



Memorandum

To: Planning Commission Members
From: Elizabeth J Corwin, PE, AIPC; Planning Director
Date: July 11, 2024
Re: School Bell Child Care Center Expansion
4501 W Highland
PIN 11-30-101-002
URSA 24-03/SPR 24-04

The project submitted for your consideration is the addition of a second, modern building to house the child care center at 4501 W. Highland. The center is currently housed in a historic building, but its use as a child care center was established in the 1980's.

The owner has explained that the project is proposed to provide upgraded facilities for the existing clients, not in an effort to expand the service or add new employees. The existing historic structure will be maintained on site and put to a different use, such as office or storage. The Planning Commission may wish to consider what ancillary uses would be appropriate given that this is a residential neighborhood with LV, Lakes and Villages Zoning.

Staff has not received any phone calls or correspondence from the adjoining neighborhood during the public notice period.

Carlisle-Wortman Associates has provided a review and analysis of the site as well as the Special Land Use Approval Standards. Hubbell, Roth & Clark has provided a review of the engineering concepts. The fire Marshall has also provided a report.





Carlisle | Wortman
ASSOCIATES, INC.

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

Date: July 10, 2024

Special Land Use Review For Highland Township, Michigan

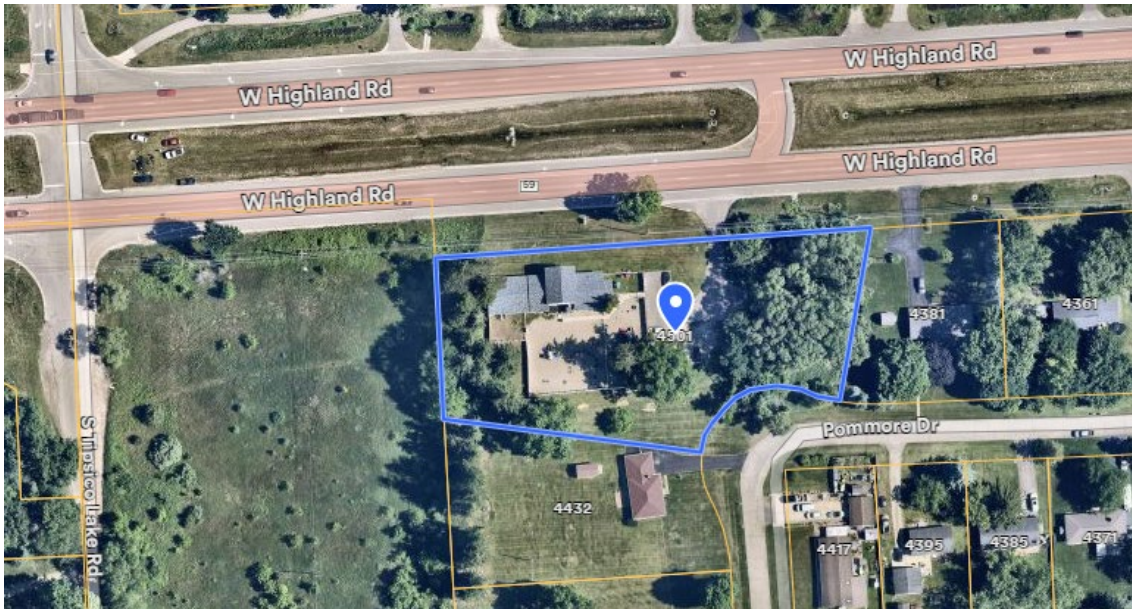
Applicant:	School in the Pines Inc. and Marc Kasabasic
Project Name:	School Bell Child Care
Plan Date:	May 31, 2024
Location:	4501 West Highland Road Parcel #11-30-101-002 East of Highland Road and South Tipsico Lake Road Intersection
Zoning:	Lakes and Villages (LV)
Action Requested:	Special Land Use Preliminary Site Plan Approval

PROJECT AND SITE DESCRIPTION

The applicant has submitted a preliminary site plan dated May 31, 2024, that proposes an expansion of the existing childcare center at 4501 West Highland Road (#11-30-101-002) with an additional building is 7,621 square feet. The number of students at the daycare center is proposed to increase from fifty (50) students to ninety-six (96) students. The existing building is proposed to remain and continue to be used. A new dumpster pad, concrete walk, and an asphalt parking area.

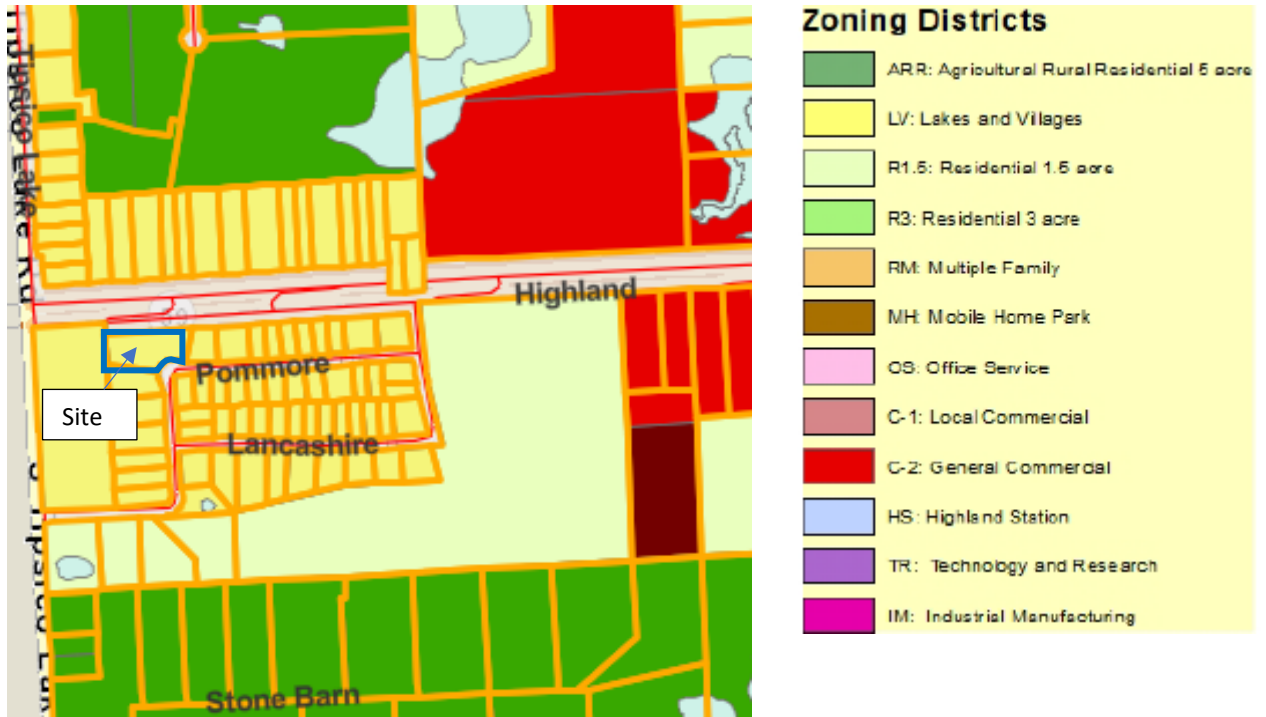
The proposed building is proposed on the east side of the parcel across from the existing building and parking area. The proposed Child Care Center is permitted through Special Land Use approval in the Lakes and Villages Zoning District. Figure 1 provides an aerial image of the current site outlined in blue. Figure 2 shows the zoning of the site and surrounding parcels.

Figure 1. Aerial Image of Subject Site and Vicinity



Source: NearMap

Figure 2. Zoning Map



The intent of the Lakes and Villages Residential District is:

"It is the intent of these districts to provide for single-family detached residential development in Highland Township at varying densities which are consistent with the

existing and desirable future pattern of development in the Township. It is the goal of the Township to protect single-family residential development from the encroachment of incompatible land uses. The Residential R-3, R-1.5 and LV Zoning Districts are distinguished by varying residential densities to accommodate a wide range of existing and future residential preferences in the Township.

The R-3 and R-1.5 Districts are intended for lower density rural residential development. The R-3 and R-1.5 Districts are designated in the northern, western and southern portions of the Township, consistent with the Township Master Plan. Restricting these areas to lower density use will help ensure that the majority of future development occurs in the central portion of the Township, where public services can be more economically provided.

The LV - Lake and Village, Residential Zoning District consists of historical small lot settlements around the lakes as well as developments within the Township. LV regulations are intended to preserve established development patterns. No new LV Districts shall be created in the Township, except that new parcels within the LV Zoning District may be created through land division and combination."

Items to be Addressed: None.

NEIGHBORING ZONING, LAND USE AND MASTER PLAN

Table 1 lists the existing land use, zoning, and master plan future land use designations of the subject site and neighboring properties. Figure 3 shows the land use designations for the subject site and surrounding properties from the Future Land Use Map last updated on September, 9, 2021.

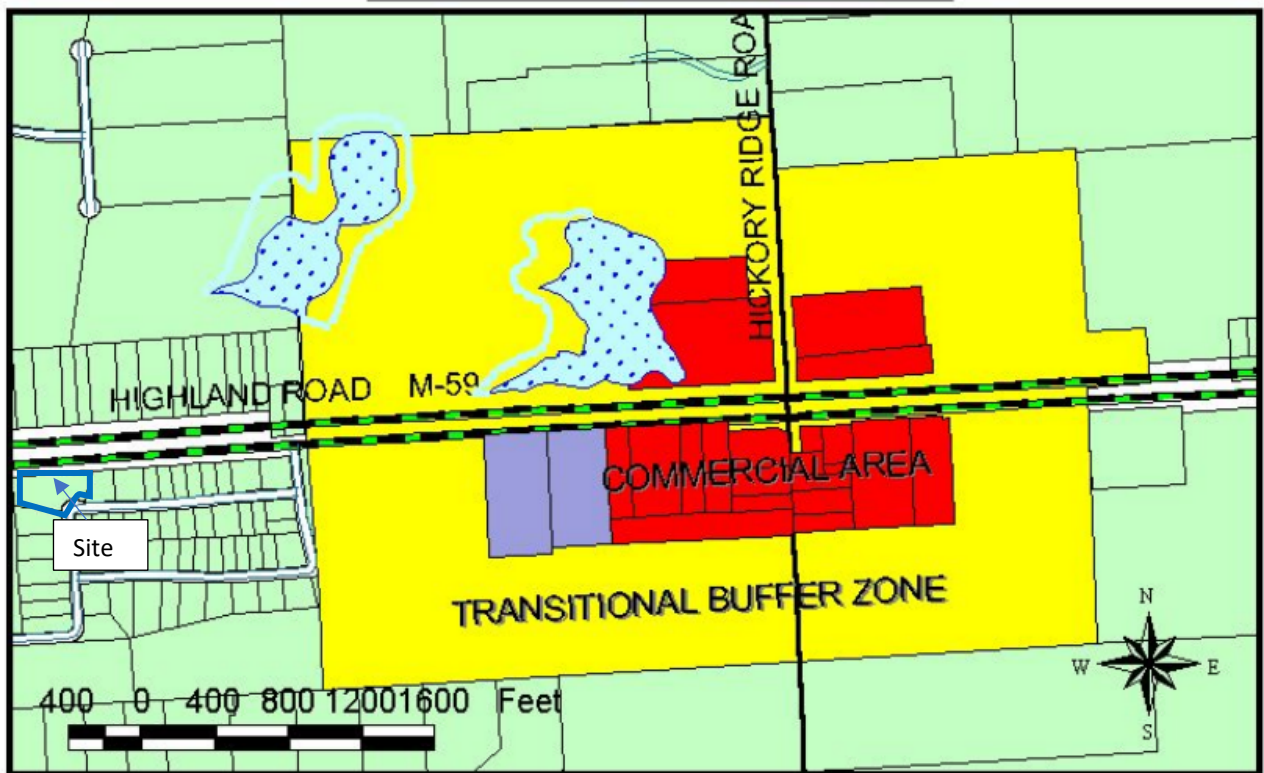
Table 1. Existing Land Use, Zoning Districts, and Future Land Use Designations

	Existing Land Use	Zoning	Future
Subject Site	Day Care Center	Lakes and Villages (LV)	Medium and Small Lot (LV Zoning)
North	Single Family Residential	Lakes and Villages (LV)	Medium and Small Lot (LV Zoning)
South	Single Family Residential	Lakes and Villages (LV)	Medium and Small Lot (LV Zoning)
East	Single Family Residential	Lakes and Villages (LV)	Medium and Small Lot (LV Zoning)
West	Vacant	Lakes and Villages (LV)	Medium and Small Lot (LV Zoning)

Figure 3. Future Land Use Map



Figure 4. West Highland Micro-Area Analysis Commercial Area and Potential Transitional Buffer



The 2000-2020 Comprehensive Land Use Plan does not address day care centers in areas planned for residential specifically. The site is located in the West Highland Micro-Area Analysis Master Land Use Amendment adopted in 2001. In that document, the subject site and the surrounding property are designated as medium and small lot residential. That document emphasizes the retention of "rural atmosphere" by the preservation of open space along major thoroughfares, such as Highland Road. The micro-area analysis seeks the development of distinct, compact commercial districts, specifically at Highland Road and Hickory Ridge Road, as shown in Figure 4.

Items to be Addressed: None.

AREA, WIDTH, HEIGHT, SETBACKS

The following table summarizes the Coverage, Placement, and Height Regulations for the site plan associated with the use. The proposed structures appear to meet all dimensional regulations of the zoning ordinance.

Table 2. Coverage, Placement, and Height Regulations

	Required	Provided
Lot Coverage	35 % Max	34.7%
Front Setback	40 Feet	40 Feet
Side Setback	10 Feet Minimum (Minimum Total of Both Sides=30 Feet)	10 Feet >30 Feet
Rear Setback	40 Feet	52 Feet
Building Height	2 Stories or 28 Feet	27 Feet 10 Inches

Items to be Addressed: None.

BUILDING LOCATION AND SITE ARRANGEMENT

The facility will be accessible from Highland Road (M-59). The proposed layout allows proper vehicular circulation as shown on Sheet 9. The plan includes the creation of an additional reserve field and septic field on the Southern end of the parcel.

Items to be Addressed: None.

PARKING, LOADING

The required parking for daycare centers, per Section 11.02 of the Highland Township Zoning Ordinance, is two (2) spaces, plus one (1) additional space for each eight (8) children of licensed authorized capacity. The proposed building will be licensed for ninety-six (96) children with the requirement of fourteen (14) parking spaces. The applicant has provided fifteen (15) parking spaces including one (1) handicap accessible space.

Items to be Addressed: None.

FENCING

The applicant is proposing 778 lineal feet of vinyl fencing at heights of four (4) feet and six (6) feet along the rear perimeter. The plans do not delineate where the fence is proposed to be four (4) feet or six (6) feet.

Items to be Addressed: 1) Applicant to show where fence is proposed to be four (4) feet and where fence is to be six (6) feet. 2) Planning Commission input on screening requirements per Section 12.04.

SITE ACCESS AND CIRCULATION

The applicant provides an emergency vehicle circulation plan on Sheet 9, which demonstrates proper vehicular traffic flow.

We defer to Engineering and the Fire Chief for further consideration.

Items to be Addressed: None.

NATURAL FEATURES

The parcel is mostly developed. The remaining eastern half of the site is moderately wooded with a stand of trees.

The site slopes from the center outwardly at 1-3% in all directions. The site generally drains from the center to the north onto W Highland Road (M-59) with the remaining drainage following the site slopes.

The NRCS soils on the whole property are Fox Sandy Loam at 1-6% slope which is consistent with the general character of the slopes on the site.

Items to be Addressed: None.

LANDSCAPING

The applicant has provided a landscape plan which meets the Zoning Ordinance requirements with approval and determinations by the Planning Commission, as shown in the Table 3.

Table 3. Landscaping Requirements

Landscaping Requirement	Required	Provided	Complies
Screening Between Land Uses	6 ft height visual screen (Section 12.04)	6 new conifer trees, 1 new deciduous tree, 5 existing deciduous trees (south)	Planning Commission to determine type conifer hedge, solid wall, or decorative fence
		3 existing deciduous trees (east)	
Parking Lot Landscaping	1 tree + 3 shrubs per 8 spaces Section 12.05 (A)	1.75 trees + 5.25 shrubs for 15 spaces (1.75 trees, 5.25 shrubs)	Planning Commission to determine appropriate location
Landscaping Adjacent to Public Rights-of-Way	Landscaped berm, wall, or sufficient plantings (3 ft height) Section 12.05 (B)	4-foot high-opacity deciduous shrub row along M-59 side of lot (17 shrubs)	Complies
Greenbelts	20 ft width for non-residential on Highland Road (M-59)	Highland Road/M-59: 20 feet, 15 deciduous trees (425 linear feet)	Complies
	12 ft width for other non-residential uses	Pommere Drive: 20 feet, 6 deciduous trees (172 linear feet)	
	1 tree/30 linear feet of frontage	1 existing deciduous tree + 14 deciduous trees (Highland Road)	
		5 existing deciduous trees + 1 deciduous tree (Pommere Drive)	
Site Landscaping	15% of site area (7,507 sq ft or 0.243 acres) (Section 12.07)	Total Landscaped 16,115 sq ft (0.370 acres)	Complies
		West Side Yard: 7,053 sq ft	
		East Side Yard: 2,943 sq ft	
		Foundation Planting: 914 sq ft	
		Rear Yard: 5,205 sq ft	

Landscaping Requirement	Required	Provided	Complies
Screening of Trash Containers	All sides screened with opaque fence or wall and gate (Section 12.09)	6 ft height walled enclosure with gate included	Complies

Items to be Addressed: 1) Planning Commission to determine type conifer hedge, solid wall, or decorative fence. 2) Planning Commission to determine appropriate location for parking lot landscaping.

LIGHTING

A sufficient lighting plan has been provided on Sheet E-04. A photometric plan indicates that the light levels at property lines are acceptable. Planned lighting is indicated to be included on Sheet E-01, which is not included.

Items to be Addressed: Include Sheet E-01 for fixture locations, specifications, and other lighting system information.

SIGNS

Site plan does include a wall mounted sign on Sheet A-10. The sign includes 10 individual letters, occupies 1.4 square feet per linear foot of building, and 14 square feet of total wall area. The proposed sign is in compliance with the standards set forth in Section 14.03.

Items to be Addressed: Number and size of signs is to be determined by the intended use of the parcel by the Planning Commission.

FLOOR PLAN AND ELEVATIONS

Floor plan and elevation sheets have been included in the site plan on sheets A-2, A-3, A-4, and A-6.

Items to be Addressed: None.

TRASH ENCLOSURE

The applicant has indicated that a garbage receptacle will be placed in the south-central area of the property and is adequately secured.

Items to be Addressed: None.

SPECIAL LAND USE STANDARDS

Section 6.03(H) lists the standards for all special land uses. Prior to making a recommendation to the Township Board, the Planning Commission must make a determination on the special land use based on these standards.

- 1. All special land uses shall be designed, located, planned and operated so that the public health, safety and welfare will be protected.**

CWA COMMENTS: This standard can be met. However, additional details including the hours of operation and the operation plan required by Section 10.09 (see standard 7 in this section of the review) must be provided in order to assess this standard.

- 2. The Special Land Use will be consistent with the stated intent of the zoning district.**

CWA COMMENT: The standard is met if the Planning Commission feels that expansion of the child care center is compatible with the surrounding single-family residential development. The intent of the residential districts in general is to "protect single-family residential development from the encroachment of incompatible land uses." The intent of the LV zoning district in particular is to "preserve established development patterns."

Day care centers are allowed as a special land use in the LV zoning district, with the assumption that these use could be compatible with single-family residential. A limit on the size or intensity of day care centers is not included in the specific regulations for day care centers in Section 10.09.

- 3. The proposed special land use shall be in general agreement with the Master Plan designation for the area where the use is proposed.**

CWA COMMENTS: The standard may be met if the Planning Commission finds that the proposed expansion will maintain the rural character of the Township and is appropriate outside of the commercial node planned at Highland Road and Hickory Ridge Road. Both the adopted Master Plan and West Highland Micro-Area Analysis Master Land Use Amendment offer little guidance on day care centers in particular, with no mention of this land use.

The Master Plan places priority on preserving the rural nature of Highland Township. The existing building has a rural architecture, similar to a large farm house. The proposed building is more formal and modern in nature, with cultured stone and composite shake style siding. We recommend that the architecture of the proposed building, through the use of similar siding and roof styles, match that of the existing building on site.

- 4. All special land uses shall provide facilities for safe and convenient vehicular and pedestrian traffic, including but not limited to: turning movements, traffic flow, proximity and relationship to intersections, adequacy of sight distances, location and access of off-street parking, and provisions for pedestrian traffic.**

CWA COMMENTS: The standard can be met. We defer to Township staff, engineering, and Fire Department for comments. However, we note that the applicant has not provided traffic patterns for pickup and drop off of the clients, as required by Section 10.09(D) for day care centers. The pickup and drop off circulation are relevant to the evaluation of this standard.

- 5. **All special land uses shall be designed, constructed and operated in a manner that prevents detrimental impacts to surrounding properties such as noise, dust, fumes, smoke, air, water, odor, light and/or vibration, etc. The special land use shall be designed, constructed and operated in a manner that does not detract from area aesthetics.**

CWA COMMENTS: The standard can be met. The site is designed in a manner that prevents detrimental impacts to surrounding properties, with proper screening and vehicular access limited to Highland Road. In terms of area aesthetics, we reiterate our previous recommendation that the building materials and roof pitches of the proposed building should match those of the existing building on site.

- 6. **The proposed special land use shall not unreasonably burden the capacity of public services and/or facilities.**

CWA COMMENTS: We defer to Township staff and engineering.

- 7. **The proposed special land use shall comply with any specific standards set forth in Article 10, Supplemental Use Regulations, that are applicable to the use.**

CWA COMMENTS: The application as submitted does not comply with the standards in Section 10.09 - Day Care Centers, adult or child. Table 4 shows how the applicant has met those regulations.

Table 4. Regulations in Section 10.09

Regulation	CWA Comment
An adult or child day center must have frontage on a major thoroughfare.	The regulation is met. The site is on Highland Road.
The proposed use shall not change the essential character of the surrounding residential area and shall not create a nuisance.	The regulation can be met. More information on pick and drop off is needed.
A child care center located in a residential zoning district may not exceed sixteen (16) hours of operation during a 24-hour period and may not operate between the hours of 10 p.m. and 6 a.m.	The hours of operation have not been provided.

Regulation	CWA Comment
The operator must provide an operations plan indicating: The number of clients to be cared for and number of employees. The operations plan must indicate traffic patterns for pickup and drop off of clients, including designation of suitable parking areas. The operation plan is subject to review and approval by the Planning Commission.	An operations plan has not been provided.
Screening between the outdoor play area adjacent residentially zoned and used property shall be provided in accordance with Section 12.04, Screening Between Land Uses.	The regulation is met. The landscape plan shows 778 lineal feet of fencing.
Fencing of portions of the site where it is necessary to ensure the safety and security of the clients shall be provided unless it is determined by the Planning Commission that the applicant has satisfied this condition through other means. A fenced outdoor play area of at least five thousand (5,000) square feet must be provided.	The regulation is met.
Signage must comply with the provisions of Article 14, Signs.	The regulation is met.

Items to be Addressed: 1) Applicant provides the information needed to evaluate compliance with Section 10.09 2) Planning Commission determination on whether the proposal meets the Special Land Use standards.

RECOMMENDATIONS

We recommend the following items be addressed by the applicant before the Planning Commission takes action:

1. Provision on Sheet E-01 for fixture locations, specifications, and other lighting system information.
2. Show where fence is proposed to be four (4) feet and where fence is to be six (6) feet.
3. Provide the information needed to evaluate compliance with Section 10.09, including an operations plan.

The Planning Commission should make the following determinations as part of a recommendation:

1. Planning Commission determination on screening requirements per Section 12.04.

2. Planning Commission to determine type conifer hedge, solid wall, or decorative fence.
3. Planning Commission to determine appropriate location for parking lot landscaping.
4. Planning Commission determination on whether the Special Land Use Standards for a Daycare Center have been met.

Respectfully submitted,



CARLISLE/WORTMAN ASSOC., INC.
Megan Masson-Minock, AICP
Principal



CARLISLE/WORTMAN ASSOC., INC.
Grayson Moore
Community Planner



July 10, 2024

Highland Township
205 North John Street
Highland, MI 48357

Attn: Ms. Beth Corwin, P.E.
Planning & Development Director

Re: Preliminary Site Plan Review
School Bell Childcare
4501 West Highland Road
Sidwell No. 11-30-101-002

Dear Ms. Corwin:

As requested, this office has reviewed the plans for the above-mentioned project as prepared by Boss Engineering (dated May 31, 2024). The proposed improvements include a new building and parking lot on an existing school site. We have the following comments:

Water Supply & Wastewater Disposal

1. The plans indicate that the existing well will be used to supply both buildings. This will require the review and approval of the County Health Department. They may not allow 2 buildings to be served by a single well.
2. The plans indicate that the existing and a proposed septic tank and field will be used for wastewater disposal of the buildings. This will require the review and approval of the County Health Department.

Storm Water Management

1. All proposed storm sewer improvements will need to be designed in accordance with Highland Township Engineering Design Standards.
2. A new underground stormwater detention system will be provided to accommodate the proposed building and parking lot. This system will outlet to the ditch along Highland Road and will require the review of the Michigan Department of Transportation (MDOT). The proposed metal pipe system is not an approved material and will need to be revised to be HDPE pipe.

Paving and Grading Improvements

1. The proposed paving and grading improvements will need to be designed in accordance with Highland Township Engineering Design Standards.
2. A permit from MDOT will be required for the proposed work within the Highland Road right-of-way.
3. Site circulation will need to be reviewed and approved by the Township Planner and Fire Department.

Soil Erosion Control

1. The Soil Erosion and sediment control plans will require the review and permitting of the Oakland County Water Resources Commission.

Summary

The items noted above will need to be addressed in future site plan submittals. This office is available to discuss any of these comments with the applicant prior to the site plan submittal. If you have any questions or require any additional information, please contact the undersigned.

Very truly yours,

HUBBELL, ROTH & CLARK, INC.



Michael P. Darga, P.E.

MPD/mpd

pc: Highland Township; R. Hamill
HRC; R. Alix, File



Charter Township of Highland - Fire Department

1600 W. Highland Rd.
Highland, MI 48357
(248)887-9050

Re:
4501 W. Highland Rd.
Highland, Mi 48380

July 9, 2024

To whom it may concern:

Project Overview: The proposed site plan for a new building located at 4501 W. Highland Rd

I have reviewed a proposed new building site plan at the above location.
All current site concerns regarding fire department access have been addressed.

1. Building plans shall be submitted and evaluated for use and further requirements.
4. A plan set shall be provided to The Department of Licensing & Regulatory Affairs Bureau of Fire Service for review.

Review and approval by the Authority Having Jurisdiction shall not relieve the applicant of the responsibility of compliance with these codes.

If you have any questions about this plan review report, don't hesitate to get in touch with me.

Respectfully submitted,

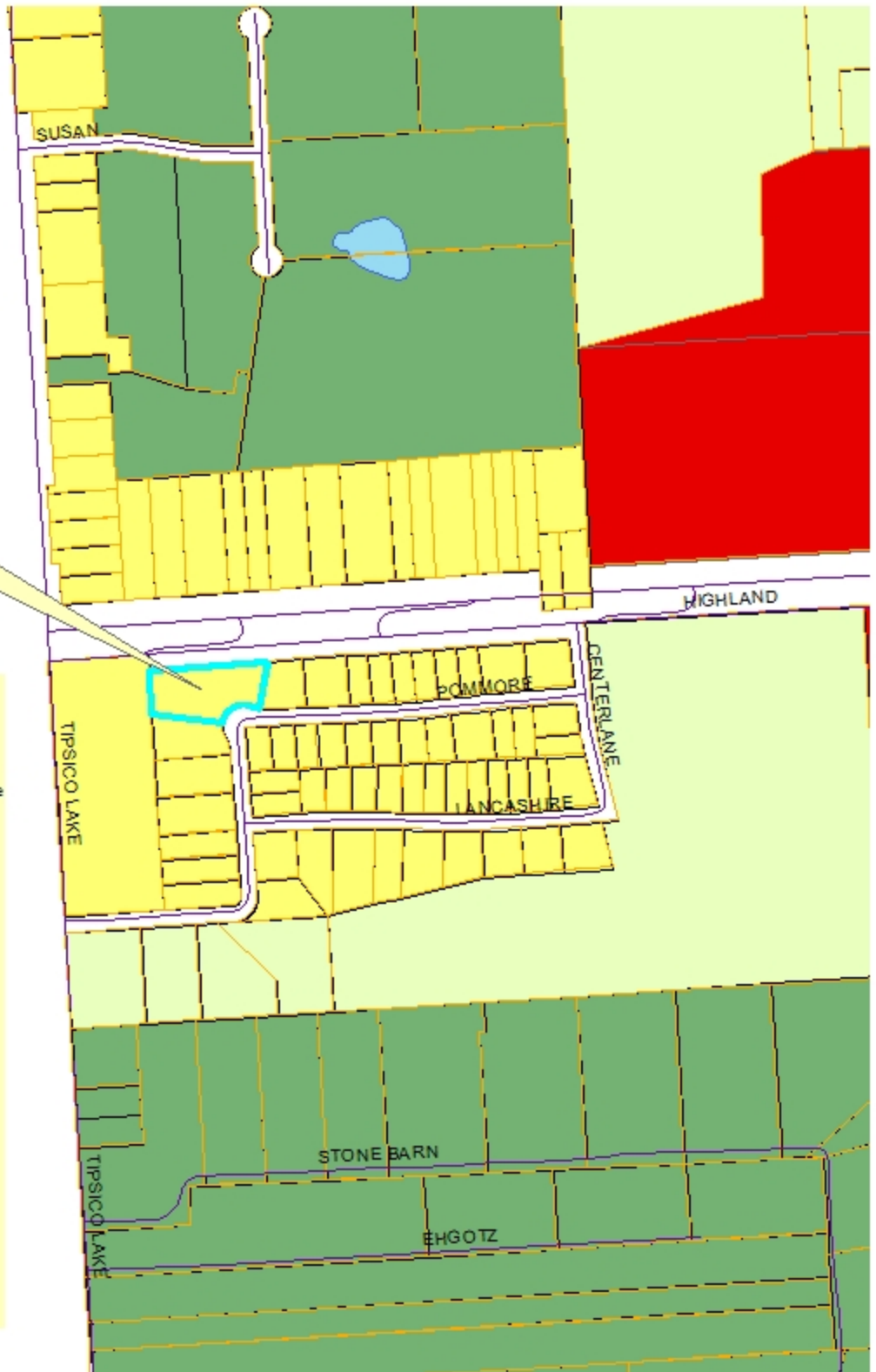
Shawn Bell
Fire Marshal
Highland Township Fire Department

CHARTER TOWNSHIP OF HIGHLAND ZONING MAP

URSA 24-03
 SPR 24-03
 SCHOOL BELL
 CHILD CARE CENTER

- OC Tax Parcel Stacked

- Zoning Districts**
- ARR: Agricultural Rural Residential 5 acre
- LV: Lakes and Villages
- R1.5: Residential 1.5 acre
- R3: Residential 3 acre
- RM: Multiple Family
- MH: Mobile Home Park
- OS: Office Service
- C-1: Local Commercial
- C-2: General Commercial
- HS: Highland Station
- TR: Technology and Research
- IM: Industrial Manufacturing



ENACTED: November 18, 2010



- Site Plan Review
- Rezoning
- Use Requiring Special Approval
- Land Division
- Land Division & Combination
- Road Profile
- Other

PLAN REVIEW APPLICATION

Highland Township Planning Department, 205 N. John St, Highland, Michigan 48357 (248) 887-3791 Ext. 2

Date Filed: _____ Fee: _____ Escrow: _____ Case Number: _____

NOTICE TO APPLICANT AND OWNER

BY SIGNING THIS APPLICATION, THE APPLICANT AND OWNER ACKNOWLEDGE ONE OR THE OTHER OR BOTH ARE RESPONSIBLE FOR ALL APPLICATION AND CONSULTANT FEES THAT ARISE OUT OF THE REVIEW OF THIS REQUEST THE OWNER ALSO AUTHORIZES THE TOWNSHIP TO PLACE A SIGN ON THE PROPERTY, IF NECESSARY, TO INFORM THE PUBLIC OF THE PENDING MATTER BEING REQUESTED.

REQUIRED COPIES OF PLANS

INITIAL REVIEW: 2 HARD COPIES OF PLANS AND .PDF COPY OF PLANS
 CONSULTANTS REVIEW OF APPROVED PLANS SUBJECT TO CONDITIONS: 5 COPIES AND .PDF COPY

1. APPLICANT INFORMATION

NAME: _____
 ADDRESS: _____

 PHONE: _____
 EMAIL: _____

OWNER INFORMATION

NAME: _____
 ADDRESS: _____

 PHONE: _____
 EMAIL: _____

2. PROPERTY INFORMATION

ADDRESS OR ADJACENT STREETS: _____
 LOT WIDTH: _____ LOT DEPTH: _____ LOT AREA: _____
 PARCEL IDENTIFICATION NUMBER(S): _____

3. PROJECT INFORMATION

PROJECT NAME: _____
 PRESENT ZONING: _____ PROPOSED ZONING: _____
 PRESENT USE: _____ PROPOSED USE: _____

APPLICANT

SIGNATURE: Marc Kasabasic
 PRINT NAME: _____

On the ___ day of _____, _____ before me, a Notary Public, personally appeared the above named person whose signature appears above, and who executed the foregoing instrument, and he/she acknowledged to me that he/she executed the same.

State Of Michigan
 County Of Oakland

Notary Public: _____

OWNER

SIGNATURE: Federica Kasabasic
 PRINT NAME: _____

On the ___ day of _____, _____ before me, a Notary Public, personally appeared the above named person whose signature appears above, and who executed the foregoing instrument, and he/she acknowledged to me that he/she executed the same.

State Of Michigan
 County Of Oakland

Notary Public: _____

• If there are Co-Applicants and/or Co-Owners associated with this property(ies) to be acted upon, please submit a Notarized Co-Applicant's and/or Co-owner's "Interest in Property Certificate" with this application. The person signing this cover sheet will be considered the official designee for the group and all correspondence will be addressed to this person.

• A notarized letter giving the Applicant authorization to represent the Owner is also permitted in lieu of a signature on this application. The person signing this cover sheet, however, will be considered the official designee for the Owner and all correspondence will be addressed to this person.

**HIGHLAND TOWNSHIP IMPACT ASSESSMENT
School Bell Childcare**

Prepared for:

**Property Owner
School of the Pines Inc. dba School Bell Childcare
Marc Kasabasic**

**Applicant
School of the Pines Inc. dba School Bell Childcare
Marc Kasabasic**

Prepared by:

Jared Prather, E.I.T.



3121 E. Grand River Howell, MI 48843
517.546.4836 fax 517.548.1670
www.bosseng.com

May 31st, 2024

DISCUSSION ITEMS

Name(s) and address(es) of person(s) responsible for preparation of the General Description and a brief statement of their qualifications.

Prepared by:

Jared Prather, E.I.T.
Project Engineer
Boss Engineering
3121 E Grand River
Howell, MI 48843

Prepared for:

Owner & Applicant:

School of the Pines Inc. dba School Bell Childcare / Marc Kasabasic
4501 W. Highland Road
Milford, MI 48380

General Site Description

The project site is on parcel #11-30-101-002 in Section 30, Highland Township, Oakland County, MI 48380.

The subject site is bordered:

- On the west by a large, open parcel 6.10 acres in size zoned Lake & Village (LV).
- On the north by the West Highland Road (M-59) MDOT Right of Way.
- On the east by a single-family residential parcel, 0.75 acres in size, zoned LV.
- On the southeast by Pommere Drive
- And on the south by a single-family residential parcel, 0.85 acres in size, zoned LV.

The subject site is an occupied parcel of land consisting of an operational day care center along West Highland Road with a driveway, paved parking lot, playground, fence separating the driveway from the playground, and wooded area in the east. Sanitary and water services are provided by existing onsite septic and well systems. The existing septic field and reserve septic field is on the southwest side of the playground and the well is on the northern edge of the parking lot. Along the southeastern property bend lies Pommere Drive (See the Existing Conditions Plan). The front of the property is a flat lawn space and the eastern half of the property has a moderately wooded area. There is currently one existing paved commercial drive approach from the north end of the subject property leading to the unstriped parking lot and gravel parking area from W Highland Road (M-59).

Natural Features

The parcel is developed. As described earlier, the property includes a day care building, a paved parking lot, and a playground. The day care center and playground occupy approximately the western half of the site with the paved parking lot in the middle of the site. The remaining eastern half of the site is moderately wooded with a collection of trees.

The site slopes from the center outwardly at 1-3% in all directions. The northern side of the parcel slopes toward W Highland Road (M-59) with slopes increasing from 2% to 6-10%, western side slopes toward the adjacent parcel field from 1-2% to 5-10%, eastern side sloping toward the adjacent property from 2% to 3-5%, and southern side sloping toward Pommere Drive from 2-3% to 10-20%. The site generally drains from the center to the north onto W Highland Road (M-59) with the remaining drainage following the site slopes.

The NRCS soils on the whole property are Fox Sandy Loam at 1-6% slope which is consistent with the general character of the slopes on the site.

Storm Water Management

Storm water will be managed onsite with the creation of a new storm water sewer network. The new school building, parking lot, and some of the modified playground area will be captured in catch basins and directed to the new underground detention system with a restricted discharge to the W Highland Road (M-59) MDOT right-of-way storm ditch and culvert through an overflow control structure. Detailed construction plans will be reviewed by the Township Engineer and the Soil Erosion Control plans will be reviewed and permit issued by the Livingston County Drain Commissioners office prior to construction commencing. Ongoing/periodic soil erosion inspections will occur per County requirements to ensure soil erosion is managed proactively.

Impact on Surrounding Land Use

The proposed special use will conform to existing development patterns and will not negatively impact adjacent properties with added lighting, noise, or air pollution. The proposed project seeks to expand the business operation of School Bell Childcare with the creation of a new schoolhouse building. The site development will comply with Township Ordinances and will meet the current Township, County, and State engineering standards. There will be minimal impact on surrounding land uses or development patterns as there will be no change to these uses. Additional lighting will be designed to illuminate the new schoolhouse building and parking lot and will not impact the adjacent residential homes.

Impact on Public Facilities and Services

The proposed updates to the existing site will not add any additional burden on the fire and police services. Fire trucks will use the M-59 right-of-way to access the site in case of a fire on either side of the site with an additional access behind the site from Pommere Drive. No hydrant coverage exists on the site. Refuse vehicles will have access to the onsite dumpster located at the southern end of the driveway to collect the garbage. The use increases the maximum overall school population to 96 students and 13 staff.

Impact on Public Utilities

Storm water will be detained onsite via the use of an underground detention system. Overall runoff along the northern end of the site toward W Highland Road (M-59) will be reduced below existing conditions. The storm water will be discharged at the restricted rate to the MDOT right-of-way culvert and ditch instead of the existing uncontrolled condition. Detailed construction plans would be reviewed by the Township Engineer and a Soil Erosion Control permit would be reviewed and issued by the Oakland County Drain Commissioner. Water & sanitary services will continue to be provided using the existing well and the existing and proposed septic systems onsite.

Storage or Handling of any Hazardous Materials

No storing or handling of any bulk hazardous materials is expected for this development.

Impact on Traffic and Pedestrians

A Trip Generation summary has been completed using the ITE 10th Edition Volume 2 manual and is included on the plans. The number of students will increase from 50 to 96 and would generate a maximum AM peak total of 75 trips and PM peak total of 76 trips from the arrival to the departure of the site. The entryway will be enlarged to 24 feet wide in conformance with the driveway width requirement along W Highland Road (M-59).

Special Provisions

A special land use permit application will be submitted with the site plan.

Description of all sources:

- Highland Township Zoning Ordinance and engineering standards
- Oakland County Drain Commissioner engineering standards
- NRCS Web Soil Survey
- Institute of Traffic Engineers (ITE) Trip General Manual, 10th Edition

GENERAL NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED TOWNSHIP, COUNTY, AND STATE OF MICHIGAN PERMITS.
2. A GRADING PERMIT FOR SOIL EROSION--SEDIMENTATION CONTROL SHALL BE OBTAINED FROM THE GOVERNING AGENCY PRIOR TO THE START OF CONSTRUCTION.
3. IF DUST PROBLEM OCCURS DURING CONSTRUCTION, CONTROL WILL BE PROVIDED BY AN APPLICATION OF WATER, EITHER BY SPRINKLER OR TANK TRUCK.
4. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH LOCAL MUNICIPAL STANDARDS AND SPECIFICATIONS.
5. PAVED SURFACES, WALKWAYS, SIGNS, LIGHTING AND OTHER STRUCTURES SHALL BE MAINTAINED IN A SAFE, ATTRACTIVE CONDITION AS ORIGINALLY DESIGNED AND CONSTRUCTED.
6. ALL BARRIER-FREE FEATURES SHALL BE CONSTRUCTED TO MEET ALL LOCAL, STATE AND A.D.A. REQUIREMENTS. WHERE EXISTING CONDITIONS AND/OR THE REQUIREMENTS OF THE PLANS WILL RESULT IN FINISHED CONDITIONS THAT DO NOT MEET ADA REQUIREMENTS, THE CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER PRIOR TO WORK COMMENCING.
7. ANY DISCREPANCY IN THIS PLAN AND ACTUAL FIELD CONDITIONS SHALL BE REPORTED TO THE DESIGN ENGINEER PRIOR TO THE START OF CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL SETBACKS, EASEMENTS AND DIMENSIONS SHOWN HEREON PRIOR TO BEGINNING CONSTRUCTION.
8. THE CONTRACTOR SHALL CONTACT ALL OWNERS OF EASEMENTS, UTILITIES AND RIGHT-OF-WAY, PUBLIC OR PRIVATE, PRIOR TO THE START OF CONSTRUCTION.
9. THE CONTRACTOR SHALL COORDINATE WITH ALL OWNERS TO DETERMINE THE LOCATION OF EXISTING LANDSCAPING, IRRIGATION LINES & PRIVATE UTILITY LINES. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING LANDSCAPING, IRRIGATION LINES, AND PRIVATE UTILITY LINES.
10. THE CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE UPON COMPLETION OF THE PROJECT.
11. THE CONTRACTOR SHALL MAINTAIN THE SITE IN A MANNER SO THAT WORKMEN AND PUBLIC SHALL BE PROTECTED FROM INJURY, AND ADJOINING PROPERTY PROTECTED FROM DAMAGE.
12. THE CONTRACTOR SHALL KEEP THE AREA OUTSIDE THE "CONSTRUCTION LIMITS" BROOM CLEAN AT ALL TIMES.
13. THE CONTRACTOR SHALL CALL MISS DIG A MINIMUM OF 72 HOURS PRIOR TO THE START OF CONSTRUCTION.
14. ALL PAVEMENT REPLACEMENT AND OTHER WORKS COVERED BY THESE PLANS SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE TOWNSHIP, INCLUDING THE LATEST MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT) SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.
15. THE CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGE TO EXISTING UTILITIES.
16. NO ADDITIONAL COMPENSATION WILL BE PAID TO THE CONTRACTOR FOR ANY DELAY OR INCONVENIENCE DUE TO THE MATERIAL SHORTAGES OR RESPONSIBLE DELAYS DUE TO THE OPERATIONS OF SUCH OTHER PARTIES DOING WORK INDICATED OR SHOWN ON THE PLANS OR IN THE SPECIFICATION OR FOR ANY REASONABLE DELAYS IN CONSTRUCTION DUE TO THE ENCOUNTERING OR EXISTING UTILITIES THAT MAY OR MAY NOT BE SHOWN ON THE PLANS.
17. DURING THE CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL NOT PERFORM WORK BY PRIVATE AGREEMENT WITH PROPERTY OWNERS ADJACENT TO THE PROJECT.
18. IF WORK EXTENDS BEYOND NOVEMBER 15, NO COMPENSATION WILL BE DUE TO THE CONTRACTOR FOR ANY WINTER PROTECTION MEASURES THAT MAY BE REQUIRED BY THE ENGINEER.
19. NO TREES ARE TO BE REMOVED UNTIL MARKED IN THE FIELD BY THE ENGINEER.
20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE PROPERTY BEYOND THE CONSTRUCTION LIMITS INCLUDING BUT NOT LIMITED TO EXISTING FENCE, LAWN, TREES AND SHRUBBERY.
21. TRAFFIC SHALL BE MAINTAINED DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL SIGNS AND TRAFFIC CONTROL DEVICES. FLAG PERSONS SHALL BE PROVIDED BY THE CONTRACTOR IF DETERMINED NECESSARY BY THE ENGINEER. ALL SIGNS SHALL CONFORM TO THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AT NO COST TO THE TOWNSHIP. NO WORK SHALL BE DONE UNLESS THE APPROPRIATE TRAFFIC CONTROL DEVICES ARE IN PLACE.
22. ALL DEMOLISHED MATERIALS AND SOIL SPOILS SHALL BE REMOVED FROM THE SITE AT NO ADDITIONAL COST, AND DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
23. ANY EXISTING APPURTENANCES SUCH AS MANHOLES, GATE VALVES, ETC. SHALL BE ADJUSTED TO THE PROPOSED GRADE AND SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.
24. ALL PERMANENT SIGNS AND PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST REVISION OF THE MICHIGAN MUTCD MANUAL AND SHALL BE INCIDENTAL TO THE CONTRACT.
25. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL ITEMS REQUIRED FOR CONSTRUCTION OF THE PROJECT ARE INCLUDED IN THE CONTRACT, ANY ITEMS NOT SPECIFICALLY DESIGNATED IN THE PLANS SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.
26. THE CONTRACTOR IS RESPONSIBLE FOR HAVING A SET OF APPROVED CONSTRUCTION PLANS, WITH THE LATEST REVISION DATE, ON SITE PRIOR TO THE START OF CONSTRUCTION, IN THE EVENT OF ANY QUESTIONS PERTAINING TO THE INTENT OF THE CONSTRUCTION PLANS OR SPECIFICATIONS, THE CONTRACTOR SHALL CONTACT THE DESIGN ENGINEER FOR A FINAL DETERMINATION FROM THE DESIGN ENGINEER.
27. THE CONTRACTOR, NOT THE OWNER OR THE ENGINEER, ARE RESPONSIBLE FOR THE MEANS, METHODS, AND SEQUENCE OF CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR SAFE EXECUTION OF THE PROJECT SCOPE IN ACCORDANCE WITH THE APPROVED CONSTRUCTION PLANS.
28. THE CONTRACTOR IS RESPONSIBLE FOR PRESERVING CONSTRUCTION STAKING AS NECESSARY. CONTRACTOR TO NOTIFY CONSTRUCTION SURVEYOR OF REPLACEMENT STAKES NEEDED WHICH SHALL BE AT THE CONTRACTORS EXPENSE.
29. THE OWNER AND/OR CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING FRANCHISE UTILITY SERVICES (CABLE, ELECTRIC, GAS, ETC.) OWNER AND/OR CONTRACTOR SHALL WORK WITH UTILITY COMPANIES ON FURNISHING SITE UTILITY LAYOUTS AND PROVIDING CONDUIT CROSSINGS AS REQUIRED.
30. DAMAGE TO ANY EXISTING UTILITIES OR INFRASTRUCTURE (INCLUDING PAVEMENT, CURB, SIDEWALK, ETC.) SHALL PROMPTLY BE REPLACED IN KIND AND SHALL BE AT THE CONTRACTORS EXPENSE.
31. COORDINATION OF TESTING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND PER ALL CITY/TOWNSHIP/COUNTY REQUIREMENTS. COPIES OF ALL TEST REPORTS SHALL BE FURNISHED TO THE DESIGN ENGINEER.
32. PRIOR TO THE START OF CONSTRUCTION, PROTECTION FENCING SHALL BE ERECTED AROUND THE TREE DRIPLINE OF ANY TREES INDICATED TO BE SAVED WITHIN THE LIMITS OF DISTURBANCE.
33. THE CONTRACTOR SHALL MAINTAIN DRAINAGE OF THE PROJECT AREA AND ADJACENT AREAS. WHERE EXISTING DRAINAGE FACILITIES ARE IMPACTED/DISTURBED DUE TO CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE ANY NECESSARY TEMPORARY DRAINAGE PROVISIONS.
34. SOIL BORING LOGS ARE REPRESENTATIVE OF SPECIFIC POINTS ON THE PROJECT SITE, AND IF PROVIDED TO THE CONTRACTOR ARE FOR INFORMATIONAL PURPOSES ONLY.
35. WHERE CITY/TOWNSHIP STANDARD CONSTRUCTION DETAILS/SPECIFICATIONS ARE PROVIDED AND ARE IN CONFLICT WITH NOTES AND SPECIFICATIONS HEREIN, THE CITY/TOWNSHIP STANDARD SHALL GOVERN.

INDEMNIFICATION STATEMENT

THE CONTRACTOR SHALL HOLD HARMLESS THE DESIGN PROFESSIONAL, MUNICIPALITY, COUNTY, STATE, AND ALL OF ITS SUB CONSULTANTS, PUBLIC AND PRIVATE UTILITY COMPANIES, AND LANDOWNERS FOR DAMAGES TO INDIVIDUALS AND PROPERTY, REAL OR OTHERWISE, DUE TO THE OPERATIONS OF THE CONTRACTOR AND/OR THEIR SUBCONTRACTORS.

CONTRACTOR TO FOLLOW MANUFACTURER SPECS/RECOMMENDATIONS THAT SUPERCEDE PLANS

GENERAL GRADING & SESC NOTES

1. THE CONTRACTOR SHALL HAVE IN PLACE ALL REQUIRED EROSION CONTROL METHODS AS INDICATED ON THE CONSTRUCTION PLANS AND AS REQUIRED BY GENERAL PRACTICE. SPECIFIC MEANS, METHODS AND SEQUENCES OF CONSTRUCTION MAY DICTATE ADDITIONAL SOIL EROSION CONTROL MEASURES BE NEEDED. THE CONTRACTOR SHALL COORDINATE WITH THE DESIGN ENGINEER ON THESE ANTICIPATED METHODS. ADDITIONAL SOIL EROSION CONTROL METHODS SHALL BE INCIDENTAL TO THE SCOPE OF WORK.
2. ACTUAL FIELD CONDITIONS MAY DICTATE ADDITIONAL OR ALTERNATE SOIL EROSION CONTROL MEASURES BE UTILIZED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DEFICIENCIES OR FIELD CONDITIONS THAT WARRANT ADDITIONAL AND/OR ALTERNATIVE SESC MEASURES BE UTILIZED.
3. AT THE CLOSE OF EACH DAY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING ALL CONSTRUCTION OPERATIONS, MATERIALS, DEBRIS, ETC ARE CONTAINED ON-SITE.
4. AT THE CLOSE OF EACH WORKING DAY, ALL DRAINAGE STRUCTURES SHALL BE FREE OF DIRT AND DEBRIS AT THE FLOW LINE.
5. ALL SOIL EROSION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE PER MDEGL REGULATIONS AND BEST PRACTICES. ALL SOIL EROSION CONTROL MEASURES SHALL BE MAINTAINED BY THE CONTRACTOR.
6. THE SOIL EROSION CONTROL MEASURES SHALL BE KEPT IN PLACE UNTIL SUCH A TIME THAT THE SITE IS DETERMINED TO BE ESTABLISHED WITH ACCEPTABLE AMOUNT OF VEGETATIVE GROUND COVER.
7. ALL AREAS DISTURBED BY THE CONTRACTOR BEYOND THE NORMAL CONSTRUCTION LIMITS OF THE PROJECT SHALL BE SODDED OR SEEDED AS SPECIFIED OR DIRECTED BY THE ENGINEER.
8. AFTER REMOVAL OF TOPSOIL, THE SUBGRADE SHALL BE COMPACTED TO 95% OF ITS UNIT WEIGHT.
9. ALL GRADING IN THE PLANS SHALL BE DONE AS PART OF THIS CONTRACT. ALL DELETERIOUS MATERIAL SHALL BE REMOVED FROM THE SUBGRADE PRIOR TO COMPACTING.
10. ALL ROOTS, STUMPS AND OTHER OBJECTIONABLE MATERIALS SHALL BE REMOVED AND THE HOLE BACKFILLED WITH SUITABLE MATERIAL. WHERE GRADE CORRECTION IS REQUIRED, THE SUBGRADE SHALL BE CUT TO CONFORM TO THE CROSS-SECTION AS SHOWN IN THE PLANS.
11. ALL EXCAVATION UNDER OR WITHIN 3 FEET OF PUBLIC PAVEMENT, EXISTING OR PROPOSED SHALL BE BACKFILLED AND COMPACTED WITH SAND (MDOT CLASS II).

GENERAL LANDSCAPE NOTES

1. ALL PLANT MATERIAL SHALL CONFORM TO THE REQUIREMENTS AND SPECIFICATIONS OF THE GOVERNING MUNICIPALITY. ALL STOCK SHALL BE NURSERY GROWN, CONFORMING TO ANSI Z60.1 "AMERICAN STANDARD FOR NURSERY STOCK", AND IN ACCORDANCE WITH GOOD HORTICULTURAL PRACTICE. STOCK SHALL EXHIBIT NORMAL GROWTH HABIT AND BE FREE OF DISEASE, INSECTS, EGGS, LARVAE, & DEFECTS SUCH AS KNOTS, SUN-SCALD, INJURIES, ABRASIONS, OR DISFIGUREMENT. ALL PLANT MATERIAL SHALL BE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT.
 2. ALL PLANT MATERIALS SHALL BE BALLED AND BURLAPPED OR CONTAINER STOCK. NO BARE ROOT STOCK IS PERMITTED. ALL PLANT BALLS SHALL BE FIRM, INTACT, AND SECURELY WRAPPED AND BOUND.
 3. ALL PLANT BED MATERIALS SHALL BE EXCAVATED OF ALL BUILDING MATERIALS, OTHER EXTRANEUS OBJECTS, AND POOR SOILS TO A MINIMUM DEPTH OF 12-INCHES AND BACKFILLED TO GRADE WITH SPECIFIED PLANTING MIX (SEE BELOW).
 4. PLANTING MIXTURE SHALL CONSIST OF 5 PARTS TOPSOIL FROM ON-SITE (AS SUPERP), 4 PARTS COARSE SAND, 1 PART SPHAGNUM PEAT MOSS (OR APPROVED COMPOST), AND 5 LBS OF SUPERPHOSPHATE FERTILIZER PER CU. YD. OF MIX. INGREDIENTS SHALL BE THOROUGHLY BLENDED FOR UNIFORM CONSISTENCY.
 5. ALL PLANT BEDS AND INDIVIDUAL PLANTS, NOT OTHERWISE NOTED SHALL BE MULCHED WITH A 4-INCH LAYER OF SHREDED BARK MULCH. EDGE OF MULCH BEDS AS SHOWN. DECIDUOUS TREES IN LAWN AREAS SHALL RECEIVE A 5-FT DIAMETER CIRCLE OF MULCH AND CONIFER TREES 8-FT (PLANTED CROWN OF TREE) UNLESS OTHERWISE NOTED.
 6. LANDSCAPE STONE SHALL BE INSTALLED WHERE NOTED OR INDICATED (HATCHED). STONE SHALL BE 3/4"-1-1/4" WASHED RIVER GRAVEL OR AS SELECTED AND SHALL BE INSTALLED TO A MINIMUM DEPTH OF 3-INCHES.
 7. ALL LANDSCAPE BEDS, UNLESS OTHERWISE NOTED SHALL BE INSTALLED OVER WEED BARRIER FABRIC - WATER PERMEABLE FILTRATION FABRIC OF NON-WOVEN POLYPROPYLENE OR POLYESTER FABRIC. FABRIC SHALL BE OF SUITABLE THICKNESS FOR APPLICATION.
 8. ALL PLANTS AND PLANT BEDS SHALL BE THOROUGHLY WATERED UPON COMPLETION OF PLANTING AND STAKING OPERATIONS.
 9. THE CONTRACTOR SHALL GUARANTEE ALL PLANT MATERIALS FOR A PERIOD OF 1 YEAR FROM THE DATE THE WORK IS ACCEPTED, IN WRITING, BY THE LANDSCAPE ARCHITECT. THE CONTRACTOR SHALL REPLACE, WITHOUT COST TO THE OWNER, WITHIN A SPECIFIED PERIOD OF TIME, ALL DEAD PLANTS, AND ALL PLANTS NOT IN A VIGOROUS, THRIVING CONDITION, AS DETERMINED BY THE LANDSCAPE ARCHITECT, DURING AND AT THE END OF THE GUARANTEE PERIOD. REPLACEMENT STOCK SHALL CONFORM TO THE ORIGINAL SPECIFICATIONS.
 10. EDGING SHALL BE PROVIDED FOR ALL LANDSCAPE BEDS NOT ADJACENT TO CONCRETE PAVEMENT. EDGING SHALL BE BLACK ALUMINUM EDGING, 3/16-INCH X 4-INCH. INSTALL PER MANUFACTURER'S INSTRUCTIONS, ALL EDGING SHALL BE INSTALLED IN STRAIGHT LINES OR SMOOTH CURVES WITHOUT IRREGULARITIES.
 11. SOD SHALL BE DENSE, WELL ROOTED TURF, FREE OF WEEDS. IT SHALL BE COMPRISED OF A BLEND OF AT LEAST TWO KENTUCKY BLUE GRASSES AND ONE FESCUE. IT SHALL HAVE A UNIFORM THICKNESS OF 3/4-INCH AT TIME OF PLANTING, AND CUT IN UNIFORM STRIPS NOT LESS THAN 10-INCHES BY 18-INCHES. SOD SHALL BE KEPT MOIST AND LAID WITHIN 36-HOURS AFTER CUTTING.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH A DENSE LAWN OF PERMANENT GRASSES, FREE OF LUMPS AND DEPRESSIONS. ALL SODDED AREAS THAT BROWN-OUT OR HAVE NOT FIRMLY KNITTED TO THE SOIL BASE WITHIN A PERIOD OF 1 MONTH SHALL BE REPLACED BY THE CONTRACTOR, AT NO COST TO THE OWNER.
12. ALL AREAS OF THE SITE THAT BECOME DISTURBED DURING CONSTRUCTION AND ARE NOT TO BE PAVED, STONED, LANDSCAPED, OR SODDED SHALL BE SEEDED AND MULCHED.
- SEED MIXTURE SHALL BE AS FOLLOWS:
 KENTUCKY BLUEGRASS (CHOOSE 3 VARIETIES - ADLPHI, RUGBY, GLADE, OR PARADE) 30%
 RUBY RED OR DAWSON RED FINE FESCUE 30%
 ATLANTA RED FESCUE 20%
 PENNINE PERENNIAL RYE 20%
- THE ABOVE SEED MIXTURE SHALL BE SOWN AT A RATE OF 250 LBS PER ACRE. PRIOR TO SEEDING, THE TOPSOIL SHALL BE FERTILIZED WITH A COMMERCIAL FERTILIZER WITH A 10-0-10 ANALYSIS:
 10% NITROGEN - MIN 25% FROM A UREA FORMALDEHYDE SOURCE
 0 % PHOSPHATE
 10% POTASH - SOURCE POTASSIUM SULFATE OR POTASSIUM NITRATE
- THE FIRST FERTILIZER APPLICATION SHALL BE AT A RATE OF 10 LBS PER 1000 SQ FT OF BULK FERTILIZER.

13. ALL AREAS OF THE SITE SCHEDULED FOR SEEDING OR SODDING SHALL FIRST RECEIVE A 6-INCH LAYER OF CLEAN, FRIABLE TOPSOIL. THE SOIL SHALL BE DISCED AND SHALL BE GRADED IN CONFORMANCE WITH THE GRADING PLAN.
14. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION OF ALL UTILITIES AND TO INFORM THE LANDSCAPE ARCHITECT OF ANY CONFLICTS PRIOR TO COMMENCING LANDSCAPING.

GENERAL UTILITY NOTES

1. BEDDING SHALL EXTEND A MINIMUM OF 4" BELOW THE PIPE. UNLESS OTHERWISE NOTED ON THE PLANS, BEDDING SHALL BE OF UNIFORM GRADATION MDOT 6A+ STONE OR MDOT CLASS II GRANULAR MATERIAL FOR SANITARY AND STORM PIPE AND MDOT CLASS II GRANULAR MATERIAL ONLY FOR WATERMAIN.
2. WHERE UNSTABLE GROUND CONDITIONS ARE ENCOUNTERED, STONE BEDDING SHALL BE USED AS DIRECTED BY THE ENGINEER.
3. BACKFILL SHALL BE OF A SUITABLE MATERIAL AND SHALL BE FREE OF ANY ORGANIC MATERIALS AND ROCKS.
4. BACKFILL ABOVE THE PIPE SHALL BE OF GRANULAR MATERIAL MDOT CLASS II TO A POINT 12" ABOVE THE TOP OF THE PIPE. THE TRENCH IS NOT WITHIN THE INFLUENCE OF THE RISE OF THE SITE MATERIALS MAY BE COMPACTED AND UTILIZED FROM A POINT 12" ABOVE THE PIPE TO GRADE. WHERE THE TRENCH IS WITHIN A 1:1 INFLUENCE OF THE ROAD, GRANULAR MATERIAL, MDOT CLASS II OR III, IS TO BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 12" IN THICKNESS. COMPACTION SHALL BE 95% AS DETERMINED BY AASHTO T99.
5. 18" MINIMUM VERTICAL SEPARATION AND 10" HORIZONTAL SEPARATION IS TO BE MAINTAINED BETWEEN WATERMAIN AND SANITARY/STORM SEWER TO THE MAXIMUM EXTENT POSSIBLE.

GENERAL STORM NOTES

1. ALL STORM PIPE LENGTHS ARE SHOWN FROM C/L TO C/L OF STRUCTURE OR FROM C/L OF STRUCTURE TO DISCHARGE END OF FLARED END SECTION.
2. STORM PIPE MATERIALS SHALL BE AS FOLLOWS:
 2.1. RCP(REINFORCED CONCRETE PIPE): SHALL MEET THE REQUIREMENTS OF ASTM C76 WITH MODIFIED GROOVED TONGUE AND RUBBER GASKETS MEETING THE REQUIREMENTS OF ASTM C443. RCP TO BE EITHER CLASS IV OR V AS CALLED OUT ON THE PLANS.
3. STORM PIPE JOINTS SHALL MEET THE REQUIREMENTS OF ASTM D3212. HDPE AND PP PIPE GASKETS SHALL MEET THE REQUIREMENTS OF ASTM F477.
4. ALL STORM PIPE TO HAVE WATERTIGHT PREMIUM JOINTS, UNLESS OTHERWISE NOTED ON THE PLANS.
5. STORM DRAINAGE STRUCTURES SHALL BE FURNISHED WITH STEPS WHICH SHALL BE STEEL ENCASED WITH POLYPROPYLENE PLASTIC OR EQUIVALENT. STEPS SHALL BE SET AT 16" CENTER TO CENTER.
6. FLARED END SECTIONS DISCHARGING STORM WATER SHALL RECEIVE A MINIMUM OF 10 SQ YDS OF PLAIN COBBLESTONE RIP RAP WITH A MINIMUM STONE SIZE OF 6" AND SHALL BE PLACED ON A GEOTEXTILE FABRIC WRAP.
7. ALL CATCH BASINS WITHIN THE ROADWAY SHALL INCLUDE INSTALLATION OF 6" DIAMETER PERFORATED PIPE SUBDRAIN.
8. STORM DRAINAGE STRUCTURE COVERS SHALL BE OF THE FOLLOWING (OR APPROVED EQUAL):

COVER USE	FRAME	GRATE/BACK
'A' MANHOLE	1040	TYPE 'B'
'D' PARKING LOTS	1040/5100	TYPE 'M1' GRATE OR 5105 TYPE 'M1' GRATE
'E' LAWN	1040	TYPE 'O2' GRATE

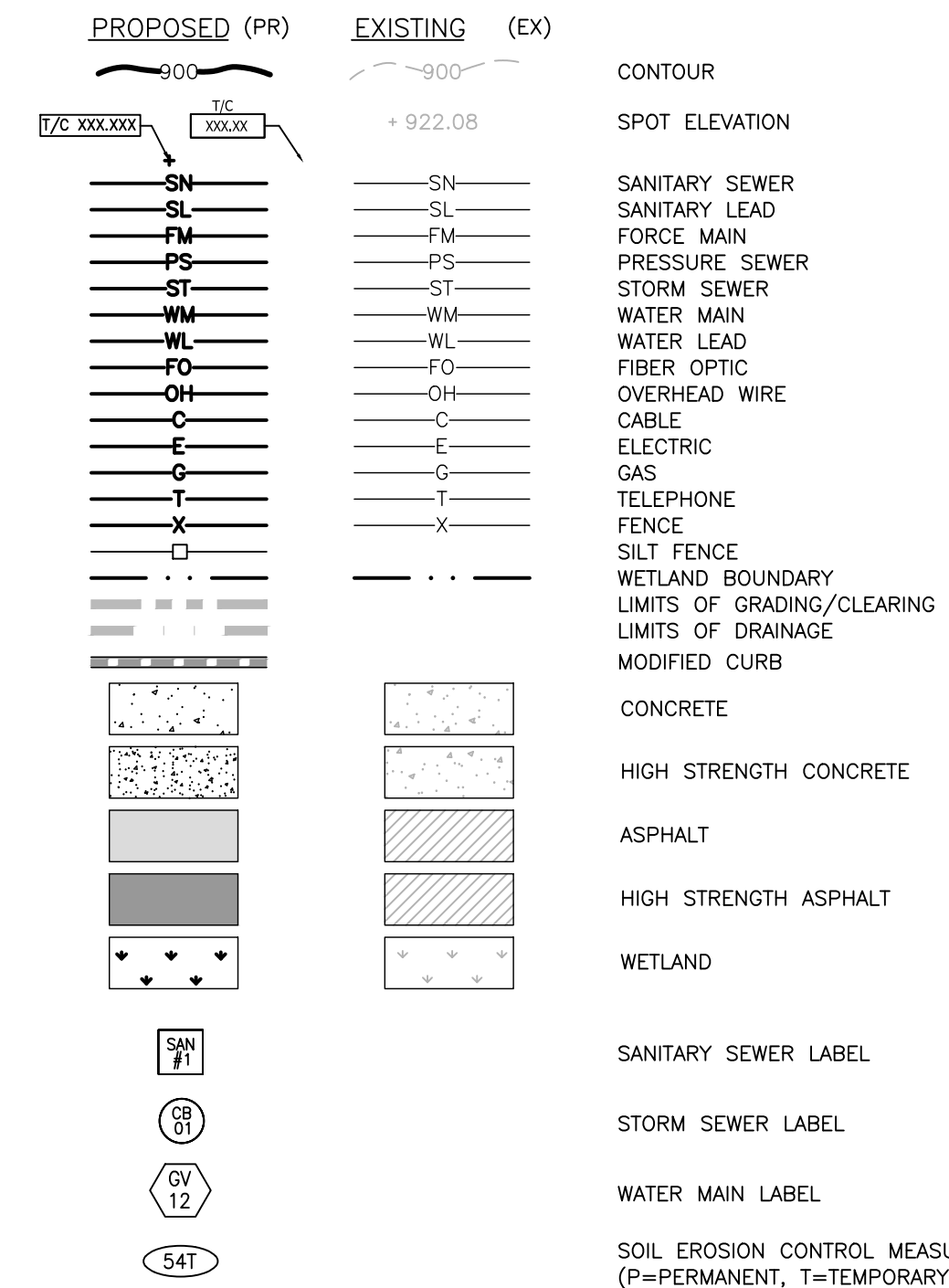
GENERAL SANITARY NOTES

1. ALL SANITARY PIPE LENGTHS ARE SHOWN FROM C/L OF STRUCTURE TO C/L OF STRUCTURE.
2. SANITARY PIPE MATERIALS SHALL BE AS FOLLOWS:
 2.1. HDPE DR-11 (SANITARY FORCEMAIN)
3. ALL PVC SDR SANITARY SEWER PIPE SHALL MEET THE REQUIREMENTS OF ASTM D3034 AND D2241. PVC SCHD 40 PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785. GASKET JOINTS FOR SANITARY PIPE SHALL MEET THE REQUIREMENTS OF ASTM D3139 AND D3212.
4. SANITARY STRUCTURES SHALL BE FURNISHED WITH STEPS WHICH SHALL BE STEEL ENCASED WITH POLYPROPYLENE PLASTIC OR EQUIVALENT. STEPS SHALL BE SET AT 16" CENTER TO CENTER.
5. ALL NEW MANHOLES SHALL BE MINIMUM 4' DIAMETER, PRECAST MANHOLE SECTIONS AND AN ECCENTRIC ONE. PRECAST MANHOLE JOINTS SHALL BE INSTALLED WITH BUTYL ROPE MEETING THE REQUIREMENTS OF ASTM C990.
6. MANHOLES SHALL BE CONSTRUCTED WITH FLOW CHANNEL WALLS THAT ARE FORMER, AT A MINIMUM, TO THE SPRINGLINE OF THE PIPE.
7. ALL NEW MANHOLES SHALL HAVE AN APPROVED FLEXIBLE, WATERTIGHT SEALS WHERE PIPES PASS THROUGH MANHOLE WALLS.
8. ALL MANHOLES SHALL BE PROVIDED WITH WATERTIGHT COVERS. COVERS TO BE EJCO 1040 TYPE 'A' SOLID COVER.
9. A MAXIMUM OF 12" OF GRADE ADJUSTMENT RINGS SHALL BE USED TO ADJUST THE FRAME ELEVATION. BUTYL ROPE SHALL BE USED BETWEEN EACH ADJUSTMENT RING.
10. SANITARY SEWER LATERALS SHALL HAVE A MINIMUM SLOPE OF 1.0%.
11. CLEANOUTS SHALL BE INSTALLED EVERY 100', AT ALL BENDS AND STUBS.

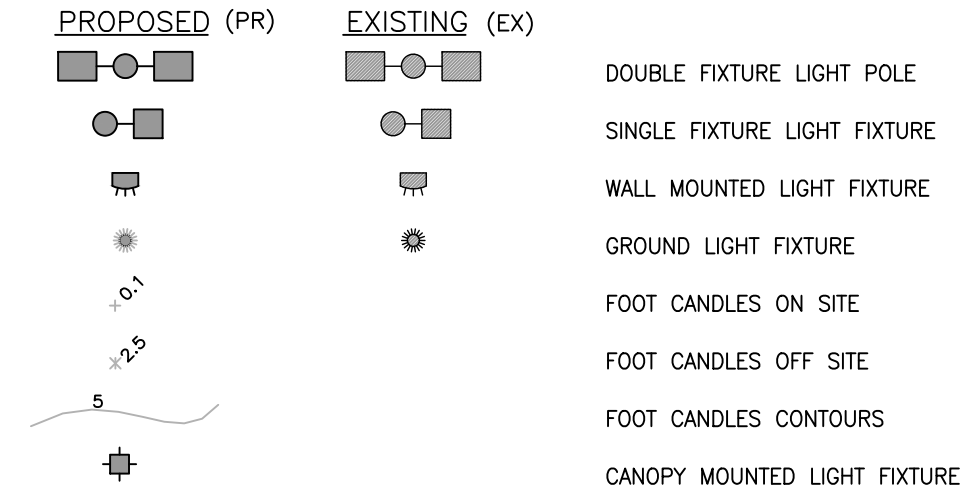
GENERAL WATERMAIN NOTES

1. WATERMAIN PIPE MATERIALS SHALL BE AS FOLLOWS:
 1.1. D.I.P. CL-52 (WATERMAIN)
 1.2. HDPE DR-9 (WATER LATERAL - CURB STOP TO STUB)
2. WATERMAIN FITTINGS SHALL BE OF DUCTILE IRON WITH CEMENT MORTAR LINING AND MECHANICAL JOINTS CONFORMING TO AWWA C110.
3. WATERMAINS SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA C651. BAC-T SAMPLES SHALL BE TAKEN IN ACCORDANCE WITH R235.11110 OF THE ADMINISTRATIVE RULES PROMULGATED UNDER MICHIGAN SAFE DRINKING WATER ACT, 1976 PA 399, AS AMENDED.
4. ALLOWABLE LEAKAGE OR HYDROSTATIC PRESSURE TESTING SHALL BE IN ACCORDANCE WITH AWWA C600 AND C605.
5. MAXIMUM DEFLECTION AT PIPE JOINTS SHALL BE IN ACCORDANCE WITH PIPE MANUFACTURERS CURRENT RECOMMENDATIONS AND AWWA SPECIFICATIONS.
6. A FULL STICK OF PIPE SHALL BE LAID CENTERED AT A PIPE CROSSING IN ORDER TO MAINTAIN THE MAXIMUM SEPARATION OF WATERMAIN JOINT TO THE CROSSING PIPE.
7. WATERMAIN SHALL BE INSTALLED WITH A MINIMUM OF 5.5' OF COVER FROM FINISHED GRADE TO TOP OF PIPE AND NO MORE THAN 8' OF COVER, UNLESS SPECIAL CONDITIONS WARRANT.
8. WATERMAIN VALVES SHALL BE IRON BODY RESILIENT WEDGE GATE VALVES, NON-RISING STEMS, COUNTERCLOCKWISE OPEN, AWWA C509.
9. THE BREAKAWAY FLANGE AND ALL BELOW GRADE FITTINGS SHALL HAVE STAINLESS STEEL NUTS AND BOLTS.

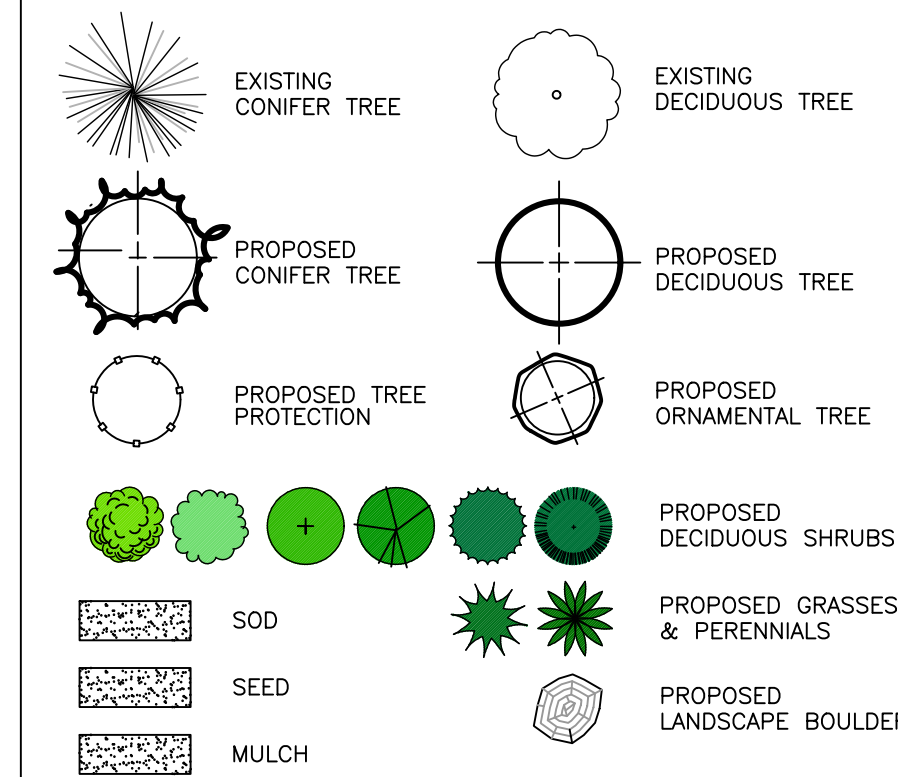
LINES & HATCHES LEGEND



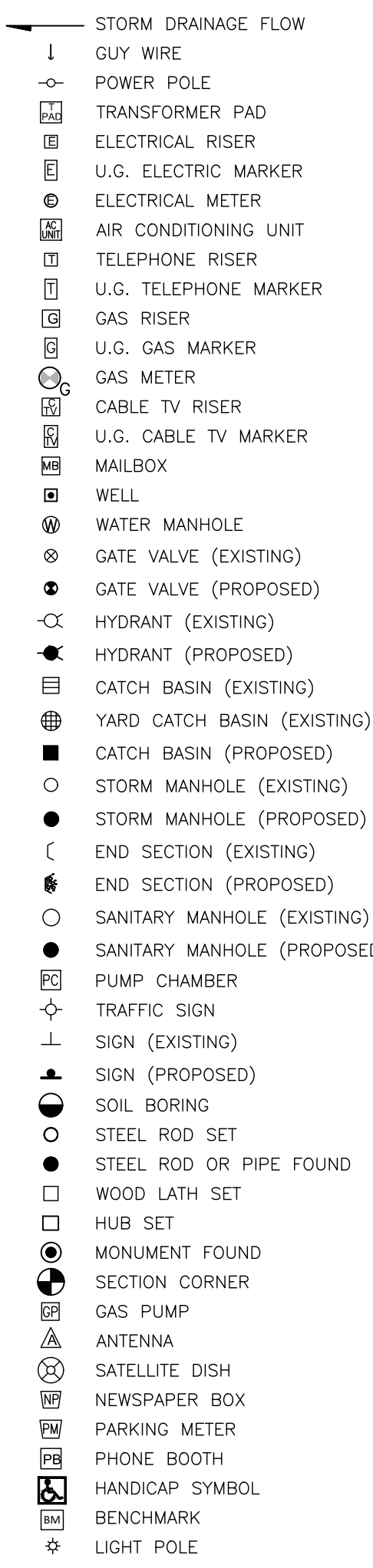
LIGHTING LEGEND



LANDSCAPE LEGEND



SYMBOL LEGEND



ABBREVIATIONS

- FFE FINISHED FLOOR ELEVATION
- BFE BASEMENT FLOOR ELEVATION
- GFE GARAGE FLOOR ELEVATION
- FG FINISHED GRADE
- T/A TOP OF ASPHALT
- T/C TOP OF CONCRETE/CURB
- T/W TOP OF WALK
- T/P TOP OF PIPE
- B/P BOTTOM OF PIPE
- F/L FLOW LINE
- RIM RIM ELEVATION (AT FLOW LINE)
- INV INVERT ELEVATION
- MH MANHOLE
- CB CATCH BASIN
- RY REAR YARD
- YD YARD DRAIN
- RD ROOF DRAIN
- FES FLARED END SECTION
- CMP CORRUGATED METAL PIPE
- GPP CORRUGATED PLASTIC PIPE
- RCP REINFORCED CONCRETE PIPE
- HDPE HIGH DENSITY POLYETHYLENE
- PVC POLYVINYL CHLORIDE
- DIP DUCTILE IRON PIPE
- GV GATE VALVE
- GVW GATE VALVE IN WELL
- QVB GATE VALVE IN BOX
- HYD HYDRANT
- FDC FIRE DEPARTMENT CONNECTION
- UP UTILITY POLE
- NFV NOT FIELD VERIFIED
- TR TO BE REMOVED
- L LIBER
- P PAGE
- L.C.R. LIVINGSTON COUNTY RECORDS
- (M&R) MEASURED AND RECORD
- L.O.B. POINT OF BEGINNING

THE LOCATION AND ELEVATION OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE DRAWINGS ARE ONLY APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OF THESE UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE PLANS.

BEFORE ANY WORK BEGINS, THE CONTRACTOR SHALL CALL MISS DIG AT 1-800-487-7171 TO LOCATE ALL UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE PLANS.

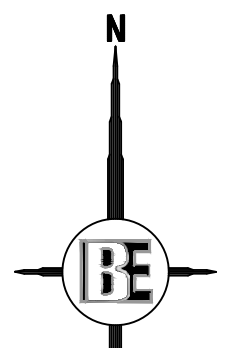
BEBOSS Engineering
 Engineers Surveyors Planners Landscape Architects
 3121 E. GRAND RIVER AVE.
 HOWELL, MI. 48843
 517.546.4836 FAX 517.548.1670

SCHOOL BELL CHILDCARE
 PROJECT PREPARED FOR
 SCHOOL IN THE PINES INC. dba SCHOOL BELL CHILDCARE
 4501 WEST HIGHLAND ROAD
 METEOR, MI 48380
 248.830.9542

GENERAL NOTES & LEGEND	
PROJECT	SCHOOL BELL CHILDCARE
PREPARED FOR	SCHOOL IN THE PINES INC. dba SCHOOL BELL CHILDCARE
TITLE	GENERAL NOTES & LEGEND
DATE	
REVISION	PER
BY	
DATE	
DESIGNED BY:	BL
DRAWN BY:	JP
CHECKED BY:	
SCALE:	NO SCALE
JOB NO:	24-048
DATE:	05/31/24
SHEET NO.	2



SEE SHEET 2 FOR GENERAL NOTES AND LEGEND



SCALE: 1" = 20' FEET

USDA Soil Conservation Service in cooperation with MI Agricultural Experiment Station (1977) Soil Survey of Oakland County, Michigan
18B Fox Sandy Loam 1-6% Slopes

PARCEL INFORMATION:

PARCEL ID: #11-30-101-002
LOT ACREAGE: 1.62 AC. ±
ZONING: LAKE & VILLAGE (LV)
ADDRESS: 4501 W HIGHLAND ROAD, MILFORD, MI 48380
CLIENT: SCHOOL BELL CHILDCARE

PROPERTY DESCRIPTION PER OAKLAND COUNTY TAX ROLL:

T3N, R7E, SEC 30 WEST HIGHLAND VILLAGE
LOTS 32 & 33

GENERAL SURVEY NOTES:

1. BEARINGS ARE BASED ON MICHIGAN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE.
2. SUBSURFACE UTILITIES NOT LOCATED FOR THIS SURVEY MAY EXIST. IT IS THE RESPONSIBILITY OF THE OWNER OF THE RESPECTIVE UTILITY TO ACCURATELY LOCATE SUCH UTILITIES.
3. EASEMENTS OR RESTRICTIONS OF RECORD NOT DEPICTED ON THIS DRAWING MAY EXIST.
4. POST-PROCESSING (NAVD88 DATUM)
5. CONTOURS ARE SHOWN AT 1 FOOT INTERVALS.
6. THE LOCATIONS OF UNDERGROUND UTILITIES, AS SHOWN ON THIS DRAWING ARE APPROXIMATE. THE LOCATIONS ARE BASED ON PHYSICAL FIELD LOCATIONS OF STRUCTURES ALONG WITH MISS DIG MARKINGS IN THE FIELD.
7. ALL WORK SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE MUNICIPALITY, THE COUNTY, AND THE STATE OF MICHIGAN.
8. ALLOW THREE WORKING DAYS BEFORE YOU DIG. CALL MISS DIG TOLL FREE 1-800-482-7171.

SITE BENCHMARKS (NAVD88 DATUM):

- BM #200 = BOSS NAIL/TAG SET S/S POWER POLE ELEV.=1014.63
- BM #201 = BM X TOP OF WELL ELEV.=1019.68
- BM #202 = BOSS NAIL/TAG SET E/S 40" WALNUT ELEV.=1020.17

DEVELOPMENT: TWENTY-TWO (22) TREES ARE TO BE REMOVED FOR THE DEVELOPMENT OF THE SITE - ALL IN THE EAST, UNDEVELOPED AREA. NO TREES ARE TO BE RELOCATED. REMOVED TREES ARE WITHIN THE PROPOSED BUILDING OUTLINE AND WHERE IMPACTED BY THE EXPANDED PARKING LOT. MATURE TREES AROUND THE PERIMETER OF THE SITE WILL BE PRESERVED DURING CONSTRUCTION. PORTIONS OF THE EXISTING LOT AREA WILL BE UTILIZED FOR TOPSOIL STOCKPILING AND MATERIAL STAGING AREAS (AS NOTED ON THE PLAN).

TREE REMOVAL INVENTORY

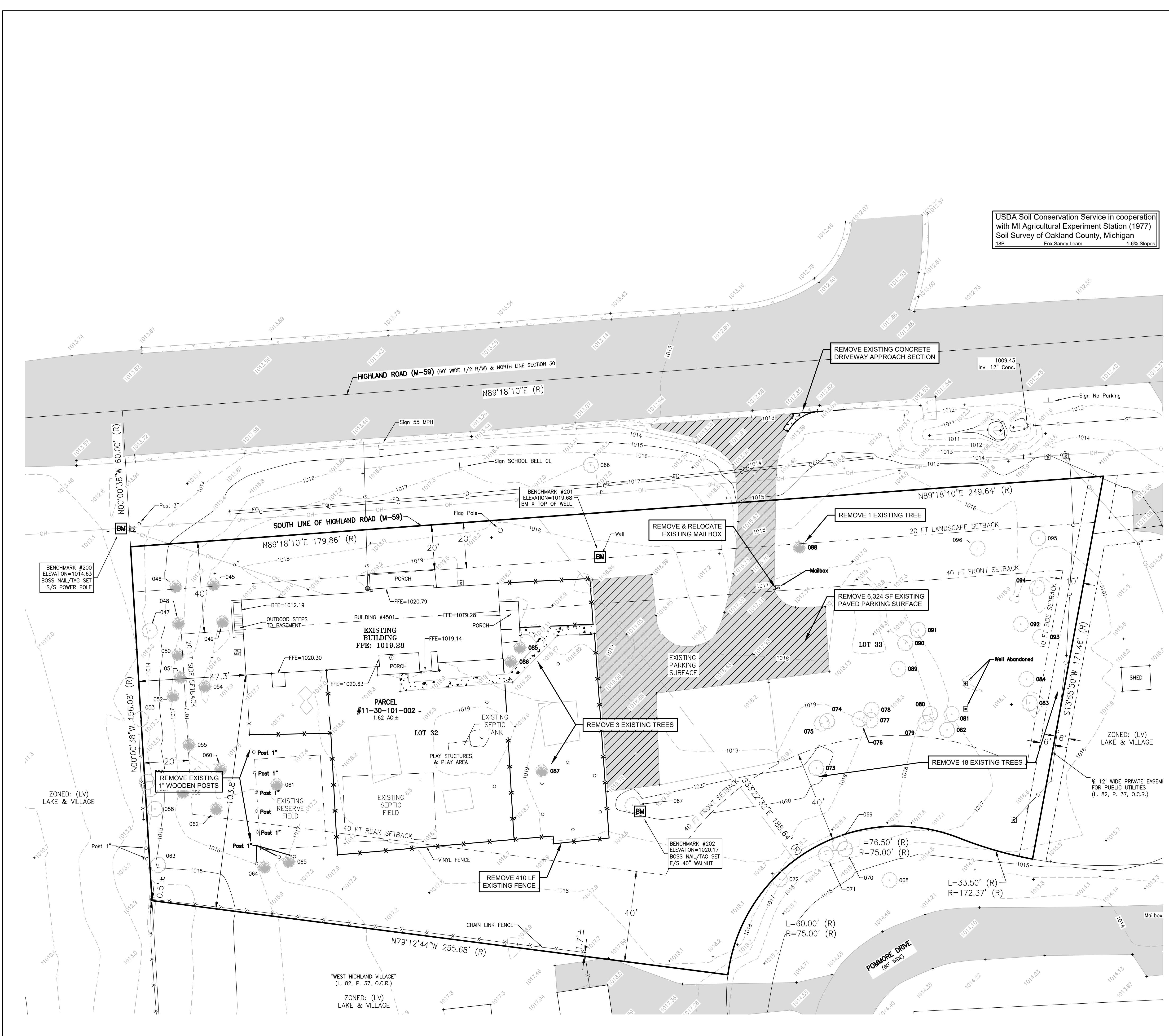
TREE NUMBER	TREE SPECIES	TREE COMMON NAME	TREE DIAMETER	TREE CONDITION
73	CARYA GLABRA	PIGNOT HICKORY	14	FAIR
74	ACER RUBURM	RED MAPLE	11	FAIR
75	ACER RUBURM	RED MAPLE	12	FAIR
76	CARYA GLABRA	PIGNOT HICKORY	17	FAIR
77	CARYA GLABRA	PIGNOT HICKORY	11	FAIR
78	ACER RUBURM	RED MAPLE	7	POOR
79	JUGLANS NIGRA	BLACK WALNUT	12	POOR
80	JUGLANS NIGRA	BLACK WALNUT	12	POOR
81	JUGLANS NIGRA	BLACK WALNUT	15	POOR
82	JUGLANS NIGRA	BLACK WALNUT	13	POOR
83	JUGLANS NIGRA	BLACK WALNUT	19	FAIR
84	PICEA ABIES	NORWAY SPRUCE	9	GOOD
85	PICEA ABIES	NORWAY SPRUCE	9	GOOD
86	PICEA ABIES	NORWAY SPRUCE	8	GOOD
87	PICEA ABIES	NORWAY SPRUCE	19	GOOD
88	PICEA ABIES	NORWAY SPRUCE	14	GOOD
89	JUGLANS NIGRA	BLACK WALNUT	15	GOOD
90	JUGLANS NIGRA	BLACK WALNUT	12	POOR
91	ACER RUBURM	RED MAPLE	10	FAIR
92	JUGLANS NIGRA	BLACK WALNUT	14	POOR
93	JUGLANS NIGRA	BLACK WALNUT	10	FAIR
94	JUGLANS NIGRA	BLACK WALNUT	18	POOR

THE LOCATION AND ELEVATION OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE DRAWINGS ARE ONLY APPROXIMATE. NO WARRANTY IS MADE BY THE ENGINEER AS TO THE ACCURACY OF THE LOCATION AND ELEVATION OF EXISTING UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION AND ELEVATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL UTILITIES REMAINING ON THE SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FROM THE PUBLIC UTILITIES COMPANIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FROM THE PUBLIC UTILITIES COMPANIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FROM THE PUBLIC UTILITIES COMPANIES.

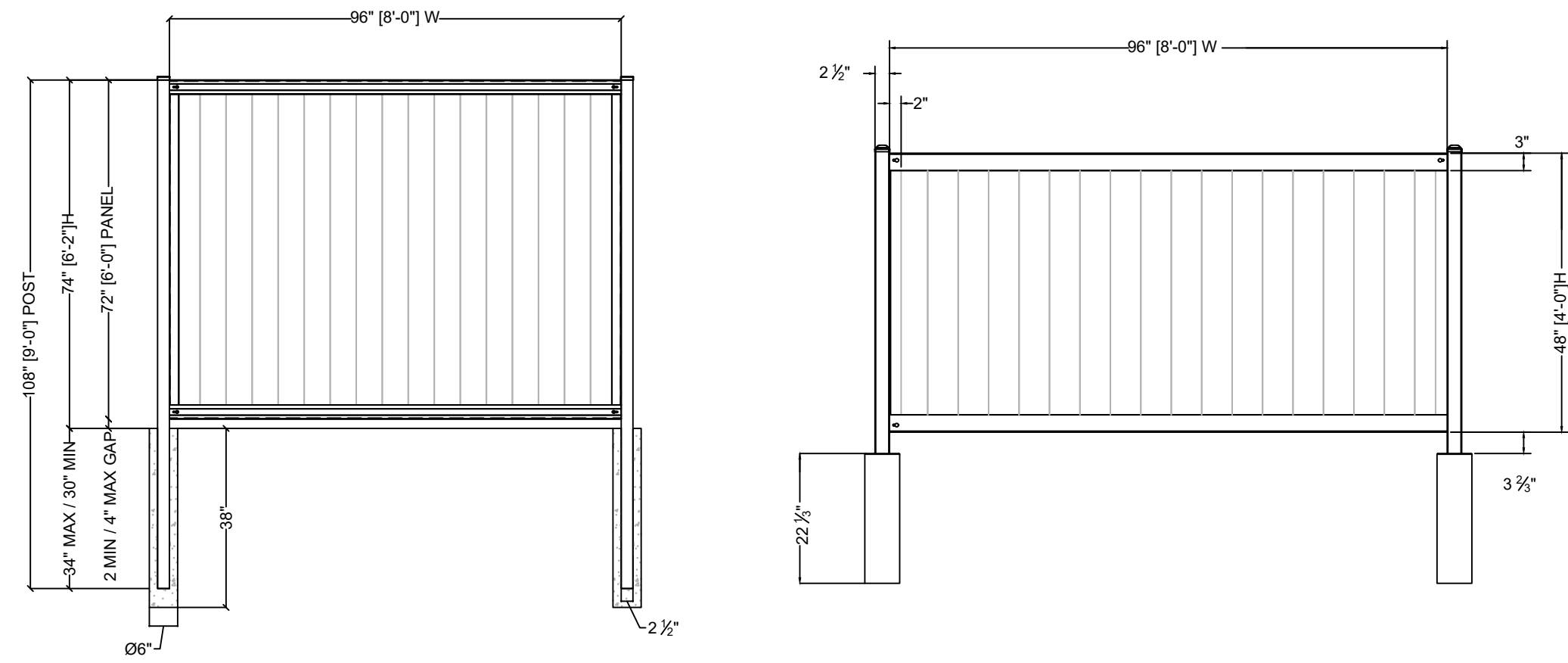
BEBOSS
Engineering
Engineers Surveyors Planners Landscape Architects
3121 E. GRAND RIVER AVE.
HOWELL, MI. 48843
517.546.4836 FAX 517.548.1670

PROJECT: SCHOOL BELL CHILDCARE
PREPARED FOR: SCHOOL IN THE PINES INC. dba SCHOOL BELL CHILDCARE
4501 WEST HIGHLAND ROAD
MILFORD, MI 48380
248.830.9542
TITLE: EXISTING CONDITIONS & DEMOLITION PLAN

DESIGNED BY:	DATE
BL	
DRAWN BY:	DATE
JP	
CHECKED BY:	DATE
SCALE:	REVISION PER
1"=20'	
JOB NO:	DATE
24-048	05/31/24
SHEET NO.	DATE
3	

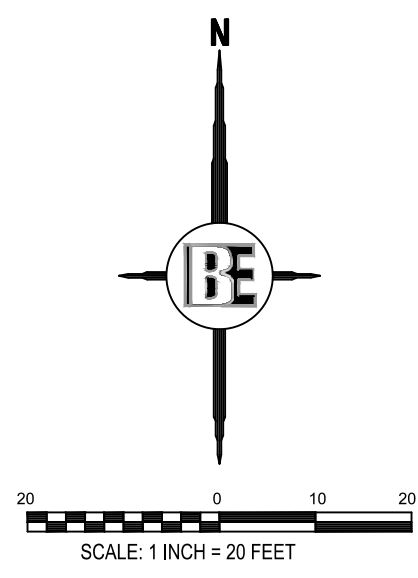


SEE SHEET 2 FOR GENERAL NOTES AND LEGEND



TYPICAL 6' VINYL FENCE
(FENCETRIC VERTICAL 6'X8')
(NO SCALE)

TYPICAL 4' VINYL FENCE
(FENCETRIC VERTICAL 4'X8')
(NO SCALE)



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BE BOSS ENGINEERING, INC.
1-800-482-7171
1-800-482-7171

SITE DATA:

HIGHLAND TOWNSHIP
PARCEL #11-30-101-002
4501 WEST HIGHLAND ROAD, MILFORD, MI 48380
1.62 AC ±

ZONING: LAKE & VILLAGE (LV)
SCHOOL DISTRICT: HURON VALLEY SCHOOLS

EXISTING SITE USE: SCHOOL BELL CHILDCARE
EXISTING CHILDCARE BLDG SF: 3,600 GSF ±
EXISTING PLAYGROUND SF: 10,313 GSF ±

MAX. LOT COVERAGE: 35.0% BLDG,
BUILDABLE AREA: 0.79 AC ± (34,363 SQ FT)
EXISTING LOT COVERAGE: 5.09% BLDG, 14.6% IMPERVIOUS
PROPOSED LOT COVERAGE: 15.4% BLDG, 34.7% IMPERVIOUS

MIN. LOT AREA REQUIRED FOR ZONING: 1.00 ACRE
EX. LOT AREA: 1.62 AC ± (70,754 SQ FT) + 0.03 AC ± (1,744 SF) DRIVEWAY APPROACH & CURB
MIN. LOT WIDTH: 120 FT TOTAL EXISTING LOT WIDTH: 156.08 FT

IMPERVIOUS AREAS =

PROPOSED ASPHALT PARKING	10,248 SF (0.24 AC)
PROPOSED ASPHALT DRIVEWAY APPROACH - OFFSITE	7,359 SF (0.03 AC)
PROPOSED CONCRETE WALK	1,764 SF (0.04 AC)
PROPOSED CONCRETE CURB - OFFSITE	385 SF (0.01 AC)
PROPOSED DUMPSTER PAD	240 SF (0.01 AC)
EXISTING BUILDING	3,600 SF (0.08 AC)
PROPOSED BUILDING	7,621 SF (0.17 AC)
SUBTOTAL:	25,217 SF (0.58 AC)

PERVIOUS AREAS =

MODIFIED PLAYGROUND	13,196 SF (0.30 AC)
EXISTING LAWN/VEGETATION	34,085 SF (0.78 AC)
SUBTOTAL:	47,281 SF (1.08 AC)

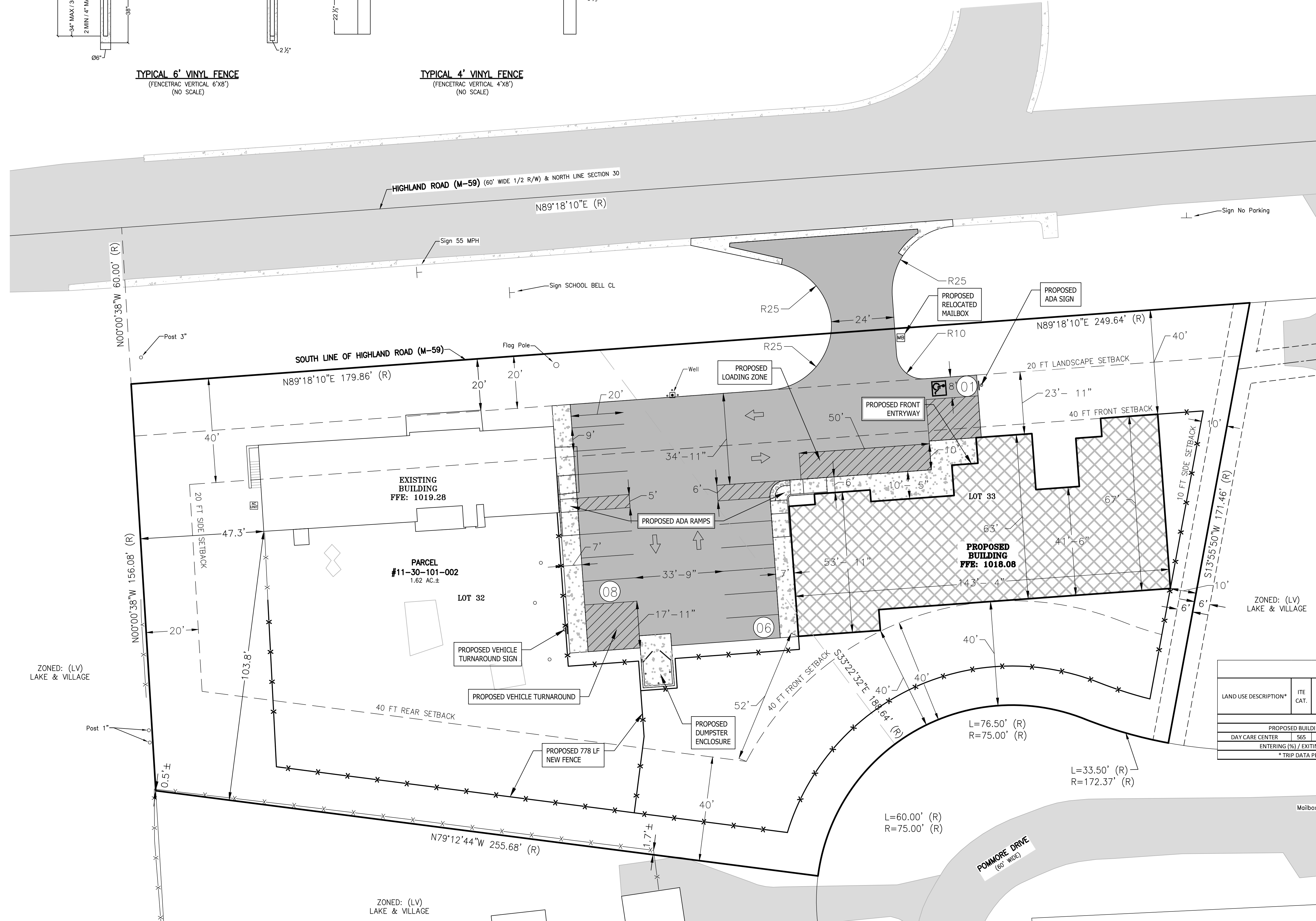
TOTAL SITE AREAS = TOTAL: 70,754 SF (1.62 AC) + 1,359 SF (0.03 AC) + 385 SF (0.01 AC)

MIN. BLDG. SETBACKS REQUIRED: EXISTING BLDG SETBACKS: PROPOSED BLDG SETBACKS:

RIGHT-OF-WAY:	33-FT	33-FT	33-FT
FRONT:	40-FT	20-FT	40-FT
SIDE:	30-FT: 10-FT MIN SIDE	47-FT	10-FT
REAR:	40-FT	103-FT	52-FT
MAX BLDG HGT:	28-FT	25-FT (2-STORY)	27-FT (1-STORY)

PARKING CALCULATION:
THE EXISTING BUILDING WILL CONTINUE TO BE USED FOR DAY CARE PURPOSES. PRIMARY CARE, INCLUDING STAFFING AND CHILDCARE, WILL INSTEAD OCCUR IN THE PROPOSED BUILDING. THE NEW BUILDING WILL HAVE 13 EMPLOYEES AND BE LICENSED FOR 96 CHILDREN. THE NUMBER OF REQUIRED SPACES ON SITE IS EQUAL TO 2 SPACES + 1 SPACE/8 CHILDREN WHICH TOTALS 14 REQUIRED SPACES, INCLUDING 1 VEHICLE ACCESSIBLE SPACE.

TOTAL PROVIDED PARKING: 15 SPACES (INCLUDING 1 VEHICLE ACCESSIBLE SPACE)



GENERAL NOTES:
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ALL WORK SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE MUNICIPALITY, THE COUNTY, AND THE STATE OF MICHIGAN.

ALLOW THREE WORKING DAYS BEFORE YOU DIG, CALL MISS DIG TOLL FREE 1-800-482-7171

VEHICLE TRIP GENERATION TABLE

LAND USE DESCRIPTION*	ITE CAT.	SIZE	UNIT	WEEKDAY AM PEAK (7-9AM)			WEEKDAY PM PEAK (4-6PM)			REMARKS
				TOTAL	IN	OUT	TOTAL	IN	OUT	
PROPOSED BUILDING										
DAY CARE CENTER	565	96	STUDENTS	75	40	35	-	76	36	40
ENTERING (%) / EXITING (%)				100%	53%	47%	-	100%	47%	53%
* TRIP DATA PER INSTITUTE OF TRAFFIC ENGINEERS (ITE) TRIP GENERATION MANUAL 10TH EDITION - VOLUME 2										

BE BOSS Engineering
Engineers Surveyors Planners Landscape Architects
3121 E. GRAND RIVER AVE.
HOWELL, MI. 48843
517.546.4836 FAX 517.548.1670

SCHOOL BELL CHILDCARE
SCHOOL IN THE PINES INC. dba SCHOOL BELL CHILDCARE
4501 WEST HIGHLAND ROAD
MILFORD, MI 48380
248.830.9542

SITE PLAN

DESIGNED BY:	BL
DRAWN BY:	JP
CHECKED BY:	
SCALE:	1"=20'
JOB NO:	24-048
DATE:	05/31/24
SHEET NO.	5

FOR SITE PLAN APPROVAL ONLY!
NOT FOR CONSTRUCTION

DYODS™
Design Your Own Detention System

CONTECH
CMP DETENTION SYSTEMS

For design assistance, drawings, and pricing send completed worksheet to: dyods@contech-cpi.com

Project Summary

Date: 4/18/2024
 Project Name: School Bell Childcare
 City / County: Highland/Oakland
 State: MI
 Designed By: JMP
 Company: Boss Engineering
 Telephone: 517.546.4836

Enter information in Blue Cells

Corrugated Metal Pipe Calculator

Storage Volume Required (cf):	5,000	
Limiting Width (ft):	26.00	
Invert Depth Below Asphalt (ft):	6.00	
Solid or Perforated Pipe:	Perforated	15.90 ft ² Pipe Area
Shape Or Diameter (in):	54	
Number Of Headers:	1	
Spacing between Barrels (ft):	2.25	
Stone Width Around Perimeter of System (ft):	0	
Depth A: Porous Stone Above Pipe (in):	0	
Depth C: Porous Stone Below Pipe (in):	0	
Stone Porosity (0 to 40%):	0	

System Sizing

Pipe Storage:	5,038 cf	
Porous Stone Storage:	0 cf	
Total Storage Provided:	5,038 cf	100.8% Of Required Storage
Number of Barrels:	4 barrels	
Length per Barrel:	73.0 ft	
Length Per Header:	24.8 ft	
Rectangular Footprint (W x L):	24.75 ft x 77.5 ft	

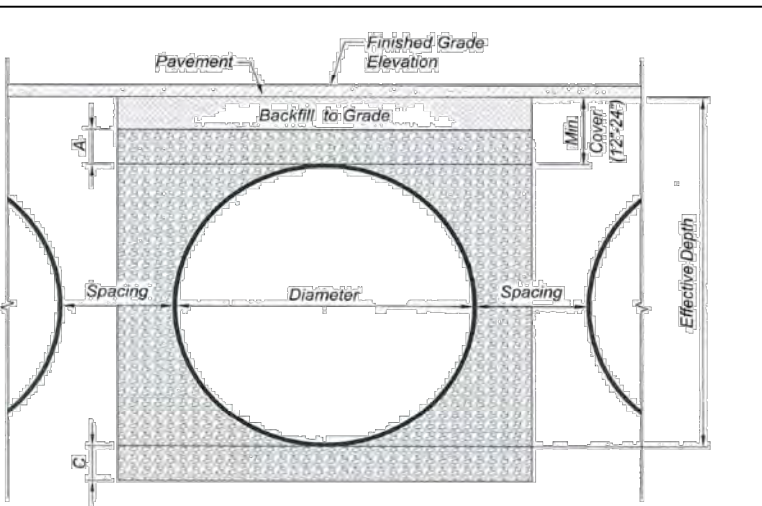
CONTECH Materials

Total CMP Footage:	317 ft
Approximate Total Pieces:	18 pcs
Approximate Coupling Bands:	17 bands
Approximate Truckloads:	5 trucks

Construction Quantities**

Total Excavation:	427 cy
Porous Stone Backfill For Storage:	133 cy stone
Backfill to Grade Excluding Stone:	107 cy fill

**Construction quantities are approximate and should be verified upon final design

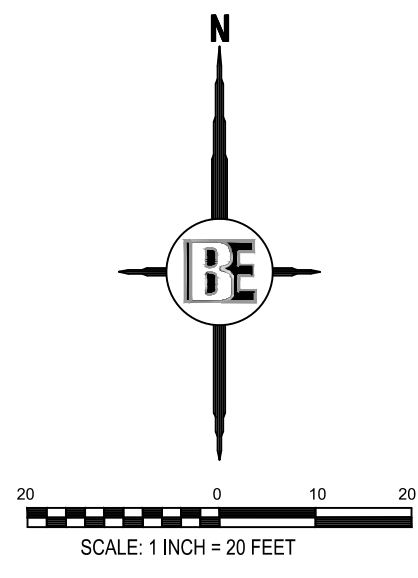


System Layout

Barrel 12	0
Barrel 11	0
Barrel 10	0
Barrel 9	0
Barrel 8	0
Barrel 7	0
Barrel 6	0
Barrel 5	0
Barrel 4	73
Barrel 3	73
Barrel 2	73
Barrel 1	73

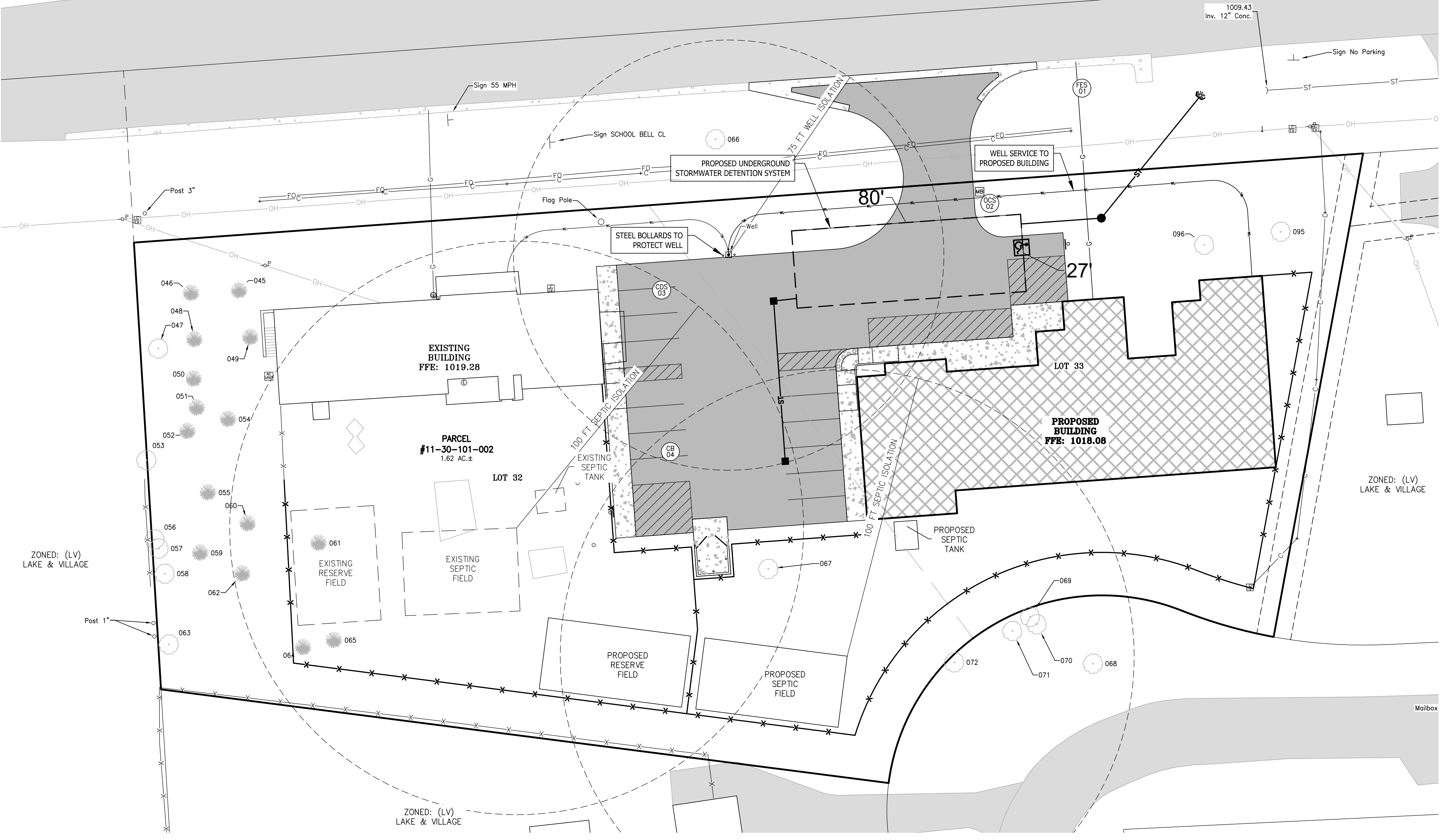
Barrel Footage (w/o headers)

SEE SHEET 2 FOR GENERAL NOTES AND LEGEND



STRUCTURE FRAMES & COVERS

COVER	TYPE	USE	EAST JORDAN (OR EQUAL)	TYPE OF COVER OR GRATE
A	MH	ALL	1040	TYPE "B"
D	CB & INLET	PARKING LOTS	1040 5100	TYPE "M1" GRATE 5105 TYPE "M1" GRATE
E	CB & INLET	LAWN AREA OR DITCH	1040	TYPE "O2"



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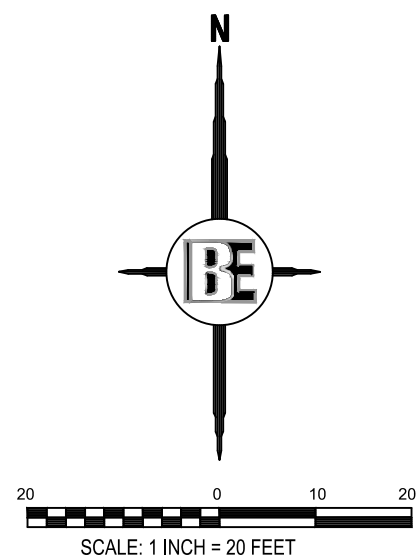
BE BOSS Engineering
 3121 E. GRAND RIVER AVE.
 HOWELL, MI. 48843
 517.546.4836 FAX 517.548.1670

SCHOOL BELL CHILDCARE
 PREPARED FOR: SCHOOL IN THE PINES INC. dba SCHOOL BELL CHILDCARE
 4501 WEST HIGHLAND ROAD
 MIFORD, MI 48860
 248.830.9542

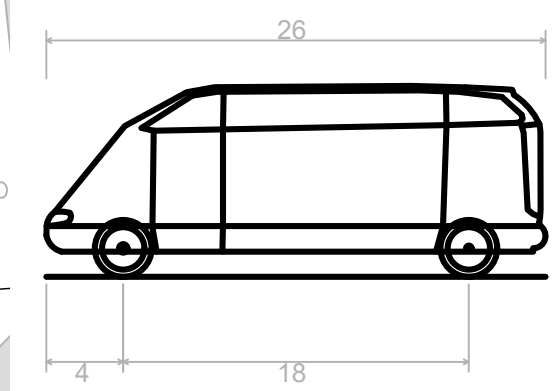
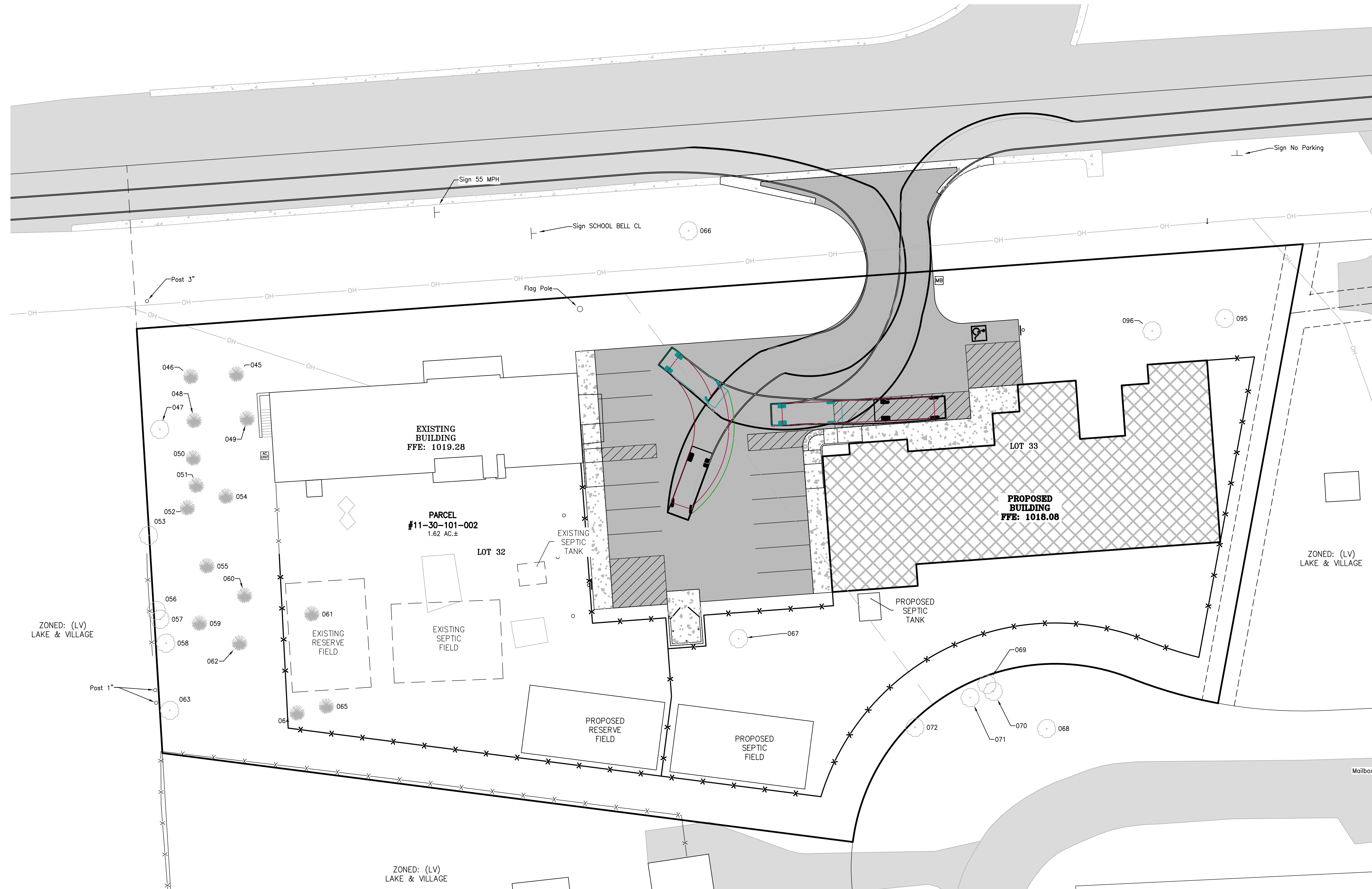
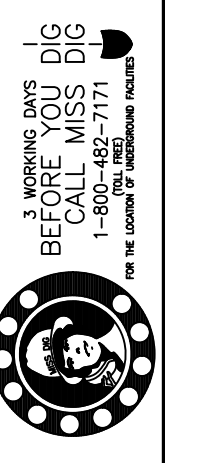
UTILITY PLAN

DESIGNED BY:	DATE
BL	
DRAWN BY:	DATE
JP	
CHECKED BY:	DATE
SCALE:	DATE
1"=20'	
JOB NO:	DATE
24-048	05/31/24
SHEET NO.	REVISION PER
8	

SEE SHEET 2 FOR GENERAL NOTES AND LEGEND



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UPS Truck
Overall Length 26.000ft
Overall Width 8.000ft
Overall Body Height 9.942ft
Min Body Ground Clearance 1.312ft
Track Width 8.000ft
Lock-to-lock time 2.00s
Wall to Wall Turning Radius 26.000ft

EMERGENCY VEHICLE ACCESS NARRATIVE:
FIRE TRUCKS WILL USE THE WEST HIGHLAND ROAD (M-59) RIGHT OF WAY FOR PRIMARY ACCESS. ADDITIONALLY, POMMORE DRIVE BEHIND THE SITE CAN ALSO BE USED AS A SECONDARY ACCESS POINT.

BE BOSS
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517.546.4836 FAX 517.548.1670

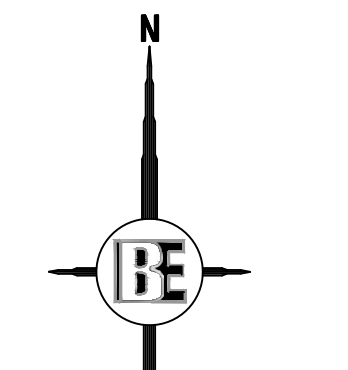
PROJECT: SCHOOL BELL CHILDCARE
PREPARED FOR: SCHOOL IN THE PINES INC. dba SCHOOL BELL CHILDCARE
4501 WEST HIGHLAND ROAD
MILFORD, MI 48360
248.830.9542
TITLE: VEHICLE CIRCULATION PLAN

NO	BY	REVISION PER	DATE

DESIGNED BY: BL
DRAWN BY: JP
CHECKED BY:
SCALE: 1"=20'
JOB NO: 24-048
DATE: 05/31/24

SHEET NO. 9

SEE SHEET 2 FOR GENERAL NOTES AND LEGEND



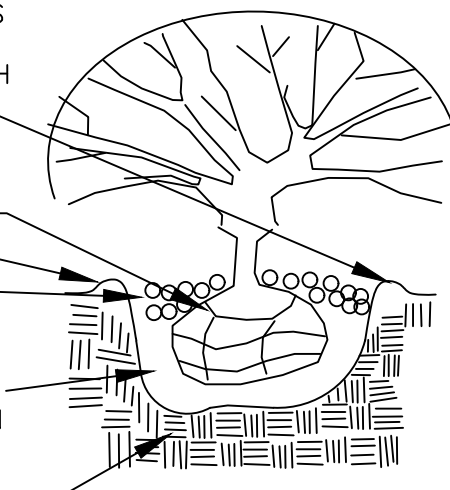
PRUNE BROKEN OR MISSHAPEN - RETAIN NATURAL SHAPE

IN SODDED AREAS PLACE SOD TO BOTTOM OF EARTH SAUCER

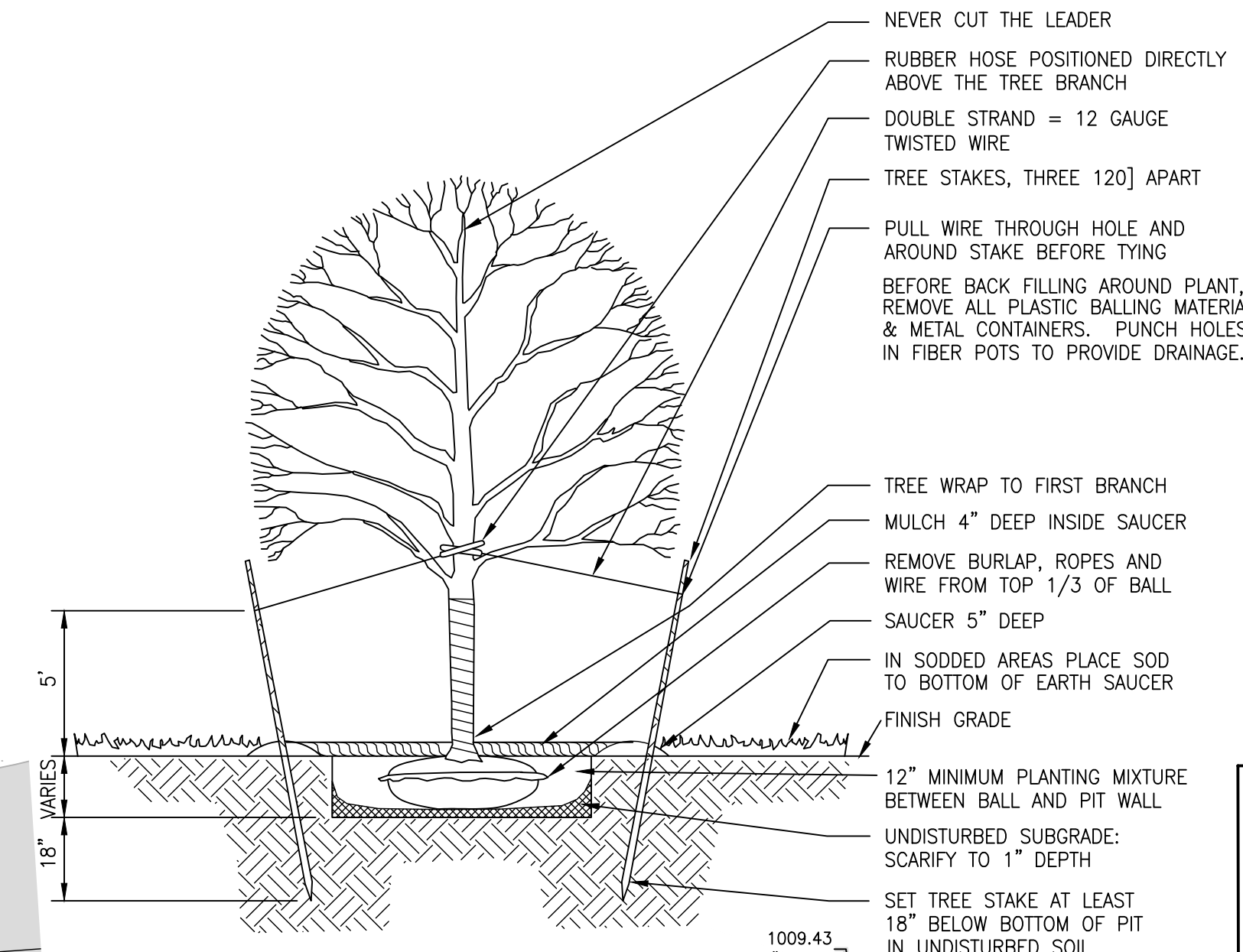
REMOVE BALLING MATERIAL &/OR CONTAINER. FINISH GRADE MIN. 4" SHREDDED MULCH

6" MIN. PLANTING MIXTURE BETWEEN BALL & PIT WALL UNDISTURBED SUBGRADE SCARIFY TO 2" DEPTH

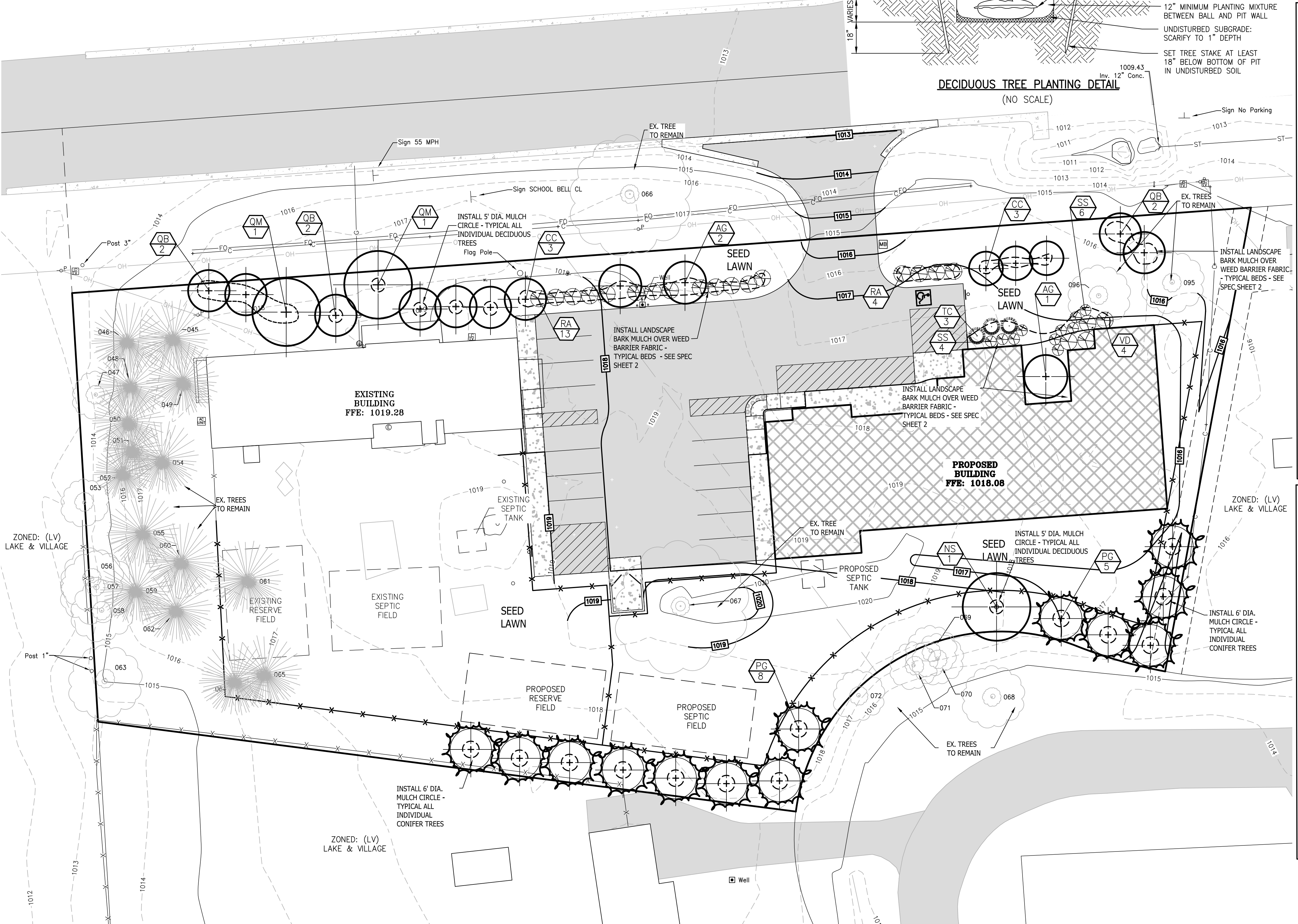
SHRUB PLANTING DETAIL
(NO SCALE)



PLANT LIST				
KEY QUAN.	BOTANICAL NAME	COMMON NAME	SIZE	REMARK
DECIDUOUS TREES				
AG 3	Amelanchier x Grandiflora 'Autumn Brilliance'	Autumn Brilliance Serviceberry	6' hgt.	B-B
CC 6	Cercis canadensis 'The Rising Sun' (JNU)	Rising Sun Redbud	2" cal.	B-B
NS 1	Nyssa sylvatica 'Northern Splendor'	Northern Splendor Black Gum	2.5" cal.	B-B
QM 2	Quercus macrocarpa 'JFS-KWS'	Urban Pinnacle Oak	2.5" cal.	B-B
QB 6	Quercus bicolor 'Bonnie and Mike'	Beacon Oak (Columnar)	2.5" cal.	B-B
CONIFER TREES				
PG 13	Picea glauca	White Spruce	6' hgt.	B-B
DECIDUOUS SHRUBS				
RA 17	Rhus aromatica 'Lacette'	Lacette Fragrant Sumac	24"/#3	Cont.
DP 10	Symphoricarpos sp.	Proud Berry Coralberry	18"/#3	Cont.
TC 3	Taxus canadensis	Canada Yew	36"/#5	Cont.
VD 9	Viburnum dentatum 'Christom'	Blue Muffin Arrowwood Viburnum	36"/#5	Cont.



DECIDUOUS TREE PLANTING DETAIL
(NO SCALE)



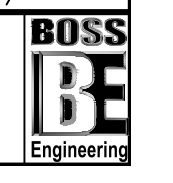
LANDSCAPE CALCULATIONS

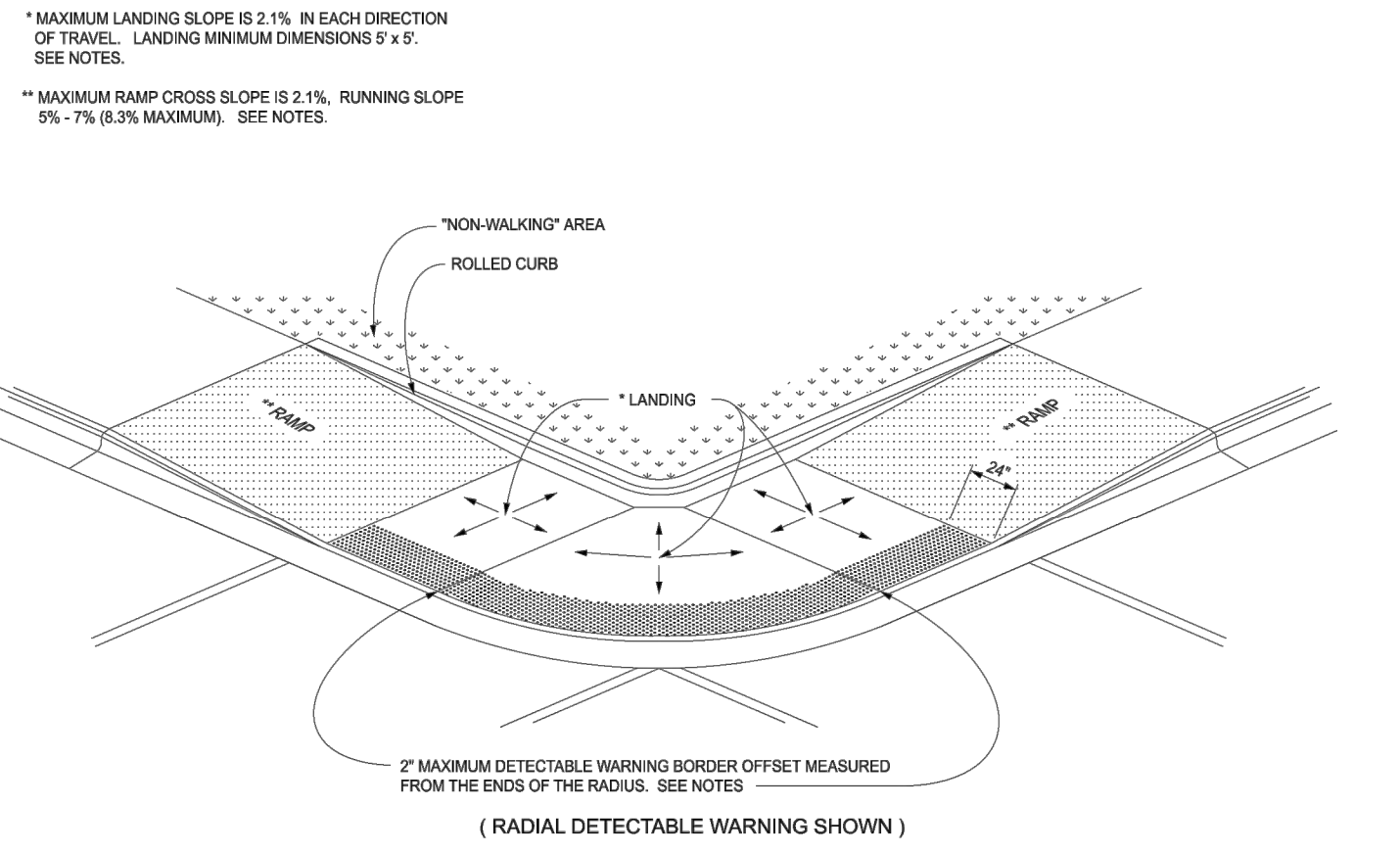
PROJECT INFORMATION:	1.62 AC TOTAL SITE
SITE SIZE / AREA OF WORK:	LV (LAKES AND VILLAGES)
ADJACENT ZONING / USES:	EAST - LV / SINGLE-FAMILY RESIDENTIAL WEST - LV (LAKES AND VILLAGES) NORTH - M-59 RIGHT-OF-WAY SOUTH - LV / SINGLE-FAMILY RESIDENTIAL
PARKING LOT:	14 NEW SPACES + 1 ADA SPACE PROVIDED IN 1 PARKING LOT (15 TOTAL SPACES)
REQUIRED:	
GENERAL:	SECTION 12.03 (B) (4) THE PRESERVATION AND INCORPORATION OF EXISTING TREES IS ENCOURAGED
SCREENING BETWEEN LAND USES:	SECTION 12.04 SCREENING BETWEEN LAND USES MIN 6FT HEIGHT VISUAL SCREEN REQUIRED FOR "INTENSE USE" PLAN COMMISSION SHALL DETERMINE TYPE CONIFER HEDGE, SOLID WALL, OR DECORATIVE FENCE
PARKING LOT LANDSCAPING:	SECTION 12.05 (A) 1 TREE + 3 SHRUBS / 8 SPACES. SEPARATE LANDSCAPE ISLANDS MIN. 200 SQFT EACH THE PLANNING COMMISSION MAY APPROVE AN EQUIVALENT AMOUNT OF LANDSCAPE PLANTINGS AT THE PERIMETER OF PARKING LOTS WHERE LANDSCAPING WITHIN PARKING LOTS WOULD BE IMPRACTICAL DUE TO THE SIZE OF THE PARKING LOT, DETRIMENTAL TO SAFE AND EFFICIENT TRAFFIC FLOW, OR WOULD CREATE AN UNREASONABLE BURDEN FOR MAINTENANCE AND SNOW PLOWING.
REQUIRED LANDSCAPING ADJACENT TO ROAD PUBLIC RIGHTS-OF-WAY:	SECTION 12.05 (B) PARKING LOTS SHALL BE SCREENED FROM VIEW THAT ARE VISIBLE FROM ALL RIGHTS-OF-WAY BY A LANDSCAPED BERM, WALL, OR SUFFICIENT PLANTINGS 3 FEET IN HEIGHT.
GREENBELTS:	SECTION 12.06 MINIMUM 20 FEET IN WIDTH FOR ALL NON-RESIDENTIAL PROPERTIES FRONTING HIGHLAND ROAD (M-59) AND 12 FEET IN WIDTH FOR ALL OTHER NON-RESIDENTIAL USES. MIN 1 TREE/ 30 LI.FT FRONTAGE ROW (NOT INCL. DRIVES)
SITE LANDSCAPING:	THE GREENBELT SHALL BE LANDSCAPED WITH A MINIMUM OF 1 DECIDUOUS TREE FOR EVERY 30 LINEAL FEET, OR FRACTION THEREOF OF FRONTAGE ABUTTING A PUBLIC ROAD RIGHT-OF-WAY. THE REMAINDER OF THE GREENBELT SHALL BE LANDSCAPED WITH TREES, GRASSES, GROUND COVERS, AND SHRUBS.
SCREENING OF TRASH CONTAINERS:	SECTION 12.09 SCREENED ON ALL SIDES WITH OPAQUE FENCE OR WALL AND GATE AT LEAST 6FT HIGH.
PROVIDED:	
SCREENING BETWEEN LAND USES:	PROPOSE: 6 NEW CONIFER TREES, 1 NEW DECIDUOUS TREE, 5 EXISTING DECIDUOUS TREES SCREEN SOUTH. 3 EXISTING DECIDUOUS TREES SCREEN EAST.
PARKING LOT LANDSCAPING:	(15 SPACES TOTAL) X (1 TREE/8 SPACES) = 1.75 TREES = 2 TREES (15 SPACES TOTAL) X (3 SHRUBS/8 SPACES) = 5.25 SHRUBS = 6 SHRUBS PROPOSE LANDSCAPING AT THE PERIMETER OF THE LOT DUE TO SMALL SIZE OF LOT FOR SAFE AND EFFICIENT TRAFFIC FLOW.
LANDSCAPING ADJACENT TO PUBLIC RIGHTS-OF-WAY:	4-FOOT HIGH-OPACITY DECIDUOUS SHRUB ROW ALONG M59 SIDE OF LOT (17) SHRUBS
GREENBELTS:	HIGHLAND ROAD/M59: 20 FEET 425/30 LINEAL FEET = 15 DECIDUOUS TREES 1 EXISTING DECIDUOUS TREE + 14 DECIDUOUS TREES
SITE LANDSCAPING:	POHMORE DRIVE: 20 FEET 35.50+76.50+60.00= 172 LINEAL FEET, 172/30 LINEAL FEET = 6 DECIDUOUS TREES 5 EXISTING DECIDUOUS TREES + 1 DECIDUOUS TREE
SCREENING OF TRASH CONTAINERS:	PROVIDED BY 6' HEIGHT WALLED ENCLOSURE WITH GATE INCLUDED
REQUIRED:	7,507 SQFT X (15) = 10585 SQ.FT. OR 0.243 ACRE
PROVIDED:	WEST SIDE YARD: 7053 SQFT EAST SIDE YARD: 2943 SQFT FOUNDATION PLANTING: 914 SQFT REAR YARD: 5205 SQFT
TOTAL LANDSCAPED:	16115 SQFT OR 0.370 ACRE
CONSISTING OF PRESERVED TREES AND LAWN AREAS AND FOUNDATION PLANTINGS (AC COUNT)	

BEBOSS
Engineering
Engineers Surveyors Planners Landscape Architects
3121 E. GRAND RIVER AVE.
HOWELL, MI. 48843
517.546.4836 FAX 517.548.1670

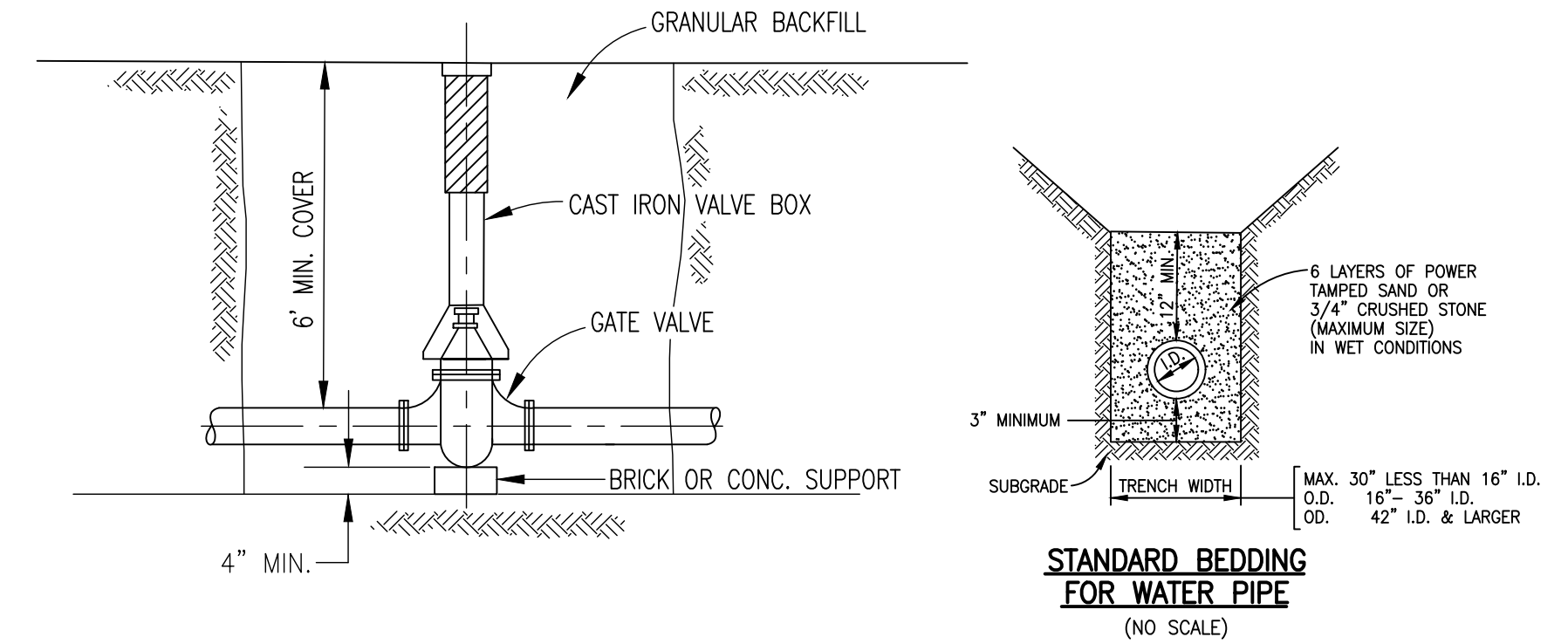
SCHOOL BELL CHILDCARE
SCHOOL IN THE PINES INC. dba SCHOOL BELL CHILDCARE
4501 WEST HIGHLAND ROAD
MILFORD, MI 48380
248.830.9542

PROJECT	PREPARED FOR	TITLE	DATE
SCHOOL BELL CHILDCARE	SCHOOL IN THE PINES INC. dba SCHOOL BELL CHILDCARE	LANDSCAPE PLAN	
DESIGNED BY:	TC		
DRAWN BY:	TC		
CHECKED BY:	PC		
SCALE:	1" = 20'		
JOB NO:	24-048		
DATE:	05/31/24		
SHEET NO.	10		

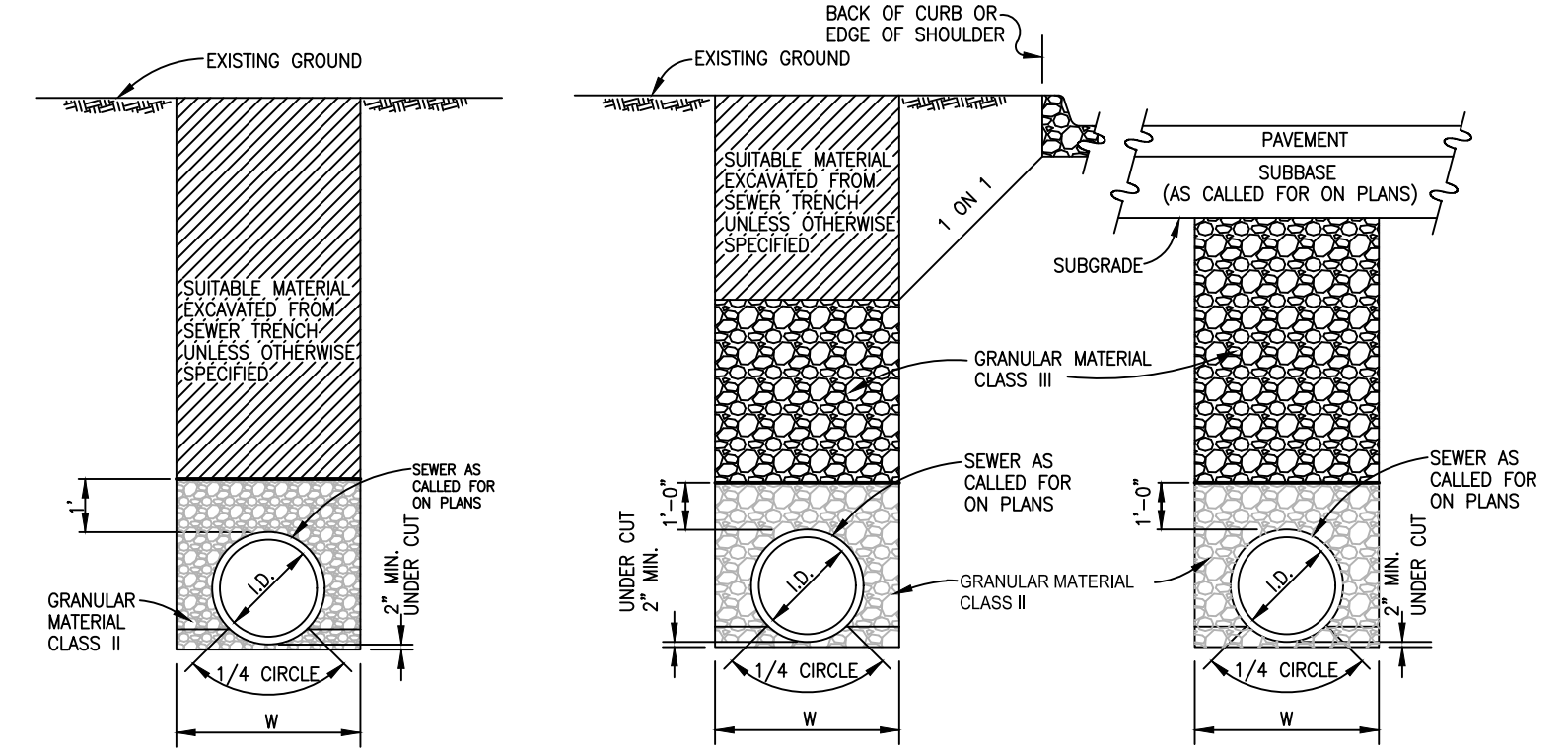




	STANDARD PLAN FOR CURB RAMP AND DETECTABLE WARNING DETAILS		SHEET 4 OF 7
	(SPECIAL DETAIL) 11/09/2023	PLAN DATE	
DEPARTMENT DIRECTOR: BRADLEY C. WIEFFRICH		THRU APPROVAL:	RECT

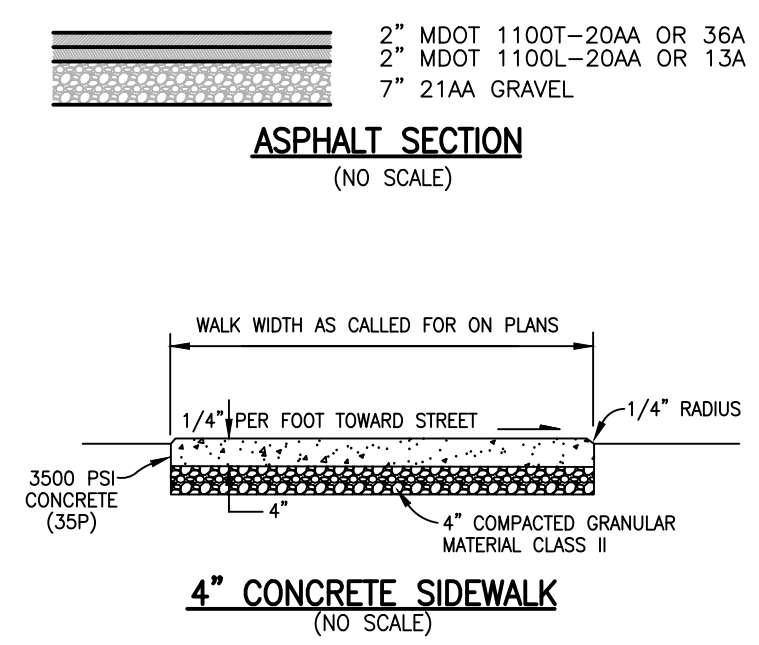


STANDARD GATE VALVE & BOX (NO SCALE)



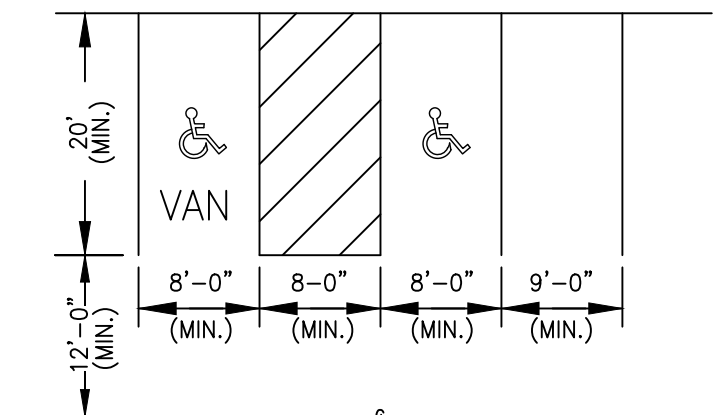
SEWER NOT UNDER ROADBED (REF. MDOT DETAIL IV-830) NO SCALE

SEWER UNDER ROADBED OR WITHIN INFLUENCE OF ROADBED (REF. MDOT DETAIL IV-830) NO SCALE

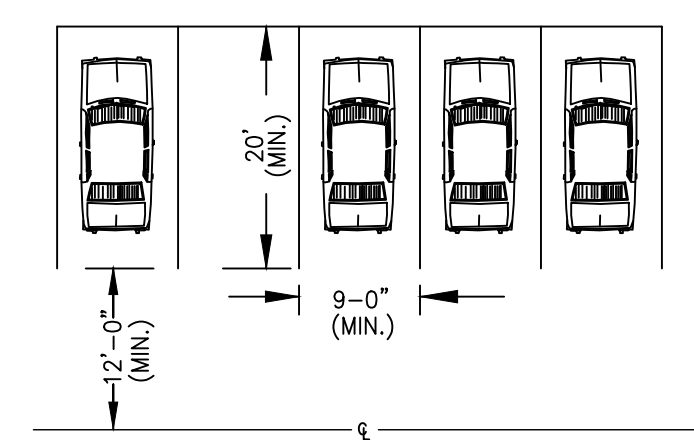


ASPHALT SECTION (NO SCALE)

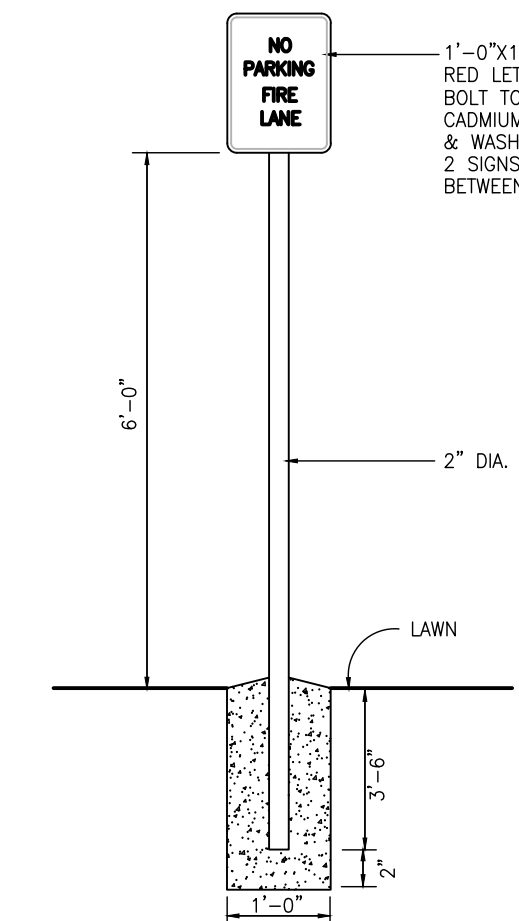
4" CONCRETE SIDEWALK (NO SCALE)



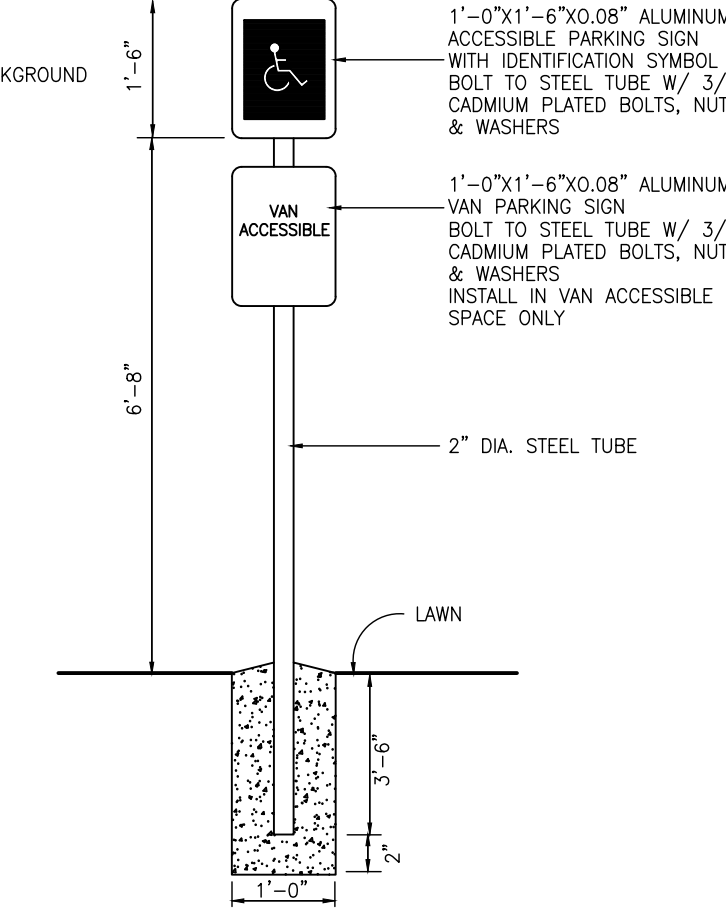
TYPICAL BARRIER FREE PARKING SPACE (NO SCALE)



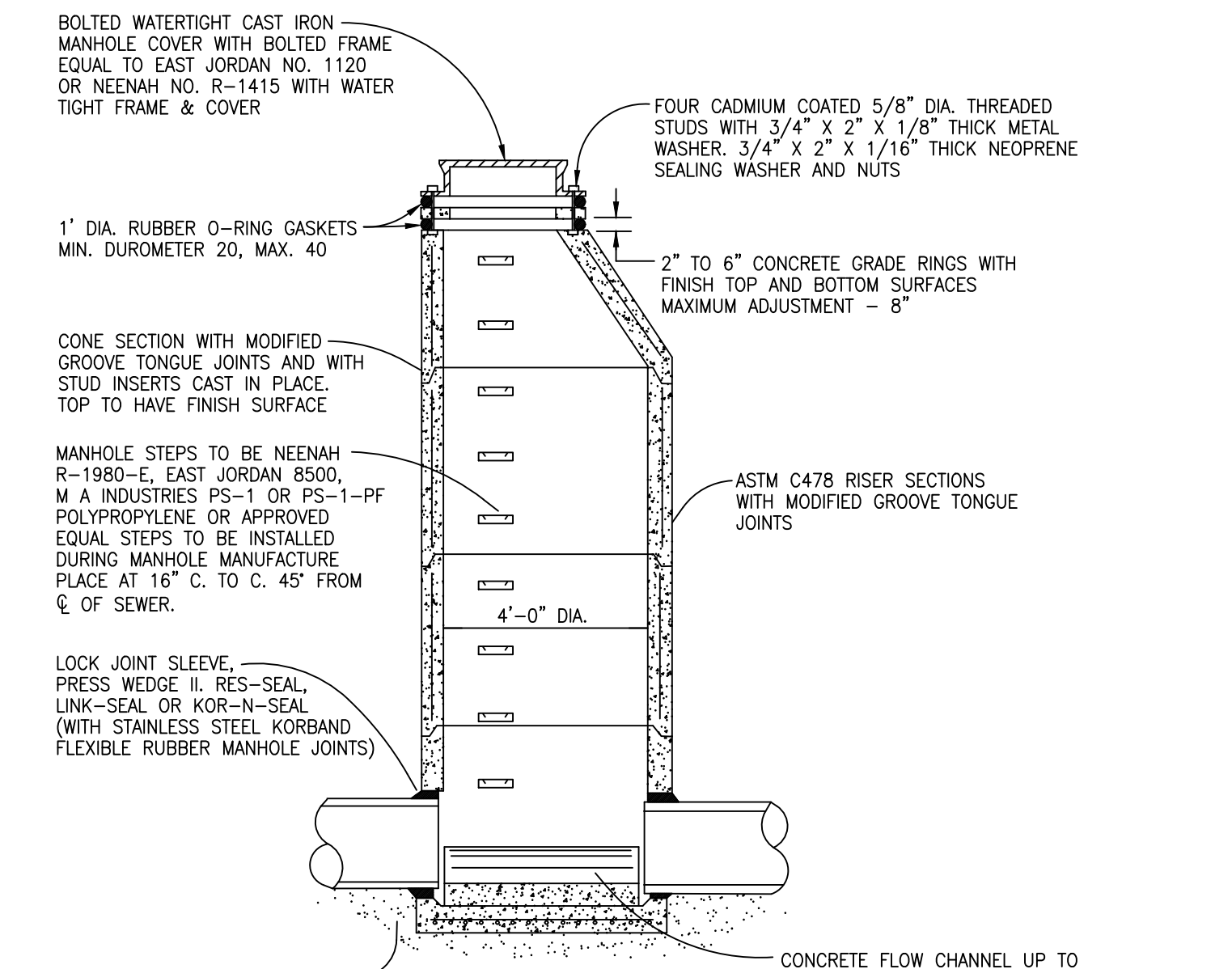
TYPICAL PARKING SPACE (NO SCALE)



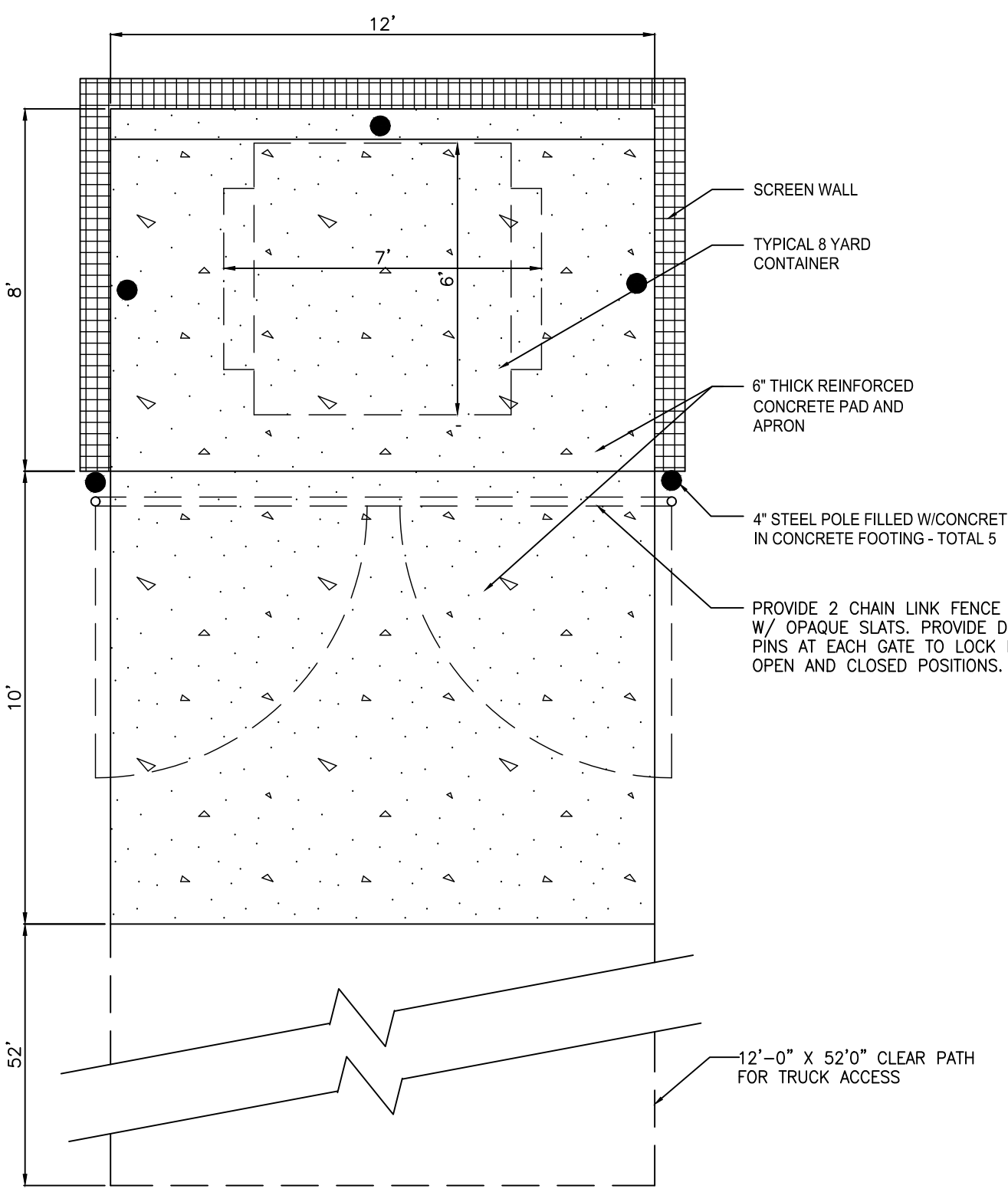
NO PARKING SIGN DETAIL (NO SCALE)



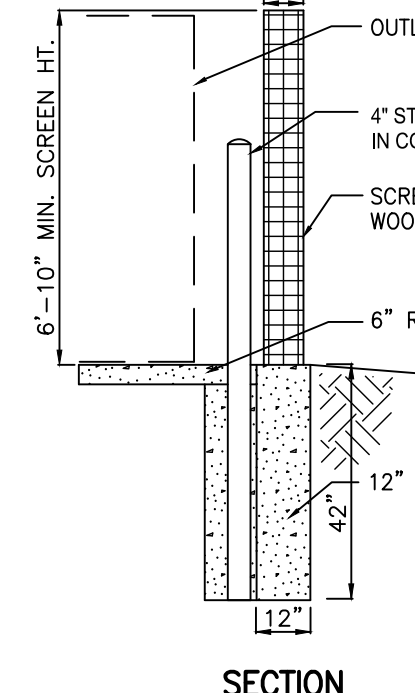
HANDICAP PARKING SIGN DETAIL (NO SCALE)



STANDARD ECCENTRIC SANITARY MANHOLE (ON 8" THROUGH 24" DIAMETER SEWERS) (NO SCALE)



DUMPSTER ENCLOSURE DETAIL (NO SCALE)



BOLLARD DETAIL (NO SCALE)

CDS2015-4-C DESIGN NOTES

THE STANDARD CDS2015-4-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION	
GRATED INLET ONLY (NO INLET PIPE)	
GRATED INLET WITH INLET PIPE OR PIPES	
CURB INLET ONLY (NO INLET PIPE)	
CURB INLET WITH INLET PIPE OR PIPES	
SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)	
SEDIMENT WEIR FOR NJDEP / NJACT CONFORMING UNITS	

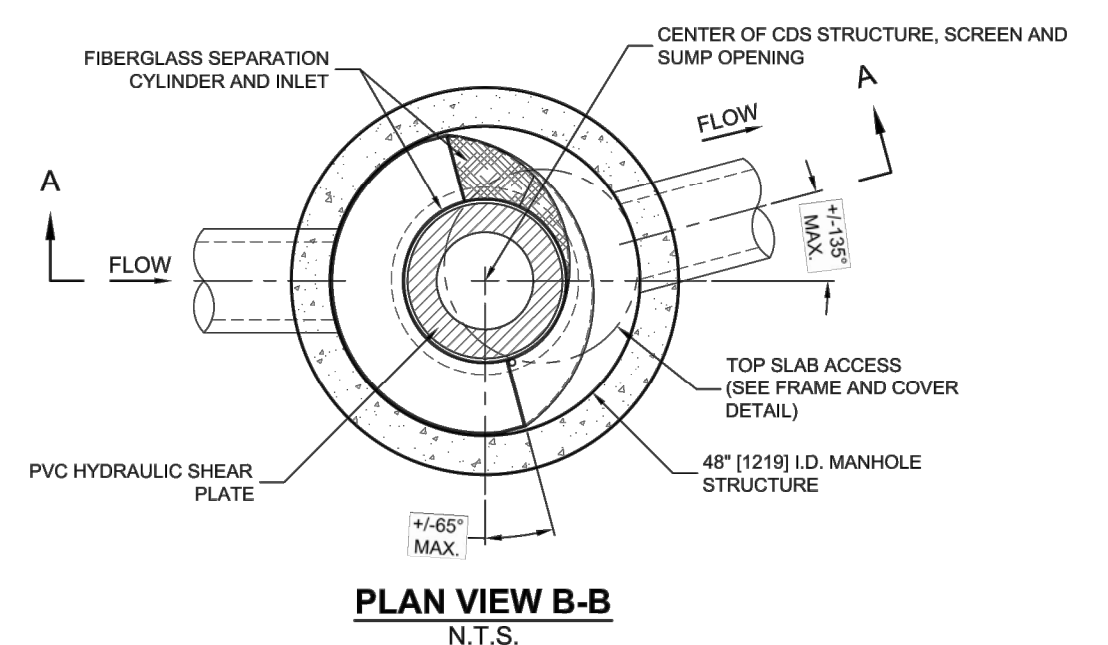
SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	
WATER QUALITY FLOW RATE (CFS OR L/S)	*
PEAK FLOW RATE (CFS OR L/S)	*
RETURN PERIOD OF PEAK FLOW (YRS)	*
SCREEN APERTURE (2400 OR 4700)	*
PIPE DATA	I.E. MATERIAL DIAMETER
INLET PIPE 1	
INLET PIPE 2	
OUTLET PIPE	
RIM ELEVATION	*
ANTI-FLOTATION BALLAST	WIDTH HEIGHT
NOTES/SPECIAL REQUIREMENTS:	
* PER ENGINEER OF RECORD	

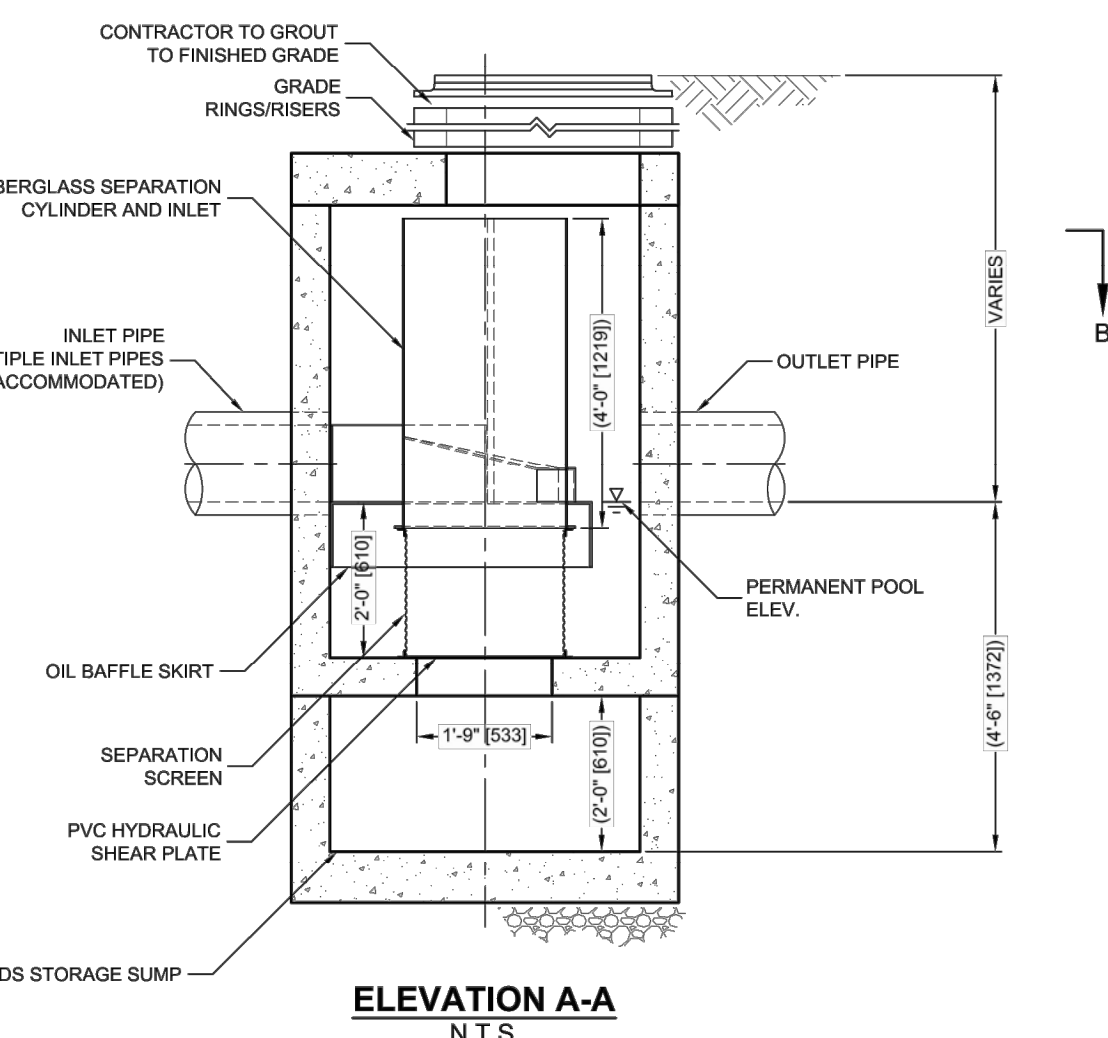
- GENERAL NOTES
- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
 - DIMENSIONS MARKED WITH () ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
 - FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
 - CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
 - STRUCTURE SHALL MEET AASHTO H20 AND CASTINGS SHALL MEET H20 (AASHTO M 300) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
 - PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
- INSTALLATION NOTES
- ANY SUB-BASE BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
 - CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
 - CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
 - CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
 - CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH ENGINEERED SOLUTIONS LLC
 9025 Centre Pointe Dr., Suite 400, West Chester, OH 45380
 800-338-1122 513-645-7000 513-645-7993 FAX

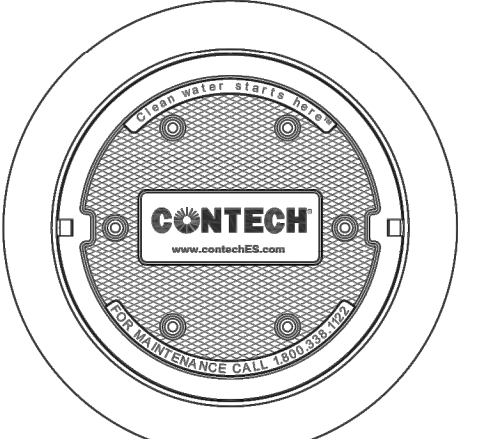
CDS2015-4-C
 INLINE CDS
 STANDARD DETAIL



PLAN VIEW B-B N.T.S.



ELEVATION A-A N.T.S.



FRAME AND COVER (DIAMETER VARIES) N.T.S.

SEE SHEET 2 FOR GENERAL NOTES AND LEGEND

THE LOCATION AND ELEVATION OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE DRAWINGS ARE ONLY APPROXIMATE. NO WARRANTIES, EXPRESS OR IMPLIED, ARE MADE BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION AND ELEVATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION OR DEPTH DIFFERS SIGNIFICANTLY FROM THE PLANS.

BEBOSS Engineering
 Engineers Surveyors Planners Landscape Architects
 3121 E. GRAND RIVER AVE.
 HOWELL, MI. 48843
 517.546.4836 FAX 517.548.1670

SCHOOL BELL CHILDCARE
 SCHOOL IN THE PINES INC. dba SCHOOL BELL CHILDCARE
 4501 WEST HIGHLAND ROAD
 MILFORD, MI 48380
 248.830.9542

PROJECT: SCHOOL BELL CHILDCARE
 PREPARED FOR: SCHOOL IN THE PINES INC.
 TITLE: CONSTRUCTION DETAILS

DESIGNED BY:	BL
DRAWN BY:	JP
CHECKED BY:	
SCALE:	NO SCALE
JOB NO:	24-048
DATE:	05/31/24
SHEET NO.	11

REVISION PER DATE

SEE SHEET 2 FOR GENERAL NOTES AND LEGEND

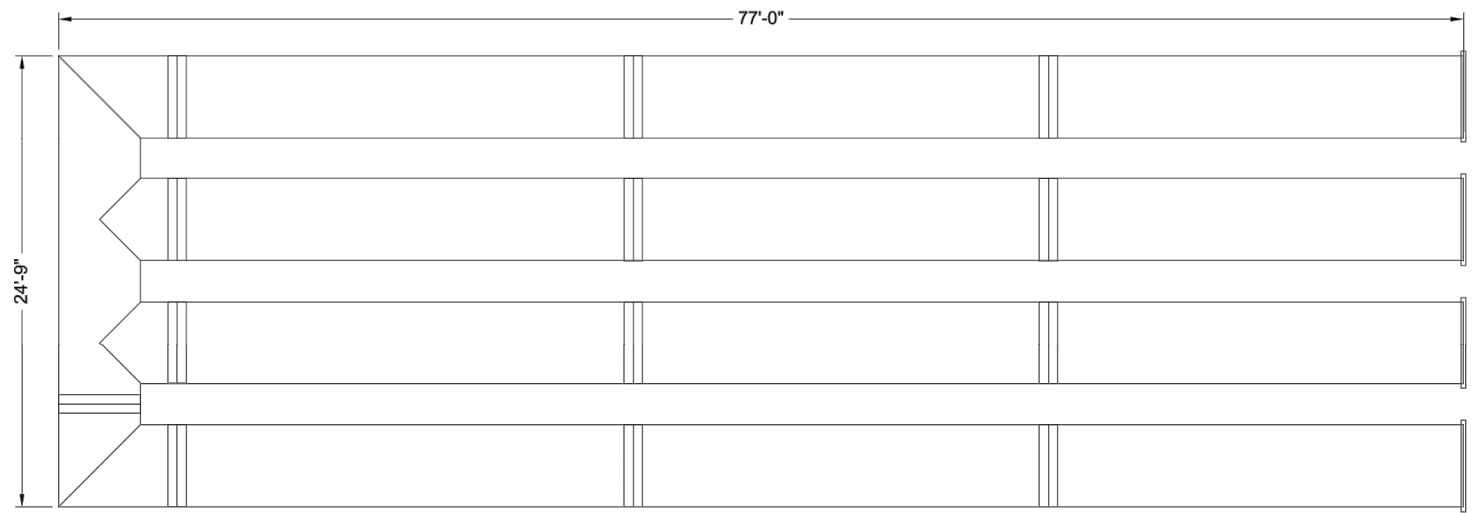
PROJECT SUMMARY

CALCULATION DETAILS
LOADING = H20/S16S
APPROX. LINEAR FOOTAGE = 315 LF

STORAGE SUMMARY
STORAGE VOLUME REQUIRED = 5,000 CF
PIPE STORAGE VOLUME = 5,006 CF
BACKFILL STORAGE VOLUME = 0 CF
TOTAL STORAGE PROVIDED = 5,006 CF

PIPE DETAILS
DIAMETER = 54"
CORRUPTION = 5x1
GAGE = 16
COATING = ALT2
WALL TYPE = SOLID
BARREL SPACING = 27"

BACKFILL DETAILS
WIDTH AT ENDS = 12"
ABOVE PIPE = 0"
WIDTH AT SIDES = 12"
BELOW PIPE = 0"



NOTES
ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A996.

CONTECH ENGINEERED SOLUTIONS LLC logo and contact information.

ASSEMBLY SCALE: 1" = 10'

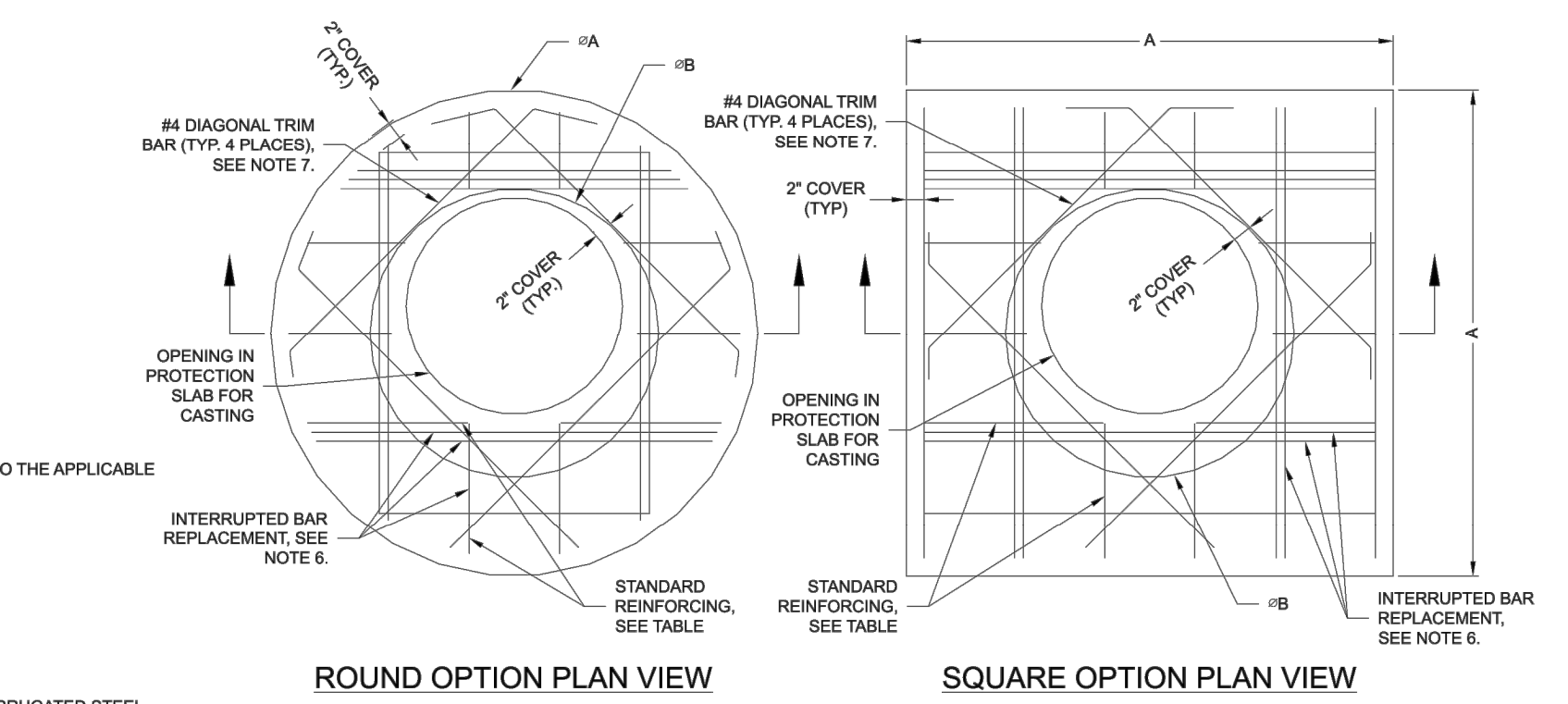
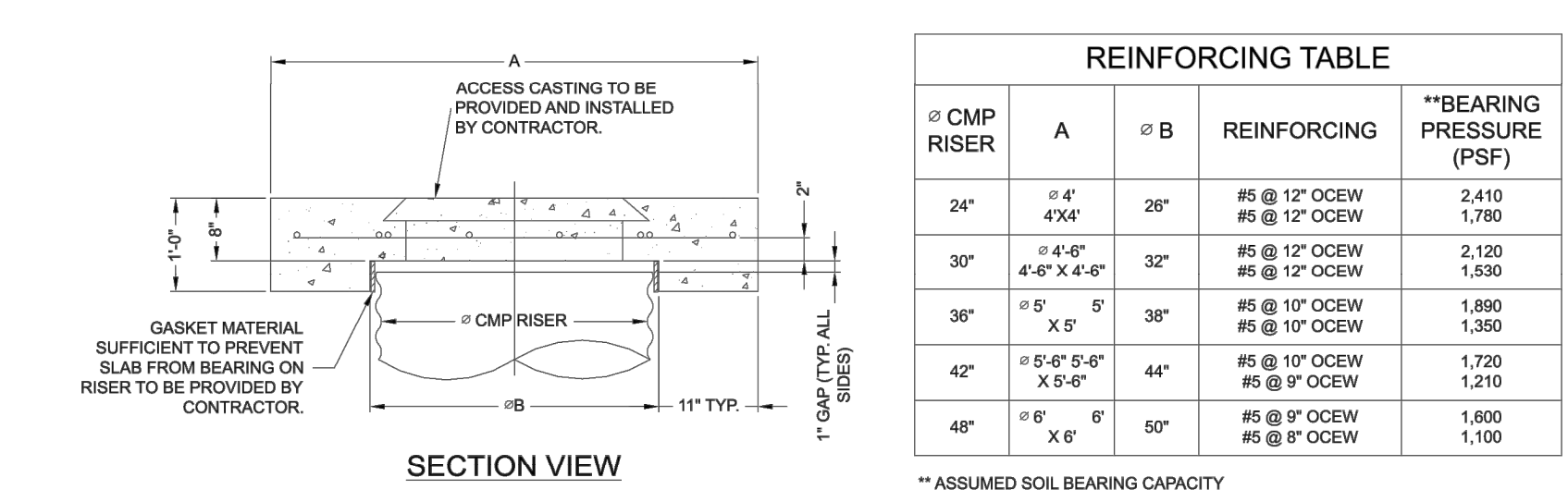
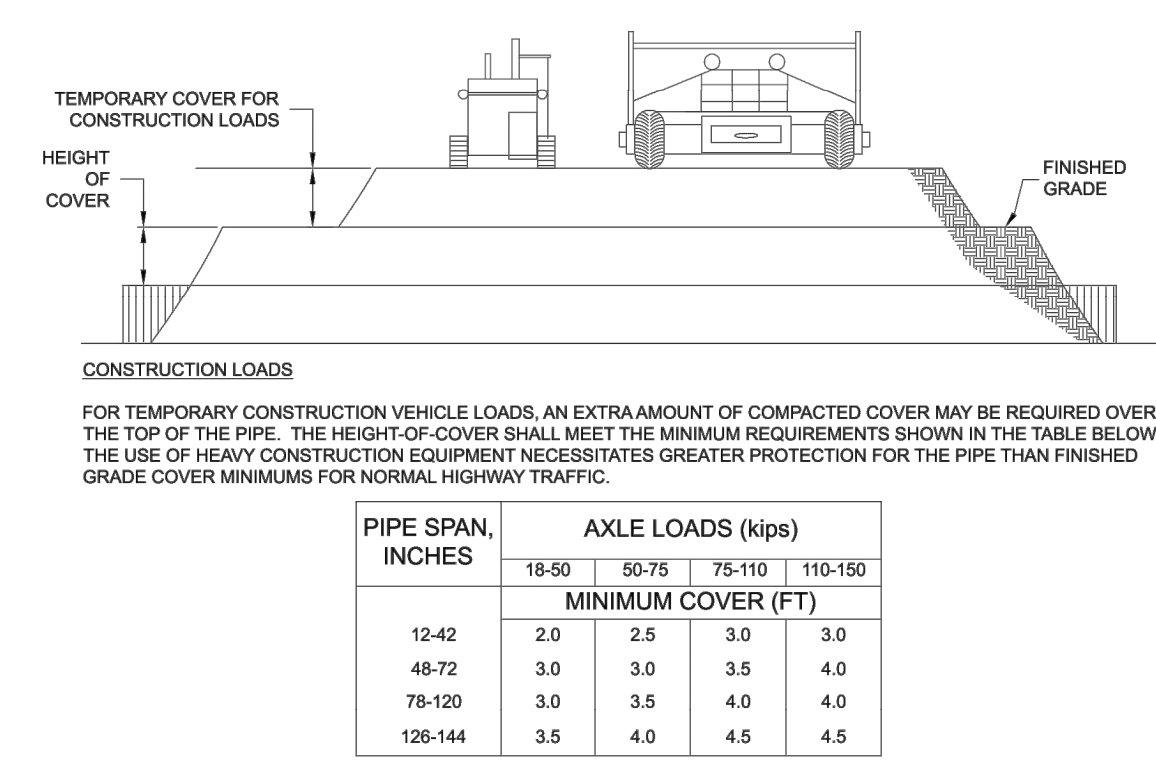
Project information for DYO48754 School Bell Childcare Underground Detention System.

CONTECH logo and drawing information.

CONTECH logo and drawing information.

Project information for DYO48754 School Bell Childcare Underground Detention System.

CONTECH logo and drawing information.



NOTES
1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 3,500 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.

CONTECH ENGINEERED SOLUTIONS LLC logo and contact information.

Project information for DYO48754 School Bell Childcare Underground Detention System.

CONTECH logo and drawing information.

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Project information for DYO48754 School Bell Childcare Underground Detention System.

CONTECH logo and drawing information.

NOTE
THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

CONSTRUCTION LOADING DIAGRAM
SCALE: N.T.S.

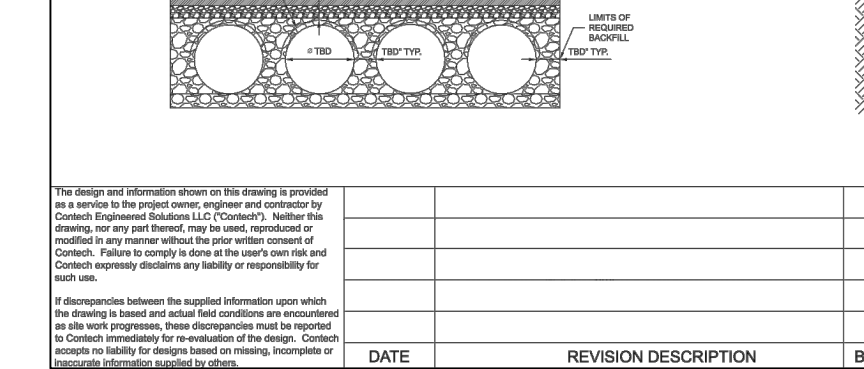
REINFORCING TABLE
DIAMETER, D MIN COVER CORR. PROFILE
6"-10" 12" 1 1/2" x 1/4"

CMP DETENTION INSTALLATION GUIDE
PROPER INSTALLATION OF A FLEXIBLE UNDERGROUND DETENTION SYSTEM WILL ENSURE LONG-TERM PERFORMANCE.

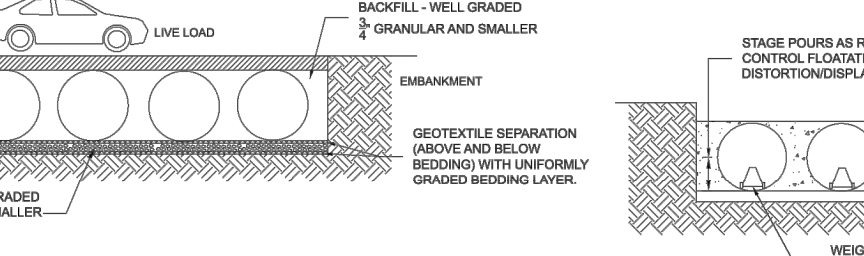
FOUNDATION
CONSTRUCT A FOUNDATION THAT CAN SUPPORT THE DESIGN LOADING APPLIED BY THE PIPE AND ADJACENT BACKFILL WEIGHT AS WELL AS MAINTAIN ITS INTEGRITY DURING CONSTRUCTION.

BACKFILL PLACEMENT
MATERIAL SHALL BE WORKED INTO THE PIPE HAUNCHES BY MEANS OF SHOVEL-SLICING, RODDING, AIR TAMPER, VIBRATORY ROD, OR OTHER EFFECTIVE METHODS.

GEOMEMBRANE BARRIER
A SITE'S RESISTIVITY MAY CHANGE OVER TIME WHEN VARIOUS TYPES OF SALTING AGENTS ARE USED, SUCH AS ROAD SALTS FOR DEICING AGENTS.

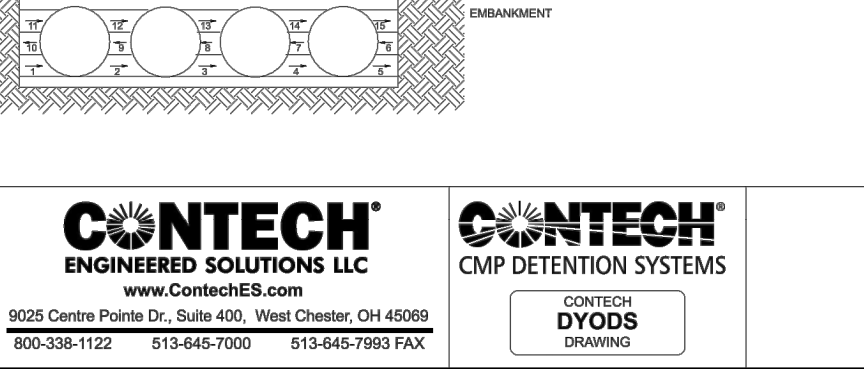


IN-SITU TRENCH WALL
IF EXCAVATION IS REQUIRED, THE TRENCH WALL NEEDS TO BE CAPABLE OF SUPPORTING THE LOAD THAT THE PIPE SHEDS AS THE SYSTEM IS LOADED.



CONSTRUCTION LOADING
TYPICALLY, THE MINIMUM COVER SPECIFIED FOR A PROJECT ASSUMES H-20 LIVE LOAD, BECAUSE CONSTRUCTION LOADS OFTEN EXCEED DESIGN LIVE LOADS.

ADDITIONAL CONSIDERATIONS
BECAUSE MOST SYSTEMS ARE CONSTRUCTED BELOW-GRADE, RAINFALL CAN RAPIDLY FILL THE EXCAVATION, POTENTIALLY CAUSING FLOATATION AND MOVEMENT OF THE PREVIOUSLY PLACED PIPES.

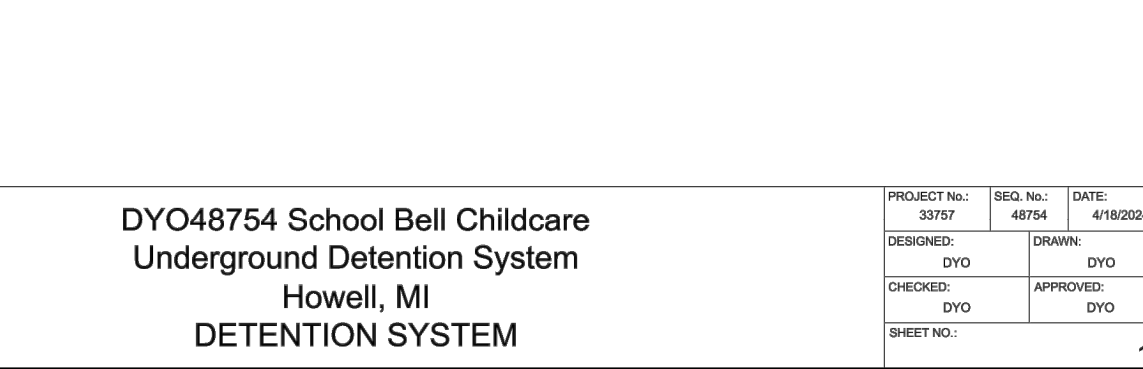


CMP DETENTION SYSTEM INSPECTION AND MAINTENANCE
UNDERGROUND STORMWATER DETENTION AND INFILTRATION SYSTEMS MUST BE INSPECTED AND MAINTAINED AT REGULAR INTERVALS FOR PURPOSES OF PERFORMANCE AND LONGEVITY.

INSPECTION
INSPECTION IS THE KEY TO EFFECTIVE MAINTENANCE OF CMP DETENTION SYSTEMS AND IS EASILY PERFORMED. CONTECH RECOMMENDS ONGOING, ANNUAL INSPECTIONS.

MAINTENANCE
CMP DETENTION SYSTEMS SHOULD BE CLEANED WHEN AN INSPECTION REVEALS ACCUMULATED SEDIMENT OR TRASH IS CLOGGING THE DISCHARGE ORIFICE.

CONSTRUCTION LOADING
TYPICALLY, THE MINIMUM COVER SPECIFIED FOR A PROJECT ASSUMES H-20 LIVE LOAD, BECAUSE CONSTRUCTION LOADS OFTEN EXCEED DESIGN LIVE LOADS.



CONTECH ENGINEERED SOLUTIONS LLC logo and contact information.

Project information for DYO48754 School Bell Childcare Underground Detention System.

CONTECH logo and drawing information.

CONTECH logo and drawing information.

Project information for DYO48754 School Bell Childcare Underground Detention System.

CONTECH logo and drawing information.

BOSS Engineering logo and contact information.

SCHOOL IN THE PINES INC. dba SCHOOL BELL CHILDCARE logo and contact information.

CONSTRUCTION DETAILS table with columns for PROJECT, PREPARED FOR, TITLE, REVISION, PER, DATE.

CONSTRUCTION DETAILS table with columns for PROJECT, PREPARED FOR, TITLE, REVISION, PER, DATE.

CONSTRUCTION DETAILS table with columns for PROJECT, PREPARED FOR, TITLE, REVISION, PER, DATE.

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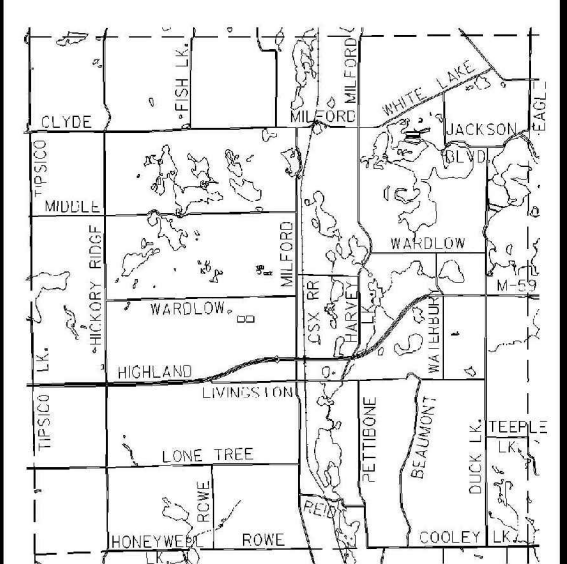


HRC

Hubbell, Roth & Clark, Inc.
CONSULTING ENGINEERS
105 W. GRAND RIVER AVE.
HOWELL, MICHIGAN 48843
PHONE: (248) 454-6300
DIRECT PHONE: (517) 552-9199
FAX: (517) 552-8099
WEB SITE: <http://www.hrc-enr.com>

DATE	ADDITIONS AND/OR REVISIONS
DESIGNED	M.P.D.
DRAWN	T.E.W.
CHECKED	J.B.
APPROVED	G.E.H.

W:\2005\20050366\c\detfor-stsewer.dwg-2.10.dgn

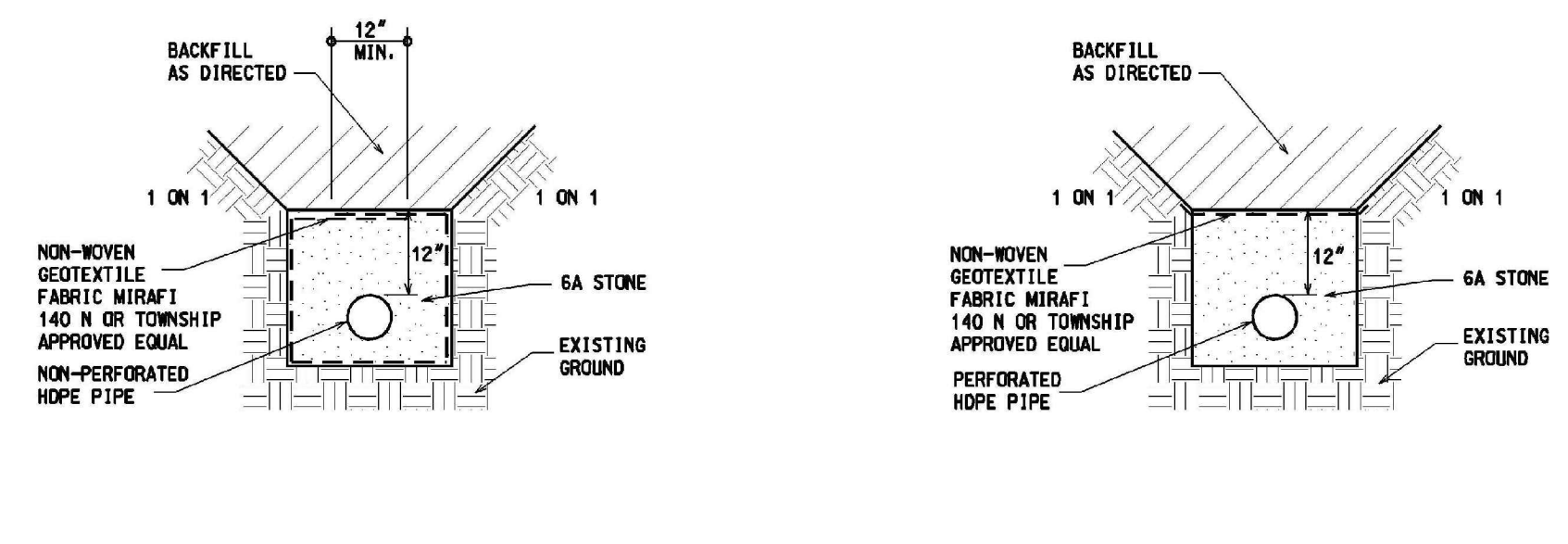


HIGHLAND TOWNSHIP

**HIGHLAND TOWNSHIP
DESIGN STANDARDS**

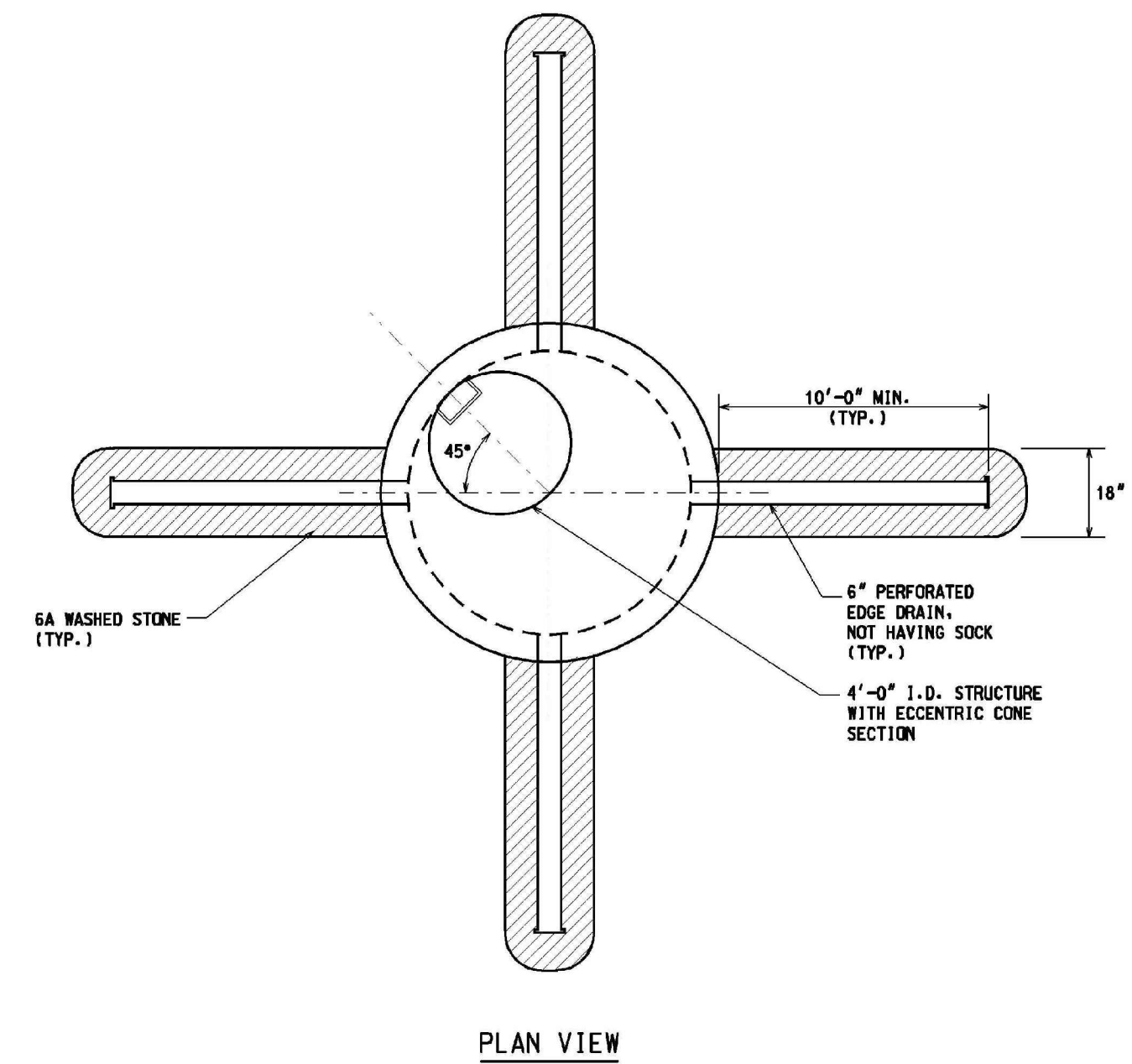
STORM SEWER DETAILS

HRC JOB NO.	SCALE
20050366	NONE
DATE	SHEET NO.
SEPTEMBER 2005	2 OF 2

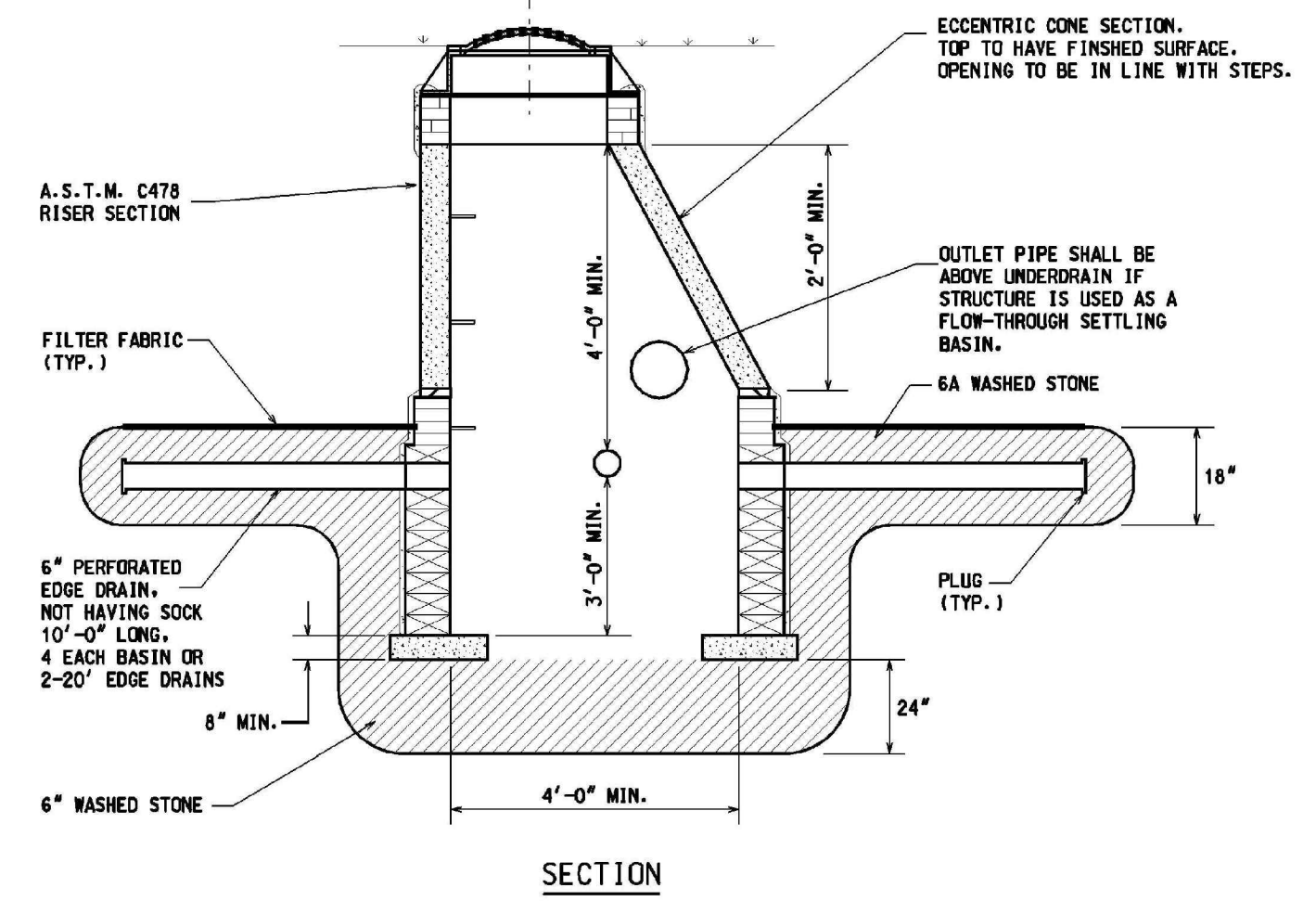


**HDPE PIPE TRENCH DETAIL
FOR DETENTION SYSTEMS
WITHOUT GROUNDWATER
RECHARGE**

**HDPE PIPE TRENCH DETAIL
FOR DETENTION/RETENTION SYSTEMS
WITH GROUNDWATER
RECHARGE**

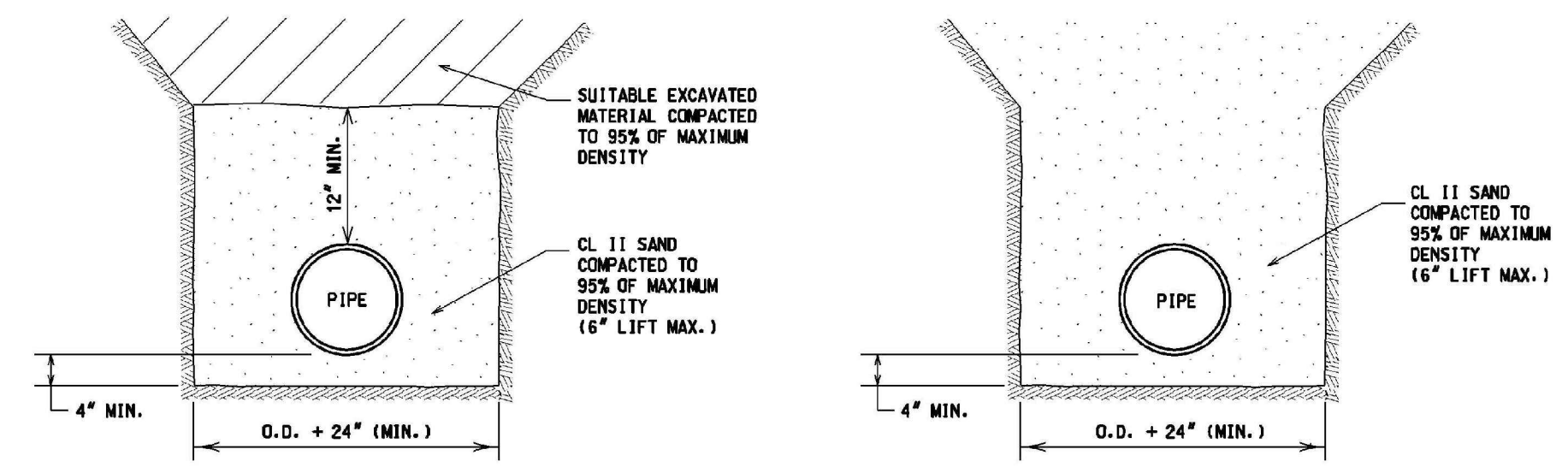


PLAN VIEW



SECTION

STANDARD LEACHING BASIN

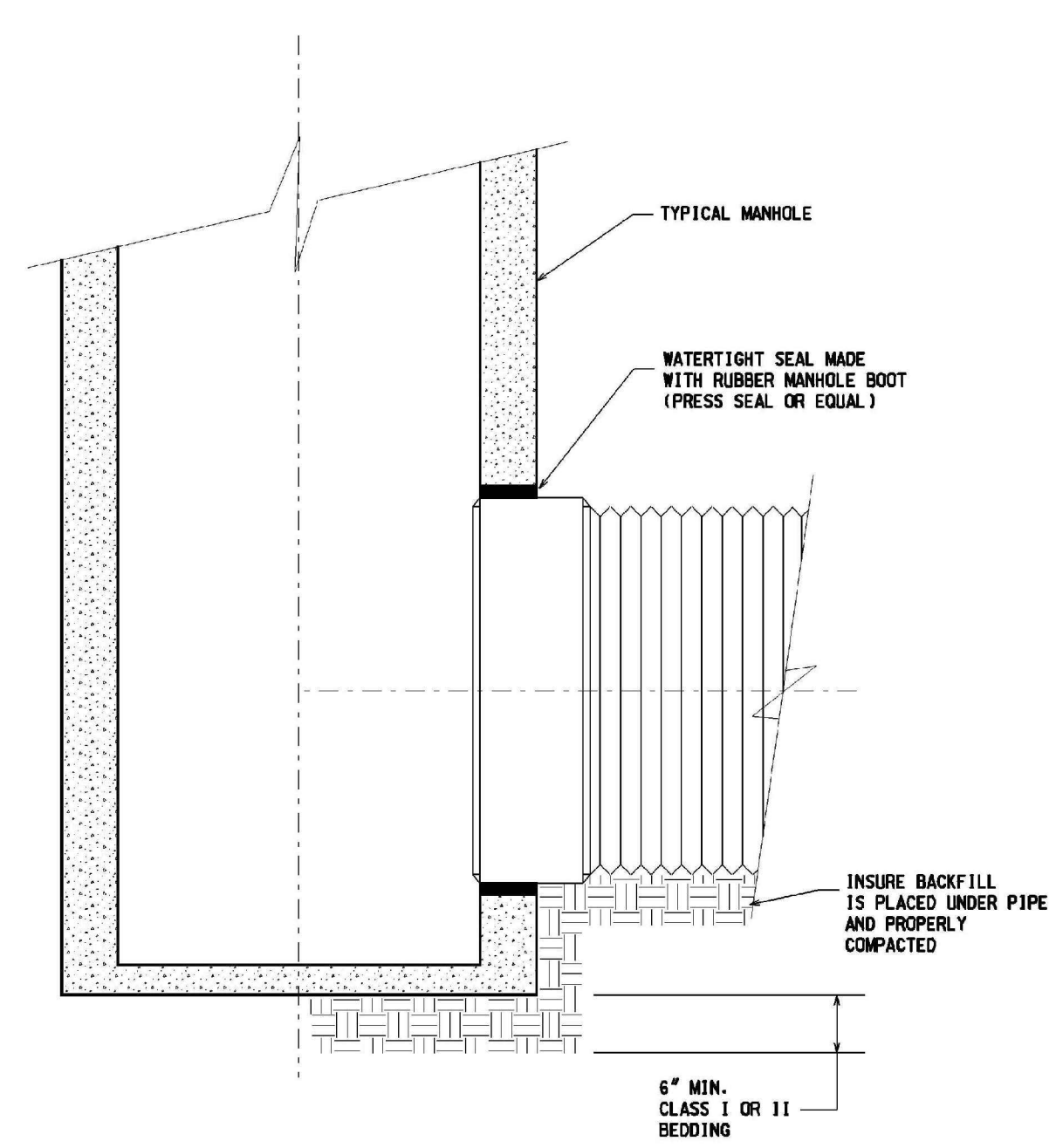


BEDDING DETAIL - TRENCH B

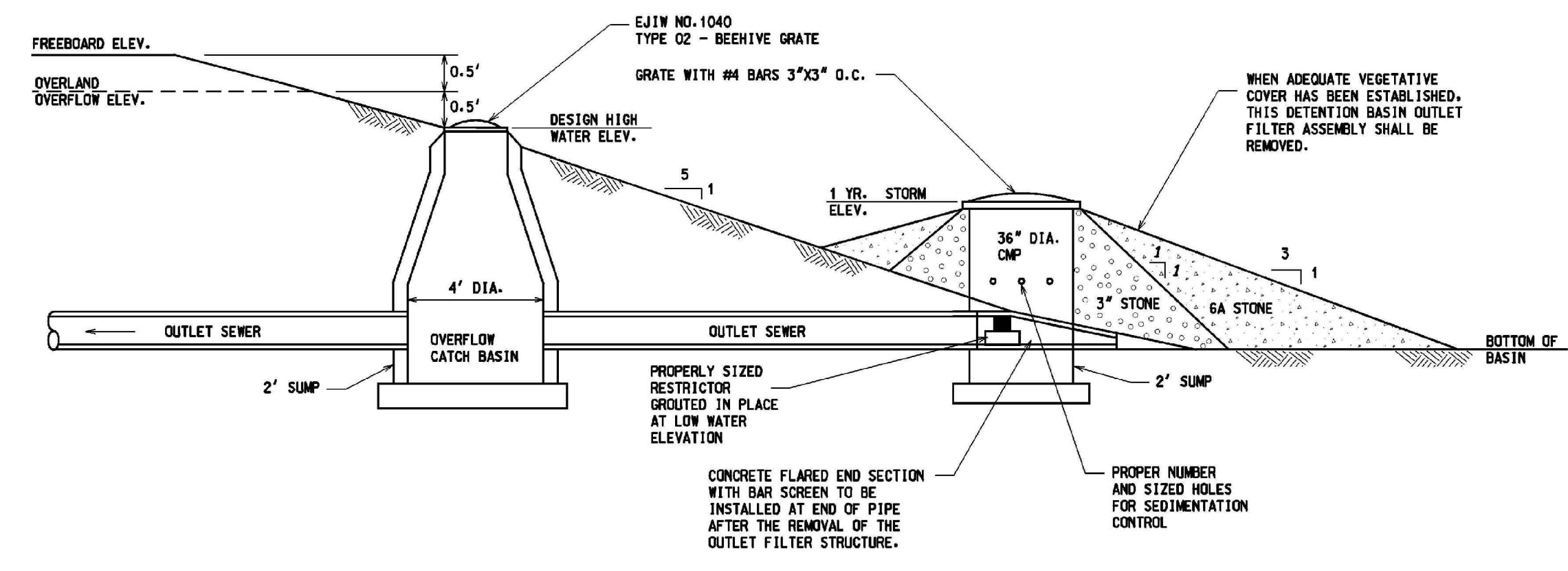
BEDDING DETAIL - TRENCH A

(REQUIRED FOR INSTALLATION UNDER PAVEMENT OR WITHIN THE INFLUENCE OF ROAD BED.)

- NOTES:**
- ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CURRENT ENGINEERING DESIGN STANDARDS AND SPECIFICATIONS OF HIGHLAND TOWNSHIP.
 - IT SHALL BE THE OWNER'S ENGINEER AND CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES.
 - ALL SEWER TRENCHES UNDER THE 45 DEGREE ZONE OF INFLUENCE LINE OF EXISTING OR PROPOSED PAVEMENTS, BIKE PATHS, SIDEWALKS OR DRIVE APPROACHES SHALL BE BACKFILLED WITH MDOT CLASS II SAND COMPACTED TO AT LEAST 95% OF MAXIMUM UNIT WEIGHT.
 - ALL STORM SEWER SHALL BE INSTALLED ON CLASS "B" BEDDING OR BETTER.
 - JOINTS FOR STORM SEWER SHALL BE PREMIUM JOINTS (TONGUE AND GROOVE WITH RUBBER GASKETS).
 - LEAD MATERIAL SHALL BE 4" DIA. (MIN.) PVC SCHEDULE 40 OR SDR 23.5. LEAD CONNECTIONS MAY ONLY BE AT STRUCTURES.
 - CONTACT THE TOWNSHIP ENGINEER 48 HOURS PRIOR TO STORM SEWER INSTALLATION TO SCHEDULE OBSERVATION. FULL TIME OBSERVATION IS REQUIRED FOR ALL UNDERGROUND STORM SEWER AND LEACHING SYSTEM CONSTRUCTION. CONTACT MICHAEL DARGA WITH HUBBELL, ROTH & CLARK, INC. 248-454-6532.
 - BEFORE YOU DIG CALL MISS DIG AT 1-800-482-7171.
 - ALL MORTAR AND CONCRETE WORK SHALL BE PROTECTED FROM FREEZING (40° F. AND FALLING) FOR A MINIMUM OF 48 HOURS.
 - PIPE FOR STORM SEWERS WITHIN THE PUBLIC ROAD RIGHT-OF-WAY OR PRIVATE ROAD EASEMENT SHALL BE RCP, C-76, CLASS IV OR V RCP.
 - DOUBLE WALLED HDPE MEETING THE REQUIREMENTS OF ASTM F2306.

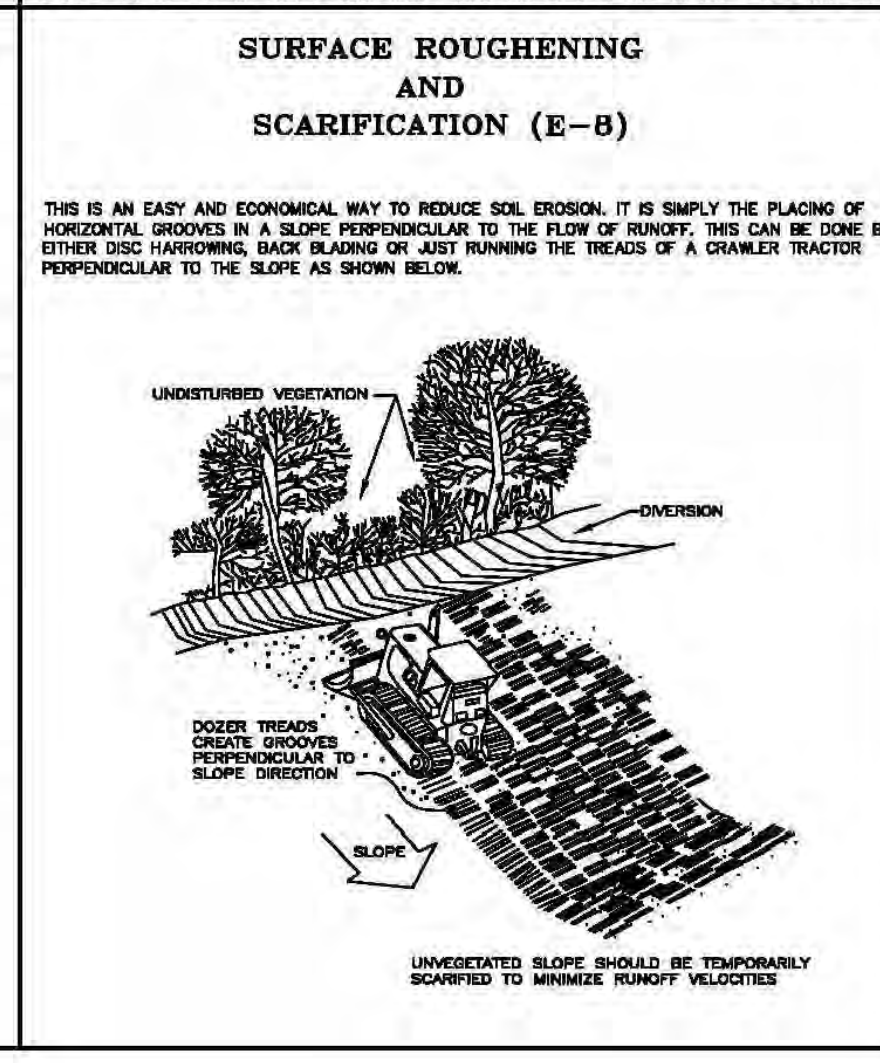
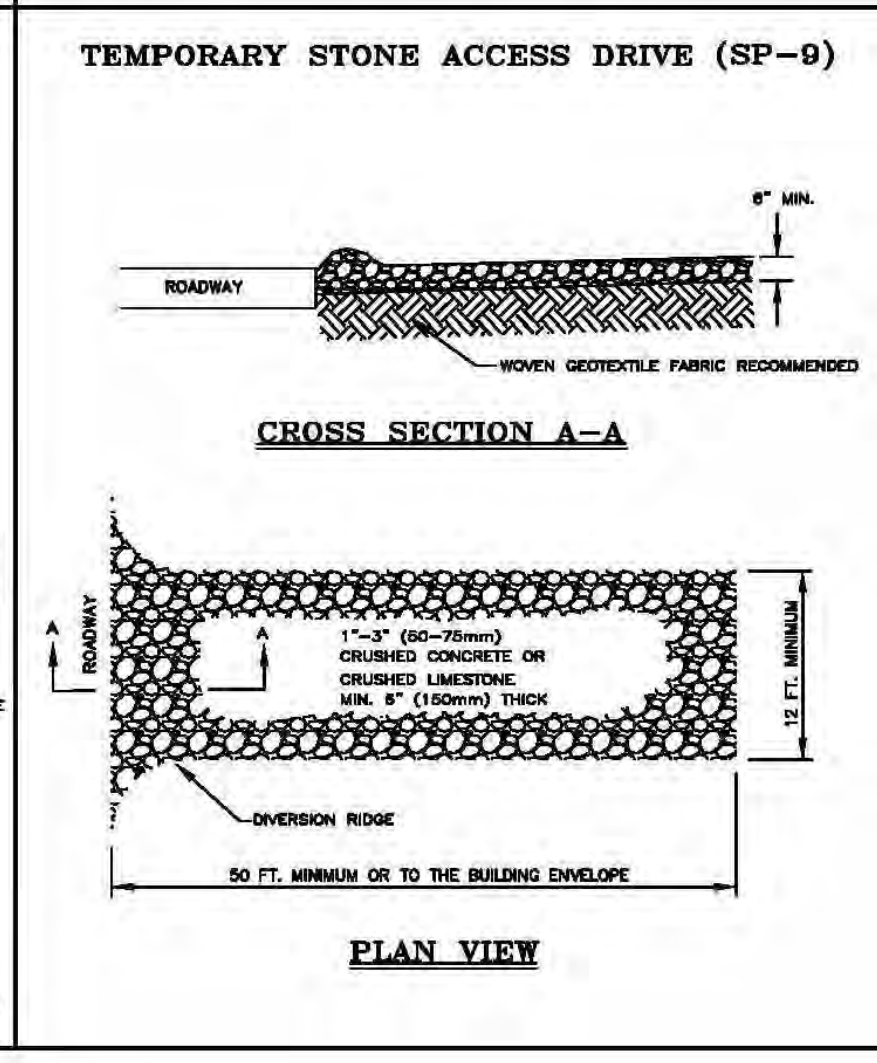
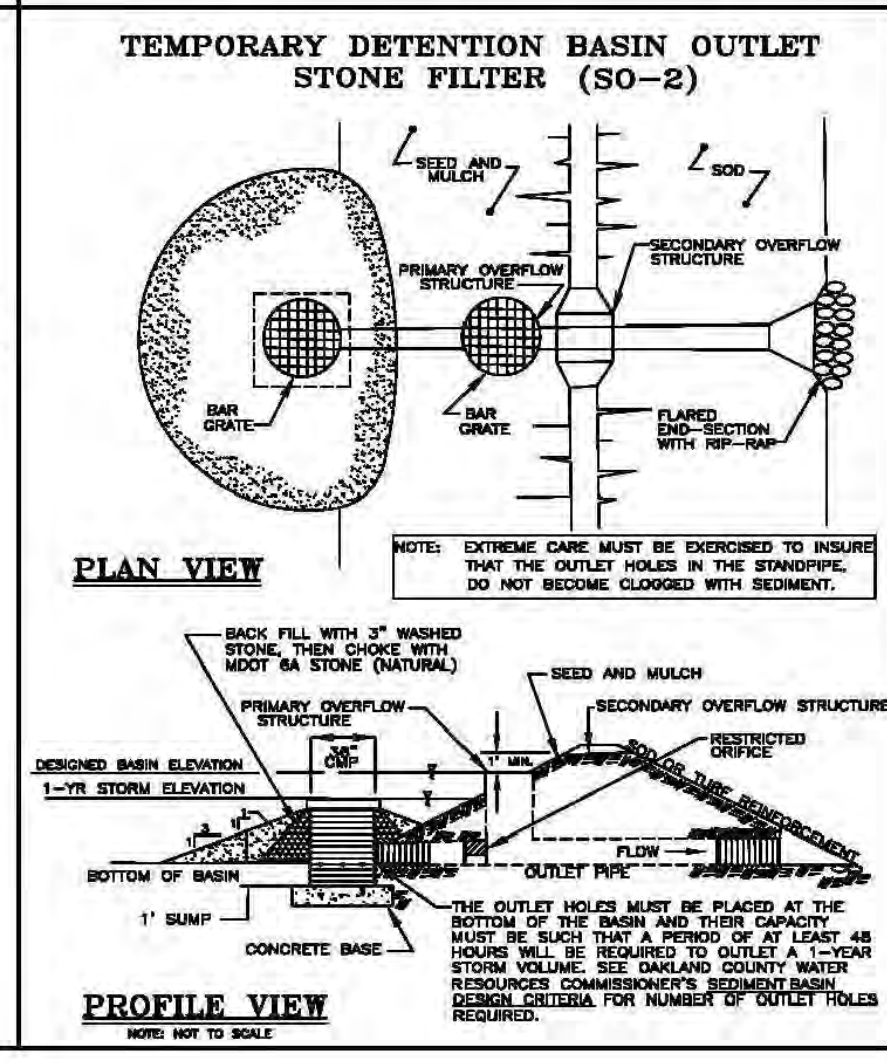
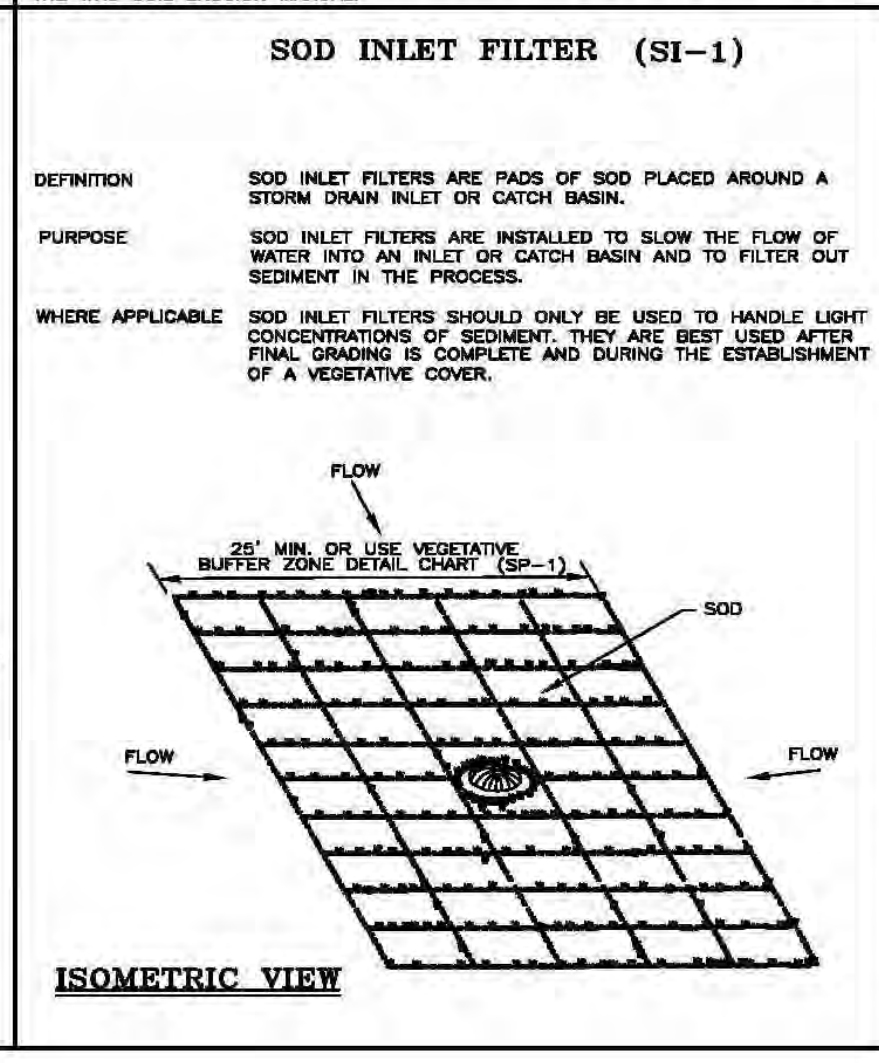
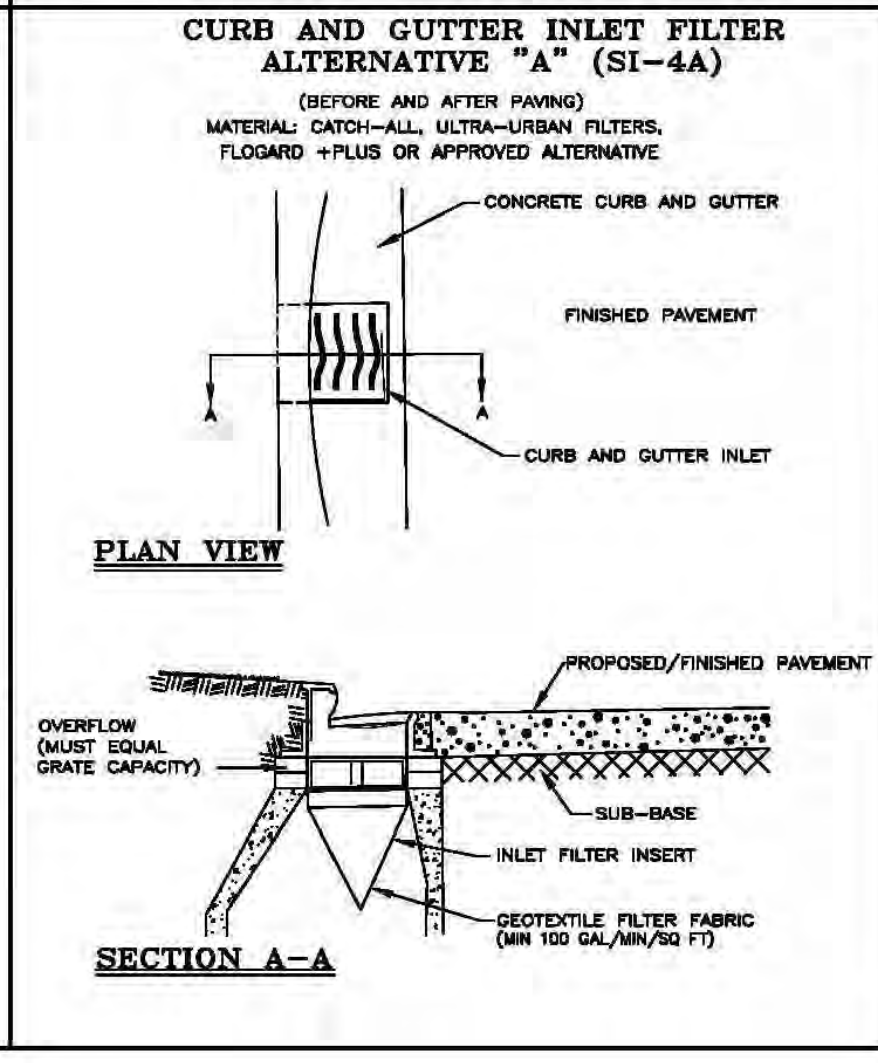
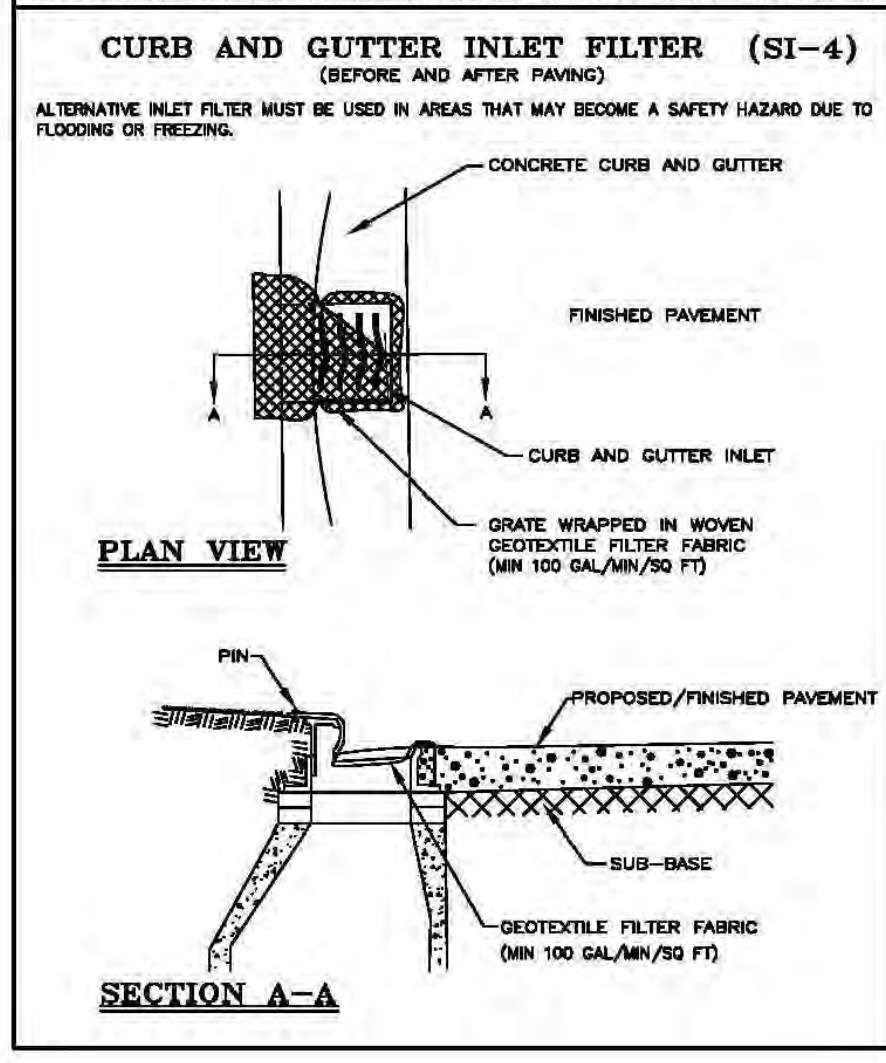
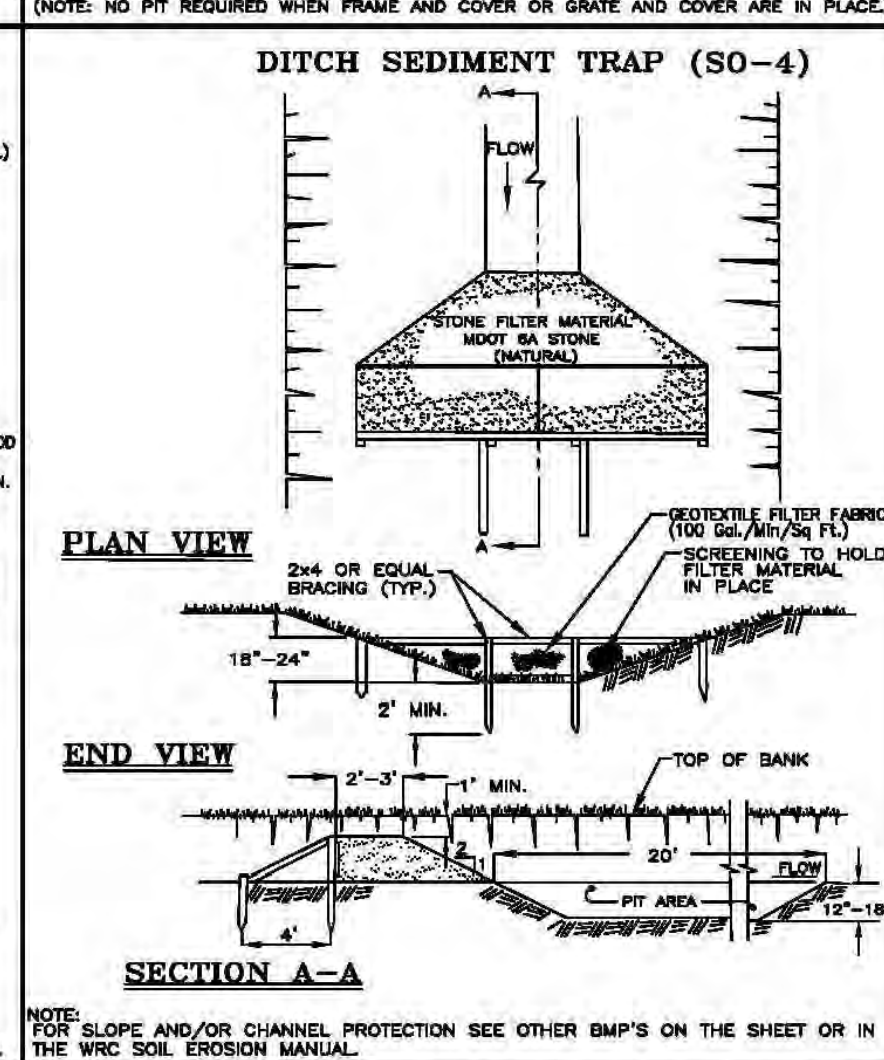
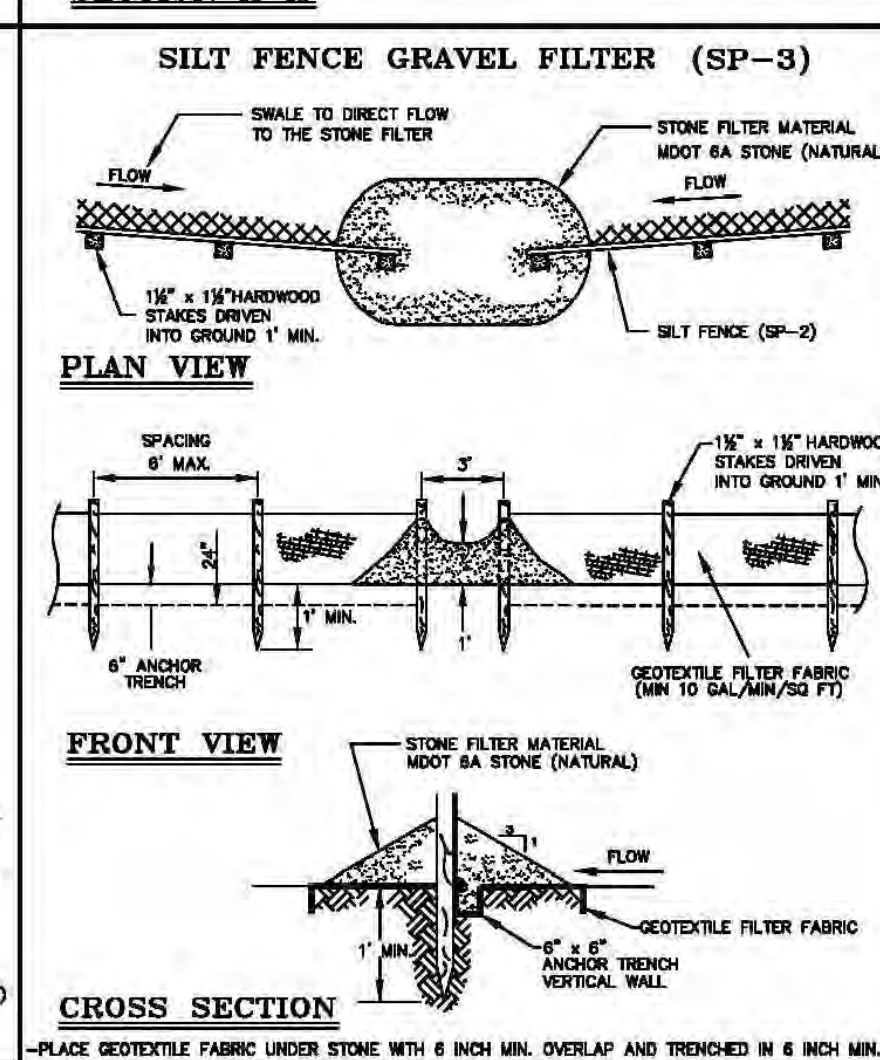
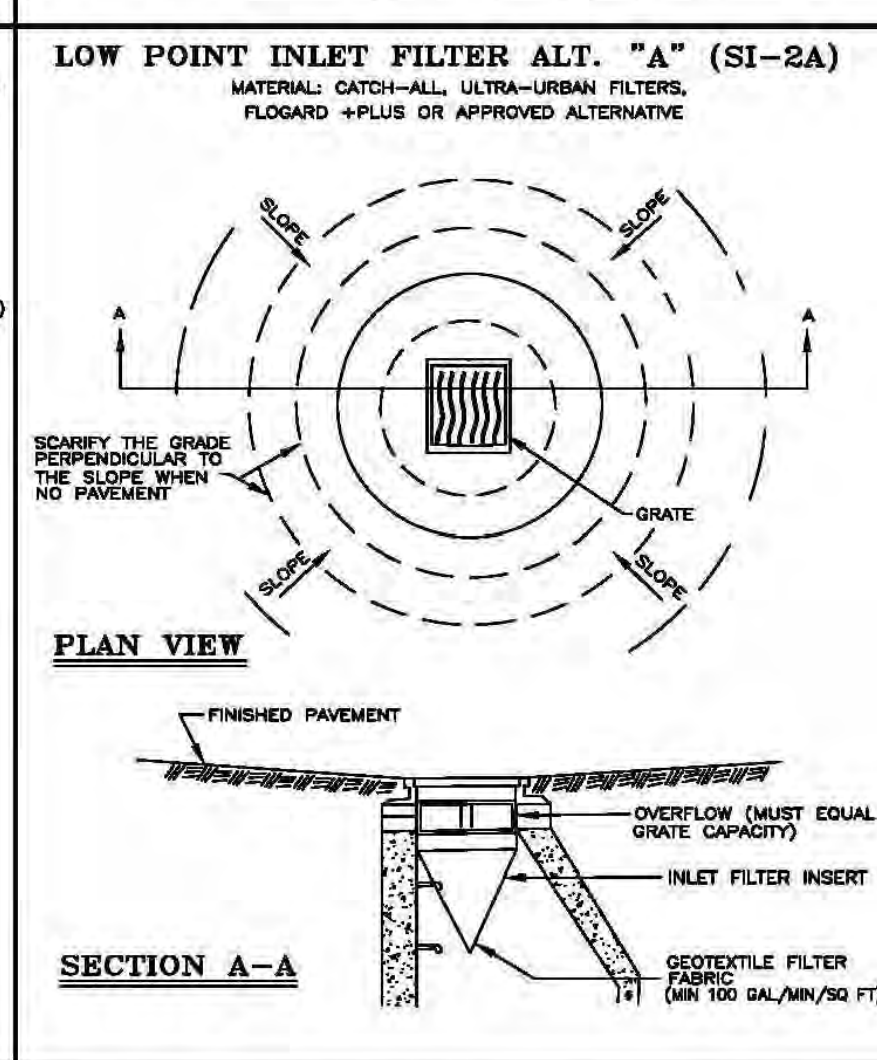
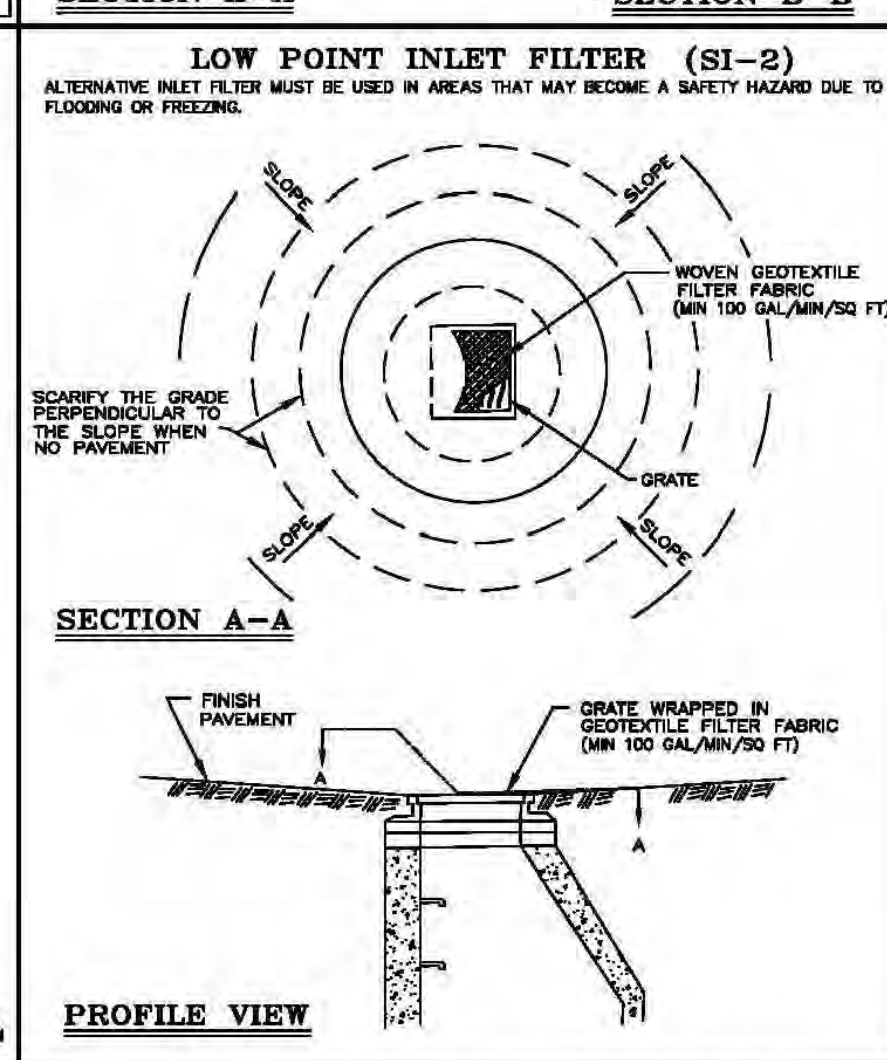
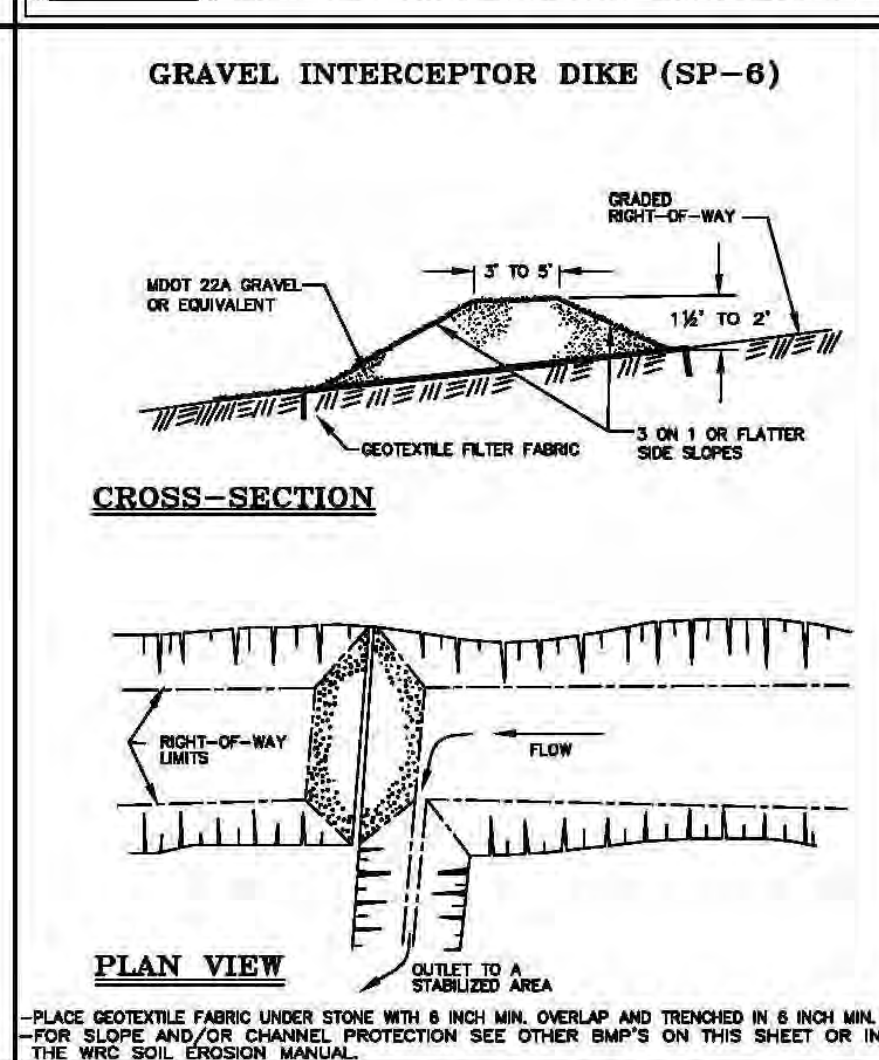
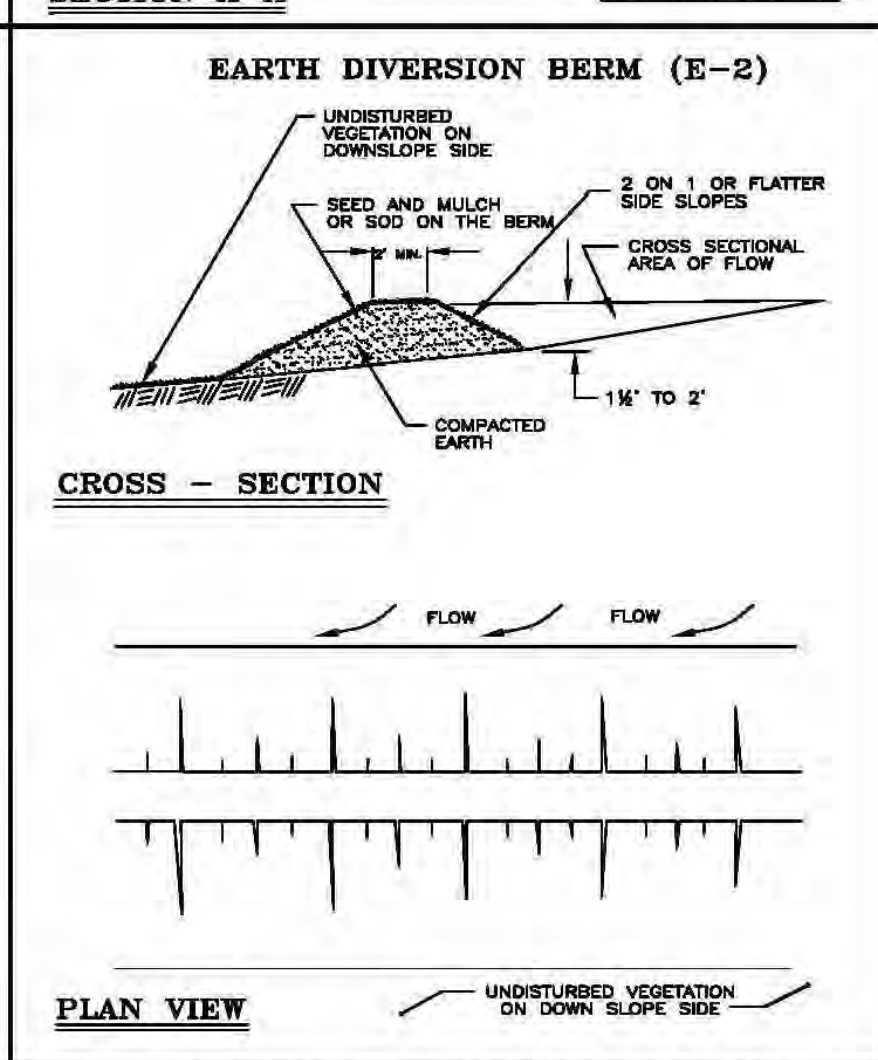
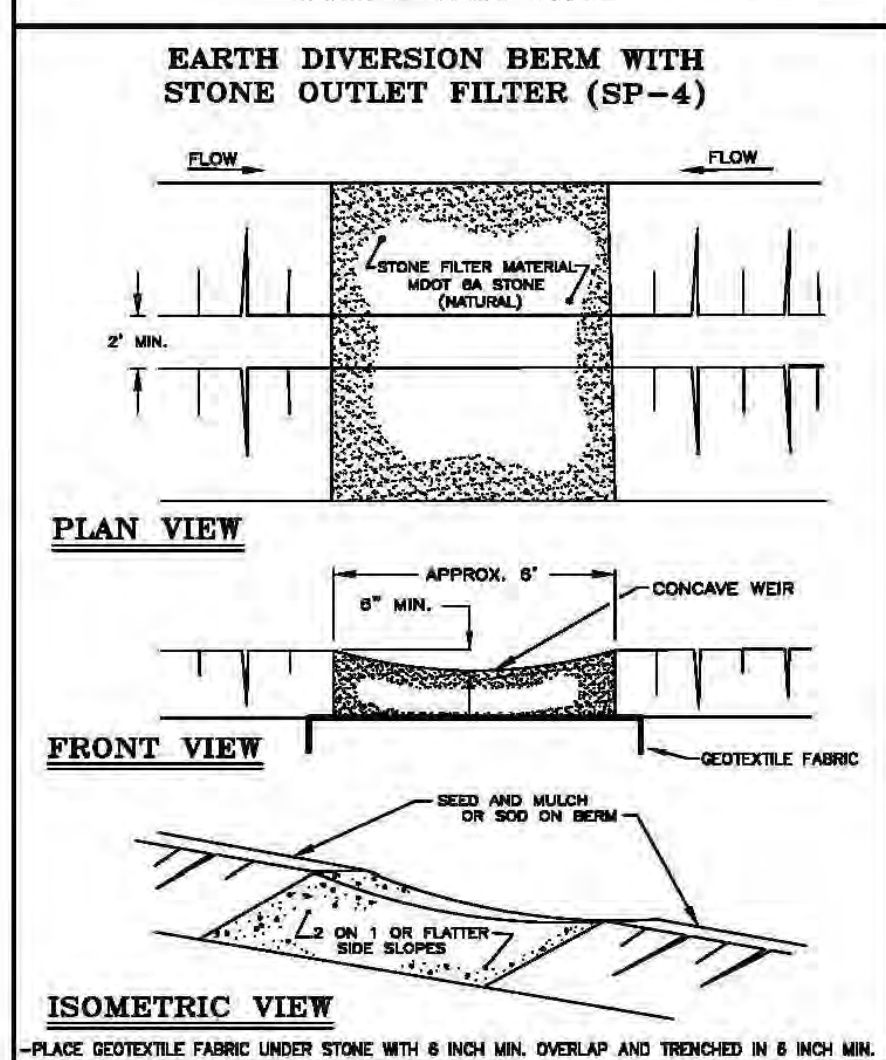
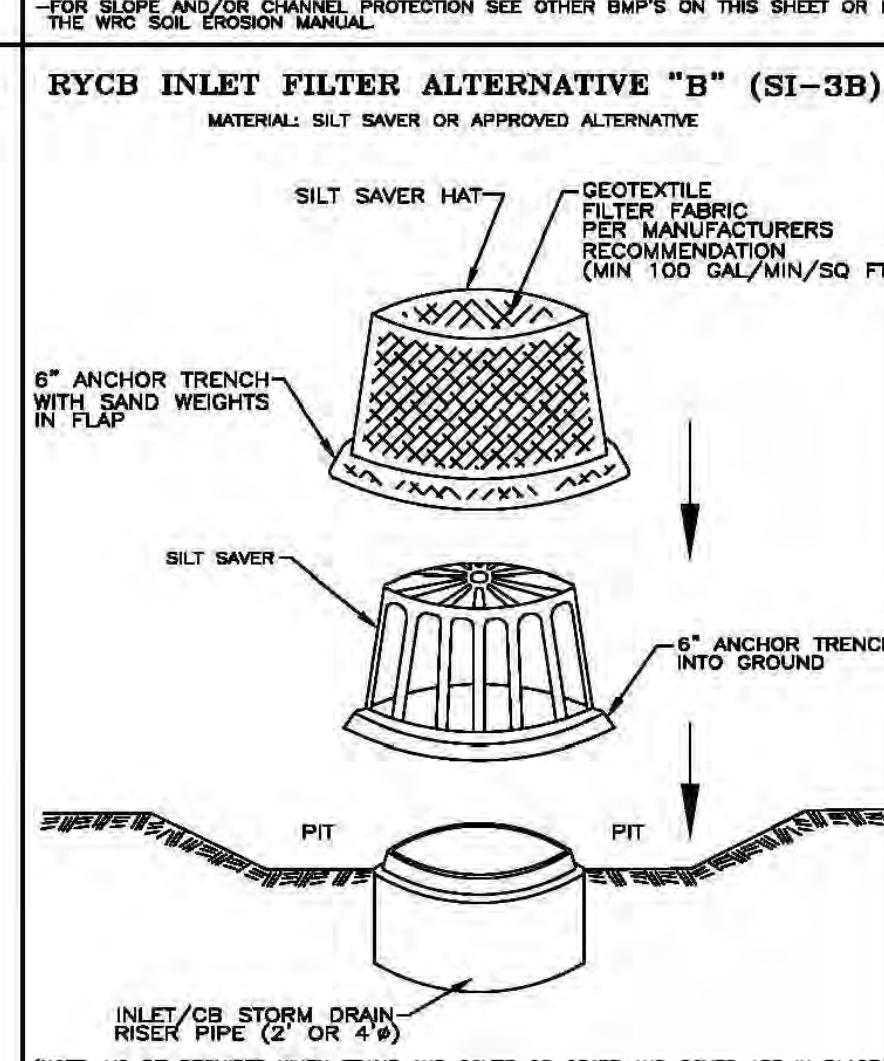
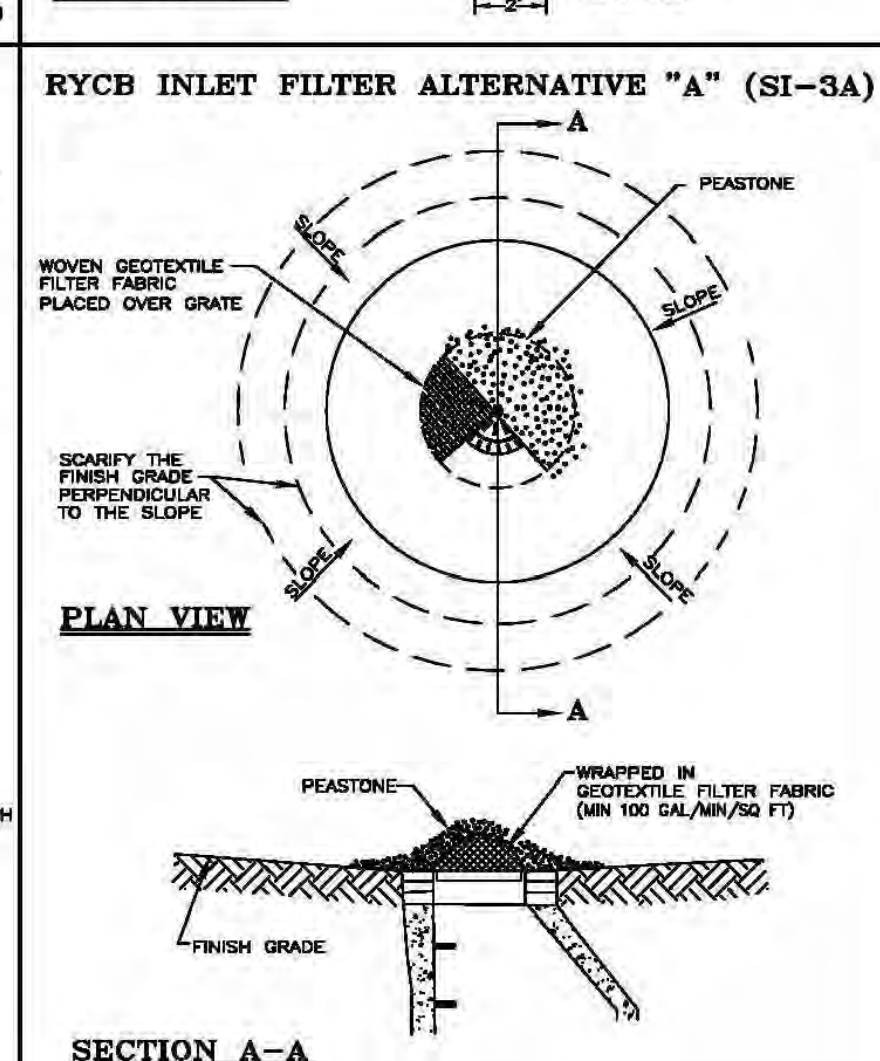
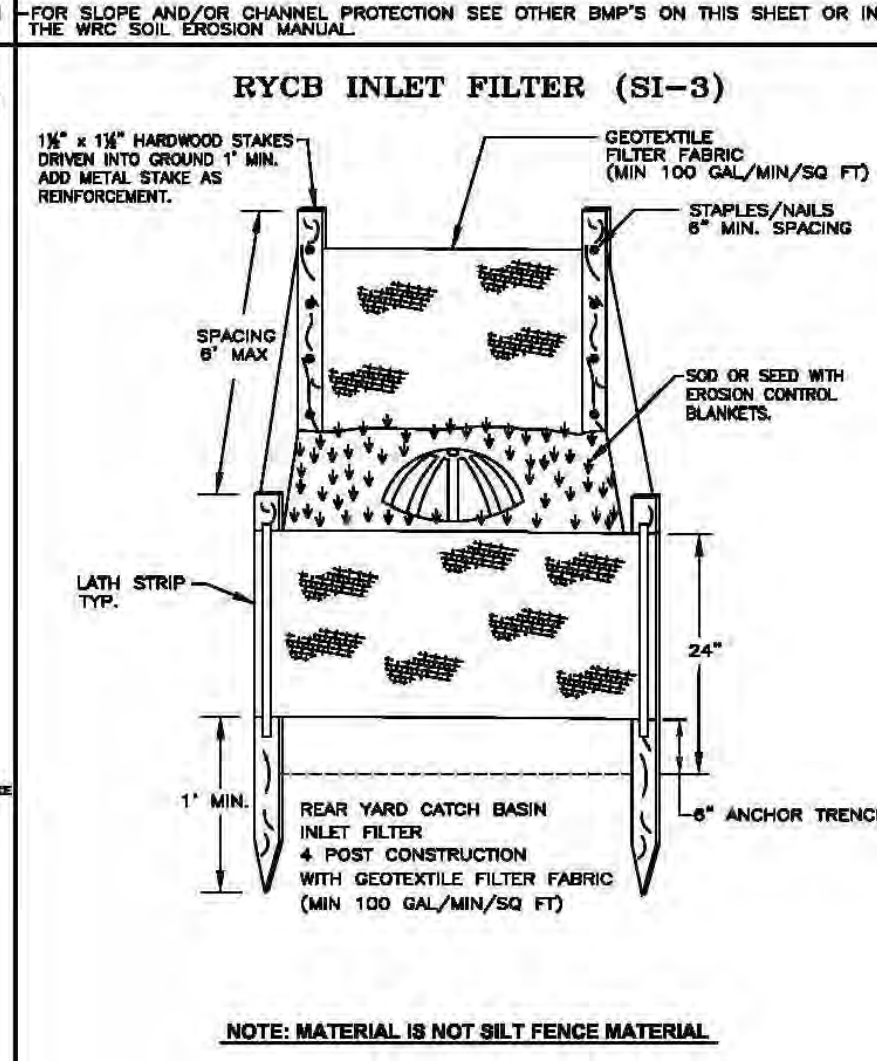
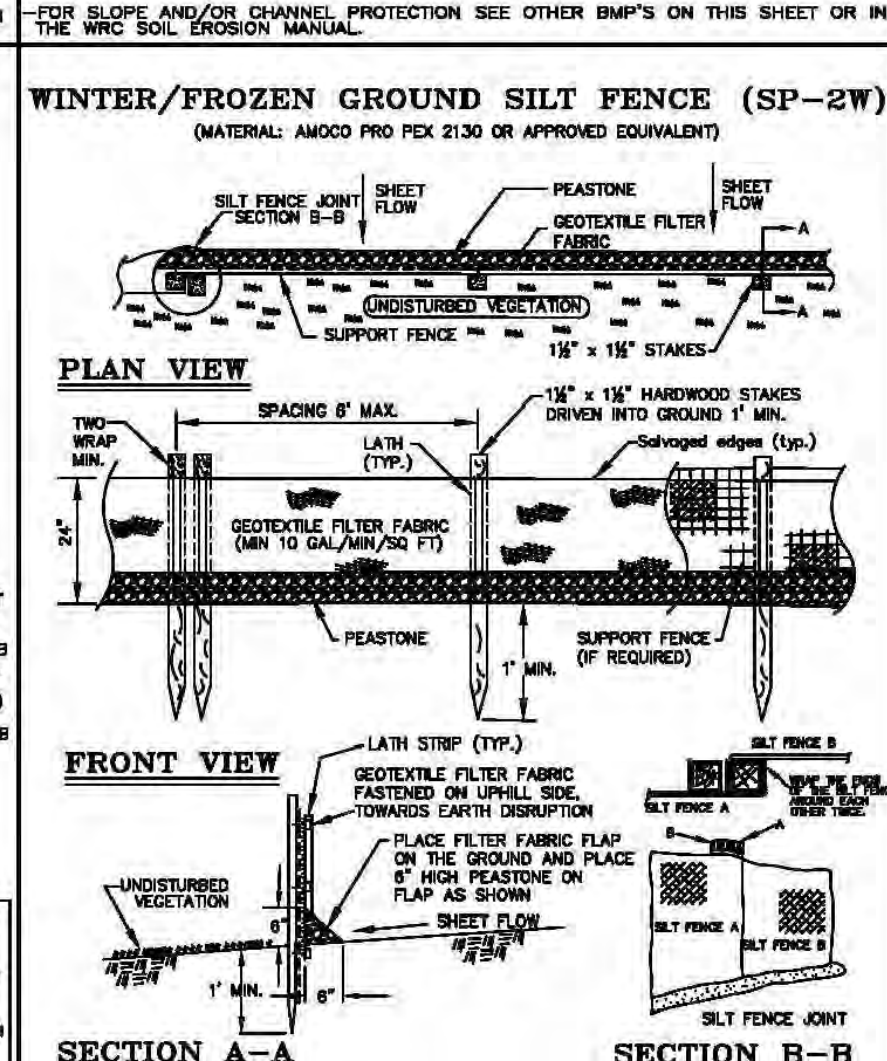
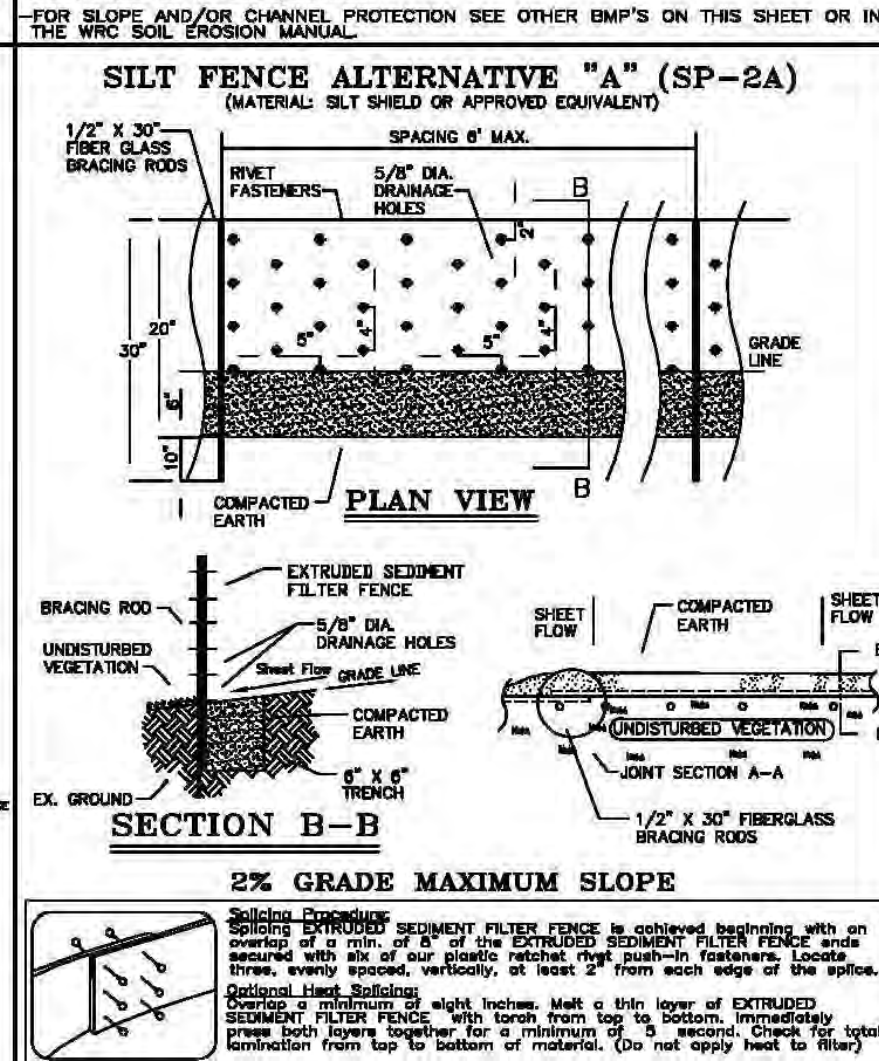
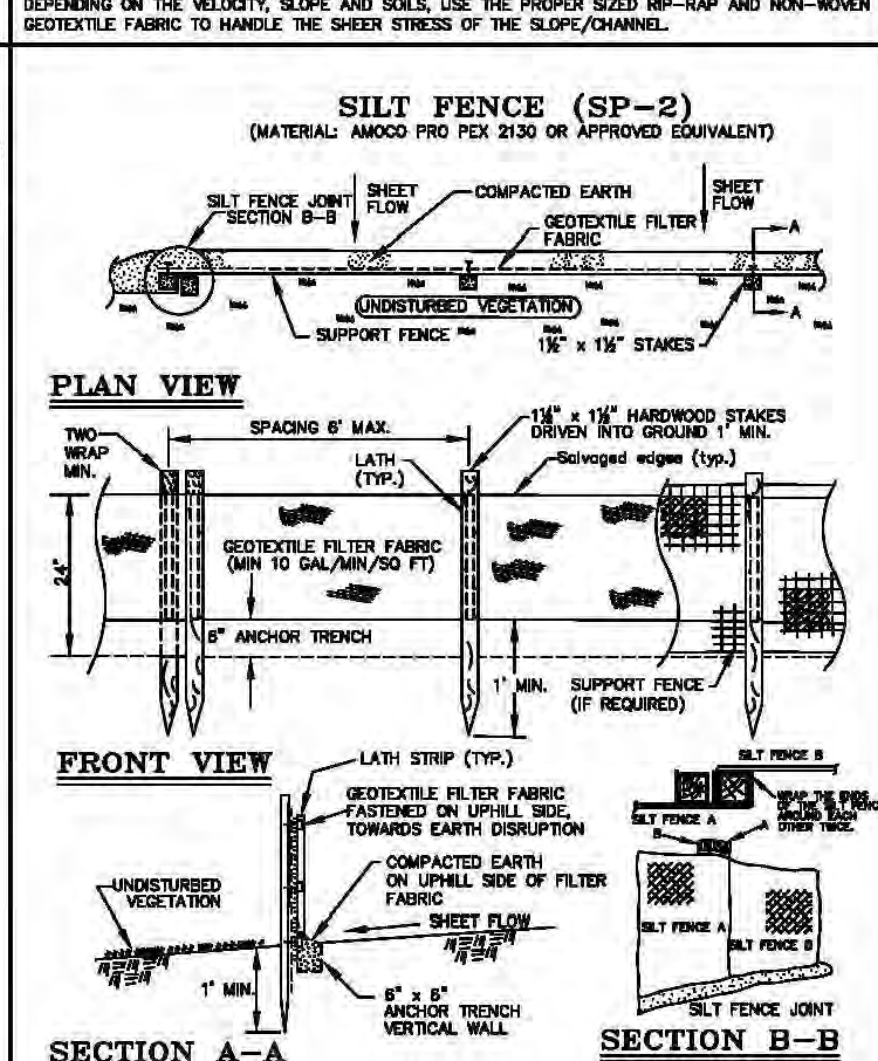
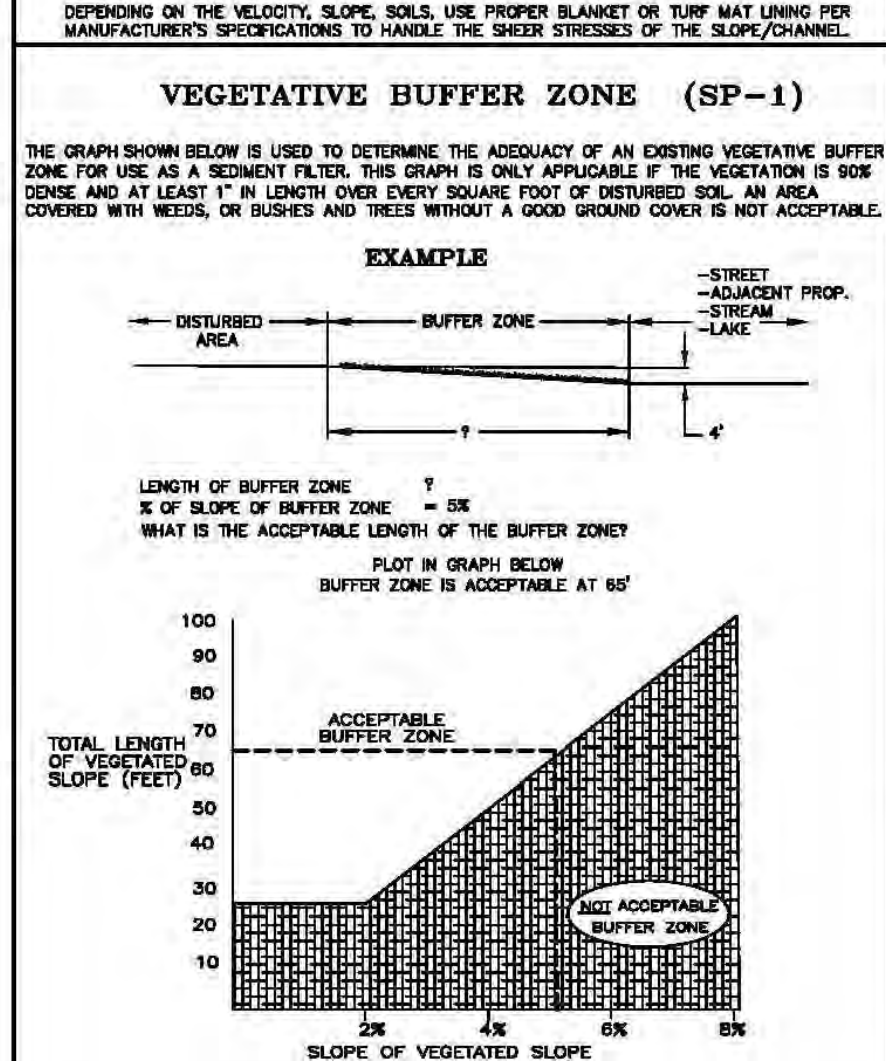
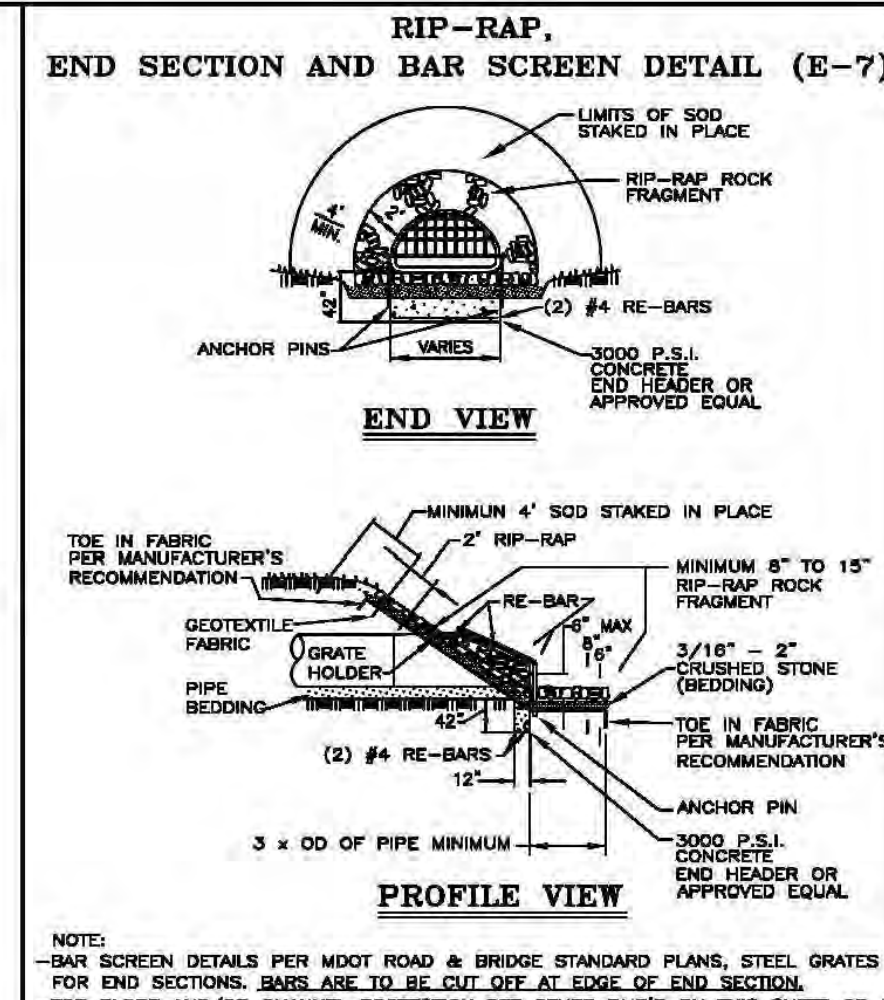
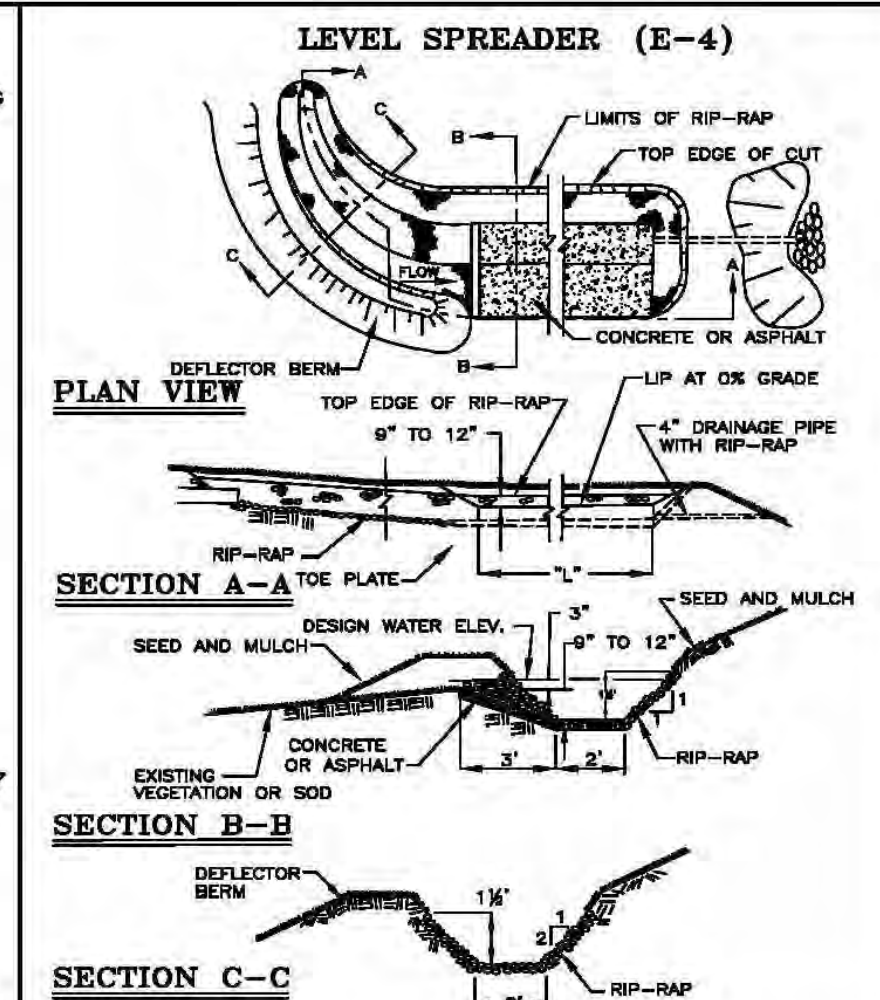
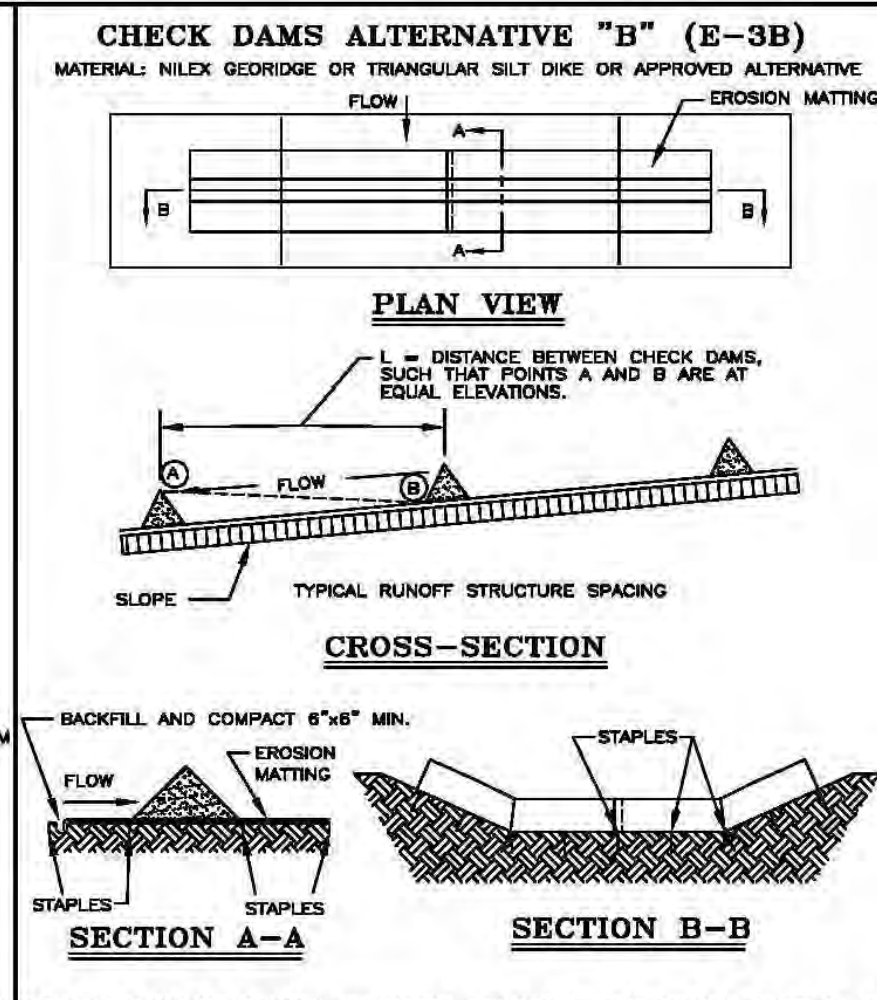
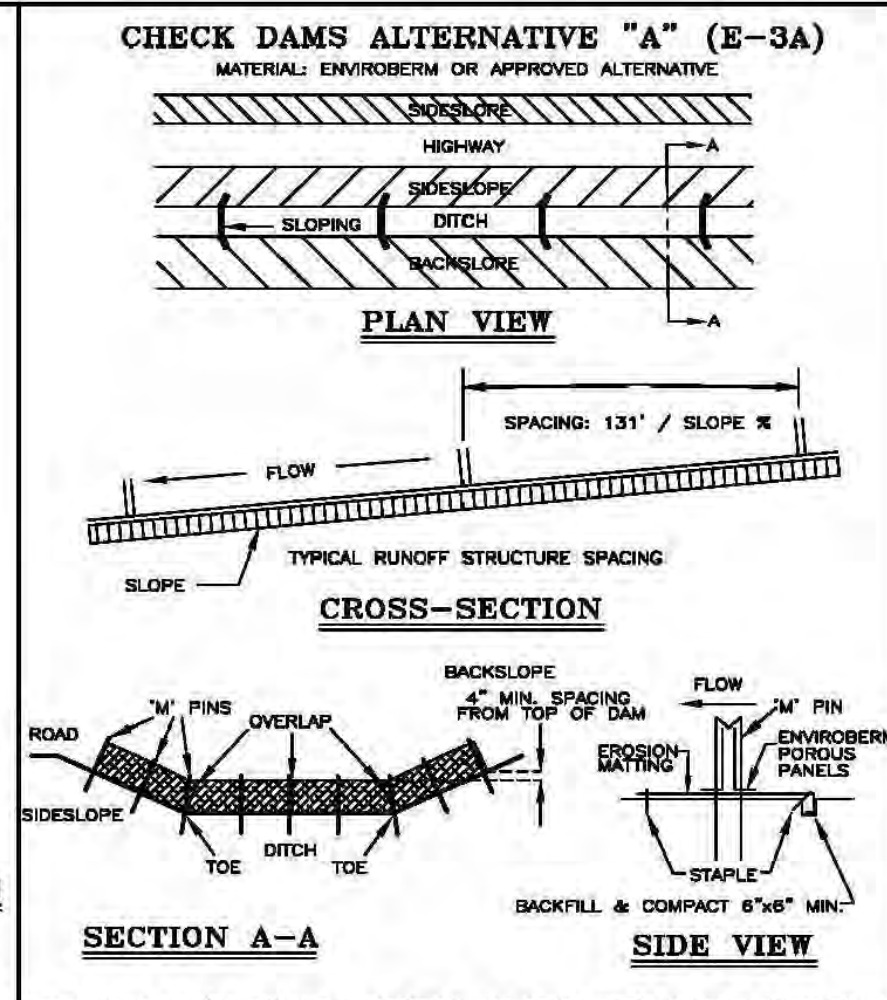
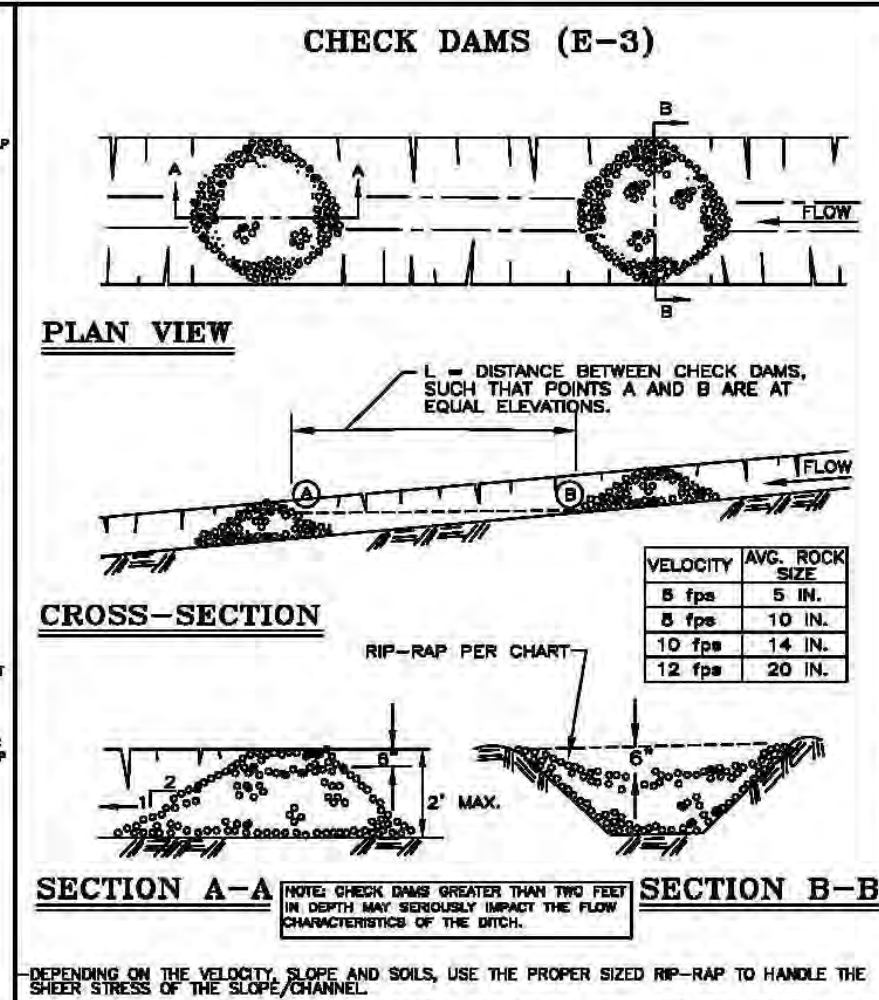
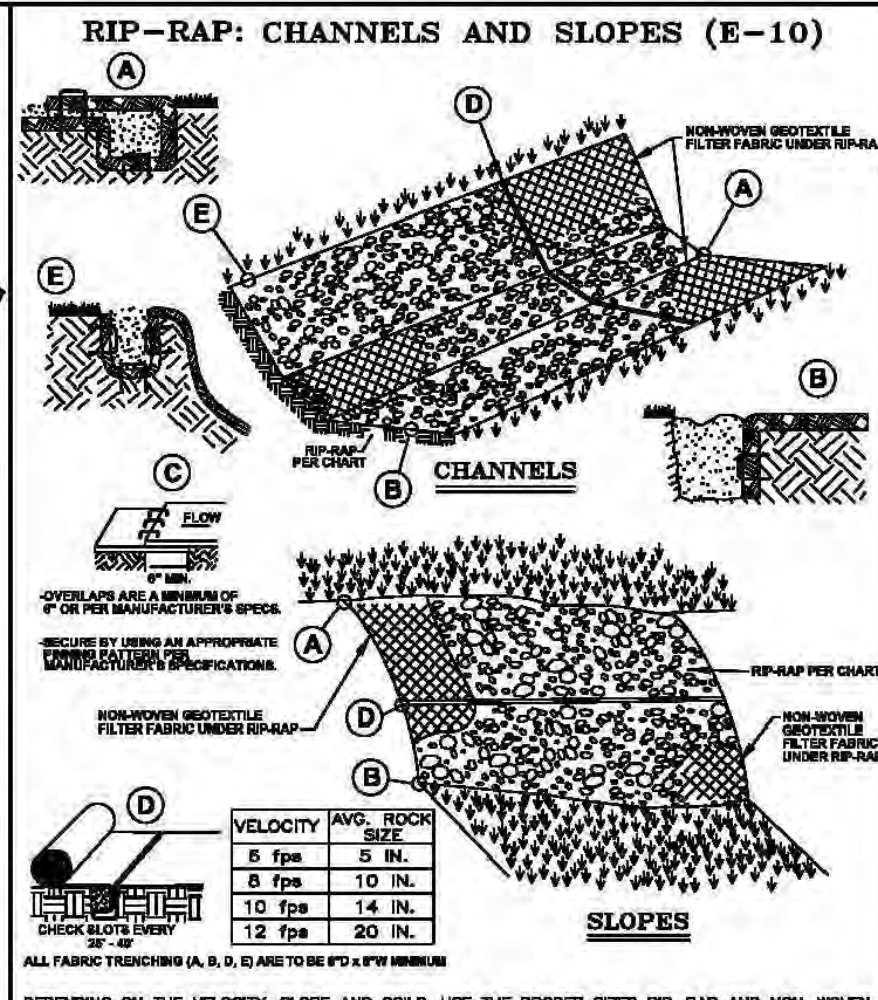
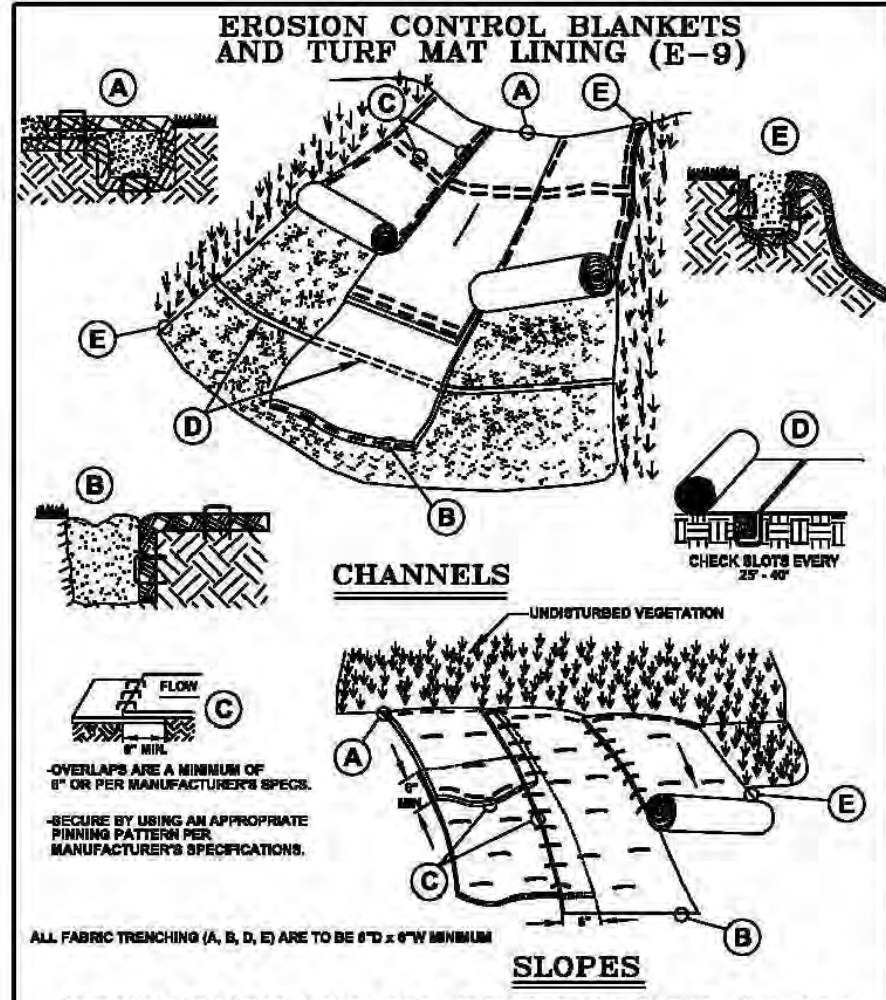


**WATERTIGHT MANHOLE CONNECTION
HDPE TO CONCRETE DETAIL**



DETENTION POND OUTLET STRUCTURE DETAIL

TIME: 25-JAN-2010 10:24
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 DESIGN FILE: W:\2005\20050366\c\detfor-stsewer.dwg-2.10.dgn
 USER NAME: hrlifeng



NOTE:

WHILE PERFORMING WORK INVOLVING GROUNDS MAINTENANCE AND/OR THE CONSTRUCTION/MAINTENANCE OF ANY INFRASTRUCTURE, INCLUDING ROADS, WATER MAINS, SANITARY SEWERS, STORM DRAINS AND STORM WATER BEST MANAGEMENT PRACTICES (BMPs), CONTRACTORS SHALL MINIMIZE POLLUTION FROM STORM WATER RUNOFF THAT CAN AFFECT WATER QUALITY RELATED TO WORK ACTIVITIES. POLLUTANTS THAT COULD IMPAIR WATER QUALITY MAY INCLUDE FUEL, GREASE AND OIL, NUTRIENTS, BACTERIA AND PATHOGENS, LITTER AND DEBRIS, AND SOIL EROSION AND SEDIMENTATION. APPLICABLE BMPs SHALL BE IMPLEMENTED BY THE CONTRACTOR TO THE MAXIMUM EXTENT PRACTICABLE TO PROTECT WATER QUALITY AND WILDLIFE HABITAT.

SOIL EROSION AND SEDIMENTATION CONTROL DETAILS

REVISION BLOCK

NO.	DATE	DESCRIPTION
1	01/01/01	ISSUED FOR BIDDING
2	01/01/01	ISSUED FOR BIDDING
3	01/01/01	ISSUED FOR BIDDING
4	01/01/01	ISSUED FOR BIDDING

ORG. DATE: 01/01/01

SCALE: NONE

DESIGNED BY: WRC

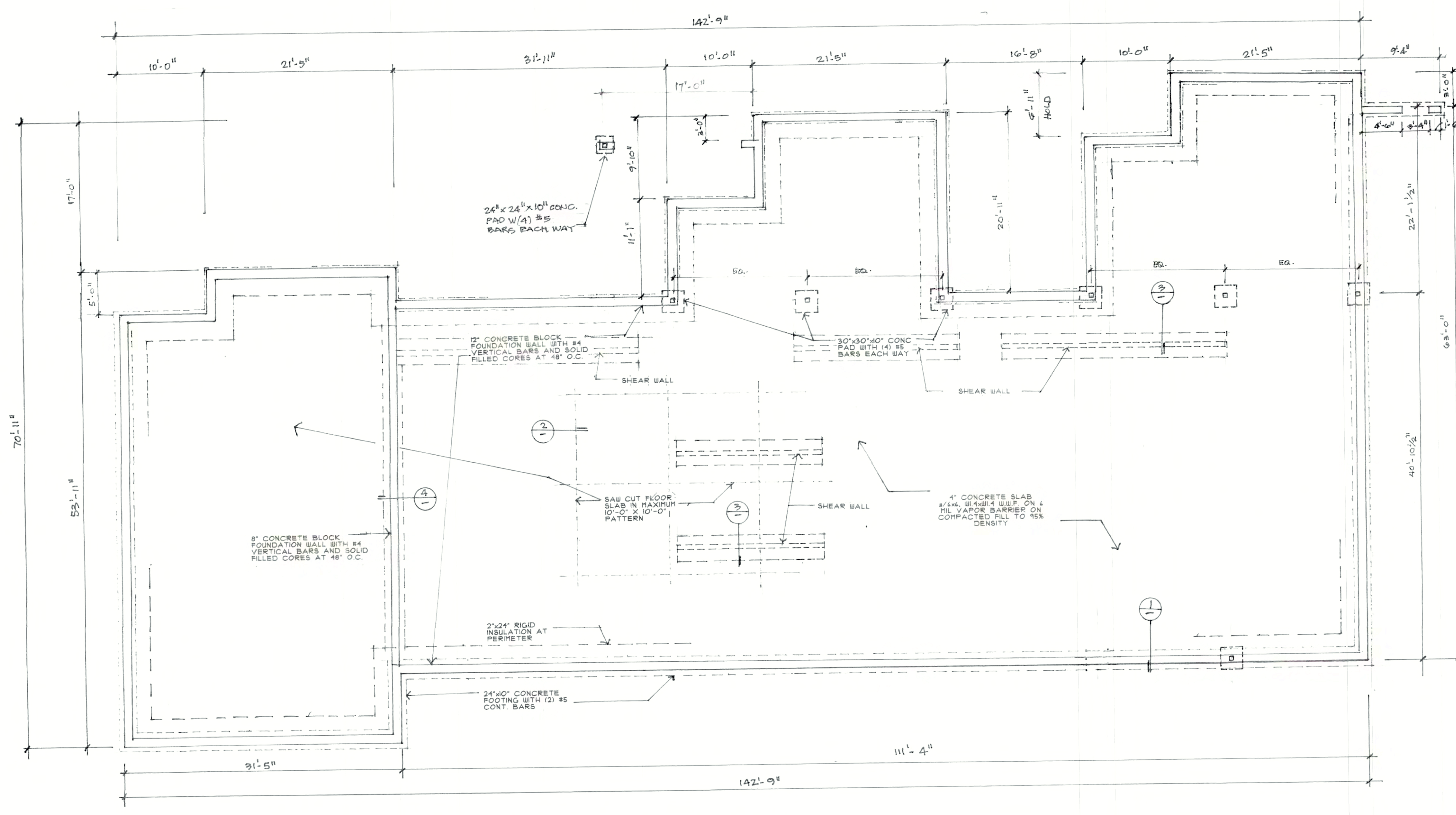
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ONE PUBLIC WORKS DRIVE, BLDG. 96 WEST WATERLOO, MICHIGAN 48201-1007

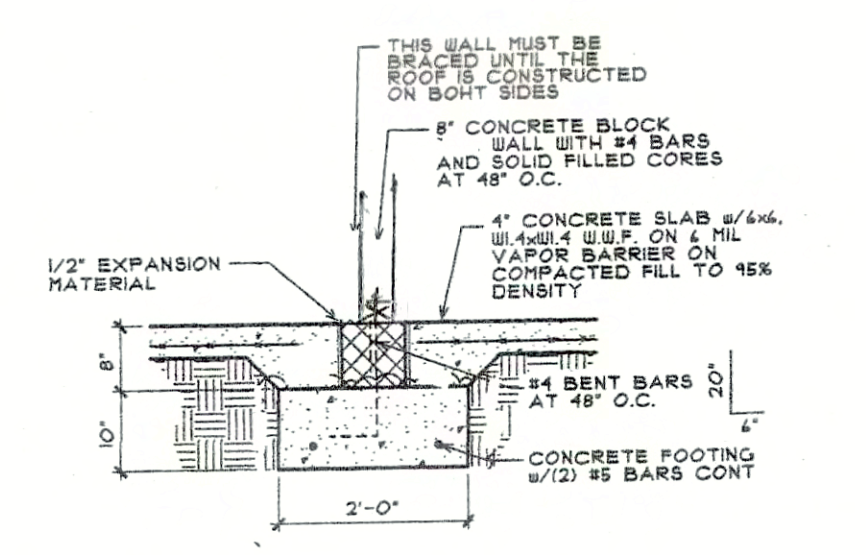
SHEET NO.: 1 of 1

- CONCRETE NOTES:**
- ALL READY MIX CONCRETE SHALL CONFORM TO A.S.T.M. C 14.
 - MEASURING, MIXING, TRANSPORTING, AND PLACING OF ALL CONCRETE SHALL COMPLY W/ ACI 304R-02.
 - ALL REINFORCING BARS, DOBELS, ANCHOR BOLTS AND ANY INVERTS SHALL BE SECURED IN POSITION PRIOR TO PLACING OF CONCRETE.
 - AIR ENTRAINED CONCRETE SHALL BE USED FOR ALL SIDESALKS, PAVING, PLATFORMS, CURBS, AND ALL CONCRETE ELEMENTS EXPOSED TO THE WEATHER.
 - ALL CONCRETE SHALL DEVELOP THE FOLLOWING COMPRESSIVE STRENGTHS AT 28 DAYS (U.N.O.):

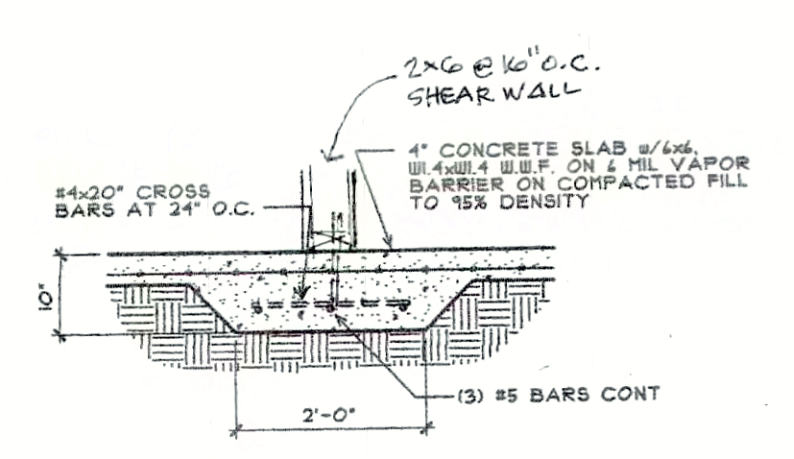
INTERIOR CONCRETE SLABS	= 4000 PSI
EXTERIOR CONCRETE SLABS	= 4000 PSI
FOOTINGS AND FOUNDATION WALLS	= 3000 PSI
 - LOCATE ALL SLEEVES, OPENINGS, EMBEDDED ITEMS, ETC., WHICH ARE INDICATED ON ALL DESIGN DRAWINGS. CHECK WITH ALL TRADES TO VERIFY THAT ALL SLEEVES, OPENINGS, AND EMBEDDED ITEMS ARE IN PLACE AND LOCATED CORRECTLY PRIOR TO PLACING THE ADJACENT CONCRETE.
 - THE SURFACE OF ALL CONSTRUCTION JOINTS SHALL BE CLEANED TO REMOVE ALL DUST, CHIPS OR OTHER FOREIGN MATTER PRIOR TO PLACING THE ADJACENT CONCRETE.
 - ALL SLABS SHALL BE CURED AND SEALED TO MINIMIZE SHRINKAGE CRACKING.
 - REFER TO ARCHITECTURAL DRAWINGS FOR MOLDS, GROOVES, ORNAMENTS, OR ACCESSORIES REQUIRED TO BE CAST IN CONCRETE AND FOR LOCATIONS OF FLOOR FINISHES AND SLAB DEPRESSIONS.
 - PIPE MAY PASS THROUGH STRUCTURAL CONCRETE IN SLEEVES, BUT SHALL NOT BE EMBEDDED THEREIN. SLEEVES SHALL BE WRAPPED WITH EXPANSION JOINT FILLER MATERIAL TO ALLOW CONCRETE TO CURE WITHOUT RESTRAINT. PIPES OR CONDUITS EXCEEDING ONE THIRD THE SLAB OR WALL THICKNESS SHALL NOT BE IN STRUCTURAL CONCRETE UNLESS SPECIFICALLY DETAILED. SEE MECHANICAL AND/OR ELECTRICAL DRAWINGS FOR LOCATIONS OF SLEEVES, ACCESSORIES, ETC.
 - SLAB SURFACES SHALL BE SMOOTH AND LEVEL OR SHALL HAVE SMOOTH EVEN SLOPE. CONCRETE FINISH SHALL BE SMOOTH FOR INTERIOR FLOOR SLABS AND BROOKE FOR EXTERIOR WALKS.
 - DURING COLD WEATHER MONTHS, ALL CONCRETE SHALL COMPLY W/ ACI COLD WEATHER CONCRETING AC 308R-11. PER ACI COLD WEATHER IS DEFINED AS A PERIOD WHEN FOR MORE THAN 15) CONSECUTIVE DAYS, THE FOLLOWING CONDITIONS MUST EXIST:
 - THE AVERAGE DAILY AIR TEMP IS LESS THAN 40 F. AND,
 - THE AIR TEMP IS NOT GREATER THAN 50 F FOR MORE THAN 50 F THAN ONE-HALF OF ANY 12-HR PERIOD.
 - DURING WARM WEATHER MONTHS, ALL CONCRETE SHALL COMPLY W/ ACI COLD WEATHER CONCRETING, AC 308R-11.
- GENERAL NOTES:**
- PASTENERS AND CONNECTORS, INCLUDING NUTS AND WASHERS, IN CONTACT WITH PRESERVATIVE TREATED WOOD SHALL BE OF HOT-DIPPED, ZINC COATED GALVANIZED STEEL.
 - CONTINUOUS HORIZONTAL REBAR LAP TO BE A MINIMUM OF 24"
- SOIL BEARING CAPACITY, 1000 PSF (VERIFY)**
- AS INDICATED IN THE SOILS REPORT, ALL INTERIOR AND EXTERIOR LOAD BEARING FOOTINGS SHALL BE ENGINEERED TO BE SUPPORTED ON ALL SOILS CONTAINING A SIGNIFICANT AMOUNT OF ORGANIC SUBSTANCES OR EXCESSIVELY SOFT SOILS. THE SOILS SHALL BE TESTED TO VERIFY THAT THE REQUIRED BEARING CAPACITY IS MET. ALL ENGINEERING SHALL BE AS INDICATED IN THE SOILS REPORT. RECOMMENDED THAT GEOLOGICAL AND ASSOCIATES BE RETAINED TO OBSERVE THE SOILS IN THE FOOTING EXCAVATIONS PRIOR TO OBSERVING THE REQUIRED BEARING CAPACITY SO THEY CAN TEST THE SOILS FOR THE



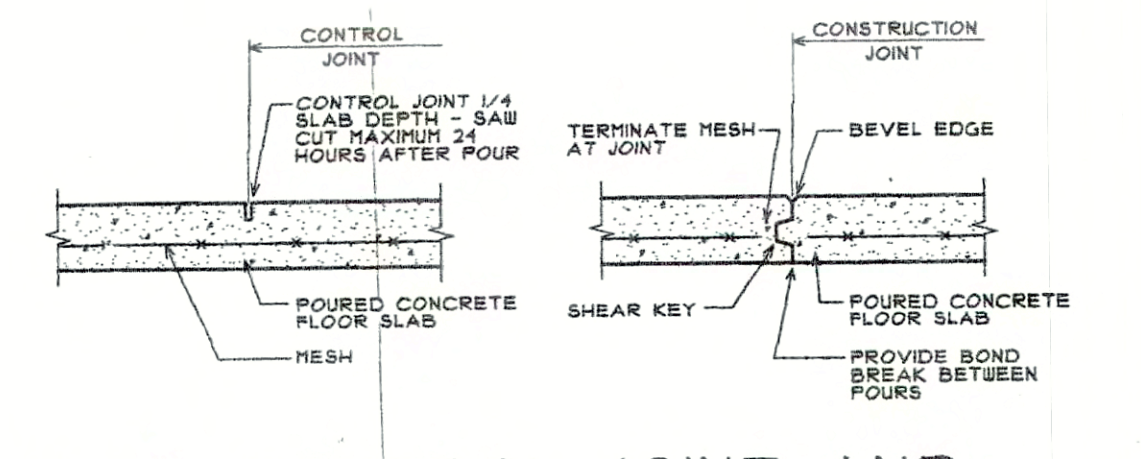
FOUNDATION PLAN
SCALE: 1/8" = 1'-0"



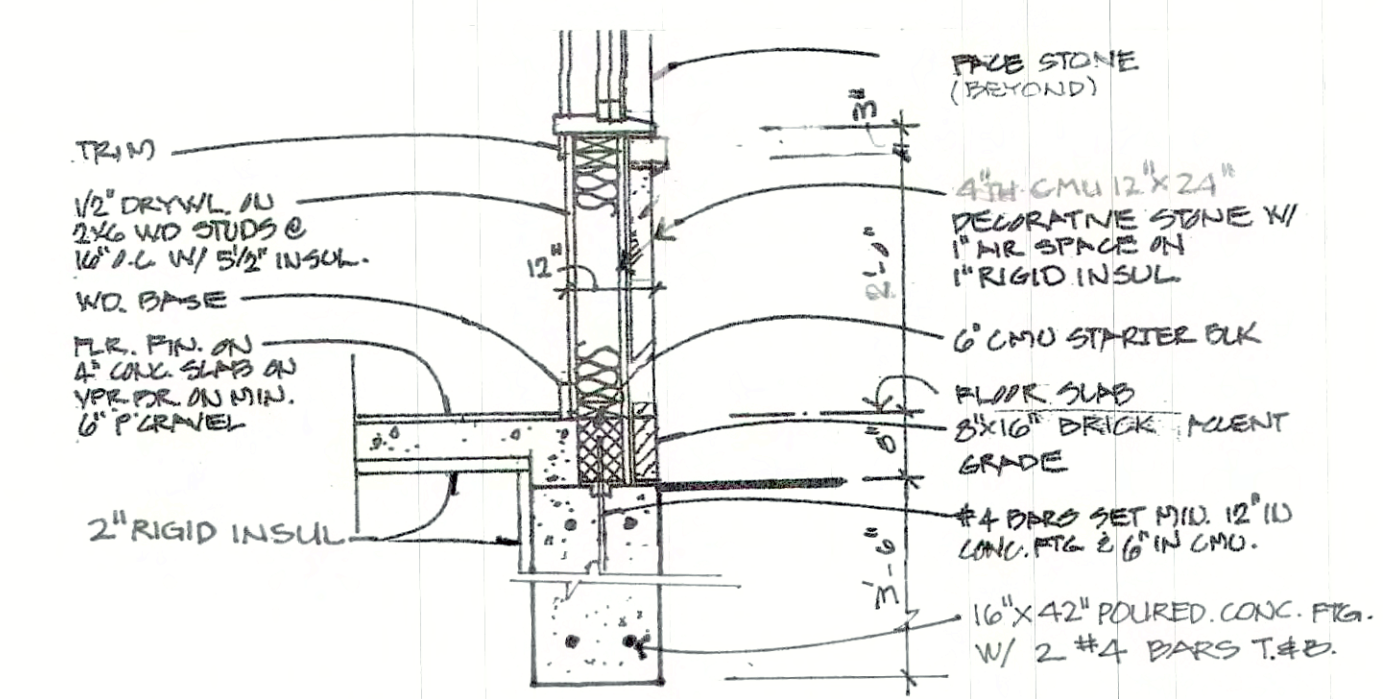
FOUNDATION DETAIL 1
SCALE: 1/2" = 1'-0"



FOUNDATION DETAIL 2
SCALE: 1/2" = 1'-0"



SLAB CONTROL JOINT AND CONSTRUCTION JOINT DETAIL
SCALE: NONE



DET. @ ALT. TRENCH FTG.
SCALE: 1/2" = 1'-0"

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PETKOSKI ARCHITECTS, L.L.C.

issue / revision

Drawn by JN/BG

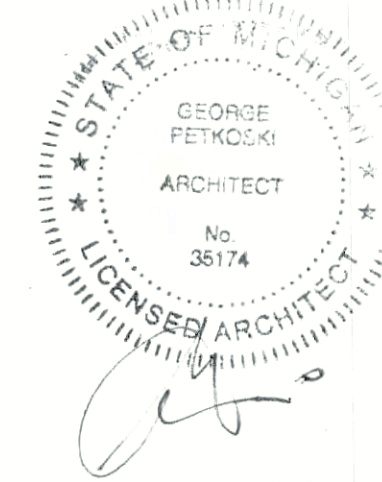
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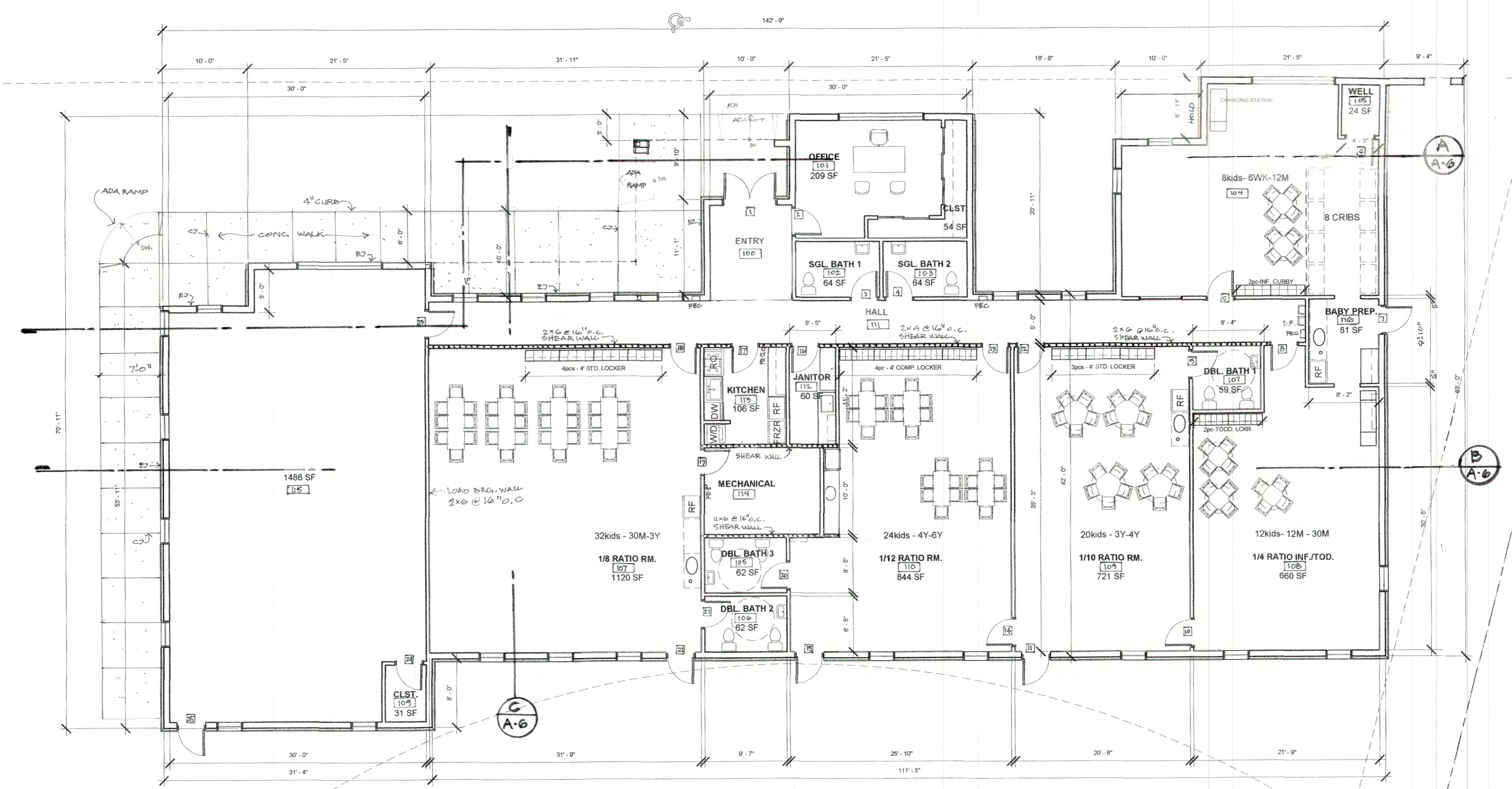
Date 5-18-2024

Scale AS NOTED

Project No. 24-010

Sheet No. A-1

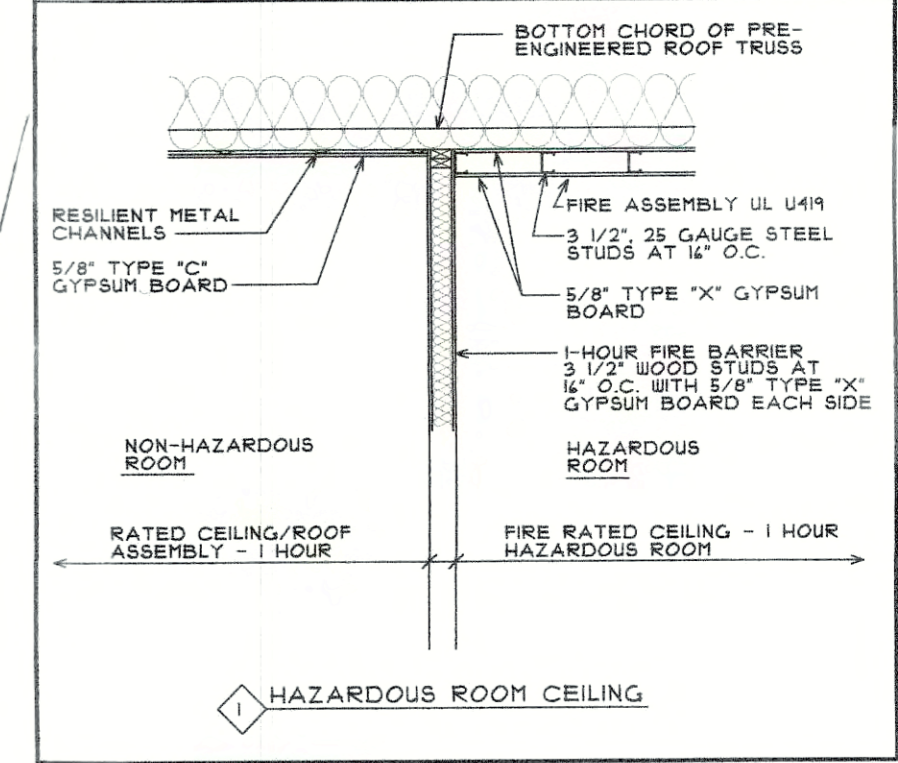




FLOOR PLAN
SCALE: 1/8" = 1'-0"

FIRE RATING NOTES:

- INTERIOR DOORS TO BE RATED PER DOOR SCHEDULE, INTERIOR WINDOWS TO BE RATED PER WINDOW SCHEDULE
- ALL UL ASSEMBLIES SPECIFIC CONSTRUCTION CRITERIA CAN BE OBTAINED AND PRINTED FROM UL'S WEB SITE.
- ALL PENETRATIONS SHALL BE SEALED TIGHT WITH AN APPROVED FIRE CAULKING.
- PROVIDE FIRE DAMPERS AND SMOKE DAMPERS PER MECHANICAL PLAN WHERE INDICATED
- ALL FIRE RATED AND SMOKE BARRIER WALLS WILL BE MARKED AND LABELED ABOVE THE CEILING AND OR ATTIC SPACING 301 FOOT INTERVALS AND 64 FEET FROM EACH END OF THE WALL. LETTERING HEIGHT TO BE 3 MINIMUM AND WIDTH OF 3/8 MIN. SUGGESTED WORDING FIRE AND/OR SMOKE BARRIER & PROTECT ALL OPENINGS.



FIRE EXTINGUISHER LEGEND

- REC 10# ABC FIRE EXTINGUISHER IN RECESSED CABINET
- FE-1 5# ABC FIRE EXTINGUISHER (MECHANICAL ROOM ONLY)
- FE-2 'K' STYLE FIRE EXTINGUISHER (KITCHEN)

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PETKOSKI ARCHITECTS, L.L.C.

issue / revision

Drawn by IN/BG

Checked by GP

Date 5-18-2024

Scale AS NOTED

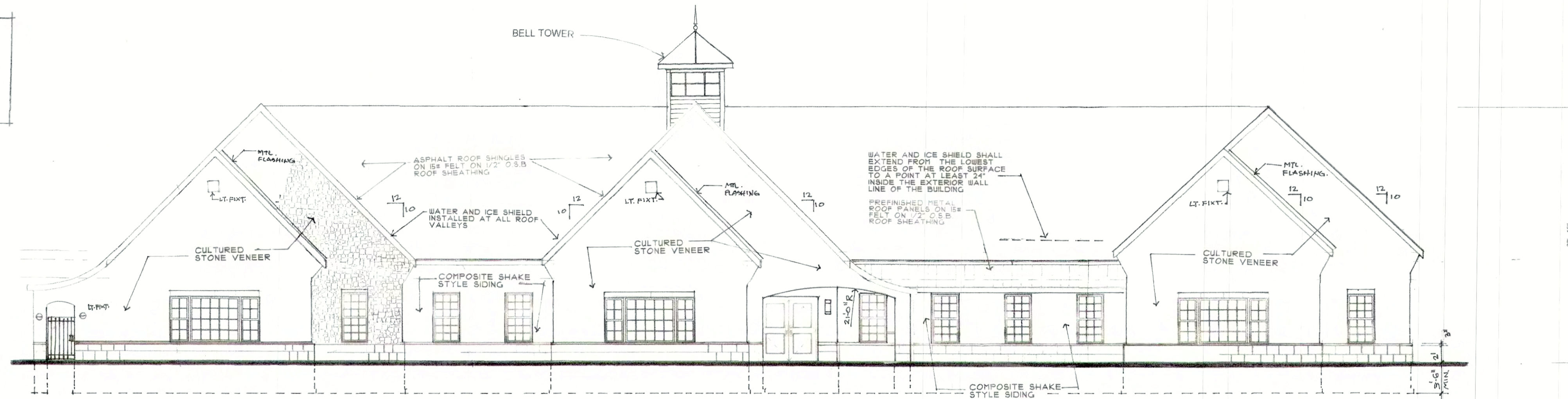
Project No. 24-010

Sheet No. A-2



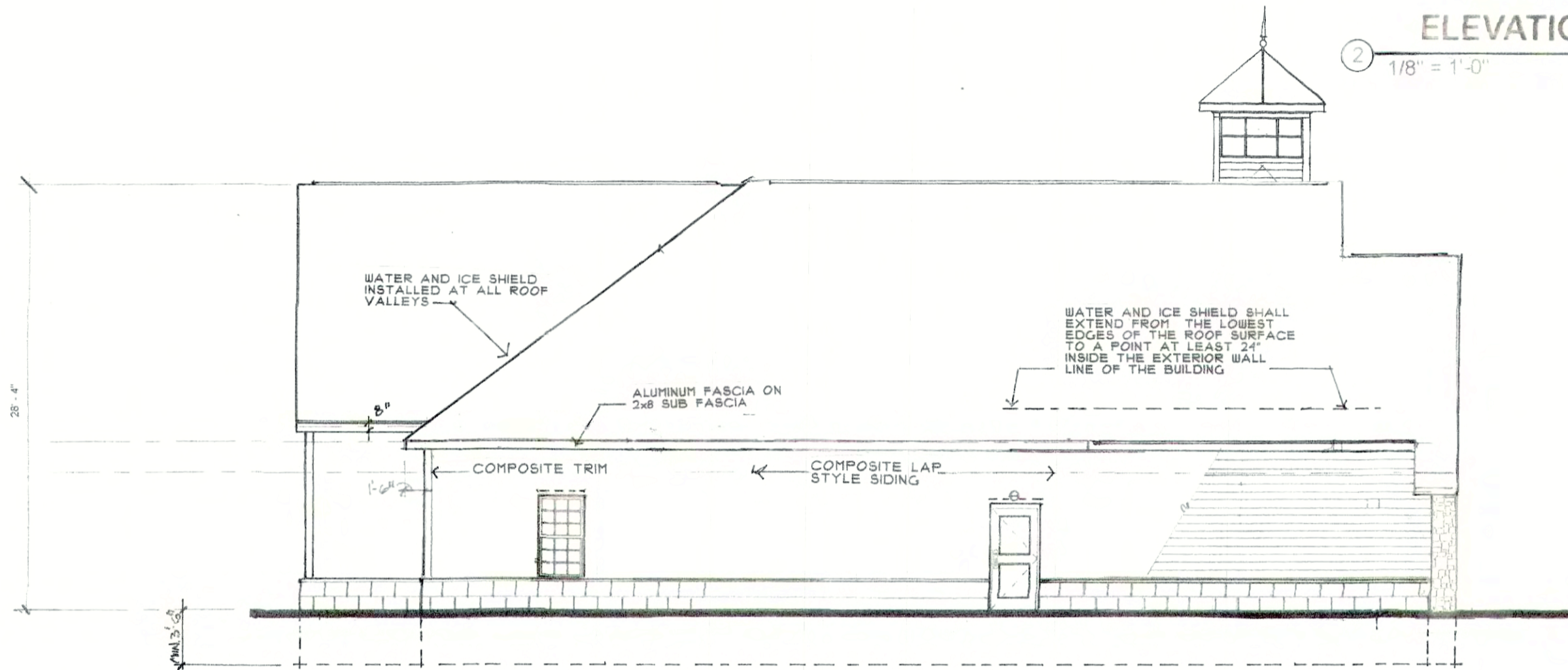
NOTE:

PLUMBING AND HVAC VENTS SHALL BE GROUPED IN ATTIC TO LIMIT THE NUMBER OF ROOF PENETRATIONS. ALL ROOF PENETRATIONS SHALL OCCUR TO THE REAR.



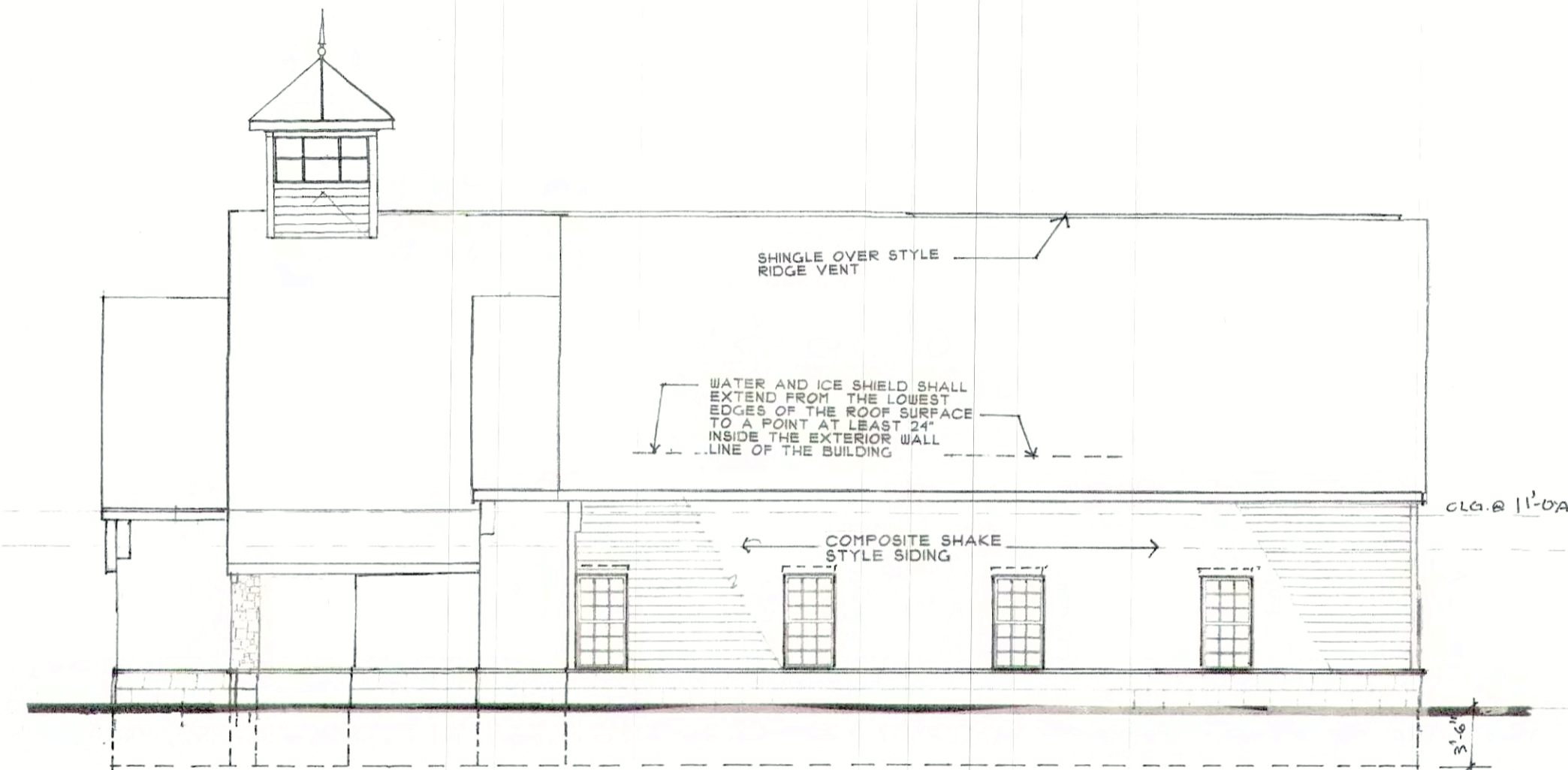
ELEVATION - NORTH

1/8" = 1'-0"



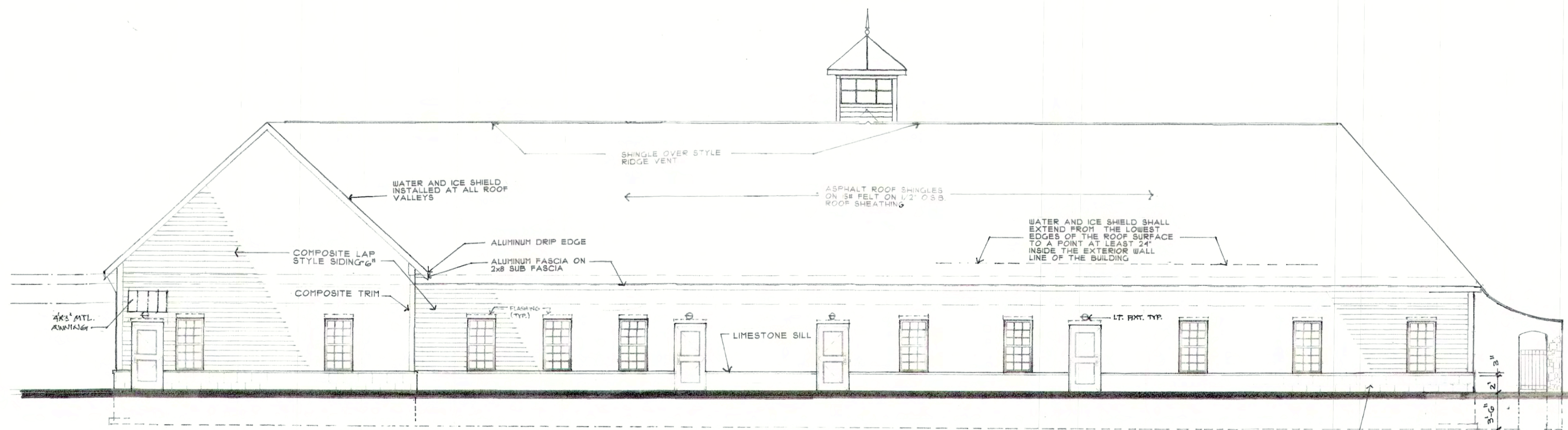
ELEVATION - EAST

1/8" = 1'-0"



ELEVATION - WEST

1/8" = 1'-0"



ELEVATION - SOUTH

1/8" = 1'-0"

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Drawn by **JN/BG**

Checked by **GP**

Date **5-18-2024**

Scale **AS NOTED**

Project No. **24-010**

Sheet No. **A-3**



ROOF STRUCTURE NOTES

1. REFER TO COVER SHEET FOR MINIMUM GROUND SNOW LOADING FOR ROOF TRUSSES
2. ROOF TRUSS DESIGN SHALL BE PERFORMED BY A REGISTERED ENGINEER IN THE STATE OF MICHIGAN
3. CONTRACTOR SHALL PROVIDE FINAL TRUSS SHOP DRAWING TO THE ARCHITECT AND THE BUILDING DEPARTMENT FOR REVIEW AND CORRECT PLAN COPIES SUBMITTED TO BUILDING DEPARTMENT SHALL BE SEALED BY A REGISTERED ENGINEER IN THE STATE OF MICHIGAN
4. CONTRACTOR SHALL PROVIDE ANCHORING AND BRACING FOR ALL ROOF TRUSSES AS REQUIRED BY ROOF TRUSS SHOP DRAWINGS
5. ARCHITECT WILL PROVIDE REQUIRED ADDITIONAL TRUSS BRACING PLAN TO GENERAL CONTRACTOR AFTER BEARING TRUSS SHOP DRAWINGS ARE SUBMITTED TO ARCHITECT
6. CONTRACTOR SHALL VERIFY HEIGHT AND LOCATION OF ALL ROOFTRUSS EQUIPMENT AND SUBMIT TO TRUSS ENGINEER FOR ADEQUATE REINFORCEMENT
7. ALL ROOF TRUSSES SHALL BE CONNECTED TO WALL PLATES USING "IMPROM" H2S BEARING HURRICANE CLIPS AT EACH TRUSS CONNECTION COORDINATE APPROPRIATE TRUSS CONNECTOR WITH TRUSS MANUFACTURER'S SHOP DRAWINGS
8. CONTRACTOR TO VERIFY ALL LOADING WITH TRUSS MANUFACTURER AND ARCHITECT PRIOR TO CONSTRUCTION
9. STRUCTURAL LUMBER SUPPLIER SHALL SUBMIT SHOP DRAWING ON ALL STRUCTURAL LUMBER PRODUCTS INDICATING SIZE, GRADE AND DESIGN STRENGTH TO MEET CONDITIONS INDICATED IN HEADERS AND BEAM SCHEDULE. SHOP DRAWING SHALL BE REVISED AND APPROVED BY ARCHITECT PRIOR TO CONSTRUCTION
10. NO DRAFT STOPPING REQUIRED DUE TO SPRINKLER SYSTEM THROUGHOUT BUILDING INCLUDING ATTIC. PER DRAFTSTOPPING EXCEPTION IN MICHIGAN BUILDING CODE IF FIRE SUPPRESSION IS NOT SUPPLIED IN ATTIC, THEN DRAFTSTOPPING IS REQUIRED
1. WATER AND ICE SHIELD SHALL BE APPLIED A MINIMUM OF 2" REARDED HOZ. FROM INSIDE FACE OF OUTSIDE WALLS AT ALL ROOF OVERHANGS AND AT ALL ROOF VALLEYS
2. PROVIDE INSULATED FIRE RATED ATTIC ACCESS DOORS WHEN IN FIRE RATED CEILING - SEE FLOOR PLAN FOR ATTIC ACCESS LOCATIONS. DOORS AND HINGERS, HOOKS AND EYES TO BE PROVIDED BY FRAMING CONTRACTOR
3. COORDINATE DOUBLE AND TRIPLE STUD FRAMING WITH PRE-ENGINEERED GIRDER TRUSS LOCATIONS. REVISE FINAL TRUSS PLANS FOR THESE LOCATIONS AND ANY OTHER ADDITIONAL LOCATIONS AS A RESULT OF TRUSS REVIEW

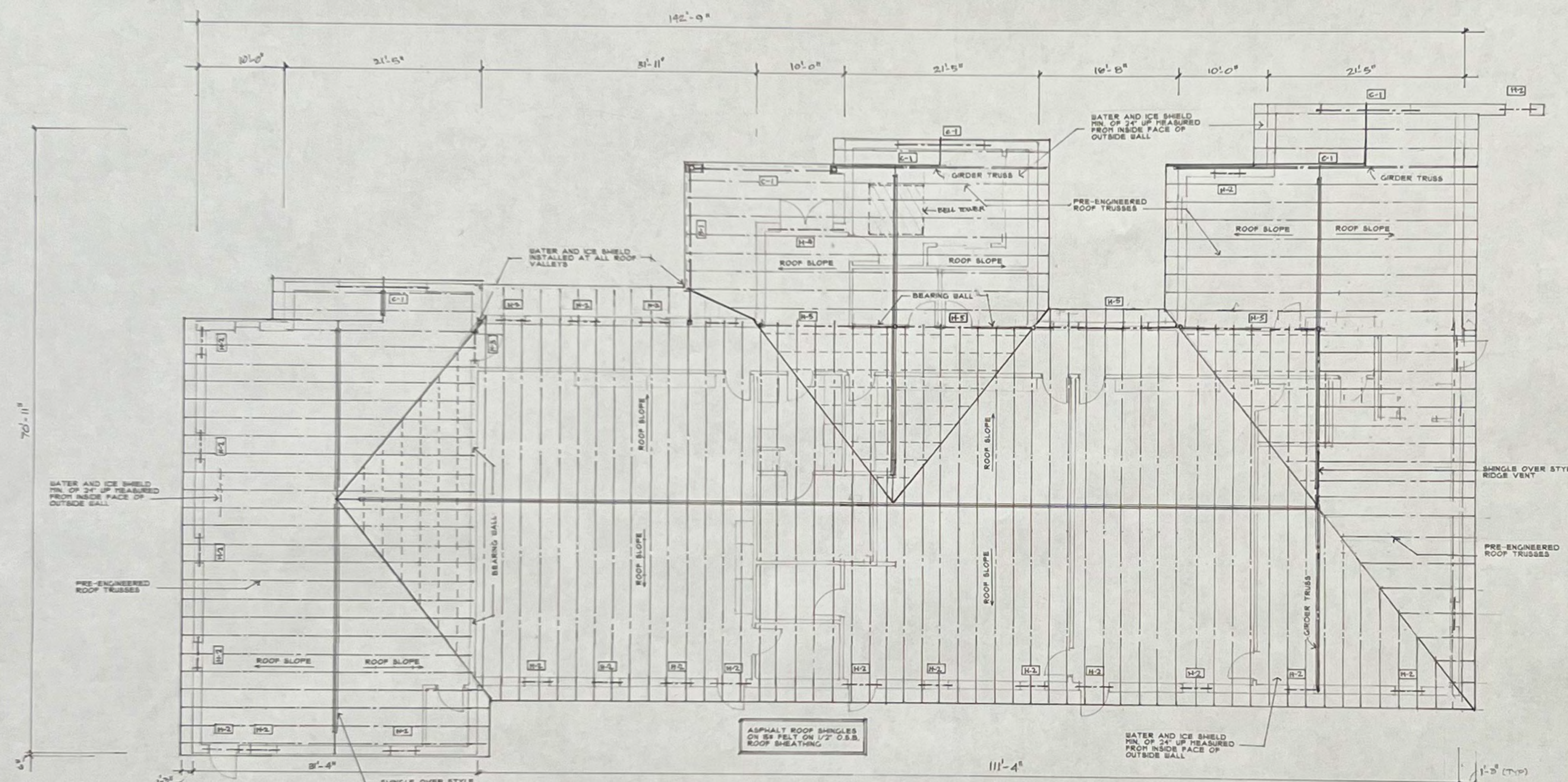
WOOD HEADERS AND BEAM SCHEDULE

- H-1 5'-1/4" x 1-1/2" LSS LSL OR (2) 1-3/4" x 1-1/2" LSS LSL BEAR ON ONE (1) STUD.
- H-2 5'-1/4" x 1-1/2" 2.0E LVL OR (2) 1-3/4" x 1-1/2" 2.0E LVL BEAR ON TWO (2) STUDS.
- H-3 5'-1/4" x 1-1/8" 2.0E LVL OR (3) 1-3/4" x 1-1/8" 2.0E LVL BEAR ON TWO (2) STUDS.
- H-4 5'-1/4" x 1-1/8" 2.0E LVL BEAR ON TWO (2) STUDS.
- H-5 5'-1/4" x 1-1/8" 2.0E LVL BEAR ON THREE (3) STUDS.
- B-1 5B x 21 STEEL BEAM
- C-1 5 x 3 1/2 x 5/8 LINTEL SEE DETAIL

NOTE:
ALL HEADERS TO BE VERIFIED AFTER FINAL TRUSS SHOP DRAWINGS ARE AVAILABLE AND SUBMITTED TO ARCHITECT

NOTE:

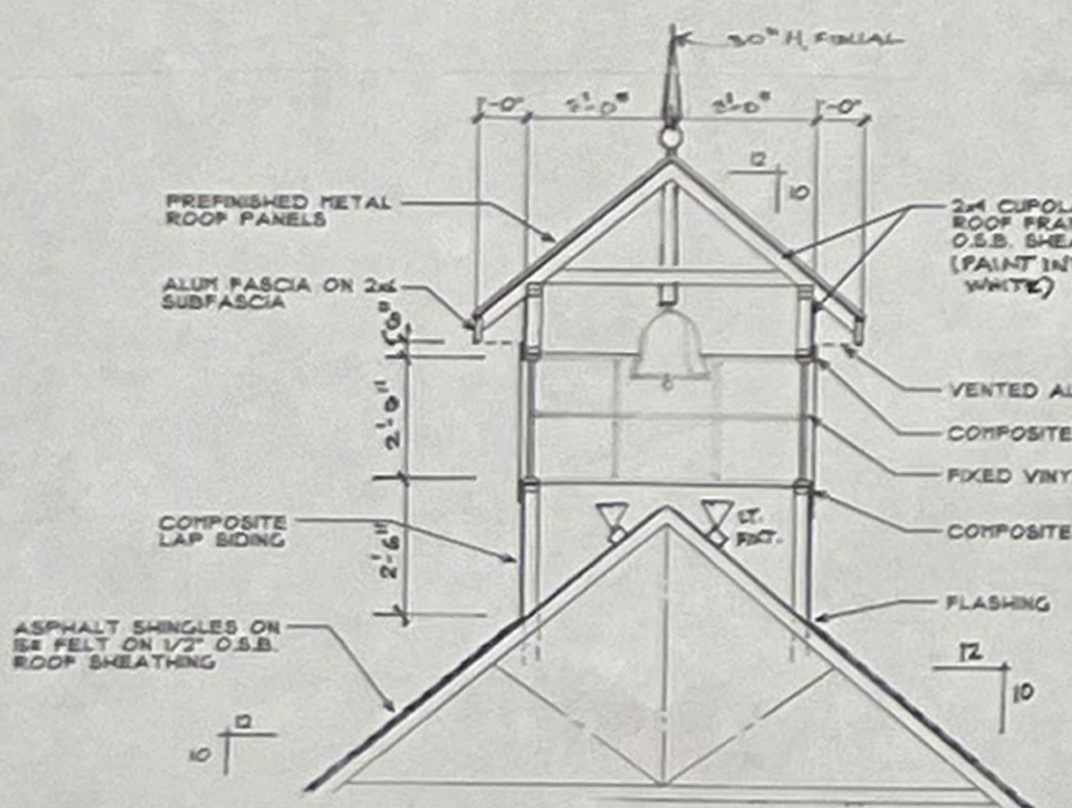
TRUSS FABRICATOR TO VERIFY ALL ROOF SLOPE AS INDICATED ON THIS. NOTIFY ARCHITECT OF ANY ADJUSTMENTS TO THE PROPOSED ROOF SLOPES



ROOF PLAN

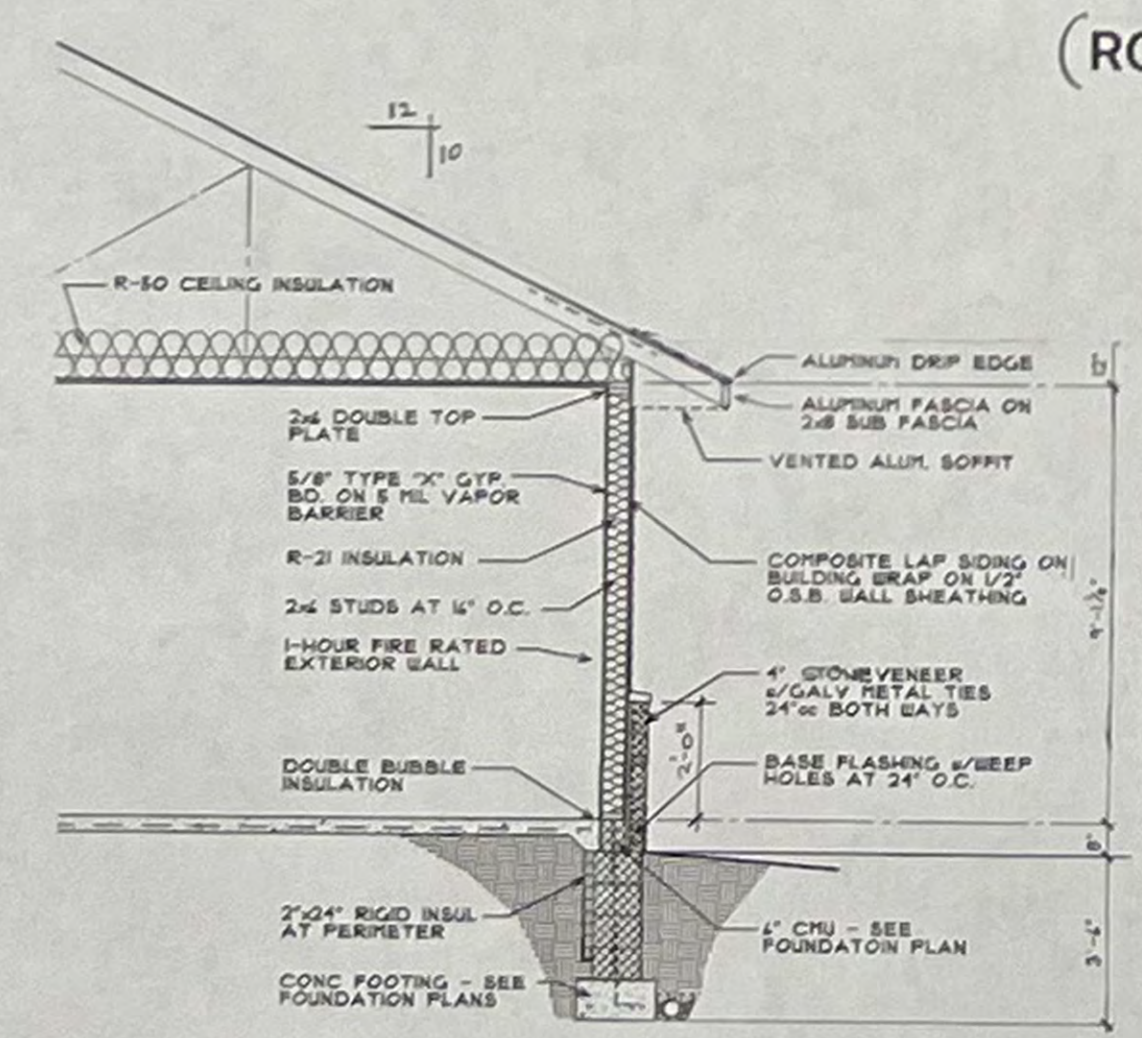
SCALE: 1/8" = 1'-0"

(ROOF/FRAMING PLAN)



DETAIL SECTION @ BELL TOWER

SCALE: 1/4" = 1'-0"

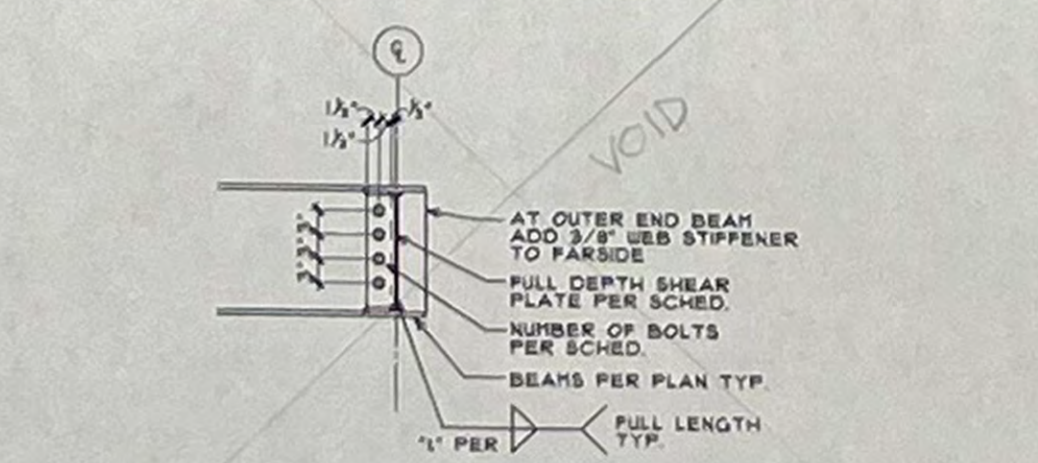


DETAIL WALL SECTION

SCALE: 1/4" = 1'-0"

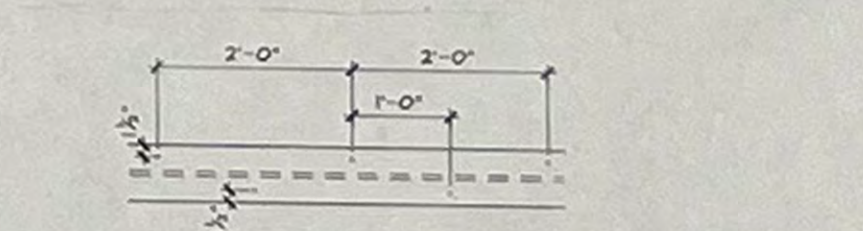
BEAM CONNECTION SCHEDULE

BEAM SIZE	NUMBER OF BOLTS AND SIZE	BOLT TYPE	BOLT BEARING TYPE	PLIET BILD 1" THICKNESS	SHEAR PLATE THICKNESS
W 8 x 21	(4) 3/4" DIA.	A325	TYPE 1N	1/4"	3/8"



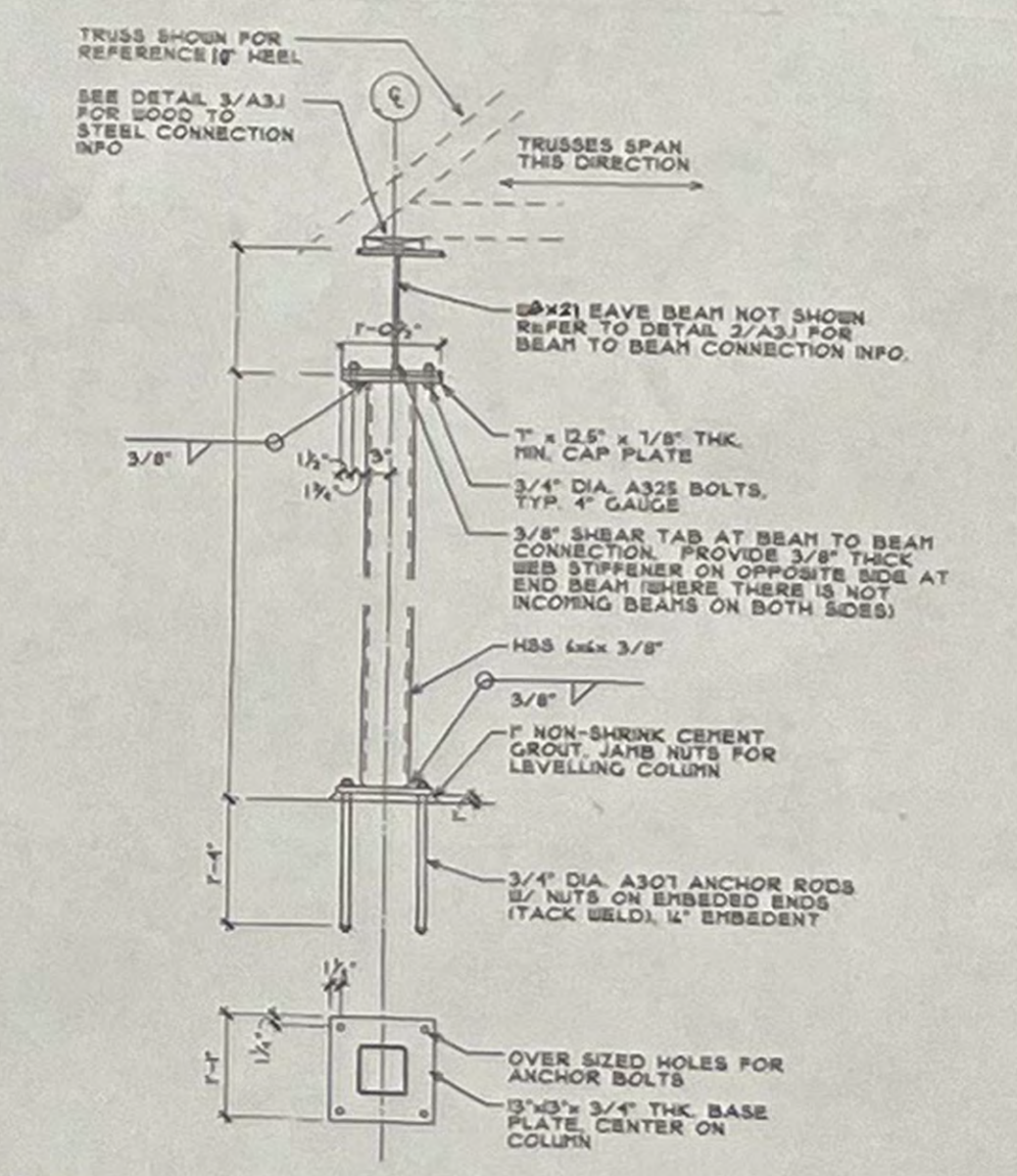
BEAM CONNECTION SINGLE PLATE

SCALE: 1/2" = 1'-0"



WOOD PLATES TO STEEL BEAM

SCALE: 1/2" = 1'-0"



COLUMN & BEAM DETAIL

SCALE: 1/2" = 1'-0"

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Drawn by: JN/BI

Checked by: GF

Date: B-18-2024

Scale: AS NOTED

Project No.: 24-010

Sheet No.:

A-4



Handwritten signature

project

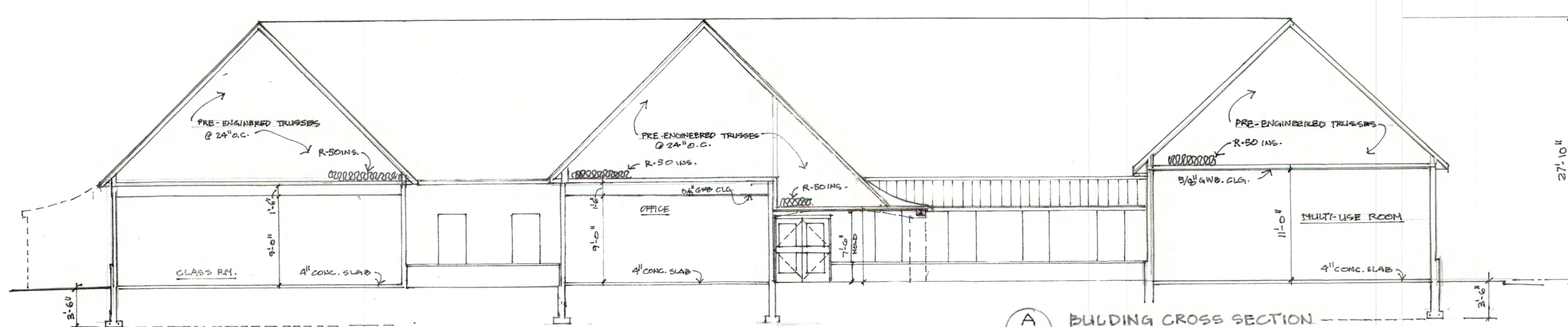
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CHILDCARE
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HIGHLAND ROAD
MILFORD, MI 48380

owner

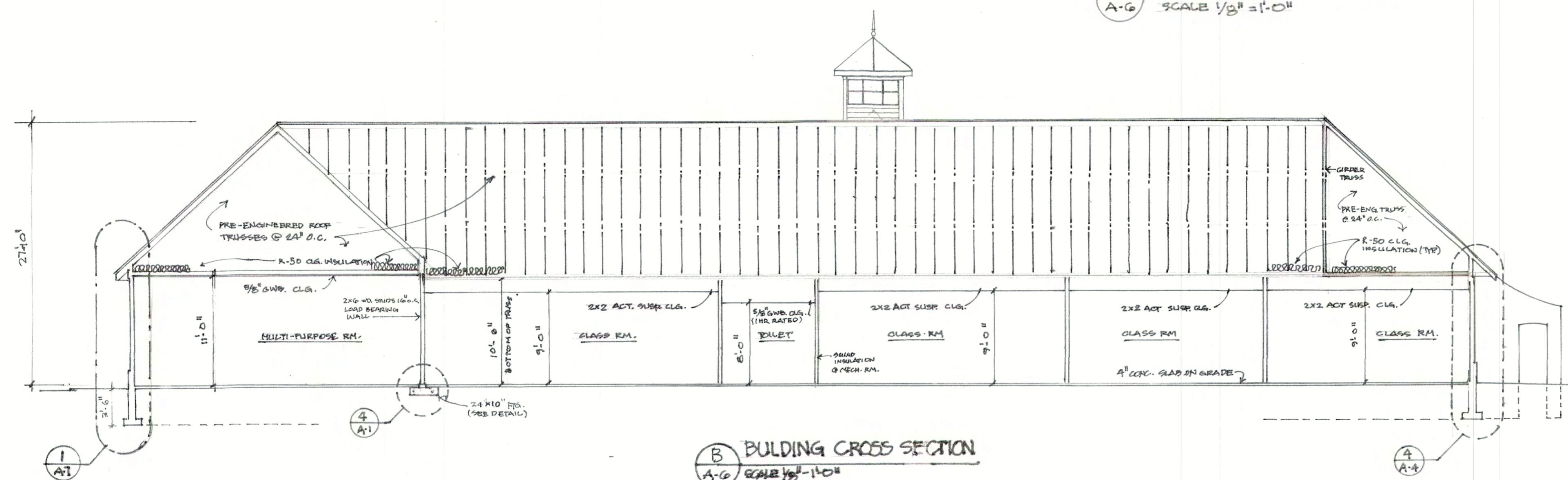
SCHOOL
IN THE PINES INC.

sheet

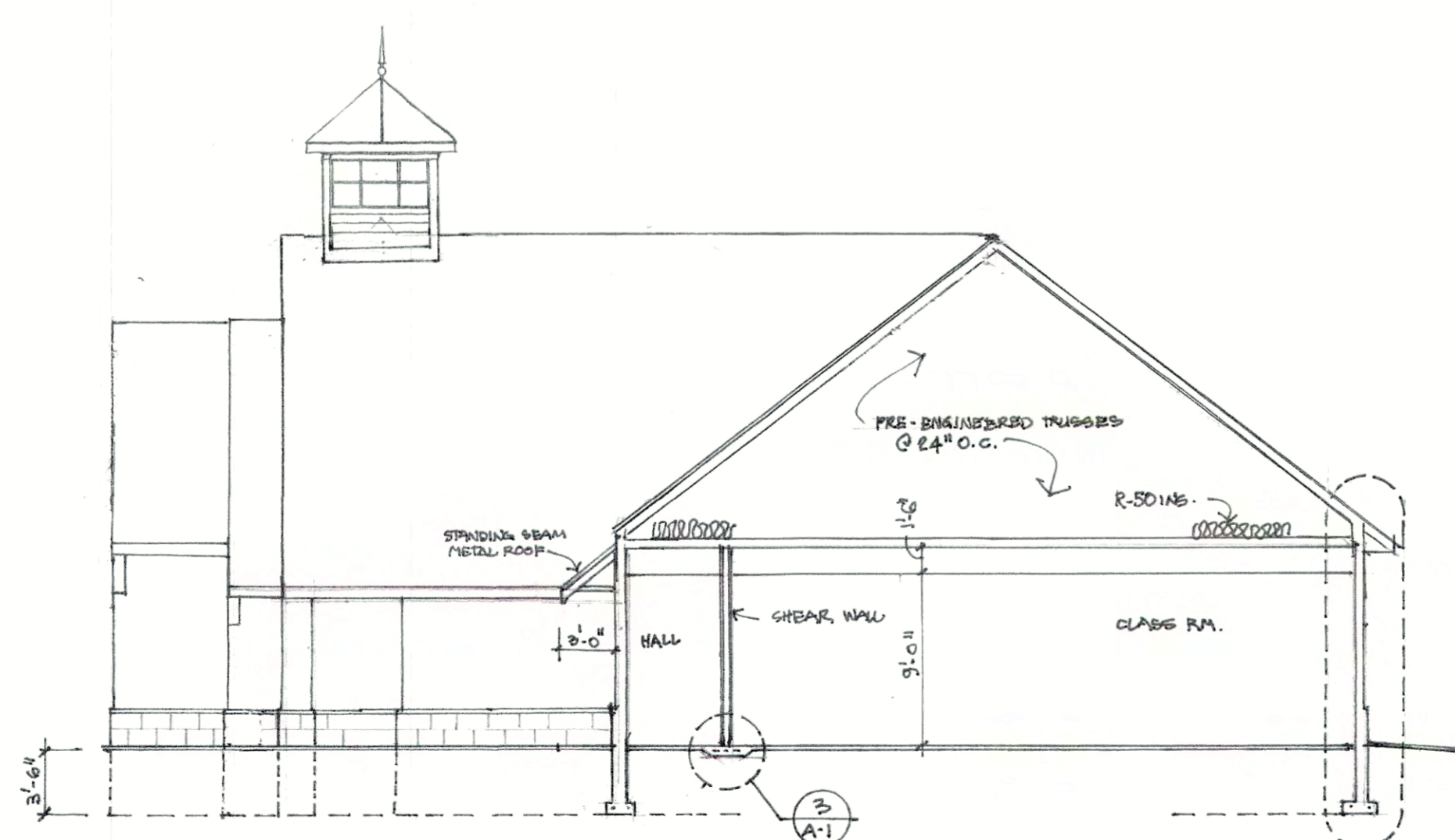
BUILDING
CROSS SECTIONS



(A) BUILDING CROSS SECTION
A-G SCALE 1/8" = 1'-0"



(B) BUILDING CROSS SECTION
A-G SCALE 1/8" = 1'-0"



(C) BUILDING CROSS SECTION
A-G SCALE 1/8" = 1'-0"

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issue / revision

Drawn by JN/BG

Checked by GP

Date 5-18-2024

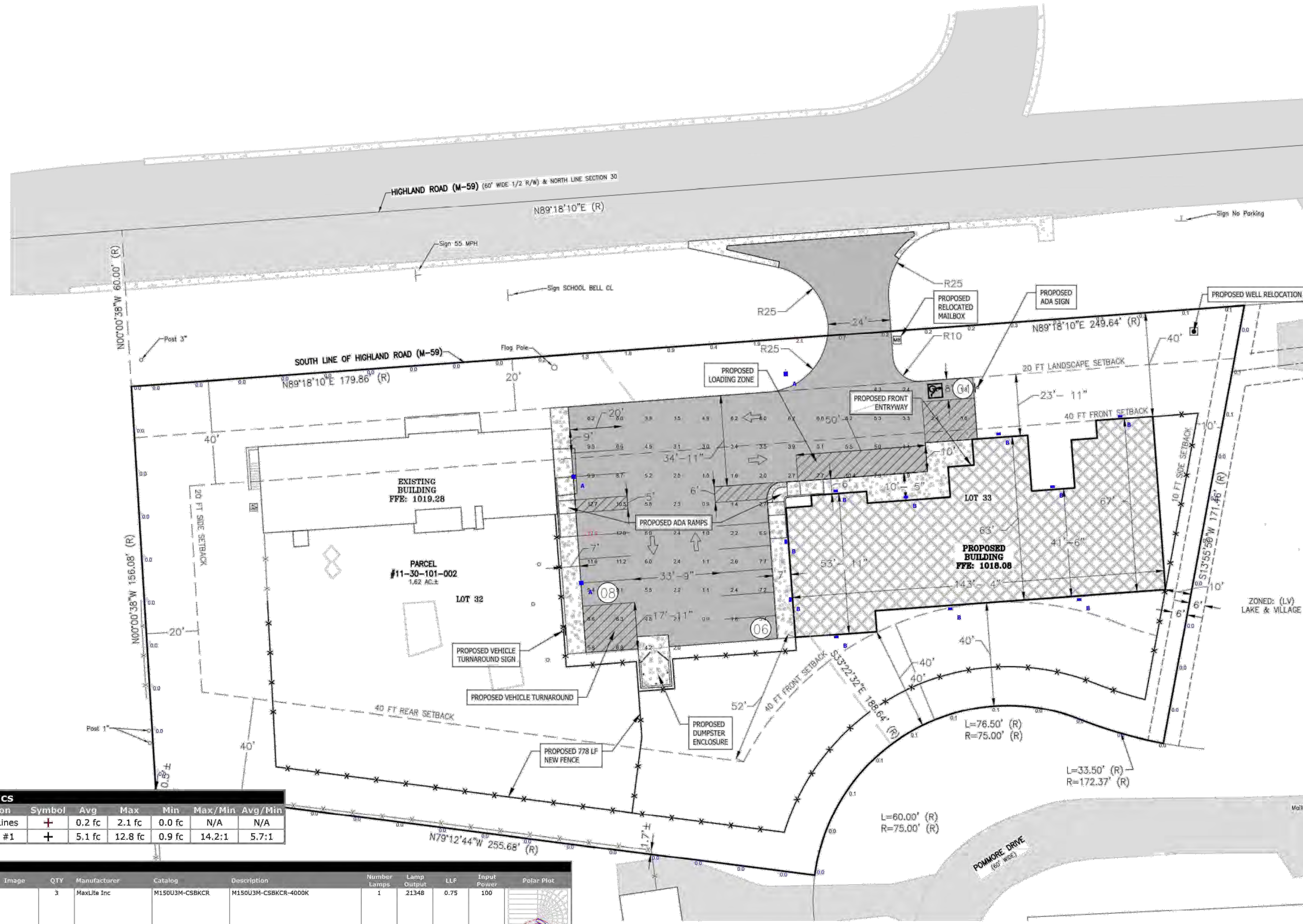
Scale AS NOTED

Project No. 24-010

Sheet No.

A-6





Statistics						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
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Calc Zone #1	+	5.1 fc	12.8 fc	0.9 fc	14.2:1	5.7:1

Schedule											
Symbol	Label	Image	QTY	Manufacturer	Catalog	Description	Number Lamps	Lamp Output	LLF	Input Power	Polar Plot
	A		3	MaxLite Inc	M150U3M-CSBKCR	M150U3M-CSBKCR-4000K	1	21348	0.75	100	
	B		10	Above All Lighting Inc	GRA-SP401-F1	Outdoor Full-Cutoff Wall-Mounted Area Luminaires	1	8134	0.71	66.52	

Note
 1. POLES ARE MOUNTED AT 17'-0" AFF, 15' POLES ATOP A 2FT TALL BASE.
 2. WALL PACKS ARE MOUNTED AT 15'-0" AFF.
 3. FOOT-CANDLES ARE MEASURED AT LOT LEVEL, 0'-0" AFF.

SITE PHOTOMETRY
 SCALE: 1"=20'-0"

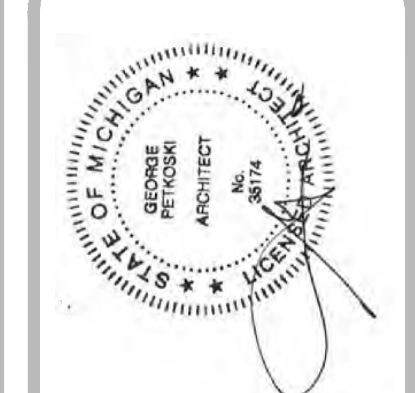
NOTE:
 PHOTOMETRIC STUDY ON THIS SHEET SIMULATED TO CALCULATE LIGHT LEVELS ONLY. REFER TO SHEET E-01 FOR ALL FIXTURE LOCATIONS, SPECIFICATIONS, AND OTHER LIGHTING SYSTEM INFORMATION.



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TITLE:
 SITE PHOTOMETRY

CLIENT:
 SCHOOL IN THE PINES INC.
 4501 WEST HIGHLAND RD
 MILFORD, MI 48380
 PROJECT:
 SCHOOL BELL DAYCARE
 4501 WEST HIGHLAND RD
 MILFORD, MI 48380



SEAL:

ISSUED FOR:	DATE	SYM	DESCRIPTION	BY	APPD

PROJECT NO.:
 MK-003



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FAX (517) 546-1478

**HASTINGS TESTING ENGINEERS
AND ENVIRONMENTAL INC.**

"Testing to keep America on a firm foundation"

4841 GOLF CLUB ROAD • HOWELL, MI 48843

May 08, 2024

Boss Engineering
3121 East Grand River Avenue
Howell, MI 48843

Attention: Jared Prather

Reference: 4501 West Highland Road - Sub-Surface Exploration

Dear Mr. Prather,

Five (05) soil test borings designated as soil boring locations #1 through #5 were drilled in the influence of a planned new building located at 4501 West Highland Road in Highland Charter Township, Michigan. Soil test boring locations #1 and #5 were performed to determine the soil infiltration characteristics of the sub-surface sub-grade materials for a proposed underground detention system. Soil test borings #2 through #4 were performed in the influence of the proposed building to determine the structural integrity of the sub-surface sub-grade materials. Each of the test boring locations were advanced to a depth of twenty feet (20'-0") below the existing site grade. The soil boring locations can be identified on the enclosed diagram.

Soil descriptions and depths shown on the soil boring logs were approximate indications of changes from one soil to another and are not intended to represent an exact geological change or stratification.

Ground water was encountered in some of the test boring locations at the following depths:

Test boring #1 – None

Test boring #2 – None

Test boring #3 – 18'-6" below the existing site grade.

Test boring #4 – 19'-0" below the existing site grade.

Test boring #5 – 19'-0" below the existing site grade.

It should be noted that short-term ground water observations may not provide a reliable indication of the depth of the water table. In cohesive soils this is due to the slow rate of water infiltration into the bore hole as well as the potential for water to be trapped in overlying layers of granular soil in periods of heavy rain fall.

Information obtained from soil blow counts (standard penetration) indicate that the soils are variably compacted. The encountered granular soils were generally in a medium dense state, and the encountered cohesive soils generally had medium stiff to very stiff consistencies.



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Soil blow counts, profiles and the unconfined compressive strengths of the encountered sub-grade soils can be reviewed on the test boring logs.

Site Preparation

It is anticipated that there will be a minimal amount of fill material required for the site. Prior to the construction of footings or slabs all organic soils or unsuitable fill materials should be removed and it is recommended that the existing sub-grade be uniformly compacted to a minimum density of ninety-five percent of the materials maximum unit weight with a 20 ton vibratory roller. Engineered fill materials could then be placed in horizontal lifts not exceeding one foot in depth with each lift compacted uniformly to a minimum density of ninety-five percent of the materials maximum unit weight as determined by AASHTO T-180 or ASTM D1557. It is anticipated that the granular sub grade soils could be used as engineered fill materials in areas where an MDOT class III granular material is suitable. If any of the on-site cohesive material is re-used as an engineered fill material it is recommended that the material be compacted with a padfoot (sheepsfoot) roller. Hastings Testing Engineers and Environmental Inc. should be on site during excavating and filling operations to verify the suitability of the native sub-grade and proposed engineered fill materials. It is recommended that all existing sub-grade soils be proof rolled with a fully loaded tandem axle dump truck or other approved equipment to determine if there is any sub-grade instability. Any unstable sub-grade materials should be removed and replaced with engineered fill material as described above.

Site Utilities

Temporary excavations for site utilities shallower than twelve feet should be able to use typical benched excavations at a 1.5:1 slope. For site utilities deeper than twelve feet it is recommended that a protective system be utilized such as trench boxes or shoring. The excavating contractor should be prepared for the potential of encountering perched ground water. Any ground water encountered at depths less than nineteen feet should be able to be removed with typical 2" pumps. Special dewatering techniques may be required for utilities placed deeper than the anticipated ground water elevation of approximately nineteen feet (19'-0) below the existing site grade. All temporary excavations should be performed according to OSHA standards and specifications.

The existing granular sub-grade materials could be suitable for backfilling utility trenches where a MDOT Class III granular material is required. The excavating contractor should be prepared to import material for utility trenches requiring MDOT class II granular material.



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Foundation Recommendation

Based on the project information provided (one story building with slab on grade) and the results of field tests, it is believed that the proposed structure can be supported with conventional spread or strip footings. Prior to the construction of footings or floor slabs all organic soil and unsuitable fill materials should be removed and replaced with engineered fill materials as described in the site preparation portion of the report.

Footings could then be proportioned for a design soil pressure of two thousand pounds per square foot between one foot (1'-0") and ten feet (10'-0") below the existing site grade. Care should be taken to either remove or re-compact any loose granular or cohesive soils found in the bottom of the footing sub-grade locations. All exterior footings should be constructed at or below the maximum frost penetration of three feet six inches (3'-6") below finished grade. All footings and slabs should be constructed on naturally occurring sub-soils or engineered fill materials.

Floor Slab Recommendation

It is recommended that a minimum of six inches of clean coarse granular soil (MDOT class II granular material) be placed under all concrete slabs to provide a capillary break for any moisture migration. It is also recommended that a minimum 10 mil vapor barrier be installed directly under the concrete slab.

Expected Settlement

It is estimated that a properly configured shallow foundation constructed on the naturally occurring sub-grade soil or engineered fill material will have less than one inch of settlement and less than one-half inch of differential settlement.

Seismic Site Class

The known properties of the soils at the site are limited to the explored depths of the borings (20 feet) performed for this evaluation. Based on the conditions encountered in the borings, seismic site Class D applies to this site in accordance with the IBC and Michigan Building Code. The potential for liquefaction of the sub-grade soils should be considered low.

Detention Basin Infiltration

Test boring location #1 and #5 were drilled in the influence of the proposed underground detention system. Hastings Testing Engineers and Environmental Inc. was requested to perform permeability tests from soil sampled during drilling operations. The permeability tests were performed to determine the hydraulic conductivity of existing soils in the influence of the proposed detention pond.



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Hastings Testing Engineers and Environmental Inc. performed the constant head/falling head permeability tests on five samples (ASTM D2434). The results of the tests are as follows:

Test #1

Sample: Soil boring location #1.

Depth: Approximately four feet below the existing site grade.

Sub-Grade Material: Coarse Brown Sand with Fine Gravel and some Silt

$$K_{sat} = 3.8 \frac{in}{hr}$$

Test #2

Sample: Soil boring location #1.

Depth: Approximately nine feet below the existing site grade.

Sub-Grade Material: Silty Brown Clay

$$K_{sat} = 0.000088 \frac{in}{hr}$$

Test #3

Sample: Soil boring location #1.

Depth: Approximately nineteen feet below the existing site grade.

Sub-Grade Material: Coarse Brown Sand

$$K_{sat} = 8.6 \frac{in}{hr}$$

Test #4

Sample: Soil boring location #5.

Depth: Approximately five feet below the existing site grade.

Sub-Grade Material: Coarse Brown Sand with Fine Gravel and some Silt

$$K_{sat} = 2.0 \frac{in}{hr}$$

Test #5

Sample: Soil boring location #5.

Depth: Approximately seven feet below the existing site grade.

Sub-Grade Material: Silty Brown Clay

$$K_{sat} = 0.000031 \frac{in}{hr}$$



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Conclusion

Experience indicates that the actual subsoil conditions at the site could vary from those generalized on the basis of the test borings made at specific locations. It is therefore essential that Hastings Testing Engineers and Environmental Inc. be notified of any variation of the soil conditions to determine the effects on the recommendations in this report. The evaluations and recommendations contained in the report have been formulated on assumed data relating to the proposed project. Any significant change in this data in the final design plans should be brought to our attention for review and evaluation.

If you should have further questions, please contact our office.

Sincerely,

Marc A. W. Smith PE





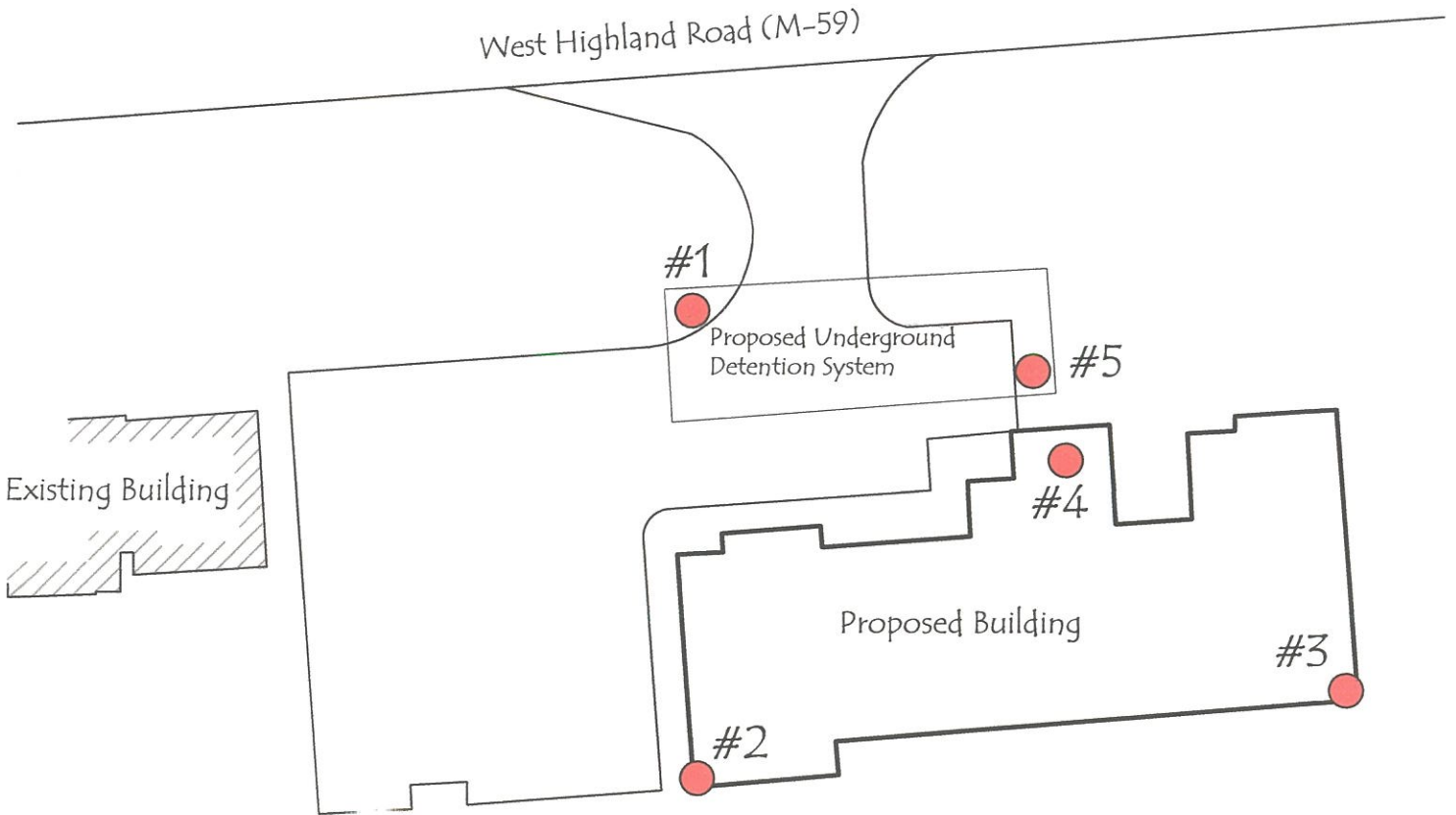
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4501 West Highland Road
Soil Boring Testing Diagram
Date : 04/26/2024



● = Approximate Test Location



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REPORT OF SOIL BORING

TESTED FOR: Boss Engineering
 3121 E. Grand River
 Howell, MI 48843

REPORT # : 7029
 CLIENT # : 4562
 DATE : 04/26/24
 PAGE : 1

LOCATION : Soil Boring #1 - See Enclosed Diagram

Soil Description	Depth in Feet	Sample & Type	Blow Count *	N Val	% Water	Natural WT. P C F	Unconfined Strength	
							Str. PSF	Fail Strain
Organic Soil & Material	0.5							
Coarse Brown Sand with Fine Gravel and some Silt	1.0							
	1.5		4					
	2.0		6					
	2.5	SS1	6	12	4.6			
	3.0							
	3.5		6					
	4.0		7					
	4.5	SS2	6	13	5.1			
	5.0							
	5.5							
	6.0		5					
Silty Brown Clay	6.5		9					
	7.0	SS3	13	22	10.8		9000.	
Type of Sample: SS - Split Spoon SL - Split Spoon With Liner ST - Shelby Tube			* Standard Penetration Test - Driving 2" OD Sampler 18" with 140 # Hammer, Falling 30" Count made at 6" intervals.					
DRILLING METHOD : Track Mounted Auger DRILLING FOREMAN : T. Dingman BACKFILL MATERIAL: Existing Material			GROUND WATER ENCOUNTERED AT : None GROUND WATER AFTER COMPLEATION: None GROUND WATER AFTER :					



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REPORT OF SOIL BORING

TESTED FOR: Boss Engineering
 3121 E. Grand River
 Howell, MI 48843

REPORT # :7029
 CLIENT # :4562
 DATE :04/26/24
 PAGE :2

LOCATION :Soil Boring #1 - See Enclosed Diagram

Soil Description	Depth in Feet	Sample & Type	Blow Count *	N Val	% Water	Natural WT. P C F	Unconfined Strength	
							Str. PSF	Fail Strain
Silty Brown Clay	7.5							
	8.0							
	8.5		7					
	9.0		7					
	9.5	SS4	12	19	10.4		8000.	
	10.0							
	10.5							
	11.0							
	11.5							
	12.0							
	12.5							
	13.0							
	13.5			9				
	14.0			9				

Type of Sample: SS - Split Spoon
 SL - Split Spoon With Liner
 ST - Shelby Tube

* Standard Penetration Test - Driving 2" OD
 Sampler 18" with 140 # Hammer, Falling 30"
 Count made at 6" intervals.

DRILLING METHOD :Track Mounted Auger
 DRILLING FOREMAN :T. Dingman
 BACKFILL MATERIAL:Existing Material

GROUND WATER ENCOUNTERED AT :None
 GROUND WATER AFTER COMPLEATION:None
 GROUND WATER AFTER :



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REPORT OF SOIL BORING

TESTED FOR: Boss Engineering
 3121 E. Grand River
 Howell, MI 48843

REPORT # :7029
 CLIENT # :4562
 DATE :04/26/24
 PAGE :3

LOCATION :Soil Boring #1 - See Enclosed Diagram

Soil Description	Depth in Feet	Sample & Type	Blow Count *	N Val	% Water	Natural WT. P C F	Unconfined Strength	
							Str. PSF	Fail Strain
Silty Brown Clay	14.5	SS5	10	19	11.3		7500.	
	15.0							
	15.5							
	16.0							
	16.5							
	17.0							
	17.5							
	18.0							
Coarse Brown Sand	18.5		6					
	19.0		9					
	19.5	SS6	12	21	5.0			
End Of Soil Boring #1	20.0							

Type of Sample: SS - Split Spoon
 SL - Split Spoon With Liner
 ST - Shelby Tube

* Standard Penetration Test - Driving 2" OD
 Sampler 18" with 140 # Hammer, Falling 30"
 Count made at 6" intervals.

DRILLING METHOD :Track Mounted Auger
 DRILLING FOREMAN :T. Dingman
 BACKFILL MATERIAL:Existing Material

GROUND WATER ENCOUNTERED AT :None
 GROUND WATER AFTER COMPLEATION:None
 GROUND WATER AFTER :



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REPORT OF SOIL BORING

TESTED FOR: Boss Engineering
 3121 E. Grand River
 Howell, MI 48843

REPORT # :7030
 CLIENT # :4562
 DATE :04/26/24
 PAGE :1

LOCATION :Soil Boring #2 - See Enclosed Diagram

Soil Description	Depth in Feet	Sample & Type	Blow Count *	N Val	% Water	Natural WT. P C F	Unconfined Strength	
							Str. PSF	Fail Strain
Organic Soil & Material	0.5							
Silty Brown Clay	1.0							
	1.5		4					
	2.0		6					
	2.5	SS1	7	13	14.6		2000.	
	3.0							
Coarse Brown Sand with Fine Gravel and some Silt	3.5		3					
	4.0		5					
Silty Brown Clay	4.5	SS2	9	14	5.3			
	5.0							
	5.5							
	6.0		6					
	6.5		9					
Silty Brown Clay	7.0	SS3	9	18	15.5		2000.	

Type of Sample: SS - Split Spoon
 SL - Split Spoon With Liner
 ST - Shelby Tube

* Standard Penetration Test - Driving 2" OD
 Sampler 18" with 140 # Hammer, Falling 30"
 Count made at 6" intervals.

DRILLING METHOD :Track Mounted Auger
 DRILLING FOREMAN :T. Dingman
 BACKFILL MATERIAL:Existing Material

GROUND WATER ENCOUNTERED AT :None
 GROUND WATER AFTER COMPLEATION:None
 GROUND WATER AFTER :



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REPORT OF SOIL BORING

TESTED FOR: Boss Engineering
 3121 E. Grand River
 Howell, MI 48843

REPORT # :7030
 CLIENT # :4562
 DATE :04/26/24
 PAGE :2

LOCATION :Soil Boring #2 - See Enclosed Diagram

Soil Description	Depth in Feet	Sample & Type	Blow Count *	N Val	% Water	Natural WT. P C F	Unconfined Strength	
							Str. PSF	Fail Strain
Silty Brown Clay	7.5							
	8.0							
Coarse Brown Sand	8.5		7					
	9.0		8					
	9.5	SS4	11	19	6.1			
	10.0							
	10.5							
	11.0							
	11.5							
	12.0							
	12.5							
	13.0							
	13.5			6				
	14.0			6				

Type of Sample: SS - Split Spoon * Standard Penetration Test - Driving 2" OD
 SL - Split Spoon With Liner Sampler 18" with 140 # Hammer, Falling 30"
 ST - Shelby Tube Count made at 6" intervals.

DRILLING METHOD :Track Mounted Auger GROUND WATER ENCOUNTERED AT :None
 DRILLING FOREMAN :T. Dingman GROUND WATER AFTER COMPLEATION:None
 BACKFILL MATERIAL:Existing Material GROUND WATER AFTER :



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REPORT OF SOIL BORING

TESTED FOR: Boss Engineering
 3121 E. Grand River
 Howell, MI 48843

REPORT # :7031
 CLIENT # :4562
 DATE :04/26/24
 PAGE :1

LOCATION :Soil Boring #3 - See Enclosed Diagram

Soil Description	Depth in Feet	Sample & Type	Blow Count *	N Val	% Water	Natural WT. P C F	Unconfined Strength	
							Str. PSF	Fail Strain
Organic Soil & Material	0.5							
Coarse Brown Sand with Fine Gravel and some Silt	1.0							
	1.5		4					
	2.0		3					
	2.5	SS1	4	7	5.6			
	3.0							
	3.5		4					
	4.0		4					
	4.5	SS2	5	9	6.5			
	5.0							
	5.5							
Silty Brown Clay	6.0		3					
	6.5		8					
	7.0	SS3	6	14	9.9		9000.	

Type of Sample: SS - Split Spoon
 SL - Split Spoon With Liner
 ST - Shelby Tube

* Standard Penetration Test - Driving 2" OD
 Sampler 18" with 140 # Hammer, Falling 30"
 Count made at 6" intervals.

DRILLING METHOD :Track Mounted Auger
 DRILLING FOREMAN :T. Dingman
 BACKFILL MATERIAL:Existing Material

GROUND WATER ENCOUNTERED AT :18' 6" BEG
 GROUND WATER AFTER COMPLEATION:18' 6" BEG
 GROUND WATER AFTER :1 Hour



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REPORT OF SOIL BORING

TESTED FOR: Boss Engineering

3121 E. Grand River

Howell,

MI 48843

REPORT # :7031

CLIENT # :4562

DATE :04/26/24

PAGE :2

LOCATION :Soil Boring #3 - See Enclosed Diagram

Soil Description	Depth in Feet	Sample & Type	Blow Count *	N Val	% Water	Natural WT. P C F	Unconfined Strength	
							Str. PSF	Fail Strain
Silty Brown Clay	7.5							
	8.0							
	8.5		8					
	9.0		8					
	9.5	SS4	12	20	10.1		9000.	
	10.0							
	10.5							
	11.0							
	11.5							
	12.0							
	12.5							
	13.0							
	13.5			5				
	14.0			4				
	Type of Sample: SS - Split Spoon SL - Split Spoon With Liner ST - Shelby Tube			* Standard Penetration Test - Driving 2" OD Sampler 18" with 140 # Hammer, Falling 30" Count made at 6" intervals.				
DRILLING METHOD :Track Mounted Auger			GROUND WATER ENCOUNTERED AT :18' 6" BEG					
DRILLING FOREMAN :T. Dingman			GROUND WATER AFTER COMPLEATION:18' 6" BEG					
BACKFILL MATERIAL:Existing Material			GROUND WATER AFTER :1 Hour					



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REPORT OF SOIL BORING

TESTED FOR: Boss Engineering
 3121 E. Grand River
 Howell, MI 48843

REPORT # :7031
 CLIENT # :4562
 DATE :04/26/24
 PAGE :3

LOCATION :Soil Boring #3 - See Enclosed Diagram

Soil Description	Depth in Feet	Sample & Type	Blow Count *	N Val	% Water	Natural WT. P C F	Unconfined Strength	
							Str. PSF	Fail Strain
 Silty Brown Clay	14.5	SS5	4	8	12.7		5000.	
	15.0							
	16.0							
	16.5							
	17.0							
	17.5							
	18.0							
	18.5			3				
 Coarse Brown Sand	19.0		3					
	19.5	SS6	3	6	8.9			
 End Of Soil Boring #3	20.0							

Type of Sample. SS Split Spoon
 SL - Split Spoon With Liner
 ST - Shelby Tube

* Standard Penetration Test - Driving 2" OD
 Sampler 18" with 140 # Hammer, Falling 30"
 Count made at 6" intervals.

DRILLING METHOD :Track Mounted Auger
 DRILLING FOREMAN :T. Dingman
 BACKFILL MATERIAL:Existing Material

GROUND WATER ENCOUNTERED AT :18' 6" BEG
 GROUND WATER AFTER COMPLEATION:18' 6" BEG
 GROUND WATER AFTER :1 Hour



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REPORT OF SOIL BORING

TESTED FOR: Boss Engineering
 3121 E. Grand River
 Howell, MI 48843

REPORT # :7032
 CLIENT # :4562
 DATE :04/27/24
 PAGE :1

LOCATION :Soil Boring #4 - See Enclosed Diagram

Soil Description	Depth in Feet	Sample & Type	Blow Count *	N Val	% Water	Natural WT. P C F	Unconfined Strength	
							Str. PSF	Fail Strain
Organic Soil & Material	0.5							
Coarse Brown Sand with Fine Gravel and some Silt	1.0							
	1.5		2					
	2.0		5					
	2.5	SS1	5	10	4.5			
	3.0							
	3.5		5					
	4.0		9					
	4.5	SS2	9	18	5.3			
	5.0							
	5.5							
Silty Brown Clay	6.0		8					
	6.5		13					
	7.0	SS3	14	27	8.8		9000.	

Type of Sample: SS - Split Spoon
 SL - Split Spoon With Liner
 ST - Shelby Tube

* Standard Penetration Test - Driving 2" OD Sampler 18" with 140 # Hammer, Falling 30" Count made at 6" intervals.

DRILLING METHOD :Track Mounted Auger
 DRILLING FOREMAN :T. Dingman
 BACKFILL MATERIAL:Existing Material

GROUND WATER ENCOUNTERED AT :19' 0" BEG
 GROUND WATER AFTER COMPLETION:19' 0" BEG
 GROUND WATER AFTER :1 Hour



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REPORT OF SOIL BORING

TESTED FOR: Boss Engineering

3121 E. Grand River

Howell,

MI 48843

REPORT # :7032

CLIENT # :4562

DATE :04/27/24

PAGE :2

LOCATION :Soil Boring #4 - See Enclosed Diagram

Soil Description	Depth in Feet	Sample & Type	Blow Count *	N Val	% Water	Natural WT. P C F	Unconfined Strength	
							Str. PSF	Fail Strain
Silty Brown Clay	7.5							
	8.0							
	8.5		3					
	9.0		5					
	9.5	SS4	12	17	12.5		7000.	
	10.0							
	10.5							
	11.0							
	11.5							
	12.0							
	12.5							
	13.0							
	13.5			2				
	14.0			4				

Type of Sample: SS - Split Spoon
 SL - Split Spoon With Liner
 ST - Shelby Tube

* Standard Penetration Test - Driving 2" OD Sampler 18" with 140 # Hammer, Falling 30" Count made at 6" intervals.

DRILLING METHOD :Track Mounted Auger
 DRILLING FOREMAN :T. Dingman
 BACKFILL MATERIAL:Existing Material

GROUND WATER ENCOUNTERED AT :19' 0" BEG
 GROUND WATER AFTER COMPLETION:19' 0" BEG
 GROUND WATER AFTER :1 Hour



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4841 GOLF CLUB ROAD • HOWELL, MI 48843

REPORT OF SOIL BORING

TESTED FOR: Boss Engineering
 3121 E. Grand River
 Howell, MI 48843

REPORT # :7032
 CLIENT # :4562
 DATE :04/27/24
 PAGE :3

LOCATION :Soil Boring #4 - See Enclosed Diagram

Soil Description	Depth in Feet	Sample & Type	Blow Count *	N Val	% Water	Natural WT. P C F	Unconfined Strength	
							Str. PSF	Fail Strain
Coarse Brown Sand	14.5	SS5	12	16	6.0			
	15.0							
	15.5							
	16.0							
	16.5							
	17.0							
	17.5							
	18.0							
	18.5			2				
	19.0			4				
	19.5	SS6	4	8	9.5			
End Of Soil Boring #4	20.0							
Type of Sample: SS - Split Spoon SL - Split Spoon With Liner ST - Shelby Tube			* Standard Penetration Test - Driving 2" OD Sampler 18" with 140 # Hammer, Falling 30" Count made at 6" intervals.					
DRILLING METHOD :Track Mounted Auger DRILLING FOREMAN :T. Dingman BACKFILL MATERIAL:Existing Material			GROUND WATER ENCOUNTERED AT :19' 0" BEG GROUND WATER AFTER COMPLEATION:19' 0" BEG GROUND WATER AFTER :1 Hour					



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 PAGE :1

LOCATION :Soil Boring #5 - See Enclosed Diagram

Soil Description	Depth in Feet	Sample & Type	Blow Count *	N Val	% Water	Natural WT. P C F	Unconfined Strength	
							Str. PSF	Fail Strain
Organic Soil & Material	0.5							
	1.0							
Coarse Brown Sand with Fine Gravel and some Silt	1.5		2					
	2.0		2					
	2.5	SS1	3	5	4.3			
	3.0							
	3.5		2					
	4.0		4					
	4.5	SS2	4	8	6.6			
	5.0							
	5.5							
	Silty Brown Clay	6.0		3				
6.5			4					
7.0		SS3	6	10	14.9		3000.	
Type of Sample: SS - Split Spoon SL - Split Spoon With Liner ST - Shelby Tube			* Standard Penetration Test - Driving 2" OD Sampler 18" with 140 # Hammer, Falling 30" Count made at 6" intervals.					
DRILLING METHOD :Track Mounted Auger DRILLING FOREMAN :T. Dingman BACKFILL MATERIAL:Existing Material			GROUND WATER ENCOUNTERED AT :19' 0" BEG GROUND WATER AFTER COMPLEATION:19' 0" BEG GROUND WATER AFTER :1 Hour					



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 DATE :04/27/24
 PAGE :2

LOCATION :Soil Boring #5 - See Enclosed Diagram

Soil Description	Depth in Feet	Sample & Type	Blow Count *	N Val	% Water	Natural WT. P C F	Unconfined Strength	
							Str. PSF	Fail Strain
Silty Brown Clay	7.5							
	8.0							
	8.5		3					
	9.0		5					
	9.5	SS4	10	15	11.3		9000.	
	10.0							
	10.5							
	11.0							
	11.5							
	12.0							
	12.5							
	13.0							
	13.5			5				
	14.0			4				

Type of Sample: SS - Split Spoon
 SL - Split Spoon With Liner
 ST - Shelby Tube

* Standard Penetration Test - Driving 2" OD
 Sampler 18" with 140 # Hammer, Falling 30"
 Count made at 6" intervals.

DRILLING METHOD :Track Mounted Auger
 DRILLING FOREMAN :T. Dingman
 BACKFILL MATERIAL:Existing Material

GROUND WATER ENCOUNTERED AT :19' 0" BEG
 GROUND WATER AFTER COMPLEATION:19' 0" BEG
 GROUND WATER AFTER :1 Hour



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LOCATION :Soil Boring #5 - See Enclosed Diagram

Soil Description	Depth in Feet	Sample & Type	Blow Count *	N Val	% Water	Natural WT. P C F	Unconfined Strength	
							Str. PSF	Fail Strain
Coarse Brown Sand	14.5	SS5	10	14	6.7			
	15.0							
	15.5							
	16.0							
	16.5							
	17.0							
	17.5							
	18.0							
	18.5			2				
	19.0			4				
	19.5		SS6	10	14	10.7		
	20.0							
End Of Soil Boring #5								

Type of Sample: SS - Split Spoon
SL - Split Spoon With Liner
ST - Shelby Tube

* Standard Penetration Test - Driving 2" OD Sampler 18" with 140 # Hammer, Falling 30" Count made at 6" intervals.

DRILLING METHOD :Track Mounted Auger
DRILLING FOREMAN :T. Dingman
BACKFILL MATERIAL:Existing Material

GROUND WATER ENCOUNTERED AT :19' 0" BEG
GROUND WATER AFTER COMPLEATION:19' 0" BEG
GROUND WATER AFTER :1 Hour