



REGULAR MEETING AGENDA

**Tuesday, July 23, 2024
6:30 P.M.**

If you need any assistance due to a disability, please contact the Planning Department at least 48 hours in advance of the meeting at planning@ypsitownship.org or 734-544-4000 ext. 1.

1. CALL TO ORDER
2. ROLL CALL
3. APPROVAL OF THE MARCH 26, 2024, REGULAR MEETING MINUTES
4. APPROVAL OF AGENDA
5. PUBLIC HEARINGS
 - A. **SPECIAL LAND USE – WHITE WATER CAR WASH – 2675 WASHTENAW AVENUE – PACEL K-11-06-304-004** – TO CONSIDER THE SPECIAL CONDITIONAL USE PERMIT APPLICATION OF EROP, LLC TO PERMIT THE CONSTRUCTION OF A 6,820 SQ. FT. CAR WASH FOR A 1.55-ACRE SITE ZONED RC, REGIONAL CORRIDOR, WITH A PROPOSED SITE TYPE C DESIGNATION.
 - B. **SPECIAL LAND USE – SHEETZ – 755 S. HEWITT ROAD, 2103 AND 2059 W. MICHIGAN AVENUE – PARCEL K-11-18-100-019, K-11-39-350-023, AND K-11-39-350-022** – TO CONSIDER THE SPECIAL CONDITIONAL USE PERMIT APPLICATION OF SKILKEN GOLD TO PERMIT THE CONSTRUCTION OF A 6,139 SQ. FT. GAS STATION / CONVIENENCE STORE WITH 8 GAS PUMPS FOR A 7.36-ACRE SITE ZONED RC, REGIONAL CORRIDOR WITH A SITE TYPE C DESIGNATION.
 - C. **SPECIAL LAND USE – BLUEMIND THERAPY – 1122 WALNUT STREET – PARCEL K-11-03-463-014** – TO CONSIDER THE SPECIAL CONDITIONAL USE PERMIT APPLICATION OF ZEINAB HASSAN TO PERMIT A CHILD DAYCARE CENTER FOR A 1.7-ACRE SITE ZONED R-5, ONE-FAMILY RESIDENTIAL.
6. OLD BUSINESS
7. NEW BUSINESS
 - A. **PRELIMINARY SITE PLAN – WHITE WATER CAR WASH – 2675 WASHTENAW AVENUE – PACEL K-11-06-304-004** – TO CONSIDER THE PRELIMINARY SITE PLAN APPLICATION OF EROP, LLC TO PERMIT THE CONSTRUCTION OF A 6,820 SQ. FT. CAR WASH FOR A 1.55-ACRE SITE ZONED RC, REGIONAL CORRIDOR, WITH A PROPOSED SITE TYPE C DESIGNATION.
 - B. **PRELIMINARY SITE PLAN – SHEETZ – 755 S. HEWITT ROAD, 2103 AND 2059 W. MICHIGAN AVENUE – PARCEL K-11-18-100-019, K-11-39-350-023, AND K-11-39-350-022** –

Township Supervisor
Brenda L. Stumbo
Township Clerk
Heather Jarrell Roe
Township Treasurer
Stan Eldridge



**YPSILANTI
TOWNSHIP**
— PLANNING & ZONING DEPARTMENT —

Trustees
John Newman II
Gloria Peterson
Debbie Swanson
Ryan Hunter

TO CONSIDER THE PRELIMINARY SITE PLAN APPLICATION OF SKILKEN GOLD TO PERMIT THE CONSTRUCTION OF A 6,139 SQ. FT. GAS STATION / CONVIENENCE STORE WITH 8 GAS PUMPS FOR A 7.36-ACRE SITE ZONED RC, REGIONAL CORRIDOR WITH A SITE TYPE C DESIGNATION.

8. OPEN DISCUSSION FOR ISSUES NOT ON THE AGENDA
 - A. CORRESPONDENCE RECEIVED
 - B. PLANNING COMMISSION MEMBERS
 - C. MEMBERS OF THE AUDIENCE

9. TOWNSHIP BOARD REPRESENTATIVE REPORT

**CHARTER TOWNSHIP OF YPSILANTI
PLANNING COMMISSION MEETING
Tuesday, March 26, 2024
6:30 pm**

COMMISSIONERS PRESENT

Bill Sinkule
Elizabeth El-Assadi
Gloria Peterson
Larry Doe
Bianca Tyson
Darryl Kirby
Caleb Copeland

STAFF AND CONSULTANTS

Fletcher Reyher, Planning and Development Coordinator
Megan Masson Minock - Carlisle Wortman
Dennis McLain – Township Attorney

- **CALL TO ORDER/ESTABLISH QUORUM**

MOTION: Mr. Sinkule called the meeting to order at 6:30 pm.

- **APPROVAL OF MARCH 12, 2024, REGULAR MEETING MINUTES**

MOTION: Mr. Doe **MOVED** to approve the March 12, 2024, regular meeting minutes. The **MOTION** was **SECONDED** by Ms. El-Assadi and **PASSED** by unanimous consent.

- **APPROVAL OF AGENDA**

MOTION: Mr. Kirby **MOVED** to approve the agenda. The **MOTION** was **SECONDED** by Ms. El-Assadi and **PASSED** by unanimous consent.

- **PUBLIC HEARINGS**

None to Report

- **OLD BUSINESS**

None to Report.

- **NEW BUSINESS**

PRELIMINARY SKETCH SITE PLAN – DR. PAWS VETERINARY CLINIC – 2789/2751 WASHTENAW AVENUE – PARCEL K-11-06-303-003 & 004 – TO CONSIDER THE PRELIMINARY SKETCH SITE PLAN APPLICATION OF MR. VANCE PALMER FOR THE ESTABLISHMENT OF A VETERINARY CLINIC UTILIZING THE EXISTING BUILDING AND SITE. THE PROPOSED PROJECT WILL OCCUPY A 0.92-ACRE SITE ZONED RC, REGIONAL CORRIDOR WITH SITE TYPE B DESIGNATION.

Mr. Fletcher Reyher, Planning and Development Coordinator, presented to the Commission the receipt of a Preliminary Sketch Plan Application from Mr. Vance Palmer representing Dr. Paws requesting authorization for the use of the existing building located at 2789/2751 Washtenaw Avenue for a Veterinary Clinic. Dr. Paws provides animal health care, urgent care, and surgery for animals in the community.

The Charter Township of Ypsilanti 2040 Master Plan designates this site for Mixed Use Corridors, a designation intended to be developed transportation arteries, with a mixture of residential, commercial, office and employment use. Regional Mixed-Use Corridors areas are along the busiest corridors, which support a high volume of local and regional traffic. This area may include large national chains, regional retailers and auto oriented users that draw customers both regionally and locally.

Mr. Fletcher Reyher presented the Commission with an aerial view of the property in discussion.

This site has historically been used as a restaurant and most recently as an auto dealership. The rear of the lot has an impervious surface where the used cars were parked for sale. The adjacent uses surrounding the property: North is a restaurant (Zone: RC – Regional Corridor); South is vacant (Zone: NB – Neighborhood

Business); East is a restaurant (Zone: RC – Regional Corridor); West is a restaurant (Zone: RC – Regional Corridor).

The Planning Department reviewed the application, and as per the Township Zoning Ordinance, changes in use must undergo a site plan review. A change in use for a site that does not comply with current design standards (such as landscaping, signage, lighting, or drainage) requires a Sketch Plan Review / Planning Commission review.

Mr. Fletcher Reyher talked about the natural features of the parcel; The parcel is relatively flat. There are no wetlands or woodland on the subject property. The Regional Corridor Zoning District allows for veterinary clinics.

The applicant is not requesting to enlarge the building, all the work that would be done on the site would be done inside the building and the removal of impervious surface on the parking lot, a new dumpster enclosure, landscaping and the removal of a non-conforming sign.

Parking: The Planning Department underwent a parking calculation for the site. The applicant would provide 30 spaces, which meet the requirements of the zoning ordinance for professional offices of doctors, dentists or similar professions. As per the Zoning Ordinance, the applicant is required to have a minimum of 2 barrier-free parking spaces and one (1) bicycle rack.

Landscaping Requirements: the applicant complies with the township's landscaping requirements. They are providing trees for the street yard landscaping, shrubs. They would provide 9 trees for the parking lot perimeter; General landscaping would be provided with 20 trees and 40 shrubs; Parking lot with have 7 trees.

Dumpster Enclosure: The dumpster plans will need to be revised as the gate is constructed with wood. The applicant must revise the gate materials to use treated aluminum or metal. Wood is not a permitted material, and it does not comply with the Township Zoning Ordinance.

Exterior Lighting: The applicant will be utilizing the existing lighting on site. The Planning Department has requested that all lights be properly shielded to avoid projecting light onto neighboring properties.

Elevations: The applicant is not proposing major modifications to the building's elevations. The applicant is proposing to remove the existing ground sign and

replace it with a monumental sign, as well as repainting the brick facade. Permits will be required for installing new ground or wall signs.

Fencing: The applicant is proposing a chain-link fence around the back of the building for a dog run area. The applicant will need to obtain a variance through the Zoning Board of Appeals to have this proposed dog run.

Other Requirements: Mr. Fletcher Reyher informed the Planning Commission and the applicant to be aware of the Reimagine Washtenaw initiative for Washtenaw Avenue. A comprehensive study was conducted in 2013-2014 to determine future cross-sections for the corridor, accommodating full sidewalks and bike lanes. The Michigan Department of Transportation (MDOT) is currently conducting a Planning and Environmental Linkages Study, to accommodate new bus lanes and new pedestrian infrastructure. The current stretch of Washtenaw Avenue that the applicants located on will require 108 feet of right of way. The applicant needs to be aware when installing signs/ landscape to accommodate this future right of way.

The Charter Township of Ypsilanti Planning Department finds this land use to be compatible with the Zoning District.

Recommendations: The Planning Department recommends approval of the Dr. Paws Veterinarian Clinic Preliminary Sketch Plan with the following conditions of approval as part of the final site plan:

- The applicant shall provide the required bicycle parking.
- The applicant shall ensure that all existing lights are appropriately shielded.
- The applicant shall restripe the parking lot.
- The applicant shall remove the existing non-conforming pole sign adjacent to Washtenaw Avenue.
- The applicant shall replace the proposed wooden trash enclosure gate with a gate made of treated aluminum or metal.
- The applicant shall consider the width of the future public access limits identified in the 2014 Reimagine Washtenaw Study, to accommodate future roadway reconstruction.
- The applicant shall obtain all applicable internal and outside agency permits prior to construction.
- The applicant shall obtain a variance for the proposed dog run.
- The applicant shall address all outstanding comments from reviewing agencies prior to Final Site Plan approval.

- Any other conditions based upon Planning Commission discussion.

Reviews of different departments:

- **OHM:** OHM recommended approval with a list of conditions
- **Fire Department:** Fire Marshal issued an approval with no conditions

The Commissioner inquired about the concrete area at the back of the parcel: Mr. Fletcher Reyher stated that the site has an excess of impervious surface, and a vet clinic has no need to have many parking spaces. The applicant has proposed removing some of the impervious surface, which will help with stormwater runoff and look more appealing for residents and customers visiting their establishment.

Mr. Fletcher Reyher informed the Planning Commission that the sidewalk is in good condition, since it is outside of the proposed future right of way, which is 54 feet from the centerline. If there are changes of the right of way in the future, the applicant may need to consider moving the sidewalk closer to the building.

Ms. Debbie Honai (Gazall Lewis Architect), Doctor Eastman, Akona and Vance Palmer were present to answer the Planning Commission:

The Commissioner inquired if the business was brand new or currently practicing somewhere else; The applicant stated that they currently practice at another location.

The Commissioner inquired about surgeries; Dr. Eastman/ Akona stated that they can handle most soft tissue surgeries, spaying and neutering. Currently they won't be handling orthopedic surgery.

Ms. Debbie Honai informed the Planning Commission that no pets would be spending the night at the clinic. There is no need for a kennel or cages. The only time the area will be used is when the dogs need to relieve themselves in that secluded area. Dogs will be on leash and no dog will be out there for an extended time.

MOTION: Mr. Copeland MOVED to approve the preliminary sketch site plan of Dr. Paws Veterinary Clinic to permit the establishment of a veterinary clinic utilizing the existing building and site for a 0.92-acre site zoned RC, Regional Corridor with a Site Type B Designation, located at 2789/2751 Washtenaw Avenue, Ypsilanti, MI 48197, Parcel K-11-06-303-003 & 004, with the following conditions:

- The applicant shall address all outstanding comments from reviewing agencies prior to Final Site Plan approval.

- The applicant shall obtain all applicable internal and outside agency permits prior to construction.
- The applicant shall provide the required bicycle parking.
- The applicant shall ensure that all existing lights are appropriately shielded.
- The applicant shall restripe the parking lot.
- The applicant shall remove the existing non-conforming pole sign adjacent to Washtenaw Avenue.
- The applicant shall consider the width of the future public access limits identified in the 2014 Reimagine Washtenaw Study, to accommodate future roadway reconstruction.
- The applicant shall replace the proposed wooden trash enclosure gate with a gate made of treated aluminum or metal.
- Any other conditions based upon Planning Commission discussion.

The **MOTION** was **SECONDED** by Ms. El-Assadi

Roll Call Vote: Mr. Copeland (Yes); Mr. Doe (Yes); Ms. Peterson (Yes); Mr. Sinkule (Yes); Ms. El-Assadi (Yes); Ms. Tyson (Yes); Mr. Kirby (Yes);

MOTION PASSED.

- **OPEN DISCUSSIONS FOR ISSUES NOT ON AGENDA**

- a. **Correspondence received**

None to Report.

- b. **Planning Commission members**

None to Report.

- c. **Members of the audience**

None to Report.

- **TOWNSHIP BOARD REPRESENTATIVE REPORT**

None to Report.

- **ZONING BOARD OF APPEALS REPRESENTATIVE REPORT**

None to Report.

- **TOWNSHIP ATTORNEY REPORT**

None to Report.

- **PLANNING DEPARTMENT REPORT**

None to Report.

- **OTHER BUSINESS**

None to Report.

- **ADJOURNMENT**

MOTION: Ms. El-Assadi **MOVED** to adjourn at 6:50 pm. **The MOTION** was **PASSED** by unanimous consent.

Respectively Submitted by Minutes Services.

Township Supervisor
Brenda L. Stumbo
Township Clerk
Heather Jarrell Roe
Township Treasurer
Stan Eldridge



**YPSILANTI
TOWNSHIP**
— PLANNING & ZONING DEPARTMENT —

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Ryan Hunter

**Staff Report
White Water Car Wash
2675 Washtenaw Avenue
Preliminary Site Plan and Special Land Use**

July 23, 2024

Applicant: EROP, LLC

Project Name: White-Water Car Wash

Plan Date: June 11, 2024

Location: 2675 Washtenaw Avenue, Ypsilanti, MI 48197, Parcel K-11-06-304-004

Zoning: RC, Regional Corridor with a Site Type A Designation

Action Requested: Preliminary Site Plan & Special Land Use Approval

CASE LOCATION AND SUMMARY

The Office of Community Standards is in receipt of a Preliminary Site Plan and Special Land Use Application from White-Water representative, EROP, LLC, for a proposed 6,820 sq. ft. tunnel car wash with two pay stations and 18 vacuum stations / parking spaces. The parking lot will also offer five (5) employee parking spaces. A Public Hearing to consider the Special Land Use application is scheduled for the July 23 meeting.

The subject site is zoned RC, Regional Corridor with a Site Type A Designation. The applicant is requesting that the Planning Commission consider modifying the Regulating Plan, and designating this parcel as a Site Type C, which permits vehicle washes as a Special Land Use. A Public Hearing to consider the change to Site Type C will be considered at a future meeting, after the applicant has obtained the needed variance.

SUBJECT SITE USE, ZONING AND COMPREHENSIVE PLAN

The Charter Township of Ypsilanti 2040 Master Plan designates this site as Regional Mixed-Use Corridor. Regional Mixed-Use Corridors areas are located along the busiest corridors, which support a high volume of both local and regional traffic. This area may include large national chains, regional retailers, and auto oriented uses that draw customers both regionally and locally. Compared to Neighborhood Mixed-Use Corridors areas they are high intensity and feature the largest scale of commercial development.

Township Supervisor
Brenda L. Stumbo
Township Clerk
Heather Jarrell Roe
Township Treasurer
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2675 Washtenaw Avenue – Aerial Photograph – 2023



ANALYSIS

The plans have been reviewed by Township Staff and Consultants in accordance with our procedures.

Planning Consultants (Carlisle/Wortman Associates):

Carlisle Wortman Associates, Inc. reviewed the Preliminary Site Plan and has recommended multiple items to be discussed with the Planning Commission prior to the



applicant seeking one (1) variance with the Zoning Board of Appeals. The discussion items are listed below:

Special Land Use

1. Planning Commission to determine if the project meets the ordinance criteria for Special Land Use approval.

Change in Site Type

1. Planning Commission to evaluate change in the Regulating Plan from Site Type A to Site Type C, per ordinance criteria.
2. Applicant to consider dedicating an easement within the 14-feet of the “future” right-of-way for installation of future streetscape improvements in front of the property.

Natural Features

1. Applicant to provide survey information on existing “protected” trees, and protected trees shown as preserved in resubmission for review at Final Site Plan stage.
2. Planning Commission considers condition of approval that any trees identified as “protected” in tree survey are shown as preserved on the Final Site Plan.

Site Access, Circulation, Traffic

1. Defer site driveway locations to Township Engineer.
2. Applicant confirms that 36’ knee wall is opaque; detail of knee wall added to Final Site Plan.
3. Modify architectural plans to be consistent with opaque knee wall (as specified on Site Plan).

Screening and Landscaping

1. Add 13 more shrubs to plans along Boston Ave. frontage; or Planning Commission to consider waiving/modifying this standard due to site constraints.
2. Planning Commission to consider proposed modification of screening between land uses (or no narrow evergreens).
3. Applicant to consider native alternative to English Laurel.

Lighting

1. Planning Commission to consider suggestions that reduce the lighting levels at the vacuum stations to be more consistent with the other areas of the site.

Elevations and Floor Plans

1. Add more glazing on Washtenaw Avenue façade or applicant seeks variance.



Engineering Consultants (OHM):

The Township Engineer recommended approval in their letter dated June 25, 2024. OHM has provided preliminary detailed engineering comments that will be addressed at the time of Final Site Plan and Detailed Engineering.

Ypsilanti Community Utilities Authority (YCUA):

YCUA reviewing agent Scott Westover has recommended approval in his letter dated June 25, 2024.

Ypsilanti Township Fire Department:

YTFD Fire Marshall Steve Wallgren has recommended approval in a letter dated June 20, 2024.

Washtenaw County Water Resources Commission:

Reviewing agent Theresa Marsik has asked the applicant to address 22 items in a letter dated June 12, 2024.

Washtenaw County Road Commission:

WCRC Project Manager Gary Straight shared comments with the Planning Department on June 27, 2024.

SUGGESTED MOTIONS:

The applicant needs to seek a variance to the glazing/transparency requirements

The following suggested motions and conditions are provided to assist the Planning Commission in making the most appropriate decision for this application. The Commission may utilize, add, or reject any conditions as they deem appropriate.

Special Land Use:

Motion to Postpone:

"I move to postpone the request for special land use approval for the construction of a 6,820 sq. ft. tunnel carwash with two pay stations and 18 vacuum stations at the property located at 2675 Washtenaw Avenue, Ypsilanti, MI 48197, Parcel K-11-06-304-004, to allow the applicant time to obtain the required variance as outlined in the staff report."

Preliminary Site Plan:

Motion to Postpone:

Township Supervisor
Brenda L. Stumbo
Township Clerk
Heather Jarrell Roe
Township Treasurer
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"I move to postpone the request for preliminary site plan approval for the construction of a 6,820 sq. ft. tunnel carwash with two pay stations and 18 vacuum stations at the property located at 2675 Washtenaw Avenue, Ypsilanti, MI 48197, Parcel K-11-06-304-004, to allow the applicant time to obtain the required variance as outlined in the staff report."

Respectfully submitted,

Fletcher Reyher

Fletcher Reyher, AICP
Planning & Development Coordinator
Charter Township of Ypsilanti Planning Department

Planning Department Report

Project Name: White Water Car Wash

Location: 2675 Washtenaw Avenue, Ypsilanti, MI 48197

Date: 07-01-2024

- | | |
|--|---|
| <input checked="" type="checkbox"/> Full Preliminary Site Plan Review # 2
<input type="checkbox"/> Sketch Preliminary Site Plan Review #
<input type="checkbox"/> Administrative Preliminary Site Plan Review #
<input type="checkbox"/> Detailed Engineering/Final Site Plan Review #
<input checked="" type="checkbox"/> Special Use Permit
<input type="checkbox"/> Public Hearing | <input type="checkbox"/> Rezoning
<input type="checkbox"/> Tentative Preliminary Plat
<input type="checkbox"/> Final Preliminary Plat
<input type="checkbox"/> Final Plat Process
<input type="checkbox"/> Planned Development Stage I
<input type="checkbox"/> Planned Development Stage II |
|--|---|

Contact / Reviewer	Consultants, Departments, & Agencies	Approved	Approved with Conditions	Denied	N/A	See email/letter attached or comments below
Planning Department	Township Planning Department	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See comments below
Carlisle/Wortman Associates	Planning Consultant	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See letter dated 06-28-2024
OHM / Stantec	Engineering Consultant	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See letter dated 06-25-2024
Steven Wallgren, Fire Marshal	Township Fire Department	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See letter dated 06-20-2024
Dave Bellers, Building Official	Township Building Department	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Brian McCleery, Deputy Assessor	Township Assessing Department	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Scott Westover, Engineering Manager	Ypsilanti Community Utilities Authority	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See letter dated 06-25-2024
Gary Streight, Project Manager	Washtenaw County Road Commission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	See email dated 06-27-2024
Theresa Marsik, Stormwater Engineer	Washtenaw County Water Resources Commission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See letter dated 06-12-2024
James Drury, Permit Agent	Michigan Department of Transportation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Planning Department Recommended Action:

The White Water Car Wash is eligible for Preliminary Site Plan and Special Land Use Consideration by the Planning Commission. This project is scheduled for the Planning Commission meeting on Tuesday, July 23, 2024, for the required Public Hearing and Preliminary Site Plan review. It would be the Planning Department's recommendation that the Planning Commission grant Preliminary Site Plan and Special Land Use approval if the applicant obtains the required variance as outlined in the report, and addresses the remaining comments and concerns from Planning & Zoning and outside reviewing agencies. The applicant will need to obtain the required variance prior to a formal motion from the Planning Commission.



Carlisle | Wortman
ASSOCIATES, INC.

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

Date: May 15, 2024

Rev.: June 28, 2024

**Preliminary Site Plan and Special Use Review
For
Ypsilanti Township, Michigan**

Applicant:	EROP LLC
Project Name:	Whitewater Car Wash
Plan Date:	April 18, 2024
Latest Revision:	June 11, 2024
Location:	South side of Washtenaw Ave., between N. Hewitt and Golfside. Parcel abuts Northlawn Ave. to the south and Boston Ave. to the west.
Zoning:	RC, Regional Corridor – Form Based District
Action Requested:	Preliminary Site Plan and Special Use Approval

PROJECT AND SITE DESCRIPTION

The applicant is proposing to build a 6,820 s.f. tunnel car wash with two pay stations and 18 vacuum stations/parking spaces. The parking lot will also offer five (5) employee parking spaces.

Access to the site occurs off of a side road (Boston Ave.), which has not been fully developed as a public road, and is not a through road between Washtenaw Ave. and Northlawn Ave. to the south. It essentially functions as a shared driveway to this site and the adjacent sites on the west side of the road.

The subject site is zoned RC, Regional Corridor, which is a Form Based District. The site is categorized as a Site Type A on the Regulating Plan. The applicant is requesting that the Planning Commission consider modifying the Regulating Plan, and designating this parcel as a Site Type C, which permits vehicle washes as a Special Land Use. An aerial of the proposed site is shown below.

Benjamin R. Carlisle, President Douglas J. Lewan, Executive Vice President John L. Enos, Vice President
David Scurto, Principal Sally M. Elmiger, Principal R. Donald Wortman, Principal
Paul Montagno, Principal Megan Masson-Minock, Principal Laura Kreps, Senior Associate
Richard K. Carlisle, Past President/Senior Principal

Figure 1: Subject Site



Source: Nearmap (Captured April 8, 2024)

Size of Subject Site:
 1.55 acres (67,384 s.f.)

Current Use of Subject Site:
 Vacant (Previous put-put golf course)

Table 1: Adjacent Zoning and Existing Land Uses

Direction	Zoning	Use
North	North Side of Washtenaw Ave.: RC, Regional Corridor (Form Based District)	Commercial (Auto Repair)
South	South Side of Northlawn Ave.: RM-LD – Multiple Family Low Density	Residential
East	North: RC, Regional Corridor (Form Based District), and South: NB, Neighborhood Business	Commercial (Auto Repair) & Vacant
West	North: RC, Regional Corridor (Form Based District), and South: NB, Neighborhood Business	Commercial (Retail, Restaurant) & Vacant

MASTER PLAN

The site is designated as Regional Mixed Use Corridor. Regional Mixed-Use Corridors are located along the busiest corridors, which support a high volume of both local and regional traffic. This area may include auto-oriented uses that draw customers both regionally and locally. Compared to the Neighborhood Mixed-Use corridors, this area is intended for higher-intensity and the largest scale of commercial development. While an auto wash is not specifically listed in the Master Plan's Regional Corridor description, it does list auto-oriented commercial facilities. An auto wash could be considered consistent with this description, as it could serve the regional market and local neighborhoods.

Applicable design concepts included the Master Plan include:

- *Large parking lots shall be screened landscaped, and provided with pedestrian connections and other design amenities to break up excessive pavement and reduce visual impact of parking areas.*
- *Architectural design must create an interesting visual experience for both sidewalk users and automobiles.*
- *Ensure appropriate transition to adjacent neighborhoods.*

We find that the site design considerations are addressed in the site plan. However, the architectural design does not, in our opinion, create an interesting visual experience for sidewalk users or automobiles. Please see additional comments in the "Floor Plans and Elevations" section of this review.

CHANGE IN SITE TYPE

Sheet C-3 indicates that the applicant would like to change the Site Type under the Form Based Code from Site Type A to Site Type C. A Site Type "A" does not permit a vehicle wash use, nor does it allow a Building Form B (as proposed in this application). If the Site Type were changed to "C," then a vehicle wash could be considered as a Special Land Use, and Building Form B would also be allowed.

Site Types are determined by street orientation, lot size, lot configuration, location, and relationship to neighboring sites. Changing Site Types is a change to the Form Based Regulating Plan (Sec. 502(5)). This change can be reviewed and approved by the Planning Commission after conducting a public hearing.

Descriptions of Site Type A and Site Type C are provided below:

Site Type A:

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. Site Type A lots are typically mid-block and not located on a corner. 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. These sites are intended for small sized neighborhood residential, commercial/office, or mixed-use sites.

Site Type C:

The sites in Site Type C are mostly larger than one (1) acre 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. These sites are intended for community commercial/office, multiple family residential, and mixed-use sites.

In considering a Site Type change to the Regulating Plan, Sec. 502(5) states that the Planning Commission shall consider the following criteria. We have listed the criteria below, and provided an evaluation after each:

A. The applicant's property cannot be used for the purpose permitted in the form-based district (In this case, Regional Corridor).

CWA Comments: While we can't confirm that all of the permitted uses allowed on Site Type A are unfeasible on the subject site, the frontage on Washtenaw Ave. makes a vehicle-oriented commercial use logical. However, given the desired character of this corridor, a new vehicle-oriented use would need to be designed so that it "fits" into the mix of pedestrian and vehicular facilities. The relatively small lot size and frontage along Washtenaw Ave. makes it unlikely that a residential use would occupy this site. Lastly, the project is expanding the size of the site so that it meets the "larger than one acre" characteristic of Site Type C.

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

CWA Comments: The Regulating Plan only identifies the small portion of this site along Washtenaw Ave. as a Site Type "A." The remaining portion (to the south) is not designated any site type on the Regulating Plan. The proposed project site is 1.55 acres in size, which is consistent with the size range in Site Type C.

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

CWA Comments: The business to the east (R&J Auto Repair) has vehicle parking in front of the building, and the building is setback relatively far from Washtenaw Ave. (approx. 100 feet). The building to the west (Fish Doctor's Aquarium Shop) is located closer to Washtenaw Ave. (approx. 30 feet), and has one parking space in front of the building. Two other nearby buildings (Wendy's to west and Taco Bell to east) are both set back approximately 45 feet from the front property line, and don't have parking directly in front of the building.

The Form Based Code design standards bring buildings closer to the road and sidewalk, and eliminate parking in front to give more emphasis to pedestrian facilities and comfort. The proposed site plan locates the front of the building 10-feet from the "future" Washtenaw Ave. right-of-way line, and does not locate any vehicular parking or maneuvering in front of the building. This layout of this site will alter the existing character of the area, but in a positive way by helping to establish the character envisioned by the Form Based Code.

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

CWA Comments: The intent of the Regional Corridor District is described as follows:

Regional: Regional Mixed-Use Corridors areas are located along the busiest corridors, which support a high volume of both local and regional traffic. This area may include large national chains, regional retailers, and auto oriented uses that draw customers both regionally and locally. Compared to Neighborhood Mixed-Use Corridors areas they are high intensity and feature the largest scale of commercial development.

This site is located along one of the larger corridors in the Township. The vehicle wash is an auto-oriented use that would draw both local and regional customers.

E. Existing streets have been improved and/or new streets constructed that may result in the modification of a specific site type.

CWA Comments: As part of this project, Boston Ave. will be improved, as shown on the plans. In their most recent narrative, the applicant states that the Road Commission will retain jurisdiction over Boston Ave., and that any improvements to this road will be made to the Road Commission's standards. We consider the access to this site from Boston Ave. beneficial, as this use will not require another curb-cut along Washtenaw Ave.

F. Modification to the Regulating Plan is in conformance to the Master Plan and Placemaking Plan.

CWA Comments: As described in the "Master Plan" section in this review, we consider the proposed use to be consistent with the Regional Mixed-Use Corridor designation.

The "Reimagine Washtenaw Corridor Improvement Study" (or placemaking plan for Washtenaw Ave.) includes a Future Public Access Plan showing planned future right-of-way widths along Washtenaw Ave. On the Future Public Access Plan, the future right-of-way in front of this site is shown as 108-foot wide. The most recent site plan identifies the "future" right-of-way line, and sets the building back 10-feet from this line. Another part of the Improvement Study is to install wider sidewalks along this side of Washtenaw, in front of this property. The site plans show installation of an 8-foot-wide sidewalk in the "future" right-of-way (or the additional 14-feet along Washtenaw Ave.). For future planning and improvements, would the applicant be willing to dedicate a public sidewalk easement for the 14-feet to the Township for streetscape improvements in the future?

We find the proposal meets the criteria to modify the Regulating Plan from Site Type A to Site Type C, with the outstanding issues mentioned here to be addressed.

Items to be Addressed: 1) Planning Commission to evaluate change in Regulating Plan from Site Type A to Site Type C, per ordinance criteria. 2) Applicant to consider dedicating an easement within the 14-feet of the "future" right-of-way for installation of future streetscape improvements in front of the property.

NATURAL FEATURES

Topography: The site was previously used as a put-put golf course, and was fully graded to accommodate this use with artificial hills and water features. The existing parking lot at the back of the site slopes down from north to south into a swale along Northlawn Ave.

The proposed grading will work with the existing topography, and grade the site from Washtenaw Ave. on the north end, to a rain garden and underground stormwater chamber system on the south end of the site. However, given the length of the building (190 feet long), the design installs a 3-foot tall retaining wall, with a 36" high knee wall on top along the north and west side of the vehicle lanes into the car wash building.

Woodlands:

Our previous review memo asked the applicant to confirm that the existing trees (shown on the aerial photograph of the site) do not meet the minimum size to be classified as “protected” trees by the ordinance. The applicant’s response memo states that if any “protected” trees are identified by a surveyor, then they will remain and be protected. The details about the trees will be provided with the next submission. If protected trees are not being disturbed by the project, then there will not be any mitigation requirements. We will evaluate the new survey information once provided. The Planning Commission could consider conditioning any approval on any trees identified as “protected” to be preserved and this is reflected on the Final Site Plan.

Items to be Addressed: 1) Applicant to provide survey information on existing “protected” trees, and protected trees shown as preserved in resubmission for review at Final Site Plan stage. 2) Planning Commission considers condition of approval that any trees identified as “protected” in tree survey are shown as preserved on the Final Site Plan.

AREA, WIDTH, HEIGHT, SETBACKS

The remainder of this review assumes a Site Type C, with Building Form B.

Table 2. Bulk Requirements

	Required / Allowed	Provided	Complies with Ordinance
Min. Lot Area	Site Type C: Larger than 1 acre	67,384 s.f. (1.55 ac.)	Complies
Front Build-to-Line (Washtenaw Ave.)	10-foot to 30-foot build-to-line; 75% of the building must meet the required build-to line.	Building located 10 feet from the “Future” Washtenaw Ave. ROW.	Complies
Side Setback – East Property Line	5 feet	5 feet	Building Complies
Side Setback – West Property Line	5 feet	44.6 feet	Building Complies
Rear Setback	10 feet	230.6 feet	Building Complies
Impervious Surface	80% maximum	56%	Complies
Building Height	Minimum: 1 story/14 feet Maximum: 3 stories/ 38 feet	1 story Building: 18 feet Parapet: 29 feet	Complies See Below

	Required / Allowed	Provided	Complies with Ordinance
Parking	Located in side or rear yard; if abutting a required “build-to” line, screened with a minimum 30-inch masonry wall on the required build-to line, or within 5 feet of the required building line.	Parking is located in the rear yard.	Complies

Table 3. Bulk Requirements for Vehicle Wash Operations

Requirements of 1129, Specific Use Provisions for Vehicle Wash Operations			
	Required / Allowed	Provided	Complies with Ordinance
Min. Front Yard	50 feet; however, the Form Based Code requirements supersede this requirement	10 feet	Complies
Wash facilities within completely enclosed building	--	--	Complies
Vacuuming and drying areas may be outside, but no closer than 25-feet from residential district	25-feet from south property line (along Northlawn Ave.)	96.7 feet	Complies
Stacking/Parking complies with Sec. 1205 and 1118	See Parking Section of this review		
Stacking/Parking hard-surfaced and dust free	--	Proposing concrete pavement	Complies

Building Height

When measuring the building height dimension using the ordinance definitions, this building is 18-feet tall. The front parapet is an additional 12-feet above the roof. This tall parapet will span the front façade, and wrap the east and west sides for approximately 24-feet. The building height is much taller than the two properties to the west, and the vehicle repair building to the east; however, it appears to be consistent with the new Taco Bell restaurant further east. The building height complies with the ordinance. Also, given the width of Washtenaw Ave., the added height will coordinate better with this large corridor.

Items to be Addressed: None.

PARKING, LOADING

The ordinance requires a vehicle wash use to meet the minimum parking space requirement in Sec. 1205, *Access, Parking and Loading Requirements*, as well as the drive-through requirements in Sec. 1118, *Drive-In and Drive-Through Facilities*.

Table 4. Parking and Stacking Spaces

Requirements	Required	Provided	Complies with Ordinance
Parking Spaces	1 space for each employee or 5 employees = 5 spaces	5 spaces	Complies
Stacking Spaces	Entry per lane: 8 spaces Exit per lane: 2 spaces	West Entry Lane: 9 spaces East Entry Lane: 7 spaces Exit: 2	See Below
Stacking Space Dimensions	12' x 20'	10' x 15'	See Below
Barrier-Free Spaces	2 spaces	2 spaces	Complies
Loading spaces	1 space	0 spaces	See Below
Bicycle parking	2 spaces	4 spaces	Complies

Stacking Spaces

The vehicle symbols shown on the plans have lengthened to 20-feet long in the stacking lanes, meeting this requirement. are only 15-feet long, while a stacking space minimum is 20-feet long. The stacking lanes are approximately 140-feet long before cars must make the turn into the wash tunnel. The west lane accommodates nine (9), 20-foot-long stacking spaces, and the east lane accommodates seven (7), 20-foot-long stacking spaces. Given that the total of the two lanes accommodates 16 stacking spaces we think the project meets ordinance requirements.

Also, the ordinance requires stacking spaces to be 12-feet wide. The proposed stacking lanes have been widened to 12 to 14-feet wide, meeting this requirement.

Parking Lot Design

The proposed employee parking spaces meet the dimensional requirements in the ordinance. The proposed vacuum stations exceed the minimum width by 4-feet, giving users enough space to keep their doors open to vacuum the inside. Maneuvering lanes in the parking/vacuum station area also meet ordinance requirements.

Loading Space

One 10' x 25' loading space has been added to the plans, directly behind the back end of the building at the second overhead exit door. The applicant's narrative states that a box-type truck or Amazon van will deliver materials to the site. Sheet C-13, *Truck Turning Analysis*, shows that this type of vehicle will be able to maneuver and fit into the proposed loading zone.

Items to be Addressed: None.

SITE ACCESS, CIRCULATION, TRAFFIC

Boston Ave. – Public Road Right-of-Way

As mentioned above, the applicant states that the Road Commission will retain jurisdiction of Boston Ave. as a public road. Boston Ave. currently serves the subject site and the three parcels on the west side of the street. The plans show improvements to this roadway, up to the southerly access driveway on the subject site. These improvements will be evaluated by the Road Commission during Final Site Plan review.

Stacking Lanes

Vehicles for this use enter the car wash stacking lanes from a two-way driveway off of Boston Ave. Given that the site driveway is off of this side road vs. Washtenaw Ave., stacking will not interfere with traffic on Washtenaw. We defer the location of this driveway to the Township Engineer.

Vehicles stack into two lanes, which are located on the west side of the site. Sec. 1118 states that multi-lane drive-throughs shall be located in a manner that will be the least visible from a public thoroughfare. Building Form B standards (Sec. 503(4), Building Form Types) also states that parking abutting the required build-to line adjacent to the right-of-way shall be screened with a minimum 30" tall masonry wall, and landscape treatment added between the wall and build-to line. The site plan shows a 36" tall knee (screen) wall along the property lines abutting Boston Ave. and Washtenaw Ave., meeting this requirement. We assume that the applicant is proposing an opaque, masonry knee wall that will screen the drive-through lanes. The applicant should confirm this, and add details of the knee wall to the Final Site plan. Also, the architectural plans show a metal railing (vs. "knee wall") that will not obstruct views of the stacking lanes from the road or sidewalk. The architectural plans should be modified to include the 36" knee wall specified on the site plan.

The location of the lanes does not interfere with vehicular circulation on the rest of the site, or parking maneuvers. There is an "escape" lane just to the east of the stacking lanes that would allow a car to exit the wash building before being washed. We consider this circulation system acceptable.

Vacuum Station Access

A second driveway allowing vehicles into and out of the site is located further south. This driveway allows customers to enter the site and use the vacuum stations only. It also allows washed vehicles to exit the site. If a person vacuums their car first, they need to exit the site, and re-enter using the southerly driveway. We aren't concerned about these maneuvers given that Boston Ave. will most likely have very low traffic. We defer the location of this second driveway to the Township Engineer.

Sidewalks

The plans show an 8-foot-wide sidewalk along Washtenaw Ave., 13-feet from the curb. As requested, the safety path location was shifted away from the curb. See our comments below regarding a landscaped separation between the safety path and curb/travel lanes, for a more consistent design along the street.

The Form Based Districts require pedestrian pathways between the site and the road right-of-way. Stairs have been added between the safety path along Washtenaw Ave. and the pedestrian access door on the west side (near the front) of the building.

Items to be Addressed: 1) Defer site driveway locations to Township Engineer. 2) Applicant confirms that 36" knee wall is opaque; detail of wall added to Final Site Plan. 3) Modify architectural plans to be consistent with opaque knee wall (as specified on Site Plan).

SCREENING & LANDSCAPING

Table 5. Landscaping

	Required	Provided	Complies with Ordinance
General Landscaping: <ul style="list-style-type: none"> 1 tree per 1,000 s.f. lawn 1 shrub per 500 s.f. lawn 	5,276 s.f. lawn = 6 trees and 11 shrubs	6 trees and 11 shrubs	Complies
Street Yard Landscaping: <ul style="list-style-type: none"> 1 large deciduous tree per 40 l.f. of frontage 1 ornamental tree per 100 l.f. of frontage 1 shrub per 10 l.f. of frontage 	<u>Washtenaw Ave.:</u> 107 L.F. / 40 = 3 trees 107 l.f. / 100 = 1 ornamental tree 107 l.f. / 10 = 11 shrubs <u>Boston Ave.:</u> 295 l.f. / 40 = 8 trees 295 l.f. / 100 = 3 ornamental trees l.f. / 10 = 30 shrubs	<u>Washtenaw Ave.:</u> 3 trees 1 ornamental tree 17 shrubs <u>Boston Ave.:</u> 8 trees 3 ornamental trees 17 shrubs on top side of retaining wall	Complies with Trees Complies with Ornamental Trees Deficient by 13 shrubs See Below
Parking Lot Landscaping: <ul style="list-style-type: none"> 1 large deciduous tree per 2,000 s.f. of pavement 1 large deciduous tree per 40 l.f. of parking lot perimeter 	24,709 s.f. / 2,000 s.f. = 12 interior trees 747 l.f. / 40 = 19 perimeter trees	12 interior trees and 19 perimeter trees	Complies
Stormwater Basin Landscaping: 1 tree and 10 shrubs per 50 feet of basin perimeter	278 l.f. / 50 = 6 trees and 56 shrubs	6 trees and 56 shrubs	Complies
Screening Between Land Uses: 1 lg. evergreen per 10 l.f. and 1 narrow evergreen 3 l.f. for screening between an automotive use and residential use	176 l.f. / 10 = 18 lg. evergreen trees and 176 l.f. / 3 = 59 narrow evergreen trees	18 lg. evergreen trees and 0 narrow evergreen trees	Deficient by 59 narrow evergreen trees See Below

Street Yard Landscaping – Boston Ave.

The purpose of this requirement is to beautify the site along road frontages, and create a more “pedestrian-friendly” atmosphere. Because there is a retaining wall along a portion of this frontage, plants installed on the “low” side of the wall will not accomplish the goals of this requirement. There are no plantings along the “top” side of the retaining wall along the Boston Ave. frontage. There is space on the top side of the retaining wall (on west side of the knee wall) to plant shrubs. Shrubs could also be planted in the lawn area between the two site access driveways. Note that the ordinance allows the Planning Commission to waive this standard where site constraints make conformance unreasonable.

Parking Lot Islands

Sec. 1301(3)(D) requires the following:

- 1) There shall be no more than twelve (12) parking spaces in a row without a landscape break. The plans comply with this requirement.
- 2) Parking lot end islands shall be a minimum of five (5) feet wide, and provided at the intersection of any parking aisles. The islands are the minimum dimensions, and their location complies with the ordinance.

Screening Between Land Uses

The project is an “automotive” use next to a residential use, requiring a Type 3 screen. The plans show one row of large evergreen trees along the southern boundary, and do not show any narrow evergreen trees. The Planning Commission may modify the requirements in the ordinance, where the intent of this Section can be met through reasonable alternatives. The Planning Commission will need to consider the proposed modification.

Plant Material

- 1) The shrub ‘Otto Luyken’ English Laurel has poisonous berries, and can be fatal if eaten (source: ivasiveplantatlas.org). We would suggest a native alternative of ‘Gro-Low’ Sumac that doesn’t have this characteristic, and is very hardy, tolerating urban conditions.

Trash and Recycling Containers

The dumpster is located in a “front” yard along Boston Ave. The ordinance prohibits locating a dumpster in a “required” front yard. Because this is a form-based district, the “required” front yard is 10-feet-wide. The dumpster screen is more than 20-feet from the Boston Ave. right-of-way. The landscape plan shows that the screen itself will be shielded from view of the south and west properties with landscaping.

The dumpster screen detail (shown on Sheet C-15) will be a three-sided, 6-foot-tall masonry screen made of CMU block with a brick veneer that matches the building. The gate will be made of metal.

Items to be Addressed: 1) Add 13 more shrubs to plans along Boston Ave. frontage; or Planning Commission to consider waiving/modifying this standard due to site constraints. 2) Planning Commission to consider proposed modification of screening between land uses (or no narrow evergreens). 3) Applicant to consider native alternative to English Laurel.

LIGHTING

The applicant is proposing to install six (6) single-luminaire pole-mounted fixtures, and one, double-luminaire pole-mounted fixture as site lighting. The building will be illuminated with two types of building-mounted fixtures. Lastly, the vacuum stations will have linear luminaires on the vacuums. We have the following comments:

Pole-Mounted Fixtures:

These fixtures are downward facing, and shielded. They are within the 18-foot tall height maximum.

Building-Mounted Fixtures:

These fixtures are also downward facing. However, there are 9 luminaires along the west side of the building, and 3 luminaires along the south side of the building. The applicant should confirm that these lights are only provided for security, and not to attract attention to the use. The housing around the light source will shield the light and help to direct it downward on the site.

Linear Luminaires

The “linear luminaire” is used on all 18 vacuum stations, plus there are 5 additional luminaires on the ends of the vacuum stations. An illustration of what this looks like from the manufacturer’s website is provided below:



Source: ggled.net

While the footcandle readings in the vacuum station area are within the 20-footcandle maximum, the light levels in this part of the site are substantially greater than the lighting in any other area of the site. Also, the vacuum stations are at the rear of the site, directly across the street from the residential neighborhood. We have the following comments:

- 1) On the lighting plan, linear luminaires are not proposed in the seven (7) vacuum stations along the east property line.
- 2) Lighting intended to attract attention to the use and not strictly for security purposes are prohibited. This approach to lighting the vacuum stations is most likely a typical “corporate” approach. However, the same result could be accomplished with a few overhead light fixtures. Since the vacuum stations are at the rear of the property, and will not be clearly visible from Washtenaw Ave., is it necessary to use the linear light fixtures for this site, given the possibility that they will be disturbing to neighbors?
- 2) If the linear fixtures cannot be replaced by less intrusive lighting, we suggest the possibility of removing a linear light from every other vacuum station. This way, there would only be nine (9) linear lights vs. 18, which should reduce the lighting levels so that they are not so much brighter than the surrounding area.

- 3) As requested, the applicant states that the vacuum lighting will be turned off within one hour of closing (lights off by 9pm). The lighting plan notes that all site lighting will be turned off by 9pm.

Items to be Addressed: 1) Planning Commission to consider suggestions that reduce the lighting levels at the vacuum stations to be more consistent with the other areas of the site.

ELEVATIONS AND FLOOR PLANS

Elevations and floor plans have been provided.

The floor plans show one car wash tunnel on the east side of the building. The west side of the building is occupied by two small rooms (assuming office and storage), a restroom, and an equipment area. The front, open portion of the building will accommodate vehicles making the turn into the wash tunnel.

Façade Variation:

The Form Based District architectural standards require façade variation. As requested, a color rendering has been provided.

Elevations are comprised of the following material, and help to provide façade variation as follows:

- All elevations will receive architectural concrete brick, with a pre-cast concrete horizontal sill on the east and west elevations. The sill is consistently 4-feet from grade along the east/west elevations, until the change in grade at the front of the building. The applicant’s response memo and color rendering show that the sill will divide different color brick along the façades, and help to provides relief from the expanse of these long facades.
- Pillar details on all elevations provide a vertical façade articulation.
- The parapet detail on the front of the building with decorative metal panels below and EFIS cornice above identifies the “front” of the building, and provides a more prominent feature along the road. The parapet detail contains wall signs on north, east and west elevations.
- Windows and aluminum canopies over windows are provided on the west elevation as an architectural detail. The windows will be visible from Washtenaw Ave., breaking up the expanse of the west wall.
- Windows are also proposed along the east facade, which will be visible from Washtenaw Ave. This helps to break up this façade as well.

Transparency:

First floors of buildings facing a ROW are required to provide 50% transparency, and 30% along facades facing a side street or parking area.

- The façade facing Washtenaw Ave. (or “front elevation”) has changed because the building is now approximately 3-feet below the Washtenaw Ave. grade. As described above, lowering this long building at the front was necessary to meet the existing grade at the rear of the site. Therefore, the windows facing Washtenaw Ave. have been significantly reduced in size. In comparison to the EFIS “tower” detail, these windows are very small, and the EFIS feature is out of proportion. Is it possible to replace the decorative metal panels with windows, so that the two features (windows and EFIS) relate better to each other?

- The first floor elevation is proposed at 444 s.f., which would require 222 s.f. of window glazing on this elevation. The proposal shows approximately 54 s.f. of window glazing. Either more glazing needs to be added to this façade, or the applicant seeks a variance.

Items to be Addressed: 1) Add more glazing to Washtenaw Ave. façade or applicant seeks a variance.

SPECIAL USE

In the Regional Corridor District, a vehicle wash requires a special use. Standards for Special Use review are set forth in Section 1003. The Planning Commission shall review the particular circumstances and facts of each proposed use in terms of the following standards and required findings, and with respect to any additional standards set forth in this Ordinance. The Planning Commission shall find and report adequate data, information, and evidence showing that the proposed use meets all required standards:

1. Will be harmonious, and in accordance with the objectives, intent, and purpose of this Ordinance.
2. Will be compatible with the natural environment and existing and future land uses in the vicinity.
3. Will be compatible with the Township master plans.
4. Will be served adequately by essential public facilities and services, such as highways, streets, police and fire protection, drainage ways and structures, refuse disposal, or that the persons or agencies responsible for the establishment of the proposed use shall be able to provide adequately for such services
5. Will not be detrimental, hazardous, or disturbing to existing or future neighboring uses, persons, property, or the public welfare.
6. Will not create additional requirements at public costs for public facilities and services that will be detrimental to the economic welfare of the community.

To confirm that the proposal meets the standard that the use is not disturbing to the existing residential neighbors, we asked the applicant to provide the following information. The response memo provides requested information, as listed below:

1. Proposed hours of operation are 7:30am – 8:00pm daily.
2. Will vacuums be available when the car wash tunnel is closed for the night? The response states that vacuums will only be available during their regular hours of operation.
3. Applicant's response to linear lighting concerns raised in this review. The plans have not been modified from our previous review. In summary, the response memo states that higher light levels provide value and safety to customers, and that the southern portion of the site is densely screened from residential neighbors. They also state that all site lighting will be turned off by 9pm each night.

Regarding the other criteria, we find that the standards have been met. Our comments regarding how this proposal compares to the remaining Special Land Use standards follow:

- Washtenaw Ave. is designated as a Regional Corridor, intended to support a high volume of both local and regional traffic. This corridor type accommodates large national chains and auto-oriented uses that draw customers both regionally and locally. The proposed use is consistent with the intent of this district.
- The proposed use of the site as a vehicle wash can serve both the regional market, but also local neighborhoods, making this use consistent with the Master Plan.

- The project will redevelop the site, including sidewalk installation along the Washtenaw Ave. road frontage, landscaping, and lighting.
- With utility and other improvements, the site can adequately be served with public facilities and services
- The development of this site will not be detrimental to the future use and development of the corridor.

Items to be Addressed: 1) *Planning Commission to determine if project meets the ordinance criteria for Special Land Use approval.*

RECOMMENDATIONS

The proposal, as presented, will require one variance for front façade glazing, unless the façade design can be modified to meet the 50% glazing requirement. The Planning Commission will need to determine if the project meets the criteria for a Regulating Plan change (from Site Type A to Site Type C), and a Special Land Use. Also, the ordinance allows the Planning Commission to waive or modify several requirements, based on the existing site constraints. A summary of possible waivers/modifications and our comments is below.

Special Land Use

- 1) *Planning Commission to determine if project meets the ordinance criteria for Special Land Use approval.*

Change in Site Type

- 1) *Planning Commission to evaluate change in Regulating Plan from Site Type A to Site Type C, per ordinance criteria.*
- 2) *Applicant to consider dedicating an easement within the 14-feet of the “future” right-of-way for installation of future streetscape improvements in front of the property.*

Natural Features

- 1) *Applicant to provide survey information on existing “protected” trees, and protected trees shown as preserved in resubmission for review at Final Site Plan stage.*
- 2) *Planning Commission considers condition of approval that any trees identified as “protected” in tree survey are shown as preserved on the Final Site Plan.*

Site Access, Circulation, Traffic

- 1) *Defer site driveway locations to Township Engineer.*
- 2) *Applicant confirms that 36” knee wall is opaque; detail of knee wall added to Final Site Plan.*
- 3) *Modify architectural plans to be consistent with opaque knee wall (as specified on Site Plan).*

Screening and Landscaping

- 1) *Add 13 more shrubs to plans along Boston Ave. frontage; or Planning Commission to consider waiving/modifying this standard due to site constraints.*
- 2) *Planning Commission to consider proposed modification of screening between land uses (or no narrow evergreens).*
- 3) *Applicant to consider native alternative to English Laurel.*

Whitewater Car Wash
June 28, 2024

Lighting

- 1) *Planning Commission to consider suggestions that reduce the lighting levels at the vacuum stations to be more consistent with the other areas of the site.*

Elevations and Floor Plans

- 1) *Add more glazing to Washtenaw Ave. façade or applicant seeks a variance.*



CARLISLE/WORTMAN ASSOC., INC.

Benjamin R. Carlisle, AICP, LEED AP

Principal



June 25, 2024

Mr. Fletcher Reyher
Township Planning and Development Coordinator
Charter Township of Ypsilanti
7200 S. Huron River Drive
Ypsilanti, MI 48197

RE: White Water Car Wash
Site Plan Review #2

Dear Mr. Reyher:

We have completed the second site plan review of the plans dated February 7, 2024, with a latest revision date of June 11, 2024, and stamped received by OHM advisors on June 11, 2024.

At this time, the plans are recommended for approval for the Planning Commission's consideration, contingent on the following comments being addressed. Preliminary detailed engineering comments have been provided to the applicant as a courtesy and shall be addressed prior to submitting detailed engineering plans for review.

A brief description of the project has been provided below, followed by our comments and a list of anticipated required permits and approvals. Comments in Section C are detailed in nature, do not influence the overall site layout, and can be addressed during the detailed engineering drawing submittal.

A. PROJECT AND SITE DESCRIPTION

The applicant is proposing a 6,820 square-foot, one-story, tunnel car wash at 2675 Washtenaw Avenue. Associated parking, including 18 vacuum spaces and 5 employee spaces, and landscaping improvements are also being proposed.

The site will be serviced by connection to the existing water main and sanitary sewer within Boston Avenue, to the west of the site. Stormwater runoff will be managed by a new underground conveyance system to an underground detention basin and an above ground bioretention basin.

B. SITE PLAN COMMENTS

Utilities

1. The applicant shall provide the location of the existing water main they're proposing to connect to on the plans for reference. This office defers to YCUA on the review and approval of all water and sewer improvements.
2. The applicant shall note that trees shall not be placed directly above any existing or proposed utilities (water, sanitary, storm). It is recommended that the applicant relocate the proposed tree near the southwest corner of the car wash for ease of potential future maintenance with the nearby sanitary sewer service.



Stormwater Management

3. The applicant shall address the following regarding the Stormwater Calculations (Sheet C-18) and review and revise all calculations as needed:
 - a. Verify the Peak of the Unit Hydrograph value in Worksheet 10, as it appears the incorrect time of concentration is being used. Note that the time of concentration should be in hours.
 - b. Verify the Total Required Detention Volume in Worksheet 13.

C. PRELIMINARY DETAILED ENGINEERING COMMENTS

The following comments shall be addressed by the applicant during the detailed engineering drawing submittal, and do not affect the recommendation for approval to the Township of Ypsilanti Planning Commission. It should be noted that this is not an all-inclusive list and additional comments may be generated as new information is presented.

1. The applicant shall provide spot elevations at all four (4) corners of all barrier-free parking spaces, access aisles, ramps, and level landings, as well as along both sides of all proposed sidewalk at 50-foot intervals. The applicant shall note that the cross-slope shall not exceed 2%, per ADA Standards.
2. The applicant shall provide a receiving ramp on the west side of Boston Avenue, per ADA Standards. The applicant noted in their response letter, dated June 11, 2024, that this would be within private property, and they will obtain permission from the adjacent landowner for construction.
3. The applicant shall provide structural calculations for all proposed retaining/knee walls that exceed two (2) feet in height, per Township Standards.
4. The applicant noted in their response letter, dated June 11, 2024, that they have requested the Michigan Department of Environment, Great Lakes, and Energy (EGLE) to confirm the presence of any wetlands on-site as there appears to be a discrepancy between the National Wetlands Mapper/EGLE Wetlands Mapper and the Washtenaw County GIS. If wetlands are not present on-site, the applicant shall provide correspondence from EGLE with the next submittal for the project file. If wetlands are present on-site, the applicant shall provide all wetland boundaries on the plans for reference and note that review and permitting may be required by EGLE.
5. The applicant shall provide a stormwater narrative on the plans clarifying how the proposed stormwater runoff will be managed, as well as the ultimate outlet.
6. The applicant shall provide a Certificate of Outlet, signed and sealed by a registered engineer in the State of Michigan, on the plans.
7. The applicant shall label the existing Ypsilanti Township #02 County Drain and its easement limits (if applicable) on every plan sheet it's depicted as it does not appear to have been labeled.
8. The applicant shall provide a maintenance schedule for all proposed permanent soil erosion and stormwater management activities both during and after construction. The schedule shall include the frequency of activities as well as the party responsible.
9. The applicant shall adjust the Drainage Area callouts (Sheet C-6) as one of them is currently cutoff.
10. The applicant shall verify the ground/rim elevation of Structure EX-1 as there appears to be a discrepancy between the profile view (Sheet C-17) and the plan view (Sheet C-5).
11. The applicant shall verify the NE invert of storm sewer manhole I1 as there appears to be a discrepancy between the Invert Table and the plan view (Sheet C-5). The applicant shall also label the structures provided in the Invert Table on the plan view and remove the structures from the Invert Table that aren't shown on the plans for clarity.
12. The applicant shall provide the location of all curb stop boxes and gate valves on the plans. The applicant shall note that curb stop boxes shall be provided within the green space where possible.
13. The applicant shall provide the size of all existing utilities (water, sanitary, storm) on the plans.
14. The applicant shall adjust the inlet filter callout near the southwest corner of the proposed car wash.
15. The applicant shall provide a quantity list for all proposed utilities (water, sanitary, storm) on the Cover Sheet, delineated by existing or proposed road right-of-way or easement, per Township Standards.



D. REQUIRED PERMITS & APPROVALS

The following outside agency reviews and permits will be required for the project. Copies of any correspondence between the applicant and the review agencies, as well as the permit or waiver, shall be sent to both the Township and OHM Advisors (email: stacie.monte@ohm-advisors.com).

- ▶ **Ypsilanti Community Utilities Authority (YCUA):** Review and approval of all water main and sanitary sewer improvements is required.
- ▶ **Ypsilanti Township Fire Department:** Review and approval is required.
- ▶ **Washtenaw County Water Resources Commissioner's Office (WCWRC):** Review and approval is required. A drain-use permit will be required for the proposed outlet to the County Drain.
- ▶ **Michigan Department of Transportation (MDOT):** Review, approval, and permitting is required for all proposed work within the Washtenaw Avenue ROW. MDOT is currently doing a PEL Study along Washtenaw Avenue, and the "Future ROW" may or may not be needed by MDOT. Additional improvements as a result of the Study may be required along the frontage.
- ▶ **Washtenaw County Road Commission (WCRC):** Review and approval of all work proposed within the Boston Ave ROW is required.
- ▶ **Michigan Department of Environment, Great Lakes & Energy (EGLE):** An EGLE Act 399 and Part 41 permit will be required for construction of all public water main and sanitary sewer systems improvements.
- ▶ **Michigan Department of Environment, Great Lakes & Energy (EGLE):** An EGLE permit will be required for any work and/or stormwater discharge into the wetlands.
- ▶ **Ypsilanti Township Office of Community Standards:** A Soil Erosion and Sedimentation Control permit shall be secured from the Ypsilanti Township Office of Community Standards.

Should you have any questions regarding this matter, please contact this office at (734) 466-4580.

Sincerely,
OHM Advisors



Stacie L. Monte



Matthew D. Parks, P.E.

SLM/MDP/mh

cc: Doug Winters, Township Attorney
Steven Wallgren, Township Fire Marshall
Scott Westover, P.E., YCUA
File

P:\0000_0100\SITE_YpsilantiTwp\2023\0098231030_2675 Washtenaw Ave_White Water Car Wash\MUNI\01_SITE\PSP#2\White Water Car Wash_PSP#2_2024-06-25.docx

CHARTER TOWNSHIP OF YPSILANTI FIRE DEPARTMENT BUREAU OF FIRE PREVENTION

222 South Ford Boulevard, Ypsilanti, MI 48198



June 20, 2024

Fletcher Reyher, development coordinator
Charter Township of Ypsilanti
7200 S. Huron River Drive
Ypsilanti, MI 48197

RE: Preliminary (non-residential) Site Plan Review #2

Project Name:	Whitewater Car Wash
Project Location:	2675 Washtenaw Ave. Ypsilanti, MI 48197
Plan revision Date:	6/11/2024
Project ID:	DET-230108.01
Engineering:	Stonefield Engineering & design
Architects Address:	607 Shelby Suite 200, Detroit, MI 48226
Applicable Codes:	IFC 2018

Status of Review

Status of review: Approved as Submitted

Site Coverage - Hydrants

Comments: Proposed Hydrant coverage is acceptable.

Site Coverage - Access

Comments: Turning templates provided on C-12 are acceptable.

Sincerely,

A handwritten signature in black ink that reads "Steve Wallgren".

Steve Wallgren, Fire Marshal
Charter Township of Ypsilanti Fire Department
CFPS, CFI I



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Environmentally Safe Water and Wastewater Services to Our Customers

YPSILANTI COMMUNITY UTILITIES AUTHORITY

2777 STATE ROAD
YPSILANTI, MICHIGAN 48198-9112
TELEPHONE: 734-484-4600
WEBSITE: www.ycua.org

June 25, 2024

VIA ELECTRONIC MAIL

Mr. Fletcher Reyher, Planning and Development Coordinator
Office of Community Standards
CHARTER TOWNSHIP OF YPSILANTI
7200 S. Huron River Drive
Ypsilanti, MI 48197

Re: Preliminary (non-residential) Site Plan Review #1
White Water Car Wash
Charter Township of Ypsilanti (Plan Date: 06-11-2024)

Dear Mr. Reyher:

In response to the electronic mail message from your office dated June 11, 2024, we have reviewed both the referenced plans with regards to water supply and wastewater system design. The plans are acceptable to YCUA.

As noted in the May 14, 2024, letter from this office, connection fees apply to the proposed development. Please note that the total cash price for connection fees, **\$32,859.50 plus the construction phase escrow deposit, YCUA administration fee, and record plan guarantee**, must be paid to YCUA by the Applicant, with a receipt delivered to the Township, before either the building or soil and grading permit is issued. The construction phase escrow deposit and associated fees and deposits and the entity responsible for maintaining those accounts will be determined during the Detailed Engineering phase of the project in conjunction with your office and the Township Engineer. Should there be any questions please contact this office.

Sincerely,

SCOTT D. WESTOVER, P.E., Director of Engineering
Ypsilanti Community Utilities Authority

Enclosure as noted

cc: Mr. Luke Blackburn, Mr. Sean Knapp, File, YCUA
Mr. Steve Wallgren, Township Fire Department
Mr. Matt Parks, P.E., Ms. Stacie Monte, Township Engineer
Mr. Jeff Justice, Applicant
Mr. Jonathon Cooksey, P.E., Applicant's design engineer

Mr. Fletcher Reyher
CHARTER TOWNSHIP OF YPSILANTI
June 25, 2024
Page 2

G:\CDproj\YpsiTwp\2024 - White Water Car Wash\PNRSP Rev#2.docx

Whitewater Car Wash - Preliminary Plan

SG

Streight, Gary <streightg@wcroads.org>

To: Fletcher Reyher

Cc: Lawrence, Callie <lawrencec@wcroads.org>

☺ ↶ ↷ ↲ ⋮
Thu 6/27/2024 3:11 PM

Fletcher,

The WCRC does not have an issue with the proposed car wash located on Boston Ave. We will require the submittal of a commercial drive permit application and associated fees. A traffic impact study, or similar analysis, may be required which will be determined at the time of application. The existing public right of way for Boston Ave. shall remain in place as there are other properties with access to the public right of way. Upon the receipt of a permit application, a full engineering review will be provided.

Gary Streight, P.E.
Senior Project Manager



Washtenaw County Road Commission
555 N. Zeeb Road, Ann Arbor, Michigan

Direct: (734) 327-6692 | Main: (734) 761-1500

wcroads.org | [Follow us on Facebook](#)

↶ Reply ↶ Reply all ↷ Forward



EVAN N. PRATT, P.E.

Water Resources Commissioner

705 N Zeeb Road
Ann Arbor, MI 48103
734-222-6860

Drains@washtenaw.org

Harry Sheehan
Chief Deputy Water Resources Commissioner

Scott Miller P.E.
Deputy Water Resources Commissioner

Theo Eggermont
Public Works Director

June 12, 2024

Mr. Eric Williams, P.E.
Stonefield Engineering
607 Shelby, Suite 200
Deroit, Michigan 48226

RE: Whitewater Car Wash –
2675 Washtenaw Avenue
Ypsilanti Township, Michigan
WCWRC Project No. 10776

Dear Mr. Williams:

On April 29, 2024, this office received site plans and a drain use permit application via e-mail for the referenced project. At that time, no initial review fee for the plan review was received by this office. Revised plans were submitted on June 10, 2024 and the initial review fees were received on June 11, 2024. The drain use permit application to tap the Ypsilanti Township Drain (YTD) #02 will be held until the site plans are further along in the review process.

This office has reviewed the site plans for the above-referenced project to be located in Ypsilanti Township. These plans have a job number of DET-230108.01 and a date of June 10, 2024. As a result of our review, we would like to offer the following comments:

1. The plans should be signed and sealed by a registered, professional engineer.
2. The engineer's certificate of outlet, accompanied by corresponding calculations and documentation, should be submitted to our office for review.
3. An infiltration testing report, meeting the reporting requirements listed in the rules of this office and signed and sealed by a licensed geotechnical engineer, should be submitted to our office for review.
4. The YTD #02 must be identified on every plan sheet where it is depicted.
5. The call outs on the grading plan (plan sheet C-4) cover up structure labels and other information. Please revise for clarity.
6. A stormwater narrative should be prepared and submitted to our office for review.
7. Per the rules of this office, the maximum allowable void ratio for coarse aggregate is 0.3. The storage volume table for the below grade detention system should be revised based on the corrected void ratio.

8. The site is covered by hydrologic soil group D/B. The curve numbers and runoff coefficients used on Worksheet W1 should be revised. As noted in Section VIII, Part H of the rules of this office, the first letter is the undrained classification which should be used for the runoff calculations.
9. The bioretention basin area up to the maximum ponding elevation should be included with the relative imperviousness calculations at a c-value of 1.0 and a CN value of 98 on Worksheet W1.
10. A post-construction cover type of Woods – Good Condition is listed on Worksheet W1. This area should be considered Open Space. The curve numbers and runoff coefficients used on Worksheet W1 should be revised
11. The post-development cover chart area used for the NRCS portion of Worksheet W1 does not match the cover chart area used in the Rational Method portion of W1.
12. Worksheet W3 should present pre-development conditions, not the current, existing conditions at the site.
13. Based on field observations made by WCWRC staff during the infiltration testing operations, it appeared unlikely that native soils meeting the minimum infiltration rate requirements were encountered and the required separation between the high groundwater level and a proposed infiltration elevation was met. Worksheet W11 includes an infiltration volume credit, but no credit is available based on the observed conditions.
14. If infiltration is not provided in the bioretention basin, the outlet structure must have an outlet orifice to ensure that the basin can drain completely. As a reminder, the minimum required detention time for the first flush storm event is 24 hours, with a maximum detention time of 72 hours for the 100-year storm event.
15. The outlet calculations were not reviewed. They will be reviewed with the next submittal, after the runoff calculations and storage volume tables have been revised.
16. A minimum freeboard of one foot is required beyond the 100-year storm volume elevation in the below-grade detention system.
17. The minimum velocity of 3 feet per second was not met within some of the storm water pipes.
18. A long-term stormwater maintenance plan, including budget and responsible party, should be designed and included with the plan set.
19. The bioretention basin area shown on the landscape plan (sheet C-9) was hatched up to what appeared to be Elevation 793 feet. The hatched area should be expanded to include both the basin and buffer areas.

20. At the time of plant and seed delivery, a WCWRC landscape reviewer must be present. The quantity and species delivered will be reviewed on site. Contact Catie Wytychak at wytychakc@washtenaw.org or (734) 222-6813 to coordinate.
21. Prior to construction, a pre-construction meeting must be held between the developer, design engineer and WCWRC. This meeting can be held in conjunction with the municipality's pre-construction meeting, if requested.
22. Please see the attached invoice for the current fees and remit these fees upon receipt. As requested, the invoice is being submitted directly to EROP, LLC.

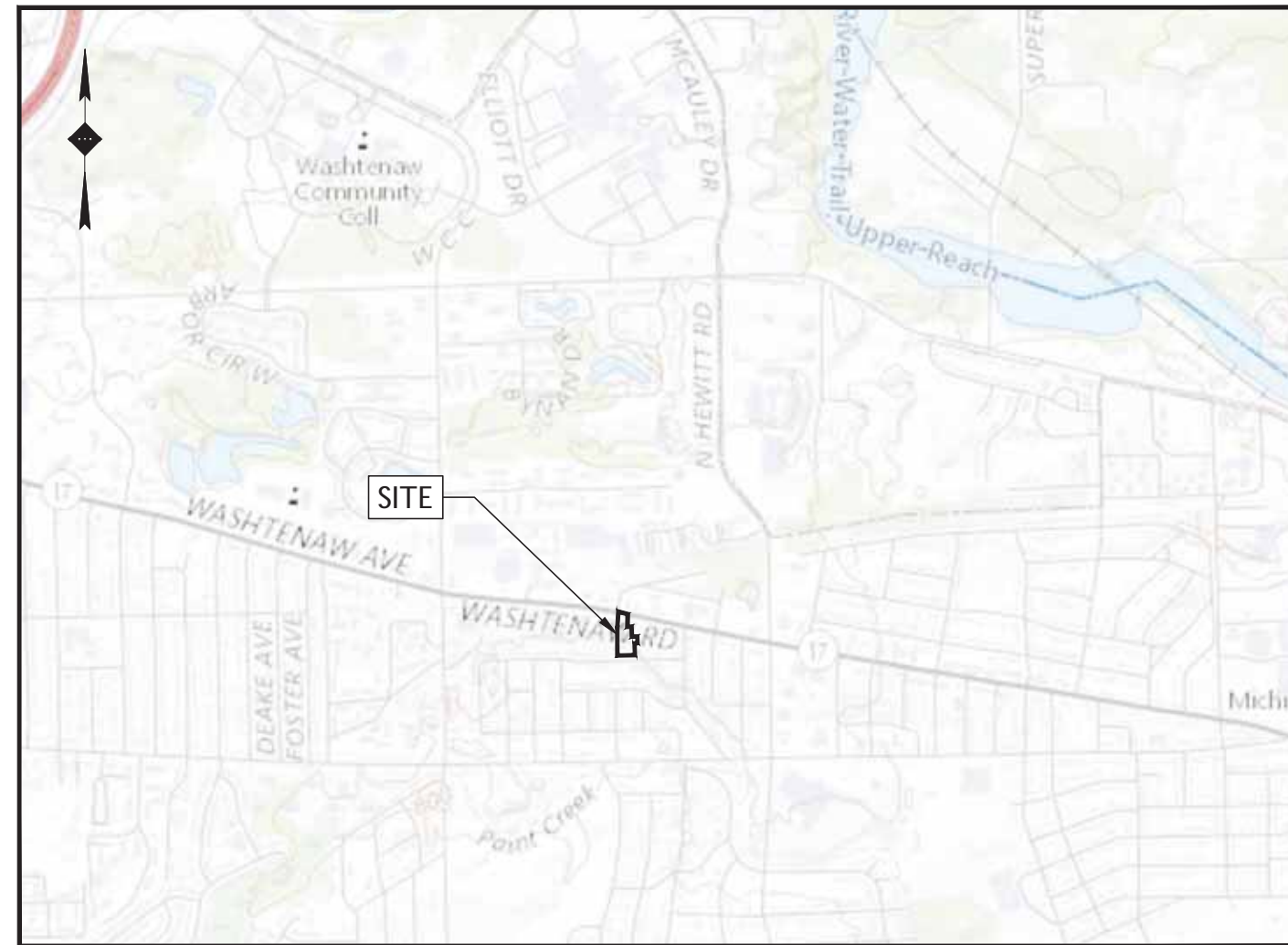
At your convenience, please send us a complete set of revised plans and the additional information requested above so that we may continue our review. If you have any questions, please contact our office.

Sincerely,



Theresa M. Marsik, P.E.
Stormwater Engineer
(permit\Whitewater Car Wash rev1)

cc: Jeff Justice, EROP, LLC
Lauren Doppke, Ypsilanti Township Planning Department
Belinda Kingsley, Ypsilanti Township Planning & Zoning Coordinator
Fletcher Reyher, Ypsilanti Township Planning & Development Coordinator
Doug Winters, McLain and Winters
Matt Parks, P.E., Ypsilanti Township Engineer (OHM)
Stacie Monte, Ypsilanti Township Engineer (OHM)



SOURCE: USGS MAPPING SYSTEM

LOCATION MAP

SCALE: 1" = 2,000'±



SOURCE: GOOGLE EARTH PRO

AERIAL MAP

SCALE: 1" = 200'±

SITE DEVELOPMENT PLANS

FOR



PROPOSED CAR WASH

PARCEL ID: K-11-06-304-004
 2675 WASHTENAW AVENUE (M-17)
 CHARTER TOWNSHIP OF YPSILANTI, WASHTENAW COUNTY, MICHIGAN

PROJECT NARRATIVE

GROSS SITE AREA: 1.55 AC
 DEVELOPABLE AREA: 1.55 AC
 EXISTING CONDITIONS: EXISTING MINIATURE GOLF COURSE
 PROPOSED USE: CAR WASH
 ANTICIPATED EMPLOYEES: FIVE
 PARKING: 23 SPACES
 HOURS OF OPERATION (INCLUDING VACUUMS): DAILY 7:20 AM - 8:00 PM
 LIGHTING: SITE LIGHTING TO BE TURNED OFF BY 9:00 PM

APPLICANT

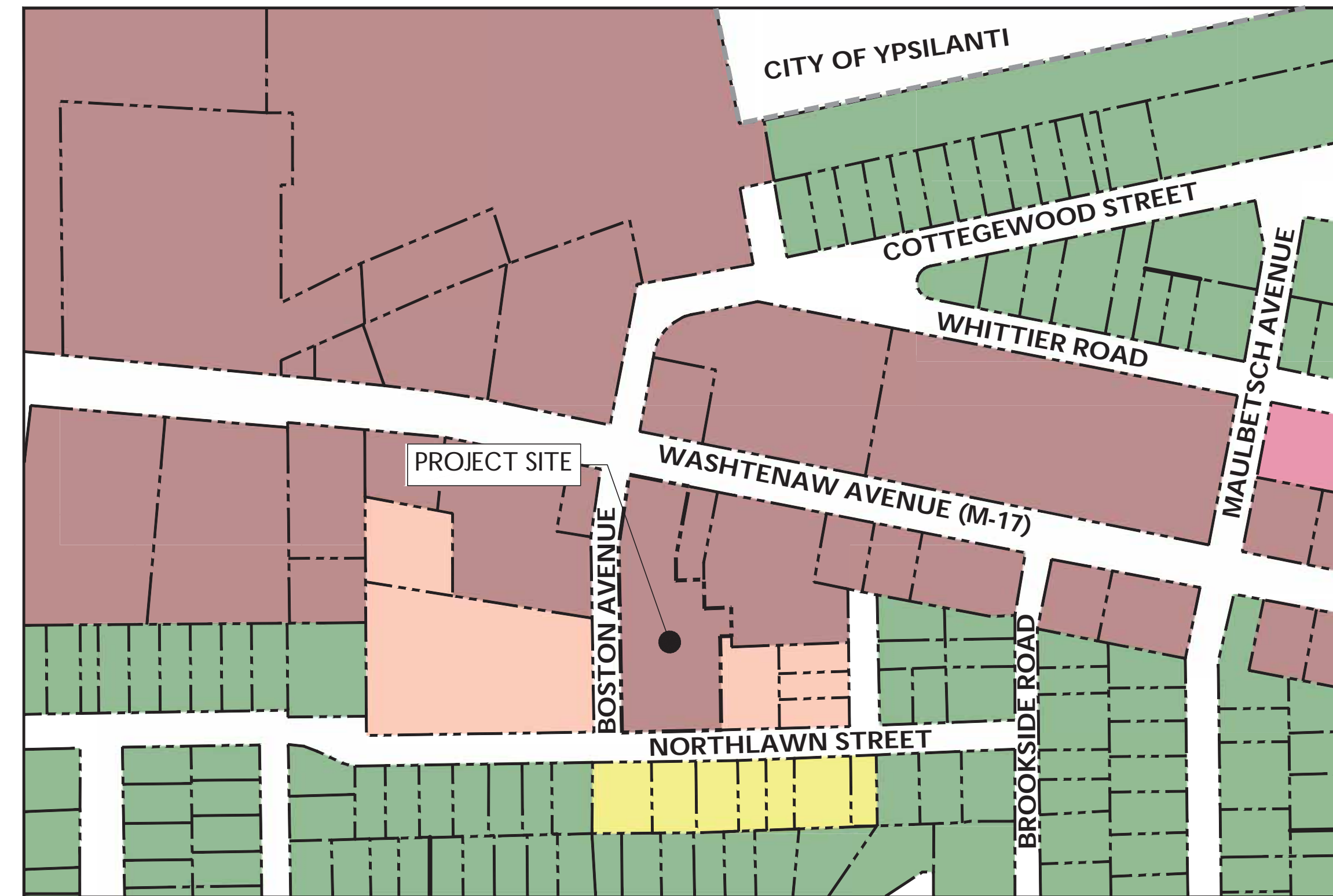
EROP LLC
 3130 NORTH KANDY LANE
 DECATUR, ILLINOIS 62526
 217-972-4296

OWNER

KASHAM, AMIR
 RONNY, FURRHA
 2675 WASHTENAW AVENUE
 YPSILANTI, MICHIGAN 48197



Know what's **below**
 Call before you dig.



SOURCE: CHARTER TOWNSHIP OF YPSILANTI, WASHTENAW COUNTY, MICHIGAN OFFICIAL ZONING MAP

ZONING MAP

SCALE: 1" = 200'±

ZONING KEY

- RC: REGIONAL CORRIDOR
- NB: NEIGHBORHOOD BUSINESS
- R-5: ONE-FAMILY RESIDENTIAL
- RM-HD: MULTIPLE FAMILY (LOW DENSITY)
- GB: GENERAL BUSINESS

MDOT NOTES:

1. ANY LANE CLOSURE ON M-17 WILL ONLY BE ALLOWED WHEN THERE IS ACTIVE WORK. PRIOR TO APPROVAL, A LANE CLOSURE REQUEST FORM NEEDS TO BE SUBMITTED FOR REVIEW AND APPROVAL.
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 - 3.4. ALL EXISTING PERMANENT MDOT SIGNS DAMAGED OR LOST BY THE CONTRACTOR MUST BE REPLACED IN KIND ON NEW SUPPORTS AT THE CONTRACTORS EXPENSE.
 - 3.5. ALL SIGN MATERIALS AND SUPPORTS MUST MEET NCHRP-350 CRASH WORTHY OR MASH REQUIREMENTS.
 - 3.6. TEMPORARY WARNING, REGULATORY, AND GUIDE SIGNS NOT REQUIRED FOR A PARTICULAR LANE OR SHOULDER MUST BE REMOVED, COVERED OR LAID DOWN WITH THE LEG SREMOVED.

PLAN REFERENCE MATERIALS:

1. THIS PLAN SET REFERENCES THE FOLLOWING DOCUMENTS INCLUDING, BUT NOT LIMITED TO:
 - ALTA/INSPS LAND TITLE SURVEY PREPARED BY AEI CONSULTANTS DATED 04/17/2023
 - ARCHITECTURAL PLANS PREPARED REB ARCHITECTS BY DATED 04/17/2023
 - AERIAL MAP OBTAINED FROM GOOGLE EARTH PRO
 - LOCATION MAP OBTAINED FROM USGS MAP
2. ALL REFERENCE MATERIAL LISTED ABOVE SHALL BE CONSIDERED A PART OF THIS PLAN SET AND ALL INFORMATION CONTAINED WITHIN THESE MATERIALS SHALL BE UTILIZED IN CONJUNCTION WITH THIS PLAN SET. THE CONTRACTOR IS RESPONSIBLE TO OBTAIN A COPY OF EACH REFERENCE AND REVIEW IT THOROUGHLY PRIOR TO THE START OF CONSTRUCTION.

PLANS PREPARED BY:



Detroit, MI · Rutherford, NJ · New York, NY
 Boston, MA · Princeton, NJ · Tampa, FL
 www.stonefieldeng.com

607 Shelby Suite 200, Detroit, MI 48226
 Phone 248.247.1115

SHEET INDEX

DRAWING TITLE	SHEET #
COVER SHEET	C-1
DEMOLITION PLAN	C-2
SITE PLAN	C-3
GRADING PLAN	C-4
STORMWATER MANAGEMENT PLAN	C-5
DRAINAGE AREA MAPS	C-6
UTILITY PLAN	C-7
LIGHTING PLAN	C-8
LANDSCAPING PLAN & DETAILS	C-9 TO C-10
EROSION & SEDIMENT CONTROL PLAN	C-11
TRUCK TURNING ANALYSIS	C-12 TO C-13
CONSTRUCTION DETAILS	C-14 TO C-19

ADDITIONAL SHEETS

DRAWING TITLE	SHEET #
ALTA / NSPS LAND TITLE SURVEY	1 - 3
ARCHITECTURAL PLANS	A-1, A-2
ARCHITECTURAL RENDERINGS	1
RECLAMATION TANKS PLUMBING PLAN	P-2

TOWNSHIP / YCUA DETAILS

DRAWING TITLE	SHEET #
STANDARD WATER MAIN DETAILS	1 OF 2
STANDARD WATER MAIN DETAILS	2 OF 2
STANDARD SANITARY SEWER DETAILS	1 OF 2
STANDARD SANITARY SEWER DETAILS	2 OF 2
STANDARD STORM SEWER DETAILS	1 OF 2
STANDARD STORM SEWER DETAILS	2 OF 2
SOIL EROSION CONTROL DETAILS	1 OF 1

REVISION	DATE	ISSUE	BY	DESCRIPTION
3	06/11/2024	EM		REVISED PER PLANNING DEPARTMENT REVIEW #1
2	04/18/2024	EM / JP		SUBMISSION FOR PRELIMINARY SITE PLAN REVIEW
1	02/07/2024	ECM		SUBMISSION FOR PRE-APPLICATION MEETING

NOT APPROVED FOR CONSTRUCTION

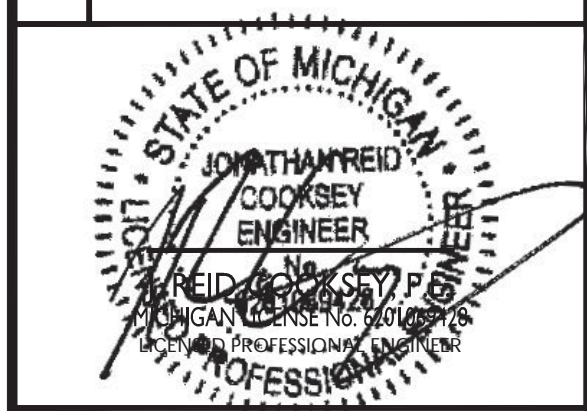
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 607 Shelby Suite 200, Detroit, MI 48226
 Phone 248.247.1115

PROPOSED CAR WASH



PARCEL ID: K-11-06-304-004
 2675 WASHTENAW AVENUE (M-17)
 CHARTER TOWNSHIP OF YPSILANTI
 WASHTENAW COUNTY, MICHIGAN



STONEFIELD
 engineering & design

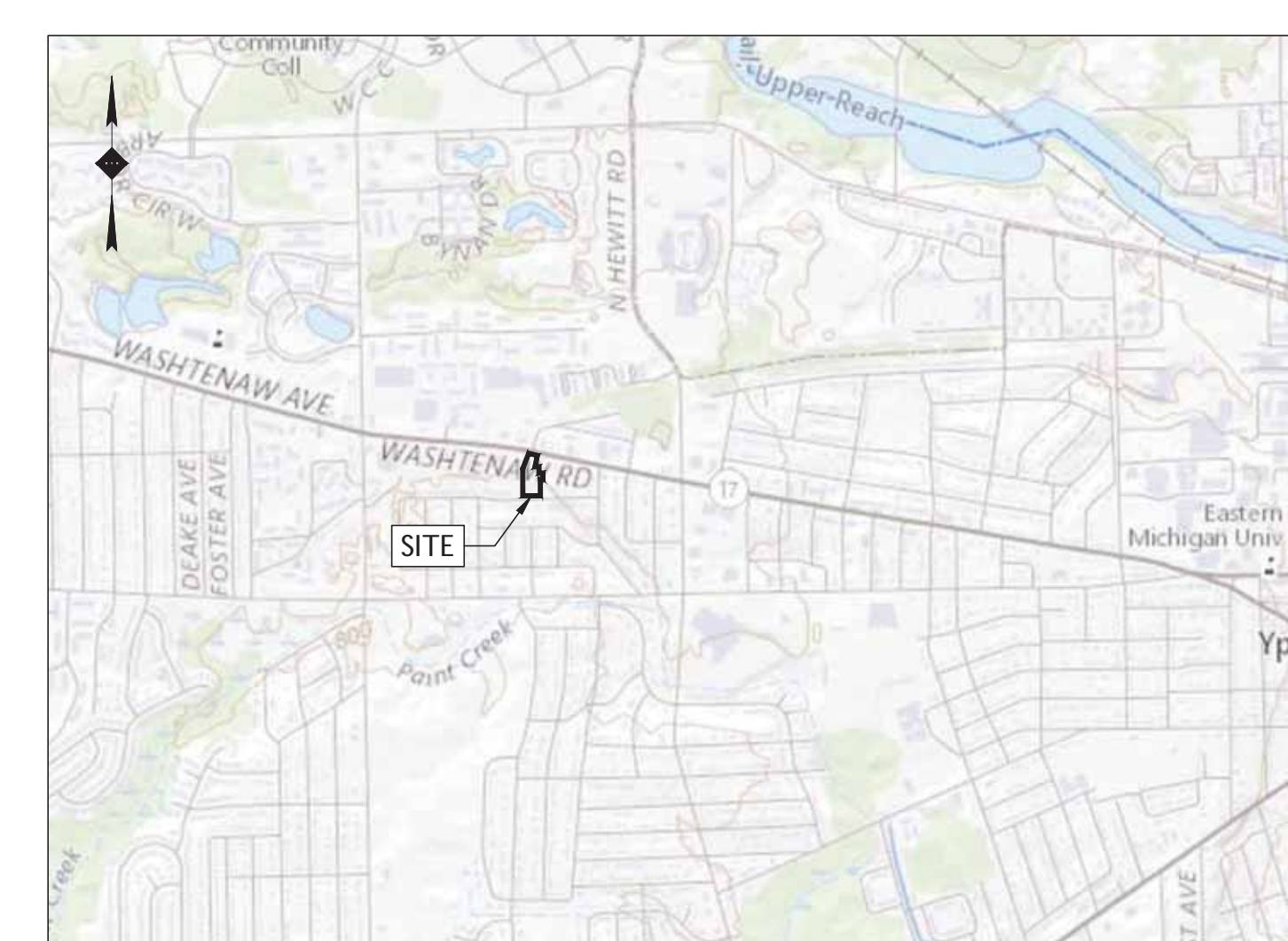
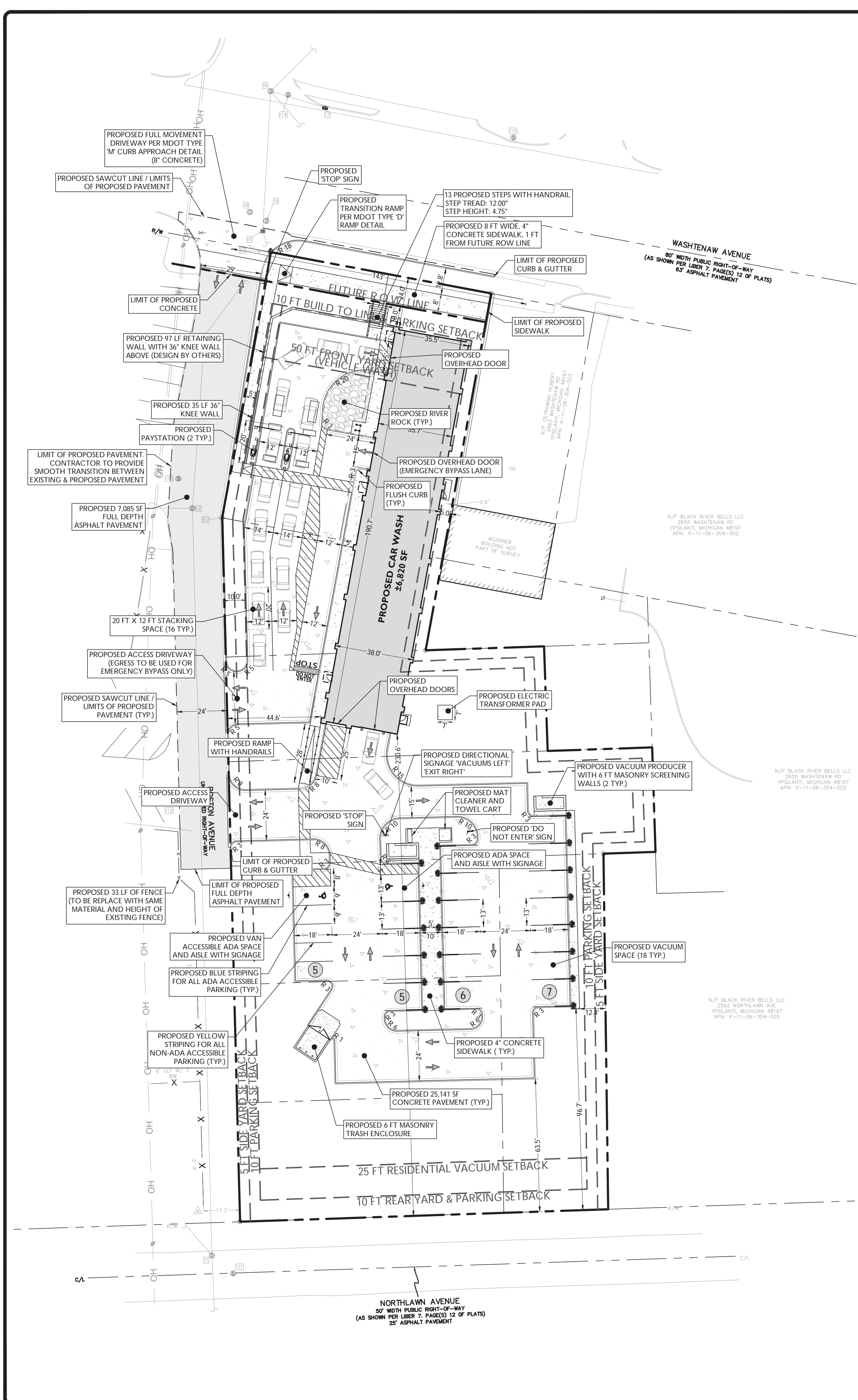
SCALE: AS SHOWN PROJECT ID: DET-230108.01

TITLE:
COVER SHEET

DRAWING:

C-1

\P\2023\DET-230108.01\EROP.LIC-245 WASHTENAW AVENUE - YPSILANTI, MI\CAD\DWG\230108.DWG



LOCATION MAP
SCALE: 1" = 2,000'±

OFF-STREET PARKING REQUIREMENTS		
CODE SECTION	REQUIRED	PROPOSED
§ 1205.G.2	VEHICLE WASH: 1 SPACE PER 1 EMPLOYEE 5 EMPLOYEES = 5 SPACES	18 VACUUM SPACES ≥ 5 EMP. SPACE 23 TOTAL SPACES
§ 1118.D.3	VEHICLE WASH STACKING: ENTRY 8 SPACES (12 FT X 20 FT) EXIT 2 SPACES (12 FT X 20 FT)	ENTRY: 16 SPACES EXIT: 2 SPACES
§ 1205.6.D	90° PARKING: 9 FT X 18 FT W/ 24 FT AISLE (1) 50° PARKING: 9 FT X 18 FT W/ 14 FT AISLE (1)	90°: 9 FT X 18 FT W/ 24 FT AISLE 50°: 9 FT X 18 FT W/ 14 FT AISLE
§ 1129.5.8	VEHICLE WASH RESIDENTIAL SCREENING: 6 FT MASONRY WALL (2)	EXISTING / PROPOSED LANDSCAPE BUFFER
§ 1207.2.A.2	LOADING: 10 FT X 55 FT	TO OCCUR OFF HOURS

- (1) WHERE A PARKING SPACE ABUTS A 7 FT SIDEWALK OR 10 FT GREENBELT THE PARKING STALL LENGTH MAY BE REDUCED BY 2 FT
- (2) ALTERNATIVE SCREENING MATERIALS MAY BE APPROVED BY THE PLANNING COMMISSION

LAND USE AND ZONING		
PID: K-11-06-304-004		
FORM BASED DISTRICT: REGIONAL CORRIDOR (RC)		
PROPOSED SITE TYPE: C (> 1 AC)		
PERMITTED BUILDING FORM: A2, B, C		
PROPOSED USE	VEHICLE WASH (USE GROUP 6, BUILDING FORM B)	SPECIAL USE GROUP
ZONING REQUIREMENT	REQUIRED	PROPOSED
MINIMUM LOT AREA	1.0 AC	67,384 SF (1.55 AC)
MINIMUM LOT WIDTH	N/A	107.2 FT
MAXIMUM IMPERVIOUS SURFACE	80% (53,907 SF)	56% (37,694 SF)
MINIMUM BUILDING HEIGHT	14 FT (1 STORY)	32.0 FT (1 STORY)
MAXIMUM BUILDING HEIGHT	38 FT (3 STORIES)	32.0 FT (1 STORY)
MAXIMUM BUILD-TO LINE	10 FT (1)	10.0 FT (2)
MINIMUM SIDE YARD SETBACK	5 FT	5.0 FT
MINIMUM REAR YARD SETBACK	10 FT	230.6 FT
RESIDENTIAL VACUUM SETBACK	25 FT (10)	96.7 FT
PARKING SETBACK	10 FT	10.0 FT
MINIMUM ESCAPE LANE	12 FT	12.0 FT
MINIMUM FRONT YARD SETBACK	50 FT (10)	10.0 FT (20)
MINIMUM REAR YARD GREENBELT	N/A	63.5 FT (3)

- (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
- (2) MAXIMUM 10 FT BUILD TO LINE REQUIRED BY FORM BASED DISTRICT
- (3) 50 FT GREENBELT PROVIDED AT REQUEST OF CITY PLANNING DEPARTMENT
- (4) VEHICLE WASH SPECIAL USE REQUIREMENT
- (5) VACUUMING AND DRYING AREAS MAY BE LOCATED OUTSIDE THE BUILDING BUT SHALL NOT BE IN THE REQUIRED FRONT YARD AND SHALL NOT BE CLOSER THAN TWENTY-FIVE (25) FEET FROM ANY RESIDENTIAL DISTRICT.
- (6) MEASURED FROM FUTURE RIGHT OF WAY LINE

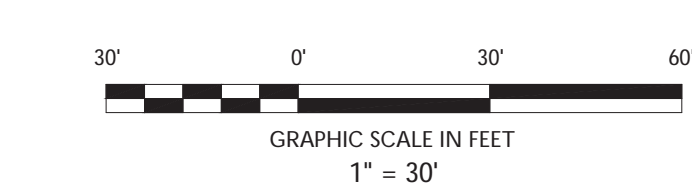
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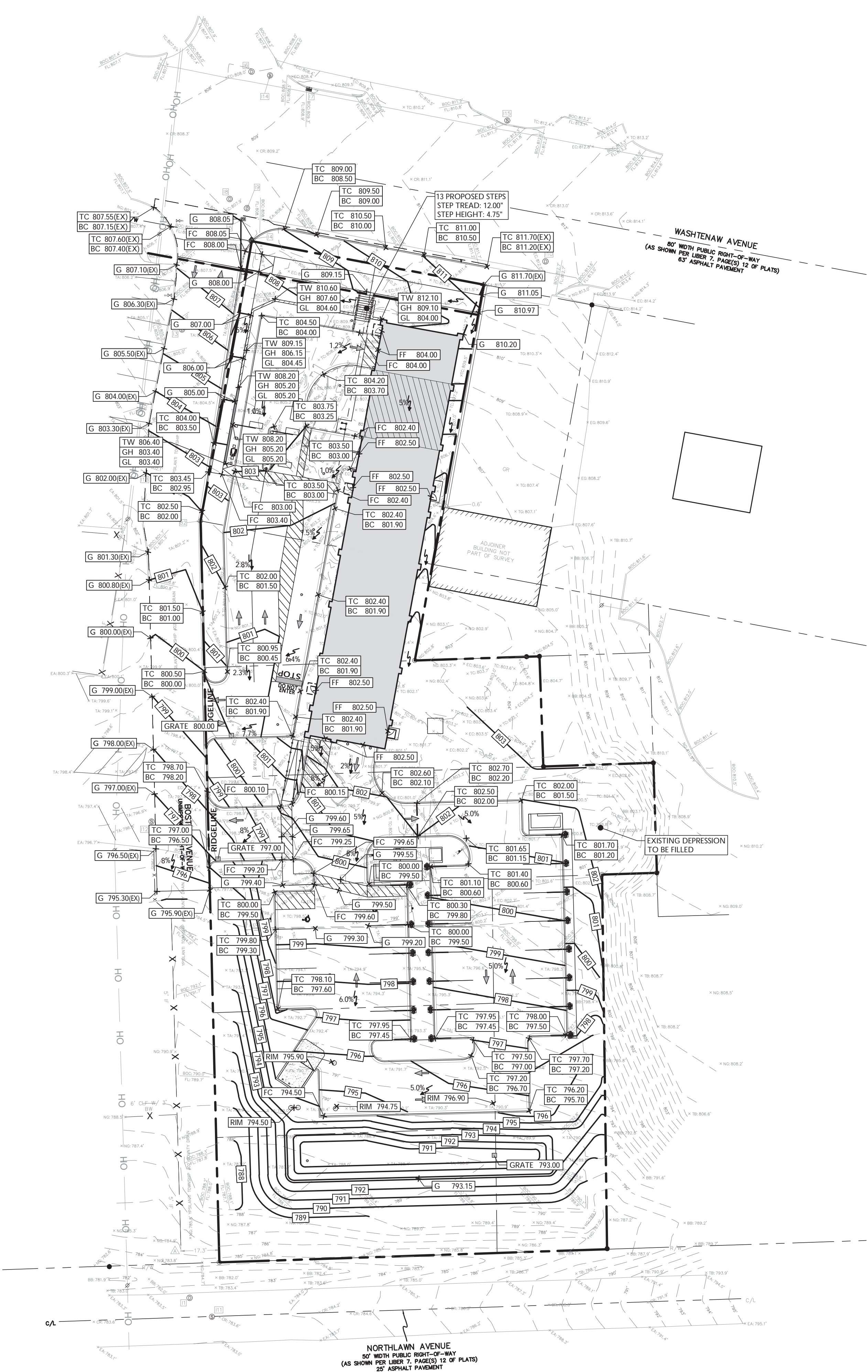
SYMBOL	DESCRIPTION
---	PROPERTY LINE
- - - -	SETBACK LINE
- . - . - .	SAWCUT LINE
=====	PROPOSED CURB & GUTTER
=====	PROPOSED MOUNTABLE CURB & GUTTER
=====	PROPOSED FLUSH CURB
○ ○ ○	PROPOSED SIGNS / BOLLARDS
■	PROPOSED BUILDING
■	PROPOSED ASPHALT
■	PROPOSED CONCRETE
■	PROPOSED RIVER ROCK
■	PROPOSED RETAINING WALL WITH 36" KNEE WALL
■	PROPOSED 36" KNEE WALL
~ ~ ~	PROPOSED BUILDING DOORS
— — —	PROPOSED HANDRAILS
— x — x —	PROPOSED CHAIN-LINK FENCE
■	PROPOSED AREA LIGHT
■	PROPOSED BUILDING MOUNTED LIGHTS

GENERAL NOTES

- 1. THE CONTRACTOR SHALL VERIFY AND FAMILIARIZE THEMSELVES WITH THE EXISTING SITE CONDITIONS AND THE PROPOSED SCOPE OF WORK (INCLUDING DIMENSIONS, LAYOUT, ETC.) PRIOR TO INITIATING THE IMPROVEMENTS IDENTIFIED WITHIN THESE DOCUMENTS. SHOULD ANY DISCREPANCY BE FOUND BETWEEN THE EXISTING SITE CONDITIONS AND THE PROPOSED WORK THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC PRIOR TO THE START OF CONSTRUCTION.
- 2. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND ENSURE THAT ALL REQUIRED APPROVALS HAVE BEEN OBTAINED PRIOR TO THE START OF CONSTRUCTION. COPIES OF ALL REQUIRED PERMITS AND APPROVALS SHALL BE KEPT ON SITE AT ALL TIMES DURING CONSTRUCTION.
- 3. ALL CONTRACTORS WILL, TO THE FULLEST EXTENT PERMITTED BY LAW, INDEMNIFY AND HOLD HARMLESS STONEFIELD ENGINEERING & DESIGN, LLC, AND ITS SUB-CONSULTANTS FROM AND AGAINST ANY DAMAGES AND LIABILITIES INCLUDING ATTORNEY'S FEES ARISING OUT OF CLAIMS BY EMPLOYEES OF THE CONTRACTOR IN ADDITION TO CLAIMS CONNECTED TO THE PROJECT AS A RESULT OF NOT CARRYING THE PROPER INSURANCE FOR WORKERS COMPENSATION, LIABILITY INSURANCE, AND LIMITS OF COMMERCIAL GENERAL LIABILITY INSURANCE.
- 4. THE CONTRACTOR SHALL NOT DEVIATE FROM THE PROPOSED IMPROVEMENTS IDENTIFIED WITHIN THIS PLAN SET UNLESS APPROVAL IS PROVIDED IN WRITING BY STONEFIELD ENGINEERING & DESIGN, LLC.
- 5. THE CONTRACTOR IS RESPONSIBLE TO DETERMINE THE MEANS AND METHODS OF CONSTRUCTION.
- 6. THE CONTRACTOR SHALL NOT PERFORM ANY WORK OR CAUSE DISTURBANCE ON A PRIVATE PROPERTY NOT CONTROLLED BY THE PERSON OR ENTITY WHO HAS AUTHORIZED THE WORK WITHOUT PRIOR WRITTEN CONSENT FROM THE OWNER OF THE PRIVATE PROPERTY.
- 7. THE CONTRACTOR IS RESPONSIBLE TO RESTORE ANY DAMAGED OR UNDERMINED STRUCTURE OR SITE FEATURE THAT IS IDENTIFIED TO REMAIN ON THE PLAN SET. ALL REPAIRS SHALL USE NEW MATERIALS TO RESTORE THE FEATURE TO ITS EXISTING CONDITION AT THE CONTRACTORS EXPENSE.
- 8. CONTRACTOR IS RESPONSIBLE TO PROVIDE THE APPROPRIATE SHOP DRAWINGS, PRODUCT DATA, AND OTHER REQUIRED SUBMITTALS FOR REVIEW. STONEFIELD ENGINEERING & DESIGN, LLC, WILL REVIEW THE SUBMITTALS IN ACCORDANCE WITH THE DESIGN INTENT AS REFLECTED WITHIN THE PLAN SET.
- 9. THE CONTRACTOR IS RESPONSIBLE FOR TRAFFIC CONTROL IN ACCORDANCE WITH MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
- 10. THE CONTRACTOR IS REQUIRED TO PERFORM ALL WORK IN THE PUBLIC RIGHT-OF-WAY IN ACCORDANCE WITH THE APPROPRIATE GOVERNING AUTHORITY AND SHALL BE RESPONSIBLE FOR THE PROCUREMENT OF STREET OPENING PERMITS.
- 11. THE CONTRACTOR IS REQUIRED TO RETAIN AN OSHA CERTIFIED SAFETY INSPECTOR TO BE PRESENT ON SITE AT ALL TIMES DURING CONSTRUCTION & DEMOLITION ACTIVITIES.
- 12. SHOULD AN EMPLOYEE OF STONEFIELD ENGINEERING & DESIGN, LLC, BE PRESENT ON SITE AT ANY TIME DURING CONSTRUCTION, IT DOES NOT RELIEVE THE CONTRACTOR OF ANY OF THE RESPONSIBILITIES AND REQUIREMENTS LISTED IN THE NOTES WITHIN THIS PLAN SET.



STONEFIELD engineering & design	PROPOSED CAR WASH		PROPOSED CAR WASH		PROPOSED CAR WASH		PROPOSED CAR WASH
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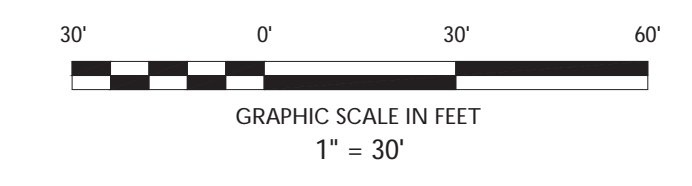


SYMBOL	DESCRIPTION
---	PROPERTY LINE
—100—	PROPOSED GRADING CONTOUR
—RIDLIN—	PROPOSED GRADING RIDGELINE
←	PROPOSED DIRECTION OF DRAINAGE FLOW
X G 100.00	PROPOSED GRADE SPOT SHOT
X TC 100.50 BC 100.00	PROPOSED TOP OF CURB / BOTTOM OF CURB SPOT SHOT
X FC 100.00	PROPOSED FLUSH CURB SPOT SHOT

INVERT TABLE

- 11 STORM SEWER MANHOLE
RIM ELEVATION: 783.59'
12" RCP INVERT NW: 778.4'
12" RCP INVERT NE: 778.7' (UNABLE TO DETERMINE SOURCE)
RCP INVERT N: 770.6' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
RCP INVERT S: 769.6' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
- 12 STORM SEWER MANHOLE
RIM ELEVATION: 802.10'
18" RCP INVERT W: 796.3'
RCP INVERT N: 792.6' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
RCP INVERT S: 774.6' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
- 13 STORM SEWER MANHOLE
RIM ELEVATION: 805.98'
RCP INVERT N: 787.0' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
RCP INVERT S: 786.8' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
- 14 CURB INLET
RIM ELEVATION: 807.65'
SUMP ELEVATION: 805.7'
UNABLE TO LOCATE PIPES, FULL OF WATER & DEBRIS
- 15 GRATED INLET
RIM ELEVATION: 808.15'
10" CMP INVERT SE: 805.1'
24" RCP INVERT N: 804.2'
- 16 STORM SEWER MANHOLE
RIM ELEVATION: 808.21'
24" RCP INVERT S: 796.8'
8" CLAY PIPE INVERT E: 802.8'
24" RCP INVERT NE: 796.6'
24" RCP INVERT SE (UNABLE TO MEASURE DUE TO DEPTH)
- 17 CURB INLET
RIM ELEVATION: 808.89'
8" CLAY PIPE INVERT W: 803.6'
- 18 STORM SEWER MANHOLE
RIM ELEVATION: 808.48'
UNABLE TO OPEN DUE TO HIGH TRAFFIC
- 19 STORM SEWER MANHOLE
RIM ELEVATION: 808.80'
UNABLE TO OPEN DUE TO HIGH TRAFFIC
- 20 STORM SEWER MANHOLE
RIM ELEVATION: 812.55'
UNABLE TO OPEN DUE TO HIGH TRAFFIC
- 21 SANITARY SEWER MANHOLE
RIM ELEVATION: 783.94'
8" CAST IRON PIPE INVERT W: 776.2'
8" CAST IRON PIPE INVERT E: 776.1'
8" CAST IRON PIPE INVERT N: 775.6'
8" CAST IRON PIPE INVERT S: 775.5'
- 22 SANITARY SEWER MANHOLE
RIM ELEVATION: 798.41'
6" CAST IRON PIPE INVERT W: 776.7'
8" CAST IRON PIPE INVERT N: 776.7'
8" CAST IRON PIPE INVERT S: 776.7'
- 23 SANITARY SEWER MANHOLE
RIM ELEVATION: 802.34'
CAST IRON PIPE INVERT N: 787.6' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
CAST IRON PIPE INVERT S: 787.4' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
- 24 SANITARY SEWER MANHOLE
RIM ELEVATION: 808.29'
8" CAST IRON PIPE INVERT NE: 799.0'
6" CAST IRON PIPE INVERT E: 799.0'
SUMP ELEVATION: 798.9'
UNABLE TO LOCATE DISCHARGE PIPE, FULL OF SEWAGE
- 25 SANITARY SEWER MANHOLE
RIM ELEVATION: 812.13'
8" CAST IRON PIPE INVERT E: 801.7'
8" CAST IRON PIPE INVERT W: 801.6'

- GRADING NOTES**
- ALL SOIL AND MATERIAL REMOVED FROM THE SITE SHALL BE DISPOSED OF IN ACCORDANCE WITH LOCAL STATE AND FEDERAL REQUIREMENTS. ANY GROUNDWATER DE-WATERING PRACTICES SHALL BE PERFORMED UNDER THE SUPERVISION OF A QUALIFIED PROFESSIONAL. THE CONTRACTOR IS REQUIRED TO OBTAIN ALL NECESSARY PERMITS FOR THE DISCHARGE OF DE-WATERED GROUNDWATER. ALL SOIL IMPORTED TO THE SITE SHALL BE CERTIFIED CLEAN FILL. CONTRACTOR SHALL MAINTAIN RECORDS OF ALL FILL MATERIALS BROUGHT TO THE SITE.
 - THE CONTRACTOR IS REQUIRED TO PROVIDE TEMPORARY AND/OR PERMANENT SHORING WHERE REQUIRED DURING EXCAVATION ACTIVITIES INCLUDING BUT NOT LIMITED TO UTILITY TRENCHES TO ENSURE THE STRUCTURAL INTEGRITY OF NEARBY STRUCTURES AND STABILITY OF THE SURROUNDING SOILS.
 - PROPOSED TOP OF CURB ELEVATIONS ARE GENERALLY 4 INCHES TO 7 INCHES ABOVE EXISTING GRADES UNLESS OTHERWISE NOTED. THE CONTRACTOR WILL SUPPLY ALL STAKEOUT CURB GRADE SHEETS TO STONEFIELD ENGINEERING & DESIGN, LLC FOR REVIEW AND APPROVAL PRIOR TO POURING CURBS.
 - THE CONTRACTOR IS RESPONSIBLE TO SET ALL PROPOSED UTILITY COVERS AND RESET ALL EXISTING UTILITY COVERS WITHIN THE PROJECT LIMITS TO PROPOSED GRADE IN ACCORDANCE WITH ANY APPLICABLE MUNICIPAL COUNTY, STATE AND/OR UTILITY AUTHORITY REGULATIONS.
 - MINIMUM SLOPE REQUIREMENTS TO PREVENT PONDING SHALL BE AS FOLLOWS:
 - CURB GUTTER: 0.50%
 - CONCRETE SURFACES: 1.00%
 - ASPHALT SURFACES: 1.00%
 - A MINIMUM SLOPE OF 1.00% SHALL BE PROVIDED AWAY FROM ALL BUILDINGS. THE CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE FROM THE BUILDING IS ACHIEVED AND SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC IF THIS CONDITION CANNOT BE MET. FOR PROJECTS WHERE BASEMENTS ARE PROPOSED, THE DEVELOPER IS RESPONSIBLE TO DETERMINE THE DEPTH TO GROUNDWATER AT THE LOCATION OF THE PROPOSED STRUCTURE. IF GROUNDWATER IS ENCOUNTERED WITHIN THE BASEMENT AREA, SPECIAL CONSTRUCTION METHODS SHALL BE UTILIZED AND REVIEWED/APPROVED BY THE CONSTRUCTION CODE OFFICIAL. IF SUMP PUMPS ARE UTILIZED, ALL DISCHARGES SHALL BE CONNECTED DIRECTLY TO THE PUBLIC STORM SEWER SYSTEM WITH APPROVAL FROM THE GOVERNING STORM SEWER SYSTEM AUTHORITY.
- ADA NOTES**
- THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 2.00% SLOPE IN ANY DIRECTION WITHIN THE ADA PARKING SPACES AND ACCESS AISLES.
 - THE CONTRACTOR SHALL PROVIDE COMPLIANT SIGNAGE AT ALL ADA PARKING AREAS IN ACCORDANCE WITH STATE GUIDELINES.
 - THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 5.00% RUNNING SLOPE AND A MAXIMUM OF 2.00% CROSS SLOPE ALONG WALKWAYS WITHIN THE ACCESSIBLE PATH OF TRAVEL (SEE THE SITE PLAN FOR THE LOCATION OF THE ACCESSIBLE PATH). THE CONTRACTOR IS RESPONSIBLE TO ENSURE THE ACCESSIBLE PATH OF TRAVEL IS 36 INCHES WIDE OR GREATER UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET.
 - THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 2.00% SLOPE IN ANY DIRECTION AT ALL LANDINGS. LANDINGS INCLUDE, BUT ARE NOT LIMITED TO, THE TOP AND BOTTOM OF AN ACCESSIBLE RAMP. AT ACCESSIBLE BUILDING ENTRANCES, AT AN AREA IN FRONT OF A WALK-UP ATM, AND AT TURNING SPACES ALONG THE ACCESSIBLE PATH OF TRAVEL, THE LANDING AREA SHALL HAVE A MINIMUM CLEAR AREA OF 60 INCHES BY 60 INCHES UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET.
 - THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 8.33% RUNNING SLOPE AND A MAXIMUM 2.00% CROSS SLOPE ON ANY CURB RAMPS ALONG THE ACCESSIBLE PATH OF TRAVEL. WHERE PROVIDED, CURB RAMP FLARES SHALL NOT HAVE A SLOPE GREATER THAN 100% IF A LANDING AREA IS PROVIDED AT THE TOP OF THE RAMP. FOR ALTERATIONS, A CURB RAMP FLARE SHALL NOT HAVE A SLOPE GREATER THAN 8.33% IF A LANDING AREA IS NOT PROVIDED AT THE TOP OF THE RAMP. CURBS RAMPS SHALL NOT RISE MORE THAN 6 INCHES IN ELEVATION WITHOUT A HANDRAIL. THE CLEAR WIDTH OF A CURB RAMP SHALL BE NO LESS THAN 36 INCHES WIDE.
 - ACCESSIBLE RAMPS WITH A RISE GREATER THAN 6 INCHES SHALL CONTAIN COMPLIANT HANDRAILS ON BOTH SIDES OF THE RAMP AND SHALL NOT RISE MORE THAN 30" IN ELEVATION WITHOUT A LANDING AREA IN BETWEEN RAMP RUNS. LANDING AREAS SHALL ALSO BE PROVIDED AT THE TOP AND BOTTOM OF THE RAMP.
 - A SLIP RESISTANT SURFACE SHALL BE CONSTRUCTED ALONG THE ACCESSIBLE PATH AND WITHIN ADA PARKING AREAS.
 - THE CONTRACTOR SHALL ENSURE A MAXIMUM OF 1/4 INCHES VERTICAL CHANGE IN LEVEL ALONG THE ACCESSIBLE PATH. WHERE A CHANGE IN LEVEL BETWEEN 1/4 INCHES AND 1/2 INCHES EXISTS, CONTRACTOR SHALL ENSURE THAT THE TOP 1/4 INCH CHANGE IN LEVEL IS BEVELED WITH A SLOPE NOT STEEPER THAN 1 UNIT VERTICAL AND 2 UNITS HORIZONTAL (2:1 SLOPE).
 - THE CONTRACTOR SHALL ENSURE THAT ANY OPENINGS (GAPS OR HORIZONTAL SEPARATION) ALONG THE ACCESSIBLE PATH SHALL NOT ALLOW PASSAGE OF A SPHERE GREATER THAN 1/4 INCH.



REVISION	DATE	ISSUE	BY	DESCRIPTION
3	06/11/2024	EM		REVISED PER PLANNING DEPARTMENT REVIEW #1
2	04/18/2024	EM / JF		SUBMISSION FOR PRELIMINARY SITE PLAN REVIEW
1	02/07/2024	ECM		SUBMISSION FOR PRE-APPLICATION MEETING

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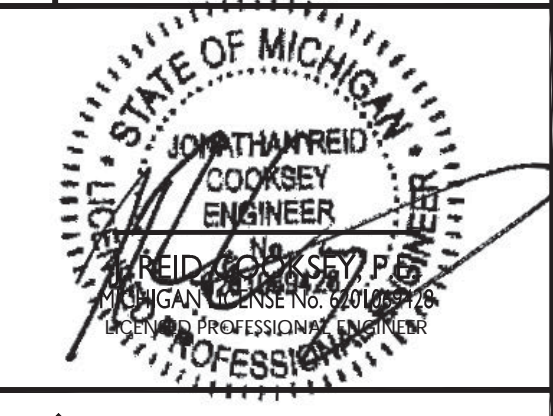
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607 Shelby Suite 200, Detroit, MI 48226
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PROPOSED CAR WASH

WHITEWATER EXPRESS
CAR WASH

PARCEL ID: K-11-06-304-004
2675 WASHTENAW AVENUE (M-17)
CHARTER TOWNSHIP OF YPSILANTI
WASHTENAW COUNTY, MICHIGAN



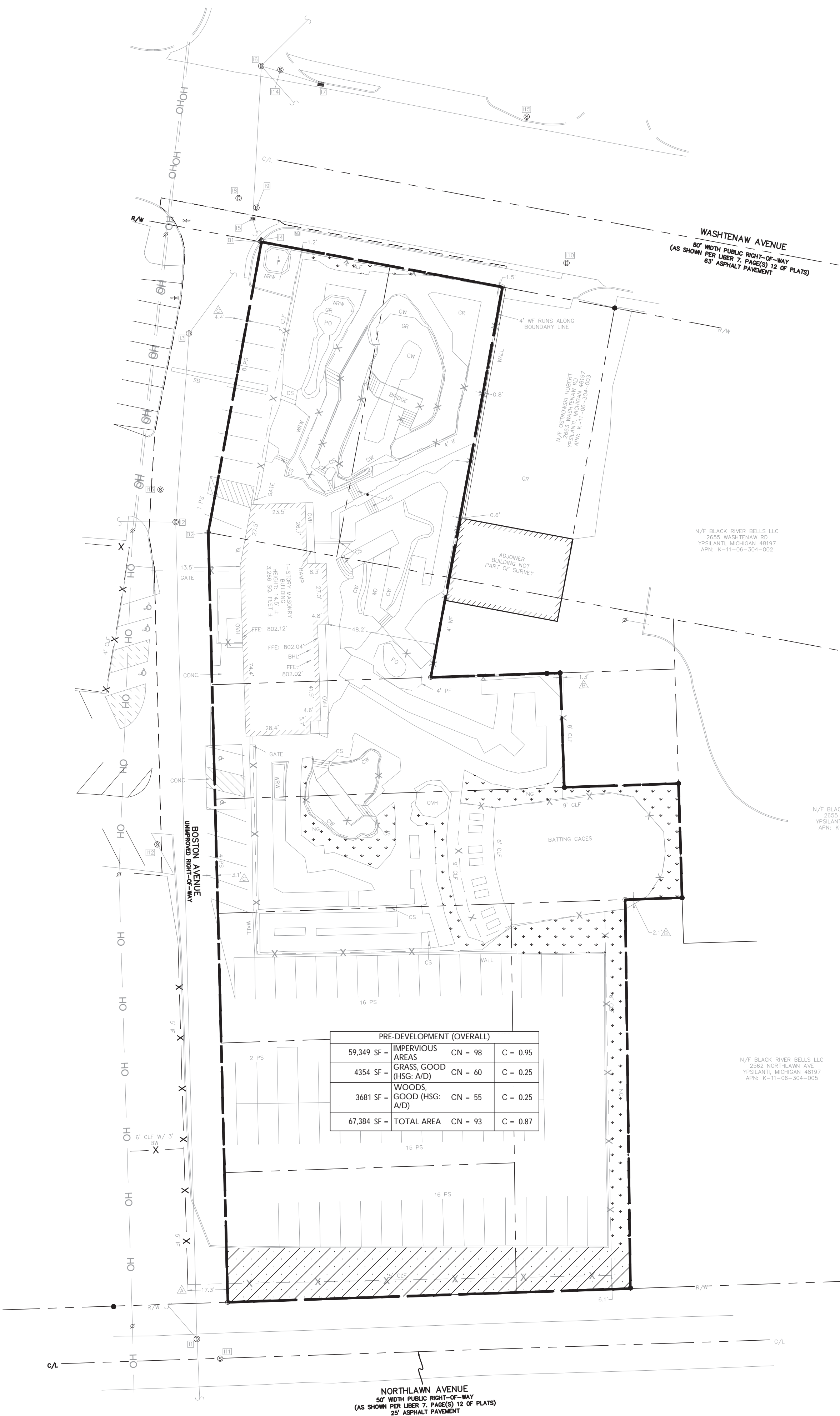
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SCALE: 1" = 30' PROJECT ID: DET-230108.01

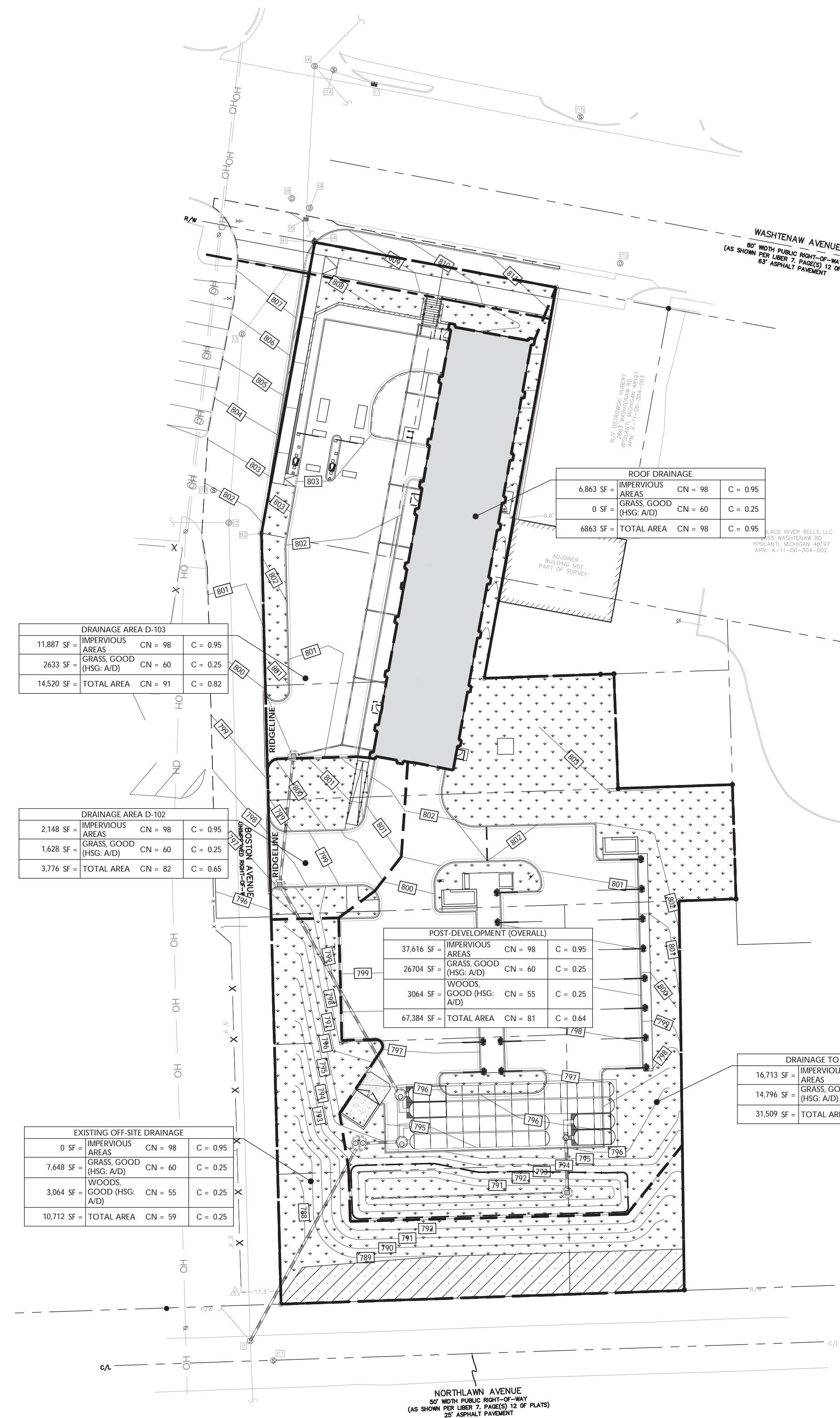
TITLE:
GRADING PLAN

DRAWING:
C-4

NOT TO SCALE. SEE PLANS FOR DIMENSIONS. WASHINGTON AVENUE, YPSILANTI, MICHIGAN 48197

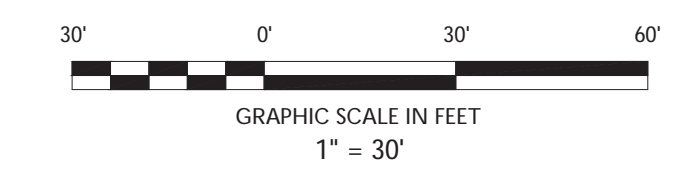


PRE-DEVELOPMENT DRAINAGE AREA MAP



POST-DEVELOPMENT DRAINAGE AREA MAP

SYMBOL	DESCRIPTION
	PROPERTY LINE
	PROPOSED GRADING CONTOUR
	PROPOSED DRAINAGE AREA
	PROPOSED STORMWATER STRUCTURES
	PROPOSED STORMWATER PIPING
	PROPOSED UNDERGROUND OUTLET STRUCTURE



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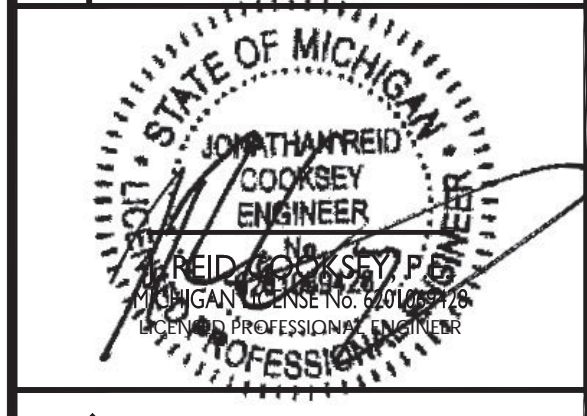
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SITE DEVELOPMENT PLANS

PROPOSED CAR WASH

PARCEL ID: K-11-06-304-004
2675 WASHINGTON AVENUE (M-17)
CHARTER TOWNSHIP OF YPSILANTI
WASHINGTON COUNTY, MICHIGAN

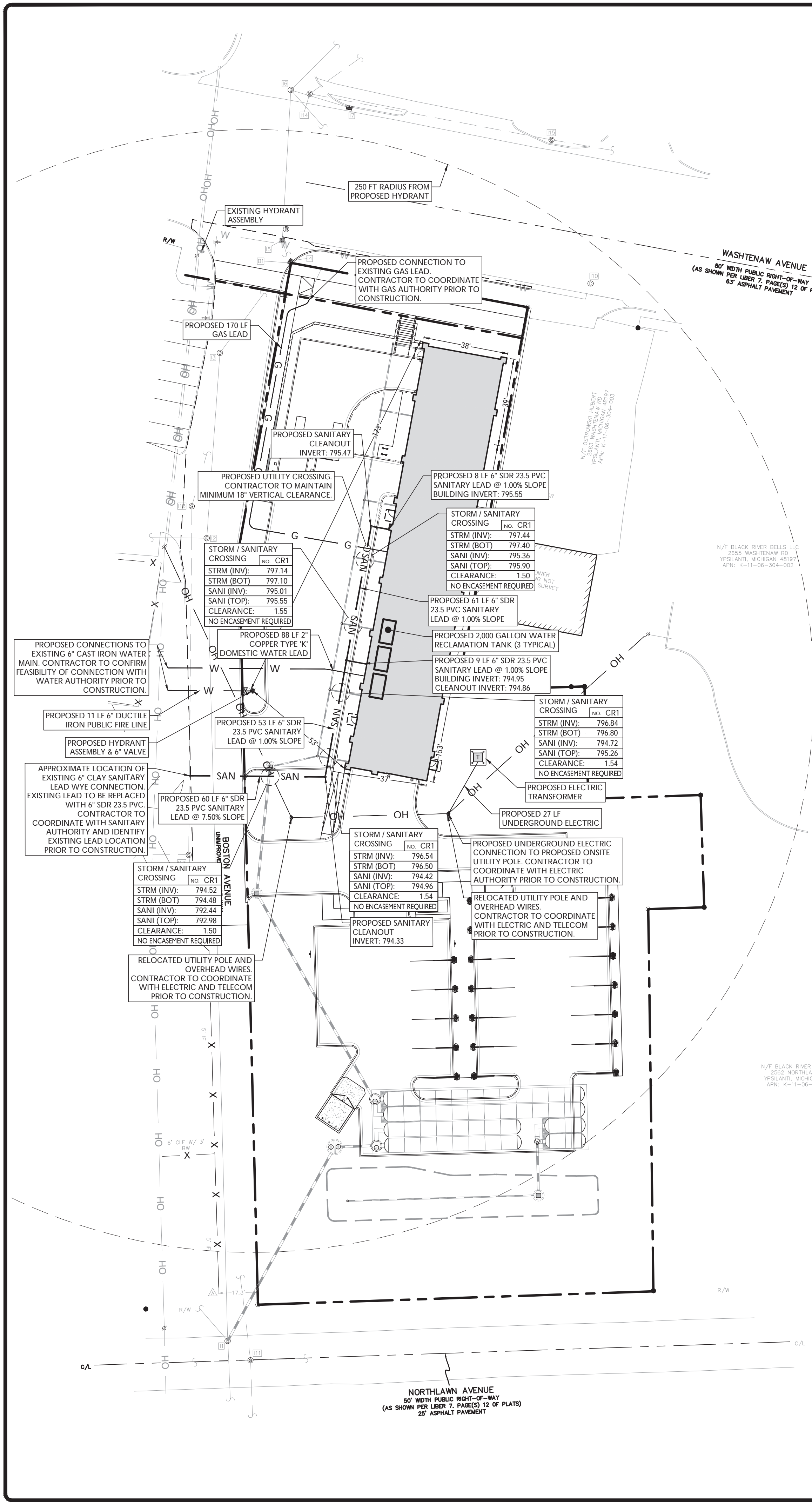


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SCALE: 1" = 30' PROJECT ID: DET-230108.01

TITLE:
DRAINAGE AREA MAPS

DRAWING:
C-6



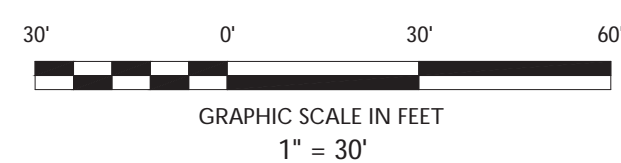
SYMBOL	DESCRIPTION
---	PROPERTY LINE
— SAN —	PROPOSED SANITARY LATERAL
— W —	PROPOSED DOMESTIC WATER SERVICE
— E —	PROPOSED ELECTRIC CONDUITS
— OH —	PROPOSED OVERHEAD WIRES
— G —	PROPOSED GAS LINE
○	PROPOSED CLEANOUT
⊙	PROPOSED UTILITY POLE
⊞	PROPOSED TRANSFORMER ON CONCRETE PAD WITH BOLLARDS

INVERT TABLE

- 11 STORM SEWER MANHOLE
RIM ELEVATION: 783.59'
12" RCP INVERT NW: 778.4'
12" RCP INVERT NE: 778.7' (UNABLE TO DETERMINE SOURCE)
RCP INVERT N: 770.6' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
RCP INVERT S: 776.6' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
- 12 STORM SEWER MANHOLE
RIM ELEVATION: 802.10'
18" RCP INVERT W: 796.3'
RCP INVERT N: 782.6' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
RCP INVERT S: 774.6' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
- 13 STORM SEWER MANHOLE
RIM ELEVATION: 805.98'
RCP INVERT N: 787.0' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
RCP INVERT S: 786.8' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
- 14 CURB INLET
RIM ELEVATION: 807.65'
SUMP ELEVATION: 805.7'
UNABLE TO LOCATE PIPES, FULL OF WATER & DEBRIS
- 15 GRATED INLET
RIM ELEVATION: 808.15'
10" CMP INVERT SE: 805.1'
24" RCP INVERT N: 804.2'
- 16 STORM SEWER MANHOLE
RIM ELEVATION: 808.21'
24" RCP INVERT S: 796.8'
8" CLAY PIPE INVERT E: 802.8'
24" RCP INVERT NE: 796.6'
24" RCP INVERT SE (UNABLE TO MEASURE DUE TO DEPTH)
- 17 CURB INLET
RIM ELEVATION: 808.89'
8" CLAY PIPE INVERT W: 803.6'
- 18 STORM SEWER MANHOLE
RIM ELEVATION: 808.48'
UNABLE TO OPEN DUE TO HIGH TRAFFIC
- 19 STORM SEWER MANHOLE
RIM ELEVATION: 808.60'
UNABLE TO OPEN DUE TO HIGH TRAFFIC
- 11a STORM SEWER MANHOLE
RIM ELEVATION: 812.55'
UNABLE TO OPEN DUE TO HIGH TRAFFIC
- 11b SANITARY SEWER MANHOLE
RIM ELEVATION: 783.94'
8" CAST IRON PIPE INVERT W: 776.2'
8" CAST IRON PIPE INVERT E: 776.1'
8" CAST IRON PIPE INVERT N: 775.6'
8" CAST IRON PIPE INVERT S: 775.5'
- 11c SANITARY SEWER MANHOLE
RIM ELEVATION: 796.41'
6" CAST IRON PIPE INVERT W: 776.7'
8" CAST IRON PIPE INVERT N: 776.7'
8" CAST IRON PIPE INVERT S: 776.7'
- 11d SANITARY SEWER MANHOLE
RIM ELEVATION: 802.34'
CAST IRON PIPE INVERT N: 787.6' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
CAST IRON PIPE INVERT S: 787.4' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
- 11e SANITARY SEWER MANHOLE
RIM ELEVATION: 808.29'
8" CAST IRON PIPE INVERT NE: 799.0'
6" CAST IRON PIPE INVERT E: 799.0'
SUMP ELEVATION: 798.9'
UNABLE TO LOCATE DISCHARGE PIPE, FULL OF SEWAGE
- 11f SANITARY SEWER MANHOLE
RIM ELEVATION: 812.13'
8" CAST IRON PIPE INVERT E: 801.7'
8" CAST IRON PIPE INVERT W: 801.6'

DRAINAGE AND UTILITY NOTES

1. THE CONTRACTOR IS REQUIRED TO CALL THE APPROPRIATE AUTHORITY FOR NOTICE OF CONSTRUCTION/EXCAVATION AND UTILITY MARK OUT PRIOR TO THE START OF CONSTRUCTION IN ACCORDANCE WITH STATE LAW. CONTRACTOR IS REQUIRED TO CONFIRM THE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES IN THE FIELD. SHOULD A DISCREPANCY EXIST BETWEEN THE FIELD LOCATION OF A UTILITY AND THE LOCATION SHOWN ON THE PLAN SET OR SURVEY, THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC IMMEDIATELY IN WRITING.
2. THE CONTRACTOR IS RESPONSIBLE TO PROTECT AND MAINTAIN IN OPERATION ALL UTILITIES NOT DESIGNATED TO BE REMOVED.
3. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO ANY EXISTING UTILITY IDENTIFIED TO REMAIN WITHIN THE LIMITS OF THE PROPOSED WORK DURING CONSTRUCTION.
4. A MINIMUM HORIZONTAL SEPARATION OF 10 FEET IS REQUIRED BETWEEN ANY SANITARY SEWER SERVICE AND ANY WATER LINES IF THIS SEPARATION CANNOT BE PROVIDED, A CONCRETE ENCASUREMENT SHALL BE UTILIZED FOR THE SANITARY SEWER SERVICE AS APPROVED BY STONEFIELD ENGINEERING & DESIGN, LLC.
5. ALL WATER LINES SHALL BE VERTICALLY SEPARATED ABOVE SANITARY SEWER LINES BY A MINIMUM DISTANCE OF 18 INCHES. IF THIS SEPARATION CANNOT BE PROVIDED, A CONCRETE ENCASUREMENT SHALL BE UTILIZED FOR THE SANITARY SEWER SERVICE AS APPROVED BY STONEFIELD ENGINEERING & DESIGN, LLC.
6. THE CONTRACTOR TO PERFORM A TEST PIT PRIOR TO CONSTRUCTION (RECOMMEND 30 DAYS PRIOR) AT LOCATIONS OF EXISTING UTILITY CROSSINGS FOR WATER AND SANITARY SEWER CONNECTION IMPROVEMENTS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC IN WRITING.
7. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING GAS, ELECTRIC AND TELECOMMUNICATION CONNECTIONS WITH THE APPROPRIATE GOVERNING AUTHORITY.
8. CONTRACTOR SHALL START CONSTRUCTION OF ANY GRAVITY SEWER AT THE LOWEST INVERT AND WORK UP GRADIENT.
9. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN A RECORD SET OF PLANS REFLECTING THE LOCATION OF EXISTING UTILITIES THAT HAVE BEEN CAPPED, ABANDONED, OR RELOCATED BASED ON THE DEMOLITION/REMOVAL ACTIVITIES REQUIRED IN THIS PLAN SET. THIS DOCUMENT SHALL BE PROVIDED TO THE OWNER FOLLOWING COMPLETION OF WORK.
10. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN A RECORD OF THE AS-BUILT LOCATIONS OF ALL PROPOSED UNDERGROUND INFRASTRUCTURE. THE CONTRACTOR SHALL NOTE ANY DISCREPANCIES BETWEEN THE AS-BUILT LOCATIONS AND THE LOCATIONS DEPICTED WITHIN THE PLAN SET. THIS RECORD SHALL BE PROVIDED TO THE OWNER FOLLOWING COMPLETION OF WORK.



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PROPOSED CAR WASH

WHITEWATER EXPRESS CAR WASH

PARCEL ID: K-11-106-304-004
2675 WASHINGTON AVENUE (M-17)
CHARTER TOWNSHIP OF YPSILANTI
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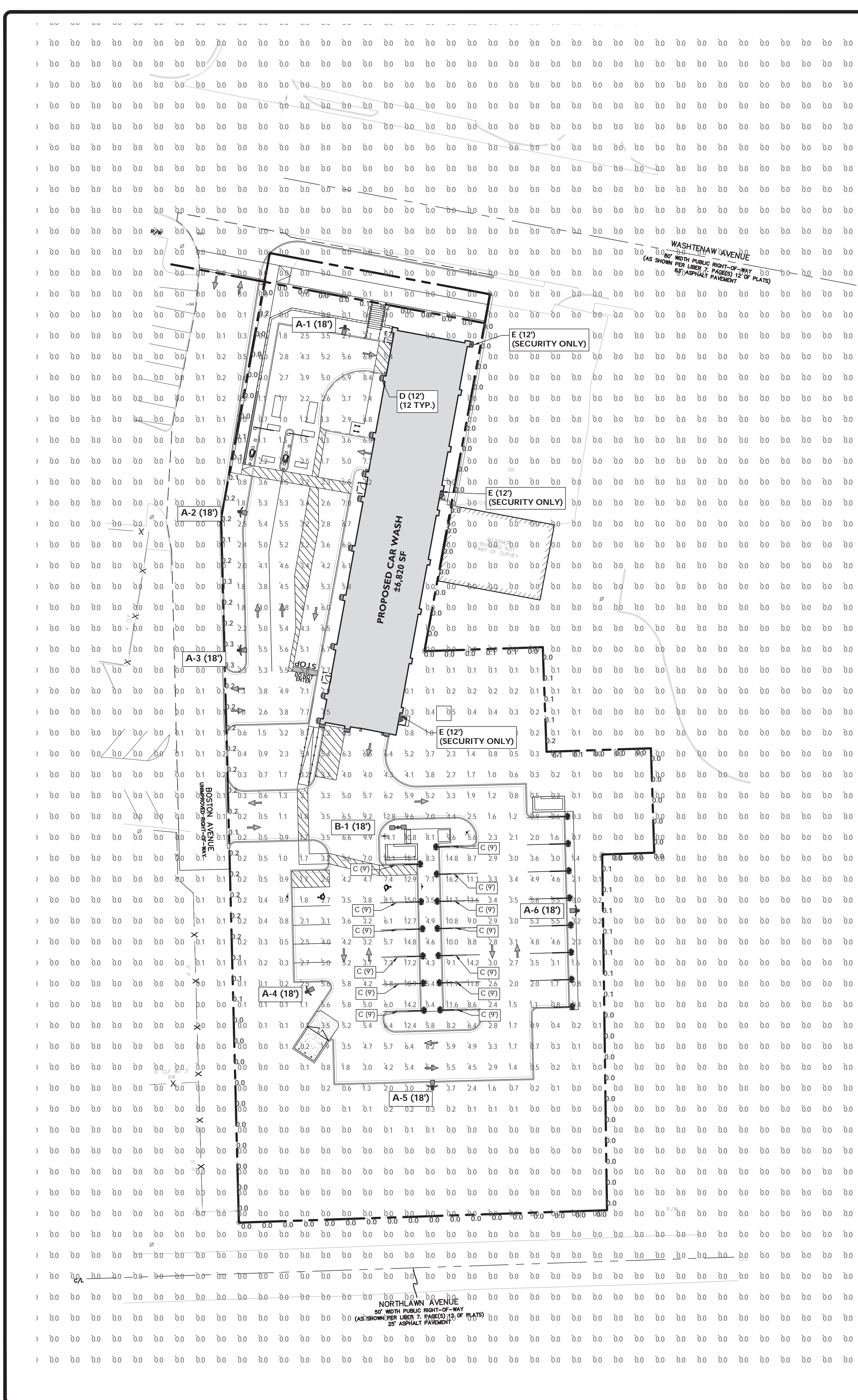


STONEFIELD
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SCALE: 1" = 30' PROJECT ID: DET-230108.01

TITLE: **UTILITY PLAN**

DRAWING: **C-7**



LIGHTING STATISTICS			
DESCRIPTION	AVERAGE	MINIMUM	MAXIMUM
OVERALL PARCEL	2.42 FC	0.0 FC	18.9 FC
PROPERTY LINE	0.06 FC	0.0 FC	0.3 FC

LIGHTING REQUIREMENTS		
CODE SECTION	REQUIRED	PROPOSED
§ 1303.3(B)	MAXIMUM NON-RESIDENTIAL INTENSITY: 1.0 FT AT GROUND LEVEL	0.3 FC
§ 1303.3(B)	MAXIMUM RESIDENTIAL INTENSITY: 0.5 FC AT GROUND LEVEL	0.0 FC
§ 1303.3(B)	MAXIMUM INTENSITY: 20.0 FC ANYWHERE TO BE ILLUMINATED	18.9 FC
§ 1303.3(C)	MAXIMUM HEIGHT: 25 FT INCLUDING BASE	18 FT
§ 1303.3(C)	MAXIMUM HEIGHT ADJ. TO RESIDENTIAL 18 FT INCLUDING BASE	18 FT
§ 1303.3(D)	MINIMUM LIGHTING AT PARKING LOT: 0.4 FC	0.5 FC
§ 1303.3(E)	MAXIMUM COLOR STANDARD: 3,500 K	3,000 K

SYMBOL	DESCRIPTION
---	PROPERTY LINE
A (XX)	PROPOSED LIGHTING FIXTURE (MOUNTING HEIGHT)
+XX	PROPOSED LIGHTING INTENSITY (FOOTCANDLES)
[Symbol]	PROPOSED AREA LIGHT
[Symbol]	PROPOSED BUILDING MOUNTED LIGHT

PROPOSED LUMINAIRE SCHEDULE									
SYMBOL	LABEL	QUANTITY	SECURITY LIGHTING	DISTRIBUTION	LUMENS	LLF	MANUFACTURER	CONTROL	IES FILE
[Symbol]	A	6	MIRADA MEDIUM - MRM OUTDOOR LED AREA LIGHT - SINGLE SHIELDED, 1 @ 90°	FT	18,000 LMS	0.9	LSI	-	MRM-LED-18L-SL-FT-30-70CRH-ILIES
[Symbol]	B	1	MIRADA MEDIUM - MRM OUTDOOR LED AREA LIGHT - DOUBLE 2 @ 180°	FT	18,000 LMS	1.0	LSI	-	MRM-LED-18L-SL-FT-30-70CRH-IES
[Symbol]	C	13	LOW-PROFILE, DRIVERLESS LINKABLE IP67 LED LINEAR LUMINAIRE (6 FT) - 9 FT A.F.G.	N/A	600 LMS/FT	0.9	G & G INDUSTRIAL LIGHTING	-	GPX6-SO-IES
[Symbol]	D	12	MIRANDA WALL SCENE-XWM OUTDOOR LED WALL SCENCE	TYPE 11	3,000 LMS	0.9	LSI	-	XWM-2-LED-03L-30-IES
[Symbol]	E	3	MIRANDA WALL SCENE-XWM OUTDOOR LED WALL SCENCE*	TYPE 11	3,000 LMS	0.9	LSI	-	XWM-2-LED-03L-30-IES

* FIXTURE 'E' ARE SECURITY LIGHTING ONLY. NOT INCLUDED WITHIN LIGHTING MODEL.

SECURITY CAMERAS TO BE MOUNTED ON EACH POLE 10 FT ABOVE GRADE		
POLE LABEL	NUMBER OF CAMERAS	DIRECTION OF CAMERAS
A-1		
A-2		
A-3		
A-4		
A-5		
A-6		
B-1		



FIXTURES 'A' & 'B'

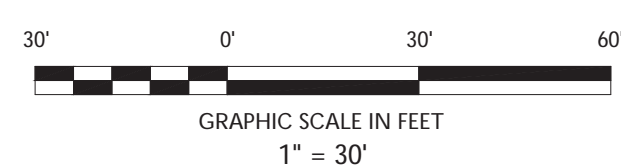


FIXTURES 'D', 'E'

SITE LIGHTING SHALL BE TURNED OFF BY 9:00 PM

GENERAL LIGHTING NOTES

- THE LIGHTING LEVELS DEPICTED WITHIN THE PLAN SET ARE CALCULATED UTILIZING DATA OBTAINED FROM THE LISTED MANUFACTURER. ACTUAL ILLUMINATION LEVELS AND PERFORMANCE OF ANY PROPOSED LIGHTING FIXTURE MAY VARY DUE TO UNCONTROLLABLE VARIABLES, SUCH AS WEATHER, VOLTAGE SUPPLY, LAMP TOLERANCE, EQUIPMENT SERVICE LIFE AND OTHER VARIABLE FIELD CONDITIONS.
- WHERE APPLICABLE, THE EXISTING LIGHT LEVELS DEPICTED WITHIN THE PLAN SET SHALL BE CONSIDERED APPROXIMATE. THE EXISTING LIGHT LEVELS ARE BASED ON FIELD OBSERVATIONS AND THE MANUFACTURERS' DATA OF THE ASSUMED OR MOST SIMILAR LIGHTING FIXTURE MODEL.
- UNLESS NOTED ELSEWHERE WITHIN THIS PLAN SET, THE LIGHT LOSS FACTORS USED IN THE LIGHTING ANALYSIS ARE AS FOLLOWS:
 - LIGHT EMITTING DIODES (LED): 0.90
 - HIGH PRESSURE SODIUM: 0.72
 - METAL HALIDE: 0.72
- THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC IN WRITING PRIOR TO THE START OF CONSTRUCTION, OF ANY PROPOSED LIGHTING LOCATIONS THAT CONFLICT WITH EXISTING/PROPOSED DRAINAGE, UTILITY, OR OTHER IMPROVEMENTS. THE CONTRACTOR IS RESPONSIBLE TO PREPARE A WIRING PLAN AND PROVIDE ELECTRIC SERVICE TO ALL PROPOSED LIGHTING FIXTURES. THE CONTRACTOR IS REQUIRED TO PREPARE AN AS-BUILT PLAN OF WIRING AND PROVIDE COPIES TO THE OWNER AND STONEFIELD ENGINEERING & DESIGN, LLC.



REVISIONS: 06/11/2024 (EM) REVISED PER PLANNING DEPARTMENT REVIEW #1
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DESCRIPTION
 BY
 DATE
 ISSUE

NOT APPROVED FOR CONSTRUCTION

SITE DEVELOPMENT PLANS

PROPOSED CAR WASH

PARCEL ID: K-11-06-304-004
 2675 WASHENAW AVENUE (M-17)
 CHARTER TOWNSHIP OF YPSILANTI
 WASHENAW COUNTY, MICHIGAN

STONEFIELD engineering & design

SCALE: 1" = 30' PROJECT ID: DET-230108.01
 TITLE:
 LIGHTING PLAN
 DRAWING:
C-8



Know what's below
Call before you dig.

SYMBOL	DESCRIPTION
	PROPOSED GENERAL LANDSCAPING TREES
	PROPOSED STREET YARD TREES
	PROPOSED INTERIOR PARKING LOT TREES
	PROPOSED PARKING LOT PERIMETER TREES
	PROPOSED SCREENING TREES

PLANT SCHEDULE						
SYMBOL	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER
DECIDUOUS TREES						
	ACE	9	ACER RUBRUM	RED MAPLE	2.5" - 3" CAL	B&B
	CAR	9	CARPINUS CAROLINIANA 'IN UPRIGHT'	FIRESPICE AMERICAN HORNBEAM	2.5" - 3" CAL	B&B
	GIN	8	GINKGO BILOBA 'AUTUMN GOLD'	AUTUMN GOLD MAIDENHAIR TREE	2.5" - 3" CAL	B&B
	GLE	13	GLEDITSIA TRIACANTHOS INERMIS 'SKYCOLE'	SKYLINE® HONEY LOCUST	2.5" - 3" CAL	B&B
	LIR	5	LIRIODENDRON TULIPIFERA	TULIP POPLAR	2.5" - 3" CAL	B&B
	QUE	6	QUERCUS PHELLOS	WILLOW OAK	2.5" - 3" CAL	B&B
EVERGREEN TREES						
	THU	21	THUIA X 'GREEN GIANT'	GREEN GIANT ARBORVITAE	6' - 7' HT	B&B
ORNAMENTAL TREES						
	COR	4	CORNUS FLORIDA	FLOWERING DOGWOOD	2.5" - 3" CAL	B&B
SHRUBS						
	HYD	11	HYDRANGEA QUERCIFOLIA 'PEE WEE'	PEE WEE OAKLEAF HYDRANGEA	24" - 36"	POT
	VER	3	ILEX VERTICILLATA 'RED SPRITE'	RED SPRITE WINTERBERRY	24" - 36"	POT
	VIB	11	VIBURNUM DENTATUM	VIBURNUM	36" - 42"	POT
BASIN SHRUBS						
	ASC	23	ASCLEPIAS INCARNATA	SWAMP MILKWEED	3 GAL	POT
	HIB	18	HIBISCUS MOSCHEUTOS	ROSE MALLOW	3 GAL	POT
	ITE	8	ITEA VIRGINICA 'LITTLE HENRY'	VIRGINIA SWEETSPIRE	3 GAL	POT
	SAM	7	SAMBUCUS CANADENSIS	AMERICAN ELDERBERRY	3 GAL	POT
EVERGREEN SHRUBS						
	ICO	35	ILEX GLABRA 'COMPACTA'	COMPACT INKBERRY	36" - 42"	POT
	PLO	35	PRUNUS LAUROCERASUS 'OTTO LUYKEN'	OTTO LUYKEN ENGLISH LAUREL	36" - 42"	POT
GRASSES						
	CAL	15	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER'	KARL FOERSTER FEATHER REED GRASS	2 GAL	POT

NOTE: IF ANY DISCREPANCIES OCCUR BETWEEN AMOUNTS SHOWN ON THE LANDSCAPE PLAN AND WITHIN THE PLANT LIST, THE PLAN SHALL DICATE.

CODE SECTION	REQUIRED	PROPOSED
GENERAL LANDSCAPING		
§ 1301.3.B.(1)	1 TREE PER 1,000 SF (5,276 SF) * (1 TREE / 1,000 SF) = 6 TREES	6 TREES
§ 1301.3.B.(2)	1 SHRUB PER 500 SF (5,276 SF) * (1 SHRUB / 500 SF) = 11 SHRUBS	11 SHRUBS
STREET YARD LANDSCAPING		
§ 1301.3.C.(1)	1 DECIDUOUS TREE PER 40 LF ORNAMENTAL TREE PER 100 LF, & 1 SHRUB PER 10 LF WASHENAW AVENUE: 107 LF DECIDUOUS TREES: (107 LF) / (40 LF) = 3 TREES ORNAMENTAL TREES: (107 LF) / (100 LF) = 1 TREE SHRUBS: (107 LF) / (10) = 11 SHRUBS BOSTON AVENUE: 297 LF DECIDUOUS TREES: (297 LF) / (40 LF) = 7 TREES ORNAMENTAL TREES: (297 LF) / (100 LF) = 3 TREES SHRUBS: (297 LF) / (10) = 30 SHRUBS	3 TREES 1 TREE 11 SHRUBS 7 TREES 3 TREES 30 SHRUBS
INTERIOR PARKING LOT LANDSCAPING		
§ 1301.3.D.(1)a	1 TREE PER 2,000 SF OF PAVED SURFACE (24,155 SF) / (2,000 SF) = 12 TREES	12 TREES
§ 1301.3.D.(1)b	NO MORE THAN 12 SPACES IN A ROW	COMPLIES
§ 1301.3.D.(1)c	EACH TREE SHALL CONTAIN 150 SF OF LANDSCAPE AREA	COMPLIES
§ 1301.3.D.(1)d	ISLANDS SHALL BE NO LESS THAN 5 FT IN ANY DIRECTION	COMPLIES
PERIMETER PARKING LOT LANDSCAPING		
§ 1301.3.D.(2)a	1 TREE PER 40 LF OF PARKING LOT PERIMETER (747 LF) / (40 LF) = 19 TREES	19 TREES
BIORETENTION POND LANDSCAPING:		
§ 1301.3.G.(5)	1 DECIDUOUS TREE & 10 SHRUBS PER 50 LF TOTAL PERIMETER: 278 DECIDUOUS TREES: (278 LF) / (50 LF) = 6 TREES SHRUBS: (278 LF) / (50 LF) = 5.56 * (10) = 56 SHRUBS	6 TREES 56 SHRUBS
SCREENING		
§ 1301.3.H.(2)	OFFICER/TALENT/INSTITUTIONAL/SERVICE TO SINGLE FAMILY RESIDENTIAL SCREEN 2 1 LARGE EVERGREEN TREE PER 10 LF EVERGREEN TREES: (176 LF) / (10 LF) = 18 TREES	COMPLIES 18 TREES

IRRIGATION NOTE:

IRRIGATION CONTRACTOR TO PROVIDE A DESIGN FOR AN IRRIGATION SYSTEM SEPARATING PLANTING BEDS FROM LAWN AREA. PRIOR TO CONSTRUCTION, DESIGN IS TO BE SUBMITTED TO THE PROJECT LANDSCAPE DESIGNER FOR REVIEW AND APPROVAL. WHERE POSSIBLE, DRIP IRRIGATION AND OTHER WATER CONSERVATION TECHNIQUES SUCH AS RAIN SENSORS SHALL BE IMPLEMENTED. CONTRACTOR TO VERIFY MAXIMUM ON-SITE DYNAMIC WATER PRESSURE AVAILABLE MEASURED IN PSI. PRESSURE REDUCING DEVICES OR BOOSTER PUMPS SHALL BE PROVIDED TO MEET SYSTEM PRESSURE REQUIREMENTS. DESIGN TO SHOW ALL VALVES, PIPING, HEADS, BACKFLOW PREVENTION, METERS, CONTROLLERS, AND SLEEVES WITHIN HARDSCAPE AREAS.

LANDSCAPING NOTES

- THE CONTRACTOR SHALL RESTORE ALL DISTURBED GRASS AND LANDSCAPED AREAS TO MATCH EXISTING CONDITIONS UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET.
- THE CONTRACTOR SHALL RESTORE ALL DISTURBED LAWN AREAS WITH A MINIMUM 4 INCH LAYER OF TOPSOIL AND SEED.
- THE CONTRACTOR SHALL RESTORE MULCH AREAS WITH A MINIMUM 3 INCH LAYER OF MULCH.
- THE MAXIMUM SLOPE ALLOWABLE IN LANDSCAPE RESTORATION AREAS SHALL BE 3 FEET HORIZONTAL TO 1 FOOT VERTICAL (3:1 SLOPE) UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET.
- THE CONTRACTOR IS REQUIRED TO LOCATE ALL SPRINKLER HEADS IN AREA OF LANDSCAPING DISTURBANCE PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL RELOCATE SPRINKLER HEADS AND LINES IN ACCORDANCE WITH OWNER'S DIRECTION WITHIN AREAS OF DISTURBANCE.
- THE CONTRACTOR SHALL ENSURE THAT ALL DISTURBED LANDSCAPED AREAS ARE GRADED TO MEET FLUSH AT THE ELEVATION OF WALKWAYS AND TOP OF CURB ELEVATIONS EXCEPT UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET. NO ABRUPT CHANGES IN GRADE ARE PERMITTED IN DISTURBED LANDSCAPED AREAS.

MOWINGS WITHIN STORM WATER BASIN AREA ARE PERMITTED TWICE A YEAR.

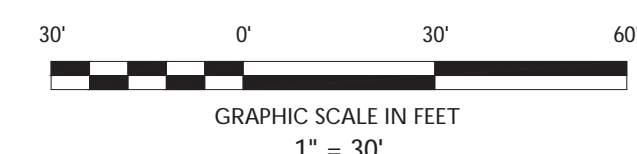
STORMWATER DETENTION POND TOPSOIL TO BE AMENDED WITH ORGANIC MATERIAL SOILS AND MUST BE FREE OF CONSTRUCTION DEBRIS AND SUBSOILS. THE SOIL SHALL CONTAIN BETWEEN 20-30 PERCENT COMPOST.

FERTILIZATION NOTE:

- APPLICATIONS OF FERTILIZER BEYOND THE INITIAL TOPSOIL AND SEEDING SHALL BE FERTILIZER WITH NO PHOSPHOROUS.

SOIL COMPACTION NOTE:

- ONCE FINE GRADING HAS BEEN COMPLETED, HEAVY MACHINERY SHALL NOT BE USED WITHIN PLANTING AREAS TO PREVENT COMPACTION. IN ALL PLANTING AREAS WHERE SOIL COMPACTION HAS OCCURRED DURING CONSTRUCTION, SOIL SHALL BE TILLED TO THE DEPTH OF THE PROPOSED ROOT BALL OF THE PLANTINGS OR 4" DEPTH FOR SEEDS AREAS PRIOR TO PLANTING.
- OVER EXCAVATE SIDES OF PLANTING PITS IN COMPACTED SOIL AREAS.



Raingarden Mix - Forbs

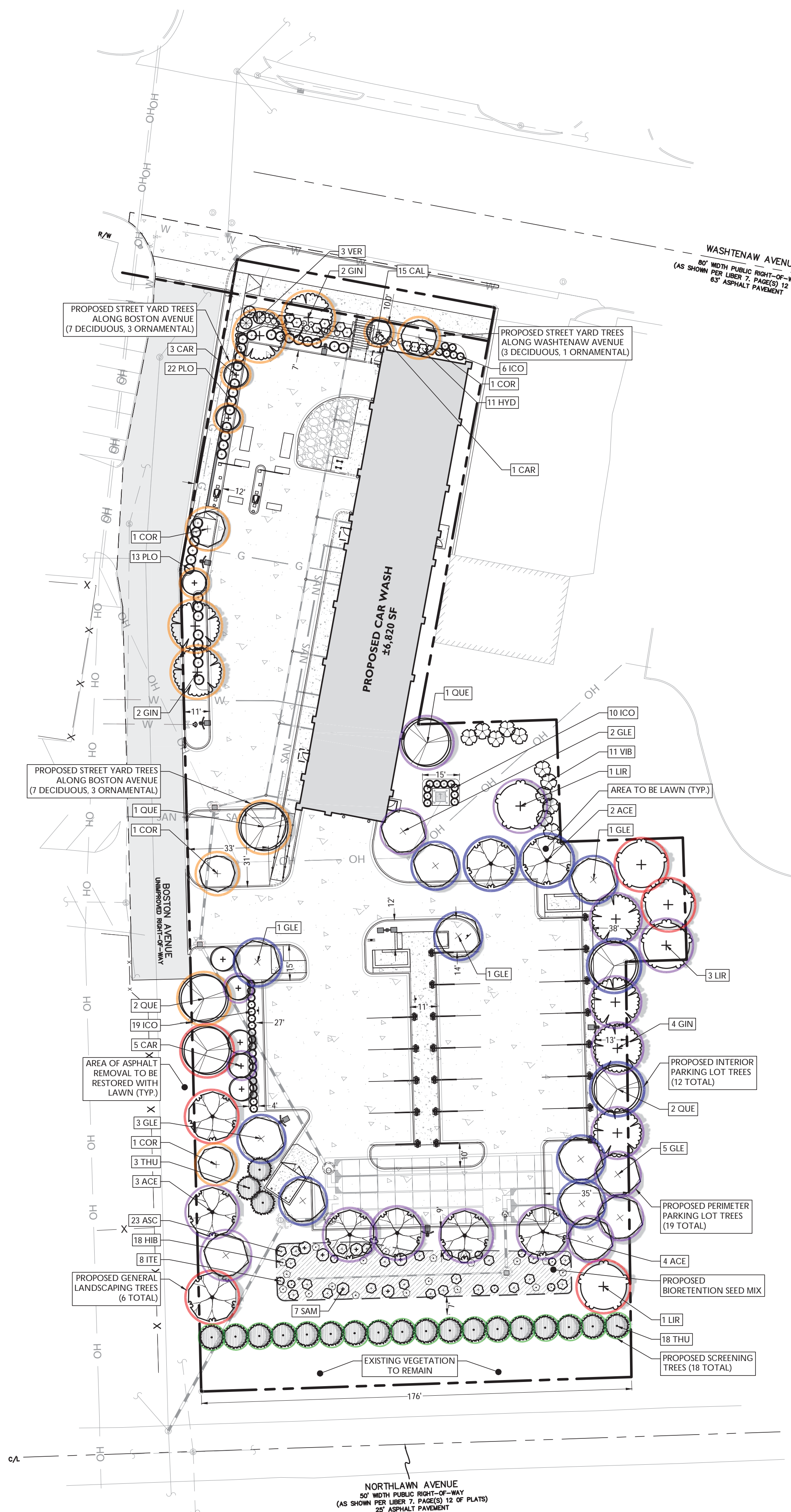
Scientific Name	Common Name
Anemone canadensis	Canada Anemone
Angelica atropurpurea	Angelica
Asclepias incarnata	Swamp Milkweed
Eupatorium maculatum	Joe-Pye Weed
Eupatorium perfoliatum	Boneset
Helenium autumnale	Sneezeweed
Hibiscus moscheutos	Swamp Rose Mallow
Iris virginica	Southern Blue Flag
Liatris spicata	Marsh Blazing Star
Labella alphitica	Great Blue Lobelia
Rudbeckia fulgida	Sweet Black-eyed Susan
Solidago graminifolia	Grass-leaved Goldenrod
Symphoricarum puniceum	Swamp Aster
Verbena hastata	Blue Vervain
Vernonia missouriica	Ironweed

Raingarden Mix - Grasses

Scientific Name	Common Name
Carex spp.	Carex species
Elymus virginicus	Virginia Wild Rye
Scirpus spp.	Scirpus species
Sparganium eurycarpum	Common Bur Reed

BIORETENTION/RAIN GARDEN SEED MIX

3 O.Z./1,000 SF OR 6 LBS PER ACRE



REVISION	DATE	ISSUE	DESCRIPTION
3	06/11/2024	EM	REVISED PER PLANNING DEPARTMENT REVIEW #1
2	04/18/2024	EM/JF	SUBMISSION FOR PRELIMINARY SITE PLAN REVIEW
1	02/07/2024	ECM	SUBMISSION FOR PRE-APPLICATION MEETING

NOT APPROVED FOR CONSTRUCTION

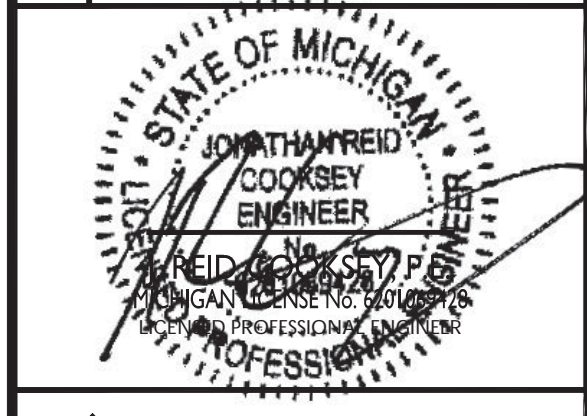
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Detroit, MI • New York, NY • Boston, MA
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www.stonefielddesign.com
607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLANS
PROPOSED CAR WASH



PARCEL ID: K-11-06-304-004
2675 WASHENAW AVENUE (M-17)
CHARTER TOWNSHIP OF YPSILANTI
WASHENAW COUNTY, MICHIGAN



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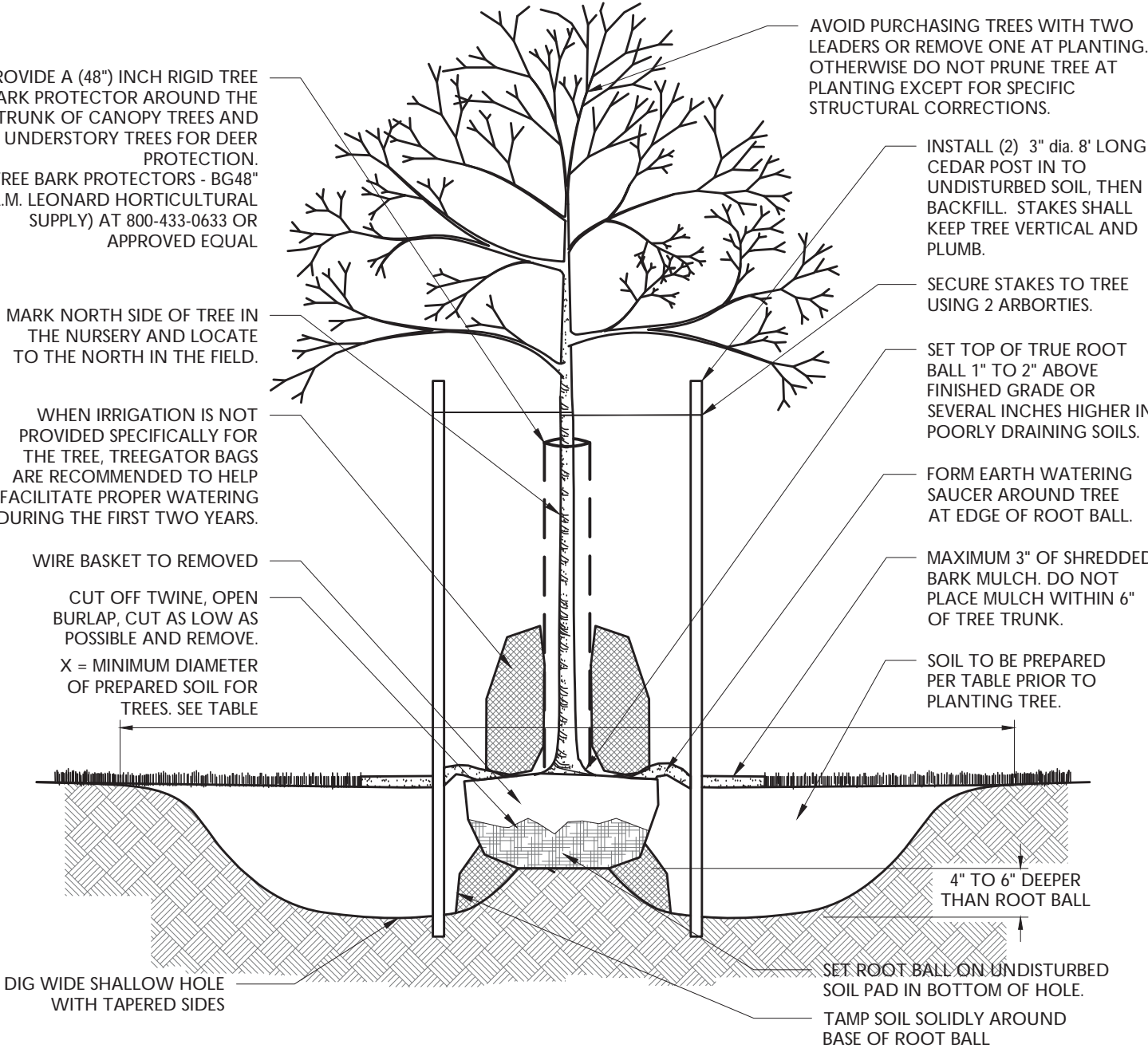
SCALE: 1" = 30' PROJECT ID: DET-230108.01

TITLE: LANDSCAPING PLAN

DRAWING: C-9

NOTES:

- FOR CONTAINER-GROWN TREES, USE FINGERS OR SMALL HAND TOOLS TO PULL THE ROOTS OUT OF THE OUTER LAYER OF POTTING SOIL. THEN CUT OR PULL APART ANY ROOTS CIRCLING THE PERIMETER OF THE CONTAINER.
- THOROUGHLY SOAK THE TREE ROOT BALL AND ADJACENT PREPARED SOIL SEVERAL TIMES DURING THE FIRST MONTH AFTER PLANTING AND REGULARLY THROUGHOUT THE FOLLOWING TWO SUMMERS.
- SOIL AMENDMENTS:
 - MODIFY HEAVY CLAY OR SILT SOILS (MORE THAN 40% CLAY OR SILT) BY ADDING COMPOSTED PINE BARK (UP TO 30% BY VOLUME) OR GYPSUM
 - MODIFY EXTREMELY SANDY SOILS (MORE THAN 85% SAND) BY ADDING ORGANIC MATTER AND/OR DRY, SHREDDED CLAY LOAM UP TO 30% OF THE TOTAL MIX



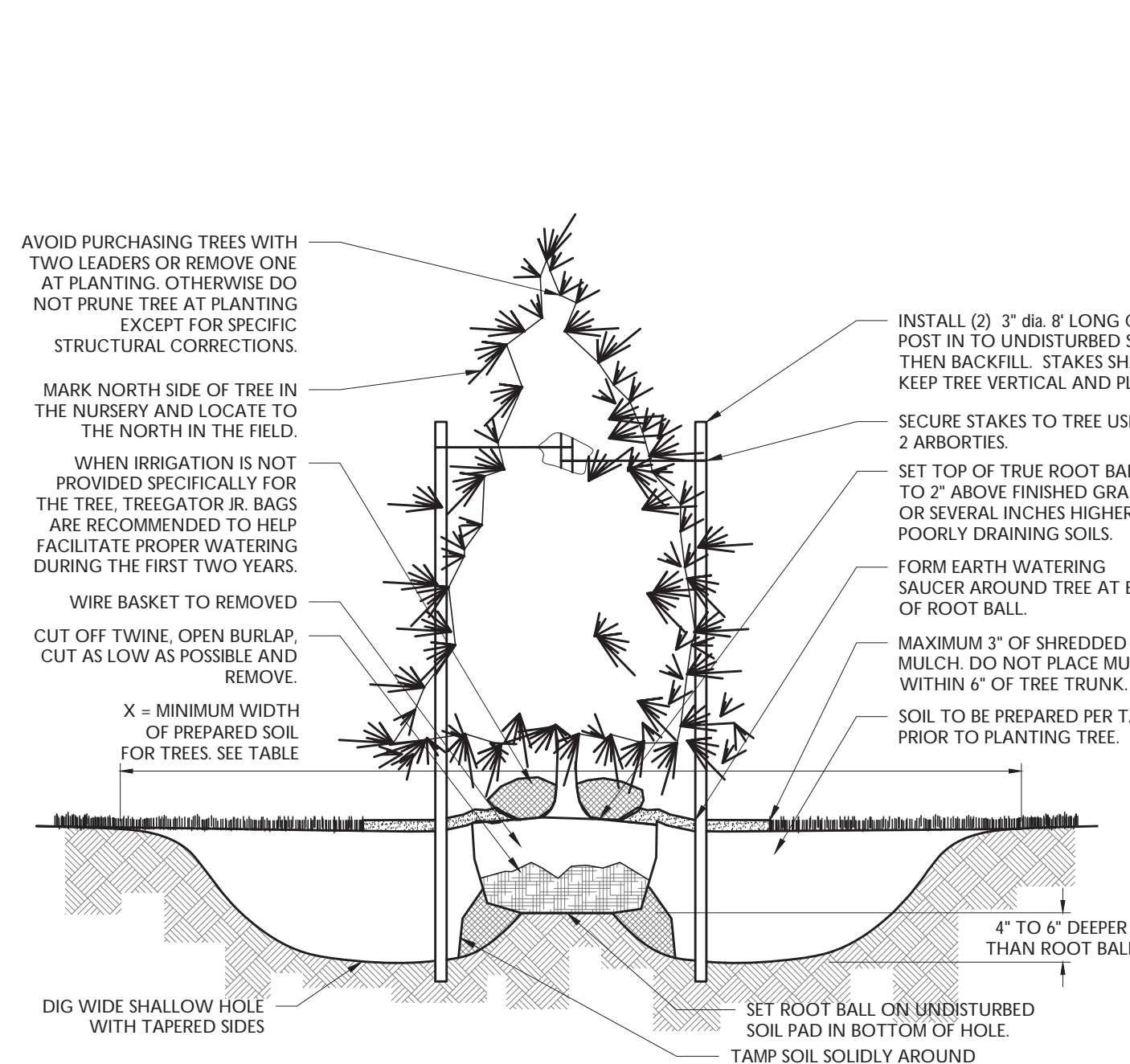
DECIDUOUS TREE PLANTING DETAIL

NOT TO SCALE

1

NOTES:

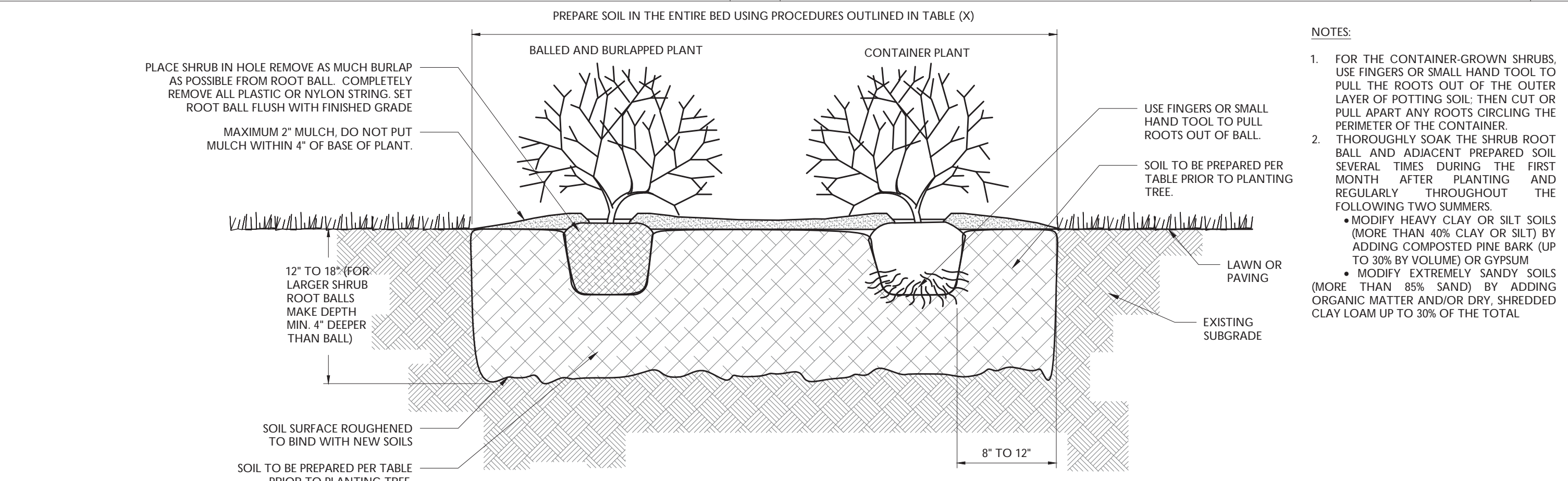
- FOR CONTAINER-GROWN TREES, USE FINGERS OR SMALL HAND TOOLS TO PULL THE ROOTS OUT OF THE OUTER LAYER OF POTTING SOIL. THEN CUT OR PULL APART ANY ROOTS CIRCLING THE PERIMETER OF THE CONTAINER.
- THOROUGHLY SOAK THE TREE ROOT BALL AND ADJACENT PREPARED SOIL SEVERAL TIMES DURING THE FIRST MONTH AFTER PLANTING AND REGULARLY THROUGHOUT THE FOLLOWING TWO SUMMERS.
- SOIL AMENDMENTS:
 - MODIFY HEAVY CLAY OR SILT SOILS (MORE THAN 40% CLAY OR SILT) BY ADDING COMPOSTED PINE BARK (UP TO 30% BY VOLUME) OR GYPSUM
 - MODIFY EXTREMELY SANDY SOILS (MORE THAN 85% SAND) BY ADDING ORGANIC MATTER AND/OR DRY, SHREDDED CLAY LOAM UP TO 30% OF THE TOTAL MIX



CONIFEROUS TREE PLANTING DETAIL

NOT TO SCALE

2



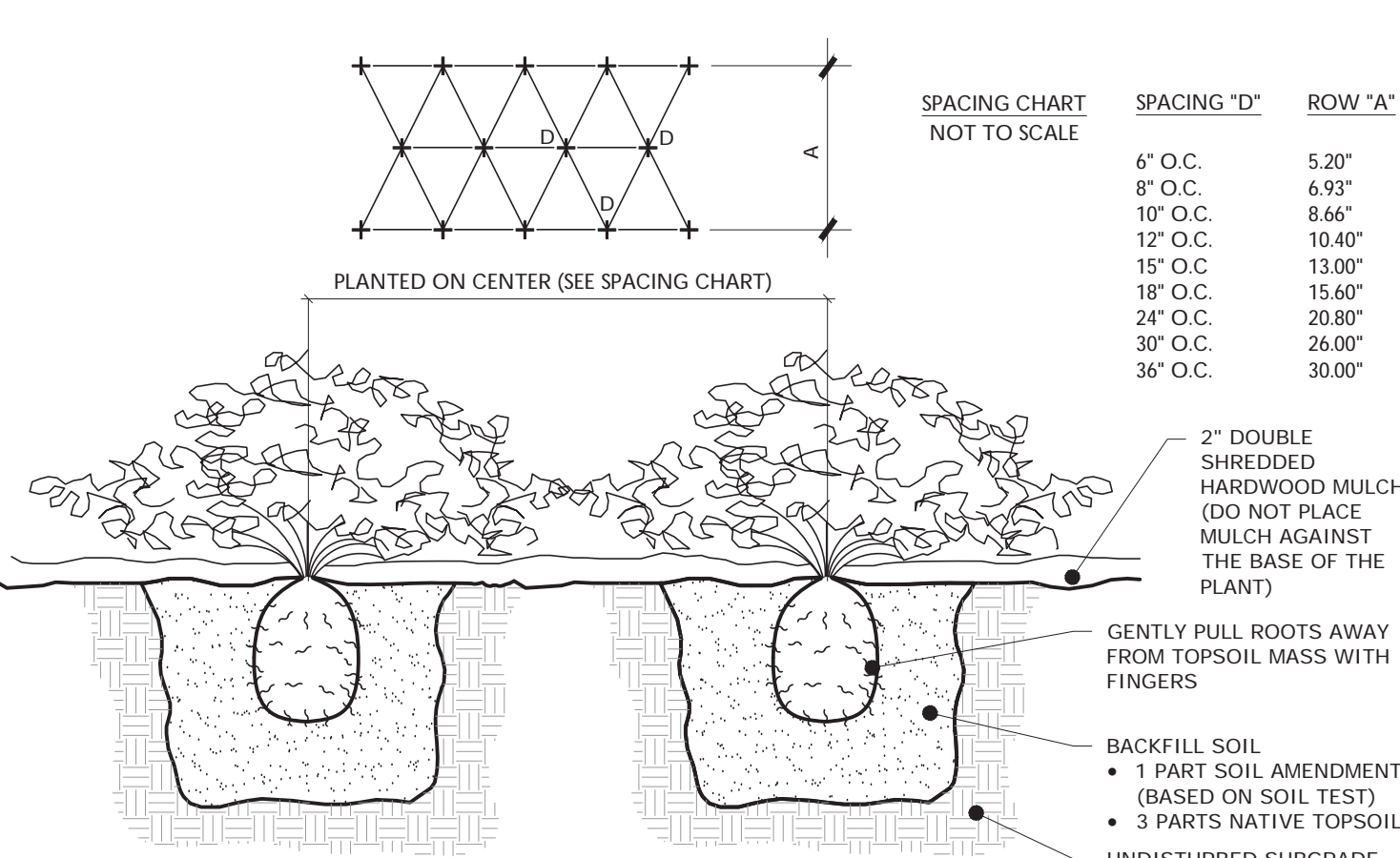
DECIDUOUS AND EVERGREEN SHRUB PLANTING DETAIL

NOT TO SCALE

3

NOTES:

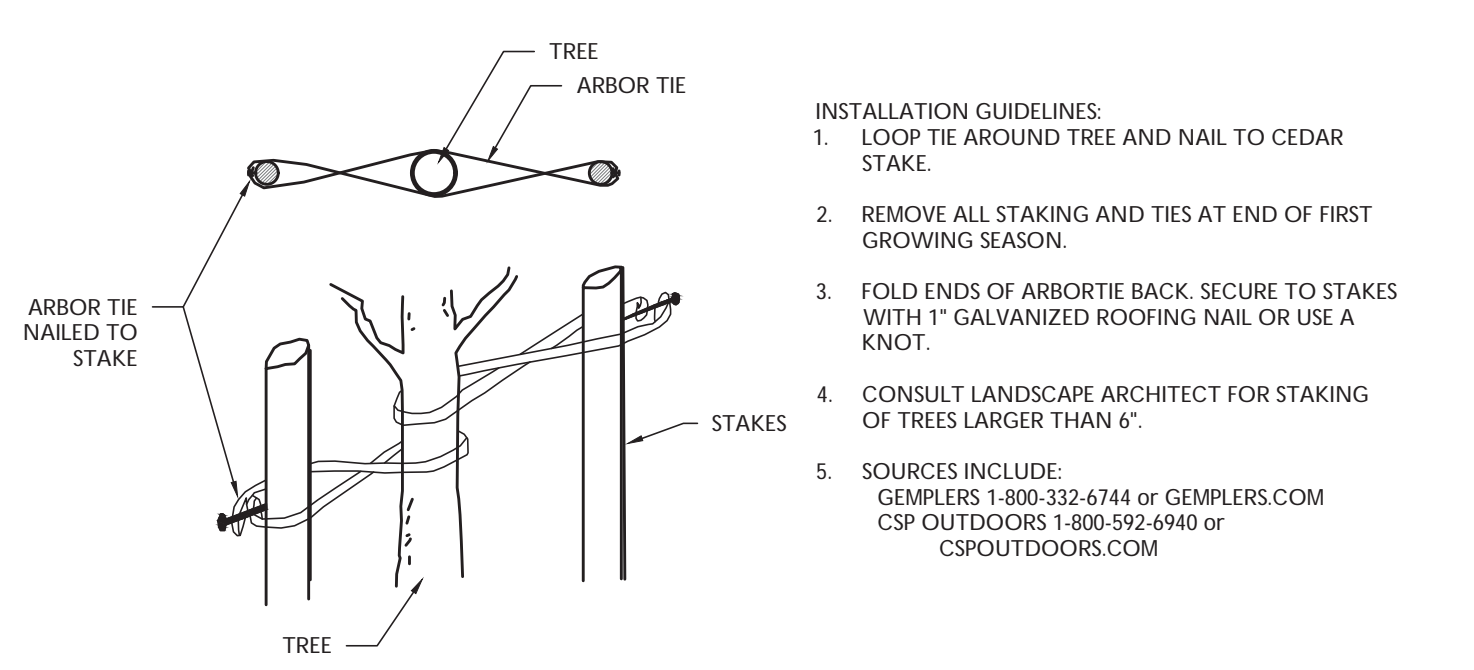
- THOROUGHLY SOAK THE GROUND COVER ROOT BALL AND ADJACENT PREPARED SOIL SEVERAL TIMES DURING THE FIRST MONTH AFTER PLANTING AND REGULARLY THROUGHOUT THE FOLLOWING TWO SUMMERS.
- SOIL AMENDMENTS:
 - MODIFY HEAVY CLAY OR SILT SOILS (MORE THAN 40% CLAY OR SILT) BY ADDING COMPOSTED PINE BARK (UP TO 30% BY VOLUME) OR GYPSUM
 - MODIFY EXTREMELY SANDY SOILS (MORE THAN 85% SAND) BY ADDING ORGANIC MATTER AND/OR DRY, SHREDDED CLAY LOAM UP TO 30% OF THE TOTAL MIX
- ALL GROUND COVER AREAS SHALL BE TREATED WITH A PRE-EMERGENT WEED CONTROL PER MANUFACTURER'S SPECIFICATIONS



GROUND COVER/PERENNIAL/ANNUAL PLANTING DETAIL

NOT TO SCALE

4



ARBORTIE DETAIL

NOT TO SCALE

5

GENERAL LANDSCAPING NOTES:

- THE LANDSCAPE CONTRACTOR SHALL FURNISH ALL MATERIALS AND PERFORM ALL WORK IN ACCORDANCE WITH THESE SPECIFICATIONS, APPROVED OR FINAL DRAWINGS, AND INSTRUCTIONS PROVIDED BY THE PROJECT LANDSCAPE DESIGNER, MUNICIPAL OFFICIALS OR OWNER/OWNER'S REPRESENTATIVE. ALL WORK COMPLETED AND MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH THE INTENTION OF THE SPECIFICATIONS, DRAWINGS, AND INSTRUCTIONS AND EXECUTED WITH THE STANDARD LEVEL OF CARE FOR THE LANDSCAPE INDUSTRY.
- WORK MUST BE CARRIED OUT ONLY DURING WEATHER CONDITIONS FAVORABLE TO LANDSCAPE CONSTRUCTION AND TO THE HEALTH AND WELFARE OF PLANTS. THE SUITABILITY OF SUCH WEATHER CONDITIONS SHALL BE DETERMINED BY THE PROJECT LANDSCAPE DESIGNER OR GOVERNING MUNICIPAL OFFICIAL.
- IT IS THE RESPONSIBILITY OF THE LANDSCAPE CONTRACTOR, BEFORE ORDERING OR PURCHASING MATERIALS, TO PROVIDE SAMPLES OF THOSE MATERIALS TO THE PROJECT LANDSCAPE DESIGNER OR GOVERNING MUNICIPAL OFFICIAL FOR APPROVAL, IF SO REQUESTED.
- IF SAMPLES ARE REQUESTED, THE LANDSCAPE CONTRACTOR IS TO SUBMIT CERTIFICATION TAGS FROM TREES, SHRUBS AND SEED VERIFYING TYPE AND PURITY.
- UNLESS OTHERWISE AUTHORIZED BY THE PROJECT LANDSCAPE DESIGNER OR GOVERNING MUNICIPAL OFFICIAL, THE LANDSCAPE CONTRACTOR SHALL PROVIDE NOTICE AT LEAST FORTY-EIGHT HOURS (48 HRS) IN ADVANCE OF THE ANTICIPATED DELIVERY DATE OF ANY PLANT MATERIAL TO THE PROJECT SITE. A LEGIBLE COPY OF THE INVOICE, SHOWING VARIETIES AND SIZES OF MATERIALS INCLUDED FOR EACH SHIPMENT SHALL BE FURNISHED TO THE PROJECT LANDSCAPE DESIGNER, OR GOVERNING MUNICIPAL OFFICIAL.
- THE PROJECT LANDSCAPE DESIGNER OR GOVERNING MUNICIPAL OFFICIAL RESERVES THE RIGHT TO INSPECT AND REJECT PLANTS AT ANY TIME AND AT ANY PLACE.

PROTECTION OF EXISTING VEGETATION NOTES:

- BEFORE COMMENCING WORK, ALL EXISTING VEGETATION WHICH COULD BE IMPACTED AS A RESULT OF THE PROPOSED CONSTRUCTION ACTIVITIES MUST BE PROTECTED FROM DAMAGE BY THE INSTALLATION OF TREE PROTECTION FENCING. FENCING SHALL BE LOCATED AT THE DRIP-LINE OR LIMIT OF DISTURBANCE AS DEPICTED WITHIN THE APPROVED OR FINAL PLAN, ERECT, ESTABLISHED, TREE PROTECTION ZONE. FENCE INSTALLATION SHALL BE IN ACCORDANCE WITH THE PROVIDED TREE PROTECTION FENCE DETAIL. NO WORK MAY BEGIN UNTIL THIS REQUIREMENT IS FULFILLED. THE FENCING SHALL BE INSPECTED REGULARLY BY THE LANDSCAPE CONTRACTOR AND MAINTAINED UNTIL ALL CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.
- IN ORDER TO AVOID DAMAGE TO ROOTS, BARK OR LOWER BRANCHES, NO VEHICLE, EQUIPMENT, DEBRIS, OR OTHER MATERIALS SHALL BE DRIVEN, PARKED OR PLACED WITHIN THE TREE PROTECTION ZONE. ALL ON-SITE CONTRACTORS SHALL USE ANY AND ALL PRECAUTIONARY MEASURES WHEN PERFORMING WORK AROUND TREES, WALKS, PAVEMENTS, UTILITIES, AND ANY OTHER FEATURES EITHER EXISTING OR PREVIOUSLY INSTALLED UNDER THIS CONTRACT.
- IN RARE INSTANCES WHERE EXCAVATING, FILL, OR GRADING IS REQUIRED WITHIN THE DRIP-LINE OF TREES TO REMAIN, THE WORK SHALL BE PERFORMED AS FOLLOWS:
 - TRENCHING: WHEN TRENCHING OCCURS AROUND TREES TO REMAIN, THE TREE ROOTS SHALL NOT BE CUT, BUT THE TRENCH SHALL BE TUNNELED UNDER OR AROUND THE ROOTS BY CAREFUL HAND DIGGING AND WITHOUT INJURY TO THE ROOTS. NO ROOTS, LIMBS, OR WOODS ARE TO HAVE ANY PAINT OR MATERIAL APPLIED TO ANY SURFACE.
 - RAISING GRADES: WHEN THE GRADE AT AN EXISTING TREE IS BELOW THE NEW FINISHED GRADE, AND FILL NOT EXCEEDING 6 INCHES (6") IS REQUIRED, CLEAN, WASHED GRAVEL FROM ONE TO TWO INCHES (1" - 2") IN SIZE SHALL BE PLACED DIRECTLY AROUND THE TREE TRUNK. THE GRAVEL SHALL EXTEND OUT FROM THE TRUNK ON ALL SIDES A MINIMUM OF 18 INCHES (18") AND FINISH APPROXIMATELY TWO INCHES (2") ABOVE THE FINISHED GRADE AT THE PERIMETER OF THE GRAVEL. BEFORE ANY EARTH FILL IS PLACED, NEW EARTH FILL SHALL NOT BE LEFT IN CONTACT WITH THE TRUNK OF ANY TREE REQUIRING FILL. WHERE FILL EXCEEDING 6 INCHES (6") IS REQUIRED, A DRY LAID TREE WELL SHALL BE CONSTRUCTED. IF APPLICABLE, TREE WELL INSTALLATION SHALL BE IN ACCORDANCE WITH THE PROVIDED TREE WELL DETAIL.
 - LOWERING GRADES: EXISTING TREES LOCATED IN AREAS WHERE THE NEW FINISHED GRADE IS TO BE LOWERED, SHALL HAVE RE-GRADING WORK DONE BY HAND TO THE INDICATED ELEVATION, NO GREATER THAN SIX INCHES (6"). ROOTS SHALL BE CUT CLEANLY THREE INCHES (3") BELOW FINISHED GRADE UNDER THE DIRECTION OF A LICENSED ARBORIST. WHERE CUT EXCEEDING 6 INCHES (6") IS REQUIRED, A DRY LAID RETAINING WALL SHALL BE CONSTRUCTED. IF APPLICABLE, THE RETAINING WALL INSTALLATION SHALL BE IN ACCORDANCE WITH THE PROVIDED TREE RETAINING WALL DETAIL.

SOIL PREPARATION AND MULCH NOTES:

- LANDSCAPE CONTRACTOR SHALL OBTAIN A SOIL TEST OF THE IN SITU TOPSOIL BY A CERTIFIED SOIL LABORATORY PRIOR TO PLANTING. LANDSCAPE CONTRACTOR SHALL ALLOW FOR A TWO WEEK TURNAROUND TIME FROM SUBMITTAL OF SAMPLE TO NOTIFICATION OF RESULTS.
- BASED ON SOIL TEST RESULTS, ADJUST THE RATES OF LIME AND FERTILIZER THAT SHALL BE MIXED INTO THE TOP SIX INCHES (6") OF TOPSOIL. THE LIME AND FERTILIZER RATES PROVIDED WITHIN THE "SEE SPECIFICATION" IS APPROXIMATE AND FOR BIDDING PURPOSES ONLY. IF ADDITIONAL AMENDMENTS ARE NECESSARY, ADJUST THE TOPSOIL AS FOLLOWS:
 - MODIFY HEAVY CLAY OR SILT SOILS (MORE THAN 40% CLAY OR SILT) BY ADDING COMPOSTED PINE BARK (UP TO 30% BY VOLUME) OR GYPSUM.
 - MODIFY EXTREMELY SANDY SOILS (MORE THAN 85%) BY ADDING ORGANIC MATTER AND/OR DRY, SHREDDED CLAY LOAM UP TO 30% OF THE TOTAL MIX.
- TOPSOIL SHALL BE FERTILE, FRIABLE, NATURAL, TOPSOIL OF LOAMING CHARACTER, WITHOUT ADMIXTURE OF SUBSOIL MATERIAL OBTAINED FROM A VULCANIC OR DRAINAGE AREA, FREE FROM ALL CLAY, LUMPS, COARSE SAND, STONES, STICKS, AND OTHER FOREIGN MATERIAL GREATER THAN ONE INCH (1").
- TOPSOIL SHALL HAVE A PH RANGE OF 5.0-7.0 AND SHALL NOT CONTAIN LESS THAN 6% ORGANIC MATTER BY WEIGHT.
- OBTAIN TOPSOIL ONLY FROM LOCAL SOURCES OR FROM AREAS HAVING SIMILAR SOIL CHARACTERISTICS TO THAT FOUND AT THE PROJECT SITE.
- CONTRACTOR SHALL PROVIDE A SIX INCH (6") DEEP LAYER OF TOPSOIL IN ALL PLANTING AREAS. TOPSOIL SHALL BE SPREAD OVER A PREPARED SURFACE IN A UNIFORM LAYER TO ACHIEVE THE DESIRED COMPACTED THICKNESS. THE SPREADING OF TOPSOIL SHALL NOT BE CONDUCTED UNDER MUDDY OR FROZEN SOIL CONDITIONS.
- UNLESS OTHERWISE NOTED IN THE CONTRACT, THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF TOPSOIL AND THE ESTABLISHMENT OF FINE GRADING WITHIN THE DISTURBED AREA OF THE SITE.
- LANDSCAPE CONTRACTOR SHALL VERIFY THAT THE SUB-GRADE ELEVATION MEETS THE FINISHED GRADE ELEVATION (LESS THE REQUIRED TOPSOIL), IN ACCORDANCE WITH THE APPROVED OR FINAL GRADING PLAN.
- ALL LAWN AND PLANTING AREAS SHALL BE GRADED TO A SMOOTH, EVEN AND UNIFORM PLANE WITH NO ABRUPT CHANGE OF SURFACE AS DEPICTED WITHIN THE APPROVED OR FINAL CONSTRUCTION SET UNLESS OTHERWISE DIRECTED BY THE PROJECT LANDSCAPE DESIGNER OR MUNICIPAL OFFICIAL.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER SURFACE AND SUBSURFACE PAVED DRAINAGE PRIOR TO THE INSTALLATION OF PLANTINGS. IF POOR DRAINAGE CONDITIONS EXIST, CORRECTIVE ACTION SHALL BE TAKEN PRIOR TO INSTALLATION. ALL PLANTING AND LAWN AREAS SHALL BE GRADED AND MAINTAINED TO ALLOW A FREE FLOW OF SURFACE WATER.
- DOUBLE SHREDDED HARDWOOD MULCH OR APPROVED EQUAL, SHALL BE USED AS A THREE INCH (3") TOP DRESSING IN ALL SHRUB PLANTING BEDS AND AROUND ALL TREES PLANTED BY LANDSCAPE CONTRACTOR. GROUND COVER, PERENNIAL, AND ANNUAL PLANTING BEDS SHALL BE MULCHED WITH A TWO INCH (2") TOP DRESSING. SINGLE TREES OR SHRUBS SHALL BE MULCHED TO AVOID CONTACT WITH TRUNK OR PLANT STEM. MULCH SHALL BE OF SUFFICIENT CHARACTER AS NOT TO BE EASILY DISPLACED BY WIND OR WATER RUNOFF.
- WHENEVER POSSIBLE, THE SOIL PREPARATION AREA SHALL BE CONNECTED FROM PLANTING TO PLANTING.
- SOIL SHALL BE LOOSENED WITH A BACKHOE OR OTHER LARGE COARSE-TILING EQUIPMENT UNLESS THE SOIL IS FROZEN OR EXCESSIVELY WET. TILING THAT PRODUCES LARGE COARSE CHUNKS OF SOIL IS PREFERABLE TO TILING THAT RESULTS IN FINE GRAINS UNIFORM IN TEXTURE. AFTER THE AREA IS LOOSENED IT SHALL NOT BE DRIVEN OVER BY ANY VEHICLE.
- APPLY PRE-EMERGENT WEED CONTROL TO ALL PLANT BEDS PRIOR TO MULCHING. ENSURE COMPATIBILITY BETWEEN PRODUCT AND PLANT MATERIAL.
- ALL PLANTING SOIL SHALL BE AMENDED WITH THE FOLLOWING:
 - MYCRO® TREE SAVER - A DRY GRANULAR MYCORRHIZAL FUNGI INOCULANT THAT IS MIXED IN THE BACKFILL WHEN PLANTING TREES AND SHRUBS. IT CONTAINS SPORES OF BOTH ECTOMYCORRHIZAL AND VA MYCORRHIZAL FUNGI (VAM), BENEFICIAL RHIZOSPHERE BACTERIA, TERRA-SORB SUPERABSORBENT HYDROGEL TO REDUCE WATER LEACHING, AND SELECTED ORGANIC MICROBIAL TRIFENTS.
 - DIRECTIONS FOR USE: 3-OZ PER EACH FOOT DIAMETER OF THE ROOT BALL, OR 3-OZ PER INCH CALIPER. MIX INTO THE BACKFILL WHEN TRANSPLANTING TREES AND SHRUBS. MIX PRODUCT IN A RING-SHAPED VOLUME OF SOIL AROUND THE UPPER PORTION OF THE ROOT BALL, EXTENDING FROM THE SOIL SURFACE TO A DEPTH OF ABOUT 8 INCHES, AND EXTENDING OUT FROM THE TRUNK ABOUT 8 INCHES INTO THE BACKFILL. APPLY WATER TO SOIL SATURATION.
 - MYCRO® TREE SAVERS IS EFFECTIVE FOR ALL TREE AND SHRUB SPECIES EXCEPT RHODODENDRONS, AZALEAS, AND MOUNTAIN LAUREL, WHICH REQUIRE ERICOID MYCORRHIZAE.
 - SOIL PH: THE FUNGI IN THIS PRODUCT WERE CHOSEN BASED ON THEIR ABILITY TO SURVIVE AND COLONIZE PLANT ROOTS IN A PH RANGE OF 4.5 TO 9.
 - FUNGICIDES: THE USE OF CERTAIN FUNGICIDES CAN HAVE A DETRIMENTAL EFFECT ON THE INOCULATION PROGRAM. SOIL APPLICATION OF ANY FUNGICIDE IS NOT RECOMMENDED FOR TWO WEEKS AFTER APPLICATION.
 - OTHER PESTICIDES: HERBICIDES AND INSECTICIDES DO NOT NORMALLY INTERFERE WITH MYCORRHIZAL FUNGAL DEVELOPMENT, BUT MAY INHIBIT THE GROWTH OF SOME TREE AND SHRUB SPECIES IF NOT USED PROPERLY.

HEALTHY START MACRO TABS 12-8-8

- FERTILIZER TABLETS ARE PLACED IN THE UPPER 4 INCHES OR BACKFILL SOIL WHEN PLANTING TREES AND SHRUBS.
- TABLETS ARE FORMULATED FOR 12 MONTH RELEASE, GRADATION, AND LAST UP TO 2 YEARS AFTER PLANTING. TABLETS CONTAIN 12-8-8 NPK FERTILIZER, AS WELL AS A MINIMUM OF SEVEN PERCENT (7%) HUMIC ACID BY WEIGHT, MICROBIAL NUTRIENTS DERIVED FROM SEA KELP, PROTEIN BYPRODUCTS, AND YUCCA SCHIDIGERA, AND A COMPLEMENT OF BENEFICIAL RHIZOSPHERE BACTERIA. THE STANDARD 21 GRAM TABLET IS SPECIFIED HERE. DIRECTIONS FOR USE: FOR PLANTING BALLED & BURLAPPED (B&B) TREES AND SHRUBS, MEASURE THE THICKNESS OF THE TRUNK AND USE ABOUT 1 TABLET (21-G) PER HALF-INCH. PLACE THE TABLETS DIRECTLY NEXT TO THE ROOT BALL, EVENLY DISTRIBUTED AROUND ITS PERIMETER, AT A DEPTH OF ABOUT 4 INCHES.

SIZE AT PLANTING	IRRIGATION FOR VITALITY	IRRIGATION FOR SURVIVAL
< 2" CALIPER	DAILY FOR TWO WEEKS, EVERY OTHER DAY FOR TWO MONTHS, WEEKLY UNTIL ESTABLISHED	TWO TO THREE TIMES WEEKLY FOR TWO TO THREE MONTHS
2"-4 CALIPER	DAILY FOR ONE MONTH, EVERY OTHER DAY FOR THREE MONTHS, WEEKLY UNTIL ESTABLISHED	TWO TO THREE TIMES WEEKLY FOR THREE TO FOUR MONTHS
4"-6 CALIPER	DAILY FOR SIX WEEKS, EVERY OTHER DAY FOR FIVE MONTHS, WEEKLY UNTIL ESTABLISHED	TWICE WEEKLY FOR FOUR TO FIVE MONTHS

- TABLE NOTES:
- AT EACH IRRIGATION, APPLY TWO TO THREE GALLONS PER INCH TRUNK CALIPER TO THE ROOT BALL SURFACE. APPLY IT IN A MANNER SO ALL WATER SOAKS THE ENTIRE ROOT BALL. DO NOT WATER IF ROOT BALL IS WET/SATURATED ON THE IRRIGATION DAY.
 - WHEN IRRIGATING FOR VITALITY, DELETE DAILY IRRIGATION WHEN PLANTING IN WINTER OR WHEN PLANTING IN COOL CLIMATES. ESTABLISHMENT TAKES THREE TO FOUR MONTHS PER INCH TRUNK CALIPER. NEVER APPLY IRRIGATION IF THE SOIL IS SATURATED.
 - WHEN IRRIGATING FOR SURVIVAL, TREES TAKE MUCH LONGER TO ESTABLISH THAN REGULARLY IRRIGATED TREES. IRRIGATION MAY BE REQUIRED IN THE NORMAL, HOT, DRY PORTIONS OF THE FOLLOWING YEAR.

PLANT QUALITY AND HANDLING NOTES:

- ALL PLANT MATERIAL SHALL CONFORM TO THE AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z601-2004) OR LATEST REVISION AS PUBLISHED BY THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION.
- IN ALL CASES, BOTANICAL NAMES LISTED WITHIN THE APPROVED OR FINAL PLANT LIST SHALL TAKE PRECEDENCE OVER COMMON NAMES.
- ALL PLANTS SHALL BE OF SELECTED SPECIMEN QUALITY, EXCEPTIONALLY HEAVY, TIGHTLY KNIT, SO TRAINED OR FAVORED IN THEIR DEVELOPMENT AND APPEARANCE AS TO BE SUPERIOR IN FORM, NUMBER OF BRANCHES, COMPACTNESS AND SYMMETRY. ALL PLANTS SHALL HAVE A NORMAL HABIT OR SOUND, HEALTHY, VIGOROUS PLANTS WITH WELL DEVELOPED ROOT SYSTEM. PLANTS SHALL BE FREE OF DISEASE, INSECT PESTS, EGGS OR LARVAE.
- PLANTS SHALL NOT BE PRUNED BEFORE DELIVERY. TREES WITH ABRASION OF THE BARK, SUNSCALDS, DEVELOPING KNOTS OR FRESH CUTS OF LIMBS OVER ONE AND ONE-FOURTH INCHES (1-1/4") WHICH HAVE NOT COMPLETELY CALLOUSED SHALL BE REJECTED.
- ALL PLANTS SHALL BE TYPICAL OF THEIR SPECIES OR VARIETY AND SHALL HAVE A NORMAL HABIT OF GROWTH AND BE LEGIBLY TAGGED WITH THE PROPER NAME AND SIZE.
- THE ROOT SYSTEM OF EACH PLANT SHALL BE WELL PROVIDED WITH FIBROUS ROOTS. ALL PARTS SHALL BE SOUND, HEALTHY, VIGOROUS, WELL-BRANCHED AND DENSELY FOLIATED WHEN IN LEAF.
- ALL PLANTS DESIGNATED BALL AND BURLAP (B&B) MUST BE MOVED WITH THE ROOT SYSTEM AS SOLID UNITS WITH BALLS OF EARTH FIRMLY WRAPPED WITH BURLAP. THE DIAMETER AND DEPTH OF THE BALLS OF EARTH MUST BE SUFFICIENT TO ENCOMPASS THE FIBROUS ROOT FEEDING SYSTEMS NECESSARY FOR THE HEALTHY DEVELOPMENT OF THE PLANT. NO PLANT SHALL BE ACCEPTED WHEN THE BALL OF EARTH SURROUNDING ITS ROOTS HAS BEEN BADLY CRACKED OR BROKEN PREPARATORY TO OR DURING THE PROCESS OF PLANTING. THE BALLS SHALL REMAIN INTACT DURING ALL OPERATIONS. ALL PLANTS THAT CANNOT BE PLANTED AT ONCE MUST BE HELED-IN BY SETTING IN THE GROUND AND COVERING THE BALLS WITH SOIL OR MULCH AND THEN WATERING. HEMP BURLAP AND TWINE IS PREFERABLE TO TREATED. IF TREATED BURLAP IS USED, ALL TWINE IS TO BE CUT FROM AROUND THE TRUNK AND ALL BURLAP IS TO BE REMOVED.
- ALL PLANTS TRANSPORTED TO THE PROJECT IN OPEN VEHICLES SHALL BE COVERED WITH TARPS OR OTHER SUITABLE COVERS SECURELY FASTENED TO THE BODY OF THE VEHICLE TO PREVENT INJURY TO THE PLANTS. CLOSED VEHICLES SHALL BE ADEQUATELY VENTILATED TO PREVENT OVERHEATING OF THE PLANTS. EVIDENCE OF INADEQUATE PROTECTION FOLLOWING DIGGING, CARELESSNESS WHILE IN TRANSIT, OR IMPROPER HANDLING OR STORAGE SHALL BE CAUSE FOR REJECTION OF PLANT MATERIAL. ALL PLANTS SHALL BE KEPT MOIST, FRESH AND PROTECTED. SUCH PROTECTION SHALL ENCOMPASS THE ENTIRE PERIOD DURING WHICH THE PLANTS ARE IN TRANSIT, BEING HANDLED, OR ARE IN TEMPORARY STORAGE.
- ALL PLANT MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH THE CORRESPONDING LANDSCAPE PLAN AND PLANTING SPECIFICATIONS.
- LANDSCAPE CONTRACTOR SHALL MAKE BEST EFFORT TO INSTALL PLANTINGS ON THE SAME DAY AS DELIVERY. IF PLANTS ARE NOT PLANTED IMMEDIATELY ON SITE, PROPER CARE SHALL BE TAKEN TO PLACE THE PLANTINGS IN PARTIAL SHADE WHEN POSSIBLE. THE ROOT BALL SHALL BE KEPT MOIST AT ALL TIME AND COVERED WITH MOISTENED MULCH OR AGED MULCH. PROPER IRRIGATION SHALL BE SUPPLIED SO AS NOT TO ALLOW THE ROOT BALL TO DRY OUT. PLANTINGS SHALL BE UNTIED AND PROPER SPACING SHALL BE ALLOTTED FOR AIR CIRCULATION AND TO PREVENT DISEASE, WILTING, AND LEAF LOSS. PLANTS THAT REMAIN UNPLANTED FOR A PERIOD OF TIME GREATER THAN THREE (3) DAYS SHALL BE HEALED IN WITH TOPSOIL OR MULCH AND WATERED AS REQUIRED TO PRESERVE ROOT MOISTURE.
- NO PLANT MATERIAL SHALL BE PLANTED IN MUDDY OR FROZEN SOIL.
- PLANTS WITH INJURED ROOTS OR BRANCHES SHALL BE PRUNED PRIOR TO PLANTING UTILIZING CLEAN, SHARP TOOLS. ONLY DISEASED OR INJURED PLANTS SHALL BE REMOVED.
- IF ROCK OR OTHER UNDERGROUND OBSTRUCTION IS ENCOUNTERED, THE LANDSCAPE DESIGNER RESERVES THE RIGHT TO RELOCATE OR ENLARGE PLANTING LOCATIONS. PLANTS SHALL BE LIMBED AND MAINTAINED TO A HEIGHT OF EIGHT FEET (8') ABOVE GRADE, AND SHRUBS, GROUND COVER, PERENNIALS, AND ANNUALS SHALL BE MAINTAINED TO A HEIGHT NOT TO EXCEED TWO FEET (2') ABOVE GRADE UNLESS OTHERWISE NOTED OR SPECIFIED BY THE GOVERNING MUNICIPALITY OR AGENCY.
- INSTALLATION SHALL OCCUR DURING THE FOLLOWING SEASONS:
 - PLANTS (MARCH 15 - JUNE 15 OR SEPTEMBER 1 - DECEMBER 1)
 - THE FOLLOWING TREES ARE SUSCEPTIBLE TO TRANSPLANT SHOCK AND SHALL NOT BE PLANTED DURING THE FALL SEASON (STARTING SEPTEMBER 15):
 - ABIES CONCOLOR
 - ACER BURGERSIANUM
 - ACER FRAXINIFOLIUM
 - ACER RUBRUM
 - ACER SACCHARINUM
 - BETULA VARIETIES
 - CARPINUS VARIETIES
 - CEDRUS DEODARA
 - CELTIS VARIETIES
 - CERCIDIPHYLLUM VARIETIES
 - CORNUS VARIETIES
 - CRATAEGUS VARIETIES
 - CORNUS VARIETIES
 - CRATAEGUS VARIETIES
 - NYSSA SYLVATICA
 - OSTRYA VIRGINIANA
 - PINUS NIGRA
 - PLATANUS VARIETIES
 - POPULUS VARIETIES
 - PRUNUS VARIETIES
 - PYRUS VARIETIES
 - QUERCUS VARIETIES (NOT Q. PALUSTRIS)
 - SALIX WEeping VARIETIES
 - SORBUS VARIETIES
 - TAXODIUM VARIETIES
 - TAXUS CANADENSIS
 - LIRODENDRON VARIETIES
 - MALUS IN LEAF
 - ULMUS PARVIFOLIA VARIETIES
 - ZELKOVA VARIETIES
- IF A PROPOSED PLANT IS UNATTAINABLE OR ON THE FALL DIGGING HAZARD LIST, AN EQUIVALENT SPECIES OF THE SAME SIZE MAY BE REQUESTED FOR SUBSTITUTION OF THE ORIGINAL PLANT. ALL SUBSTITUTIONS SHALL BE APPROVED BY THE PROJECT LANDSCAPE DESIGNER OR MUNICIPAL OFFICIAL PRIOR TO ORDERING AND INSTALLATION.
- DURING THE COURSE OF CONSTRUCTION/PLANT INSTALLATION, EXCESS AND WASTE MATERIALS SHALL BE CONTINUOUSLY AND PROMPTLY REMOVED AT THE END OF EACH WORK DAY. ALL DEBRIS, MATERIALS, AND TOOLS SHALL BE PROPERLY STORED, STOCKPILED OR DISPOSED OF AND ALL PAVED AREAS SHALL BE CLEANED.
- LANDSCAPE CONTRACTOR SHALL DISPOSE OF ALL RUBBISH AND EXCESS SOIL AT HIS EXPENSE TO AN OFF-SITE LOCATION AS APPROVED BY THE LOCAL MUNICIPALITY.
- 90-DAY MAINTENANCE PERIOD SHALL BEGIN IMMEDIATELY AFTER ALL PLANTS HAVE BEEN SATISFACTORILY INSTALLED.
- MAINTENANCE SHALL INCLUDE, BUT NOT BE LIMITED TO, REPLACING MULCH THAT HAS BEEN DISPLACED BY EROSION OR OTHER MEANS, REPAIRING AND RESHAPING WATER RINGS OR SAUCERS, MAINTAINING STAKES AND GUY'S IF ORIGINALLY REQUIRED, WATERING WHEN NEEDED OR DIRECTED, WEEDING, PRUNING, SPRAYING, FERTILIZING, MOWING THE LAWN, AND PERFORMING ANY OTHER WORK REQUIRED TO KEEP THE PLANTS IN A HEALTHY CONDITION.
- MOW ALL GRASS AREAS AT REGULAR INTERVALS TO KEEP THE GRASS HEIGHT FROM EXCEEDING THREE INCHES (3"). MOWING SHALL BE PERFORMED ONLY WHEN GRASS IS DRY. MOWER BLADE SHALL BE SET TO REMOVE NO MORE THAN ONE THIRD (1/3) OF THE GRASS LENGTH. WHEN THE AMOUNT OF GRASS IS HEAVY, IT SHALL BE REMOVED TO PREVENT DESTRUCTION OF THE UNDERLYING TURF. MOW GRASS AREAS IN SUCH A MANNER AS TO PREVENT CLIPPINGS FROM BLOWING ON PAVED AREAS, AND SIDEWALKS. CLEANUP AFTER MOWING SHALL INCLUDE SWEEPING OR BLOWING OF PAVED AREAS AND SIDEWALKS TO CLEAR THEM FROM MOWING DEBRIS.
- GRASSED AREAS DAMAGED DURING THE PROCESS OF THE WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, WHO SHALL RESTORE THE DISTURBED AREAS TO A CONDITION SATISFACTORY TO THE PROJECT LANDSCAPE DESIGNER, MUNICIPAL OFFICIAL, OR OWNER/OWNER'S REPRESENTATIVE. THIS MAY INCLUDE FILLING TO GRADE, FERTILIZING, SEEDING, AND MULCHING.
- SHOULD THE OWNER REQUIRE MAINTENANCE BEYOND THE STANDARD 90-DAY MAINTENANCE PERIOD, A SEPARATE CONTRACT SHALL BE ESTABLISHED.
- LANDSCAPE CONTRACTOR SHALL WATER NEW PLANTINGS FROM TIME OF INSTALL AND THROUGHOUT REQUIRED 90-DAY MAINTENANCE PERIOD UNTIL PLANTS ARE ESTABLISHED. IF ON-SITE WATER IS NOT AVAILABLE AT THE PROJECT LOCATION, THE LANDSCAPE CONTRACTOR SHALL FURNISH BY MEANS OF A WATERING TRUCK OR OTHER ACCEPTABLE MANNER.
- THE QUANTITY OF WATER APPLIED AT ONE TIME SHALL BE SUFFICIENT TO PENETRATE THE SOIL TO A MINIMUM OF EIGHT INCHES (8") IN SHRUB BEDS AND SIX INCHES (6") IN TURF AREAS AT A RATE WHICH WILL PREVENT SATURATION OF THE SOIL.
- IF AN AUTOMATIC IRRIGATION SYSTEM HAS BEEN INSTALLED, IT CAN BE USED FOR WATERING PLANT MATERIAL. HOWEVER, FAILURE OF THE SYSTEM DOES NOT ELIMINATE THE LANDSCAPE CONTRACTOR'S RESPONSIBILITY OF PLANT HEALTH AND ESTABLISHMENT.

CRATAEGUS VARIETIES	CORNUS VARIETIES	OSTRYA VIRGINIANA
CRATAEGUS VARIETIES	CORNUS VARIETIES	PINUS NIGRA
CRATAEGUS VARIETIES	CRATAEGUS VARIETIES	PLATANUS VARIETIES
CRATAEGUS VARIETIES	CRATAEGUS VARIETIES	POPULUS VARIETIES
CRATAEGUS VARIETIES	CRATAEGUS VARIETIES	PRUNUS VARIETIES
CRATAEGUS VARIETIES	CRATAEGUS VARIETIES	PYRUS VARIETIES
CRATAEGUS VARIETIES	CRATAEGUS VARIETIES	QUERCUS VARIETIES (NOT Q. PALUSTRIS)
CRATAEGUS VARIETIES	CRATAEGUS VARIETIES	SALIX WEeping VARIETIES
CRATAEGUS VARIETIES	CRATAEGUS VARIETIES	SORBUS VARIETIES
CRATAEGUS VARIETIES	CRATAEGUS VARIETIES	TAXODIUM VARIETIES
CRATAEGUS VARIETIES	CRATAEGUS VARIETIES	TAXUS CANADENSIS
CRATAEGUS VARIETIES	CRATAEGUS VARIETIES	LIRODENDRON VARIETIES
CRATAEGUS VARIETIES	CRATAEGUS VARIETIES	MALUS IN LEAF
CRATAEGUS VARIETIES	CRATAEGUS VARIETIES	ULMUS PARVIFOLIA VARIETIES
CRATAEGUS VARIETIES	CRATAEGUS VARIETIES	ZELKOVA VARIETIES

- THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL PLANT MATERIAL FOR A PERIOD OF ONE YEAR (1YR) FROM APPROVAL OF LANDSCAPE INSTALLATION BY THE PROJECT LANDSCAPE DESIGNER, MUNICIPAL OFFICIAL, OR OWNER/OWNER'S REPRESENTATIVE.
- THE LANDSCAPE CONTRACTOR SHALL REMOVE AND REPLACE DYING, DEAD, OR DEFECTIVE PLANT MATERIAL AT HIS EXPENSE. THE LANDSCAPE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR ANY DAMAGES CAUSED BY HIS COMPANY'S OPERATIONS.
- ALL REPLACEMENT PLANTS SHALL BE OF THE SAME SPECIES AND SIZE AS SPECIFIED ON THE APPROVED OR FINAL PLANT LIST. REPLACEMENTS RESULTING FROM REMOVAL, LOSS, OR DAMAGE DUE TO OCCUPANCY OF THE PROJECT IN ANY PART, VANDALISM, PHYSICAL DAMAGE BY ANIMALS, VEHICLES, ETC., AND LOSSES DUE TO CURTAILMENT OF WATER BY LOCAL AUTHORITIES SHALL BE APPROVED AND PAID FOR BY THE OWNER.
- THE CONTRACTOR SHALL INSTRUCT THE OWNER AS TO THE PROPER CARE AND MAINTENANCE OF ALL PLANTINGS.

PLANT MATERIAL GUARANTEE NOTES:

- SEED MIXTURE SHALL BE FRESH, CLEAN, NEW CROP SEED. SOD SHALL BE STRONGLY ROOTED, UNIFORM IN THICKNESS, AND FREE OF WEEDS, DISEASE, AND PESTS.
- SEED OR SOD SHALL BE PURCHASED FROM A RECOGNIZED DISTRIBUTOR AND SHALL BE COMPOSED OF THE MIX OR BLEND WITH THE PREPARED "SEE SPECIFICATION" OR "SOD SPECIFICATION".
- REFERENCE LANDSCAPE PLAN FOR AREAS TO BE SEEDED OR LAID WITH SOD.
- SEEDING SHALL NOT BE PERFORMED IN WINDY WEATHER. IF THE SEASON OF THE PROJECT COMPLETION PROHIBITS PERMANENT STABILIZATION, TEMPORARY STABILIZATION SHALL BE PROVIDED IN ACCORDANCE WITH THE TEMPORARY SEEDING SPECIFICATION.
- SEEDING SHALL BE PERFORMED IN LAWN AREAS AGAINST TRESPASSING WHILE THE SEED IS GERMINATING. FURNISH AND INSTALL FENCES, SIGNS, BARRIERS OR ANY OTHER NECESSARY TEMPORARY PROTECTIVE DEVICES. DAMAGE RESULTING FROM TRESPASS, EROSION, WASHOUT, SETTLEMENT OR OTHER CAUSES SHALL BE REPAIRED BY THE LANDSCAPE CONTRACTOR AT HIS EXPENSE. REMOVE ALL FENCES, SIGNS, BARRIERS OR OTHER TEMPORARY PROTECTIVE DEVICES ONCE LAWN HAS BEEN ESTABLISHED.

LAWN (SEED OR SOD) NOTES:

- SEED MIXTURE SHALL BE FRESH, CLEAN, NEW CROP SEED. SOD SHALL BE STRONGLY ROOTED, UNIFORM IN THICKNESS, AND FREE OF WEEDS, DISEASE, AND PESTS.
- SEED OR SOD SHALL BE PURCHASED FROM A RECOGNIZED DISTRIBUTOR AND SHALL BE COMPOSED OF THE MIX OR BLEND WITH THE PREPARED "SEE SPECIFICATION" OR "SOD SPECIFICATION".
- REFERENCE LANDSCAPE PLAN FOR AREAS TO BE SEEDED OR LAID WITH SOD.
- SEEDING SHALL NOT BE PERFORMED IN WINDY WEATHER. IF THE SEASON OF THE PROJECT COMPLETION PROHIBITS PERMANENT STABILIZATION, TEMPORARY STABILIZATION SHALL BE PROVIDED IN ACCORDANCE WITH THE TEMPORARY SEEDING SPECIFICATION.
- SEEDING SHALL BE PERFORMED IN LAWN AREAS AGAINST TRESPASSING WHILE THE SEED IS GERMINATING. FURNISH AND INSTALL FENCES, SIGNS, BARRIERS OR ANY OTHER NECESSARY TEMPORARY PROTECTIVE DEVICES. DAMAGE RESULTING FROM TRESPASS, EROSION, WASHOUT, SETTLEMENT OR OTHER CAUSES SHALL BE REPAIRED BY THE LANDSCAPE CONTRACTOR AT HIS EXPENSE. REMOVE ALL FENCES, SIGNS, BARRIERS OR OTHER TEMPORARY PROTECTIVE DEVICES ONCE LAWN HAS BEEN ESTABLISHED.

REVISION	DATE	DESCRIPTION
1	06/17/2024	REVISED PER PLANNING DEPARTMENT REVIEW #1
2	04/18/2024	SUBMISSION FOR PRELIMINARY SITE PLAN REVIEW
3	02/07/2024	SUBMISSION FOR PRE-APPLICATION MEETING

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PROPOSED CAR WASH

WHITEWATER EXPRESS CAR WASH

SITE DEVELOPMENT PLANS

PROPOSED CAR WASH

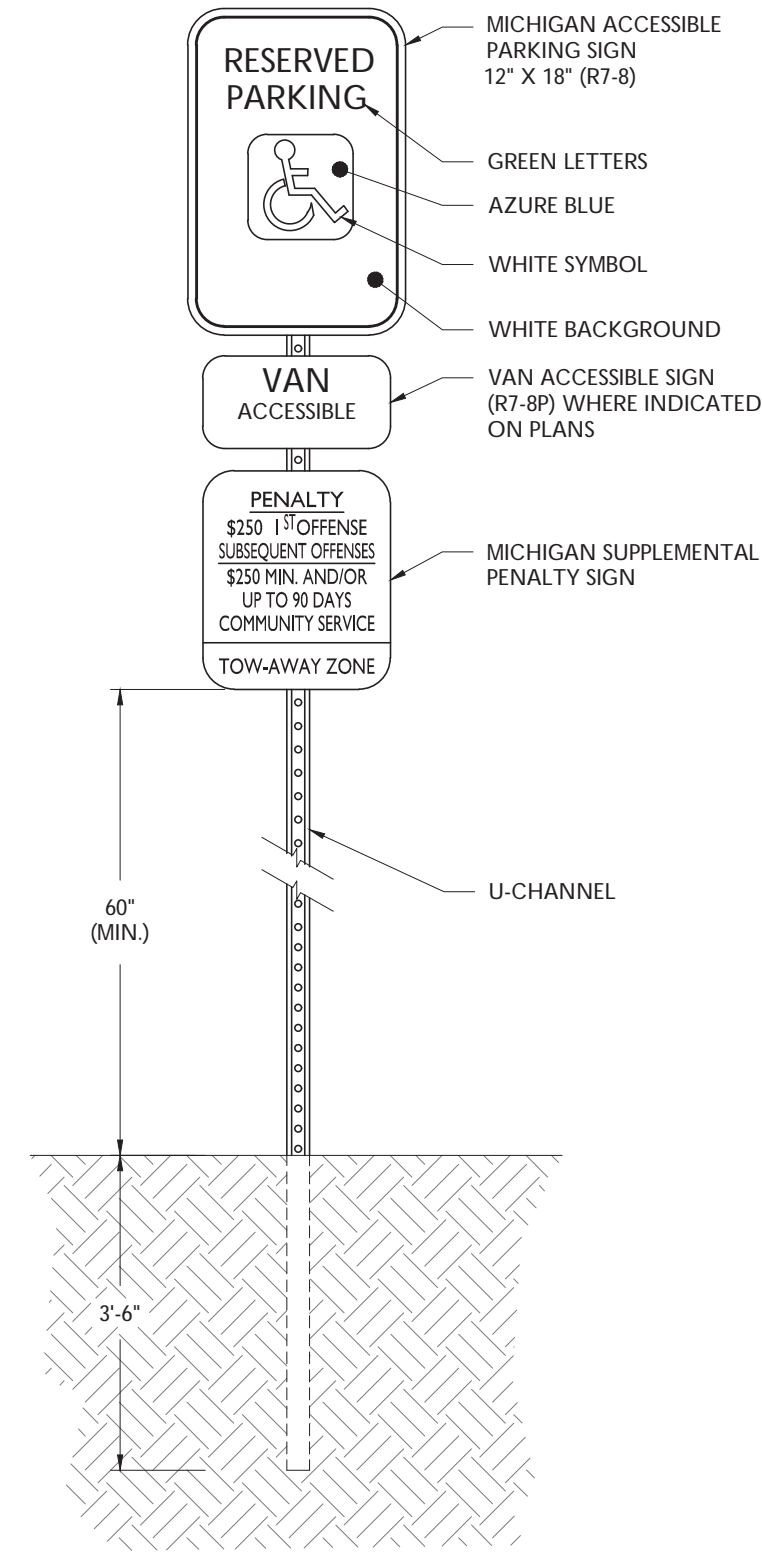
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CHARTER TOWNSHIP OF YPSILANTI
WASHINGTON COUNTY, MICHIGAN

STATE OF MICHIGAN
JONATHAN REED
COOKSEY
ENGINEER
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SCALE: AS SHOWN PROJECT ID: DET-230108.01

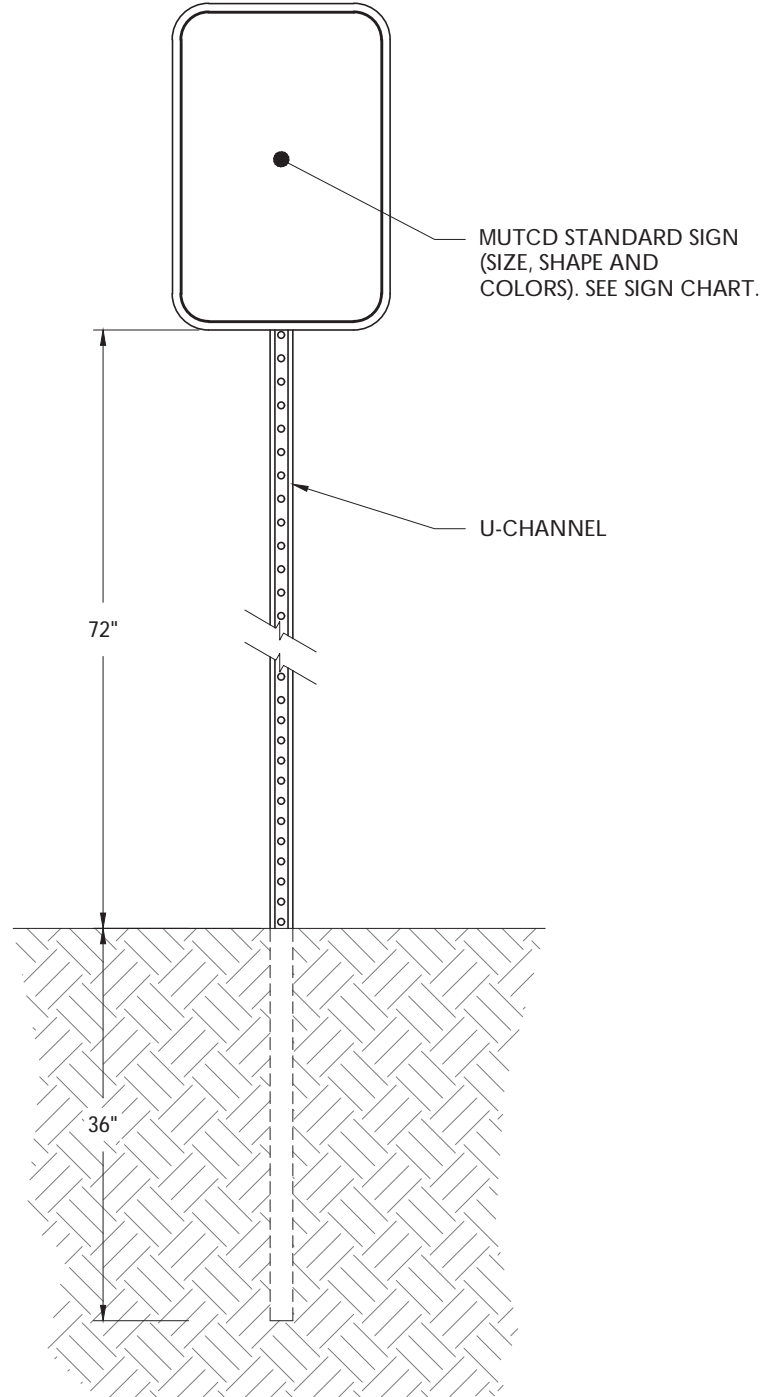
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ACCESSIBLE PARKING SIGN DETAIL

NOT TO SCALE

1



SIGN POST DETAIL

NOT TO SCALE

2

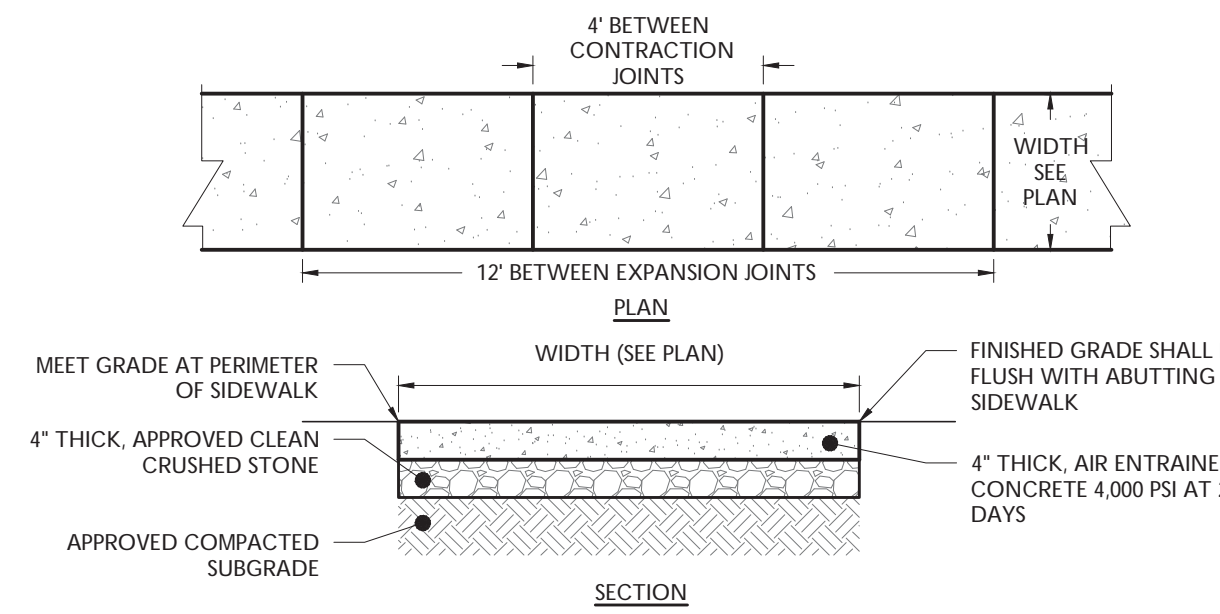
MUT.C.D. NUMBER	TEXT	COLOR		SIZE OF SIGN (WIDTH X HEIGHT)	TYPE OF MOUNT
		LEGEND	BACKGROUND		
STOP SIGN (R1-1)		WHITE	RED	36"x36"	GROUND
DO NOT ENTER (R5-1)		RED	WHITE	30"x30"	GROUND

NOTE:
 1. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE FEDERAL HIGHWAY ADMINISTRATION (FHWA) MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), EXCEPT AS NOTED.
 2. ALL SIGNS SHALL BE MOUNTED AS TO NOT OBSTRUCT THE SHAPE OF "STOP" (R1-1) AND "YIELD" (R1-2) SIGNS.

SIGN DATA TABLE

NOT TO SCALE

3

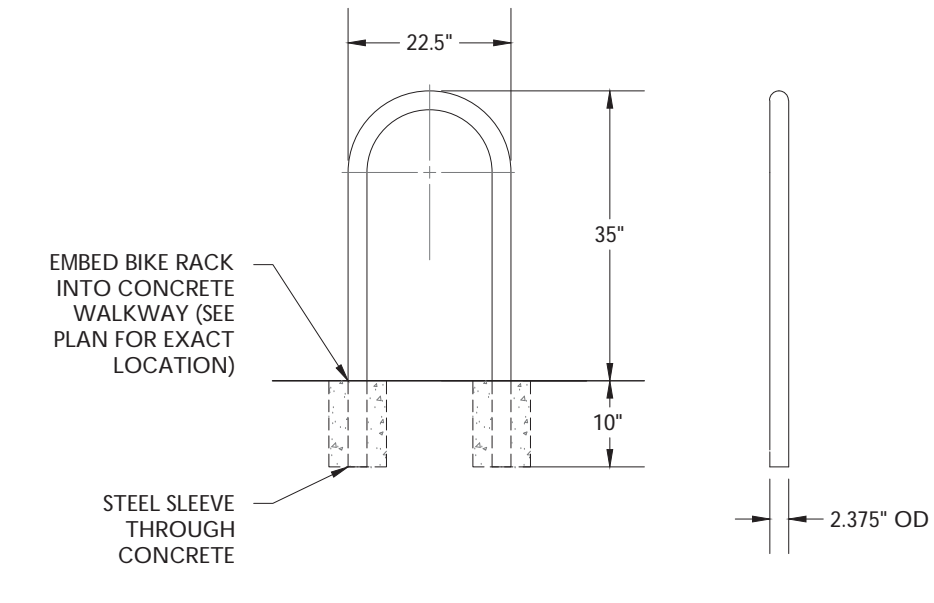


CONCRETE WALKWAY DETAIL

NOT TO SCALE

NOTES:
 1. MAXIMUM CROSS SLOPE SHALL BE 1/4" PER FOOT.
 2. 1/2" EXPANSION JOINTS SHALL BE PROVIDED AT 12' INTERVALS WITH PRE-MOLDED, BITUMINOUS JOINT FILLER, RECESSED 1/2" FROM THE SURFACE.
 3. 1" DEEP BY 1/2" WIDE, TOOLED CONTRACTION JOINTS SHALL BE PROVIDED AT 4' INTERVALS.
 4. EXPANSION JOINT SHALL BE PROVIDED WHERE ADJACENT TO A BUILDING.

5

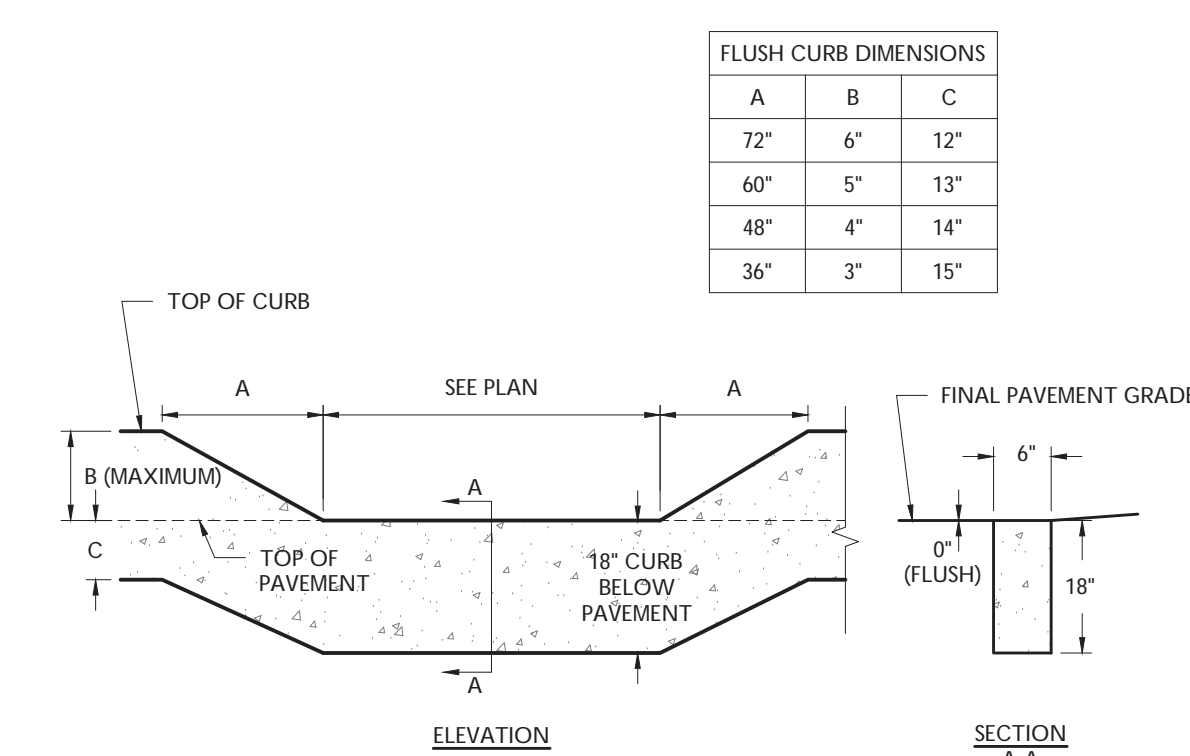


HOOP RACK HD IN GROUND MOUNTED BIKE RACK DETAIL

NOT TO SCALE

NOTES:
 1. BIKE RACK TO BE MANUFACTURED BY DERO BIKE RACKS OR APPROVED EQUAL.
 2. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS

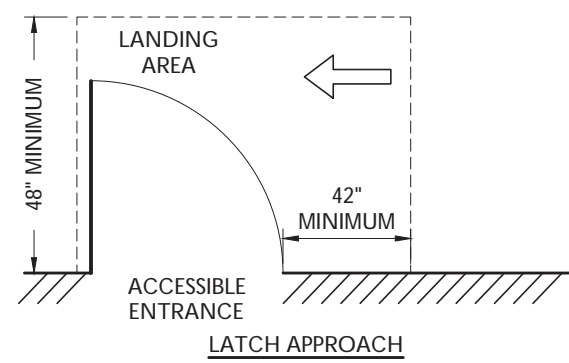
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FLUSH CURB DETAIL

NOT TO SCALE

6

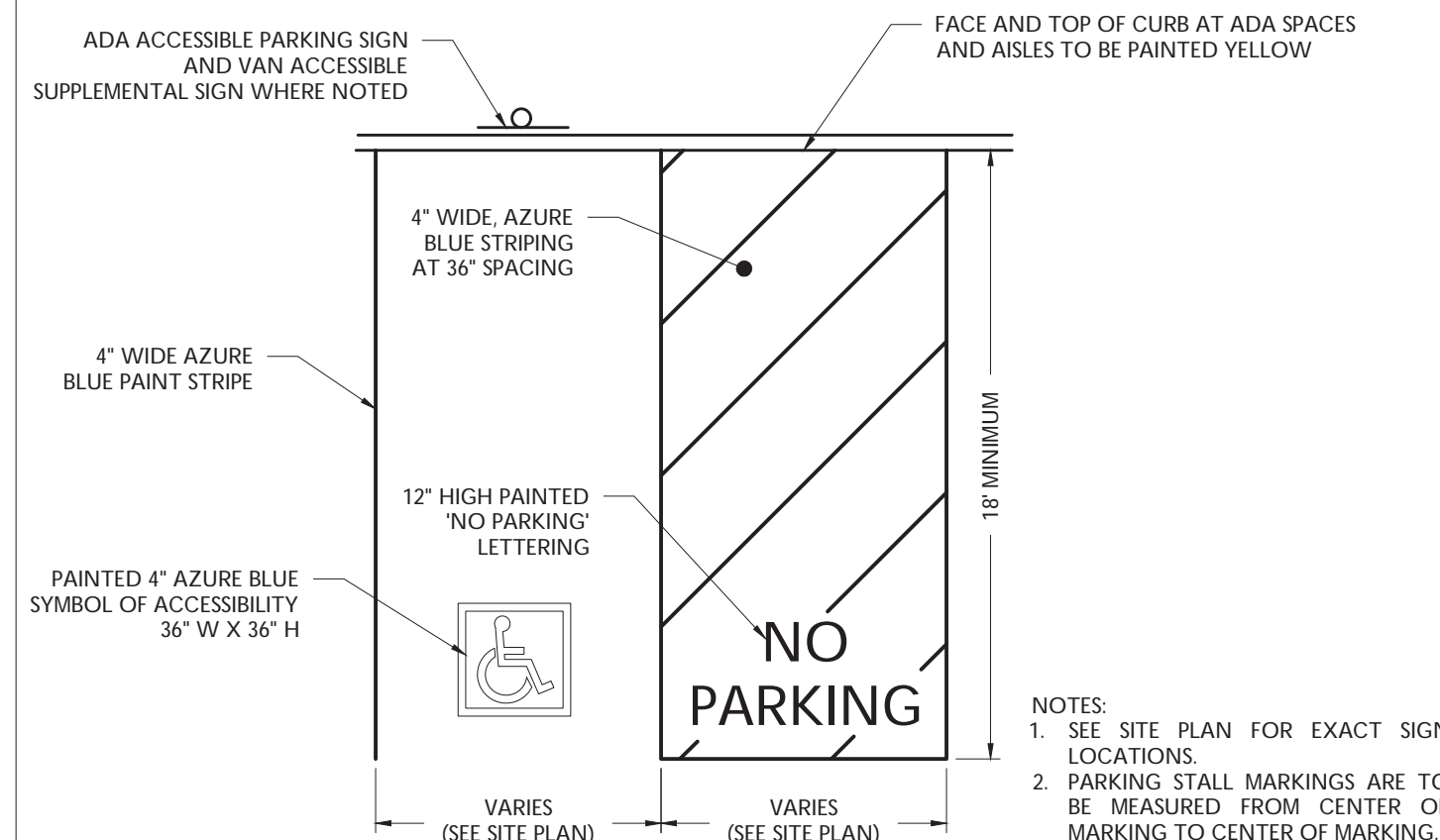


ACCESSIBLE ENTRANCE LANDING DETAIL

NOT TO SCALE

NOTES:
 1. MAXIMUM SLOPE ON LANDING SHALL BE 1:50 IN ALL DIRECTIONS.
 2. DIMENSIONS SHOWN HERE ARE THE MINIMUM DIMENSIONS REQUIRED FOR AN ADA COMPLIANT LANDING AT THE ACCESSIBLE ENTRANCE. REFER TO SITE PLAN FOR SITE SPECIFIC DIMENSIONS THAT MAY SPECIFY A LARGER LANDING AREA.
 3. CONTRACTOR SHALL CONTACT THE ENGINEER BEFORE CONSTRUCTION IF THE ACCESSIBLE ENTRANCE ON SITE DOES NOT MATCH THE SCENARIO SHOWN ABOVE.

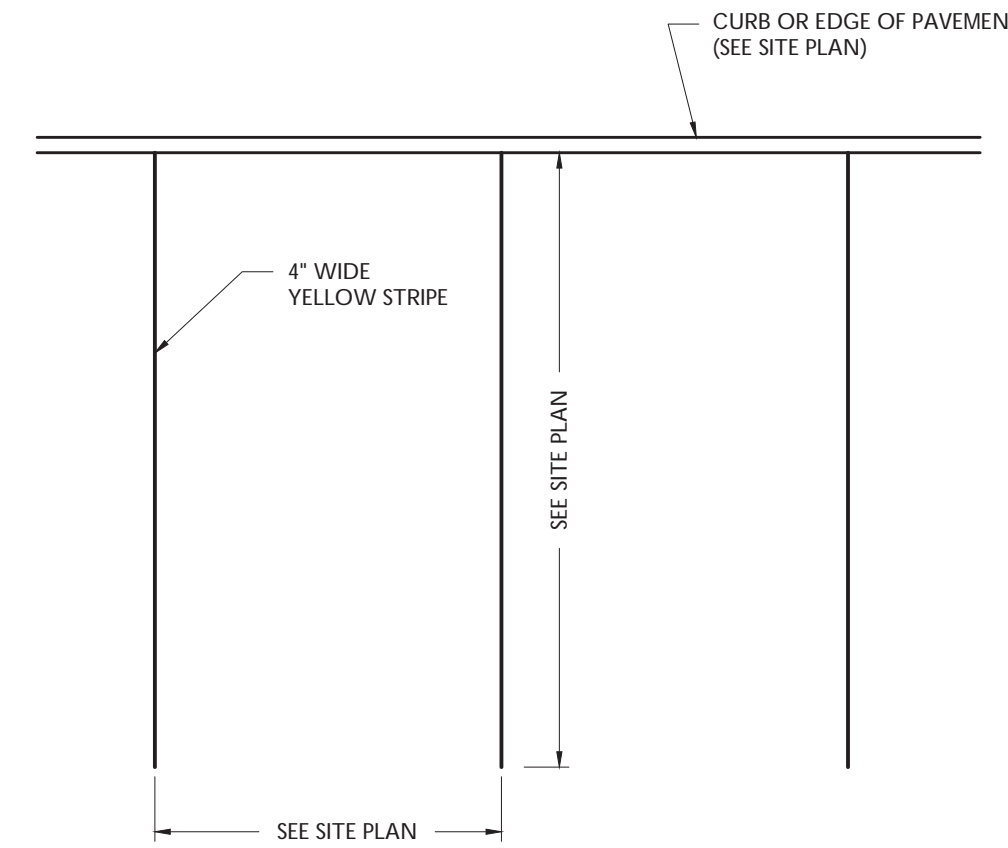
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ACCESSIBLE PARKING STALL MARKINGS

NOT TO SCALE

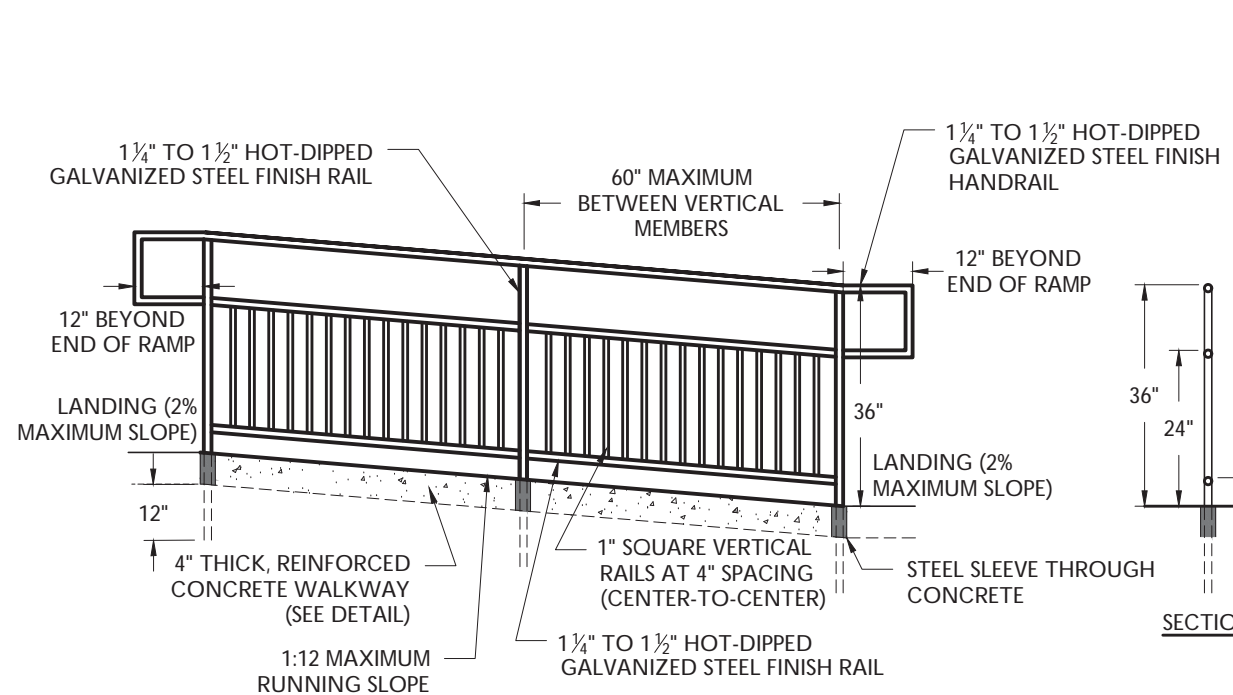
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PARKING STALL MARKINGS

NOT TO SCALE

9

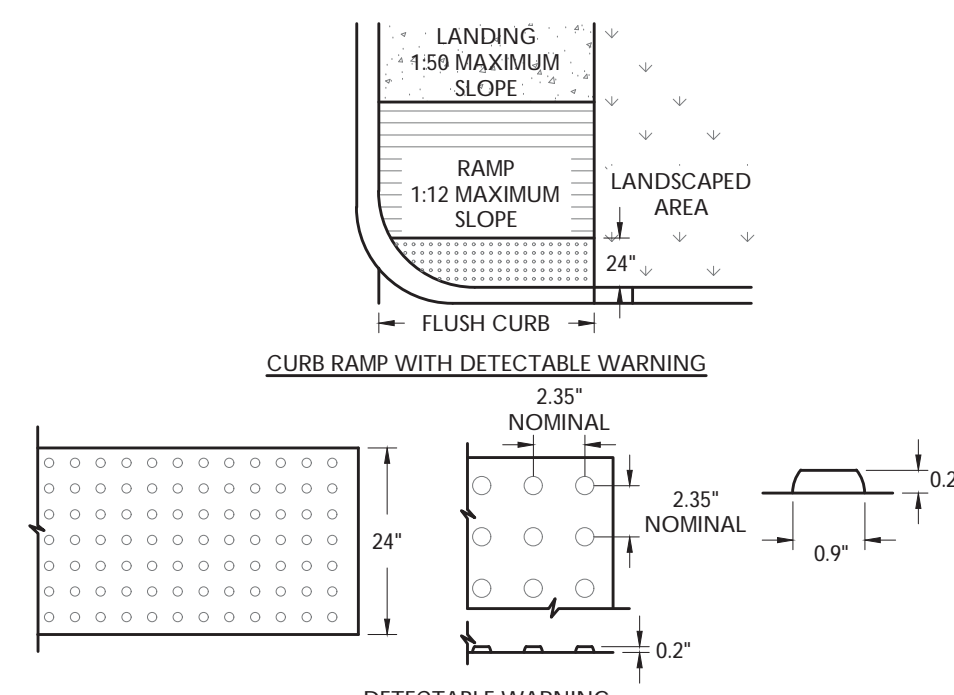


HANDRAIL DETAIL ON RAMP

NOT TO SCALE

NOTES:
 1. SEE PLAN FOR RAMP DIMENSIONS.
 2. GRIND ALL WELDS SMOOTH.
 3. HANDRAIL TO BE INSET 6" FROM EDGE OF CONCRETE.
 4. 30" MAXIMUM RISE IN ELEVATION BETWEEN LANDINGS.
 5. RAMP SHALL HAVE RAILINGS ON BOTH SIDES WITH 36" MINIMUM CLEARANCE BETWEEN RAILS.

11



CURB RAMP DETAIL

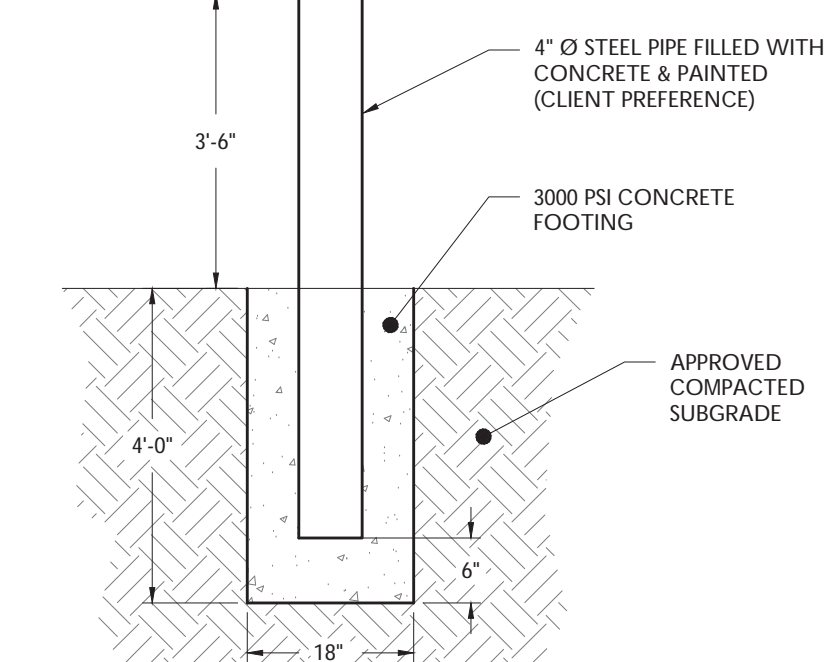
NOT TO SCALE

NOTES:
 1. CROSS SLOPE ON RAMP SHALL NOT EXCEED 2%.
 2. A FLUSH CURB SHALL HAVE A MINIMUM WIDTH OF 36". SEE PLAN FOR EXACT WIDTH.
 3. DOMES SHALL BE ALIGNED ON A SQUARE GRID IN THE PREDOMINANT DIRECTION OF TRAVEL TO PERMIT WHEELS TO ROLL BETWEEN DOMES.
 4. VISUAL CONTRAST: THERE SHALL BE A MINIMUM OF 70% CONTRAST IN LIGHT REFLECTANCE BETWEEN THE DETECTABLE WARNING AND AN ADJOINING SURFACE.
 5. DETECTABLE WARNING STRIP REQUIRED WHERE RAMP DIRECTS PEDESTRIAN TRAFFIC TOWARDS VEHICLE TRAVEL WAY. WARNING STRIP SHALL BE CAST-IN-PLACE.
 6. RAMP SHALL HAVE A MAXIMUM RISE OF 6" WITHOUT A HANDRAIL.

12

PAVEMENT STRIPING & MARKINGS NOTES:
 1. ALL SIGNING AND STRIPING IN EXISTING CONDITION IN CONFLICT WITH THE PROPOSED DESIGN PLAN SHALL BE REMOVED.
 2. ALL PROPOSED SIGNING AND STRIPING SHALL CONFORM TO THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION.
 3. PAVEMENT STRIPING AND MARKINGS SHALL BE INSTALLED IN CONFORMANCE WITH ALL APPLICABLE LOCAL, COUNTY AND STATE REQUIREMENTS.
 4. UNLESS OTHERWISE SPECIFIED, ALL STRIPING AND MARKINGS IN THE PUBLIC RIGHT-OF-WAY SHALL BE OF THERMOPLASTIC PAINT OR PREFORMED THERMOPLASTIC MARKINGS.
 5. UNLESS OTHERWISE SPECIFIED, ON SITE PARKING STALL STRIPING, FIRE LANE STRIPING AND DIRECTIONAL ARROWS SHALL BE EPOXY PAINT. ON SITE STOP BARS, "DO NOT ENTER" BARS, AND ASSOCIATED LETTERING SHALL BE THERMOPLASTIC PAINT OR PREFORMED THERMOPLASTIC MARKINGS.

13



BOLLARD DETAIL

NOT TO SCALE

14

NO.	DATE	ISSUE	BY	DESCRIPTION
3	06/11/2024	EM		REVISED PER PLANNING DEPARTMENT REVIEW #1
2	04/18/2024	EM/JF		SUBMISSION FOR PRELIMINARY SITE PLAN REVIEW
1	02/07/2024	ECM		SUBMISSION FOR PRE-APPLICATION MEETING

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PROPOSED CAR WASH

WHITEWATER EXPRESS CAR WASH

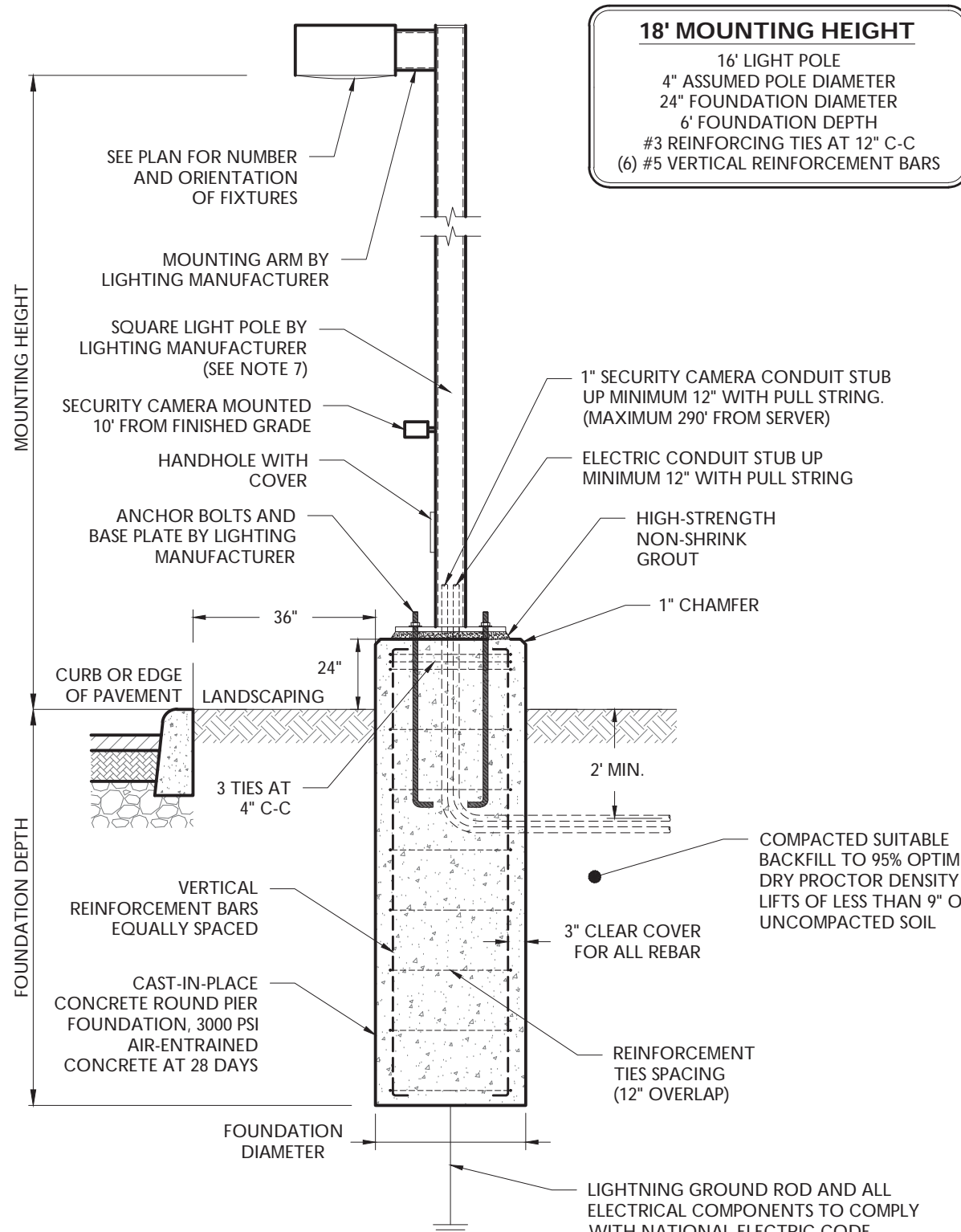
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 CHARTER TOWNSHIP OF YPSILANTI
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STATE OF MICHIGAN
 JONATHAN REID
 COOKSEY ENGINEER
 REGISTERED PROFESSIONAL ENGINEER
 LICENSE NO. 94087

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SCALE: AS SHOWN PROJECT ID: DET-230108.01
 TITLE: CONSTRUCTION DETAILS
 DRAWING: C-14

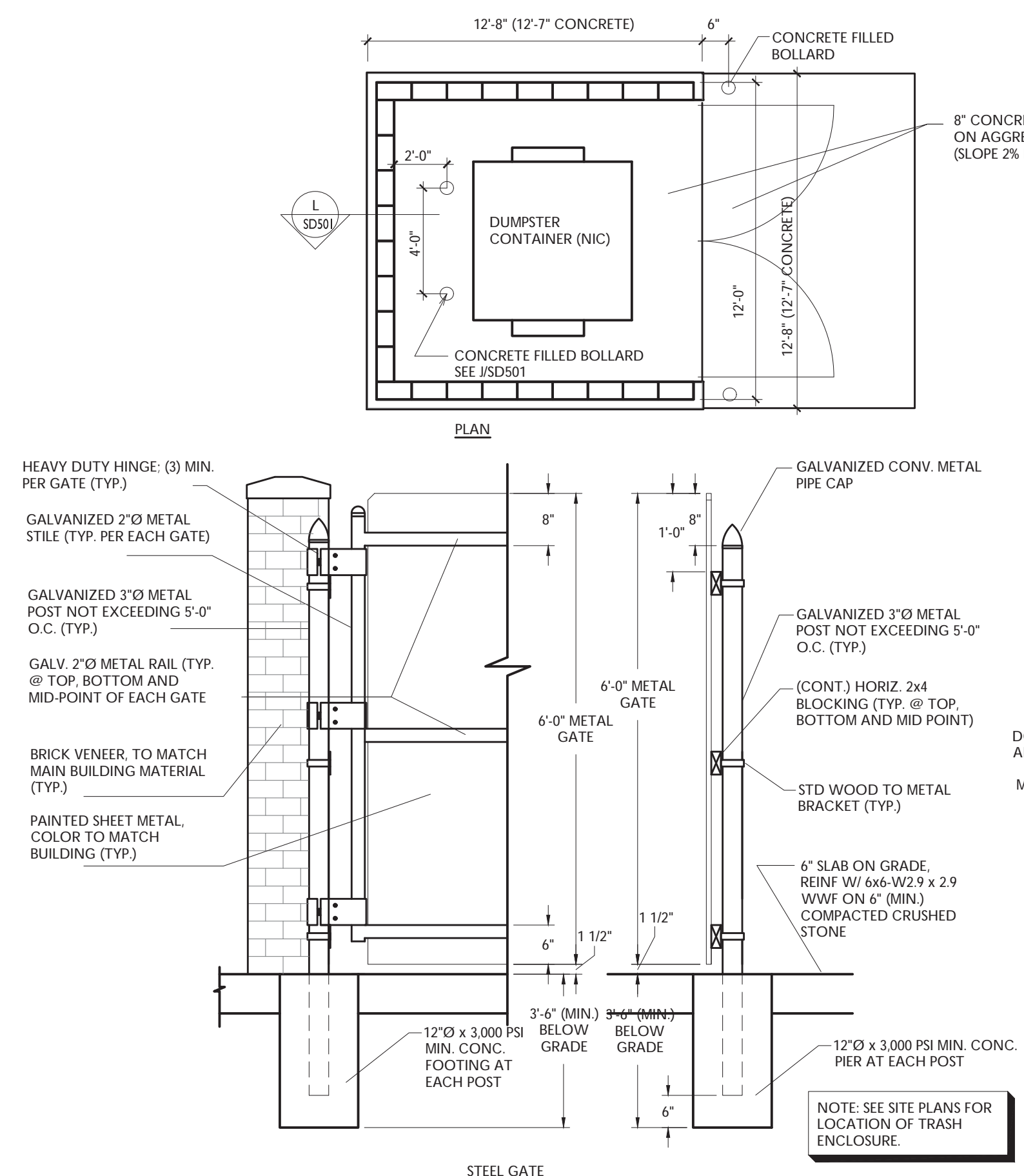
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LIGHT POLE INSTALLATION

- NOTES:
- MINIMUM SOIL BEARING PRESSURE OF 1500 PSF. SOIL FRICTION ANGLE OF 30 DEGREES, AND SOIL DRY UNIT WEIGHT OF 120 PCF SHALL BE CONFIRMED IN THE FIELD BY A QUALIFIED PROFESSIONAL.
 - CAST-IN-PLACE CONCRETE SHALL BE CONSOLIDATED USING VIBRATOR.
 - ALL REBAR TO BE NEW GRADE 60 STEEL.
 - PRE-CAST PIERS ACCEPTABLE UPON WRITTEN APPROVAL OF SHOP DRAWING BY ENGINEER.
 - CONCRETE TO BE INSTALLED A MINIMUM OF 7 DAYS PRIOR TO INSTALLING LIGHT POLE. POURED CONCRETE MIX REQUIRED TO OBTAIN 80% OF DESIGN STRENGTH PRIOR TO INSTALLING LIGHT POLE.
 - CONCRETE SHALL HAVE A MAXIMUM SLUMP OF 4" (WITHIN 1" TOLERANCE).
 - POLE SHALL BE RATED FOR 10 MPH HIGHER THAN MAXIMUM WIND SPEED 33FT ABOVE GROUND FOR THE AREA BASED ON ANSI/ASCE 7-93.
 - POUR TO BE TERMINATED AT A FORM.
 - WORK SHALL CONFORM TO ACI BEST PRACTICES FOR APPROPRIATE TEMPERATURE AND WEATHER CONDITIONS.
 - CONTRACTOR TO TEMPORARILY SUPPORT ADJACENT SOIL AND STRUCTURES DURING EXCAVATION IF REQUIRED.

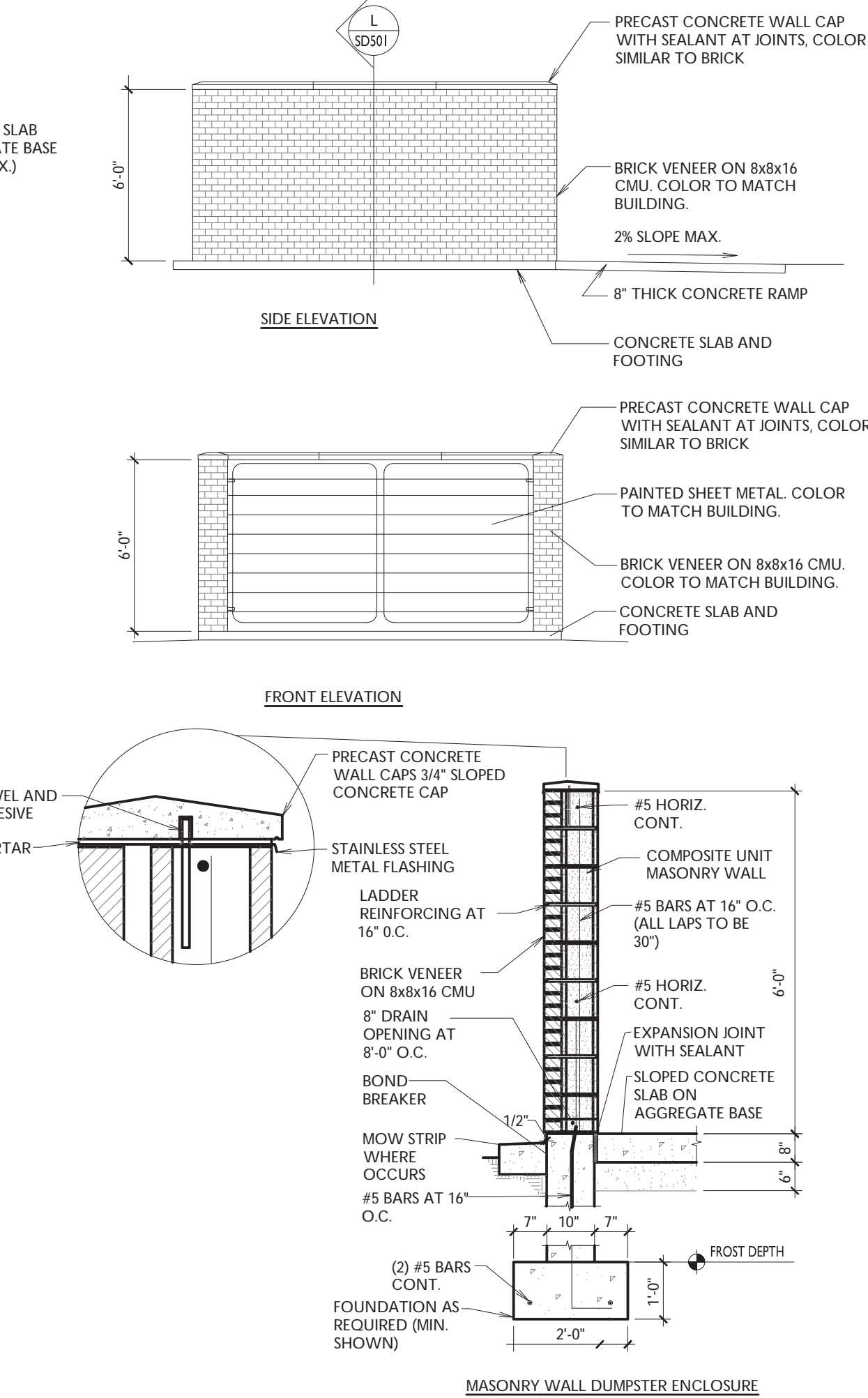
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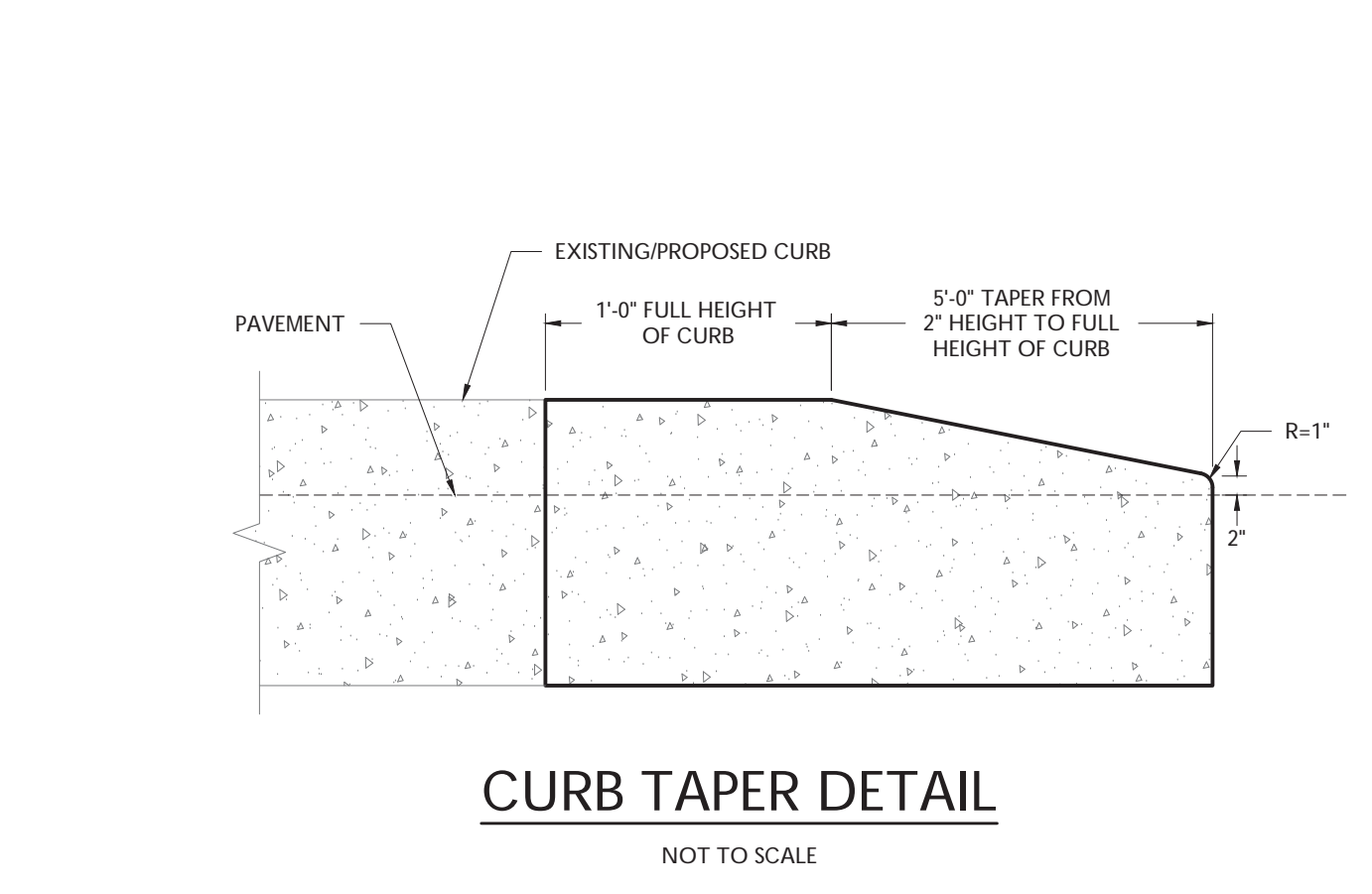
TRASH / RECYCLE ENCLOSURE DETAIL

- NOTE:
BLOCK COLOR TO MATCH BUILDING OR AS SPECIFIED BY OWNER

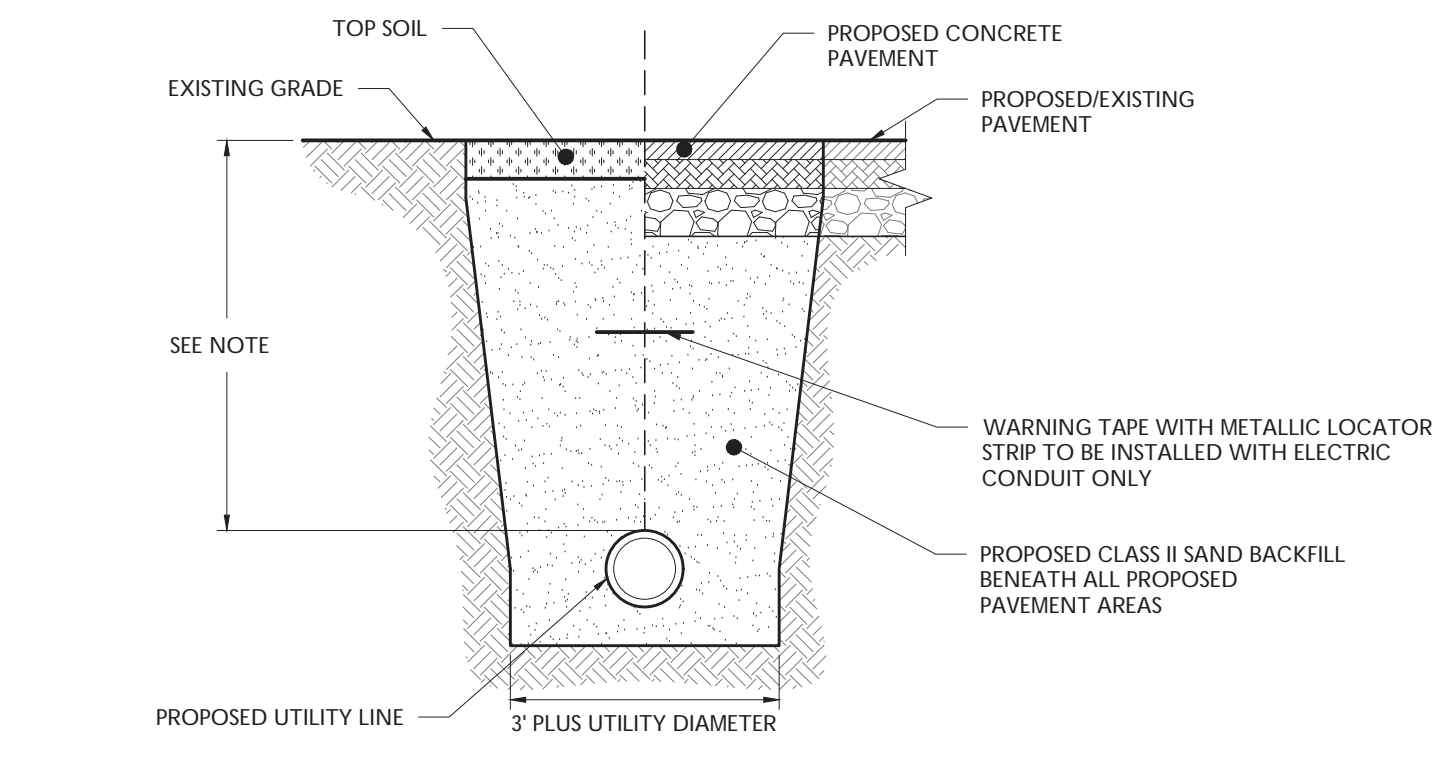
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3

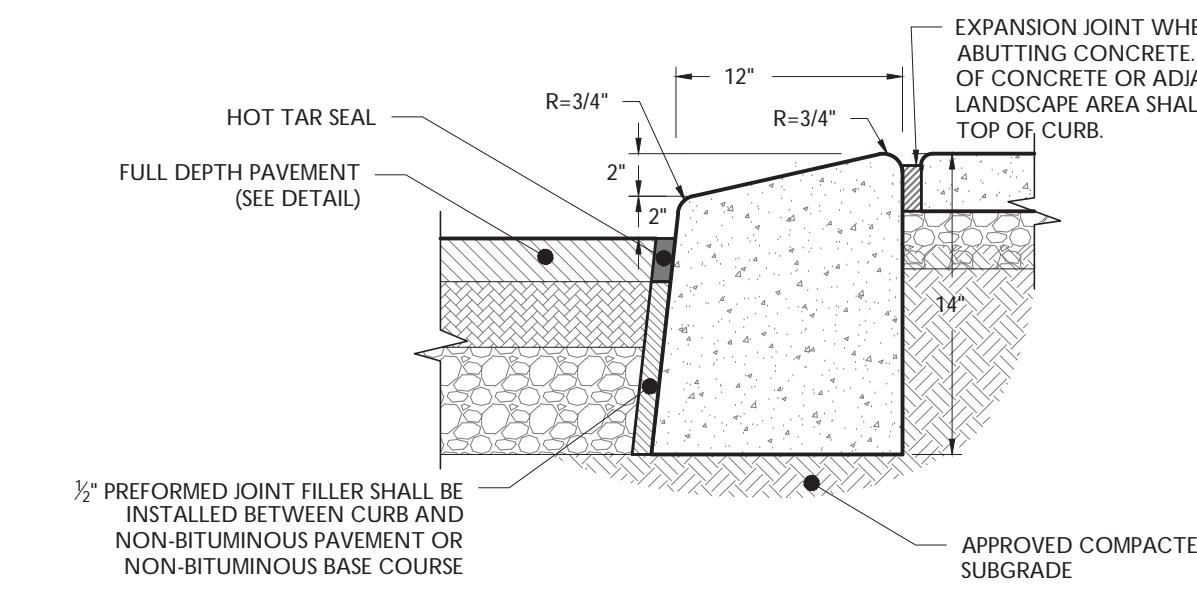


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3

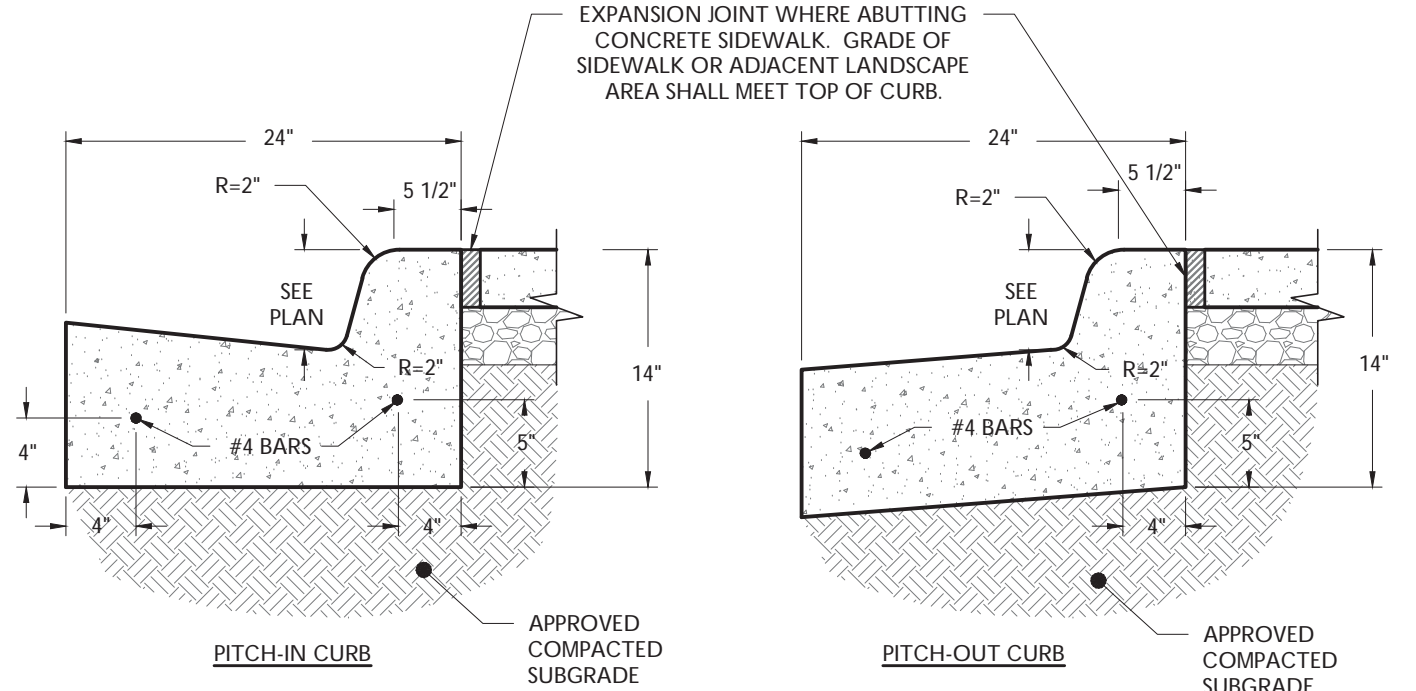
- NOTE:
MINIMUM PIPE COVER SHALL BE AS FOLLOW:
• ELECTRIC SERVICE - PER APPLICABLE UTILITY AUTHORITY
• GAS SERVICE - PER APPLICABLE UTILITY AUTHORITY
• SEWER SERVICE - 36" MINIMUM
• WATER LEAD - 48" MINIMUM
• WATER MAIN - 72" MINIMUM



MOUNTABLE CONCRETE CURB

- NOTES:
- CONCRETE SHALL BE 3500 PSI AT 28 DAYS. AIR-ENTRAINED.
 - TRANSVERSE EXPANSION JOINTS SHALL BE PROVIDED AT 20 FOOT INTERVALS WITH PRE-MOLDED, BITUMINOUS JOINT FILLER. RECESSED 1/2" FROM SURFACE.
 - HALF DEPTH CONTRACTION JOINTS SHALL BE PROVIDED AT 10 FOOT INTERVALS.
 - 18" CURB DEPTH SHALL BE MAINTAINED AT DEPRESSED OR FLUSH CURBED AREAS.

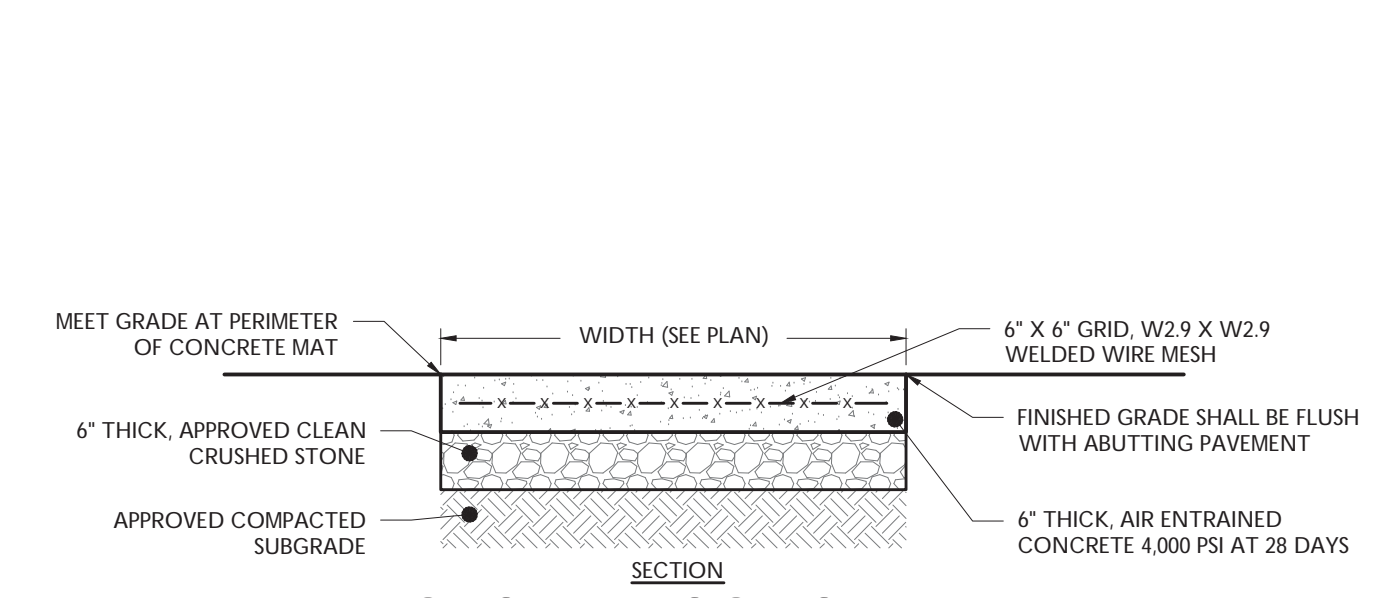
4



CONCRETE CURB AND GUTTER DETAIL

- NOTES:
- CONCRETE SHALL BE 3500 PSI AT 28 DAYS. AIR-ENTRAINED.
 - TRANSVERSE EXPANSION JOINTS SHALL BE PROVIDED AT 20 FOOT INTERVALS WITH PRE-MOLDED, BITUMINOUS JOINT FILLER. RECESSED 1/2" FROM SURFACE.
 - HALF DEPTH CONTRACTION JOINTS SHALL BE PROVIDED AT 10 FOOT INTERVALS.
 - 14" CURB DEPTH SHALL BE MAINTAINED AT DEPRESSED OR FLUSH CURBED AREAS.

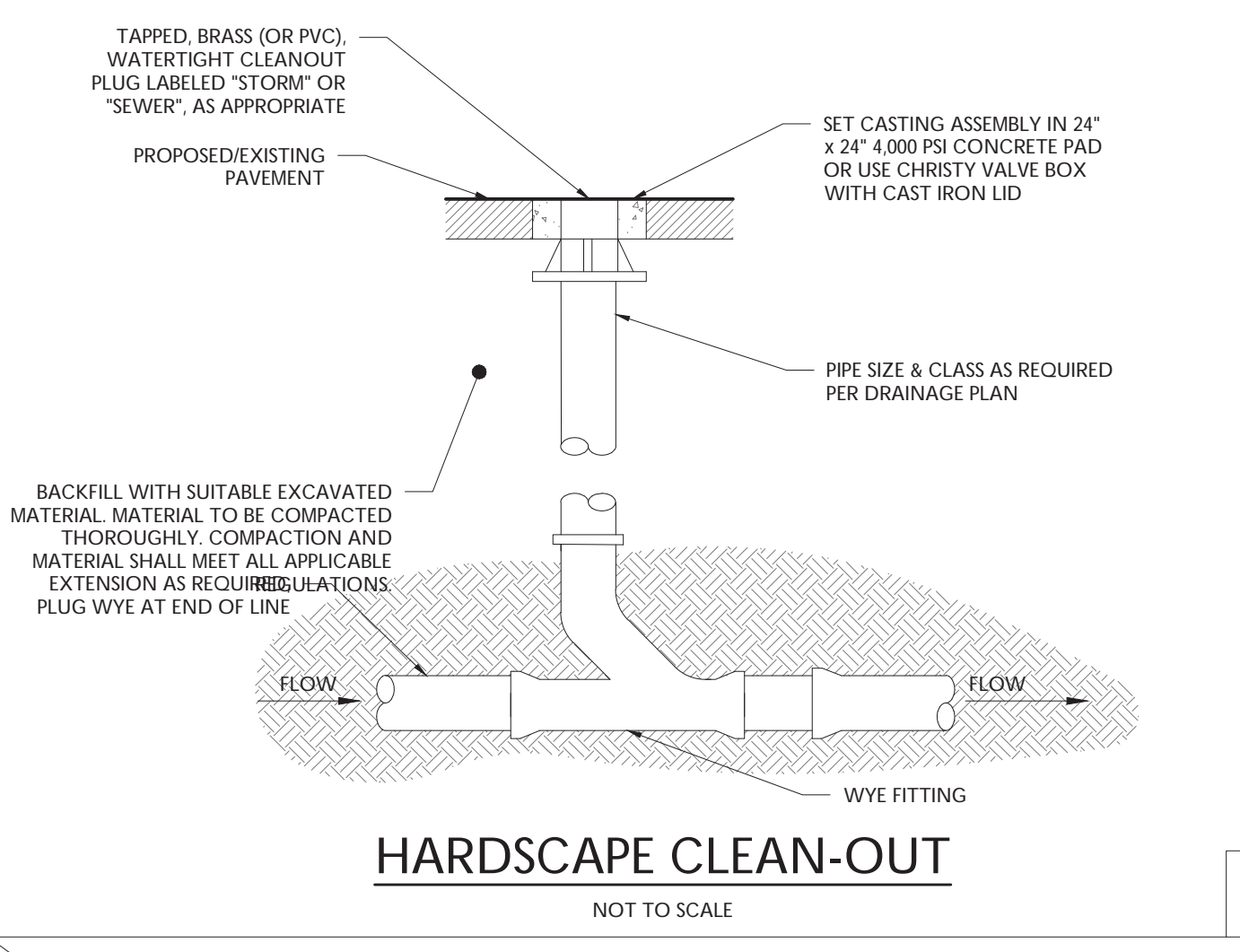
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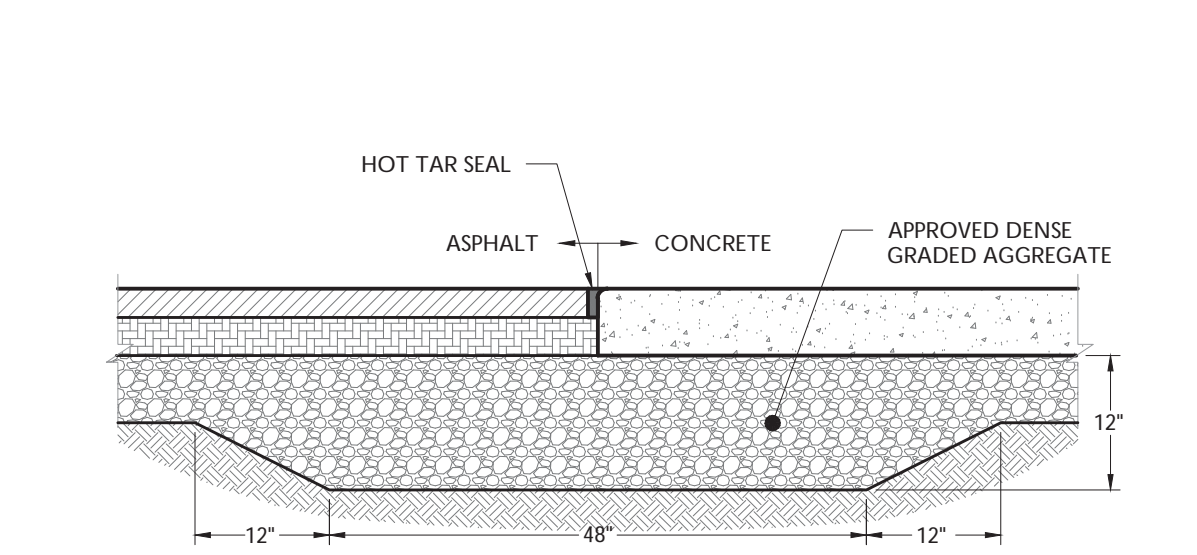
REINFORCED 6" CONCRETE MAT (FOR TRANSFORMER PAD AND TRASH MATS)

- NOTES:
- 1/2" EXPANSION JOINTS WITH WATER SEAL SHALL BE PROVIDED AT 12' INTERVALS WITH PRE-MOLDED, BITUMINOUS JOINT FILLER. RECESSED 1/2" FROM THE SURFACE. LONGITUDINAL REBAR TO BE CUT AT EXPANSION JOINTS.
 - 1" DEEP BY 3/4" WIDE, TOOLED CONTRACTION JOINTS SHALL BE PROVIDED AT MID-POINT BETWEEN EXPANSION JOINTS OR 6' INTERVALS MAX.
 - CONCRETE SHALL RECEIVE BROOM FINISH.
 - ALL EXPOSED CORNERS TO HAVE 12" CHAMFER.

6



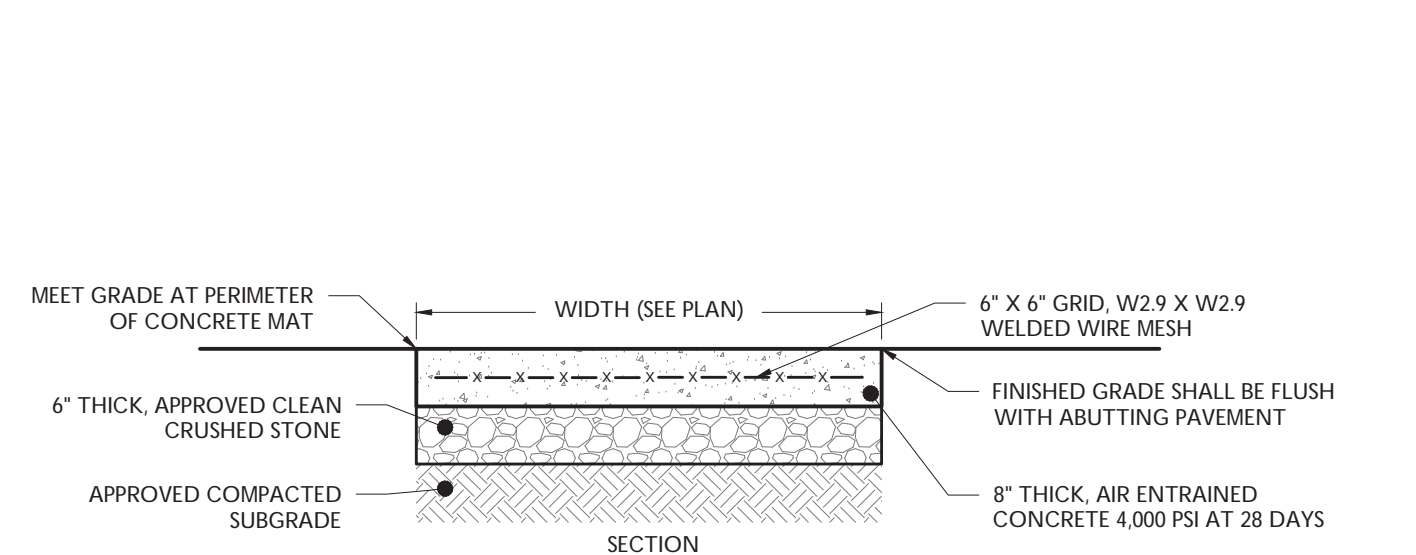
7



CONCRETE TO ASPHALT TRANSITION DETAIL

- NOTES:
- 1/2" EXPANSION JOINTS WITH WATER SEAL SHALL BE PROVIDED AT 12' INTERVALS WITH PRE-MOLDED, BITUMINOUS JOINT FILLER. RECESSED 1/2" FROM THE SURFACE. LONGITUDINAL REBAR TO BE CUT AT EXPANSION JOINTS.
 - 1" DEEP BY 3/4" WIDE, TOOLED CONTRACTION JOINTS SHALL BE PROVIDED AT MID-POINT BETWEEN EXPANSION JOINTS OR 6' INTERVALS MAX.
 - CONCRETE SHALL RECEIVE BROOM FINISH.
 - ALL EXPOSED CORNERS TO HAVE 12" CHAMFER.

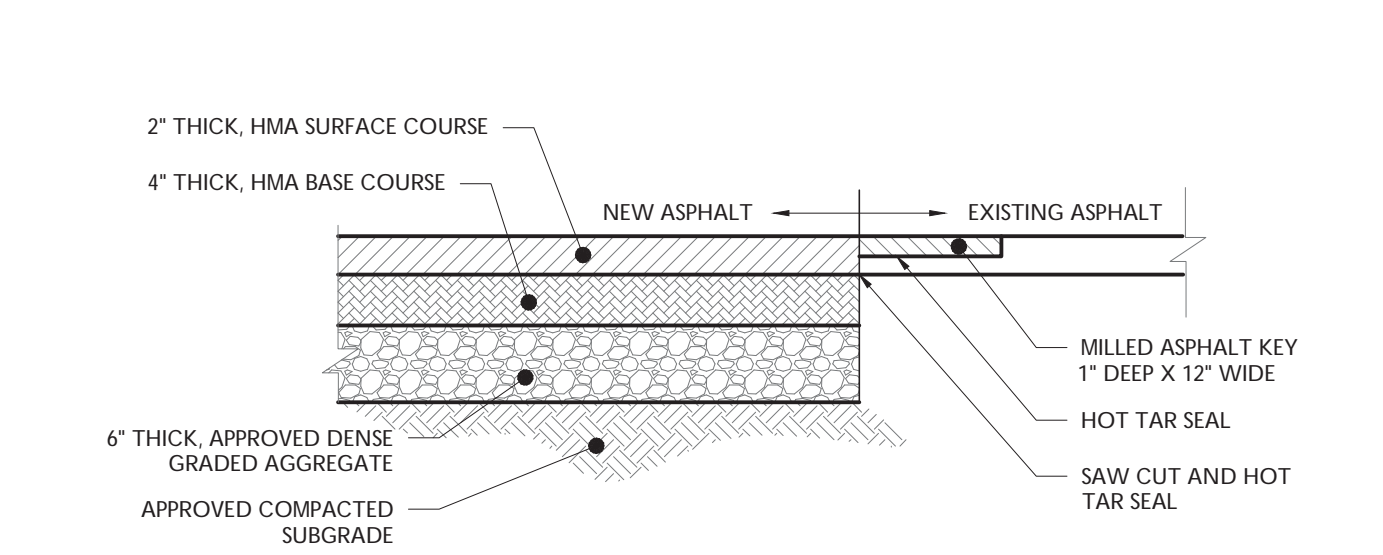
8



REINFORCED 8" CONCRETE PAVEMENT

- NOTES:
- 1/2" EXPANSION JOINTS WITH WATER SEAL SHALL BE PROVIDED AT 12' INTERVALS WITH PRE-MOLDED, BITUMINOUS JOINT FILLER. RECESSED 1/2" FROM THE SURFACE. LONGITUDINAL REBAR TO BE CUT AT EXPANSION JOINTS.
 - 1" DEEP BY 3/4" WIDE, TOOLED CONTRACTION JOINTS SHALL BE PROVIDED AT MID-POINT BETWEEN EXPANSION JOINTS OR 6' INTERVALS MAX.
 - CONCRETE SHALL RECEIVE BROOM FINISH.
 - ALL EXPOSED CORNERS TO HAVE 12" CHAMFER.

9



FULL DEPTH ASPHALT PAVEMENT DETAIL

- NOTE:
HMA MIX AND DENSE GRADED AGGREGATE SHALL CONFORM TO STATE DEPARTMENT OF TRANSPORTATION SPECIFICATIONS.

10

REVISION	DATE	ISSUE	DESCRIPTION
1	02/07/2024	ECM	SUBMISSION FOR PRE-APPLICATION MEETING
2	04/18/2024	EM / JF	SUBMISSION FOR PRELIMINARY SITE PLAN REVIEW
3	06/11/2024	EM	REVISED PER PLANNING DEPARTMENT REVIEW #1

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607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

PROPOSED CAR WASH

WHITEWATER EXPRESS CAR WASH

PARCEL ID: K-11-006-304-004
2675 WASHINGTON AVENUE (M-17)
CHARTER TOWNSHIP OF YPSILANTI
WASHINGTON COUNTY, MICHIGAN

STATE OF MICHIGAN
JONATHAN REID
COOKSEY
ENGINEER

STONEFIELD
engineering & design

SCALE: AS SHOWN PROJECT ID: DET-230108.01

TITLE:
CONSTRUCTION DETAILS

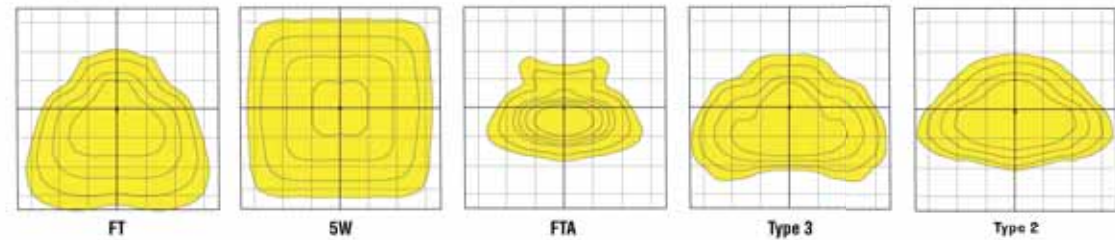
DRAWING:
C-15

NOT TO SCALE



Mirada Medium - MRM Outdoor LED Area Light

Performance (Cont.)
All published luminaire photometric testing performed to IESNA LM-79 standards. ISO footcandle plots below demonstrate the Mirada (MRM) light patterns only. Not for total fixture output. For complete specifications and IES files, see website.



Ordering Guide
TYPICAL ORDER EXAMPLE: **MRM LED 36L SIL FTA UNV DIM 50 70CRI ALCS04 BRZ IL**

Luminaire Photo	Light Source	Lumen Package*	Light Output	Distribution	Orientation*	Voltage	Other
MRM Medium	LED	7L - 7,000 lms	7L - 7,000 lms	2 - Type 2	(Blank) - Standard	UNV - Universal Voltage (120-277V)	DIM - 0-10V Dimming (0-10%)
		8L - 8,000 lms	8L - 8,000 lms	3 - Type 3	L - Optics rotated 90°	UV - High Output (347-400V)	
		12L - 12,000 lms	12L - 12,000 lms	SW - Type 5 Wide	R - Optics rotated right 90°		
		24L - 24,000 lms	24L - 24,000 lms	FT - Forward Throw			
		36L - 36,000 lms	36L - 36,000 lms	FTA - Forward Throw Automotive			

Color Temp	Color Rendering	Controls (Choose One)	Finish	Options
30 - 3,000 CCT	90 - 90 CRI	Blank - None	BRZ - Bronze	(Blank) - None
40 - 4,000 CCT	90 - 90 CRI	ALSC - ALink Simplex Control System**	GRF - Graphite	TL - Integral Louver (RSP)
50 - 5,000 CCT	90 - 90 CRI	ALSD - ALink Simplex Control System Host - Standard**	MTL - Metallic Silver	
57 - 5,700 CCT	90 - 90 CRI	ALSM - ALink Simplex Control System with 8-12 Motion Sensor**	WHT - White	
65 - 6,500 CCT	90 - 90 CRI	ALSH - ALink Simplex Control System Host - Standard**	PLM - Platinum Pink	
70 - 7,000 CCT	90 - 90 CRI	ALSE - ALink Simplex Control System with 12-20 Motion Sensor**	SWG - Satin White Green	
80 - 8,000 CCT	90 - 90 CRI	ALSD4 - ALink Simplex Control System with 20-40 Motion Sensor**		
90 - 9,000 CCT	90 - 90 CRI	ALSD8 - ALink Simplex Control System Host - Standard with 20-40 Motion Sensor**		

MRM-LED-18L-SIL-FT-30-70CRI-IL

LSI Industries Inc. 1000 Alliance Rd. Cincinnati, OH 45242 • www.lsiindustries.com • (513) 372-3200 • LSI Industries Inc. All Rights Reserved. 12/20

FIXTURES 'A' AND 'B' SPECIFICATIONS

NOT TO SCALE

1



Low-Profile, Driverless Linkable IP67 LED Linear Luminaire

Product Features
Maintenance-Free Driverless Design
Connects directly to AC line voltage without an LED driver or electrolytic capacitors, for extreme reliability and lifetime. Requires zero maintenance.

Easy to Install Quick-Connect Cabling
Convenient push-and-click connectors and cabling make GPX Series fixtures easy to install and daisy chain.

Coextruded Copolyester/Aluminum Housing
Our patented process combines copolyester and aluminum together, with no seals or gaskets. The result is a single piece enclosure with excellent heat-sinking characteristics for long lifetime.

Superior Chemical & UV Resistance
Seamless polymeric outer shell provides IP67 ingress protection and is specialized for superior chemical resistance. An additional protective coating is available which integrates a UV inhibitor and UV blocker for outdoor applications.

Ordering Information	Product Length	Lumen Output	Color Temp.	Lens Diffusion	UV Protection	Through Wired	Voltage
GPX 6	2' / 6ft	50K	40K	Blank - Standard Blank - Standard Blank - Standard	Blank - Standard Blank - Standard Blank - Standard	Blank - Standard Blank - Standard Blank - Standard	120V 277V

Power & Connection Accessories	Cable	Type	Length	Wire	Mounting Hardware	Description
	GPX-JMP-1	Jumpers	1ft	18 AWG S/UTW	GPX-MNT-AM	Non-Metallic Quick Latch
	GPX-JMP-2	Jumpers	2ft	18 AWG S/UTW	GPX-MNT-SS	Stainless Steel Bulk Latch
	GPX-JMP-4	Jumpers	4ft	18 AWG S/UTW		
	GPX-JMP-8	Jumpers	8ft	18 AWG S/UTW		
	GPX-LDR-10	Leader Cable	10ft	18 AWG S/UTW		
	GPX-LDR-25	Leader Cable	25ft	18 AWG S/UTW		

STRONG. SIMPLE. COMPACT.

FIXTURE 'C' SPECIFICATIONS

NOT TO SCALE

2

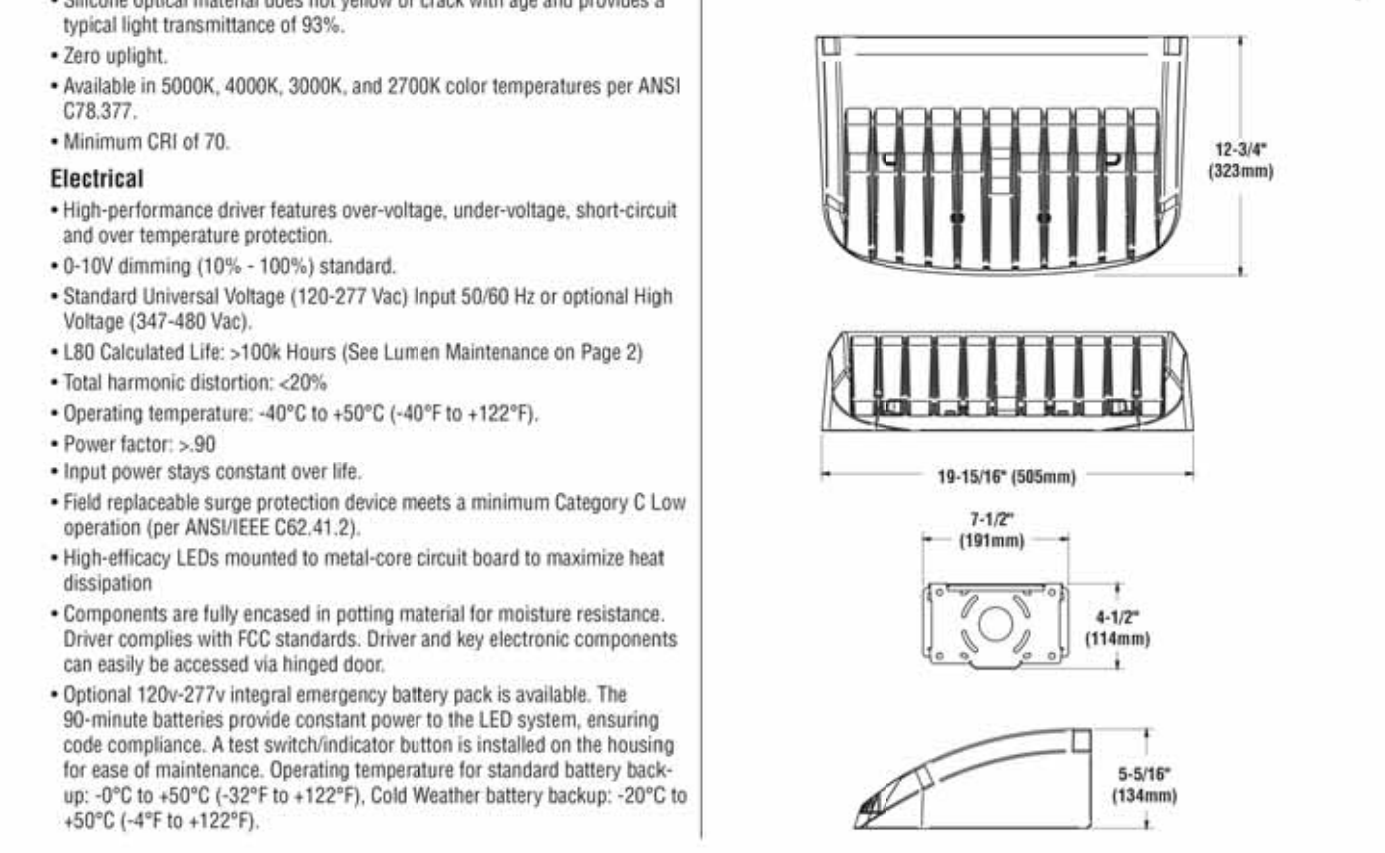
Catalog #: _____ Project: _____
Prepared By: _____ Date: _____

Mirada Wall Sconce - XWM Outdoor LED Wall Sconce

The XWMs sleek design makes it perfectly suited for architectural & commercial applications, while its cost-effective die-cast aluminum housing makes its acquisition cost very competitive. The XWM offers high performance silicone optics, 4 standard CCTs, 5 lumen packages, and is available with integral Airlink™ Wireless Controls.

Features & Specifications
Optical System
• State-of-the-art one piece silicone optic sheet delivers industry leading optical control with an integrated gasket to provide IP65 rated sealed optical chamber in 1 component.
• Proprietary silicone refractor optics provide exceptional coverage and uniformity in IES Types 2, 3, and Forward Throw (FT).
• Silicone optical material does not yellow or crack with age and provides a typical light transmittance of 93%.
• Zero uplight.
• Available in 5000K, 4000K, 3000K, and 2700K color temperatures per ANSI C78.377.
• Dimming: Yes, TRIAC Dimmable.
• Voltage: 120 VAC or 277 VAC Input.
• Maximum Run Length: Refer to the Table on Page 2.
• Ambient Temperature: 40°C to 51°C.

Product Dimensions	Height	Width	Depth
	12-3/4" (323mm)	19-15/16" (505mm)	7-1/2" (191mm)

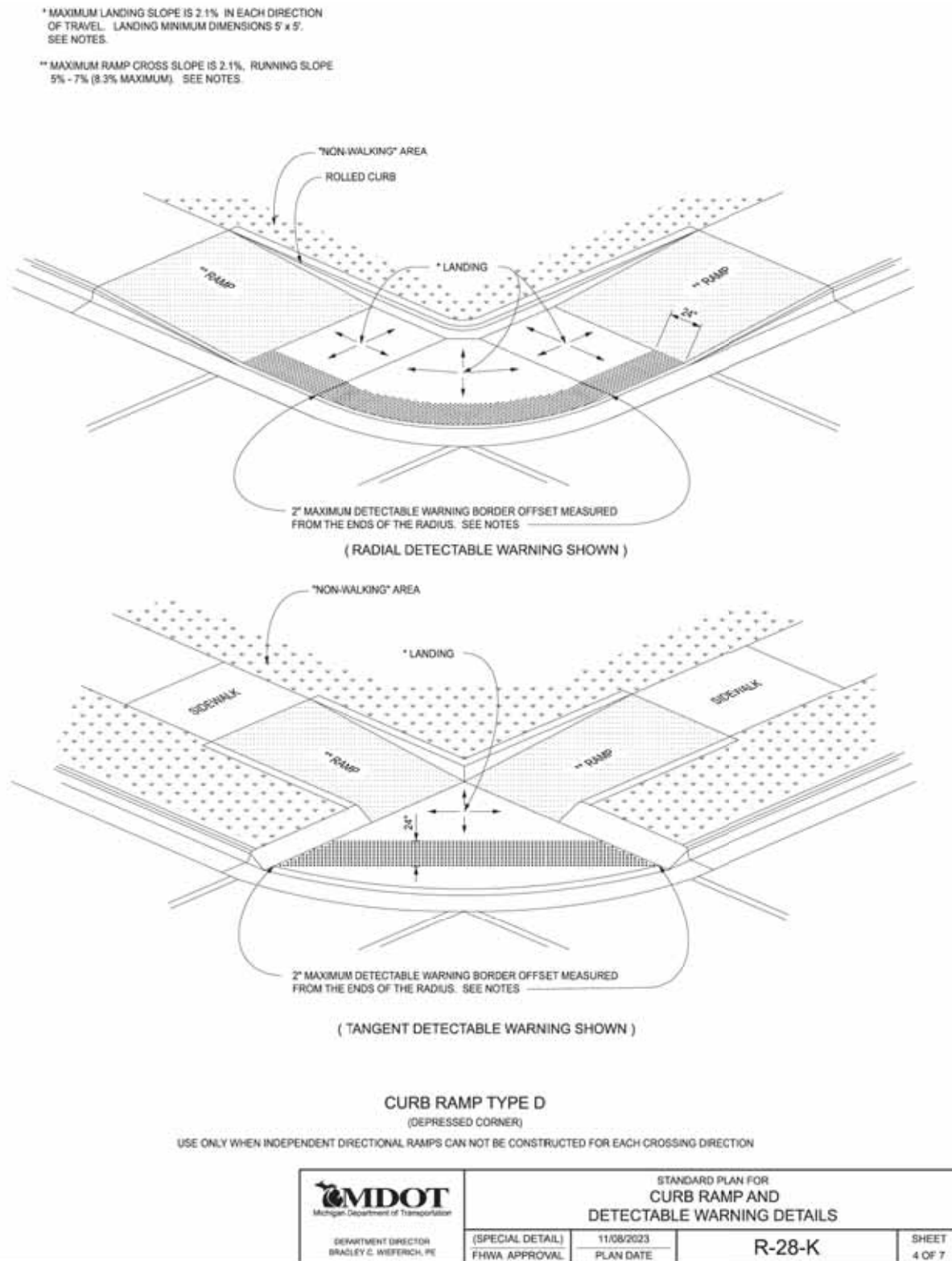


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FIXTURE 'D & E' SPECIFICATIONS

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3

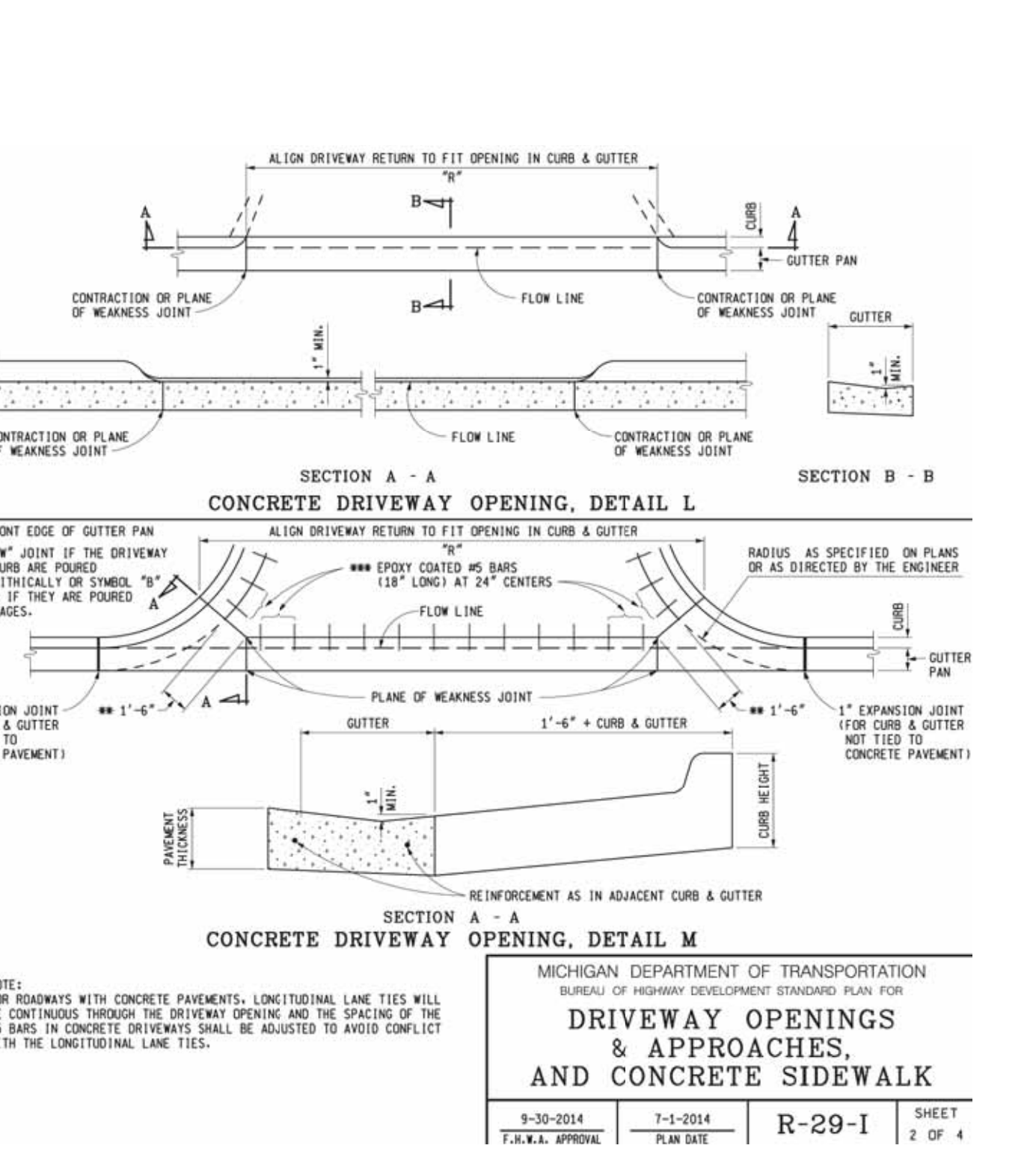


MDOT CURB RAMP DETAILS

NOT TO SCALE

4

MDOT	DEPARTMENT DIRECTOR	SPECIAL DETAIL	11/08/2023	PLAN DATE	R-28-K	SHEET	4 OF 7
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MDOT CURB APPROACH DETAILS

NOT TO SCALE

5

MDOT	DEPARTMENT DIRECTOR	SPECIAL DETAIL	11/08/2023	PLAN DATE	R-29-I	SHEET	2 OF 4
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NO.	DATE	DESCRIPTION
1	06/11/2024	REVISED PER PLANNING DEPARTMENT REVIEW #1
2	04/18/2024	SUBMISSION FOR PRELIMINARY SITE PLAN REVIEW
3	02/07/2024	SUBMISSION FOR PRE-APPLICATION MEETING

NOT APPROVED FOR CONSTRUCTION

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Phone 248.247.1115

PROPOSED CAR WASH

WHITEWATER EXPRESS CAR WASH

STATE DEVELOPMENT PLANS

PARCEL ID: K-11-06-304-004
2675 WASHINGTON AVENUE (M-17)
CHARTER TOWNSHIP OF YPSILANTI
WASHINGTON COUNTY, MICHIGAN

STATE OF MICHIGAN
JONATHAN R. COOKSEY
REGISTERED PROFESSIONAL ENGINEER
No. 64127

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR
DRIVEWAY OPENINGS & APPROACHES, AND CONCRETE SIDEWALK

CONCRETE DRIVEWAY THICKNESS	WIRE SIZE (16" x 4" MESH)	AVERAGE WEIGHT (LBS/100 SQ FT)
LESS THAN 8"	W-4	21
8" OR GREATER	W-9	42

9-30-2014
T.J.K.W.A. APPROVAL

1-1-2014
PLAN DATE

R-29-I
SHEET 3 OF 4

SCALE: AS SHOWN PROJECT ID: DET-230108.01

TITLE: CONSTRUCTION DETAILS

DRAWING: C-16

WASHTENAW COUNTY STORMWATER CALCULATIONS
(Based on Washtenaw County Stormwater Management Regulations)

Project: 2675 WASHTENAW AVENUE Designer: ECM Date: 05/30/24

W1. DETERMINING POST-DEVELOPMENT COVER TYPES, AREAS, CURVE NUMBERS, AND RUNOFF COEFFICIENTS

RATIONAL METHOD VARIABLES (REQUIRED FOR FIRST FLUSH RUNOFF CALCULATIONS)

Cover Type (Post-Development)	Area (SF)	C-Value*	Weighted Value
Building / Roof	6,863	0.95	6,520
Pavement / Hardscape	30,753	0.95	29,215
Open Space	26,704	0.25	6,676
Woods (Good)	3,064	0.25	766
Subtotals	67,384		43,177

*C-values obtained from Washtenaw County Water Resources Commission

Composite C Value, C_c: 0.64

Site Area, A_c: 1.55 AC

NRCS VARIABLES (REQUIRED FOR BANKFULL & 100-YEAR RUNOFF CALCULATIONS)

Cover Type (Pre-Development)	Soil Type	Area (SF)	Curve Number (CN)	Weighted Value
Paved Parking Lots, Roofs, Driveways	A / D	59,349	98.0	5,816,202
Fully Developed Open Space (Good Condition)	A / D	4,354	60.0	261,240
Woods (Good)	A / D	3,681	55.0	202,455
Subtotals		67,384		6,279,897

Cover Type (Post-Development)	Soil Type	Area (SF)	Curve Number (CN)	Weighted Value
Paved Parking Lots, Roofs, Driveways	A / D	37,616	98.0	3,686,368
Fully Developed Open Space (Good Condition)	A / D	30,753	60.0	1,845,180
Woods (Good)	A / D	3,064	55.0	168,520
Total		71,433		5,699,068

*Curve Numbers obtained from Washtenaw County Water Resources Commission

Composite CN Value, CN_c: 93.20

Composite CN Value, CN_c: 79.80

W2. FIRST FLUSH RUNOFF CALCULATION (V_{ff})

V_{ff} = (1 IN) * (1 FT / 12 IN) * (43,560 SF) * A * C

Site Area, A_c: 1.55 AC

First Flush Runoff Volume, V_{ff}: 3,598 CF

W3. PRE-DEVELOPMENT BANKFULL RUNOFF CALCULATION (V_{bf-pre})

S = (1000 / CN) - 10

Q = (P - 0.2*S)² / (P + 0.8*S)

V_{bf-pre} = Q * (1/12) * Area

Rainfall Value (2 Year / 24 Hour Storm Event), P: 2.35 IN

Function of Watershed Soil & Conditions, S: 0.73

Runoff, Q: 1.66 IN

Total Site Area: 67,384 SF

Pre-Development Bankfull Volume, V_{bf-pre}: 9,296 CF

W4. PERVIOUS COVER POST-DEVELOPMENT BANKFULL RUNOFF CALCULATION (V_{bf-per-post})

S = (1000 / CN) - 10

Q = (P - 0.2*S)² / (P + 0.8*S)

V_{bf-per-post} = Q * (1/12) * Area

Rainfall Value (2 Year / 24 Hour Storm Event), P: 2.35 IN

Function of Watershed Soil & Conditions, S: 6.79

Runoff, Q: 0.13 IN

Pervious Cover Area: 33,817 SF

Pervious Cover Post Development Bankfull Volume, V_{bf-per-post}: 356 CF

W5. IMPERVIOUS COVER POST-DEVELOPMENT BANKFULL RUNOFF CALCULATION (V_{bf-imp-post})

S = (1000 / CN) - 10

Q = (P - 0.2*S)² / (P + 0.8*S)

V_{bf-imp-post} = Q * (1/12) * Area

Rainfall Value (2 Year / 24 Hour Storm Event), P: 2.35 IN

Function of Watershed Soil & Conditions, S: 0.20

Runoff, Q: 2.12 IN

Impervious Cover Area: 37,616 SF

Impervious Cover Post Development Bankfull Volume, V_{bf-imp-post}: 6,651 CF

W6. PERVIOUS COVER POST-DEVELOPMENT 100 YEAR STORM RUNOFF CALCULATION (V_{100-per-post})

S = (1000 / CN) - 10

Q_{100-per} = (P - 0.2*S)² / (P + 0.8*S)

V_{100-per-post} = Q * (1/12) * Area

Rainfall Value (100 Year Storm Event), P: 5.11 IN

Function of Watershed Soil & Conditions, S: 6.79 IN

Runoff, Q_{100-per}: 1.33 IN

Pervious Cover Area: 33,817 SF

Pervious Cover Post Development 100-Year Volume, V_{100-per-post}: 3,761 CF

W7. IMPERVIOUS COVER POST-DEVELOPMENT 100 YEAR STORM RUNOFF CALCULATION (V_{100-imp-post})

S = (1000 / CN) - 10

Q_{100-imp} = (P - 0.2*S)² / (P + 0.8*S)

V_{100-imp-post} = Q * (1/12) * Area

Rainfall Value (100 Year Storm Event), P: 5.11 IN

Function of Watershed Soil & Conditions, S: 0.20 IN

Runoff, Q_{100-imp}: 4.87 IN

Impervious Cover Area: 37,616 SF

Impervious Cover Post Development 100-Yr Vol, V_{100-imp-post}: 15,275 CF

W8. TIME OF CONCENTRATION FOR APPLICABLE FLOW TYPES (T_c hrs)

Flow Type	K	HEIGHT (H)	LENGTH (L)	SLOPE% (S * 100%)	S ^{0.45}	V _{adj} *S ^{0.45}	T _c = L / (V _{adj} *S ^{0.45}) (hr)
Sheet Flow	0.48	3	150	2.00	1.41	0.68	0.061
Sheet Flow	0.48	1.9	52	3.65	1.91	0.92	0.016
Pipe Channel	1.2	2.49	83	3.00	1.73	2.08	0.011
Pipe Channel	1.2	1.55	106	1.46	1.21	1.45	0.020
							T _c = 0.109

If T_c < 15 minutes use minimum T_c Below

Minimum T_c: 0.25 hrs = 15 min

W9. RUNOFF SUMMARY

First Flush Runoff Volume, V_{ff}: 3,598 CF

Pre-Development Bankfull Volume, V_{bf-pre}: 9,296 CF

Pervious Cover Post Development Bankfull Volume, V_{bf-per-post}: 356 CF

Impervious Cover Post Development Bankfull Volume, V_{bf-imp-post}: 6,651 CF

Total Bankfull Volume (V_{bf-post}): 7,006 CF

Pervious Cover Post Development 100-Year Storm Volume, V_{100-per-post}: 3,761 CF

Impervious Cover Post Development 100-Year Storm Volume, V_{100-imp-post}: 15,275 CF

Total 100 Year Volume (V₁₀₀): 19,036 CF

Bankfull Volume Difference, V_{bf-diff}: (2,290) CF

Onsite Infiltration Requirement, V_{inf}: 3,598 CF

First Flush Volume

W10. DETENTION REQUIREMENTS

Q_p = 238.6 * T_c^{-0.82}

*Site Area Excluding "Self-Creeping" BMPs

Q₁₀₀ = Q_{100-per} + Q_{100-imp}

PF = (Q_p * Q₁₀₀ * Area) / 640

Δ = PF - (0.15 * Area)

V_{det} = (Δ / PF) * V₁₀₀

Peak of the Unit Hydrograph, Q_p: 26 CFS / IN-MI²

*Total Site Area: 1.55 AC

100 Year Storm Runoff, Q₁₀₀: 6.21 IN

Peak Flow, PF: 0.39 CFS

Δ: 0.16 CFS

Required Detention Volume, V_{det}: 7,669 CF

W11. STANDARD METHOD RUNOFF VOLUME CALCULATIONS

BIORETENTION BASIN (INFILTRATION BMP) VOLUME PROVIDED

Infiltration Bed Area	Elevation	Surface Area (SF)	Total Volume (CF)	Basin Height, H:
1,662 SF	791.00	888	0	2.00 FT
	792.00	1,626	1,257	
	793.00	2,436	2,031	
Subsurface Depth, D:	2.00 FT			
Void Ratio	30%			
Subsurface Storage Volume	997 CF			

Flow Type	Area (ft ²)	Storage Volume (ft ³)		Design Infiltration Rate (in / hr)	Infiltration Volume During Storm (ft ³)	Total Volume Reduction (ft ³)
		Surface	Soil			
Infiltration Basin	1,662	2,031	997	1.00	831	3,859

1. Infiltration Rate x 6 hrs x BMP Area x Unit Conversion = Infiltration Volume

Total Volume Reduction: 3,859 CF

Onsite Infiltration Requirement, V_{inf}: 3,598 CF

Runoff Volume Credit: 261 CF

W13. SUMMARY

A. STORMWATER MANAGEMENT SUMMARY

Minimum Onsite Infiltration Requirement, V_{inf}: 3,598 CF

Provided Infiltration Volume: 3,859 CF

% Minimum Required Infiltration Provided: 107%

Total Calculated Detention Volume, V_{DET}: 7,669 CF

Net Required Detention Volume, V_{det}: 3,810 CF

V_{det} - Designed / Provided Infiltration Volume

B. DETENTION VOLUME INCREASE WITHOUT INFILTRATION

% Required Infiltration NOT Provided: 0%

Net % Penalty (20% * % Required Infiltration NOT Provided): 0%

Total Required Detention Volume, including penalty: 3,810 CF

[(100% + %Net Penalty) * Net Required Detention Volume]

C. ON-SITE DETENTION VOLUME

Required Detention Volume: 3,810 CF

Site Area, A_c: 1.55 AC

First Flush Volume, V_{ff}: 3,598 CF

Bankfull Volume, V_{bf}: 7,006 CF

Bankfull Detained Volume: 3,408 CF

On-site Infiltration Requirement: 3,598 CF

100-YR Detention Volume: 3,810 CF

ELEVATION	VOLUME (CF)
787.00	0
787.50	559
788.00	1407
788.50	2524
789.00	3613
789.50	4663
790.00	5662
790.50	6590
791.00	7413
791.50	8044
792.00	8603
792.50	9163

Bankfull Detained Elevation = 788.59

100-YR Storm Elevation = 789.09

Basin volume obtained from ADS Stage Storage Table - See Sheet C-17

Total Detention Volume = 9,163 CF > 3,810 CF

W14. OUTLET DESIGN - 2 STAGE OUTLET

Q_{allow} = (0.15)(A)

A. BANKFULL DISCHARGE

Q_{min-bf} = V_{inf} / T₁₀₀

h_{min} = (K_{sf} - X_{sub})

A_{bf} = Q_{min-bf} / [(2 * g * h_{min})]

Maximum # Orifices = A_{bf} / A_{orif}

Orifice Size Proposed: 3.00 in (0.75" Minimum)

Q_{act-bf} = 0.62 * #Orif * A_{orif} * √(2 * g * h_{min})

T_{act-bf} = V_{bf} / Q_{act-bf}

B. 100-YEAR STORM DISCHARGE

Q_{or} = [0.62 * #Orif * A_{orif} * √(2 * g * (K₁₀₀ * h_{min}))]

Q_{max-100} = Q_{allow} - (Q_{or})

A_{max-100} = Q_{max-100} / [0.62 * √(2 * g * (K₁₀₀ * h_{min}))]

Maximum # Orifices = A_{max-100} / A_{orif}

Orifice Size Proposed: 3.00 in (0.75" Minimum)

Q_{act-100} = Q_{or} + 0.62 * #Orif * A_{orif} * √(2 * g * (K₁₀₀ * h_{min}))

h_{both-ave} = (K₁₀₀ * h_{min}) + (K_{orif} * h_{min})

Q_{both} = 0.62 * #Orif * A_{orif} * √(2 * g * h_{both-ave})

h_{100-ave} = (K₁₀₀ * h_{min})

Q_{100-ave} = 0.62 * #Orif * A_{orif} * √(2 * g * h_{100-ave})

V_{rem} = V₁₀₀ - V_{bf}

T₁₀₀ = V_{rem} / (Q_{act} + Q_{100-ave})

Allowable Release Rate, Q_{allow}: 0.23 CFS

Minimum Bank Full Release Rate, Q_{min-bf}: 0.0394 CFS

Average Head, h_{ave}: 1.59 FT

A_{bf}: 0.0063 SF

Maximum # Orifices: 1.15

Proposed # Orifices: 1.00

Proposed Bankfull Release Rate, Q_{act-bf}: 0.0343 CFS

Release Time, T_{act-bf}: 27.63 Hours

Release Rate, Q_{or}: 0.0343 CFS

Maximum 100-Year Release Rate, Q_{max}: 0.1978 CFS

Orifice Area, A_{max-100}: 0.06 SF

Maximum # Orifices: 1.15

Proposed # Orifices: 1.00

Proposed 100-Year Release Rate, Q_{act-100}: 0.21 CFS

if < 0.23 okay

Total Head, h_{both-ave}: 2.09 FT

Both Release Rate, Q_{act}: 0.35 CFS

100-Year Orifice Total Head, h_{100-ave}: 0.50 FT

Proposed 100-Year Orifice Release Rate, Q_{100-ave}: 0.1726 CFS

Volume Remaining, V_{rem}: 401 CF

TITLE COMMITMENT INFORMATION

THE PROPERTY HEREON DESCRIBED IS THE SAME AS THE PERTINENT PROPERTY AS DESCRIBED IN FIRST AMERICAN TITLE INSURANCE COMPANY, COMMITMENT FILE NO.: VT414851, DATED FEBRUARY 16, 2023 AT 8:00 A.M. (LAST REVISED MARCH 30, 2023 12:44 P.M.)

LEGAL DESCRIPTION

THE LAND IS DESCRIBED AS FOLLOWS:
 LAND SITUATED IN THE TOWNSHIP OF YPSILANTI, COUNTY OF WASHTENAW, STATE OF MICHIGAN, MORE PARTICULARLY DESCRIBED AS:
 LOT(S) 172 THROUGH 180, OF "FAIRVIEW HEIGHTS", ACCORDING TO THE PLAT THEREOF RECORDED IN LIBER 7, PAGE(S) 12 OF PLATS, WASHTENAW COUNTY RECORDS, EXCEPT THE EAST 50 FEET OF LOT 175; AND EXCEPT THAT PART OF LOT 174 DESCRIBED AS FOLLOWS: COMMENCING AT THE SOUTHEAST CORNER OF LOT 172; THENCE SOUTHEAST ALONG THE SOUTHWEST SIDE LINE OF LOTS 171 AND 170 TO THE NORTHEAST CORNER OF LOT 174; THENCE SOUTH ALONG THE EAST SIDE LINE OF LOT 174 TO THE SOUTHEAST CORNER OF LOT 174; THENCE WEST ALONG THE SOUTH LINE OF LOT 174 TO A POINT WHERE THE SOUTH-EAST SIDE LINE OF LOT 172 EXTENDED SOUTH-EAST WOULD INTERSECT THE SOUTH SIDE LINE OF LOT 174; THENCE NORTHERLY TO THE PLACE OF BEGINNING.

NOTES CORRESPONDING TO SCHEDULE B

12 — EASEMENTS, SETBACK LINES, AS SHOWN ON THE RECORDED PLAT. (AFFECTS, CONTAINS NO PLOTTABLE EASEMENT ITEMS)

GENERAL NOTES

1. THE UTILITIES SHOWN ON THIS DRAWING HEREON HAVE BEEN LOCATED BY FIELD MEASUREMENTS, UTILITY MAP DRAWINGS, AND MICHIGAN 811 DIG UTILITY LOCATE REQUEST. BLEW AND ASSOCIATES MAKES NO WARRANTY TO THE EXACT LOCATION OF ANY UNDERGROUND UTILITIES SHOWN OR NOT SHOWN ON THIS DRAWING. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ANY AND ALL UTILITIES PRIOR TO CONSTRUCTION. TICKET NUMBER: 2023040601662-000

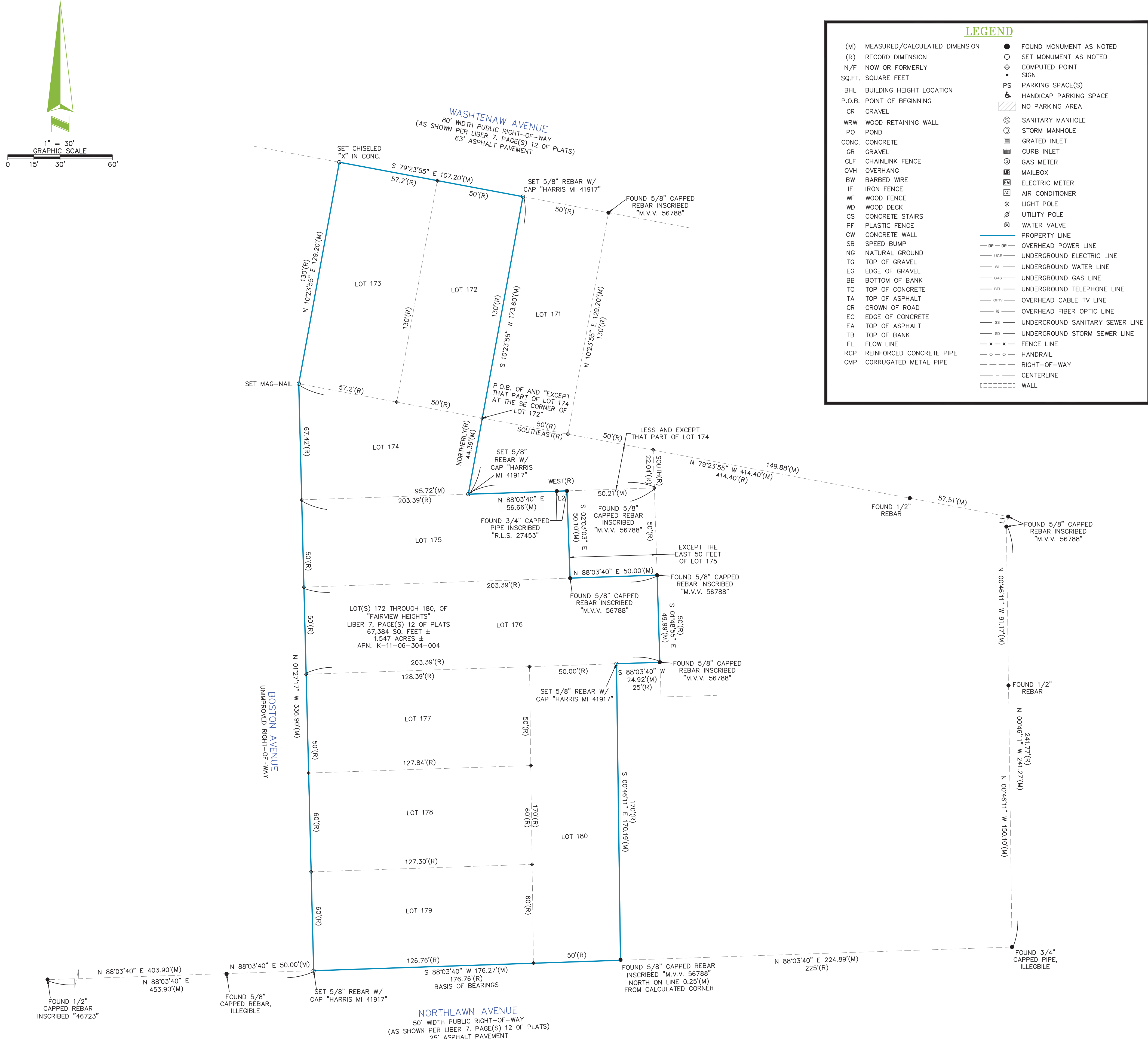
COMPANY: ANN ARBOR CITY FIBER OPTICS (734) 794-6350
 AT&T TELEPHONE (800) 778-9140
 COMCAST CABLE TV (855) 962-8525
 COMCAST FIBER OPTICS (855) 962-8525
 DTE ENERGY (ELECTRIC) (313) 407-5364
 DTE ENERGY (GAS) (248) 318-7839
 METRO FIBERNET, LLC FIBER OPTICS (800) 778-9140
 WASHTENAW COUNTY ROAD COMMISSION ELECTRIC (734) 327-6671
 YPSILANTI COMMUNITY UTILITIES AUTHORITY POTABLE WATER (734) 323-1699
 YPSILANTI COMMUNITY UTILITIES AUTHORITY SANITARY SEWER (734) 323-1699

2. ALL STATEMENTS WITHIN THE CERTIFICATION, AND OTHER REFERENCES LOCATED ELSEWHERE HEREON, RELATED TO UTILITIES, IMPROVEMENTS, STRUCTURES, BUILDINGS, PARTY WALLS, PARKING, EASEMENTS, SERVITUDES, AND SIGNIFICANT OBSERVATIONS ARE BASED SOLELY ON ABOVE GROUND, VISIBLE EVIDENCE, UNLESS ANOTHER SOURCE OF INFORMATION IS SPECIFICALLY REFERENCED HEREON.
 3. THIS SURVEY MEETS OR EXCEEDS THE SURVEY STANDARDS/STANDARDS OF CARE AS SET FORTH IN SECTION 3 OF THE 2021 ALTA/NSPS SURVEY REQUIREMENTS.
 4. THE SUBJECT PROPERTY HAS INDIRECT ACCESS TO WASHTENAW AVENUE, A DEDICATED PUBLIC STREET OR HIGHWAY.
 5. THERE WAS NO VISIBLE EVIDENCE OF CEMETERIES ON SUBJECT PROPERTY.
 6. IN REGARD TO TABLE A ITEM 16, THERE WAS NO OBSERVABLE EVIDENCE OF RECENT EARTH MOVING WORK, BUILDING CONSTRUCTION OR ADDITIONS EXCEPT AS SHOWN HEREON.
 7. THE PARCELS CONTAINED IN THE LEGAL DESCRIPTION ARE CONTIGUOUS WITHOUT ANY GAPS, OR OVERLAPS.
 8. BUILDING AREAS SHOWN HEREON ARE FOR THE FOOTPRINT OF THE BUILDING ONLY.
 9. IN REGARD TO TABLE A ITEM 17, THERE WERE NO KNOWN PROPOSED CHANGES IN RIGHT OF WAY LINES, RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIRS EXCEPT AS SHOWN HEREON.
 10. NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL SEAL OF A LICENSED SURVEYOR. ADDITIONS AND DELETIONS TO SURVEY MAPS, SKETCHES, OR REPORTS BY OTHER THAN THE SIGNING PARTY OR PARTIES IS PROHIBITED WITHOUT WRITTEN CONSENT OF THE SIGNING PARTY OR PARTIES.
 11. THE NEAREST INTERSECTING STREET IS THE INTERSECTION OF WASHTENAW AVENUE AND BOSTON AVENUE, WHICH IS APPROXIMATELY 70' FROM THE NORTHWEST CORNER OF THE SUBJECT PROPERTY.
 12. THE DISTANCES SHOWN HEREON ARE UNITS OF GROUND MEASUREMENTS.
 13. ELEVATIONS ESTABLISHED WITH GPS STATIC OBSERVATIONS UTILIZING ONLINE POSITIONING USER SERVICE (OPUS) FOR POST PROCESSING WITH ORIGINATING BENCHMARK, PID: AA5188, VERTICAL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM (NAVD88) IN US SURVEY FEET. CONTOURS SHOWN ARE 1' INTERVALS.
 PID: AA5188
 PUBLISHED ELEVATION: 845.67'
 MONUMENT DESCRIPTION: STEEL ROD IMBEDDED IN MONUMENT

SIGNIFICANT OBSERVATIONS

- ▲ FENCE APPEARS TO EXTEND BEYOND THE WEST PROPERTY LINE BY AS MUCH AS 17.3'.
- ▲ FENCE APPEARS TO EXTEND BEYOND THE EAST PROPERTY LINE BY AS MUCH AS 21'.
- ▲ PARKING STRIPES APPEARS TO EXTEND BEYOND THE WEST PROPERTY LINE BY AS MUCH AS 4.4'.

BOUNDARY DETAIL



LEGEND

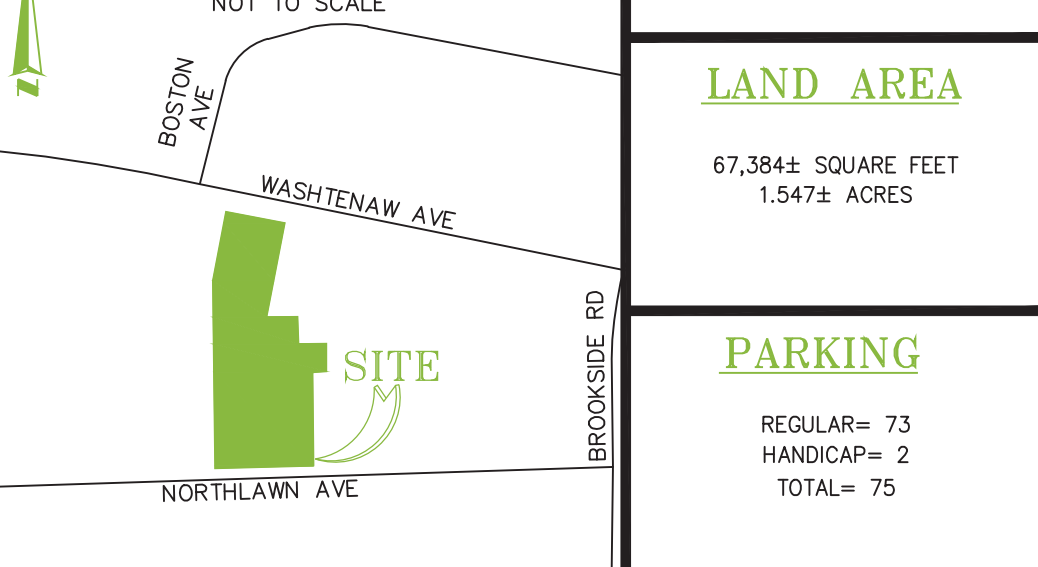
(M) MEASURED/CALCULATED DIMENSION	● FOUND MONUMENT AS NOTED
(R) RECORD DIMENSION	○ SET MONUMENT AS NOTED
N/F NOW OR FORMERLY	◆ COMPUTED POINT
SQ.FT. SQUARE FEET	■ SIGN
BHL BUILDING HEIGHT LOCATION	PS PARKING SPACE(S)
P.O.B. POINT OF BEGINNING	♿ HANDICAP PARKING SPACE
GR GRAVEL	▨ NO PARKING AREA
WRW WOOD RETAINING WALL	⊙ SANITARY MANHOLE
PO POND	⊙ STORM MANHOLE
CONC. CONCRETE	▨ GRATED INLET
GR GRAVEL	▨ CURB INLET
CLF CHAINLINK FENCE	⊙ GAS METER
OVH OVERHANG	⊙ MAILBOX
BW BARBED WIRE	⊙ ELECTRIC METER
IF IRON FENCE	⊙ AIR CONDITIONER
WF WOOD FENCE	⊙ LIGHT POLE
WD WOOD DECK	⊙ UTILITY POLE
CS CONCRETE STAIRS	⊙ WATER VALVE
PF PLASTIC FENCE	— PROPERTY LINE
CW CONCRETE WALL	— OVERHEAD POWER LINE
SB SPEED BUMP	— UNDERGROUND ELECTRIC LINE
NG NATURAL GROUND	— UNDERGROUND WATER LINE
TC TOP OF CONCRETE	— UNDERGROUND GAS LINE
TA TOP OF ASPHALT	— UNDERGROUND TELEPHONE LINE
CR CROWN OF ROAD	— OVERHEAD CABLE TV LINE
EA EDGE OF CONCRETE	— OVERHEAD FIBER OPTIC LINE
EC TOP OF ASPHALT	— UNDERGROUND SANITARY SEWER LINE
TB TOP OF BANK	— UNDERGROUND STORM SEWER LINE
FL FLOW LINE	— FENCE LINE
RCP REINFORCED CONCRETE PIPE	— HANDRAIL
CMP CORRUGATED METAL PIPE	— RIGHT-OF-WAY
	— CENTERLINE
	— WALL

LINE TABLE

LINE	BEARING	DISTANCE
L1	S 10°43'31" W	5.84'(M)
L2	S 88°03'40" W	5.84'(M)

SURVEYED BY:
 BLEW & ASSOCIATES, P.A.
 3825 N SHILOH DRIVE
 FAYETTEVILLE, AR 72703
 SURVEY@BLEWINC.COM

VICINITY MAP



SHEET 1 OF 3

LAND AREA

67,384± SQUARE FEET
 1.547± ACRES

PARKING

REGULAR= 73
 HANDICAP= 2
 TOTAL= 75

FLOOD INFORMATION

FLOOD NOTE: BASED ON MAPS PREPARED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) AVAILABLE ONLINE AT WWW.MSC.FEMA.GOV, AND BY GRAPHIC PLOTTING ONLY, THIS PROPERTY IS LOCATED IN ZONE "X" ON FLOOD INSURANCE RATE MAP NUMBER 26161C0264E, WHICH BEARS AN EFFECTIVE DATE OF 04/03/2012 AND IS NOT IN A SPECIAL FLOOD HAZARD AREA. BY REVIEWING FLOOD MAPS PROVIDED BY THE NATIONAL FLOOD INSURANCE PROGRAM WE HAVE LEARNED THIS COMMUNITY DOES PARTICIPATE IN THE PROGRAM.

BEARING BASIS

THE BASIS OF BEARING FOR THIS SURVEY IS GRID NORTH PER MICHIGAN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, NAD83-2011, AS MEASURED ALONG THE SOUTH LINE OF THE SUBJECT PROPERTY, ALSO BEING THE NORTH RIGHT-OF-WAY LINE OF NORTHLAWN AVENUE, WHICH BEARS S 88°03'40" W PER GPS COORDINATE OBSERVATIONS.
 LATITUDE: 42°15'55.4708"
 LONGITUDE: -83°39'14.3503"
 CONVERGENCE ANGLE: 0°29'05.9997"

ALTA/NSPS LAND TITLE SURVEY

AEI JOB #476480 - TASK 2
 PUTTERZ
 2675 WASHTENAW AVENUE
 WASHTENAW COUNTY YPSILANTI, MICHIGAN 48197

SITE PICTURE



COORDINATED BY:
 AEI CONSULTANTS
 2500 CAMINO DIABLO
 WALNUT CREEK, CA, 94597
 TELEPHONE: 925.746.6000
 EMAIL: SURVEYS@AEICONSULTANTS.COM

SURVEYOR'S CERTIFICATE

TO: FIRST AMERICAN TITLE INSURANCE COMPANY:
 THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2021 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1, 2, 3, 4, 5, 6A, 6B, 7A, 7B, 7C, 8, 9, 11B, 13, 14, 15, AND 17 OF TABLE A THEREOF. THE FIELDWORK WAS COMPLETED ON 04/17/2023. DATE OF PLAT OR MAP: 04/24/2023.

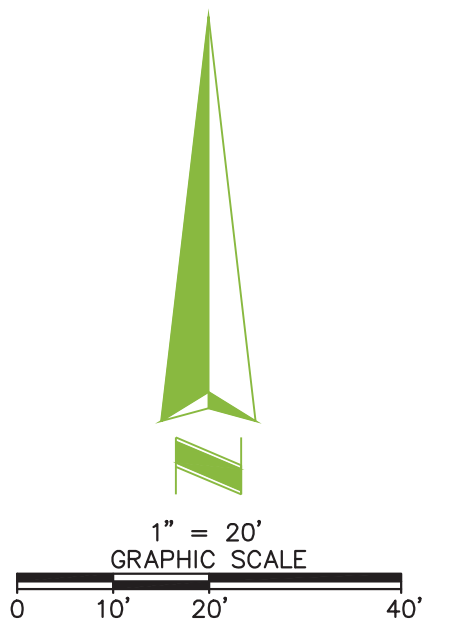
RONALD R. HARRIS
 PROFESSIONAL LAND SURVEYOR NO.: 4001041917
 STATE OF MICHIGAN

DATE	REVISION HISTORY	BY	SURVEYOR JOB NUMBER: 23-1796.01
			SCALE: 1" = 30'
			DRAWN BY: AK
			APPROVED BY: LT

PRELIMINARY

TEMPORARY BENCHMARK TABLE

- 81 SET CHISELED "X" IN CONCRETE
ELEVATION: 808.16'
NORTHING: 273922.86
EASTING: 13316364.27
- 82 SET MAG-NAIL
ELEVATION: 801.64'
NORTHING: 273795.81
EASTING: 13316340.93



INVERT TABLE

- 11 STORM SEWER MANHOLE
RIM ELEVATION: 783.59'
12" RCP INVERT NW: 778.4'
12" RCP INVERT NE: (UNABLE TO DETERMINE SOURCE)
RCP INVERT N: 770.6' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
RCP INVERT S: 769.6' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
- 12 STORM SEWER MANHOLE
RIM ELEVATION: 802.10'
18" RCP INVERT W: 796.3'
RCP INVERT N: 782.6' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
RCP INVERT S: 774.6' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
- 13 STORM SEWER MANHOLE
RIM ELEVATION: 805.98'
RCP INVERT N: 787.0' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
RCP INVERT S: 786.8' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
- 14 CURB INLET
RIM ELEVATION: 807.65'
SUMP ELEVATION: 805.7'
UNABLE TO LOCATE PIPES, FULL OF WATER & DEBRIS
- 15 GRATED INLET
RIM ELEVATION: 808.15'
10" CMP INVERT SE: 805.1'
24" RCP INVERT N: 804.2'
- 16 STORM SEWER MANHOLE
RIM ELEVATION: 808.21'
24" RCP INVERT S: 796.8'
8" CLAY PIPE INVERT E: 802.8'
24" RCP INVERT NE: 796.6'
24" RCP INVERT SE (UNABLE TO MEASURE DUE TO DEPTH)
- 17 CURB INLET
RIM ELEVATION: 808.89'
8" CLAY PIPE INVERT W: 803.6'
- 18 STORM SEWER MANHOLE
RIM ELEVATION: 808.48'
UNABLE TO OPEN DUE TO HIGH TRAFFIC
- 19 STORM SEWER MANHOLE
RIM ELEVATION: 808.60'
UNABLE TO OPEN DUE TO HIGH TRAFFIC
- 20 STORM SEWER MANHOLE
RIM ELEVATION: 812.55'
UNABLE TO OPEN DUE TO HIGH TRAFFIC
- 21 SANITARY SEWER MANHOLE
RIM ELEVATION: 783.94'
8" CAST IRON PIPE INVERT W: 776.2'
8" CAST IRON PIPE INVERT E: 776.1'
8" CAST IRON PIPE INVERT N: 775.6'
8" CAST IRON PIPE INVERT S: 775.5'
- 22 SANITARY SEWER MANHOLE
RIM ELEVATION: 796.41'
6" CAST IRON PIPE INVERT W: 776.7'
8" CAST IRON PIPE INVERT N: 776.7'
8" CAST IRON PIPE INVERT S: 776.7'
- 23 SANITARY SEWER MANHOLE
RIM ELEVATION: 802.34'
CAST IRON PIPE INVERT N: 787.6' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
CAST IRON PIPE INVERT S: 787.4' (UNABLE TO DETERMINE PIPE SIZE DUE TO DEPTH)
- 24 SANITARY SEWER MANHOLE
RIM ELEVATION: 808.29'
8" CAST IRON PIPE INVERT NE: 799.0'
6" CAST IRON PIPE INVERT E: 799.0'
SUMP ELEVATION: 798.9'
UNABLE TO LOCATE DISCHARGE PIPE, FULL OF SEWAGE
- 25 SANITARY SEWER MANHOLE
RIM ELEVATION: 812.13'
8" CAST IRON PIPE INVERT E: 801.7'
8" CAST IRON PIPE INVERT W: 801.6'

LEGEND

- (M) MEASURED/CALCULATED DIMENSION
- (R) RECORD DIMENSION
- N/F NOW OR FORMERLY
- SQ.FT. SQUARE FEET
- BHL BUILDING HEIGHT LOCATION
- P.O.B. POINT OF BEGINNING
- GR GRAVEL
- WRW WOOD RETAINING WALL
- PO POND
- CONC. CONCRETE
- GR GRAVEL
- CLF CHAINLINK FENCE
- OVH OVERHANG
- BW BARBED WIRE
- IF IRON FENCE
- WF WOOD FENCE
- WD WOOD DECK
- CS CONCRETE STAIRS
- PF PLASTIC FENCE
- CW CONCRETE WALL
- SB SPEED BUMP
- NG NATURAL GROUND
- TC TOP OF GRAVEL
- CG EDGE OF GRAVEL
- BB BOTTOM OF BANK
- TA TOP OF CONCRETE
- TA TOP OF ASPHALT
- CR CROWN OF ROAD
- EC EDGE OF CONCRETE
- EA TOP OF ASPHALT
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- FL FLOW LINE
- RCP REINFORCED CONCRETE PIPE
- CMP CORRUGATED METAL PIPE
- FOUND MONUMENT AS NOTED
- SET MONUMENT AS NOTED
- ⊕ COMPUTED POINT
- ⚡ SIGN
- PS PARKING SPACE(S)
- ♿ HANDICAP PARKING SPACE
- ⊘ NO PARKING AREA
- ⊙ SANITARY MANHOLE
- ⊙ STORM MANHOLE
- ⊙ GRATED INLET
- ⊙ CURB INLET
- ⊙ GAS METER
- ⊙ MAILBOX
- ⊙ ELECTRIC METER
- ⊙ AIR CONDITIONER
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- UNDERGROUND TELEPHONE LINE
- OVERHEAD CABLE TV LINE
- OVERHEAD FIBER OPTIC LINE
- UNDERGROUND SANITARY SEWER LINE
- UNDERGROUND STORM SEWER LINE
- FENCE LINE
- HANDRAIL
- RIGHT-OF-WAY
- CENTERLINE
- WALL



SURVEYED BY:
BLEW & ASSOCIATES, P.A.
3825 N SHILOH DRIVE
FAYETTEVILLE, AR 72703.
SURVEY@BLEWINC.COM

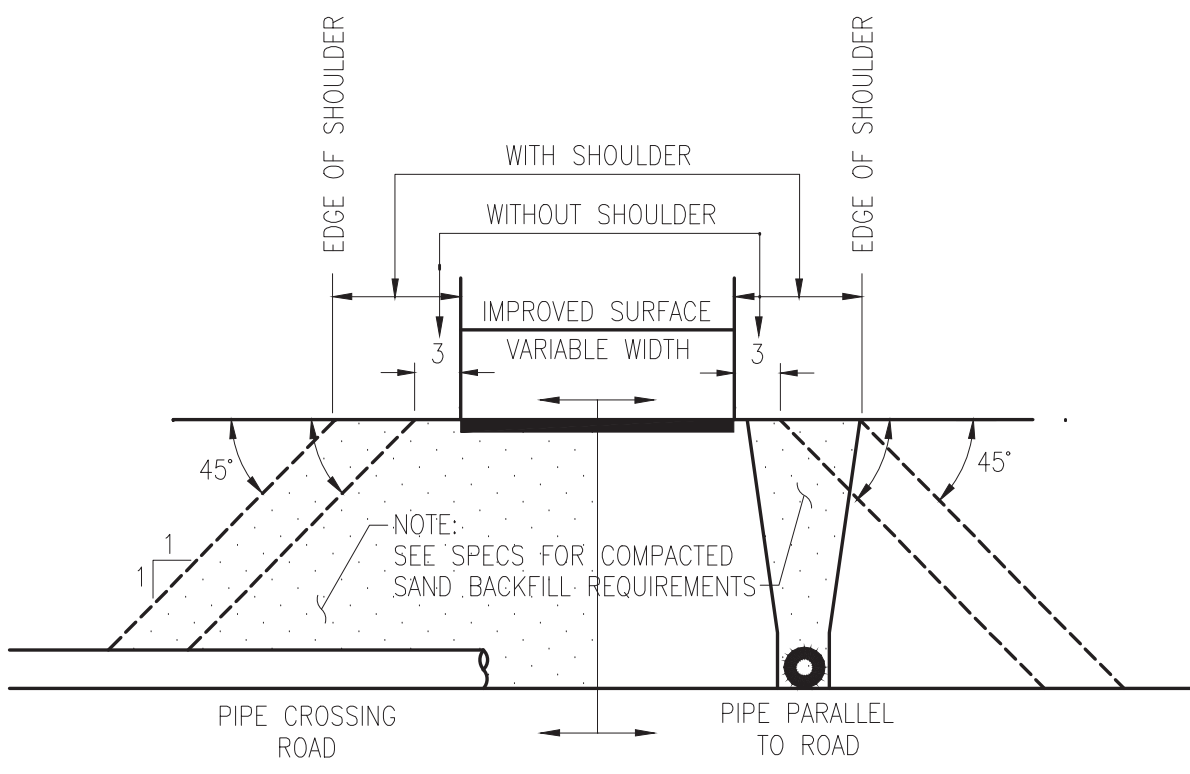
COORDINATED BY:
AEI Consultants
TELEPHONE: 925.746.6000
EMAIL: SURVEYS@AEICONSULTANTS.COM

ALTA/NSPS LAND TITLE SURVEY
AEI JOB #476480 - TASK 2
PUTTERZ
2675 WASHTENAW AVENUE
WASHTENAW COUNTY YPSILANTI, MICHIGAN 48197

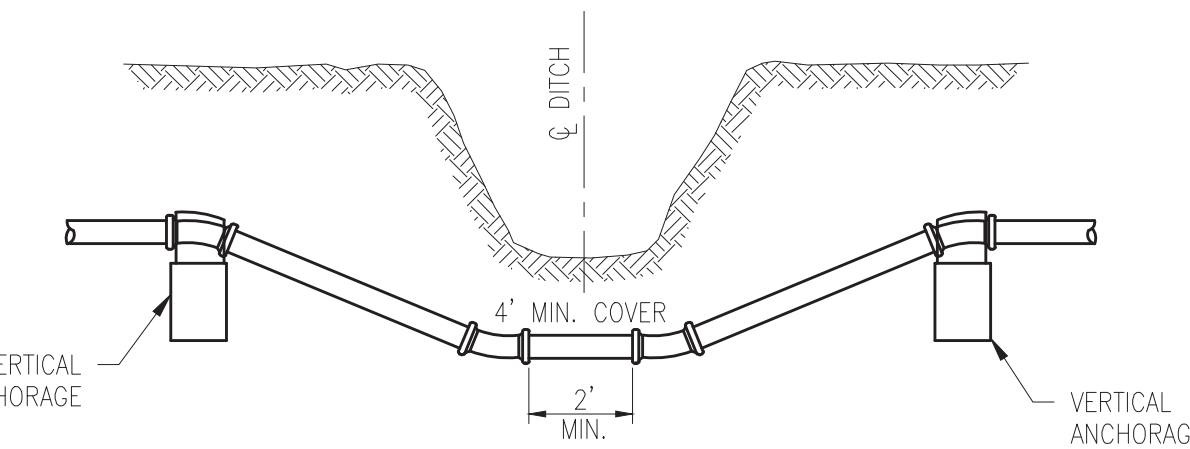
DATE	REVISION HISTORY	BY	SURVEYOR JOB NUMBER: 23-1796.01
			SCALE: 1" = 20'
			DRAWN BY: AK
			APPROVED BY: LT



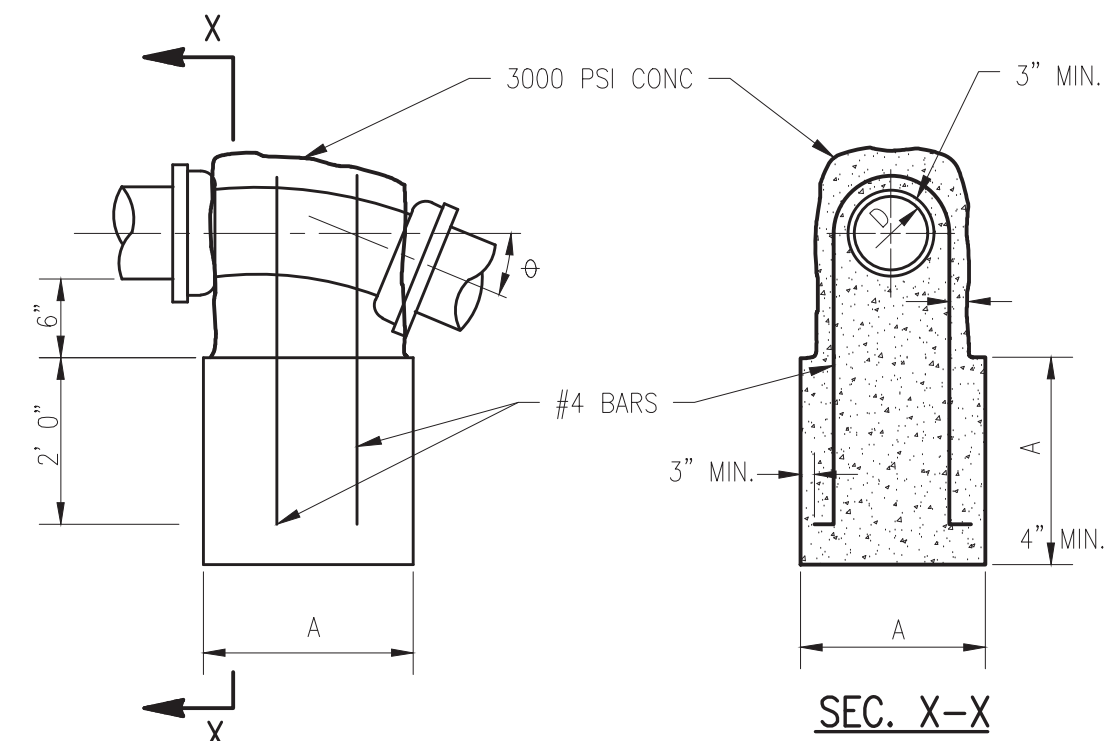
TRACER WIRE DETAILS



**BACKFILL IN THE AREA OF STREETS, ALLEYS
SIDEWALKS, DRIVES & PARKING LOTS**
NOT TO SCALE



STANDARD DITCH CROSSING
NOT TO SCALE



DETAIL OF VERTICAL ANCHORAGE
NOT TO SCALE

DIA. OF WATER MAIN	BEND	A	NUMBER OF BARS
6"	22 1/2°	2'-0"	2
	45°	3'-3"	2
8"	22 1/2°	3'-3"	2
	45°	4'-0"	3
12"	11 1/4°	3'-3"	2
	22 1/2°	4'-0"	3
16"	11 1/4°	3'-3"	2
	22 1/2°	4'-0"	3
20"	11 1/4°	4'-0"	2
	22 1/2°	5'-0"	3
24"	11 1/4°	4'-0"	2
	22 1/2°	5'-0"	3

PIPE RESTRAINT SCHEDULE

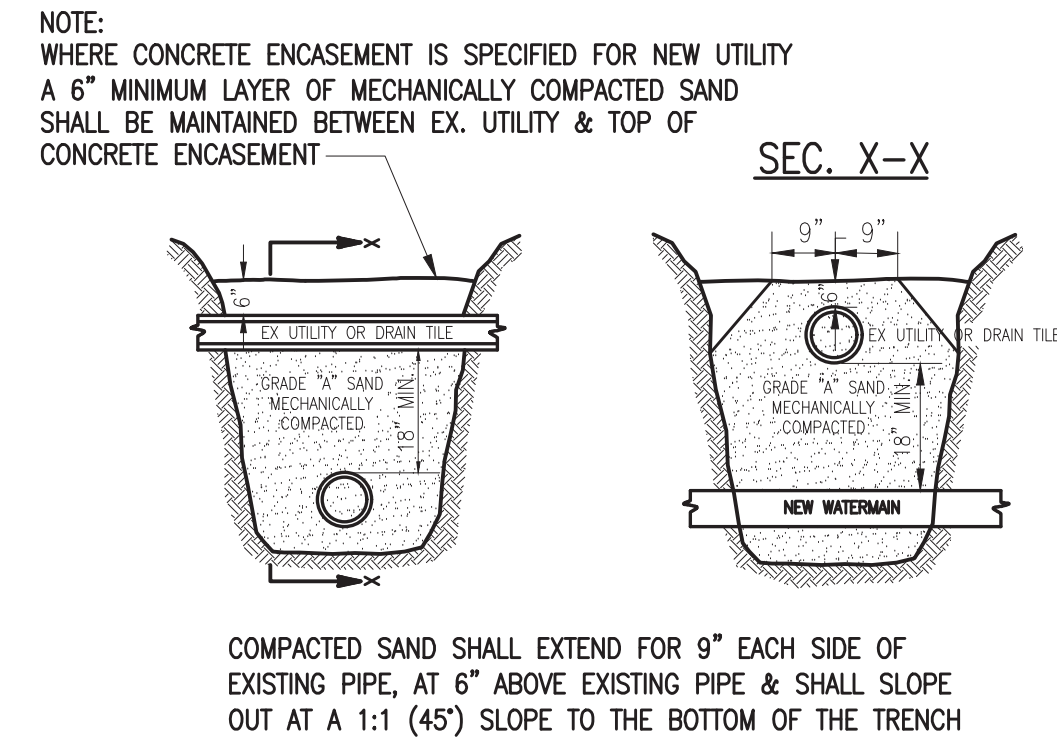
THE FOLLOWING TABLE IS A JOINT RESTRAINT SCHEDULE (DIPRA) FOR GROUND-BURIED DUCTILE IRON OR PVC PIPE. LENGTHS OF PIPE RESTRAINT ARE GIVEN IN FEET.

PIPE DIAMETER	TEES, 90° PLUGS	45° BENDS	22 1/2° BENDS	REDUCERS
6"	40	25	25	30
8"	55	25	25	30
12"	80	35	25	55
16"	100	40	25	60
24"	135	56	25	65

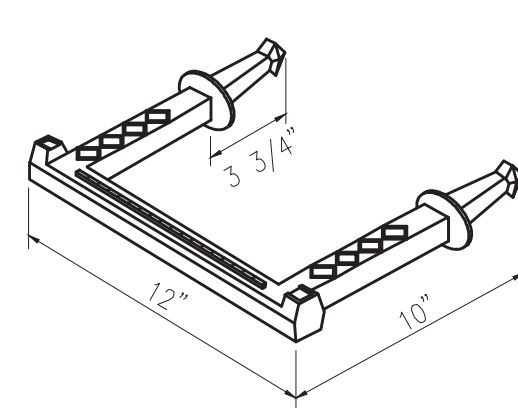
BASED UPON

INTERNAL PRESSURE: 180
PIPE DEPTH: 5
BEDDING CLASS: TYPE 4
SOIL TYPE: GOOD SAND
SAFETY FACTOR: 2

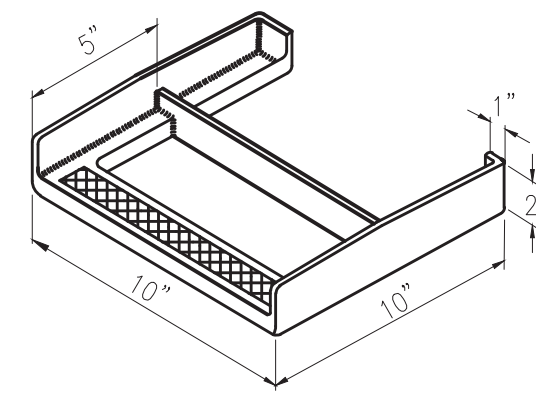
- IF PIPE DIAMETER IS NOT LISTED IN THIS TABLE, THE NEXT LARGEST PIPE SHALL BE USED. THIS TABLE IS BASED ON A TEST PRESSURE OF 180 PSI (OPERATING PRESSURE PLUS WATER HAMMER).
- FOR OTHER TEST PRESSURES, ALL VALUES TO BE INCREASED OR DECREASED PROPORTIONALLY. THE VALUES PROVIDED OF RESTRAINT LENGTH ARE IN EACH DIRECTION FROM THE POINT OF DEFLECTION OR TERMINATION EXCEPT FOR TEES, AT WHICH ONLY THE BRANCH IN THE DIRECTION OF THE STEM.
- IF TIE RODS ARE USED, USE FOUR RODS MINIMUM AND ADD 1/8 INCH TO BAR DIAMETER AS CORROSION ALLOWANCE. SIZE REDUCTION IS BASED UPON THE PIPE DIAMETER SHOWN IN THIS TABLE.
- MANUFACTURER'S RESTRAINT SCHEDULE AND SPECIFIC SITE CONDITIONS MAY MODIFY THE ABOVE SCHEDULE. ANY ALTERNATIVE SCHEDULE SHALL BE SUBMITTED TO YCUA FOR APPROVAL.



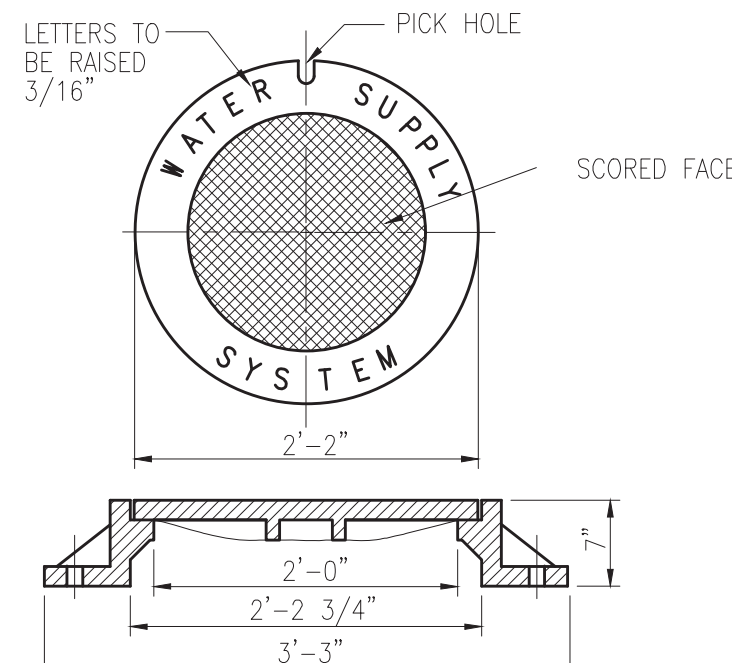
STANDARD PIPE SUPPORT
NOT TO SCALE



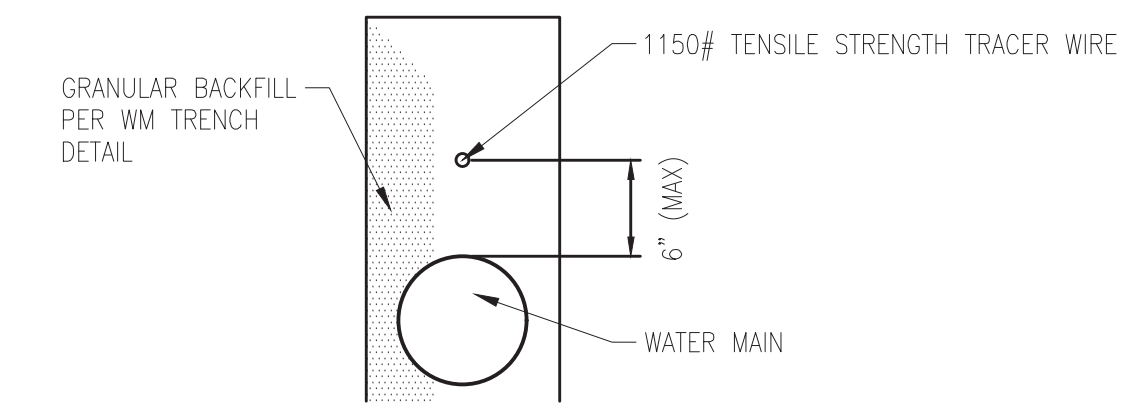
MANHOLE STEP
M.A. PSI-375
USE AS REQUIRED



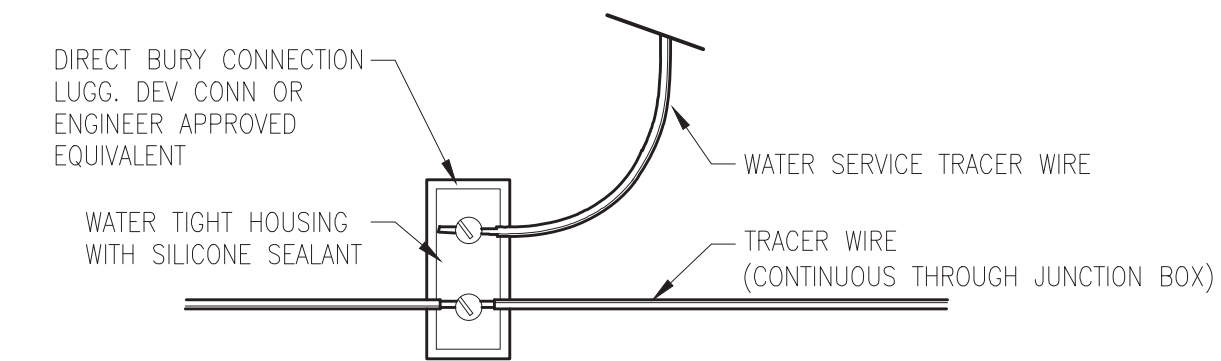
STANDARD MANHOLE STEP
EJ 8500
USE AS REQUIRED



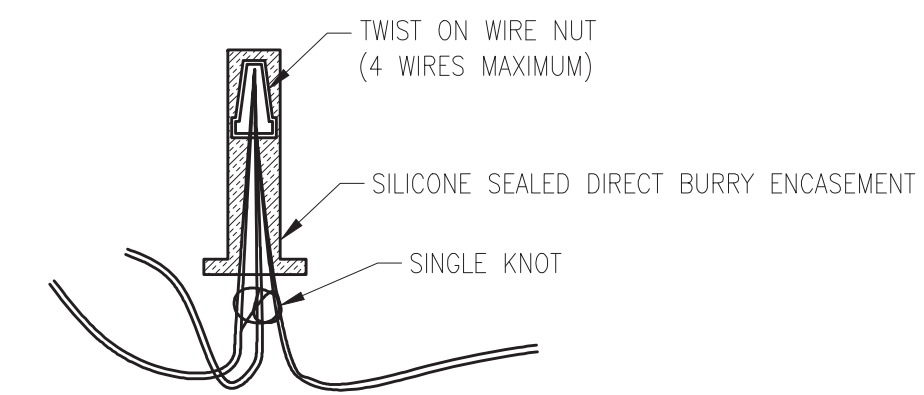
STANDARD FRAME & COVER
EJ #1040
USE AS REQUIRED



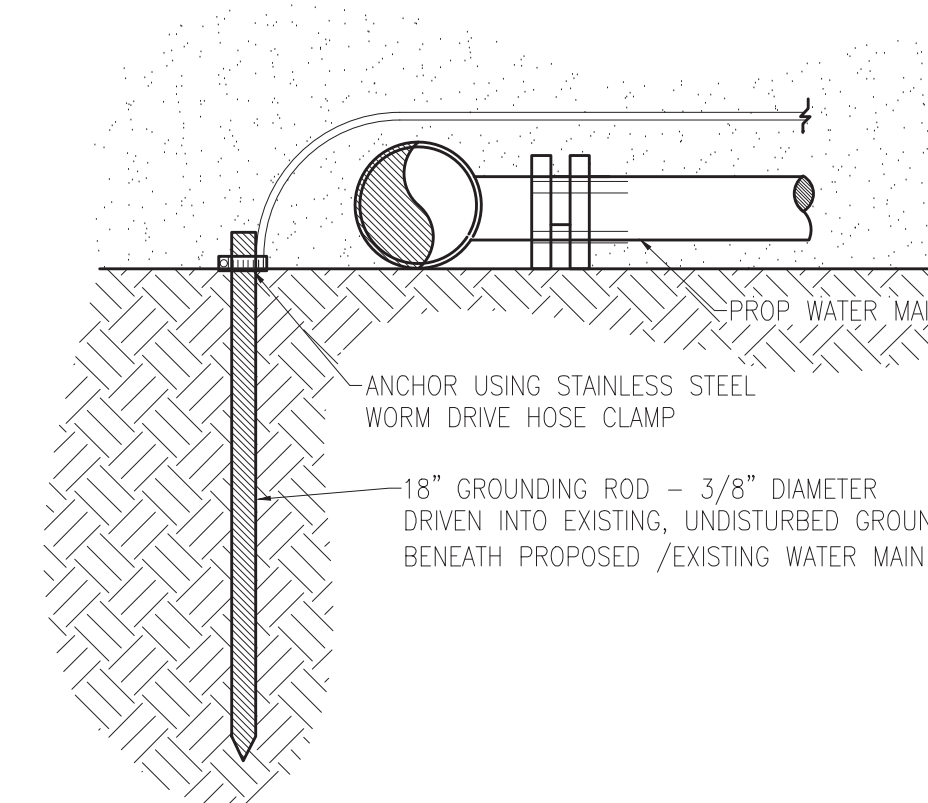
OPEN CUT MAIN LINE TRENCH
NOT TO SCALE



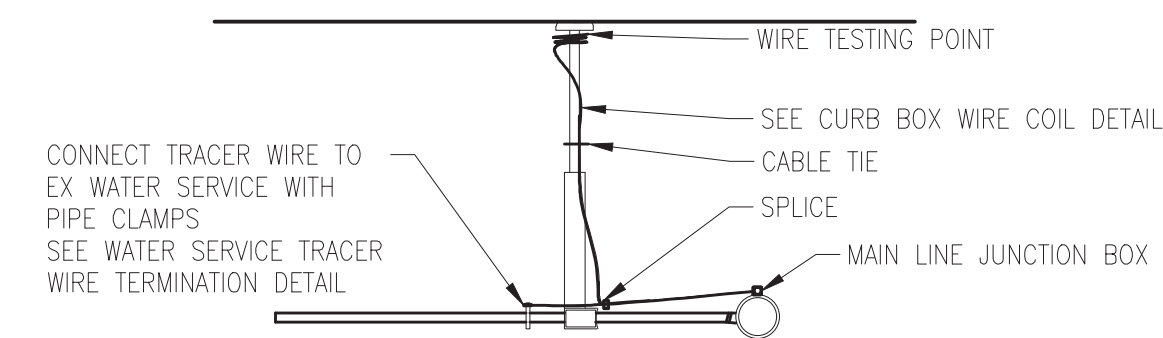
MAIN LINE JUNCTION BOX
NOT TO SCALE



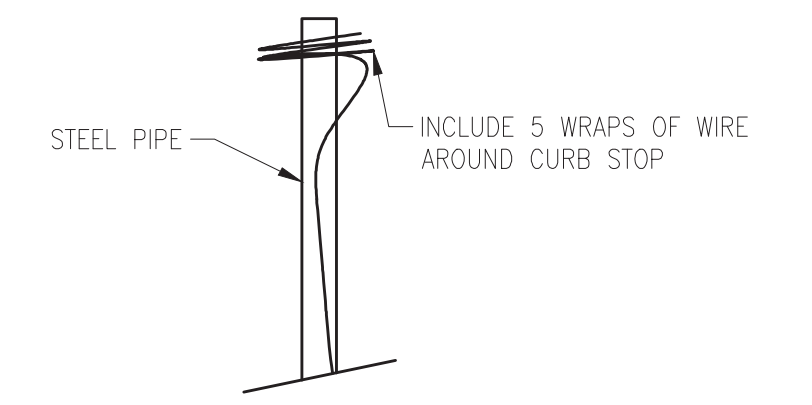
SPLICE CONNECTOR
NOT TO SCALE



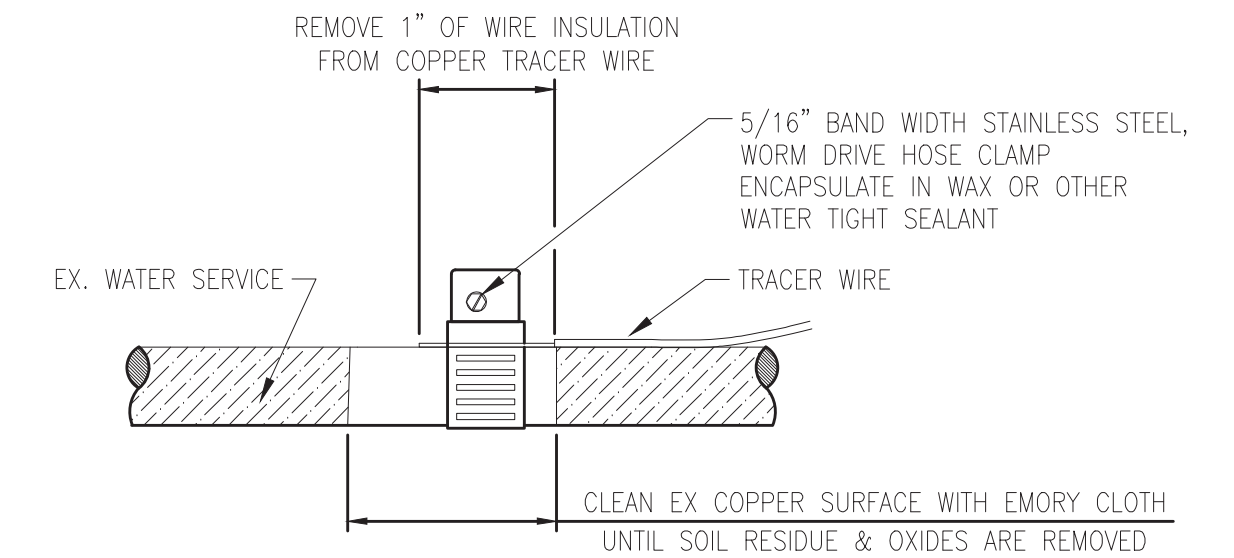
GROUNDING ROD TERMINATION
NOT TO SCALE



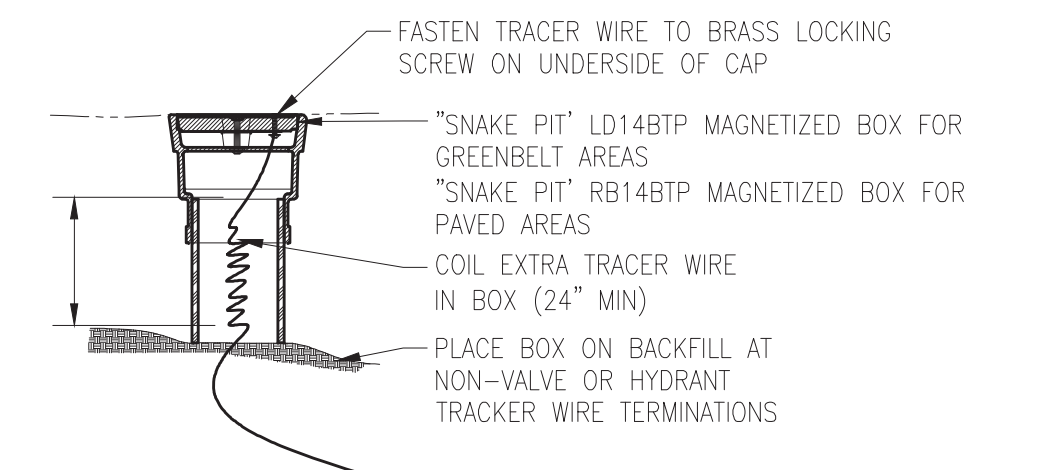
CURB STOP CONNECTION
NOT TO SCALE



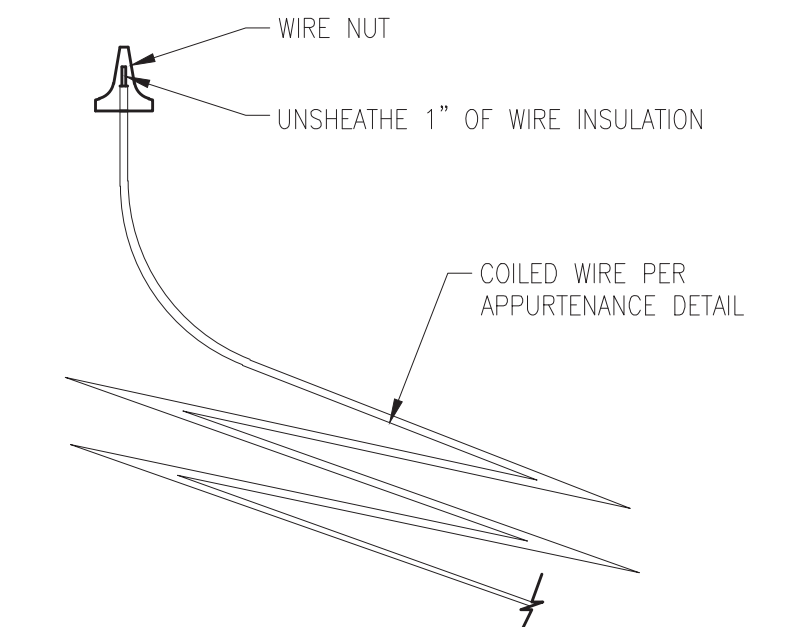
CURB BOX WIRE COIL
NOT TO SCALE



WATER SERVICE TERMINATION
NOT TO SCALE



TRACER WIRE TEST POINT
NOT TO SCALE



WIRE TESTING POINT
NOT TO SCALE



Know what's below.
Call before you dig.



REVISIONS

STANDARD WATER MAIN DETAILS

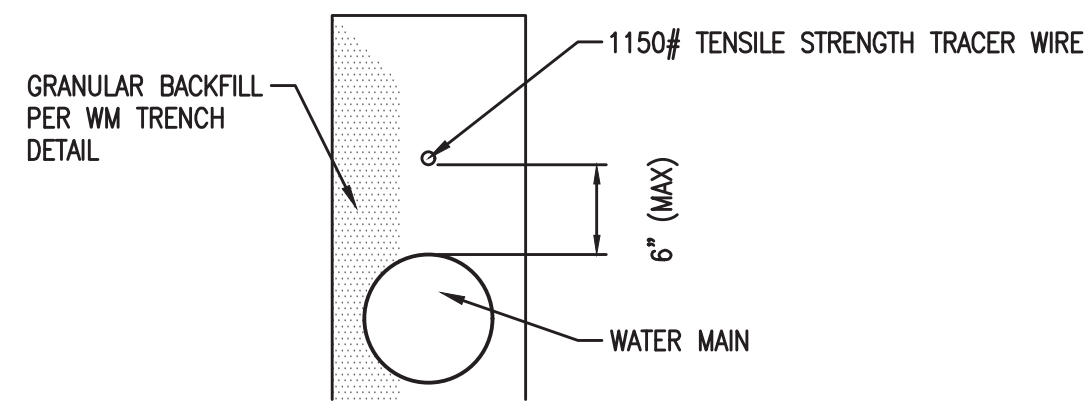
YPSILANTI COMMUNITY UTILITIES AUTHORITY
2777 STATE ROAD
YPSILANTI, MICHIGAN 48198-9112
(734) 484-4800
FAX: (734) 544-7221
WWW.YCUA.ORG

YCUA
ENVIRONMENTAL LEADERS

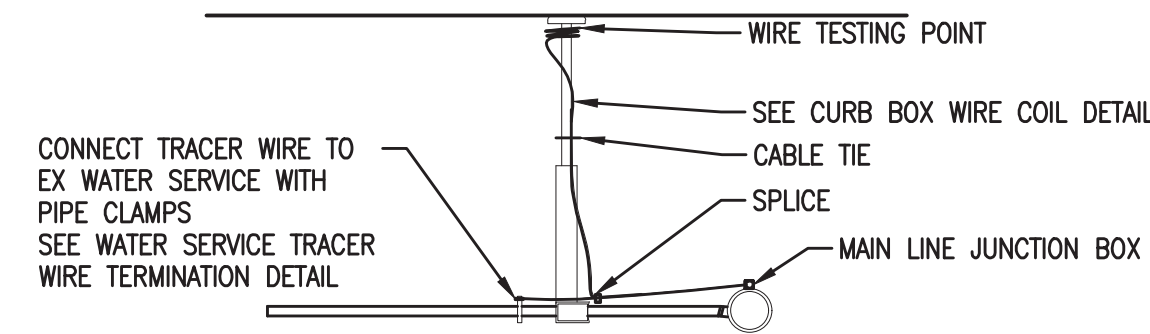
DATE	SCALE	SHEET
09/25/19	NO SCALE	

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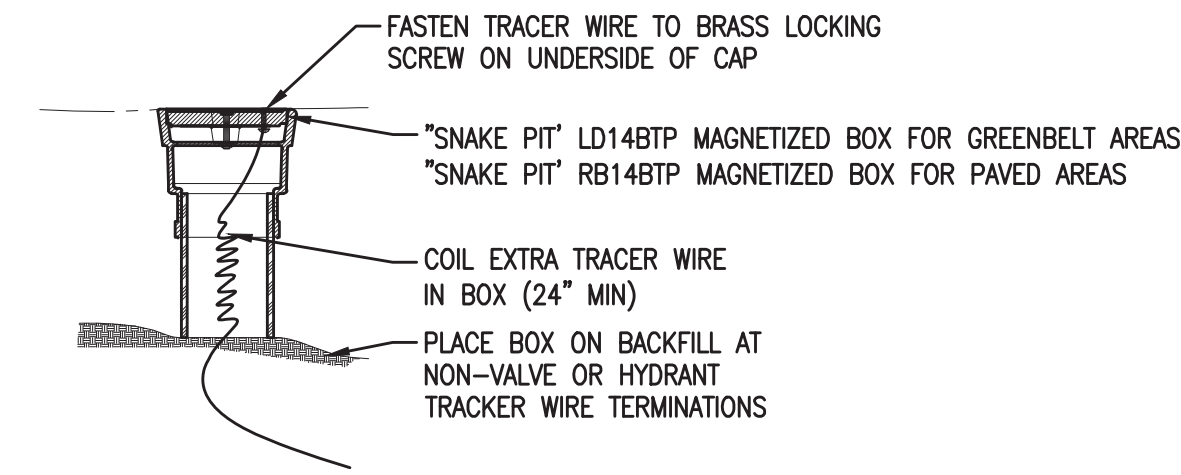
TRACER WIRE SHALL BE INCLUDED WITH ALL PVC WATER MAIN INSTALLATIONS



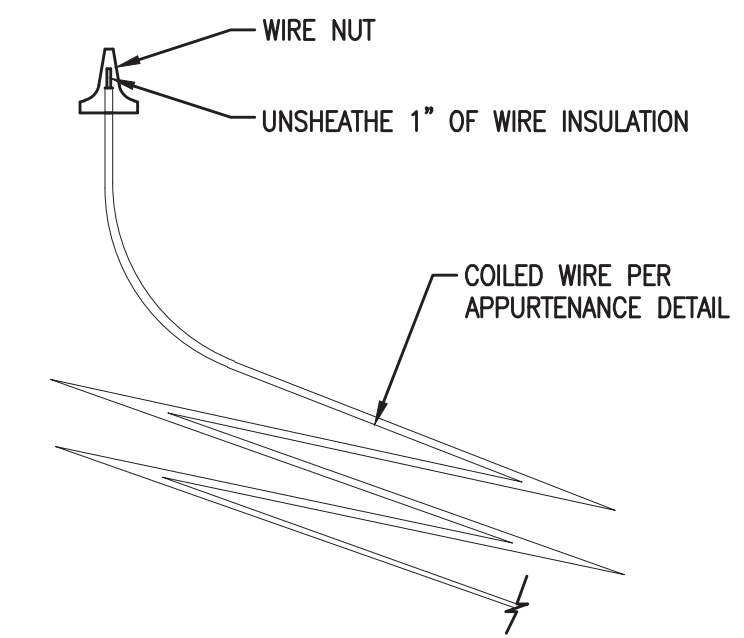
OPEN CUT MAIN LINE TRENCH
N.T.S.



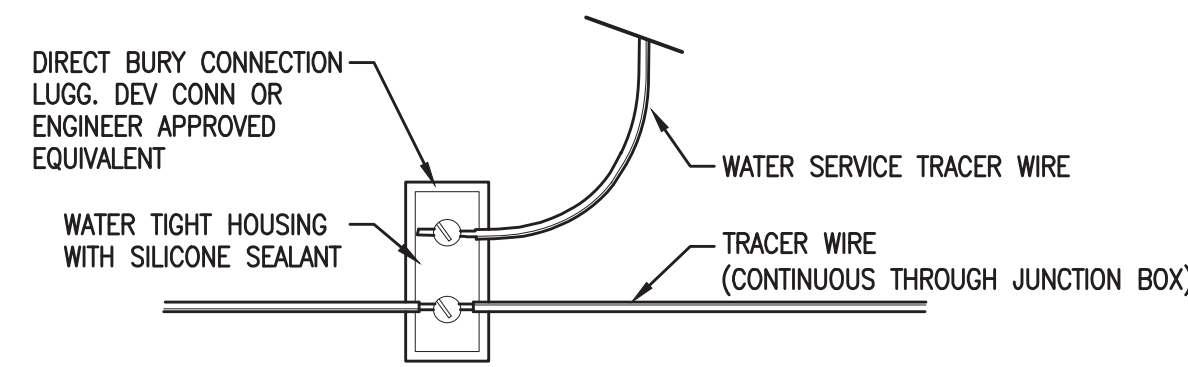
CURB STOP CONNECTION
N.T.S.



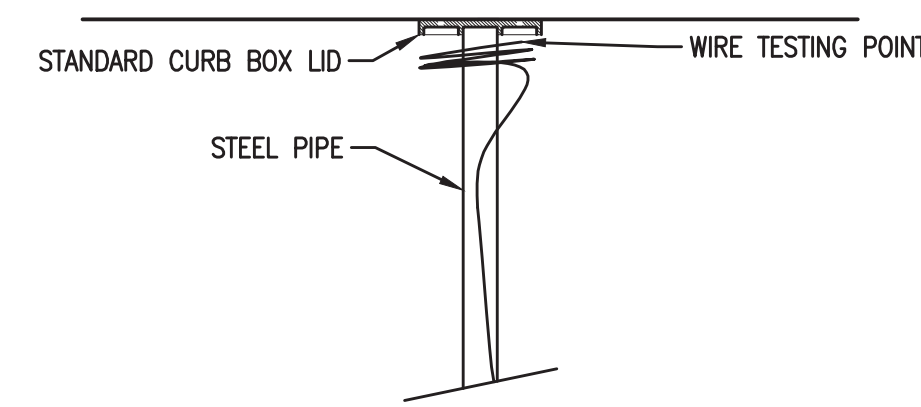
TRACER WIRE TEST POINT
N.T.S.



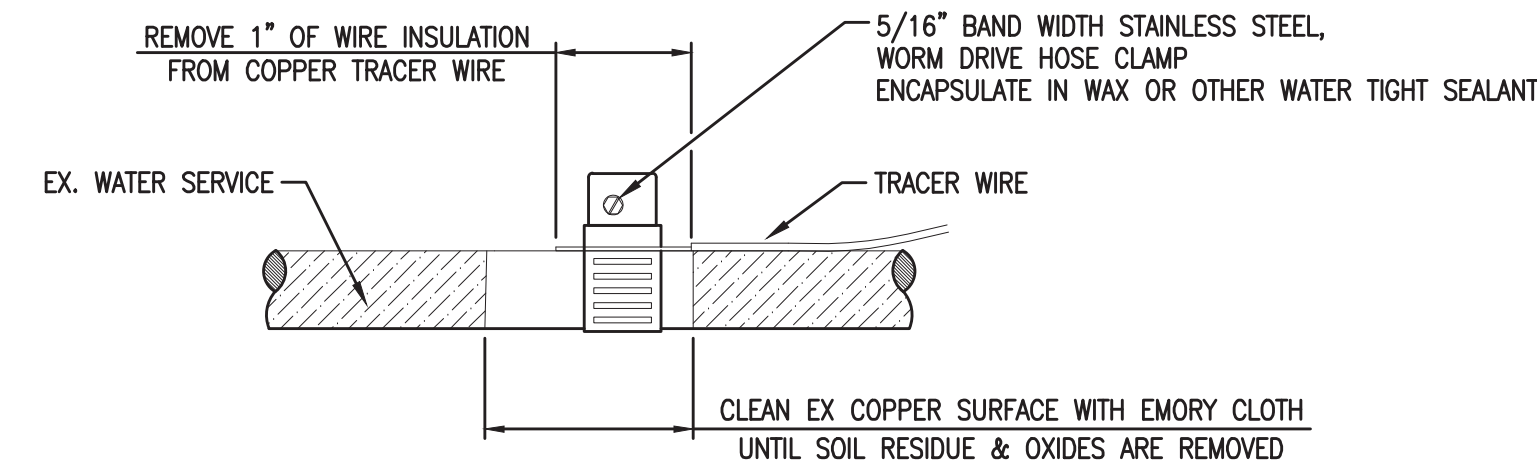
WIRE TESTING POINT
N.T.S.



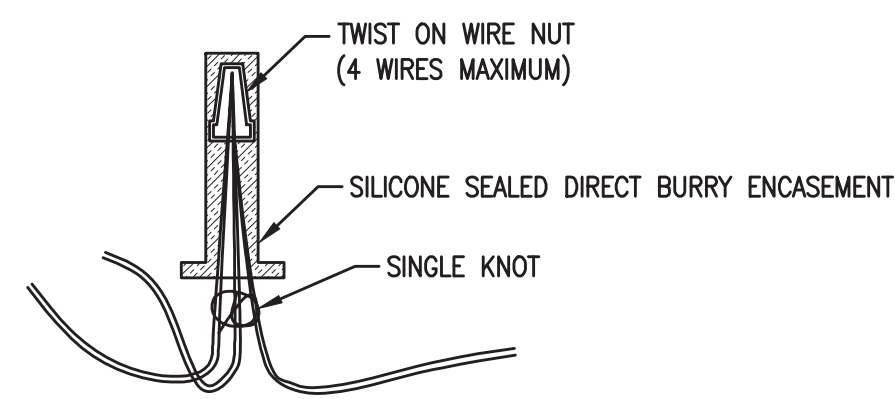
MAIN LINE JUNCTION BOX
N.T.S.



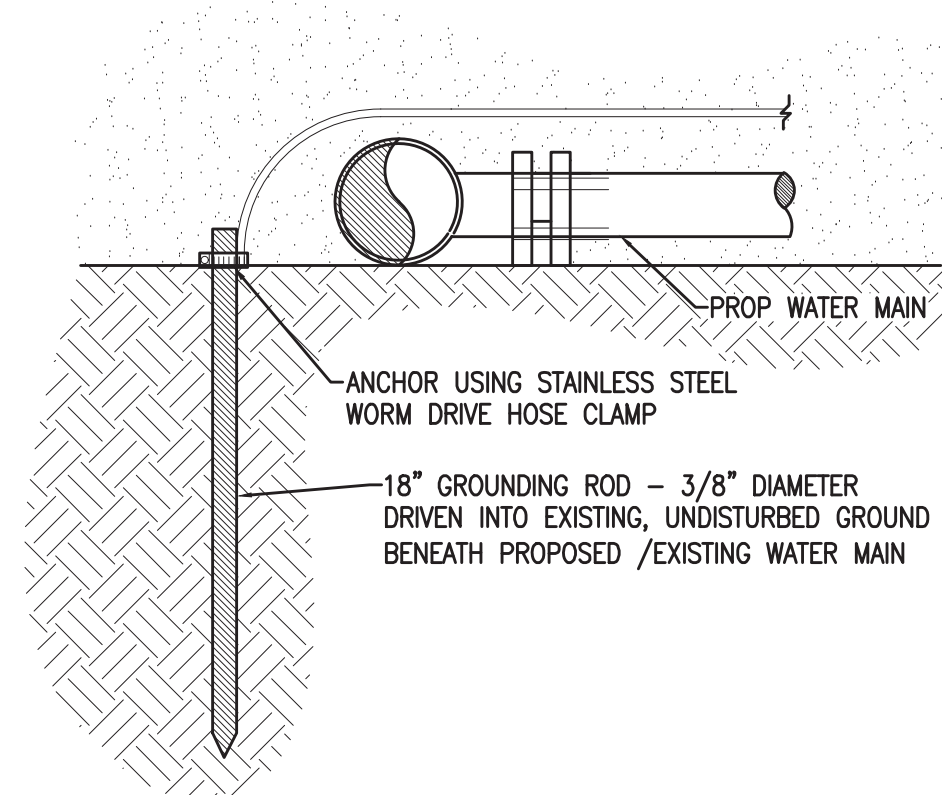
CURB BOX WIRE COIL
N.T.S.



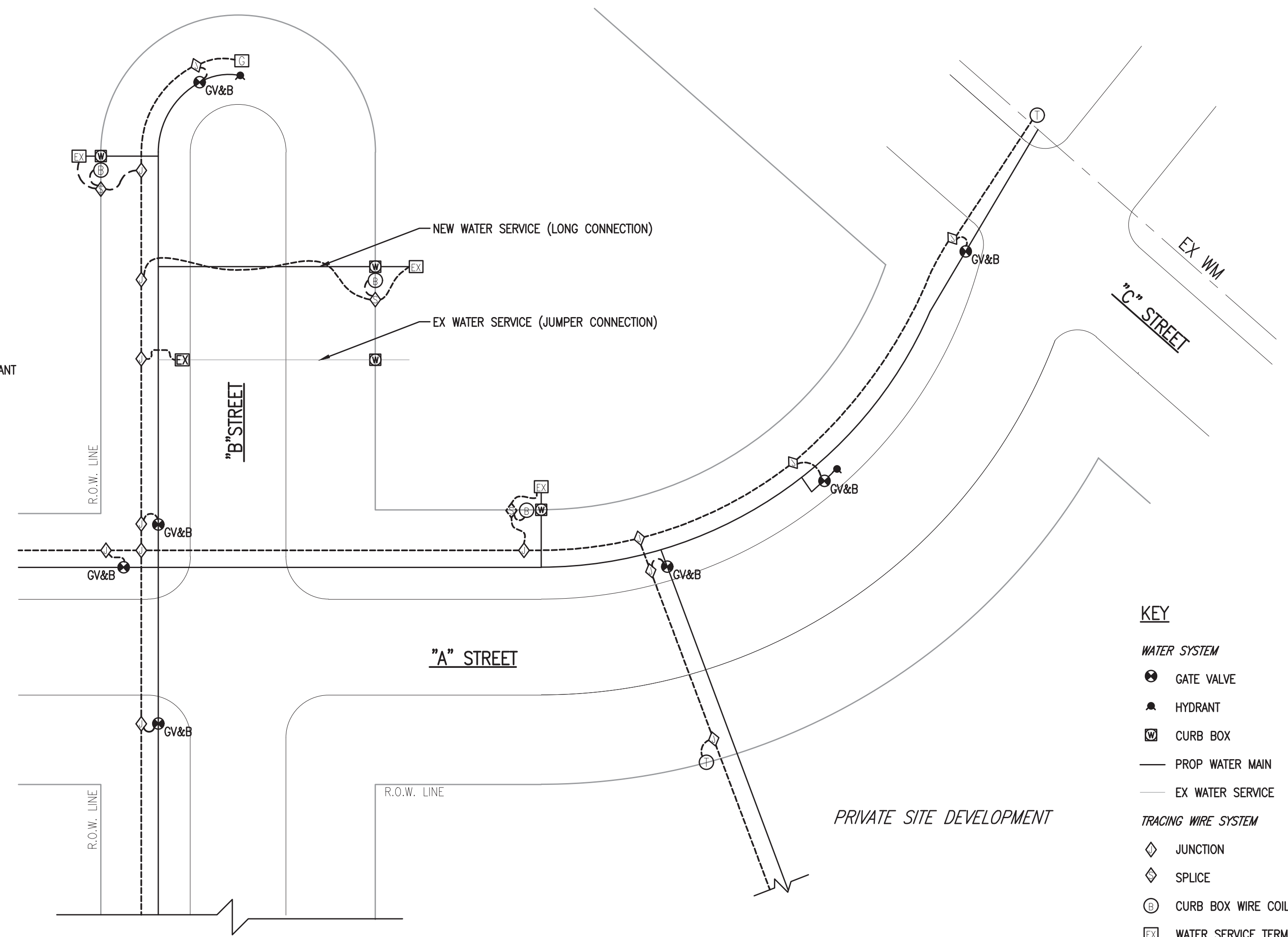
WATER SERVICE TERMINATION
N.T.S.



SPLICE CONNECTOR
N.T.S.



GROUNDING ROD TERMINATION
N.T.S.



- KEY**
- WATER SYSTEM**
- ⊕ GATE VALVE
 - ⊙ HYDRANT
 - ⊠ CURB BOX
 - PROP WATER MAIN
 - EX WATER SERVICE
- TRACING WIRE SYSTEM**
- ◇ JUNCTION
 - ◇ SPLICE
 - ⊙ CURB BOX WIRE COIL
 - ⊠ WATER SERVICE TERMINATION
 - ⊙ TEST POINT
 - ⊠ GROUNDING ROD TERMINATION
 - TRACING WIRE

TRACER WIRE SYSTEM SCHEMATIC



Know what's below.
Call before you dig.

REVISIONS

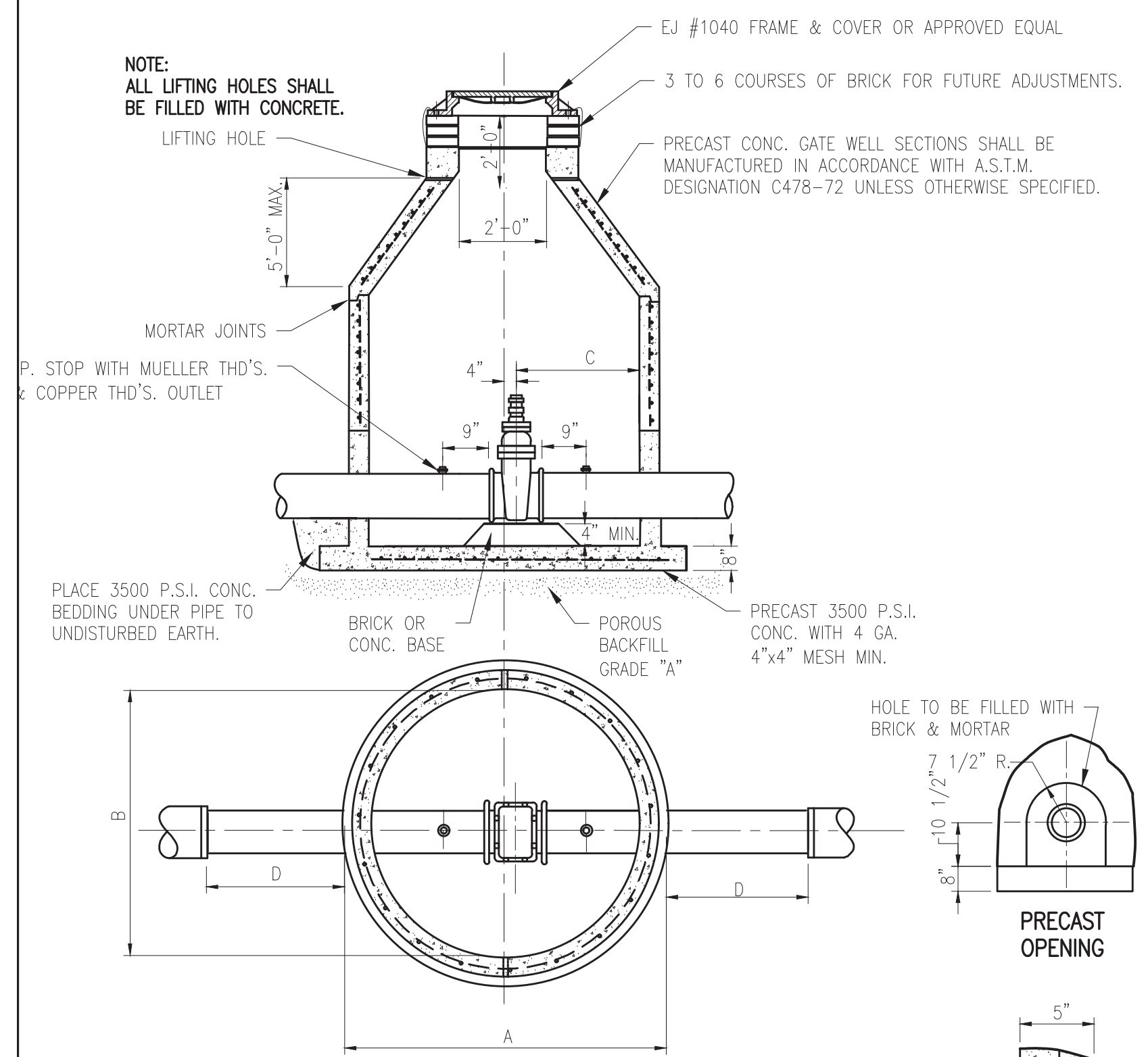
STANDARD WATER MAIN DETAILS

YPSILANTI COMMUNITY UTILITIES AUTHORITY
 2777 STATE ROAD
 YPSILANTI, MICHIGAN 48198-9112
 (734) 484-4800
 FAX: (734) 544-7221
 WWW.YCAU.ORG

YCAU
 ENVIRONMENTAL LEADERS

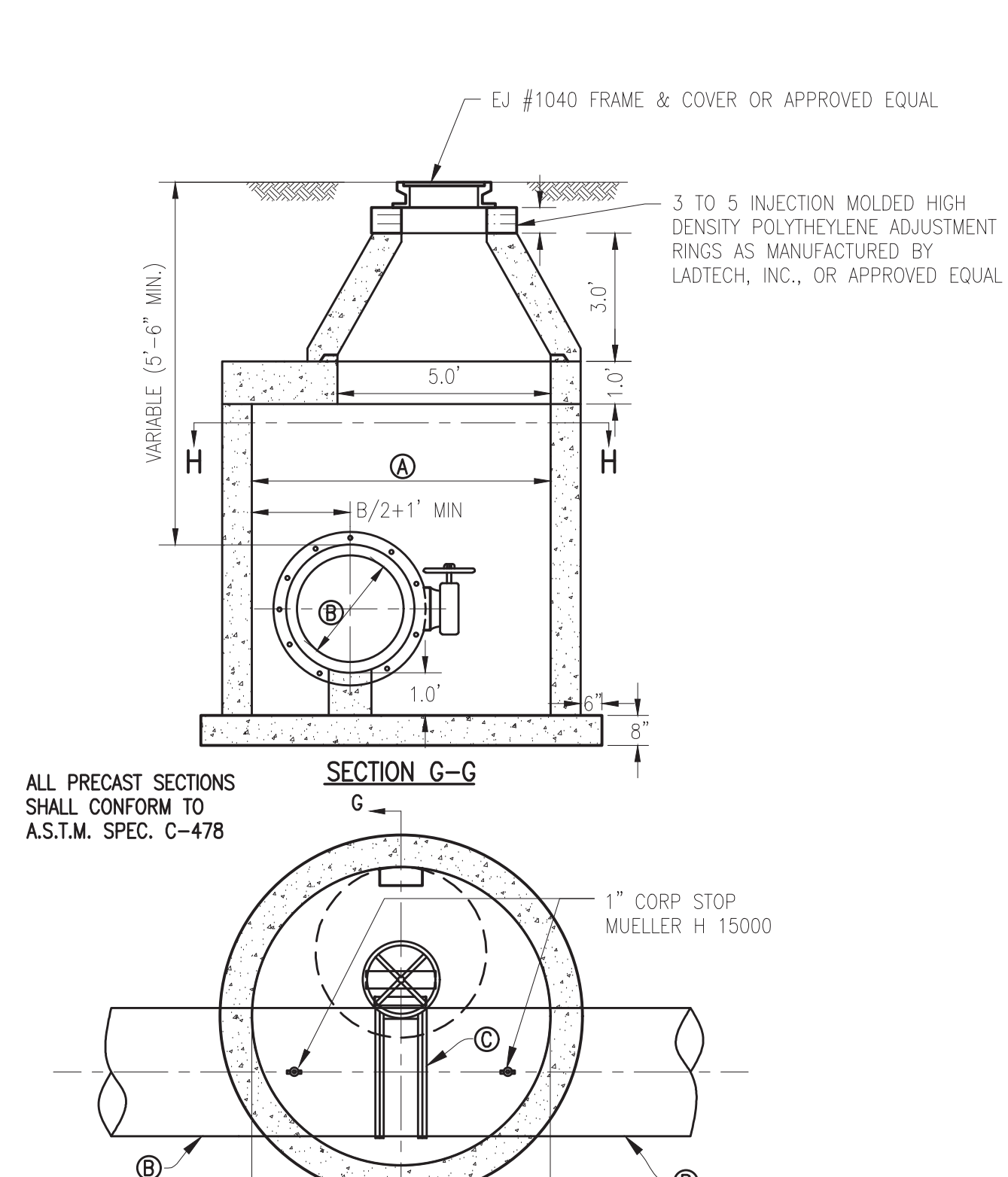
DATE	SCALE	SHEET
07/24/18	NO SCALE	

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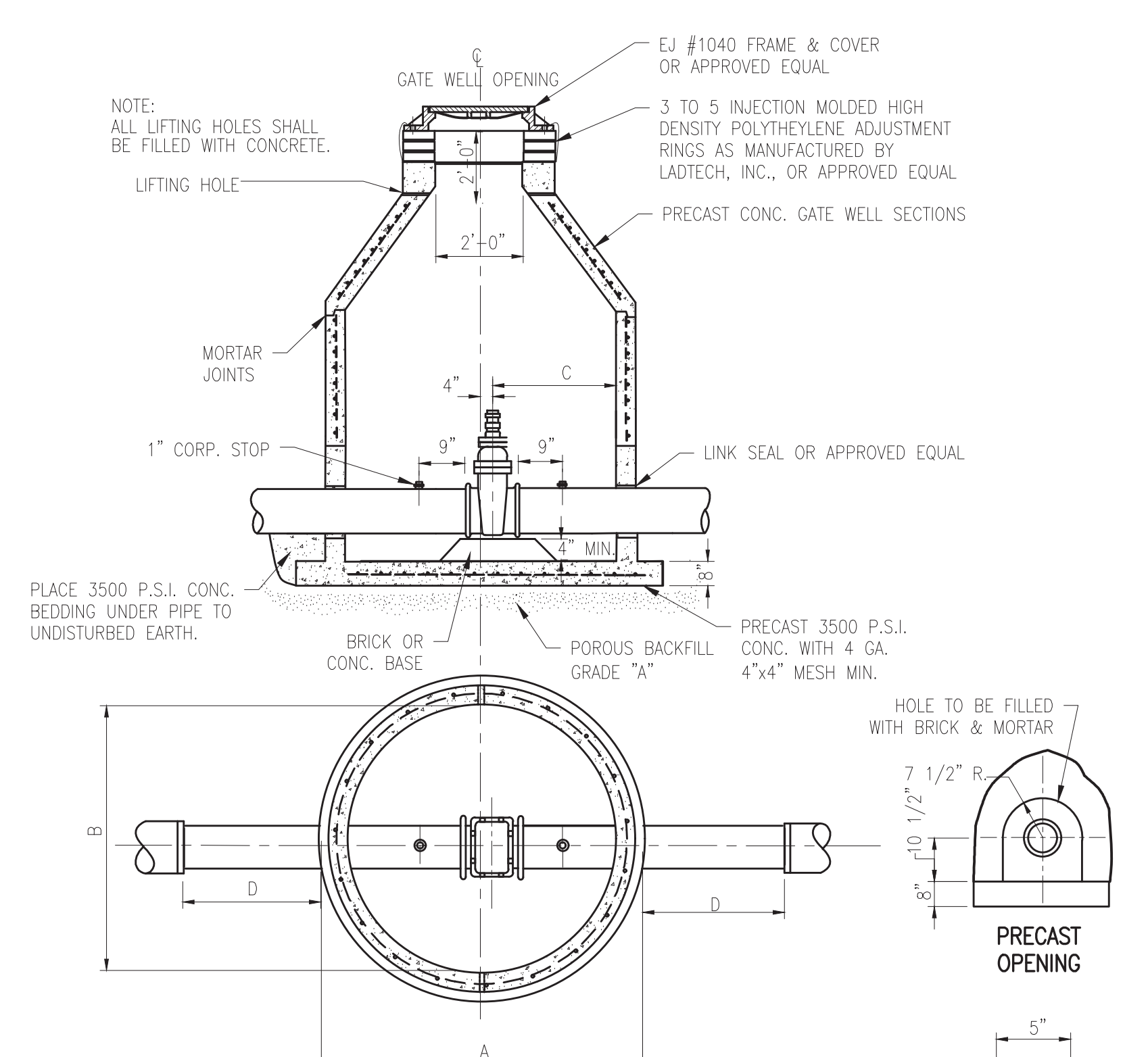
SIZE	A	B	C	D
8"	5'-0"	4'-0"	2'-2"	—
12"	5'-6"	4'-6"	2'-5"	—
16"	6'-0"	5'-6"	2'-8"	3'-0" MIN. * 13'-0" MAX.

STANDARD PRECAST GATE VALVE & WELL (CONCENTRIC)



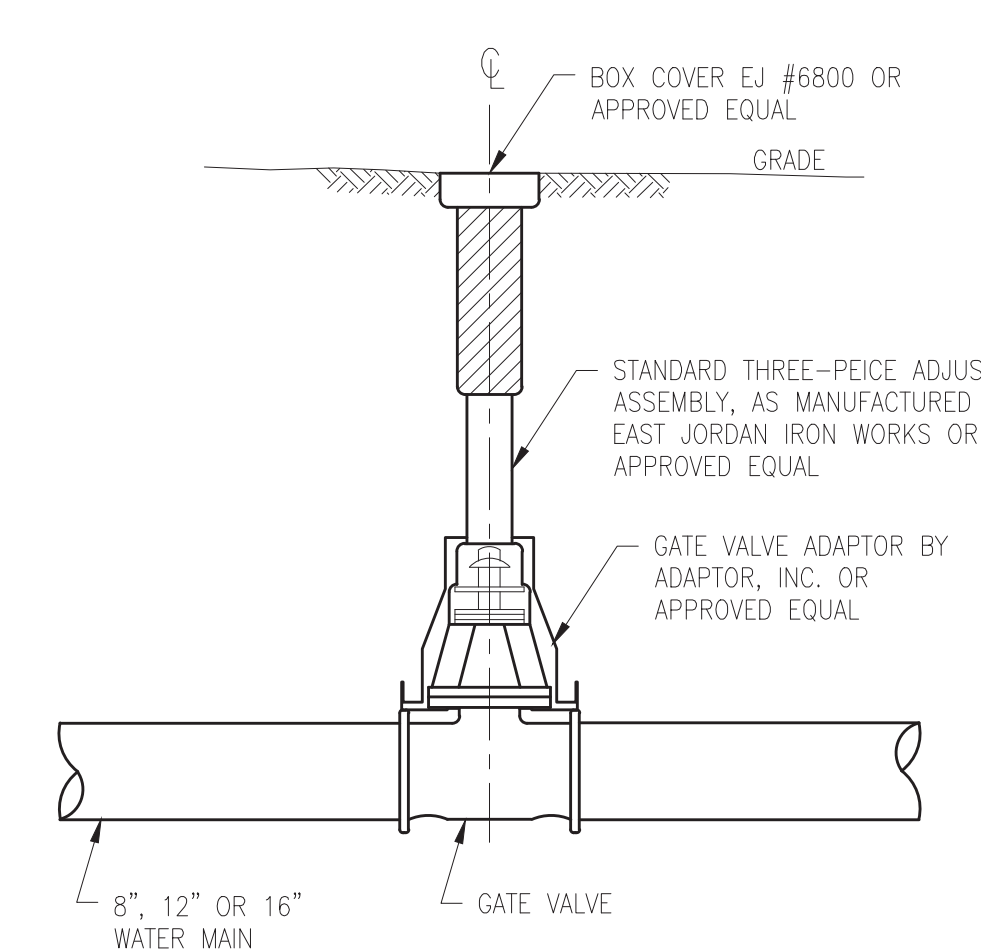
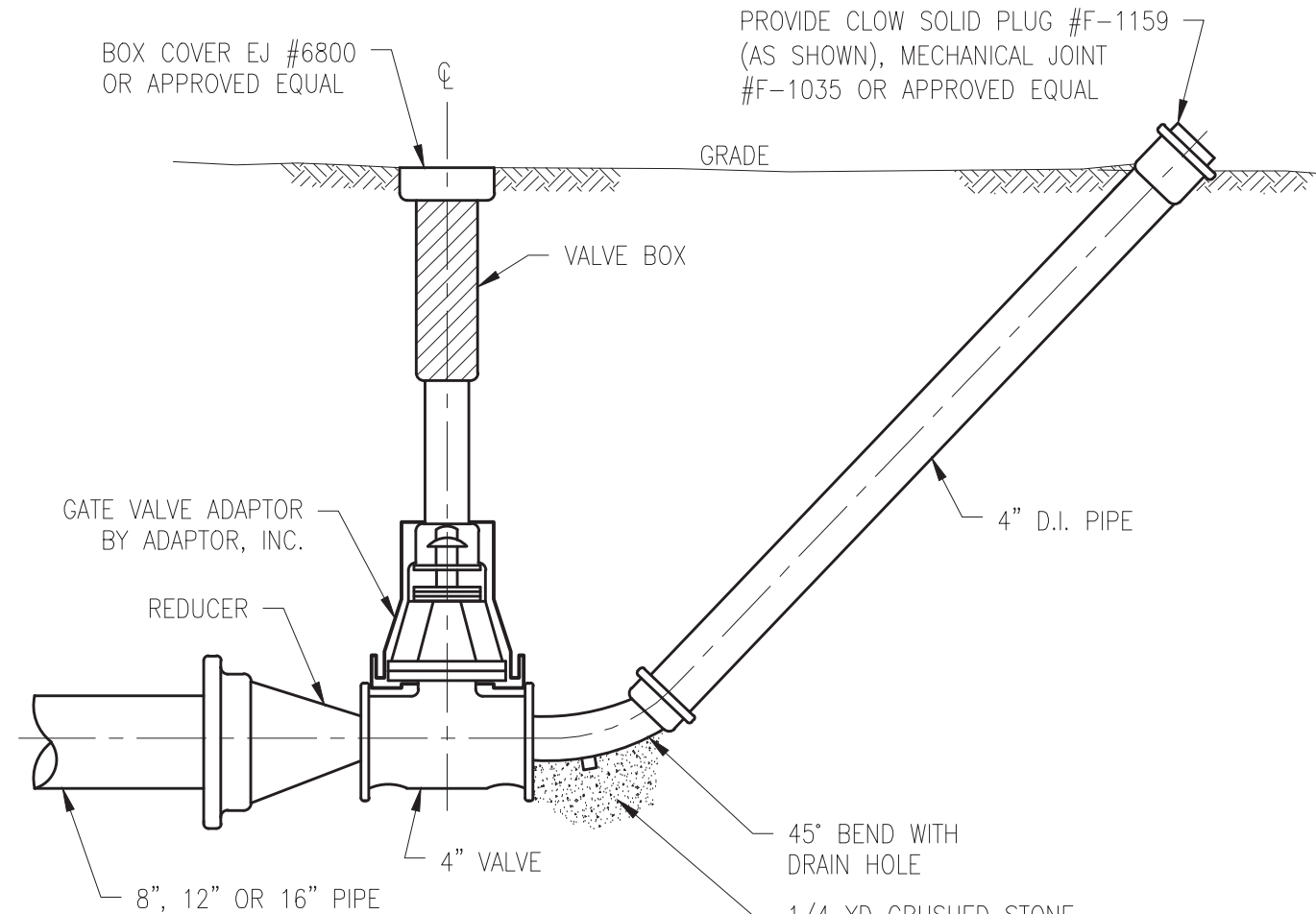
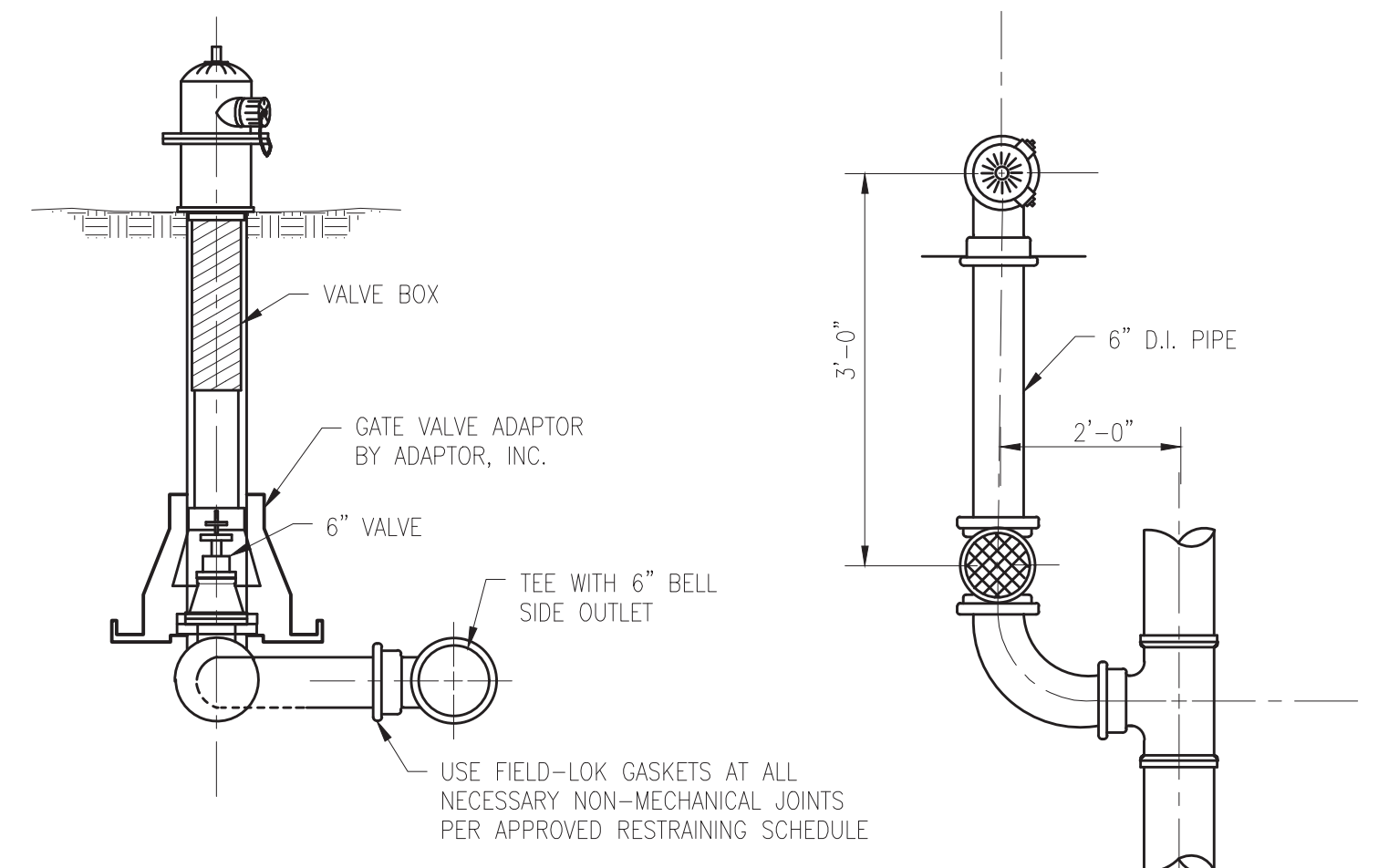
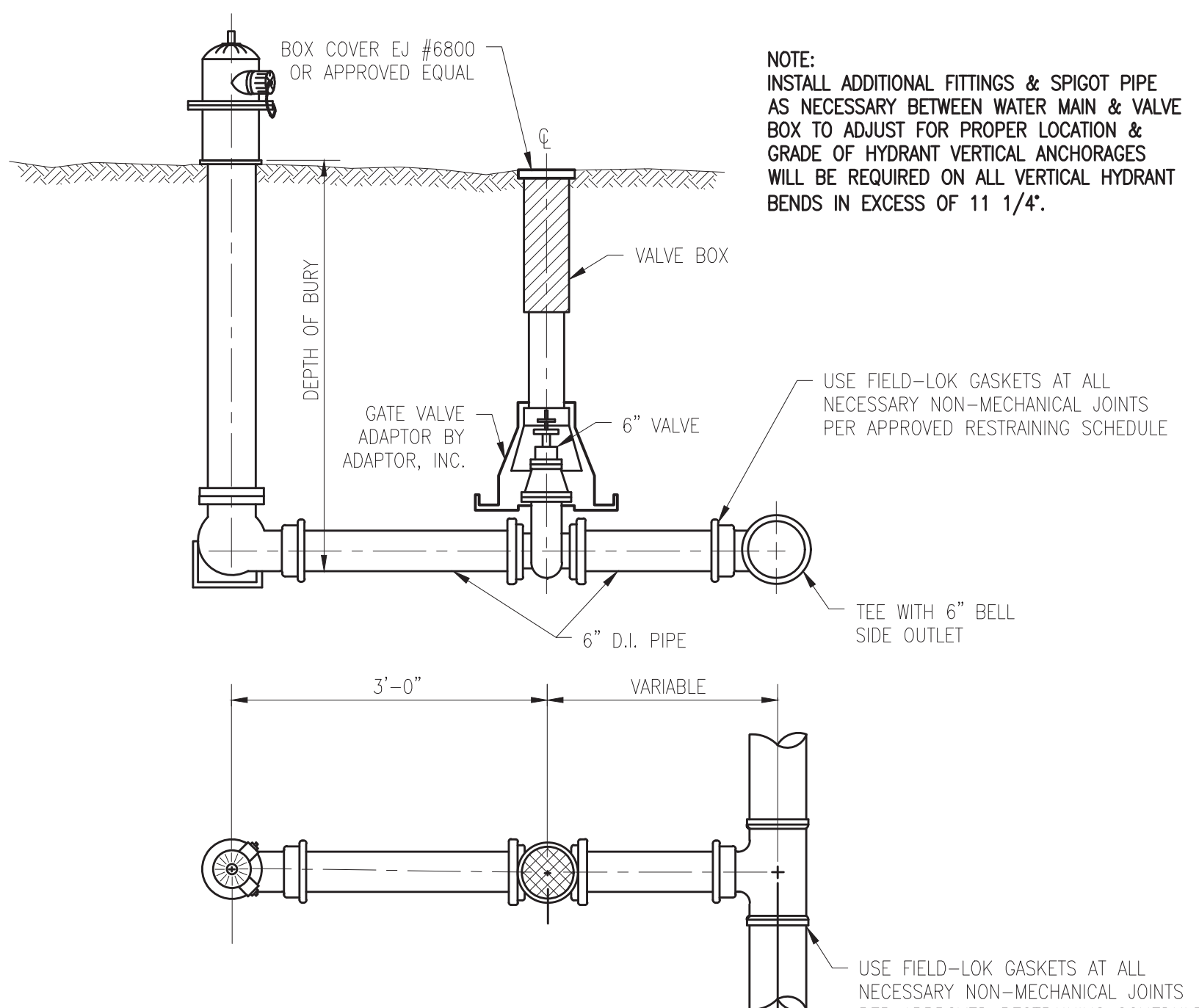
A	B
DIA WELL	DIA MAIN
7'-0"	20"
7'-0"	24"
8'-0"	30"
8'-0"	36"

TAPPING SLEEVE, VALVE & WELL (CONCENTRIC) NOT TO SCALE



WM	A	B	C	D
8"	5'-0"	4'-0"	2'-2"	—
12"	5'-6"	4'-6"	2'-5"	—
16"	6'-0"	5'-6"	2'-8"	3'-0" MIN. * 13'-0" MAX.

GATE VALVE & WELL (CONCENTRIC) NOT TO SCALE



Know what's below. Call before you dig.



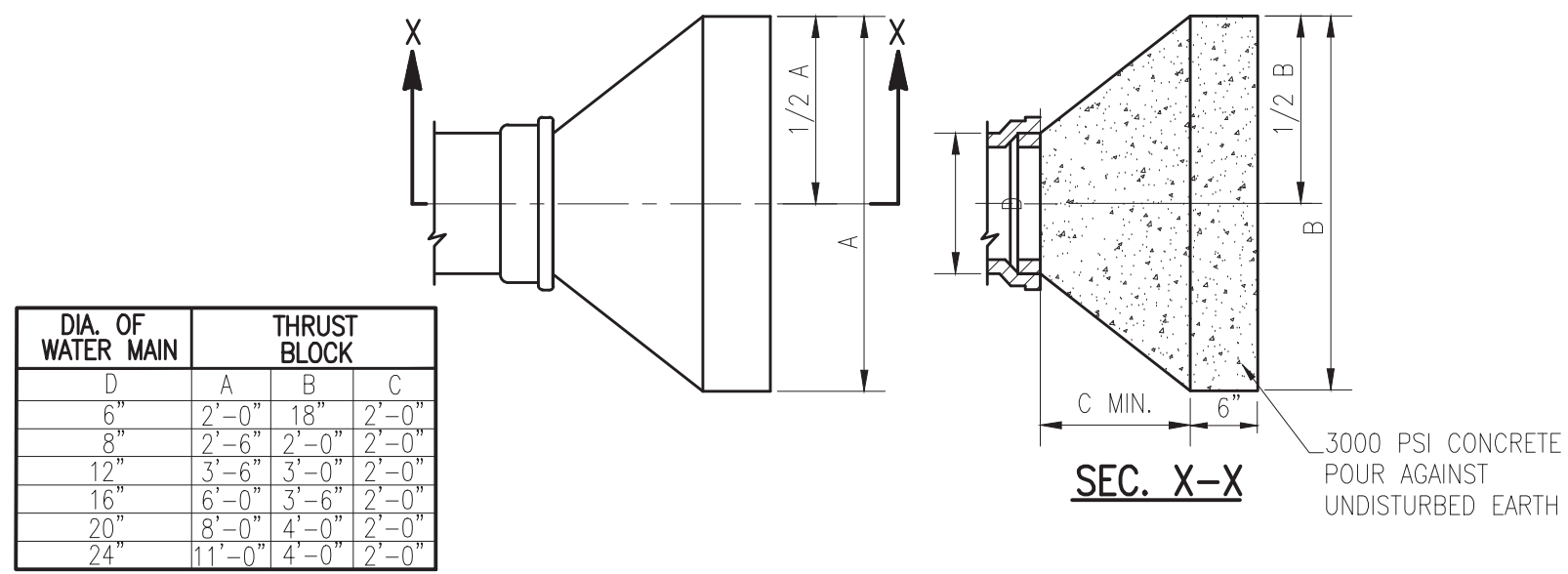
REVISIONS

STANDARD WATER MAIN DETAILS

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 WWW.YCAU.ORG

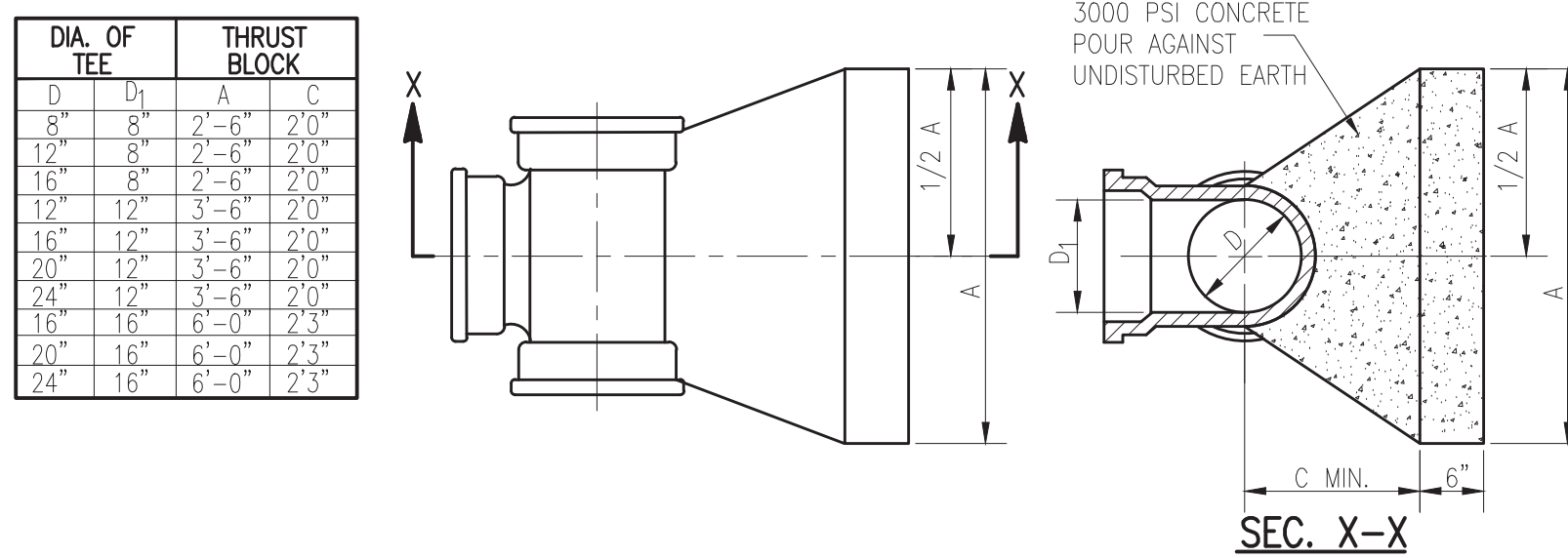
DATE: 09/25/19
 SCALE: NO SCALE
 SHEET:

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DIA. OF WATER MAIN		THRUST BLOCK		
D	A	B	C	
8"	2'-0"	18"	2'-0"	
8"	2'-6"	2'-0"	2'-0"	
12"	3'-6"	3'-0"	2'-0"	
16"	6'-0"	3'-6"	2'-0"	
20"	8'-0"	4'-0"	2'-0"	
24"	11'-0"	4'-0"	2'-0"	

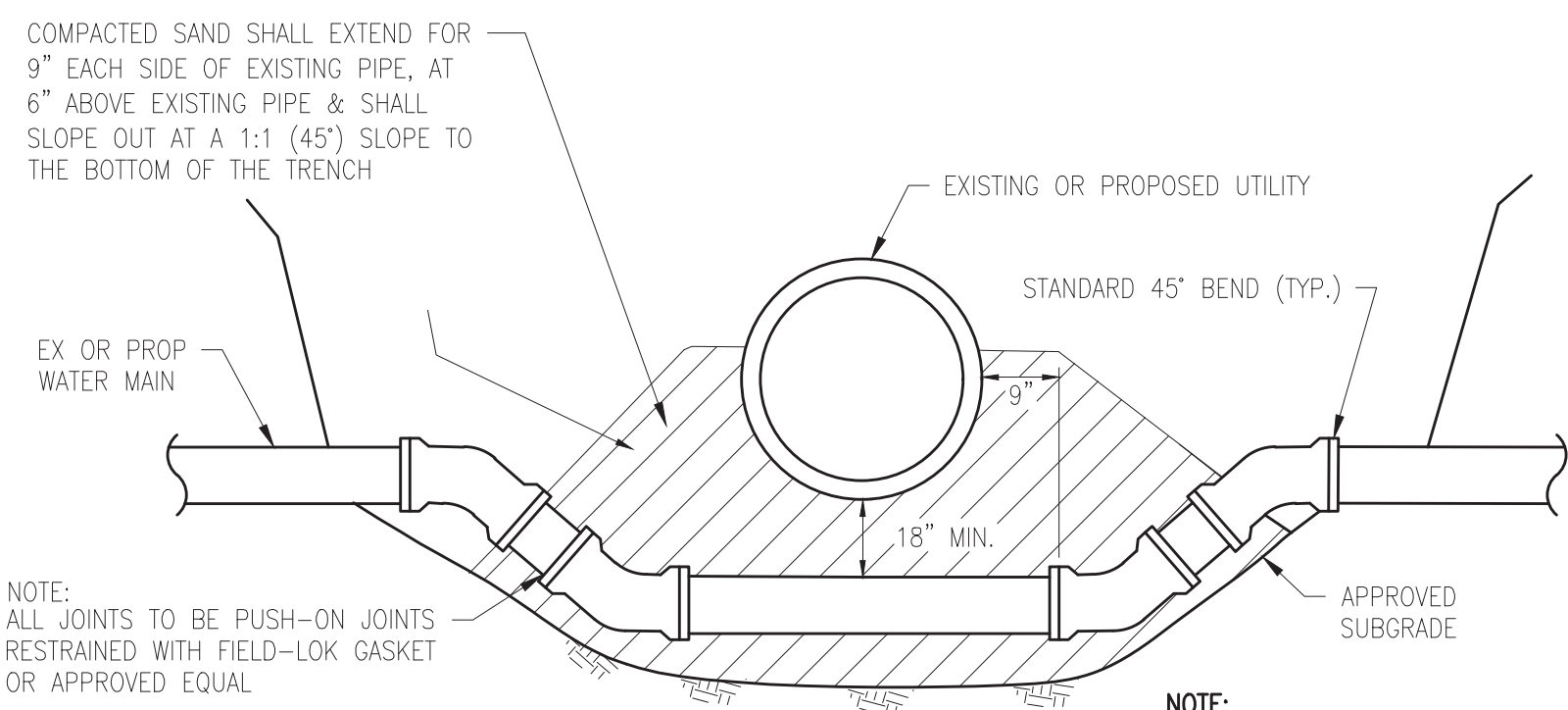
THRUST BLOCK AT PLUG OR HYDRANT SHOE
NOT TO SCALE



DIA. OF TEE		THRUST BLOCK		
D	A	B	C	
8"	2'-6"	2'-0"	2'-0"	
12"	3'-6"	2'-0"	2'-0"	
16"	6'-0"	3'-6"	2'-0"	
20"	8'-0"	4'-0"	2'-0"	
24"	11'-0"	4'-0"	2'-0"	

THRUST BLOCK AT TAPPING SLEEVE TEE
NOT TO SCALE

NOTE: CONCRETE THRUST BLOCKS WILL NOT BE PERMITTED EXCEPT BEHIND HYDRANT SHOES AND TAPPING SLEEVES. USE OF CONCRETE THRUST BLOCKS IN OTHER LOCATIONS WILL NOT BE PERMITTED WITHOUT THE WRITTEN APPROVAL OF YCUA. ALL OTHER VERTICAL AND HORIZONTAL BENDS SHALL BE RESTRAINED WITH FIELD-LOK GASKETS OR APPROVED MECHANICAL JOINTS.

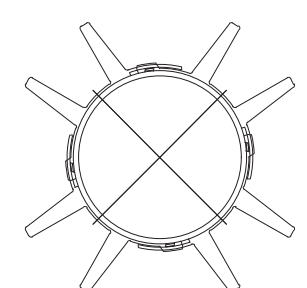


WATER MAIN LOWERING
NOT TO SCALE

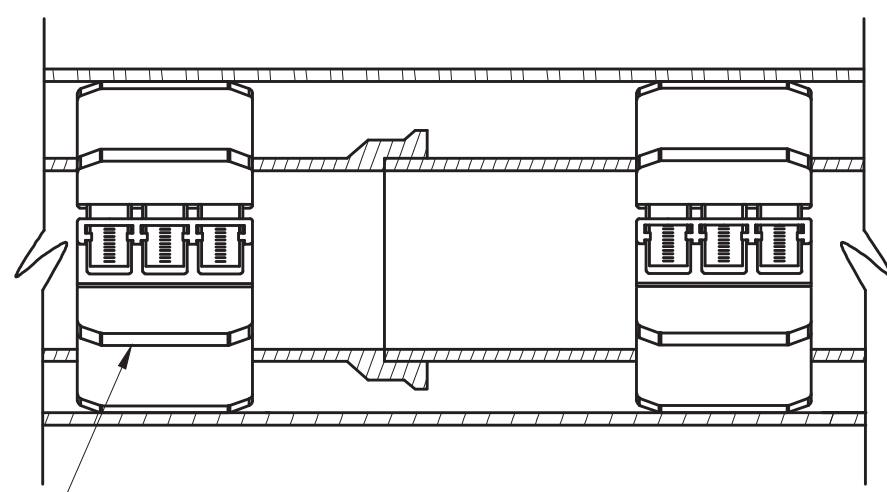
NOTE: COMPACTED SAND SHALL EXTEND FOR 9" EACH SIDE OF EXISTING PIPE, AT 6" ABOVE EXISTING PIPE & SHALL SLOPE OUT AT A 1:1 (45°) SLOPE TO THE BOTTOM OF THE TRENCH.

NOTE: ALL JOINTS TO BE PUSH-ON JOINTS RESTRAINED WITH FIELD-LOK GASKET OR APPROVED EQUAL.

NOTE: FOR BEDDING OF WATER MAIN SEE STANDARD PIPE SUPPORT DETAIL.



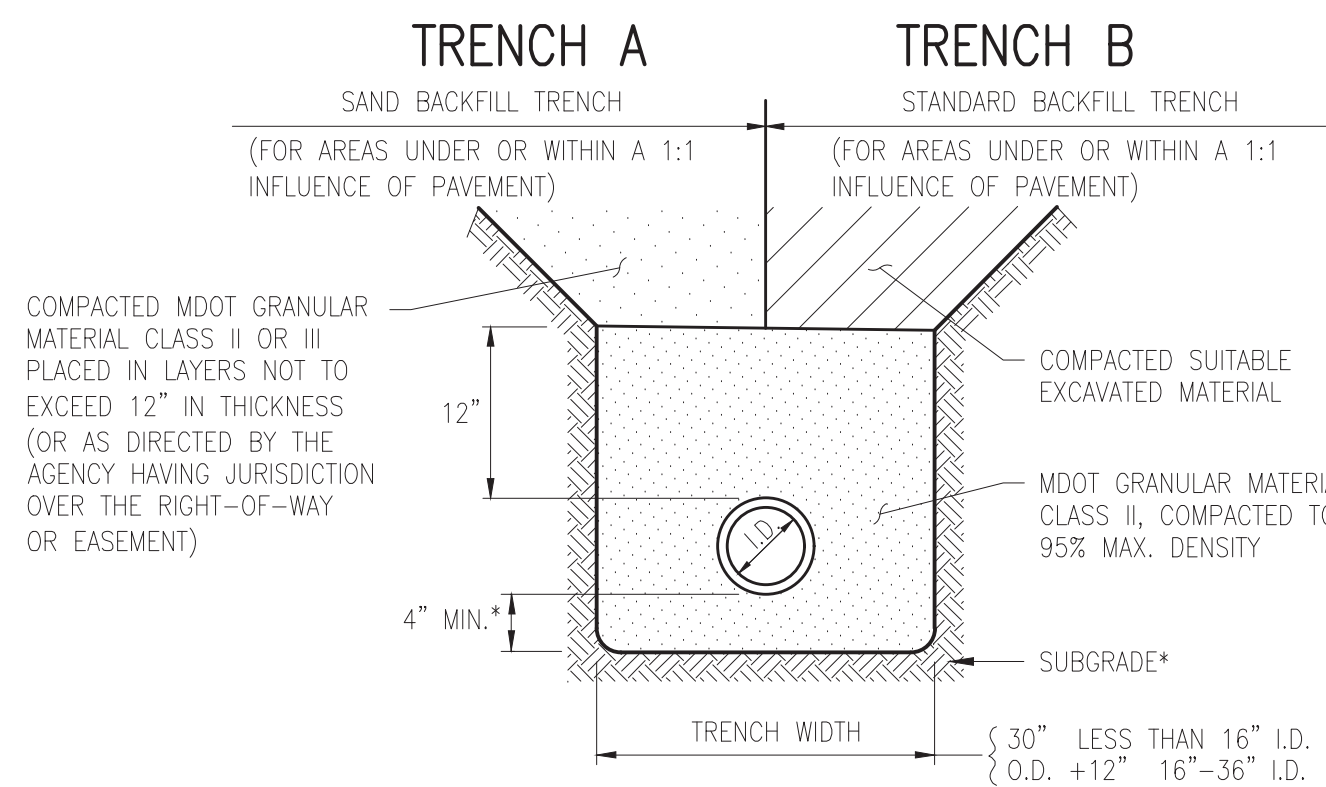
SPACER END VIEW
NOT TO SCALE



STANDARD CASING SECTION
NOT TO SCALE

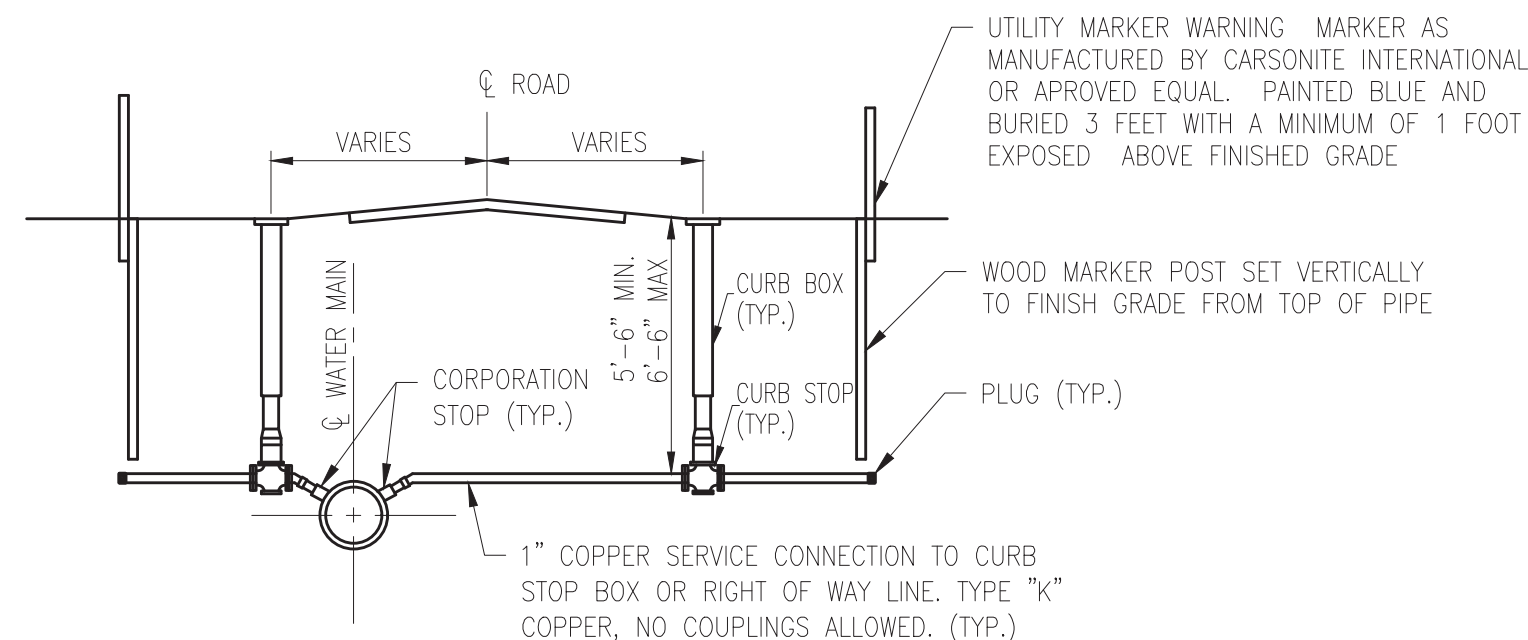
NOTES:

- SPACERS FOR PLACEMENT IN THE ANNULAR SPACE BETWEEN THE CARRIER PIPE AND A CASING PIPE SHALL BE RANGER II AS MANUFACTURED BY PSI OR APPROVED EQUAL.
- END SEALS SHALL BE MODEL C RUBBER SEAL WITH STAINLESS STEEL BANDS AS MANUFACTURED BY PSI OR APPROVED EQUAL.

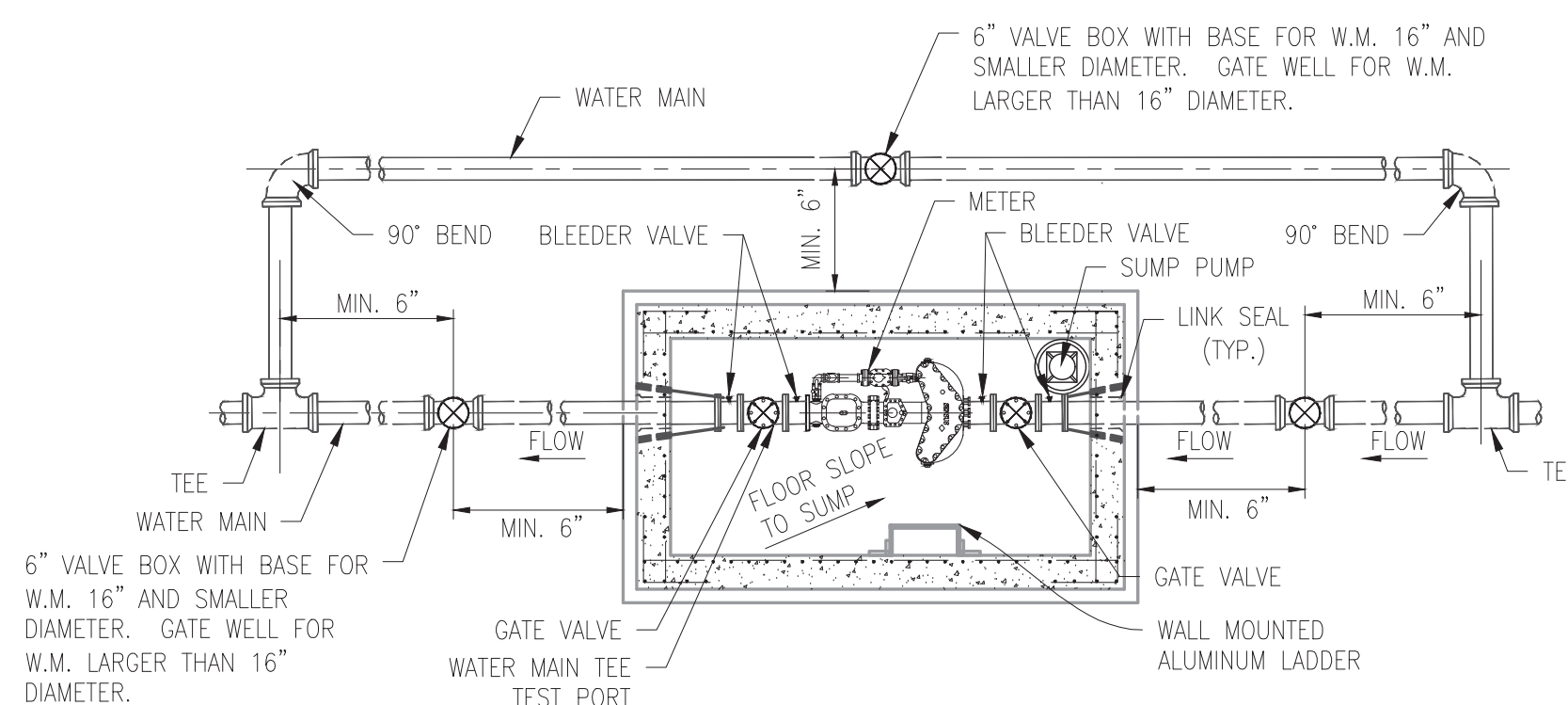


BEDDING AND TRENCH BACKFILL DETAIL FOR WATER MAIN
NOT TO SCALE

*NOTE: IF THE EXISTING SUBGRADE MATERIAL MEETS THE REQUIREMENTS FOR MDOT GRANULAR MATERIAL CLASS II (MINIMUM 4" THICK), THEN THE WATER MAIN MAY BE LAID DIRECTLY ON THE COMPACTED EXISTING SUBGRADE MATERIAL.



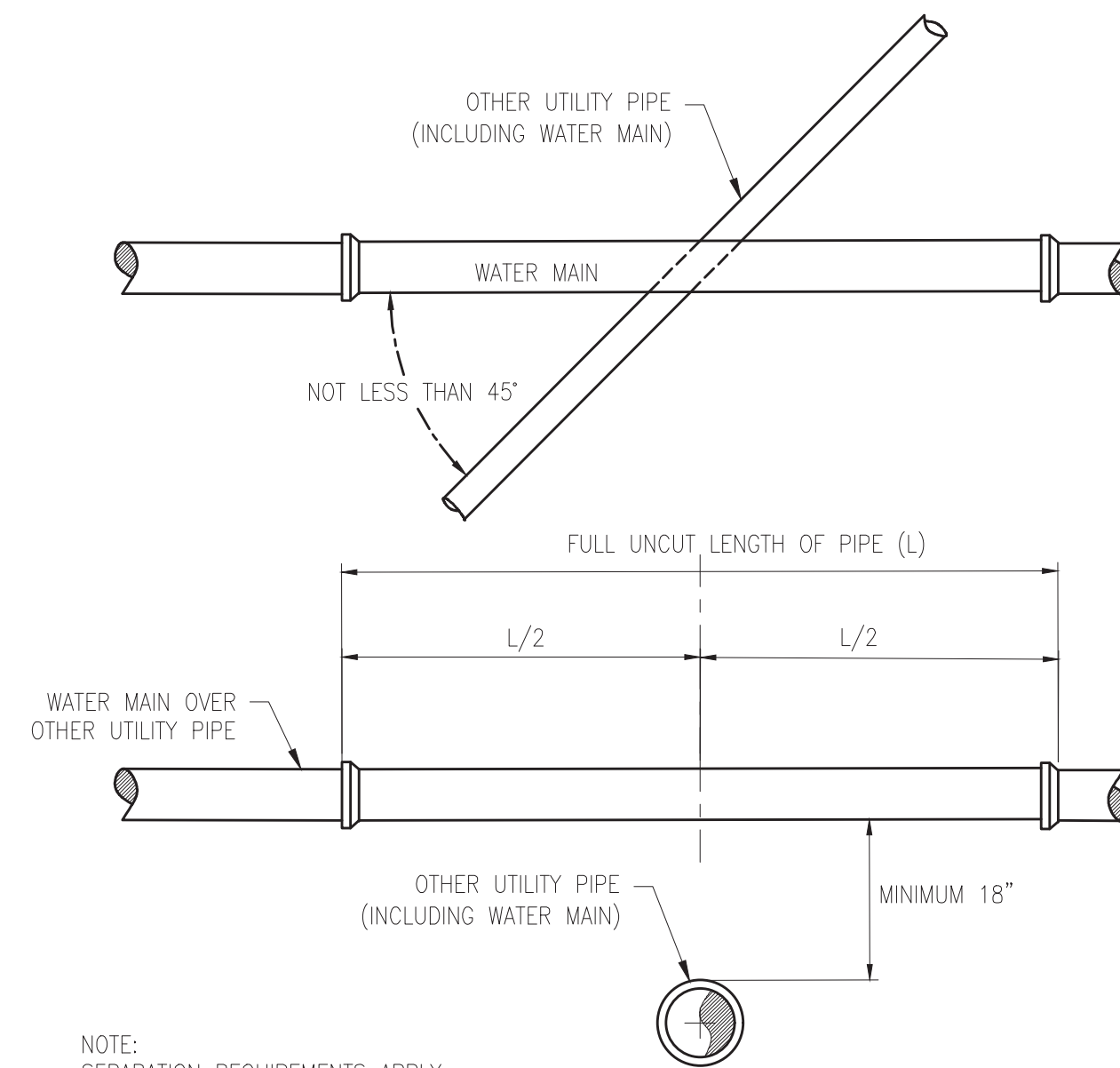
TYPICAL WATER SERVICE
NOT TO SCALE



MASTER METER VAULT CONFIGURATION (WITHOUT COVER)
NOT TO SCALE

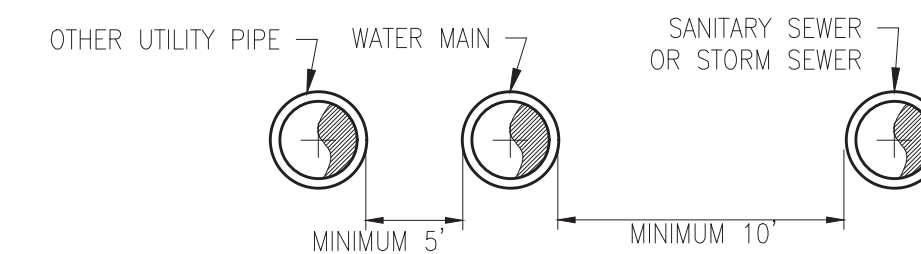
NOTES:

- WHERE POSSIBLE THE METER VAULT SHALL BE LOCATED AWAY FROM TRAFFIC AREAS, ROADS, PARKING LOTS, ETC.
- THE ACCESS HATCH SHALL BE SIZED LARGE ENOUGH TO ACCOMMODATE REMOVAL OF THE LARGEST METER OR THE LARGEST APPURTENANCE FOR MAINTENANCE PURPOSES. THE HATCH SHALL BE MANUFACTURED BY THE BILCO COMPANY. METER VAULT HATCH SHALL BE WATER TIGHT.
- THE METER VAULT FLOOR SHALL BE SLOPED TO THE SUMP.
- ELECTRICAL SERVICE SHALL BE SUPPLIED TO THE VAULT.



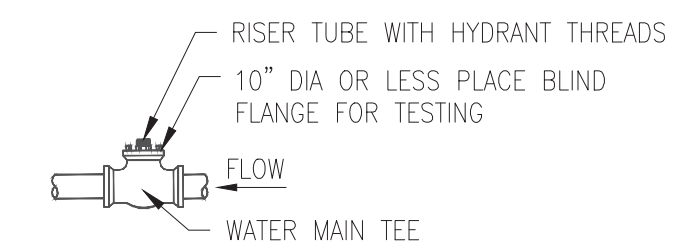
NOTE: SEPARATION REQUIREMENTS APPLY REGARDLESS OF VERTICAL ALIGNMENTS OF UTILITIES

VERTICAL SEPARATION



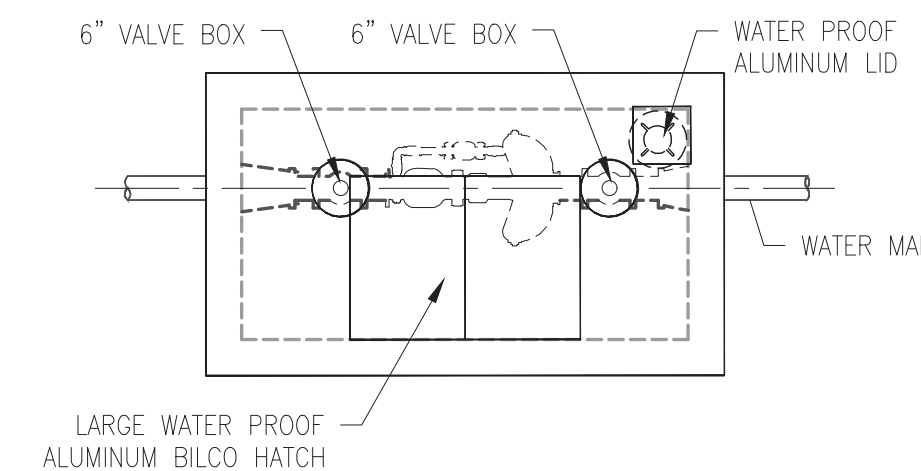
HORIZONTAL SEPARATION

WATER MAIN CROSSING OTHER UTILITIES
NOT TO SCALE



TEST PORT

PIPE DIA	TEST PORT SIZE
6"	6"
8"	8"
10"	10"
12"	10"
16"	10"



MASTER METER VAULT CONFIGURATION WITH COVER
NOT TO SCALE

NO TRANSITION COUPLINGS IN VAULT
ALL FLANGED CONNECTIONS IN VAULT
WALL MOUNTED ALUMINUM LADDER SHALL BE
EQUIPPED WITH LADDER UP SAFETY POST, BILCO
OR APPROVED EQUAL



Know what's below.
Call before you dig.



REVISIONS

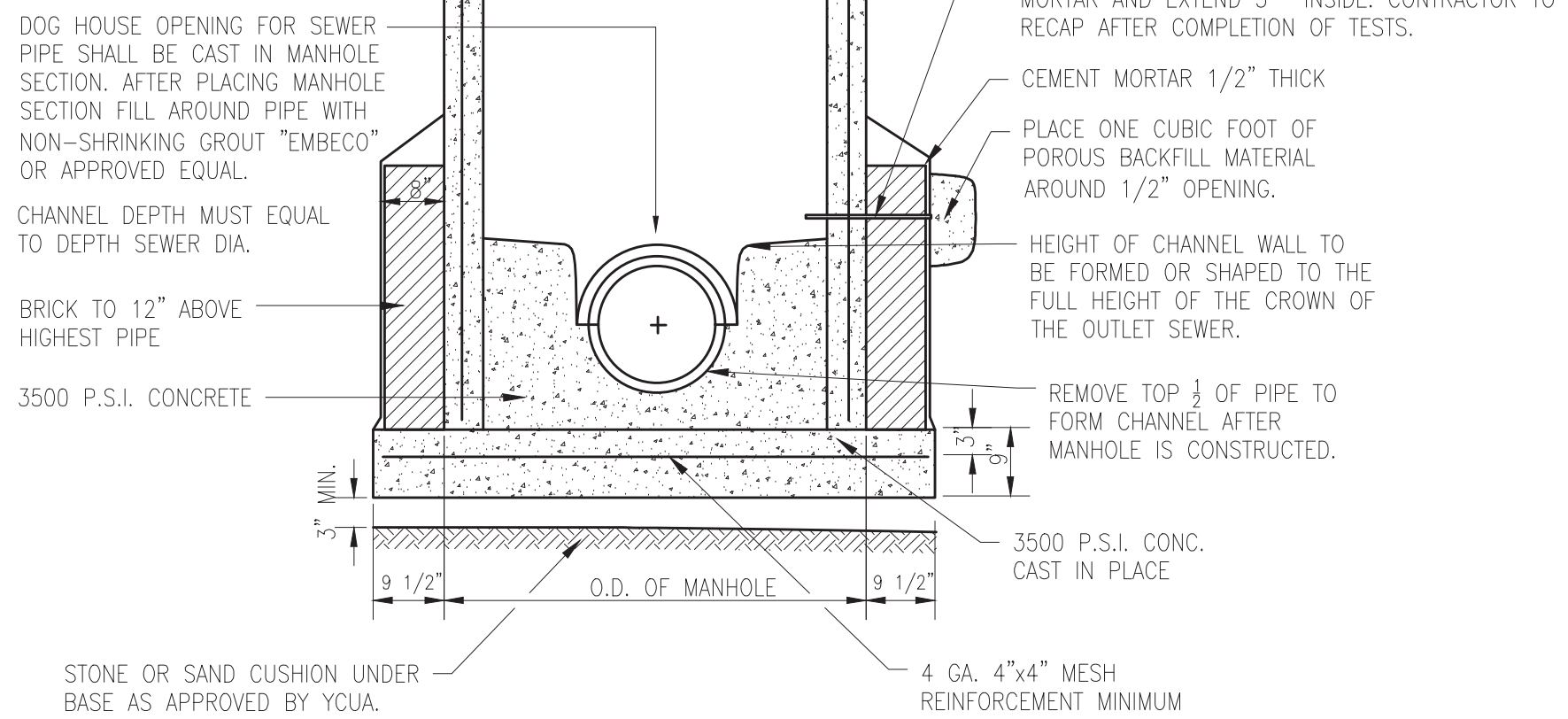
STANDARD WATER MAIN DETAILS

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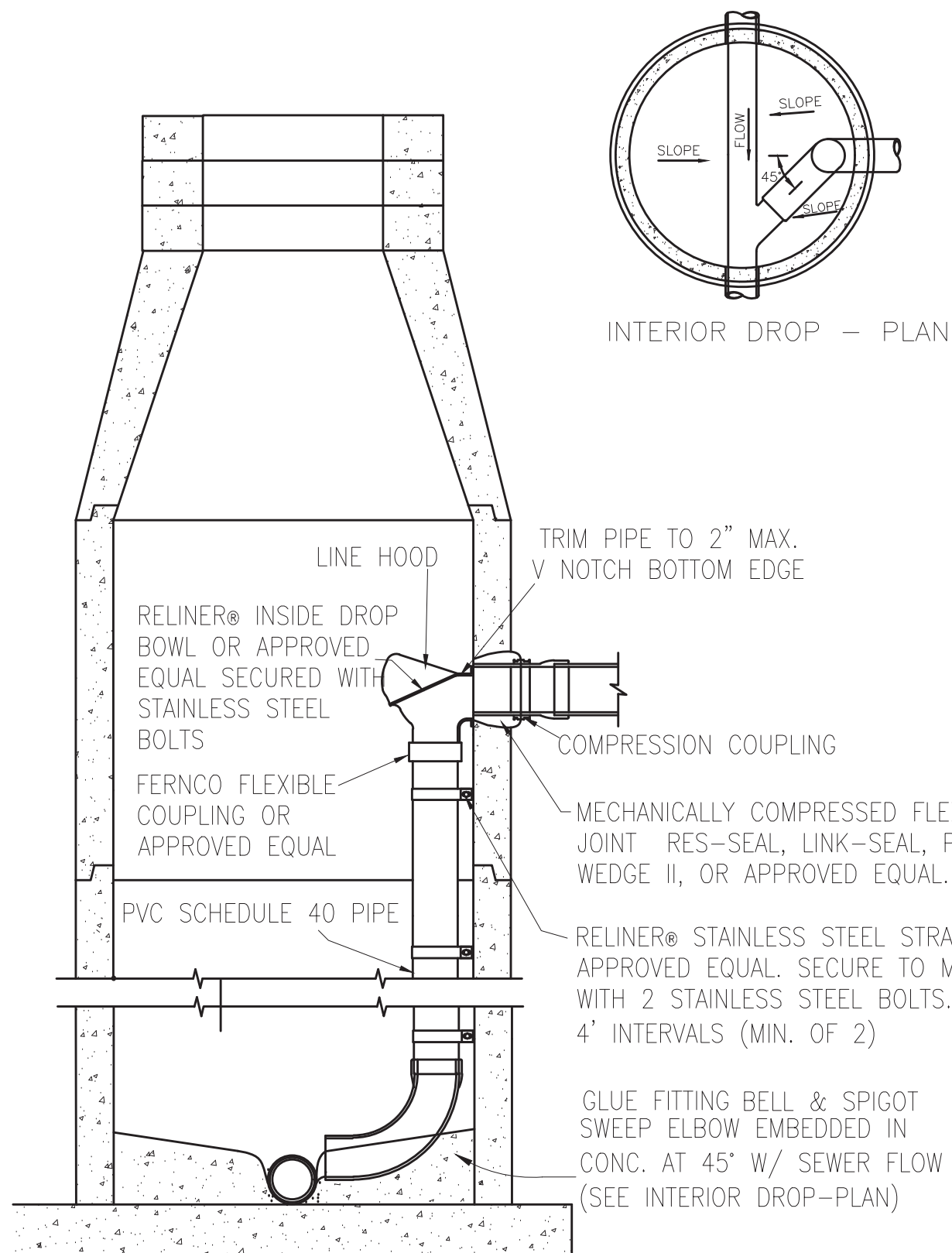
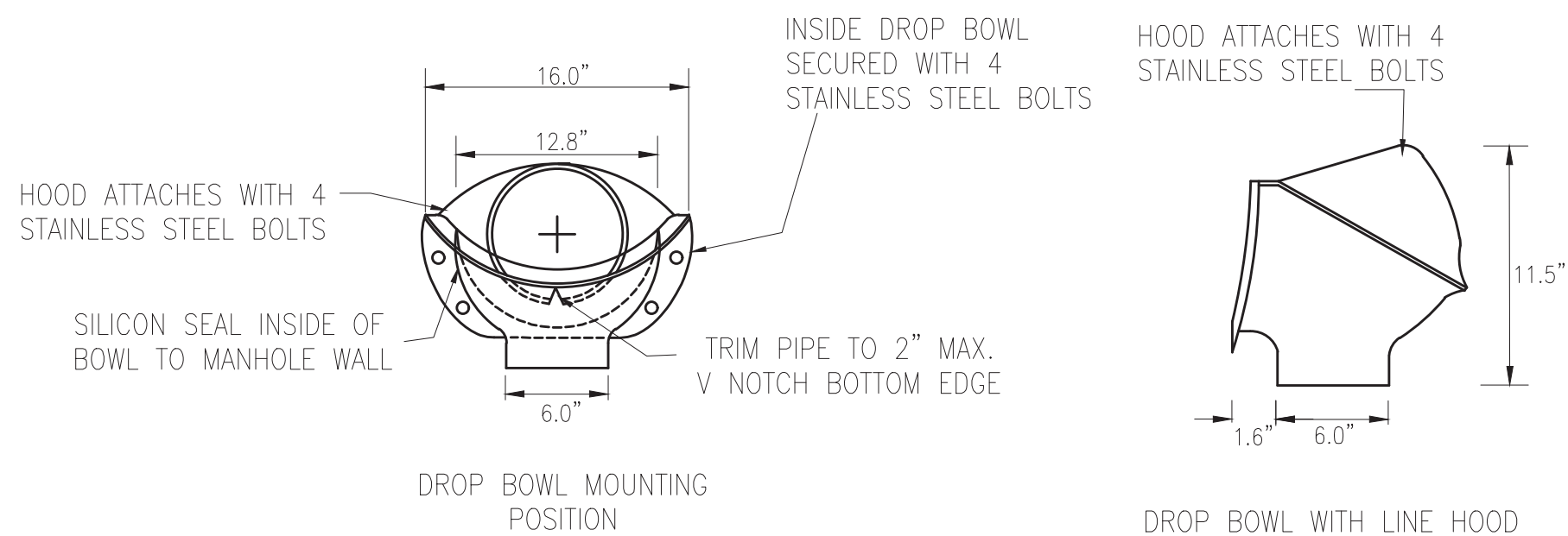
YCUA
ENVIRONMENTAL LEADERS

DATE	SCALE	SHEET
09/25/19	NO SCALE	

SEWER SIZE	MAX. CUT OUT SIZE
8" THRU 10"	17 1/2"
12" THRU 15"	20"

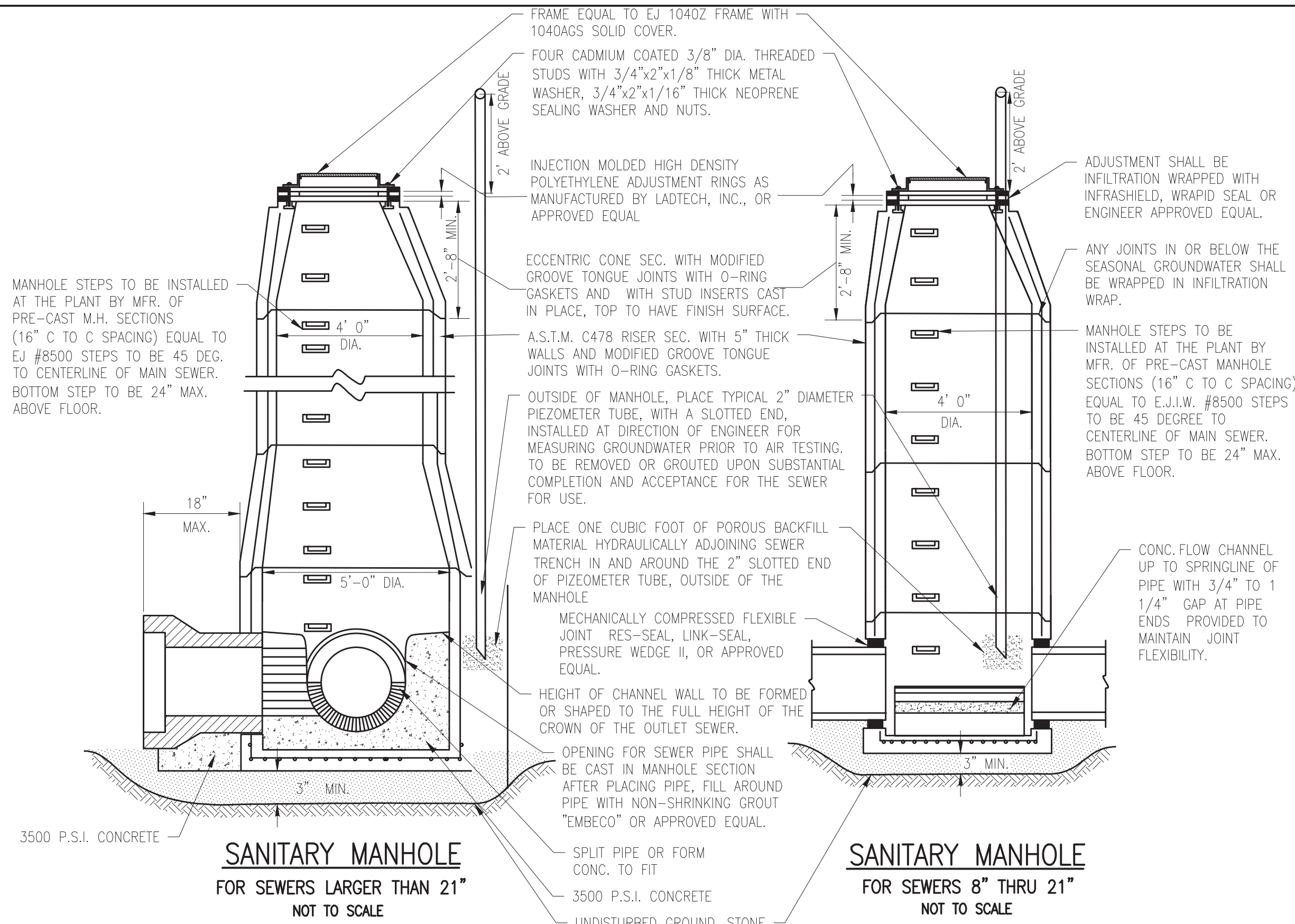


SANITARY MANHOLE ON EXISTING SEWERS 8" THRU 42"
NOT TO SCALE



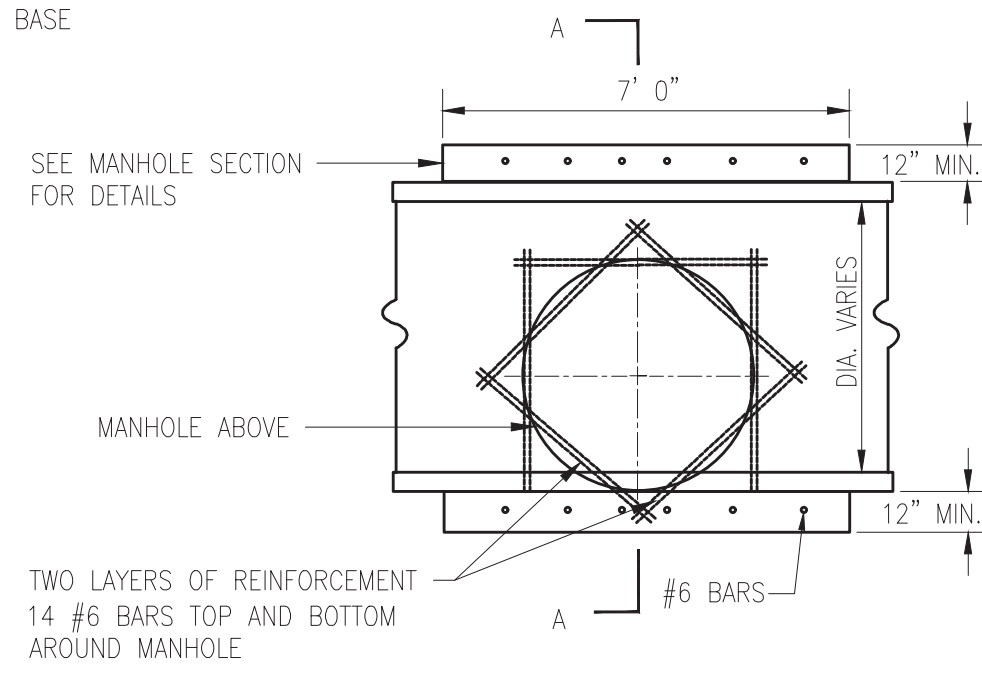
INTERIOR DROP CONNECTION
NOT TO SCALE

DIA. OF SEWER	DIA. OF DROP CONNECTION
4"	4"
6"	4"
8"	6"
10"	8"

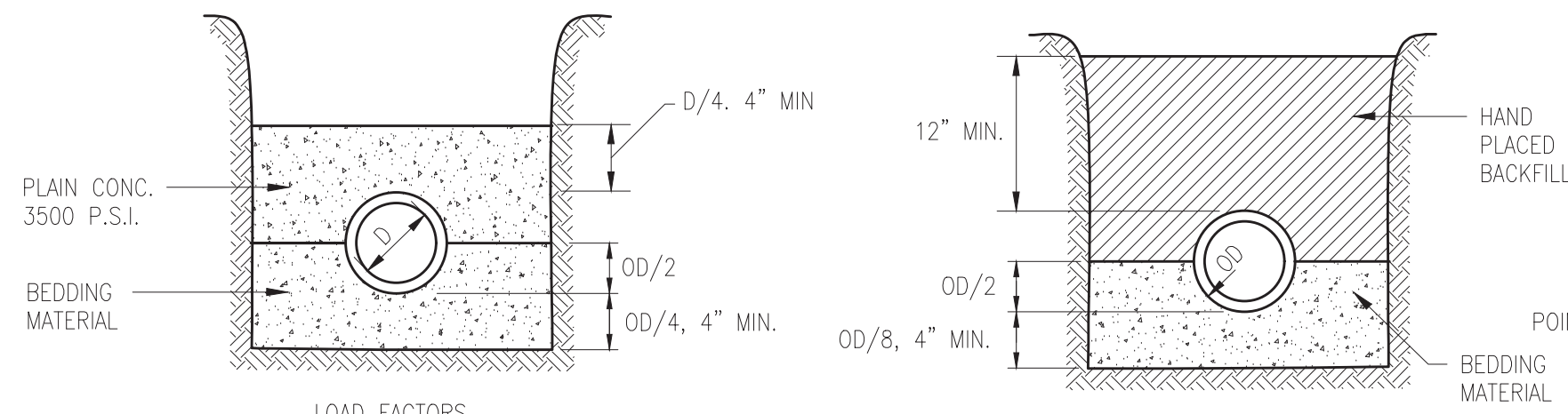


SANITARY MANHOLE FOR SEWERS LARGER THAN 21"
NOT TO SCALE

SANITARY MANHOLE FOR SEWERS 8" THRU 21"
NOT TO SCALE



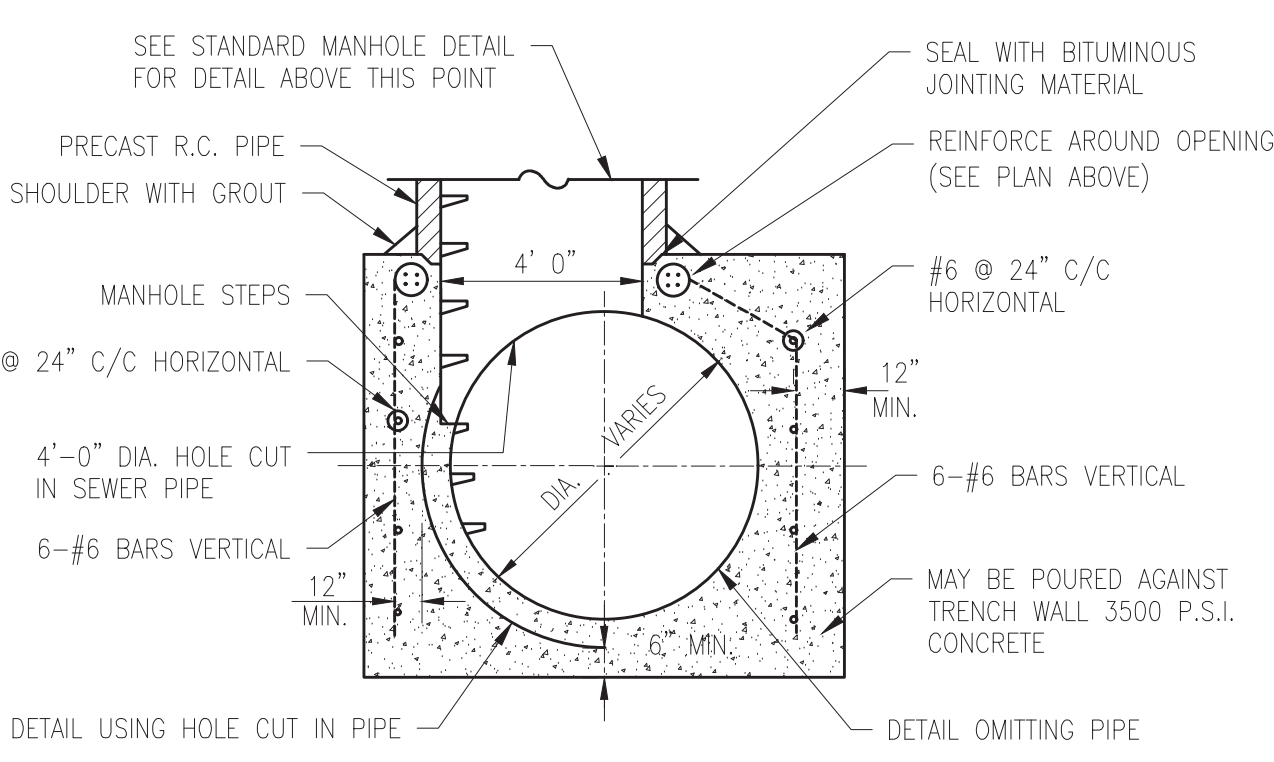
MANHOLE PLAN 48" & LARGER SEWERS
NOT TO SCALE



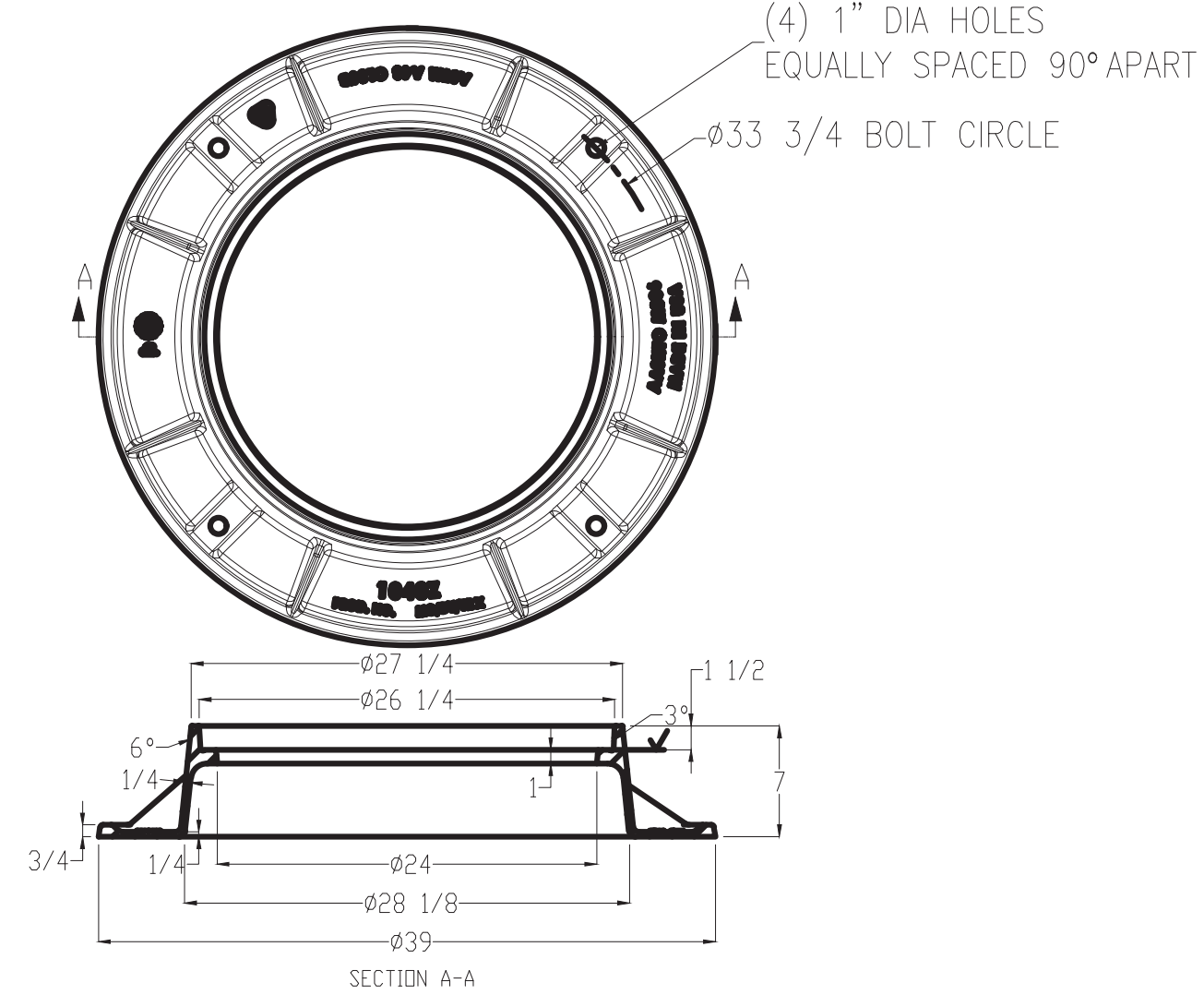
MAX. WIDTH OF TRENCH 12" ABOVE TOP OF PIPE
6" THRU 12" PIPE 30" WIDE
15" THRU 36" PIPE - OD+16"
42" THRU 60" PIPE - OD+20"
OVER 60" PIPE OUTSIDE DIA. OF PIPE+24"

MIN. WIDTH OF TRENCH 12" ABOVE THE TOP OF THE PIPE SHALL BE 6" ON EACH SIDE OF PIPE.

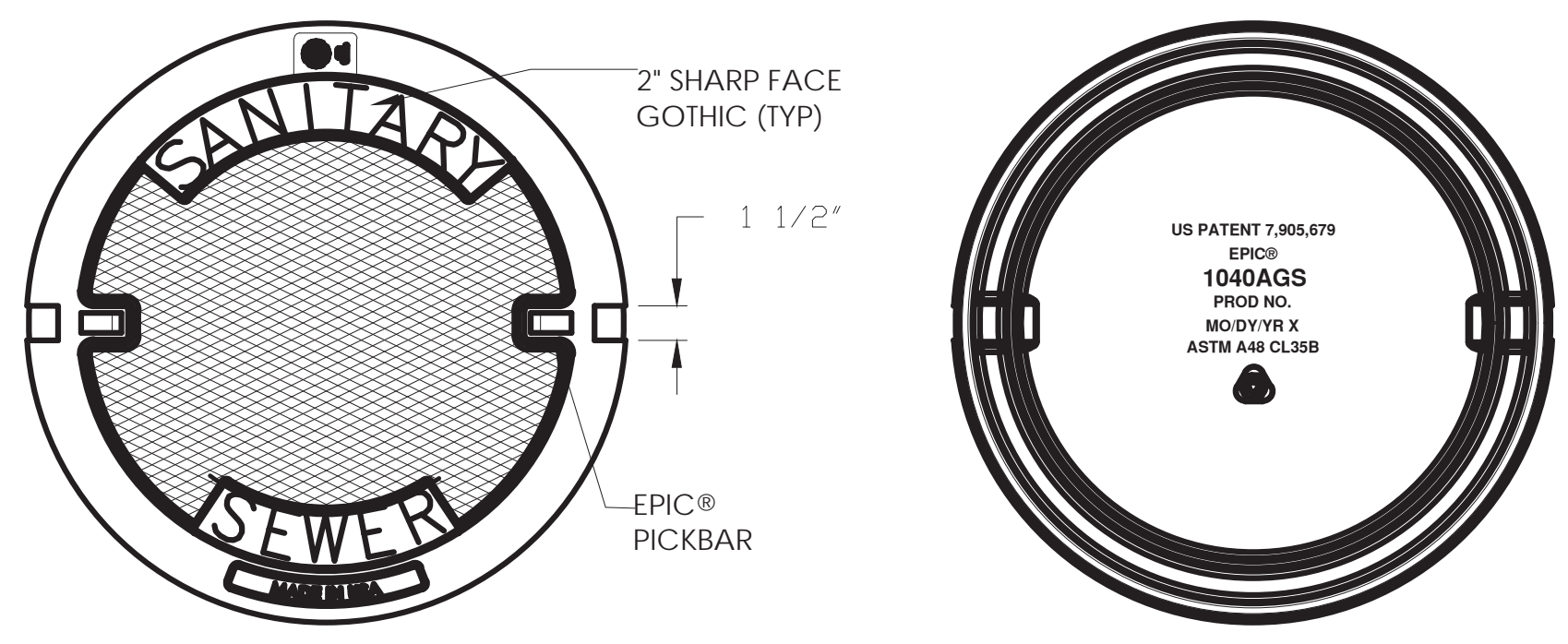
PIPE BEDDING DETAILS



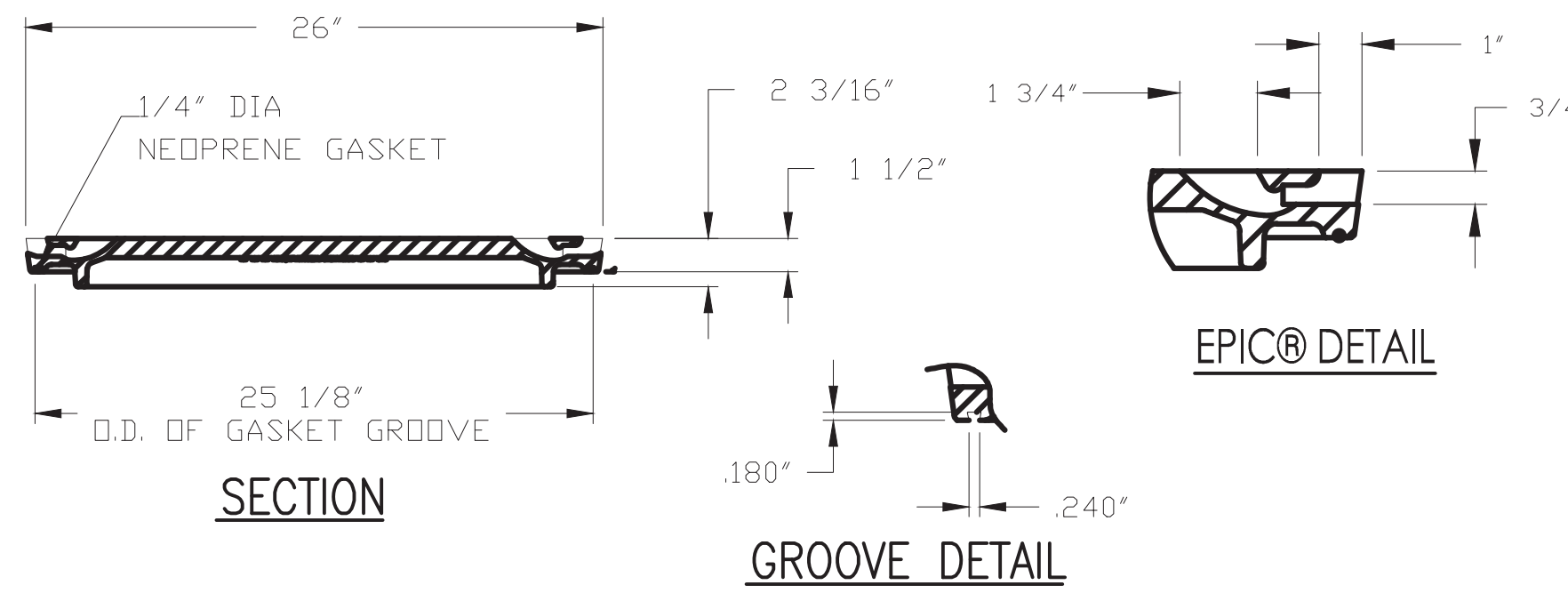
MANHOLE SECTION 48" & LARGER SEWERS
NOT TO SCALE



1040Z FRAME



BOTTOM VIEW



SECTION

GROOVE DETAIL

1040 AGS COVER



Know what's below.
Call before you dig.



REVISIONS

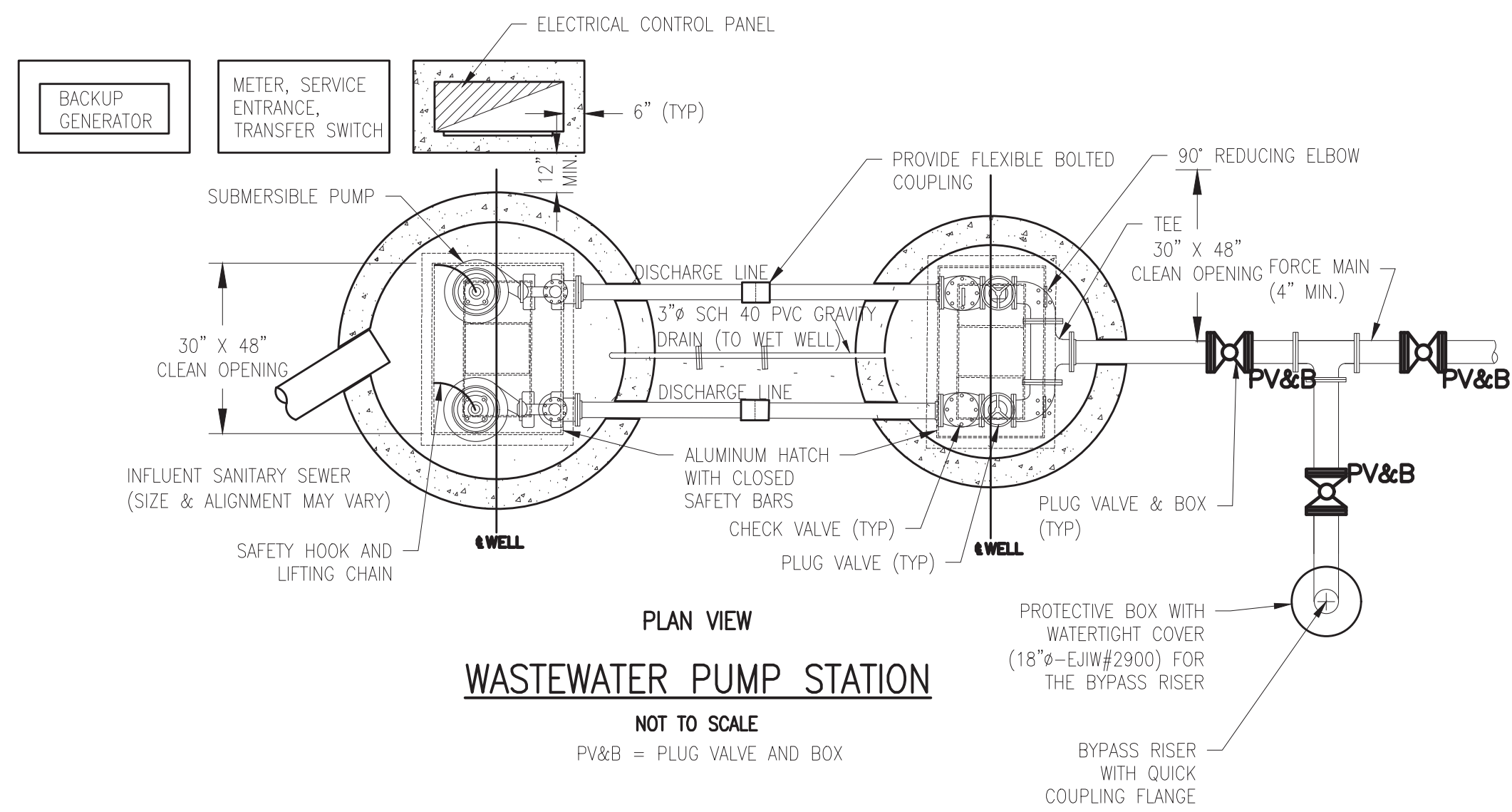
STANDARD SANITARY SEWER DETAILS

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YPSILANTI, MICHIGAN 48198-9112
(734) 484-4800
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ENVIRONMENTAL LEADERS

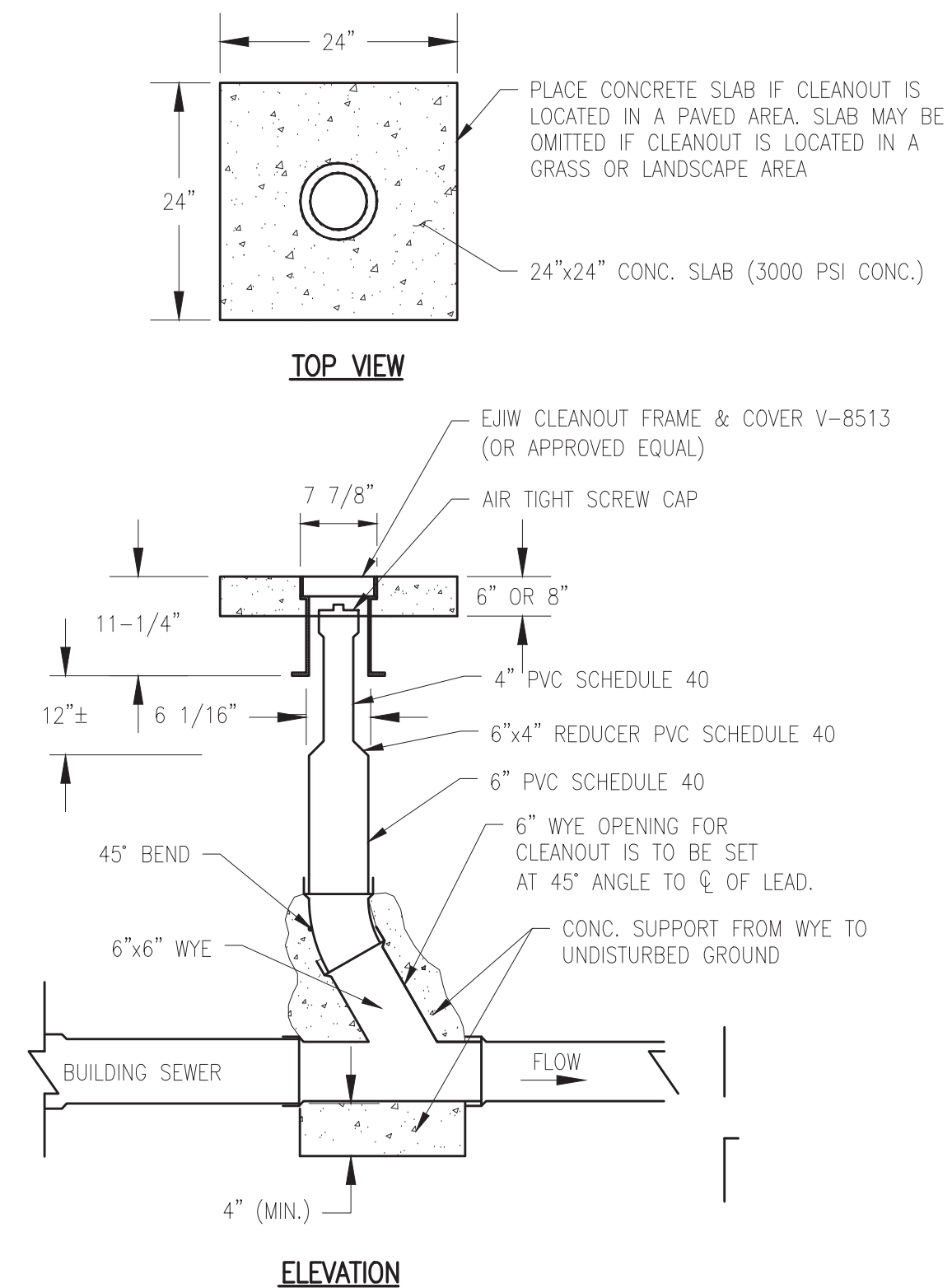
DATE	SCALE	SHEET
10/25/19	NO SCALE	

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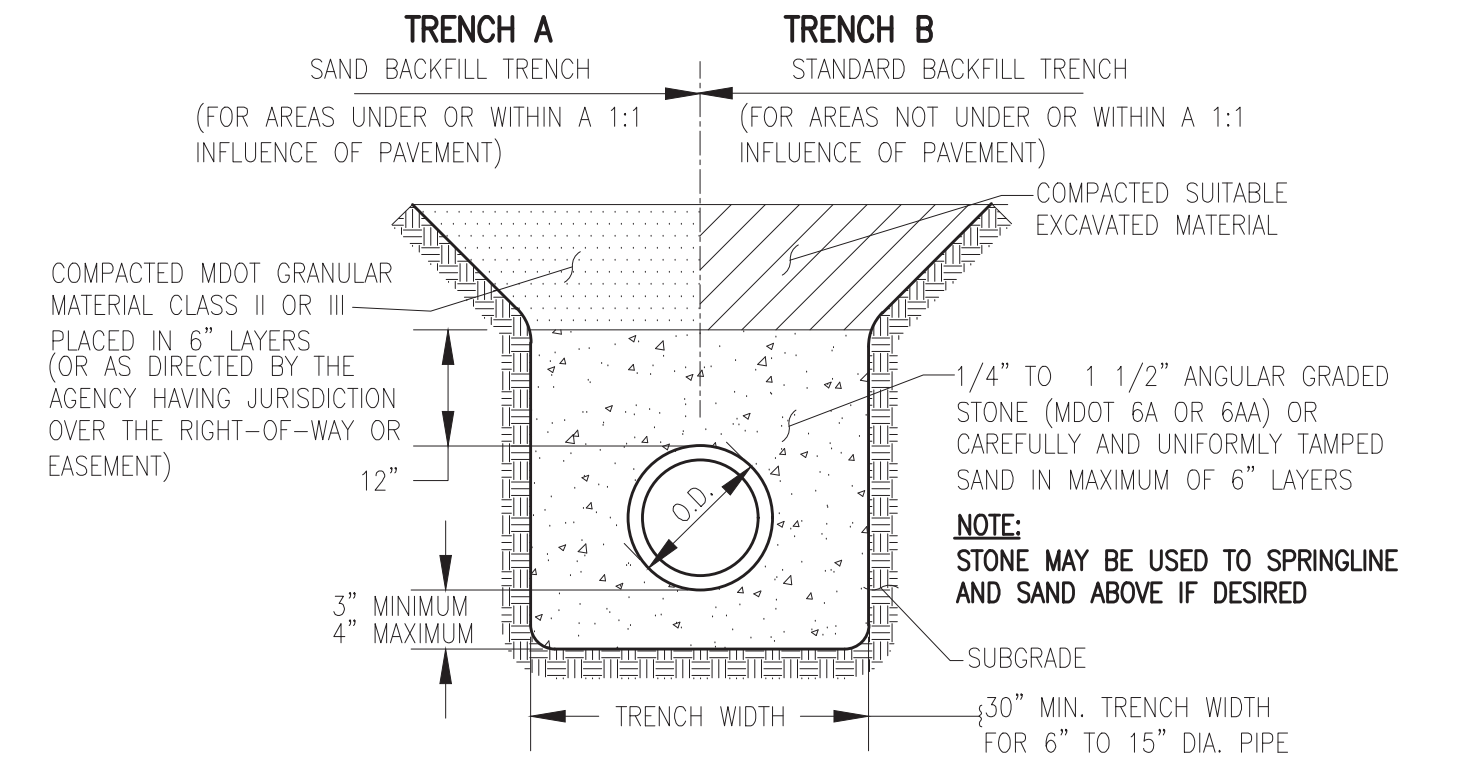
WASTEWATER PUMP STATION

NOT TO SCALE
PV&B = PLUG VALVE AND BOX



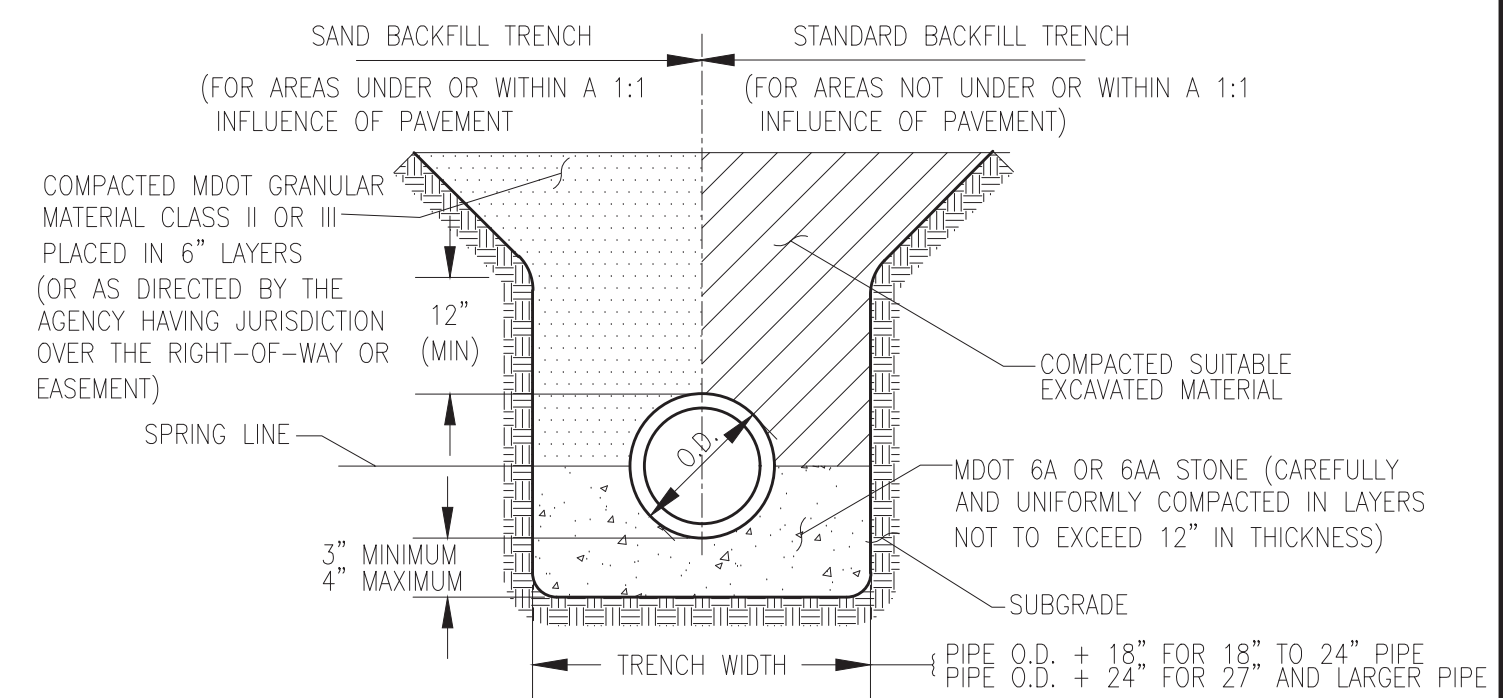
SANITARY SEWER CLEANOUT

NOT TO SCALE



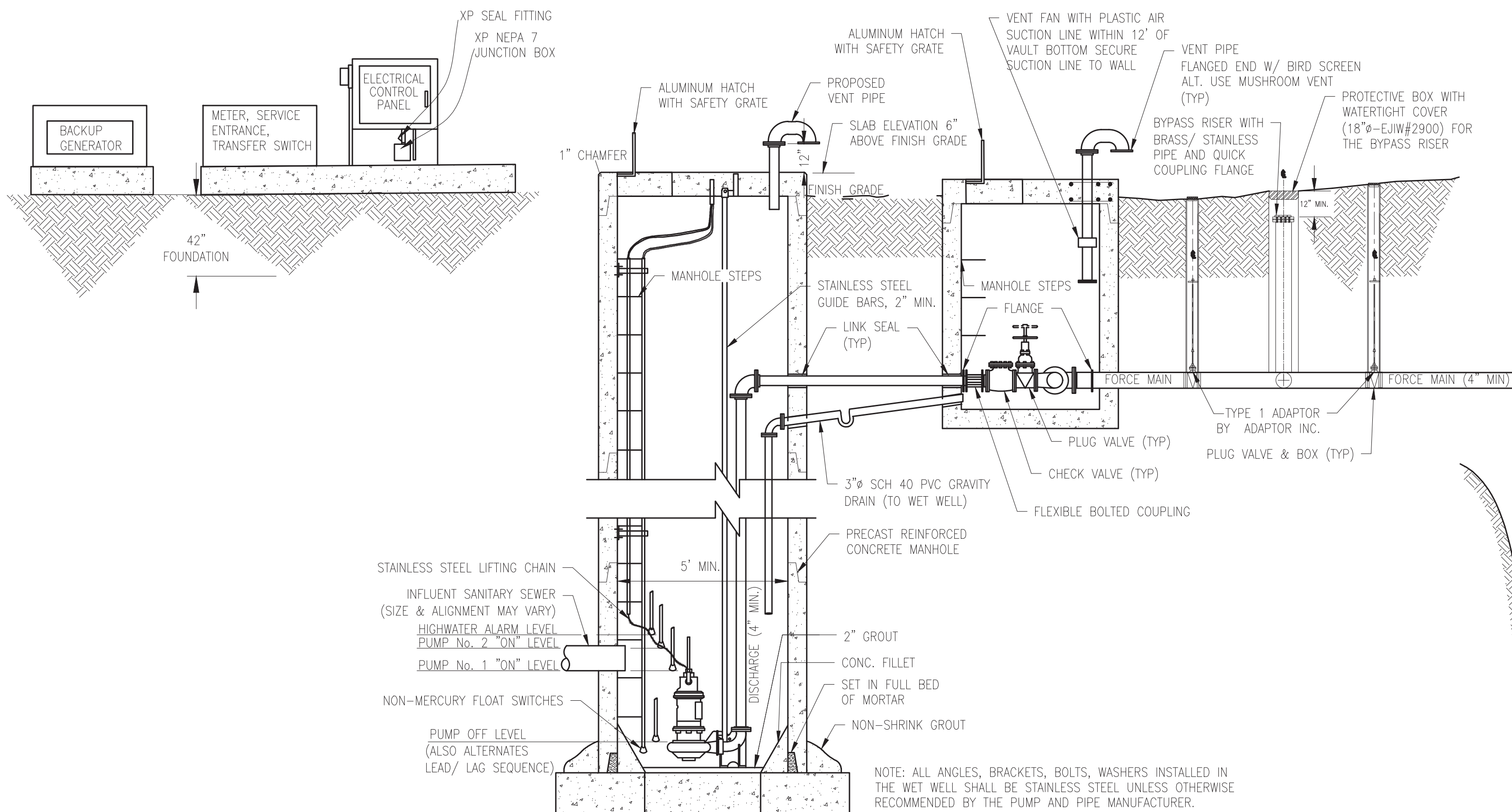
FLEXIBLE PIPE (8\"/>

NOT TO SCALE



RIGID PIPE (18\"/>

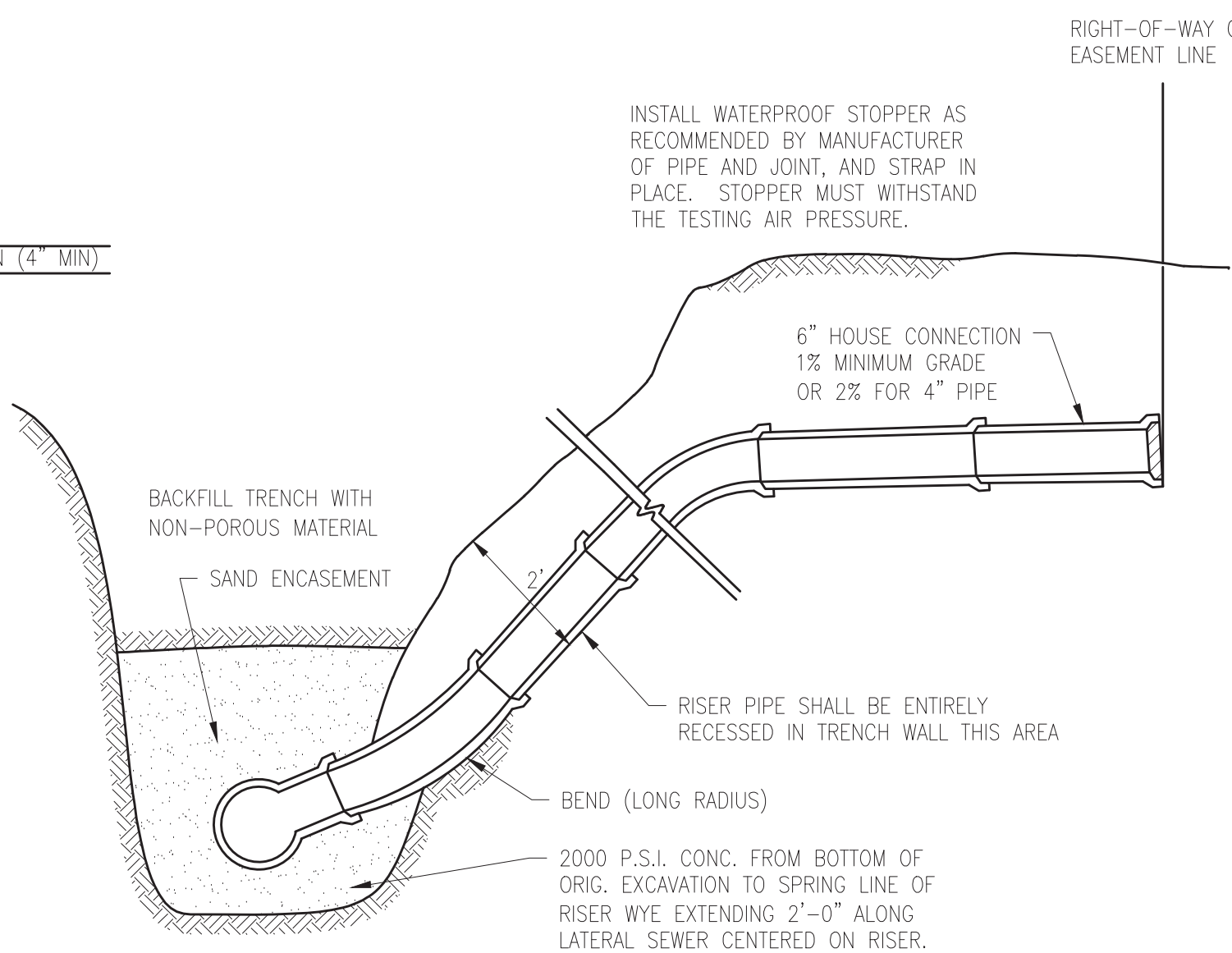
NOT TO SCALE



WASTEWATER PUMP STATION

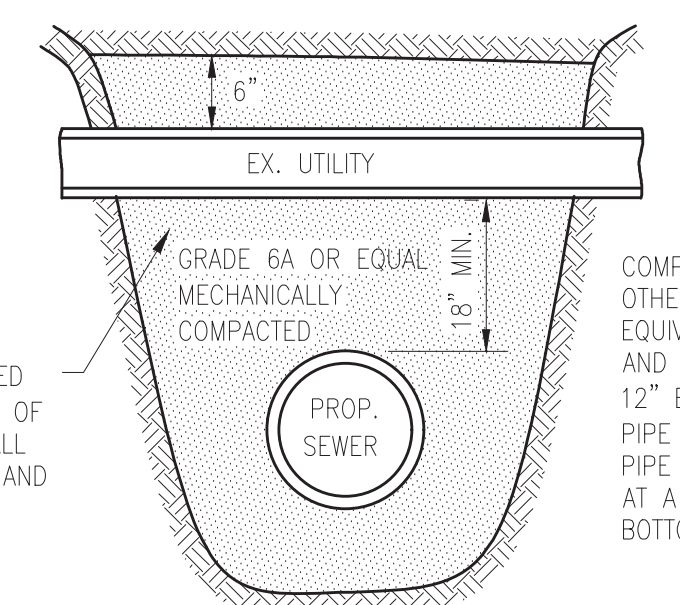
NOT TO SCALE

DETAILS ARE FOR LAYOUT AND GENERALITIES ONLY. THE SPECIFIC COMPONENTS AND EXACT DETAILS MUST BE IDENTIFIED OR CREATED ON A CASE BY CASE BASIS THROUGH A DETAILED SUBMITTAL REVIEW PROCESS.



BUILDING SEWER

NOT TO SCALE



STANDARD PIPE SUPPORT

SANITARY OR STORM
NOT TO SCALE

WHERE DET. "D" BEDDING IS SPECIFIED FOR NEW UTILITY A 6" MIN. LAYER OF MECHANICALLY COMPACTED SAND SHALL BE MAINTAINED BETWEEN EX. UTILITY AND TOP OF CONC. ENCASUREMENT.



Know what's below.
Call before you dig.



REVISIONS

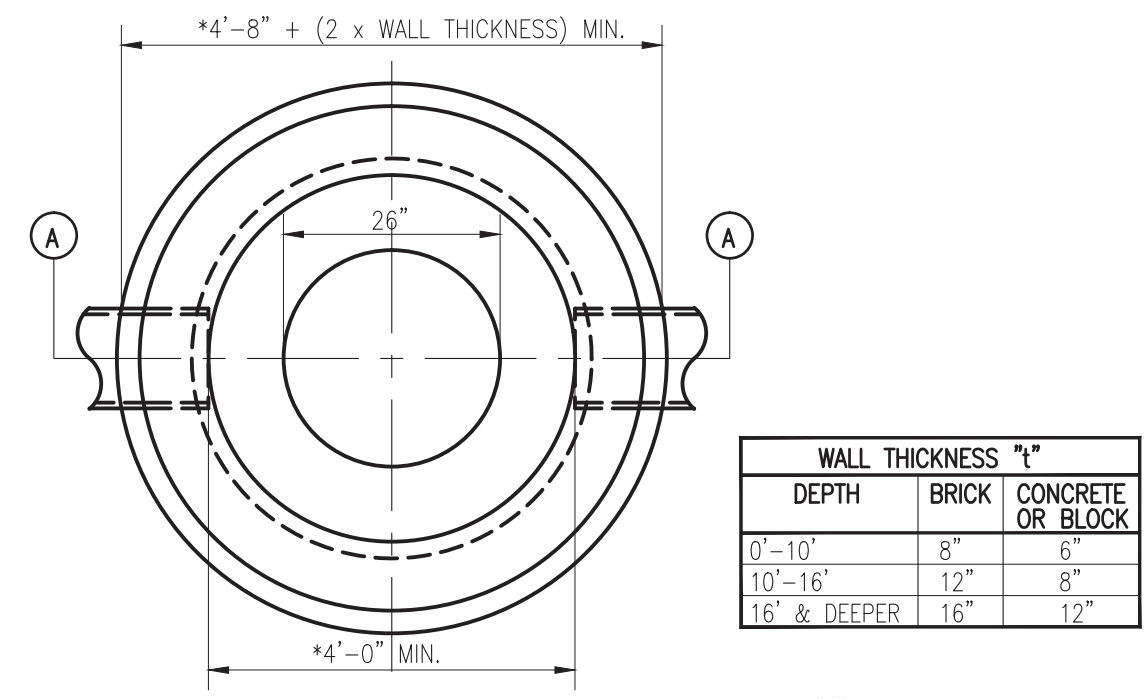
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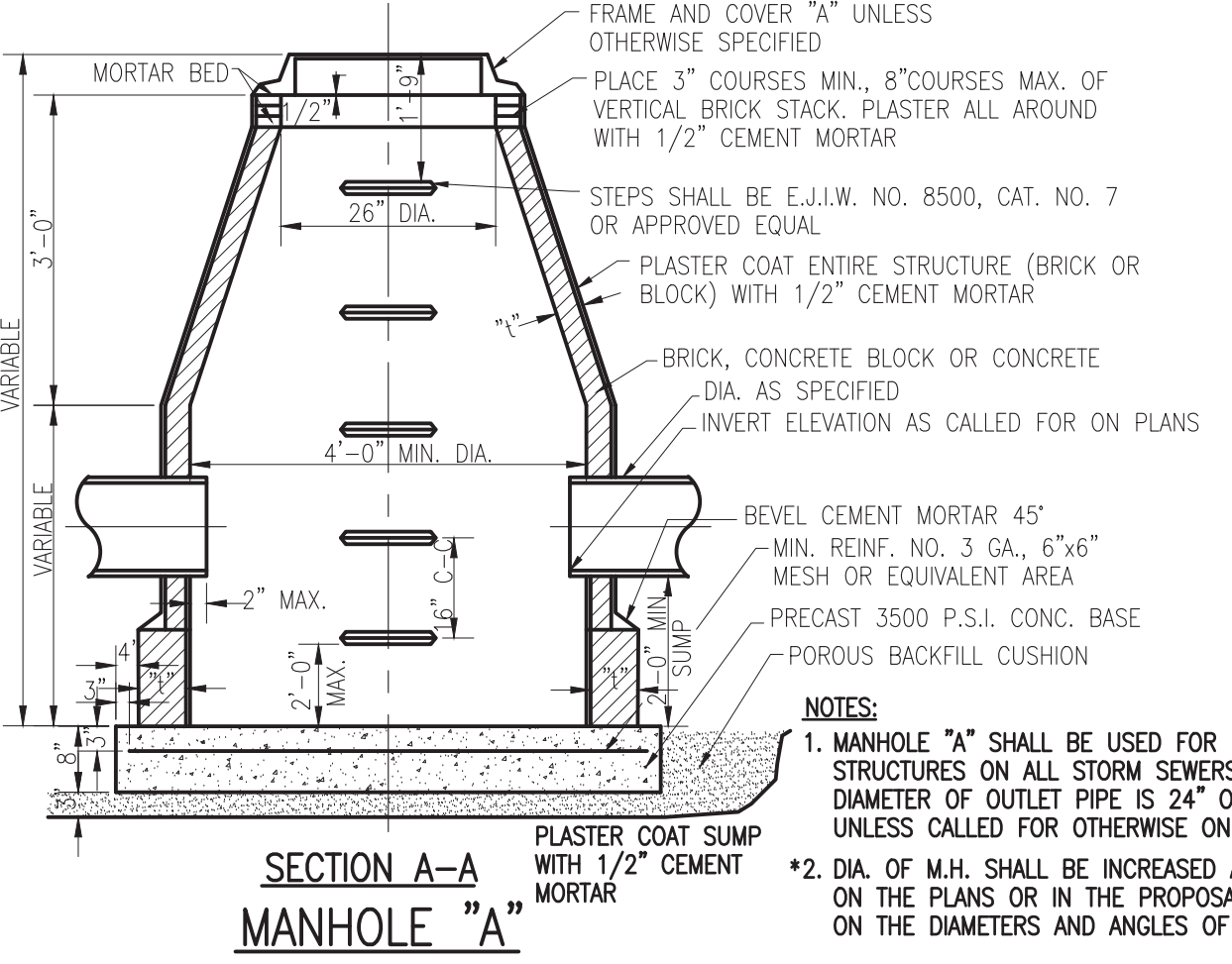
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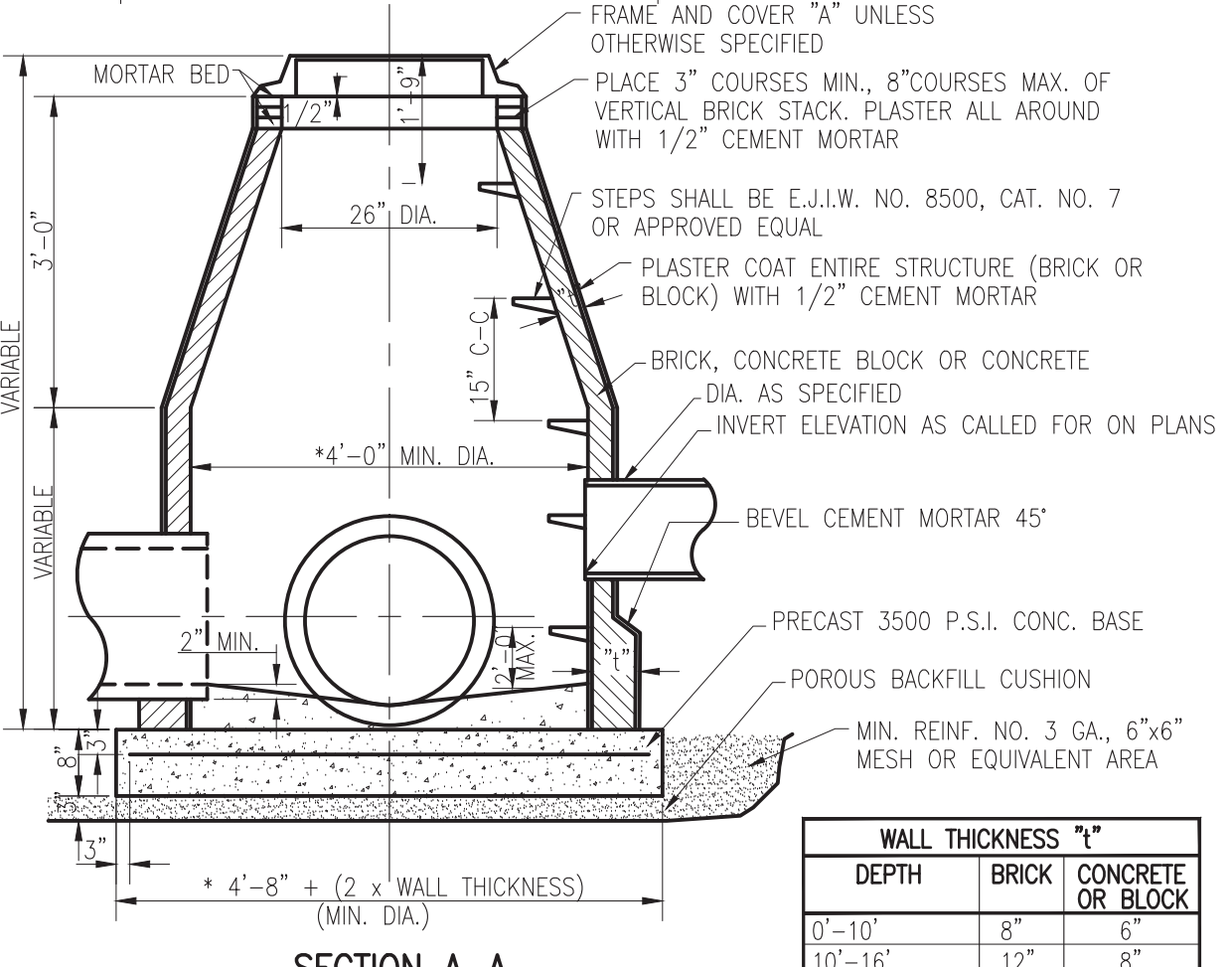
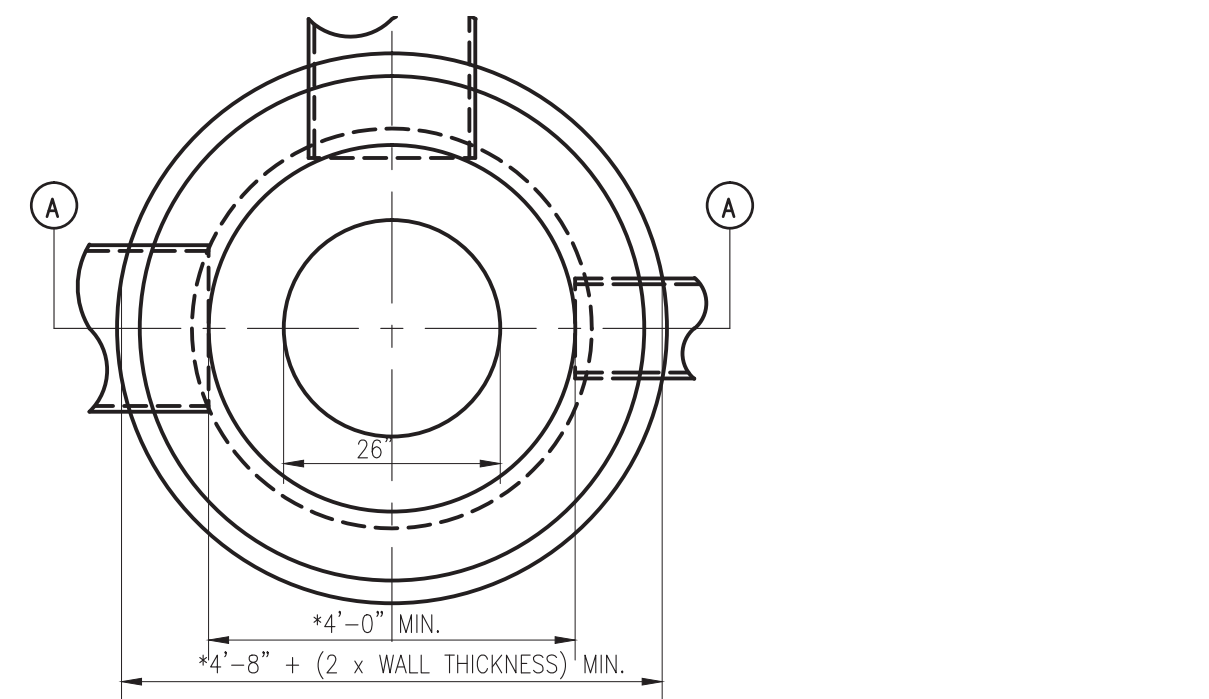
DATE	CADD	ENG./ARCH	PROJ. MGR.	SECTION	TOWN	RANGE	COUNTY	CITY/TOWNSHIP	SCALE	VERT. DATUM	JOB #



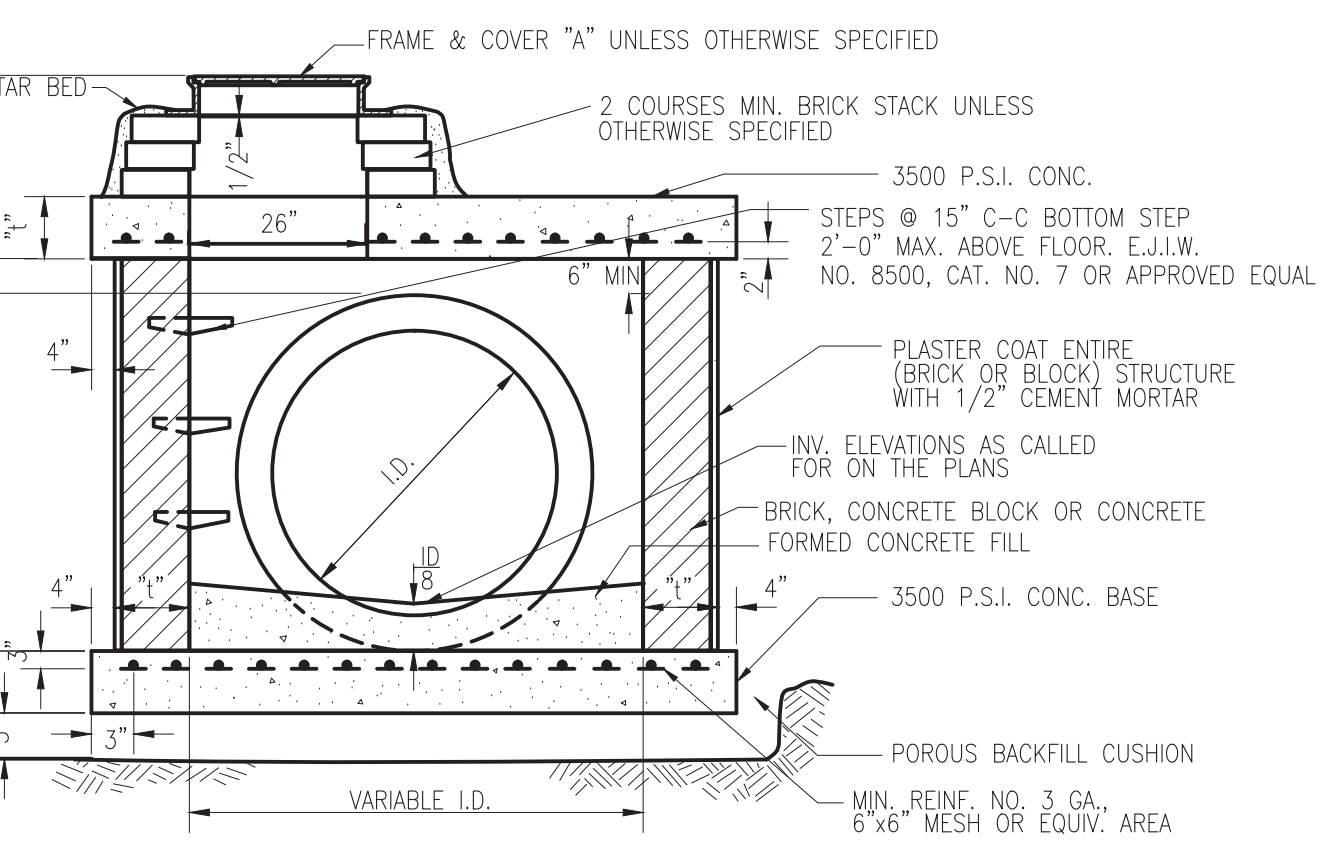
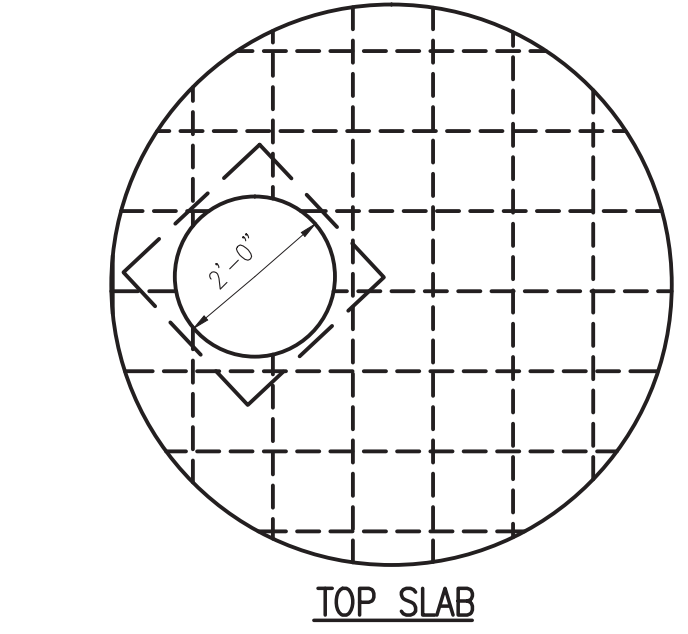
DEPTH	BRICK	CONCRETE OR BLOCK
0'-10"	8"	6"
10'-16"	12"	8"
16" & DEEPER	16"	12"



- NOTES:**
- MANHOLE "A" SHALL BE USED FOR MANHOLE STRUCTURES ON ALL STORM SEWERS WHERE THE DIAMETER OF OUTLET PIPE IS 24" OR SMALLER, UNLESS CALLED FOR OTHERWISE ON THE PLANS.
 - DIA. OF M.H. SHALL BE INCREASED AS SHOWN ON THE PLANS OR IN THE PROPOSAL DEPENDING ON THE DIAMETERS AND ANGLES OF THE SEWERS.



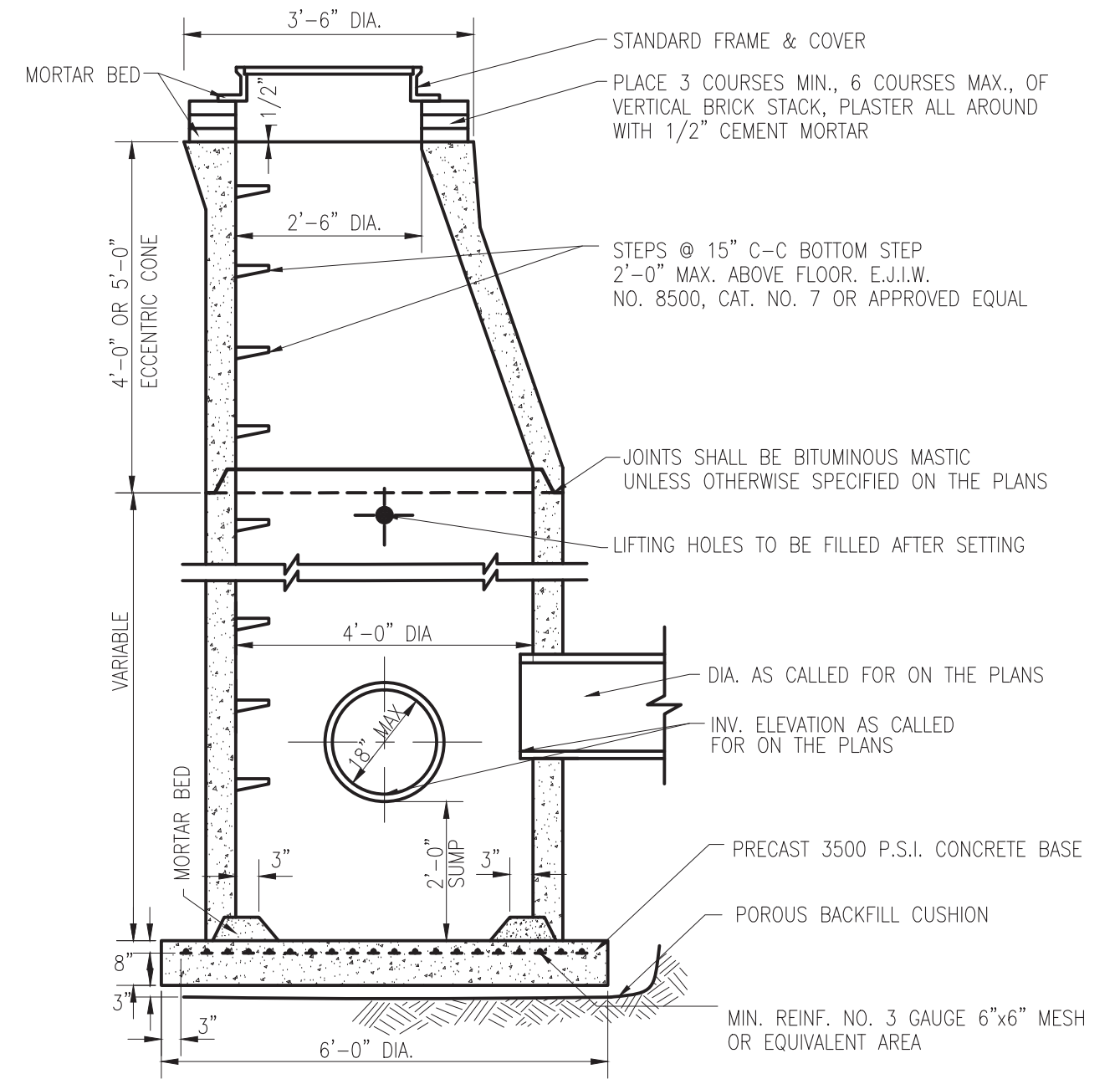
- NOTES:**
- MANHOLE "B" SHALL BE USED FOR MANHOLE STRUCTURES ON ALL STORM SEWERS WHERE THE DIAMETER OF OUTLET PIPE IS 24" OR SMALLER, UNLESS CALLED FOR OTHERWISE ON THE PLANS.
 - DIA. OF M.H. SHALL BE INCREASED AS SHOWN ON THE PLANS OR IN THE PROPOSAL DEPENDING ON THE DIAMETERS AND ANGLES OF THE SEWERS.



OUTLET I.D.	M.H. D	TOP SLAB T	WALLS T	REINFORCING STEEL (SLAB)
24" OR LESS	4'-0"	9"	8"	3/4" @ 9" EACH WAY
30"	4'-0"	9"	8"	3/4" @ 9" EACH WAY
36"	4'-0"	9"	12"	3/4" @ 9" EACH WAY
42"	4'-0"	10"	12"	3/4" @ 9" EACH WAY
48"	4'-0"	11"	12"	7/8" @ 9" EACH WAY
54"	4'-0"	11"	12"	7/8" @ 9" EACH WAY

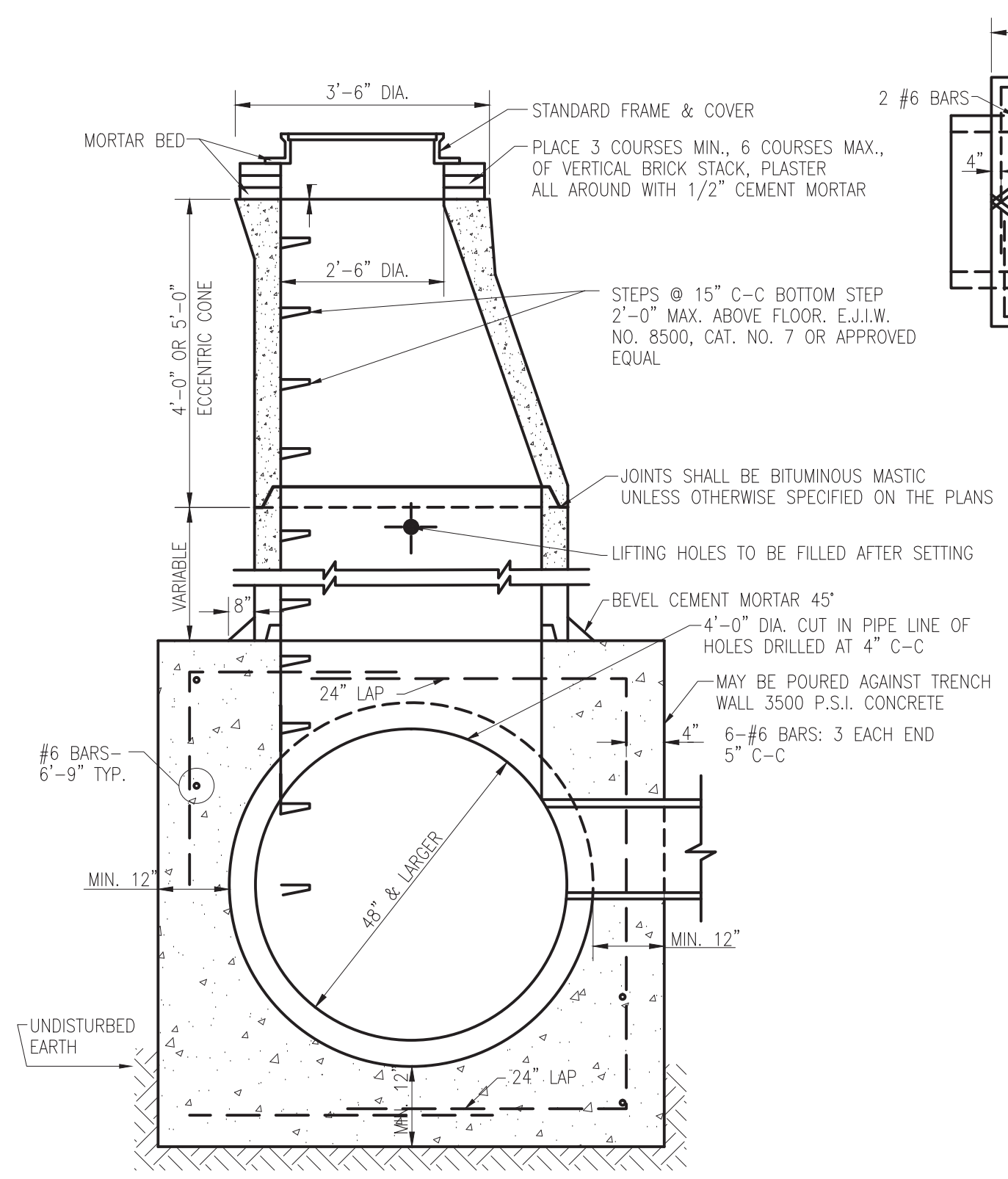
M.H. D	TOP SLAB T	WALLS T	REINFORCING STEEL (SLAB)
7'-0"	12"	12"	7/8" @ 9" EACH WAY
8'-0"	12"	12"	1" @ 9" EACH WAY

- NOTES:**
- DIA. SHALL BE INCREASED AS SHOWN ON PLANS OR IN THE PROPOSAL DEPENDING ON THE ANGLE OF THE SEWERS.
 - M.H. "D" SHALL BE USED WHERE THE DEPTH OF COVER FROM THE TOP OF CASTING TO THE TOP OF SEWER IS LESS THAN 4'-0". M.H. "D" SHALL BE CONSTRUCTED WITH A 2' SUMP WHERE DIAMETER OF OUTLET SEWER IS 24" OR LESS.



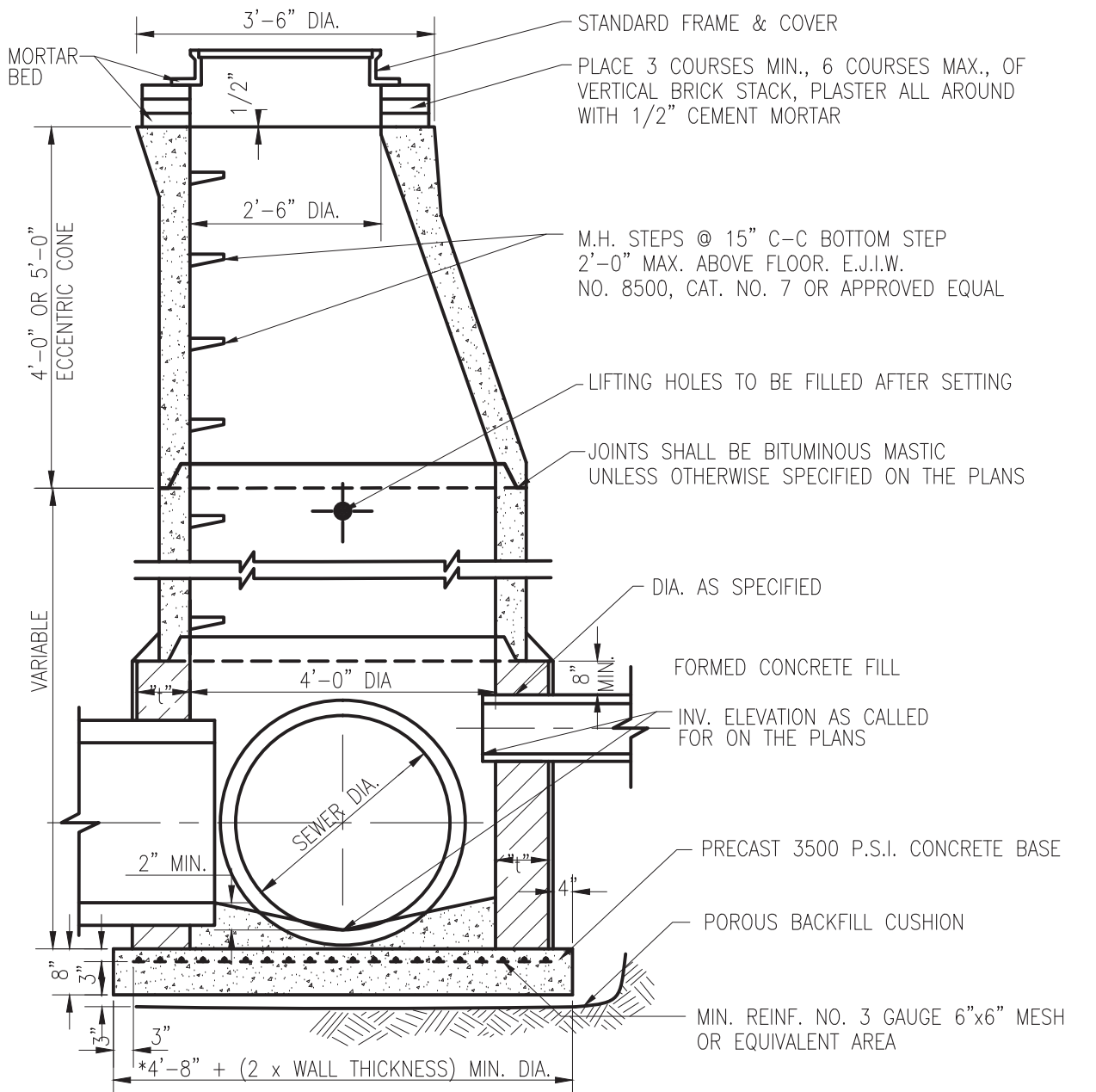
TYPICAL SECTION PRECAST MANHOLE "E"

- NOTES:**
- THIS MANHOLE SHALL BE USED ONLY WHEN MEETING CONDITIONS STATED IN THE "GENERAL MANHOLE NOTES", ITEM NO. 2A
 - PRECAST UNITS SHALL MEET THE REQUIREMENTS SPECIFIED BY A.S.T.M. C-478-68.



TYPICAL SECTION PRECAST MANHOLE "C"

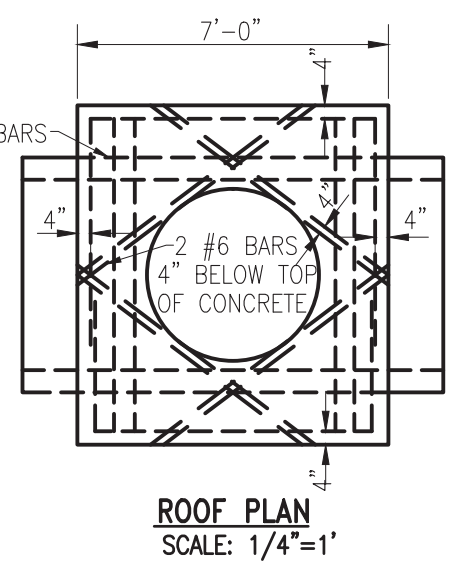
- NOTES:**
- MANHOLE "C" SHALL BE USED FOR MANHOLE STRUCTURES ON ALL STORM SEWERS WHERE 48" OR LARGER DIA. PIPES INTERSECT.
 - PRECAST UNITS SHALL MEET THE REQUIREMENTS SPECIFIED BY A.S.T.M. C-478-68.



TYPICAL SECTION PRECAST MANHOLE "F"

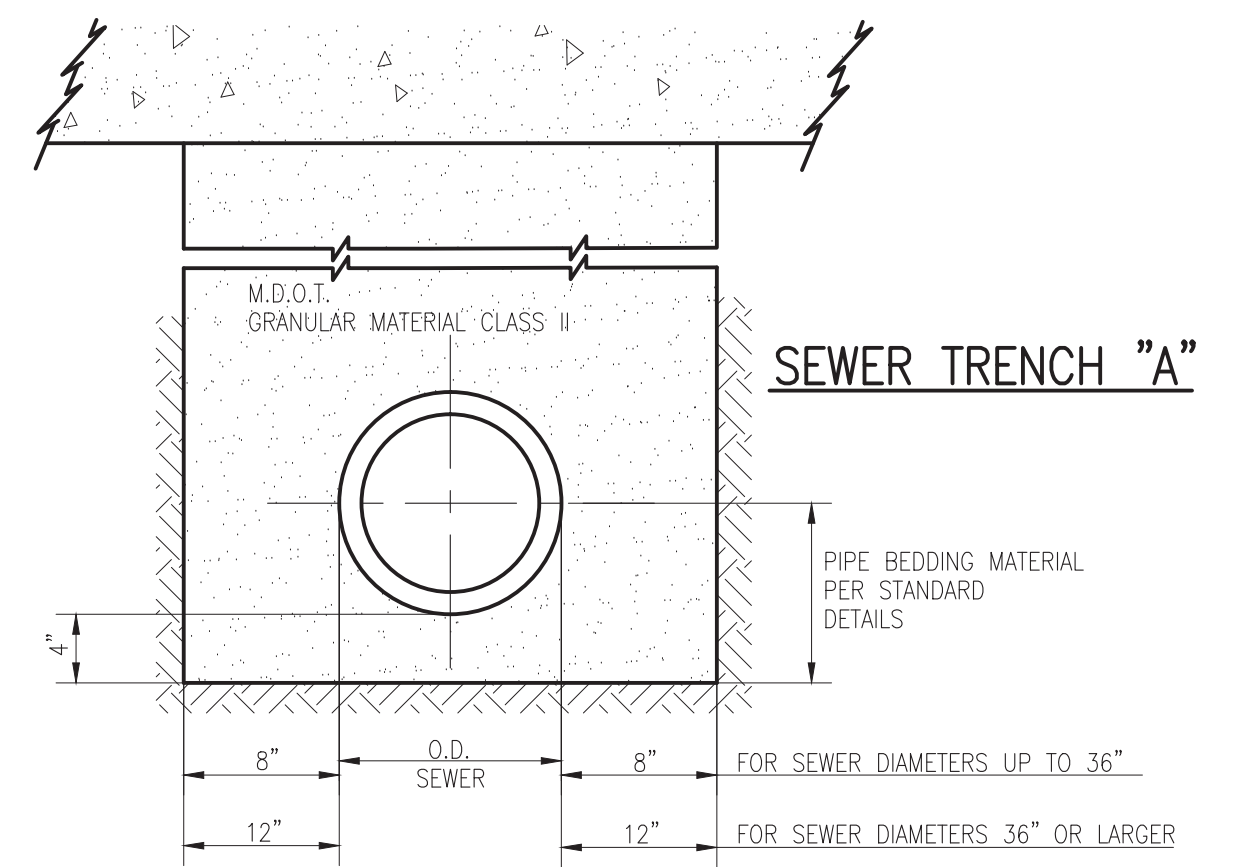
- NOTES:**
- THIS MANHOLE SHALL BE USED ONLY WHEN MEETING CONDITIONS STATED IN THE "GENERAL MANHOLE NOTES", ITEM NO. 2A
 - PRECAST UNITS SHALL MEET THE REQUIREMENTS SPECIFIED BY A.S.T.M. C-478-68.
 - DIAMETER OF MANHOLE SHALL BE INCREASED AS SHOWN ON PLANS OR IN THE PROPOSAL, DEPENDING ON THE DIAMETERS AND ANGLES OF THE SEWERS.

DEPTH	BRICK	CONCRETE OR BLOCK
0'-10"	8"	6"
10'-16"	12"	8"
16" & DEEPER	16"	12"



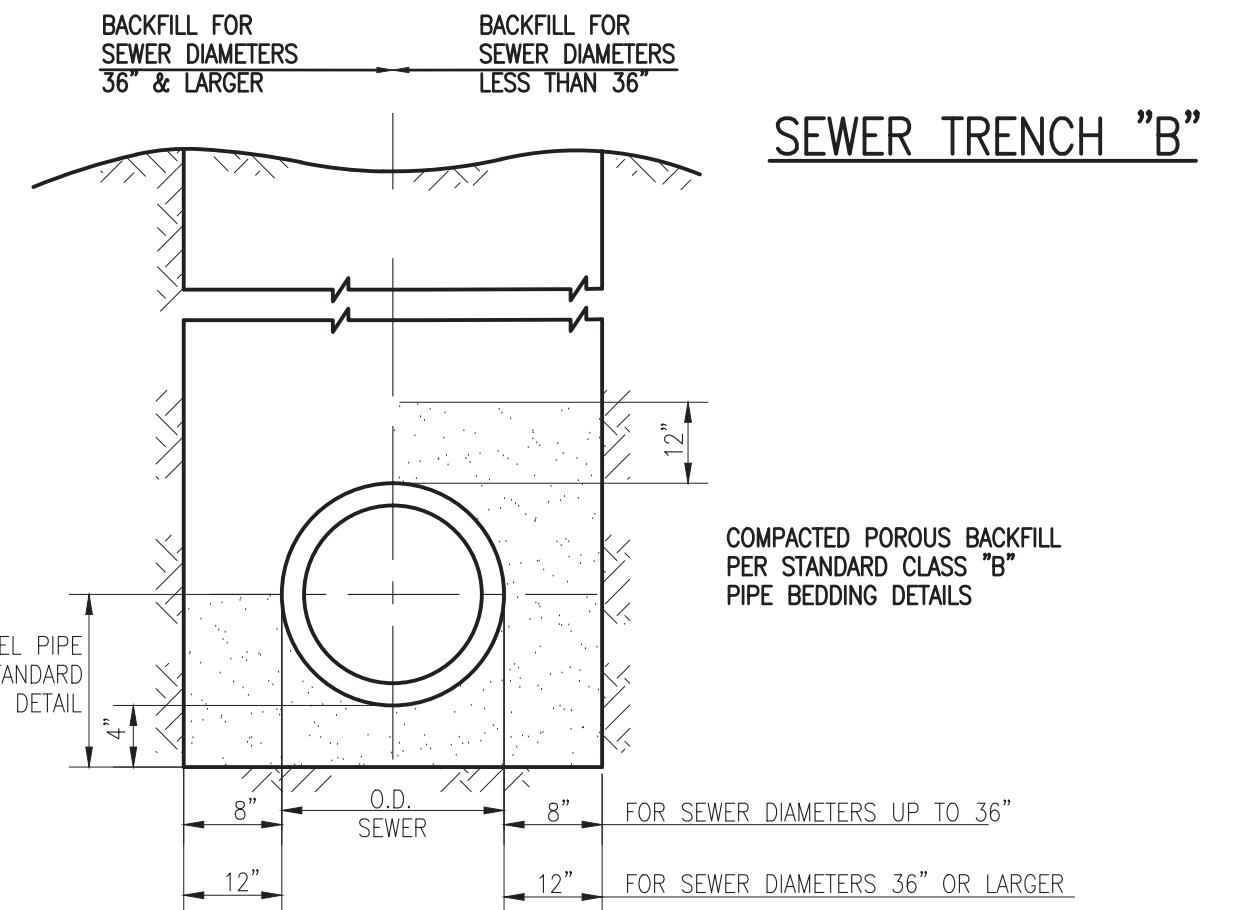
ROOF PLAN SCALE: 1/4"=1'

- GENERAL NOTES FOR STORM SEWER MANHOLES**
- ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND SPECIFICATIONS OF THE TOWNSHIP OF YPSILANTI AND YCUA.
 - CONTRACTOR SHALL CONSTRUCT MANHOLES WITH PRECAST REINFORCED CONCRETE UNITS ("E", "F", AND "I") IN LIEU OF CONCRETE, BRICK AND BLOCK MANHOLES ("A" AND "B") IN ACCORDANCE WITH THE FOLLOWING CONDITIONS:
 - MAXIMUM DIAMETER OF SEWER OUTLET IN ANY PRECAST UNIT SHALL BE 18" (MANHOLE "E" ONLY).
 - NO OPENINGS SHALL BE MADE IN PRECAST UNITS WHICH WOULD LEAVE LESS THAN 24" OF UNDISTURBED PRECAST PIPE OR WOULD REMOVE MORE THAN 30% OF THE CIRCUMFERENCE ALONG ANY HORIZONTAL PLANE.
 - STRUCTURES FOR SEWERS LARGER THAN 18", OR THOSE NOT MEETING THE OPENING REQUIREMENTS, SHALL BE BUILT OF BLOCK OR BRICK UP TO A MINIMUM OF 8" ABOVE THE TOP OF SEWER, WITH PRECAST UNITS BEING USED ABOVE THIS POINT. WHERE PRECAST UNITS REST ON THE BLOCK OR BRICK, THE GROOVE IN THE PRECAST UNIT SHALL BE FILLED WITH MORTAR.
 - OPENINGS FOR THE OUTLET SEWER SHALL BE PRECAST WITH A DIAMETER OF 3 INCHES LARGER THAN THE OUTSIDE DIAMETER OF THE OUTLET PIPE. ALL OTHER OPENINGS SHALL BE MADE IN THE FIELD AFTER MANHOLE HAS BEEN CONSTRUCTED.
 - ALL VERTICAL OPENINGS IN CONCRETE BLOCK STRUCTURE WALLS SHALL BE COMPLETELY FILLED WITH MORTAR. ALL VERTICAL WALL JOINTS SHALL BE CENTER POINTED.
 - A "POURED 3500 P.S.I. CONCRETE BASE" WITHOUT STEEL REINFORCEMENT MAY BE SUBSTITUTED FOR PRECAST BASE WHEN APPROVED BY THE TOWNSHIP ENGINEER. A POROUS BACKFILL CUSHION WILL NOT BE REQUIRED UNDER THE POURED BASE UNLESS CONTRACTOR HAS EXCAVATED BELOW THE REQUIRED ELEVATION, AT WHICH TIME THE ENGINEER WILL DECIDE AS TO THE MERITS OF INCREASING THE THICKNESS OF THE CONCRETE BASE OR THE USE OF A POROUS BACKFILL CUSHION.
 - WHERE UNSTABLE GROUND CONDITIONS ARE ENCOUNTERED, SLAG OR STONE BEDDING SHALL BE USED AS DIRECTED BY THE ENGINEER IN ORDER TO PROVIDE A STABLE FOUNDATION FOR PIPE AND MANHOLES.
 - ALL PIPES ENTERING OR LEAVING A MANHOLE SHALL BE ADEQUATELY SUPPORTED BY POURING 2500 P.S.I. CONCRETE FILL FROM UNDISTURBED EARTH TO SPRINGLINE.
 - WHEREVER EXISTING MANHOLES OR SEWER PIPE ARE TO BE TAPPED, DRILL HOLES AT 4" CENTER TO CENTER AROUND PERIPHERY OR OPENING TO CREATE A PLANE OF WEAKNESS BEFORE BREAKING SECTION OUT.



SEWER TRENCH "A"

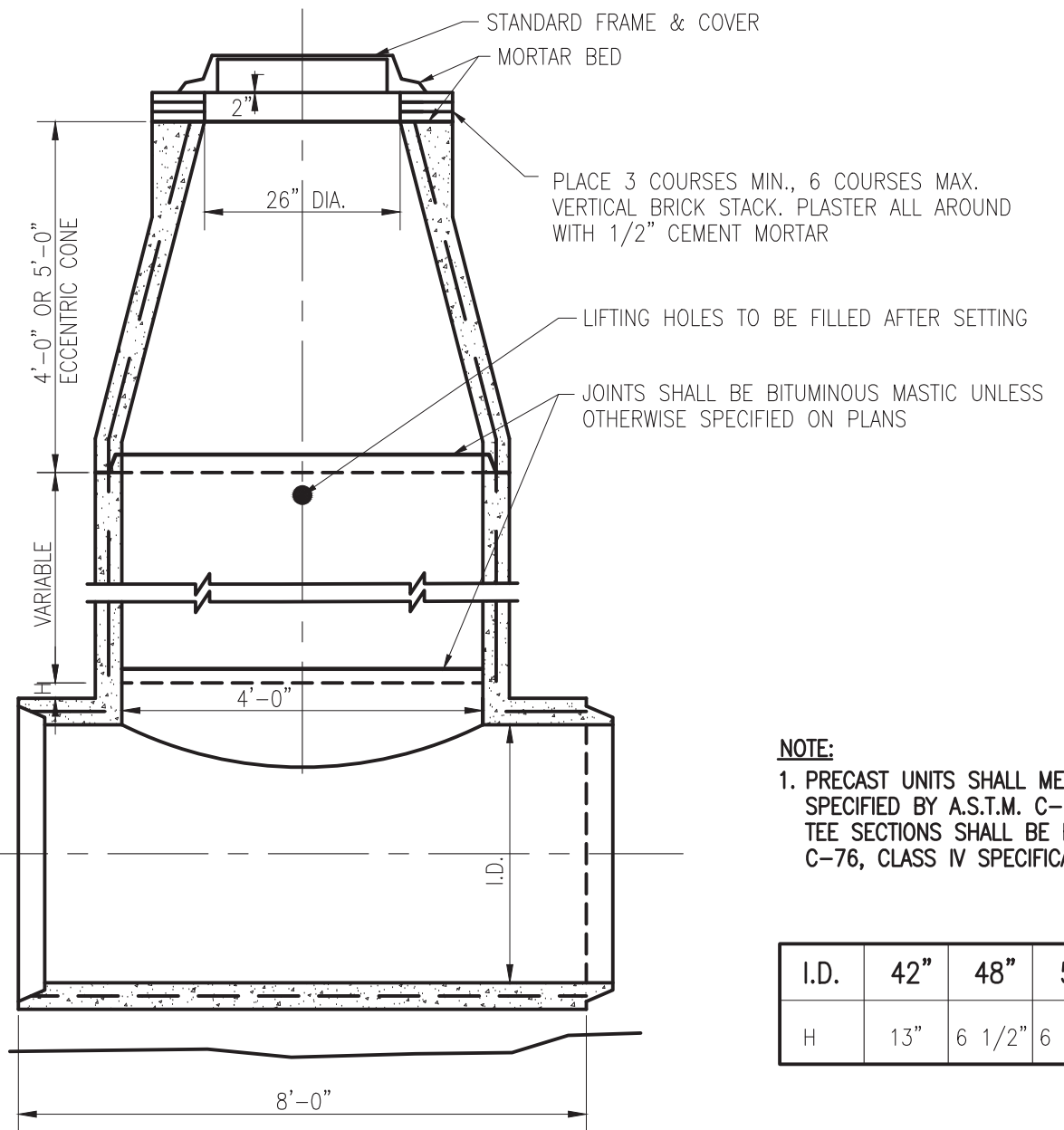
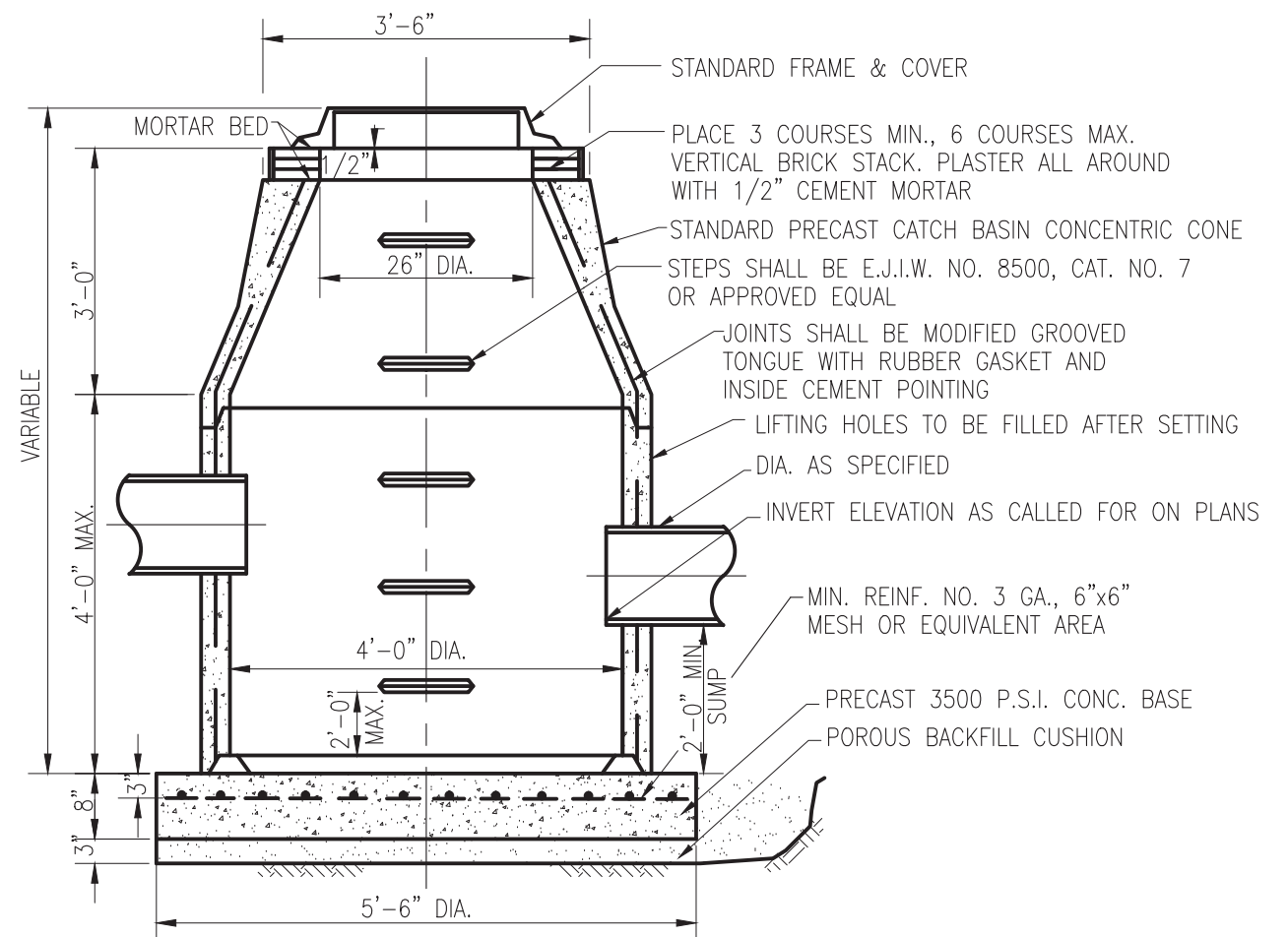
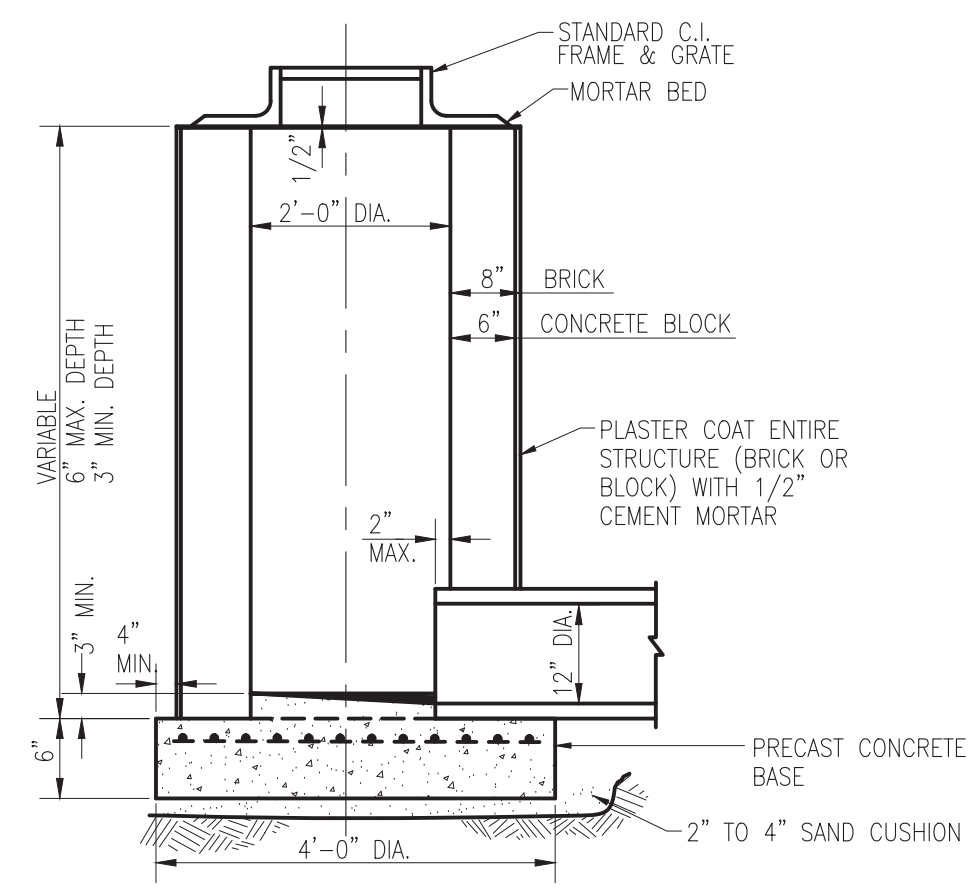
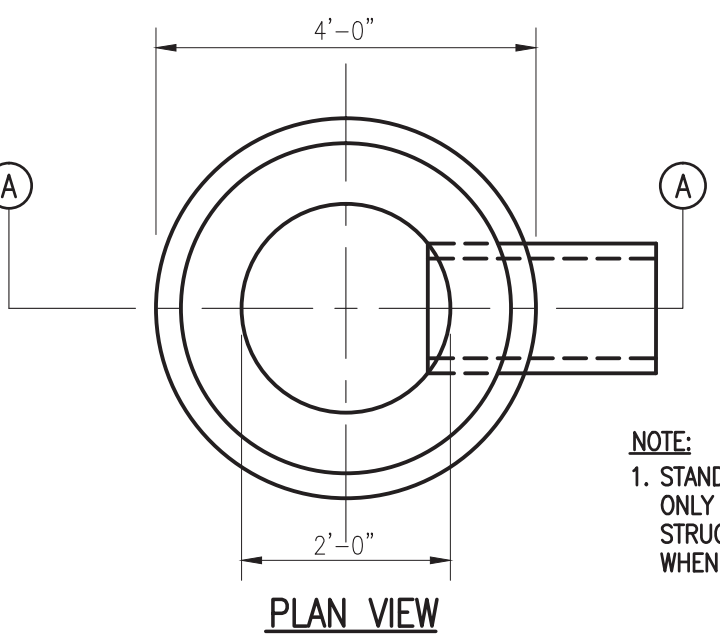
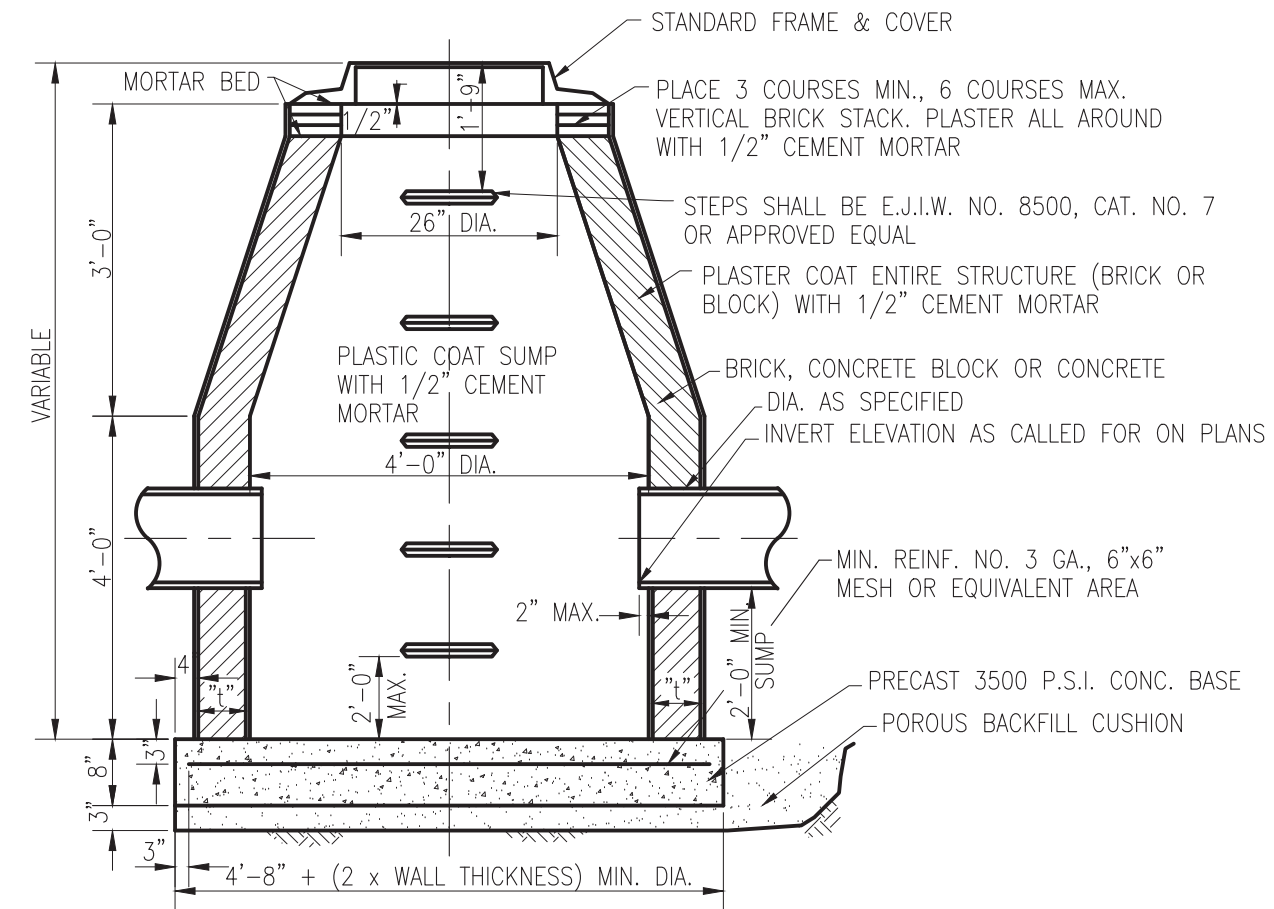
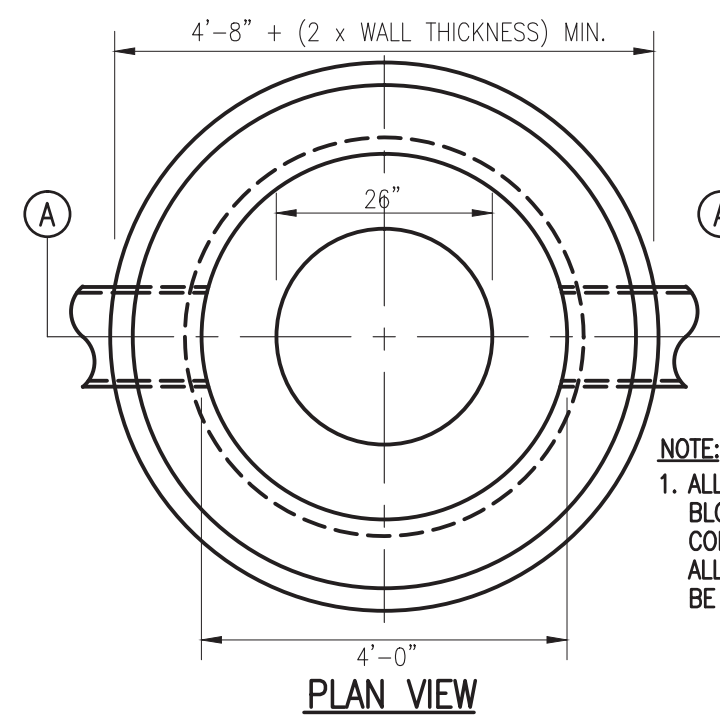
- NOTES:**
- TRENCH "A" SHALL BE USED UNDER ROAD SURFACES, PAVEMENT, SIDEWALK, CURB, AGGREGATE & PAVED DRIVES AND WHERE THE EDGE OF TRENCH IS WITHIN 3 FEET OF THE PAVEMENT
 - GRANULAR MATERIAL SHALL BE PLACED BY THE "CONTROLLED DENSITY METHOD" OR OTHER MEANS HAVING APPROVAL OF THE ENGINEER AND IS TO BE COMPACTED TO 95% OF MAXIMUM UNIT WEIGHT



SEWER TRENCH "B"

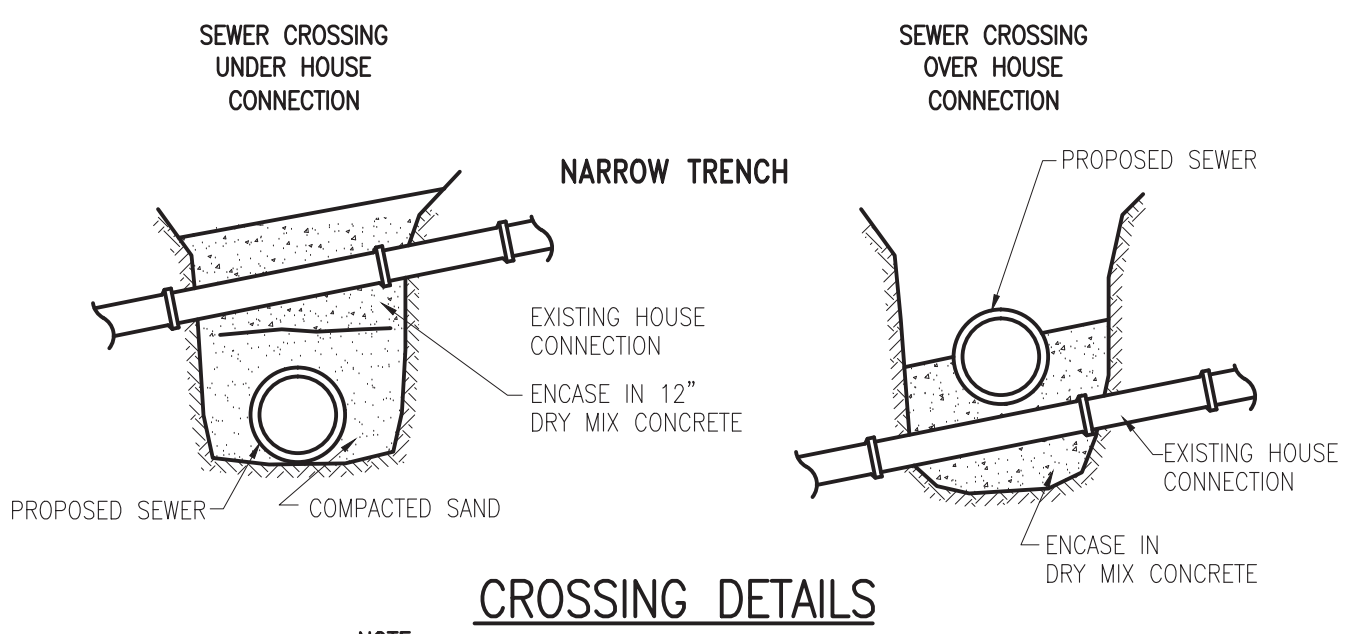
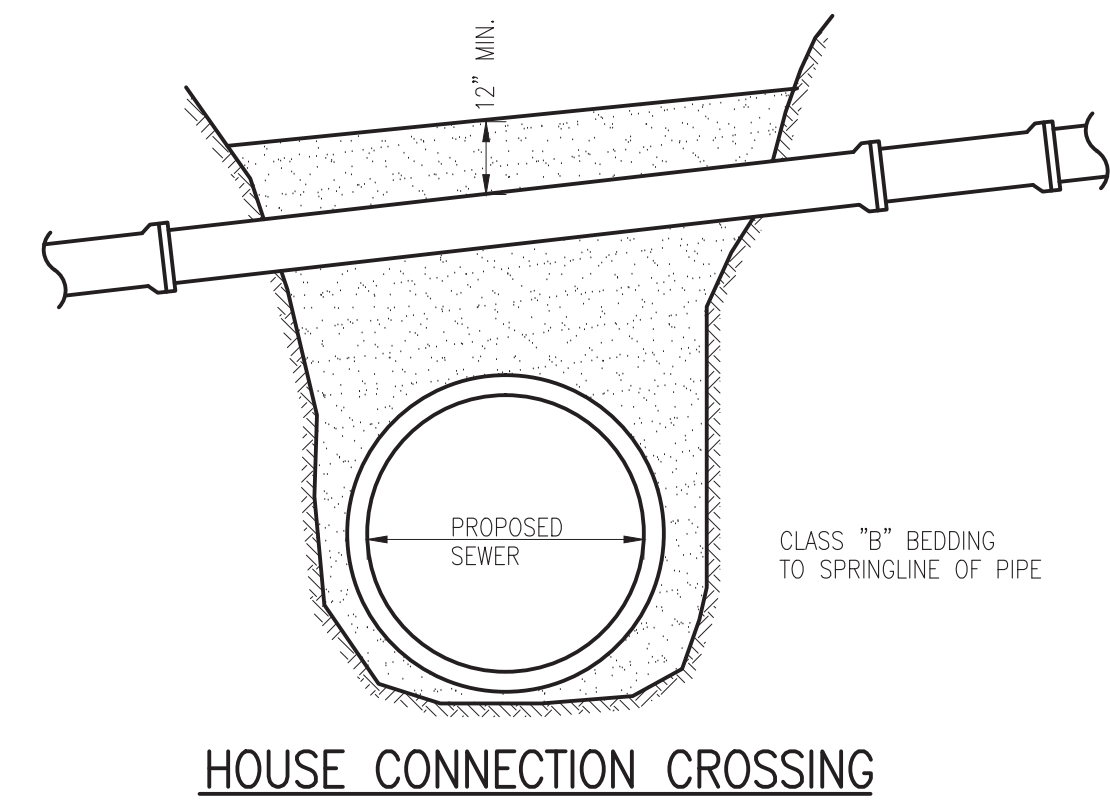
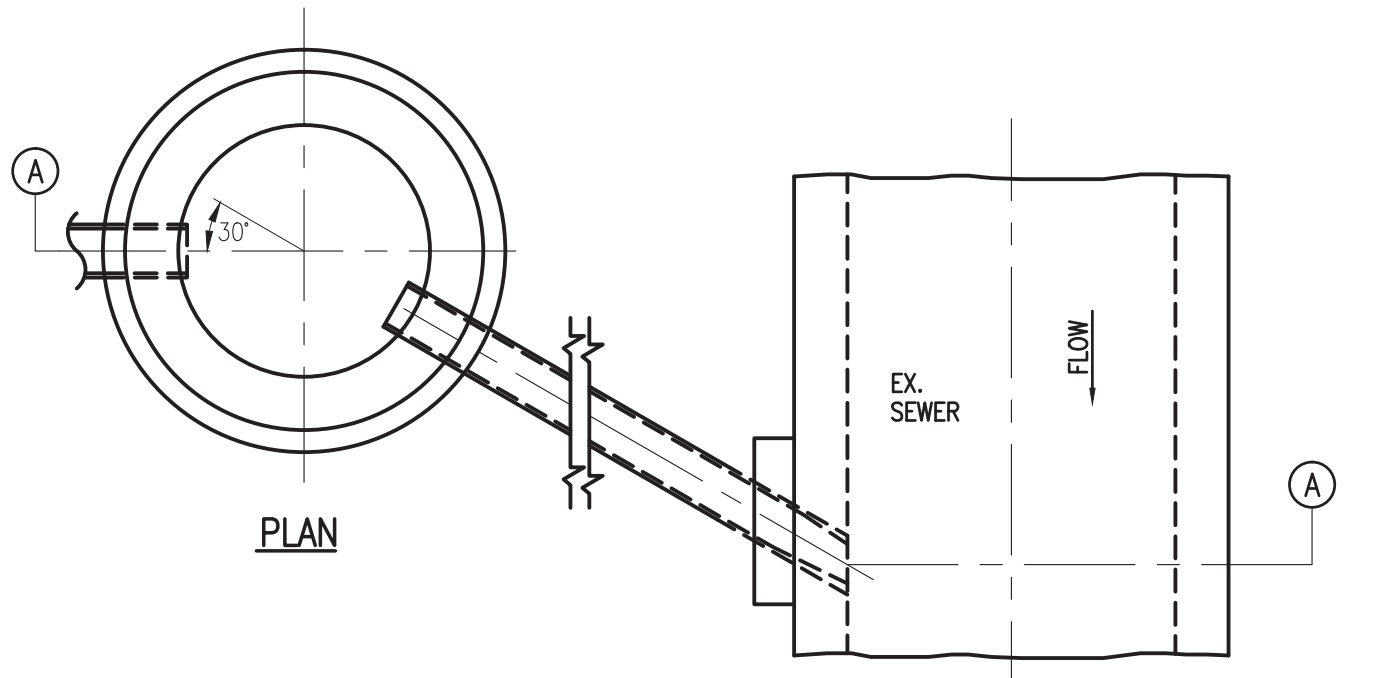
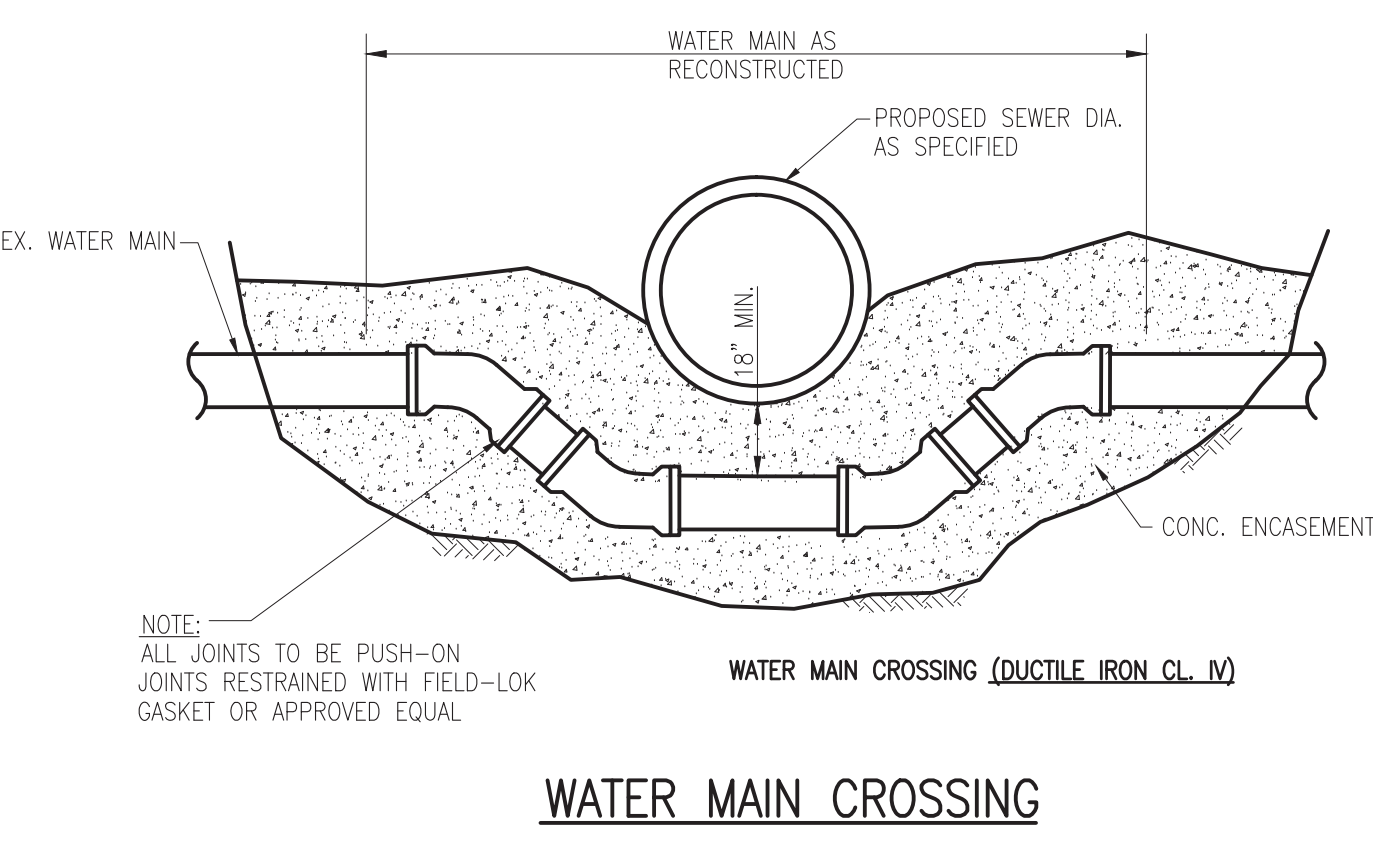
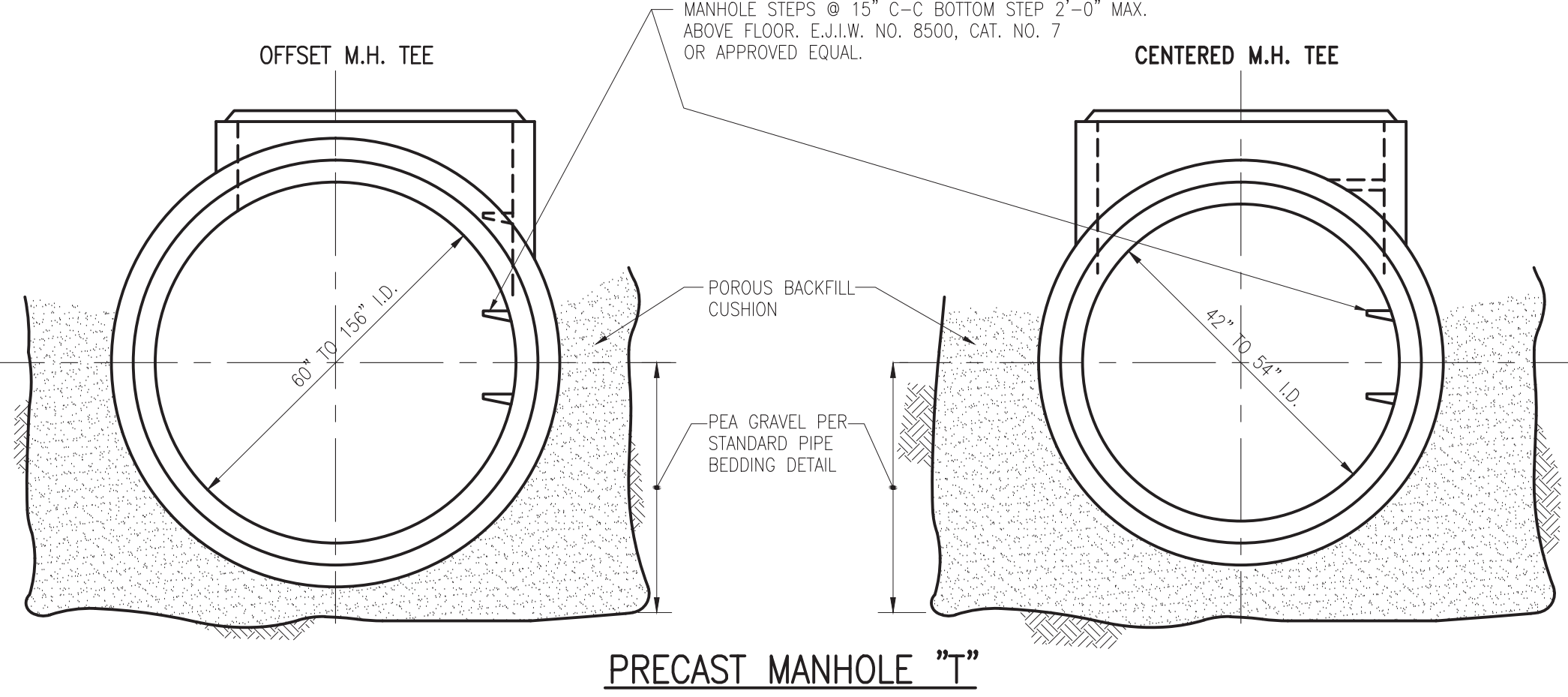
- NOTES:**
- SUITABLE EXCAVATED BACKFILL MATERIAL SHALL BE PLACED IN ONE FOOT LAYERS AND COMPACTED BY MECHANICAL TAMPING OR OTHER EFFECTIVE MEANS HAVING APPROVAL OF THE ENGINEER, TO A DENSITY EQUIVALENT TO THE UNDISTURBED ADJACENT SOIL
 - TRENCH "B" SHALL BE USED UNDER CONDITIONS OTHER THAN SPECIFIED FOR TRENCH "A"

DATE	CADD	ENG. ARCH	PROJ. MGR	SECTION	TOWN	RANGE	COUNTY	CITY/TOWNSHIP	SCALE	VERT. DATUM



NOTE:
1. PRECAST UNITS SHALL MEET THE REQUIREMENTS SPECIFIED BY A.S.T.M. C-478-68. ALL MANHOLE TEE SECTIONS SHALL BE REINFORCED TO A.S.T.M. C-76, CLASS IV SPECIFICATIONS

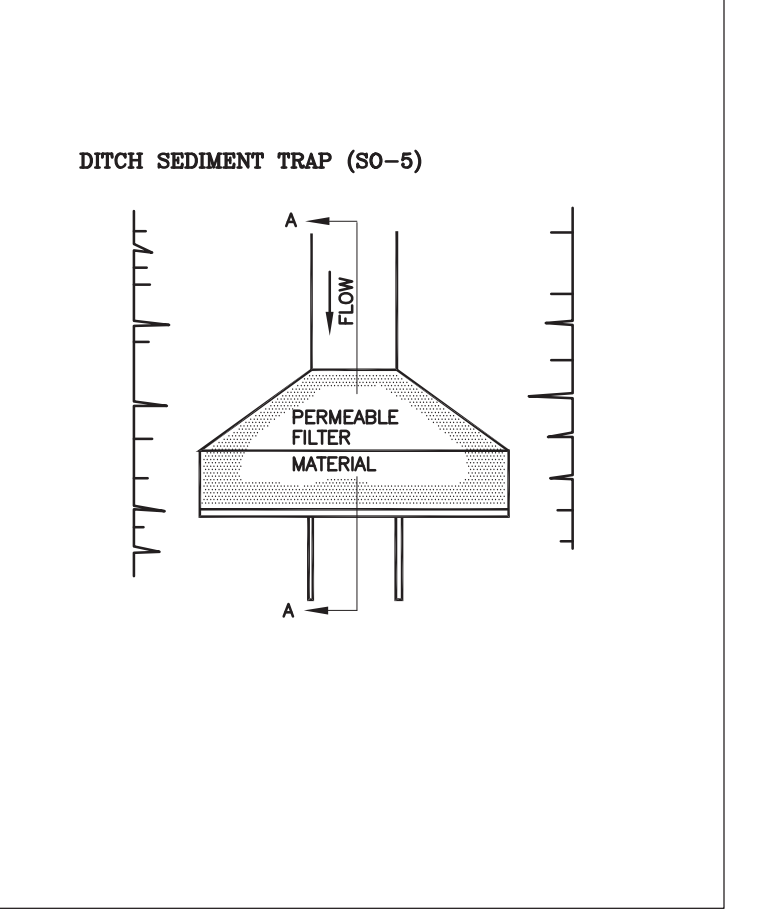
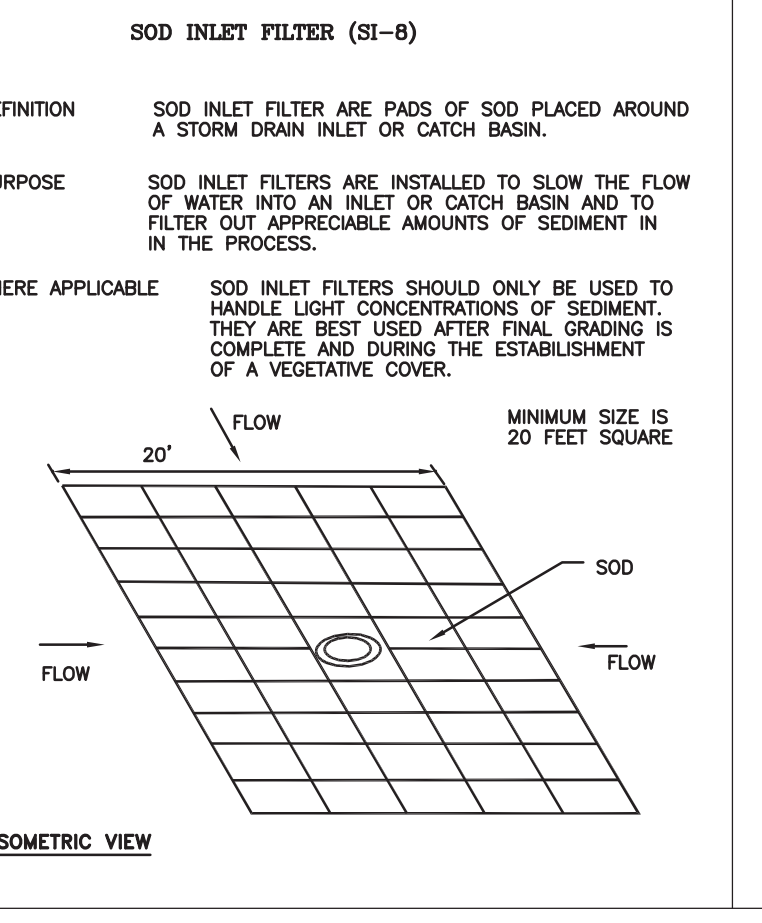
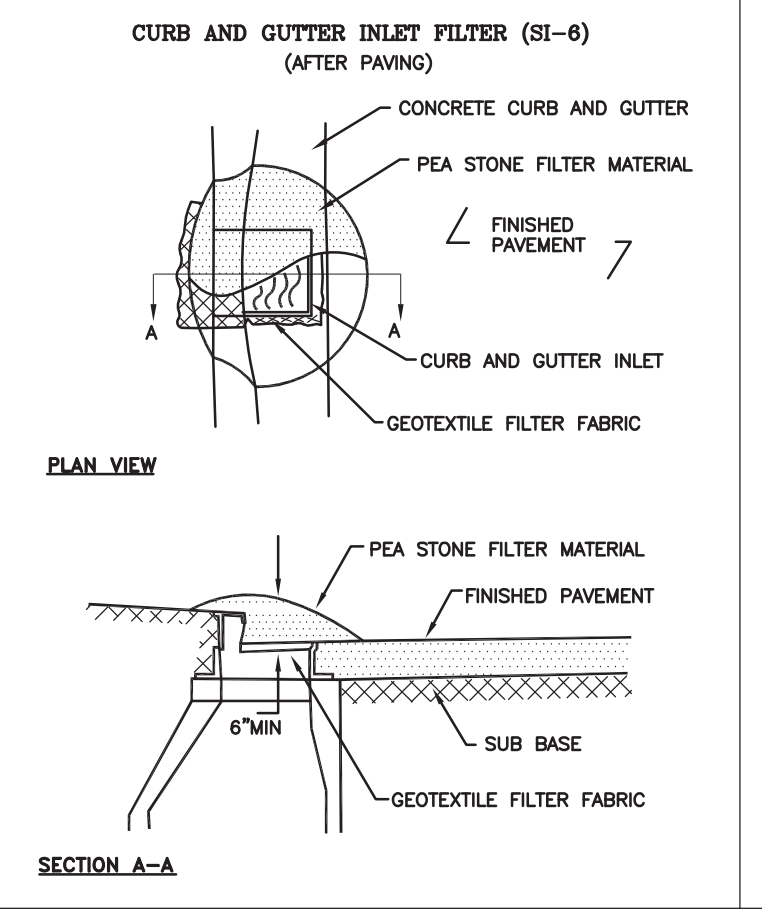
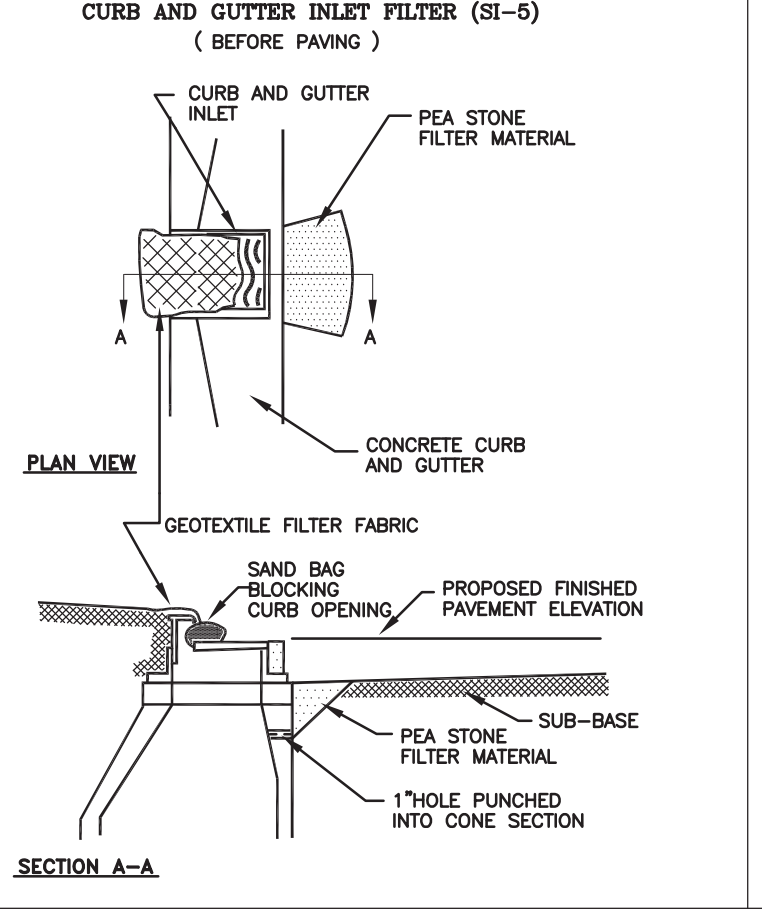
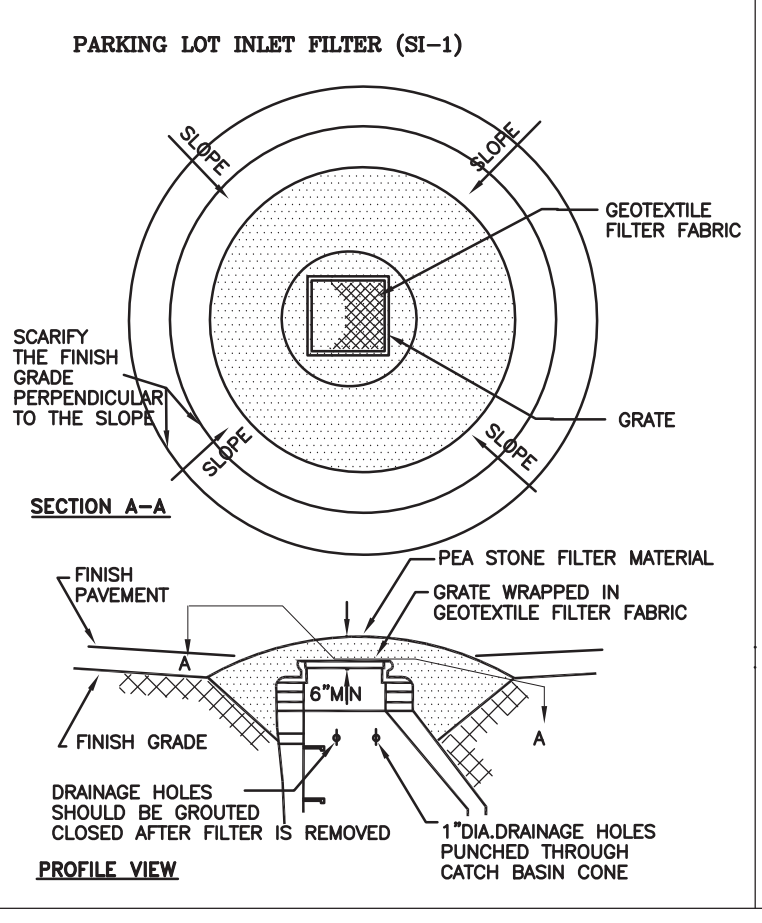
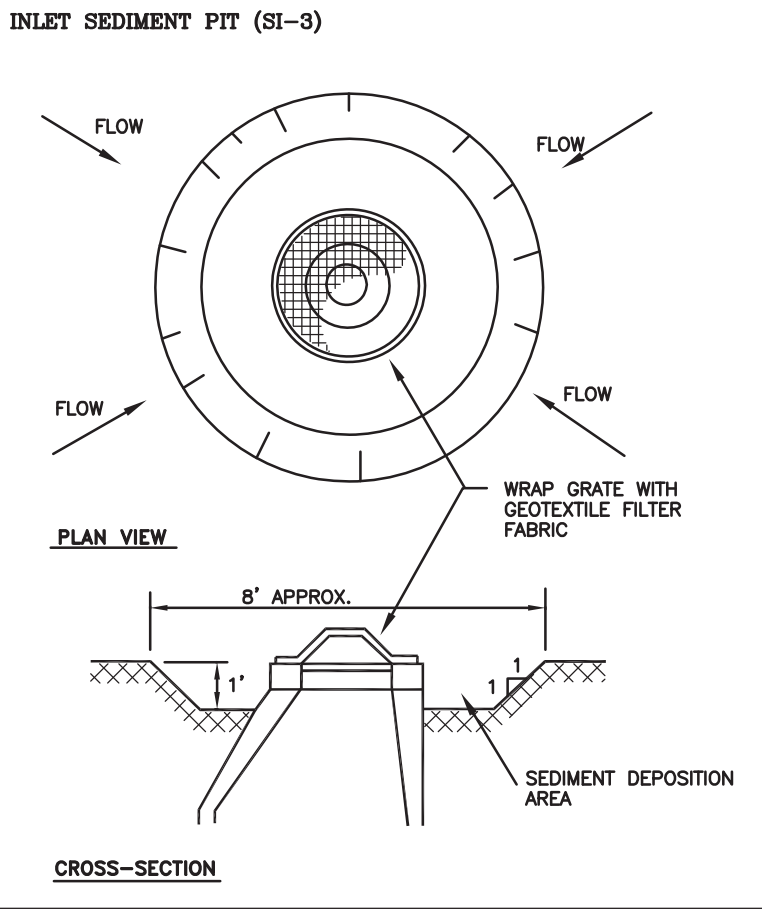
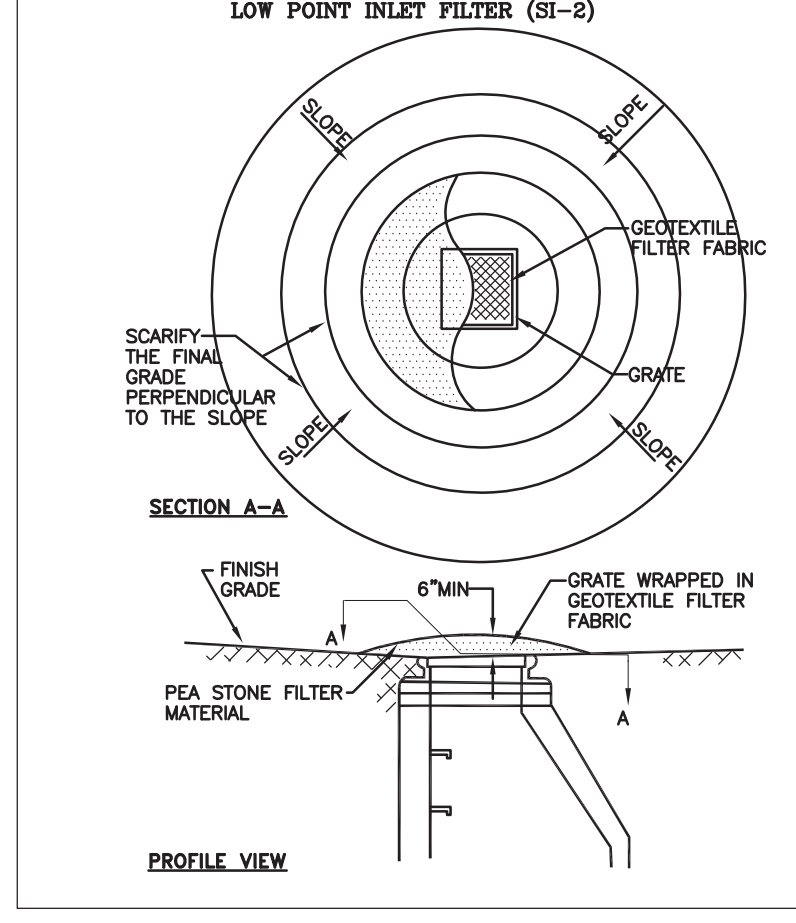
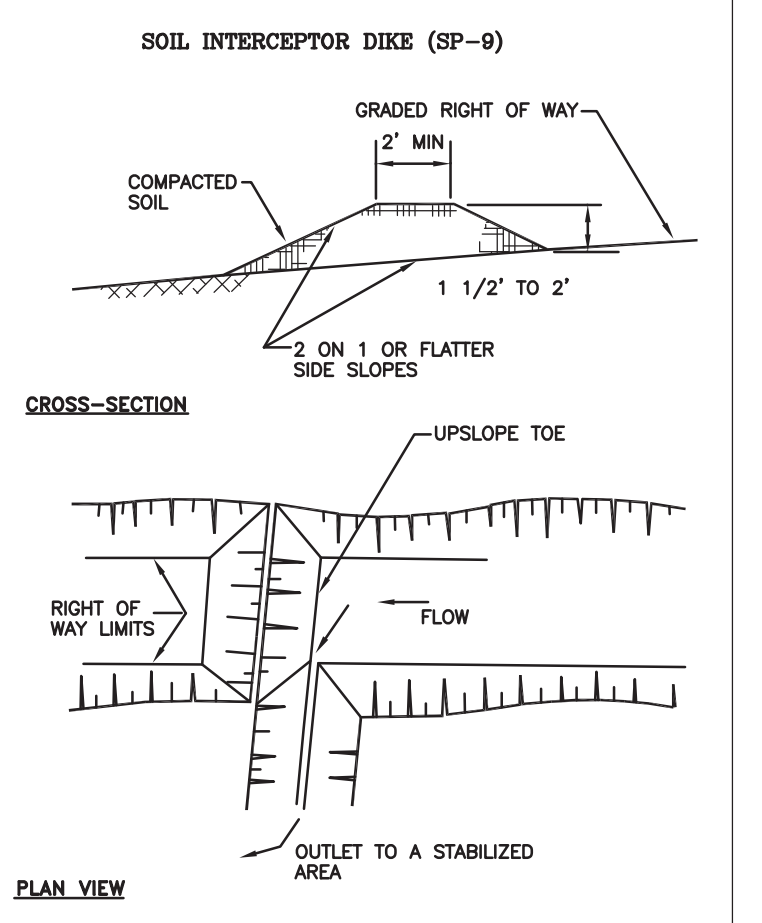
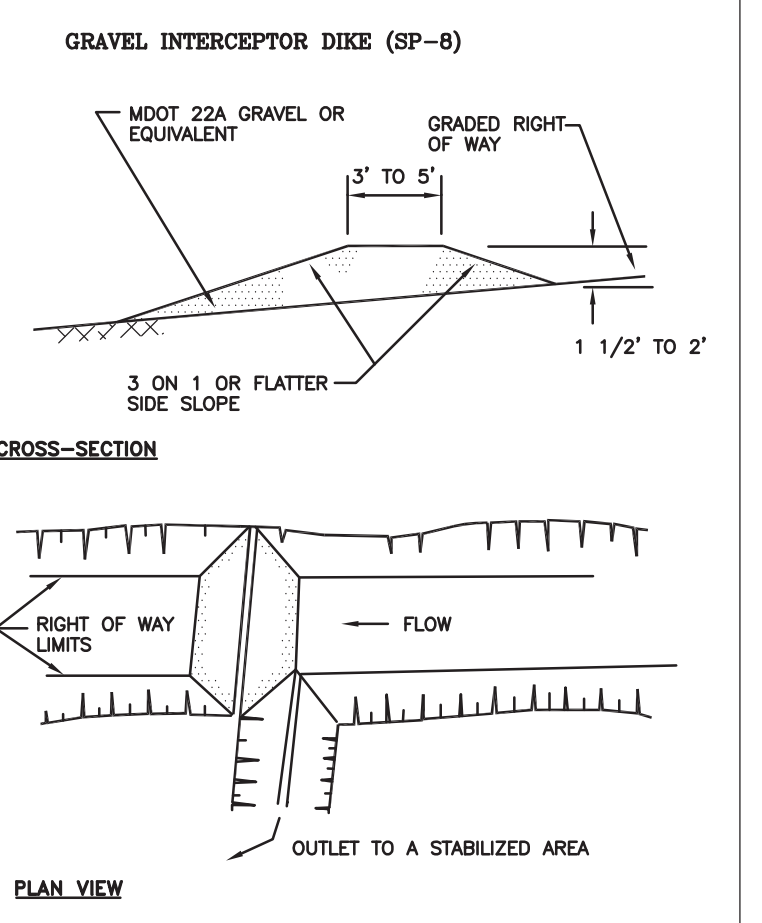
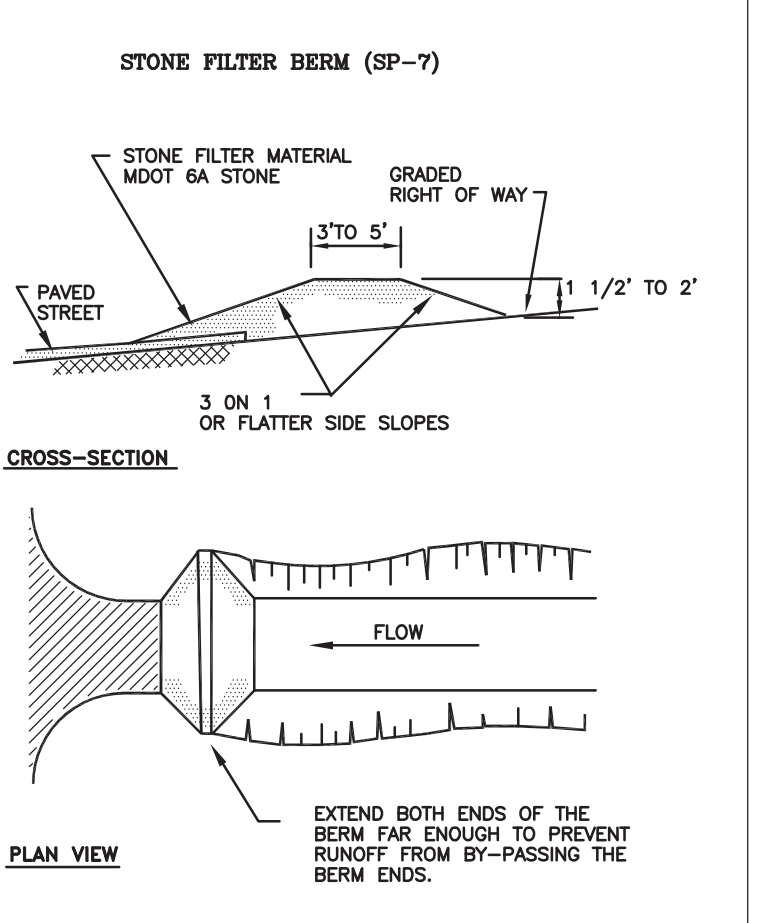
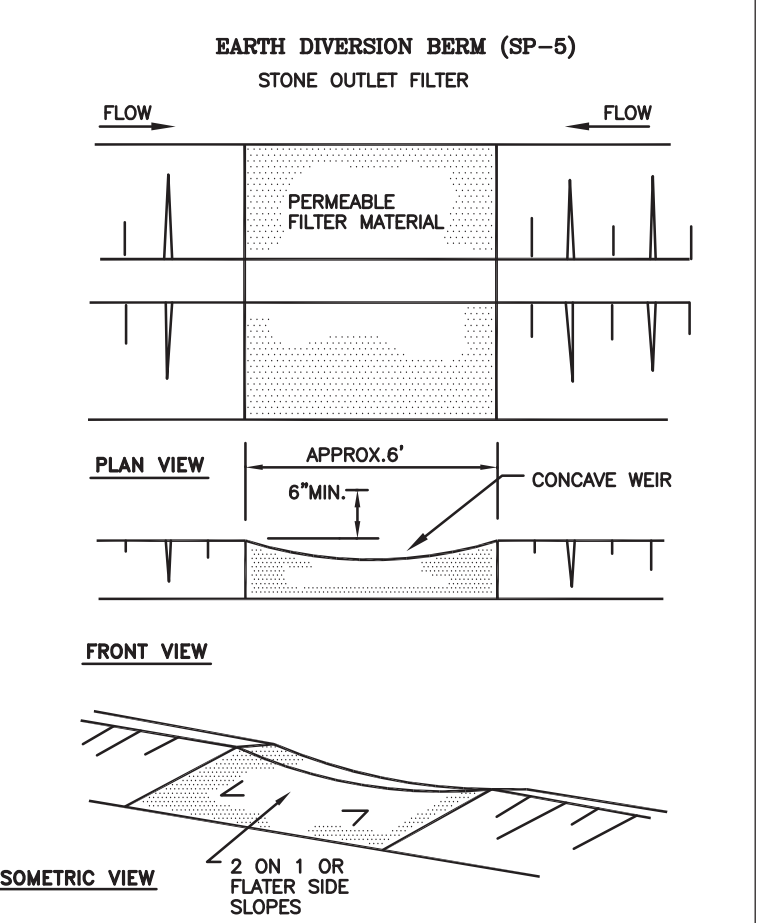
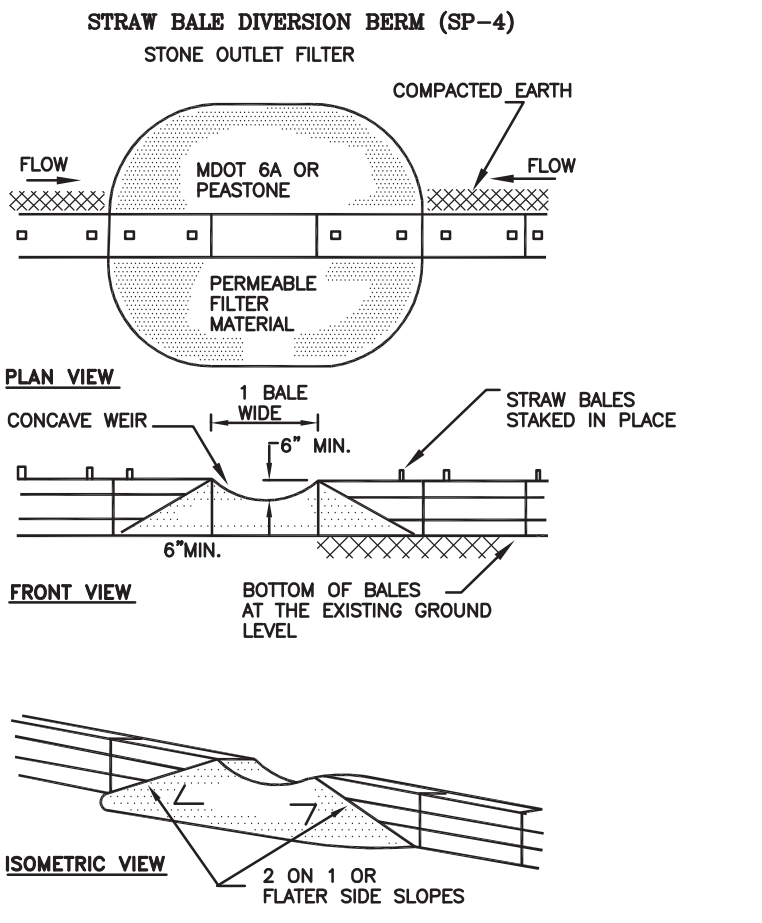
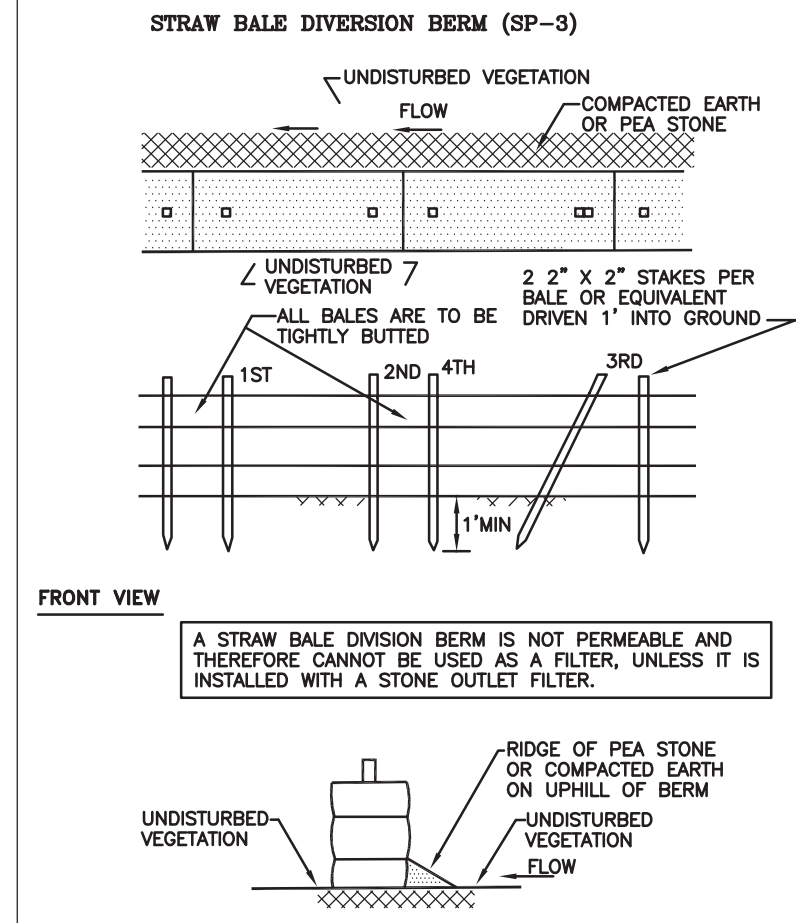
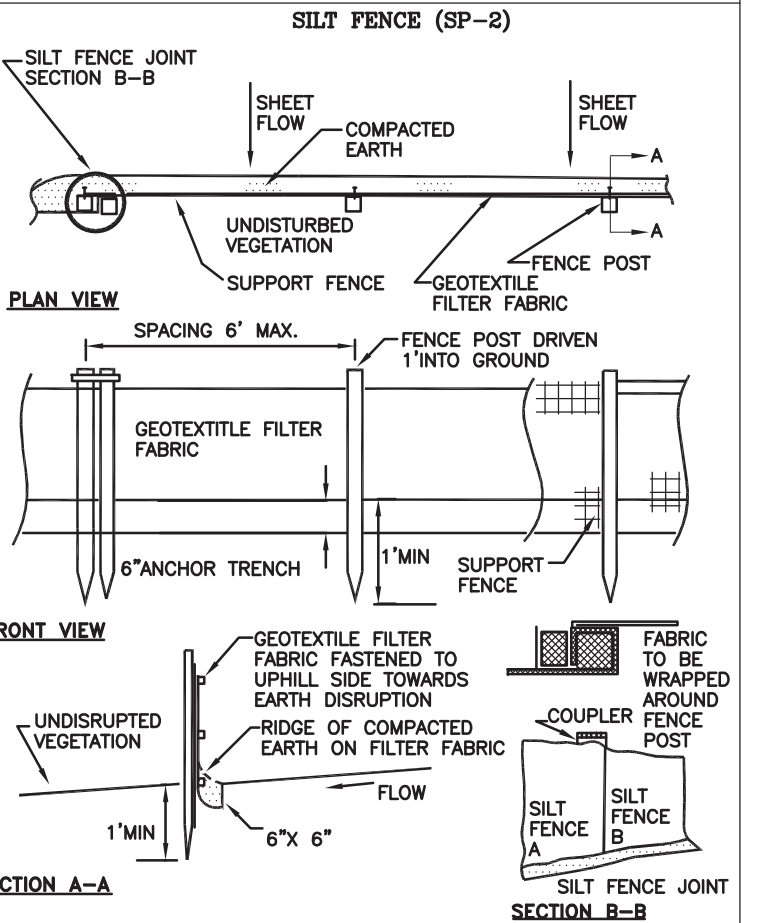
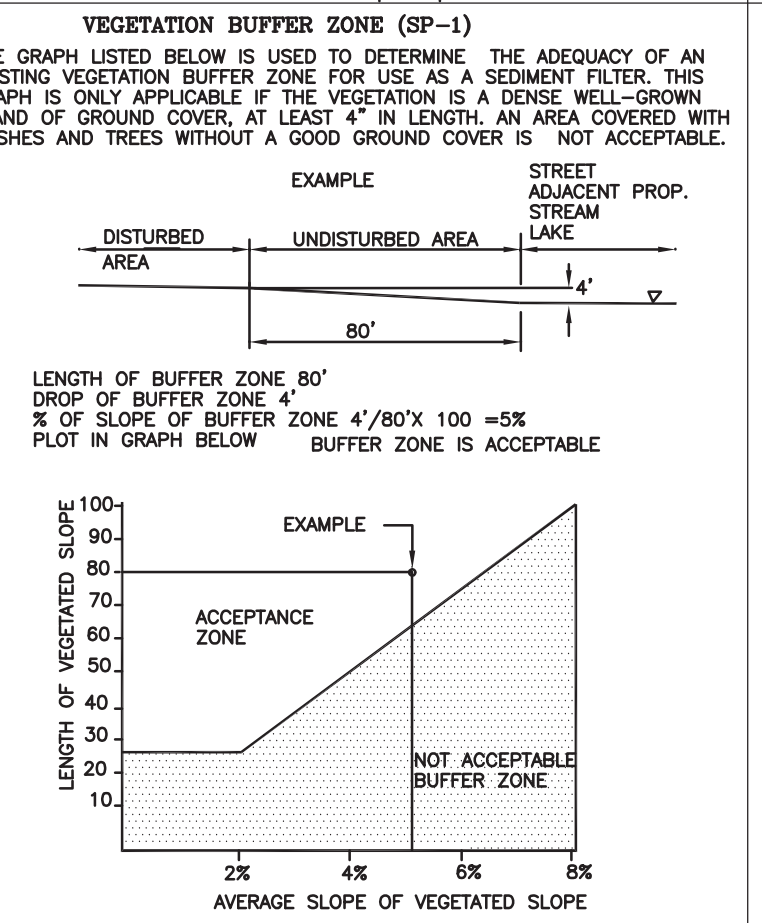
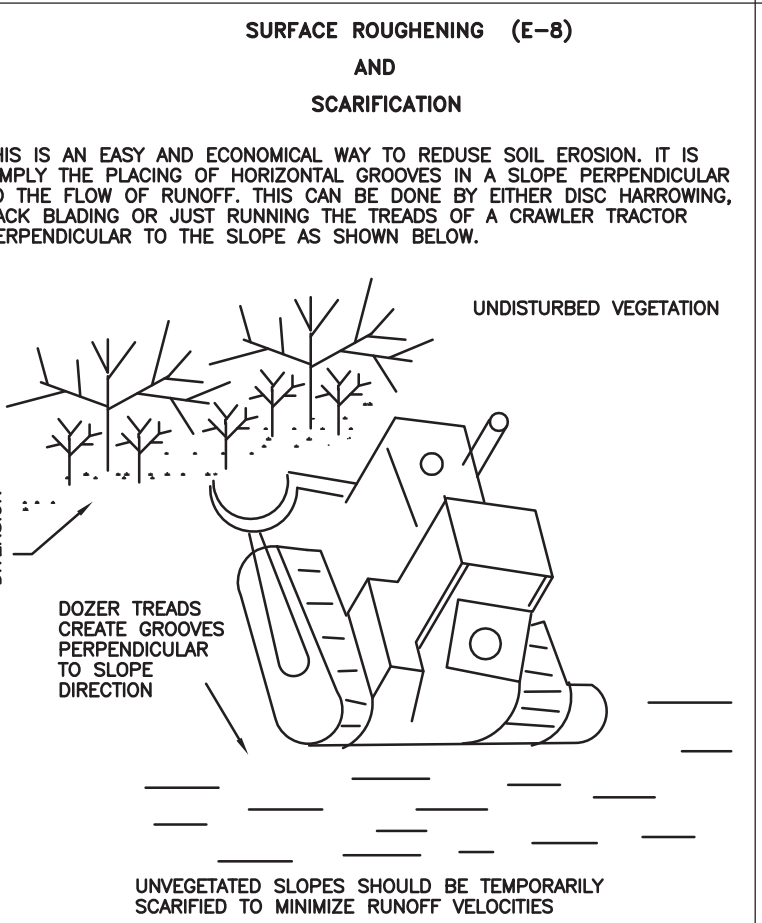
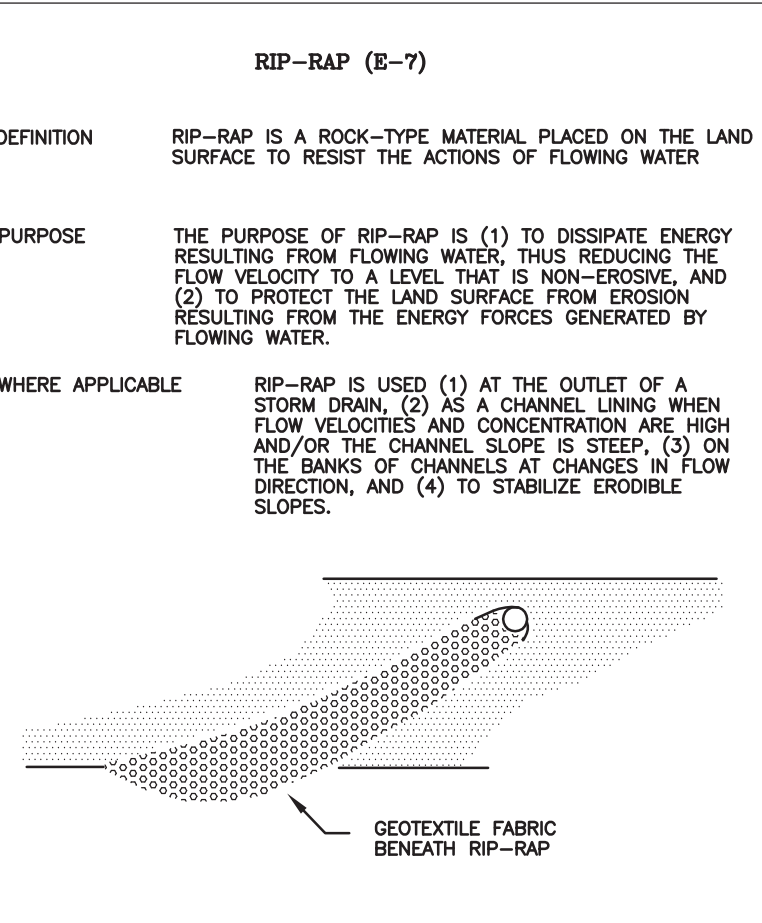
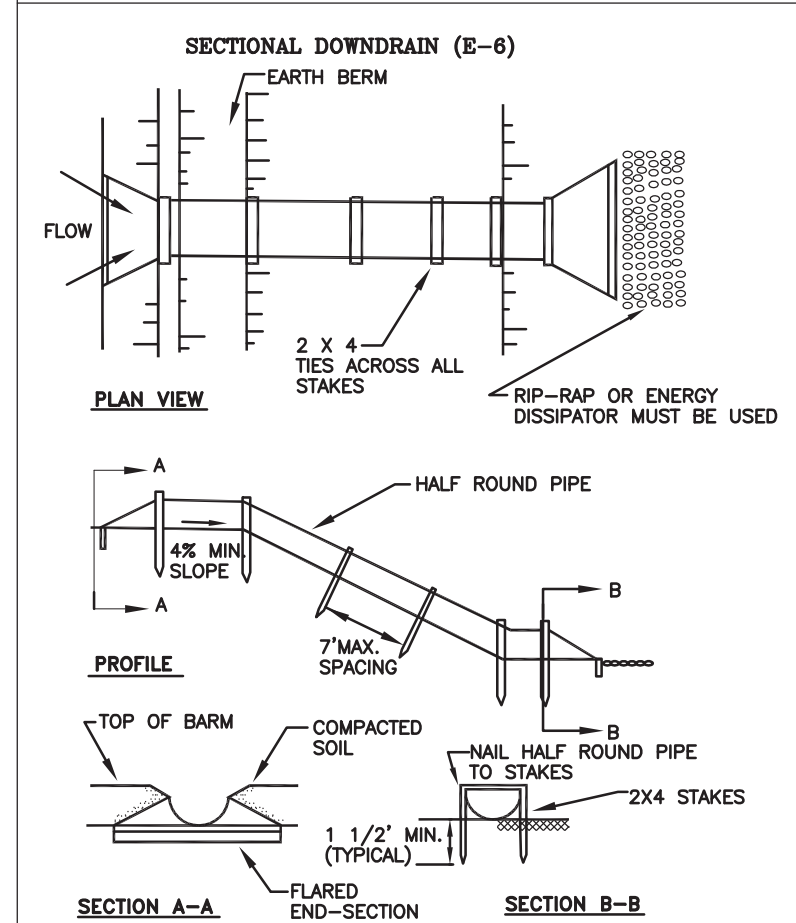
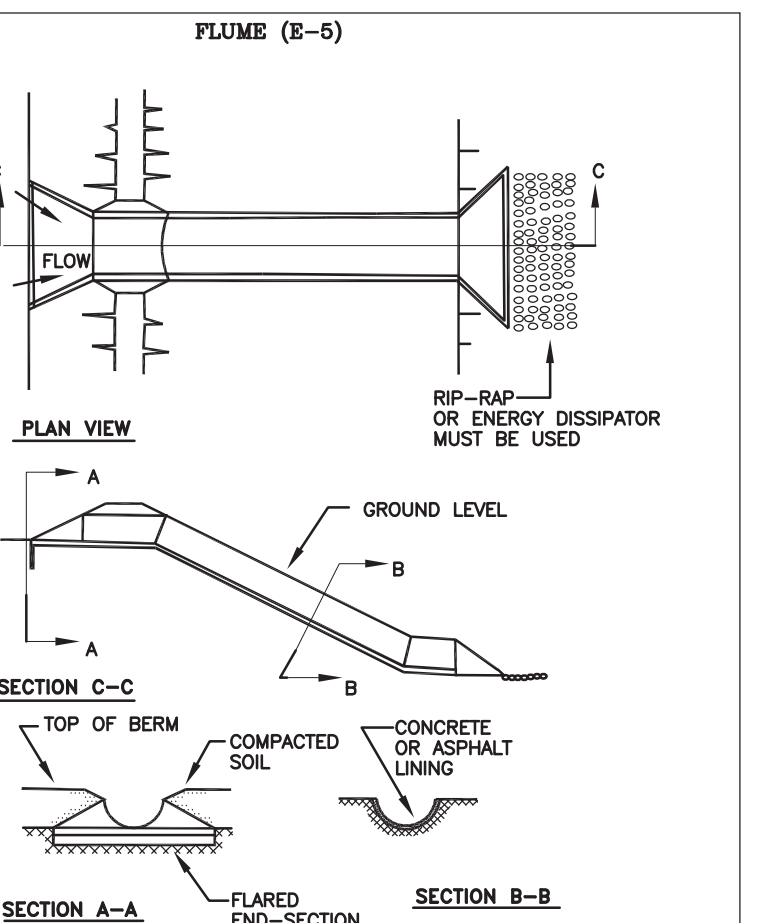
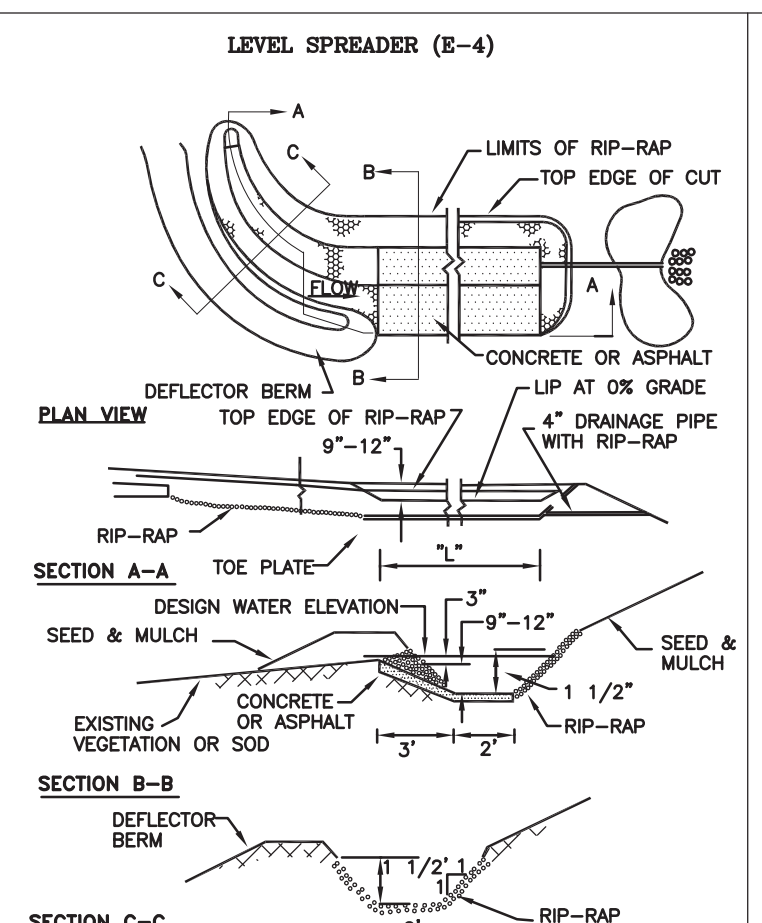
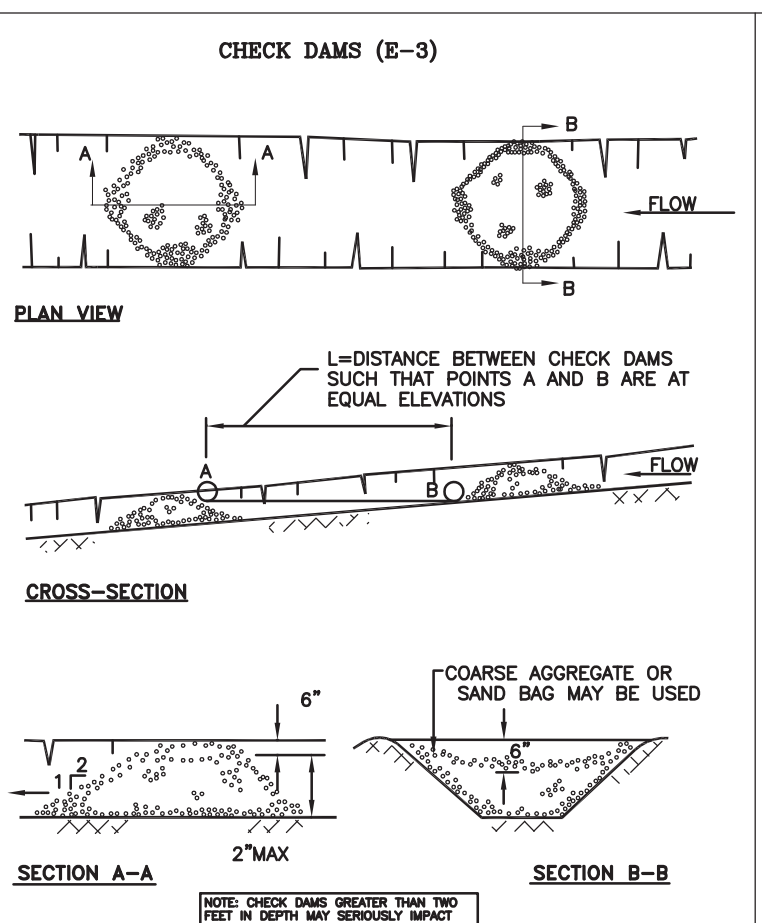
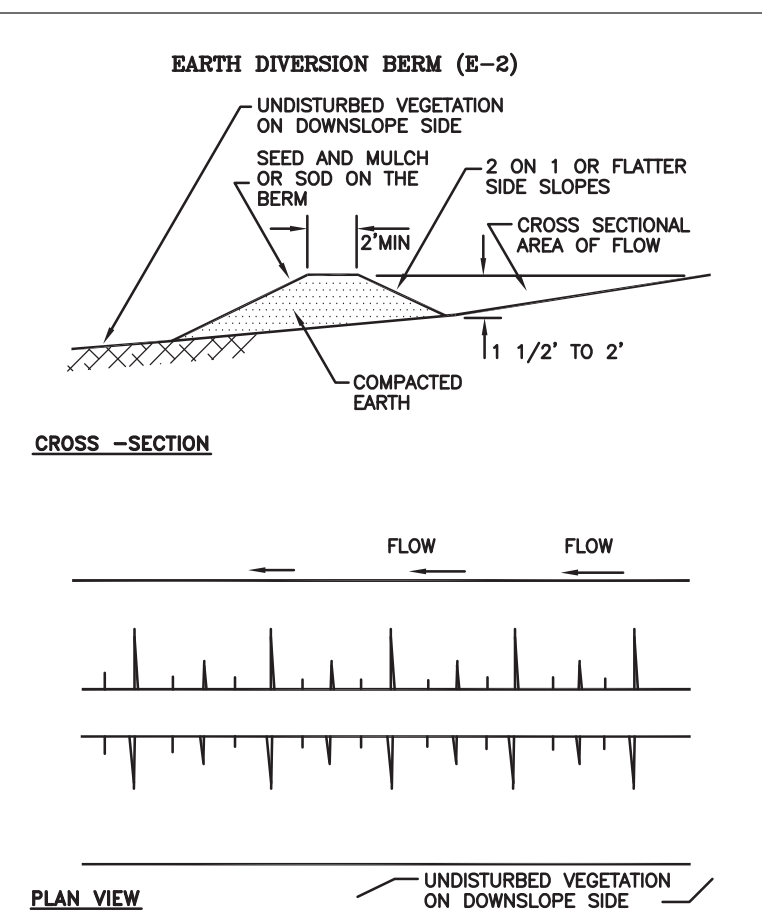
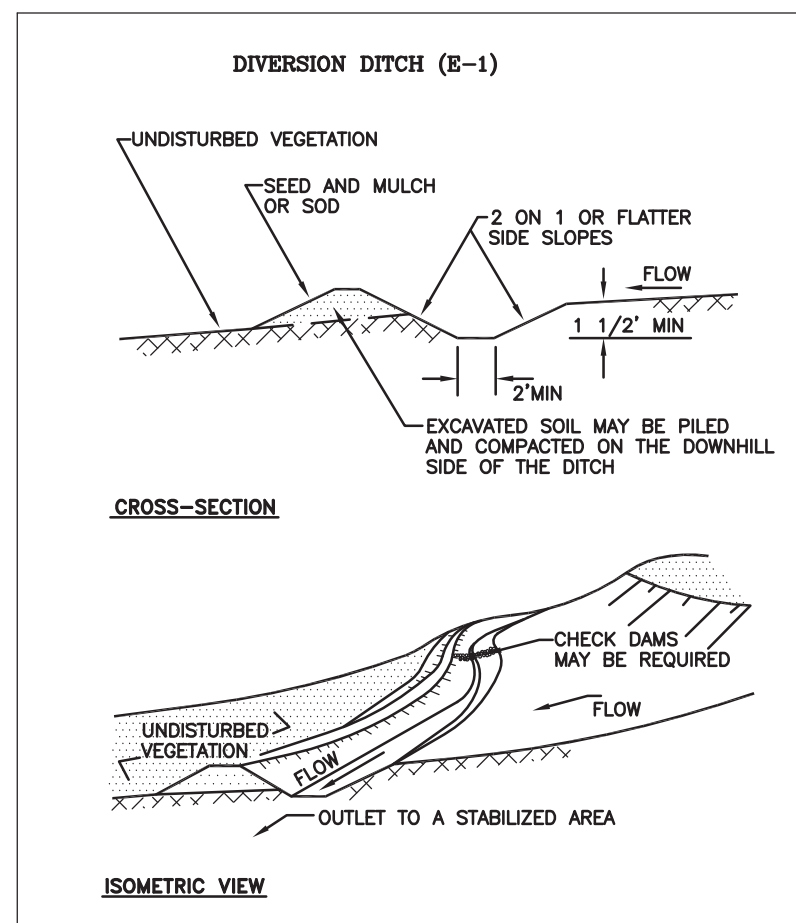
H DIMENSION	
I.D.	42" 48" 54" 60" 66" 72" 78" 84" OVER 84"
H	13" 6 1/2" 6 1/2" 1" 1 3/4" 2 1/2" 4" 6" 7"



RULE 323.1703
SOIL EROSION AND SEDIMENTATION CONTROL PLAN REQUIREMENTS.

A PERSON SHALL PREPARE A SOIL EROSION AND SEDIMENTATION CONTROL PLAN FOR ANY EARTH CHANGE IDENTIFIED IN R 323.1704. A PERSON SHALL DESIGN THE PLAN TO EFFECTIVELY REDUCE ACCELERATED SOIL EROSION AND SEDIMENTATION AND SHALL IDENTIFY FACTORS THAT MAY CONTRIBUTE TO SOIL EROSION OR SEDIMENTATION, OR BOTH. THE PLAN SHALL INCLUDE, BUT NOT BE LIMITED TO, ALL OF THE FOLLOWING:

- (A) A MAP OR MAPS AT A SCALE OF NOT MORE THAN 200 FEET TO THE INCH OR AS OTHERWISE DETERMINED BY THE COUNTY OR LOCAL ENFORCING AGENCY. A MAP SHALL INCLUDE A LEGAL DESCRIPTION AND SITE LOCATION SKETCH THAT INCLUDES THE PROXIMITY OF ANY PROPOSED EARTH CHANGE TO LAKES OR STREAMS, OR BOTH; PREDOMINANT LAND FEATURES; AND CONTOUR INTERVALS OR SLOPE DESCRIPTION.
- (B) A SOILS SURVEY OR A WRITTEN DESCRIPTION OF THE SOIL TYPES OF THE EXPOSED LAND AREA CONTEMPLATED FOR THE EARTH CHANGES.
- (C) DETAILS FOR PROPOSED EARTH CHANGES, INCLUDING ALL OF THE FOLLOWING:
 - (i) A DESCRIPTION AND THE LOCATION OF THE PHYSICAL LIMITS OF EACH PROPOSED EARTH CHANGE.
 - (ii) A DESCRIPTION AND THE LOCATION OF ALL EXISTING AND PROPOSED ON-SITE DRAINAGE AND DEWATERING FACILITIES.
 - (iii) THE TIMING SEQUENCE OF EACH PROPOSED EARTH CHANGE.
 - (iv) THE LOCATION AND DESCRIPTION FOR INSTALLING AND REMOVING ALL PROPOSED TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES.
 - (v) A DESCRIPTION AND THE LOCATION OF ALL PROPOSED PERMANENT SOIL EROSION AND SEDIMENTATION MEASURES.
 - (vi) A PROGRAM PROPOSAL FOR THE CONTINUED MAINTENANCE OF ALL PERMANENT SOIL EROSION AND SEDIMENTATION CONTROL MEASURES THAT REMAIN AFTER PROJECT COMPLETION, INCLUDING THE DESIGNATION OF THE PERSON RESPONSIBLE FOR THE MAINTENANCE. MAINTENANCE RESPONSIBILITIES SHALL BECOME A PART OF ANY SALES OR EXCHANGE AGREEMENT FOR THE LAND ON WHICH THE PERMANENT SOIL EROSION CONTROL MEASURES ARE LOCATED.



REVISIONS:	ISSUE NO.	BID DATE
	B.G. DRN.	DATE
	TOPO DRN.	DESIGN
	PROFILE DRN.	ENG. DRN.
	APPROVED	SCALE
	V:	
	H: NTS	

YPSILANTI TOWNSHIP
TOWNSHIP STANDARD
SOIL EROSION CONTROL DETAILS

ORCHARD, HILTZ & McCLIMENT, INC.

34000 Plymouth Road
Livonia, MI 48150
(734) 522-6711
(734) 522-6427 FAX

CLIENT: YPSILANTI TOWNSHIP

STONEFIELD

June 11, 2024

Ypsilanti Township Office of Community Standards
Tilden R. Stumbo Civic Center
7200 S. Huron River Drive
Ypsilanti, MI 48197

**RE: Preliminary Site Plan Review
Proposed Car Wash Development
Parcel ID: K-11-06-304-004
2675 Washtenaw Road
Charter Township of Ypsilanti, Washtenaw County, Michigan**

To whom it may concern:

Our office is submitting documents on behalf of the Applicant to address the comments contained within the latest Planning Review Letter. Please find the following items enclosed:

ITEM DESCRIPTION	DATED	PREPARED BY
Site Development Plans	6-11-2024	Stonefield Engineering & Design
Preliminary Geotechnical Report	05-23-2024	G2 Consulting
N-12 HDPE Specifications	N/A	ADS

The following is an itemized response to the comments contained within the Planning Review Letter dated May 15, 2024:

Special Land Use

1. Applicant to provide proposed hours of operation.

Stonefield Response: WhiteWater Car Wash hours of operation are from 7:30 AM – 8:00 PM daily. This has been included within the Project Narrative on the Cover Sheet.

2. Applicant to describe if vacuum stations are available when the car wash building is closed for the night.

Stonefield Response: Vacuum stations are only open during the hours of operation from 7:30 AM – 8:00 PM daily. The vacuums are off outside of operating hours. This has been included within the Project Narrative on the Cover Sheet.

3. Applicant to respond to linear lighting concerns expressed in this review.

Stonefield Response: The proposed lighting is in compliance with the lighting ordinance requirements. The eastern most row of vacuums does not have vacuum lights to ensure there is zero light spillover at the property lines. The higher light levels at the internal vacuum areas provide great value and safety to customers, giving adequate lighting while vacuuming after dark. This area of the site is densely screened from the south by existing and proposed vegetation. All site lighting

STONEFIELDENG.COM

607 SHELBY STREET, SUITE 200, DETROIT, MI 48226 248.247.1115 T. 201.340.4472 F.

including the vacuum lighting will be turned off within one hour of closing (lights off by 9:00 PM). A note has been added to the lighting plan indicating this.

Change in Site Type

1. Provide correspondence from the Road Commission for vacating Boston Ave.

Stonefield Response: The Road Commission has determined that they can no longer abandon Boston Avenue as it would land lock multiple parcels. Boston Avenue is to remain a County Road. Plans have been submitted to County Road Commission for review.

Natural Features

1. Applicant to confirm that the existing shown on the aerial photograph do not meet the minimum size to be classified as a “protected” tree by the ordinance.

Stonefield Response: Surveyor is completing additional work to have all protected trees (if any) identified on the survey. If protected trees are identified, they will remain and be protected. Revised survey to be included with next submission.

Area, Width, Height, Setbacks (Bulk Requirements)

1. Amend plans to locate front façade of building on the 10-foot “build-to” line along Washtenaw Ave.

Stonefield Response: Site plan has been revised and shifted 15 FT south so that the building columns are located on the 10 FT build to line and the future right of way is considered. The 10 FT build to line is setback from the future right of way line.

Parking and Loading

1. Increase stacking lane width to 12-feet, or obtain a variance.

Stonefield Response: Stacking lanes have been increased in width to 12 FT wide minimum.

2. Add one more 20-foot long stacking space to plans, or obtain a variance.

Stonefield Response: Stacking spaces have been revised to ensure 20 FT length is provided per space. A total of 16 stacking spaces are provided.

3. Add one (1) 10' x 25' loading space to the plans.

Stonefield Response: The second overhead door at the wash exit is utilized for loading. A 10 FT x 25 FT space has been identified at this location on the site plan.

4. Applicant to describe the type and size of delivery truck that will deliver supplies to the site.

Stonefield Response: Deliveries to the site occur via small box trucks or Amazon vans. See Truck Turning Analysis on Sheet C-13.

Site Access, Circulation, Traffic

1. Recommend Planning Commission condition any approval on the applicant establishing a shared driveway easement and maintenance agreement for vacated Boston Ave.

Stonefield Response: Access easement will not be required as Boston Avenue is no longer being vacated.

2. Defer site driveway locations to Township Engineer.

Stonefield Response: Noted. Boston Avenue is to remain a County Road. Will defer to comments from the Road Commission regarding driveway locations.

3. Shift location of safety path one-foot to the south, and add landscaped area between Washtenaw Ave. curb and safety path.

Stonefield Response: Safety path has been located 1 FT from future right of way line per MDOT standards.

4. Add sidewalk connection from development to the safety path along the Washtenaw Ave. right- of-way.

Stonefield Response: Per discussions with the Township, a secondary pedestrian access has been provided on Washtenaw with a proposed stairway.

Screen and Landscaping

1. Add one (1) more “general landscaping” tree to plans.

Stonefield Response: One (1) more general landscaping tree has been added to the Landscaping Plan. See Sheet C-9.

2. Add eight (8) more shrubs to plans along Boston Ave. frontage.

Stonefield Response: Eight (8) more shrubs have been added along Boston Avenue to the Landscaping Plan. See Sheet C-9.

3. Planning Commission to consider proposed modification of screening between land uses.

Stonefield Response: Noted.

4. Increase size of Hydrangea and Winterberry to 24” minimum; increase size of Viburnum, Holly, and Inkberry to 36” minimum.

Stonefield Response: Minimum planting sizes have been increased on the Plant Schedule. See Sheet C-9.

Lighting

1. Applicant to respond to suggestions that reduce the lighting levels at the vacuum stations to be more consistent with the other areas of the site.

Stonefield Response: The proposed lighting is in compliance with the lighting ordinance requirements. The eastern most row of vacuums does not have vacuum lights to ensure there is zero light spillover at the property lines. The higher light levels at the internal vacuum areas provide great value and safety to customers, giving adequate lighting while vacuuming after dark. This area of the site is densely screened from the south by existing and proposed vegetation. All site lighting including the vacuum lighting will be turned off within one hour of closing (lights off by 9:00 PM). A note has been added to the lighting plan indicating this.

2. Provide hours of operation.

Stonefield Response: WhiteWater Car Wash hours of operation are from 7:30 AM – 8:00 PM daily. This has been included within the Project Narrative on the Cover Sheet.

3. Applicant to indicate if they intend to turn off linear lights after closing for the day.

Stonefield Response: All site lighting, including linear lights, will be turned off when employees leave the site, within an hour of closing (lights off by 9:00 PM). Note has been added to Lighting Plan.

Elevations and Floor Plans

1. Provide color building renderings.

Stonefield Response: Colored Building Rendering has been added as an additional sheet to the Site Development Plans.

2. Applicant to confirm that concrete sill will divide different color brick.

Stonefield Response: Yes, on the elevation the different colors are indicated. The bottom section is Sienna Cream and the upper section is Winter A.

3. Suggest raising sill further from the ground where it is currently proposed at 1.5-feet from the ground.

Stonefield Response: The sill on the east and west elevations have been raised to match that of the rear section.

4. Add window in section of west elevation between overhead and pedestrian doors.

Stonefield Response: Window has been added to the West Elevation.

5. Add windows on east elevation within 100 feet of front elevation.

Stonefield Response: False windows have been added to the East elevation within 100 FT of the front elevation.

6. Add more glazing to Washtenaw Ave. façade or applicant seeks a variance.

Stonefield Response: Glazing on Washtenaw Avenue has been revised per the proposed grade change across the building. Per discussions with the Township, glazing calculations exclude all building façade below grade.

The following is an itemized response to the comments contained within the Engineering Review Letter dated May 13, 2024:

B. Site Plan Comments

Utilities

1. There appears to be a discrepancy between the existing conditions and the YCUA GIS. This office defers to YCUA on the coordination and review of all water and sewer improvements. The applicant shall utilize existing services where feasible and note that unused services will need to be properly abandoned at the man.

Stonefield Response: Noted, will defer to YCUA review comments.

2. The applicant shall provide the location of the nearest fire hydrant, as well as a 250-foot hose radius, to verify sufficient hydrant coverage is provided. This office defers to the Ypsilanti Township Fire Department on the review and approval of hydrant coverage.

Stonefield Response: The nearest fire hydrant has been identified on the Utility Plan. 6 FT of the building lies outside of the 250 radius so an additional hydrant has been proposed. The proposed hydrant and 250 FT radius are shown on the Utility Plan. After the vacation of Boston Avenue, easements will be drafted for the proposed hydrant and all existing public utilities.

3. The applicant shall provide an oil/water separator and an applicable standard detail on the plans.

Stonefield Response: The oil / water separator is housed inside of the building. A series of 3 tanks are proposed providing oil /water separation and treatment per state standards prior to discharging into the sanitary sewer. Reclamation tank plumbing plan from a recent WhiteWater development have been added to the Site Development Plans as an additional sheet. Site specific plumbing plans will be provided prior to Building Permit review.

Stormwater Management

4. The applicant shall address the following regarding the Stormwater Calculations (Sheet C-17) and review and revise all calculations as needed:
 - a. Provide the pre-development (woods or meadow) curve number, according to the WCWRC, for Worksheet 3.

Stonefield Response: Wooded area has been added to the pre and post development land cover summaries.

- b. Verify the Peak of the Unit Hydrograph value in Worksheet 10, as there appears to be a discrepancy.

Stonefield Response: Equation was referencing the incorrect time of concentration, this has been corrected. See revised calculations on Sheet C-18.

- c. Verify the Total Required Detention Volume in Worksheet 13.

Stonefield Response: Equations have been reviewed and corrected. See revised calculations on Sheet C-18.

- d. Verify the sheet number reference for the Proposed Underground Detention Basin volumes.

Stonefield Response: The Stage Storage Table has been added to Sheet C-17. The reference within the Calculations has been updated.

5. The applicant shall clarify if a wetland delineation has been performed as it appears majority of the site may be wetlands, according to the Washtenaw County GIS; however, it is anticipated that less of the site is wetlands. The applicant shall provide the wetland boundaries on the plans for reference.

Stonefield Response: The National Wetlands Mapper and EGLE Wetlands mapper do not show any wetlands on / near the site. The Washtenaw County GIS shows the entire site as wetlands. As the site is developed this is assumed inaccurate. A request has been made to EGLE to confirm the presence of any wetlands on site.

6. The applicant shall clarify if soil borings or infiltration testing has been performed. If so, their logs and locations shall be provided, and a copy of the testing report shall be provided to this office.

Stonefield Response: Please see attached Preliminary Geotechnical Report. The investigation found 5 – 10 feet of topsoil on site, resulting in infiltration not being feasible per County standards.

7. The applicant shall review and revise the slope between the proposed outlet structure and the existing manhole as it appears to be too steep.

Stonefield Response: The proposed slope of 8.16% ensures adequate cover is maintained over the pipe run and the proposed pipe does not daylight. The invert into the existing manhole is set to provide the minimum 3.5 FT of cover. Please advise on what the permitted maximum slope is for a 12” pipe.

8. It is recommended that the applicant relocate the proposed tree near the northwest corner of the car wash for ease of potential future maintenance with the nearby storm sewer.

Stonefield Response: The proposed tree near the northwest corner of the car wash has been relocated away from the nearby storm sewer. See Sheet C-9.

Paving/Grading

9. The applicant shall relocate the proposed internal sidewalk connection, from the entrance drive to the car wash, to the south to avoid potential conflict with the stacking lanes.

Stonefield Response: The internal sidewalk location has not been revised as it is routed to the Car Wash's main office. Additionally, shifting the sidewalk further south would cross areas of steep slopes on site and still result in the sidewalk crossing car wash traffic. Proper striping has been provided delineating the pedestrian pathway and a second pedestrian access has been provided on Washtenaw Avenue.

10. The applicant shall provide a receiving ramp on the west side of the proposed entrance drive, per ADA Standards. The applicant shall note that ADA Standards also require a 5'x5' level landing at any change in direction along the proposed sidewalk. It appears that the proposed sidewalk on the east side of the entrance drive does not meet this requirement.

Stonefield Response: The proposed site plan considers the future right of way. The location of a ramp on the west side of the existing access drive would currently lie within private property. Applicant is to discuss with the adjacent landowner to obtain permission to construct the receiving ramp.

11. The applicant shall provide additional firetruck turning movements throughout the proposed parking and vacuum space area. This office defers to the Ypsilanti Township Fire Department on the review and approval of site accessibility.

Stonefield Response: Additional Truck Turning Analysis has been added to the plan set. See Sheet C-12.

12. The applicant shall provide a turning template for the proposed emergency bypass lane to ensure sufficient space for maneuverability has been provided.

Stonefield Response: Additional Truck Turning Analysis has been added to the plan set. See Sheet C-13.

13. The applicant shall provide the location of the loading space, referenced in the Off-Street Parking Requirements table, as well as a turning template, on the plans.

Stonefield Response: The second overhead door at the wash exit is utilized for loading. A 10 FT x 25 FT space has been identified at this location on the Site Plan. Additional Truck Turning Analysis has been added to the plan set for a delivery truck. See Sheet C-13.

C. Preliminary Detailed Engineering Comments

The following comments shall be addressed by the applicant during the detailed engineering drawing submittal, and do not affect the recommendation for approval to the Township of Ypsilanti Planning Commission. It should be noted that this is not an all-inclusive list and additional comments may be generated as new information is presented.

1. The applicant shall provide spot elevations at all four (4) corners of all barrier-free parking spaces, access aisles, ramps, and level landings, as well as along both sides of all proposed sidewalk at 50-foot intervals. The applicant shall note that the cross-slope shall not exceed 2%, per ADA Standards.

Stonefield Response: A smaller scale, more detailed grading plan will be provided during the detailed engineering drawing submittal.

2. The applicant shall provide structural calculations for all proposed retaining/knee walls that exceed two (2) feet in height, per Township Standards.

Stonefield Response: Structural calculations for the proposed retaining wall to be provided during the detailed engineering drawing submittal.

3. The applicant shall provide a stormwater narrative on the plans clarifying how the proposed stormwater runoff will be managed.

Stonefield Response: Stormwater Narrative to be provided during the detailed engineering drawing submittal.

4. The applicant shall provide a Certificate of Outlet, signed and sealed by a registered engineer in the State of Michigan.

Stonefield Response: Certificate of Outlet to be provided during the detailed engineering drawing submittal.

5. The applicant shall label the existing Ypsilanti Township #02 County Drain and its easement limits (if applicable) on the plans.

Stonefield Response: The County Drain has been labeled. There is no existing easement over the drain. Will defer to WCWRC if an easement is required.

6. The applicant shall provide the C-factors for the proposed drainage areas (Sheet C-6).

Stonefield Response: C-factors have been added to the drainage areas on Sheet C-6.

7. The applicant shall provide a maintenance schedule for all proposed permanent soil erosion and stormwater management activities. The schedule shall include the frequency of activities as well as the party responsible.

Stonefield Response: Maintenance schedule to be provided during the detailed engineering drawing submittal.

8. The applicant shall label the proposed storm sewer structures within the profiles (Sheet C-16) for

Stonefield Response: Storm Structure labels have been added to the Stormwater Profiles. See Sheet C-17.

9. It is recommended that the applicant use RCP for the proposed storm sewer under the influence of the pavement. At a minimum, the applicant shall provide the manufacturer's specification for use of the proposed N-12 HDPE under the influence of the pavement on the plans.

Stonefield Response: Adequate cover is provided for all storm pipes. Please see attached N-12 HDPE specifications for your consideration.

10. The applicant shall clarify the size of all existing utilities (water, sanitary, storm).

Stonefield Response: The survey is currently being revised to include all existing utility sizes. Revised survey to be included with next resubmission.

11. The applicant shall revise the Invert Table on Sheets C-4, C-5, and C-7 to make it more legible.

Stonefield Response: The Invert Table has been made more legible on all sheets.

12. The applicant shall note that the proposed water service shall be type K copper, per Township Standards.

Stonefield Response: Proposed 2" water lead has been identified as type 'K' copper. The proposed 6" fire lead has been identified as ductile iron.

13. The applicant shall provide a quantity list for all proposed utilities (water, sanitary, storm) on the Cover Sheet, delineated by existing or proposed road right-of-way or easement, per Township Standards.

Stonefield Response: Quantities to be provided during the detailed engineering drawing submittal.

14. The applicant shall provide the applicable Ypsilanti Township Standard Detail Sheets and the Ypsilanti Township SESC Standard Detail Sheet within the plan set. These can be obtained by emailing stacie.monte@ohm-advisors.com.

Stonefield Response: Ypsilanti Township Standard Details have been included as additional sheets to the Site Development Plans.

D. Required Permits & Approvals

The following outside agency reviews and permits will be required for the project. Copies of any correspondence between the applicant and the review agencies, as well as the permit or waiver, shall be sent to both the Township and OHM Advisors (email: stacie.monte@ohm-advisors.com).

- Ypsilanti Community Utilities Authority (YCUA): Review and approval of all water main and sanitary sewer improvements is required.

Stonefield Response: Noted. Comments within YCUA Review Letter have been addressed.

- Ypsilanti Township Fire Department: Review and approval is required.

Stonefield Response: Noted. Comments within Fire Department Review Letter have been addressed.

- Washtenaw County Water Resources Commissioner's Office (WCWRC): Review and approval is required. A drain-use permit will be required for the proposed outlet to the County Drain.

Stonefield Response: Noted. Plans were submitted to MCWRC on 4/29. Review Letter has not yet been received.

- Michigan Department of Transportation (MDOT): Review, approval, and permitting is required for all proposed work within the Washtenaw Avenue ROW. MDOT is currently doing a PEL Study along Washtenaw Avenue, and the "Future ROW" may or may not be needed by MDOT. The building shall be proposed with a layout that is consistent with what MDOT determines is needed with future ROW improvements. Additional improvements as a result of the Study may be required along the frontage.

Stonefield Response: MDOT has reviewed the plans with their only comments being to add notes to the plans and to remove the detectable warning from the curb ramp. Plans have been resubmitted to MDOT 6/11/24. Final approval will be provided upon receipt. MDOT confirmed the PEL study is not yet finalized, and they will not require right of way dedication at this time. Per direction from the Township, the future right of way line has been shown on the plans and the site has been shifted south to accommodate this.

- Michigan Department of Environment, Great Lakes & Energy (EGLE): An EGLE Act 399 and Part 41 permit will be required for construction of all public water main and sanitary sewer systems improvements.

Stonefield Response: Noted. EGLE permit to be coordinated with YCUA.

- Michigan Department of Environment, Great Lakes & Energy (EGLE): An EGLE permit will be required for any work and/or stormwater discharge into the wetlands.

Stonefield Response: Request has been made to EGLE to confirm the presence of any wetlands on site. If identified, wetlands boundary will be added to the plans.

- Ypsilanti Township Office of Community Standards: A Soil Erosion and Sedimentation Control permit shall be secured from the Ypsilanti Township Office of Community Standards.

Stonefield Response: Noted. Plans and application have been submitted to the Township 6/11/24 for Soil Erosion review and approval.

The following is an itemized response to the comments contained within the Fire Department Review Letter dated May 22, 2024. For the sake of brevity, any comments that are statements of fact or have been previously addressed are not included in the response below:

Site Coverage – Hydrants

- The entire structure must fall within a 250 radius of a hydrant or multiple hydrants.

Stonefield Response: The nearest fire hydrant has been identified on the Utility Plan. 6 FT of the building lies outside of the 250 radius so an additional hydrant has been proposed. The proposed hydrant and 250 FT radius are shown on the Utility Plan. After the vacation of Boston Avenue, easements will be drafted for the proposed hydrant and all existing public utilities.

Site Coverage - Access

- IFC 2018 Provides specifications for Fire department turnarounds past 150' of dead-end access. A turnaround solution must be provided for the southern entrance on Boston Ave.

Stonefield Response: An additional Truck Turning Analysis has been provided for this scenario. See Sheet C-12 of the Site Development Plans.

The following is an itemized response to the comments contained within the YCUA Review Letter dated May 14, 2024. For the sake of brevity, any comments that are statements of fact or have been previously addressed are not included in the response below:

Comments

- I. YCUA records indicate both the domestic water service and sanitary lateral were connected to water main and sanitary sewer, respectively, within the Boston Avenue right-of-way. The water service is believed to be 1½" diameter copper and the sanitary lateral is believed to be 6" diameter vitrified clay pipe.

Stonefield Response: Note has been added to the utility plan for the contractor to identify the location of the existing 6" sanitary lead prior to construction. The existing 6" clay lead is to be replaced with 6" pvc. The existing 1.5" water lead is to be abandoned. The car wash requires a minimum 2" water lead. A new water tap is proposed.

Should you have any questions regarding the submission items or responses above please do not hesitate to contact our office.

Regards,



J. Reid Cooksey, PE, LEED, AP BD+C
Stonefield Engineering and Design, LLC



Erin McMachen
Stonefield Engineering and Design, LLC

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Report on Preliminary
Geotechnical Investigation and Infiltration Evaluation

**Ypsilanti Township Car Wash
2675 Washtenaw Avenue
Charter Township of Ypsilanti, Michigan
48197**

Latitude 42.248382° N
Longitude 83.653650° W

Prepared for:

Stonefield
607 Shelby Street, Suite 200
Detroit, Michigan 48226

G2 Project No. 240207
May 23, 2024



CONSULTING
GROUP

May 27, 2024

Ms. Erin McMachen
Stonefield
607 Shelby Street, Suite 200
Detroit, Michigan 48226

Re: Report on Preliminary Geotechnical Investigation and Infiltration Evaluation
Ypsilanti Township Car Wash
2675 Washtenaw Avenue
Charter Township of Ypsilanti, Washtenaw County, Michigan
G2 Project No. 240207

Dear Ms. McMachen:

We have completed the preliminary geotechnical investigation and infiltration evaluation for the proposed car wash development to be constructed at the above-mentioned address in the Charter Township of Ypsilanti, Michigan. This report presents the results of our observations and analyses, our preliminary recommendations for site development, our infiltration evaluation within the areas of the proposed stormwater management structures, and construction considerations as they relate to the geotechnical conditions for parcel area.

We appreciate the opportunity to be of service to Stonefield and look forward to discussing the recommendations presented. In the meantime, if you have any questions regarding the report or any other matter pertaining to the project, please call us.

Sincerely,

G2 Consulting Group, LLC

Zachery R. Lilly, E.I.T.
Staff Engineer

Amy L. Schneider, P.E.
Associate / Project Manager

ZRL/ALS/ljv

Enclosures

EXECUTIVE SUMMARY

We understand the project includes the demolition of the existing development on the property which consists of a single-story building, putt-putt structures, batting cages, and associated pavements and utilities. Following demolition of the existing development, a new 6,820 square-foot, single-story, slab-on-grade car wash facility, associated pavements, stormwater management systems, and utilities will be constructed in conjunction with this development. At the time of this investigation, access to most of the development (including the entirety of the building) was not available due to the presence of the structures. Therefore, the overall property and potential development issues were evaluated in conjunction with this preliminary investigation and recommendations considered preliminary.

Approximately 3 to 9 inches of bituminous concrete are present at the soil boring locations. Fill soils, consisting of very loose to compact clayey sand and stiff sandy clay with intermixed construction debris, underlie the pavement section and extend to approximate depths ranging from 5-1/2 to 10-1/2 feet at borings B-1A and B-2 and to the explored depth of 10 feet at boring B-3. Native stiff to hard sandy clay and silty clay are present below the fill at borings B-1A and B-2 and extend to an approximate depth of 18-1/2 feet. Native very soft to medium silty clay is present below 18-1/2 feet and extends to the explored depth of 25 feet below existing grade. No measurable groundwater was encountered during or upon completion of drilling operations.

Based on the Stormwater Management Plan prepared by Stonefield (C-5), the proposed building will have a finished floor of approximately 803 to 804 feet. Proposed grades across the site will slope downward to the south, ranging from approximately 804 feet at the north side of the property to 795 feet at the south side of the pavement; therefore, grade cuts of up to 5 feet and fill placement of up to 3 feet will be required to achieve proposed finished grades across the property. However, the full scope of necessary site preparation for the proposed development will not become fully apparent until the demolition of the existing building is completed, and additional soil borings are performed.

The existing fill present at the soil borings on the south side of the property are not suitable for support of foundations and should be considered marginally suitable for support of the floor slabs and engineered fill to achieve proposed grades. Once the existing building and associated structures are demolished and the entirety of the development is accessible for a drill rig, additional soil borings must be performed to determine design recommendations. Recommendations presented in this report should be considered preliminary and are not to be used for site design, but rather development issues associated with the site.

Foundations must extend through any existing fill to bear on the underlying native soils, if practical. Where extending foundation through the existing fill soils is impractical, the existing fill soils should be completely removed from within the influence of foundations and replaced with engineered fill or a deep foundation system. As an alternative to deep uncontrolled fill soil removal or deep foundations, consideration could be given to improving the support characteristics of the uncontrolled fill by installation of a ground improvement system, such as rammed aggregate piers or stone columns.

In general, uncontrolled fill is considered unsuitable for infiltration due to its variability in both grain size distribution and relative density. In addition, cohesive soils are unsuitable for infiltration due to their low permeability rates. Due to the lack of suitable soils for infiltration testing per the County guidelines, no infiltration testing was performed during our initial field investigation. Based on the results of our infiltration evaluation, we recommend that the proposed stormwater management area be constructed assuming little to no infiltration of the collected stormwater.

Caving and sloughing of the existing fill and granular engineered fill to raise grades may occur during foundation excavation operations. Therefore, the contractor should be prepared to over excavate and form foundation within the granular soils. The sides of the foundations should be constructed straight and vertical to reduce the risk of frozen soil adhering to the concrete and raising the foundation.

This summary is not to be considered separate from the entire text of this report, with all the conclusions and qualifications mentioned herein. Details of our analysis and recommendations are discussed in the following sections and in the Appendix of this report.



PROJECT DESCRIPTION

We understand the project includes the demolition of the existing development on the property which consists of a single-story building, putt-putt greens, ponds, bridges, batting cages, fences, and associated pavements and utilities. Following demolition of the existing development, a new 6,820 square-foot, single-story, slab-on-grade car wash facility, vacuum stations, pay station, associated pavements, stormwater management system (including a detention pond and an underground detention system), and utilities will be constructed in conjunction with this development.

Based on the Stormwater Management Plan, Sheet C-5, prepared by Stonefield, the proposed building will have a finished floor between 803 and 804 feet. Proposed grades across the site will slope downward to the south, ranging from approximately 804 feet at the north side of the property to 795 feet at the south side of the pavement. The underground detention system will have an invert of 787 feet. The detention basin will have an elevation at the tops and bottom of the structure of 796 to 791 feet and an invert of the outlet structure at 788.5 feet.

Existing grades across the site slope downward to the south, ranging from approximately 811 feet along Washtenaw Avenue to 783 feet along Northlawn Avenue. Based on the existing and proposed grades, grade cuts of up to 5 feet and dill placement of up to 3 feet will be required to achieve proposed finished grades across the property.

At the time of this investigation, access to most of the development (including the entirety of the building) was not available due to the presence of the structures. Therefore, the overall property and potential development issues were evaluated in conjunction with this preliminary investigation. Recommendations presented in this report should be considered preliminary and are not to be used for design.

When the existing development on the property is demolished and access is available for soil boring, G2 will perform additional soil borings. Following completion of the additional borings, we will also review our preliminary findings presented herein and provide final design recommendations for the proposed development.

SCOPE OF SERVICES

The field operations, laboratory testing, and engineering report preparation were performed under the direction and supervision of a licensed professional engineer. Our services were performed according to generally accepted standards and procedures in the practice of geotechnical engineering in this area. Our scope of services for this project is as follows:

1. We drilled three soil borings in conjunction with this preliminary investigation. Borings B-1 and B-2 were drilled within the footprint of the proposed underground detention chamber system and extended to a depth of 25 feet each below existing grade. Auger refusal was encountered at an approximate depth of 6 feet at boring B-1 and was offset and redrilled, labeled B-1A. Boring B-3 was drilled in the proposed pavement area north of the detention system and extended to a depth of 10 feet below existing grade.
2. We performed laboratory testing on representative samples obtained from the soil borings. Laboratory testing included visual engineering classification, natural moisture content, and unconfined compressive strength determinations.
3. We prepared this preliminary engineering report. Our report includes recommendations regarding preliminary foundation types suitable for the encountered subsurface conditions, site development issues, and construction considerations related to foundation construction and associated development.



FIELD OPERATIONS

G2 Consulting Group, LLC (G2), in conjunction with Stonefield, selected the number, depth, and location of the soil borings for the preliminary investigation. The soil boring locations were determined in the field by use of hand-held GPS device and measuring from existing site features using conventional taping methods prior to drilling operations. The approximate soil boring locations are shown on the Soil Boring Location Plan, Plate No. 1. Ground surface elevations at the boring locations were interpolated from the topographical information presented in the drawing titled "Stormwater Management Plan," Sheet No. C-5, prepared by Stonefield, dated March 6, 2024. If you would like more accurate positional information at the soil boring locations, we recommend their as-drilled positions be determined in the field using conventional surveying techniques.

The soil borings were drilled utilizing a truck-mounted rotary drilling rig. Continuous flight 2-1/4 inch inside diameter, hollow-stem augers were used to advance the boreholes to the explored depths. Within each soil boring, soil samples were obtained at intervals of 2-1/2 feet within the upper 10 feet and at intervals of 5 feet thereafter. The samples were obtained by the Standard Penetration Test method ASTM D 1586, which involves driving a 2-inch diameter split-spoon sampler into the soil with a 140-pound weight falling 30 inches. The sampler is generally driven three successive 6-inch increments with the number of blows for each increment recorded. The number of blows required to advance the sampler the last 12 inches is termed the Standard Penetration Resistance (N). The blow counts for each 6-inch increment and the resulting N-value are presented on the individual soil boring logs.

The soil samples were placed in sealed containers in the field and brought to the laboratory for testing and classification. During drilling operations, G2 maintained logs of the encountered subsurface conditions, including changes in stratigraphy and observed groundwater levels of the soil borings to be used in conjunction with our analysis of the subsurface conditions. The final boring logs are based on the field logs and laboratory soil classification and testing results. After completion of the drilling operations, the boreholes were backfilled with auger cuttings and capped with cold patch.

LABORATORY TESTING

Representative soil samples were subjected to laboratory testing to determine soil parameters pertinent to pavement and foundation design and site preparation. An experienced geotechnical engineer classified the samples in general conformance with the Unified Soil Classification System.

Laboratory testing included natural moisture content and unconfined compressive strength determinations. The moisture content of representative samples was determined in accordance with ASTM Test Method D2216, "Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass". The unconfined compressive strengths were determined using a spring-loaded hand penetrometer. The hand penetrometer estimates the unconfined compressive strength to a maximum of 4-1/2 tons per square foot (tsf) by measuring the resistance of the soil sample to the penetration of a calibrated spring-loaded cylinder.

The results of the moisture content and unconfined compressive strength tests are indicated on the soil boring logs at the depths the samples were obtained. We will hold the soil samples for 60 days from the date of this report, after which time they will be discarded. If you would like the samples, please let us know.

SOIL CONDITIONS

Approximately 3 to 9 inches of bituminous concrete (are present at the soil boring locations. Fill soils, consisting of clayey sand and sandy clay with concrete, asphalt, and brick debris, underlie the pavement section and extend to approximate depths ranging from 5-1/2 to 10-1/2 feet below existing grade at borings B-1, B-1A, and B-2 and to the explored depth of 10 feet at boring B-3. Native sandy clay and silty clay are present below the fill and extend to the explored depth of 25 feet below existing grade.



The clayey sand fill is generally very loose to medium compact with Standard Penetration Test (SPT) N-values ranging from 4 to 22 blows per foot (bpf). However, compact clayey sand fill soil is present at soil boring B-3 with an SPT N-value of 47 bpf and 50 blows for zero penetration. The sandy clay fill is stiff in consistency with moisture contents ranging from 14 to 18 percent and an unconfined compressive strength of 3,000 pounds per square foot (psf). The native silty clay and sandy clay are generally stiff to hard in consistency within the upper 18-1/2 feet with natural moisture contents ranging from 16 to 30 percent and unconfined compressive strengths ranging from 2,500 to 9,000 psf. The underlying silty clay extending to the explored depth is very soft to medium in consistency with natural moisture contents ranging between 29 to 40 percent and unconfined compressive strengths ranging between 400 and 1,600 psf.

The stratification depths shown on the soil boring logs represent the soil conditions at the boring locations. Variations may occur between borings. Additionally, the stratigraphic lines represent the approximate boundaries between soil types. The transition may be more gradual than what is shown. We have prepared the boring logs on the basis of laboratory classification and testing as well as field logs of the soils encountered.

The Soil Boring Location Plan, Plate No. 1, and Soil Boring Logs, Figure Nos. 1 through 4, are presented in the Appendix. The soil profiles described above are generalized descriptions of the conditions encountered at the boring locations. General Notes Terminology defining the nomenclature used on the boring logs and elsewhere in this report is presented on Figure No. 5.

GROUNDWATER CONDITIONS

Groundwater observations were recorded during soil boring operations. No measurable groundwater was encountered during or upon completion of drilling operations.

Fluctuations in perched and long-term groundwater levels should be anticipated due to seasonal variations and following periods of prolonged precipitation. It should also be noted that groundwater observations made during drilling operations in cohesive soils are not necessarily indicative of the static groundwater level. This is due to the low permeability of such soils and the tendency of drilling operations to seal off the natural paths of groundwater flow.

SITE CONDITIONS

The project site is located on the south side of Washtenaw Avenue, approximately 1,700 feet west of Hewitt Road, in the Charter Township of Ypsilanti, Michigan. An existing single-story building is currently present at the center of the property. A bituminous concrete drive extends south into the property from Washtenaw Avenue and leads to an existing parking lot at the south side of the site. The area directly to the north of the parking lot is occupied with an existing 3,266 square foot building, a mini putt-putt course, bridges, ponds, batting cages, trees, and various elements of the previous establishment of the property.

Surrounding properties are generally commercial to the east, north and west and residential in nature to the south. Based on provided topographical data, the site generally slopes downward from the northeast to the southwest with site elevations ranging from 811 to 785 feet.

Based on historical aerial images from Google Earth, no evidence of previous structures or development was evident in the vicinity of the current borings dating to prior to 1999. The existing development and bituminous parking lots were constructed prior to 1999.

SITE PREPARATION

Earthwork operations are expected to consist of demolition of the existing building, miscellaneous structures, and associated foundations, demolition of existing utilities, removing any existing



pavements, topsoil, vegetation, and trees within the location of the proposed building and pavements, grade cuts or placement of engineered fill to achieve proposed finished grades, subgrade preparation for support of engineered fill, floor slabs, and pavements. and excavating and backfilling of new foundations and utilities. We recommend all earthwork operations be performed in accordance with comprehensive specifications and be properly monitored in the field by qualified geotechnical engineers and technicians.

The existing structures must be demolished and any footings and debris resulting from demolition of the existing structures completely removed. The resulting excavations should be backfilled with granular engineered fill. Any existing utilities present in the footprint of the proposed building should be removed and the resulting excavations backfilled with engineered fill. Abandoned utilities outside the influence of the zone of influence of any new structures may be grouted in place.

Following demolition of the existing structures, any vegetation, trees, associated root structures, topsoil, pavements should be completely removed from within the limits of any areas of development. Based on the provided plans, site grades at the north end and southeast end of the site will be cut up to approximately 5 feet and raised by up to 5 feet at the southwest end of the site.

Following satisfactory removal of any vegetation and topsoil, completion of any grade cuts and undercuts, and prior to placement of engineered fill, any exposed cohesive subgrade should be thoroughly proof rolled with a tri-axle fully loaded dump truck and any exposed granular soils should be thoroughly proof compacted with a vibratory roller making a minimum of 10 passes in 2 perpendicular directions. The subgrade should be monitored by a qualified geotechnical engineer or technician. Any unstable or unsuitable areas noted should be improved by additional compaction or removed and replaced with specified engineered fill. Any soils that are disturbed during grading operations or during removal of existing surface vegetation should be removed and replaced with engineered fill.

Engineered fill should be free of organic matter, frozen soil, clods, or other harmful material. The fill should be placed in uniform horizontal layers that are not more than 9 inches in loose thickness. The engineered fill should be compacted to achieve a density of at least 95 percent of the maximum dry density as determined by the Modified Proctor compaction test (ASTM D 1557). All engineered fill material should be placed and compacted at approximately the optimum moisture content. Frozen material should not be used as fill, nor should fill be placed on a frozen subgrade.

We recommend using granular engineered fill within confined areas such as within demolished foundation excavations, adjacent to new foundation walls, catch basins, and utility trenches. Granular engineered fill is generally more easily compacted than cohesive soils within these confined areas. Additionally, the proper placement and compaction of backfill within these areas is imperative to provide adequate support for overlying foundations, floor slabs, and pavements.

FOUNDATION AND FLOOR SLAB RECOMMENDATIONS

Soil borings were not performed in the footprint of the proposed building due to limited access associated with the existing development. Three borings were performed at the south side of the property within the proposed parking lot and underground detention system where access was available. The existing fill present at these soil borings is not suitable for support of foundations and should be considered marginally suitable for support of the floor slabs and engineered fill. Once the existing building and associated structures are demolished and the proposed building footprint is accessible for a drill rig, additional soil borings must be performed to determine foundation and floor slab design recommendations. Recommendations presented in this report should be considered preliminary and are not to be used for site design but rather development issues associated with the site.

If fill soils are encountered at additional boring locations, foundations must extend through any existing fill to bear on the underlying native soils, if practical. Where extending foundation through the existing fill soils is impractical, the existing fill soils should be completely removed from within the influence of



foundations and replaced with engineered fill or a deep foundation system construction. As an alternative to deep uncontrolled fill soil removal or deep foundations, consideration could be given to improving the support characteristics of the uncontrolled fill by installation of a ground improvement system, such as rammed aggregate piers or stone columns.

Exterior foundations should bear at a minimum depth of 3-1/2 feet below finished grade for protection against frost heave. Interior foundations can bear at shallower depths provided suitable bearing soils are present and foundations are protected from frost during construction operations. Continuous wall or strip footings should be at least 16 inches in width and isolated spread footings should be at least 30 inches in their least dimension. We recommend all strip footings be suitably reinforced to minimize the effects of differential settlements associated with local variations in subsoil conditions.

INFILTRATION CONSIDERATIONS

Our infiltration investigation was generally conducted in accordance with Washtenaw County Water Resource Commission's (WCWRC) revised "Rules and Guidelines - Procedures & Design Criteria for Stormwater Management Systems" dated October 17, 2016. The purpose of our investigation was to determine infiltration rates in the area of the proposed underground stormwater detention chambers for use in design.

Per the County guidelines, uncontrolled fill is considered unsuitable for infiltration due to its variability in both grain size distribution and relative density. In addition, cohesive soils are unsuitable for infiltration due to their low permeability rates. Based on the presence of both existing fill and cohesive soil, no infiltration testing was performed during our initial field investigation. Therefore, we recommend the proposed stormwater management area be constructed assuming no infiltration of the collected stormwater.

PAVEMENT RECOMMENDATIONS

New pavements will be constructed west and south of the proposed building. Based on the existing fill soils encountered at the borings at the south side of the property, we anticipate pavements will be supported on the existing fill and engineered fill overlying the existing fill soils to achieve proposed finished grades. We anticipate undercuts will be required during proof roll/proof compaction operations where existing fill soils are present, especially if the material is exposed to precipitation.

Once demolition of the existing development is completed, we can evaluate the subgrade soils across the remainder of the property and provide a pavement design for both standard-duty bituminous concrete and Portland cement concrete pavements, as required.

CONSTRUCTION CONSIDERATIONS

Based on the soil borings performed at the south side of the property, we do not anticipate groundwater will be encountered within foundation and utility excavations. We further anticipate groundwater seepage or surface run-off can be controlled with properly constructed sumps and pumps.

Caving and sloughing of the existing fill and any granular engineered fill soil may occur during foundation excavation operations. Therefore, the contractor should be prepared to over excavate and form foundation within the granular soils. The sides of the foundations should be constructed straight and vertical to reduce the risk of frozen soil adhering to the concrete and raising the foundation.

Where excavations extend deeper than 5 feet and sufficient space is available, we recommend maximum slopes of 2 horizontal units to 1 vertical unit (2H:1V) for sloped excavations within the existing very loose to loose granular fill soils and medium cohesive soils and 1-1/2H:1V within the medium compact granular fill soils and stiff to hard cohesive soils. Where seepage is observed, excavations should be



sloped at 3:1 or flatter. Excavations should not extend below the groundwater table without dewatering. All excavations should be safely sheeted, shored, sloped, or braced in accordance with MI-OSHA requirements. If material is stored or equipment is operated near an excavation, stronger shoring must be used to resist the extra pressure due to the superimposed loads.

GENERAL COMMENTS

We have formulated the evaluations and recommendations presented in this preliminary geotechnical report relative to site preparation and development on the basis of data provided to us relating to the project location, scope, and surface grade for the proposed site. Any significant change in this data should be brought to our attention for review and evaluation with respect to prevailing subsurface conditions. Furthermore, if changes occur in the design, location, or concept of the project, conclusions and recommendations contained in this report are not valid unless G2 Consulting Group, LLC reviews the changes. G2 Consulting Group, LLC will then confirm the recommendations presented herein or make changes in writing.

The scope of the preliminary investigation was limited to evaluation of subsurface conditions for the site development and other related aspects of the development. No chemical, environmental, or hydrogeological testing or analyses were included in the scope of this investigation.

We base the analyses and recommendations submitted in this report upon the data from the soil borings performed at the approximate locations shown on the Soil Boring Location Plan, Plate No. 1. This report does not reflect variations that may occur between the actual boring locations and the actual pavement locations. The nature and extent of any such variations may not become clear until the time of construction. If significant variations then become evident, it may be necessary for us to re-evaluate our report recommendations.

We recommend G2 Consulting Group, LLC observe all geotechnical related work, including foundation construction, subgrade preparation, and engineered fill placement. G2 Consulting Group, LLC will perform the appropriate testing to confirm the geotechnical conditions given in the report are found during construction.

APPENDIX

Soil Boring Location Plan

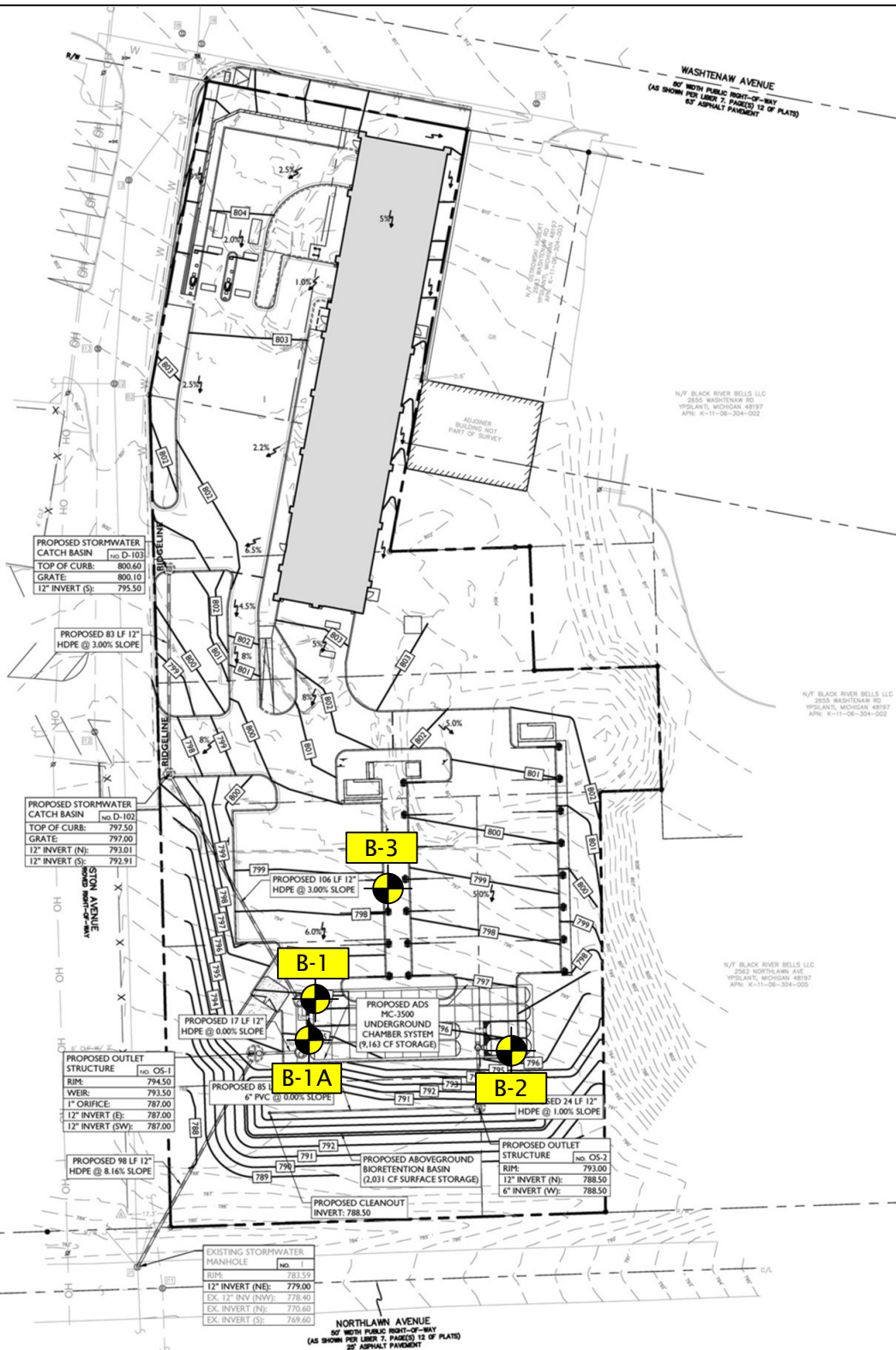
Plate No. 1

Soil Boring Log

Figure Nos. 1 through 4

General Notes Terminology

Figure No. 5



Legend



Soil borings performed by Xterra Drilling on April 25, 2024

Soil Boring Location Plan

Ypsilanti Township Car Wash
2675 Washtenaw Avenue
Ypsilanti Township, Washtenaw County, Michigan



Project No. 240207

Drawn by: ZRL

Date: 4/30/24

Scale: NTS

Plate No. 1

Project Name: Ypsilanti Township Car Wash

Project Location: 2675 Washtenaw Avenue
Ypsilanti, Michigan 48197

G2 Project No. 240207

Latitude: N/A Longitude: N/A



Soil Boring No. B-1

CONSULTING GROUP

SUBSURFACE PROFILE

SOIL SAMPLE DATA

ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 791.5 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Bituminous Concrete (4 inches)	0.3						
		Fill: Medium Compact Mottled Brown and Gray Clayey Sand with trace gravel; occasional clay clods, asphalt and concrete fragments		S-1	5 4 16	20			
786.5			5	S-2	10 9 13	22			
		End of Boring @ 6 ft, Auger Refusal	6.0						
781.5			10						
776.5			15						
771.5			20						
766.5			25						

SOIL / PAVEMENT BORING 240207.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 5/27/24

Total Depth: 6 ft
Drilling Date: April 25, 2024
Inspector: P. Guisinger
Contractor: Xterra Drilling
Driller: B. Hansen

Water Level Observation:
Dry during and upon completion

Notes:
Hit scrap rebar around 6 feet, wrapped around augers, abandoned hole and offset approximately 10 feet south, 2 feet west to B-1A

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 1

Project Name: Ypsilanti Township Car Wash

Project Location: 2675 Washtenaw Avenue
Ypsilanti, Michigan 48197

G2 Project No. 240207

Latitude: N/A Longitude: N/A



Soil Boring No. B-1A

CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA					
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 790.5 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Bituminous Concrete (3 inches)	0.3						
		(Tough drilling between 2 and 6 feet, concrete fragments, skipped 3-1/2 to 5 foot sample)		S-1	26 50/2"	---			
785.5		Fill: Very Loose to Loose Brown Clayey Sand with trace gravel; occasional asphalt and brick fragments	5	S-2					
				S-3	3 3 1	4			
780.5			10	S-4	WOH 2 3	5			
			10.5						
775.5		Very Stiff Brown Silty Clay with trace sand and gravel	15	S-5	3 5 6	11	29.9		5000*
			18.5						
770.5		Very Soft Gray Silty Clay with trace sand and gravel	20	S-6	WOH/18"	---	39.1		400**
765.5			25.0	S-7	WOH/18"	---	29.9		400**
		End of Boring @ 25 ft							

SOIL / PAVEMENT BORING 240207.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 5/27/24

Total Depth: 25 ft
 Drilling Date: April 25, 2024
 Inspector: P. Guisinger
 Contractor: Xterra Drilling
 Driller: B. Hansen

Water Level Observation:
 Dry during and upon completion

Notes:
 WOH = weight of hammer
 * Calibrated Hand Penetrometer
 ** Torvane

Drilling Method:
 2-1/4 inch inside diameter hollow-stem augers

Excavation Backfilling Procedure:
 Auger cuttings

Figure No. 2

Project Name: Ypsilanti Township Car Wash

Project Location: 2675 Washtenaw Avenue
Ypsilanti, Michigan 48197

G2 Project No. 240207

Latitude: N/A Longitude: N/A



Soil Boring No. **B-2**
CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA					
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 792.0 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Bituminous Concrete (5 inches)	0.4						
		Fill: Stiff Mottled Brown Sandy Clay with trace silt and gravel; occasional asphalt fragments and various debris		S-1	3 4 3	7	17.1		3000*
787.0			5	S-2	2 0 1	1	14.2		3000*
		Hard Brown Sandy Clay with trace silt and gravel	5.5						
					S-3	3 4 4	8	16.7	
		Stiff Gray Sandy Clay with trace silt and gravel	9.0						
782.0			10	S-4	2 2 2	4	16.7		2500*
		Hard Mottled Brown and Gray Silty Clay with trace sand and gravel	13.5						
777.0			15	S-5	4 6 9	15	26.1		9000*
		Medium Gray Silty Clay with trace sand and gravel	18.5						
772.0			20	S-6	WOH/12" 3	---	32.1		1600**
		End of Boring @ 25 ft	25.0						
767.0			25	S-7	WOH/18"	---	33.7		1200**

SOIL / PAVEMENT BORING_240207.GPJ_20150116 G2 CONSULTING DATA TEMPLATE.GDT_5/27/24

Total Depth: 25 ft
 Drilling Date: April 25, 2024
 Inspector: P. Guisinger
 Contractor: Xterra Drilling
 Driller: B. Hansen

Water Level Observation:
 Dry during and upon completion

Notes:
 WOH = weight of hammer
 * Calibrated Hand Penetrometer
 ** Torvane

Drilling Method:
 2-1/4 inch inside diameter hollow-stem augers

Excavation Backfilling Procedure:
 Auger cuttings

Figure No. 3

Project Name: Ypsilanti Township Car Wash

Project Location: 2675 Washtenaw Avenue
Ypsilanti, Michigan 48197

G2 Project No. 240207

Latitude: N/A Longitude: N/A



Soil Boring No. **B-3**
CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA					
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 798.0 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Bituminous Concrete (9 inches)	0.8						
		Fill: Compact Mottled Brown Clayey Sand with trace gravel; occasional asphalt and concrete fragments (Hard drilling, concrete/asphalt fragments, no recovery for S-01 and S-03)		S-1	50/0"	---			
793.0			5	S-2	3 15 32	47			
		Fill: Very Loose Brown Clayey Sand with trace gravel		S-3	50/0"	---			
788.0			10.0	S-4	2 1 1	2			
		End of Boring @ 10 ft							
783.0			15						
778.0			20						
773.0			25						

SOIL / PAVEMENT BORING_240207.GPJ_20150116 G2 CONSULTING DATA TEMPLATE.GDT_5/27/24

Total Depth: 10 ft
 Drilling Date: April 25, 2024
 Inspector: P. Guisinger
 Contractor: Xterra Drilling
 Driller: B. Hansen

Water Level Observation:
 Dry during and upon completion

Notes:
 WOH = weight of hammer

Excavation Backfilling Procedure:
 Auger cuttings

Drilling Method:
 2-1/4 inch inside diameter hollow-stem augers

Figure No. 4

GENERAL NOTES TERMINOLOGY

Unless otherwise noted, all terms herein refer to the Standard Definitions presented in ASTM 653.

PARTICLE SIZE

Boulders	- greater than 12 inches
Cobbles	- 3 inches to 12 inches
Gravel - Coarse	- 3/4 inches to 3 inches
- Fine	- No. 4 to 3/4 inches
Sand - Coarse	- No. 10 to No. 4
- Medium	- No. 40 to No. 10
- Fine	- No. 200 to No. 40
Silt	- 0.005mm to 0.074mm
Clay	- Less than 0.005mm

CLASSIFICATION

The major soil constituent is the principal noun, i.e. clay, silt, sand, gravel. The second major soil constituent and other minor constituents are reported as follows:

Second Major Constituent (percent by weight)	Minor Constituent (percent by weight)
Trace - 1 to 12%	Trace - 1 to 12%
Adjective - 12 to 35%	Little - 12 to 23%
And - over 35%	Some - 23 to 33%

COHESIVE SOILS

If clay content is sufficient so that clay dominates soil properties, clay becomes the principal noun with the other major soil constituent as modifier, i.e. sandy clay. Other minor soil constituents may be included in accordance with the classification breakdown for cohesionless soils, i.e. silty clay, trace sand, little gravel.

Consistency	Unconfined Compressive Strength (psf)	Approximate Range of (N)
Very Soft	Below 500	0 - 2
Soft	500 - 1,000	3 - 4
Medium	1,000 - 2,000	5 - 8
Stiff	2,000 - 4,000	9 - 15
Very Stiff	4,000 - 8,000	16 - 30
Hard	8,000 - 16,000	31 - 50
Very Hard	Over 16,000	Over 50

Consistency of cohesive soils is based upon an evaluation of the observed resistance to deformation under load and not upon the Standard Penetration Resistance (N).

Density Classification	COHESIONLESS SOILS Relative Density %	Approximate Range of (N)
Very Loose	0 - 15	0 - 4
Loose	16 - 35	5 - 10
Medium Compact	36 - 65	11 - 30
Compact	66 - 85	31 - 50
Very Compact	86 - 100	Over 50

Relative Density of cohesionless soils is based upon the evaluation of the Standard Penetration Resistance (N), modified as required for depth effects, sampling effects, etc.

SAMPLE DESIGNATIONS

- AS - Auger Sample - Cuttings directly from auger flight
- BS - Bottle or Bag Samples
- S - Split Spoon Sample - ASTM D 1586
- LS - Liner Sample with liner insert 3 inches in length
- ST - Shelby Tube sample - 3 inch diameter unless otherwise noted
- PS - Piston Sample - 3 inch diameter unless otherwise noted
- RC - Rock Core - NX core unless otherwise noted

STANDARD PENETRATION TEST (ASTM D 1586) - A 2.0 inch outside-diameter, 1-3/8 inch inside-diameter split barrel sampler is driven into undisturbed soil by means of a 140-pound weight falling freely through a vertical distance of 30 inches. The sampler is normally driven three successive 6-inch increments. The total number of blows required for the final 12 inches of penetration is the Standard Penetration Resistance (N).

ADS N-12[®] WT (per ASTM F2648) Submittal Package



Package Contents

1. Sell Sheet
2. Specification
3. Technical notes
4. Corrugated plastic pipe installation guide



adspipe.com

800-821-6710

N-12[®] WT IB Pipe (per ASTM F2648)

N-12 WT IB pipe (per ASTM F2648) has recycled content and provides material properties to meet or exceed the demands of the market.

N-12 WT IB contains a superior built-in bell-and-spigot joint. An exterior bell wrap provides a quick visual indicator to customers and inspectors that a watertight product is being used. A patented gasket, that meets all requirements of ASTM F477, increases its sealing forces as temporary internal or external hydrostatic pressure increases.

Applications

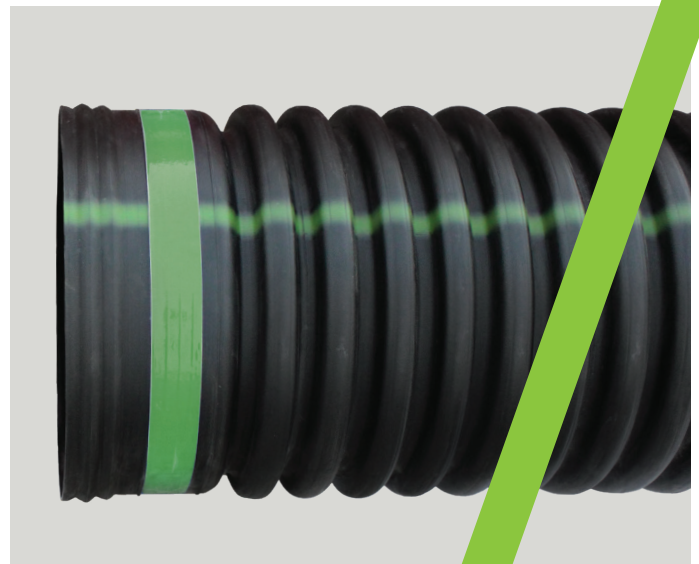
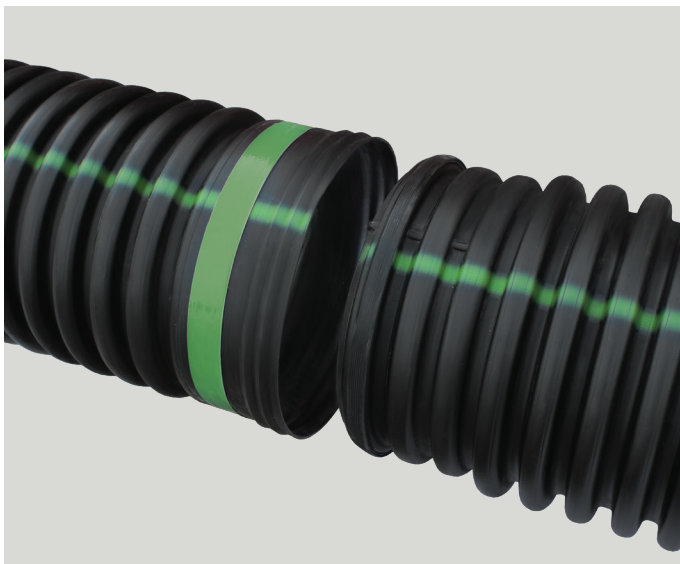
- Storm sewers
- Retention/Detention
- Ditch enclosures
- Culverts & cross drains
- Slope/edge drains
- Mining/Forestry/Industrial

Features

- 4"-60" (100-1500 mm) diameters available
- Nominal 20' (6 m) and 13' (4 m) lengths available
- Integral bell and factory-installed gasket
- Joint meets or exceeds ASTM D3212 lab test as well as ASTM F2487 and ASTM F1417 watertight field test
- Exceptional joint strength
- Light weight for fast installation times
- Structural strength will support H-25 or HL-93 live loads with 12" (300 mm) minimum cover; 60" (1500 mm) requires 24" (600 mm) cover for H-25 or HL-93 live loads

Benefits

- Variety of diameters and lengths that will fit any project
- Factory-installed gaskets and built-in bell allow for efficient installation and reduced opportunities for risk
- Installation cost savings from lower shipping costs, reduced labor and less heavy equipment
- Hydraulic efficiency from smooth interior
- Long-term durability of HDPE



ADS N-12 WT IB Pipe (per ASTM F2648) Specification

Scope

This specification describes 4- through 60-inch (100 to 1500 mm) ADS N-12 WT IB pipe (per ASTM F2648) for use in gravity-flow land drainage applications.

Pipe Requirements

ADS N-12 WT IB pipe (per ASTM F2648) shall have a smooth interior and annular exterior corrugations.

- 4- through 60-inch (100 to 1500 mm) shall meet ASTM F2648
- Manning's "n" value for use in design shall be 0.012.

Joint Performance

4- through 60-inch (100 to 1500 mm) pipe shall be watertight according to the requirements of ASTM D3212. Gaskets shall meet the requirements of ASTM F477. Gaskets shall be installed by the pipe manufacturer and covered with a removable, protective wrap to ensure the gasket is free from debris. A joint lubricant available from the manufacturer shall be used on the gasket and bell during assembly.

12- through 60-inch (300 to 1500 mm) diameters shall have an exterior bell wrap installed by the manufacturer.

Fittings

Fittings shall conform to ASTM F2306. Bell and spigot connections shall utilize a spun-on or welded bell and valley or saddle gasket meeting the watertight joint performance requirements of ASTM F2306.

Field Pipe and Joint Performance

To assure watertightness, field performance verification may be accomplished by testing in accordance with ASTM F2487. Appropriate safety precautions must be used when field testing any pipe material. Contact the manufacturer for recommended leakage rates.

Material Properties

Material for pipe production shall be an engineered compound of virgin and recycled high-density polyethylene conforming with the minimum requirements of cell classification 424420C, (ESCR Test Condition B) for 4- through 10-inch (100 to 250 mm) diameters, and 435420C, (ESCR Test Condition B) for 12- through 60-inch (300 to 1500 mm) diameters, as defined and described in the latest version of ASTM D3350, except that carbon black content should not exceed 4%. The design engineer shall verify compatibility with overall system including structural, hydraulic, material and installation requirements for a given application.

Installation

Installation shall be in accordance with ASTM D2321 and ADS' published installation guidelines, with the exception that minimum cover in trafficked areas for 4- through 48-inch (100 to 1200 mm) diameters shall be one foot (0.3 m) , and for 60-inch (1500 mm) diameters, the minimum cover shall be two feet (0.6 m) in single run applications. Backfill for minimum cover situations shall consist of Class 1 (compacted) or Class 2 (minimum 90% SPD) material. Maximum fill heights depend on embedment material and compaction level; please refer to Technical Note 2.02. Contact your local ADS representative or visit our website adspipe.com for a copy of the latest installation guidelines.

Pipe Dimensions*

Nominal Diameter													
Pipe I.D. in (mm)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)	15(375)	18 (450)	24 (600)	30 (750)	36 (900)	42 (1050)	48 (1200)	60 (1500)
Pipe O.D. in (mm)	4.8 (122)	6.9 (175)	9.1 (231)	11.4 (290)	14.5 (368)	18 (457)	22 (559)	28(711)	36 (914)	42 (1067)	48 (1219)	54 (1372)	67 (1702)

*Check with sales representative for availability by region. **Pipe O.D. values are provided for reference purposes only, values stated for 12- through 60-inch are ±1 inch. Contact a sales representative for exact values.



ADS N-12® WT IB PIPE (PER ASTM F2648) SPECIFICATION

Scope

This specification describes 4- through 60-inch (100 to 1500 mm) ADS N-12 WT IB pipe (per ASTM F2648) for use in gravity-flow land drainage applications.

Pipe Requirements

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- 4- through 60-inch (100 to 1500 mm) pipe shall meet ASTM F2648.
- Manning’s “n” value for use in design shall be 0.012.

Joint Performance

Pipe shall be joined using a bell & spigot joint meeting ASTM F2648. The joint shall be watertight according to the requirements of ASTM D3212. Gaskets shall meet the requirements of ASTM F477. Gaskets shall be installed by the pipe manufacturer and covered with a removable, protective wrap to ensure the gasket is free from debris. A joint lubricant available from the manufacturer shall be used on the gasket and bell during assembly. 12- through 60-inch (300 to 1500 mm) diameters shall have an exterior bell wrap installed by the manufacturer.

Fittings

Fittings shall conform to ASTM F2306. Bell and spigot connections shall utilize a welded bell and valley or saddle gasket meeting the watertight joint performance requirements of ASTM F2306.

Field Pipe and Joint Performance

To assure watertightness, field performance verification may be accomplished by testing in accordance with ASTM F2487. Appropriate safety precautions must be used when field-testing any pipe material. Contact the manufacturer for recommended leakage rates.

Material Properties

Material for pipe production shall be an engineered compound of virgin and recycled high-density polyethylene conforming with the minimum requirements of cell classification 424420C (ESCR Test Condition B) for 4- through 10-inch (100 to 250 mm) diameters, and 435420C (ESCR Test Condition B) for 12- through 60-inch (300 to 1500 mm) diameters, as defined and described in the latest version of ASTM D3350, except that carbon black content should not exceed 4%. The design engineer shall verify compatibility with overall system including structural, hydraulic, material, and installation requirements for a given application.

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Pipe O.D.* in (mm)	4.8 (122)	6.9 (175)	9.1 (231)	11.4 (290)	14.5 (368)	18 (457)	22 (559)	28 (711)	36 (914)	42 (1067)	48 (1219)	54 (1372)	67 (1702)

*Pipe O.D. values are provided for reference purposes only, values stated for 12 through 60-inch are ±1 inch. Contact a sales representative for exact values

Technical Note

TN 1.07 Manhole Adapter Guide - SaniTite® HP, HP Storm, N-12® HDPE Pipe

Manhole Connection Basics

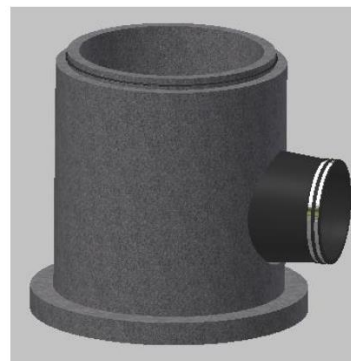
Compression Connections

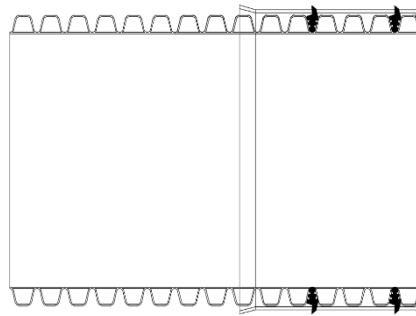
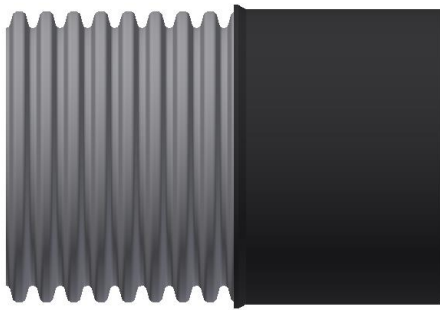
- Gasket is cast into the wall of the manhole at the precaster's facility. Gasket cannot be field installed.
- A-LOK® Premium™ is recommended for all connections. The Premium gasket has higher compression than the A-LOK STM standard gasket, which aids in sealing against the outer wall of SaniTite HP triple wall pipe and the SaniTite HP manhole adapter sleeve for dual wall pipe.
- A-LOK gaskets always need to connect to a smooth surface of pipe – Nyloplast® adapter or ADS adapter sleeves are required when using dual wall pipe. Triple wall pipe requires no adapter.



Boot Connections:

- Gasket can be installed by the precaster or field-installed by the contractor. The precaster will form the required hole in the structure and either the precaster or contractor will install the boot.
- Preferred manufacturers are Press Seal® (PSX Direct Drive) and Trelleborg (Kor-n-Seal®).
- Boots always need to connect to a smooth surface. You can connect to a dual wall pipe with an installed corrugated pipe adapter (valley fill gasket) or a Manhole adapter sleeve.



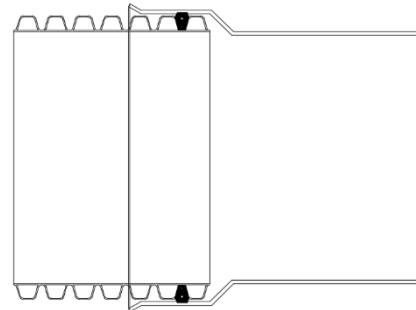
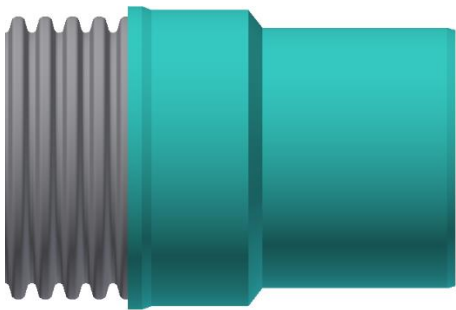


Sleeve Manhole Adapter

Boot or Compression Connection

For HP & HDPE
12" - 24" (XX22AAPP)
Sanitary or Storm Joint

Not Available for 21"



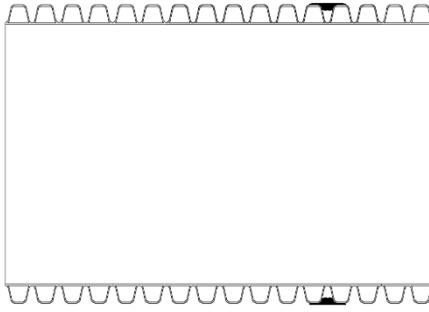
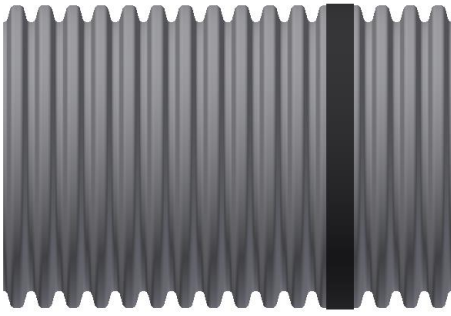
Nyloplast® PVC Manhole Adapter

Same OD as SDR35

Boot or Compression Connection

HP { 12" - 24" (XX57AGHPU2) Sanitary Joint
12" - 30" (XX57AGHPU) Storm Joint

HDPE { 12" - 30" (XX77AGU) Storm Joint

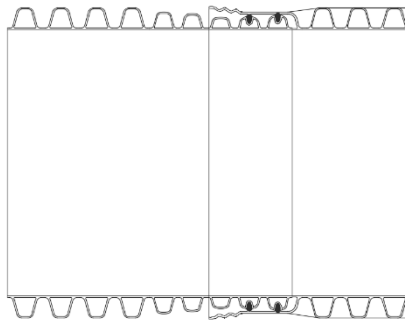
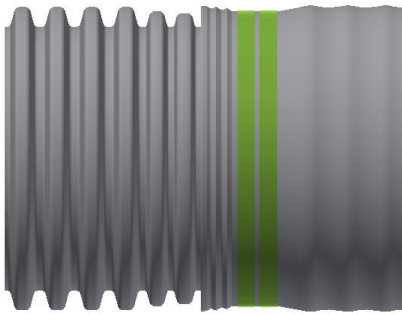


Corrugated Pipe Adapter Gasket

Boot Connection Only
(XX50PS)

12" – 30" Sanitary or Storm Joint

36" – 60" Storm Joint



SaniTite HP TW to HP Storm DW

Boot or Compression Connection

30" – 60" Dual Wall

Storm Joint

Coordinate with plant to ensure correct gasket
for compatibility is installed prior to shipment.

CONSULT ADS SERIES 200 STANDARD DETAILS



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Technical Note

TN 2.02 Minimum and Maximum Cover Heights for Corrugated HDPE Pipe (per ASTM F2648)

Introduction

The information in this document is designed to provide answers to general cover height questions; the data provided is not intended to be used for project design. The design procedure described in the *Structures* section (Section 2) of the Drainage Handbook provides detailed information for analyzing most common installation conditions. This procedure should be utilized for project specific designs.

The two common cover height concerns are minimum cover in areas exposed to vehicular traffic and maximum cover heights. Either may be considered “worst case” scenario from a loading perspective, depending on the project conditions.

Minimum Cover in Traffic Applications

Pipe diameters from 4- through 48-inch (100-1200 mm) installed in traffic areas (AASHTO H-25 or HS-25 loads) must have at least one foot (0.3m) of cover over the pipe crown, while 60-inch (1500 mm) pipe must have at least 24 inches (0.6m) of cover. The backfill envelope must be constructed in accordance with the *Installation* section (Section 5) of the Drainage Handbook and the requirements of ASTM D2321. The backfill envelope must be of the type and compaction listed in Appendix A-5, Table A-5-2A of the Drainage Handbook. In Table 1 below, this condition is represented by a Class II material compacted to 90% standard Proctor density, although other material can provide similar strength at slightly lower levels of compaction. Structural backfill material should extend to the crown of the pipe; the remaining cover should be appropriate for the installation and as specified by the design engineer. If settlement or rutting is a concern, it may be appropriate to extend the structural backfill to grade. Where pavement is involved, sub-base material can be considered in the minimum burial depth. While rigid pavements can be included in the minimum cover, the thickness of flexible pavements should not be included in the minimum cover.

Additional information that may affect the cover requirements is included in the *Installation* section (Section 5) of the Drainage Handbook. Some examples of what may need to be considered are temporary heavy equipment, construction loading, paving equipment and similar loads that are less than the design load, the potential of pipe flotation, and the type of surface treatment which will be installed over the pipe zone. Please note that Table 1 and 3 are based on the installation of N-12 and MEGA GREEN (per ASTM F2648) pipe under pavement using a uniform backfill type and compaction level, as depicted in Figure 1.

Table 1
Minimum Cover Requirements for N-12[®] and MEGAGREEN[™] Pipes (per ASTM F2648)
with AASHTO H-25 or HS-25 Load

Inside Diameter, ID, inches (mm)	Minimum Cover feet (m)
4 (100) – 48 (1200)	1 (0.3)
60 (1500)	2 (0.6)

Note: Minimum covers presented here were calculated assuming Class II backfill material compacted to 90% standard Proctor density around the pipe and structural backfill to the crown of the pipe, as recommended in Section 5 of the Drainage Handbook, with an additional layer of compacted traffic lane sub-base for a total cover as required. In shallow traffic installations, especially where pavement is involved, a good quality compacted material to grade is required to prevent surface settlement and rutting.

Maximum Cover

Wall thrust generally governs the maximum cover a pipe can withstand and conservative maximum cover heights will result when using the information presented in the Structures section (Section 2) of the Drainage Handbook.

The maximum burial depth is highly influenced by the type of backfill and level of compaction around the pipe. General maximum cover limits for N-12 and MEGA GREEN (per ASTM F2648) pipe are shown in Table 3 for a variety of backfill conditions.

Table 3 was developed assuming pipe is installed in accordance with ASTM D2321 and the Installation section (Section 5) of the Drainage Handbook. Additionally, the calculations assume no hydrostatic load around the pipe, incorporate the maximum safety factors represented in Structures section of the Drainage Handbook, use material properties consistent with the expected performance characteristics for N-12 and MEGA GREEN (per ASTM F2648) materials as shown in Table 2 below, and assume the native soil (in-situ) is of adequate strength and is suitable for installation. For applications requiring fill heights greater than those shown in Table 3 or where hydrostatic pressure due to groundwater is present, contact an ADS engineering representative.

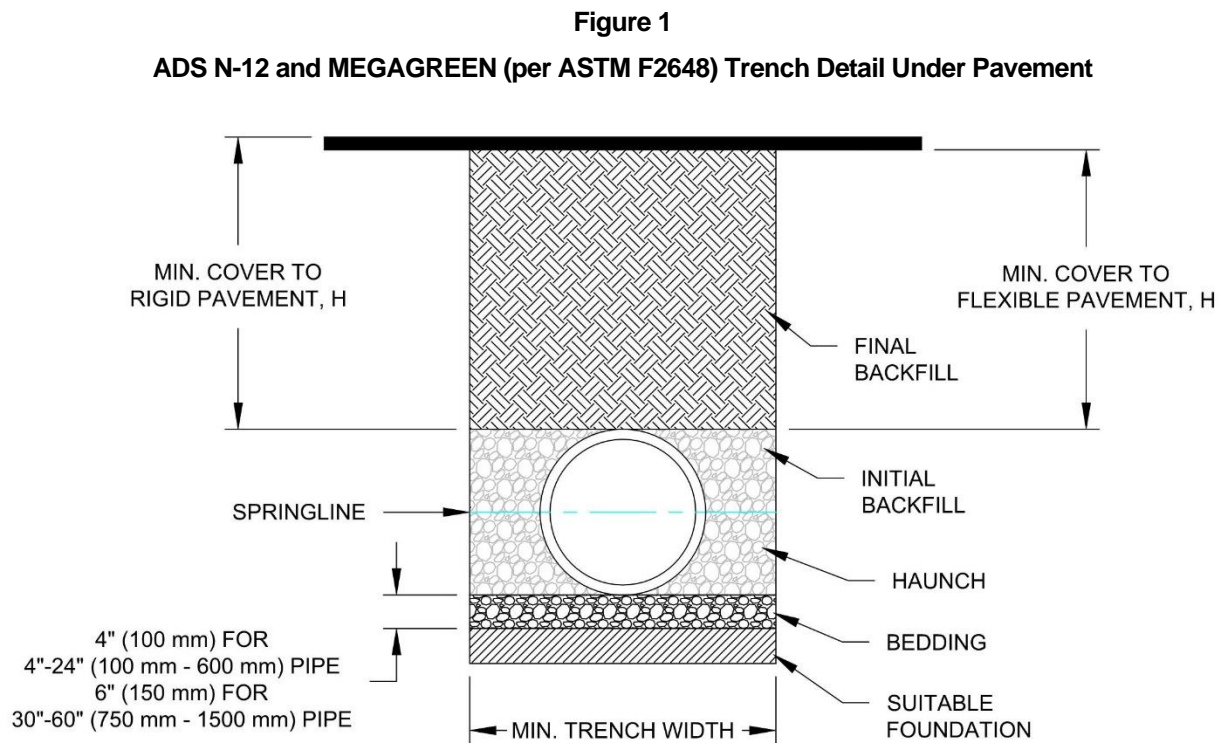


Table 2
ADS N-12 and MEGAGREEN (per ASTM F2648) Mechanical Properties

Cell Class	Design Compressive Strain (%)	Design Tensile Strain (%)	Initial		50-Year	
			Fu (psi)	E (psi)	Fu (psi)	E (psi)
ASTM D3350 424420C – 4-10" 435420C – 12-60"	3.7	4.0	3,000	110,000	800	21,000

Table 3
Maximum Cover for ADS N-12 and MEGAGREEN Pipes (per ASTM F2648), ft (m)

Diameter in. (mm)	Class 1				Class 2				Class 3	
	Compacted		Dumped		95%		90%		95%	
4 (100)	34	(10.4)	16	(4.9)	23	(7.0)	16	(4.9)	17	(5.2)
6 (150)	40	(12.2)	19	(5.8)	27	(8.2)	19	(5.8)	20	(6.1)
8 (200)	30	(9.1)	14	(4.3)	21	(6.4)	14	(4.3)	15	(4.6)
10 (250)	34	(10.4)	16	(4.9)	23	(7.0)	16	(4.9)	17	(5.2)
12 (300)	35	(10.7)	17	(5.2)	24	(7.3)	17	(5.2)	18	(5.5)
15 (375)	37	(11.3)	18	(5.5)	25	(7.6)	18	(5.5)	19	(5.8)
18 (450)	32	(9.8)	15	(4.6)	22	(6.7)	15	(4.6)	16	(4.9)
24 (600)	27	(8.2)	13	(4.0)	19	(5.8)	13	(4.0)	14	(4.3)
30 (750)	22	(6.7)	11	(3.4)	16	(4.9)	11	(3.4)	11	(3.4)
36 (900)	26	(7.9)	12	(3.7)	18	(5.5)	12	(3.7)	13	(4.0)
42 (1050)	24	(7.3)	11	(3.4)	17	(5.2)	11	(3.4)	12	(3.7)
48 (1200)	23	(7.0)	11	(3.4)	16	(4.9)	11	(3.4)	12	(3.7)
60 (1500)	26	(7.9)	12	(3.7)	18	(5.5)	12	(3.7)	13	(4.0)

Notes:

1. Results based on calculations shown in the Structures section of the ADS Drainage Handbook(v20.6). Calculations assume no hydrostatic pressure and a density of 120 pcf (1926 kg/m³) for overburden material.
2. Installation assumed to be in accordance with ASTM D2321 and the Installation section of the Drainage Handbook.
3. Material must be adequately “knifed” into haunch and in between corrugations. Compaction and backfill material is assumed uniform throughout entire backfill zone.
4. Compaction levels shown are for standard Proctor density.
5. Installations of pipe manufactured per ASTM F2648 are only applicable to the fill heights, type of embedment materials and compaction levels listed above.
6. For projects where cover exceeds the maximum values listed above, contact ADS for specific design considerations.
7. Calculations assume no hydrostatic pressure. Hydrostatic pressure will result in a reduction in allowable fill height. Reduction in allowable fill height must be assessed by the design engineer for the specific field conditions.



Technical Note

TN 5.02 Flowable Fill Backfill for Thermoplastic Pipe

Introduction

The use of flowable fill, also known as controlled low strength material (CLSM), controlled density fill (CDF), and slurry fill, as pipe bedding and backfill material has steadily been increasing. The term “flowable fill” encompasses a variety of fill materials that are used as alternates to compacted granular fill. The materials are comprised of mixtures of sand, Portland cement, Class C or Class F fly ash, and water. In addition, the mix is typically flowable and self-leveling at the time of placement.

Flowable fill is an alternative to conventional soil or stone backfill and has been used for unique applications and installations of pipe for some time. It has the advantage of providing adequate strength quickly, while providing an easy and efficient placement system. Flowable fill has proven to be a viable alternative when stone, sand, or other backfills have limited availability or cost prohibits their use. Even with these advantages it is necessary that the fill be controlled and care taken to provide for the proper installation.

Use of Flowable Fill

The following provides some advantages and disadvantages when deciding whether flowable fill should be specified or recommended on a project.

Advantages

- Allows for narrower trench and less disturbance to the native material.
- Eliminates the need for backfill compaction.
- Ensured proper distribution of support around the pipe.
- Reduces the amount of material excavated on a project.
- Time, personnel and equipment required to install flowable fill are typically less than that required for proper placement and compaction of conventional backfill materials, particularly fine-grained soils.
- Flowable fill may be made on-site using native soil as part of the mix where sands or silty sands exist.
- Time and equipment required for compressive strength testing is often less than that required to test soil compaction.



Disadvantages

- More costly than granular backfill due to the many components required and specialized delivery.
- Improper mix components can cause difficult future excavation if taps or extensions are required.
- Cannot be stockpiled on site like granular backfill. Time saved during the placement of the flowable fill can be wasted waiting on ready-mix delivery.
- Unless precaution is taken, the potential for pipe flotation is high during the installation process.

Mix Design

The mix design of flowable fill can vary widely. The flowable fill mix should be designed to meet all strength and flowability requirements. A suggested strength ranges between 50 psi and 100 psi for the 28 day strength; mixes that have 28-day compressive strengths greater than 100 psi should be avoided due to increased difficulty in future excavation, if needed. The flowable fill should be able to flow into all voids between the pipe and the trench walls. The mix design should be laboratory tested prior to installation ensure that the proper results are obtained during field batching. The field mix may also require monitoring and adjustments to maintain the proper mix and properties. These variations in the field mix can be due to many factors including water content, temperature and humidity during placement.

Installation Considerations

Environment

Flowable fill cannot be used in all temperature and weather conditions. It is recommended that the temperature be at least 40°F and that the soil exposed to the flowable fill be unfrozen. There should be no appreciable precipitation during placement to initial set. Flowable fill should be protected from freezing temperatures.

Joints

For flowable fill applications, the use of a watertight joint is recommended. For soiltight joints, precautionary measures should be taken to prevent infiltration of flowable fill mix material. This will depend nearly entirely on the consistency of the mix design.

Placement of Flowable Fill

Trench excavation should follow normal procedures and meet all OSHA safety regulations. Trench width will be dictated by the native material strength. When acceptable in-situ material exists in the trench, like rock or other high-bearing soils, the trench widths may be reduced to within 6-in along each side of the pipe, provided there is enough space to properly place the flowable fill in the pipe haunch areas. Table 1 depicts typical trench widths for a flowable fill installation. Once the trench is excavated to the proper line and grade, placement of pipe may begin. The pipe should be laid in the trench and joined in accordance with publish recommended installation guidelines.

Table 1
Recommended Trench Widths for Flowable Fill Backfill

Nominal Pipe Diam, in. (mm)	Minimum Trench in. (m)	Nominal Pipe Diam, in. (mm)	Minimum Trench in. (m)
12 (300)	22 (0.6)	36 (900)	59 (1.5)
15 (375)	27 (0.7)	42 (1050)	66 (1.7)
18 (450)	33 (0.8)	48 (1200)	74 (1.9)
24 (600)	42 (1.0)	54 (1350)	82 (2.0)
30 (750)	51 (1.3)	60 (1500)	90 (2.3)

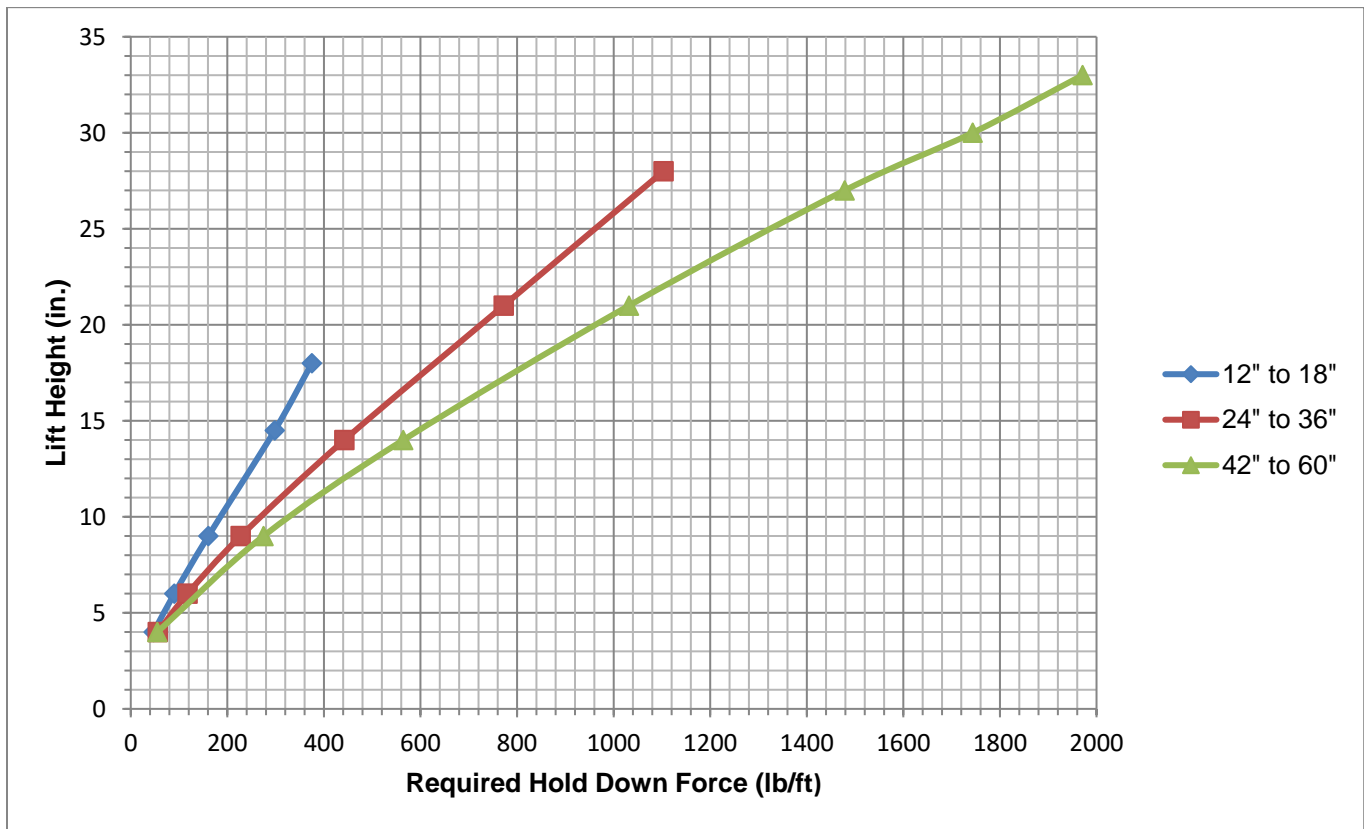
*AASHTO LRFD Section C12.6.6.1, 2006

It is recommended that both an anchoring system and incremental lifts be utilized during installation. Refer to Figure 1 below for lift recommendations and corresponding recommended anchoring forces. Keep in mind that the fill should be brought up evenly on both sides to prevent unbalanced forces from acting on the pipe. Each lift should be allowed to reach initial set, prior to placing the next lift. Time to initial set is dependent on the mix design as well as ambient temperature and moisture. The mix supplier should be contacted to determine the site-specific waiting period recommended between lifts. NOTE: The use of plasticizers or other admixtures can greatly affect cure time and final compressive strength. While it is recommended to place the flowable fill in incremental lifts, it should be noted, one continuous lift may be used provided flotation restraints have been properly designed and installed, see Table 2 for recommendations.

If additional backfill is to be placed over the flowable fill to reach final grade, it should not be placed until the flowable fill has reached a minimum compressive strength, as determined by the design engineer. If minimum strength is not specified or time constraints do not allow for testing of cylinders, ASTM C403 and ASTM D6024 can be referenced to determine if flowable fill has gained adequate strength.

Since moisture is beneficial to curing it may be desirable to place a thin layer of soil (6 inches) on top of the flowable fill section for enhanced curing.

Figure 1
Hold Down Force for Incremental Lifts



*Assumes a unit weight of flowable fill of 150 pcf and no water in the pipe at time of placement

Anchoring Systems

Probably the greatest concern associated with flowable fill during installation is its tendency to float the pipe. Flotation and misalignment issues are extremely critical and should not be ignored. When backfilling with flowable fill, the absence of soil overburden will cause the pipe to float since the pipe weight does not offset the flowable fill uplift. Therefore, the pipe must be anchored to keep the intended alignment and grade. There are a number of acceptable methods for anchoring the pipe in the trench. It may be assumed that flowable fill acts as a fluid with a density of 140 - 150 lb/cu ft. prior to stiffening. When properly designed, pipe restraints should account for buoyant forces exerted by the fluid.

Common methods include placing bags of soil or cement or heaping native material at intervals along the pipe, rebar placed in an "X" pattern above the pipe and anchored into the trench sidewall, or use of on-site construction equipment that can be left in place while curing (e.g. boom/bucket of excavator). Additional methods may include a pre-cast concrete swamp weight, or a commercially available screw anchor assembly. Anchor design and spacing shall be determined by the project design engineer. For other restraint options and additional technical information related to flotation, refer to Technical Note 5.05: *Pipe Flotation*.

Table 2
Hold Down Force, One Continuous Lift

Full Depth Placement of Flowable Fill Backfill		
Nominal Pipe Diam, in. (mm)	Lift Height (Pipe OD), in. (mm)	Required Hold Down Force, lb/ft (kg/m)
12 (300)	14.5 (368)	186 (276)
15 (375)	18 (457)	287 (426)
18 (450)	22 (559)	429 (638)
24 (600)	28 (711)	693 (1032)
30 (750)	36 (914)	1149 (1710)
36 (900)	42 (1067)	1566 (2330)
42 (1050)	48 (1219)	2044 (3042)
48 (1200)	54 (1372)	2590 (3854)
54 (1350)	61 (1549)	3311 (4927)
60 (1500)	67 (1702)	3990 (5938)



Technical Note

TN 5.04 HDPE and HP Storm Connections to Manholes and Structures for Storm Sewer Applications

Introduction

A full line of pipe jointing options is available to fit the requirements of nearly any storm drain or gravity flow project specifications. The joints available range from soil tight split couplers to gasketed soil-tight (ST) and watertight (WT) pipe. When connecting pipe to drainage structures it is important to make those connections with a joint performance at least equal to that of the piping system.

Connection Options

Soil-Tight Performance

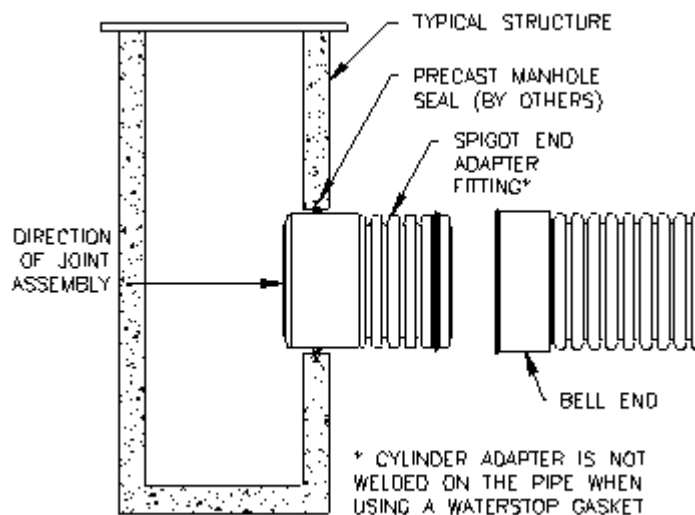
When using soil-tight pipe in non-watertight applications, it may be acceptable to grout the void space between the pipe and drainage structure.

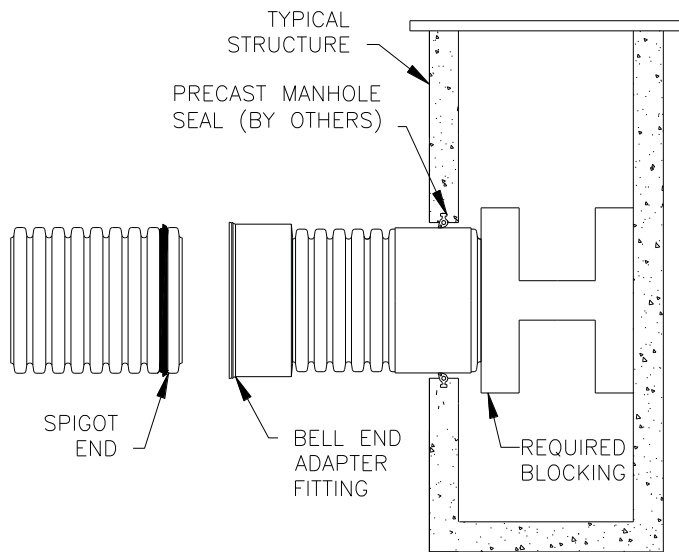
Watertight Performance

When using watertight pipe for testable systems, requiring some degree of watertight performance, it is necessary to provide additional measures to insure a watertight connection between the pipe and structure. ASTM F2510/F 2510M, "Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures and Corrugated High Density Polyethylene Drainage Pipes," is the governing standard for corrugated HDPE pipe-manhole connections, but specific performance/installation requirements should be verified for each specific project. Along with a full line of adapter fittings available, including the Waterstop® Gasket, are flexible boot fittings provided by other manufactures. Fitting dimensions should be supplied to the manufacturer to insure the proper fitting size and manhole boot connector are supplied.

Installation Recommendations

When installing a manhole adapter on the upstream end, the fitting may be over inserted into the structure temporarily while the adjoining pipe is laid. The spigot piece is then pushed back through the structure and connected to the bell end when pushing the joint together, as shown to the right.





Alternately, when using the adapter fitting in the downstream end of the structure, before pushing the bell and spigot together from inside the structure, it is necessary to provide blocking at the structure to prevent the fitting from moving in the structure, as shown to the left.

Summary

The selection of which manhole connection is best suited for a project is based on the joint and connection requirements along with preferred manhole connection method for the region. It is imperative that prevailing regulations be consulted before selecting a manhole connection. Other options may be available for watertight manhole connections. Refer to 200 Series Standard Details for installation and connection-specific details. Contact your Regional Engineer or Application Engineering for further assistance.



Technical Note

TN 5.06 Culvert Sliplining with HDPE Pipe

Introduction

An abrasive or corrosive environment can cause premature deterioration of some types of pipe. In lieu of a total replacement, sliplining the existing pipe with a durable material may be an economical method to significantly extend the service life. Polyethylene pipe, because of its resistance to aggressive environments, is often the product of choice to slipline deteriorated pipes. This technical bulletin describes the site and installation considerations that must be evaluated before using HDPE pipe in these applications.

Access to the Host Pipe

The “host” pipe may be open on both ends, as in a culvert application, or it may be accessible only through a manhole opening, as in a storm sewer application. Open-ended applications are more appropriate for HDPE pipe products, provided they do not require the pipe to be bent in order to enter the host pipe. If access can only be made through a manhole, HDPE pipe products may not be acceptable because they cannot be bent sufficiently.

Diameter of the Host Pipe

The greater of either the outside diameter of the HDPE pipe or coupler should be compared to the inside diameter of the host pipe. This may be accomplished by attempting to pull a short section (~2 feet in length) through the host pipe as a trial run. The host pipe should be clean; free from sediment and debris so as to not interfere with the installation of the liner pipe. Sliplining installations may be subject to thermal length changes of 0.07-inches per 100 feet of pipe per change in degree F. One should design to allow for these changes during installation. To allow for proper grout placement and clearance, the relined pipe should have a maximum outside diameter no greater than 90% of the inside diameter of the host pipe. The maximum outside diameters of ADS products are shown in Table 1.

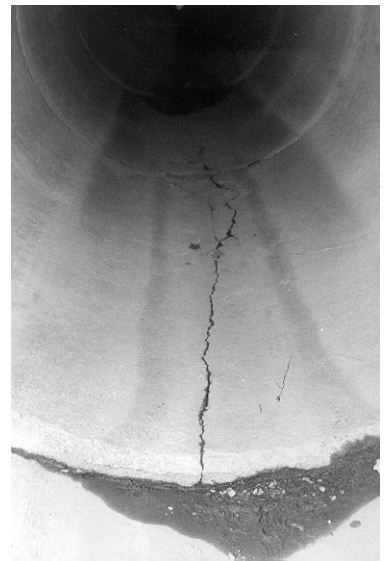


Table 1
HDPE Pipe Dimensions

Nominal Inside Diam. in (mm)	Max Outside Diam. in (mm)	Nominal Inside Diam. in (mm)	Max Outside Diam. in (mm)
4 (100)	4.8 (122)	24 (600)	28.4 (721)
6 (150)	7.0 (178)	30 (750)	35.6 (904)
8 (200)	9.5 (241)	36 (900)	41.4 (1052)
10 (250)	12.0 (305)	42 (1050)	48.0 (1219)
12 (300)	14.5 (367)	48 (1200)	55.0 (1397)
15 (375)	17.8 (452)	54 (1350)	61.0 (1549)
18 (450)	21.5 (546)	60 (1500)	67.3 (1709)

Length of Installation

HDPE pipe joints are not designed to withstand large pulling forces. Furthermore, pushing the liner pipe in through the host pipe may damage the corrugations at the pipe ends as they butt up against each other. The method of installation will affect, in large part, the maximum length that can be slip lined without damaging the pipe. Using skids, especially in a corrugated host pipe, will help minimize resistance between the two surfaces. Skids could be as simple as a pair of 2X4's placed near the invert. A push-and-pull technique keeps stress on the joints to a minimum. Projects in excess of 100 ft (30 m) between access points are addressed in Technical Note 5.11: *Sliplining Extended Lengths with HDPE Pipe*.

Hydraulic Considerations

Original design calculations may be referenced, however careful attention should be given to changes in land use which would change the calculated runoff tributary to the culvert. Once a discharge has been determined, the required size of the HDPE pipe may be established. If original design calculations are not available, the project engineer should complete a thorough drainage study. A culvert size can be selected based on watershed attributes, design storm, allowable headwater, culvert entrance conditions and any other related design factors.

In many cases, where culverts are too deep to make replacement practical, slightly reduced hydraulics may be an acceptable tradeoff to an expensive replacement. Typically, gravity flow systems are designed using Manning's Equation with a conservative 'n' value of 0.012 for HDPE. It should be noted that culverts in need of relining do not have Manning's 'n' values typical of original design values. Relineing with smooth interior HDPE pipe may actually increase the capacity of the deteriorated culvert.

Structural Requirements

Failing culverts in need of relining may eventually deteriorate into a conduit with no structural integrity at all. For this reason, it is important to reline with a culvert capable of handling the loads based on its installation assuming no load reduction from the host pipe. Loading for Highway and pavement tunnels shall be based upon a continuous load carrying structure for the height of cover under HS-25 loading. Voids between the surrounding soil and the host pipe shall be pressure grouted to ensure structural integrity and resistance to thermal effects. For more information for determining the structural capacity of HDPE, refer to the Structures section of the *Drainage Handbook*.

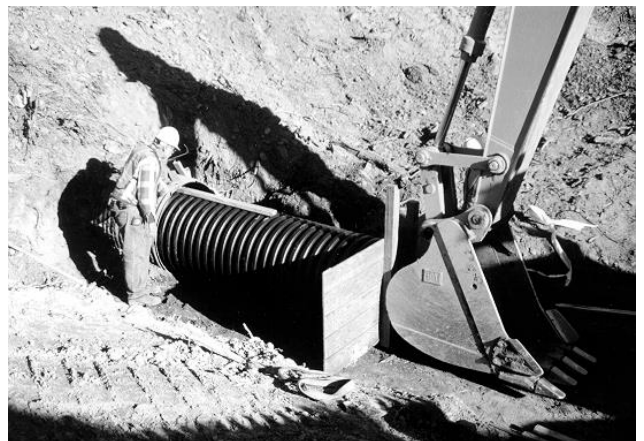
Installation of HDPE in Host Pipe

Before the HDPE pipe is inserted into an existing culvert for relining, it is critical to inspect the existing culvert for any objects or obstructions, which may be extending into the barrel of the existing culvert to be relined. Failure to do this may result in a damaged reline.

Insertion Forces

Once the culvert is clear, the new material may be pushed through. It is important to determine the maximum insertion force that can be applied to the culvert. This will prevent the pipe wall profile from buckling in the axial direction under excessive insertion loading.

In cases where the new culvert will be two or more sizes smaller than the existing culvert, it is possible to construct mechanisms to transport the new material along the existing culvert without sliding across the invert. Although ideal for construction, many times there is insufficient room to allow this technique.



Grouting Procedures

When relining a culvert with HDPE pipe, it is recommended to fill the void space between the existing culvert and the new material with a grout material. The grout material is often a controlled low strength material – controlled density fill (CLSM-CDF). A CLSM or flowable fill material will help provide uniform support on the sides of the pipe, maintain a consistent soil density, provide lateral support for the pipe, and eliminate point loads. For more information on flowable fill mix, refer to Technical Note: *Flowable Fill Backfill for Thermoplastic Pipe*.

It is common for aging metal culverts to have deteriorated or completely destroyed inverts. This allows the fluid carried through the culvert to create void space under the pipe, creating an undesired design consideration. The grout material will help plug and fill any fractures or holes in the existing culvert along with structurally stabilizing the system from thermal, hydrostatic pressure, point loads, and function as a water barrier.



To ensure proper alignment and prevent joint separation, the pipe should be anchored against flotation when placing the grout material. Grouting in layers thin enough such that they don't float the pipe helps tremendously. Each layer should be allowed to set up between pours. Contractors may have other techniques that will also prevent flotation such as the use of deadweight inside the pipe. Regardless of the method used, it is also important to avoid applying point loads to the pipe. For more information on flotation and anchoring methods, refer to Technical Note: *Pipe Flotation*.

When HDPE pipe, or any flexible pipe, is used as a liner, it is very important not to use excessive grout pressure. In most circumstances, the joint, not the wall strength, will be the limiting factor for maximum allowable grouting pressure. Including a factor of safety, the recommended maximum grouting pressure for water tight pipe products is 5 psi; this

value may vary based on specific site conditions and specific products used. Due to the application method of grout, water tight pipe is recommended for sliplining applications. During the grouting operation, gauges should be used to monitor the grout pressure exerted on the pipe system. For some applications, hydrostatic head pressure may increase the expected pressure on the pipe from the grouting. Additional pressure may be a result of the slope and/or diameter of the pipe, elevation changes between the pipe and the gauge, and other conditions that should be considered during the design. The sum of all pressures that will be exerted on the pipe should not exceed the recommended maximum pressure for the application.



Technical Note

TN 5.07 Post Installation Testing for HDPE Pipe

Introduction

HDPE pipe is often tested after or during installation to ensure a sound installation was accomplished. Types of post installation field testing include deflection testing and joint testing. Specific testing required for the project will be found in the project specifications. This technical note is not meant to supersede any project specification, but should be used in conjunction with the project specification and national testing standards as it relates specifically to HDPE pipe.

Deflection Testing

An important feature of any flexible pipe is its ability to deflect, or oval, under load without structural distress. Flexible pipe *must* deflect in order to mobilize the strength of the surrounding backfill. Deflection allows the load to be transferred from the pipe to the surrounding backfill. As a result, flexible pipe can withstand very high loads as a relatively light structure.

According to current thermoplastic design procedures, deflection is defined as a service limit. The designer, considering all site conditions, will set this service limit in order to perform a proper design evaluation. Deflection in excess of this service limit does not necessarily result in strength limits being exceeded, i.e. system failure. For more information on service and strength limit states, see the *Structures* section of the Drainage Handbook. HDPE can be expected to perform satisfactorily in most applications with 5% or 7.5% deflection and so it is typical of designers to choose a service limit in this range.

When testing for allowable deflection limits, the minimum inside diameter should be used when establishing mandrel sizing. The minimum inside diameter accounts for the allowable manufacturing tolerances. Table 1 lists the inside diameters that result from 5% and 7.5% deflection from the minimum inside diameter. Values listed in Table 1 should be used for sizing mandrels for deflection testing. Mandrels may be obtained from a variety of commercial suppliers.

Table 1
Base Inside Diameters for HDPE Pipe

Nominal Pipe Diameter (in.)	Base Inside Diameter (in.)	Base Inside Diameter with 5% Deflection (in.)	Base Inside Diameter with 7.5% Deflection (in.)
4	3.88	3.68	3.59
6	5.82	5.53	5.38
8	7.76	7.37	7.17
10	9.69	9.21	8.97
12	11.63	11.05	10.76
15	14.54	13.82	13.45
18	17.45	16.58	16.14
24	23.27	22.10	21.52
30	29.08	27.63	26.90
36	34.90	33.16	32.28
42	40.72	38.68	37.66
48	46.54	44.21	43.05
54	52.35	49.73	48.43
60	58.17	55.26	53.81

*Value is per AASHTO M252¹ (4"-10" dia.) and AASHTO M294² (12" – 60" dia.).
If designing to a specific standard, please review allowable minimum diameter.

It is important to understand that mandrel testing is a go/no-go test. If any line were to not pass a mandrel, it is important to determine the cause. Obstructions in the line, not associated with deflection, may influence the test. Visual inspection is recommended in the event of a no-go result.

Joint Testing

Joint testing is an important part of any gravity sewer system, both in testing for infiltration and exfiltration. Infiltration aids to estimate the amount of sewer water that will be conveyed to, and ultimately treated by, the waste water treatment plant. Exfiltration aids to estimate the loss of sewage water into the surrounding soil. The two primary ways of testing sewer pipe joints for infiltration and/or exfiltration is using air or water to create a constant pressure within the system.

Exfiltration Testing with Air

Air is a compressible gas and so it is extremely important one adheres to the appropriate safety regulations outlined in OSHA and project specifications. There are two primary national testing standards that may be applied to joint testing HDPE: ASTM F1417 *Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air*, and ASTM F3058 *Preliminary Field Testing of Thermoplastic Pipe Joints for Gravity Flow (Non-Pressure) Sewer Lines*. When either standard is specified by the project plans, one should review the standards carefully and follow the testing procedure and safety precautions outlined. The below commentary on the ASTM testing procedures should be considered a summary and does not replace the testing procedures outlined in their respective specifications.

ASTM F1417 entails testing a run of pipe from one manhole to the next adjacent manhole. Inflatable plugs are positioned into the manholes and secured. Air is introduced into the pipe line and gradually builds pressure. Once the line has been pressurized and is stable at 4.0-psi, the pressure is decreased to 3.5-psi at which time the line must not lose more than 0.5- or 1.0-psi (whichever is specified by the design engineer) in the specified amount of time. Table 2 below summarizes the minimum time that must be reached for less than 0.5- or 1.0-psi of pressure drop, depending on the diameter and length of pipe being tested.

Table 2
Time to Pressure Drop for HDPE (per ASTM F1417)

Pipe Diameter	Pressure Drop (psi)	Minimum Test Time (min:sec)	Length for Minimum Time, (ft)	Time for Longer Lengths, (sec)	Time for Length Shown, (min:sec)							
					100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
12	0.5	5:40	199	1.709 L	5:40	5:40	5:42	7:08	8:33	9:58	11:24	12:50
	1.0	11:20		3.418 L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38
15	0.5	7:05	159	2.671 L	7:05	7:05	8:54	11:08	13:21	15:35	17:48	20:02
	1.0	14:10		5.342 L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04
18	0.5	8:30	133	3.846 L	8:30	9:37	12:49	16:01	19:14	22:26	25:38	28:51
	1.0	17:00		7.692 L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41
24	0.5	11:20	99	6.837 L	11:24	17:57	22:48	28:30	34:11	39:53	45:35	51:17
	1.0	22:40		13.764 L	22:47	34:11	43:34	56:58	68:22	79:46	91:10	102:33
30	0.5	14:10	80	10.683 L	17:48	26:43	35:37	44:31	53:25	62:19	71:13	80:07
	1.0	28:20		21.366 L	35:37	53:25	71:13	89:02	106:50	124:38	142:26	160:15

Data taken from ASTM F 1417³ and Uni-Bell, Uni-B-6-98⁵.

It may not be necessary to hold the test for the entire time period listed above when it is evident that the rate of air loss is zero or less than the allowable pressure drop and authorized by the approving authority¹.

When the pipe is large enough to be physically accessed, it may be desirable to test individual joints for safety reasons. In these cases, one may consider joint testing in accordance with ASTM F3058, also known as a joint isolation test. ADS recommends a joint isolation test, in lieu of a full line test, for testing pipe diameters 36" and larger for safety reasons. This test is typically done with air, though water may also be used, and involves the use of special testing equipment. The equipment consists of two inflatable bladders, placed on each side of the joint, creating an open center cavity between them. The bladders are inflated and then the center cavity is pressurized to 3.5 psi. The joint passes the test if the pressure is held for 5 seconds without dropping more than 1.0-psi. For all practical purposes, this is a go/no-go test. Final acceptance of the pipeline per this testing method shall be at the discretion of the Design Engineer. One advantage of this type of test is the ability for the installer to quickly test the joint immediately after installation, allowing for any corrective measures to be taken early on in the project.

Infiltration/Exfiltration with Water

Testing gravity sewer joints via water infiltration or exfiltration is a common practice. For HDPE, this testing should be conducted in accordance with ASTM F2487 *Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Corrugated High Density Polyethylene Pipelines*. These standards entail first observing the ground water conditions and, if applicable, measuring the infiltration rate of the ground water through the joints. If ground water is not applicable, then the line is filled with water and the leakage is observed through exfiltration.

Manholes shall be tested separately and independently of the pipe line to the requirements established in the project specifications. When water level is measured in the manhole for the exfiltration test, the leakage associated with the manhole shall be subtracted from the overall leakage of the test section to establish a pass or fail grade for the pipe.

Allowable Leakage

The allowable leakage rate for HDPE is 200 gallons/in-dia/mi-pipe/day for both infiltration and exfiltration when tested in accordance with ASTM F2487

Conclusion

HDPE pipe is intended for gravity flow drainage applications and may be tested for deflection and joint tightness as discussed in this technical document. It is important to note that the testing procedures are no different than for other gravity flow drainage products currently being used in the market. This document does not purport to address the safety concerns associated with testing HDPE pipe. Any questions associated with testing HDPE pipe can be directed to your local representative.

References

1. AASHTO M252, *Standard Specification for Corrugated Polyethylene Pipe Drainage Pipe*, AASHTO, 2012
2. AASHTO M294, *Standard Specification for Corrugated Polyethylene Pipe, 300 to 1500 mm (12 to 60 in.) Diameter*, AASHTO, 2015
3. ASTM F1417, *Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air*, ASTM, 2005
4. F3058, *Preliminary Field Testing of Thermoplastic Pipe Joints for Gravity Flow (non-Pressure) Sewer Lines*, ASTM, 2016.
5. Uni-B-6-98, *Recommended Practice for Low-Pressure Air Testing of Installed Sewer Pipe*, Uni-Bell PVC Pipe Association, 1998
6. ASTM F2487, *Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Corrugated High Density Polyethylene Pipelines*, ASTM, 2006



Technical Note

TN 5.10 Integral Bell Transition for HDPE Pipe

ADS offers a variety of joints to the market place. Corrugated HDPE pipe can be cut at any corrugation allowing a great degree of flexibility in making field cuts. Plain end pipe can be connected using split couplers, cleated bell-bell couplers, or bell end couplers and gaskets. The standard pipe joint ADS offers is the Integral Bell (IB) joint which requires field cuts when transitioning to plain end pipe, fittings or other materials.

ADS N-12[®] IB pipe has an integral bell which maintains a constant pipe outside diameter (OD). This constant OD eliminates the need for bell holes and makes it easier to maintain line and grade during installation. The gasketed bell and spigot design, with an elastomeric rubber gasket meeting ASTM F477, is intended for soil-tight (ST) or watertight (WT), gravity-flow storm sewer applications, as defined in ASTM F 2306 and ASTM D 3212..

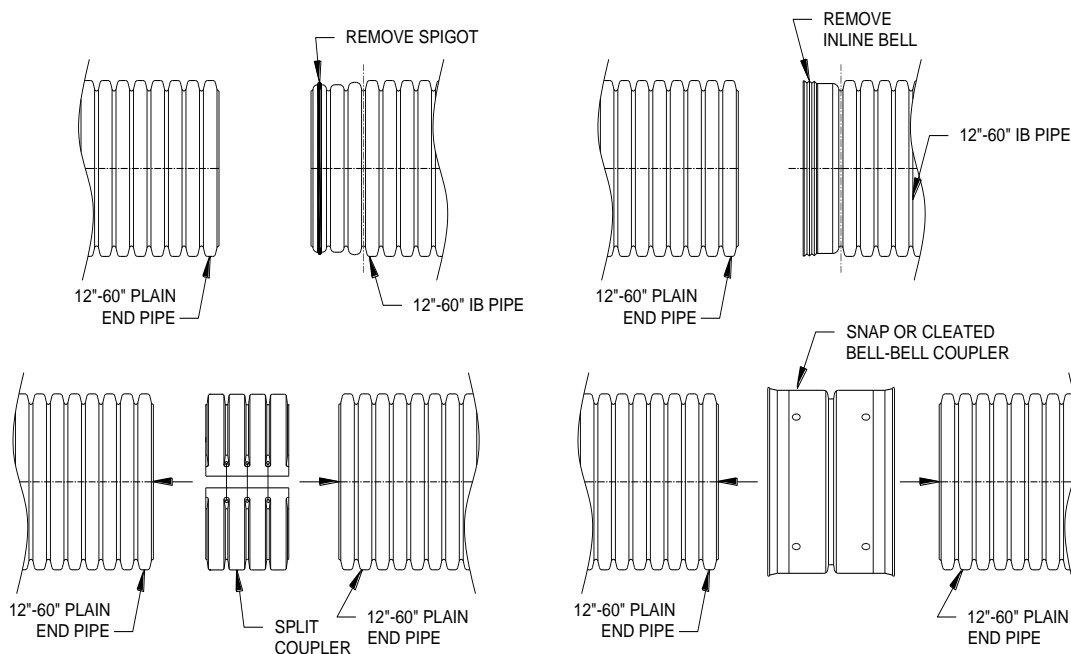
Connections for Integral Bell Pipe

With the variety of couplers available, connecting to existing pipe runs or to fabricated fittings may necessitate a transition to other ADS joints. ADS fittings come as either plain end or bell end; which makes it necessary to transition from an IB joint to either a plain end connection or a bell end connection. This technical note will give guidance in selecting the proper method of making these connections.

Integral Bell Pipe to Plain End Pipe (12" – 60") (Plain End Pipe/Fitting Connections)

Remove the bell or spigot end of the pipe. The spigot end on 12"-60" pipe will have mini or reduced-size corrugations; for smaller diameter pipe, 4"-10", there will be no mini corrugations to remove. Utilize a split coupler or cleated bell-bell coupler (snap coupler) to make the connection. Refer to Figure 1 for common configurations. This connection is considered soil-tight in most embedment soil conditions.

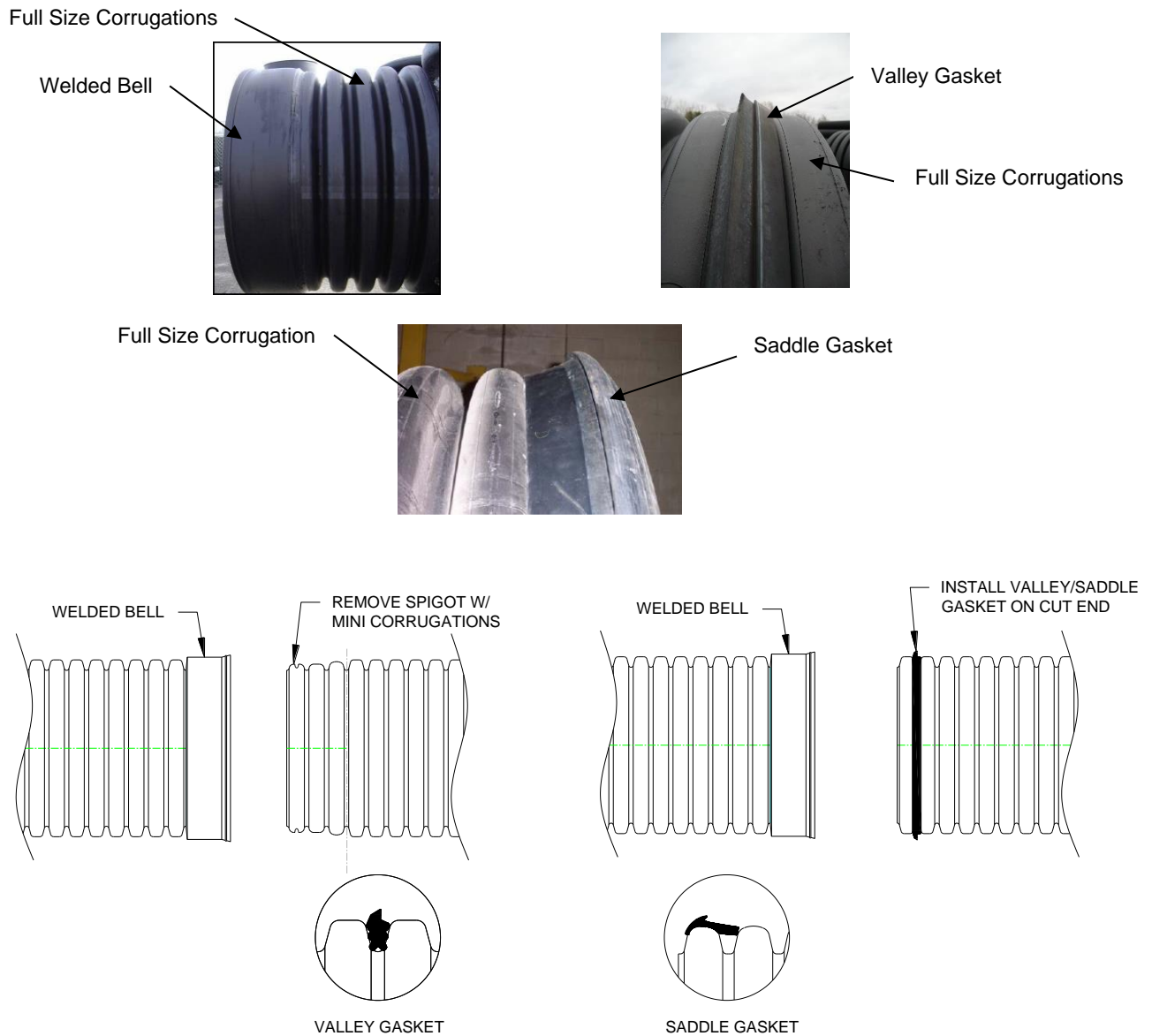
Figure 1
Integral Bell Pipe to Plain End Pipe Connection



Integral Bell Pipe to a Welded Bell (Welded Bell End Pipe/Fitting Connections)

To connect pipe or fittings, which already have a welded bell, remove the mini corrugations from the spigot end of pipe or the IB bell from the bell end. The welded bell can be identified easily compared to the integral bell, because a weld seam will be present where the bell and corrugations meet. In addition to the weld seam, the OD of the welded bell is slightly larger than the OD of the adjacent corrugations. Refer to the pictures in Figure 2. Once the mini corrugations or IB bell have been removed, install a valley gasket (12"-36") or saddle gasket (42"-60") provided by ADS. Valley gaskets are to be placed in the valley behind the first corrugation crown. Saddle gaskets are placed on the crown of the first corrugation. Lettering printed on the gasket will face the joining bell. Lube gasket and the inside of the welded bell, be sure to lube the bells leading edge, and insert the spigot into the welded bell. This connection is considered soil-tight or watertight based on the type of gasket used. Consult an ADS representative to ensure the correct gasket is ordered to meet connection performance requirements.

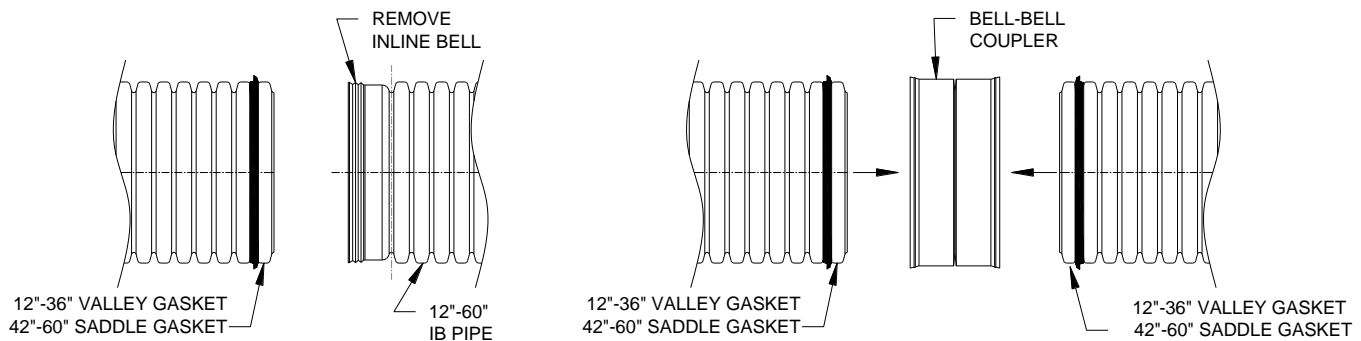
Figure 2
Welded Bell Connection



Integral Bell Pipe to Bell-Bell Coupler Connection

Some field modification will require the use of a bell-bell coupler in conjunction with a valley or saddle gasket. This field joint configuration follows very similarly to that described above for welded bell pipe/fitting connections. Remove the inline bell, spigot and/or the appropriate number of corrugations needed to make the connection and install a valley gasket (12"-36") or saddle gasket (42"-60") provided by ADS. Valley gaskets are to be placed in the valley behind the first corrugation crown. Saddle gaskets are placed on the crown of the first corrugation. Lettering printed on the gasket will face the joining bell. The joint will now consist of two pipes/fitting which each have a valley or saddle gasket installed as shown in Figure 3. Lubricate the interior and leading edge of a bell-bell coupler and the valley/saddle gaskets. Connect the pipes by inserting the valley/saddle gasket end of the pipes into the bell-bell coupler. This connection is considered soil-tight or watertight based on the type of gasket used. Consult an ADS representative to ensure the correct bell-bell coupler with accompanying gasket is ordered to meet connection performance requirements. If a non-gasketed connection is allowed, a split coupler or cleated bell-bell coupler (snap coupler) can be used in place of the bell-bell coupler for a soil-tight joint.

Figure 3
Bell-Bell Coupler Connection



Vent Tube Sealing

The manufacturing process of corrugated plastic pipe requires the release of hot air from inside the corrugations in order to properly form the corrugations. This hot air is allowed to escape from the corrugations during the extrusion process via vent tubes that run the length of the pipe. Vent tubes become exposed when the pipe is cut in the field to install a fitting, connect to a manhole, or otherwise adjust the length of a pipe run. Exposed vent tubes may result in a leak path, and therefore is recommended that they be sealed. It is important that these vent tubes be sealed whenever the pipe is cut in the field. Please see Technical Note 5.16: *Methods for Sealing Vent Tubes* for instructions on sealing the vent tubes.



Corrugated Plastic Pipe Storm **Installation Guide**



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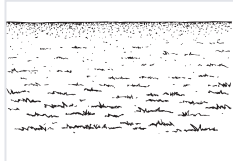
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Job Site Handling and Receiving

Receiving Recommendations

Our distributors and customer service personnel make service and customer satisfaction their highest priority. If your order is incorrect, contact your distributor or our customer service personnel.

- Direct driver to a smooth, flat area, free of rocks and debris.



- Examine load quantities and quality immediately after unloading.

Inspect pipe carefully for possible damage from transportation or unloading.



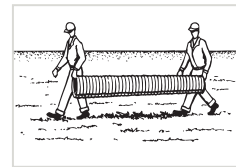
- Note damaged or missing items on delivery receipt.
- Shortages and damaged material are not automatically reshipped. Reorder replacement material.
- Do not dispose of damaged items. Check with driver for proper return method. If driver is unsure, contact our customer service personnel.

Handling Recommendations

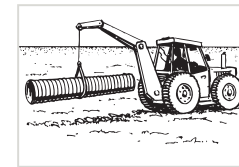
To avoid damage to the pipe and fittings the following handling recommendations should be followed:

- OSHA safety requirements.

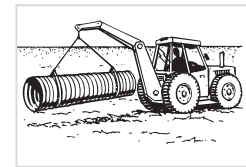
- Do not drop pipe.
- Avoid any impact to the bell or spigot.
- 18" (450 mm) and smaller pipe can be moved by hand. Larger pipe requires a backhoe with a nylon sling.
- Lift 36" (900 mm) and larger diameter pipe with a sling at two points, spaced approximately 10 feet (3 m) apart. Smaller diameters can use one lift point. Refer to Table 1 for recommended handling methods.



≤18" (450mm)



24"-30" (600-750mm)



≥36" (900mm)

- Contractor assistance is required to unload palletized pipe.
- Do not use a loading boom or forklift directly on or inside pipe.

Table 1: Recommended Pipe Handling Method

Diameter in (mm)	HDPE Approx. lb/ft (kg/m)	HP DW Approx. lb/ft (kg/m)	Handling Method
4" (100)	0.44 (.65)	n/a	Labor
6" (150)	0.85 (1.3)	n/a	Labor
8" (200)	1.5 (2.2)	n/a	Labor
10" (250)	2.1 (3.1)	n/a	Labor
12" (300)	3.2 (4.8)	3.6 (5.4)	Labor
15" (375)	4.6 (6.9)	5.3 (7.9)	Labor
18" (450)	6.4 (9.6)	7.1 (10.5)	Labor
24" (600)	11.0 (16.4)	11.9 (17.7)	Sling (1 point)
30" (750)	15.2 (22.6)	16.8 (24.9)	Sling (1 point)
36" (900)	19.8 (29.5)	20.3 (30.2)	Sling (2 points)
42" (1050)	24.3 (36.1)	25.1 (37.4)	Sling (2 points)
48" (1200)	30.9 (45.9)	32.4 (48.2)	Sling (2 points)
60" (1500)	44.5 (66.3)	49.6 (73.8)	Sling (2 points)

**Recommended handling methods are based on two laborers per pipe length, neither of which is carrying more than 100 lb. (45kg).*

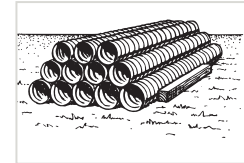
Job Site Pipe Storage

Storage Recommendations

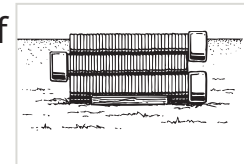
To ensure that your delivered pipe products do not become damaged during job site storage, follow these simple guidelines:

- Non-palletized pipe may be temporarily stockpiled on a flat, clear area.
- Use securing timbers (or blocks) to ensure the stockpile does not collapse.
- Failure to block pipe may result in stack collapsing, pipe damage, or personal injury.

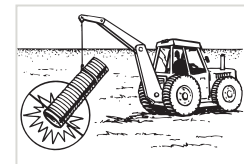
- Stack pipe no higher than approximately 6 feet (1.8 m).



- While supporting lengths of pipe evenly, alternate bells for each row of pipe.



- To prevent damage to the bell or spigot when moving pipe sections, do not drag or strike pipe ends against anything.



Trench Construction

- Information provided in this pocket installation guide is intended as a quick reference only and does not supersede requirements specified on project plans.
- The trench or ditch should be wide enough to place and compact backfill around the entire pipe.
- Refer to Table 2 for recommended minimum trench widths. The design engineer may modify the trench width based on site specific conditions.

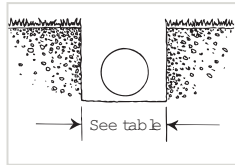


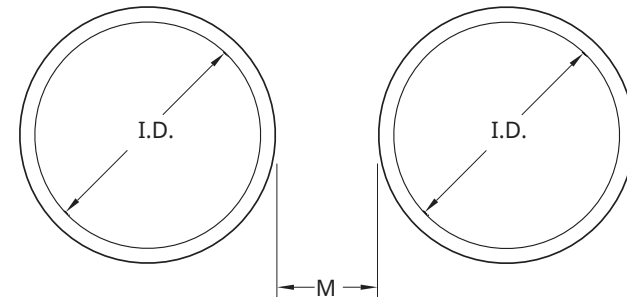
Table 2: Minimum Trench Widths

Pipe Diameter in (mm)	Trench Width in (mm)
4"-8" (100-200)	*
10" (250)	28" (711)
12" (300)	30" (762)
15" (375)	34" (863)
18" (450)	39" (990)
24" (600)	48" (1219)
30" (750)	56" (1422)
36" (900)	64" (1625)
42" (1050)	72" (1828)
48" (1200)	80" (2032)
60" (1500)	96" (2438)

**Usually dependent on smallest bucket size available.*

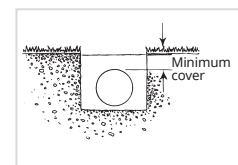
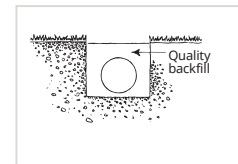
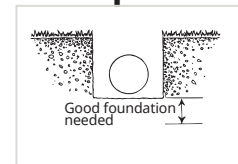
- For parallel pipe installations, allow space between pipes for proper compaction. Refer to Figure 1 for minimum pipe spacing. Spacing will differ for retention/detention systems due to the intended use of this product.

Figure 1: Parallel Pipe Installation



UP TO 24" (600MM) I.D.: M=12" (300MM)
 MORE THAN 24" (600 mm) I.D.: M=1/2 I.D.

- Trench or ditch bottoms containing bedrock, soft muck or refuse, or other material unable to provide long-term uniform pipe support are **unacceptable**.
- All unsuitable foundation shall be excavated before pipe installation proceeds.
- Where the trench bottom is unstable, the contractor shall excavate to a depth required by the engineer and replace with suitable material as is specified by the engineer.



- If native soil can migrate into backfill, use synthetic fabric (geotextile) to separate native soil from backfill.

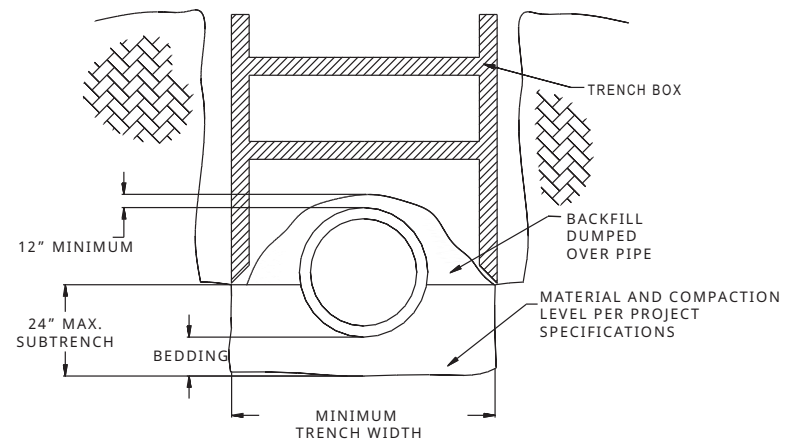
Trench Boxes

Trench boxes provide a safe work area to install pipe in deep trenches or in soils that have insufficient stability. **Always** follow OSHA requirements when using a trench box.

The length of the trench box should be suitable for the pipe length. Nominal length for pipe is 20 ft. (6.1 m) although shorter lengths can be supplied.

The most effective way to maintain a sound system is to provide a 'subtrench' within which to place the pipe and backfill. The subtrench shall not be greater than 24" (600 mm) above the bottom on the trench as shown in Figure 2. Backfill and compact according to the design specifications within the subtrench. The trench box can be pulled along the top edge of the subtrench without affecting the backfill in the pipe embedment zone.

Figure 2: Subtrench Installation

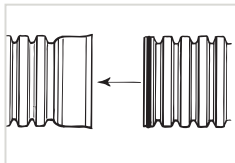
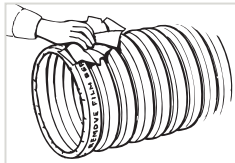
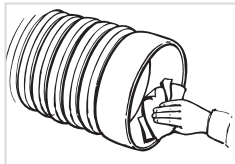


In installations not involving a subtrench, dragging a trench box should only be done if it does not damage the pipe or disrupt the backfill; otherwise, the box should be lifted vertically into its new position, again taking great care not to disturb the pipe or backfill.

Bell & Spigot Joint Assembly

For pipe with a bell-and-spigot connection, it is imperative that the joint be assembled properly to ensure that the product performs to expectations. The steps that must be followed to obtain a quality joint are provided below. Failure to follow these instructions may cause the joint quality to be severely compromised.

- Lower pipe into trench by hand, or use nylon straps and excavating equipment.
- Begin by inspecting the bell and remove any foreign matter.
- Use a clean rag or brush to lubricate bell of pipe lubricant.
- Clean spigot end of pipe.
- Remove protective wrap from gasket.
- Using clean rag or brush, lubricate exposed gasket with pipe lubricant.
- Do not allow lubricated section to touch dirt or backfill. Foreign matter could adhere to surface and compromise joint integrity.
- Place spigot into bell and align.
Note: It is recommended that one always lay pipe starting at the down stream end, pushing spigots into bells with the bells facing upstream. Always push spigot ends into bell, **not** bell end into spigot.

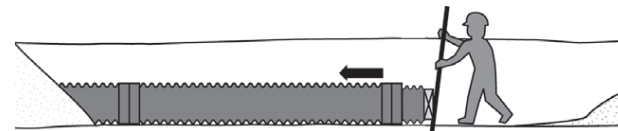


Assemble joint using one of the following methods. (For smaller diameters, pipe may be joined manually.)

- For all methods, ensure bell and spigot are adequately “homed” for proper installation and tight joining seal. If no homing mark is present, measure the depth of the bell and use a crayon or other material to place a homing mark on appropriate corrugation of the spigot end. Care should be taken to not over home the pipe during assembly.
- Installation stubs, mentioned in the assembly instructions, can be purchased or made following the information on page 15.
- Some high joint performance applications may require the joint to be held in place for a short time, immediately after insertion, to properly set the gasket.

Bar & Block Method

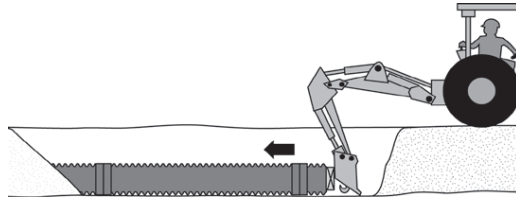
- Place installation stub into bell end of pipe.
- Place wooden block horizontally across end of installation stub.
- With a bar, push against wooden block until pipe is fully inserted into bell.



NOTE: This method requires use of installation stub. DO NOT push directly against pipe.

Backhoe Method

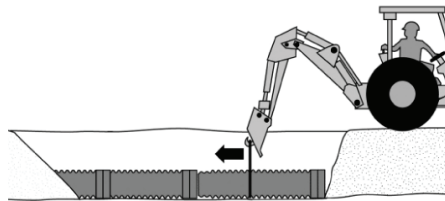
- Place installation stub into bell end of pipe.
- Place wooden block horizontally across installation stub.
- Carefully push back of backhoe bucket against block until pipe is fully inserted into bell.



NOTE: This method requires use of installation stub. DO NOT push backhoe directly against pipe.

Backhoe and Sling Method

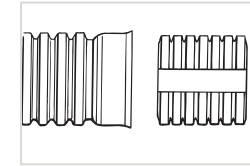
- Wrap nylon sling around pipe. Pipe 36" (900 mm) or larger should be picked up at two points approximately 10' (3m) apart.
- Hook other end of nylon sling to backhoe bucket.
- Operator should carefully push strap tight toward bell of downstream pipe until spigot is fully inserted into bell.
- Ensure pipe slides **squarely** into bell to avoid misalignment.
- **Keep pipe level.**



NOTE: Distance from bedding to bottom of pipe not to exceed 6" (150mm) for a 20' (6m) pipe.

Installation Stub Fabrication

To push "home" bell-and-spigot pipe, an installation stub can be used to prevent accidental damage to the bell. Installation stubs are not required if the bell is not pushed on directly. Installation stubs in all sizes are available from your distributor, or you can fabricate your own on site by following the proceeding steps:



- Cut a section of pipe five corrugations long in the center of the corrugation valley.
- Using a saw, remove a strip of pipe wall from the short stub of pipe (Figure 3). Note: Strip width depends on pipe size. See Table 3 for recommended widths.

Figure 3: Installation Stub

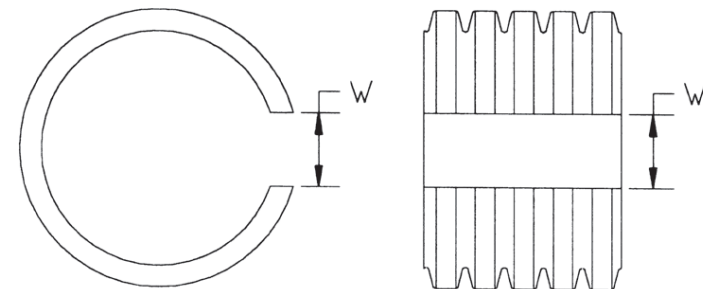


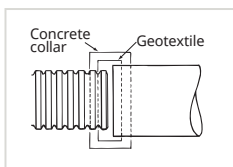
Table 3: Strip Width for Installation Stub

Pipe Diameter in (mm)	Trench Width in (mm)
4"-6" (100-150)	2 (51)
8" (200)	2.5" (64)
10"-12" (250-300)	4" (102)
15" (375)	5" (127)
18" (450)	6" (152)
24" (600)	7.5" (191)
30"-42" (750-1050)	10" (254)
48"-60" (1200-1500)	12" (305)

- To use stub, push on pipe walls to change O.D. of stub to I.D. of bell to be installed.

Joining Different Pipe Types or Sizes

Drainage systems often involve connecting pipes of different materials or sizes. Options to make these transitions are often limited by the joint quality required. One very common method of connecting different types of pipe of the same size, and in some cases different sizes, is through the use of a concrete collar. This generally provides a minimum silt-tight joint quality but the resulting quality ultimately depends on workmanship.



- A concrete collar is formed by butting the two pipe ends tightly together, wrapping the junction with a geotextile to keep out most soil and concrete, and then pouring a concrete collar that covers both pipe ends.

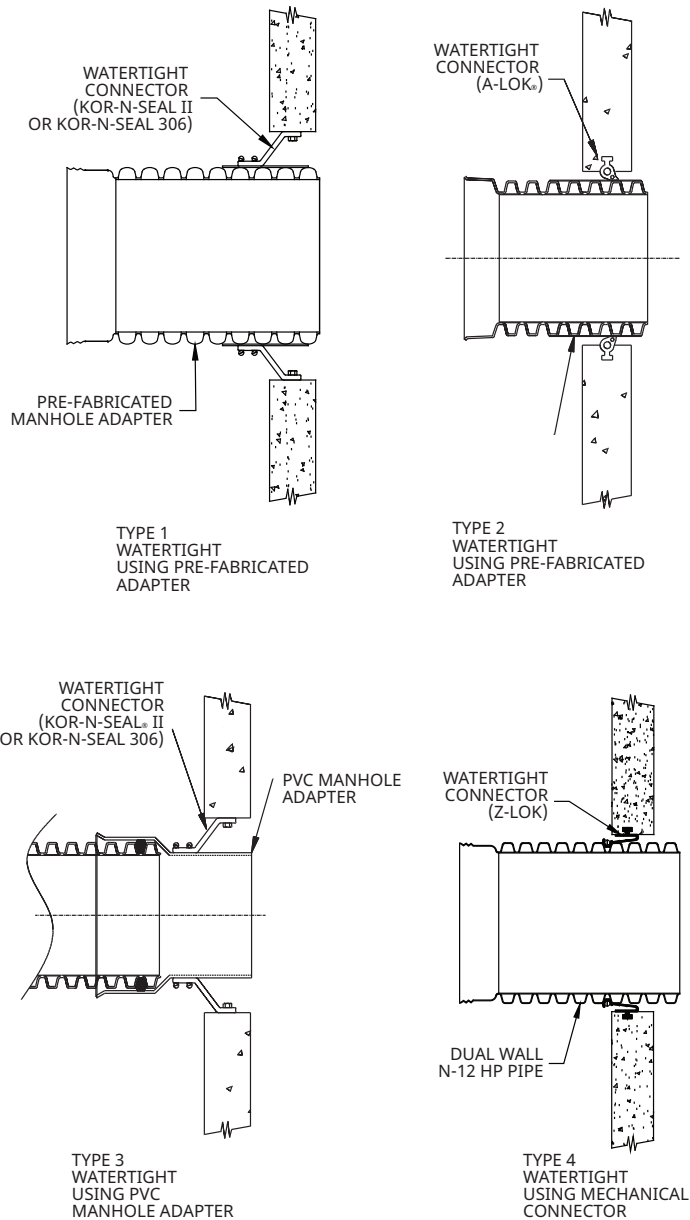
Another option may be using fittings or adapters specifically designed for this application. A selection of fittings designed to make the transition from one material directly to another is available. In other cases a fitting may need to be used in combination with another manufacturer's gasket or coupler to complete the transition. Transitions made in this manner may provide for a higher performance joint than a concrete collar.

Manholes and Catch Basin/Connections

Manholes or catch basins can be used at changes in pipe material, size, grade, direction and elevation. Manholes and catch basins can be more costly than other alternatives but also allow grade and directional changes in addition to changes in pipe material and size.

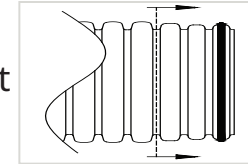
- Local regulations should be consulted to determine if manholes or catch basins are required at any or all pipe changes.
- Refer to Figure 4 for the acceptable methods of connecting plastic pipe to manholes or basins.
- See appendix for references to additional product specific resources applicable to connecting pipe to manholes.

**Figure 4: Manhole Connection
Product Details**



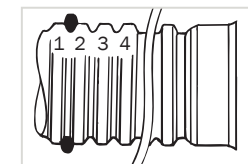
Field Gasket Assembly

When standard lengths of pipe must be cut to fit in a field application, the following instructions will ensure proper performing joints:



- For reduced spigot pipe **ONLY**, reducing spigot must be removed.
- Using a saw, cut in the center of the valley of the first full corrugation.
- Trim remaining plastic burrs from saw cut. *Note: Failure to smoothly trim burrs may compromise joint integrity.*
- Wipe clean first valley from end of pipe. *This is where gasket will be placed.*
- Hold gasket with both hands so printing is facing you.
- With printing on gasket face-up and toward spigot end of pipe, slide gasket into first corrugation valley, starting at bottom. *Note: It is easier to pull gasket up to conform to valley.*
- Slide gasket into first corrugation valley by hand.
- Ensure printing on gasket is face-up and toward spigot end of pipe.
- Vent tubes shall be appropriately scaled at joint where applicable, see *Technical Note 5.10: Integral Bell Transition for HDPE.*

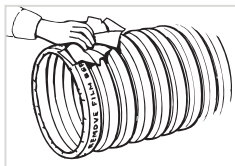
Gasket printing should be visible in this location when properly installed.



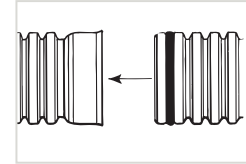
Fittings Assembly

This section includes information necessary for:

1. Soil-tight belled fittings
 2. Watertight fittings
 3. Repair couplers
- Cut pipe to desired length in the center of the corrugation valley before placing in trench.
 - Trim remaining polyethylene burrs from saw cut. Note: Failure to smoothly trim burrs may compromise joint integrity.
 - Excavate bedding from around spigot end where fitting shall be used. A bell hole will help prevent dirt and debris from contaminating joint during assembly.
 - Install gasket in accordance with gasket assembly procedure (page 19).
 - Measure the depth of the bell and use a crayon or other material to place a homing mark on appropriate corrugation of the spigot end.
 - Vent tubes shall be appropriately sealed at joint where applicable, see *Technical Note 5.10: Integral Bell Transition for HDPE*.
 - Using clean rag or brush, lubricate exposed gasket with pipe lubricant.
 - Do not let lubricated section touch dirt or backfill, as foreign material could adhere to surface and compromise joint integrity.



- Inspect fitting and remove any foreign matter.
- Align and center pipe.
- Lubricate inside of bell.
- Align fitting with pipe end.
- Use installation stub or blocking where required.
- Take care not to damage pipe or fittings.
- Ensure pipe is straight and bell reaches homing mark.
- Assemble other end of pipe or fitting as described in the pipe assembly section on page 12.
- Special care should be taken to replace and compact bedding material in bell hole to provide adequate support under the joint.



Backfill Recommendations

Plastic pipe and a well-constructed backfill envelope work together to support soil and traffic loads. Correct installation will ensure long-term trouble-free service for all types of pipe systems.

Backfill Material Selection

- Provided the plans meet minimum recommendations as stated in Table 4, they should take precedence.
- Locally available materials may be acceptable for backfill use, but must meet one of the acceptable soil classifications outlined in Table 4.
- Class I materials can be dumped around pipe. Voids must be eliminated by knifing under and around pipe or by some other technique.
- Non-cohesive sand, sand/gravel mixes and other Class II and III materials must be compacted to a minimum of 85% and 90% standard Proctor density, respectively.
- Inorganic silts, and gravelly, sandy or silty clays, and other Class IV materials are not permitted.
- Flowable fill is another acceptable backfill material. Misalignment or flotation may occur unless added precautions are taken, such as anchoring the pipe or pouring the flowable fill in lifts.
- See appendix for references to additional product specific resources that may be used when installing corrugated plastic pipe.

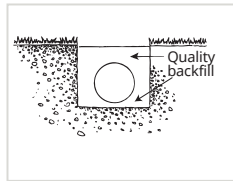
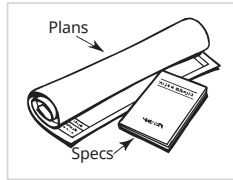


Table 4: Acceptable Backfill Material and Compaction Requirements

Description	Soil Classification			Minimum Standard Proctor Density %
	ASTM D2321	ASTM D2487	AASHTO M43	
Graded or crushed, crushed stone, gravel	Class I	-	5 56	Dumped
Well-graded sand, gravels and gravel/sand mixtures; poorly graded sand, gravels and gravel/sand mixtures; little or no fines	Class II	GW GP SW SP	57 6	85%
Silty or clayey gravels, gravel/sand/silt or gravel and clay mixtures; silty or clayey sands, sand/clay or sand/silt mixtures	Class III	GM GC SM SC	Gravel and sand (<10% fines)	90%

* Layer heights should not exceed 1/2 the pipe diameter. Layer heights may also need to be reduced to accommodate compaction method.

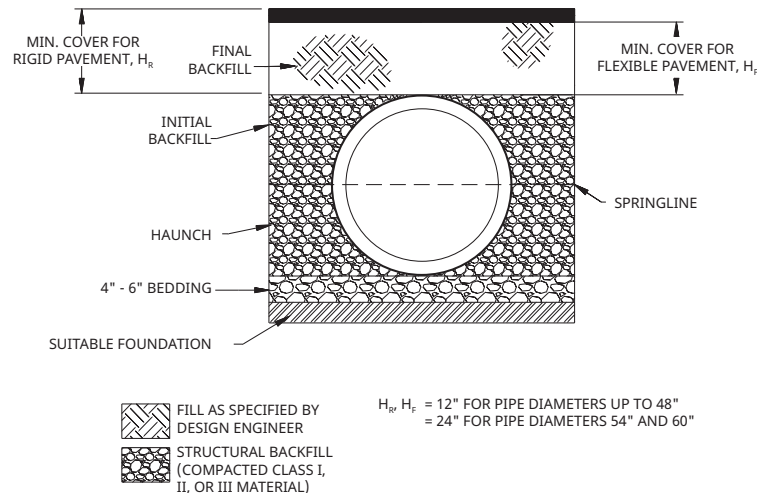
Groundwater or Surface Runoff

When groundwater or surface runoff is present in the work area, dewater to maintain stability of native and imported materials. Maintain water level below pipe foundation to provide a stable trench bottom.

Backfill Envelope Construction

- If native soil cannot carry load, import, compact and level adequate bedding material as in Figure 5.
- Figure 5 represents typical trench construction applicable to all products. See appendix for references to additional product specific resources.

Figure 5:



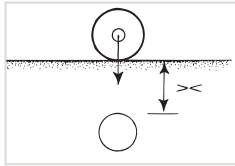
- Place and compact backfill in layers to meet requirements of Table 4 and project requirements. Note that the large diameter pipes may require layer heights less than those indicated in the table to achieve proper compaction.
- Avoid impacting pipe with compaction equipment.
- 4" - 48" (100-1200 mm) single pipe runs receiving H-25 traffic requires final backfill 12" (0.3 m) above initial backfill to provide at least 12" (0.3 m) of total cover as measured from the top of pipe to bottom of flexible pavement or to top of rigid pavement.
- 60" (1500 mm) single pipe runs receiving H-25 traffic require final backfill 24" (0.6 m) above initial backfill to provide at least 24" (0.6 m) of total cover as measured from top of the pipe to the bottom of flexible pavement or to top of rigid pavement.
- Minimum cover may be reduced in areas with no or infrequent light traffic. These situations must first be reviewed by the pipe manufacturer.

Other Installation Considerations

All unique situations cannot be anticipated; however, several common questions are answered in the following material.

Construction and Paving Traffic

- Some construction vehicles, such as many types of paving equipment, are not as heavy as the design load.
- For situations with relatively light construction vehicles, the 12" (0.3 m) and 24" (0.6 m) minimum covers criteria discussed earlier can be decreased during the construction phase.
- Table 5 presents the surface applied loads and the corresponding minimum cover that can be permitted on a temporary basis. *These criteria should only be employed during construction; finished projects should always have a minimum*



cover of at least 12" (0.3 m) for 4" - 48" (100-1200 mm) diameters and minimum cover of at least 24" (0.6 m) for 60" (1500 mm) diameters.

- Vehicles exceeding these criteria must not be permitted to drive over the installation.
- Areas receiving heavy construction equipment traffic between 30 and 60 tons require at least 3 feet (0.9 m) of cover. Higher loads require cover greater than 3 feet (0.9 m), depending on the load.
- If sufficient cover is not provided, mound and compact material over pipe to provide minimum cover needed for load during construction.
- For heavy duty compaction equipment, such as a hoe-pack or equivalent type compactor, a minimum of 3 feet (0.9 m) of compacted backfill shall separate the pipe from the equipment.

Table 5: Temporary Cover Requirements for Light Construction Traffic

Type of Vehicle	Vehicular Load at Surface psi (kPa) ASTM D2321	Temporary Minimum Cover in (mm) for:	
		4"-48" (100-1200) Diameter Pipe	54"-60" (1350-1500) Diameter Pipe
Semi-tractor ¹	75 (517)	9 (230)	12 (300)
Loaded pick-up truck ²	50 (345)	6 (150)	9 (230)
Skid steer loader ³	25 (172)	3 (80)	6 (15)

1. Based on typical 3-axel day-trip tractor without trailer.

2. Chevy® 3500 series, fully loaded.

3. Bobcat® T180 model skid steer loader.

Table 6: Maximum Cover for ADS N-12, N-12 ST & N-12 WT Pipe (per AASHTO) ft (m)

Diameter in (mm)	Class 1		Class 2			Class 3	
	Compacted	Dumped	95%	90%	85%	95%	90%
4" (100)	37 (11.3)	18 (5.5)	25 (7.6)	18 (5.5)	12 (3.7)	18 (5.5)	13 (4.0)
6" (150)	44 (13.4)	20 (6.1)	29 (8.8)	20 (6.1)	14 (4.3)	21 (6.4)	15 (4.6)
8" (200)	32 (9.8)	15 (4.6)	22 (6.7)	15 (4.6)	10 (3.0)	16 (4.9)	11 (3.4)
10" (250)	38 (11.6)	18 (5.5)	26 (7.9)	18 (5.5)	12 (3.7)	18 (5.5)	13 (4.0)
12" (300)	35 (10.7)	17 (5.2)	24 (7.3)	17 (5.2)	8 (2.4)	17 (5.2)	11 (3.4)
15" (375)	38 (11.6)	17 (5.2)	25 (7.6)	17 (5.2)	8 (2.4)	18 (5.5)	11 (3.4)
18" (450)	36 (11.0)	17 (5.2)	24 (7.3)	17 (5.2)	8 (2.4)	17 (5.2)	11 (3.4)
24" (600)	28 (8.5)	13 (4.0)	20 (6.1)	13 (4.0)	7 (2.1)	14 (4.3)	10 (3.0)
30" (750)	28 (8.5)	13 (4.0)	20 (6.1)	13 (4.0)	7 (2.1)	14 (4.3)	9 (2.7)
36" (900)	26 (7.9)	12 (3.7)	18 (5.5)	12 (3.7)	7 (2.1)	13 (4.0)	9 (2.7)
42" (1050)	23 (7.0)	11 (3.4)	16 (4.9)	11 (3.4)	7 (2.1)	11 (3.4)	7 (2.1)
48" (1200)	25 (7.6)	11 (3.4)	17 (5.2)	11 (3.4)	7 (2.1)	12 (3.7)	7 (2.1)
60" (1500)	25 (7.6)	11 (3.4)	17 (5.2)	11 (3.4)	6 (1.8)	12 (3.7)	7 (2.1)

Maximum Cover

The maximum burial depth is highly influenced by the type of backfill installed around the pipe. Maximum cover limits for dual wall HDPE pipe made to the requirements of AASHTO M252, M294 and ASTM F2306 are shown in Table 6 for a variety of backfill conditions. Maximum cover limits for HP pipe made to the requirements of ASTM F2881 and AASHTO M330 are shown in Table 7. Greater cover heights may be possible but should be reviewed by the Engineering Department.

Notes:

- 1) Results based on calculations shown in the Structures section of the Drainage Handbook (N20.2). Calculations assume no hydrostatic pressure and a density of 120 pcf (1926 kg/m³) for overburden material.
- 2) Installation assumed to be in accordance with ASTM D2321 and the installation section of the Drainage Handbook.
- 3) For installations using lower quality backfill materials or lower compaction efforts, pipe deflection may exceed the 5% design limit; however controlled deflection may not be a structurally limiting factor for the pipe. For installations where deflection is critical, pipe placement techniques or periodic deflection measurements may be required to ensure satisfactory pipe installation.
- 4) Backfill materials and compaction levels not shown in the table may also be acceptable. Contact ADS for further detail.
- 5) Material must be adequately "knifed" into haunch and in between corrugations. Compaction and backfill material is assumed uniform throughout entire backfill zone.
- 6) Compaction levels shown are for standard Proctor density.
- 7) For projects where cover exceeds the maximum values listed above, contact ADS for specific design considerations.
- 8) Calculations assume no hydrostatic pressure. Hydrostatic pressure will result in a reduction in allowable fill height. Reduction in allowable fill height must be assessed by the design engineer for the specific field conditions.
- 9) Fill height for dumped Class 1 material incorporate an additional degree of conservatism that is difficult to assess due to the large degree of variation in the consolidation of this material as it is dumped. There is limited analytical data on its performance. For this reason, values as shown are estimated to be conservatively equivalent to Class 2, 90% SPD.

Vertical Installations

- Corrugated plastic pipe is sometimes installed vertically for use as catch basins or manholes, meter pits, and similar applications.
- Backfill should extend a minimum of 12" (300 mm) completely around the vertical structure.
- Backfill material recommendations are identical to those for a horizontal installation; compaction levels and maximum lift requirements must be strictly followed (refer to Table 4 for material selection).
- Height of the vertical structure must not exceed 8' (2.4 m), unless the Engineering Department reviews the design.
- If traffic will be driving over a vertical structure, a concrete collar similar to that shown in Figure 6 shall be used to transfer the load into the ground.
- Cast iron frames holding grates or lids must be seated on a concrete collar or similar structure so that the weight of the frame and grate or lid is transferred into the ground, *not* to the vertical pipe.
- There may also be other product performance limits depending on the application. Contact Engineering for further information.

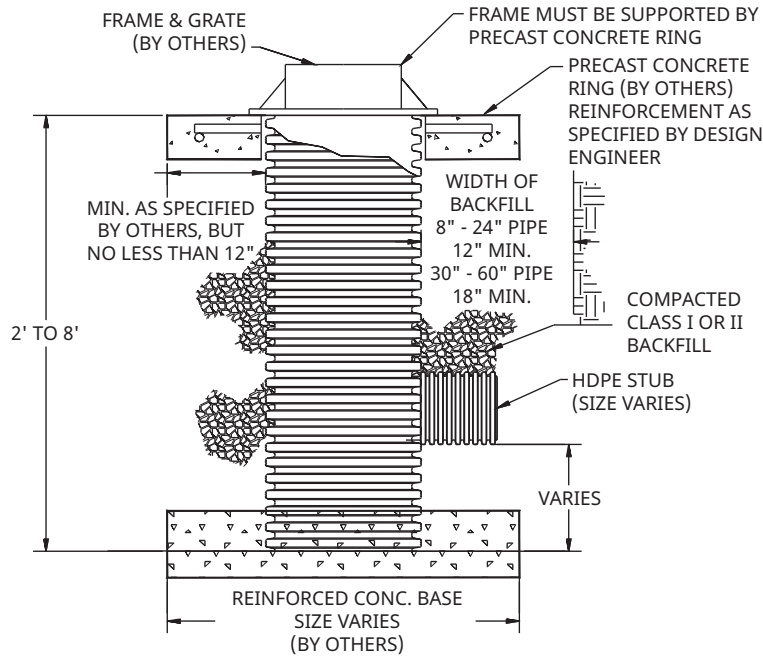
Table 7: Maximum Cover for ADS HP Storm Pipe with Uniform Backfill ft (m)

Diameter in (mm)	Class 1	Class 2			Class 3		Class 4
	Compacted	95%	90%	85% ³	95%	90% ³	95% ³
12" (300)	41 (12.5)	28 (8.5)	21 (6.4)	16 (4.9)	20 (6.1)	16 (4.9)	16 (4.9)
15" (375)	42 (12.8)	29 (8.8)	21 (6.4)	16 (4.9)	21 (6.4)	16 (4.9)	16 (4.9)
18" (450)	44 (13.4)	30 (9.1)	21 (6.4)	16 (4.9)	22 (6.7)	17 (5.2)	16 (4.9)
24" (600)	37 (11.3)	26 (7.9)	18 (5.5)	14 (4.3)	19 (5.8)	14 (4.3)	14 (4.3)
30" (750)	39 (11.9)	27 (8.2)	19 (5.8)	14 (4.3)	19 (5.8)	15 (4.6)	14 (4.3)
36" (900)	28 (8.5)	20 (6.1)	14 (4.3)	10 (3.0)	14 (4.3)	11 (3.4)	10 (3.0)
42" (1050)	30 (9.1)	21 (6.4)	14 (4.3)	10 (3.0)	15 (4.6)	11 (3.4)	10 (3.0)
48" (1200)	29 (8.8)	20 (6.1)	14 (4.3)	9 (2.7)	14 (4.3)	10 (3.0)	10 (3.0)
60" (1500)	29 (8.8)	20 (6.1)	14 (4.3)	9 (2.7)	14 (4.3)	10 (3.0)	9 (2.7)

Notes:

- 1) Results based on calculations shown in the Structures section of the Drainage Handbook (v20.7). Calculations assume no hydrostatic pressure and a density of 120 pcf (1926 kg/m³) for overburden material.
- 2) Installation assumed to be in accordance with ASTM D2321 and the installation section of the Drainage Handbook.
- 3) For installations using lower quality backfill materials or lower compaction efforts, pipe deflection may exceed the 5% design limit; however controlled deflection may not be a structurally limiting factor for the pipe. For installation where deflection is critical, pipe placement techniques or periodic deflection measurements may be required to ensure satisfactory pipe installation.
- 4) Backfill materials and compaction levels not shown in the table may also be acceptable. Contact ADS for further detail.
- 5) Material must be adequately "knifed" into haunch and in between corrugations. Compaction and backfill material is assumed uniform throughout entire backfill zone.
- 6) Compaction levels shown are for standard Proctor density.
- 7) For projects where cover exceeds the maximum values listed above, contact ADS for specific design considerations.
- 9) See ADS Standard Detail STD-101D for additional details.

Figure 6: Vertical Riser



Flotation

Table 8 shows minimum cover heights for various plastic pipe sizes to prevent flotation.

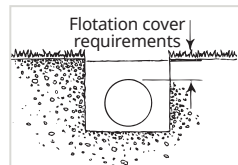


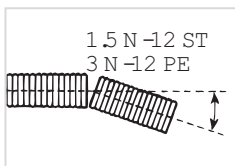
Table 8: Required Minimum Cover* to Prevent Flotation

Pipe Type	Nominal Diameter in (mm)	Minimum Cover in (mm)
Dual Wall HDPE & HP	4" (100)	3" (77)
	6" (150)	4" (102)
	8" (200)	5" (127)
	10" (250)	7" (178)
	12" (300)	9" (228)
	15" (375)	11" (280)
	18" (450)	13" (330)
	24" (600)	17" (432)
	30" (750)	22" (559)
	36" (900)	25" (635)
Single Wall HDPE	42" (1050)	29" (737)
	48" (1200)	33" (838)
	60" (1500)	40" (1016)
	3" (75)	2" (50)
	4" (100)	3" (77)
	6" (150)	4" (102)
	8" (200)	6" (152)
	10" (250)	7" (178)
12" (300)	9" (228)	
15" (375)	11" (280)	
18" (450)	13" (330)	
24" (600)	17" (432)	

*Based on the pipe being completely empty, water table at the ground surface, soil density of 130 pcf (2083 kg/m³), and a soil friction angle appropriate for most sand/gravel mixtures. The average of the inside and outside diameters was used to determine soil and water displacement.

Bending Radius

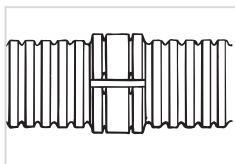
A curved pipe alignment is sometimes desired in pipe systems so that they can be installed around buildings or utilities without the use of fittings. Plastic pipe can be angled slightly at the joints to create this curvature. Coupling bands allow approximately 3° of angular misalignment at each joint, while each bell-and-spigot joint can accommodate 1-1.5° and remain at its specified joint quality. Additional information can be obtained through your Sales Representative or the Engineering Department.



Soil Tight Repair Methods

Option 1: Split Band Coupler

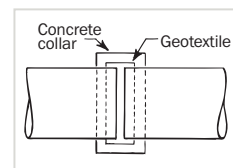
For repairs of 4" - 30" (100-750 mm) pipe with a damaged area less than 10% of the diameter of pipe in a non-trafficked area, use a split band coupler as described in the following steps:



- Center split band coupler around damaged section of pipe.
- Wrap the coupler around the pipe and tighten nylon straps.
- Carefully replace and compact bedding and backfill to provide proper support for pipe and coupler.

Option 2: Concrete Collar

For repairs of 4" - 60" (100-1500 mm) pipe with a damaged area less than 25% the diameter of pipe, use a concrete collar as described in the following steps:



- Excavate area beneath damaged section of pipe about 6" (0.15 m).
- Wrap the damaged area with a geotextile to completely cover the area to be repaired.
- Strut or brace damaged section as necessary.
- Encase damaged section of pipe with a concrete collar.
- Carefully replace bedding and backfill to provide proper support for pipe.

Option 3: Mastic Banding

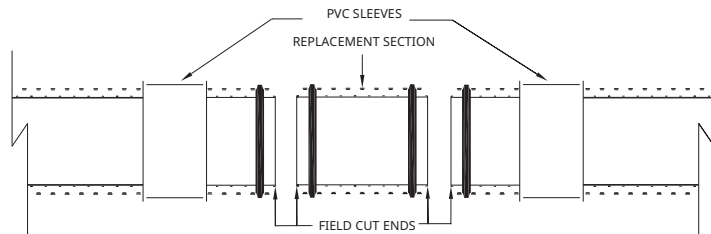
Typically with external sealing of 4" - 60" (100-1500 mm) pipe, a mastic material is used to wrap a small section of pipe. The use of the Mar-Mac® Polyseal Pipe Coupler by Mar-Mac Construction Products, Inc., or a comparable equal is recommended. This band is a self-adhering rubberized mastic that wraps around the damaged section or joint. A protective peelable paper is removed from the back of the band to expose a tacky mastic surface. The band is then adhered to the entire circumference of the pipe. Straps on the band tighten for a positive seal.

*Note: Mar-Mac bands shall be installed in accordance with manufacturer's recommendations.

Watertight Repair Methods

Option 1: PVC Slip Coupling

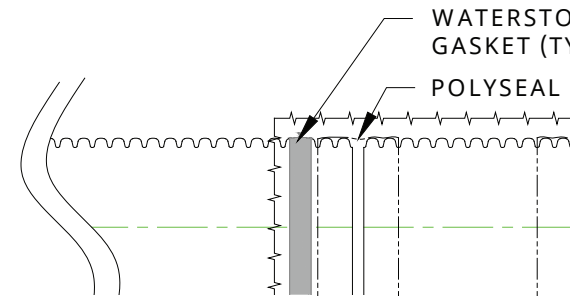
For repairs of 12" - 24" (300-600 mm) pipe, a PVC slip coupling is recommended. The PVC slip coupling is typically used when a damaged section of pipe is cut and removed in an existing line. Couplings provide a bell-bell connection to join the existing pipe to a replacement section of pipe or other end of the existing pipe. Installation of PVC slip coupling should follow recommendations listed on page 20.



Option 2: Concrete Collar

For 12" - 60" (300-1500 mm) pipe, a concrete collar can provide a water tight repair testable to most hydrostatic test with an appropriate leakage requirement. Installing a concrete collar involves building a form around the area to be repaired and encasing it in concrete. A *Mar Mac*[®] *Polyseal Pipe Coupler* is wrapped around the repair area or joint prior to pouring the collar to keep the concrete from seeping into the pipe. *WaterStop* gaskets are installed outside of the *Polyseal* coupler towards the outside edge of the concrete collar. Typically, approximately

6" (150 mm) is excavated beneath the pipe to allow for proper application of the *Polyseal* coupler and a concrete encasement. If the pipe itself is damaged, the damaged area shall be removed and a replacement pipe section spliced in prior to pouring the collar.



Option 3: Chemical Grouting

For repairs of 4" - 60" (100-1500 mm) pipe with improperly assembled joints, chemical grouting can be considered an optional repair method. Chemical grout creates a waterproof collar around leaking pipes and joints.

Option 4: Internal Sealing

For repairs of 18"-60" (450-1500 mm) pipe with a damaged area on the interior, a repair with internal sealing methods may be used. Internal mechanical sealing is usually comprised of a metal band with a rubber gasket, which expands to conform to the inner wall of the pipe. The feasibility of this repair method depends on the size of the damaged section or joint and available access into the pipe.

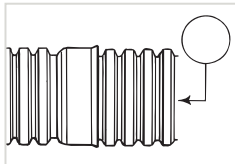
Recommendations for In-Field Testing

Normally, a visual inspection is all that is necessary to identify proper line and excessive deflection. If it is determined that additional in-field testing is necessary, the following criteria or methods should be used:



Leakage Testing (where applicable):

After watertight pipe has been installed, sections of pipe may be tested for leakage. When required, pipe shall be tested by water infiltration or by air pressure. The test method must be in accordance with ASTM F2487 for water and F1417 or F3058 for air.



Deflection Testing:

If considered necessary, pipe deflection can be tested within 30 days of installation by pulling a mandrel through the installed pipe. Testing 10% of the overall project should provide a reasonable indication of installation quality. Table 8 lists the inside diameters that result from common testing limits of 5% and 7.5% deflection. Mandrel tests yield only pass/fail results and can provide misleading results. Before excavating, further investigate to make sure the problem is not being caused by foreign material in the pipe, a slightly offset joint, or some other similar situation.

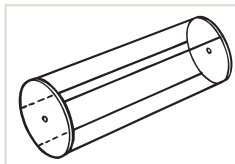


Table 9: HDPE Pipe Base Inside Diameters

Nominal Pipe Diameter in (mm)	Base Inside Diameter in (mm)	Base Inside Diameter with 5% Deflection in (mm)	Base Inside Diameter with 7.5% Deflection in (mm)
4" (100)	3.88 (99)	3.68 (93)	3.59 (91)
6" (150)	5.82 (148)	5.53 (140)	5.38 (137)
8" (200)	7.76 (197)	7.37 (187)	7.17 (182)
10" (250)	9.69 (246)	9.21 (234)	8.97 (228)
12" (300)	11.63 (295)	11.05 (281)	10.76 (273)
15" (375)	14.54 (369)	13.82 (351)	13.45 (342)
18" (450)	17.45 (443)	16.58 (421)	16.14 (410)
24" (600)	23.27 (591)	22.10 (561)	21.52 (547)
30" (750)	29.08 (739)	27.63 (702)	26.90 (683)
36" (900)	34.90 (886)	33.16 (842)	32.28 (820)
42" (1050)	40.72 (1034)	38.68 (982)	37.66 (957)
48" (1200)	46.54 (1182)	44.21 (1123)	43.05 (1093)
60" (1500)	58.17 (1478)	55.26 (1404)	53.81 (1367)

* Value is per AASHTO M252¹ (4"-10" diameter) and AASHTO M294² (12"-60" diameter). If designing to a specific standard, please review allowable minimum diameter.

All sales of our product are subject to a limited warranty and purchasers are solely responsible for installation and use of our products and determining whether a product is suited for any specific needs. Please consult a full copy of the Terms and Conditions of Sale at adspipe.com.

Appendix

All product specific resources are available from the manufacturer's web site: adspipe.com

- Drainage Handbook
- Technical Note 2.01 Minimum and Maximum Burial Depths for HDPE Pipe per AASHTO
- Technical Note 2.02 Minimum and Maximum Burial Depths for ASTM F2648 Pipe
- Technical Note 2.03 Minimum and Maximum Burial Depths for Single Wall HDPE
- Technical Note 2.04 Minimum and Maximum Burial Depths for HP Storm for Storm Drainage
- Technical Note 5.01 Recommended Use for Trench Boxes
- Technical Note 5.02 Flowable Fill Backfill for Thermoplastic Pipe
- Technical Note 5.03 HDPE Pipe Repair Options
- Technical Note 5.04 HDPE and HP Storm Connections to Manholes and Structures
- Technical Note 5.05 Pipe Flotation
- Technical Note 5.06 Culvert Sliplining with HDPE Pipe
- Technical Note 5.07 Post-Installation Testing for HDPE
- Technical Note 5.10 Integral Bell Transition
- Technical Note 5.11 Sliplining Extended Lengths with HDPE Pipe
- Technical Note 5.12 HP Storm Drainage Pipe Repair Options
- Technical Note 5.14 Culvert Sliplining with HP Pipe
- STD-100 series, Trench Installation Details for N-12, HP Storm and SaniTite HP
- STD-200 series, Manhole Connection Details for N-12, HP Storm and SaniTite HP
- STD-600 series, Adapting to Dissimilar Materials



adspipe.com

800-821-6710

ADS "Terms and Conditions of Sale" are available on the ADS website, www.ads-pipe.com.

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Township Supervisor
Brenda L. Stumbo
Township Clerk
Heather Jarrell Roe
Township Treasurer
Stan Eldridge



**YPSILANTI
TOWNSHIP**
— PLANNING & ZONING DEPARTMENT —

Trustees
John Newman II
Gloria Peterson
Debbie Swanson
Ryan Hunter

Staff Report
Sheetz Gas Station / Convenience Store
755 S. Hewitt Road and 2103 and 2059 W. Michigan Avenue
Preliminary Site and Special Land Use Application

July 23, 2024

Applicant: Skilken Gold

Project Name: Sheetz – Gas Station / Convenience Store

Plan Date: June 12, 2024

Location: 755 S. Hewitt Road and 2103 and 2059 W. Michigan Avenue, Ypsilanti, MI 48197, Parcel K-11-18-100-019, K-11-39-350-023, K-11-39-350-022

Zoning: RC, Regional Corridor with a Site Type C Designation

Action Requested: Preliminary Site Plan & Special Land Use Approval

CASE LOCATION AND SUMMARY

The Office of Community Standards is in receipt of a Preliminary Site Plan and Special Land Use Application from Sheetz representative, Skilken Gold for a proposed 6,132 sq. ft. gas station / convenience store / restaurant, and eight (8) gas pumps for a total of sixteen (16) fueling positions at the southeast corner of W. Michigan Avenue and S. Hewitt Road. The site is made up of three (3) sperate parcels. The applicant is proposing to split off the southern portion of property to create a new parcel, which is not part of this development.

SUBJECT SITE USE, ZONING AND COMPREHENSIVE PLAN

The Charter Township of Ypsilanti 2040 Master Plan designates this site as Regional Mixed-Use Corridor. Regional Mixed-Use Corridors areas are located along the busiest corridors, which support a high volume of both local and regional traffic. This area may include large national chains, regional retailers, and autooriented uses that draw customers both regionally and locally. Compared to Neighborhood Mixed-Use Corridors areas they are high intensity and feature the largest scale of commercial development.

Township Supervisor
Brenda L. Stumbo
Township Clerk
Heather Jarrell Roe
Township Treasurer
Stan Eldridge



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— PLANNING & ZONING DEPARTMENT —

Trustees
John Newman II
Gloria Peterson
Debbie Swanson
Ryan Hunter

**755 S. Hewitt Road and 2103 and 2059 W. Michigan Avenue
Aerial Photograph – 2023**





ANALYSIS

The plans have been reviewed by Township Staff and Consultants in accordance with our procedures.

Planning Consultants (Carlisle/Wortman Associates):

Carlisle Wortman Associates, Inc. reviewed the Preliminary Site Plan and has recommended multiple items to be discussed with the Planning Commission prior to the applicant seeking three (3) variances with the Zoning Board of Appeals. The discussion items are listed below:

Natural Features

- 1) *Planning Commission to discuss how the amount of impervious surface on site complies with the steep slope standards.*
- 2) *Show tree protective fencing symbol around “trees to remain” on Sheets C-2, C-9 and C-10.*
- 3) *Include following note on Sheets C-2, C-9, C-10 and C-18: “No vehicle, other construction equipment, or construction materials or debris shall be parked or stored within the dripline of any tree or plant material intended to be saved.”*

Area, Width, Height, Setbacks (Bulk Requirements)

- 1) *Recommend Planning Commission condition any approval on implementation of the proposed lot split shown on the plans.*

Parking and Loading

- 1) *Provide building floor plans so that usable floor area dimensions can be confirmed.*

Site Access, Circulation, Traffic

- 1) *Planning Commission and applicant discuss shifting the gas-pump canopy to the west to allow easier turning movements for tanker trucks around canopy.*

Screening and Landscaping

- 1) *Planning Commission to consider allowing location of parking lot trees (number sufficient, but location not per ordinance).*
- 2) *Planning Commission to consider allowing 14 parking spaces in a row with the addition of the landscaped island on the east end of this bay of spaces.*
- 3) *Planning Commission to consider the heavy landscaped screen vs. six-foot-tall screening wall along property line abutting residential district.*
- 4) *Change label “4 NYS” to “5 NYS” on Sheets C15 & C-16.*

Lighting

- 1) *Applicant to describe necessity for proposed color temperature of lighting.*



Elevations and Floor Plans

- 1) *Planning Commission to evaluate that the proposed design with unattached canopy is more functional and aesthetically pleasing.*
- 2) *Applicant to provide any applicable “transparency alternatives” or seek variance for deficiency in W. Michigan and S. Hewitt facades.*

Engineering Consultants (OHM):

The Township Engineer recommended approval in their letter dated June 26, 2024. OHM has provided preliminary detailed engineering comments that will be addressed at the time of Final Site Plan and Detailed Engineering.

Ypsilanti Community Utilities Authority (YCUA):

YCUA reviewing agent Scott Westover has recommended approval in his letter dated June 25, 2024.

Ypsilanti Township Fire Department:

YTFD Fire Marshall Steve Wallgren has approval in a letter dated June 18, 2024.

Washtenaw County Water Resources Commission:

Reviewing agent Theresa Marsik has asked the applicant to address 11 items in a letter dated June 28, 2024.

Washtenaw County Road Commission:

WCRC Project Manager Gary Straight shared comments with the Planning Department on June 27, 2024.

SUGGESTED MOTIONS:

Special Land Use

Suggested motions: *The following suggested motions and conditions are provided to assist the Planning Commission in making the most appropriate motion for this application. The Commission may utilize, add or reject any conditions suggested herein, as they deem appropriate.*

Motion to postpone:

Township Supervisor
Brenda L. Stumbo
Township Clerk
Heather Jarrell Roe
Township Treasurer
Stan Eldridge



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— PLANNING & ZONING DEPARTMENT —

Trustees
John Newman II
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*"I move to postpone the request for **special land use** approval for construction of a 6,132 sq. ft. convenience store / gas station / restaurant building, and eight (8) gas pumps (for a total of sixteen (16) fueling positions) at the properties located at 755 S. Hewitt Road and 2103 and 2059 W. Michigan Avenue, Ypsilanti, MI 48197, Parcel K-11-18-100-019, K-11-39-350-023, K-11-39-350-022 to allow the applicant to obtain the required variances as outlined in the staff report.*

Preliminary Site Plan

Suggested motions: *The following suggested motions and conditions are provided to assist the Planning Commission in making the most appropriate motion for this application. The Commission may utilize, add or reject any conditions suggested herein, as they deem appropriate.*

Motion to postpone:

*"I move to postpone the request for **Preliminary Site Plan** approval for construction of a 6,132 sq. ft. convenience store / gas station / restaurant building, and eight (8) gas pumps (for a total of sixteen (16) fueling positions) at the properties located at 755 S. Hewitt Road and 2103 and 2059 W. Michigan Avenue, Ypsilanti, MI 48197, Parcel K-11-18-100-019, K-11-39-350-023, K-11-39-350-022 to allow the applicant to obtain the required variances as outlined in the staff report.*

Respectfully submitted,

Fletcher Reyher

Fletcher Reyher, AICP
Planning & Development Coordinator
Charter Township of Ypsilanti Planning Department

Planning Department Report

Project Name: Sheetz - Gas Station / Convenience Store

Location: 2103 W. Michigan Avenue, Ypsilanti, MI 48197

Date: 07-01-2024

- | | |
|--|---|
| <input checked="" type="checkbox"/> Full Preliminary Site Plan Review # 2
<input type="checkbox"/> Sketch Preliminary Site Plan Review #
<input type="checkbox"/> Administrative Preliminary Site Plan Review #
<input type="checkbox"/> Detailed Engineering/Final Site Plan Review #
<input checked="" type="checkbox"/> Special Use Permit
<input type="checkbox"/> Public Hearing | <input type="checkbox"/> Rezoning
<input type="checkbox"/> Tentative Preliminary Plat
<input type="checkbox"/> Final Preliminary Plat
<input type="checkbox"/> Final Plat Process
<input type="checkbox"/> Planned Development Stage I
<input type="checkbox"/> Planned Development Stage II |
|--|---|

Contact / Reviewer	Consultants, Departments, & Agencies	Approved	Approved with Conditions	Denied	N/A	See email/letter attached or comments below
Planning Department	Township Planning Department	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See comments below
Carlisle/Wortman Associates	Planning Consultant	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See letter dated 06-29-2024
OHM / Stantec	Engineering Consultant	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See letter dated 06-26-2024
Steven Wallgren, Fire Marshal	Township Fire Department	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See letter dated 06-18-2024
Dave Bellers, Building Official	Township Building Department	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Brian McCleery, Deputy Assessor	Township Assessing Department	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Scott Westover, Engineering Manager	Ypsilanti Community Utilities Authority	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See letter dated 06-25-2024
Gary Streight, Project Manager	Washtenaw County Road Commission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	See email dated 06-27-2024
Theresa Marsik, Stormwater Engineer	Washtenaw County Water Resources Commission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	See letter dated 07-02-2024
James Drury, Permit Agent	Michigan Department of Transportation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Planning Department Recommended Action:

At this time, the Sheetz Gas Station / Convenience Store is eligible for Preliminary Site Plan and Special Land Use Consideration by the Planning Commission. This project is being placed on the Planning Commission Agenda for Tuesday, July 23, 2024, for the required Public Hearing and Preliminary Site Plan consideration. It would be the Planning Department's recommendation that the Planning Commission grant Preliminary Site Plan and Special Land Use approval if the applicant obtains the required variances as outlined in the report, and addresses the remaining comments and concerns from Planning & Zoning and outside reviewing agencies. The applicant will need to obtain the required variances prior to a formal motion from the Planning Commission.



Carlisle | Wortman
ASSOCIATES, INC.

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

Date: April 26, 2024

Rev.: June 29, 2024

**Preliminary Site Plan and Special Use Review
For
Ypsilanti Township, Michigan**

Applicant:	Skilken Gold
Project Name:	Sheetz Convenience Store & Fueling Station
Plan Date:	April 9, 2024
Latest Revision:	June 12, 2024
Location:	Southeast Corner of W. Michigan Ave. and S. Hewitt Rd.
Zoning:	RC, Regional Corridor – Form Based District
Action Requested:	Preliminary Site Plan and Special Use Approval

PROJECT AND SITE DESCRIPTION

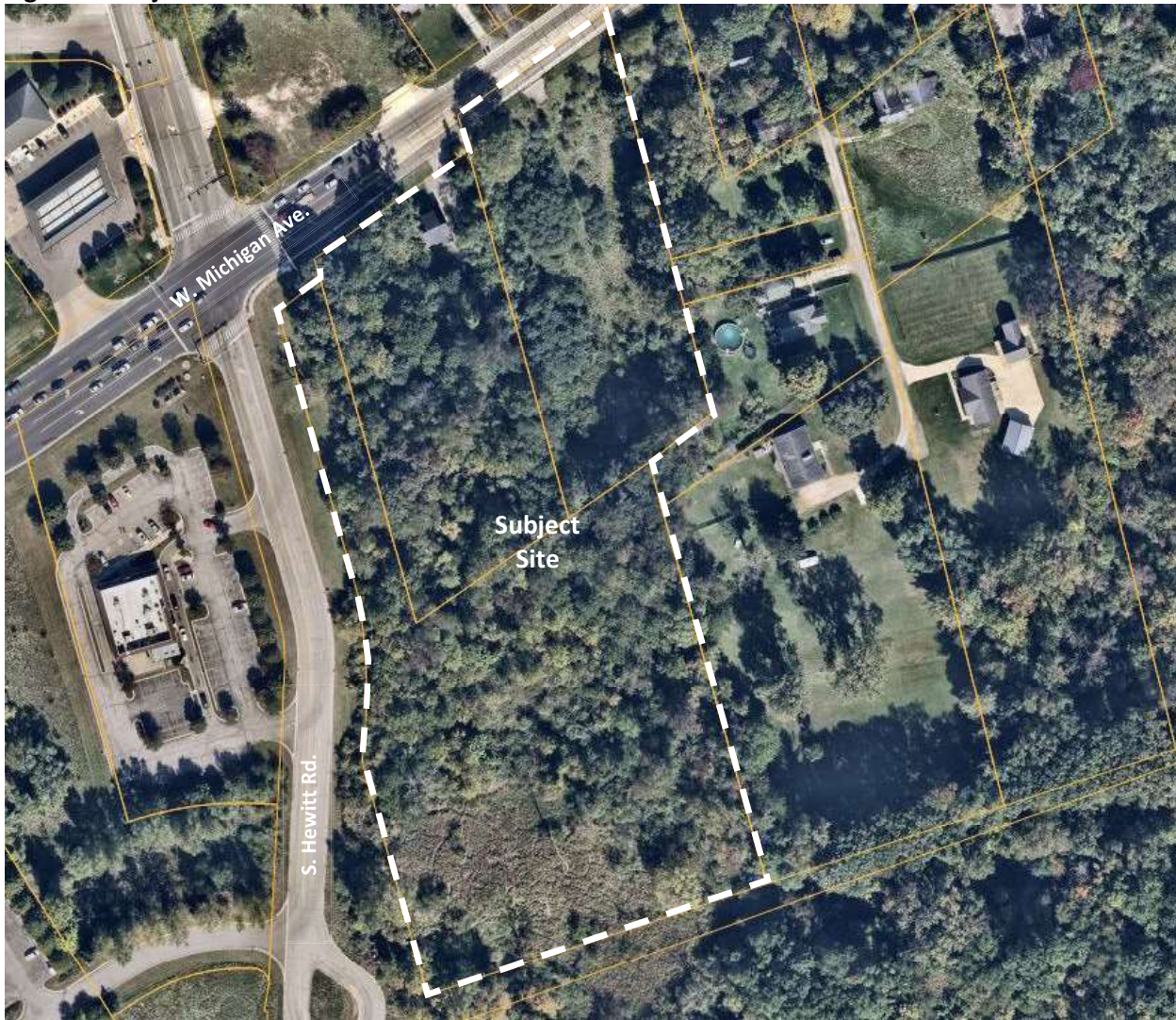
The applicant is proposing to build a 6,132 s.f. convenience store/gas station and restaurant building, and eight (8) gas pumps (for a total of 16 fueling positions) at the southeast corner of W. Michigan Avenue and S. Hewitt Road. Other site features include an outdoor eating patio, parking, future EV charging stations, two air machines, outdoor sales of propane, ice, and windscreen fluid (shown on building elevations), and landscaping.

This site is made up of three separate parcels. The applicant is proposing to split off the southern portion of the property to create a new parcel, which is not part of this development project.

The subject site is zoned RC, Regional Corridor, which is a Form Based District. The site is categorized as a Site Type C. General retail and food use without a drive-through are permitted uses on this site. Vehicle fueling stations are a special use. Mixed-use buildings (containing the convenience store and food use) are permitted. An aerial of the proposed site is shown on the next page.

Benjamin R. Carlisle, President Douglas J. Lewan, Executive Vice President John L. Enos, Vice President
David Scurto, Principal Sally M. Elmiger, Principal R. Donald Wortman, Principal
Paul Montagno, Principal Megan Masson-Minock, Principal Laura Kreps, Senior Associate
Richard K. Carlisle, Past President/Senior Principal

Figure 1: Subject Site



Source: Nearmap (Image captured October 2, 2023)

Size of Subject Site:

Entire Site: 7.36 acres:

- Development Parcel: 3.65 acres
- Split-Off Parcel: 3.71 acres

Current Use of Subject Site:

Vacant and residential

Table 1: Adjacent Zoning and Existing Land Uses

Direction	Zoning	Use
North	RC, Regional Corridor (Form Based District)	Vacant & Residential
South	PMD, Production, Manufacturing, Distribution (City of Ypsilanti)	Vacant
East	RC, Regional Corridor (Form Based District)	Vacant & Residential
West	RC, Regional Corridor (Form Based District)	Fast Food Restaurants

MASTER PLAN

The site is designated as Regional Mixed Use Corridor. Regional Mixed-Use Corridors are located along the busiest corridors, which support a high volume of both local and regional traffic. This area may include auto-oriented uses that draw customers both regionally and locally. Compared to the Neighborhood Mixed-Use corridors, this area is intended for higher-intensity and the largest scale of commercial development. Specifically listed along Regional Corridors are gas stations, convenience stores, and restaurants, which are consistent with this proposal.

Applicable design concepts included the Master Plan include:

- *Architectural design must create an interesting visual experience for both sidewalk users and automobiles.*
- *Ensure appropriate transition to adjacent neighborhoods.*
- *Design creativity with regard to materials will be encouraged, although low quality materials or building designs that inhibit activity on the corridor will not be permitted.*
- *Walkability and non-motorized connections within and to Mixed Use corridors is essential to create character and access for all residents and visitors.*

We find these design considerations are addressed in the site plan and submitted architecture. See our site plan review section for more detail.

We find that the proposed uses of the site as a gas station, convenience store, and restaurant can both serve the regional market but also local neighborhoods, and are consistent with the Master Plan.

NATURAL FEATURES

Topography:

The site to be developed has rolling topography between approximately 5% - 14%, sloping from a high point in the western central portion down to the south towards the wetland.

Sec. 1407, *Steep Slope Protection*, identifies a “moderate” steep slope as any naturally occurring landform with slopes between twelve and nineteen percent (12% - 19%), and includes standards for addressing such slopes in development projects. On this site, these slopes will be graded flat to accommodate the proposed development. Therefore, the only standard that could be applied to this site is “*Stormwater runoff shall be reduced, and infiltration of stormwater enhanced through best management practices.*”

The proposed stormwater management system includes catch basins, with pipe connections to a large detention basin on the southern end of the development site. The basin is described as a “Bioretention/Rain Garden,” which implies that the basin will have infiltration characteristics. There doesn’t appear to be any pre-treatment basin proposed. Also, the amount of impervious pavement proposed is significantly more than required by the ordinance. The proposed width

of the entry drives, maneuvering lanes, and parking lot spaces are compared to the requirements in the table below:

Table 2. Impervious Surface Dimension Comparison

	Required	Proposed
Entry Drive Width	31 ft.*	36 – 40 ft.
Maneuvering Lane Width	24 ft.	40 – 63 ft.
Parking Spaces	9 ft. x 18 ft.	10 ft. x 20 ft.

*Per Ypsilanti Township 2020 Engineering Standards and Design Specifications.

Reducing the amount of impervious surface on this site could in turn, reduce the required size/depth of the proposed detention basin, and comply with the steep slope standard in the ordinance.

Woodlands:

The submitted information shows that this property has tree and woodland resources that fall under the provisions of Article III, *Woodlands Protection*. The submitted plans show where the trees are located on the site, and provide a table listing the tree tag number, species, size, and condition of the tree, and if it is to remain or be removed.

The plans list removal of 85 trees (down from 97 in the previous submission) that are greater than 8-inches in diameter at breast height (d.b.h.). The ordinance exempts all removed trees from the mitigation requirements if they are located where buildings, structures or grading are necessary to allow the development on site. Sheet C-3, *Tree Removal Plan & Site Plan Overlay*, shows how the proposal will impact existing trees, and all of the “removed” trees are within the boundary of buildings & grading. Therefore, none of these trees will need to be mitigated.

As requested, tree #5167 (30” Honeylocust in good condition) is proposed for preservation. This tree is located at the northern property line, and the plans show that no grading will be conducted within the dripline of this tree. They have also proposed locating the proposed 8-foot wide pathway along W. Michigan Ave. around this tree. We consider this a positive aspect of the plan.

Tree Protection

This section requires that the plans identify how the trees “to remain” will be protected during construction. A Tree Protection fence detail is provided on Sheet C-20, *Construction Details*. A symbol showing the location of this fencing is shown on Sheet C-18, *Soil Erosion and Sedimentation Plan* around all trees to remain. This symbol needs to be added around “trees to remain” on the following sheets:

- a. Sheet C-2, *Demolition/Tree Removal Plan*.
- b. Sheets C-9 and C-10, *Grading Plan (North)* and *Grading Plan (South)*.

Also, the following note should also be added to Sheets C-2, C-9, C-10, and C-18: *“No vehicle, other construction equipment, or construction materials or debris shall be parked or stored within the dripline of any tree or plant material intended to be saved.”*

Wetlands:

The southern portion of the site contains a wetland. The project will not be physically impacting the wetland itself, but will be discharging stormwater into the wetland. Sec. 1405, *Protection of Water Quality and Quantity*, has specific standards for discharge into a wetland, prohibiting modification of existing water levels or flows, and direct discharge of untreated stormwater into a wetland. No information about the regulatory status of the wetland has been provided with the plan set; however, it appears to be connected to a much larger wetland system off-site to the south. The Township Engineer also states that an EGLE Permit will be required to discharge stormwater into this wetland.

Items to be Addressed: 1) *Planning Commission to discuss how the amount of impervious surface on site complies with the steep slope standards.* 2) *Show tree protective fencing symbol around “trees to remain” on Sheets C-2, C-9 and C-10.* 3) *Include following note on Sheets C-2, C-9, C-10 and C-18: “No vehicle, other construction equipment, or construction materials or debris shall be parked or stored within the dripline of any tree or plant material intended to be saved.”*

AREA, WIDTH, HEIGHT, SETBACKS

The proposed development is being constructed under Building Type A.2. Note that the eastern property line abuts lots that are used for residential purposes.

Table 3. Bulk Requirements

	Required / Allowed	Provided	Complies with Ordinance
Front (W. Michigan Ave.)	10-foot to 30-foot build-to-line	Building located 10 feet from the W. Michigan Ave. ROW.	Building Complies Outdoor Sales Complies
Front (S. Hewitt Rd.)	10-foot to 30-foot build-to-line; Parking located in side/rear yard	Building located 63 feet from the S. Hewitt Rd. ROW. Parking located in front yard	Requires Variances
Side Setback – East Property Line	1.5 x height of building, or 1.5 x 16.3 feet = min. 24.5 feet	257 feet	Complies
Rear Setback	10 feet	278 feet to building See Below	Complies
Impervious Surface	80% maximum	42.1% (159,017 s.f. / 67,029 s.f.)	Complies

	Required / Allowed	Provided	Complies with Ordinance
Building Height (Feet)	Minimum: 14 feet Maximum: 30 feet	16.0 - 16.3 feet	Complies
Building Height (Stories)	Minimum: 1 story Maximum: 2 stories	1 story	Complies
Parking	Located in side or rear yard; if abutting a required "build-to" line, screened with a minimum 30-inch masonry wall on the required build-to line, or within 5 feet of the required building line.	Parking is located in the front yard along S. Hewitt Rd., and in the rear yard. Screen wall is proposed at the build-to-line along S. Hewitt Rd.	Requires Variance for Location Complies with Screen Wall

Table 4. Bulk Requirements for Fueling Stations

Requirements of 1126, Specific Use Provisions for Vehicle Fueling/Multi-Use Stations			
	Required / Allowed	Provided	Complies with Ordinance
Min. Lot Size	15,000 s.f. + 1,500 s.f. for each additional pump island above 2. 8 pump islands = (15,000 + (1,500 x 6)) = 24,000 s.f. min.	3.65 ac. (159,017 s.f.)	Complies
Min. Street Lot Line Length	150 feet	500 feet	Complies
Driveway Distance to Adjacent Property Lines/ Intersection	10 feet, or 25 feet if adjacent to residential district 25 feet from street intersection	65 feet (east driveway); 150 feet (west driveway) +185 feet from intersection	Complies
Canopy Support Setbacks	Front: 35 feet Side: 20 feet Rear: 30 feet	Front (W. Michigan): 148 ft. Front (S. Hewitt): 112 ft. Side (East): 210 ft. Rear: 186 ft.	Complies
Canopy Roof Setbacks	Front: 25 feet Side: 10 feet Rear: 20 feet	Front (W. Michigan): 139 ft. Front (S. Hewitt): 99.5 ft. Side (East): 192 ft. Rear: 174 ft.	Complies
Pump Island Setbacks	Front (W. Michigan Ave.): 30 feet Side: 20 feet Rear: 20 feet	Front (W. Michigan): 143 ft. Front (S. Hewitt): 109 ft. Side (East): 204 feet Rear: 179 ft.	Complies

Rear Setback

To calculate setbacks, we are using the “proposed lot split” line shown on the plans. If the site isn’t divided, then the rear setbacks will increase in size. We recommend any Planning Commission decision be conditioned on the proposed lot split, as shown on the plan.

A small portion of the southerly property line (comprised of an existing property line to the east, and a proposed property line to the west) abuts an existing residential use. This requires that a minimum 20-foot-wide greenbelt be provided between a non-commercial use and residential use. The required greenbelt has been provided.

Items to be Addressed: 1) Applicant to obtain required variance for building and parking location along S. Hewitt. 2) Recommend Planning Commission condition any approval on implementation of the proposed lot split shown on the plans.

PARKING, LOADING

This project is proposing two uses inside the building. Floor area dimensions are provided in the table on Sheet C-6, *Site Plan*; however, no floor plans have been provided confirming these figures. Floor plans need to be provided.

Using the figures on the Site Plan, the table below compares the number of spaces required by the ordinance and the number of spaces provided on the plans.

Table 5. Number of Parking Spaces

Parking Requirements	Number of Spaces Required	Number of Spaces Provided	Complies with Ordinance
Convenience Store and Vehicle Fueling Station	<p>1 space for each 125 s.f. of Usable Floor Area Plus 2 spaces per Fueling Station</p> <p>$(3,264 \text{ s.f.} / 125) = 26 \text{ spaces}$ $+ 8 \text{ fueling stations} \times 2 = 16 \text{ spaces}$</p>	60 spaces	Complies
Standard Restaurant	<p>2 spaces per 5 seats</p> <p>$((46 \text{ seats} / 5) \times 2 = 18 \text{ spaces})$</p>		
	TOTAL: 60 Spaces		
Barrier-Free Spaces	3 spaces	3 spaces	Complies
Loading spaces	1 space	1 space	Complies
Bicycle parking	2 spaces	4 spaces	Complies

Parking Dimensions

As mentioned above, the parking spaces, maneuvering lanes, and access driveway dimensions are substantially larger than required in the ordinance, which increases the amount of impervious surface on the site.

Parking Lot Location Along S. Hewitt

Where parking lots abut a required build-to line, the Form Based District design standards limit this condition for up to 25% of the total site's linear feet along the required build-to line, or 60-feet, whichever is less. On this site, the 60-foot dimension is the smaller of the two, and applies to the six (6) parking spaces along the S. Hewitt build-to line. This bay of parking spaces measures 60-feet along the build-to line, and complies with the ordinance.

Sidewalks

The walk abutting the most westerly two parking spaces (in the bay on the south side of the building) has been widened to a minimum of seven (7) feet, per Sec. 1205(6)(K).

Items to be Addressed: 1) Provide building floor plans so that usable floor area dimensions can be confirmed.

SITE ACCESS, CIRCULATION, TRAFFIC

Site access is provided from both W. Michigan Ave. and S. Hewitt Rd. Vehicles can circulate around the site and the gas-pump canopy.

Sheets C-6 and C-7 show turning movements of various truck types (delivery, tanker, trash and fire). All of these vehicles can make the turning movements around the gas-pump canopy. One observation we have is that the easterly position of the canopy makes the tanker truck movements a little tight. The canopy could be shifted to the west to give the tanker more space to make this movement, while still providing enough space for users of the west parking spaces to access and exit these spaces. The Planning Commission may want to discuss this with the applicant.

The Form Based Districts require pedestrian pathways between the site and the road right-of-way. A sidewalk connection is provided from the W. Michigan Ave. right-of-way and the S. Hewitt Rd. right-of-way, as required.

Items to be Addressed: 1) Planning Commission and applicant discuss shifting the gas-pump canopy to the west to allow easier turning movements for tanker trucks around canopy.

SCREENING & LANDSCAPING

Table 6. Landscaping

	Required	Provided	Complies with Ordinance
General Landscaping: <ul style="list-style-type: none"> • 1 tree per 1,000 s.f. lawn • 1 shrub per 500 s.f. lawn 	12,617 s.f. lawn = 13 trees and 25 shrubs	13 trees and 25 shrubs	Complies
Street Yard Landscaping: <ul style="list-style-type: none"> • 1 large deciduous tree per 40 l.f. of frontage • 1 ornamental tree per 100 l.f. of frontage • 1 shrub per 10 l.f. of frontage 	<u>W. Michigan Ave.:</u> 400 L.F. / 40 = 10 trees 400 l.f. / 100 = 4 ornamental trees 400* l.f. / 10 = 40 shrubs <u>S. Hewitt Rd.:</u> 309 l.f. / 40 = 8 trees 309 l.f. / 100 = 3 ornamental trees 309 l.f. / 10 = 31 shrubs	18 deciduous trees 7 ornamental trees +71 shrubs	Complies with Trees, Ornamental Trees & Shrubs
Parking Lot Landscaping: <ul style="list-style-type: none"> • 1 large deciduous tree per 2,000 s.f. of pavement • 1 large deciduous tree per 40 l.f. of parking lot perimeter 	56,081 s.f. / 2,000 s.f. = 28 interior trees 299 l.f. / 40 = 7 perimeter trees	35 interior and perimeter trees	Total number sufficient; not located as required
Stormwater Basin Landscaping: 1 tree and 10 shrubs per 50 feet of basin perimeter	649 l.f. / 50 = 13 trees and 130 shrubs	13 trees and 130 shrubs	Complies See Below

Parking Lot Islands

Sec. 1301(3)(D) requires the following:

- 1) There shall be no more than twelve (12) parking spaces in a row without a landscape break. The plans show 14 parking spaces in a row abutting the south side of the building. However, an area on the east end of this bay of spaces has been converted into a landscaped island. The Planning Commission could consider allowing the landscaped bed on the end of the spaces vs. breaking them up.

Shrubs Around Stormwater Basin

The label “4 NYS” located on Sheets C-15 & C-16 (next to existing tree #5047) should say “5 NYS.” There are five (5) *Nyssa sylvatica* tree symbols circled in purple.

Planning Commission Modifications

The Planning Commission may waive or modify the landscaping standards above where the intent of this Section can be met through reasonable alternatives. The plans are not fully compliant with the ordinance requirements include the following areas, where the Planning Commission has flexibility:

- 1) Parking lot landscaping (Sufficient number, but not located per ordinance)
- 3) Parking lot islands (Landscaped island on end of 14 space bay, vs. breaking up spaces per ordinance)

Screening Required in Specific Use Provisions

Sec. 1126 requires installation of a six-foot tall screening wall where a fueling station abuts a residential district. The Planning Commission may approve alternative screening materials. The plans show a heavy landscape screen consisting of evergreen and deciduous trees, ornamental trees, and evergreen and deciduous shrubs. The Planning Commission will need to discuss this alternative.

Trash and Recycling Containers

The dumpster is located in the rear yard and screened with a 7.3-foot-tall masonry wall and gate. The design of the screen matches the elevation materials on the building.

Items to be Addressed: 1) Planning Commission to consider allowing location of parking lot trees (number sufficient, but location not per ordinance). 2) Planning Commission to consider allowing 14 parking spaces in a row with the addition of the landscaped island on the east end of this bay of spaces. 3) Planning Commission to consider the heavy landscaped screen vs. six-foot-tall screening wall along property line abutting residential district. 4) Change label "4 NYS" to "5 NYS" on Sheets C15 & C-16.

LIGHTING

The applicant is proposing to install 13 single-luminaire, pole-mounted fixtures, and one, double-luminaire pole-mounted fixture as site lighting. The building will be illuminated with two different style light fixtures, and the gas-pump canopy will have 22 downward-facing light fixtures. We have the following comments.

- 1) The ordinance requires that light fixtures shall be shielded and direct light away from adjoining properties. As requested, manufacturer cut sheets were provided and show that the proposed fixtures can be shielded if necessary.
- 2) The lighting levels are within the maximum 20 footcandles, and the maximums along the property lines.
- 3) As requested, the height of light fixture XPM4 (#19) near the residences to the east has been reduced to 18-feet per ordinance requirements.
- 5) The Kelvin color temperature of the proposed fixtures is 4000K. Sec. 1303(3)(E) states that the color temperature of any outdoor light source shall not exceed 3500K unless introduced as part of a façade or landscape lighting scheme used exclusively for the decorative illumination through color of certain building façade or landscape features. The applicant will need to describe the necessity for the proposed color temperature.

Note that the ordinance requires that all outdoor lighting shall be reduced to at least 50% of the light level at full illumination one (1) hour after closing.

Items to be Addressed: 1) Applicant to describe necessity for proposed color temperature of lighting.

ELEVATIONS AND FLOOR PLANS

Elevations have been provided. As noted earlier, floor plans need to be provided.

Façade Variation:

The Form Based District architectural standards require façade variation. This project provides façade variation on each facade through the use of varying colors and materials. Façade materials are high quality (brick, cast stone sills and masonry veneer, metal roof accents).

Sec. 1126, *Vehicle fueling/multi-use station*, requires that the canopy structure be designed in a manner which is architecturally compatible with the principal building. An elevation of the proposed canopy has been provided and shows that the canopy design is consistent with the building design.

This section also requires that the canopy be attached to the principal building. If not attached, the applicant needs to demonstrate that the design is more functional and aesthetically pleasing. The response memo states the following: “It is Sheetz prerogative to provide an aesthetically pleasing site for consumers, and have designed their flagship building and canopy to strongly supplement one another.” The Planning Commission will need to evaluate the function/aesthetics of the applicant’s proposal.

Transparency:

First floors of buildings facing a ROW are required to provide 50% transparency. First floors along a side street or parking area are required to provide 30% transparency. Transparency calculations have been provided for each elevation. We have compared the façade transparency for each façade with the ordinance requirements in the table below:

Table 7. Façade Transparency

	Provided	Complies with Ordinance
W. Michigan Ave. Façade: 50% transparency required	26.8%	Does Not Comply – Requires Transparency Alternative or Variance
S. Hewitt Façade: 30% transparency required	16.7%	
Parking Lot Façade: 30% transparency required	31.33%	Complies
East Façade: 30% transparency required	40.0%	Complies

If applicable, the applicant should also describe if any of the “transparency alternatives” (Sec. 507(H)) applies to either of these two facades, and include them in the calculation.

Items to be Addressed: 1) *Planning Commission to evaluate that the proposed design with unattached canopy is more functional and aesthetically pleasing.* 2) *Applicant to provide any applicable “transparency alternatives” or seek variance for deficiency in W. Michigan and S. Hewitt facades.*

SPECIAL USE

In the Regional Corridor District, a fueling/multi-use station requires a special use. Standards for Special Use review are set forth in Section 1003. The Planning Commission, and the Board of Trustees when required, shall review the particular circumstances and facts of each proposed use in terms of the following standards and required findings, and with respect to any additional standards set forth in this Ordinance. The Planning Commission, either as part of its final decision or in its recommendation, shall find and report adequate data, information, and evidence showing that the proposed use meets all required standards and:

1. Will be harmonious, and in accordance with the objectives, intent, and purpose of this Ordinance.
2. Will be compatible with the natural environment and existing and future land uses in the vicinity.
3. Will be compatible with the Township master plans.
4. Will be served adequately by essential public facilities and services, such as highways, streets, police and fire protection, drainage ways and structures, refuse disposal, or that the persons or agencies responsible for the establishment of the proposed use shall be able to provide adequately for such services
5. Will not be detrimental, hazardous, or disturbing to existing or future neighboring uses, persons, property, or the public welfare.
6. Will not create additional requirements at public costs for public facilities and services that will be detrimental to the economic welfare of the community.

We find that the standards have been met. Comments regarding how this proposal compares to the Special Land Use standards follow:

- W. Michigan Ave. is designated as a Regional Corridor, intended to support a high volume of both local and regional traffic. This corridor type accommodates large national chains and auto-oriented uses that draw customers both regionally and locally. The proposed use is consistent with the intent of this district.
- While variances are required, the applicant has worked with the Township to meet the form-based zoning requirements.
- The proposed use of the site as a fueling station, convenience store and restaurant that can serve both the regional market, but also local neighborhoods is consistent with the Master Plan.
- The applicant is making a significant investment to improve the site including sidewalk installation along both road frontages, landscaping, and lighting.
- With utility and other improvements, the site can adequately be served with public facilities and services
- The development of this site will not be detrimental to the future use and development of the corridor.

RECOMMENDATIONS

The proposal has a number of positive attributes. However, this design will require several variances:

- 1) *Building setback from S. Hewitt Rd. further than permitted by Form Based ordinance standards.*
- 2) *Parking is in front yard along S. Hewitt, which is not permitted in the Form Based ordinance standards.*
- 3) *Amount of glazing is deficient in W. Michigan Ave. and S. Hewitt St. façades.*

Regarding other design issues, the ordinance allows the Planning Commission some flexibility in its application. A summary of the comments in this review are provided below which should be discussed with the Planning Commission:

Natural Features

- 1) *Planning Commission to discuss how the amount of impervious surface on site complies with the steep slope standards.*
- 2) *Show tree protective fencing symbol around “trees to remain” on Sheets C-2, C-9 and C-10.*
- 3) *Include following note on Sheets C-2, C-9, C-10 and C-18: “No vehicle, other construction equipment, or construction materials or debris shall be parked or stored within the dripline of any tree or plant material intended to be saved.”*

Area, Width, Height, Setbacks (Bulk Requirements)

- 1) *Recommend Planning Commission condition any approval on implementation of the proposed lot split shown on the plans.*

Parking and Loading

- 1) *Provide building floor plans so that usable floor area dimensions can be confirmed.*

Site Access, Circulation, Traffic

- 1) *Planning Commission and applicant discuss shifting the gas-pump canopy to the west to allow easier turning movements for tanker trucks around canopy.*

Screening and Landscaping

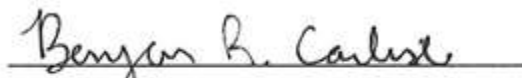
- 1) *Planning Commission to consider allowing location of parking lot trees (number sufficient, but location not per ordinance).*
- 2) *Planning Commission to consider allowing 14 parking spaces in a row with the addition of the landscaped island on the east end of this bay of spaces.*
- 3) *Planning Commission to consider the heavy landscaped screen vs. six-foot-tall screening wall along property line abutting residential district.*
- 4) *Change label “4 NYS” to “5 NYS” on Sheets C15 & C-16.*

Lighting

- 1) *Applicant to describe necessity for proposed color temperature of lighting.*

Elevations and Floor Plans

- 1) *Planning Commission to evaluate that the proposed design with unattached canopy is more functional and aesthetically pleasing.*
- 2) *Applicant to provide any applicable “transparency alternatives” or seek variance for deficiency in W. Michigan and S. Hewitt facades.*


CARLISLE/WORTMAN ASSOC., INC.
Benjamin R. Carlisle, AICP, LEED AP
Principal

June 26, 2024

Mr. Fletcher Reyher
Township Planning and Development Coordinator
Charter Township of Ypsilanti
7200 S. Huron River Drive
Ypsilanti, MI 48197

RE: Sheetz
Site Plan Review #2

Dear Mr. Reyher:

We have completed the second site plan review of the plans dated June 12, 2024, with a latest revision date of June 12, 2024, and stamped received by OHM Advisors on June 13, 2024.

At this time, the plans are recommended for approval for the Planning Commission's consideration, contingent on the following comments being addressed. Preliminary detailed engineering comments have been provided to the applicant as a courtesy and shall be addressed prior to submitting detailed engineering plans for review.

A brief description of the project has been provided below, followed by our comments and a list of anticipated required permits and approvals. Comments in Section B are detailed in nature, do not influence the overall site layout, and can be addressed during the detailed engineering drawing submittal.

A. PROJECT AND SITE DESCRIPTION

The applicant is proposing a 6,139 square-foot Sheetz gas station at 2103/2059 W Michigan Avenue. The development will include a convenience store, restaurant, and fuel stations. Associated parking, utilities, and landscaping are also being proposed.

The site will be serviced by connection to the existing 8-inch water main along the west side of S Hewitt Road and connection to the existing 8-inch sanitary sewer along the south side of W Michigan Avenue. Stormwater runoff will be managed by a new infiltration basin and underground conveyance system.

B. PRELIMINARY DETAILED ENGINEERING COMMENTS

The following comments shall be addressed by the applicant during the detailed engineering drawing submittal, and do not affect the recommendation for approval to the Township of Ypsilanti Planning Commission. It should be noted that this is not an all-inclusive list and additional comments may be generated as new information is presented.

1. The applicant shall provide utility pipe profiles, including pipe diameter, material, length, slope, and hydraulic grade line (where applicable) for all proposed utilities (water, sanitary, storm).
2. The applicant shall provide spot elevations at all four (4) corners of all barrier-free parking spaces, access aisles, ramps, and level landings, as well as along both sides of all proposed sidewalk at 50-foot intervals. The applicant shall note that the cross-slope shall not exceed 2%, per ADA Standards.



3. The applicant shall verify the curve number used in Worksheet 3 (Sheet C-22) as there appears to be a discrepancy. The applicant shall review and revise all subsequent calculations, including Worksheet 9, accordingly.
4. The applicant shall provide a detailed drainage area map that provides drainage areas corresponding to each catch basin, including their acreages, C-factors, and C-factor calculations.
5. The applicant shall provide conveyance calculations for the proposed stormwater management system.
6. The applicant shall provide a Certificate of Outlet, signed and sealed by a registered engineer in the State of Michigan.
7. The applicant shall provide a maintenance schedule for all proposed permanent soil erosion and stormwater management activities. The schedule shall include the frequency of activities as well as the party responsible.
8. The applicant shall provide the infiltration test pit logs on the plans for reference.
9. It is recommended that the applicant use RCP for the proposed storm sewer under the influence of the pavement. At a minimum, the applicant shall provide the manufacturer's specification for use of the proposed N-12 HDPE under the influence of the pavement on the plans.
10. The applicant shall clarify the method of the proposed water main connection.
11. The applicant shall provide cleanouts along the sanitary sewer service at all bends and at intervals not greater than 90 feet, per Township Standards.
12. The applicant shall provide a detail of the oil/water separator.
13. The applicant shall provide the material of the proposed water main and water service. The applicant shall also provide the length of the proposed water main and water service on Sheet C-14 as it currently wasn't provided.
14. The applicant shall adjust the callouts on Sheet C-14 as one of them is currently cutoff.
15. The applicant shall provide a quantity list for all proposed utilities (water, sanitary, storm) on the Cover Sheet, delineated by existing or proposed road right-of-way or easement, per Township Standards.
16. The applicant shall clearly label the location of all benchmarks for clarity.
17. The applicant shall provide the applicable Ypsilanti Township Standard Detail Sheets within the plan set. The applicant shall also provide the Ypsilanti Township SESC Standard Detail Sheet and remove the SESC details on Sheet C-18 for clarity. These can be obtained by emailing stacie.monte@ohm-advisors.com.

C. REQUIRED PERMITS & APPROVALS

The following outside agency reviews and permits will be required for the project. Copies of any correspondence between the applicant and the review agencies, as well as the permit or waiver, shall be sent to both the Township and OHM Advisors (email: stacie.monte@ohm-advisors.com).

- ▶ **Ypsilanti Community Utilities Authority (YCUA):** Review and approval of all water main and sanitary sewer improvements is required.
- ▶ **Ypsilanti Township Fire Department:** Review and approval of site accessibility, hydrant coverage, and fire suppression, if needed, is required.
- ▶ **Washtenaw County Water Resources Commissioner's Office (WCWRC):** Review and approval is required.
- ▶ **Washtenaw County Road Commission (WCRC):** Review and approval is required.
- ▶ **Michigan Department of Environment, Great Lakes & Energy (EGLE):** An EGLE Act 399 and Part 41 permit will be required for construction of all public water main and sanitary sewer systems improvements.
- ▶ **Michigan Department of Environment, Great Lakes & Energy (EGLE):** An EGLE permit will be required for any work and/or stormwater discharge into the wetlands.
- ▶ **Ypsilanti Township Office of Community Standards:** A Soil Erosion and Sedimentation Control permit shall be secured from the Ypsilanti Township Office of Community Standards.



Should you have any questions regarding this matter, please contact this office at (734) 466-4580.

Sincerely,
OHM Advisors

Stacie L Monte
Stacie L. Monte

Matthew D. Parks
Matthew D. Parks, P.E.

SLM/MDP/kh

cc: Doug Winters, Township Attorney
Steven Wallgren, Township Fire Marshall
Scott Westover, P.E., YCUA
File

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Station\MUNI\01_SITE\SP#2\Sheetz_SP#2_2024-06-26.docx

CHARTER TOWNSHIP OF YPSILANTI FIRE DEPARTMENT

BUREAU OF FIRE PREVENTION

222 South Ford Boulevard, Ypsilanti, MI 48198



June 18, 2024

Fletcher Reyher, Planning and Development Coordinator
Charter Township of Ypsilanti
7200 S. Huron River Drive
Ypsilanti, MI 48197

RE: Preliminary (non-residential) Site Plan Review #3

Project Name:	Sheetz Convenience Store and Fuel Station
Project Location:	2103 W. Michigan Ave. Ypsilanti, MI 48197
Plan Date:	6/12/2024
Applicable Codes:	IFC 2018
Engineer:	Stonefield Engineering and design
Engineer Address:	607 Shelby Suite 200, Detroit, MI 48226

Status of Review

Status of review: Approved as Submitted

All pages were reviewed

Site Access

Comments: Fire Department site access is adequate.

Suppression / Hydrants

Comments: The proposed Hydrant location is acceptable.

Sincerely,

A handwritten signature in black ink that reads "Steve Wallgren". The signature is written in a cursive style.

Steve Wallgren, Fire Marshal
Charter Township of Ypsilanti Fire Department
CFPS, CFI I



YPSILANTI COMMUNITY UTILITIES AUTHORITY

2777 STATE ROAD
YPSILANTI, MICHIGAN 48198-9112
TELEPHONE: 734-484-4600
WEBSITE: www.ycua.org

June 25, 2024

VIA ELECTRONIC MAIL

Mr. Fletcher Reyher, Planning and Development Coordinator
Office of Community Standards
CHARTER TOWNSHIP OF YPSILANTI
7200 S. Huron River Drive
Ypsilanti, MI 48197

Re: Preliminary (non-residential) Site Plan Review #1
Sheetz
Charter Township of Ypsilanti (Plan Date: 04-09-2024)

Dear Mr. Reyher:

In response to the electronic mail message from your office dated April 11, 2024, we have reviewed both the referenced plans with regards to water supply and wastewater system design. The plans are acceptable to YCUA for this stage of review. The following comment is offered for consideration by the Applicant and/or the Applicant’s design engineer prior to the Detailed Engineering phase of the project.

1. It is felt that the proposed 2” diameter domestic water meter is oversized. It is recommended that the Applicant and their design team review what size domestic meter is needed, as oversizing the meter will result in significant increase in the base cost of the YCUA rate schedule, the readiness to service charge. Note the maximum flow rates through various size meters are as follows:

Meter Size (diameter in inches)	Maximum Flow Rate (gallons per minute)
1½	100
2	160
3	500

As noted in the April 25, 2024, letter from this office, connection fees apply to the proposed development. Please note that the total cash price for connection fees, **\$2,466.41 plus the construction phase escrow deposit, Authority administration fee, and record plan guarantee**, must be paid to YCUA by the Applicant, with a receipt delivered to the Township, before either the building or soil and grading permit is issued. The construction phase escrow deposit and associated fees and deposits and the entity responsible for maintaining those accounts will be determined during the Detailed Engineering phase of the project in conjunction with your office and the Township Engineer. Should there be any questions please contact this office.

Mr. Fletcher Reyher
CHARTER TOWNSHIP OF YPSILANTI
June 25, 2024
Page 2

Sincerely,



SDW Digital Signature

SCOTT D. WESTOVER, P.E., Director of Engineering
Ypsilanti Community Utilities Authority

cc: Mr. Luke Blackburn, Mr. Sean Knapp, File, YCUA
Mr. Steve Wallgren, Township Fire Department
Mr. Matt Parks, P.E., Ms. Stacie Monte, Township Engineer
Skilken Gold, Applicant
Mr. Eric Williams, P.E., Applicant's design engineer

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WCRC App. 20031 - Sheetz

SG

Streight, Gary <streightg@wcroads.org>



Thu 6/27/2024 2:25 PM

To: Drew Richlen <drichlen@skilkengold.com>; Williams, Eric <ewilliams@stonefieldeng.com>

Cc: Lawrence, Callie <lawrencec@wcroads.org>; Matt Parks <matt.parks@ohm-advisors.com>; Fletcher Reyher; Lauren Doppke; swestover@ycua.org

I have completed the review of the engineering plans provided for the above permit application and the plans meet the technical requirements of the WCRC. The following administrative items must be completed prior to the issuance of a permit:

- Provide a cost estimate for all work within the right of way.
- An inspection fee equal to 3% of the cost estimate, \$500 minimum, along with a deposit equal to the full amount of the cost estimate must be provided in the form of a letter of credit or cashier's check.
- Provide the name, contact info and certificate of insurance for the contractor performing the work.

Once the above items have been addressed a permit may be issued. If there are any questions feel free to contact me.

If there are any questions feel free to contact me.

Gary Streight, P.E.
Project Manager



Washtenaw County Road Commission
555 N. Zeeb Road, Ann Arbor, Michigan

Direct: (734) 327-6692 | Main: (734) 761-1500
wcroads.org | [Follow us on Facebook](#)



EVAN N. PRATT, P.E.

Water Resources Commissioner

705 N Zeeb Road
Ann Arbor, MI 48103
734-222-6860

Drains@washtenaw.org

Harry Sheehan
Chief Deputy Water Resources Commissioner

Scott Miller P.E.
Deputy Water Resources Commissioner

Theo Eggermont
Public Works Director

June 28, 2024

Mr. Eric Williams, P.E.
Stonefield Engineering
607 Shelby, Suite 200
Deroit, Michigan 48226

RE: Sheetz Fuel Center –
2103 W. Michigan Avenue
Ypsilanti Township, Michigan
WCWRC Project No. 10501

Dear Mr. Williams:

This office has reviewed the site plans for the above-referenced project to be located in Ypsilanti Township. These plans have a job number of DET-230091.01, a date of June 12, 2024, and were received via e-mail on June 13, 2024. As a result of our review, we would like to offer the following comments:

1. The engineer's certificate of outlet, accompanied by corresponding calculations and documentation, should be submitted to our office for review. **Repeat Comment.**
 - a. The certificate of outlet is to be provided by the design engineer during the review process to certify that the receiving channel has adequate capacity to receive the detention basin discharge. Preliminary site plan approval will not be granted unless the certificate of outlet is submitted for our review and approval.
2. Based on site information available on MapWashtenaw and in the rules of this office, portions of the site are covered by hydrologic soil types B, C, and D. The soil types and the areas that they cover should be presented on the grading plan. The curve numbers and runoff coefficients used on Worksheet W1 should be revised to reflect both the proposed impervious and pervious areas that are underlain by hydrologic soil groups B, C, and D. **Repeat Comment.**
 - a. The soils information provided on plan sheet C-13 indicates that Oshtemo loamy sand is hydrologic group A, but it is hydrologic soil group B according to the information contained in the rules of this office and on MapWashtenaw.
3. The curve number used on Worksheet W3 corresponds to hydrologic group C soils, rather than a weighted average based on those portions of the drainage area that are underlain by groups B, C, and group D soils. This directly affects the required infiltration volume determined on Worksheet W9 and should be corrected. **Repeat Comment.**

- a. The soils information provided on plan sheet C-13 indicates that Oshtemo loamy sand is hydrologic group A, but it is hydrologic soil group B according to the information contained in the rules of this office and on MapWashtenaw.
 - b. The pre-development cover types should reflect the cover type of good condition woods or meadow prior to any development of the site. The information shown on Worksheet W3 on plan sheet C-22 reflects the existing conditions.
4. If the provided infiltration volume exceeds the calculated first flush volume but is less than the calculated bankfull volume, the outlet should be designed as a two-stage outlet based on the calculated bankfull volume minus the provided infiltration volume, and the net required detention volume from W13. The lowest orifice should be placed at an elevation corresponding to the provided infiltration volume determined on Worksheet W11.
 5. The maximum impervious loading ratio of 8:1 and the maximum total loading ratio of 10:1 has been exceeded for the proposed development.
 6. The planting plans must show what native plants and/or seeds will be planted in the basin buffer zone, and the quantity/spacing of the plants and/or seeds.
 7. Comments 8 through 10 below must be addressed in the construction plans, although it is preferred that they are addressed in the next plan submittal.
 8. A 6-inch interceptor layer of sand must be applied to the bottom of the infiltration basin to filter out sediment and debris. In addition, a maintainable engineered structure, such as an infiltration trench, must be placed in the bottom of the infiltration basin. **Repeat Comment.**
 9. A long-term stormwater maintenance plan, including budget and responsible party, should be designed and included with the plan set. **Repeat Comment.**
 10. Inspection of the infiltration basin following storms of 1 inch or more should be added to the long-term maintenance plan. **Repeat Comment.**
 11. Please see the attached invoice for the current fees and remit these fees upon receipt. As requested, the invoice is being submitted directly to Skilken Gold.

Mr. Eric Williams, P.E.
Stonefield Engineering
Sheetz Fuel Center
WCWRC Project No. 10501
Page 3 of 3

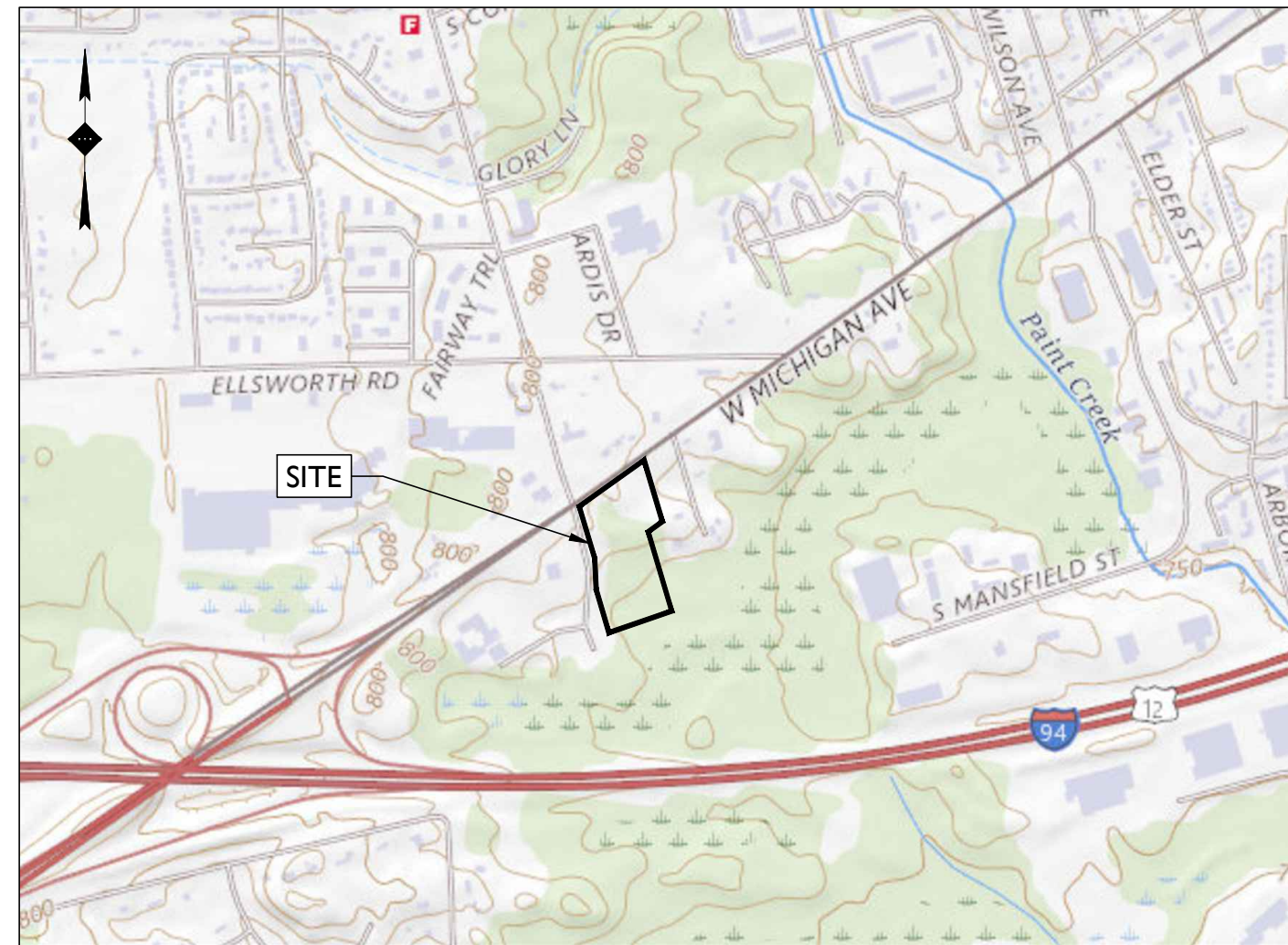
At your convenience, please send us a complete set of revised plans and the additional information requested above so that we may continue our review. If you have any questions, please contact our office.

Sincerely,



Theresa M. Marsik, P.E.
Stormwater Engineer
(approval\Sheetz Fuel Center rev2)

cc: Derick Riba, Skilken Gold
Lauren Doppke, Ypsilanti Township Planning Department
Belinda Kingsley, Ypsilanti Township Planning & Zoning Coordinator
Fletcher Reyher, Ypsilanti Township Planning & Development Coordinator
Doug Winters, McLain and Winters
Matt Parks, P.E., Ypsilanti Township Engineer (OHM)
Stacie Monte, Ypsilanti Township Engineer (OHM)



SOURCE: USGS TOPOGRAPHICAL MAPPER, DATE RETRIEVED 12/22/2023

LOCATION MAP

SCALE: 1" = 1000'±

SITE DEVELOPMENT PLANS

FOR



PROPOSED CONVENIENCE STORE AND FUEL SALES

PID: K11-39-350-022, K-11-39-350-023, K-11-18-100-019
 2103 WEST MICHIGAN AVENUE
 CHARTER TOWNSHIP OF YPSILANTI, WASHTENAW COUNTY, MICHIGAN

APPLICANT

SKILKEN GOLD
 4270 MORSE ROAD
 COLUMBUS, OH 43230
 419.799.7656
 DRIBA@SKILKENGOLD.COM

ENGINEER

STONEFIELD ENGINEERING & DESIGN, LLC
 607 SHELBY STREET, SUITE 200
 DETROIT, MI 48226
 248.247.1115
 E.WILLIAMS@STONEFIELDENG.COM

NO.	DATE	BY	DESCRIPTION
3	06/12/2024	KH	REVISED FOR SITE PLAN REVIEW
2	05/09/2024	NBJD	FOR SITE PLAN REVIEW
1	04/09/2024	NBJD	FOR SITE PLAN REVIEW

NOT APPROVED FOR CONSTRUCTION



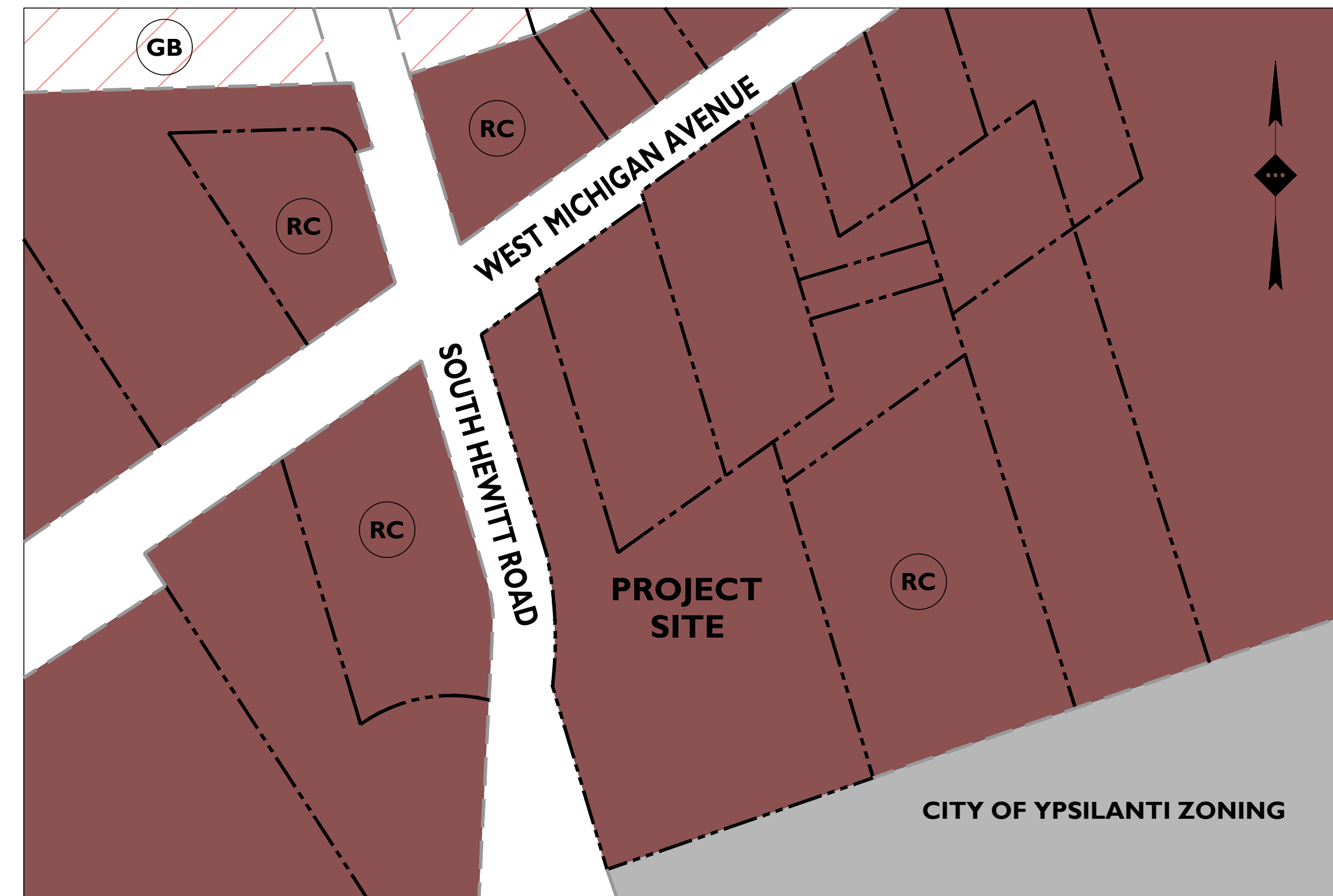
Rutherford, NJ · New York, NY · Boston, MA
 Princeton, NJ · Tampa, FL · Detroit, MI
 www.stonefieldeng.com
 607 Shelby Suite 200, Detroit, MI 48226
 Phone 248.247.1115



SOURCE: NEARMAP ONLINE MAPPING SYSTEM, DATE RETRIEVED 12/22/2023

AERIAL MAP

SCALE: 1" = 150'±



SOURCE: CHARTER TOWNSHIP OF YPSILANTI ZONING MAP, DATE RETRIEVED 03/12/2024

RC - REGIONAL CORRIDOR DISTRICT
 GB - GENERAL BUSINESS DISTRICT

ZONING MAP

SCALE: 1" = 150'±

PLANS PREPARED BY:



Detroit, MI · New York, NY · Boston, MA
 Princeton, NJ · Tampa, FL · Rutherford, NJ
 www.stonefieldeng.com

607 Shelby Suite 200, Detroit, MI 48226
 Phone 248.247.1115

PLAN REFERENCE MATERIALS:

- THIS PLAN SET REFERENCES THE FOLLOWING DOCUMENTS INCLUDING, BUT NOT LIMITED TO:
 - ALTA / NSPS LAND TITLE SURVEY PREPARED BY KEM-TEC, DATED 12/08/23
 - ARCHITECTURAL PLANS PREPARED BY CONVENIENCE ARCHITECTURE AND DESIGN P.C., DATED 12/08/2023
 - AERIAL MAP PROVIDED BY NEARMAP ONLINE MAPPING SYSTEM, DATE RETRIEVED 12/22/2023
 - LOCATION MAP PROVIDED BY USGS TOPOGRAPHICAL MAPS, DATED RETRIEVED 12/22/2023
- ALL REFERENCE MATERIAL LISTED ABOVE SHALL BE CONSIDERED A PART OF THIS PLAN SET AND ALL INFORMATION CONTAINED WITHIN THESE MATERIALS SHALL BE UTILIZED IN CONJUNCTION WITH THIS PLAN SET. THE CONTRACTOR IS RESPONSIBLE TO OBTAIN A COPY OF EACH REFERENCE AND REVIEW IT THOROUGHLY PRIOR TO THE START OF CONSTRUCTION.

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SHEET INDEX	
DRAWING TITLE	SHEET #
ALTA / NSPS LAND TITLE SURVEY	2 OF 2

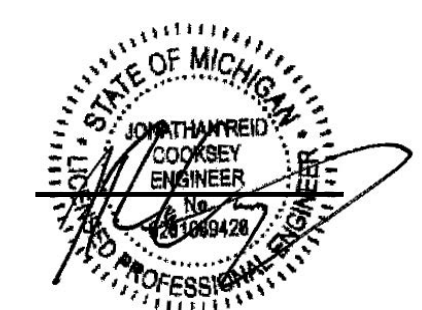
PROJECT NARRATIVE:

THE PROJECT PROPOSES A 6,139 SF CONVENIENCE STORE (PERMITTED USE) AND RESTAURANT (PERMITTED USE) WITH FUEL SALES (SPECIAL LAND USE) AT THE SOUTHEAST CORNER OF WEST MICHIGAN AVENUE AND SOUTH HEWITT ROAD. THE SITE IS LOCATED WITHIN THE RC - REGIONAL CORRIDOR DISTRICT. THE BUILDING IS PROPOSED ALONG THE HARD CORNER, WITH THE FUEL CANOPY AND PUMPS TO THE SOUTH. PARKING IS PROVIDED WITHIN THE SIDE AND REAR YARDS; 62 SPACES ARE PROPOSED WHERE 60 ARE REQUIRED. OUTDOOR SEATING IS PROVIDED ALONG THE EASTERN FACADE OF THE BUILDING. LANDSCAPING IS PROPOSED TO SCREEN THE SITE FROM ABUTTING RIGHTS-OF-WAY AND RESIDENTIAL PROPERTIES. STORMWATER WILL BE DETAINED AND RELEASED TO THE EXISTING WETLANDS ON THE SOUTHERN PORTION OF THE SITE.



Know what's below
 Call before you dig.

SITE DEVELOPMENT PLAN
SHEETZ
 PROPOSED CONVENIENCE STORE AND FUEL STATION
 PID: K11-39-350-022, K-11-39-350-023, K-11-18-100-019
 2103 WEST MICHIGAN AVENUE
 CHARTER TOWNSHIP OF YPSILANTI
 WASHTENAW COUNTY, MICHIGAN



SCALE: AS SHOWN PROJECT ID: DET-230091.01

TITLE:

COVER SHEET

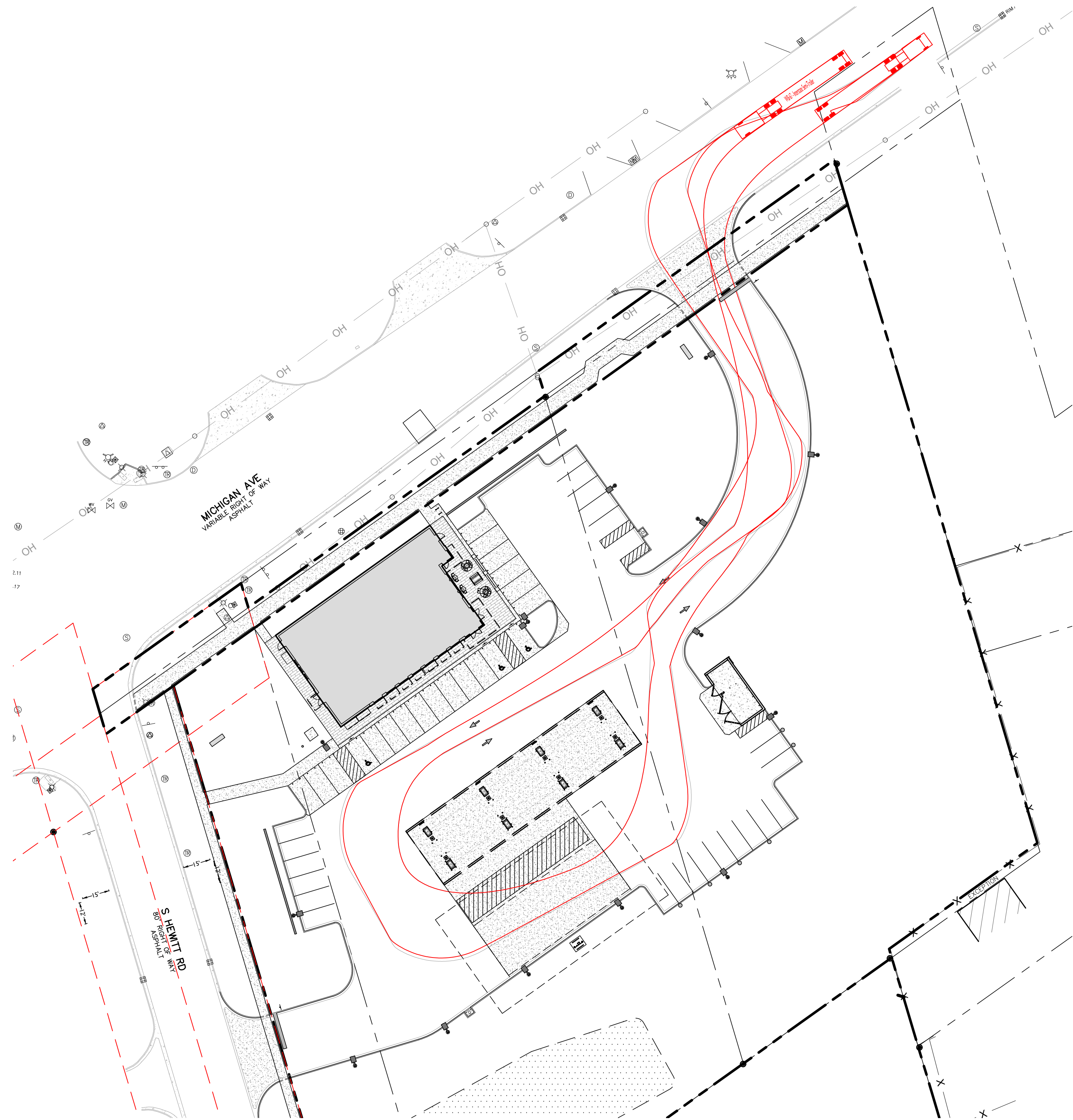
DRAWING:

C-1

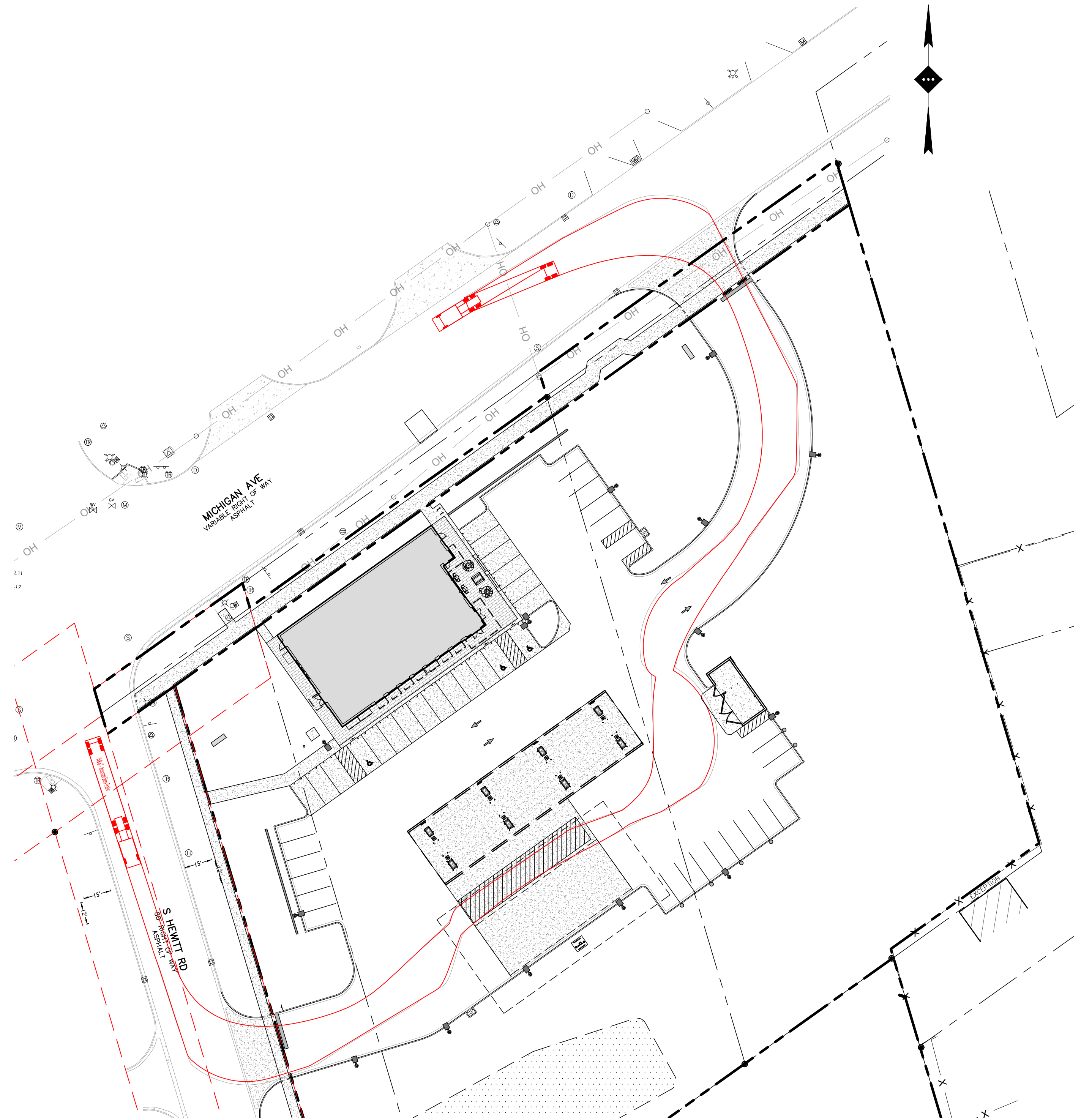
TREE INVENTORY for: 2103 West Michigan Avenue, Ypsilanti Township, Michigan									
Tree #	d.b.h. (inches)	Canopy Radius (feet)	Botanical Name	Common Name	Condition	Comments	(N) NOT REGULATED (s = size, sp = species, c = condition)	Historic (H) Specimen (S)	Recommendation
4992	14	15	Juglans spp.	Walnut	poor	- Extensive rot/hollow @ crotch	N (c)		To Remain
4993	9 / 7	9	Catalpa speciosa	Northern Catalpa	fair	- Contorted crown			To Remain
4994	13	14	Populus deltoides	Cottonwood	fair	- Dead branch(es)			To Remain
4995	14	15	Populus deltoides	Cottonwood	fair	- Bent/crooked/bowed leader			To Remain
4996	10	11	Ulmus pumila	Siberian Elm	fair	- Bent/crooked/bowed leader			To Remain
4997	15	16	Populus deltoides	Cottonwood	fair	- 1-sided crown			To Remain
4998	10	11	Populus deltoides	Cottonwood	fair	- 1-sided crown			To Remain
4999	7	7	Salix spp.	Willow	poor	- HAZARD - Broken trunk/leader	N (s, c)		To Remain
5000	13	14	Populus deltoides	Cottonwood	fair	- Bent/crooked/bowed leader			To Remain
5001	14	15	Populus deltoides	Cottonwood	fair	- Dead branch(es)			To Remain
5002	13	14	Populus deltoides	Cottonwood	fair	- Contorted crown			To Remain
5003	16	17	Juglans spp.	Walnut	fair	- Dead branch(es)			To Remain
5004	18	19	Juglans spp.	Walnut	good				To Remain
5005	17 / 15	18	Morus spp.	Mulberry	poor	- Lean > 45 degrees	N (c)		To Remain
5006	23	---	---	---	dead		N (c)		To Remain
5007	17	18	Morus spp.	Mulberry	fair	- Contorted crown			To Remain
5008	33	10	Populus deltoides	Cottonwood	poor	- 75% or more dead	N (c)		To Remain
5009	8	8	Juglans spp.	Walnut	fair	- Dead branch(es)			To Remain
5010	9	9	Catalpa speciosa	Northern Catalpa	fair	- Dead branch(es)			To Remain
5011	9	9	Ulmus spp.	Elm	good				To Remain
5012	10	11	Juglans spp.	Walnut	fair	- Dead branch(es)			To Remain
5013	8 / 4	8	Juglans spp.	Walnut	fair	- Contorted crown			To Remain
5014	8	8	Juglans spp.	Walnut	fair	- Dead branch(es)			To Remain
5015	7 / 6	7	Juglans spp.	Walnut	fair	- V-shaped crotch(es)	N (s)		To Remain
5016	15	5	Malus spp.	Apple / Crabapple	poor	- 75% or more dead	N (c)		To Remain
5017	7	7	Juglans spp.	Walnut	good		N (s)		To Remain
5018	11	12	Acer negundo	Boxelder	fair	- Contorted crown			To Be Removed
5019	9	9	Juglans spp.	Walnut	fair	- Dead branch(es)			To Be Removed
5020	10	11	Juglans spp.	Walnut	fair	- Bent/crooked/bowed leader			To Be Removed
5021	21	22	Juglans spp.	Walnut	fair	- Dead branch(es)			To Be Removed
5022	10	11	Juglans spp.	Walnut	fair	- Dead branch(es)			To Be Removed
5023	10	11	Tilia americana	American Linden	good				To Be Removed
5024	26	20	Prunus serotina	Black Cherry	poor	- 50% or more dead	N (c)		To Be Removed
5025	8	8	Prunus spp.	Cherry	fair	- Bent/crooked/bowed leader			To Remain
5026	9	9	Juglans spp.	Walnut	fair	- Contorted crown			To Remain
5027	26	27	Prunus serotina	Black Cherry	fair	- Dead branch(es)			To Remain
5028	9	9	Juglans spp.	Walnut	fair	- Bent/crooked/bowed leader			To Remain
5029	8	8	Juglans spp.	Walnut	fair	- Bent/crooked/bowed leader			To Remain
5030	9	9	Catalpa speciosa	Northern Catalpa	fair	- Dead branch(es)			To Remain
5031	9	9	Juglans spp.	Walnut	good				To Remain
5032	12	13	Catalpa speciosa	Northern Catalpa	fair	- Contorted crown			To Remain
5033	11	10	Juglans spp.	Walnut	poor	- Split(ting)/break(ing) apart	N (c)		To Remain
5034	10	11	Juglans spp.	Walnut	good				To Remain
5035	8	8	Juglans spp.	Walnut	good				To Remain
5036	9	9	Juglans spp.	Walnut	good				To Remain
5037	22	23	Prunus serotina	Black Cherry	poor	- 50% or more dead	N (c)		To Remain
5038	18	19	Ulmus spp.	Elm	fair	- 1-sided crown			To Remain
5039	12	13	Ulmus spp.	Elm	fair	- Contorted crown			To Be Removed
5040	18	15	Prunus serotina	Black Cherry	poor	- Split(ting)/break(ing) apart	N (c)		To Be Removed
5041	14	15	Prunus serotina	Black Cherry	fair	- Dead branch(es)			To Be Removed
5042	8	8	Juglans spp.	Walnut	fair	- Dead branch(es)			To Be Removed
5043	12 / 6	13	Juglans spp.	Walnut	fair	- Contorted crown			To Be Removed
5044	12 / 9	13	Juglans spp.	Walnut	poor	- Split(ting)/break(ing) apart	N (c)		To Be Removed
5045	14 / 7	15	Ulmus spp.	Elm	fair	- Contorted crown			To Be Removed
5046	10	11	Prunus serotina	Black Cherry	fair	- Bent/crooked/bowed leader			To Remain
5047	8	8	Prunus serotina	Black Cherry	fair	- Bent/crooked/bowed leader			To Remain
5048	12	13	Prunus serotina	Black Cherry	poor	- Extensive rot & dead branches	N (c)		To Be Removed
5049	17	18	Prunus serotina	Black Cherry	poor	- Extensive rot & dead branches	N (c)		To Remain
5050	11	5	Prunus serotina	Black Cherry	poor	- 75% or more dead	N (c)		To Remain
5051	12	13	Prunus serotina	Black Cherry	fair	- Bent/crooked/bowed leader			To Remain
5052	21 / 9 / 9	10	Acer negundo	Boxelder	poor	larger trunk(s) dead & substantial	N (c)		To Be Removed
5053	10	11	Prunus spp.	Cherry	fair	- Vine-choked			To Be Removed
5054	8	---	---	---	dead		N (c)		To Be Removed
5055	8	8	Acer negundo	Boxelder	fair	- Contorted crown			To Be Removed
5056	8	8	Acer negundo	Boxelder	fair	- Bent/crooked/bowed leader			To Be Removed
5057	8	8	Prunus spp.	Cherry	poor	- 75% or more dead	N (c)		To Be Removed
5058	8	---	---	---	dead		N (c)		To Be Removed
5059	9 / 9 / 7	9	Prunus spp.	Cherry	poor	- 50% or more dead	N (c)		To Be Removed
5060	9	9	Ulmus spp.	Elm	fair	- Contorted crown			To Be Removed
5061	8	8	Populus deltoides	Cottonwood	poor	- 50% or more dead	N (c)		To Be Removed
5062	11	---	---	---	dead		N (c)		To Be Removed
5063	10	---	---	---	dead		N (c)		To Be Removed
5064	9	9	Juglans spp.	Walnut	fair	- Contorted crown			To Be Removed
5065	13	14	Juglans spp.	Walnut	good				To Be Removed
5066	8	8	Juglans spp.	Walnut	good				To Be Removed
5067	11 / 10	12	Acer negundo	Boxelder	poor	Partially uprooted / knocked over	N (c)		To Be Removed
5068	20 / 13 / 11	21	Morus spp.	Mulberry	fair	- Contorted crown			To Be Removed
5069	20	---	---	---	dead		N (c)		To Be Removed
5070	36	38	Quercus spp.	Oak (white family)	fair	- Dead branch(es)			To Be Removed
5071	28	29	Quercus spp.	Oak (red family)	fair	- Rot in trunk			To Be Removed
5072	10 / 7	11	Morus spp.	Mulberry	fair	- Contorted crown			To Be Removed
5073	26	20	Prunus serotina	Black Cherry	poor	- 50% or more dead	N (c)		To Be Removed
5074	12 / 3	13	Juglans spp.	Walnut	fair	- V-shaped crotch(es)			To Be Removed
5075	23	15	Prunus serotina	Black Cherry	poor	- 75% or more dead	N (c)		To Be Removed
5076	8	8	Catalpa speciosa	Northern Catalpa	fair	- Contorted crown			To Be Removed
5077	9	9	Juglans spp.	Walnut	fair	- Bent/crooked/bowed leader			To Be Removed
5078	11	0	Juglans spp.	Walnut	poor	- Split(ting)/break(ing) apart	N (c)		To Be Removed
5079	7	7	Juglans spp.	Walnut	fair	- Bent/crooked/bowed leader	N (s)		To Be Removed
5080	12	13	Juglans spp.	Walnut	good				To Be Removed

TREE SURVEY COMPLETED BY KEM-TEC SURVEYING DATED 9/29/2023.

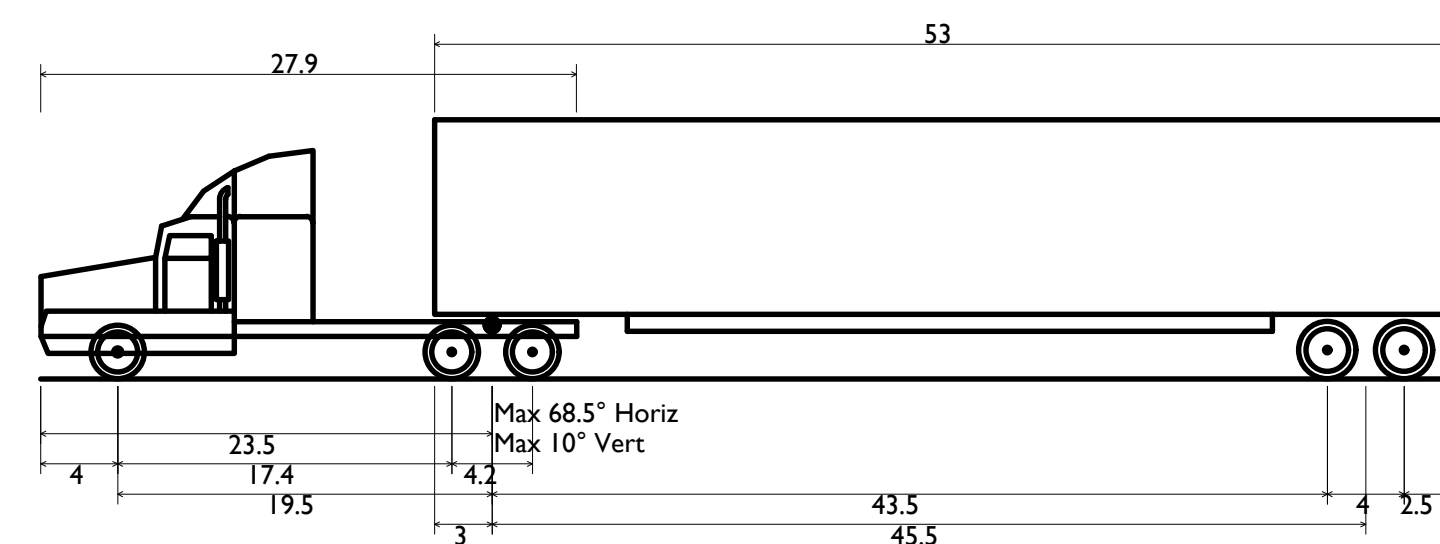
5081	11	12	Juglans spp.	Walnut	fair	- Dead branch(es)			To Be Removed
5082	9	9	Juglans spp.	Walnut	fair	- Bent/crooked/bowed leader			To Remain
5083	9	9	Juglans spp.	Walnut	fair	- Bent/crooked/bowed leader			To Be Removed
5084	9	9	Juglans spp.	Walnut	good				To Be Removed
5085	7	7	Juglans spp.	Walnut	good			N (s)	To Be Removed
5086	14 / 4	15	Juglans spp.	Walnut	fair	- Smaller trunk(s) dead			To Be Removed
5087	10 / 8	11	Catalpa speciosa	Northern Catalpa	fair	- Contorted crown			To Be Removed
5088	8	8	Juglans spp.	Walnut	good				To Be Removed
5089	24	20	Prunus serotina	Black Cherry	poor	- 50% or more dead	N (c)		To Be Removed
5090	20	15	Prunus serotina	Black Cherry	poor	- 50% or more dead	N (c)		To Be Removed
5091	21	22	Juglans spp.	Walnut	good				To Be Removed
5092	9	9	Juglans spp.	Walnut	fair	- Broken branch(es)			To Be Removed
5093	22	20	Prunus serotina	Black Cherry	fair	- Dead branch(es)			To Be Removed
5094	25	26	Prunus serotina	Black Cherry	fair	- Rot in trunk			To Be Removed
5095	32	34	Prunus serotina	Black Cherry	fair	- Dead branch(es)			To Be Removed
5096	28	25	Prunus serotina	Black Cherry	poor	- 50% or more dead	N (c)		To Be Removed
5097	27	25	Prunus serotina	Black Cherry	poor	- Extensive rot & dead branches	N (c)		To Be Removed
5098	8	8	Juglans spp.	Walnut	fair	- Bent/crooked/bowed leader			To Be Removed
5099	16 / 10 / ...	10	Acer negundo	Boxelder	poor	- Split(ting)/break(ing) apart	N (c)		To Be Removed
5100	17 / 19	18	Acer negundo	Boxelder	poor	- Extensive rot & dead branches	N (c)		To Be Removed
5101	12	13	Morus spp.	Mulberry	fair	- Contorted crown			To Be Removed
5102	10	11	Juglans spp.	Walnut	fair	- 1-sided crown			To Be Removed
5103	23	24	Ulmus spp.	Elm	fair	- Dead branch(es)			To Remain
5104	11 / 11	12	Morus spp.	Mulberry	poor	- Extensive rot & dead branches	N (c)		To Be Removed
5105	7	7	Morus spp.	Mulberry	fair	- Contorted crown	N (s)		To Be Removed
5106	10	11	Acer platanoides	Norway Maple	good				To Be Removed
5107	11	12	Juglans spp.	Walnut	good				To Be Removed
5108	10	11	Juglans spp.	Walnut	fair	- Broken branch(es)			To Be Removed
5109	11	12	Celtis occidentalis	Hackberry	good				To Be Removed
5110	29	25	Prunus serotina	Black Cherry	poor	- 50% or more dead	N (c)		To Be Removed
5111	28	20	Prunus serotina	Black Cherry	poor	- Extensive rot & dead branches	N (c)		To Be Removed
5112	26	20	Prunus serotina	Black Cherry	poor	- 50% or more dead	N (c)		To Be Removed
5113	10	---	---	---	dead		N (c)		To Be Removed
5114	10 / 4 / 2	11	Ulmus spp.	Elm	fair	- Contorted crown			To Be Removed
5115	18	10	Prunus serotina	Black Cherry	poor	- 75% or more dead	N (c)		To Be Removed
5116	14	15	Pseudotsuga menziesii	Douglasfir	fair	lower/shaded branches dead/missing			To Be Removed
5117	9	9	Juglans spp.	Walnut	fair	- Contorted crown			To Be Removed
5118	12	13	Juglans spp.	Walnut	good				To Be Removed
5119	8	5	Ulmus pumila	Siberian Elm	poor	- 50% or more dead	N (c)		To Be Removed
5120	12 / ...	---	---	---	dead		N (c)		To Be Removed
5121	49	45	Acer saccharinum	Silver Maple	poor	- Hollow/extensive rot	N (c)		To Remain
5122	12 / 12	13	Juglans spp.	Walnut	fair	- Contorted crown			To Be Removed
5123	13	14	Juglans spp.	Walnut	fair	- Leaning			To Be Removed
5124	13	14	Juglans spp.	Walnut	fair	- Bent/crooked/bowed leader			To Be Removed
5125	8 / 7	8	Acer platanoides	Norway Maple	fair	- Contorted crown			To Be Removed
5126	8	8	Juglans spp.	Walnut	fair	- Contorted crown			To Be Removed
5127	8	5	Juglans spp.	Walnut	poor	- 50% or more dead	N (c)		To Be Removed
5128	13 / 13 / 11	14	Juglans spp.	Walnut	fair	- V-shaped crotch(es)			To Be Removed
5129	12	13	Juglans spp.	Walnut	fair	- 1-sided crown			To Be Removed
5130	9	9	Juglans spp.	Walnut	fair	- Dead branch(es)			To Be Removed
5131	11	12	Juglans spp.	Walnut	good				To Be Removed
5132	8 / 7 / 3	8	Morus spp.	Mulberry	fair	- Smaller trunk(s) dead			To Be Removed
5133	7 / 4	7	Acer negundo	Boxelder	fair	- Contorted crown	N (s)		To Be Removed
5134	8	8	Prunus serotina	Black Cherry	fair	- 1-sided crown			To Be Removed
5135	8	8	Prunus serotina	Black Cherry	fair	- Leaning			To Be Removed
5136	31 / 21	33	Morus spp.	Mulberry	poor	- Split(ting)/break(ing) apart	N (c)		To Be Removed
5137	12	13	Acer platanoides	Norway Maple	fair	- Leaning			To Be Removed
5138	8	8	Ulmus spp.	Elm	fair	- Contorted crown			To Be Removed
5139	8	8	Ulmus pumila	Siberian Elm	fair	- Extensive rot & dead branches			To Be Removed
5140	14 / 8	15	Morus spp.	Mulberry	fair	- Contorted crown			To Be Removed
5141	8 / 8 / 6 / ...	---	---	---	dead		N (c)		To Be Removed
5142	11	12	Juglans spp.	Walnut	fair	- Contorted crown			To Be Removed
5143	11	12	Juglans spp.	Walnut	fair	- Dead branch(es)			To Be Removed
5144	13	14	Juglans spp.	Walnut	fair	- Bent/crooked/bowed leader			To Be Removed
5145	8	8	Juglans spp.	Walnut	fair	- Bent/crooked/bowed leader			To Be Removed
5146	17	5	Acer platanoides	Norway Maple	poor	- 75% or more dead	N (c)		To Be Removed
5147	21	22	Acer platanoides	Norway Maple	fair	- 1-sided crown			To Be Removed
5148	17	18	Acer platanoides	Norway Maple	good				To Be Removed
5149	17	15	Acer platanoides	Norway Maple	poor	- 75% or more dead	N (c)		To Be Removed
5150	11	12	Acer platanoides	Norway Maple	poor	- Extensive rot & dead branches	N (c)		To Be Removed
5151	14 / 13	15	Acer platanoides	Norway Maple	fair	- Contorted crown			To Be Removed
5152	15	16	Acer platanoides	Norway Maple	fair	- Contorted crown			



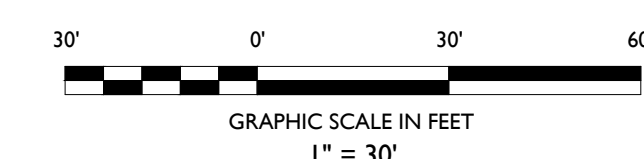
DELIVERY TRUCK CIRCULATION



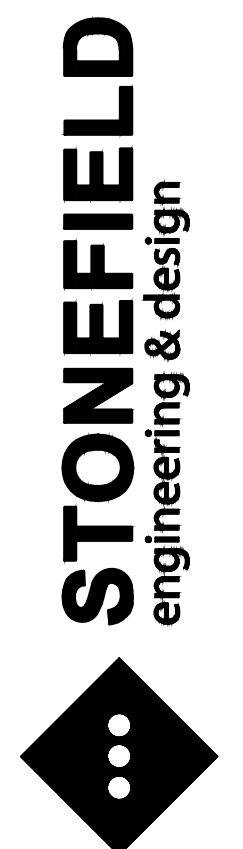
FUEL TRUCK CIRCULATION



WB-67 - Interstate Semi-Trailer
 Overall Length 73.50ft
 Overall Width 8.500ft
 Overall Body Height 13.500ft
 Min Body Ground Clearance 1.334ft
 Max Track Width 8.500ft
 Lock-to-lock time 6.00s
 Max Steering Angle (Virtual) 28.40°



NOT APPROVED FOR CONSTRUCTION



Rutherford, NJ - New York, NY - Boston, MA
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 www.stonefielddeng.com

607 Shelby Suite 200, Detroit, MI 48226
 Phone 248.247.1115

SITE DEVELOPMENT PLAN



**PROPOSED CONVENIENCE
 STORE AND FUEL STATION**

PID: K11-39-350-023, K-11-39-350-023, K-11-18-100-019
 2103 WEST MICHIGAN AVENUE
 CHARTER TOWNSHIP OF YPSILANTI
 WASHTEENAW COUNTY, MICHIGAN



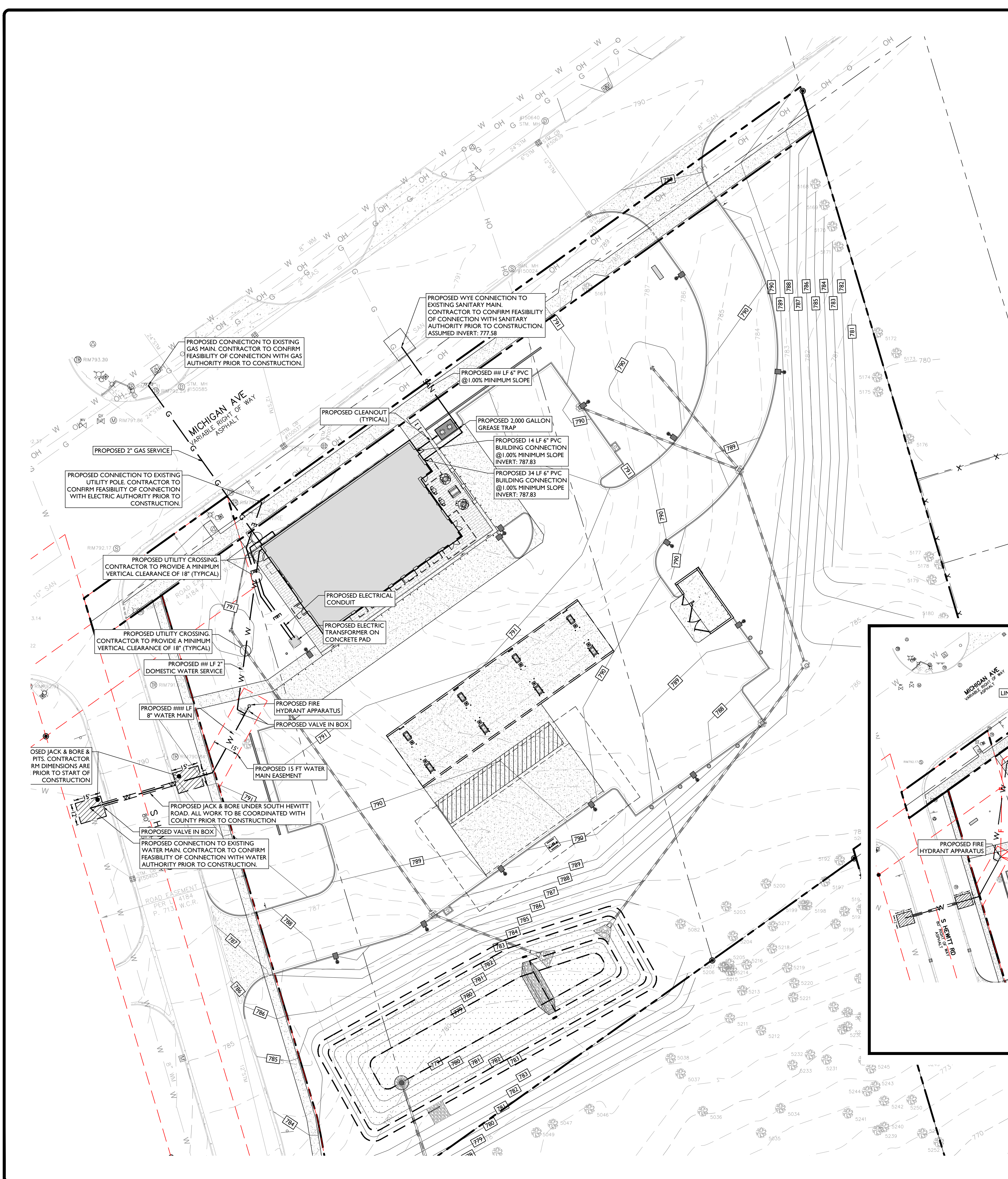
SCALE: 1" = 30' PROJECT ID: DET-230091.01

TITLE:
**TRUCK CIRCULATION
 (DELIVERY & FUEL)**

DRAWING:

C-7

ISSUE	DATE	BY	DESCRIPTION
3	06/12/2024	KH	REVISED FOR SITE PLAN REVIEW
2	05/09/2024	NBJD	FOR SITE PLAN REVIEW
1	04/09/2024	NBJD	FOR SITE PLAN REVIEW



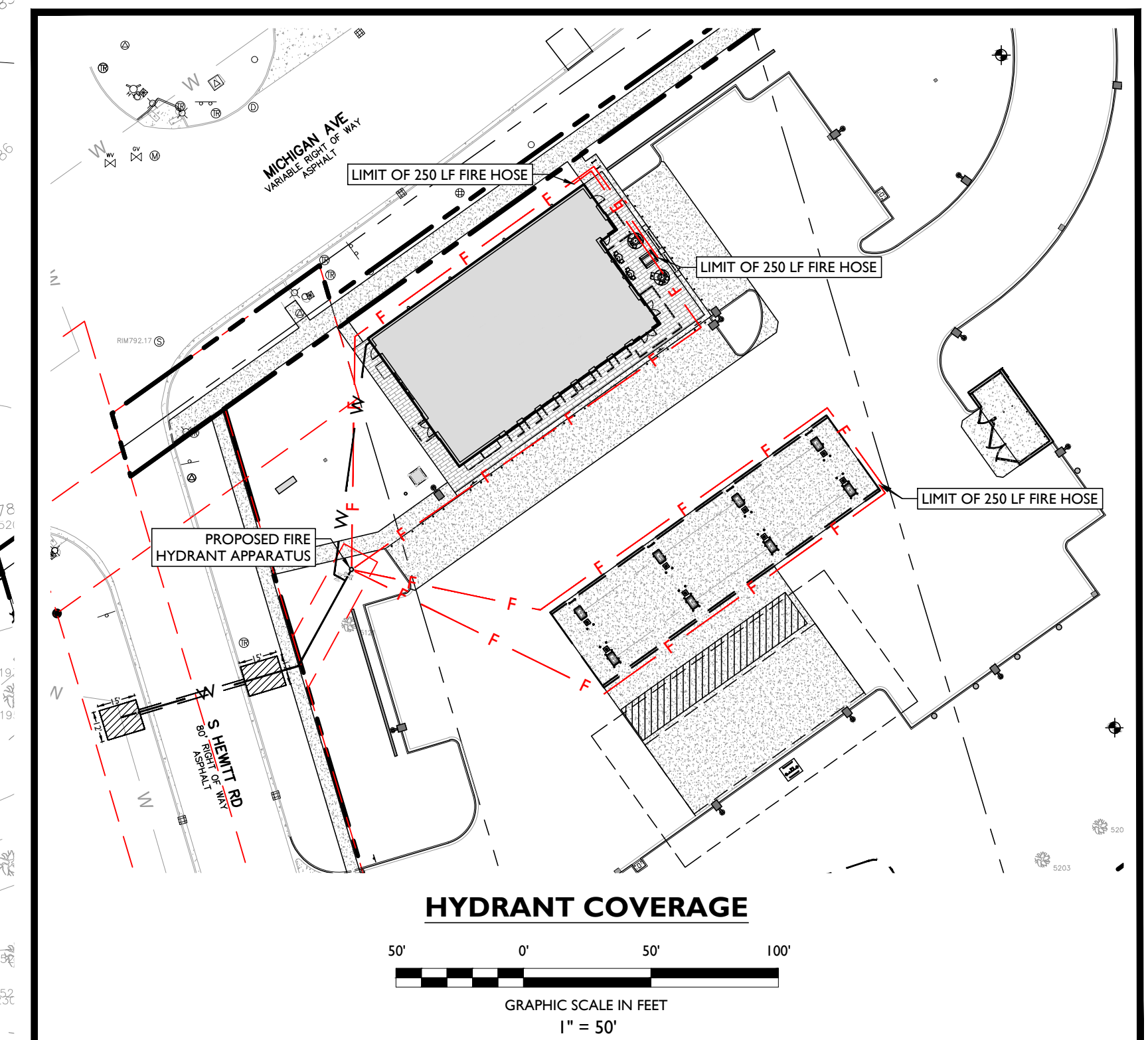
BENCHMARK

SITE BENCHMARK #1
CHISEL SQUARE ON SOUTHEAST TOP OF CONC LIGHT POLE BASE 40'
WEST OF HEWITT RD 175'± SOUTH OF MICHIGAN AVE
ELEVATION = 784.79' (NAVD 88)

SITE BENCHMARK #2
CHISEL SQUARE ON SOUTHEAST TOP OF CONC TRAFFIC SIGNAL BASE @
SOUTHEAST QUAD OF MICHIGAN AVE & HEWITT RD
ELEVATION = 791.95' (NAVD 88)

SITE BENCHMARK #3
MAG NAIL IN SOUTHEAST FACE OF UTILITY POLE 125'± EAST OF HEWITT
RD 30'± SOUTH OF MICHIGAN AVE
ELEVATION = 791.01' (NAVD 88)

SYMBOL	DESCRIPTION
---	PROPERTY LINE
— SAN —	PROPOSED SANITARY LATERAL
— W —	PROPOSED DOMESTIC WATER SERVICE
— E —	PROPOSED ELECTRIC CONDUITS
— G —	PROPOSED GAS LINE
— F —	FIRE HOSE COVERAGE
⊗	PROPOSED VALVE IN BOX
⊕	PROPOSED FIRE HYDRANT
○	PROPOSED SANITARY CLEANOUT
⊕	PROPOSED SANITARY GREASE TRAP
T	PROPOSED TRANSFORMER ON CONCRETE PAD WITH BOLLARDS



- DRAINAGE AND UTILITY NOTES**
- THE CONTRACTOR IS REQUIRED TO CALL THE APPROPRIATE AUTHORITY FOR NOTICE OF CONSTRUCTION/EXCAVATION AND UTILITY MARK OUT PRIOR TO THE START OF CONSTRUCTION IN ACCORDANCE WITH STATE LAW. CONTRACTOR IS REQUIRED TO CONFIRM THE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES IN THE FIELD. SHOULD A DISCREPANCY EXIST BETWEEN THE FIELD LOCATION OF A UTILITY AND THE LOCATION SHOWN ON THE PLAN SET OR SURVEY, THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC IMMEDIATELY IN WRITING.
 - THE CONTRACTOR IS RESPONSIBLE TO PROTECT AND MAINTAIN IN OPERATION ALL UTILITIES NOT DESIGNATED TO BE REMOVED.
 - THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO ANY EXISTING UTILITY IDENTIFIED TO REMAIN WITHIN THE LIMITS OF THE PROPOSED WORK DURING CONSTRUCTION.
 - A MINIMUM HORIZONTAL SEPARATION OF 10 FEET IS REQUIRED BETWEEN ANY SANITARY SEWER SERVICE AND ANY WATER LINES. IF THIS SEPARATION CANNOT BE PROVIDED, A CONCRETE ENCASMENT SHALL BE UTILIZED FOR THE SANITARY SEWER SERVICE AS APPROVED BY STONEFIELD ENGINEERING & DESIGN, LLC.
 - ALL WATER LINES SHALL BE VERTICALLY SEPARATED ABOVE SANITARY SEWER LINES BY A MINIMUM DISTANCE OF 18 INCHES. IF THIS SEPARATION CANNOT BE PROVIDED, A CONCRETE ENCASMENT SHALL BE UTILIZED FOR THE SANITARY SEWER SERVICE AS APPROVED BY STONEFIELD ENGINEERING & DESIGN, LLC.
 - THE CONTRACTOR TO PERFORM A TEST PIT PRIOR TO CONSTRUCTION (RECOMMEND 30 DAYS PRIOR) AT LOCATIONS OF EXISTING UTILITY CROSSINGS FOR WATER AND SANITARY SEWER CONNECTION IMPROVEMENTS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC IN WRITING.
 - THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING GAS, ELECTRIC AND TELECOMMUNICATION CONNECTIONS WITH THE APPROPRIATE GOVERNING AUTHORITY.
 - CONTRACTOR SHALL START CONSTRUCTION OF ANY GRAVITY SEWER AT THE LOWEST INVERT AND WORK UP-GRADE.
 - THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN A RECORD SET OF PLANS REFLECTING THE LOCATION OF EXISTING UTILITIES THAT HAVE BEEN CAPPED, ABANDONED, OR RELOCATED BASED ON THE IDENTIFICATION/REMOVAL ACTIVITIES REQUIRED IN THIS PLAN SET. THIS DOCUMENT SHALL BE PROVIDED TO THE OWNER FOLLOWING COMPLETION OF WORK.
 - THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN A RECORD OF THE AS-BUILT LOCATIONS OF ALL PROPOSED UNDERGROUND INFRASTRUCTURE. THE CONTRACTOR SHALL NOTE ANY DISCREPANCIES BETWEEN THE AS-BUILT LOCATIONS AND THE LOCATIONS DISPICTED WITHIN THE PLAN SET. THIS RECORD SHALL BE PROVIDED TO THE OWNER FOLLOWING COMPLETION OF WORK.

REVISION	DATE	ISSUE	DESCRIPTION
3	06/12/2024		REVISED FOR SITE PLAN REVIEW
2	05/09/2024		FOR SITE PLAN REVIEW
1	04/09/2024		FOR SITE PLAN REVIEW

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SITE DEVELOPMENT PLAN

SHEETZ

PROPOSED CONVENIENCE STORE AND FUEL STATION

PID: K11-39-350-022, K-11-39-350-023, K-11-18-100-019
2103 WEST MICHIGAN AVENUE
CHARTER TOWNSHIP OF YPSILANTI
WASHTENAW COUNTY, MICHIGAN

STATE OF MICHIGAN
DEPARTMENT OF CONSUMER SERVICES
REGISTERED PROFESSIONAL ENGINEER

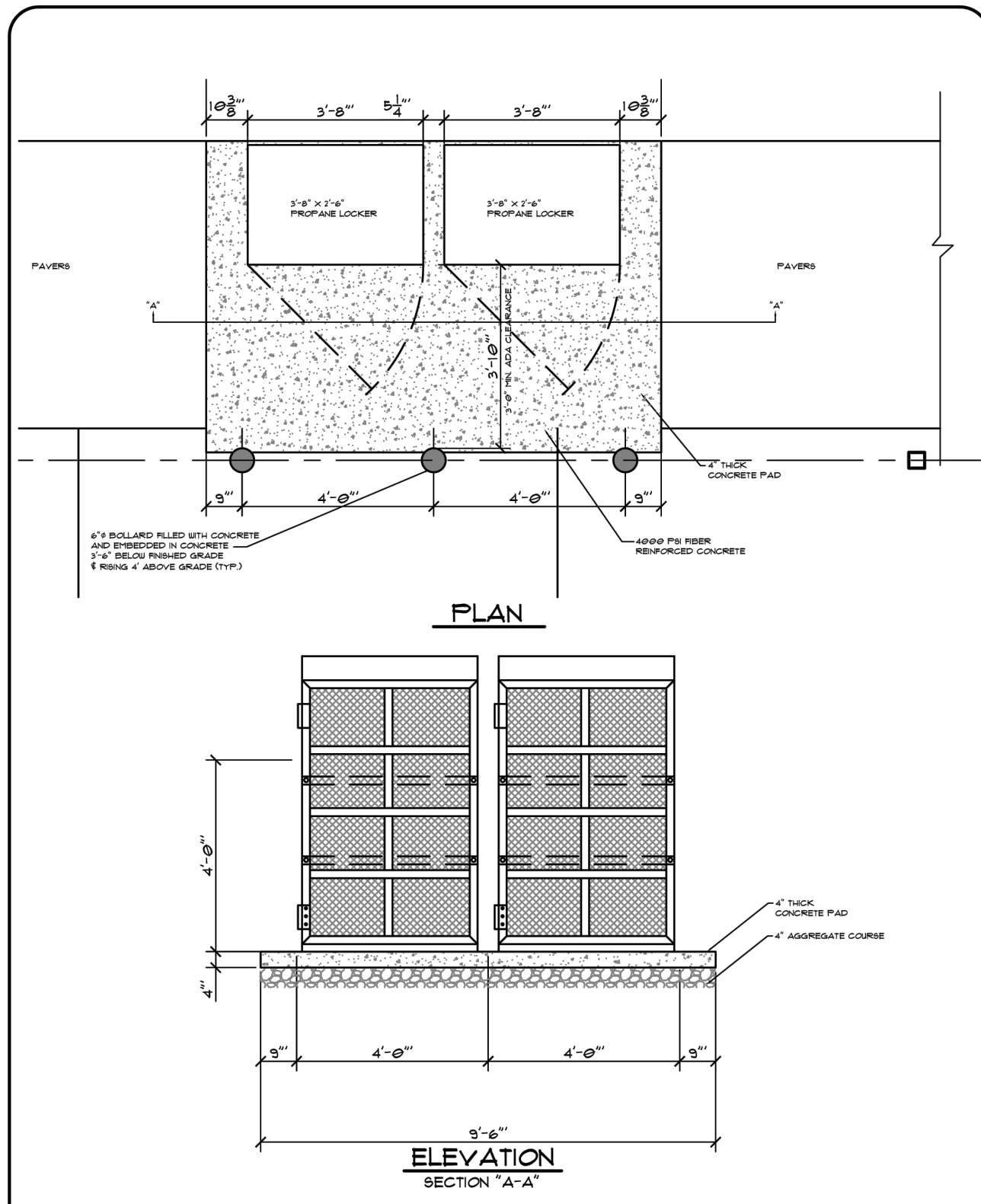
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SCALE: AS SHOWN PROJECT ID: DET-230091.01

TITLE:
UTILITY PLAN

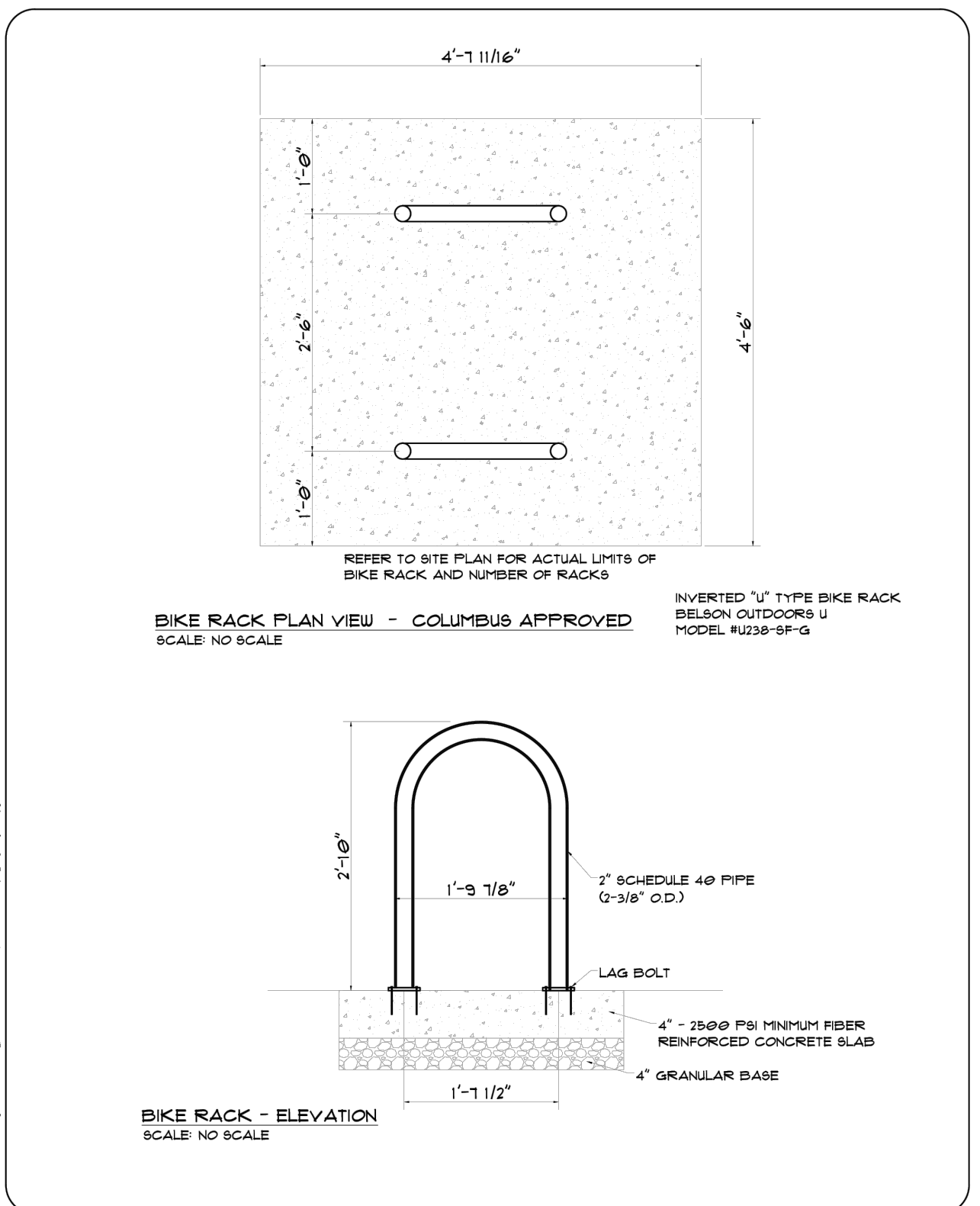
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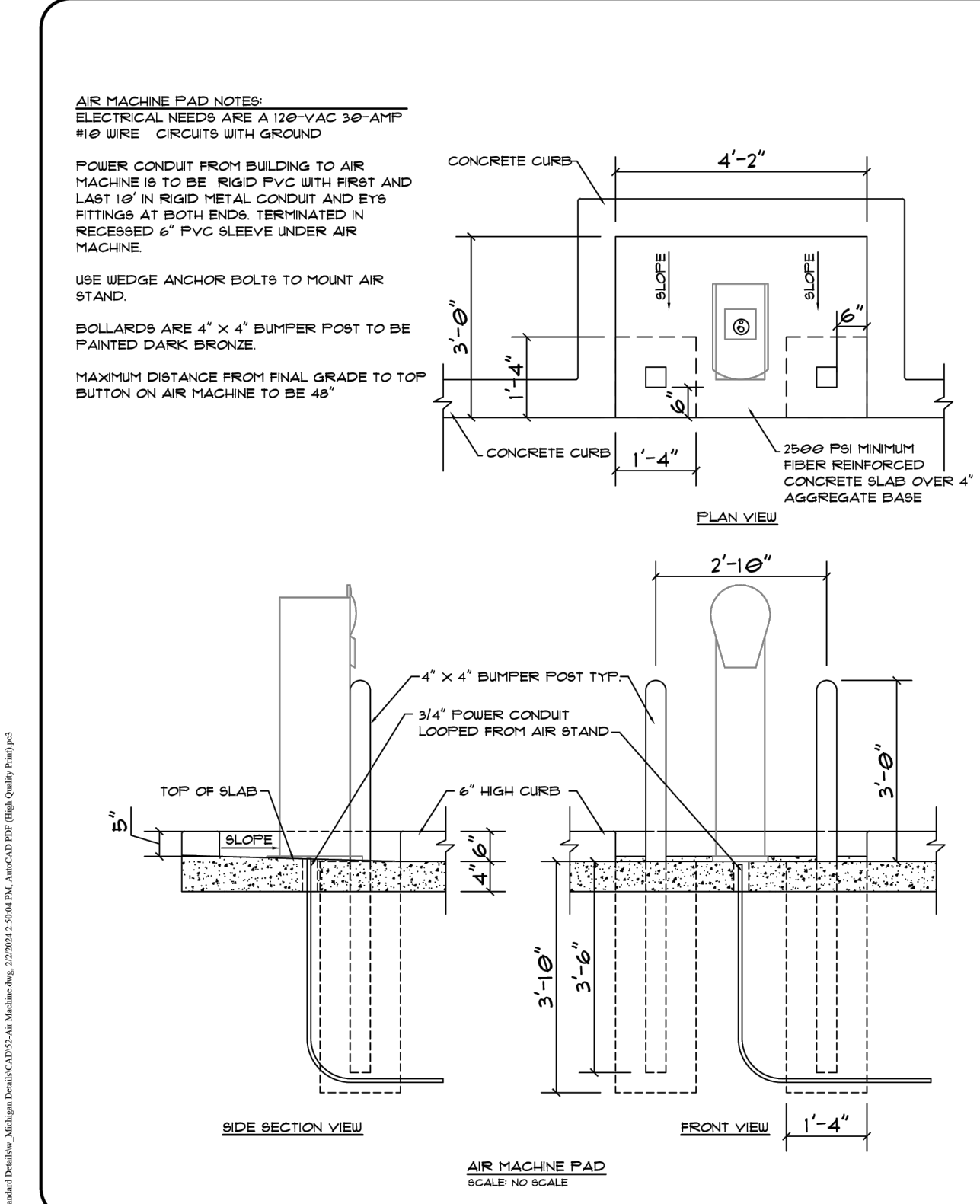
DATE	BY	DESCRIPTION	REVISIONS

SHEETZ	PROPANE LOCKER (AT BUILDING) (MICHIGAN ONLY)	SCALE: 3/8" = 1'-0"	DATE: 2/2/2024
		DRAWN BY: DMH	54



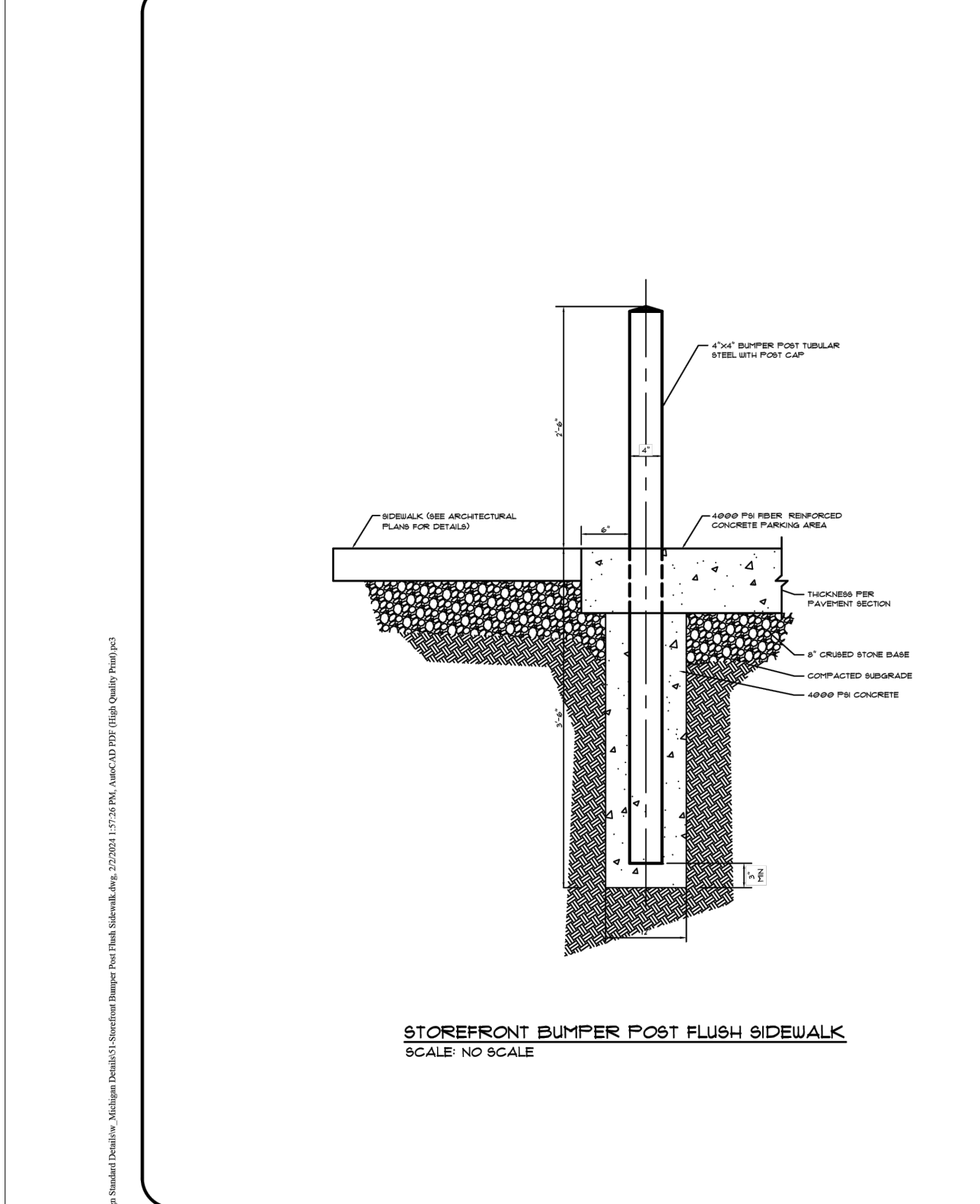
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SHEETZ	BIKE RACK	SCALE: AS NOTED	DATE: 2/2/2024
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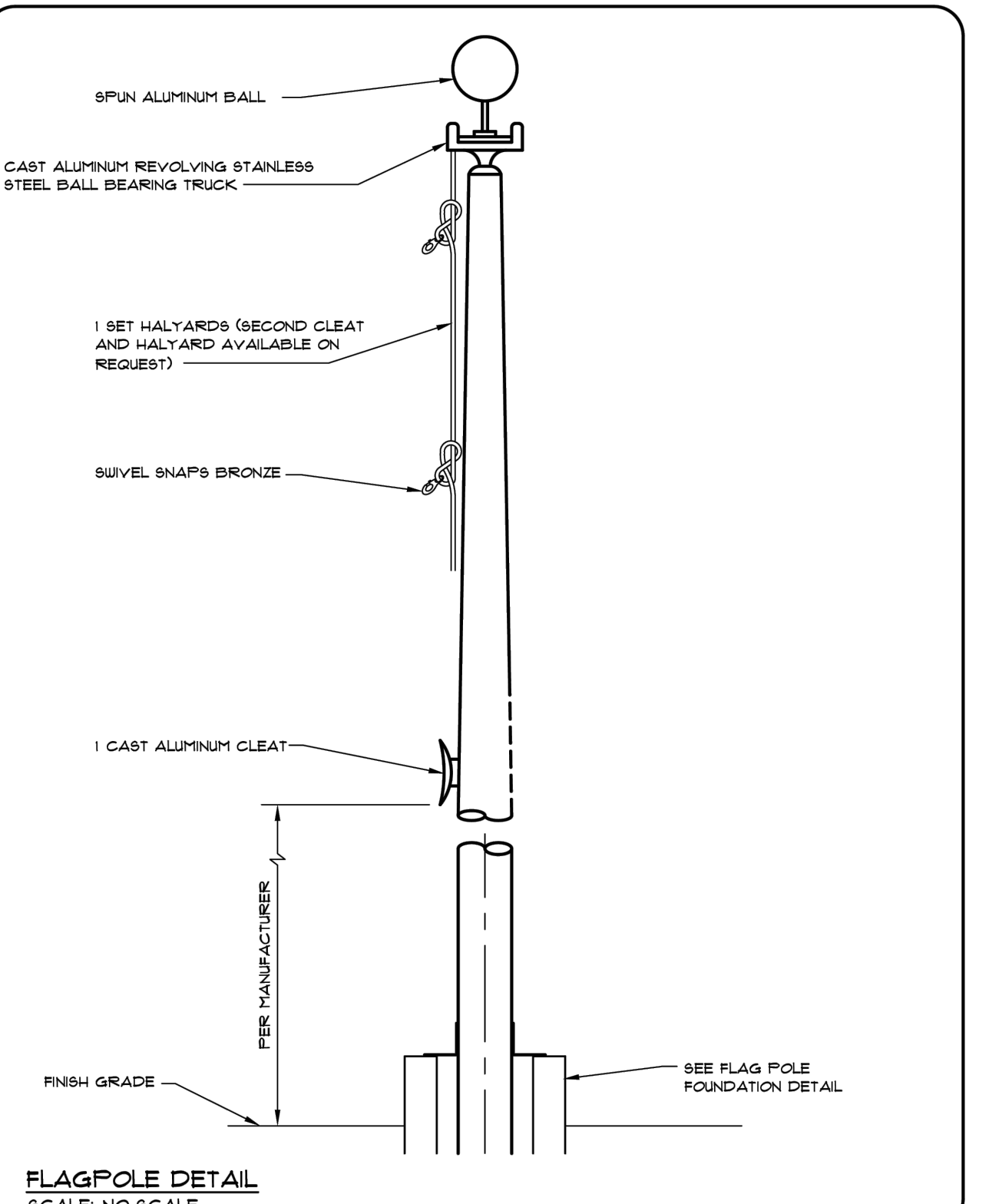
DATE	BY	DESCRIPTION	REVISIONS

SHEETZ	AIR MACHINE PAD DETAILS (MICHIGAN ONLY)	SCALE: AS NOTED	DATE: 2/2/2024
		DRAWN BY: DMH	52



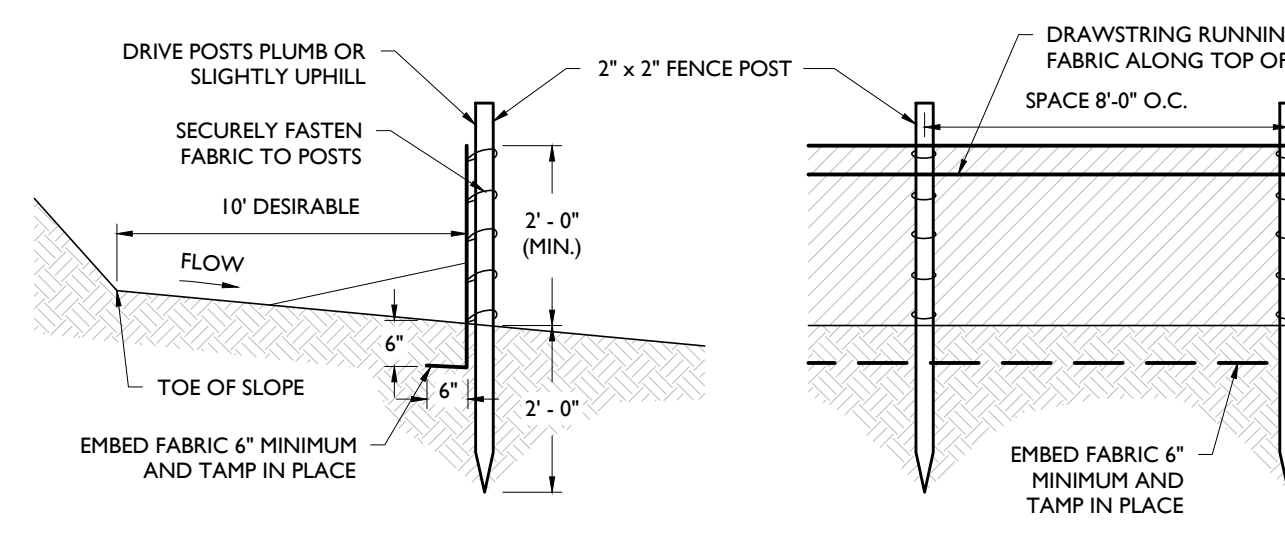
DATE	BY	DESCRIPTION	REVISIONS

SHEETZ	STOREFRONT BUMPER POST DETAIL (MICHIGAN ONLY)	SCALE: AS NOTED	DATE: 2/2/2024
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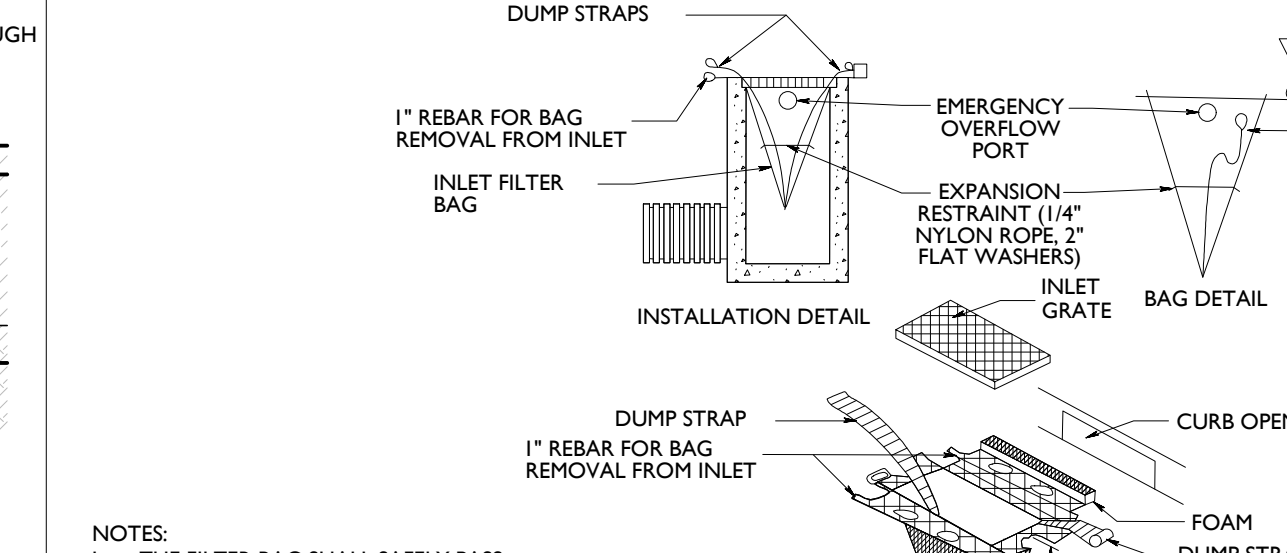
DATE	BY	DESCRIPTION	REVISIONS

SHEETZ	FLAGPOLE DETAIL	SCALE: NO SCALE	DATE: 2/2/2024
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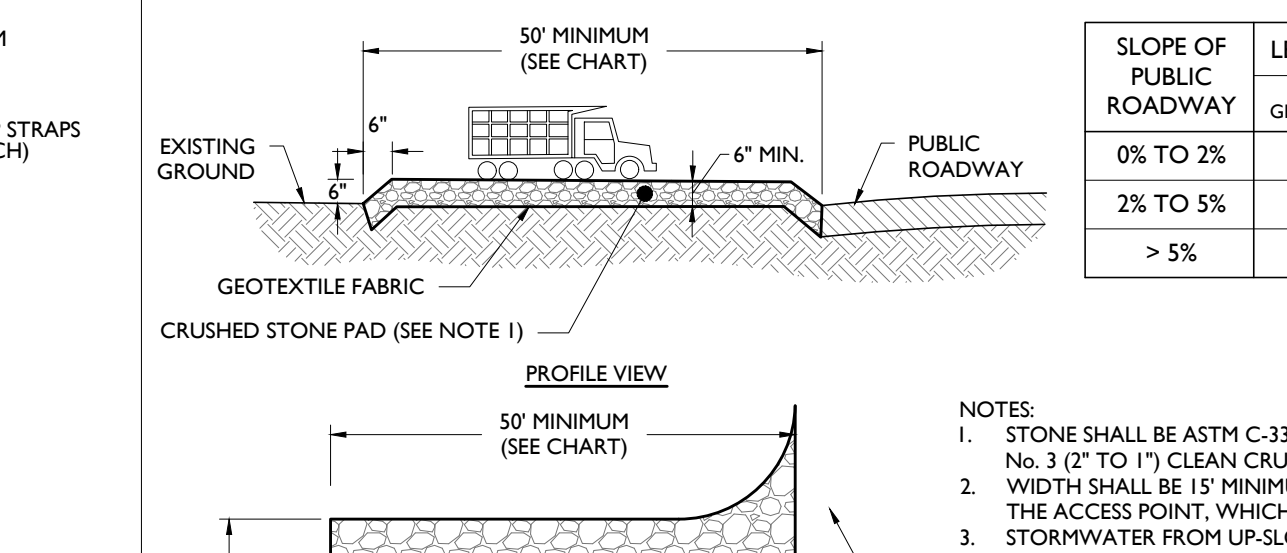
DATE	BY	DESCRIPTION	REVISIONS

SHEETZ	SILT FENCE DETAIL	SCALE: NOT TO SCALE	DATE: 2/2/2024
		DRAWN BY: DMH	6



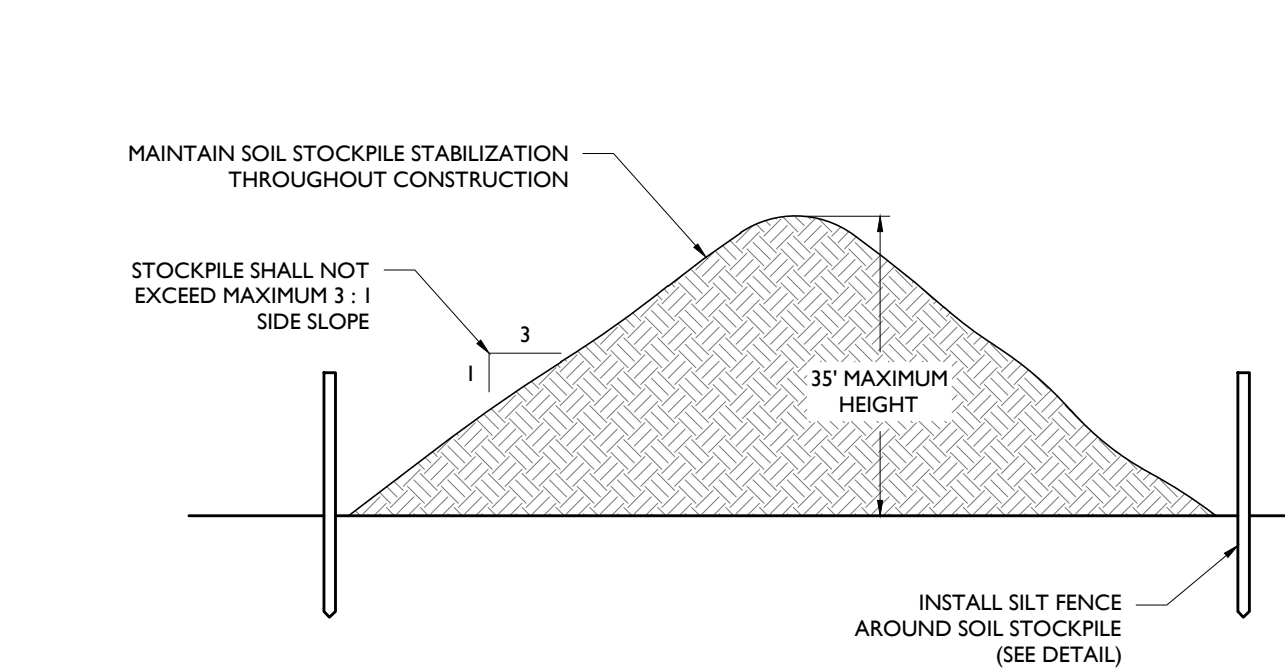
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SHEETZ	INLET FILTER BAG DETAIL	SCALE: NOT TO SCALE	DATE: 2/2/2024
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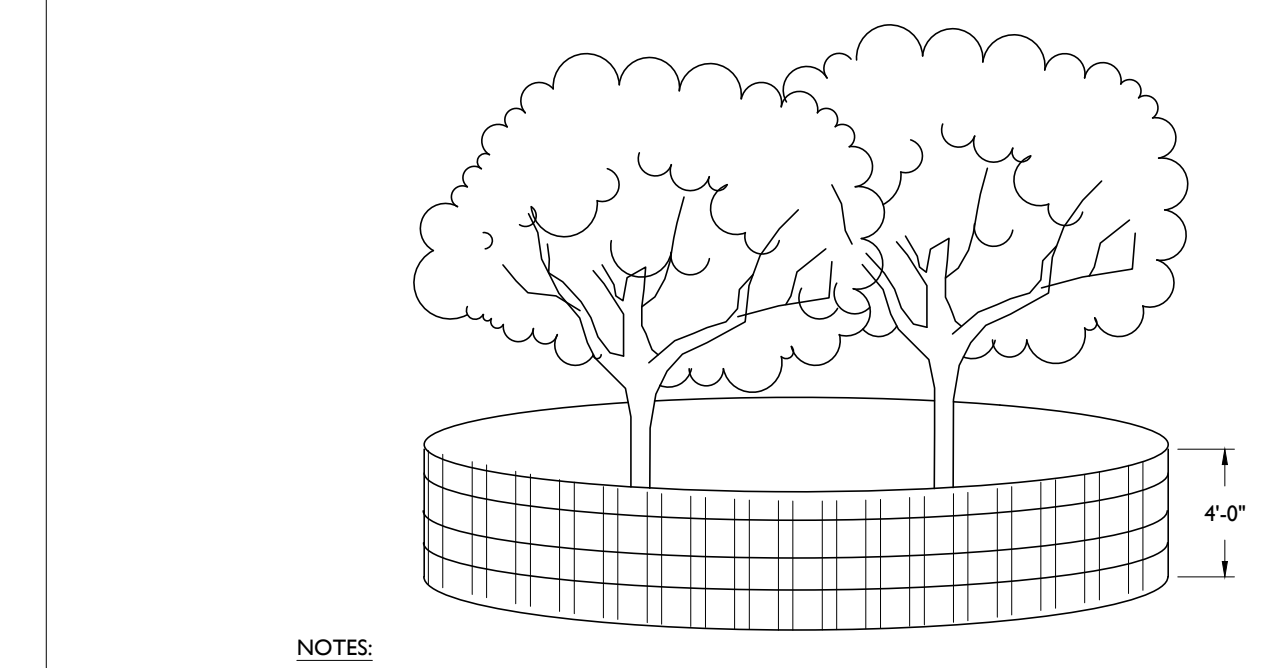
DATE	BY	DESCRIPTION	REVISIONS

SHEETZ	STABILIZED CONSTRUCTION ACCESS DETAIL	SCALE: NOT TO SCALE	DATE: 2/2/2024
		DRAWN BY: DMH	8



DATE	BY	DESCRIPTION	REVISIONS

SHEETZ	SOIL STOCKPILE DETAIL	SCALE: NOT TO SCALE	DATE: 2/2/2024
		DRAWN BY: DMH	9



DATE	BY	DESCRIPTION	REVISIONS

SHEETZ	TREE PROTECTION DETAIL	SCALE: NOT TO SCALE	DATE: 2/2/2024
		DRAWN BY: DMH	10

NO. OF SHEETS	NO. OF SHEETS USED	NO. OF SHEETS LEFT	NO. OF SHEETS MISSING

REVISION	DATE	BY	DESCRIPTION
1	04/09/2024	NBJD	FOR SITE PLAN REVIEW
2	05/09/2024	NBJD	FOR SITE PLAN REVIEW
3	06/12/2024	KH	REVISED FOR SITE PLAN REVIEW

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SHEETZ

PROPOSED CONVENIENCE STORE AND FUEL STATION

PID: K11-39-350-022, K-11-39-350-023, K-11-18-100-019
2103 WEST MICHIGAN AVENUE
CHARTER TOWNSHIP OF YPSILANTI
WASHTENAW COUNTY, MICHIGAN

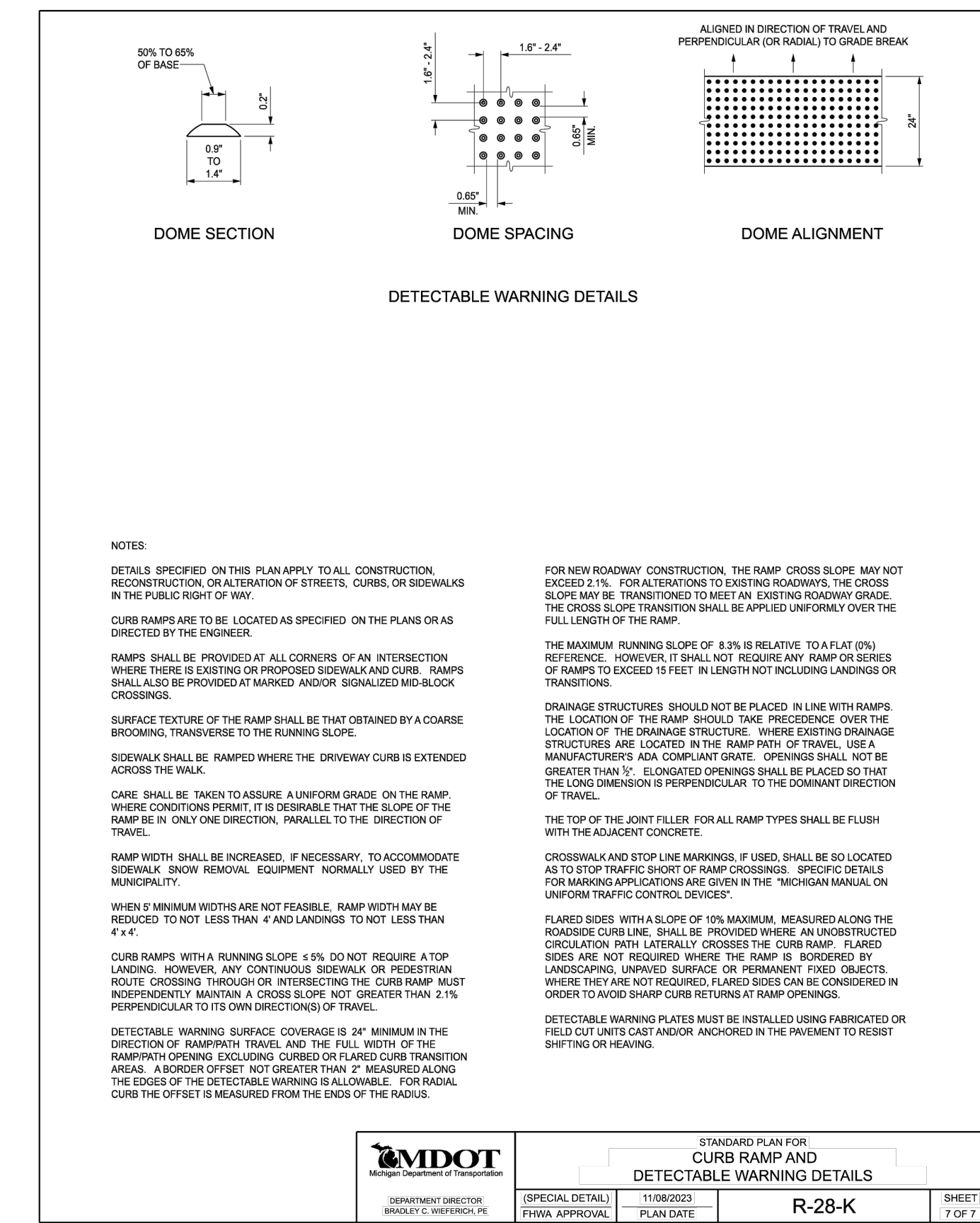
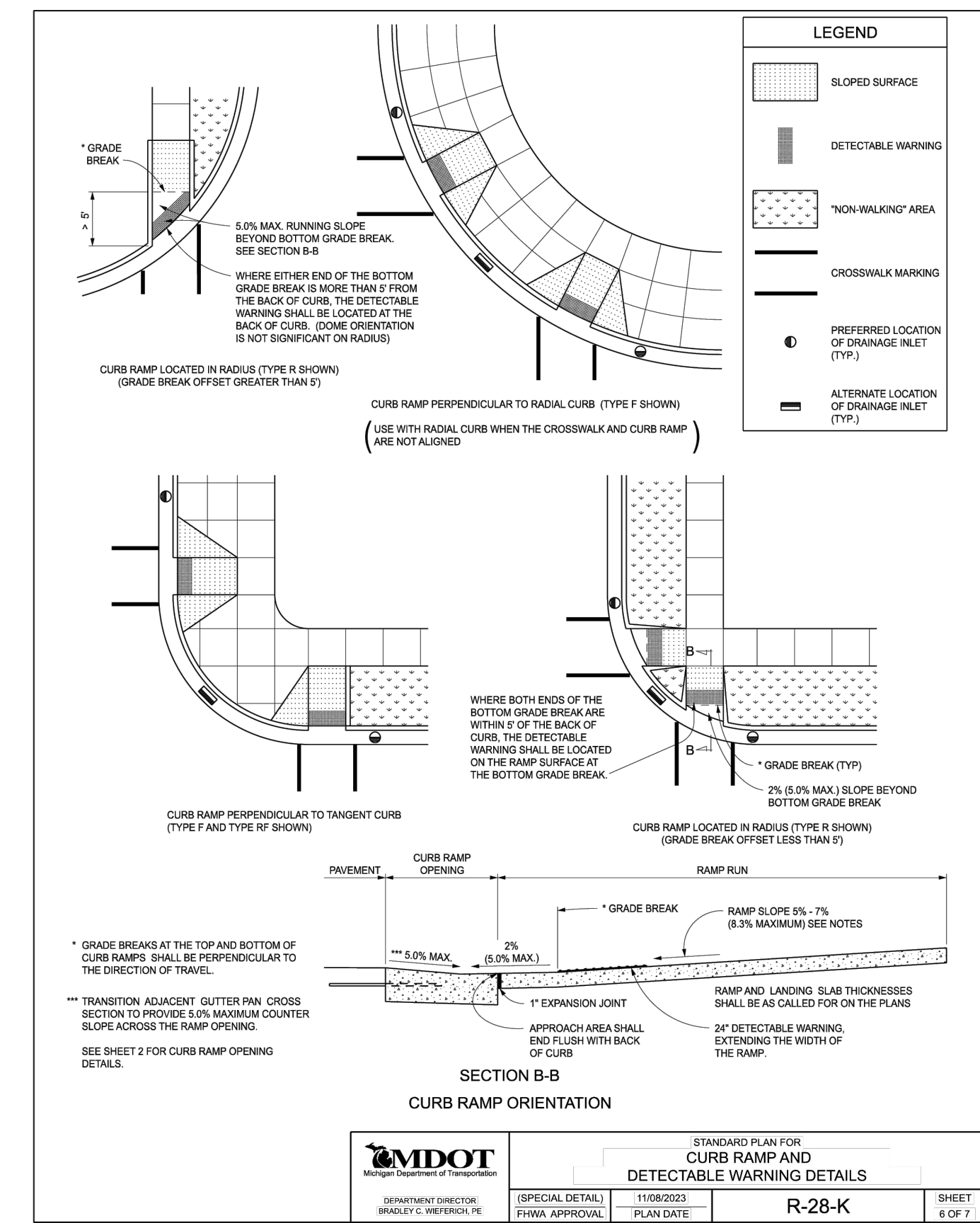
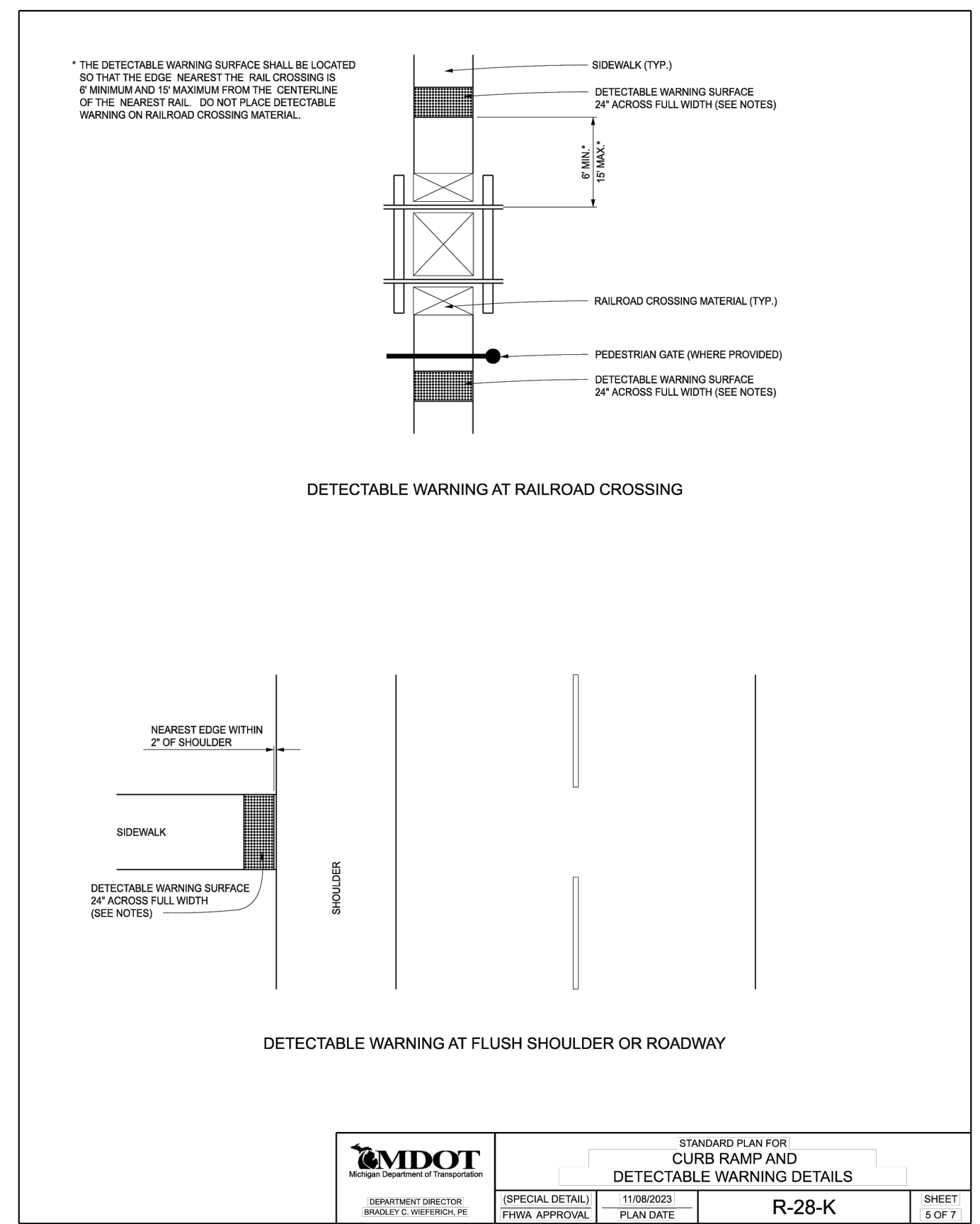
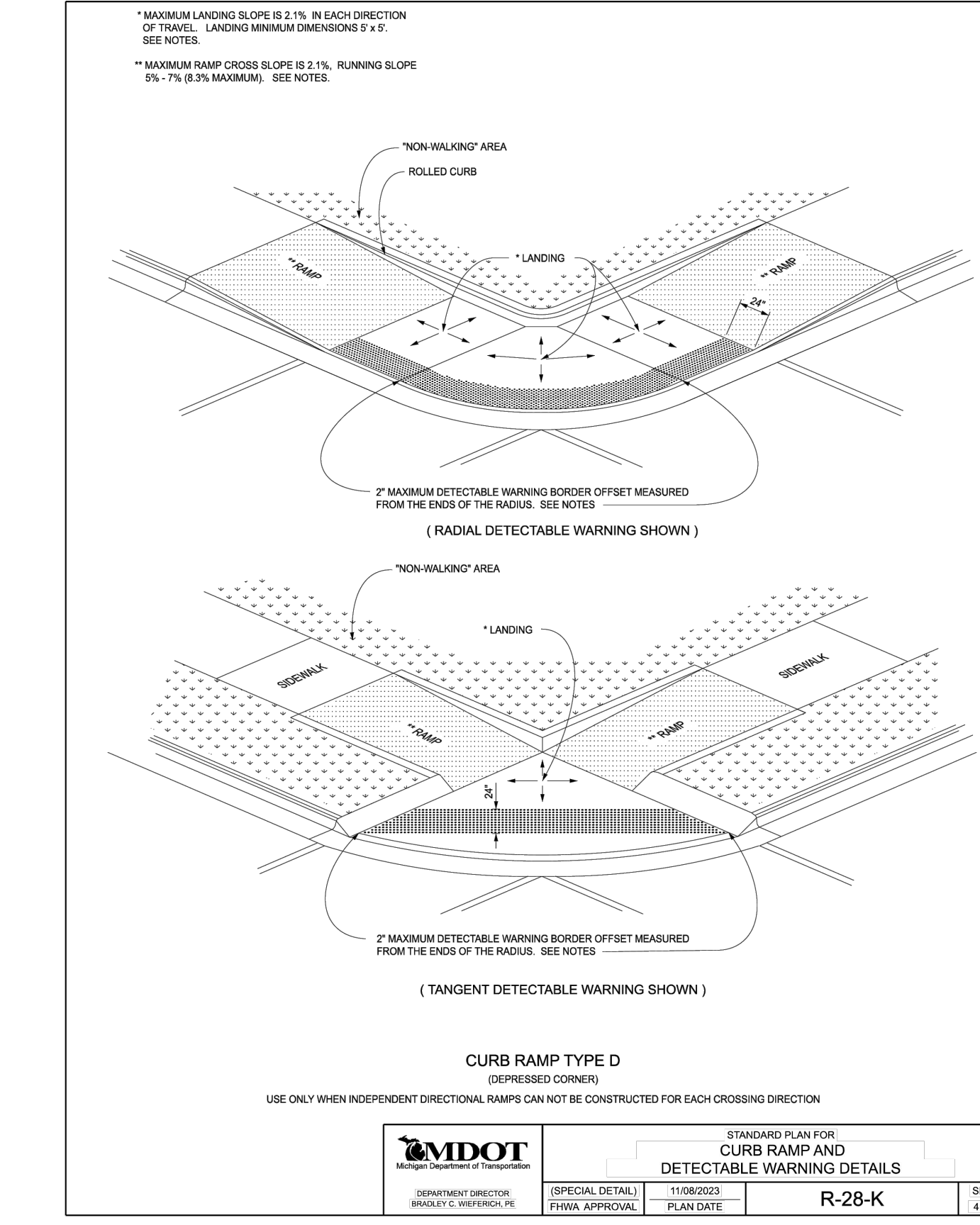
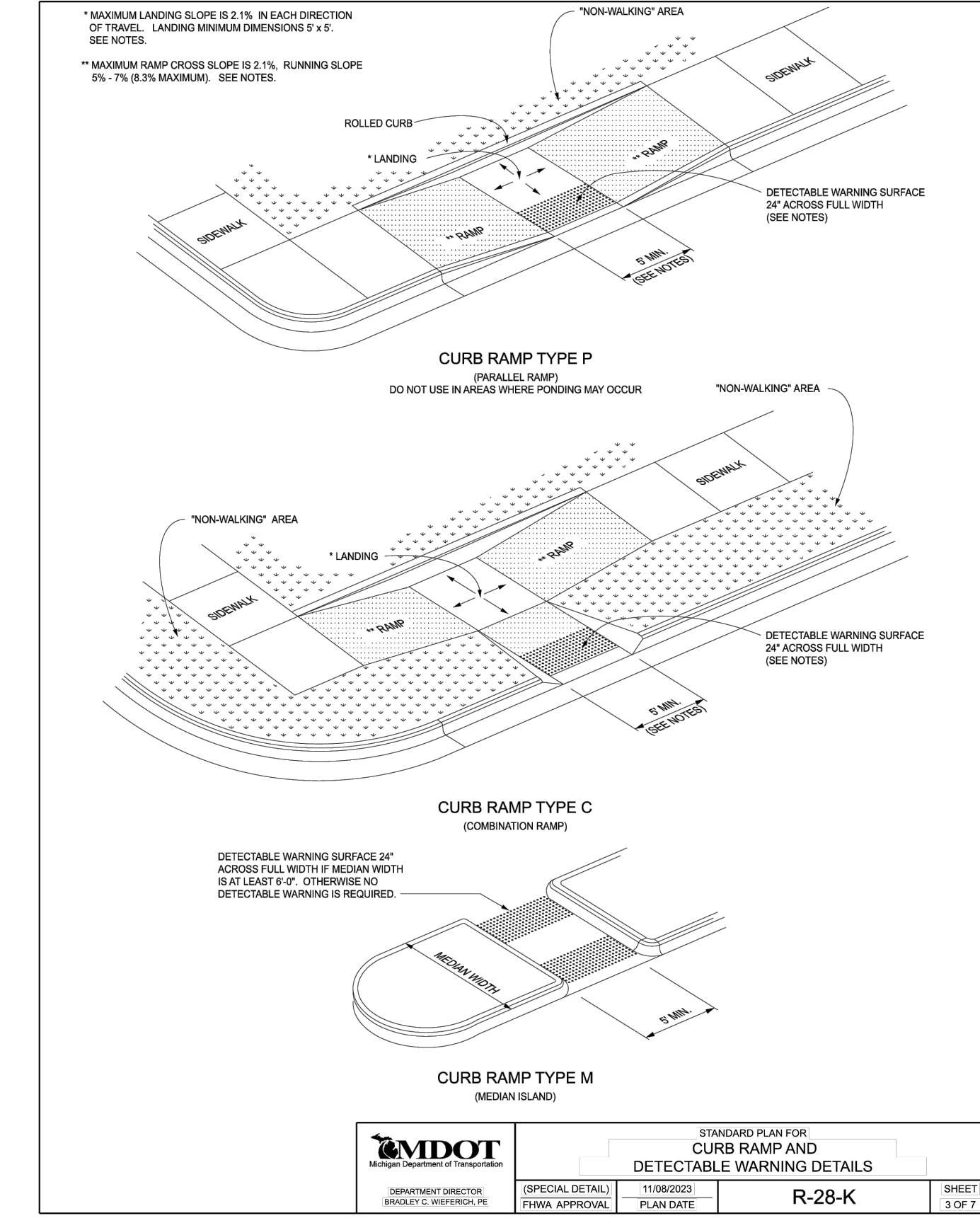
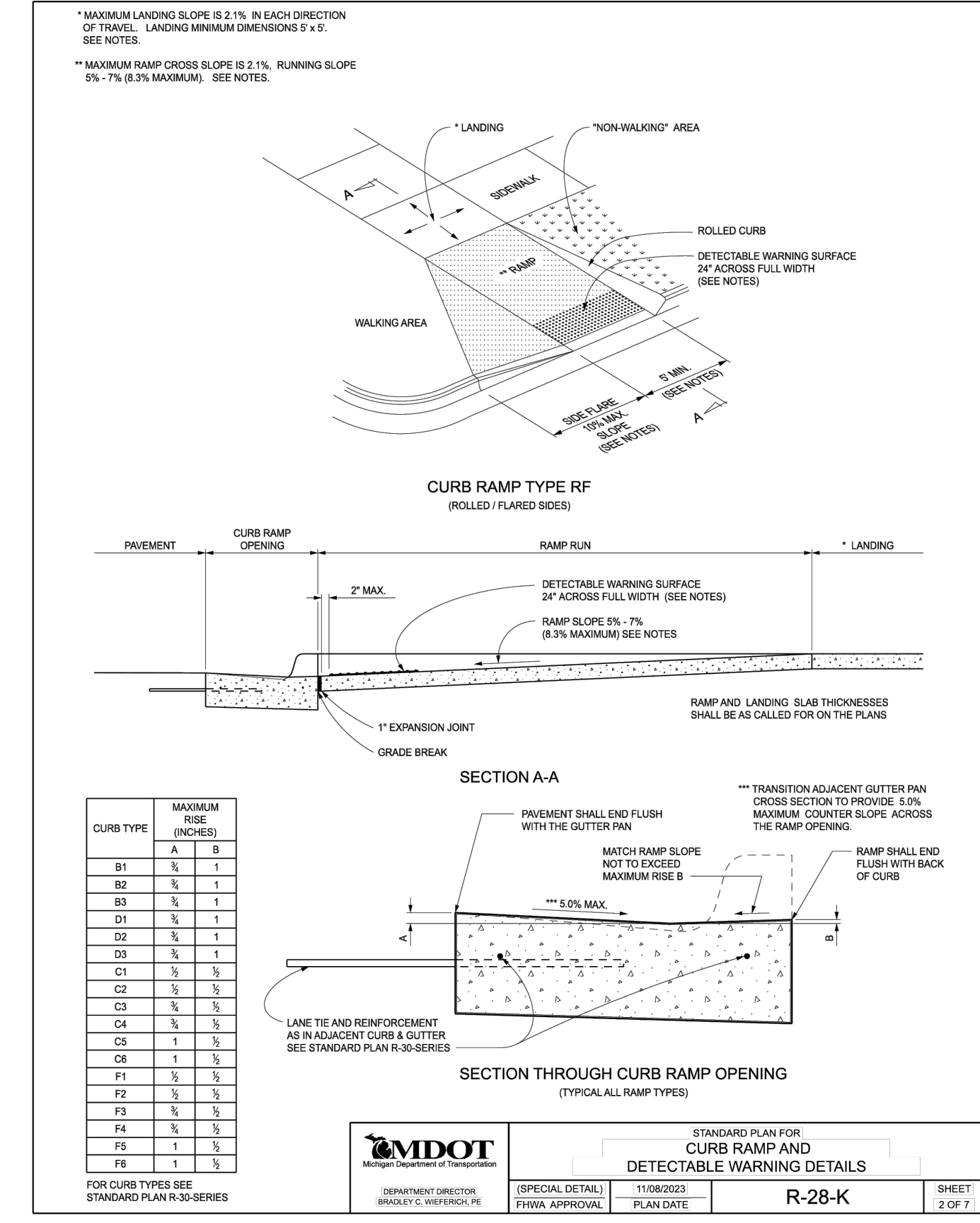
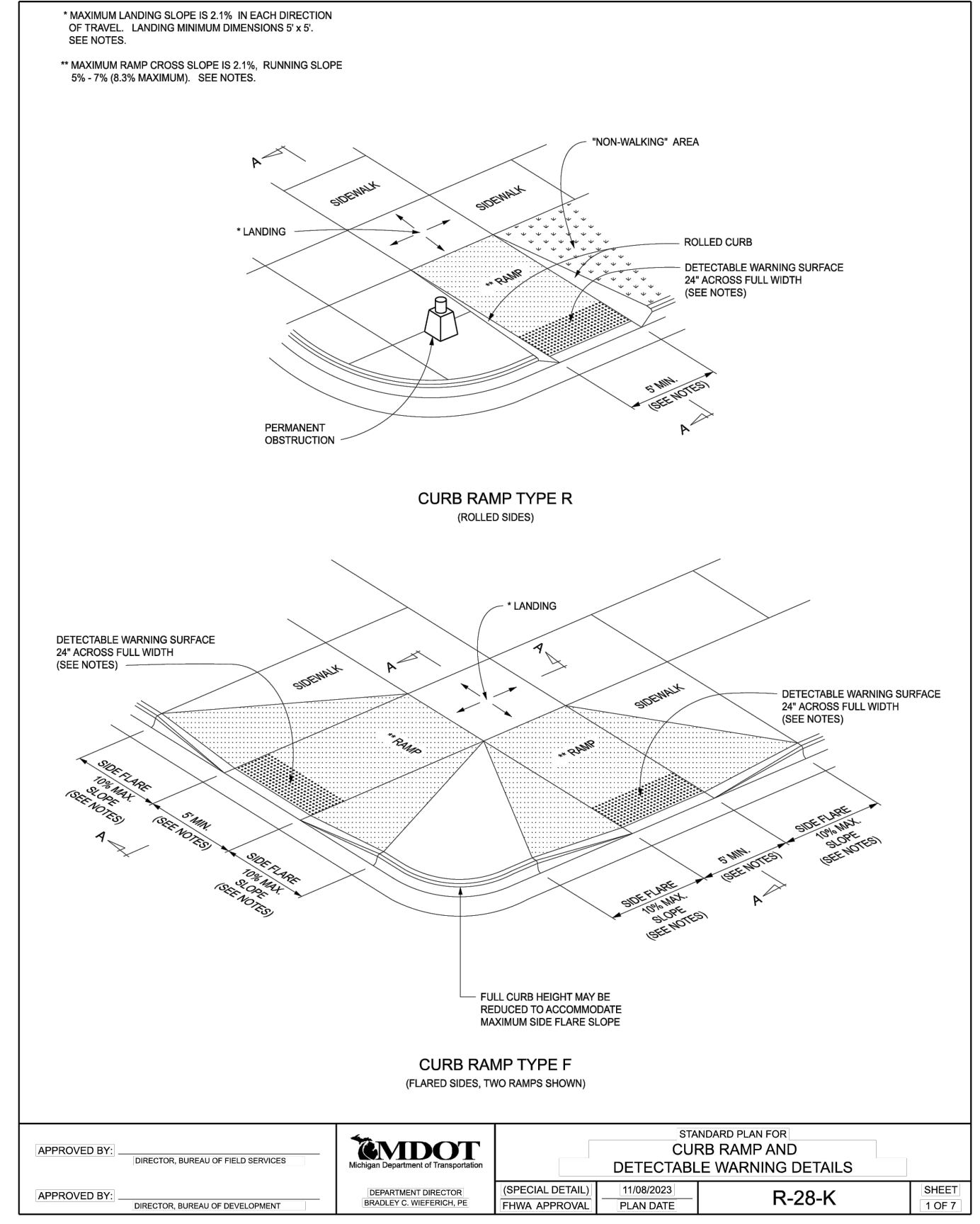
STATE OF MICHIGAN
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ENGINEER
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CONSTRUCTION DETAILS

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C-20



NO.	DATE	ISSUE	BY	DESCRIPTION
3	06/12/2024		KH	REVISED FOR SITE PLAN REVIEW
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1	04/09/2024		NBJD	FOR SITE PLAN REVIEW

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SITE DEVELOPMENT PLAN

SHEETZ

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2103 WEST MICHIGAN AVENUE
CHARTER TOWNSHIP OF YPSILANTI
WASHTENAW COUNTY, MICHIGAN

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PROFESSIONAL SEAL

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SCALE: AS SHOWN PROJECT ID: DET-230091.01
TITLE: CONSTRUCTION DETAILS
DRAWING: C-21

V:\0730\0730127\2001-10-30\K11-39-350-022\2103 WEST MICHIGAN AVENUE YPSILANTI CHARTER TOWNSHIP MICHIGAN\DWG\19-261-122-DTL-DWG

WASHTENAW COUNTY STORMWATER CALCULATIONS
(Based on Washtenaw County Stormwater Management Regulations)

Project: Ypsilanti Township - Hewitt Designer: KTH Date: 06/11/24

W1. DETERMINING POST-DEVELOPMENT COVER TYPES, AREAS, CURVE NUMBERS, AND RUNOFF COEFFICIENTS

RATIONAL METHOD VARIABLES (REQUIRED FOR FIRST FLUSH RUNOFF CALCULATIONS)

Landcover	Area (SF)	C-Value*	Weighted Value
Building / Roof	6,602	0.95	6,272
Pavement / Hardscape	40,427	0.95	37,406
Open Water (Based on Bankfull Storage Elevation)	0	1.00	0
Open Space (HSG 'A')	73,317	0.15	10,998
Open Space (HSG 'B')	5,561	0.25	1,390
Open Space (HSG 'C')	9,460	0.30	2,838
Open Space (HSG 'D')	1,952	0.45	878
Subtotals	157,319		79,782

*C-values obtained from Washtenaw County Water Resources Commission

Composite C Value, C_c : 0.51
Site Area, A_c : 3.61 AC

NRCS VARIABLES (REQUIRED FOR BANKFULL & 100-YEAR RUNOFF CALCULATIONS)

Cover Type (Pre-Development)	Soil Type	Area (SF)	Curve Number (CN)	Weighted Value
Building, Roof	-	1,568	98.0	153,664
Paved	-	2,531	98.0	248,038
Open Water	-	0	100.0	0
Woods (Good)	A	132,819	30.0	3,984,570
Woods (Good)	B	5,561	55.0	305,855
Woods (Good)	C	12,411	70.0	868,770
Woods (Good)	D	2,428	77.0	186,956
Subtotals		157,319		5,747,853

Composite CN Value, CN_c : 36.54

Previous Cover Type (Post-Development)	Soil Type	Area (SF)	Curve Number (CN)	Weighted Value
Fully Developed Open Space (Good Condition)	A	73,317	39.0	2,859,363
Fully Developed Open Space (Good Condition)	B	5,561	61.0	339,221
Fully Developed Open Space (Good Condition)	C	9,460	74.0	700,040
Fully Developed Open Space (Good Condition)	D	1,952	80.0	156,160
Subtotals		90,290		4,054,784

Composite CN Value, CN_c : 44.91

Impervious Cover Type (Post-Development)	Soil Type	Area (SF)	Curve Number (CN)	Weighted Value
Paved Parking Lots, Roofs, Driveways	A/B/C/D	67,029	98.0	6,568,842
Open Water	A/B/C/D	0	100.0	0
Subtotals		67,029		6,568,842

Composite CN Value, CN_c : 98.00

W2. FIRST FLUSH RUNOFF CALCULATION (V_{ff})

$V_{ff} = (1 \text{ IN}) \cdot (1 \text{ FT} / 12 \text{ IN}) \cdot (43,560 \text{ SF}) \cdot A \cdot C$

Site Area, A_c : 3.61 AC

First Flush Runoff Volume, V_{ff} : 6,648 CF

W3. PRE-DEVELOPMENT BANKFULL RUNOFF CALCULATION (V_{bfpre})

$S = (1000 / CN)^2 - 10$
 $CN_{pre} = 36.54$

$Q = (P - 0.2 \cdot S)^2 \cdot (P + 0.8 \cdot S)$

*Site Area Excluding "Self-Creeping" BMPs

$V_{bfpre} = Q \cdot (1/12) \cdot \text{Area}$

Rainfall Value (2 Year / 24 Hour Storm Event), P : 2.35 IN

Function of Watershed Soil & Conditions, S : 17.37

Runoff, Q : 0.078 IN

*Total Site Area: 157,319 SF

Pre-Development Bankfull Volume, V_{bfpre} : 1,020 CF

W4. Pervious COVER POST-DEVELOPMENT BANKFULL RUNOFF CALCULATION ($V_{bfper-post}$)

$S = (1000 / CN) - 10$

$Q = (P - 0.2 \cdot S)^2 \cdot (P + 0.8 \cdot S)$

$V_{bfper-post} = Q \cdot (1/12) \cdot \text{Area}$

Rainfall Value (2 Year / 24 Hour Storm Event), P : 2.35 IN

Function of Watershed Soil & Conditions, S : 12.27

Runoff, Q : 0.001 IN

Pervious Cover Area: 90,290 SF

Pervious Cover Post Development Bankfull Volume, $V_{bfper-post}$: 7 CF

W5. IMPERVIOUS COVER POST-DEVELOPMENT BANKFULL RUNOFF CALCULATION ($V_{bfimp-post}$)

$S = (1000 / CN) - 10$

$Q = (P - 0.2 \cdot S)^2 \cdot (P + 0.8 \cdot S)$

$V_{bfimp-post} = Q \cdot (1/12) \cdot \text{Area}$

Rainfall Value (2 Year / 24 Hour Storm Event), P : 2.35 IN

Function of Watershed Soil & Conditions, S : 0.20 IN

Runoff, Q : 2.122 IN

Impervious Cover Area: 67,029 SF

Impervious Cover Post Development Bankfull Volume, $V_{bfimp-post}$: 11,851 CF

W6. Pervious COVER POST-DEVELOPMENT 100 YEAR STORM RUNOFF CALCULATION ($V_{100-per-post}$)

$S = (1000 / CN) - 10$

$Q_{100-per} = (P - 0.2 \cdot S)^2 \cdot (P + 0.8 \cdot S)$

$V_{100-per-post} = Q \cdot (1/12) \cdot \text{Area}$

Rainfall Value (100 Year Storm Event), P : 5.11 IN

Function of Watershed Soil & Conditions, S : 12.27 IN

Runoff, $Q_{100-per}$: 0.47 IN

Pervious Cover Area: 90,290 SF

Pervious Cover Post Development 100-Year Volume, $V_{100-per-post}$: 3,558 CF

W7. IMPERVIOUS COVER POST-DEVELOPMENT 100 YEAR STORM RUNOFF CALCULATION ($V_{100-imp-post}$)

$S = (1000 / CN) - 10$

$Q_{100-imp} = (P - 0.2 \cdot S)^2 \cdot (P + 0.8 \cdot S)$

$V_{100-imp-post} = Q \cdot (1/12) \cdot \text{Area}$

W8. TIME OF CONCENTRATION FOR APPLICABLE FLOW TYPES (T_c)

If $T_c < 15$ minutes use minimum T_c below

Minimum T_c : 0.25 hrs = 15 min

Rainfall Value (100 Year Storm Event), P : 5.11 IN

Function of Watershed Soil & Conditions, S : 0.20 IN

Runoff, $Q_{100-imp}$: 4.87 IN

Impervious Cover Area: 67,029 SF

Impervious Cover Post Development 100-Yr Vol, $V_{100-imp-post}$: 27,219 CF

W9. RUNOFF SUMMARY

First Flush Runoff Volume, V_{ff} : 6,648 CF

Pre-Development Bankfull Volume, V_{bfpre} : 1,020 CF

Pervious Cover Post Development Bankfull Volume, $V_{bfper-post}$: 7 CF

Impervious Cover Post Development Bankfull Volume, $V_{bfimp-post}$: 11,851 CF

Total Bankfull Volume ($V_{bf-total}$): 11,858 CF

Pervious Cover Post Development 100-Year Storm Volume, $V_{100-per-post}$: 3,558 CF

Impervious Cover Post Development 100-Year Storm Volume, $V_{100-imp-post}$: 27,219 CF

Total 100 Year Volume ($V_{100-total}$): 30,777 CF

ONSITE INFILTRATION REQUIREMENTS

$V_{inf} = V_{bfper-post} - V_{bfpre}$

Onsite Infiltration Requirement: 10,838 CF

*Basin to include additional 20% volume if required infiltration is not provided

W10. DETENTION REQUIREMENTS

$Q_p = 238.4 \cdot T_c^{0.82}$

*Site Area Excluding "Self-Creeping" BMPs

$Q_{100} = Q_{100-per} + Q_{100-imp}$

$PF = (Q_p + Q_{100} \cdot \text{Area}) / 640$

$\Delta = PF \cdot (0.15 \cdot \text{Area})$

$V_{det} = (\Delta / PF) \cdot V_{100}$

W11. STANDARD METHOD RUNOFF VOLUME CALCULATIONS

SUBSURFACE STORAGE / INFILTRATION / PERMEABLE PAVEMENT VOLUME

Infiltration Bed Area: 2,686 SF

Subsurface Depth, D : 0.00 FT

Void Ratio: 30%

Subsurface Storage Volume: 0 CF

Flow Type	Area (ft ²)	Storage Volume (ft ³)		Design Infiltration Rate (in/hr)	Infiltration Volume During Storm (ft ³)	Total Volume Reduction (ft ³)
		Surface	Soil			
Infiltration Basin	2,686	0	0	10.00	13,430	13,430

1. Infiltration Rate \times 6 hrs \times BMP Area \times Unit Conversion = Infiltration Volume

2. Infiltration rate deemed negligible based on environmental investigations finding contaminated soils onsite

Total Volume Reduction: 13,430 CF

No Reduction can be Credited Due to Contaminated Soils (No Infiltration Permitted)

Onsite Infiltration Requirement, V_{inf} : 10,838 CF

Runoff Volume Credit: 2,592 CF

W13. SUMMARY

A. STORMWATER MANAGEMENT SUMMARY

Minimum Onsite Infiltration Requirement, V_{inf} : 10,838 CF

Provided Infiltration Volume: 13,430 CF

% Minimum Required Infiltration Provided: 124%

Net Required Detention Volume, V_{det} : 16,604 CF

$V_{det} = \text{Desired} / \text{Provided Infiltration Volume}$

B. DETENTION VOLUME INCREASE WITHOUT INFILTRATION

% Required Infiltration NOT Provided: 0%

Net % Penalty (20% \times % Required Infiltration NOT Provided): 0%

Total Required Detention Volume, including penalty: 16,604 CF

C. ON-SITE DETENTION VOLUME TO BE PROVIDED

Required Detention Volume: 16,604 CF

Required Forebay Volume: 830 CF

*5% of Required Detention Volume

PROPOSED FOREBAY #1		
ELEVATION	AREA (SF)	VOLUME (CF)
779.00	498	-
780.00	1,007	753
780.40	1,253	1,204

PROPOSED DETENTION BASIN		
ELEVATION	AREA (SF)	VOLUME (CF)
779.00	2,686	-
780.00	4,393	3,540
781.00	4,200	7,836
782.00	6,297	13,085
783.00	8,396	20,431
784.00	10,691	29,975

First Flush Elevation = 780.77

Bankfull Elevation = 781.83

100-Year Storm Elevation = 782.48

Design 100-Year Storm Elevation = 782.50

Freeboard Elevation = 783.50

Basin Height = 3.50

Total Basin Volume = 16,758 CF > 16,604 CF

Basin volume calculated based on a trapezoidal prism

W14. OUTLET DESIGN - 3 STAGE OUTLET

$Q_{allow} = (0.15)(A)$

A. FIRST FLUSH DISCHARGE

$Q_{min-ff} = V_{ff} / T_{ff}$

$h_{min-ff} = 2/3 \cdot (X_{ff} - X_{sur})$

$A_{ff} = Q_{min-ff} / [0.62 \cdot \sqrt{(2 \cdot g \cdot h_{min-ff})}]$

Maximum #Orifices = A_{ff} / A_{orif}

*Orifice Size Proposed: 1.00 in

$Q_{acc-ff} = 0.62 \cdot \#Orifices \cdot A_{orif} \cdot \sqrt{(2 \cdot g \cdot h_{min-ff})}$

$T_{acc-ff} = V_{ff} / Q_{acc-ff}$

B. BANKFULL DISCHARGE

$h_{min-bf} = 2/3 \cdot (X_{bf} - X_{sur})$

$Q_{bf} = 0.62 \cdot \#Orifices \cdot A_{orif} \cdot \sqrt{(2 \cdot g \cdot h_{min-bf})}$

$T_{bf} = V_{bf} / Q_{bf}$

$V_{rem} = V_{bf} - V_{ff}$

$T_{rem} = T_{target} - T_{acc-ff}$

*Target Time Proposed: 42 Hours

$h_{min-ave} = 2/3 \cdot (X_{ff} + X_{bf}) + (X_{ff} - X_{sur})$

$Q_{ave} = 0.62 \cdot \#Orifices \cdot A_{orif} \cdot \sqrt{(2 \cdot g \cdot h_{min-ave})}$

$V_{rem} = T_{rem} \cdot Q_{ave}$

$V_{bf} = V_{rem} + V_{ff}$

$Q_{bf} = V_{bf} / T_{rem}$

$h_{min-ave} = 2/3 \cdot (X_{ff} + X_{bf})$

$A_{bf} = Q_{bf} / [0.62 \cdot \sqrt{(2 \cdot g \cdot h_{min-ave})}]$

Maximum #Orifices = A_{bf} / A_{orif}

*Orifice Size Proposed: 1.00 in (0.75" Minimum)

$Q_{acc-bf} = 0.62 \cdot \#Orifices \cdot A_{orif} \cdot \sqrt{(2 \cdot g \cdot h_{min-ave})}$

$T_{acc-bf} = T_{acc-ff} + V_{rem} / (Q_{bf} + Q_{acc-bf})$

C. 100-YEAR STORM DISCHARGE

$Q_{rem} = [0.62 \cdot \#Orifices \cdot A_{orif} \cdot \sqrt{(2 \cdot g \cdot (X_{100-per} - X_{sur})}] + [0.62 \cdot \#Orifices \cdot A_{orif} \cdot \sqrt{(2 \cdot g \cdot (X_{100-imp} - X_{sur})}]$

$Q_{max-100} = Q_{allow} - (Q_{rem})$

$A_{max-100} = Q_{max-100} / [0.62 \cdot \sqrt{(2 \cdot g \cdot (X_{100-ave} - X_{sur})}]$

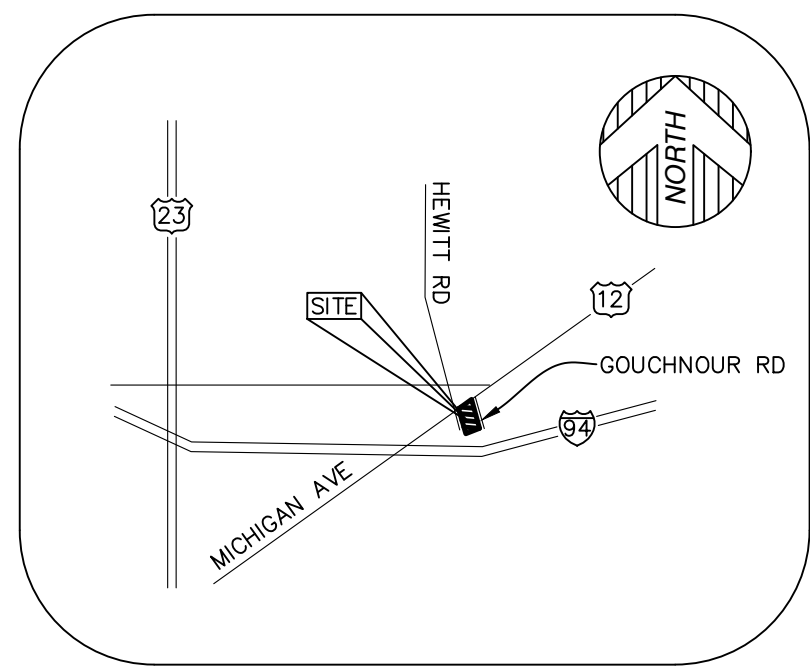
Maximum #Orifices = $A_{max-100} / A_{orif}$

*Orifice Size Proposed: 1.00 in (0.75" Minimum)

$Q_{acc-100} = Q_{rem} + \#Orifices \cdot A_{orif} \cdot \sqrt{(2 \cdot g \cdot (X_{100-ave} - X_{sur})}$

$h_{min-ave} = 2/3 \cdot (X_{100-per} + X_{100-imp})$

$Q_{all} = 0.62 \cdot \#Orifices \cdot A_{orif} \cdot \sqrt{(2 \cdot g \cdot h_{min-ave})}$



VICINITY MAP
(NOT TO SCALE)

PARKING
NO MARKED PARKING ON SITE.

PARCEL AREA
PARCEL 1:
74,455± SQUARE FEET = 1.70± ACRES
PARCEL 2:
174,964± SQUARE FEET = 4.01± ACRES
PARCEL 3:
72,289± SQUARE FEET = 1.65± ACRES

BASIS OF BEARING
NORTH 16°04'20" WEST, BEING THE WEST LINE OF FRENCH CLAIM 690, AS DESCRIBED.

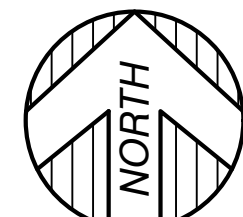
BENCHMARK
SITE BENCHMARK #1
CHISLED SQUARE ON SOUTHEAST TOP OF CONC LIGHT POLE BASE 40"± WEST OF HEWITT RD 175'± SOUTH OF MICHIGAN AVE ELEVATION = 784.79' (NAVD 88)
SITE BENCHMARK #2
CHISLED SQUARE ON SOUTHEAST TOP OF CONC TRAFFIC SIGNAL BASE @ SOUTHEAST QUAD OF MICHIGAN AVE & HEWITT RD ELEVATION = 791.95' (NAVD 88)
SITE BENCHMARK #3
MAG NAIL IN SOUTHEAST FACE OF UTILITY POLE 125'± EAST OF HEWITT RD 30'± SOUTH OF MICHIGAN AVE ELEVATION = 791.01' (NAVD 88)

LEGEND

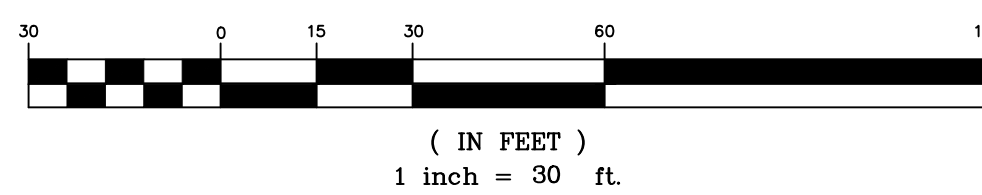
(R&M)	FOUND MONUMENT (AS NOTED)
(R)	RECORD AND MEASURED DIMENSION
(M)	RECORD DIMENSION
(M)	MEASURED DIMENSION
0.00	GROUND ELEVATION
○	TRANSFORMER
○	UTILITY POLE
○	GAS METER
○	GAS VALVE
○	CABLE TV BOX
○	CABLE TV RISER
○	TRAFFIC SIGNAL
○	TRAFFIC SIGNAL MANHOLE
○	TRAFFIC SIGNAL CONTROL BOX
○	SANITARY MANHOLE
○	ROUND CATCH BASIN
○	SQUARE CATCH BASIN
○	STORM DRAIN MANHOLE
○	FIRE HYDRANT
○	WATER GATE MANHOLE
○	WATER VALVE
○	WELL
○	WETLAND FLAG
○	MONITOR WELL
○	UNKNOWN MANHOLE
○	AIR CONDITIONING UNIT
○	FENCE POST
○	LIGHTPOST/LAMP POST
○	MAIL BOX
○	SINGLE POST SIGN
○	DECIDUOUS TREE (AS NOTED)
---	PARCEL BOUNDARY LINE
---	ADJOINER PARCEL LINE
---	EASEMENT (AS NOTED)
---	RIGHT-OF-WAY
---	BUILDING
---	CONCRETE CURB
---	RAISED CONCRETE
---	EDGE OF CONCRETE (CONC.)
---	EDGE OF ASPHALT (ASPH.)
---	EDGE OF GRAVEL
---	FENCE (AS NOTED)
---	WALL (AS NOTED)
---	TREE / BRUSH LINE (AS NOTED)
---	OVERHEAD UTILITY LINE
---	GAS LINE
---	SANITARY LINE
---	STORM LINE
---	WATER LINE
---	WETLAND LIMITS
---	UNDERGROUND PIPE (AS NOTED)
---	MINOR CONTOUR LINE
---	MAJOR CONTOUR LINE
---	BUILDING AREA
---	ASPHALT
---	CONCRETE

SURVEYOR'S NOTE

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES OTHER THAN THE STRUCTURE INVENTORY SHOWN HEREON.

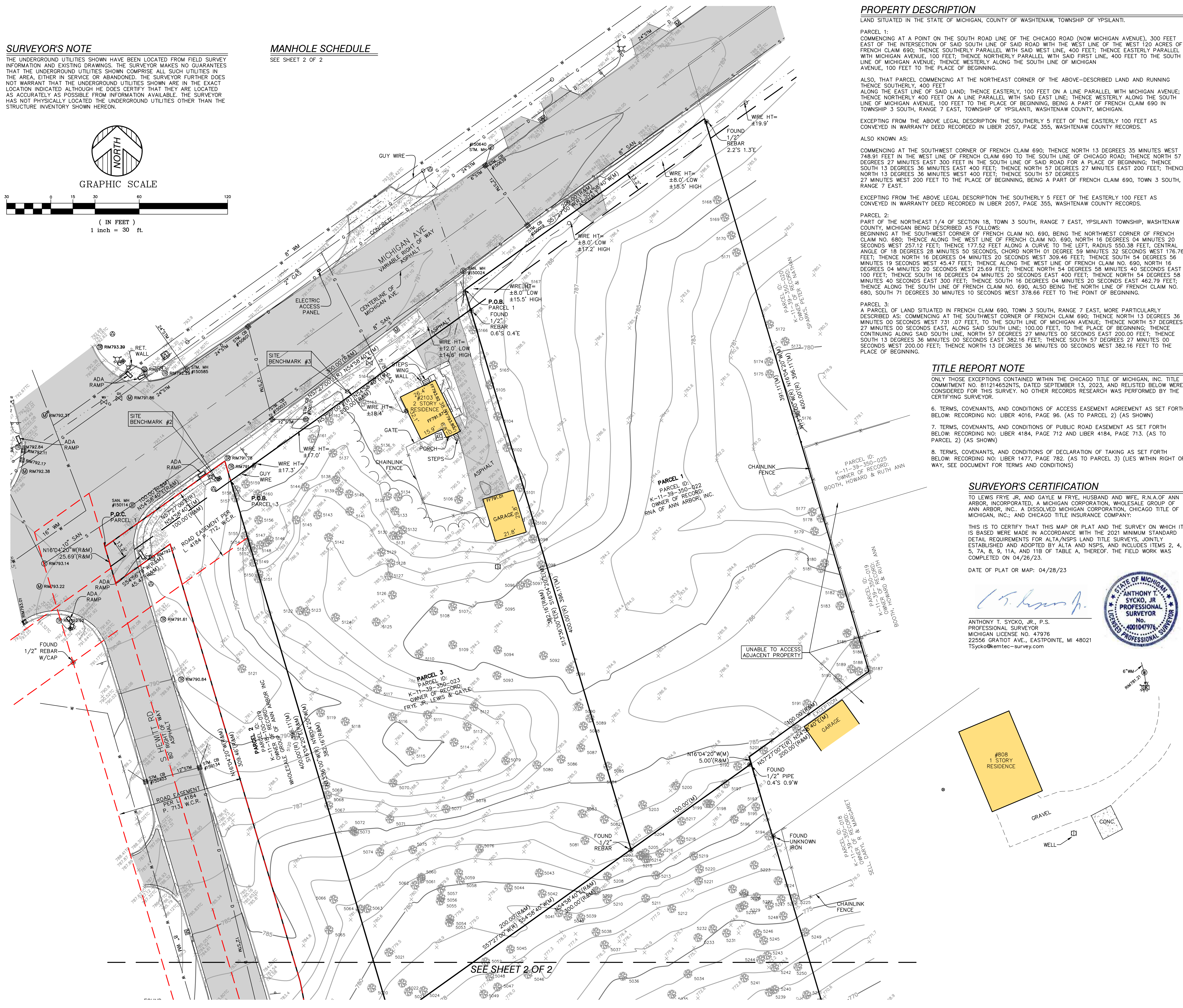


GRAPHIC SCALE



MANHOLE SCHEDULE

SEE SHEET 2 OF 2



PROPERTY DESCRIPTION

LAND SITUATED IN THE STATE OF MICHIGAN, COUNTY OF WASHTENAW, TOWNSHIP OF YPSILANTI.
PARCEL 1:
COMMENCING AT A POINT ON THE SOUTH ROAD LINE OF THE CHICAGO ROAD (NOW MICHIGAN AVENUE), 300 FEET EAST OF THE INTERSECTION OF SAID SOUTH LINE OF SAID ROAD WITH THE WEST LINE OF THE WEST 120 ACRES OF FRENCH CLAIM 690; THENCE SOUTHERLY PARALLEL WITH SAID WEST LINE, 400 FEET; THENCE EASTERLY PARALLEL WITH MICHIGAN AVENUE, 100 FEET; THENCE NORTHERLY PARALLEL WITH SAID FIRST LINE, 400 FEET TO THE SOUTH LINE OF MICHIGAN AVENUE; THENCE WESTERLY ALONG THE SOUTH LINE OF MICHIGAN AVENUE, 100 FEET TO THE PLACE OF BEGINNING.
ALSO, THAT PARCEL COMMENCING AT THE NORTHEAST CORNER OF THE ABOVE-DESCRIBED LAND AND RUNNING THENCE SOUTHERLY, 400 FEET ALONG THE EAST LINE OF SAID LAND; THENCE EASTERLY, 100 FEET ON A LINE PARALLEL WITH MICHIGAN AVENUE; THENCE NORTHERLY 400 FEET ON A LINE PARALLEL WITH SAID EAST LINE; THENCE WESTERLY ALONG THE SOUTH LINE OF MICHIGAN AVENUE, 100 FEET TO THE PLACE OF BEGINNING, BEING A PART OF FRENCH CLAIM 690 IN TOWNSHIP 3 SOUTH, RANGE 7 EAST, TOWNSHIP OF YPSILANTI, WASHTENAW COUNTY, MICHIGAN.

EXCEPTING FROM THE ABOVE LEGAL DESCRIPTION THE SOUTHERLY 5 FEET OF THE EASTERLY 100 FEET AS CONVEYED IN WARRANTY DEED RECORDED IN LIBER 2057, PAGE 355, WASHTENAW COUNTY RECORDS.
ALSO KNOWN AS:
 COMMENCING AT THE SOUTHWEST CORNER OF FRENCH CLAIM 690; THENCE NORTH 13 DEGREES 35 MINUTES WEST 745.91 FEET IN THE WEST LINE OF FRENCH CLAIM 690 TO THE SOUTH LINE OF CHICAGO ROAD; THENCE NORTH 57 DEGREES 27 MINUTES EAST 300 FEET IN THE SOUTH LINE OF SAID ROAD FOR A PLACE OF BEGINNING; THENCE SOUTH 13 DEGREES 36 MINUTES EAST 400 FEET; THENCE NORTH 57 DEGREES 27 MINUTES EAST 200 FEET; THENCE NORTH 13 DEGREES 36 MINUTES WEST 400 FEET; THENCE SOUTH 57 DEGREES 27 MINUTES WEST 200 FEET TO THE PLACE OF BEGINNING, BEING A PART OF FRENCH CLAIM 690, TOWN 3 SOUTH, RANGE 7 EAST.

EXCEPTING FROM THE ABOVE LEGAL DESCRIPTION THE SOUTHERLY 5 FEET OF THE EASTERLY 100 FEET AS CONVEYED IN WARRANTY DEED RECORDED IN LIBER 2057, PAGE 355, WASHTENAW COUNTY RECORDS.

PARCEL 2:
PART OF THE NORTHEAST 1/4 OF SECTION 18, TOWN 3 SOUTH, RANGE 7 EAST, YPSILANTI TOWNSHIP, WASHTENAW COUNTY, MICHIGAN BEING DESCRIBED AS FOLLOWS:
BEGINNING AT THE SOUTHWEST CORNER OF FRENCH CLAIM NO. 690, BEING THE NORTHWEST CORNER OF FRENCH CLAIM NO. 680; THENCE ALONG THE WEST LINE OF FRENCH CLAIM NO. 690, NORTH 15 DEGREES 04 MINUTES 20 SECONDS WEST 257.12 FEET; THENCE 177.52 FEET ALONG A CURVE TO THE LEFT, RADIUS 550.38 FEET, CENTRAL ANGLE OF 18 DEGREES 28 MINUTES 50 SECONDS, CHORD NORTH 01 DEGREE 59 MINUTES 32 SECONDS WEST 176.76 FEET; THENCE NORTH 16 DEGREES 04 MINUTES 20 SECONDS WEST 309.46 FEET; THENCE SOUTH 54 DEGREES 56 MINUTES 19 SECONDS WEST 45.47 FEET; THENCE ALONG THE WEST LINE OF FRENCH CLAIM NO. 690, NORTH 16 DEGREES 04 MINUTES 20 SECONDS WEST 25.69 FEET; THENCE NORTH 54 DEGREES 58 MINUTES 40 SECONDS WEST 100 FEET; THENCE SOUTH 16 DEGREES 04 MINUTES 20 SECONDS EAST 400 FEET; THENCE NORTH 54 DEGREES 58 MINUTES 40 SECONDS EAST 300 FEET; THENCE SOUTH 16 DEGREES 04 MINUTES 20 SECONDS EAST 462.79 FEET; THENCE ALONG THE SOUTH LINE OF FRENCH CLAIM NO. 690, ALSO BEING THE NORTH LINE OF FRENCH CLAIM NO. 680, SOUTH 71 DEGREES 30 MINUTES 10 SECONDS WEST 378.66 FEET TO THE POINT OF BEGINNING.

PARCEL 3:
A PARCEL OF LAND SITUATED IN FRENCH CLAIM 690, TOWN 3 SOUTH, RANGE 7 EAST, MORE PARTICULARLY DESCRIBED AS: COMMENCING AT THE SOUTHWEST CORNER OF FRENCH CLAIM 690; THENCE NORTH 13 DEGREES 36 MINUTES 00 SECONDS WEST 731.07 FEET, TO THE SOUTH LINE OF MICHIGAN AVENUE; THENCE NORTH 57 DEGREES 27 MINUTES 00 SECONDS EAST, ALONG SAID SOUTH LINE, 100.00 FEET, TO THE PLACE OF BEGINNING; THENCE CONTINUING ALONG SAID SOUTH LINE, NORTH 57 DEGREES 27 MINUTES 00 SECONDS EAST 200.00 FEET; THENCE SOUTH 13 DEGREES 36 MINUTES 00 SECONDS EAST 382.16 FEET; THENCE SOUTH 57 DEGREES 27 MINUTES 00 SECONDS WEST 200.00 FEET; THENCE NORTH 13 DEGREES 36 MINUTES 00 SECONDS WEST 392.16 FEET TO THE PLACE OF BEGINNING.

TITLE REPORT NOTE

ONLY THOSE EXCEPTIONS CONTAINED WITHIN THE CHICAGO TITLE OF MICHIGAN, INC. TITLE COMMITMENT NO. 811214652N2S, DATED SEPTEMBER 13, 2023, AND RELISTED BELOW WERE CONSIDERED FOR THIS SURVEY. NO OTHER RECORDS RESEARCH WAS PERFORMED BY THE CERTIFYING SURVEYOR.

- TERMS, COVENANTS, AND CONDITIONS OF ACCESS EASEMENT AGREEMENT AS SET FORTH BELOW. RECORDING NO: LIBER 4016, PAGE 96. (AS TO PARCEL 2) (AS SHOWN)
- TERMS, COVENANTS, AND CONDITIONS OF PUBLIC ROAD EASEMENT AS SET FORTH BELOW. RECORDING NO: LIBER 4184, PAGE 712 AND LIBER 4184, PAGE 713. (AS TO PARCEL 2) (AS SHOWN)
- TERMS, COVENANTS, AND CONDITIONS OF DECLARATION OF TAKING AS SET FORTH BELOW. RECORDING NO: LIBER 1477, PAGE 782. (AS TO PARCEL 3) (LIES WITHIN RIGHT OF WAY. SEE DOCUMENT FOR TERMS AND CONDITIONS)

SURVEYOR'S CERTIFICATION

TO LEWIS FRYE, JR. AND GAYLE M. FRYE, HUSBAND AND WIFE, R.N.A. OF ANN ARBOR, INCORPORATED, A MICHIGAN CORPORATION, WHOLESALER GROUP OF ANN ARBOR, INC., A DISSOLVED MICHIGAN CORPORATION, CHICAGO TITLE OF MICHIGAN, INC.; AND CHICAGO TITLE INSURANCE COMPANY:

THIS IS TO CERTIFY THAT THIS MAP OR PLAN AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2021 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 2, 4, 5, 7A, 8, 9, 11A, AND 11B OF TABLE A, THEREOF. THE FIELD WORK WAS COMPLETED ON 04/26/23.

DATE OF PLAT OR MAP: 04/28/23

Anthony T. Sycko, Jr.

ANTHONY T. SYCKO, JR., P.S.
PROFESSIONAL SURVEYOR
MICHIGAN LICENSE NO. 47976
22556 GRATIOT AVE., EASTPOINTE, MI 48021
TSycko@kemttec-survey.com



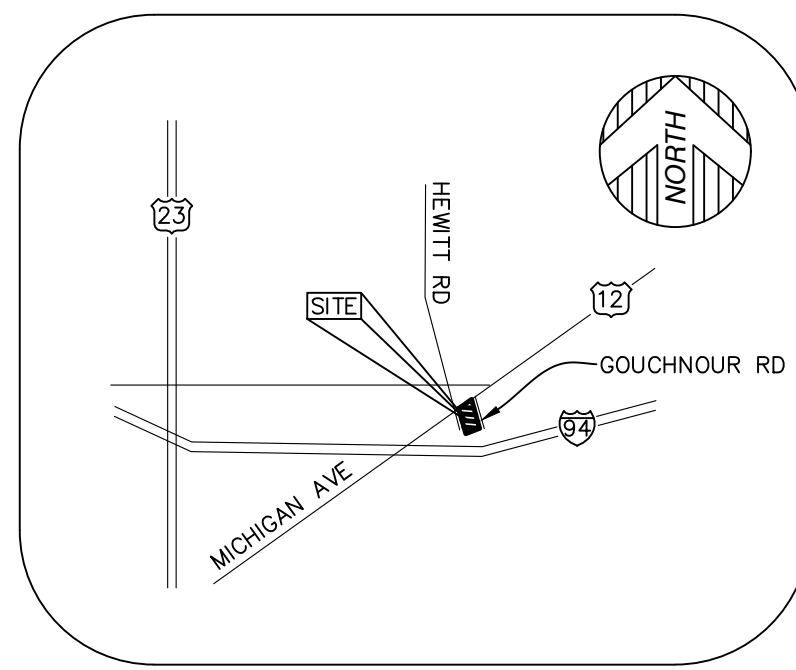
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PROFESSIONAL ENGINEERING, SURVEYING & ENVIRONMENTAL SERVICES
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(734) 954-0888
(313) 758-0977
www.kemttecgroupofcompanies.com

ALTA / NSPS LAND TITLE SURVEY
PREPARED FOR: STONEFIELD ENGINEERING AND DESIGN
2509 & 2103 MICHIGAN; 755 HEWITT
YPSILANTI, MICHIGAN
PART OF SECTION 17 & 18,
TOWN 3 SOUTH, RANGE 7 EAST

DATE	BY	REVISION	DESCRIPTION
04/28/23	MRJ	1	PER REVIEW COMMENTS
03/28/24	MRJ	2	ADD ROAD CENTRELINE
12/08/23	AT	1	PER REVISED TITLE WORK
9/29/23	JDM	1	DATE

SCALE: 1" = 30'

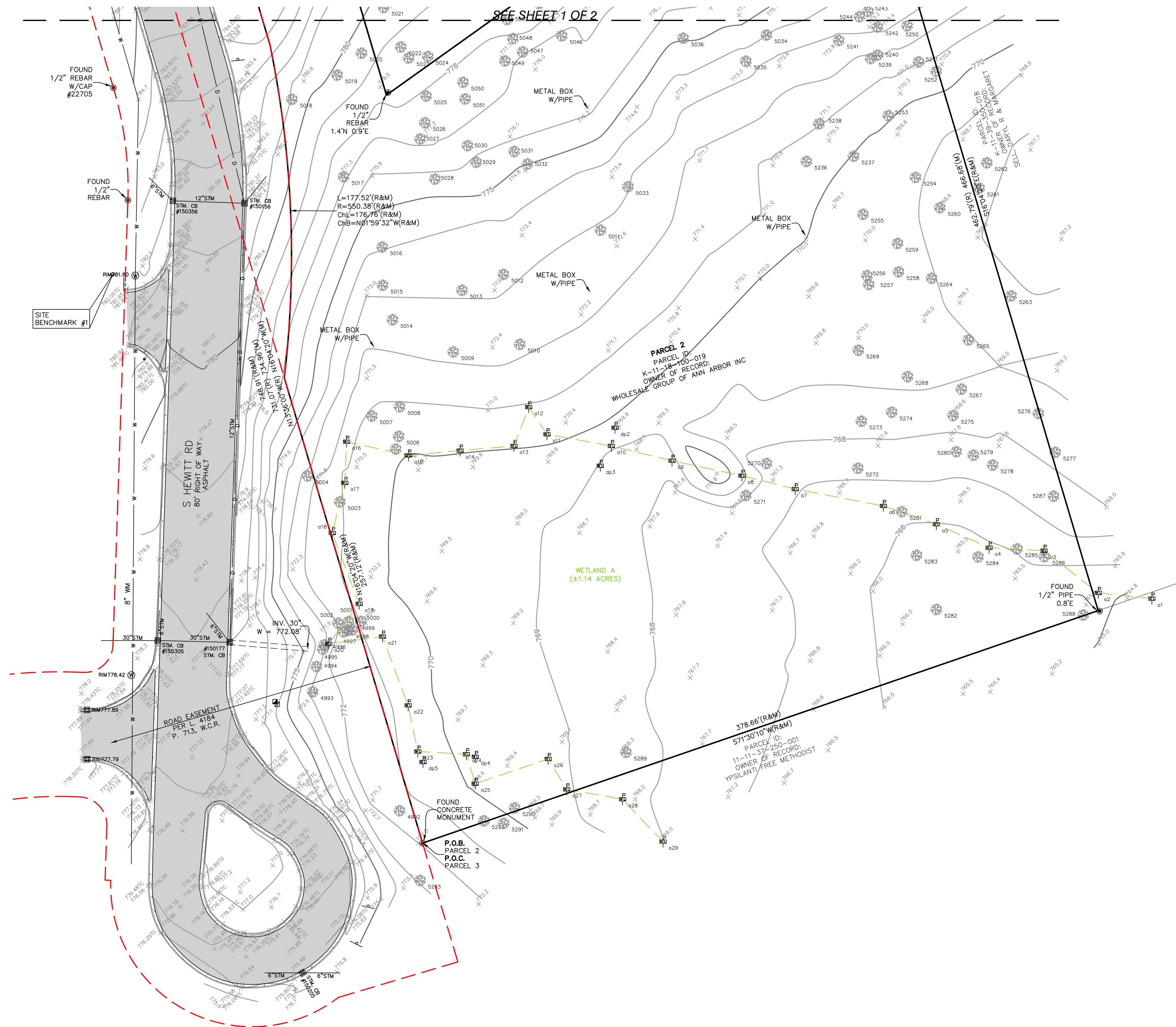
SEE SHEET 2 OF 2



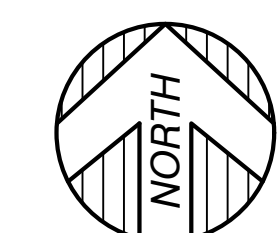
VICINITY MAP
(NOT TO SCALE)

MANHOLE SCHEDULE

NUM	TYPE	RIM (FT)	SIZE (IN)	DIR	INV ELEV (FT)
70010	BEEHIVE CATCH BASIN	789.12	12 W		787.99
	FULL OF DEBRIS				
150019	CATCH BASIN	790.06	12 NW		784.63
	FULL OF DIRT				
150024	SANITARY MANHOLE	790.50	8 SW		778.32
			8 NE		778.38
			6 S		781.85
150037	CATCH BASIN	791.11	12 N		787.67
			12 E		787.81
			B/STRUCTURE		787.51
150114	SANITARY MANHOLE	792.17	10 SW		780.99
			8 NE		780.29
150134	CATCH BASIN	788.06	12 W		782.43
			12 S		782.24
			6 NE		784.22
			B/STRUCTURE		779.81
150156	CATCH BASIN	781.26	12 W		774.63
			12 N		775.52
			12 S		773.64
			6 NE		777.12
			B/STRUCTURE		771.68
150177	CATCH BASIN	777.42	12 N		773.00
			30 W		771.69
			6 NW		771.92
			30 E		OFFSET
			B/STRUCTURE		769.64
150205	CATCH BASIN	775.35	6 W		772.46
			6 E		772.47
			B/STRUCTURE		771.25
150304	CATCH BASIN	777.55	30 W		772.30
			30 E		771.90
			6 N		773.79
			B/STRUCTURE		771.46
150356	CATCH BASIN	781.28	12 E		774.76
			6 NW		777.57
			B/STRUCTURE		774.28
150403	CATCH BASIN	788.10	12 E		782.61
			6 NW		784.20
			B/STRUCTURE		780.55
150585	STORM MANHOLE	791.40	24 NE		787.22
			24 SW		787.47
			24 NW		787.96
150600	CATCH BASIN	791.13	24 SW		787.13
			12 SE		786.93
			24 NE		787.12
150639	CATCH BASIN	789.98	12 SE		785.35
			12 NE		784.58
			6 SW		785.95
			B/STRUCTURE		783.00
150640	CATCH BASIN	790.70	12 SW		785.92
			24 SW		783.85
			24 NE		783.44
			B/STRUCTURE		783.52



SEE SHEET 1 OF 2



GRAPHIC SCALE



(IN FEET)
1 inch = 30 ft.

ALTA / NSPS LAND TITLE SURVEY
PREPARED FOR: STONEFIELD, ENGINEERING AND DESIGN
2509 & 2103 MICHIGAN, 755 HEWITT
YPSILANTI, MICHIGAN
PART OF SECTION 17 & 18,
TOWN 3 SOUTH, RANGE 7 EAST

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PER REVIEW COMMENTS	DATE	BY
PER REVIEW COMMENTS	03/28/24	MRJ
ADD ROAD CENTRELINE	12/08/23	ATS
PER REVISED TITLE WORK	9/29/23	JDM
REVISION	DATE	BY

DRAWN BY:	JG/NRJ	04/28/23
CHECKED BY:	ATS	04/28/23
DATE:	APRIL 28, 2023	SCALE: 1" = 30'
PROJECT NO.:	23-00730	



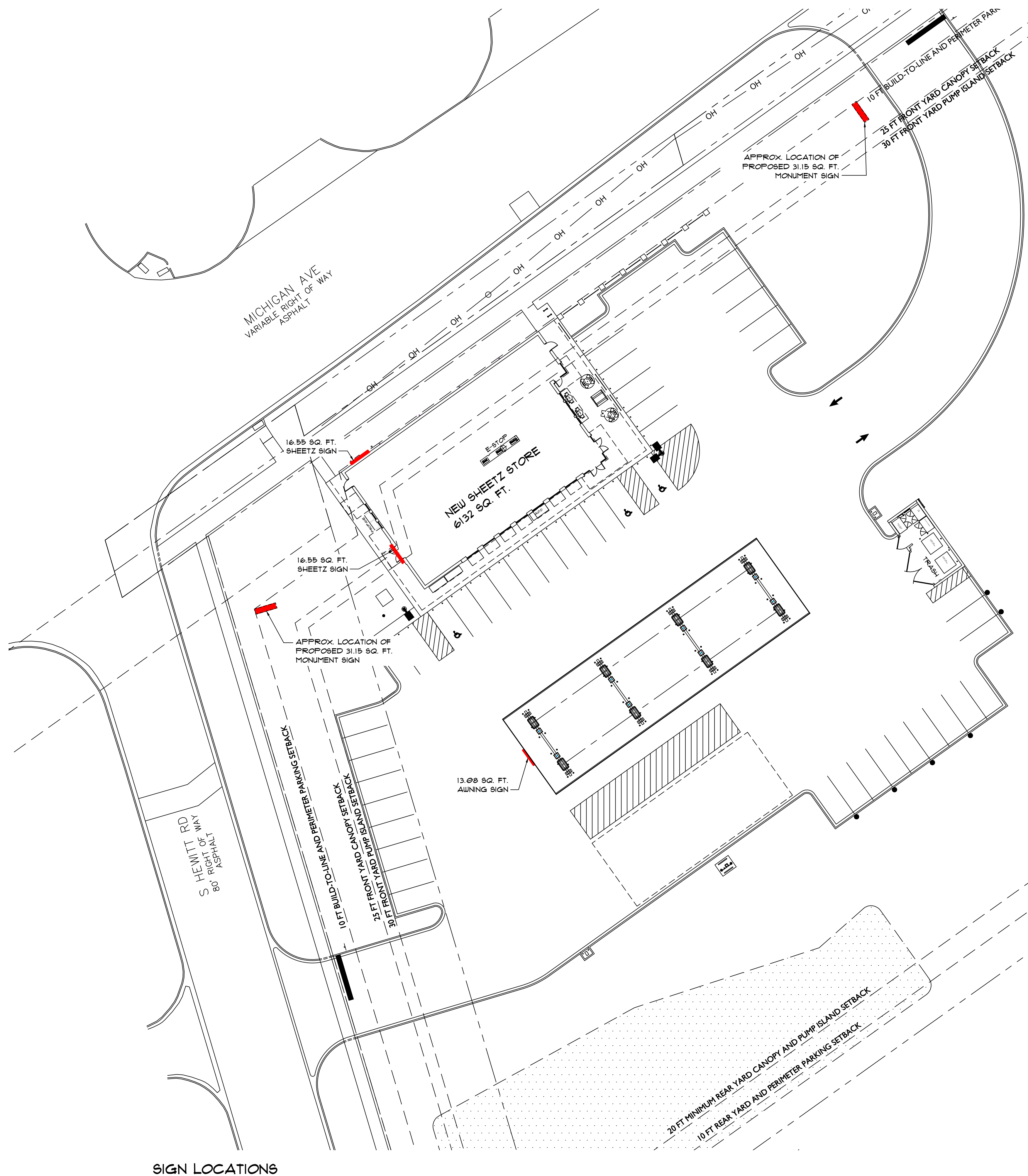
SHEETZ, INCORPORATED
 5700 SIXTH AVENUE
 ALTOONA, PA 16602
 (814) 946-3611

NEW SHEETZ STORE "YPSILANTI"

INT. OF MICHIGAN AVENUE
 AND HEWITT ROAD
 YPSILANTI, MICHIGAN

SIGNAGE SQUARE FOOTAGE BREAKDOWN

BUILDING ELEVATIONS	SHEETZ SIGN = 16.55 SQ. FT. X 2 = 33.10 SQ. FT.	
	TOTAL = 33.10 SQ. FT.	33.10 SQ. FT.
GAS PRICE MONUMENT SIGN	SHEETZ SIGN = 12.13 SQ. FT. X 1 = 12.13 SQ. FT.	
	GAS PRICE SIGN = 19.02 SQ. FT. X 1 = 19.02 SQ. FT.	
	TOTAL = 31.15 SQ. FT. X 2 = 62.30 SQ. FT.	
GAS CANOPY AWNING	SHEETZ SIGN AREA = 13.08 SQ. FT. X 1 = 13.08 SQ. FT.	
	FUEL OFFERING FLAG AREA = 2.76 SQ. FT. X 16 = 44.16 SQ. FT.	
	TOTAL = 57.24 SQ. FT.	57.24 SQ. FT.



SIGN LOCATIONS

PROJECT NAME:
NEW SHEETZ STORE

**YPSILANTI
S. HEWITT ROAD**

Int. of South Hewitt Road
and Michigan Avenue
Ypsilanti, MI

OWNER:
SHEETZ, INC.

5700 SIXTH AVE.
ALTOONA, PA 16602

CONSULTANT

PROFESSIONAL

KEYPLAN

ISSUE: **04.02.2024**
SITE ID NO: 214556
AUTHOR BY: RJK, JNW
REVIEW BY: RJH
VERSION: 6132R_v1.6

EXTERIOR
ELEVATIONS

A200

PRELIMINARY ELEVATIONS



1 FRONT ELEVATION (SOUTHEAST)
1/4" = 1'-0"

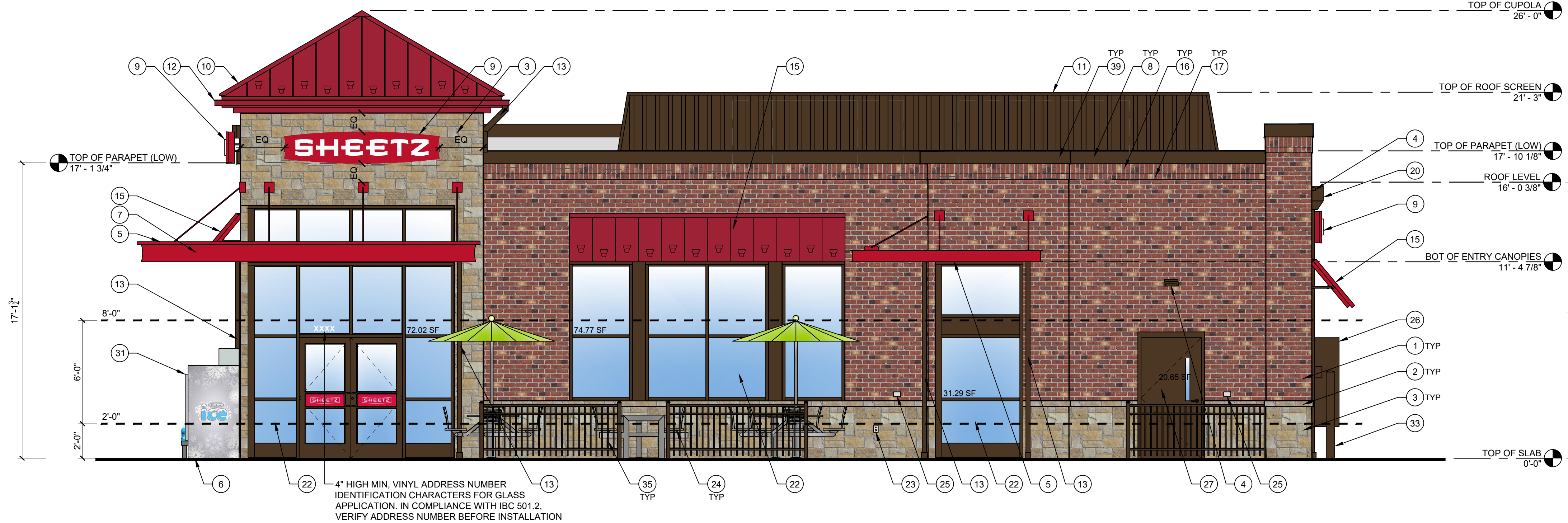
FIRST FLOOR GLAZING CALCULATION (2' TO 8')		
FRONT ELEVATION = 628 SQ FT		
DESCRIPTION	AREA (SQ FT)	% OF COVERAGE
TRANSPARENT GLAZING	196.10	31.33%
FAUX WINDOW GLAZING	N/A	N/A
TOTAL GLAZING	196.10	31.33%

TYPICAL EXTERIOR ELEVATION NOTES:

- ALL LIGHTS SHOWN ABOVE AND/OR BELOW DOORS OR WINDOWS ARE TO BE CENTERED ON THE DOOR OR WINDOW UNLESS NOTED OTHERWISE.
- FIXTURES/EQUIPMENT BETWEEN TWO DOORS OR WINDOWS ARE TO BE CENTERED EQUALLY.
- EXTERIOR SEALANT FOR STONE SHALL COMPLY WITH SECTION 07 8005 JOINT SEALANTS, GENERAL BUILDING FASCIAE WEATHER SEALANT AND SHALL MATCH THE COLOR OF THE STORE.

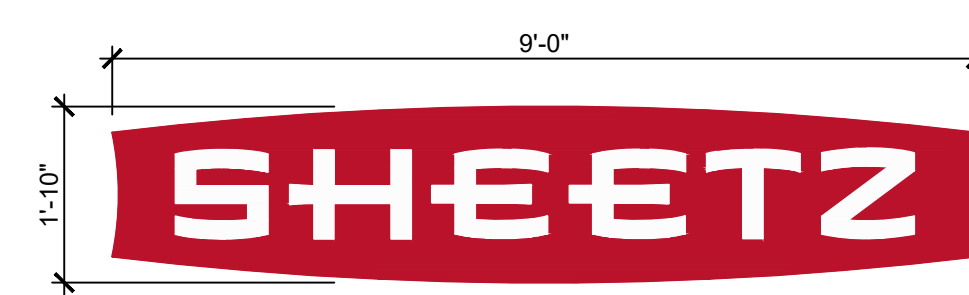
EXTERIOR ELEVATION KEYNOTES:

- BRICK VENEER, COLOR: 680 BY CONTINENTAL BRICK COMPANY. SEE MASONRY SPEC
- CAST STONE SILL, COLOR: CRAB ORCHARD. SEE MASONRY SPEC
- ANCHORED CAST STONE MASONRY VENEER, COLOR: CRAB ORCHARD. SEE MASONRY SPEC
- EXTERIOR LIGHT FIXTURE, REFER TO ELECTRICAL DRAWINGS
- ARCHITECTURAL CANOPY, COLOR: REGAL RED, PREMIUM TWO-COAT KYMAR FINISH
- BRICK PAVER WALKWAY
- LIGHTED CURVED FASCIA CANOPY ATTACHMENT
- METAL COPING, COLOR: DARK BRONZE
- WALL MOUNTED BUILDING SIGN, SEE SHEET A200.
- STANDING SEAM METAL ROOF, COLOR: BRITE RED
- ROOF EQUIPMENT SCREEN, COLOR: DARK BRONZE
- GUTTER, COLOR TO MATCH CUPOLA COLOR
- DOWNSPOUT, COLOR: DARK BRONZE
- DRIVE-THRU WINDOW (IF APPLICABLE)
- METAL STANDING SEAM SHED STYLE AWNING AND FRAME ASSEMBLY, ROOF COLOR: BRITE RED, FRAME COLOR: DARK BRONZE
- BRICK SOLDIER COURSE, COLOR: 680 BY CONTINENTAL BRICK COMPANY. SEE MASONRY SPEC
- BRICK ROWLOCK COURSE, COLOR: 680 BY CONTINENTAL BRICK COMPANY. SEE MASONRY SPEC
- CONTROL JOINT, SEE MASONRY SPEC
- STEEL ROOF LADDER AND CRANKY POST, COLOR: DARK BRONZE
- STANDARD THROUGH WALL SCUPPER WITH CONDUCTOR HEAD & DOWNSPOUT, COLOR: DARK BRONZE
- OVERFLOW SCUPPER
- ALUMINUM STOREFRONT SYSTEM, SEE A600
- EXTERIOR HOSE BIB, REFER TO PLUMBING DRAWINGS
- OUTDOOR FURNITURE
- ELECTRICAL RECEPTACLE, REFER TO ELECTRICAL DRAWINGS
- ELECTRICAL EQUIPMENT, REFER TO ELECTRICAL DRAWINGS
- HM DOOR AND FRAME, COLOR: DARK BRONZE
- EMERGENCY WATER CONNECTION, REFER TO PLUMBING DRAWINGS
- SEAMLESS ALUM PANEL SYSTEM WITH EXPOSED FASTENERS, COLOR: DARK BRONZE
- PROPANE LOCKER
- ICE MERCHANDISER
- RTI FILLPORT
- STEEL BOLLARD, COLOR: DARK BRONZE
- CO2 FILLPORT
- DECORATIVE ALUMINUM FENCE, COLOR: DARK BRONZE
- AUTOMATIC DOOR PUSH PLATE AND BOLLARD, BOLLARD COLOR: DARK BRONZE
- GAS METER AND RISER, REFER TO CIVIL UTILITY PLAN, COLOR: DARK BRONZE
- NOT USED.
- LIGHT CHANNEL AT PARAPET COPING. SEE ARCHITECTURAL AND ELECTRICAL DRAWINGS FOR MORE INFORMATION.



2 RIGHT ELEVATION (NORTHEAST)
1/4" = 1'-0"

FIRST FLOOR GLAZING CALCULATION (2' TO 8')		
LEFT ELEVATION = 496 SQ FT		
DESCRIPTION	AREA (SQ FT)	% OF COVERAGE
TRANSPARENT GLAZING	198.73	40.07%
FAUX WINDOW GLAZING	N/A	N/A
TOTAL GLAZING	198.73	40.07%



OUTLINE AREA = 14.84 SQ.FT.
BOX AREA = 16.52 SQ.FT.
TYPICAL OF FOUR
PROJECTS 7" OFF FACE OF BUILDING

A WALL MOUNTED "SHEETZ" BUILDING SIGN
1/2" = 1'-0"

PROJECT NAME:
NEW SHEETZ STORE

**YPSILANTI
S. HEWITT ROAD**

Int. of South Hewitt Road
and Michigan Avenue
Ypsilanti, MI

OWNER:
SHEETZ, INC.

5700 SIXTH AVE.
ALTOONA, PA 16602

CONSULTANT

PROFESSIONAL

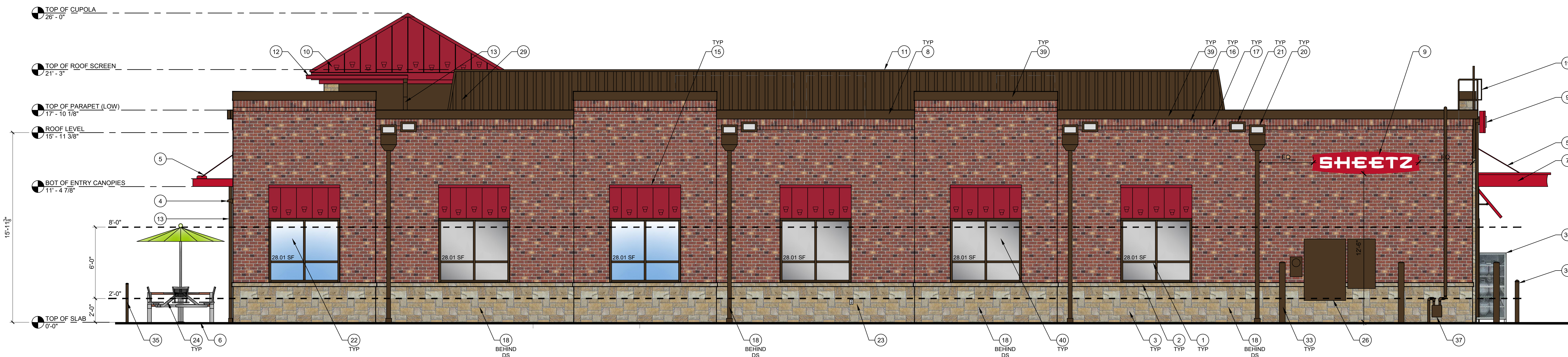
KEYPLAN

ISSUE: **04.02.2024**
SITE ID NO: **214556**
AUTHOR BY: **RJK, JNW**
REVIEW BY: **RJH**
VERSION: **6132R_v1.6**

EXTERIOR
ELEVATIONS

A201

PRELIMINARY ELEVATIONS



3 BACK ELEVATION (NORTHWEST)
1/4" = 1'-0"

FIRST FLOOR GLAZING CALCULATION (2 TO 6)		
REAR ELEVATION = 627 SQ FT		
DESCRIPTION	AREA (SQ FT)	% OF COVERAGE
TRANSPARENT GLAZING	56.02	8.93%
FAUX WINDOW GLAZING	132.04	17.87%
TOTAL GLAZING	188.06	26.80%

TYPICAL EXTERIOR ELEVATION NOTES:

- ALL LIGHTS SHOWN ABOVE AND/OR BELOW DOORS OR WINDOWS ARE TO BE CENTERED ON THE DOOR OR WINDOW UNLESS NOTED OTHERWISE.
- FIXTURES/EQUIPMENT BETWEEN TWO DOORS OR WINDOWS ARE TO BE CENTERED EQUALLY.
- EXTERIOR SEALANT FOR STONE SHALL COMPLY WITH SECTION 07 9005 JOINT SEALANTS, GENERAL BUILDING FASCIADE WEATHER SEALANT AND SHALL MATCH THE COLOR OF THE STORE.

- EXTERIOR SEALANT FOR STONE SHALL COMPLY WITH SECTION 07 9005 JOINT SEALANTS, GENERAL BUILDING FASCIADE WEATHER SEALANT AND SHALL MATCH THE COLOR OF THE STORE.

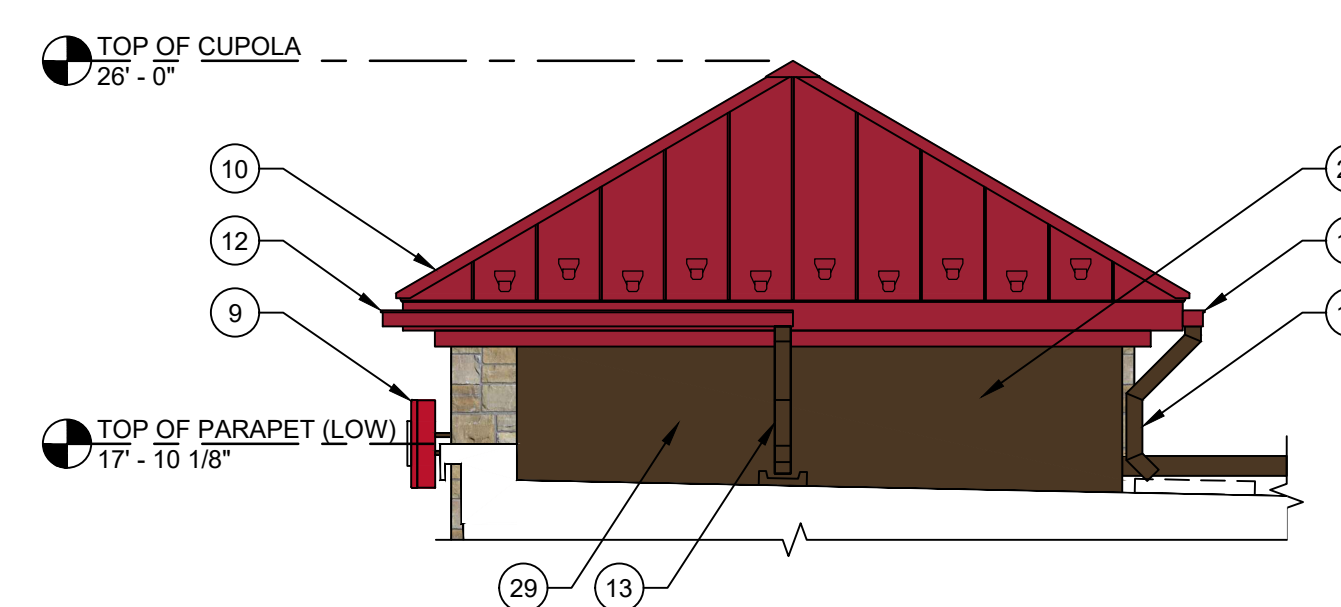
EXTERIOR ELEVATION KEYNOTES:

- BRICK VENEER, COLOR: 680 BY CONTINENTAL BRICK COMPANY. SEE MASONRY SPEC
- CAST STONE SILL, COLOR: CRAB ORCHARD. SEE MASONRY SPEC
- ANCHORED CAST STONE MASONRY VENEER, COLOR: CRAB ORCHARD. SEE MASONRY SPEC
- EXTERIOR LIGHT FIXTURE, REFER TO ELECTRICAL DRAWINGS
- ARCHITECTURAL CANOPY, COLOR: REGAL RED, PREMIUM TWO-COAT KYNAR FINISH
- BRICK PAVER WALKWAY
- LIGHTED CURVED FASCIA CANOPY ATTACHMENT
- METAL COPING, COLOR: DARK BRONZE
- WALL MOUNTED BUILDING SIGN, SEE SHEET A200.
- STANDING SEAM METAL ROOF, COLOR: BRITE RED
- ROOF EQUIPMENT SCREEN, COLOR: DARK BRONZE
- GUTTER, COLOR TO MATCH CUPOLA COLOR
- DOWNSPOUT, COLOR: DARK BRONZE
- DRIVE-THRU WINDOW (IF APPLICABLE)
- METAL STANDING SEAM SHED STYLE AWNING AND FRAME ASSEMBLY, ROOF COLOR: BRITE RED, FRAME COLOR: DARK BRONZE
- BRICK SOLDIER COURSE, COLOR: 680 BY CONTINENTAL BRICK COMPANY. SEE MASONRY SPEC
- BRICK ROWLOCK COURSE, COLOR: 680 BY CONTINENTAL BRICK COMPANY. SEE MASONRY SPEC
- CONTROL JOINT, SEE MASONRY SPEC
- STEEL ROOF LADDER AND CRANKY POST, COLOR: DARK BRONZE
- STANDARD THROUGH WALL SCUPPER WITH CONDUCTOR HEAD & DOWNSPOUT, COLOR: DARK BRONZE
- OVERFLOW SCUPPER
- ALUMINUM STOREFRONT SYSTEM, SEE A600
- EXTERIOR HOSE BIB, REFER TO PLUMBING DRAWINGS
- OUTDOOR FURNITURE
- ELECTRICAL RECEPTACLE, REFER TO ELECTRICAL DRAWINGS
- ELECTRICAL EQUIPMENT, REFER TO ELECTRICAL DRAWINGS
- HM DOOR AND FRAME, COLOR: DARK BRONZE
- EMERGENCY WATER CONNECTION, REFER TO PLUMBING DRAWINGS
- SEAMLESS ALUM PANEL SYSTEM WITH EXPOSED FASTENERS, COLOR: DARK BRONZE
- PROPANE LOCKER
- ICE MERCHANDISER
- RTI FILLPORT
- STEEL BOLLARD, COLOR: DARK BRONZE
- CO2 FILLPORT
- DECORATIVE ALUMINUM FENCE, COLOR DARK BRONZE
- AUTOMATIC DOOR PUSH PLATE AND BOLLARD, BOLLARD COLOR: DARK BRONZE
- GAS METER AND RISER, REFER TO CIVIL UTILITY PLAN, COLOR: DARK BRONZE
- NOT USED.
- LIGHT CHANNEL AT PARAPET COPING. SEE ARCHITECTURAL AND ELECTRICAL DRAWINGS FOR MORE INFORMATION.

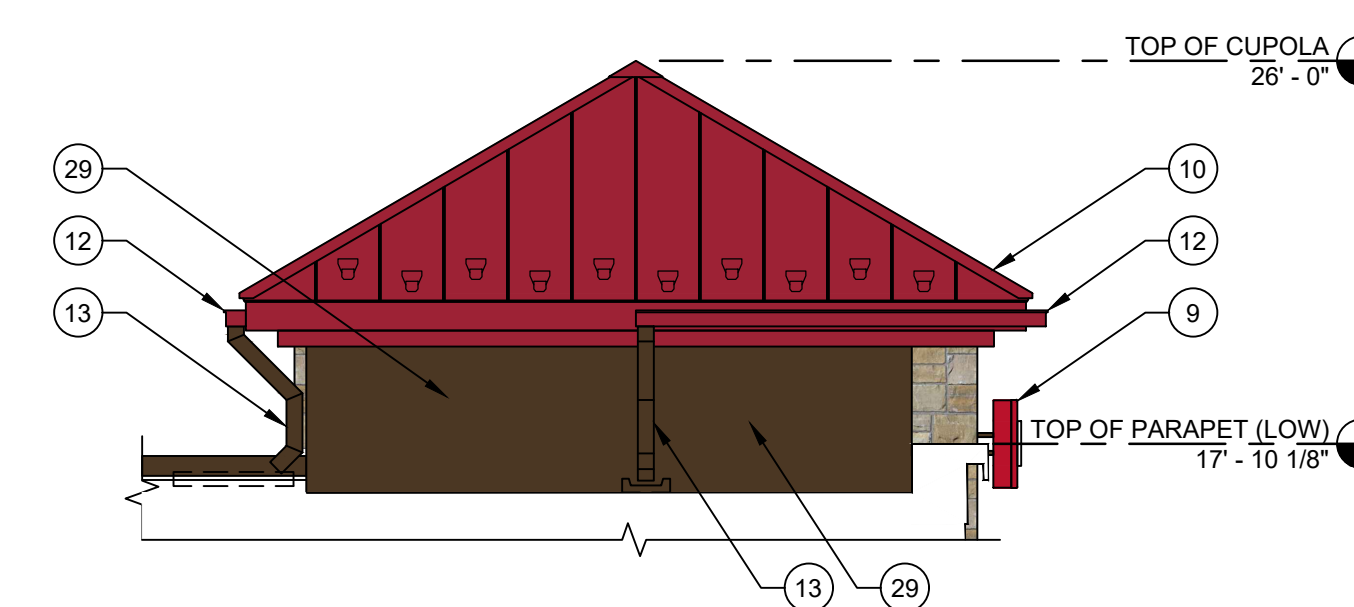


4 LEFT ELEVATION (SOUTHWEST)
1/4" = 1'-0"

FIRST FLOOR GLAZING CALCULATION (2 TO 8)		
RIGHT ELEVATION = 490 SQ FT		
DESCRIPTION	AREA (SQ FT)	% OF COVERAGE
TRANSPARENT GLAZING BETWEEN	54.94	11.03%
FAUX WINDOW GLAZING	28.01	5.62%
TOTAL GLAZING	82.95	16.65%



5 CUPOLA ELEVATION FROM ROOF
1/4" = 1'-0"



6 CUPOLA ELEVATION FROM ROOF
1/4" = 1'-0"

PROJECT NAME:
**NEW SHEETZ STORE
YPSILANTI**

Int. of Michigan Avenue
and Hewitt Road
Ypsilanti
Michigan

OWNER:
SHEETZ, INC.

5700 SIXTH AVE.
ALTOONA, PA 16602

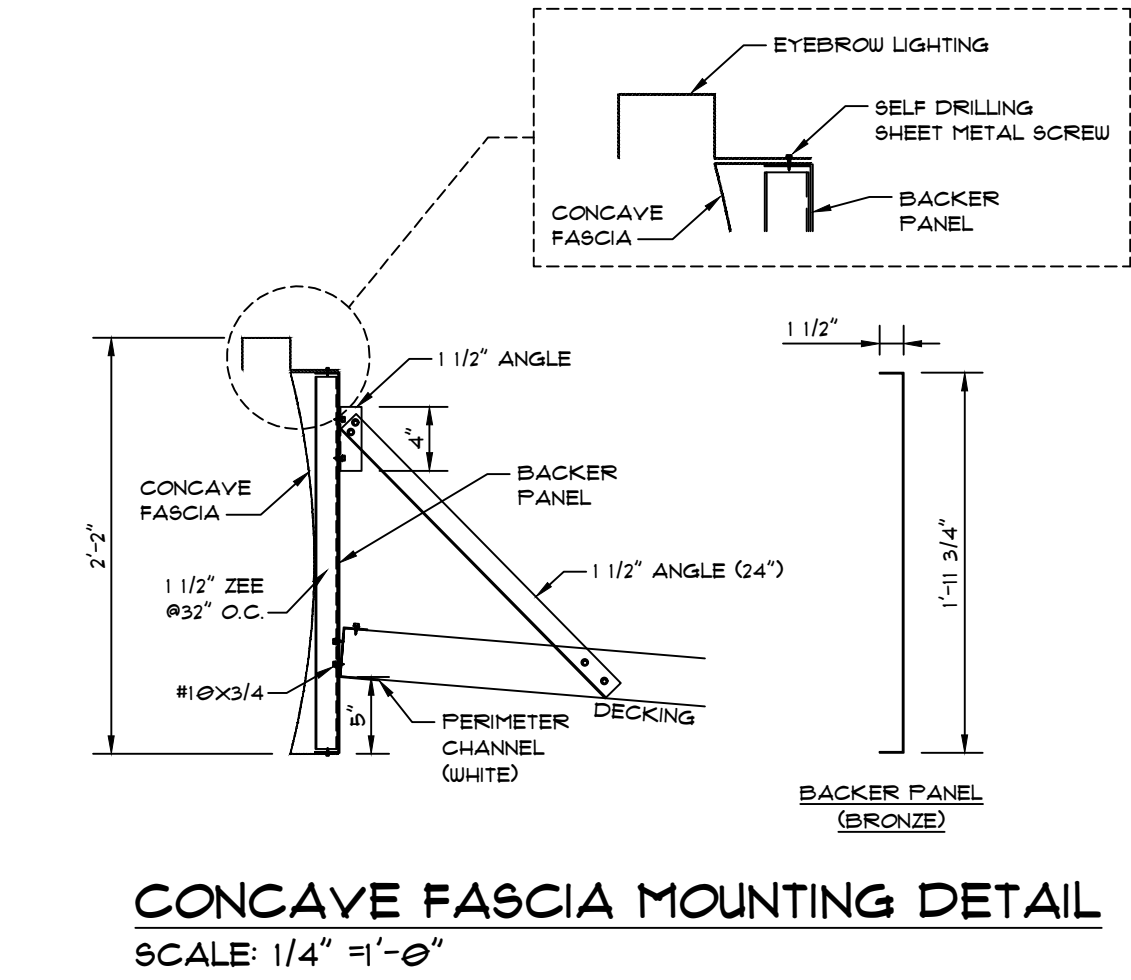
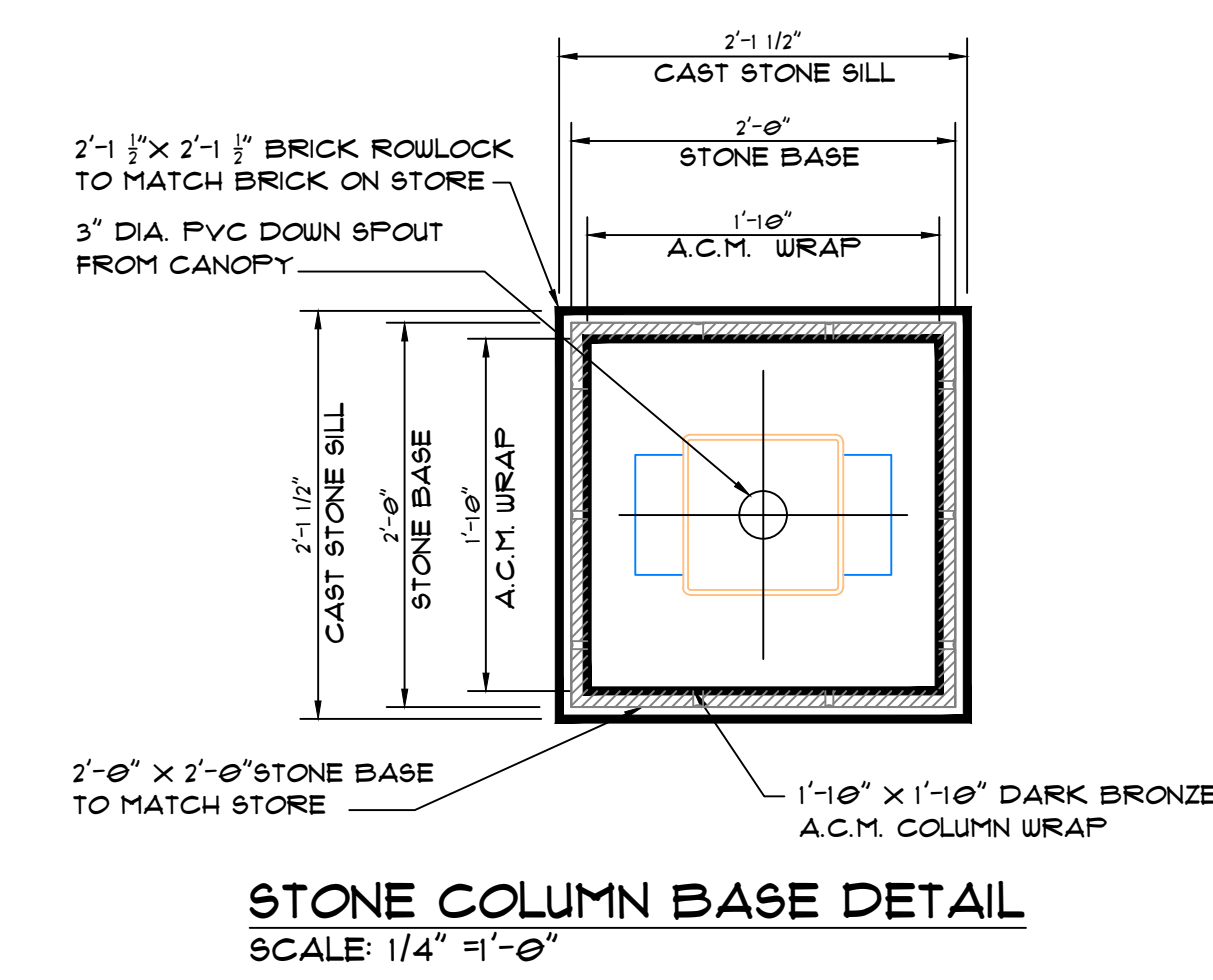
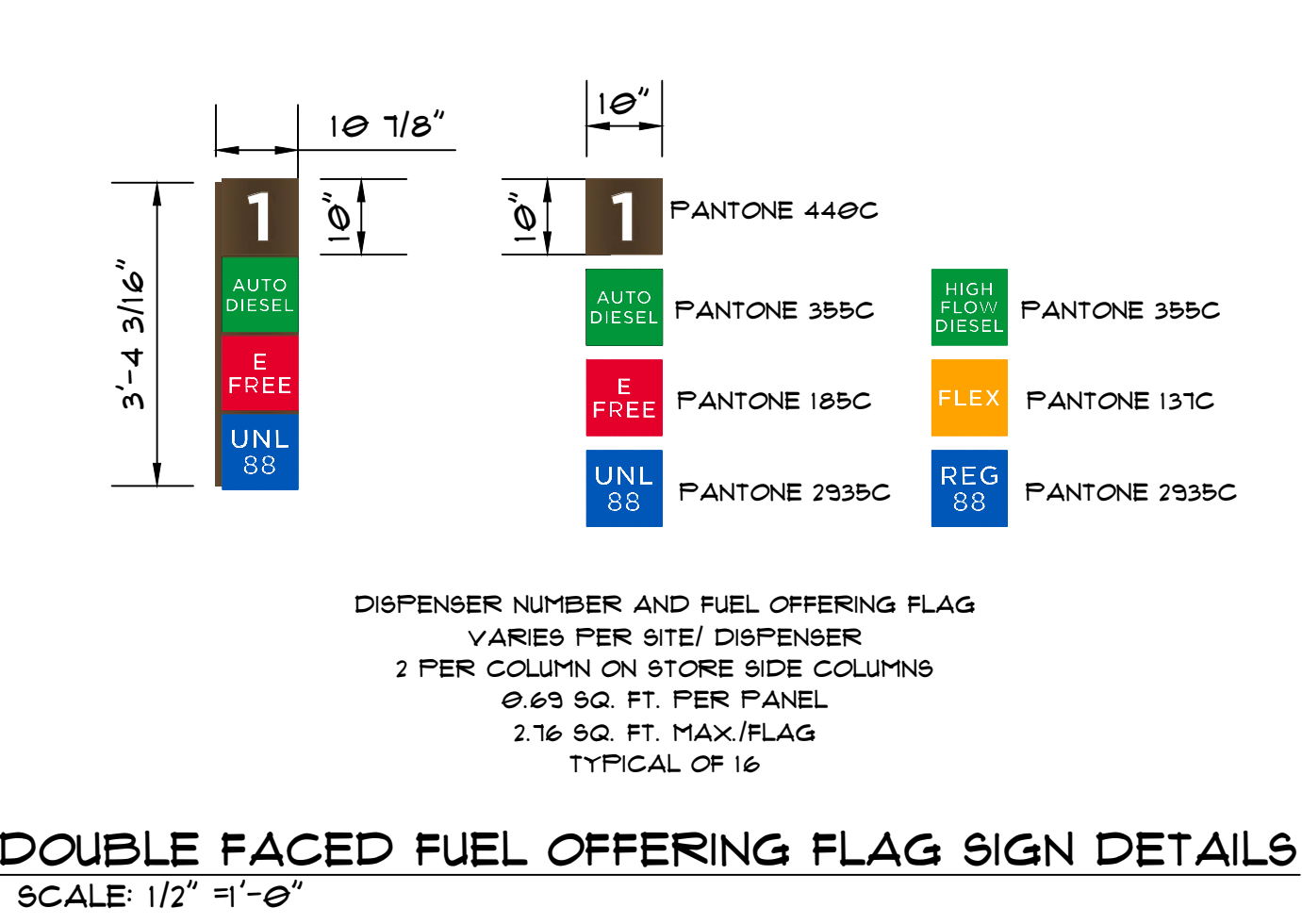
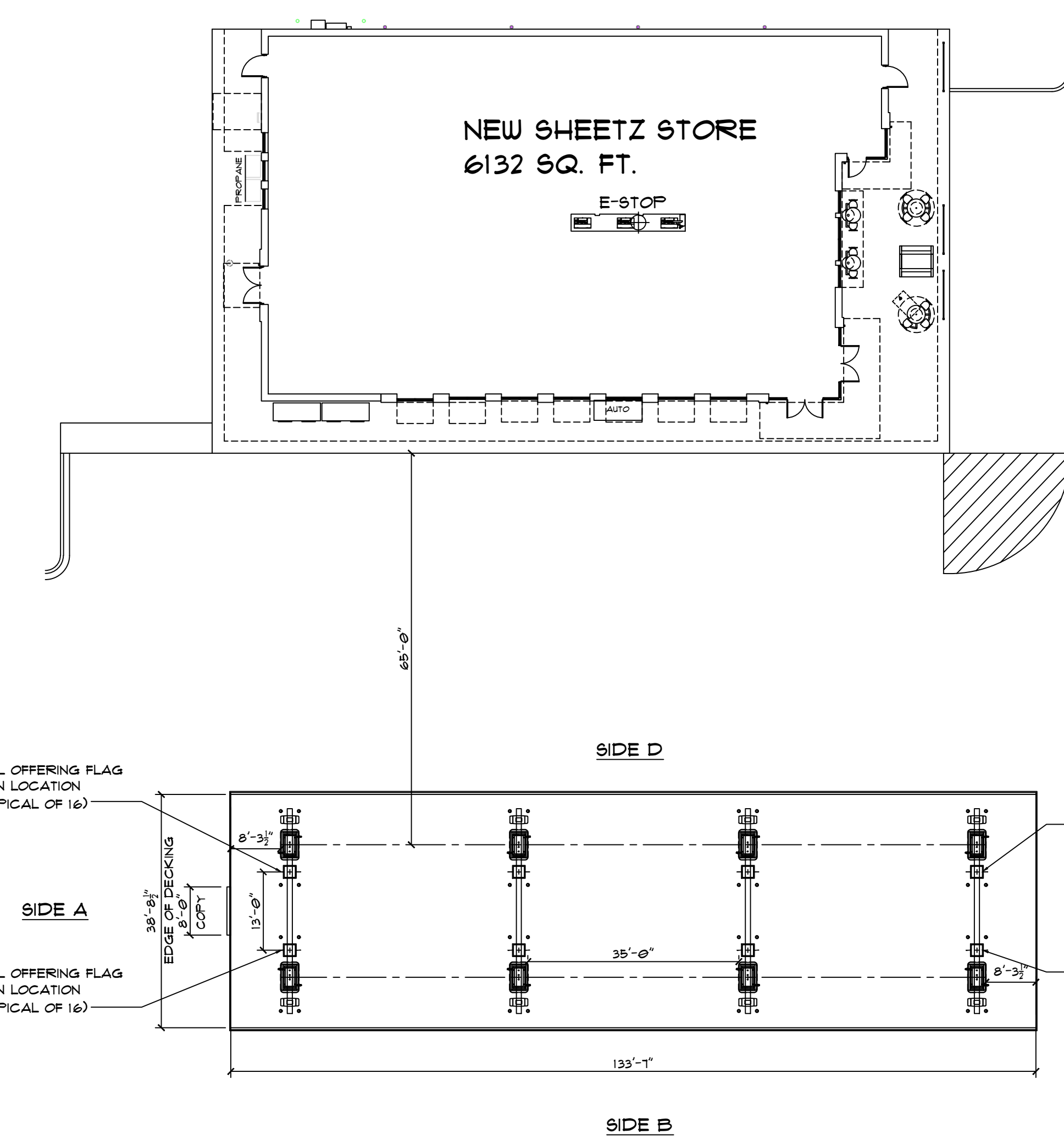
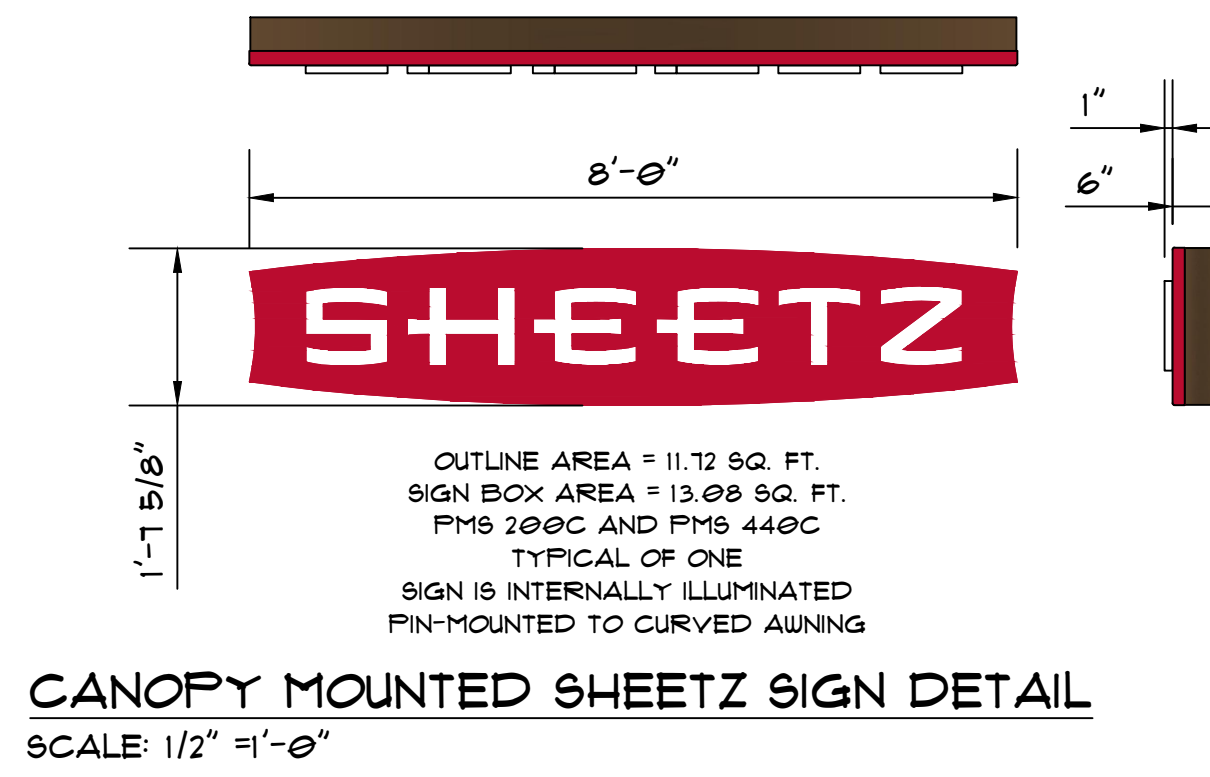
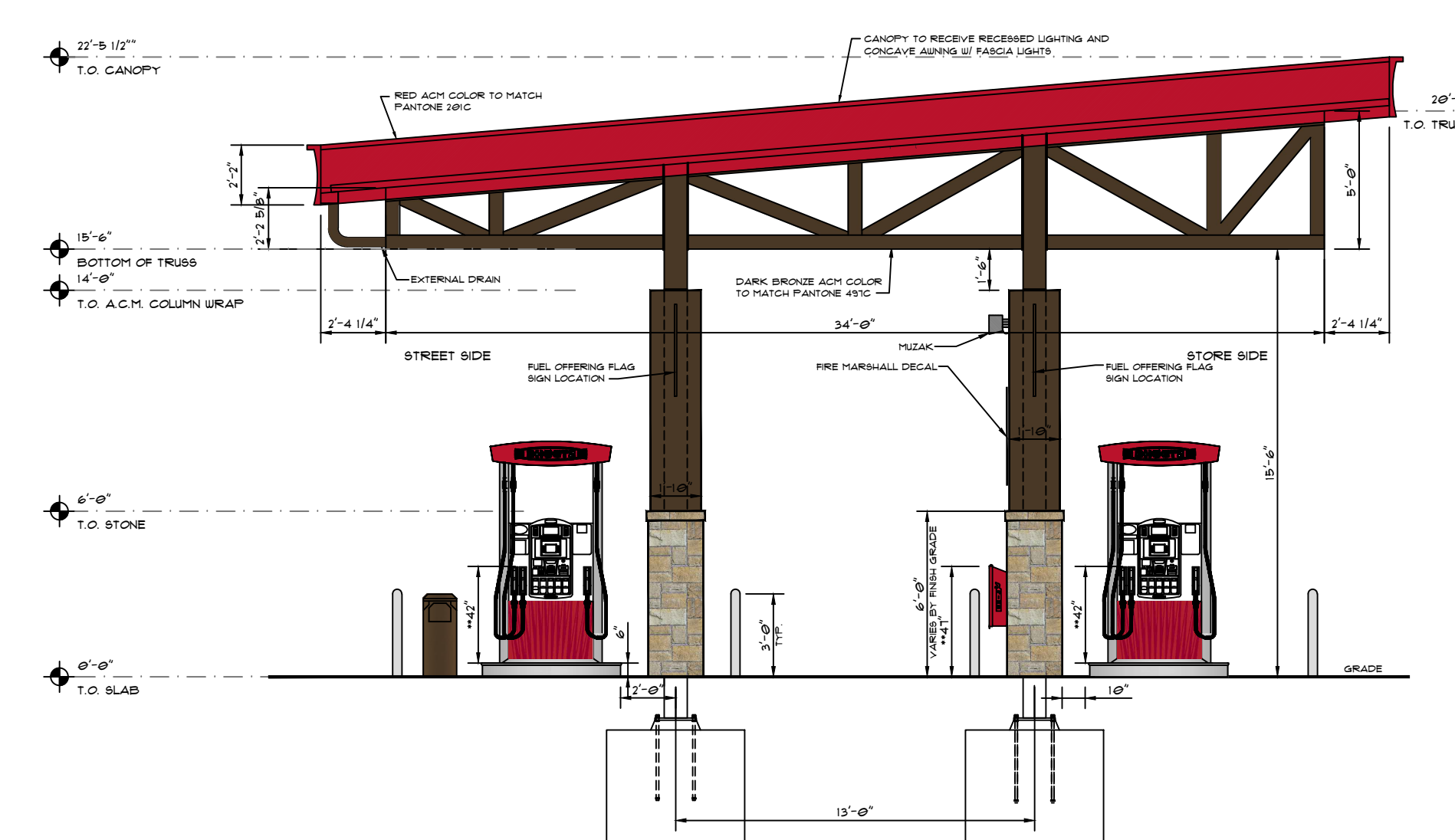
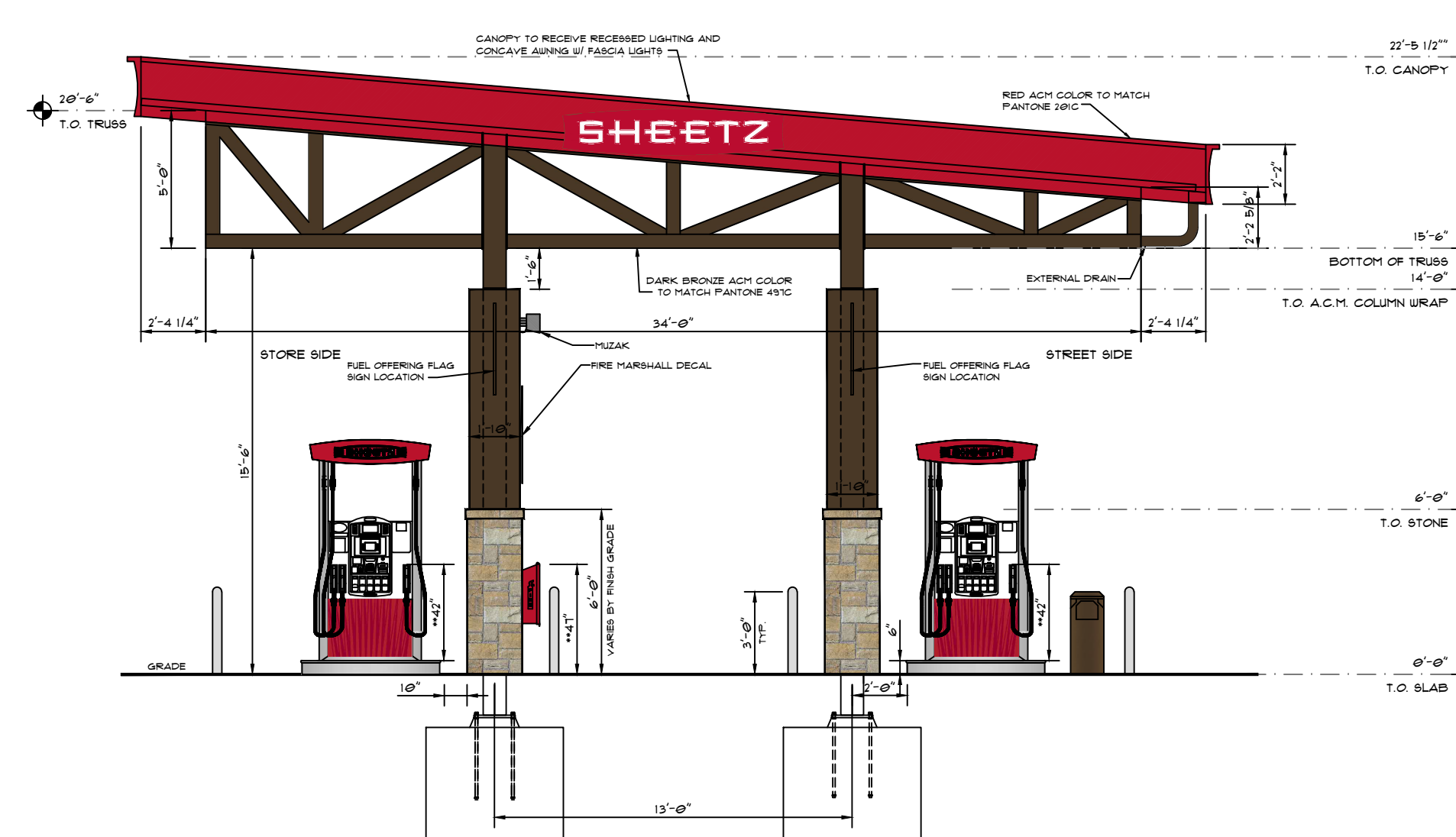
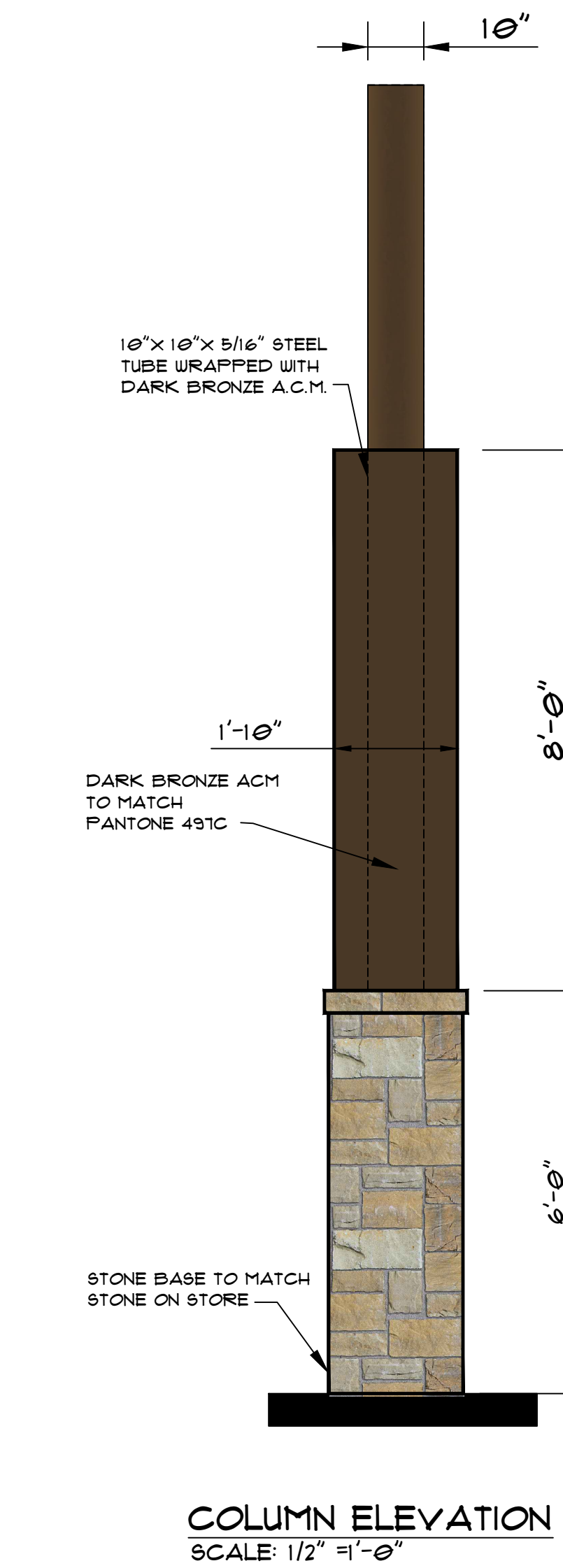
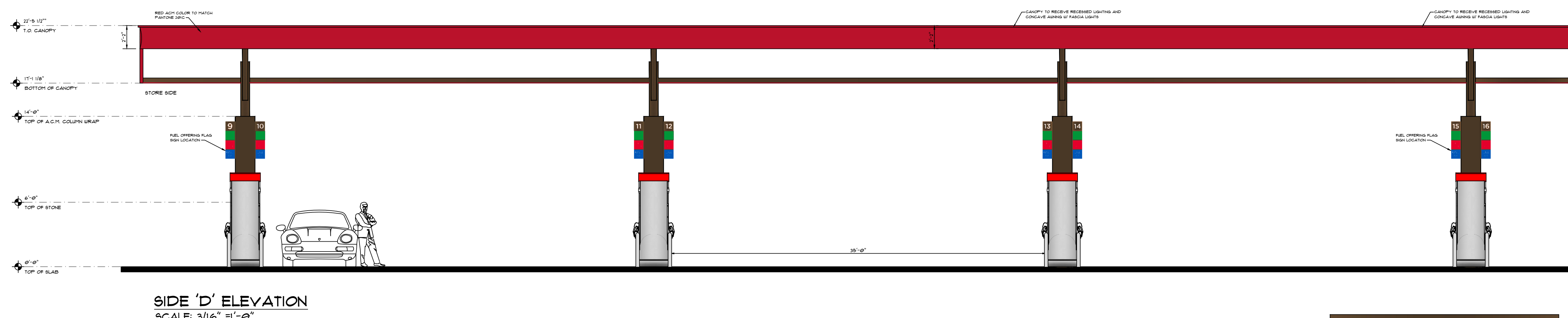
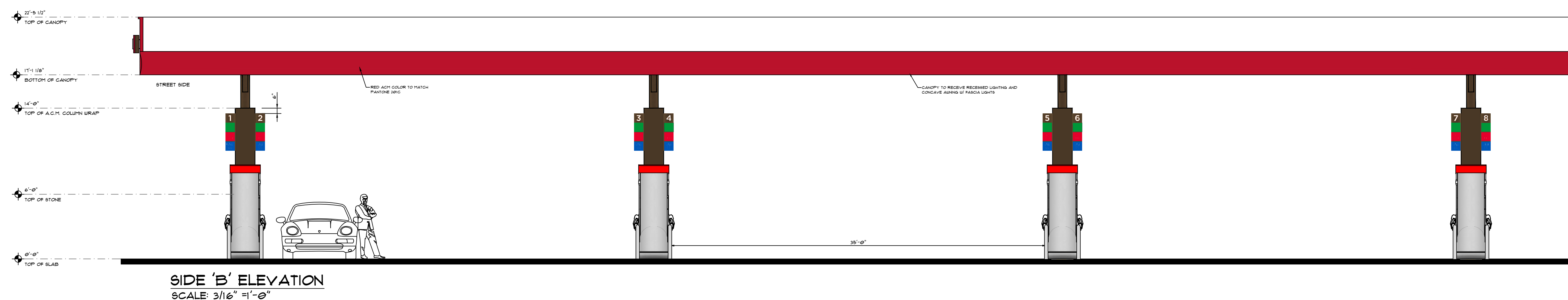
CONSULTANT

PROFESSIONAL

KEYPLAN

ISSUE: **04-05-24**
PROJECT NO:
AUTHOR BY: DNC
REVIEW BY:
SHEET TITLE

GAS AWNING



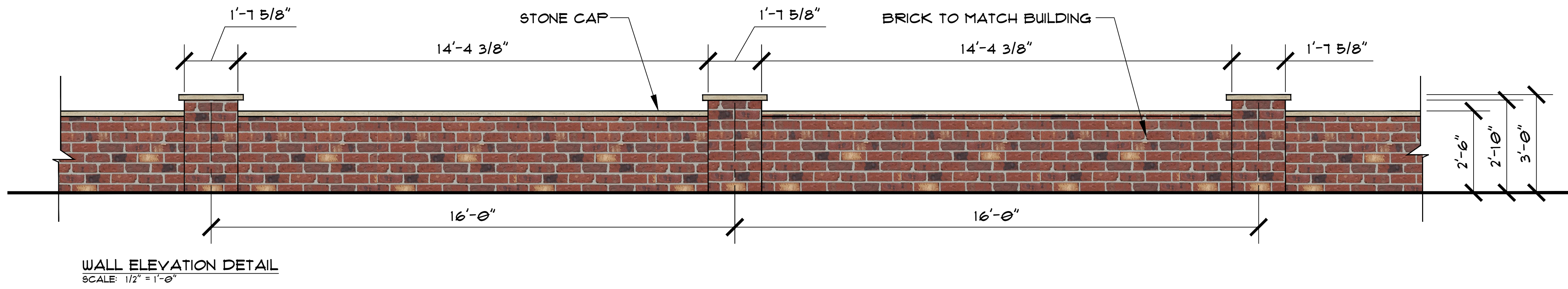
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PROJECT NAME:
**NEW SHEETZ STORE
YPSILANTI**

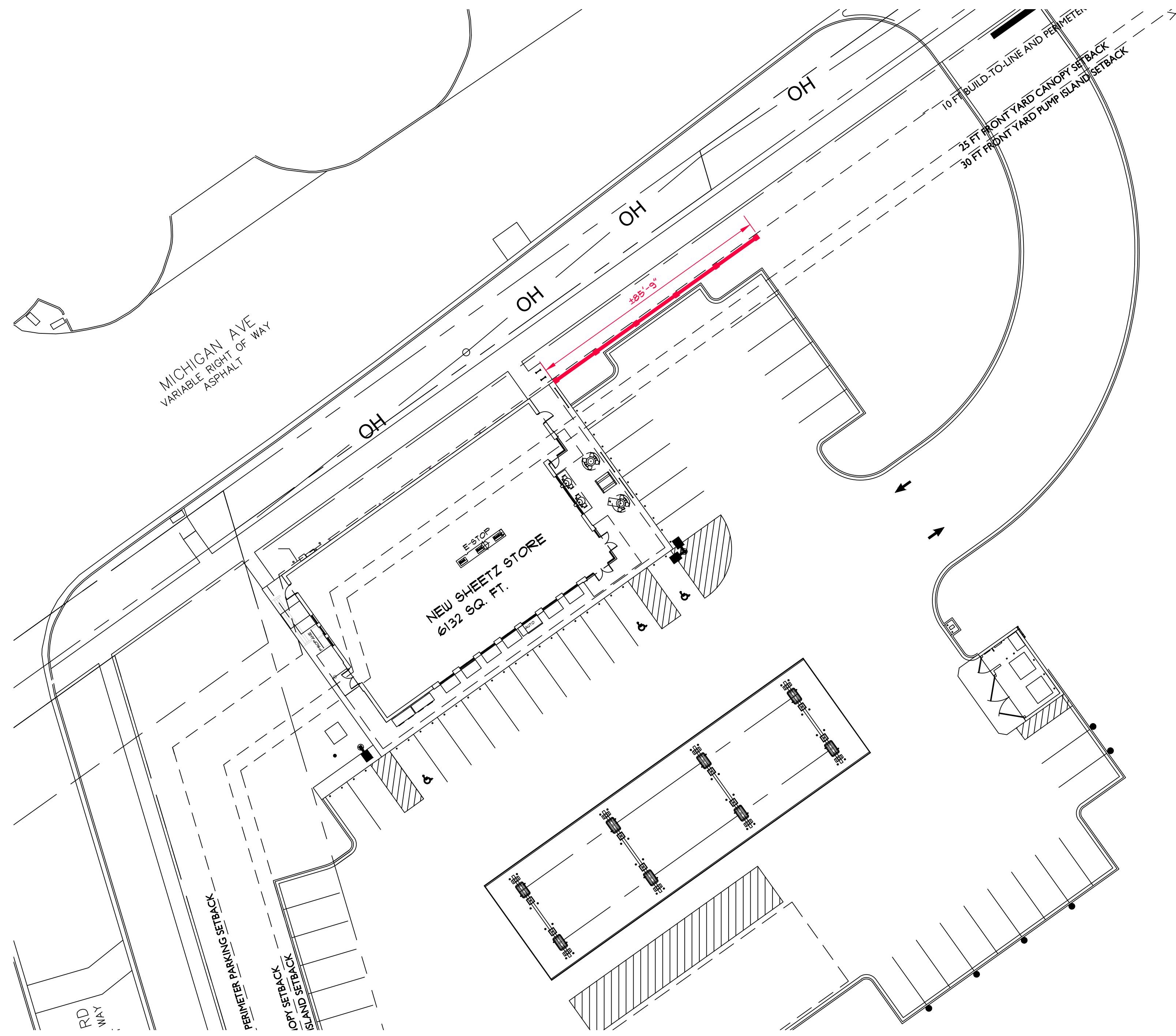
Int. of South Hewitt Road
and Michigan Avenue
Ypsilanti
Michigan

OWNER:
SHEETZ, INC.

5700 SIXTH AVE.
ALTOONA, PA 16602



WALL ELEVATION DETAIL
SCALE: 1/2" = 1'-0"

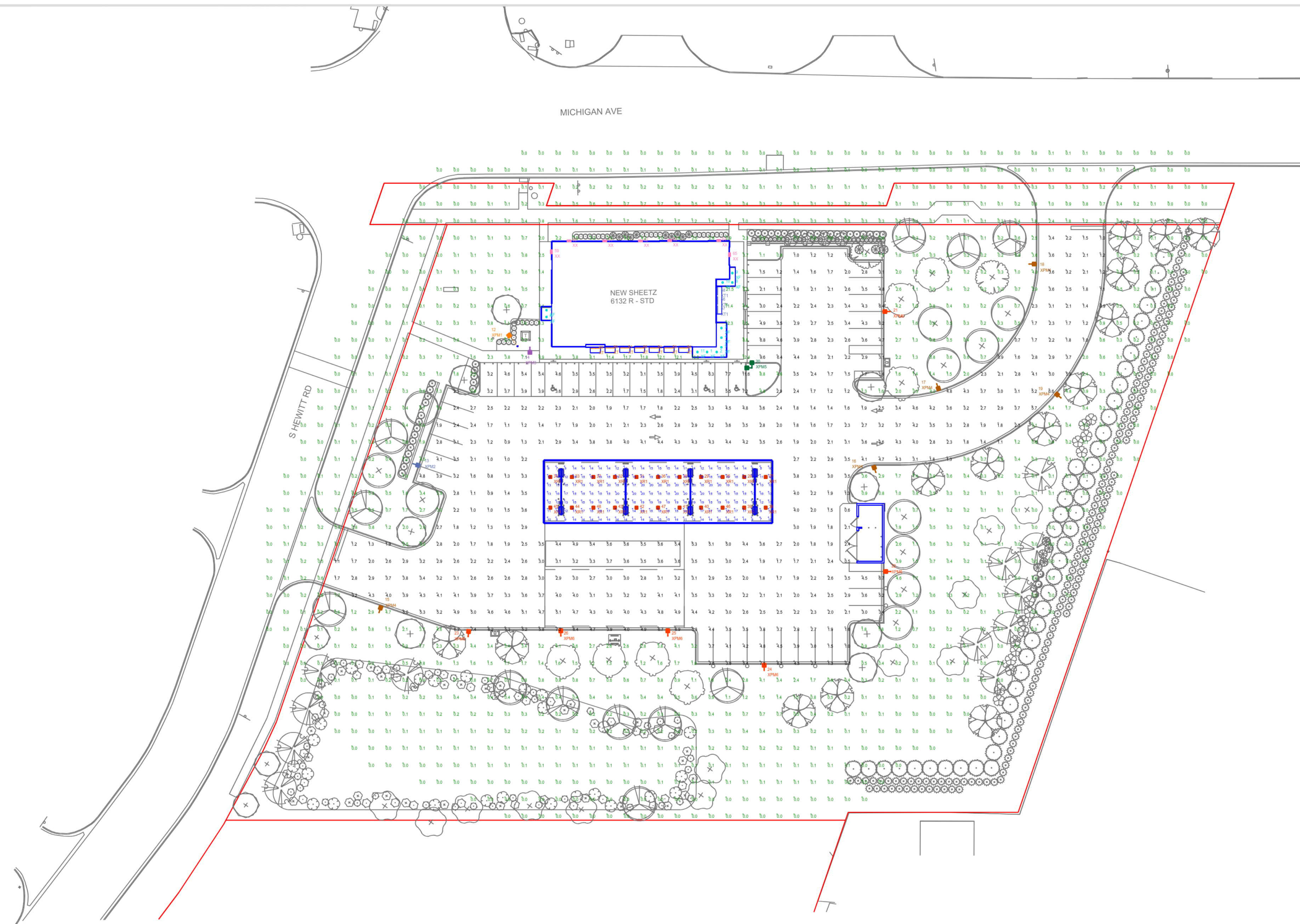


SITE PLAN LOCATION
SCALE: 1/2" = 1'-0"

MARK	DATE	DESCRIPTION
DNC	05-13-24	REVISED WALL TO SOLID MASONRY

ISSUE: **04-05-24**
PROJECT NO:
AUTHOR BY: DNC
REVIEW BY:
SHEET TITLE

**PERIMETER
WALL ELEVATIONS**



NOTES:
 - ALL AREA LIGHTS, EXCEPT #19, ON NEW 20 FT. POLE MOUNTED ON 3 FT. CONCRETE BASE
 - AREA LIGHT #19 ON NEW 15 FT. POLE MOUNTED ON 3 FT. CONCRETE BASE

LUM NO.	LABEL	MTG. HT.	TILT
1-11	XF	11.33	0
12	XPM1	1	166
13	XPM2	23	0
14	XPM3	23	0
15-18	XPM4	23	0
19	XPM4	18	0
20	XPM5	23	0
21-26	XPM6	23	0
27-37	XR1	17.45	0
38-48	XR1	19.02	0
49-55	XT	13.5	0
56-58	XT1	13.5	0
59-64	XX	15.5	0
65	XX	11.333	0

THIS SITE IS LOCATED IN A REGION WHERE LIGHTING IS REGULATED BY LOCAL ORDINANCES

ILLUMINATION LEVELS ARE THE RESULT OF CONDITIONS OR REQUESTS BY OTHERS. RED LEONARD ASSOCIATES IS NOT RESPONSIBLE FOR INCIDENTS CAUSED BY INSUFFICIENT LIGHTING AND DOES NOT RECOMMEND THESE LEVELS FOR SECURITY AND SAFETY REASONS.

FOOTCANDLE LEVELS CALCULATED AT GRADE USING INITIAL LUMEN VALUES					
LABEL	AVG	MAX	MIN	AVG/MIN	MAX/MIN
SITE PAVED AREA	3.09	11.6	0.5	6.18	23.20
UNDEFINED	0.70	21.5	0.0	N.A.	N.A.
UNDER CANOPY	15.78	20	7	2.25	2.86

LUMINAIRE SCHEDULE										
SYMBOL	QTY	LABEL	ARRANGEMENT	LUMENS	LLF	BUG RATING	WATTS/LUMINAIRE	TOTAL WATTS	MANUFACTURER	CATALOG LOGIC
11	11	XF	Single	1037	1.000	B1-U0-G0	13	143	LF Illumination LLC (Ledi)	BULLET MINI-5911-1AA-T-13C-9240-M-DMU-BLACK COLOR 90CRI
1	1	XPM1	SINGLE	11000	1.020	B4-U0-G1	68	68	Cree Lighting	OSQ-ML-C-AA-XX w/PGM-1 + OSQM-C-11L-40K7-33-UL-NM-XX
1	1	XPM2	Single	10450	1.020	B2-U0-G2	97	97	Cree Lighting	OSQ-ML-C-DA-XX + OSQM-C-16L-40K7-3B-UL-NM-XX
1	1	XPM3	Single	15200	1.020	B3-U0-G3	97	97	Cree Lighting	OSQ-ML-C-DA-XX + OSQM-C-16L-40K7-3M-UL-NM-XX
5	5	XPM4	Single	9575	1.020	B2-U0-G2	97	485	Cree Lighting	OSQ-ML-C-DA-XX + OSQM-C-16L-40K7-4B-UL-NM-XX
1	1	XPM5	2 @ 90 degrees	15200	1.020	B3-U0-G2	97	194	Cree Lighting	OSQ-ML-C-DA-XX + OSQM-C-16L-40K7-4M-UL-NM-XX
6	6	XPM6	Single	15200	1.020	B3-U0-G2	97	582	Cree Lighting	OSQ-ML-C-DA-XX + OSQM-C-16L-40K7-4M-UL-NM-XX
22	22	XR1	Single	5475	1.020	B2-U2-G1	44	968	Cree Lighting	CP5-13L-50K9-DF-UL-DM-XX-Q1-HZ
7	7	XT	Single	1840	1.000	N.A.	20	140	SPI Lighting Inc.	SEW12146 5FT-L20W[AN08] 120-277V 4000K SMA (12IN PROJECTION STEM, BLACK, 80CRI)
3	3	XT1	Single	1472	1.000	N.A.	16	48	SPI Lighting Inc.	SEW12146 4FT-L16W[AN08] 120-277V 4000K SMA (12IN PROJECTION STEM, BLACK, 80CRI)
7	7	XX	Single	1921	1.000	B1-U0-G0	16	112	WILLIAMS OUTDOOR	VWM-H-L17/840-TL-DBZ-CGL-DIM-UNV (BRONZE COLOR 80CRI)

DISCLAIMER


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REV.	BY	DATE	DESCRIPTION
R1	JAN	03/28/24	REVISED PER UPDATED SITE PLAN
R2	JAN	04/04/24	MOVED FLAG POLE TO AVOID CONFLICT
R3	JAN	06/03/24	REVISED PER UPDATED SITE PLAN, REMOVED PARAPET LIGHTING
R4	JAN	06/07/24	REVISED PER CITY COMMENTS

DOWNLIGHT



AREA




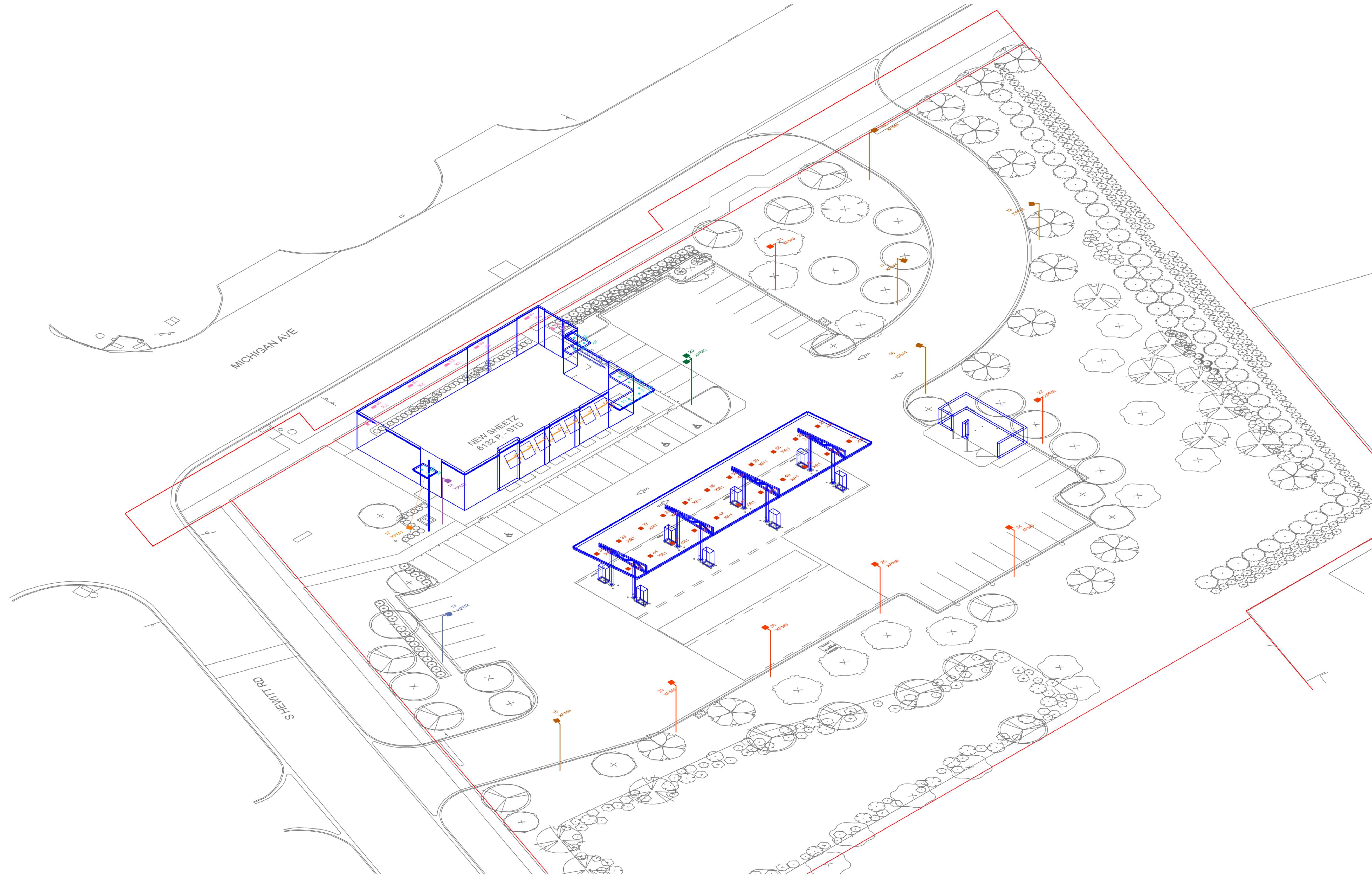
CANOPY

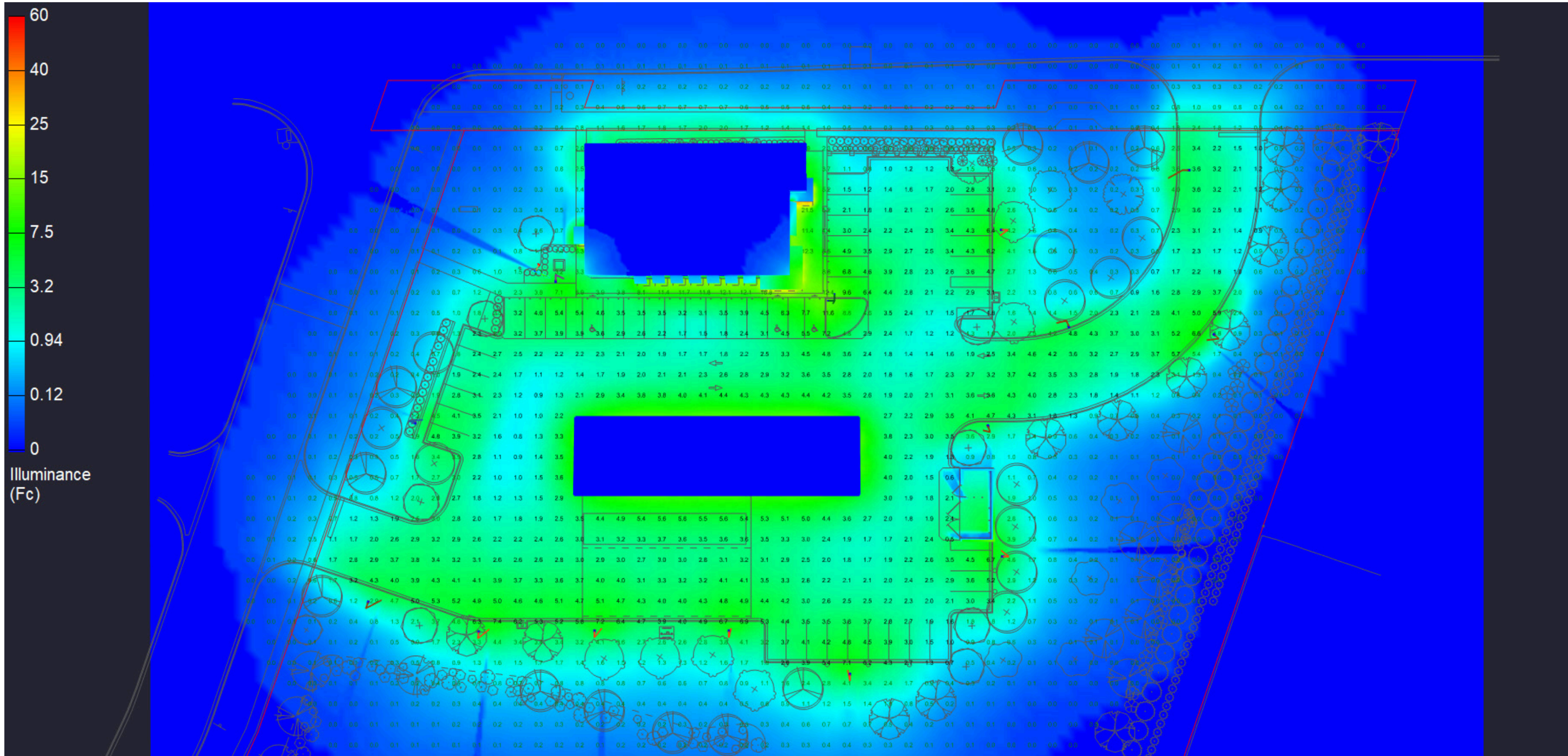


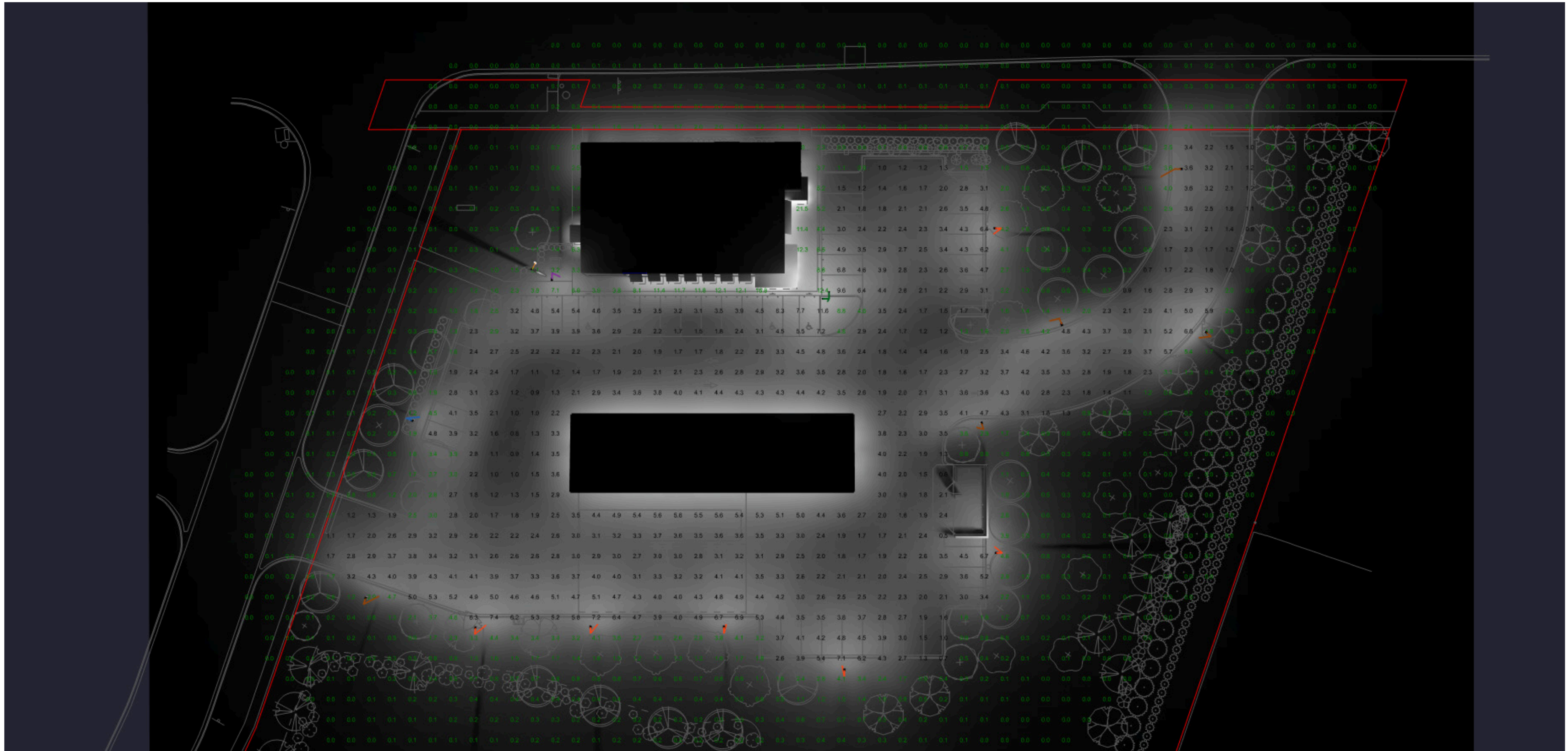
WALL MOUNTED



WALL MOUNTED







MATERIALS TESTING CONSULTANTS

April 2, 2024
Project No. 231688R

Skilken Gold
4270 Morse Road
Columbus, Ohio 43230

Attention: Derick Riba
Project Manager

Reference: Report of Geotechnical Investigation
Sheetz, West Michigan Avenue and Hewitt Road
Ypsilanti, Michigan

Dear Mr. Riba:

MATERIALS TESTING CONSULTANTS, INC. has completed a geotechnical investigation for the above-referenced project. The findings of the study along with recommendations for the design of foundations and earth-related structures are presented in the attached report.

We appreciate this opportunity to provide foundation engineering services and express our interest in providing continuing services in the areas of subgrade verification, special inspections and quality testing on various construction materials. Please contact our office should you have any questions or require further assistance.

Sincerely,

MATERIALS TESTING CONSULTANTS, INC.

Isaac L. MacMillan, P.E.
Project Engineer

Robert J. Warren, P.E.
Senior Project Manager

att: Report





GEOTECHNICAL REPORT

SHEETZ, WEST MICHIGAN AVENUE AND HEWITT ROAD
YPSILANTI, MICHIGAN

Prepared For:

SKILKEN GOLD
Columbus, Ohio

Prepared By:

MATERIALS TESTING CONSULTANTS, INC.

April 2024

MTC Project No. 231688R



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	BORING LOG TERMINOLOGY AND CLASSIFICATION OUTLINE
	BORING LOGS
	SUMMARY OF LABORATORY TEST DATA
	SUMMARY LETTER OF INFILTRATION TESTING (12-8-2023)



REPORT OF GEOTECHNICAL INVESTIGATION SHEETZ YPSILANTI

1.0 INTRODUCTION

MATERIALS TESTING CONSULTANTS, INC. (MTC) has completed a geotechnical investigation for Sheetz Ypsilanti, located east of the intersection of West Michigan Avenue and Hewitt Road in Ypsilanti, Michigan. This work has been performed as described in our proposal number 17655 dated September 29, 2023. Authorization to proceed was received from Mr. Andrew Richlen, P.E. of Silken Gold on January 30, 2024.

The scope of this study in general includes the following:

- performance of a field investigation including soil test borings and field engineering reconnaissance;
- review of recovered samples by one of our engineers and assignment of technical soil classifications;
- performance of laboratory testing on selected soil samples;
- engineering evaluation of encountered conditions with respect to the proposed construction; and
- preparation of this report.

Presented herein are descriptions of our understanding of the design considerations, the investigation program, encountered conditions and engineering recommendations. The Appendix contains the report limitations, boring log terminology, soil classification chart and boring logs.



2.0 DESIGN CONSIDERATIONS

2.1 Available Information

We have been provided the following documents and information for use in this investigation:

- A site development plan prepared by Stonefield Engineering and Design dated February 6, 2024 and received from Mr. Andrew Richlen, P.E. of Skilken Gold on February 7, 2024.
- A topographic survey prepared by Kem-Tec dated December 8, 2023, received from Mr. Andrew Richlen, P.E. of Skilken Gold on February 7, 2024.
- Soil boring logs from the project site prepared by Materials Testing Consultants for Casto dated May 11, 2023. Permission to utilize the boring information was provided by Mr. Mitch Augustine of Casto in an email dated September 26, 2023.
- A site grading plan prepared by Stonefield Engineering and Design dated March 19, 2024 and received from Mr. Eric Williams, P.E. of Stonefield Engineering and Design on March 25, 2024.
- Telephone and email correspondence with Mr. Andrew Richlen, P.E. and Mr. Derick Riba of Skilken Gold regarding the type of construction and scope of geotechnical investigation.

2.2 Location and Type of Structure

The proposed construction will be located in plan as shown on the attached Boring Location Plans, Figure No 1 and 2. The site is located east of the intersection of South Hewitt Road and West Michigan Avenue in Ypsilanti, Michigan.

The proposed construction includes a 6,132 sq. ft. convenience store, a fuel island with canopy, underground fuel storage, new site pavements and a new stormwater detention basin. The convenience store building will be single-story, approximately 60 by 100 ft in plan with no basement. The fuel island canopy will be approximately 135 by 35 ft in plan and on the order of 25 feet high. We have considered the proposed convenience store finish floor elevation will be at el 792, and the bottom of underground fuel storage tanks will be on the order of 10 to 12 ft below finished grades at el 778 to 780.



We have considered the convenience store will be of steel and masonry construction and the fuel island canopy will be of steel construction. We have considered maximum column loads of 50 kips and maximum wall loads of 5 kips per lineal foot.

Asphalt and concrete pavement areas are planned. Traffic is expected to consist of relatively light passenger vehicles with only occasional heavier axle wheel loadings from trucks for deliveries, refuse pickup, etc. We have considered a maximum traffic loading of 750 vehicles per day. Finish pavement grades will range from el 786 to 791.

Based on the site grading plan provided by Mr. Eric Williams, P.E. of Stonefield Engineering and Design, we understand the existing grades will be modified significantly to balance the site. New fill will be placed to raise site grades between 1 and 6 ft above existing elevations within the fuel island and convenience store footprints. Fills up to 6 ft are also planned within pavement areas. Fills between 1 and 4 ft are planned for the stormwater detention basin sides with a cut of 2 ft at the basin bottom.

We should be informed of any changes between the actual design conditions and those described herein as this information may affect our recommendations.

3.0 INVESTIGATION METHODOLOGY

3.1 Field Investigation

Subsurface conditions were investigated by 18 conventional soil test borings and 4 test pits divided across 3 separate investigations:

- May 2023 – Borings B-2, B-5, B-10 and B-14 were drilled to depths of 10 to 20 ft near the northeast quadrant of the property during a preliminary subsurface investigation for a separate development.
- November 2023 – Four test pits were excavated at the project site for infiltration testing.
- February 2024 – Borings B-101 through B-114 were drilled to depths of 10 to 35 ft for the Sheetz site design.



Boring locations are shown on the attached plans, Figure Nos. 1 and 2. The test pit locations, test pit logs and infiltration test results are summarized in the letter dated December 8, 2023 attached to this report.

One of our engineers staked the approximate boring locations in the field. Boring elevations were approximated by GPS. The elevations used in this report are given in feet and are based on NAVD 88 datum with boring coordinates based on the Michigan State Plane South coordinate system. If more precise location and elevation data are desired, a registered professional land surveyor should be retained to locate the borings and determine their ground elevations.

The drilling was performed using conventional hollow-stem auger methods to advance the boreholes. The boreholes were backfilled to the original ground surface after drilling completion.

Soil samples were recovered on regular intervals by means of the Standard Penetration Test (SPT), ASTM D1586. The SPT test involves the use of a 140-lb hammer with a 30-inch drop to drive a standard 2.0-inch O.D. split spoon sampler. The number of hammer blows required to drive the sampler 12 inches, after seating 6 inches, is termed the soil N-value and provides an indication of the soil's relative density and strength parameters at the sample location. SPT blow counts in 6-inch increments are recorded on the boring logs. The drill rig was equipped with an automatic hammer system which delivers a more consistent driving energy to the sampler compared to the rope and cathead system.

Recovered samples were sealed, labeled and transported to our laboratory. All soil samples will be discarded after sixty days unless a longer hold time is specifically requested.

The recovered soil samples were reviewed by an engineer and technically classified according to the methods of ASTM D2488 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)". Estimates of the unconfined compressive strength of the cohesive samples were made using a calibrated penetrometer. A copy of the test boring logs along with a description of the terminology used on the logs and a chart of the ASTM D2488 group symbol names are provided in the Appendix.



Borings were drilled and other sampling was conducted solely to obtain indications of subsurface conditions as part of a geotechnical exploration program. No services were performed to evaluate subsurface environmental conditions.

3.2 Laboratory

Selected samples were subjected to laboratory testing per ASTM D2216 "Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass" and ASTM D2974 "Test Methods for Determining the Water (Moisture) Content, Ash Content, and Organic Material of Peat and Other Organic Soils." The laboratory test results are noted on the boring logs and summarized in a table provided in the Appendix.

4.0 INVESTIGATION RESULTS

4.1 Regional Geology

The *Map of the Surface Formations of the Southern Peninsula of Michigan*, published by the State of Michigan, indicates the site is in an area of moraines. Soil conditions in this type of geologic area typically consist of unsorted layers of sand, silt, and/or clay. The thickness of individual units and horizontal alignment may vary due to the direct deposition of this material from glacial ice drift. Areas with more distinctly sorted sand, silt and/or clay strata may be present, while in other areas the soil can consist of silty sand, clayey sand, etc. The *Map of Bedrock Topography of the Southern Peninsula of Michigan* indicates bedrock to be between elevations 550 and 600 ft, on the order of 180 to 240 ft below existing site elevations.

4.2 Site Conditions

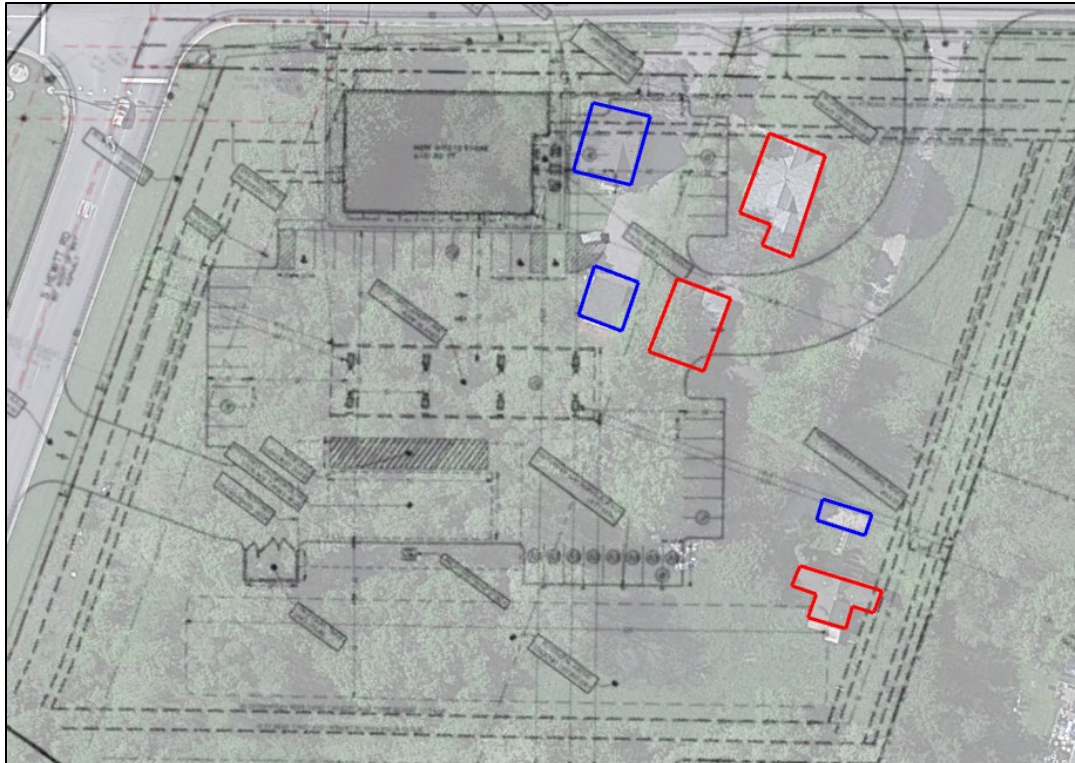
At the time of our field work most of the project site was thickly wooded. The existing site grades generally sloped down from the north and west to the south and east with elevations approximately ranging from 791 to 780. A low-lying area was present near the center of the



site at an approximate elevation of 785 with grades sloping up about 5 ft to the north, south and west. The observed low-lying area was located in the general vicinity of the proposed fuel canopy and underground storage tanks.



During our investigation an existing residential structure and garage were present to the east of the proposed Sheetz store. Historic aerial photographs of the site available on Google Earth indicated several other residential structures were present at the project site and demolished between 2011 and 2015. In addition, remnants of an abandoned concrete slab or pavement section were observed at the ground surface where the southeasternmost structure was previously located. Additional demolition debris or existing undocumented fill not observed during our reconnaissance or detected by the soil borings may be present.



Aerial image of the project site from 2010 with proposed site plan overlay. The approximate locations of previous structures are outlined in red and existing structures in blue.



4.3 Subsurface Conditions

The investigation, in general, encountered 2 to 6 inches of sandy and clayey topsoil at the surface with the exception of Borings B-107, B-111 and B-114 which did not encounter topsoil. General summaries of the subgrade soil encountered in the building and pavement areas follow.

New Convenience Store – Borings B-101 through B-105

Below the topsoil, Borings B-101 through B-105 generally encountered very loose to loose sand with varying amounts of silty and clayey fines (SC, SM, SP-SM, SP-SC) and very stiff lean clay (CL) to depths ranging from 4 to 7 ft (els 779.2 to 784.9). Boring B-105 encountered fill consisting of loose poorly graded sand with clay (SP-SC) from the surface to a depth of 3 ft (el 783.2).

Below these soils, loose to medium dense poorly graded sand (SP) was encountered to the explored depth of 20 ft (els 766.2 to 770.4) in Borings B-101, B-102, B-104 and B-105. Boring B-103 encountered loose to medium dense poorly graded sand (SP) to a depth of 23 ft (el 763.7) and medium dense silty sand (SM) to the explored depth of 35 ft (el 751.7).

Fuel Island Canopy and Storage Tanks – Borings B-106 through B-111

Below the topsoil, Borings B-106 through B-109 and B-111 generally encountered very loose to loose sand with varying amounts of silty and clayey fines (SC, SP-SC, SP-SM) to depths of 3 to 8 ft (els 776.6 to 787.2) overlying very loose to medium dense poorly graded sand (SP) to the explored depth of 20 ft (els 764.5 to 770.2). Boring B-111 encountered a very stiff lean clay (CL) stratum from 13 to 14.2 ft (els 776.0 to 777.2).

Boring B-110 encountered very loose poorly graded sand with clay (SP-SC) and stiff sandy lean clay (CL) to a depth of 5.5 ft (el 783.4), medium dense silty sand (SM) and sandy silt (ML) to a depth of 12.5 ft (el 776.4) and poorly graded sand with silt (SP-SM) to the explored depth of 20 ft (el 768.9).



Pavement Areas – Borings B-2, B-14 and B-112 through B-114

Borings B-2, B-14 and B-112 generally encountered medium stiff to hard lean clay (CL) to depths of 5 to 10 ft (els 775.1 to 782.0). Boring B-112 encountered fill consisting of medium dense poorly graded sand with silt (SP-SM) from the surface to a depth of 3 ft (el 782.1). Boring B-2 encountered loose to medium dense poorly graded sand (SP) from a depth of 5 ft (el 782) to the explored depth of 20 ft (el 767.0).

Borings B-113 and B-114 generally encountered very loose to medium dense clayey sand (SC), poorly graded sand with silt and clay (SP-SM) (SP-SC) and poorly graded sand (SP) to the explored depth of 10 ft (els 774.9 to 775.0). Boring B-114 encountered fill consisting of poorly graded sand with clay (SP-SC) and trace organic fines and glass debris from the surface to a depth of 3 ft (el 781.9).

The relative density of granular soil is based on recorded SPT N-values while the consistency of cohesive soil is based on both recorded SPT N-values and on estimates of the unconfined compressive strength obtained with a calibrated penetrometer.

Groundwater was encountered in Borings B-2, B-5, B-10, B-101 through B-111 and B-113 at depths ranging from 8.5 to 17.2 ft (els 771.7 to 778.9). Groundwater levels may fluctuate due to seasonal variations such as precipitation, snowmelt, nearby drain, river or lake levels and other factors that may not be evident at the time of measurement. Groundwater levels may be different at the time of construction.

Test Pits for Stormwater Structures

The December 2023 Summary Letter of Infiltration Testing, included in the Appendix, summarized the findings of the test pits as follows:

“In general, Test Pits TP-1, TP-2 and TP-3 encountered approximately three to four inches of topsoil over lean clay, silty clay, and silt soils. Test Pit TP-4 encountered 8 inches of topsoil overlying granular soil to the explored depth. Test Pits TP-1 and TP-2 encountered clayey fill with debris, topsoil and organics to an approximate depth of two feet below the existing grade (els 784 ft to 782 ft). None of the test pits encountered groundwater.”



This section has provided a generalized description of the encountered subsurface soil conditions. The boring and test pit logs located in the Appendix should be reviewed for detailed soil descriptions. Some variation between boring and test pit locations may be expected.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Due to variations in the existing topography, new fill will be placed to raise site grades between 1 and 6 ft above existing elevations within the fuel island and convenience store footprints. Fills up to 6 ft are also planned within pavement areas. Engineered fill should be placed from a suitable native subgrade as recommended in Section 5.2 of this report.

The native subgrade soil on the site is generally expected to provide adequate support for foundations, slabs and pavements, with the exception of the very loose granular soils encountered within the upper 2 to 5 ft in Borings B-102, B-104, B-106, B-107 and B-108. Some improvement of very loose native soils should be expected during construction. In addition, Borings B-2, B-105, B-112 and B-114 encountered undocumented fill to depths of 3 to 5 ft. Undocumented fill likely exists in other areas of the project site due to previous demolition of structures. Over-excavation to remove existing undocumented fill should be performed prior to placing new engineered fill or constructing foundations, floor slabs and pavements. Remediation of unsuitable subgrade soil is addressed in Section 5.2.

5.1 Foundations

A conventional shallow continuous and spread foundation system is recommended for support of the proposed structures. It is important that the recommendations of this report, in particular those pertaining to subgrade preparation, construction observation and testing, be implemented during design and construction.



The following parameters are recommended for foundation design:

Table 5.1.1 - Foundation Design Parameters

Bearing pressure for square or rectangular foundations, maximum net allowable	3,000 psf
Bearing pressure for continuous foundations, maximum net allowable	3,000 psf
Minimum width of square or rectangular foundations	24 inches
Minimum width of continuous foundations	18 inches
Minimum embedment depth for frost protection	42 inches

Foundations are expected to bear on the native loose to medium dense granular soil or very stiff lean clay as encountered in the borings or on approved engineered fill. Subgrade preparation recommendations are contained in the following section.

Foundation recommendations presented herein are based on a safety factor to resist bearing capacity failure of at least 3.0 and a maximum anticipated total foundation settlement of 1 inch or less.

5.2 Site and Subgrade Preparation

All topsoil, vegetation, roots and any other miscellaneous debris should be removed from within the proposed construction areas. The limits of the proposed construction area, prior to the placement of any structures or engineered fill material, should be proof-rolled and, where granular soil is present, compacted in the upper 12 inches using suitable compaction equipment to at least 95 percent of the soil's maximum ASTM D1557 dry density by the Contractor. Proof-rolling is defined as the passing of relatively heavy construction equipment over the soil subgrade under observation by the Geotechnical Engineer. The response of the soil, when subjected to the applied load, is subjectively evaluated by qualified geotechnical personnel with respect to its ability to support the overlying soil or structure. In areas where excessive deflection is observed, special subgrade preparation measures may be recommended to provide an acceptable subgrade condition. These measures may consist of compaction of the subgrade at moisture contents close to the optimum value, undercutting affected areas and replacing with engineered fill, use of a geotextile separation fabric or some combination of these measures. Subgrade improvement is likely to be required where



undocumented fill and soft or loose surficial soil has been encountered (Borings B-2, B-102, B-104, B-105, B-106, B-107, B-108, B-112 and B-114).

Due to the very loose granular soils and undocumented fill encountered within the upper 2 to 5 ft in Borings B-2, B-102, B-104, B-105, B-106, B-107, B-108, B-112 and B-114, it is expected that some form of subgrade improvement will be required within portions of the canopy and building areas to provide suitable foundation bearing conditions. Variations between borings may exist that could necessitate subgrade improvements beyond these areas. Subgrade improvement may include, but not be necessarily limited to, densification of existing soil in-place or excavation of all unsuitable material to an approved subgrade and replacement with engineered fill. If overexcavation is selected, it should encompass soil within the stress influence region of the foundation, defined as a region bordered by 2V:1H planes extending down and away from the bottom edge of the foundation to the approved bearing stratum.

The foundation subgrade should be inspected and tested by qualified geotechnical personnel. As part of the inspection and testing, the subgrade at each individual bearing element should be verified to be consistent with the conditions encountered in this investigation and the indicated recommended allowable bearing pressures. This testing should include the verification of acceptable unconfined compressive strengths in cohesive soil and a dynamic cone penetrometer (ASTM STP399) to verify minimum relative densities and equivalent N-values in granular soil. Care should be taken to maintain the natural moisture content of clayey subgrade soil which may become soft when saturated from rainfall, etc.

Engineered fill is approved on-site or imported soil placed in uniform layers and compacted to a minimum required density. Generally, on-site soil with group symbols of SP, SP-SC or SP-SM are expected to be suitable for engineered fill. Cohesive and fine-grained soils may be used as engineered fill; however, due to the need for moisture contents during compaction to be within a relatively narrow range, they are relatively difficult to compact especially in wet or cold weather. Imported engineered fill should meet the requirements for MDOT Class II granular material. MDOT Class II soil or approved on-site soil meeting the requirements of SP or SP-SM should be used as backfill against below-grade walls and foundations.



Granular engineered fill and backfill should be compacted to at least 95 percent of the soil's maximum dry density as determined by the Modified Proctor test (ASTM D1557). Vibratory compaction methods are typically found to be most effective in granular soils; however, relatively light equipment should be used adjacent to retaining or basement walls to avoid overstressing the walls. Engineered fill composed of primarily clay soil should be compacted to at least 95 percent of the maximum Standard Proctor dry density (ASTM D698). Moisture contents during compaction should be within ± 2 percent of the soil's optimum moisture content. Sheepsfoot type compactors with a kneading form of compaction are typically found to be most effective in cohesive soil.

The fill should be placed and compacted in horizontal layers not exceeding 9 inches. Field density tests should be taken on each lift, as the fill is being placed, to verify compliance with compaction specifications.

If the earthwork takes place during winter months, fill must not be placed on frozen ground and fill with frozen conglomerations of soil must not be used.

Existing structures are present on the project site. Demolition of existing structures should include the complete removal of all foundations, floor slabs, pavements and associated debris. Following demolition, excavations should be backfilled with engineered fill as recommended in this report. Because the site has been previously developed, there may be buried items not encountered in our borings, such as a septic tank, well, or utility conduit, which may cause settlement problems. The contract documents should reflect that it is necessary to remove or relocate such structures and to fill the excavation with engineered fill.

5.3 Groundwater

Groundwater was encountered in Borings B-2, B-5, B-10, B-101 through B-111 and B-113 at depths ranging from 8.5 to 17.2 ft (els 771.7 to 778.9). Groundwater was encountered substantially below the anticipated excavation depth for foundations, however, excavations for fuel storage tanks may extend to a depth close to the encountered groundwater levels. Suitable control of groundwater should be anticipated and planned for accordingly before the start of construction. The contractor should be responsible for selecting and implementing an appropriate groundwater control system. The contractor should have previous dewatering



experience on sites with similar conditions. Suitable silt and sediment traps should be incorporated into the dewatering system.

5.4 Slopes and Temporary Excavations

The owner and the contractor should make themselves aware of and become familiar with applicable local, state, and federal safety regulations, including current OSHA excavation and trench safety standards. Construction site safety generally is the sole responsibility of the contractor. The contractor shall also be solely responsible for the means, methods, techniques, sequences and operations of construction operations. We are providing the following information solely as a service on this project and, under no circumstances, should our provision of the following information be construed to mean that we are assuming responsibility for construction site safety or the contractor's activities; such responsibility is not implied and should not be inferred.

The Contractor should be aware that slope height, slope inclination, and excavation depths (including utility trench excavations) should in no case exceed those specified in local, state, or federal safety regulations; e.g., OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations. For this site, the overburden soil encountered in our exploratory program is primarily granular soil. We anticipate that OSHA will classify these materials as Type C. OSHA recommends a maximum slope inclination of 1½H:1V for Type C soil under ideal conditions. If any excavation, including a utility trench, is extended to a depth of more than 20 ft, OSHA requires that the side slopes of such excavation be designed by a professional engineer registered in the State of Michigan.

5.5 Concrete Floor Slabs and Rigid Pavements

Subgrade preparation in floor slab areas should be as described in the "Site and Subgrade Preparation" section of this report. For design of the concrete floor slabs and rigid pavements supported on-grade, a modulus of subgrade reaction value, K_{30} , of 100 psi/inch is recommended. We recommend placement of at least 4 inches of MDOT Class II fill directly beneath the floor slab. Design of concrete slabs should be in accord with ACI and the applicable building code recognized design guidelines. If a vapor sensitive covering will be placed over the floor slab or the slab will be in a humidity-controlled area, a vapor



retarder/barrier is recommended following ACI 302.1R-15 guidelines and the floor covering manufacturer's guidelines.

Where rigid pavements will be constructed, a minimum concrete thickness of 6 inches is recommended. A plain jointed (unreinforced) concrete pavement with proper spacing of control joints is recommended. Load transfer devices (dowel bars) are not expected to be necessary given the expected axle loadings from primarily passenger vehicles and occasional deliveries. A minimum 6-in base of MDOT Class II sand should be placed underneath the concrete. The concrete strength should be designed for a minimum modulus of rupture, S'_c , of 600 psi and the concrete should be air entrained. The pavement should be properly jointed (sawcut) with the joints sealed. A jointing plan should be prepared as part of the design. Typically, joints are placed every 12 to 15 ft with the sawcut extending approximately 1/4 of the pavement depth.

5.6 Flexible Pavement

Subgrade preparation in pavement areas should be as described in the "Site and Subgrade Preparation" section of this report. The following flexible pavement sections are recommended:

Table 5.6.1 - Flexible Pavement Section

Traffic Condition	Standard Duty	Heavy Duty
Sand subbase thickness, inches	10	12
Aggregate base thickness, inches	6	8
Bituminous leveling course thickness, inches	2.0	2.5
Bituminous wearing course thickness, inches	1.5	1.5

The following materials are recommended:

Table 5.6.2 - Flexible Pavement Materials

Sand subbase	MDOT Class II granular
Aggregate base	MDOT 21AA Natural Aggregate
Bituminous leveling	MDOT 13A
Bituminous wearing	MDOT 36A
Binder grade	PG 58-28



Sand subbase material should be laboratory tested to confirm MDOT Class II grading requirement. MDOT standard specifications for materials and placement should be observed. We recommend a maximum of 17 percent recycled asphalt pavement (RAP), measured as a percent of asphalt replacement, be utilized in HMA mixes. Air voids should be field regressed to 3.5 percent using liquid asphalt cement.

A natural aggregate base product, often consisting of crushed limestone, is recommended relative to crushed concrete aggregate base products considering the long-term performance risk crushed concrete presents due to potential hydration of free cement and decreased permeability over time.

Construction procedures and workmanship are of key importance with respect to pavement appearance and long-term pavement performance. Key components of workmanship include appropriate joint construction resulting in sufficient density, prevention of segregation, and maintaining a minimum temperature during placement. At a minimum, the procedures outlined in Section 501 of the 2020 MDOT Specifications should be followed with respect to equipment, placement, and temperatures. Compaction of the asphalt courses should range between 92 and 96 percent of the Theoretical Maximum Density (TMD) based on MDOT requirements.

It is recommended that cracks that may develop in the pavement be quickly and properly sealed through a regular maintenance program. Also, the subgrade should be sufficiently sloped to provide drainage within the sand subbase and underdrains should be provided within the subbase, at catch basins and pavement edges, to facilitate drainage. At each catch basin, four underdrains with a watertight connection should extend out radially at least 20 ft. A suitable rubberized asphalt sealant should be placed between all concrete curb/HMA joints immediately after paving.

5.7 MBC Seismic Considerations

The seismic design category can be determined with noted exceptions following Section 1613 of the 2015 Michigan Building Code. The Risk Category under Section 1613.3.5 shall be determined by a licensed structural engineer. Based on the subsurface conditions identified in the soil borings, our experience with the geological conditions in the site vicinity and the



procedures outlined in Section 1613 of the 2015 Michigan Building Code and Chapter 20, Table 20.3-1 of ASCE 7, we recommend assigning a Site Class D to this site. A Site Class D designates a stiff soil profile in the upper 100 ft with average SPT uncorrected N-values between 15 and 50 in granular soil and average undrained shear strengths, s_u , between 1,000 and 2,000 psf in cohesive soil. Recommended seismic ground motion values are provided in Table 5.7.1.

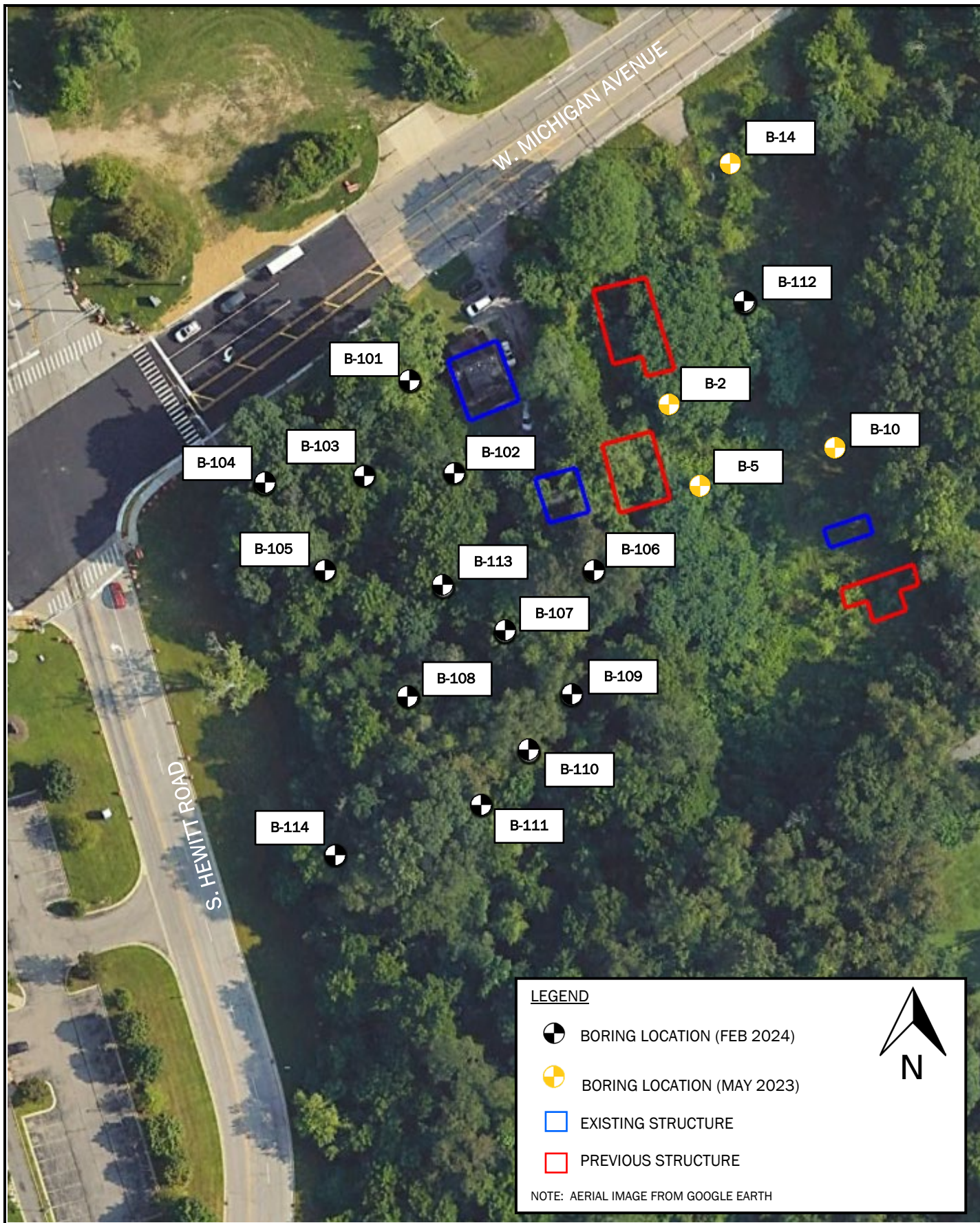
Table 5.7.1 - Recommended Seismic Ground Motion Values

2015 Michigan Building Code Values	Short Period (0.2 sec)	Long Period (1 sec)
Spectral Response Acceleration, Figure 1613.3.1 (1 and 2), %g	$S_s = 10$	$S_l = 5$
Seismic Site Coefficient, Table 1613.3.3 (1 and 2)	$F_a = 1.6$	$F_v = 2.4$
Maximum Considered Spectral Response Acceleration, Equations 16-37 and 16-38	$S_{MS} = 0.160g$	$S_{MI} = 0.120g$
5% Damped Spectral Response Acceleration, Equations 16-39 and 16-40	$S_{DS} = 0.107g$	$S_{DI} = 0.080g$





6.0 CLOSURE

In this report, descriptions of the geotechnical investigation, encountered conditions and recommendations for the design of foundations and earth-related structures have been provided. The limitations of this study are described in the Appendix.


The recommendations presented in this report are based upon a limited number of subsurface samples obtained from various sampling locations. The samples may not fully indicate the nature and extent of the variations that actually exist between sampling locations. For that reason, among others, we strongly recommend that a qualified geotechnical firm be retained to observe earthwork construction. If variations or other latent conditions become evident during construction, it will be necessary for us to review these conditions and our recommendations as appropriate.




LEGEND


-  BORING LOCATION (FEB 2024)
-  BORING LOCATION (MAY 2023)
-  EXISTING STRUCTURE
-  PREVIOUS STRUCTURE


NOTE: AERIAL IMAGE FROM GOOGLE EARTH



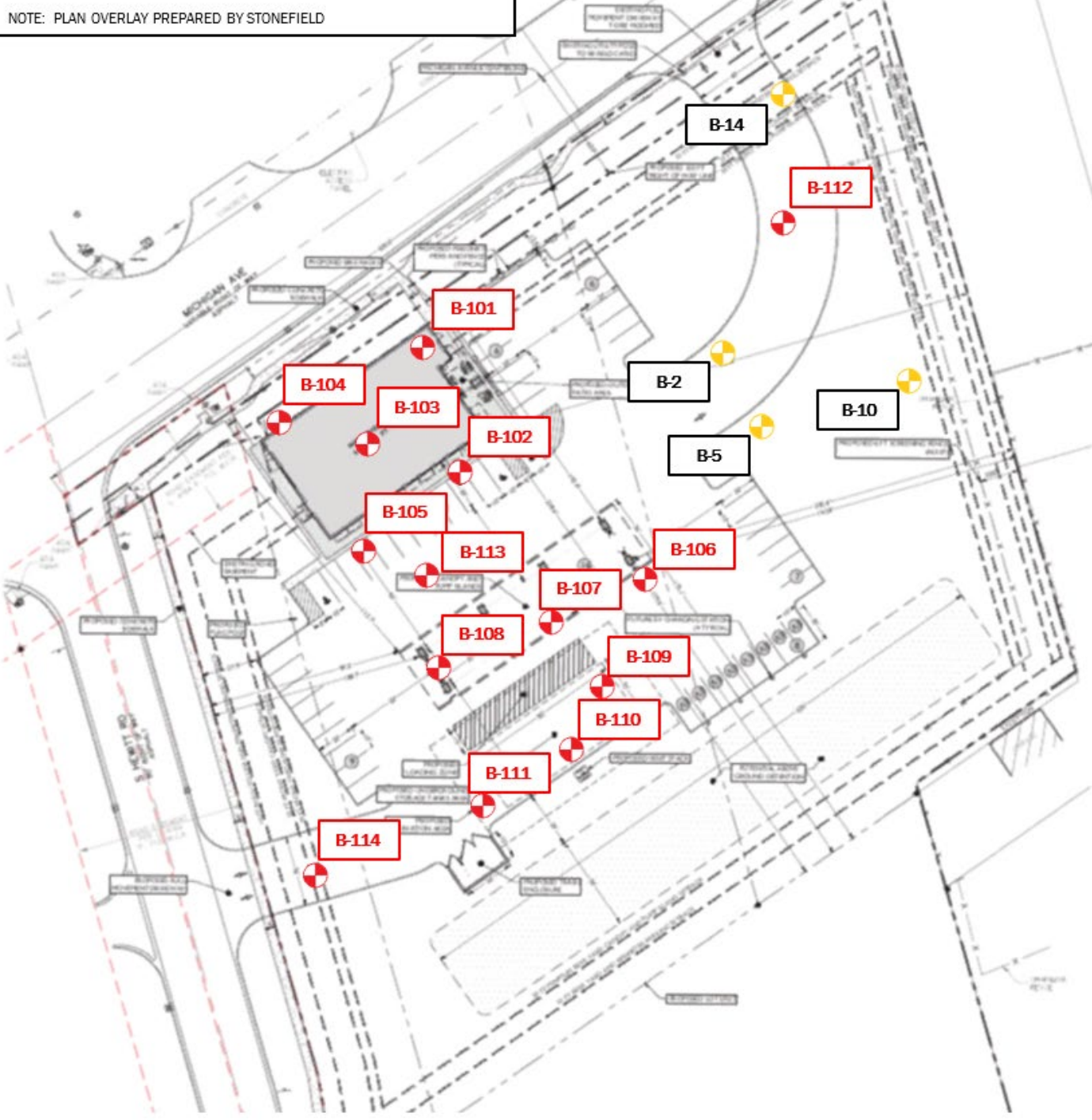
TITLE: BORING LOCATION PLAN - EXISTING CONDITIONS			PROJECT: SHEETZ YPSILANTI
SCALE: NTS	DATE: 3/22/2024	PROJECT NO.: 231688	
FIG. NO.: 1	DR. BY: IA	REV. BY: IM	

LEGEND

 BORING LOCATION (FEB 2024)

 BORING LOCATION (MAY 2023)

NOTE: PLAN OVERLAY PREPARED BY STONEFIELD



TITLE: BORING LOCATION PLAN - PROPOSED CONSTRUCTION

PROJECT: SHEETZ YPSILANTI

SCALE: NTS

DATE: 3/22/2024

PROJECT NO.: 231688

FIG. NO.: 2

DR. BY: IA

REV. BY: IM





APPENDIX

- Limitations
- Test Drilling and Sampling Procedures
- Boring Log Terminology and Classification Outline
- Boring Logs
- Summary of Laboratory Test Data
- Summary Letter of Infiltration Testing



LIMITATIONS

Soil Variations

The recommendations in this report are based upon the data obtained from the soil borings. This report does not reflect variations which may occur between these borings, and which would not become evident until construction. If variations then become evident, it would be necessary for a re-evaluation of recommendations of this report, after performing on-site observations.

Warranties

We have prepared this report in accordance with generally accepted soil and foundation engineering practices. We make no other warranties, either expressed or implied, as to the professional advice provided under the terms of our agreement and included in this report. This report is prepared exclusively for our client and may not be relied upon by other parties without written consent from our office.

Boring Logs

In the process of obtaining and testing samples and preparing this report, we follow reasonable and accepted practice in the field of soil engineering. Field logs maintained during drilling describe field occurrences, sampling locations, and other information. The samples obtained in the field are subjected to additional testing in the laboratory and differences may exist between the field logs and the final logs. The engineer reviews the field logs and laboratory test data, and then prepares the final boring logs. Our recommendations are based on the contents of the final logs.

Review of Design Plans and Specifications

In the event that any changes in the design of the building or the location, however slight, are planned, our recommendations shall not be considered valid unless modified or approved in writing by our office. We recommend that we be provided the opportunity to review the final design and specifications in order to determine whether changes in the original concept may have affected the validity of our recommendations, and whether our recommendations have, in fact, been implemented in the design and specifications.



TEST DRILLING AND SAMPLING PROCEDURES

Test Drilling Methods:

- Hollow stem auger, ASTM D6151
- Mud rotary, ASTM D5783
- Casing advancer, ASTM D5872
- Rock coring, ASTM D2113
- Core/Hand Auger

Note: Cone penetration test data can be used to interpret subsurface stratigraphy and can provide data on engineering properties of soils. The ASTM procedure does not include a procedure for determining soil classification from CPT testing. Soil classifications shown on CPT logs are based on published procedures and are not based on physical ASTM soil classification tests.

Sampling Methods:

- SPT, ASTM D1586, Auto hammer (140 lb., 30" drop, 2" OD split spoon sampler)
- Thin-walled tube sampler (Shelby), ASTM D1587

Note: The number of hammer blows required to drive the SPT sampler 12 inches, after seating 6 inches, is termed the soil N-value and provides an indication of the soil's relative density and strength parameters at the sample location. SPT blow counts in 6 inch increments are recorded on the boring logs.

Drill Rig:

- CME 55 (ATV)
- Acker Renegade (ATV)
- CME 45 Truck
- Geoprobe 7822 (ATV)
- Geoprobe Rotary Sonic

Boreholes Backfilled With:

- Excavated soil
- Cement bentonite grout
- Piezometer or Monitoring Well (see notes on logs)
- Concrete or asphalt patch where appropriate

Sample Handling and Disposition:

- Samples labeled, placed in jars, returned to MTC Laboratory
- Discard after 60 days



BORING LOG TERMINOLOGY AND ASTM D 2488 CLASSIFICATION OUTLINE

TERMS DESCRIBING CONSISTENCY OR CONDITION

COARSE-GRAINED SOILS (major portions retained on No. 200 sieve): includes (1) clean gravel and sands and (2) silty or clayey gravels and sands. Condition is rated according to relative density as determined by laboratory tests or standard penetration resistance tests.

Descriptive Terms	Relative Density	SPT Blow Count
Very loose	0 to 15 %	< 5
Loose	15 to 35 %	5 to 10
Medium dense	35 to 65 %	10 to 30
Dense	65 to 85 %	30 to 50
Very dense	85 to 100 %	> 50

Per ASTM D2487, the following conditions must be met based on laboratory testing to justify the label 'well graded' in a soil description.

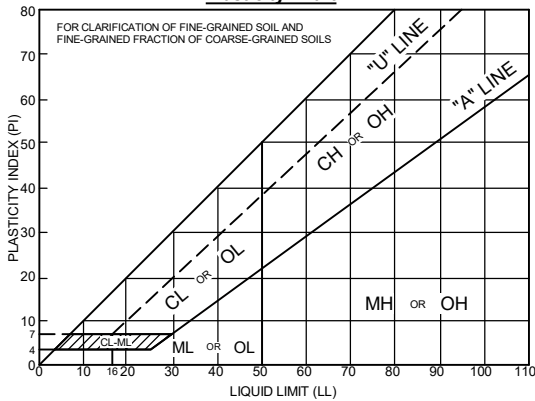
Gravel: $C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3

Sand: $C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3

FINE-GRAINED SOILS (major portions passing on No. 200 sieve): includes (1) inorganic and organic silts and clays, (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as indicated by penetrometer readings, SPT blow count, or unconfined compression tests.

Descriptive Terms	Unconfined Compressive Strength TSF	SPT Blow Count
Very soft	< 0.25	< 2
Soft	0.25 to 0.5	2 to 4
Medium stiff	0.5 to 1.0	4 to 8
Stiff	1.0 to 2.0	8 to 15
Very stiff	2.0 to 4.0	15 to 30
Hard	> 4.0	> 30

Plasticity Chart



MAJOR DIVISIONS		TYPICAL NAMES		
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LESS THAN 15% FINES	GW	WELL-GRADED GRAVELS WITH OR WITHOUT SAND
		GRAVELS WITH 15% OR MORE FINES	GP	POORLY-GRADED GRAVELS WITH OR WITHOUT SAND
			GM	SILTY GRAVELS WITH OR WITHOUT SAND
		GC	CLAYEY GRAVELS WITH OR WITHOUT SAND	
	SANDS MORE THAN HALF COARSE FRACTION IS FINER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LESS THAN 15% FINES	SW	WELL-GRADED SANDS WITH OR WITHOUT GRAVEL
			SP	POORLY-GRADED SANDS WITH OR WITHOUT GRAVEL
		SANDS WITH 15% OR MORE FINES	SP-SM	POORLY-GRADED SANDS WITH SILT WITH OR WITHOUT GRAVEL
			SM	SILTY SANDS WITH OR WITHOUT GRAVEL
		SC	CLAYEY SANDS WITH OR WITHOUT GRAVEL	
		FINE-GRAINED SOILS MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS	ML
CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY WITH OR WITHOUT SAND OR GRAVEL			
OL	ORGANIC SILTS OR CLAYS OF LOW TO MEDIUM PLASTICITY WITH OR WITHOUT SAND OR GRAVEL			
SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%	MH		INORGANIC SILTS OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL	
	CH		INORGANIC CLAYS OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL	
OH	ORGANIC SILTS OR CLAYS OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL			
HIGHLY ORGANIC SOILS	PT/OL	PEAT AND OTHER HIGHLY ORGANIC SOILS		

GENERAL NOTES

- Classifications are based on the United Soil Classification System and include consistency, moisture, and color. Field descriptions have been modified to reflect results of laboratory tests where deemed appropriate.
- "Grades with" or "Grades without" may be used to describe soil when characteristics vary within a stratum.
- Preserved soil samples will be discarded after 60 days unless alternate arrangements have been made.

GROUNDWATER OBSERVATIONS:

During - indicates water level encountered during the boring
End - indicates water level immediately after drilling
Date and Depth - Measurements at indicated date

SAMPLE TYPES AND NUMBERING

S	SPT, split barrel sample, ASTM D1586
U	Shelby tube sample, ASTM D1587
R	Rock core run
*S	Other than 2" split barrel sample
L	SPT with liner, ASTM D1586
A	Auger cuttings
G	Geoprobe liner

MINOR COMPONENT QUANTIFYING TERMS

Less than 5%	TRACE
5 to 10%	FEW
15 to 25%	LITTLE
30 to 40%	SOME
50 to 100%	MOSTLY

GRAIN SIZE

BOULDER	>12"
COBBLE	12" to 3"
COARSE GRAVEL	3" to 0.75"
FINE GRAVEL	0.75" to No. 4
COARSE SAND	No. 4 to No. 10
MEDIUM SAND	No. 10 to No. 40
FINE SAND	No. 40 to No. 200



LOG OF BORING

Project No.: 231242

Boring No.: B-2

Sheet: 1 of 1

Project: 2103 West Michigan Avenue - GEO

Client: Casto

Location: Ypsilanti, Michigan

Drill Type: Geoprobe 7822

Crew Chief: MS **Field Eng.:** IA **Rev. By:** IM

Coordinates: N=266324.7 E=13319621.4 (MI South 1ft)

Elevation: 787.0 ft **Datum:** NAVD 88 (GPS Observation)

Notes:

Date Begin: 05/11/2023

Date End: 05/11/2023

Tooling	Type	Dia.	Groundwater, ft.	
Casing	Auger	4 1/2"	During	13
Sampler	Split Spoon	2"	End	15
Core			Seepage	
Tube			Date	Depth, ft.
SPT Hammer				

Plugging Record: Backfilled borehole with compacted cuttings. Cave in at 15.5 ft.

Depth Drilled: 20.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS		
786.0	1	S-1	1.5	2-2-3 N=5	CL	3" Clayey Topsoil				Fill: 0.0' to 5.0'		
785.0	2					Brown lean CLAY; mostly clayey fines, moist, Fill with roots and brick chips						
784.0	3											
783.0	4	S-2	1.5	3-4-5 N=9	CL							
782.0	5											
781.0	6	S-3	1.5	3-3-3 N=6	SP	Brown poorly graded SAND; mostly medium to fine sand, moist						
780.0	7											
779.0	8											
778.0	9	S-4	1.5	4-4-4 N=8	SP							
777.0	10											
776.0	11	S-5	1.5	7-11-14 N=25	SP							
775.0	12											
774.0	13											
773.0	14											
772.0	15											
771.0	16	S-6	1.5	6-10-20 N=30	SP							
770.0	17											
769.0	18											
768.0	19											
767.0	20											

End of Boring

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



LOG OF BORING

Project No.: 231242

Boring No.: B-5

Sheet: 1 of 1

Project: 2103 West Michigan Avenue - GEO

Client: Casto

Location: Ypsilanti, Michigan

Drill Type: Geoprobe 7822

Crew Chief: MS **Field Eng.:** IA **Rev. By:** IM

Coordinates: N=266279.2 E=13319639.2 (MI South 1ft)

Elevation: 785.1 ft **Datum:** NAVD 88 (GPS Observation)

Notes:

Date Begin: 05/11/2023

Date End: 05/11/2023

Tooling	Type	Dia.	Groundwater, ft.	
Casing	Auger	4 1/2"	During	13
Sampler	Split Spoon	2"	End	13
Core			Seepage	
Tube			Date	Depth, ft.
SPT Hammer				

Plugging Record: Backfilled borehole with compacted cuttings. Cave in at 15.0 ft.

Depth Drilled: 19.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS	
784.1	1	S-1	1.5	1-1-3 N=4	CL	6" Clayey Topsoil					
783.1	2					Brown lean CLAY with sand; mostly clayey fines, little medium to fine sand, moist					0.5
782.1	3										
781.1	4	S-2	1.5	2-2-2 N=4	SP	Brown poorly graded SAND; mostly medium to fine sand, trace silty fines, moist					
780.1	5										4.0
779.1	6	S-3	1.5	6-8-11 N=19	SP	Grades wet at 13'					
778.1	7										
777.1	8										
776.1	9	S-4	1.5	5-8-10 N=18	SP	Grades wet at 13'					
775.1	10										
774.1	11	S-5	1.5	7-8-10 N=18	SP	Grades wet at 13'					
773.1	12										
772.1	13										
771.1	14	S-5	1.5	7-8-10 N=18	SP	Grades wet at 13'					
770.1	15										
769.1	16	S-6	0.5	3/6"		End of Boring					
768.1	17										
767.1	18										
766.1	19	S-6	0.5	3/6"		End of Boring	19.0				

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



LOG OF BORING

Project No.: 231242

Boring No.: B-10

Sheet: 1 of 1

Project: 2103 West Michigan Avenue - GEO

Client: Casto

Location: Ypsilanti, Michigan

Drill Type: Geoprobe 7822

Crew Chief: MS **Field Eng.:** IA **Rev. By:** IM

Coordinates: N=266301.6 E=13319715.9 (MI South 1ft)

Elevation: 781.7 ft **Datum:** NAVD 88 (GPS Observation)

Notes:

Date Begin: 05/11/2023

Date End: 05/11/2023

Tooling	Type	Dia.	Groundwater, ft.	
Casing	Auger	4 1/2"	During	8.5
Sampler	Split Spoon	2"	End	N/A
Core			Seepage	
Tube			Date	Depth, ft.
SPT Hammer				

Plugging Record: Backfilled borehole with compacted cuttings. Cave in at 5.5 ft.

Depth Drilled: 10.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS	
780.7	1	S-1	1.5	1-1-10 N=11	CL	6" Clayey Topsoil					
779.7	2					Brown lean CLAY; mostly clayey fines, moist					0.5
778.7	3										
777.7	4										
776.7	5	S-2	1.5	3-4-4 N=8	CL						
775.7	6					6.0					
774.7	7	S-3	1.5	3-3-3 N=6	SP	Brown poorly graded SAND; mostly medium to fine sand, trace silty fines, moist					
773.7	8										
772.7	9										
771.7	10	S-4	1.5	3-4-6 N=10		Grades wet at 8.5'					10.0

End of Boring

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



LOG OF BORING

Project No.: 231242

Boring No.: B-14

Sheet: 1 of 1

Project: 2103 West Michigan Avenue - GEO

Client: Casto

Location: Ypsilanti, Michigan

Drill Type: Geoprobe 7822

Crew Chief: MS **Field Eng.:** IA **Rev. By:** IM

Coordinates: N=266461 E=13319654 (MI South 1ft)

Elevation: 786.9 ft **Datum:** NAVD 88 (GPS Observation)

Notes:

Date Begin: 05/11/2023

Date End: 05/11/2023

Tooling	Type	Dia.	Groundwater, ft.	
Casing	Auger	4 1/2"	During	None
Sampler	Split Spoon	2"	End	N/A
Core			Seepage	
Tube			Date	Depth, ft.
SPT Hammer				

Plugging Record: Backfilled borehole with compacted cuttings. Cave in at 5.0 ft.

Depth Drilled: 10.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS	
785.9	1	S-1	1.0	1-2-3 N=5	CL	6" Topsoil				S-1: Poor recovery; possible coarse gravel / COBBLE	
784.9	2					Brown lean CLAY; mostly clayey fines, few medium to fine sand, moist					0.5
783.9	3										
782.9	4	S-2	1.5	4-8-12 N=20	CL	Brown lean CLAY; mostly clayey fines, moist					
781.9	5										4.0
780.9	6	S-3	1.5	10-15-20 N=35	CL						
779.9	7										
778.9	8	S-4	1.5	6-14-22 N=36	CL						
777.9	9										
776.9	10						10.0				

End of Boring

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



LOG OF BORING

Project No.: 231688

Boring No.: B-101

Sheet: 1 of 1

Project: Sheetz, West Michigan Avenue and Hewitt Road
 Client: Skilken Gold
 Location: Ypsilanti, Michigan
 Drill Type: Acker Renegade
 Crew Chief: NB Field Eng.: IA Rev. By: IM
 Coordinates: N=266327.6 E=13319473.7 (MI South 1ft)
 Elevation: 790.4 ft Datum: NAVD 88 (GPS Observation)
 Notes:
 Plugging Record: Backfilled borehole with compacted cuttings. Cave in at 15.8 ft.

Date Begin: 02/28/2024 Date End: 02/28/2024

Tooling	Type	Dia.	Groundwater, ft.	
Casing	HSA	4 1/4"	During	15.0
Sampler	SPT	2"	End	15.0
Core			Delayed Groundwater, ft.	
Tube			Date	Depth, ft.
SPT Hammer	Auto			

Depth Drilled: 20.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
789.4	1	S-1	1.5	2-4-6 N=10	CL	4" Clayey Topsoil	2.0	21.0		
788.4	2					Brown lean CLAY; mostly clayey fines, moist				
787.4	3									
786.4	4									
785.4	5	S-2	1.5	10-12-14 N=26	CL		2.5	17.0		
784.4	6									
783.4	7	S-3	1.5	5-11-12 N=23	SP	Light brown poorly graded SAND; mostly medium to fine sand, trace silty fines, moist				
782.4	8									
781.4	9	S-4	1.5	11-12-13 N=25	SP					
780.4	10									
779.4	11	S-5	1.5	7-8-10 N=18	SP	Grades wet at 15'				
778.4	12									
777.4	13									
776.4	14									
775.4	15	S-6	1.5	10-10-11 N=21	SP					
774.4	16									
773.4	17									
772.4	18									
771.4	19									
770.4	20									

End of Boring

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



LOG OF BORING

Project No.: 231688

Boring No.: B-102

Sheet: 1 of 1

Project: Sheetz, West Michigan Avenue and Hewitt Road
 Client: Skilken Gold
 Location: Ypsilanti, Michigan
 Drill Type: Acker Renegade
 Crew Chief: NB Field Eng.: IA Rev. By: IM
 Coordinates: N=266258.9 E=13319492.4 (MI South 1ft)
 Elevation: 788.9 ft Datum: NAVD 88 (GPS Observation)
 Notes:

Date Begin: 02/28/2024 Date End: 02/28/2024

Tooling	Type	Dia.	Groundwater, ft.	
Casing	HSA	4 1/4"	During	12.0
Sampler	SPT	2"	End	17.2
Core			Delayed Groundwater, ft.	
Tube			Date	Depth, ft.
SPT Hammer	Auto			

Plugging Record: Backfilled borehole with compacted cuttings. Cave in at 18.0 ft.

Depth Drilled: 20.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
787.9	1	S-1	0.6	2-2-2 N=4	SC	4" Clayey Topsoil				Occasional roots from 0' to 7' S-1: Poor recovery; possible coarse gravel / COBBLE
786.9	2					Brown poorly graded SAND with clay; mostly coarse to fine sand, little clayey fines, moist				
785.9	3									
784.9	4	S-2	1.5	4-3-2 N=5	SP	Brown poorly graded SAND; mostly medium to fine sand, trace silty fines, moist				
783.9	5									
782.9	6	S-3	1.5	4-6-7 N=13	SP	Grades wet at 12'				
781.9	7									
780.9	8									
779.9	9	S-4	1.5	8-6-10 N=16	SP	Grades wet at 12'				
778.9	10									
777.9	11	S-5	1.5	7-9-10 N=19	SP	Grades wet at 12'				
776.9	12									
775.9	13									
774.9	14	S-5	1.5	7-9-10 N=19	SP	Grades wet at 12'				
773.9	15									
772.9	16	S-6	1.5	7-11-11 N=22	SP	Grades wet at 12'				
771.9	17									
770.9	18									
769.9	19	S-6	1.5	7-11-11 N=22	SP	Grades wet at 12'				
768.9	20									
						End of Boring				

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



LOG OF BORING

Project No.: 231688

Boring No.: B-103

Sheet: 1 of 1

Project: Sheetz, West Michigan Avenue and Hewitt Road
 Client: Skilken Gold
 Location: Ypsilanti, Michigan
 Drill Type: Acker Renegade
 Crew Chief: NB Field Eng.: IA Rev. By: IM
 Coordinates: N=266277.6 E=13319443.0 (MI South lift)
 Elevation: 786.7 ft Datum: NAVD 88 (GPS Observation)
 Notes:

Date Begin: 02/28/2024 Date End: 02/28/2024

Tooling	Type	Dia.	Groundwater, ft.	
Casing	HSA	4 1/4"	During	12.0
Sampler	SPT	2"	End	11.5*
Core			Delayed Groundwater, ft.	
Tube			Date	Depth, ft.
SPT Hammer	Auto			

Plugging Record: Backfilled borehole with compacted cuttings. Cave in at 12.0 ft.

Depth Drilled: 35.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
785.7	1	S-1	1.5	1-2-3 N=5	SC	4" Clayey Topsoil				Occasional roots from 0' to 10'
784.7	2					Brown clayey SAND; mostly coarse to fine sand, some clayey fines, moist				
783.7	3							0.3		
782.7	4	S-2	1.5	3-3-4 N=7	SP-SM	Brown poorly graded SAND with silt; mostly coarse to fine sand, few silty fines, moist				
781.7	5						5.5			
780.7	6	S-3	1.5	3-3-3 N=6		Light brown to brown poorly graded SAND; mostly coarse to fine sand, trace silty fines, moist				
779.7	7									
778.7	8									
777.7	9	S-4	1.5	3-3-3 N=6		Grades wet at 12'				
776.7	10									
775.7	11									
774.7	12	S-5	1.5	5-6-9 N=15	SP	Grades gray at 17'				Charged augers with water at 15' *End water level may be influenced by charged augers
773.7	13									
772.7	14									
771.7	15	S-6	1.5	5-11-15 N=26		Gray silty SAND; mostly fine sand, little silty fines, wet				
770.7	16									
769.7	17									
768.7	18	S-7	1.5	5-10-12 N=22						
767.7	19									
766.7	20									
765.7	21	S-8	1.5	5-7-10 N=17	SM					
764.7	22									
763.7	23									
762.7	24	S-9	1.5	5-10-15 N=25						
761.7	25									
760.7	26									
759.7	27									
758.7	28									
757.7	29									
756.7	30									
755.7	31									
754.7	32									
753.7	33									
752.7	34									
751.7	35						35.0			
End of Boring										

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



LOG OF BORING

Project No.: 231688

Boring No.: B-104

Sheet: 1 of 1

Project: Sheetz, West Michigan Avenue and Hewitt Road
 Client: Skilken Gold
 Location: Ypsilanti, Michigan
 Drill Type: Acker Renegade
 Crew Chief: NB Field Eng.: IA Rev. By: IM
 Coordinates: N=266290.5 E=13319403.0 (MI South 1ft)
 Elevation: 790.1 ft Datum: NAVD 88 (GPS Observation)
 Notes:

Date Begin: 02/28/2024 Date End: 02/28/2024

Tooling	Type	Dia.	Groundwater, ft.	
Casing	HSA	4 1/4"	During	12.0
Sampler	SPT	2"	End	NA
Core			Delayed Groundwater, ft.	
Tube			Date	Depth, ft.
SPT Hammer	Auto			

Plugging Record: Backfilled borehole with compacted cuttings. Cave in at 12.0 ft.

Depth Drilled: 20.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
789.1	1	S-1	1.4	2-2-2 N=4	SP-SC	4" Clayey Topsoil	0.3			Occasional roots from 0' to 8'
788.1	2					Brown poorly graded SAND with clay; mostly coarse to fine sand, few clayey fines, trace fine gravel, moist				
787.1	3									
786.1	4									
785.1	5	S-2	1.5	3-2-5 N=7	SP-SC		5.5			
784.1	6									
783.1	7	S-3	1.5	4-4-4 N=8	SP	Brown poorly graded SAND; mostly medium to fine sand, trace silty fines, moist	8.0			
782.1	8									
781.1	9	S-4	1.5	4-3-3 N=6	SP	Brown poorly graded SAND; mostly coarse to fine sand, moist				
780.1	10									
779.1	11									
778.1	12									
777.1	13	S-5	1.5	2-4-6 N=10	SP	Grades wet at 12'				
776.1	14									
775.1	15									
774.1	16									
773.1	17	S-6	1.5	9-12-14 N=26	SP				Charged augers with water at 15' *End water level may be influenced by charging augers	
772.1	18									
771.1	19									
770.1	20						20.0			

End of Boring

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



LOG OF BORING

Project No.: 231688

Boring No.: B-105

Sheet: 1 of 1

Project: Sheetz, West Michigan Avenue and Hewitt Road
 Client: Skilken Gold
 Location: Ypsilanti, Michigan
 Drill Type: Acker Renegade
 Crew Chief: NB Field Eng.: IA Rev. By: IM
 Coordinates: N=266222.7 E=13319440.9 (MI South 1ft)
 Elevation: 786.2 ft Datum: NAVD 88 (GPS Observation)
 Notes:

Date Begin: 02/09/2024 Date End: 02/09/2024

Tooling	Type	Dia.	Groundwater, ft.	
Casing	HSA	4 1/4"	During	9.5
Sampler	SPT	2"	End	11.5*
Core			Delayed Groundwater, ft.	
Tube			Date	Depth, ft.
SPT Hammer	Auto			

Plugging Record: Backfilled borehole with compacted cuttings. Cave in at 12.0 ft.

Depth Drilled: 20.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
785.2	1	S-1	1.5	WOH/12"-3-2 N=5	SP-SC	2" Sandy Topsoil				WOH = Weight of Hammer Fill: 0' to 3'
784.2	2					Dark brown poorly graded SAND with clay; mostly coarse to fine sand, few clayey fines, moist, Fill	0.2			
783.2	3						3.0			
782.2	4	S-2	1.5	3-3-4 N=7	SM	Light brown silty SAND; mostly fine sand, some silty fines, moist				Charged augers with water at 15' *End water level may be influenced by charging augers
781.2	5									
780.2	6									
779.2	7	S-3	1.5	4-4-5 N=9	SP	Light brown poorly graded SAND; mostly medium to fine sand, trace silty fines, moist				
778.2	8									
777.2	9									
776.2	10	S-4	1.5	3-4-4 N=8	SP	Grades wet at 9.5'				
775.2	11									
774.2	12									
773.2	13	S-5	1.5	7-8-8 N=16	SP	Grades gray at 14'				
772.2	14									
771.2	15									
770.2	16	S-6	1.5	8-10-13 N=23	SP					
769.2	17									
768.2	18									
767.2	19									
766.2	20									

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



LOG OF BORING

Project No.: 231688

Boring No.: B-106

Sheet: 1 of 1

Project: Sheetz, West Michigan Avenue and Hewitt Road
 Client: Skilken Gold
 Location: Ypsilanti, Michigan
 Drill Type: Acker Renegade
 Crew Chief: NB Field Eng.: IA Rev. By: IM
 Coordinates: N=266209.5 E=13319588.9 (MI South 1ft)
 Elevation: 784.5 ft Datum: NAVD 88 (GPS Observation)
 Notes:

Date Begin: 02/09/2024 Date End: 02/09/2024

Tooling	Type	Dia.	Groundwater, ft.	
Casing	HSA	4 1/4"	During	12.0
Sampler	SPT	2"	End	10.5*
Core			Delayed Groundwater, ft.	
Tube			Date	Depth, ft.
SPT Hammer	Auto			

Plugging Record: Backfilled borehole with compacted cuttings. Cave in at 12.0 ft.

Depth Drilled: 20.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
783.5	1	S-1	1.5	2-1-1 N=2	SP-SC	4" Sandy Topsoil	0.3			Occasional roots from 0' to 8'
782.5	2					Brown poorly graded SAND with clay; mostly coarse to fine sand, few clayey fines, moist	2.5			
781.5	3	S-2	1.5	4-4-4 N=8	SP-SM	Brown poorly graded SAND with silt; mostly coarse to fine sand, few silty fines, moist				
780.5	4									
779.5	5	S-3	1.5	4-4-5 N=9	SP	Light brown to brown poorly graded SAND; mostly coarse to fine sand, trace silty fines, moist				
778.5	6									
777.5	7	S-4	1.5	3-4-6 N=10	SP	Grades wet at 12'				
776.5	8									
775.5	9	S-5	1.5	7-8-9 N=17	SP	Grades wet at 12'				
774.5	10									
773.5	11	S-6	1.5	9-12-16 N=28	SP	Grades wet at 12'				
772.5	12									
771.5	13	S-6	1.5	9-12-16 N=28	SP	Grades wet at 12'				
770.5	14									
769.5	15	S-6	1.5	9-12-16 N=28	SP	Grades wet at 12'				
768.5	16									
767.5	17	S-6	1.5	9-12-16 N=28	SP	Grades wet at 12'				
766.5	18									
765.5	19	S-6	1.5	9-12-16 N=28	SP	Grades wet at 12'				
764.5	20									

Charged augers with water at 15'
 *End water level may be influenced by charging augers

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



LOG OF BORING

Project No.: 231688

Boring No.: B-107

Sheet: 1 of 1

Project: Sheetz, West Michigan Avenue and Hewitt Road
 Client: Skilken Gold
 Location: Ypsilanti, Michigan
 Drill Type: Acker Renegade
 Crew Chief: NB Field Eng.: IA Rev. By: IM
 Coordinates: N=266185.3 E=13319538.2 (MI South ift)
 Elevation: 784.6 ft Datum: NAVD 88 (GPS Observation)
 Notes:

Date Begin: 02/09/2024 Date End: 02/09/2024

Tooling	Type	Dia.	Groundwater, ft.	
Casing	HSA	4 1/4"	During	12.0
Sampler	SPT	2"	End	11.2
Core			Delayed Groundwater, ft.	
Tube			Date	Depth, ft.
SPT Hammer	Auto			

Plugging Record: Backfilled borehole with compacted cuttings. Cave in at 11.5 ft.

Depth Drilled: 20.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
783.6	1	S-1	1.5	WOH-2-2 N=4	SC	Brown clayey SAND; mostly coarse to fine sand, some clayey fines, moist				WOH = Weight of Hammer Occasional roots from 0' to 2'
782.6	2									
781.6	3	S-2	1.5	3-3-3 N=6	SP-SM	Brown poorly graded SAND with silt; mostly coarse to fine sand, few silty fines, moist				
780.6	4									
779.6	5									
778.6	6	S-3	1.5	2-4-5 N=9						
777.6	7									
776.6	8	S-4	1.5	3-4-5 N=9		Brown poorly graded SAND; mostly coarse to fine sand, trace silty fines, moist				
775.6	9									
774.6	10									
773.6	11	S-5	1.5	6-8-9 N=17	SP	Grades wet at 12'				Charged augers with water at 15' *End water level may be influenced by charging augers
772.6	12									
771.6	13									
770.6	14									
769.6	15									
768.6	16	S-6	1.5	6-10-14 N=24						
767.6	17									
766.6	18									
765.6	19									
764.6	20									

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



LOG OF BORING

Project No.: 231688

Boring No.: B-108

Sheet: 1 of 1

Project: Sheetz, West Michigan Avenue and Hewitt Road
 Client: Skilken Gold
 Location: Ypsilanti, Michigan
 Drill Type: Acker Renegade
 Crew Chief: NB Field Eng.: IA Rev. By: IM
 Coordinates: N=266160.5 E=13319479.9 (MI South 1ft)
 Elevation: 786.3 ft Datum: NAVD 88 (GPS Observation)
 Notes:

Date Begin: 02/09/2024 Date End: 02/09/2024

Tooling	Type	Dia.	Groundwater, ft.	
Casing	HSA	4 1/4"	During	12.5
Sampler	SPT	2"	End	13.3*
Core			Delayed Groundwater, ft.	
Tube			Date	Depth, ft.
SPT Hammer	Auto			

Plugging Record: Backfilled borehole with compacted cuttings. Cave in at 15.2 ft.

Depth Drilled: 20.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
785.3	1	S-1	1.5	WOH/18"	SP-SM	2" Sandy Topsoil				WOH= Weight of Hammer Occasional roots from 0' to 9.5'
784.3	2					Brown poorly graded SAND with silt; mostly coarse to fine sand, few silty fines, moist				
783.3	3	S-2	1.5	3-2-2 N=4	SP	Light brown to brown poorly graded SAND; mostly medium to fine sand, trace silty fines, moist			5.0	
782.3	4									
781.3	5	S-3	1.5	2-3-2 N=5	SP					
780.3	6									
779.3	7	S-4	1.5	3-2-3 N=5	SP					
778.3	8									
777.3	9	S-5	1.5	6-8-9 N=17	SP	Grades wet at 12.5'				Charged augers with water at 15' *End water level may be influenced by charging augers
776.3	10									
775.3	11	S-6	1.5	9-11-17 N=28	SP					
774.3	12									
773.3	13									
772.3	14									
771.3	15									
770.3	16									
769.3	17									
768.3	18									
767.3	19									
766.3	20									

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



LOG OF BORING

Project No.: 231688

Boring No.: B-109

Sheet: 1 of 1

Project: Sheetz, West Michigan Avenue and Hewitt Road
 Client: Skilken Gold
 Location: Ypsilanti, Michigan
 Drill Type: Acker Renegade
 Crew Chief: NB Field Eng.: IA Rev. By: IM
 Coordinates: N=266156.1 E=13319565.5 (MI South 1ft)
 Elevation: 785.0 ft Datum: NAVD 88 (GPS Observation)
 Notes:

Date Begin: 02/09/2024 Date End: 02/09/2024

Tooling	Type	Dia.	Groundwater, ft.	
Casing	HSA	4 1/4"	During	9.5
Sampler	SPT	2"	End	10.5*
Core			Delayed Groundwater, ft.	
Tube			Date	Depth, ft.
SPT Hammer	Auto			

Plugging Record: Backfilled borehole with compacted cuttings. Cave in at 12.0 ft.

Depth Drilled: 20.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
784.0	1	S-1	1.5	2-2-3 N=5	SP-SC	4" Sandy Topsoil				Occasional roots from 0' to 9.5'
783.0	2					Brown poorly graded SAND with clay; mostly coarse to fine sand, few clayey fines, moist				
782.0	3									
781.0	4	S-2	1.5	3-4-4 N=8	SP-SC					
780.0	5									
779.0	6	S-3	1.5	3-4-4 N=8	SP					Charged augers with water at 15' *End water level may be influenced by charging augers
778.0	7					Light brown to brown poorly graded SAND; mostly medium to fine sand, trace silty fines, moist				
777.0	8									
776.0	9	S-4	1.5	3-4-4 N=8	SP					
775.0	10					Grades wet at 9.5'				
774.0	11	S-5	1.5	7-8-11 N=19	SP					
773.0	12									
772.0	13									
771.0	14	S-5	1.5	7-8-11 N=19	SP					
770.0	15									
769.0	16	S-6	1.5	8-10-13 N=23	SP					
768.0	17									
767.0	18									
766.0	19	S-6	1.5	8-10-13 N=23	SP					
765.0	20									

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



LOG OF BORING

Project No.: 231688

Boring No.: B-110

Sheet: 1 of 1

Project: Sheetz, West Michigan Avenue and Hewitt Road
 Client: Skilken Gold
 Location: Ypsilanti, Michigan
 Drill Type: Acker Renegade
 Crew Chief: NB Field Eng.: IA Rev. By: IM
 Coordinates: N=266123.3 E=13319549.8 (MI South 1ft)
 Elevation: 788.9 ft Datum: NAVD 88 (GPS Observation)
 Notes:

Date Begin: 02/08/2024 Date End: 02/08/2024

Tooling	Type	Dia.	Groundwater, ft.	
Casing	HSA	4 1/4"	During	10.0
Sampler	SPT	2"	End	13.0
Core			Delayed Groundwater, ft.	
Tube			Date	Depth, ft.
SPT Hammer	Auto			

Plugging Record: Backfilled borehole with compacted cuttings. Cave in at 16.0 ft.

Depth Drilled: 20.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
787.9	1	S-1	1.4	WOH/12"-1	SP-SC	3" Sandy Topsoil	0.3	1.5		WOH= Weight of Hammer Occasional roots from 0' to 5.5'
786.9	2					Dark brown to brown poorly graded SAND with clay; mostly coarse to fine sand, few clayey fines, moist	2.0			
785.9	3	S-2	1.5	2-2-3 N=5	CL	Brown sandy lean CLAY; mostly clayey fines, some coarse to fine sand, moist	5.5			
784.9	4									
783.9	5	S-3	1.5	7-9-11 N=20	SM	Light brown silty SAND; mostly fine sand, little silty fines, moist	9.5			
782.9	6									
781.9	7	S-4	1.5	9-10-9 N=19	ML	Light brown sandy SILT; mostly silty fines, some fine sand, moist Grades wet at 10'	12.5			
780.9	8									
779.9	9	S-5	1.5	6-8-10 N=18	SP-SM	Brown poorly graded SAND with silt; mostly medium to fine sand, few silty fines, wet	20.0			
778.9	10									
777.9	11	S-6	1.5	6-8-10 N=18						
776.9	12									
775.9	13									
774.9	14									
773.9	15									
772.9	16									
771.9	17									
770.9	18									
769.9	19									
768.9	20									

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



LOG OF BORING

Project No.: 231688

Boring No.: B-111

Sheet: 1 of 1

Project: Sheetz, West Michigan Avenue and Hewitt Road
 Client: Skilken Gold
 Location: Ypsilanti, Michigan
 Drill Type: Acker Renegade
 Crew Chief: NB Field Eng.: IA Rev. By: IM
 Coordinates: N=266094.4 E=13319505.7 (MI South lift)
 Elevation: 790.2 ft Datum: NAVD 88 (GPS Observation)
 Notes:
 Plugging Record: Backfilled borehole with compacted cuttings. Cave in at 7.5 ft.

Date Begin: 02/08/2024 Date End: 02/08/2024

Tooling	Type	Dia.	Groundwater, ft.	
Casing	HSA	4 1/4"	During	18.5
Sampler	SPT	2"	End	NA
Core			Delayed Groundwater, ft.	
Tube			Date	Depth, ft.
SPT Hammer	Auto			

Depth Drilled: 20.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
789.2	1	S-1	1.5	WOH/16"	SP-SC	Brown poorly graded SAND with clay; mostly medium to fine sand, few clayey fines, moist	3.0			WOH= Weight of Hammer Occasional roots from 0' to 3'
788.2	2									
787.2	3									
786.2	4	S-2	1.5	1-1-1 N=2	SP	Light brown poorly graded SAND; mostly medium to fine sand, trace silty fines, moist				
785.2	5									
784.2	6	S-3	1.5	9-12-13 N=25	SP					
783.2	7									
782.2	8									
781.2	9	S-4	1.5	6-11-18 N=29	SP					
780.2	10									
779.2	11	S-5	1.5	10-11-13 N=24	CL	Brown lean CLAY; mostly clayey fines, few coarse to fine sand, trace coarse to fine gravel, moist	13.0	4.0	12.4	
778.2	12									
777.2	13									
776.2	14									
775.2	15	S-6	1.5	10-12-14 N=26	SP	Light brown poorly graded SAND; mostly medium to fine sand, trace silty fines, moist	14.2			
774.2	16									
773.2	17									
772.2	18									
771.2	19									
770.2	20					Grades wet at 18.5'	20.0			

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



LOG OF BORING

Project No.: 231688

Boring No.: B-112

Sheet: 1 of 1

Project: Sheetz, West Michigan Avenue and Hewitt Road
 Client: Skilken Gold
 Location: Ypsilanti, Michigan
 Drill Type: Acker Renegade
 Crew Chief: NB Field Eng.: IA Rev. By: IM
 Coordinates: N=266390.5 E=13319656.2 (MI South ift)
 Elevation: 785.1 ft Datum: NAVD 88 (GPS Observation)
 Notes:
 Plugging Record: Backfilled borehole with compacted cuttings. Cave in at 8.0 ft.

Date Begin: 02/28/2024 Date End: 02/28/2024

Tooling	Type	Dia.	Groundwater, ft.	
Casing	HSA	4 1/4"	During	None
Sampler	SPT	2"	End	NA
Core			Delayed Groundwater, ft.	
Tube			Date	Depth, ft.
SPT Hammer	Auto			

Depth Drilled: 10.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
784.1	1	S-1	1.5	6-8-7 N=15	SP-SM	3" Sandy Topsoil				Fill: 0' to 3'
783.1	2					Dark brown to gray poorly graded SAND with silt and gravel; mostly coarse to fine sand, little coarse to fine gravel, few silty fines, moist, Fill	0.3			
782.1	3	S-2	1.5	8-12-16 N=28	CL	Brown lean CLAY; mostly clayey fines, few coarse to fine gravel, moist				
781.1	4						3.0			
780.1	5						3.5	13.9		
779.1	6	S-3	1.5	9-9-13 N=22	CL	Grades without gravel and with few coarse to fine sand				
778.1	7						3.0	14.3		
777.1	8	S-4	1.5	13-17-17 N=34						
776.1	9						3.25	12.1		
775.1	10						10.0			

End of Boring

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



LOG OF BORING

Project No.: 231688

Boring No.: B-113

Sheet: 1 of 1

Project: Sheetz, West Michigan Avenue and Hewitt Road

Client: Skilken Gold

Location: Ypsilanti, Michigan

Drill Type: Acker Renegade

Crew Chief: NB Field Eng.: IA Rev. By: IM

Coordinates: N=266210.6 E=13319479.1 (MI South 1ft)

Elevation: 785.0 ft Datum: NAVD 88 (GPS Observation)

Notes:

Plugging Record: Backfilled borehole with compacted cuttings. Cave in at 7.9 ft.

Date Begin: 02/28/2024

Date End: 02/28/2024

Tooling	Type	Dia.	Groundwater, ft.	
Casing	HSA	4 1/4"	During	8.7
Sampler	SPT	2"	End	NA
Core			Delayed Groundwater, ft.	
Tube			Date	Depth, ft.
SPT Hammer	Auto			

Depth Drilled: 10.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS	
784.0	1	S-1	1.5	2-2-2 N=4	SC	4" Sandy Topsoil					
783.0	2					Dark brown clayey SAND; mostly coarse to fine sand, some clayey fines, moist	0.3				Occasional roots from 0' to 3'
782.0	3	S-2	1.5	2-2-3 N=5	SP-SM	Brown poorly graded SAND with silt; mostly medium to fine sand, few silty fines, moist					
781.0	4										3.0
780.0	5										7.2
779.0	6	S-3	1.5	4-5-3 N=8	SP	Brown poorly graded SAND; mostly medium to fine sand, moist					
778.0	7										
777.0	8	S-4	1.5	2-2-3 N=5	SP	Grades wet at 8.7'					
776.0	9										
775.0	10						10.0				

End of Boring

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



LOG OF BORING

Project No.: 231688

Boring No.: B-114

Sheet: 1 of 1

Project: Sheetz, West Michigan Avenue and Hewitt Road
 Client: Skilken Gold
 Location: Ypsilanti, Michigan
 Drill Type: Acker Renegade
 Crew Chief: NB Field Eng.: IA Rev. By: IM
 Coordinates: N=266054.6 E=13319419.7 (MI South 1ft)
 Elevation: 784.9 ft Datum: NAVD 88 (GPS Observation)
 Notes:

Date Begin: 02/08/2024 Date End: 02/08/2024

Tooling	Type	Dia.	Groundwater, ft.	
Casing	HSA	4 1/4"	During	None
Sampler	SPT	2"	End	NA
Core			Delayed Groundwater, ft.	
Tube			Date	Depth, ft.
SPT Hammer	Auto			

Plugging Record: Backfilled borehole with compacted cuttings. Cave in at 7.5 ft.

Depth Drilled: 10.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
783.9	1	S-1	1.3	2-2-3 N=5	SP-SC	Dark brown poorly graded SAND with clay; mostly coarse to fine sand, few clayey fines, moist, Fill with trace organic fines and glass debris	3.0	13.4		Fill: 0' to 3' S-1: Organic Content = 2.5%
782.9	2									
781.9	3									
780.9	4	S-2	1.5	5-5-6 N=11	SP	Light brown poorly graded SAND; mostly coarse to fine sand, trace silty fines, moist				
779.9	5									
778.9	6									
777.9	7	S-3	1.5	4-5-6 N=11	SP					
776.9	8									
775.9	9									
774.9	10	S-4	1.5	5-6-7 N=13						

End of Boring

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



SUMMARY OF LABORATORY TEST DATA

Boring Number	Sample Number	Depth (ft)	Sample USCS Classification	Natural Moisture Content (ASTM D2216) (%)	Organic Content (ASTM D2974) (%)
B-101	S-1	0-1.5	CL	21.0	
B-101	S-2	3.5-5	CL	17.0	
B-111	S-5	13.5-15	CL	12.4	
B-112	S-2	3.5-5	CL	13.9	
B-112	S-3	6-7.5	CL	14.3	
B-112	S-4	8.5-10	CL	12.1	
B-114	S-1	0 - 1.5	SP-SC	13.4	2.5

* S - Split Spoon Sample (ASTM D 1586)

PROJECT NO.: 231688
PAGE: 1 OF 1



MATERIALS TESTING CONSULTANTS

December 8, 2023
Project No. 231688

Skilken Gold
4270 Morse Road
Columbus, Ohio 43230

Attention: Andrew Richlen, P.E.
Project Manager

Reference: Summary of Infiltration Testing
Sheetz, West Michigan Avenue and Hewitt Road
Ypsilanti, Michigan

Dear Mr. Richlen:

We have completed infiltration testing for the above-referenced project. Four test pits were completed on the property located at 2013 West Michigan Avenue in Ypsilanti, as shown on Figure No. 1.

At the time of our field work, the area of investigation was vacant and covered with grass, brush, and trees. The site, in general, sloped down from north to south with elevations ranging from 790 to 779 ft.

Four test pits were excavated to depths of eight feet to ten feet (els 774 ft to 777 ft) using an 18-inch wide bucket. Test pit locations are shown on the attached location plan, Figure No. 1.

A summary of the subsurface conditions encountered within the test pits is provided. The attached test pit logs contain detailed soil descriptions. Some variation in subsurface conditions may be expected.

In general, Test Pits TP-1, TP-2 and TP-3 encountered approximately three to four inches of topsoil over lean clay, silty clay, and silt soils. Test Pit TP-4 encountered 8 inches of topsoil overlying granular soil to the explored depth. Test Pits TP-1 and TP-2 encountered clayey fill with debris, topsoil and organics to an approximate depth of two feet below the existing grade (els 784 ft to 782 ft). None of the test pits encountered groundwater.

Infiltration tests were performed within Test Pit TP-4 using the double ring method outlined in the Washtenaw County Water Resource Commissioner's Procedures and Design Criteria for Storm Water Management. Infiltration tests were not performed in Test Pits TP-1 through TP-3 due to the encountered clay and silt soils.

The double ring infiltration tests were performed in Test Pit TP-4 at a depth of 4 feet below existing grade (el 778 ft). Two concentric rings were used to perform the tests, with a 6-inch



outer ring diameter and 4-inch inner ring diameter. The purpose of the outer ring is to prevent divergent flow of water from the inner ring while water level in the inner ring is monitored to calculate a one-dimensional infiltration rate. Readings were taken at 10-minute intervals for a maximum of eight intervals. The individual infiltration test reports are attached. Test pits were backfilled to the surface with excavated soil at the conclusion of testing. A summary of the stabilized infiltration rates, average rate, and design rate (safety factor of 2) for each Test Pit are listed in Table 1, below.

Table 1 – Infiltration Test Results

Test Pit	Test Elevation (ft)	Test No.	Stabilized Infiltration Rate (in/hr)	Average Infiltration Rate (in/hr)	Design Infiltration Rate (in/hr)
TP-4	778	4.1	45	45	10*
		4.2	45		

*WCWRC Procedures and Design Criteria for Stormwater Management specify a maximum design infiltration of 10 in/hr.

We appreciate the opportunity to provide this service to you on this project. Should you have any questions or require further assistance, please contact our office.

Sincerely,

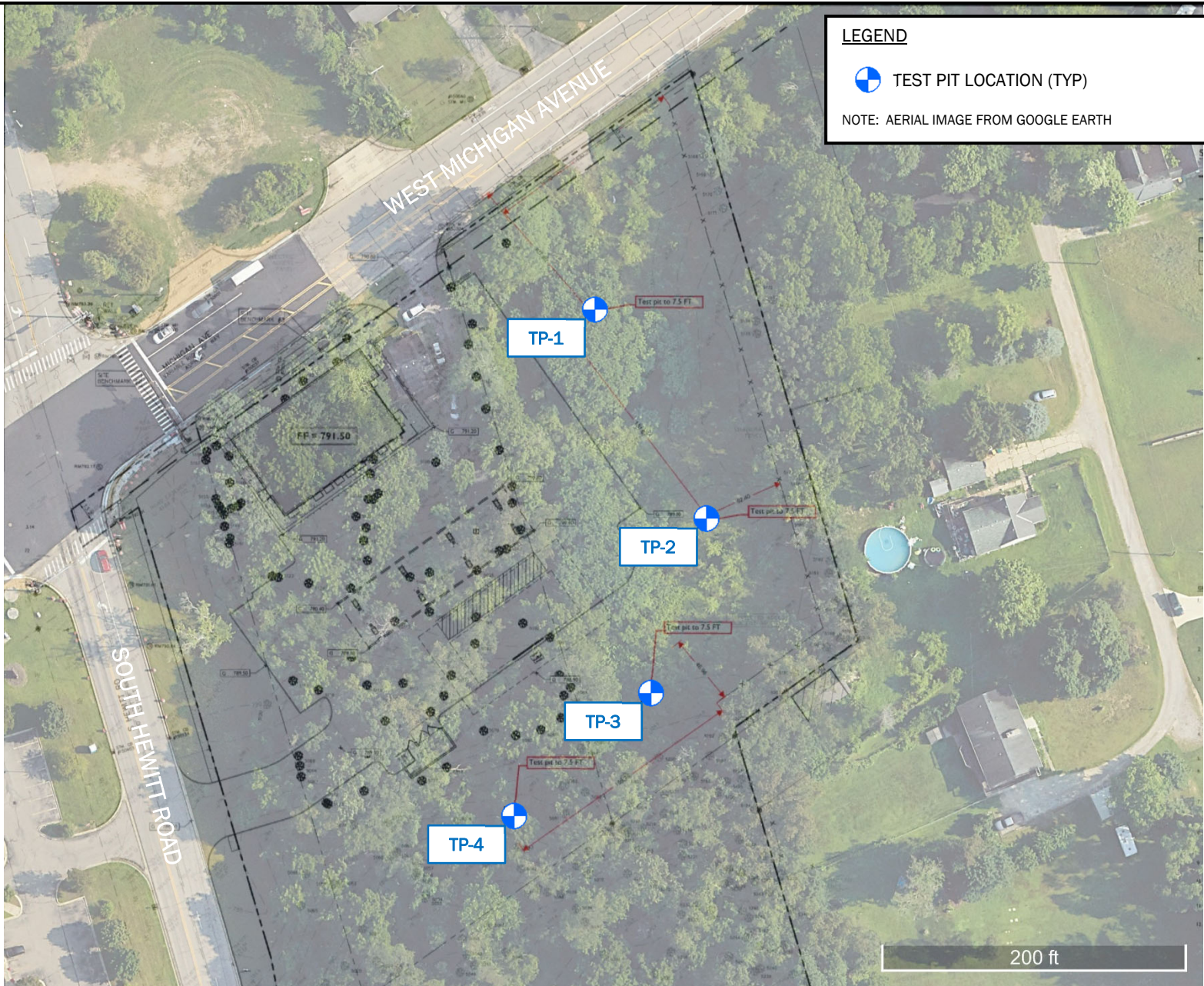
MATERIALS TESTING CONSULTANTS, INC.

Isaac MacMillan, P.E.
 Project Engineer

Robert Warren, P.E.
 Project Manager

- Attachments: Figure No. 1 – Test Pit Location Plan
 Infiltration Test Reports
 Test Pit Terminology and Classification Outline
 Test Pit Logs





TITLE: TEST PIT LOCATION PLAN

PROJECT: SHEETZ, 2013 WEST MICHIGAN AVENUE, YPSILANTI

SCALE: AS SHOWN

DATE: 12/08/2023

PROJECT NO.: 231688

FIG. NO.: 1

DR. BY: JM

REV. BY: RW





Double Ring Infiltration Test

Client:

 Skilken Gold
 4270 Morse Road
 Columbus, OH 43230

Project:

 231688G
 Sheetz, 2013 W Michigan Ave, Ypsilanti
 2013 W Michigan Ave

Activity Information

Weather: Cloudy

Low / High Temp, °F: 33 / 43

Activity Date: 11/22/2023

Tested By: MacMillan, Isaac

Test No.: 4.1

DOUBLE RING INFILTRATION TEST - SEMCOG METHOD

Pre-Test Soaking Duration (min): 60

Water Level Drop in Last 30 Minutes of Presoak (in): 17 1/2

Inner Diameter (in): 4

Outer Diameter (in): 6

Ground Surface Elev. (ft): 782

Test Elev. (ft): 778

Groundwater Elev. (ft): N/A

Soil Description: Light brown poorly graded SAND

Test Data

Time (min:sec)	Water Drop (in)	Time Interval (min)	Infiltration Rate (inches per hour)
10:00	10	10	60
20:00	9	10	54
30:00	9	10	54
40:00	8 1/4	10	49 1/2
50:00	8	10	48
60:00	8	10	48
70:00	7 3/4	10	46 1/2
80:00	7 1/2	10	45

Note: This test method provides a measure of infiltration rate, not hydraulic conductivity. Although the units of infiltration rate, and hydraulic conductivity are similar, there is a distinct difference between these two quantities. They cannot be directly related unless the hydraulic boundary conditions, such as hydraulic gradient and the extent of lateral flow of water are known or can be reliably estimated. Test results apply only to the specific test location, depth/elevation, and in-situ moisture content and density at time of test. An appropriate factor of safety should be applied to these results.

Remarks: Initial head: 21 in.



Double Ring Infiltration Test

Client:

 Skilken Gold
 4270 Morse Road
 Columbus, OH 43230

Project:

 231688G
 Sheetz, 2013 W Michigan Ave, Ypsilanti
 2013 W Michigan Ave

Activity Information

Weather: Cloudy

Low / High Temp, °F: 33 / 43

Activity Date: 11/22/2023

Tested By: MacMillan, Isaac

Test No.: 4.2

DOUBLE RING INFILTRATION TEST - SEMCOG METHOD

Pre-Test Soaking Duration (min): 60

Ground Surface Elev. (ft): 782

Water Level Drop in Last 30 Minutes of Presoak (in): 18

Test Elev. (ft): 778

Inner Diameter (in): 4

Groundwater Elev. (ft): N/A

Outer Diameter (in): 6

Soil Description: Light brown poorly graded SAND

Test Data

Time (min:sec)	Water Drop (in)	Time Interval (min)	Infiltration Rate (inches per hour)
10:00	10	10	60
20:00	8 1/2	10	51
30:00	8 1/2	10	51
40:00	8 1/2	10	51
50:00	8	10	48
60:00	8	10	48
70:00	8	10	48
80:00	7 1/2	10	45

Note: This test method provides a measure of infiltration rate, not hydraulic conductivity. Although the units of infiltration rate, and hydraulic conductivity are similar, there is a distinct difference between these two quantities. They cannot be directly related unless the hydraulic boundary conditions, such as hydraulic gradient and the extent of lateral flow of water are known or can be reliably estimated. Test results apply only to the specific test location, depth/elevation, and in-situ moisture content and density at time of test. An appropriate factor of safety should be applied to these results.

Remarks: Initial head: 21 in.



TEST PIT LOG TERMINOLOGY AND ASTM D 2488 CLASSIFICATION OUTLINE

TERMS DESCRIBING CONSISTENCY OR CONDITION

COARSE-GRAINED SOILS (major portions retained on No. 200 sieve): includes (1) clean gravel and sands and (2) silty or clayey gravels and sands. Condition is rated according to relative density as determined by laboratory tests or standard penetration resistance tests.

Descriptive Terms	Relative Density	SPT Blow Count
Very loose	0 to 15 %	< 5
Loose	15 to 35 %	5 to 10
Medium dense	35 to 65 %	10 to 30
Dense	65 to 85 %	30 to 50
Very dense	85 to 100 %	> 50

Per ASTM D2487, the following conditions must be met based on laboratory testing to justify the label 'well graded' in a soil description.

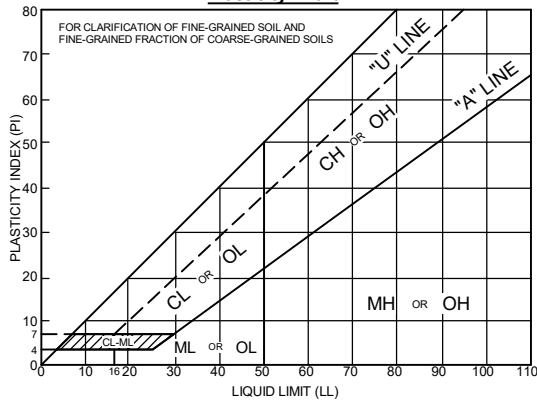
Gravel: $C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3

Sand: $C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3

FINE-GRAINED SOILS (major portions passing on No. 200 sieve): includes (1) inorganic and organic silts and clays, (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as indicated by penetrometer readings, SPT blow count, or unconfined compression tests.

Descriptive Terms	Unconfined Compressive Strength TSF	SPT Blow Count
Very soft	< 0.25	< 2
Soft	0.25 to 0.5	2 to 4
Medium stiff	0.5 to 1.0	4 to 8
Stiff	1.0 to 2.0	8 to 15
Very stiff	2.0 to 4.0	15 to 30
Hard	> 4.0	> 30

Plasticity Chart



MAJOR DIVISIONS				TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LESS THAN 15% FINES	GW	WELL-GRADED GRAVELS WITH OR WITHOUT SAND
			GP	POORLY-GRADED GRAVELS WITH OR WITHOUT SAND
		GRAVELS WITH 15% OR MORE FINES	GM	SILTY GRAVELS WITH OR WITHOUT SAND
			GC	CLAYEY GRAVELS WITH OR WITHOUT SAND
	SANDS MORE THAN HALF COARSE FRACTION IS FINER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LESS THAN 15% FINES	SW	WELL-GRADED SANDS WITH OR WITHOUT GRAVEL
			SP	POORLY-GRADED SANDS WITH OR WITHOUT GRAVEL
		SANDS WITH 15% OR MORE FINES	SP-SM	POORLY-GRADED SANDS WITH SILT WITH OR WITHOUT GRAVEL
			SM	SILTY SANDS WITH OR WITHOUT GRAVEL
			SC	CLAYEY SANDS WITH OR WITHOUT GRAVEL
		FINE-GRAINED SOILS MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS	ML
CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY WITH OR WITHOUT SAND OR GRAVEL			
OL	ORGANIC SILTS OR CLAYS OF LOW TO MEDIUM PLASTICITY WITH OR WITHOUT SAND OR GRAVEL			
SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%	MH		INORGANIC SILTS OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL	
	CH		INORGANIC CLAYS OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL	
	OH	ORGANIC SILTS OR CLAYS OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL		
HIGHLY ORGANIC SOILS		PT/OL	PEAT AND OTHER HIGHLY ORGANIC SOILS	

GENERAL NOTES

- Classifications are based on the United Soil Classification System and include consistency, moisture, and color. Field descriptions have been modified to reflect results of laboratory tests where deemed appropriate.
- "Grades with" or "Grades without" may be used to describe soil when characteristics vary within a stratum.
- Preserved soil samples will be discarded after 60 days unless alternate arrangements have been made.

GROUNDWATER OBSERVATIONS:

- During - indicates water level encountered during the boring
- End- indicates water level immediately after drilling
- Date and Depth - Measurements at indicated date

SAMPLE TYPES AND NUMBERING

S	SPT, split barrel sample, ASTM D1586
U	Shelby tube sample, ASTM D1587
R	Rock core run
*S	Other than 2" split barrel sample
L	SPT with liner, ASTM D1586
A	Auger cuttings
G	Geoprobe liner

MINOR COMPONENT QUANTIFYING TERMS

Less than 5%	TRACE
5 to 10%	FEW
15 to 25%	LITTLE
30 to 40%	SOME
50 to 100%	MOSTLY

GRAIN SIZE

BOULDER	>12"
COBBLE	12" to 3"
COARSE GRAVEL	3" to 0.75"
FINE GRAVEL	0.75" to No. 4
COARSE SAND	No. 4 to No. 10
MEDIUM SAND	No. 10 to No. 40
FINE SAND	No. 40 to No. 200



LOG OF TEST PIT

Project No.: 231688

Boring No.: TP-1

Sheet: 1 of 1

Project: Sheetz, 2013 W Michigan Ave, Ypsilanti
 Client: Skilken Gold
 Location: Ypsilanti, Michigan
 Drill Type: Excavator
 Crew Chief: Field Eng.: IM Rev. By: RW
 Coordinates: N=266382.1 E=13319632.3 (MI South 1ft)
 Elevation: 786 ft Datum:
 Notes: Approximate elevation inferred from site plan

Date Begin: 11/22/2023 Date End: 11/22/2023

Tooling	Type	Dia.	Groundwater, ft.	
Excavator	Bucket	18"	During	None
			End	None
			Seepage	
			Date	Depth, ft.

Plugging Record: Backfilled with excavated soil.

Depth Excavated: 10.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
785.0	1				CL	Dark brown lean CLAY; mostly clayey fines, moist, Fill with organic fines				Fill: 0' to 2'
784.0	2				CL-ML	Drain tile and bedding sand encountered	3.0			
783.0	3					Light brown SILTY CLAY; mostly clayey and silty fines, moist				
782.0	4									
781.0	5									
780.0	6						3.0			
779.0	7									
778.0	8									
777.0	9									
776.0	10						10.0			

End of Test Pit

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



LOG OF TEST PIT

Project No.: 231688

Boring No.: TP-2

Sheet: 1 of 1

Project: Sheetz, 2013 W Michigan Ave, Ypsilanti

Client: Skilken Gold

Location: Ypsilanti, Michigan

Drill Type: Excavator

Crew Chief: Field Eng.: IM Rev. By: RW

Coordinates: N=266245.4 E=13319707.4 (MI South 1ft)

Elevation: 784 ft Datum:

Notes: Approximate elevation inferred from site plan

Plugging Record: Backfilled with excavated soil.

Date Begin: 11/22/2023

Date End: 11/22/2023

Tooling	Type	Dia.	Groundwater, ft.	
Excavator	Bucket	18"	During	None
			End	None
			Seepage	
			Date	Depth, ft.

Depth Excavated: 9.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
783.0	1				CL	3" Sandy Topsoil				Fill: 0' to 2.3' Fill contains concrete rubble and brick fragments. Buried topsoil at 2'
782.0	2				CL	Brown to dark brown sandy lean CLAY; mostly clayey fines, some fine sand, moist, Fill	2.0		2.3	
781.0	3									
780.0	4				CL-ML	Brown to light brown SILTY CLAY; mostly silty and clayey fines, moist	3.0		6'	
779.0	5									
778.0	6									
777.0	7									
776.0	8									
775.0	9								9.0	

End of Test Pit

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



LOG OF TEST PIT

Project No.: 231688

Boring No.: TP-3

Sheet: 1 of 1

Project: Sheetz, 2013 W Michigan Ave, Ypsilanti

Client: Skilken Gold

Location: Ypsilanti, Michigan

Drill Type: Excavator

Crew Chief: Field Eng.: IM **Rev. By:** RW

Coordinates: N=266131.4 E=13319671.6 (MI South ift)

Elevation: 786 ft **Datum:**

Notes: Approximate elevation inferred from site plan

Plugging Record: Backfilled with excavated soil.

Date Begin: 11/22/2023

Date End: 11/22/2023

Tooling	Type	Dia.	Groundwater, ft.	
Excavator	Bucket	18"	During	None
			End	None
			Seepage	
			Date	Depth, ft.

Depth Excavated: 9.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
785.0	1					4" Clayey Topsoil	0.3			
784.0	2				CL	Brown lean CLAY; mostly clayey fines, moist with occasional silt lenses	3.0			
783.0	3									
782.0	4						4.0			
781.0	5				ML	Light brown SILT; mostly silty fines, moist with occasional clay lenses	3.5			Moderate excavation difficulty from 4' to 9'
780.0	6									
779.0	7									
778.0	8									
777.0	9									

End of Test Pit

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



LOG OF TEST PIT

Project No.: 231688

Boring No.: TP-4

Sheet: 1 of 1

Project: Sheetz, 2013 W Michigan Ave, Ypsilanti

Client: Skilken Gold

Location: Ypsilanti, Michigan

Drill Type: Excavator

Crew Chief: Field Eng.: IM **Rev. By:** RW

Coordinates: N=266050.4 E=13319582.4 (MI South ift)

Elevation: 782 ft **Datum:**

Notes: Approximate elevation inferred from site plan

Date Begin: 11/22/2023

Date End: 11/22/2023

Tooling	Type	Dia.	Groundwater, ft.	
Excavator	Bucket	18"	During	None
			End	None
			Seepage	
			Date	Depth, ft.

Plugging Record: Backfilled with excavated soil.

Depth Excavated: 8.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
781.0	1					8" Sandy Topsoil	0.7			
780.0	2				SP-SC	Brown poorly graded SAND with clay; mostly medium sand, few clayey fines, moist				
779.0	3									
778.0	4				SP	Light brown poorly graded SAND; mostly medium to fine sand, trace silty fines, moist with occasional silt lenses				
777.0	5									
776.0	6									
775.0	7									
774.0	8									
						End of Test Pit				

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.

STONEFIELD

June 12, 2024

Benjamin R. Carlisle, AICP, LEED AP
Charter Township of Ypsilanti
7200 S. Huron River Drive
Ypsilanti, MI 48197

**RE: Site Plan Review #1
Proposed Convenience Store and Fuel Sales
Parcel ID: K11-39-350-022, K-11-39-350-023, K-11-18-100-019
2103 West Michigan Avenue
Ypsilanti Charter Township, Washtenaw County, Michigan**

Mr. Carlisle:

Our office is submitting documents on behalf of the Applicant to address the outstanding conditions of the contained within the latest Site Plan review letter. Please find the following items enclosed:

ITEM DESCRIPTION	DATED	COPIES	PREPARED BY
Site Development Plans	06-12-2024	1	Stonefield Engineering & Design
Architectural Plans	05-21-2024	1	Sheetz
Lighting Plans	06-07-2024	1	Red Leonard Associates

The following is an itemized response to the comments contained within the Carlisle Wortman Associates Review Letter dated April 26, 2024. For the sake of brevity, any comments that are statements of fact or have been previously addressed are not included in the response below:

Natural Features

1. *Planning Commission to discuss how the amount of impervious surface on site complies with the steep slope standards.*

Noted.

2. *Correct Tree Inventory Table showing trees #5165 and #5166 as "removed."*

The Tree Inventory Table has been updated. Refer to Sheets C-4 & C-5 of the Site Development Plans.

3. *Consider alternatives to preserve 30" Honeylocust tree.*

The proposed sidewalk has been deflected to preserve the existing honeylocust.

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4. *Show symbols for trees to be removed on the same sheet as the site improvements to confirm exemption from tree removal mitigation requirements.*

An additional Tree Removal Plan has been provided overlayed atop the Site Plan. Refer to Sheet C-3 of the Site Development Plans.

Area, Width, Height, Setbacks

1. *Move outdoor sales proposed on the front of the building (W. Michigan Ave.) to another side of the building where it will be located outside of the setback.*

The proposed outdoor sales are located on the southern façade. Refer to Sheet C-6 of the Site Development Plans as well as the Architectural Plans.

2. *Applicant to obtain required variances for building and parking location along S. Hewitt.*

The required variances will be pursued through the Zoning Board of Appeals.

3. *Show proposed height of flat roof on elevation plans.*

The proposed height of flat roof is provided within the Land Use and Zoning Table on Sheet C-3 of the Site Development Plans.

4. *Recommend Planning Commission condition any approval on implementation of the proposed lot split shown on the plans.*

Noted.

5. *Amend plans to show 30-inch masonry wall along parking lot abutting S. Hewitt Rd. build-to line.*

A 30" masonry wall is proposed along parking abutting S. Hewitt Rd. and Michigan Ave. Refer to Sheet C-6 of the Site Development Plans.

Parking, Loading

1. *Provide building floor plans so that usable floor area dimensions can be confirmed.*

Refer to the attached Architectural Plans.

2. *Parking lot abutting S. Hewitt Rd. build-to line: either reduce to 60-feet along the build-to line, or applicant obtains a variance.*

The parking row abutting S. Hewitt Rd. has been reduced to 60 FT. Refer to Sheet C-6 of the Site Development Plans.

3. *Increase width of most westerly sidewalk abutting the building to 7-feet.*

The sidewalk has been increased to 7 FT in width. Refer to Sheet C-6 of the Site Development Plans.

Site Access, Circulation, Traffic

1. *Planning Commission and applicant discuss shifting the gas-pump canopy to the west to allow easier turning movements for tanker trucks around canopy.*

Noted.

2. *Add sidewalk connection from development to S. Hewitt Rd right-of-way.*

A sidewalk connection to S. Hewitt Rd. has been added. Refer to Sheet C-6 of the Site Development Plans.

Screening & Landscaping

1. *Planning Commission to consider using Oak Tree alternatives to meet the “ornamental tree” requirement along W. Michigan Ave.*

Noted.

2. *Add 18 shrubs to plans to meet Street Yard Landscaping requirement.*

Additional shrubs have been added to north of the building to meet the street yard landscaping requirements.

3. *Either eliminate one parking space along south side of building, or add a landscape island.*

The applicant is requesting a waiver.

4. *Replace stripped pavement with landscape island where bays of parking along the building intersect.*

The striped pavement has been replaced with a landscaped island. Refer to Sheet C-6 of the Site Development Plans.

5. *Add 13 trees to meet the parking lot landscaping requirement.*

Additional trees have been added south of the canopy to meet the parking lot landscaping requirements.

6. *Use shrubs in place of 59 herbaceous perennials around detention basin.*

The detention basin plantings have been revised accordingly.

7. *Consider species alternative to English Laurel; increase size of Viburnum and Elderberry.*

The English Laurel has been replaced with a Japanese Yew, and the viburnam & elderberry sizes have been updated accordingly.

8. *Planning Commission to consider ordinance flexibility in landscaping requirements.*

Noted.

9. *Planning Commission to consider the heavy landscaped screen vs. six-foot-tall screening wall.*

Noted.

Lighting

1. *Address lighting issues, as described in this review.*

Refer to the attached Lighting Plan.

Elevations And Floor Plans

1. *Provide elevations of proposed canopy.*

Elevations for the proposed canopy are provided within the attached Architectural Plans.

2. *Applicant demonstrates that the proposed design with the canopy unattached to the principal building is more functional and aesthetically pleasing.*

Correct – It is Sheetz prerogative to provide an aesthetically pleasing site for consumers, and have designed their flagship building and canopy to strongly supplement one another.

3. *Add more glazing to W. Michigan Ave. façade or applicant seeks a variance.*

The applicant is seeking a waiver for glazing along the Michigan Ave. frontage.

4. *Provide transparency calculations for other three facades (west, south & east), including any applicable “transparency alternatives.”*

Transparency calculations for all four facades are provided within the attached Architectural Plans.

Should you have any questions regarding the submission items or responses above please do not hesitate to contact our office.

Regards,



Eric Williams, PE
Stonefield Engineering and Design, LLC



Nik Bauer
Stonefield Engineering and Design, LLC

STONEFIELD

June 12, 2024

Stacie L. Monte & Matthew D. Parks, P.E.
Charter Township of Ypsilanti
7200 S. Huron River Drive
Ypsilanti, MI 48197

**RE: Site Plan Review #1
Proposed Convenience Store and Fuel Sales
Parcel ID: K11-39-350-022, K-11-39-350-023, K-11-18-100-019
2103 West Michigan Avenue
Ypsilanti Charter Township, Washtenaw County, Michigan**

Ms. Monte & Mr. Parks:

Our office is submitting documents on behalf of the Applicant to address the outstanding conditions of the contained within the latest Site Plan review letter. Please find the following items enclosed:

ITEM DESCRIPTION	DATED	COPIES	PREPARED BY
Site Development Plans	06-12-2024	1	Stonefield Engineering & Design

The following is an itemized response to the comments contained within the OHM Advisors Review Letter dated April 19, 2024. For the sake of brevity, any comments that are statements of fact or have been previously addressed are not included in the response below:

B. Site Plan Comments

Site Utilities

1. *It is recommended that the applicant provide the domestic water service connection directly to the existing water main instead of to the proposed hydrant service. This office defers to YCUA on the review and approval of the final water main and water service layout.*

Noted.

Stormwater Management

2. *The applicant shall provide a stormwater narrative, clarifying the existing and proposed stormwater management, as well as how stormwater will be managed around the building (i.e. roof drains, etc.).*

A stormwater management narrative is provided on Sheet C-11 of the Site Development Plans.

Paving and Grading

3. *It is recommended that the applicant provide a sidewalk connection to the sidewalk along S Hewitt Rd.*

A sidewalk connection to S. Hewitt Rd. has been provided. Refer to Sheet C-6 of the Site Development Plans.

Should you have any questions regarding the submission items or responses above please do not hesitate to contact our office.

Regards,



Eric Williams, PE
Stonefield Engineering and Design, LLC



Nik Bauer
Stonefield Engineering and Design, LLC

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STONEFIELD

June 12, 2024

Gary Streight, PE
Project Manager
Washtenaw County Road Commission
555 N. Zeeb Road
Ann Arbor, MI

RE: Engineering Review
Proposed Convenience Store and Fuel Sales
Parcel ID: K11-39-350-022, K-11-39-350-023, K-11-18-100-019
2103 West Michigan Avenue
Ypsilanti Charter Township, Washtenaw County

Mr. Straight:

Our office is submitting documents on behalf of the Applicant to address the outstanding conditions of the Board's Resolution including comments contained within the latest Engineering review email. Please find the following items enclosed:

ITEM DESCRIPTION	DATED	COPIES	PREPARED BY
Site Development Plans	06-12-2024	1	Stonefield Engineering & Design

The following is an itemized response to the comments contained within the Engineering Review Email dated May 15, 2024. For the sake of brevity, any comments that are statements of fact or have been previously addressed are not included in the response below:

Comments

1. Investigate the possibility of an existing sanitary sewer lead serving the property rather than installing a new lead. If no sanitary lead exists, the pavement area removed and replaced shall be a full lane width, not a partial width.

At this time no existing sewer leads are available for reuse. The proposed sanitary connection has been updated to show a full lane's width removal & replacement.

2. The watermain crossing Hewitt Road shall be a jack and bore. The proximity to the intersection will not provide sufficient space for vehicle stacking if the road were to be open cut.

This has been revised. Refer to Sheets C-2 & C-14 for the newly proposed jack & bore locations & details.

3. The HMA pavement cross section shall be 1.5" 5E1, 1.5" 4E1, 2" 3C over 10" 21AA limestone.

This has been revised. Refer to detail #4 on Sheet C-19

4. Include MDOT Special Detail R-28 series in the plan set.

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This has been added. Refer to Sheet C-2I

5. Provide a cost estimate for all work within the right of way.

A cost estimate will be provided during the future engineering review phase.

6. An inspection fee equal to 3% of the cost estimate, \$500 minimum, along with a deposit equal to the full amount of the cost estimate must be provided in the form of a letter of credit or cashier's check.

All fees & deposits will be provided during the future engineering review phase.

7. Provide the name, contact info and certificate of insurance for the contractor performing the work.

All contact information will be provided during the future engineering review phase.

Should you have any questions regarding the submission items or responses above please do not hesitate to contact our office.

Regards,



Eric Williams, PE
Stonefield Engineering and Design, LLC



Kevin Heffernan, PE
Stonefield Engineering and Design, LLC

STONEFIELD

June 12, 2024

Theresa M. Marsik, P.E.
Stormwater Engineer
Washtenaw County Water Resources Commission
705 N Zeeb Road
Ann Arbor, MI 48103

**RE: Site Plan Review #1
Proposed Convenience Store and Fuel Sales
Parcel ID: K11-39-350-022, K-11-39-350-023, K-11-18-100-019
2103 West Michigan Avenue
Ypsilanti Charter Township, Washtenaw County, Michigan**

Ms. Marsik:

Our office is submitting documents on behalf of the Applicant to address the outstanding conditions of the contained within the latest Site Plan review letter. Please find the following items enclosed:

ITEM DESCRIPTION	DATED	COPIES	PREPARED BY
Site Development Plans	06-12-2024	1	Stonefield Engineering & Design
Geotechnical Report & Infiltration Analysis	04-02-2024	1	Materials Testing Consultants

The following is an itemized response to the comments contained within the Washtenaw County Water Resources Commission Review Letter dated May 22, 2024. For the sake of brevity, any comments that are statements of fact or have been previously addressed are not included in the response below:

- 1. The engineer's certificate of outlet, accompanied by corresponding calculations and documentation, should be submitted to our office for review.*

The certificate of outlet will be deferred until the engineering review phase. Please note the development team has had multiple meetings with EGLE to confirm that the overall discharge to the southern wetlands is acceptable.

- 2. An infiltration testing report, meeting the reporting requirements listed in the rules of this office and signed and sealed by a licensed geotechnical engineer, should be submitted to our office for review.*

Please refer to the Geotechnical Report & Infiltration Analysis, included within this resubmission.

- 3. A storm water narrative should be prepared and submitted to our office for review.*

Refer to the stormwater narrative on Sheet C-12.

- 4. A drainage area map should be included with the design plans on the grading sheet.*

Refer to the drainage maps on Sheet C-13, outlining all pervious areas as well as the type & hydrologic group of the underlying soils.

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5. An emergency overflow channel, approximately 0.25 to 0.5 feet above the 100-year storm volume elevation, with an unimpeded route to a receiving channel should be included in the detention basin design.

A 10'-wide emergency overflow has been added to the south side of the proposed basin. The emergency overflow will be designed per all County requirements, and more details will be added during the engineering review phase.

6. A 6-inch interceptor layer of sand must be applied to the bottom of the infiltration basin to filter out sediment and debris. In addition, a maintainable engineered structure, such as an infiltration trench, must be placed in the bottom of the infiltration basin.

Noted. A cross-section & additional details of the proposed basin will be added during the engineering review phase. The basin will include the 6" sand interceptor layer and will be noted within the proposed cross-section.

7. Based on site information available on MapWashtenaw and in the rules of this office, portions of the site are covered by hydrologic soil types B, C, and D. The soil types and the areas that they cover should be presented on the grading plan. The curve numbers and runoff coefficients used on Worksheet W1 should be revised to reflect both the proposed impervious and pervious areas that are underlain by hydrologic soil groups B, C, and D.

Refer to the drainage maps on Sheet C-13, outlining all soil types & hydrologic groups noted on-site. Per the provided geotechnical report & available mapping, we conclude that the vast majority of underlying soils reflect HSG 'A' due to their sandy nature and high infiltration rates. This has been reflected in the updated stormwater calculations on Sheet C-22.

8. The curve number used on Worksheet W3 corresponds to hydrologic group C soils, rather than a weighted average based on those portions of the drainage area that are underlain by groups B, C, and group D soils. This directly affects the required infiltration volume determined on Worksheet W9 and should be corrected.

This has been revised – Refer to the above response #7.

9. Worksheet W11 included a volume credit for storage in stone. A profile drawing of the basin must be included in the next submittal. At a minimum, the bottom of basin elevation, the thickness of the stone layer, the freeboard elevation, and the emergency overflow elevation must be called out.

No Stone storage is proposed, and the subsurface credit has been removed. Refer to the updated stormwater calculations on Sheet C-22.

10. The next submittal should include outlet calculations.

Outlet calculations have been provided – Refer to Sheet C-22.

11. The basin area shown on the landscape plan was hatched up to Elevation 783 feet. The plan did not contain a legend that identified the significance of the hatching.

- a. If it was to denote the area of the basin plantings, the hatched areas should be expanded to include both the basin and buffer areas.

The hatching represents the infiltration basin planting. Mix information has been provided in table-form at the bottom of Sheet C-15.

12. A long-term stormwater maintenance plan, including budget and responsible party, should be designed and included with the plan set.

A stormwater O&M plan will be provided during the future engineering review phase.

13. *Inspection of the infiltration basin following storms of 1 inch or more should be added to the long-term maintenance plan.*

Noted. A stormwater O&M plan will be provided during the future engineering review phase.

14. *A note should be added to indicate that no chemicals are allowed in stormwater features or buffer zones with the following exception: invasive species may be treated with chemicals by a certified applicator.*

The above note has been added in the top-left corner of Sheet C-15.

15. *The note regarding stormwater detention pond planting soils, listed on plan sheets C-13 and C-14, must be modified to state that the clay content of the planting soil should be limited to a maximum of 10 percent.*

The above note has been added.

16. *Within areas above the first flush elevation of the proposed infiltration basin, seeding and/or live plantings are allowed. Only native seeds (as defined by Michigan Flora, michiganflora.net) are allowed for permanent soil stabilization. Annual seeds are allowed in an amount necessary to temporarily stabilize the limits of disturbance. Include the species list and quantity for the Native Grass seed mix.*

Noted. Plantings have been limited to the extents of the basin, and species have been selected with the above native planting lists in mind.

17. *Below the first flush elevation within the proposed infiltration basin, live plantings must cover the entire area. The first flush elevation should be noted on the details. Native plants are preferred. Cultivars and non-native perennials are allowable if approved by WCWRC. Plants listed on the WCWRC Rain Garden Plant List are acceptable. Invasive species are not allowed (see the City of Ann Arbor's invasive species list).*

Refer to the infiltration basin planting table on Sheets C-15 & C-16.

18. *Plantings should be locally adapted and appropriate to the hydric conditions proposed. For more information on individual species, see "Plants for Stormwater Design: Species Selection for the Upper Midwest" by Daniel Shaw & Rusty Schmidt.*

Noted.

19. *Please see the attached invoice for the current fees and remit these fees upon receipt. As requested, the invoice is being submitted directly to Skilken Gold.*

Noted.

Should you have any questions regarding the submission items or responses above please do not hesitate to contact our office.

Regards,



Eric Williams, PE
Stonefield Engineering and Design, LLC

Z:\Michigan\DET\2023\DET-230091.01-Skilken Gold-2103 West Michigan Avenue, Ypsilanti Charter Township, MI\Correspondence\Outgoing\County\2024-05-23_WCWRC Response Letter.docx

STONEFIELD

June 12, 2024

Scott D. Westover
Director of Engineering
Ypsilanti Community Utilities Authority
2777 State Road
Ypsilanti, MI 48198

**RE: Site Plan Review #1
Proposed Convenience Store and Fuel Sales
Parcel ID: K11-39-350-022, K-11-39-350-023, K-11-18-100-019
2103 West Michigan Avenue
Ypsilanti Charter Township, Washtenaw County, Michigan**

Mr. Westover:

Our office is submitting documents on behalf of the Applicant to address the outstanding conditions of the contained within the latest Site Plan review letter. Please find the following items enclosed:

ITEM DESCRIPTION	DATED	COPIES	PREPARED BY
Site Development Plans	05-09-2024	1	Stonefield Engineering & Design

The following is an itemized response to the comments contained within the Ypsilanti Community Utilities Authority Review Letter dated April 25, 2024. For the sake of brevity, any comments that are statements of fact or have been previously addressed are not included in the response below:

- Both 2059 and 2103 W. Michigan have water services connected to the 8” diameter water main on the opposite side of the road, if not used for the proposed redevelopment the project will be responsible for disconnecting each service from the water main with each corporation stop closed.*

A note has been added to the demolition plan stating that the existing service connections shall be removed to the 8” water main within the Michigan Ave. right-of-way. Refer to Sheet C-2 of the Site Development Plans.

- Both 2059 and 2103 W. Michigan were connected to the sanitary sewer system – 2059 was tapped into the sanitary sewer pipe and 2103 was tapped into a manhole in the southerly curb line east of the existing driveway. If these services are not reused as part of the proposed redevelopment the project will be responsible for properly abandoning each connection.*

The existing sanitary sewers will be properly abandoned during construction.

- The proposed 8” diameter water main alignment needs to be revised such that it is perpendicular to the centerline of Hewitt Road until it is outside the influence of the pavement.*

The proposed water service connection has been updated to be perpendicular to the Hewitt Rd. centerline. Refer to Sheet C-13 of the Site Development Plans.

STONEFIELDENG.COM

607 SHELBY STREET, SUITE 200, DETROIT, MI 48226 248.247.1115 T. 201.340.4472 F.

Should you have any questions regarding the submission items or responses above please do not hesitate to contact our office.

Regards,



Eric Williams, PE
Stonefield Engineering and Design, LLC



Nik Bauer
Stonefield Engineering and Design, LLC

Z:\Michigan\DET\2023\DET-230091.01-Skilken Gold-2103 West Michigan Avenue, Ypsilanti Charter Township, MI\Correspondence\Outgoing\Municipal\2024-04-29_YCUA Response Letter.docx

STONEFIELD

June 12, 2024

Steve Wallgren, Fire Marshal
Charter Township of Ypsilanti Fire Department
Bureau Of Fire Prevention
222 South Ford Boulevard
Ypsilanti, MI 48198

**RE: Site Plan Review #1
Proposed Convenience Store and Fuel Sales
Parcel ID: K11-39-350-022, K-11-39-350-023, K-11-18-100-019
2103 West Michigan Avenue
Ypsilanti Charter Township, Washtenaw County, Michigan**

Mr. Wallgren:

Our office is submitting documents on behalf of the Applicant to address the outstanding conditions of the contained within the latest Site Plan review letter. Please find the following items enclosed:

ITEM DESCRIPTION	DATED	COPIES	PREPARED BY
Site Development Plans	06-12-2024	1	Stonefield Engineering & Design

The following is an itemized response to the comments contained within the Charter Township of Ypsilanti Fire Department Review Letter dated April 22, 2024. For the sake of brevity, any comments that are statements of fact or have been previously addressed are not included in the response below:

Site Access

- *Fire Department site access is adequate.*

Noted

- *A minimum of 13' 6" height clearance is required for the Fuel Canopy.*

A vertical clearance of 17'1" is provided under the canopy.

Suppression / Hydrants

- *The proposed Hydrant location provides the appropriate 250' coverage of the structure.*

Noted.

Should you have any questions regarding the submission items or responses above please do not hesitate to contact our office.

Regards,



Eric Williams, PE
Stonefield Engineering and Design, LLC

Z:\Michigan\DET\2023\DET-230091.01-Skilken Gold-2103 West Michigan Avenue, Ypsilanti Charter Township, MI\Correspondence\Outgoing\Municipal\2024-04-29_YTFD Response Letter.docx



June 7, 2024

Ypsilanti Charter Township
 Attn: Planning & Zoning Department
 7200 South Huron River Drive
 Ypsilanti, MI 48197

RE: Response to Lighting Plan Review comments for location:
 Sheetz; 2103 West Michigan Ave; Ypsilanti, MI 48197

To whom it may concern,

Sheetz, Inc. has contracted with Red Leonard Associates to provide adjustments to the lighting plan proposed for this location. That updated plan has been included in this re-submission for your review. In particular, these were our responses to the review comments provided.

- The ordinance requires that light fixtures shall be shielded and direct light away from adjoining properties. Manufacturer cut sheets showing that the proposed fixtures can be shielded need to be provided.

RESPONSE: All lighting is shielded and directed away from adjoining properties. Cut sheets are provided on the second page of the lighting plan. It is important to cross-reference the lighting fixture model number from the first page. For example, light standard number "122" by the trash enclosure is a "XPM6" fixture. The table at the bottom of page 1 outlines that a 'XPM6' has the long form model number "OSQ-ML-C-DA-XX + OSQM-C-16L-40K7-4M-UL-NM-XX." The chart on page 2 clarifies that.

Ordering Information

Fully assembled luminaire is composed of two components that must be ordered separately:

Example: **Mount: OSQ-ML-C-AA-BK + Luminaire: OSQM-C-4L-30K7-2M-UL-NM-BK**

Mount (Luminaire must be ordered separately)*			
OSQ-			
Medium/Large Mounts OSQ-ML-C-AA Adjustable Arm OSQ-ML-C-DA Direct Arm OSQ-ML-C-TM Trunnion Mount	Extra Large Mounts OSQ-X-C-AA Adjustable Arm OSQ-X-C-DA Direct Arm	Color Options:	SV Silver BK Black BZ Bronze WH White

* Reference fixture mounting drill pattern, EPA, and pole configuration suitability data beginning on page 14.

Luminaire (Mount must be ordered separately)										
OSQ	C									
Family	Size	Series	Lumen Package*	CCT/ CRI	Optic		Voltage	Mount	Color Options	Controls*
OSQ	M Medium L Large X Extra Large	C	Medium	30K7	Asymmetric	4B Type IV Mid w/ Factory- Installed Backlight Shield AF Automotive FrontlineOptic™ AB Automotive- FrontlineOptic™ w/Factory- Installed Backlight Shield	UL Universal 120-277V UH Universal 347-480V - Not available with 4L, 40L or 75L lumen packages UE Universal 277-480V - Available	NM No Mount - Must specify mount from table above - Mount ships separately	BK Black BZ Bronze SV Silver WH White	BML Bluetooth® Tec Multi-Level Se - Utilizes a mul - Refer to BML - 20-40° sensor luminaire; 8-2 aisle shroud ir - Intended for d at 0° tilt - Not available or Synapse TL accessories 09/08/07/06/05/04/03/02, or Q1
			4L 4,000 Lumens	2M Type II Mid						
			6L 6,000 Lumens	2B Type II Mid w/ Factory-Installed Backlight Shield						
			9L 9,000 Lumens	3M Type III Mid						
			11L 11,000 Lumens	3B Type III Mid w/ Factory-Installed Backlight Shield						
			16L 16,000 Lumens	4M Type IV Mid						

2. The canopy light fixtures exceed the maximum light levels of 20 footcandles. The proposed light levels under the canopy range from 21 to 58 footcandles.

RESPONSE: Light levels have been reduced to a maximum of 20 footcandles under the canopy.

3. The building-mounted light fixtures at the parking lot entry door also exceed the maximum light level of 20 footcandles. The proposed light levels that exceed this maximum are between 26-31 footcandles.

RESPONSE: Maximum light output at the building entrances is now 16.8 footcandles.

4. Light fixture XPM4 is near the residences to the east. The maximum mounting height of fixtures adjacent to residential areas is 18 feet (including the base). These fixtures are proposed at 23 feet.

RESPONSE: Fixture number "19" has been reduced to 18' in height.

5. The Kelvin color temperature of the proposed fixtures has not been provided and needs to be.

RESPONSE: The chart identified in response to comment #1 identifies how to read the Kelvin temperature. We are proposing 4000k.

6. The photometric plan shows linear strip lights (84 lights identified as "XL") around the gas pump canopy. Lighting intended to attract attention to the use and not strictly for security purposes are prohibited. The strip lights are shown in the image below: On the building, the photometric plan shows 276 light fixtures identified as "XP" in single and double rows around the entire exterior of the building. Also shown are an additional 16 fixtures with a "light strip" shape (identified as "XM") proposed around the canopy over the front door. These building mounted fixtures are in addition to other building fixtures at doorways and along sidewalks abutting the building. As mentioned above, Sec. 1303(6) prohibits the use of building lighting intended to attract attention to the building and/or use and is not strictly designed for security purposes.

RESPONSE: All strip lighting has been removed from the building parapet, building entrances, and fueling canopy.



Please feel free to reach out to Alex Siwicki with any questions at (330) 402-6861 or asiwicki@sheetz.com.

Sincerely,

A handwritten signature in black ink, appearing to read "Alex Siwicki", written in a cursive style.

Alexander Siwicki
Engineering & Entitlements
Sheetz, Inc.
39300 West 12 Mile Road; Suite 100
Farmington Hills, MI 48331



**Staff Report
BlueMind Therapy
1122 Walnut Street, Ypsilanti, MI 48198
Special Land Use Application**

July 23, 2024

Applicant: Zeinab Hassan

Project Name: BlueMind Therapy – Childcare Center

Plan Date: June 28, 2024

Location: 1122 Walnut Street, Ypsilanti, MI 48198, Parcel K-11-03-463-014

Zoning: R5, One-Family Residential

Action Requested: Special Land Use Approval

CASE LOCATION AND SUMMARY

The Office of Community Standards is in receipt of a Special Land Use Application from Zeinab Hassan, representing BlueMind Therapy requesting authorization for the use of the existing 7,622 sq. ft. building located at 1122 Walnut Street, Ypsilanti, MI 48198 for a childcare center. BlueMind Therapy provides applied behavior analysis therapy (ABA), education, and support services to children with autism spectrum disorder and related development disabilities.

CROSS REFERENCES

- Article 4, District Regulations
- Article 10, Special Land Use

SUBJECT SITE USE, ZONING AND COMPREHENSIVE PLAN

The Charter Township of Ypsilanti 2040 Master Plan designates this site Neighborhood Preservation, a designation intended for older neighborhoods within the Township's urbanized footprint. The Neighborhood Preservation area features older housing stock on grid block patterns. They provide housing options in a more urban setting, on typically smaller lots. These areas are intended to be served by and provide convenient access to commercial areas, parks and open space, community facilities and other destinations. Connections to the Mixed-Use Corridors is important to access daily services and meet daily needs. The Plan contemplates continued preservation and improvement, with quality rehabilitation and infill new construction that is sensitive to the character of existing residences. Reinvestment, upkeep, maintenance and pride in ownership are vital to the stability of these neighborhoods.

Township Supervisor
Brenda L. Stumbo
Township Clerk
Heather Jarrell Roe
Township Treasurer
Stan Eldridge



**YPSILANTI
TOWNSHIP**
— PLANNING & ZONING DEPARTMENT —

Trustees
John Newman II
Gloria Peterson
Debbie Swanson
Ryan Hunter

1122 Walnut Street, Ypsilanti, MI 48198 – Street View



Size of Subject Site:

1.7-Acres (74,052 sq. ft.)

Current Use of Subject Site:

Vacant (Previous Childcare Center)

NATURAL FEATURES

Topography: The subject parcel is relatively flat.

Woodlands: No woodlands are present on the site.

Wetlands: There are no wetlands on the subject property. According to FEMA MAP 26161C0430E, Dated April 3, 2012, the site is in an area of minimal flood hazard.

Soils: Unknown



ADJACENT USES, ZONING AND COMPREHENSIVE PLAN

<i>Direction</i>	<i>Use</i>	<i>Zoning</i>	<i>Master Plan</i>
North	Residential	R-5, One-Family Residential	Neighborhood Preservation
South	Vacant	R-5, One-Family Residential	Neighborhood Preservation
East	Residential	R-5, One-Family Residential	Neighborhood Preservation
West	Vacant	R-5, One-Family Residential	Neighborhood Preservation

LAND USE

Per Sec. 420 of the Residential Use Table, adult and child daycare centers, as well as preschools, are permitted in the R-5, One-Family Residential Zoning District with Special Land Use Approval. This site has a history of being used both as a school and a childcare center, aligning with the proposed use. Per Sec. 1005.1 – Remain in Force: Upon receipt of site plan approval, special land use approval shall continue in force if the particular use or activity continues to operate as approved on the site plan, unless otherwise specified in the approval. Given this history and the zoning regulations, the proposed childcare center aligns with both the historical use of the site and the current zoning requirements, subject to obtaining Special Land Use Approval.

The use as described by the applicant is as follows:

Our center aims to provide critical applied behavior analysis therapy, education and support services to children with autism spectrum disorder (ASD) and related developmental disabilities, and will serve as a safe, welcoming, and therapeutic education environment for children who require ABA therapy & education to develop essential life skills, communication abilities, and behavioral management techniques. There are no medical-related treatments, services or related activities offered or provided to our students. Our primary goals are to enhance the quality of life for our students and support their integration into the community.

Hours of Operation:

Monday-Friday (8am to 8pm). Some Saturdays from 9am to 5pm. No operation on holidays.



Students / Staff:

Maximum 35 students per day. Students do not attend daily but are typically scheduled 2 or 3 days a week. The center employs enough staff members to maintain a 1:1 staff-to-student ratio. However, the number of staff members on-site during the largest shift should be provided.

Township Definition of Childcare Center:

A facility other than a private residence, receiving more than six (6) children for group day care for periods of less than twenty-four (24) hours a day, and where the parents or guardians are not immediately available to the child. It includes a facility which provides not less than (2) consecutive weeks, regardless of the number of hours of care per day.

The facility is generally described as a childcare center, day care center, day nursery, nursery school, parent cooperative preschool, play group, or drop-in center. Childcare center or day care center does not include a Sunday school conducted by a religious institution or a facility operated by a religious organization where children are cared for during short periods of time while persons responsible are such children are attending a religious service.

Ypsilanti Township Planning & Zoning Comments:

The Township Planning Department classifies BlueMind Therapy as a childcare center; however, this organization does not fall under the jurisdiction of the State of Michigan like traditional childcare centers and group daycare homes. This type of organization is similar to a traditional daycare center; thus, we are treating it as one. BlueMind Therapy will still need to undergo local inspections performed by the Building Department and Fire Department to ensure the building is safe to occupy.

The Zoning Administrator has the authority to group similar land uses into a reasonable definition / category. Below, I have included a list similarities and differences between BlueMind Therapy and a traditional daycare center:

Childcare Center vs. BlueMind Therapy

Aspect	BlueMind Therapy	Traditional Childcare Center
Services Provided	Applied Behavioral Analysis (ABA) therapy, education, and support services for children with Autism	General childcare, early education, and recreational activities
Operational Hours	8 AM to 8 PM on weekdays	Typically, 7 AM to 6 PM on weekdays



Drop-off/Pick-up	Standard drop-off and pick-up	Standard drop-off and pick-up
Age Range	1.5 to 15 years old	6 weeks to 12 years old
Age grouping	Different times for specific age ranges	Grouped by age (infants, toddlers, preschoolers, school-age)
Staff qualifications	Certified to provide ABA support	Varies; typically certified in early childhood education, CPR, and first aid
Focus	Autism therapy and education	General childcare and early education
Special needs services	Specialized services for children with Autism	Limited or no specialized services
Typical Activities	ABA therapy sessions, educational activities, social skills training	Playtime, nap time, basic educational activities, outdoor play
Parent Involvement	Education and support services for parents	Regular updates on child's progress, parent-teacher meetings
Facility Requirements	Standard childcare rooms and some specialized rooms and equipment	Standard childcare rooms and playgrounds
Licensing and Regulation	Must meet local and county regulations for providing ABA therapy	Must meet state and local regulations for childcare centers

BlueMind Therapy and traditional childcare centers are very similar in structure and operation. Both provide care and educational services for children, have designated drop-off and pick-up times, and group children by age. However, BlueMind Therapy specifically supports children with Autism through specialized ABA therapy, while traditional centers offer general childcare and early education. Due to these similarities, the Planning Department classifies BlueMind Therapy as a childcare center. The main difference is that BlueMind Therapy does not require state licensing approval.

The Planning Department supports the use of the existing building for BlueMind Therapy because the building has a history of serving as a school and then a childcare center. The R-5 zoning district allows for childcare centers with special land use approval from the Planning Commission, making this location suitable for BlueMind Therapy's services. This continuity of use aligns with the building's intended purpose and meets community needs.



SITE HISTORY

1980-2012: The building was constructed by Calvary Baptist Church in 1980 and initially served as a school for the Ypsilanti Boys Preparatory Academy, accommodating preschool through 6th-grade students. During this period, the Faith Academy Development Center also operated within the building, providing childcare services for infants to 5-year-old children.

2012: Vanita Bird took over the childcare center, operating under a new license (Michigan License Number: DC810321330). The current license for the property was issued on March 19, 2023, and is valid until March 18, 2025. The center was licensed to care for up to 77 children, ages infant to 5 years old, and typically had over 45 children enrolled at any given time.

2017: Vanita Bird purchased the property from Calvary Baptist Church and continued to operate the Faith Academy Development Center.

2023: The childcare center ceased operations, and the property was listed for sale.

2024: BlueMind Therapy is proposing to re-establish a childcare center at this location with a capacity of 35 children.

SPECIAL LAND USE

In the R-5, One-Family Residential Zoning District, a childcare center requires a special use approval. Standards for Special Use review is set forth in Sec. 1003. The Planning Commission shall review the circumstances and facts of each proposed use in terms of the following standards and required findings, and with respect to any additional standards set forth in this ordinance. The Planning Commission shall find and report adequate data, information, and evidence showing that the proposed use meets all required standards:

1. Will be harmonious, and in accordance with the objectives, intent, and purpose of this ordinance.
2. Will be compatible with the natural environment and existing and future land uses in the vicinity.
3. Will be compatible with the Township Master Plans.
4. Will be served adequately by essential public facilities and services, such as highways, streets, police and fire protection, drainage ways and structures, refuse disposal, or that the persons or agencies responsible for the establishment of the proposed use shall be able to provide adequately for such services.
5. Will not be detrimental, hazardous, or disturbing to existing or future neighboring uses, persons, property, or public welfare.



6. Will not create additional requirements at public costs for public facilities and services that will be detrimental to the economic welfare of the community.

We find that the standards have been met. Comments regarding how this proposal compares to the Special Land Use standards follows:

Harmonious with Objectives, Intent, and Purpose of the Ordinance:

BlueMind Therapy's proposal to operate as a childcare center aligns with the objectives and intent of the R-5 zoning district, in our opinion. The district aims to provide a variety of residential uses, including childcare services that support family needs within the community. By offering specialized ABA therapy for children with Autism, BlueMind Therapy not only provides essential childcare services but also addresses specific community needs, making it harmonious with the ordinance's purpose.

Compatibility with the Natural Environment and Existing/Future Land Uses:

The building has a long history of being used for educational and childcare purposes. BlueMind Therapy's use will maintain this continuity, helping to ensure compatibility with the existing land use. The proposed use will have minimal environmental impact, as it involves indoor activities within an already developed structure. No changes are proposed to the exterior of the building or the site, thus being compatible with the natural environment and future land uses in the vicinity.

Compatibility with the Township Master Plans:

The Township Master Plan supports the provision of diverse and inclusive services that cater to the needs of all residents. BlueMind Therapy's focus on ABA therapy for children with Autism aligns with the Master Plan's goals of promoting inclusive and supportive community services, ensuring compatibility with the Township Master Plan.

Adequate Service by Essential Public Facilities and Services:

The location of BlueMind Therapy is well-served by existing public facilities and services. The building has been used as a school and childcare center historically, indicating that it is adequately served by highways, streets, police and fire protection, drainage systems, and refuse disposal services. BlueMind Therapy's operation will not require additional public services beyond what is already in place.



Not Detrimental, Hazardous, or Disturbing to Neighboring Uses:

In general, we don't believe BlueMind Therapy will be detrimental, hazardous, or disturbing to existing or future neighboring uses. The proposed use is consistent with the building's historical function as a childcare center and school. The building itself is setback from the residential neighborhood, being more than 100-feet from the neighbors to the east and screened by an existing woodland to neighbors to the west. Also, all activities will be conducted indoors.

Vehicles access the site from Walnut Street, into a one-way maneuvering/parking area on the east side of the building. The applicant should confirm that the parking lot is signed for one-way movement. Also, pavement markings indicating one-way movement should be provided.

The wide maneuvering lane allows vehicles to stop at the front of the building for drop-offs, although the applicant's narrative states that the parking spots will likely be used by parents when dropping off their children. Parents will then leave once their child is in the building and vacate the parking space. Children will also arrive at the facility on foot, as well as via the company's transportation vehicle. The applicant should describe how parent traffic is addressed during the drop-off and pick-up times. Parents parking/waiting in their cars along Walnut St. must be avoided.

The aerial photograph shows eighteen (18) angled parking spaces located on the east side of the maneuvering lane. As mentioned above, the applicant should provide the number of staff members that will be on site during the largest shift. Also, if the parents are using the parking spaces to drop off their children, where will staff park?

No Additional Public Costs for Public Facilities and Services:

BlueMind Therapy's operation will not create additional requirements at public cost for public facilities and services. The existing infrastructure is sufficient to support the proposed use, and we don't think the specialized nature of the services provided will impose additional burdens on public resources.

RECOMMENDATIONS

The applicant should address the following questions:

1. Provide the number of staff members on site during the largest shift.
2. Confirm that the vehicle maneuvering/parking area is signed for one-way movement.
3. Describe how parent traffic during drop-off and pick-up times will be managed; parents parking/waiting on Walnut St. must be avoided.



4. If parents are using parking spaces to drop off their children, where will staff park?

Overall, the Charter Township of Ypsilanti Planning Department finds this land use to be compatible and appropriate for the site located at 1122 Walnut Street, Ypsilanti, MI 48198. However, the applicant needs to provide the additional information requested above.

If the responses to the questions above are adequate, as determined by the Planning Commission, the Planning Department recommends approval of the BlueMind Therapy Special Land Use Permit with the following conditions of approval:

1. *The applicant shall submit a Business Registration application to the Office of Community Standards.*
2. *For the safety of all occupants and upon sufficient notice, the applicant shall permit, prior to opening the childcare center, the facility to be inspected by the Township Building official and/or Fire Marshal to ensure compliance with the adopted property maintenance code.*
3. *The applicant owner shall comply with the Township Sign Ordinance.*
4. *The applicant shall repaint the parking lot striping/markings to ensure safe and orderly vehicle maneuvering and parking for the public.*
5. *Any other conditions based upon Planning Commission discussion.*

SUGGESTED MOTIONS

The following suggested motions and conditions are provided to assist the Planning Commission in making the most appropriate motion for this application. The commission may utilize, add, or reject any conditions suggested herein, as they deem appropriate.

Motion to postpone:

“I move to postpone the special use permit submitted by Zeinab Hassan to permit the establishment of a childcare center as described in this application, utilizing the existing building on the 1.7-acre site zoned R-5, One-Family Residential, located at 1122 Walnut Street, Ypsilanti, MI 48198, Parcel K-11-03-463-014 to consider comments presented by the Planning Commission during the discussion of the project.”

Motion to approve:

“I move to approve the Special Land Use Permit submitted by Zeinab Hassan to permit the establishment of a childcare center as described in this application, utilizing the existing building on the 1.7-acre site zoned R-5, One-Family Residential, located at 1122 Walnut Street, Ypsilanti, MI 48198, Parcel K-11-03-463-014, with the following conditions:

1. *The applicant shall submit a Business Registration application to the Office of Community Standards.*

Township Supervisor
Brenda L. Stumbo
Township Clerk
Heather Jarrell Roe
Township Treasurer
Stan Eldridge



**YPSILANTI
TOWNSHIP**
— PLANNING & ZONING DEPARTMENT —

Trustees
John Newman II
Gloria Peterson
Debbie Swanson
Ryan Hunter

2. *For the safety of all occupants and upon sufficient notice, the applicant shall permit, prior to operation of a childcare center, the facility to be inspected by the Township Building official and/or Fire Marshal to ensure compliance with the adopted property maintenance code.*
3. *The applicant owner shall comply with the Township Sign Ordinance.*
4. *The applicant shall repaint the parking lot striping/markings to ensure a safe and orderly vehicle maneuvering and parking for the public.*
5. *Any other conditions based upon Planning Commission discussion.*

Motion to deny:

“I move to deny the special use permit submitted by Zeinab Hassan to permit the establishment of a childcare center as described in this application, utilizing the existing building on the 1.7-acre site zoned R-5, One-Family Residential, located at 1122 Walnut Street, Ypsilanti, MI 48198, Parcel K-11-03-463-014, due to the following reasons:”

1. _____
2. _____
3. _____

Respectfully submitted,

Fletcher Reyher

Fletcher Reyher, AICP
Planning & Development Coordinator
Charter Township of Ypsilanti Planning Department

Charter Township of Ypsilanti

Office of Community Standards

7200 S. Huron Drive, Ypsilanti, MI 48197

Phone: (734) 485-3943

Website: <https://ytown.org>

OFFICE USE ONLY

All special conditional use applications

- | | |
|---|--|
| <ul style="list-style-type: none"><input type="checkbox"/> The application is filled out in its entirety and includes the signature of the applicant and, if different than the applicant, the property owner.<input type="checkbox"/> Name(s) and address(es) of all record owner(s) and proof of ownership. If the applicant is not the property owner, written and signed permission from the property owner is required<input type="checkbox"/> A detailed description of the proposed use.<input type="checkbox"/> A site plan, if requested by the planning commission<input type="checkbox"/> Fees | <ul style="list-style-type: none"><input type="checkbox"/> Scaled and accurate survey drawing, correlated with a legal description and showing:<ul style="list-style-type: none"><input type="checkbox"/> All property lines and dimensions<input type="checkbox"/> All existing and proposed structures and dimensions<input type="checkbox"/> Locations of drives, sidewalks, and other paved areas on the property and on the adjacent streets<input type="checkbox"/> Location and dimensions of the nearest structures on adjacent properties<input type="checkbox"/> Easements and dimensions, if applicable |
|---|--|

Zeinab Hassan
2395 S Huron Parkway
Ann Arbor MI 48104
BMT@bluemandmi.com
313-676-2779

AMENDED APPLICATION FOR ZONING USE DETERMINATION – June 18, 2024

Ypsilanti Township Planning Department

PURPOSE FOR AMENDMENT:

This Amendment is being provided to clarify the intended purpose of the facility and to explain the **similarities between the intended purpose and the current use.**

Currently, this building is used as a preschool and childcare center (“**School**”). Children with Autism Spectrum Disorder (ASD) were enrolled in the School and received extremely similar services to the services we offer. Our hope is to now use this building to provide a safe space for children with ASD and related developmental disabilities. In the end, this building has long been used for institutional and educational purposes and we intend to uphold that spirit.

Please consider the following points of clarification:

- While some of the terminology previously used is similar to terminology used by hospitals—**this is not a hospital.** This will be a place where parents can bring children with ASD and related developmental disabilities during the day, for care, education, and growth.
- We do not prescribe medication or perform medical procedures.
- “Applied behavior analysis therapy” for children with autism isn’t the same thing as traditional medical therapy.
- I intend to see a maximum of 35 students per day. The current owner is able to see a maximum of 77 students per day. **I intend to see roughly 42 less students than the current use.**
- I intend for my hours of operation to be Monday through Friday 8:00 AM until 8:00 PM, and some Saturdays from 9:00 AM until 5:00 PM. The current owner operates Monday through Friday 7:00 AM until 5:30 PM.
- A majority of our students live within two to seven miles of the facility.

The remaining portion of this letter will provide supportive information to the statements above and some new information.

Description of the Proposed Use:

Address: 1122 Walnut St, Ypsilanti, MI 48198

Type of Facility: Applied Behavior Analysis (ABA) Center for Childhood Therapy & Education.

Dear Members of the Ypsilanti Township Planning Department,

I hope this letter finds you well. I am writing to formally propose the use of 1122 Walnut St for an Applied Behavior Analysis (ABA) Center for Childhood Therapy & Education. Our intention is to operate this Center with the same or potentially even less capacity than the previous daycare center that occupied the premises.

Purpose of the Center:

Our Center aims to provide critical applied behavior analysis therapy, education and support services to children with Autism Spectrum Disorder (ASD) and related developmental disabilities, and will serve as a safe, welcoming, and therapeutic education environment for children who require ABA therapy & education to develop essential life skills, communication abilities, and behavioral management techniques. There are no medical related treatments, services or related activities offered or provided to our students. Our primary goals are to enhance the quality of life for our students and support their integration into the community.

Hours of Operation:

The 1122 Walnut Street Center plans to operate during standard business hours, Monday through Friday, from 8 am to 8 pm. Some Saturdays from 9 am to 5 pm. There will be no operation on holidays.

Student and Staff Capacity:

- Maximum Number of Students per Day: 35
 - Most students do not attend daily; many attend 2 or 3 days per week.
 - This means some days will have fewer students than others, based on their individual schedules.
 - The number of students varies throughout the day/week, depending on scheduling times.
- The Center employs the appropriate number of staff to maintain a 1:1 staff-to-student ratio, depending on the needs of the students scheduled for that day.
- Transportation Vehicle:
 - Currently, the Center uses one transportation vehicle to pick up and drop off students.
 - No plans to add more transportation vehicles as the current vehicle is sufficient.
 - A majority of students only live 5-10 minutes away from the building minimizing the need for several vehicles.
 - This vehicle reduces the need for multiple cars coming to the Center, minimizing traffic impact.
- Parking Spaces:

- There are 25 parking spots on site.
- These parking spots will likely not be fully utilized as parents only drop off and pick up their children without staying. We also have pick up schedules and protocols in place to ensure there is no disruption to neighboring areas.

Comparison to Previous Child Care Center Capacity:

- The previous child care license allowed up to 77 children, starting from infancy. ● On average, there were over 45 children present at any given day/time and could go up to the maximum of 77.
- BlueMind will have a lower maximum student capacity, reducing the overall impact on the neighborhood.
- The previous childcare staff capacity was a minimum of 15+ members and varied depending on the number of children present at a time.

About BlueMind Therapy:

At BlueMind Therapy, we are dedicated to making a meaningful difference in the lives of children with Autism Spectrum Disorder (ASD) and related developmental disabilities. Our commitment to excellence is reflected in our BHCOE (Behavioral Health Center of Excellence) National Accreditation. We are also credentialed with CMH (Community Mental Health) to provide high-quality Applied Behavior Analysis (ABA) Therapy & Education to our students.

One of the key reasons we have chosen the 1122 Walnut St location is because it is exceptionally convenient for our current students. Many of them struggle with reliable transportation, and this location is within walking distance for a significant number of them. This proximity will greatly reduce the transportation barriers that some of our students face, ensuring that they can access the critical services they need more easily.

Zoning Compliance:

We are fully committed to complying with all zoning regulations and requirements set forth by Ypsilanti Township. We understand the importance of adhering to local ordinances and will work closely with the Planning Department to ensure that our facility meets all necessary zoning and safety standards.

We kindly request your consideration and approval for the proposed use of 1122 Walnut St. We believe that our Center will be a valuable addition to the Ypsilanti Township community, providing essential services to children in need while respecting the character and integrity of the neighborhood.

If you require any additional information or have questions regarding our proposal, please do not hesitate to contact me at 313-676-2779 or bmt@bluemindmi.com. We appreciate your time and attention to this matter and look forward to working collaboratively with the Ypsilanti Township Planning Department.

Thank you for your consideration.

Sincerely,

Zeinab Hassan

M.A., BCBA, LBA



LARA Corporations
Online Filing System
Department of Licensing and Regulatory Affairs

ID Number: 803180764

Summary for: 1122 STREET WALNUT LLC

The name of the DOMESTIC LIMITED LIABILITY COMPANY: 1122 STREET WALNUT LLC

Entity type: DOMESTIC LIMITED LIABILITY COMPANY

Identification Number: 803180764

Date of Organization in Michigan: 03/15/2024

Purpose: All Purpose Clause

Term: Perpetual

The name and address of the Resident Agent:

Resident Agent Name: VANITA BIRD

Street Address: 1122 WALNUT STREET

Apt/Suite/Other:

City: YPSILANTI

State: MI

Zip Code: 48198

Registered Office Mailing address:

P.O. Box or Street Address: 1122 WALNUT STREET

Apt/Suite/Other:

City: YPSILANTI

State: MI

Zip Code: 48198

Act Formed Under: 023-1993 Michigan Limited Liability Company Act

Acts Subject To: 023-1993 Michigan Limited Liability Company Act

Managed By:

Members

View filings for this business entity:

Comments or notes associated with this business entity:

SERVICE CONTRACT

BETWEEN

County of Washtenaw

AND

BlueMind THERAPY



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This contractual agreement, herein referred to as the "Contract" is entered into pursuant to the authority granted by Act 258 of the Public Acts of 1974 (hereinafter referred to as the "Mental Health Code"), as amended. This Contract is in accordance with the Michigan Department of Health and Human Services (MDHHS)/CMHSP Managed Mental Health Supports and Services contract for general funds; and the MDHHS/PIHP Master Contract for Medicaid Funds entered into by MDHHS and the Community Mental Health Partnership of Southeast Michigan (CMHPSM) as the Prepaid Inpatient Health Plan (PIHP); and the contractual agreement with Office of Drug Control Policy; and the rules, regulations, and standards (hereinafter referred to as "Rules") adopted and promulgated by MDHHS. Said Acts, Contracts, and Rules shall govern in any area not specifically covered in this Contract.

ARTICLE II: DEFINITIONS / ACRONYMS

ARRA: American Recovery and Reinvestment Act

Centers for Disease Control and Prevention (CDC): The Centers for Disease Control and Prevention is a national public health institute in the United States. It is a United States federal agency, under the Department of Health and Human Services.

CFR: Code of Federal Regulations

Community Mental Health Partnership of Southeast Michigan (CMHPSM): The prepaid inpatient health plan for the counties of Lenawee, Livingston, Monroe, and Washtenaw, identified as Region Six by the Michigan Department of Health and Human Services.

Community Mental Health Services Program (CMHSP): A program operated under Chapter Two of the Michigan Mental Health Code.

Consumer/Beneficiaries/Recipients: Individuals to be served under this Contract.

Current Procedural Terminology (CPT) Codes: Are billing codes published by the American Medical Association to provide uniform language that accurately describes services provided.

Electronic Health Record (EHR): An electronic version of a patient's medical history, that is maintained by the provider over time, and may include all of the key administrative clinical data relevant to a patient's care under a particular provider, including demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data and radiology reports.

Early Periodic Screening Diagnosis and Treatment (EPSDT): Medicaid's comprehensive and preventative child health program for beneficiaries under age twenty-one.

GAGAS: Generally Accepted Government Auditing Standards

Healthcare Common Procedure Coding System (HCPCS): Healthcare procedure codes utilized for claims payment related to service provision based upon CPT standards set by the American Medical Association.

HCEA: Health Care Finance Administration

Individual Plan of Service (IPOS): An individual plan of service supporting a consumer that builds upon an individual's capacity to engage in activities that promote community life and that honor the individual's preference, choices, and abilities. The process is directed by the consumer and focuses on his/her desires, dreams, strengths, and need for support.

OMB: Office of Management and Budget

ORR: Office of Recipient Rights

Michigan Department of Health and Human Services (MDHHS): The Michigan Department of Health and Human Services is a principal department of the State of Michigan, headquartered in Lansing, that provides public assistance, child, and family welfare services, and oversees health policy and management.

Performance Improvement/Quality Improvement: The mechanism by which the CONTRACTOR measures the quality of its service delivery and implements changes when improvement is needed, or replicates strengths.

Prepaid Inpatient Health Plan (PIHP): A term contained in federal regulations from the Centers for Medicare & Medicaid Services. It means an entity that 1) provides medical services to enrollees under contract with the state Medicaid agency on the basis of prepaid capitation payments, 2) includes responsibility for arranging inpatient hospital care, and 3) does not have a comprehensive risk contract.

Protected Health Information (PHI): Under US law is any information about health status, provision of health care, or payment for health care that is created or collected by a "Covered Entity" (or a Business Associate of a Covered Entity) and can be linked to a specific individual.

USC: United States Code.

ARTICLE III: POLICIES

CONTRACTOR shall follow all CMHSP and CMHPSM/PIHP policies and procedures that are applicable to service providers. All CMHPSM/PIHP regional policies and procedures can be found at [CMHPSM Regional Policies](#).

ARTICLE IV: CONTRACT TERM

This Contract shall be in effect from **September 15, 2022**, to **September 30, 2024**, inclusive, with an option to extend for two (2) additional one (1) year periods. The option to extend shall be executed by written notification to the CONTRACTOR prior to the expiration of the current term. This Contract shall terminate at the end of its current term if the option to extend is not exercised.

**SERVICE CONTRACT
with
BlueMind THERAPY**

This contract is between the **County of Washtenaw**, on behalf of the Washtenaw County Mental Health Agency, a municipal corporation, located at 555 Towner Street, Ypsilanti, MI 48198 (hereinafter referred to as "CMHSP"), and **BlueMind THERAPY** located at 2395 Huron Parkway, Ann Arbor, Michigan, 48104 (hereinafter referred to as "CONTRACTOR").

ARTICLE I: CONTRACT AUTHORITY

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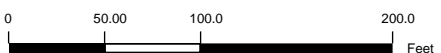
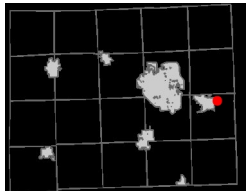
USC: United States Code.

ARTICLE III: POLICIES

CONTRACTOR shall follow all CMHSP and CMHPSM/PIHP policies and procedures that are applicable



1118 & 1122 Walnut St., Ypsilanti Township
 © 2013 Washtenaw County



1: 1,200

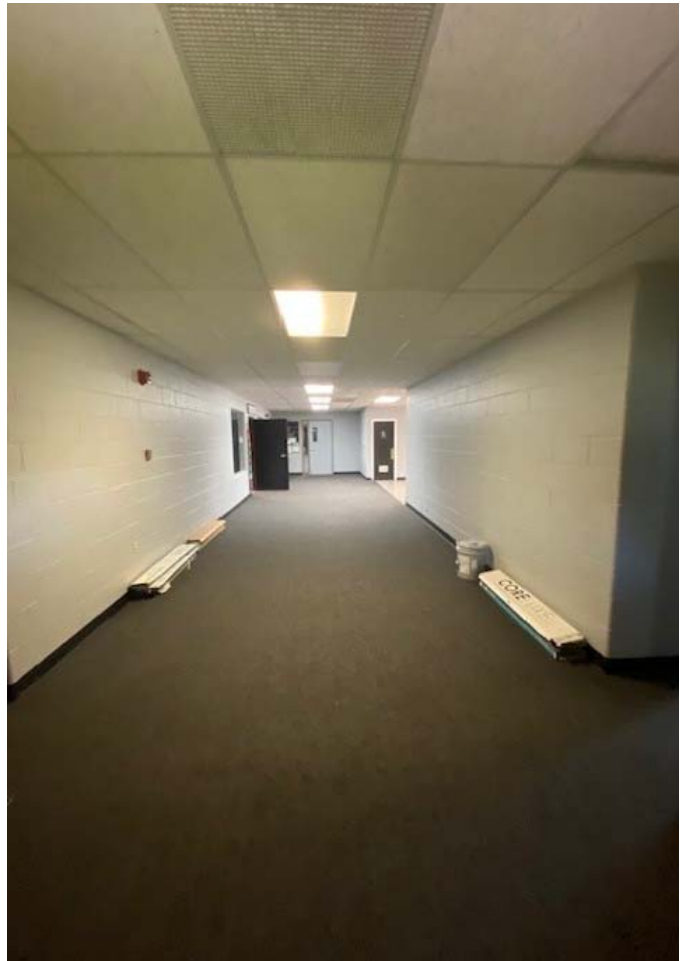
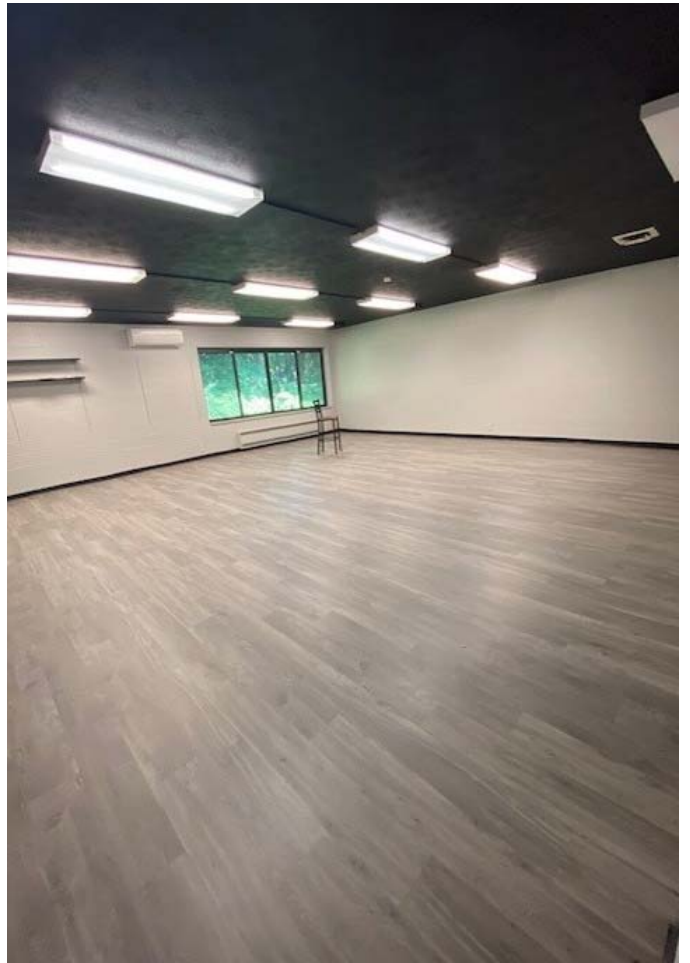
6/6/2023

THIS MAP REPRESENTS PARCELS AT THE TIME OF PRINTING. THE OFFICIAL PARCEL TAX MAPS ARE MAINTAINED SOLELY BY THE WASHTENAW COUNTY EQUALIZATION DEPARTMENT AND CAN BE OBTAINED BY CONTACTING THAT OFFICE AT 734-222-6662.

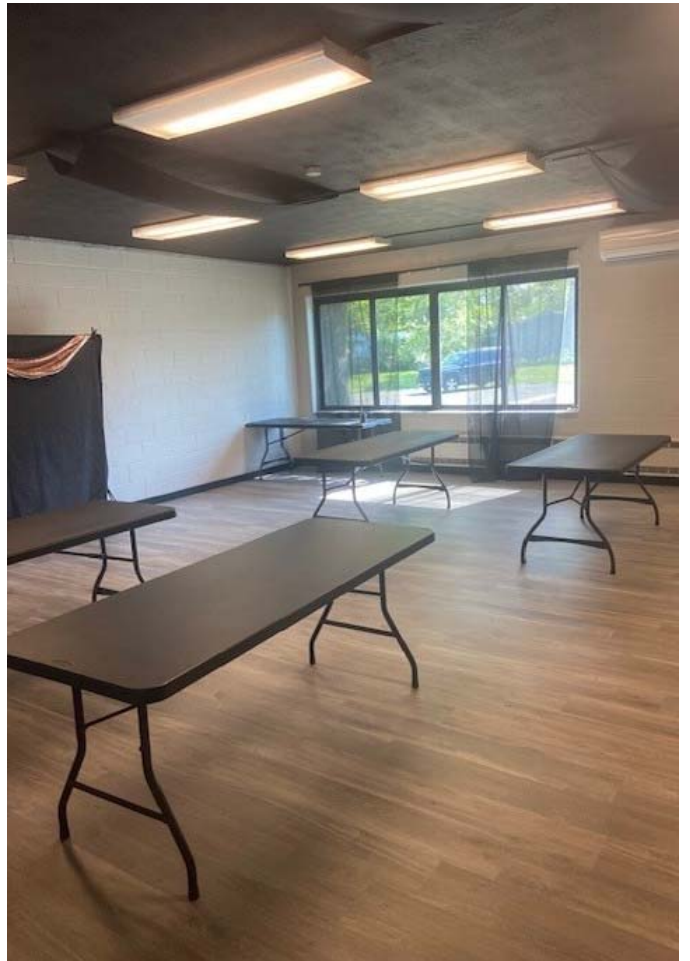
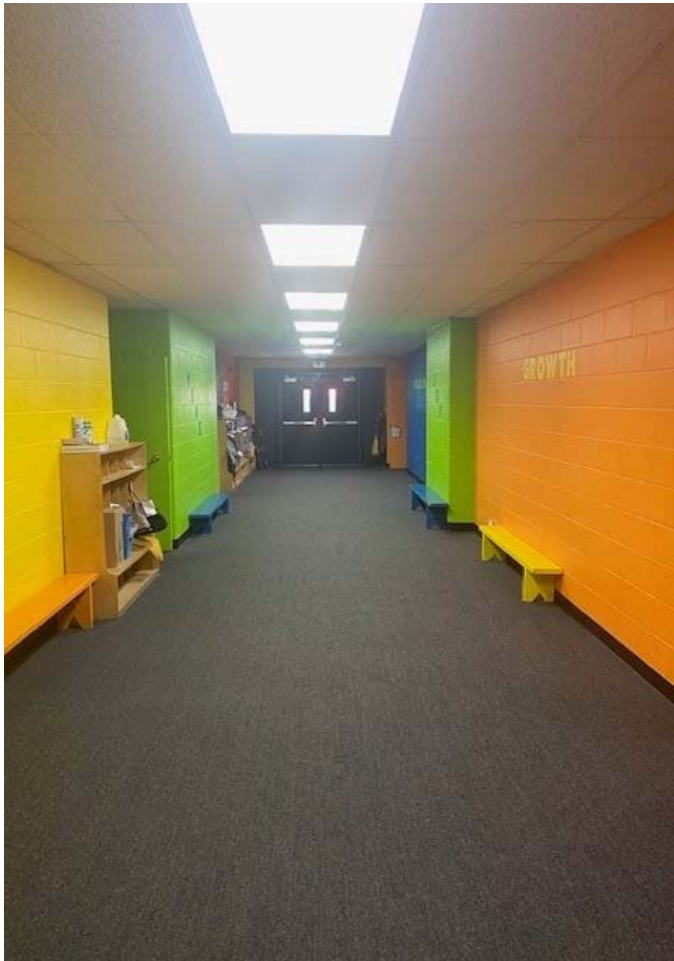
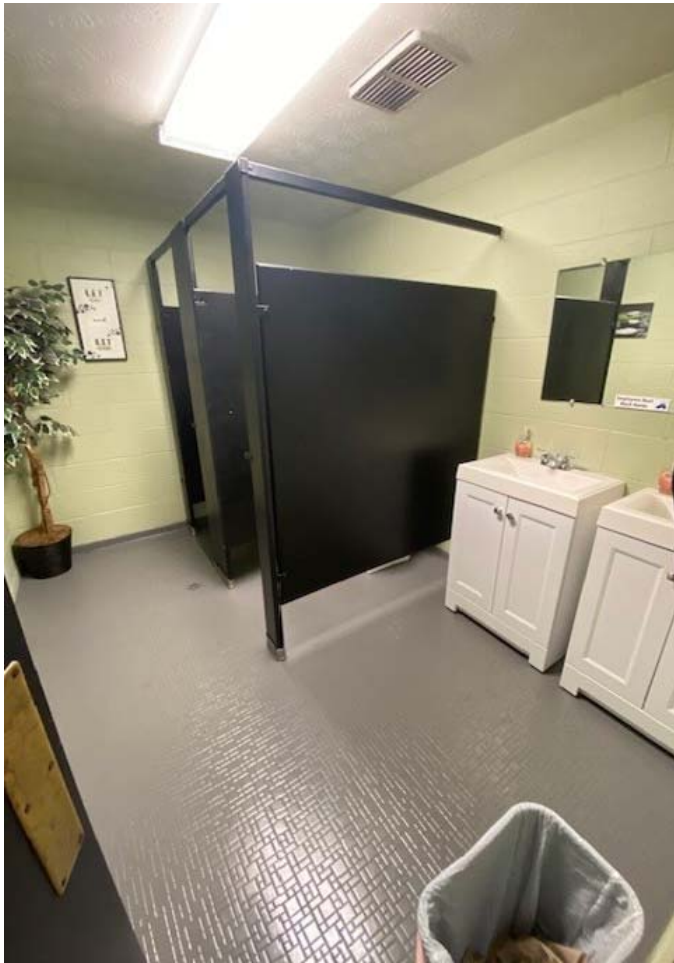


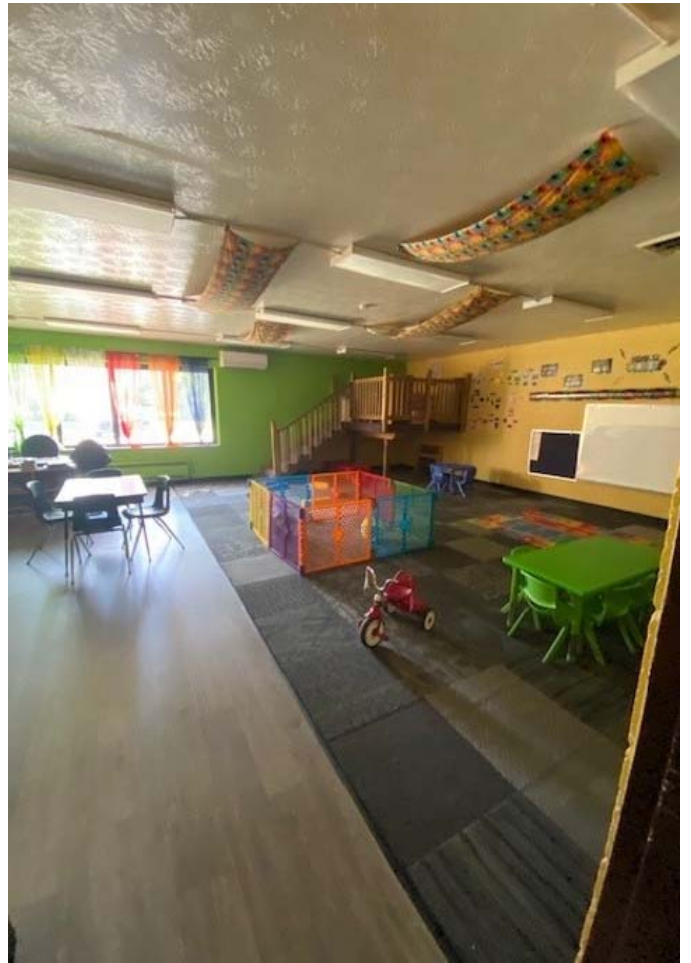
NOTE: Parcels may not be to scale.
 The information contained in this cadastral map is used to locate, identify and inventory parcels of land in Washtenaw County for appraisal and taxing purposes only and is not to be construed as a "survey description". The information is provided with the understanding that the conclusions drawn from such information are solely the responsibility of the user. Any assumption of legal status of this data is hereby disclaimed.

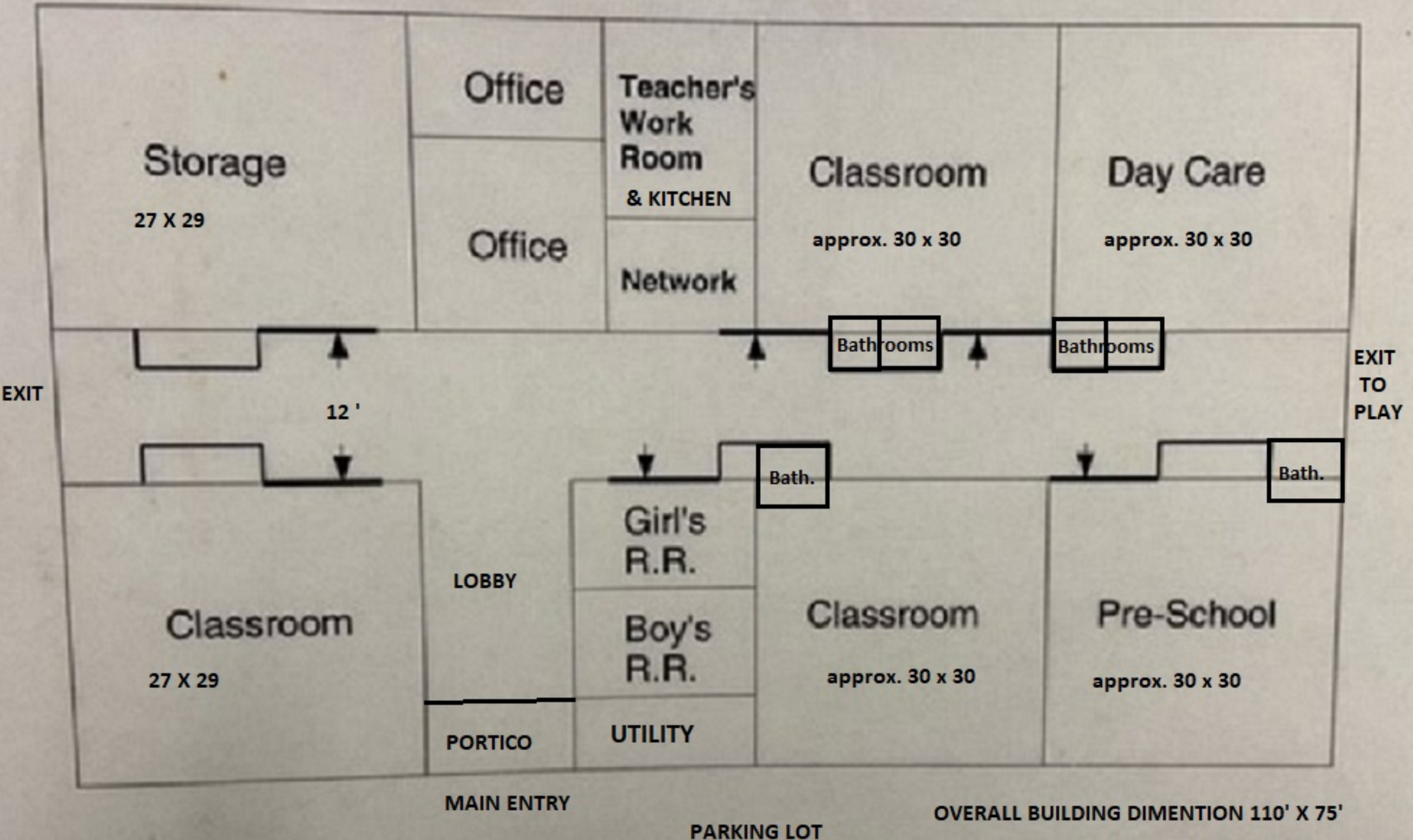












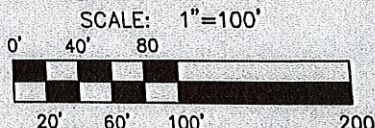
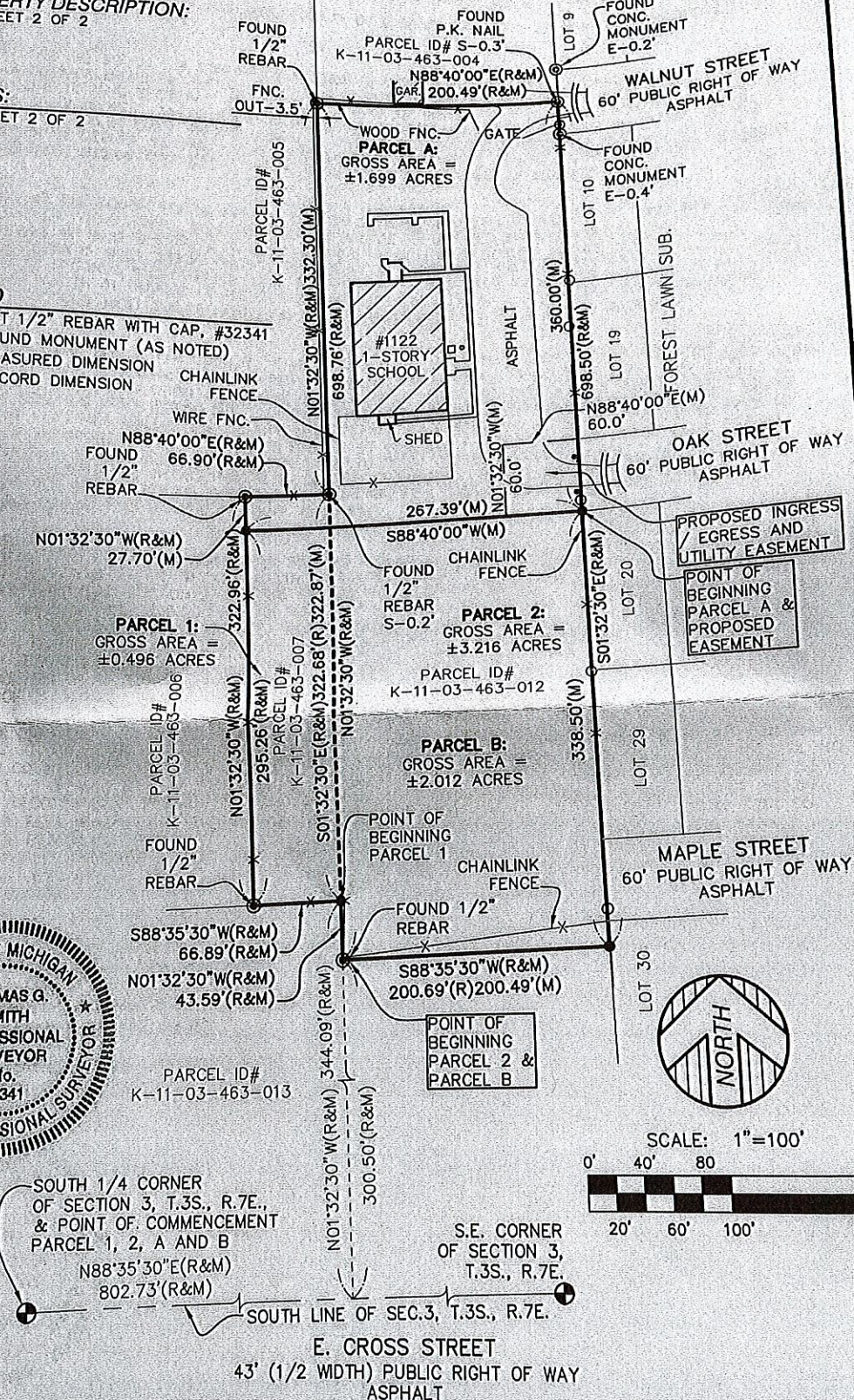
CERTIFIED BOUNDARY / SPLIT SURVEY

PROPERTY DESCRIPTION:
SEE SHEET 2 OF 2

NOTES:
SEE SHEET 2 OF 2

LEGEND

- SET 1/2" REBAR WITH CAP, #32341
- ⊙ FOUND MONUMENT (AS NOTED)
- (M) MEASURED DIMENSION
- (R) RECORD DIMENSION



SOUTH 1/4 CORNER OF SECTION 3, T.3S., R.7E., & POINT OF COMMENCEMENT PARCEL 1, 2, A AND B
 N88°35'30"E(R&M) 802.73'(R&M)

S.E. CORNER OF SECTION 3, T.3S., R.7E.

SOUTH LINE OF SEC.3, T.3S., R.7E.

E. CROSS STREET
 43' (1/2 WIDTH) PUBLIC RIGHT OF WAY
 ASPHALT

I HEREBY CERTIFY THAT I HAVE SURVEYED THE LAND HEREIN PLATTED AND DESCRIBED AND THAT THE RATIO OF CLOSURE MEETS THE REQUIREMENTS OF PUBLIC ACT 132 OF 1970.

Thomas G. Smith

THOMAS G. SMITH, P.S. NO. 32341

KEM-TEC & ASSOCIATES
 22556 GRATIOT AVE. EASTPOINTE, MI 48021
 PROFESSIONAL SURVEYORS - PROFESSIONAL ENGINEERS
 (586)772-2222 * FAX (586)772-4048

CERTIFIED TO: CALVARY BAPTIST CHURCH	
FIELD SURVEY: TS MR	DATE: JANUARY 17, 2017
DRAWN BY: DLD	SHEET: 1 OF 2
SCALE: 1" = 100'	JOB NO.: 17-00001

CERTIFIED BOUNDARY / SPLIT SURVEY

PROPERTY DESCRIPTION:

LAND SITUATED IN THE TOWNSHIP YPSILANTI, COUNTY OF WASHTENAW, STATE OF MICHIGAN, DESCRIBED AS FOLLOWS:

PARCEL 1:

COMMENCING AT THE SOUTH 1/4 CORNER OF SECTION 3, TOWN 3 SOUTH, RANGE 7 EAST, YPSILANTI TOWNSHIP, WASHTENAW COUNTY, MICHIGAN; THENCE NORTH 88 DEGREE 35 MINUTES 30 SECONDS EAST 802.73 FEET ALONG THE SOUTH LINE OF SAID SECTION 3 AND THE CENTERLINE OF CROSS STREET; THENCE NORTH 01 DEGREE 32 MINUTES 30 SECONDS WEST 344.09 FEET TO THE POINT OF BEGINNING; THENCE SOUTH 88 DEGREE 35 MINUTES 30 SECONDS WEST 66.89 FEET; THENCE NORTH 01 DEGREE 32 MINUTES 30 SECONDS WEST 322.96 FEET; THENCE NORTH 88 DEGREE 40 MINUTES 00 SECONDS EAST 66.90 FEET; THENCE SOUTH 01 DEGREE 32 MINUTES 30 SECONDS WEST 322.68 FEET (322.87 FEET MEASURED) TO THE POINT OF BEGINNING.

PARCEL 2:

COMMENCING AT THE SOUTH 1/4 CORNER OF SECTION 3, TOWN 3 SOUTH, RANGE 7 EAST, YPSILANTI TOWNSHIP, WASHTENAW COUNTY, MICHIGAN; THENCE NORTH 88 DEGREE 35 MINUTES 30 SECONDS EAST 802.73 FEET ALONG THE SOUTH LINE OF SAID SECTION 3 AND THE CENTERLINE OF CROSS STREET; THENCE NORTH 01 DEGREE 32 MINUTES 30 SECONDS WEST 300.50 FEET TO THE POINT OF BEGINNING; THENCE CONTINUING NORTH 01 DEGREE 32 MINUTES 30 SECONDS WEST 698.75 FEET; THENCE NORTH 88 DEGREE 40 MINUTES 00 SECONDS EAST 200.49 FEET; THENCE SOUTH 01 DEGREE 32 MINUTES 30 SECONDS EAST 698.50 FEET; THENCE SOUTH 88 DEGREE 35 MINUTES 30 SECONDS WEST 200.69 FEET (200.49 FEET MEASURED) TO THE POINT OF BEGINNING.

PARCEL A:

COMMENCING AT THE SOUTH 1/4 CORNER OF SECTION 3, TOWN 3 SOUTH, RANGE 7 EAST, YPSILANTI TOWNSHIP, WASHTENAW COUNTY, MICHIGAN; THENCE NORTH 88 DEGREE 35 MINUTES 30 SECONDS EAST 802.73 FEET ALONG THE SOUTH LINE OF SAID SECTION 3 AND THE CENTERLINE OF CROSS STREET; THENCE NORTH 01 DEGREE 32 MINUTES 30 SECONDS WEST 300.50 FEET; THENCE NORTH 88 DEGREE 35 MINUTES 30 SECONDS WEST 338.50 FEET TO THE POINT OF BEGINNING; THENCE SOUTH 88 DEGREE 40 MINUTES 00 SECONDS WEST 267.39 FEET; THENCE NORTH 01 DEGREE 32 MINUTES 30 SECONDS WEST 27.70 FEET; THENCE NORTH 88 DEGREE 40 MINUTES 00 SECONDS EAST 66.90 FEET; THENCE NORTH 01 DEGREE 32 MINUTES 30 SECONDS WEST 332.30 FEET; THENCE NORTH 88 DEGREE 40 MINUTES 00 SECONDS EAST 200.49 FEET; THENCE SOUTH 01 DEGREE 32 MINUTES 30 SECONDS EAST 360.00 FEET TO THE POINT OF BEGINNING.

PARCEL B:

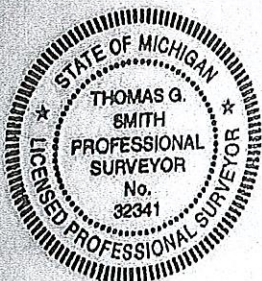
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PROPOSED EASEMENT:

COMMENCING AT THE SOUTH 1/4 CORNER OF SECTION 3, TOWN 3 SOUTH, RANGE 7 EAST, YPSILANTI TOWNSHIP, WASHTENAW COUNTY, MICHIGAN; THENCE NORTH 88 DEGREE 35 MINUTES 30 SECONDS EAST 802.73 FEET ALONG THE SOUTH LINE OF SAID SECTION 3 AND THE CENTERLINE OF CROSS STREET; THENCE NORTH 01 DEGREE 32 MINUTES 30 SECONDS WEST 300.50 FEET; THENCE NORTH 88 DEGREE 35 MINUTES 30 SECONDS EAST 200.69 FEET (200.49' FEET MEASURED); THENCE NORTH 01 DEGREE 32 MINUTES 30 SECONDS WEST 338.50 FEET TO THE POINT OF BEGINNING; THENCE SOUTH 88 DEGREE 40 MINUTES 00 SECONDS WEST 60.00 FEET; THENCE NORTH 01 DEGREE 32 MINUTES 30 SECONDS WEST 60.00 FEET; THENCE NORTH 88 DEGREE 40 MINUTES 00 SECONDS EAST 60.00 FEET; THENCE SOUTH 01 DEGREE 32 MINUTES 30 SECONDS EAST 60.00 FEET TO THE POINT OF BEGINNING.

NOTES:

1. A CURRENT TITLE POLICY HAS NOT BEEN FURNISHED AT TIME OF SURVEY, THEREFORE EASEMENTS AND/OR ENCUMBRANCES AFFECTING SUBJECT PARCEL MAY NOT BE SHOWN.
2. ALL PROPERTY SPLITS REQUIRE PRIOR CITY, TOWNSHIP, COUNTY, AND/OR STATE APPROVAL.



I HEREBY CERTIFY THAT I HAVE SURVEYED THE LAND HEREIN PLATTED AND DESCRIBED AND THAT THE RATIO OF CLOSURE MEETS THE REQUIREMENTS OF PUBLIC ACT 132 OF 1970.

Thomas G. Smith

THOMAS G. SMITH, P.S. NO. 32341

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CERTIFIED TO: CALVARY BAPTIST CHURCH	
FIELD SURVEY: TS MR	DATE: JANUARY 17, 2017
DRAWN BY: DLD NS	SHEET: 2 OF 2
SCALE: N/A	JOB NO.: 17-00001

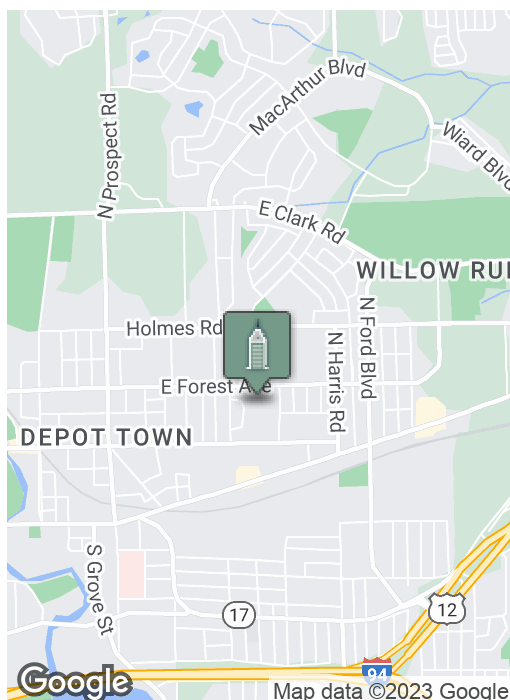
School / Daycare / Church

1122 WALNUT STREET, YPSILANTI TWP, MI 48198



Swisher
COMMERCIAL

FOR SALE



SUMMARY

Sale Price:	\$550,000
Lot Size:	1.7 Acres
Building Size:	7,622 SF
Zoning:	R-5 (Conditional Use Approved)

PROPERTY HIGHLIGHTS

- Zoning allows for School / Church / Daycare / Assembly
- Turn-key building in exceptional condition
- Some FF&E included with sale
- Owner may consider long-term lease to qualified tenant

Building relationships.

208 East Washington Street Ann Arbor, MI 48104

734.663.0501

Tony Caprese

734.904.3521

TONYCAP@SWISHERCOMMERCIAL.COM

SWISHERCOMMERCIAL.COM



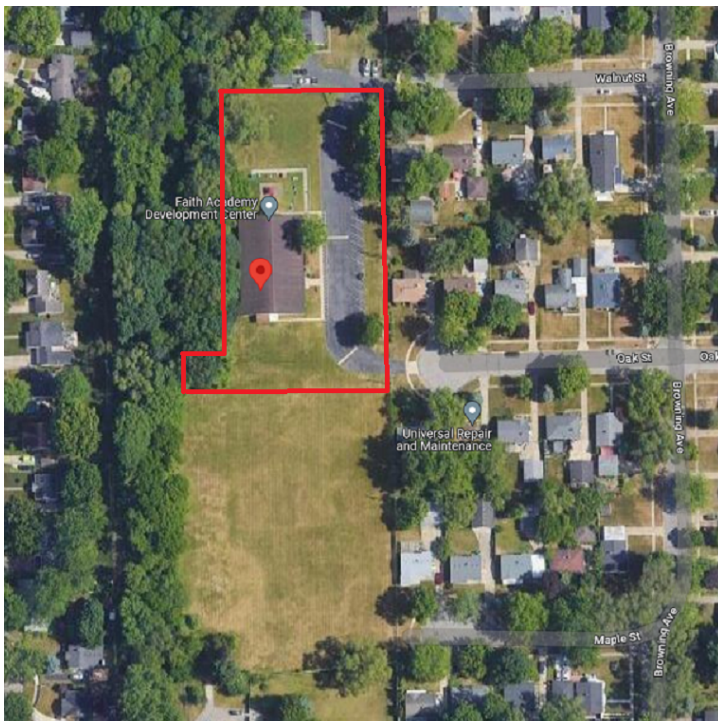
PROPERTY DESCRIPTION

Exceptional property utilized last 10 years for successful Child Care business. Previously Calvary Baptist Church.

Building is in turn-key condition for future childcare business or easily converted to school or church with Special Use zoning approval.

Building has main entrance and two end unit entrances, private office, lounge, kitchen, visitor restrooms, six (6) large meeting/classrooms each having a private restroom, 9' ceilings, electric heat and a large fenced in playground area. Some of existing furniture, fixtures & equipment are included in sale price.

Owner may also consider a long-term lease for qualified tenant.



LOCATION DESCRIPTION

Located in Ypsilanti Township, south of E. Forest Ave between N. Prospect Rd and N. Harris Rd.

SITE DESCRIPTION

Building is located in a residential neighborhood with access into parking lot at end of Walnut & Oak Street cul-de-sacs. Surface lot has 20 parking spaces.

Building relationships.

208 East Washington Street Ann Arbor, MI 48104

734.663.0501

Tony Caprrese

734.904.3521

TONY@SWISHERCOMMERCIAL.COM

SWISHERCOMMERCIAL.COM

For Sale - School / Daycare / Church

1122 WALNUT STREET, YPSILANTI TWP, MI 48198



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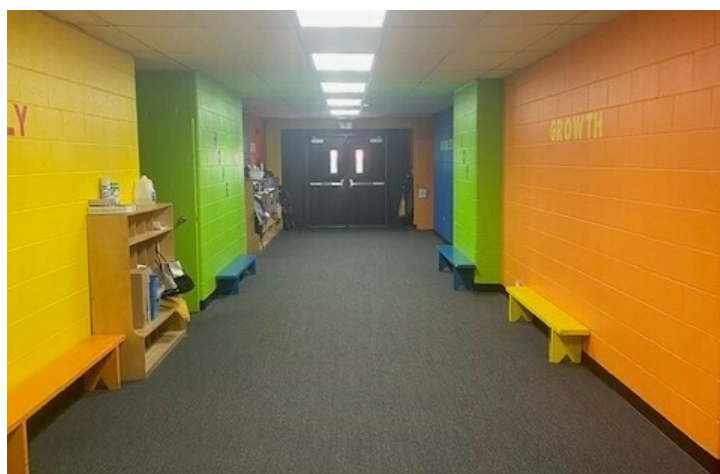
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