

CHARTER TOWNSHIP OF GARFIELD PLANNING COMMISSION MEETING

Wednesday, November 9, 2022 at 7:00 pm
Garfield Township Hall
3848 Veterans Drive
Traverse City, MI 49684
Ph: (231) 941-1620

A G E N D A

ORDER OF BUSINESS

Call meeting to order
Pledge of Allegiance
Roll call of Board Members

1. Public Comment

Public Comment Guidelines:

Any person shall be permitted to address a meeting of The Planning Commission, which is required to be open to the public under the provision of the Michigan Open Meetings Act, as amended. (MCLA 15.261, et.seq.) Public Comment shall be carried out in accordance with the following Commission Rules and Procedures: a.) any person wishing to address the Commission is requested to state his or her name and address. b.) No person shall be allowed to speak more than once on the same matter, excluding time needed to answer Commissioner's questions. Where constrained by available time the Chairperson may limit the amount of time each person will be allowed to speak to (3) minutes. 1.) The Chairperson may at his or her own discretion, extend the amount of time any person is allowed to speak. 2.) Whenever a Group wishes to address a Committee, the Chairperson may require that the Group designate a spokesperson; the Chairperson shall control the amount of time the spokesperson shall be allowed to speak when constrained by available time. Note: If you are here for a Public Hearing, please hold your comments until that Public Hearing time.

2. Review and Approval of the Agenda – Conflict of Interest

3. Minutes – October 26, 2022

4. Correspondence

5. Reports

- a. Township Board
- b. Planning Commissioners
 - i. Zoning Board of Appeals
 - ii. Parks and Recreation Commission
 - iii. Joint Planning Commission
- c. Staff Report

6. Unfinished Business

- a. PD 2022-104 – Birmley Hills Site Condominium – Public Hearing
- b. PD 2022-102 – 7 Brew 2537 North US 31 Special Use Permit – Findings of Fact

7. New Business

- a. PD 2022-103 – Loving Neighbors Preschool Special Use Permit – Introduction

8. Public Comment

9. Other Business

10. Items for Next Agenda – December 14, 2022

- a. Loving Neighbors Preschool Special Use Permit – Public Hearing
- b. Birmley Hills Site Condominium – Findings of Fact

11. Adjournment

**Joe Robertson, Secretary
Garfield Township Planning Commission
3848 Veterans Drive
Traverse City, MI 49684**

The Garfield Township Board will provide necessary reasonable auxiliary aids and services, such as signers for hearing impaired and audio tapes of printed materials being considered at the meeting to individuals with disabilities upon the provision of reasonable advance notice to the Garfield Township Board. Individuals with disabilities requiring auxiliary aids or services should contact the Garfield Township Board by writing or calling Lanie McManus, Clerk, Ph: (231) 941-1620.

**CHARTER TOWNSHIP OF GARFIELD
PLANNING COMMISSION MEETING
October 26, 2022**

Call Meeting to Order: Vice Chair McManus called the October 26, 2022 Planning Commission meeting to order at 7:00pm at the Garfield Township Hall.

Pledge of Allegiance

The Pledge of Allegiance was recited by all in attendance.

Roll Call of Commission Members:

Present: Pat Cline, Joe Robertson, Joe McManus, Chris DeGood, and Robert Fudge

Absent and Excused: John Racine and Molly Agostinelli

Staff Present: Planning Director John Sych, Deputy Planning Director Steve Hannon, Michael Green, Zoning Administrator

1. Public Comment (7:01)

None

2. Review and Approval of the Agenda – Conflict of Interest (7:01)

Robertson moved and Cline seconded to approve the agenda as presented.

Yeas: Robertson, Cline, McManus, Fudge, DeGood

Nays: None

4. Minutes (7:02)

a. September 28, 2022 Regular Meeting

Fudge moved and DeGood seconded to approve the September 28, 2022 Regular Meeting minutes as presented.

Yeas: Fudge, DeGood, Robertson, Cline, McManus

Nays: None

4. Correspondence (7:02)

a. PD 2022-94 – Planning Department Monthly Report – October 2022

b. Letter from Scott Rokos dated August 19, 2022

c. Letter from Haggard's Plumbing and Heating dated October 13, 2022

d. Public Notice from Green Lake Township received October 17, 2022

5. Reports (7:03)

Township Board Report

Sych stated that there was no board meeting.

Planning Commissioners

- (i) **Zoning Board of Appeals**
Fudge said there was no Zoning Board of Appeals meeting.
- (ii) **Parks and Recreation Commission**
DeGood had no report but noted that the Parks Commission is reviewing the Grand Traverse Commons Natural Area Design Plan.
- (iii) **Joint Planning Commission**
McManus stated that the Joint Planning Commission also reviewed the Commons Natural Area Design Plan. Sych noted that the final open house for the Design Plan will be held on November 7 at 5:00 p.m. at Kirkbride Hall.

Staff Report

Green was present to share information about Township Zoning Department activity. He discussed a meeting between township administrations to talk about enforcement actions in the various municipalities.

6. Unfinished Business

a. **PD 2022-97 – 7Brew 2537 North US 31 Special Use Permit – Public Hearing (7:09)**

This application requests approval of a Special Use Permit for a proposed 652-square foot drive-through coffee shop with only drive-through and walk-up service, with no dine-in services. Drive-through business uses are permitted via Special Use Permit in the C-G General Commercial District. The site (Parcel ID #05- 021-036-10) is occupied by the former PNC Bank building with drive-through. New information was received which addressed the existing driveway which serves Mutual Gas and this site. Rob Larrea, of Community Planning and Land Use Consultants representing the applicant, stated that there was an agreement with Mutual Gas for a cross access agreement and maintenance agreement. MDOT asked the 7Brew applicants to add some arrows indicating where traffic should flow and curbing to further channel traffic and those have been added to the plan. Vice Chair McManus opened the public hearing 7:13 and seeing no one wishing to speak, then closed the public hearing. Planning Commissioners discussed the application.

DeGood moved and Cline seconded to direct Staff to prepare Findings of Fact for application SUP 2022-01, submitted by BFA, Inc., for a Special Use Permit for a drive-through coffee shop at 2537 N US-31 South.

Yeas: DeGood, Cline, Robertson, Fudge, McManus

Nays: None

7. New Business**a. PD 2022-98 – Birmley Hills Site Condominium – Introduction (7:20)**

This application is for a site condominium development of 35 single-family residential lots. According to the application, the lots will be between 15,000 and 38,000 square feet. Approximately 14% of the site will be preserved as open space and is primarily forested hills. The proposed development would be served by the water and sewer extending from the existing Birmley Hills Estates subdivision. The property is approximately 21.3 acres and is zoned as R-1 One-Family Residential. The property is at the end of Farmington Drive and Birmley Estates Drive which both provide access from Birmley Road. Carrie May, engineer for the project, stated that the roads would be 24' wide and the development will be on county water and sewer. Stormwater areas are being reviewed by the township engineer and road maintenance agreements are in place since the roads in the development will be private. The wooded areas will be maintained along the perimeter of the property. Commissioners asked questions and discussed the proposed site condominium development. A western road connection to link developments was discussed and staff will review that issue.

8. Public Comment (7:40)

None

9. Other Business: (7:41)**a. PD 2022-99 - Chick-fil-A – Update**

The special use permit was approved in May of 2021 and construction was completed shortly thereafter. Issues with traffic overflow onto US 31 and onsite parking were outstanding issues. Green stated that traffic flow seems to have been resolved, but the gravel parking lot for employees is still outstanding. Application has been made for the adjoining hotel behind the Chick-fil-A which would give more shared parking to Chick-fil-A since an agreement is already in place. Right now, the township is issuing a one-month temporary occupancy permit for the business each month to continue to monitor the situation. Rob Larrea speaking on behalf of Chick-fil-A stated that the hotel is moving along and due to the existing agreement, the parking lot issue will be resolved when the hotel is constructed. The hotel is a use by right and subject to administrative site plan review. Administrative site plan review does not need to come before the Planning Commission for approval. Administrative uses will be communicated to commissioners in the future.


10. Items for Next Agenda – November 9, 2022 (7:54)

- a. Birmley Hills Site Condominium – Public Hearing
- b. 7Brew 2537 North US 31 Special Use Permit – Findings of Fact
- c. Northern Lakes Church Child Care Special Use Permit – Introduction

11. **Adjournment**

Fudge moved to adjourn the meeting at 7:56 pm.

Joe Robertson, Secretary
Garfield Township Planning
Commission
3848 Veterans Drive
Traverse City, MI 49684

 Charter Township of Garfield Planning Department Report No. 2022-104			
Prepared:	November 2, 2022	Pages:	5
Meeting:	November 9, 2022 Planning Commission	Attachments:	<input checked="" type="checkbox"/>
Subject:	SPR 2022-16 Birmley Hills Site Condominium – Public Hearing		
File No.	SPR 2022-16	Parcel No.	05-026-020-30
Owner:	T&R Investments, Steve Zakrajsek		
Agent:	Boyne Engineering and Design		

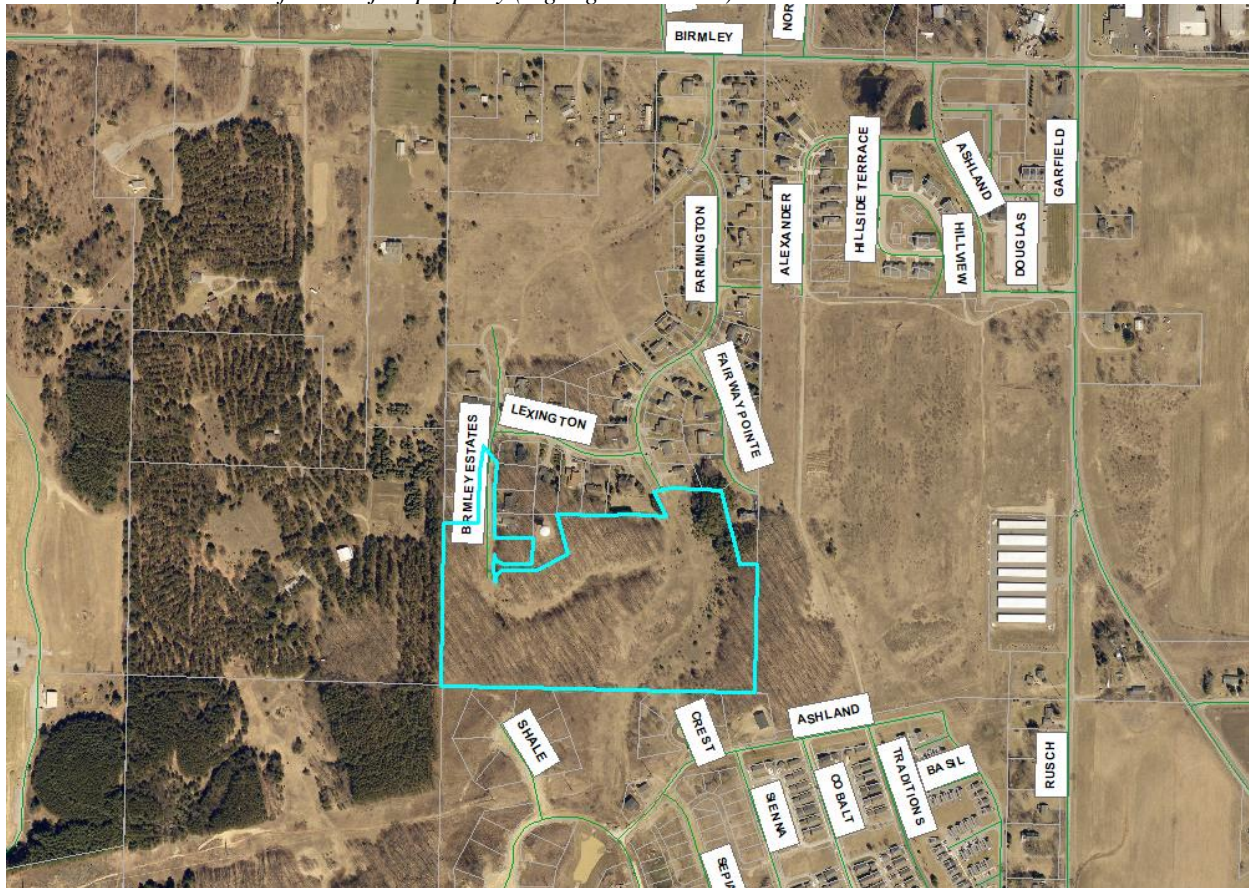
BACKGROUND:

Birmley Hills is a proposed 35-lot residential site condominium development immediately adjacent to the south of the existing Birmley Hills Estates subdivision. This application was introduced at the Planning Commission meeting on October 26, 2022. A public hearing was also scheduled for November 9, 2022.

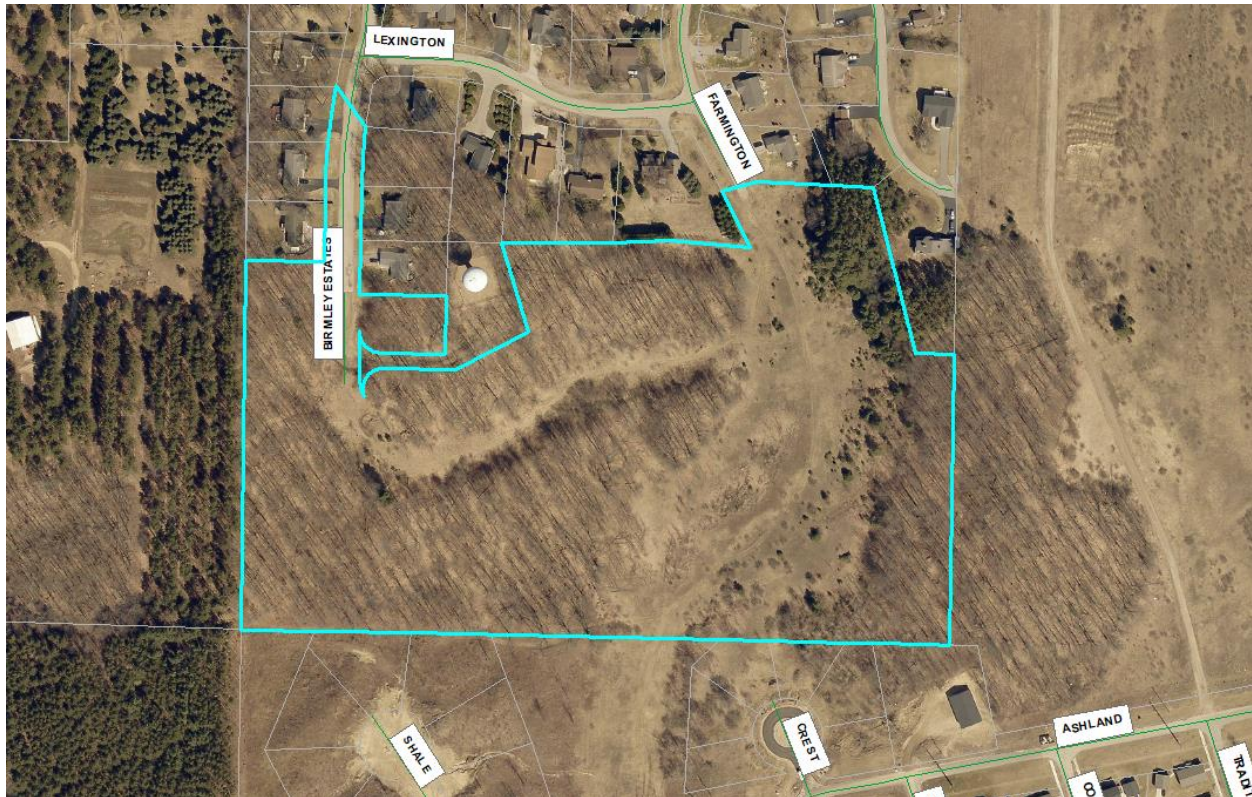
PURPOSE OF APPLICATION:

This application is for a site condominium development of 35 single-family residential lots. According to the application, the lots will be between 15,000 and 38,000 square feet in area. About 14% of the site will be preserved as open space and is primarily forested hills. The proposed development would be served by the water and sewer extending from the existing Birmley Hills Estates subdivision. These extensions of nearby utilities are currently being reviewed by the Township Engineer.

Zoomed-out aerial view of the subject property (highlighted in blue):



Zoomed-in aerial view of subject property (highlighted in blue):



SUBJECT PROPERTY:

The property is approximately 21.3 acres and is zoned as R-1 One-Family Residential. The property is at the end of Farmington Drive and Birmley Estates Drive which both provide access from Birmley Road.

STAFF COMMENT:

At the Planning Commission meeting on October 26, 2022, Commissioners asked if this site is required to connect its streets to neighboring properties to the east, south, and west. In reviewing the standards of the Zoning Ordinance, Staff identifies the following excerpt from Section 521:

“SECTION 521 STREET DESIGN AND TRANSPORTATION

G. Connectivity

Purpose: The Township finds that discontinuous street systems are inefficient and that channeling traffic onto relatively few points of the transportation network causes undue congestion. A well-connected street network spreads traffic efficiently, provides greater opportunities for access by service and emergency vehicles, and furthers pedestrian mobility by increasing the number of destinations that can be reached by walking. Accordingly, this section provides for and promotes both external and internal connectivity.

The Township acknowledges that there is a market for cul-de-sacs and streets with few connections. This section is intended to preserve the opportunity to provide cul-de-sacs while maintaining the integrity of the network as a whole...

... (2) Projecting Streets

Where abutting areas are not subdivided, the arrangement of streets in a development shall connect the streets to the unsubdivided areas. Parcels shall be arranged to allow the opening of future streets and logical further development patterns while providing a transition sufficient to ensure safe and efficient

traffic flow. Physical construction of the projecting street to the property line shall be completed concurrent with construction of remaining streets within the development. This section is not intended to require local streets to project into floodplains, bluffs, or other natural features or existing development that has not made accommodations for connection.”

Section 521.G(2) indicates that connecting streets are needed where “abutting areas are not subdivided.” The term “subdivided” is understood to refer to either platted subdivisions or condominium subdivisions. Based on this understanding, Ashland Park to the east and Traditions to the south are both considered as subdivided areas, as both are condominiums within the Ashland Park Planned Unit Development.

The site to the west is not subdivided and thus the proposed Birmley Hills site condominium is required to provide a street connection to the west. The adjacent parcel to the west (Parcel No. 05-026-015-21) is currently zoned as A-Agricultural but is designated Low Density Residential on the Future Land Use Map in the Master Plan. Furthermore, comments from the Township Engineer indicate that a water main stub and sanitary main stub shall be provided to the abutting western parcel. The Township Engineer’s letter dated November 1, 2022 is provided as an attachment.

The applicant is advised to prepare an updated site plan drawing with a design showing a stub for water, sewer, and street connection to the adjacent property to the west.

SITE CONDOMINIUM REVIEW CONSIDERATIONS:

Consultation

Section 429 B. of the Zoning Ordinance allows for the Planning Commission to consider input from the Township Attorney and Township Engineer as needed in its review of a condominium development plan, especially the master deed, deed restrictions, utility systems and streets, subdivision layout and design, and compliance with the Condominium Act. Other agencies will also review this application as needed. As noted above, the Township Engineer is reviewing the application for storm water, private roads, water, and sewer, and their letter dated November 1, 2022 is provided as an attachment.

Review Criteria

Section 429 G. of the Zoning Ordinance described the review criteria for site condominium subdivisions: “For purposes of making a decision to approve, approve with conditions or to deny a site condominium subdivision plan, the Township shall consider and make findings with respect to the following criteria:”

- (1) That each condominium lot in a site condominium subdivision shall be considered as a single lot and shall comply with all regulations of the zoning district in which it is located. In a condominium development containing single-family detached dwelling units, not more than one (1) dwelling unit shall be located on a condominium lot, nor shall a dwelling unit be located on a condominium lot with any other principal structure or use. Required yards shall be measured from boundaries of a condominium lot. These requirements shall be made part of the bylaws and recorded as part of the master deed*

The application proposes 35 single-family lots on a site with R-1 One-Family Residential zoning. For lots in R-1 with public sewer, the minimum lot area is 15,000 square feet and the minimum lot width is 100 feet. Along the curve of a road, the lot width is measured from the front setback line instead of at the front lot line. The lots shown on the site plan appear to meet the minimum lot area and minimum lot width requirements.

- (2) That there is a proper relationship between the existing streets and highways within the vicinity, and proposed deceleration lanes, service drives, entrance and exit driveways, and parking areas to assure the safety and convenience of pedestrian and vehicular traffic, and that the proposed*

streets and access plan conform to any street or access plan adopted by the Township or the County Road Commission

The two proposed roads are Birmley Hills Drive, an extension of Birmley Estates Drive, and an extension of Farmington Court. These roads connect to Birmley Road. The proposed streets for this proposed project appear to be a logical extension of the street pattern for this area, although a stub connection to the adjacent parcel to the west shall be provided. Metro Fire has also provided comments on the site plan.

- (3) *That as many natural features of the landscape shall be retained as possible, particularly where they furnish a barrier or buffer between the project and adjoining properties used for dissimilar purposes, and where they assist in preserving the general appearance of the neighborhood or help control erosion or the discharge of storm waters*

The applicants propose to reserve approximately 14% of the property as a wooded area including a contiguous area of 1.94 acres in the southeast corner of the site. This is a hilly area which helps provide a natural buffer to portions of Ashland Park and Traditions.

- (4) *That any adverse effect of the proposed development and activities emanating therefrom upon adjoining residents or owners shall be minimized by appropriate screening, fencing or walls, or landscaping*

The proposed development consists of single-family homes which is compatible with the existing single-family homes to the north in the Birmley Hills Estates subdivision and to the south within Traditions. The site is also compatible with the partially built Ashland Park residential site to the east. The site to the west is currently vacant but is designated as Low Density Residential on the Future Land Use Map; the proposed development in this application is compatible with the site to the west if the water, sewer, and street connection is provided. There are no major adverse effects anticipated from the proposed development.

- (5) *That all provisions of this ordinance are complied with*

- Development standards such as fences, lighting, landscaping, and parking are handled as part of the design for each individual condominium lot. The site plan notes that no site lighting is proposed for this development and that parking will be located on individual lots. No additional parking areas are proposed.
- As described above, Section 521.G(2) indicates that connecting streets are needed where “abutting areas are not subdivided” and therefore a street connection to the west shall be provided to meet this standard. This street connection will also coincide with water and sewer connections to the west as indicated by the Township Engineer.
- Details for a proposed entrance sign are shown on Sheet C6.0. Signs require sign permit review and are not approved under the site plan review process.

- (6) *That all site condominium lots shall be provided access by either public or private roads in conformance with the requirements of this ordinance. All site condominium units shall be accessible to emergency vehicles*

All lots are proposed to be accessed by an extension of Farmington Court and by Birmley Hills Drive, which are proposed to be private roads. As mentioned previously, a stub street connection to the adjacent parcel to the west shall be provided, and this would also be a private road. Access for emergency vehicles should reflect any comments from the relevant agencies.

- (7) *That a plan for erosion control and storm water discharge has been approved by the appropriate public agency; and*

Review of erosion control and storm water will be handled by the Grand Traverse County Soil Erosion and Sedimentation and the Township Engineer, respectively. Storm water retention areas are shown on the west side behind Lot 22 and in northeast part of the site.

- (8) *That the plan as approved is consistent with the intent and purpose of zoning to promote public health, safety and general welfare; to encourage the use of lands in accordance with their character and adaptability to avoid the overcrowding of population; to lessen congestion on the public roads and streets; to reduce hazards to life and property; to facilitate adequate provisions for a system of transportation, sewage disposal, safe and adequate water supply, education, recreation and other public requirements; and to conserve the expenditure of funds for public improvements and services to conform with the most advantageous uses of land, resources and properties; to preserve property values and natural resources; and to give reasonable consideration to character of a particular area, its suitability for particular uses and the general appropriate trend and character of land, building, and population development and is otherwise in compliance with law.*

The proposed development is consistent with the current zoning of R-1 One-Family Residential and the Future Land Use Map designation of Low Density Residential and is consistent with the intent to promote the public health, safety, and welfare and with the provisions of this standard if the stub street connection to the adjacent parcel to the west is provided.

PROCESS:

Site condominiums are reviewed by both the Planning Commission and Township Board. The Planning Commission shall hold a public hearing on the application and make a recommendation on the application to the Township Board. The Township Board conducts final review of the application but is not required to hold its own public hearing. This application was introduced at the Planning Commission meeting on October 26, 2022. A public hearing was also scheduled for November 9, 2022.

ACTION REQUESTED:

The purpose of this agenda item is to hold a public hearing on the application. If, following the applicant presentation and subsequent discussion, Commissioners are prepared to direct Staff to prepare Findings of Fact for the proposed Site Condominium, then the following motion is offered for consideration:

MOTION TO direct staff to prepare Findings of Fact for application SPR-2022-16, submitted by T&R Investments, for a proposed site condominium development to be known as Birmley Hills at parcel 05-026-020-30, subject to the following items being addressed by the applicant:

1. A stub street, water, and sewer connection to the adjacent parcel to the west shall be provided.

Any additional information the Planning Commission deems necessary should be added to this motion.

Attachments:

1. Application for Site Condominium Subdivision review dated September 22, 2022.
2. Birmley Hills Site Condominium Site Plan Set dated September 21, 2022.
3. Letter from Township Engineer dated November 1, 2022.



Charter Township of Garfield

Grand Traverse County

3848 VETERANS DRIVE
TRAVERSE CITY, MICHIGAN 49684
PH: (231) 941-1620 • FAX: (231) 941-1588

SITE CONDOMINIUM SUBDIVISION (SCSP) APPLICATION

ASSISTANCE

This application must be completed in full. An incomplete or improperly prepared application will not be accepted and will result in processing delays. Before submitting an application, it is recommended that you contact the Planning Department to arrange an appointment to discuss your proposed application. Time is often saved by these preliminary discussions. For additional information or assistance in completing this development application, please contact the Planning Department at (231) 941-1620.

ACTION REQUESTED

Site Condominium Subdivision Plan Review

PROJECT / DEVELOPMENT NAME

BIRMLEY HILLS

APPLICANT INFORMATION

Name:

T & R INVESTMENTS

Address:

841 ASHLAND DRIVE, TC, MI 49696

Phone Number:

(231) 838-6004

Email:

zakrajseksteve@gmail.com

AGENT INFORMATION

Name:

BOYNE ENGINEERING AND DESIGN

Address:

PO BOX 94, BOYNE CITY, MI 49712

Phone Number:

(231) 499-8361

Email:

boyneeng@torchlake.com

OWNER INFORMATION

Name:

T & R

Address:

Phone Number:

Email:

CONTACT PERSON

Please select one person to be contact person for all correspondence and questions:

<input checked="" type="checkbox"/> Applicant:	Steve Zakrajsek
<input checked="" type="checkbox"/> Agent:	Carrie May, P.E.
<input type="checkbox"/> Owner:	

PROPERTY INFORMATION

Property Address:	
Property Identification Number:	05-026-020-30
Legal Description:	Sheet CO.0
Zoning District:	R-1
Master Plan Future Land Use Designation:	
Area of Property (acres or square feet)	

SITE CONDOMINIUM SUBDIVISION PLAN

The site condominium subdivision plan shall indicate specific unit dimensions with front, rear and side site condominium lot lines allocated to each condominium unit. Parcels shall be referred to as site condominium lots. The description, size, location, and arrangement of the site condominium lots shall conform to the requirements of the Zoning Ordinance. All site condominium subdivision lots shall be deeded as limited common elements for the exclusive use of the owners of the condominium subdivision units. Each condominium dwelling unit shall be located within a condominium lot.

1. Name of the project, name and address of preparer, and date. ✓
2. The plan shall be of a scale not less than one inch (1") equals fifty feet (50'). ✓
3. All plans are to be accurately sealed. ✓
4. Layout and dimensions of all condominium lots.
5. Layout and dimensions of all roadways and pedestrian pathways. ✓
6. Adequate drainage of surface water, stormwater disposal methods. .
7. Distribution of telephone, electric, television, and other similar services by underground wire or cable.
8. First floor elevation of buildings (if applicable).
9. Location of gas lines.
10. Location of water lines, and hydrants or other appurtenances.
11. Location of sanitary sewer lines including the location and size of the proposed service.
12. Location of existing and proposed fencing, landscaping, screening, or other buffers required.
13. Location of streetlights and light fixture details.

REQUIRED SUBMITTAL ITEMS

A complete application for a Site Condominium Subdivision Plan consists of the following:

Application Form:

- One original signed application
- One digital copy of the application (PDF only)

Application Fee:

Fees are established by resolution of the Garfield Township Board and are set out in the current Fee Schedule as listed on the Planning Department page of the Township website (<http://www.garfield-twp.com>). Please make check out to Charter Township of Garfield.

Fee

Site Condominium Subdivision Plan:

Ten complete stapled 11"x17" paper sets

Two complete bound 24"x36" paper sets

One digital set (PDF only)

Digital items to be delivered via email or USB flash drive

SUBMITTAL DEADLINE

Submittal deadlines are listed on the Planning Department page of the Township website (<http://www.garfield-twp.com>). Please note that the listed dates are the deadlines after which submittals will not be considered for the indicated meeting. Any errors or missing information on an application submitted at the deadline will result in a delay in the processing of the application. An earlier submittal is encouraged to avoid possible delays.

REVIEW PROCEDURE

Subject to the standards of § 429.G of the Zoning Ordinance, a proposed Site Condominium Subdivision shall be reviewed in accordance with § 429.H and generally summarized as follows:

1. Agency Submittal: The applicant shall provide copies of the proposed site condominium subdivision plan to the following Grand Traverse County Agencies: Health Department (or Department of Public Works if proposed on municipal water and/or sanitary sewer), Drain Commissioner (or Township designee), Soil Erosion-Sedimentation Control Director (or Township designee), Road Commission (or Michigan Department of Transportation if proposed on a state highway), and the Metro Fire Department.
2. Independent Review: An independent engineer or other consultant may be hired, at the applicant's expense, to review the project and make recommendations to the Township.
3. Public Hearing: The Planning Commission shall hold a public hearing on the proposed site condominium subdivision plan, for the purpose of reviewing and making a recommendation of approval, approval with conditions, or denial to the Township Board.
4. Planning Commission Determination: If the Planning Commission determines that the proposed plan meets all requirements of this ordinance and the Condominium Act, the Planning Commission shall recommend approval or approval with conditions of the site condominium subdivision plan and shall send notice of action taken with comments to the Township Board. If the Planning Commission determines that the site condominium subdivision plan does not meet all requirements, the Planning Commission shall state its reason in its official minutes, shall forward same to the Township Board, and shall recommend disapproval of the plan by the Township Board until the objections causing disapproval have been changed to meet the requirements of this ordinance and the Condominium Act.
5. Township Board Determination: The Township Board shall approve the site condominium subdivision plan, with or without conditions, reject the plan and give its reasons, table the proceedings pending further review or pending changes to the plan to make it acceptable to the Board, or refer that application back to the Planning Commission for further review and report.

OTHER INFORMATION

If there is any other information that you think may be useful in the review of this application, please attach it to this application or explain it on a separate page.

PERMISSION TO ENTER SUBJECT PROPERTY

Permission is hereby granted to Garfield Township staff and Planning Commissioners to enter the premises subject to this application for the purposes of making inspections associated with this application, during normal and reasonable working hours.

Owner Signature:	
Applicant Signature:	
Agent Signature:	
Date:	9-22-22

OWNER'S AUTHORIZATION

If the applicant is not the registered owner of the lands that is the subject of this application, the owner(s) must complete the authorization set out below.

I/We _____ am/are the registered owner(s) of the lands that is the subject of this application for a site condominium subdivision.


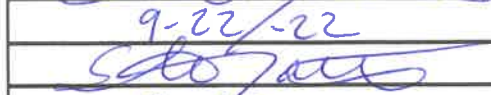
Owner Signature:	
Date:	

I/We _____ authorize to make this application on my/our behalf and to provide any of my/our personal information necessary for the processing of this application.

Owner Signature:	
Date:	

AFFIDAVIT

The undersigned affirms that he/she or they is (are) the owner, or authorized agent of the owner, involved in the application and all of the information submitted in this application, including any supplemental information, is in all respects true and correct. The undersigned further acknowledges that willful misrepresentation of information will terminate this permit application and any permit associated with this document.

Owner Signature:	
Date:	9-22-22
Applicant Signature:	
Date:	9-22-22



BOYNE ENGINEERING AND DESIGN, PLLC.
PO BOX 94 Boyne City, MI 49712 (231) 499-8361 boyneeng@torchlake.com

BIRMLEY HILLS
A SITE CONDOMINIUM PROPOSAL

September 22, 2022

Applicant / Owner: T & R Investments
841 Ashland Drive
Traverse City, MI 49696

Steve Zakrajsek (231) 838-6004

Meeting Date: October 26, 2022

Package Contents:

1. Statement of Proposed Use
2. Impact Statement & Traffic Assessment
3. Stormwater Control Plan
4. Engineered Plans 10 Sheets
Dated 9/21/22

STATEMENT OF PROPOSED USE

Birmley Hills is a proposed 35 lot residential site condominium development on 21.3 acres located in Garfield Township's R-1 Residential zoning district.

The property is part of Section 26, Township 27 North, Range 11 West and is located at the end of Birmley Estates Drive and Farmington Drive off of Birmley Road. The Tax ID for the property is 05-026-020-30.

The lots in this proposed development are between 1,500 sf and 3,800 sf. Approximately 14% of the net acreage in this development is being reserved as open space and consists primarily of forested hills. The development will include 2 new 24' wide private roads which intersect and connect in a loop to Birmley Estates Drive and Farmington Road. Both existing roads have partial extensions where additional roads have previously been planned. Birmley Hills Drive is approximately 1,469 ft long and will intersect with Farmington Court, which is approximately 822 ft long and ends in a cul-de-sac. The proposed development will be served by municipal water and sewer also extending from the same Birmley Estates roads. There is a Garfield Township elevated water storage tank at the top of this development. All utilities will be underground and there is a monument sign proposed for the entry at Farmington Court.



IMPACT STATEMENT

T & R Investments
841 Ashland Drive
Traverse City, MI 49696

Contact: Steve Zakrajsek (231) 838-6004

Proposed Birmley Hills 35 Lot Residential Site Condominium

Tax ID: 05-026-020-30

1.) PROJECT DESCRIPTION:

Birmley Hills is a proposed 35 lot residential site condominium development located on 21.3 acres in Garfield Township's R-1 Residential zoning district.

The property is part of Section 26, Township 27 North, Range 11 West and is located at the end of Birmley Estates Drive and Farmington Drive off of Birmley Road. The Tax ID for the property is 05-026-020-30.

The lots in this proposed development are between 1,500 sf and 3,800 sf. Approximately 14% of the net acreage in this development is being preserved as open space and consists primarily of forested hills. The development will include 2 new 24' wide private roads which intersect and connect in a loop to Birmley Estates Drive and Farmington Road. Both existing roads have partial extensions where additional roads have previously been planned. Birmley Hills Drive is approximately 1,469 ft long and will intersect with Farmington Court, which is approximately 822 ft long and ends in a cul-de-sac. The cul-de-sac includes an elongated edge which will accommodate a sports court. The proposed development will be served by municipal water and sewer also extending from the same Birmley Estates roads. There is a Garfield Township elevated water storage tank at the top of this development. All utilities will be underground and there is a monument sign proposed for the entry at Farmington Court. The private right-of-way is 66 feet wide and there is an additional 10 foot public easement on both sides for municipal utilities. The road grades in this development range between 1% and 8.5%. Homes in the development are expected to average 1,800 square feet with some larger homes. There are forested slopes throughout the property and the roadways are located in the middle of the property to minimize disruption of those forests and impact on the neighboring community. Stormwater will be handled with open ditches along the roadways and basins near the natural discharge locations in keeping with the character of the adjacent development. There is a break in the direction of the stormwater watershed midway through the property. A stormwater control plan has been engineered to meet Garfield Township stormwater regulations which includes detention and infiltration basins with sediment forebays.

2.) DEMAND ON COMMUNITY SERVICES:

- A.) The development will be served by municipal sewer which is expected to have capacity for these homes. The plans will be reviewed by the Grand Traverse County Department of Public Works
- B.) The development will be served by municipal water which is also expected to have capacity for these homes. There is an elevated storage tank feeding the system directly adjacent to the development. The plans will be reviewed by the Grand Traverse County Department of Public Works.
- C.) According to the Institute of Transportation Engineers (ITE) publication for Trip Generation, 10th Edition, a Single-Family Detached home generates an Average Daily Traffic rate of 9.44 trips per day divided between the two points of entry. The Peak Hour traffic for this use would occur typically between the hours of 7:00am and 9:00 am with a rate of 0.74 trips per hour with outbound traffic accounting for 75% of those trips. This would equate to approximately 26 trips in that hour divided by the two points of entry. It is unlikely that a formal traffic study would find that this number of trips would reduce the Level of Service on the adjoining public roads. The plans will be reviewed by the Grand Traverse County Road Commission.
- D.) According to 2000 census data, this development could add approximately 35 children to local schools.
- E.) The Grand Traverse Metro Fire Department will review the plans for this relatively simple residential development. Appropriate home spacing, road grades, paving, access routes, turning radii and fire hydrants are included in the design.

1.) ENVIRONMENTAL IMPACTS:

- A.) The Engineered Site Plan includes proposed grading and soil erosion control measures.
- B.) The Engineered Site Plan includes a Stormwater Runoff Control Plan which addresses stormwater runoff and control according to the Garfield Township requirements. A soil erosion and sediment control permit will be required for construction of the project.
- C.) This project does not border on the shoreline and there are no wetlands in the vicinity of the proposed development.
- D.) This project preserves forested areas and will not significantly disturb the existing forested areas of the property outside of homesites. It would not negatively affect wildlife habitats in those areas. Some tree clearing will be required to construct the improvements and create buildable lots but will be minimized to the extent possible.
- E.) This project will not significantly contribute to air pollution due to the fact that it is not a commercial type use and is replacing the same residential uses elsewhere.
- F.) It is not anticipated that water pollution will result from this development. Increased runoff due to impervious surfaces is mitigated according to the Stormwater Control Plan and infiltration is planned in what are well draining sandy soils.
- G.) The proposed development can be expected to generate noise typical of a residential development which is not considered a harmful noise producing use.

This completes the impact statement for this project. If there are any questions regarding this statement or the project, please contact:

Boyne Engineering and Design - Ms. Carrie May, P.E. at (231) 499-8361.



BOYNE ENGINEERING AND DESIGN, PLLC.
PO BOX 94 Boyne City, MI 49712 (231) 499-8361 boyneeng@torchlake.com

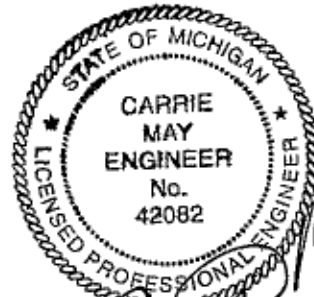
SUMMARY OF
STORMWATER RUNOFF CONTROL PLAN
FOR

BIRMLEY HILLS A SITE CONDOMINIUM

GARFIELD TOWNSHIP, MI

BED PROJECT NO: 22016

September 22, 2022



Carrie May
9/22/22

STORMWATER CONTROL PLAN

DESCRIPTION

Birmley Hills is a proposed 35 lot residential site condominium development located in Garfield Township's R-1 Residential zoning district.

The property is part of Section 26, Township 27 North, Range 11 West and is located at the end of Birmley Estates Drive and Farmington Drive off of Birmley Road. The Tax ID for the property is 05-026-020-30.

Hydrology modeling and runoff calculations were performed by Boyne Engineering and Design using SCS TR-20 Method and Hydrocad software. Detailed model calculations are attached which correspond to the stormwater summary and watershed maps included on the engineered plans (See Sheet C2.1). The following parameters describe the site conditions and modeling assumptions.

WATERSHED

The overall watershed containing this 21.3 acre development is approximately 116 acres. Much of that watershed is upstream of the property and includes forested hills and pasture and range land. These areas do not generate significant runoff because of their cover and well-draining soils. The developed areas are modeled as 1/3 ac residential, paved surfaces, and wooded open space.

SOILS AND TERRAIN

The USDA Soil Conservation maps of this area show that the soils can be expected to be sandy. A test hole was dug at the location of the lower detention basin and these expectations were confirmed. Historical soil borings in other parts of the property corroborate sandy soils. The slopes on the site vary between 1% and 28% with the steep areas being largely confined areas not planned for development. The proposed drives have been profiled to follow the existing contours to the extent possible and to balance earthwork.

SOIL EROSION

The engineered Grading and Drainage plan (See Sheet C2.1) specifies temporary and permanent soil erosion measures including construction entrances, silt fence, minimum earth disturbance requirements, slope stabilization requirements, 3:1 and 4:1 maximum ditch and basin side slopes, stabilized overflows and level spreader outlets, and seeding requirements.

STORMWATER

The following summarizes the stormwater control requirements of Garfield Township and the design components which satisfy those requirements (See the attached detailed calculations and Sheet C2.1 of the engineered plans for more information).

- RUNOFF GENERATED FROM SITE IMPROVEMENTS IS RETAINED ON SITE IN RETENTION/INFILTRATION BASINS DESIGNED TO LIMIT OUTFLOW < 0.13 CFS PER ACRE FOR A 25 YEAR, 24HR STORM EVENT:

DEVELOPED AREA: 21.10 ACRE * 0.13 = 2.743 CFS ALLOWED
DESIGN OUTFLOW 25 YR, 24 HR EVENT: 2.28 CFS

- THE STORAGE VOLUME PROVIDED EXCEEDS REQUIREMENTS:

PREDEVELOPED 2 YEAR RUNOFF: 0.005af

DEVELOPED 25 YEAR GENERATED RUNOFF: 2.156af
DEVELOPED 25 YEAR INFILTRATION: -1.175af
=0.981af

STORAGE REQUIRED(0.981-0.005): 0.967af
STORAGE PROVIDED: 1.55 af

- BASIN SLOPES DO NOT EXCEED 3:1, NO SLOPES EXCEEDING 2:1
- SNOW STORAGE AREAS ARE INDICATED ON PLAN
- CHECK DAMS ARE PROVIDED AT DITCH LOCATIONS WITH ANTICIPATED FLOWS > 4FT/S AND EROSION CONTROL BLANKETS ARE SPECIFIED
- THE STORMWATER FACILITIES ARE DESIGNED TO SAFELY PASS A 100 YEAR, 24HR STORM EVENT WITHOUT INCREASING DOWNSTREAM FLOODING.
- BASINS ARE DESIGNED TO DRAIN THROUGH INFILTRATION WITHIN 72 HOURS

ATTACHMENTS

1. NRCS soil report
2. Hydrocad modeling and runoff calculations
3. Engineered Site Plans

ATTACHMENTS



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

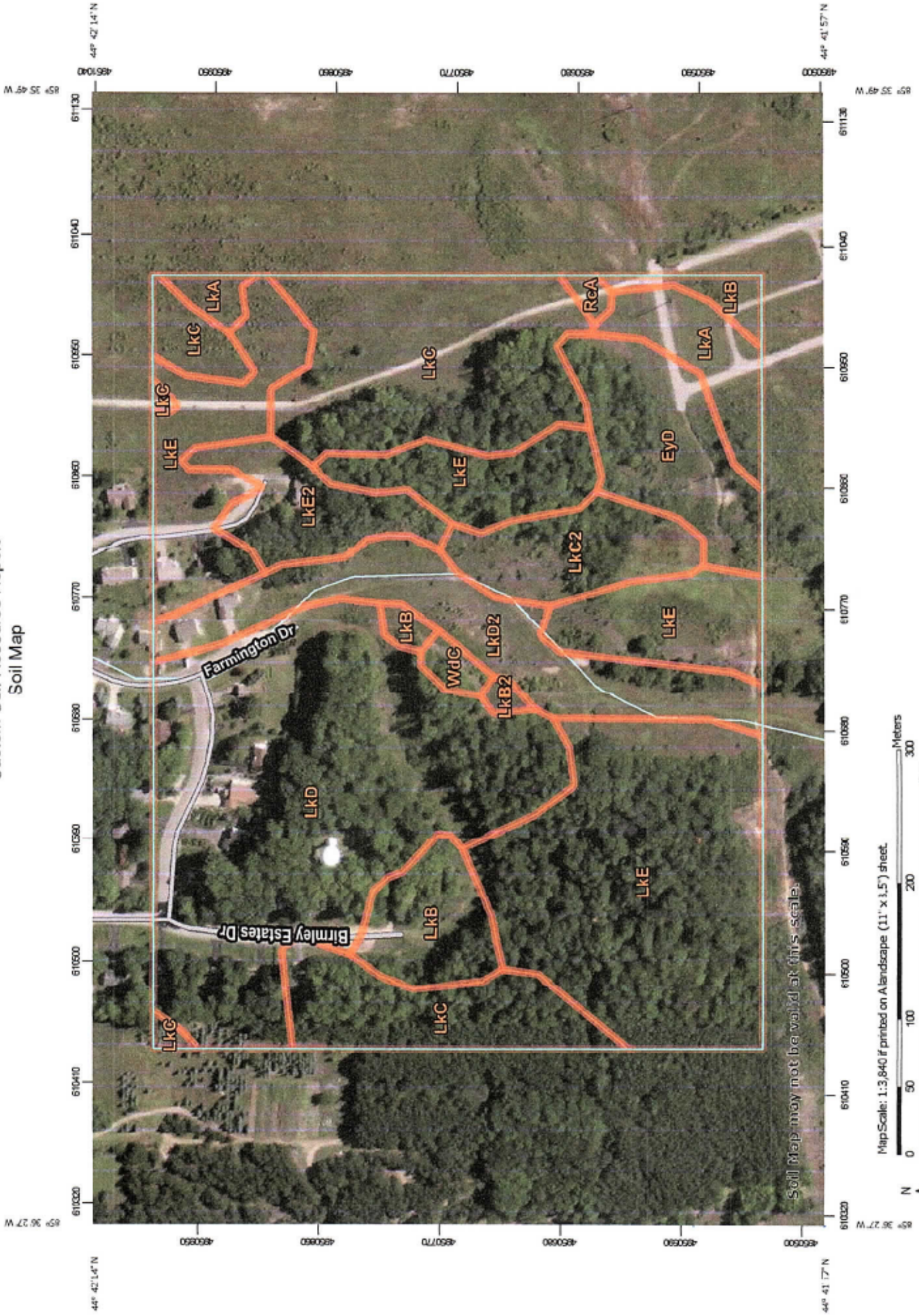
A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Grand Traverse County, Michigan**

Birmley Estates

































Custom Soil Resource Report
Soil Map



Map Scale: 1:3,840 if printed on A landscape (11" x 17.5") sheet.
 0 50 100 200 300 Meters
 0 150 300 600 900 Feet
 Map projection: Web Mercator Corner coordinates: NGS84 Edge tic: UTM Zone 16N WGS84

MAP LEGEND

- Area of Interest (AOI)
 -  Area of Interest (AOI)
- Soils
 -  Soil Map Unit Polygons
 -  Soil Map Unit Lines
 -  Soil Map Unit Points
- Special Point Features
 -  Blowout
 -  Borrow Pit
 -  Clay Spot
 -  Closed Depression
 -  Gravel Pit
 -  Gravelly Spot
 -  Landfill
 -  Lava Flow
 -  Marsh or swamp
 -  Mine or Quarry
 -  Miscellaneous Water
 -  Perennial Water
 -  Rock Outcrop
 -  Saline Spot
 -  Sandy Spot
 -  Severely Eroded Spot
 -  Sinkhole
 -  Slide or Slip
 -  Sodic Spot
- Water Features
 -  Streams and Canals
- Transportation
 -  Rails
 -  Interstate Highways
 -  US Routes
 -  Major Roads
 -  Local Roads
- Background
 -  Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Grand Traverse County, Michigan
 Survey Area Data: Version 15, Sep 1, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Jun 19, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
EyD	Emmet sandy loam, 12 to 18 percent slopes	3.6	5.6%
LkA	Leelanau-Kalkaska loamy sands, 0 to 2 percent slopes	2.3	3.5%
LkB	Leelanau-Kalkaska loamy sands, 2 to 6 percent slopes	2.9	4.4%
LkB2	Leelanau-Kalkaska loamy sands, 2 to 6 percent slopes, moderately eroded	0.2	0.2%
LkC	Leelanau-Kalkaska loamy sands, 6 to 12 percent slopes	11.0	17.1%
LkC2	Leelanau-Kalkaska loamy sands, 6 to 12 percent slopes, moderately eroded	2.6	4.0%
LkD	Leelanau-Kalkaska loamy sands, 12 to 18 percent slopes	15.4	23.8%
LkD2	Leelanau-Kalkaska loamy sands, 12 to 18 percent slopes, moderately eroded	5.0	7.8%
LkE	Leelanau-Kalkaska loamy sands, 18 to 25 percent slopes	18.7	29.0%
LkE2	Leelanau-Kalkaska loamy sands, 18 to 25 percent slopes, moderately eroded	2.4	3.7%
RcA	Richter loams, 0 to 2 percent slopes, overwash	0.2	0.3%
WdC	Wind eroded land, sloping	0.4	0.5%
Totals for Area of Interest		64.6	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class.

Hydric soil rating: No

**LkB2—Leelanau-Kalkaska loamy sands, 2 to 6 percent slopes,
moderately eroded**

Map Unit Setting

National map unit symbol: 6c5z
Elevation: 600 to 1,900 feet
Mean annual precipitation: 27 to 34 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 70 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Leelanau, moderately eroded, and similar soils: 60 percent
Kalkaska, moderately eroded, and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Leelanau, Moderately Eroded

Setting

Landform: Moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: 20 to 52 inches of sandy and loamy material over calcareous sandy glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loamy sand
H2 - 7 to 28 inches: loamy sand
H3 - 28 to 36 inches: sandy loam
H4 - 36 to 60 inches: loamy sand

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Custom Soil Resource Report

Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: A

Ecological site: F096XA006MI - Snowy Rich Sandy Drift

Hydric soil rating: No

Description of Kalkaska, Moderately Eroded

Setting

Landform: Moraines, outwash plains

Landform position (three-dimensional): Rise

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 6 inches: loamy sand

H2 - 6 to 8 inches: sand

H3 - 8 to 36 inches: sand

H4 - 36 to 60 inches: sand

Properties and qualities

Slope: 2 to 6 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: A

Ecological site: F096XA006MI - Snowy Rich Sandy Drift

Hydric soil rating: No

LkC—Leelanau-Kalkaska loamy sands, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 6c6D

Elevation: 600 to 1,900 feet

Mean annual precipitation: 27 to 34 inches

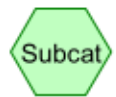
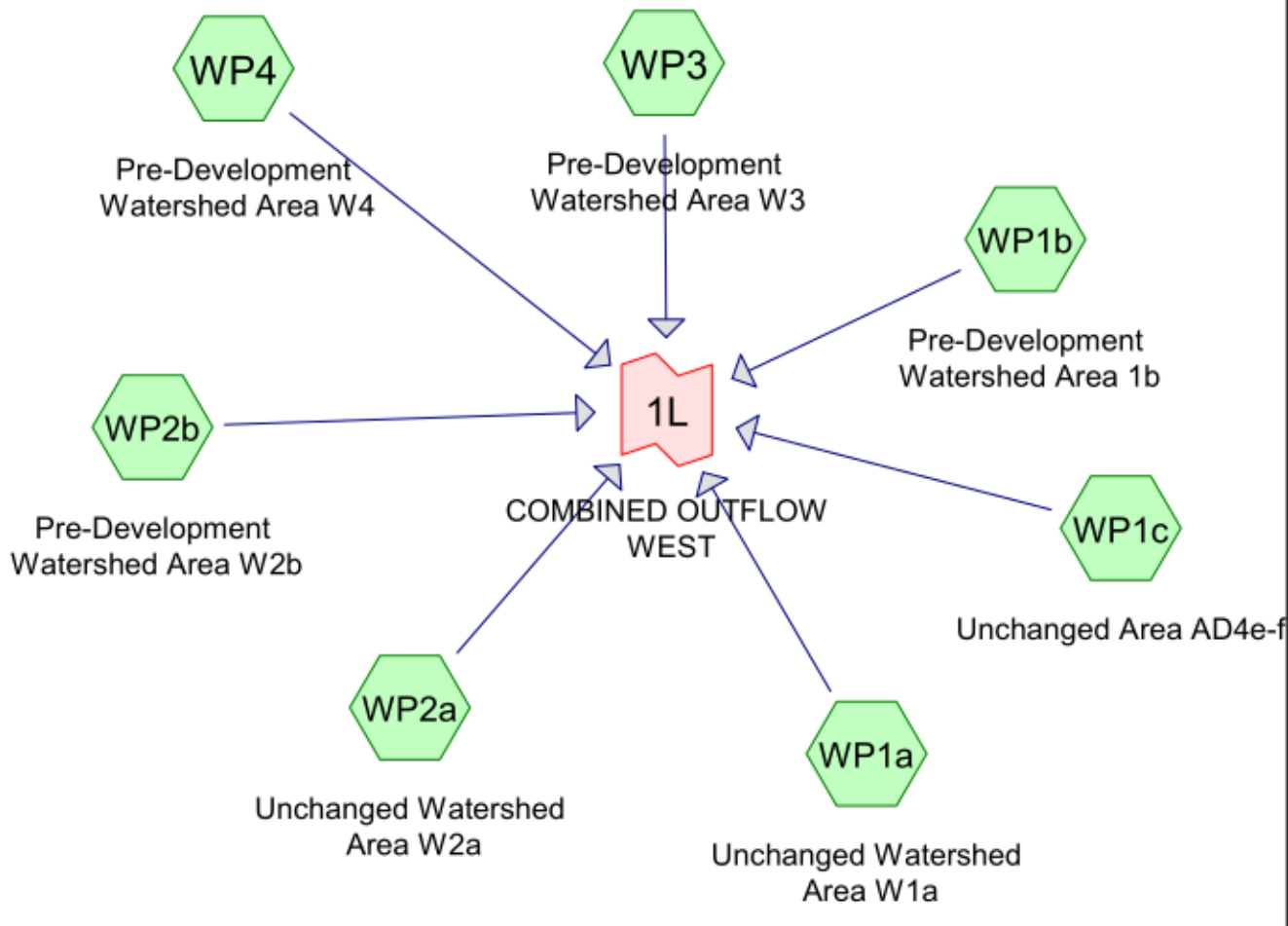
Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 70 to 150 days

Farmland classification: Farmland of local importance

Map Unit Composition

Leelanau and similar soils: 55 percent



Routing Diagram for 22016 BIRMLEY HILLS PREDEVELOPED
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22016 BIRMLEY HILLS PREDEVELOPED

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	25-Year	Type II 24-hr		Default	24.00	1	3.89	2

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BIRMLEY HILLS SITE CONDOMINIUM

Type II 24-hr 25-Year Rainfall=3.89"

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Time span=0.00-200.00 hrs, dt=0.05 hrs, 4001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment WP1a: Unchanged Runoff Area=3,964,046 sf 7.19% Impervious Runoff Depth=0.13"
 Flow Length=5,546' Tc=111.9 min CN=44 Runoff=1.28 cfs 0.974 af

Subcatchment WP1b: Pre-Development Runoff Area=724,193 sf 0.00% Impervious Runoff Depth=0.00"
 Flow Length=5,546' Tc=111.9 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment WP1c: Unchanged Area Runoff Area=139,558 sf 2.87% Impervious Runoff Depth=0.00"
 Flow Length=823' Tc=49.5 min CN=33 Runoff=0.00 cfs 0.000 af

Subcatchment WP2a: Unchanged Runoff Area=30,019 sf 30.00% Impervious Runoff Depth=0.71"
 Flow Length=300' Slope=0.0600 '/' Tc=39.8 min CN=60 Runoff=0.26 cfs 0.041 af

Subcatchment WP2b: Pre-Development Runoff Area=146,620 sf 0.00% Impervious Runoff Depth=0.00"
 Flow Length=300' Slope=0.0600 '/' Tc=39.8 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment WP3: Pre-Development Runoff Area=24,099 sf 8.51% Impervious Runoff Depth=0.04"
 Tc=15.0 min CN=39 Runoff=0.00 cfs 0.002 af

Subcatchment WP4: Pre-Development Runoff Area=25,056 sf 19.49% Impervious Runoff Depth=0.33"
 Tc=15.0 min CN=51 Runoff=0.11 cfs 0.016 af

Link 1L: COMBINED OUTFLOW WEST Inflow=1.33 cfs 1.033 af
 Primary=1.33 cfs 1.033 af

Total Runoff Area = 116.014 ac Runoff Volume = 1.033 af Average Runoff Depth = 0.11"
93.97% Pervious = 109.016 ac 6.03% Impervious = 6.998 ac

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BIRMLEY HILLS SITE CONDOMINIUM

Type II 24-hr 25-Year Rainfall=3.89"

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Summary for Subcatchment WP1a: Unchanged Watershed Area W1a

Runoff = 1.28 cfs @ 15.05 hrs, Volume= 0.974 af, Depth= 0.13"
 Routed to Link 1L : COMBINED OUTFLOW WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Year Rainfall=3.89"

Area (sf)	CN	Description
1,216,417	36	Woods, Fair, HSG A
1,349,870	49	Pasture/grassland/range, Fair, HSG A
* 71,405	36	*Paved roads w/curbs & sewers, HSG A
* 779,709	36	*1/3 acre lots, 30% imp, HSG A
327,334	60	Woods, Fair, HSG B
49,414	69	Pasture/grassland/range, Fair, HSG B
* 169,897	60	*1/3 acre lots, 30% imp, HSG B
3,964,046	44	Weighted Average
3,679,164		92.81% Pervious Area
284,882		7.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.8	300	0.0600	0.13		Sheet Flow, DOWN FORESTED HILLSIDE
					Woods: Light underbrush n= 0.400 P2= 2.24"
72.1	5,246	0.0300	1.21		Shallow Concentrated Flow, WINDING THROUGH VALLEYS
					Short Grass Pasture Kv= 7.0 fps
111.9	5,546	Total			

Summary for Subcatchment WP1b: Pre-Development Watershed Area 1b

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"
 Routed to Link 1L : COMBINED OUTFLOW WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Year Rainfall=3.89"

Area (sf)	CN	Description
407,380	30	Woods, Good, HSG A
313,744	30	Meadow, non-grazed, HSG A
3,069	55	Woods, Good, HSG B
724,193	30	Weighted Average
724,193		100.00% Pervious Area

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BIRMLEY HILLS SITE CONDOMINIUM

Type II 24-hr 25-Year Rainfall=3.89"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.8	300	0.0600	0.13		Sheet Flow, DOWN FORESTED HILLSIDE Woods: Light underbrush n= 0.400 P2= 2.24"
72.1	5,246	0.0300	1.21		Shallow Concentrated Flow, WINDING THROUGH VALLEYS Short Grass Pasture Kv= 7.0 fps
111.9	5,546	Total			

Summary for Subcatchment WP1c: Unchanged Area AD4e-f

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Link 1L : COMBINED OUTFLOW WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=3.89"

Area (sf)	CN	Description
126,188	30	Woods, Good, HSG A
13,370	57	1/3 acre lots, 30% imp, HSG A
139,558	33	Weighted Average
135,547		97.13% Pervious Area
4,011		2.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
44.7	100	0.0200	0.04		Sheet Flow, FROM TOP OF WOODLAND Woods: Dense underbrush n= 0.800 P2= 2.24"
1.7	203	0.1500	1.94		Shallow Concentrated Flow, THROUGH WOODS Woodland Kv= 5.0 fps
1.3	123	0.0490	1.55		Shallow Concentrated Flow, THROUGH YARD Short Grass Pasture Kv= 7.0 fps
1.8	397	0.0153	3.67	6.89	Trap/Vee/Rect Channel Flow, DITCH Bot.W=2.00' D=0.50' Z= 4.0 & 3.0 ' Top.W=5.50' n= 0.024
49.5	823	Total			

Summary for Subcatchment WP2a: Unchanged Watershed Area W2a

Runoff = 0.26 cfs @ 12.45 hrs, Volume= 0.041 af, Depth= 0.71"
Routed to Link 1L : COMBINED OUTFLOW WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=3.89"

Area (sf)	CN	Description
* 30,019	60	*1/3 acre lots, 30% imp, HSG B
21,013		70.00% Pervious Area
9,006		30.00% Impervious Area

22016 BIRMLEY HILLS PREDEVELOPED

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BIRMLEY HILLS SITE CONDOMINIUM

Type II 24-hr 25-Year Rainfall=3.89"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.8	300	0.0600	0.13		Sheet Flow, DOWN FORESTED HILLSIDE Woods: Light underbrush n= 0.400 P2= 2.24"

Summary for Subcatchment WP2b: Pre-Development Watershed Area W2b

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Link 1L : COMBINED OUTFLOW WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=3.89"

Area (sf)	CN	Description
116,908	30	Woods, Good, HSG A
29,712	30	Meadow, non-grazed, HSG A
146,620	30	Weighted Average
146,620		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.8	300	0.0600	0.13		Sheet Flow, across meadow/woods Woods: Light underbrush n= 0.400 P2= 2.24"

Summary for Subcatchment WP3: Pre-Development Watershed Area W3

Runoff = 0.00 cfs @ 18.39 hrs, Volume= 0.002 af, Depth= 0.04"
Routed to Link 1L : COMBINED OUTFLOW WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=3.89"

Area (sf)	CN	Description
19,999	30	Woods, Good, HSG A
4,100	83	Paved roads w/open ditches, 50% imp, HSG A
24,099	39	Weighted Average
22,049		91.49% Pervious Area
2,050		8.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, Direct Entry

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Summary for Subcatchment WP4: Pre-Development Watershed Area W4

Runoff = 0.11 cfs @ 12.14 hrs, Volume= 0.016 af, Depth= 0.33"
 Routed to Link 1L : COMBINED OUTFLOW WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
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Area (sf)	CN	Description
15,288	30	Woods, Good, HSG A
9,768	83	Paved roads w/open ditches, 50% imp, HSG A
25,056	51	Weighted Average
20,172		80.51% Pervious Area
4,884		19.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, Direct Entry

Summary for Link 1L: COMBINED OUTFLOW WEST

Inflow Area = 116.014 ac, 6.03% Impervious, Inflow Depth = 0.11" for 25-Year event

Inflow = 1.33 cfs @ 15.04 hrs, Volume= 1.033 af

Primary = 1.33 cfs @ 15.04 hrs, Volume= 1.033 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

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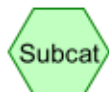
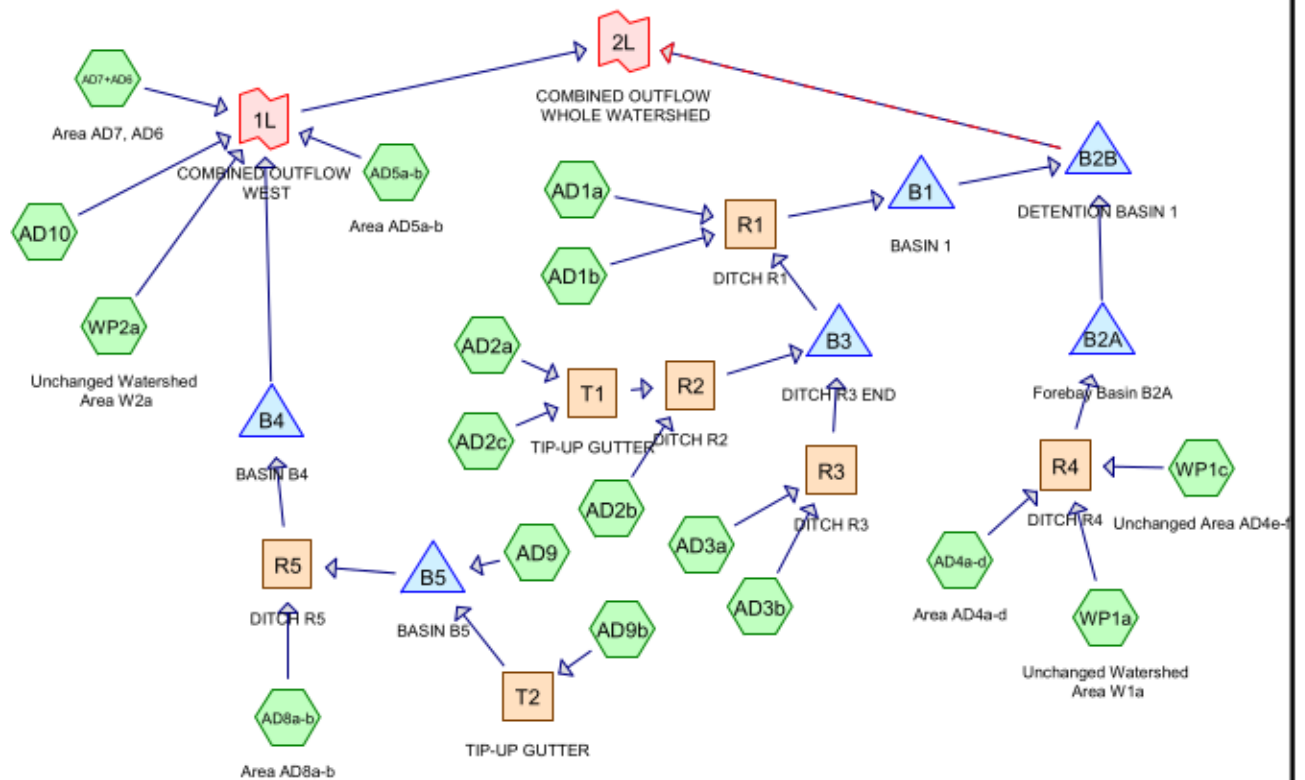
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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	25-Year	Type II 24-hr		Default	24.00	1	3.89	2

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Time span=0.00-200.00 hrs, dt=0.05 hrs, 4001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment AD10:	Runoff Area=41,321 sf 20.00% Impervious Runoff Depth=0.33" Tc=15.0 min CN=51 Runoff=0.18 cfs 0.026 af
Subcatchment AD1a:	Runoff Area=91,393 sf 30.00% Impervious Runoff Depth=0.57" Tc=15.0 min CN=57 Runoff=1.11 cfs 0.100 af
Subcatchment AD1b:	Runoff Area=6,448 sf 100.00% Impervious Runoff Depth=3.66" Tc=15.0 min CN=98 Runoff=0.61 cfs 0.045 af
Subcatchment AD2a:	Runoff Area=86,887 sf 30.00% Impervious Runoff Depth=0.57" Tc=15.0 min CN=57 Runoff=1.05 cfs 0.095 af
Subcatchment AD2b:	Runoff Area=59,060 sf 30.00% Impervious Runoff Depth=0.57" Tc=15.0 min CN=57 Runoff=0.71 cfs 0.065 af
Subcatchment AD2c:	Runoff Area=19,495 sf 100.00% Impervious Runoff Depth=3.66" Tc=15.0 min CN=98 Runoff=1.85 cfs 0.136 af
Subcatchment AD3a:	Runoff Area=80,158 sf 30.00% Impervious Runoff Depth=0.57" Tc=15.0 min CN=57 Runoff=0.97 cfs 0.088 af
Subcatchment AD3b:	Runoff Area=9,125 sf 100.00% Impervious Runoff Depth=3.66" Tc=15.0 min CN=98 Runoff=0.87 cfs 0.064 af
Subcatchment AD4a-d: Area AD4a-d	Runoff Area=361,088 sf 25.31% Impervious Runoff Depth=0.33" Tc=15.0 min UI Adjusted CN=51 Runoff=1.56 cfs 0.231 af
Subcatchment AD5a-b: Area AD5a-b	Runoff Area=23,950 sf 35.37% Impervious Runoff Depth=0.71" Tc=15.0 min CN=60 Runoff=0.40 cfs 0.032 af
Subcatchment AD7+AD6: Area AD7, AD6	Runoff Area=26,325 sf 34.70% Impervious Runoff Depth=0.71" Tc=15.0 min CN=60 Runoff=0.44 cfs 0.036 af
Subcatchment AD8a-b: Area AD8a-b	Runoff Area=66,931 sf 31.50% Impervious Runoff Depth=0.62" Tc=15.0 min CN=58 Runoff=0.91 cfs 0.079 af
Subcatchment AD9:	Runoff Area=32,828 sf 30.00% Impervious Runoff Depth=0.57" Tc=15.0 min CN=57 Runoff=0.40 cfs 0.036 af
Subcatchment AD9b:	Runoff Area=15,425 sf 100.00% Impervious Runoff Depth=3.66" Tc=15.0 min CN=98 Runoff=1.47 cfs 0.108 af
Subcatchment WP1a: Unchanged	Runoff Area=3,964,046 sf 7.19% Impervious Runoff Depth=0.13" Flow Length=5,546' Tc=111.9 min CN=44 Runoff=1.28 cfs 0.974 af
Subcatchment WP1c: Unchanged Area	Runoff Area=139,558 sf 2.87% Impervious Runoff Depth=0.00" Flow Length=823' Tc=49.5 min CN=33 Runoff=0.00 cfs 0.000 af

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Subcatchment WP2a: Unchanged	Runoff Area=30,019 sf	30.00% Impervious	Runoff Depth=0.71"
	Flow Length=300'	Slope=0.0600 '/'	Tc=39.8 min CN=60 Runoff=0.26 cfs 0.041 af
Reach R1: DITCH R1	Avg. Flow Depth=0.34'	Max Vel=4.03 fps	Inflow=4.29 cfs 0.401 af
	n=0.024 L=145.0'	S=0.0285 '/'	Capacity=198.76 cfs Outflow=4.30 cfs 0.401 af
Reach R2: DITCH R2	Avg. Flow Depth=0.25'	Max Vel=4.74 fps	Inflow=3.53 cfs 0.296 af
	n=0.024 L=344.0'	S=0.0535 '/'	Capacity=272.45 cfs Outflow=3.51 cfs 0.296 af
Reach R3: DITCH R3	Avg. Flow Depth=0.24'	Max Vel=2.52 fps	Inflow=1.80 cfs 0.151 af
	n=0.024 L=325.0'	S=0.0160 '/'	Capacity=149.11 cfs Outflow=1.75 cfs 0.151 af
Reach R4: DITCH R4	Avg. Flow Depth=0.22'	Max Vel=2.42 fps	Inflow=1.56 cfs 1.205 af
	n=0.024 L=640.0'	S=0.0160 '/'	Capacity=148.75 cfs Outflow=1.52 cfs 1.205 af
Reach R5: DITCH R5	Avg. Flow Depth=0.17'	Max Vel=3.48 fps	Inflow=1.47 cfs 0.210 af
	n=0.024 L=82.0'	S=0.0448 '/'	Capacity=222.28 cfs Outflow=1.47 cfs 0.210 af
Reach T1: TIP-UP GUTTER	Avg. Flow Depth=0.15'	Max Vel=4.90 fps	Inflow=2.84 cfs 0.231 af
	n=0.013 L=330.0'	S=0.0604 '/'	Capacity=10.64 cfs Outflow=2.82 cfs 0.231 af
Reach T2: TIP-UP GUTTER	Avg. Flow Depth=0.14'	Max Vel=2.88 fps	Inflow=1.47 cfs 0.108 af
	n=0.013 L=296.0'	S=0.0230 '/'	Capacity=6.57 cfs Outflow=1.44 cfs 0.108 af
Pond B1: BASIN 1	Peak Elev=733.73'	Storage=1,807 cf	Inflow=4.30 cfs 0.401 af
Discarded=0.14 cfs 0.111 af	Primary=3.82 cfs 0.291 af	Secondary=0.00 cfs 0.000 af	Outflow=3.96 cfs 0.401 af
Pond B2A: Forebay Basin B2A	Peak Elev=736.62'	Storage=4,079 cf	Inflow=1.52 cfs 1.205 af
Discarded=0.26 cfs 0.384 af	Primary=1.26 cfs 0.822 af		Outflow=1.52 cfs 1.205 af
Pond B2B: DETENTION BASIN 1	Peak Elev=733.00'	Storage=5,207 cf	Inflow=3.82 cfs 1.113 af
Discarded=0.19 cfs 0.295 af	Primary=1.33 cfs 0.817 af	Secondary=0.00 cfs 0.000 af	Outflow=1.53 cfs 1.113 af
Pond B3: DITCH R3 END	Peak Elev=740.80'	Storage=3,738 cf	Inflow=5.26 cfs 0.447 af
Discarded=0.22 cfs 0.191 af	Primary=3.18 cfs 0.256 af		Outflow=3.40 cfs 0.447 af
Pond B4: BASIN B4	Peak Elev=768.29'	Storage=2,894 cf	Inflow=1.47 cfs 0.210 af
Discarded=0.17 cfs 0.182 af	Primary=0.55 cfs 0.028 af		Outflow=0.72 cfs 0.210 af
Pond B5: BASIN B5	Peak Elev=775.04'	Storage=1,192 cf	Inflow=1.83 cfs 0.144 af
Discarded=0.09 cfs 0.012 af	Primary=0.61 cfs 0.131 af		Outflow=0.70 cfs 0.144 af
Link 1L: COMBINED OUTFLOW WEST			Inflow=1.10 cfs 0.164 af
			Primary=1.10 cfs 0.164 af
Link 2L: COMBINED OUTFLOW WHOLE WATERSHED			Inflow=2.25 cfs 0.981 af
			Primary=2.25 cfs 0.981 af

Total Runoff Area = 116.025 ac Runoff Volume = 2.156 af Average Runoff Depth = 0.22"
88.29% Pervious = 102.439 ac 11.71% Impervious = 13.587 ac

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Summary for Subcatchment AD10:

Runoff = 0.18 cfs @ 12.14 hrs, Volume= 0.026 af, Depth= 0.33"
 Routed to Link 1L : COMBINED OUTFLOW WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Year Rainfall=3.89"

Area (sf)	CN	Description
41,321	51	1 acre lots, 20% imp, HSG A
33,057		80.00% Pervious Area
8,264		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, MIN TC

Summary for Subcatchment AD1a:

Runoff = 1.11 cfs @ 12.11 hrs, Volume= 0.100 af, Depth= 0.57"
 Routed to Reach R1 : DITCH R1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Year Rainfall=3.89"

Area (sf)	CN	Description
91,393	57	1/3 acre lots, 30% imp, HSG A
63,975		70.00% Pervious Area
27,418		30.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, MINIMUM DURATION

Summary for Subcatchment AD1b:

Runoff = 0.61 cfs @ 12.06 hrs, Volume= 0.045 af, Depth= 3.66"
 Routed to Reach R1 : DITCH R1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Year Rainfall=3.89"

Area (sf)	CN	Description
6,448	98	Paved roads w/curbs & sewers, HSG A
6,448		100.00% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, MIN DURATION

Summary for Subcatchment AD2a:

Runoff = 1.05 cfs @ 12.11 hrs, Volume= 0.095 af, Depth= 0.57"
 Routed to Reach T1 : TIP-UP GUTTER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Year Rainfall=3.89"

Area (sf)	CN	Description
86,887	57	1/3 acre lots, 30% imp, HSG A
60,821		70.00% Pervious Area
26,066		30.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, MINIMUM DURATION

Summary for Subcatchment AD2b:

Runoff = 0.71 cfs @ 12.11 hrs, Volume= 0.065 af, Depth= 0.57"
 Routed to Reach R2 : DITCH R2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Year Rainfall=3.89"

Area (sf)	CN	Description
59,060	57	1/3 acre lots, 30% imp, HSG A
41,342		70.00% Pervious Area
17,718		30.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, MINIMUM DURATION

Summary for Subcatchment AD2c:

Runoff = 1.85 cfs @ 12.06 hrs, Volume= 0.136 af, Depth= 3.66"
 Routed to Reach T1 : TIP-UP GUTTER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Year Rainfall=3.89"

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Area (sf)	CN	Description
19,495	98	Paved roads w/curbs & sewers, HSG A
19,495		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, MIN DURATION

Summary for Subcatchment AD3a:

Runoff = 0.97 cfs @ 12.11 hrs, Volume= 0.088 af, Depth= 0.57"
 Routed to Reach R3 : DITCH R3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Year Rainfall=3.89"

Area (sf)	CN	Description
80,158	57	1/3 acre lots, 30% imp, HSG A
56,111		70.00% Pervious Area
24,047		30.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, MINIMUM DURATION

Summary for Subcatchment AD3b:

Runoff = 0.87 cfs @ 12.06 hrs, Volume= 0.064 af, Depth= 3.66"
 Routed to Reach R3 : DITCH R3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Year Rainfall=3.89"

Area (sf)	CN	Description
9,125	98	Paved roads w/curbs & sewers, HSG A
9,125		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, MIN DURATION

Summary for Subcatchment AD4a-d: Area AD4a-d

Runoff = 1.56 cfs @ 12.14 hrs, Volume= 0.231 af, Depth= 0.33"
 Routed to Reach R4 : DITCH R4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Year Rainfall=3.89"

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Area (sf)	CN	Adj	Description
251,898	57		1/3 acre lots, 30% imp, HSG A
15,821	98		Unconnected pavement, HSG A
90,300	30		Woods, Good, HSG A
3,069	55		Woods, Good, HSG B
361,088	52	51	Weighted Average, UI Adjusted
269,698			74.69% Pervious Area
91,390			25.31% Impervious Area
15,821			17.31% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, MIN TC

Summary for Subcatchment AD5a-b: Area AD5a-b

Runoff = 0.40 cfs @ 12.10 hrs, Volume= 0.032 af, Depth= 0.71"
 Routed to Link 1L : COMBINED OUTFLOW WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Year Rainfall=3.89"

Area (sf)	CN	Description
22,112	57	1/3 acre lots, 30% imp, HSG A
1,838	98	Unconnected pavement, HSG A
23,950	60	Weighted Average
15,478		64.63% Pervious Area
8,472		35.37% Impervious Area
1,838		21.70% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, Direct Entry

Summary for Subcatchment AD7+AD6: Area AD7, AD6

Runoff = 0.44 cfs @ 12.10 hrs, Volume= 0.036 af, Depth= 0.71"
 Routed to Link 1L : COMBINED OUTFLOW WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Year Rainfall=3.89"

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Area (sf)	CN	Description
19,768	57	1/3 acre lots, 30% imp, HSG A
1,766	98	Unconnected pavement, HSG A
4,791	57	1/3 acre lots, 30% imp, HSG A
26,325	60	Weighted Average
17,191		65.30% Pervious Area
9,134		34.70% Impervious Area
1,766		19.33% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, Direct Entry

Summary for Subcatchment AD8a-b: Area AD8a-b

Runoff = 0.91 cfs @ 12.11 hrs, Volume= 0.079 af, Depth= 0.62"
 Routed to Reach R5 : DITCH R5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Year Rainfall=3.89"

Area (sf)	CN	Description
65,496	57	1/3 acre lots, 30% imp, HSG A
1,435	98	Unconnected pavement, HSG A
66,931	58	Weighted Average
45,847		68.50% Pervious Area
21,084		31.50% Impervious Area
1,435		6.81% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, MIN TC

Summary for Subcatchment AD9:

Runoff = 0.40 cfs @ 12.11 hrs, Volume= 0.036 af, Depth= 0.57"
 Routed to Pond B5 : BASIN B5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Year Rainfall=3.89"

Area (sf)	CN	Description
32,828	57	1/3 acre lots, 30% imp, HSG A
22,980		70.00% Pervious Area
9,848		30.00% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, MINIMUM DURATION

Summary for Subcatchment AD9b:

Runoff = 1.47 cfs @ 12.06 hrs, Volume= 0.108 af, Depth= 3.66"
 Routed to Reach T2 : TIP-UP GUTTER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Year Rainfall=3.89"

Area (sf)	CN	Description
15,425	98	Paved roads w/curbs & sewers, HSG A
15,425		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, MIN DURATION

Summary for Subcatchment WP1a: Unchanged Watershed Area W1a

Runoff = 1.28 cfs @ 15.05 hrs, Volume= 0.974 af, Depth= 0.13"
 Routed to Reach R4 : DITCH R4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Year Rainfall=3.89"

Area (sf)	CN	Description
1,216,417	36	Woods, Fair, HSG A
1,349,870	49	Pasture/grassland/range, Fair, HSG A
* 71,405	36	*Paved roads w/curbs & sewers, HSG A
* 779,709	36	*1/3 acre lots, 30% imp, HSG A
327,334	60	Woods, Fair, HSG B
49,414	69	Pasture/grassland/range, Fair, HSG B
* 169,897	60	*1/3 acre lots, 30% imp, HSG B
3,964,046	44	Weighted Average
3,679,164		92.81% Pervious Area
284,882		7.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.8	300	0.0600	0.13		Sheet Flow, DOWN FORESTED HILLSIDE Woods: Light underbrush n= 0.400 P2= 2.24"
72.1	5,246	0.0300	1.21		Shallow Concentrated Flow, WINDING THROUGH VALLEYS Short Grass Pasture Kv= 7.0 fps
111.9	5,546	Total			

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BIRMLEY HILLS SITE CONDOMINIUM

Type II 24-hr 25-Year Rainfall=3.89"

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Summary for Subcatchment WP1c: Unchanged Area AD4e-f

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"
 Routed to Reach R4 : DITCH R4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Year Rainfall=3.89"

Area (sf)	CN	Description
126,188	30	Woods, Good, HSG A
13,370	57	1/3 acre lots, 30% imp, HSG A
139,558	33	Weighted Average
135,547		97.13% Pervious Area
4,011		2.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
44.7	100	0.0200	0.04		Sheet Flow, FROM TOP OF WOODLAND Woods: Dense underbrush n= 0.800 P2= 2.24"
1.7	203	0.1500	1.94		Shallow Concentrated Flow, THROUGH WOODS Woodland Kv= 5.0 fps
1.3	123	0.0490	1.55		Shallow Concentrated Flow, THROUGH YARD Short Grass Pasture Kv= 7.0 fps
1.8	397	0.0153	3.67	6.89	Trap/Vee/Rect Channel Flow, DITCH Bot.W=2.00' D=0.50' Z= 4.0 & 3.0' Top.W=5.50' n= 0.024
49.5	823	Total			

Summary for Subcatchment WP2a: Unchanged Watershed Area W2a

Runoff = 0.26 cfs @ 12.45 hrs, Volume= 0.041 af, Depth= 0.71"
 Routed to Link 1L : COMBINED OUTFLOW WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
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Area (sf)	CN	Description
* 30,019	60	*1/3 acre lots, 30% imp, HSG B
21,013		70.00% Pervious Area
9,006		30.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.8	300	0.0600	0.13		Sheet Flow, DOWN FORESTED HILLSIDE Woods: Light underbrush n= 0.400 P2= 2.24"

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Summary for Reach R1: DITCH R1

Inflow Area = 8.094 ac, 36.96% Impervious, Inflow Depth = 0.60" for 25-Year event
Inflow = 4.29 cfs @ 12.19 hrs, Volume= 0.401 af
Outflow = 4.30 cfs @ 12.20 hrs, Volume= 0.401 af, Atten= 0%, Lag= 0.5 min
Routed to Pond B1 : BASIN 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.03 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.18 fps, Avg. Travel Time= 2.0 min

Peak Storage= 155 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.34' , Surface Width= 4.35'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 198.76 cfs

2.00' x 2.00' deep channel, n= 0.024
Side Slope Z-value= 3.0 4.0 ' / ' Top Width= 16.00'
Length= 145.0' Slope= 0.0285 ' / '
Inlet Invert= 738.68', Outlet Invert= 734.55'



Summary for Reach R2: DITCH R2

Inflow Area = 3.798 ac, 38.25% Impervious, Inflow Depth = 0.93" for 25-Year event
Inflow = 3.53 cfs @ 12.10 hrs, Volume= 0.296 af
Outflow = 3.51 cfs @ 12.12 hrs, Volume= 0.296 af, Atten= 1%, Lag= 0.9 min
Routed to Pond B3 : DITCH R3 END

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.74 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 3.9 min

Peak Storage= 254 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.25' , Surface Width= 3.78'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 272.45 cfs

2.00' x 2.00' deep channel, n= 0.024
Side Slope Z-value= 3.0 4.0 ' / ' Top Width= 16.00'
Length= 344.0' Slope= 0.0535 ' / '
Inlet Invert= 760.41', Outlet Invert= 742.00'

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Summary for Reach R3: DITCH R3

Inflow Area = 2.050 ac, 37.15% Impervious, Inflow Depth = 0.89" for 25-Year event
 Inflow = 1.80 cfs @ 12.09 hrs, Volume= 0.151 af
 Outflow = 1.75 cfs @ 12.12 hrs, Volume= 0.151 af, Atten= 2%, Lag= 1.5 min
 Routed to Pond B3 : DITCH R3 END

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Max. Velocity= 2.52 fps, Min. Travel Time= 2.1 min
 Avg. Velocity = 0.78 fps, Avg. Travel Time= 6.9 min

Peak Storage= 225 cf @ 12.12 hrs
 Average Depth at Peak Storage= 0.24' , Surface Width= 3.70'
 Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 149.11 cfs

2.00' x 2.00' deep channel, n= 0.024
 Side Slope Z-value= 4.0 3.0 ' /' Top Width= 16.00'
 Length= 325.0' Slope= 0.0160 ' /'
 Inlet Invert= 747.21', Outlet Invert= 742.00'



Summary for Reach R4: DITCH R4

Inflow Area = 102.495 ac, 8.52% Impervious, Inflow Depth = 0.14" for 25-Year event
 Inflow = 1.56 cfs @ 12.14 hrs, Volume= 1.205 af
 Outflow = 1.52 cfs @ 14.96 hrs, Volume= 1.205 af, Atten= 3%, Lag= 169.1 min
 Routed to Pond B2A : Forebay Basin B2A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Max. Velocity= 2.42 fps, Min. Travel Time= 4.4 min
 Avg. Velocity = 1.74 fps, Avg. Travel Time= 6.1 min

Peak Storage= 401 cf @ 14.96 hrs
 Average Depth at Peak Storage= 0.22' , Surface Width= 3.57'
 Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 148.75 cfs

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2.00' x 2.00' deep channel, n= 0.024
Side Slope Z-value= 4.0 3.0 ' ' Top Width= 16.00'
Length= 640.0' Slope= 0.0160 ' '
Inlet Invert= 747.21', Outlet Invert= 737.00'



Summary for Reach R5: DITCH R5

Inflow Area = 2.644 ac, 40.25% Impervious, Inflow Depth = 0.95" for 25-Year event
Inflow = 1.47 cfs @ 12.12 hrs, Volume= 0.210 af
Outflow = 1.47 cfs @ 12.12 hrs, Volume= 0.210 af, Atten= 0%, Lag= 0.2 min
Routed to Pond B4 : BASIN B4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.48 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.30 fps, Avg. Travel Time= 1.0 min

Peak Storage= 35 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.17' , Surface Width= 3.01'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 222.28 cfs

2.00' x 2.00' deep channel, n= 0.024
Side Slope Z-value= 3.0 ' ' Top Width= 14.00'
Length= 82.0' Slope= 0.0448 ' '
Inlet Invert= 772.42', Outlet Invert= 768.75'



Summary for Reach T1: TIP-UP GUTTER

Inflow Area = 2.442 ac, 42.83% Impervious, Inflow Depth = 1.14" for 25-Year event
Inflow = 2.84 cfs @ 12.08 hrs, Volume= 0.231 af
Outflow = 2.82 cfs @ 12.10 hrs, Volume= 0.231 af, Atten= 0%, Lag= 0.9 min
Routed to Reach R2 : DITCH R2

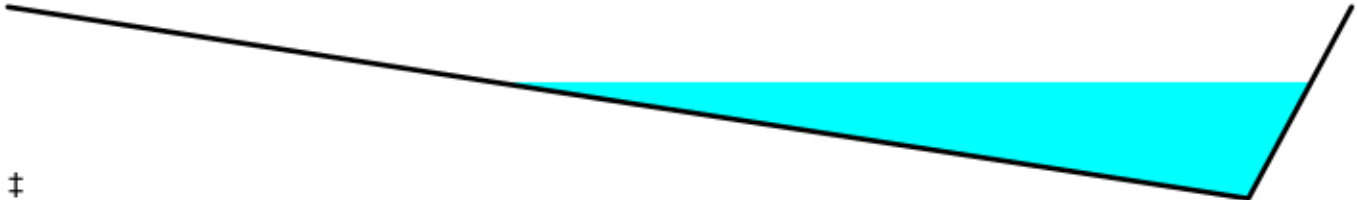
Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.90 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.86 fps, Avg. Travel Time= 3.0 min

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Peak Storage= 190 cf @ 12.10 hrs
 Average Depth at Peak Storage= 0.15' , Surface Width= 7.90'
 Bank-Full Depth= 0.24' Flow Area= 1.6 sf, Capacity= 10.64 cfs

Custom cross-section, Length= 330.0' Slope= 0.0604 '/'
 Constant n= 0.013
 Inlet Invert= 782.91', Outlet Invert= 762.99'



‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	0.00	0.00
6.00	-0.12	0.12
12.00	-0.24	0.24
13.00	0.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Width (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0.0	0	0.00
0.12	0.4	6.5	6.5	129	1.68
0.24	1.6	13.0	13.0	515	10.64

Summary for Reach T2: TIP-UP GUTTER

Inflow Area = 0.354 ac, 100.00% Impervious, Inflow Depth = 3.66" for 25-Year event
 Inflow = 1.47 cfs @ 12.06 hrs, Volume= 0.108 af
 Outflow = 1.44 cfs @ 12.08 hrs, Volume= 0.108 af, Atten= 2%, Lag= 1.4 min
 Routed to Pond B5 : BASIN B5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Max. Velocity= 2.88 fps, Min. Travel Time= 1.7 min
 Avg. Velocity = 1.06 fps, Avg. Travel Time= 4.7 min

Peak Storage= 148 cf @ 12.08 hrs
 Average Depth at Peak Storage= 0.14' , Surface Width= 7.36'
 Bank-Full Depth= 0.24' Flow Area= 1.6 sf, Capacity= 6.57 cfs

Custom cross-section, Length= 296.0' Slope= 0.0230 '/'
 Constant n= 0.013
 Inlet Invert= 782.91', Outlet Invert= 776.10'

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Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	0.00	0.00
6.00	-0.12	0.12
12.00	-0.24	0.24
13.00	0.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Width (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0.0	0	0.00
0.12	0.4	6.5	6.5	115	1.03
0.24	1.6	13.0	13.0	462	6.57

Summary for Pond B1: BASIN 1

Inflow Area = 8.094 ac, 36.96% Impervious, Inflow Depth = 0.60" for 25-Year event
 Inflow = 4.30 cfs @ 12.20 hrs, Volume= 0.401 af
 Outflow = 3.96 cfs @ 12.29 hrs, Volume= 0.401 af, Atten= 8%, Lag= 5.5 min
 Discarded = 0.14 cfs @ 12.29 hrs, Volume= 0.111 af
 Primary = 3.82 cfs @ 12.29 hrs, Volume= 0.291 af
 Routed to Pond B2B : DETENTION BASIN 1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Peak Elev= 733.73' @ 12.29 hrs Surf.Area= 1,972 sf Storage= 1,807 cf

Plug-Flow detention time= 33.3 min calculated for 0.401 af (100% of inflow)
 Center-of-Mass det. time= 33.3 min (872.3 - 838.9)

Volume	Invert	Avail.Storage	Storage Description
#1	732.00'	3,866 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
732.00	16	0	0
732.55	732	206	206
733.00	1,216	438	644
734.00	2,251	1,734	2,378
734.55	3,160	1,488	3,866

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Device	Routing	Invert	Outlet Devices
#1	Primary	732.90'	24.0" Round Culvert L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 732.90' / 732.00' S= 0.0180 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Discarded	732.00'	3.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 680.00'
#3	Secondary	734.05'	2.0' long + 3.0 '/ SideZ (Profile 9) Broad-Crested Rectangular Weir Head (feet) 1.97 2.46 2.95 3.94 4.92 Coef. (English) 3.55 3.55 3.57 3.60 3.66

Discarded OutFlow Max=0.14 cfs @ 12.29 hrs HW=733.73' (Free Discharge)

↳ **2=Exfiltration** (Controls 0.14 cfs)

Primary OutFlow Max=3.80 cfs @ 12.29 hrs HW=733.73' TW=731.62' (Dynamic Tailwater)

↳ **1=Culvert** (Inlet Controls 3.80 cfs @ 3.10 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=732.00' (Free Discharge)

↳ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B2A: Forebay Basin B2A

Inflow Area = 102.495 ac, 8.52% Impervious, Inflow Depth = 0.14" for 25-Year event
 Inflow = 1.52 cfs @ 14.96 hrs, Volume= 1.205 af
 Outflow = 1.52 cfs @ 15.04 hrs, Volume= 1.205 af, Atten= 0%, Lag= 4.8 min
 Discarded = 0.26 cfs @ 15.04 hrs, Volume= 0.384 af
 Primary = 1.26 cfs @ 15.04 hrs, Volume= 0.822 af
 Routed to Pond B2B : DETENTION BASIN 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Peak Elev= 736.62' @ 15.04 hrs Surf.Area= 3,685 sf Storage= 4,079 cf

Plug-Flow detention time= 75.7 min calculated for 1.205 af (100% of inflow)
 Center-of-Mass det. time= 75.8 min (1,179.6 - 1,103.9)

Volume	Invert	Avail.Storage	Storage Description
#1	734.00'	5,614 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
734.00	80	0	0
735.00	912	496	496
736.00	2,441	1,677	2,173
736.50	3,441	1,471	3,643
737.00	4,441	1,971	5,614

Device	Routing	Invert	Outlet Devices
#1	Primary	736.50'	8.0' long + 3.0 '/ SideZ (Profile 9) Broad-Crested Rectangular Weir Head (feet) 1.97 2.46 2.95 3.94 4.92 Coef. (English) 3.55 3.55 3.57 3.60 3.66

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#2 Discarded 734.00' **3.000 in/hr Exfiltration over Surface area**
 Conductivity to Groundwater Elevation = 680.00'

Discarded OutFlow Max=0.26 cfs @ 15.04 hrs HW=736.62' (Free Discharge)
 ↳ **2=Exfiltration** (Controls 0.26 cfs)

Primary OutFlow Max=1.26 cfs @ 15.04 hrs HW=736.62' TW=732.98' (Dynamic Tailwater)
 ↳ **1=Broad-Crested Rectangular Weir** (Weir Controls 1.26 cfs @ 1.23 fps)

Summary for Pond B2B: DETENTION BASIN 1

Inflow Area = 110.589 ac, 10.60% Impervious, Inflow Depth = 0.12" for 25-Year event
 Inflow = 3.82 cfs @ 12.29 hrs, Volume= 1.113 af
 Outflow = 1.53 cfs @ 12.74 hrs, Volume= 1.113 af, Atten= 60%, Lag= 27.2 min
 Discarded = 0.19 cfs @ 12.74 hrs, Volume= 0.295 af
 Primary = 1.33 cfs @ 12.74 hrs, Volume= 0.817 af
 Routed to Link 2L : COMBINED OUTFLOW WHOLE WATERSHED
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link 2L : COMBINED OUTFLOW WHOLE WATERSHED

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Peak Elev= 733.00' @ 12.74 hrs Surf.Area= 2,696 sf Storage= 5,207 cf

Plug-Flow detention time= 97.8 min calculated for 1.112 af (100% of inflow)
 Center-of-Mass det. time= 97.9 min (1,133.1 - 1,035.2)

Volume	Invert	Avail.Storage	Storage Description
#1	729.50'	10,364 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
729.50	10	0	0
730.00	696	177	177
731.00	1,308	1,002	1,179
732.00	2,030	1,669	2,848
733.00	2,697	2,364	5,211
734.55	3,952	5,153	10,364

Device	Routing	Invert	Outlet Devices
#1	Primary	732.29'	15.0" Round Culvert L= 24.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 732.29' / 732.05' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	733.55'	5.0' long + 3.0 ' SideZ x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Discarded	729.50'	3.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 680.00'

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#4 Device 1 732.32' **10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
 #5 Device 1 733.30' **24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.19 cfs @ 12.74 hrs HW=733.00' (Free Discharge)

↑ **3=Exfiltration** (Controls 0.19 cfs)

Primary OutFlow Max=1.33 cfs @ 12.74 hrs HW=733.00' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 1.33 cfs of 1.61 cfs potential flow)

↑ **4=Orifice/Grate** (Orifice Controls 1.33 cfs @ 2.80 fps)

↑ **5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=729.50' TW=0.00' (Dynamic Tailwater)

↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B3: DITCH R3 END

Inflow Area = 5.848 ac, 37.86% Impervious, Inflow Depth = 0.92" for 25-Year event
 Inflow = 5.26 cfs @ 12.12 hrs, Volume= 0.447 af
 Outflow = 3.40 cfs @ 12.25 hrs, Volume= 0.447 af, Atten= 35%, Lag= 7.9 min
 Discarded = 0.22 cfs @ 12.25 hrs, Volume= 0.191 af
 Primary = 3.18 cfs @ 12.25 hrs, Volume= 0.256 af
 Routed to Reach R1 : DITCH R1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Peak Elev= 740.80' @ 12.25 hrs Surf.Area= 3,094 sf Storage= 3,738 cf

Plug-Flow detention time= 75.8 min calculated for 0.447 af (100% of inflow)
 Center-of-Mass det. time= 75.9 min (926.2 - 850.3)

Volume	Invert	Avail.Storage	Storage Description
#1	738.00'	8,597 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
738.00	10	0	0
739.00	769	390	390
740.00	1,926	1,348	1,737
741.00	3,390	2,658	4,395
742.00	5,013	4,202	8,597

Device	Routing	Invert	Outlet Devices
#1	Primary	739.71'	15.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 739.71' / 739.21' S= 0.0100 '/ Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Discarded	738.00'	3.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 680.00'

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Discarded OutFlow Max=0.22 cfs @ 12.25 hrs HW=740.80' (Free Discharge)

↑2=Exfiltration (Controls 0.22 cfs)

Primary OutFlow Max=3.17 cfs @ 12.25 hrs HW=740.80' TW=739.01' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 3.17 cfs @ 2.80 fps)

Summary for Pond B4: BASIN B4

Inflow Area = 2.644 ac, 40.25% Impervious, Inflow Depth = 0.95" for 25-Year event
Inflow = 1.47 cfs @ 12.12 hrs, Volume= 0.210 af
Outflow = 0.72 cfs @ 12.77 hrs, Volume= 0.210 af, Atten= 51%, Lag= 39.1 min
Discarded = 0.17 cfs @ 12.75 hrs, Volume= 0.182 af
Primary = 0.55 cfs @ 12.77 hrs, Volume= 0.028 af

Routed to Link 1L : COMBINED OUTFLOW WEST

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Peak Elev= 768.29' @ 12.75 hrs Surf.Area= 2,464 sf Storage= 2,894 cf

Plug-Flow detention time= 179.9 min calculated for 0.210 af (100% of inflow)

Center-of-Mass det. time= 180.0 min (1,032.1 - 852.1)

Volume	Invert	Avail.Storage	Storage Description
#1	766.00'	3,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
766.00	214	0	0
767.00	1,064	639	639
768.00	2,123	1,594	2,233
768.50	2,713	1,209	3,442

Device	Routing	Invert	Outlet Devices
#1	Discarded	766.00'	3.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 680.00'
#2	Primary	768.25'	20.0' long + 3.0 ' SideZ (Profile 9) Broad-Crested Rectangular Weir Head (feet) 1.97 2.46 2.95 3.94 4.92 Coef. (English) 3.55 3.55 3.57 3.60 3.66

Discarded OutFlow Max=0.17 cfs @ 12.75 hrs HW=768.29' (Free Discharge)

↑1=Exfiltration (Controls 0.17 cfs)

Primary OutFlow Max=0.54 cfs @ 12.77 hrs HW=768.29' TW=0.00' (Dynamic Tailwater)

↑2=Broad-Crested Rectangular Weir (Weir Controls 0.54 cfs @ 0.70 fps)

22016 BIRMLEY HILLS DEVELOPED

Prepared by Boyne Engineering and Design

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BIRMLEY HILLS SITE CONDOMINIUM

Type II 24-hr 25-Year Rainfall=3.89"

Printed 9/22/2022

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Summary for Pond B5: BASIN B5

Inflow Area = 1.108 ac, 52.38% Impervious, Inflow Depth = 1.56" for 25-Year event
Inflow = 1.83 cfs @ 12.09 hrs, Volume= 0.144 af
Outflow = 0.70 cfs @ 12.32 hrs, Volume= 0.144 af, Atten= 62%, Lag= 13.5 min
Discarded = 0.09 cfs @ 12.32 hrs, Volume= 0.012 af
Primary = 0.61 cfs @ 12.32 hrs, Volume= 0.131 af
Routed to Reach R5 : DITCH R5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 775.04' @ 12.32 hrs Surf.Area= 1,260 sf Storage= 1,192 cf

Plug-Flow detention time= 14.8 min calculated for 0.144 af (100% of inflow)
Center-of-Mass det. time= 14.8 min (814.2 - 799.4)

Volume	Invert	Avail.Storage	Storage Description
#1	771.92'	2,846 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
771.92	16	0	0
773.00	33	26	26
774.00	487	260	286
775.00	1,219	853	1,139
776.00	2,195	1,707	2,846

Device	Routing	Invert	Outlet Devices
#1	Primary	772.92'	18.0" Round Culvert L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 772.92' / 772.42' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Discarded	771.92'	3.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 680.00'
#3	Device 1	771.92'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.09 cfs @ 12.32 hrs HW=775.04' (Free Discharge)

↑ **2=Exfiltration** (Controls 0.09 cfs)

Primary OutFlow Max=0.61 cfs @ 12.32 hrs HW=775.04' TW=772.56' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 0.61 cfs of 9.65 cfs potential flow)

↑ **3=Orifice/Grate** (Orifice Controls 0.61 cfs @ 7.01 fps)

Summary for Link 1L: COMBINED OUTFLOW WEST

Inflow Area = 5.436 ac, 34.30% Impervious, Inflow Depth = 0.36" for 25-Year event
Inflow = 1.10 cfs @ 12.12 hrs, Volume= 0.164 af
Primary = 1.10 cfs @ 12.12 hrs, Volume= 0.164 af, Atten= 0%, Lag= 0.0 min
Routed to Link 2L : COMBINED OUTFLOW WHOLE WATERSHED

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

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BIRMLEY HILLS SITE CONDOMINIUM

Type II 24-hr 25-Year Rainfall=3.89"

Printed 9/22/2022

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Summary for Link 2L: COMBINED OUTFLOW WHOLE WATERSHED

Inflow Area = 116.025 ac, 11.71% Impervious, Inflow Depth = 0.10" for 25-Year event

Inflow = 2.25 cfs @ 12.75 hrs, Volume= 0.981 af

Primary = 2.25 cfs @ 12.75 hrs, Volume= 0.981 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

22016 BIRMLEY HILLS DEVELOPED

Prepared by Boyne Engineering and Design

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BIRMLEY HILLS SITE CONDOMINIUM

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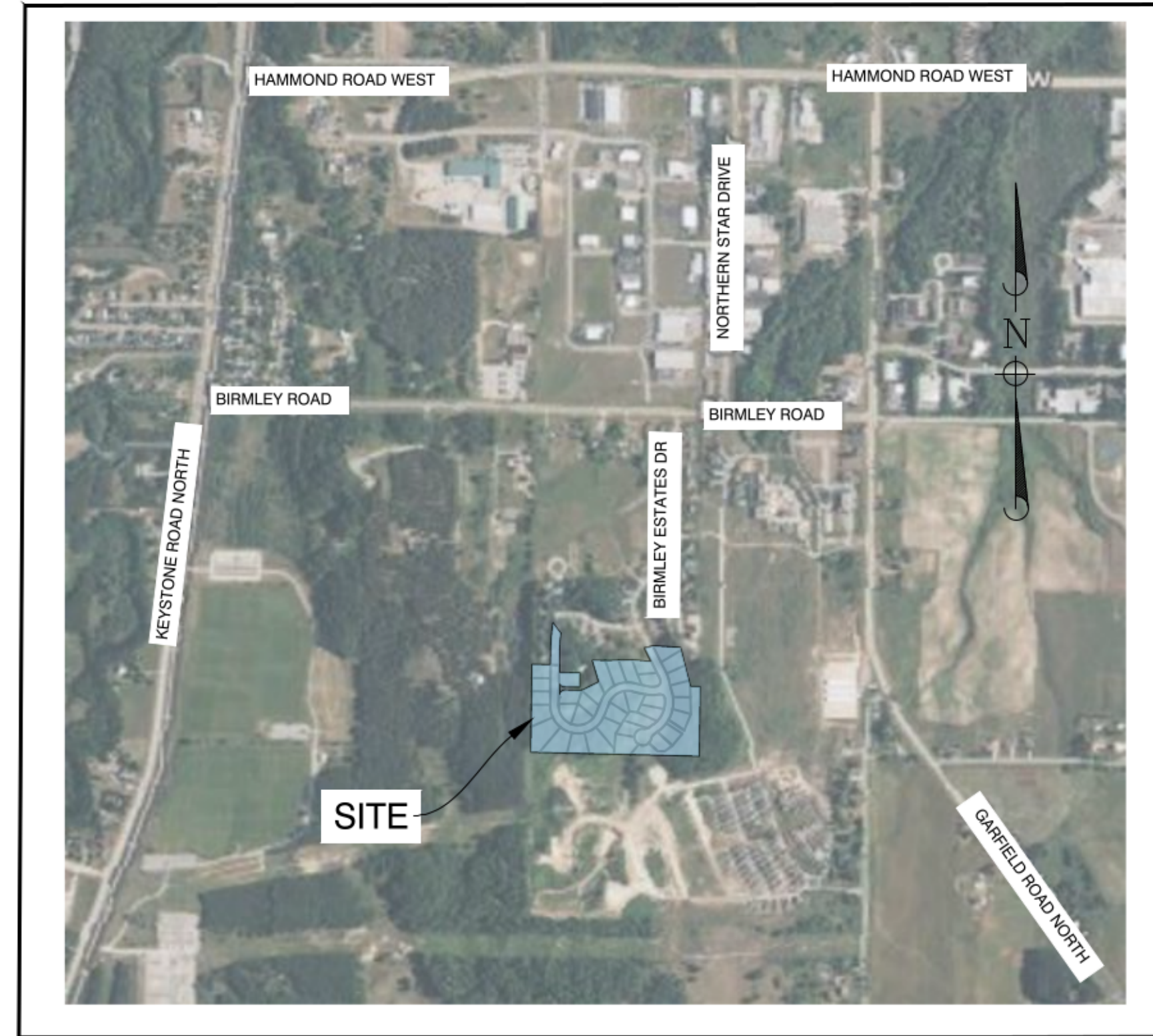
GENERAL NOTES

- THIS CONSTRUCTION PROJECT SHALL AT ALL TIMES AND IN ALL SITUATIONS PROCEED IN A MANNER CONSISTENT WITH THE REQUIREMENTS OF THE GARFIELD TOWNSHIP ZONING ORDINANCE: PART 91 - SOIL EROSION AND SEDIMENTATION CONTROL OF THE NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION ACT, 1994 PA 451, THE CURRENT GRAND TRAVERSE COUNTY CONSTRUCTION STANDARDS, AND ALL OTHER APPLICABLE RULES, REGULATIONS AND LAWS OF ANY OTHER AUTHORITY WITH JURISDICTION TO GOVERN SUCH CONSTRUCTION. THE CONTRACTOR SHALL KEEP A COPY OF THOSE REQUIREMENTS AND ALL CONSTRUCTION DOCUMENTS RELATED TO THIS PROJECT ON THE PROJECT AT ALL TIME AND REFERENCE SHALL BE MADE TO THEM FOR PROPER MATERIALS, METHODS, ETC. REGARDING CONSTRUCTION IMPROVEMENTS.
- THE CONTRACTOR SHALL CHECK THESE PLANS AND FIELD VERIFY EXISTING CONDITIONS PRIOR TO STARTING WORK ON ANY SEGMENT OF THE PROJECT. IF THE CONTRACTOR HAS ANY QUESTIONS OR SUSPECTS THERE IS AN ERROR OR OMISSION WITHIN THE PLANS OR THE CONSTRUCTION STAKES, HE OR SHE SHALL NOT PROCEED UNTIL THE ENGINEER OR HIS OR HER REPRESENTATIVE HAS BEEN FULLY NOTIFIED, HAS RESPONDED, AND HAS SPECIFICALLY STATED THE CONTRACTOR MAY PROCEED.
- EXISTING PUBLIC UTILITIES AND UNDERGROUND STRUCTURES SUCH AS PIPE LINES, ELECTRIC CONDUITS, SEWER AND WATER ARE IDENTIFIED BY THE BEST KNOWLEDGE OF THE SURVEYOR, HOWEVER, NEITHER THE CORRECTNESS NOR THE COMPLETENESS OF SUCH INFORMATION IS GUARANTEED. PRIOR TO THE START OF ANY WORK ON THE PROJECT, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES AND MISS DIG: (800) 482-7171. THE CONTRACTOR SHALL ENSURE THAT THE LOCATIONS OF ALL UTILITIES WITHIN THE VICINITY OF THE PROJECT ARE STAKED AND IDENTIFIED PRIOR TO PROCEEDING WITH WORK IN ANY AREA OF THE PROJECT. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE PROTECTION OR RELOCATION OF EXISTING UTILITIES AND STRUCTURES AND SHALL SAVE THOSE UTILITIES AND STRUCTURES HARMLESS FROM DAMAGE, WHETHER PUBLICLY OR PRIVATELY OWNED. THE CONTRACTOR SHALL REPAIR, AT HIS OR HER COST, ANY DAMAGE TO THOSE UTILITIES AND STRUCTURES. UTILITY POLES, ANCHORING CABLES AND UTILITY FOUNDATIONS SHALL NOT BE DISTURBED OR UNDERMINED. CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANY AND PROVIDE PROPER SUPPORT OF SUCH UTILITIES IN THE VICINITY OF THE WORK, AND IF NECESSARY, INSTALL TEMPORARY SHEETING OR TRENCH BOXES TO MINIMIZE EXCAVATION LIMITS.
- THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ANY DAMAGE CAUSED TO THIS OR ADJACENT PROPERTY, AND FOR INJURY TO ANY PERSON, OCCURRING DURING OR AS A RESULT OF THE CONSTRUCTION PROCESS, WHETHER SUCH DAMAGE OR INJURY RESULTS FROM ANY ACTION OR LACK OF ACTION BY PRINCIPALS OF THE COMPANY, EMPLOYEES, SUBCONTRACTORS, OR SUPPLIERS. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LAWS AND REGULATIONS GOVERNING CONSTRUCTION SAFETY. THE CONTRACTOR SHALL ALSO FURNISH AND INSTALL ALL NECESSARY TEMPORARY SAFETY DEVICES, SAFEGUARDS, AND PROTECTIVE EQUIPMENT AND FOLLOW ALL ADVISABLE SAFETY PRACTICES NECESSARY TO PROTECT THE LIFE AND HEALTH OF EMPLOYEES AND THE PUBLIC DURING THE CONSTRUCTION PROCESS. NEITHER THE OWNER OR THE ENGINEER ASSUME ANY LIABILITY FOR MATTERS RELATING TO SAFETY AT THE CONSTRUCTION SITE.
- ANY DAMAGE TO IMPROVEMENTS NOT CAUSED BY THE OWNER, PRIOR TO FINAL PROJECT ACCEPTANCE BY THE ZONING ADMINISTRATOR AND THE OWNER, SHALL BE REPAIRED OR REPLACED AS NECESSARY TO CONFORM WITH THE DESIGN AT THE EXPENSE OF THE CONTRACTOR.
- THE CONTRACTOR SHALL NOTIFY THE GRAND TRAVERSE COUNTY CONSTRUCTION SUPERVISOR 3 DAYS PRIOR TO STARTING WORK AND SHALL FIRST PROVIDE ALL NECESSARY NOTICES, OBTAIN ALL REQUIRED PERMITS AND PAY ALL FEES ASSOCIATED WITH SUCCESSFULLY COMPLETING THE CONSTRUCTION PROCESS, INCLUDING ALL PUBLIC INSPECTION FEES.
- ALL STUMPS, LARGE ROCKS, CONCRETE, SCRAP MATERIALS, TRASH AND OTHER DELETERIOUS MATERIAL SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER.
- DURING CONSTRUCTION EXPOSE THE MINIMUM AREA OF SOIL FOR THE MINIMUM TIME POSSIBLE. SEE SOIL EROSION AND STORMWATER CONTROL NOTES.
- THROUGH TRAFFIC ON ADJACENT ROADWAYS SHALL NOT BE INTERRUPTED WITHOUT EXPLICIT PERMISSION FROM, AND COORDINATION WITH THE GRAND TRAVERSE COUNTY ROAD COMMISSION. ALL WORK WITHIN THE COUNTY RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE COUNTY ROAD COMMISSION CONSTRUCTION SPECIFICATIONS AND PERMIT REQUIREMENTS. PAVEMENT CUTS ARE TO BE MADE WITH A SAW, IMMEDIATELY PRIOR TO PAVING.
- ALL WORK IS TO BE PERFORMED WITHIN THE PROPERTY, WITHIN THE PUBLIC RIGHT-OF-WAY, OR WITHIN ESTABLISHED EASEMENTS. ALL WORK WITHIN EASEMENTS SHALL BE COORDINATED WITH THE EASEMENT HOLDER AND BE IN ACCORDANCE WITH THE LIMITATIONS AND RESTRICTIONS OF THOSE EASEMENTS. ANY WORK OUTSIDE OF THESE LIMITS SHALL BE COORDINATED AND APPROVED BY THE PROPERTY OWNER AFFECTED. DOCUMENTATION OF THIS ARRANGEMENT SHALL BE PROVIDED TO THE ZONING AUTHORITY. ANY DISRUPTION CAUSED TO ADJACENT PROPERTIES OR TO THE PUBLIC RIGHT-OF-WAY SHALL BE PROPERLY RESTORED INCLUDING LAWNS, SIDEWALKS, DRIVEWAYS, PLANTINGS, SIGNS, MAILBOXES, ETC., AT NO ADDITIONAL COST TO THE OWNER.
- THE CONTRACTOR SHALL PROVIDE ADEQUATE ON-SITE SUPERVISION OF THE WORK AT ALL TIMES DURING THE CONSTRUCTION PROCESS. THERE SHALL BE ONE DESIGNATED ON-SITE SUPERVISOR AVAILABLE WHENEVER CONSTRUCTION IS UNDERWAY WHO HAS THE AUTHORITY TO ACT ON BEHALF OF THE CONTRACTOR.

** ALL ELEVATIONS ARE BASED ON:
NAVD 88 DATUM REFERENCED TO THE TRAVERSE CITY CORS

PLANS FOR: BIRMLEY HILLS SITE CONDOMINIUM

PART OF SECTION 26, TOWNSHIP 27 NORTH, RANGE 11 WEST, GARFIELD TOWNSHIP, GRAND TRAVERSE COUNTY MICHIGAN



LOCATION MAP
NOT TO SCALE

LEGAL DESCRIPTION

PREPARED FOR STEVE ZAKRAJSK

Total Parcel

Part of Section 26, Town 27 North, Range 11 West, Garfield Township, Grand Traverse County, Michigan more fully described as follows:

Beginning at the South one-quarter corner of said Section 26;
thence South 88°39'03" East, 1311.74 feet,
along the South line of said Section 26
thence North 00°51'35" East, 540.00 feet,
along the East one-eighth line of said Section 26
thence North 88°39'03" West, 75.00 feet,
thence North 14°19'07" West, 314.48 feet,
thence North 86°49'30" West, 214.48 feet,
thence South 75°27'05" West, 67.51 feet,
thence South 26°40'38" East, 116.61 feet,
thence North 85°43'06" West, 150.00 feet,
thence South 88°12'40" West, 104.89 feet,
thence South 88°46'29" West, 105.00 feet,
thence North 88°25'45" West, 100.00 feet,
thence South 16°38'02" East, 174.39 feet,
thence South 62°47'48" West, 149.46 feet,
thence North 89°15' 43" West, 132.95 feet,
thence Southwesterly, 76.79 feet, along said centerline on the arc of a 40.00 foot radius curve to the left, the central angle of which is 109°59'41" and the long chord of which bears South 35°44'33" West, 65.53 feet,
thence Northwesterly, 54.78 feet, along said centerline on the arc of a 157.00 foot radius curve to the right, the central angle of which is 19°59'26" and the long chord of which bears North 09°15'27" West, 54.50 feet,
thence North 00°44'17" East, 70.00 feet,
thence Southeasterly, 62.83 feet, along said centerline on the arc of a 40.00 foot radius curve to the left, the central angle of which is 90°00'11" and the long chord of which bears South 44°15'43" East, 56.57 feet,
thence South 89°15'43" East, 119.98 feet,
thence North 00°44'17" East, 107.92 feet,
thence North 89°15'43" West, 159.99 feet,
thence North 00°44'17" East, 182.33 feet,
thence Northeasterly, 126.78 feet, along said centerline on the arc of a 1233.86 foot radius curve to the right, the central angle of which is 05°53'13" and the long chord of which bears North 03°40'54" East, 126.72 feet,
thence North 36°27'22" West, 93.98 feet,
thence Southwesterly, 202.23 feet, along said centerline on the arc of a 1299.86 foot radius curve to the left, the central angle of which is 08°54'51" and the long chord of which bears South 05°11'42" West, 202.03 feet,
thence South 00°44'17" West, 122.58 feet,
thence North 89°15'43" West, 145.00 feet,
thence South 00°44'17" West, 682.00 feet,
along the North-South one-quarter line of said Section 26;
to the POINT OF BEGINNING of said Parcel.

Said described parcel contains 400,463.21 square feet (9.19 acres), more or less.

subject to any and all easements, reservations, restrictions and conveyances of record.

INDEX OF DRAWINGS:

C0.0	COVER
C1.0	EXISTING CONDITIONS SURVEY
C2.0	OVERALL SITE ARRANGEMENT PLAN
C2.1	OVERALL SITE GRADING AND DRAINAGE PLAN
C3.0	SITE UTILITY PLAN
C4.0	BIRMLEY HILL DRIVE PLAN AND PROFILE
C4.1	FARMINGTON COURT PLAN AND PROFILE
C5.0	CROSS SECTIONS
C6.0	SITE DETAILS
C6.1	UTILITY DETAILS *(BY GRAND TRAVERSE COUNTY DPW)

OWNER / APPLICANT

T&R INVESTMENTS
841 ASHLAND DRIVE
TRAVERSE CITY, MI 49696

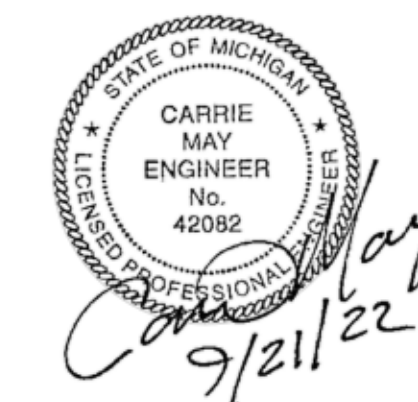
STEVE ZAKRAJSEK
(231) 638-6004

ENGINEER

BOYNE ENGINEERING AND DESIGN
PO BOX 94
BOYNE CITY, MI 49712
CONTACT CARRIE MAY, P.E.
PRINCIPAL ENGINEER
PHONE: (231) 499-8361

SURVEYOR

GOURDIE-FRASER
123 W FRONT ST
TRAVERSE CITY, MI 49684
PHONE: (231) 946-5874



PLAN APPROVAL

THESE CONSTRUCTION PLANS HAVE BEEN REVIEWED AND APPROVED BY THE GARFIELD TOWNSHIP WITH THE EXCEPTIONS, CONDITIONS AND MODIFICATIONS INDICATED BY ME ON THIS PLAN SET

GARFIELD TOWNSHIP PLANNER OR ZONING ADMINISTRATOR DATE

PUBLIC AUTHORITIES

GARFIELD TOWNSHIP
3848 VETERANS DRIVE
TRAVERSE CITY, MI 49684
Telephone: (231) 941-1620

GRAND TRAVERSE COUNTY D.P.W.
2650 LAFRANIER ROAD
TRAVERSE CITY, MI 49686
Telephone: (231) 995-6039

GRAND TRAVERSE COUNTY ROAD COMMISSION
1881 LAFRANIER ROAD
TRAVERSE CITY, MI 49684
Telephone: (231) 922-4848

GRAND TRAVERSE COUNTY DRAIN COMMISSIONER
2650 LAFRANIER ROAD
TRAVERSE CITY, MI 49686
Telephone: (231) 922-4807

GRAND TRAVERSE COUNTY SOIL EROSION & SEDIMENTATION CONTROL
2650 LAFRANIER ROAD
TRAVERSE CITY, MI 49686
Telephone: (231) 995-6051

GRAND TRAVERSE COUNTY ENVIRONMENTAL HEALTH DEPARTMENT
2650 LAFRANIER ROAD
TRAVERSE CITY, MI
Telephone: (231) 995-6051

EGLE - CADILLAC
120 W CHAPIN STREET
CADILLAC, MI 49801
Telephone: (231) 775-3960

UTILITY AGENCIES

CONSUMERS ENERGY ELECTRIC
Telephone: (231) 929-6242

DTE ENERGY NATURAL GAS
Telephone: (231) 932-2823

CHARTER COMMUNICATIONS CABLE
Telephone: (231) 929-7012

AT&T MICHIGAN TELEPHONE
Telephone: (231) 941-2707

EMERGENCY SERVICES

EMERGENCY CALLS

AMBULANCE SERVICE / POLICE / FIRE: 911

GRAND TRAVERSE METRO FIRE DEPARTMENT: 231.947-3000

GRAND TRAVERSE COUNTY SHERIFF: 231.995-5000

MISS DIG: 1.800.482.7171



BOYNE ENGINEERING AND DESIGN
P.O. Box 94
Boyne City, MI 49727
(231) 499-8361
boyneengineering.com

BIRMLEY HILLS SITE CONDOMINIUM

PREPARED FOR:
T&R INVESTMENTS

841 Ashland Drive
Traverse City, MI

NO.	DATE	APP'D	ISSUE / REVISION DESCRIPTION	
				REVISIONS

COVER

ORIGINAL ISSUE DATE:
09/21/2022

SCALE:

BED JOB NO. 22016

DRAWING NUMBER

CO.0

NO.	DATE	APPD	ISSUE / REVISION DESCRIPTION

EXISTING CONDITIONS

ORIGINAL ISSUE DATE:
09/21/2022
 SCALE: 1"=50'
 BED JOB NO. 22016
 DRAWING NUMBER

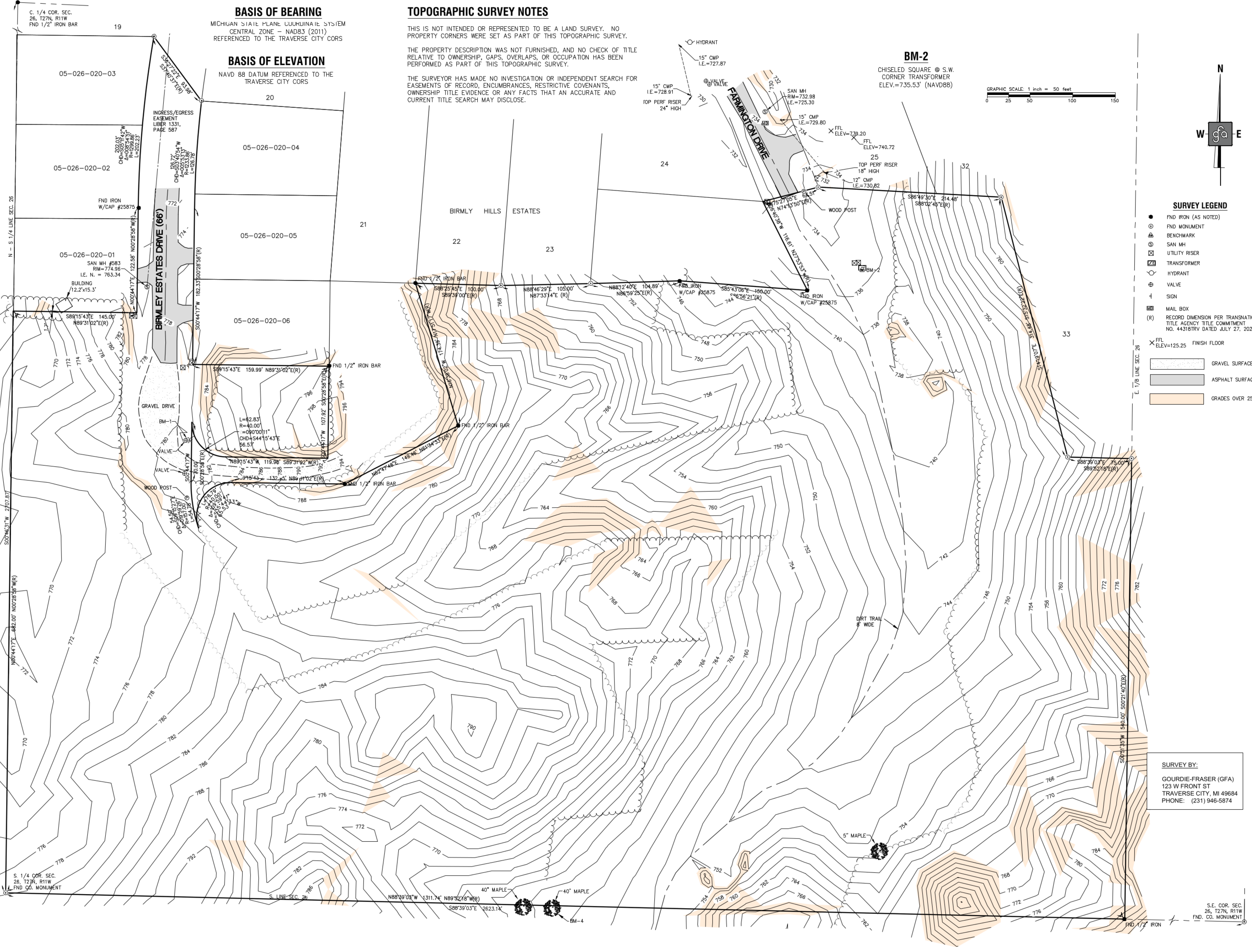
C1.0

TOPOGRAPHIC SURVEY NOTES

THIS IS NOT INTENDED OR REPRESENTED TO BE A LAND SURVEY. NO PROPERTY CORNERS WERE SET AS PART OF THIS TOPOGRAPHIC SURVEY.
 THE PROPERTY DESCRIPTION WAS NOT FURNISHED, AND NO CHECK OF TITLE RELATIVE TO OWNERSHIP, GAPS, OVERLAPS, OR OCCUPATION HAS BEEN PERFORMED AS PART OF THIS TOPOGRAPHIC SURVEY.
 THE SURVEYOR HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS OF RECORD, ENCUMBRANCES, RESTRICTIVE COVENANTS, OWNERSHIP TITLE EVIDENCE OR ANY FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE.

BASIS OF BEARING
 MICHIGAN STATE PLANE COORDINATE SYSTEM
 CENTRAL ZONE - NAD83 (2011)
 REFERENCED TO THE TRAVERSE CITY CORNERS

BASIS OF ELEVATION
 NAVD 88 DATUM REFERENCED TO THE TRAVERSE CITY CORNERS



SURVEY LEGEND

- FND IRON (AS NOTED)
- ⊙ FND MONUMENT
- ⊕ BENCHMARK
- ⊕ SAN MH
- ⊕ UTILITY RISER
- ⊕ TRANSFORMER
- ⊕ HYDRANT
- ⊕ VALVE
- ⊕ SIGN
- ⊕ MAIL BOX
- (R) RECORD DIMENSION PER TRANSDATION TITLE AGENCY TITLE COMMITMENT NO. 44318TRV DATED JULY 27, 2021
- × FFL ELEV=125.25 FINISH FLOOR
- ▨ GRAVEL SURFACE
- ▨ ASPHALT SURFACE
- ▨ GRADES OVER 25%

SURVEY BY:
 GOURDIE-FRASER (GFA)
 123 W FRONT ST
 TRAVERSE CITY, MI 49684
 PHONE: (231) 946-5874

C. 1/4 COR. SEC. 26, T27N, R11W FND 1/2" IRON BAR 19
 N - S 1/4 LINE SEC. 26
 S 1/4 COR. SEC. 26, T27N, R11W FND CO. MONUMENT
 S. LINE SEC. 26

C:\USERS\BOYNE\MY DOCUMENTS\BOYNE ENGINEERING\2022\2022\2016 BIRMLEY ESTATES\DESIGNWORKING CAD - CURRENT\2022\2022\2016 BIRMLEY ESTATES\DESIGNWORKING CAD - CURRENT\8-22 WITH BURDOLONG\09/19/22 7:43 PM\CARBEE.MXD

SOILS

SOILS ON THIS PROPERTY HAVE BEEN OBSERVED TO BE SANDY - CONSISTENT WITH NRCS SOIL SURVEY MAPPING

SEE SHEET C2.1 FOR TEST HOLES

LIGHTING

NO SITE LIGHTING IS PROPOSED FOR THIS DEVELOPMENT

PARKING

PARKING FOR THIS DEVELOPMENT WILL BE LOCATED ON INDIVIDUAL LOTS. NO ADDITIONAL PARKING AREAS ARE PROPOSED

COVERAGE AREAS

SITE ELEMENT	AREA	UNIT	% OF COVERAGE	NOTES
OVERALL SITE	21.3	AC		GROSS AREA (SEE CALCULATION THIS SHEET)
EX BUILDINGS	0	SF		VACANT
NEW BUILDINGS	0	SF		
PAVEMENT	59,240	SF	6.4%	
RESERVED WOODED OPEN SPACE	2.28	AC	10.7%	14.3% OF NET AREA

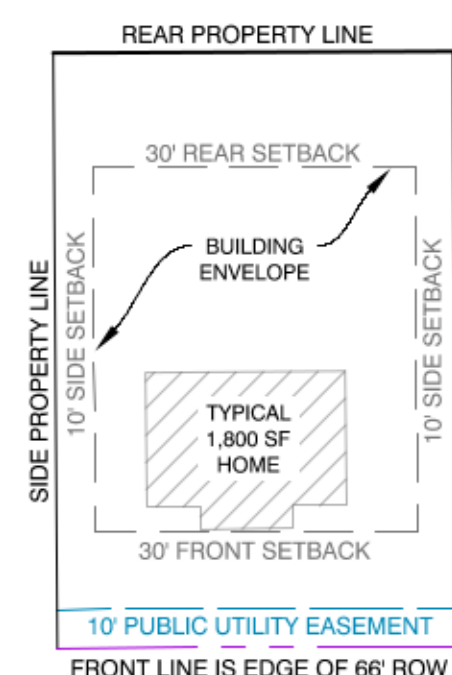
GROSS/NET AREA

GROSS AREA: 21.33 AC
PUBLIC EASEMENTS: -1.72 AC
RIGHT-OF-WAYS: -3.66 AC
NET AREA: 15.95 AC

ZONING

GARFIELD TOWNSHIP ZONING INFORMATION
CHARTER TOWNSHIP OF GARFIELD ORDINANCE 68 AMENDED THROUGH 9/26/21

ZONING DISTRICT	MIN LOT PER UNIT	MAX HEIGHT/STORIES	YARD SETBACKS (FT)	MAX BUILDING COVERAGE
R-1 ONE FAMILY RESIDENTIAL * WITH PUBLIC SEWER	*15,000 SF	2-1/2 / 3 ⁵	30' 10' 30'	30%

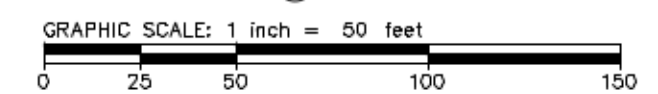


REPRESENTATIVE LOT CONFIGURATION

INDIVIDUAL SITE CONFIGURATIONS VARY
MINIMUM AREA = 1,500 SF
SCALE: 1"=50'

LEGEND

- PROPERTY LINE
- LOT LINE
- SETBACK
- EASEMENT
- RIGHT OF WAY
- PROPOSED ROADWAY CENTER
- EDGE OF PAVEMENT
- STORMWATER FLOW
- EXISTING 10' CONTOUR LINE
- EXISTING 2' CONTOUR LINE
- PROPOSED 10' CONTOUR LINE
- PROPOSED 2' CONTOUR LINE
- TREE LINE
- LIMIT OF DISTURBANCE
- EX PAVING / GRAVEL
- STORMWATER BASIN
- SOIL BORING
- BENCHMARK



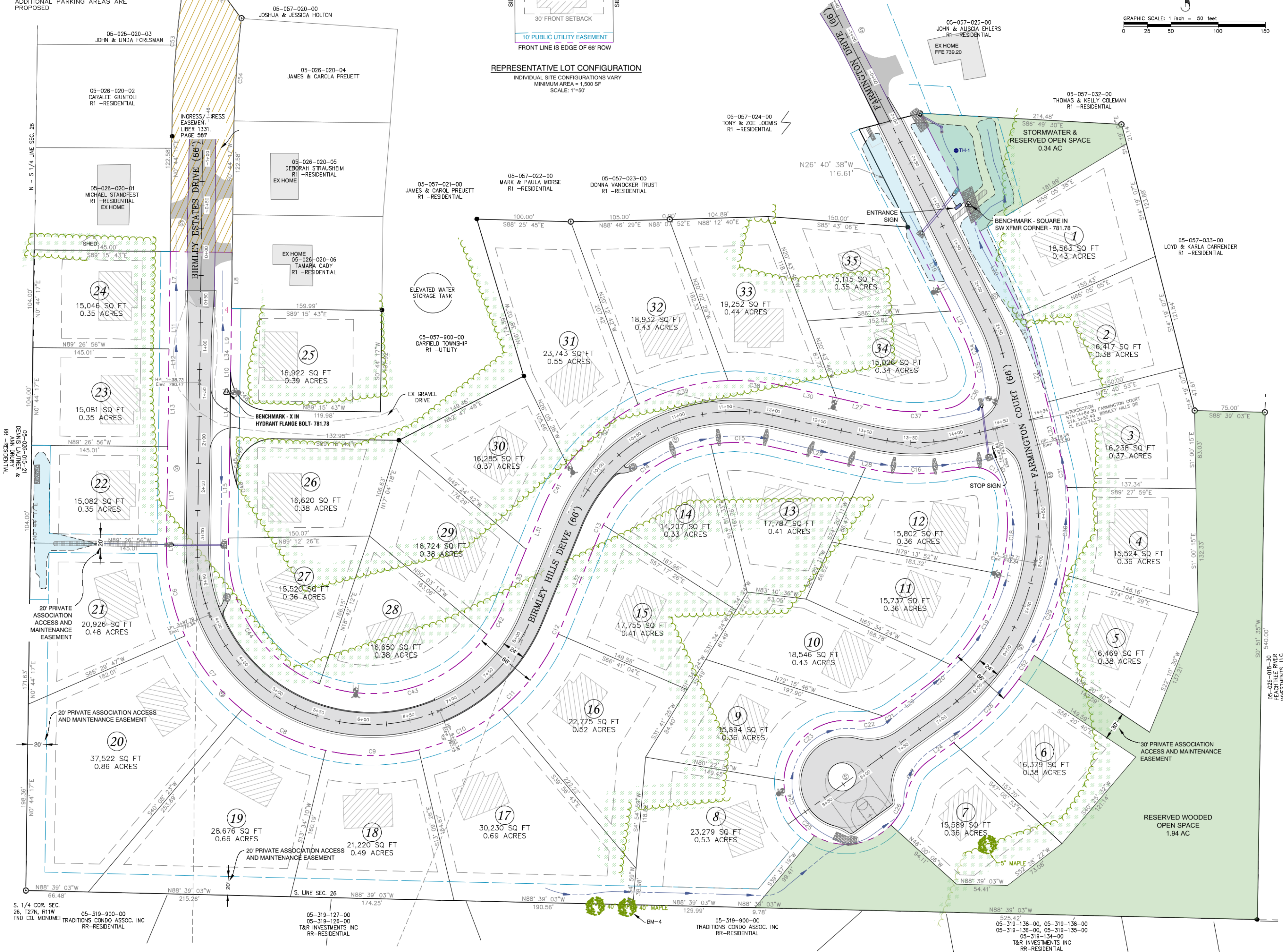
BOYNE ENGINEERING AND DESIGN
P.O. Box 94
Boyer City, MI 49727
(231) 499-8361
boyneengineering.com

BIRMLEY HILLS SITE CONDOMINIUM
PREPARED FOR:
T&R INVESTMENTS
841 Ashland Drive
Traverse City, MI

Curve #	Length	Radius
C6	96.35	218.00
C7	100.01	218.00
C8	100.02	218.00
C9	100.01	218.00
C10	100.01	218.00
C11	100.00	218.00
C12	6.57	218.00
C13	10.60	157.00
C14	148.38	157.00
C15	61.67	157.00
C16	105.98	233.00
C17	58.33	35.00
C18	84.48	217.00
C19	111.52	217.00
C20	38.52	217.00
C21	10.31	80.37
C22	31.72	80.37
C23	110.20	86.00
C24	43.18	86.00
C25	27.22	86.00
C26	37.58	86.00
C27	42.03	60.37

Curve #	Length	Radius
C28	89.92	283.00
C29	92.15	283.00
C30	93.41	283.00
C31	32.61	283.00
C32	38.03	233.00
C33	11.23	233.00
C34	39.11	167.00
C35	0.07	167.00
C36	53.15	35.00
C37	76.40	171.77
C38	57.98	223.00
C39	100.00	223.00
C40	100.00	223.00
C41	35.43	223.00
C42	36.02	152.00
C43	200.04	152.00
C44	184.37	152.00
C45	54.77	157.00
C46	0.00	158.74
C47	79.79	40.00
C48	82.83	40.00

Line #	Length	Direction
L7	58.75	S0° 44' 12.26"W
L11	43.78	S0° 43' 50.02"W
L12	24.14	S0° 43' 50.02"W
L13	79.86	S0° 44' 17.26"W
L17	104.00	S0° 44' 17.26"W
L18	6.13	S0° 44' 17.26"W
L32	106.55	N22° 15' 33.74"E
L29	105.81	S77° 12' 54.41"E
L28	1.64	S77° 12' 54.41"E
L20	41.73	S54° 08' 05.99"W
L24	34.06	N54° 08' 05.99"E
L19	100.00	S28° 40' 37.74"E
L21	27.28	S28° 40' 37.74"E
L27	48.13	N77° 12' 54.41"W
L30	59.35	N77° 12' 54.41"W
L31	44.67	S22° 15' 33.74"W
L33	63.98	S22° 15' 33.74"W
L16	11.67	N0° 44' 17.25"E
L15	106.33	N0° 44' 17.25"E
L10	0.00	N0° 44' 17.09"E
L9	67.91	N0° 43' 50.02"E
L8	59.75	S0° 44' 17.26"W
L14	78.00	S0° 44' 17.26"W
L34	67.91	N0° 43' 50.02"E



NO.	DATE	APPD.	ISSUE / REVISION DESCRIPTION

OVERALL SITE ARRANGEMENT PLAN

ORIGINAL ISSUE DATE:
09/21/2022
SCALE: 1"=50'
BED JOB NO. 22016
DRAWING NUMBER
C2.0



SOIL EROSION AND STORM WATER CONTROL NOTES

1. THE CONTRACTOR IS ADVISED THAT ALL SOIL EROSION MEASURES AND STORMWATER FACILITIES SHALL BE CONSTRUCTED AT THE EARLIEST FEASIBLE SCHEDULE. NO OTHER CONSTRUCTION ACTIVITIES SHALL PROCEED WHICH DO NOT PHYSICALLY DRAIN TO THESE FACILITIES UNLESS ADDITIONAL TEMPORARY FACILITIES ARE INSTALLED PRIOR TO ACCEPTOR FOR THE PROJECT. AS COMPLETE, ALL PERMANENT STORMWATER FACILITIES USED DURING CONSTRUCTION SHALL BE RESTORED TO OPERATE IN THEIR DESIGNED CONDITION AT NO ADDITIONAL COST TO THE PROJECT.
2. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN TEMPORARY SOIL EROSION CONTROL MEASURES PER P.A. 451 AS AMENDED. WITH THE USE OF SILT FENCE AND OTHER TEMPORARY MEASURES THE CONTRACTOR SHALL PROTECT THE ADJACENT AREA FROM ACCELERATED EROSION AND SEDIMENTATION FLOWS RESULTING FROM CONSTRUCTION. THE CONTRACTOR SHALL INSTALL ADDITIONAL TEMPORARY AND PERMANENT SOIL EROSION CONTROL MEASURES, IF DIRECTED BY THE ENGINEER OR SOIL EROSION CONTROL OFFICER, AT NO ADDITIONAL COST TO THE PROJECT.
3. SHOULD ADDITIONAL SOIL EROSION CONTROL MEASURES BE DETERMINED TO BE NECESSARY BY EITHER THE SOIL EROSION CONTROL OFFICER OR THE OWNER'S ENGINEER THEY SHALL BE IN PLACE NO LATER THAN 24 HOURS FROM THE TIME OF NOTIFICATION TO THE GENERAL CONTRACTOR FOR THE PROJECT. IF NOT PLACED IN 24 HOURS OR LESS ALL ON SITE CONSTRUCTION WILL BE HALTED UNTIL SUCH MEASURES ARE INSTALLED AND APPROVED BY EITHER THE SOIL EROSION CONTROL OFFICER OR THE OWNER'S ENGINEER.
4. ALL DISTURBED NON-HARD SURFACE AREAS TO BE STABILIZED WITH TOPSOIL, SEEDING, FERTILIZED AND MULCHED. DISTURBED AREAS SHALL BE TOPSOILED TO A DEPTH NOT LESS THAN FOUR (4) INCHES. SLOPES WHICH ARE BETWEEN 3:1 AND 2:1 GRADE AND ARE GOOD OR BETTER OR RECEIVE SEEDING IN COMBINATION WITH DOUBLE NET, BIODEGRADABLE EROSION CONTROL BLANKET (EXCEL CO-4 OR EQUAL), IN NO CASE SHALL CONSTRUCTED SLOPES IN EXCESS OF 2:1 BE ALLOWED ON THE PROJECT. ALL SLOPES GREATER THAN 3:1 GRADE AND SUBJECT TO CONCENTRATED FLOWS SHALL RECEIVE PERMANENT TURF REINFORCING MATTING (EXCEL PPS-10 OR EQUAL). INSTALLATION OF EROSION CONTROL BLANKETS AND TURF REINFORCING MATS SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS. STORMWATER CHANNELS AND BASINS SHALL BE TREATED ACCORDING TO THE DESIGNATION ON THE PLANS AND DETAILS.
5. CONTRACTOR SHALL STABILIZE DISTURBED EARTH IMMEDIATELY UPON ESTABLISHMENT OF FINAL GRADE AND SHALL BE SOLELY RESPONSIBLE FOR ESTABLISHMENT OF A HEALTHY STAND OF GRASS PRIOR TO THE ONSET OF COLD WEATHER. ALL PERMANENT SOIL EROSION CONTROL MEASURES SHALL BE IN PLACE WITHIN 5 DAYS OF COMPLETION OF EARTH CHANGES.
6. ALL NEW STORM DRAINAGE PIPE SHALL BE CORRUGATED GALVANIZED STEEL PIPE, SMOOTH LINED CORRUGATED HDPE (DPE) OR APPROVED EQUAL. A MINIMUM OF TWO (2) FEET OF COVER FROM FINISHED ELEVATIONS SHALL BE MAINTAINED OVER ALL STORM DRAIN PIPES.
7. ALL DRAINAGE PIPES THAT OUTLET AT GROUND SURFACE SHALL INCLUDE END SECTIONS.
8. ALL EXISTING STORM DRAINS WITHIN THE CONSTRUCTION ZONE TO BE INSTALLED/MONITORED WITH SILT SACKS. SACKS TO BE PULLED AS NEEDED TO KEEP SEDIMENT OUT.
10. EXISTING STORM DRAINAGE DITCHES SHALL BE REBUILT IF FILLED IN OR REMOVED DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE TO REPAIR OR REPLACE, AS REQUIRED, ALL DRAINAGE CULVERTS DAMAGED DURING CONSTRUCTION AND SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.
11. THE CONTRACTOR SHALL REMOVE ALL SEDIMENT OR SOILS THAT HAVE BEEN DROPPED, WASHED ONTO OR TRACKED OUT ONTO PUBLIC RIGHT-OF-WAY OR PRIVATE ROADS AT THE END OF EACH WORKING DAY OR AFTER EACH RAIN EVENT ON NON-WORK DAYS.
12. ALL REMOVED TOPSOIL WILL BE STOCKPILED WITHIN THE PROJECT AREA. IF ADDITIONAL TOPSOIL IS AVAILABLE AFTER TOPSOILING THE CONSTRUCTION AREA, IT WILL BE STOCKPILED WITHIN 1000 FEET OF THE CONSTRUCTION AREA AS DIRECTED BY THE OWNER OR ENGINEER.
13. THE CONTRACTOR SHALL REPAIR ALL WASHOUTS AND EROSION DURING THE GUARANTEE PERIOD OF ONE (1) YEAR AT NO ADDITIONAL COST TO THE OWNER.
14. IF REQUESTED BY THE ENGINEER OR SOIL EROSION CONTROL OFFICER, A WATER TRUCK SHALL BE KEPT ON STANDBY ON SITE DURING THE CONSTRUCTION PHASE OF THE PROJECT. THE WATER TRUCK SHALL BE USED AS DIRECTED BY THE ENGINEER OR SOIL EROSION CONTROL OFFICER TO CONTROL DUST AND WIND EROSION.

STORMWATER CONTROL:

A STORM WATER DRAINAGE STUDY OF THE EXISTING AND PROPOSED DEVELOPED CONDITIONS FOR THIS SITE HAS BEEN PERFORMED USING THE METHOD AND HYDROCAD VERSION 10. STORM WATER CONTROL FACILITIES HAVE BEEN DESIGNED TO MEET THE GARFIELD TOWNSHIP STORM WATER CONTROL ORDINANCE - PER THAT CODE:

- RUNOFF GENERATED FROM SITE IMPROVEMENTS IS RETAINED ON SITE IN RETENTION/INFILTRATION BASINS DESIGNED TO LIMIT OUTFLOW < 0.13 CFS PER ACRE FOR A 25 YEAR, 24HR STORM EVENT:

DEVELOPED AREA: 21.10 ACRE • 0.13 = 2.743 CFS ALLOWED
DESIGN OUTFLOW 25 YR, 24 HR EVENT: 2.28 CFS

- THE STORAGE VOLUME PROVIDED EXCEEDS REQUIREMENTS:

PREDEVELOPED 2 YEAR RUNOFF: 0.005af
DEVELOPED 25 YEAR GENERATED RUNOFF: 2.156af
DEVELOPED 25 YEAR INFILTRATION: -1.175af
STORAGE REQUIRED(0.981-0.005):0.976af
STORAGE PROVIDED: 1.55 af

- BASIN SLOPES DO NOT EXCEED 3:1, NO SLOPES EXCEEDING 2:1
- SNOW STORAGE AREAS ARE INDICATED ON PLAN
- CHECK DAMS ARE PROVIDED AT DITCH LOCATIONS WITH ANTICIPATED FLOWS > 4F/5 AND EROSION CONTROL BLANKETS ARE SPECIFIED
- THE STORMWATER FACILITIES ARE DESIGNED TO SAFELY PASS A 100 YEAR, 24HR STORM EVENT WITHOUT INCREASING DOWNSTREAM FLOODING.
- BASINS ARE DESIGNED TO DRAIN THROUGH INFILTRATION WITHIN 72 HOURS

BASIN B1 RETENTION/INFILTRATION

TOP OF BASIN: EL = 634.55
BOTTOM OF BASIN: EL = 732.00
2W X 5L LEVEL STABILIZED OVERFLOW WEIR: EL = 634.05
50 LF OF 24" CPE OUTLET @ 1% TO BASIN B2B
END SECTIONS 2 SIDES
100 YEAR HW ELEV.: EL = 734.18
VOLUME PROVIDED: 3,866 CF

BASIN B2A SEDIMENT FOREBAY

TOP OF BASIN: EL = 637.00
BOTTOM OF BASIN: EL = 734.00
8W X 5L LEVEL STABILIZED OVERFLOW WEIR: EL = 636.50
5W ACCESS PATH TO OVERFLOW
100 YEAR HW ELEV.: EL 736.87
VOLUME PROVIDED: 5,614 CF

BASIN B2B RETENTION/INFILTRATION

TOP OF BASIN: EL = 734.55
BOTTOM OF BASIN: EL = 729.50
5W X 5L LEVEL STABILIZED OVERFLOW WEIR: EL = 733.55
24LF OF 15" CPE OUTLET @ 1% W/ OUTLET CONTROL STRUCTURE ON INLET
END SECTION ON OUTLET
10" VERT ORIFICE: FL = 732.32
24" OF GRATED OVERFLOW RISER: FL = 732.30
100 YEAR HW ELEV.: EL = 733.89
VOLUME PROVIDED: 10,364 CF

BASIN B3 RETENTION/INFILTRATION

TOP OF BASIN: EL = 742.00
BOTTOM OF BASIN: EL = 738.00
50 LF OF 15" CPE OUTLET @ 1% END SECTIONS 2 SIDES
100 YEAR HW ELEV.: EL = 741.58
VOLUME PROVIDED: 8,597 CF

BASIN B4 RETENTION/INFILTRATION

TOP OF BASIN: EL = 768.50
BOTTOM OF BASIN: EL = 766.00
20W X 6L STABILIZED LEVEL SPREADER OUTLET OVERFLOW WEIR: EL = 768.25
5W ACCESS PATH TO OVERFLOW
100 YEAR HW ELEV.: EL 736.87
VOLUME PROVIDED: 5,614 CF

BASIN B5 RETENTION/INFILTRATION

TOP OF BASIN: EL = 778.00
BOTTOM OF BASIN: EL = 771.92
50 LF OF 18" CPE OUTLET @ 1% END SECTIONS 2 SIDES
100 YEAR HW ELEV.: EL = 775.71
VOLUME PROVIDED: 2,846 CF

STORM OUTLET & INLET PROTECTION

INLETS: 4W X 4L - ANGULAR STONE @50 - 33X.75 DEEP OVER NON-WOVEN GEOTEXTILE FABRIC
OUTLETS: 4W X 8L - ANGULAR STONE @50 - 33X.75 DEEP OVER NON-WOVEN GEOTEXTILE FABRIC

ROAD CONSTRUCTION NOTES

1. ALL WORK PERFORMED AND ALL MATERIALS SUPPLIED SHALL BE IN ACCORDANCE WITH THE CURRENT M.D.O.T. STANDARD SPECIFICATIONS AND CURRENT GRAND TRAVERSE COUNTY ROAD COMMISSION STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE INDICATED ON THE PLANS AND CONTRACT DOCUMENTS. THE CONTRACTOR IS REQUIRED TO FAMILIARIZE HIMSELF/HERSELF WITH THESE SPECIFICATIONS.
2. THE ENGINEER SHALL BE NOTIFIED AT LEAST 24 HOURS PRIOR TO BITUMINOUS PAVING.
3. THE PREPARED SUBBASE MUST BE TESTED AND APPROVED PRIOR TO PLACEMENT OF BASE.
4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT THE GRAVEL TO BE USED ON THIS PROJECT IS APPROVED PRIOR TO PLACEMENT.
5. THE PREPARED GRAVEL WIDTH, DEPTH, AND COMPACTION MUST BE REVIEWED AND APPROVED BY THE OWNERS ENGINEER PRIOR TO BITUMINOUS PAVING.
6. ALL CONSTRUCTION SIGNING SHALL MEET M.M.U.T.C.D. STANDARDS.
7. THROUGH TRAFFIC ON CONNECTING ROADS MUST BE MAINTAINED AT ALL TIMES. ANY LANE CLOSURE MUST BE APPROVED BY THE GRAND TRAVERSE COUNTY ROAD COMMISSION AT NO ADDITIONAL COST TO THE PROJECT.
9. ALL PAVEMENT CUTS ARE TO BE MADE WITH SAW, IMMEDIATELY PRIOR TO PAVING.
10. THE CONTRACTOR SHALL NOTIFY RESIDENTS 24 HOURS (EXCLUDING SATURDAYS AND SUNDAYS) IN ADVANCE OF DISRUPTION TO SERVICE, SUCH AS DRIVEWAY CLOSING.
12. PAVEMENT MARKING SHALL MEET M.D.O.T. SPECIFICATION AND STANDARDS.

- BLUES: DEVELOPED
- GREENS: WOODED
- TANS: MEADOW/RANGE
- GRAYS: PAVED/GRAVEL

STORMWATER FACILITY MAINTENANCE NOTE:
IT IS UNDERSTOOD BY ALL PARTIES INVOLVED THAT THE DETENTION BASINS WILL BE MAINTAINED BY THE PROPERTY OWNER (MOVED, SEDIMENT REMOVAL, ETC.) AND WILL BE SUBJECT TO REVIEW BY GOVERNING AGENCIES. NO ALTERATION MAY BE PERFORMED ON THE BASINS WITHOUT ENGINEERING APPROVAL ONCE THE BASIN HAS BEEN ACCEPTED AS CORRECTLY BUILT BY THE DESIGN ENGINEER.

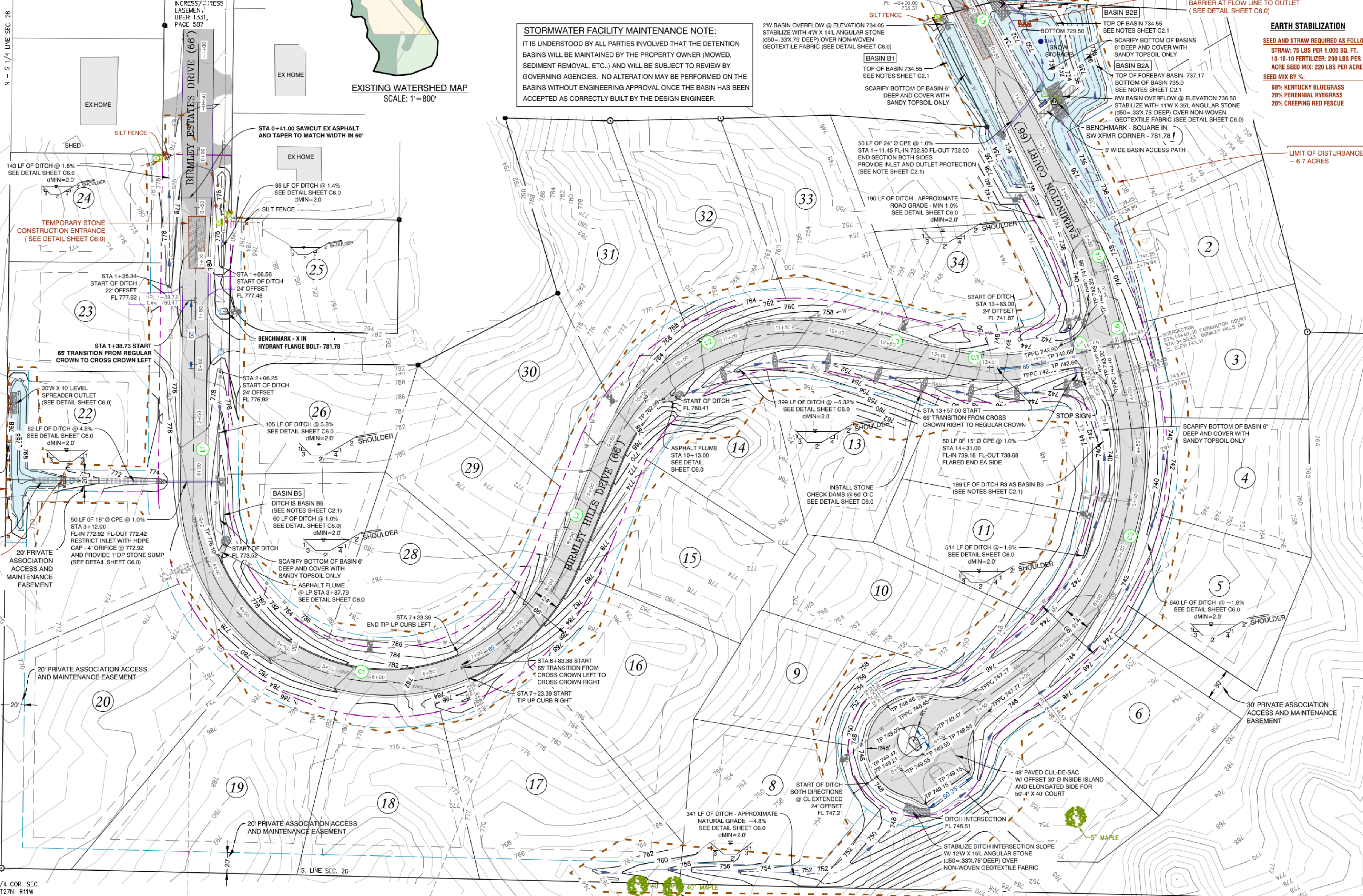
DEVELOPED AREA SCALE: 1"=300'

EXISTING WATERSHED MAP SCALE: 1"=800'

N = S 1/4 COR. SEC. 26

S. LINE SEC. 26

S. 1/4 COR. SEC. 26, T27N, R11W FND CO. MONUMENT



SOILS
SOIL EVALUATION AT APPROXIMATE BASIN LOCATION CONDUCTED BY BOYNE ENGINEERING AND DESIGN - CARRIE MAY, PE ON JULY 1, 2022
TH-1
0"-5" SANDY TOPSOIL
5"-36" MEDIUM GRAINED SAND
36"-72" MEDIUM GRAINED SAND-LOAMY SAND
WELL-DRAINED NO GROUNDWATER ENCOUNTERED

GRAPHIC SCALE: 1 inch = 50 feet
0 25 50 100 150

LEGEND

PROPERTY LINE	---
LOT LINE	---
SETBACK	---
EASEMENT	---
RIGHT OF WAY	---
PROPOSED ROADWAY CENTER	---
EDGE OF PAVEMENT	---
STORMWATER FLOW	---
EXISTING 10' CONTOUR LINE	---
EXISTING 2' CONTOUR LINE	---
PROPOSED 10' CONTOUR LINE	---
PROPOSED 2' CONTOUR LINE	---
TREE LINE	---
LIMIT OF DISTURBANCE	---
EX PAVING / GRAVEL	---
SILT FENCING	---
STORMWATER BASIN	---
SOIL BORING	---
BENCHMARK	---

EARTH STABILIZATION
SEED AND STRAW REQUIRED AS FOLLOWS:
STRAW: 75 LBS PER 1,000 SQ. FT.
10-10-10 FERTILIZER: 200 LBS PER ACRE
SEED MIX BY %:
60% KENTUCKY BLUEGRASS
20% PERENNIAL RYEGRASS
20% CREEPING RED FESCUE

BOYNE ENGINEERING AND DESIGN
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BIRMINGHAM HILLS SITE CONDOMINIUM
PREPARED FOR:
T&R INVESTMENTS
841 Ashland Drive
Traverse City, MI

REVISIONS

NO.	DATE	APP'D	ISSUE / REVISION DESCRIPTION

OVERALL SITE GRADING AND DRAINAGE PLAN

ORIGINAL ISSUE DATE: 09/21/2022
SCALE: 1"=50'
BED JOB NO. 22016
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C2.1

WATERMAIN NOTES

- ALL CONSTRUCTION MATERIALS AND PROCEDURES MUST CONFORM WITH CURRENT DPW STANDARDS, SPECIFICATIONS AND DETAILS.
- THE CONTRACTOR SHALL NOTIFY THE ENGINEER 48 HOURS PRIOR TO THE START OF CONSTRUCTION OF THE WATER MAIN. CONTRACTOR SHALL ISSUE A WORK SCHEDULE TO THE ENGINEER PRIOR TO THE START OF WATER MAIN CONSTRUCTION.
- ALL WATER MAIN SHALL BE DR 14 C900 PVC MEETING CURRENT AWWA STANDARDS.
- WATER MAIN SHALL HAVE A MINIMUM OF SIX (6) FEET OF COVER BELOW EXISTING OR PROPOSED GRADE, UNLESS NOTED OTHERWISE ON THE PLANS.
- THE ALIGNMENT OF THE PROPOSED WATER MAIN IS PROVIDED FOR REFERENCE ONLY. CONTRACTOR MAY DEViate/DEFLECT AS NECESSARY TO AVOID CONFLICTS FOR EASIER CONSTRUCTION. COST FOR ADDITIONAL PIPE, FITTINGS, ETC. ARE INCLUDED IN THE COST OF THE PROJECT.
- LENGTH OF WATER MAIN SHALL BE DETERMINED ON A CASE BY CASE BASIS IN ORDER TO CONSTRUCT ACCORDING TO THE PLANS AND SPECIFICATIONS. COSTS FOR THE MAIN ARE INCLUDED IN THE COSTS OF THE PROJECT.
- RETAINER GLANDS SHALL BE USED ON ALL MECHANICAL JOINT FITTINGS.
- BURLAP, PLASTIC OR POLY (20 MILLS) OR APPROVED EQUAL SHALL BE PLACED BETWEEN THE CONCRETE THRUST BLOCK AND DEAD-END MAINS OR DEAD-END PLUGS, TEES, HYDRANTS AND CROSSES TO FACILITATE THE REMOVAL OF THE THRUST BLOCK FOR FUTURE EXTENSION AND MAINTENANCE.
- A PHYSICAL GAP SHALL BE MAINTAINED BETWEEN THE PROPOSED WATER MAIN AND THE EXISTING WATER MAIN UNTIL ALL WATER MAIN TESTING HAS BEEN COMPLETED AND APPROVED BY THE ENGINEER AND THE DPW.
- THE CONTRACTOR SHALL COORDINATE THE CONNECTION TO THE EXISTING WATER MAIN WITH THE DPW AND THE ENGINEER. THE DPW SHALL BE GIVEN A MINIMUM OF 24 HOURS NOTICE PRIOR TO ANY CONNECTIONS.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN WATER FOR FLUSHING AND TESTING PURPOSES. CONTRACTOR SHALL COORDINATE WITH THE DPW, IF WATER IS OBTAINED FROM THE CITY/VILLAGE/TOWNSHIP WATER SYSTEM, THE DPW SHALL BE GIVEN 24 HOURS NOTICE PRIOR TO USING ANY WATER FROM THE TOWNSHIP WATER SYSTEM.
- TO FACILITATE WATER SAMPLING, THE CONTRACTOR MAY INSTALL TWO (2) INCH CORPORATION STOPS AND TYPE K COPPER TUBE FROM THE TWO (2) INCH CORPORATION TO APPROXIMATELY FOUR (4) FEET ABOVE THE FINISH GRADE IN LOCATIONS APPROVED BY THE FIELD ENGINEER. AFTER THE WATER MAIN HAS BEEN FLUSHED AND SATISFACTORY BACTERIOLOGICAL ANALYSIS TESTS HAVE PASSED, THE TYPE "K" COPPER TUBE SHALL BE REMOVED AND THE TWO (2) INCH CORPORATION WILL BE CLOSED. CONTRACTOR WILL INFORM THE FIELD REPRESENTATIVE/CONSTRUCTION REPRESENTATIVE TO ALLOW HIM TO WITNESS THE REMOVING OF THE COPPER TUBING AND THE CLOSING OF THE CORPORATION.
- PRIOR TO PIGGING AND FLUSHING ALL LINES SHALL BE CHARGED WITH WATER.
- ALL PERMANENT BLOW-OFF ASSEMBLIES SHALL BE CUT OFF BELOW GRADE AFTER TESTING IS COMPLETE. THE STANDING WATER WITHIN THE BLOW-OFF SHALL BE PUMPED OUT OF THE RISER CAPPED, BOLTED AND BURIED.
- CONTRACTOR SHALL PROPERLY DISPOSE OF CHLORINATED WATER USED IN TESTING OPERATIONS.
- ACTUAL WATER MAIN, HYDRANT AND GATE VALVE LOCATIONS SHALL BE FIELD STAKED PRIOR TO CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTING THE FIRE HYDRANTS AND VALVE BOXES TO THE FINISHED GRADE.
- THE CONTRACTOR MUST OBTAIN APPROVAL BEFORE DIRECTING ANY FLUSHING AND TESTING WATERS TO ANY COUNTY STORM WATER DRAINAGE DITCH SYSTEM. CONTRACTOR SHALL PROTECT THE DITCH FROM EROSION WHICH MAY REQUIRE THE USE AN ENERGY DISSIPATER ON THE DISCHARGE OF THE FLUSHING VALVE. ALL FLUSHING WATERS SHALL BE CONTAINED WITHIN THE DITCH AND SHALL NOT IMPACT THE ROADWAY OR ADJACENT LANDOWNERS. IF NOT APPROVED, AN ALTERNATE METHOD MUST BE DETERMINED AND APPROVED. ALL COSTS ASSOCIATED WITH FLUSHING, TESTING, AND DISCHARGING ARE INCLUDED IN THE COST OF THE PROJECT.
- WATER SERVICE LEADS SHOWN ARE FOR REFERENCE ONLY. ACTUAL LOCATIONS SHALL BE DETERMINED BY THE DPW AND ENGINEER PRIOR TO PLACEMENT, IF APPLICABLE.
- CONTRACTOR MUST MAINTAIN A MINIMUM HORIZONTAL SEPARATION OF TEN (10) FEET FROM ALL SANITARY SEWER AND STORM SEWER WHEN INSTALLING THE WATER MAIN, AS MEASURED FROM OUTSIDE TO OUTSIDE.
- CONTRACTOR MUST MAINTAIN A MINIMUM VERTICAL SEPARATION OF EIGHTEEN (18) INCHES AT ALL SANITARY SEWER AND STORM SEWER CROSSINGS WHEN INSTALLING THE WATER MAIN, AS MEASURED FROM OUTSIDE TO OUTSIDE.
- IT WILL BE REQUIRED THAT THE CONTRACTOR INSTALL ALL NEW WATER MAIN BELOW EXISTING WATER MAIN WHEN A CROSSING IS ENCOUNTERED. MAINTAIN A MINIMUM SIX (6) INCH SEPARATION FROM EXISTING WATER MAIN WITH PROPER BACKFILL/COMPACTION.
- FIRE HYDRANT ASSEMBLY SHALL CONSIST OF:
1-8"x6" TEE OR 1-8"x6" REDUCER
1-6" GATE VALVE
1-FIRE HYDRANT
- CONTRACTOR TO MAINTAIN WATER SERVICE TO CUSTOMERS AT ALL TIME WITH THE EXCEPTION OF LEAD TRANSFERS, IF APPLICABLE.
- CONTRACTOR TO PROTECT EXISTING WATER MAIN AND SERVICES DURING THE INSTALLATION OF THE PROPOSED WATER MAIN. IF EXISTING WATER MAIN IS DAMAGED, CONTRACTOR IS TO REPAIR TO MAINTAIN SERVICE TO RESIDENCE. ALL COST FOR THIS ARE INCLUDED IN THE COST OF THE PROJECT.
- ALL OPERATIONS OF EXISTING EQUIPMENT, VALVES, ETC. TO BE PERFORMED BY THE DPW STAFF ONLY.
- CONTRACTOR TO SUBMIT A CONSTRUCTION SCHEDULE AND SEQUENCE FOR APPROVAL PRIOR TO PERFORMING ANY WORK.

SANITARY SEWER/FORCE MAIN NOTES

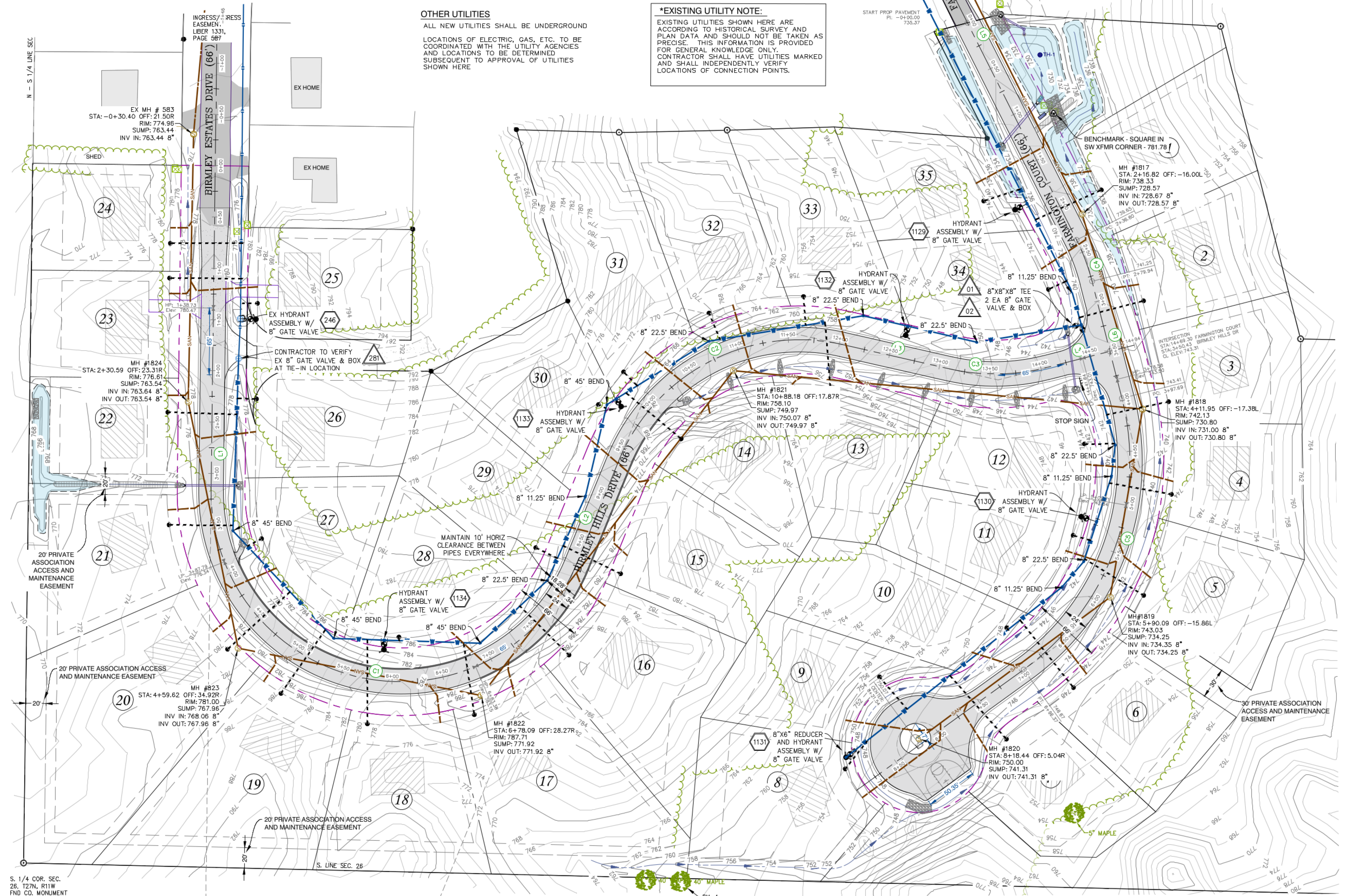
- ALL CONSTRUCTION MATERIALS AND PROCEDURES MUST CONFORM WITH CURRENT DPW STANDARDS, SPECIFICATIONS AND DETAILS.
- ALL SANITARY SEWER SHALL BE SDR-35 PVC UNLESS DEEPER THAN 16 FT. SANITARY SEWER DEEPER THAN 16 FT SHALL BE SDR-26 AND MEET THE ASTM D 3034 REQUIREMENTS UNLESS OTHERWISE NOTED.
- THE CONTRACTOR SHALL NOTIFY THE ENGINEER 48 HOURS PRIOR TO THE START OF CONSTRUCTION OF THE SANITARY SEWER. CONTRACTOR SHALL ISSUE A WORK SCHEDULE TO THE ENGINEER PRIOR TO THE START OF SANITARY SEWER CONSTRUCTION.
- NO CONNECTION RECEIVING STORM WATER OR GROUND WATER SHALL BE MADE TO SANITARY SEWERS.
- NO CONNECTION TO THE EXISTING SANITARY SEWER SHALL BE MADE UNTIL THE NEW SEWER HAS BEEN INSTALLED, TESTED, INSPECTED, AND APPROVED BY THE ENGINEER AND THE DPW.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTING THE MANHOLE RIMS TO THE FINISH GRADE ELEVATIONS. THE ELEVATIONS SHOWN ARE BASED UPON PLAN GRADES AND ARE SUBJECT TO CHANGE.
- THE ALIGNMENT OF THE PROPOSED SANITARY SEWER/FORCE MAIN IS SHOWN FOR REFERENCE ONLY. CONTRACTOR MAY DEViate/DEFLECT AS NECESSARY TO AVOID CONFLICTS FOR EASIER CONSTRUCTION. COSTS FOR ADDITIONAL PIPING, FITTINGS, ETC. SHALL BE INCLUDED IN THE COST OF THE PROJECT.
- CONTRACTOR MUST MAINTAIN A MINIMUM HORIZONTAL SEPARATION OF TEN (10) FEET FROM ALL WATER MAIN WHEN INSTALLING THE SANITARY SEWER/FORCE MAIN, AS MEASURED FROM OUTSIDE TO OUTSIDE.
- CONTRACTOR MUST MAINTAIN A MINIMUM VERTICAL SEPARATION OF EIGHTEEN (18) INCHES AT ALL WATER MAIN CROSSINGS WHEN INSTALLING THE SANITARY SEWER/FORCE MAIN, AS MEASURED FROM OUTSIDE TO OUTSIDE.
- CONTRACTOR SHALL MAINTAIN A MINIMUM FIVE (5) FEET OF COVER OVER GRAVITY SANITARY SEWER AND SIX (6) FEET OF COVER OVER FORCE MAIN.
- IF THE CONTRACTOR CREATES HIGH POINTS IN THE FORCE MAIN DUE TO CONSTRUCTION METHODS, THE CONTRACTOR IS TO INSTALL ADDITIONAL AIR RELEASE STRUCTURES, AS PER SPECIFICATIONS, AT NO ADDITIONAL COST TO THE PROJECT.
- CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING EXISTING SANITARY SEWER/FORCE MAIN PRIOR TO MAKING ANY CONNECTIONS.
- CONTRACTOR SHALL MAINTAIN SEWER FLOWS AT ALL TIMES. PUMPING AND HAULING MAY BE REQUIRED TO TRANSFER FLOWS TO NEW LIFT STATION DURING CONNECTION TO EXISTING SANITARY SEWER/FORCE MAIN. STATION EXPERIENCES PEAK HOUR FLOWS UP TO XXX GPM AND EXISTING WET WELL HAS AVAILABLE HOLDING CAPACITY OF XXXX GALLONS. CONTRACTOR MUST VERIFY RATES. ALL COSTS FOR HAULING/TRANSFERING FLOWS ARE TO BE INCLUDED IN THE COST OF THE PROJECT.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING ANY BY-PASS PUMPING AT NO ADDITIONAL COST TO PROJECT. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR HAVING A BACKUP METHOD IN THE EVENT THE PRIMARY BY-PASS PUMPING METHOD FAILS.
- ALL WORK TO BE COORDINATED WITH THE DPW AND ENGINEER.
- CONTRACTOR TO SUBMIT A CONSTRUCTION SCHEDULE AND SEQUENCE FOR APPROVAL PRIOR TO PERFORMING ANY WORK.

OTHER UTILITIES

ALL NEW UTILITIES SHALL BE UNDERGROUND
LOCATIONS OF ELECTRIC, GAS, ETC. TO BE COORDINATED WITH THE UTILITY AGENCIES AND LOCATIONS TO BE DETERMINED SUBSEQUENT TO APPROVAL OF UTILITIES SHOWN HERE

***EXISTING UTILITY NOTE:**

EXISTING UTILITIES SHOWN HERE ARE ACCORDING TO HISTORICAL SURVEY AND PLAN DATA AND SHOULD NOT BE TAKEN AS PRECISE. THIS INFORMATION IS PROVIDED FOR GENERAL KNOWLEDGE ONLY. CONTRACTOR SHALL HAVE UTILITIES MARKED AND SHALL INDEPENDENTLY VERIFY LOCATIONS OF CONNECTION POINTS.



BOYNE ENGINEERING AND DESIGN
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BIRMLEY HILLS SITE CONDOMINIUM
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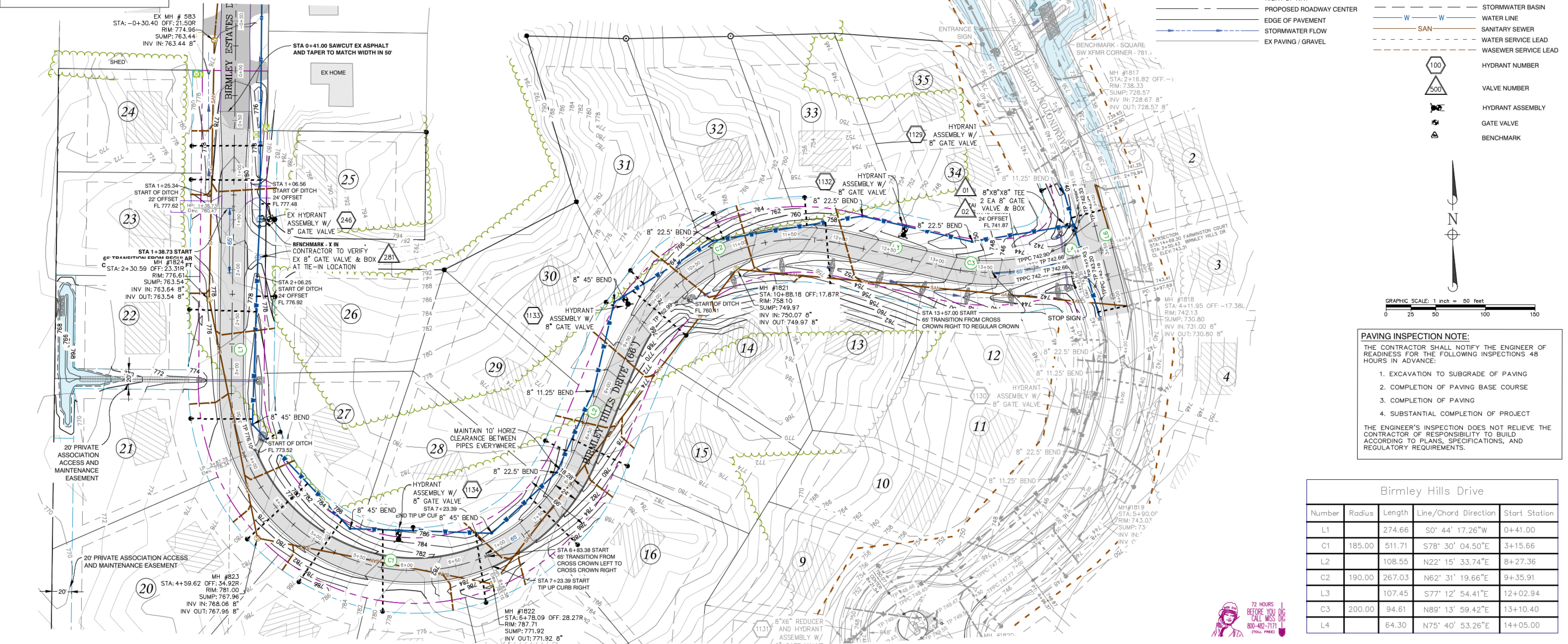
***EXISTING UTILITY NOTE:**
EXISTING UTILITIES SHOWN HERE ARE ACCORDING TO HISTORICAL SURVEY AND PLAN DATA AND SHOULD NOT BE TAKEN AS PRECISE. THIS INFORMATION IS PROVIDED FOR GENERAL KNOWLEDGE ONLY. CONTRACTOR SHALL HAVE UTILITIES MARKED AND SHALL INDEPENDENTLY VERIFY LOCATIONS OF CONNECTION POINTS.

ADDITIONAL NOTES:
SEE PLAN SHEETS FOR ADDITIONAL NOTES:
SHEET C0.0 - GENERAL NOTES
SHEET C2.1 - SITE GRADING AND DRAINAGE
SHEET C3.0 - UTILITIES

- LEGEND**
- 900 — EXISTING 10' CONTOUR LINE
 - 900 — EXISTING 2' CONTOUR LINE
 - 900 — PROPOSED 10' CONTOUR LINE
 - 900 — PROPOSED 2' CONTOUR LINE
 - TREE LINE
 - STORMWATER BASIN
 - WATER LINE
 - SANITARY SEWER
 - WATER SERVICE LEAD
 - WSEWER SERVICE LEAD
 - 100 — HYDRANT NUMBER
 - 500 — VALVE NUMBER
 - HYDRANT ASSEMBLY
 - GATE VALVE
 - BENCHMARK

BOYNE ENGINEERING AND DESIGN
P.O. Box 94
Bozette, MI 49727
(231) 499-8361
boayneengineering.com

BIRMLEY HILLS SITE CONDOMINIUM
PREPARED FOR:
T&R INVESTMENTS
841 Ashland Drive
Traverse City, MI

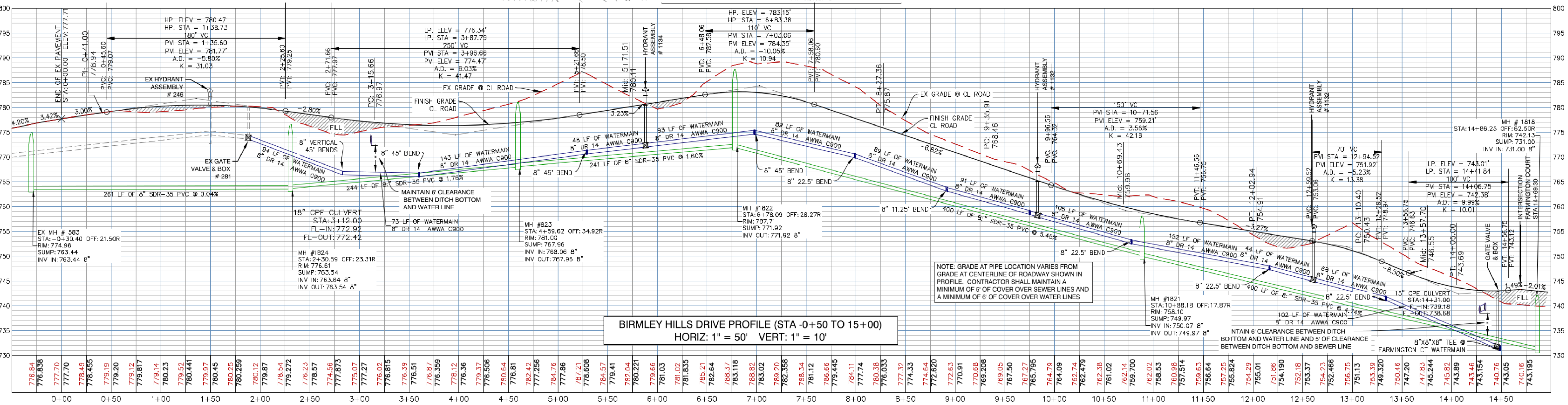


PAVING INSPECTION NOTE:
THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF READINESS FOR THE FOLLOWING INSPECTIONS 48 HOURS IN ADVANCE:

- EXCAVATION TO SUBGRADE OF PAVING
- COMPLETION OF PAVING BASE COURSE
- COMPLETION OF PAVING
- SUBSTANTIAL COMPLETION OF PROJECT

THE ENGINEER'S INSPECTION DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY TO BUILD ACCORDING TO PLANS, SPECIFICATIONS, AND REGULATORY REQUIREMENTS.

Birmley Hills Drive				
Number	Radius	Length	Line/Chord Direction	Start Station
L1		274.66	S0° 44' 17.26"W	0+41.00
C1	185.00	511.71	S78° 30' 04.50"E	3+15.66
L2		108.55	N22° 15' 33.74"E	8+27.36
C2	190.00	267.03	N62° 31' 19.66"E	9+35.91
L3		107.45	S77° 12' 54.41"E	12+02.94
C3	200.00	94.61	N89° 13' 59.42"E	13+10.40
L4		64.30	N75° 40' 53.26"E	14+05.00



BIRMLEY HILLS DRIVE PROFILE (STA -0+50 TO 15+00)
HORIZ: 1" = 50' VERT: 1" = 10'

REVISIONS

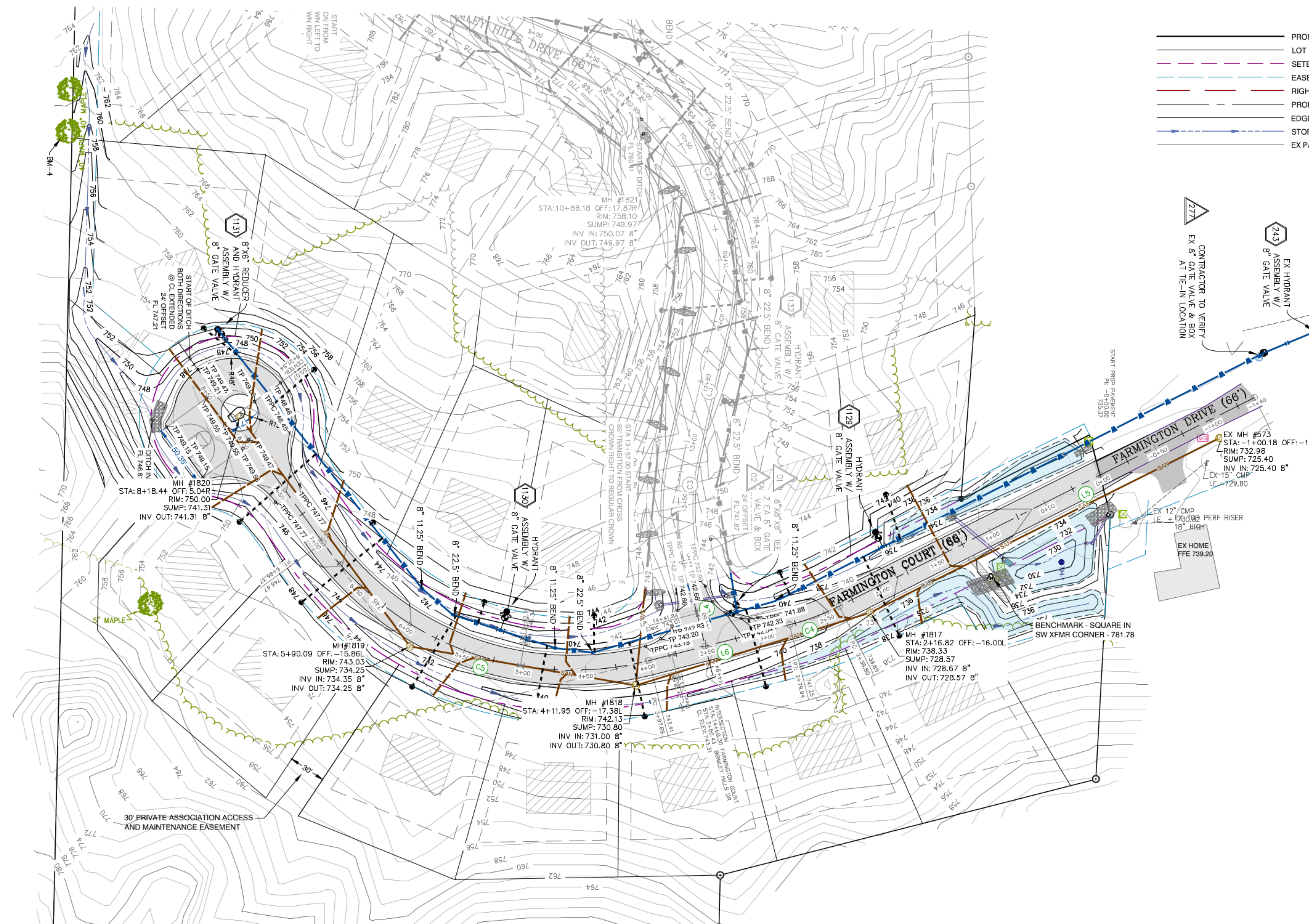
NO.	DATE	APPD.	ISSUE / REVISION DESCRIPTION

BIRMLEY HILLS DRIVE PLAN & PROFILE

ORIGINAL ISSUE DATE: 09/21/2022
SCALE: 1"=50'
BED JOB NO. 22016
DRAWING NUMBER **C4.0**

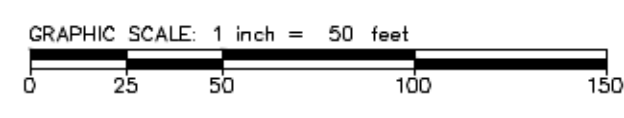
***EXISTING UTILITY NOTE:**
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ADDITIONAL NOTES:
 SEE PLAN SHEETS FOR ADDITIONAL NOTES: SHEET C0.0 - GENERAL NOTES SHEET C2.1 - SITE GRADING AND DRAINAGE SHEET C3.0 - UTILITIES



- LEGEND**
- PROPERTY LINE
 - LOT LINE
 - SETBACK
 - EASEMENT
 - RIGHT OF WAY
 - PROPOSED ROADWAY CENTER
 - EDGE OF PAVEMENT
 - STORMWATER FLOW
 - EX PAVING / GRAVEL
 - EXISTING 10' CONTOUR LINE
 - EXISTING 2' CONTOUR LINE
 - PROPOSED 10' CONTOUR LINE
 - PROPOSED 2' CONTOUR LINE
 - TREE LINE
 - STORMWATER BASIN
 - WATER LINE
 - SANITARY SEWER
 - WATER SERVICE LEAD
 - WASEWER SERVICE LEAD

- HYDRANT NUMBER
- VALVE NUMBER
- HYDRANT ASSEMBLY
- GATE VALVE
- BENCHMARK

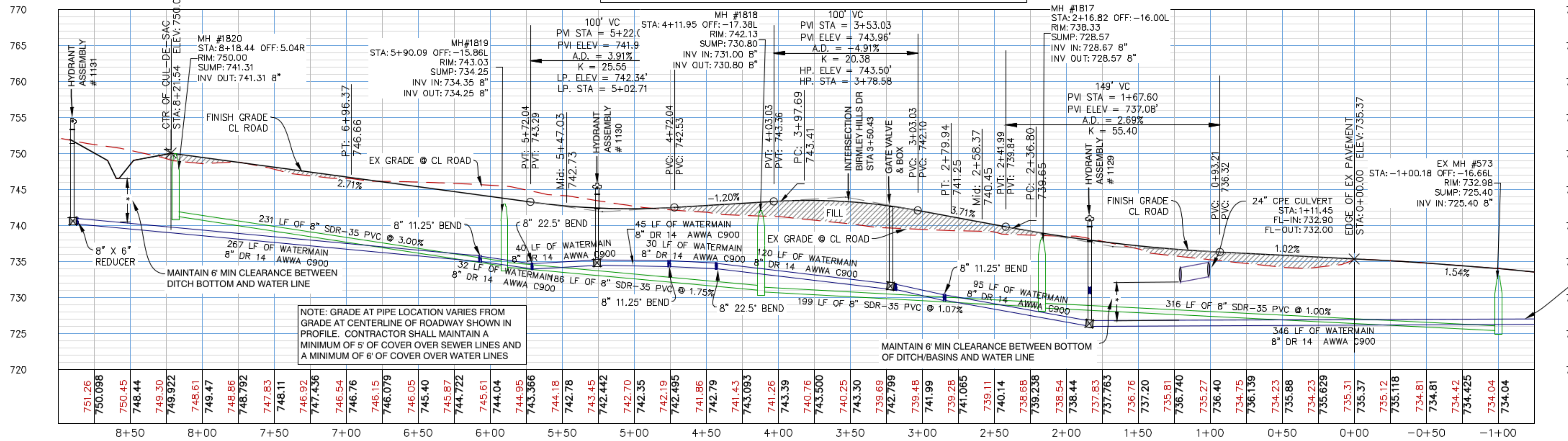


PAVING INSPECTION NOTE:
 THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF READINESS FOR THE FOLLOWING INSPECTIONS 48 HOURS IN ADVANCE:
 1. EXCAVATION TO SUBGRADE OF PAVING
 2. COMPLETION OF PAVING BASE COURSE
 3. COMPLETION OF PAVING
 4. SUBSTANTIAL COMPLETION OF PROJECT
 THE ENGINEER'S INSPECTION DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY TO BUILD ACCORDING TO PLANS, SPECIFICATIONS, AND REGULATORY REQUIREMENTS.

Farmington Court

Number	Radius	Length	Line/Chord Direction	Start Station
L5		236.80	S26° 40' 37.62"E	-0+00.00
C4	200.00	43.14	S20° 29' 52.18"E	2+36.80
L6		117.75	S14° 19' 06.74"E	2+79.94
C5	250.00	298.68	S19° 54' 26.80"W	3+47.69

FARMINGTON COURT PROFILE (STA -1+25 TO 8+90)
 HORIZ: 1" = 50' VERT: 1" = 10'



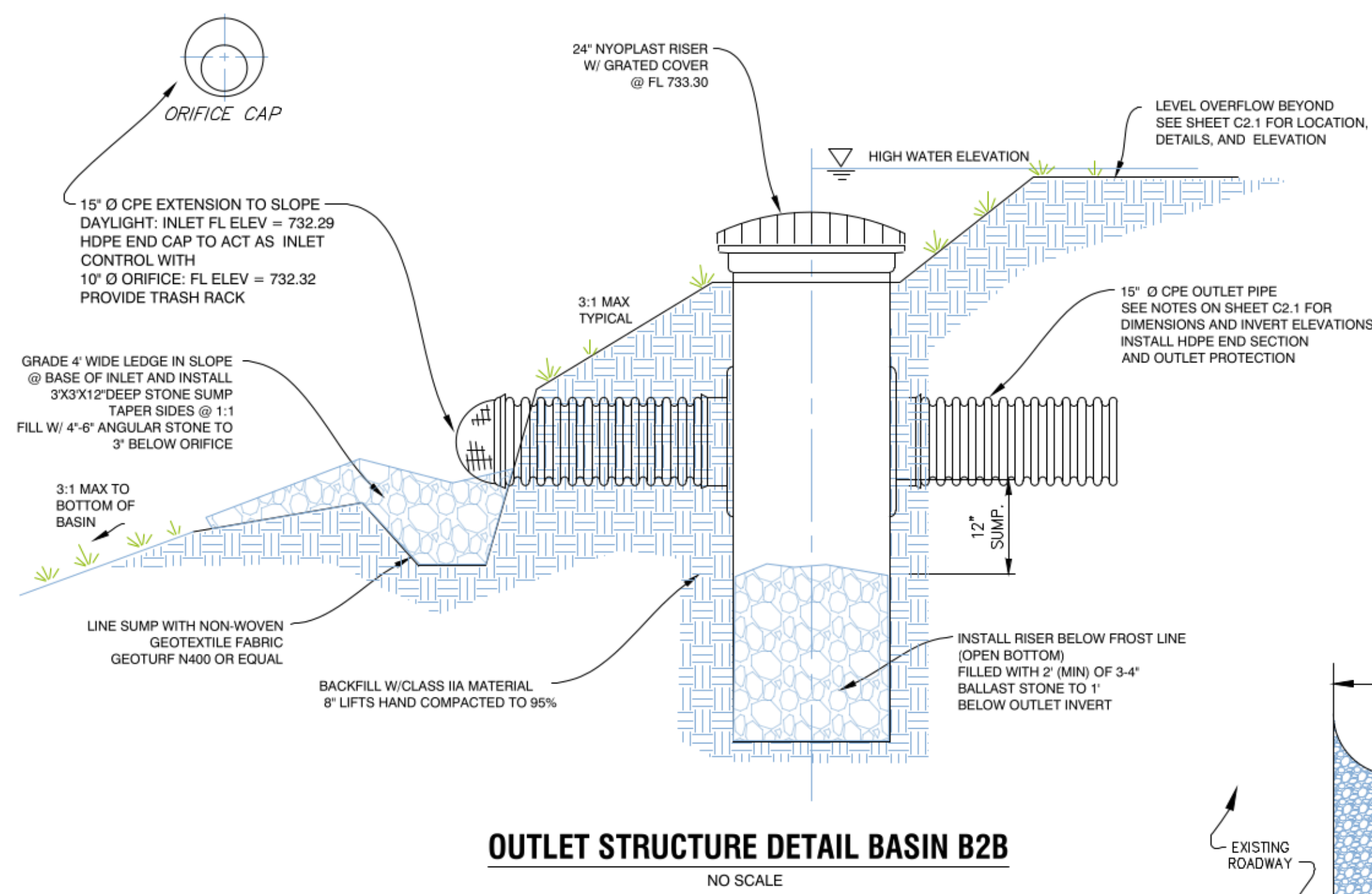
SEE PLAN FOR PIPE CONNECTION APPROXIMATELY 346LF FROM HYDRANT 1129
 CONTRACTOR TO VERIFY EX 8" GATE VALVE & BOX # 277 AT TIE-IN LOCATION

REVISIONS

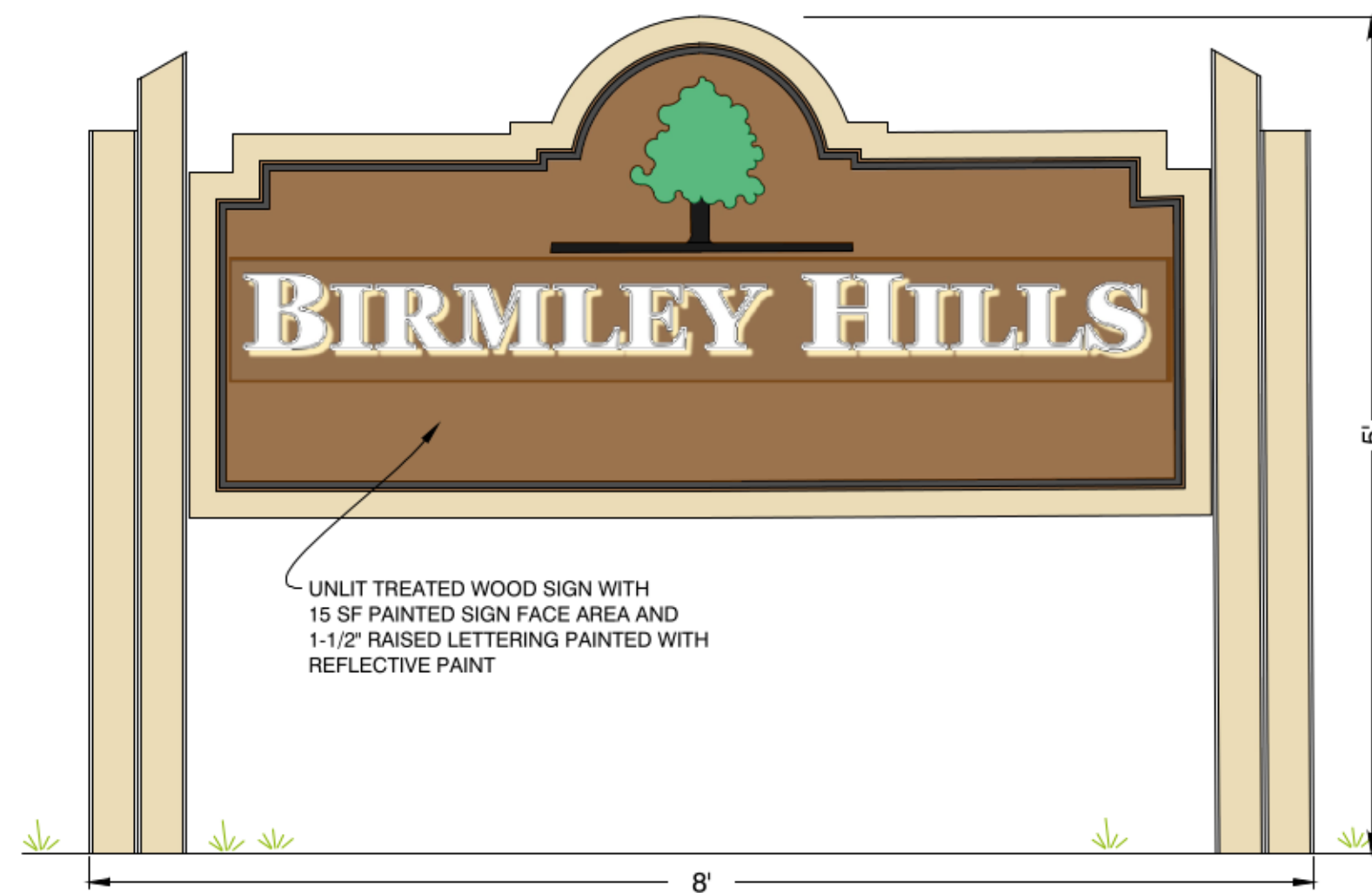
NO.	DATE	ISSUE / REVISION DESCRIPTION

**FARMINGTON COURT
 PLAN & PROFILE**

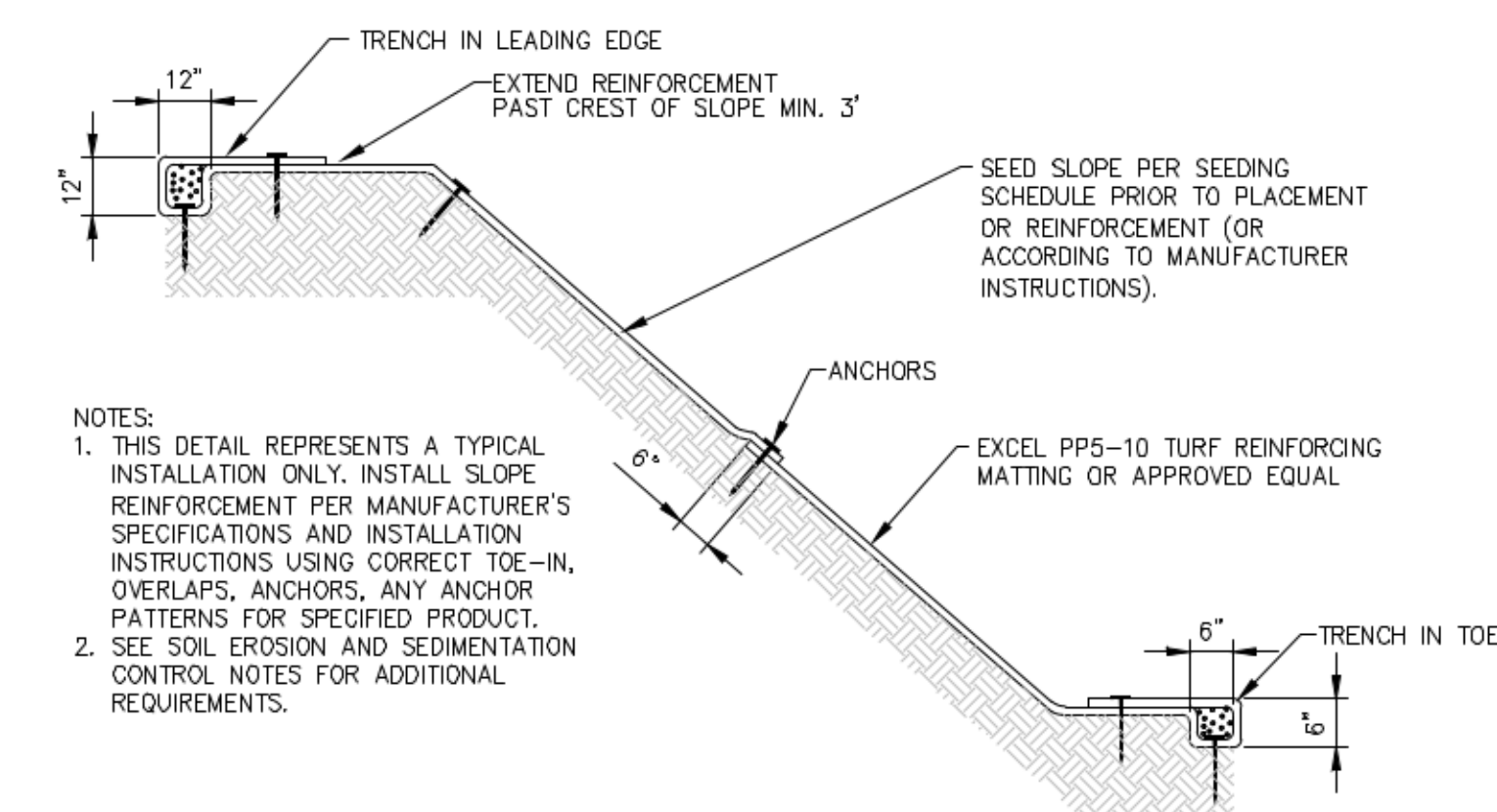




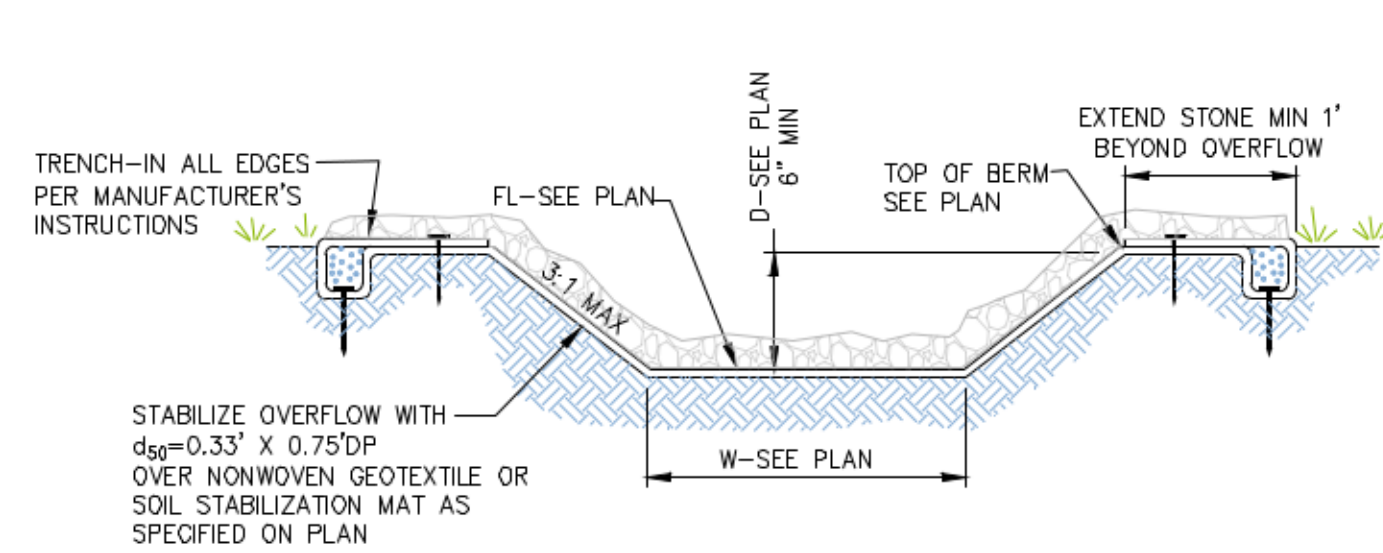
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NO SCALE



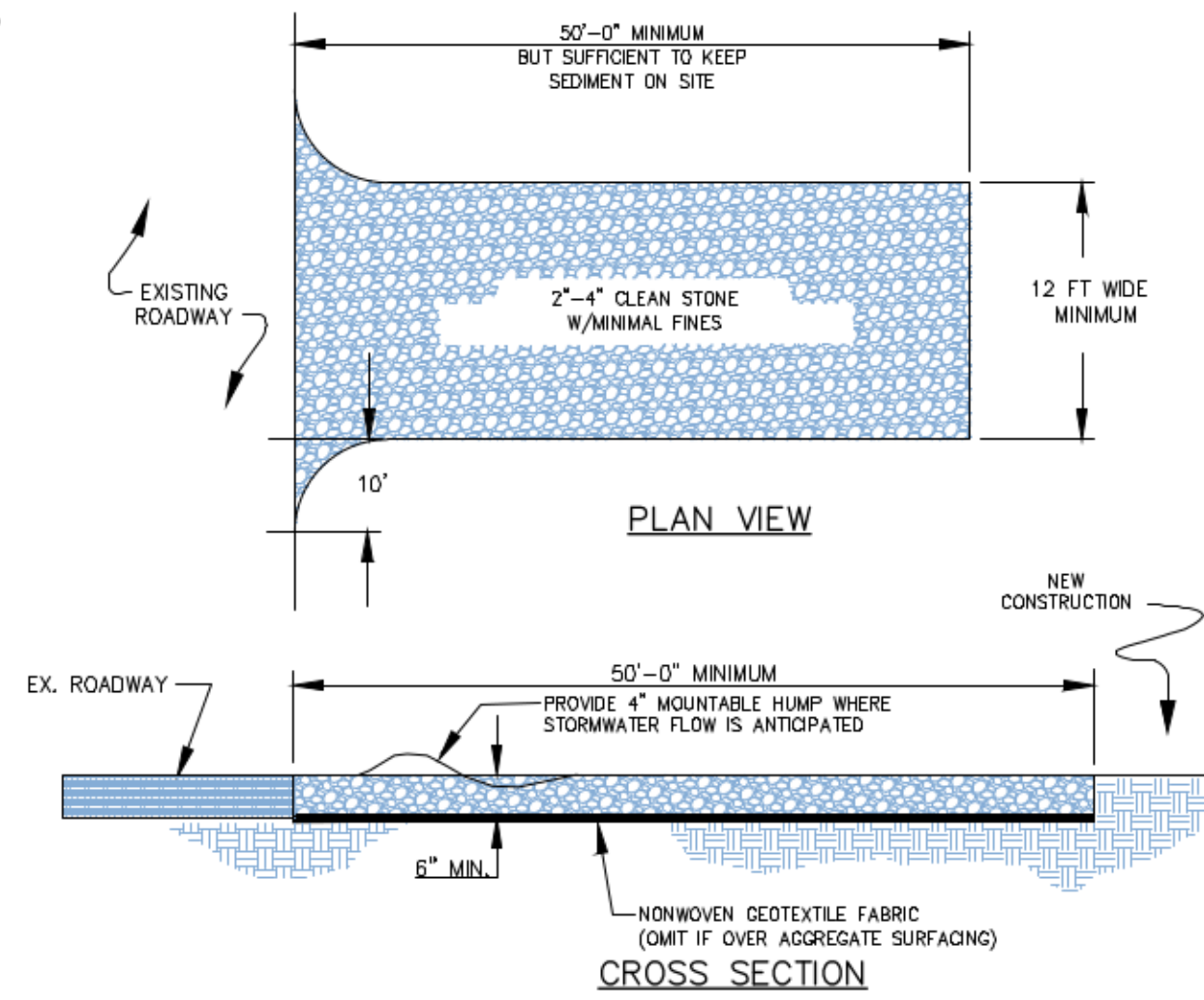
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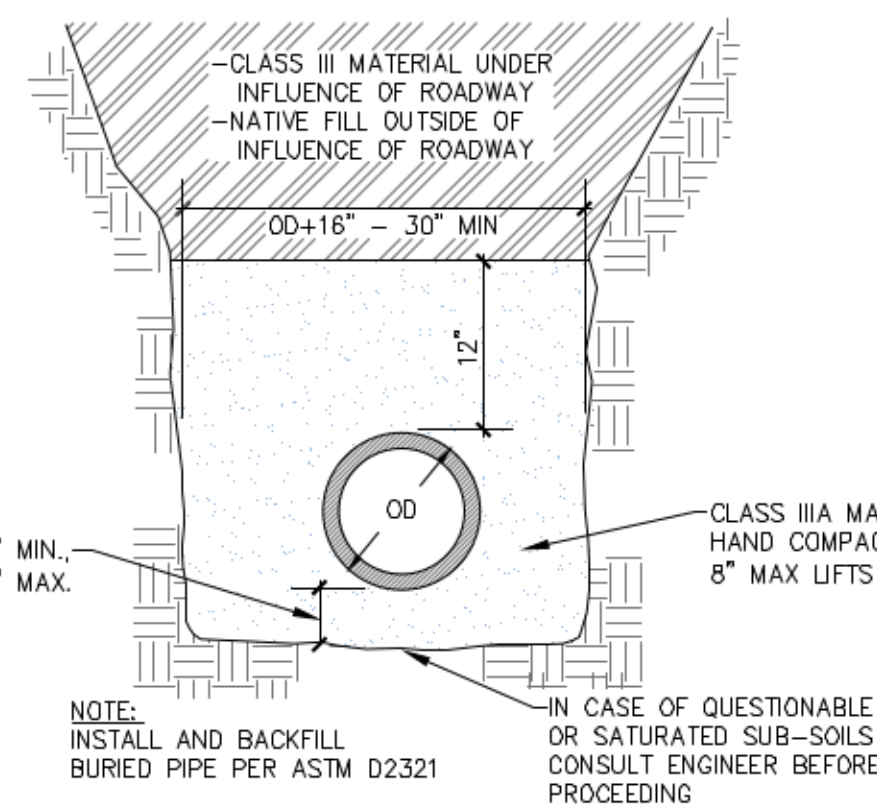
REINFORCEMENT ON CONSTRUCTED 2:1 SLOPES
NO SCALE



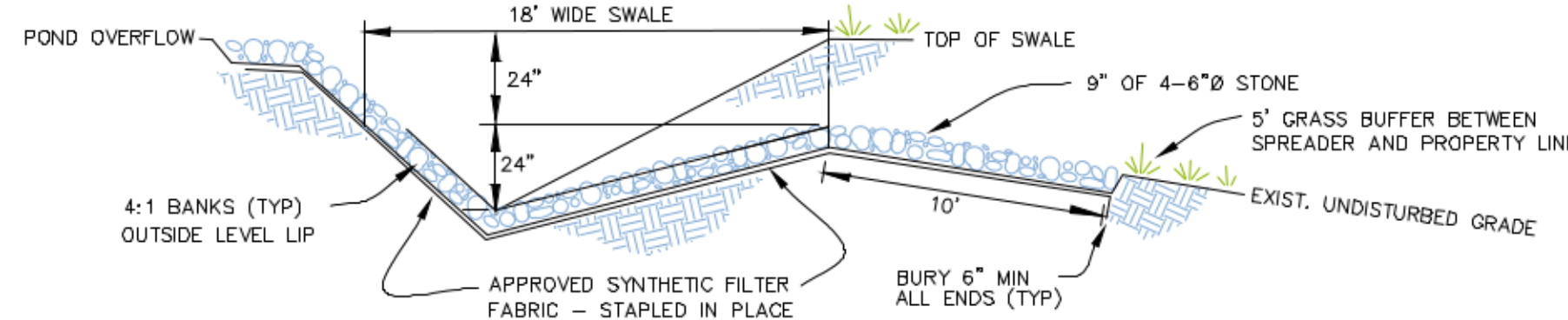
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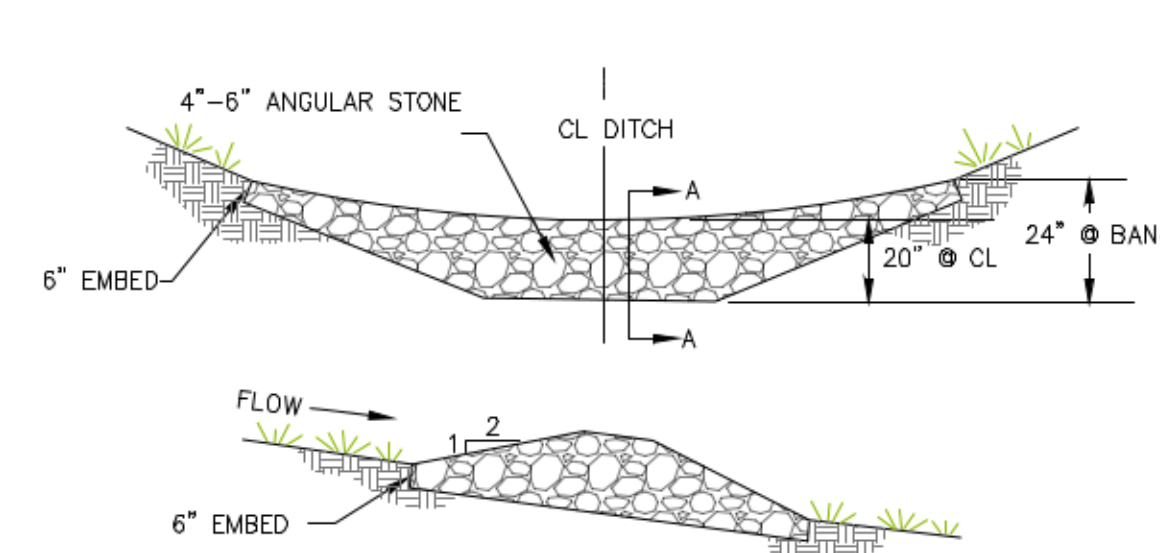
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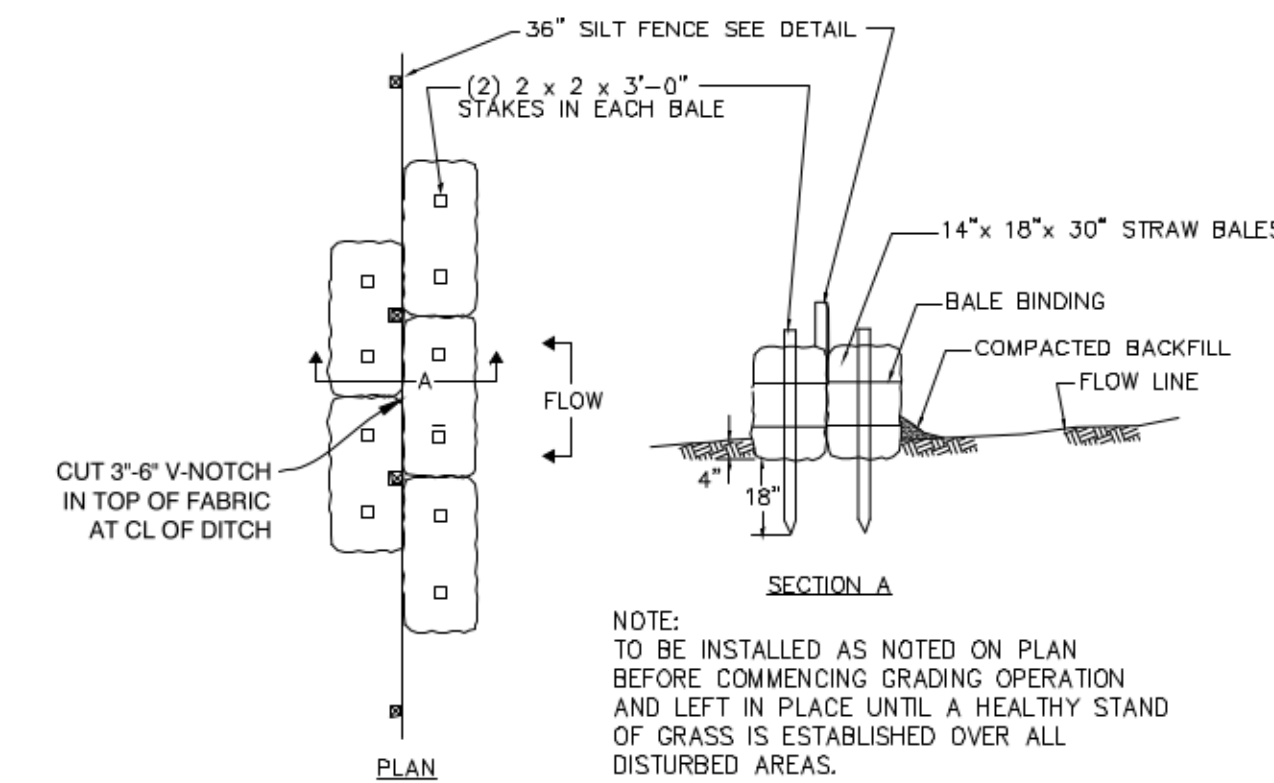
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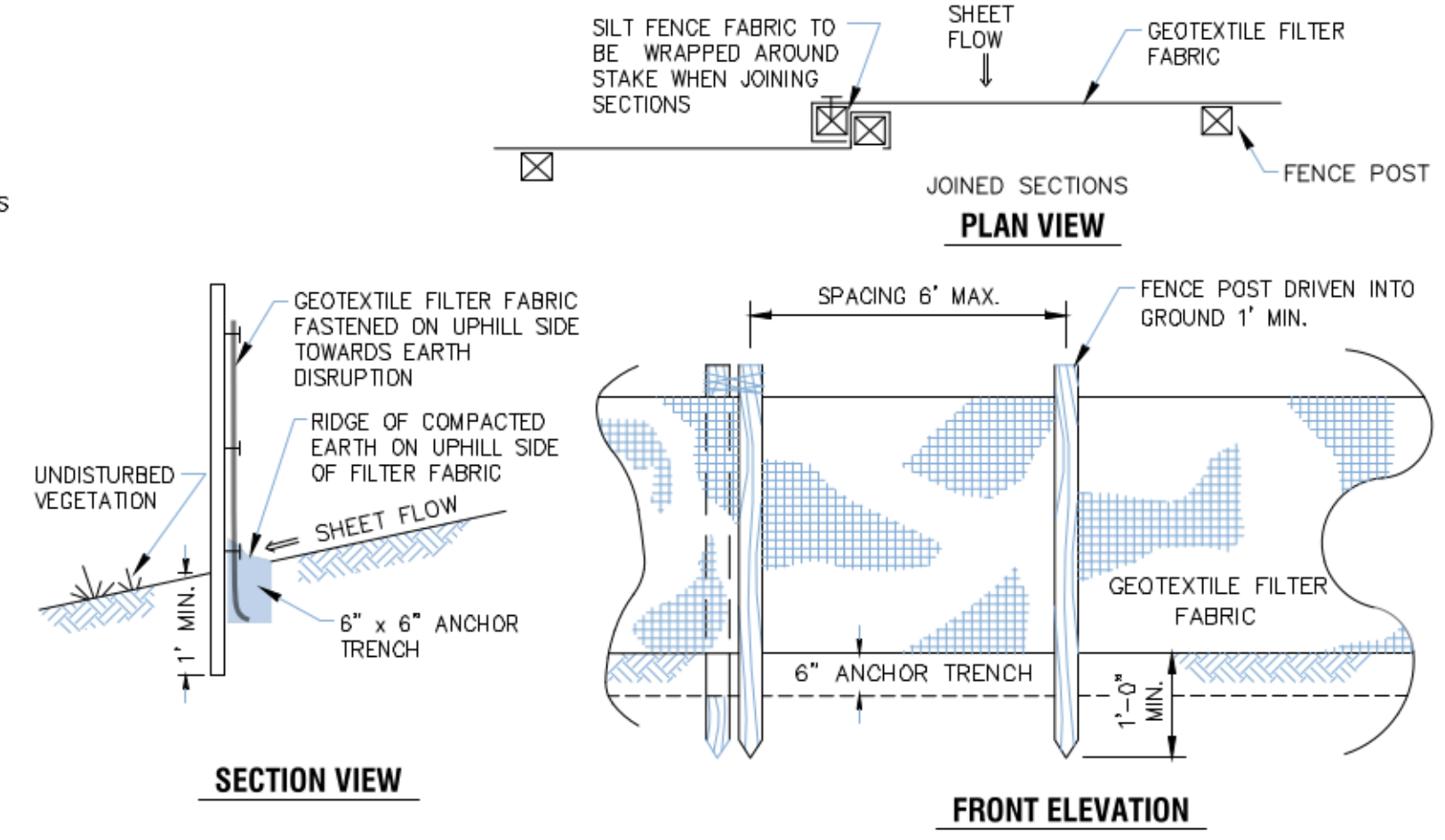
VEGETATED LEVEL SPREADER DETAIL
NOT TO SCALE



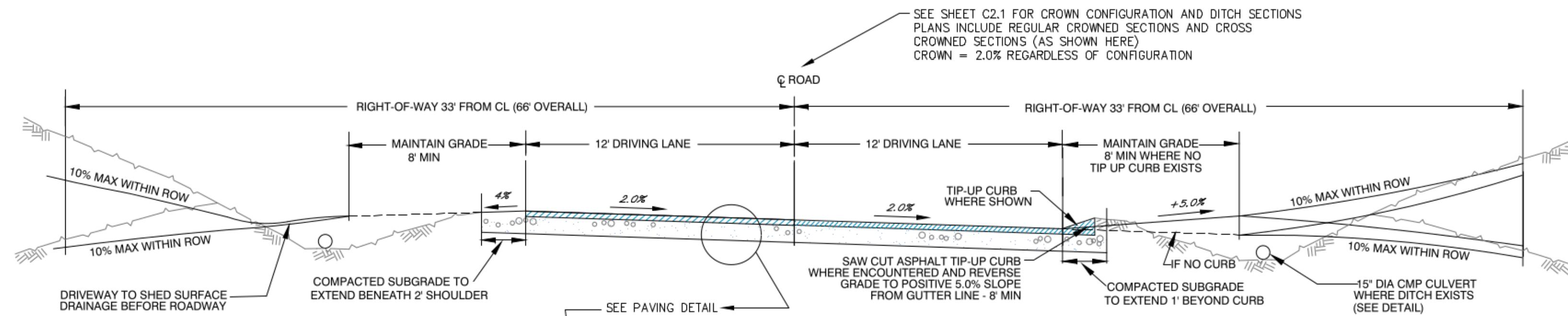
CHECK DAM
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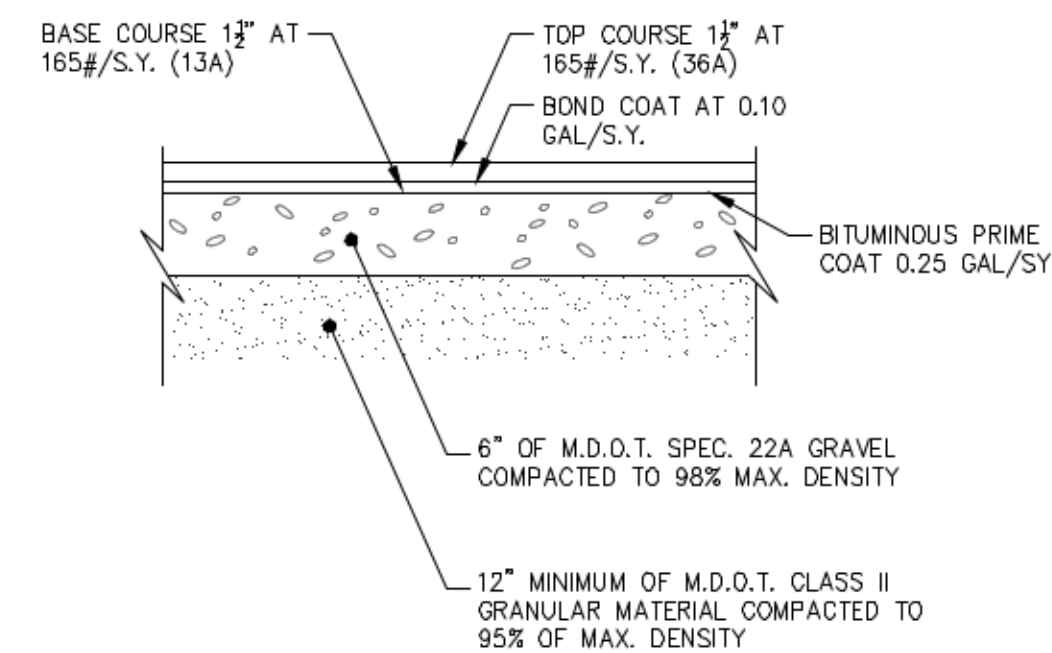
STRAW BALE DITCH CHECK



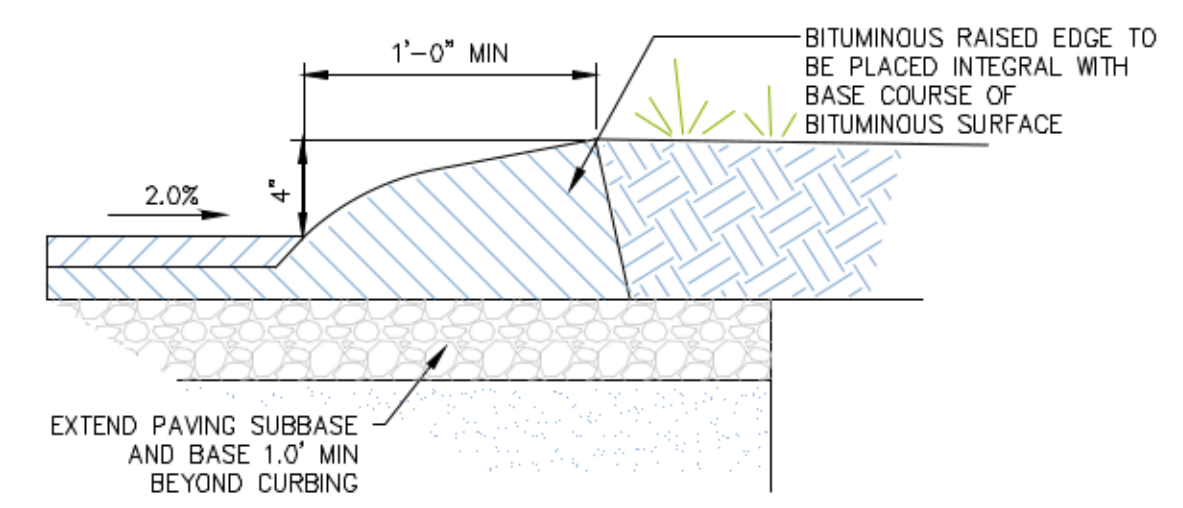
SILT FENCE DETAIL
NO SCALE



ROAD AND FUTURE DRIVEWAY CROSS SECTION
NO SCALE



PAVING DETAIL
NOT TO SCALE



BITUMINOUS RAISED EDGE DETAIL
NOT TO SCALE



BOYNE ENGINEERING AND DESIGN
P.O. Box 94
Boyer City, MI 49727
(231) 499-8361
boyneengineering.com

BIRMLEY HILLS SITE CONDOMINIUM
PREPARED FOR:
T&R INVESTMENTS
841 Ashland Drive
Traverse City, MI

NO.	DATE	APP'D	ISSUE / REVISION DESCRIPTION

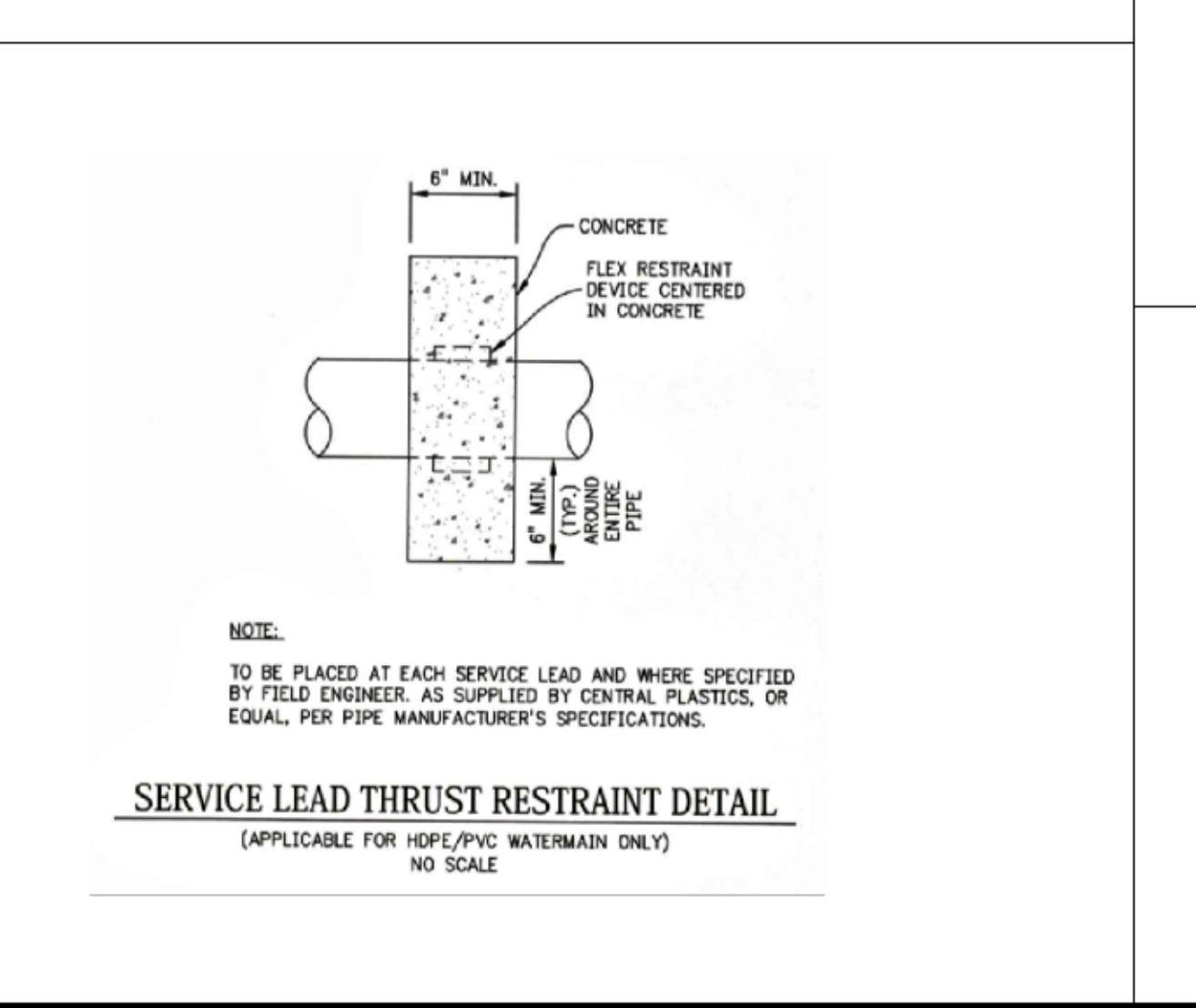
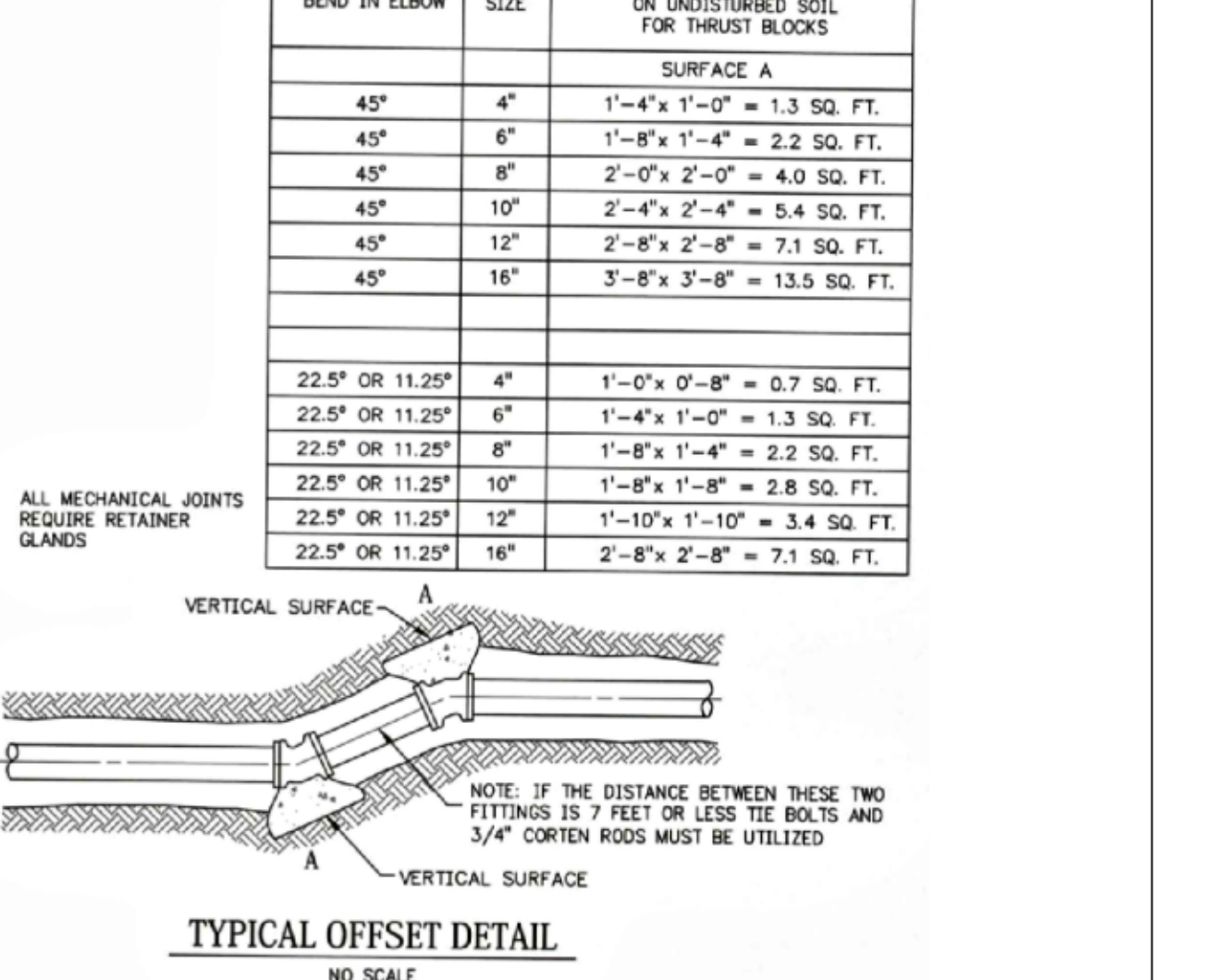
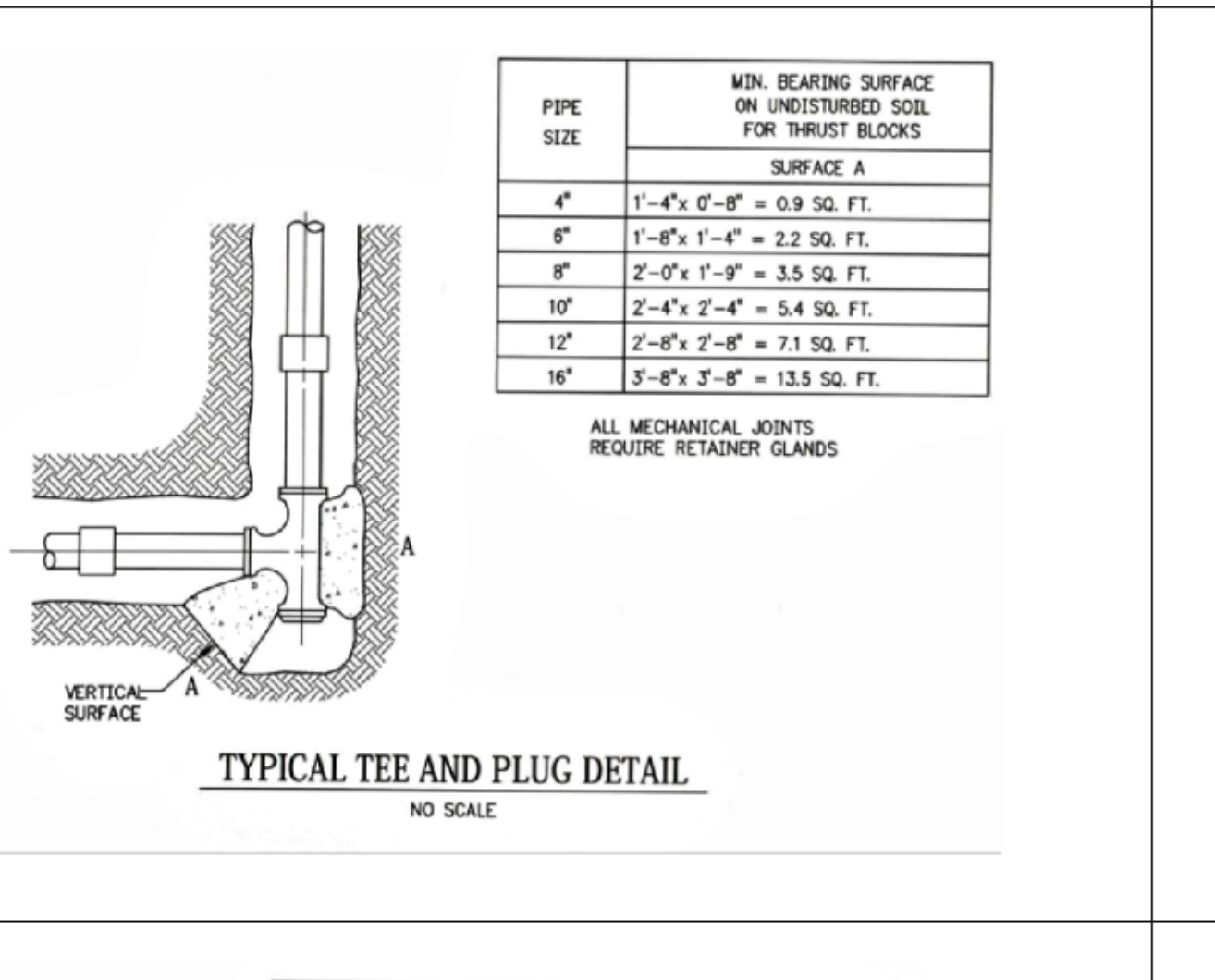
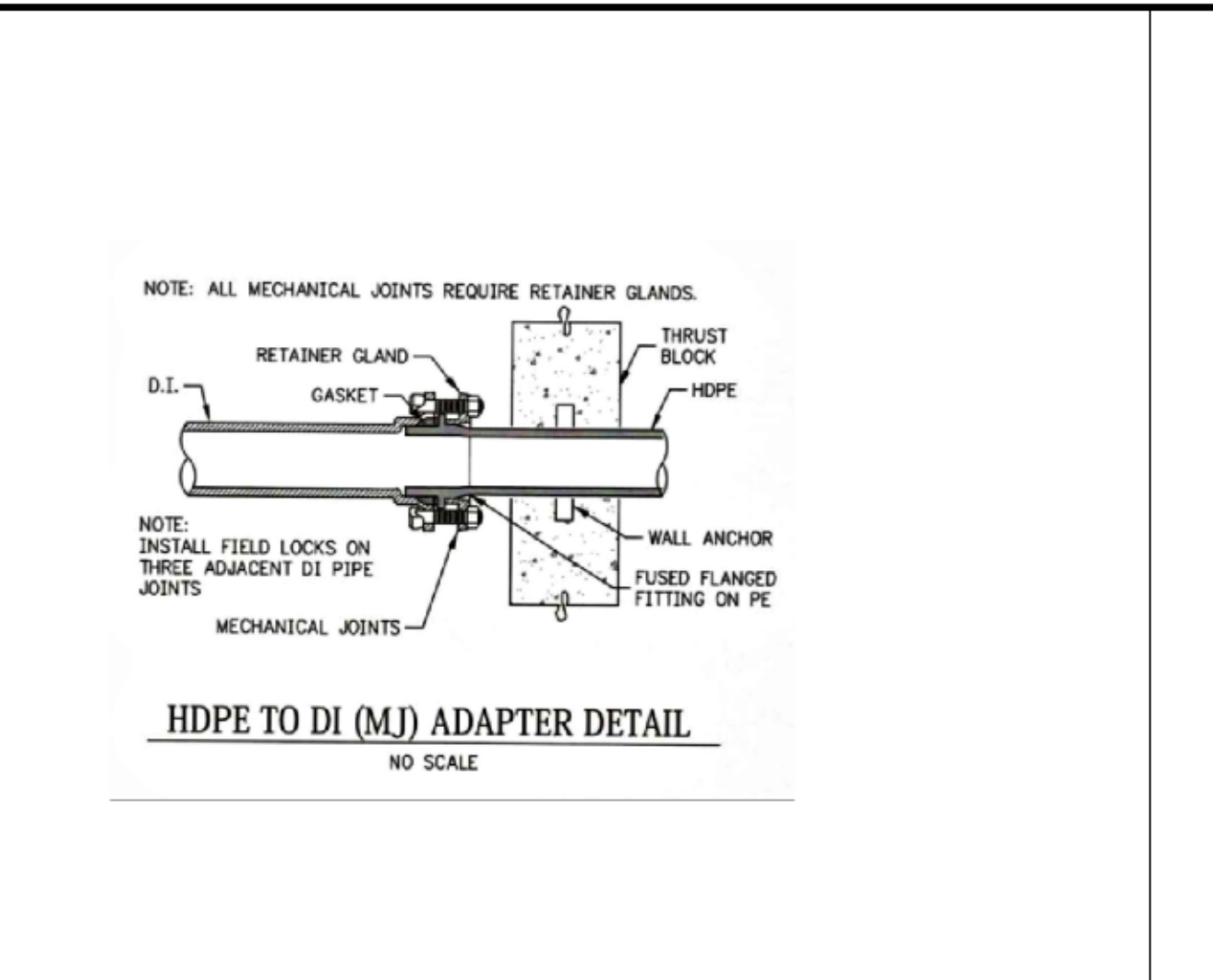
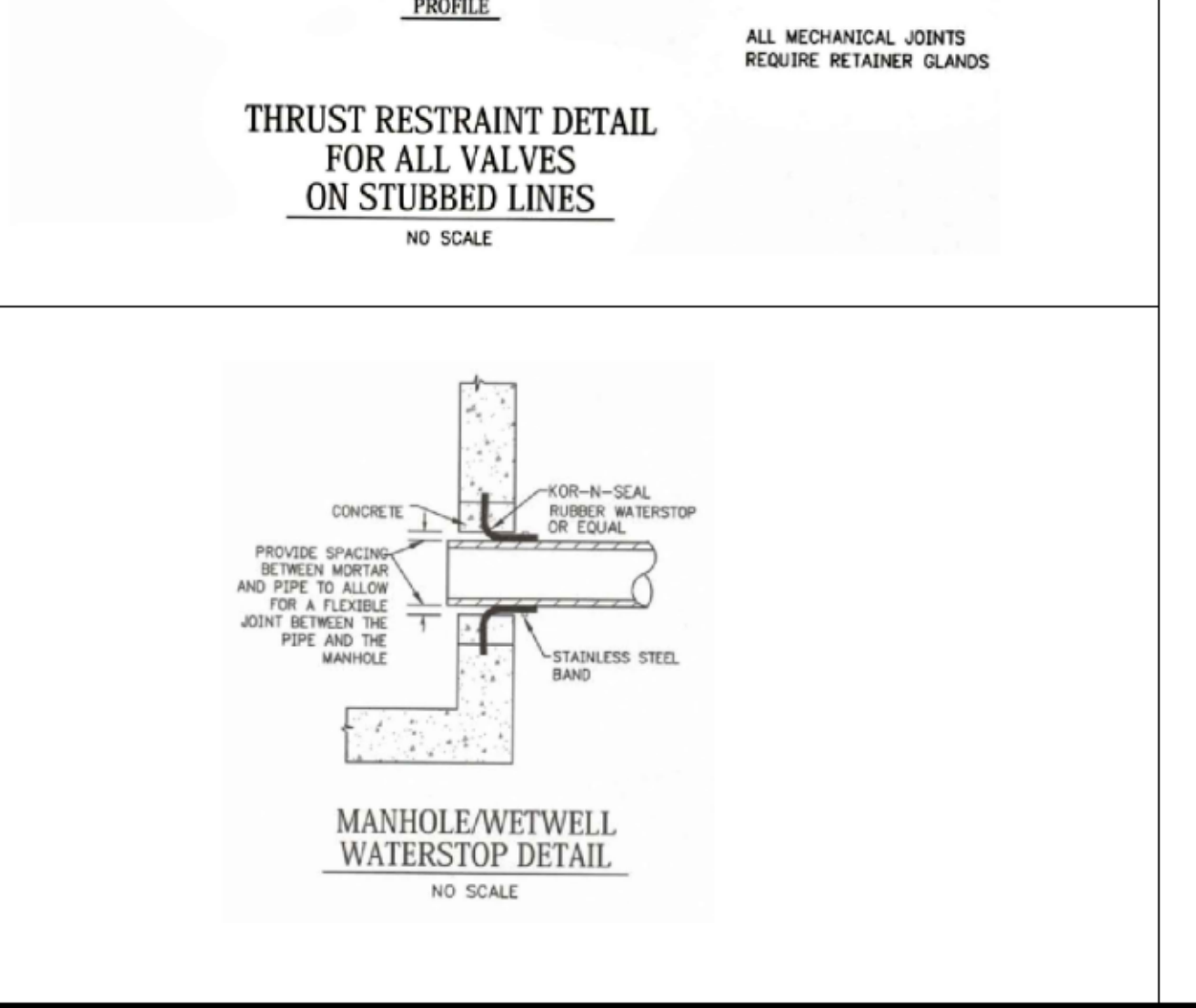
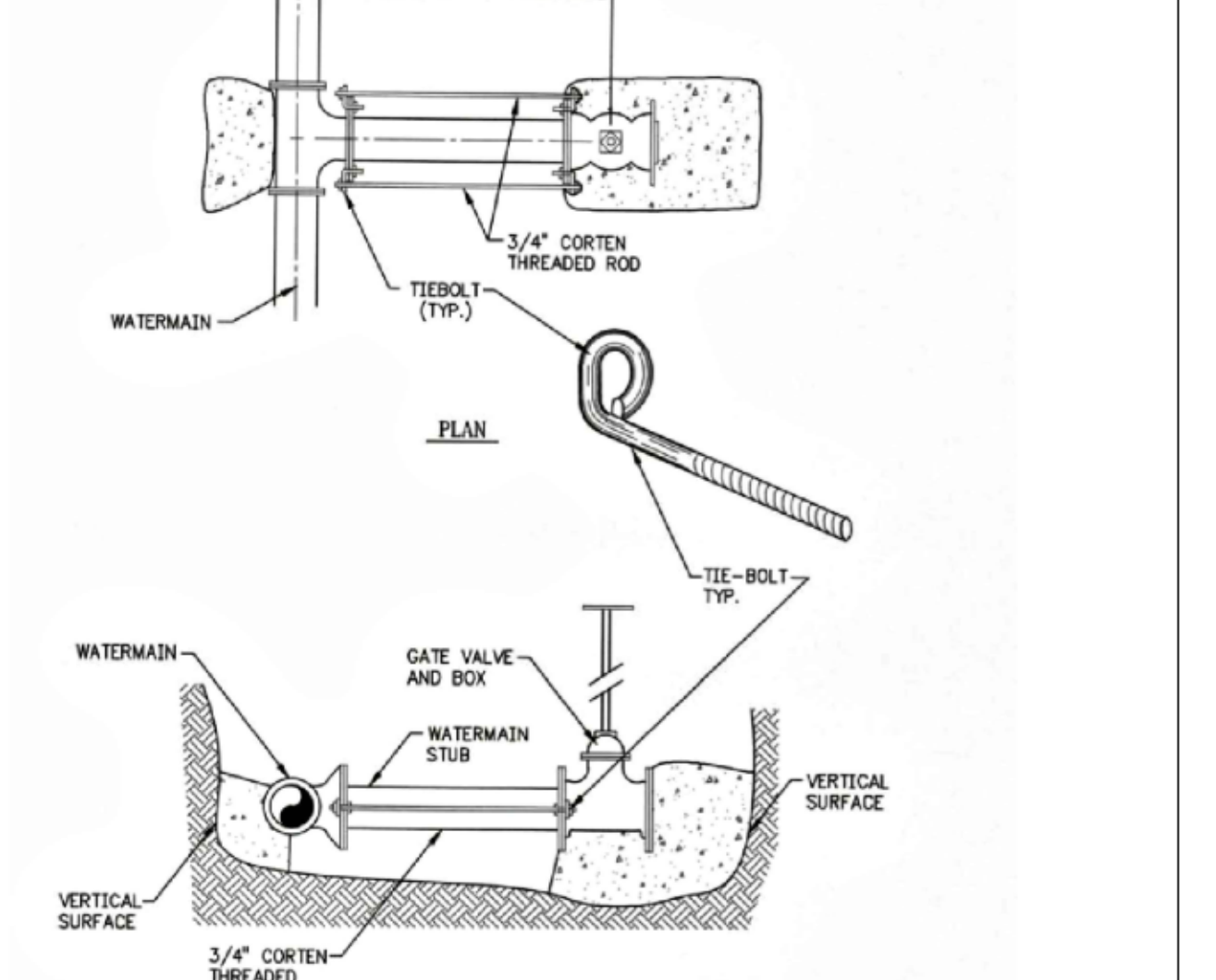
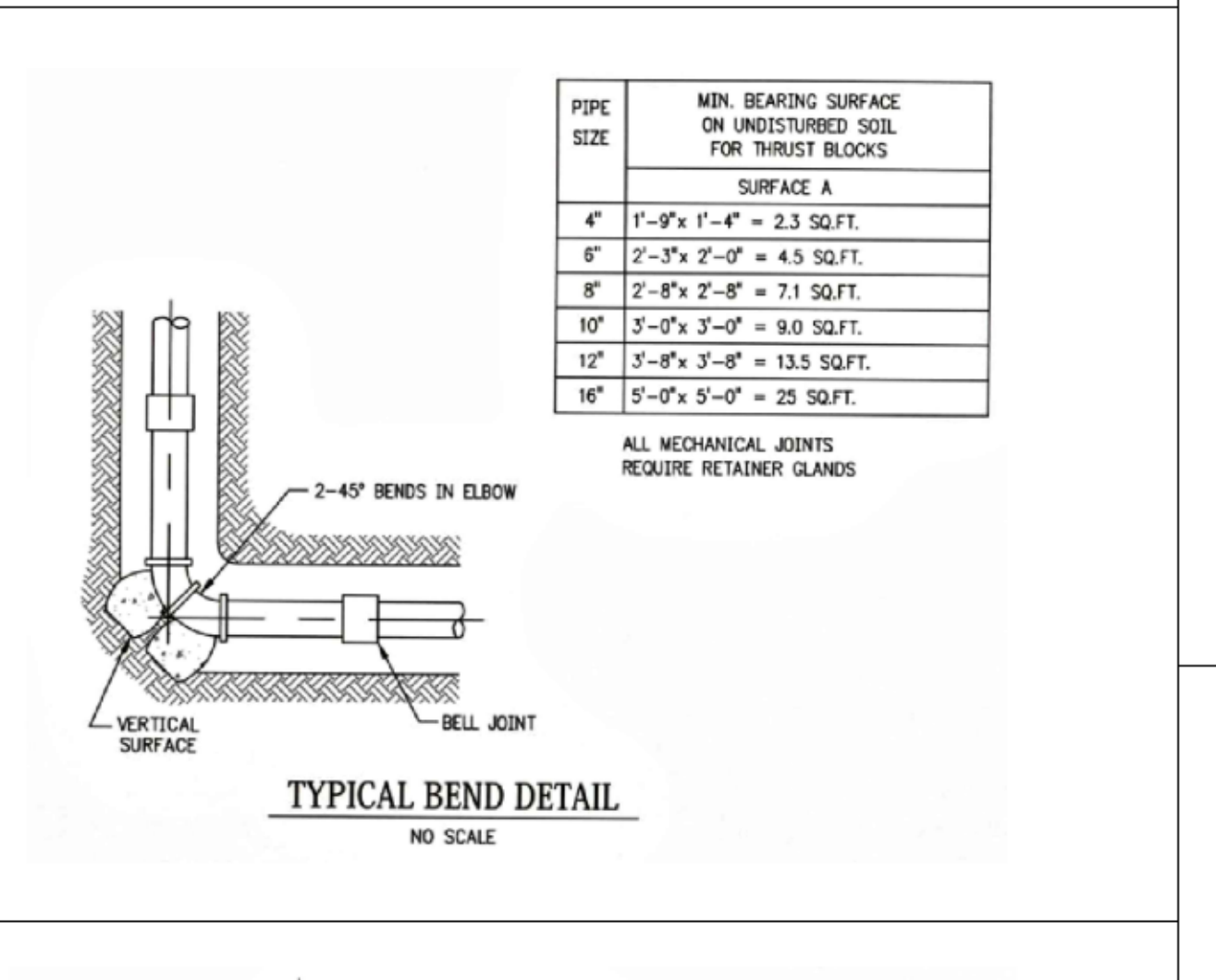
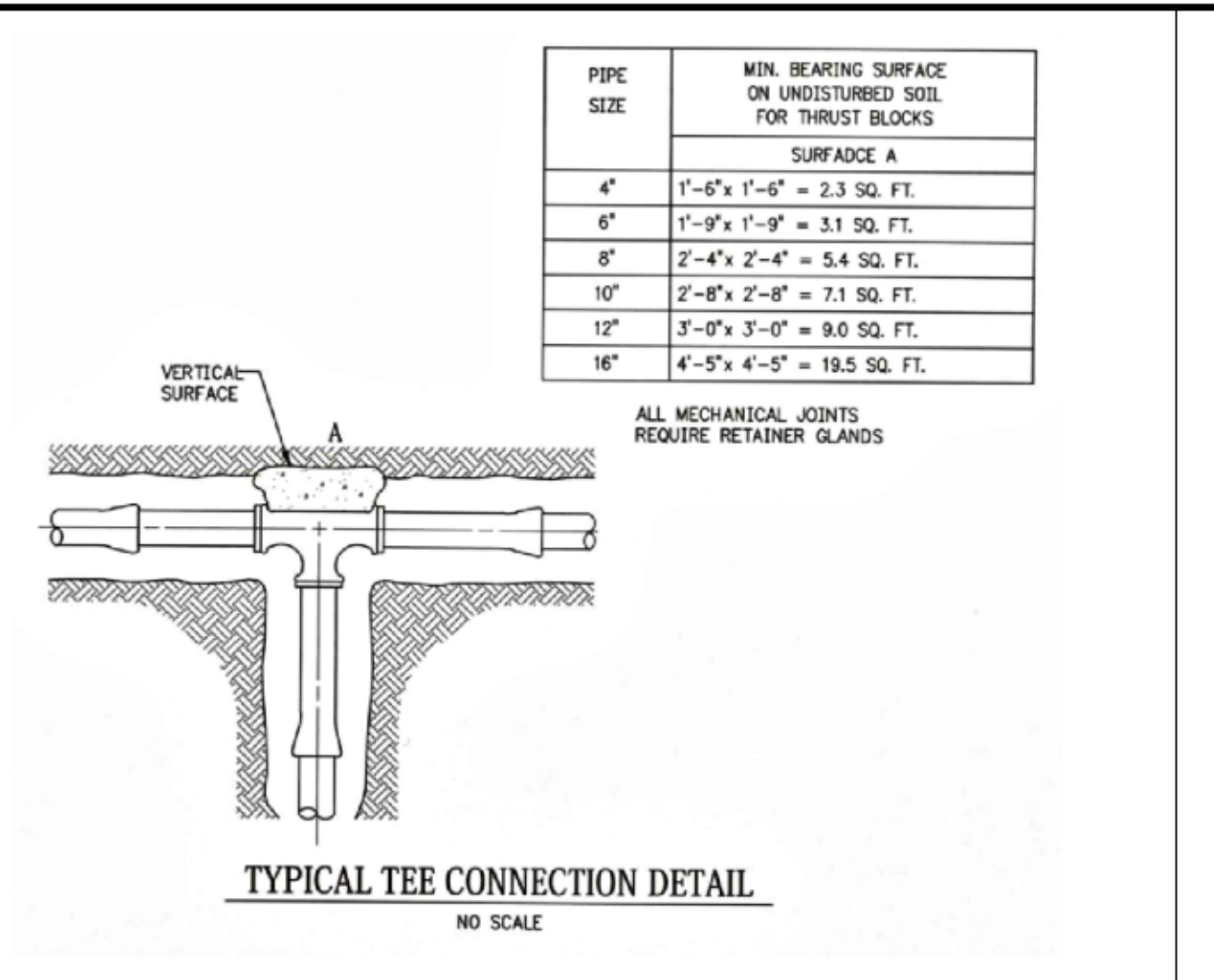
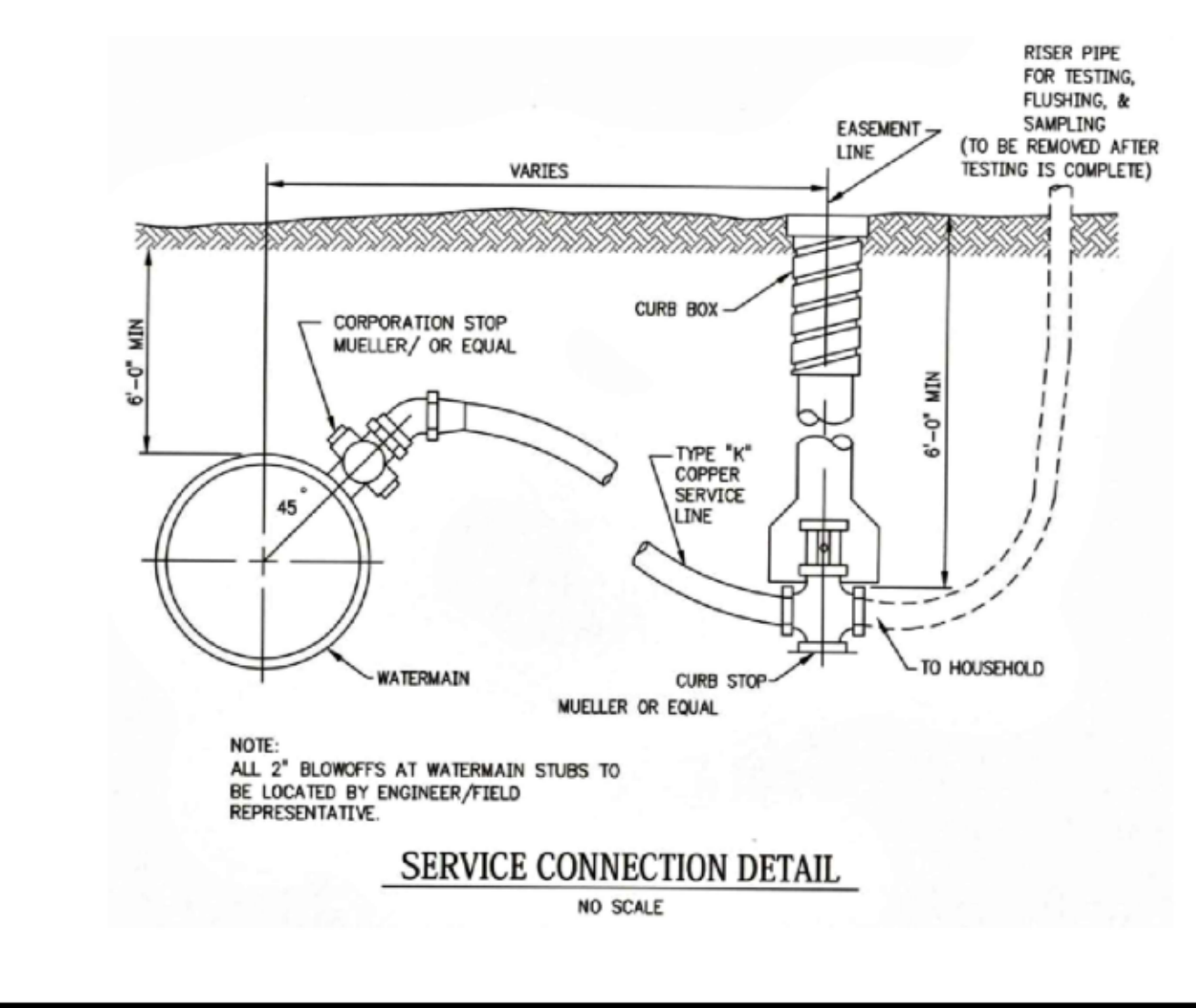
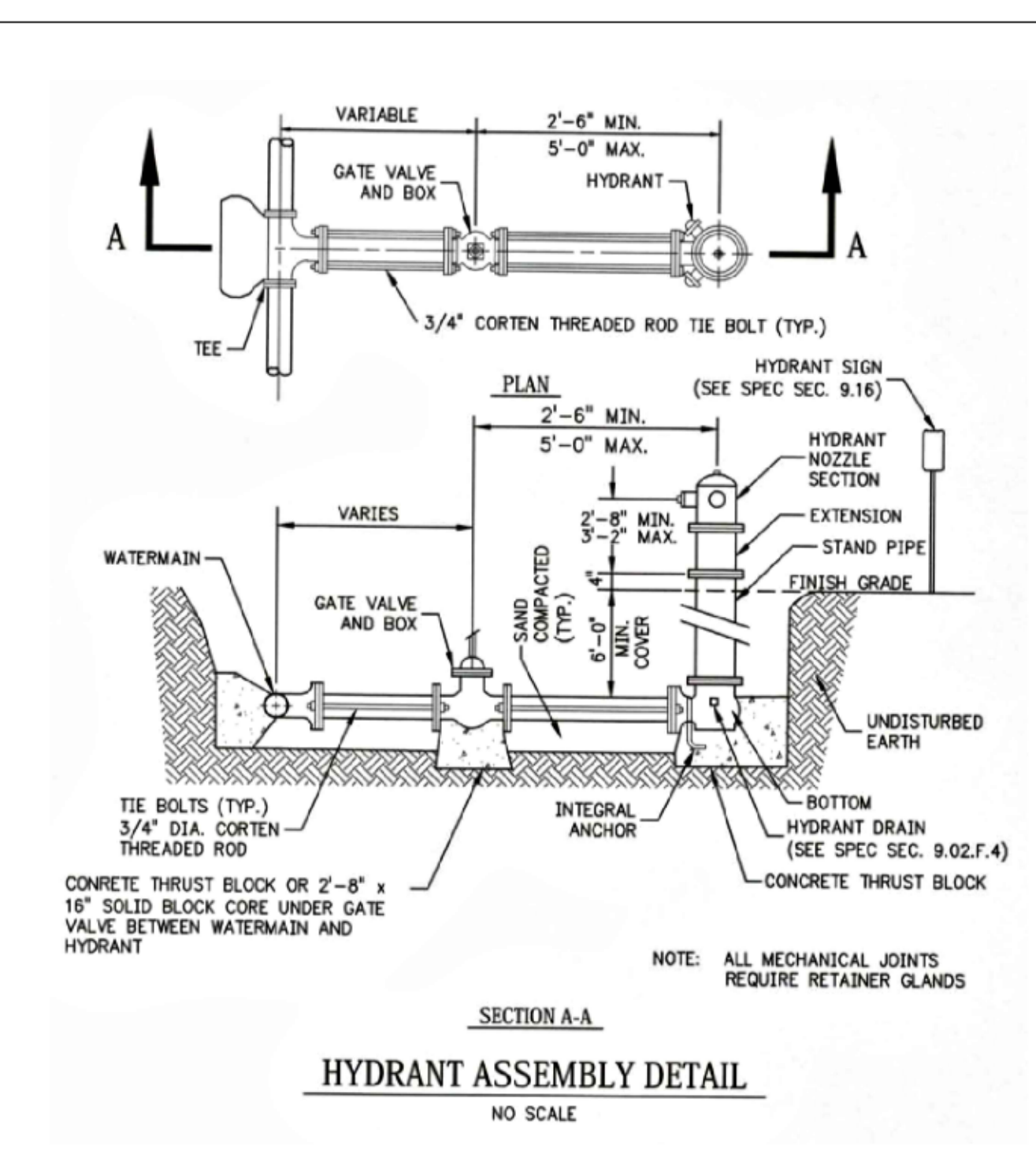
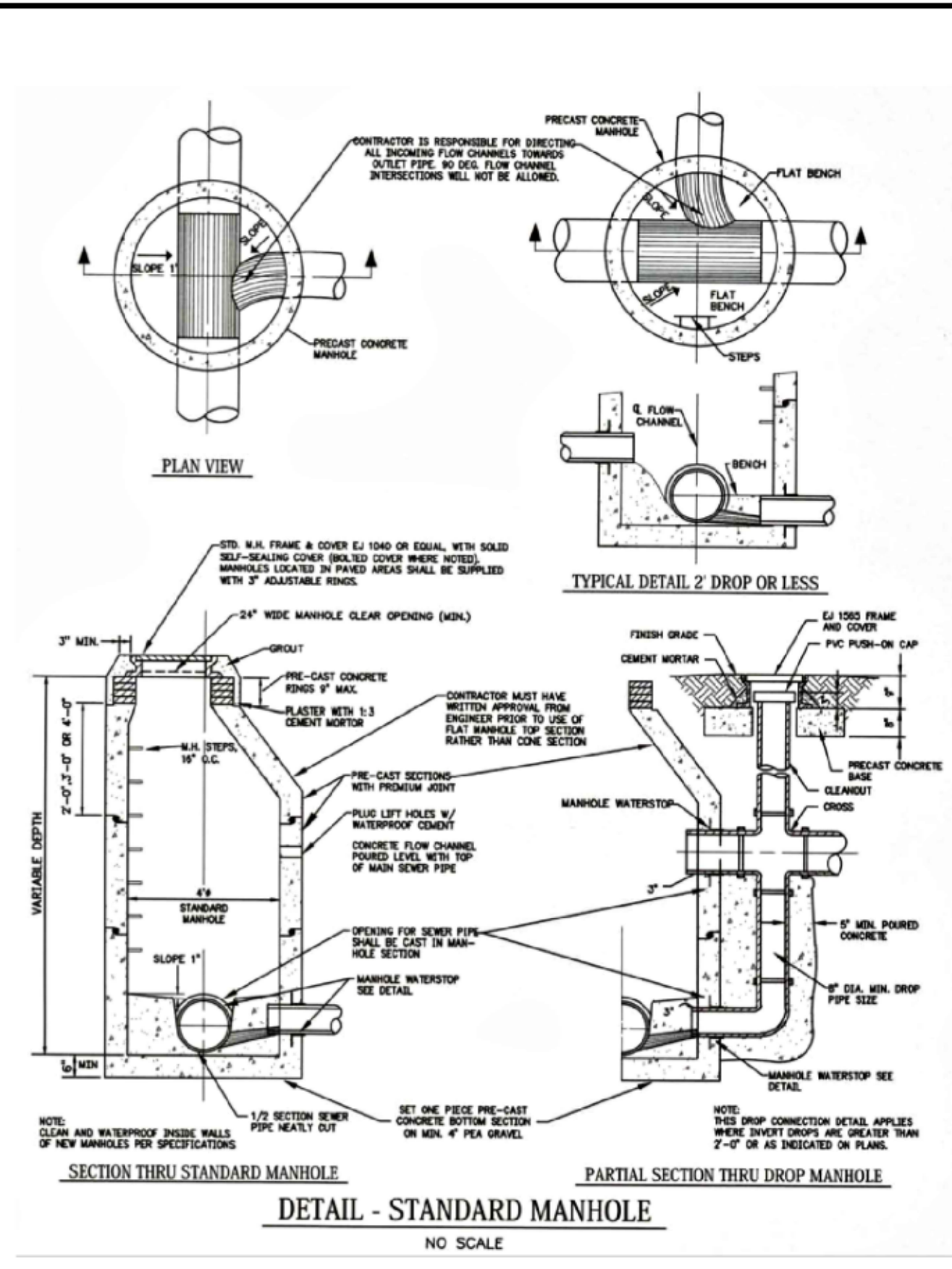
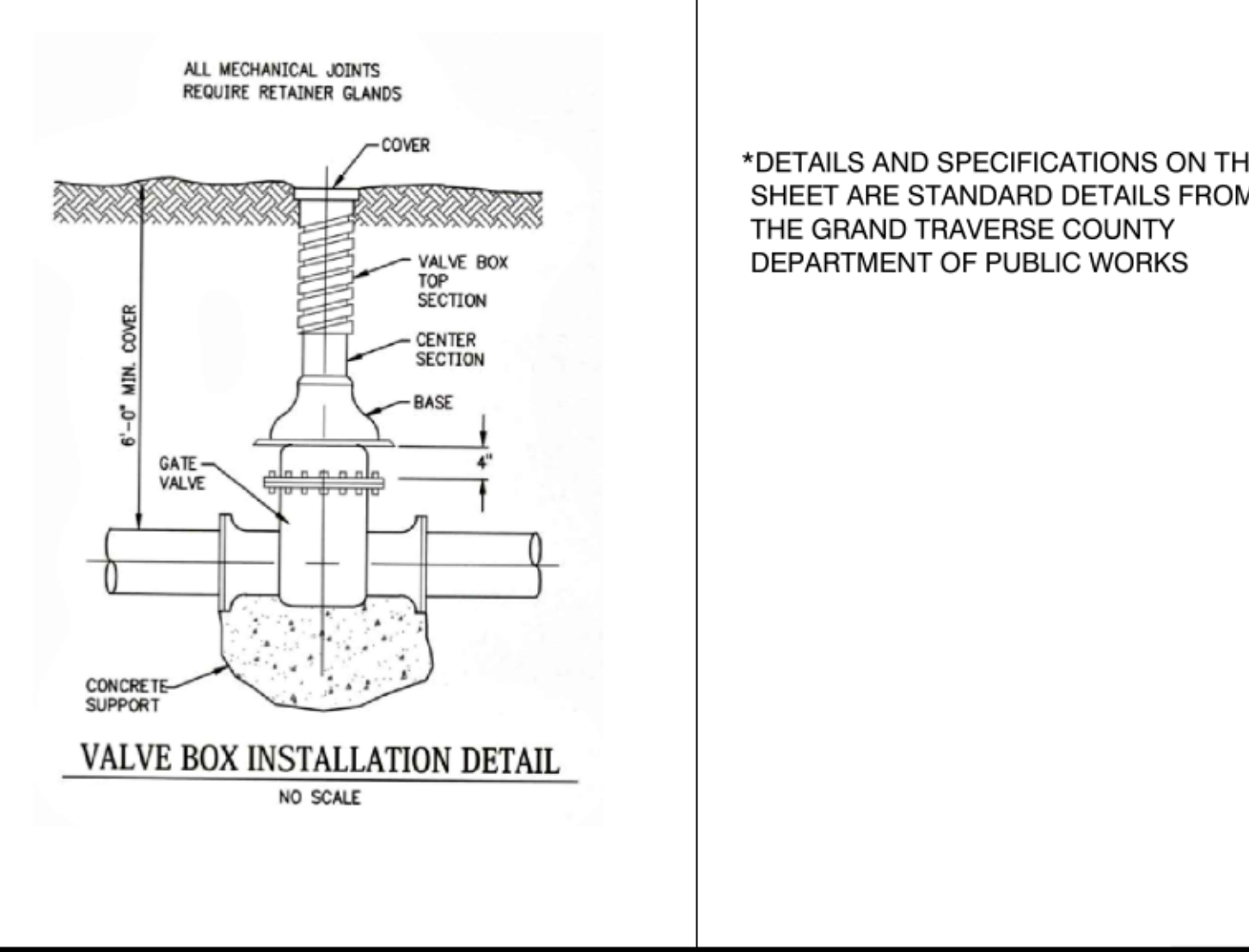
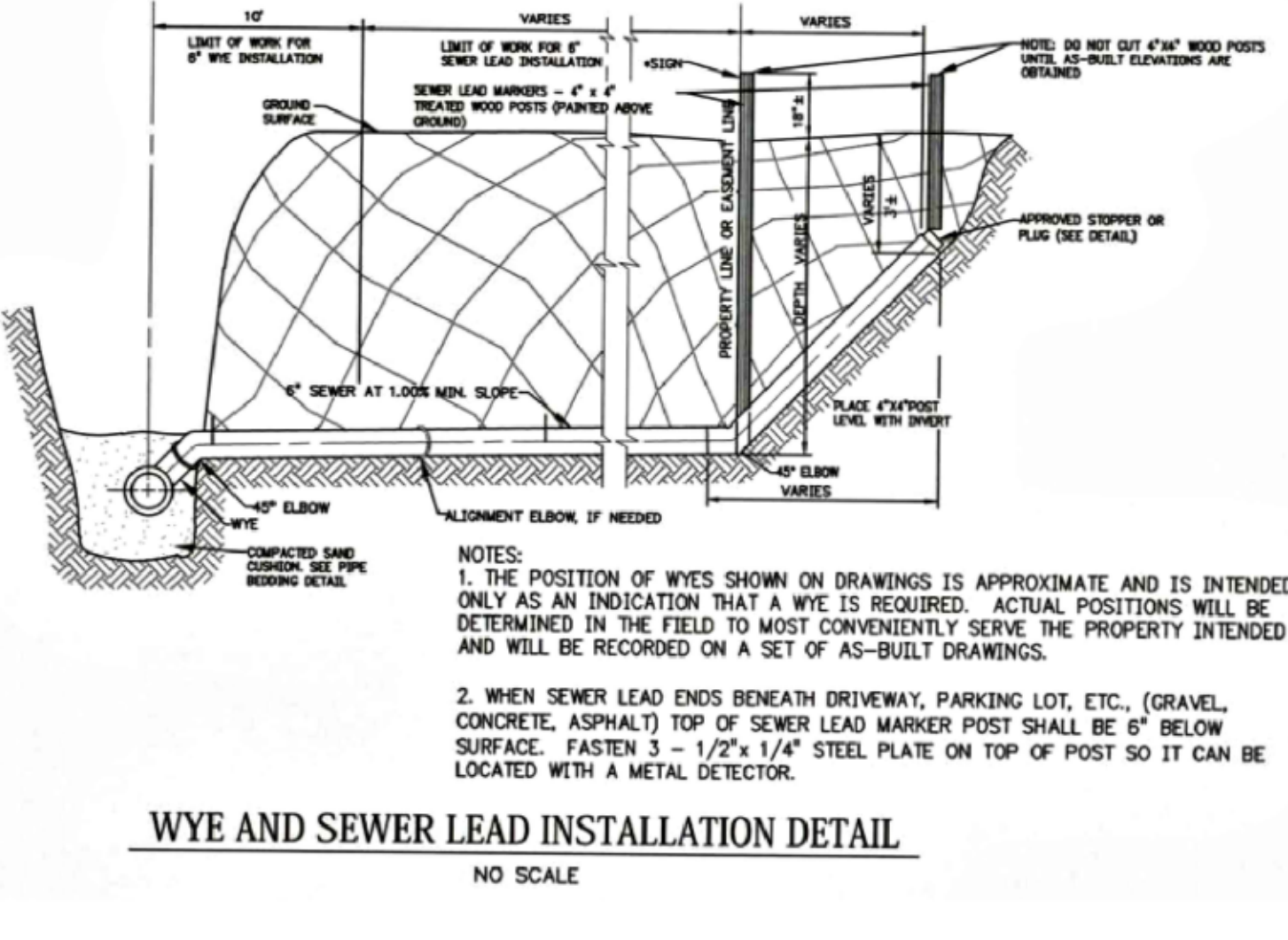
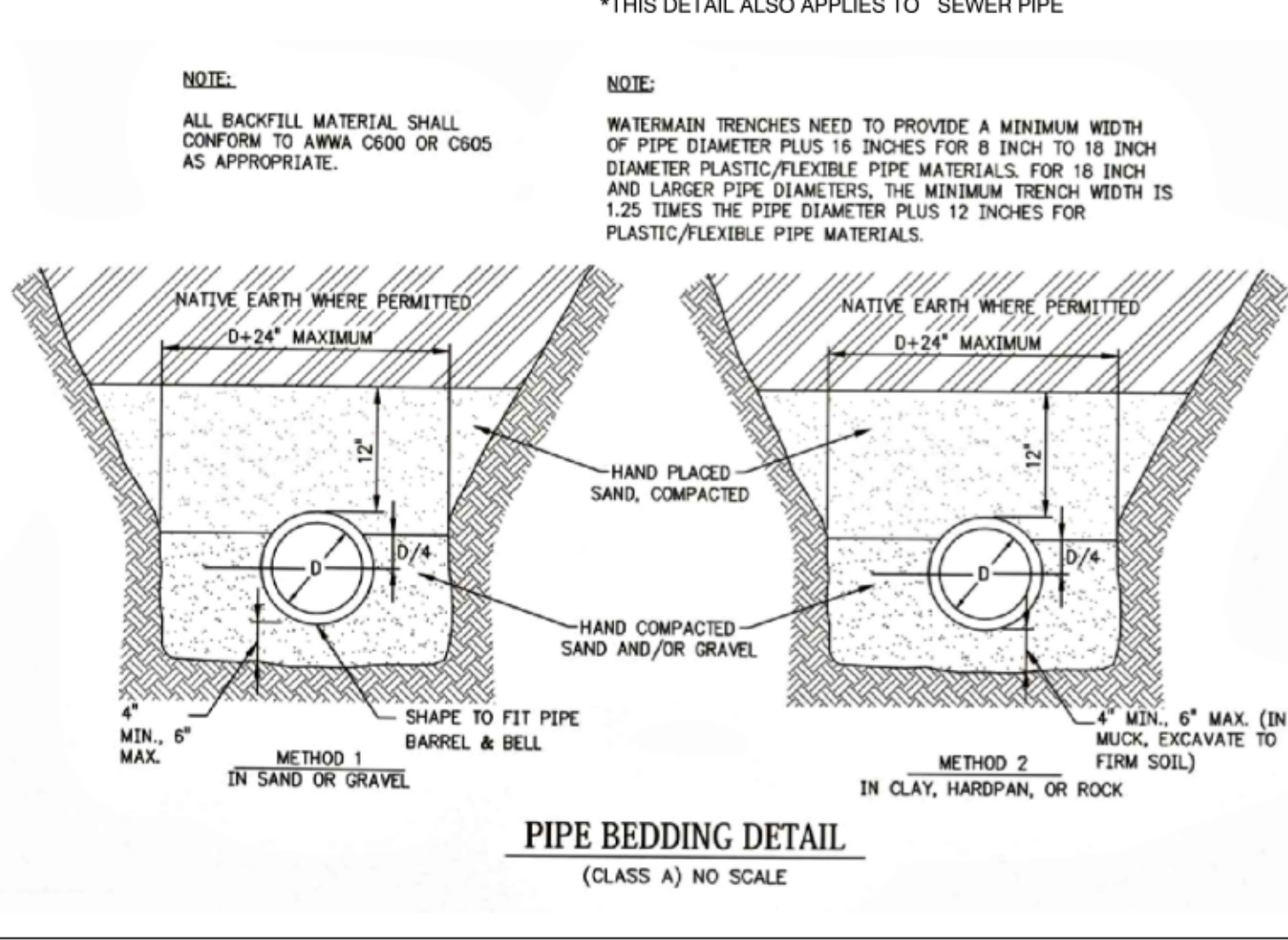
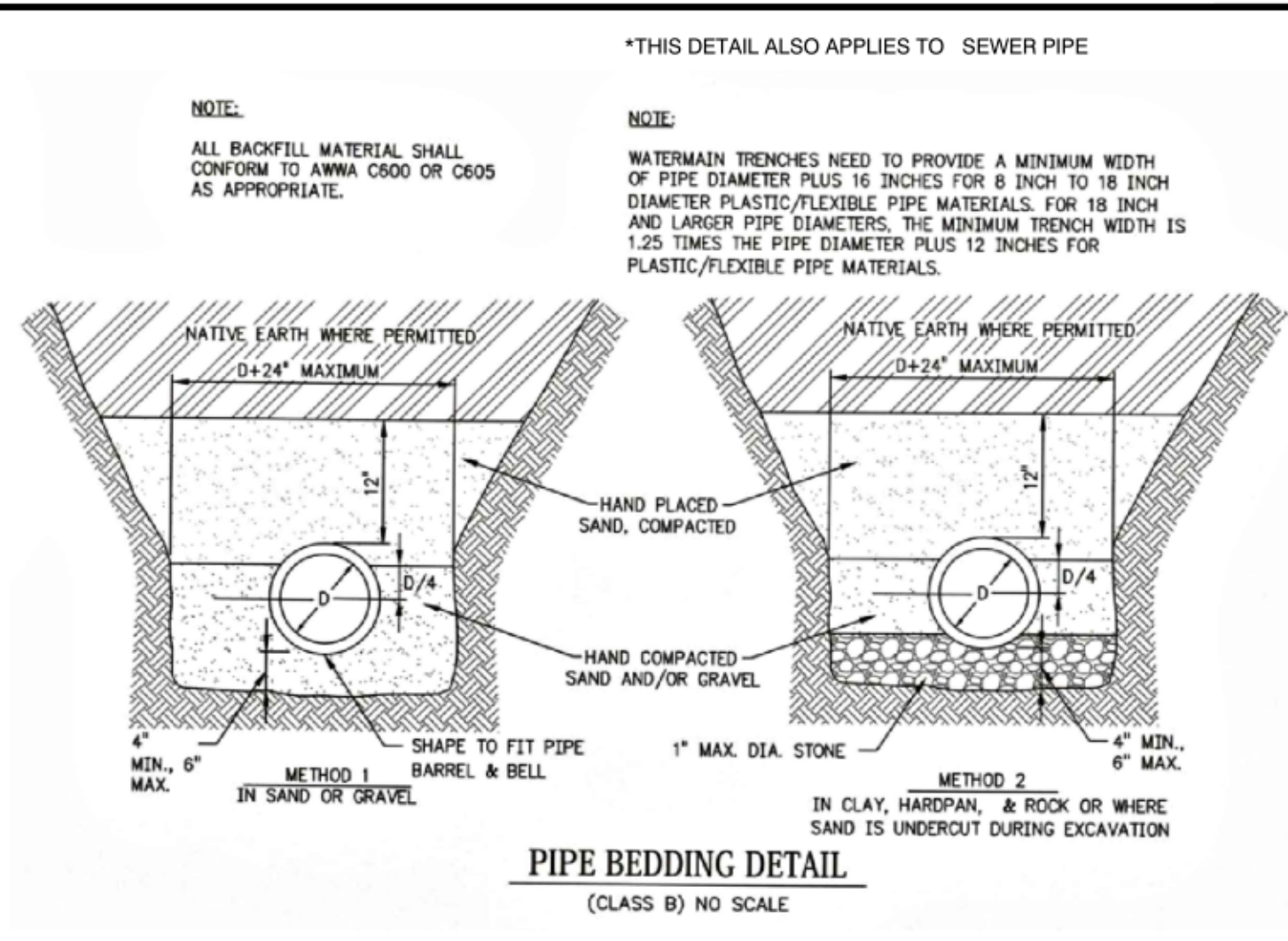
SITE DETAILS

ORIGINAL ISSUE DATE:
09/21/2022
SCALE:
BED JOB NO. 22016
DRAWING NUMBER

C6.0

NO.	DATE	APP'D	REVISIONS	ISSUE / REVISION DESCRIPTION

UTILITY DETAILS





November 1, 2022

Mr. Chuck Korn, Supervisor
Charter Township of Garfield
3848 Veterans Drive
Traverse City, MI 49684

RE: Birmley Hills Site Condominium – T&R Investments
Water Main and Sanitary Sewer Extension, Plan Review
GFA No. 22300

Dear Mr. Korn,

We have reviewed the plans for the proposed water and sewer system improvements associated with the above referenced project. The review was based on the current standards adopted by Garfield Township in conjunction with the Grand Traverse County Department of Public Works as well as Michigan Department of Environmental Quality requirements, Ten State Standards and accepted engineering practice for this area. The plans were prepared by Boyne Engineering & Design dated 9-21-22. Based upon our review on behalf of Garfield Township with respect to utilities, I offer the following comments.

DESCRIPTION OF THE PROPOSED PROJECT

Water System

The proposed water system extension consists of a scaled quantity of approximately 2,200 linear feet of 8-inch PVC C900 water main to service the proposed development with one (1) extension. The system incorporates two (2) connections that loop back to the water system and provide increased reliability to this service area. The development will be served by the Lower Pressure zone of the Birmley District.

Sanitary Sewer System

The proposed sanitary sewer system extension consists of a scaled quantity of approximately 2,480 linear feet of 8-inch PVC sanitary sewer to service the proposed development extension. The system incorporates two (2) connections to the existing sanitary sewer system.

IMPACT ON THE EXISTING SYSTEM

Sanitary Sewer System

The Garfield Township sanitary sewer collection system is divided up into eight (8) distinct service areas, designated by name according to the primary trunkline running along the respective road. In this case the proposed developed would be immediately serviced by the Garfield Road Service District. The development proposes to connect to the existing sanitary sewer system at five (5) locations, including connections at two (2) existing structures and three (3) new “doghouse” structures on existing sanitary lines. Sewer flow will follow the gravity sewer system to Birmley Road, and north along Garfield Road to



Garfield Lift Station No. 1. The design peak flows for the developments ultimate buildout is approximately 35 gpm. Garfield Lift Station No. 1 was upgraded in 2005 to increase firm capacity to 2,700 gpm. The lift station is currently experiencing peak flows of approximately 1,032 gpm. Based on our review, the existing lift station is capable of handling the anticipated peak flows from the development. One segment of sanitary sewer (8" line between Manhole 565 and 565G) is the restrictive segment and will be at or near 90% capacity with full build out at permit flow values. The Township is aware of this and will maintain monitoring of the system and sees no issue to allow the connection. Sewer review does not account for ability to provide basement service and only finish floor.

Water System

The Garfield Township water distribution system is divided up into five (5) distinct service districts with the limits defined by the existing infrastructure that services the users. In this case the proposed developed would be immediately serviced by the Birmley District. A portion of the development proposes to connect to the Birmley Primary Lower Pressure Zone receiving its supply directly from the City of Traverse City's four (4) million gallon storage tank on LaFranier road. Pressure is supplied by the Birmley Estates Elevated Storage Tank and maintained by Booster Station #2 having a rated firm capacity of 1,440 gpm. This portion of the development proposes to connect to existing water main at two (2) locations. All locations are within previously constructed phases of the development. Based upon information obtained from the 2011 Water Reliability Study and hydrant test data conducted by GFA, operating pressures are range from 45 to 65 psi with an available fire flow of approximately 1,800 gpm at 20 psi. It is estimated that the design maximum domestic demands for this portion the development are approximately 18 gpm to serve 35 REUs, therefore the existing infrastructure appears to be capable to accommodate. GFA has requested a recent hydrant test report from the DPW and awaiting results. Our evaluation does not account for basement and/or 2nd story service and is limited to ensure a minimum of 35 psi working pressure at the main and minimum of 40 psi static pressure at the house. Finish Floor Elevations are not provided however to comply should be at or below 770.

COMMENTS ON THE PLANS

General Comments

1. All design standards and specifications shall comply with the Current Standards adopted by Grand Traverse County Sewer and Water Systems (2017). Copies may be obtained from the Grand Traverse County Department of Public Works.
2. Please ensure all local regulatory permits including Soil Erosion and EGLE NPDES Permits are obtained. Please ensure Township receives copies of issued permits.
3. Please ensure all easements have been obtained and recorded with the Township prior to final acceptance of the utilities. Currently the plans illustrate an ingress/ egress easement however this shall be updated to include utilities and/or an additional 20' independent easement shall be provided for utilities and illustrated on the drawings.
4. Please ensure the Grand Traverse County DPW and Fire Department has reviewed the proposed plans and accepted.
5. The installation of water main, sewer main, hydrants, valves, and manholes shall not be installed within proposed sidewalk, and/or asphalt that would inhibit access by the DPW. Please ensure that there are no obstructions that would prohibit access. If this cannot be complied with,



please note the DPW is not responsible for any costs associated with replacement of such infrastructure such as the landscaping, drives. It appears some of the water main and sanitary sewer are in close proximity to or below proposed private drive.

6. Hydrant #s are incorrect as shown on the plans and shall be updated to reflect: 1229 to 1234
7. Please also note the following: In order for a developer to obtain their building permit and begin site work all permits must be issued including benefit fee payment to the DPW. However the DPW cannot accept this payment unless the infrastructure is either in place (water / sewer main) or a bond is provided by the developer equivalent to 100% of the cost of the utility. Please contact the DPW if you need further clarification, etc.
8. The applicant / design engineer is responsible to verify and confirm adequate water and sewer lead design (size and slope) are adequate to meet demands.
9. There appears to be a lot of water / sewer lead installed that cross proposed ditching along the road. Confirm adequate coverage will be provided for all service leads.
10. Two (2) benchmarks shall be provided on each utility sheet.
11. Applicant shall confirm that all water main and lines maintain 18" vertical and 10' horizontal separation from existing and proposed sewer (storm and sanitary) mains and leads.

Water Main Plan and Profile Comments

1. Portions of water main and valves appear to be located outside of the proposed easement. Please adjust easement or watermain to confirm all are located within the proposed easement.
2. Multiple locations along the water main will at the same elevation as sanitary sewer piping causing concerns for service lead crossings not maintaining appropriate separation. The profile shall be updated to illustrate the crossings and denote 18" separation.
3. Please note that C900 DR 18 is a minimum requirement and DR 14 is proposed.
4. Sheet C4.1 profile sta. 3+25 to 2+75 water main length not called out.
5. Water main stub shall be provided to the abutting western parcel to accommodate a future access.
6. A main line valves shall be installed on Sheet C4.0. Valves are to be installed every 1,000 feet to accommodate isolation.
7. It is recommended hydrants be installed at high points to act as air release. Please adjust locations as possible to accommodate.
8. Watermain shall maintain minimum of 18" vertical separation from all storm water ditches / basins and 10' horizontal.

Sanitary Sewer Plan and Profile Comments

1. The proposed slope between existing MH#583 and proposed MH #1824 is 0.38%. The minimum slope required by Ten States Standards for 8" pipe is 0.4% to ensure 2 feet per second. This is of concern due to this sewer serving only 10 REUs and the minimum slope should be avoided to prevent solid deposition.
2. Manholes in the profile appear to be below/above existing grade in all locations, the manhole rim should at or slightly above proposed grade as to not impede on regular maintenance activities such as plowing, mowing.
3. Portions of sanitary sewer main and manholes appear to be outside or directly on the easement line, please adjust to assure all sanitary sewer is located within the proposed utility easement.



4. A sanitary main stub shall be provided to the abutting western parcel to accommodate a future access/ connection.
5. Sewer Manhole 1822 appears to have flow in two (2) directions and shall be separated into two (2) manholes and segments rather than connected to prevent backups and surcharging.
6. Manhole 1818 inverts and sump elevations do match between sheet C4.0 and C4.1
7. All manholes shall be constructed to provide 1/10 drop between in and out inverts. MH #1819 illustrates both as the same.

COMMENTS ON THE PERMIT APPLICATIONS

EGLE Part 41 and Act 399 Please provide word document draft of the permit application with items 1 - 19 filled out.

1. Technical specifications need to be provided and are available on the GTC DPWs website. Please prepare three (3) copies submitted, signed and sealed.
2. Please provide basis of design for the project. A typical REU usage value 350 GPD/REU and a maximum of 4 peaking factor should be applied for sewer and 200 GPD/ REU and a maximum peaking factor of 3.0 for water.

At this point we expect that the design engineer will be making the above revisions and re-submitting the plans and permit applications for a minor second review. We will provide the subsequent review to verify the appropriate revisions have been made. Assuming the appropriate corrections have been made we will make recommendation to the Township for submission of permit application. At such time, four (4) copies of plans and specifications (signed/ sealed) including an Act 399 Permit Application will need to be provided for submission.


We appreciate the opportunity to assist the Township during the approval of this project. If you have any questions, please don't hesitate to contact me at (231) 946-5874.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Jennifer Graham'.

Jennifer Graham, P.E.
Project Manager

CC: John Divozzo, Director, GTC DPW
Carrie May, P.E., Boyne Engineering & Design

 Charter Township of Garfield Planning Department Report No. 2022-102			
Prepared:	November 2, 2022	Pages:	11
Meeting:	November 9, 2022 Planning Commission	Attachments:	<input checked="" type="checkbox"/>
Subject:	7Brew 2537 North US-31 Special Use Permit – Findings of Fact		
File No.	SUP 2022-01	Parcel No.	05-021-036-10
Applicant:	2537 N US 31 South LLC – Kevin Myers		
Agent:	BFA, Inc. – John Schebaum		
Owner:	2537 N US 31 South LLC		

BRIEF OVERVIEW:

- Location: 2537 N US-31 South, north of South Airport Road
- Parcel area: 0.46 acres
- Existing land use: Former PNC Bank building with drive-through
- Existing zoning: C-G General Commercial District

PURPOSE OF APPLICATION:

This application requests approval of a Special Use Permit for a proposed 652-square foot drive-through coffee shop with only drive-through and walk-up service, with no dine-in services. Drive-through business uses are permitted via Special Use Permit in the C-G General Commercial District. The site (Parcel ID #05-021-036-10) is occupied by the former PNC Bank building with drive-through.

Aerial image of the subject property (property lines highlighted in blue):



SITE DESIGN AND ZONING COMPLIANCE OVERVIEW:

In approving any Special Use Permit pursuant to Section 423, the Planning Commission may impose such reasonable standards, conditions, or requirements, in addition to or that supersede any standard specified in this ordinance, as it may deem necessary to protect the public interest and welfare. Such additional standards may include, but need not be limited to:

- a) Financing;
- b) Availability of adequate public facilities or services;
- c) Dedication of land;
- d) Reservation of land;
- e) Creation of special assessment districts;
- f) Creation of restrictive covenants or easements;
- g) Special setbacks;
- h) Yard requirements;
- i) Increased screening or landscaping requirements;
- j) Area requirements;
- k) Development phasing; or
- l) Standards pertaining to traffic, circulation, noise, lighting, hours of operation, protection of environmentally sensitive areas, and similar characteristics.

Staff offers the following comments regarding site design and compliance with the Zoning Ordinance:

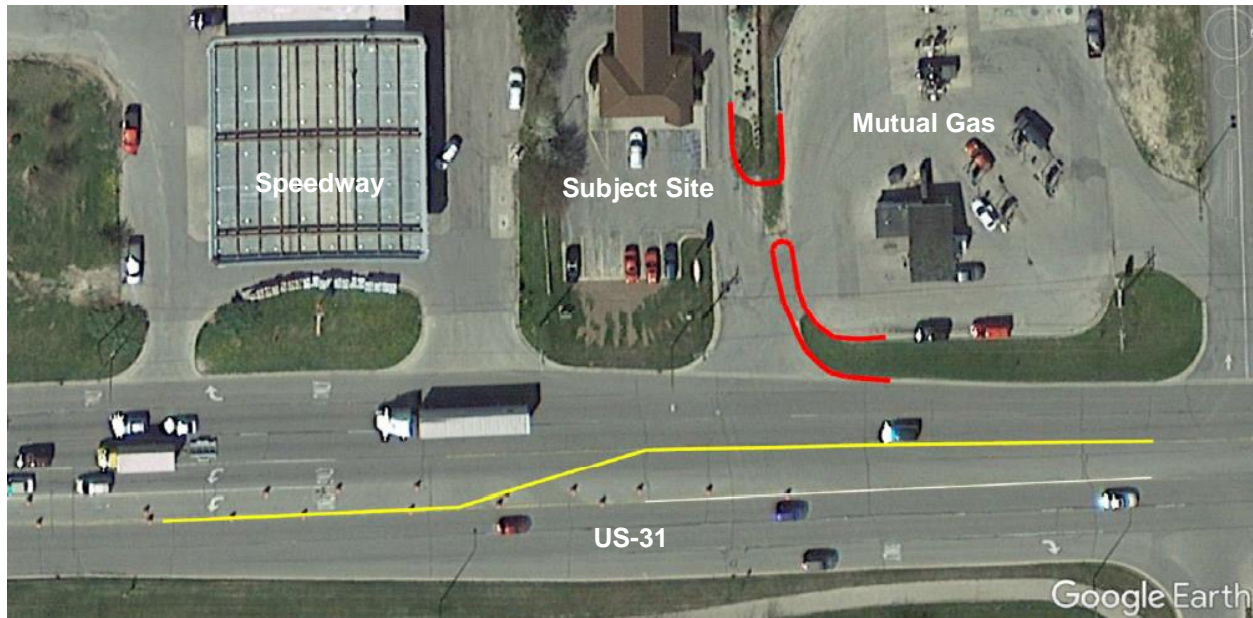
Setbacks:

The front setback is 40 feet in the C-G District; however, drive-throughs are required to have a 60-foot setback from the right-of-way line. Side and rear yards in the C-G District shall be ten percent (10%) of the lot width and depth, respectively, but need not exceed twenty-five (25) feet each, provided that no setback shall be less than ten (10) feet. In this case, the parcel is 100 feet wide, therefore the side and rear yard setbacks shall be 10 feet. The proposed buildings and structures meet the front, side, and rear yard setback requirements.

Traffic Impact Report:

In accordance with Section 618, a traffic impact report was requested to determine that unsafe or hazardous conditions will not be created by the development as proposed. As requested, the applicant provided a traffic impact report prepared by Fishbeck. The Township's traffic engineer, OHM Advisors, conducted a review of the traffic impact report and provided a response. See attached reports from Fishbeck and OHM. As noted in the OHM report dated September 6, 2022, the following recommendation was made:

“US-31 at Airport Road Queues – The analysis indicates that the PM peak southbound queues (both existing and future) extend to and beyond the 7Brew site drive. This may become an issue when vehicles are attempting to access the site traveling NB on US-31. While the study indicates there is room for two vehicles to stack to turn left into the site, there may be no room due to queues extending through this area. In addition, for vehicles to get into this storage area there is no taper, so vehicles would need to cross the double yellow to get in. Providing a taper and stacking for left turns in would be safer for 7Brew traffic but would then have SB US-31 left-turn traffic spilling into the through lanes. This leaves this situation as an area of concern and may warrant further discussion with MDOT (Michigan Department of Transportation).”



Response from MDOT stated, “Overall, MDOT agrees with the proposed plan for the 7Brew development. However, the department would like to see the entrance striped for a right turn lane, left turn lane, and an inbound lane.”

Access Management:

Currently, ingress from and egress to US-31 is through a shared drive with the Mutual gas station. The shared driveway was never approved for the site; however, it was constructed as part of an MDOT intersection improvement project in 2003. As part of their review, OHM was directed to review the driveway configuration to determine that unsafe or hazardous conditions will not be created by the proposed development. As noted in the OHM report dated September 6, 2022, the following recommendation was made:

“The site plan has been improved to help traffic navigate leaving and entering 7Brew while considering traffic to/from the gas station. The proposed changes include providing a setback stop for vehicles leaving 7Brew, which would provide right of way to traffic leaving the gas station. While this does improve on the previous site plan, there could be further improvement if the gas station and 7Brew worked together to revise the access for both sites. The figure above provides an additional concept to further channelize traffic to reduce conflicts. In this configuration, traffic leaving both 7Brew and the gas station could be under stop control. This concept gives priority to traffic entering both sites, which in turn prevents vehicles from backing up onto US-31.”

Pavement markings, curbing, and stop signs for the joint driveway have been provided to manage ingress and egress of the site for both 7Brew and Mutual Gas. Furthermore, a shared driveway easement and agreement has been offered to conform with the requirements of Section 513 Commercial and Industrial Joint Driveways of the Zoning Ordinance.

Parking, Loading, and Snow Storage

Drive-in or drive-through only restaurants have a minimum parking requirement of 1 for each employee on the largest shift plus 1 for each outdoor table. The site plan indicates there are 5 employees per shift. There are 6 parking spaces proposed including 1 barrier-free space. The building is small enough that a loading zone is not required.

Bicycle parking shall be provided at the rate of 2 bicycle spaces per 25 motor vehicle spaces. One bicycle rack is proposed and indicated on the plan, which will give space for 2 bicycles.

As required by Section 551 of the Ordinance, a ratio of 10 square feet of snow storage is required per 100 square feet of parking area. With 10,390 square feet of parking area, 1,275 square feet of snow storage area has been indicated on the site plan which meets this requirement.

Sidewalks:

A bike path is required on US-31 according to Section 522.A. of the Zoning Ordinance. A 10-foot-wide asphalt bike path is shown on the site plan. A five-foot-wide concrete sidewalk from the bike path towards the building is also shown.

Lighting

A photometric site plan is included with the site plan. Lighting standards of Section 517 of the Zoning Ordinance are described as follows:

Zoning Ordinance Lighting Standard	Subject Site
<i>A. Applicability</i> – All outdoor lighting shall be installed in conformance with the provisions of this section. Certain light fixtures exempt from this section include decorative lighting, public streetlights, emergency lights, nonconforming existing lights, neon, and flag lighting.	None of these exceptions apply to this site, so all lighting for this site is subject to the requirements of this section.
<i>B. Shielding and Filtration</i> – Lighting fixtures shall provide glare free area beyond the property line and light shall be confined to the lot from which it originates. All fixtures shall have full cut-off and shall not direct light upwards. Light sources shall be located, and light poles shall be coated, to minimize glare.	Information has been provided on the type of fixtures and appear to meet these requirements.
<i>C. Illumination</i> – Average illumination levels shall not exceed 3.0 foot-candles (FC) for the main parking area, 2.0 FC for the peripheral parking area, 5.0 FC for main drive areas, and 20.0 FC directly below the lighting fixture. The illumination levels shall also not exceed 1.0 FC adjoining another nonresidential zoning district along a property line, or 2.0 FC along an arterial. Average lighting values of illuminated areas ranging from 0.5 to 1.5 FC are recommended.	The photometric plan shows 29 light fixtures, including four pole mounted fixtures, one building mounted fixture, and 24 under canopy fixtures. The most intense light is under the canopy at 30.4 foot-candles. The lighting fixtures need to be adjusted to meet the lighting standards of Section 517 for illumination.

Zoning Ordinance Lighting Standard	Subject Site
<i>D. Color Temperature</i> – All proposed lamps shall emit light measuring 3,500 K or warmer.	Fixture specifications have been provided that indicate a color temperature of 3,000 K which meets this requirement.
<i>E. Prohibitions</i> – Prohibitions include mercury-vapor or metal halide fixture and lamps, laser source lights, searchlights, or any light that does not meet shielding and illumination standards.	Information has been provided on the type of fixtures and appear to meet these requirements.
<i>F. Pole Height</i> – All pole-mounted lighting shall not exceed the maximum zoning district height.	Four light poles are proposed and meet height requirements.

The lighting plan shall adjust the lighting fixtures to meet illumination levels in accordance with Section 517 of the Zoning Ordinance.

Landscaping

Landscaping requirements are described by the following for each length of greenspace area (e.g., without including the ingress and egress drives):

Greenspace (Length)	Adjacent Land Use	Buffer Planting Requirement	Amount Required	Amount Provided
East (75 ft.)	State Highway (US 31)	Type “D” * Ground cover as specified in Section 530.J, plus * 4 large trees, 3 medium or small trees, and 3 evergreen or coniferous trees per 100 linear feet of greenspace area * Minimum width: 20 feet	3 large trees 2 med./small trees 2 evergreen trees 20-foot width	3 large trees 2 med./small trees 2 evergreen trees 10-foot to 20-foot width
North (165 ft.)	Commercial	Type “B” * Ground cover as specified in Section 530.J, plus * 2 large trees, 1 medium or small tree, and 4 shrubs per 100 linear feet of greenspace area * Minimum width: 10 feet	3 large trees 2 med./small trees 6 shrubs 10-foot width	0 large trees 2 existing med./small trees (*credit for 4 trees) 1 new med./small tree 10 shrubs 7-foot width
West (161 ft.)			2 large trees 1 med./small tree 4 shrubs 10-foot width	Existing retaining wall with gravel due to the steep slope.
South (200 ft.)			4 large trees 2 med./small trees 8 shrubs 10-foot width	4 existing large trees (*credit for 16 trees) 4 existing med./small trees (*credit for 8 trees) 5-foot width

The Planning Commission may waive or adjust any landscaping requirement in whole or in part provided that certain conditions exist upon the site.

- As proposed, the plantings for the north and south buffers are acceptable due to credit from existing trees. The existing widths of the buffers are substandard with the north at 7 feet and the south at 5 feet, however they are acceptable.
- The existing west buffer consisting of landscape gravel and a retaining wall is acceptable due to the steep slope between the subject site and the existing Best Buy store.
- As proposed, the east buffer meets planting requirements. However, the buffer width is substandard in places.

Dumpster Enclosure

Section 516 states that enclosures shall be finished with the same materials and colors as the exterior finish of the principal structure or shall be concrete block or similar material. A dumpster enclosure is shown for the northside of the site. Details of the enclosure are included (Sheet A5.0) and show an enclosure that is 16-0” x 12-8” and 7’ tall. The enclosure will be a red brick and block with a wood gate.

Signs

Signs require sign permit review and are not approved under the site plan review process. A note on Sheet SP-1 states “Signs are subject to sign permit review by Garfield Township.”

Stormwater Management

Stormwater review by the Township Engineer will be required prior to the issuance of a Land Use Permit.

Other Reviews:

Other reviews may be necessary including Metro Fire and Michigan Department of Transportation.

USE STANDARDS – DRIVE-THROUGH:

Section 730 of the Zoning Ordinance outlines several specific regulations and conditions for drive-in and drive-through uses, including the following:

1. *Service and dining may be in automobiles or outdoors, but all other activities shall be carried on within a building.*

The site plan shows the building, drive-through, and parking area. No outdoor dining is proposed, but a picnic table is provided.

2. *A setback of at least sixty (60) feet from the right-of-way line of any existing or proposed street shall be maintained.*

The building measures approximately 60 feet from the right-of-way line of US-31.

3. *Ingress and egress points shall be located at least fifty (50) feet from the nearest edge of the traveled portion of any intersecting streets.*

The proposed drive is 400 feet from the intersection of US-31 and South Airport Road. However, due to the large scale of this intersection, deceleration lanes and double left turn lanes extend back from the intersection to the subject site.

4. *Pedestrian areas shall be clearly marked and maintained.*

The site plan shows internal sidewalks around the front and sides of the building with a designated connection to the pathway on US-31.

5. *Only one (1) ingress-egress drive shall be allowed per major thoroughfare.*

There is only one existing ingress-egress drive for this site onto US-31.

6. *All parking requirements shall comply with Article 5 of this Ordinance.*

Parking requirements are described in a previous section of this report.

7. *Notwithstanding the dimensional standards of this Ordinance, lots used for drive-in businesses and drive-in or drive-through restaurants shall have a minimum width of one hundred (100) feet.*

The parcel width is 100 feet.

8. *Queuing requirements, drive-in and drive-through businesses shall be designed to accommodate the maximum number of queuing vehicles that may be expected to seek service at any one time without queuing onto an adjacent thoroughfare, including service drives. The determination as to the required queuing spaces shall be established by the Planning Commission based upon the anticipated number of vehicles likely to queue while waiting for service. The Planning Commission may require more than twelve (12) queuing spaces based upon evidence presented to it, but in no event shall the required number of queuing spaces be reduced below twelve (12).*

The site plan shows the drive-through lanes will accommodate at least 12 queuing spaces.

9. *Notwithstanding the provisions of this section, the queuing of vehicles onto the traveled portion of a public roadway providing access to the business establishment such that queuing interferes to an extent with the free flow of traffic on the traveled portion of that roadway shall subject the Special Use Permit holder to enforcement action, including fines, injunctive relief and/or revocation of the Special Use Permit.*

This requirement shall be enforced as needed as part of the operation of the site.

10. *The site shall have been found to be a suitable site for a drive-in or drive-through establishment, with regard to traffic safety, by a registered engineer with an educational specialization in traffic engineering.*

The applicant has provided a traffic impact report from a registered traffic engineer.

FINDINGS OF FACT:

At its meeting on October 26, 2022, the Planning Commission passed a motion directing Staff to prepare Findings of Fact for the application, which are provided below for your consideration.

A special use is permitted only if the applicant demonstrates that:

(1) The proposed use will be consistent with the purpose and intent of the master plan and this Ordinance, including all regulations of the applicable zoning district;

*The Planning Commission may find this standard to be **MET** for the following reasons:*

- The site is in the C-G General Commercial zoning district. Drive-in or drive-through businesses are permitted via special use permit in the C-G district.
- The Master Plan identifies this site as Commercial on the Future Land Use map. The commercial designation indicates where commercial uses of varying intensity may be appropriate. The C-G district is one of the potentially compatible zoning districts for the Commercial designation.
- The site will be able to meet all regulations of the C-G zoning district.

(2) The proposed use will be designed, constructed, operated and maintained so as to be compatible, harmonious, and appropriate with the existing or planned character and uses of the neighborhood, adjacent properties and the natural environment;

*The Planning Commission may find this standard to be **MET** for the following reasons:*

- The site is surrounded by other commercial uses in the area including Mutual Gas to the north, Best Buy to the west, and Speedway to the south.
- The applicants have designed the site to allow for at least 12 queuing vehicles in two drive-through service lanes, which will minimize the impacts of the drive-through on adjacent properties. There is area within the driveway on the site for additional queuing.
- There are no known wetlands or sensitive areas of the natural environment on this site.

(3) The proposed use will not be detrimental, hazardous or disturbing to existing or future adjacent uses or to the public welfare by reason of excessive traffic, noise, dust, gas, smoke, vibration, odor, glare, visual clutter, electrical or electromagnetic interference;

*The Planning Commission may find this standard to be **MET** for the following reasons:*

- Fishbeck prepared a traffic impact study on behalf of the applicant, which was reviewed by OHM on behalf of the Township and by MDOT. The likely traffic levels are not anticipated to be detrimental to public welfare or to adjacent sites, based on the review of the traffic impact study. While the study indicates that the development will not be hindered by the location and its relationship to the often-busy US-31/South Airport Road intersection, monitoring of the operation by MDOT is still recommended to ensure safe traffic movement.
- No other nuisances or hazards are expected to be generated.
- The proposed lighting and photometric plan shall meet all lighting requirements of the Ordinance.

(4) Potential adverse effects arising from the proposed use on the neighborhood and adjacent properties will be minimized through the provision of adequate parking, the placement of buildings, structures and entrances, as well as the provision and location of screening, fencing, landscaping, buffers or setbacks;

*The Planning Commission may find this standard to be **MET** for the following reasons:*

- The applicants have designed the site to allow for at least 12 queuing vehicles in two drive-through service lanes, which will minimize the impacts of the drive-through on adjacent properties. There is area within the driveway on the site for additional queuing.
- Setback requirements and landscaping requirements have been met.

(5) The proposed use will retain as many natural features of the property as practicable, particularly where the natural features assist in preserving the general character of the neighborhood;

*The Planning Commission may find this standard to be **MET** for the following reasons:*

- There are no known wetlands or sensitive areas of the natural environment on this site.
- The proposed development will provide landscaping as part of the site design and existing mature trees will remain in place to contribute positively to the general character of the area.

(6) Adequate public and private infrastructure and services such as streets, water and sewage facilities, drainage structures, police and fire protection, and schools, already exist or will be provided without excessive additional requirements at public cost;

*The Planning Commission may find this standard to be **MET** for the following reasons:*

- Municipal water and sewer facilities exist along US 31 and currently serve the site.
- The applicant proposes to manage storm water onsite with an existing system. Details for the storm water management system shall be reviewed and approved by the Township Engineer.
- Significant additional demand for schools, police, or fire protection is not anticipated.

(7) The establishment, maintenance, or operation of the proposed use shall not be detrimental to or endanger the public health, safety, morals, comfort, or general welfare;

*The Planning Commission may find this standard to be **MET** for the following reasons:*

- The proposed use will not be detrimental to public health safety, morals, or general welfare. The proposed use is compatible with nearby uses and is not expected to generate any nuisances.
- The applicants have designed the site to allow for at least 12 queuing vehicles in two drive-through service lanes, which will minimize the impacts of the drive-through on adjacent properties. There is area within the driveway on the site for additional queuing.
- Fishbeck prepared a traffic impact study on behalf of the applicant, which was reviewed by OHM on behalf of the Township and by MDOT. The likely traffic levels are not anticipated to be detrimental to public welfare or to adjacent sites, based on the review of the traffic impact study. While the study indicates that the development will not be hindered by the location and its relationship to the often-busy US-31/South Airport Road intersection, monitoring of the operation by MDOT is still recommended to ensure safe traffic movement.

(8) The public interest and welfare supporting the proposed use shall be sufficient to outweigh individual interests that are adversely affected by the establishment of the proposed use;

*The Planning Commission may find this standard to be **MET** for the following reasons:*

- The public interest and welfare are served by the proposed use, which is allowed via special use permit in the C-G district and is located on a site that currently has a vacant building that formerly housed PNC Bank with a drive-through.
- A public hearing was held on October 26, 2022. No comments nor concerns were made about the proposed development.

(9) Adequate measures shall be taken to provide ingress and egress so designed as to minimize traffic hazards and to minimize traffic congestion on the public roads;

*The Planning Commission may find this standard to be **MET** for the following reasons:*

- The applicant is proposing to utilize an existing shared driveway to US-31. Based on recommendations from OHM and the Township's requirements for shared driveways, improvements, including pavement markings, curbing, and stop signs, will be installed to manage ingress and egress of the site for both 7Brew and Mutual Gas. Furthermore, a shared driveway easement and maintenance agreement will be established for the shared driveway.
- Fishbeck prepared a traffic impact study on behalf of the applicant, which was reviewed by OHM on behalf of the Township and by MDOT. The likely traffic levels are not anticipated to be detrimental to public welfare or to adjacent sites, based on the review of the traffic impact study. While the study indicates that the development will not be hindered by the location and its relationship to the often-busy US-31/South Airport Road intersection, monitoring of the operation by MDOT is still recommended to ensure safe traffic movement.

(10) Adequate measures shall be taken to provide vehicular and pedestrian traffic within the site, and in relation to streets and sidewalks servicing the site in a safe and convenient manner; and

*The Planning Commission may find this standard to be **MET** for the following reasons:*

- The site design will allow for safe vehicular traffic throughout the site. The drive-through lanes on the site will allow for enough queueing space to avoid traffic conflicts.
- A bike path will be installed across the front of the site.
- Pedestrians will be accommodated via a sidewalk between the bike path and the building.

(11) The proposed use shall not impede the orderly development and improvement of surrounding property for uses permitted within the zoning district.

*The Planning Commission may find this standard to be **MET** for the following reasons:*

- The proposed use is permitted via special land use permit in the C-G district. Nothing about the proposed project would impede the orderly development and improvement of surrounding sites.

ACTION REQUESTED:

The purpose of this agenda item is to consider Findings of Fact for the application. Upon consideration and Commissioner discussion, the following motion is offered for consideration:

MOTION THAT the Findings of Fact for application SUP 2022-01, as presented in Planning Department Report 2022-102 and being made a part of this motion, BE ADOPTED.

The following motion is recommended to approve the project, subject to the conditions as noted below, and subject to conditions which are routinely added to all approvals:

MOTION THAT application SUP-2022-01 BE APPROVED, subject to the following conditions:

1. The lighting plan shall adjust the lighting fixtures to meet illumination levels in accordance with Section 517 of the Zoning Ordinance.
2. A shared driveway easement and maintenance agreement shall be established for the shared driveway between the applicant and Mutual Gas located to the north.
3. As per the requirements of Section 730 of the Zoning Ordinance, if the queuing of vehicles interferes with the free flow of traffic on the public roadway, then the Special Use Permit

- holder is subject to enforcement such as fines, injunctive relief and/or revocation of the Special Use Permit.
4. As the traffic impact study indicates that the development will not be hindered by the location and its relationship to the often-busy US-31/South Airport Road intersection, monitoring of the operation on traffic patterns by Michigan Department of Transportation is recommended to ensure safe traffic movement.
 5. Final engineering review and approval by the Township Engineer is required including all infrastructure and stormwater.
 6. All final reviews from agencies with jurisdiction shall be provided prior to any Land Use Permits being issued.
 7. All proposed landscaping and site amenities shall be installed prior to the issuance of a Certificate of Occupancy.
 8. The applicant shall provide two (2) full-size plan sets, one (1) 11x17” plan set, and one electronic copy of the full application (in PDF format) with all updates as required by the conditions of this approval and indicating compliance with all provisions of the Zoning Ordinance.
 9. The applicant shall record promptly the amended Report and Decision Order (RDO) and any amendment to such order with the Grand Traverse County Register of Deeds in the chain of title for each parcel or portion thereof to which the RDO pertains. A copy of each recorded document shall be filed with the Director of Planning within thirty (30) days of final approval by the Township or approval shall be considered to have expired.

Any additional information the Planning Commission deems necessary should be added to this motion.

Attachments:

1. Application for Special Use Permit (dated June 8, 2022)
2. Impact Statement and Basis of Determination (dated June 8, 2022)
3. 7Brew – Traffic Impact Study (from Fishbeck dated June 8, 2022 – summary only)
4. Proposed 7Brew Coffee Shop Traffic Impact Study Review (from OHM dated July 28, 2022)
5. 7Brew Traffic Impact Study – Response to OHM Review (from Fishbeck dated August 23, 2022 – summary only)
6. OHM Comments Re: 7Brew – Traffic Impact Study Response to OHM Review (from OHM dated September 6, 2022)
7. Site Plan prepared by BFA, Inc. (dated November 1, 2022)
8. Photometric Lighting Plan prepared by Ben Kerstens, LC (dated October 19, 2022)
9. Email from Michigan Department of Transportation (MDOT) (dated September 29, 2022)
10. Letter from Community Planning & Land Use Consulting and attachment (dated October 17, 2022)



Charter Township of Garfield

Grand Traverse County

3848 VETERANS DRIVE
TRAVERSE CITY, MICHIGAN 49684
PH: (231) 941-1620 • FAX: (231) 941-1588

SPECIAL USE PERMIT (SUP) APPLICATION

ASSISTANCE

This application must be completed in full. An incomplete or improperly prepared application will not be accepted and will result in processing delays. Before submitting an application, it is recommended that you contact the Planning and/or Zoning Department to arrange an appointment to discuss your proposed application. Time is often saved by these preliminary discussions. For additional information or assistance in completing this development application, please contact the Planning Department at (231) 941-1620.

ACTION REQUESTED

- New Special Use Permit
- Major Amendment
- Minor Amendment
- Administrative Amendment

PROJECT / DEVELOPMENT NAME

7Brew - 2537 N. US 31

APPLICANT INFORMATION

Name: 2537 N US 31 SOUTH LLC - Kevin Myers
Address: PO Box 100843 Fort Worth, TX 76185
Phone Number: 940-300-6569
Email: km@netleasedev.com

AGENT INFORMATION

Name: BFA, Inc. - John Schebaum
Address: 103 Elm Street Washington, MO 63090
Phone Number: 636-231-4337
Email: jschebaum@bfaeng.com

OWNER INFORMATION

Name: 2537 N US 31 SOUTH LLC
Address: PO Box 100843 Fort Worth, TX 76185
Phone Number: 940-300-6569
Email: km@netleasedev.com

CONTACT PERSON

Please select one person to be contact person for all correspondence and questions:

Applicant:	
Agent:	BFA, Inc. - John Schebaum
Owner:	

PROPERTY INFORMATION

Property Address:	2537 N US 31 South Traverse City, MI
Property Identification Number:	05-021-036-10
Legal Description:	Attached
Zoning District:	C-G General Commercial
Master Plan Future Land Use Designation:	Commercial
Area of Property (acres or square feet):	0.46 Acres
Existing Use(s):	Vacant Bank
Proposed Use(s):	Drive-Through Coffee Shop

PROJECT TIMELINE

Estimated Start Date:	September 2022
Estimated Completion Date:	December 2022

REQUIRED SUBMITTAL ITEMS

A complete application for a Special Use Permit consists of the following:

Application Form:

- One original signed application
- One digital copy of the application (PDF only)

Application Fee:

Fees are established by resolution of the Garfield Township Board and are set out in the current Fee Schedule as listed on the Planning Department page of the Township website (<http://www.garfield-twp.com>). Please make check out to Charter Township of Garfield.

- Fee

Escrow Fee:

Additional fees may be required if a review by independent professional help is deemed necessary by the Township. If required, such additional fees must be placed in escrow by the applicant in accordance with the escrow policies of the Township and prior to any further processing of this application. Any unused escrow funds shall be returned to the applicant. Please complete an Escrow and Review (ER) Application form.

Site Development Plan:

- Ten complete stapled 11"x17" paper sets (Administrative Amendments require one copy)
- Two complete bound 24"x36" paper sets
- One digital set (PDF only)

Written Information:

- Ten paper copies of the Approval Criteria (Administrative Amendments require one copy)
- One digital copy of the Approval Criteria (PDF only)
- Ten paper copies of the Impact Assessment (Administrative Amendments require one copy)
- One digital copy of the Impact Assessment (PDF only)

Digital items to be delivered via email or USB flash drive

SUBMITTAL DEADLINE

Submittal deadlines are listed on the Planning Department page of the Township website (<http://www.garfield-twp.com>). Please note that the listed dates are the deadlines after which submittals will not be considered for the indicated meeting. Any errors or missing information on an application submitted at the deadline will result in a delay in the processing of the application. An earlier submittal is encouraged to avoid possible delays.

WAIVERS

Submittal Waiver:

At the discretion of the Director of Planning, a Site Development Plan may be waived in any of the following cases when it is determined that the submission would serve no useful purpose:

1. The erection or enlargement of an accessory structure;
2. The enlargement of a principal building by less than 20 percent of its existing gross floor area, provided such enlargement will not result in a requirement for additional off-street parking;
3. A change in principal use where such change would not result in an increase in impervious surface area, additional off-street parking, site access, other external site characteristics or a violation of this ordinance.

Data Waiver:

The Director of Planning may waive a particular element of information or data otherwise required for a Site Development Plan upon a finding that the information or data is not necessary to determine compliance with this ordinance or that such information or data would not bear on the decision of the approval authority.

SITE PLAN

Check that your site plan includes all required elements for a Site Development Plan (SDP). Please use the Required Site Plan Elements Checklist below.

APPROVAL CRITERIA

Indicate, on a separate sheet of paper, how the proposed special use will comply with, meet, or facilitate each of the following Approval Criteria from § 423.E of the Zoning Ordinance. The Planning Commission must determine that each of these criteria are satisfied in order to grant approval of a Special Use Permit. A special use is permitted only if the applicant demonstrates that: special use is permitted only if the applicant demonstrates that:

- The proposed use will be consistent with the purpose and intent of the master plan and this ordinance, including all regulations of the applicable zoning district;

- The proposed use will be designed, constructed, operated and maintained so as to be compatible, harmonious and appropriate with the existing or planned character and uses of the neighborhood, adjacent properties and the natural environment;
- The proposed use will not be detrimental, hazardous or disturbing to existing or future adjacent uses or to the public welfare by reason of excessive traffic, noise, dust, gas, smoke, vibration, odor, glare, visual clutter, electrical or electromagnetic interference;
- Potential adverse effects arising from the proposed use on the neighborhood and adjacent properties will be minimized through the provision of adequate parking, the placement of buildings, structures and entrances, as well as the provision and location of screening, fencing, landscaping, buffers or setbacks;
- The proposed use will retain as many natural features of the property as practicable, particularly where the natural features assist in preserving the general character of the neighborhood;
- Adequate public and private infrastructure and services such as streets, water and sewage facilities, drainage structures, police and fire protection, and schools, already exist or will be provided without excessive additional requirements at public cost;
- The establishment, maintenance, or operation of the proposed use shall not be detrimental to or endanger the public health, safety, morals, comfort, or general welfare;
- The public interest and welfare supporting the proposed use shall be sufficient to outweigh individual interests that are adversely affected by the establishment of the proposed use;
- Adequate measures shall be taken to provide ingress and egress so designed as to minimize traffic hazards and to minimize traffic congestion on the public roads;
- Adequate measures shall be taken to provide vehicular and pedestrian traffic within the site, and in relation to streets and sidewalks servicing the site in a safe and convenient manner; and
- The proposed use shall not impede the orderly development and improvement of surrounding property for uses permitted within the zoning district.

IMPACT ASSESSMENT

A written impact statement to include the following information:

- A written illustrative description of the environmental characteristics of the site prior to development, i.e., topography, soils, vegetative cover, drainage, streams, creeks or ponds.
- Types of uses and other man-made facilities.
- The number of people to be housed, employed, visitors or patrons and vehicular and pedestrian traffic.
- Phasing of the project including ultimate development proposals.
- Natural features which will be retained, removed and/or modified including vegetation, drainage, hillsides, streams wetlands, woodlands, wildlife and water. The description of the areas to be changed shall include their effect on the site and adjacent properties. An aerial photo may be used to delineate the areas of change.
- The method to be used to serve the development with water and sanitary sewer facilities.
- The method to be used to control drainage on the site and from the site. This shall include runoff control during periods of construction.
- If the public sewers are not available to the site, the Applicant shall submit a current approval from the Health Department or other responsible public agency indicating approval of plans for sewage treatment.

- The method to be used to control any increase in effluent discharge to the air or any increase in noise level emanating from the site. Consideration of any nuisance that would be created within the site or external to the site whether by reason of dust, noise, fumes vibration, smoke or lights.
- An indication of how the proposed use conforms with existing and potential development patterns and any adverse effects.
- The proposed density in units per acre for residential developments.
- Name(s) and address(es) of person(s) responsible for preparation of statement.
- Description of measures to control soil erosion and sedimentation during grading and construction operations and until a permanent ground cover is established. Recommendations for such measures may be obtained from the County Soil Erosion and Sedimentation office.
- Type, direction, and intensity of outside lighting.
- General description of deed restrictions, if any.

ADDITIONAL INFORMATION

If applicable, provide the following further information:

	<u>Yes</u>	<u>No</u>	<u>Not Applicable</u>
A. <u>Sanitary Sewer Service</u>			
1. Does project require extension of public sewer line?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If yes, has a Utility Agreement been prepared?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Will a community wastewater system be installed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If yes, has a Utility Agreement been prepared?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If yes, provide construction plans and specifications			
3. Will on-site disposal be used?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If yes, is it depicted on plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
B. <u>Water Service</u>			
1. Does project require extension of public water main?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If yes, has a Utility Agreement been prepared?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Will a community water supply be installed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If yes, has a Utility Agreement been prepared?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If yes, provide construction plans and specifications			
C. <u>Public utility easements required?</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If yes, show on plan.			
D. <u>Stormwater Review/Soil Erosion</u>			
1. Soil Erosion Plans approved by Soil Erosion Office?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If so, attach approval letter.			
If no, are alternate measures shown?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Stormwater Plans approved by Township Engineer?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If so, attach approval letter.			
If no, are alternate measures shown?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Note: Alternate measures must be designed and sealed by a registered Engineer.			

E. Roads and Circulation

- 1. Are interior public streets proposed?
If yes, has Road Commission approved (attach letter)?
- 2. Will public streets connect to adjoining properties or future streets?
- 3. Are private roads or interior drives proposed?
- 4. Will private drives connect to adjoining properties service roads?
- 5. Has the Road Commission or MDOT approved curb cuts?
If yes, attach approved permit.

OTHER INFORMATION

If there is any other information that you think may be useful in the review of this application, please attach it to this application or explain it on a separate page.


REVIEW PROCESS

- Upon submittal of this application, Staff will review the materials submitted and will, within ten (10) working days, forward a determination of completeness to the applicant. If the submission is incomplete or noncompliant with the Zoning Ordinance, it will be returned to the applicant for revision. Once the submission is revised, Staff will again review it for completeness and again forward a determination to the applicant within ten (10) working days. This procedure shall be repeated until a complete submission is received.
- Once the application is deemed to be complete and submitted according to the application deadlines, it will be forwarded to the Planning Commission for review. The Planning Commission will determine if the application is complete and schedule a public hearing.
- Upon holding a public hearing, the Planning Commission may approve, approve with conditions, or deny the proposed special use.
- If approved or approved with conditions, the decision of the Planning Commission shall be incorporated into a written report and decision order.

PERMISSION TO ENTER SUBJECT PROPERTY

Permission is hereby granted to Garfield Township staff and Planning Commissioners to enter the premises subject to this application for the purposes of making inspections associated with this application, during normal and reasonable working hours.

Owner Signature:



Applicant Signature:

Agent Signature:

Date:

6/7/22

OWNER'S AUTHORIZATION

If the applicant is not the registered owner of the lands that is the subject of this application, the owner(s) must complete the authorization set out below.

I/We 2537 N US 31 SOUTH LLC authorize to make this application on my/our behalf and to provide any of my/our personal information necessary for the processing of this application. Moreover, this shall be your good and sufficient authorization for so doing.

Owner Signature:



Date:

6/7/22

AFFIDAVIT

The undersigned affirms that he/she or they is (are) the owner, or authorized agent of the owner, involved in the application and all of the information submitted in this application, including any supplemental information, is in all respects true and correct. The undersigned further acknowledges that willful misrepresentation of information will terminate this permit application and any permit associated with this document.

Owner Signature:




Date:

6/7/22

Applicant Signature:

Date:

<p align="center">Required Site Plan Elements Checklist (See § 956 of the Zoning Ordinance) Site Diagram (SD) / Administrative Site Plan (ASP) / Site Development Plan (SDP)</p>	SD	ASP/ SDP
A. Basic Information		
1. Applicant's name, address, telephone number and signature	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2. Property owner's name, address, telephone number and signature	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Proof of property ownership	<input type="checkbox"/>	<input type="checkbox"/>
4. Whether there are any options or liens on the property	<input type="checkbox"/>	<input type="checkbox"/>
5. A signed and notarized statement from the owner of the property that the applicant has the right to act as the owner's agent	<input type="checkbox"/>	<input type="checkbox"/>
6. The address and/or parcel number of the property, complete legal description and dimensions of the property, setback lines, gross and net acreages and frontage	<input type="checkbox"/>	<input type="checkbox"/>
7. A vicinity map showing the area and road network surrounding the property	<input type="checkbox"/>	<input type="checkbox"/>
8. Name, address and phone number of the preparer of the site plan	<input type="checkbox"/>	<input type="checkbox"/>
9. Project title or name of the proposed development	<input type="checkbox"/>	<input type="checkbox"/>
10. Statement of proposed use of land, project completion schedule, any proposed development phasing	<input type="checkbox"/>	<input type="checkbox"/>
11. Land uses and zoning classification on the subject parcel and adjoining parcels	<input type="checkbox"/>	<input type="checkbox"/>
12. Seal of the registered engineer, architect, landscape architect, surveyor, or planner who prepared the plan, as well as their name, address and telephone number	<input type="checkbox"/>	<input type="checkbox"/>
B. Site Plan Information		
1. North arrow, scale, and date of original submittal and last revision	<input type="checkbox"/>	<input type="checkbox"/>
2. Boundary dimensions of natural features	<input type="checkbox"/>	<input type="checkbox"/>
3. Natural features such as woodlots, water bodies, wetlands, high risk erosion areas, slopes over twenty-five percent (25%), beach, drainage, and similar features	<input type="checkbox"/>	<input type="checkbox"/>
4. Proposed alterations to topography and other natural features	<input type="checkbox"/>	<input type="checkbox"/>
5. Existing topographic elevations at two-foot intervals except shown at five-foot intervals where slopes exceed 18%	<input type="checkbox"/>	<input type="checkbox"/>
6. Soil erosion and sediment control measures as required by the Grand Traverse County Soil Erosion Department.	<input type="checkbox"/>	<input type="checkbox"/>
7. The location, height and square footage of existing and proposed main and accessory buildings, and other existing structures	<input type="checkbox"/>	<input type="checkbox"/>
8. Location and specifications for any existing or proposed (above or below ground) storage facilities for any chemicals, salts, flammable materials, or hazardous materials. Include any containment structures or clear zones required by county, state or federal government authorities	<input type="checkbox"/>	<input type="checkbox"/>
9. Proposed finish floor and grade line elevations of any structures <i>*Required only for habitable construction within the floodplain on site diagrams and administrative site plans.</i>	<input type="checkbox"/>	<input type="checkbox"/>
10. Existing and proposed driveways, including parking areas	<input type="checkbox"/>	<input type="checkbox"/>
11. Neighboring driveways and other vehicular circulation features adjacent to the site	<input type="checkbox"/>	<input type="checkbox"/>
12. A dimensional plan indicating the location, size and number of parking spaces of the on-site parking areas, and shared parking areas	<input type="checkbox"/>	<input type="checkbox"/>
13. Identification and dimensions of service lanes and service parking, snow storage areas, loading and unloading and docks	<input type="checkbox"/>	<input type="checkbox"/>
14. Proposed roads, access easements, sidewalks, bicycle paths, and other vehicular and pedestrian circulation features within and adjacent to the site	<input type="checkbox"/>	<input type="checkbox"/>
15. Location of and dimensions of curb cuts, acceleration, deceleration and passing lanes	<input type="checkbox"/>	<input type="checkbox"/>
16. Location of neighboring structures that are close to the parcel line or pertinent to the proposal	<input type="checkbox"/>	<input type="checkbox"/>
17. Location of water supply lines and/or wells	<input type="checkbox"/>	<input type="checkbox"/>
18. Location of sanitary sewer lines and/or sanitary sewer disposal systems	<input type="checkbox"/>	<input type="checkbox"/>
19. Location, specifications, and access to a water supply in the event of a fire emergency	<input type="checkbox"/>	<input type="checkbox"/>
20. Sealed (2) stormwater plans including the location and design of storm sewers, retention or detention ponds, swales, wastewater lines, clean out locations, connection points and treatment systems	<input type="checkbox"/>	<input type="checkbox"/>
21. A utility plan including the location of all other utilities on the site including but not limited to natural gas, electric, cable TV, telephone and steam	<input type="checkbox"/>	<input type="checkbox"/>
22. A sign plan indicating the location, size and specifications of all signs and advertising features, including cross sections	<input type="checkbox"/>	<input type="checkbox"/>
23. A lighting plan including exterior lighting locations with area of illumination illustrated by point values on a photometric plan, Kelvin rating, as well as the type of fixtures and shielding to be used	<input type="checkbox"/>	<input type="checkbox"/>
24. Proposed location of any open spaces, landscaping and buffering features such as buffer areas, vegetation belts, fences, walls, trash receptacle screening, and other screening features with cross sections shown	<input type="checkbox"/>	<input type="checkbox"/>
25. A Landscape plan and table identifying the species, size of landscape materials, and number proposed, compared to what is required by the Ordinance. All vegetation to be retained on site must also be indicated, as well as, its typical size by general location or range of sizes as appropriate	<input type="checkbox"/>	<input type="checkbox"/>
26. Statements regarding the project impacts on existing infrastructure (including traffic capacity, schools, and existing utilities, and on the natural environment on and adjacent to the site)	<input type="checkbox"/>	<input type="checkbox"/>
27. Changes or modifications required for any applicable regulatory agencies' approvals	<input type="checkbox"/>	<input type="checkbox"/>

 First American Title™	ALTA Commitment for Title Insurance
	ISSUED BY First American Title Insurance Company
Schedule C	

Commitment No.: TC13-101789

The land is described as follows:

Land situated in the Township of Garfield, County of Grand Traverse, State of Michigan, described as follows:

Part of the Northwest 1/4 of Section 21, Town 27 North, Range 11 West, more particularly described as:

THE NORTH 100 FEET of the following described premises:
Commencing at the center of said Section 21; thence West along the East-West 1/4 line 51.27 feet to the West right of way line of Highway US 31; thence along said line, being parallel to and 75 feet distant from the centerline of said Highway, North 01 degree 19 minutes West 33.01 feet to the North right of way line of County Road and Point of Beginning; thence continuing along West right of way line of US 31, North 01 degree 19 minutes West 461.00 feet; thence West 200.00 feet; thence South 01 degree 19 minutes East 461.00 feet to the aforesaid North right of way line of County Road; thence along said line, East 200.00 feet to the point of beginning, except a parcel in the Southeast corner thereof measuring 105 East and West by 161 feet North and South, Section 21, Town 27 North, Range 11 West.

This page is only a part of a 2016 ALTA® Commitment for Title Insurance issued by First American Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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DATE: June 8, 2022

TO: John Sych, Planning Director
Charter Township of Garfield Planning Commission

FROM: John Schebaum, BFA, Inc. – Civil Engineer for NLD Acquisitions LLC

SUBJECT: 2537 US Hwy 31 Development Traverse City, MI (Charter Township of Garfield)
Proposed 7Brew Coffee Shop

Mr. Sych and Members of the Planning Commission,

Thank you for your time and consideration of our proposed development. On behalf of NLD Acquisitions LLC, we would like to introduce a proposed redevelopment of the former PNC Bank property located at 2537 North US Hwy 31 in Traverse City, Michigan. This project was originally in front of the Planning Commission on March 9th, 2022 for a Conceptual Review. We appreciate the initial comments and concerns that were presented at this meeting, and believe the documents provided with our Special Use Permit Application adequately address them.

The proposed use of a drive-through coffee shop is consistent with the purpose and intent of the master plan, and this ordinance. The property is zoned C-G General Commercial, which permits a drive-through business by a Special Use Permit.

Approval Criteria

- The proposed use will be consistent with the purpose and intent of the master plan and this ordinance, including all regulations of the applicable zoning district;
 - **The Master Plan Future Land Use Designation is Commercial, which applies to the proposed use. The proposed use is consistent with the regulations of the applicable zoning district.**
- The proposed use will be designed, constructed, operated and maintained so as to be compatible, harmonious and appropriate with the existing or planned character and uses of the neighborhood, adjacent properties and the natural environment;
 - **The proposed commercial use is compatible to the surrounding commercial uses.**
- The proposed use will not be detrimental, hazardous or disturbing to existing or future adjacent uses or to the public welfare by reason of excessive traffic, noise, dust, gas, smoke, vibration, odor, glare, visual clutter, electrical or electromagnetic interference;
 - **The proposed use will not have any negative impacts on the surrounding uses.**
- Potential adverse effects arising from the proposed use on the neighborhood and adjacent properties will be minimized through the provision of adequate parking, the placement of buildings, structures and entrances, as well as the provision and location of screening, fencing, landscaping, buffers or setbacks;
 - **The surrounding neighborhood and properties will benefit from the new commercial use that will provide a unique service to the surrounding area. Adequate parking and site design have been completed and designed to compliment the proposed use.**

- The proposed use will retain as many natural features of the property as practicable, particularly where the natural features assist in preserving the general character of the neighborhood;
 - **The site was designed in a manner to preserve many existing trees and site features to enhance the redeveloped property.**
- Adequate public and private infrastructure and services such as streets, water and sewage facilities, drainage structures, police and fire protection, and schools, already exist or will be provided without excessive additional requirements at public cost;
 - **Adequate infrastructure exists, and no additional requirements at public cost are anticipated.**
- The establishment, maintenance, or operation of the proposed use shall not be detrimental to or endanger the public health, safety, morals, comfort, or general welfare;
 - **The proposed use will not have any negative impacts to public health.**
- The public interest and welfare supporting the proposed use shall be sufficient to outweigh individual interests that are adversely affected by the establishment of the proposed use;
 - **The proposed use will not have any negative impacts to the public interest or welfare.**
- Adequate measures shall be taken to provide ingress and egress so designed as to minimize traffic hazards and to minimize traffic congestion on the public roads;
 - **As detailed in the Traffic Impact Study, the proposed development will not result in traffic hazards or traffic congestion on the public roads.**
- Adequate measures shall be taken to provide vehicular and pedestrian traffic within the site, and in relation to streets and sidewalks servicing the site in a safe and convenient manner;
 - **Vehicular and pedestrian traffic are adequately handled within the site using pavement striping and curbs. Vehicular access to the public road is provided by an existing Michigan DOT approved access.**
- The proposed use shall not impede the orderly development and improvement of surrounding property for uses permitted within the zoning district.
 - **The proposed use will not impede the development and improvement of surrounding properties.**

Impact Assessment

- A written illustrative description of the environmental characteristics of the site prior to development, i.e., topography, soils, vegetative cover, drainage, streams, creeks or ponds.
 - **The existing site is a vacant bank with drive-through, parking, and associated site features. An existing retaining wall is located at the western side of the property, with drainage facilities located throughout the site, draining towards the east/US 31.**
- Types of uses and other man-made facilities.
 - **The proposed use will include a new drive-through coffee shop building with canopy, parking, and associated site features.**
- The number of people to be housed, employed, visitors or patrons and vehicular and pedestrian traffic.
 - **The proposed coffee shop will have 5 employees on the max shift. The anticipated vehicular traffic is detailed in the Traffic Impact Study provided. Pedestrian traffic is not anticipated due to the specific type of use proposed.**
- Phasing of the project including ultimate development proposals.
 - **The project is anticipated to be completed in one demolition/construction phase.**
- Natural features which will be retained, removed and/or modified including vegetation, drainage, hillsides, streams, wetlands, woodlands, wildlife and water. The description of the areas to be changed shall include their effect on the site and adjacent properties. An aerial photo may be used to delineate the areas of change.
 - **As shown on the Civil Plans, the existing retaining wall and slopes on the west portion of the property are to remain. Existing landscaping/mature trees are also proposed to remain where possible.**
- The method to be used to serve the development with water and sanitary sewer facilities.
 - **The proposed development will be served with water and sanitary sewer similar to the existing bank building, connecting to the mains located along US 31.**
- The method to be used to control drainage on the site and from the site. This shall include runoff control during periods of construction.
 - **The proposed development will collect stormwater drainage similar to the existing bank site via inlets and storm piping. Erosion and Sediment Control devices will be installed by the contractor during construction to prevent stormwater pollution.**
- If the public sewers are not available to the site, the Applicant shall submit a current approval from the Health Department or other responsible public agency indicating approval of plans for sewage treatment.
 - **N/A**
- The method to be used to control any increase in effluent discharge to the air or any increase in noise level emanating from the site. Consideration of any nuisance that would be created within the site or external to the site whether by reason of dust, noise, fumes vibration, smoke or lights.
 - **No increase is anticipated.**

- An indication of how the proposed use conforms with existing and potential development patterns and any adverse effects.
 - **The proposed use conforms with the surrounding commercial uses and no adverse effects are anticipated.**
- The proposed density in units per acre for residential developments.
 - **N/A**
- Name(s) and address(es) of person(s) responsible for preparation of statement.
 - **NLD Acquisitions LLC – Kevin Myers**
 - **BFA, Inc. – John Schebaum**
(Contact information provided on application)
- Description of measures to control soil erosion and sedimentation during grading and construction operations and until a permanent ground cover is established. Recommendations for such measures may be obtained from the County Soil Erosion and Sedimentation office.
 - **Detailed Erosion and Sediment Control Plans are provided in the Civil Plans submitted.**
- Type, direction, and intensity of outside lighting.
 - **Photometric Plans are provided detailing the proposed site lighting for the commercial use.**
- General description of deed restrictions, if any.
 - **None known.**

Supplemental Use Regulations – Drive-Through Use

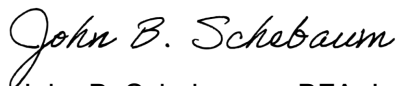
1. Service and dining may be in automobiles or outdoors, but all other activities shall be carried on within a building.
 - **Requirement met.**
2. A setback of at least sixty (60) feet from the right-of-way line of any existing or proposed street shall be maintained.
 - **Requirement met.**
3. Ingress and egress points shall be located at least fifty (50) feet from the nearest edge of the traveled portion of any intersecting streets.
 - **Requirement met.**
4. Pedestrian areas shall be clearly marked and maintained.
 - **Requirement met.**
5. Only one (1) ingress-egress drive shall be allowed per major thoroughfare.
 - **Requirement met.**
6. All parking requirements shall comply with Article 5 of this Ordinance.
 - **Requirement met.**
7. Notwithstanding the dimensional standards of this Ordinance, lots used for drive-in businesses and drive-in or drive-through restaurants shall have a minimum width of one hundred (100) feet.
 - **Requirement met.**
8. Queuing requirements, drive-in and drive-through businesses shall be designed to accommodate the maximum number of queuing vehicles that may be expected to seek service at any one time without queuing onto an adjacent thoroughfare, including service drives. The determination as to the required queuing spaces shall be established by the Planning Commission based upon the anticipated number of vehicles likely to queue while waiting for service. The Planning Commission may require more than twelve (12) queuing spaces based upon evidence presented to it, but in no event shall the required number of queuing spaces be reduced below twelve (12).
 - **The proposed coffee shop has internal storage for 20 vehicles without impacts to site circulation nor queue spillback onto US 31.**
9. Snack and nonalcoholic beverage bars shall have a minimum queuing space in advance of order boards to accommodate six (6) motor vehicles at any time.
 - **N/A**
10. These requirements shall not apply to drive-in or drive-through businesses including restaurants, where queuing is accommodated entirely within the confines of a development exclusive of that development's access or service drives.
 - **N/A**
11. Notwithstanding the provisions of this section, the queuing of vehicles onto the traveled portion of a public roadway providing access to the business establishment such that queuing interferes to an extent with the free flow of traffic on the traveled portion of that roadway shall subject the Special Use Permit holder to enforcement action, including fines, injunctive relief and/or revocation of the Special Use Permit.
 - **N/A**
12. The site shall have been found to be a suitable site for a drive-in or drive-through establishment, with regard to traffic safety, by a registered engineer with an educational specialization in traffic engineering.
 - **The Traffic Impact Study provided by Fishbeck finds that the site is suitable for the proposed use.**

13. For the C-L Local Commercial and C-O Office Commercial districts, a Financial Institution, with Drive-Through shall have a maximum of two (2) drive-through lanes.
 - **N/A**
14. For the C-G General Commercial district, a Financial Institution, with Drive-Through which has two (2) or fewer drive-through lanes shall be permitted by special conditions. All other drive-in and drive-through uses in the C-G district shall require a Special Use Permit.
 - **N/A**

Please note the existing site, and proposed site, do not meet the 10-foot side yard landscape setback. Mr. Sych has advised that the minor encroachment into the landscape setback could potentially be approved by the Planning Commission in lieu of obtaining approval from Zoning Board of Appeals. In order to accommodate this request, the landscaping has been designed in a manner to maintain a majority of the existing, mature, trees on site.

We appreciate your review of our proposed development, and look forward to working with the Charter Township of Garfield.

Respectfully,



John B. Schebaum – BFA, Inc.
Project Manager

Memo

TO: John Schebaum, PE – BFA, Inc

FROM: Kyle Reidsma, PE, PTOE
Jeffery Morden, PE, PTOE

DATE: June 8, 2022

PROJECT NO.: 220851

RE: 7Brew – Traffic Impact Study

Introduction

BFA, Inc is proposing a 7Brew Coffee Shop in Garfield Township, Grand Traverse County, Michigan. The project site is located on the west side of US-31 approximately 475 feet north of South Airport Road. The site was formerly occupied by an approximately 1,050 square-foot PNC Drive-in Bank with five drive-through lanes. PNC Bank will be torn down and a new building will be constructed. The project is expected to be built and in operation by 2023.

Garfield Township has jurisdiction over the review and approval of the proposed 7Brew Coffee Shop. The Township has required a traffic study to compare traffic generation potential of the proposed coffee shop versus the previously occupied PNC Bank. In addition, the Michigan Department of Transportation (MDOT) has jurisdiction over US-31 and the Grand Traverse County Road Commission (GTCRC) has jurisdiction over South Airport Road. All work was completed according to methodology published by the Institute of Transportation Engineers (ITE). Relevant data and calculations are attached to this memorandum. The project location and study intersections are indicated on Figure 1.

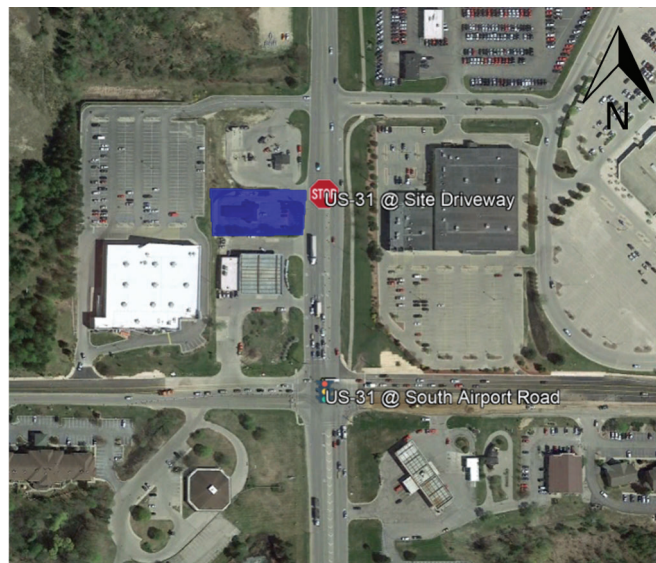


Figure 1: Project Location and Study Network

Baseline Traffic Conditions (without 7Brew Coffee Shop)

US-31 is principal arterial under MDOT jurisdiction. In the vicinity of the site, US-31 has five lanes (two in either direction and a center lane for left turns), and a speed limit of 45 miles per hour (mph). South Airport Road is a minor arterial under GTCRC jurisdiction. In the vicinity of the site, South Airport Road has five lanes to the east and two lanes to the west with a speed limit of prima facie, 55 mph. The intersection of US-31 and South Airport Road is signalized. All intersection approaches have dual left turn lanes with protected only phasing. The north, south, and westbound approaches of the intersection have exclusive right turn lanes with overlap phases. This signal runs on an adaptive control system, which is fully actuated and capable to respond to traffic demand variations. Push-button actuated pedestrian crossings are located east, west, and south legs of the intersection.

Existing intersection turning movement traffic volumes were collected by Fishbeck subconsultant Gewalt Hamilton Associates, Inc. (GHA) using MioVision Scout cameras. Data were collected during the weekday morning (7:00 to 9:00 a.m.) peak period on Tuesday, May 24, 2022. Traffic data were collected in 15-minute intervals and included heavy vehicle counts. The analysis was limited to the morning peak hour as that would typically be the busiest time for a coffee shop resulting in the most site trips.

Historical traffic data for South Airport Road, east of US-31 and US-31, south of Silver Lake Road/Fourteenth Street were obtained from the MDOT Transportation Data Management System (TDMS). Hourly segment data were obtained from 2021 and 2017, respectively, reflective of conditions before and after the COVID-19 pandemic of 2020. Review of the historical data in comparison with the May 2022 counts collected by GHA for this study indicate that current a.m. peak hour volumes are larger than the 2021 and 2017 traffic volumes from South Airport Road and US-31. Based on this review, there was no compelling evidence to apply a COVID adjustment factor to the collected turning movement counts (TMCs).

Additional historical data on US-31 dating back to 2009 were also obtained from the MDOT TDMS system and reviewed relative to seasonal variations in traffic demand. Counts taken between 2009 and 2014 were recorded during the summer (June/July) months, whereas data were recorded in October of 2017. Comparison of average daily traffic (ADT) volumes on US-31 between summer 2009-14 and fall 2017 indicate that volumes are approximately 13% higher during the summer months.

Baseline volumes reflect traffic conditions absent of the proposed 7Brew Coffee Shop. Fishbeck has completed several studies across Michigan during the post-pandemic era; in most cases traffic volumes have returned to pre-pandemic levels. Typical adjustment factors applied and accepted by MDOT have ranged between 0% to 5%. Based on this review of historical traffic counts, a seasonal adjustment factor of 15% was applied to the existing May 2022 volumes. This slightly conservative growth rate also accounts for any ambient background traffic growth that may occur to the expected opening year 2023.

Baseline Operations Analysis

Baseline intersection operations were calculated using Synchro traffic analysis software based on methodologies published in the Highway Capacity Manual (HCM), 6th Edition. Simulated traffic operations and vehicle queues were also observed using SimTraffic. Measures of effectiveness for this study include vehicle delay, Level of Service (LOS), and vehicle queue lengths. Modeling and simulation were completed in accordance with the MDOT *Electronic Traffic Control Device Guidelines*.

LOS is a letter grade that describes traffic operations based on the amount of delay experienced by vehicles at an intersection, along an intersection approach (e.g., eastbound (EB), WB), or in a specific lane group (e.g., EB right turn, EB thru-left). LOS is measured using letter grades ranging from A to F, with LOS A representing negligible delay and LOS F indicating failing conditions. LOS D is generally considered acceptable for most areas. Table 1

presents the HCM criteria for various LOS for unsignalized and signalized intersections. The color coding in the table is used in the capacity analysis summary tables later in this report.

Table 1 – LOS Criteria for Intersections

LOS	Average Stopped Vehicle Delay (seconds)	
	Unsignalized	Signalized
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	> 50	> 80

The study network includes the following intersections:

1. US-31 and South Airport Road (signalized);
2. US-31 and Site Driveway (minor stop-controlled).

This development will be using the existing access on US-31 which is shared with the Mutual Gas Station to the north.

Synchro models for the study network were created based on the existing roadway configurations and traffic controls. Existing roadway geometrics and traffic controls were determined based on available plans and aerial imagery. MDOT provided a traffic signal timing permit for the intersection of US-31 and South Airport Road as well as supplemental information regarding operations of the adaptive signal control. The traffic signal was modeled to run a 160-second cycle during the a.m. peak hour, as specified with traffic signal splits within the weekday a.m. timing parameters provided.

Baseline 2023 vehicle delay and LOS at the study intersections, absent of the proposed 7Brew Coffee Shop, are shown in Table 2. These results indicate that the signalized intersection of US-31 and South Airport Road currently operates at an overall LOS D during the a.m. peak hour. The EB and WB approaches operate at LOS F and E, respectively. Several of the individual movements operate at an acceptable LOS D or better except EB left, EB thru, EB thru/right, and NB left movements operate at LOS F and WB left and SB left operates at LOS E. The stop-controlled EB approach and NB left-turn movement at US-31 and the Site Driveway operate at a LOS C or better with existing gas station traffic. Observation of simulations indicate no adverse operations during the a.m. peak hour. Vehicle queues at the US-31/South Airport Road traffic signal are typically serviced each traffic signal cycle and this operation is determined to be acceptable despite the calculated LOS E/F.

Table 2 – Baseline 2023 LOS/Delay (without 7Brew Coffee Shop)

Approach	Lane Group	LOS/Delay (s)
		a.m. Peak Hour
US-31 & South Airport Road (signalized)		
EB South Airport Road	Left	F (80.3)
	Thru	F (86.8)
	Thru/right	F (87.2)
	Approach	F (86.0)
WB South Airport Road	Left	E (77.0)
	Thru	D (46.9)
	Right	D (39.0)
	Approach	E (58.5)
NB US-31	Left	F (80.4)
	Thru	D (38.3)
	Right	C (22.4)
	Approach	D (38.8)
SB US-31	Left	E (79.9)
	Thru	C (27.0)
	Right	B (19.1)
	Approach	D (41.3)
Overall		D (53.3)
US-31 & Site Driveway (minor stop-controlled)		
NB US-31	Left	A (8.9)
SB US-31	Thru/Right	free movement
EB Site Driveway	Left	C (19.3)
	Right	B (10.4)

Site Trip Generation

The volume of traffic that would be generated by the 7Brew Coffee Shop was forecast based on data published by ITE in *Trip Generation, 11th Edition*. Land use and density information was provided by the Applicant and was compared to land use codes described in the ITE dataset. The 7Brew Coffee Shop will have two (2) drive-through lanes. In addition to forecasting the number of vehicle trips expected for the proposed 7Brew Coffee Shop, a trip generation forecast was completed for the PNC Bank that formerly occupied the site.

As is the case for most commercial development, a portion of the traffic generated by the former site uses is considered to be “pass-by” in nature. Pass-by trips are trips already present on the adjacent roadway network, which are interrupted to visit the site. Pass-by trips are normally expressed as a percentage of the total trips generated by the development. ITE data indicates that 29% of the former PNC Bank and 90% of the proposed 7Brew Coffee Shop trips are pass-by in nature for the a.m. peak hour. For the weekday forecast trips, the analysis referenced the midday peak hour ITE pass-by rates which were 26% and 84%, for the PNC Bank and 7Brew Coffee Shop, respectively. In order to provide a direct comparison of new trips for the former and proposed uses, pass-by trips are accounted for by reducing the number of forecast trips added to the adjacent roadway network; however, actual driveway volumes are not reduced.

Trip generation forecasts for the former and proposed uses are shown in Table 3 and Table 4, respectively. A comparison of the trip generation potential for the former and proposed site occupancies is shown in Table 5. The comparison shows the proposed 7Brew Coffee Shop will generate significantly fewer trips on a typical weekday, both at the driveway and on the adjacent road network. During the a.m. peak hour, driveway trips will be slightly higher with a coffee use as compared to the former bank use; however, the number of new trips on the adjacent road network is actually reduced.

Table 3 - Weekday Trip Generation: Former PNC Bank

ITE Code	ITE Rate Description	Unit	Amount	a.m. Peak Hour			Weekday (In + Out)
				In	Out	Total	
912	Drive-in Bank (PNC Bank)	Lanes	5	26	17	43	625
<i>Pass-by Trips (912: 29% AM, 26% Weekday)</i>				8	5	13	163
New Trips				18	12	30	462

Table 4 - Weekday Trip Generation: Proposed 7-Brew Coffee Shop

ITE Code	ITE Rate Description	Unit	Amount	a.m. Peak Hour			Weekday (In + Out)
				In	Out	Total	
938	Coffee/Donut Shop with Drive-Through Window and No Indoor Seating	Drive-Through Lanes	2	40	40	80	358
<i>Pass-by Trips (912: 90% AM, 84% Weekday)</i>				36	36	72	301
New Trips				4	4	8	57

Table 5 - Trip Generation Comparison Summary

Development Scenario	Trip Type	a.m. Peak Hour			Weekday (In + Out)
		In	Out	Total	
Previous PNC Bank	Total Trips	26	17	43	625
	Pass-by	8	5	13	163
	New Trips	18	12	30	462
Proposed 7Brew Coffee Shop	Total Trips	40	40	80	358
	Pass-by	36	36	72	301
	New Trips	4	4	8	57
Driveway Trip Potential Difference		14	23	37	-267
New Trip Potential Difference		-14	-8	-22	-405

Trip Distribution

The directions that site traffic will travel to and from the subject site were based upon existing traffic patterns during the a.m. peak hour. The existing traffic patterns reflect the gravity between origins and destinations in the study area, and therefore an accurate indication of where the proposed trips would be coming from and going to. Key rationale for this distribution model includes:

1. Trips will be distributed to the adjacent road network based on ITE methodology, which indicates new trips will return to their direction of origin.
2. Traffic patterns at the intersection of US-31 and South Airport Road indicate a pattern towards Traverse City with slightly heavier volumes on the traveling north and east in the morning.

This trip distribution model applied to the site-generated trips is summarized in Table 6.

Trip Assignment

The assignment of traffic to the roadway network is based on the development’s trip generation in conjunction with the expected directional distribution on the adjacent roadways. The proposed site will have one access point, which will operate under stop-control on the minor approach:

1. US-31 and Site Driveway: shared access with Mutual Gas Station

The existing driveway location and configuration is proposed to remain the same.

Table 6 – Trip Distribution Model (a.m. Peak Hour)

Direction	Via	Trip Origin		Pass-by
		To	From	To/From
North	US-31	36%	17%	68%
South	US-31	20%	45%	32%
East	Airport Road	33%	17%	-
West	Airport Road	11%	21%	-
Total		100%	100%	100%

Turn Lane Warrant Analysis

An evaluation was performed in accordance with MDOT guidelines to determine if a right-turn deceleration lane is required at the site access point with US-31. MDOT publishes turn lane warrant criteria in *Geometric Design Guidance* document prepared by the Traffic and Safety Department. There is an existing center lane for left turns that would facilitate ingress movements from US-31; therefore, left-turn lane criteria were not reviewed.

The minimum thresholds to warrant a taper or full-width right-turn lane at a site driveway on US-31 are 20 and 40 right-turns per hour, respectively. The maximum number of ingress right-turns from the north at the driveway on US-31 is expected to be 13 vehicles per hour. Therefore, no new auxiliary turn lane is warranted.

Build (2023) Traffic Analysis

The objective of this TIS is to determine what impacts, if any, the proposed 7Brew Coffee Shop will have on traffic operations along adjacent public roadways or what mitigation measures may be warranted. To quantify these impacts, the intersection traffic operations under the 2023 Baseline (no-build) conditions were compared to operations under the 2023 Opening Year Build conditions scenarios.

Where traffic operations under Build conditions remain acceptable (LOS D or better), the impact of the proposed 7Brew Coffee Shop on local traffic operations is assumed to be minimal. Where traffic operations under Build conditions are considerably worse than those of the Baseline (no-build) conditions, or if operations degrade from acceptable operations (LOS D or better) to unacceptable levels (LOS E or F), the proposed 7Brew Coffee Shop is considered to have an impact on network traffic operations. In this instance, mitigation is investigated which returns the overall intersection operations to LOS D or near the Baseline conditions (LOS or delay), as feasible for overall intersection operations or affected lane group movements.

Table 7 presents the intersection capacity analysis results for the Build conditions in the Opening Year (2023) for the weekday a.m. peak hour. The Baseline 2023 conditions are also shown for reference. These results indicate no discernable impact to operations at the signalized intersection of US-31 and South Airport Road as a result of the proposed redevelopment. The adaptive traffic signal accommodates the small increase in traffic volume due to the proposed 7Brew Coffee Shop with minimal increase in vehicle delay. The stop-controlled approaches and left-turns at the driveway intersection continue to operate at a LOS C or better.

Table 7 – Build 2023 LOS/Delay (with 7Brew Coffee Shop)

Approach	Lane Group	Baseline 2023	Build 2023
		a.m. Peak Hour	a.m. Peak Hour
US-31 & South Airport Road (signalized)			
EB South Airport Road	Left	F (80.3)	F (80.4)
	Thru	F (86.8)	F (86.8)
	Thru/Right	F (87.2)	F (87.2)
	Approach	F (86.0)	F (86.0)
WB South Airport Road	Left	E (77.0)	E (77.8)
	Thru	D (46.9)	D (47.0)
	Right	D (39.0)	D (39.1)
	Approach	E (58.5)	E (58.9)
NB US-31	Left	F (80.4)	F (80.4)
	Thru	D (38.3)	D (38.3)
	Right	C (22.4)	C (22.4)
	Approach	D (38.8)	D (38.8)
SB US-31	Left	E (79.9)	E (79.9)
	Thru	C (27.0)	C (26.9)
	Right	B (19.1)	B (19.0)
	Approach	D (41.3)	D (41.3)
Overall		D (53.3)	D (53.3)
US-31 & Site Driveway (minor stop-controlled)			
NB US-31	Left	A (8.9)	B (9.0)
SB US-31	Thru/Right	free movement	
EB Site Driveway	Left	C (19.3)	C (23.4)
	Right	B (10.4)	B (10.6)

Observation of network simulations indicates no adverse queuing on the adjacent road network or on the stop-controlled driveway approach. Based on a review of simulations and SimTraffic queue calculations, SB US-31 queues did not back-up to nor block the Site Driveway for any portion of the a.m. peak hour. NB US-31 95th percentile left-turn queue length into the site is calculated to be 44 feet. SB US-31 95th percentile queue length at South Airport Road is calculated to be 224 feet for the thru lanes and 175 feet for the left turn lanes. There is approximately 400 feet between the SB stop bar on US-31 at South Airport Road, and the site driveway location. Therefore, conflicting left-turn queues are provided sufficient storage and will not interlock.

Drive-Through Storage

7Brew provided observed field data from one of their other locations in Missouri from February 2022. In that review of site operations, 61 vehicles/hour were observed in the morning peak hour. The average queue during the peak period was five vehicles with a maximum observed queue of 14 vehicles. The proposed 7Brew coffee shop has internal storage for 20 vehicles without impacts to site circulation nor queue spillback onto US-31. These observations are conservative as compared to the ITE trip generation forecast. Based on the observed queuing data and the proposed site plan, there will be sufficient drive-through storage on-site.

Conclusions and Recommendations

Garfield Township and MDOT have required a traffic study to compare the traffic generation potential of the proposed 7Brew Coffee Shop versus the previously occupied PNC Bank. The objective of this TIS is to determine what impacts, if any, the proposed coffee shop will have on traffic operations along adjacent public roadways or what mitigation measures may be warranted. The following conclusions are based on the data, analyses, and results as outlined herein.

1. Review of historical data in comparison with May 2022 traffic counts indicate that current volumes are larger than the 2021 and 2017 traffic volumes from South Airport Road and US-31, respectively. Based on this review, there was no compelling evidence to apply a COVID adjustment factor to the collected TMCs.
2. Baseline traffic volumes for this study were conservatively adjusted upward by 15% to adjust for seasonal variations to peak summer months and any ambient traffic growth to the expected 2023 buildout year, based on review of historical data.
3. The proposed 7Brew Coffee Shop will generate significantly fewer trips on a typical weekday, both at the driveway and on the adjacent road network as compared to the former bank. During the a.m. peak hour, driveway trips will be slightly higher with a coffee use as compared to the former bank use; however, the number of new trips on the adjacent road network is actually reduced.
4. The signalized intersection of US-31 and South Airport Road will continue to operate acceptably with this proposed 7Brew Coffee Shop. Minor changes in traffic demands will be accommodated by the adaptive signal operation and no timing adjustments are necessary.
5. All movements at the stop-controlled driveway approach at US-31 will operate at a LOS C or better.
6. No additional turn lanes are warranted at the site driveway.
7. The existing access point will be maintained in the current configuration.
8. Based on observed peak hour data provided from 7Brew from another one of their locations, the proposed site stacking space (20 vehicles) will be adequate to accommodate peak hour drive-through queuing.

Based on the results of this traffic study, no roadway nor traffic control improvements are necessary to accommodate the proposed redevelopment project.

Attachments: Traffic Volume Data
ITE Trip Generation Calculations
Turn Lane Warrant Criteria
Synchro HCM Calculations
SimTraffic Queue Calculations

By email

Copy: Timothy J. Likens, PE PTOE – Fishbeck



memorandum

Date: July 28, 2022

To: John Sych, AICP

From: Taryn Juidici, PE &
Stephen Dearing, PE, PTOE

Re: Proposed 7Brew Coffee Shop
Traffic Impact Study Review

We have reviewed the traffic impact study for the proposed 7Brew coffee shop for Garfield Township. The site was formerly occupied by a PNC drive-in bank. The existing shared driveway will be used for the proposed development. The traffic impact study was prepared by Fishbeck and is dated June 8th, 2022.

OHM does not recommend approval of the traffic impact study and its recommendations, due to concerns with the report.

OHM's comments are as follows:

1. TIS Report:
 - a. Please provide the Synchro modeling files for review. We have significant concerns about the adequacy of gaps to allow left turns in and out of the site and want to review the SimTraffic simulations to see if enough information is available, or if it will be required that a field gap study be performed. Please note that if the signal to the north (Lowes / Marketplace Dr) is not part of the model, gap information from the simulation may not be considered adequate.
 - b. A stamp by a current Michigan Professional Engineer with expertise in Traffic Engineering is missing.
 - c. Only the AM peak hour was evaluated within this study. While coffee shops will likely be busiest in the morning, this does not limit the potential traffic impacts to only the morning peak hour. We assume the proposed developments hours of operation will extend beyond the AM peak hour. Analysis of the PM Peak hour should be included.
 - d. In Table 7, an additional column stating the change in delay could be beneficial when comparing baseline versus build conditions.
 - e. As stated in Article 6 of the zoning ordinance, "...the impact of development shall be analyzed for the year after the development is completed and 10 years after the development is completed". In this memo only 2023 baseline and 2023 build conditions were analyzed. Based on the above statement years 2024 and 2034 should also be included in this study.



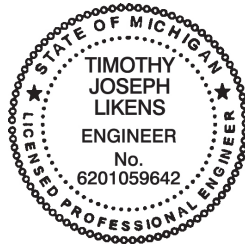
- f. In the Appendix for the driveway conditions, there are southbound right turning volumes; however, no right turn designation. Under the southbound through category, the lane configuration should be thru, thru & right.
- g. NB US-31 has a double yellow centerline marking up to this site, which precludes use of center lane for 2-way left turns. This is a function of the left turn lane widening to provide the dual SB left lanes at the South Airport intersection. For the purposes of this analysis, delete dedicated NBL lane in the Synchro analysis and show NBT as a shared thru/left. Make this modification for all periods analyzed.

2. Site Plan:

- a. In the outside lane of the drive-thru there is a dimension labeled as 5', which does not seem accurate. Looks like it should be 15'.
- b. It does not appear that the site plan identifies where the order board(s) are being positioned for the two drive thru lanes. This needs to be shown.
- c. There is a circulation concern for garbage trucks. If there are vehicles in the drive-thru the garbage truck will have to wait for the queue to clear to be able to exit the site.
- d. We note that the shared-use driveway north of the Mutual Gas Station, used for that property and also Best Buy, is signed and marked for inbound only traffic. So most all gas station traffic, including the tanker trucks, must exit by way of the shared-use driveway with this site. This site plan should explore ways to harmonize the inbound and exiting traffic of both properties in the short distance of the driveway approach to US-31.

Memo

TO: John Schebaum, PE – BFA, Inc
FROM: Timothy J. Likens, PE, PTOE
DATE: August 23, 2022
RE: 7Brew – Traffic Impact Study
Response to OHM Review



Digitally signed by
Timothy J. Likens,
PE, PTOE
Date: 2022.08.23
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PROJECT NO.: 220851

Introduction

BFA, Inc is proposing a 7Brew Coffee Shop in Garfield Township, Grand Traverse County, Michigan. The project site is located on the west side of US-31 approximately 475 feet north of South Airport Road. The site was formerly occupied by an approximately 1,050 square-foot PNC Drive-in Bank with five drive-through lanes. PNC Bank will be torn down and a new building will be constructed. Fishbeck completed a Traffic Impact Study (TIS) for the proposed project as outlined in a June 8, 2022 memorandum.

Garfield Township has jurisdiction over special land use review and approval of the proposed 7Brew Coffee Shop. Garfield Township's traffic engineering consultant, OHM Advisors, reviewed the TIS and presented findings to the Township in a memorandum dated July 28, 2022. Subsequently, Fishbeck and the applicant met virtually with OHM and Township Planning Department representatives on August 4, 2022. The purpose of this meeting was to discuss the concerns outlined in the OHM review and establish consensus on technical steps and assumptions required to address those concerns. These steps were completed by Fishbeck per direction from OHM:

1. Obtain weekday a.m. and p.m. peak period turning movement counts and signal timing data at the intersection of US-31 and Marketplace/Lowes Drive from MDOT. Additionally, obtain weekday p.m. peak period turning movement counts at the intersection of US-31 and S Airport Road from MDOT. These data were obtained from a weekday in July; therefore, no seasonal adjustment was applied.
2. Collect weekday p.m. turning movement counts at the intersection of US-31 and the site driveway. Video was also obtained to observe current driveway operations and relative gaps on US-31.
3. Add the Marketplace/Lowes Drive intersection to the Synchro traffic analysis models. The project is expected to add negligible traffic volume to this intersection; whereby, operational results are not reported but this modeling was required by OHM to reflect traffic flows from the upstream traffic signal.
4. Calculate operational results for the weekday a.m. and p.m. peak hours for the 2034 horizon year. The results outlined herein reflect horizon year 2034 traffic volumes with a 0.5% annual growth rate applied. This represents a slightly conservative scenario as compared to opening year 2023 conditions.

The following points are in response to the items outlined in the OHM review memorandum. All work was completed according to methodology published by the Institute of Transportation Engineers (ITE). Site-generated trips for the p.m. peak hour were calculated based on ITE *Trip Generation* data as shown in Table 1 and assigned to the study network based on existing traffic patterns.

Table 1 - Weekday Trip Generation: Proposed 7-Brew Coffee Shop

ITE Code	ITE Rate Description	Unit	Amount	a.m. Peak Hour			p.m. Peak Hour			Weekday (In + Out)
				In	Out	Total	In	Out	Total	
938	Coffee/Donut Shop with Drive-Through Window and No Indoor Seating	Drive-Through Lanes	2	40	40	80	15	15	30	358
<i>Pass-by Trips (90% AM, 98% PM, 84% Weekday)</i>				36	36	72	14	14	28	301
New Trips				4	4	8	1	1	2	57

1. TIS Report:

- a. All Synchro traffic analysis files will be submitted to the Township and OHM with this memorandum. Fishbeck also provided data via email to OHM outlining historical traffic volume trends on US-31 to determine the 0.5% annual growth rate to horizon year 2034. Furthermore, new data obtained from MDOT from July 2022 indicate that the 15% seasonal adjustment applied for the a.m. peak hour in the original study is high as compared to actual seasonal fluctuation; therefore, the 2034 forecast represents an overly conservative analysis of future traffic conditions.

Highway Capacity Manual (HCM) calculations indicate that the site driveway egress approach would operate at a LOS D or better during both a.m. and p.m. peak hours, as shown in Table 2. During the critical a.m. peak hour, the project would add less than six seconds of delay per vehicle for vehicles turning left exiting the site, and less than one second per vehicle for vehicles turning left into the site. Increases in delay at the site driveway would be negligible during the p.m. peak hour.

There is approximately 400 feet of storage between the SB stop bar on US-31 at S Airport Road and the site driveway location. Average and 95th percentile simulated queue lengths are shown in Table 3. These results show that during the busiest a.m. period for the coffee shop, the site driveway is not blocked and there is adequate storage for conflicting left turn movements.

During the p.m. peak hour, SB queues do periodically block the site driveway; however, the proposed coffee shop would add negligible traffic volumes to this existing condition during the p.m. peak hour. During our p.m. field observations, vehicles were observed to safely complete left-turn maneuvers when traffic clears, and this operation is expected to remain consistent with current conditions.

Historical crash data from 2014 to 2021 published on the Michigan Traffic Crash Facts website (which references the Michigan State Police database) were reviewed and indicate no pattern of crashes at the site driveway. This date range was utilized to capture a period when the PNC bank was also in operation. Crashes of angle and head-on left-turn type were of particular interest, which would relate to driveway turning maneuvers. Six angle crashes appear to have occurred at this location over the eight-year period. Investigation of UD-10 reports indicate that three actually occurred at the subject driveway, while three others were related to other access points. One crash resulted in B-level injury while the other two resulted in property damage only (PDO).

- b. This memorandum is stamped by a licensed Professional Engineer in the State of Michigan, also certified by the national Transportation Professional Certification Board as a Professional Traffic Operations Engineer (PTOE).

- c. Analysis of the p.m. peak hour has been included as described above. The results of this analysis indicate low trip generation for the proposed use and negligible resultant operational changes as compared to existing weekday afternoon conditions. Tables 2 and 3 show the operational results for both a.m. and p.m. peak hours.

Table 2 – 2034 LOS/Delay Comparison

Approach	Lane Group	a.m. Peak Hour			p.m. Peak Hour		
		No-Build	Build	Delta	No-Build	Build	Delta
US-31 & South Airport Road (signalized)							
EB South Airport Road	Left	F (80.3)	F (80.3)	-	F (87.1)	F (87.1)	No change. No new trips thru this intersection.
	Thru	F (90.5)	F (90.5)	-	F (94.9)	F (94.9)	
	Thru/right	F (90.9)	F (90.9)	-	F (97.5)	F (97.5)	
	Approach	F (89.1)	F (89.1)	-	F (93.9)	F (93.9)	
WB South Airport Road	Left	E (78.6)	E (78.6)	-	F (216.1)	F (216.1)	
	Thru	D (45.9)	D (45.9)	-	D (51.6)	D (51.6)	
	Right	D (38.0)	D (38.0)	-	C (30.9)	C (30.9)	
	Approach	E (58.4)	E (58.4)	-	F (139.6)	F (139.6)	
NB US-31	Left	F (80.2)	F (80.2)	-	F (89.5)	F (89.5)	
	Thru	D (42.4)	D (42.6)	+0.2	D (45.8)	D (45.8)	
	Right	C (24.2)	C (24.3)	+0.1	C (20.9)	C (20.9)	
	Approach	D (42.0)	D (42.1)	+0.1	D (43.4)	D (43.4)	
SB US-31	Left	E (79.8)	E (79.7)	-0.1	F (92.5)	F (92.5)	
	Thru	C (28.7)	C (28d.7)	-	D (43.7)	D (43.7)	
	Right	B (20.1)	C (20.1)	-	C (24.4)	C (24.4)	
	Approach	D (42.3)	D (42.4)	+0.1	D (54.8)	D (54.8)	
Overall		E (55.5)	E (55.6)	+0.1	F (89.4)	F (89.4)	
US-31 & Site Driveway (minor stop-controlled)							
NB US-31	Left	A (9.0)	A (9.2)	+0.2	B (13.3)	B (13.5)	+0.2
SB US-31	Thru/Right	free movement					
EB Site Driveway	Left	C (20.4)	D (26.1)	+5.7	D (32.0)	D (34.4)	+2.4
	Right	B (10.5)	B (10.7)	+0.2	C (17.1)	C (17.4)	+0.3

Table 3 – 2034 Queue Lengths

Approach	Queue (feet)	a.m. Peak Hour		p.m. Peak Hour	
		No-Build	Build	No-Build	Build
US-31 & South Airport Road (signalized)					
SB US-31 thrus	Average	112'	117'	374'	377'
	95th %	180'	198'	468'	471'
SB US-31 lefts	Average	83'	86'	201'	233'
	95th %	142'	149'	364'	420'
US-31 & Site Driveway (minor stop-controlled)					
NB US-31 lefts	Average	4'	14'	6'	9'
	95th %	22'	43'	27'	34'
EB Site Driveway	Average	10'	28'	45'	45'
	95th %	33'	67'	106'	102'
Combined Queue Length (opposing left turn movements)					
400 feet of storage	Average	87'	100'	207'	242'
	95th %	164'	192'	391'	454'

- d. A column showing the delta between baseline/no-build and build conditions has been added to Table 2. As this use generates primarily pass-by trips that are already on US-31, changes at the adjacent traffic signal are negligible.
- e. Study analyses have been updated to reflect a 10-year horizon of 2034. OHM indicated during the review meeting that the 2024 scenario is not necessary given negligible expected change from 2023. Results of the 2034 analysis are shown in Table 2 and 3.
- f. The HCM results indicated in the original study and this memo are not impacted by this lane use coding; however, this has been updated in the 2034 Synchro models.
- g. A field review of the double-yellow pavement markings was completed. The double-yellow marking terminates 50 feet south of the site driveway, providing area for two ingress left-turn vehicles to enter and stack in the center lane. During field observations, all vehicles making this ingress left-turn movement did so from the center lane for left-turns. This configuration was designed and installed to permit such movement; therefore, the coding requested by OHM is not accurate to actual conditions.

2. Site Plan:

- a. The dimension of the outside lane is 15 feet. The text has been updated to be clearer.
- b. There are no order boards proposed for this site. Orders will be taken by employees or via mobile ordering apps.
- c. The 7Brew operations team and manager will coordinate with the garbage services to coordinate pickups that will not impact peak service times. The outside drive-through lane can be closed to vehicle traffic during off-peak times to coordinate waste service.

- d. The proposed site plan includes features to channelize and control on-site circulating traffic and minimize conflicts with gas station traffic. The existing access configuration with the on-site features shown on the site plan are expected to provide acceptable traffic operations to facilitate traffic demands for both uses for the following reasons:
- The results of the TIS and this update do not indicate any operational deficiencies or crash patterns that require mitigation according to accepted traffic engineering practice.
 - The proposed coffee shop peaks during the a.m. peak hour, which is a favorable land use for this site given that traffic volumes on US-31 and exiting the gas station are heavier during the p.m. peak hour. The study analysis indicates that the proposed land use does not create a situation that would otherwise require reconfiguration of access for multiple parcels, nor prohibition of currently permitted turning movements.
 - Access to the north of the gas station (Best Buy driveway) opposes an unsignalized ingress/egress driveway for the Grand Traverse Mall. Permitting egress movements from this driveway would introduce greater conflict points at a location with higher opposing traffic volumes than at the shared use driveway.
 - Tanker trucks were not observed at the gas station during peak hours and are not expected to have significant interactions with driveway queues.
 - MDOT has provided written approval of the proposed use with no changes to the current access configuration.

Attachments: Traffic Volume Data
ITE Trip Generation Calculations
Synchro HCM Calculations
SimTraffic Queue Calculations
Historical Crash Data
MDOT Approval Email
Original TIS Memorandum

Submitted: Synchro Models
Site Photos
Site Video

By email

Copy: Kyle Reidsma, PE, PTOE – Fishbeck

memorandum

Date: September 6, 2022

To: John Sych, AICP

From: Steven Loveland, PE, PTOE
Stephen Dearing, PE, PTOE

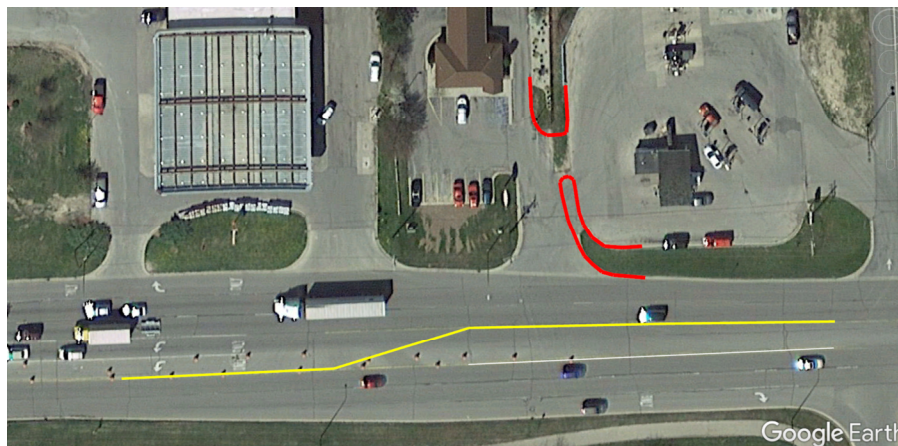
Re: OHM Comments Re: 7Brew – Traffic Impact Study Response to OHM Review

We have reviewed the memo and updated data for the proposed 7Brew Traffic Impact Study. Fishbeck has provided response and information for all the requests put forward from OHM's first review of the TIS. We find the methodology and approach to be acceptable. The following provides some key information provided and offers comments for consideration.

Data Collection – Fishbeck collected the requested traffic count data for the locations of US-31 and Marketplace/Lowes Drive (AM and PM peaks), US-31 and S Airport Road (PM peak), and US-31 at the site drive (PM peak).

Modeling and Analysis – The updated Synchro models added the Marketplace/Lowes Drive intersection, now provide PM peak analysis to go along with AM and include 2034 horizon year analysis. The modeling results indicate that the proposed development will have negligible impact to the operations of adjacent intersections.

US-31 at Airport Road Queues – The analysis indicates that the PM peak southbound queues (both existing and future) extend to and beyond the 7Brew site drive. This may become an issue when vehicles are attempting to access the site traveling NB on US-31. While the study indicates there is room for two vehicles to stack to turn left into the site, there may be no room due to queues extending through this area. In addition, for vehicles to get into this storage area there is no taper, so vehicles would need to cross the double yellow to get in. Providing a taper and stacking for left turns in would be safer for 7Brew traffic but would then have SB US-31 left-turn traffic spilling into the through lanes. This leaves this situation as an area of concern and may warrant further discussion with MDOT.





Site Plan – The site plan has been improved to help traffic navigate leaving and entering 7Brew while considering traffic to/from the gas station. The proposed changes include providing a setback stop for vehicles leaving 7Brew, which would provide right of way to traffic leaving the gas station. While this does improve on the previous site plan, there could be further improvement if the gas station and 7Brew worked together to revise the access for both sites. The figure above provides an additional concept to further channelize traffic to reduce conflicts. In this configuration, traffic leaving both 7Brew and the gas station could be under stop control. This concept gives priority to traffic entering both sites, which in turn prevents vehicles from backing up out onto US-31.

Crash Data – Crashes have been reviewed and found 3 angle crashes have occurred over an 8-year period at the site drive. This number is not outside the norm.

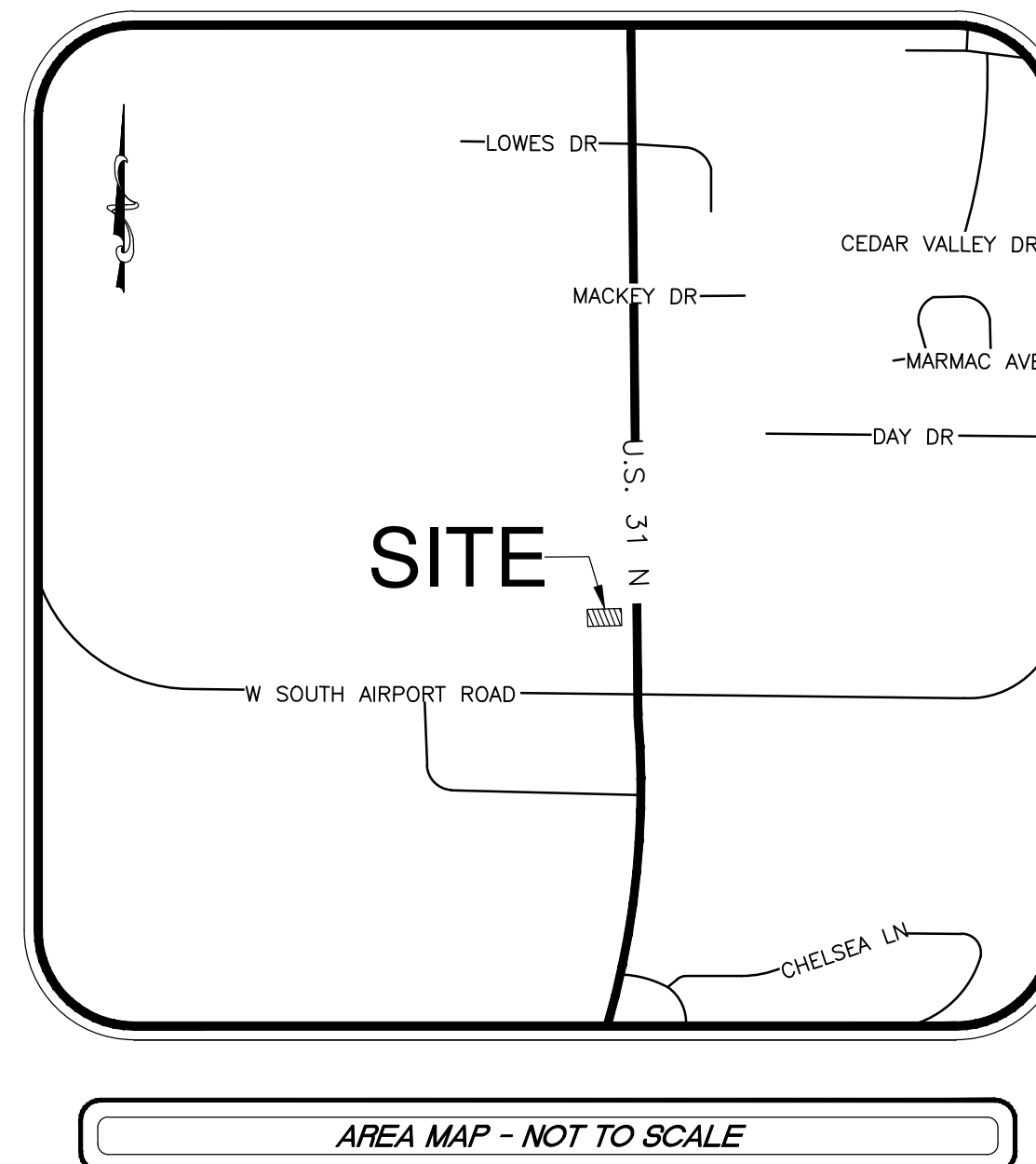
PROPOSED 7BREW COFFEE SHOP

2537 NORTH U.S. 31 SOUTH

TRAVERSE CITY, GRAND TRAVERSE COUNTY, MICHIGAN 49684

GARFIELD TOWNSHIP

UTILITY/ GOVERNING AGENCIES CONTACTS	
GAS	DTE ENERGY CONTACT: PHONE:(855)-383-4249 EMAIL:
TELEPHONE	CENTURY LINK CONTACT: PHONE:(866)-770-1479 EMAIL:
ELECTRIC	CONSUMERS ENERGY CONTACT: PHONE: (231)-922-4923
SANITARY SEWER	GRAND TRAVERSE COUNTY DEPARTMENT OF PUBLIC WORKS CONTACT: PHONE: (231)-995-6039 EMAIL:
WATER	GRAND TRAVERSE COUNTY DEPARTMENT OF PUBLIC WORKS CONTACT: PHONE: (231)-995-6039 EMAIL:
STORM SEWER	CHARTER TOWNSHIP OF GARFIELD CONTACT: PHONE: (231)-992-4923 EMAIL:



SHEET INDEX	
SHEET TITLE	SHEET NUMBER
COVER SHEET	CS-1
*ALTA	ALTA
TOPOGRAPHIC SURVEY	TS-1
DEMOLITION PLAN	DM-1
EROSION AND SEDIMENT CONTROL PHASE I	ESC-1
EROSION AND SEDIMENT CONTROL PHASE II	ESC-2
EROSION AND SEDIMENT CONTROL DETAIL SHEET I	ESC-3
EROSION AND SEDIMENT CONTROL DETAIL SHEET II	ESC-4
GRADING PLAN	GR-1
SITE PLAN	SP-1
UTILITY PLAN	UT-1
LANDSCAPE PLAN	LP-1
LANDSCAPE DETAILS	LP-2
PRE DEVELOPMENT DRAINAGE AREA MAP	DA-1
POST DEVELOPMENT DRAINAGE AREA MAP	DA-2
*PROVIDED UNDER SEPARATE SEAL	

CAUTION--NOTICE TO CONTRACTOR REGARDING EXISTING UTILITIES

THE CONTRACTOR MUST CONTACT THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE PERFORMING ANY CONSTRUCTION ACTIVITIES TO REQUEST FIELD LOCATIONS OF THEIR UTILITIES. THE CONTRACTOR MUST BE AWARE THAT SOME EXISTING UTILITIES MAY NOT BE ACCURATELY SHOWN, KNOWN TO EXIST, AND/OR LOCATED BY LOCAL OR STATE UTILITY COMPANIES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAKE NECESSARY ACCOMMODATIONS TO ACCURATELY LOCATE ALL EXISTING UTILITIES PRIOR TO COMMENCEMENT OF WORK.

ALL EXISTING UTILITIES ON THIS PROJECT SITE AND ON ADJACENT DEVELOPMENTS SHALL REMAIN IN PLACE AND OPERATIONAL AT ALL TIMES DURING CONSTRUCTION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE EXISTING UTILITIES, WHEN NECESSARY, TO FACILITATE THE REQUIRED IMPROVEMENTS SHOWN BY THESE PLANS. THE CONTRACTOR MUST COORDINATE ANY RELOCATIONS OR MODIFICATIONS TO THE EXISTING UTILITIES WITH THE APPROPRIATE UTILITY COMPANY, THE OWNER, AND BFA, INC.

Three working days prior to the start of any excavation on this site the Contractor shall contact 1-800-482-7171 for utility location information.

The contractor shall verify and implement all the required Federal Occupational Safety and Health Administration (OSHA) and/or OSHA approved state-plan regulations established for the type of construction required by these plans.

FOR REVIEW ONLY

Raymond H. Frankenberg II, P.E. #42538 11/01/22
State of Michigan Date
Registered Professional Engineer
for BFA, Inc.

bfaeng.com TELEPHONE: (636) 239-4751

103 ELM STREET WASHINGTON, MISSOURI 63090

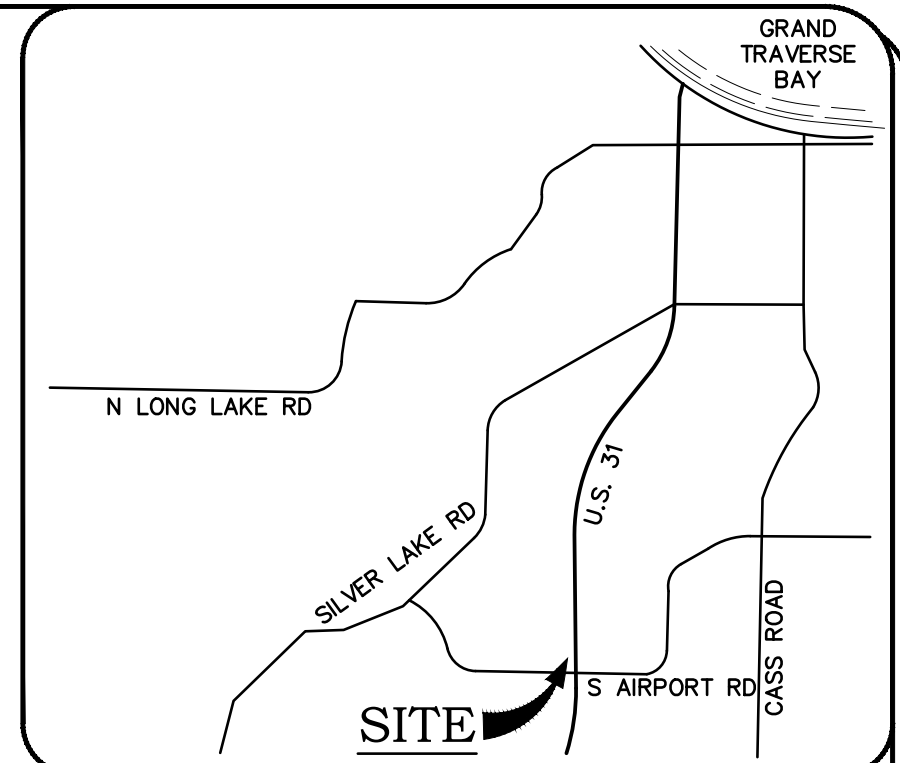
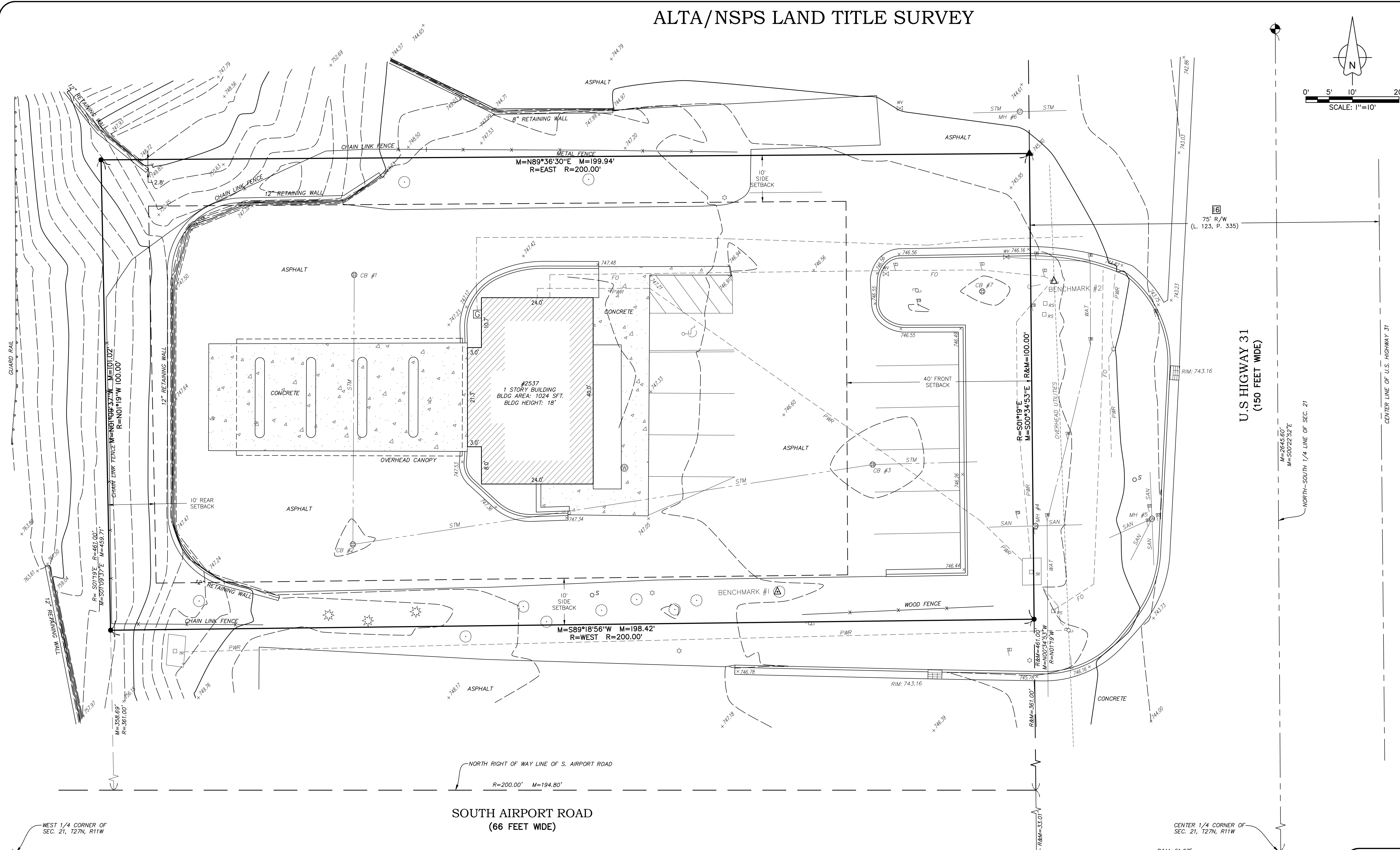
TRAVERSE CITY, MICHIGAN
NLD ACQUISITIONS LLC
PO BOX 100843
Fort Worth, TX 76185

REVISIONS	
1	By: App:
2	By: App:
3	By: App:
4	By: App:

DRAWN
B.L.F.
CHECKED
R.G.R.
DATE
11/01/22
SCALE
NONE
JOB No.
7146
SHEET NAME
COVER SHEET

CS-1

ALTA/NSPS LAND TITLE SURVEY



LOCATION MAP (NOT TO SCALE)

ZONING INFORMATION
 ZONE DISTRICT: C-G - GENERAL COMMERCIAL
 SETBACKS: FRONT 40'
 SIDE 10'
 REAR 10'

FLOOD NOTE
 This property is located in Zone 'X', defined as area of minimal flood hazard according to graphic plotting on Flood Insurance Rate Map, Community Panel Number '26055C 0207 C', effective 08/28/2018.
<http://www.fema.gov>
 Flood Zone lines are approximate locations, taken from the current Flood Insurance Rate Map as noted.
 No field surveying was performed to determine this Zone and an elevation certificate may be needed to verify this determination or apply for a variance from the Federal Emergency Management Agency.

- MISCELLANEOUS NOTES**
- THIS SURVEY IS BASED ON FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NO. TC13-101789, BEARING A COMMITMENT DATE OF APRIL 12, 2022.
 - PROPERTY ADDRESS: 2537 N. U.S. 31 S, TRAVERSE CITY, MI, 49684
 - THE SUBJECT PROPERTY IS 19,994 SQ. FT. OR 0.459 ACRES.
 - UTILITIES SHOWN BY OBSERVED EVIDENCE, MARKING PROVIDED BY MISS DIG LOCATION SERVICES. AT&T HAS INDICATED THAT THERE MAY BE UNDERGROUND FACILITIES ON-SITE THAT WILL NEED TO BE RE-MARKED PRIOR TO COMMENCEMENT OF ANY WORK.
 - NO EVIDENCE OF RECENT EARTH MOVING WORK ON SITE.
 - NO KNOWN PROPOSED CHANGES TO STREET RIGHT OF WAY LINES.

BENCHMARK INFORMATION

BENCHMARK #1
 MAG IN TREE LOCATED ALONG SOUTH SIDE OF PARKING LOT AND 14 FEET WEST OF A WOOD FENCE.
 EL: 750.24 (NAVD 88)

BENCHMARK #2
 MAG IN UTILITY POLE LOCATED ON SOUTH SIDE OF THE NORTH ENTRANCE TO THE SITE.
 EL: 748.43 (NAVD 88)

FURNISHED LEGAL DESCRIPTION
 (PER FIRST AMERICAN TITLE INSURANCE COMPANY, COMMITMENT #TC 13-101789, DATED JANUARY 24, 2022)
 Land situated in the Township of Garfield, County of Grand Traverse, State of Michigan, described as follows: Part of the Northwest 1/4 of Section 21, Town 27 North, Range 11 West, more particularly described as: THE NORTH 100 FEET of the following described premises: Commencing at the center of said Section 21; thence West along the East-West 1/4 line 51.27 feet to the West right of way line of Highway US 31; thence along said line, being parallel to and 75 feet distant from the centerline of said Highway, North 01 degree 19 minutes West 33.01 feet to the North right of way line of County Road and Point of Beginning; thence continuing along West right of way line of US 31, North 01 degree 19 minutes West 461.00 feet; thence West 200.00 feet; thence South 01 degree 19 minutes East 461.00 feet to the aforesaid North right of way line of County Road; thence along said line, East 200.00 feet to the point of beginning, except a parcel in the Southeast corner thereof measuring 105 East and West by 161 feet North and South, Section 21, Town 27 North, Range 11 West.

LEGEND OF SYMBOLS & ABBREVIATIONS

MEASURED	M=
RECORDED	R=
FOUND IRON	●
FOUND CONCRETE MONUMENT	■
STORM MANHOLE	⊗
CATCH BASIN	⊕
SANITARY MANHOLE	⊙
SIGN	⊛
RISER - PHONE	⊠
WATER VALVE	⊡
CONIFEROUS TREE	⊙
DECIDUOUS TREE	⊙
TRANSFORMER	⊙
CONIFEROUS TREE	⊙
DECIDUOUS TREE	⊙
MISS DIG FLAG - WATER	⊙
MISS DIG FLAG - COMMUNICATIONS	⊙

STRUCTURE INVENTORY

STRUCTURE #1 - CATCH BASIN RIM: 747.03 8" CPP SOUTH INV. 744.23'	STRUCTURE #5 - SANITARY MANHOLE RIM: 744.05 8" PVC NORTH INV. 725.30' 8" PVC SOUTH INV. 725.30' 8" PVC WEST-SOUTHWEST INV. 726.45' 8" PVC WEST-SOUTHWEST INV. 733.20'
STRUCTURE #2 - CATCH BASIN RIM: 746.90 8" CPP NORTH INV. 743.25' 8" CPP EAST-SOUTHEAST INV. 743.10'	STRUCTURE #6 - STORM MANHOLE RIM: 744.76 8" PVC WEST INV. 738.56' 8" PVC EAST INV. 738.56'
STRUCTURE #3 - CATCH BASIN RIM: 745.67 8" CPP WEST-SOUTHWEST INV. 741.67' 10" CPP INV. 742.17'	STRUCTURE #7 - CATCH BASIN RIM: 745.67 10" CPP INV. 740.97'
STRUCTURE #4 - SANITARY MANHOLE RIM: 745.91 8" PVC WEST INV. 736.91' 8" PVC EAST INV. 736.06'	

ITEMS CORRESPONDING TO SCHEDULE B

15 Right of Way in favor of Michigan Public Service Company recorded in Liber 123, page 85
 Blanket in nature and therefore not shown hereon

16 Right of Way in favor of the Michigan State Highway Department recorded in Liber 164, page 335.
 Establishes U.S. 31 as shown hereon

17 Covenants, conditions, restrictions and other provisions as contained in Covenant Deed recorded in Instrument No. 2021R-00970. Please be advised that any provision contained in this document, or in a document that is attached, linked, or referenced in this document, that under applicable law illegally discriminates against a class of individuals based upon personal characteristics such as race, color, religion, sex, sexual orientation, gender identity, familial status, disability, national origin, or any other legally protected class, is illegal and unenforceable.
 Blanket in nature and therefore not shown hereon

SURVEY CERTIFICATION

To BUYER PENDING and FIRST AMERICAN TITLE INSURANCE COMPANY and LENDER PENDING:

This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2021 Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys, jointly established and adopted by ALTA and NSPS, and includes Items 1, 2, 3, 4, 5, 6a, 6b, 7a, 7b1, 7c, 8, 9, 10, 11a, 11b, 13, 14, 16, 17, 18 and 19 of Table A thereof. The field work was completed on May 16, 2022.

Date of Plat or Map: _____, 2022

Daniel D. Pratt
 P.S. #4001039094
 1128 Foxchase Lane, SE
 Grand Rapids, MI 49546
 tpc_inc@comcast.net

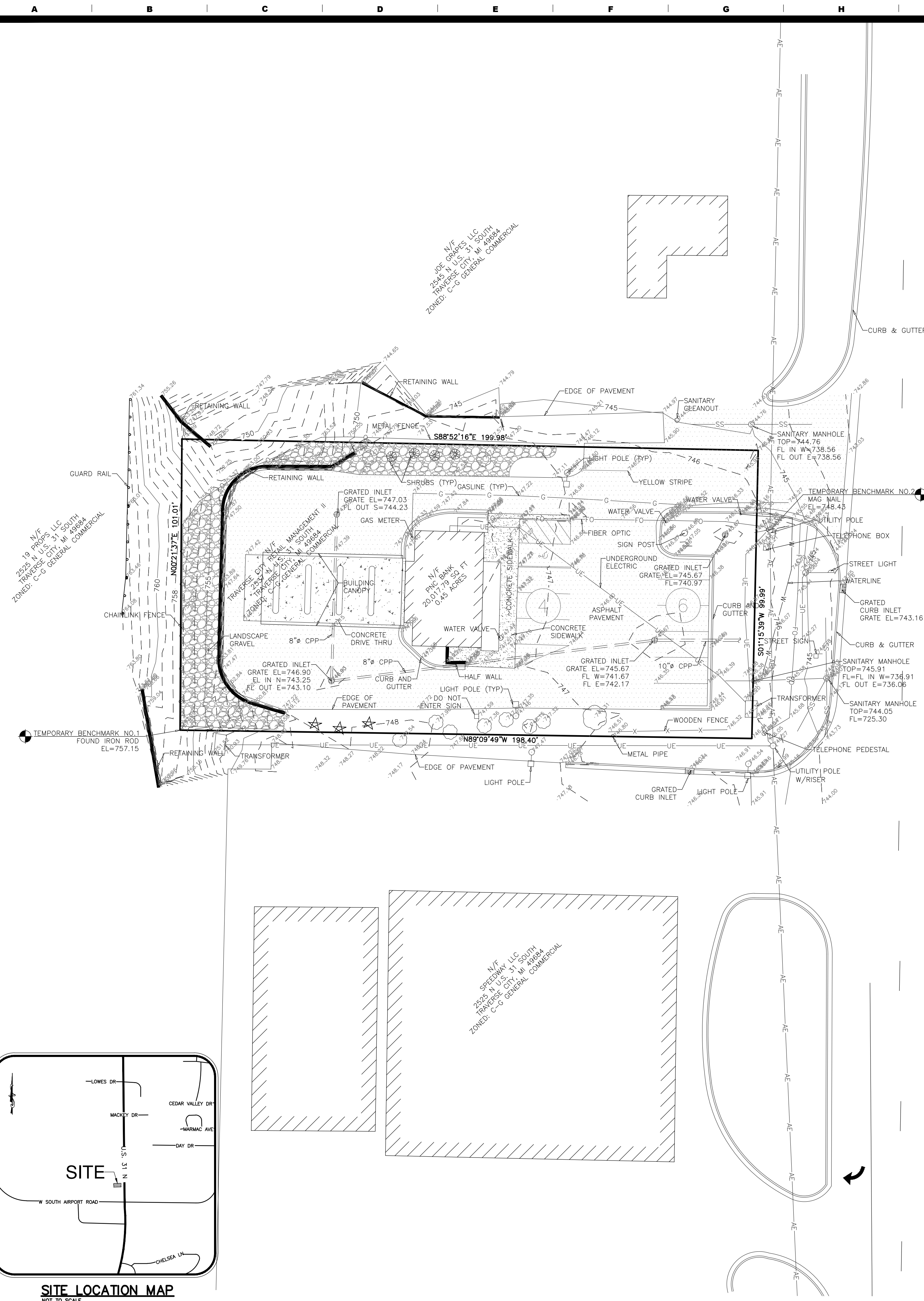
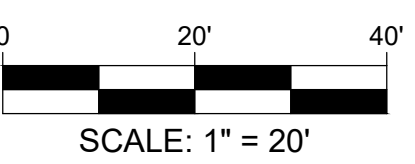
Terra Pointe Consultants, Inc.
 Client: BFA Inc.
 103 Elm Street
 Washington, MO 63090
 TPC Job No. 22014 Sheet 1 of 1
 Date of Field Survey: 05/16/2022

TOPOGRAPHIC SURVEY

(THIS IS NOT A BOUNDARY SURVEY)

TOPOGRAPHIC SURVEY NOTES:

- Underground facilities, structures, and utilities have been plotted from available surveys and records. Therefore, their location must be considered approximate only. There may be others, the existence of which is presently not known.
 - Bearings and elevation information is based on information provided by Terra Pointe Consultants, Inc. Bearings referenced to Grid North of the Michigan Coordinate System, Central zone and elevations referenced to NAD88 (2011) (INTERNATIONAL FOOT).
 - Bearings and Distances are shown per field data gathered by Terra Pointe Consultants, Inc. on May 02, 2022.
 - Field work was completed on this site by Terra Pointe Consultants, Inc. on May 02, 2022.
 - Contractor shall verify elevation of temporary benchmarks based on the elevation of the primary benchmark, prior to the start of construction. Contractor shall notify engineer if elevations differ from those shown on these plans.
- Primary Benchmark - Bearings and elevation information is based on information provided by Terra Pointe Consultants, Inc. Bearings referenced to Grid North of the Michigan Coordinate System, Central zone and elevations referenced to NAD88 (2011) (INTERNATIONAL FOOT).
- Temporary Benchmark No. 1 - Found Iron Rod South West corner
 Northing = 515655.877
 Easting = 19352258.934
 Elevation = 757.15'
 - Temporary Benchmark No. 2 - Mag Nail in utility pole located on south side of the entrance to the site.
 Northing = 515725.424
 Easting = 19352463.482
 Elevation = 748.43'
- This site scales within Zone X, Defined as areas determined to be outside the 0.2% annual chance floodplain, as shown on the Flood Insurance Rate Map prepared by the Federal Emergency Management Agency for the City of Traverse, Grand Traverse County, Michigan, Map Number 26055C0207C, dated August 28, 2018.
 - Existing curbs and gutters on site are vertical. Curbs and gutters along asphalt paved areas are 6" wide with 6" curb and 18" wide gutter. Curbs along concrete areas are 6" high.
 - This site is zoned G-C General Commercial District per Garfield Township, MI Zoning Code.
 Building setback lines as per Garfield Township, MI Zoning Code:
 Front Yard= 40' (60' W/ Drive Thru Use)
 Side Yard= 10% of lot width, not less than 10'
 Rear Yard= 10% of lot width, not less than 10'
 - Water service to this site is provided by Grand Traverse County Public Works at time of survey.
 - Sanitary sewer service to this site is provided by Grand Traverse County Public Works, at time of survey.
 - Electrical service to this site is provided by Consumers Energy, at time of survey.
 - Telephone service to this site is provided by Century Link, at time of survey.
 - Gas service to this site is provided by DTE Energy, at time of survey.
 - NFV = Not Field Verified
 - The minimum depth of cover for waterlines on this site is 72 inches as per Traverse City Sewer and Water Maintenance.



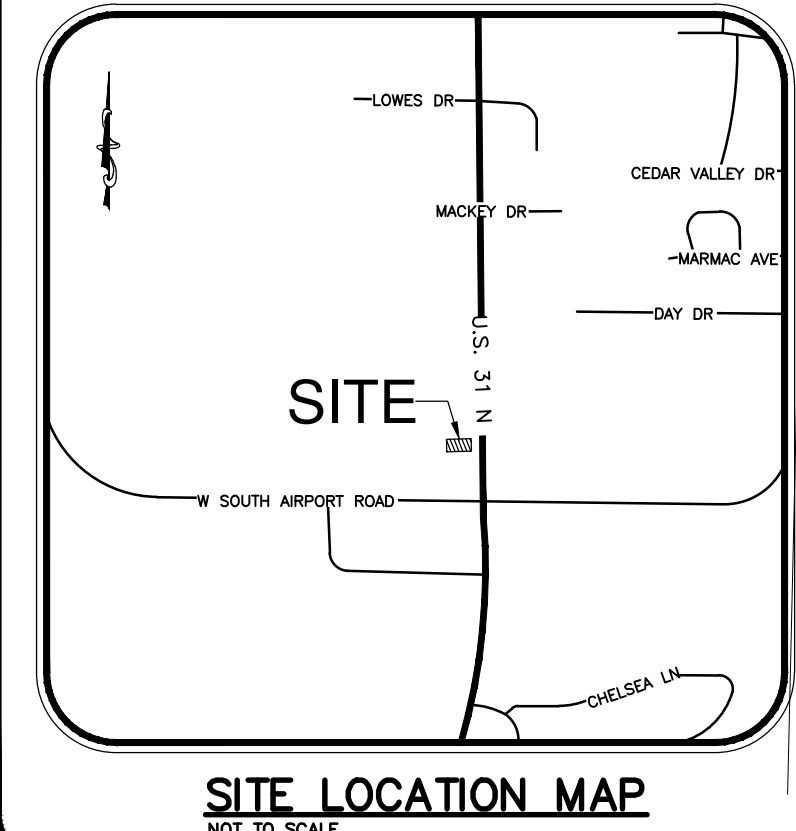
N.U.S. 315
(ASPHALT PAVEMENT)

TOPOGRAPHIC LEGEND	
DESCRIPTION	EXISTING
AERIAL ELECTRIC	— AE —
UNDERGROUND ELECTRIC	— UE —
UNDERGROUND TELEPHONE	— UT —
GAS LINE	— G —
WATERLINE	— W —
SANITARY SEWER	— SS —
STORM SEWER	=====
EASEMENT	— — — — —
PROPERTY LINE	— — — — —
CHAINLINK/WOODEN FENCE	— — — — —
CONTOURS	— 100 —
UTILITY POLE	o
GUARD POST	o
SANITARY MANHOLE	o
WATER VALVE	o
FIRE HYDRANT	o
CATCH BASIN	o
JUNCTION BOX	o
FLARED END SECTION	o
CLEANOUT	o
GRATED INLET	o
SOIL BORING	o

NOTE:
EXISTING FIELD DATA SHOWN HEREON WAS GATHERED BY TERRA PONTI CONSULTANTS, INC. ON 05-02-22

Three working days prior to the start of any excavation on this site the Contractor shall contact 1-800-482-7171 for utility location information.

The contractor shall verify and implement all the required Federal Occupational Safety and Health Administration (OSHA) and/or OSHA approved state-plan regulations established for the type of construction required by these plans.



FOR REVIEW ONLY

Raymond H. Frankenberg II, P.E. #42538
 State of Michigan
 Registered Professional Engineer
 for BFA, Inc.

11/01/22
 Date

bfaeng.com TELEPHONE: (636) 239-4751

103 ELM STREET WASHINGTON, MISSOURI 63090

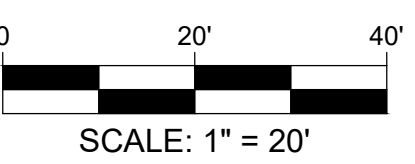
TRAVERSE CITY, MICHIGAN
NLD ACQUISITIONS LLC
PO BOX 100843
Fort Worth, TX 76185

REVISIONS	
1	By: _____ App: _____
2	By: _____ App: _____
3	By: _____ App: _____
4	By: _____ App: _____

DRAWN B.L.F.
 CHECKED R.G.R.
 DATE 11/01/22
 SCALE 1"=20'
 JOB No. 7146
 SHEET NAME TOPOGRAPHIC SURVEY
 TS-1

DEMOLITION PLAN

(THIS IS NOT A BOUNDARY SURVEY)



DEMOLITION PLAN NOTES:

- The Contractor shall conform to all applicable State and local codes for demolition of structures, safety of adjacent structures, dust control, and sediment and erosion control during construction.
- The Contractor shall verify that all required permits and licenses from appropriate authorities have been obtained prior to construction.
- The Contractor shall notify and coordinate scheduling with affected utility companies before starting work and comply with their requirements.
- The Contractor shall not close or obstruct public or private roadways, sidewalks, or fire hydrants without appropriate permits or written authorization.
- The Contractor shall accurately record actual locations of capped utilities and subsurface obstructions that will remain after demolition.
- The Contractor shall provide, erect, and maintain sediment and erosion control devices, temporary barriers, and security devices during construction.
- The Contractor shall protect existing landscaping materials, appurtenances, and structures, which are not to be demolished. Any damage caused by demolition operations shall be repaired by the Contractor at no cost to Owner.
- The Contractor shall protect and maintain in a safe and operable condition utilities that are to remain. The Contractor shall prevent interruption of existing utility service to occupied or used facilities, except when authorized in writing by authorities having jurisdiction. The Contractor shall provide temporary services during interruptions to existing utilities as acceptable to governing authorities and Owner.
- The Contractor shall notify adjacent owners of work that may affect their property, potential noise, utility outages or disruptions.
- Completely fill below grade areas and voids resulting from demolition or removal of structures, footings, foundations, underground fuel storage tanks, wells, cisterns, etc., using approved select fill materials consisting of stone, gravel, and sand. Fill materials shall be free from debris, trash, frozen materials, roots, and other organic matter.
- No burning of any material, debris, or trash on-site or off-site will be allowed, except when allowed by appropriate governing authority and Owner. Any permits required for doing so shall be obtained by the Contractor.
- All items noted "To Remain, and/or To Be Adjusted" shall be raised or lowered to match the new grade indicated or flush with the surrounding pavement. (i.e. manhole rims, valve covers, grates, etc.)
- Unless noted otherwise, utilities designated to be removed shall be removed in their entirety. Trenches shall then be backfilled and compacted. (See Soil Preparation and Compaction note on these plans.)
- Should hazardous materials be found during demolition operations, the Contractor shall notify the owner and all governing agencies, if necessary, and conform to all applicable regulatory procedures.
- The Contractor shall provide, install, and maintain traffic control at all times during construction. This includes signs, barriers, construction fencing, striping, etc. necessary to safely control site and construction traffic. Contractor shall be responsible for notifying adjacent property owners when closing cross access drive.
- The Contractor shall keep the premises clean and free of debris during construction.
- The fire protection for the site shall remain in service at all times during construction.
- Existing paint striping within the parking lot shall be removed as necessary for the proposed striping as shown on these plans. Striping shall be removed by sand blasting, milling, or grinding.
- All survey monuments disturbed during construction shall be replaced by a licensed land surveyor, licensed in the state where this project is located.
- The edges of all pavement and curb sections to be removed shall be saw cut. Remaining pavement and curb sections shall have smooth, clean edges. This means additional sawcuts may be necessary depending on contractor's means and methods.
- Remove all stumps, bushes, trees, weeds and other surface obstructions from the site that are within the proposed construction area and that are not otherwise noted to remain. Contractor to strip all topsoil from entire area to be graded. This may be done in phases. (Refer to Erosion and Sediment Control Plans.) Extent of topsoil use on site as per the on site geotechnical representative.
- The sitework for this project shall meet or exceed applicable AHJ Specifications, permit requirements, and manufacturer specifications.
- The contractor shall maintain the site in a well-drained manner in order to assure the shortest possible drying time after each rainfall. This will mean that pumping of standing water in the low areas on the site may be required during construction.
- The contractor is specifically cautioned that the location and/or elevation of existing utilities as shown on these plans is based on records of the various utility companies and, where possible, measurements taken in the field. The information is not to be relied on as being exact or complete. The contractor must call the appropriate utility company to request exact field location of utilities. It shall be the responsibility of the contractor to relocate all existing utilities which conflict with the proposed improvements shown on plans.
- Contractor shall be responsible for repair and replacement of any existing site features that are to remain that is disturbed during construction, including trench backfill, granular base, and pavements. Contractor's bid shall include any and all removal of and replacement of existing features due to utility removals and new connections.
- The Contractor shall be responsible for inspecting the condition of the existing retaining wall to remain prior to bid and provide notice to owner and BFA of any defects, if any. If there are defects/wall maintenance recommendations, the contractor shall provide a detailed estimate and scope of work of proposed improvements. Contractor shall be responsible for repairs and replacement of structures damaged during construction, at their own expense.
- (TBR) = To Be Removed
(TBR&R) = To Be Removed and Replaced/Relocated
(TR) = To Remain
(TBA) = To Remain and adjusted to proposed finish grade

NOTE:
EXISTING FIELD DATA SHOWN HEREON WAS GATHERED
BY TERRA POINTE CONSULTANTS, INC. ON 05-02-22

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DEMOLITION LEGEND	
DESCRIPTION	EXISTING
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UNDERGROUND ELECTRIC	—UE—
UNDERGROUND TELEPHONE	—UT—
GAS LINE	—G—
WATERLINE	—W—
SANITARY SEWER	—SS—
STORM SEWER	-----
EASEMENT	----
PROPERTY LINE	-----
CHAINLINK/WOODEN FENCE	o-o-o-o
CONTOURS	---100---
UTILITY POLE	o
GUARD POST	oP
SANITARY MANHOLE	o
WATER VALVE	o
FIRE HYDRANT	o
CATCH BASIN	o
JUNCTION BOX	o
FLARED END SECTION	o>
CLEANOUT	o
GRADED INLET	o
SOIL BORING	o

TRAVERSE CITY, MICHIGAN
NLD ACQUISITIONS LLC
PO BOX 100843
Fort Worth, TX 76185

REVISIONS	
1	By: _____ App: _____
2	By: _____ App: _____
3	By: _____ App: _____
4	By: _____ App: _____

DRAWN
B.L.F.
CHECKED
J.B.S.
DATE
11/01/22
SCALE
1"=20'
JOB No.
7146

SHEET NAME
DEMOLITION PLAN

DM-1

FOR REVIEW ONLY

Raymond H. Frankenberg II, P.E. #42538 11/01/22
 State of Michigan Date
 Registered Professional Engineer
 for BFA, Inc.

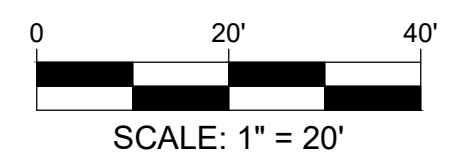
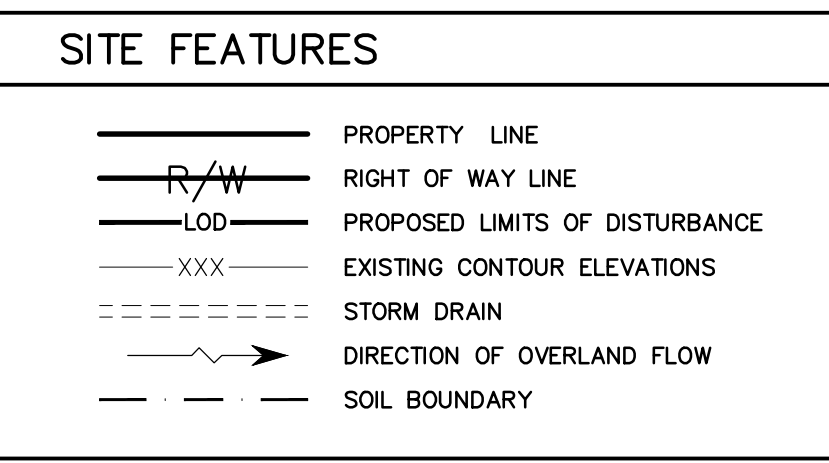
bfaeng.com TELEPHONE: (636) 239-4751

103 ELM STREET WASHINGTON, MISSOURI 63090

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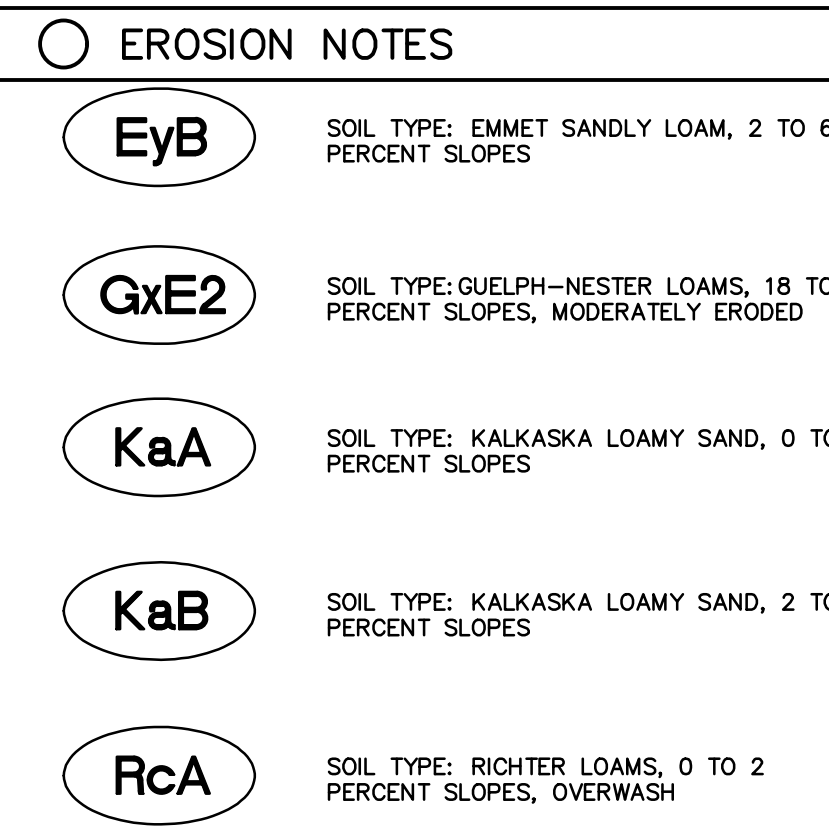
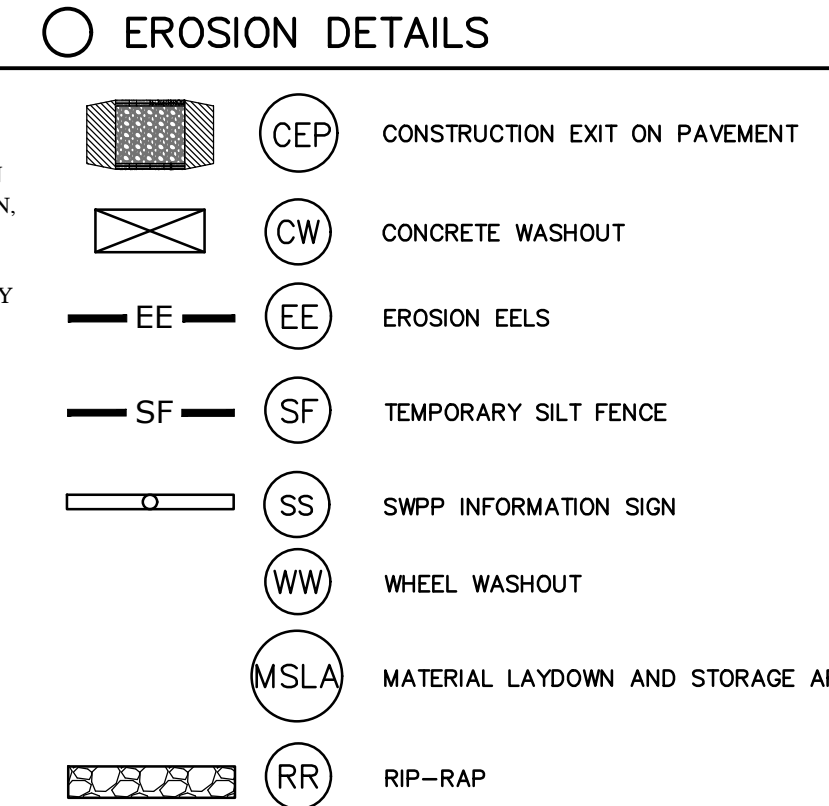
PHASE I EROSION AND SEDIMENTATION CONTROL PLAN / SITE MAP

ACREAGE SUMMARY (IN ACRES)	
PROPERTY AREA	0.45
AREA WITHIN PROPERTY	0.45
AREA OUTSIDE OF TAKE 5 PROPERTY	0.05
TOTAL PROJECT AREA	0.50
IMPERVIOUS AREA BEFORE PROJECT	0.32
IMPERVIOUS AREA AT COMPLETION	0.33
PERVIOUS AREA AT COMPLETION	0.17



SEQUENCE OF CONSTRUCTION

- PHASE I**
- INSTALL STABILIZED CONSTRUCTION EXITS.
 - PREPARE TEMPORARY PARKING AND STORAGE AREA. UPON IMPLEMENTATION AND INSTALLATION OF THE FOLLOWING AREAS: TRAILER, PARKING, LAYDOWN, PORTA POTTY, WHEEL WASH, CONCRETE WASHOUT, MASON'S AREA, FUEL AND MATERIAL STORAGE CONTAINERS, SOLID WASTE CONTAINERS, ETC., DENOTE THEM ON THE SITE MAPS AND NOTE ANY CHANGES IN THE LOCATIONS AS THEY OCCUR THROUGHOUT THE CONSTRUCTION PROCESS.
 - INSTALL INLET PROTECTIONS AND SILT FENCES(S) ON THE SITE.
 - OVER-EXCAVATE FOR BUILDING PAD.
 - BEGIN GRADING THE SITE.
- PHASE II**
- START CONSTRUCTION OF BUILDING PAD AND STRUCTURES.
 - TEMPORARILY SEED/STABILIZE DISTURBED AREAS.
 - INSTALL UTILITIES, UNDERDRAINS, STORM SEWERS, CURBS AND GUTTERS.
 - INSTALL INLET PROTECTION AROUND ALL STORM SEWER STRUCTURES.
 - PREPARE SITE FOR PAVING.
 - PAVE SITE.
 - INSTALL INLET PROTECTION DEVICES.
 - COMPLETE GRADING AND INSTALL PERMANENT SEEDING AND PLANTINGS.
 - REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES (ONLY IF SITE IS STABILIZED).



BENCHMARK INFORMATION

TEMPORARY BENCHMARK NO. 1 - FOUND IRON ROD ELEVATION=757.15'
TEMPORARY BENCHMARK NO. 2 - MAG NAIL ELEVATION=748.43'

NOTE:

IN THE EVENT THAT AN INSPECTOR OF THE U.S. E.P.A. OR A STATE OR LOCAL AGENCY SHOULD APPEAR AT THE PROJECT TO CONDUCT AN INSPECTION, THE CONTRACTOR SHALL IMMEDIATELY CONTACT BFA, INC. AT 636-239-4751 AND ADVISE THEM OF THE INSPECTION.

DEVELOPER/OWNER:
 NLD ACQUISITIONS, LLC
 PO BOX 100843
 FORT WORTH, TX 76185

SITE OPERATOR/GENERAL CONTRACTOR:

 SUPERINTENDENT:

MINIMIZATION OF DISTURBED AREAS:

- CONTRACTOR SHALL MANAGE CONSTRUCTION ACTIVITIES TO REDUCE EROSION AND RETAIN SEDIMENT AND OTHER POLLUTANTS IN THE SOIL AT THE CONSTRUCTION SITE.
- CONTRACTOR SHALL MINIMIZE THE TIME BARE SOIL IS EXPOSED.
- CONTRACTOR SHALL MINIMIZE SITE DISTURBANCE BY MINIMIZING THE EXTENT OF GRADING AND CLEARING TO EFFECTIVELY REDUCE SEDIMENT YIELD.

NOTE TO GC: OWNER HAS AUTHORITY AT ANY TIME TO LIMIT SURFACE AREA OF ERODIBLE EARTH MATERIAL EXPOSED BY CLEARING AND GRUBBING; EXCAVATION, BORROW AND EMBANKMENT OPERATIONS AND TO DIRECT THE GC TO PROVIDE IMMEDIATE PERMANENT OR TEMPORARY POLLUTION CONTROL MEASURES.

Three working days prior to the start of any excavation on this site the Contractor shall contact 1-800-482-7171 for utility location information.

The contractor shall verify and implement all the required Federal Occupational Safety and Health Administration (OSHA) and/or OSHA approved state-plan regulations established for the type of construction required by these plans.

FOR REVIEW ONLY

Raymond H. Frankenberg II, P.E. #42538 11/01/22
 State of Michigan
 Registered Professional Engineer
 for BFA, Inc. Date

bfaeng.com TELEPHONE: (636) 239-4751

103 ELM STREET WASHINGTON, MISSOURI 63090

TRAVERSE CITY, MICHIGAN
NLD ACQUISITIONS LLC
PO BOX 100843
Fort Worth, TX 76185

REVISIONS

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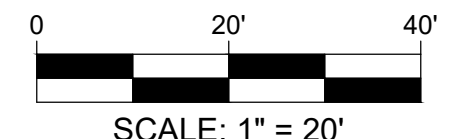
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 JOB No.
 7146
 SHEET NAME
 ESC PHASE I
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PHASE II EROSION AND SEDIMENTATION CONTROL PLAN / SITE MAP

ACREAGE SUMMARY (IN ACRES)	
PROPERTY AREA	0.45
AREA WITHIN PROPERTY	0.45
AREA OUTSIDE OF TAKE 5 PROPERTY	0.05
TOTAL PROJECT AREA	0.50
IMPERVIOUS AREA BEFORE PROJECT	0.32
IMPERVIOUS AREA AT COMPLETION	0.33
PERVIOUS AREA AT COMPLETION	0.17

LEGEND	
SITE FEATURES	
	PROPERTY LINE
	RIGHT OF WAY LINE
	PROPOSED LIMITS OF DISTURBANCE
	EXISTING CONTOUR ELEVATIONS
	STORM DRAIN
	DIRECTION OF OVERLAND FLOW
	SOIL BOUNDARY



SEQUENCE OF CONSTRUCTION

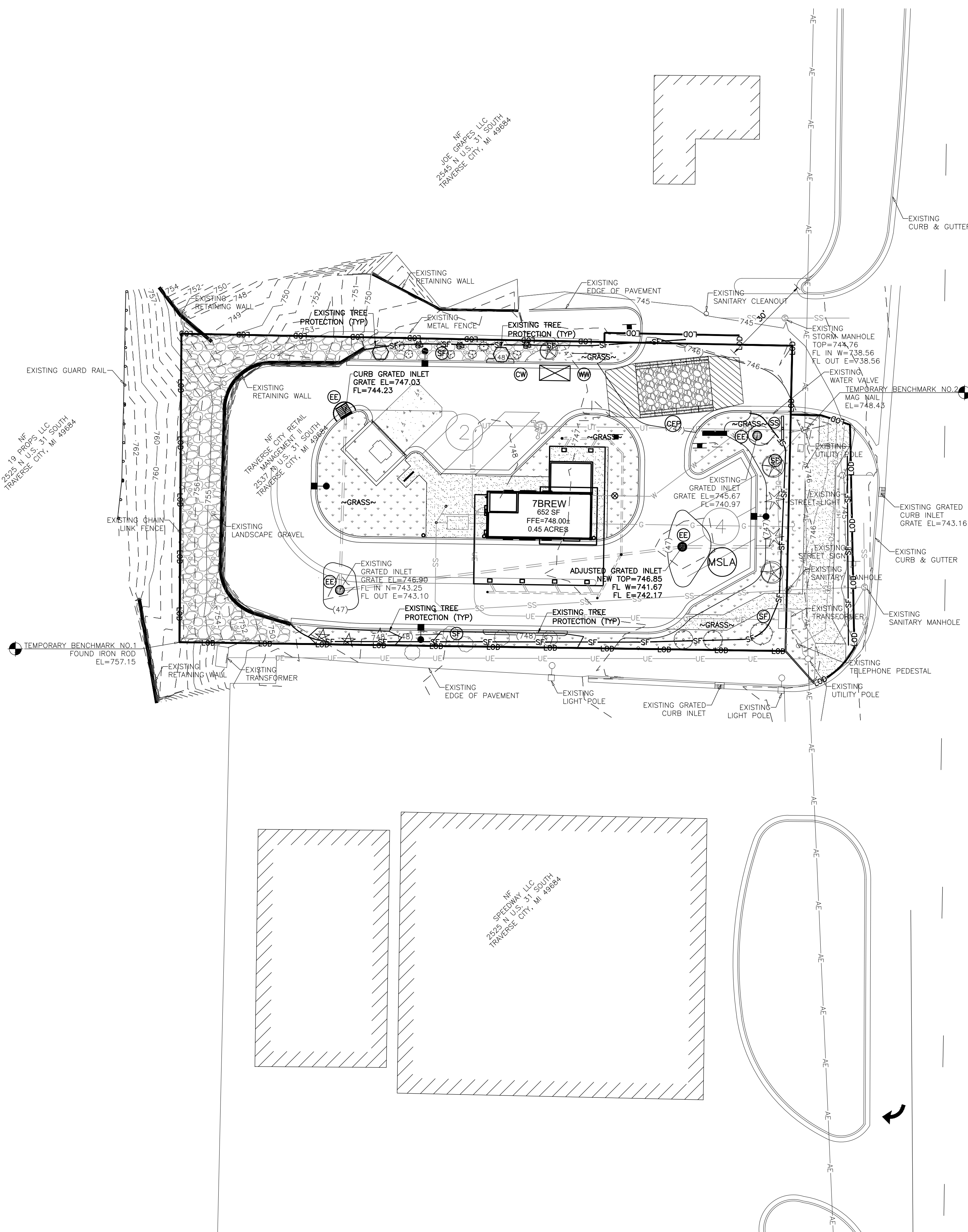
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 4. OVER-EXCAVATE FOR BUILDING PAD.
 5. BEGIN GRADING THE SITE.
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1. START CONSTRUCTION OF BUILDING PAD AND STRUCTURES.
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 8. COMPLETE GRADING AND INSTALL PERMANENT SEEDING AND PLANTINGS.
 9. REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES (ONLY IF SITE IS STABILIZED).

EROSION DETAILS

- CEP CONSTRUCTION EXIT ON PAVEMENT
- CW CONCRETE WASHOUT
- EE EROSION EELS
- SF TEMPORARY SILT FENCE
- SS SWPP INFORMATION SIGN
- WW WHEEL WASHOUT
- MSLA MATERIAL LAYDOWN AND STORAGE AREA
- RR RIP-RAP
- FS FILTER SACK

EROSION NOTES

- PS PERMANENT SEEDING/SOIL
- GR LANDSCAPE GRAVEL



BENCHMARK INFORMATION

TEMPORARY BENCHMARK NO. 1 - FOUND IRON ROD
ELEVATION=757.15'

TEMPORARY BENCHMARK NO. 2 - MAG NAIL
ELEVATION=748.43'

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The contractor shall verify and implement all the required Federal Occupational Safety and Health Administration (OSHA) and/or OSHA approved state-plan regulations established for the type of construction required by these plans.

NOTE:
EXISTING FIELD DATA SHOWN HEREON WAS GATHERED BY TERRA POINTE CONSULTANTS, INC. ON 05-02-22

ESC PLAN LEGEND	
DESCRIPTION	EXISTING
AERIAL ELECTRIC	—AE—
UNDERGROUND ELECTRIC	—UE—
UNDERGROUND TELEPHONE	—UT—
GAS LINE	—G—
FIBER OPTIC LINE	—FO—
WATERLINE	—W—
SANITARY SEWER	—SS—
STORM SEWER	-----
EASEMENT	----
PROPERTY LINE	-----
CONTOURS	---100---
UTILITY POLE	o
GUARD POST	oP
SANITARY MANHOLE	o
WATER VALVE	o
FIRE HYDRANT	o
CLEANOUT	o

TRAVERSE CITY, MICHIGAN
NLD ACQUISITIONS LLC
PO BOX 100843
Fort Worth, TX 76185

REVISIONS	
1	By: _____ App: _____
2	By: _____ App: _____
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4	By: _____ App: _____

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 B.L.F.
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 SHEET NAME
 ESC PHASE II

FOR REVIEW ONLY

Raymond H. Frankenberg II, P.E. #42538 11/01/22
 State of Michigan Date
 Registered Professional Engineer
 for BFA, Inc.

bfaeng.com TELEPHONE: (636) 239-4751

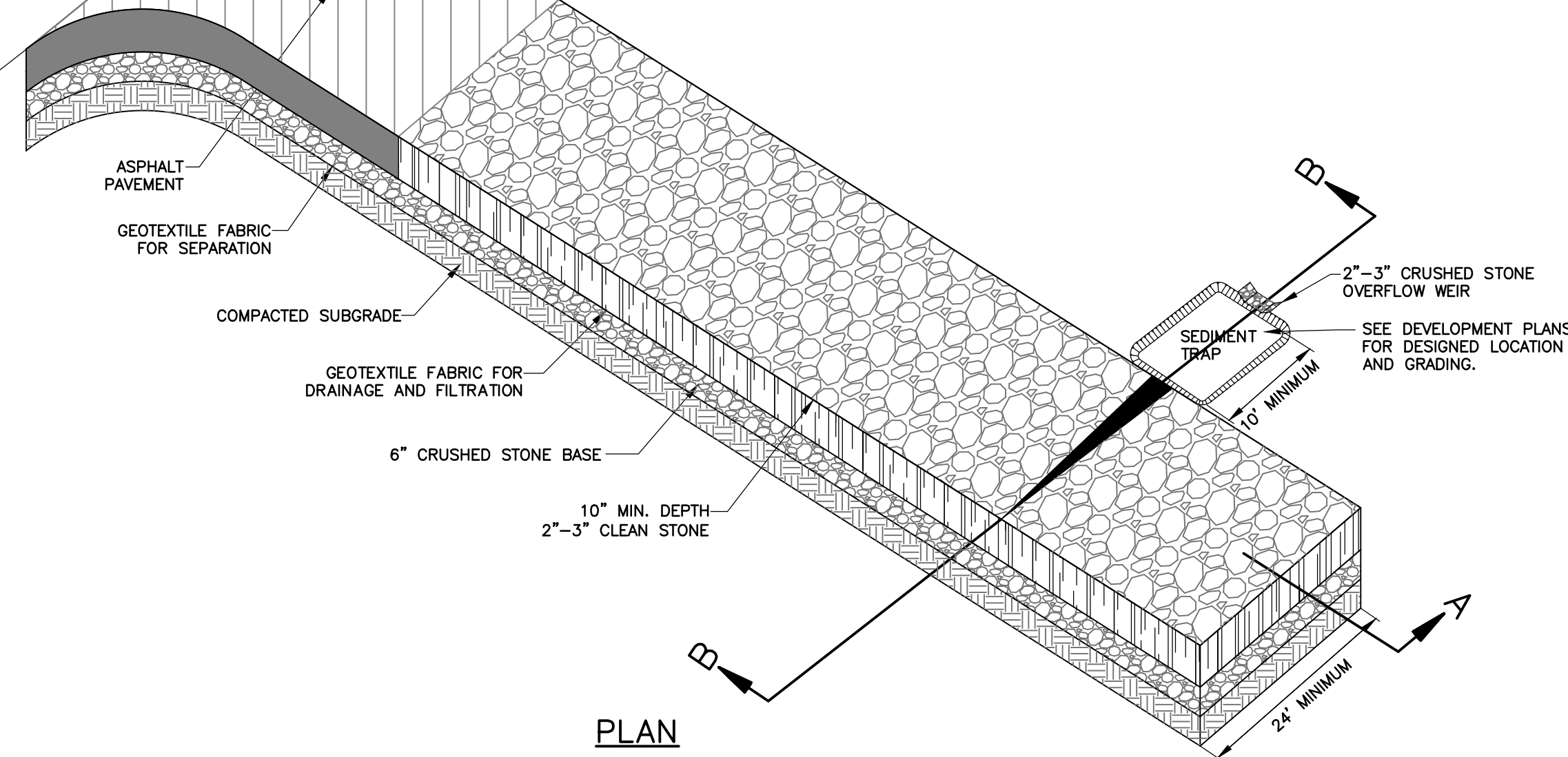
103 ELM STREET WASHINGTON, MISSOURI 63090

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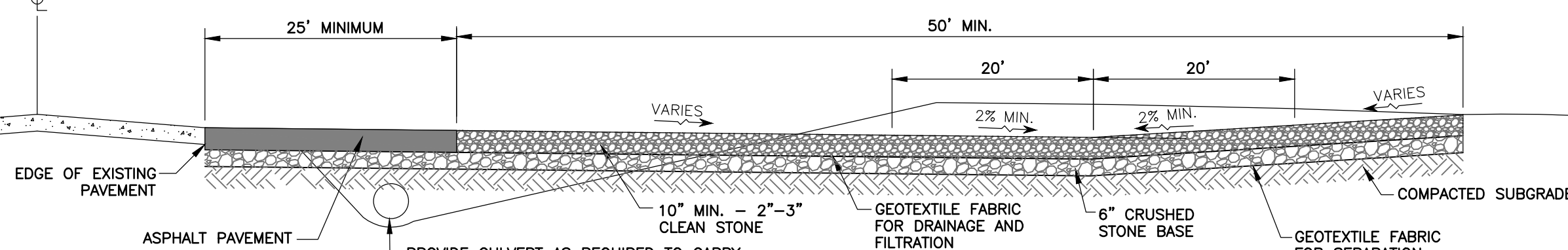
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1. PROVIDE SEDIMENT TRAP ON DOWN GRADIENT SIDE (OR BOTH SIDES) IF WHEEL WASHING IS REQUIRED.
2. FLUSH SURFACE STONE TOWARD SEDIMENT TRAP WITH HIGH VOLUME WATER FLOW AS NEEDED TO MAINTAIN CLEAN SURFACE STONE.
3. SEDIMENT TRAP SHALL BE LOCATED OUTSIDE OF THE RIGHT-OF-WAY AND AT A MINIMUM SETBACK DISTANCE AS REQUIRED PER LOCAL JURISDICTION.
4. SEE SWPPP PLANS FOR LOCATION OF SEDIMENT TRAP(S).
5. CONTRACTOR TO LOCATE TEMPORARY CONSTRUCTION FENCING, JERSEY BARRIERS, OR BOTH ALONG THE SIDES OF THE CONSTRUCTION EXIT TO PREVENT CONSTRUCTION TRAFFIC FROM SHORT CIRCUITING/BYPASSING THE EXIT.

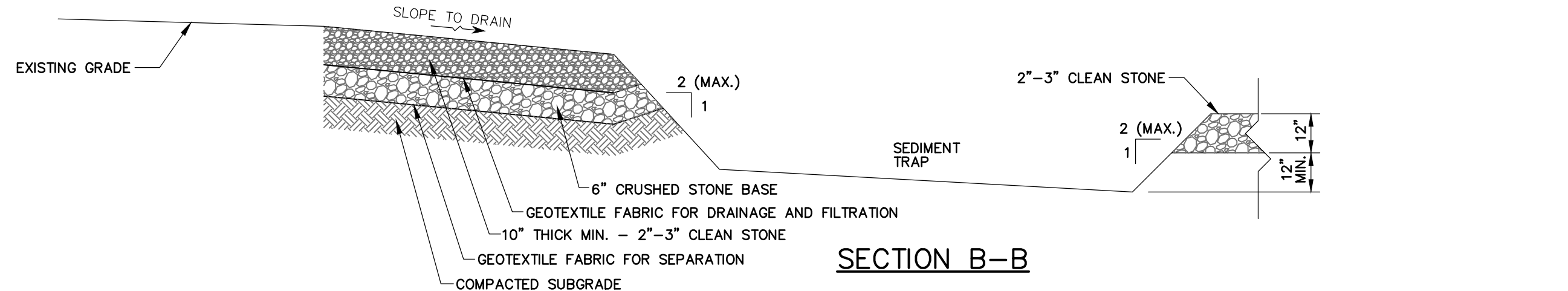
HARD SURFACE INTERSECTING ROAD



PLAN



SECTION A-A



SECTION B-B

CONSTRUCTION EXIT DETAIL

CE NO SCALE

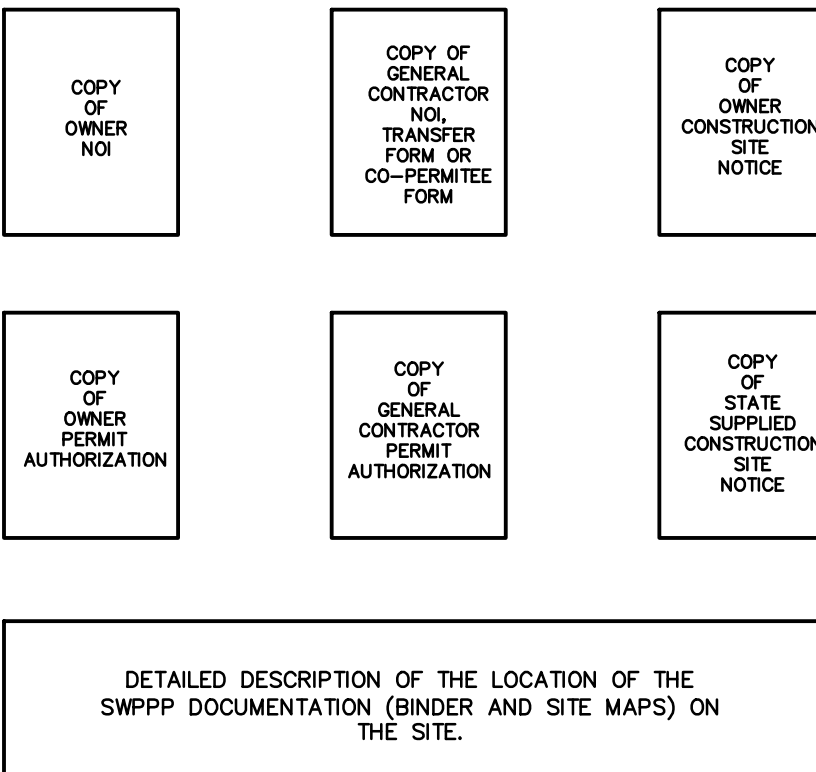
NOTES:

1. PERMANENT STABILIZATION SHALL BE ACCOMPLISHED IN ALL DISTURBED AREAS BY COVERING THE SOIL WITH PAVEMENT, BUILDING STRUCTURES, VEGETATION, OR OTHER FORMS OF SOIL STABILIZATION.
2. THE GC IS REQUIRED TO INITIATE PERMANENT SOIL STABILIZATION MEASURES IMMEDIATELY UPON REACHING FINAL GRADE. FOR THOSE AREAS NOT AT FINAL GRADE THAT WILL NOT BE DISTURBED FOR GREATER THAN 14 DAYS, THE CONTRACTOR SHOULD INITIATE TEMPORARY STABILIZATION PER THE TEMPORARY SEEDING OR STABILIZATION DETAIL.
3. THE GC HAS 7 DAYS FROM INITIATION OF STABILIZATION TO COMPLETE SOIL PREPARATION, SEEDING, MULCHING, AND ANY OTHER REQUIRED ACTIVITIES RELATED TO THE PLANTING AND ESTABLISHMENT OF VEGETATION. THE GC ALSO HAS 7 DAYS FROM INITIATION OF STABILIZATION TO COMPLETELY INSTALL NON-VEGETATED MEASURES, IF UTILIZED.
4. SOILS MUST BE PREPARED BEFORE INSTALLATION OF SOD OR SEED.
5. AT THE COMPLETION OF GROUND-DISTURBING ACTIVITIES, THE ENTIRE SITE MUST HAVE PERMANENT VEGETATIVE COVER MEETING VEGETATIVE DENSITY REQUIREMENTS IN THE GENERAL PERMIT, OR MULCH PER LANDSCAPE PLAN, IN ALL AREAS NOT COVERED BY HARDSCAPE (STONE, PAVEMENT, BUILDINGS, ETC.).
6. SEEDING AREAS SHALL BE PROTECTED WITH STRAW MULCH, HYDRAULIC MULCH OR A ROLLED EROSION CONTROL PRODUCT. STRAW MULCH MUST BE TACKIFIED OR CRIMPED BY DISC OR OTHER MACHINERY, AND ROLLED EROSION CONTROL PRODUCTS MUST BE INSTALLED PER MANUFACTURER RECOMMENDATIONS. ONLY ROLLED EROSION CONTROL PRODUCTS ARE PERMITTED TO BE USED IN FLOW CONVEYANCES.
7. ALL AREAS TO BE SEEDING MUST MEET TOPSOIL DEPTH, PH AND ORGANIC CONTENT REQUIREMENTS.
8. FINAL SITE STABILIZATION IS ACHIEVED WHEN PERENNIAL VEGETATIVE COVER PROVIDES PERMANENT STABILIZATION WITH A UNIFORM DENSITY GREATER THAN 70 PERCENT OVER THE ENTIRE AREA TO BE STABILIZED BY VEGETATIVE COVER. THIS AREA IS EXCLUSIVE OF AREAS THAT ARE COVERED WITH ROCK (CRUSHED GRANITE, GRAVEL, ETC.) OR LANDSCAPE MULCH, PAVED OR HAVE A BUILDING OR OTHER PERMANENT STRUCTURE ON THEM.

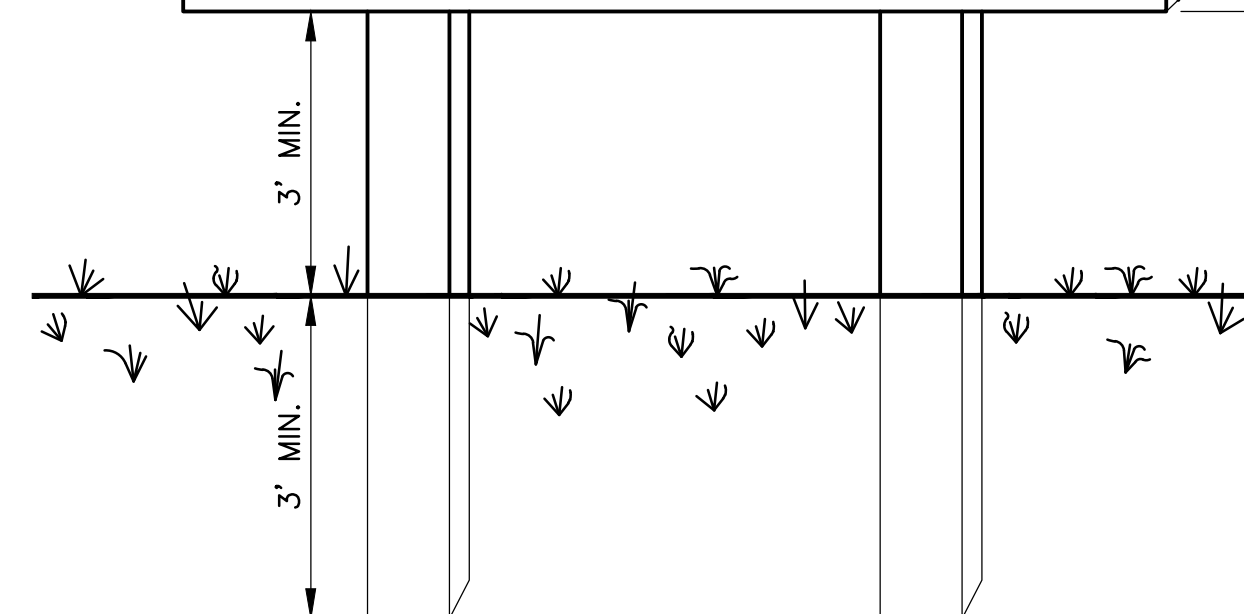
SD PS PERMANENT SEEDING, SOD OR MULCHING

"SWPPP INFORMATION" MUST BE DISPLAYED PROMINENTLY ACROSS THE TOP OF THE SIGN, AS SHOWN IN THE DETAIL.

SWPPP INFORMATION



SIGN TO BE CONSTRUCTED OF A RIGID MATERIAL, SUCH AS PLYWOOD OR OUTDOOR SIGN BOARD. SIGN MUST BE CONSTRUCTED IN A MANNER TO PROTECT DOCUMENTS FROM DAMAGE DUE TO WEATHER (WIND, SUN, MOISTURE, ETC.).



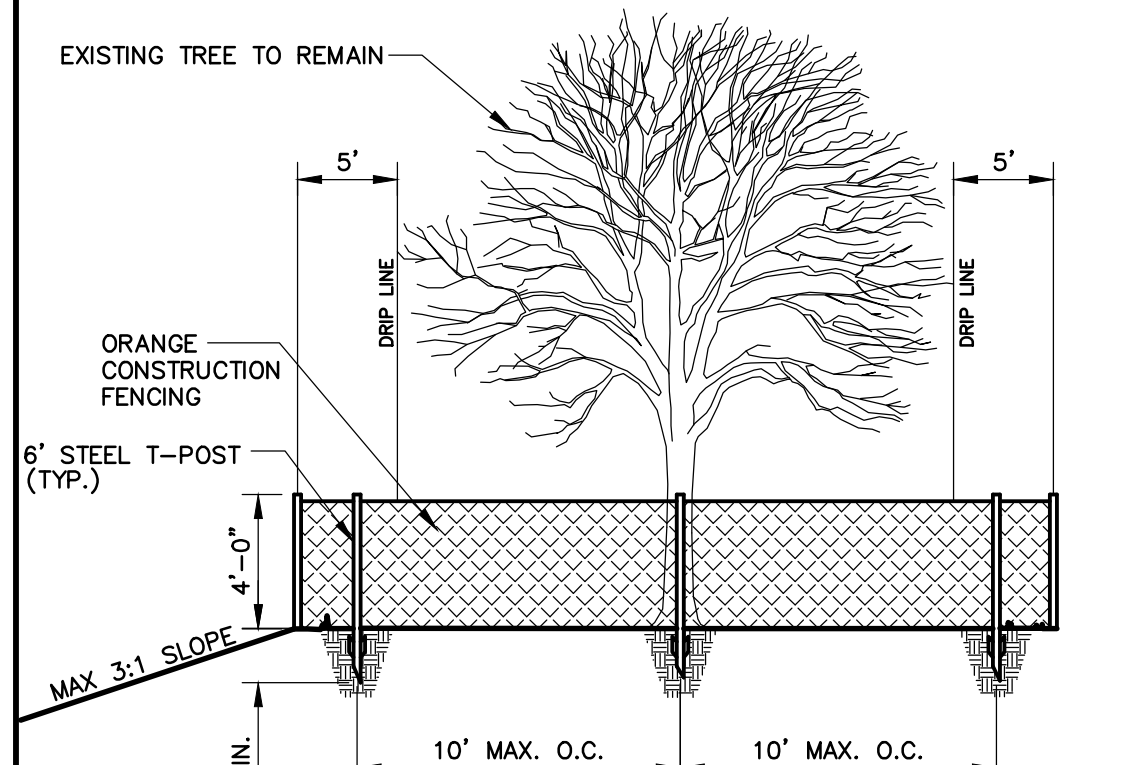
NOTES:

1. THE SWPPP INFORMATION SIGN MUST BE LOCATED NEAR THE CONSTRUCTION EXIT OF THE SITE, SUCH THAT IT IS ACCESSIBLE AND VIEWABLE BY THE GENERAL PUBLIC, BUT NOT OBSTRUCTING VIEWS AS TO CAUSE A SAFETY HAZARD.
2. ALL POSTED DOCUMENTS MUST BE MAINTAINED IN A CLEARLY READABLE CONDITION AT ALL TIMES THROUGHOUT CONSTRUCTION AND UNTIL THE NOTICE-OF-TERMINATION (NOT) IS FILED FOR THE PERMIT.
3. CONTRACTOR SHALL POST OTHER STORMWATER AND/OR EROSION AND SEDIMENT CONTROL RELATED PERMITS ON THE SIGN AS REQUIRED BY THE GOVERNING AGENCY.
4. SIGN SHALL BE LOCATED OUTSIDE OF PUBLIC RIGHT-OF-WAY AND EASEMENTS UNLESS APPROVED BY THE GOVERNING AGENCY.
5. CONTRACTOR IS RESPONSIBLE FOR ENSURING STABILITY OF THE SWPPP INFORMATION SIGN.

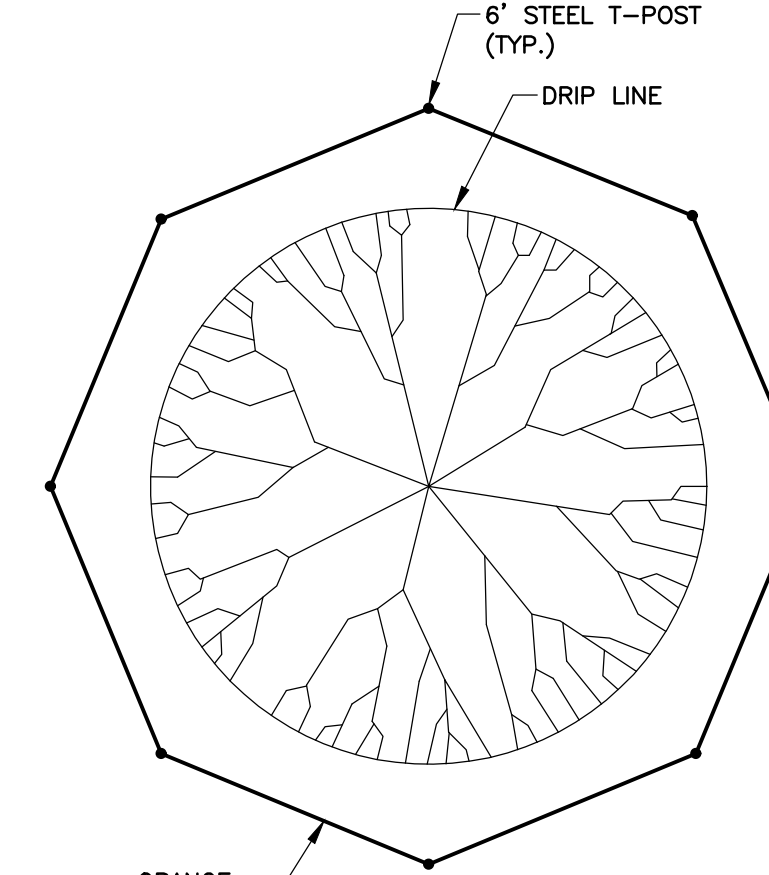
SWPPP INFORMATION SIGN DETAIL

NO SCALE

SS



NO GRADING WORK TO BE DONE WITH IN 5' OF THE DRIP LINE OF ANY TREE TO BE PROTECTED UNLESS OTHERWISE SPECIFIED.



PLAN VIEW

TREE PROTECTION FENCE DETAIL

NO SCALE

(TO BE REMOVED AT END OF CONSTRUCTION)

TRAVERSE CITY, MICHIGAN
 NLD ACQUISITIONS LLC
 PO BOX 100843
 Fort Worth, TX 76185

REVISIONS

1	By:	App:
2	By:	App:
3	By:	App:
4	By:	App:

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The contractor shall verify and implement all the required Federal Occupational Safety and Health Administration (OSHA) and/or OSHA approved state-plan regulations established for the type of construction required by these plans.

FOR REVIEW ONLY

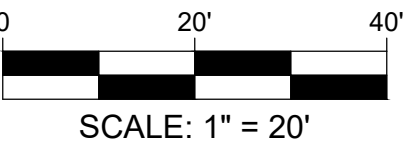
Raymond H. Frankenberg II, P.E. #42538 10/17/22 Date
 State of Michigan
 Registered Professional Engineer
 for BFA, Inc.

bfaeng.com TELEPHONE: (636) 239-4751

103 ELM STREET WASHINGTON, MISSOURI 63090

DRAWN B.L.F.
 CHECKED J.B.S.
 DATE 10/17/22
 SCALE NONE
 JOB No. 7146
 SHEET NAME ESC DETAIL SHEET 2
 ESC-4

GRADING PLAN

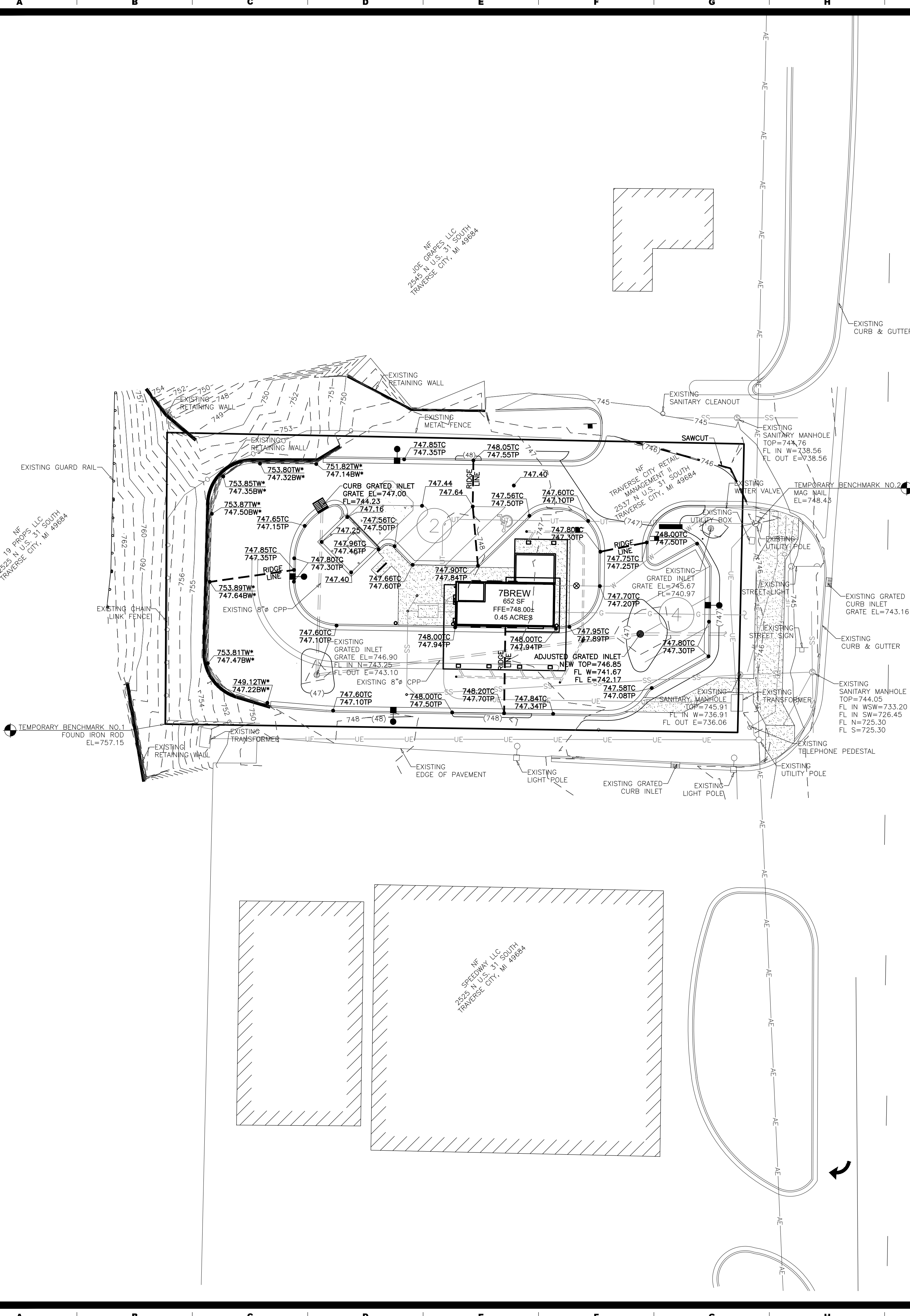


GRADING NOTES:

- Contractor shall verify elevation of temporary benchmarks based on the elevation of the primary benchmark, prior to the start of construction. Contractor shall notify engineer if elevations differ from those shown on these plans.
 Primary Benchmark - Bearings and elevation information is based on information provided by Terra Pointe Consultants, Inc. Bearings referenced to Grid North of the Michigan Coordinate System, Central zone and elevations referenced to NAD88 (2011) (INTERNATIONAL FOOT).
 Temporary Benchmark No. 1 - Found Iron Rod South West corner
 Northing = 515655.877
 Easting = 19352258.934
 Elevation = 757.15
 Temporary Benchmark No. 2 - Mag Nail in utility pole located on south side of the north entrance to the site.
 Northing = 515725.424
 Easting = 19352463.482
 Elevation = 748.43
- This site scales within Zone X, Defined as areas of determined to be outside the 0.2% annual chance floodplain, as shown on the Flood Insurance Rate Map prepared by the Federal Emergency Management Agency for the City of Traverse, Grand Traverse County, Michigan, Map Number 26055C0207C dated, August 28, 2018.
- The Contractor is specifically cautioned that the location and/or elevation of existing utilities as shown on these plans is based on records of the various utility companies and, where possible, measurements taken in the field. The information is not to be relied on as being exact or complete. The Contractor must call the appropriate utility company to request exact field location of utilities. It shall be the responsibility of the Contractor to relocate all existing utilities which conflict with the proposed improvements shown on plans.
- All trenches under paved areas shall be backfilled with granular material and compacted to meet compaction requirements for the parking lot. Granular material shall be placed and compacted to a level equal to the trench depth at the time of the utility installations.
- All unsurfaced areas are to receive four inches of topsoil. Contractor to seed, mulch, fertilize, water, and maintain all areas outside of paved areas that were disturbed during construction until an acceptable stand of grass is established. Contractor shall be responsible to take whatever means necessary to establish permanent soil stabilization.
- The earthwork for all building foundations and slabs shall be in accordance with Building Plans & Specifications, unless otherwise noted.
- The contractor is responsible for keeping storm water run-off and sediment under control during construction. All contractors shall refer to the Erosion and Sediment Control Plan throughout construction.
- The Contractor shall maintain the site in a well-drained manner in order to assure the shortest possible drying time after each rainfall. This will mean that pumping of standing water in low areas on the site will most likely be required during construction. Also pumping of ground water in utility trenches and deep excavations will be required during construction.
- The sitework for this project shall meet or exceed applicable AHJ Specifications, permit requirements, and/or manufacturer specifications.
- Contractor shall refer to architectural plans for exact locations and dimensions of entrances, exit doors, downspouts, roof drains, precise building dimensions, and exact building utility entrance locations.
- Layers of pavement shall be placed perpendicular to each other with the final layer perpendicular to the finished contours on parking lot.
- Contractor shall refer to architectural plans for exact locations and dimensions of entrances, exit doors, downspouts, roof drains, precise building dimensions, and exact building utility entrance locations.
- The Contractor shall verify and/or perform all necessary inspections and/or certifications required by codes and/or utility companies prior to the announced building possession date and the final connections of utility services. All fees shall be paid by the contractor.
- Prior to placement of the base rock within the parking lot, the entire area shall be proof rolled with a loaded tandem axle dump truck, having no more than 3 axles and weighing a minimum of 40,000 pounds.
- Due to seasonal variations in rainfall and the groundwater level, the Contractor may be required to use light earth moving equipment to minimize pumping.
- The Contractor shall grade all areas to drain in order to prevent ponding water. The minimum allowable slope on all paved surfaces shall be 1 percent.
- The minimum depth of cover for waterlines on this site is 72 inches. Actual depths of waterlines may vary.
- Unless indicated otherwise, all waterline and sanitary sewer crossings shall have a minimum 18 inch vertical separation and 10 feet horizontal separation. The Contractor shall note that the depths of existing utilities have been plotted from information provided by various utility companies and is to be considered approximate. If the minimum separations cannot be constructed as shown the Contractor shall notify the BFA and appropriate modifications will be issued.
- All landscaping, paving, curbing, utilities, etc. adjacent to public right-of-way disturbed by construction activities (grading, utilities, sidewalk, etc.) shall be improved to new condition.
- All ramps and sidewalks shall meet jurisdiction and ADA Rules/Regulations. Handrails shall be required on all ramps (sidewalk routes exceeding 1'v:2'0" shall be constructed as ramps) that have a vertical change greater than 6 inches. Cross slopes on all sidewalks shall not exceed 2 percent.
- All landscapes/planter areas adjacent to the building shall allow for proper stormwater/irrigation drainage. Where storm structures or storm pipes are readily available, the contractor shall install 4" diameter drain tile and connect to the storm sewer. 2" diameter PVC weep holes shall also be provided in adjacent curb @ 48" O.C. to release at pavement grade.

SOIL PREPARATION AND COMPACTION

Within all construction areas and five feet beyond, existing utilities, structures, foundations, footings, slabs, pavements, and related below-grade components to be abandoned shall be properly demolished and the debris removed from the site, unless specifically noted otherwise. Existing utilities, cisterns and septic fields, as well as their associated backfill, shall be removed from the site, unless specifically noted to remain. Excavations resulting from the removal of existing site improvements shall be backfilled with properly compacted fill material meeting site specific specifications. Excavations shall be protected from extreme temperatures, precipitation, and construction disturbances. Areas to be cut or to receive fill shall be striped of any surface vegetation and/or organic topsoil. The stripings shall be removed from the site and/or stockpiled for later placement in landscape or common ground areas. Masonry rubble, rocks, and pavement broken to less than 3 inches in maximum dimension may be used as fill, if properly blended with acceptable soil and placed as approved by the site testing firm. Prior to compaction, soils may require moisture adjustment. The entire site shall be proof-rolled by systematically passing over the subgrade to achieve complete coverage with proper compaction or loaded construction equipment, and observing the subgrade for pockets of excessively soft, wet, or otherwise unacceptable materials. Remove, replace, and/or repair unsuitable areas with suitable material meeting site specific geotechnical recommendations prior to placement of additional fill, then proof-roll again. Proof-roll passes shall be limited, particularly on silty subgrades, to reduce the potential for pumping of moisture from within the soil. Fill material shall be free of organics, debris, other deleterious material, shall contain no chemicals that may result in the material being classified as "contaminated", shall not contain rocks greater than three (3) inches in size, and shall be placed in loose lifts not to exceed eight (8) inches in thickness. Within building and pavement areas, fill material shall be mechanically compacted to at least 98 percent of its Standard Proctor maximum dry density (ASTM D 698) within a moisture content range of 2% of the soil's optimum moisture content for lean clays and 0% to 4% above optimum moisture content for lean to fat or fat clay. Moisture content for granular soils shall be at a workable level to allow for compaction and prevent undue pumping. Fill material shall be plastic with a maximum liquid limit of 50 and a maximum plasticity index of 30. Soils that become unstable due to moisture or disturbance shall be scarified, dried, and recompacted, or undercut to a suitable bearing subgrade and replaced with compacted fill material. Refer to the Building Plans for any additional earthwork criteria associated with the building pad preparation and to the geotechnical report for additional requirements, recommendations, and remediation associated with the site soils. All earthwork activities and soil remediation performed shall be included in the contractor's base bid.



TOP OF CURB	000.00TC
PAVEMENT ELEVATION @ CURB/SIDEWALK	000.00TP
INTERIOR PAVEMENT/GROUND ELEVATIONS	000.00
GUTTER ELEVATION @ FACE OF CURB	000.00GC
ELEVATION TO MATCH EXISTING	000.00*
TOP OF SIDEWALK	000.00TS
TOP OF EXISTING RETAINING WALL	000.00TW
BOTTOM OF EXISTING RETAINING WALL	000.00BW

ABBREVIATION	DESCRIPTION
BHI	BEE HIVE INLET
EL	ELEVATION
FL	FLOW LINE
N/F	NOW AND/OR FORMERLY
DS	DOWNSPOUT
SSCO	SANITARY SEWER CLEANOUT
STCO	STORM SEWER CLEANOUT
(R)	ADA ACCESSIBLE RAMP

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NLD ACQUISITIONS LLC
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Fort Worth, TX 76185

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DRAWN B.L.F.
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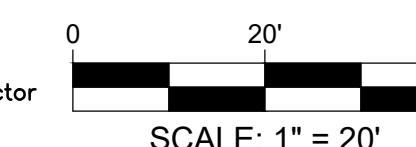
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 State of Michigan Date
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bfaeng.com TELEPHONE: (636) 239-4751

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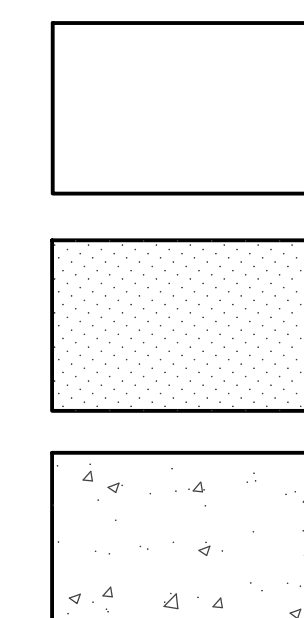
SITE PLAN



SITE NOTES:

- The Contractor is specifically cautioned that the location and/or elevation of existing utilities as shown on these plans is based on records of the various utility companies and, where possible, measurements taken in the field. The information is not to be relied on as being exact or complete. The Contractor must call the appropriate utility company to request exact field location of utilities. It shall be the responsibility of the Contractor to relocate all existing utilities which conflict with the proposed improvements shown on plans.
- Contractor shall verify elevation of temporary benchmarks based on the elevation of the primary benchmark, prior to the start of construction. Contractor shall notify engineer if elevations differ from those shown on these plans.
 Primary Benchmark - Bearings and elevation information is based on information provided by Terra Pointe Consultants, Inc. Bearings referenced to Grid North of the Michigan Coordinate System, Central zone and elevations referenced to NAD83 (2011) (INTERNATIONAL FOOT).
 Temporary Benchmark No. 1 - Found Iron Rod South West corner
 Northing = 515655.877
 Easting = 19352258.934
 Elevation = 757.15
 Temporary Benchmark No. 2 - Mag Nail in utility pole located on south side of the north entrance to the site.
 Northing = 515725.424
 Easting = 19352463.482
 Elevation = 748.43
- This site scales within Zone X, Defined as areas determined to be outside the 0.2% annual chance floodplain, as shown on the Flood Insurance Rate Map prepared by the Federal Emergency Management Agency for the City of Traverse, Grand Traverse County, Michigan, Map Number 2605500207C, dated August 28, 2018.
- All trenches under paved areas shall be backfilled with granular material and compacted to meet compaction requirements for the parking lot. Granular material shall be placed and compacted to a level equal to the trench depth at the time of the utility installations.
- Contractor to contact telephone, electric, gas, and water companies to have underground utilities located on this site and adjacent to this site prior to doing any excavating.
- The contractor is responsible for keeping storm water run-off and sedimentation under control during construction.
- All survey monuments disturbed during construction shall be replaced by a surveyor licensed in the state, in which this project is located, at the contractors expense.
- The sitework for this project shall meet or exceed industry standards and manufacturers specifications for each improvement feature.
- The Contractor shall verify and/or perform all necessary inspections and/or certifications required by codes and/or utility companies prior to the announced building possession date and the final connections of utility services. All fees shall be paid by the Contractor.
- All dimensions and radii are to the face of curb, unless otherwise shown.
- Contractor shall be responsible for all removals of and/or relocations, including but not limited to, utilities, storm drainage, signs, traffic signals and poles, etc as required. All work shall be done in accordance with governing authorities specifications and shall be approved by such. All costs shall be included in base bid.
- The edges of all pavement and curb sections to be removed and/or that will have new pavement/curb sections abutting them, shall be sawcut. Remaining pavement and curb sections shall have smooth, clean edges. This means additional sawcuts may be necessary depending on Contractor's Means and methods.
- This site is zoned C-G General Commercial District per Garfield Township, MI Zoning Code.
 Building setback lines as per Garfield Township, MI Zoning Code:
 Front Yard= 40' (60' W/ Drive Thru use)
 Side Yard= 10% of lot width, not less than 10'
 Rear Yard= 10% of lot width, not less than 10'
- All ramps and sidewalks shall meet Jurisdiction and ADA Rules/Regulations. Handrails shall be required on all ramps (sidewalk routes exceeding 1'x20'H shall be constructed as ramps) that have a vertical change greater than 6 inches. Cross slopes on all sidewalks shall not exceed 2 percent.
- Pavement striping and/or markings shall be applied using two coats of the color specified on a clean surface, at manufacturer's recommended rate, without addition of thinner, with maximum of 100 square feet per gallon or as required to provide a minimum wet film thickness of 15 mils and dry film thickness of 7 1/2 mils per coat. Paint shall be applied for a total dry film thickness of 15 mils. Apply with mechanical equipment to produce uniform straight edges. At sidewalk curbs and crosswalks, use straightedge to ensure uniform, clean, and straight stripe.
- Signs are subject to sign permit review by Garfield Township.

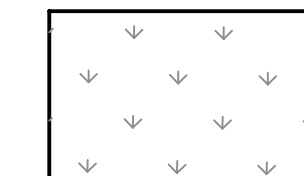
PAVEMENT LEGEND



STANDARD DUTY PAVEMENT (SDP)

HEAVY DUTY PAVEMENT (HDP)

CONCRETE PAVEMENT



**SNOW STORAGE AREA
(1,275 SF PROVIDED BASED ON
10,390 SF OF PARKING AREA)**

ABBREVIATION LEGEND	
ABBREVIATION	DESCRIPTION
BHI	BEE HIVE INLET
EL	ELEVATION
FL	FLOW LINE
N/F	NOW AND/OR FORMERLY
DS	DOWNSPOUT
SSCO	SANITARY SEWER CLEANOUT
STCO	STORM SEWER CLEANOUT
(R)	ADA ACCESSIBLE RAMP

NOTE:
EXISTING FIELD DATA SHOWN HEREON WAS GATHERED BY TERRA PONTI CONSULTANTS, INC. ON 05-02-22

SITE PLAN LEGEND		
DESCRIPTION	PROPOSED	EXISTING
AERIAL ELECTRIC	—AE—	—AE—
UTILITY POLE	•	•
GUARD POST	•	•
SANITARY MANHOLE	•	•
CATCH BASIN	■	■
JUNCTION BOX	•	•
FLARED END SECTION	▢	▢
CLEANOUT	•	•
GRATED INLET	■	■
GUARD RAIL	—	—
CHAINLINK/WOODEN FENCE	—	—
WATER VALVE	•	•
FIRE HYDRANT	•	•
EASEMENT	---	---
PROPERTY LINE	---	---

SITE PLAN LEGEND

- STRIPED AREA PAINTED SINGLE YELLOW SOLID LINE/ 4" AT 45' AT 2'-0" O.C.
- ENCLOSED DUMPSTER (SEE DETAILS BY OTHERS)
- HEAVY DUTY CONCRETE PAD FOR ENCLOSED DUMPSTER (ORIENT FOR TRUCK LOADING)
- ACCESSIBLE PARKING SPACE (TYP). SEE DETAIL SHEET FOR ACCESSIBLE PARKING SPACE SIZE, SIGN, SYMBOL AND STRIPING.
- PAINTED TRAFFIC ARROW (TYP).
- 24" CURB AND GUTTER (TYP). SEE DETAIL.
- STOP BAR
- EXISTING ELECTRIC TRANSFORMER FOR ELECTRICAL SERVICE. CONTRACTOR TO COORDINATE WITH LOCAL POWER COMPANY FOR DETAILS.
- LIGHT POLE (TYP)
- DOWNSPOUT FOR ROOF DRAIN (TO CONNECT TO STORM SEWER) (REF ARCH FOR EXACT LOCATIONS)
- PYLON SIGN (REF SIGNAGE BY OTHERS) (SIGNS ARE SUBJECT TO SIGN PERMIT REVIEW)
- 4'x6' CONCRETE PAD AND INVERTED "U" BIKE RACK (GLOBAL INDUSTRIES U-RACK, BLACK 2-BIKE FLANGE MOUNT OR EQUAL)
- 6" PIPE BOLLARD (TYPICAL, UNLESS NOTED OTHERWISE). SEE DETAIL. CONTRACTOR SHALL COORDINATE BOLLARD INSTALLATION WITH FOOTING, EXTERIOR FINISHES, ETC.

PARKING DATA

PROPOSED BUILDING: COFFEE SHOP 652 S.F.

TOWNSHIP REQUIRED PARKING:
RESTAURANT, DRIVE-THROUGH ONLY:
1 FOR EACH EMPLOYEE ON THE LARGEST WORKING SHIFT, PLUS 1 FOR EACH OUTDOOR TABLE (ASSUME 5 EMPLOYEES, 1 OUTDOOR TABLE)

TOTAL REQUIRED: 6 SPACES

PROVIDED STANDARD SPACES 5 SPACES
 PROVIDED H.C. ACCESSIBLE SPACES 1 SPACES
 PROVIDED TOTAL PARKING 6 SPACES

PROVIDED OVERALL PARKING RATIO: 9.20/1,000 S.F.

Three working days prior to the start of any excavation on this site the Contractor shall contact 1-800-482-7171 for utility location information.

The contractor shall verify and implement all the required Federal Occupational Safety and Health Administration (OSHA) and/or OSHA approved state-plan regulations established for the type of construction required by these plans.

FOR REVIEW ONLY

Raymond H. Frankenberg II, P.E. #42538 11/01/22
 State of Michigan
 Registered Professional Engineer
 for BFA, Inc.

bfaeng.com TELEPHONE: (636) 239-4751

103 ELM STREET WASHINGTON, MISSOURI 63090

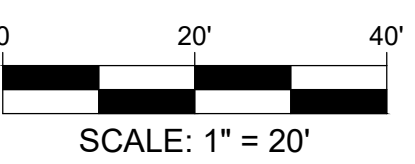
TRAVERSE CITY, MICHIGAN
NLD ACQUISITIONS LLC
PO BOX 100843
Fort Worth, TX 76185

REVISIONS	
1	By: App:
2	By: App:
3	By: App:
4	By: App:

DRAWN
B.L.F., J.D.S.
 CHECKED
J.B.S.
 DATE
11/01/22
 SCALE
1"=20'
 JOB No.
7146
 SHEET NAME
SITE PLAN

SP-1

UTILITY PLAN



UTILITY NOTES:

- The Contractor is specifically cautioned that the location and/or elevation of existing utilities as shown on these plans is based on records of the various utility companies and, where possible, measurements taken in the field. The information is not to be relied on as being exact or complete. The Contractor must call the appropriate utility company to request exact field location of utilities. It shall be the responsibility of the Contractor to relocate all existing utilities which conflict with the proposed improvements shown on plans.
 - Contractor shall verify elevation of temporary benchmarks based on the elevation of the primary benchmark prior to the start of construction. Contractor shall notify engineer if elevations differ from those shown on these plans.
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 - All trenches under paved areas shall be backfilled with granular material and compacted to meet compaction requirements for the parking lot. Granular material shall be placed and compacted to a level equal to the trench depth at the time of the utility installation.
 - Contractor to contact telephone, electric, gas, cable, and water companies to have underground utilities located on this site and adjacent to this site prior to doing any excavating.
 - The Contractor is responsible for keeping storm water run-off and sediment under control during construction. All contractors shall refer to Erosion and Sediment Control Plans throughout construction.
 - All survey monuments disturbed during construction shall be replaced at the Contractor's expense, by a surveyor licensed in the state in which this project is located, at the Contractor's expense.
 - The Contractor shall verify and/or perform all necessary inspections and/or certifications required by codes and/or utility companies prior to the announced building possession date and the final connections of utility services. All fees shall be paid by the contractor.
 - Contractor shall notify utility authorities inspectors at least 72 hours before connecting to any existing line. Underground utilities shall be installed, inspected and approved prior to backfilling.
 - Sanitary sewer pipe shall be PVC SDR 35.
 - Waterline: Unless otherwise required by local codes, waterlines that are for installation below grade and outside the building shall comply as follows: Pipe sizes 3-inch and smaller shall be Type K Copper, meeting ASTM D 2241, with ASTM D 1784 material classification. Pipe sizes 4 to 16 inches shall be PVC, AWWA C900, rated DR 18 (class 150). Waterlines shall have a minimum of 72 inches of cover below finish grade, unless otherwise indicated on plans. PVC pipe and fittings shall be installed in accordance with AWWA C605. Ductile iron pipe and fittings shall be installed in accordance with AWWA C600.
 - Contractor shall provide all waterline tees, valves, bends, tapping sleeves, meters, meter pits, fire hydrants, etc. necessary to construct the waterlines as shown on these plans. Thrust blocking shall be provided at all tees, bends and fire hydrants.
 - All flared end sections shall be RCP or CMP. Flared end sections that are CPP will not be allowed. Connections must be soil tight.
 - Contractor shall obtain and follow installation requirements for storm sewer from pipe manufactures for each type of piping material.
 - Contractor shall coordinate adjustments to existing utilities with appropriate utility company as work progresses. All costs shall be paid by the Contractor.
 - Utility Contractor shall be responsible for all taping and tie-in fees, as well as cost of service connections. Utility Contractor shall coordinate and schedule site inspections for all utility infrastructure improvements with authorities having jurisdiction prior to construction commencement and again prior to backfill placement. All required inspections shall be the responsibility of the contractor.
 - Unless indicated otherwise, all waterline and sanitary sewer crossings shall have a minimum 18 inch vertical separation and 10 feet horizontal separation. The Contractor shall note that the depths of existing utilities have been plotted from information provided by various utility companies and is to be considered approximate. If the minimum separations cannot be constructed as shown the Contractor shall notify BFA and appropriate modifications will be issued.
 - Verify location of all existing utilities to be crossed and identify potential conflicts prior to starting construction.
 - Location of site utilities shall be verified by General Contractor the proper utility company providing service.
 - General Contractor shall provide 2"x2"x8" thick concrete apron at all cleanouts, valves and meters. See Detail.
 - General Contractor will be responsible for all tap and tie on fees required, as well as cost of underground service connections to the building.
 - Contractor will be responsible for installing all 4" underground conduit from the electrical connection to the pad mounted transformer. Top of conduit shall be a minimum of 48" below finished grade, have a pull cord installed, and have no more than three (3) 90° bends. Contractor is also responsible for the wire from the pad mounted transformer to the building. Electric service connection shall be coordinated with Consumers Energy.
 - Thrust blocks shall be provided at all bends, tees, and fire hydrants.
 - Dimensions shown are to centerline of pipe or fitting.
 - All fire hydrants shall be provided with an approved gate valve a maximum of 5'-0" from hydrant.
 - All trenching, pipe laying, and backfilling shall be in accordance with federal OSHA Regulations.
 - General Contractor shall have approval of all governing agencies having jurisdiction over utility infrastructure systems prior to installation.
 - All parking lot lighting poles and fixtures with lamps and paint will be provided by owner and installed by the Electrical Contractor. The Electrical Contractor shall provide owner a one-year warranty certificate. All incurred costs for receiving, storage, liability and warranty labor shall be included in the installation and contract price. Refer to architectural plans for location and layout of conduit and wiring.
 - Contractor is cautioned of existing underground and above ground utilities that will be crossed and/or that are in the vicinity of proposed improvements shown hereon. Contractor shall locate all existing utilities and shall provide temporary support for them, as needed, for the construction of the proposed site and utility infrastructure improvements.
 - The Contractor shall provide a line item cost for irrigation to landscaping and lawn in their Design Build pricing. Contractor shall verify with the Developer prior to construction to confirm installation. The Contractor shall coordinate with water service provider for separate water meter for landscape/irrigation.
 - Contractor shall coordinate Gas Service Connection with Gas Company.

UTILITY PLAN LEGEND

1	WATER VALVE
2	EXISTING WATER METER/VALVE (COORDINATE METER SIZE, LOCATION, AND REQUIREMENTS W/ PROVIDER)
3	1" DOMESTIC WATERLINE W/ TRACER WIRE
4	GREASE INTERCEPTOR (REF MEP)
5	(2) SETS OF 4" PVC CONDUITS FOR ELECTRIC WITH PULL ROPE
6	EXISTING ELECTRIC TRANSFORMER (COORDINATE CONNECTION W/ LOCAL POWER COMPANY)
7	DOWNSPOUTS (TO CONNECT TO STORM SEWER)
8	(2) 3" CONDUITS FOR TELEPHONE/INTERNET SERVICE
9	LIGHT POLE (TYP)

LEGEND

DESCRIPTION	PROPOSED	EXISTING
AERIAL ELECTRIC	—AE—	—AE—
UNDERGROUND ELECTRIC	—UE—	—UE—
UNDERGROUND TELEPHONE	—UT—	—UT—
GAS LINE	—G—	—G—
WATERLINE	—W—	—W—
SANITARY SEWER	—SS—	—SS—
STORM SEWER	=====	=====
EASEMENT	-----	-----
PROPERTY LINE	-----	-----
CHAINLINK FENCE	—○—	—○—
UTILITY POLE	•	•
GUARD POST	GP	GP
SANITARY MANHOLE	●	○
WATER VALVE	+	+
FIRE HYDRANT	+	+
CATCH BASIN	■	■
JUNCTION BOX	●	○
FLARED END SECTION	⊞	⊞
CLEANOUT	•	•
GRATED INLET	■	■
DRAINTILE	—DT—	—DT—

ABBREVIATION LEGEND

ABBREVIATION	DESCRIPTION
STCO	STORM CLEANOUT
SSCO	SANITARY SEWER CLEANOUT
SSMH	SANITARY SAMPLING MANHOLE
EL	ELEVATION
BHI	BEE HIVE INLET
FL	FLOW LINE
N/F	NOW AND/OR FORMERLY
DS	DOWNSPOUT
DS/CO	DOWNSPOUT W/CLEANOUT
ATG	ADJUST TO GRADE
NFV	NOT FIELD VERIFIED

CAUTION—NOTICE TO CONTRACTOR REGARDING EXISTING UTILITIES

THE CONTRACTOR MUST CONTACT THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE PERFORMING ANY CONSTRUCTION ACTIVITIES TO REQUEST FIELD LOCATIONS OF THEIR UTILITIES. THE CONTRACTOR MUST BE AWARE THAT SOME EXISTING UTILITIES MAY NOT BE ACCURATELY SHOWN, KNOWN TO EXIST, AND/OR LOCATED BY LOCAL OR STATE UTILITY COMPANIES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAKE NECESSARY ACCOMMODATIONS TO ACCURATELY LOCATE ALL EXISTING UTILITIES PRIOR TO COMMENCEMENT OF WORK.

ALL EXISTING UTILITIES ON THIS PROJECT SITE AND ON ADJACENT DEVELOPMENTS SHALL REMAIN IN PLACE AND OPERATIONAL AT ALL TIMES DURING CONSTRUCTION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE EXISTING UTILITIES, WHEN NECESSARY, TO FACILITATE THE REQUIRED IMPROVEMENTS SHOWN BY THESE PLANS. THE CONTRACTOR MUST COORDINATE ANY RELOCATIONS OR MODIFICATIONS TO THE EXISTING UTILITIES WITH THE APPROPRIATE UTILITY COMPANY, THE OWNER, AND BFA, INC.

TRAVERSE CITY, MICHIGAN
NLD ACQUISITIONS LLC
PO BOX 100843
Fort Worth, TX 76185

REVISIONS

NO.	DATE	BY	APP.
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3			
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DRAWN B.L.F.
 CHECKED R.G.R.
 DATE 11/01/22
 SCALE 1"=20'
 JOB No. 7146
 SHEET NAME UT-1
 UT-1

FOR REVIEW ONLY

Raymond H. Frankenberg II, P.E. #42538 11/01/22
 State of Michigan
 Registered Professional Engineer
 for BFA, Inc.

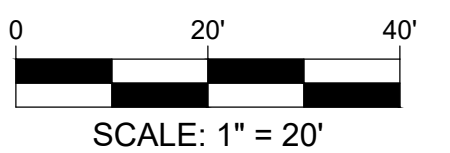
Three working days prior to the start of any excavation on this site the Contractor shall contact 1-800-482-7171 for utility location information.

The contractor shall verify and implement all the required Federal Occupational Safety and Health Administration (OSHA) and/or OSHA approved state-plan regulations established for the type of construction required by these plans.

bfaeng.com TELEPHONE: (636) 239-4751

103 ELM STREET WASHINGTON, MISSOURI 63090

LANDSCAPE PLAN



LANDSCAPE NOTES:

- Contractor shall place sod in all grass/turf areas as shown, and all other disturbed areas.
- After a stand of grass is established and no more erosion and sediment is expected, concrete swales shall be cleaned out.
- The site work for this project shall meet or exceed Industry Standards and Manufacturer's Specification for each improvement feature.
- The Contractor shall provide owner a two-year maintenance contract for all landscaping and the irrigation system.
- The planter areas shall have a weed barrier and be covered with landscape gravel of 3" minimum depth. A steel edging shall be used on all landscaped areas within grass areas.
- The Contractor is specifically cautioned that the locations and/or elevation of existing utilities as shown on these plans is based on records of the various utility companies and, where possible, measurements taken in the field. The information is not to be relied on as being exact or complete. The Contractor must call the appropriate utility company to request exact field location of utilities. It shall be the responsibility of the Contractor to relocate all existing utilities which conflict with the proposed improvements shown on plans.
- All unsurfaced areas are to receive four inches of topsoil. Contractor to seed, mulch, fertilize, water, and maintain all areas outside of paved areas that were disturbed during construction until an acceptable stand of grass is established. Contractor shall be responsible to take whatever means necessary to establish permanent soil stabilization.
- Sod shall be well-rooted and be completely free from noxious weeds and reasonably free from other objectionable grasses, weeds, and stones. Sodding and seeding shall be done in accordance with this landscape plan.
- All plants must be healthy, vigorous material, free of pest and disease.
- All plants must be container grown or balled and burlapped as indicated in the plant list.
- All trees must be straight trunked and full headed and meet all requirements specified.
- All plants are subject to the approval of the owner before, during and after installation.
- Prior to construction, the Contractor shall be responsible for locating all underground utilities and shall avoid damage to all utilities during the course of the work. The Contractor is responsible for repairing any and all damage to utilities, structures, site appearances, etc which occurs as a result of the landscape and irrigation construction.
- Contractor is responsible for verifying all quantities shown on these plans before pricing the work.
- All planter islands and planter areas shall be bermed with a 3H:1V slope and seeded to meet the seeding specifications, unless otherwise indicated on these plans.
- All landscape material must be provided by a local nursery or tree farm within a 100 radius of site.
- Contractor to adjust plantings accordingly, notify BFA and Owner of any major changes.
- Proposed plant material is to be selected by the contractor and approved by the Owner prior to Construction.
- Tree locations and planting bed to be located by the contractor and approved by the owner prior to installation.
- Planting shall not prohibit site distance requirements.
- Contractor shall coordinate with owner and water provider prior to construction to determine if a separate irrigation water meter is needed.
- The Contractor shall provide a line item cost for irrigation to landscaping and lawns in their Design Build pricing. Drip irrigation shall be provided for all shrubs/trees, and spray irrigation for all sod areas. Drip irrigation shall be installed below the weed barrier. Contractor shall verify with the Developer prior to construction to confirm installation.

LANDSCAPE REQUIREMENTS

- NORTH: TYPE "B" BUFFER**
 -REQUIRED: 3 LARGE TREES, 2 MEDIUM/SMALL TREES, 8 SHRUBS (BASED ON 165 LF OF GREENSPACE AREA)
 -PROVIDED: 2 EXISTING MEDIUM/SMALL TREES (4 CREDITS), 1 NEW MEDIUM/SMALL TREE, 10 SHRUBS
- EAST: TYPE "D" BUFFER**
 -REQUIRED: 3 LARGE TREES, 2 MEDIUM/SMALL TREES, 2 EVERGREEN/CONIFEROUS TREES (BASED ON 75 LF OF GREENSPACE AREA)
 -PROVIDED: 3 LARGE TREES, 2 MEDIUM/SMALL TREES, 2 EVERGREEN/CONIFEROUS TREES
- SOUTH: TYPE "B" BUFFER**
 -REQUIRED: 4 LARGE TREES, 2 MEDIUM/SMALL TREES, 8 SHRUBS (BASED ON 200 LF OF GREENSPACE AREA)
 -PROVIDED: 4 EXISTING LARGE TREES (16 CREDITS), 4 EXISTING MEDIUM/SMALL TREES (8 CREDITS), 8 SHRUBS
- WEST: TYPE "B" BUFFER**
 -REQUIRED: 2 LARGE TREES, 1 MEDIUM/SMALL TREE, 4 SHRUBS (BASED ON 100 LF OF GREENSPACE AREA)
 -PROVIDED: NONE PROVIDED DUE TO EXISTING RETAINING WALL. PROPOSED PLANTINGS AND IRRIGATION COULD NEGATIVELY IMPACT THE RETAINING WALL.

PLANTING LEGEND

COMMON NAME (PLANT LABEL)	SYMBOL	BOTANICAL NAME	PLANT SIZE	QUANTITY
SHADBLOW SERVICEBERRY		AMELANCHIER ARBOREA	6" HEIGHT	3
BLACK HILLS SPRUCE		PICEA GLAUCA 'DENSATA'	6" HEIGHT	2
RED MAPLE		ACER NIGRUM	2" CAL	3
WINTERGREEN		GAULTHERIA PROCUMBENS	5 GAL	6
YEW		TAXUS CANADENSIS	5 GAL	3
SNOWBERRY		SYMPHORICARPOS ALBUS	5 GAL	4
TURF-SOD		TURF TYPE FESCUE		
LANDSCAPE GRAVEL		1.5"-2" GRANITE LANDSCAPE GRAVEL		

NOTE: ALL QUANTITIES HAVE BEEN PROVIDED FOR CONVENIENCE ONLY. CONTRACTOR TO VERIFY ALL QUANTITIES.

NOTE: EXISTING FIELD DATA SHOWN HEREON WAS GATHERED BY TERRA POINTE CONSULTANTS, INC. ON 05-02-22

Three working days prior to the start of any excavation on this site the Contractor shall contact 1-800-482-7171 for utility location information.

The contractor shall verify and implement all the required Federal Occupational Safety and Health Administration (OSHA) and/or OSHA approved state-plan regulations established for the type of construction required by these plans.

FOR REVIEW ONLY

Raymond H. Frankenberg II, P.E. #42538
 State of Michigan
 Registered Professional Engineer for BFA, Inc.

11/01/22
 Date

bfaeng.com TELEPHONE: (636) 239-4751

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TRAVERSE CITY, MICHIGAN
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REVISIONS

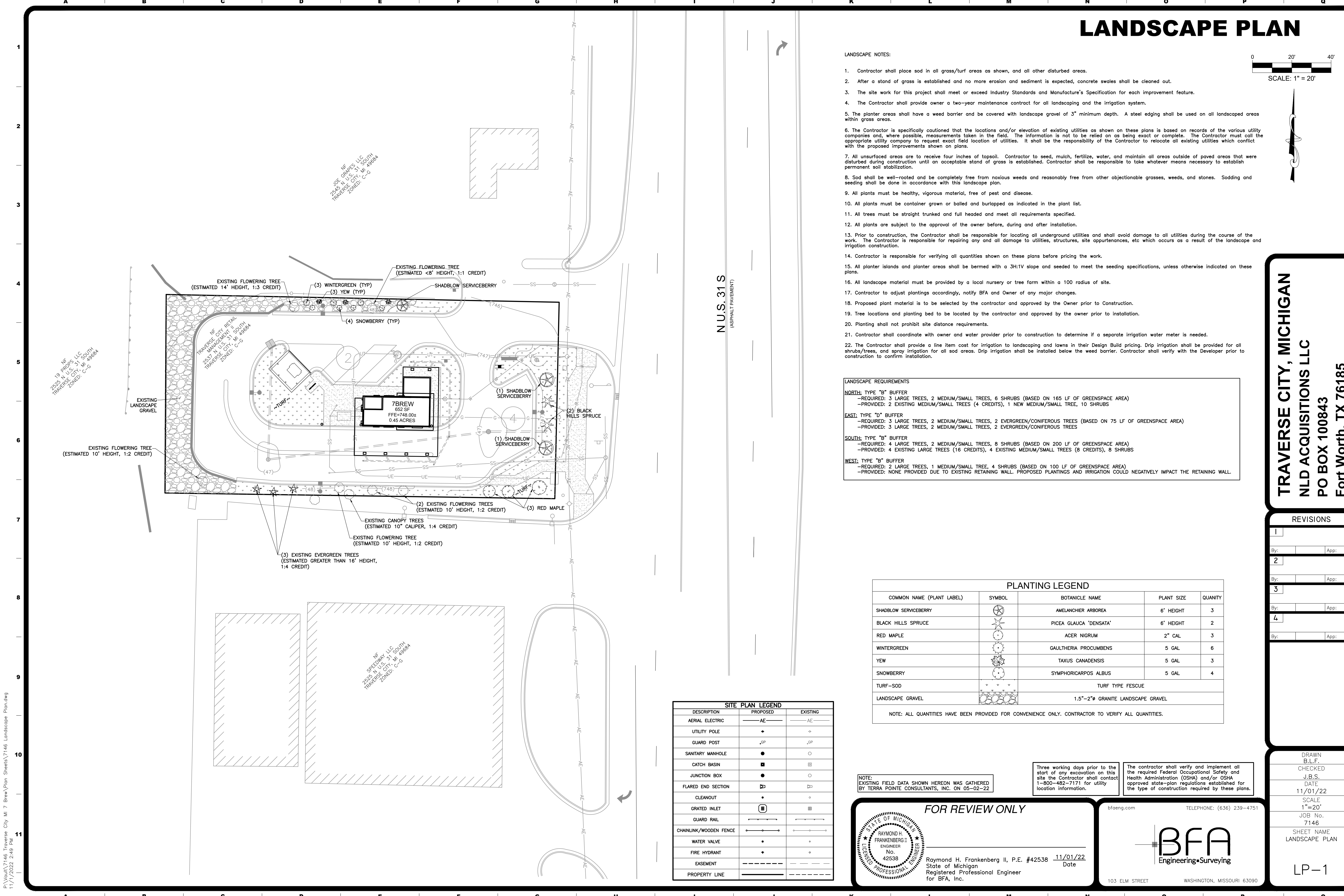
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DRAWN B.L.F.
 CHECKED J.B.S.
 DATE 11/01/22
 SCALE 1"=20'
 JOB No. 7146
 SHEET NAME LANDSCAPE PLAN
 LP-1

N.U.S. 315
 (ASPHALT PAVEMENT)

SITE PLAN LEGEND

DESCRIPTION	PROPOSED	EXISTING
AERIAL ELECTRIC	—AE—	—AE—
UTILITY POLE	•	•
GUARD POST	GP	GP
SANITARY MANHOLE	•	•
CATCH BASIN	■	■
JUNCTION BOX	•	•
FLARED END SECTION	▢	▢
CLEANOUT	•	•
GRATED INLET	■	■
GUARD RAIL	—	—
CHAINLINK/WOODEN FENCE	—	—
WATER VALVE	•	•
FIRE HYDRANT	•	•
EASEMENT	---	---
PROPERTY LINE	---	---



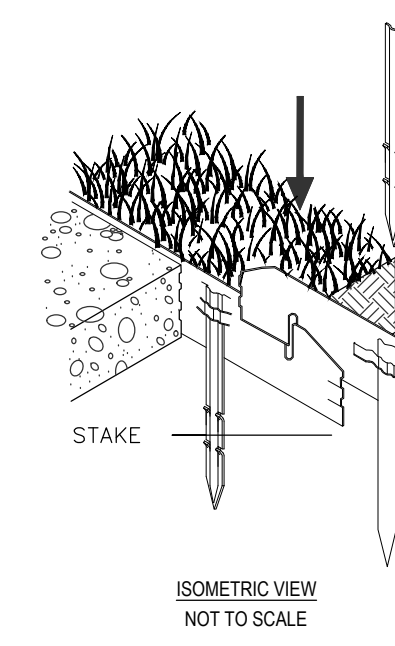
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LANDSCAPE DETAILS

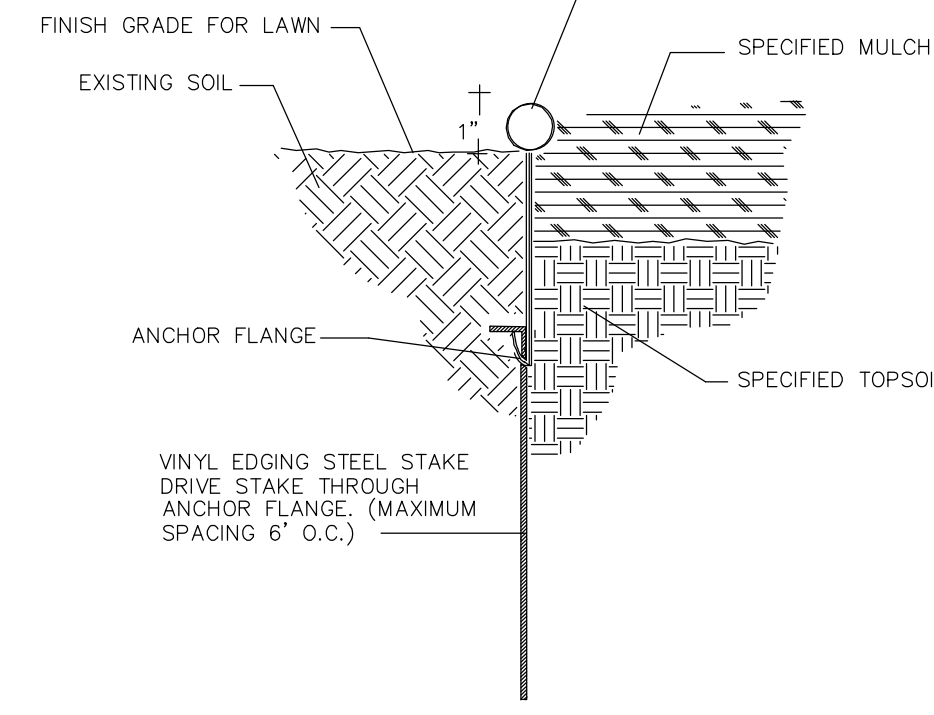


PERMALOC CORPORATION
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FAX: (616) 399-9770
www.permaloc.com

1. FINISH GRADE
2. BACKFILL WITH PREPARED PLANTING SOIL MIX AS SPECIFIED.
3. 12" x 8" CLEAN SAND, COMPACTED TO FINISHED GRADE.
4. FILTER CLOTH
5. SLOPE BOTTOM TO DRAIN
6. 18" x 6" ALUMINUM MESH PENETRATE THROUGH OCCULTING LAYER TO WATER TABLE OR TO A DEPTH OF 7' TO ASSURE PROPER DRAINAGE.
7. BACKFILL WITH 1/2" - 3/4" FINISHED GRADE.
8. WATER TABLE FOR A PAVING ISLAND PLANTING SITUATION, CONTRACTOR TO BACKFILL ENTIRE LENGTH OF PLANTING AREA TO WITHIN 8" OF BACK OF CURB OR EDGE OF PAVEMENT.

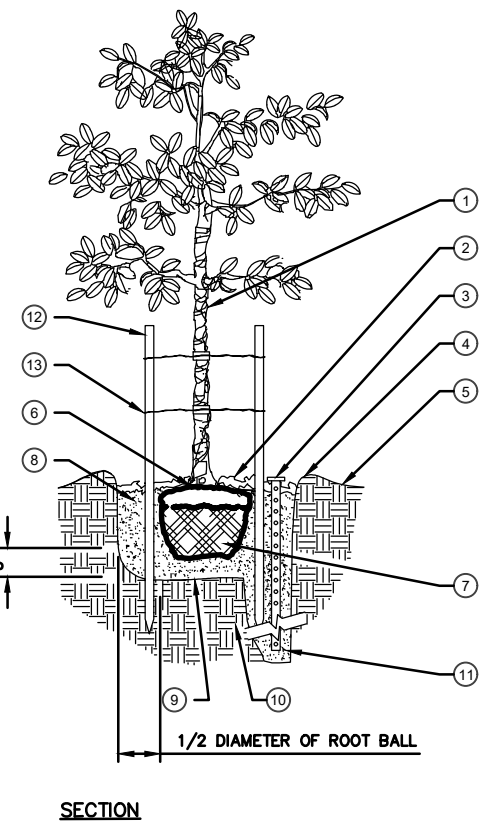
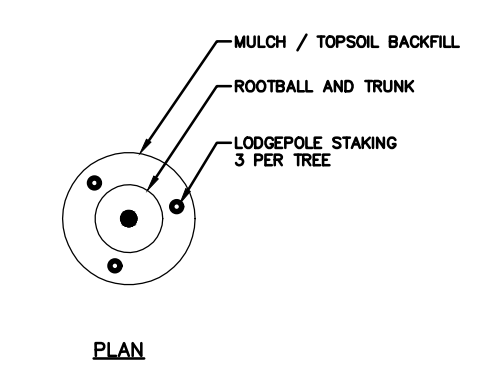


ALTERNATE #1: PERMALOC ALUMINUM EDGE DETAIL
N.T.S.



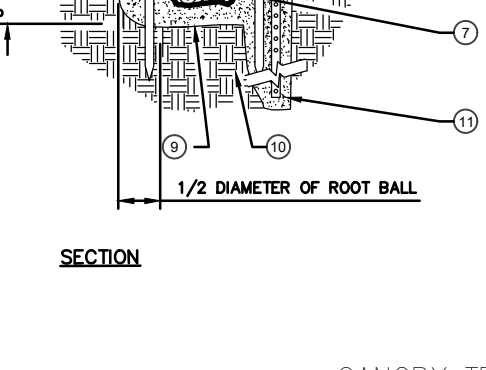
VINYL EDGE DETAIL
N.T.S.

1. TOP OF SHRUB ROOTBALLS TO BE PLANTED 1" - 2" HIGH WITH SOIL MOUNDING UP TO THE TOP OF ROOTBALL.
2. WHEN USED IN MASSES - PRUNE ALL SHRUBS TO ACHIEVE A UNIFORM MASS/SHRUB.
3. 4" MINIMUM OF HARDWOOD MULCH COMPACTED OR AS SPECIFIED.
4. EXCAVATE ENTIRE BED SPECIFIED FOR GRASSCOVER BED.
5. 4" MINIMUM OF TOPSOIL TO BRING TO FINISHED GRADE (SEE GRADING PLAN).
6. PREPARED PLANTING SOIL AS SPECIFIED. NOTE: WHEN USING SHRUBS, COVER AND SHRUBS USED IN MASSES ENTIRE BED TO BE AMENDED WITH PLANTING SOIL MIX AS SPECIFIED IN THE PLANTING SPECIFICATION.
7. SCARIFY ROOTBALL SIDES AND BOTTOM.



CANOPY TREE PLANTING
N.T.S.

1. TOP OF SHRUB ROOTBALLS TO BE PLANTED 1" - 2" HIGH WITH SOIL MOUNDING UP TO THE TOP OF ROOTBALL.
2. WHEN USED IN MASSES - PRUNE ALL SHRUBS TO ACHIEVE A UNIFORM MASS/SHRUB.
3. 4" MINIMUM OF HARDWOOD MULCH COMPACTED OR AS SPECIFIED.
4. EXCAVATE ENTIRE BED SPECIFIED FOR GRASSCOVER BED.
5. 4" MINIMUM OF TOPSOIL TO BRING TO FINISHED GRADE (SEE GRADING PLAN).
6. PREPARED PLANTING SOIL AS SPECIFIED. NOTE: WHEN USING SHRUBS, COVER AND SHRUBS USED IN MASSES ENTIRE BED TO BE AMENDED WITH PLANTING SOIL MIX AS SPECIFIED IN THE PLANTING SPECIFICATION.
7. SCARIFY ROOTBALL SIDES AND BOTTOM.
8. CUT BACK SLOPE TO PROVIDE A FLAT SURFACE FOR PLANTING.



SHRUB/GROUNDCOVER PLANTING ON SLOPE
N.T.S.

LANDSCAPE NOTES:

13. Keep all plant material (except turf) a minimum of 36" clear of fire hydrants.
14. Landscape contractor shall kill & remove all existing weeds within the project site.
15. All tags, nursery stickers, labels, etc. shall be removed by the landscape contractor at completion of all landscape installation.
16. Landscape contractor shall be in compliance with all federal, state and local laws/regulations relating to insect infestation and/or plant diseases.
17. All substitutions of plant material shall be submitted to Owner for approval.
- PRUNING:**
- 1.) Lightly prune trees at time of planting. Prune only the crossover limbs, intermingled leaders and/or any broken branches. Some interior limbs and lateral branches may be pruned. However, do not remove the terminal buds of branches that will be fully responsible for correction of negative soil issues prior to plant installation. Killing and removal of all weeds shall be the responsibility of the landscape contractor as part of this task.
 - 2.) Landscape Contractor to apply pre-emergent herbicide to all planting beds upon completion of planting operation and before application of shredded bark mulch.
 - 3.) Irrigation controls prior to commencement of any grading operation, inspect and maintain all siltation fences on a weekly basis until vegetation is established.
- MISC. MATERIAL:**
- 1.) Provide stakes and deadman of sound, new hardwood, free of knots, and winter freezing. Additionally, only 3-ply tyne material shall be used.
- TURF:**
- 1.) All disturbed lawn areas to be seeded with a mixture of turf-type fescue (300# per acre and bluegrass (16# per acre). Lawn areas shall be unconditionally warranted for a period of 90 days from date of final acceptance, one area more than one square foot per any 50 square feet shall be replaced.
 - 2.) Seed and fertilization operations shall occur between May 1 and June 15th or between September 1 and October 15th unless directed by others in writing AND Irrigation system is operating.
 - 3.) Watering of seeded or sodded lawns shall begin immediately and shall continue to be provided continuously for the following 72 hours. Regardless, the landscape contractor shall be responsible for all landscape maintenance until project turnover.
- SIGHT TRIANGLES:**
- 1.) No landscape material or other obstructions shall be placed or be maintained within the sight distance area so as not to impede the vision between a height of thirty inches (30") and ten feet (10') above the adjacent street or paving surfaces.
 - 2.) Sight triangles at the intersection of a public street and a private access way (except for a single family residence) shall also be formed by measuring from the point of intersection of the street frontage curbs and the entrance curb lines a distance of 35' and connecting the points so established to form the sight triangle area.

- 8.) Recondition existing lawn areas damaged by Contractor's operations including equipment/material storage and movement of vehicles.
- 9.) Sod Contractor to ensure sod is placed below sidewalk and all paved area elevations to allow for proper drainage.
- EROSION CONTROL BLANKET (Where applicable):**
- 1.) All seeded areas on slopes greater than 4:1 shall receive an erosion control blanket which shall consist of loose straw mat and anchor pins as manufactured by Northern American Green, DS 75 or approved equal. Install per manufacturer's recommendations.
- PLUG PLANTING NOTES:**
- 1.) All plugs to be 4-1/2" deep X 2" diameter minimum.
 - 2.) Plugs are to be planted in a hole dug with a rowed spade or planting bar such that the hole is of a minimum diameter and depth to accommodate the plug and its roots, without damage.
 - 3.) Plugs shall be spaced in a triangulated layout approximately 24" on center. Plugs shall be planted through erosion control blanket where appropriate.
 - 4.) Obtain plugs from a reputable nursery.
 - 5.) Water plugs upon completion of planting so that soil is moist but not saturated.
 - 6.) If planting is delayed more than six hours after delivery, store plugs in the shade, protect from weather and mechanical damage and keep them moist and cool. All plugs shall be planted within 24 hours after delivery.
- WARRANTY:**
- 1.) All plant material (excluding ground cover, perennials and annuals) are to be warranted for a period of 12 months after complete installation of all landscape material at 100% of the installed price.
 - 2.) Any plant material found to be defective shall be removed and replaced within 30 days of notification or in growth season determined to be best for that plant.
 - 3.) Only one replacement per tree or shrub shall be required at the end of the warranty period, unless loss is due to failure to comply with the warranty.
 - 4.) Lawn establishment periods will be in effect once the lawn has been mowed three times. Plant establishment periods shall commence on the date of acceptance and 100% completion.
 - 5.) A written guarantee shall be provided to the owner per conditions outline in #1 above.

- Tree Frog Environmental Products®**
www.treefrog.com
352-735-7411
"TREE FROG" TREE STAKING
N.T.S.
- Tree Frog® RBK40pt SYSTEM**
For up to 4" Caliper Trees
(2) Tree Frog EPM 32"x24" wood boards
(4) 3/4"x70" strapping (1,800 lb. tensile strength)
(4) Arrowhead Anchors
- Tree Frog® RBK60pt SYSTEM**
For up to 6" Caliper Trees
(4) Tree Frog EPM 32"x24" wood boards
(8) 3/4"x70" strapping (1,800 lb. tensile strength)
(8) Arrowhead Anchors
- Tree Frog® RBK INSTALLATION NOTES**
Specify Anchor
1. Biodegradable (soft or hard soil)
2. Nylon (soft soil)
3. Heavy Duty (hard soil)
See page 2 for installing root ball tree staking kit with banding machine.
See page 3 for installing root ball tree staking kit with ratchet.
- Tree Frog® RBK40pt PLAN VIEW**
(4) 3/4"x70" STRAPPING (1,800 LB TENSILE STRENGTH)
32" x 24" BOARD T/W STRAPPING
ARROWHEAD ANCHOR
EXISTING SUBSOIL
ROOTBALL
4" CALIPER TREE
- Tree Frog® RBK60pt PLAN VIEW**
(8) 3/4"x70" STRAPPING (1,800 LB TENSILE STRENGTH)
32" x 24" BOARD W/STRAPPING
ARROWHEAD ANCHOR
ROOTBALL
6" CALIPER TREE
- Tree Frog® RBK40pt DIAGRAM**
(4) 3/4"x70" STRAPPING (1,800 LB TENSILE STRENGTH)
1" STAKE GUIDES (2 PER BOARD)
NOTE: - FOR UP TO 4" CALIPER TREES-ANCHORS ARE TO BE DRIVEN TO DEEPEST POSSIBLE DEPTH ACCORDING TO SOIL TYPE
- Tree Frog® RBK60pt DIAGRAM**
(8) 3/4"x70" STRAPPING (1,800 LB TENSILE STRENGTH)
1" STAKE GUIDES (2 PER BOARD)
NOTE: - FOR UP TO 6" CALIPER TREES AND FOR PALMS - ANCHORS ARE TO BE DRIVEN TO DEEPEST POSSIBLE DEPTH ACCORDING TO SOIL TYPE

REVISIONS	
1	By: _____ App: _____
2	By: _____ App: _____
3	By: _____ App: _____
4	By: _____ App: _____

Three working days prior to the start of any excavation on the site the Contractor shall contact 1-800-482-7171 for utility location information.

The contractor shall verify and implement all the required Federal Occupational Safety and Health Administration (OSHA) and/or OSHA approved state-plan regulations established for the type of construction required by these plans.

RAYMOND H. FRANKENBERG II
ENGINEER
No. 42538
Registered Professional Engineer for BFA, Inc.

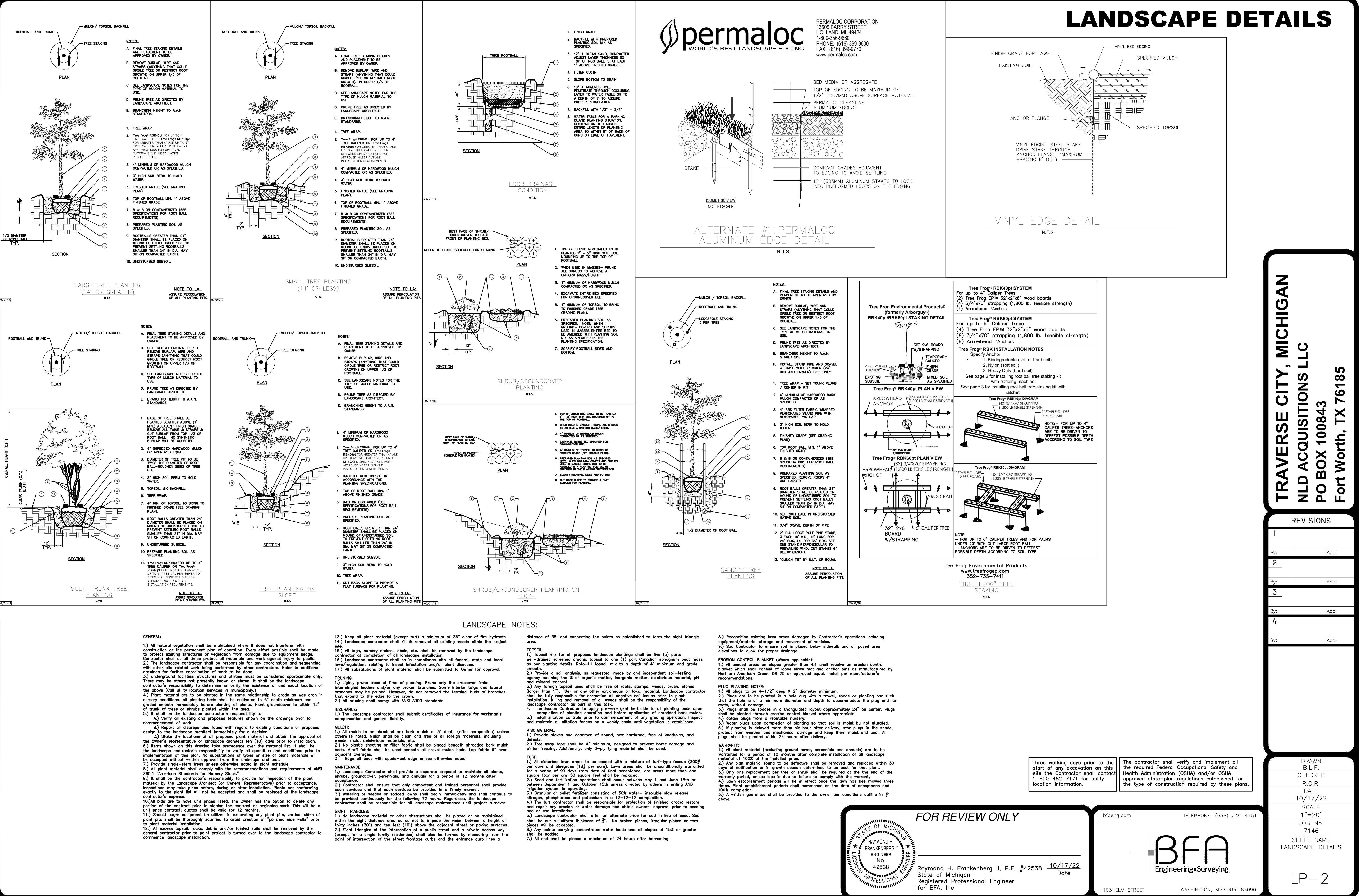
10/17/22
Date

bfaeng.com TELEPHONE: (636) 239-4751

SCALE 1"=20'
JOB No. 7146
SHEET NAME LANDSCAPE DETAILS
LP-2

TRAVERSE CITY, MICHIGAN
NLD ACQUISITIONS LLC
PO BOX 100843
Fort Worth, TX 76185

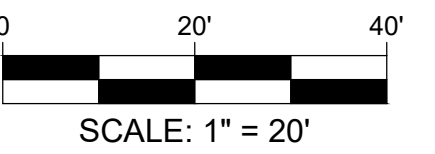
A B C D E F G H I J K L M N O P Q



A B C D E F G H I J K L M N O P Q

P:\Vault\7146 Traverse City MI 7 Braw\Plan Sheets\7146 Landscape Plan.dwg
10/17/2022 9:53 AM

PRE DEVELOPED DRAINAGE AREAS



PRE-RE-DEVELOPED DRAINAGE LEGEND	
DESCRIPTION	EXISTING
AERIAL ELECTRIC	— AE —
UNDERGROUND ELECTRIC	— UE —
UNDERGROUND TELEPHONE	— UT —
GAS LINE	— G —
FIBER OPTIC LINE	— FO —
WATERLINE	— W —
SANITARY SEWER	— SS —
STORM SEWER	-----
EASEMENT	— — — — —
PROPERTY LINE	— · — · — ·
CHAINLINK FENCE	— — — — —
CONTOURS	— 100 —
UTILITY POLE	○
SANITARY MANHOLE	○
WATER VALVE	○
FIRE HYDRANT	○
CATCH BASIN/AREA INLET	□
JUNCTION BOX	○
GRATED INLET	■
SOIL BORING	⊗

TRAVERSE CITY, MICHIGAN
NLD ACQUISITIONS LLC
PO BOX 100843
Fort Worth, TX 76185

REVISIONS	
1	By: _____ App: _____
2	By: _____ App: _____
3	By: _____ App: _____
4	By: _____ App: _____

PRE-REDEVELOPMENT	
IN ACRES	
IMPERVIOUS AREA	0.32±
PERVIOUS AREA	0.13±
TOTAL SITE	0.45±

Three working days prior to the start of any excavation on this site the Contractor shall contact 1-800-482-7171 for utility location information.

The contractor shall verify and implement all the required Federal Occupational Safety and Health Administration (OSHA) and/or OSHA approved state-plan regulations established for the type of construction required by these plans.

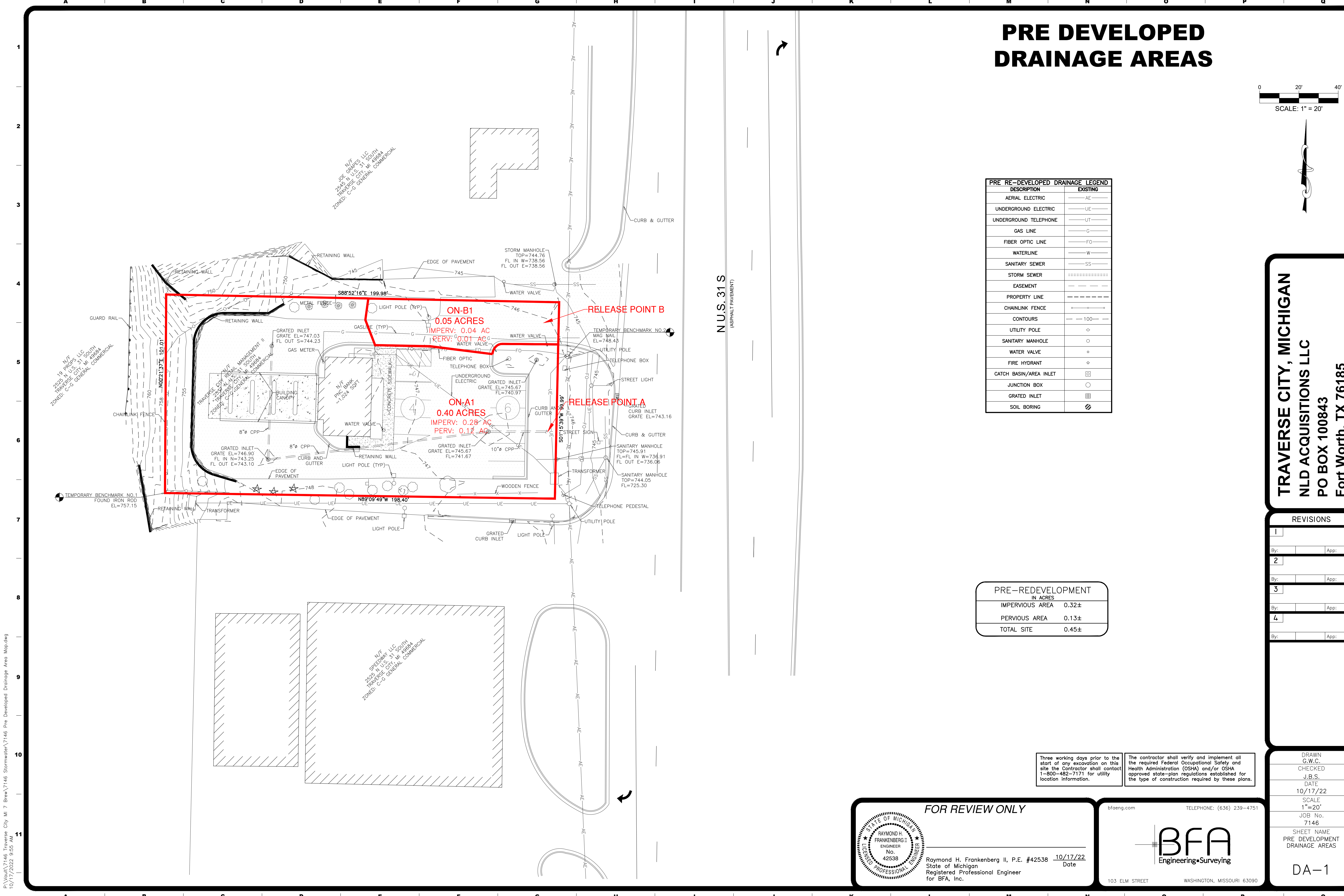
FOR REVIEW ONLY

Raymond H. Frankenberg II, P.E. #42538 10/17/22
 State of Michigan Date
 Registered Professional Engineer
 for BFA, Inc.

bfaeng.com TELEPHONE: (636) 239-4751

103 ELM STREET WASHINGTON, MISSOURI 63090

DRAWN G.W.C.
 CHECKED J.B.S.
 DATE 10/17/22
 SCALE 1"=20'
 JOB No. 7146
 SHEET NAME PRE DEVELOPMENT DRAINAGE AREAS
DA-1



F:\Vault\7146 Traverse City MI 7 Brea\7146 Stormwater\7146 Pre Developed Drainage Area Map.dwg 10/17/2022 9:55 AM

POST DEVELOPED DRAINAGE AREAS



POST RE-DEVELOPED DRAINAGE LEGEND	
DESCRIPTION	EXISTING
AERIAL ELECTRIC	— AE —
UNDERGROUND ELECTRIC	— UE —
UNDERGROUND TELEPHONE	— UT —
GAS LINE	— G —
FIBER OPTIC LINE	— FO —
WATERLINE	— W —
SANITARY SEWER	— SS —
STORM SEWER	-----
EASEMENT	- - - - -
PROPERTY LINE	- - - - -
CHAINLINK FENCE	—><—
CONTOURS	- - 100 - -
UTILITY POLE	○
SANITARY MANHOLE	○
WATER VALVE	○
FIRE HYDRANT	○
CATCH BASIN/AREA INLET	⊠
JUNCTION BOX	○
GRATED INLET	⊞
SOIL BORING	⊗

TRAVERSE CITY, MICHIGAN
NLD ACQUISITIONS LLC
PO BOX 100843
Fort Worth, TX 76185

REVISIONS

NO.	DATE	BY	APP.
1			
2			
3			
4			

POST-REDEVELOPMENT	
IN ACRES	
IMPERVIOUS AREA	0.32±
PERVIOUS AREA	0.13±
TOTAL SITE	0.45±

The contractor shall verify and implement all the required Federal Occupational Safety and Health Administration (OSHA) and/or OSHA approved state-plan regulations established for the type of construction required by these plans.

Three working days prior to the start of any excavation on this site the Contractor shall contact 1-800-482-7171 for utility location information.

FOR REVIEW ONLY

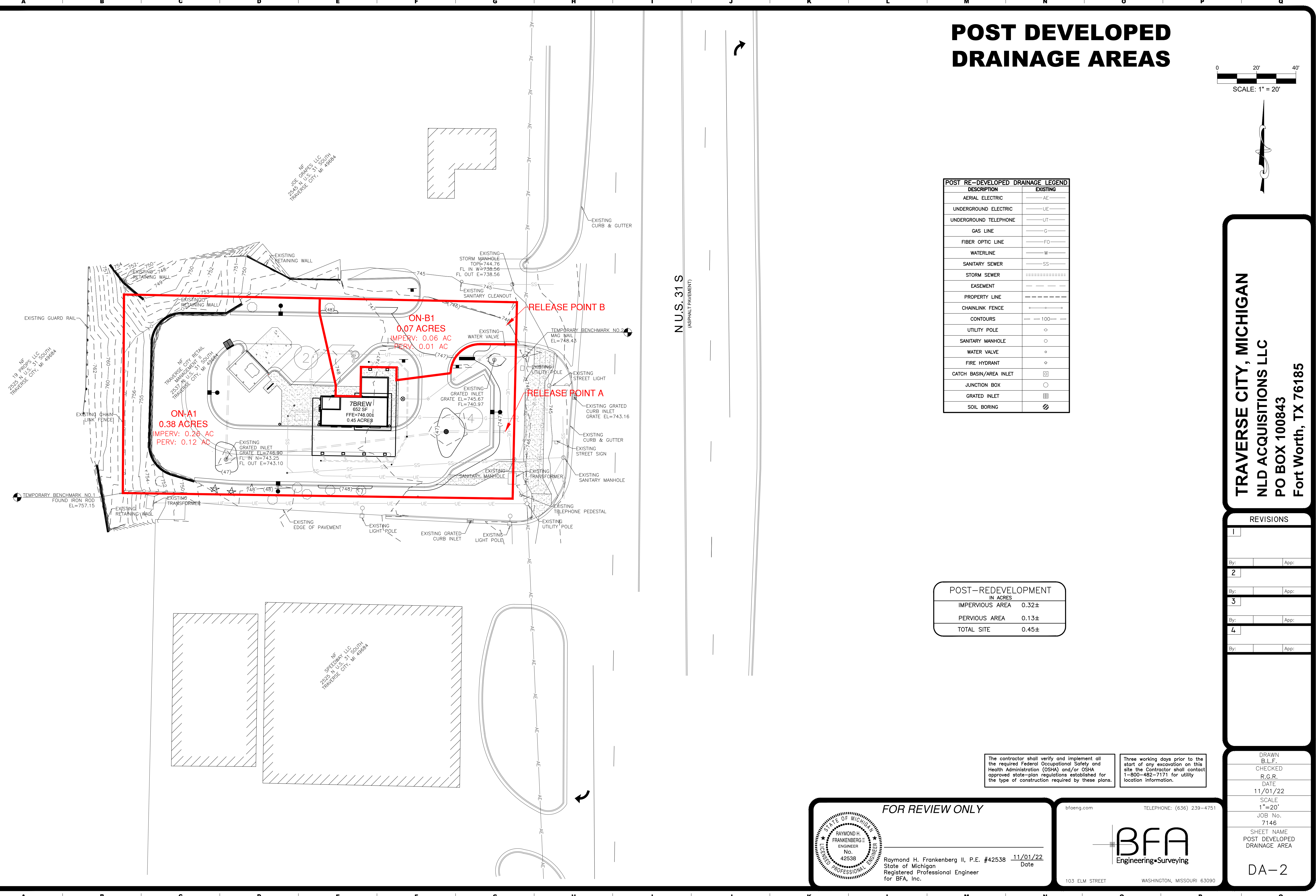
Raymond H. Frankenberg II, P.E. #42538 11/01/22 Date
 State of Michigan
 Registered Professional Engineer
 for BFA, Inc.

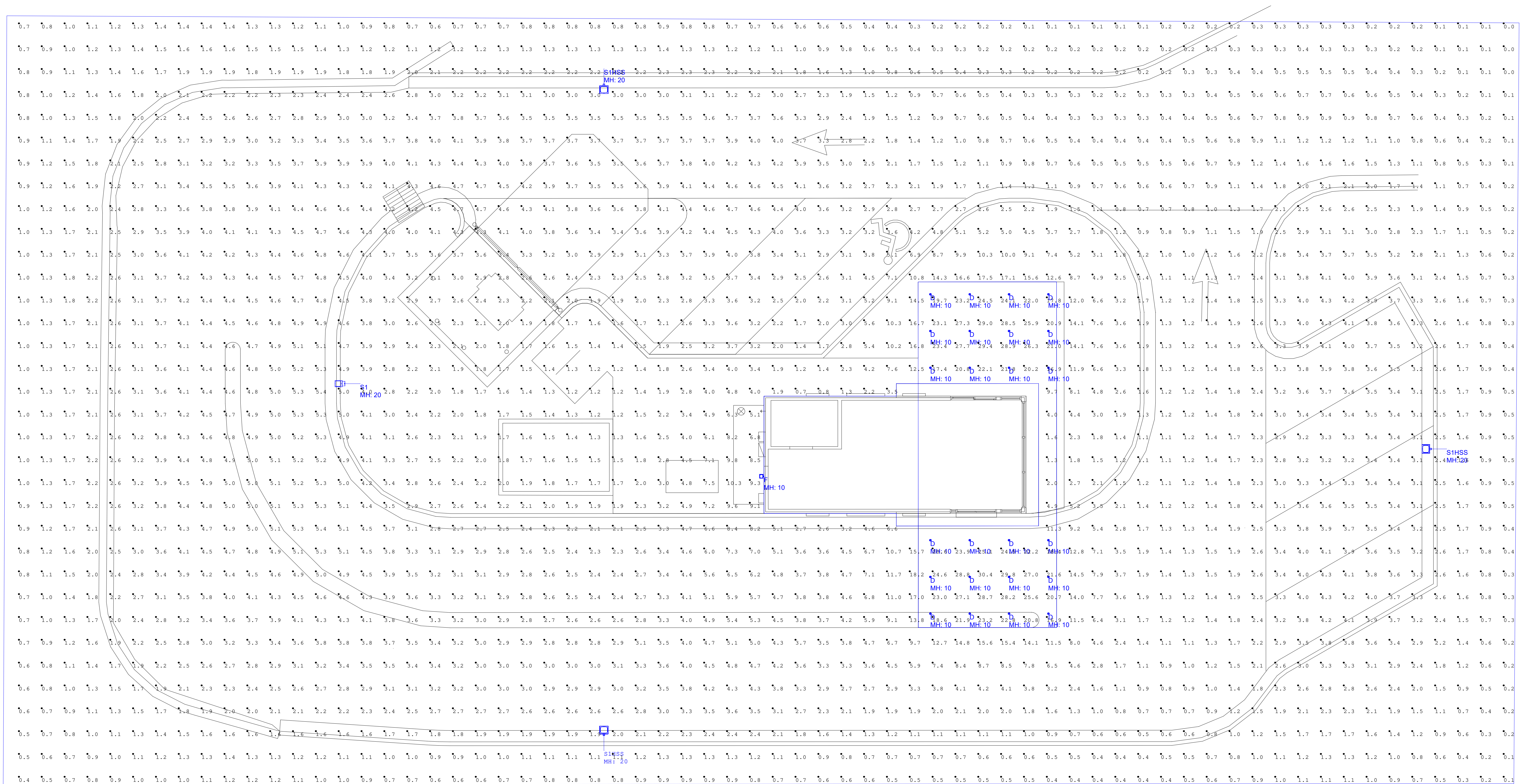
bfaeng.com TELEPHONE: (636) 239-4751

103 ELM STREET WASHINGTON, MISSOURI 63090

DRAWN B.L.F.
 CHECKED R.G.R.
 DATE 11/01/22
 SCALE 1"=20'
 JOB No. 7146
 SHEET NAME POST DEVELOPED DRAINAGE AREA
DA-2

F:\Vout\7146_Traverse City MI 7 Brew\7146 Stormwater\7146 Post_Developed Drainage Area Map.dwg 11/1/2022 2:51 PM





Luminaire Schedule								
Symbol	Qty	Label	Description	Tag	LLF	Luminaire Lumens	Total Watts	BUG Rating
	3	SAS-15L-U-40-T3-HSS	SAS-15L-U-40-T3-HSS	S1HSS	0.800	10913	324.3	B1-U0-G2
	1	WSQ_LED_P3_SR2_35K_MVOLT	WSQ LED P3 SR2 35K MVOLT		0.880	4799	39.31	B2-U0-G1
	1	SAS-15L-U-35-T3	SAS-15L-U-35-T3	S1	0.900	16982	110.5	B2-U0-G3
	24	S11810	Satco S11810	D	0.880	1109	327.85	B1-U1-G0

Calculation Summary					
Label	CalcType	Units	Avg	Max	Min
7Brew Site_Planar	Illuminance	Fc	3.14	30.4	0.0
			Avg/Min		Max/Min
			N.A.		N.A.

Light Fixture Pricing Information
Contact Information
 FOR SITE LIGHTING PRICING, CONTACT RYAN DENNEY WITH CED NATIONAL ACCOUNTS AT 281-733-8884

#	Date	Comments
Revisions		

Drawn By: Ben Kerstens, LC
 Checked By:
 Date: 10/19/2022
 Scale:

7Brew
Traverse City, MI

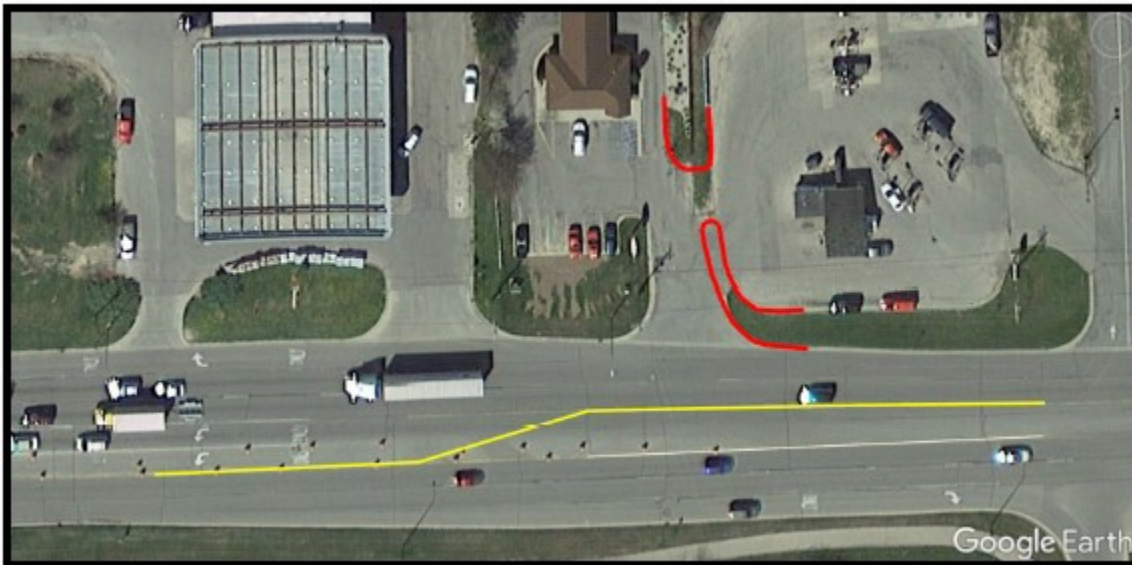
John Sych

From: Wiest, Jeremy (MDOT) <WiestJ@michigan.gov>
Sent: Thursday, September 29, 2022 8:05 AM
To: John Sych
Subject: RE: 7Brew TIS - OHM 2nd Review - 2537 N US-31 South - Garfield Twp

Good morning John,

The Michigan Department of Transportation's (MDOT) Traverse City office has reviewed the Traffic Impact Study as well as the conceptual plans for the 7Brew development.

Overall, MDOT agrees with the proposed plan for the 7Brew development. However, the department would like to see the entrance striped for a right turn lane, left turn lane, and an inbound lane. This will ensure vehicles are in their correct lane while entering/exiting the site. Also, the department concurs with OHM's recommendation to further channelize traffic to reduce conflicts by adding additional curbing and by having both 7Brew and the gas station be under stop control. This will in turn give priority to traffic entering both sites thus reducing backup onto US-31 (see figure below from OHM's September 6th, 2022 letter).



Lastly, the property owner will need to obtain a permit from MDOT for work within the right-of-way.

Thank you for providing MDOT the opportunity to comment early in the review process. Please let our office know if you need anything further.

Jeremy

Jeremy Wiest, P.E.

Permit Engineer

Michigan Department of Transportation
Traverse City Transportation Service Center
2084 US-31 South

Traverse City, MI 49685

Cell Phone: 231-649-9907



October 17, 2022

Charter Township of Garfield Planning Commission
Mr. John Sych, AICP - Director of Planning
3848 Veterans Drive
Traverse City, MI 49684

Re: 7 Brew - 2537 N US 31 South

To the Planning Commission and Mr. Sych,

Community Planning and Land Use Consulting, LLC has been retained by 2537 N US 31 South LLC (Net Lease Properties) in its request for a Special Use Permit for a 7 Brew drive-through coffee location at 2537 N US 31 South. This letter is intended to summarize our understanding of the discussion to date and to discuss resolutions to the concerns raised throughout the application process, most notably including traffic issues.

Background:

The application requests Planning Commission Special Use Permit review for a proposed Drive-Through Business, and more specifically, approval of a two-lane drive-through coffee business. Drive-through businesses are permitted by way of a special use permit in the C-G General Business zoning district. This request has been submitted pursuant to Garfield Township Zoning Ordinance § 320 C-G General Commercial Regulations, § 423 Special Use Permits, § 618 Traffic Impact Reports, and § 730 Drive-Through Business.

This letter is focused upon the discussion to date regarding § 618 Traffic Impact Reports. **To date, the Township has received and considered the following information regarding traffic impact:**

- MDOT email / consent to reuse existing driveway dated 3/3/2022
- Fishbeck traffic study dated 6/8/2022
- OHM traffic study review dated 7/28/2022
- Fishbeck response to OHM review dated 8/23/2022
- OHM comments to Fishbeck response dated 9/6/2022

- MDOT email comment regarding OHM 9/6/2022 comments dated 9/29/2022
- BFA Engineering / MDOT email dated 10/7/22 (red comment email, attached)



(Above: OHM Traffic Review reference image)

For the purposes of this letter, we will focus on three notable issues regarding traffic, including:

- Improvements (striping) within the US 31 road right-of-way (yellow line, above);
- Improvements (physical or painted curb) on the shared entrance with Mutual Gas Station (red lines, above); and
- The continued use of the shared entrance with Mutual Gas Station.

Improvements (striping) within the US 31 road right-of-way

The yellow line shown above was noted within the OHM traffic review as a possible improvement within the US 31 right-of-way.

However, in a 10/7/22 email between BFA engineering and the current MDOT Permit Engineer, it was stated that re-striping US 31 is not supported at this time. MDOT has stated that they will “monitor this location upon opening for any potential modifications.”

- Improvements within the US 31 road right-of-way are not in control of the applicant, and will be monitored by MDOT for any potential future modifications.

Improvements (physical or painted) on shared entrance with Mutual Gas Station

As also shown in the above illustration, the OHM study identified the potential improvements of curb or striping extending onto the Mutual Gas Station property (red lines). While the applicant has worked in good faith to address this request with the owner of this property, and even offered to pay for these improvements, **these discussions have not resulted in the ability to make the off-premise improvements.**

MDOT has indicated that it would like to see striping added to the driveway approach to delineate the two outbound lanes and one inbound lane. The revised site plans now include striping to delineate the two outbound lanes and one inbound lane, as requested by MDOT.

Continued use of the shared entrance with Mutual Gas Station.

The applicant's ability to continue to use this driveway was confirmed by MDOT in the 3/3/2022 email; *an MDOT permit is not necessary for its reuse.*

- The shared use of the driveway has occurred for nearly 20 years, after being constructed by MDOT during an intersection improvement project in 2003. When constructed, it was centered on the property line to provide both properties with rightful access to their business.
- In the event that use of the shared driveway comes into question, the applicant is granted the right to access via Section 512.2, which states that all land located within a single property tax code and fronting on a state highway or county road shall be entitled to one (1) driveway or road access per existing parcel.

Summary:

While we support cross-access and traffic management priorities in general, the reasonable use and redevelopment of a particular property should not be held up for circumstances that are out of the applicant's control.

A traffic study provided by the Applicant and performed by Fishbeck found the site, proposed use and shared entrance to be adequate and without concern with entering or exiting vehicles. Garfield Township traffic engineers (OHM) have now agreed with the study and provided an opinion on traffic flow, which included traffic striping and two off-premise improvements including elongating the curb cut into the Mutual gas station and delineating a yellow line on US-31 for traffic control.

MDOT has acknowledged the continued use of the existing curb cut, and will continue to monitor traffic movements for potential changes to the road right-of-way striping.

In summary, the applicant's site plan has been reviewed by independent traffic consultants, the Township's traffic consultant, and MDOT, resulting in the application being deemed satisfactory for vehicular circulation. In this case, the applicant has made reasonable efforts to work with neighboring properties and MDOT in order to accommodate traffic movements to, from, and within the site.

As evidenced above, the applicant is dedicated to working with the Township to resolve the site design challenges that have come up. We are grateful for your time and for amicably working towards a solution.

Sincerely,

Roberto Larrea

Rob Larrea, AICP

Principal | Land Use Planner

Community Planning & Land Use Consulting, LLC

Attachment:

- BFA Engineering / MDOT email dated 10/7/22

From: Wiest, Jeremy (MDOT) <WiestJ@michigan.gov>
Sent: Friday, October 7, 2022 9:34 AM
To: John Schebaum
Cc: Mark Huonder; Likens, TJ
Subject: RE: 2537 US Highway 31 Traverse City, MI Proposed Development - BFA 7146
Attachments: Wiest MDOT 7Brew 2537 N US-31 South 09.29.2022.pdf; 10 Site Plan.pdf

Good morning John,

Per our phone conversation, below are my comments in red.

Jeremy

From: John Schebaum <jschebaum@bfaeng.com>
Sent: Friday, October 7, 2022 8:35 AM
To: Wiest, Jeremy (MDOT) <WiestJ@michigan.gov>
Cc: Mark Huonder <mh@netleaseproperties.com>; Likens, TJ <tjlikens@fishbeck.com>
Subject: RE: 2537 US Highway 31 Traverse City, MI Proposed Development - BFA 7146

CAUTION: This is an External email. Please send suspicious emails to abuse@michigan.gov

Good Morning Jeremy,

John Sych with the Township passed along the attached email from you to our team yesterday afternoon. I just wanted to clarify a couple items to make sure we are on the same page.

- The image in your email shows a yellow line in the center lane of US 31. I assume it is just shown since the image was copied from OHM's report where they discussed the yellow line separately. **Can you confirm that MDOT has no desire to modify the center turn lane/dual left turn striping?**
That is correct. MDOT will monitor this location upon opening for any potential modifications.
- "The department concurs with OHM's recommendation to further channelize traffic to reduce conflicts by adding additional curbing and by having both 7Brew and the gas station be under stop control."
 - **Please note that we are proposing pavement striping in lieu of curbing for the red island shown closest to US 31. The intent is to not impede delivery truck movements for the Mutual gas station. Can you confirm this is acceptable?**
As I mentioned on the phone, MDOT likes the idea of the curbing but understands that curbing doesn't work with the Mutual gas stations truck movements. However, ultimately this is a decision for the township not MDOT.
 - We are currently working with the adjacent property owner to create the improvements shown in red, and initial conversations have gone well. However, since it is a completely separate property owner, we can never have 100% confidence that we can get them to sign the agreements necessary to complete the improvements (we are proposing to complete the improvements for them). Should things fall through with the adjacent owner, we have updated our Site Plan to provide stop control on our

property. Please see the attached Site Plan and let us know if this is acceptable, if the adjacent owner is unable to work with us.

MDOT would like to see striping added to the driveway approach to delineate the two outbound lanes and the one inbound lane.

Thanks for your help and feel free to call or email with any questions.

John Schebaum, PE

BFA, Inc. | 103 Elm Street | Washington, MO 63090

Direct 636.231.4337

Office 636.239.4751

From: Wiest, Jeremy (MDOT) <WiestJ@michigan.gov>

Sent: Monday, July 18, 2022 11:40 AM

To: Likens, TJ <tjlikens@fishbeck.com>

Cc: John Schebaum <jschebaum@bfaeng.com>; Reidsma, Kyle <kreidsma@fishbeck.com>

Subject: RE: 2537 US Highway 31 Traverse City, MI Proposed Development - BFA 7146

TJ,

Attached are the plan sheets showing the consolidation of driveways that occurred with our widening project back in 2003. These have also been sent to the township.

Let me know if you have any questions or need anything else.

Jeremy

Jeremy R Wiest, P.E.

Permit Engineer

Michigan Department of Transportation

Traverse City Transportation Service Center

2084 US-31 South, Suite B

Traverse City, MI 49685

Cell Phone: 231-649-9907

From: Likens, TJ <tjlikens@fishbeck.com>

Sent: Thursday, July 14, 2022 10:04 AM

To: Wiest, Jeremy (MDOT) <WiestJ@michigan.gov>

Cc: John Schebaum <jschebaum@bfaeng.com>; Reidsma, Kyle <kreidsma@fishbeck.com>

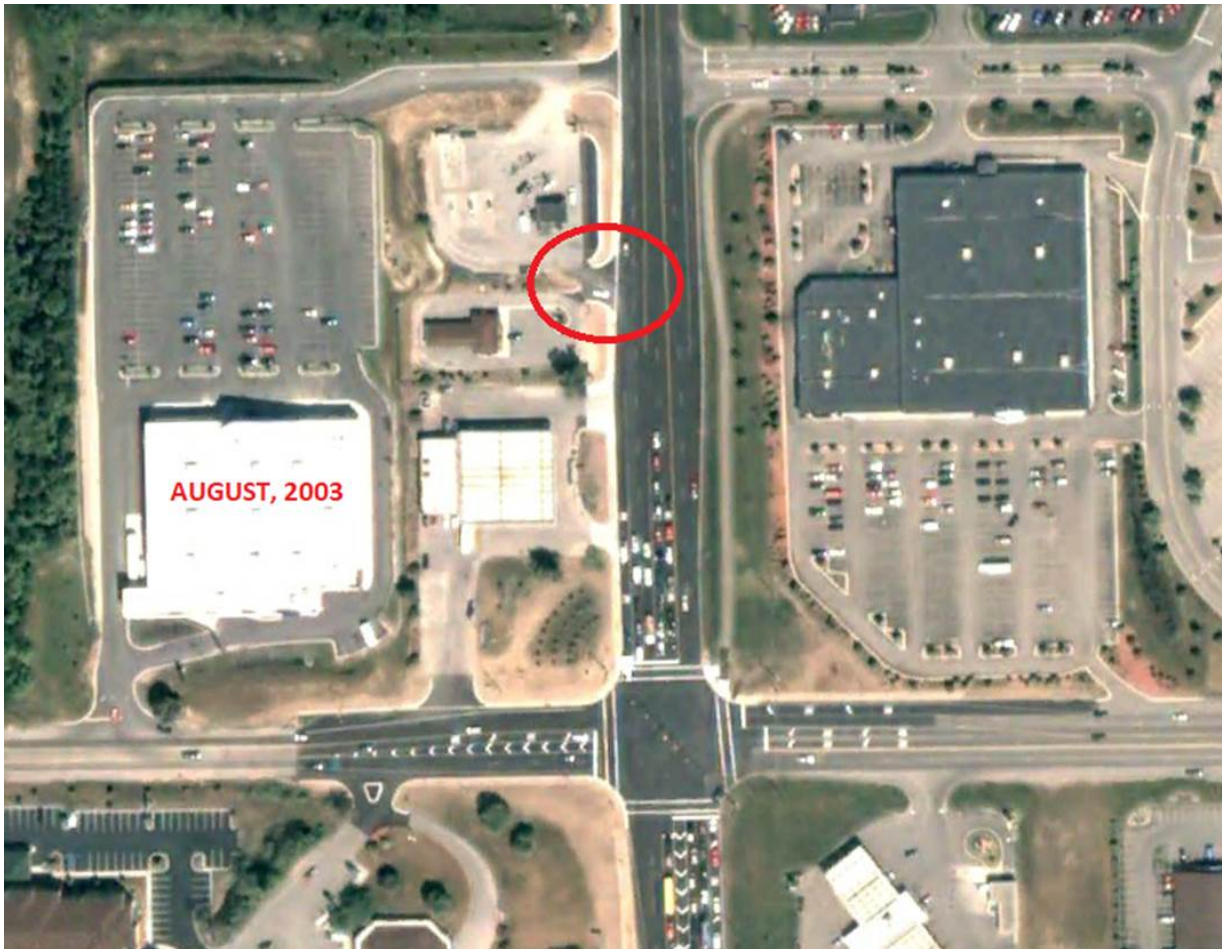
Subject: RE: 2537 US Highway 31 Traverse City, MI Proposed Development - BFA 7146

CAUTION: This is an External email. Please send suspicious emails to abuse@michigan.gov

Good morning Jeremy,

I left you a VM – am hoping to talk to you about the consolidation of access for the subject parcel (former PNC bank) and gas station, in relationship to intersection improvements at US-31 and S Airport Road. From aerial imagery it appears

these were done at the same time circa 2003. I am wondering if MDOT can provide a set of record plans for this project? The Township PC tabled the application last night and the history of this driveway consolidation was in question. Recognizing this was a while ago – any assistance is greatly appreciated.
TJL



Timothy J. Likens, PE, PTOE | Senior Traffic Engineer
Fishbeck | w: 616.464.3984 | c: 847.269.3003 | Fishbeck.com

From: Wiest, Jeremy (MDOT) <WiestJ@michigan.gov>
Sent: Wednesday, March 2, 2022 9:56 AM
To: John Schebaum <jschebaum@bfaeng.com>
Subject: RE: 2537 US Highway 31 Traverse City, MI Proposed Development - BFA 7146

Good morning John,

Our office has reviewed the attached conceptual plans for the proposed coffee shop development. This e-mail serves as the Michigan Department of Transportation's consent to reuse the existing driveway at 2537 US-31, Traverse City Michigan. A permit is not necessary for the reuse. If you need anything further from our office please do not hesitate to contact me.

Thanks!

Jeremy

Jeremy R Wiest, P.E.

Permit Engineer

Michigan Department of Transportation
Traverse City Transportation Service Center
2084 US-31 South, Suite B
Traverse City, MI 49685
Cell Phone: 231-649-9907

From: John Schebaum <jschebaum@bfaeng.com>
Sent: Monday, February 28, 2022 9:00 AM
To: Wiest, Jeremy (MDOT) <WiestJ@michigan.gov>
Cc: Kevin Myers <km@netleasedev.com>
Subject: 2537 US Highway 31 Traverse City, MI Proposed Development - BFA 7146

CAUTION: This is an External email. Please send suspicious emails to abuse@michigan.gov

Good Morning Jeremy,

Please see the attached Conceptual Site Plan regarding the proposed development in Traverse City, Michigan we discussed last week.

We do not plan to make any improvements within the ROW, or any changes to the existing access. Please let me know if you have any comments or questions.

This development will be reviewed by the Garfield Township in order to obtain a Special Use Permit, so I would anticipate that they will reach out to you for comments in the future as well.

Thanks,


John Schebaum, PE

BFA, Inc. | 103 Elm Street | Washington, MO 63090
Direct 636.231.4337
Office 636.239.4751

This electronic file is transmitted for informational purposes only. It is understood that BFA, Inc. is not responsible for the contents, use, or loss of any data contained herein.

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 Charter Township of Garfield Planning Department Report No. 2022-103			
Prepared:	November 2, 2022	Pages:	3
Meeting:	November 9, 2022 Planning Commission	Attachments:	<input checked="" type="checkbox"/>
Subject:	Loving Neighbors Preschool at Northern Lakes Community Church Special Use Permit – Introduction		
File No.	SUP-2001-03-A	Parcel No.	05-018-011-02
Applicant:	Joe Schmidt/Northern Lakes Community Church		
Agent:	Julie Burton/Northern Lakes Community Church		
Owner:	Northern Lakes Community Church/Dr. Sam Jun, Pastor		

BRIEF OVERVIEW:

- Location: 5444 Herkner Road, south of North Long Lake Road
- Parcel area: 5.94 acres
- Existing land use: Church
- Existing zoning: A – Agricultural District

PURPOSE OF APPLICATION:

This application by the Northern Lakes Community Church requests use of an existing 7,441 square foot church to accommodate a child care center. Child care centers are permitted in the A-Agricultural District by Special Use Permit. No new construction is planned.

Aerial image of the subject property (property lines highlighted in blue):



SITE DESIGN AND ZONING COMPLIANCE OVERVIEW:

In approving any special use permit pursuant to Section 423, the Planning Commission may impose such reasonable standards, conditions, or requirements, in addition to or that supersede any standard specified in this ordinance, as it may deem necessary to protect the public interest and welfare. Such additional standards may include, but need not be limited to:

- a) Financing;
- b) Availability of adequate public facilities or services;
- c) Dedication of land;
- d) Reservation of land;
- e) Creation of special assessment districts;
- f) Creation of restrictive covenants or easements;
- g) Special setbacks;
- h) Yard requirements;
- i) Increased screening or landscaping requirements;
- j) Area requirements;
- k) Development phasing; or
- l) Standards pertaining to traffic, circulation, noise, lighting, hours of operation, protection of environmentally sensitive areas, and similar characteristics.

Staff offers the following comments regarding site design and compliance with the Zoning Ordinance:

Proposed Use:

The proposed child care center is to occupy an existing church. The child care center will operate Monday through Friday from 7:00 a.m. to 6:00 p.m. and will not conflict with current church activities.

Because there is no building construction, no building addition, nor similar type of construction, Staff has waived the requirements for a full site development plan. The only improvement is a playground that must meet the requirements of Section 730 in the Zoning Ordinance.

Parking:

The parking requirement for child care centers is one (1) parking space for each three hundred (300) square feet of floor space. In this case, the 7,441 square foot church building would require 25 parking spaces.

The current parking lot has 75 spaces which will be able to handle the parking of staff and parent vehicles, as well as vehicles used by church members during the week. Current church enrollment is approximately 50 people.

The center enrollment is proposed to have 29 children (infant through age 5) and 6 staff people. Parking demand will be limited as most children will be dropped off or picked up during the school hours of operation.

Signage:

Signs require sign permit review and are not approved under the site plan review process. The application states “Signs will be updated and are subject to sign permit review.”

Other Reviews:

Other reviews may be necessary, including Metro Fire.

Child Care Center:

Section 720 of the Zoning Ordinance outlines specific regulations and conditions for child care centers, including the following:

Facility shall maintain all valid state and local licenses.

The application states, “The proposed child care center will maintain all valid state and local licenses.”

All outdoor areas used for the care and supervision of patrons shall have appropriate fencing for the safety of the children in the group day-care home; consisting of a minimum 6-foot high privacy fence along the area adjoining another residence, and a minimum 4-foot high fence in the remaining area devoted to the day-care area.

The application states that the approximate size of the playground is 59’ (along the building) x 45’ x 94’ x 30’ which is approximately 2,525 square feet. Since the playground does not adjoin a residence, no privacy fence is required; however, a 4-foot high fence is required.

Hours of operation shall not exceed sixteen (16) hours during a 24-hour period. The Planning Commission shall not prohibit evening operations completely but may establish limitations on hours of operation and/or activities between the hours of 10PM and 6AM.

The application states that the hours of operation will be 11 hours per 24-hour period from 7:00 a.m. to 6:00 p.m.

ACTION REQUESTED:

The purpose of the introductory meeting is to accept the application and to identify any concerns that should be addressed prior to holding a public hearing on the application. As such, following an opportunity for applicant presentation and Commissioner discussion, the following motion is offered for consideration:

MOTION THAT application SUP-2001-03-A, submitted by Julie Burton for a Special Use Permit for a child care center at Parcel 05-018-011-02, BE ACCEPTED, and BE SCHEDULED for a public hearing for the December 14, 2022 Regular Planning Commission meeting, subject to the following additional information being provided by the applicant:

1. The site plan is subject to review by others, including Metro Fire.

Any additional information that the Planning Commission determines to be necessary should be added to this motion.

Attachments:

1. SUP Application dated October 6, 2022 with Impact Statement
2. Survey dated January 29, 2019
3. Playground Site Plan dated October 16, 2022
4. Church Addition Site Plan dated July 12, 2007 with playground identified
5. Site photos
6. Natural Playground Idea photographs



Charter Township of Garfield

Grand Traverse County

3848 VETERANS DRIVE
TRAVERSE CITY, MICHIGAN 49684
PH: (231) 941-1620 • FAX: (231) 941-1588

SPECIAL USE PERMIT (SUP) APPLICATION

ASSISTANCE

This application must be completed in full. An incomplete or improperly prepared application will not be accepted and will result in processing delays. Before submitting an application, it is recommended that you contact the Planning and/or Zoning Department to arrange an appointment to discuss your proposed application. Time is often saved by these preliminary discussions. For additional information or assistance in completing this development application, please contact the Planning Department at (231) 941-1620.

ACTION REQUESTED

New Special Use Permit
Major Amendment
Minor Amendment
Administrative Amendment

PROJECT / DEVELOPMENT NAME

APPLICANT INFORMATION

Name:
Address:
Phone Number:
Email:

AGENT INFORMATION

Name:
Address:
Phone Number:
Email:

OWNER INFORMATION

Name:
Address:
Phone Number:
Email:

CONTACT PERSON

Please select one person to be contact person for all correspondence and questions:

Applicant:

Agent:

Owner:

PROPERTY INFORMATION

Property Address:

Property Identification Number:

Legal Description:

Zoning District:

Master Plan Future Land Use Designation:

Area of Property (acres or square feet):

Existing Use(s):

Proposed Use(s):

PROJECT TIMELINE

Estimated Start Date:

Estimated Completion Date:

REQUIRED SUBMITTAL ITEMS

A complete application for a Special Use Permit consists of the following:

Application Form:

- One original signed application
- One digital copy of the application (PDF only)

Application Fee:

Fees are established by resolution of the Garfield Township Board and are set out in the current Fee Schedule as listed on the Planning Department page of the Township website (<http://www.garfield-twp.com>). Please make check out to Charter Township of Garfield.

Fee

Escrow Fee:

Additional fees may be required if a review by independent professional help is deemed necessary by the Township. If required, such additional fees must be placed in escrow by the applicant in accordance with the escrow policies of the Township and prior to any further processing of this application. Any unused escrow funds shall be returned to the applicant. Please complete an Escrow and Review (ER) Application form.

Site Development Plan:

- Ten complete stapled 11"x17" paper sets (Administrative Amendments require one copy)
- Two complete bound 24"x36" paper sets
- One digital set (PDF only)

Written Information:

Ten paper copies of the Approval Criteria (Administrative Amendments require one copy)

One digital copy of the Approval Criteria (PDF only)

Ten paper copies of the Impact Assessment (Administrative Amendments require one copy)

One digital copy of the Impact Assessment (PDF only)

Digital items to be delivered via email or USB flash drive

SUBMITTAL DEADLINE

Submittal deadlines are listed on the Planning Department page of the Township website (<http://www.garfield-twp.com>). Please note that the listed dates are the deadlines after which submittals will not be considered for the indicated meeting. Any errors or missing information on an application submitted at the deadline will result in a delay in the processing of the application. An earlier submittal is encouraged to avoid possible delays.

WAIVERS

Submittal Waiver:

At the discretion of the Director of Planning, a Site Development Plan may be waived in any of the following cases when it is determined that the submission would serve no useful purpose:

1. The erection or enlargement of an accessory structure;
2. The enlargement of a principal building by less than 20 percent of its existing gross floor area, provided such enlargement will not result in a requirement for additional off-street parking;
3. A change in principal use where such change would not result in an increase in impervious surface area, additional off-street parking, site access, other external site characteristics or a violation of this ordinance.

Data Waiver:

The Director of Planning may waive a particular element of information or data otherwise required for a Site Development Plan upon a finding that the information or data is not necessary to determine compliance with this ordinance or that such information or data would not bear on the decision of the approval authority.

SITE PLAN

Check that your site plan includes all required elements for a Site Development Plan (SDP). Please use the Required Site Plan Elements Checklist below.

APPROVAL CRITERIA

Indicate, on a separate sheet of paper, how the proposed special use will comply with, meet, or facilitate each of the following Approval Criteria from § 423.E of the Zoning Ordinance. The Planning Commission must determine that each of these criteria are satisfied in order to grant approval of a Special Use Permit. A special use is permitted only if the applicant demonstrates that: special use is permitted only if the applicant demonstrates that:

The proposed use will be consistent with the purpose and intent of the master plan and this ordinance, including all regulations of the applicable zoning district;

The proposed use will be designed, constructed, operated and maintained so as to be compatible, harmonious and appropriate with the existing or planned character and uses of the neighborhood, adjacent properties and the natural environment;

The proposed use will not be detrimental, hazardous or disturbing to existing or future adjacent uses or to the public welfare by reason of excessive traffic, noise, dust, gas, smoke, vibration, odor, glare, visual clutter, electrical or electromagnetic interference;

Potential adverse effects arising from the proposed use on the neighborhood and adjacent properties will be minimized through the provision of adequate parking, the placement of buildings, structures and entrances, as well as the provision and location of screening, fencing, landscaping, buffers or setbacks;

The proposed use will retain as many natural features of the property as practicable, particularly where the natural features assist in preserving the general character of the neighborhood;

Adequate public and private infrastructure and services such as streets, water and sewage facilities, drainage structures, police and fire protection, and schools, already exist or will be provided without excessive additional requirements at public cost;

The establishment, maintenance, or operation of the proposed use shall not be detrimental to or endanger the public health, safety, morals, comfort, or general welfare;

The public interest and welfare supporting the proposed use shall be sufficient to outweigh individual interests that are adversely affected by the establishment of the proposed use;

Adequate measures shall be taken to provide ingress and egress so designed as to minimize traffic hazards and to minimize traffic congestion on the public roads;

Adequate measures shall be taken to provide vehicular and pedestrian traffic within the site, and in relation to streets and sidewalks servicing the site in a safe and convenient manner; and

The proposed use shall not impede the orderly development and improvement of surrounding property for uses permitted within the zoning district.

IMPACT ASSESSMENT

A written impact statement to include the following information:

A written illustrative description of the environmental characteristics of the site prior to development, i.e., topography, soils, vegetative cover, drainage, streams, creeks or ponds.

Types of uses and other man-made facilities.

The number of people to be housed, employed, visitors or patrons and vehicular and pedestrian traffic.

Phasing of the project including ultimate development proposals.

Natural features which will be retained, removed and/or modified including vegetation, drainage, hillsides, streams wetlands, woodlands, wildlife and water. The description of the areas to be changed shall include their effect on the site and adjacent properties. An aerial photo may be used to delineate the areas of change.

The method to be used to serve the development with water and sanitary sewer facilities.

The method to be used to control drainage on the site and from the site. This shall include runoff control during periods of construction.

If the public sewers are not available to the site, the Applicant shall submit a current approval from the Health Department or other responsible public agency indicating approval of plans for sewage treatment.

The method to be used to control any increase in effluent discharge to the air or any increase in noise level emanating from the site. Consideration of any nuisance that would be created within the site or external to the site whether by reason of dust, noise, fumes vibration, smoke or lights.

An indication of how the proposed use conforms with existing and potential development patterns and any adverse effects.

The proposed density in units per acre for residential developments.

Name(s) and address(es) of person(s) responsible for preparation of statement.

Description of measures to control soil erosion and sedimentation during grading and construction operations and until a permanent ground cover is established. Recommendations for such measures may be obtained from the County Soil Erosion and Sedimentation office.

Type, direction, and intensity of outside lighting.

General description of deed restrictions, if any.

ADDITIONAL INFORMATION

If applicable, provide the following further information:

	<u>Yes</u>	<u>No</u>	<u>Not Applicable</u>
A. <u>Sanitary Sewer Service</u>			
1. Does project require extension of public sewer line? If yes, has a Utility Agreement been prepared?			
2. Will a community wastewater system be installed? If yes, has a Utility Agreement been prepared? If yes, provide construction plans and specifications			
3. Will on-site disposal be used? If yes, is it depicted on plan?			
B. <u>Water Service</u>			
1. Does project require extension of public water main? If yes, has a Utility Agreement been prepared?			
2. Will a community water supply be installed? If yes, has a Utility Agreement been prepared? If yes, provide construction plans and specifications			
C. <u>Public utility easements required?</u> If yes, show on plan.			
D. <u>Stormwater Review/Soil Erosion</u>			
1. Soil Erosion Plans approved by Soil Erosion Office? If so, attach approval letter. If no, are alternate measures shown?			
2. Stormwater Plans approved by Township Engineer? If so, attach approval letter. If no, are alternate measures shown? Note: Alternate measures must be designed and sealed by a registered Engineer.			

E. Roads and Circulation

1. Are interior public streets proposed?
If yes, has Road Commission approved (attach letter)?
2. Will public streets connect to adjoining properties or future streets?
3. Are private roads or interior drives proposed?
4. Will private drives connect to adjoining properties service roads?
5. Has the Road Commission or MDOT approved curb cuts?
If yes, attach approved permit.

OTHER INFORMATION

If there is any other information that you think may be useful in the review of this application, please attach it to this application or explain it on a separate page.

REVIEW PROCESS

- Upon submittal of this application, Staff will review the materials submitted and will, within ten (10) working days, forward a determination of completeness to the applicant. If the submission is incomplete or noncompliant with the Zoning Ordinance, it will be returned to the applicant for revision. Once the submission is revised, Staff will again review it for completeness and again forward a determination to the applicant within ten (10) working days. This procedure shall be repeated until a complete submission is received.
- Once the application is deemed to be complete and submitted according to the application deadlines, it will be forwarded to the Planning Commission for review. The Planning Commission will determine if the application is complete and schedule a public hearing.
- Upon holding a public hearing, the Planning Commission may approve, approve with conditions, or deny the proposed special use.
- If approved or approved with conditions, the decision of the Planning Commission shall be incorporated into a written report and decision order.

PERMISSION TO ENTER SUBJECT PROPERTY

Permission is hereby granted to Garfield Township staff and Planning Commissioners to enter the premises subject to this application for the purposes of making inspections associated with this application, during normal and reasonable working hours.

Owner Signature:

Applicant Signature:

Agent Signature:

Date:

- | | | | |
|---|--------------------------|-------------------------------------|-------------------------------------|
| 1. Are interior public streets proposed? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| If yes, has Road Commission approved (attach letter)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Will public streets connect to adjoining properties or future streets? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Are private roads or interior drives proposed? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Will private drives connect to adjoining properties service roads? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Has the Road Commission or MDOT approved curb cuts? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| If yes, attach approved permit. | | | |

OTHER INFORMATION

If there is any other information that you think may be useful in the review of this application, please attach it to this application or explain it on a separate page.

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- Upon holding a public hearing, the Planning Commission may approve, approve with conditions, or deny the proposed special use.
- If approved or approved with conditions, the decision of the Planning Commission shall be incorporated into written report and decision order.

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Permission is hereby granted to Garfield Township staff and Planning Commissioners to enter the premises subject to application for the purposes of making inspections associated with this application, during normal and reasonable work hours.

Owner Signature:

Applicant Signature:

Agent Signature:

Date:

<i>Julie J. Burtm</i>
10/18/22

OWNER'S AUTHORIZATION

If the applicant is not the registered owner of the lands that is the subject of this application, the owner(s) must complete the authorization set out below.

I/We _____ authorize to make this application on my/our behalf and to provide any of my/our personal information necessary for the processing of this application. Moreover, this shall be your good and sufficient authorization for so doing.

Owner Signature:

Date:

AFFIDAVIT

The undersigned affirms that he/she or they is (are) the owner, or authorized agent of the owner, involved in the application and all of the information submitted in this application, including any supplemental information, is in all respects true and correct. The undersigned further acknowledges that willful misrepresentation of information will terminate this permit application and any permit associated with this document.

Owner Signature:

Date:

Applicant Signature:

Date:

Required Site Plan Elements Checklist (See § 956 of the Zoning Ordinance) Site Diagram (SD) / Administrative Site Plan (ASP) / Site Development Plan (SDP)	SD	ASP/ SDP
A. Basic Information		
1. Applicant's name, address, telephone number and signature		
2. Property owner's name, address, telephone number and signature		
3. Proof of property ownership		
4. Whether there are any options or liens on the property		
5. A signed and notarized statement from the owner of the property that the applicant has the right to act as the owner's agent		
6. The address and/or parcel number of the property, complete legal description and dimensions of the property, setback lines, gross and net acreages and frontage		
7. A vicinity map showing the area and road network surrounding the property		
8. Name, address and phone number of the preparer of the site plan		
9. Project title or name of the proposed development		
10. Statement of proposed use of land, project completion schedule, any proposed development phasing		
11. Land uses and zoning classification on the subject parcel and adjoining parcels		
12. Seal of the registered engineer, architect, landscape architect, surveyor, or planner who prepared the plan, as well as their name, address and telephone number		
B. Site Plan Information		
1. North arrow, scale, and date of original submittal and last revision		
2. Boundary dimensions of natural features		
3. Natural features such as woodlots, water bodies, wetlands, high risk erosion areas, slopes over twenty-five percent (25%), beach, drainage, and similar features		
4. Proposed alterations to topography and other natural features		
5. Existing topographic elevations at two-foot intervals except shown at five-foot intervals where slopes exceed 18%		
6. Soil erosion and sediment control measures as required by the Grand Traverse County Soil Erosion Department.		
7. The location, height and square footage of existing and proposed main and accessory buildings, and other existing structures		
8. Location and specifications for any existing or proposed (above or below ground) storage facilities for any chemicals, salts, flammable materials, or hazardous materials. Include any containment structures or clear zones required by county, state or federal government authorities		
9. Proposed finish floor and grade line elevations of any structures <i>*Required only for habitable construction within the floodplain on site diagrams and administrative site plans.</i>	*	
10. Existing and proposed driveways, including parking areas		
11. Neighboring driveways and other vehicular circulation features adjacent to the site		
12. A dimensional plan indicating the location, size and number of parking spaces of the on-site parking areas, and shared parking areas		
13. Identification and dimensions of service lanes and service parking, snow storage areas, loading and unloading and docks		
14. Proposed roads, access easements, sidewalks, bicycle paths, and other vehicular and pedestrian circulation features within and adjacent to the site		
15. Location and dimensions of curb cuts, acceleration, deceleration and passing lanes		
16. Location of neighboring structures that are close to the parcel line or pertinent to the proposal		
17. Location of water supply lines and/or wells		
18. Location of sanitary sewer lines and/or sanitary sewer disposal systems		
19. Location, specifications, and access to a water supply in the event of a fire emergency		
20. Sealed (2) stormwater plans including the location and design of storm sewers, retention or detention ponds, swales, wastewater lines, clean out locations, connection points and treatment systems		
21. A utility plan including the location of all other utilities on the site including but not limited to natural gas, electric, cable TV, telephone and steam		
22. A sign plan indicating the location, size and specifications of all signs and advertising features, including cross sections		
23. A lighting plan including exterior lighting locations with area of illumination illustrated by point values on a photometric plan, Kelvin rating, as well as the type of fixtures and shielding to be used		
24. Proposed location of any open spaces, landscaping and buffering features such as buffer areas, vegetation belts, fences, walls, trash receptacle screening, and other screening features with cross sections shown		
25. A Landscape plan and table identifying the species, size of landscape materials, and number proposed, compared to what is required by the Ordinance. All vegetation to be retained on site must also be indicated, as well as, its typical size by general location or range of sizes as appropriate		
26. Statements regarding the project impacts on existing infrastructure (including traffic capacity, schools, and existing utilities, and on the natural environment on and adjacent to the site)		
27. Changes or modifications required for any applicable regulatory agencies' approvals		

Approval Criteria/Impact Statement:

Northern Lakes Community Church wishes to utilize their existing building (addition added in 2007) for a preschool/childcare center in an effort to support our community. This is based on the immediate need in our local community and state to increase available childcare. Per the Networks Northwest Organization since 2016, there has been a huge decline in Licensed Child Care providers in our area, and waitlists are long at the centers that remain.

We plan to provide full day care for 29 children, infant through age 5. We would hire a director and staff of approximately 5 teachers. We hope to start up in fall of 2023, pending township permission and minor building updates required by the Fire Inspector.

Estimated hours of operation for the Preschool/Childcare will be 7:00am - 6:00pm. These we hope are "worst case" scenario....if we can be open less hours we would like that, however wanted to give the Township the longest hours possible.

This project will not change the current building size. We will add a playground off the north entrance to the newer portion of the building where the child care center will be housed. The playground will be a natural playground, surrounded by fencing to keep the children safely contained. The approximate size of the playground is 59' (along the building) x 45' x 94' x 30'. We have included pictures of examples of what a natural playground can look like.

Our current parking lot has 75 spaces, and will be able to handle the parking of staff and parent vehicles, as well as vehicles used by church members for their various meetings during the week. Our current church enrollment is approximately 50 people.

We do not anticipate any adverse affects on our surrounding neighbors or neighborhoods. The center's enrollment of 29 children and 6 staff people, will result in increased traffic during the morning and evening hours of approximately 35 cars, during pick up and drop off times. Currently the original building (our sanctuary) has an occupancy of 230 people. The addition, where the preschool will be housed has an approved occupancy of 100 people.

Our goal is to maintain the look of our current buildings and landscaping, with the addition of a natural playground area. The play ground is planned for an area that is currently grass. There is a wooded area beyond the playground location that we will keep as is. We like the woods and hope to allow children to take teacher guided walks in that woods!

We do not anticipate or plan for any topographical changes to our property. There are two drainage areas for water which will remain as is.

We do have outside lighting on a timer in our parking lot, and do not plan to change this.

10/11/22 - Additional Information as requested by John Sych, Director of Planning for Garfield Township:

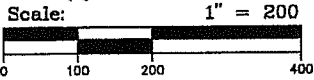
- The proposed child care center will maintain all valid state and local licenses.
- No other improvements are proposed.
- Signs will be updated and are subject to sign permit review.

This was prepared by Julie Burton, identified as Agent for the Owner and Applicant.

CERTIFICATE OF SURVEY

Legend

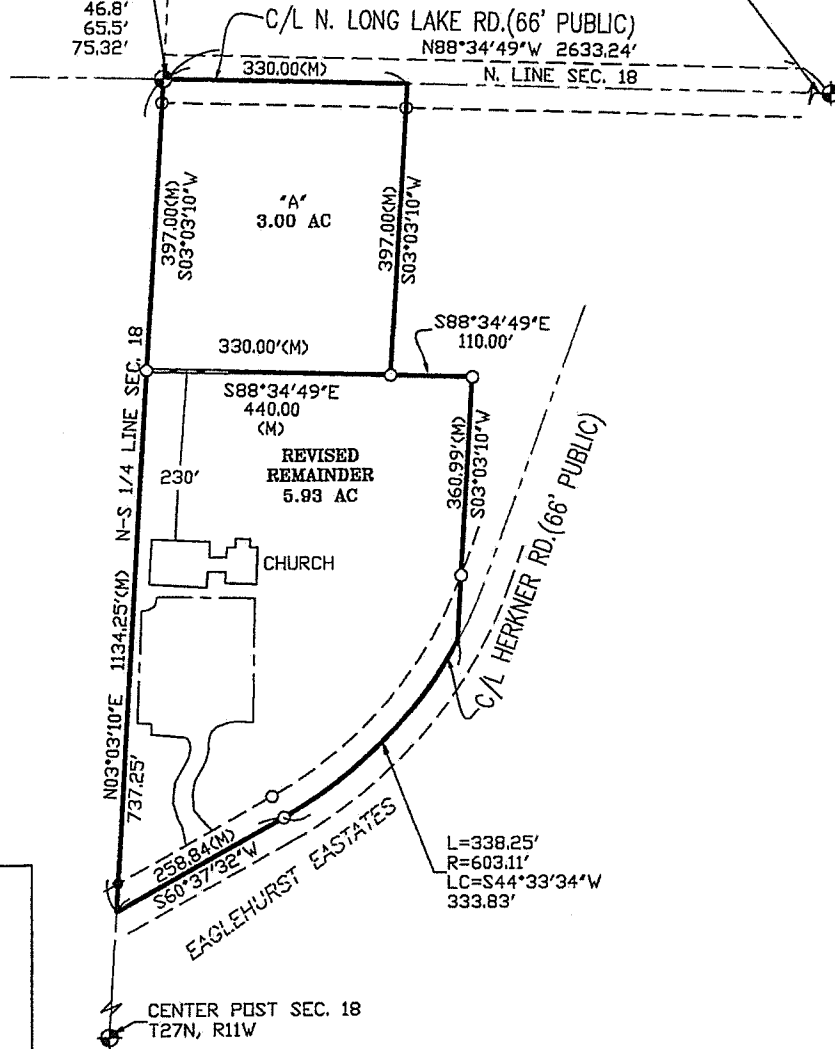
- IRON SET
- IRON FOUND
- ⊙ MONUMENT FOUND
- ▲ NAIL SET
- ▲ NAIL FOUND
- ⊕ GOVERNMENT 1/4 CORNER
- ⊙ SECTION CORNER
- ⊕ CENTER 1/4 CORNER
- (R) RECORD
- (M) MEASURED



SPACE RESERVED FOR REGISTER OF DEEDS

N. 1/4 COR. SEC. 18
 T27N, R11W
 F.D. REMON COR.
 S40°W NW COR. GARAGE 177.75'
 N36°W 1/2' REBAR 46.8'
 S26°E 1/2' REBAR 65.5'
 SOUTH P. POLE 75.32'

NE COR. SEC. 18
 T27N, R11W
 F.D. REMON COR.
 S20°W P. POLE 123.60'
 N78°E 24' MAPLE 107.94'
 S83°W 48' MAPLE 141.45'
 S26°E TEL. POLE 54.40'



THIS PROPOSED PARCEL DIVISION IS
 SUBJECT TO MUNICIPAL APPROVAL
 PURSUANT TO THE "LAND DIVISION
 ACT", P.A. 591 OF 1996, AS AMENDED.

ALTERATION OF ANY PART OF THIS DOCUMENT WITHOUT THE PERMISSION OF BOB MITCHELL & ASSOCIATES IS PROHIBITED.

Jesse E. Mitchell
 Professional Surveyor No. 54433

ERROR OF CLOSURE IS 1/10,000

BASIS OF BEARING: NAD 83 MI CENT SPCS

I, Jesse E. Mitchell, a Licensed Professional Surveyor in the State of Michigan, hereby certify that I have surveyed and mapped the above parcel of land; that the ratio of closure of the unadjusted field observations was within the accepted limits and that I have fully complied with the requirements of P.A. 132 of 1970.

CLIENT: **NORTHERN LAKES COMMUNITY CHURCH**

LOCATION:
 PART OF NORTHEAST 1/4 OF SECTION 18
 TOWN 27 NORTH, RANGE 11 WEST
 GARFIELD TOWNSHIP,
 GRAND TRAVERSE COUNTY, MICHIGAN.



BOB MITCHELL & ASSOCIATES
 SURVEYING / ENGINEERING

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 Kingsley, MI 49649 Hamden, MI 48825
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 email Jesse@mapelville.com

DWN. JEM	DATE 01.29.2019 REVISED	FILE NO. 20170295
CK. WPM	F.D. B.K. X	PG. X SHEET 1 OF 2

DESCRIPTION

DESCRIPTION: A parcel of land situated in the Township of Garfield, County of Grand Traverse, State of Michigan and described as follows to-wit:

PARCEL "A"

Part of the Northeast 1/4, Section 18, Town 27 North, Range 11 West, more fully described as: Beginning at the North 1/4 corner of said Section 18; thence South 88°34'49" East, 330.00 feet, along the North line of said Section 18; thence South 03°03'10" West, 397.00 feet, parallel to the North-South 1/4 line of said Section 18; thence North 88°34'49" West, 330.00 feet, parallel to said North line of said Section 18; thence North 03°03'10" East, 397.00 feet, parallel to said North-South 1/4 line of said Section 18 to the Point of Beginning. Said parcel contains 3.00 acres.

SUBJECT TO all agreements, covenants, easements, right-of-ways, reservations and restrictions of record, if any.

DESCRIPTION: A parcel of land situated in the Township of Garfield, County of Grand Traverse, State of Michigan and described as follows to-wit:

REVISED REMAINDER PARCEL

Part of the Northeast 1/4, Section 18, Town 27 North, Range 11 West, more fully described as: Commencing at the North 1/4 corner of said Section 18; thence South 03°03'10" West, along the North and South One-Quarter line, 397.00 feet; thence South 88°34'49" East, 440.00 feet; thence South 03°03'10" West, 360.99 feet, parallel to said North-South 1/4 line of said Section 18, to a point on the centerline of Herkner Road; thence 338.25 feet on the arc of a 603.11 foot radius curve to the right, the long chord of which bears South 44°33'34" West, 338.83 feet; thence South 60°37'32" West, 258.84 feet, continuing along said centerline to the North-South 1/4 line of said Section 18; thence North 03°03'10" East, 737.25 feet, along said North-South 1/4 line to the Point of Beginning. Said parcel contains 5.93 acres.

SUBJECT TO all agreements, covenants, easements, right-of-ways, reservations and restrictions of record, if any.

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Jesse E. Mitchell
Professional Surveyor No. 54433

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CLIENT:
NORTHERN LAKES COMMUNITY CHURCH

LOCATION:
PART OF NORTHEAST 1/4 OF SECTION 18
TOWN 27 NORTH, RANGE 11 WEST
GARFIELD TOWNSHIP,
GRAND TRAVERSE COUNTY, MICHIGAN.



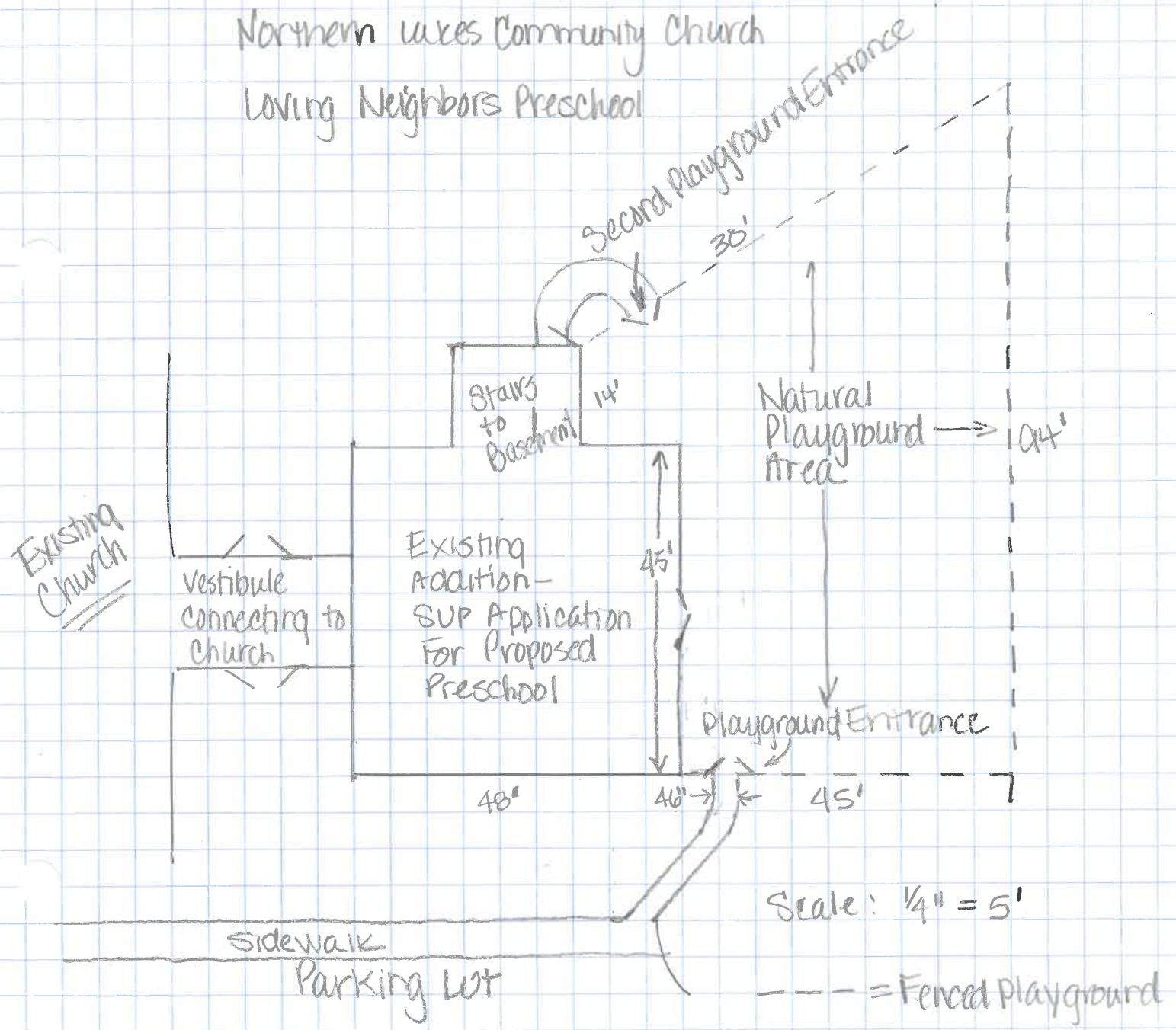
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CK. WPM	FLD. BK. X PG. X	SHEET 2 OF 2

October 16, 2022
update

Proposed Playground Area for
Northern Lakes Community Church
Loving Neighbors Preschool





Loving Neighbors Preschool: This photograph is from the parking lot. The larger building section on the left is the original church sanctuary building. The small connector building in the middle is the entrance for both the church and for the preschool. A foyer area. The building section on the right is going to house the preschool. The sidewalk that you will see on other photos is in the upper right area of the parking lot, near the large rock feature. This will provide access to the playground and a second door into the preschool building.



Loving Neighbors Preschool: This is the entrance to our church parking lot that is accessed via Herkner Road. The photograph was taken from across the street. The building is pretty well hidden from Herkner and most neighbors (probably not our best plan when we first built!).



Loving Neighbors Preschool: Entrance and foyer that connects the church building and the future preschool building. There are also double doors to the back yard area and a sidewalk...identical to the front doors.



Loving Neighbors Preschool: Sidewalk from parking lot into side yard of preschool building. After the playground and fencing is added this will go to a playground entrance (door), and to the side building entrance.



Loving Neighbors Preschool: Photo shows side of the Preschool building and location of future playground and the sidewalk approach from the parking lot. Red dashes show approximate location of playground. We kept it at least 10' short of the woods, so emergency vehicles could get through to the backyard of the church if needed.



Loving Neighbors Preschool: Photo also shows side of the Preschool building but more towards the back yard area. The playground will connect/end at the second corner marked with an X. The small white storage shed beyond the X is coming out.



The fencing on the left is the current fencing at the Children's House Montessori School, across from West High School. We like the look of the fencing that you can see through, and plan to use fencing that accomplishes this more open feel. The three fencing options below are what we are hoping to use (one like these), but have not done a full cost assessment of these options, so if it is acceptable to the township we would like to commit to an "open feel" fencing, that is finished with wood, and not just plain wood (too confining) and not chain link (not decorative enough).



Natural Playground Ideas:





