 SLEEVE-SEAL-FITTING INSTALLATION

A. Install sleeve-seal fittings in new walls and slabs as they are constructed.

B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.

C. Secure nailing flanges to concrete forms.

D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION 26 05 44

SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:

1. Identification for raceways.
2. Identification of power and control cables.
3. Identification for conductors.
4. Warning labels and signs.
5. Instruction signs.
6. Equipment identification labels.
7. Miscellaneous identification products.

1.03 SUBMITTALS

A. Product Data: For each electrical identification product indicated.

B. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.

1.04 QUALITY ASSURANCE

A. Comply with ANSI A13.1 and IEEE C2.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

D. Comply with ANSI Z535.4 for safety signs and labels.

E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

1.05 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.01 POWER RACEWAY IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.

B. Colors for Raceways Carrying Circuits at 600 V or Less:

1. Black letters on an orange field.
2. Legend: Indicate voltage and system or service type.

C. Self-Adhesive Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

D. Metal Tags: Brass or aluminum, 2 by 2 by 0.05-inch with stamped legend, punched for use with self-locking cable tie fastener.

E. Write-On Tags: Polyester tag, 0.015-inchthick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.

1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
2. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.02 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

2.03 CONDUCTOR IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.

B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

C. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

D. Write-On Tags: Polyester tag, 0.015-inchthick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.

1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
2. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.04 FLOOR MARKING TAPE

A. 2-inchwide, 5-milpressure-sensitive vinyl tape, with black and white stripes and clear vinyl overlay.

2.05 WARNING LABELS AND SIGNS

A. Comply with NFPA 70 and 29 CFR 1910.145.

B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.

C. Baked-Enamel Warning Signs:

1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
2. 1/4-inchgrommets in corners for mounting.

3. Nominal size, 7 by 10 inches

D. Metal-Backed, Butyrate Warning Signs:

1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inchgalvanized-steel backing; and with colors, legend, and size required for application.
2. 1/4-inchgrommets in corners for mounting.

3. Nominal size, 10 by 14 inches

E. Warning label and sign shall include, but are not limited to, the following legends:

1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES"

2.06 INSTRUCTION SIGNS

A. Engraved, laminated acrylic or melamine plastic, minimum 1/16-inchthick for signs up to 20 sq. inches and 1/8-inchthick for larger sizes.

1. Engraved legend with black letters on white face.

2. Punched or drilled for mechanical fasteners.
3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

B. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8-inch

C. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8-inch Overlay shall provide a weatherproof and UV-resistant seal for label.

2.07 EQUIPMENT IDENTIFICATION LABELS

A. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8-inch

B. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8-inch Overlay shall provide a weatherproof and UV-resistant seal for label.

C. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8-inch

D. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be-3/8-inch

2.08 CABLE TIES

A. General-Purpose Cable Ties: Fungus inert, self extinguishing, one piece, self locking, Type 6/6 nylon.

1. Minimum Width: 3/16-inch
2. Tensile Strength at 73 degree F According to ASTM D 638: 12,000 psi
3. Temperature Range: Minus 40 to plus 185 degree F
4. Color: Black except where used for color-coding.

B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self extinguishing, one piece, self locking, Type 6/6 nylon.

1. Minimum Width: 3/16-inch
2. Tensile Strength at 73 degree F According to ASTM D 638: 12,000 psi
3. Temperature Range: Minus 40 to plus 185 degree F
4. Color: Black.

C. Plenum-Rated Cable Ties: Self extinguishing, UV stabilized, one piece, self locking.

1. Minimum Width: 3/16-inch
2. Tensile Strength at 73 degree F According to ASTM D 638: 7000 psi
3. UL 94 Flame Rating: 94V-0.
4. Temperature Range: Minus 50 to plus 284 degree F
5. Color: Black.

2.09 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in Division 09 painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

E. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.

F. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-footmaximum intervals in straight runs, and at 25-footmaximum intervals in congested areas.

G. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.

H. Cable Ties: For attaching tags. Use general-purpose type.

I. Painted Identification: Comply with requirements in Division 09 painting Sections for surface preparation and paint application.

3.02 IDENTIFICATION SCHEDULE

A. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:
   1. Power.
   2. UPS.

B. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and hand holes, use color-coding conductor tape to identify the phase.

   1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded feeder and branch-circuit conductors.

a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
b. Colors for 208/120-V Circuits:

1) Phase A: Black.
2) Phase B: Red.
3) Phase C: Blue.

c. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

C. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.

D. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.

1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.

E. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated.

F. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels.

1. Comply with 29 CFR 1910.145.
2. Identify system voltage with black letters on an orange background.
3. Apply to exterior of door, cover, or other access.
4. For equipment with multiple power or control sources, apply to door or cover of equipment including, but not limited to, the following:
   a. Controls with external control power connections.

G. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.

H. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:

a. Indoor Equipment: Engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inchhigh letters on 1-1/2-inchhigh label; where two lines of text are required, use labels 2 inches high.

b. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

2. Equipment to Be Labeled:

   a. Enclosures and electrical cabinets.
   b. Automatic transfer switches.
   c. Enclosed switches.
   d. Enclosed controllers.
   e. Push-button stations.
   f. Monitoring and control equipment.

END OF SECTION 26 05 53

SECTION 31 10 00 - SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Protecting existing vegetation to remain.
   2. Removing existing vegetation.
   3. Clearing and grubbing.
   4. Stripping and stockpiling topsoil.
   5. Removing above- and below-grade site improvements.
   6. Disconnecting, capping or sealing, and removing site utilities.
   7. Temporary erosion- and sedimentation-control measures.

B. Related Sections:
   1. Division 01 Section "Temporary Facilities and Controls" for temporary utility services, construction and support facilities, security and protection facilities, and temporary erosion- and sedimentation-control measures.
   2. Division 01 Section "Execution" for field engineering and surveying.
   3. Division 02 Section “Structure Demolition” for demolition of buildings, structures, and site improvements.

1.3 DEFINITIONS

A. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

B. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inchesin diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.

D. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and indicated on Drawings and defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated.

E. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 MATERIAL OWNERSHIP

A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 SUBMITTALS

A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
   1. Use sufficiently detailed photographs or videotape.
   2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

B. Shop Drawings:
   1. Plan for removing trees and other large vegetation not explicitly shown or indicated for removal in the Contract Documents.
   2. Plan showing proposed limits of clearing and grubbing, if different from clearing and grubbing limits shown or indicated in the Contract Documents.

C. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
   1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
   2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

C. Utility Locator Service: Notify MISS DIG for area where Project is located before site clearing. Provide a minimum of three full working days advance notification.

D. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.

E. The following practices are prohibited within protection zones, the 100-year floodplain, and surrounding wetlands:
   1. Storage of construction materials, debris, or excavated material.
   2. Parking vehicles or equipment.
   3. Foot traffic.
   4. Erection of sheds or structures.
   5. Impoundment of water.
   6. Excavation or other digging unless otherwise indicated.
   7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

F. Do not direct vehicle or equipment exhaust towards protection zones, the 100-year floodplain, and surrounding wetlands.

G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones, the 100-year floodplain, and surrounding wetlands.

H. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Division 31 Section "Excavation and Fill."
   1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

A. Provide flagging to delineate limits of areas to be cleared or grubbed. Review at site with Engineer before commencing removal of trees, vegetation, and other materials to be removed.

B. Replace flagging that is lost, removed, or destroyed, until clearing and grubbing work is complete and Engineer allows removal of flagging.

C. Protect and maintain benchmarks and survey control points from disturbance during construction.

D. Locate and clearly identify trees, shrubs, and other vegetation to remain. Wrap a 1-inchlue vinyl tie tape flag around each tree trunk at 54 inches above the ground.

E. Protect existing site improvements to remain from damage during construction. Existing site improvements include, but are not limited to, streets, driveways, structures, underground facilities to remain, adjacent property, and structures.
   1. Restore damaged improvements to their original condition, as acceptable to Owner.

F. Identify a salvage area for placing removed materials.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones, the 100-year floodplain, and surrounding wetlands.

C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 TREE AND PLANT PROTECTION

A. General: Protect trees and plants remaining on-site according to requirements in Division 01 Section "Temporary Tree and Plant Protection."

B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Engineer. Trees and shrubs intended to remain, that are damaged beyond repair or that are removed, shall be replaced by Contractor at no additional cost to Owner.

3.4 EXISTING UTILITIES

A. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.
   1. Coordinate with utility owners as required for shutting off service.

B. Locate, identify, and disconnect utilities indicated to be abandoned in place.
   1. Coordinate with utility owners as required for shutting off service.

C. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
   1. Notify Engineer not less than five days in advance of proposed utility interruptions.
   2. Do not proceed with utility interruptions without Engineer's written permission.

D. Excavate for and remove underground utilities indicated to be removed after Engineer's permission has been obtained. Notify property owners and residents of proposed interruption schedule two days in advance of interruption.

3.5 CLEARING AND GRUBBING

A. Prior to the start of construction, the Contractor shall verify the limits of trees and other items that are to be saved. The Contractor shall then clear the site or trench excavation area of all remaining trees, brush, and other miscellaneous items that are not to be saved.

B. Remove obstructions, trees (including stump and main roots), shrubs, and other vegetation to permit installation of new construction.
   1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
   2. Grind down stumps and remove roots, obstructions, and debris to a depth of 18 inches below exposed subgrade.
   3. Use only hand methods for grubbing within protection zones.
   4. Chip removed tree branches.
   5. Dispose of all trees, shrubs, stumps, root, and all associated foliage and debris offsite.
   6. Trees less than six (6) inch diameter shall be removed where required by the work as incidental to the Contract.
   7. The Contractor shall abide by any easement agreements regarding the tree removal work and wood ownership.
   8. Clear undergrowth and deadwood without disturbing subsoil.
   9. Do not use cleared or grubbed materials as fill, backfill, or in embankments.

C. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
   1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches and compact each layer to a density equal to adjacent original ground.

D. Stump Removal: Where called for on the plans, the Contractor shall remove existing stumps, including main roots (two (2) inch diameter and larger), dispose of all associated debris offsite, and backfill the void with suitable material.

3.6 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to depth indicated on drawing in a manner to prevent intermingling with underlying subsoil or other waste materials.
   1. Remove subsoil and non-soil materials from topsoil, including clay lumps, gravel, and other objects more than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.
   1. Limit height of topsoil stockpiles to 72 inches
   2. Do not stockpile topsoil within protection zones, the 100-year floodplain, and surrounding wetlands.
   3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.
   4. Stockpile surplus topsoil to allow for re-spreading deeper topsoil.

3.7 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
   1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
   2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

C. Remove fencing where removal is designated on the drawings.

3.8 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

B. Do not burn clearing debris at the site, unless approved by Owner and authorities having jurisdiction. If burning is permitted, comply with requirements of authorities having jurisdiction and Owner’s requirements.

END OF SECTION 31 10 00

SECTION 31 20 00 - EARTH MOVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Excavating and filling for rough grading the Site.
   2. Preparing subgrades for slabs-on-grade, walks, pavements, turf and grasses, and plants.
   3. Excavating and backfilling for buildings and structures.
   4. Drainage course for concrete slabs-on-grade.
   5. Subbase course for concrete walks and pavements.
   6. Subbase course and base course for asphalt paving.
   7. Excavating and backfilling trenches for utilities and pits for buried utility structures.
   8. Removal of topsoil and subsoil.
   9. Cutting, grading, filling, compacting and rough contouring the site for structures, walks, pavements, and drainage.

1.2 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
   1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
   2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subbase course and paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
   1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Engineer. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
   2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

J. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

K. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.3 SUBMITTALS

A. Material test reports.
   1. For each borrow soil material proposed for fill and backfill as follows:
      a. Classification according to ASTM D 2487.
      b. Laboratory compaction curve according to ASTM D 698 and ASTM D 1557.

B. Product Data: For each type of the following manufactured products required:
   1. Geotextiles.
   2. Controlled low-strength material, including design mixture.
   3. Geofoam.
   4. Warning tapes and/or tracing wire.

C. Samples for verification: For the following products, in sizes indicated below.
   1. Geotextile: 12-inch by 12-inch.
   2. Warning tapes: 12 inches long; of each color.

D. Qualification Data: For qualified testing agency.

E. Pre-excavation Photographs or Video Recording: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

1.4 FIELD CONDITIONS

A. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth-moving operations.

B. Do not commence earth-moving operations until temporary erosion and sedimentation control measures are in place.

C. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
   1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
   2. Provide alternate routes around closed or obstructed traffic ways if required by owner or authorities having jurisdiction.

D. The following practices are prohibited within protection zones, 100-year floodplain and wetlands:
   1. Storage of construction materials, debris, or excavated material.
   2. Parking vehicles or equipment.
   3. Foot traffic.
   4. Erection of sheds or structures.
   5. Impoundment of water.
   6. Excavation or other digging unless otherwise indicated.
   7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

E. Do not direct vehicle or equipment exhaust towards protection zones, 100-year floodplains, and wetlands.

PART 2 - PRODUCTS

2.1 FILL SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Subsoil Fill:
   1. Excavated and reused material. Local borrow material.
   2. No on-site alluvial deposits or material containing organic matter.
   3. Well-graded throughout to avoid lenses, pickets, streaks, or layers of material differing materially in texture or gradation.
   4. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
   5. Contains no more than 20 percent by weight passing No. 200 sieve.

C. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand

D. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand

E. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand

F. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand
   1. Sand shall be a sharp, clean sand free of lumps of clay or debris with 100 percent passing a 3/8 inch sieve and less than 10% loss by wash.
   2. Granular material shall meet the requirements of:
      a. Granular Material Class II and Class III in accordance with Section 902.7 of the MDOT Standard Specifications for Construction. Only Class II is allowed for trenches.
   3. Pea gravel shall be unwashed and shall be from ¼ inch to 5/8 inch in size.
   4. Bedding material shall be provided from offsite unless the excavation passes through a well-defined stata of sand or gravel. Bedding material shall be subject to the approval of the Engineer.

G. Stone: Stone material shall meet the requirements of:
   1. Coarse Aggregate 6A in accordance with Section 902.03 of the MDOT Standard Specifications for Construction.

H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel;

I. Granular Fill
   1. Granular backfill shall be defined as sharp sand, gravel, or crushed stone that is free from lumps of clay and soft or flaky material and shall conform to the requirements of:
      a. MDOT Standard Specifications for Construction for Granular Material Class II.
   2. Granular backfill shall be used for fill work located under or within the influence of roadway surfaces and structures.

J. Impervious Fill
   1. Clayey gravel and sand mixture capable of compacting to a dense state.

K. Controlled Density Fill
   1. Self-compacted, cementitious fill consisting of cement, fly ash, fine aggregate and water.
   2. Strength: 50 psi minimum compressive strength at 28 days.
   3. Mix design to be reviewed by Engineer.

L. Stone Refill
   1. Stone refill shall consist of natural gravel, or crushed gravel that is equivalent in gradation to MDOT 6A unless otherwise called for on the drawings.

M. Job Excavated Backfill
   1. Material excavated from site that is free from frozen earth, boulders, rocks, stones larger than 3 inches in size, debris, blue and gray clay, and organic material.

N. Topsoil
   1. Excavated and re-used material. Local borrow material.
   2. Graded.
   3. Free of roots, rocks larger than ½ inch, subsoil debris, weeds, and foreign matter.
   4. Contains no greater than 20 percent nor less than 5 percent organic matter.

2.2 ACCESSORIES

A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility; colored to comply with local practice or requirements of authorities having jurisdiction.
   1. Red: electric.
   2. Yellow: gas, oil, steam, and dangerous materials.
   3. Orange: telephone and other communications.
   4. Blue: water systems.
   5. Green: sewer systems.

B. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored to comply with local practice or requirements of authorities having jurisdiction.

C. Trace Wire: Tracing wire shall be provided for all buried process pipe. Trace wire shall be #12 AWG Copper Clad Steel, High Strength with minimum 450 lb. break load, with minimum 30 mil HDPE insulation thickness. Connection is required at all structure penetrations, hydrants, valve boxes and valve wells, with exposed wire above the ground surface or at the interior top of a valve well. Conductivity shall be tested and approved prior to acceptance of the buried pipes. Wire provided shall be of a color as indicated for “Warning Tape” based on the buried service. All splices in the wire shall be made with a gel-cap product such as 3M’s Direct Bury Splice Kit #P054007/09964, which provides a waterproof seal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that survey benchmark and intended elevations for the Work are as indicated.

3.2 PREPARATION

A. Identify required lines, levels, contours and datum.

B. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.

C. Protect plant life, lawns, and other features remaining as a portion of final landscaping. Protect existing trees and shrubs.

D. Protect and maintain erosion and sedimentation controls during earth-moving operations.

E. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

F. In lawn areas and in farm fields, as determined by Engineer, remove and stockpile topsoil for replacement during backfilling.

G. Prior to open trenches entering paved limits of a street, alley, driveway, or parking area, neatly cut the pavement for its full depth, then remove and dispose of off-site.

3.3 PROTECTION, REMOVAL AND REPAIR OF TREES AND SHRUBS

A. Consult with Engineer and obtain permission prior to removal of any tree, shrub, or limb not noted on the Drawings to be removed well in advance of such removals. Such removals outside of property lines, right-of-way or easement limits shall not be performed without written permission of property owner.

B. Fell trees to be removed so as not to injure trees to remain.

C. Remove stumps and roots to a minimum of 18 inches below grade.

D. Take every precaution to prevent damage to trees and shrubs not noted to be removed.

E. Carefully trim and shape trees, tree limbs and bushes located in path of construction so that Contractor’s equipment does no damage to them. Squarely cut all limbs and branches. Replace trees and bushes other than those whose removal is approved by the Engineer, which are destroyed or damaged to the extent that their continued life is impaired.

F. Employ a competent arborist to inspect all trees and shrubs along the line of work and to properly trim, prune, repair, and protect any that have been damaged, and to designate those which have been so damaged as to required replacement.

3.4 REMOVAL OF EXISTING FACILITIES

A. Remove such existing facilities as noted to be removed, and as required to complete abandonment of existing facilities.

B. Owner reserves the right to salvage existing facilities and portions thereof removed. Dispose of all existing facilities and portion thereof removed and not salvaged by Owner.

C. For existing structures not required to be completely removed for proper completion of other work, remove casting, if any, and remove the walls to a point of at least 3'-0" below grade. Provide a minimum 6 inch hole in the bottom of the structure. Removed materials may be used to fill the remaining portion of the structure. Limit size of materials and place so as not to prohibit complete and proper filling as approved by Engineer.

D. Plug existing sewers entering and leaving existing structures to be removed as noted on the Drawings.

3.5 ABANDONMENT OF EXISTING FACILITIES

A. Structures: Remove castings, if any, and remove walls to 3'-0" below grade. Provide a minimum 6 inch diameter hole in the bottom of the structure. Structure shall be abandoned in place by filling with 500 psi flowable fill.

B. Sewers: Abandon existing sewers by plugging the ends in locations noted, or when noted, by filling with flowable fill (grout), and at such time as approved by the Engineer.
   1. Plug the ends of existing sewers with a minimum of 2'-0" of Class II concrete. Or as otherwise approved by the Engineer.
   2. Where noted, fill existing sewers with grout, placed so as to ensure complete filling of the sewer.

C. Water Mains: Abandon existing mains by plugging locations noted on Drawings, and not until the new water mains and services have been successfully tested, accepted and placed in service.
   1. Plug ends of water mains to be abandoned with a minimum of 2'-0" of Class II concrete or as otherwise approved by the Engineer.
   2. Furnish and install a mechanical joint plug on the ends of mains to remain in service, and provide a concrete thrust block where required by the Owner, or joint restraint as required by the Owner's standard water main details.

3.6 PROTECTION OF EXISTING UTILITIES

A. During construction it may be necessary to cross under sewers, drains, culverts, water mains, gas lines, electric conduits and other underground structures. Every effort shall be made to prevent damage to existing utilities and structures. Wherever such utilities or structures are disturbed or broken, they shall be restored to good condition. Specified granular backfill shall be placed as described in following sections. Concrete shall be utilized where directed by the Engineer at no additional cost to the project. Either granular backfill or concrete shall be brought to the spring line of the higher utility.

B. Uncover and determine the elevation, size and materials of existing underground utilities along the route of construction, as shown on Drawings or marked at the time of construction by the utility owner, at least 200 feet in advance of pipe installation.

C. Perform exploratory excavations as needed to locate and expose existing utilities.

D. Adequately support, shore up, or otherwise protect underground utilities whenever exposed in the trench. Extend supports a minimum of 12 inches into undisturbed earth each side of trench. Band or tie utility to bridging for its full length. Where bridging cannot be supported by a firm foundation, provide vertical support, including any lateral bracing necessary to provide firm support.

E. Above ground (aerial) utilities, including power, telephone and cable television, shall remain in service at all times. Any anticipated disruption of service shall be with the full knowledge of the utility company and required advance notice to affected users. Contractor may not remove guy wires and/or restrain utility poles without written approval of the utility owner. Any removal or restraint shall be at the expense of the Contractor.

F. Arbitrary disruption of underground and aerial utility services will not be permitted.

G. If water main is damaged, water main repairs shall be completed by the owner of the water system. Hydrostatic and bacteriological testing may be required before returning the utility to service.

H. Where existing sewers or drains are encountered in the work, adequate provision shall be made for diverting flow in the existing sewers so that the excavation will be kept dry during the progress of the construction work. Upon completion of the construction work, the existing sewers shall be restored or otherwise provided with an adequate outlet as directed by the Engineer

3.7 PAVEMENT CUTS

A. Where a trench must be cut through pavement, driveway, or sidewalk, particular care shall be taken to avoid unnecessary damage to adjoining areas of the pavement, driveway or sidewalk. All cuts through existing surfaces shall be made full-depth with a concrete saw. Cuts in concrete pavement shall be made parallel with longitudinal and transverse construction or contraction joints.

B. Saw cuts in concrete pavement shall not be nearer than five feet (5'-0") to a transverse joint, to the centerline of pavement, or to the edge of pavement or curb, i.e., no existing or replacement pavement shall be less than five feet (5'-0") in width. If the damaged pavement or surfacing is nearer than five feet (5'-0") to a joint or centerline of pavement, or to edge of pavement, surfacing or curb, removal and replacement shall be extended to said joint, centerline, edge of pavement, surfacing, or curb. These same requirements shall apply to the saw cutting and replacement of concrete driveways.

C. If a square or block of sidewalk is cut, broken, or cracked, the entire square or block shall be removed and replaced.

3.8 EXCAVATION, GENERAL

A. Remove and temporarily store topsoil from area of construction, areas to be filled and graded, and other areas designated.

B. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
   1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
   2. Remove rock to lines and grades indicated to permit installation of permanent construction.

C. All excavation shall be made in such a manner and to such depth, length, and width as will give ample room for building the structure, bracing, sheeting, and supporting the sides of the excavation, pumping and drainage of ground water and sewage which may be encountered, and removal of all materials excavated.

D. Special care shall be taken so that the soil below the bottom of structures to be built shall be left undisturbed so that a firm bed will be provided for construction. This could include sheeting, shoring and monitoring existing structures for movement during construction activities. Do not excavate beyond the 45 degree bearing plane of foundations. Any voids shall be backfilled with suitable granular material and shall be properly compacted.

E. Stockpile excavated topsoil and subsoil material classified by Engineer as suitable for further use and remove material classified as unsuitable and material in excess of project requirements.

3.9 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
   1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
   2. Pile Foundations: Stop excavations 6 to 12 inches above bottom of pile cap before piles are placed. After piles have been driven, remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.
   3. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.
   4. If excess excavation is made, or the material becomes disturbed so as to require removal beyond the prescribed limits, the resulting space shall be refilled with bedding, as specified hereinafter, and solidly machine tamped into place to 95 percent of maximum unit weight before the construction work proceeds.

B. Excavations at Edges of Tree- and Plant-Protection Zones:
   1. Excavate by hand or with an air spade to indicated lines, cross sections, elevations, and subgrades. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
   2. Cut and protect roots according to requirements in Section 01 56 39 "Temporary Tree and Plant Protection."

3.10 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.11 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

B. Excavation shall be of sufficient width and depth to provide adequate room for construction and installation of the proposed utilities.

C. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.
   1. Clearance: 12 inches each side of pipe or conduit.

2. If the maximum trench width as specified above is exceeded, unless otherwise shown on the Drawings, the Contractor shall install, at his own expense, such concrete cradling or other bedding as is approved by the Engineer, to support the added load of the backfill.

D. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
   1. Excavate trenches 6 inches deeper than elevation required in rock or clay or other unyielding bearing material to allow for bedding course.
   2. Place and compact bedding material to the underside of the pipe.

E. Bedding
   1. Where the subgrade below the bottom of the pipe is disturbed during the construction, the space shall be refilled with sand or pea gravel bedding material solidly tamped to form a firm foundation for the pipe. Sand or pea gravel bedding material shall be extended to one (1) foot above the pipe, except that the bedding shall be exclusively pea gravel to the springline for pipe 36-inch and greater in diameter.

F. Trenches in Tree- and Plant-Protection Zones:
   1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
   2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
   3. Cut and protect roots according to requirements in Section 01 56 39 "Temporary Tree and Plant Protection."

G. Amount of Trench Opening
   1. Not more than 50 feet of trench shall be open at one time in advance of the pipe unless permitted by the Engineer. The length of a street that may be occupied by the construction work at any one time shall be subject to the direction of the Engineer and will be based on the requirements of the use of the street by the public. No more than 600 consecutive feet of a street length shall be occupied at one time, and vehicle traffic through the street shall not be entirely stopped without permission of the Engineer or agency having jurisdiction. After placement of the utility line, the Contractor shall backfill the trench promptly in order to minimize the length of open trench and avoid any unsafe conditions.

3.12 UTILITY INSTALLATION BY MEANS of TUNNELING UNDER TREES

A. Trees eight (8) inches in diameter or less will require a minimum tunnel length of eight (8) feet. Trees over eight (8) inches in diameter, measured four (4) feet above the ground surface, will require a minimum tunnel length equal to one foot for each inch of tree diameter.

B. Trees shall be tunneled whenever any portion of an excavation approaches within a distance equal to one half of the required tunnel length except as otherwise noted on the plans.

C. Tunneling under trees may be accomplished by one of the following:
   1. Boring and jacking casing pipe along with placement of a carrier pipe.
   2. Boring and jacking of sewer pipe or water main without a casing pipe.
   3. Jacking sewer or water main without boring and without a casing pipe,

D. Drawing notes or existing field conditions shall indicate which method may be used for the tree tunneling work.

3.13 SHEETING, BRACING, SHORING

A. Where required to properly support the surfaces of excavations to protect the construction work, adjacent work, structures, utilities, or workers, sheeting, bracing and shoring shall be provided. If the Engineer is of the opinion that at any point sufficient or proper supports have not been provided, he may order such additional supports at the expense of the Contractor, but neither the placing of such additional supports by the order of the Engineer nor failure of the Engineer to order such additional supports placed shall release the Contractor from his responsibility for the sufficiency of such supports and the integrity of the work. In removing the sheeting and bracing after the construction has been completed, special care shall be taken to prevent any caving of the sides of the excavation and injury to the completed work or to the adjacent property.

B. Sheeting, bracing and shoring shall not be left in place after completion of the work except as required by the Engineer. Where sheeting, bracing, and shoring must be left in place in order to protect the work, adjacent structures, or property, it shall be cut off or left not less than [two (2)] [insert number] feet below the established surface grade. If sheeting, shoring or bracing must be left in place, then it shall be paid for at the contract unit bid price that is shown on the Bid Form. If a pay item was not included on the Bid Form, then a change order shall be negotiated.

3.14 SUBGRADE INSPECTION

A. Notify Engineer when excavations have reached required subgrade. Notify local building department when permit conditions require subgrade inspection prior to construction.

B. If Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes is the Work.

D. Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired dump truck to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer, without additional compensation.

3.15 UNAUTHORIZED EXCAVATION

A. Fill under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Engineer.
   1. Fill over-excavation under other construction, pipe, or conduit as directed by Engineer.

3.16 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Prevent windblown dust.
   1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
   2. Stockpile materials on-site at approved locations and so as not to impede the natural drainage in the area.
   3. Stockpile in sufficient quantities to meet project requirements.
   4. Do not store in protection zones, 100 –year floodplain, or wetlands.

3.17 STOCKPILE CLEANUP

A. Remove stockpiles and leave area in a clean and neat condition. Grade site surface to prevent free-standing surface water. If approval is given by Owner, leave unused materials in a neat, compact stockpile.

B. If a borrow area is indicated, leave area in a clean and neat condition. Grade site surface to prevent free standing water.

3.18 TRANSPORT OF NATIVE MATERIALS OFFSITE

A. If the Contractor encounters good materials (sand, gravel, topsoil, etc.) during the course of construction, he will not be allowed to transport these materials offsite without the written approval of the Owner and the Engineer. Wherever possible, suitable native sands and gravels shall be used as backfill rather than transporting them offsite and replacing them with non-native materials of a lesser quality.

3.19 UTILITY TRENCH BACKFILL

A. In locations where soil at the bottom of the trench is unstable, the Contractor shall excavate (undercut) below the trench bottom and place stone refill.

B. Place and compact backfill in excavations promptly, but not before completing the following:
   1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
   2. Surveying locations of underground utilities for record documents.
   3. Testing and inspection of underground utilities.
   4. Removing concrete formwork.
   5. Removing trash and debris.
   6. Removing temporary shoring and bracing, and sheeting.

C. Place backfill on subgrades free of mud, frost, snow, or ice.

D. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

E. Trenches under Footings: Backfill trenches excavated under footings and within 18 inches of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Section 03 30 00 "Cast-in-Place Concrete."

F. Trenches under paved streets, shoulders, traveled roadways, parking areas, driveways and sidewalks: Backfill with granular backfill, from one (1) foot above top of pipe up to the required subgrade elevation which will allow for placement of the required aggregate base and/or pavement surface.

G. Trenches under the influence of paved streets, shoulders, traveled roadways, parking areas and sidewalks: Provide granular backfill and specified compaction over the entire trench when the edge of trench is within three (3) feet of edge of pavement. On road crossings, specified compaction shall extend ten (10) feet beyond the edge of pavement for paved roadways with gravel shoulders or shall extend three (3) feet beyond the back of curb for roadways with curb.

H. Trenches under Roadways: Provide 4-inch- thick, concrete-base slab support for piping or conduit less than 30 inches below surface of roadways. After installing and testing, completely

encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway subbase course. Concrete is specified in Section 03 30 00 "Cast-in-Place Concrete."

I. Initial Backfill: Place and compact initial backfill of subbase material, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.
   1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

J. Final Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.

K. Warning Tape: Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

L. Trace Wire: Install trace wire where required by the Owner.

M. Wherever gas mains, watermains, sewers, or other utilities are located in the trench area, granular backfill shall be used for backfill from the bottom of the trench up to the springline of the pipes. Granular backfill shall be placed across the full trench width and extend far enough either side of the existing pipe to allow specified compaction so as to thoroughly support the pipe within the trench area.

3.20 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:
   1. Under grass and planted areas, use satisfactory soil material.
   2. Under walks and pavements, use satisfactory soil material.
   3. Under steps and ramps, use engineered fill.
   4. Under building slabs, use engineered fill.
   5. Under footings and foundations, use engineered fill.

3.21 BACKFILL AROUND STRUCTURES

A. Remove forms and debris after concrete structures have set. After the structure has been checked and approved, the excavated area around the structure shall be backfilled up to specified subgrade with granular material or suitable excavated material as called for on the drawings. The fill shall be thoroughly compacted by machine tamping. Do not place backfill around concrete structures until the concrete has attained at least 75% of its design strength and approval of the Engineer has been obtained.

3.22 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
   1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
   2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.23 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 12 inches in loose depth for material compacted by heavy compaction equipment and not more than 12 inches in loose depth for material compacted by hand-operated tampers. Compact to 95% of density at optimum moisture.

B. Compaction shall be obtained with the use of a bulldozer, sheepsfoot roller, mechanical tamper or other similar and effective equipment.

C. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.

D. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698 Standard Proctor :
   1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
   2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 95 percent.
   3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 90 percent.
   4. For utility trenches, compact each layer of initial and final backfill soil material at 95 percent.

3.24 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
   1. Provide a smooth transition between adjacent existing grades and new grades.
   2. Cut out soft spots, fill low spots, and trim high spot to comply with required surface tolerances.
   3. Slope away from building at a minimum of 2 inches in 10 feet, unless otherwise noted.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:
   1. Turf or Unpaved Areas: Plus or minus 1 inch.
   2. Walks: Plus or minus 1 inch.
   3. Pavements: Plus or minus 1/2 inch.

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

D. Final Cleanup and Grading: Upon completion of the construction, and before final payment is made, the Contractor shall restore his working area to as clean a condition as existed before his operations were started. He shall go over the entire line and refill any place that may have settled. He shall then re-grade and put in shape all backfilled trenches, all fills he may have made from excess excavated materials, and all other areas that may have been disturbed through all operations.

3.25 SUBSURFACE DRAINAGE

A. Subdrainage Pipe: As specified on drawings or per Owner standard.

B. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 6-inch course of filter material on subsurface drainage geotextile to support

subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches of filter material, placed in compacted layers 6 inches thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 6 inches

C. Drainage Backfill: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a course of filter material on subsurface drainage geotextile equal to half the pipe diameter to support subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches of filter material, placed in compacted layers 6 inches thick, and extend in subsurface drainage geotextile, as noted on the plans.
   1. Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D 698.

3.26 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:
   1. Shape subbase course and base course to required crown elevations and cross-slope grades.
   2. Place subbase course and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
   3. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.27 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

A. Place drainage course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:
   1. Place drainage course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
   2. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.28 SUBSTRATE PREPARATION FOR TOPSOIL

A. Eliminate uneven areas and low spots.

B. Remove debris, roots, branches, stones in excess of 2 inches in size and lumps larger than 3 inches.

C. Scarify surface to depth of 3 inches.

3.29 PLACING TOPSOIL

A. Place topsoil to a nominal depth of 4 inches. Place topsoil during dry weather.

B. Fine grade topsoil to eliminate rough or low areas. Maintain profiles and contour of subgrade.

C. Remove roots, weeds, rocks, and foreign material while spreading.

D. Manually spread topsoil close to plant life and structures to prevent damage.

E. Compact placed topsoil to 90 percent of maximum dry density.

F. Remove surplus subsoil and topsoil from the site.

G. Leave stockpile area and site clean, raked, and ready for seeding.

3.30 FIELD QUALITY CONTROL

A. Testing Agency: [Owner][Contractor] will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Engineer. Local building departments ay require their own inspection as a part of the permit process. Contractor must arrange for inspections required by permit from the local building department.

D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; re-compact and retest until specified compaction is obtained.

3.31 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
   1. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and re-compact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact to 95% maximum dry density, and reconstruct surfacing.
   1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.32 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property. Unsuitable materials may include, but are not limited to, broken concrete, asphalt, rock, stone, and other related debris. The Contractor must obtain his own disposal areas and permits and shall receive no additional compensation for this disposal work.

B. Surplus or unsuitable material shall not be disposed of either temporarily or permanently beyond the plan grading limit line or across any wetland or flood plain unless the plans provide for such placement.

C. Any agreement that the Contractor makes with local residents concerning the placement of fill on private property shall be the sole responsibility of the Contractor. The Owner will not become involved with any such agreements and will not be liable for damages that the Contractor may cause to private property.

D. Placement of fill on private property may require that the resident or Contractor obtain a grading permit or fill permit from the Owner.

END OF SECTION 31 20 00

SECTION 31 23 00 – EXCAVATION AND FILL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Work shall include furnishing of labor, materials, tools, equipment, accessories, and services necessary for completing the excavation and backfilling for the items as shown on the contract drawings and/or as herein required. This also includes trenching, trench or subgrade undercutting, roadway earthwork, complete and continual drainage of excavation, sheeting, bracing, and shoring of sides of the excavation, backfilling around structures and over pipelines, and the disposal of excess excavated material.

B. Section Includes:
   1. Preparing subgrades for slabs-on-grade, walks, pavements, turf, grasses and plants.
   2. Excavating and backfilling for structures.
   3. Drainage course for concrete slabs-on-grade.
   4. Subbase course for concrete walks and pavements.
   5. Subbase course and base course for asphalt paving.
   6. Subsurface drainage backfill for walls and trenches.
   7. Excavating and backfilling trenches for utilities and pits for buried utility structures.
   8. Removal of topsoil and subsoil.
   9. Cutting, grading, filling, compacting and rough contouring the site for structures, walks, pavements, and drainage.
   10. Final grade topsoil for seeding.
   11. Dewatering.

C. Related Sections:
   1. Division 01 Section “Temporary Facilities and Controls”.
   2. Divisions 26 and 33 Sections for installing underground mechanical and electrical utilities and buried mechanical and electrical structures.
   3. Division 31 Section "Site Clearing" for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
   4. Division 32 Section "Turf and Grasses" for finish grading in turf and grass areas, including preparing and placing planting soil for turf areas.

1.3 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
   1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
   2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subbase course and paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

1.4 Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

A. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

B. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
   1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Engineer. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
   2. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.
   3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.

C. Fill: Soil materials used to raise existing grades.
   1. For informational purposes, it is estimated that approximated 250 cubic yards will be required for embankment for the pay item “Station Grading, Site”. This may change if the Field Inspector considers the excavated soils for the proposed wet well suitable material for fill.

D. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

E. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

F. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

G. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.5 SUBMITTALS

A. Product Data: For each type of the following manufactured products required:
   1. Geotextiles.
   2. Controlled low-strength material, including design mixture.
   3. Geofoam.
   4. Warning tapes.

B. Samples for Verification: For the following products, in sizes indicated below:
   1. Geotextile: 12-inch by 12-inch.
   2. Warning tape: 12 inches long; of each color.

C. Qualification Data: For qualified testing agency.

D. Material Test Reports: For each borrow soil material proposed for fill and backfill as follows:
   1. Classification according to ASTM D 2487.
   2. Laboratory compaction curve according to ASTM D 698 and ASTM D 1557.

E. Pre-excavation Photographs or Video Recording: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

1.6 QUALITY ASSURANCE

A. Pre-excavation Conference: Conduct conference at Project site.

B. References to Michigan Department of Transportation (MDOT) Specifications shall pertain to the current edition of the Standard Specifications for Construction.

1.7 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
   1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
   2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Utility Locator Service: Notify MISS DIG for area where Project is located before beginning earth moving operations. Provide a minimum of three full working days advance notification.

C. Do not commence earth-moving operations until temporary erosion- and sedimentation-control measures are in place.

D. Do not commence earth-moving operations until plant-protection measures are in place.

E. The following practices are prohibited within protection zones, 100-year floodplain and wetlands:
   1. Storage of construction materials, debris, or excavated material.
   2. Parking vehicles or equipment.
   3. Foot traffic.
   4. Erection of sheds or structures.
   5. Impoundment of water.
   6. Excavation or other digging unless otherwise indicated.
   7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

F. Do not direct vehicle or equipment exhaust towards protection zones, 100-year floodplain and wetlands.

G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones, 100-year floodplain and wetlands.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS - GENERAL

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

2.2 BEDDING

A. Sand shall be a sharp, clean sand free of lumps of clay or debris with 100 percent passing a 3/8 inch sieve and less than 10 percent loss by wash.

B. Granular material shall meet the requirements of Section 90 2. 07 of the MDOT Standard Specifications for Construction for Granular Material Class II and Class III.

C. Pea gravel shall be unwashed and shall be from ¼ inch to 5/8 inch in size.

D. Bedding material shall be provided from offsite unless the trench passes through a well-defined strata of sand or gravel. Bedding material shall be subject to the approval of the Engineer.

E. Stone material shall meet the requirements of Section 90 2. 03 of the MDOT Standard Specifications for Construction for 6A crushed Coarse Aggregate or approved equal.

2.3 BACKFILL

A. Job Excavated Backfill: Job excavated backfill shall be defined as material excavated from the site that is free from frozen earth, boulders, rocks, stones larger than 3 inch in size, debris, blue and gray clay, and organic material.

B. Granular Backfill: Granular backfill shall be defined as sharp sand, gravel, or crushed stone that is free from lumps of clay and soft or flaky material and shall conform to the latest MDOT Standard Specification for Granular Material Class II of III. Granular backfill shall be used for fill work located under or within the influence of roadway surfaces. The Owner's standard details shall dictate which type of granular material (Class II or III) is required for the project.

C. Material excavated from the trench may be used as granular backfill when, in the opinion of the Engineer, it meets the granular backfill grading requirements.

D. Stone Refill
   1. Stone refill shall consist of natural gravel, slag, or crushed gravel that is equivalent in gradation to MDOT 6A unless otherwise called for in the plan details.

E. Embankment
   1. Embankment material shall consist of sound earth as described in Section 205 of the MDOT Standard Specifications for Construction.

F. Topsoil
   1. Excavated and re-used material. Local borrow material.
   2. Graded.
   3. Free of roots, rocks larger than ½ inch, subsoil, debris, weeds, and foreign matter.
   4. Contains no greater than 20 percent nor less than 5 percent organic matter.

G. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.4 ACCESSORIES

A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility; colored as follows:
   1. Red: Electric.
   2. Yellow: Gas, oil, steam, and dangerous materials.
   3. Orange: Telephone and other communications.

4. Blue: Water systems.
5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that survey benchmark and intended elevations for the Work are as indicated.

3.2 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Protect benchmarks, fences, structures, utilities, sidewalks, pavements, protection zones, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

C. Protect plant life, lawns, and other features remaining as a portion of final landscaping. Protect existing trees and shrubs.

D. Protect and maintain erosion and sedimentation controls during earth moving operations.

E. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.3 PAVEMENT CUTS

A. Where a trench must be cut through pavement, driveway, or sidewalk, particular care shall be taken to avoid unnecessary damage to adjoining areas of the pavement, driveway or sidewalk. All cuts through existing surfaces shall be made full-depth with a concrete saw. Cuts in concrete pavement shall be made parallel with longitudinal and transverse construction or contraction joints.

B. Saw cuts in concrete pavement shall not be nearer than five feet (5’-0”) to a transverse joint, to the centerline of pavement, or to the edge of pavement or curb, i.e., no existing or replacement pavement shall be less than five feet (5’-0”) in width. If the damaged pavement or surfacing is nearer than five feet (5’-0”) to a joint or centerline of pavement , or to edge of pavement, surfacing or curb, removal and replacement shall be extended to said joint, centerline, edge of pavement, surfacing, or curb. These same requirements shall apply to the saw cutting and replacement of concrete driveways.

C. If a square or block of sidewalk is cut, broken, or cracked, the entire square or block shall be removed and replaced.

3.4 EXCAVATION AND TRENCH DEWATERING

A. The Contactor shall maintain any excavation or trench free of water during construction of any structures and/or pipelines. Water accumulated due to rainfall or runoff and minor groundwater inflow that can be controlled through the use of portable trash, submersible or positive displacement pumps shall be considered normally expected and anticipated conditions associated with underground construction. This effort will be considered as included in the cost of construction.

B. The required use of deep wells and/or well points to lower and maintain a reduction in the groundwater elevation below the trench bottom shall be provided in accordance with the Dewatering section.

C. The Contractor shall take adequate precautions to control the discharge of dewatering pumps so as to prevent soil erosion or sedimentation of drainage ditches, structures, storm sewers, culverts, natural drainage courses, ponds, lakes or wetlands.

D. The Contractor shall insure that discharge from any dewatering operations has a suitable outlet and that it will not cause any damage to adjacent dwellings or property. Water and discharge hoses shall be placed and/or controlled so as to prevent a hazard to pedestrians or motor vehicles passing in the vicinity of the construction site.

E. Electric pumps shall have suitable power supply and appurtenances meeting NEC requirements and properly fused and grounded to prevent electrical shock hazards to on-site personnel.

F. Internal combustion engine driven pumps, if operated 24 hours per day, shall have adequate exhaust silencers in good repair to muffle engine noise to an acceptable level for the area where located.

3.5 CLASSIFICATION OF EXCAVATION

A. Earth, as a name for excavated material, shall include all glacial deposits whether cemented or not, except solid boulders one-half cubic yard or more in volume. It shall also include all alluvial deposits and material of every kind that can be excavated with equal facility by the equipment and means typically used for earth excavation.

B. Peat, as a name for excavated material, shall include all unstable organic soils such as peat, muck, marl, and underlying very soft clay.

C. Rock, as a name for excavated material, shall include pre-glacial solid ledge rock that can be removed most practically by blasting, barring or wedging, or by some other standard method of quarrying solid rock. It shall also include solid boulders of one-half cubic yard or more in volume as well as existing concrete, masonry with mortar joints, or other existing structural work that can be excavated practically only by methods of quarrying solid rock. It shall not include fragile, friable, or disintegrated materials of any kind that can be excavated by equipment and means used for earth excavation.

3.6 EXCAVATION, GENERAL

A. Remove topsoil from area of construction, areas to be filled and graded, and other areas designated.

B. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
   1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
   2. Remove rock to lines and grades indicated to permit installation of permanent construction.

C. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Engineer. The Contract Sum will be adjusted for rock excavation according to unit

prices included in the Contract Documents. Changes in Contract Time may be authorized for rock excavation.

1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, land other materials not classified as rock or unauthorized excavation.
2. Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction.

3.7 METHODS OF EXCAVATION IN EARTH

A. All excavation shall be by open cut from the surface, except in special cases where boring/jacking under pavement or structures may be required, or where boring/jacking under the root system will be required for tree root protection.

B. All excavation shall be made in such a manner and to such depth, length, and width as will give ample room for building the structures, bracing, sheeting, and supporting the sides of the excavation, pumping and drainage of ground water and sewage which may be encountered, and removal of all materials excavated.

C. Special care shall be taken so that the soil below the bottom of structures to be built shall be left undisturbed so that a firm bed will be provided for construction. Any voids shall be backfilled with suitable granular material and shall be properly compacted.

D. Stockpile excavated topsoil and subsoil material classified by Engineer as suitable for further used and remove material classified as unsuitable and material in excess of project requirements.

3.8 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
   1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
   2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

B. Excavations at Edges of Tree- and Plant-Protection Zones:
   1. Excavate by hand to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.

3.9 EXCAVATION FOR WALKS, PAVEMENTS AND ROADWAYS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

B. Roadway earthwork shall be performed in accordance with the construction methods that are described in Section 205 Roadway Earthwork of the MDOT Standard Specifications for Construction unless otherwise called for in the plan notes, details, or supplemental specifications.

3.10 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.
   1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. General
   1. Excavation shall be of sufficient width and depth to provide adequate room for construction and installation of the work to the lines, grades and dimensions called for on the plans. Unless otherwise called for on the Owner's standard details, the width of a trench from the invert to a height twelve (12) inches above the top of the pipe barrel shall be indicated as follows:
      a. Pipe size 4" through 12": Maximum trench width = 30"
      b. Pipe size larger than 12": Maximum trench width = outside diameter plus 24"

      If the maximum trench width as specified above is exceeded, unless otherwise shown on the drawings, the Contractor shall install, at his own expense, such concrete cradling or other bedding as is approved by the Engineer, to support the added load of the backfill.
   2. Where trench excavation is in granular material, the last six (6) inches of trench depth shall be carefully excavated and trimmed by hand to the exact elevation and contour of pipe. Where trench excavation is in rock or clay soil, the trench bottom shall be undercut a minimum of four (4) inches below the final elevation of pipe. The bedding material as hereinafter specified shall be placed and compacted to the underside of the pipe.
   3. Excavation for structures shall be made to the outside lines and surfaces of such structures wherever it is practicable to build directly against the sides and bottoms of excavations. In such cases, care shall be taken not to disturb the original foundation or backing. Final trimming shall be done by hand just before construction of the structure. If excess excavation is made, or the material becomes disturbed so as to require removal beyond the prescribed limits, the resulting space shall be refilled with bedding, as specified hereinafter, and solidly machine tamped into place to 95 percent of maximum unit weight before the construction work proceeds.
   4. Excavation for structures shall be extended sufficiently beyond the limits of the structure to provide ample room for form construction and other construction methods to be followed, wherever necessary.

C. Bedding
   1. Where the subgrade below the bottom of the pipe is disturbed during the construction, the space shall be refilled with sand or pea gravel bedding material solidly tamped to form a firm foundation for the pipe. Sand or pea gravel bedding material shall be extended to one (1) foot above the pipe, except that the bedding shall be exclusively pea gravel to the springline for pipe 36-inch and greater in diameter.

D. Amount of Trench Opening
   1. Not more than 50 feet of trench shall be open at one time in advance of the pipe unless permitted by the Engineer. The length of street that may be occupied by the construction work at any one time shall be subject to the direction of the Engineer and will be based on requirements of the use of the street by the public. No more than 600 consecutive feet of street length shall be occupied at one time, and vehicle traffic through the street shall not be entirely stopped without permission of the Engineer. After placement of the utility line, the Contractor shall backfill the trench promptly in order to minimize the length of open trench and avoid any unsafe conditions.

E. Trenches in Tree- and Plant-Protection Zones:
   1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.

2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
3. Cut and protect roots according to requirements in Division 01 Section "Temporary Tree and Plant Protection."

3.11 SUBGRADE INSPECTION

A. Notify Engineer when excavations have reached required subgrade.

B. If Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer, without additional compensation.

3.12 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Engineer.
1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Engineer.

3.13 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
1. Stockpile materials on-site at approved locations and so as not to impede the natural drainage in the area.
2. Stockpile in sufficient quantities to meet project requirements.
3. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
4. Do not store in protection zones, 100-year floodplain, or wetlands, as identified on the plans.

3.14 STOCKPILE CLEANUP

A. Remove stockpile; leave area in a clean and neat condition. Grade site surface to prevent free standing surface water. If approval given by Owner, leave unused materials in a neat, compact stockpile.

B. If a borrow area is indicated, leave area in a clean and neat condition. Grade site surface to prevent free standing surface water.

3.15 TRANSPORT OF NATIVE MATERIALS OFFSITE

A. If the Contractor encounters good materials (sand, gravel, topsoil, etc.) during the course of construction, he shall not be allowed to transport these materials offsite without the written approval of the Engineer. Wherever possible, suitable native sands and gravels shall be used as backfill rather than transporting them offsite and replacing them with non-native materials of a lesser quality.

3.16 STONE REFILL FOR TRENCH UNDERCUT

A. In locations where soil at the bottom trench is unstable, the Contractor shall excavate (undercut) below the trench bottom and place stone refill.

3.17 DIVERTING EXISTING SEWERS

A. Where existing sewers or drains are encountered in the work, adequate provision shall be made for diverting flow in the existing sewers so that the excavation will be kept dry during the progress of the construction work. Upon completion of the construction work, the existing sewers shall be restored or otherwise provided with an adequate outlet as directed by the Engineer.

3.18 SHEETING, BRACING, SHORING

A. Where required to properly support the surfaces of excavations to protect the construction work, adjacent work or workers, sheeting, bracing and shoring shall be provided. If the Engineer is of the opinion that at any point sufficient or proper supports have not been provided, he may order such additional supports at the expense of the Contractor, but neither the placing of such additional supports by the order of the Engineer nor failure of the Engineer to order such additional supports placed shall release the Contractor from his responsibility for the sufficiency of such supports and the integrity of the work. In removing the sheeting and bracing after the construction has been completed, special care shall be taken to prevent any caving of the sides of the excavation and injury to the completed work or to the adjacent property.

3.19 SHEETING LEFT IN PLACE

A. Sheeting, bracing and shoring shall not be left in place after completion of the work except as required by the Engineer. Where sheeting, bracing, and shoring must be left in place in order to protect the work, adjacent structures, or property, it shall be cut off or left not less than two (2) feet below the established surface grade. If sheeting, shoring or bracing must be left in place, then it shall be paid for at the contract unit bid price that is shown on the Bid Form. If a pay item was not included on the Bid Form, then a work order shall be negotiated.

3.20 CROSSING EXISTING STRUCTURES AND PIPES

A. During construction, it may be necessary to cross under certain sewers, drains, culverts, water lines, gas lines, electric conduits and other underground structures. Every effort shall be made to prevent damage to such structures. Wherever such structures are disturbed or broken, they shall be restored to good condition. Specified granular backfill shall be placed as described in the section pertaining to backfilling. MDOT Grade S3 concrete shall be utilized where directed by the Engineer at no additional cost to the project. Either granular backfill or concrete shall be brought to the spring line of the higher utility.

3.21 TUNNELING TREES

A. Trees eight (8) inches in diameter or less will require a minimum tunnel length of eight (8) feet. Trees over eight (8) inches in diameter, measured four (4) feet above the ground surface, will require a minimum tunnel length equal to one foot for each inch of tree diameter.
Trees shall be tunneled whenever any portion of an excavation approaches within a distance equal to one-half the required tunnel length except as otherwise noted on the plans.

B. Tunneling under trees may be accomplished by one of the following:
   1. Boring and jacking casing pipe along with placement of a carrier pipe.
   2. Boring and jacking of sewer pipe or water main without a casing pipe.

3. Jacking sewer or water main without boring and without a casing pipe.

C. Plan notes or existing field conditions shall indicate which method may be used for the tree tunneling work.

3.22 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:
   1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
   2. Surveying locations of underground utilities for Record Documents.
   3. Testing and inspecting underground utilities.
   4. Removing concrete formwork.
   5. Removing trash and debris.
   6. Removing temporary shoring and bracing, and sheeting.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

C. Where called for on the plans, the Contractor shall backfill trenches and/or other excavations with suitable excavated material (not including gray or blue clay) replaced into the trench or excavation and compacted to not less than 95 percent of maximum unit weight as determined at existing moisture content during backfilling. Compaction shall be provided by means of suitable mechanical compaction equipment.
   If the moisture content of cohesive backfill material exceeds the optimum moisture content for maximum density by more than three percent (3%), the Contractor shall dry the material to meet the foregoing moisture content limitation or provide, at his own expense, MDOT Granular Material Class III. No sloppy or wet backfill will be allowed.
   Maximum unit weight will be determined by current methods of Test for Compaction and Density of Soil, AASHTO Designation T-180 or by the Cone Density Method developed by MDOT, as the material may require.
   The Engineer shall make compaction tests at all locations requiring granular backfill.

D. Any depression resulting from settlement of any backfill prior to the date of final payment for all work under this contract shall be brought to the proper grade and surface and made to match the adjacent surface.

E. Compaction
   Backfill material shall be placed in layers not to exceed 12 inches in thickness unless the Contractor can demonstrate to the satisfaction of the Engineer that he can consistently attain the specified density on thicker lifts.
   Specified compaction shall be obtained with the use of a bulldozer, sheepsfoot roller, mechanical tamper or other similar and effective equipment. Specified compaction means not less than 95 percent (not average 95 percent) of maximum unit weight when tested in accordance with current MDOT Specifications.
   If excavated material is not suitable to obtain 95 percent minimum compaction, the Contractor shall, at his expense, remove unsuitable materials or add granular materials, or both, to obtain ninety-five percent (95%) minimum compaction as specified.
   Compaction tests will be made by a representative of the Owner and paid for by the Owner, unless otherwise specified in the Contract Documents.

F. Compaction Under structures
   1. Compact structure embankment to 100 percent of the maximum unit weight within the limits of 1:1 slopes, extending outward and downward from the bottom edges of the structure footings.

G. Backfilling Trenches

1. Bedding

The type of bedding required is shown on the detail drawings.

Bedding shall be worked under the haunches of the pipe to provide firm continuous support.

Bedding placed on the sides of and above the pipe shall be compacted by machine tamping to not less than ninety-five percent (95%) of maximum unit weight in layers not exceeding 12 inches in depth.

2. Trench or Excavated Area

All trenches in paved streets, shoulders, traveled roadways, parking areas and driveways shall be backfilled with suitable excavated backfill or granular backfill, as shown on the drawings from one (1) foot above top of pipe up to the required subgrade elevation which will allow for placement of the required gravel base and/or pavement surface. The approved excavated backfill or granular backfill shall be placed and thoroughly and uniformly compacted by machine tamping to the specified compaction. With the approval of the Engineer, water jetting may be accepted in lieu of tamping for granular backfill only.

Specified compaction shall be required of the entire trench when the edge of trench is within three (3) feet of edge of pavement. On road crossings, specified compaction shall extend ten (10) feet beyond the edge of pavement for paved roadways with gravel shoulders or shall extend three (3) feet beyond the back of curb for roadways with curb.

Trenches under concrete sidewalks and bike paths shall be backfilled from one foot above top of pipe to a level four (4) inches below finished grade of the sidewalk with approved suitable excavated backfill or granular backfill and compacted to ninety-five percent (95%) maximum density.

Trenches not in paved streets, shoulders, traveled roadways, parking areas, driveways or under sidewalks, shall be backfilled from one (1) foot above the top of the pipe up to the ground surface with suitable excavated backfill and shall require compaction equal to adjacent undisturbed earth.

Wherever gas mains, water mains, sewers, or other utilities are located in the trench area, granular backfill shall be used for backfill from bottom of the trench up to the springline of the pipes. Granular backfill shall be placed across the full trench width and extend far enough either side of the existing pipe to allow specified compaction so as to thoroughly support the pipe within the trench area.

H. Backfilling Around Structures

As soon as practicable after concrete structures have set, forms and debris shall be removed and the surface of the concrete pointed. After the structure has been checked and approved, the excavated area around the structure shall be backfilled up to specified subgrade with granular material or suitable excavated material as called for on the drawings for the adjacent trench. The fill shall be thoroughly compacted by machine tamping. No large boulders or masonry shall be placed in backfill. No backfill will be placed against manhole walls within 48 hours after the plaster coat has been applied to the outside of the walls nor shall backfill be placed about concrete structures until concrete has attained at least 75 percent of its design strength and approval of the Engineer has been obtained.

3.23 PLACING AND COMPACTING EMBANKMENT

A. Embankment material for fill work shall be in accordance with Section 2.05. 03 of the MDOT Standard Specifications for Construction.

3.24 DISPOSAL OF EXCAVATED MATERIAL

A. After all suitable excavated material has been used on site, the Contractor shall be responsible for properly removing and disposing of the excess.

The Contractor shall also be responsible for disposing of all other excavated materials that are unsuitable for use as fill or backfill. Unsuitable materials may include, but are not limited to, bro-

ken concrete, asphalt, rock, stone, and other related debris. The Contractor shall be required to obtain his own disposal areas and permits and shall receive no additional compensation for this disposal work.

Surplus or unsuitable material shall not be disposed of either temporarily or permanently beyond the plan grading limit line or across any wetland or flood plain unless the plans provide for such placement.

Any agreements that the Contractor makes with local residents concerning the placement of fill on private property shall be the sole responsibility of the Contractor . The Owner will not become involved with any such agreements and will not be liable for damages that the Contractor may cause to private property.

Placement of fill on private property may require that the resident or Contractor obtain a grading permit or fill permit from the Owner.

3.25 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
   1. Provide a smooth transition between adjacent existing grades and new grades.
   2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
   3. Slope grade away from building at a minimum of 2 inches in 10 feet, unless noted otherwise.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
   1. Unpaved Areas: Plus or minus 1 inch.
   2. Walks: Plus or minus 1 inch.
   3. Pavements: Plus or minus 1/2 inch.

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

D. Final Cleanup and Grading: Upon completion of the construction, and before final payment is made, the Contractor shall restore his working area to as clean a condition as existed before his operations were started. He shall go over the entire line and refill any place that may have settled. He shall then re-grade and put in shape all backfilled trenches, all fills he may have made from excess excavated materials, and all other areas that may have been disturbed through all operations.

3.26 SUBSURFACE DRAINAGE

A. Subdrainage Pipe: As specified on drawings or per Owner standard.

B. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 6-inch course of filter material on subsurface drainage geotextile to support subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches of filter material, placed in compacted layers 6 inches thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 6 inches.

C. Drainage Backfill: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a course of filter material on subsurface drainage geotextile equal to half the pipe diameter to support subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches of filter material, placed in compacted layers 6 inches thick, and extend in subsurface drainage geotextile, as noted on the plans.

1. Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D 698.

3.27 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:
   1. Install separation geotextile on prepared subgrade according to plans and manufacturer's written instructions, overlapping sides and ends.
   2. Place base course material over subbase course under hot-mix asphalt pavement.
   3. Shape subbase course and base course to required crown elevations and cross-slope grades.
   4. Place subbase course and base course 6 inches or less in compacted thickness in a single layer.
   5. Place subbase course and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
   6. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698 and ASTM D 1557.

3.28 SUBSTRATE PREPARATION FOR TOPSOIL

A. Eliminate uneven areas and low spots.

B. Remove debris, roots, branches, stones in excess of 2 inches in size and lumps larger than 3 inches.

C. Scarify surface to depth of 3 inches. Scarify in areas

3.29 PLACING TOPSOIL

A. Place topsoil to a nominal depth of 4 inches. Place topsoil during dry weather.

B. Fine grade topsoil to eliminate rough or low areas. Maintain profiles and contour of subgrade.

C. Remove roots, weeds, rocks, land foreign material while spreading.

D. Manually spread topsoil close to plant life and structures to prevent damage.

E. Compact placed topsoil to 90 percent of maximum dry density.

F. Remove surplus subsoil and topsoil from the site.

G. Leave stockpile area and site clean and raked, ready for seeding.

3.30 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
   1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
   2. Determine that fill material and maximum lift thickness comply with requirements.

3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.

B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.31 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
   1. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
   1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.32 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

3.33 CONTACTOR SAFETY REQUIREMENTS

The excavation and trenching operations shall be conducted by the Contractor in a manner that will provide safe working conditions for all persons on the site who may be affected by the Work. The Contractor shall also conduct his operations in a manner that will protect adjacent property from damage.

Trench sides shall be either cut back to the slope as necessitated by soil and ground water conditions which will provide stable sides, or supporting systems shall be installed that are capable of restraining the earth sides from movement. A qualified employee of the Contractor shall design the trench supporting systems.

The Contractor shall employ, at all times at the site of the work, a qualified person who will be responsible for the safety of both the work and workmen, and who will make all the decisions relevant to the stability of trenches, the adequacy of any and all protective devices, proper operation of equipment, and all other matters related to safety.

A. The Contractor shall not store, along and adjacent to the trench, excavated material, heavy equipment, backfill materials, sewer pipe, or other construction materials which may impose too great a load on the earth and cause displacement or caving of the earth. The Contractor shall, at all times, provide a safe means of emergency exit from all trench excavations.

END OF SECTION 31 23 00

SECTION 31 23 33 – TRENCHING AND BACKFILLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Work shall include furnishing of labor, materials, tools, equipment, accessories, and services necessary for completing the excavation and backfilling for the items as shown on the contract drawings and/or as herein required. This also includes trenching, trench or subgrade undercutting, roadway earthwork, complete and continual drainage of excavation, sheeting, bracing, and shoring of sides of the excavation, backfilling around structures and over pipelines, and the disposal of excess excavated material.

B. Section Includes:
   1. Excavating and backfilling for structures.
   2. Excavating and backfilling trenches for utilities and pits for buried utility structures.
   3. Dewatering.

C. Related Sections:
   1. Division 01 Section “Temporary Facilities and Controls”.
   2. Divisions 26 and 33 Sections for installing underground mechanical and electrical utilities and buried mechanical and electrical structures.
   3. Division 31 Section "Site Clearing" for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
   4. Division 32 Section "Turf and Grasses" for finish grading in turf and grass areas, including preparing and placing planting soil for turf areas.

1.3 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
   1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
   2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subbase course and paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
   1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Engineer. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

2. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

J. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

K. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 SUBMITTALS

A. Product Data: For each type of the following manufactured products required:
1. Geotextiles.
2. Controlled low-strength material, including design mixture.
3. Geofoam.
4. Warning tapes.

B. Samples for Verification: For the following products, in sizes indicated below:
1. Geotextile: 12-inch by 12-inch.
2. Warning tape: 12 inches long; of each color.

C. Qualification Data: For qualified testing agency.

D. Material Test Reports: For each borrow soil material proposed for fill and backfill as follows:
1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to ASTM D 698 and ASTM D 1557.

E. Pre-excavation Photographs or Video Recording: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

1.5 COORDINATION

A. Verify work at lower level is complete before placing higher elevation work.

1.6 QUALITY ASSURANCE

A. References to Michigan Department of Transportation (MDOT) Specifications shall pertain to the current edition of the Standard Specifications for Construction.

1.7 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
   1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
   2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Utility Locator Service: Notify MISS DIG for area where Project is located before beginning earth moving operations. Provide a minimum of three full working days advance notification.

C. Do not commence earth-moving operations until temporary erosion- and sedimentation-control measures are in place.

D. Do not commence earth-moving operations until plant-protection measures are in place.

E. The following practices are prohibited within protection zones, 100-year floodplain and wetlands:
   1. Storage of construction materials, debris, or excavated material.
   2. Parking vehicles or equipment.
   3. Foot traffic.
   4. Erection of sheds or structures.
   5. Impoundment of water.
   6. Excavation or other digging unless otherwise indicated.
   7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

F. Do not direct vehicle or equipment exhaust towards protection zones, 100-year floodplain and wetlands.

G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones, 100-year floodplain and wetlands.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS - GENERAL

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

2.2 BEDDING

A. Sand shall be a sharp, clean sand free of lumps of clay or debris with 100 percent passing a 3/8 inch sieve and less than 10 percent loss by wash.

B. Granular material shall meet the requirements of Section 90 2. 07 of the MDOT Standard Specifications for Construction for Granular Material Class II and Class III.

C. Pea gravel shall be unwashed and shall be from ¼ inch to 5/8 inch in size.

D. Bedding material shall be provided from offsite unless the trench passes through a well-defined strata of sand or gravel. Bedding material shall be subject to the approval of the Engineer.

E. Stone material shall meet the requirements of Section 90 2. 03 of the MDOT Standard Specifications for Construction for 6A crushed Coarse Aggregate or approved equal.

2.3 BACKFILL

A. Job Excavated Backfill: Job excavated backfill shall be defined as material excavated from the site that is free from frozen earth, boulders, rocks, stones larger than 3 inch in size, debris, blue and gray clay, and organic material.

B. Granular Backfill: Granular backfill shall be defined as sharp sand, gravel, or crushed stone that is free from lumps of clay and soft or flaky material and shall conform to the latest MDOT Standard Specification for Granular Material Class II of III. Granular backfill shall be used for fill work located under or within the influence of roadway surfaces. The Owner's standard details shall dictate which type of granular material (Class II or III) is required for the project.

C. Material excavated from the trench may be used as granular backfill when, in the opinion of the Engineer, it meets the granular backfill grading requirements.

D. Stone Refill
   1. Stone refill shall consist of natural gravel, slag, or crushed gravel that is equivalent in gradation to MDOT 6A unless otherwise called for in the plan details.

E. Embankment
   1. Embankment material shall consist of sound earth as described in Section 205 of the MDOT Standard Specifications for Construction.

F. Controlled Density Fill (C.D.F.):
   1. Self-compacted, cementitious fill material consisting of cement, fly ash, fine aggregate and water.
   2. Strength: 50 psi minimum compressive strength at 28 days
   3. Mix Design to be reviewed by Engineer.

2.4 TOPSOIL

A. Topsoil:
   1. Excavated and re-used material. Local borrow material.
   2. Graded.
   3. Free of roots, rocks larger than ½ inch, subsoil, debris, weeds, and foreign matter.
   4. Contains no greater than 20 percent nor less than 5 percent organic matter.

B.

2.5 ACCESSORIES

A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility; colored as follows:
   1. Red: Electric.
   2. Yellow: Gas, oil, steam, and dangerous materials.
   3. Orange: Telephone and other communications.
   4. Blue: Water systems.
   5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Protect benchmarks, fences, structures, utilities, sidewalks, pavements, protection zones, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

C. Protect plant life, lawns, and other features remaining as part of final landscaping. Protect existing trees and shrubs.

D. Protect and maintain erosion and sedimentation controls during earth moving operations.

E. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

F. In lawn areas and in farm fields, as determined by Engineer, remove and stockpile topsoil for replacement during backfilling.

G. Prior to open trenches entering paved limits of a street, alley, driveway, or parking area, nearly cut the pavement for its full depth, then remove, land dispose of off-site.

3.2 PAVEMENT CUTS

A. Where a trench must be cut through pavement, driveway, or sidewalk, particular care shall be taken to avoid unnecessary damage to adjoining areas of the pavement, driveway or sidewalk. All cuts through existing surfaces shall be made full-depth with a concrete saw. Cuts in concrete pavement shall be made parallel with longitudinal and transverse construction or contraction joints.

B. Saw cuts in concrete pavement shall not be nearer than five feet (5’-0”) to a transverse joint, to the centerline of pavement, or to the edge of pavement or curb, i.e., no existing or replacement pavement shall be less than five feet (5’-0”) in width. If the damaged pavement or surfacing is nearer than five feet (5’-0”) to a joint or centerline of pavement , or to edge of pavement, surfacing or curb, removal and replacement shall be extended to said joint, centerline, edge of pavement, surfacing, or curb. These same requirements shall apply to the saw cutting and replacement of concrete driveways.

C. If a square or block of sidewalk is cut, broken, or cracked, the entire square or block shall be removed and replaced.

3.3 EXCAVATION AND TRENCH DEWATERING

A. The Contactor shall maintain any excavation or trench free of water during construction of any structures and/or pipelines. Water accumulated due to rainfall or runoff and minor groundwater inflow that can be controlled through the use of portable trash, submersible or positive displacement pumps shall be considered normally expected and anticipated conditions associated with underground construction. This effort will be considered as included in the cost of construction. For contracts with a unit price for dewatering, the work described herein will not be reimbursable at the unit price bid for dewatering in the bid form.

B. The required use of deep wells and/or well points to lower and maintain a reduction in the groundwater elevation below the trench bottom shall be provided in accordance with the Dewatering section.

C. The Contractor shall take adequate precautions to control the discharge of dewatering pumps so as to prevent soil erosion or sedimentation of drainage ditches, structures, storm sewers, culverts, natural drainage courses, ponds, lakes or wetlands.

D. The Contractor shall insure that discharge from any dewatering operations has a suitable outlet and that it will not cause any damage to adjacent dwellings or property. Water and discharge hoses shall be placed and/or controlled so as to prevent a hazard to pedestrians or motor vehicles passing in the vicinity of the construction site.

E. Electric pumps shall have suitable power supply and appurtenances meeting NEC requirements and properly fused and grounded to prevent electrical shock hazards to on-site personnel.

F. Internal combustion engine driven pumps, if operated 24 hours per day, shall have adequate exhaust silencers in good repair to muffle engine noise to an acceptable level for the area where located.

3.4 CLASSIFICATION OF EXCAVATION

A. Earth, as a name for excavated material, shall include all glacial deposits whether cemented or not, except solid boulders one-half cubic yard or more in volume. It shall also include all alluvial deposits and material of every kind that can be excavated with equal facility by the equipment and means typically used for earth excavation.

B. Peat, as a name for excavated material, shall include all unstable organic soils such as peat, muck, marl, and underlying very soft clay.

C. Rock, as a name for excavated material, shall include pre-glacial solid ledge rock that can be removed most practically by blasting, barring or wedging, or by some other standard method of quarrying solid rock. It shall also include solid boulders of one-half cubic yard or more in volume as well as existing concrete, masonry with mortar joints, or other existing structural work that can be excavated practically only by methods of quarrying solid rock. It shall not include fragile, friable, or disintegrated materials of any kind that can be excavated by equipment and means used for earth excavation.

3.5 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
   1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
   2. Remove rock to lines and grades indicated to permit installation of permanent construction.

B. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Engineer. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents. Changes in Contract Time may be authorized for rock excavation.

1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, land other materials not classified as rock or unauthorized excavation.
2. Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction.

3.6 METHODS OF EXCAVATION IN EARTH

A. All excavation shall be by open cut from the surface, except in special cases where boring/jacking under pavement or structures may be required, or where boring/jacking under the root system will be required for tree root protection. All excavation shall be made in such a manner and to such depth, length, and width as will give ample room for building the structures, bracing, sheeting, and supporting the sides of the excavation, pumping and drainage of ground water and sewage which may be encountered, and removal of all materials excavated. Special care shall be taken so that the soil below the bottom of structures to be built shall be left undisturbed so that a firm bed will be provided for construction. Any voids shall be backfilled with suitable granular material and shall be properly compacted.

3.7 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
   1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
   2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

B. Excavations at Edges of Tree- and Plant-Protection Zones:
   1. Excavate by hand to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.

3.8 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.
   1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. General
   1. Excavation shall be of sufficient width and depth to provide adequate room for construction and installation of the work to the lines, grades and dimensions called for on the plans. Unless otherwise called for on the Owner's standard details, the width of a trench from the invert to a height twelve (12) inches above the top of the pipe barrel shall be indicated as follows:
      a. Pipe size 4" through 12": Maximum trench width = 30"
      b. Pipe size larger than 12": Maximum trench width = outside diameter plus 24"

      If the maximum trench width as specified above is exceeded, unless otherwise shown on the drawings, the Contractor shall install, at his own expense, such concrete cradling or other bedding as is approved by the Engineer, to support the added load of the backfill.
   2. Where trench excavation is in granular material, the last six (6) inches of trench depth shall be carefully excavated and trimmed by hand to the exact elevation and contour of pipe. Where trench excavation is in rock or clay soil, the trench bottom shall be undercut a

minimum of four (4) inches below the final elevation of pipe. The bedding material as hereinafter specified shall be placed and compacted to the underside of the pipe.

3. Excavation for structures shall be made to the outside lines and surfaces of such structures wherever it is practicable to build directly against the sides and bottoms of excavations. In such cases, care shall be taken not to disturb the original foundation or backing. Final trimming shall be done by hand just before construction of the structure. If excess excavation is made, or the material becomes disturbed so as to require removal beyond the prescribed limits, the resulting space shall be refilled with bedding, as specified hereinafter, and solidly machine tamped into place to 95 percent of maximum unit weight before the construction work proceeds.
4. Excavation for structures shall be extended sufficiently beyond the limits of the structure to provide ample room for form construction and other construction methods to be followed, wherever necessary.

C. Bedding
   1. Where the subgrade below the bottom of the pipe is disturbed during the construction, the space shall be refilled with sand or pea gravel bedding material solidly tamped to form a firm foundation for the pipe. Sand or pea gravel bedding material shall be extended to one (1) foot above the pipe, except that the bedding shall be exclusively pea gravel to the springline for pipe 36-inch and greater in diameter.

D. For Water Mains and Force Mains, and for Process Piping:
   1. Except where otherwise specifically required or permitted by Engineer, excavate trenches to a depth sufficient to provide not less than 4 feet of vertical cover over the outside top of the pipe barrel. However, install at a greater depth when shown on the Drawings, when necessary to pass under other utilities or obstructions, or where necessary to prevent high points. When paralleling roadside ditches or streams, provide lateral cove at least equal to specified vertical cover.

E. Amount of Trench Opening
   1. Not more than 50 feet of trench shall be open at one time in advance of the pipe unless permitted by the Engineer. The length of street that may be occupied by the construction work at any one time shall be subject to the direction of the Engineer and will be based on requirements of the use of the street by the public. No more than 600 consecutive feet of street length shall be occupied at one time, and vehicle traffic through the street shall not be entirely stopped without permission of the Engineer. After placement of the utility line, the Contractor shall backfill the trench promptly in order to minimize the length of open trench and avoid any unsafe conditions.

F. Trenches in Tree- and Plant-Protection Zones:
   1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
   2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
   3. Cut and protect roots according to requirements in Division 01 Section "Temporary Tree and Plant Protection."

3.9 REMOVAL OF EXISTING FACILITIES

A. Remove such existing facilities as noted to be removed, and as required to complete abandonment of existing facilities.

B. Owner reserves the right to salvage existing facilities and portions thereof removed. Dispose of all existing facilities and portion thereof removed and not salvaged by Owner.

C. For existing structures not required to be completely removed for proper completion of other work, remove castings, if any, and remove the walls to a point at least 3'-0" below grade. Provide a minimum 6 inch diameter hole in the bottom of the structure. Removed materials may be used to fill the remaining portion of the structure; limit size of materials and place so as not to prohibit complete and proper filling as approved by Engineer.

D. Plug existing sewers entering and leaving existing structures to be removed as noted on Drawings and as specified below.

3.10 ABANDONMENT OF EXISTING FACILITIES

A. Structures: Remove castings, if any, and remove walls to 3'-0" below grade. Provide a minimum 6 inch diameter hole in the bottom of the structure. Removed materials may be used to fill the remaining portion of the structure; limit size of materials and place so as not to prohibit complete and proper filling as approved by the Engineer.

B. Sewers: Abandon existing sewers by plugging the ends in locations noted, or when noted, by filling with flowable fill (grout), and at such time as approved by the Engineer.
   1. Plug the ends of existing sewers with a minimum of 2'-0" of Class II concrete, or as otherwise approved by the Engineer.
   2. Where noted, fill existing sewers with grout, placed so as to ensure complete filling of the sewer.

C. Water Mains: Abandon existing mains by plugging locations noted on Drawings, and not until the new mains and services have been successfully tested, accepted and placed in service.
   1. Plug ends of water mains to be abandoned with a minimum of 2'-0" of Class II concrete or as otherwise approved by the Engineer.
   2. Furnish and install a mechanical joint plug on the ends of mains to remain in service, and a Class I concrete thrust block as approved by the Engineer.

3.11 PROTECTION OF EXISTING UTILITIES

A. Uncover and determine the elevation, size and materials of existing underground utilities along the route of construction, as shown on Drawings or marked at the time of construction by the Utility Owner, at least 200 feet in advance of pipe installation.

B. Adequately support, shore up, or otherwise protect underground utilities whenever exposed in the trench. Extend supports a minimum of 12 inches into undisturbed earth each side of trench. Band or tie utility to bridging for its full length. Where bridging cannot be supported by a firm foundation, provide vertical support, including any lateral bracing necessary to provide firm support.

C. Above ground (aerial) utilities, including power, telephone and cable television, shall remain in service at all times. Any anticipated disruption of service shall be with the full knowledge of the Utility Company and required advance notice to affected users. Removal of guy wires and holding of poles shall be done as required to complete the Work, shall be as agreed upon by the Utility Company and Contractor, and shall be at the expense of the Contractor.

D. Arbitrary disruption of underground and aerial utility services will not be permitted.

3.12 PROTECTION, REMOVAL AND REPAIR OF TREES AND SHRUBS

A. Consult with Engineer and obtain permission prior to removal of any tree, shrub, or limb not noted on Drawings to be removed well in advance of such removals. Such removals outside

right-of-way or easement limits shall not be performed without written permission of property owner.

B. Fell trees to be removed so as not to injure trees to remain.

C. Remove stumps and roots to a minimum of 12 inches below grade.

D. Take every precaution to prevent damage to trees and shrubs not noted to be removed.

E. Carefully trim and shape trees, tree limbs and bushes located such that Contractor's equipment will damage same during construction. Squarely cut all limbs and branches. Replace trees and bushes other than those whose removal is approved by Engineer, which are destroyed or damaged to the extent that their continued life is impaired.

F. Prior to Final Payment, employ a competent arborist to inspect all trees and shrubs along the Work line and to properly trim, prune, repair and protect any that have been damaged, and to designate those which have been so damaged as to require replacement.

3.13 SUBGRADE INSPECTION

A. Notify Engineer when excavations have reached required subgrade.

B. If Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer, without additional compensation.

3.14 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Engineer.
   1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Engineer.

3.15 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
   1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
   2. Do not store in protection zones, 100-year floodplain, or wetlands, as identified on the plans.

3.16 TRANSPORT OF NATIVE MATERIALS OFFSITE

A. If the Contractor encounters good materials (sand, gravel, topsoil, etc.) during the course of construction, he shall not be allowed to transport these materials offsite without the written approval of the Engineer. Wherever possible, suitable native sands and gravels shall be used

as backfill rather than transporting them offsite and replacing them with non-native materials of a lesser quality.

3.17 STONE REFILL FOR TRENCH UNDERCUT

A. In locations where soil at the bottom trench is unstable, the Contractor shall excavate (undercut) below the trench bottom and place stone refill.

3.18 DIVERTING EXISTING SEWERS

A. Where existing sewers or drains are encountered in the work, adequate provision shall be made for diverting flow in the existing sewers so that the excavation will be kept dry during the progress of the construction work. Upon completion of the construction work, the existing sewers shall be restored or otherwise provided with an adequate outlet as directed by the Engineer.

3.19 SHEETING, BRACING, SHORING

A. Where required to properly support the surfaces of excavations to protect the construction work, adjacent work or workers, sheeting, bracing and shoring shall be provided. If the Engineer is of the opinion that at any point sufficient or proper supports have not been provided, he may order such additional supports at the expense of the Contractor, but neither the placing of such additional supports by the order of the Engineer nor failure of the Engineer to order such additional supports placed shall release the Contractor from his responsibility for the sufficiency of such supports and the integrity of the work. In removing the sheeting and bracing after the construction has been completed, special care shall be taken to prevent any caving of the sides of the excavation and injury to the completed work or to the adjacent property.

3.20 SHEETING LEFT IN PLACE

A. Sheeting, bracing and shoring shall not be left in place after completion of the work except as required by the Engineer. Where sheeting, bracing, and shoring must be left in place in order to protect the work, adjacent structures, or property, it shall be cut off or left not less than two (2) feet below the established surface grade. If sheeting, shoring or bracing must be left in place, then it shall be paid for at the contract unit bid price that is shown on the Bid Form. If a pay item was not included on the Bid Form, then a work order shall be negotiated.

3.21 CROSSING EXISTING STRUCTURES AND PIPES

A. During construction, it may be necessary to cross under certain sewers, drains, culverts, water lines, gas lines, electric conduits and other underground structures. Every effort shall be made to prevent damage to such structures. Wherever such structures are disturbed or broken, they shall be restored to good condition. Specified granular backfill shall be placed as described in the section pertaining to backfilling. MDOT Grade S3 concrete shall be utilized where directed by the Engineer at no additional cost to the project. Either granular backfill or concrete shall be brought to the spring line of the higher utility.

3.22 TUNNELING TREES

A. Trees eight (8) inches in diameter or less will require a minimum tunnel length of eight (8) feet. Trees over eight (8) inches in diameter, measured four (4) feet above the ground surface, will require a minimum tunnel length equal to one foot for each inch of tree diameter.
Trees shall be tunneled whenever any portion of an excavation approaches within a distance equal to one-half the required tunnel length except as otherwise noted on the plans.

B. Tunneling under trees may be accomplished by one of the following:
   1. Boring and jacking casing pipe along with placement of a carrier pipe.
   2. Boring and jacking of sewer pipe or water main without a casing pipe.
   3. Jacking sewer or water main without boring and without a casing pipe.

C. Plan notes or existing field conditions shall indicate which method may be used for the tree tunneling work.

3.23 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:
   1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
   2. Surveying locations of underground utilities for Record Documents.
   3. Testing and inspecting underground utilities.
   4. Removing concrete formwork.
   5. Removing trash and debris.
   6. Removing temporary shoring and bracing, and sheeting.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

C. Where called for on the plans, the Contractor shall backfill trenches and/or other excavations with suitable excavated material (not including gray or blue clay) replaced into the trench or excavation and compacted to not less than 95 percent of maximum unit weight as determined at existing moisture content during backfilling. Compaction shall be provided by means of suitable mechanical compaction equipment.
   If the moisture content of cohesive backfill material exceeds the optimum moisture content for maximum density by more than three percent (3%), the Contractor shall dry the material to meet the foregoing moisture content limitation or provide, at his own expense, MDOT Granular Material Class III. No sloppy or wet backfill will be allowed.
   Maximum unit weight will be determined by current methods of Test for Compaction and Density of Soil, AASHTO Designation T-180 or by the Cone Density Method developed by MDOT, as the material may require.
   The Engineer shall make compaction tests at all locations requiring granular backfill.

D. Any depression resulting from settlement of any backfill prior to the date of final payment for all work under this contract shall be brought to the proper grade and surface and made to match the adjacent surface.

E. Compaction
   Backfill material shall be placed in layers not to exceed 12 inches in thickness unless the Contractor can demonstrate to the satisfaction of the Engineer that he can consistently attain the specified density on thicker lifts.
   Specified compaction shall be obtained with the use of a bulldozer, sheepsfoot roller, mechanical tamper or other similar and effective equipment. Specified compaction means not less than 95 percent (not average 95 percent) of maximum unit weight when tested in accordance with current MDOT Specifications.
   If excavated material is not suitable to obtain 95 percent minimum compaction, the Contractor shall, at his expense, remove unsuitable materials or add granular materials, or both, to obtain ninety-five percent (95%) minimum compaction as specified.
   Compaction tests will be made by a representative of the Owner and paid for by the Owner, unless otherwise specified in the Contract Documents.

F. Backfilling Trenches
   1. Bedding
      The type of bedding required is shown on the detail drawings.

Bedding shall be worked under the haunches of the pipe to provide firm continuous support.

Bedding placed on the sides of and above the pipe shall be compacted by machine tamping to not less than ninety-five percent (95%) of maximum unit weight in layers not exceeding 12 inches in depth.

2. Trench or Excavated Area

All trenches in paved streets, shoulders, traveled roadways, parking areas and driveways shall be backfilled with suitable excavated backfill or granular backfill, as shown on the drawings from one (1) foot above top of pipe up to the required subgrade elevation which will allow for placement of the required gravel base and/or pavement surface. The approved excavated backfill or granular backfill shall be placed and thoroughly and uniformly compacted by machine tamping to the specified compaction. With the approval of the Engineer, water jetting may be accepted in lieu of tamping for granular backfill only.

Specified compaction shall be required of the entire trench when the edge of trench is within three (3) feet of edge of pavement. On road crossings, specified compaction shall extend ten (10) feet beyond the edge of pavement for paved roadways with gravel shoulders or shall extend three (3) feet beyond the back of curb for roadways with curb.

Trenches under concrete sidewalks and bike paths shall be backfilled from one foot above top of pipe to a level four (4) inches below finished grade of the sidewalk with approved suitable excavated backfill or granular backfill and compacted to ninety-five percent (95%) maximum density.

Trenches not in paved streets, shoulders, traveled roadways, parking areas, driveways or under sidewalks, shall be backfilled from one (1) foot above the top of the pipe up to the ground surface with suitable excavated backfill and shall require compaction equal to adjacent undisturbed earth.

Wherever gas mains, water mains, sewers, or other utilities are located in the trench area, granular backfill shall be used for backfill from bottom of the trench up to the springline of the pipes. Granular backfill shall be placed across the full trench width and extend far enough either side of the existing pipe to allow specified compaction so as to thoroughly support the pipe within the trench area.

G. Backfilling Around Structures

As soon as practicable after concrete structures have set, forms and debris shall be removed and the surface of the concrete pointed. After the structure has been checked and approved, the excavated area around the structure shall be backfilled up to specified subgrade with granular material or suitable excavated material as called for on the drawings for the adjacent trench. The fill shall be thoroughly compacted by machine tamping. No large boulders or masonry shall be placed in backfill. No backfill will be placed against manhole walls within 48 hours after the plaster coat has been applied to the outside of the walls nor shall backfill be placed about concrete structures until concrete has attained at least 75 percent of its design strength and approval of the Engineer has been obtained.

3.24 PLACING AND COMPACTING EMBANKMENT

A. Embankment material for fill work shall be in accordance with Section 2.05. 03 of the MDOT Standard Specifications for Construction.

3.25 DISPOSAL OF EXCAVATED MATERIAL

A. After all suitable excavated material has been used on site, the Contractor shall be responsible for properly removing and disposing of the excess.

The Contractor shall also be responsible for disposing of all other excavated materials that are unsuitable for use as fill or backfill. Unsuitable materials may include, but are not limited to, broken concrete, asphalt, rock, stone, and other related debris. The Contractor shall be required to obtain his own disposal areas and permits and shall receive no additional compensation for this disposal work.

Surplus or unsuitable material shall not be disposed of either temporarily or permanently beyond the plan grading limit line or across any wetland or flood plain unless the plans provide for such placement.

Any agreements that the Contractor makes with local residents concerning the placement of fill on private property shall be the sole responsibility of the Contractor. The Owner will not become involved with any such agreements and will not be liable for damages that the Contractor may cause to private property.

Placement of fill on private property may require that the resident or Contractor obtain a grading permit or fill permit from the Owner.

3.26 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
   1. Provide a smooth transition between adjacent existing grades and new grades.
   2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
   1. Unpaved Areas: Plus or minus 1 inch.
   2. Walks: Plus or minus 1 inch.
   3. Pavements: Plus or minus 1/2 inch.

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

D. Final Cleanup and Grading: Upon completion of the construction, and before final payment is made, the Contractor shall restore his working area to as clean a condition as existed before his operations were started. He shall go over the entire line and refill any place that may have settled. He shall then re-grade and put in shape all backfilled trenches, all fills he may have made from excess excavated materials, and all other areas that may have been disturbed through all operations.

3.27 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
   1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
   2. Determine that fill material and maximum lift thickness comply with requirements.
   3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.

B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.28 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
   1. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
   1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.29 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

3.30 CONTACTOR SAFETY REQUIREMENTS

A. The Contractor shall not store, along and adjacent to the trench, excavated material, heavy equipment, backfill materials, sewer pipe, or other construction materials which may impose too great a load on the earth and cause displacement or caving of the earth. The Contractor shall, at all times, provide a safe means of emergency exit from all trench excavations.

B. The excavation and trenching operations shall be conducted by the Contractor in a manner that will provide safe working conditions for all persons on the site who may be affected by the Work. The Contractor shall also conduct his operations in a manner that will protect adjacent property from damage.

C. Trench sides shall be either cut back to the slope as necessitated by soil and ground water conditions which will provide stable sides, or supporting systems shall be installed that are capable of restraining the earth sides from movement. A qualified employee of the Contractor shall design the trench supporting systems.

D. The Contractor shall employ, at all times at the site of the work, a qualified person who will be responsible for the safety of both the work and workmen, and who will make all the decisions relevant to the stability of trenches, the adequacy of any and all protective devices, proper operation of equipment, and all other matters related to safety.

END OF SECTION 31 23 33

SECTION 32 10 00 – BASES AND PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Work shall include the furnishing of all labor, materials, tools, equipment, and services necessary for the restoration of the surfaces shown on the drawings and/or as herein required.

Disposal of excess or unsuitable materials shall be considered as part of the work. All such work shall be in accordance with the best modern practice, the Owner's standards, and as specified herein. No permanent surface restoration shall be performed until all underground work has been approved.

B. This Section includes the following:

1. Aggregate base course.

2. Bituminous surface, leveling and base courses.

3. Concrete pavement, sidewalk, curb and gutter.

C. Related Sections

1. Division 31 Section "Excavation and Fill" for excavation, filling and backfilling, and rough grading.

1.3 SUBMITTALS

A. Prior to performing work under this section, the Contractor shall submit to the Engineer for approval his construction methods and design mixes, sieve analysis, and/or certification of compliance with the current Michigan Department of Transportation (MDOT) Standard Specifications for Construction except where otherwise noted.

1.4 QUALITY ASSURANCE

A. References to the Michigan Department of Transportation (MDOT) Specifications shall pertain to the 2012 Standard Specifications for Construction.

PART 2 - PRODUCTS

1.1 AGGREGATE

A. Gravel Approaches and Roads: Natural aggregate shall be used for gravel approach (driveways) and road construction and shall meet the requirements of MDOT 21 AA or

MDOT 22A as shown in Table 902-1 of the MDOT Standard Specifications for Construction.

B. Shoulders: Natural aggregate shall be used for shoulders and shall meet the requirements of MDOT 21 AA, 22A, or 23A as shown in table 902-1 of the MDOT Standard Specifications for Construction.

C. Base Course: As shown on plans. Natural aggregate shall be used for base course construction and shall meet the requirements of MDOT 21A, 21AA, or 22A as shown in table 902-1 of the MDOT Standard Specifications for Construction. Base course under concrete slab shall be MDOT Class II Sand.

2.02 HOT MIX ASPHALT SURFACE, LEVELING and BASE COURSES

A. Hot mix asphalt materials used for pavement construction shall meet the requirements of Section 501.02 of the MDOT Standard Specifications for Construction, or the requirements of the Charter Township of Ypsilanti.

2.03 CONCRETE PAVEMENT, SIDEWALKS, CURB AND GUTTER

A. Concrete used for pavement, sidewalk, and curb and gutter construction shall meet the requirements of MDOT grade P1 concrete, or the requirements of the Charter Township of Ypsilanti as called for on the construction plans. MDOT grade P-NC may also be used where circumstances require the use of a high-early strength concrete. Refer to Table 601-2 of the MDOT Standard Specifications for Construction.

2.04 PAVEMENT STRIPING

A. Pavement Striping materials shall meet the requirements shown in Section 920 of the MDOT Standard Specifications for Construction.

PART 3 - EXECUTION

3.01 GENERAL:

A. The aggregate and pavement thicknesses shown in the following sections are intended to be a guideline for minimum thicknesses. Thicker sections may be required depending upon the requirements of the Owner or the controlling agency. In pavement restoration areas, all pavements shall be restored to the elevation and section that existed prior to construction.

3.02 GRAVEL SHOULDERS and APPROACHES

A. Gravel shoulders and approaches shall be constructed as described in Section 307.03 of the MDOT Standard Specifications for Construction.

B. Gravel shoulder construction shall consist of placement and compaction of MDOT 21AA limestone or MDOT 22A gravel on a suitable subgrade to form a minimum six (6) inch thick section. The 21AA limestone or 22A gravel shall be compacted to a minimum density of ninety-eight (98) percent of the maximum unit weight. In shoulder restoration areas, the restored shoulder shall match the existing shoulder width.

C. Construction of gravel approaches shall consist of placement and compaction of MDOT 21AA limestone or MDOT 22A gravel on a suitable subgrade as called for on the

drawings to form a minimum six (6) inch thick section. The 21AA limestone or 22A gravel shall be compacted to a minimum density of ninety-eight (98) percent of the maximum unit weight. In approach restoration areas, the restored approach width shall match the existing width.

3.03 GRAVEL ROADS

A. Construction and restoration of gravel roads shall consist of placement and compaction of MDOT 21AA limestone, MDOT 22A gravel, of MDOT 23A gravel as called for in the plan details to form a minimum eight (8) inch thick section. The restored road width shall match the existing road width. Gravel roads shall be constructed as described in Section 306.03 of the MDOT Standard Specifications for Construction.

3.04 AGGREGATE BASE COURSES

A. Aggregate base courses shall be placed and compacted to the thickness and width as called for on the plan details and as described in Section 302.03 of the MDOT Standard Specifications for Construction. Unless otherwise indicated in the Contract Documents, aggregate base courses shall be compacted to a minimum density of ninety-eight (98) percent of the maximum unit weight.

3.05 SAWCUTTING

A. All pavement, curb and gutter, and sidewalk removals shall be accomplished by sawcutting with a power-driven concrete saw. Sawcutting shall be full depth for all pavements (concrete, bituminous, concrete with bituminous overlay).

B. In bituminous pavement, sawcut lines shall be parallel with pavement joints. Sawcuts shall not be nearer than six (6) feet to a transverse joint, to the center of pavement, or to the edge of pavement such that no existing or replacement pavement section shall be less than six (6) feet in width. If the proposed sawcut is nearer than six (6) feet to a joint or centerline of a pavement, then removal and replacement shall be extended to said joint or centerline.

C. If an integral concrete curb is to be removed, then the minimum removal width shall be eighteen (18) inches.

3.06 HOT MIX ASPHALT (HMA) PAVEMENT

A. Hot mix asphalt pavements shall be constructed in accordance with the plan details and Section 501 of the MDOT Standard Specifications for Construction. Where new asphalt pavement is to adjoin existing asphalt pavement, a two (2) foot wide butt joint shall be constructed. A bond coat shall be applied to the existing pavement surface. Unless otherwise called for in the plan details, the following sections shall apply as a minimum.

1. Bike Paths: 3-inch HMA over 4-inch MDOT 21AA aggregate base (with soil sterilant application)

2. Residential driveways: 2-inch HMA over 6-inch MDOT 21AA aggregate base

3. Commercial driveways: 6-inch HMA over 9-inch MDOT 21AA aggregate base; or 8-inch asphalt

4. Residential streets: 4-inch HMA over 8-inch MDOT 21AA aggregate base; or 8-inch asphalt

5. Collector Road: 9-inch HMA over 6-inch MDOT 21AA aggregate base

B. The laboratory density of HMA pavement shall be determined by the Marshall Procedure ASTM D-1559 using 50 blows on each of the specimens as the compactive effort. One set of three (3) specimens shall be made on the first day of placement and on subsequent days as determined by the Engineer.

C. The measurement of field-compacted density shall be done with a nuclear gage. The percent of compaction obtained shall be determined by dividing the field-compacted density by the laboratory density and multiplying the result by 100. Unless otherwise indicated in the plan details or Contract Documents, all HMA pavements shall be compacted to a minimum calculated density of 97 percent.

D. Density tests shall be taken on the completed pavement at a frequency of one test every 500 linear feet of paving lane, except for the last unit which will be 500 linear feet, plus any fractional unit less than 250 feet in length, or will be a fractional unit of 250 feet or more in length. Miscellaneous areas such as intersections, crossovers and widening lanes less than 250 feet long will be tested as directed by the Engineer.

3.07 CONCRETE PAVEMENT

A. Concrete pavements shall be constructed in accordance with the drawing details as well as Sections 602 and 801 of the 2012 MDOT Standard Specifications for Construction. Where new concrete pavement is to be anchored to old pavement, dowel bars and lane ties shall be installed in accordance with MDOT Standard Plans. Joints shall be installed in the new concrete pavement to match existing joint types and locations. Reinforcing steel shall be similar to that in the existing pavement and shall provide the same cross sectional area of reinforcement per foot as the existing pavement. Unless otherwise called for in the plan details, the following sections shall apply as a minimum:

1. Residential driveways: 6-inch non-reinforced concrete over 4-inch sand base

2. Commercial driveways: 8-inch non-reinforced concrete over 6-inch aggregate base

3. Residential streets: 8-inch non-reinforced concrete over 6-inch aggregate base

4. Collector road: 10-inch non-reinforced concrete over 6-inch aggregate base

3.08 CONCRETE SIDEWALK AND RAMPS

A. Concrete sidewalks and ramps shall be constructed in accordance with the drawing details and Section 803 of the MDOT Standard Specifications for Construction. Unless otherwise called for in the details, the following sections shall apply as a minimum:

1. Sidewalks: 4-inch concrete over 4-inch sand base

2. Sidewalks (at residential drive crossing): 6-inch concrete over 6-inch aggregate base

3. Sidewalks (at commercial drive crossing): 8-inch concrete over 6-inch aggregate base

4. Sidewalk ramps: 4-inch concrete over 4-inch sand base

3.09 CONCRETE CURB and GUTTER

A. Concrete curb and gutter shall be constructed in accordance with the drawing details and Section 802 of the MDOT Standard Specifications for Construction.

END OF SECTION 32 10 00

SECTION 32 17 23 - PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes painted markings applied to asphalt pavement.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include technical data and tested physical and performance properties.

B. Shop Drawings: For pavement markings.

1. Indicate pavement markings, colors, lane separations, defined parking spaces, and dimensions to adjacent work.
2. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.

C. Samples: For each exposed product and for each color and texture specified; on rigid backing, 8 inches square.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of 2012 MDOT Standard Specifications for Construction for pavement-marking work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for alkyd materials, 55 deg F for water-based materials, and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design"

2.2 PAVEMENT-MARKING PAINT

A. Pavement-Marking Paint: Alkyd-resin type, lead and chromate free, ready mixed, complying with AASHTO M 248, Type N, Type F, Type S; colors complying with FS TT-P-1952.

1. Color: Match existing pavement markings.

B. Pavement-Marking Paint: MPI #32, solvent-borne traffic-marking paint.

1. Color: Match existing pavement markings

C. Pavement-Marking Paint: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, Type II, with drying time of less than 45 minutes.

1. Color: Match existing pavement markings.

D. Pavement-Marking Paint: MPI #97, latex traffic-marking paint.

1. Color: Match existing pavement markings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that pavement is dry and in suitable condition to begin pavement marking according to manufacturer's written instructions.

B. Proceed with pavement marking only after unsatisfactory conditions have been corrected.

3.2 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Engineer.

B. Sweep and clean surface to eliminate loose material and dust.

C. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils (0.4 mm).

1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils, firmly secured to pavement. Mask an extended area beyond edges of each stencil to prevent paint application beyond stencil. Apply paint so that it cannot run beneath stencil.

2. Broadcast glass beads uniformly into wet markings at a rate of 6 lb/gal. (0.72 kg/L).

3.3 PROTECTING AND CLEANING

A. Protect pavement markings from damage and wear during remainder of construction period.

B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 32 17 23

SECTION 32 92 00 - TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Work shall include the furnishing of all labor, materials, tools, equipment, and services necessary for the restoration of the surfaces shown on the drawings and/or as herein required.

B. Disposal of excess or unsuitable materials shall be considered as part of the restoration work. All such work shall be in accordance with the best modern practice, the Owner's standards, and as specified herein. In the event that these specifications conflict with those of the Owner or the controlling agency, the more stringent requirements shall govern. No permanent surface restoration shall be performed until all underground work has been approved.

C. Section Includes:
   1. Seeding.
   2. Sod.
   3. Erosion-control material(s).
   4. Meadow grasses and wildflowers.

D. Related Sections:
   1. Division 31 Section "Site Clearing" for topsoil stripping and stockpiling.
   2. Division 32 Section "Plants" for trees, shrubs, ground covers, and other plants as well as border edgings and mow strips.

1.3 DEFINITIONS

A. Retain definition(s) remaining after this Section has been edited.

B. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.

C. Finish Grade: Elevation of finished surface of planting soil.

D. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

E. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

F. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

G. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

H. Subgrade: Surface or elevation of subsoil remaining after excavation is complete or top surface of a fill or backfill before planting soil is placed.

I. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

J. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.4 SUBMITTALS

A. First paragraph below is defined in Division 01 Section "Submittal Procedures" as an "Action Submittal."

B. Product Data: For each type of product indicated.
   1. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to this Project.

C. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
   1. Certification of each seed mixture for meadow grasses and wildflowers. Include identification of source and name and telephone number of supplier.

D. Qualification Data: For qualified landscape Installer.

E. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of meadows during a calendar year. Submit before expiration of required initial maintenance periods.

F. Before the Contractor orders any restoration materials that he is proposing to use as substitutes for specified items, he shall submit details of the substitutes to the Engineer for consideration and approval.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful meadow establishment.
   1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
   2. Pesticide Applicator: State licensed, commercial.

B. Soil-Testing Laboratory Qualifications: An independent laboratory with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

C. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; deleterious material; pH; and mineral and plant-nutrient content of the soil.
   1. Testing methods and written recommendations shall comply with USDA's Handbook No. 60.
   2. The soil-testing laboratory shall oversee soil sampling, with depth, location, and number of samples to be taken per instructions from Engineer. A minimum of three representative

samples shall be taken from varied locations for each soil to be used or amended for planting purposes.

D. Preinstallation Conference: Conduct conference at Project Site.

E. References to the Michigan Department of Transportation (MDOT) Specifications shall pertain to the 2012 Standard Specifications for Construction.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.

B. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" sections in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod within 24 hours of harvesting and in time for planting promptly. Protect sod from breakage and drying.

C. Bulk Materials:
   1. Do not dump or store bulk materials near structures, utilities, walkways, protection zones, 100-year floodplain, wetlands and pavements, or on existing plants, as specified on plans.
   2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
   3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

1.7 PROJECT CONDITIONS

A. Planting Restrictions: Plant between May 15 and September 30. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of planting completion.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

1.8 MAINTENANCE SERVICE

A. Initial Meadow Maintenance Service: Provide full maintenance by skilled employees of landscape installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable meadow is established, but for not less than 40 days from date of planting completion.

PART 2 - PRODUCTS

2.1 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.

B. Seed shall meet the following requirements (percent mixture proportions by weight).
   1. Maintained lawn areas.

a. Seed: MDOT Type THM Mix (20% Perennial Rye, 30% Kentucky Blue,50% Red Fescue) applied at 220 lbs./acre)
2. Fields, slopes, ditch banks.
a. MDOT Type THV Mix (30% Perennial Rye, 15% Kentucky Blue, 45% Red Fescue, 10% Fults Salt) applied at 220 lbs./acre

C. Seed shall have not less than 95 percent germination, not less than 85 percent pure seed, and not more than 0.5 percent weed seed.

D. All grass seeding shall meet the requirements for purity and germination as called for in the MDOT Standard Specifications for Construction Table 917-1 for Seed Mixtures. Seed shall be delivered in durable containers which show the manufacturer's name, lot number, weight, contents, purity, and germination. Other seeding mixtures shown in MDOT Tables 816-1 and 917-1 may be used where approved by the Engineer.

2.2 TURFGRASS SOD

A. Turfgrass Sod: Certified Number 1 Quality/Premium, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture that is strongly rooted and capable of vigorous growth and development when planted.

B. Turfgrass Species: Bermudagrass (Cynodon dactylon), Carpetgrass (Axonopus affinis), Centipedegrass (Eremochloa ophiuroides), St. Augustinegrass (Stenotaphrum secundatum), Zoysiagrass (Zoysia japonica), Zoysiagrass (Zoysia matrella).

C. Turfgrass Species: Sod of grass species as follows, with not less than 95 percent germination, not less than 95 percent pure seed, and not more than 0.5 percent weed seed:

1. Full Sun: Kentucky bluegrass (Poa pratensis), a minimum of three cultivars.
2. Sun and Partial Shade: Proportioned by weight as follows:

a. 50 percent Kentucky bluegrass (Poa pratensis).
b. 30 percent chewings red fescue (Festuca rubra variety).
c. 10 percent perennial ryegrass (Lolium perenne).
d. 10 percent redtop (Agrostis alba).

3. Shade: Proportioned by weight as follows:

a. 50 percent chewings red fescue (Festuca rubra variety).
b. 35 percent rough bluegrass (Poa trivialis).
c. 15 percent redtop (Agrostis alba).

2.3 FERTILIZERS

A. Fertilizer shall meet the following requirements.
1. Maintained lawn areas.
a. MDOT Class A, 228 lbs./acre
2. Fields, slopes, ditch banks.
a. MDOT Class B, 120 lbs./acre

2.4 PLANTING SOILS

A. Planting Soil: ASTM D 5268 topsoil, with pH range of 5.5 to 7, a minimum of 6 percent organic material content; free of stones 1-inch or larger in any dimension and other extraneous materials harmful to plant growth.

B. Planting Soil: Existing, native surface topsoil formed under natural conditions with the duff layer retained during excavation process and stockpiled on-site. Verify suitability of native surface topsoil to produce viable planting soil. Clean soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
   1. Supplement with another planting soil when quantities are insufficient.

2.5 TOPSOIL

A. Topsoil shall be screened and shall consist of loose black-colored soil that is suitable for the growth of grass seed or sod. The topsoil shall be obtained from the upper layer of an existing fertile soil and be free of limbs, twigs, rocks, stones, muck, roots and debris, etc. and contain organic matter rich in nutrients with negligible clay content.

B. Topsoil shall meet the following requirements.
   1. The pH range shall be from 6.0 to 7.5. Topsoil outside of this range shall be amended by the addition of pH adjusters as approved by the Engineer.
   2. The organic matter content shall range between 2% and 6% (by dry sample weight).
   3. The soil texture shall be a sandy loam, silt loam, or loam where the sand, silt, and clay contents (by dry sample weight) fall within the following ranges:
      a. Sand 40% to 65%
      b. Silt 25% to 60%
      c. Clay 5% to 15%
   4. The gradation shall be as follows:
      a. Sieve designation % Passing
      b. 1-inch screen 100
      c. 0.25-inch screen 97-100
      d. No. 10 U.S.S. mesh sieve 95-100
      e. No. 140 U.S.S. mesh sieve 15-35
   5. The soil salinity as measured by the electrical conductivity of a saturated soil sample shall not exceed 2dS/m (decisiemens/meter).
   6. Topsoil samples may be taken from stockpiles by the Engineer for submission to a testing laboratory. Topsoil that does not meet the required specifications shall be removed from the project site by the Contractor and shall be replaced with suitable topsoil that meets the testing requirements.

2.6 MULCH and MULCH BLANKETS

A. Loose Mulch: Mulching material shall consist of any straw or march hay in an air-dry condition. Hay in an air-dried condition will be permitted only when straw mulch or marsh hay is unavailable. Mulch materials shall be undamaged, rot free, clean, substantially free of weed seed and other objectionable foreign matter.

B. Mulch Blankets (for moderate runoff condition): Mulch blankets shall be one of the following or an approved equal:
   1. S1 Erosion Control Blanket – BonTerra America
   2. Contech ERO-MAT – Contech Construction Products
   3. Erosion Control Blankets DS-75 – North American Green

C. High Velocity Mulch Blankets (for medium to heavy runoff condition): High velocity mulch blankets shall be one of the following or an approved equal:
   1. S2 Erosion Control Blanket – Bon Terra America
   2. Contech High Velocity ERO-MAT – Contech Construction Products
   3. ECS High Impact Excelsior Blanket – Erosion Control Systems, Inc.
   4. ECS High Velocity Straw Mat – Erosion Control Systems, Inc.
   5. Erosion Control Blanket DS-150 – North American Green

2.7 PESTICIDES

A. General: Pesticide, registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

2.8 SOD

A. Sod shall meet the requirements of Section 91 7. 13 of MDOT Standard Specifications for Construction. The Contractor shall keep the sod watered until a vigorous growth is established.

B. Sod must be an upland mineral soil sod. Sod must be grown on loam soils. Sod grown on peat is not acceptable for use.

PART 3 - EXECUTION

3.1 GENERAL

A. The Contractor shall furnish and place topsoil, seed, or sod, and fertilizer for all areas that were disturbed during construction. Seed and sod shall be installed in accordance with the seasonal limitations that are described in Section 81 6. 03 of the MDOT Standard Specifications of Construction unless directed otherwise by the Engineer.

3.2 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting performance.
   1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
   2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
   3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
   4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Engineer and replace with new planting soil.

3.3 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, 100-year floodplain, wetlands, and plantings from damage caused by planting operations.
   1. Protect grade stakes set by others until directed to remove them.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties, walkways, 100-year floodplain and wetlands.

C. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

D. Before planting, obtain Engineer's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 PREPARATION FOR EROSION-CONTROL MATERIALS

A. For erosion-control mats, install planting soil in two lifts, with second lift equal to thickness of erosion-control mats. Install erosion-control mat and fasten as recommended by material manufacturer.

B. Fill cells of erosion-control mat with planting soil and compact before planting.

C. For erosion-control blanket or mesh, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.

D. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

3.5 TOPSOIL

A. Unless otherwise called for on the plans, a minimum of three (3) inches of topsoil shall be placed for areas that are to be restored with seeding or sod. Topsoil shall be placed on a prepared earth bed in accordance with Section 81 6. 03A of the MDOT Standard Specifications for Construction.

B. The existing earth bed shall be graded such that the placement of topsoil and sod will meet the final plan grades.

3.6 SEEDING

A. Seeding shall be sown in accordance with Section 81 6. 03C of the MDOT Standard Specifications for Construction. The application rate for the seeding shall be as specified in the Products section.

B. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
   1. Do not use wet seed or seed that is moldy or otherwise damaged.
   2. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.

C. Rake seed lightly into top 1/8-inch of soil, roll lightly, and water with fine spray.

D. Protect seeded areas with slopes exceeding 1:4 with erosion-control blankets installed and stapled according to manufacturer's written instructions.

E. Protect seeded areas with erosion-control mats where shown on Drawings; install and anchor according to manufacturer's written instructions.

F. Protect seeded areas with slopes not exceeding 1:6 by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose thickness over seeded areas. Spread by hand, blower, or other suitable equipment.
   1. Anchor straw mulch by crimping into soil with suitable mechanical equipment.

3.7 MULCH AND MULCH BLANKETS

A. Mulch and mulch blankets shall be placed over seeded areas as called for in Section 81 6. 03E through H of the MDOT Standard Specifications for Construction. If mulch blankets must be secured to a slope, then biodegradable earth staples shall be used.

B. Mulch anchoring shall be considered as incidental to mulch placement unless a pay item for mulch anchoring has been included in the Bid Form.

3.8 SOD

A. Sod shall be placed in accordance with Section 81 6. 03D of the MDOT Standard Specifications for Construction.

B. A sod cutter shall be used to establish a smooth vertical edge when new sod is to abut existing sod.

3.9 FERTILIZER

A. Fertilizer shall be placed in accordance with Section 81 6. 03B of the MDOT Standard Specifications for Construction. The application rate for the fertilizer shall be as specified in the Products section.

3.10 RESTORATION

A. Restore existing grass areas.

B. Restore existing areas damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.
   1. Reestablish areas where settlement or washouts occur or where minor regrading is required.
   2. Install new planting soil as required.

C. Remove topsoil containing foreign materials such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from Contractor's operations, and replace with new planting soil.

D. Mow, de-thatch, core aerate, and rake existing turf.

E. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.

F. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.

G. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches.

H. Apply soil amendments and initial fertilizers required for establishing new grass areas and mix thoroughly into top 4 inches of existing soil. Install new planting soil to fill low spots and meet finish grades.

I. Apply seed and protect with straw mulch.

J. Water newly planted areas and keep moist until new turf is established.

3.11 TURF MAINTENANCE

A. It is the responsibility of the Contractor to regularly water new seed and sod in order to establish a dense lawn of permanent grasses that is free from mounds and depressions. Any portion of a sodded area that “browns-out” or does not firmly knot to the soil base, or any portion of a seeded area that fails to show a uniform germination, shall be re-sodded or re-seeded. Such re-sodding or re-seeding shall be at the Contractor’s expense and shall continue until a dense lawn is established.

B. Watering seed and sod shall be considered as included in the turf establishment work unless a pay item for water has been included in the Bid Form.

C. Maintain and establish grass by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.
   1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
   2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
   3. Apply treatments as required to keep grass and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

D. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.
   1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
   2. Water turf with fine spray at a minimum rate of 1-inchperweek unless rainfall precipitation is adequate.

E. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:

3.12 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Engineer:
   1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.

2. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.

3.13 MEADOW

A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
   1. Do not use wet seed or seed that is moldy or otherwise damaged.

B. Sow seed at a total rate of 5 oz./1000 sq. ft.

C. Brush seed into top 1/16 inch of soil, roll lightly, and water with fine spray.

D. Water newly planted areas and keep moist until meadow is established.

3.14 MEADOW MAINTENANCE

A. Maintain and establish meadow by watering, weeding, mowing, trimming, replanting, and performing other operations as required to establish a healthy, viable meadow. Roll, regrade, and replant bare or eroded areas and remulch. Provide materials and installation the same as those used in the original installation.
   1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and meadow damaged or lost in areas of subsidence.
   2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
   3. Apply treatments as required to keep meadow and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering: Install and maintain temporary piping, hoses, land meadow-watering equipment to convey water from sources and to keep meadow uniformly moist.
   1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.

3.15 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents in accordance with requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

3.16 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by restoration work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

C. Remove non-degradable erosion-control measures after grass establishment period.

3.17 PROGRESS OF FINAL RESTORATION

A. If in the judgment of the Owner, adequate site restoration efforts are not being expended, then the Owner will take the necessary steps to perform such restoration and shall charge the Contractor for all of the costs until proper order is restored.

3.18 DRAINAGE STRUCTURES, CULVERTS, and DITCHES

A. As part of restoration, the Contractor shall be responsible for cleaning out all drainage structures, culverts, and ditches that are located within the area of construction. All ditches shall be restored such that drainage will flow freely. The cost of this work shall be considered as included in the pay items for restoration work.

END OF SECTION 32 92 00

SECTION 32 93 00 - PLANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Plants.
2. Tree stabilization.
3. Tree-watering devices.
4. Landscape edgings.
5. Tree grates.

B. Related Requirements:

1. Section 015639 "Temporary Tree and Plant Protection" for protecting, trimming, pruning, repairing, and replacing existing trees to remain that interfere with, or are affected by, execution of the Work.
2. Section 129200 "Interior Planters and Artificial Plants" for planters for live and artificial interior plants.
3. Section 329200 "Turf and Grasses" for turf (lawn) and meadow planting, hydroseeding, and erosion-control materials.
4. Section 329600 "Transplanting" for transplanting non-nursery-grown trees.

1.3 ALLOWANCES

A. Allowances for plants are specified in Section 012100 "Allowances."

1. Perform planting work under quantity allowances and only as authorized. Authorized work includes [**work required by Drawings and the Specifications and**] [**only**] work authorized in writing by Architect.
2. Notify Architect [**weekly**] <**Insert time interval**> of extent of work performed that is attributable to quantity allowances.
3. Perform work that exceeds quantity allowances only as authorized by Change Orders.

B. Furnish trees as part of tree allowance.

C. Furnish <**Insert plant variety**> as part of <**Insert name of allowance**>.

1.4 UNIT PRICES

A. Work of this Section is affected by unit prices specified in Section 012200 "Unit Prices."

B. Unit prices apply to authorized work covered by quantity allowances.

C. Unit prices apply to additions to and deletions from the Work as authorized by Change Orders.

1.5 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with a ball size not less than [**sizes indicated**] [**diameter and depth recommended by ANSI Z60.1 for type and size of plant required**]; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.

C. Balled and Potted Stock: Plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than [**sizes indicated**] [**diameter and depth recommended by ANSI Z60.1 for type and size of plant required**].

D. Bare-Root Stock: Plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than the minimum root spread according to ANSI Z60.1 for type and size of plant required.

E. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.

F. Fabric Bag-Grown Stock: Healthy, vigorous, well-rooted plants established and grown in-ground in a porous fabric bag with well-established root system reaching sides of fabric bag. Fabric bag size is not less than diameter, depth, and volume required by ANSI Z60.1 for type and size of plant.

G. Finish Grade: Elevation of finished surface of planting soil.

H. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant. Some sources classify herbicides separately from pesticides.

I. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

J. Planting Area: Areas to be planted.

K. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See [**Section 329113 "Soil Preparation"**] [**Section 329115 "Soil Preparation (Performance Specification)"**] for drawing designations for planting soils.

L. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

M. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

N. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

O. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.6 COORDINATION

A. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.

1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.7 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
2. Plant Photographs: Include color photographs in [**digital**] [**3- by 5-inch (76- by 127-mm) print**] format of each required species and size of plant material as it will be furnished to Project. Take photographs from an angle depicting true size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each photograph. For species where more than [**20**] <**Insert number**> plants are required, include a minimum of [**three**] <**Insert number**> photographs showing the average plant, the best quality plant, and the worst quality plant to be furnished. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.

B. Samples for Verification: For each of the following:

1. Trees and Shrubs: [**Three**] <**Insert number**> Samples of each variety and size[**delivered to site for review**]. Maintain approved Samples on-site as a standard for comparison.
2. [**Organic**] [**Compost**] Mulch: [**1-pint (0.5-L)**] [**1-quart (1-L)**] <**Insert value**> volume of each organic mulch required; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of color, texture, and organic makeup.
3. Mineral Mulch: [**2 lb (1.0 kg)**] [**5 lb (2.5 kg)**] <**Insert value**> of each mineral mulch required, in sealed plastic bags labeled with source of mulch. Sample shall be typical of the lot of material to be delivered and installed on-site; provide an accurate indication of color, texture, and makeup of the material.
4. Weed Control Barrier: 12 by 12 inches (300 by 300 mm).
5. Proprietary Root-Ball-Stabilization Device: One unit.
6. Slow-Release, Tree-Watering Device: One unit of each size required.
7. Edging Materials and Accessories: Manufacturer's standard size, to verify color selected.
8. Tree Grates[**, Frames,**] and Accessories: Manufacturer's standard size[**delivered to site for review**], to verify design[**and color**] selected.
9. Root Barrier: Width of panel by 12 inches (300 mm).

1.8 INFORMATIONAL SUBMITTALS

A. Qualification Data: For landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.

B. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:

1. Manufacturer's certified analysis of standard products.
2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

C. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.

D. Sample Warranty: For special warranty.

1.9 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before expiration of required maintenance periods.

1.10 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of plants.

1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
2. Experience: [**Three**] [**Five**] <**Insert number**> years' experience in landscape installation in addition to requirements in Section 014000 "Quality Requirements."
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Personnel Certifications: Installer's [**field supervisor**] [**personnel assigned to the Work**] shall have certification in [**one**] [**all**] of the following categories from the Professional Landcare Network:

a. Landscape Industry Certified Technician - Exterior.
b. Landscape Industry Certified Interior.
c. Landscape Industry Certified Horticultural Technician.

5. Pesticide Applicator: State licensed, commercial.

B. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

1. Selection of plants purchased under allowances is made by Architect, who tags plants at their place of growth before they are prepared for transplanting.

C. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.

1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container-grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches (150 mm) above the root flare for trees up to 4-inch (100-mm) caliper size, and 12 inches (300 mm) above the root flare for larger sizes.
2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

D. Plant Material Observation: Architect may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Architect may also observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and may reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

1. Notify Architect of sources of planting materials [**seven**] <**Insert number**> days in advance of delivery to site.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws if applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

C. Deliver bare-root stock plants within [**24 hours**] [**36 hours**] <**Insert time**> of digging. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting. Transport in covered, temperature-controlled vehicles, and keep plants cool and protected from sun and wind at all times.

D. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

E. Handle planting stock by root ball.

F. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F (16 to 18 deg C) until planting.

G. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.

1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

H. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

I. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1. Heel-in bare-root stock. Soak roots that are in less than moist condition in water for two hours. Reject plants with dry roots.
2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
3. Do not remove container-grown stock from containers before time of planting.
4. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly wet condition.

1.12 FIELD CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

1. Spring Planting: <**Insert dates**>.
2. Fall Planting: <**Insert dates**>.

C. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

1.13 WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner.
b. Structural failures including plantings falling or blowing over.
c. Faulty performance of [**tree stabilization**] [**edgings**] [**and**] [**tree grates**] <**Insert item**>.
d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Periods: From date of [**planting completion**] [**Substantial Completion**] <**Insert starting time**>.

   a. Trees, Shrubs, Vines, and Ornamental Grasses: [**12**] <**Insert number**> months.
   b. Ground Covers, Biennials, Perennials, and Other Plants: [**12**] [**Nine**] [**Six**] [**Three**] <**Insert number**> months.
   c. Annuals: [**Three**] [**Two**] <**Insert number**> months.

3. Include the following remedial actions as a minimum:

   a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
   b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
   c. A limit of one replacement of each plant is required except for losses or replacements due to failure to comply with requirements.
   d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

   1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch (19 mm) in diameter; or with stem girdling roots are unacceptable.
   2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.

C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

D. Labeling: Label [**each**] [**at least one**] plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant.

E. If formal arrangements or consecutive order of plants is indicated on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

F. [**Annuals**] [**and**] [**Biennials**]: Provide healthy, disease-free plants of species and variety shown or listed, with well-established root systems reaching to sides of the container to maintain a firm ball, but not with excessive root growth encircling the container. Provide only plants that are acclimated to outdoor conditions before delivery[**and that are in bud but not yet in bloom**].

2.2 FERTILIZERS

A. Planting Tablets: Tightly compressed chip-type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.

1. Size: [**5-gram**] [**10-gram**] [**21-gram**] <**Insert size**> tablets.
2. Nutrient Composition: 20 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.

2.3 MULCHES

A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:

1. Type: [**Shredded hardwood**] [**Ground or shredded bark**] [**Wood and bark chips**] [**Pine straw**] [**Salt hay or threshed straw**] [**Pine needles**] [**Peanut, pecan, and cocoa-bean shells**] <**Insert mulch type**>.
2. Size Range: [**3 inches (76 mm) maximum, 1/2 inch (13 mm) minimum**] <**Insert dimensions**>.
3. Color: Natural.

B. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through a 1-inch (25-mm) sieve; soluble-salt content of [**2 to 5**] <**Insert range or value**> dS/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content: [**50 to 60**] <**Insert number range**> percent of dry weight.
2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

C. Mineral Mulch: Hard, durable stone, washed free of loam, sand, clay, and other foreign substances, of the following type, size range, and color:

1. Type: [**Rounded riverbed gravel or smooth-faced stone**] [**Crushed stone or gravel**] [**Marble chips**] [**Granite chips**] <**Insert stone type**>.
2. Size Range: [**1-1/2 inches (38 mm) maximum, 3/4 inch (19 mm) minimum**] [**3/4 inch (19 mm) maximum, 1/4 inch (6.4 mm) minimum**] <**Insert dimensions**>.
3. Color: [**Uniform tan-beige color range acceptable to Architect**] [**Readily available natural gravel color range**] <**Insert color**>.

2.4 WEED-CONTROL BARRIERS

A. Nonwoven Geotextile Filter Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. (101g/sq. m) minimum, composed of fibers formed into a stable network so that fibers retain their relative

position. Fabric shall be inert to biological degradation and resist naturally encountered chemicals, alkalis, and acids.

B. Composite Fabric: Woven, needle-punched polypropylene substrate bonded to a nonwoven polypropylene fabric, 4.8 oz./sq. yd. (162 g/sq. m).

2.5 PESTICIDES

A. General: Pesticide registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

2.6 TREE-STABILIZATION MATERIALS

A. Trunk-Stabilization Materials:

1. Upright and Guy Stakes: Rough-sawn, sound, new [**hardwood**] [**softwood with specified wood pressure-preservative treatment**], free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal (38-by-38-mm actual) by length indicated, pointed at one end.
2. Wood Deadmen: Timbers measuring 8 inches (200 mm) in diameter and 48 inches (1200 mm) long, treated with specified wood pressure-preservative treatment.
3. Flexible Ties: Wide rubber or elastic bands or straps of length required to reach stakes or [**turnbuckles**] [**compression springs**].
4. Guys and Tie Wires: ASTM A 641/A 641M, Class 1, galvanized-steel wire, two-strand, twisted, 0.106 inch (2.7 mm) in diameter.
5. Tree-Tie Webbing: UV-resistant polypropylene or nylon webbing with brass grommets.
6. Guy Cables: Five-strand, 3/16-inch- (4.8-mm-) diameter, galvanized-steel cable, with zinc-coated [**turnbuckles**] [**compression springs**], a minimum of 3 inches (75 mm) long, with two 3/8-inch (10-mm) galvanized eyebolts.
7. Flags: Standard surveyor's plastic flagging tape, white, 6 inches (150 mm) long.
8. Proprietary Staking-and-Guying Devices: Proprietary stake or anchor and adjustable tie systems to secure each new planting by plant stem; sized as indicated and according to manufacturer's written recommendations.

    a. <Double click here to find, evaluate, and insert list of manufacturers and products.>

B. Root-Ball Stabilization Materials:

1. Upright Stakes and Horizontal Hold-Down: Rough-sawn, sound, new hardwood or softwood, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal (38-by-38-mm actual) by length indicated; stakes pointed at one end.
2. Wood Screws: ASME B18.6.1.

3. Proprietary Root-Ball Stabilization Devices: Proprietary at- or below-grade stabilization systems to secure each new planting by root ball and that do not encircle the trunk; sized according to manufacturer's written recommendations unless otherwise indicated.

    a. <Double click here to find, evaluate, and insert list of manufacturers and products.>

C. Palm Bracing: Battens or blocks, struts, straps, and protective padding.

1. Battens or Blocks and Struts: Rough-sawn, sound, new hardwood or softwood, free of knots, holes, cross grain, and other defects, 2-by-4-inch nominal (38-by-89-mm actual) by lengths indicated.
2. Straps: Adjustable steel or plastic package banding.
3. Padding: Burlap.
4. Proprietary Palm-Bracing Devices: Proprietary systems to secure each new planting by trunk; sized according to manufacturer's written recommendations unless otherwise indicated.

    a. <Double click here to find, evaluate, and insert list of manufacturers and products.>

2.7 LANDSCAPE EDGINGS

A. Wood Edging: Of sizes indicated on Drawings, and wood stakes as follows:

1. Species: [**Western red cedar, all heart**] [**Southern pine with specified wood pressure-preservative treatment**].
2. Stakes: Same species as edging, 1-by-2-inch nominal (19-by-38-mm actual) by 18 inches (450 mm) long, with galvanized nails for anchoring edging.

B. Steel Edging: Standard commercial-steel edging, fabricated in sections of standard lengths, with loops stamped from or welded to face of sections to receive stakes.

1. <Double click here to find, evaluate, and insert list of manufacturers and products.>
2. Edging Size: [**3/16 inch (4.8 mm) thick by 4 inches (100 mm) deep**] [**1/4 inch (6.4 mm) thick by 5 inches (125 mm) deep**] [**1/4 inch (6.4 mm) thick by 4 inches (100 mm) deep**] [**1/8 inch (3.2 mm) thick by 4 inches (100 mm) deep**] [**1/8 inch (3.2 mm) thick by 6 inches (150 mm) deep**] [**0.1 inch (2.5 mm) thick by 4 inches (100 mm) deep**] <**Insert dimensions**>.
3. Stakes: Tapered steel, a minimum of [**12 inches (300 mm)**] [**15 inches (380 mm)**] <**Insert dimension**> long.
4. Accessories: Standard tapered ends, corners, and splicers.
5. Finish: [**Manufacturer's standard paint**] [**Zinc coated**] [**Unfinished**].

    a. Paint Color: [**Black**] [**Green**] [**Brown**].

C. Aluminum Edging: Standard-profile extruded-aluminum edging, ASTM B 221 (ASTM B 221M), Alloy 6063-T6, fabricated in standard lengths with interlocking sections with loops stamped from face of sections to receive stakes.

1. <Double click here to find, evaluate, and insert list of manufacturers and products.>
2. Edging Size: [**3/16 inch (4.8 mm) thick by 5-1/2 inches (140 mm) deep**] [**3/16 inch (4.8 mm) thick by 4 inches (100 mm) deep**] [**1/8 inch (3.2 mm) thick by 5-1/2 inches (140**

mm) deep] [1/8 inch (3.2 mm) thick by 4 inches (100 mm) deep] <Insert dimensions>.

3. Stakes: Aluminum, ASTM B 221 (ASTM B 221M), Alloy 6061-T6, approximately 1-1/2 inches (38 mm) wide by 12 inches (300 mm) long.
4. Finish: [**Manufacturer's standard paint**] [**Powder-coat paint**] [**Mill (natural aluminum)**] [**Black anodized**].

    a. Paint Color: [**Black**] [**Green**] [**Brown**].

D. Plastic Edging: Standard black polyethylene or vinyl edging, [**V-lipped bottom**] [**horizontally grooved**] <**Insert configuration**>, extruded in standard lengths, with 9-inch (225-mm) [**steel angle**] [**plastic**] stakes.

1. <Double click here to find, evaluate, and insert list of manufacturers and products.>
2. Edging Size: [**0.1 inch (2.5 mm) thick by 5 inches (125 mm) deep**] [**0.07 inch (1.8 mm) thick by 5 inches (125 mm) deep**] <**Insert dimensions**>.
3. Top Profile: Straight, with top 2 inches (50 mm) being 1/4 inch (6.4 mm) thick.
4. Top Profile: Round top, [**1/2 inch (13 mm)**] [**1 inch (25 mm)**] in diameter.
5. Accessories: Manufacturer's standard alignment clips or plugs.

2.8 TREE GRATES

A. Tree Grates: Manufacturer's [**standard**] [**custom designed**] tree grates[**and frames**].

1. <Double click here to find, evaluate, and insert list of manufacturers and products.>
2. Grates: ASTM A 48/A 48M, Class 35 (Class 250) or better, gray-iron castings.
3. Frames: [**ASTM A 48/A 48M, Class 35 (Class 250) or better, gray-iron castings**] [**or**] [**ASTM A 36/A 36M steel-angle, hot-dip galvanized,**] of shape, pattern, and size indicated.

B. Shape and Size: [**As indicated on Drawings**] [**Round, 36 inches (914 mm) in diameter**] [**Round, 72 inches (1828 mm) in diameter**] [**48 inches (1219 mm) square**] [**60 inches (1524 mm) square**] [**Rectangular, 36 by 60 inches (914 by 1524 mm)**] [**Rectangular, 48 by 72 inches (1219 by 1828 mm)**] <**Insert shape and dimensions**>.

C. Finish: [**As fabricated**] [**Powder-coat finish**] <**Insert finish**>.

1. Color: Low-gloss [**black**] [**dark brown**] [**dark green**] [**dark gray**] <**Insert color**>.

2.9 TREE-WATERING DEVICES

A. Watering Pipe: PVC pipe 4 inches (100 mm) in diameter, site-cut to length as required, and with snug-fitting removable cap.

B. Slow-Release Watering Device: Standard product manufactured for drip irrigation of plants and emptying its water contents over [**an extended time period**] [**two to nine hours**] [**two to three weeks**] <**Insert number or range**>; manufactured from UV-light-stabilized nylon-reinforced polyethylene sheet, PVC, or HDPE plastic.

1. <Double click here to find, evaluate, and insert list of manufacturers and products.>
2. Color: [**As selected by Architect from manufacturer's full range**] [**black**] [**dark chocolate**] [**green**] [**or**] [**tan**] <**Insert color**>.

2.10 MISCELLANEOUS PRODUCTS

A. Wood Pressure-Preservative Treatment: AWPA U1, Use Category UC4a; acceptable to authorities having jurisdiction, and containing no arsenic or chromium.

B. Root Barrier: Black, molded, modular panels [**18 inches (457 mm)**] [**24 inches (610 mm)**] <**Insert dimension**> high (deep), 85 mils (2.2 mm) thick, and with vertical root deflecting ribs protruding 3/4 inch (19 mm) out from panel surface; manufactured with minimum 50 percent recycled polyethylene plastic with UV inhibitors.

1. <Double click here to find, evaluate, and insert list of manufacturers and products.>

C. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.

D. Burlap: Non-synthetic, biodegradable.

E. Planter Drainage Gravel: Washed, sound crushed stone or gravel complying with [**ASTM D 448 for Size No. 8**] <**Insert requirements**>.

F. Planter Filter Fabric: [**Woven**] [**Nonwoven**] geotextile manufactured for separation applications and made of polypropylene, polyolefin, or polyester fibers or combination of them.

G. Mycorrhizal Fungi: Dry, granular inoculant containing at least 5300 spores per lb (0.45 kg) of vesicular-arbuscular mycorrhizal fungi and 95 million spores per lb (0.45 kg) of ectomycorrhizal fungi, 33 percent hydrogel, and a maximum of 5.5 percent inert material.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plants, with Installer present, for compliance with requirements and conditions affecting installation and performance of the Work.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Verify that plants and vehicles loaded with plants can travel to planting locations with adequate overhead clearance.
3. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
4. Uniformly moisten excessively dry soil that is not workable or which is dusty.

B. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Architect's acceptance of layout before excavating or planting. Make minor adjustments as required.

D. Lay out plants at locations directed by Architect. Stake locations of individual trees and shrubs and outline areas for multiple plantings.

3.3 PLANTING AREA ESTABLISHMENT

A. General: Prepare planting area for soil placement and mix planting soil according to [**Section 329113 "Soil Preparation."**] [**Section 329115 "Soil Preparation (Performance Specification)."**]

B. Placing Planting Soil: [**Place and mix planting soil in-place over exposed subgrade**] [**Place manufactured planting soil over exposed subgrade**] [**Blend planting soil in place**] <**Insert requirement**>.

C. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

D. Application of Mycorrhizal Fungi: At time directed by Architect, broadcast dry product uniformly over prepared soil at application rate [**indicated on Drawings**] [**according to manufacturer's written recommendations**] <**Insert application rate**>.

3.4 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits.

1. Excavate planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are unacceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
2. Excavate approximately three times as wide as ball diameter for [**balled and burlapped**] [**balled and potted**] [**container-grown**] [**fabric bag-grown**] stock.
3. Excavate at least 12 inches (300 mm) wider than root spread and deep enough to accommodate vertical roots for bare-root stock.
4. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
5. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
6. Maintain angles of repose of adjacent materials to ensure stability. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.

7. Maintain supervision of excavations during working hours.
8. Keep excavations covered or otherwise protected [**overnight**] [**after working hours**] [**when unattended by Installer's personnel**].
9. If drain tile is indicated on Drawings or required under planting areas, excavate to top of porous backfill over tile.

B. Backfill Soil: Subsoil and topsoil removed from excavations [**may**] [**may not**] be used as backfill soil unless otherwise indicated.

C. Obstructions: Notify Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

1. Hardpan Layer: Drill 6-inch- (150-mm-) diameter holes, 24 inches (600 mm) apart, into free-draining strata or to a depth of 10 feet (3 m), whichever is less, and backfill with free-draining material.

D. Drainage: Notify Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

E. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.5 TREE, SHRUB, AND VINE PLANTING

A. Inspection: At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Balled and Burlapped Stock: Set each plant plumb and in center of planting pit or trench with root flare [**1 inch (25 mm) above**] [**2 inches (50 mm) above**] <**Insert requirement**> adjacent finish grades.

1. Backfill: Planting soil <**Insert drawing designation**>.[**For trees, use excavated soil for backfill.**]
2. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about 1 inch (25 mm) from root tips; do not place tablets in bottom of the hole.

    a. Quantity: [**As indicated on Drawings**] [**Two per plant**] [**Three for each caliper inch of plant**] <**Insert requirement**>.

5. Continue backfilling process. Water again after placing and tamping final layer of soil.

D. [**Balled and Potted**] [**and**] [**Container-Grown**] Stock: Set each plant plumb and in center of planting pit or trench with root flare [**1 inch (25 mm) above**] [**2 inches (50 mm) above**] <**Insert requirement**> adjacent finish grades.

1. Backfill: Planting soil <**Insert drawing designation**>.[**For trees, use excavated soil for backfill.**]
2. Carefully remove root ball from container without damaging root ball or plant.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about 1 inch (25 mm) from root tips; do not place tablets in bottom of the hole.

    a. Quantity: [**As indicated on Drawings**] [**Two per plant**] [**Three for each caliper inch of plant**] <**Insert requirement**>.

5. Continue backfilling process. Water again after placing and tamping final layer of soil.

E. Fabric Bag-Grown Stock: Set each plant plumb and in center of planting pit or trench with root flare [**1 inch (25 mm) above**] [**2 inches (50 mm) above**] <**Insert requirement**> adjacent finish grades.

1. Backfill: Planting soil <**Insert drawing designation**>.[**For trees, use excavated soil for backfill.**]
2. Carefully remove root ball from fabric bag without damaging root ball or plant. Do not use planting stock if root ball is cracked or broken before or during planting operation.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about 1 inch (25 mm) from root tips; do not place tablets in bottom of the hole.

    a. Quantity: [**As indicated on Drawings**] [**Two per plant**] [**Three for each caliper inch of plant**] <**Insert requirement**>.

5. Continue backfilling process. Water again after placing and tamping final layer of soil.

F. Bare-Root Stock: Set and support each plant in center of planting pit or trench with root flare [**1 inch (25 mm) above**] [**2 inches (50 mm) above**] <**Insert requirement**> adjacent finish grade.

1. Backfill: Planting soil <**Insert drawing designation**>.[**For trees, use excavated soil for backfill.**]
2. Spread roots without tangling or turning toward surface. Plumb before backfilling, and maintain plumb while working.
3. Carefully work backfill in layers around roots by hand. Bring roots into close contact with the soil.
4. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
5. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside soil-covered roots about 1 inch (25 mm) from root tips; do not place tablets in bottom of the hole or touching the roots.

a. Quantity: [**As indicated on Drawings**] [**Two per plant**] [**Three for each caliper inch of plant**] <**Insert requirement**>.

6. Continue backfilling process. Water again after placing and tamping final layer of soil.

G. Watering Pipe: During backfilling, install watering pipe 4 feet (1.25 m) deep into the planting pit outside the root ball [**as indicated on Drawings**] [**and**] [**with top of pipe 1 inch (25 mm) above the mulched surface**].

H. Slopes: When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.6 MECHANIZED TREE-SPADE PLANTING

A. Trees [**shall**] [**may**] be planted with an approved mechanized tree spade at the designated locations. Do not use tree spade to move trees larger than the maximum size allowed for a similar field-grown, balled-and-burlapped root-ball diameter according to ANSI Z60.1, or larger than manufacturer's maximum size recommendation for the tree spade being used, whichever is smaller.

B. Use the same tree spade to excavate the planting hole as will be used to extract and transport the tree.

C. When extracting the tree, center the trunk within the tree spade and move tree with a solid ball of earth.

D. Cut exposed roots cleanly during transplanting operations.

E. Plant trees following procedures in "Tree, Shrub, and Vine Planting" Article.

F. Where possible, orient the tree in the same direction as in its original location.

3.7 TREE, SHRUB, AND VINE PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.

B. Prune, thin, and shape trees, shrubs, and vines as directed by Architect.

C. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.

D. Do not apply pruning paint to wounds.

3.8 TREE STABILIZATION

A. Trunk Stabilization by Upright Staking and Tying: Install trunk stabilization as follows unless otherwise indicated:

1. Upright Staking and Tying: Stake trees of 2- through 5-inch (50- through 125-mm) caliper. Stake trees of less than 2-inch (50-mm) caliper only as required to prevent wind tip out. Use a minimum of two stakes of length required to penetrate at least 18 inches (450 mm) below bottom of backfilled excavation and to extend [**to the dimension indicated on Drawings**] [**at least 72 inches (1830 mm)**] [**one-third of trunk height**] <**Insert dimension or requirement**> above grade. Set vertical stakes and space to avoid penetrating root balls or root masses.
2. Upright Staking and Tying: Stake trees with two stakes for trees up to 12 feet (3.6 m) high and 2-1/2 inches (63 mm) or less in caliper; three stakes for trees less than 14 feet (4.2 m) high and up to 4 inches (100 mm) in caliper. Space stakes equally around trees.
3. Support trees with bands of flexible ties at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.
4. Support trees with two strands of tie wire, connected to the brass grommets of tree-tie webbing at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.

B. Trunk Stabilization by Staking and Guying: Install trunk stabilization as follows unless otherwise indicated on Drawings. Stake and guy trees more than 14 feet (4.2 m) in height and more than 3 inches (75 mm) in caliper unless otherwise indicated.

1. Site-Fabricated, Staking-and-Guying Method: Install no fewer than three guys spaced equally around tree.

    a. Securely attach guys to stakes 30 inches (760 mm) long, driven to grade. Adjust spacing to avoid penetrating root balls or root masses. Provide [**turnbuckle**] [**compression spring**] for each guy wire and tighten securely.
    b. For trees more than [**6 inches (150 mm) in caliper**] <**Insert size**>, anchor guys to wood deadmen buried at least 36 inches (900 mm) below grade. Provide [**turnbuckle**] [**compression spring**] for each guy wire and tighten securely.
    c. Support trees with bands of flexible ties at contact points with tree trunk and reaching to [**turnbuckle**] [**compression spring**]. Allow enough slack to avoid rigid restraint of tree.
    d. Support trees with [**guy cable**] [**or**] [**multiple strands of tie wire**], connected to the brass grommets of tree-tie webbing at contact points with tree trunk and reaching to [**turnbuckle**] [**compression spring**]. Allow enough slack to avoid rigid restraint of tree.
    e. Attach flags to each guy wire, 30 inches (760 mm) above finish grade.
    f. Paint [**turnbuckles**] [**compression springs**] with luminescent white paint.

2. Proprietary Staking and Guying Device: Install staking and guying system sized and positioned as recommended by manufacturer unless otherwise indicated and according to manufacturer's written instructions.

C. Root-Ball Stabilization: Install at- or below-grade stabilization system to secure each new planting by the root ball unless otherwise indicated.

1. Wood Hold-Down Method: Place vertical stakes against side of root ball and drive them into subsoil; place horizontal wood hold-down stake across top of root ball and screw at each end to one of the vertical stakes.

    a. Install stakes of length required to penetrate at least [**to the dimension indicated on Drawings**] [**18 inches (450 mm)**] <**Insert dimension**> below bottom of backfilled excavation. Saw stakes off at horizontal stake.
    b. Install screws through horizontal hold-down and penetrating at least 1 inch (25 mm) into stakes. Predrill holes if necessary to prevent splitting wood.

c. Install second set of stakes on other side of root trunk for larger trees.

2. Proprietary Root-Ball Stabilization Device: Install root-ball stabilization system sized and positioned as recommended by manufacturer unless otherwise indicated and according to manufacturer's written instructions.

D. Palm Bracing: Install bracing system at three or more places equally spaced around perimeter of trunk to secure each palm until established unless otherwise indicated.

1. Site-Fabricated Palm-Bracing Method:

a. Place battens over padding and secure battens in place around trunk perimeter with at least two straps, tightened to prevent displacement. Ensure that straps do not contact trunk.
b. Place diagonal braces and cut to length. Secure upper ends of diagonal braces with galvanized nails into battens or into nail-attached blocks on battens. Do not drive nails, screws, or other securing devices into palm trunk; do not penetrate palm trunk in any fashion. Secure lower ends of diagonal braces with stakes driven into ground to prevent outward slippage of braces.

2. Proprietary Palm-Bracing Device: Install palm-bracing system sized and positioned as recommended by manufacturer unless otherwise indicated and according to manufacturer's written instructions.

3.9 ROOT-BARRIER INSTALLATION

A. Install root barrier where trees are planted within [**60 inches (1500 mm)**] [**48 inches (1200 mm)**] <**Insert dimension**> of paving or other hardscape elements, such as walls, curbs, and walkways, unless otherwise indicated on Drawings.

B. Align root barrier [**vertically**] [**with bottom edge angled at 20 degrees away from the paving or other hardscape element**], and run it linearly along and adjacent to the paving or other hardscape elements to be protected from invasive roots.

C. Install root barrier continuously for a distance of [**60 inches (1500 mm)**] <**Insert dimension**> in each direction from the tree trunk, for a total distance of [**10 feet (3 m)**] <**Insert dimension**> per tree. If trees are spaced closer, use a single continuous piece of root barrier.

1. Position top of root barrier [**flush with finish grade**] [**1/2 inch (13 mm) above finish grade**] [**according to manufacturer's written recommendations**].
2. Overlap root barrier a minimum of 12 inches (300 mm) at joints.
3. Do not distort or bend root barrier during construction activities.
4. Do not install root barrier surrounding the root ball of tree.

3.10 PLACING SOIL IN PLANTERS

A. Place a layer of drainage gravel at least 4 inches (100 mm) thick in bottom of planter. Cover bottom with filter fabric and wrap filter fabric [**4 inches (100 mm)**] [**6 inches (150 mm)**] <**Insert dimension**> up on all sides. Duct tape along the entire top edge of the filter fabric, to secure the filter fabric against the sides during the soil-filling process.

B. Fill planter with planting soil <**Insert drawing designation**>. Place soil in lightly compacted layers to an elevation of 1-1/2 inches (38 mm) below top of planter, allowing natural settlement.

3.11 GROUND COVER AND PLANT PLANTING

A. Set out and space ground cover and plants other than trees, shrubs, and vines [**9 inches (225 mm) apart**] [**12 inches (300 mm) apart**] [**18 inches (450 mm) apart**] [**24 inches (600 mm) apart**] [**as indicated on Drawings**] in even rows with triangular spacing.

B. Use planting soil <**Insert drawing designation**> for backfill.

C. Dig holes large enough to allow spreading of roots.

D. For rooted cutting plants supplied in flats, plant each in a manner that minimally disturbs the root system but to a depth not less than two nodes.

E. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

F. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

G. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.12 PLANTING AREA MULCHING

A. Install weed-control barriers before mulching according to manufacturer's written instructions. Completely cover area to be mulched, overlapping edges a minimum of [**6 inches (150 mm)**] [**12 inches (300mm)**] and secure seams with galvanized pins.

B. Mulch backfilled surfaces of planting areas and other areas indicated.

1. Trees[**and Treelike Shrubs**] in Turf Areas: Apply [**organic**] [**mineral**] mulch ring of [**2-inch (50-mm)**] [**3-inch (75-mm)**] <**Insert dimension**> average thickness, with [**12-inch (300-mm)**] [**24-inch (600-mm)**] [**36-inch (900-mm)**] <**Insert dimension**> radius around trunks or stems. Do not place mulch within [**3 inches (75 mm)**] [**6 inches (150 mm)**] <**Insert distance**> of trunks or stems.
2. Organic Mulch in Planting Areas: Apply [**2-inch (50-mm)**] [**3-inch (75-mm)**] <**Insert dimension**> average thickness of organic mulch [**extending 12 inches (300 mm) beyond edge of individual planting pit or trench**] [**and**] [**over whole surface of planting area**], and finish level with adjacent finish grades. Do not place mulch within [**3 inches (75 mm)**] [**6 inches (150 mm)**] <**Insert distance**> of trunks or stems.
3. Mineral Mulch in Planting Areas: Apply [**2-inch (50-mm)**] [**3-inch (75-mm)**] <**Insert dimension**> average thickness of mineral mulch [**extending 12 inches (300 mm) beyond edge of individual planting pit or trench**] [**and**] [**over whole surface of planting area**], and finish level with adjacent finish grades. Do not place mulch within [**3 inches (75 mm)**] [**6 inches (150 mm)**] <**Insert distance**> of trunks or stems.

3.13 EDGING INSTALLATION

A. Wood Edging: Install edging where indicated.[**Mitre cut joints and connections at a 45-degree angle.**] Fasten each cut joint or connection with two galvanized nails. Anchor with wood stakes spaced up to 36 inches (900 mm) apart, driven at least 1 inch (25 mm) below top elevation of edging. Use two galvanized nails per stake to fasten edging, of length as needed to penetrate both edging and stake and provide 1/2-inch (13-mm) clinch at point. Predrill stakes if needed to avoid splitting. Replace stakes that crack or split during installation process.

B. Steel Edging: Install steel edging where indicated according to manufacturer's written instructions. Anchor with steel stakes spaced approximately 30 inches (760 mm) apart, driven below top elevation of edging.

C. Aluminum Edging: Install aluminum edging where indicated according to manufacturer's written instructions. Anchor with aluminum stakes spaced approximately [**36 inches (900 mm)**] [**48 inches (1200 mm)**] apart, driven below top elevation of edging.

D. Plastic Edging: Install plastic edging where indicated according to manufacturer's written instructions. Anchor with steel stakes spaced approximately [**36 inches (900 mm)**] [**48 inches (1200 mm)**] apart, driven through upper base grooves or V-lip of edging.

E. Shovel-Cut Edging: Separate mulched areas from turf areas[**, curbs, and paving**] with a 45-degree, 4- to 6-inch- (100- to 150-mm-) deep, shovel-cut edge[**as indicated on Drawings**].

F. Mow-Strip Installation:

1. Excavate for mow strip[**as indicated on Drawings**].
2. Compact subgrade uniformly beneath mow strip.
3. Apply nonselective, pre-emergent herbicide that inhibits growth of grass and weeds.
4. Install [**wood**] [**steel**] [**aluminum**] [**plastic**] edging, delineating the edge of mow strip.
5. Install weed-control barrier before mulching, covering area of mow strip, and overlapping and pinning edges of barrier at least 6 inches (150 mm) and according to manufacturer's written instructions.
6. Place indicated thickness of [**organic**] [**mineral**] mulch, fully covering weed barrier.
7. Rake mulch to a uniform surface level with adjacent finish grades.

3.14 TREE GRATE INSTALLATION

A. Tree Grates: Install according to manufacturer's written instructions. Set grate segments flush with adjoining surfaces. Shim from supporting substrate with soil-resistant plastic. Maintain a 3-inch- (75-mm-) minimum growth radius around base of tree; break away portions of casting, if necessary, according to manufacturer's written instructions.

3.15 INSTALLING SLOW-RELEASE WATERING DEVICE

A. Provide one device for each tree.

B. Place device on top of the mulch at base of tree stem and fill with water according to manufacturer's written instructions.

3.16 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.

B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.17 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents according to authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Pre-Emergent Herbicides (Selective and Nonselective): Apply to tree, shrub, and ground-cover areas according to manufacturer's written recommendations. Do not apply to seeded areas.

C. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.18 REPAIR AND REPLACEMENT

A. General: Repair or replace existing or new trees and other plants that are damaged by construction operations, in a manner approved by Architect.

1. Submit details of proposed pruning and repairs.
2. Perform repairs of damaged trunks, branches, and roots within 24 hours, if approved.
3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Architect.

B. Remove and replace trees that are more than [**25**] <**Insert number**> percent dead or in an unhealthy condition[**before the end of the corrections period**] or are damaged during construction operations that Architect determines are incapable of restoring to normal growth pattern.

1. Provide new trees of same size as those being replaced for each tree of [**6 inches (150 mm)**] [**4 inches (100 mm)**] <**Insert dimension**> or smaller in caliper size.
2. Provide [**one**] [**two**] <**Insert number**> new tree(s) of [**6-inch (150-mm)**] [**4-inch (100-mm)**] <**Insert dimension**> caliper size for each tree being replaced that measures more than [**6 inches (150 mm)**] [**4 inches (100 mm)**] in caliper size.
3. Species of Replacement Trees: [**Same species being replaced**] [**Species selected by Architect**] <**Insert species**>.

3.19 CLEANING AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

C. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

D. After installation and before [**Substantial Completion**] <**Insert time**>, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

E. At time of Substantial Completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices.

3.20 MAINTENANCE SERVICE

A. Maintenance Service for Trees and Shrubs: Provide maintenance by skilled employees of landscape Installer. Maintain as required in "Plant Maintenance" Article. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:

1. Maintenance Period: [**12**] [**Six**] [**Three**] months from date of [**planting completion**] [**Substantial Completion**] <**Insert starting time**>.

B. Maintenance Service for Ground Cover and Other Plants: Provide maintenance by skilled employees of landscape Installer. Maintain as required in "Plant Maintenance" Article. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:

1. Maintenance Period: [**Six**] [**Three**] months from date of [**planting completion**] [**Substantial Completion**] <**Insert starting time**>.

END OF SECTION 32 93 00

APPENDIX A

SECTION 26 32 13 - ENGINE GENERATORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes packaged engine-generator sets for standby power supply with the following features:
   1. **Diesel Engine**
   2. Unit-mounted cooling system.
   3. Unit-mounted control and monitoring.
   4. Performance requirements for sensitive loads.
   5. Fuel system.
   6. Outdoor enclosure.

B. **Section includes procurement for the generator and housing enclosure only.**

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:
   1. Include plans and elevations for engine-generator set and other components specified. Indicate access requirements affected by height of fuel tank.
   2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

1.3 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: Member company of NETA or an NRTL.
   1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

1.5 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace components of packaged engine generators and associated auxiliary components that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: 5 years from date of FInal Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Select from the manufacturer listed
   1. Cummins Power Generation or engineered approved equal.

2.2 PERFORMANCE REQUIREMENTS

A. ASME Compliance: Comply with ASME B15.1.

B. NFPA Compliance:
   1. Comply with NFPA 37.
   2. Comply with NFPA 70.
   3. Comply with NFPA 99.

C. UL Compliance: Comply with UL 2200.

D. Engine Exhaust Emissions: Comply with EPA **Tier 3** requirements and applicable state and local government requirements. Provide exhaust system for Residential/critical locations.

E. Noise Emission: Provide sound attenuated enclosure to ensure no more than 70dB 23 feet from machine.

F. Environmental Conditions: Engine-generator system shall withstand the following environmental conditions without mechanical or electrical damage or degradation of performance capability:
   1. Ambient Temperature: 5 to 40 deg C.
   2. Relative Humidity: Zero to 95 percent.
   3. Altitude: Sea level to 1000 feet.

2.3 ASSEMBLY DESCRIPTION

A. Factory-assembled and -tested, water-cooled engine, with brushless generator and accessories.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.

C. EPSS Class: Engine-generator set shall be classified as a Class 72 in accordance with NFPA 110.

D. Governor: Electronic isochronous, with speed sensing.

E. Emissions: Comply with EPA Tier 3 requirements.

F. Mounting Frame: Structural steel framework to maintain alignment of mounted components without depending on concrete foundation. Provide lifting attachments sized and spaced to prevent deflection of base during lifting and moving.

G. Capacities and Characteristics:
   1. As scheduled on drawings.

H. Generator-Set Performance:
   1. Steady-State Voltage Operational Bandwidth: 3 percent of rated output voltage from no load to full load.
   2. Transient Voltage Performance: Not more than 8.0 percent variation for 50 percent step-load increase or decrease. Voltage shall recover and remain within the steady-state operating band within three seconds.
   3. Steady-State Frequency Operational Bandwidth: 0.5 percent of rated frequency from no load to full load.
   4. Steady-State Frequency Stability: When system is operating at any constant load within the rated load, there shall be no random speed variations outside the steady-state operational band and no hunting or surging of speed.

5. Transient Frequency Performance: Less than 5 percent variation for 50 percent step-load increase or decrease. Frequency shall recover and remain within the steady-state operating band within five seconds.
6. Output Waveform: At no load, harmonic content measured line to line or line to neutral shall not exceed 5 percent total and 3 percent for single harmonics. Telephone influence factor, determined according to NEMA MG 1, shall not exceed 50 percent.
7. Sustained Short-Circuit Current: For a three-phase, bolted short circuit at system output terminals, system shall supply a minimum of **300 percent** of rated full-load current for not less than 10 seconds and then clear the fault automatically, without damage to generator system components.
8. Start Time: Comply with NFPA 110, Type 10, system requirements.
9. **Rating: 300 kVA.**
10. **Voltage: 208-V ac.**
11. **Frequency: 60 Hz.**
12. **Phase: Three-phase, four wire, wye.**
13. **Power Factor: 0.8, lagging.**

2.4 ENGINE

A. Fuel: NO.2 Diesel Fuel.

B. Rated Engine Speed: 1800 rpm.

C. Lubrication System: The following items are mounted on engine or skid:
1. Filter and Strainer: Rated to remove 90 percent of particles 5 micrometers and smaller while passing full flow.
2. Thermostatic Control Valve: Control flow in system to maintain optimum oil temperature. Unit shall be capable of full flow and is designed to be fail-safe.
3. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps, siphons, special tools, or appliances.

D. Jacket Coolant Heater: Electric-immersion type, factory installed in coolant jacket system. Comply with NFPA 110 requirements for Level 1 equipment for heater capacity.

E. Cooling System: Closed loop, liquid cooled, with radiator factory mounted on engine-generator-set mounting frame and integral engine-driven coolant pump.
1. Coolant: Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.
2. Size of Radiator: Adequate to contain expansion of total system coolant from cold start to **100 percent** load condition.
3. Expansion Tank: Constructed of welded steel plate and rated to withstand maximum closed-loop coolant system pressure for engine used. Equip with gage glass and petcock.
4. Temperature Control: Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.

F. Muffler/Silencer: Critical type, sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure requirements.
1. Sound level measured at a distance of 23 feet horizontally and 5 feet vertically from exhaust discharge after installation is complete shall be 70 dBA or less.

G. Air-Intake Filter: Heavy-duty, engine-mounted air cleaner with replaceable dry-filter element and "blocked filter" indicator.

H. Starting System: 24-V electric, with negative ground.
1. Components: Sized so they are not damaged during a full engine-cranking cycle with ambient temperature at maximum specified in "Performance Requirements" Article.
2. Cranking Motor: Heavy-duty unit that automatically engages and releases from engine flywheel without binding.
3. Cranking Cycle: As required by NFPA 110 for system level specified.

4. Battery: Lead acid, with capacity within ambient temperature range specified in "Performance Requirements" Article to provide specified cranking cycle at least three times without recharging.
5. Battery Stand: Factory-fabricated, two-tier metal with acid-resistant finish designed to hold the quantity of battery cells required and to maintain the arrangement to minimize lengths of battery interconnections.
6. Battery Charger: Current-limiting, automatic-equalizing and float-charging type designed for lead-acid batteries. Unit shall comply with UL 1236.
7. Batter Heater: Increases battery starting capability in lower than optimum ambient temperatures.
    a. Heater Kit:0541-0555
    b. Temperature range 40-degrees F / 70-degrees F Setting
    c. Voltage: 120V
    d. Watts: 120W
    e. Installation Sheet: C587

2.5 FUEL SYSTEM

A. Fuel Oil Piping/Tank: Fuel system shall be designed by one manufacturer for all items, including tank, tank fill system, monitoring system, and fuel delivery and filtering to engine.

B. Tank capacity shall allow generator to run at 80% load for 24 hours continuously.
    1. U.L. 142 compliant.
    2. NFPA 30, 37 and 110.
    3. Atmospheric vent cap.
    4. Raised full fill.
    5. Fuel level gauge.
    6. Low fuel level switch.
    7. Leak detection switch.
    8. Sub-base, dual wall.

2.6 CONTROL AND MONITORING

A. Automatic Starting System Sequence of Operation: When mode-selector switch on the control and monitoring panel is in the automatic position, remote-control contacts in one or more separate automatic transfer switches initiate starting and stopping of generator set. When mode-selector switch is switched to the on position, generator set starts. The off position of same switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms.

B. Provide minimum run time control set for 60 minutes with override only by operation of an emergency-stop switch.

C. Comply with UL 508A.

D. Configuration: Operating and safety indications, protective devices, basic system controls, and engine gages shall be grouped in a common control and monitoring panel mounted on the generator set. Mounting method shall isolate the control panel from generator-set vibration. Panel shall be powered from the engine-generator set battery.

E. Indicating Devices : As required by NFPA 110 for Level 2 system, including the following:
    1. AC voltmeter.
    2. AC ammeter.
    3. AC frequency meter.

4. EPS supplying load indicator.
5. Ammeter and voltmeter phase-selector switches.
6. DC voltmeter (alternator battery charging).
7. Engine-coolant temperature gage.
8. Engine lubricating-oil pressure gage.
9. Running-time meter.
10. Current and Potential Transformers: Instrument accuracy class.

F. Protective Devices and Controls in Local Control Panel: Shutdown devices and common visual alarm indication as required by NFPA 110 for Level 2 system, including the following:
1. Start-stop switch.
2. Overcrank shutdown device.
3. Overspeed shutdown device.
4. Coolant high-temperature shutdown device.
5. Coolant low-level shutdown device.
6. Low lube oil pressure shutdown device.
7. Air shutdown damper shutdown device when used.
8. Overcrank alarm.
9. Overspeed alarm.
10. Coolant high-temperature alarm.
11. Coolant low-temperature alarm.
12. Coolant low-level alarm.
13. Low lube oil pressure alarm.
14. Air shutdown damper alarm when used.
15. Lamp test.
16. Contacts for local common alarm.
17. Coolant high-temperature prealarm.
18. Generator-voltage adjusting rheostat.
19. Run-Off-Auto switch.
20. Control switch not in automatic position alarm.
21. Low cranking voltage alarm.
22. Battery-charger malfunction alarm.
23. Battery low-voltage alarm.
24. Battery high-voltage alarm.
25. Generator overcurrent protective device not closed alarm.

G. Supporting Items: Include sensors, transducers, terminals, relays, and other devices and Supporting Items: Include sensors, transducers, terminals, relays, and other devices and include wiring required to support specified items. Locate sensors and other supporting items on engine or generator, unless otherwise indicated. **Provide remote annunciator panel that duplicates data of local control panel. Provide remote fuel tank monitor and leak detection indication for low fuel and leak monitoring. Provide RS485 modbus connection to the building control system network to monitor electrical power, engine status, engine load and low fuel level.**

2.7 GENERATOR OVERCURRENT AND FAULT PROTECTION

A. Overcurrent protective devices for the entire EPSS shall be coordinated to optimize selective tripping when a short circuit occurs.
1. Overcurrent protective devices for the EPSS shall be accessible only to authorized personnel.

B. Generator Circuit Breaker: Molded-case, electronic-trip type; 100 percent rated; complying with UL 489.
1. Tripping Characteristics: Adjustable long-time and short-time delay and instantaneous.
2. Trip Settings: Selected to coordinate with generator thermal damage curve.

3. Shunt Trip: Connected to trip breaker when generator set is shut down by other protective devices.
4. Mounting: Adjacent to or integrated with control and monitoring panel.

2.8 GENERATOR, EXCITER, AND VOLTAGE REGULATOR

A. Comply with NEMA MG 1.

B. Generator shall be Separately Excited by PMG attached to generator shaft.

C. Drive: Generator shaft shall be directly connected to engine shaft. Exciter shall be rotated integrally with generator rotor.

D. Electrical Insulation: Class H.

E. Stator-Winding Leads: Brought out to terminal box to permit future reconnection for other voltages if required. Provide six lead alternator.

F. Range: Provide limited range of output voltage by adjusting the excitation level.

G. Construction shall prevent mechanical, electrical, and thermal damage due to vibration, overspeed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity.

H. Enclosure: Weather protective, sound attenuated.

I. Instrument Transformers: Mounted within generator enclosure.

J. Voltage Regulator: Solid-state type, separate from exciter, providing performance as specified and as required by NFPA 110.
1. Adjusting Control and Monitoring Panel: Provide plus or minus 5 percent adjustment of output-voltage operating band.

K. Strip Heater: Thermostatically controlled unit arranged to maintain stator windings above dew point.

L. Windings: Two-thirds pitch stator winding and fully linked amortisseur winding.

M. Subtransient Reactance: 12 percent, maximum.

2.9 OUTDOOR GENERATOR-SET ENCLOSURE

A. Description: Vandal-resistant, sound-attenuating per requirements of 2.2.E above, weather protective steel housing, wind resistant up to 90-mph. Multiple panels shall be lockable and provide adequate access to components requiring maintenance. Panels shall be removable by one person without tools. Instruments and control shall be mounted within enclosure.

B. Engine Cooling Airflow through Enclosure: Maintain temperature rise of system components within required limits when unit operates at **100 percent** of rated load for 2 hours with ambient temperature at top of range specified in system service conditions.
1. Louvers: Fixed-engine, cooling-air inlet and discharge. Storm-proof and drainable louvers prevent entry of rain and snow.
2. Ventilation: Provide temperature-controlled exhaust fan interlocked to prevent operation when engine is running.

C. Convenience Outlets: Factory wired, GFCI. Arrange for external electrical connection.

2.10 FINISHES

A. Outdoor Enclosures and Components: Manufacturer's standard finish over corrosion-resistant pretreatment and compatible primer.

2.11 SOURCE QUALITY CONTROL

A. Prototype Testing: Factory test engine-generator set using same engine model, constructed of identical or equivalent components and equipped with identical or equivalent accessories.
   1. Tests: Comply with NFPA 110, Level 1 Energy Converters and with IEEE 115.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with packaged engine-generator manufacturers' written installation and alignment instructions and with NFPA 110.

B. Equipment Mounting:
   1. Install packaged engine generators on cast-in-place concrete equipment bases. Comply with requirements for equipment bases and foundations specified in Section 03 30 00 "Cast-in-Place Concrete."
   2. Coordinate size and location of concrete bases for packaged engine generators. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.

C. Install packaged engine-generator to provide access, without removing connections or accessories, for periodic maintenance.

D. Install packaged engine-generator with elastomeric isolator pads having a minimum deflection of 1 inch on 4-inch-high concrete base. Secure sets to anchor bolts installed in concrete bases.

E. Install condensate drain piping to muffler drain outlet full size of drain connection with a shutoff valve, stainless-steel flexible connector, and Schedule 40, black steel pipe with welded joints.

F. Install complete fuel system including tank fill system, tank, and fuel delivery piping and filter system.

G. Electrical Wiring: Install electrical devices furnished by equipment manufacturers but not specified to be factory mounted.

3.2 CONNECTIONS

A. Connect cooling-system water piping to engine-generator set and heat exchanger with flexible connectors.

B. Connect engine exhaust pipe to engine with flexible connector.

C. Connect fuel piping to engines with a gate valve and union and flexible connector.

D. Ground equipment according to Section 26 05 26 "Grounding and Bonding for Electrical Systems."

E. Connect wiring according to Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables." Provide a minimum of one 90 degree bend in flexible conduit routed to the generator set from a stationary element.

F. Balance single-phase loads to obtain a maximum of 10 percent unbalance between any two phases.

3.3 IDENTIFICATION

A. Identify system components according to Section 23 05 53 "Identification for HVAC Piping and Equipment" and Section 26 05 53 "Identification for Electrical Systems."

B. Install a sign indicating the generator neutral is bonded to the main service neutral at the main service location.

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections.
   1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections.

B. Tests and Inspections:
   1. Perform tests recommended by manufacturer and each visual and mechanical inspection and electrical and mechanical test listed in the first two subparagraphs as specified in NETA Acceptance Testing Specification. Certify compliance with test parameters.
      a. Visual and Mechanical Inspection
         1) Compare equipment nameplate data with drawings and specifications.
         2) Inspect physical and mechanical condition.
         3) Inspect anchorage, alignment, and grounding.
         4) Verify the unit is clean.
      b. Electrical and Mechanical Tests
         1) Perform insulation-resistance tests in accordance with IEEE 43.
            a) Machines larger than 200 horsepower. Test duration shall be 10 minutes. Calculate polarization index.
            b) Machines 200 horsepower or less. Test duration shall be one minute. Calculate the dielectric-absorption ratio.
         2) Test protective relay devices.
         3) Verify phase rotation, phasing, and synchronized operation as required by the application.
         4) Functionally test engine shutdown for low oil pressure, overtemperature, overspeed, and other protection features as applicable.
         5) Conduct performance test in accordance with NFPA 110.
         6) Verify correct functioning of the governor and regulator.
   2. NFPA 110 Acceptance Tests: Perform tests required by NFPA 110 that are additional to those specified here including, but not limited to, single-step full-load pickup test.
   3. Battery Tests: Equalize charging of battery cells according to manufacturer's written instructions. Record individual cell voltages.
      a. Measure charging voltage and voltages between available battery terminals for full-charging and float-charging conditions. Check electrolyte level and specific gravity under both conditions.
      b. Test for contact integrity of all connectors. Perform an integrity load test and a capacity load test for the battery.
      c. Verify acceptance of charge for each element of the battery after discharge.
      d. Verify that measurements are within manufacturer's specifications.
   4. Battery-Charger Tests: Verify specified rates of charge for both equalizing and float-charging conditions.

5. System Integrity Tests: Methodically verify proper installation, connection, and integrity of each element of engine-generator system before and during system operation. Check for air, exhaust, and fluid leaks.
6. Exhaust-System Back-Pressure Test: Use a manometer with a scale exceeding 40-inch wg. Connect to exhaust line close to engine exhaust manifold. Verify that back pressure at full-rated load is within manufacturer's written allowable limits for the engine.
7. Exhaust Emissions Test: Comply with applicable government test criteria.
8. Voltage and Frequency Transient Stability Tests: Use recording oscilloscope to measure voltage and frequency transients for 50 and 100 percent step-load increases and decreases, and verify that performance is as specified.
9. Harmonic-Content Tests: Measure harmonic content of output voltage at 25 percent and 100 percent of rated linear load. Verify that harmonic content is within specified limits.
10. Noise Level Tests: Measure A-weighted level of noise emanating from generator-set installation, including engine exhaust and cooling-air intake and discharge, at four locations 25 feet from edge of the generator enclosure, and compare measured levels with required values.

C. Coordinate tests with tests for transfer switches and run them concurrently.

D. Test instruments shall have been calibrated within the last 12 months, traceable to NIST Calibration Services, and adequate for making positive observation of test results. Make calibration records available for examination on request.

E. Leak Test: After installation, charge exhaust, coolant, and fuel systems and test for leaks. Repair leaks and retest until no leaks exist.

F. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation for generator and associated equipment.

G. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

H. Remove and replace malfunctioning units and retest as specified above.

I. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.

J. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation resistances, time delays, and other values and observations. Attach a label or tag to each tested component indicating satisfactory completion of tests.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain packaged engine generators.

END OF SECTION 26 32 13

SECTION 26 36 00 - TRANSFER SWITCHES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes automatic transfer switches rated 600 V and less, including the following:
   1. Microprocessor annunciator and control system.

B. **Section 26 36 00 included for reference only.**

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for transfer switches.
   2. Include rated capacities, operating characteristics, electrical characteristics, and accessories.

B. Shop Drawings:
   1. Include plans, elevations, sections, details showing minimum clearances, conductor entry provisions, gutter space, and installed features and devices.
   2. Include material lists for each switch specified.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer-authorized service representative.

B. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For each type of product to include in emergency, operation, and maintenance manuals.
   1. In addition to items specified in Section 01 78 23 "Operation and Maintenance Data," include the following:
      a. Features and operating sequences, both automatic and manual.
      b. List of all factory settings of relays; provide relay-setting and calibration instructions, including software, where applicable.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications:
   1. Member company of NETA.
      a. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

1.7 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace components of transfer switch or transfer switch components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NEMA ICS 10.

C. Comply with NFPA 110.

D. Comply with UL 1008 unless requirements of these Specifications are stricter.

E. Indicated Current Ratings: Apply as defined in UL 1008 for continuous loading and total system transfer.

F. Tested Fault-Current Closing and Short-Circuit Ratings: Adequate for duty imposed by protective devices at installation locations in Project under the fault conditions indicated, based on testing according to UL 1008.
   1. Switch shall have AIC Rating of 65KA Symmetrical.
   2. Short-time withstand capability for 30 cycles.

G. Repetitive Accuracy of Solid-State Controls: All settings shall be plus or minus 2 percent or better over an operating temperature range of minus 20 to plus 70 deg C.

H. Resistance to Damage by Voltage Transients: Components shall meet or exceed voltage-surge withstand capability requirements when tested according to IEEE C62.62. Components shall meet or exceed voltage-impulse withstand test of NEMA ICS 1.

I. Electrical Operation: Accomplish by a nonfused, momentarily energized solenoid or electric-motor-operated mechanism. Switches for emergency or standby purposes shall be mechanically and electrically interlocked in both directions to prevent simultaneous connection to both power sources unless closed transition.

J. Service-Rated Transfer Switch:
   1. Comply with UL 869A and UL 489.
   2. Provide terminals for bonding the grounding electrode conductor to the grounded service conductor.
   3. Provide removable link for temporary separation of the service and load grounded conductors.
   4. Surge Protective Device: Service rated.
   5. Service Disconnecting Means: Externally operated, manual electrically actuated.
   6. **Rating: 600 A**
   7. **Voltage: 208-V ac.**
   8. **Frequency: 60 Hz.**
   9. **Phase: Three-phase, 3 Pole.**

K. Neutral Terminal: Solid and fully rated.

L. Annunciation, Control, and Programming Interface Components: Devices at transfer switches for communicating with remote programming devices, annunciators, or annunciator and control panels shall have communication capability matched with remote device.

M. Factory Wiring: Train and bundle factory wiring and label, consistent with Shop Drawings, by color-code or by numbered or lettered wire and cable shrinkable sleeve markers at terminations.

Color-coding and wire and cable markers are specified in Section 26 05 53 "Identification for Electrical Systems."

1. Designated Terminals: Pressure type, suitable for types and sizes of field wiring indicated.
2. Power-Terminal Arrangement and Field-Wiring Space: Suitable for top, side, or bottom entrance of feeder conductors as indicated.
3. Control Wiring: Equipped with lugs suitable for connection to terminal strips.
4. Accessible via front access.

N. Enclosures: Type 3R - dual door with seal gasket outer door and drain holes. The transfer switch and control are wall-mounted in a key-locking enclosure. Wire bend space complies with 2011 NEC.

2.2 CONTACTOR-TYPE AUTOMATIC TRANSFER SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cummins Power Generation.

B. Comply with Level 1 equipment according to NFPA 110.

C. Switch Characteristics: Designed for continuous-duty repetitive transfer of full-rated current between active power sources.
1. Limitation: Switches using molded-case switches or circuit breakers or insulated-case circuit-breaker components are unacceptable.
2. Switch Action: Double throw; mechanically held in both directions.
3. Contacts: Silver composition or silver alloy for load-current switching. Contactor-style automatic transfer-switch units, rated 600 A and higher, shall have separate arcing contacts.
4. Conductor Connectors: Suitable for use with conductor material and sizes.
5. Material: Hard-drawn copper, 98 percent conductivity.
6. Main and Neutral Lugs: Mechanical type.
7. Ground Lugs and Bus-Configured Terminators: Mechanical type.
8. Ground bar.
9. Connectors shall be marked for conductor size and type according to UL 1008.

D. Automatic Open-Transition Transfer Switches: Interlocked to prevent the load from being closed on both sources at the same time.
1. Sources shall be mechanically and electrically interlocked to prevent closing both sources on the load at the same time.

E. Automatic Delayed-Transition Transfer Switches: Pauses or stops in intermediate position to momentarily disconnect both sources, with transition controlled by programming in the automatic transfer-switch controller. Interlocked to prevent the load from being closed on both sources at the same time.
1. Adjustable Time Delay: For override of normal-source voltage sensing to delay transfer and engine start signals for alternative source. Adjustable from zero to six seconds, and factory set for one second.
2. Sources shall be mechanically and electrically interlocked to prevent closing both sources on the load at the same time.
3. Fully automatic break-before-make operation with transfer when two sources have near zero phase difference.

F. Manual Switch Operation: Under load, with door closed and with either or both sources energized. Transfer time is same as for electrical operation. Control circuit automatically disconnects from electrical operator during manual operation.

G. Manual Switch Operation: Unloaded. Control circuit automatically disconnects from electrical operator during manual operation.

H. Electric Nonautomatic Switch Operation: Electrically actuated by push buttons designated "Normal Source" and "Alternative Source." Switch shall be capable of transferring load in either direction with either or both sources energized.

I. Signal-Before-Transfer Contacts: A set of normally open/normally closed dry contacts operates in advance of retransfer to normal source. Interval shall be adjustable from 1 to 30 seconds.

J. Digital Communication Interface: Matched to capability of remote annunciator or annunciator and control panel.

K. Automatic Transfer-Switch Controller Features:
   1. Controller operates through a period of loss of control power.
   2. Undervoltage Sensing for Each Phase of NormalSource: Sense low phase-to-ground voltage on each phase. Pickup voltage shall be adjustable from 85 to 100 percent of nominal, and dropout voltage shall be adjustable from 75 to 98 percent of pickup value. Factory set for pickup at 90 percent and dropout at 85 percent.
   3. Voltage/Frequency Lockout Relay: Prevent premature transfer to generator. Pickup voltage shall be adjustable from 85 to 100 percent of nominal. Factory set for pickup at 90 percent. Pickup frequency shall be adjustable from 90 to 100 percent of nominal. Factory set for pickup at 95 percent.
   4. Time Delay for Retransfer to Normal Source: Adjustable from zero to 30 minutes, and factory set for 10 minutes. Override shall automatically defeat delay on loss of voltage or sustained undervoltage of emergency source, provided normal supply has been restored.
   5. Test Switch: Simulate normal-source failure.
   6. Switch-Position Pilot Lights: Indicate source to which load is connected.
   7. Source-Available Indicating Lights: Supervise sources via transfer-switch normal- and emergency-source sensing circuits.
      a. Normal Power Supervision: Green light with nameplate engraved "Normal Source Available."
      b. Emergency Power Supervision: Red light with nameplate engraved "Emergency Source Available."
   8. Unassigned Auxiliary Contacts: Two normally open, single-pole, double-throw contacts for each switch position, rated 10 A at 240-V ac.
   9. Transfer Override Switch: Overrides automatic retransfer control so transfer switch will remain connected to emergency power source regardless of condition of normal source. Pilot light indicates override status.
   10. Engine Starting Contacts: One isolated and normally closed, and one isolated and normally open; rated 10 A at 32-V dc minimum.
   11. Engine Shutdown Contacts: Instantaneous; shall initiate shutdown sequence at remote engine-generator controls after retransfer of load to normal source.
   12. Engine Shutdown Contacts: Time delay adjustable from zero to five minutes, and factory set for five minutes. Contacts shall initiate shutdown at remote engine-generator controls after retransfer of load to normal source.
   13. Engine-Generator Exerciser: Solid-state, programmable-time switch starts engine generator and transfers load to it from normal source for a preset time, then retransfers and shuts down engine after a preset cool-down period. Initiates exercise cycle at preset intervals adjustable from 7 to 30 days. Running periods shall be adjustable from 10 to 30 minutes. Factory settings shall be for 7-day exercise cycle, 20-minute running period, and 5-minute cool-down period. Exerciser features include the following:

a. Exerciser Transfer Selector Switch: Permits selection of exercise with and without load transfer.
b. Push-button programming control with digital display of settings.
c. Integral battery operation of time switch when normal control power is unavailable.

2.3 SOURCE QUALITY CONTROL

A. Factory Tests: Test and inspect components, assembled switches, and associated equipment according to UL 1008. Ensure proper operation. Check transfer time and voltage, frequency, and time-delay settings for compliance with specified requirements. Perform dielectric strength test complying with NEMA ICS 1.

B. Prepare test and inspection reports.
1. For each of the tests required by UL 1008, performed on representative devices, for emergency systems. Include results of test for the following conditions:
a. Overvoltage.
b. Undervoltage.
c. Loss of supply voltage.
d. Reduction of supply voltage.
e. Alternative supply voltage or frequency is at minimum acceptable values.
f. Temperature rise.
g. Dielectric voltage-withstand; before and after short-circuit test.
h. Overload.
i. Contact opening.
j. Endurance.
k. Short circuit.
l. Short-time current capability.
m. Receptacle withstand capability.
n. Insulating base and supports damage.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Wall-Mounting Switch: Anchor to exterior wall by bolting.
1. Provide workspace and clearances required by NFPA 70.

B. Identify components according to Section 26 05 53 "Identification for Electrical Systems."

C. Set field-adjustable intervals and delays, relays, and engine exerciser clock.

D. Comply with NECA 10.

3.2 CONNECTIONS

A. Wiring to Remote Components: Match type and number of cables and conductors to generator sets, motor controls, and communication requirements of transfer switches as recommended by manufacturer. Increase raceway sizes at no additional cost to Owner if necessary to accommodate required wiring.

B. Wiring Method: Install cables in raceways except within electrical enclosures. Conceal raceway and cables except in unfinished spaces.
1. Comply with requirements for raceways and boxes specified in Section 26 05 33 "Raceways and Boxes for Electrical Systems."

C. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii.

D. Ground equipment according to Section 26 05 26 "Grounding and Bonding for Electrical Systems."

E. Connect wiring according to Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."

F. Route and brace conductors according to manufacturer's written instructions and Section 26 05 29 "Hangers and Supports for Electrical Systems." Do not obscure manufacturer's markings and labels.

G. Brace and support equipment according to Section 26 05 48.16 "Seismic Controls for Electrical Systems."

3.3 FIELD QUALITY CONTROL

A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
   1. After installing equipment, test for compliance with requirements according to NETA ATS.
   2. Visual and Mechanical Inspection:
      a. Compare equipment nameplate data with Drawings and Specifications.
      b. Inspect physical and mechanical condition.
      c. Inspect anchorage, alignment, grounding, and required clearances.
      d. Verify that the unit is clean.
      e. Verify appropriate lubrication on moving current-carrying parts and on moving and sliding surfaces.
      f. Verify that manual transfer warnings are attached and visible.
      g. Verify tightness of all control connections.
      h. Inspect bolted electrical connections for high resistance using one of the following methods, or both:
         1) Use of low-resistance ohmmeter.
         2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method according to manufacturer's published data.
      i. Perform manual transfer operation.
      j. Verify positive mechanical interlocking between normal and alternate sources.
      k. Perform visual and mechanical inspection of surge arresters.
      l. Inspect control power transformers.
         1) Inspect for physical damage, cracked insulation, broken leads, tightness of connections, defective wiring, and overall general condition.
         2) Verify that primary and secondary fuse or circuit-breaker ratings match Drawings.
         3) Verify correct functioning of drawout disconnecting contacts, grounding contacts, and interlocks.
   3. Electrical Tests:
      a. Perform insulation-resistance tests on all control wiring with respect to ground.
      b. Perform a contact/pole-resistance test. Compare measured values with manufacturer's acceptable values.
      c. Verify settings and operation of control devices.
      d. Calibrate and set all relays and timers.
      e. Verify phase rotation, phasing, and synchronized operation.
      f. Perform automatic transfer tests.
      g. Verify correct operation and timing of the following functions:
         1) Normal source voltage-sensing and frequency-sensing relays.
         2) Engine start sequence.
         3) Time delay on transfer.

4) Alternative source voltage-sensing and frequency-sensing relays.
5) Automatic transfer operation.
6) Interlocks and limit switch function.
7) Time delay and retransfer on normal power restoration.
8) Engine cool-down and shutdown feature.

4. Measure insulation resistance phase-to-phase and phase-to-ground with insulation-resistance tester. Include external annunciation and control circuits. Use test voltages and procedure recommended by manufacturer. Comply with manufacturer's specified minimum resistance.
   a. Check for electrical continuity of circuits and for short circuits.
   b. Inspect for physical damage, proper installation and connection, and integrity of barriers, covers, and safety features.
   c. Verify that manual transfer warnings are properly placed.
   d. Perform manual transfer operation.
5. After energizing circuits, perform each electrical test for transfer switches stated in NETA ATS and demonstrate interlocking sequence and operational function for each switch at least three times.
   a. Simulate power failures of normal source to automatic transfer switches and retransfer from emergency source with normal source available.
   b. Simulate loss of phase-to-ground voltage for each phase of normal source.
   c. Verify time-delay settings.
   d. Verify pickup and dropout voltages by data readout or inspection of control settings.
   e. Test bypass/isolation unit functional modes and related automatic transfer-switch operations.
   f. Perform contact-resistance test across main contacts and correct values exceeding 500 microhms and values for one pole deviating by more than 50 percent from other poles.
   g. Verify proper sequence and correct timing of automatic engine starting, transfer time delay, retransfer time delay on restoration of normal power, and engine cool-down and shutdown.
6. Ground-Fault Tests: Coordinate with testing of ground-fault protective devices for power delivery from both sources.
   a. Verify grounding connections and locations and ratings of sensors.

B. Coordinate tests with tests of generator and run them concurrently.

C. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation and contact resistances and time delays. Attach a label or tag to each tested component indicating satisfactory completion of tests.

D. Transfer switches will be considered defective if they do not pass tests and inspections.

E. Remove and replace malfunctioning units and retest as specified above.

F. Prepare test and inspection reports.

G. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each switch. Remove all access panels so joints and connections are accessible to portable scanner.
   1. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
   2. Record of Infrared Scanning: Prepare a certified report that identifies switches checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.
   3. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each switch 11 months after date of Substantial Completion.

3.4 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain transfer switches and related equipment.

B. Coordinate this training with that for generator equipment.

END OF SECTION 26 36 00

OTHER DISCUSSION

A. BOARD MEMBERS HAVE THE OPPORTUNITY TO DISCUSS ANY OTHER PERTINENT ISSUES