PACKET #2

GENOA CHARTER TOWNSHIP
PLANNING COMMISSION
PUBLIC HEARING
AUGUST 11, 2025
MONDAY
6:30 P.M.
AGENDA

CALL TO ORDER:

PLEDGE OF ALLEGIANCE:

APPROVAL OF AGENDA:

DECLARATION OF CONFLICT OF INTEREST:

CALL TO THE PUBLIC: (*Note: The Board reserves the right to not begin new business after 10:00 p.m.)*

OPEN PUBLIC HEARING #1… Consideration for a PUD agreement, environmental impact assessment, final PUD plan to construct a 55-unit single-family site condominium development located at the northwest corner of Challis Road and Bauer Road. The project includes the following parcels: 4711-23-400-008, 4711-23-400-007, 4711-23-400-001 and 4711-23-300-003. The request is submitted by Pulte Homes of Michigan.

A. Recommendation of Planned Unit Development Agreement
B. Recommendation of Environmental Impact Assessment (3-5-25)
C. Recommendation of Final PUD Site Plan (7-22-25)

OPEN PUBLIC HEARING #2…Consideration for a Special Land Use application, site plan and impact assessment for a drive through restaurant within a multi-tenant commercial building. The property is located at 1111 S. Latson Road (4711-09-100-043), east side of Latson Road, south of Grand River Avenue. The request is submitted by Kevin Bahnam

A. Recommendation of Special Use Application
B. Recommendation of Environmental Impact Assessment (5-27-25)
C. Recommendation of Site Plan (5-27-25)

OPEN PUBLIC HEARING #3… Consideration for a Special Land Use application, impact assessment, private road with a shared driveway for 7 new homes on 20.39 acres located at 6025 Brighton Road. Special Land Use is required for shared driveway crossing regulated wetland and 25-foot natural features buffer. The proposed development is for the following parcels: 4711-26-300-011 and 4711-27-400-012. The request is submitted Boss engineering.

A. Recommendation of Special Use Application
B. Recommendation of Environmental Impact Assessment (5-20-25)
C. Recommendation of Site Plan (7-22--25)

OPEN PUBLIC HEARING #4… Consideration of an ordinance amendment to Article 13 entitled "Environmental Protection Regulations" and Article 21 entitled "Administration and Enforcement". **STAFF REQUESTS ARTICLE 13 "ENVIRONMENTAL PROTECTION REGULATIONS" TO BE POSTED TO THE SEPTEMBER 8, 2025 PLANNING COMMISSION MEETING.**

A. Recommendation of Zoning Ordinance Amendment to Article 21 entitled "Administration and Enforcement".

ADMINISTRATIVE BUSINESS:

- Staff Report
- Approval of June 9, 2025 Planning Commission meeting minutes
- Member discussion
- Adjournment

*Citizen's Comments- In addition to providing the public with an opportunity to address the Planning Commission at the beginning of the meeting, opportunity to comment on individual agenda items may be offered by the Chairman as they are presented. Anyone speaking on an agenda item will be limited to 2 minutes.

GENOA CHARTER TOWNSHIP
Application for Site Plan Review

TO THE GENOA TOWNSHIP PLANNING COMMISSION AND TOWNSHIP BOARD:

APPLICANT NAME & ADDRESS: 1015 S. Latson Road, LLC - address 1111 S. Latson Road, Howell, MI 48843
If applicant is not the owner, a letter of Authorization from Property Owner is needed.

OWNER'S NAME & ADDRESS: Kevin Bahnam - 6280 Rue Du Lac, West Bloomfield, MI

SITE ADDRESS: 1111 S. Latson Road, Howell, MI 48843 PARCEL #(s): 4711-09-100-043

APPLICANT PHONE: (248)767-5337 OWNER PHONE: (248) 767-5337

OWNER EMAIL: kbahnam@usa2goquickstore.com

LOCATION AND BRIEF DESCRIPTION OF SITE:

See attached.

BRIEF STATEMENT OF PROPOSED USE: See attached.

THE FOLLOWING BUILDINGS ARE PROPOSED: No buildings are proposed. This substantially is in connection with a Special Land Use Application, which will not materially alter the previously approved site plan.

I HEREBY CERTIFY THAT ALL INFORMATION AND DATA ATTACHED TO AND MADE PART OF THIS APPLICATION IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

BY: Kevin Bahnam K. Bl Kevin Bahnam (May 22, 2025 15:35 EDT)

ADDRESS: 6280 Rue Du Lac, West Bloomfield, MI

Contact Information - **Review Letters and Correspondence shall be forwarded to the following:**

1.) Catherine A. Riesterer (Name) of Cooper, Riesterer, & Gross (Business Affiliation) at cathy@crlaw.biz (E-mail Address)

FEE EXCEEDANCE AGREEMENT

As stated on the site plan review fee schedule, all site plans are allocated two (2) consultant reviews and one (1) Planning Commission meeting. If additional reviews or meetings are necessary, the applicant will be required to pay the actual incurred costs for the additional reviews. If applicable, additional review fee payment will be required concurrent with submittal to the Township Board. By signing below, applicant indicates agreement and full understanding of this policy.

SIGNATURE: K.BL Kevin Bahnam ;May 22, 2025 15:35 EDT) DATE: 5/27/25

PRINT NAME: Kevin Bahnam PHONE: 248-767-5337

ADDRESS: 6280 Rue Du Lac, West Bloomfield, MI

ATTACHMENT TO SITE PLAN REVIEW

MAY 27, 2025

1111 S Latson Road, Howell, MI 48843

4711-09-100-043

LOCATION AND BRIEF DESCRIPTION OF SITE

The project site is on parcel # 4711-09-100-043 in Section 9, Genoa Township, Livingston County, MI, and is in the general commercial zoning district.

The subject site is bordered:

- On the north by the 1.14 acre +/- parcel zoned General Commercial (GCD) with an existing O'Reilly Auto Parts store.
- On the east by the 9.13 acre +/- parcel zoned General Commercial (GCD) with the Country Corners Shopping center.
- On the east and south by the 12.09 acre +/- parcel zoned High Density Residential (HDR) with the Prentis Estates Apartments. An approximately 4' tall berm is directly along the property line here on the adjacent HDR parcel and is planted with large Red and Scotch Pines ranging in size from 11" d.b.h. to 24" d.b.h. There is an additional evergreen screen just south of the berm along the east property line planted with White Cedar.
- On the west by S. Latson Road is the Non-Residential PUD shopping center with Walmart, PetSmart, Lowe's and various fast-food restaurants.
- The north side of the proposed project will be immediately adjacent to another proposed development project within the GCD zoning.

The subject site is part of the South Latson Commercial Development, as previously approved in 2024, which will contain a multi-tenant commercial building housing retail and restaurants, and a car wash. A drive-thru coffee shop was previously approved for the commercial building. The site has a full access drive that aligns with the Lowe's drive on the opposite side of Latson Road, and has been designed with a separate drive through lane in addition to a full access lane around the site.

PROPOSED USE

This application for special land use is made with respect to the northern end of the multi-tenant commercial building that was previously approved for a drive-thru coffee shop. In connection with that approval, the applicant went through the township's zoning board of appeals to have the drive-thru approved with a variance for a required setback. Since the initial approval of the coffee shop, the applicant has been approached by Chipotle, who wishes to locate in the building where the drive-thru coffee shop would have been. When this was initially discussed with the township, it was discovered that while drive-thru coffee shops were allowed in general commercial zoning, drive-thru fast casual restaurants were allowed only in the regional commercial district. The applicant, therefore, initially sought to have this property rezoned to RCD so that it could proceed to allow the drive-thru fast casual restaurant. That action resulted in a discussion by the township as to the need to update the general commercial section of the Township's zoning ordinance regarding drive-thru restaurants. As a result of that discussion, changes were made to the zoning ordinance to allow a drive-thru restaurant in the general commercial zoning district as a special use. That change became effective on May 18, 2025. Therefore, the applicant now seeks a special land use approval for a drive-thru restaurant for this site pursuant to the newly enacted ordinance provisions.

GENOA CHARTER TOWNSHIP
Special Land Use Application

This application **must** be accompanied by a site plan review application and the associated submittal requirements. (The Zoning Official may allow a less detailed sketch plan for a change in use.)

APPLICANT NAME & ADDRESS: 1015 S. Latson Road, LLC - address 1111 S. Latson Road, Howell, MI 48843
Submit a letter of Authorization from Property Owner if application is signed by Acting Agent.

APPLICANT PHONE: (248 767-5337 EMAIL: kbahnam@usa2goquickstore.com

OWNER NAME & ADDRESS: Kevin Bahnam - 6280 Rue Du Lac, West Bloomfield, MI

SITE ADDRESS: 1111 S. Latson Road, Howell, MI 48843 PARCEL #(s): 4711-09-100-043

OWNER PHONE: (248 767-5337 EMAIL: kbahnam@usa2goquickstore.com

Location and brief description of site and surroundings:
See attached

Proposed Use:
See attached

Describe how your request meets the Zoning Ordinance General Review Standards (section 19.03):

a. Describe how the use will be compatible and in accordance with the goals, objectives, and policies of the Genoa Township Comprehensive Plan and subarea plans, and will promote the Statement of Purpose of the zoning district in which the use is proposed.

See attached

b. Describe how the use will be designed, constructed, operated, and maintained to be compatible with, and not significantly alter, the existing or intended character of the general vicinity.

See attached

c. How will the use be served adequately by essential public facilities and services such as highways, streets, police and fire protection, drainage structures, water and sewage facilities, refuse disposal and schools?

See attached

d. Will the use involve any uses, activities, processes, or materials potentially detrimental to the natural environment, public health, safety, or welfare by reason of excessive production of traffic, noise, vibration, smoke, fumes, odors, glare, or other such nuisance? If so, how will the impacts be mitigated?

See attached

e. Does the use have specific criteria as listed in the Zoning Ordinance (sections 3.03.02, 7.02.02, & 8.02.02)? If so, describe how the criteria are met.

See attached.

I HEREBY CERTIFY THAT ALL INFORMATION AND DATA ATTACHED TO AND MADE PART OF THIS APPLICATION ARE TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF. I AGREE TO DESIGN, CONSTRUCT AND OPERATE, AND MAINTAIN THESE PREMISES AND THE BUILDINGS, STRUCTURES, AND FACILITIES WHICH ARE GOVERNED BY THIS PERMIT IN ACCORDANCE WITH THE STATED REQUIREMENTS OF THE GENOA TOWNSHIP ZONING ORDINANCE, AND SUCH ADDITIONAL LIMITS AND SAFEGUARDS AS MAY BE MADE A PART OF THIS PERMIT.

THE UNDERSIGNED Kevin Bahnam STATES THAT THEY ARE THE FREE OWNER OF THE PROPERTY OF PROPERTIES DESCRIBED ABOVE AND MAKES APPLICATION FOR THIS SPECIAL LAND USE PERMIT.

BY: K.B
Kevin Bahnam (May 22, 2025 15:36 EDT)

ADDRESS: 6280 Rue Du Lac, West Bloomfield, MI

Contact Information - Review Letters and Correspondence shall be forwarded to the following:

Catherine A. Riesterer	of Cooper, Riesterer, & Gross, PLC	at cathy@crlaw.biz
Name	Business Affiliation	Email

FEE EXCEEDANCE AGREEMENT

As stated on the site plan review fee schedule, all site plans are allocated two (2) consultant reviews and one (1) Planning Commission meeting. If additional reviews or meetings are necessary, the applicant will be required to pay the actual incurred costs for the additional reviews. If applicable, additional review fee payment will be required concurrent with submittal to the Township Board. By signing below, applicant indicates agreement and full understanding of this policy.

SIGNATURE: K.B DATE: 05

PRINT NAME: Kevin Bahnam PHONE: 248 767-5337

Revised 08-15-13. kasp

ATTACHMENT TO SPECIAL LAND USE APPLICATION

MAY 23, 2025

1111 S Latson Road, Howell, MI 48843

4711-09-100-043

LOCATION AND BRIEF DESCRIPTION OF SITE AND SURROUNDINGS

The project site is on parcel # 4711-09-100-043 in Section 9, Genoa Township, Livingston County, MI, and is in the general commercial zoning district.

The subject site is bordered:

- On the north by the 1.14 acre +/- parcel zoned General Commercial (GCD) with an existing O'Reilly Auto Parts store.
- On the east by the 9.13 acre +/- parcel zoned General Commercial (GCD) with the Country Corners Shopping center.
- On the east and south by the 12.09 acre +/- parcel zoned High Density Residential (HDR) with the Prentis Estates Apartments. An approximately 4' tall berm is directly along the property line here on the adjacent HDR parcel and is planted with large Red and Scotch Pines ranging in size from 11" d.b.h. to 24" d.b.h. There is an additional evergreen screen just south of the berm along the east property line planted with White Cedar.
- On the west by S. Latson Road is the Non-Residential PUD shopping center with Walmart, PetSmart, Lowe's and various fast-food restaurants.
- The north side of the proposed project will be immediately adjacent to another proposed development project within the GCD zoning.

The subject site is part of the South Latson Commercial Development, as previously approved in 2024, which will contain a multi-tenant commercial building housing retail and restaurants, and a car wash. A drive-thru coffee shop was previously approved for the commercial building. The site has a full access drive that aligns with the Lowe's drive on the opposite side of Latson Road, and has been designed with a separate drive through lane in addition to a full access lane around the site.

PROPOSED USE

This application for special land use is made with respect to the northern end of the multi-tenant commercial building that was previously approved for a drive-thru coffee shop. In connection with that approval, the applicant went through the township's zoning board of appeals to have the drive-thru approved with a variance for a required setback. Since the initial approval of the coffee shop, the applicant has been approached by Chipotle, who wishes to locate in the building where the drive-thru coffee shop would have been. When this was initially discussed with the township, it was discovered that while drive-thru coffee shops were allowed in general commercial zoning, drive-thru fast casual restaurants were allowed only in the regional commercial district. The applicant, therefore, initially sought to have this property rezoned to RCD so that it could proceed to allow the drive-thru fast casual restaurant. That action resulted in a discussion by the township as to the need to update the general commercial section of the Township's zoning ordinance regarding drive-thru restaurants. As a result of that discussion, changes were made to the zoning ordinance to allow a drive-thru restaurant in the general commercial zoning district as a special use. That change became effective on May 18, 2025. Therefore, the applicant now seeks a special land use approval for a drive-thru restaurant for this site pursuant to the newly enacted ordinance provisions.

DESCRIBE HOW YOUR REQUEST MEETS THE ZONING ORDINANCE GENERAL REVIEW STANDARDS

a. Describe how the use will be compatible and in accordance with the goals, objectives, and policies of the Genoa Township Comprehensive Plan and subarea plans, and will promote the Statement of Purpose of the zoning district in which the use is proposed.

As noted above, the township just passed an amendment to its zoning ordinances for the general commercial zoning district to specifically allow drive-thru restaurants in general commercial zoning. This intended use is therefore consistent with the current and updated zoning ordinance. As it is located on Latson Road near the I-96 interchange which has been identified as an area appropriate for fast service restaurants, it is therefore compatible with the current and future zoning for the area.

b. Describe how the use will be designed, constructed, operated, and maintained to be compatible with, and not significantly alter, the existing or intended character of the general vicinity.

As noted above, the building in which this use will be located has been approved and has been deemed to be compatible with the character of the general vicinity. The specifics of the adjacent boundaries are noted above and include other general commercial uses, including fast food, and high density residential. This project is in the heart of a busy commercial area and the use will be generally compatible.

c. How will the use be served adequately by essential public facilities and services such as highways, streets, police and fire protection, drainage structures, water and sewage facilities, refuse disposal and schools?

Again as noted, this site has been approved. The MHOG sanitary runs along the west property line and south Latson Road. MHOG water runs along the east property line and the adjacent parcel. This project is near the Latson interchange on Latson Road and therefore provides for adequate access to streets and highways and necessary utilities.

d. Will the use involve any uses, activities, processes, or materials potentially detrimental to the natural environment, public health, safety, or welfare by reason of excessive production of traffic, noise, vibration, smoke, fumes, odors, glare, or other such nuisance? If so, how will the impacts be mitigated?

When the coffee shop was previously approved for this location, the applicant provided a traffic impact study for the site. That study is attached hereto. Boss Engineering has provided an updated letter, which indicates that use by a fast casual restaurant will produce significantly less traffic than would the previously approved drive-thru coffee restaurant. Of particular note, the hours when the use is likely to be busy will not include morning rush hour traffic. Operation of restaurants are authorized in this zoning district and there are numerous restaurants in the surrounding area. Therefore, there will be no other noises or environmental impacts that are inconsistent than those that are currently occurring in the adjoining areas. Additionally, the commercial building when approved contains appropriate screening from the adjacent high density residential.

e. Does the use have specific criteria as listed in the Zoning Ordinance (sections 3.03.02, 7.02.02, & 8.02.02)? If so, describe how the criteria are met.

Yes, the amendments to the general commercial zoning district refer to 7.02.02(j). All requirements are met, with the exception of 7.02.02(j)(2), which states that the establishment of a new drive-thru

restaurant shall require that the lot be separated a minimum of 500 ft from any other lot containing a drive-thru. The new ordinance language, however, allows the planning commission to waive this requirement for uses with vehicular access to an internal service drive and where other criteria are met. We believe this site meets all required criteria for modification. As noted, this requirement also exists for a drive-thru coffee shop. The applicant successfully obtained a variance from that requirement from the zoning board of appeals for this site. As demonstrated by the letter from Boss Engineering, a coffee shop would provide more traffic than a drive-thru restaurant, particularly at peak hours. Accordingly, the prior approval and reduced impact supports the planning commissions use of its discretion with respect to this requirement. The prior ZBA variance was conditional upon traffic and pavement impact modifications that were recommended by the Livingston County Road Commission and MDOT. The applicant is prepared to include those modifications with this project to address this issue.

Moved by Lowe, supported by Hunt, to approve the Environmental Impact Assessment dated January 16, 2024 to allow for a proposed automatic car wash on the northern portion of vacant parcel #4711-04-300-017. The site is located on the east side of Latson Road, south side of Grand River Avenue with the following condition:

- Official approval from MDOT for the stormwater discharge shall be submitted prior to land use permit issuance.

The motion carried unanimously.

Moved by Hunt, supported by Lowe, to approve of the Site Plan dated March 14, 2024 to allow for a proposed automatic car wash on the northern portion of vacant parcel #4711-04-300-017. The site is located on the east side of Latson Road, south side of Grand River Avenue, with the following conditions:

- The required concrete pad at the Dumpster enclosure shall be installed.
- The property split shall be approved prior to land use permit issuance.
- The limited access driveway should remain at 15-foot width or preferably be eliminated. The applicant shall work with the Livingston County Road Commission, Brighton Area Fire Dept., and Township staff on the final design.
- The applicant shall use all available efforts to establish the connection to the north.
- An executed cross access easement with the property to the south shall be submitted and recorded prior to land use permit issuance.
- All site plan review overage fees must be paid prior to issuance of a land use permit.

The motion carried unanimously.

5. Consideration of a recommendation for approval of a special land use application, environmental impact assessment, and site plan to allow for a proposed multi-tenant commercial center including a drive-through coffee shop and outdoor seating restaurant. The site consists of vacant parcels #4711-04-300-017 and 4711-09-100-004 and is located on the east side of Latson Road, south of Grand River Avenue. The request is petitioned by Kevin Bahnam, 1015 Latson Road LLC.
A. Disposition of Special Use Application.
B. Disposition of Environmental Impact Assessment (1-16-24)
C. Disposition of Site Plan (3-14-24)

Mr. Brent LaVanway of Boss Engineering, Mr. Jeff Klatt, the architect, and Mr. Travis Sokana with Symmetry Management were present.

Mr. LaVanway provided a review of the project, which will have multiple tenants, one of which is a drive thru. They will need a variance from the ZBA for the drive thru as it is within 500 feet of another drive thru restaurant. They will be on their April agenda.

Ms. Hunt reiterated her concerns for the underground storage tanks for stormwater, but the engineer and Planning Commission approved them. She likes the building design. She confirmed that the existing entrance drive on Latson will be removed and Mr. LaVanway stated, “yes”.

Supervisor Rogers likes the building design as well. He asked if the applicant knew what the other tenants would be and if they would be combined. Mr. Lavanway stated that the amount of parking available will determine what uses can be here.

Moved by Skolarus, supported by Lowe, to approve the Special Use Permit to allow for a proposed multi-tenant commercial center including a drive-through coffee shop and outdoor seating restaurant located on vacant parcels #4711-04-300-017 and 4711-09- 100-004. The site is located on the east side of Latson Road, south side of Grand River Avenue with the following condition:

- A variance from the Zoning Board of Appeals shall be obtained for the 500-foot requirement from an existing drive-though.

The motion carried unanimously.

Moved by Lowe, supported by Hunt, to approve the Environmental Impact Assessment dated January 16, 2024 to allow for a proposed multi-tenant commercial center including a drive-through coffee shop and outdoor seating restaurant located on vacant parcels #4711-04-300-017 and 4711-09-100-004. The site is located on the east side of Latson Road, south side of Grand River with the following condition:

- Official approval from MDOT for the stormwater discharge shall be submitted prior to land use permit issuance.

The motion carried unanimously.

Moved by Ledford, supported by Lowe, to approve of the Site Plan dated March 14, 2024 to allow for a proposed multi-tenant commercial center including a drive through coffee shop and outdoor seating restaurant located at vacant parcels #4711-04- 300-017 and 4711-09-100-004. The site is located on the east side of Latson Road, south side of Grand River Avenue, with the following conditions:

- The required concrete pad for the Dumpster enclosure shall be installed.
- The reconfiguring of the parcels shall be approved prior to land use permit issuance.
- An executed cross access easement with the property to the north shall be submitted and recorded prior to land use permit issuance.
- All site plan review overage fees must be paid prior to issuance of a land use permit.

The motion carried unanimously.

6. **Consideration of a recommendation for approval of a special land use application, environmental impact assessment, and site plan to allow for outdoor RV/camper storage. The site is located at 2630 Grand River Avenue on the south side of Grand**

LCRC's request for the signal changes. Mr. Tougisnant stated they will be working with MDOT to modify the signalization as requested.

Commissioner Dhaenens is satisfied with the landscaping provided and would not require the petitioner to add additional trees.

The call to the public was made at 7:36 pm with no response.

Moved by Commissioner Rassel, supported by Commissioner Chouinard, to recommend to the Township Board approval of the Special Use Application to allow for a proposed automatic car wash located on vacant parcels #4711-04-300-017 ~~and 4711-09-100-017~~ Latson Road, east side of Latson Road, south side of Grand River Avenue as this Commissioner finds that the special land use standards of Section 19.03 are generally met and the conditions of Section 7.02.02(l) have been met. **The motion carried unanimously**.

Moved by Commissioner Rassel, supported by Commissioner Chouinard, to recommend to the Township Board approval of the Environmental Impact Assessment dated January 16, 2024 to allow for a proposed automatic car wash located on vacant parcels #4711-04-300-017 ~~and 4711-09-100-017~~ Latson Road, east side of Latson Road, south side of Grand River Avenue. **The motion carried unanimously**.

Moved by Commissioner Rassel, supported by Commissioner Rauch, to recommend to the Township Board approval of the Site Plan dated January 16, 2024 to allow for a proposed automatic car wash located on vacant parcels #4711-04-300-017 ~~and 4711-09-100-017~~ Latson Road, east side of Latson Road, south side of Grand River Avenue, with the following conditions:

- The color of the fencing shall be changed from blue to a dark bronze or black color.
- The required concrete pad at the Dumpster enclosure shall be installed.
- The Planning Commission approves the landscape deficiency.
- The property split of this parcel shall be approved.

The motion carried unanimously.

OPEN PUBLIC HEARING #3…Consideration of a special land use application, environmental impact assessment and site plan to allow for a proposed multi-tenant commercial center including a drive through coffee shop and outdoor seating restaurant located on vacant parcels#:4711-04-300-017 and 4711-09-100-~~017~~ 004 Latson Road, east side of Latson Road, south side of Grand River Avenue. The request is petitioned by Kevin Bahnam, 1015 Latson Road LLC.
A. Recommendation of Special Use Application.
B. Recommendation of Environmental Impact Assessment (1-16-24)
C. Recommendation of Site Plan (1-16-24)

Mr. Scott Tousignant of Boss Engineering and Jeff Klatt, the architect, were present. Mr. Tousignant stated that MDOT's approval for the stormwater discharge applies to this site as well. He provided the changes made to the previous plans after discussions with the Planning Commission. They have relocated the access drive further to the north per the LCRC's request, moved the building closer to the access drive, relocated a bank of parking spaces, eliminated the site access from the right side of the property, and added the sidewalk.

Mr. Borden reviewed his letter dated February 6, 2024.

1. Special Land Uses (Section 19.03):
   a. The special land use standards of Section 19.03 are generally met.
   b. In order to make favorable findings related to compatibility and impacts, the conditions of Sections 7.02.02(i) and (j) and the buffer zone requirements of Section 12.02.03 must be met to the Commission's satisfaction.
   c. If a favorable recommendation is made, the Commission may wish to include a condition that a sound study be provided for the drive-through speaker system when the tenant is known.
   d. The applicant must address any comments provided by the Township Engineer or Brighton Area Fire Authority regarding public facilities and services.

2. Drive-Through Use Conditions (Section 7.02.02(j)):
   a. The 500-foot spacing between drive-throughs is not met (approximately 120 feet). The applicant notes that they will seek a variance from ZBA.

3. Site Plan Review:
   a. Building materials and color scheme are subject to review and approval by the Planning Commission.
   b. The landscape plan is deficient in width and a full screen wall for the easterly buffer zone; there is only a partial screen wall.

Mr. Barber reviewed Ms. Byrne's letter dated February 6, 2024 states:

1. The petitioner should obtain approval from the Livingston County Road Commission (LCRC) for the proposed site driveway prior to final site plan approval.
2. The petitioner is proposing a closed pipe type underground detention basin comprised of five 42-inch diameter pipes to provide 16,890 cubic feet of storage. The proposed building, site drive, and parking improvements do not allow enough space for any at-grade stormwater detention or retention.
3. Soil borings and infiltration testing should be provided within the proposed detention basin footprint and should show the documented high groundwater elevation. Soil borings shall be provided to a depth of at least 20 feet. The petitioner has noted that no geotechnical work has been completed for the site yet, but the geotechnical from the northern parcel was used for the current design. The infiltration rate and soil borings being used for the current design should be confirmed prior to construction of the storm system. Mr. Tousignant stated they will obtain those.

4. The proposed underground detention basin will tie into the existing storm sewer on Latson Road. The LCRC has indicated that the existing storm sewer is under MDOT jurisdiction and approval from MDOT will be required to connect to it. If approval from MDOT cannot be obtained the proposed site layout and storm management plan would change significantly, therefore we recommend that approval from MDOT be obtained prior to bringing the site plan before the Township Planning Commission.
5. The LCRC completed a review of the traffic impact study and plans, and the study was revised per their recommendation. The study recommended signal modifications at the Grand River Avenue and Latson Road intersection, which would need to be reviewed and discussed with MDOT. The study also recommended restricting the northernmost site driveway to right-in-right-out and aligning the southernmost site driveway to align directly with the existing Lowes driveway. Both site driveway recommendations have been addressed on the revised plans.

The Brighton Area Fire Authority Fire Marshal's letter dated February 2, 2024 states "The East drive clear width has been reduced to 23.5-feet and shall be increased to 26-feet as required. West drive fire lane signs are facing the incorrect direction." Mr. Tousignant stated they will amend the plans to meet the

Commissioner Rauch thanked the applicant for making the revisions. He is very happy with the building colors and materials. He noted that the color of the fencing should be changed as requested in the previous project.

Commissioner McCreary questioned the traffic impact study. Mr. Tousignant stated the changes to the signalization at Grand River and Latson Road will be made to improve the peak hour grades. This will be done at the time the project is developed.

Commissioner Dhaenens questioned Mr. Borden's suggestion regarding the noise ordinance and the drive thru speaker. Mr. Borden stated that since we do not know what is being built there, the Commission may wish to include a condition that a sound study be provided for the drive-through speaker system when the tenant is known.

The call to the public was made at 8:00 pm with no response.

Moved by Commissioner Chouinard, supported by Commissioner Rassel, to recommend to the Township Board approval of the Special Use Application to allow for a proposed multi-tenant commercial center including a drive through coffee shop and outdoor seating restaurant located on vacant parcels#:4711-04-300-017 and 4711-09-100-~~017~~ 004 Latson Road, east side of Latson Road, south side of Grand River Avenue. **The motion carried unanimously.**

Moved by Commissioner Chouinard, supported by Commissioner Rassel, to recommend to the Township Board approval of the Environmental Impact Assessment dated January 16, 2024 to allow for a proposed multi-tenant commercial center including a drive through coffee shop and

outdoor seating restaurant located on vacant parcels#:4711-04-300-017 and 4711-09-100-~~017~~ 004 Latson Road, east side of Latson Road, south side of Grand River Avenue. **The motion carried unanimously.**

Moved by Commissioner Chouinard, supported by Commissioner Rauch to recommend to the Township Board approval of the Site Plan dated January 16, 2024 to allow for a proposed multi-tenant commercial center including a drive through coffee shop and outdoor seating restaurant located on vacant parcels#:4711-04-300-017 and 4711-09-100-~~017~~ 004 Latson Road, east side of Latson Road, south side of Grand River Avenue, with the following conditions:

- The color of the fencing shall be changed from blue to a dark bronze or black color.
- The ZBA's approval of the future drive thru uses.
- The required concrete pad at the Dumpster enclosure shall be installed.
- The property split of this parcel shall be approved.
- All conditions by other agencies shall be met.

The motion carried unanimously.

NEW BUSINESS:

OPEN PUBLIC HEARING #4...Consideration of a special land use application, environmental impact assessment and site plan to allow for temporary boat sales and service at an existing commercial site located at 5776 Grand River Avenue, south side of Grand River Avenue, west of Dorr Road. The request is petitioned by Wonderland Marine West.
A. Recommendation of Special Use Application
B. Recommendation of Environmental Impact Assessment (~~11-29-23~~1-16-24)
C. Recommendation of Site Plan ~~(2-16-24~~2-19-24)

Mr. Gary Mitter, Sr. stated they are in the process of renovating their existing building, and during construction, they need a temporary building. They purchased the building next to their business. They will be remodeling it and it will match the same style as their renovated existing building.

Mr. Borden reviewed his letter dated March 5, 2024.
1. Special Land Uses (Section 19.03):
   a. The special land use standards of Section 19.03 are generally met.
   b. In order to make favorable findings related to compatibility and impacts, the use requirements of Section 7.02.02(c) must be met to the Commission's satisfaction.
   c. The applicant must address any comments provided by the Township Engineer or Brighton Area Fire Authority regarding public facilities and services.

2. Use Requirements (Section 7.02.02(c)):
   a. The majority of the use conditions are met; however, the buffer zone/screen fence requirement for outdoor storage is not fully met at the rear of the site. They are proposing

- The practical difficulty is that strict compliance with the setbacks would cause the applicant to be unable to construct the proposed single family home. Other homes in the vicinity have reduced side yard setbacks that will support substantial justice and is necessary for the preservation and enjoyment of a substantial property right possessed by other properties in the same vicinity
- The granting of the variances will not impair an adequate supply of light and air to adjacent property or unreasonably increase the congestion in public streets or increase the danger of fire or endanger the public safety, comfort, morals or welfare of the inhabitants of the Township of Genoa.
- The proposed variances would have little impact on the appropriate development, continued use, or value of adjacent properties and the surrounding neighborhood.

The approval is conditioned upon the following:

1. The structure to be guttered with downspouts.
2. If retaining walls are required, they must adhere to the township zoning ordinance and receive a land use permit.

The motion carried unanimously.

~~3. 24-10…A request by MITTS LLC, 5776 E. Grand River Avenue, for a front yard setback variance and any other variance deemed necessary by the Zoning Board of Appeals, to allow barrier-free parking near the building entrance. (REQUEST TO WITHDRAW)~~

4. 24-12…A request by 1015 Latson Road LLC, 1111 S. Latson Road, for a setback variance and any other variance deemed necessary by the Zoning Board of Appeals, to allow for a drive-thru.

Mr. Brent LaVanway from Boss Engineering and Mr. Travis O'Connor, representing the property owner, were present.

Chairperson McCreary advised the Board Members that this was recommended to be approved by the Planning Commission; however, it was conditioned upon this variance being approved.

Mr. LaVanway provided a review of the project and the property. A drive-thru is allowed as a special use; however, a variance is needed because of the distance between this property and Panda Express, which has an existing drive-thru. He stated the applicant had purchased the property and was in the process of planning its development but the Panda Express was approved and built first. This drive thru is over 700 feet from the Panera Drive through and over 800 feet from the Panda Express, but the ordinance states 500 feet from lot line to lot line. The parcel is only 88 feet from the Panda Express Parcel

This will not have a negative impact on the surrounding area. It was recommended for approval by the Planning Commission and approved by the Township Board. The practical difficulty is the configuration of the Panda Express Parcel and how it came in after this property was purchased and the planning began.

They have worked with the township, Brighton Area Fire Authority, and Livingston County Road Commission regarding the two entrances. The entrance that is directly across from the Wal Mart driveway will be the primary entrance and the entrance to the north, on the car wash parcel, will be the secondary and will be a right on and right out. They are required to have both of these entrances from the LCRC.

Ms. Ruthig stated that township staff are working with O'Reilly's for an easement from them for the second entrance and then the right in/right out will be removed.

Mr. O'Connor stated there is no committed tenant for this space. Mr. LaVanway stated in developments such as this, a coffee shop is an anchor, and they want to have a drive thru. Having a coffee shop helps the marketing for the other tenants. Ms. Ruthig advised that a coffee shop is the only use that is allowed in this space.

Mr. Rockwell stated that this is not zoned for a drive thru, but it's allowed through a special use, and now they are asking for a variance. Ms. Ruthig stated it is zoned for a coffee shop with a special use. In a different zoning district, a drive-thru would not be allowed. The applicant is not asking for a variance from the zoning district. She added that a fast-food restaurant would not be allowed here.

Board Member Fons noted that there are seven lanes of roadway between the two drive thru windows and the Panda Express lot has an irregular shape.

Mr. LaVanway stated that part of the traffic study included the intersection of Latson Road and Grand River, and traffic signal timing issues will need to be done to improve the traffic score at this location. These types of uses are local uses, and not destinations, so the drive-by traffic are people who would be traveling in this area already.

Board Member Rockwell is not in favor of the increase in traffic in this area.

The call to the public was opened at 7:37 pm with no response.

Moved by Board Member Kreutzberg, supported by Board Member Fons, to approve Case #24-12 submitted by 1015 Latson Road LLC for 1111 Latson Road a drive-through setback variance of 412 feet from the required 500 feet for a setback of 88 feet, to allow construction of a drive-thru coffee shop within 500 feet of another drive-thru restaurant, based on the following findings of fact:

- Strict complaint with the setbacks would unreasonably restrict use of the property. This variance will provide substantial justice, is the least necessary and would make the property consistent with other restaurants in the area.

- The need for variance is driven by a proposed use, extraordinary size and depth of parcel, which reduce the list of permissible uses. Site plan approval was recommended from the Planning Commission and granted by the Township Board.
- Granting of this variance would not impair adequate light or air to adjacent properties, would not increase congestion or increase danger of fire or threaten public safety or welfare.
- Proposed variance would have little impact on appropriate development, continued use or value of adjacent properties and surrounding neighborhood.

This approval is conditioned upon the following:

1. As noted by project engineering traffic and pavement impact modifications must be implemented as recommended by the Livingston County Road Commission and MDOT.

The motion carried (Fons - yes; Kreutzberg - yes; Rockwell - no; McCreary - yes; Ledford - yes).

5. 24-11…A request by Michael Brown, 4655 Sweet Road, for a side yard setback variance and any other variance deemed necessary by the Zoning Board of Appeals, to allow solar panels to remain.

Mr. Brown stated that if the solar panels were put in a location to meet the ordinance, it would have completely blocked their view of the lake. He thought that the solar panel company was going to obtain the correct permits prior to placing them on the side of the house. That company is now out of business. He has spent $45,000 and it would cost another $20,000 to have them moved, but then they would block his view of the lake. He has listed his home for sale and will build a new home on another parcel that he owns on Sweet Road.

Chairperson McCreary confirmed that the solar panel company is out of business.

Board Member Kreutzberg stated that the solar panels are on top of the septic tank and within view of the neighbor.

There was a discussion regarding the actual location of the solar panels on the property as there is a discrepancy of the survey and the information that was provided by the applicant. The variance needed is 22 feet, and the setback is 18 feet.

Board Member Rockwell noted that the property to the east of Mr. Brown's may be developed one day and the panels would be within view of that neighbor.

The call to the public was opened at 8:07 pm.

Mr. Wade Migliore, who owns property near Mr. Brown stated he was not aware that the solar panels were there. He does not have an issue with them. He agreed to sell Mr. Brown part of his property adjacent to him to ensure that he meets the ordinance.

The call to the public was closed at 8:09 pm.

July 31, 2025

Planning Commission
Genoa Township
2911 Dorr Road
Brighton, Michigan 48116

Attention:	Amy Ruthig, Planning Director
Subject:	South Latson Commercial Development – Special Land Use and Site Plan Review #2
Location:	1111 S. Latson Road – east side of Latson Road, south side of Grand River Avenue
Zoning:	GCD General Commercial District

Dear Commissioners:

At the Township's request, we have reviewed the revised submittal materials requesting special land use review/approval for a drive-through restaurant within a multi-tenant commercial building (plans dated 5/27/25).

A. Summary

1. Special Land Uses (Section 19.03):
- a. The special land use standards of Section 19.03 are generally met.
- b. In order to make favorable findings related to compatibility and impacts, the use conditions of Section 7.02.02(j) must be met to the Commission's satisfaction.
- c. The applicant must address any comments provided by the Township Engineer or Brighton Area Fire Authority regarding public facilities and services.

2. Drive-Through Use Conditions (Section 7.02.02(j)):
- a. Planning Commission has the authority to waive/modify the 500-foot spacing requirement between drive-throughs.
- b. The rear yard buffer zone provides the required plantings, but is deficient in width and a full length screen wall/fence (similar to the previously approved plan).
- c. In our opinion, the plan may benefit from some additional directional signage or pavement markings to help patrons properly navigate the site.
- d. The plan provides a partial escape lane. Planning Commission has the authority to waive/modify the escape lane requirement.

3. Site Plan Review:
- a. Building materials and color scheme are subject to review/approval by the Planning Commission.
- b. The rear yard buffer zone B is deficient in width and screen wall/fence length; however, the Planning Commission has the discretion to modify these requirements (similar to the previously approved plans).

Aerial view of site and surroundings (looking east)

B. Background/Proposal/Process

The applicant previously obtained special land use and site plan approval for development of a multi-tenant commercial building, including outdoor seating and a drive-through coffee shop. A variance was also granted by the ZBA to reduce the drive-through spacing requirement for the coffee shop.

The applicant now seeks consideration of a drive-through restaurant, as opposed to a coffee shop, which requires a new review.

Due to recent amendments to the Township Zoning Ordinance, Table 7.02 now allows drive-through restaurants with special land use approval in the GCD. The request is also subject to the use conditions of Section 7.02.02(j).

Procedurally, the Planning Commission is to review the special land use, site plan, and Environmental Impact Assessment, and put forth recommendations on each to the Township Board.

C. Special Land Use Review

Section 19.03 of the Zoning Ordinance identifies the review criteria for Special Land Use applications as follows:

1. **Master Plan.** The Township Master Plan identifies the subject site as Mixed Use – West Grand River. This classification states that "regional commercial uses, such as auto-oriented uses (including fast-food) are only intended at interchange uses and where otherwise currently existing along Grand River Avenue."

   The subject site is located near a major roadway intersection and within close proximity to the S. Latson/I-96 interchange. Furthermore, there are other auto-oriented uses (gas stations and drive-throughs) in the immediate area.

   As such, the Commission may find that the proposal is consistent with the Master Plan.

2. **Compatibility.** Surrounding properties are primarily commercial/service in nature, though the site also abuts residential zoning and land use along the east side lot line.

   The primary concerns under this criterion are related to potential impacts upon the adjacent residential property (light and noise).

   The use conditions of Section 7.02.02(j) and landscaping and lighting requirements of Article 12 are intended to help mitigate potential off-site impacts. In order to make a favorable finding under this criterion, these standards must be met to the Commission's satisfaction.

3. **Public Facilities and Services.** Given that the site fronts Latson Road near Grand River Avenue, was previously developed, and recently obtained special land use and site plan approval, we believe that necessary public facilities and services are in place for the proposal.

   However, the applicant must address any comments provided by the Township Engineer and/or Brighton Area Fire Authority related to this criterion.

4. **Impacts.** Similar to comments above, use conditions and buffering requirements must be met to the Township's satisfaction to ensure that the adjacent residential use is not adversely impacted by the proposed development.

   It is worth noting that the intended drive-through use is that of a pick-up lane and not a full-service drive-through, which will help to further mitigate any potential off-site impacts.

5. **Mitigation.** If further concerns arise as part of the review process, the Township may require additional efforts to mitigate potential adverse impacts.

D. Use Conditions

Drive-through restaurants are subject to the use requirements of Section 7.02.02(j), as follows:

1. **Principal and accessory buildings shall be setback a minimum of fifty (50) feet from any adjacent public right of way line or property line.**

The building provides setbacks in excess of 50 feet from each lot line. This standard is met.

2. **The establishment of a new drive-through, excluding a drive-in, shall require the lot be separated a minimum of five hundred (500) feet from any other lot containing a drive-through. The Planning Commission may waive this requirement for uses with vehicular access to an internal service drive (and not directly to/from the main roadway), where access to the main roadway is via a shared driveway or signalized intersection, or where the use is expected to generate 50 directional or fewer trips during the a.m. or p.m. peak hour.**

The subject site is within 500 feet of another drive-through across S. Latson Road. In this instance, access to/from S. Latson Road is via a shared driveway with the property immediately north of the subject site. As such, the Planning Commission may waive the spacing requirement.

Though the proposal exceeds 50 directional trips in the peak hours, it is worth noting that the revised traffic study identifies a reduction in trip generation for the proposed use in comparison to the previously approved coffee shop.

3. **Only one (1) access shall be provided onto any street.**

The site plan provides one full turning movement driveway with access to/from S. Latson. This standard is met.

4. **Such uses constructed adjacent to other commercial developments shall have a direct vehicular access connection (cross-site access) where possible.**

The site plan provides a direct vehicular access connection with the commercial development immediately north of the subject site. This standard is met.

5. Where the property abuts a residential land use or zoning district, the site plan shall comply with the applicable landscaping and lighting regulations of Article 12 of the Township Zoning Ordinance. Additionally, the applicant shall provide a sound study demonstrating compliance with the Township Noise Ordinance (Ordinance #011203).

Landscaping. A buffer zone B is required along the common property line with residential zoning/usage (rear and south side). The south side buffer zone fully complies with Ordinance standards; however, the rear yard buffer zone is deficient in width and a full screen wall/fence (similar to the previously approved plans).

Lighting. Photometric readings along the rear lot line, which abuts residential zoning, are 0.0. The pole mounted fixtures are at a height of 20 feet. Both the light intensity and pole heights comply with current standards for commercial sites abutting residential.

Noise. The applicant has provided a sound study, as required. The study concludes that noise levels generated by the proposed development will be within that allowed by the Township Noise Ordinance.

6. Clear identification and delineation between the drive-through lane and parking lot shall be provided.

The drive-through lane is delineated from the parking lot via curbed landscape islands and sidewalks. The distinction between the drive-through lane and drive aisle along the rear of the building is simply a change in pavement surface.

In our opinion, the plan may benefit from some additional directional signage or pavement markings to help patrons properly navigate the site.

7. Each drive-through shall provide an escape lane to allow other vehicles to pass those waiting to be served. The Planning Commission may waive the requirement for an escape lane where it can be demonstrated that such a waiver will not result in an adverse effect on public safety or the convenience of patrons of the facility.

The drive-through provides a partial escape lane, in that the first 7 stacking spaces are not physically blocked into the drive-through lane and can exit at any time. The remaining spaces are blocked by a curbed landscape island.

The Planning Commission has the discretion to waive/modify this requirement.

8. The drive-through lane and window shall be located on the side or rear elevation of the building to minimize visibility from the public or private roadway. The Planning Commission may allow a drive-through lane and window in a front yard of a corner lot, provided it is located in the front yard of the secondary street and the greenbelt requirements of Section 12.02.01 of the Township Zoning Ordinance are met. The Commission may also require additional landscaping/screening of the drive-through lane and window, if deemed necessary.

The drive-through lane is located along the side and rear of the building, while the window is on the side. This standard is met.

E. Site Plan Review

1. **Dimensional Requirements.** As noted in the table below, the site plan complies with the dimensional requirements of the GCD:

	Min. Lot Req.		Minimum Yard Setbacks (feet)				Max. Lot Coverage (%)	Max. Height
	Area (acres)	Width (feet)	Front Yard	Side Yard	Rear Yard	Parking Lot		
GCD	1	150	70	15	50	20 front 10 side/rear	35% building 75% impervious	35' 2 stories
Proposed	1.81	397	70	104 (N) 149 (S)	50	20 front 20 side 10 rear	11% building 74.3% impervious	21' 1 story

2. **Building Design and Materials.** The primary building materials are brick and stone, with relatively small amounts of wood paneling and metal as accent materials.

   The building elevation drawings include material calculations demonstrating compliance with the material standards of Section 12.01.

   Building materials and colors are subject to review and approval by the Planning Commission.

3. **Pedestrian Circulation.** The site plan provides an 8-foot wide concrete sidewalk along S. Latson.

   The plan also provides internal pedestrian connections between the parking areas and building entrances, as well as a crosswalk connection to the public sidewalk along Latson Road.

4. **Vehicular Circulation.** The site plan provides 1 curb cut for a full turning movement driveway to/from S. Latson. Cross-access is also provided with the proposed development to the north.

   Drive aisles are of sufficient width for two-way traffic around the site.

   The proposed driveway is nearly 400 feet from the existing driveway to the south (on the same side of Latson Road) and is properly aligned with the existing driveway across S. Latson Road.

   The proposed un/loading areas occupy a portion of the drive aisle in the northeast and southeast corners of the site; however, a note is included stating that deliveries will be scheduled for off-peak hours to avoid potential conflicts.

   The applicant must address any comments provided by the Township Engineer and/or the Brighton Area Fire Authority with respect to vehicular circulation.

5. **Parking.** Based on the parking calculations included on Sheet 5, the project requires 73 parking spaces. The site plan provides 73 parking spaces, including the 3 required barrier-free spaces.

   The design and dimensions of parking spaces and drive aisles comply with Ordinance standards. The number of stacking spaces and barrier-free spaces is also compliant.

6. **Exterior Lighting.** The lighting plan identifies 9 light poles, 7 recessed canopy fixtures, and 15 wall mounted fixtures (9 of which are ornamental/architectural).

   Based on the detail sheets, aside from the ornamental/architectural fixtures, the proposed fixtures are downward direct LEDs, as required.

Pole heights and photometric readings (both on-site and along property lines) comply with Ordinance standards.

7. Landscaping. The landscape plan has been reviewed for compliance with the standards of Section 12.02, as follows:

Standard	Required	Proposed	Comments
Front yard greenbelt	20' width 10 canopy trees	20' width 10 canopy trees	In compliance
Buffer Zone C (N)	10' width 9 canopy trees OR 9 evergreen trees OR 36 shrubs	24' width 5 canopy trees 16 shrubs	In compliance
Buffer Zone B (S)	20' width 6' wall OR 3' berm 7 canopy trees 7 evergreen trees 26 shrubs	20' width 3' berm 7 canopy trees 7 evergreen trees 27 shrubs	In compliance
Buffer Zone B (E)	20' width 6' wall OR 3' berm 14 canopy trees 14 evergreen trees 56 shrubs	10' width Partial 6' wall 14 canopy trees 14 evergreen trees 56 shrubs	Deficient width and full length wall
Parking lot	8 canopy trees 730 SF landscaped area	8 canopy trees 1,400 SF landscaped area	In compliance

The Commission has the authority to modify landscaping requirements, per Section 12.02.13 (similar to the previously approved plans).

8. Waste Receptacle. The proposed waste receptacle has been reviewed for compliance with the standards of Section 12.04, as follows:

	Requirement	Proposed	Comments
Location	Rear yard or non-required side yard AND not less than 20' from residential	Rear yard 20' from residential	Requirements met
Access	Clear access w/ out damaging buildings/vehicles	Turning template demonstrates sufficient maneuvering area	Requirements met
Base design	9' x 15' concrete pad	Approximately 20' x 20' concrete pad	Requirement met
Enclosure	3-sided enclosure w/ gate Masonry walls 6' height/taller than receptacle	3 sides w/ gate across 4th Masonry walls 6' height	Requirements met

Should you have any questions concerning this matter, please do not hesitate to contact our office.

Respectfully,
SAFEBUILT

Brian V. Borden, AICP
Michigan Planning Manager

TETRA TECH

June 13, 2025

Ms. Amy Ruthig
Genoa Township
2911 Dorr Road
Brighton, MI 48116

Re: South Latson Commercial Development
Site Plan Review No. 1

Dear Ms. Ruthig:

Tetra Tech conducted a review of the proposed South Latson commercial development submittal last dated May 27, 2025. The site plan was prepared by Boss Engineering on behalf of 1015 South Latson Road, LLC. The site is located on the east side of Latson Road, approximately 650 feet south of Grand River Avenue. A site plan was previously approved for the site, which included a drive-thru coffee shop use on the north side of the site. The applicant has submitted a new site plan application, along with a special land use application to change the previously approved coffee shop to a drive-thru fast casual restaurant.

The proposed site plan does not have any major changes to the site plan that was approved for the property last year. Some changes include a more detailed building footprint with a slightly reduced square footage, outdoor seating, and adjustments to underground utilities per agency review requirements. Since no significant changes have been made to the engineering design of the site and the proposed change in use generally results in a similar impact to traffic and utilities, we have no engineering concern with the proposed site plan and special land use.

Please call or email if you have any questions.

Sincerely,

Shelby Byrne

Shelby Byrne, P.E.
Project Engineer

Tetra Tech
3497 Coolidge Road, East Lansing, MI 48823
Tel 517.316.3930 Fax 517.484.8140 www.tetratech.com

BRIGHTON AREA FIRE AUTHORITY
615 W. Grand River Ave.
Brighton, MI 48116
o: 810-229-6640 f: 810-229-1619

June 4, 2025

Sharon Stone-Francis
Genoa Township
2911 Dorr Road
Brighton, MI 48116

RE: South Latson Commercial Development
1111 S. Latson Rd.
Genoa Twp., MI

Dear Sharon,

The Brighton Area Fire Department has reviewed the above-mentioned site plan. The plans were received for review on May 28, 2025 and the drawings are dated May 27, 2025. The project is based on the proposed redevelopment of an existing vacant parcel for a new 8,925 square foot multi-tenant commercial retail development. The plan review is based on the requirements of the International Fire Code (IFC) 2021 edition.

All previous concerns cited for the project have been addressed. The fire authority has no further concerns regarding the amended Special Land Use Change based on the recently submitted documents.

Additional comments will be given during the building plan review process (specific to the building plans and occupancy). The applicant is reminded that the fire authority must review the fire protection systems submittals (sprinkler & alarm) prior to permit issuance by the Building Department and that the authority will also review the building plans for life safety requirements in conjunction with the Building Department.

If you have any questions about the comments on this plan review please contact me at 810-229-6640.

Cordially,

Rick Boisvert, CFPS
Fire Marshal

cc:Amy Ruthig amy@genoa.org

GENOA TOWNSHIP IMPACT ASSESSMENT
South Latson Commercial Development

Prepared for:

Owner / Applicant
1015 Latson Road LLC
Kevin Bahnam

Prepared by:

Scott Tousignant, P.E.

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

October 4, 2023
Revised: October 26, 2023
Revised: December 11, 2023
Revised: January 16, 2024
Revised: May 27, 2025

DISCUSSION ITEMS

A. Name(s) and address(es) of person(s) responsible for preparation of the Impact Assessment and a brief statement of their qualifications.

Prepared by:

Scott Tousignant, P.E.
Professional Engineer/Project Manager
Boss Engineering
3121 E Grand River
Howell, MI 48843

Prepared for:

Owner/Applicant:
1015 Latson Road LLC / Kevin Bahnam
29592 Beck Road
Wixom, MI 48393

B. Description of the site, including existing structures, man-made facilities, and natural features, all-inclusive to within 10' of the property boundary.

The project site is on parcels # 4711-04-300-017 and # 4711-09-100-004 in Sections 4 & 9, Genoa Township, Livingston County, MI.

The subject site is bordered:

- On the north by the 1.14 acre +/- parcel zoned General Commercial (GCD) with an existing O'Reilly Auto Parts store.
- On the east by the 9.13 acre +/- parcel zoned General Commercial (GCD) with the Country Corners Shopping center.
- On the east and south by the 12.09 acre +/- parcel zoned High Density Residential (HDR) with the Prentis Estates Apartments. An approximately 4' tall berm is directly along the property line here on the adjacent HDR parcel and is planted with large Red and Scotch Pines ranging in size from 11" d.b.h. to 24" d.b.h. There is an additional evergreen screen just south of the berm along the east property line planted with White Cedar.
- On the west by S. Latson Road and the Non-Residential PUD shopping center with Walmart, PetSmart, Lowe's and various fast-food restaurants.
- The north side of the proposed project will be immediately adjacent to the Mister Car Wash development project within the GCD zoning.

MHOG sanitary runs along the west property line and South Latson Road. MHOG water runs along the east property line in the adjacent parcel. See the Existing Conditions for locations.

The subject site is a vacant parcel of land consisting of tall, unmaintained grasses and minimal trees. There are currently two existing commercial drive approaches accessing the 2 subject properties. Both will be removed and replaced with a full access drive that aligns with the existing Lowe's drive on the opposite side of Latson Road.

C. Impact on natural features: A written description of the environmental characteristics of the site prior to development, i.e., topography, soils, vegetative cover, drainage, streams, creeks or ponds.

These currently vacant parcels are flat (2-6% slopes) and covered by grass and weeds. The 0.50 acre parcel at the south does feature a woodland with small trees and shrubs below 6" d.b.h. unless otherwise noted on the tree survey. Species within the woodland include Pyrus spp. (Pear), Acer saccharinum (Silver Maple), Populus deltoides (Eastern Cottonwood), Prunus serotina (Black Cherry), and Pinus sylvestris (Scotch Pine.)

The soils are largely Miami Loam with 2 to 6% slopes. Other soils on site are Conover Loam and Washtenaw Silt Loam. The site drains via surface flow from east to west to the South Latson Road storm sewer system. No wetlands/streams/creeks or other water bodies are located on site.

D. Impact on storm water management: description of soil erosion control measures during construction.

Storm water will be managed on site and installed before any building construction. Underground storm water detention is planned with a discharge to the South Latson Road storm system and ultimately to the regional detention basin to the south by I-96. Detailed construction plans will be reviewed by the Township Engineer and the Soil Erosion Control plans will be reviewed and permit issued by the Livingston County Drain Commissioners office prior to construction commencing. Ongoing/periodic soil erosion inspections will occur per County requirements to ensure soil erosion is managed proactively.

E. Impact on surrounding land use: Description of proposed usage and other man-made facilities; how it conforms to existing and potential development patterns. Effects of added lighting, noise or air pollution which could negatively impact adjacent properties.

Proposed uses on this General Commercial site include a Fast Food with Drive-Through and a variety of retail & restaurant spaces. The proposed uses conform to existing and potential development patterns and will not negatively impact adjacent properties with added lighting, noise or air pollution. The site development will comply with Township Ordinances for lighting levels as well as noise levels. The uses proposed do not impact adjacent properties with noise, light or air pollution.

An existing berm and evergreen screening in the adjacent parcel to the north along the High-Density Residential (HDR) property line screens that use from these proposed commercial uses. In addition, a 6-foot-tall screening fence is proposed for the northern portion and 8' high screen fence proposed for the southern portion of the east property line to screen the HDR use. An existing tree screen is on the property line and installing a screen fence would jeopardize and/or require removal of some of the mature trees currently screening the parcel. On the northern half of the east property line, there are no living units, so providing additional plantings to be a continuation of the landscaped screen to the adjacent HDR zoning is being proposed. A screen fence is proposed there as well given the reduction in landscape buffer width that is being sought. Proposed uses on this site are compatible with existing zoning and adjacent zoning on S. Latson Road.

F. Impact on public facilities and services: Description of number of residents, employees, patrons, and impact on general services, i.e., schools, police, fire.

The proposed commercial development does not add additional burden on the fire and police services as the site is surrounded by similar development that already receives coverage. The uses do not add population that impacts schools. The commercial retail will add to Township tax revenue as the site currently sits vacant. The commercial retail will add approximately 60 jobs which has a positive impact on the community.

G. Impact on public utilities: description of public utilities serving the project, i.e., water, sanitary sewer, and storm drainage system. Expected flows projected in residential units.

Storm water will be detained on-site via the use of an underground detention system. The storm water will be discharge at pre-development rates to the South Latson Road storm sewer system as the site currently sheet flows into this road storm system. Detailed construction plans would be reviewed by the Township Engineer and the Soil Erosion Control permit would be reviewed and issued by the Livingston County Drain Commissioner. MHOG sanitary sewer runs along the west property line and South Latson Road. It is expected that the site will be connected to MHOG sanitary sewer along South Latson Road and MHOG water along the east property line in the adjacent parcel. The commercial development, being supported by these public utilities is not anticipated to have a negative impact. The development is projected to be approximately 11 REU's (projecting possible end users of the commercial leasable space) which equates to approximately a peak flow usage of 13,000 gpd.

H. Storage or handling of any hazardous materials: Description of any hazardous materials used, stored, or disposed of on-site.

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

I. Impact on traffic and pedestrians: Description of traffic volumes to be generated and their effect on the area.

A traffic study has been performed. It is prepared under separate cover and submitted to the Township and Livingston County Road Commission. In summary of the Traffic Impact Study performed by Colliers Engineering & Design, *"Based on the results of this study, the following should be considered to provide acceptable traffic operations with the proposed development project. 1) Optimize signal timings at the intersection of Grand River Avenue and Latson Road. 2) Construct two driveways to Latson Road with the S. site driveway aligned with the existing Lowes driveway and the N. site driveway restricted to right-in-right-out only."* A supplemental Traffic Memo has been provided as well to discuss the change in use from coffee shop with drive thru to a fast food with drive thru.

The Livingston County Road Commission will be required to review and approve the commercial driveway approaches on South Latson Road. Communications with LCRC indicate that the proposed drive locations are acceptable. A right-in/right-out access will be provided on the site to the north and a full access drive provided on the subject site directly across from the existing Lowe's access drive. A cross access easement will be provided for the adjacent site to the north.

J. Special provisions: Deed restrictions, protective covenants, etc.

Ingress/Egress easement with Mister Car Wash for MCW use of the full access drive

K. Description of all sources:

- Genoa Township Zoning Ordinance
- "Soil Survey of Livingston County Michigan" Soil Conservation Services, USDA
- Traffic Impact Study by Colliers Engineering & Design dated September 15, 2023

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

May 27th, 2025

Amy Ruthig, Planning Director
Genoa Township
2911 Dorr Road
Brighton, MI 48116

Re: South Latson Commercial Development – Resubmittal for change in use
Statement of Traffic Changes

Dear Ms. Ruthig,

The proposed project is seeking a new Special Land Use application for a change in use form the previously approved Coffee Shop with drive thru to the now allowed fast food with drive thru within the GCD zoning. To support this site modification, an evaluation on the traffic was done. Per the approved TIS prepared by Colliers dated December 9th, 2023, the Table 6 Site Trip Generations is shown below.

Table 6: Site Trip Generation

Land Use	ITE Code	Amount	Units	ADT	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Strip Retail Plaza	822	4,025	SF	400	9	6	15	21	20	41
		Pass-By (34% PM)		*136*	*0*	*0*	*0*	*7*	*7*	*14*
		New Trips		264	9	6	15	14	13	27
High-Turnover (Sit-Down) Restaurant	932	2,700	SF	289	14	12	26	15	9	24
		Pass-By (43%)		*124*	*5*	*5*	*10*	*5*	*5*	*10*
		New Trips		165	9	7	16	10	4	14
Coffee Shop with Drive-Through	937	2,950	SF	1,574	129	124	253	58	57	115
		Pass-By (50%)		*787*	*63*	*63*	*126*	*29*	*29*	*58*
		New Trips		787	66	61	127	29	28	57
Automated Car Wash	948	1	Tunnel	0	10	10	20	39	39	78
		Pass-By (35%)		*0*	*3*	*3*	*6*	*13*	*13*	*26*
		New Trips		0	7	7	14	26	26	52
Total		**Total Trips**		**2,263**	**162**	**152**	**314**	**133**	**125**	**258**
		Pass-By Trips		***1,047***	***71***	***71***	***142***	***54***	***54***	***108***
		New Trips		**1,216**	**91**	**81**	**172**	**79**	**71**	**150**

Since the previous approval on this site, the building areas in the above table have been refined and reduced. Table 1 below shows the previous use and area allocations compared to that of the currently proposed use and area allocations. Since the allocated areas are reduced, the resultant traffic generated will also be slightly reduced. We find it unnecessary to update the traffic study

with less intensive use/reduced areas as the proposed improvements will remain the same and are proposed to be constructed as previously approved.

Table 1: Use & Area Comparison Table

Land Use	Use Code	Previously Proposed Area	New Area
High-Turnover (Sit-Down) Restaurant	932	2,700	2,397
Strip Retail Plaza	822	4,025	3,452
Coffee Shop with Drive-Through Window	937	2,950	-
Fast Food Restaurant with Drive-Through Window	934	-	2,702

Utilizing the ITE Trip Generation Manual, below is a comparison of the previously approved "Coffee Shop with Drive-Through" use (ITE Land Use Code 937) compared to that of the "Fast Food Restaurant with Drive-Through" use (ITE Land Use Code 934). The below data in Table 2 shows there is a significant decrease in AM Peak Hour trips generated and a slight increase in PM Peak Hour trips comparing a Coffee Shop use to that of the Fast Food use. Ultimately, a modification in use to allow a "Fast Food with Drive-Through" use results in a reduction of total Peak Hour trips generated to the site and provides a more balanced trip breakdown throughout the day.

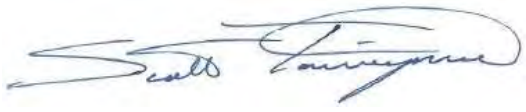
Table 2: Peak Hour Traffic changes with Use Change

Land Use	Use Code	Amount	Units	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Coffee Shop with Drive-Through Window	937	2,950	sft	129	124	253	58	57	115
Fast Food Restaurant with Drive-Through Windo	934	2,702	sft	72	66	138	71	68	139

Should you have any questions concerning the modifications indicated above, please don't hesitate to ask.

Sincerely,

BOSS ENGINEERING COMPANY



Scott Tousignant, PE
Senior Project Manager
Scottt@bosseng.com

NOISE IMPACT ANALYSIS

SOUTH LATSON COMMERCIAL DEVELOPMENT PROJECT

GENOA TOWNSHIP, HOWELL, MICHIGAN

LSA

July 2025

NOISE IMPACT ANALYSIS

SOUTH LATSON COMMERCIAL DEVELOPMENT PROJECT

GENOA TOWNSHIP, HOWELL, MICHIGAN

Submitted to:

Scott Tousignant
BOSS Engineering
3121 East Grand River
Howell, Michigan 48843

Prepared by:

LSA
157 Park Place
Point Richmond, California 94801
(949) 553-0666

Project No. 20252450

LSA

July 2025

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FIGURES

TABLES

APPENDICES

LIST OF ABBREVIATIONS AND ACRONYMS

APN	Assessor's Parcel Number
dB	decibel(s)
dBA	A-weighted decibel(s)
ft	foot/feet
HVAC	heating, ventilation, and air conditioning
I-96	Interstate 96
L_{dn}	day-night average noise level
L_{eq}	equivalent continuous sound level
L_{max}	maximum instantaneous noise level
L_w	sound power level
project	South Latson Commercial Development Project
sf	square foot/feet
Township	Genoa Township

INTRODUCTION

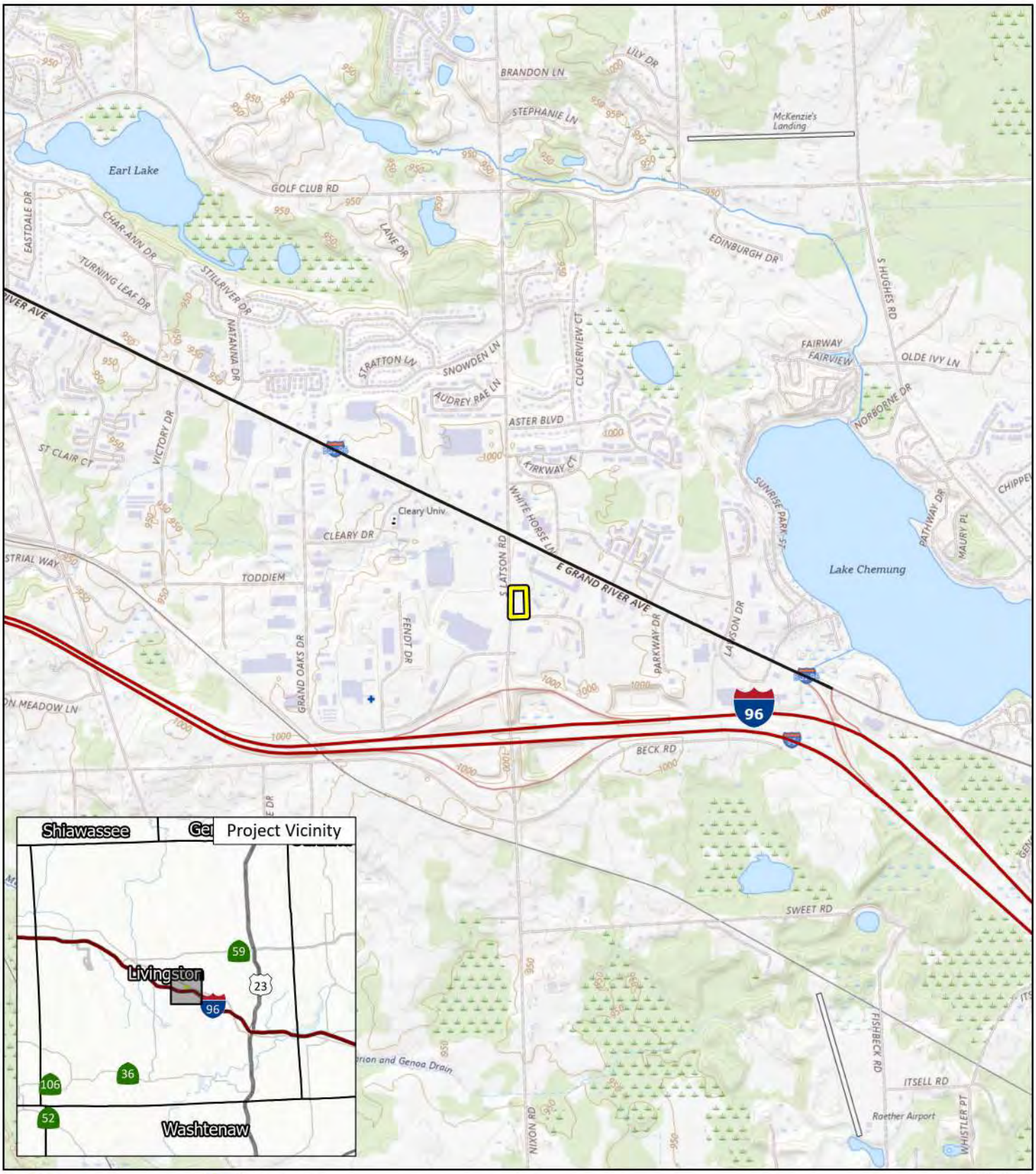
This noise impact analysis evaluates the potential noise impacts and noise reduction measures associated with the proposed South Latson Commercial Development Project (project) in Genoa Township, Howell, Michigan. This report is intended to satisfy the Genoa Township's requirement for a project-specific noise impact analysis by examining the impacts of the proposed uses on the project site and identifies whether any noise reduction measures to reduce project noise impacts would be necessary.

PROJECT LOCATION

The proposed project is located at 1111 South Latson Road (Assessor's Parcel Number [APN] 11-09-004) in Genoa Township, Howell, Michigan. Regional access to the project site is provided by Grand River Avenue, located north of the project site, and Interstate 96 (I-96), located south of the project site. Figure 1 shows the project location.

PROJECT DESCRIPTION

The proposed project would construct an 8,706-square-foot (sf) commercial building on a 0.5-acre site. The project would consist of a 2,560 sf fast-food restaurant with drive-thru, a 3,568 sf general retail use, a 2,398 sf sit-down restaurant, and a 180 sf landlord mechanical room. Also, the project would provide a total of 73 parking spaces. The hours of operation for the proposed commercial uses would be from 6:00 a.m. to 11:00 p.m., while the drive-thru would operate from 10:00 a.m. to 11:00 p.m. Figure 2 shows site plan.



LSA

FIGURE 1

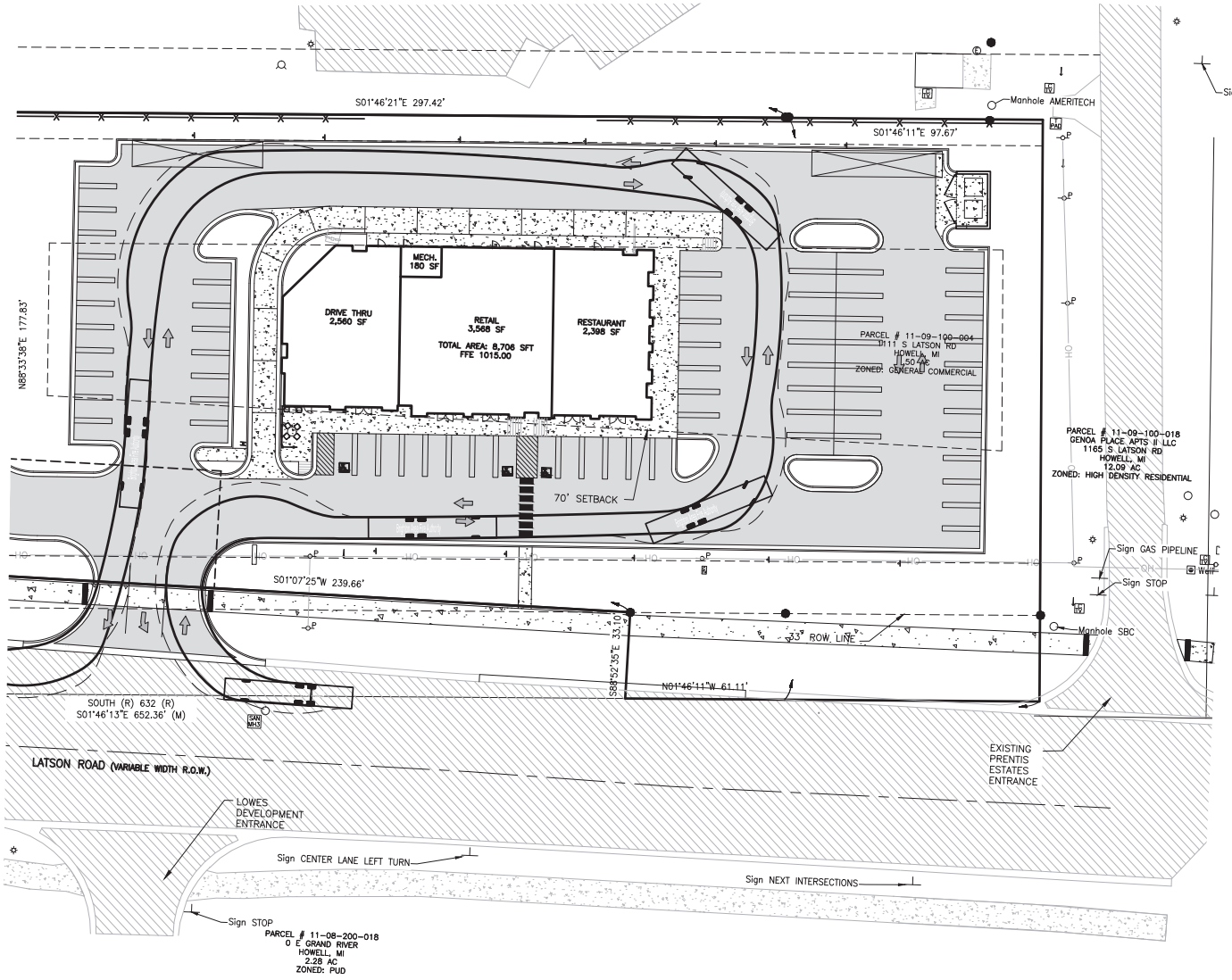
0 1000 2000
FEET

SOURCE: USGS The National Map (2018)

I:\2025\20252450\GIS\Pro\1015 Latson Rd South Latson Comm Dev\1015 Latson Rd South Latson Comm Dev.aprx (6/30/2025)

South Latson Commercial Development

Project Location



LSA

FIGURE 2

0 30 60
FEET

SOURCE: Boss Engineering
I:\2025\20252450\G\Site_Plan.ai (7/1/2025)

South Latson Commercial Development Project
Site Plan

NOISE FUNDAMENTALS

CHARACTERISTICS OF SOUND

Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, and sleep.

To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally an annoyance, while loudness can affect the ability to hear. Pitch is the number of complete vibrations, or cycles per second, of a sound wave, which results in the tone's range from high to low. Loudness is the strength of a sound, and it describes a noisy or quiet environment; it is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound wave combined with the reception characteristics of the human ear. Sound intensity refers to the power carried by sound waves per unit area in a direction perpendicular to that area. This characteristic of sound can be precisely measured with instruments. The analysis of a project defines the noise environment of the project area in terms of sound pressure level and its effect on adjacent sensitive land uses.

Measurement of Sound

Sound intensity is measured with the A-weighted decibel (dBA) scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound, similar to the human ear's de-emphasis of these frequencies. Decibels (dB), unlike linear units (e.g., inches or pounds), are measured on a logarithmic scale, which is a scale based on powers of 10.

For example, 10 dB is 10 times more intense than 0 dB, 20 dB is 100 times more intense than 0 dB, and 30 dB is 1,000 times more intense than 0 dB. Thirty decibels (30 dB) represents 1,000 times as much acoustic energy as 0 dB. The decibel scale increases as the square of the change, representing the sound pressure energy. A sound as soft as human breathing is about 10 times greater than 0 dB. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. A 10 dB increase in sound level is perceived by the human ear as only a doubling of the sound's loudness. Ambient sounds generally range from 30 dB (very quiet) to 100 dB (very loud).

Sound levels are generated from a source, and their decibel level decreases as the distance from that source increases. Sound levels dissipate exponentially with distance from their noise sources. For a single point source, sound levels decrease approximately 6 dB for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is produced by a line source (e.g., highway traffic or railroad operations) the sound decreases 3 dB for each doubling of distance in a hard site environment. Line-source sound levels decrease 4.5 dB for each doubling of distance in a relatively flat environment with absorptive vegetation.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. The equivalent continuous sound level (L_{eq}) is the total sound energy of time-varying noise over a sample period.

Other noise rating scales of importance when assessing the annoyance factor include the maximum instantaneous noise level (L_{max}), which is the highest exponential time-averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis for short-term noise impacts are specified in terms of maximum levels denoted by L_{max}, which reflects peak operating conditions and addresses the annoying aspects of intermittent noise. It is often used together with another noise scale, or noise standards in terms of percentile noise levels, in noise ordinances for enforcement purposes. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level. Half the time the noise level exceeds this level, and half the time it is less than this level. The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, the L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first category includes audible impacts that refer to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3 dB or greater because this level has been found to be barely perceptible in exterior environments. Additionally, an increase of more than 5 dBA is typically considered readily perceptible in an exterior environment. The second category, potentially audible, refers to a change in the noise level between 1 dB and 3 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category includes changes in noise levels of less than 1 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to sound levels higher than 85 dBA. Exposure to high sound levels affects the entire system, with prolonged sound exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the nervous system. In comparison, extended periods of sound exposure above 90 dBA would result in permanent cell damage. When the sound level reaches 120 dBA, a tickling sensation occurs in the human ear, even with short-term exposure. This level of sound is called the threshold of feeling. As the sound reaches 140 dBA, the tickling sensation is replaced by a feeling of pain in the ear (i.e., the threshold of pain). A sound level of 160–165 dBA will result in dizziness or a loss of equilibrium. The ambient or background noise problem is widespread and generally more concentrated in urban areas than in outlying, less-developed areas.

Table A lists definitions of acoustical terms, and Table B shows common sound levels and their sources.

Table A: Definitions of Acoustical Terms

Term	Definitions
Decibel, dB	A unit of sound level that denotes the ratio between two quantities that are proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time, the number of times that the quantity repeats itself in 1 second (i.e., the number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter de-emphasizes the very low and very high-frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. (All sound levels in this report are A-weighted unless reported otherwise.)
L_{01}, L_{10}, L_{50}, L_{90}	The fast A-weighted noise levels that are equaled or exceeded by a fluctuating sound level 1%, 10%, 50%, and 90% of a stated time period, respectively.
Equivalent Continuous Noise Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time varying sound.
Day/Night Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 dBA to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter, during a designated time interval, using fast time averaging.
Ambient Noise Level	The all-encompassing noise associated with a given environment at a specified time. It is usually a composite of sound from many sources from many directions, near and far; no particular sound is dominant.
Intrusive	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, time of occurrence, and tonal or informational content, as well as the prevailing ambient noise level.

Source: *Technical Noise Supplement* (Caltrans 2013) and *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).
Caltrans = California Department of Transportation
FTA = Federal Transit Administration

Table B: Common Sound Levels and Their Noise Sources

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1,000 ft		
	— 100 —	
Gas lawn mower at 3 ft		
	— 90 —	
Diesel truck at 50 ft at 50 mph		Food blender at 3 ft
	— 80 —	Garbage disposal at 3 ft
Noisy urban area, daytime		
Gas lawn mower, 100 ft	— 70 —	Vacuum cleaner at 10 ft
Commercial area		Normal speech at 3 ft
Heavy traffic at 300 ft	— 60 —	
		Large business office
Quiet urban daytime	— 50 —	Dishwasher next room
Quiet urban nighttime	— 40 —	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	— 20 —	
		Broadcast/recording studio
	— 10 —	

Source: *Technical Noise Supplement* (Caltrans 2013).
Caltrans = California Department of Transportation
dBA = A-weighted decibels
ft = feet
mph = miles per hour

REGULATORY SETTING

APPLICABLE NOISE STANDARDS

Genoa Township Noise Ordinance

Genoa Township addresses operational noise standards in Ordinance No. #011203: Noise Ordinance.

Section 3 states:

> *"No person, firm or corporation or other legal entity shall cause or create any unreasonable or unnecessarily loud noise or disturbance, injurious to health, peace, or quiet of the residents and property owners of the Township.*
>
> *Specific violations the following noises and disturbances are hereby declared to be a violation of this ordinance; provided however, that the specification of the same is not thereby to be construed to exclude other violations of this ordinance not specifically enumerated:*
>
> > *9. The operation of any machinery, equipment or mechanical device so as to emit unreasonably loud noise which is disturbing to the quiet, comfort or repose of any person."*

Section 4 states:

> *"No person shall conduct or permit any activity, including those specific prohibitions listing in section 3 that produces an OBA at or beyond the property line of the property on which it is conducted which exceeds the levels specified in Table I. Such noise levels shall be measured on the property line or on the adjacent property, which is receiving the noise. Where property is used for both residential and commercial purposes, the limitations set forth below for commercial property shall apply."*

Table I of the Ordinance provides the specific noise levels standards that are applicable when a commercial property is producing sound onto a residential property. The established noise level standards are 80 dBA from 7:00 a.m. to 10:00 p.m. and 50 dBA from 10:00 p.m. to 7:00 a.m.

EXISTING SETTING

This section describes the existing noise environment in the project vicinity. Noise level measurements were used to describe the existing noise environment in the project vicinity.

OVERVIEW OF THE EXISTING NOISE ENVIRONMENT

Transportation facilities are the primary existing noise sources in the project area. Traffic noise in the project area includes South Latson Road and other local roadways in the project area. Commercial activities north, south, and west of the project site contribute to the noise environment in the project area.

LAND USES IN THE PROJECT VICINITY

The project site is surrounded by commercial and residential uses. Land uses adjacent to the project site include:

- **North:** Existing commercial uses (car wash)
- **East:** Existing residential uses (Prentis Estates Apartments)
- **South:** Existing commercial uses (HealthPlus Pharmacy of Howell)
- **West:** Existing commercial uses (Panda Express and Lowe's)

EXISTING NOISE LEVEL MEASUREMENTS

Two long-term (24-hour) noise level measurements were conducted from October 9 and October 10, 2023, using Larson Davis Spark 706RC dosimeters to document the existing noise environment within the project area. Table C summarizes the results of the long-term noise level measurements along with a description of the measurement locations and noise sources that occurred during the measurements. As shown in Table C, daytime noise levels ranged from 60.0 to 70.4 dBA L_{eq} and nighttime noise levels ranged from 52.5 to 64.1 dBA L_{eq}. The long-term noise level measurement survey sheets, along with the hourly L_{eq} and L_{max} results, are provided in Appendix A. Figure 3 shows the long-term monitoring locations.

Table C: Long-Term Noise Level Measurements

Monitoring No.	Location	Noise Levels (dBA L_{eq})		Noise Source
		Daytime[1]	Nighttime[2]	
LT-1	North of the project site. Approximately 160 feet from the Latson Road centerline.	62.5–70.4	52.5–64.1	Traffic on South Latson Road and noise from adjacent commercial activity.
LT-2	Northwest of the Prentis Estates Apartments. Approximately 250 feet from the South Latson Road centerline.	60.0–64.5	53.2–62.1	Traffic on South Latson Road.

Source: Compiled by LSA (2023).
[1] Daytime hours are from 7:00 a.m. to 10:00 p.m.
[2] Nighttime hours are from 10:00 p.m. to 7:00 a.m.
dBA = A-weighted decibels
L_{eq} = equivalent continuous sound level

LSA

FIGURE 3

LEGEND

Project Site Boundary

LT-X Long-term Noise Monitoring Location

N

0 100 200
FEET

SOURCE: Google Earth 2025

I:\2025\20252450\G\Noise_Locs.ai (6/30/2025)

South Latson Commercial Development Project

Noise Monitoring Locations

PROJECT IMPACTS

LONG-TERM OPERATIONAL NOISE IMPACTS

The operational noise analysis includes the individual sources associated with operations, including heating, ventilation, and air conditioning (HVAC) equipment, drive-thru vehicle activities, speakerphone noise, and parking lot activities. The following subsections present the reference noise assumptions and operation noise impact conclusions.

The software SoundPLAN was used to calculate the expected impacts due to long-term operational stationary-source activities. Within the model, the noise library allows for the input of many noise sources and calculates the composite noise levels experienced at any receptor. The results from the calculations are presented in graphic format in Appendix B.

Heating, Ventilation, and Air Conditioning Equipment

The proposed project would include three York Sun Pro KJ Series rooftop HVAC units based on the site plan and information provided by BOSS Engineering. The HVAC equipment would operate during business hours. Rooftop HVAC equipment would generate sound power levels (L_w) of 83 dBA and 89 dBA for the 6.5-ton and 10-ton units (Johnson Controls Ducted Systems 2024), respectively. The specifications of the HVAC equipment, including the reference noise level, are provided in Appendix B.

Drive-Thru Vehicle Activities

The proposed project would include a vehicle drive-thru. Noise levels from idling vehicles would be approximately 50.1 dBA L_{eq} at a distance of 50 feet (ft) (Caltrans 2013).

Speakerphone Noise

The proposed project would include a drive-through speakerphone that is part of the menu board. Noise generated from the speakerphone would be 60 dBA L_{eq} at a distance of 16 ft (HM Electronics 1998). The specifications of the speakerphone, including the reference noise level, are provided in Appendix C. Drive-thru speakers are expected to operate for 30 minutes within an hour during daytime and nighttime hours.

Parking lot activities

Parking lot operations are expected to result in maximum noise levels of 83.4 dBA L_{max} at a distance of 5 ft based on reference information within SoundPLAN. Parking lot activities are expected to occur for a period of 5 minutes during daytime hours and 1 minute during nighttime hours.

Long-Term Operational Noise Impacts Summary

Noise levels generated from the operations of the proposed commercial uses during the day and at night are shown in the SoundPLAN printouts in Appendix D. As shown in the SoundPLAN printouts, noise levels at the closest residence to the east would not exceed the Township's daytime and

nighttime noise limit of 80 dBA L_{eq} and 50 dBA L_{eq}, respectively. Therefore, the operations of the proposed commercial use would comply with the Township's daytime and nighttime noise limits.

CONCLUSION

Noise levels generated from the operations of the proposed project during the day and a night would not exceed the Township's daytime and nighttime noise limits of 80 dBA L_{eq} and 50 dBA L_{eq}, respectively. Therefore, the operations of the proposed commercial use would comply with the Township's daytime and nighttime noise limits.

REFERENCES

California Department of Transportation (Caltrans). 2013. *Technical Noise Supplement to the Traffic Noise Analysis Protocol*. September. Website: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tens-sep2013-a11y.pdf (accessed July 2025).

Federal Transit Administration (FTA). 2018. *Transit Noise and Vibration Impact Assessment Manual. FTA Report 0123*. Office of Planning and Environment. September. Website: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf (accessed July 2025).

Genoa Township. 2023. *Code of Ordinances*. Website: https://www.genoa.org/government/ordinances/ordinance-noise (accessed July 2025).

HM Electronics. 1998. *Drive-Thru Sound Pressure Levels From the Menu Board or Speaker Post.* December.

Johnson Controls Ducted Systems. 2024. *Technical Guide: Sun™ Pro KJ Series, 3 ton to 12.5 ton, AC*. March 4. Website: https://files.hvacnavigator.com/p/6481606-ytg-a-0324.pdf (accessed July 2025).

SITE PLAN / CONSTRUCTION PLAN
FOR
SOUTH LATSON COMMERCIAL DEVELOPMENT
PART OF NW QUARTER, SECTION 4 & 9
GENOA CHARTER TOWNSHIP, LIVINGSTON COUNTY, MI

PROPERTY DESCRIPTION:

PROPERTY DESCRIPTION PER KEM-TEC PROJECT #21-03542 DATE 11-24-21 PARCEL #4711-09-100-004

LAND SITUATED IN THE TOWNSHIP OF GENOA, COUNTY OF LIVINGSTON IN THE STATE OF MICHIGAN AND IS DESCRIBED AS FOLLOWS:

A PART OF THE NORTHWEST 1/4 OF THE NORTHWEST 1/4 OF SECTION 9, TOWN 2 NORTH, RANGE 5 EAST, MICHIGAN, DESCRIBED AS: BEGINNING 632 FEET SOUTH OF THE NORTHWEST CORNER OF THE NORTHWEST 1/4, THENCE EAST 223.00 FEET; THENCE NORTH 97.67 FEET; THENCE WEST 223.00 FEET; THENCE SOUTH 97.67 FEET TO THE POINT OF BEGINNING.

PROPERTY DESCRIPTION PER METRO CONSULTING ASSOCIATES PROJECT #1037-17-8480 DATED 01-19-18 PARCEL #4711-04-300-017

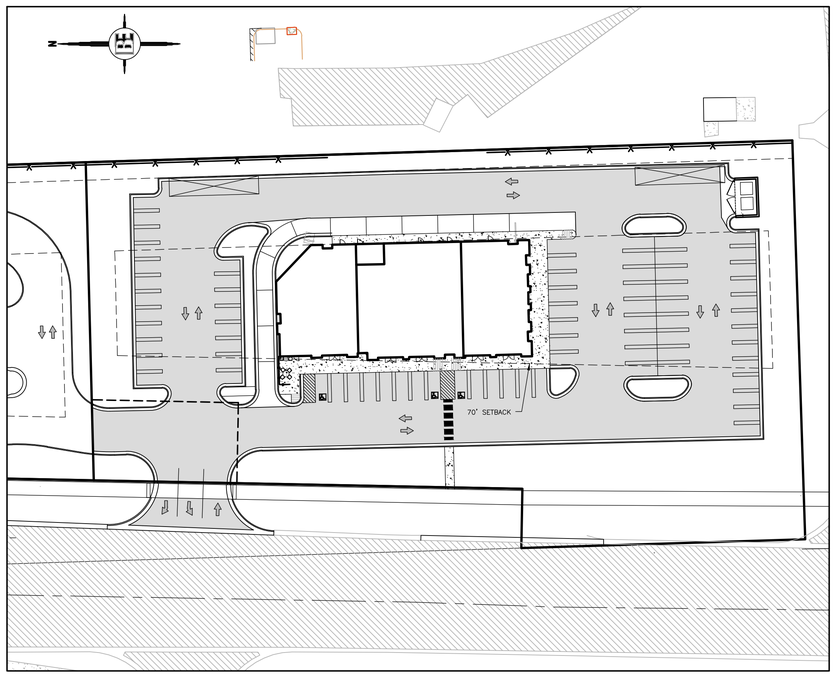
Commencing at the Southwest Corner of Section 4, Town 2 North, Range 5 East, Genoa Township, Livingston County, Michigan, said corner being N01°46'11"W 19.43 feet from a point referenced in Quit Claim Deed dated January 29, 1957, recorded April 4, 1961 in Liber 391, Page 382, Livingston County Records; thence N87°18'40"E 56.81 feet along the North line of said Section 9 and the South line of said Section 4, as established and approved by the Livingston County Remonumentation Peer Group, dated June 6, 2002 and recorded in LSC# 1718m, Livingston County Records to the POINT OF BEGINNING; thence 159.36 feet along the arc of a 10,060.00 foot radius non-tangential circular curve to the left, having a central angle of 00°54'27" having a chord which bears N00°15'46"W 159.36 feet along the East line of MDOT Right-of-Way as recorded in Instrument # 2011R-023812, Livingston County Records; thence N88°33'52"E 150.45 feet along the South line of Parcel 3 as described in a Warranty Deed recorded June 6, 2016, in Instrument # 2016R-019284 and the North line of the Consumers Power Company land per Warranty Deed recorded in 539, Page 13, Livingston County Records; thence S01°15'25"E 125.00 feet along said Consumers Power Company land and parallel with the West line of said Section 4; thence the following four (4) courses along the North, East and South line of a Quit-Claim Deed to Consumers Power Company, recorded in Liber 391, Page 382, Livingston County Records: (1) N88°33'52"E 12.94 feet (recorded as 13.00 feet), (2) S01°14'08"E 30.69 feet to the South line of said Section 4, (3) S01°46'21"E 557.91 feet and (4) S66°08'19"W 223.00 feet along the North line of the South 97.67 feet as stated in Warranty Deed recorded in Liber 232, Page 199, Livingston County Records; thence N01°46'11"W 61.11 feet along the West line of said Section 9 and within the Right-of-Way of Latson Road (variable width); thence S88°52'35"E 33.10 feet along the South line of MDOT Right-of-Way as recorded in Instrument # 2011R-023812; thence the following two (2) courses along said Right-of-Way: (1) N01°07'25"E 333.02 feet and (2) 63.72 feet along the arc of a 10,060.00 foot radius circular curve to the left, with a central angle of 00°55'57", having a chord which bears N00°39'26"E 163.71 feet to the POINT OF BEGINNING. Containing 2.69 acres of land, more or less. Being part of the SW. 1/4 of the SW. 1/4 of Section 4 and part of the NW. 1/4 of Section 9, Town 2 North, Range 5 East, Genoa Township, Livingston County, Michigan. Subject to the right of the Public over the West 33.00 feet thereof, as occupied by Latson Road (Variable Width), being subject to any other Easement and restrictions of record, if any.

RESULTANT PARCEL

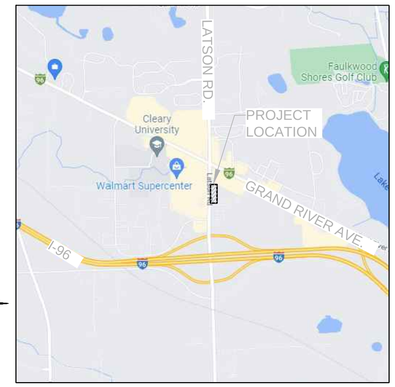
PROPOSED PARCEL 2 (SOUTH):

Part of the Northwest 1/4 of Section 9, T2N-R5E, Genoa Township, Livingston County, Michigan, more particularly described as follows: Commencing at the Northwest Corner of Section 9, also being the Southwest 1/4 of Section 4, said corner being North 01 degree 46 minutes 11 seconds West, 19.43 feet from a point referenced in Quit Claim Deed, dated January 29, 1957, recorded April 4, 1961 in Liber 391, Page 382, Livingston County Records; thence along the North line of Section 9 and the South line of Section 4, N 87°18'40" E, 56.81 feet; thence along the East line of MDOT Right-of-Way for Latson Road, as recorded in Instrument #2011R-023812, Livingston County Records, the following two (2) courses: 1) Southerly along an arc left, having a length of 163.71 feet, a radius of 10,091.50 feet, a central angle of 00°55'46", and a long chord which bears S 00°39'23" W, 163.71 feet; thence S 01°07'25" W, 68.33 feet, to the POINT OF BEGINNING of the Parcel to be described; thence N 88°33'38" E, 177.83 feet; thence S 01°46'21" E, 297.42 feet; thence S 01°46'11" E, 97.67 feet; thence S 88°08'19" W, 223.00 feet; thence along the West line of said Section 9 and within the Right-of-Way of Latson Road (Variable Width Right of Way), N 01°46'11" W, 158.78 feet; thence along the South line of MDOT Right-of-Way for Latson Road, as recorded in Instrument #2011R-023812, Livingston County Records, S 88°52'35" E, 33.10 feet; thence along the East line of MDOT Right-of-Way for Latson Road, as recorded in Instrument #2011R-023812, Livingston County Records, the following two (2) courses: 1) N 01°07'25" E, 239.66 feet, to the POINT OF BEGINNING, containing 1.81 acres, more or less, and subject to the rights of the public over the existing Latson Road. Also subject to any other easements or restrictions of record.

Bearings are based on Michigan State Plane Coordinate System, South Zone and legal description per Chicago Title Insurance Company, File No.: 21040145- C, Policy No.: 7430600-224063018, dated 6-4-21:



OVERALL SITE MAP
NO SCALE



LOCATION MAP
NO SCALE

SHEET INDEX

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3	EXISTING CONDITIONS, DEMO & NATURAL FEATURES PLAN
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PERMITS & APPROVALS

AGENCY	DATE SUBMITTED	DATE APPROVED
TOWNSHIP ENGINEERING APPROVAL	04/15/2024	06/28/2024
LCRC	03/06/2024	04/29/2024
MDOT DRAINAGE	01/19/2024	03/11/2024
LCDC SESC	04/15/2024	-
EGLE - ACT 399	10/24/2024	11/06/2024

LIGHTING PREPARED BY:
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PREPARED BY:

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STATE OF MICHIGAN LICENSED SCOTT T. TOUSIGNANT ENGINEER No. 6201054872 PROFESSIONAL ENGINEER

INDEMNIFICATION STATEMENT

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

NO	BY	CK	REVISION	DATE
4	ST	ST	CHANGE IN USE - NEW SLU SUBMITTAL	5-27-25
3	ST	ST	PER ACT 399 REVIEW	10-24-24
2	ST	ST	PER MHOG REVIEW	6-17-24
1	ST	ST	PER MHOG REVIEW	5-20-24

ISSUE DATE: 04/15/24
JOB NO: 21-519

1

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AutoCAD PDF (Smallest File).pc3

GENERAL NOTES

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

INDEMNIFICATION STATEMENT

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CONTRACTOR TO FOLLOW MANUFACTURER SPECS/RECOMMENDATIONS THAT SUPERCEDE PLANS

GENERAL GRADING & SESC NOTES

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

GENERAL LANDSCAPE NOTES

1. ALL PLANT MATERIAL SHALL CONFORM TO THE REQUIREMENTS AND SPECIFICATIONS OF THE GOVERNING MUNICIPALITY. ALL STOCK SHALL BE NURSERY GROWN, CONFORMING TO ANSI Z60.1 "AMERICAN STANDARD FOR NURSERY STOCK", AND IN ACCORDANCE WITH GOOD HORTICULTURAL PRACTICE. STOCK SHALL EXHIBIT NORMAL GROWTH HABIT AND BE FREE OF DISEASE, INSECTS, EGGS, LARVAE, & DEFECTS SUCH AS KNOTS, SUN-SCALD, INJURIES, ABRASIONS, OR DISFIGUREMENT. ALL PLANT MATERIAL SHALL BE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT.
2. ALL PLANT MATERIALS SHALL BE BALLED AND BURLAPPED OR CONTAINER STOCK. NO BARE ROOT STOCK IS PERMITTED. ALL PLANT BALLS SHALL BE FIRM, INTACT, AND SECURELY WRAPPED AND BOUND.
3. ALL PLANT BED MATERIALS SHALL BE EXCAVATED OF ALL BUILDING MATERIALS, OTHER EXTRANEOUS OBJECTS, AND POOR SOILS TO A MINIMUM DEPTH OF 12-INCHES AND BACKFILLED TO GRADE WITH SPECIFIED PLANTING MIX (SEE BELOW).
4. PLANTING MIXTURE SHALL CONSIST OF 5 PARTS TOPSOIL FROM ON-SITE (AS APPROVED), 4 PARTS COARSE SAND, 1 PART SPHAGNUM PEAT MOSS (OR APPROVED COMPOST), AND 5 LBS OF SUPERPHOSPHATE FERTILIZER PER CU. YD. OF MIX. INGREDIENTS SHALL BE THOROUGHLY BLENDED FOR UNIFORM CONSISTENCY.
5. ALL PLANT BEDS AND INDIVIDUAL PLANTS, NOT OTHERWISE NOTED SHALL BE MULCHED WITH A 4-INCH LAYER OF SHREDDED BARK MULCH. EDGE OF MULCH BEDS AS SHOWN. DECIDUOUS TREES IN LAWN AREAS SHALL RECEIVE A 5-FT DIAMETER CIRCLE OF MULCH AND CONIFER TREES 8-FT (PLANTED CROWN OF TREE) UNLESS OTHERWISE NOTED.
6. LANDSCAPE STONE SHALL BE INSTALLED WHERE NOTED OR INDICATED (HATCHED). STONE SHALL BE 3/4"-1-1/4" WASHED RIVER GRAVEL OR AS SELECTED AND SHALL BE INSTALLED TO A MINIMUM DEPTH OF 3-INCHES.
7. ALL LANDSCAPE BEDS, UNLESS OTHERWISE NOTED SHALL BE INSTALLED OVER WEED BARRIER FABRIC – WATER PERMEABLE FILTRATION FABRIC OF NON-WOVEN POLYPROPYLENE OR POLYESTER FABRIC. FABRIC SHALL BE OF SUITABLE THICKNESS FOR APPLICATION.
8. ALL PLANTS AND PLANT BEDS SHALL BE THOROUGHLY WATERED UPON COMPLETION OF PLANTING AND STAKING OPERATIONS.
9. THE CONTRACTOR SHALL GUARANTEE ALL PLANT MATERIALS FOR A PERIOD OF 1 YEAR FROM THE DATE THE WORK IS ACCEPTED, IN WRITING, BY THE LANDSCAPE ARCHITECT. THE CONTRACTOR SHALL REPLACE, WITHOUT COST TO THE OWNER, WITHIN A SPECIFIED PERIOD OF TIME, ALL DEAD PLANTS, AND ALL PLANTS NOT IN A VIGOROUS, THRIVING CONDITION, AS DETERMINED BY THE LANDSCAPE ARCHITECT, DURING AND AT THE END OF THE GUARANTEE PERIOD. REPLACEMENT STOCK SHALL CONFORM TO THE ORIGINAL SPECIFICATIONS.
10. EDGING SHALL BE PROVIDED FOR ALL LANDSCAPE BEDS NOT ADJACENT TO CONCRETE PAVEMENT. EDGING SHALL BE BLACK ALUMINUM EDGING, 3/16-INCH X 4-INCH. INSTALL PER MANUFACTURER'S INSTRUCTIONS, ALL EDGING SHALL BE INSTALLED IN STRAIGHT LINES OR SMOOTH CURVES WITHOUT IRREGULARITIES.
11. SOD SHALL BE DENSE, WELL ROOTED TURF, FREE OF WEEDS. IT SHALL BE COMPRISED OF A BLEND OF AT LEAST TWO KENTUCKY BLUE GRASSES AND ONE FESCUE. IT SHALL HAVE A UNIFORM THICKNESS OF 3/4-INCH AT TIME OF PLANTING, AND CUT IN UNIFORM STRIPS NOT LESS THAN 10-INCHES BY 18-INCHES. SOD SHALL BE KEPT MOIST AND LAID WITHIN 36-HOURS AFTER CUTTING.

   IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH A DENSE LAWN OF PERMANENT GRASSES, FREE OF LUMPS AND DEPRESSIONS. ALL SODDED AREAS THAT BROWN-OUT OR HAVE NOT FIRMLY KNITTED TO THE SOIL BASE WITHIN A PERIOD OF 1 MONTH SHALL BE REPLACED BY THE CONTRACTOR, AT NO COST TO THE OWNER.
12. ALL AREAS OF THE SITE THAT BECOME DISTURBED DURING CONSTRUCTION AND ARE NOT TO BE PAVED, STONED, LANDSCAPED, OR SODDED SHALL BE SEEDED AND MULCHED.

   SEED MIXTURE SHALL BE AS FOLLOWS:

KENTUCKY BLUEGRASS (CHOOSE 3 VARIETIES – ADELPHI, RUGBY, GLADE, OR PARADE)	30%
RUBY RED OR DAWSON RED FINE FESCUE	30%
ATLANTA RED FESCUE	20%
PENNFINE PERENNIAL RYE	20%

   THE ABOVE SEED MIXTURE SHALL BE SOWN AT A RATE OF 250 LBS PER ACRE. PRIOR TO SEEDING, THE TOPSOIL SHALL BE FERTILIZED WITH A COMMERCIAL FERTILIZER WITH A 10-0-10 ANALYSIS:

   10% NITROGEN – MIN 25% FROM A UREA FORMALDEHYDE SOURCE
   0 % PHOSPHATE
   10% POTASH – SOURCE POTASSIUM SULFATE OR POTASSIUM NITRATE

   THE FIRST FERTILIZER APPLICATION SHALL BE AT A RATE OF 10 LBS PER 1000 SQ FT OF BULK FERTILIZER.

   IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH A DENSE LAWN OF PERMANENT GRASSES, FREE OF LUMPS AND DEPRESSIONS. ANY PART OF THE AREA THAT FAILS TO SHOW A UNIFORM GERMINATION SHALL BE RE-SEEDED AND SUCH RE-SEEDING SHALL CONTINUE UNTIL A DENSE LAWN IS ESTABLISHED. DAMAGE TO SEEDED AREAS RESULTING FROM EROSION SHALL BE REPAIRED BY THE CONTRACTOR.
13. ALL AREAS OF THE SITE SCHEDULED FOR SEEDING OR SODDING SHALL FIRST RECEIVE A 6-INCH LAYER OF CLEAN, FRIABLE TOPSOIL. THE SOIL SHALL BE DISCED AND SHALL BE GRADED IN CONFORMANCE WITH THE GRADING PLAN.
14. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION OF ALL UTILITIES AND TO INFORM THE LANDSCAPE ARCHITECT OF ANY CONFLICTS PRIOR TO COMMENCING LANDSCAPING.

GENERAL UTILITY NOTES

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

GENERAL STORM NOTES

1. ALL STORM PIPE LENGTHS ARE SHOWN FROM C/L TO C/L OF STRUCTURE OR FROM C/L OF STRUCTURE TO DISCHARGE END OF FLARED END SECTION.
2. STORM PIPE MATERIALS SHALL BE AS FOLLOWS:
   - 2.1. RCP(REINFORCED CONCRETE PIPE): SHALL MEET THE REQUIREMENTS OF ASTM C76 WITH MODIFIED GROOVED TONGUE AND RUBBER GASKETS MEETING THE REQUIREMENTS OF ASTM C443. RCP TO BE EITHER CLASS IV OR V AS CALLED OUT ON THE PLANS.
   - 2.2. HDPE(HIGH DENSITY POLYETHYLENE): SHALL MEET THE REQUIREMENTS OF ASTM F2648.
   - 2.3. PP(POLYPROPYLENE): SHALL MEET THE REQUIREMENTS OF ASTM F2881.
   - 2.4. PVC(POLYVINYL CHLORIDE): SHALL MEET THE REQUIREMENTS OF ASTM D3034.
3. STORM PIPE JOINTS SHALL MEET THE REQUIREMENTS OF ASTM D3212. HDPE AND PP PIPE GASKETS SHALL MEET THE REQUIREMENTS OF ASTM F477.
4. ALL STORM PIPE TO HAVE WATERTIGHT PREMIUM JOINTS, UNLESS OTHERWISE NOTED ON THE PLANS.
5. STORM DRAINAGE STRUCTURES SHALL BE FURNISHED WITH STEPS WHICH SHALL BE STEEL ENCASED WITH POLYPROPYLENE PLASTIC OR EQUIVALENT. STEPS SHALL BE SET AT 16" CENTER TO CENTER.
6. ALL FLARED END SECTIONS 15" AND LARGER SHALL BE FURNISHED WITH AN ANIMAL GRATE.
7. FLARED END SECTIONS DISCHARGING STORM WATER SHALL RECEIVE A MINIMUM OF 10 SQ YDS OF PLAIN COBBLESTONE RIP RAP WITH A MINIMUM STONE SIZE OF 6" AND SHALL BE PLACED ON A GEOTEXTILE FABRIC WRAP.
8. ALL CATCH BASINS WITHIN THE ROADWAY SHALL INCLUDE INSTALLATION OF 6" DIAMETER PERFORATED PIPE SUBDRAIN.
9. STORM DRAINAGE STRUCTURE COVERS SHALL BE OF THE FOLLOWING (OR APPROVED EQUAL):

TYPE	LOCATIION	FRAME	COVER/INLET
'MH'	ALL	1040	SANITARY-SOLID SELF-SEALING STORM-VENTED
'CB'	TYPE A CURB	7000-T1-MI	FLAT GRATE WITH VERT. OPEN BACK
'CB'	TYPE B CURB	7065-T1-M1	FLAT GRATE WITH ROLL BACK
'CB'	PAVEMENT/SHOULDER	1020-M1	FLAT GRATE
'CB'	OPEN AREA	1020-01	BEEHIVE GRATE 4" HIGH
'CB'	GUTTER	5100	CONCAVE INLET

GENERAL SANITARY NOTES

1. ALL SANITARY PIPE LENGTHS ARE SHOWN FROM C/L OF STRUCTURE TO C/L OF STRUCTURE.
2. SANITARY PIPE MATERIALS SHALL BE AS FOLLOWS:
   - 2.1. PVC SDR-26 (SANITARY MAIN)
   - 2.2. PVC SDR-23.5 (SANITARY LEADS)
   - 2.3. HDPE DR-11 (SANITARY FORCEMAIN)
3. ALL PVC SDR SANITARY SEWER PIPE SHALL MEET THE REQUIREMENTS OF ASTM D3034 AND D2241. PVC SCHD 40 PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785. GASKET JOINTS FOR SANITARY PIPE SHALL MEET THE REQUIREMENTS OF ASTM D3139 AND D3212.
4. SANITARY STRUCTURES SHALL BE FURNISHED WITH STEPS WHICH SHALL BE STEEL ENCASED WITH POLYPROPYLENE PLASTIC OR EQUIVALENT. STEPS SHALL BE SET AT 16" CENTER TO CENTER.
5. ALL NEW MANHOLES SHALL BE MINIMUM 4' DIAMETER, PRECAST MANHOLE SECTIONS AND AN ECCENTRIC CONE. PRECAST MANHOLE JOINTS SHALL BE INSTALLED WITH BUTYL ROPE MEETING THE REQUIREMENTS OF ASTM C990.
6. MANHOLES SHALL BE CONSTRUCTED WITH FLOW CHANNEL WALLS THAT ARE FORMER, AT A MINIMUM, TO THE SPRINGLINE OF THE PIPE.
7. ALL NEW MANHOLES SHALL HAVE AN APPROVED FLEXIBLE, WATERTIGHT SEALS WHERE PIPES PASS THROUGH MANHOLE WALLS.
8. WHEREVER AN EXISTING MANHOLE IS TO BE TAPPED, THE STRUCTURE SHALL BE CORED AND A KOR-N-SEAL BOOT UTILIZED FOR THE PIPE CONNECTION.
9. ALL MANHOLES SHALL BE PROVIDED WITH WATERTIGHT COVERS. COVERS TO BE EJCO 1040 TYPE 'A' SOLID COVER.
10. A MAXIMUM OF 12" OF GRADE ADJUSTMENT RINGS SHALL BE USED TO ADJUST THE FRAME ELEVATION. BUTYL ROPE SHALL BE USED BETWEEN EACH ADJUSTMENT RING.
11. SANITARY SEWER LATERALS SHALL HAVE A MINIMUM SLOPE OF 1.0%.
12. CLEANOUTS SHALL BE INSTALLED EVERY 100', AT ALL BENDS AND STUBS.
13. PUBLIC SANITARY SEWER SHALL BE CENTERED WITHIN A 20 FOOT WIDE SANITARY SEWER EASEMENT.

GENERAL WATERMAIN NOTES

1. WATERMAIN PIPE MATERIALS SHALL BE AS FOLLOWS:
   - 1.1. D.I.P. CL.52 (WATERMAIN)
   - 1.2. TYPE 'K' COPPER (WATER LATERAL – MAIN TO CURB STOP)
   - 1.3. HDPE DR-9 (WATER LATERAL – CURB STOP TO STUB)
2. WATERMAIN FITTINGS SHALL BE OF DUCTILE IRON WITH CEMENT MORTAR LINING AND MECHANICAL JOINTS CONFORMING TO AWWA C110.
3. WATERMAINS SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA C651. BAC-T SAMPLES SHALL BE TAKEN IN ACCORDANCE WITH R235.11110 OF THE ADMINISTRATIVE RULES PROMULGATED UNDER MICHIGAN SAFE DRINKING WATER ACT, 1976 PA 399, AS AMENDED.
4. ALLOWABLE LEAKAGE OR HYDROSTATIC PRESSURE TESTING SHALL BE IN ACCORDANCE WITH AWWA C600 AND C605.
5. MAXIMUM DEFLECTION AT PIPE JOINTS SHALL BE IN ACCORDANCE WITH PIPE MANUFACTURERS CURRENT RECOMMENDATIONS AND AWWA SPECIFICATIONS.
6. A FULL STICK OF PIPE SHALL BE LAID CENTERED AT A PIPE CROSSING IN ORDER TO MAINTAIN THE MAXIMUM SEPARATION OF WATERMAIN JOINT TO THE CROSSING PIPE.
7. WATERMAIN SHALL BE INSTALLED WITH A MINIMUM OF 5.5' OF COVER FROM FINISHED GRADE TO TOP OF PIPE AND NO MORE THAN 8' OF COVER, UNLESS SPECIAL CONDITIONS WARRANT.
8. WATERMAIN VALVES SHALL BE IRON BODY RESILIENT WEDGE GATE VALVES, NON-RISING STEMS, COUNTERCLOCKWISE OPEN, AWWA C509.
9. FIRE HYDRANTS SHALL BE INSTALLED WITH AN AUXILIARY VALVE WITH CAST IRON VALVE BOX. THE HYDRANT PUMPER HOSE CONNECTION SHALL FACE THE ROADWAY.
10. THE BREAKAWAY FLANGE AND ALL BELOW GRADE FITTINGS SHALL HAVE STAINLESS STEEL NUTS AND BOLTS.
11. PUBLIC WATERMAIN SHALL BE CENTERED WITHIN A 25 FOOT WIDE WATERMAIN EASEMENT.

LINES & HATCHES LEGEND

PROPOSED (PR) — EXISTING (EX)

- CONTOUR (900)
- SPOT ELEVATION (T/C XXX.XXX; T/C XXX.XX; + 922.08)
- SANITARY SEWER (SN)
- SANITARY LEAD (SL)
- FORCE MAIN (FM)
- PRESSURE SEWER (PS)
- STORM SEWER (ST)
- WATER MAIN (WM)
- WATER LEAD (WL)
- FIBER OPTIC (FO)
- OVERHEAD WIRE (OH)
- CABLE (C)
- ELECTRIC (E)
- GAS (G)
- TELEPHONE (T)
- FENCE (X)
- SILT FENCE
- WETLAND BOUNDARY
- LIMITS OF GRADING/CLEARING
- LIMITS OF DRAINAGE
- MODIFIED CURB
- CONCRETE
- HIGH STRENGTH CONCRETE
- ASPHALT
- HIGH STRENGTH ASPHALT
- WETLAND
- SANITARY SEWER LABEL (SAN #1)
- STORM SEWER LABEL (CB 01)
- WATER MAIN LABEL (GV 12)
- SOIL EROSION CONTROL MEASURE (P=PERMANENT, T=TEMPORARY) (54T)

LIGHTING LEGEND

PROPOSED (PR) — EXISTING (EX)

- DOUBLE FIXTURE LIGHT POLE
- SINGLE FIXTURE LIGHT FIXTURE
- WALL MOUNTED LIGHT FIXTURE
- GROUND LIGHT FIXTURE
- FOOT CANDLES ON SITE (0.1)
- FOOT CANDLES OFF SITE (2.5)
- FOOT CANDLES CONTOURS (5)
- CANOPY MOUNTED LIGHT FIXTURE

LANDSCAPE LEGEND

- EXISTING CONIFER TREE
- EXISTING DECIDUOUS TREE
- PROPOSED CONIFER TREE
- PROPOSED DECIDUOUS TREE
- PROPOSED TREE PROTECTION
- PROPOSED ORNAMENTAL TREE
- PROPOSED DECIDUOUS SHRUBS
- SOD
- PROPOSED GRASSES & PERENNIALS
- SEED
- PROPOSED LANDSCAPE BOULDER
- MULCH

SYMBOL LEGEND

- STORM DRAINAGE FLOW
- GUY WIRE
- POWER POLE
- TRANSFORMER PAD
- ELECTRICAL RISER
- U.G. ELECTRIC MARKER
- ELECTRICAL METER
- AIR CONDITIONING UNIT
- TELEPHONE RISER
- U.G. TELEPHONE MARKER
- GAS RISER
- U.G. GAS MARKER
- GAS METER
- CABLE TV RISER
- U.G. CABLE TV MARKER
- MAILBOX
- WELL
- WATER MANHOLE
- GATE VALVE (EXISTING)
- GATE VALVE (PROPOSED)
- HYDRANT (EXISTING)
- HYDRANT (PROPOSED)
- CATCH BASIN (EXISTING)
- YARD CATCH BASIN (EXISTING)
- CATCH BASIN (PROPOSED)
- STORM MANHOLE (EXISTING)
- STORM MANHOLE (PROPOSED)
- END SECTION (EXISTING)
- END SECTION (PROPOSED)
- SANITARY MANHOLE (EXISTING)
- SANITARY MANHOLE (PROPOSED)
- PUMP CHAMBER
- TRAFFIC SIGN
- SIGN (EXISTING)
- SIGN (PROPOSED)
- SOIL BORING
- STEEL ROD SET
- STEEL ROD OR PIPE FOUND
- WOOD LATH SET
- HUB SET
- MONUMENT FOUND
- SECTION CORNER
- GAS PUMP
- ANTENNA
- SATELLITE DISH
- NEWSPAPER BOX
- PARKING METER
- PHONE BOOTH
- HANDICAP SYMBOL
- BENCHMARK
- LIGHT POLE

ABBREVIATIONS

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

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3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 (TOLL FREE) FOR THE LOCATION OF UNDERGROUND FACILITIES

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

PROJECT: SOUTH LATSON COMMERCIAL DEVELOPMENT

PREPARED FOR: 1015 LATSON ROAD LLC, 29592 BECK ROAD, WIXOM, MI 48393, 248.773.7992

TITLE: GENERAL NOTES & LEGEND

NO	BY	REVISION PER	DATE
4	ST	CHANGE IN USE – NEW SLU SUBMITTAL	5-27-2025
3	ST	PER ACT 399 REVIEW	10-24-2024
2	ST	PER MHOG REVIEW	6-17-2024
1	ST	PER MHOG REVIEW	5-20-2024

DESIGNED BY: ST
DRAWN BY: ST
CHECKED BY:
SCALE: NO SCALE
JOB NO: 21-519
DATE: 04/15/2024
SHEET NO. 2

BOSS BE Engineering

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SANITARY SEWER INVENTORY:

SAN MH1 RIM=1009.24
INV. N=1002.04 (8")
INV. S=1002.14 (8")

SAN MH2 RIM=1011.15
INV. N=1004.05 (8")
INV. S=1004.15 (8")

SAN MH3 RIM=1012.06
INV. N=1005.11 (8")
INV. S=1005.16 (8")

SAN MH4 RIM=1013.91
INV. N=1006.81 (8")
INV. S=1006.91 (8")
INV. E=1008.91 (6")

STORM SEWER INVENTORY:

LT26 RIM=1009.05 M
RIM=1009.35 R
INV. S=1003.27 R (15")

LT24 RIM=1009.36 M
RIM=1009.91 R
INV. S=1002.75 R (18")
INV. N=1002.85 R (15")
INV. E=1006.00 R (12")
INV. N=1006.90 R (12")

LT24A RIM=1009.12 M
RIM=1009.51 R
INV. W=1006.50 (12")

LT24B RIM=1009.64 M
RIM=1009.88 R
INV. S=1007.00 R (12")

LT21 RIM=1011.78 M
RIM=1012.20 R
INV. S=1001.10 R (24")
INV. N=1001.10 R (24")

LT21A RIM=1011.61 M
RIM=1011.90 R
INV. S=1008.20 R (12")

LT20 RIM=1012.23 M
RIM=1012.25 R
INV. S=1000.90 R (24")
INV. N=1000.90 R (24")
INV. E=1007.00 R (12")

LT20A RIM=1011.93 M
RIM=1012.25 R
INV. W=1008.00 R (12")
INV. N=1008.00 R (12")

STORM SEWER INVENTORY:

LT22 RIM=1010.55 M
RIM=1010.87 R
INV. S=1001.55 R (24")
INV. N=1001.65 R (18")
INV. E=1006.78 R (12")
INV. N=1006.90 R (12")

LT22A RIM=1010.48 M
RIM=1010.85 R
INV. W=1007.10 R (12")
INV. N=1007.20 R (12")

LT22B RIM=1010.40 M
RIM=1010.79 R
INV. S=1007.30 R (12")

LT22C RIM=1010.46 M
RIM=1010.83 R
INV. S=1007.00 R (12")

LT19 RIM=1012.86 M
RIM=1013.18 R
INV. S=1000.70 R (24")
INV. N=1000.70 R (24")
INV. E=1008.00 R (12")

LT19A RIM=1012.62 M
RIM=1012.94 R
INV. W=1009.00 R (12")

LT18 RIM=1013.17 M
RIM=1013.50 R
INV. S=1000.00 R (30")
INV. N=1000.50 R (24")
INV. E=1008.50 R (12")

LT18A RIM=1013.07 M
RIM=1013.30 R
INV. W=1009.50 R (12")

GENERAL SURVEY NOTES:

1. BEARINGS WERE ESTABLISHED FROM METRO CONSULTING ASSOCIATES, JOB NO. SG-19193, DATED 01/19/2018.
2. SUBSURFACE UTILITIES NOT LOCATED FOR THIS SURVEY MAY EXIST. IT IS THE RESPONSIBILITY OF THE OWNER OF THE RESPECTIVE UTILITY TO ACCURATELY LOCATE SUCH UTILITIES.
3. EASEMENTS OR RESTRICTIONS OF RECORD NOT DEPICTED ON THIS DRAWING MAY EXIST.
4. ELEVATIONS WERE ESTABLISHED WITH GPS USING OPUS GPS POST-PROCESSING. (NAVD88 DATUM)
5. CONTOURS ARE SHOWN AT 1 FOOT INTERVALS.
6. THE LOCATIONS OF STORM SEWER, SANITARY SEWER & WATERMAIN, AS SHOWN ON THIS DRAWING ARE APPROXIMATE. THE LOCATIONS ARE BASED ON PHYSICAL FIELD LOCATIONS OF STRUCTURES ALONG WITH DRAWINGS SUPPLIED BY MDOT AND MHOG.
7. ALL WORK SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE MUNICIPALITY, THE COUNTY, AND THE STATE OF MICHIGAN.
8. ALLOW THREE WORKING DAYS BEFORE YOU DIG, CALL MISS DIG TOLL FREE 1-800-482-7171.
9. THERE WAS SNOW ON THE GROUND AT THE TIME OF FIELDWORK FOR THIS SURVEY.

SOIL NOTES:

THE PROJECT SITE IS COMPRISED OF THE FOLLOWING SOIL TYPE ACCORDING TO THE USDA NATURAL RESOURCES CONSERVATION SERVICE:

CvraaB -- CONOVER LOAM, 0 TO 4 % SLOPES
MoB -- MIAMI LOAM, 2 TO 6 % SLOPES
Wh -- WASHTENAW SILT LOAM

SITE BENCHMARKS (NAVD88):

-BM #200 = NAIL/TAG S/S POWER POLE ELEV.=1013.34
-BM #201 = NAIL/TAG NE/S POWER POLE ELEV.=1014.28
-BM #202 = NAIL/TAG NE/S POWER POLE ELEV.=1013.57
-BM #203 = NORTH EAST CORNER TRANS-PAD ELEV.=1011.58

NATURAL FEATURES NARRATIVE:

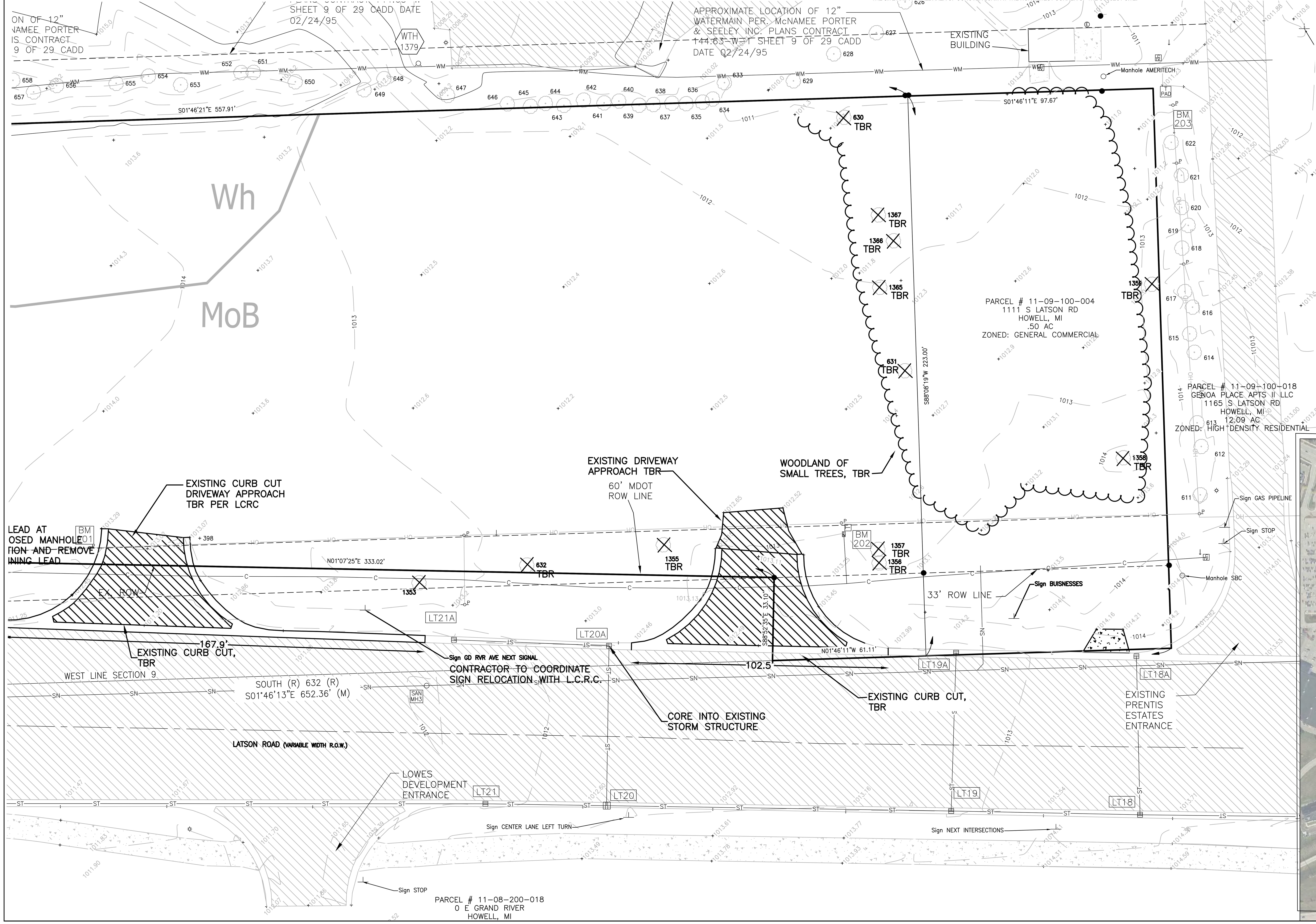
NATURAL FEATURES WERE IDENTIFIED DURING AN ON-SITE VISIT TO THE PROPERTY ON SEPTEMBER 28, 2023. SITE IS VACANT AND PRIMARILY CAN BE DESCRIBED AS UNMANICURED TALL GRASS. THE SOUTHERN PORTION OF THE SITE CONTAINS SOME TREES AS INDICATED BY THE PLAN BELOW AND TREE LIST ON THIS SHEET.

ENTIRE SITE IS RELATIVELY FLAT, WITH A LOWER ELEVATION AT LATSON ROAD. SITE SLOPES WESTERLY TO LATSON ROAD AT SLOPES OF 2-4%. SOILS ARE ALSO UNIFORM PER USDA NRCS SOILS DATA CONSISTING OF MIAMI LOAM FOR ABOUT 80% OF THE SITE. THE REMAINDER IS STATED AS WASHTENAW SILT LOAM AT THE EAST SIDE OF THE SITE AND A SMALL AREA OF CONOVER LOAM AT THE NORTHWEST CORNER OF THE SUBJECT SITE.

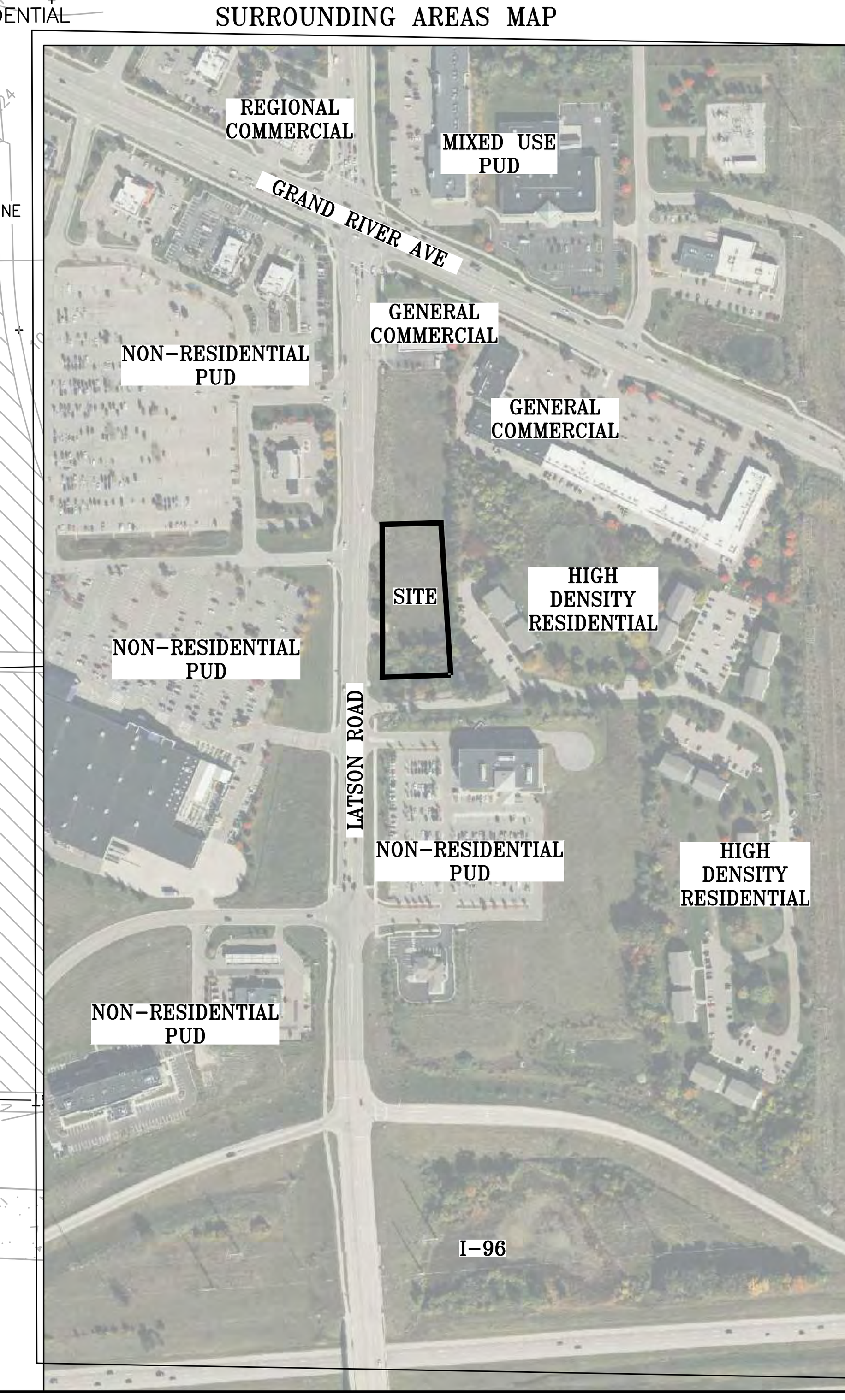
SEE SHEET 2 FOR GENERAL NOTES AND LEGEND

SCALE: 1 INCH = 20 FEET

	Tag #	Botanical Name	Common Name	Size	Condition
TBR	~~1355~~	~~Quercus rubra~~	~~Northern Red Oak~~	~~13.5"~~	~~good~~
TBR	~~1356~~	~~Pinus resinosa~~	~~Red Pine~~	~~11.5"~~	~~good~~
TBR	~~1357~~	~~Quercus rubra~~	~~Northern Red Oak~~	~~13~~	~~good~~
TBR	~~1358~~	~~Pinus sylvestris~~	~~Scotch Pine~~	~~15.5", 16"~~	~~good~~
	611	Pinus resinosa	Red Pine	14.5"	good
	612	Pinus resinosa	Red Pine	17"	fair
	613	Pinus resinosa	Red Pine	14.5"	fair
	614	Pinus resinosa	Red Pine	10"	poor
	615	Pinus resinosa	Red Pine	12"	poor
	616	Pinus resinosa	Red Pine	9"	poor
	617	Pinus resinosa	Red Pine	12"	poor
TBR	~~1359~~	~~Acer rubrum~~	~~Red Maple~~	~~30"~~	~~good~~
	618	Pinus resinosa	Red Pine	13.5"	poor
	619	Pinus resinosa	Red Pine	7"	poor
	620	Pinus resinosa	Red Pine	16"	poor
	621	Pinus resinosa	Red Pine	15"	poor
	622	Pinus resinosa	Red Pine	13"	poor
	623	Picea abies	Norway Spruce	14"	good
	624	Picea abies	Norway Spruce	14"	good
	625	Picea abies	Norway Spruce	17"	good
	626	Picea abies	Norway Spruce	25"	good
	627	Pinus resinosa	Red Pine	15"	fair
	628	Pinus resinosa	Red Pine	11"	fair
	629	Pinus resinosa	Red Pine	13"	good
TBR	~~630~~	~~Populus deltoides~~	~~Eastern cottonwood~~	~~6"~~	~~good~~
	1368	Prunus serotina	Black Cherry	11",13"	poor
TBR	~~1367~~	~~Quercus bicolor~~	~~Swamp White Oak~~	~~12",10"~~	~~good~~
	Tag #	Botanical Name	Common Name	Size	Condition
TBR	~~1366~~	~~Pinus sylvestris~~	~~Scotch Pine~~	~~13"~~	~~fair~~
TBR	~~1365~~	~~Prunus serotina~~	~~Black Cherry~~	~~11", 9"~~	~~good~~
TBR	~~631~~	~~Acer saccharinum~~	~~Silver Maple~~	~~27"~~	~~good~~
TBR	~~632~~	~~Quercus rubra~~	~~Northern Red Oak~~	~~10"~~	~~good~~
TBR	~~1353~~	~~Acer platanoides~~	~~Norway Maple~~	~~9"~~	~~good~~
	633	Pinus resinosa	Red Pine	17"	fair
	634	Thuja occidentalis	Northern White Cedar	8"	good
	635	Thuja occidentalis	Northern White Cedar	6"	good
	636	Thuja occidentalis	Northern White Cedar	7", 5"	good
	637	Thuja occidentalis	Northern White Cedar	7", 5"	good
	638	Thuja occidentalis	Northern White Cedar	7"	good
	639	Thuja occidentalis	Northern White Cedar	7"	good
	640	Thuja occidentalis	Northern White Cedar	6.5", 7"	good
	641	Thuja occidentalis	Northern White Cedar	8"	good
	642	Thuja occidentalis	Northern White Cedar	8"	good
	643	Thuja occidentalis	Northern White Cedar	8.5"	good
	644	Thuja occidentalis	Northern White Cedar	7.5"	good
	645	Thuja occidentalis	Northern White Cedar	6", 5"	good
	646	Thuja occidentalis	Northern White Cedar	6",5",4"	good
	647	Pinus resinosa	Red Pine	11"	fair
	648	Pinus resinosa	Red Pine	16"	good
	649	Pinus resinosa	Red Pine	16"	good
	650	Pinus resinosa	Red Pine	18"	good
	651	Pinus resinosa	Red Pine	11", 15"	fair
	652	Pinus resinosa	Red Pine	15"	fair
	653	Pinus resinosa	Red Pine	10", 15", 17"	good
	654	Pinus resinosa	Red Pine	10", 11"	good
	Tag #	Botanical Name	Common Name	Size	Condition
	655	Pinus resinosa	Red Pine	24"	good
	656	Pinus sylvestris	Scotch Pine	20"	good



SURROUNDING AREAS MAP



PROJECT: SOUTH LATSON COMMERCIAL DEVELOPMENT

PREPARED FOR: 1015 LATSON ROAD LLC
29592 BECK ROAD
WIXOM, MI 48393
248.773.7992

TITLE: EXISTING CONDITIONS, DEMO & NATURAL FEATURES PLAN

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

NO	BY	REVISION PER	DATE
4	ST	CHANGE IN USE - NEW SLU SUBMITTAL	5-27-2025
3	ST	PER ACT 399 REVIEW	10-24-2024
2	ST	PER MHOG REVIEW	6-17-2024
1	ST	PER MHOG REVIEW	5-20-2024

DESIGNED BY: ST
DRAWN BY: ST
CHECKED BY:
SCALE: 1" = 20'
JOB NO: 21-519
DATE: 04/15/2024
SHEET NO. 3

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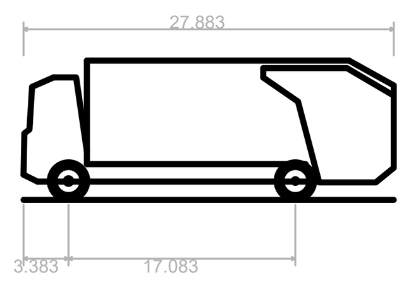
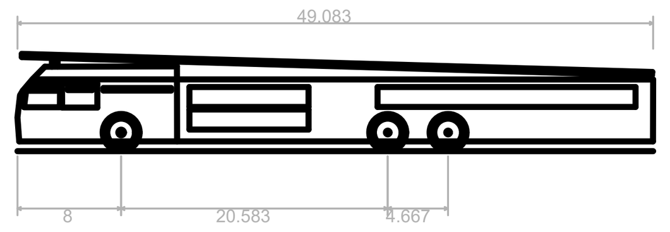


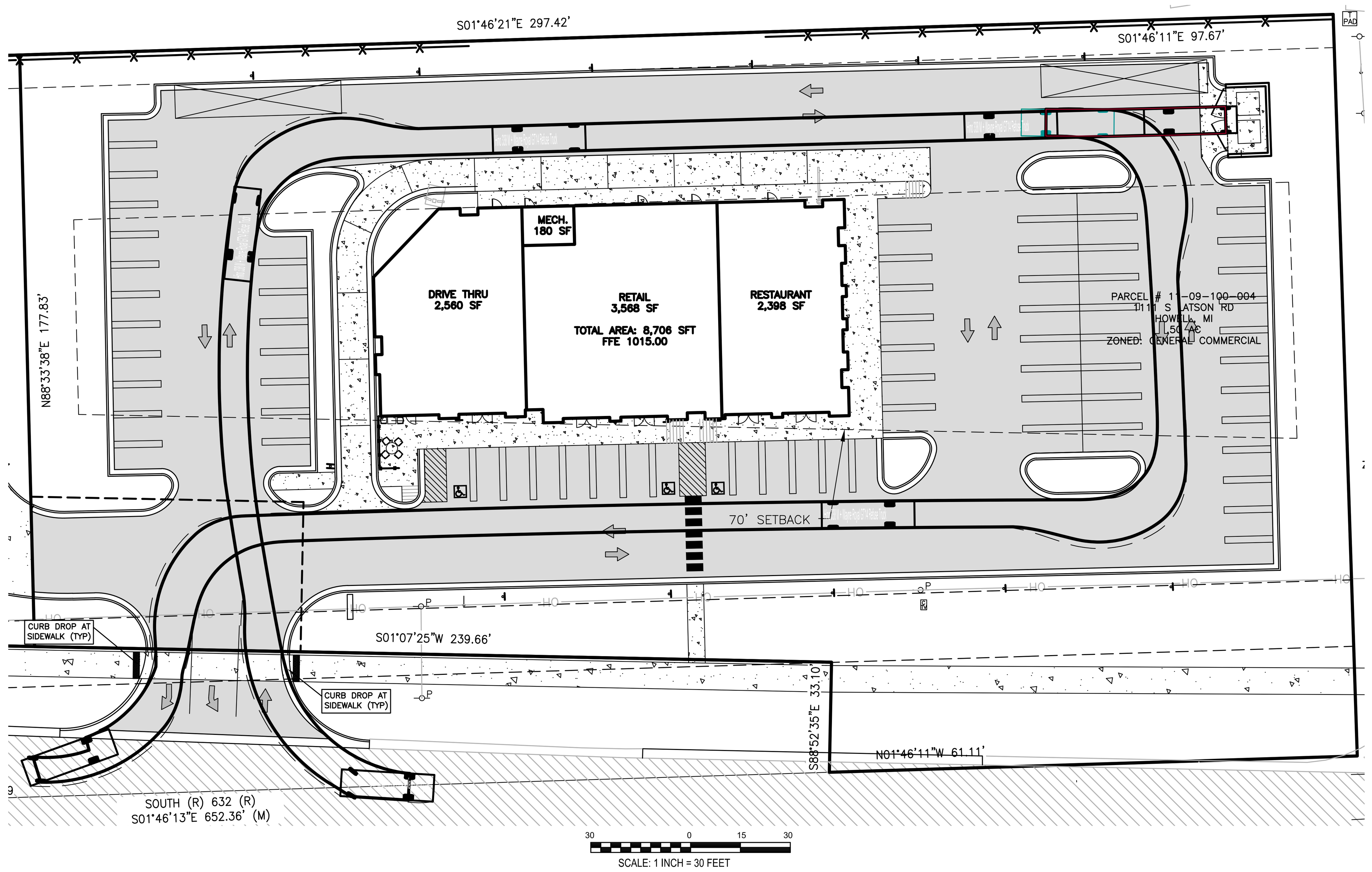
Hino 338 M + Wayne Royal GT14 Refuse Truck

Overall Length	27.883ft
Overall Width	8.042ft
Overall Body Height	10.488ft
Min Body Ground Clearance	1.318ft
Track Width	8.042ft
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	27.400ft

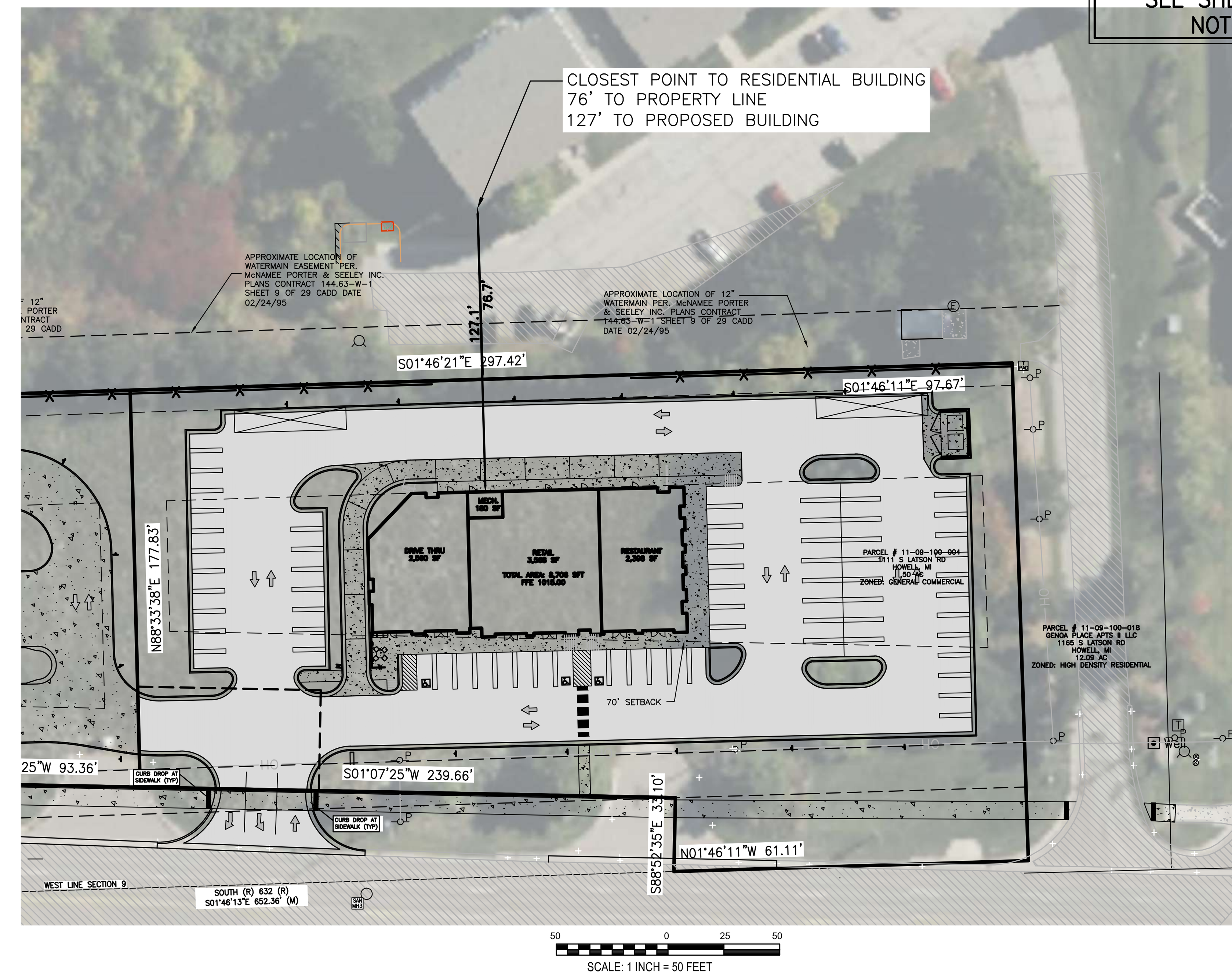


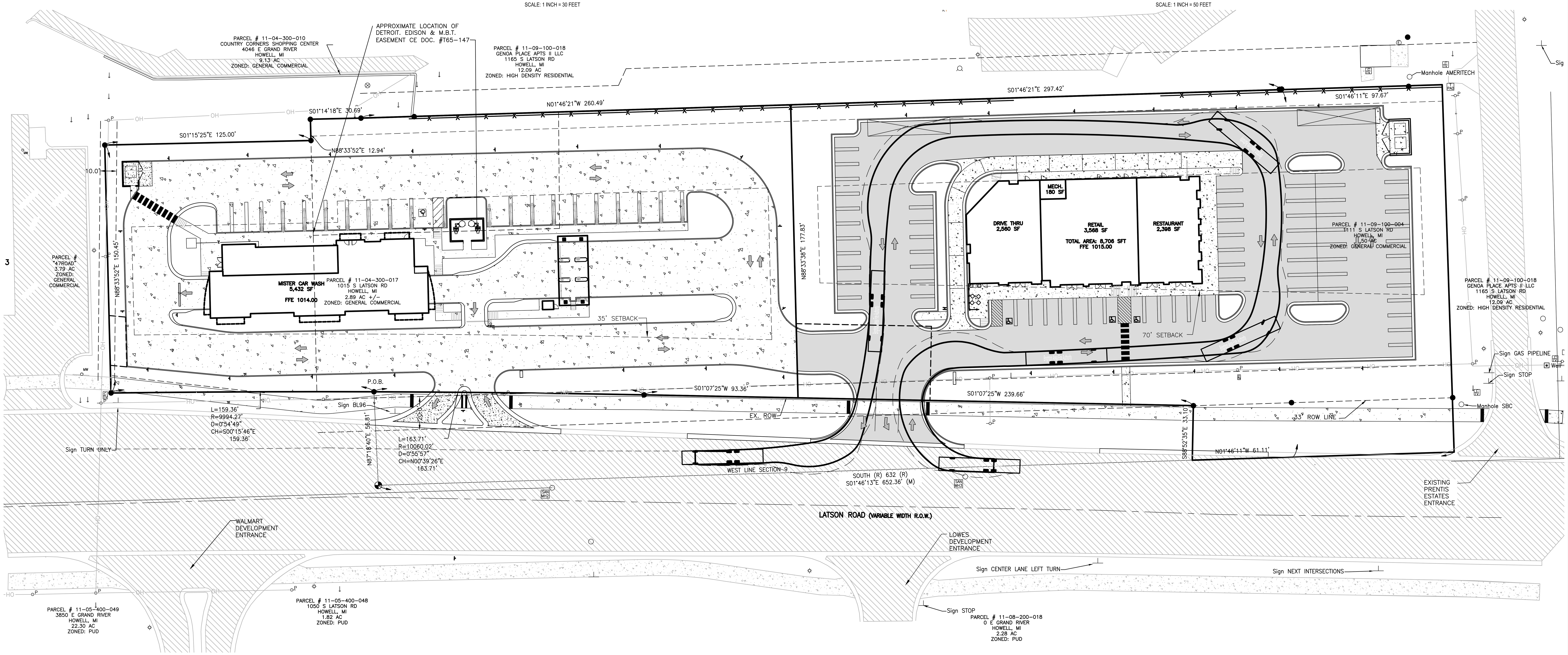
Brighton Area Fire Authority

Overall Length	49.083ft
Overall Width	8.167ft
Overall Body Height	7.500ft
Min Body Ground Clearance	0.750ft
Track Width	8.167ft
Lock-to-lock time	5.00s
Max Steering Angle (Virtual)	45.00°



SEE SHEET 2 FOR GENERAL NOTES AND LEGEND





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517.546.4836 FAX 517.548.1670

PROJECT: SOUTH LATSON COMMERCIAL DEVELOPMENT

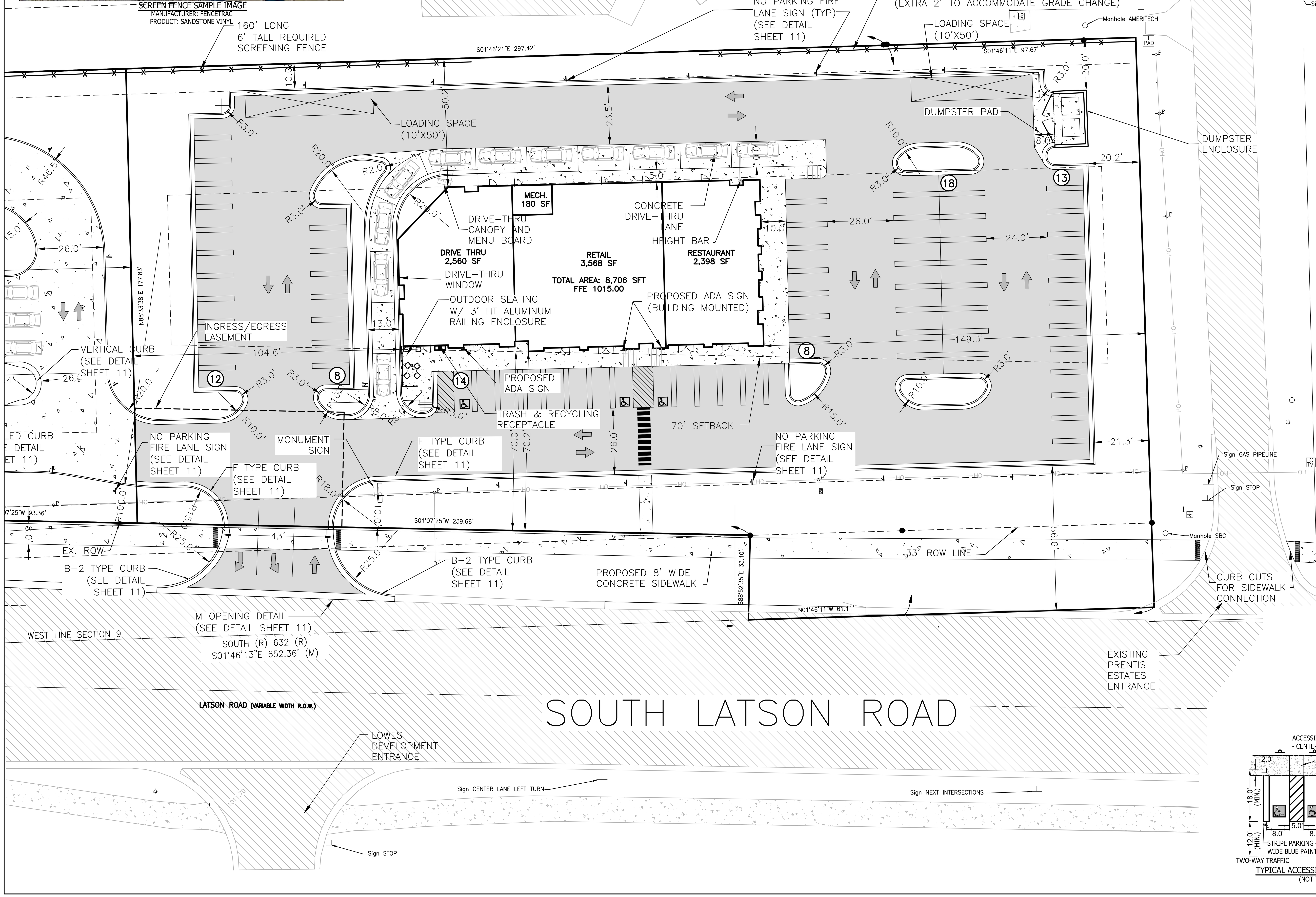
PREPARED FOR: 1015 LATSON ROAD LLC
29592 BECK ROAD
WIXOM, MI 48393
248.773.7992

TITLE: OVERALL SITE PLAN

NO	BY	REVISION PER	DATE
4	ST	CHANGE IN USE - NEW SLU SUBMITTAL	5-27-2025
3	ST	PER ACT 399 REVIEW	10-24-2024
2	ST	PER MHOG REVIEW	6-17-2024
1	ST	PER MHOG REVIEW	5-20-2024

DESIGNED BY: ST
DRAWN BY: ST
CHECKED BY:
SCALE: VARIES
JOB NO: 21-519
DATE: 04/15/2024
SHEET NO. 4

SCREEN FENCE SAMPLE IMAGE
MANUFACTURER: FENCETRAC
PRODUCT: SANDSTONE VINYL


SCALE: 1 INCH = 20 FEET
160' LONG 6' TALL REQUIRED SCREENING FENCE
NO PARKING FIRE LANE SIGN (TYP) (SEE DETAIL SHEET 11)
170' LONG BY 8' TALL REQUIRED SCREENING FENCE (EXTRA 2' TO ACCOMMODATE GRADE CHANGE)
LOADING SPACE (10'X50')
DUMPSTER PAD
DUMPSTER ENCLOSURE
MECH. 180 SF
DRIVE-THRU CANOPY AND MENU BOARD
CONCRETE DRIVE-THRU LANE HEIGHT BAR
DRIVE THRU 2,560 SF
RETAIL 3,568 SF
TOTAL AREA: 8,706 SFT
FFE 1015.00
RESTAURANT 2,398 SF
DRIVE-THRU WINDOW
OUTDOOR SEATING W/ 3' HT ALUMINUM RAILING ENCLOSURE
PROPOSED ADA SIGN (BUILDING MOUNTED)
INGRESS/EGRESS EASEMENT
VERTICAL CURB (SEE DETAIL SHEET 11)
PROPOSED ADA SIGN
TRASH & RECYCLING RECEPTACLE
70' SETBACK
NO PARKING FIRE LANE SIGN (SEE DETAIL SHEET 11)
MONUMENT SIGN
F TYPE CURB (SEE DETAIL SHEET 11)
EX. ROW
B-2 TYPE CURB (SEE DETAIL SHEET 11)
PROPOSED 8' WIDE CONCRETE SIDEWALK
33' ROW LINE
CURB CUTS FOR SIDEWALK CONNECTION
M OPENING DETAIL (SEE DETAIL SHEET 11)
WEST LINE SECTION 9
SOUTH (R) 632 (R)
S01°46'13"E 652.36' (M)
EXISTING PRENTIS ESTATES ENTRANCE
LATSON ROAD (VARIABLE WIDTH R.O.W.)
SOUTH LATSON ROAD
LOWES DEVELOPMENT ENTRANCE
Sign CENTER LANE LEFT TURN
Sign NEXT INTERSECTIONS
Sign STOP
Manhole AMERITECH
Manhole SBC
Sign GAS PIPELINE

SEE SHEET 2 FOR GENERAL NOTES AND LEGEND

SITE DATA
PARCEL # 4711-04-300-017 & 4711-09-100-004
1015 S. LATSON RD & 1111 S LATSON RD
HOWELL, MI
GENOA TOWNSHIP
3.40 AC
ZONING: GENERAL COMMERCIAL DISTRICT (GCD)
CURRENT USE: VACANT

GENERAL COMMERCIAL DISTRICT

	PROVIDED
- MIN. LOT AREA: 1 ACRE	
- MIN. LOT WIDTH: 150 FT	
- BUILDING SETBACK:	PROVIDED
FRONT: 70 FT	70.2 FT
SIDE: 15 FT	105.6 FT
REAR: 50 FT	50.5 FT
-PARKING SETBACK:	PROVIDED
FRONT: 20 FT	23.5 FT
SIDE: 10 FT	24.0 FT
REAR: 10 FT	10.0 FT
-MAX LOT COVERAGE:	PROVIDED
PARCEL AREA:	78,946 SFT (1.81 AC)
BUILDING: 35%	8,706 SFT (11.0%)
IMPERVIOUS: 75%	58,686 SFT (74.3%)
-MAX BUILDING HEIGHT: 35 FT (2 STORIES)	20 FT

* TOTAL PROPOSED GROSS SQUARE FOOTAGE:

-LANDLORD MECHANICAL ROOM	180 GSF
-FAST FOOD W/ DRIVE-THROUGH	2,560 GSF
-GENERAL RETAIL	3,568 GSF
-SIT DOWN RESTAURANT (NO LIQUOR LICENSE)	2,398 GSF
TOTAL	8,706 GSF

PARKING CALCULATIONS:

-FAST FOOD DRIVE THRU: 1 SPACE PER 70 SQFT GROSS LEASABLE FLOOR AREA (85% OF GROSS FLOOR AREA)
2,560 * 85% = 2176 / 70 = 31.1 SPACES & 10 STACKING SPACES

-SIT DOWN RESTAURANT WITHOUT LIQUOR LICENSE = 1 SPACE/100 SFT GFA
2,398 SFT / 100 SFT = 24.0 SPACES

-RETAIL = 1 SPACE /250 SFT GFA
3,568 SFT / 250 SFT = 14.3 SPACES

-OUTDOOR SEATING = 1 SPACE / 1 TABLE
2 TABLES / 1 = 2 SPACES

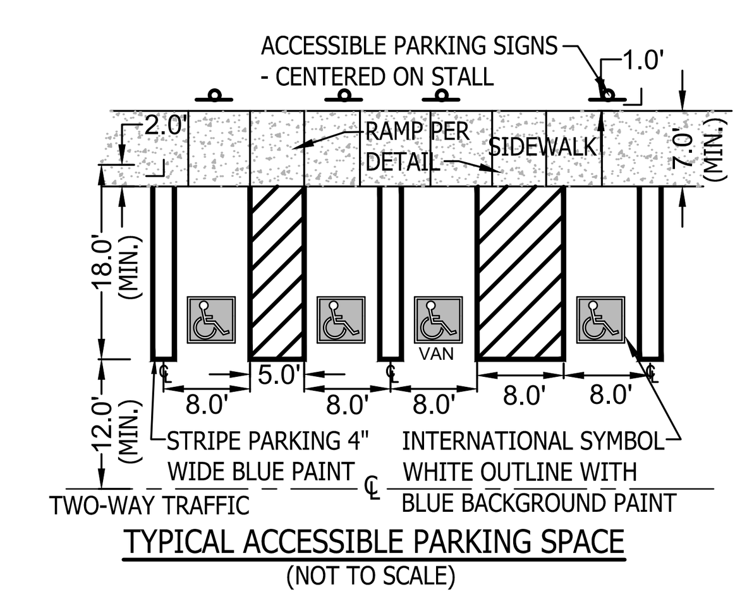
REQUIRED: 32 + 24 + 15 + 2 = 73 SPACES
PROVIDED: 73 SPACES

LOADING/UNLOADING SPACES: 10' x 50'
REQUIRED: 5,001 GFA TO 20,000 GFA REQUIRES 2 SPACES
PROVIDED: 2 LOADING/UNLOADING SPACES

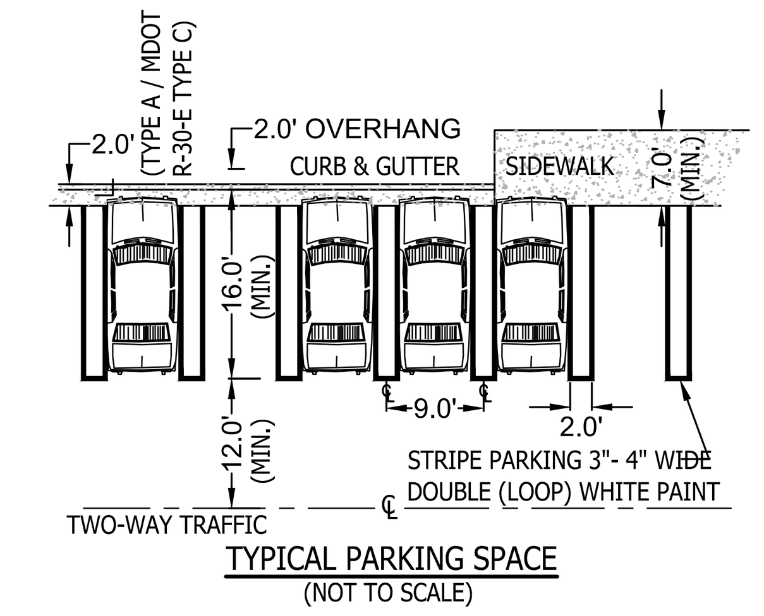
PLANNING COMMISSION WAIVERS REQUESTED:
A REDUCTION IN LANDSCAPE BUFFER ON THE WEST AND EAST SIDE OF PROPERTY DUE TO SHALLOW DEPTH OF EXISTING PARCEL. A SCREEN FENCE AND ADEQUATE LANDSCAPING ARE STILL PROPOSED TO MEET THE ORDINANCE TO THE MAXIMUM EXTENT POSSIBLE.

VARIANCES OBTAINED:
1) DRIVE-THRU SEPARATION TO ANOTHER DRIVE-THRU

GENERAL NOTES
1. ALL OUTDOOR LIGHTS SHALL BE SHIELDED TO REDUCE GLARE AND SHALL BE ARRANGED TO NOT INTERFERE WITH THE VISION OF PERSONS ON ADJACENT ROADWAYS OR ADJACENT PROPERTY.
2. ALL SIGNS SHALL MEET LOCAL MUNICIPALITY ORDINANCE REQUIREMENTS.
3. THE BUILDING ADDRESS SHALL BE A MINIMUM 6" HIGH LETTERS OF CONTRASTING COLORS AND BE CLEARLY VISIBLE FROM THE STREET. THE LOCATION AND SIZE SHALL BE VERIFIED PRIOR TO INSTALLATION.
4. A KEY BOX/KNOX BOX SHALL BE LOCATED NEAR THE FRONT ENTRY AT EACH TENANT SPACE (FINAL LOCATION TO BE DETERMINED BETWEEN THE OWNER & FIRE MARSHALL).
5. ONE SIDE OF THE STREET SHALL BE MARKED AS A FIRE LANE AND SHALL HAVE APPROPRIATE SIGNAGE.
6. ACCESS ROADS TO THE SITE SHALL BE PROVIDED AND MAINTAINED DURING CONSTRUCTION.
7. ACCESS ROADS SHALL BE CONSTRUCTED TO BE CAPABLE OF SUPPORTING THE IMPOSED LOAD OF FIRE APPARATUS WEIGHING AT LEAST 84,000 LBS.
8. A MINIMUM VERTICAL CLEARANCE OF 13.5 FEET SHALL BE MAINTAINED THROUGHOUT THE SITE. THIS INCLUDES ENCROACHMENTS FROM LARGE TREE CANOPIES, LIGHTING, ETC.
9. DURING THE CONSTRUCTION PROCESS, THE BUILDING WILL BE EVALUATED FOR EMERGENCY RESPONDER RADIO SIGNAL STRENGTH. IF COVERAGE IS FOUND TO BE QUESTIONABLE OR INADEQUATE; AN APPROVED CONTRACTOR SHALL BE HIRED TO PERFORM A GRID TEST OF THE FACILITY. IF THE SIGNAL STRENGTH COVERAGE IS FOUND TO BE NON-COMPLIANT, AN APPROVED EMERGENCY RESPONDER RADIO COVERAGE SYSTEM SHALL BE PROVIDED IN THE BUILDING.
10. SITE LIGHTING SHALL BE PLACED ON TIMERS TO BE OFF DURING NON-USE HOURS TO THE EXTENT POSSIBLE WHILE MAINTAINING SITE SAFETY. SITE LIGHTING SHALL BE PROGRAMMED TO TURN OFF AT NIGHT WHEN ACTIVITIES ARE NO LONGER OCCURRING ON THE PROPERTY.
11. DELIVERIES SHALL BE ARRANGED FOR OFF PEAK HOURS TO AVOID POTENTIAL VEHICULAR CONFLICTS.
12. NO OUTDOOR SPEAKERS ARE PROPOSED OTHER THAN THAT REQUIRED FOR THE DRIVE-THRU WINDOW ORDERING EQUIPMENT.



TYPICAL ACCESSIBLE PARKING SPACE
(NOT TO SCALE)



TYPICAL PARKING SPACE
(NOT TO SCALE)

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

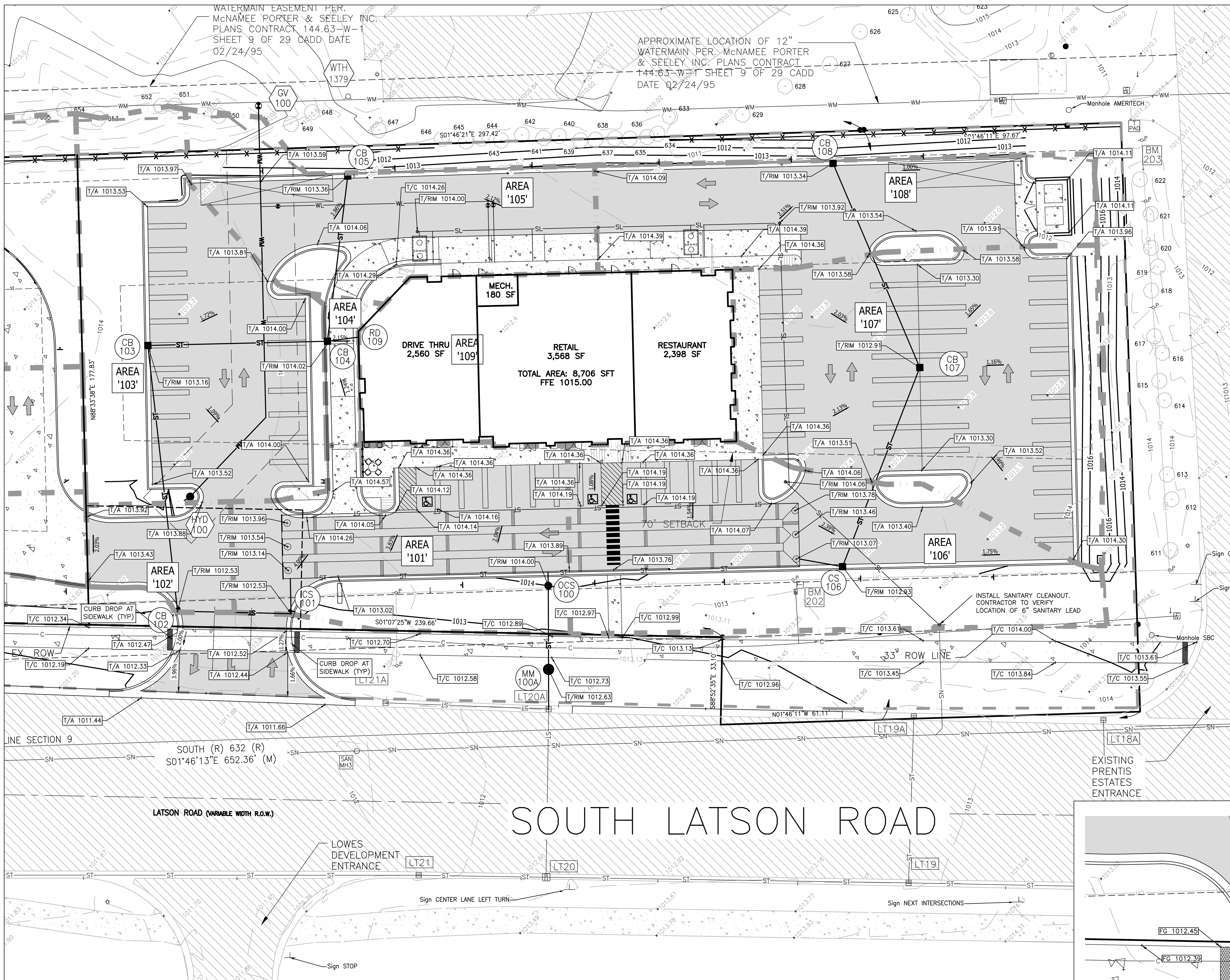
PROJECT: SOUTH LATSON COMMERCIAL DEVELOPMENT

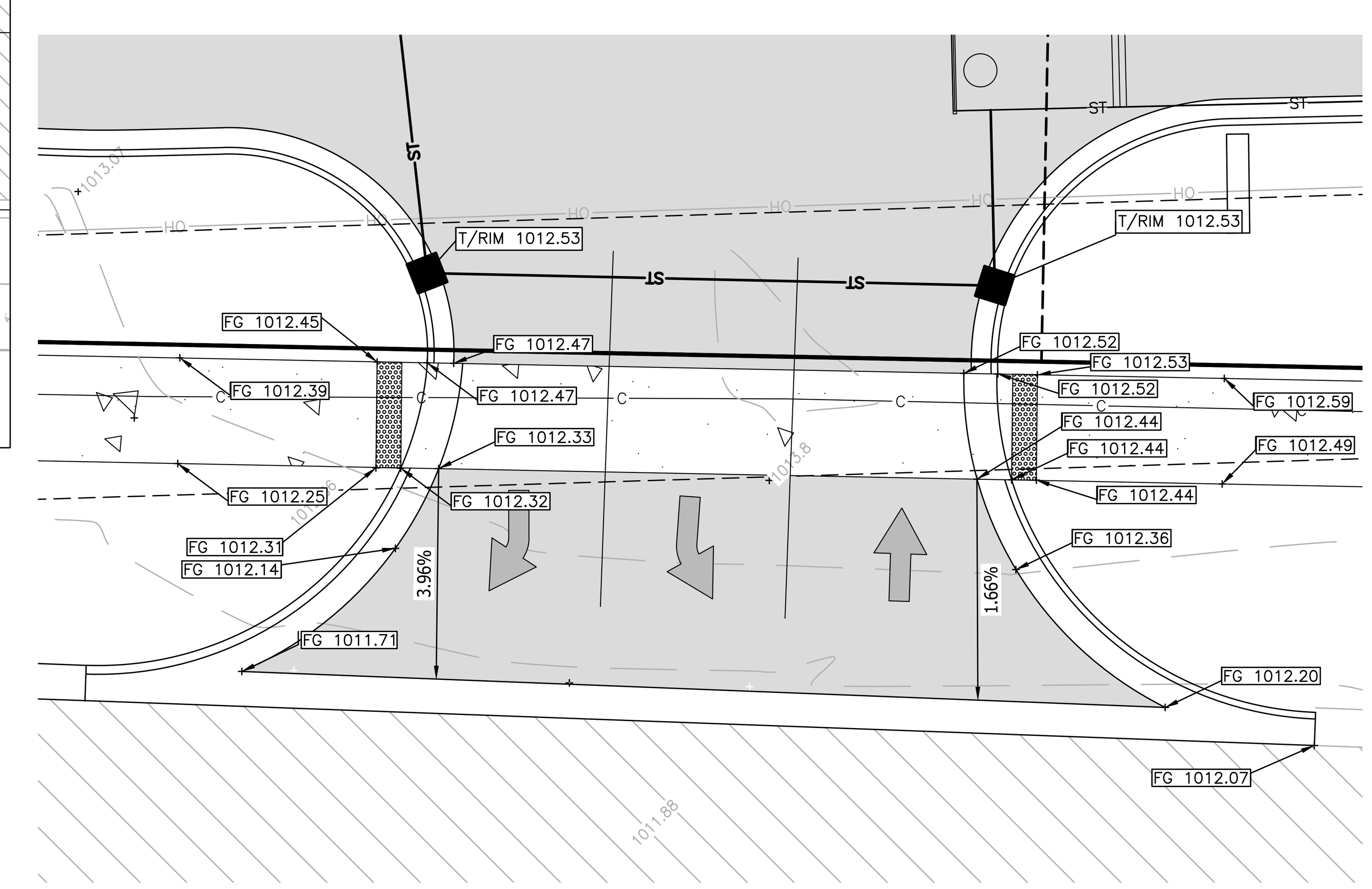
PREPARED FOR: 1015 LATSON ROAD LLC
29592 BECK ROAD
WIXOM, MI 48393
248.773.7992

TITLE: SITE PLAN

NO	BY	REVISION PER	DATE
4	ST	CHANGE IN USE - NEW SLU SUBMITTAL	5-27-2025
3	ST	PER ACT 399 REVIEW	10-24-2024
2	ST	PER MHOG REVIEW	6-17-2024
1	ST	PER MHOG REVIEW	5-20-2024

DESIGNED BY: ST
DRAWN BY: ST
CHECKED BY:
SCALE: 1" = 20'
JOB NO: 21-519
DATE: 04/15/2024
SHEET NO. 5





ENTRANCE GRADING DETAIL
(SCALE: 1" = 10')

SCALE: 1 INCH = 20 FEET

SEE SHEET 2 FOR GENERAL NOTES AND LEGEND

SITE BENCHMARKS (NAVD88):
- BM #200 = NAIL/TAG S/S POWER POLE ELEV.=1013.34
- BM #201 = NAIL/TAG NE/S POWER POLE ELEV.=1014.28
- BM #202 = NAIL/TAG NE/S POWER POLE ELEV.=1013.57
- BM #203 = NORTH EAST CORNER TRANS-PAD ELEV.=1011.58

DRAINAGE AREA TABLE

DRAINAGE AREA	TOTAL AREA (AC)	IMP. AREA (AC)	C VALUE	A*C
100	-	-	-	-
101	0.18	0.14	0.72	0.13
102	0.05	0.04	0.84	0.04
103	0.25	0.14	0.60	0.15
104	0.02	0.02	0.84	0.02
105	0.15	0.12	0.76	0.12
106	0.26	0.15	0.61	0.16
107	0.30	0.26	0.82	0.24
108	0.16	0.15	0.85	0.14
109	0.21	0.21	0.90	0.18
TOTALS	1.58	1.23	0.75	1.18

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HOWELL, MI. 48843
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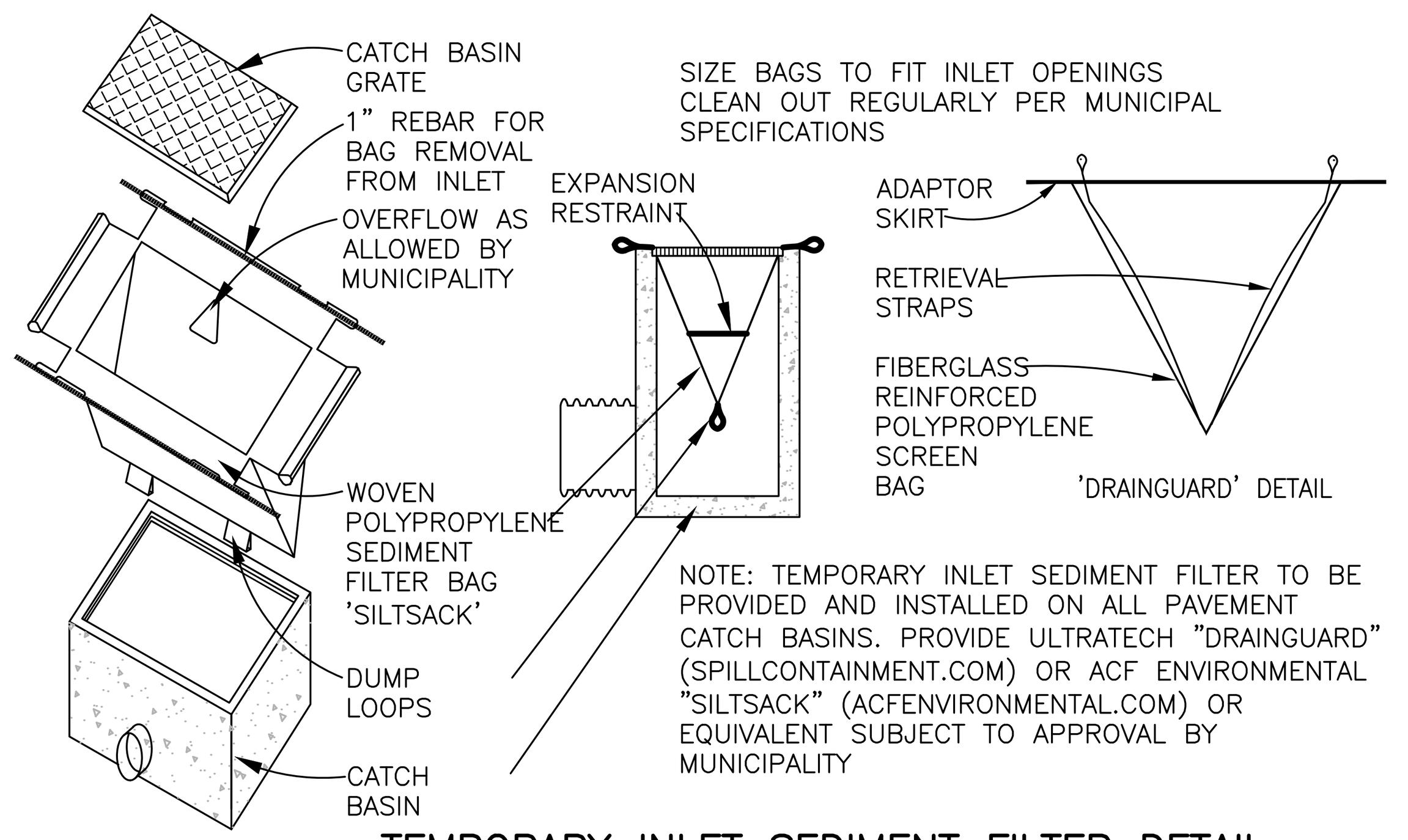
PROJECT: SOUTH LATSON COMMERCIAL DEVELOPMENT

PREPARED FOR: 1015 LATSON ROAD LLC
29592 BECK ROAD
WIXOM, MI 48393
248.773.7992

TITLE: GRADING & DRAINAGE PLAN

NO	BY	REVISION PER	DATE
4	ST	CHANGE IN USE - NEW SLU SUBMITTAL	5-27-2025
3	ST	PER ACT 399 REVIEW	10-24-2024
2	ST	PER MHOG REVIEW	6-17-2024
1	ST	PER MHOG REVIEW	5-20-2024

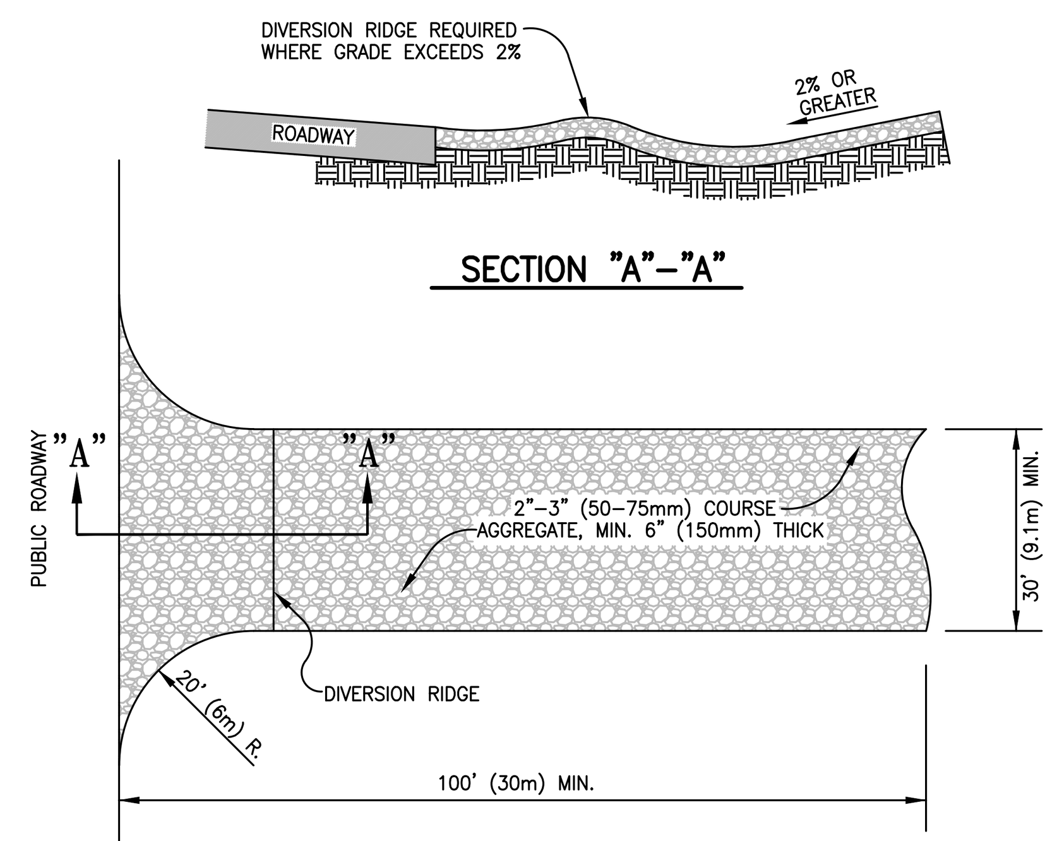
DESIGNED BY: ST
DRAWN BY: DH
CHECKED BY:
SCALE: 1" = 20'
JOB NO: 21-519
DATE: 04/15/2024
SHEET NO. 6



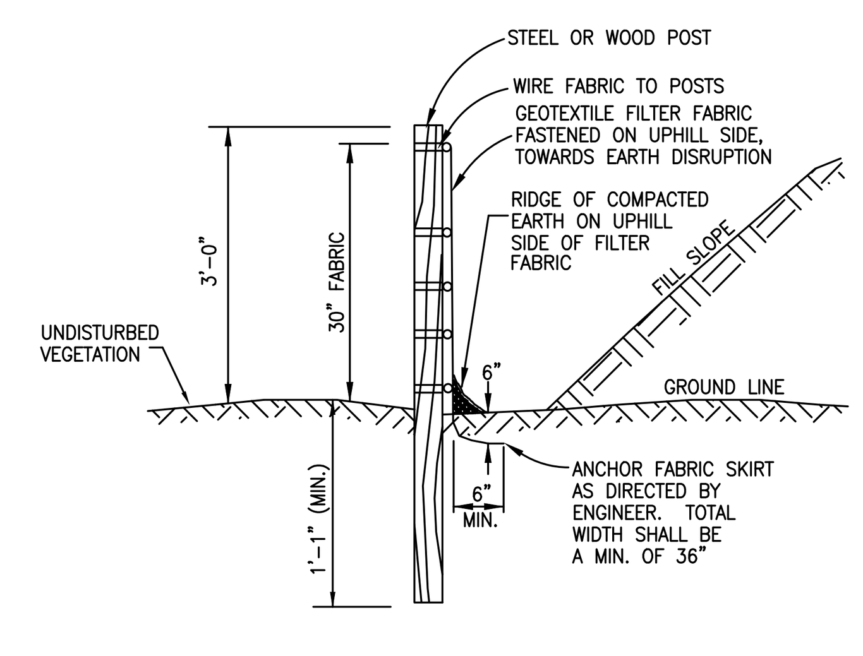
SIZE BAGS TO FIT INLET OPENINGS CLEAN OUT REGULARLY PER MUNICIPAL SPECIFICATIONS

NOTE: TEMPORARY INLET SEDIMENT FILTER TO BE PROVIDED AND INSTALLED ON ALL PAVEMENT CATCH BASINS. PROVIDE ULTRATECH "DRAINGUARD" (SPILLCONTAINMENT.COM) OR ACF ENVIRONMENTAL "SILTSACK" (ACFENVIRONMENTAL.COM) OR EQUIVALENT SUBJECT TO APPROVAL BY MUNICIPALITY

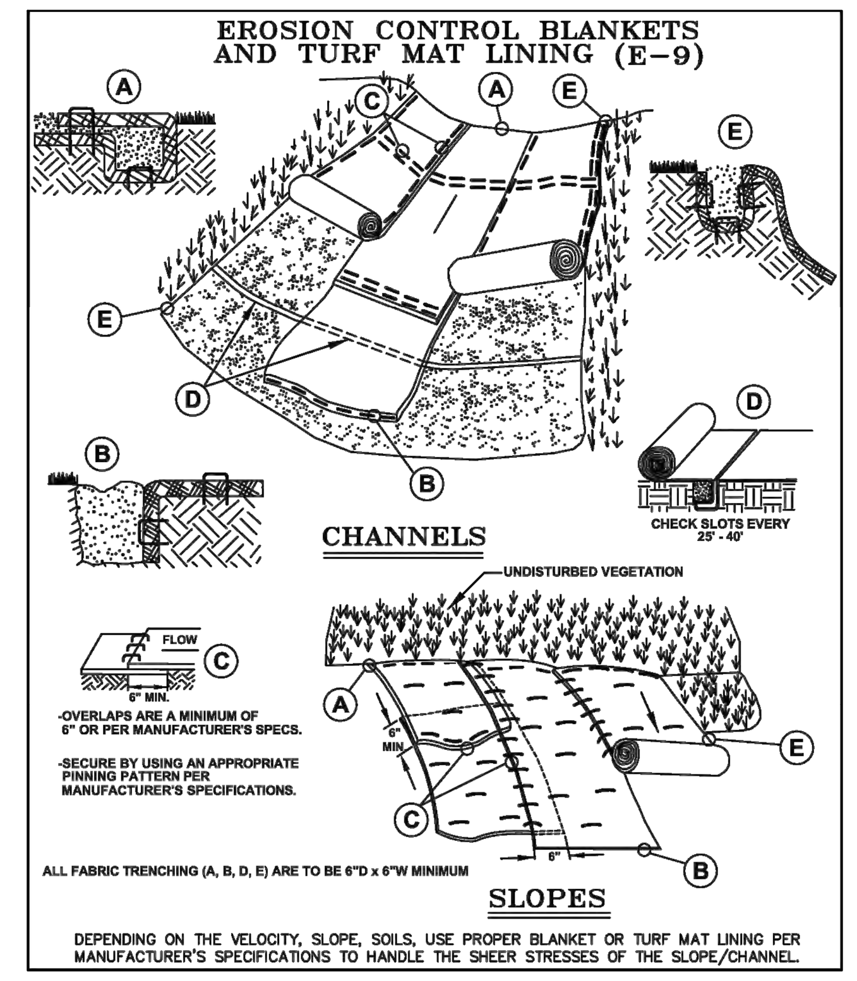
TEMPORARY INLET SEDIMENT FILTER DETAIL
(NO SCALE)

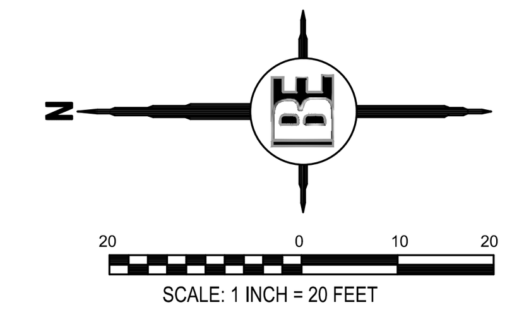


TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT
NO SCALE



SILT FENCE DETAIL
NO SCALE





SEE SHEET 2 FOR GENERAL NOTES AND LEGEND

SOIL EROSION CONTROL MEASURES

No.	Measure	Description
1	STRIPPING & STOCKPILING TOPSOIL	TOPSOIL MAY BE STOCKPILED ABOVE BORROW AREAS TO ACT AS A DIVERSION STOCKPILE SHOULD BE TEMPORARILY SEEDED
6	SEEDING WITH MULCH AND/OR MATTING	FACILITATES ESTABLISHMENT OF VEGETATIVE COVER EFFECTIVE FOR DRAINAGEWAYS WITH LOW VELOCITY EASILY PLACED IN SMALL QUANTITIES BY INEXPERIENCED PERSONNEL SHOULD INCLUDE PREPARED TOPSOIL BED
14	AGGREGATE COVER	STABILIZES SOIL SURFACE, THUS MINIMIZING EROSION PERMITS CONSTRUCTION TRAFFIC IN ADVERSE WEATHER MAY BE USED AS PART OF PERMANENT BASE CONSTRUCTION OF PAVED AREAS
15	PAVING	PROTECTS AREAS WHICH CANNOT OTHERWISE BE PROTECTED, BUT INCREASES RUNOFF VELOCITY IRREGULAR SURFACE WILL HELP SLOW VELOCITY
16	CURB & GUTTER	KEEPS HIGH VELOCITY RUNOFF ON PAVED AREAS FROM LEAVING PAVED SURFACE COLLECTS AND CONDUCTS RUNOFF TO ENCLOSED DRAINAGE SYSTEM OR PREPARED DRAINAGEWAY
35	STORM SEWER	SYSTEM REMOVES COLLECTED RUNOFF FROM SITE, PARTICULARLY FROM PAVED AREAS CAN ACCEPT LARGE CONCENTRATIONS OF RUNOFF CONDUCTS RUNOFF TO MUNICIPAL SEWER SYSTEM OR STABILIZED OUTFALL LOCATION USE CATCH BASINS TO COLLECT SEDIMENT
36	CATCH BASIN, DRAIN INLET	COLLECTS HIGH VELOCITY CONCENTRATED RUNOFF MAY USE FILTER CLOTH OVER INLET
40	INLET SEDIMENT FILTER	EASY TO SHAPE COLLECTS SEDIMENT MAY BE CLEANED AND EXPANDED AS NEEDED
51	RETAINING WALL	REDUCES GRADIENT WHERE SLOPES ARE EXTREMELY STEEP PERMITS RETENTION OF EXISTING VEGETATION, KEEPING SOIL STABLE IN CRITICAL AREAS MINIMIZES MAINTENANCE
54	SILT FENCE	USES GEOTEXTILE FABRIC AND POST OR POLES. EASY TO CONSTRUCT AND LOCATE AS NECESSARY. (SEE DETAIL THIS SHEET)

T= TEMPORARY, P= PERMANENT
TOTAL DISTURBED AREA= 1.81 AC.

DEWATERING NOTE:

1. ANY DEWATERING REQUIRED SHALL HAVE A DEWATERING PLAN SUBMITTED PRIOR TO STARTING THE ACTIVITY AND MAY REQUIRE EGLE APPROVAL.

SURFACE WATER & COUNTY DRAINS
WETLAND – APPROXIMATELY 200 FT SOUTHEAST BEHIND PLATINUM CONTRACTING
LAKES – APPROXIMATELY 4000 FT NORTHEAST TO LAKE CHEMUNG
STREAMS – APPROXIMATELY 1000 FT NORTHWEST TO LIVINGSTON COMMONS SHOPPING CENTER
BASINS – APPROXIMATELY 900 FT NORTHWEST TO SLEEPCHEK MATTRESS STORE
DRAINS – APPROXIMATELY 650 FT NORTHWEST TO LATSON ROAD DRAIN
PONDS – APPROXIMATELY 200 FT EAST BEHIND PLATINUM CONTRACTING

CONSTRUCTION SEQUENCE

THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT EROSION IS MINIMIZED AND THAT COMPLIANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS, REGULATIONS, AND ORDINANCES IS MAINTAINED THROUGHOUT EXECUTION OF THIS PROJECT.

1 DAYS	1.	INSTALL SILT FENCE AS SHOWN ON PLANS.
30 DAYS	2.	ROUGH GRADE AND INSTALL STORM DRAINAGE.
1 DAY	3.	INSTALL INLET PROTECTION ON STORM INLETS.
180 DAY	4.	START BLDG. CONSTRUCTION
30 DAYS	5.	INSTALL PAVEMENT
10 DAYS	6.	FINE GRADE AROUND BUILDING, SPREAD TOPSOIL, SEED OR SOD AS APPLICABLE.
1 DAY	7.	REMOVE ALL EROSION CONTROL STRUCTURES.
1 DAY	8.	REMOVE ACCUMULATED SILT FROM ALL EXISTING DRAINAGE.

CONTROLS & MEASURES POST CONSTRUCTION SEQUENCE

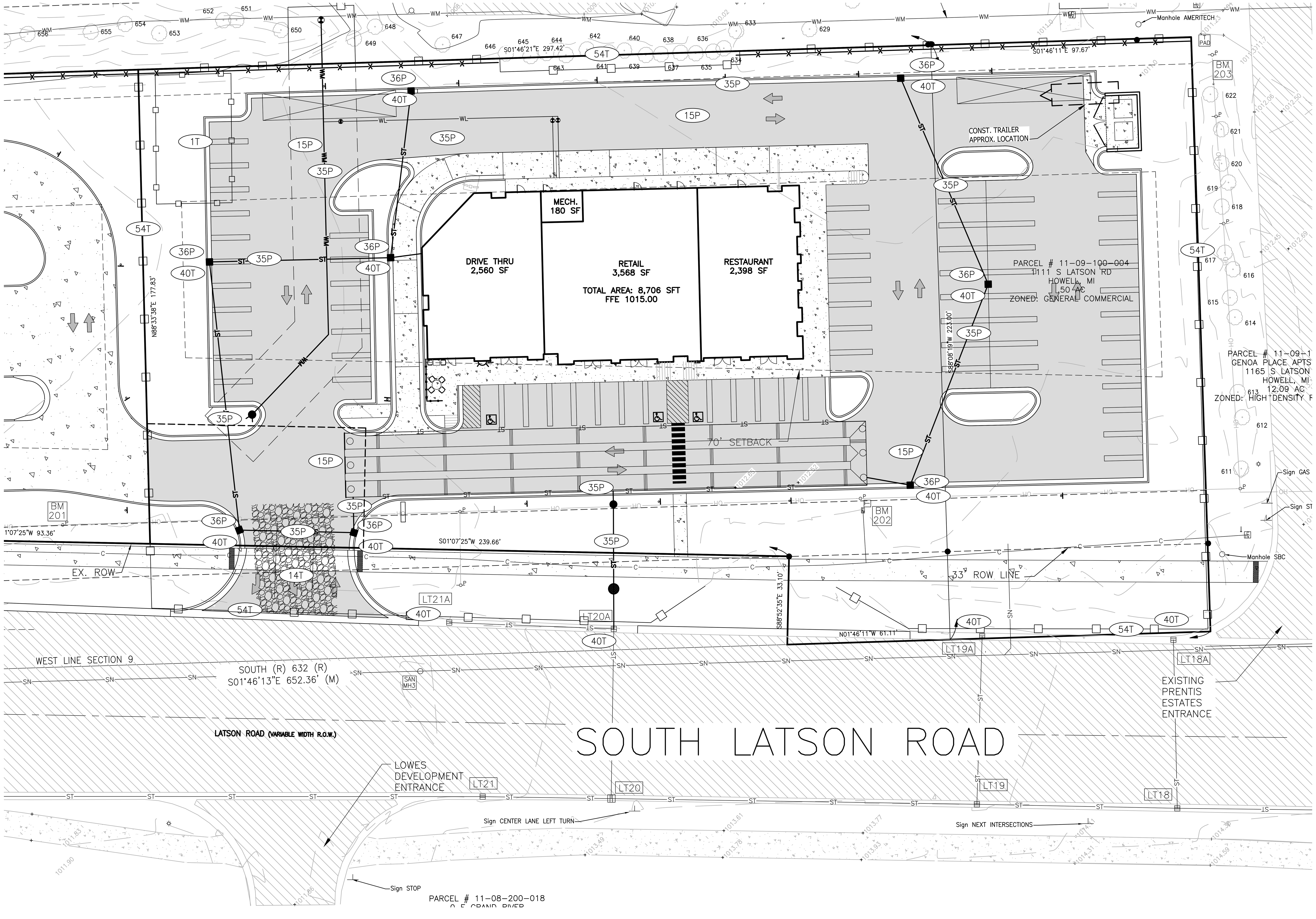
ACTIVITY	WEEKLY	MONTHLY	AS REQUIRED
MAINTAIN LANDSCAPING, REPLACE MULCH	X	X	X
CLEAN INLETS		X	X
COLLECT LITTER	X		X
SWEEP PARKING LOT		X	X

CONTROLS & MEASURES NARRATIVE

ACTIVITY	DESCRIPTION
MAINTAIN LANDSCAPING, REPLACE MULCH	COLLECT GRASS, TREE, AND SHRUB CLIPPINGS. DISPOSE IN APPROVED CONTAINER. REPLACE DEAD SOD, TREES AND SHRUBS.
CLEAN INLETS	REMOVE LITTER, SEDIMENT, AND DEBRIS. DISPOSE OF IN APPROVED LANDFILL.
COLLECT LITTER	DISPOSE OF WITH INLET DEBRIS.
SWEEP PARKING LOT	REMOVE MUD, DIRT, GREASE AND OIL WITH PERIODIC SWEEPING
DUST CONTROL	SPRINKLE WATER AS NEEDED

PROPOSED CONST. SCHEDULE FOR THE YEAR 2024

ACTIVITY	MAY	JUNE	JULY	AUG	SEPT	OCT
DEMO & CLEAR						
MASS GRADING						
UNDERGROUND UTILITY						
FINAL GRADING						
SEED & MULCH						



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PROJECT: SOUTH LATSON COMMERCIAL DEVELOPMENT

PREPARED FOR: 1015 LATSON ROAD LLC
29592 BECK ROAD
WIXOM, MI 48393
248.773.7992

TITLE: SOIL EROSION & SEDIMENTATION CONTROL PLAN

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DESIGNED BY: ST
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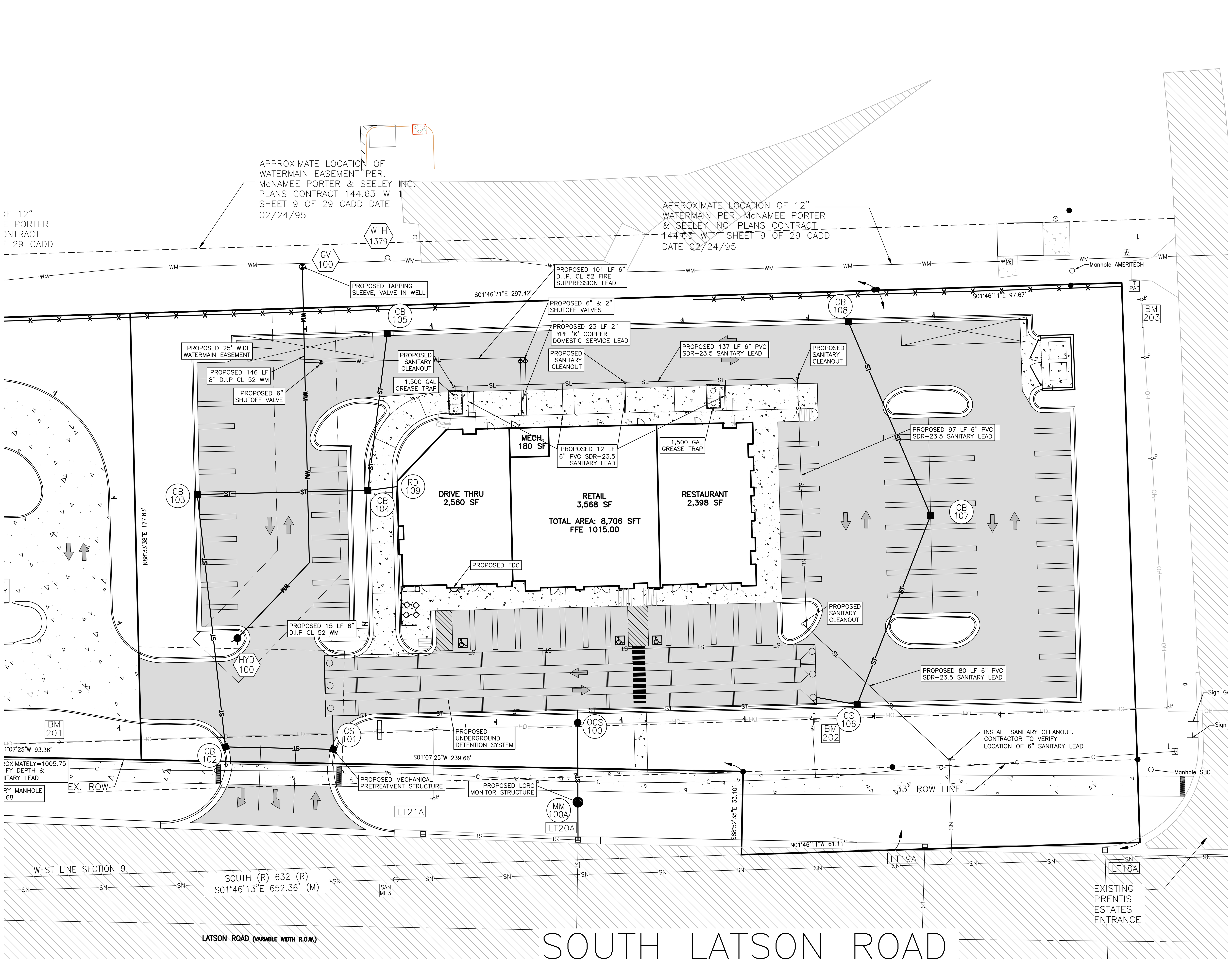
CHECKED BY:
SCALE: 1" = 20'
JOB NO: 21-519
DATE: 04/15/2024
SHEET NO. 7

SEE SHEET 2 FOR GENERAL NOTES AND LEGEND



STORM STRUCTURE TABLE	
STRUCTURE NAME	STRUCTURE DETAILS
CB102 48Ø COVER TYPE 'K' 2' SUMP	RIM = 1012.53 SUMP = 2' 12" INV IN = 1008.46 12" INV OUT = 1008.46
CB103 48Ø COVER TYPE 'K' 2' SUMP	RIM = 1013.16 SUMP = 2' 12" INV IN = 1008.97 12" INV OUT = 1008.97
CB104 48Ø COVER TYPE 'K' 2' SUMP	RIM = 1014.01 SUMP = 2' 12" INV IN = 1009.31 8" INV IN = 1009.57 12" INV OUT = 1009.31
CB105 48Ø COVER TYPE 'K' 2' SUMP	RIM = 1013.37 SUMP = 2' 12" INV OUT = 1009.62
CB107 48Ø COVER TYPE 'K' 2' SUMP	RIM = 1012.91 SUMP = 2' 12" INV IN = 1009.41 12" INV OUT = 1009.41
CB108 24Ø COVER TYPE 'K' 2' SUMP	RIM = 1013.34 SUMP = 2' 12" INV IN = 1009.83
CS101 48Ø COVER TYPE 'K' 2' SUMP	RIM = 1012.53 SUMP = 2' 12" INV IN = 1008.25 12" INV OUT = 1008.25
CS106 48Ø COVER TYPE 'K' 2' SUMP	RIM = 1012.93 SUMP = 2' 12" INV OUT = 1009.00 12" INV OUT = 1009.00
EXLT20A 48Ø COVER TYPE 'EXISTING' 2' SUMP	RIM = 1011.96 SUMP = 2' 12" INV IN = 1008.00
MM100A 48Ø COVER TYPE 'A' 2' SUMP	RIM = 1012.63 SUMP = 2' 12" INV IN = 1008.05 12" INV OUT = 1008.05
OCS100 48Ø COVER TYPE 'A' 2' SUMP	RIM = 1014.00 SUMP = 2' 12" INV IN = 1008.15 12" INV OUT = 1008.15

UTILITY NOTES

1. WATER IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CURRENT MARION, HOWELL, OCEOLA, AND GENOA (MHOG) DESIGN STANDARDS AND SPECIFICATIONS.
2. ALL FIRE HYDRANTS SHALL BE INSTALLED A MINIMUM OF 3 FEET BEHIND BACK OF CURB.
3. ALL SANITARY SEWER IMPROVEMENTS SHOULD BE CONDUCTED IN CURRENT GENOA-OCEOLA (GO) DESIGN STANDARDS AND SPECIFICATIONS.
4. A TRACER WIRE SHALL BE INCLUDED ON ALL WATER MAIN DISTRIBUTION LINES.

FROM	TO	DRAIN AREA	ACRES A	RUNOFF COEFF C	EQUIV. AREA A * C	INTEN-SITY I	TIME OF CONC. T_C	ADD'L RUNOFF Q	RUNOFF (CFS) Q	PIPE LENGTH (LF)	PIPE DIA. (IN)	VELOCITY FLOWING FULL (FPS)	HYDRAULIC GRADIENT SLOPE %	ACTUAL SLOPE USED	MANNING COEFFICIENT	MANNING FLOW CAPACITY	MANNING'S VELOCITY (FT/SEC)	TIME (MIN)	HG ELEV UPPER END	HG ELEV LOWER END	RIM ELEV UPPER END	RIM ELEV LOWER END	INVERT UPPER END	INVERT LOWER END
105	104	105	0.15	0.76	0.12	4.38	15.00		0.51	63	12	2.15	0.22%	0.50%	0.013	2.53	3.22	0.33	1010.42	1010.11	1013.36	1014.01	1009.62	1009.31
104	103	104	0.02	0.84	0.02	4.34	15.33	0.81	1.39	68	12	2.86	0.40%	0.50%	0.013	2.53	3.22	0.35	1010.11	1009.80	1014.01	1013.16	1009.31	1008.97
103	102	103	0.25	0.60	0.15	4.30	15.68		2.03	101	12	3.18	0.49%	0.50%	0.013	2.53	3.22	0.52	1009.80	1009.31	1013.16	1012.53	1008.97	1008.46
102	101	102	0.05	0.84	0.04	4.25	16.20		2.20	43	12	3.54	0.60%	0.50%	0.013	2.53	3.22	0.22	1009.31	1009.05	1012.53	1012.53	1008.46	1008.25
101	BASIN	101	0.18	0.72	0.13	4.22	16.43		2.76	13	12	3.52	0.60%	0.60%	0.013	2.77	3.52	0.06	1009.05	1008.97	1012.53	1013.33	1008.25	1008.17
108	107	108	0.16	0.85	0.14	4.38	15.00		0.61	84	12	2.25	0.24%	0.50%	0.013	2.53	3.22	0.43	1010.63	1010.21	1013.34	1012.91	1009.83	1009.41
107	106	107	0.30	0.82	0.24	4.33	15.43		1.65	81	12	2.98	0.43%	0.50%	0.013	2.53	3.22	0.42	1010.21	1009.84	1012.91	1012.93	1009.41	1009.00
106	BASIN	106	0.26	0.61	0.16	4.28	15.85		2.32	17	12	3.86	0.72%	0.50%	0.013	2.53	3.22	0.09	1009.84	1009.72	1012.93	1013.33	1009.00	1008.92
109	104	109	0.21	0.90	0.18	4.38	15.00		0.81	12	8	3.21	0.86%	1.00%	0.013	1.21	3.47	0.06	1010.23	1010.11	1015.00	1014.01	1009.69	1009.57
BASIN	OCS 100	ALL	1.58	0.75	1.175804	6.03	16.43		7.09	5	12	3.34	0.54%	0.32%	0.013	2.02	2.57	0.03	1009.08	1009.05	1013.78	1014.00	1008.17	1008.15
OCS 100	MM 100A	OCS 100	-	-	-	-	16.46		7.09	32	12	3.34	0.54%	0.32%	0.013	2.02	2.57	0.21	1009.05	1008.88	1014.00	1012.63	1008.15	1008.05
MM 100A	EX	MM 100A	-	-	-	-	16.66		7.09	15	12	3.34	0.54%	0.32%	1.013	2.02	2.57	0.10	1008.88	1008.80	1012.63	-	1008.05	1008.00

BOSS Engineering
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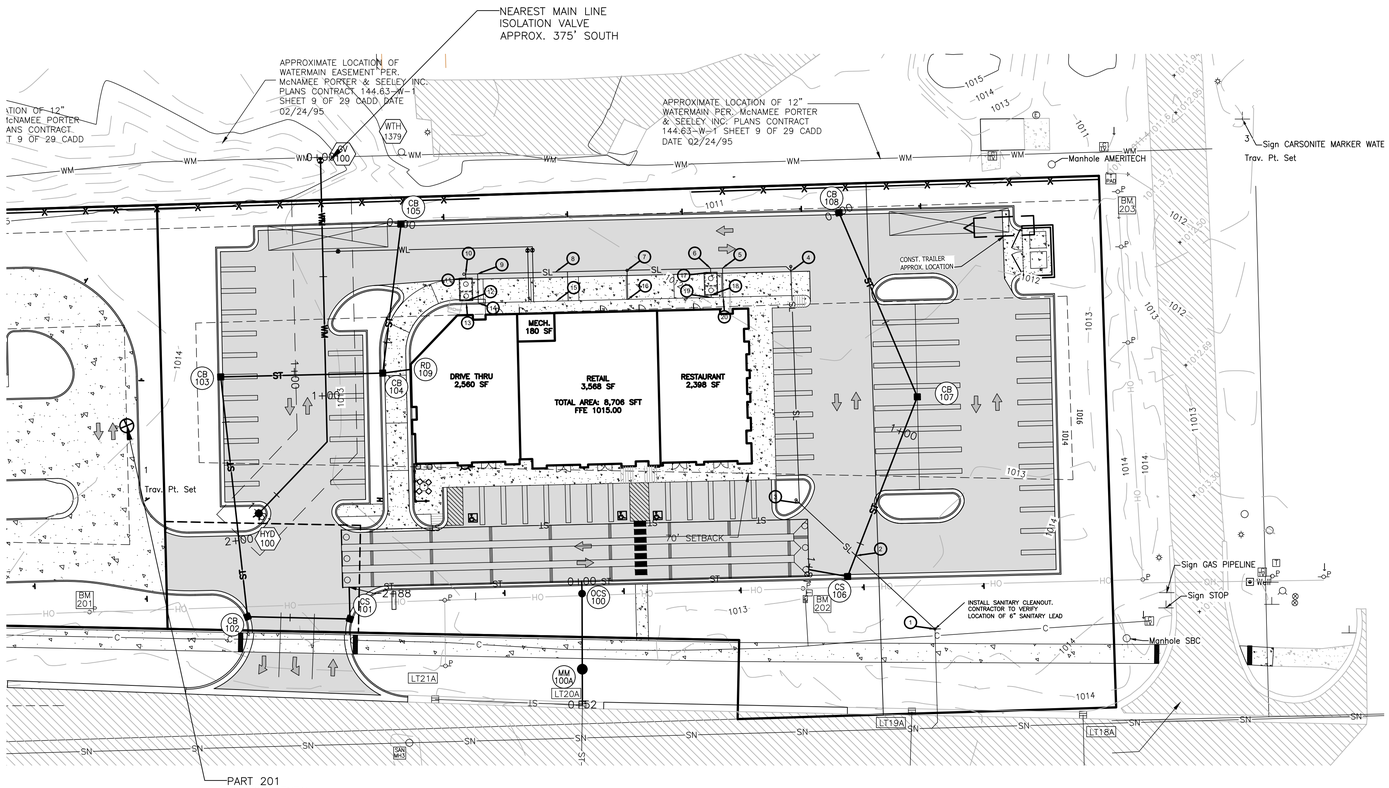
PROJECT
SOUTH LATSON COMMERCIAL DEVELOPMENT

PREPARED FOR
1015 LATSON ROAD LLC
29592 BECK ROAD
WIXOM, MI 48393
248.773.7992

TITLE
UTILITY PLAN

NO	BY	REVISION PER	DATE
4	ST	CHANGE IN USE - NEW SLU SUBMITTAL	5-27-2025
3	ST	PER ACT 399 REVIEW	10-24-2024
2	ST	PER MHOG REVIEW	6-17-2024
1	ST	PER MHOG REVIEW	5-20-2024

DESIGNED BY: ST
DRAWN BY: DH
CHECKED BY:
SCALE: 1" = 20'
JOB NO: 21-519
DATE: 04/15/2024
SHEET NO. 8
BOSS Engineering



SANITARY LEAD ELEVATIONS TABLE		
	LOCATION/DESCRIPTION	INVERT ELEVATION
20	BUILDING STUB	1009.74
19	BUILDING STUB	1009.77
18	GREASE TRAP INLET	1009.75
17	GREASE TRAP OUTLET	1009.57
16	BUILDING STUB	1010.14
15	BUILDING STUB	1010.44
14	BUILDING STUB	1010.77
13	BUILDING STUB	1010.80
12	GREASE TRAP INLET	1010.78
11	GREASE TRAP OUTLET	1010.60
10	CLEANOUT #5	1010.58
9	SANITARY WYE	1010.53
8	SANITARY WYE	1010.20
7	SANITARY WYE & CLEANOUT #4	1009.90
6	SANITARY WYE	1009.55
5	SANITARY WYE	1009.50
4	CLEANOUT #3	1009.20
3	CLEANOUT #2	1008.22
2	SANITARY LEAD X STORM	1007.87
1	EXISTING SANITARY STUB & CLEANOUT #1 (CONTRACTOR TO VERIFY PRIOR TO CONSTRUCTION)	1007.42*

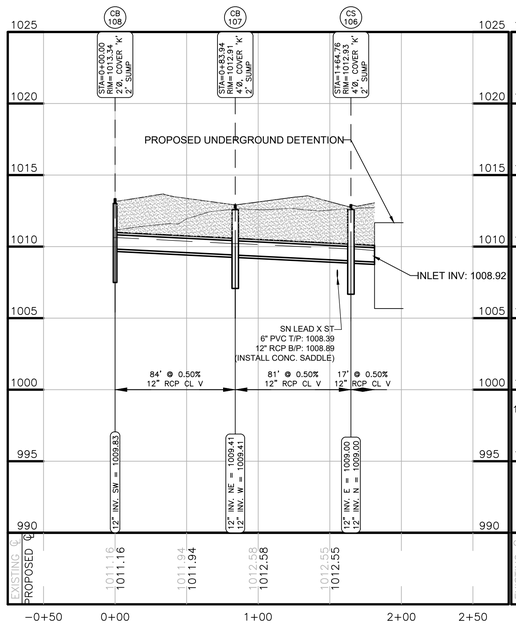
EXISTING SANITARY STUB ELEVATION CALCULATED FROM MCNAMEE PORTER & SEELEY PLANS DATED NOVEMBER 1990 AND WAS CALCULATED TO 1007.17. AS A FACTOR OF SAFETY, THE STARTING DESIGN ELEVATION WAS SET TO BE 3" ABOVE THIS CALCULATED STUB ELEVATION AT 1007.42. WHEN CONTRACTOR VERIFIES EXISTING STUB INVERT ELEVATION, CONTACT DESIGN ENGINEER. IF STUB ELEVATION IS LOWER THAN THE STARTING 1007.42 INVERT ELEVATION, THE CONTRACTOR SHALL INSTALL THE PROPOSED SANITARY LEAD AT THE EXISTING DEPTH TO OBTAIN ADDITIONAL VERTICAL CLEARANCE BETWEEN THE SANITARY LEAD AND THE STORM SEWER CROSSING.

SEE SHEET 2 FOR GENERAL NOTES AND LEGEND

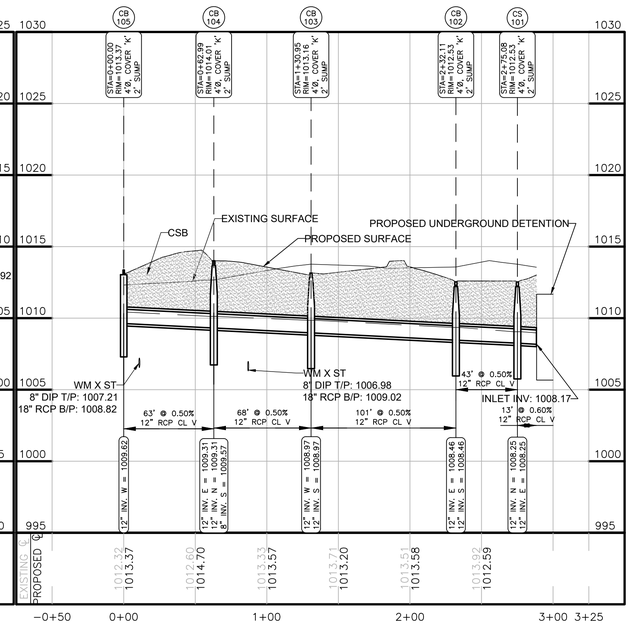
ENVIRONMENTAL CONTAMINATION SITE NOTE:
THE SUBJECT PARCEL HAS A KNOWN PART 201 ENVIRONMENTAL CONTAMINATION SITE. THE CONTAMINATION IS LOCATED CENTRALLY ON THE SUBJECT PARCEL AS SHOWN ON THE MDEGLE RIDE MAPPER. THE CONTAMINANT IS INDICATED TO BE MERCURY IN THE 'ELEMENTS/METALS/OTHER INORGANICS' CONTAMINANT CLASSIFICATION.

THE CONSTRUCTION OF WATERMAIN SHOULD REQUIRE THE USE OF ANY OF THE BELOW WATERMAIN GASKETS THAT ARE ACCEPTABLE FOR USE WITH THIS SPECIFIC CONTAMINANT.
–NATURAL RUBBER, SBR, BUTYL, EPR, EPT, EPDM,BUNA–N, NITRILE, NBR, HYDRIN, NEOPRENE, URETHANE, POLYURETHANE, POLYSULFIDE, FLOURO ELASTOMERS.

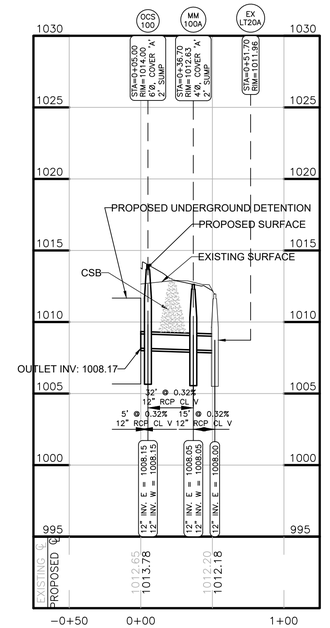
CB 108 TO UNDERGROUND DETENTION



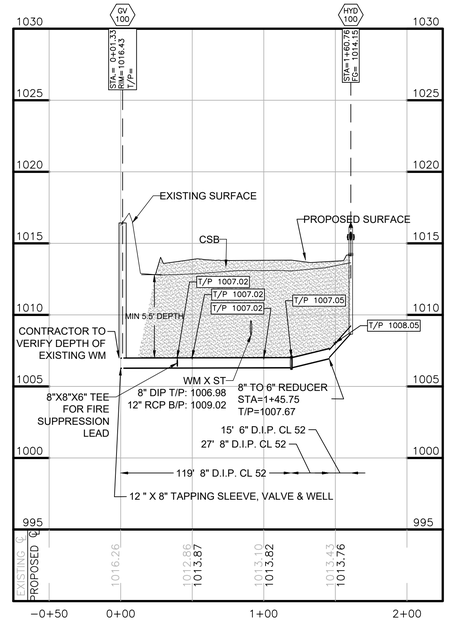
CB 105 TO UNDERGROUND DETENTION



UNDERGROUND DETENTION TO EX LT20A



HYDRANT



SCALE: 1" = 5' (VERT)
1" = 50' (HORIZ)

BE BOSS Engineering
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PROJECT
SOUTH LATSON COMMERCIAL DEVELOPMENT
1015 LATSON ROAD LLC
2592 BECK ROAD
WIXOM, MI 48393
248.773.7992
PREPARED FOR

TITLE
PLAN & PROFILE

NO	BY	REVISION PER	DATE
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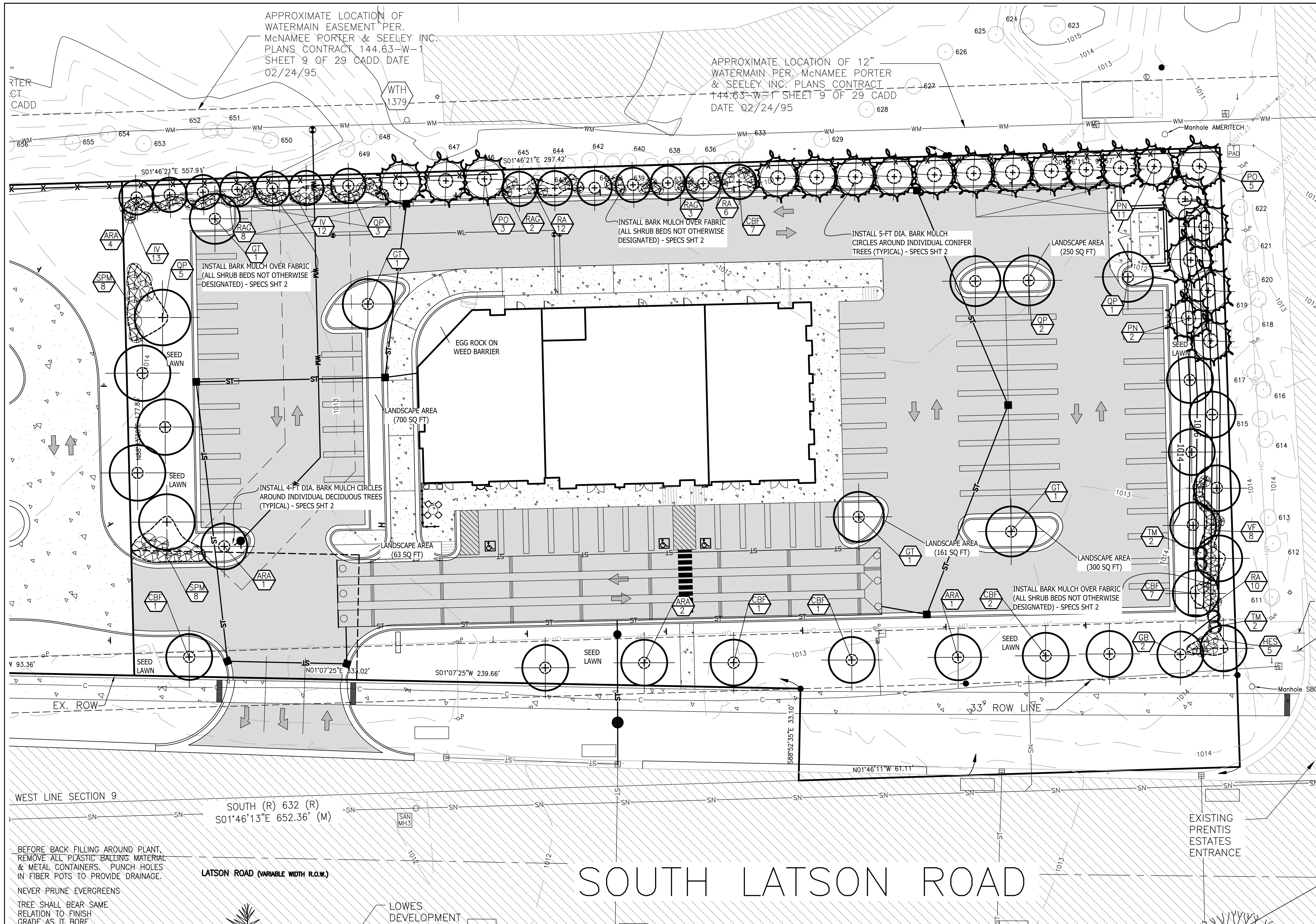
DESIGNED BY: ST
DRAWN BY: DH/MD
CHECKED BY:
SCALE: 1" = 30'
JOB NO: 21-519
DATE: 04/15/23
SHEET NO. 9



SEE SHEET 2 FOR GENERAL NOTES AND LEGEND

LANDSCAPE CALCULATIONS GCD ZONING:

REQUIRED:

GREENBELT - PUBLIC R.O.W. :	1 CANOPY TREE / 40 LFT FRONTAGE, MIN 20 FT WIDTH
BUFFER - SOUTH ADJ. TO MULTI-FAMILY - TYPE B:	MIN. 20-FT WIDTH, 6-FT HGT CONTINUOUS WALL OR 3-FT HGT BERM + 1 CANOPY TREE + 1 CONIFER TREE + 4 SHRUBS / 30 LFT
BUFFER - NORTH ADJ. TO COMMERCIAL - TYPE C:	1 CANOPY OR CONIFER TREE OR 4 SHRUBS / 20 LFT MIN. 10 FT WIDTH
BUFFER - EAST ADJ. TO MULTI-FAMILY- TYPE B:	6-FT HGT CONTINUOUS WALL + 1 CANOPY TREE + 1 CONIFER TREE + 4 SHRUBS / 30 LFT
PARKING AREA (>10 SPACES):	1 CANOPY TREE & 100 SF OF LANDSCAPE AREA / 10 SPACES. 1/3 OF TREES MUST BE ON THE INTERIOR OF THE PARKING
DETENTION / RETENTION BASIN:	N/A - UNDERGROUND SYSTEM

PROVIDED:

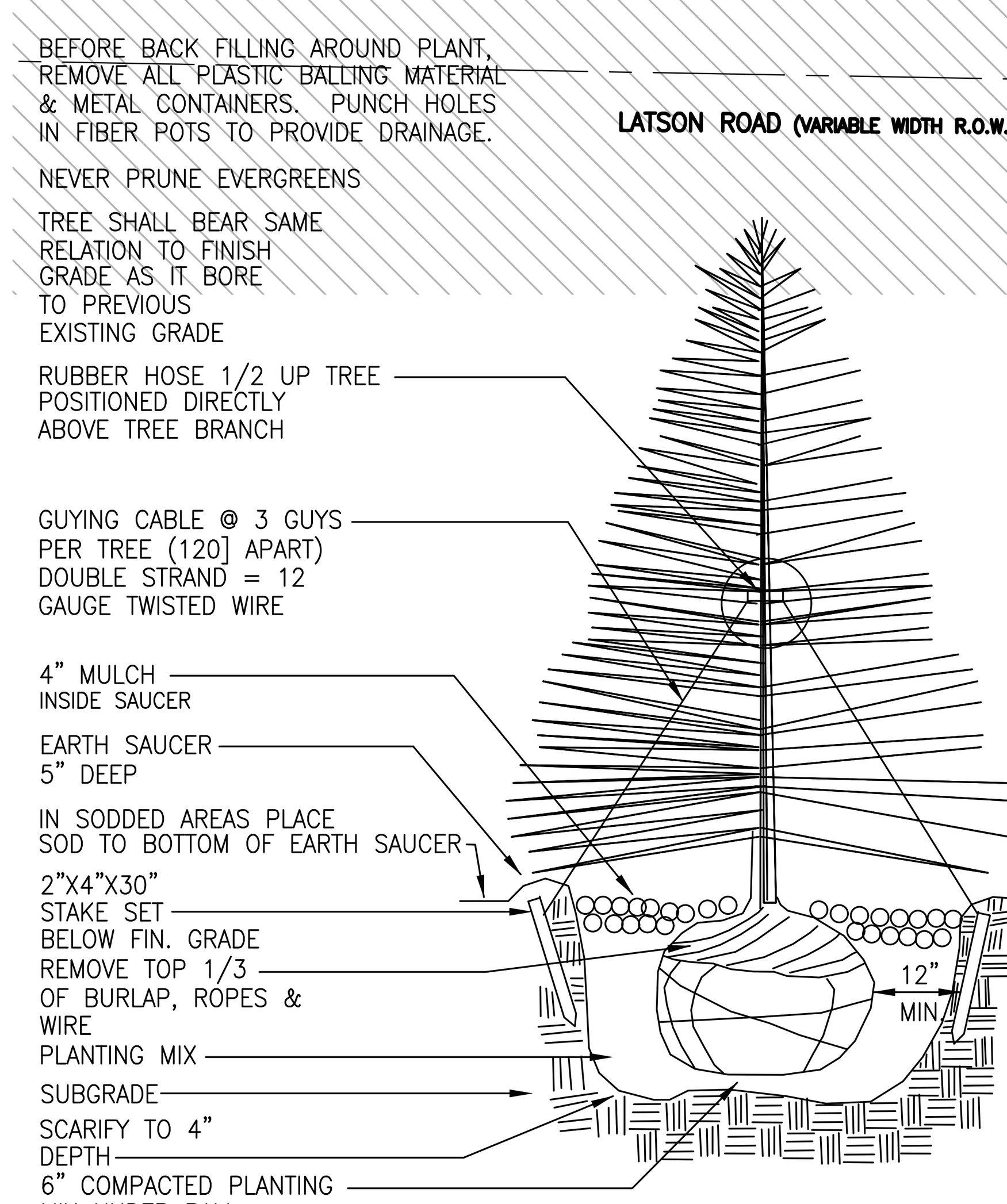
GREENBELT - PUBLIC R.O.W. :	396.79 LFT FRONTAGE / 40 = 10 CANOPY TREES PROVIDED
BUFFER - SOUTH PROP. LINE: ADJ. TO MULTI-FAMILY - TYPE B:	190.00 / 30 = 7 CANOPY + 7 CONIFER TREES + 26 SHRUBS WITH BERM AND 20-FT WIDTH
BUFFER - NORTH PROP. LINE ADJ. TO COMMERCIAL - TYPE C:	177.83 / 20 = 9 TREES OR 36 SHRUBS OR COMBINATION 5 TREES + 16 SHRUBS PROVIDED
BUFFER - EAST ADJ. TO MULTI-FAMILY - TYPE B:	395.70 / 30 = 14 CANOPY + 14 CONIFER TREES + 56 SHRUBS + 290-FT WALL ; PROPOSED SHORTER LENGTH WALL DUE TO EX. CONDITIONS: APPROX. 90 LFT OF EX. MATURE CONIFER SCREENING VEGETATION AT THE PROPERTY LINE RESTRICTS NEW WALL INSTALLATION
PARKING AREA (>10 SPACES):	73 (SPACES PROVIDED) / 10 = 8 TREES + 800 SQFT OF LANDSCAPE AREA 8 TREES & 1400+ SQFT OF LANDSCAPE AREA PROVIDED

PLANT LIST

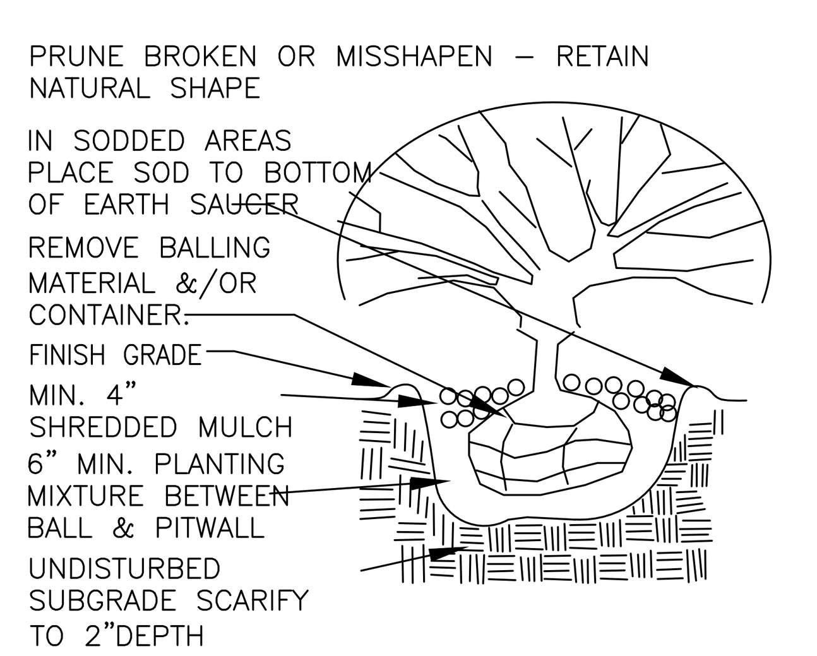
KEY	QUAN.	BOTANICAL NAME	COMMON NAME	SIZE	REMARK
DECIDUOUS TREES					
ARA	8	Acer ruburm 'jfs KW 78'	Armstrong Gold Red Maple	2-1/2" cal.	B-B
CBF	19	Carpinus betulus 'Frans Fontaine'	Frans Fontaine European Hornbeam	2-1/2" cal.	B-B
GB	2	Ginkgo biloba 'Princeton Sentry'	Princeton Sentry Columnar Ginkgo	2-1/2" cal.	B-B
GT	4	Gleditsia triacanthos var inermis 'Skycole'	Skyline Honeylocust	2-1/2" cal.	B-B
QP	11	Quercus plalustris	Northern Pin Oak	2-1/2" cal.	B-B
CONIFER TREES					
PN	13	Pinus nigra 'Oregon Green'	Oregon Green Austrian Pine	6-ft hgt.	B-B
PO	8	Picea omorika	Serbian Spruce	6-ft hgt.	B-B
CONIFER SHRUBS					
TM	4	Taxus x media 'Densiformis'	Densiformis Spreading Yew	30" ht./#5	Cont.
DECIDUOUS SHRUBS					
HES	5	Hydrangea macrophylla 'Bailmer'	Endless Summer Hydrangea	36" ht./#5	Cont.
IV	25	Itea virginica 'Sprich'	Little Henry Virginia Sweetspire	25" ht./#3	Cont.
RA	28	Ribes Alpinum 'Greenmound'	Greenmound Currant	18" ht./#3	Cont.
RAG	13	Rhus aromatica 'Gro-Low'	Gro-Low Fragrant Sumac	24" ht./#3	Cont.
SPM	16	Syringa patula 'Miss Kim'	Miss Kim Lilac	24" ht./#3	Cont.
VF	8	Viburnum farreri nanum	Dwarf Fragrant Viburnum	18" ht./#3	Cont.

SUPPLEMENTAL LANDSCAPE NOTES

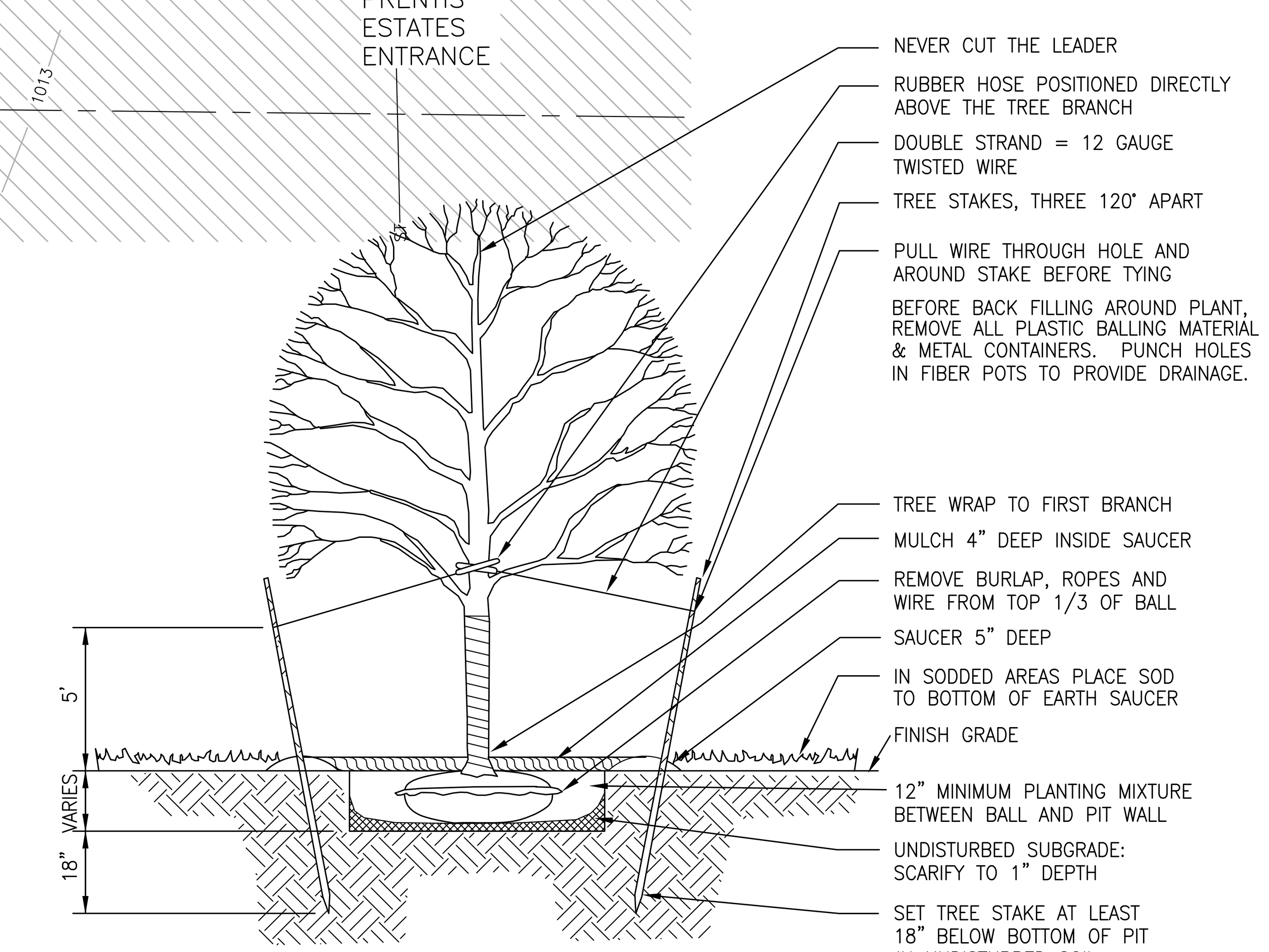
1. ANY SUBSTITUTIONS OF PLANT MATERIAL FROM THE APPROVED SITE PLAN WILL BE APPROVED BY THE TOWNSHIP PRIOR TO INSTALLATION.



EVERGREEN TREE PLANTING DETAIL
(NO SCALE)



SHRUB PLANTING DETAIL
(NO SCALE)



DECIDUOUS TREE PLANTING DETAIL
(NO SCALE)

THE LOCATION AND ELEVATION OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE DRAWINGS ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION AND ELEVATION OF EXISTING UTILITIES AND PROPOSED UTILITY CROSSINGS IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF ANY CONFLICTS ARE APPARENT OR IF THE LOCATION OR DEPTH DIFFERS SIGNIFICANTLY FROM THE PLANS.

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 (TOLL FREE) FOR THE LOCATION OF UNDERGROUND FACILITIES

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

PROJECT: SOUTH LATSON COMMERCIAL DEVELOPMENT

PREPARED FOR: 1015 LATSON ROAD LLC
29592 BECK ROAD
WIXOM, MI 48393
248.773.7992

TITLE: LANDSCAPE PLAN

NO	BY	REVISION PER	DATE
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DESIGNED BY: PC
DRAWN BY: PC
CHECKED BY:
SCALE: 1" = 20'-0"
JOB NO: 21-519
DATE: 04/15/2024
SHEET NO. 10

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LIVINGSTON COUNTY SOIL EROSION PERMIT TEMPLATE
TEMPORARY CONTROLS AND SEQUENCE

1. NOTIFY LIVINGSTON COUNTY DRAIN COMMISSIONER'S OFFICE 24 HOURS PRIOR TO START OF GRADE WORK.
2. IN ACCORDANCE WITH PUBLIC ACT NO. 53, OF 1974 THE PERMIT HOLDER SHALL CALL MISS DIG FOR STAKING AND LOCATING OF UTILITIES, AT LEAST 72 HOURS IN ADVANCE OF THE START OF ANY WORK.

PERMITTING STANDARDS

3. (IMPORTANT NOTICE) RETENTION/DETENTION PONDS SHALL BE EXCAVATED, TOPSOILED, SEEDED, MULCHED AND TACKED PRIOR TO THE START OF MASSIVE EARTH DISRUPTION. INGRESS/EGRESS MUST HAVE LARGE CRUSHED ROCK TO REDUCE THE TRACKING OF SOIL ONTO THE PUBLIC TRAFFIC AREAS. SEE DETAIL ITEMS BELOW.
4. 36" M.D.O.T SPECIFICATION TYPE SILT FABRIC FENCE AS SHOWN ON PLANS SHALL BE PLACED AND MAINTAINED ALONG PERIMETER ON ALL LOW LYING AREAS OF THE CONSTRUCTION SITE TO FILTER RUNOFF BEFORE LEAVING PROJECT SITE.
5. ALL TEMPORARY EROSION CONTROL DEVICES AS NOTED ON PLANS SHALL BE INSTALLED PRIOR TO THE START OF MASSIVE EARTH DISTRIBUTION.
6. PLAN DOES DENOTE A DETAILED EROSION CONTROL DEVICE TO RESTRICT TRACKING OF MATERIAL ONTO THE HIGHWAY. STONE DIAPERS SHALL BE INSTALLED AT ALL INGRESS/EGRESS AREAS OF THE SITE PRIOR TO THE START OF MASSIVE EARTH DISRUPTION. DIAPERS SHALL BE OF CRUSHED STONE AND SHALL HAVE A MINIMUM LENGTH OF 100' LINEAL FEET.

RETENTION PONDS

7. RETENTION/DETENTION/SEDIMENTATION PONDS SHALL BE EXCAVATED, TOPSOILED, SEEDED, MULCHED AND TACKED PRIOR TO THE START OF MASSIVE EARTH DISRUPTION.
8. DETENTION POND OUTLETS SHALL BE OF THE STANDPIPE AND STONE FILTER SYSTEM, WITH TRASH SCREEN. OUTLET FLOW SHALL NOT EXCEED 0.20 CUBIC FEET OF WATER PER SECOND/PER ACRE. POND DIKES SHALL HAVE A MINIMUM OF ONE (1) FOOT OF FREEBOARD. AN EMERGENCY SPILLWAY SHALL BE CONSTRUCTED WITHIN THE FREEBOARD LEVEL.
9. THE EMERGENCY SPILLWAY FROM THE DETENTION POND SHALL BE SODDED AND PEGGED, OR RIP RAPPED, 15 FEET PAST THE TOE OF THE SLOPE OF THE BERM.
10. DIKES AND BERMS SHALL BE FREE OF ALL ORGANIC MATTER.
11. RETENTION/DETENTION PONDS SHALL BE FENCED WITH A 4' CHAIN LINK FENCE, INCLUDING A 12' ACCESS GATE FOR MAINTENANCE UNLESS MINIMUM 5 FT. HORIZONTAL TO 1 FT. VERTICAL SIDE SLOPES ARE PROVIDED. THE FENCE SHALL BE INSTALLED AT THE OUTER PORTION OF THE BERM, TO ALLOW FOR MAINTENANCE WORK TO BE DONE INSIDE THE FENCE.
12. ALL UNIMPROVED DISTURBED AREAS SHALL BE STRIPPED OF TOPSOIL WHICH WILL BE STORED ONSITE DURING THE EXCAVATING STAGE. TOPSOIL PILES SHALL BE SEEDED AND MULCHED, OR MATTED WITH STRAW IN THE NON-GROWING SEASON, IMMEDIATELY AFTER THE STRIPPING PROCESS IS COMPLETED, TO PREVENT WIND AND WATER EROSION.
13. SOIL EROSION CONTROLS SHALL BE MONITORED DAILY BY THE ON-SITE ENGINEER, OR CONTRACTOR, WHICHEVER CASE APPLIES.

SLOPES AND DITCHES

14. ON SITE DITCHES SHALL BE OF THE FLAT BOTTOM TYPE MINIMUM WIDTH OF 2' WITH A MINIMUM OF 3 HORIZONTAL TO 1 VERTICAL SIDE SLOPES, 3:1.
15. DITCHES WITH STEEP SLOPES WILL NEED FLOW CHECKS TO PREVENT SCOURING OF THE DITCH BOTTOM. THESE SHALL BE INSTALLED AS DIRECTED BY THE ENGINEER OR INSPECTOR.
16. SLOPES IN EXCESS OF 3 HORIZONTAL TO 1 VERTICAL SHALL NOT BE USED EXCEPT WITH A MECHANICAL DEVICE SUCH AS A RETAINING WALL, TERRACING, OR OTHER PRIOR APPROVED DEVICE.

STORM DRAINS

17. ALL STORM WATER STRUCTURES, CATCH BASINS AND/OR MANHOLES, IF BLOCK, SHALL BE PLASTERED ON BOTH THE INSIDE AND OUTSIDE OF THE STRUCTURES. GROUTING AND POINTING WILL BE NECESSARY AT THE CASTING AND STRUCTURE JOINT TO PREVENT LEAKAGE AND THE RESULTING SOIL MOVEMENT, AROUND THE STRUCTURE.
18. STORM WATER INLETS SHALL HAVE AS A TEMPORARY CONTROL A STRAW BALE BARRIER AND STONE FILTER INSTALLED AROUND THE INLET DURING CONSTRUCTION. AS AN ALTERNATIVE TO THE STRAW BALE BARRIER, A BURLAP AND PEA STONE FILTER MAY BE USED. THREE LAYERS OF BURLAP FIBER AND A FILTER OF PEA STONE MINIMUM 1 FT. IN DEPTH CAN BE USED. DUE TO THE POROSITY OF THE BURLAP FILTER THE MINIMUM OF 1 FT. OF STONE IS VERY IMPORTANT. THE CONTROL SHALL BE INSTALLED AS SOON AS THE STRUCTURE IS BUILT AND INSPECTED DAILY.
19. BURLAP AND PEA STONE FILTERS WILL NEED TO BE CHANGED AFTER EACH RAINFALL.
20. COUNTY CODE REQUIRES A MINIMUM PIPE SIZE OF 12" IN DIAMETER. IF SMALLER PIPE IS NEEDED FOR OUTLET PURPOSES THE 12" CAN BE BAFFLED TO THE CORRECT SIZE. ALL PIPE SHALL MEET THE 12" DIAMETER CODE SIZE.
21. ALL STORM DRAIN OUTLETS 15" IN DIAMETER OR LARGER SHALL HAVE ANIMAL GUARDS INSTALLED TO PREVENT ENTRANCE TO THE SYSTEM.
22. ALL STORM DRAINAGE PIPE 30" IN DIAMETER OR LARGER SHALL BE POINTED, AT THE JOINTS ON THE INSIDE WITH MORTAR, AFTER BACKFILLING.
23. ALL STORM DRAIN OUTLETS THAT DO NOT EMPTY INTO THE RETENTION/DETENTION POND SHALL HAVE A TEMPORARY 5'X10'X3' SUMP INSTALLED AT THE TERMINATION OF THE STORM SEWER. UPON COMPLETION OF THE STABILIZATION WORK THE SUMP AREA SHALL BE FILLED AND RIP RAPPED WITH COBBLE STONE. SILT TRAPS SHALL BE INSPECTED AFTER EACH STORM.
24. STORM WATER OUTLETS DO DENOTE RIP RAP. ALL OUTLETS SHALL BE RIP RAPPED OVER KEYED FILTER FABRIC WITH A MINIMUM OF 15 SQ. YARDS OF 6" OR LARGER COBBLE STONE.
25. RIP RAP AS NOTED ON THE PLAN SHALL BE OF A FUNNEL SHAPE CONSTRUCTION, WIDTH SHALL INCREASE AS DISTANCE FROM THE OUTLET POINT INCREASES AT A 3:1 RATIO.
26. RIP RAP SHALL BE OF COBBLE STONE, 6" IN DIAMETER OR LARGER. GROUTING MAY BE NECESSARY, AND SHALL BE A MINIMUM OF 6" IN DEPTH WITH THE COBBLE SET IN THE CEMENT SLURRY.
27. STORM WATER OUTLET IS IN NEED OF A SPLASH BLOCK WHICH IS NOT NOTED ON THE PLAN. INSTALL SPLASH BLOCK IF SLOPE OF THE PIPE IS 4% OR GREATER.
28. IT WILL BE NECESSARY FOR THE DEVELOPER TO HAVE THE STORM DRAINAGE LINES CLEANED PRIOR TO FINAL INSPECTION BY THE LIVINGSTON COUNTY DRAIN COMMISSIONER'S OFFICE. IF REQUIRED, THIS WORK SHALL BE DONE BY A PROFESSIONAL SEWER CLEANING FIRM AND CERTIFIED IN WRITING BY THE PROJECT ENGINEER. ALL SUMPS AND TEMPORARY SILT TRAPS SHALL ALSO BE CLEANED AT THIS TIME.

STABILIZATION

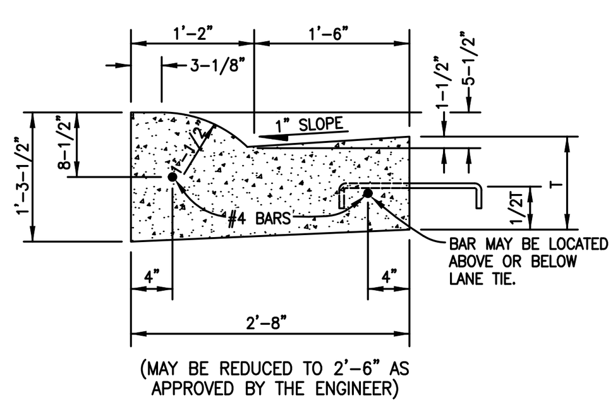
29. ALL UNIMPROVED DISTURBED AREAS SHALL BE RE-TOP SOILED, WITH A MINIMUM OF 3" OF MATERIAL, SEEDED, MULCHED AND TACKED WITHIN 15 DAYS OF THE COMPLETION OF THE MASSIVE EARTH DISRUPTION. IN THE NON-GROWING SEASON STRAW MATTING WILL SUFFICE. HYDROSEEDING WILL BE AN ACCEPTABLE ALTERNATE FOR MULCHING. EXTREME CARE SHOULD BE EXERCISED IN SPRING AND FALL PERIODS AS A FROST WILL BREAK THE BIND OF THE HYDROSEEDING, WHICH WILL AFFECT THE EFFECTIVENESS OF THIS PROCEDURE.
30. IN THE NON-GROWING SEASON, TEMPORARY STABILIZATION OF MASSIVELY EXPOSED AREAS FOR WINTER STABILIZATION SHALL BE DONE WITH STRAW MATTING.
31. PERIODIC INSPECTIONS WILL BE MADE THROUGHOUT THE COURSE OF THE PROJECT. IT WILL BE THE RESPONSIBILITY OF THE MANAGERS OF THE PROJECT TO CONTACT THIS OFFICE FOR THE FINAL INSPECTION AT THE END OF THE PROJECT.
32. THIS COMMERCIAL PERMIT IS VALID FOR THE MASS EARTH MOVEMENT, THE INSTALLATION OF ROADS, DRAINS, AND UTILITIES AND IS NOT FOR ANY SINGLE FAMILY RESIDENCE. ALL RESIDENTIAL BUILDERS WILL NEED TO SECURE WAIVERS AND OR PERMITS AS NECESSARY FOR EACH LOT IN THIS DEVELOPMENT AT THE TIME APPLICATION FOR SINGLE FAMILY RESIDENCE IS MADE.
33. THE ISSUING BUILDING DEPARTMENT SHALL NOT ISSUE THE CERTIFICATE OF OCCUPANCY UNTIL THE FINAL INSPECTION LETTER FROM THE LIVINGSTON COUNTY DRAIN COMMISSIONER'S OFFICE HAS BEEN OBTAINED.
34. PER THE LIVINGSTON COUNTY DRAIN COMMISSIONER THE SEEDING, FERTILIZER AND MULCH MINIMUM QUANTITIES SHALL BE AS FOLLOWS:

TOP-SOIL	3" IN DEPTH
GRASS SEED	218 LBS. PER ACRE
FERTILIZER	150 LBS. PER ACRE
STRAW MULCH	3" IN DEPTH 1.5 TO 2 TONS PER ACRE (ALL MULCHING MUST HAVE A TIE DOWN, SUCH AS TACKIFIER, NET BINDING, ETC.)
HYDRO-SEEDING	HYDRO-SEEDING IS NOT ACCEPTABLE FOR SLOPES EXCEEDING 1%, IN SUCH CASES STABILIZATION SHALL BE DONE WITH SEED AND STRAW MULCH WITH A TACKIFIER.

MAINTENANCE SCHEDULE FOR SOIL EROSION CONTROLS

1. SILT FENCE SHALL BE INSPECTED WEEKLY AND AFTER EACH MAJOR STORM EVENT. MAINTENANCE SHALL INCLUDE REMOVAL OF ACCUMULATED SILT AND REPLACEMENT OF TORN SECTIONS. SILT FENCE SHALL BE REMOVED WHEN ALL CONTRIBUTING AREAS HAVE BEEN STABILIZED.
2. TRACKING PAD SHALL BE INSPECTED MONTHLY FOR ACCUMULATED DIRT. TRACKING PAD SHALL BE REPLACED WHEN THE STONES ARE CHOKED WITH DIRT. TRACKING PAD SHALL BE REMOVED IMMEDIATELY PRIOR TO THE FIRST COURSE OF ASPHALT BEING LAID.
3. DETENTION/RETENTION POND SHALL BE INSPECTED QUARTERLY ON A PERMANENT BASIS. MAINTENANCE SHALL INCLUDE SEDIMENT REMOVAL, EMBANKMENT STABILIZATION AND MAINTAINING THE OUTLET STRUCTURE IN GOOD CONDITION. NO TREES SHALL BE ALLOWED TO GROW ON THE EMBANKMENT.
4. CATCH BASINS SHALL BE INSPECTED ANNUALLY FOR ACCUMULATION OF SEDIMENT. ALL SEDIMENT MUST BE REMOVED AND DISPOSED OF PROPERLY WHEN THE SUMP IS FULL.
5. COMMON AREAS SHALL BE STABILIZED NO LATER THAN 15 DAYS AFTER GRADE WORK, PURSUANT TO RULE 1709 (5).

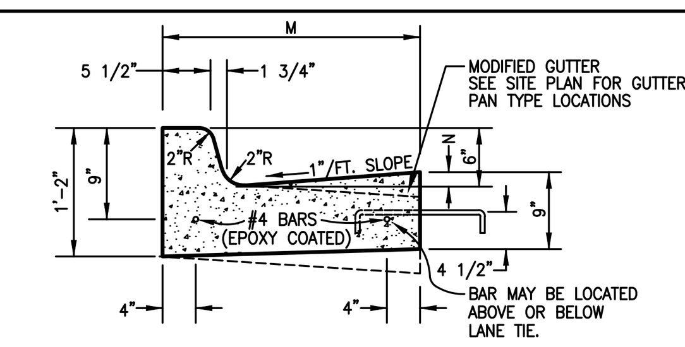
SILT FENCE SHALL BE A MINIMUM 36".



(MAY BE REDUCED TO 2'-6" AS APPROVED BY THE ENGINEER)

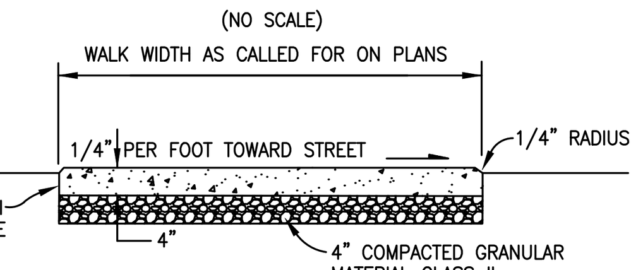
DETAIL	DIMEN. T	LANE TIES	CONCRETE CU.YD/LIN.FT.
B1	9"	AS SHOWN	0.0900
B2	9"	OMITTED	0.0900
B3	10"	AS SHOWN	0.0941

MDOT B-2 CURB DETAIL
(NO SCALE)

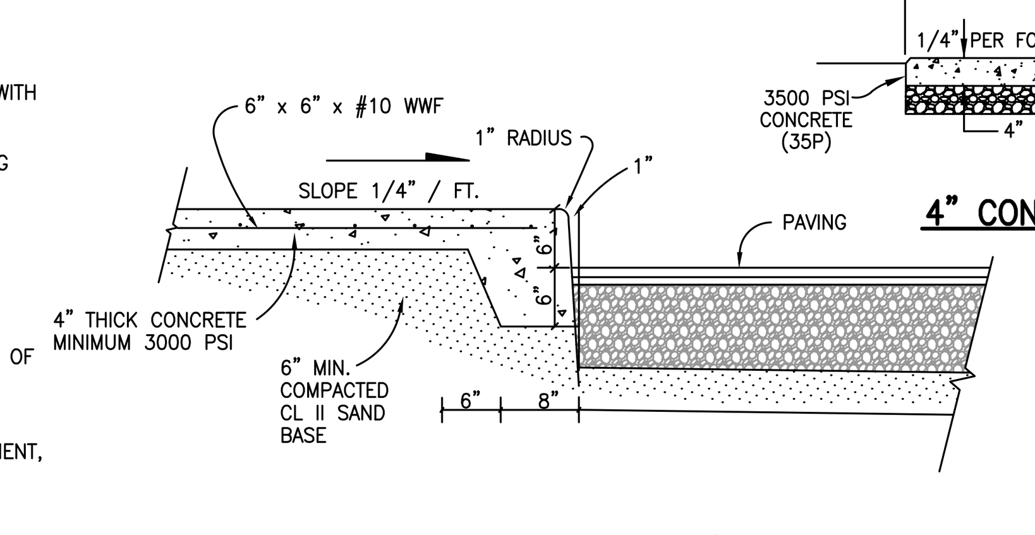


DETAIL	DIMENSIONS M	N	LANE TIES	CONCRETE CU.YD/LIN.FT.
F1	1'-6"	7/8"	AS SHOWN	0.0484
F2	1'-6"	7/8"	OMITTED	0.0484
F3	2'-0"	1 3/8"	AS SHOWN	0.0610
F4	2'-0"	1 3/8"	OMITTED	0.0610
F5	2'-6"	1 7/8"	AS SHOWN	0.0737
F6	2'-6"	1 7/8"	OMITTED	0.0737

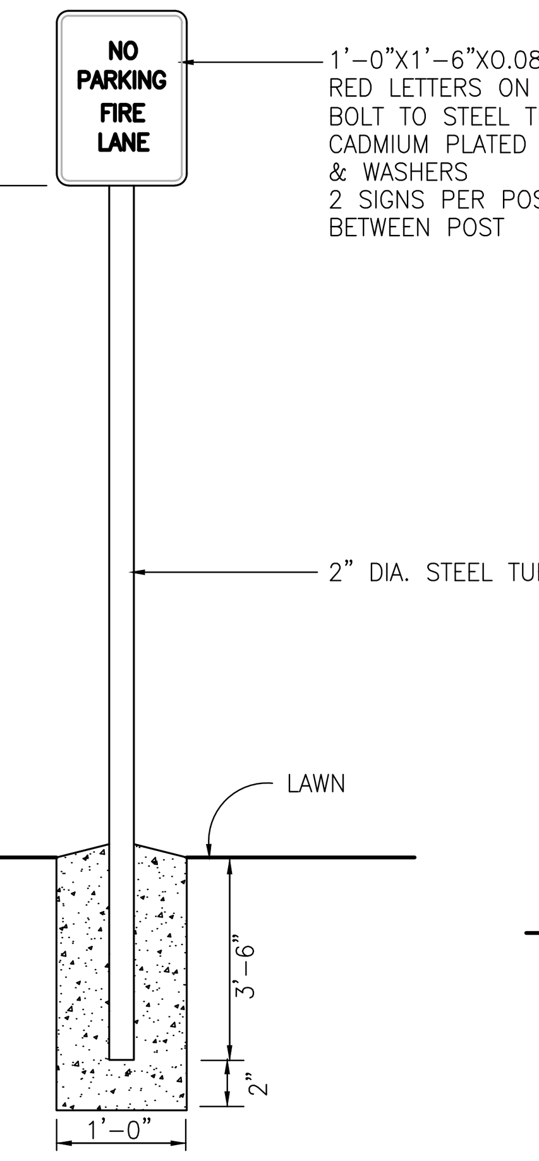
CONCRETE CURB & GUTTER TYPE F
(NO SCALE)



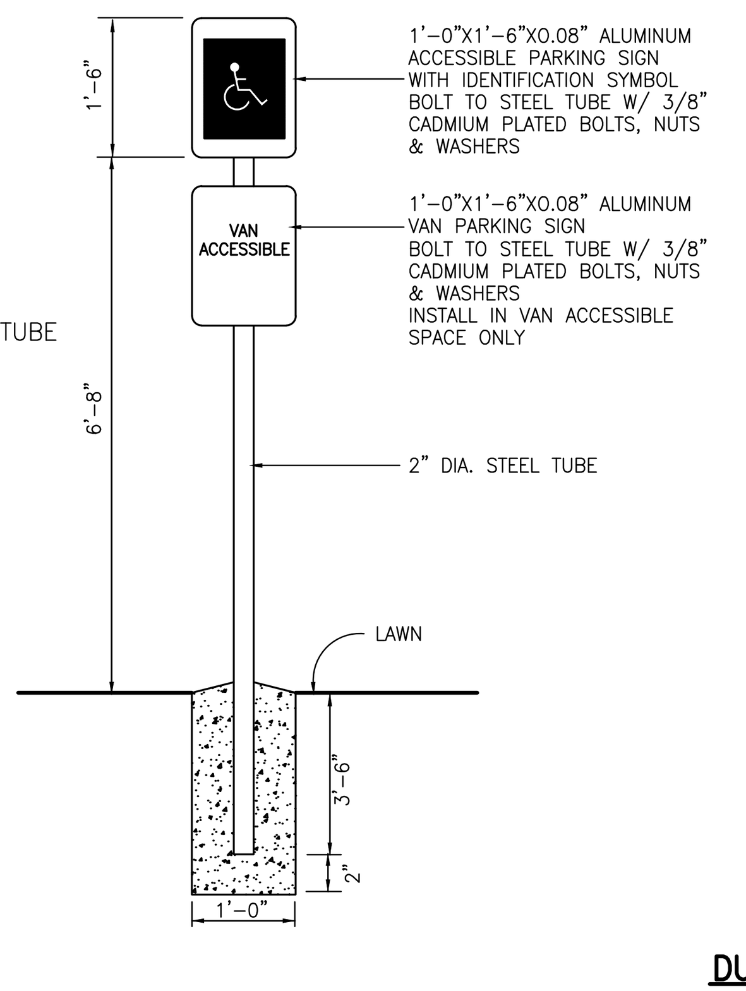
4" CONCRETE SIDEWALK
(NO SCALE)



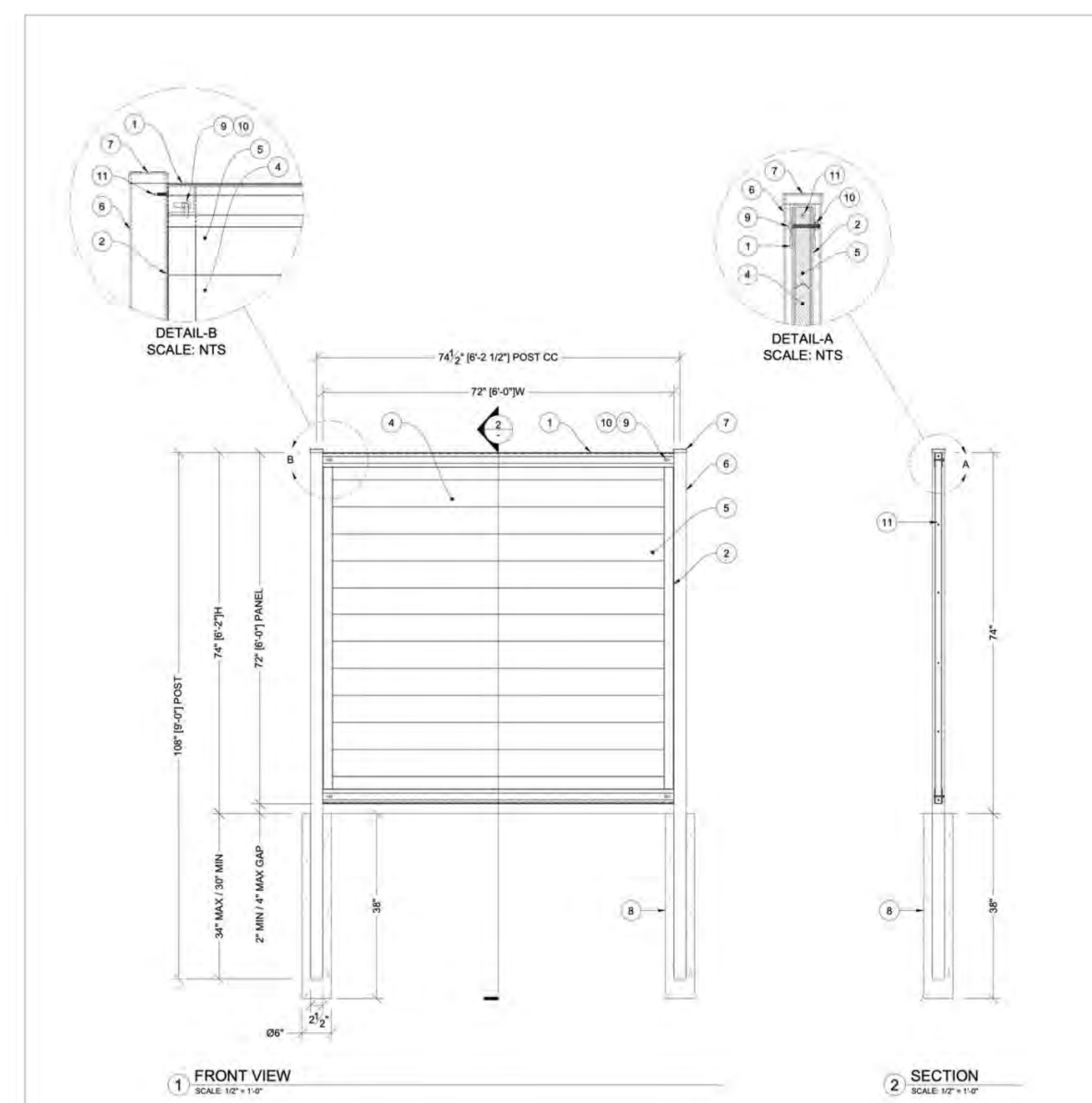
INTEGRAL CONCRETE WALK / CURB DETAIL
(NO SCALE)



NO PARKING SIGN DETAIL
(NO SCALE)



HANDICAP PARKING SIGN DETAIL
(NO SCALE)



BILL OF MATERIALS			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	3" X 6'-0" CHANNEL	HORIZONTAL (TOP/BTM) GALVANIZED STEEL CHANNEL RAIL
2	2	2" X 6'-0" CHANNEL	VERTICAL GALVANIZED STEEL CHANNEL RAIL
3	N/A	CHANNELS ALLOW FOR UP TO 1" THK INFILL MATERIAL	INFILL QUANTITY MAY VARY DEPENDING ON TYPE SELECTED
4	11	1" X 6" X 6'-0" BOARDS	INFILL EXAMPLE ILLUSTRATED: HORIZONTAL BOARDS
5	2	1" X 6" X 6'-0" NOTCHED INFILL/BOARDS	TWO BOARDS TO BE NOTCHED FOR BOLT CLEARANCE AT TOP AND BTM CHANNEL
6	2	2-1/2" X 2-1/2" X 16GA, 9'-0" POST	STANDARD FENCE POST
7	2	2-1/2" X 2-1/2" CAP	2-1/2" SQ POST CAP STANDARD
8	2	6" DIAMETER CONCRETE PIER	POST PIER SIZE AND DEPTH TO BE SPECIFIED BY THE PROJECT'S EOR
9	4	ANSI B18.5 - 1/4-20 X 1-1/2" UNC CARRIAGE BOLT	ROUND HEAD SQUARE NECK CARRIAGE BOLT
10	4	IFI 100/107 1/4-20 HEX-HEAD FLANGE NUT	PREVAILING TORQUE TYPE HEX-HEAD FLANGE NUT
11	12	ANSI B18.6.4 - NO.10 X 5/8" SELF-TAPPING SCREW	VERTICAL CHANNEL, RECESSED HEAD SELF-TAPPING SCREW_TYPE-BT_TYPE-I

ABBREVIATIONS	
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
CC	CENTER TO CENTER
EOR	ENGINEER OF RECORD
GA	GAUGE
H	HEIGHT
IFI	INDUSTRIAL FASTENER INSTITUTE
L	LENGTH
MAX	MAXIMUM
MIN	MINIMUM
NTS	NOT TO SCALE / DO NOT SCALE
SQ	SQUARE
THK	THICK / THICKNESS
TYP	TYPICAL
UNC	UNIFIED COURSE THREAD
W	WIDTH

DIMENSIONS ARE IN INCHES
UNLESS OTHERWISE SPECIFIED:
TOLERANCES:
FRACTIONAL ±1/32"
ANGULAR: MACH±1/2° BEND ±1/2°
TWO PLACE DECIMAL ±.03
THREE PLACE DECIMAL ±.005

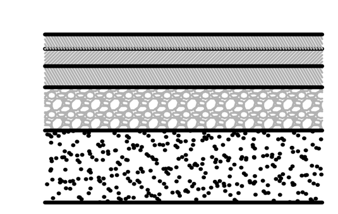
PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FENCE TRAC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OFFENCE TRAC IS PROHIBITED.

	NAME	DATE
DRAWN	NLI	05/30/2022
REVISED		
MFG APPR		

MATERIAL: GALVANIZED STEEL

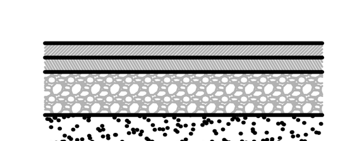
MANUFACTURED BY: FENCE TRAC
DISTRIBUTED BY: PERIMTEC
TITLE: HORIZONTAL 6'X6' PANEL
SIZE B DWG. NO. 22-0530-002 REV A
SCALE: SEE DRAWING SHEET 1 OF 1

SCREEN FENCE DETAIL
(COMES IN 6' HIGH AND 8' HIGH OPTIONS)
(NO SCALE)



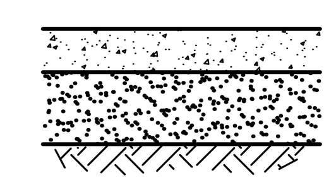
1.5" MDOT 5EML
2.0" MDOT 4EML
3.5" MDOT 3EML
6" 21AA GRAVEL
12" MDOT CLASS II SAND SUBBASE
NOTE: USE 0.05 GAL/SYD BOND COAT BETWEEN LIFTS

ASPHALT SECTION S. LATSON RD. R.O.W.
(NO SCALE)



1.5" MDOT 1100T-20AA OR 36A
1.5" MDOT 1100L-20AA OR 13A
6" 21AA GRAVEL
12" MDOT CLASS II SAND SUBBASE
NOTE: USE 0.05 GAL/SYD BOND COAT BETWEEN LIFTS

ASPHALT SECTION
(NO SCALE)



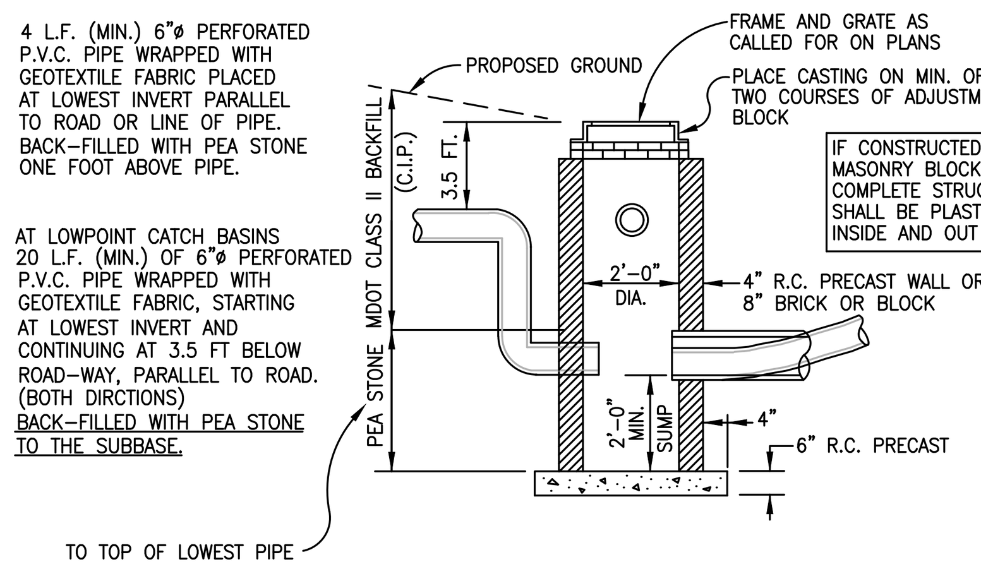
8" CONCRETE – 3500 PSI W/ #3 REBAR 18" O.C.E.W.
7" COMPACTED MDOT CLASS II SAND BASE
COMPACTED SUBBASE

DUMPSTER PAD CONCRETE PAVEMENT CROSS SECTION
(NO SCALE)

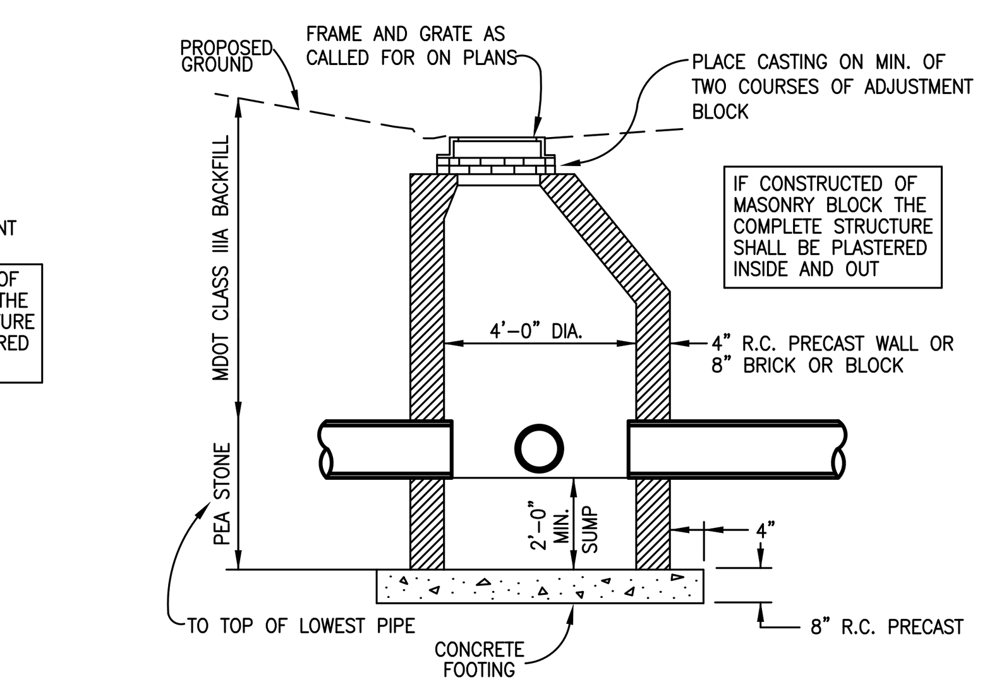
INSTALL SUBDRAINS AT ALL CATCH BASINS LOCATED WITHIN ROADWAY

(1) 4 L.F. (MIN.) 6"ø PERFORATED P.V.C. PIPE WRAPPED WITH GEOTEXTILE FABRIC PLACED AT LOWEST INVERT PARALLEL TO ROAD OR LINE OF PIPE. BACK-FILLED WITH PEA STONE ONE FOOT ABOVE PIPE.

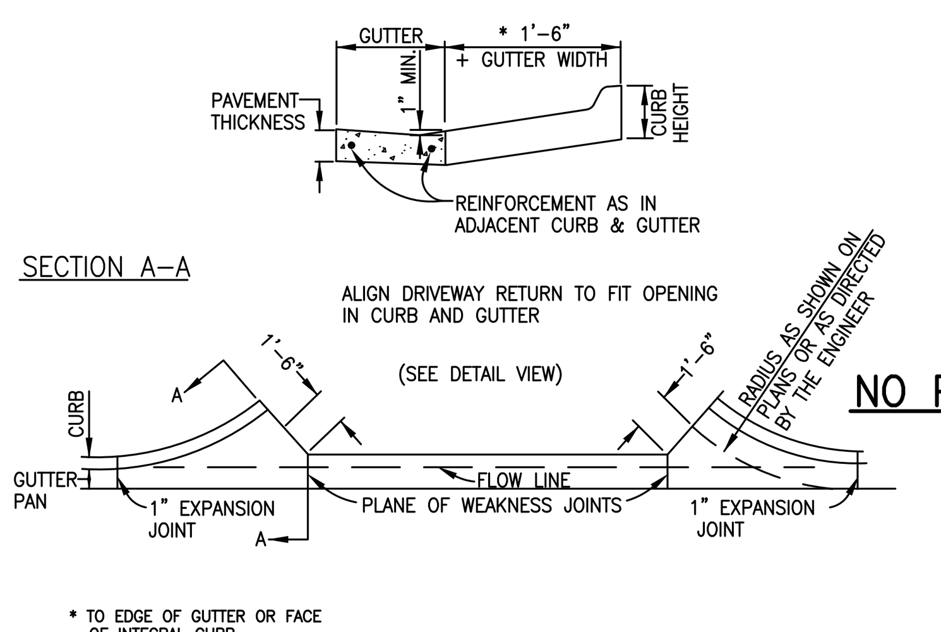
(2) AT LOWPOINT CATCH BASINS 20 L.F. (MIN.) OF 6"ø PERFORATED P.V.C. PIPE WRAPPED WITH GEOTEXTILE FABRIC, STARTING AT LOWEST INVERT AND CONTINUING AT 3.5 FT BELOW ROAD-WAY, PARALLEL TO ROAD. (BOTH DIRCTIONS) BACK-FILLED WITH PEA STONE TO THE SUBBASE.



2 FT. DIA. CATCH BASIN W/SUMP
NO SCALE

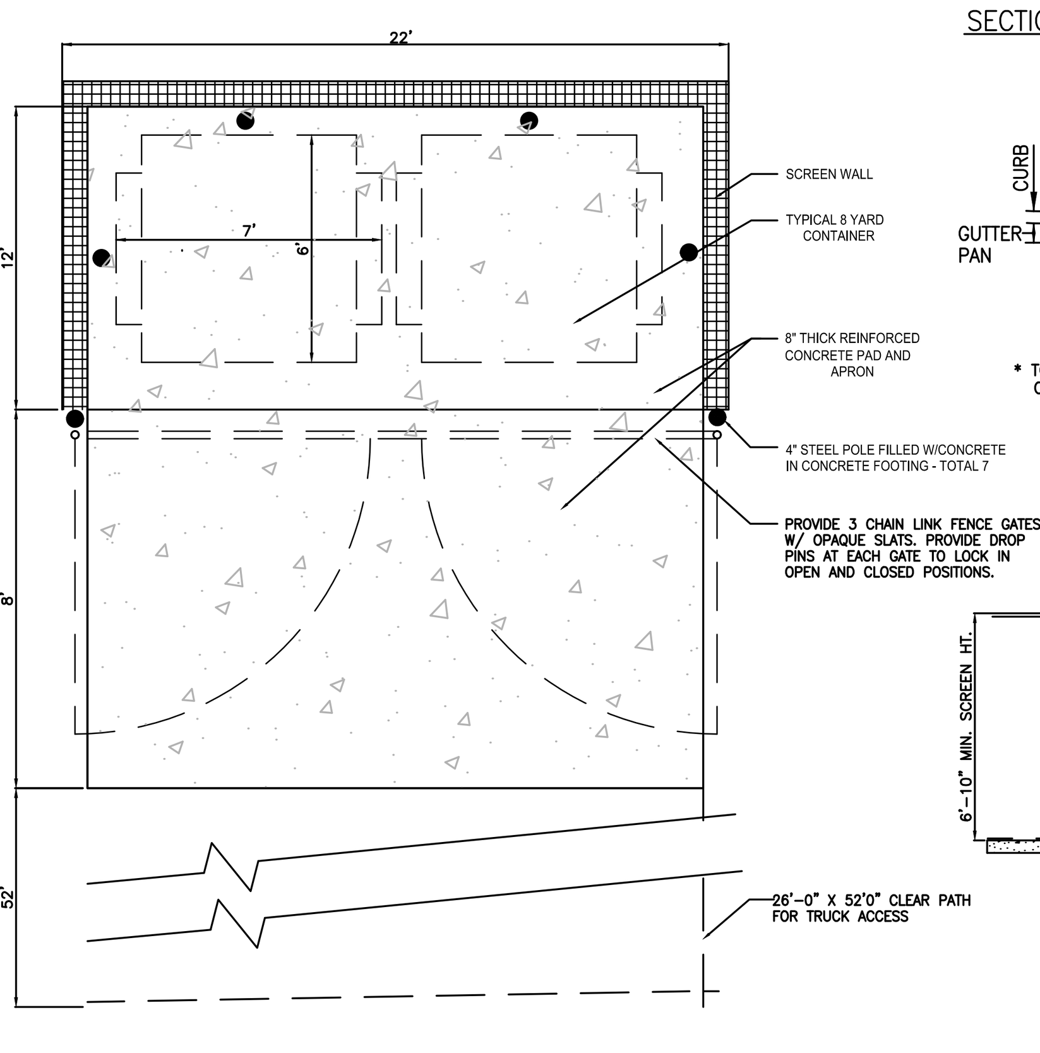


4 FT. DIA. CATCH BASIN W/SUMP
NO SCALE

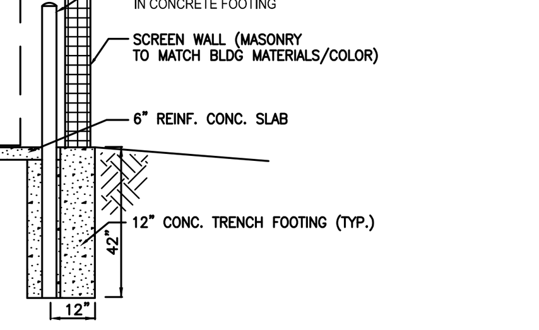


* TO EDGE OF GUTTER OR FACE OF INTEGRAL CURB.

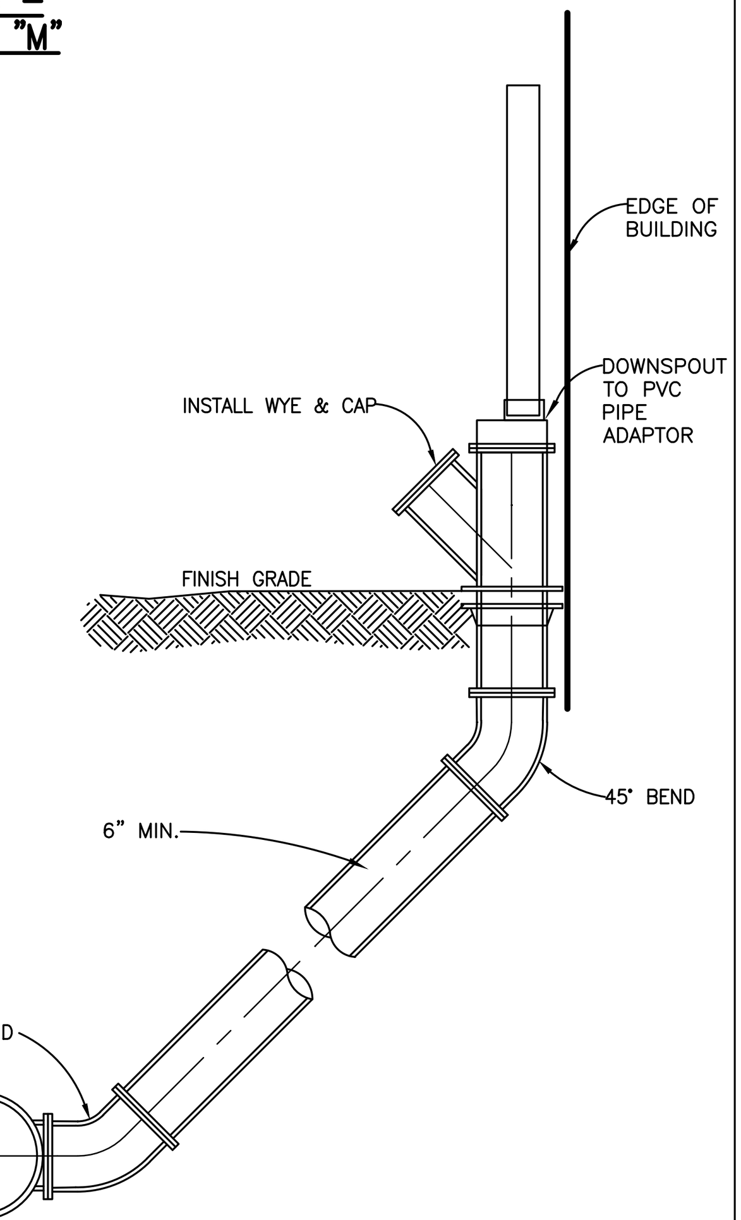
CONCRETE DRIVEWAY OPENING – MDOT STANDARD II-42, DETAIL "M"
(NO SCALE)



DUMPSTER ENCLOSURE DETAIL
(NO SCALE)



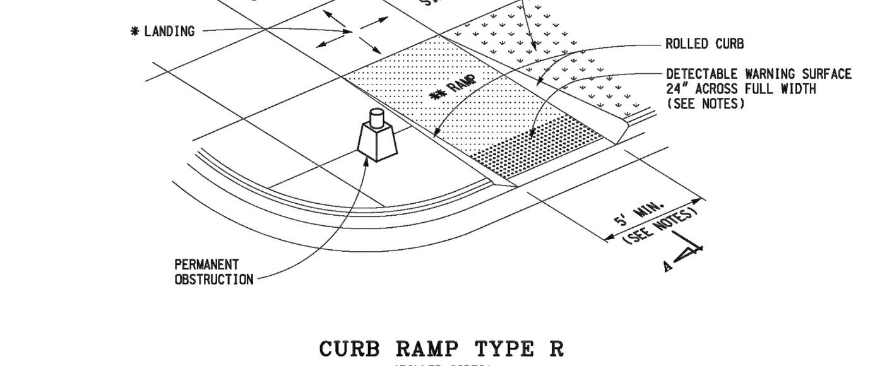
SECTION PLAN



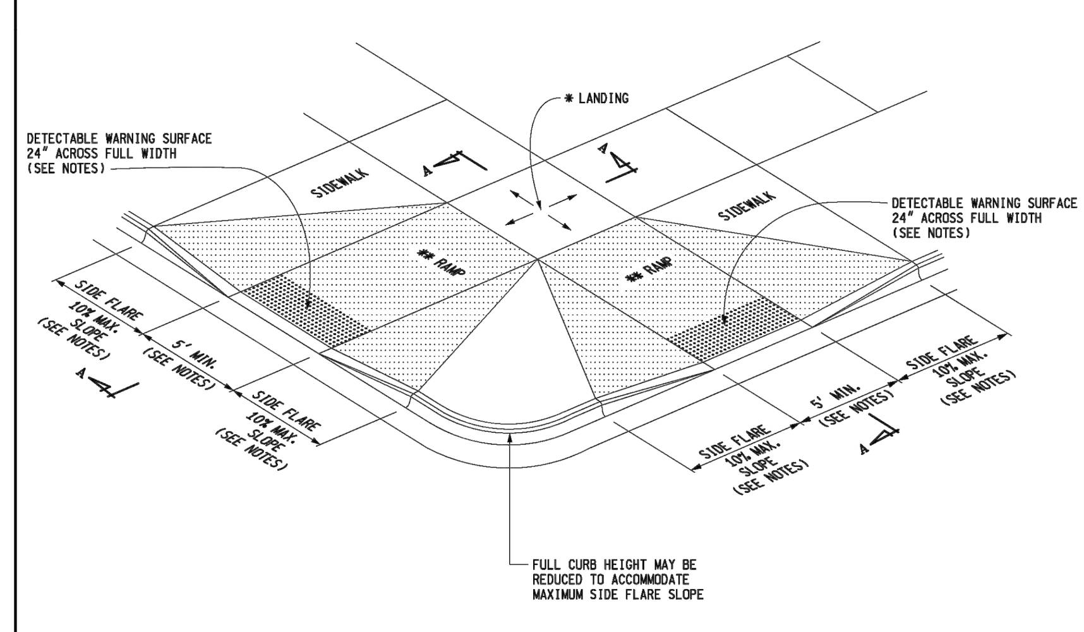
ROOF DRAIN CLEANOUT DETAIL
NO SCALE

MANHOLE FRAME & COVER & CATCH BASIN INLETS					
TYPE	LOCATION	MANUFACTURER OR EQUAL EAST JORDAN	NEENAH	TYPE OF COVER OR INLET	MAXIMUM DRAINAGE AREA (ACRES)
MH	ALL	1040	R-1916 F1	SANITARY-SOLID SELF-SEALING STORM-VENTED	N/A
CB	TYPE A CURB	7000-T1-M1	R-3070	FLAT GRATE WITH VERT. OPEN BACK	0.71
CB	TYPE B CURB	7065-T1-M1	R-3034-B	FLAT GRATE WITH ROLL BACK	0.87
CB	PAVEMENT/ SHOULDER	1020-M1	R-2060-D	FLAT GRATE	0.66
CB	OPEN AREA	1020-01	R-2560-D	BEEHIVE GRATE 4" HIGH	0.63
CB	GUTTER	5100	R-3238	CONCAVE INLET	0.96

* MAXIMUM LANDING SLOPE IS 2.0% IN EACH DIRECTION OF TRAVEL. LANDING MINIMUM DIMENSIONS 5' x 5'. SEE NOTES.
** MAXIMUM RAMP CROSS SLOPE IS 2.0%. RUNNING SLOPE 5% - 7% (8.3% MAXIMUM). SEE NOTES.



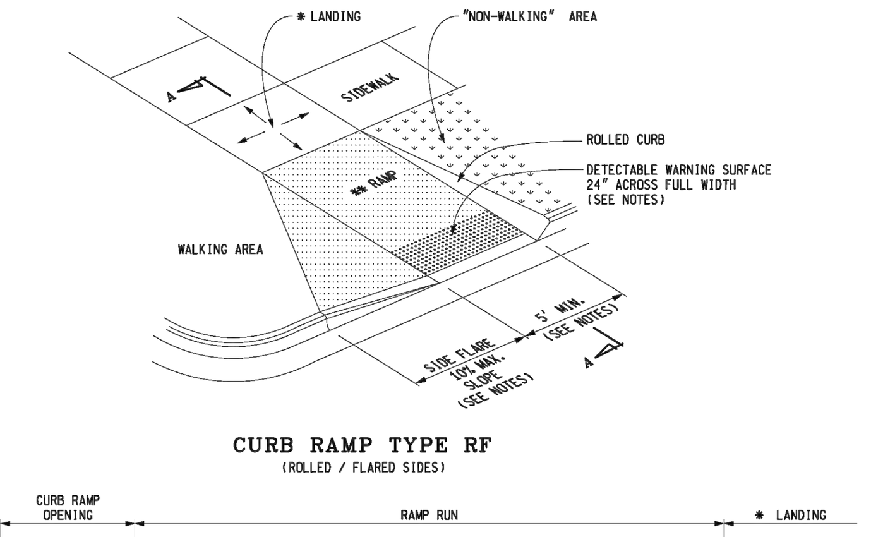
CURB RAMP TYPE R
(ROLLED SIDES)



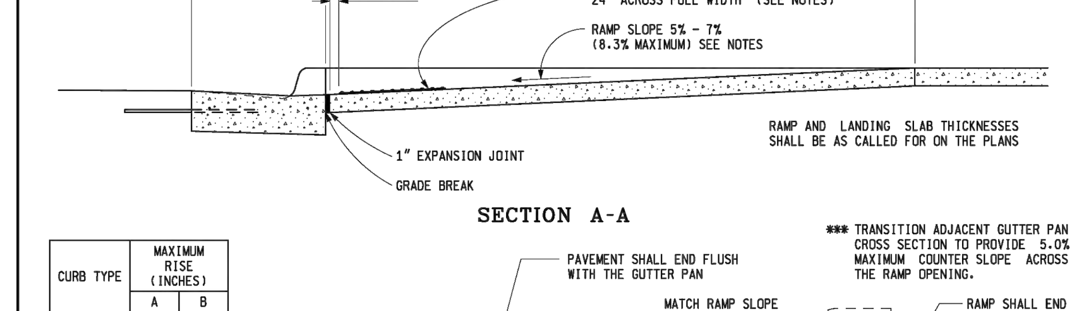
CURB RAMP TYPE F
(FLARED SIDES, TWO RAMPS SHOWN)

MDOT Michigan Department of Transportation
PREPARED BY DESIGN DIVISION
DRAWN BY: B.L.T.
CHECKED BY: W.K.P.
DEPARTMENT DIRECTOR Paul C. Ajegba
APPROVED BY: Gregg Brunner, P.E. Gregg Brunner Oct 14 2021 12:32 PM
DIRECTOR, BUREAU OF FIELD SERVICES
APPROVED BY: Bradley C. Wieferich Bradley C. Wieferich Oct 14 2021 11:01 AM
DIRECTOR, BUREAU OF DEVELOPMENT
MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR
CURB RAMP AND DETECTABLE WARNING DETAILS
4-7-2022 F.H.W.A. APPROVAL | 5-8-2020 PLAN DATE | R-28-J | SHEET 1 OF 7

* MAXIMUM LANDING SLOPE IS 2.0% IN EACH DIRECTION OF TRAVEL. LANDING MINIMUM DIMENSIONS 5' x 5'. SEE NOTES.
** MAXIMUM RAMP CROSS SLOPE IS 2.0%. RUNNING SLOPE 5% - 7% (8.3% MAXIMUM). SEE NOTES.



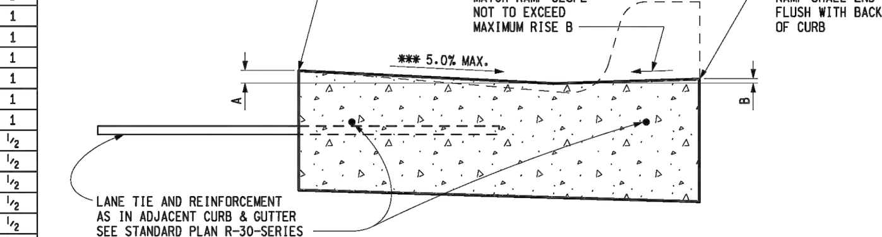
CURB RAMP TYPE RF
(ROLLED / FLARED SIDES)



SECTION A-A

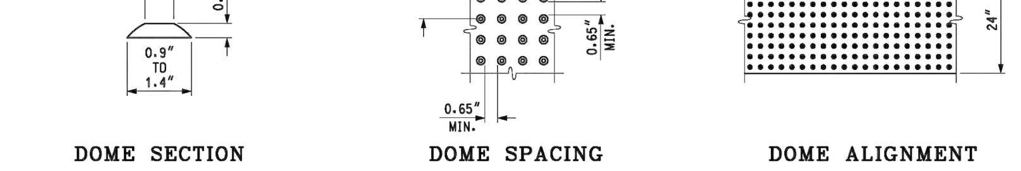
CURB TYPE	MAXIMUM RISE (INCHES) A	B
B1	3/4	1
B2	3/4	1
B3	3/4	1
D1	3/4	1
D2	3/4	1
D3	3/4	1
C1	1/2	1/2
C2	1/2	1/2
C3	3/4	1/2
C4	3/4	1/2
C5	1	1/2
C6	1	1/2
F1	1/2	1/2
F2	1/2	1/2
F3	3/4	1/2
F4	3/4	1/2
F5	1	1/2
F6	1	1/2

FOR CURB TYPES SEE STANDARD PLAN R-30-SERIES



SECTION THROUGH CURB RAMP OPENING
(TYPICAL ALL RAMP TYPES)

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR
CURB RAMP AND DETECTABLE WARNING DETAILS
4-7-2022 F.H.W.A. APPROVAL | 5-8-2020 PLAN DATE | R-28-J | SHEET 2 OF 7



DETECTABLE WARNING DETAILS

NOTES:

DETAILS SPECIFIED ON THIS PLAN APPLY TO ALL CONSTRUCTION, RECONSTRUCTION, OR ALTERATION OF STREETS, CURBS, OR SIDEWALKS IN THE PUBLIC RIGHT OF WAY.

CURB RAMPS ARE TO BE LOCATED AS SPECIFIED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

RAMPS SHALL BE PROVIDED AT ALL CORNERS OF AN INTERSECTION WHERE THERE IS EXISTING OR PROPOSED SIDEWALK AND CURB. RAMPS SHALL ALSO BE PROVIDED AT MARKED AND/OR SIGNALIZED MID-BLOCK CROSSINGS.

SURFACE TEXTURE OF THE RAMP SHALL BE THAT OBTAINED BY A COARSE BROOMING, TRANSVERSE TO THE RUNNING SLOPE.

SIDEWALK SHALL BE RAMPED WHERE THE DRIVEWAY CURB IS EXTENDED ACROSS THE WALK.

CARE SHALL BE TAKEN TO ASSURE A UNIFORM GRADE ON THE RAMP. WHERE CONDITIONS PERMIT, IT IS DESIRABLE THAT THE SLOPE OF THE RAMP BE IN ONLY ONE DIRECTION, PARALLEL TO THE DIRECTION OF TRAVEL.

RAMP WIDTH SHALL BE INCREASED, IF NECESSARY, TO ACCOMMODATE SIDEWALK SNOW REMOVAL EQUIPMENT NORMALLY USED BY THE MUNICIPALITY.

WHEN 5' MINIMUM WIDTHS ARE NOT PRACTICABLE, RAMP WIDTH MAY BE REDUCED TO NOT LESS THAN 4' AND LANDINGS TO NOT LESS THAN 4' x 4'.

CURB RAMPS WITH A RUNNING SLOPE ≤5% DO NOT REQUIRE A TOP LANDING. HOWEVER, ANY CONTINUOUS SIDEWALK OR PEDESTRIAN ROUTE CROSSING THROUGH OR INTERSECTING THE CURB RAMP MUST INDEPENDENTLY MAINTAIN A CROSS SLOPE NOT GREATER THAN 2% PERPENDICULAR TO ITS OWN DIRECTION(S) OF TRAVEL.

DETECTABLE WARNING SURFACE COVERAGE IS 24" MINIMUM IN THE DIRECTION OF RAMP/PATH TRAVEL AND THE FULL WIDTH OF THE RAMP/PATH OPENING EXCLUDING CURBED OR FLARED CURB TRANSITION AREAS. A BORDER OFFSET NOT GREATER THAN 2" MEASURED ALONG THE EDGES OF THE DETECTABLE WARNING IS ALLOWABLE. FOR RADIAL CURB THE OFFSET IS MEASURED FROM THE ENDS OF THE RADIUS.

FOR NEW ROADWAY CONSTRUCTION, THE RAMP CROSS SLOPE MAY NOT EXCEED 2.0%. FOR ALTERATIONS TO EXISTING ROADWAYS, THE CROSS SLOPE MAY BE TRANSITIONED TO MEET AN EXISTING ROADWAY GRADE. THE CROSS SLOPE TRANSITION SHALL BE APPLIED UNIFORMLY OVER THE FULL LENGTH OF THE RAMP.

THE MAXIMUM RUNNING SLOPE OF 8.3% IS RELATIVE TO A FLAT (0%) REFERENCE. HOWEVER, IT SHALL NOT REQUIRE ANY RAMP OR SERIES OF RAMPS TO EXCEED 15 FEET IN LENGTH NOT INCLUDING LANDINGS OR TRANSITIONS.

DRAINAGE STRUCTURES SHOULD NOT BE PLACED IN LINE WITH RAMPS. THE LOCATION OF THE RAMP SHOULD TAKE PRECEDENCE OVER THE LOCATION OF THE DRAINAGE STRUCTURE. WHERE EXISTING DRAINAGE STRUCTURES ARE LOCATED IN THE RAMP PATH OF TRAVEL, USE A MANUFACTURER'S ADA COMPLIANT GRATE. OPENINGS SHALL NOT BE GREATER THAN 1/2". ELONGATED OPENINGS SHALL BE PLACED SO THAT THE LONG DIMENSION IS PERPENDICULAR TO THE DOMINANT DIRECTION OF TRAVEL.

THE TOP OF THE JOINT FILLER FOR ALL RAMP TYPES SHALL BE FLUSH WITH THE ADJACENT CONCRETE.

CROSSWALK AND STOP LINE MARKINGS, IF USED, SHALL BE SO LOCATED AS TO STOP TRAFFIC SHORT OF RAMP CROSSINGS. SPECIFIC DETAILS FOR MARKING APPLICATIONS ARE GIVEN IN THE "MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

FLARED SIDES WITH A SLOPE OF 10% MAXIMUM, MEASURED ALONG THE ROADSIDE CURB LINE, SHALL BE PROVIDED WHERE AN UNOBSTRUCTED CIRCULATION PATH LATERALLY CROSSES THE CURB RAMP. FLARED SIDES ARE NOT REQUIRED WHERE THE RAMP IS BORDERED BY LANDSCAPING, UNPAVED SURFACE OR PERMANENT FIXED OBJECTS. WHERE THEY ARE NOT REQUIRED, FLARED SIDES CAN BE CONSIDERED IN ORDER TO AVOID SHARP CURB RETURNS AT RAMP OPENINGS.

DETECTABLE WARNING PLATES MUST BE INSTALLED USING FABRICATED OR FIELD CUT UNITS CAST AND/OR ANCHORED IN THE PAVEMENT TO RESIST SHIFTING OR HEAVING.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR
CURB RAMP AND DETECTABLE WARNING DETAILS
4-7-2022 F.H.W.A. APPROVAL | 5-8-2020 PLAN DATE | R-28-J | SHEET 7 OF 7

THE LOCATION AND ELEVATION OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE DRAWINGS ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION AND ELEVATION OF EXISTING UTILITIES AND PROPOSED UTILITY CROSSINGS IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF ANY CONFLICTS ARE APPARENT OR IF THE LOCATION OR DEPTH DIFFERS SIGNIFICANTLY FROM THE PLANS.

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 (TOLL FREE) FOR THE LOCATION OF UNDERGROUND FACILITIES

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

PROJECT: SOUTH LATSON COMMERCIAL DEVELOPMENT

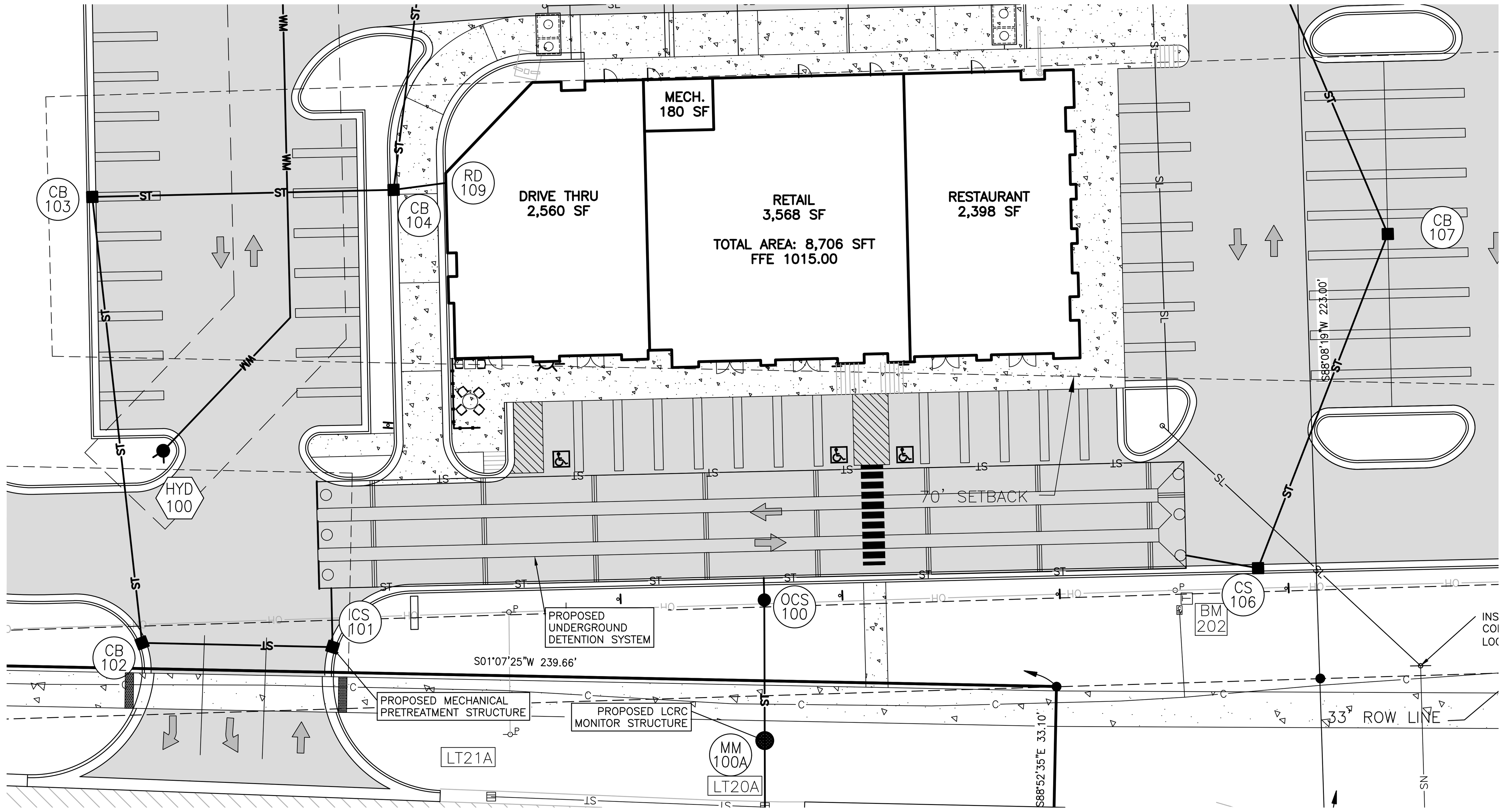
PREPARED FOR: 1015 LATSON ROAD LLC
29592 BECK ROAD
WIXOM, MI 48393
248.773.7992

TITLE: CONSTRUCTION DETAILS

NO	BY	REVISION PER	DATE
4	ST	CHANGE IN USE - NEW SLU SUBMITTAL	5-27-2025
3	ST	PER ACT 399 REVIEW	10-24-2024
2	ST	PER MHOG REVIEW	6-17-2024
1	ST	PER MHOG REVIEW	5-20-2024

DESIGNED BY: ST
DRAWN BY: DH/JS
CHECKED BY:
SCALE: NO SCALE
JOB NO: 21-519
DATE: 04/15/2024
SHEET NO. 11

g:\21-519\DWG\CP\21-519 SHEETS CP-COMMERCIAL.dwg, 5/27/2025 8:25:05 AM, scottt, AutoCAD PDF (General Documentation).pc3


MECH.
180 SF
DRIVE THRU
2,560 SF
RETAIL
3,568 SF
RESTAURANT
2,398 SF
TOTAL AREA: 8,706 SFT
FFE 1015.00
CB 103
CB 104
RD 109
CB 107
HYD 100
70' SETBACK
CB 102
ICS 101
OCS 100
CS 106
BM 202
PROPOSED UNDERGROUND DETENTION SYSTEM
PROPOSED MECHANICAL PRETREATMENT STRUCTURE
PROPOSED LCRC MONITOR STRUCTURE
S01°07'25"W 239.66'
S88°52'35"E 33.10'
33' ROW LINE
MM 100A
LT21A
LT20A

20 0 10 20
SCALE: 1 INCH = 20 FEET

SEE SHEET 2 FOR GENERAL NOTES AND LEGEND

STORM WATER MANAGEMENT NARRATIVE

PRE–DEVELOPMENT:
THE SITE CURRENTLY SITS VACANT AND SHEET FLOWS FROM EAST TO WEST TO THE LATSON ROAD STORM SEWER SYSTEM.

POST DEVELOPMENT:
THE SITE WILL BE DEVELOPED AND PAVED FOR USE AS A MULTI–TENANT COMMERCIAL SPACE WITH RESTAURANT AND RETAIL USE. THE SITE WILL CONTAIN A STORM SEWER COLLECTION SYSTEM WHICH WILL COLLECT ALL ON–SITE (AND SOME TRIBUTARY OFF–SITE) STORM WATER AND ROUTE IT TO A MECHANICAL PRETREATMENT UNIT. THE MECHANICAL PRETREATMENT UNIT IS PROPOSED AND DESIGNED TO MEET THE REQUIRED WATER QUALITY STANDARDS PRIOR TO DISCHARGE INTO THE PROPOSED ON–SITE UNDERGROUND DETENTION SYSTEM. INFILTRATION TESTING HAS BEEN COMPLETED ON A NEARBY AREA TO THE NORTH THAT INDICATE THAT ON–SITE SOILS IN THE VICINITY OF THE PROPOSED BASIN ARE APPROXIMATELY 1.5 IN/HR. INFILTRATION TESTING PERFORMED ON–SITE IN THE FOOTPRINT OF THE BASIN INDICATE INFILTRATION RATES OF 0.75 IN/HR.

ONE OF THE MAIN GOALS OF THE CURRENT LIVINGSTON COUNTY DRAIN COMMISSIONER STORM WATER STANDARDS IS TO PROMOTE ON–SITE INFILTRATION IF SUITABLE SOILS EXIST. IF SITE SOILS EXCEED 0.25 IN/HR, INFILTRATION IS EXPECTED TO BE IMPLEMENTED. AND WITH ON–SITE SOILS WITH INFILTRATIVE RATES GREATER THAN 0.50 IN/HR, THE SOILS DO NOT NEED ANY AMENDMENT TO FURTHER PROMOTE INFILTRATION. DUE TO THE GEOMETRICS OF THE SUBJECT SITE (BEING SHALLOW AND A SMALLER COMMERCIAL PARCEL), THERE ARE MINIMAL OPPORTUNITY TO PROMOTE INFILTRATION OTHER THAN AT THE LOCATION OF THE UNDERGROUND DETENTION SYSTEM. IN ORDER TO PROMOTE INFILTRATION AT THE BASIN FOOTPRINT PRIOR TO STORM WATER DISCHARGE TO THE LATSON ROAD STORM SEWER SYSTEM OCCURRING, THE UNDERGROUND DETENTION SYSTEM PIPE INVERT IS SET BELOW THE OUTLET CONTROL ORIFICE ELEVATION BY 2.5'. SO 2.5' OF THE 6' DIAMETER UNDERGROUND SYSTEM PIPE WILL BE BELOW THE OUTLET ELEVATION. A PERFORATED PIPE AND THE SURROUNDING STRUCTURAL BACKFILL AROUND THE UNDERGROUND DETENTION SYSTEM WILL AID IN PROMOTION OF THE INFILTRATION OF STORM WATER IN THE ON–SITE 0.75 IN/HR SOILS. THE VOLUME WITHIN THE UNDERGROUND SYSTEM THAT IS BELOW THE OUTLET ELEVATION IS 6,613 CFT:

593 LFT PIPE X 11.1511 CFT/LFT OF PIPE (BOTTOM 2.5' OF 6' DIA PIPE) = 6,613 CFT

THE 6,613 CFT PROVIDED BELOW THE INVERT IS INTENDED TO MEET OR EXCEED THE REQUIRED CHANNEL PROTECTION VOLUME 5,517 CFT. THIS DESIGN MEETS THAT VOLUME REQUIREMENT.

PER THE LCDC STANDARDS, VOLUME PROVIDED FOR THE CHANNEL PROTECTION VOLUME CAN BE CREDITED TOWARDS THE REQUIRED 100–YR DETENTION VOLUME, SO LONG AS THE REMAINING DETENTION VOLUME REQUIRED IS NOT LESS THAN THE EXTENDED DETENTION VOLUME. WITH THIS, A REMAINING 9,019 CFT OF VOLUME IS NEEDED:

15,632 CFT – 6,613 CFT = 9,019 CFT (REMAINING VOLUME NEEDED ABOVE OUTLET)
9,019 CFT > 8,064 CFT (EXTENDED DETENTION VOLUME)

A VOLUME OF 10,154 CFT IS PROVIDED ABOVE THE OUTLET CONTROL ELEVATION.

593 LFT PIPE X 17.1232 CFT/LFT OF PIPE (TOP 3.5' OF 6' DIA PIPE) = 10,154 CFT

THE TOTAL STORAGE VOLUME PROVIDED IN THE SYSTEM IS 16,767 CFT
(6,613 CFT BELOW OUTLET FOR CPVC INFILTRATION VOLUME + 10,154 CFT ABOVE OUTLET)

IN ORDER FOR INFILTRATION TO OCCUR IN THE BASIN FOOTPRINT, AN ADEQUATE FOOTPRINT FOR INFILTRATION MUST BE PROVIDED. PER THE LCDC STANDARDS AND WITH AN INFILTRATION RATE OF 0.75 IN/HR, A MINIMUM BASIN FOOTPRINT OF 3,153 SFT IS REQUIRED. A BASIN FOOTPRINT OF THE PROPOSED SYSTEM IS 4,692 SFT. WITH THIS FOOTRPINT AREA AND ON–SITE INFILTRATION RATE, THE PROVIDED RATE OF INFILTRATION IS 293.3 CFT/HR WHICH RESULTS IN FULL INFILTRATION WITHIN 22.5 HOURS.

4,692 SFT X (0.75 IN/HR X 1FT/12IN) = 293.3 CFT/HR
6,613 CFT / 293.3 CFT/HR = 22.5 HRS TO INFILTRATE THE PROVIDED CPVC STORAGE VOLUME BELOW THE OUTLET INVERT.

LIVINGSTON COUNTY DETENTION BASIN CALCULATIONS

AREA (ACRES)	IMPERVIOUS FACTOR	ACRE IMPERVIOUS
1.23	0.9	1.10
0.00	0.7	0.00
0.35	0.2	0.07

COMPOUND C: 0.74
TOTAL DRAINAGE AREA: 1.58 ACRES

WATER QUALITY VOLUME V_{WQ}
V_{WQ} = 3,630(C)(A) = 4244 FT^3
Are upstream infiltration BMP's provided? no
V_F = $0.15(V_{WQ})$ = 637 FT^3

WATER QUALITY RATE FOR MECHANICAL STRUCTURE 101
T_C = MAX TIME OF CONCENTRATION = 16.43 MIN
Q_{WQ} = $(C)(A)30.2/(T_C+9.17)^{.81}$ = 1.40 CFS

WATER QUALITY RATE FOR MECHANICAL STRUCTURE 106
T_C = MAX TIME OF CONCENTRATION = 15.85 MIN
Q_{WQ} = $(C)(A)30.2/(T_C+9.17)^{.81}$ = 1.18 CFS

CHANNEL PROTECTION VOLUME CONTROL - REQUIRED
V_{CP-R} = 4,719(C)(A) = 5517 FT^3

CHANNEL PROTECTION VOLUME CONTROL - PROVIDED
In-Situ Infiltration rate = 0.75 IN/HR
Are upstream infiltration BMP's provided? NO INFILTRATION
Basin Footrpint Infiltration Area Required = 3153 FT^2
V_{CP-P} = 6613 FT^3

CHANNEL PROTECTION RATE CONTROL (EXTENDED DETENTION VOLUME)
V_{ED} = 6,897(C)(A) = 8064 FT^3

EXTENDED DETENTION OUTLET RATE
Q_{ED} = $V_{ED}/(48hr)$ = 0.047 CFS
H_{ED} = $V_{ED}/4{,}800\,(H)^{1/2}$ = 1.0 1" HOLES
H = 2.39 FT
$ELEV_{ED}$ = 1010.56 FT

100-YEAR ALLOWABLE OUTLET RATE
Q_{DRAIN} = Restricted Drain Rate = 0.15 CFS/ACRE
Q_{VRR} = 1.1055 - 0.206LN(A) = 1.000 CFS/ACRE
Q_{100P} = (LESSER OF Q_{DRAIN} & Q_{VRR})*A = 0.237 CFS

VARIABLE RELEASE RATE	
1 CFS/ACRE	< 2 ACRES
0.15 CFS/ACRE	> 100 ACRES

100-YEAR DETENTION VOLUME
V_{100R} = 18985 (C)(A) = 22197 FT^3
Q_{100IN} = $(C)(A)83.3/(T_c+9.17)^{0.81}$ = 7.18 CFS
R = $0.206-.15(\ln(Q_{100P}/Q_{100IN})$ = 0.7176
V_{100D} = $V_{100R}*R-V_{CP-P}$ = 9315 FT^3
Is $V_{100D} \geq V_{ED}$? YES
V_{100D} = 9315 FT^3

BASIN STORAGE PROVIDED
Lineal Footage of Pipe in system: 593 lft

ELEVATION	INCREMENTAL VOLUME / LFT	VOLUME (FT^3)	TOTAL VOLUME (FT^3)	
1011.67	1.1254	667.4	10,154	16,767
1011.17	1.9721	1169.5	9,487	
1010.67	2.4302	1441.1	8,317	
1010.17	2.7225	1614.4	6,876	
1009.67	2.9009	1720.2	5,262	
1009.17	2.9861	1770.8	3,542	
1008.67	2.9861	1770.8	1,771	
1008.17		0.0	0	**BOTTOM OF STORAGE**
1008.17	2.9009	1720.2	6,613	**VOLUME BELOW OUTLET**
1007.67	2.7225	1614.4	4,892	**(FOR CPVC VOLUME)**
1007.17	2.4302	1441.1	3,278	
1006.67	1.9721	1169.5	1,837	
1006.17	1.1254	667.4	667	
1005.67	0	0	0	

PROVIDED FOOTPRINT OF BASIN BOTTOM AREA 4692 FT^2

OUTLET CONTROL STRUCTURE
Q_{ED} ACTUAL
H_{ED} = 1 (1" HOLES)
A_{ED} = 0.0055 FT^2
$Q_{ED-ACTUAL}$ = $(A_{ED})(0.62 \times (2 \times 32\,2 \times h)^{0.5})$ = 0.042 CFS

Q_{100ALL} OUTLET
$Q_{100-ACTUAL} = Q_{100P} - Q_{ED-ACTUAL}$ = 0.195 CFS
$A_{100} = Q_{100-ACTUAL} / (0.62 * (2 * 32.2 * (ELEV_{DHWL} - ELEV_{ED}))^{0.5})$ = 0.037 FT^2
AREA OF 2 INCH DIAMETER ORIFICE = 0.022 FT^2
ORIFICES = A100 / 0.005 = 1.0 ORIFICES

OVERFLOW SPILLWAY DESIGN
Design Flow Rate: Q_{100IN} = 7.18 CFS
Depth of Spillway: D_{SPILL} = 6 INCHES
Width of Spillway: $W_{SPILL} = Q_{100IN}/3.33D_{SPILL}^{3/2}$ = 6.1 FT

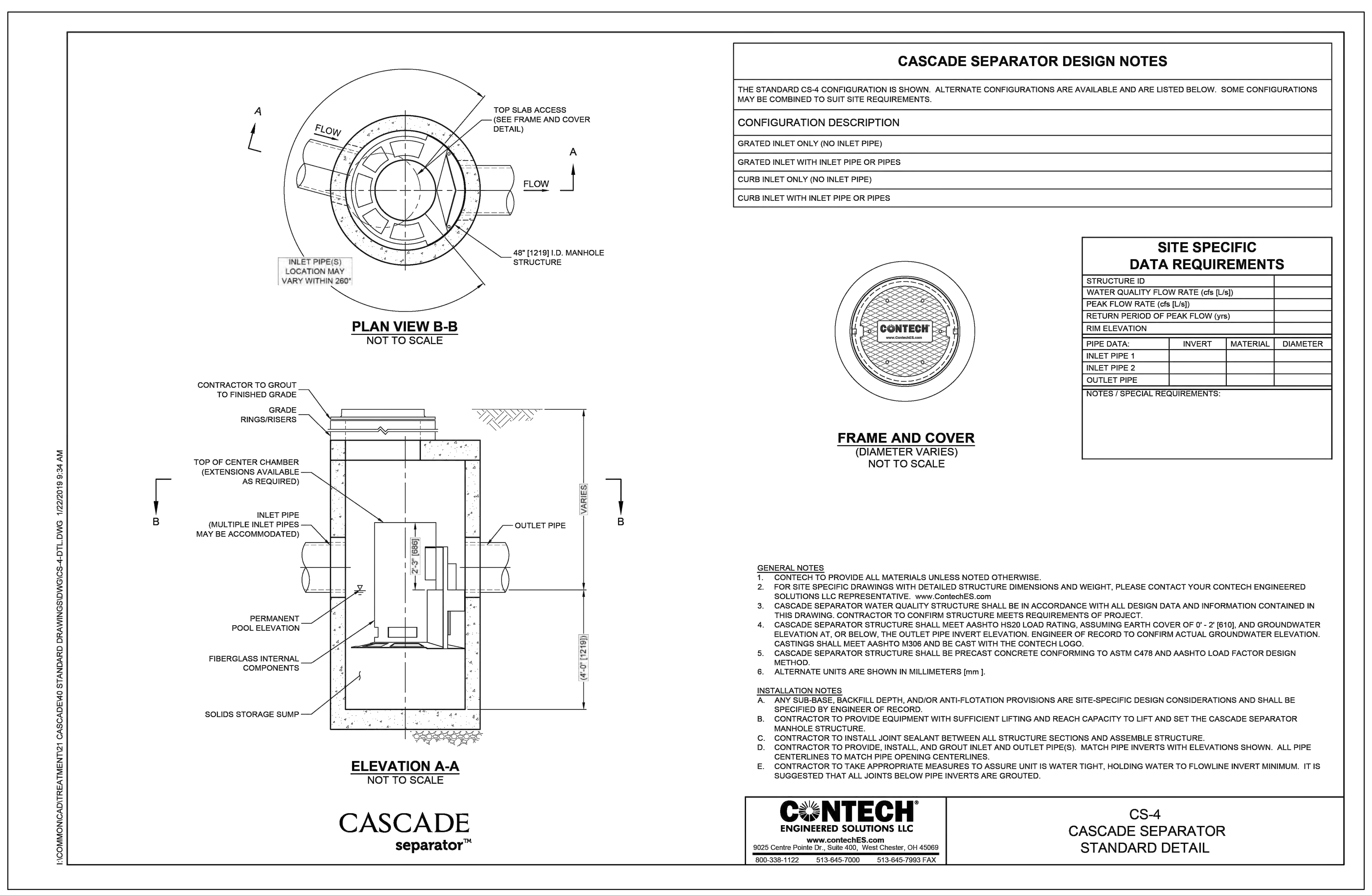
BASIN DESIGN SUMMARY		
BASIN SIZE REQUIRED =	9315	FT^3
BASIN SIZE PROVIDED =	10,154	FT^3
ORIFICE DESIGN SUMMARY		
ELEVATION	# OF HOLES	DIAMETER OF HOLES
1008.17	1.0	1 -INCH
1010.56	1.0	2 -INCH
OVERFLOW SPILLWAY SUMMARY		
WIDTH OF OVERFLOW SPILLWAY =	6	FT

Design Criteria					
Site Designation	Commercial East Latson CS 101			Sizing Method	Treatment Flow Rate
Screening Required?	No	Treatment Flow Rate	1.40	Peak Flow (cfs)	2.77
Groundwater Depth (ft)	5 - 10	Pipe Invert Depth (ft)	0 - 5	Bedrock Depth (ft)	5 - 10
Multiple Inlets?	No	Grate Inlet Required?	No	Pipe Size (in)	12.00
Required Particle Size Distribution?	No	90° between two inlets?	N/A		

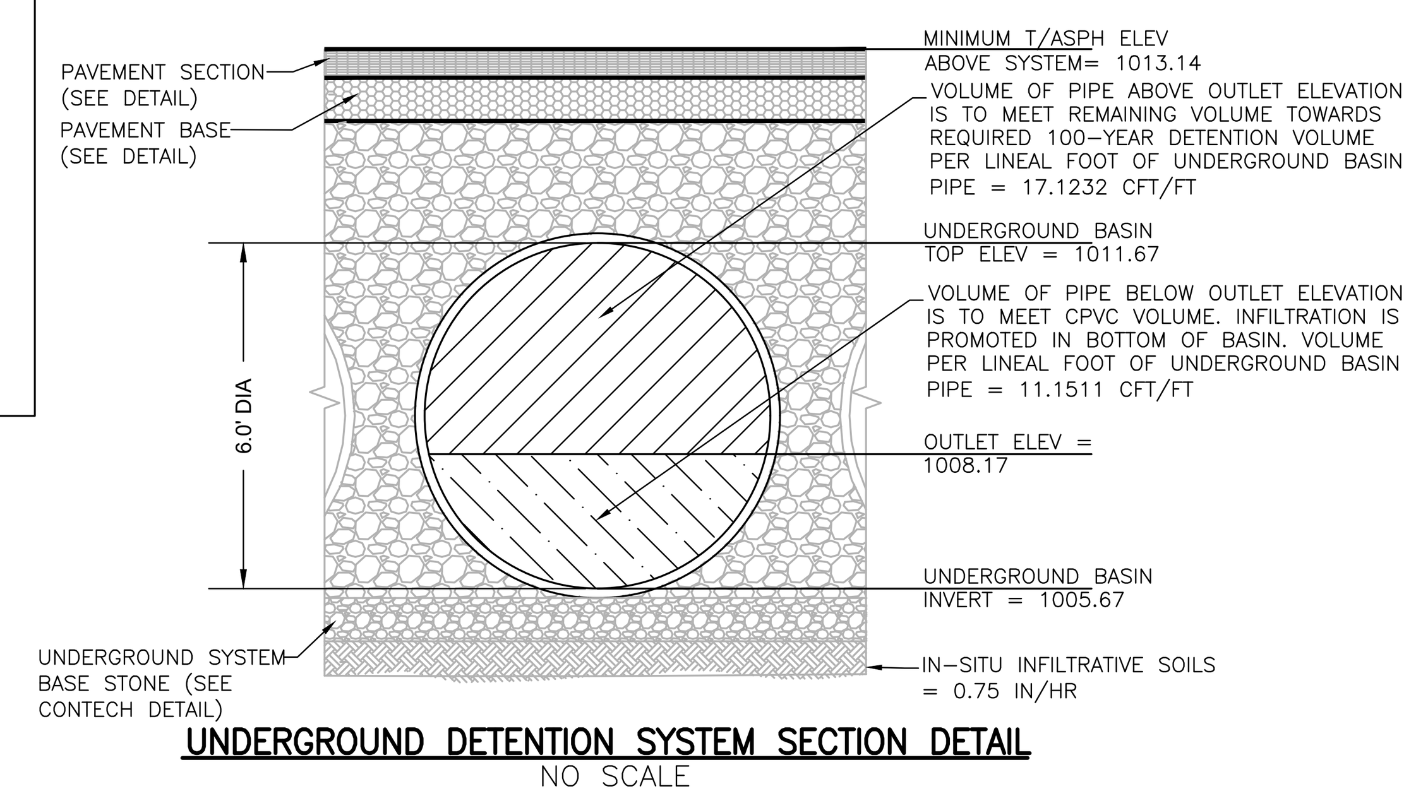
Treatment Selection				
Treatment Unit	CASCADE SEPARATOR	System Model	CS-4	
Target Removal	80%	Particle Size Distribution (PSD)	NJDEP	

Design Criteria					
Site Designation	Commercial East Latson CS 106			Sizing Method	Treatment Flow Rate
Screening Required?	No	Treatment Flow Rate	1.18	Peak Flow (cfs)	2.30
Groundwater Depth (ft)	5 - 10	Pipe Invert Depth (ft)	0-5	Bedrock Depth (ft)	5 - 10
Multiple Inlets?	No	Grate Inlet Required?	No	Pipe Size (in)	12.00
Required Particle Size Distribution?	No	90° between two inlets?	N/A		

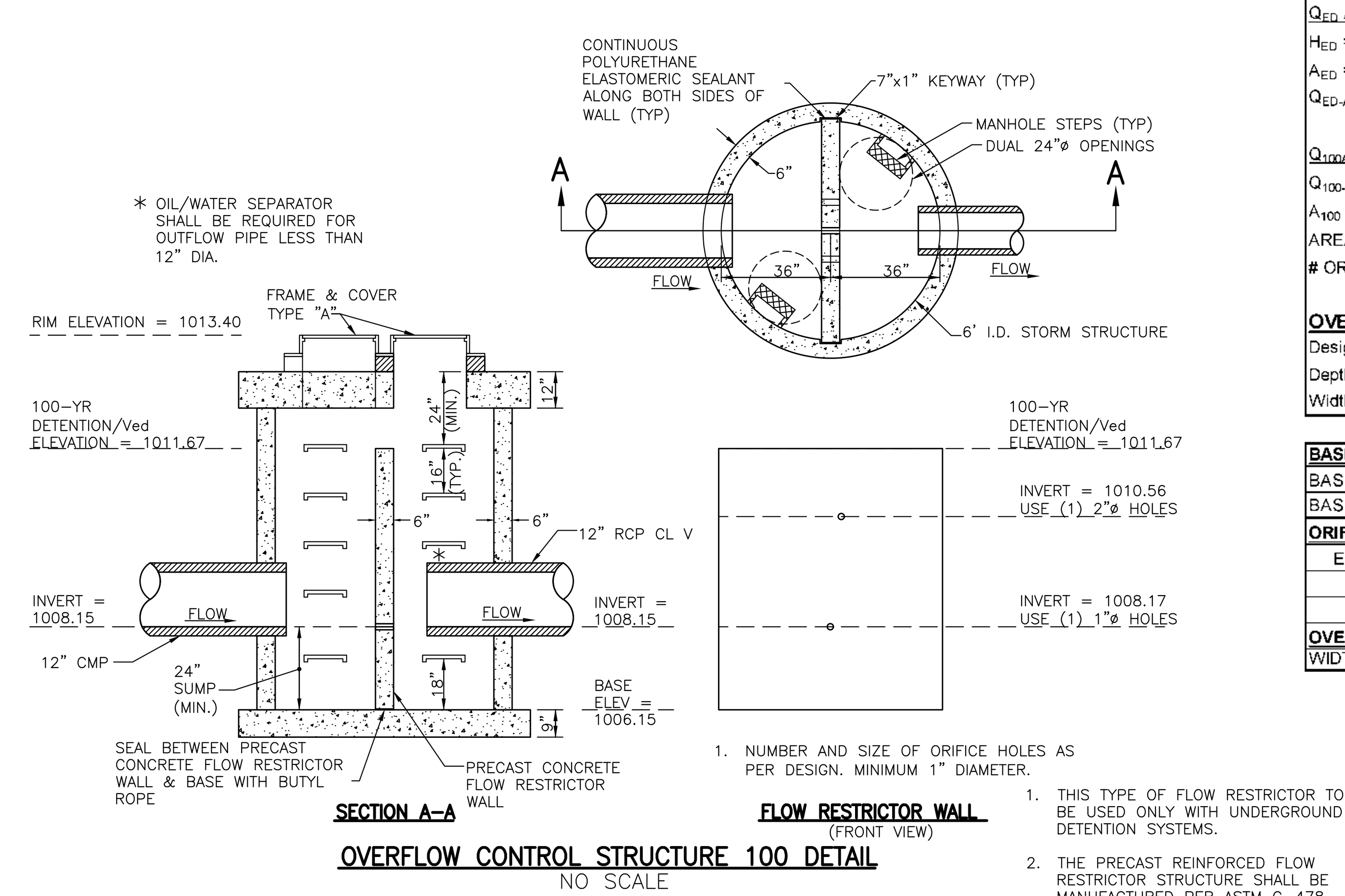
Treatment Selection				
Treatment Unit	CASCADE SEPARATOR	System Model	CS-4	
Target Removal	80%	Particle Size Distribution (PSD)	NJDEP	


CASCADE SEPARATOR DESIGN NOTES
THE STANDARD CS-4 CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.
CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
PLAN VIEW B-B
NOT TO SCALE
FRAME AND COVER
(DIAMETER VARIES)
NOT TO SCALE
SITE SPECIFIC
DATA REQUIREMENTS
ELEVATION A-A
NOT TO SCALE
CASCADE
separator™
CONTECH
ENGINEERED SOLUTIONS LLC
CS-4
CASCADE SEPARATOR
STANDARD DETAIL

MECHANICAL PRETREATMENT STRUCTURE 101 DETAIL


PAVEMENT SECTION
(SEE DETAIL)
PAVEMENT BASE
(SEE DETAIL)
MINIMUM T/ASPH ELEV
ABOVE SYSTEM= 1013.14
VOLUME OF PIPE ABOVE OUTLET ELEVATION IS TO MEET REMAINING VOLUME TOWARDS REQUIRED 100–YEAR DETENTION VOLUME PER LINEAL FOOT OF UNDERGROUND BASIN PIPE = 17.1232 CFT/FT
UNDERGROUND BASIN
TOP ELEV = 1011.67
VOLUME OF PIPE BELOW OUTLET ELEVATION IS TO MEET CPVC VOLUME. INFILTRATION IS PROMOTED IN BOTTOM OF BASIN. VOLUME PER LINEAL FOOT OF UNDERGROUND BASIN PIPE = 11.1511 CFT/FT
6.0' DIA
OUTLET ELEV =
1008.17
UNDERGROUND BASIN
INVERT = 1005.67
UNDERGROUND SYSTEM
BASE STONE (SEE
CONTECH DETAIL)
IN–SITU INFILTRATIVE SOILS
= 0.75 IN/HR

UNDERGROUND DETENTION SYSTEM SECTION DETAIL
NO SCALE


CONTINUOUS POLYURETHANE ELASTOMERIC SEALANT ALONG BOTH SIDES OF WALL (TYP)
7"x1" KEYWAY (TYP)
MANHOLE STEPS (TYP)
DUAL 24"ø OPENINGS
6' I.D. STORM STRUCTURE
FLOW
✳ OIL/WATER SEPARATOR SHALL BE REQUIRED FOR OUTFLOW PIPE LESS THAN 12" DIA.
FRAME & COVER
RIM ELEVATION = 1013.40
100–YR DETENTION/Ved ELEVATION = 1011.67
INVERT = 1010.56
USE (1) 2"ø HOLES
INVERT = 1008.17
USE (1) 1"ø HOLES
12" RCP CL V
INVERT = 1008.15
12" CMP
24" SUMP (MIN.)
BASE ELEV = 1006.15
SEAL BETWEEN PRECAST CONCRETE FLOW RESTRICTOR WALL & BASE WITH BUTYL ROPE
PRECAST CONCRETE FLOW RESTRICTOR WALL
SECTION A–A
FLOW RESTRICTOR WALL
(FRONT VIEW)

1. NUMBER AND SIZE OF ORIFICE HOLES AS PER DESIGN. MINIMUM 1" DIAMETER.

1. THIS TYPE OF FLOW RESTRICTOR TO BE USED ONLY WITH UNDERGROUND DETENTION SYSTEMS.
2. THE PRECAST REINFORCED FLOW RESTRICTOR STRUCTURE SHALL BE MANUFACTURED PER ASTM C–478 SPECIFICATIONS.

OVERFLOW CONTROL STRUCTURE 100 DETAIL
NO SCALE

THE LOCATION AND ELEVATION OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE DRAWINGS ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION AND ELEVATION OF EXISTING UTILITIES AND PROPOSED UTILITY CROSSINGS IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF ANY CONFLICTS ARE APPARENT OR IF THE LOCATION OR DEPTH DIFFERS SIGNIFICANTLY FROM THE PLANS.

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 (TOLL FREE)

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

PROJECT: SOUTH LATSON COMMERCIAL DEVELOPMENT

PREPARED FOR: 1015 LATSON ROAD LLC
29592 BECK ROAD
WIXOM, MI 48393
248.773.7992

TITLE: BASIN DETAILS

NO	BY	REVISION PER	DATE
4	ST	CHANGE IN USE – NEW SLU SUBMITTAL	5–27–2025
3	ST	PER ACT 399 REVIEW	10–24–2024
2	ST	PER MHOG REVIEW	6–17–2024
1	ST	PER MHOG REVIEW	5–20–2024

DESIGNED BY: ST
DRAWN BY: DH
CHECKED BY:
SCALE: 1" = 20'
JOB NO: 21–519
DATE: 04/15/2024
SHEET NO. 12

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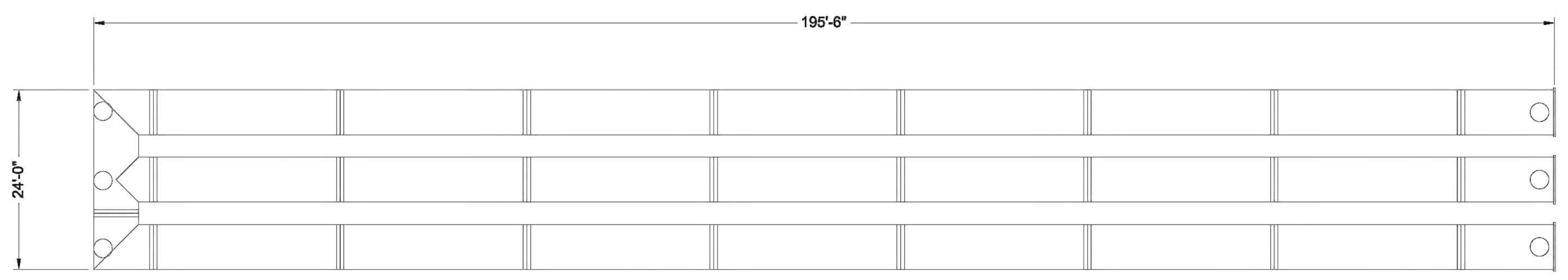
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 593 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 16,170 CF
- PIPE STORAGE VOLUME = 16,767 CF
- BACKFILL STORAGE VOLUME = 0 CF

PIPE DETAILS
- DIAMETER = 72"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 36"

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



ASSEMBLY
SCALE: 1" = 20'

NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE $2\frac{2}{3}$" x $\frac{1}{2}$" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYODS DESIGN, QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

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DATE	REVISION DESCRIPTION	BY

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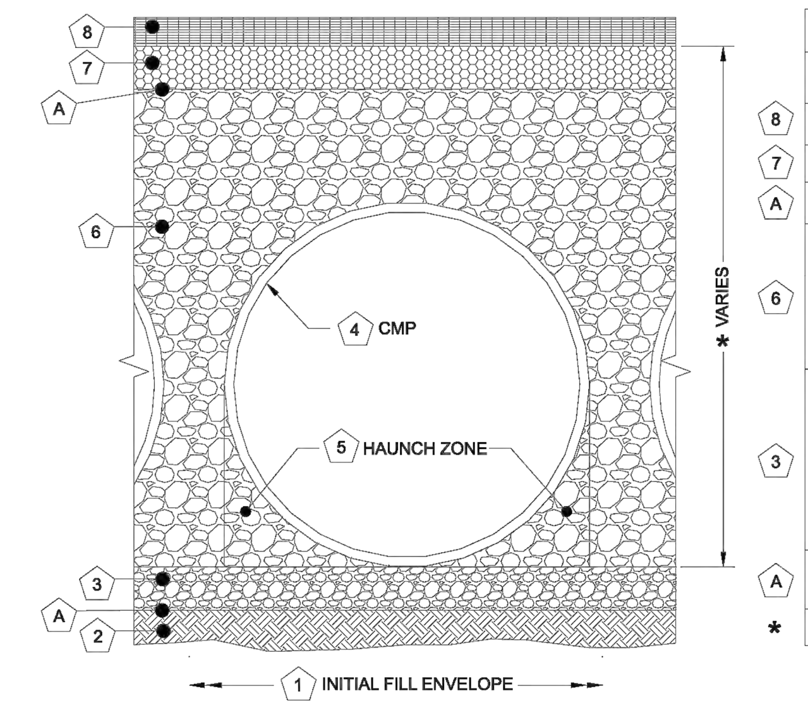
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH® CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

DYO39920 East Latson - South Parcel
South Parcel - COPY
Howell, MI
DETENTION SYSTEM

PROJECT No.: 26325	SEQ. No.: 39920	DATE: 10/25/2023
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		



Infiltration Systems - CMP Infiltration & CMP Perforated Drainage Pipe

	Material Location	Description	Material Designation	Designation
8	Rigid or Flexible Pavement (if applicable)			
7	Road Base (if applicable			
A	Geotextile Layer	Non-Woven Geotextile	CONTECH C-40 or C-45	Engineer Decision for consideration to prevent soil migration into varying soil types. Wrap the trench only.
6	Backfill	Infiltration pipe systems have a pipe perforation sized of 3/8" diameter. An open graded, free draining stone, with a particle size of ½" – 2 ½" diameter is recommended.	AASHTO M 145- A-1 or AASHTO M 43 - 3, 4	Material shall be worked into the pipe haunches by means of shovel-slicing, rodding, air-tamper, vibratory rod, or other effective methods. Compaction of all placed fill material is necessary and shall be considered adequate when no further yielding of the material is observed under the compactor, or under foot, and the Project Engineer or his representative is satisfied with the level of compaction*
3	Bedding Stone	Well graded granular bedding material w/maximum particle size of 3"	AASHTO M43 - 3,357,4,467, 5, 56, 57	For soil aggregates larger than 3/8" a dedicated bedding layer is not required for CMP. Pipe may be placed on the trench bottom comprised of native suitable well graded & granular material. For Arch pipes it is recommended to be shaped to a relatively flat bottom or fine-grade the foundation to a slight v-shape. Soil aggregates less than 3/8" and unsuitable material should be over-excavated and re-placed with a 4"-6" layer of well graded & granular stone per the material designation.
A	Geotextile Layer	None	None	Contech does not recommend geotextiles be placed under the invert of Infiltration systems due to the propensity for geotextiles to clog over time.
*	Note: The listed AASHTO designations are for gradation only. The stone must also be angular and clean.			

1. MINIMUM WIDTH DEPENDS ON SITE CONDITIONS AND ENGINEERING JUDGEMENT.

FOUNDATION/BEDDING PREPARATION

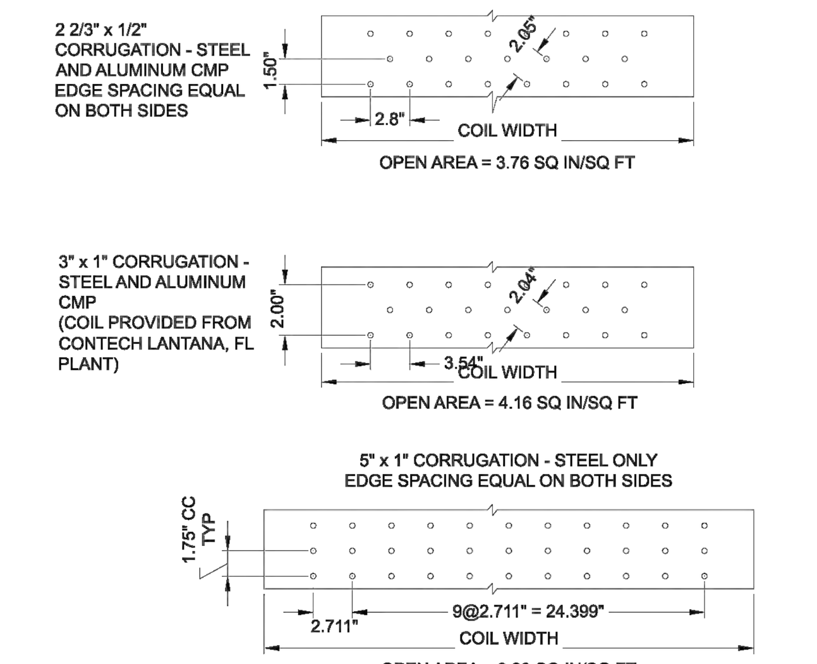
2. PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND BROUGHT BACK TO THE GRADE WITH A FILL MATERIAL AS APPROVED BY THE ENGINEER.

5. HAUNCH ZONE MATERIAL SHALL BE PLACED AND UNIFORMLY COMPACTED WITHOUT SOFT SPOTS.

BACKFILL
MATERIAL SHALL BE PLACED IN 8"-10" MAXIMUM LIFTS. INADEQUATE COMPACTION CAN LEAD TO EXCESSIVE DEFLECTIONS WITHIN THE SYSTEM AND SETTLEMENT OF THE SOILS OVER THE SYSTEM. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO-LIFT DIFFERENTIAL BETWEEN THE SIDES OF ANY PIPE IN THE SYSTEM AT ALL TIMES DURING THE BACKFILL PROCESS. BACKFILL SHALL BE ADVANCED ALONG THE LENGTH OF THE SYSTEM AT THE SAME RATE TO AVOID DIFFERENTIAL LOADING ON ANY PIPES IN THE SYSTEM.

EQUIPMENT USED TO PLACE AND COMPACT THE BACKFILL SHALL BE OF A SIZE AND TYPE SO AS NOT TO DISTORT, DAMAGE, OR DISPLACE THE PIPE. ATTENTION MUST BE GIVEN TO PROVIDING ADEQUATE MINIMUM COVER FOR SUCH EQUIPMENT. MAINTAIN BALANCED LOADING ON ALL PIPES IN THE SYSTEM DURING ALL SUCH OPERATIONS.

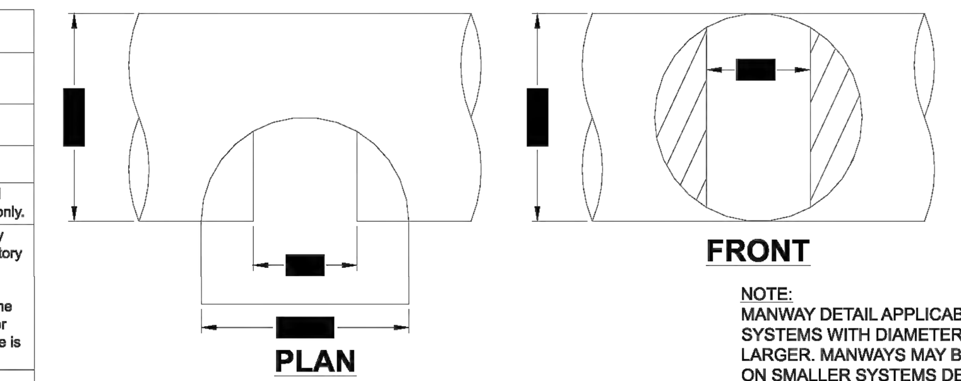
OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS. REFER TO TYPICAL BACKFILL DETAIL FOR MATERIAL REQUIRED.



NOTES:

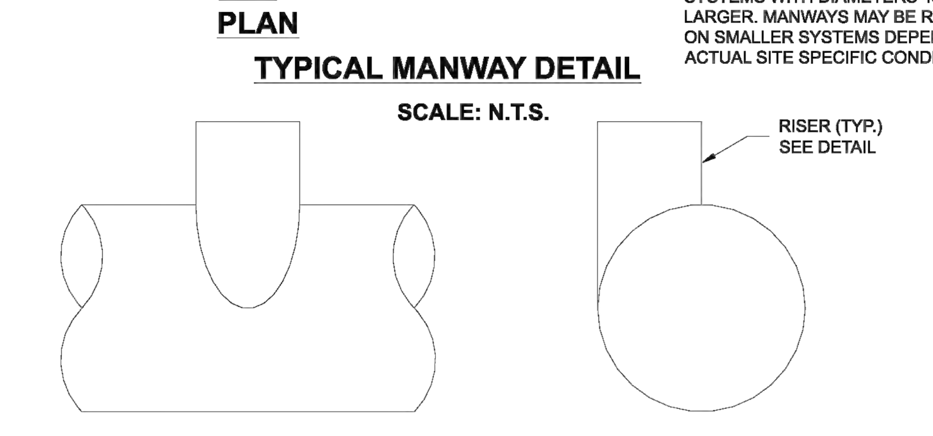
1. PERFORATIONS MEET AASHTO AND ASTM SPECIFICATIONS.
2. PERFORATION OPEN AREA PER SQUARE FOOT OF PIPE IS BASED ON THE NOMINAL DIAMETER AND LENGTH OF PIPE.
3. ALL DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
4. ALL HOLES ⌀3/8".

TYPICAL PERFORATION DETAIL
SCALE: N.T.S.



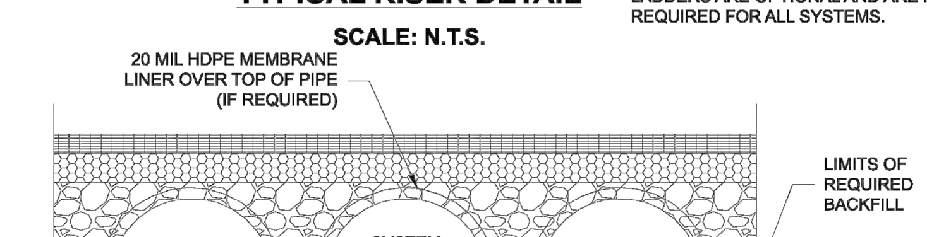
TYPICAL MANWAY DETAIL
SCALE: N.T.S.

NOTE:
MANWAY DETAIL APPLICABLE FOR CMP SYSTEMS WITH DIAMETERS 48" AND LARGER. MANWAYS MAY BE REQUIRED ON SMALLER SYSTEMS DEPENDING ON ACTUAL SITE SPECIFIC CONDITIONS.



TYPICAL RISER DETAIL
SCALE: N.T.S.

NOTE:
LADDERS ARE OPTIONAL AND ARE NOT REQUIRED FOR ALL SYSTEMS.



TYPICAL SECTION VIEW
LINER OVER ROWS
SCALE: N.T.S.

NOTE: IF SALTING AGENTS FOR SNOW AND ICE REMOVAL ARE USED ON OR NEAR THE PROJECT, AN HDPE MEMBRANE LINER IS RECOMMENDED WITH THE SYSTEM. THE IMPERMEABLE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM A CHANGE IN THE SURROUNDING ENVIRONMENT OVER A PERIOD OF TIME. PLEASE REFER TO THE CORRUGATED METAL PIPE DETENTION DESIGN GUIDE FOR ADDITIONAL INFORMATION.

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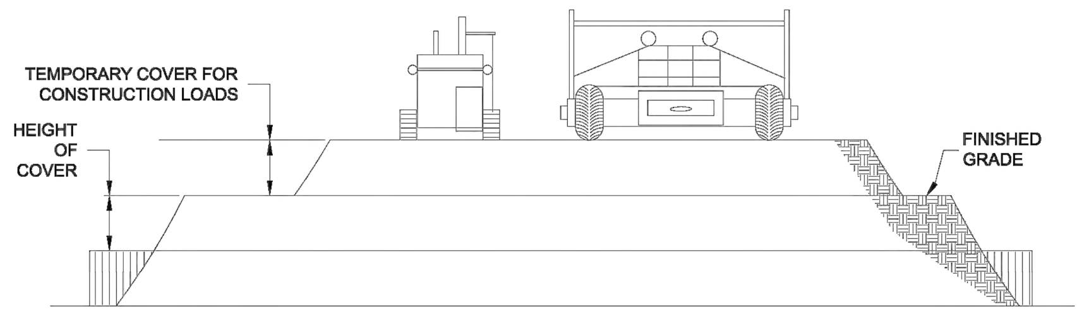
DETENTION SYSTEM



CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOADING DIAGRAM
SCALE: N.T.S.

SPECIFICATION FOR DESIGNED DETENTION SYSTEM:

SCOPE
THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE DESIGNED DETENTION SYSTEM DETAILED IN THE PROJECT PLANS.

MATERIAL
THE MATERIAL SHALL CONFORM TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-274 OR ASTM A-92.

THE GALVANIZED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-218 OR ASTM A-929.

THE POLYMER COATED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-246 OR ASTM A-742.

THE ALUMINUM COILS SHALL CONFORM TO THE APPLICABLE OF AASHTO M-197 OR ASTM B-744.

CONSTRUCTION LOADS
CONSTRUCTION LOADS MAY BE HIGHER THAN FINAL LOADS. FOLLOW THE MANUFACTURER'S OR NCSPA GUIDELINES.

PIPE
THE PIPE SHALL BE MANUFACTURED IN ACCORDANCE TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2: AASHTO M-36 OR ASTM A-760

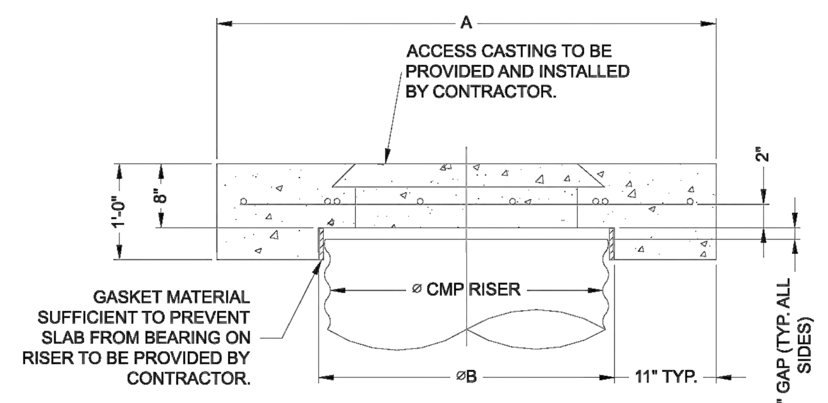
GALVANIZED: AASHTO M-36 OR ASTM A-760

APPLICABLE POLYMER COATED: AASHTO M-245 OR ASTM A-762

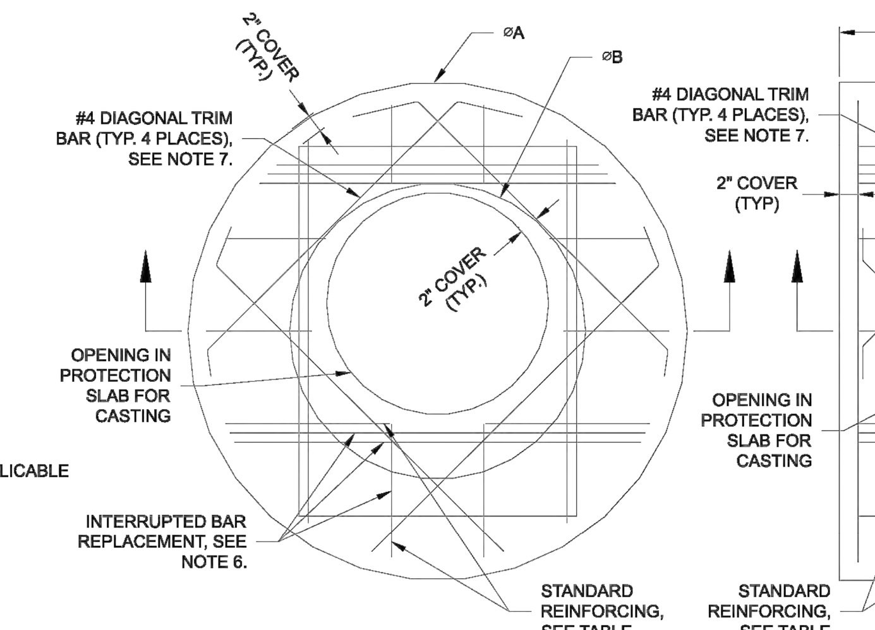
ALUMINUM: AASHTO M-196 OR ASTM B-745
APPLICABLE
HANDLING AND ASSEMBLY
SHALL BE IN ACCORDANCE WITH NCSP'S (NATIONAL CORRUGATED STEEL APPLICABLE PIPE ASSOCIATION) FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL. SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS FOR ALUMINUM PIPE.
REQUIREMENTS
INSTALLATION
SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II DIVISION II OR ASTM A-798 (FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL) OR ASTM B-788 (FOR ALUMINUM PIPE) AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

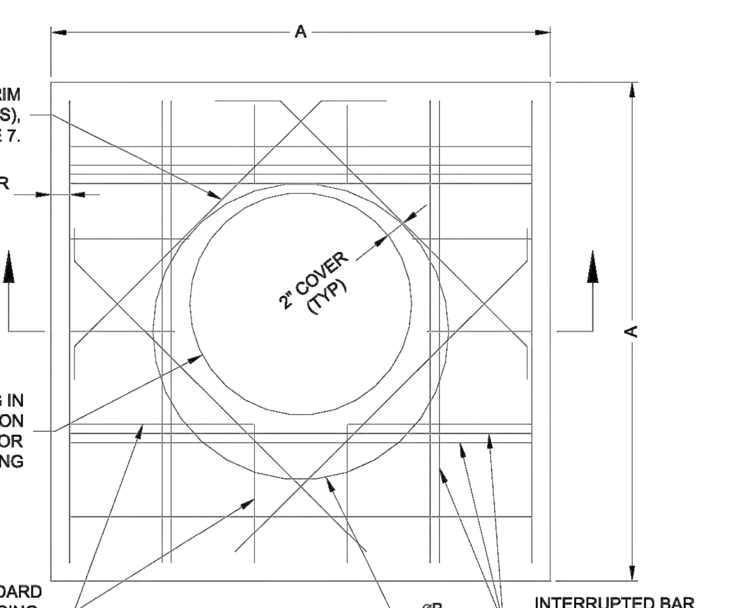
NOTE:
THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.



SECTION VIEW



ROUND OPTION PLAN VIEW



SQUARE OPTION PLAN VIEW

REINFORCING TABLE				
⌀ CMP RISER	A	⌀ B	REINFORCING	**BEARING PRESSURE (PSF)
24"	⌀ 4' 4'X4'	26"	#5 @ 12" OCEW #5 @ 12" OCEW	2,410 1,780
30"	⌀ 4'-6" 4'-6" X 4'-6"	32"	#5 @ 12" OCEW #5 @ 12" OCEW	2,120 1,530
36"	⌀ 5' 5' X 5'	38"	#5 @ 10" OCEW #5 @ 10" OCEW	1,890 1,350
42"	⌀ 5'-6" 5'-6" X 5'-6"	44"	#5 @ 10" OCEW #5 @ 9" OCEW	1,720 1,210
48"	⌀ 6' 6' X 6'	50"	#5 @ 9" OCEW #5 @ 8" OCEW	1,600 1,100

** ASSUMED SOIL BEARING CAPACITY

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 3,500 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERING, BINGHAMTON, NY.

MANHOLE CAP DETAIL
SCALE: N.T.S.

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DETENTION SYSTEM

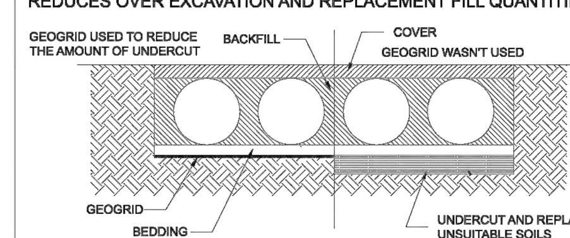
CMP DETENTION INSTALLATION GUIDE

PROPER INSTALLATION OF A FLEXIBLE UNDERGROUND DETENTION SYSTEM WILL ENSURE LONG-TERM PERFORMANCE. THE CONFIGURATION OF THESE SYSTEMS OFTEN REQUIRES SPECIAL CONSTRUCTION PRACTICES THAT DIFFER FROM CONVENTIONAL FLEXIBLE PIPE CONSTRUCTION. CONTECH ENGINEERED SOLUTIONS STRONGLY SUGGESTS SCHEDULING A PRE-CONSTRUCTION MEETING WITH YOUR LOCAL SALES ENGINEER TO DETERMINE IF ADDITIONAL MEASURES, NOT COVERED IN THIS GUIDE, ARE APPROPRIATE FOR YOUR SITE.

FOUNDATION

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

IF SOFT OR UNSUITABLE SOILS ARE ENCOUNTERED, REMOVE THE POOR SOILS DOWN TO A SUITABLE DEPTH AND THEN BUILD UP TO THE APPROPRIATE ELEVATION WITH A COMPETENT BACKFILL MATERIAL. THE STRUCTURAL FILL MATERIAL GRADATION SHOULD NOT ALLOW THE MIGRATION OF FINES, WHICH CAN CAUSE SETTLEMENT OF THE DETENTION SYSTEM OR PAVEMENT ABOVE. IF THE STRUCTURAL FILL MATERIAL IS NOT COMPATIBLE WITH THE UNDERLYING SOILS AN ENGINEERING FABRIC SHOULD BE USED AS A SEPARATOR. IN SOME CASES, USING A STIFF REINFORCING GEOGRID REDUCES OVER EXCAVATION AND REPLACEMENT FILL QUANTITIES.

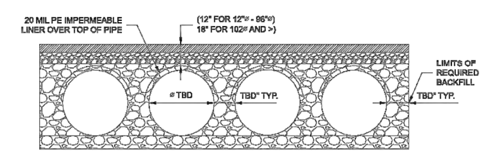


GRADE THE FOUNDATION SUBGRADE TO A UNIFORM OR SLIGHTLY SLOPING GRADE. IF THE SUBGRADE IS CLAY OR RELATIVELY NON-POROUS AND THE CONSTRUCTION SEQUENCE WILL LAST FOR AN EXTENDED PERIOD OF TIME, IT IS BEST TO SLOPE THE GRADE TO ONE END OF THE SYSTEM. THIS WILL ALLOW EXCESS WATER TO DRAIN QUICKLY, PREVENTING SATURATION OF THE SUBGRADE.

GEOMEMBRANE BARRIER

A SITE'S RESISTIVITY MAY CHANGE OVER TIME WHEN VARIOUS TYPES OF SALTING AGENTS ARE USED, SUCH AS ROAD SALTS FOR DEICING AGENTS. IF SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE, A GEOMEMBRANE BARRIER IS RECOMMENDED WITH THE SYSTEM. THE GEOMEMBRANE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM THE USE OF SUCH AGENTS INCLUDING PREMATURE CORROSION AND REDUCED ACTUAL SERVICE LIFE.

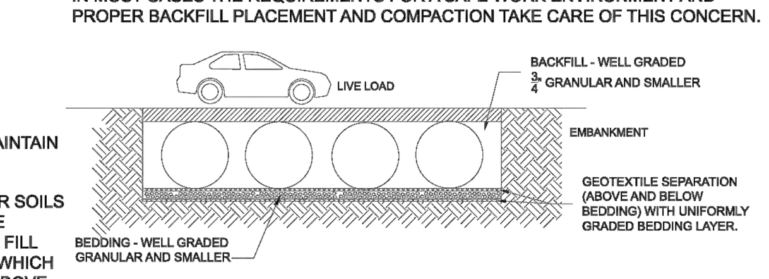
THE PROJECT'S ENGINEER OF RECORD IS TO EVALUATE WHETHER SALTING AGENTS WILL BE USED ON OR NEAR THE PROJECT SITE, AND USE HIS/HER BEST JUDGEMENT TO DETERMINE IF ANY ADDITIONAL PROTECTIVE MEASURES ARE REQUIRED. BELOW IS A TYPICAL DETAIL SHOWING THE PLACEMENT OF A GEOMEMBRANE BARRIER FOR PROJECTS WHERE SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE.



IN-SITU TRENCH WALL

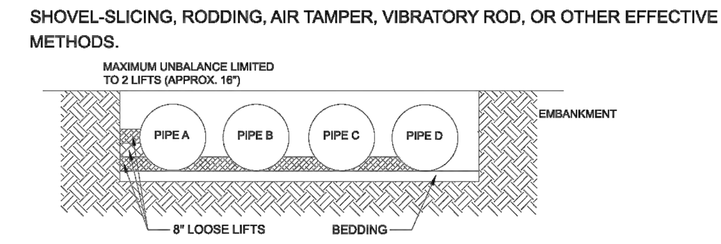
IF EXCAVATION IS REQUIRED, THE TRENCH WALL NEEDS TO BE CAPABLE OF SUPPORTING THE LOAD THAT THE PIPE SHEDS AS THE SYSTEM IS LOADED. IF SOILS ARE NOT CAPABLE OF SUPPORTING THESE LOADS, THE PIPE CAN DEFLECT. PERFORM A SIMPLE SOIL PRESSURE CHECK USING THE APPLIED LOADS TO DETERMINE THE LIMITS OF EXCAVATION BEYOND THE SPRING LINE OF THE OUTER MOST PIPES.

IN MOST CASES THE REQUIREMENTS FOR A SAFE WORK ENVIRONMENT AND PROPER BACKFILL PLACEMENT AND COMPACTION TAKE CARE OF THIS CONCERN.



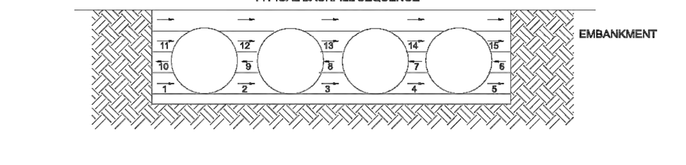
BACKFILL PLACEMENT

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

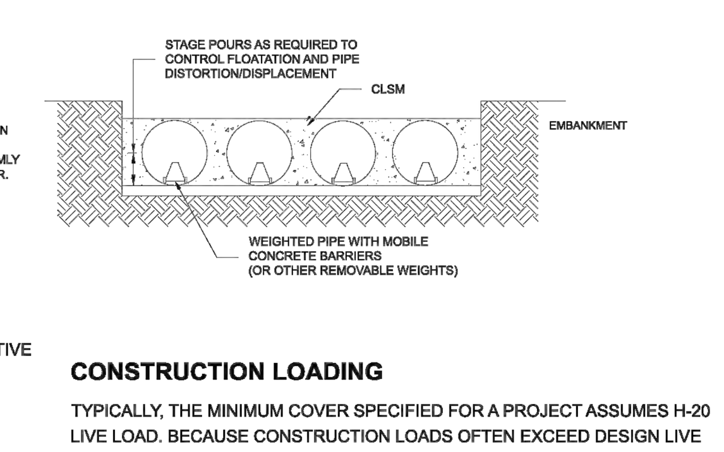


IF AASHTO T99 PROCEDURES ARE DETERMINED INFEASIBLE BY THE GEOTECHNICAL ENGINEER OF RECORD, COMPACTION IS CONSIDERED ADEQUATE WHEN NO FURTHER YIELDING OF THE MATERIAL IS OBSERVED UNDER THE COMPACTOR, OR UNDER FOOT, AND THE GEOTECHNICAL ENGINEER OF RECORD (OR REPRESENTATIVE THEREOF) IS SATISFIED WITH THE LEVEL OF COMPACTION.

FOR LARGE SYSTEMS, CONVEYOR SYSTEMS, BACKHOES WITH LONG REACHES OR DRAGLINES WITH STONE BUCKETS MAY BE USED TO PLACE BACKFILL. ONCE MINIMUM COVER FOR CONSTRUCTION LOADING ACROSS THE ENTIRE WIDTH OF THE SYSTEM IS REACHED, ADVANCE THE EQUIPMENT TO THE END OF THE RECENTLY PLACED FILL, AND BEGIN THE SEQUENCE AGAIN UNTIL THE SYSTEM IS COMPLETELY BACKFILLED. THIS TYPE OF CONSTRUCTION SEQUENCE PROVIDES ROOM FOR STOCKPILED BACKFILL DIRECTLY BEHIND THE BACKHOE, AS WELL AS THE MOVEMENT OF CONSTRUCTION TRAFFIC. MATERIAL STOCKPILES ON TOP OF THE BACKFILLED DETENTION SYSTEM SHOULD BE LIMITED TO 8- TO 10-FEET HIGH AND MUST PROVIDE BALANCED LOADING ACROSS ALL BARRELS. TO DETERMINE THE PROPER COVER OVER THE PIPES TO ALLOW THE MOVEMENT OF CONSTRUCTION EQUIPMENT SEE TABLE 1, OR CONTACT YOUR LOCAL CONTECH SALES ENGINEER.



WHEN FLOWABLE FILL IS USED, YOU MUST PREVENT PIPE FLOATATION. TYPICALLY, SMALL LIFTS ARE PLACED BETWEEN THE PIPES AND THEN ALLOWED TO SET-UP PRIOR TO THE PLACEMENT OF THE NEXT LIFT. THE ALLOWABLE THICKNESS OF THE CLSM LIFT IS A FUNCTION OF A PROPER BALANCE BETWEEN THE UPLIFT FORCE OF THE CLSM, THE OPPOSING WEIGHT OF THE PIPE, AND THE EFFECT OF OTHER RESTRAINING MEASURES. THE PIPE CAN CARRY LIMITED FLUID PRESSURE WITHOUT PIPE DISTORTION OR DISPLACEMENT, WHICH ALSO AFFECTS THE CLSM LIFT THICKNESS. YOUR LOCAL CONTECH SALES ENGINEER CAN HELP DETERMINE THE PROPER LIFT THICKNESS.

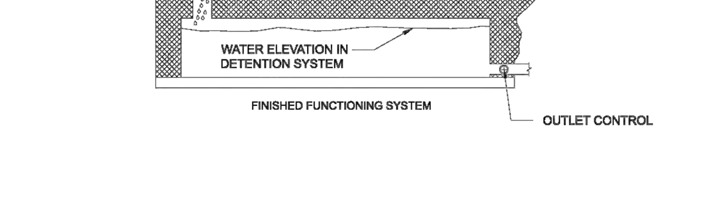


CONSTRUCTION LOADING

TYPICALLY, THE MINIMUM COVER SPECIFIED FOR A PROJECT ASSUMES H-20 LIVE LOAD. BECAUSE CONSTRUCTION LOADS OFTEN EXCEED DESIGN LIVE LOADS, INCREASED TEMPORARY MINIMUM COVER REQUIREMENTS ARE NECESSARY. SINCE CONSTRUCTION EQUIPMENT VARIES FROM JOB TO JOB, IT IS BEST TO ADDRESS EQUIPMENT SPECIFIC MINIMUM COVER REQUIREMENTS WITH YOUR LOCAL CONTECH SALES ENGINEER DURING YOUR PRE-CONSTRUCTION MEETING.

ADDITIONAL CONSIDERATIONS

BECAUSE MOST SYSTEMS ARE CONSTRUCTED BELOW-GRADE, RAINFALL CAN RAPIDLY FILL THE EXCAVATION; POTENTIALLY CAUSING FLOATATION AND MOVEMENT OF THE PREVIOUSLY PLACED PIPES. TO HELP MITIGATE POTENTIAL PROBLEMS, IT IS BEST TO START THE INSTALLATION AT THE DOWNSTREAM END WITH THE OUTLET ALREADY CONSTRUCTED TO ALLOW A ROUTE FOR THE WATER TO ESCAPE. TEMPORARY DIVERSION MEASURES MAY BE REQUIRED FOR HIGH FLOWS DUE TO THE RESTRICTED NATURE OF THE OUTLET PIPE.



CMP DETENTION SYSTEM INSPECTION AND MAINTENANCE

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

INSPECTION

INSPECTION IS THE KEY TO EFFECTIVE MAINTENANCE OF CMP DETENTION SYSTEMS AND IS EASILY PERFORMED. CONTECH RECOMMENDS ONGOING, ANNUAL INSPECTIONS. SITES WITH HIGH TRASH LOAD OR SMALL OUTLET CONTROL ORIFICES MAY NEED MORE FREQUENT INSPECTIONS. THE RATE AT WHICH THE SYSTEM COLLECTS POLLUTANTS WILL DEPEND MORE ON SITE SPECIFIC ACTIVITIES RATHER THAN THE SIZE OR CONFIGURATION OF THE SYSTEM.

INSPECTIONS SHOULD BE PERFORMED MORE OFTEN IN EQUIPMENT WASHDOWN AREAS, IN CLIMATES WHERE SANDING AND/OR SALTING OPERATIONS TAKE PLACE, AND IN OTHER VARIOUS INSTANCES IN WHICH ONE WOULD EXPECT HIGHER ACCUMULATIONS OF SEDIMENT OR ABRASIVE/ CORROSIVE CONDITIONS. A RECORD OF EACH INSPECTION IS TO BE MAINTAINED FOR THE LIFE OF THE SYSTEM

MAINTENANCE

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

ACCUMULATED SEDIMENT AND TRASH CAN TYPICALLY BE EVACUATED THROUGH THE MANHOLE OVER THE OUTLET ORIFICE. IF MAINTENANCE IS NOT PERFORMED AS RECOMMENDED, SEDIMENT AND TRASH MAY ACCUMULATE IN FRONT OF THE OUTLET ORIFICE. MANHOLE COVERS SHOULD BE SECURELY SEATED FOLLOWING CLEANING ACTIVITIES. CONTECH SUGGESTS THAT ALL SYSTEMS BE DESIGNED WITH AN ACCESS/INSPECTION MANHOLE SITUATED AT OR NEAR THE INLET AND THE OUTLET ORIFICE. SHOULD IT BE NECESSARY TO GET INSIDE THE SYSTEM TO PERFORM MAINTENANCE ACTIVITIES, ALL APPROPRIATE PRECAUTIONS REGARDING CONFINED SPACE ENTRY AND OSHA REGULATIONS SHOULD BE FOLLOWED.

ANNUAL INSPECTIONS ARE BEST PRACTICE FOR ALL UNDERGROUND SYSTEMS. DURING THIS INSPECTION, IF EVIDENCE OF SALTING/DE-ICING AGENTS IS OBSERVED WITHIN THE SYSTEM, IT IS BEST PRACTICE FOR THE SYSTEM TO BE RINSED, INCLUDING ABOVE THE SPRING LINE SOON AFTER THE SPRING THAW AS PART OF THE MAINTENANCE PROGRAM FOR THE SYSTEM.

MAINTAINING AN UNDERGROUND DETENTION OR INFILTRATION SYSTEM IS EASIEST WHEN THERE IS NO FLOW ENTERING THE SYSTEM. FOR THIS REASON, IT IS A GOOD IDEA TO SCHEDULE THE CLEANOUT DURING DRY WEATHER.

THE FOREGOING INSPECTION AND MAINTENANCE EFFORTS HELP ENSURE UNDERGROUND PIPE SYSTEMS USED FOR STORMWATER STORAGE CONTINUE TO FUNCTION AS INTENDED BY IDENTIFYING RECOMMENDED REGULAR INSPECTION AND MAINTENANCE PRACTICES. INSPECTION AND MAINTENANCE RELATED TO THE STRUCTURAL INTEGRITY OF THE PIPE OR THE SOUNDNESS OF PIPE JOINT CONNECTIONS IS BEYOND THE SCOPE OF THIS GUIDE.

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DETENTION SYSTEM

THE LOCATION AND ELEVATION OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE DRAWINGS ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION AND ELEVATION OF EXISTING UTILITIES AND PROPOSED UTILITY CROSSINGS IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF ANY CONFLICTS ARE APPARENT OR IF THE LOCATION OR DEPTH DIFFERS SIGNIFICANTLY FROM THE PLANS.

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 (TOLL FREE) FOR THE LOCATION OF UNDERGROUND FACILITIES

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

PROJECT
SOUTH LATSON COMMERCIAL DEVELOPMENT

PREPARED FOR
1015 LATSON ROAD LLC
29592 BECK ROAD
WIXOM, MI 48393
248.773.7992

TITLE
UNDERGROUND DETENTION DETAILS

NO	BY	REVISION PER	DATE
4	ST	CHANGE IN USE – NEW SLU SUBMITTAL	5-27-2025
3	ST	PER ACT 399 REVIEW	10-24-2024
2	ST	PER MHOG REVIEW	6-17-2024
1	ST	PER MHOG REVIEW	5-20-2024

DESIGNED BY: ST
DRAWN BY: DH/JS
CHECKED BY:
SCALE: NO SCALE
JOB NO: 21-519
DATE: 04/15/2024
SHEET NO. 13

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PIPE RESTRAINT SCHEDULE

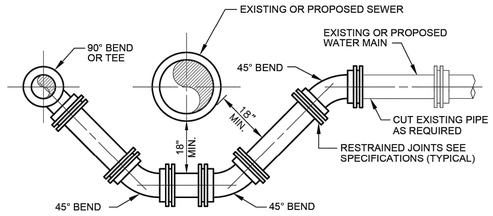
GROUND BURIED PRESSURE PIPE - POLYETHYLENE ENCASED DUCTILE IRON PIPE

PIPE DIAMETER	TEES, 90° BENDS	45° BENDS	22-1/2° BENDS	11-1/4° BENDS	DEAD ENDS	REDUCERS (ONE SIZE REDUCTION)*	REDUCERS (TWO SIZE REDUCTIION)*
4	13	5	3	1	40	--	--
6	19	8	4	2	58	31	--
8	24	10	5	2	75	30	70
12	34	14	7	3	107	57	116
16	43	18	9	4	139	59	137
20	52	22	10	5	169	59	134
24	61	25	12	6	199	60	132
30	73	30	15	7	242	85	168
36	84	35	17	8	281	84	168

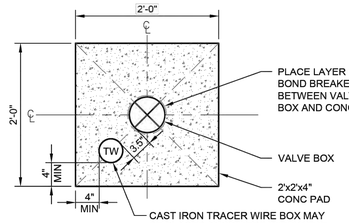
1. LENGTHS OF PIPE RESTRAINT ARE GIVEN IN FEET.
2. IF REQUIRED PIPE DIAMETER IS NOT LISTED IN THIS TABLE, THE NEXT LARGEST PIPE DIAMETER SHALL BE USED.
3. THIS TABLE IS BASED ON A TEST PRESSURE OF 180 PSI (OPERATING PRESSURE PLUS WATER HAMMER. FOR OTHER TEST PRESSURES, ALL VALUES TO BE INCREASED OR DECREASED PROPORTIONALLY.
4. THE VALUES PROVIDED OF RESTRAINT LENGTH ARE IN EACH DIRECTION FROM THE POINT OF DEFLECTION OR TERMINATION EXCEPT FOR TEES, AT WHICH ONLY THE BRANCH IN THE DIRECTION OF THE STEM.
5. IF TIE RODS ARE USED, USE FOUR RODS MINIMUM AND ADD 1/8-INCH TO BAR DIAMETER AS CORROSION ALLOWANCE.

* SIZE REDUCTION IS BASED UPON THE PIPE DIAMETER SHOWN IN THIS TABLE.

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

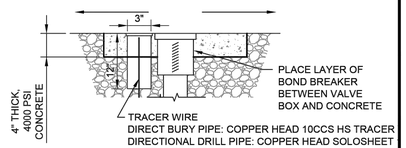


WATER MAIN UTILITY OFFSET



NOTE: ALL BOXES & ADJOINING TW BOXES SHALL BE ENCASED IN A CONC. PAD UNLESS OTHERWISE DETERMINED BY MHOG.

PLAN

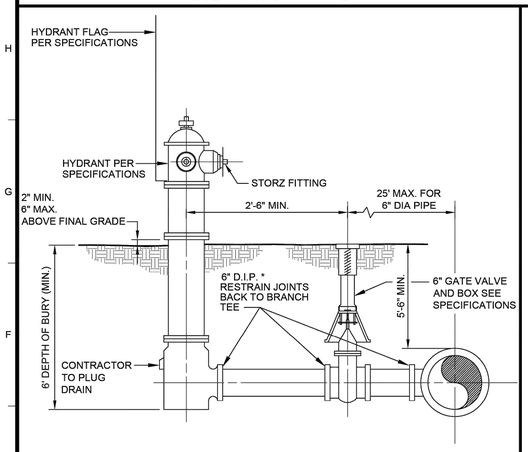


NOTE:
1. TRACER WIRE BOXES LOCATED WITHOUT A VALVE BOX ONLY REQUIRE AN 18" X 18" CONCRETE PAD.
2. TRACER WIRE BOX SHALL HAVE A LOCKING LID W/STANDARD AWWA PENTAGON KEY.
3. TRACER WIRE BOX SHALL BE COPPERHEAD RB14*TP IN ASPHALT INSTALLATIONS AND CD14*TP FOR ALL OTHER INSTALLATIONS.

SECTION

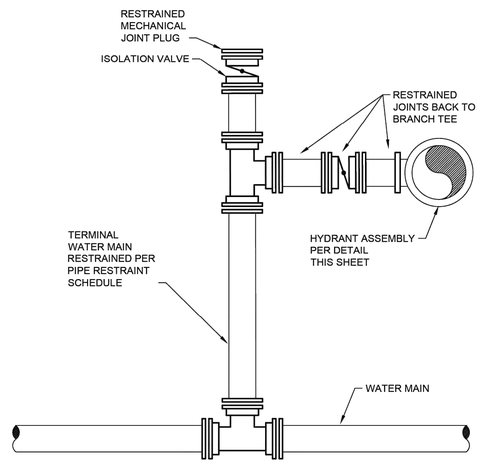
VALVE/TRACER WIRE BOX IN CONCRETE DETAIL

NO SCALE

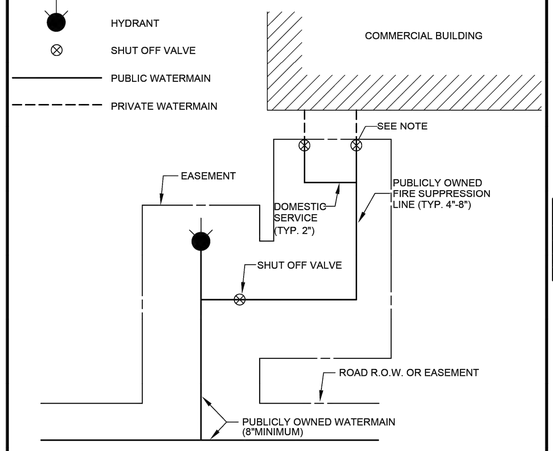


* THE LENGTH OF 6" PIPE FROM THE MAIN TO THE HYDRANT ASSEMBLY CANNOT EXCEED 25'. ANY PIPE OVER 25 FEET SHALL BE 8" DIAMETER MINIMUM AND DESIGNED PER MHOG SPECIFICATIONS.

FIRE HYDRANT ASSEMBLY

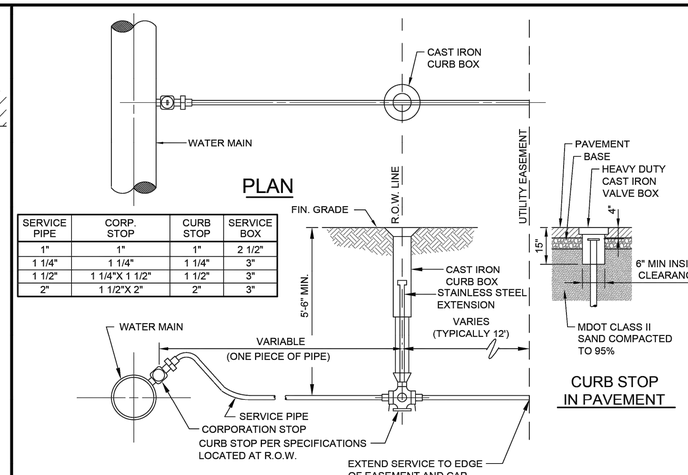


TERMINAL HYDRANT DETAIL



NOTE: FIRE SUPPRESSION LINE AND DOMESTIC SERVICE TO BE LOCATED WITHIN EASEMENT UP TO SHUTOFF VALVES OUTSIDE OF BUILDING.

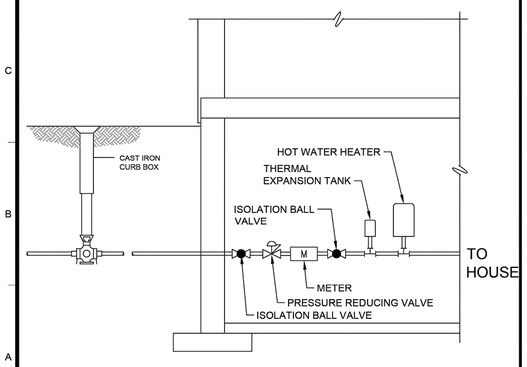
COMMERCIAL BUILDING WATER SERVICE LAYOUT



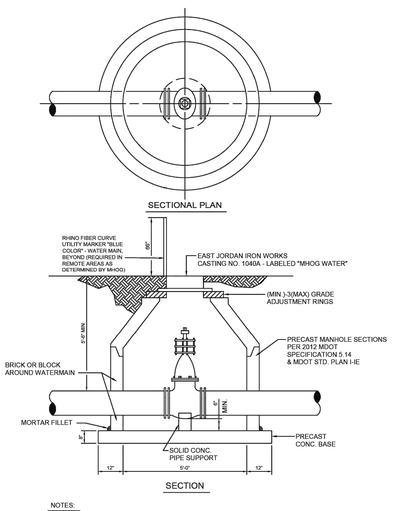
SERVICE PIPE	CORP. STOP	CURB STOP	SERVICE BOX
1"	1"	1"	2 1/2"
1 1/4"	1 1/4"	1 1/4"	3"
1 1/2"	1 1/4"X 1 1/2"	1 1/2"	3"
2"	1 1/2"X 2"	2"	3"

CURB STOP IN PAVEMENT

SECTION
WATER SERVICE LATERAL

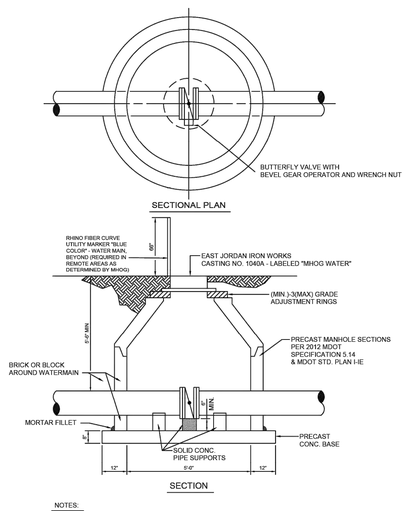


PRIVATE RESIDENCE
PRESSURE REDUCING VALVE (PRV)



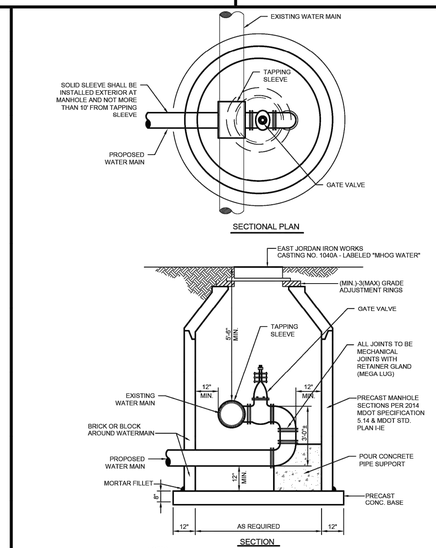
NOTES:
1. ALL LIFT HOLES AND JOINTS SHALL BE MORTARED BOTH INSIDE AND OUTSIDE.
2. BLOCK MANHOLES TO BE USED ONLY WITH ENGINEERS PERMISSION.
3. NO STEPS PERMITTED.

VALVE AND GATE WELL



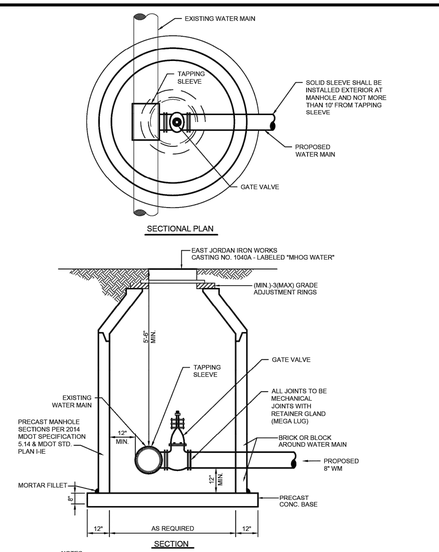
NOTES:
1. ALL LIFT HOLES AND JOINTS SHALL BE MORTARED BOTH INSIDE AND OUTSIDE.
2. BLOCK MANHOLES TO BE USED ONLY WITH ENGINEERS PERMISSION.
3. NO STEPS PERMITTED.

BUTTERFLY VALVE AND WELL



NOTES:
1. ALL LIFT HOLES AND JOINTS SHALL BE MORTARED BOTH INSIDE AND OUTSIDE.
2. BLOCK MANHOLES TO BE USED ONLY WITH ENGINEERS PERMISSION.
3. TAPPING SLEEVES ONLY PERMITTED FOR CONNECTIONS SMALLER THAN MAIN LINE.
4. NO STEPS PERMITTED.

REVERSE TAP GATE WELL



NOTES:
1. ALL LIFT HOLES AND JOINTS SHALL BE MORTARED BOTH INSIDE AND OUTSIDE.
2. BLOCK MANHOLES TO BE USED ONLY WITH ENGINEERS PERMISSION.
3. TAPPING SLEEVES ONLY PERMITTED FOR CONNECTIONS SMALLER THAN MAIN LINE.
4. NO STEPS PERMITTED.

REGULAR TAP GATE WELL

MARION HOWELL OCEOLA GENOA
Sewer and Water Authority

STANDARD DETAILS

Scale: NONE

Issued Date JANUARY - 2014

UPDATED: MAY 2015
UPDATED: FEBRUARY 2016
UPDATED: APRIL 2016
UPDATED: OCTOBER 2017
UPDATED: FEBRUARY 2019
UPDATED: NOVEMBER 2022

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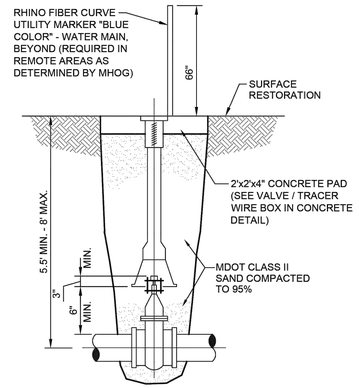
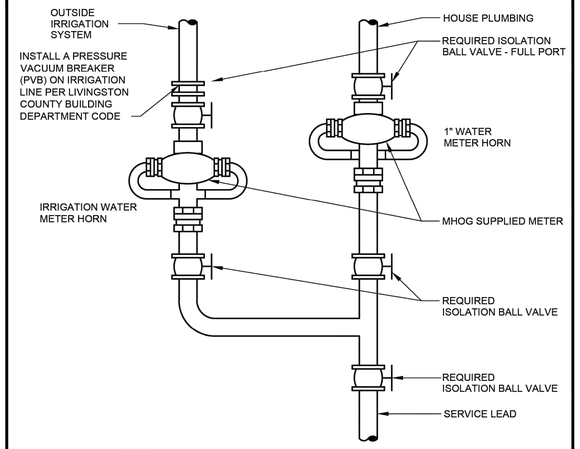
AutoCAD PDF (General Documentation).pc3



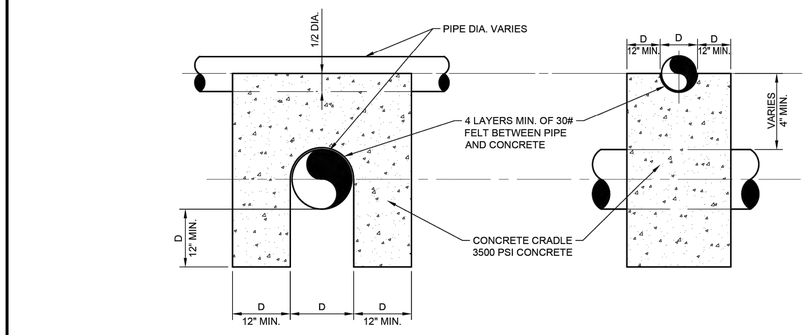
NOTES:
1. VALVE BOX SHALL NOT REST ON VALVE OR MAIN LINE PIPE.
2. A VALVE STEM EXTENSION WITH CENTERING RING IS REQUIRED FOR VALVES BURIED DEEPER THAN 6'.

GATE VALVE AND BOX



NOTES:
1. ALL METERS ARE TO BE INSTALLED HORIZONTALLY IN A DRY, CLEAN, SANITARY LOCATION THAT IS READILY ACCESSIBLE. THIS DRAWING IS NOT TO SCALE & IS ONLY A REPRESENTATION OF HOW THE VALVES AND METERS SHOULD BE INSTALLED. THE SECOND METER IS OPTIONAL FOR IRRIGATION USAGE. METERS SHOULD NOT BE INSTALLED IN LINE (ONE RIGHT AFTER THE OTHER).
2. PROPERTIES DESIGNATED "HIGH HAZARD" PER THE MHOG CROSS CONNECTION RULES MANUAL WILL REQUIRE THE INSTALLATION OF A REDUCED PRESSURE ZONE (RPZ) BACK FLOW PREVENTION DEVICE.

TYPICAL METER HORN INSTALLATION



ELEVATION

SECTION

CONCRETE CRADLE DETAIL

SCALE: NONE

MHOG CASTING DETAIL

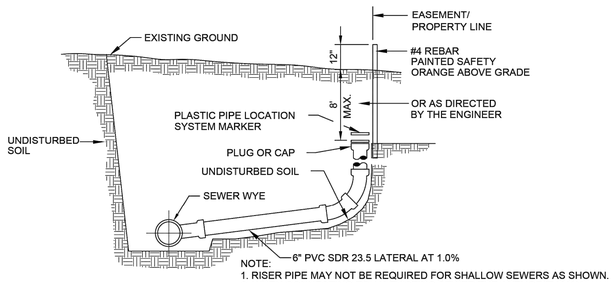
NO SCALE

MARION HOWELL OCEOLA GENOA
Sewer and Water Authority

STANDARD DETAILS

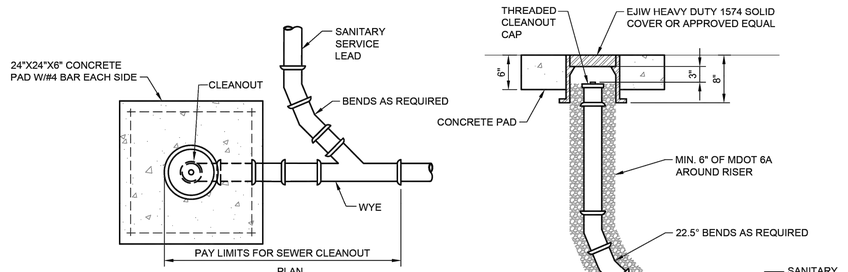
Scale:	NONE
Issued Date	JANUARY - 2014

UPDATED: MAY 2015
UPDATED: FEBRUARY 2016
UPDATED: APRIL 2016
UPDATED: OCTOBER 2017
UPDATED: FEBRUARY 2019
UPDATED: NOVEMBER 2022



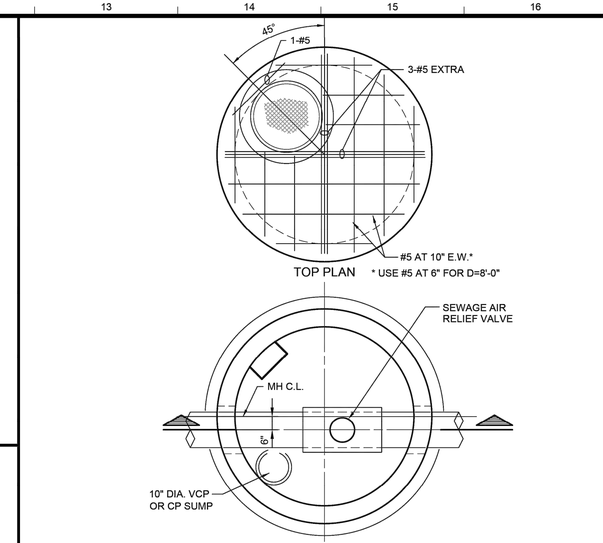
NOTE:
1. RISER PIPE MAY NOT BE REQUIRED FOR SHALLOW SEWERS AS SHOWN.
2. WHEN CONNECTING TO AN EXISTING SEWER THE AUTHORITY MAY REQUIRE CORING OF THE EXISTING PIPE AND INSTALLATION OF A SEWER SADDLE. SADDLE SHALL BE ROMAC "CB" SEWER SADDLE OR APPROVED EQUAL.

SANITARY SEWER LATERAL



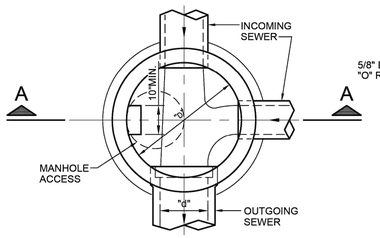
NOTES:
1. ALL CONNECTION SHALL BE BELL AND SPIGOT TYPE.
2. CLEANOUT IS TO BE SAME DIAMETER AS SERVICE LEAD.
3. CONCRETE PAD REQUIRED UNLESS OTHERWISE DETERMINED BY MHOG.
4. THERE MUST BE A 3" GAP FROM THE BOTTOM OF THE CLEAN OUT LID TO THE TOP OF THE THREADED CAP.

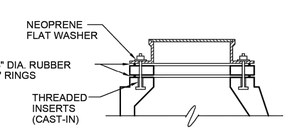
SEWER CLEANOUT DETAIL



NOTE: ALL PLUMBING MATERIALS TO BE NON-CORROSIVE, ALL FITTINGS SHALL BE STAINLESS STEEL.

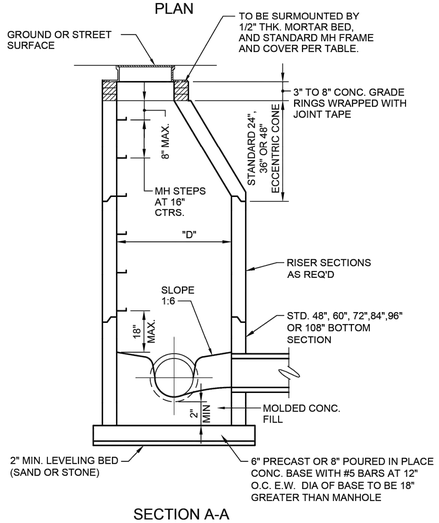
AIR RELIEF STRUCTURE





WATERTIGHT COVER ANCHORAGE

MANHOLE SCHEDULE	
PIPE SIZE (" d")	D
8"-24"	48"
27"-36"	60"
42"-48"	72"
54"	84"

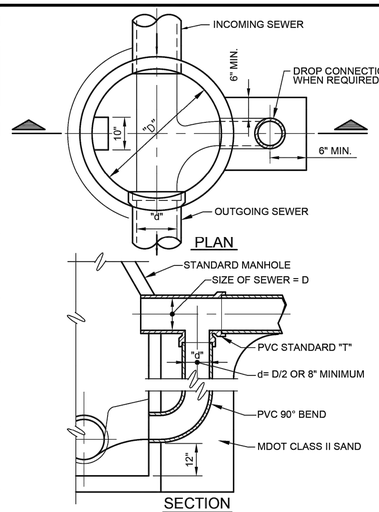


SECTION A-A

NOTES:
1. ALL SANITARY MANHOLES TO BE PRECAST REINFORCED CONCRETE WITH PREMIUM JOINTS. SEE SPECIFICATIONS FOR BASE SLAB AND PIPE OPENINGS AND CONNECTIONS.
2. MANHOLE CONES SHALL BE THE ECCENTRIC TYPE.
3. PROVIDE 6" OF COMPACTED GRANULAR MATERIAL UNDER ALL PRECAST CONCRETE BASE SLPVC.
4. FORCE MAINS CONNECT DIRECTLY TO A MANHOLE SHALL BE INSTALLED SO THAT THE ELEVATION OF THE PIPE CROWNS MATCH. THE FORCE MAIN SHALL BE DIRECTED DOWNWARD INTO THE FLOW CHANNEL.
5. FOR SANITARY SEWERS ALL PIPES SHALL ENTER MANHOLE THROUGH RUBBER BOOTED CONNECTION.

FRAME & COVER FOR SANITARY SEWER MANHOLES			
		MANUFACTURER OR EQUAL	
TYPE	TYPE OF COVER	EAST JORDAN	NEENAH
MH	SANITARY - SOLID SELF-SEALING	1040.0000	R-1642
MH	SANITARY - SOLID WATERTIGHT	1040-APT	R-1916-F
CO	SOLID	1574A	R-1973-A

STANDARD MANHOLE



REQUIRED WHEN AN INLET PIPE IS 24" OR MORE ABOVE THE OUTLET PIPE IN A MANHOLE

DROP CONNECTION

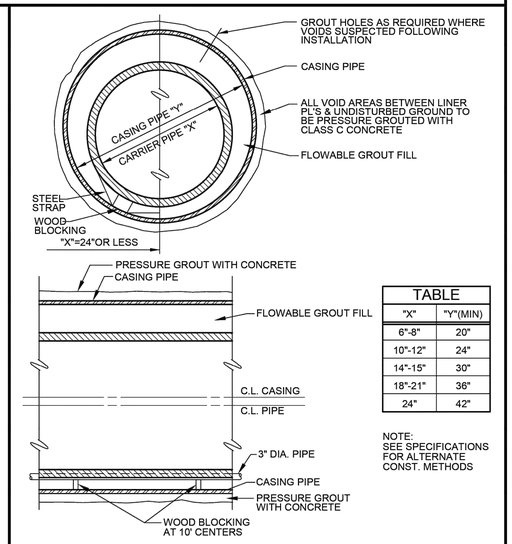
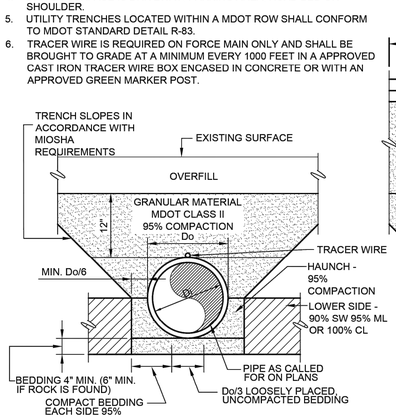


TABLE	
"X"	"Y"(MIN)
6"-8"	20"
10"-12"	24"
14"-15"	30"
18"-21"	36"
24"	42"

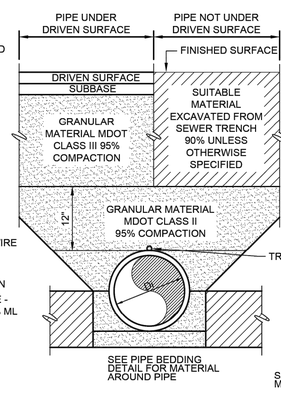
NOTE:
SEE SPECIFICATIONS FOR ALTERNATE CONST. METHODS

CASING PIPE

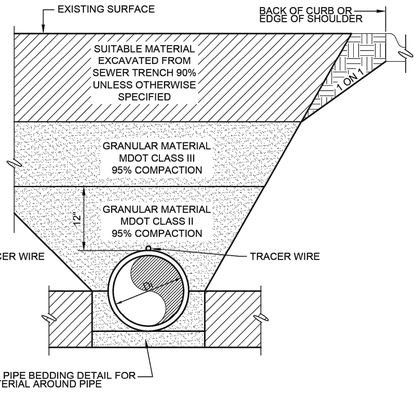
NOTES:
1. COMPACTION PRESENTED AS MINIMUM STANDARD PROCTOR VALUES.
2. MATERIALS AROUND THERMOPLASTIC PIPE WITH DIAMETER < 6 INCHES SHALL PASS 0.5 INCH SIEVE, MATERIALS AROUND OTHER PIPES SHALL PASS 1.5 INCH SIEVE.
3. MATERIALS AROUND HDPE PIPE TO BE MDOT 6A OR 21AA.
4. DRIVEN SURFACE IS DRIVEWAY, PARKING AREA, ROAD BED OR SHOULDER.
5. UTILITY TRENCHES LOCATED WITHIN A MDOT ROW SHALL CONFORM TO MDOT STANDARD DETAIL R-83.
6. TRACER WIRE IS REQUIRED ON FORCE MAIN ONLY AND SHALL BE BROUGHT TO GRADE AT A MINIMUM EVERY 1000 FEET IN A APPROVED CAST IRON TRACER WIRE BOX ENCASED IN CONCRETE OR WITH AN APPROVED GREEN MARKER POST.



PIPE BEDDING

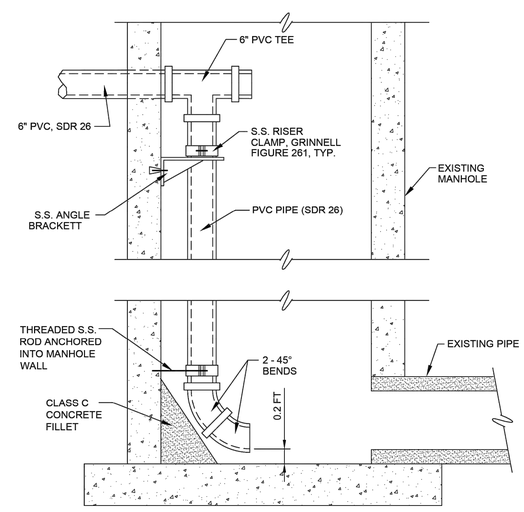


PIPE UNDER/NOT UNDER DRIVEN SURFACE



PIPE WITHIN INFLUENCE OF DRIVEN SURFACE

TRENCH EXCAVATION & PIPE BEDDING



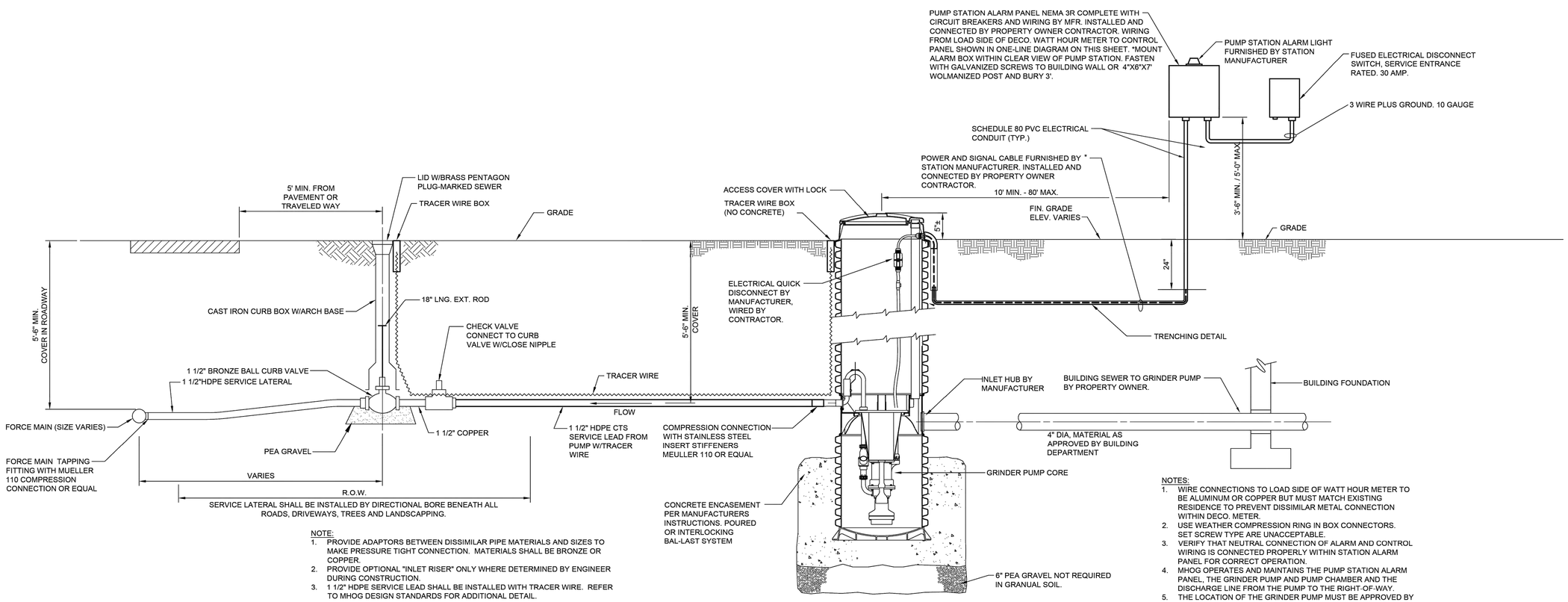
INTERIOR SEWER LATERAL DROP CONNECTION

MARION HOWELL OCEOLA GENOA
Sewer and Water Authority

STANDARD DETAILS

Scale: NONE
Issued Date JANUARY - 2014

UPDATED: MAY 2015
UPDATED: FEBRUARY 2016
UPDATED: APRIL 2016
UPDATED: OCTOBER 2017
UPDATED: FEBRUARY 2019

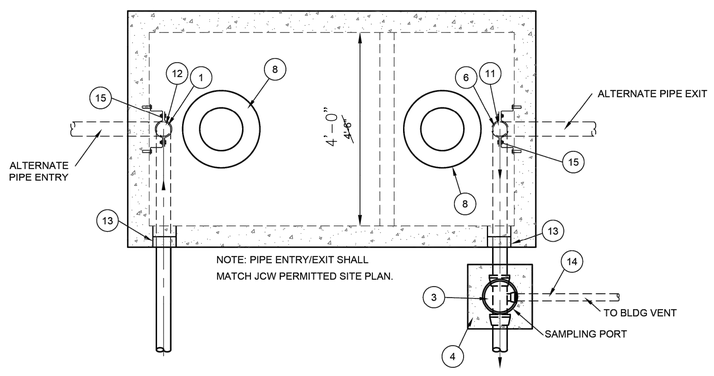


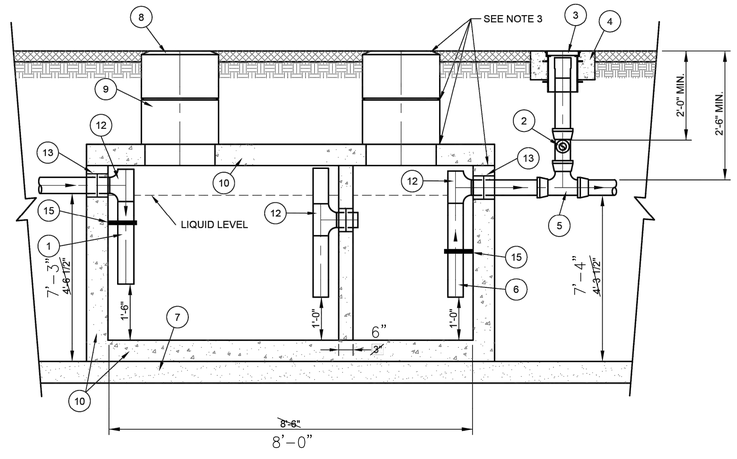
NOTE:
1. PROVIDE ADAPTORS BETWEEN DISSIMILAR PIPE MATERIALS AND SIZES TO MAKE PRESSURE TIGHT CONNECTION. MATERIALS SHALL BE BRONZE OR COPPER.
2. PROVIDE OPTIONAL "INLET RISER" ONLY WHERE DETERMINED BY ENGINEER DURING CONSTRUCTION.
3. 1 1/2" HDPE SERVICE LEAD SHALL BE INSTALLED WITH TRACER WIRE. REFER TO MHOG DESIGN STANDARDS FOR ADDITIONAL DETAIL.

NOTES:
1. WIRE CONNECTIONS TO LOAD SIDE OF WATT HOUR METER TO BE ALUMINUM OR COPPER BUT MUST MATCH EXISTING RESIDENCE TO PREVENT DISSIMILAR METAL CONNECTION WITHIN DECO. METER.
2. USE WEATHER COMPRESSION RING IN BOX CONNECTORS. SET SCREW TYPE ARE UNACCEPTABLE.
3. VERIFY THAT NEUTRAL CONNECTION OF ALARM AND CONTROL WIRING IS CONNECTED PROPERLY WITHIN STATION ALARM PANEL FOR CORRECT OPERATION.
4. MHOG OPERATES AND MAINTAINS THE PUMP STATION ALARM PANEL, THE GRINDER PUMP AND PUMP CHAMBER AND THE DISCHARGE LINE FROM THE PUMP TO THE RIGHT-OF-WAY.
5. THE LOCATION OF THE GRINDER PUMP MUST BE APPROVED BY MHOG PRIOR TO INSTALLATION. THE GRINDER PUMP MUST BE SERVICEABLE (ACCESSIBLE BY TRUCK) AND FREE FROM OBSTRUCTION.
6. MHOG MUST BE ONSITE FOR STARTUP OF ALL NEW GRINDER PUMPS.

SIMPLEX/DUPLEX GRINDER PUMPING STATION

NO SCALE





ITEM	DESCRIPTION
1	4" PVC INLET PIPE*
2	4"x4"x2" TEE WITH 2" PIPE TO BUILDING VENT*
3	THREADED C/O CAP JOSAM 58860 OR APP EQUAL**
4	CONCRETE PAD
5	4"x4"x4" TWO-WAY CLEANOUT TEE*
6	4" PVC OUTLET*
7	4" - 6" GRAVEL BEDDING
8	HEAVY-DUTY CAST IRON FRAME AND COVER ***
9	CONCRETE ADJUSTMENT RINGS
10	REINFORCE AS REQUIRED FOR SERVICE CONDITIONS
11	4" PVC 90° ELBOW*
12	4" PVC TEE*
13	A-LOK OR PRESS SEAL PSX PIPE/WALL CONNECTOR
14	2" VENT PIPE (IDENTIFY PIPE TYPE, CLASS & JOINT AS REQUIRED FOR PROJECT)
15	STAINLESS STEEL PIPE SUPPORT CLAMP ****

* 6" PIPE MAY BE SUBSTITUDED TO MATCH UPSTREAM PIPE DIAMETER.
** REFER TO CLEAN OUT DETAIL(S) ON STANDARD DETAIL SHEET.
*** CLAY & BAILEY 2008 BV OR EQUAL (FROST PROOF COVERS OPTIONAL)
**** FM STAINLESS FASTNERS #63 OR EQUAL. 1/2"x2-1/2" SS BRACKET W/ 1/2"x1-1/2" FULLY THREADED SS HEX BOLT WITH 1/2" SS WASHER AND 1/2"X1-3/4" SS ANCHORS. CLAMP TO BE FACTORY INSTALLED.

NOTES:
1. THREE COVERS AND RISERS SHOWN. TWO COVERS AND RISERS CENTERED OVER UPPER TWO BAFFLES ARE OPTIONAL.
2. INTERCEPTOR SIZE - 1000 GAL MINIMUM (REVISE THE SIZE DIMENSIONS, AS NEEDED, FOR LARGER CAPACITY INTERCEPTORS)
3. ALL JOINTS AT THE FRAME & COVER*, CONCRETE ADJUSTMENT RINGS AND THE LID OF THE INTERCEPTOR SHALL BE SEALED WITH A MINIMUM OF TWO (2) ROWS OF 3/4 TO 1 INCH PREFORMED BUTYL JOINT SEALER AND A 6" BUTYL JOINT WRAP AROUND SLEEVE (EZ WRAP). THE ENDS OF THE 6" EZ WRAP SHALL OVERLAP BY 12".
4. PIPING ON THE INTERIOR OF THE INTERCEPTOR SHALL BE PVC WITH SOLVENT-CEMENTED JOINTS.
5. GREASE INTERCEPTOR INCLUDING ADJUSTMENT RINGS AND CASTINGS SHALL BE WATER TESTED FOR WATER TIGHTNESS AFTER THE BACKFILL OPERATIONS HAVE BEEN COMPLETED. WATER TESTING SHALL CONSIST OF THE FOLLOWING: 1. SEAL THE TANK, 2. FILL WITH WATER, 3. LET STAND FOR 24 HOURS, 4. REFILL TANK, 5. TANK IS APPROVED IS WATER LEVEL IS HELD FOR 1 HOUR.
6. ONLY KITCHEN WASTE SHALL BE DIVERTED TO THE GREASE TRAP.

1500 GREASE INTERCEPTOR ~~1000~~ GALLON

NO SCALE

MARION HOWELL OCEOLA GENOA
Sewer and Water Authority

STANDARD DETAILS

Scale: NONE
Issued Date JANUARY - 2014

UPDATED: MAY 2015
UPDATED: FEBRUARY 2016
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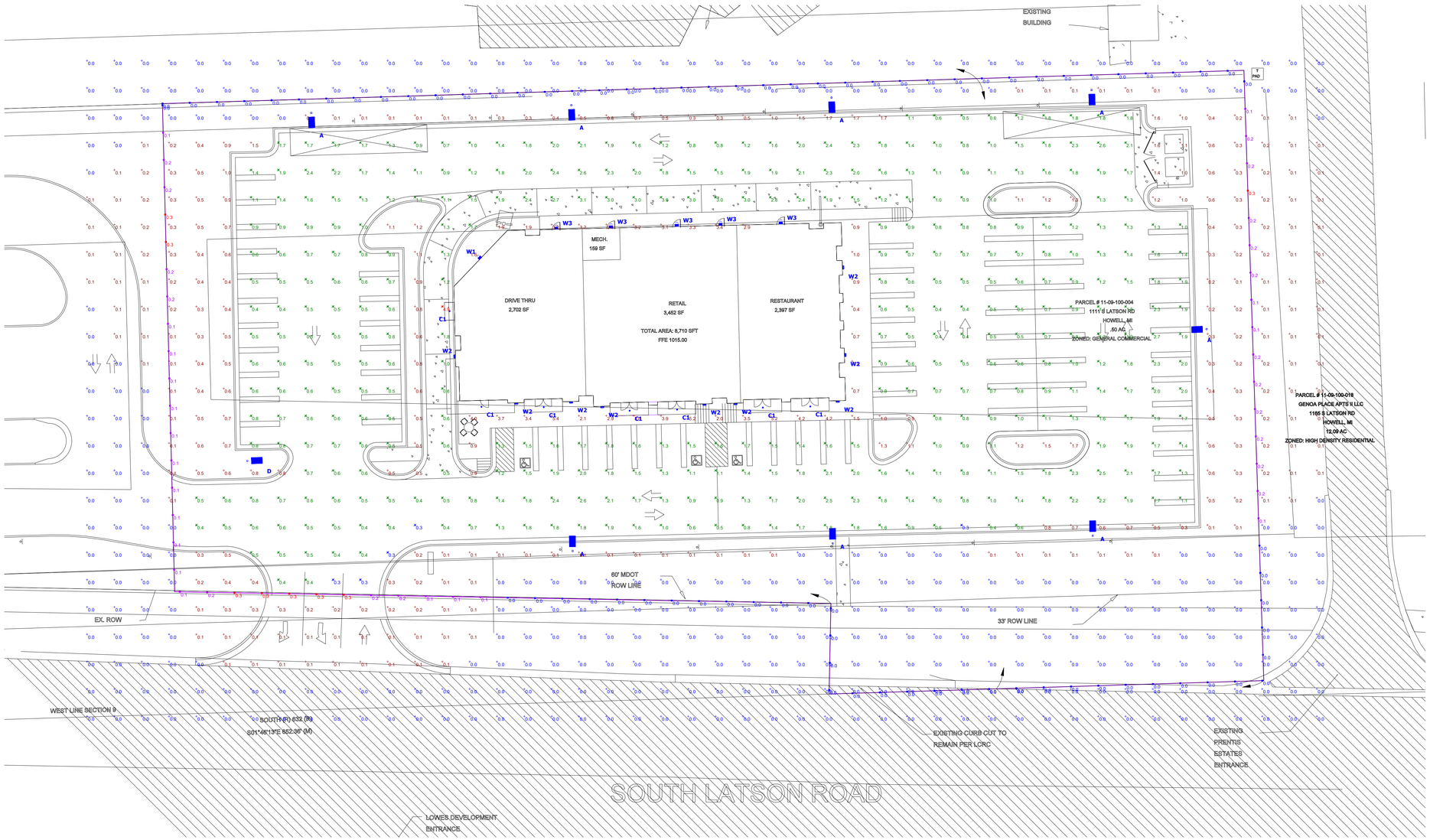


Plan View

Scale - 1" = 20ft

Schedule

Symbol	Label	QTY	Manufacturer	Catalog Number	Description	Lamp	Number Lamps	Lumens per Lamp	LLF	Wattage	Mounting Height
	A	8	Lithonia Lighting	DSX1 LED P2 40K 70CRI BLC4	D-Series Size 1 Area Luminaire P2 Performance Package 4000K CCT 70 CRI Type 4 Extreme Backlight Control	LED	1	7334	0.9	67.79	20'-0"
	C1	7	GENERATION BRANDS	EN3R-LO-9-40-A65-A-XX	LED RECESSED WITH 65° BEAM SPREAD	LED	1	988	0.9	11.9	11'-0"
	D	1	Lithonia Lighting	DSX1 LED P1 40K 70CRI T5W HS	D-Series Size 1 Area Luminaire P1 Performance Package 4000K CCT 70 CRI Type 5 Wide Houseside Shield	LED	1	5473	0.9	50.9015	20'-0"
	W1	1	Lithonia Lighting	WDGE2 LED P1 40K 70CRI T4M	WDGE2 LED WITH P1 - PERFORMANCE PACKAGE, 4000K, 70CRI, TYPE 4 MEDIUM OPTIC	LED	1	1397	0.9	11.1658	12'-0"
	W2	9	Brownlee Lighting	7329-H21-40	Gray steel housing / heatsink, frosted plastic lens	LED	1	1114	0.9	20.83	8'-0"
	W3	5	Lithonia Lighting	WDGE2 LED P1 40K 80CRI T3M	WDGE2 LED WITH P1 - PERFORMANCE PACKAGE, 4000K, 80CRI, TYPE 3 MEDIUM OPTIC	LED	1	1265	0.9	11.1658	9'-0"

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min	Avg/Max
PROPERTY LINE	■	0.1 fc	0.3 fc	0.0 fc	N/A	N/A	0.3:1
RETAIL PARKING	✕	1.2 fc	4.9 fc	0.3 fc	16.3:1	4.0:1	0.2:1
OVERALL	+	0.6 fc	5.6 fc	0.0 fc	N/A	N/A	0.1:1

General Note

1. SEE SCHEDULE FOR LUMINAIRE MOUNTING HEIGHT.
2. SEE LUMINAIRE SCHEDULE FOR LIGHT LOSS FACTOR.
3. CALCULATIONS ARE SHOWN IN FOOTCANDLES AT: 0' - 0".

THE ENGINEER AND/OR ARCHITECT MUST DETERMINE APPLICABILITY OF THE LAYOUT TO EXISTING / FUTURE FIELD CONDITIONS. THIS LIGHTING LAYOUT REPRESENTS ILLUMINATION LEVELS CALCULATED FROM LABORATORY DATA TAKEN UNDER CONTROLLED CONDITIONS IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY APPROVED METHODS. ACTUAL PERFORMANCE OF ANY MANUFACTURER'S LUMINAIRE MAY VARY DUE TO VARIATION IN ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, AND OTHER VARIABLE FIELD CONDITIONS. MOUNTING HEIGHTS INDICATED ARE FROM GRADE AND/OR FLOOR UP.

THESE LIGHTING CALCULATIONS ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM SUITABILITY AND SAFETY. THE ENGINEER AND/OR ARCHITECT IS RESPONSIBLE TO REVIEW FOR MICHIGAN ENERGY CODE AND LIGHTING QUALITY COMPLIANCE.

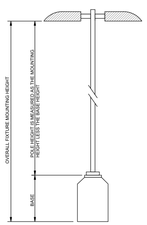
UNLESS EXEMPT, PROJECT MUST COMPLY WITH LIGHTING CONTROLS REQUIRMENTS DEFINED IN ASHRAE 90.1 2013. FOR SPECIFIC INFORMATION CONTACT GBA CONTROLS GROUP AT ASG@GASSERBUSH.COM OR 734-266-6705

Drawing Note

THIS DRAWING WAS GENERATED FROM AN ELECTRONIC IMAGE FOR ESTIMATION PURPOSE ONLY. LAYOUT TO BE VERIFIED IN FIELD BY OTHERS.

Ordering Note

FOR INQUIRIES CONTACT GASSER BUSH AT QUOTES@GASSERBUSH.COM OR 734-266-6705.



LATSON ROAD COMMERCIAL
PHOTOMETRIC SITE PLAN
GASSER BUSH ASSOCIATES
PREPARED FOR: BOSS ENGINEERING
WWW.GASSERBUSH.COM

Designer
DB/KB
Date
5/22/2025
Scale
Not to Scale
Drawing No.
#23-17620-V6

D-Series Size 1
LED Area Luminaire

Specifications
- EPA: 0.69 ft²
- Length: 32.71"
- Width: 14.26"
- Height H1: 7.88"
- Height H2: 2.73"
- Weight: 34 lbs

Introduction
The modern styling of the D-Series features a highly refined aesthetic that blends seamlessly with its environment. The D-Series offers the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire.

The photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. D-Series outstanding photometry aids in reducing the number of poles required in area lighting applications with typical energy savings of 65% and expected service life of over 100,000 hours.

Ordering Information
EXAMPLE: DSX1 LED P7 40K 70CRI T3M MVOLT SPA NLTAIR2 PIRHN DDBXD

LITHONIA LIGHTING · COMMERCIAL OUTDOOR

WDGE2 LED
Architectural Wall Sconce
Precision Refractive Optic

Specifications
- Depth (D1): 7"
- Depth (D2): 1.5"
- Height: 9"
- Width: 11.5"
- Weight (without options): 13.5 lbs

Introduction
The WDGE LED family is designed to meet specifier's every wall-mounted lighting need in a widely accepted shape that blends with any architecture. The clean rectilinear design comes in four sizes with lumen packages ranging from 1,200 to 25,000 lumens, providing a true site-wide solution. Embedded with nLight® AIR wireless controls, the WDGE family provides additional energy savings and code compliance.

WDGE2 with industry leading precision refractive optics provides great uniform distribution and optical control. When combined with multiple integrated emergency battery backup options, including an 18W cold temperature option, the WDGE2 becomes the ideal wall-mounted lighting solution for pedestrian scale applications in any environment.

WDGE LED Family Overview

Ordering Information
EXAMPLE: WDGE2 LED P3 40K 80CRI VF MVOLT SRM DDBXD

LITHONIA LIGHTING · COMMERCIAL OUTDOOR

FLEX [OPEN]
PROJECT:
MODEL #:
FIXTURE TYPE:

STANDARD SPECIFICATIONS

HOUSING

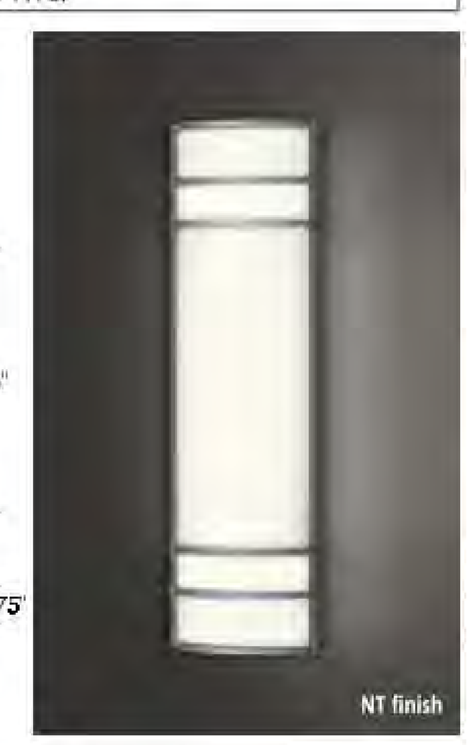
DIFFUSER

LED PERFORMANCE - 3500K STANDARD

MOUNTING

FINISH

WARRANTY



ORDERING INFORMATION

7329 - 2. - 3. - 4. - 5. (if required)

2. FINISH — STANDARD: NT Nickel Tone; OPTIONAL: BL Black, BZ Bronze, GM Gun Metal, MB Metallic Bronze, WH White; CUSTOM

3. WATTAGE — H16, H21, H32, H41

4. COLOR TEMPERATURE — 35K, 30K, 40K

5. AVAILABLE OPTIONS

Specifications subject to change without notice.

BROWNLEE LIGHTING

VISUAL COMFORT & CO. | ARCHITECTURAL COLLECTION

ENTRA™ CL 3" LED
ADJUSTABLE, FIXED, AND WALL WASH DOWNLIGHTS

LUMEN MULTIPLIER (CRI/CCT)

SPECIFICATIONS

Schedule

Symbol	Label	QTY	Manufacturer	Catalog Number	Description	Lamp	Number Lamps	Lumens per Lamp	LLF	Wattage	Mounting Height
	A	8	Lithonia Lighting	DSX1 LED P2 40K 70CRI BLC4	D-Series Size 1 Area Luminaire P2 Performance Package 4000K CCT 70 CRI Type 4 Extreme Backlight Control	LED	1	7334	0.9	67.79	20'-0"
	C1	7	GENERATION BRANDS	EN3R-LO-9-40-A65-A-XX	LED RECESSED WITH 65° BEAM SPREAD	LED	1	988	0.9	11.9	11'-0"
	D	1	Lithonia Lighting	DSX1 LED P1 40K 70CRI T5W HS	D-Series Size 1 Area Luminaire P1 Performance Package 4000K CCT 70 CRI Type 5 Wide Houseside Shield	LED	1	5473	0.9	50.9015	20'-0"
	W1	1	Lithonia Lighting	WDGE2 LED P1 40K 70CRI T4M	WDGE2 LED WITH P1 - PERFORMANCE PACKAGE, 4000K, 70CRI, TYPE 4 MEDIUM OPTIC	LED	1	1397	0.9	11.1658	12'-0"
	W2	9	Brownlee Lighting	7329-H21-40	Gray steel housing / heatsink, frosted plastic lens	LED	1	1114	0.9	20.83	8'-0"
	W3	5	Lithonia Lighting	WDGE2 LED P1 40K 80CRI T3M	WDGE2 LED WITH P1 - PERFORMANCE PACKAGE, 4000K, 80CRI, TYPE 3 MEDIUM OPTIC	LED	1	1265	0.9	11.1658	9'-0"

LATSON ROAD COMMERCIAL
PHOTOMETRIC SITE PLAN
GASSER BUSH ASSOCIATES
PREPARED FOR: BOSS ENGINEERING
WWW.GASSERBUSH.COM

Designer
DB/KB
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2 of 2

KRIEGER KLATT ARCHITECTS
2120 E. 11 Mile Rd. | Royal Oak, MI 48067
P: 248.414.9270 **F:** 248.414.9275
www.kriegerklatt.com

Client:
Group 10 Management
29200 Northwestern Hwy., Suite 450
Southfield, MI 48034

Project:
South Latson Commercial Development
1015 & 1111 S. Latson Rd.
Howell, MI 48843
(Genoa Township)

Issued	Description	By
04.01.2022	Conceptual Design	
12.11.2023	SPA Revisions	
01.16.2024	SPA Revisions	
05.27.2025	SPA Submittal	

PRELIMINARY NOT FOR CONSTRUCTION

Seal:

Note:
Do not scale drawings. Use calculated dimensions only. Verify existing conditions in field.

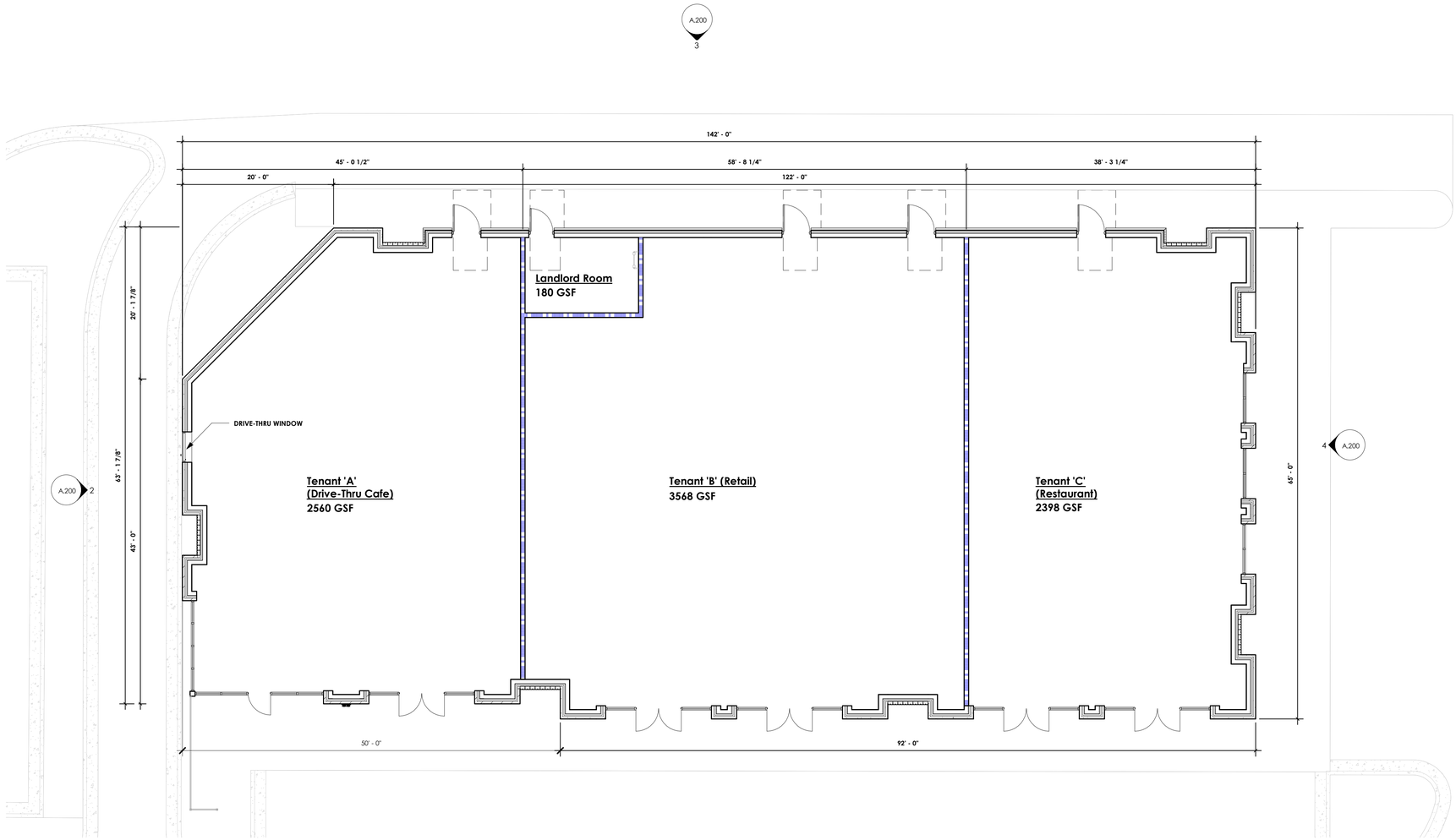
North Arrow:
North

Sheet Title:
Floor Plan

Project Number:
22-033

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

Sheet Number:
A.100



Floor Plan
1/8" = 1'-0"

1
A.200

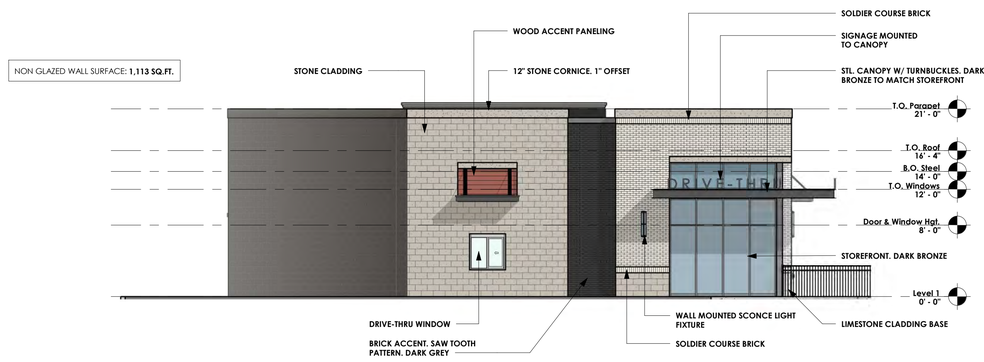
1 A.100 West (Front) Elevation

1/8" = 1'-0"

MATERIAL PERCENTAGES: FRONT (WEST) FACADE

FRONT FACADE: 1,901 SQ FT

MATERIALS	TOTAL (S.F.)	% OF OPAQUE	TOTAL PERCENTAGE OF OPAQUE
BRICK	572 SF	30%	BRICK/STONE MATERIALS MAX ALLOWED: **100%** PROVIDED: **86%**
CAST STONE/ LIMESTONE CLADDING	1,081 SF	56%	
WOOD PANELING	205 SF	11%	ACCENT MATERIALS MAX ALLOWED: **25%** PROVIDED: **14%**
METAL DARK BRONZE	72 SF	3%	



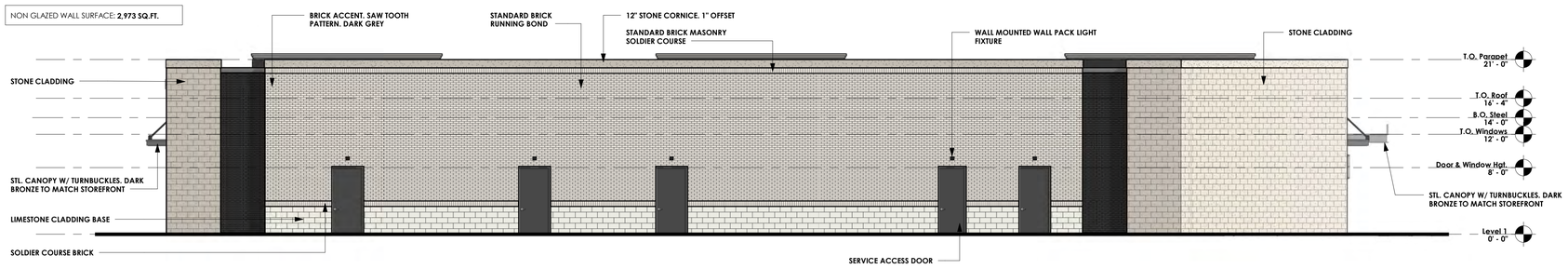
2 A.100 North (Side) Elevation

1/8" = 1'-0"

MATERIAL PERCENTAGES: SIDE (NORTH) FACADE

FRONT FACADE: 1,113 SQ FT

MATERIALS	TOTAL (S.F.)	% OF OPAQUE	TOTAL PERCENTAGE OF OPAQUE
BRICK	279 SF	25%	BRICK/STONE MATERIALS MAX ALLOWED: **100%** PROVIDED: **96%**
CAST STONE/ LIMESTONE CLADDING	793 SF	71%	
WOOD PANELING	24 SF	2%	ACCENT MATERIALS MAX ALLOWED: **25%** PROVIDED: **4%**
METAL DARK BRONZE	26 SF	2%	



3 A.100 East (Rear) Elevation

1/8" = 1'-0"

MATERIAL PERCENTAGES: REAR (EAST) FACADE

FRONT FACADE: 2,973 SQ FT

MATERIALS	TOTAL (S.F.)	% OF OPAQUE	TOTAL PERCENTAGE OF OPAQUE
BRICK	275 SF	9%	BRICK/STONE MATERIALS MAX ALLOWED: **100%** PROVIDED: **99%**
CAST STONE/ LIMESTONE CLADDING	2,543 SF	90%	
WOOD PANELING	0 SF	0%	ACCENT MATERIALS MAX ALLOWED: **25%** PROVIDED: **1%**
METAL DARK BRONZE	152 SF	1%	

4 A.100 South (Side) Elevation

1/8" = 1'-0"

MATERIAL PERCENTAGES: SIDE (SOUTH) FACADE

FRONT FACADE: 1,143 SQ FT

MATERIALS	TOTAL (S.F.)	% OF OPAQUE	TOTAL PERCENTAGE OF OPAQUE
BRICK	585 SF	52%	BRICK/STONE MATERIALS MAX ALLOWED: **100%** PROVIDED: **92%**
CAST STONE/ LIMESTONE CLADDING	446 SF	40%	
WOOD PANELING	80 SF	7%	ACCENT MATERIALS MAX ALLOWED: **25%** PROVIDED: **8%**
METAL DARK BRONZE	14 SF	1%	

PRELIMINARY NOT FOR CONSTRUCTION

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Client:

Group 10 Management
29200 Northwestern Hwy., Suite 450
Southfield, MI 48034

Project:

South Latson Commercial Development
1015 & 1111 S. Latson Rd.
Howell, MI 48843
(Genoa Township)

Issued	Description	By
04.01.2022	Conceptual Design	
12.11.2023	SPA Revisions	
01.16.2024	SPA Revisions	
05.27.2025	SPA Submittal	

Seal:

Note:
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North Arrow:

Sheet Title:
Exterior Elevations

Project Number:
22-033

Scale:
As indicated

Sheet Number:
A.200

Rendering View Towards Northeast

Scale: N.T.S.

Rendering View Towards Southeast

Scale: N.T.S.

PRELIMINARY NOT FOR CONSTRUCTION

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05.27.2025	SPA Submittal	

Seal:

Note:
Do not scale drawings. Use calculated dimensions only. Verify existing conditions in field.

North Arrow:

Sheet Title:
Renderings

Project Number:
22-033

Scale:

Sheet Number:
A.300

GENOA TOWNSHIP
APPLICATION FOR PRIVATE ROAD
2911 Dorr Road, Brighton MI 48116 (810) 227-5225

A private road requiring approval of the Township shall be any road providing access to more than four dwelling units or two non-residential principal buildings. This does not include drives within a multiple family complex or parking lot aisles, but does include collector type roadways within such a development.

APPLICANT: Mr. Kevin Van Kannel

OWNER ADDRESS: 5300 Old Hickory, Brighton, MI 48116

SITE ADDRESS: 6025 Brighton Rd, Brighton, MI 48116

APPLICABILITY OF PUBLIC VS. PRIVATE ROAD STANDARDS

All private roads in Genoa Township shall be constructed to the standards of the Livingston County Road Commission unless the Planning Commission and Township Board determine your road qualifies under the following ordinance criteria:

1. Explain how there will be no need for the roadway to be dedicated as a public road in the future.

There will only be 7 homes for the development.

2. Explain how dedication of the road as a public street would not result in continuity in the public street system at the present time or in the future.

Olde Barn Court is a single access, dead end road ending in a tee turnaround & dead end shared driveway.

3. What uses (number of lots, number of residential units, number of buildings, etc) will have access from the private road. Will the expected traffic volumes along the roadway be below three hundred vehicles per average weekday, based on accepted trip generation figures?

There will be 7 single family homes accessing the private road (3 from the private road & 4 from the shared drive). At 9.44 trips/day/home, there will be 66 trips/day.

4. Are there any significant natural features such as mature trees, natural slopes, wetlands or other water bodies would be preserved through construction and maintenance as a private road?

Mature trees along Brighton Road (outside of LCDC clear vision area) and on the north end of the site will be preserved by the use of selective grading where possible.

5. What financial and administrative mechanisms will be provided to ensure maintenance of the private road?

There will be a private road agreement prepared, allocating maintenance costs to the co-owners.

AFFIDAVIT

The undersigned says that they are the owner (owner, lessee, or other specified interest) involved in this petition and that the foregoing answers and statements herein contained and the information herewith submitted are in all respects true and correct to the best of his/her knowledge and belief.

By: Kevin Van Kannel

Address: 65300 Old Hickory, Brighton Phone: (734) 434-5900

Contact Information - Review Letters and Correspondence shall be forwarded to the following:

1.) Brent LaVanway *Name* of Boss Engineering *Business Affiliation* at (517) 548-1670 *Fax No.*

FEE EXCEEDANCE AGREEMENT

As stated on the site plan review fee schedule, all site plans are allocated two (2) consultant reviews and one (1) Planning Commission meeting. If additional reviews or meetings are necessary, the applicant will be required to pay the actual incurred costs for the additional reviews. If applicable, additional review fee payment will be required concurrent with submittal to the Township Board. By signing below, applicant indicates agreement and full understanding of this policy.

PROJECT NAME: The Farm

PROJECT LOCATON & DESCRIPTION: Part of SW 1/4 Section 26 & SE 1/4 Section 27 T.2N.,R.5E., Genoa Township, Livingston County, MI

SIGNATURE: _____ DATE: _____

PRINT NAME: Kevin Van Kannel PHONE: (810) 355-6300

COMPANY NAME & ADDRESS: 65300 Old Hickory, Brighton, MI 48116

GENOA CHARTER TOWNSHIP
Application for Site Plan Review

TO THE GENOA TOWNSHIP PLANNING COMMISSION AND TOWNSHIP BOARD:

APPLICANT NAME & ADDRESS: Mr. Kevin Van Kannel, 65300 Old Hickory, Brighton, MI 48116
If applicant is not the owner, a letter of Authorization from Property Owner is needed.

OWNER'S NAME & ADDRESS: (Same as Owner)

SITE ADDRESS: 6025 Brighton Rd, Brighton, MI 48116 PARCEL #(s): 4711-26-300-011

APPLICANT PHONE: (810)355-6300 OWNER PHONE: ( )

OWNER EMAIL: kvankannel@utecit.com

LOCATION AND BRIEF DESCRIPTION OF SITE: The site is located on the north side of Brighton Rd, approximately 1,835 feet east of the Clifford Road intersection. The property consists of a single-family home, a couple of accessory structures, and undeveloped land. The property is zoned as Low Density Residential (LDR), with 666 lineal feet of frontage along Brighton Rd. The surrounding properties of the site are zoned as Low Density Residential (LDR).

BRIEF STATEMENT OF PROPOSED USE: The site is proposed to be split into 7 parcels for the construction of a private road & shared driveway for residential use. A private road application has been submitted to the Township, and this site plan application is needed as part of the special land use permit for the portion of the shared drive that crosses the natural features setback and wetland.

THE FOLLOWING BUILDINGS ARE PROPOSED: No buildings are proposed at this time.

I HEREBY CERTIFY THAT ALL INFORMATION AND DATA ATTACHED TO AND MADE PART OF THIS APPLICATION IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

BY: _____

ADDRESS: 6025 Brighton Rd Brighton MI 48116

Contact Information - **Review Letters and Correspondence shall be forwarded to the following:**

1.) Brent LaVanway (Name) of Boss Engineering (Business Affiliation) at BrentL@bosseng.com (E-mail Address)

FEE EXCEEDANCE AGREEMENT

As stated on the site plan review fee schedule, all site plans are allocated two (2) consultant reviews and one (1) Planning Commission meeting. If additional reviews or meetings are necessary, the applicant will be required to pay the actual incurred costs for the additional reviews. If applicable, additional review fee payment will be required concurrent with submittal to the Township Board. By signing below, applicant indicates agreement and full understanding of this policy.

SIGNATURE: _____ DATE: 6/6/25

PRINT NAME: Kevin Van Kannel PHONE: 810-355-6300

ADDRESS: 6025 Brighton Rd Brighton, MI 48116

GENOA CHARTER TOWNSHIP
Special Land Use Application

This application **must** be accompanied by a site plan review application and the associated submittal requirements. (The Zoning Official may allow a less detailed sketch plan for a change in use.)

APPLICANT NAME & ADDRESS: Mr. Kevin Van Kannel, 65300 Old Hickory, Brighton, MI 48116
Submit a letter of Authorization from Property Owner if application is signed by Acting Agent.

APPLICANT PHONE: (810) 355-6300 EMAIL: kvankannel@utecit.com

OWNER NAME & ADDRESS: Mr. Kevin Van Kannel, 65300 Old Hickory, Brighton, MI 48116

SITE ADDRESS: 6025 Brighton Rd, Brighton, MI 48116 PARCEL #(s): 4711-26-300-011

OWNER PHONE: (810) 355-6300 EMAIL: kvankannel@utecit.com

Location and brief description of site and surroundings:
The site is located on the north side of Brighton Rd, approximately 1,835 feet east of the Clifford Road intersection. Tho property consists of a single-family home, a couple of accessory structures, and undeveloped land. The property is zoned as Low Density Residential (LDR), with 666 lineal feet of frontage along Brighton Rd. The surrounding properties of the site are zoned as Low Density Residential (LDR).

Proposed Use:
The site is proposed to be split into 7 parcels for the construction of a private road & shared driveway for residential use. A private road application has been submitted to the Township, and this special land use permit is required since the shared drive crosses the natural features setback.

Describe how your request meets the Zoning Ordinance General Review Standards (section 19.03):

a. Describe how the use will be compatible and in accordance with the goals, objectives, and policies of the Genoa Township Comprehensive Plan and subarea plans, and will promote the Statement of Purpose of the zoning district in which the use is proposed.

The property is currently zoned LDR, with no change proposed in the Township Master Plan. The proposed development is residential with parcels having a minimum area of 2-acres. This aligns with the statement purpose of LDR zoning, which is for a residential development located between rural residential areas and the more developed areas of the Township, with minimum lot size of 1-acre.

b. Describe how the use will be designed, constructed, operated, and maintained to be compatible with, and not significantly alter, the existing or intended character of the general vicinity.

The use is designed as residential using LDR setback and lot sizing requirements, to align with the neighboring properties.

c. How will the use be served adequately by essential public facilities and services such as highways, streets, police and fire protection, drainage structures, water and sewage facilities, refuse disposal and schools?

The development will not be served by public drainage or water and sewer facilities, as an onsite retention basin is proposed while with each parcel will have a septic system and well. With only 7 single family residential homes being proposed, the impact on public facilities (such as Brighton Area Schools, and police and fire departments) and public roads will be minimal.

d. Will the use involve any uses, activities, processes, or materials potentially detrimental to the natural environment, public health, safety, or welfare by reason of excessive production of traffic, noise, vibration, smoke, fumes, odors, glare, or other such nuisance? If so, how will the impacts be mitigated?

The proposed land division creates 7 parcels on site, that are proposed for single family homes. This type of development conforms with current surrounding land uses for the site. The increase in light, noise or air pollution is minimal with only 7 single family homes being proposed while having a minimal impact on surrounding properties.

e. Does the use have specific criteria as listed in the Zoning Ordinance (sections 3.03.02, 7.02.02, & 8.02.02)? If so, describe how the criteria are met.

No, the use is single-family residential. Special use required because the shared driveway crosses the existing wetland and natural features setback.

I HEREBY CERTIFY THAT ALL INFORMATION AND DATA ATTACHED TO AND MADE PART OF THIS APPLICATION ARE TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF. I AGREE TO DESIGN, CONSTRUCT AND OPERATE, AND MAINTAIN THESE PREMISES AND THE BUILDINGS, STRUCTURES, AND FACILITIES WHICH ARE GOVERNED BY THIS PERMIT IN ACCORDANCE WITH THE STATED REQUIREMENTS OF THE GENOA TOWNSHIP ZONING ORDINANCE, AND SUCH ADDITIONAL LIMITS AND SAFEGUARDS AS MAY BE MADE A PART OF THIS PERMIT.

THE UNDERSIGNED Kevin Van Kannel STATES THAT THEY ARE THE FREE OWNER OF THE PROPERTY OF PROPERTIES DESCRIBED ABOVE AND MAKES APPLICATION FOR THIS SPECIAL LAND USE PERMIT.

BY: _____ Kevin Van Kannel

ADDRESS: 6025 Brighton RD Brighton, MI 48116

Contact Information - Review Letters and Correspondence shall be forwarded to the following:

Brent LaVanway	of Boss Engineering	at 517 548-1670
Name	Business Affiliation	Email

FEE EXCEEDANCE AGREEMENT

As stated on the site plan review fee schedule, all site plans are allocated two (2) consultant reviews and one (1) Planning Commission meeting. If additional reviews or meetings are necessary, the applicant will be required to pay the actual incurred costs for the additional reviews. If applicable, additional review fee payment will be required concurrent with submittal to the Township Board. By signing below, applicant indicates agreement and full understanding of this policy.

SIGNATURE: _____ DATE: 5/22/25

PRINT NAME: Kevin Van Kannel PHONE: (810) 355-6300

Revised 08-15-13, kasp

July 31, 2025

Planning Commission
Genoa Township
2911 Dorr Road
Brighton, Michigan 48116

Attention:	Amy Ruthig, Planning Director
Subject:	Olde Barn Court – Private Road and Special Land Use Review #2
Location:	6025 Brighton Road – north side of Brighton Road, east of Clifford Road
Zoning:	LDR Low Density Residential

Dear Commissioners:

At the Township's request, we have reviewed the revised submittal materials (plans dated 7/22/25) proposing the construction of a private road and shared residential driveway to accommodate 7 new home sites (to be created via land division) on a 20.39-acre parcel of land.

A. Summary

Shared Residential Driveway (Section 15.04):

1. Construction is subject to review and comment by the Township Engineer and Brighton Area Fire Authority.
2. If necessary, the applicant must obtain a permit from the County.
3. The applicant must obtain a permit from the State for the wetland crossing.

Private Road Review (Section 15.05):

1. The Private Road Easement and Maintenance Agreement is subject to review and comment by the Township Attorney.
2. The design and construction requirements are subject to review and comment by the Township Engineer and Brighton Area Fire Authority.
3. If favorable action is considered by the Township, it should be conditioned upon approval by the Livingston County Road Commission.

Special Land Use Review (Section 19.03):

1. So long as impacts to the wetland are minimized and properly mitigated to the Commission's satisfaction, the Township may find that the request is consistent with the Master Plan.
2. The applicant must address any comments provided by staff, the Township Engineer, and/or Brighton Area Fire Authority.
3. The wetland crossing requires approval by the Planning Commission for activity within 10 feet of the wetland itself.

Aerial view of site and surroundings (looking north)

B. Proposal/Process

The applicant seeks to construct a private road and shared residential driveway for access to/from 7 new home sites to be created via the land division process.

Procedurally, the Planning Commission has review and approval authority over the site plan for the private road; however, the proposed road/shared driveway crosses a wetland. As such, the request also needs special land use approval, per Section 13.02.04.

The Township Board has the final approval authority over the special land use and the private road maintenance agreement.

C. Shared Residential Driveway (Section 15.04)

1. **Number Served.** The proposed shared driveway will provide access to/from 4 home sites (parcels 2-5). This standard is met.

2. **Width.** The proposed shared driveway has a width of 20 feet. This standard is met, though the applicant may reduce the entire driveway width to 16 feet, while certain portions may be further reduced to 12 feet.

3. **Construction.** This standard is subject to review and comment by the Township Engineer and Brighton Area Fire Authority.

4. **Easement.** The proposed shared driveway is within a 33-foot wide easement. This standard is met.

5. **Access Permits.** The proposed shared driveway will connect to the proposed private road (reviewed in Paragraph D below). If necessary, the applicant must obtain a permit from the County.

   Additionally, the proposed shared driveway crosses a wetland, which will require a permit from the State (as well as special land use approval from the Township, as reviewed in Paragraph E below).

D. Private Road (Section 15.05)

1. **Public versus Private Road Standards.** The project will be served by a private road and shared residential driveway. Access to/from the development will be via the intersection of the proposed private road with Brighton Road.

   Based on our review, the proposal demonstrates compliance with the standards to allow a private road (as opposed to public).

   The submittal includes a Private Road Easement and Maintenance Agreement, as required. This document is subject to review and comment by the Township Attorney.

2. **AASHTO Standards.** The applicant must address any comments provided by the Township Engineer with respect to this standard.

3. **Easement Width**. The typical private road cross-section on Sheet 6 depicts a 66-foot wide easement. This standard is met.

4. **Road Design.** The proposed roadway width is 26 feet, which complies with the Ordinance requirement for residential lots of 2 acres or more.

5. **Maximum Length/Turnarounds.** In total, the proposed private road and shared residential driveway are approximately 900 feet in length. Two tee turnarounds are provided, as required.

   The applicant must address any comments provided by the Township Engineer and/or Brighton Area Fire Authority with respect to this standard.

6. **Grading.** The applicant must address any comments provided by the Township Engineer with respect to this standard.

7. **Horizontal Curve.** The applicant must address any comments provided by the Township Engineer with respect to this standard.

8. **Intersection Design.** The proposed private road intersects Brighton Road at a 90-degree angle, as required.

   If favorable action is considered by the Township, it should be conditioned upon approval by the Livingston County Road Commission.

9. **Minimum Offsets.** The proposed private road aligns with Timberline Lane on the opposite side of Brighton Road.

   From our perspective, this standard is met; however, the applicant must address any comments provided by the Township Engineer.

10. **Boulevard Medians.** The proposal does not include a boulevard median.

11. **Vertical Clearance.** A note on Sheet 4 states that "a minimum vertical clearance of 15 feet shall be maintained along the length of all apparatus access roads." This standard is met.

12. **Street Names.** Street names are subject to County approval following review and comment by the Township.

The applicant must address any comments provided by the Township Engineer and/or Brighton Area Fire Authority.

13. **Signs.** A note on Sheet 4 states that street signs will comply with the Michigan Manual of Uniform Traffic Control Devices and Road Commission standards, as required.

14. **Yard Setback.** The proposed private road easement does not abut an exterior property line.

15. **Impact Assessment.** The submittal includes an Environmental Impact Assessment, as required.

16. **Project Phasing.** A note on Shet 4 states that "the private road, shared driveway, and infrastructure are proposed to be built in a single phase."

E. Special Land Use (Section 19.03)

1. **Master Plan.** The Township Master Plan identifies the subject site as Low Density Residential. Per the Plan, "this designation is for single family residential development located between rural residential areas and the more developed areas of the Township."

   The existing zoning (LDR) and proposed development pattern are consistent with the Future Land Use classification.

   The Commission must consider the balancing of seemingly opposing goals of the Plan. More specifically, the Plan includes the following statements:

   - Allow the pattern of homes on large rural lots to continue where it exists, particularly south of I-96; and
   - Protect natural areas by limiting development to areas with existing infrastructure and strictly enforcing the natural features setback.

   The lots that require access via the wetland crossing are more than double the minimum LDR standard for lot area, which helps to preserve the large rural lot development pattern; however, strict enforcement of the natural features setback precludes access to the northerly half of the subject site.

   In our opinion, so long as impacts to the wetland are minimized and properly mitigated, the Commission may find that the request is consistent with the Township Master Plan.

2. **Compatibility.** The subject area includes single-family development of varying densities – save for the development abutting the golf course, the residences on the north side of Brighton Road are generally on larger lots, while those on the south side are on slightly smaller lots.

   The area also contains several environmental conditions – large, wooded areas, areas of wetlands, and open water (the wetlands on site appear to lead directly to a lake).

   The proposal entails lots that are at least double the minimum requirement of the zoning district. As such, the applicant is not over-developing the land, which should ultimately be beneficial to these environmental conditions.

3. **Public Facilities and Services.** The project does not entail public roads, water or sewer; however, the applicant must address any comments provided by the Township Engineer and/or Brighton Area Fire Authority related to this criterion.

4. **Impacts.** As previously noted, the wetland crossing requires approval by the State (EGLE). Given the extent of the encroachment, it also requires specific consideration by the Planning Commission since it is within 10 feet of the wetland itself.

   Provided approval is granted by the State, we anticipate that impacts of the wetland crossing will be properly mitigated to the greatest extent possible.

   Section 15.04.01 allows the applicant to reduce the width of the shared residential driveway at the crossing to as little as 12 feet. However, the International Fire Code requires a minimum access width of 20 feet, per the Brighton Area Fire Authority.

   As such, the applicant cannot utilize this option to further reduce potential impacts on the wetland itself.

5. **Mitigation.** If further concerns arise as part of the review process, the Township may require additional efforts to mitigate potential adverse impacts.

Should you have any questions concerning this matter, please do not hesitate to contact our office.

Respectfully,
SAFEBUILT

Brian V. Borden, AICP
Michigan Planning Manager

August 4, 2025

Ms. Amy Ruthig
Genoa Township
2911 Dorr Road
Brighton, MI 48116

Re: The Farm
Site Plan Review No. 2

Dear Ms. Ruthig:

Tetra Tech conducted a review of the site plan submittal for The Farm last dated July 22, 2025. The site plan was prepared by Boss Engineering on behalf of Mr. Kevin Van Kennel. The development is located on 20 acres north of Brighton Road, 1.3 miles east of Chilson Road. The Petitioner is proposing 7 single-family units. The proposed site includes storm sewer, on-site detention, and private road improvements. We offer the following comments:

TRAFFIC AND ROADWAYS

1. Section 15.05.03.d of Genoa Township's Ordinance states that for any single means of access serving more than five lots, it shall include a turn-around with a center landscaped island or continuous loop. A hammerhead turnaround is provided in the plan set. This ordinance requirement may be adjusted by the planning commission in particular cases. This layout should be approved by the fire department prior to site plan approval.
2. Brighton Area Fire Authority has required that the width of the private road be increased to 26-feet wide from the 22-foot road width required in the Genoa Township Zoning Ordinance. Due to this, the gravel shoulder has been reduced from 5 feet to 3 feet wide and we have no engineering related concern to this reduced shoulder width.

We recommend that the petitioner address the above comments to the planning commissions satisfaction prior to final site plan approval. Please call or email if you have any questions.

Sincerely,

Shelby Byrne, P.E.
Project Engineer

Sydney Streveler, EIT
Civil Engineering Group

Tetra Tech
3497 Coolidge Road, East Lansing, MI 48823
Tel 517.316.3930 Fax 517.484.8140 www.tetratech.com

BRIGHTON AREA FIRE AUTHORITY
615 W. Grand River Ave.
Brighton, MI 48116
o: 810-229-6640 f: 810-229-1619

August 5, 2025

Amy Ruthig
Genoa Township
2911 Dorr Road
Brighton, MI 48116

RE: The FARM - Residential development with 7 homes
6025 Brighton Rd.
Genoa Twp., MI

Dear Amy,

The Brighton Area Fire Department has reviewed the above-mentioned site plan. The plans were received for review on July 23, 2025 and the drawings are dated April 21, 2025 with latest revisions dated July 22, 2025. The project is based on the proposed combination of two parcels totaling 20.39 acres. The new parcel will be subdivided into seven single-family home lots. The plan review is based on the International Fire Code (IFC) 2024 edition requirements.

All previous comments have been addressed in the recent submittal.

If you have any questions about the comments on this plan review, please contact me at 810-229-6640.

Cordially,

Rick Boisvert, CFPS
Fire Marshal
cc:Amy Ruthig amy@genoa.org

SITE PLAN / CONSTRUCTION PLANS
FOR
THE FARM
A RESIDENTIAL DEVELOPMENT
PART OF S.W. 1/4 SECTION 26 & S.E. 1/4 SECTION 27, T.2N., R.5E.
GENOA TOWNSHIP, LIVINGSTON COUNTY, MI

PROPERTY DESCRIPTION:

PROPERTY DESCRIPTION AS SUPPLIED:
PROPERTY DESCRIPTIONS PER BOSS ENGINEERING SURVEY, JOB NO. 11-011C, DATED 5-24-11, AS RECORDED IN INSTRUMENT #2012S-0043, LIVINGSTON COUNTY RECORDS:

DESCRIPTION OF PARCEL 4711-26-300-011, AS SURVEYED:
PART OF THE SOUTHWEST 1/4 OF SECTION 26, T2N-R5E, GENOA TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN, MORE PARTICULARLY DESCRIBED AS FOLLOWS: BEGINNING AT THE SOUTHWEST CORNER OF SECTION 26, SAID POINT ALSO BEING THE SOUTHEAST CORNER OF SECTION 27; THENCE ALONG THE WEST LINE OF SECTION 26, ALSO BEING THE EAST LINE OF SECTION 27, N 02°34'25" W, 1334.04 FEET (RECORDED AS N 02°33'50" W, 1334.08 FEET); THENCE ALONG THE NORTH LINE OF THE SOUTH 1/2 OF THE SOUTHWEST 1/4 OF SECTION 26, AS SURVEYED AND MONUMENTED, N 87°10'05" E, 330.78 FEET (RECORDED AS N 87°26'10" E, 326.51 FEET); THENCE ALONG THE EAST LINE OF THE WEST 10 ACRES OF THE SOUTHWEST 1/4 OF THE SOUTHWEST 1/4 OF SECTION 26, AS SURVEYED AND MONUMENTED, S 02°36'30" E, 1335.65 FEET (RECORDED AS S 02°31'47" E, 1334.09 FEET); THENCE ALONG THE CENTERLINE OF BRIGHTON ROAD (66 FOOT WIDE RIGHT OF WAY) AND THE SOUTH LINE OF SECTION 27, S 87°38'16" W, 331.59 FEET (RECORDED AS S 87°26'19" W, 331.48 FEET), TO THE POINT OF BEGINNING, CONTAINING 10.15 ACRES, MORE OR LESS AND SUBJECT TO THE RIGHTS OF THE PUBLIC OVER THE EXISTING BRIGHTON ROAD. ALSO SUBJECT TO ANY OTHER EASEMENTS OR RESTRICTIONS OF RECORD.

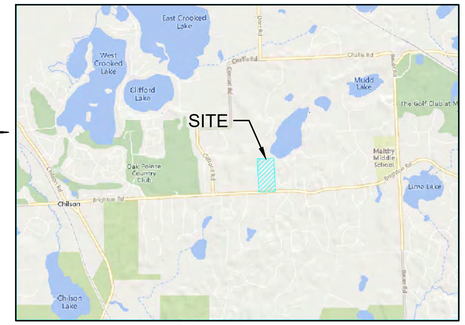
DESCRIPTION OF PARCEL 4711-27-400-012, AS SURVEYED:
PART OF THE SOUTHEAST 1/4 OF SECTION 27, T2N-R5E, GENOA TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN, MORE PARTICULARLY DESCRIBED AS FOLLOWS: BEGINNING AT THE SOUTHEAST CORNER OF SECTION 27, SAID POINT ALSO BEING THE SOUTHWEST CORNER OF SECTION 26; THENCE ALONG THE CENTERLINE OF BRIGHTON ROAD (66 FOOT WIDE RIGHT OF WAY) AND THE SOUTH LINE OF SECTION 27, S 87°19'30" W, 334.70 FEET (RECORDED AS 334.72 FEET); THENCE ALONG THE WEST LINE OF THE EAST 1/2 OF THE EAST 1/2 OF THE SOUTHEAST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 27, AS SURVEYED, N 02°32'41" E, 1333.89 FEET (RECORDED AS N 02°32'14" W, 1333.91 FEET), THENCE ALONG THE NORTH LINE OF THE SOUTH 1/2 OF THE SOUTHEAST 1/4 OF SECTION 27, AS SURVEYED, N 87°17'41" E, 334.03 FEET (RECORDED AS N 87°17'45" W, 334.10 FEET); THENCE ALONG THE EAST LINE OF SECTION 27, ALSO BEING THE WEST LINE OF SECTION 26, S 02°34'25" E, 1334.04 FEET (RECORDED AS S 02°33'50" E, 1334.08 FEET), TO THE POINT OF BEGINNING, CONTAINING 10.24 ACRES, MORE OR LESS AND SUBJECT TO THE RIGHTS OF THE PUBLIC OVER THE EXISTING BRIGHTON ROAD. ALSO SUBJECT TO ANY OTHER EASEMENTS OR RESTRICTIONS OF RECORD.

TRAFFIC STATEMENT

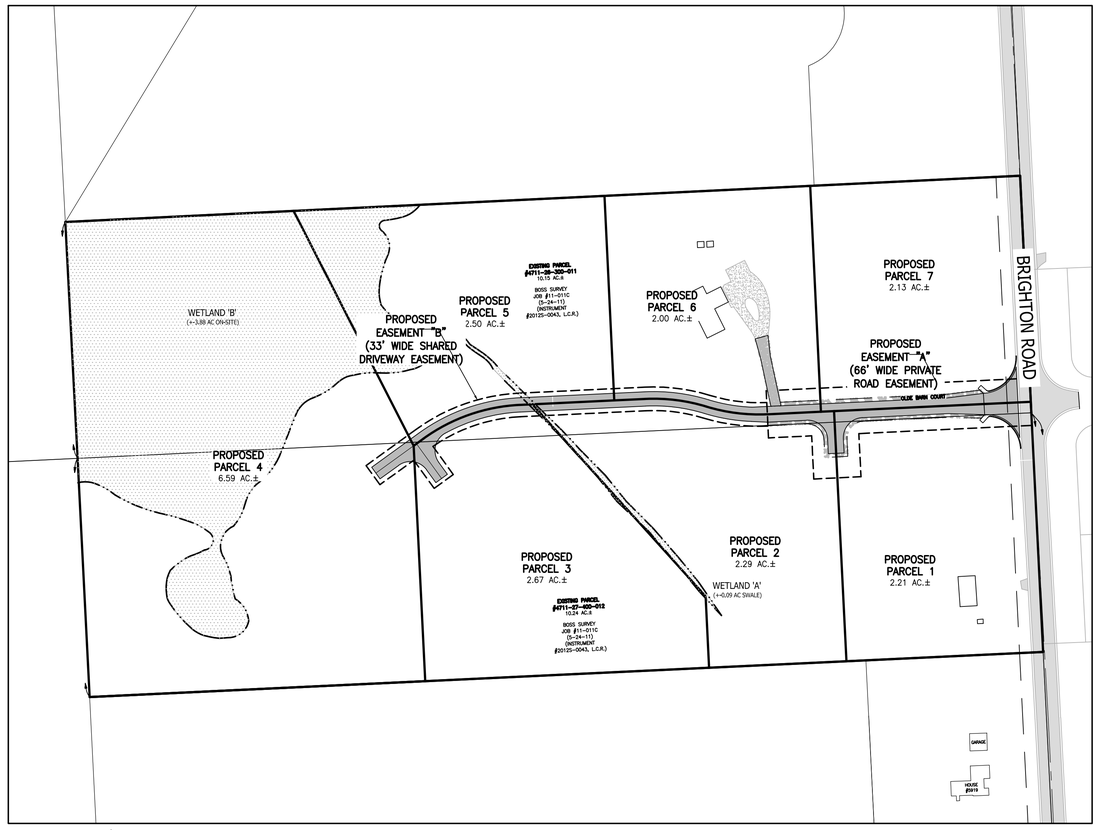
USE INSTITUTE OF TRANSPORTATION ENGINEERS TRIP GENERATION MANUAL – 10TH EDITION CODE NUMBER 210 (SINGLE-FAMILY DETACHED HOUSING). THE SITE CONTAINS 7 DWELLING UNITS.

FOR SINGLE-FAMILY DETACHED HOUSING:
WEEKDAY = 9.44 TRIPS / DWELLING UNIT X 7 HOMES = 66.08 TRIPS
AM PEAK = 0.74 TRIPS / DWELLING UNIT X 7 HOMES = 5.18 TRIPS
PM PEAK = 0.99 TRIPS / DWELLING UNIT X 7 HOMES = 6.93 TRIPS

CONCLUSION:
THE NUMBER OF TRIPS GENERATED FOR THIS SITE WILL HAVE A NEGLIGIBLE IMPACT ON THE BRIGHTON ROAD TRAFFIC DAILY AND IN THE AM & PM PEAK HOURS.



LOCATION MAP
NO SCALE



OVERALL SITE MAP
NO SCALE

SHEET INDEX

PERMITS & APPROVALS

AGENCY	DATE SUBMITTED	DATE APPROVED
• GENOA TOWNSHIP	–	–
• BRIGHTON AREA FIRE AUTHORITY	–	–
• LIVINGSTON COUNTY HEALTH DEPARTMENT	–	–
• LIVINGSTON COUNTY ROAD COMMISSION	–	–
• LCDC SOIL EROSION & SEDIMENTATION CONTROL	–	–
• MDEGLE WETLAND	–	–

INDEMNIFICATION STATEMENT

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

PREPARED FOR:

MR. KEVIN VAN KANNEL
65300 OLD HICKORY
BRIGHTON, MI 48116
PHONE: 810-355-6300
EMAIL: KVANKANNEL@UTECIT.COM

PREPARED BY:

BOSS Engineering
Engineers Surveyors Planners Landscape Architects
3121 E. GRAND RIVER AVE.
HOWELL, MI. 48843
517.546.4836 FAX 517.548.1670
CONTACT: BRENT LAVANWAY
EMAIL: BRENTL@BOSSENG.COM

STATE OF MICHIGAN — BRENT N. LAVANWAY — ENGINEER — No. 38211 — REGISTERED PROFESSIONAL ENGINEER

LCRC comments 5/30/25

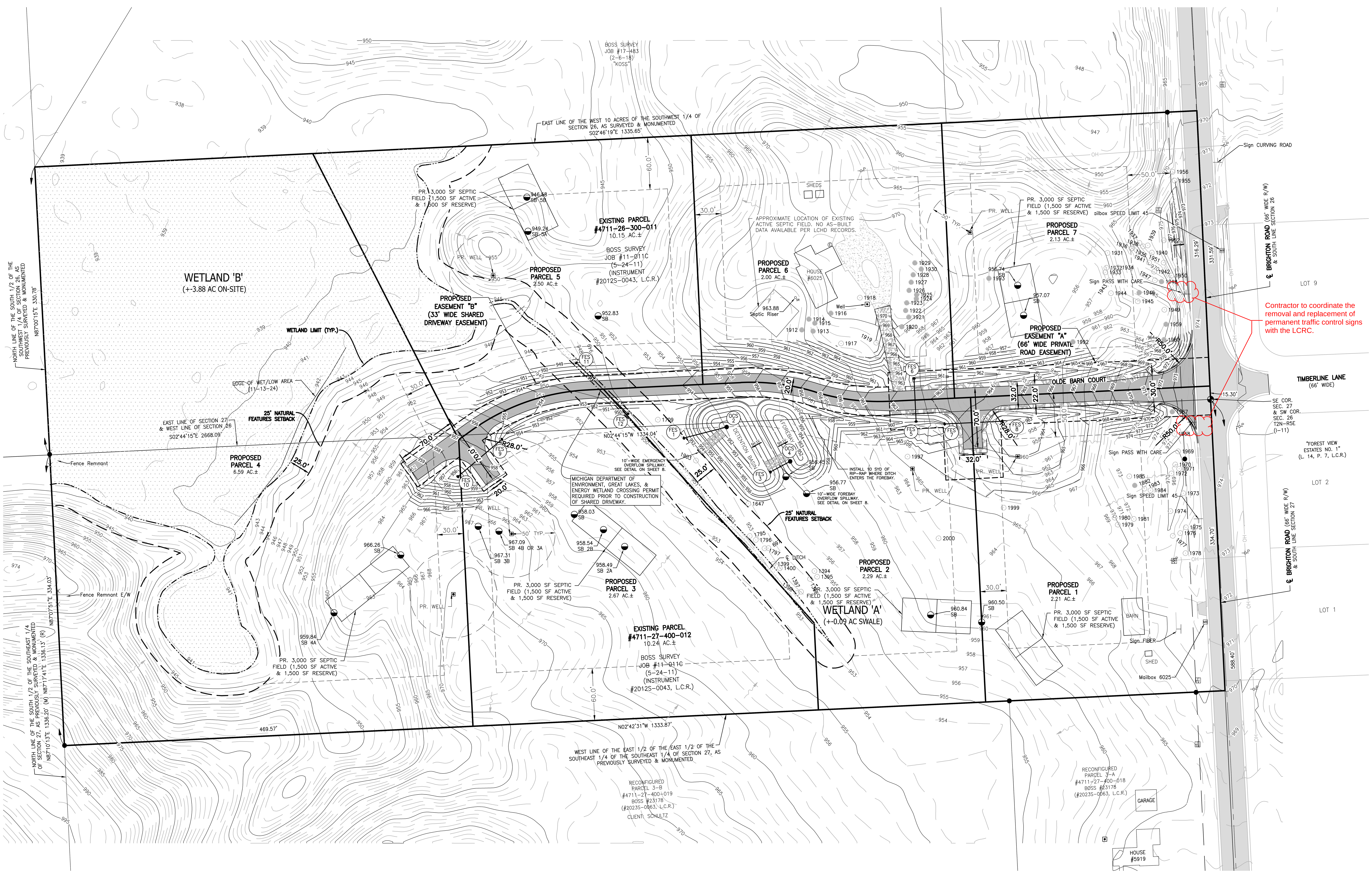
NO	BY	CK	REVISION	DATE	JOB NO: 24-380
1	NL	BL	PER INITIAL TWP REVIEW	5/20/25	ISSUE DATE: 4/21/25

1

NOTES:
1. WELLS SHALL COMPLY WITH ALL LOCAL, STATE, & FEDERAL REGULATIONS.
2. SEPTIC SYSTEMS SHALL COMPLY WITH ALL LOCAL, STATE, & FEDERAL REGULATIONS.

SCALE: 1 INCH = 50 FEET

SEE SHEET 2 FOR GENERAL NOTES AND LEGEND



THE LOCATION AND ELEVATION OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE DRAWINGS ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION AND ELEVATION OF EXISTING UTILITIES AND PROPOSED UTILITY CROSSINGS IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF ANY CONFLICTS ARE APPARENT OR IF THE LOCATION OR DEPTH DIFFERS SIGNIFICANTLY FROM THE PLANS.

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171

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

PROJECT: THE FARM

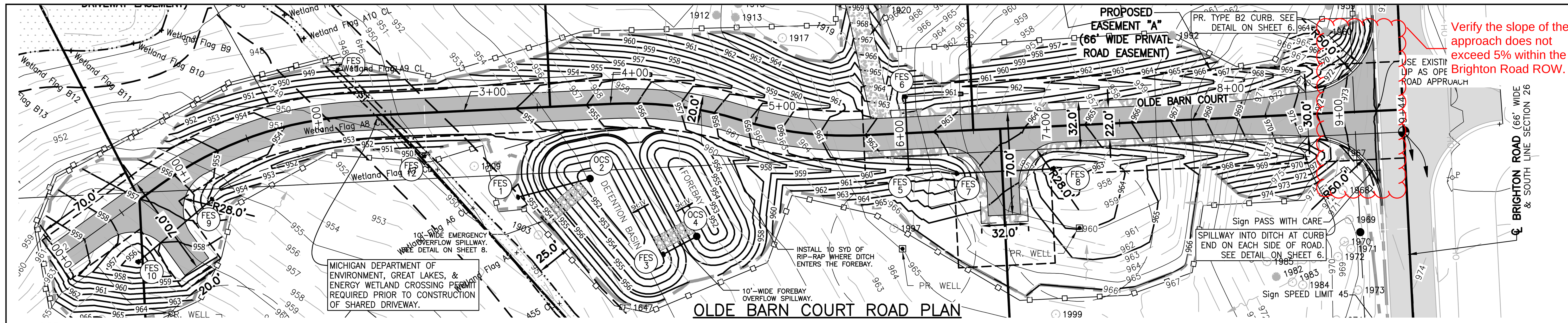
PREPARED FOR: MR. KEVIN VAN KANNEL

TITLE: WELL & SEPTIC PLAN

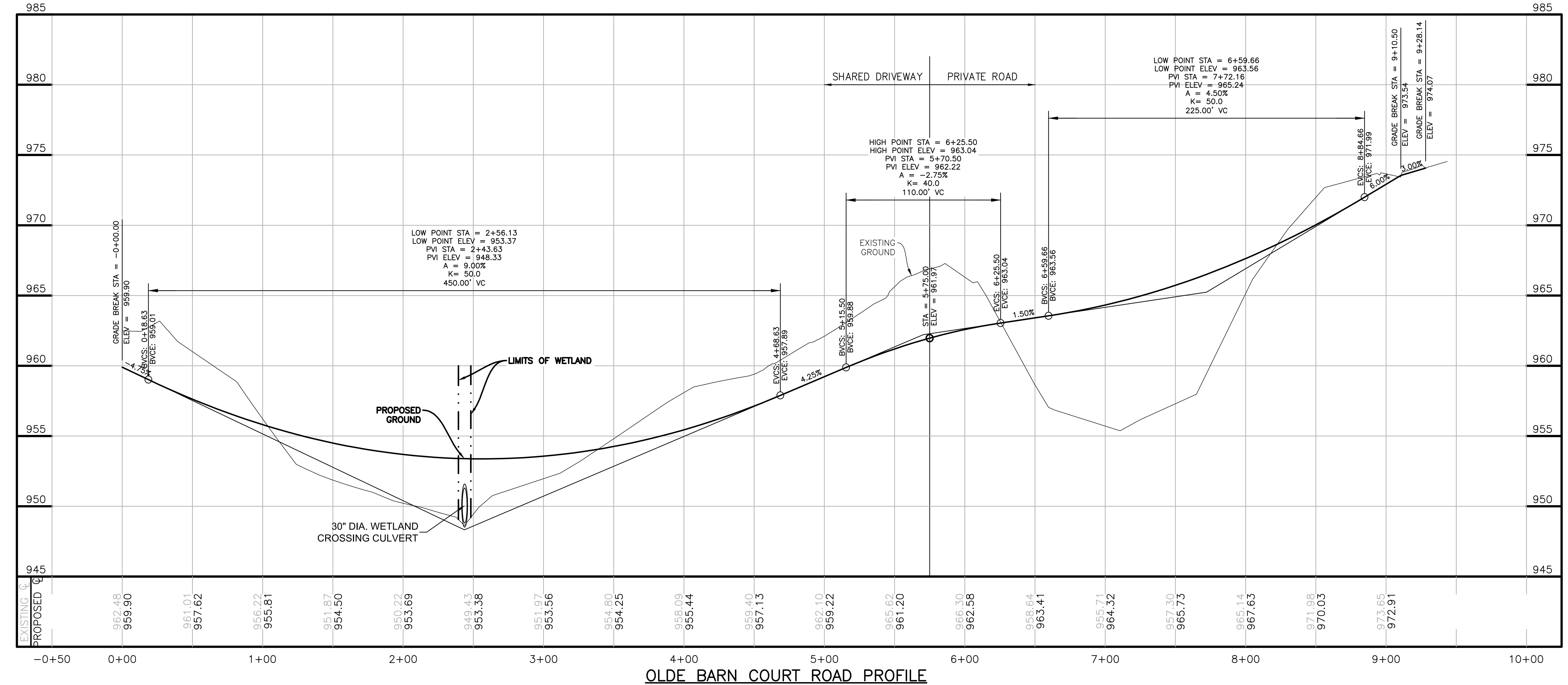
NO	BY	REVISION PER	DATE
1	NL	INITIAL TWP REVIEW	5/20/25

DESIGNED BY:	NL
DRAWN BY:	NL
CHECKED BY:	BL
SCALE:	1" = 50'
JOB NO:	24-380
DATE:	4/21/25
SHEET NO.	5

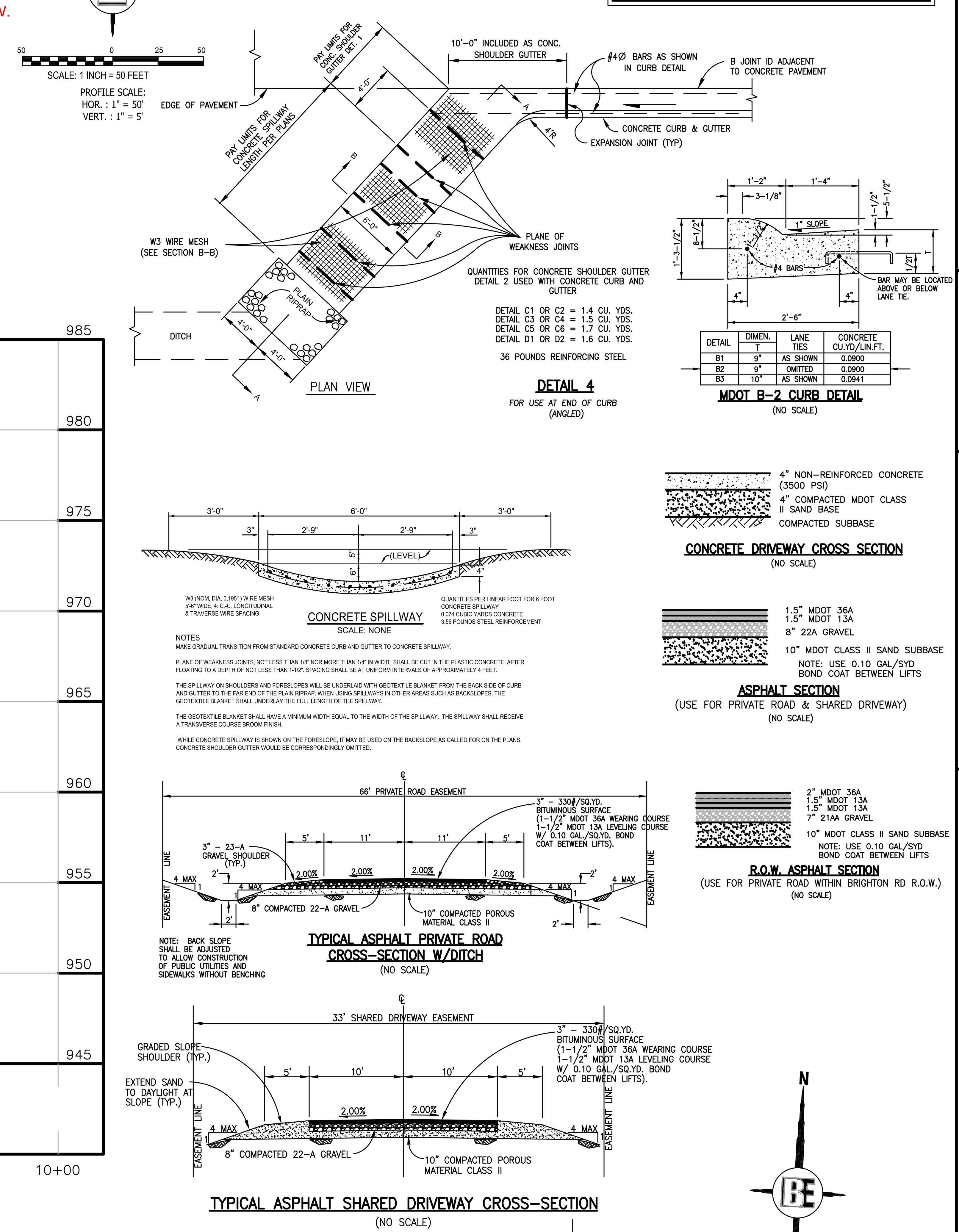
SEE SHEET 2 FOR GENERAL NOTES AND LEGEND



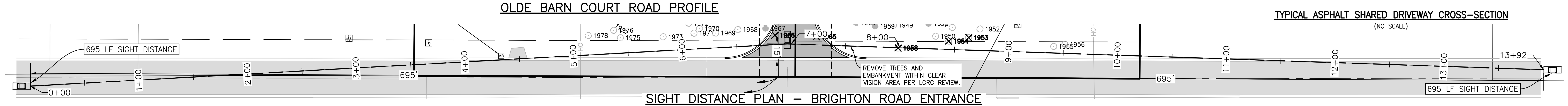
OLDE BARN COURT ROAD PLAN
PROPOSED EASEMENT "A" (66' WIDE PRIVATE ROAD EASEMENT)
PR. TYPE B2 CURB. SEE DETAIL ON SHEET 6.
OLDE BARN COURT
DETENTION BASIN
FOREBAY
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, & ENERGY WETLAND CROSSING PERMIT REQUIRED PRIOR TO CONSTRUCTION OF SHARED DRIVEWAY.
INSTALL 10 SYD OF RIP-RAP WHERE DITCH ENTERS THE FOREBAY.
10'-WIDE FOREBAY OVERFLOW SPILLWAY.
SPILLWAY INTO DITCH AT CURB END ON EACH SIDE OF ROAD. SEE DETAIL ON SHEET 6.
Sign PASS WITH CARE
Sign SPEED LIMIT 45
BRIGHTON ROAD (66' WIDE) & SOUTH LINE SECTION 26
Verify the slope of the approach does not exceed 5% within the Brighton Road ROW.
SCALE: 1 INCH = 50 FEET
PROFILE SCALE: HOR. : 1" = 50' VERT. : 1" = 5'

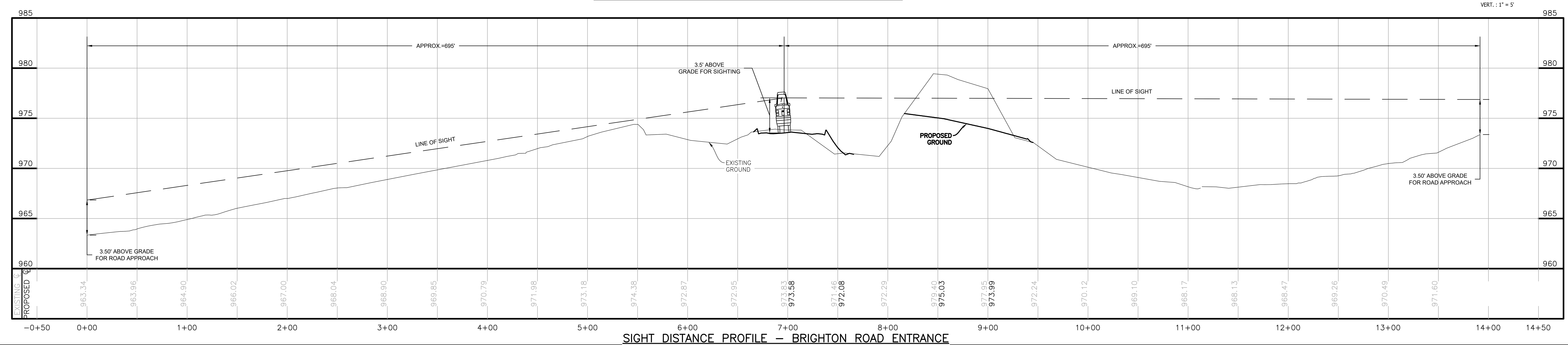


OLDE BARN COURT ROAD PROFILE
SHARED DRIVEWAY
PRIVATE ROAD
LOW POINT STA = 2+56.13
LOW POINT ELEV = 953.37
PVI STA = 2+43.63
PVI ELEV = 948.33
A = 9.00%
K= 50.0
450.00' VC
HIGH POINT STA = 6+25.50
HIGH POINT ELEV = 963.04
PVI STA = 5+70.50
PVI ELEV = 962.22
A = -2.75%
K= 40.0
110.00' VC
LOW POINT STA = 6+59.66
LOW POINT ELEV = 963.56
PVI STA = 7+72.16
PVI ELEV = 965.24
A = 4.50%
K= 50.0
225.00' VC
LIMITS OF WETLAND
PROPOSED GROUND
EXISTING GROUND
30" DIA. WETLAND CROSSING CULVERT



DETAIL 4
FOR USE AT END OF CURB (ANGLED)
PLAN VIEW
QUANTITIES FOR CONCRETE SHOULDER GUTTER DETAIL 2 USED WITH CONCRETE CURB AND GUTTER
DETAIL C1 OR C2 = 1.4 CU. YDS.
DETAIL C3 OR C4 = 1.5 CU. YDS.
DETAIL C5 OR C6 = 1.7 CU. YDS.
DETAIL D1 OR D2 = 1.6 CU. YDS.
36 POUNDS REINFORCING STEEL
MDOT B-2 CURB DETAIL
(NO SCALE)
BAR MAY BE LOCATED ABOVE OR BELOW LANE TIE.
CONCRETE SPILLWAY
SCALE: NONE
CONCRETE DRIVEWAY CROSS SECTION
(NO SCALE)
4" NON-REINFORCED CONCRETE (3500 PSI)
4" COMPACTED MDOT CLASS II SAND BASE
COMPACTED SUBBASE
ASPHALT SECTION
(USE FOR PRIVATE ROAD & SHARED DRIVEWAY)
(NO SCALE)
R.O.W. ASPHALT SECTION
(USE FOR PRIVATE ROAD WITHIN BRIGHTON RD R.O.W.)
(NO SCALE)
TYPICAL ASPHALT PRIVATE ROAD CROSS-SECTION W/DITCH
(NO SCALE)
TYPICAL ASPHALT SHARED DRIVEWAY CROSS-SECTION
(NO SCALE)





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3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 (TOLL FREE) FOR THE LOCATION OF UNDERGROUND FACILITIES

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

PROJECT: THE FARM

PREPARED FOR: MR. KEVIN VAN KANNEL

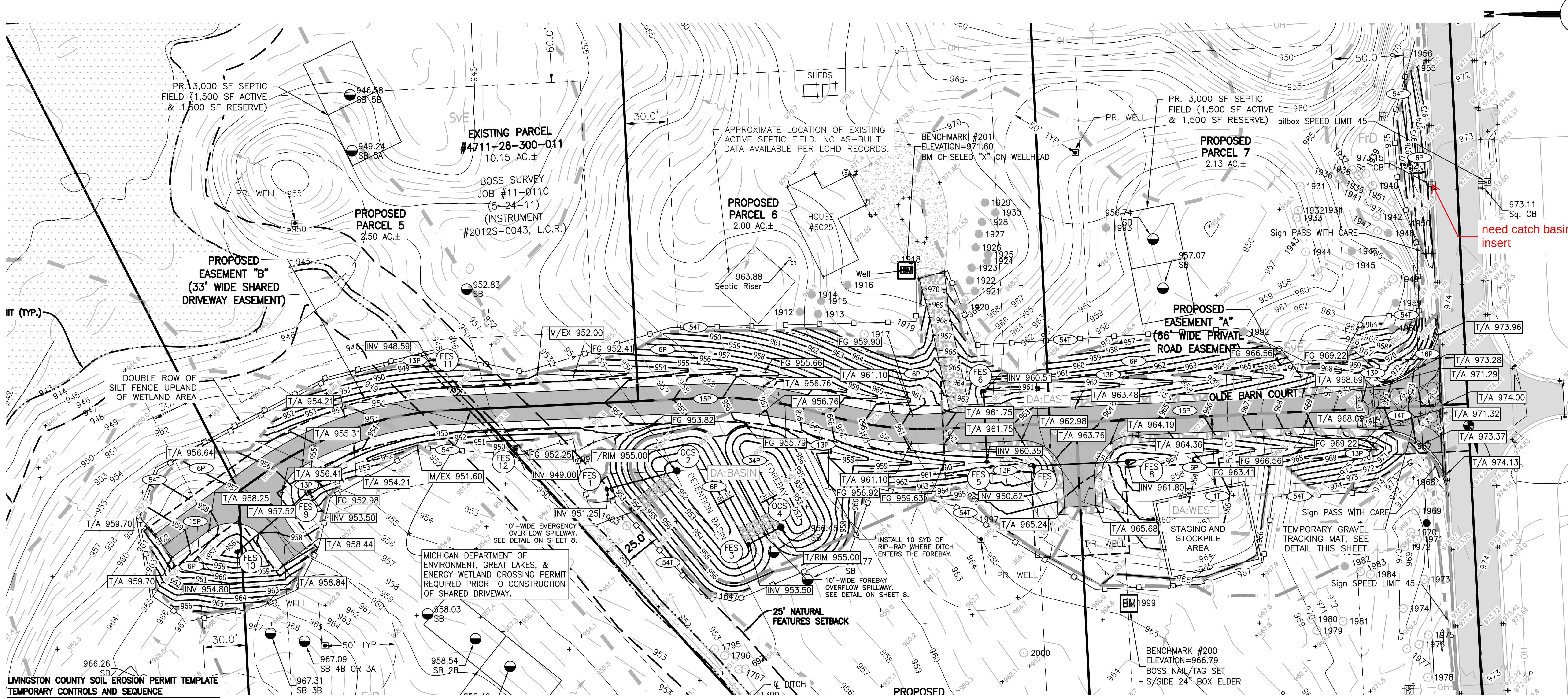
TITLE: ROAD PLAN & PROFILE

NO	BY	REVISION PER	DATE
1	NL	INITIAL TMP REVIEW	5/20/25

DESIGNED BY:	NL
DRAWN BY:	NL
CHECKED BY:	BL
SCALE:	1" = 50'
JOB NO:	24-380
DATE:	4/21/25
SHEET NO.	6

SEE SHEET 2 FOR GENERAL NOTES AND LEGEND

SCALE: 1 INCH = 50 FEET



NRCS EXISTING SOILS DATA:	
CarabA	CARLISLE MUCK, 0-2% SLOPES
FoB	FOX SANDY LOAM, 2-6% SLOPES
FrB	FOX-BOYER COMPLEX, 2-6% SLOPES
FrC	FOX-BOYER COMPLEX, 6-12% SLOPES
FrD	FOX-BOYER COMPLEX, 12-18% SLOPES
	FOX-BOYER COMPLEX, 18-25% SLOPES
	SPINKS-OAKVILLE LOAMY SANDS, 18-25% SLOPES
Wh	WASHTENAW SILT LOAM

SOIL EROSION CONTROL MEASURES

No.	Measure	Description
1	STRIPPING & STOCKPILING TOPSOIL	TOPSOIL MAY BE STOCKPILED ABOVE BORROW AREAS TO ACT AS A DIVERSION STOCKPILE SHOULD BE TEMPORARILY SEEDED
6	SEEDING WITH MULCH AND/OR MATTING	FACILITATES ESTABLISHMENT OF VEGETATIVE COVER EFFECTIVE FOR DRAINAGEWAYS WITH LOW VELOCITY EASILY PLACED IN SMALL QUANTITIES BY INEXPERIENCED PERSONNEL SHOULD INCLUDE PREPARED TOPSOIL BED
13	RIP-RAP, RUBBLE, GABIONS	USED WHERE VEGETATION IS NOT EASILY ESTABLISHED EFFECTIVE FOR HIGH VELOCITIES OR HIGH CONCENTRATIONS PERMITS RUNOFF TO INFILTRATE SOIL DISSIPATES ENERGY FLOW AT SYSTEM OUTLETS
14	AGGREGATE COVER	STABILIZES SOIL SURFACE, THUS MINIMIZING EROSION PERMITS CONSTRUCTION TRAFFIC IN ADVERSE WEATHER MAY BE USED AS PART OF PERMANENT BASE CONSTRUCTION OF PAVED AREAS
15	PAVING	PROTECTS AREAS WHICH CANNOT OTHERWISE BE PROTECTED, BUT INCREASES RUNOFF VELOCITY IRREGULAR SURFACE WILL HELP SLOW VELOCITY
16	CURB & GUTTER	KEEPS HIGH VELOCITY RUNOFF ON PAVED AREAS FROM LEAVING PAVED SURFACE COLLECTS AND CONDUCTS RUNOFF TO ENCLOSED DRAINAGE SYSTEM OR PREPARED DRAINAGEWAY
34	SEDIMENT BASIN	TRAPS SEDIMENT RELEASES RUNOFF AT NON-EROSIVE RATES CONTROLS RUNOFF AT SYSTEM OUTLETS CAN BE VISUAL AMENITIES
54	SILT FENCE	USES GEOTEXTILE FABRIC AND POST OR POLES. EASY TO CONSTRUCT AND LOCATE AS NECESSARY. (SEE DETAIL THIS SHEET)

T= TEMPORARY, P= PERMANENT
TOTAL DISTURBED AREA= 2.48 AC.

NOTES:

- LIVINGSTON COUNTY DRAIN COMMISSION SESC PERMIT SHALL BE OBTAINED PRIOR TO CONSTRUCTION.
- THE SESC PERMIT IS VALID FOR THE MASS EARTH MOVEMENT AND INSTALLATION OF ROADS, DRAINS, AND UTILITIES ONLY. THE PERMIT IS NOT FOR INDIVIDUAL BUILDING UNITS. IT IS REQUIRED THAT TEMPORARY STABILIZATION OF THE ENTIRE SITE BE COMPLETED AND APPROVAL FROM THE LIVINGSTON COUNTY DRAIN COMMISSIONER'S OFFICE MUST BE OBTAINED PRIOR TO THE ISSUANCE OF PERMITS FOR INDIVIDUAL BUILDING UNITS.
- ANY DEWATERING REQUIRED SHALL HAVE A DEWATERING PLAN SUBMITTED PRIOR TO STARTING THE ACTIVITY AND MAY REQUIRE EGLE APPROVAL.
- DITCHES/ SWALES WITH GRADES 3% AND GREATER WILL NEED CHECK DAMS (SEE BELOW DETAIL) TO PREVENT SCOURING OF THE DITCH BOTTOMS.
- HYDRO-SEEDING IS NOT ACCEPTABLE FOR SLOPES EXCEEDING 1%. ON SLOPES OVER 1%, STABILIZATION SHALL BE DONE WITH SEED & STRAW MULCH WITH A TACKIFIER, OR STRAW BLANKETS PEGGED IN PLACE.

LIVINGSTON COUNTY SOIL EROSION PERMIT TEMPLATE TEMPORARY CONTROLS AND SEQUENCE

1. NOTIFY LIVINGSTON COUNTY DRAIN COMMISSIONER'S OFFICE 24 HOURS PRIOR TO START OF GRADE WORK.
2. IN ACCORDANCE WITH PUBLIC ACT NO. 53, OF 1974 THE PERMIT HOLDER SHALL CALL MISS DIG FOR STAKING AND LOCATING OF UTILITIES, AT LEAST 72 HOURS IN ADVANCE OF THE START OF ANY WORK.

PERMITTING STANDARDS

3. (IMPORTANT NOTICE) RETENTION/DETENTION PONDS SHALL BE EXCAVATED, TOPSOILED, SEEDED, MULCHED AND TACKED PRIOR TO THE START OF MASSIVE EARTH DISRUPTION. INGRESS/EGRESS MUST HAVE LARGE CRUSHED ROCK TO REDUCE THE TRACKING OF SOIL ONTO THE PUBLIC TRAFFIC AREAS. SEE DETAIL ITEMS BELOW.
4. 36" M.D.O.T SPECIFICATION TYPE SILT FABRIC FENCE AS SHOWN ON PLANS SHALL BE PLACED AND MAINTAINED ALONG PERIMETER ON ALL LOW LYING AREAS OF THE CONSTRUCTION SITE TO FILTER RUNOFF BEFORE LEAVING PROJECT SITE.
5. ALL TEMPORARY EROSION CONTROL DEVICES AS NOTED ON PLANS SHALL BE INSTALLED PRIOR TO THE START OF MASSIVE EARTH DISTRIBUTION.
6. PLAN DOES DENOTE A DETAILED EROSION CONTROL DEVICE TO RESTRICT TRACKING OF MATERIAL ONTO THE HIGHWAY. STONE DIAPERS SHALL BE INSTALLED AT ALL INGRESS/EGRESS AREAS OF THE SITE PRIOR TO THE START OF MASSIVE EARTH DISRUPTION. DIAPERS SHALL BE OF CRUSHED STONE AND SHALL HAVE A MINIMUM LENGTH OF 100' LINEAL FEET.

RETENTION PONDS

7. RETENTION/DETENTION/SEDIMENTATION PONDS SHALL BE EXCAVATED, TOPSOILED, SEEDED, MULCHED AND TACKED PRIOR TO THE START OF MASSIVE EARTH DISRUPTION.
8. DETENTION POND OUTLETS SHALL BE OF THE STANDPIPE AND STONE FILTER SYSTEM, WITH TRASH SCREEN. OUTLET FLOW SHALL NOT EXCEED 0.20 CUBIC FEET OF WATER PER SECOND/PER ACRE. POND DIKES SHALL HAVE A MINIMUM OF ONE (1) FOOT OF FREEBOARD. AN EMERGENCY SPILLWAY SHALL BE CONSTRUCTED WITHIN THE FREEBOARD LEVEL.
9. THE EMERGENCY SPILLWAY FROM THE DETENTION POND SHALL BE SODDED AND PEGGED, OR RIP RAPPED, 15 FEET PAST THE TOE OF THE SLOPE OF THE BERM.
10. DIKES AND BERMS SHALL BE FREE OF ALL ORGANIC MATTER.
11. RETENTION/DETENTION PONDS SHALL BE FENCED WITH A 4' CHAIN LINK FENCE, INCLUDING A 12' ACCESS GATE FOR MAINTENANCE UNLESS MINIMUM 5 FT. HORIZONTAL TO 1 FT. VERTICAL SIDE SLOPES ARE PROVIDED. THE FENCE SHALL BE INSTALLED AT THE OUTER PORTION OF THE BERM, TO ALLOW FOR MAINTENANCE WORK TO BE DONE INSIDE THE FENCE.
12. ALL UNIMPROVED DISTURBED AREAS SHALL BE STRIPPED OF TOPSOIL WHICH WILL BE STORED ONSITE DURING THE EXCAVATING STAGE. TOPSOIL PILES SHALL BE SEEDED AND MULCHED, OR MATTED WITH STRAW IN THE NON-GROWING SEASON, IMMEDIATELY AFTER THE STRIPPING PROCESS IS COMPLETED, TO PREVENT WIND AND WATER EROSION.
13. SOIL EROSION CONTROLS SHALL BE MONITORED DAILY BY THE ON-SITE ENGINEER, OR CONTRACTOR, WHICHEVER CASE APPLIES.

SLOPES AND DITCHES

14. ON SITE DITCHES SHALL BE OF THE FLAT BOTTOM TYPE MINIMUM WIDTH OF 2' WITH A MINIMUM OF 3 HORIZONTAL TO 1 VERTICAL SIDE SLOPES, 3:1.
15. DITCHES WITH STEEP SLOPES WILL NEED FLOW CHECKS TO PREVENT SCOURING OF THE DITCH BOTTOM. THESE SHALL BE INSTALLED AS DIRECTED BY THE ENGINEER OR INSPECTOR.
16. SLOPES IN EXCESS OF 3 HORIZONTAL TO 1 VERTICAL SHALL NOT BE USED EXCEPT WITH A MECHANICAL DEVICE SUCH AS A RETAINING WALL, TERRACING, OR OTHER PRIOR APPROVED DEVICE.

STORM DRAINS

17. ALL STORM WATER STRUCTURES, CATCH BASINS AND/OR MANHOLES, IF BLOCK, SHALL BE PLASTERED ON BOTH THE INSIDE AND OUTSIDE OF THE STRUCTURES. GROUTING AND POINTING WILL BE NECESSARY AT THE CASTING AND STRUCTURE JOINT TO PREVENT LEAKAGE AND THE RESULTING SOIL MOVEMENT, AROUND THE STRUCTURE.
18. COUNTY CODE REQUIRES A MINIMUM PIPE SIZE OF 12" IN DIAMETER. IF SMALLER PIPE IS NEEDED FOR OUTLET PURPOSES THE 12" CAN BE BAFFLED TO THE CORRECT SIZE. ALL PIPE SHALL MEET THE 12" DIAMETER CODE SIZE.
19. ALL STORM DRAIN OUTLETS 15" IN DIAMETER OR LARGER SHALL HAVE ANIMAL GUARDS INSTALLED TO PREVENT ENTRANCE TO THE SYSTEM.
20. ALL STORM DRAINAGE PIPE 30" IN DIAMETER OR LARGER SHALL BE POINTED, AT THE JOINTS ON THE INSIDE WITH MORTAR, AFTER BACKFILLING.
21. ALL STORM DRAIN OUTLETS THAT DO NOT EMPTY INTO THE RETENTION/DETENTION POND SHALL HAVE A TEMPORARY 5'X10'X3' SUMP INSTALLED AT THE TERMINATION OF THE STORM SEWER. UPON COMPLETION OF THE STABILIZATION WORK THE SUMP AREA SHALL BE FILLED AND RIP RAPPED WITH STONE. SILT TRAPS SHALL BE INSPECTED AFTER EACH STORM.
22. STORM WATER OUTLETS DO DENOTE RIP RAP. ALL OUTLETS SHALL BE RIP RAPPED OVER KEYED FILTER FABRIC WITH A MINIMUM OF 15 SQ. YARDS OF 6" OR LARGER STONE.
23. RIP RAP AS NOTED ON THE PLAN SHALL BE OF A FUNNEL SHAPE CONSTRUCTION, WIDTH SHALL INCREASE AS DISTANCE FROM THE OUTLET POINT INCREASES AT A 3:1 RATIO.
24. RIP RAP SHALL BE 6" IN DIAMETER OR LARGER. GROUTING MAY BE NECESSARY, AND SHALL BE A MINIMUM OF 6" IN DEPTH WITH THE STONE SET IN THE CEMENT SLURRY.
25. STORM WATER OUTLET IS IN NEED OF A SPLASH BLOCK WHICH IS NOT NOTED ON THE PLAN. INSTALL SPLASH BLOCK IF SLOPE OF THE PIPE IS 4% OR GREATER.
26. IT WILL BE NECESSARY FOR THE DEVELOPER TO HAVE THE STORM DRAINAGE LINES CLEANED PRIOR TO FINAL INSPECTION BY THE LIVINGSTON COUNTY DRAIN COMMISSIONER'S OFFICE. IF REQUIRED, THIS WORK SHALL BE DONE BY A PROFESSIONAL SEWER CLEANING FIRM AND CERTIFIED IN WRITING BY THE PROJECT ENGINEER. ALL SUMPS AND TEMPORARY SILT TRAPS SHALL ALSO BE CLEANED AT THIS TIME.

STABILIZATION

27. ALL UNIMPROVED DISTURBED AREAS SHALL BE RE-TOP SOILED, WITH A MINIMUM OF 3" OF MATERIAL, SEEDED, MULCHED AND TACKED WITHIN 15 DAYS OF THE COMPLETION OF THE MASSIVE EARTH DISRUPTION. IN THE NON-GROWING SEASON STRAW MATTING WILL SUFFICE. HYDROSEEDING WILL BE AN ACCEPTABLE ALTERNATE FOR MULCHING. EXTREME CARE SHOULD BE EXERCISED IN SPRING AND FALL PERIODS AS A FROST WILL BREAK THE BIND OF THE HYDROSEEDING, WHICH WILL AFFECT THE EFFECTIVENESS OF THIS PROCEDURE.
28. IN THE NON-GROWING SEASON, TEMPORARY STABILIZATION OF MASSIVELY EXPOSED AREAS FOR WINTER STABILIZATION SHALL BE DONE WITH STRAW MATTING.
29. PERIODIC INSPECTIONS WILL BE MADE THROUGHOUT THE COURSE OF THE PROJECT. IT WILL BE THE RESPONSIBILITY OF THE MANAGERS OF THE PROJECT TO CONTACT THIS OFFICE FOR THE FINAL INSPECTION AT THE END OF THE PROJECT.
30. THIS COMMERCIAL PERMIT IS VALID FOR THE MASS EARTH MOVEMENT, THE INSTALLATION OF ROADS, DRAINS, AND UTILITIES AND IS NOT FOR ANY SINGLE FAMILY RESIDENCE. ALL RESIDENTIAL BUILDERS WILL NEED TO SECURE WAIVERS AND OR PERMITS AS NECESSARY FOR EACH LOT IN THIS DEVELOPMENT AT THE TIME APPLICATION FOR SINGLE FAMILY RESIDENCE IS MADE.
31. THE ISSUING BUILDING DEPARTMENT SHALL NOT ISSUE THE CERTIFICATE OF OCCUPANCY UNTIL THE FINAL INSPECTION LETTER FROM THE LIVINGSTON COUNTY DRAIN COMMISSIONER'S OFFICE HAS BEEN OBTAINED.
32. PER THE LIVINGSTON COUNTY DRAIN COMMISSIONER THE SEEDING, FERTILIZER AND MULCH MINIMUM QUANTITIES SHALL BE AS FOLLOWS:
    - TOP-SOIL — 3" IN DEPTH
    - GRASS SEED — 218 LBS. PER ACRE
    - FERTILIZER — 150 LBS. PER ACRE
    - STRAW MULCH — 3" IN DEPTH 1.5 TO 2 TONS PER ACRE (ALL MULCHING MUST HAVE A TIE DOWN, SUCH AS TACKIFIER, NET BINDING, ETC.)
    - HYDRO-SEEDING — HYDRO-SEEDING IS NOT ACCEPTABLE FOR SLOPES EXCEEDING 1%, IN SUCH CASES STABILIZATION SHALL BE DONE WITH SEED AND STRAW MULCH WITH A TACKIFIER.

SANITARY SEWERS

33. SANITARY SEWER TAP TO THE ________________________ SANITARY COUNTY DRAIN, SHALL ONLY BE MADE AFTER SECURING IN WRITING CLEARANCE FROM THE _________________ TOWNSHIP AND A SEWER TAP PERMIT FROM THE LIVINGSTON COUNTY DEPARTMENT OF BUILDING & SAFETY.
34. A TAP PERMIT WILL BE NEEDED BY THE OWNER/DEVELOPER OF THIS PROJECT TO TAP TO THE LEGALLY ESTABLISHED COUNTY STORM DRAIN. THE OWNER/DEVELOPER SHALL MAKE A WRITTEN REQUEST TO THE DRAIN COMMISSIONER TO REQUEST THE TAP TO THE STORM SEWER. THE FEES FOR SUCH TAP ARE AS FOLLOWS:

A. NON REFUNDABLE ADMINISTRATIVE FEE OF $50.00, TO BE PAID AT THE TIME OF APPLICATION.
B. INSPECTION FEES ARE BASED ON TIME AND MATERIAL BASIS FROM PORT TO PORT FOR THE ON-SITE INSPECTOR. INSPECTORS RATE, VEHICLE MILEAGE, AND 0.5 HOURS OF REPORT PREPARATION TIME WILL BE CHARGED, AS WELL AS ANY NECESSARY MATERIALS. TIME AND MATERIAL FEES ARE PAID AT THE COMPLETION OF THE TAP INSTALLATION.

SINGLE FAMILY RESIDENCE CONSTRUCTION

37. PRIOR TO THE START OF SINGLE FAMILY RESIDENCES, THE BUILDER OR HOMEOWNER SHALL INSTALL A STRAW BALE BARRIER AND/OR SILT FENCE BEHIND THE CURB, OR BEHIND THE CROWN OF THE ROAD DITCH BACK SLOPE. PRIOR TO THE START OF THE DWELLING, THE HOMEOWNER OR BUILDER SHALL INSTALL THE DRIVEWAY CULVERT AND AGGREGATE MATERIAL TO ALLOW FOR ENTRANCE TO THE LOT.
38. IF THE LIVINGSTON COUNTY HEALTH DEPARTMENT REQUIRES A MOUNDED SEPTIC FIELD, THE HOMEOWNER/BUILDER SHALL INSTALL POSITIVE DRAINAGE FROM THE MOUNDED AREA SO AS NOT TO ALLOW EXCESSIVE FLOW ONTO ADJACENT LOTS.
39. DRAINAGE EASEMENTS WITHIN THE SUBDIVISION SHALL NOT BE ENCROACHED UPON. OPEN SWALES SHALL NOT BE FILLED OR ENCROACHED UPON. STRAW BALE BARRIERS OR SILT FENCES SHALL BE INSTALLED BETWEEN THE CONSTRUCTION AND THE OPEN DRAIN TO PREVENT SILTATION OF THE SYSTEM. ENCLOSED DRAINS WILL HAVE PERIODIC CATCH BASINS OR MANHOLES, LOT GRADES SHALL NOT BE RAISED OVER THE ESTABLISHED STRUCTURE TOPS.

MAINTENANCE SCHEDULE FOR SOIL EROSION CONTROLS

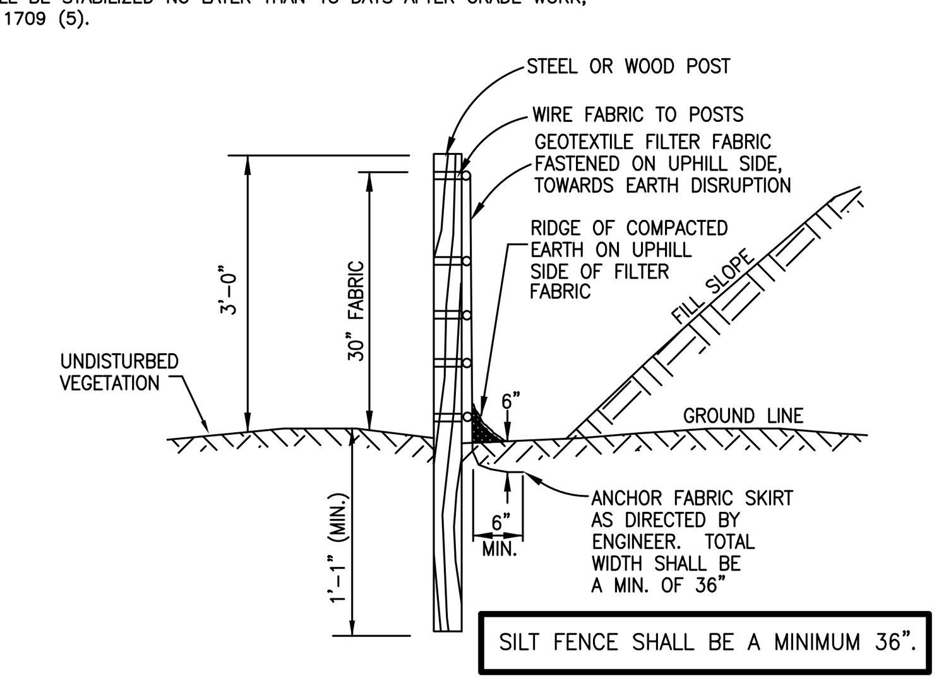
1. SILT FENCE SHALL BE INSPECTED WEEKLY AND AFTER EACH MAJOR STORM EVENT. MAINTENANCE SHALL INCLUDE REMOVAL OF ACCUMULATED SILT AND REPLACEMENT OF TORN SECTIONS. SILT FENCE SHALL BE REMOVED WHEN ALL CONTRIBUTING AREAS HAVE BEEN STABILIZED.
2. TRACKING PAD SHALL BE INSPECTED MONTHLY FOR ACCUMULATED DIRT. TRACKING PAD SHALL BE REPLACED WHEN THE STONES ARE CHOKED WITH DIRT. TRACKING PAD SHALL BE REMOVED IMMEDIATELY PRIOR TO THE FIRST COURSE OF ASPHALT BEING LAID.
3. DETENTION/RETENTION POND SHALL BE INSPECTED QUARTERLY ON A PERMANENT BASIS. MAINTENANCE SHALL INCLUDE SEDIMENT REMOVAL, EMBANKMENT STABILIZATION AND MAINTAINING THE OUTLET STRUCTURE IN GOOD CONDITION. NO TREES SHALL BE ALLOWED TO GROW ON THE EMBANKMENT.
4. CATCH BASINS SHALL BE INSPECTED ANNUALLY FOR ACCUMULATION OF SEDIMENT. ALL SEDIMENT MUST BE REMOVED AND DISPOSED OF PROPERLY WHEN THE SUMP IS FULL.
5. COMMON AREAS SHALL BE STABILIZED NO LATER THAN 15 DAYS AFTER GRADE WORK, PURSUANT TO RULE 1709 (5).

DRAINAGE AREA TABLE				
DRAINAGE AREA	TOTAL AREA (AC)	IMP. AREA (AC)	C VALUE	A*C
BASIN	0.57	0.07	0.30	0.17
WEST	0.57	0.10	0.34	0.20
EAST	0.26	0.11	0.55	0.14
TOTALS	1.40	0.28	0.37	0.51

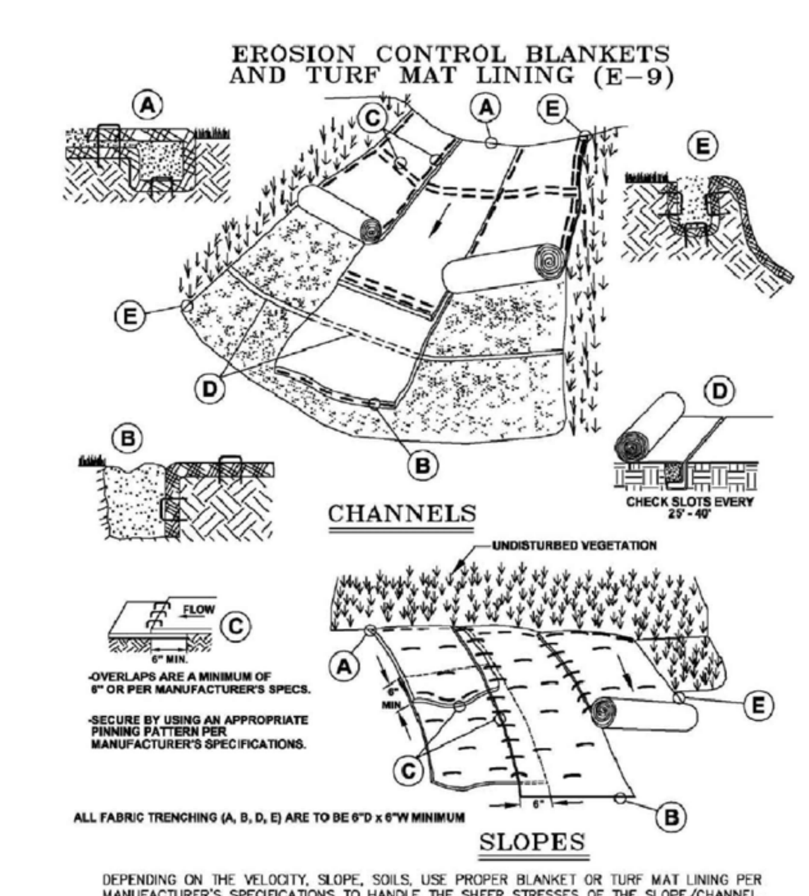
DRAINAGE NARRATIVE:

PRE-DEVELOPMENT: THE SUBJECT PROPERTY CURRENTLY CONTAINS ONE SINGLE FAMILY HOME AND SEVERAL ACCESSORY STRUCTURES. RUNOFF FROM THE SOUTH PART OF THE PROPERTY FLOWS TO A POTHOLE IN THE SOUTHEAST CORNER OF THE PROPERTY. RUNOFF FROM THE REMAINDER OF THE PROPERTY SHEET FLOWS TO A WETLAND DITCH THAT BISECTS THE SITE, AND DISCHARGES TO A LARGER WETLAND BODY AT BAETCKE LAKE NORTH OF THE SITE.

POST-DEVELOPMENT: A FOREBAY AND A DETENTION BASIN ARE PROPOSED TO BE GRADED TO HANDLE THE RUNOFF GENERATED BY THE PRIVATE ROAD. THE FOREBAY AND BASIN ARE SIZED TO HANDLE THE FLOW FROM THE INCREASED IMPERVIOUS SURFACE AREA FROM THE ROAD. RUNOFF FROM THE ROAD AND ASSOCIATED GRADING WILL BE COLLECTED BY THE ROADSIDE DITCHES AND CONVEYED TO THE FOREBAY. THE FOREBAY WILL OUTLET TO THE DETENTION BASIN THROUGH AN OUTLET CONTROL STANDPIPE. THE DETENTION BASIN WILL OUTLET TO A WETLAND DITCH ONSITE THROUGH AN OUTLET CONTROL STANDPIPE. BASIN CALCULATIONS AND DETAILS ARE SHOWN ON SHEET 8.



SILT FENCE DETAIL
NO SCALE



MULCH BLANKET NOTES:
MULCH BLANKET TO BE HANES-GEO STRAW EROSION CONTROL BLANKETS OR APPROVED EQUAL.

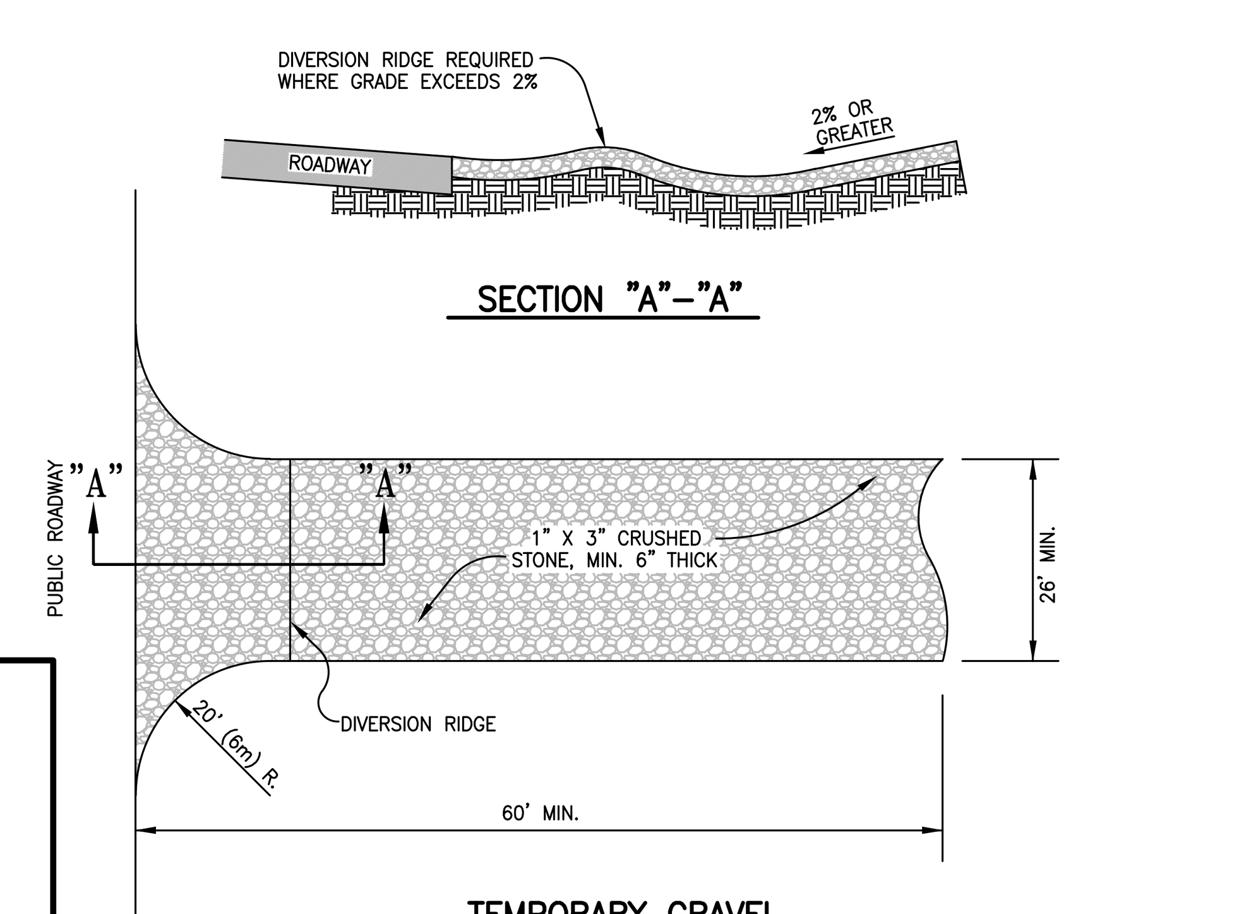
1. BEFORE PLACING, PREPARE THE SOIL SURFACE BY RAKING, SEEDING, AND FERTILIZING. MAKE SURE SURFACE HAS NO RILLS, GULLIES, OR VOIDS THAT WILL CAUSE THE BLANKET NOT TO BE IN CONTACT WITH THE GROUND.
2. FOLLOW MANUFACTURER'S SPECIFICATIONS IN THE PLACEMENT OF STAPLES/STAKES TO SECURE THE BLANKET TO THE SLOPE.
3. ALL ANCHORING TRENCHES, OVERLAPS, OR CHECK SLOTS SHALL BE 6" MINIMUM.
4. PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED TO INSURE THAT THE EROSION CONTROL BLANKETS AND TURF MAT LINING OPERATE EFFICIENTLY.

PROPOSED CONST. SCHEDULE FOR THE YEAR 2025

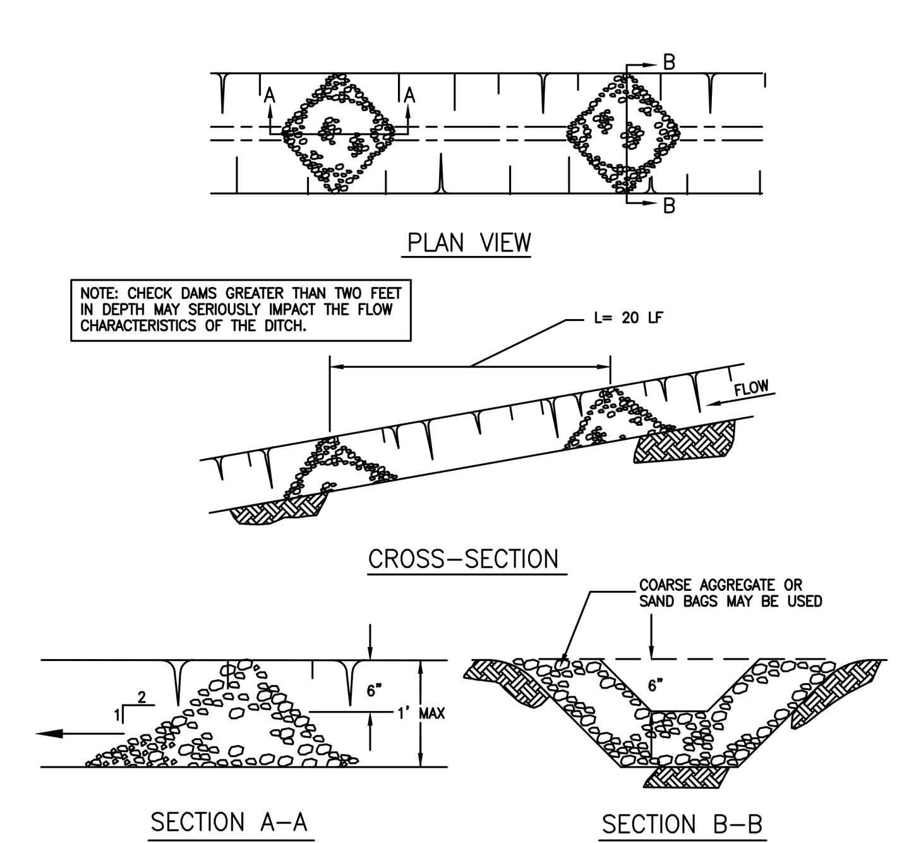
ACTIVITY	JUNE	JULY	AUG	SEP	OCT
DEMO & CLEAR*		—			
MASS GRADING		—	—		
ROAD CONST.			—		
FINAL GRADING				—	
SEED & MULCH				—	

*IMMEDIATELY AFTER INSTALLATION OF THE SESC MEASURES AND THE CLEARING WORK THE BASIN SHALL BE EXCAVATED, TOP SOILED, SEEDED AND MULCH BLANKETED, AND RINGED WITH SILT FENCE PRIOR TO THE MASS EARTH DISRUPTION.

SURFACE WATER & COUNTY DRAINS
WETLAND – ON SITE
LAKES – APPROXIMATELY 585 FT NE TO BAETCKE LAKE
STREAMS – N/A
BASINS – ON SITE
DRAINS – APPROXIMATELY 350 FT SW TO BOULDER CREEK TWP DRAIN
PONDS – APPROXIMATELY 410 FT E AT 4920 BRIGHTON OAKS TRAIL



TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT
NO SCALE



CHECK DAM
(NO SCALE)

CONTROLS & MEASURES POST CONSTRUCTION SEQUENCE			
ACTIVITY	WEEKLY	MONTHLY	AS REQUIRED
MAINTAIN LANDSCAPING, REPLACE MULCH	X	X	X
CLEAN INLETS		X	X
COLLECT LITTER	X		X
SWEEP PARKING LOT		X	X

CONTROLS & MEASURES NARRATIVE	
ACTIVITY	DESCRIPTION
MAINTAIN LANDSCAPING, REPLACE MULCH	COLLECT GRASS, TREE, AND SHRUB CLIPPINGS. DISPOSE IN APPROVED CONTAINER. REPLACE DEAD SOD, TREES AND SHRUBS.
CLEAN INLETS	REMOVE LITTER, SEDIMENT, AND DEBRIS. DISPOSE OF IN APPROVED LANDFILL.
COLLECT LITTER	DISPOSE OF WITH INLET DEBRIS.
SWEEP PARKING LOT	REMOVE MUD, DIRT, GREASE AND OIL WITH PERIODIC SWEEPING
DUST CONTROL	SPRINKLE WATER AS NEEDED

CONSTRUCTION SEQUENCE

THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT EROSION IS MINIMIZED AND THAT COMPLIANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS, REGULATIONS, AND ORDINANCES IS MAINTAINED THROUGHOUT EXECUTION OF THIS PROJECT.

1 DAYS	1.	INSTALL SILT FENCE AS SHOWN ON PLANS.
20 DAYS	2.	ROUGH GRADE AND INSTALL STORM DRAINAGE.
1 DAY	3.	INSTALL INLET PROTECTION ON STORM INLETS.
4 DAYS	4.	INSTALL PAVEMENT & GRAVEL ROAD SURFACE
4 DAYS	5.	FINE GRADE AROUND SITE, SPREAD TOPSOIL, SEED OR SOD AS APPLICABLE.
1 DAY	6.	REMOVE ALL EROSION CONTROL STRUCTURES.
1 DAY	7.	REMOVE ACCUMULATED SILT FROM ALL EXISTING DRAINAGE.

THE LOCATION AND ELEVATION OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE DRAWINGS ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION AND ELEVATION OF EXISTING UTILITIES AND PROPOSED UTILITY CROSSINGS IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF ANY CONFLICTS ARE APPARENT OR IF THE LOCATION OR DEPTH DIFFERS SIGNIFICANTLY FROM THE PLANS.

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 (TOLL FREE) FOR THE LOCATION OF UNDERGROUND FACILITIES

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

PROJECT: THE FARM
PREPARED FOR: MR. KEVIN VAN KANNEL, 65300 OLD HICKORY, BRIGHTON, MI 48116, (XXX) XXX-XXXX
TITLE: DRAINAGE, GRADING, & SESC PLAN

NO	BY	REVISION PER	DATE
1	NL	INITIAL TWP REVIEW	5/20/25

DESIGNED BY:	NL
DRAWN BY:	NL
CHECKED BY:	BL
SCALE:	1" = 50'
JOB NO:	24-380
DATE:	4/21/25
SHEET NO.	7

IMPACT ASSESSMENT
FOR
PRIVATE ROAD PETITION
"OLDE BARN COURT"
GENOA TOWNSHIP, LIVINGSTON COUNTY
MICHIGAN

Prepared for:

KEVIN VAN KANNEL
5300 OLD HICKORY
BRIGHTON, MI 48116
(810) 355-6300

Prepared by:

BOSS ENGINEERING COMPANY
3121 E. GRAND RIVER
HOWELL, MI 48843
(517) 546-4836

Issue Date: April 21,2025
Revised: May 20,2025

24-380 EIA

INTRODUCTION

The purpose of this Impact Assessment (IA) report is to show the effect that this proposed development may have on various factors in the general vicinity of the project. The format used for presentation of this report conforms to the *Submittal Requirements for Impact Assessment* guidelines in accordance with Section 18.07 of the published Zoning Ordinance for Genoa Township, Livingston County, Michigan.

DISCUSSION ITEMS

A. Name(s) and address(es) of person(s) responsible for preparation of the impact assessment and a brief statement of their qualifications.

Prepared For:
Kevin Van Kannel
5300 Old Hickory
Brighton, MI 48116
(810) 355-6300

Prepared By:
BOSS ENGINEERING COMPANY
Civil Engineers, Land Surveyors, Landscape Architects and Planners
3121 E. Grand River
Howell, MI 48843
(517) 546-4836

Boss Engineering has been successfully providing engineering, surveying, planning and landscape architecture services on land development projects since 1969. Since its beginning, Boss Engineering has strived to provide unparalleled professional services with integrity and respect to every client. Today, Boss provides a complete lineup of consulting services for each project, ranging from conceptual design through final construction. The company currently employs a variety of professions including civil engineers, surveyors, landscape architects and sanitarians.

B. Map(s) and written description / analysis of the project site including all existing structures, manmade facilities, and natural features. The analysis shall also include information for areas within 10 feet of the property. An aerial photograph or drawing may be used to delineate these areas.

The site is located on the north side of Brighton Rd, approximately 1,835 feet east of the Clifford Road intersection. The property consists of a single-family home, a couple of accessory structures, and undeveloped land. The property is zoned as Low Density Residential (LDR), with 666 lineal feet of frontage along Brighton Rd. The surrounding properties of the site are zoned as Low Density Residential (LDR).

C. Impact on natural features: A written description of the environmental characteristics of the site prior to development and following development, i.e., topography, soils, wildlife, woodlands, mature trees (eight inch caliper or greater), wetlands, drainage, lakes, streams, creeks or ponds. Documentation by a qualified wetland specialist shall be required wherever the Township determines that there is a potential regulated wetland. Reduced copies of the Existing Conditions Map(s) or aerial photographs may accompany written material.

The total site area is 20.39 acres. Current drainage patterns on site consist of slopes up to approximately 30%, with water being directed towards a wetland and a low area. The wetland begins as a narrow ditch, bisecting the property as it runs north, before transitioning into a larger wetland area in the northwest corner of the property which continues offsite to Baetcke Lake. The low area is in the southeast corner of the property along Brighton Road.

Boss Engineering completed a wetland delineation on May 12, 2025, in accordance with the 1987 USACOE Wetland Delineation Manual and the regional supplement for the Midwest region August 2010 and/or the regional supplement for the northcentral and northeast region January 2012. A routine methodology was used. Wetland transects, USACOE regional wetland data sheets (OMB 2024) were completed and boundary surveyed as part of the overall investigation. According to the National Wetlands Inventory the wetland onsite is classified as a mix of Palustrine Scrub-Shrub (PSS1C) & Palustrine Forested (PFO1C) wetland with an area of 7.76 acres. This wetland continues offsite to the northeast and changes classification to a Palustrine Emergent (PEMC) wetland of 0.75 acres along the edge of Baetcke Lake. Wetland disturbance will be limited to that required for the shared driveway crossing. A wetland permit from the Michigan Department of Environment, Great Lakes, & Energy will be obtained prior to construction of the shared driveway.

Vegetated areas onsite are mainly within or bordering the wetland area, with a tree line located along Brighton Road, while the remainder of the site is open area. A tree survey was completed by Boss Engineering on May 12, 2025, locating all trees with a caliper of eight (8) inches or greater within 100-feet of the private road easement and around the proposed detention basin. The proposed road will run through the tree line along Brighton Road, and the shared driveway will cross the narrow ditch portion of the wetland and through a portion of the wooded area in the northeast part of the property. Tree removal will be limited to that required for installation of the road, driveway, forebay, detention basin, and associated ditches and grading. The tree inventory list on sheet 3B of the attached site/construction plan shows which trees are proposed to be removed. The USDA Soil Conservation Service soil classification for the site is a majority Fox-Boyer Complex with some Carlisle Muck in wetland areas and Spinks-Oakville Loamy Sands for the southeast pothole area.

D. Impact on storm water management: 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 County Soil Conservation Service.

Surface runoff during periods of construction will be controlled by proper methods set forth by the Livingston County Drain Commissioner, including silt fence, temporary gravel entrance, and seed and mulch.

At the time of construction, there may be some temporary dust, noise, vibration and smoke, but these conditions will be of relatively short duration and shall be controlled by applying appropriate procedures to minimize the effects, such as watering if necessary for dust control.

The Site Plan documents show the proposed locations of all site improvements along with detailed soil erosion control information. The plans will be reviewed by the Livingston County Drain Commissioner's office for compliance with their regulations prior to issuance of a Soil Erosion Control permit.

E. Impact on surrounding land use: Description of the types of proposed uses and other man made facilities, including any project phasing, and an indication of how the proposed use

conforms or conflicts with existing and potential development patterns. A description shall be provided of any increases of light, noise or air pollution which could negatively impact adjacent properties.

The proposed land division creates 7 parcels on site, that are proposed for single family homes. This type of development conforms with current surrounding land uses for the site. The increase in light, noise or air pollution is minimal with only 7 single family homes being proposed while having a minimal impact on surrounding properties.

F. Impact on public facilities and services: Description of number of expected residents, employees, visitors, or patrons, and the anticipated impact on public schools, police protection and fire protection. Letters from the appropriate agencies may be provided, as appropriate.

With only 7 single family residential homes being proposed the impact on public facilities such as, Brighton Area Schools, and police and fire departments will be minimal.

G. Impact on public utilities: Description of the method to be used to service the development with water and sanitary sewer facilities, the method to be used to control drainage on the site and from the site, including runoff control during periods of construction. For sites service with sanitary sewer, calculations for pre- and post development flows shall be provided in equivalents to a single family home. Where septic systems are proposed, documentation or permits from the Livingston County Health Department shall be provided.

The development has no impact on public utilities, as it is not to be served by either public water or sanitary sewer. The site will utilize wells and septic fields to service the future houses of the individual lots. Soil borings were conducted with the Health Department, final approval of septic systems and wells are pending.

With regards to storm water management, the project will be required to meet all local, county and state storm water and erosion control requirements. All of the required information is included in the Site Plan documents. The increased volume of runoff due to development of the private road, along with the existing site runoff, will be detained onsite and outlet at a controlled rate into existing wetlands. Existing slopes and drainage patterns that are outside of the proposed development area will remain the same.

H. Storage or handling of any hazardous materials: Description of any hazardous substances expected to be used, stored or disposed of on the site. The information shall describe the type of materials, location within the site and method of containment. Documentation of compliance with federal and state requirements, and a Pollution Incident Prevention Plan (PIPP) shall be submitted, as appropriate.

There will be no hazardous materials used or disposed of on this site, such as gas cans, paint, etc.

I. Impact on traffic and pedestrians: A description of the traffic volumes to be generated based on national reference documents, such as the most recent edition of the Institute of Transportation Engineers Trip Generation Manual, other published studies or actual counts of similar uses in Michigan.

According to the Institute of Transportation Engineers Trip Generation 10th edition, with the construction of 7 single family homes, the expected number of trips generated by this development will be 66.08 total trips per day with an AM peak volume of 5.18 trips and a PM peak

volume of 6.93 trips. No center turn lane or bypass lane will be required by the Livingston County Road Commission.

J. A detailed traffic impact study shall be submitted for any site over ten (10) acres in size which would be expected to generate 100 directional vehicle trips (i.e. 100 inbound or 100 outbound trips) during the peak hour of traffic of the generator or on the adjacent streets.

The site is over 10 acres, however the proposed development will not generate 100 direction vehicle trips during the peak hour of traffic, therefore a detailed traffic impact study is not necessary.

K. Special Provisions: General description of any deed restrictions, protective covenants, master deed or association bylaws.

None at this time.

L. A list of all sources shall be provided.

Genoa Township's *Submittal Requirements for Impact Assessment*

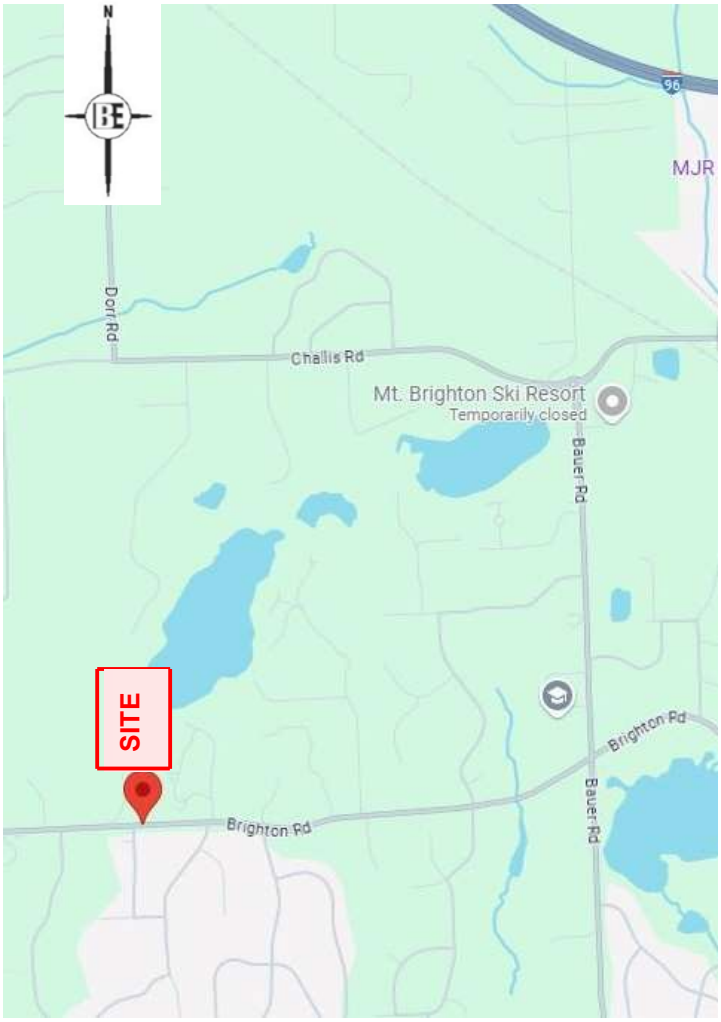
Genoa Township Zoning Ordinances

Soil Survey of Livingston County, Michigan, U.S.D.A. Soil Conservation Service

National Wetland Inventory Plan, United States Department of the Interior, Fish and Wildlife Service

Trip Generation Manual, 10th edition, Institute of Transportation Engineers

WETLAND DELINEATION FOR: VAN KANNEL



6025 Brighton Road
Brighton / Genoa Township
LIVINGSTON COUNTY, MI

I. Summary

A wetland delineation site visit was conducted at the property (parcel #'s 4711-27-400-011 and -012) in Genoa Township, MI on May 12, 2025.

The location is shown in the map figure at left. The gross overall site – both parcels - is 20.39 acres. During the site visit 2 wetlands were identified. Wetland 'A' is an approximately 0.09 acre drainage swale and Wetland 'B' is approximately 3.88 acres in size on-site – expanding north and west off the property. The site is bisected by a Section line. Parcel # – 011 is located in the SW ¼ of Section 26 and Parcel #-012 is located in the SE ¼ of Section 27. The purpose of the delineation was to determine existing conditions.

Report Index:

As part of the work the following information was reviewed for this report:

- National Wetland Inventory (NWI) Map 1
- USDA NRCS Soil Survey Map 2
- Aerial Map 3

Relatively normal conditions for the season existed for the site visit.

Wetland 'A' appears to be a partially 'ditched' natural drainage swale. Wetland 'B' is a fringe wetland to Baetcke Lake located northeast off-site. Wetland 'A' appears to have tertiary overflow connection to Wetland 'B' – a defined connecting channel was difficult to determine.

Owner: Kevin & Carolyne Van Kannel
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Brighton, MI 48116
Email: kvankannel00@comcast.net
Phone: 734-434-5963

Prepared By:

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

Patrick Cleary, PLA

May 22, 2025
Boss Project #24-380-1

The delineation was completed in accordance with the 1987 U.S. Army Corps of Engineers (USACOE) Wetland Delineation Manual, the Regional Supplement for the Northcentral and Northeast Region (NCNE) January 2012, and USACOE NC NE Plant List 2022. Wetlands were determined by the soil, vegetation and hydrology criteria that have been established by the USACOE - and adopted by the Michigan Department of Environment, Great Lakes and Energy (EGLE).

Due to the proximity of Wetland 'B' to the Lake (minimum water surface area of 36-acres plus additional fringe wetlands), and a presumed hydraulic connection between Wetlands 'A' and 'B', both wetland areas are most likely regulated wetlands. EGLE is the final arbiter for wetland determinations in the state (non-coastal).

There is a minimum wetland setback of 25-feet from wetlands contained in the Genoa Township Zoning ordinance. Permits and restrictions for any impact to wetlands for this site will be administered by EGLE.

II. Wetland Descriptions

Two wetlands were flagged in the field – Wetland 'A' (Transects A1, A2, A3) and 'B' (Transects B1, B2, B3):

Wetland 'A': This wetland approximately bisects the site, south to north and appears to have been a natural drainage swale that was excavated deeper for most of its length. The 'ditching' begins on-site at marker A1. The approximate total 0.09-acre swale continues to be more defined at an average width of 5-7-feet with progressively steeper (3:1) eroded banks and transitioning to surface water for a portion, to approximately a total of 3/4 of its length. Curiously, before it reaches the larger Wetland 'B' the swale spreads out with minimal definition. However, there still appears to be an overflow function with a hydraulic connection to Wetland 'B' and the approximate centerline was marked in the field to its connection to Wetland 'B'.

Three (3) Transects (A1, A2, A3) with 1 representative upland data sheet (total of 4), were completed to describe the varying conditions along the length of this linear wetland.

TRANSECT A1: This was documented perpendicularly to the swale at the south end at marker A3 (see 'Wetland Boundary Map' & Photo 1).

Soils & Hydrology: Soil at the center of the defined (3:1 side slopes) swale was a 10YR 4/2 mucky sand with few but prominent 10YR 3/6 copper red mottles developing at 7-inches through 14-inches. The soil was saturated at the surface, but no standing water was observed at this location. The soil appeared to meet the Sandy Mucky Mineral (S1) criteria.

Additional Hydrologic Indicators: The swale meets the definitions of Geomorphic Position (D2), the FAC-Neutral Test (D5), drainage patterns (B10), and water-stained leaves (B9).

Vegetation: Vegetation in the middle of the swale was dominated by Fowl Manna Grass (Glyceria striata) with clusters of Jewelweed (Impatiens capensis). Just outside the ditched swale, on both sides, were more decidedly upland species including Poison Ivy (Toxicodendron radicans) and Japanese Honeysuckle (Lonicera japonica) vines, seedling Boxelder (Acer negundo), and Black Cherry (Prunus serotina). There were also scattered Yellow Avens (Geum aleppicum), Garlic Mustard (Alliaria petiolate), and Dame's Rocket (Hesperis matronalis). There were also scattered larger Boxelder in the Tree Stratum – but overall density of vegetation outside of the swale was relatively low.

TRANSECT A2: This was documented perpendicularly to the swale at the south end at marker A6 (see 'Wetland Boundary Map' & Photo 2). This was also the transect that included the representative Upland data sheet information.

Soils & Hydrology: This transect was noted by the presence of standing water and darker soil within the swale. Soil at the center of the defined (3:1) partially eroded swale was a 10YR 2/2 mucky sand through 8-inches, then turning to a light sand (10YR 5/2, 8-12 inches, 10YR 6/2, 12-inches plus). There was no evident mottling through the sample soil section. Beginning between markers A5 & A6 through A8 was the wettest part of the wetland with standing water. No obvious flow was observed. The soil continued to appear to meet the Sandy Mucky Mineral (S1) criteria.

Outside of the swale at the transect the soil was a 10YR 4/3 sandy to loamy sand through 14-inches. Sampling taken elsewhere in the immediate area were similar with a few areas with a 10YR 5/2 to 10YR 6/2 color sand beginning at 12-14-inches.

Additional Hydrologic Indicators: The swale meets the definitions of Geomorphic Position (D2), the FAC-Neutral Test (D5), drainage patterns (B10), water-stained leaves (B9), and sparsely vegetated concave surface (B8).

Vegetation: This transect was noted by the significant reduction in overall vegetation. Vegetation in the middle of the swale were in clumps with the primary littered with water-stained leaves. There were 2 wetland dominants noted again here – Jewelweed (Impatiens capensis) and Fowl Manna Grass (Glyceria striata), but the grass cover percentage was greatly reduced (50% to 8%). Just outside the ditched swale, on both sides, were more decidedly upland species including Poison Ivy and Japanese Honeysuckle vines, seedling Boxelder, and Black Cherry.

Further outside of the swale were scattered amounts of Dame's Rocket / Mother-Of-The-Evening (Hesperis matronalis), Dead Nettle (Lamium purpureum), May-Apple (Podophyllum peltatum), Orchard Grass (Dactylis glomerata), Garlic Mustard (Alliaria petiolate), and Common Burdock (Arctium minus). The herbaceous stratum density was relatively low. Within the 15-foot plot size there were more Japanese Honeysuckle and Multiflora Rose (Rosa multiflora). Within the 30-ft plot size were several larger trees including Black Oak (Quercus veluntina), larger Boxelder, Red Maple (Acer rubrum), and Black Cherry. The overall area was generally forested with a relatively sparsely vegetated understory and a lot of leaf clutter.

TRANSECT A3: This was documented perpendicularly to the swale at the south end at marker A10 (see 'Wetland Boundary Map' & Photo 3).

Soils & Hydrology: This transect was noted by a much less defined swale, no evident previous additional excavation, no standing water, and less mucky – although still saturated at this point. Soil at the center of the swale (5-8% side slopes) was a 10YR 3/2 mucky sand with few but prominent 10YR 3/6 copper red mottles developing at 8-inches through 14-inches. The soil appeared to still meet the Sandy Mucky Mineral (S1) criteria.

Further north of this section the soil remained at a 10YR 2/2 to 10YR 3/2 color but without mottles and saturation – although still relatively more moist than the surroundings. The approximate centerline of the swale was continued to Wetland 'B' by this relative moisture transition, slight topographic definition, and the FAC to FACU vegetation bordering either side (May-Apple for example). From A11 to A15 this centerline may be more of an overflow or conveyance than wetland but indeterminant.

Additional Hydrologic Indicators: The swale meets the definitions of Geomorphic Position (D2), the FAC-Neutral Test (D5), drainage patterns (B10), water-stained leaves (B9), and sparsely vegetated concave surface (B8).

Vegetation: This transect was noted by being back to more overall vegetation – particularly more Fowl Manna Grass (20%). In addition to the increase in grass density the Jewelweed remained at a noticeable percentage (13%) and there was the addition of ferns – Sensitive Fern (Onoclea sensibilis) and Cinnamon Fern (Osmundastrum cinnamomeum) – in small percentages (5% & 7% respectively). Just outside the swale, on both sides, continued to be more decidedly upland species including Poison Ivy, Japanese Honeysuckle - and Virginia Creeper (Parthenocissus quinquefolia) - vines, seedling Boxelder, Black Cherry, and also seedling Green Ash (Fraxinus pennsylvanica) and American Elm (Ulmus americana). The overall area continued to be generally forested with a relatively sparsely vegetated understory and a lot of leaf clutter.

The boundary of Wetland 'A' was primarily determined by Geomorphic Position (D2), Saturation (A3) and corresponding FACW & OBL vegetation. In its present condition, with varying stretches of standing water, and no apparent regular flow the swale will most likely be considered a conveyance or 'linear wetland' by EGLE (not a 'stream').

Wetland 'B': This wetland is located in approximately the west 1/3 of the site. The wetland continues off-site & is a fringe wetland to Baetcke Lake with open water approximately at another 200-ft northwest of the site. There is approximately a total of 3.88-acres of wetland on-site. Wetland 'B' intersects Wetland 'A' between markers B7 & B8 (see the 'Wetland Boundary Map' & Photo 4).

Three (3) Transects (B1, B2, B3) with 1 representative upland data sheet (total of 4), were completed to describe the varying conditions along the perimeter of this fringe wetland.

TRANSECT B1: This was documented between markers B2 and B3 near the north end of the site (see 'Wetland Boundary Map' & Photo 5).

Soils & Hydrology: This transect was noted for its distinct line between sandy slope and thick muck. Soil at the bottom of the defined (20-25%) sandy slope was a distinct 10YR 2/1 muck through 14-inches from a 10YR 4/3 loamy sand. There was standing water and a presumed water table at this water's edge location. The soil sample met the Muck (A10) criteria.

Additional Hydrologic Indicators: The wetland at this transect meets the definitions of Geomorphic Position (D2), the FAC-Neutral Test (D5), drainage patterns (B10), water-stained leaves (B9) and inundation seen from aerial imagery (C9 & B7).

Vegetation: This transect was marked by a distinct change from forested to open wetland. Vegetation in the obvious wetland was dominated by Reed Canary Grass (Phalaris arundinacea) (50%) followed by Hardstem Rush (Schoenoplectus acutus) (20%). Cattail (Typha angustifolia) was a lesser percentage (15%) at the wetland edge of the plot but dominant further into the wetland to the north and west.

On the upland bank side of the plot shrub & tree plot sizes were more decidedly upland species including Japanese Honeysuckle (Lonicera japonica), Multiflora Rose (Rosa multiflora), and a few Hazelnut (Corylus americana). There was also seedling and larger Green Ash (Fraxinus pennsylvanica), American Elm (Ulmus americana), Swamp White Oak (Quercus bicolor), and Boxelder (Acer negundo).

TRANSECT B2: This was documented at marker B15 on the south side of where Wetland 'A' and Wetland 'B' intersect, facing more west (see 'Wetland Boundary Map' & Photo 6).

Soils & Hydrology: This transect was noted for its distinct line between sandy slope and thick muck but at less of a steep slope (8-10% vs 20-25%). Soil at the bottom of the slope was again a distinct 10YR 2/1 muck through 14-inches from a 10YR 4/3 loamy sand. There was no standing water but saturation & sparse vegetation. At the time of the visit it appeared that the area was recently inundated. The soil sample met the Muck (A10) criteria.

Additional Hydrologic Indicators: The wetland at this transect meets the definitions of Geomorphic Position (D2), the FAC-Neutral Test (D5), drainage patterns (B10), water-stained leaves (B9) and inundation seen from aerial imagery (C9 & B7).

Vegetation: This transect was marked by a distinct change from forested to open wetland but with less vegetation at the edge. Dominant vegetation in the obvious wetland included less Reed Canary Grass (5%) but Blue Flag Iris (Iris versicolor) (15%) and Sensitive Fern (15%) along with Hardstem Rush (7%) & Yellow Avens (8%). Further into the wetland was dominanted by shrubs – what appeared to be Speckled Alder (Alnus incana) and not open water or Cattail.

On the upland bank side of the plot shrub & tree plot sizes were again more decidedly upland species including Japanese Honeysuckle, Multiflora Rose along with seedling and larger Green Ash, American Elm, Swamp White Oak, and Boxelder.

Further upland there were many of the same species as noted around Wetland 'A' (listed in Data Sheet A2-2 & B2-2) and with the addition of Trillium (Trillium grandiflorum) and unfortunate Japanese Barberry (Berberis thunbergii) in scattered clusters.

TRANSECT B3: This was documented at marker B21. This marker was at a mostly enclosed depression off the 'main' wetland but had an evident surface connection so not documented as a separate wetland (see 'Wetland Boundary Map' & Photos 7 & 8).

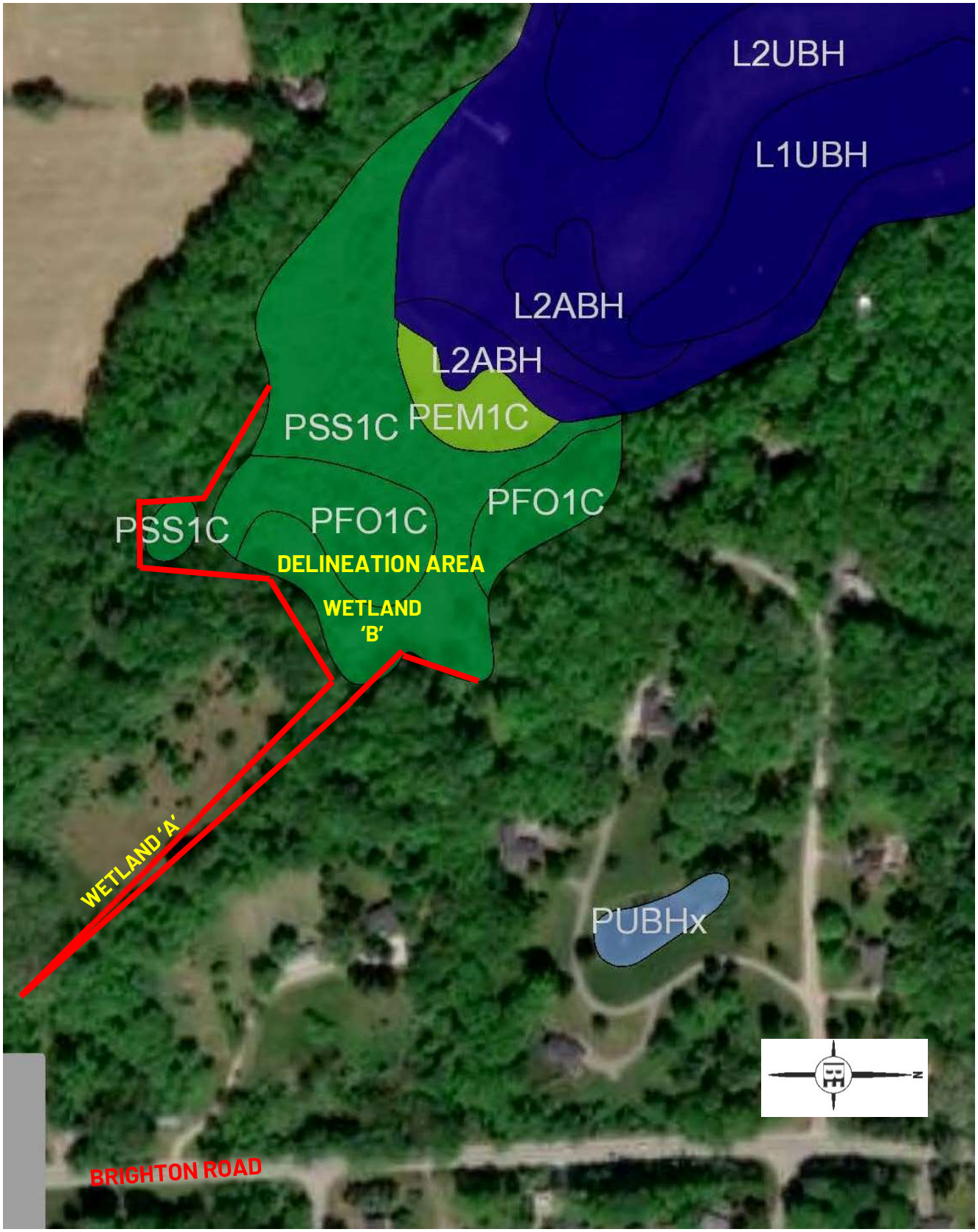
Soils & Hydrology: This transect was noted for its distinct line between sandy slope (7-8%) and thick muck with standing water. Soil at the bottom of the slope was again a distinct 10YR 2/1 muck through 14-inches from a 10YR 4/3 loamy sand. There was shallow, mucky standing water at the edge that became deeper approximately another 8-feet further in. At the time of the visit it also appeared that the area was recently inundated. The soil sample met the Muck (A10) criteria.

Additional Hydrologic Indicators: The wetland at this transect meets the definitions of Geomorphic Position (D2), the FAC-Neutral Test (D5), drainage patterns (B10), water-stained leaves (B9) and inundation seen from aerial imagery (C9 & B7).

Vegetation: This transect was marked by a distinct change from forested to shrub-scrub wetland There was less vegetation at the edge but dominated by Speckled Alder further in. Dominant vegetation in the obvious wetland included Common Duckweed (Lemna minor) (25%+), Sensitive Fern (16%), Yellow Avens (12%) & Blue Flag Iris (7%).

The boundary of Wetland 'B' was primarily determined by Geomorphic Position (D2) with a distinct, abrupt change from sandy soil to muck and a corresponding abrupt change from upland vegetation species to FACW & OBL vegetation.

III. Reference Maps



MAP 1 – National Wetland Inventory (NWI) Map

MAP 2 – USDA NRCS Hydric Soils Map

MAP 3 – Livingston County GIS Parcel Aerial Map

IV. Site Photos

PHOTO 1 – Wetland 'A' – Looking North, near marker A3

PHOTO 2 – Wetland 'A' – Looking North, near marker A6

PHOTO 3 – Wetland 'A', Looking North, between markers A9 & A10, swale becoming less defined

PHOTO 4 – Wetland 'B' - Looking West, where Wetlands Meet

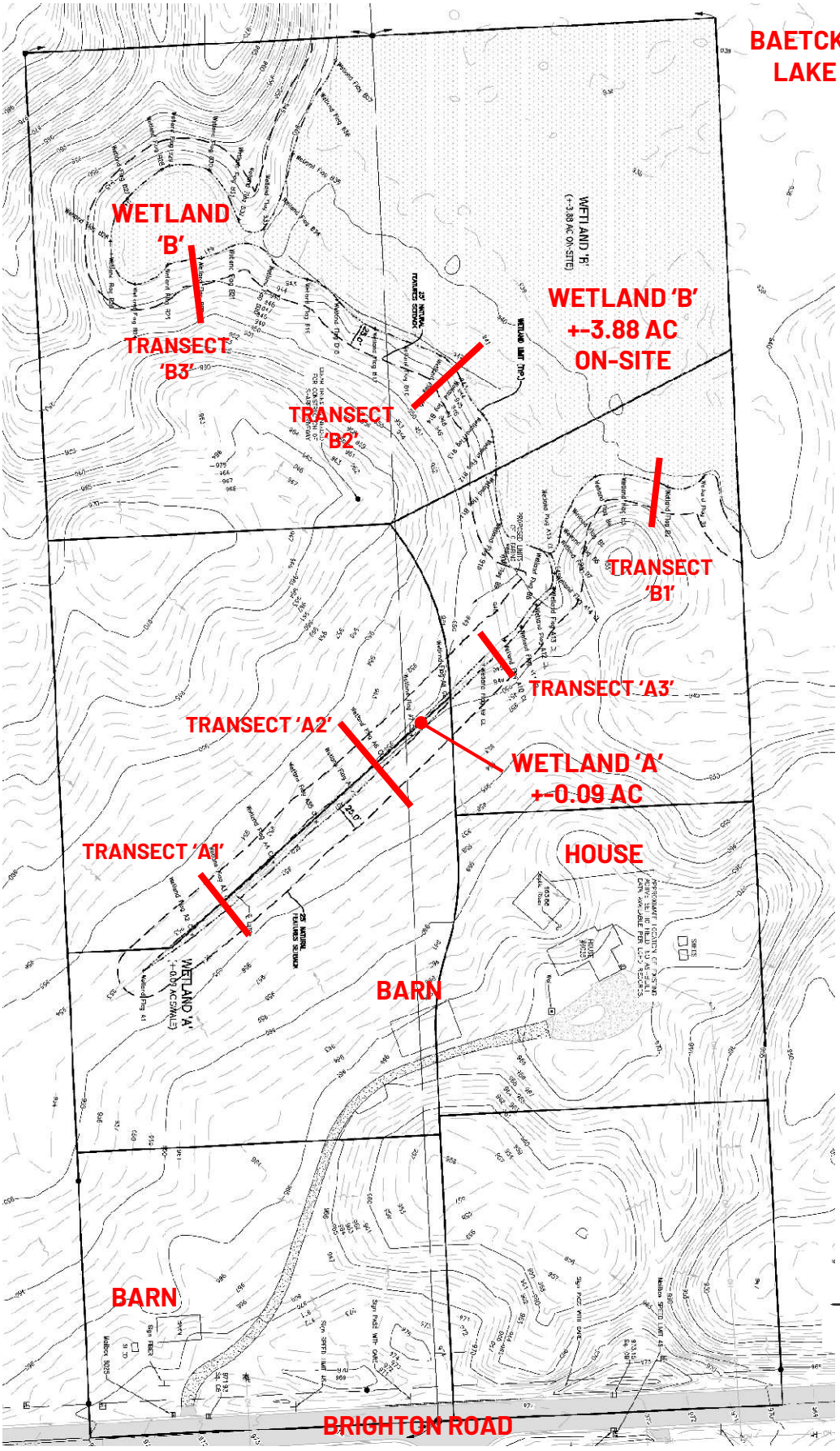
PHOTO 5 – Wetland 'B' Looking West, near marker B2

PHOTO 6 – Wetland 'B' Looking West, near marker B15

PHOTO 7 – Wetland 'B', Looking West, near marker B21, at 'narrows'

PHOTO 8 – Wetland 'B', Looking southwest, near marker B22

WETLAND BOUNDARY MAP



U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Van Kannel / 6025 Brighton Road | City/County: Genoa Twnshp, Livingston | Sampling Date: 5/12/25
Applicant/Owner: Kevin & Carolyn Van Kannel | State: MI | Sampling Point: A1-1
Investigator(s): Patrick Cleary | Section, Township, Range: Sections 27 & 28, T2N-R5E
Landform (hillside, terrace, etc.): swale | Local relief (concave, convex, none): concave
Slope (%): 33 | Lat: 42 deg 32' 49" N | Long: 83 deg 49' 52"W | Datum: NAVD88
Soil Map Unit Name: Carisle Muck (CarabA), Fox-Boyer Complex (FrB/FrC) | NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? **Yes** X **No** ____

Remarks:
TRANSECT A1-1 - WETLAND: Sample taken at A3. Defined 5'-7- wide swale - appears to have been ditched out at some point (wetland portion starts at A-1, swale continues a little further, less defined)

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	15	Yes	FAC
2.			
3.			
4.			
5.			
	15	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Acer negundo*	15	Yes	FAC
2. *Prunus serotina*	5	Yes	FACU
3.			
4.			
5.			
	20	=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Impatiens capensis*	20	Yes	FACW
2. *Glyceria striata*	50	Yes	OBL
3. *Geum aleppicum*	8	No	FACW
4. *Alliaria petiolata*	5	No	FAC
5. *Hesperis matronalis*	2	No	FACU
6.			
7.			
8.			
9.			
10.			
	85	=Total Cover	
Woody Vine Stratum (Plot size: 15)			
1. *Toxicodendron radicans*	10	Yes	FAC
2. *Lonicera japonica*	15	Yes	FACU
	25	=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)
Total Number of Dominant Species Across All Strata: 7 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 71.4% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	28	x 2 =	56
FAC species	45	x 3 =	135
FACU species	22	x 4 =	88
UPL species	0	x 5 =	0
Column Totals:	145 (A)		329 (B)

Prevalence Index = B/A = 2.27

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Heavily vegetated with Fowl Manna Grass & clusters of Jewelweed in center, the vines, shrubs & trees on the swale edges

SOIL

Sampling Point: A1-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 4/2	100					Mucky Sand	
7-14	10YR 4/2	85	10YR 3/6	15	C	M	Mucky Sand	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- X Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Silty mucky sand through 7" then progressively more silt and a little clay through 14"

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Saturated at surface but no surface water; defined swale / channel with steep banks

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Van Kannel / 6025 Brighton Road | City/County: Genoa Twnshp, Livingston | Sampling Date: 5/12/25

Applicant/Owner: Kevin & Carolyn Van Kannel | State: MI | Sampling Point: A2-1

Investigator(s): Patrick Cleary | Section, Township, Range: Sections 27 & 28, T2N-R5E

Landform (hillside, terrace, etc.): swale | Local relief (concave, convex, none): concave

Slope (%): 33 | Lat: 42 deg 32' 49" N | Long: 83 deg 49' 52"W | Datum: NAVD88

Soil Map Unit Name: Carisle Muck (CarabA), Fox-Boyer Complex (FrB/FrC) | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
TRANSECT A2-1 - WETLAND: Sample taken at A6. Defined 6'-7- wide swale - appears to have been ditched out at some point. Relatively lower, water at surface, flow indeterminant

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	15	Yes	FAC
2.			
3.			
4.			
5.			
	15	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Acer negundo*	10	Yes	FAC
2. *Prunus serotina*	5	Yes	FACU
3.			
4.			
5.			
	15	=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Impatiens capensis*	20	Yes	FACW
2. *Glyceria striata*	8	Yes	OBL
3. *Onoclea sensibilis*	7	No	FACW
4. *Osmundastrum cinnamomeum*	5	No	FACW
5. *Geum aleppicum*	5	No	FACW
6.			
7.			
8.			
9.			
10.			
	45	=Total Cover	
Woody Vine Stratum (Plot size: 15)			
1. *Toxicodendron radicans*	7	Yes	FAC
2. *Lonicera japonica*	15	Yes	FACU
	22	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 71.4% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	8	x 1 =	8
FACW species	37	x 2 =	74
FAC species	32	x 3 =	96
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	97 (A)		258 (B)

Prevalence Index = B/A = 2.66

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Sparsely vegetated with clumps of Jewelweed , less Fowl Manna Grass, more Sensitive & Cinnammon Ferns in center; vine, shrub, tree at edges

SOIL

Sampling Point: A2-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/2	100					Mucky Sand	
8-12	10YR 5/2	100					Mucky Sand	
12-13	10YR 6/2	100					Sandy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- X Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Silty mucky sand through 8" then progressively more sandy through 13"

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 0		
Water Table Present?	Yes ___	No X	Depth (inches): ___		
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0	**Wetland Hydrology Present?**	**Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Surface water present, beginning between A-5 & A-6; more water-stained leaves, much less overall herbaceous vegetation

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Van Kannel / 6025 Brighton Road City/County: Genoa Twnshp, Livingston Sampling Date: 5/12/25

Applicant/Owner: Kevin & Carolyn Van Kannel State: MI Sampling Point: A2-2

Investigator(s): Patrick Cleary Section, Township, Range: Sections 27 & 28, T2N-R5E

Landform (hillside, terrace, etc.): swale Local relief (concave, convex, none): concave

Slope (%): 4-6 Lat: 42 deg 32' 49" N Long: 83 deg 49' 52"W Datum: NAVD88

Soil Map Unit Name: Carisle Muck (CarabA), Fox-Boyer Complex (FrB/FrC) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "N X Yes X No ____

Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling p X

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
TRANSECT A2-2 - REPRESENTATIVE UPLAND: Sample taken near A6. Low sloping terrain either side of swale/ditch

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	15	Yes	FAC
2. *Acer rubrum*	3	No	FAC
3. *Quercus velutina*	10	Yes	UPL
4. *Prunus serotina*	7	Yes	FACU
5.			
	35	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Acer negundo*	10	Yes	FAC
2. *Prunus serotina*	4	No	FACU
3. *Rosa multiflora*	10	Yes	FACU
4. *Fraxinus pennsylvanica*	3	No	FACW
5. *Ulmus americana*	3	No	FACW
	30	=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Geum aleppicum*	3	No	FACW
2. *Hesperis matronalis*	7	Yes	FACU
3. *Arctium minus*	5	Yes	FACU
4. *Alliaria petiolata*	5	Yes	FAC
5. *Lamium purpureum*	5	Yes	UPL
6. *Dactylis glomerata*	7	Yes	FACU
7. *Taraxacum officinale*	3	No	FACU
8. *Podophyllum peltatum*	5	Yes	FACU
9.			
10.			
	40	=Total Cover	
Woody Vine Stratum (Plot size: 15)			
1. *Parthenocissus quinquefolia*	7	Yes	FACU
2. *Lonicera japonica*	10	Yes	FACU
	17	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 13 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 23.1% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	9	x 2 =	18
FAC species	33	x 3 =	99
FACU species	65	x 4 =	260
UPL species	15	x 5 =	75
Column Totals:	122 (A)		452 (B)
Prevalence Index = B/A =			3.70

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
Generally sparsely vegetated herbaceous layer with scattered groupings; mostly seedling trees, most larger tr

SOIL

Sampling Point: A2-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 4/3	100					Sandy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

Darker sand, somewhat moist

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Sandy, relatively flat but draining toward swale

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Van Kannel / 6025 Brighton Road | City/County: Genoa Twnshp, Livingston | Sampling Date: 5/12/25
Applicant/Owner: Kevin & Carolyn Van Kannel | State: MI | Sampling Point: A3-1
Investigator(s): Patrick Cleary | Section, Township, Range: Sections 27 & 28, T2N-R5E
Landform (hillside, terrace, etc.): swale | Local relief (concave, convex, none): concave
Slope (%): 8 | Lat: 42 deg 32' 49" N | Long: 83 deg 49' 52"W | Datum: NAVD88
Soil Map Unit Name: Carisle Muck (CarabA), Fox-Boyer Complex (FrB/FrC) | NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? **Yes** X **No** ____

Remarks:
TRANSECT A3-1 - WETLAND: Sample taken at A10. Defined 6'-7'- wide swale - much less defined channel A10-A15 - swale identified by slight depression and vegetation or lack there of

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	10	Yes	FAC
2. *Acer rubrum*	5	Yes	FAC
3.			
4.			
5.			
	15	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Acer negundo*	5	Yes	FAC
2. *Prunus serotina*	3	No	FACU
3. *Fraxinus pennsylvanica*	5	Yes	FACW
4. *Ulmus americana*	3	No	FACW
5.			
	16	=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Impatiens capensis*	13	Yes	FACW
2. *Glyceria striata*	20	Yes	OBL
3. *Onoclea sensibilis*	5	No	FACW
4. *Osmundastrum cinnamomeum*	7	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
	45	=Total Cover	
Woody Vine Stratum (Plot size: 15)			
1. *Toxicodendron radicans*	7	Yes	FAC
2. *Parthenocissus quinquefolia*	12	Yes	FACU
	19	=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)
Total Number of Dominant Species Across All Strata: 8 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 87.5% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	33	x 2 =	66
FAC species	27	x 3 =	81
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	95 (A)		227 (B)

Prevalence Index = B/A = 2.39

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
More sparsely vegetated with clumps of Jewelweed , more Fowl Manna Grass, few Sensitive & Cinnammon Ferns; Larger Red Maple at 30' edge

SOIL

Sampling Point: A3-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	100					Mucky Sand	
8-13	10YR 3/2	85	10YR 3/6	15	C	M	Mucky Sand	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- X Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Mucky sand with few prominent mottles beginning at 8"

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No surface water but still saturated, somewhat less mucky

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Van Kannel / 6025 Brighton Road | City/County: Genoa Twnshp, Livingston | Sampling Date: 5/12/25

Applicant/Owner: Kevin & Carolyn Van Kannel | State: MI | Sampling Point: B1-1

Investigator(s): Patrick Cleary | Section, Township, Range: Sections 27 & 28, T2N-R5E

Landform (hillside, terrace, etc.): swale | Local relief (concave, convex, none): concave

Slope (%): 20-25 | Lat: 42 deg 31' 48" N | Long: 83 deg 49' 52"W | Datum: NAVD88

Soil Map Unit Name: Carisle Muck (CarabA), Fox-Boyer Cmplx (FrB/FrC), Spinks-Oakville Loam Sand (SvE) | NWI classification: PFO1C / PSS1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
TRANSECT B1-1 - WETLAND: Sample taken between B2 & B3. Distinct topographic and vegetative line from forest to open wetland, sand to muck.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	5	No	FAC
2. *Ulmus americana*	15	Yes	FACW
3. *Fraxinus pennsylvanica*	10	Yes	FACW
4. *Quercus bicolor*	15	Yes	FACW
5.			
	45	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Corylus americana*	3	No	FACU
2. *Fraxinus pennsylvanica*	7	No	FACW
3. *Ulmus americana*	8	Yes	FACW
4. *Lonicera japonica*	7	No	FACU
5. *Rosa multiflora*	15	Yes	FACU
	40	=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Phalaris arundinacea*	50	Yes	FACW
2. *Typha angustifolia*	15	No	OBL
3. *Schoenoplectus acutus*	20	Yes	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	85	=Total Cover	
Woody Vine Stratum (Plot size: 15)			
1. *Rubus allegheniensis*	13	Yes	FACU
2. *Lonicera japonica*	7	Yes	FACU
	20	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	35	x 1 =	35
FACW species	105	x 2 =	210
FAC species	5	x 3 =	15
FACU species	45	x 4 =	180
UPL species	0	x 5 =	0
Column Totals:	190 (A)		440 (B)

Prevalence Index = B/A = 2.32

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Heavily vegetated with Reed Canary Grass at wetland edge, with some Hardstem Rush, Cattail wet edge of plot; vines, shrubs & trees on bank

SOIL

Sampling Point: B1-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/1	100					Muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Thick muck at well defined edge from sandy bank

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 0
Water Table Present?	Yes X	No ___	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Water at surface with apparent water level line

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Van Kannel / 6025 Brighton Road | City/County: Genoa Twnshp, Livingston | Sampling Date: 5/12/25
Applicant/Owner: Kevin & Carolyn Van Kannel | State: MI | Sampling Point: B2-1
Investigator(s): Patrick Cleary | Section, Township, Range: Sections 27 & 28, T2N-R5E
Landform (hillside, terrace, etc.): swale | Local relief (concave, convex, none): concave
Slope (%): 8-10 | Lat: 42 deg 31' 48" N | Long: 83 deg 49' 52"W | Datum: NAVD88
Soil Map Unit Name: Carisle Muck (CarabA), Fox-Boyer Cmplx (FrB/FrC), Spinks-Oakville Loam Sand (SvE) | NWI classification: PFO1C / PSS1C
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
TRANSECT B2-1 - WETLAND: Sample taken at B15. Distinct soil and vegetative line from sand to muck, forested to scrub-shrub, but less of a steep topographic change

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	8	No	FAC
2. *Ulmus americana*	15	Yes	FACW
3. *Fraxinus pennsylvanica*	7	No	FACW
4. *Quercus bicolor*	10	Yes	FACW
5. *Acer rubrum*	10	Yes	FAC
	50	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Alnus incana*	3	No	FACW
2. *Fraxinus pennsylvanica*	7	No	FACW
3. *Ulmus americana*	8	Yes	FACW
4. *Lonicera japonica*	10	Yes	FACU
5. *Rosa multiflora*	12	Yes	FACU
	40	=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Phalaris arundinacea*	5	No	FACW
2. *Iris versicolor*	15	Yes	OBL
3. *Schoenoplectus acutus*	7	No	OBL
4. *Geum aleppicum*	8	No	FACW
5. *Onoclea sensibilis*	15	Yes	FACW
6.			
7.			
8.			
9.			
10.			
	50	=Total Cover	
Woody Vine Stratum (Plot size: 15)			
1. *Rubus allegheniensis*	5	Yes	FACU
2. *Toxicodendron radicans*	10	Yes	FAC
	15	=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)
Total Number of Dominant Species Across All Strata: 10 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 70.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	22	x 1 =	22
FACW species	78	x 2 =	156
FAC species	28	x 3 =	84
FACU species	27	x 4 =	108
UPL species	0	x 5 =	0
Column Totals:	155 (A)		370 (B)
Prevalence Index = B/A =	2.39		

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
At transect sparsely vegetated but thicker vegetation in the area - shrubs & trees at edge of respective plot sizes

SOIL

Sampling Point: B2-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/1	100					Muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Thick muck at well defined edge from sandy bank

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Surface water present at spots in the area but not at the transect; sparsely vegetated

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Van Kannel / 6025 Brighton Road City/County: Genoa Twnshp, Livingston Sampling Date: 5/12/25

Applicant/Owner: Kevin & Carolyn Van Kannel State: MI Sampling Point: B2-2

Investigator(s): Patrick Cleary Section, Township, Range: Sections 27 & 28, T2N-R5E

Landform (hillside, terrace, etc.): swale Local relief (concave, convex, none): concave

Slope (%): 10-25 Lat: 42 deg 32' 49" N Long: 83 deg 49' 52"W Datum: NAVD88

Soil Map Unit Name: Carisle Muck (CarabA), Fox-Boyer Complex (FrB/FrC) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "N X Yes X No ____

Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling p X

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
TRANSECT B2-2 - REPRESENTATIVE UPLAND: Sample taken near B15. Undulating, steeper sloping terrain

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	15	Yes	FAC
2. *Acer rubrum*	5	No	FAC
3. *Quercus velutina*	20	Yes	UPL
4. *Prunus serotina*	10	Yes	FACU
5.			
	50	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Acer negundo*	12	Yes	FAC
2. *Prunus serotina*	7	No	FACU
3. *Rosa multiflora*	10	Yes	FACU
4. *Berberis thunbergii*	8	Yes	FACU
5. *Ulmus americana*	3	No	FACW
	40	=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Geum aleppicum*	2	No	FACW
2. *Hesperis matronalis*	8	Yes	FACU
3. *Arctium minus*	5	No	FACU
4. *Alliaria petiolata*	8	Yes	FAC
5. *Lamium purpureum*	3	No	UPL
6. *Dactylis glomerata*	3	No	FACU
7. *Taraxacum officinale*	3	No	FACU
8. *Podophyllum peltatum*	10	Yes	FACU
9. *Trillium grandiflorum*	8	Yes	UPL
10.			
	50	=Total Cover	
Woody Vine Stratum (Plot size: 15)			
1. *Parthenocissus quinquefolia*	10	Yes	FACU
2. *Lonicera japonica*	15	Yes	FACU
	25	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 12 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	40	x 3 =	120
FACU species	89	x 4 =	356
UPL species	31	x 5 =	155
Column Totals:	165 (A)		641 (B)

Prevalence Index = B/A = 3.88

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
Generally open forested understory with a lot of leaf clutter

SOIL

Sampling Point: B2-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 4/3	100					Sandy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Sandy, undulating terrain

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Van Kannel / 6025 Brighton Road | City/County: Genoa Twnshp, Livingston | Sampling Date: 5/12/25
Applicant/Owner: Kevin & Carolyn Van Kannel | State: MI | Sampling Point: B3-1
Investigator(s): Patrick Cleary | Section, Township, Range: Sections 27 & 28, T2N-R5E
Landform (hillside, terrace, etc.): swale | Local relief (concave, convex, none): concave
Slope (%): 7-8 | Lat: 42 deg 32' 50" N | Long: 83 deg 49' 52"W | Datum: NAVD88
Soil Map Unit Name: Carisle Muck (CarabA), Fox-Boyer Complex (FrB/FrC) | NWI classification: PSS1C
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? **Yes** X **No** ____

Remarks:
TRANSECT B3-1 - WETLAND: Sample taken at B22. Distinct soil & vegetative line from sand to muck, forested to scrub-shrub, less of a steep topographic change. Transect in a mostly enclosed depression off the main wetland but evident surface connection - not numbered separately

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	3	No	FAC
2. *Ulmus americana*	15	Yes	FACW
3. *Fraxinus pennsylvanica*	10	Yes	FACW
4. *Quercus bicolor*	5	No	FACW
5.			
	33	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Alnus incana*	20	Yes	FACW
2. *Fraxinus pennsylvanica*	5	No	FACW
3. *Ulmus americana*	10	Yes	FACW
4. *Lonicera japonica*	8	No	FACU
5. *Rosa multiflora*	7	No	FACU
	50	=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Lemna minor*	25	Yes	OBL
2. *Iris versicolor*	7	No	OBL
3. *Schoenoplectus acutus*	5	No	OBL
4. *Geum aleppicum*	12	No	FACW
5. *Onoclea sensibilis*	16	Yes	FACW
6.			
7.			
8.			
9.			
10.			
	65	=Total Cover	
Woody Vine Stratum (Plot size: 15)			
1. *Parthenocissus quinquefolia*	5	Yes	FACU
2. *Toxicodendron radicans*	10	Yes	FAC
	15	=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)
Total Number of Dominant Species Across All Strata: 8 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 87.5% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	37	x 1 =	37
FACW species	93	x 2 =	186
FAC species	13	x 3 =	39
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	163 (A)		342 (B)
Prevalence Index = B/A =			2.10

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
At transect sparsely vegetated but thicker vegetation in the area - shrubs & trees at edge of respective plot sizes; some open water

SOIL

Sampling Point: B3-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/1	100					Muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Thick muck at well defined edge from sandy bank

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 0
Water Table Present?	Yes X	No ___	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Thick muck transitioning quickly to deeper standing water then shrubs at the interior

SITE PLAN / CONSTRUCTION PLANS
FOR
THE FARM
A RESIDENTIAL DEVELOPMENT
PART OF S.W. 1/4 SECTION 26 & S.E. 1/4 SECTION 27, T.2N., R.5E.
GENOA TOWNSHIP, LIVINGSTON COUNTY, MI

PROPERTY DESCRIPTION:

PROPERTY DESCRIPTION AS SUPPLIED:
PROPERTY DESCRIPTIONS PER BOSS ENGINEERING SURVEY, JOB NO. 11-011C, DATED 5-24-11, AS RECORDED IN INSTRUMENT #2012S-0043, LIVINGSTON COUNTY RECORDS:

DESCRIPTION OF PARCEL 4711-26-300-011, AS SURVEYED:
PART OF THE SOUTHWEST 1/4 OF SECTION 26, T2N-R5E, GENOA TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN, MORE PARTICULARLY DESCRIBED AS FOLLOWS: BEGINNING AT THE SOUTHWEST CORNER OF SECTION 26, SAID POINT ALSO BEING THE SOUTHEAST CORNER OF SECTION 27; THENCE ALONG THE WEST LINE OF SECTION 26, ALSO BEING THE EAST LINE OF SECTION 27, N 02°34'25" W, 1334.04 FEET (RECORDED AS N 02°33'50" W, 1334.08 FEET); THENCE ALONG THE NORTH LINE OF THE SOUTH 1/2 OF THE SOUTHWEST 1/4 OF SECTION 26, AS SURVEYED AND MONUMENTED, N 87°10'05" E, 330.78 FEET (RECORDED AS N 87°26'10" E, 326.51 FEET); THENCE ALONG THE EAST LINE OF THE WEST 10 ACRES OF THE SOUTHWEST 1/4 OF THE SOUTHWEST 1/4 OF SECTION 26, AS SURVEYED AND MONUMENTED, S 02°36'30" E, 1335.65 FEET (RECORDED AS S 02°31'47" E, 1334.09 FEET); THENCE ALONG THE CENTERLINE OF BRIGHTON ROAD (66 FOOT WIDE RIGHT OF WAY) AND THE SOUTH LINE OF SECTION 27, S 87°38'16" W, 331.59 FEET (RECORDED AS S 87°26'19" W, 331.48 FEET), TO THE POINT OF BEGINNING, CONTAINING 10.15 ACRES, MORE OR LESS AND SUBJECT TO THE RIGHTS OF THE PUBLIC OVER THE EXISTING BRIGHTON ROAD. ALSO SUBJECT TO ANY OTHER EASEMENTS OR RESTRICTIONS OF RECORD.

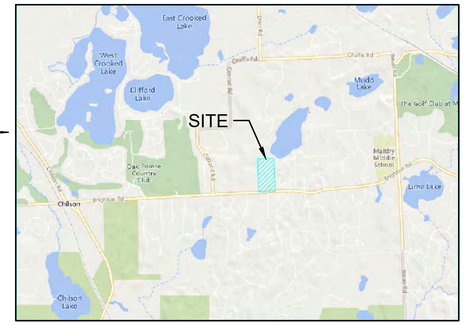
DESCRIPTION OF PARCEL 4711-27-400-012, AS SURVEYED:
PART OF THE SOUTHEAST 1/4 OF SECTION 27, T2N-R5E, GENOA TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN, MORE PARTICULARLY DESCRIBED AS FOLLOWS: BEGINNING AT THE SOUTHEAST CORNER OF SECTION 27, SAID POINT ALSO BEING THE SOUTHWEST CORNER OF SECTION 26; THENCE ALONG THE CENTERLINE OF BRIGHTON ROAD (66 FOOT WIDE RIGHT OF WAY) AND THE SOUTH LINE OF SECTION 27, S 87°19'30" W, 334.70 FEET (RECORDED AS 334.72 FEET); THENCE ALONG THE WEST LINE OF THE EAST 1/2 OF THE EAST 1/2 OF THE SOUTHEAST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 27, AS SURVEYED, N 02°32'41" E, 1333.89 FEET (RECORDED AS N 02°32'14" W, 1333.91 FEET), THENCE ALONG THE NORTH LINE OF THE SOUTH 1/2 OF THE SOUTHEAST 1/4 OF SECTION 27, AS SURVEYED, N 87°17'41" E, 334.03 FEET (RECORDED AS N 87°17'45" W, 334.10 FEET); THENCE ALONG THE EAST LINE OF SECTION 27, ALSO BEING THE WEST LINE OF SECTION 26, S 02°34'25" E, 1334.04 FEET (RECORDED AS S 02°33'50" E, 1334.08 FEET), TO THE POINT OF BEGINNING, CONTAINING 10.24 ACRES, MORE OR LESS AND SUBJECT TO THE RIGHTS OF THE PUBLIC OVER THE EXISTING BRIGHTON ROAD. ALSO SUBJECT TO ANY OTHER EASEMENTS OR RESTRICTIONS OF RECORD.

TRAFFIC STATEMENT

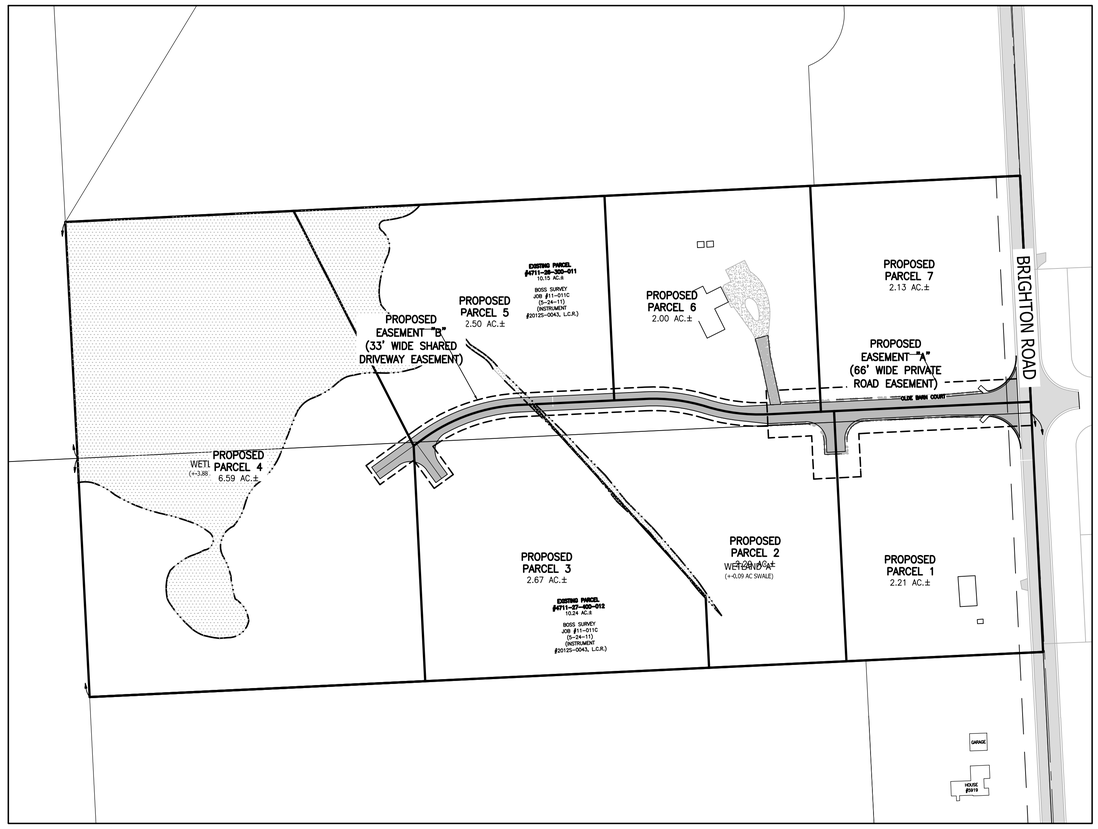
USE INSTITUTE OF TRANSPORTATION ENGINEERS TRIP GENERATION MANUAL – 10TH EDITION CODE NUMBER 210 (SINGLE-FAMILY DETACHED HOUSING). THE SITE CONTAINS 7 DWELLING UNITS.

FOR SINGLE-FAMILY DETACHED HOUSING:
WEEKDAY = 9.44 TRIPS / DWELLING UNIT X 7 HOMES = 66.08 TRIPS
AM PEAK = 0.74 TRIPS / DWELLING UNIT X 7 HOMES = 5.18 TRIPS
PM PEAK = 0.99 TRIPS / DWELLING UNIT X 7 HOMES = 6.93 TRIPS

CONCLUSION:
THE NUMBER OF TRIPS GENERATED FOR THIS SITE WILL HAVE A NEGLIGIBLE IMPACT ON THE BRIGHTON ROAD TRAFFIC DAILY AND IN THE AM & PM PEAK HOURS.



LOCATION MAP
NO SCALE



OVERALL SITE MAP
NO SCALE

SHEET INDEX

PERMITS & APPROVALS

AGENCY	DATE SUBMITTED	DATE APPROVED
• GENOA TOWNSHIP	04/22/25	–
• BRIGHTON AREA FIRE AUTHORITY	05/27/25	–
• LIVINGSTON COUNTY HEALTH DEPARTMENT	–	–
• LIVINGSTON COUNTY ROAD COMMISSION	05/27/25	–
• LCDC SOIL EROSION & SEDIMENTATION CONTROL	–	–
• MDEGLE WETLAND	–	–

INDEMNIFICATION STATEMENT

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

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STATE OF MICHIGAN — BRENT N. LAVANWAY — ENGINEER — No. 38211 — REGISTERED PROFESSIONAL ENGINEER

NO	BY	CK	REVISION	DATE
2	NL	BL	PER B.A.F.A., L.C.R.C., & TWP ENG REVIEW	7/22/25
1	NL	BL	PER INITIAL TWP REVIEW	5/20/25

ISSUE DATE: 4/21/25
JOB NO: 24-380
1

GENERAL NOTES

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

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CONTRACTOR TO FOLLOW MANUFACTURER SPECS/RECOMMENDATIONS THAT SUPERCEDE PLANS

GENERAL GRADING & SESC NOTES

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

GENERAL LANDSCAPE NOTES

1. ALL PLANT MATERIAL SHALL CONFORM TO THE REQUIREMENTS AND SPECIFICATIONS OF THE GOVERNING MUNICIPALITY. ALL STOCK SHALL BE NURSERY GROWN, CONFORMING TO ANSI Z60.1 "AMERICAN STANDARD FOR NURSERY STOCK", AND IN ACCORDANCE WITH GOOD HORTICULTURAL PRACTICE. STOCK SHALL EXHIBIT NORMAL GROWTH HABIT AND BE FREE OF DISEASE, INSECTS, EGGS, LARVAE, & DEFECTS SUCH AS KNOTS, SUN-SCALD, INJURIES, ABRASIONS, OR DISFIGUREMENT. ALL PLANT MATERIAL SHALL BE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT.
2. ALL PLANT MATERIALS SHALL BE BALLED AND BURLAPPED OR CONTAINER STOCK. NO BARE ROOT STOCK IS PERMITTED. ALL PLANT BALLS SHALL BE FIRM, INTACT, AND SECURELY WRAPPED AND BOUND.
3. ALL PLANT BED MATERIALS SHALL BE EXCAVATED OF ALL BUILDING MATERIALS, OTHER EXTRANEOUS OBJECTS, AND POOR SOILS TO A MINIMUM DEPTH OF 12-INCHES AND BACKFILLED TO GRADE WITH SPECIFIED PLANTING MIX (SEE BELOW).
4. PLANTING MIXTURE SHALL CONSIST OF 5 PARTS TOPSOIL FROM ON-SITE (AS APPROVED), 4 PARTS COARSE SAND, 1 PART SPHAGNUM PEAT MOSS (OR APPROVED COMPOST), AND 5 LBS OF SUPERPHOSPHATE FERTILIZER PER CU. YD. OF MIX. INGREDIENTS SHALL BE THOROUGHLY BLENDED FOR UNIFORM CONSISTENCY.
5. ALL PLANT BEDS AND INDIVIDUAL PLANTS, NOT OTHERWISE NOTED SHALL BE MULCHED WITH A 4-INCH LAYER OF SHREDDED BARK MULCH. EDGE OF MULCH BEDS AS SHOWN. DECIDUOUS TREES IN LAWN AREAS SHALL RECEIVE A 5-FT DIAMETER CIRCLE OF MULCH AND CONIFER TREES 8-FT (PLANTED CROWN OF TREE) UNLESS OTHERWISE NOTED.
6. LANDSCAPE STONE SHALL BE INSTALLED WHERE NOTED OR INDICATED (HATCHED). STONE SHALL BE 3/4"-1-1/4" WASHED RIVER GRAVEL OR AS SELECTED AND SHALL BE INSTALLED TO A MINIMUM DEPTH OF 3-INCHES.
7. ALL LANDSCAPE BEDS, UNLESS OTHERWISE NOTED SHALL BE INSTALLED OVER WEED BARRIER FABRIC - WATER PERMEABLE FILTRATION FABRIC OF NON-WOVEN POLYPROPYLENE OR POLYESTER FABRIC. FABRIC SHALL BE OF SUITABLE THICKNESS FOR APPLICATION.
8. ALL PLANTS AND PLANT BEDS SHALL BE THOROUGHLY WATERED UPON COMPLETION OF PLANTING AND STAKING OPERATIONS.
9. THE CONTRACTOR SHALL GUARANTEE ALL PLANT MATERIALS FOR A PERIOD OF 1 YEAR FROM THE DATE THE WORK IS ACCEPTED, IN WRITING, BY THE LANDSCAPE ARCHITECT. THE CONTRACTOR SHALL REPLACE, WITHOUT COST TO THE OWNER, WITHIN A SPECIFIED PERIOD OF TIME, ALL DEAD PLANTS, AND ALL PLANTS NOT IN A VIGOROUS, THRIVING CONDITION, AS DETERMINED BY THE LANDSCAPE ARCHITECT, DURING AND AT THE END OF THE GUARANTEE PERIOD. REPLACEMENT STOCK SHALL CONFORM TO THE ORIGINAL SPECIFICATIONS.
10. EDGING SHALL BE PROVIDED FOR ALL LANDSCAPE BEDS NOT ADJACENT TO CONCRETE PAVEMENT. EDGING SHALL BE BLACK ALUMINUM EDGING, 3/16-INCH X 4-INCH. INSTALL PER MANUFACTURER'S INSTRUCTIONS, ALL EDGING SHALL BE INSTALLED IN STRAIGHT LINES OR SMOOTH CURVES WITHOUT IRREGULARITIES.
11. SOD SHALL BE DENSE, WELL ROOTED TURF, FREE OF WEEDS. IT SHALL BE COMPRISED OF A BLEND OF AT LEAST TWO KENTUCKY BLUE GRASSES AND ONE FESCUE. IT SHALL HAVE A UNIFORM THICKNESS OF 3/4-INCH AT TIME OF PLANTING, AND CUT IN UNIFORM STRIPS NOT LESS THAN 10-INCHES BY 18-INCHES. SOD SHALL BE KEPT MOIST AND LAID WITHIN 36-HOURS AFTER CUTTING.

    IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH A DENSE LAWN OF PERMANENT GRASSES, FREE OF LUMPS AND DEPRESSIONS. ALL SODDED AREAS THAT BROWN-OUT OR HAVE NOT FIRMLY KNITTED TO THE SOIL BASE WITHIN A PERIOD OF 1 MONTH SHALL BE REPLACED BY THE CONTRACTOR, AT NO COST TO THE OWNER.
12. ALL AREAS OF THE SITE THAT BECOME DISTURBED DURING CONSTRUCTION AND ARE NOT TO BE PAVED, STONED, LANDSCAPED, OR SODDED SHALL BE SEEDED AND MULCHED.

    SEED MIXTURE SHALL BE AS FOLLOWS:

KENTUCKY BLUEGRASS (CHOOSE 3 VARIETIES - ADELPHI, RUGBY, GLADE, OR PARADE)	30%
RUBY RED OR DAWSON RED FINE FESCUE	30%
ATLANTA RED FESCUE	20%
PENNFINE PERENNIAL RYE	20%

    THE ABOVE SEED MIXTURE SHALL BE SOWN AT A RATE OF 250 LBS PER ACRE. PRIOR TO SEEDING, THE TOPSOIL SHALL BE FERTILIZED WITH A COMMERCIAL FERTILIZER WITH A 10-0-10 ANALYSIS:

    10% NITROGEN - MIN 25% FROM A UREA FORMALDEHYDE SOURCE
    0 % PHOSPHATE
    10% POTASH - SOURCE POTASSIUM SULFATE OR POTASSIUM NITRATE

    THE FIRST FERTILIZER APPLICATION SHALL BE AT A RATE OF 10 LBS PER 1000 SQ FT OF BULK FERTILIZER.

    IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH A DENSE LAWN OF PERMANENT GRASSES, FREE OF LUMPS AND DEPRESSIONS. ANY PART OF THE AREA THAT FAILS TO SHOW A UNIFORM GERMINATION SHALL BE RE-SEEDED AND SUCH RE-SEEDING SHALL CONTINUE UNTIL A DENSE LAWN IS ESTABLISHED. DAMAGE TO SEEDED AREAS RESULTING FROM EROSION SHALL BE REPAIRED BY THE CONTRACTOR.
13. ALL AREAS OF THE SITE SCHEDULED FOR SEEDING OR SODDING SHALL FIRST RECEIVE A 6-INCH LAYER OF CLEAN, FRIABLE TOPSOIL. THE SOIL SHALL BE DISCED AND SHALL BE GRADED IN CONFORMANCE WITH THE GRADING PLAN.
14. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION OF ALL UTILITIES AND TO INFORM THE LANDSCAPE ARCHITECT OF ANY CONFLICTS PRIOR TO COMMENCING LANDSCAPING.

GENERAL UTILITY NOTES

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

GENERAL STORM NOTES

1. ALL STORM PIPE LENGTHS ARE SHOWN FROM C/L TO C/L OF STRUCTURE OR FROM C/L OF STRUCTURE TO DISCHARGE END OF FLARED END SECTION.
2. STORM PIPE MATERIALS SHALL BE AS FOLLOWS:
    - 2.1. RCP(REINFORCED CONCRETE PIPE): SHALL MEET THE REQUIREMENTS OF ASTM C76 WITH MODIFIED GROOVED TONGUE AND RUBBER GASKETS MEETING THE REQUIREMENTS OF ASTM C443. RCP TO BE EITHER CLASS IV OR V AS CALLED OUT ON THE PLANS.
    - 2.2. HDPE(HIGH DENSITY POLYETHYLENE): SHALL MEET THE REQUIREMENTS OF ASTM F2648.
    - 2.3. PP(POLYPROPYLENE): SHALL MEET THE REQUIREMENTS OF ASTM F2881.
    - 2.4. PVC(POLYVINYL CHLORIDE): SHALL MEET THE REQUIREMENTS OF ASTM D3034.
3. STORM PIPE JOINTS SHALL MEET THE REQUIREMENTS OF ASTM D3212. HDPE AND PP PIPE GASKETS SHALL MEET THE REQUIREMENTS OF ASTM F477.
4. ALL STORM PIPE TO HAVE WATERTIGHT PREMIUM JOINTS, UNLESS OTHERWISE NOTED ON THE PLANS.
5. STORM DRAINAGE STRUCTURES SHALL BE FURNISHED WITH STEPS WHICH SHALL BE STEEL ENCASED WITH POLYPROPYLENE PLASTIC OR EQUIVALENT. STEPS SHALL BE SET AT 16" CENTER TO CENTER.
6. ALL FLARED END SECTIONS 15" AND LARGER SHALL BE FURNISHED WITH AN ANIMAL GRATE.
7. FLARED END SECTIONS DISCHARGING STORM WATER SHALL RECEIVE A MINIMUM OF 10 SQ YDS OF PLAIN ANGULAR RIP RAP WITH A MINIMUM STONE SIZE OF 6" AND SHALL BE PLACED ON A GEOTEXTILE FABRIC WRAP.
8. ALL CATCH BASINS WITHIN THE ROADWAY SHALL INCLUDE INSTALLATION OF 6" DIAMETER PERFORATED PIPE SUBDRAIN.
9. STORM DRAINAGE STRUCTURE COVERS SHALL BE OF THE FOLLOWING (OR APPROVED EQUAL):

COVER	USE	FRAME	GRATE/BACK
'A'	MANHOLE	1040	TYPE 'B'
'B'	TYPE B2 CURB	7085	TYPE 'M1'
'C'	VALLEY CURB	7065	7045 TYPE 'M1' GRATE/7060 TYPE 'T1' BACK
'D'	PARKING LOTS	1040/5100	TYPE 'M1' GRATE OR 5105 TYPE 'M1' GRATE
'E'	LAWN	1040	TYPE 'O2' GRATE
'K'	TYPE C & F CURB	7045	TYPE 'M1' GRATE/7050 TYPE 'T1' BACK

10. THE PROPOSED DRAINAGE SYSTEM IS TO BE OWNED AND PROPERLY MAINTAINED BY THE PROPERTY OWNER.

LINES & HATCHES LEGEND

PROPOSED (PR) EXISTING (EX)

- CONTOUR (900)
- SPOT ELEVATION (T/C XXX.XXX; XXX.XX; + 922.08)
- SANITARY SEWER (SN)
- SANITARY LEAD (SL)
- FORCE MAIN (FM)
- PRESSURE SEWER (PS)
- STORM SEWER (ST)
- WATER MAIN (WM)
- WATER LEAD (WL)
- FIBER OPTIC (FO)
- OVERHEAD WIRE (OH)
- CABLE (C)
- ELECTRIC (E)
- GAS (G)
- TELEPHONE (T)
- FENCE (X)
- SILT FENCE
- WETLAND BOUNDARY
- LIMITS OF GRADING/CLEARING
- LIMITS OF DRAINAGE
- MODIFIED CURB
- CONCRETE
- HIGH STRENGTH CONCRETE
- ASPHALT
- HIGH STRENGTH ASPHALT
- GRAVEL
- WETLAND
- SANITARY SEWER LABEL (SAN #1)
- STORM SEWER LABEL (CB 01)
- WATER MAIN LABEL (GV 12)
- SOIL EROSION CONTROL MEASURE (P=PERMANENT, T=TEMPORARY) (54T)

LIGHTING LEGEND

PROPOSED (PR) EXISTING (EX)

- DOUBLE FIXTURE LIGHT POLE
- SINGLE FIXTURE LIGHT FIXTURE
- WALL MOUNTED LIGHT FIXTURE
- GROUND LIGHT FIXTURE
- FOOT CANDLES ON SITE (0.1)
- FOOT CANDLES OFF SITE (2.5)
- FOOT CANDLES CONTOURS (5)
- CANOPY MOUNTED LIGHT FIXTURE

LANDSCAPE LEGEND

- EXISTING CONIFER TREE
- EXISTING DECIDUOUS TREE
- PROPOSED CONIFER TREE
- PROPOSED DECIDUOUS TREE
- PROPOSED TREE PROTECTION
- PROPOSED ORNAMENTAL TREE
- PROPOSED DECIDUOUS SHRUBS
- SOD
- PROPOSED GRASSES & PERENNIALS
- SEED
- PROPOSED LANDSCAPE BOULDER
- MULCH

SYMBOL LEGEND

- STORM DRAINAGE FLOW
- GUY WIRE
- POWER POLE
- TRANSFORMER PAD (T PAD)
- ELECTRICAL RISER
- U.G. ELECTRIC MARKER
- ELECTRICAL METER
- AIR CONDITIONING UNIT (AC UNIT)
- TELEPHONE RISER
- U.G. TELEPHONE MARKER
- GAS RISER
- U.G. GAS MARKER
- GAS METER
- CABLE TV RISER
- U.G. CABLE TV MARKER
- MAILBOX (MB)
- WELL
- WATER MANHOLE
- GATE VALVE (EXISTING)
- GATE VALVE (PROPOSED)
- HYDRANT (EXISTING)
- HYDRANT (PROPOSED)
- CATCH BASIN (EXISTING)
- YARD CATCH BASIN (EXISTING)
- CATCH BASIN (PROPOSED)
- STORM MANHOLE (EXISTING)
- STORM MANHOLE (PROPOSED)
- END SECTION (EXISTING)
- END SECTION (PROPOSED)
- SANITARY MANHOLE (EXISTING)
- SANITARY MANHOLE (PROPOSED)
- PUMP CHAMBER (PC)
- TRAFFIC SIGN
- SIGN (EXISTING)
- SIGN (PROPOSED)
- SOIL BORING
- STEEL ROD SET
- STEEL ROD OR PIPE FOUND
- WOOD LATH SET
- HUB SET
- MONUMENT FOUND
- SECTION CORNER
- GAS PUMP (GP)
- ANTENNA
- SATELLITE DISH
- NEWSPAPER BOX (NP)
- PARKING METER (PM)
- PHONE BOOTH (PB)
- HANDICAP SYMBOL
- BENCHMARK (BM)
- LIGHT POLE

ABBREVIATIONS

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

THE LOCATION AND ELEVATION OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE DRAWINGS ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION AND ELEVATION OF EXISTING UTILITIES AND PROPOSED UTILITY CROSSINGS IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF ANY CONFLICTS ARE APPARENT OR IF THE LOCATION OR DEPTH DIFFERS SIGNIFICANTLY FROM THE PLANS.

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 (TOLL FREE) FOR THE LOCATION OF UNDERGROUND FACILITIES

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

PROJECT: THE FARM

PREPARED FOR: MR. KEVIN VAN KANNEL
65300 OLD HICKORY
BRIGHTON, MI 48116
(810) 355-6300

TITLE: GENERAL NOTES & LEGEND

NO	BY	REVISION PER	DATE
2	NL	B.A.F.A., L.C.R.C., & TWP ENG REVIEW	7/22/25
1	NL	INITIAL TWP REVIEW	5/20/25

DESIGNED BY: NL
DRAWN BY: NL
CHECKED BY: BL
SCALE: NO SCALE
JOB NO: 24-380
DATE: 4/21/25
SHEET NO. 2

NRCS EXISTING SOILS DATA:

CarabA	CARLISLE MUCK, 0-2% SLOPES
FoB	FOX SANDY LOAM, 2-6% SLOPES
FrB	FOX-BOYER COMPLEX, 2-6% SLOPES
FrC	FOX-BOYER COMPLEX, 6-12% SLOPES
FrD	FOX-BOYER COMPLEX, 12-18% SLOPES
FrE	FOX-BOYER COMPLEX, 18-25% SLOPES
SvE	SPINKS-OAKVILLE LOAMY SANDS, 18-25% SLOPES
Wh	WASHTENAW SILT LOAM

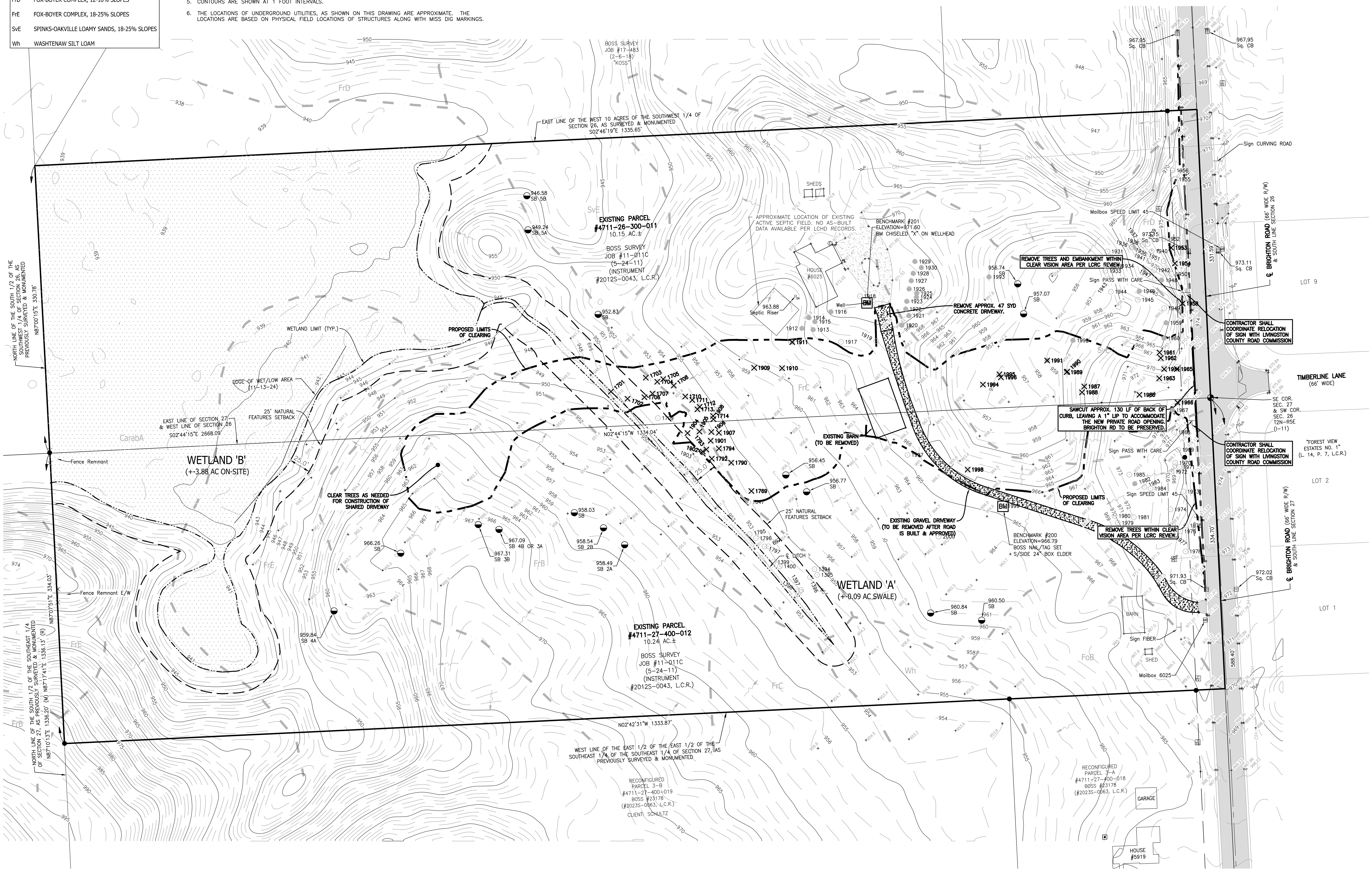
GENERAL SURVEY NOTES:

1. BEARINGS ARE BASED ON MICHIGAN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE. RECORD BEARINGS ARE FROM A PREVIOUS SURVEY BY BOSS ENGINEERING, JOB NO. 11-011C, DATED 5-24-11, AS RECORDED IN INSTRUMENT #2012S-0043 LIVINGSTON COUNTY RECORDS
2. SUBSURFACE UTILITIES NOT LOCATED FOR THIS SURVEY MAY EXIST. IT IS THE RESPONSIBILITY OF THE OWNER OF THE RESPECTIVE UTILITY TO ACCURATELY LOCATE SUCH UTILITIES.
3. EASEMENTS OR RESTRICTIONS OF RECORD NOT DEPICTED ON THIS DRAWING MAY EXIST.
4. ELEVATIONS WERE ESTABLISHED WITH GPS USING OPUS GPS POST-PROCESSING. (NAVD88 DATUM)
5. CONTOURS ARE SHOWN AT 1 FOOT INTERVALS.
6. THE LOCATIONS OF UNDERGROUND UTILITIES, AS SHOWN ON THIS DRAWING ARE APPROXIMATE. THE LOCATIONS ARE BASED ON PHYSICAL FIELD LOCATIONS OF STRUCTURES ALONG WITH MISS DIG MARKINGS.

NOTE:
SEE SHEET 3B FOR TREE INVENTORY AND WETLAND DELINEATION INFORMATION.

SCALE: 1 INCH = 50 FEET

SEE SHEET 2 FOR GENERAL NOTES AND LEGEND



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

PROJECT: THE FARM

PREPARED FOR: MR. KEVIN VAN KANNEL, 6530 OLD HICKORY, BRIGHTON, MI 48116, (810) 355-6300

TITLE: EXISTING CONDITIONS & DEMOLITION PLAN

NO	BY	REVISION PER	DATE
2	NL	B.A.F.A., L.C.R.C., & TWP ENG REVIEW	7/22/25
1	NL	INITIAL TWP REVIEW	5/20/25

DESIGNED BY:	NL
DRAWN BY:	NL
CHECKED BY:	BL
SCALE:	1" = 50'
JOB NO:	24-380
DATE:	4/21/25
SHEET NO.	3A

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SEE SHEET 2 FOR GENERAL NOTES AND LEGEND

TREE INVENTORY LIST

Tree #	Botanical Name	Common Name	DBH	Type*	Other Dia	Condition	Notes
~~1901~~	~~Quercus velutina~~	~~Black Oak~~	~~23~~	~~Deciduous~~		~~Good~~	
~~1902~~	~~Acer negundo~~	~~Boxelder~~	~~9~~	~~Deciduous~~		~~Fair~~	
1903	Acer negundo	Boxelder	10	Deciduous		Fair	
~~1904~~	~~Quercus velutina~~	~~Black Oak~~	~~16~~	~~Deciduous~~		~~Poor~~	~~Severely leaning trunk~~
~~1905~~	~~Prunus serotina~~	~~Black Cherry~~	~~17~~	~~Deciduous~~		~~Good~~	
~~1906~~	~~Quercus velutina~~	~~Black Oak~~	~~8~~	~~Deciduous~~		~~Good~~	
~~1907~~	~~Acer negundo~~	~~Boxelder~~	~~16~~	~~Deciduous~~	~~7~~	~~Poor~~	~~16,7,5 triple~~
~~1908~~	~~Quercus velutina~~	~~Black Oak~~	~~10~~	~~Deciduous~~		~~Good~~	
~~1909~~	~~Acer rubrum~~	~~Red Maple~~	~~10~~	~~Deciduous~~		~~Good~~	
~~1910~~	~~Acer rubrum~~	~~Red Maple~~	~~10~~	~~Deciduous~~		~~Good~~	
~~1911~~	~~Juniperus virginiana~~	~~Eastern Redcedar~~	~~18~~	~~Coniferous~~		~~Good~~	
1912	Picea glauca	White Spruce	10.5	Coniferous		Good	
1913	Picea glauca	White Spruce	19	Coniferous	10	Fair	Twin
1914	Picea glauca	White Spruce	11	Coniferous		Fair	
1915	Picea glauca	White Spruce	11	Coniferous		Fair	
1916	Juniperus virginiana	Eastern Redcedar	13	Coniferous		Good	
1917	Prunus serotina	Black Cherry	28	Deciduous		Good	
1918	Acer platanoides	Norway Maple	15	Deciduous		Good	
1919	Acer saccharum	Sugar Maple	14	Deciduous		Good	
1920	Picea glauca	White Spruce	11	Coniferous		Fair	
1921	Picea glauca	White Spruce	11	Coniferous		Fair	
1922	Picea glauca	White Spruce	12	Coniferous		Fair	
1923	Picea glauca	White Spruce	8	Coniferous		Fair	
1924	Pinus strobus	Eastern White Pine	18	Coniferous		Good	
1925	Pinus strobus	Eastern White Pine	18	Coniferous		Good	
1926	Picea glauca	White Spruce	11	Coniferous		Fair	
1927	Picea glauca	White Spruce	8	Coniferous		Fair	
1928	Picea glauca	White Spruce	14	Coniferous		Fair	
1929	Picea glauca	White Spruce	12	Coniferous		Fair	
1930	Juniperus virginiana	Eastern Redcedar	15	Coniferous		Fair	
1931	Robinia pseudoacacia	Black Locust	8	Deciduous		Good	
1932	Robinia pseudoacacia	Black Locust	10	Deciduous		Fair	
1933	Robinia pseudoacacia	Black Locust	9	Deciduous		Fair	
1934	Robinia pseudoacacia	Black Locust	9	Deciduous		Fair	
1935	Robinia pseudoacacia	Black Locust	10	Deciduous	10	Fair	Twin

Tree #	Botanical Name	Common Name	DBH	Type*	Other Dia	Condition	Notes
1936	Robinia pseudoacacia	Black Locust	8	Deciduous		Fair	
1937	Robinia pseudoacacia	Black Locust	13	Deciduous		Fair	
1938	Robinia pseudoacacia	Black Locust	12.5	Deciduous		Fair	
1939	Quercus velutina	Black Oak	8	Deciduous		Good	
1940	Robinia pseudoacacia	Black Locust	13	Deciduous		Fair	
1941	Quercus velutina	Black Oak	15	Deciduous		Fair	
1942	Acer platanoides	Norway Maple	7	Deciduous		Good	
1943	Robinia pseudoacacia	Black Locust	11	Deciduous		Fair	
1944	Robinia pseudoacacia	Black Locust	10.5	Deciduous		Fair	
1945	Robinia pseudoacacia	Black Locust	8	Deciduous		Fair	
1946	Pinus sylvestris	Scotch Pine	15	Coniferous		Poor	
1947	Quercus velutina	Black Oak	8	Deciduous		Good	
1948	Pinus strobus	Eastern White Pine	13	Coniferous		Fair	
1949	Prunus serotina	Black Cherry	12	Deciduous		Good	
1950	Acer platanoides	Norway Maple	8.5	Deciduous		Good	
1951	Prunus avium	Sweet Black Cherry	10	Deciduous		Good	
1952	Prunus avium	Sweet Black Cherry	10	Deciduous		Good	
~~1953~~	~~Quercus velutina~~	~~Black Oak~~	~~18~~	~~Deciduous~~		~~Good~~	
~~1954~~	~~Quercus rubrum~~	~~Red Oak~~	~~16~~	~~Deciduous~~		~~Good~~	
1955	Quercus velutina	Black Oak	19	Deciduous		Good	
1956	Quercus velutina	Black Oak	21	Deciduous		Good	
~~1958~~	~~Quercus velutina~~	~~Black Oak~~	~~36~~	~~Deciduous~~		~~Good~~	
1959	Pinus strobus	Eastern White Pine	11	Coniferous		Fair	
1960	Pinus strobus	Eastern White Pine	16	Coniferous		Fair	
~~1961~~	~~Quercus velutina~~	~~Black Oak~~	~~8~~	~~Deciduous~~		~~Good~~	
~~1962~~	~~Quercus velutina~~	~~Black Oak~~	~~16~~	~~Deciduous~~		~~Good~~	
~~1963~~	~~Quercus velutina~~	~~Black Oak~~	~~16~~	~~Deciduous~~		~~Poor~~	~~Split~~
~~1964~~	~~Prunus serotina~~	~~Black Cherry~~	~~15~~	~~Deciduous~~		~~Good~~	
~~1965~~	~~Prunus serotina~~	~~Black Cherry~~	~~9~~	~~Deciduous~~		~~Good~~	
~~1966~~	~~Quercus velutina~~	~~Black Oak~~	~~32~~	~~Deciduous~~		~~Good~~	
1967	Juniperus virginiana	Eastern Redcedar	9	Coniferous		Fair	
1968	Prunus serotina	Black Cherry	12	Deciduous		Good	
1969	Acer negundo	Boxelder	11	Deciduous		Fair	
1970	Acer negundo	Boxelder	9	Deciduous		Poor	Multiple splits dead / leaning
1971	Acer negundo	Boxelder	9.5	Deciduous		Fair	

Tree #	Botanical Name	Common Name	DBH	Type*	Other Dia	Condition	Notes
1972	Prunus serotina	Black Cherry	9	Deciduous		Fair	
1973	Acer negundo	Boxelder	16	Deciduous	14	Poor	Twin, twisted
1974	Prunus serotina	Black Cherry	9	Deciduous		Fair	
1975	Acer platanoides	Norway Maple	19	Deciduous		Good	
1976	Acer platanoides	Norway Maple	9	Deciduous	4	Fair	Twin
1977	Prunus avium	Sweet Black Cherry	12	Deciduous	7	Fair	Twin
1978	Acer negundo	Boxelder	9	Deciduous		Fair	
1979	Populus deltoides	Eastern Cottonwood	15	Deciduous		Fair	
1980	Populus deltoides	Eastern Cottonwood	13	Deciduous		Fair	
1981	Populus deltoides	Eastern Cottonwood	13	Deciduous		Poor	Possibly dead
1982	Juniperus virginiana	Eastern Redcedar	10	Coniferous		Fair	
1983	Acer negundo	Boxelder	8	Deciduous		Fair	
1984	Acer negundo	Boxelder	8	Deciduous		Fair	
1985	Populus deltoides	Eastern Cottonwood	9	Deciduous		Fair	Growing inside trailer
~~1986~~	~~Prunus serotina~~	~~Black Cherry~~	~~10~~	~~Deciduous~~	~~5~~	~~Poor~~	~~Twin, dead branches~~
~~1987~~	~~Prunus serotina~~	~~Black Cherry~~	~~10~~	~~Deciduous~~		~~Good~~	
~~1988~~	~~Pinus strobus~~	~~Eastern White Pine~~	~~15~~	~~Coniferous~~		~~Fair~~	
~~1989~~	~~Robinia pseudoacacia~~	~~Black Locust~~	~~13~~	~~Deciduous~~		~~Fair~~	
~~1990~~	~~Robinia pseudoacacia~~	~~Black Locust~~	~~8~~	~~Deciduous~~		~~Fair~~	
~~1991~~	~~Pinus sylvestris~~	~~Scotch Pine~~	~~10~~	~~Coniferous~~	~~6~~	~~Poor~~	~~Twin~~
1992	Pinus sylvestris	Scotch Pine	9	Coniferous		Poor	Possibly dead
1993	Pinus sylvestris	Scotch Pine	8	Coniferous		Fair	
~~1994~~	~~Acer negundo~~	~~Boxelder~~	~~10~~	~~Deciduous~~	~~4~~	~~Fair~~	~~Multistem~~
~~1995~~	~~Acer negundo~~	~~Boxelder~~	~~8~~	~~Deciduous~~	~~5~~	~~Poor~~	~~Multistem~~
~~1996~~	~~Acer negundo~~	~~Boxelder~~	~~10~~	~~Deciduous~~	~~5~~	~~Poor~~	~~Multistem~~
1997	Acer negundo	Boxelder	34	Deciduous		Fair	
~~1998~~	~~Acer negundo~~	~~Boxelder~~	~~16~~	~~Deciduous~~		~~Fair~~	
1999	Acer negundo	Boxelder	23	Deciduous		Fair	
2000	Acer negundo	Boxelder	11	Deciduous		Fair	

Tree #	Botanical Name	Common Name	DBH	Type*	Other Dia	Condition	Notes
697	Acer negundo	Boxelder	9	Deciduous		Poor	
1394	Acer negundo	Boxelder	8	Deciduous	8	Fair	Twin
1395	Acer negundo	Boxelder	10	Deciduous	7	Fair	Multistem
1396	Acer negundo	Boxelder	13	Deciduous	8	Fair	Twin
1397	Acer negundo	Boxelder	13	Deciduous	9	Fair	Twin
1398	Acer negundo	Boxelder	12	Deciduous	5	Fair	Twin
1399	Acer negundo	Boxelder	10	Deciduous	10	Fair	Quad 10,10,8,8
1400	Acer negundo	Boxelder	10	Deciduous	8	Fair	Quad 10,8,6,4
1647	Acer negundo	Boxelder	21	Deciduous		Fair	
~~1701~~	~~Prunus serotina~~	~~Black Cherry~~	~~8~~	~~Deciduous~~		~~Good~~	
~~1702~~	~~Prunus serotina~~	~~Black Cherry~~	~~14~~	~~Deciduous~~		~~Good~~	
~~1703~~	~~Carya ovata~~	~~Shagbark Hickory~~	~~8~~	~~Deciduous~~		~~Good~~	
~~1704~~	~~Quercus velutina~~	~~Black Oak~~	~~12~~	~~Deciduous~~		~~Good~~	
~~1705~~	~~Quercus velutina~~	~~Black Oak~~	~~12~~	~~Deciduous~~		~~Good~~	
~~1706~~	~~Quercus velutina~~	~~Black Oak~~	~~11~~	~~Deciduous~~		~~Good~~	
~~1707~~	~~Prunus serotina~~	~~Black Cherry~~	~~20~~	~~Deciduous~~		~~Fair~~	
~~1708~~	~~Quercus velutina~~	~~Black Oak~~	~~12~~	~~Deciduous~~		~~Good~~	
1709	Prunus serotina	Black Cherry	13	Deciduous		Good	
~~1710~~	~~Quercus velutina~~	~~Black Oak~~	~~15~~	~~Deciduous~~		~~Good~~	
~~1711~~	~~Quercus velutina~~	~~Black Oak~~	~~19~~	~~Deciduous~~		~~Good~~	
~~1712~~	~~Quercus velutina~~	~~Black Oak~~	~~24~~	~~Deciduous~~		~~Good~~	
~~1713~~	~~Quercus velutina~~	~~Black Oak~~	~~9~~	~~Deciduous~~		~~Good~~	
~~1714~~	~~Quercus velutina~~	~~Black Oak~~	~~11~~	~~Deciduous~~		~~Good~~	
~~1769~~	~~Acer negundo~~	~~Boxelder~~	~~13~~	~~Deciduous~~		~~Fair~~	
~~1790~~	~~Acer negundo~~	~~Boxelder~~	~~14~~	~~Deciduous~~		~~Fair~~	
~~1792~~	~~Acer negundo~~	~~Boxelder~~	~~12~~	~~Deciduous~~		~~Fair~~	
~~1793~~	~~Acer negundo~~	~~Boxelder~~	~~9~~	~~Deciduous~~		~~Fair~~	
~~1794~~	~~Acer negundo~~	~~Boxelder~~	~~9~~	~~Deciduous~~		~~Fair~~	
1795	Prunus serotina	Black Cherry	10	Deciduous		Fair	
1796	Acer negundo	Boxelder	11	Deciduous		Fair	
1797	Acer negundo	Boxelder	9	Deciduous		Fair	

SCALE: 1 INCH = 50 FEET

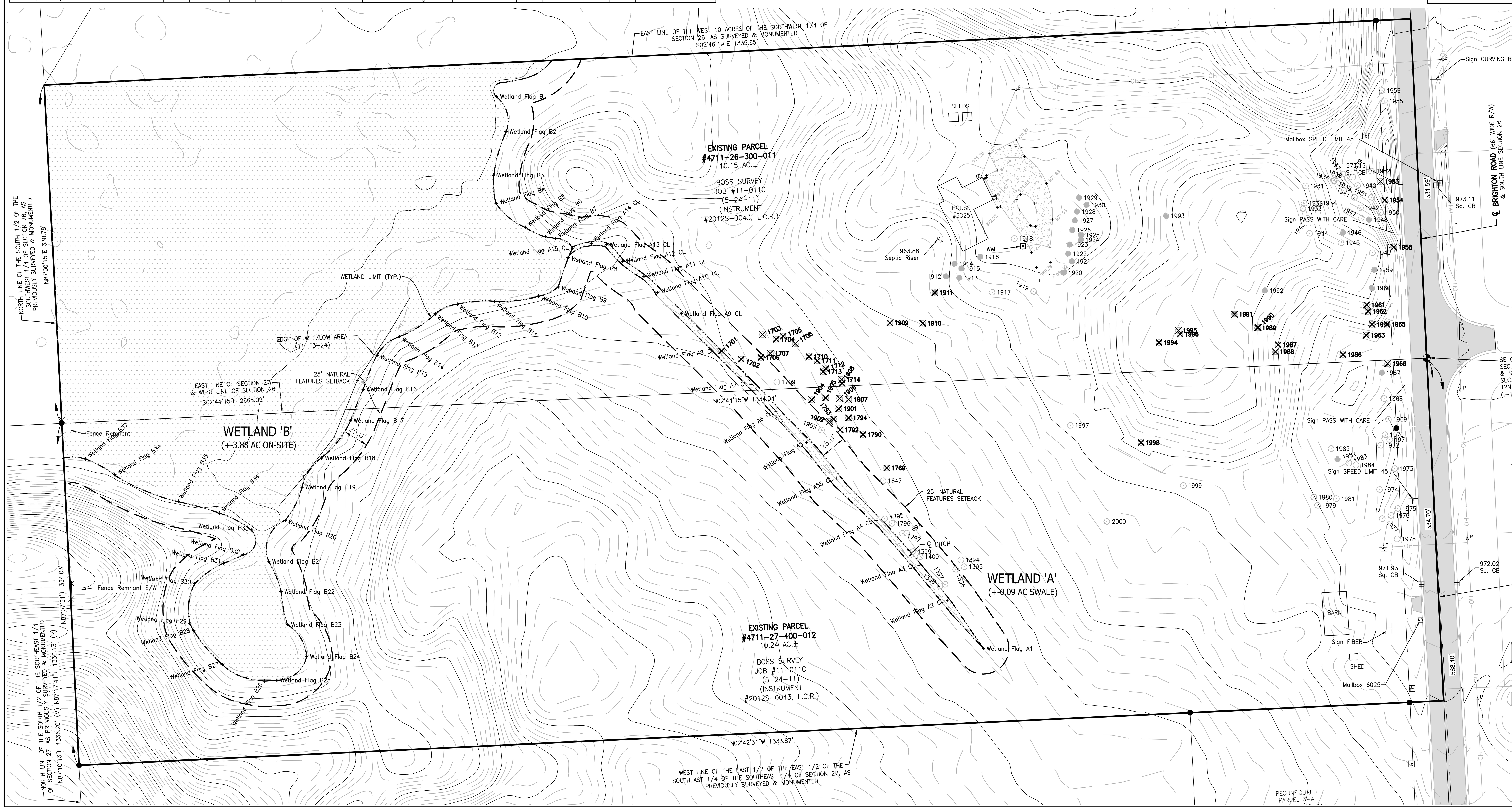
WETLAND DELINEATION

A WETLAND DELINEATION WAS CONDUCTED ON 5-12-25 IN ACCORDANCE WITH THE 1987 USACOE WETLAND DELINEATION MANUAL AND THE REGIONAL SUPPLEMENT FOR THE MIDWEST REGION AUGUST 2010 AND/OR THE REGIONAL SUPPLEMENT FOR THE NORTHCENTRAL AND NORTHEAST REGION JANUARY 2012.

REFERENCES UTILIZED INCLUDED: NATIONAL WETLAND INVENTORY (NWI) MAP, USDA NRCS WEB SOIL SURVEY, COUNTY SOIL SURVEY, AND THE USACOE NATIONAL WETLAND PLANT LIST 2022 - NORTHCENTRAL & NORTHEAST REGION AND/OR THE USACOE NATIONAL WETLAND PLANT LIST 2022 - MIDWEST REGION.

A ROUTINE METHODOLOGY WAS USED. WETLAND TRANSECTS, USACOE REGIONAL WETLAND DATA SHEETS (OMB 2024) WERE COMPLETED AND BOUNDARY SURVEYED AS PART OF THE OVERALL INVESTIGATION.

THIS DELINEATION WAS COMPLETED BASED ON OUR EXPERIENCE AND QUALIFICATIONS. IT REPRESENTS OUR BEST JUDGEMENT AS EXPERIENCED AND QUALIFIED PROFESSIONALS. IT SHOULD BE RECOGNIZED THAT THE ULTIMATE DETERMINATION AUTHORITY IS THE MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY (EGLE) AND/OR THE U.S. ARMY CORPS OF ENGINEERS (USACOE).



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3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 (TOLL FREE) FOR THE LOCATION OF UNDERGROUND FACILITIES

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

PROJECT: THE FARM

PREPARED FOR: MR. KEVIN VAN KANNEL

TITLE: TREE INVENTORY & WETLAND DELINEATION PLAN

NO	BY	REVISION PER	DATE
2	NL	B.A.F.A., L.C.R.C., & TMP ENG REVIEW	7/22/25
1	NL	INITIAL TMP REVIEW	5/20/25

DESIGNED BY: PC
DRAWN BY: PC
CHECKED BY:
SCALE: 1" = 50'
JOB NO: 24-380
DATE: 4/21/25
SHEET NO. 3B

SITE DATA
PARCEL # 4711-26-300-011, 10.15 AC ±
& PARCEL #4711-27-400-012, 10.24 AC ±
GENOA TOWNSHIP, LIVINGSTON COUNTY
USE: RESIDENTIAL
ZONING: LDR (LOW DENSITY RESIDENTIAL)

	REQUIRED
MIN. LOT AREA	43,560 SF (1 AC)
MIN. LOT WIDTH	150 FT (AT STREET)
SETBACKS	
FRONT	50 FT
SIDE	30 FT
REAR	60 FT
NATURAL FEATURES	25 FT
MAX. LOT COVERAGE	
BUILDING	N/A
BUILDING HEIGHT	35' - 2 STORIES

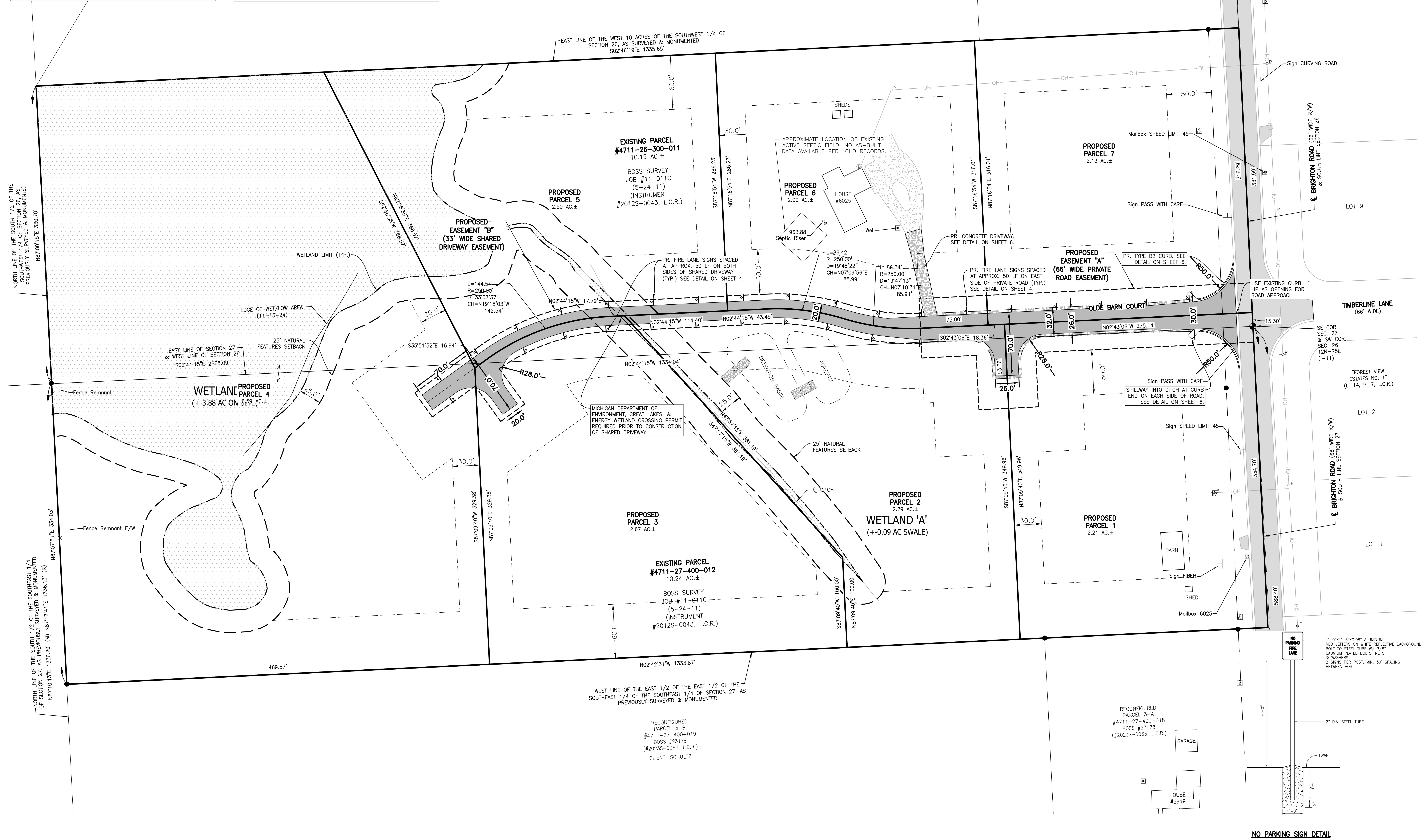
PROPOSED PARCEL DATA

PARCEL 1	96,280 SF (2.21 AC)
PARCEL 2	99,576 SF (2.29 AC)
PARCEL 3	116,275 SF (2.67 AC)
PARCEL 4	287,142 SF (6.59 AC)
PARCEL 5	108,917 SF (2.50 AC)
PARCEL 6	87,126 SF (2.00 AC)
PARCEL 7	92,789 SF (2.13 AC)

PARCELS 1, 6, & 7 SHALL HAVE DRIVEWAY ACCESS FROM THE PRIVATE ROAD. PARCELS 2-5 SHALL HAVE DRIVEWAY ACCESS FROM THE SHARED DRIVEWAY.

SITE PLAN NOTES:
1. NO PARKING SHALL BE PERMITTED ON THE ROAD.
2. BUILDING ADDRESSES SHALL BE MINIMUM 4" HIGH IN CONTRASTING COLORS TO THE BUILDING MATERIALS AND VISIBLE FROM THE THE STREET. THE LOCATION AND SIZE SHALL BE VERIFIED PRIOR TO INSTALLATION
3. A SIGN WITH MINIMUM 4" HIGH NUMBERS SHALL BE LOCATED AT THE ENTRANCE OF THE SHARED DRIVEWAY INDICATING THE ADDRESSES LOCATED AT THE DEAD END. THE SIGN SHALL MEET THE TOWNSHIP AND/OR ROAD COMMISSION SIGN REQUIREMENTS.
4. STOP SIGN AND STREET SIGN TO BE IN ACCORDANCE WITH THE MICHIGAN UNIFORM TRAFFIC CONTROL DEVICES AND CONFORM TO THE ROAD COMMISSION REQUIREMENTS.
5. ACCESS ROADS TO THE SITE SHALL BE PROVIDED AND MAINTAINED DURING CONSTRUCTION. THE PRIVATE ROAD & ANY ACCESS ROADS SHALL BE CAPABLE OF SUPPORTING A FIRE APPARATUS LOAD OF AT LEAST 84,000 POUNDS.
6. A MINIMUM VERTICAL CLEARANCE OF 15.0 FEET SHALL BE MAINTAINED ALONG THE LENGTH OF ALL APPARATUS ACCESS ROADS.
7. THE PRIVATE ROAD, SHARED DRIVEWAY, AND INFRASTRUCTURE ARE PROPOSED TO BE BUILT IN A SINGLE PHASE.

SEE SHEET 2 FOR GENERAL NOTES AND LEGEND



BOSS SURVEY JOB #17-483 (2-6-18) "KOSS"
EAST LINE OF THE WEST 10 ACRES OF THE SOUTHWEST 1/4 OF SECTION 26, AS SURVEYED & MONUMENTED S02°46'19"E 1335.65'
EXISTING PARCEL #4711-26-300-011 10.15 AC.± BOSS SURVEY JOB #11-011C (5-24-11) (INSTRUMENT #2012S-0043, L.C.R.)
PROPOSED PARCEL 5 2.50 AC.±
PROPOSED PARCEL 6 2.00 AC.±
PROPOSED PARCEL 7 2.13 AC.±
PROPOSED PARCEL 4 6.59 AC.±
PROPOSED PARCEL 3 2.67 AC.±
PROPOSED PARCEL 2 2.29 AC.±
PROPOSED PARCEL 1 2.21 AC.±
PROPOSED EASEMENT "B" (33' WIDE SHARED DRIVEWAY EASEMENT)
PROPOSED EASEMENT "A" (66' WIDE PRIVATE ROAD EASEMENT)
OLDE BARN COURT
TIMBERLINE LANE (66' WIDE)
BRIGHTON ROAD (66' WIDE R/W) & SOUTH LINE SECTION 26
BRIGHTON ROAD (66' WIDE R/W) & SOUTH LINE SECTION 27
APPROXIMATE LOCATION OF EXISTING ACTIVE SEPTIC FIELD. NO AS-BUILT DATA AVAILABLE PER LCHD RECORDS.
PR. CONCRETE DRIVEWAY. SEE DETAIL ON SHEET 6.
PR. TYPE B2 CURB. SEE DETAIL ON SHEET 6.
USE EXISTING CURB 1" LIP AS OPENING FOR ROAD APPROACH
PR. FIRE LANE SIGNS SPACED AT APPROX. 50 LF ON BOTH SIDES OF SHARED DRIVEWAY (TYP.) SEE DETAIL ON SHEET 4.
PR. FIRE LANE SIGNS SPACED AT APPROX. 50 LF ON EAST SIDE OF PRIVATE ROAD (TYP.) SEE DETAIL ON SHEET 4.
SPILLWAY INTO DITCH AT CURB END ON EACH SIDE OF ROAD. SEE DETAIL ON SHEET 6.
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, & ENERGY WETLAND CROSSING PERMIT REQUIRED PRIOR TO CONSTRUCTION OF SHARED DRIVEWAY.
WETLAND 'A' (+-0.09 AC SWALE)
WETLAND (+-3.88 AC ON SITE)
WETLAND LIMIT (TYP.)
EDGE OF WET/LOW AREA (11-13-24)
25' NATURAL FEATURES SETBACK
DETENTION BASIN
FOREBAY
EAST LINE OF SECTION 27 & WEST LINE OF SECTION 26 S02°44'15"E 2668.09'
SE COR. SEC. 27 & SW COR. SEC. 26 T2N-R5E (I-11)
"FOREST VIEW ESTATES NO. 1" (L. 14, P. 7, L.C.R.)
EXISTING PARCEL #4711-27-400-012 10.24 AC.± BOSS SURVEY JOB #11-011C (5-24-11) (INSTRUMENT #2012S-0043, L.C.R.)
WEST LINE OF THE EAST 1/2 OF THE EAST 1/2 OF THE SOUTHEAST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 27, AS PREVIOUSLY SURVEYED & MONUMENTED
N02°42'31"W 1333.87'
RECONFIGURED PARCEL 3-B #4711-27-400-019 BOSS #23178 (#2023S-0063, L.C.R.) CLIENT: SCHULTZ
RECONFIGURED PARCEL 3-A #4711-27-400-018 BOSS #23178 (#2023S-0063, L.C.R.)
HOUSE #6025
HOUSE #5919
SCALE: 1 INCH = 50 FEET

NO PARKING SIGN DETAIL
(NO SCALE)

1'-0"x1'-6"x0.08" ALUMINUM RED LETTERS ON WHITE REFLECTIVE BACKGROUND BOLT TO STEEL TUBE W/ 3/8" CADMIUM PLATED BOLTS, NUTS & WASHERS
2 SIGNS PER POST, MIN. 50' SPACING BETWEEN POST
2" DIA. STEEL TUBE

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3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171

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

PROJECT: THE FARM

PREPARED FOR: MR. KEVIN VAN KANNEL
65300 OLD HICKORY
BRIGHTON, MI 48116
(810) 355-6300

TITLE: SITE PLAN

NO	BY	REVISION PER	DATE
2	NL	B.A.F.A., L.C.R.C., & TWP ENG REVIEW	7/22/25
1	NL	INITIAL TWP REVIEW	5/20/25

DESIGNED BY:	NL
DRAWN BY:	NL
CHECKED BY:	BL
SCALE:	1" = 50'
JOB NO:	24-380
DATE:	4/21/25
SHEET NO.	4

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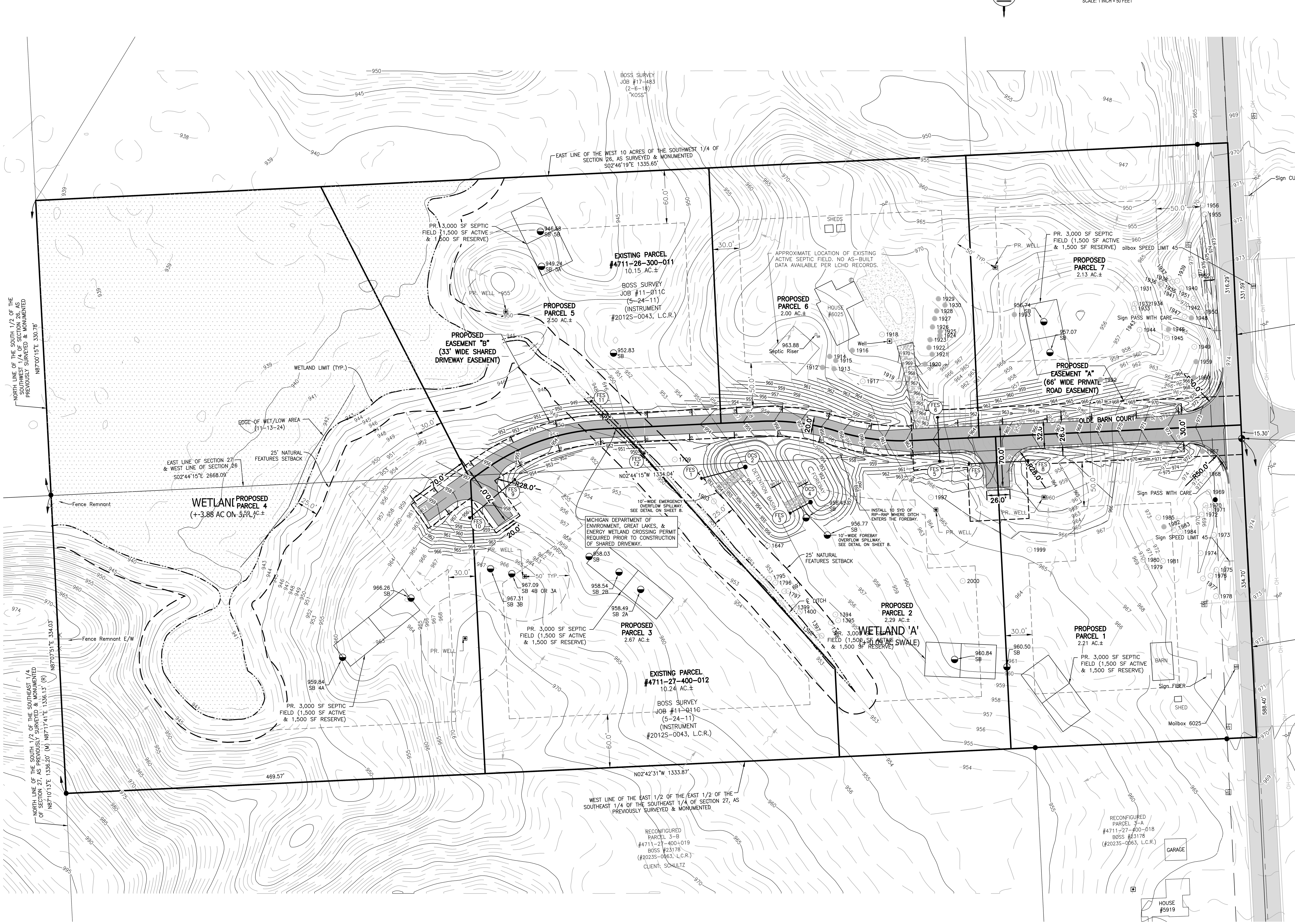
NOTES:
1. WELLS SHALL COMPLY WITH ALL LOCAL, STATE, & FEDERAL REGULATIONS.
2. SEPTIC SYSTEMS SHALL COMPLY WITH ALL LOCAL, STATE, & FEDERAL REGULATIONS.

SEE SHEET 2 FOR GENERAL NOTES AND LEGEND

SCALE: 1 INCH = 50 FEET



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

PROJECT: THE FARM

PREPARED FOR: MR. KEVIN VAN KANNEL

TITLE: WELL & SEPTIC PLAN

NO	BY	REVISION PER	DATE
2	NL	B.A.F.A., L.C.R.C., & TMP ENG REVIEW	7/22/25
1	NL	INITIAL TMP REVIEW	5/20/25

DESIGNED BY: NL
DRAWN BY: NL
CHECKED BY: BL
SCALE: 1" = 50'
JOB NO: 24-380
DATE: 4/21/25
SHEET NO. 5

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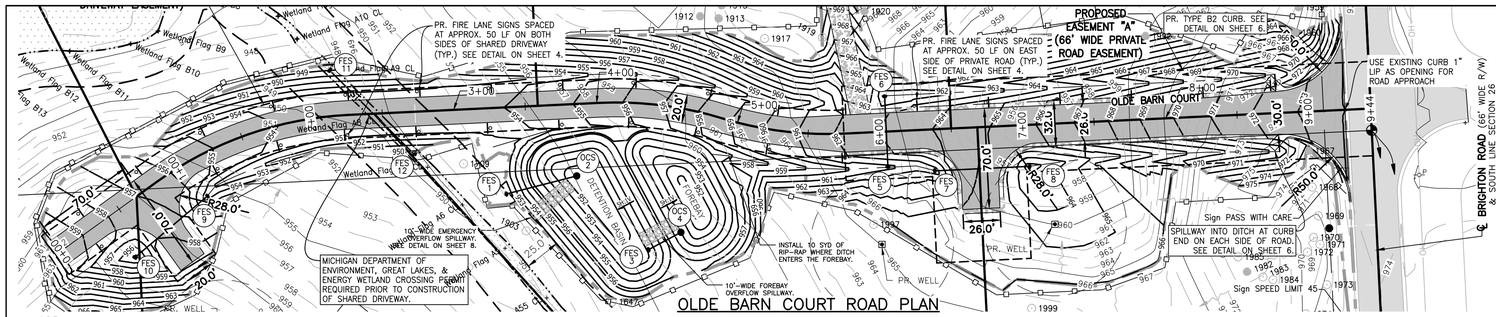
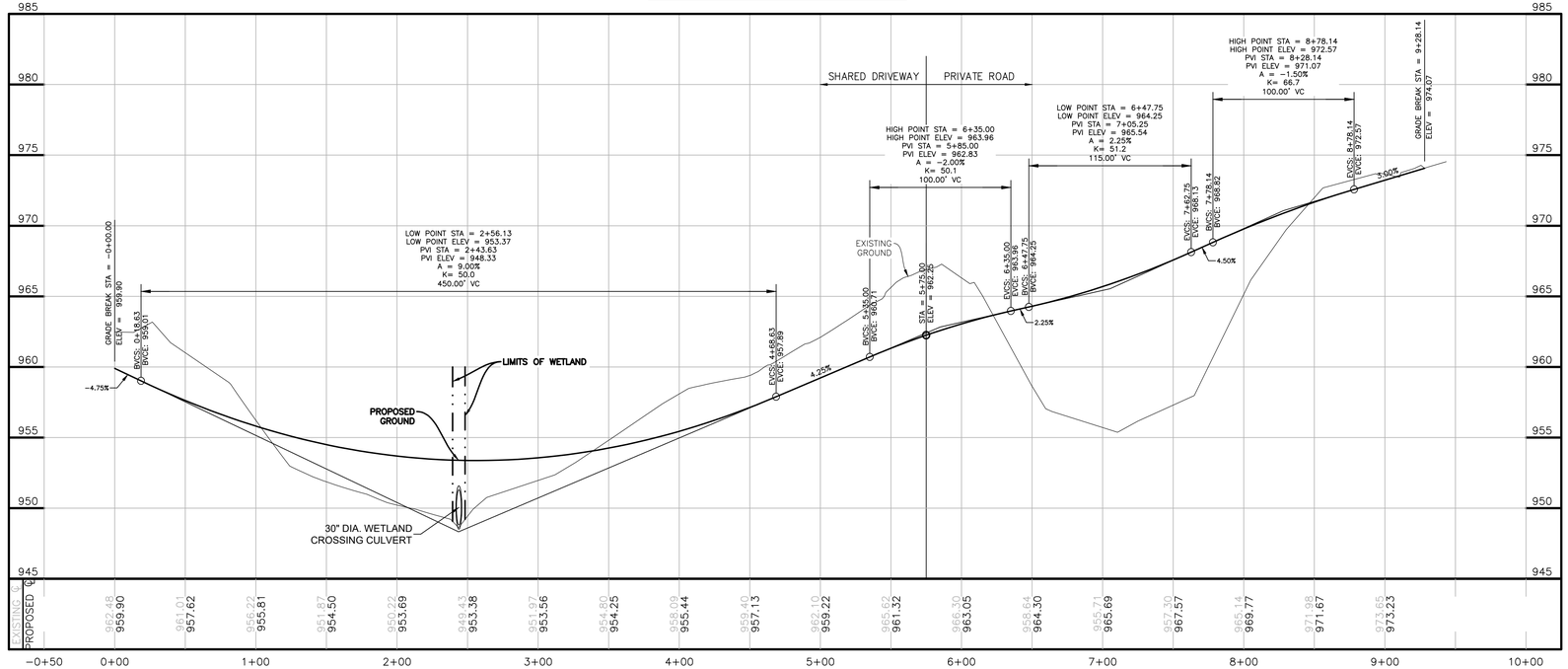
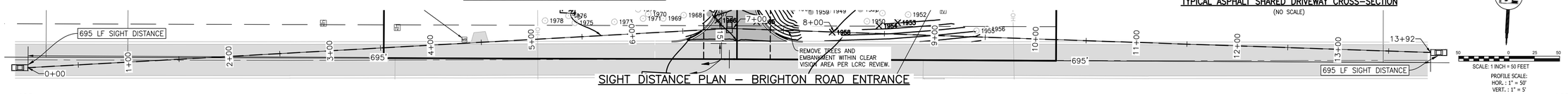


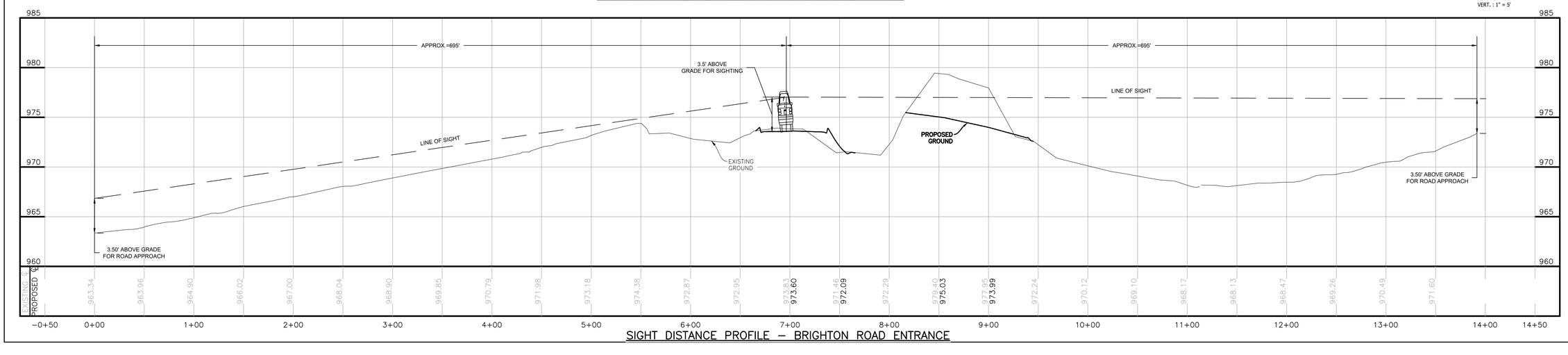
OLDE BARN COURT ROAD PLAN



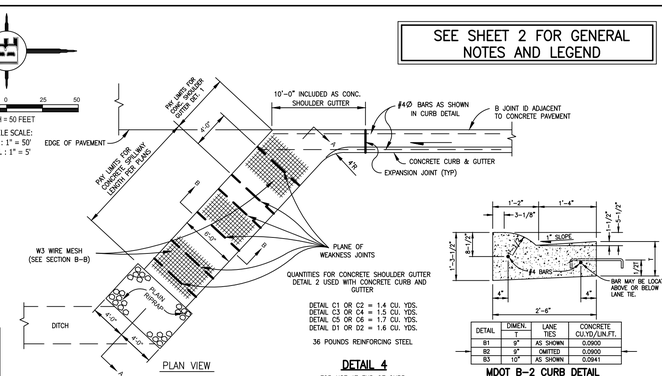
OLDE BARN COURT ROAD PROFILE



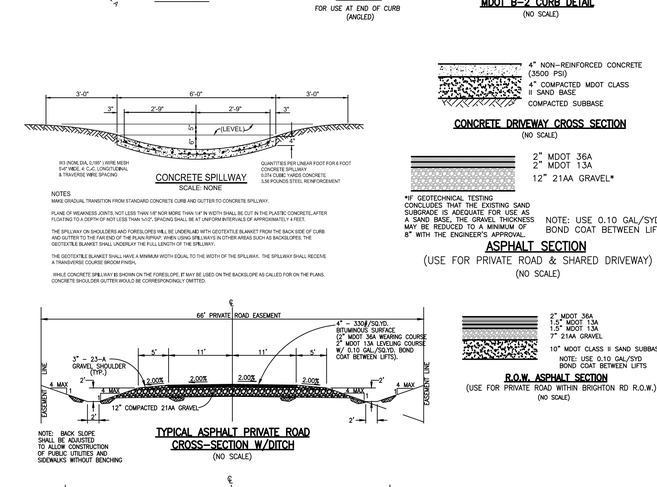
SIGHT DISTANCE PLAN – BRIGHTON ROAD ENTRANCE



SIGHT DISTANCE PROFILE – BRIGHTON ROAD ENTRANCE



DETAIL	DIMEN. T	LANE TIES	CONCRETE CU.YD./LIN.FT.
B1	9"	AS SHOWN	0.0900
B2	9"	OMITTED	0.0900
B3	10"	AS SHOWN	0.0941



SEE SHEET 2 FOR GENERAL NOTES AND LEGEND

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3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171

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

PROJECT: THE FARM
PREPARED FOR: MR. KEVIN VAN KANNEL
8530 OLD HICKORY
BRIGHTON, MI. 48116
(810) 355-6300
TITLE: ROAD PLAN & PROFILE

NO	BY	REVISION PER	DATE
2	NL	B.A.F.A., L.C.R.C. & TWP. ENG REVIEW	7/22/25
1	NL	INITIAL TWP. REVIEW	5/20/25

DESIGNED BY: NL
DRAWN BY: NL
CHECKED BY: BL
SCALE: 1" = 50'
JOB NO: 24-380
DATE: 4/21/25
SHEET NO. 6

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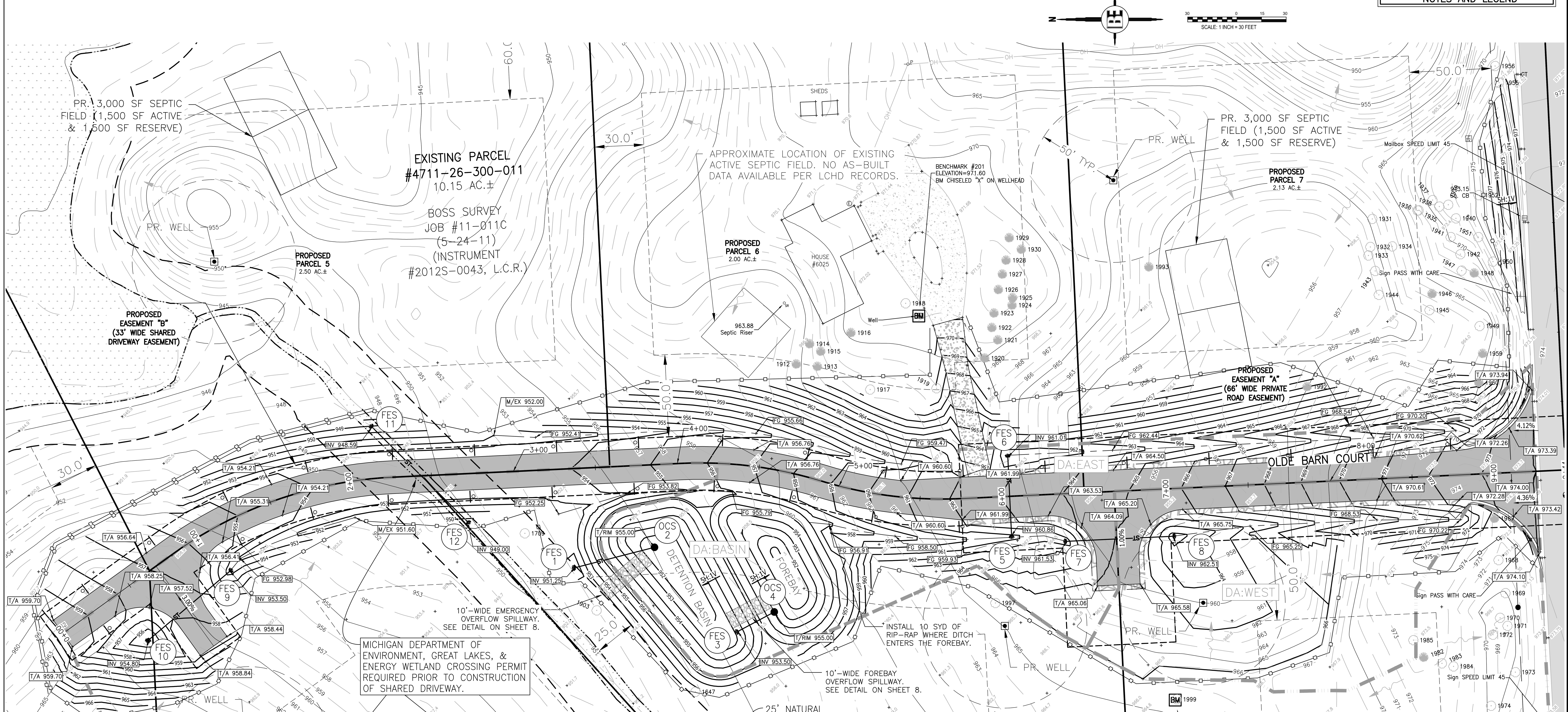
SEE SHEET 2 FOR GENERAL NOTES AND LEGEND



DRAINAGE NARRATIVE:

PRE-DEVELOPMENT: THE SUBJECT PROPERTY CURRENTLY CONTAINS ONE SINGLE FAMILY HOME AND SEVERAL ACCESSORY STRUCTURES. RUNOFF FROM THE SOUTH PART OF THE PROPERTY FLOWS TO A POTHOLE IN THE SOUTHEAST CORNER OF THE PROPERTY. RUNOFF FROM THE REMAINDER OF THE PROPERTY SHEET FLOWS TO A WETLAND DITCH THAT BISECTS THE SITE, AND DISCHARGES TO A LARGER WETLAND BODY AT BAETCKE LAKE NORTH OF THE SITE.

POST-DEVELOPMENT: A FOREBAY AND A DETENTION BASIN ARE PROPOSED TO BE GRADED TO HANDLE THE RUNOFF GENERATED BY THE PRIVATE ROAD. THE FOREBAY AND BASIN ARE SIZED TO HANDLE THE FLOW FROM THE INCREASED IMPERVIOUS SURFACE AREA FROM THE ROAD. RUNOFF FROM THE ROAD AND ASSOCIATED GRADING WILL BE COLLECTED BY THE ROADSIDE DITCHES AND CONVEYED TO THE FOREBAY. THE FOREBAY WILL OUTLET TO THE DETENTION BASIN THROUGH AN OUTLET CONTROL STANDPIPE. THE DETENTION BASIN WILL OUTLET TO A WETLAND DITCH ONSITE THROUGH AN OUTLET CONTROL STANDPIPE. BASIN CALCULATIONS AND DETAILS ARE SHOWN ON SHEET 8.

DRAINAGE AREA TABLE

DRAINAGE AREA	TOTAL AREA (AC)	IMP. AREA (AC)	C VALUE	A*C
BASIN	0.57	0.07	0.30	0.17
WEST	0.57	0.10	0.34	0.20
EAST	0.26	0.11	0.55	0.14
TOTALS	1.40	0.28	0.37	0.51

SWALE FLOW CALCULATIONS:

SCOUR PREVENTION WILL NEED TO BE PROVIDED FOR ANY DITCH THAT EXCEEDS THE MAXIMUM ALLOWABLE VELOCITY OF 4 FT/SEC. MANNING'S EQUATION (BELOW) WAS REARRANGED TO SOLVE FOR THE WETTED AREA OF FLOW & HYDRAULIC RADIUS. THE CHANNEL DISCHARGE AND WETTED AREA OF FLOW WERE THEN USED IN THE CHANNEL FLOW VELOCITY EQUATION (BELOW) TO CALCULATE THE FLOW VELOCITY AT THE STEEPEST PORTION OF SWALE AND AT THE PORTION OF SWALE WITH THE HIGHEST FLOW RATE.

THE STEEPEST PORTION OF SWALE IS JUST UPSTREAM OF FES 8, WITH A RUNNING SLOPE OF 5.80%. AT THIS POINT, RUNOFF FROM THE ENTIRETY OF DRAINAGE AREA "WEST" IS CONTRIBUTING TO THE SWALE FLOW, RESULTING IN A FLOW RATE OF 0.86 CFS FOR A 10-YEAR STORM (SEE CONVEYANCE CALCS ON SHEET 8).

THE PORTION OF SWALE WITH THE HIGHEST FLOW RATE IS JUST UPSTREAM OF THE PROPOSED DETENTION BASIN, WITH A RUNNING SLOPE OF 4.25%. RUNOFF FROM THE ENTIRETY OF DRAINAGE AREAS "EAST" & "WEST" CONTRIBUTE TO THE SWALE FLOW, RESULTING IN A FLOW RATE OF 1.48 CFS FOR A 10-YEAR STORM.

MANNING'S EQUATION: $Q = {}^{1.486}/_{n} * A_W * R_H^{2/3} * S^{1/2}$
(A VALUE OF 0.025 WAS SELECTED FOR MANNING'S COEFFICIENT OF ROUGHNESS FOR THE GRASSED SWALE)

CHANNEL FLOW VELOCITY: $V = Q / A_W$

UPSTREAM OF FES 8 RESULTS:
$A_W = 0.289\ FT^2 \Rightarrow V = 0.86\ CFS / 0.289\ FT^2 = 2.98\ FT/SEC$
SINCE FLOW VELOCITY IS BELOW 4 FT/SEC, SCOUR PREVENTION IS NOT NEEDED.

UPSTREAM OF BASIN RESULTS:
$A_W = 0.466\ FT^2 \Rightarrow V = 1.48\ CFS / 0.289\ FT^2 = 3.18\ FT/SEC$
SINCE FLOW VELOCITY IS BELOW 4 FT/SEC, SCOUR PREVENTION IS NOT NEEDED.

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3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 (TOLL FREE) FOR THE LOCATION OF UNDERGROUND FACILITIES

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

PROJECT: THE FARM

PREPARED FOR: MR. KEVIN VAN KANNEL
65300 OLD HICKORY
BRIGHTON, MI 48116
(810) 355-6300

TITLE: DRAINAGE & GRADING PLAN

NO	BY	REVISION PER	DATE
2	NL	B.A.F.A., L.C.R.C., & TWP ENG REVIEW	7/22/25
1	NL	INITIAL TWP REVIEW	5/20/25

DESIGNED BY: NL
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CHECKED BY: BL
SCALE: 1" = 30'
JOB NO: 24-380
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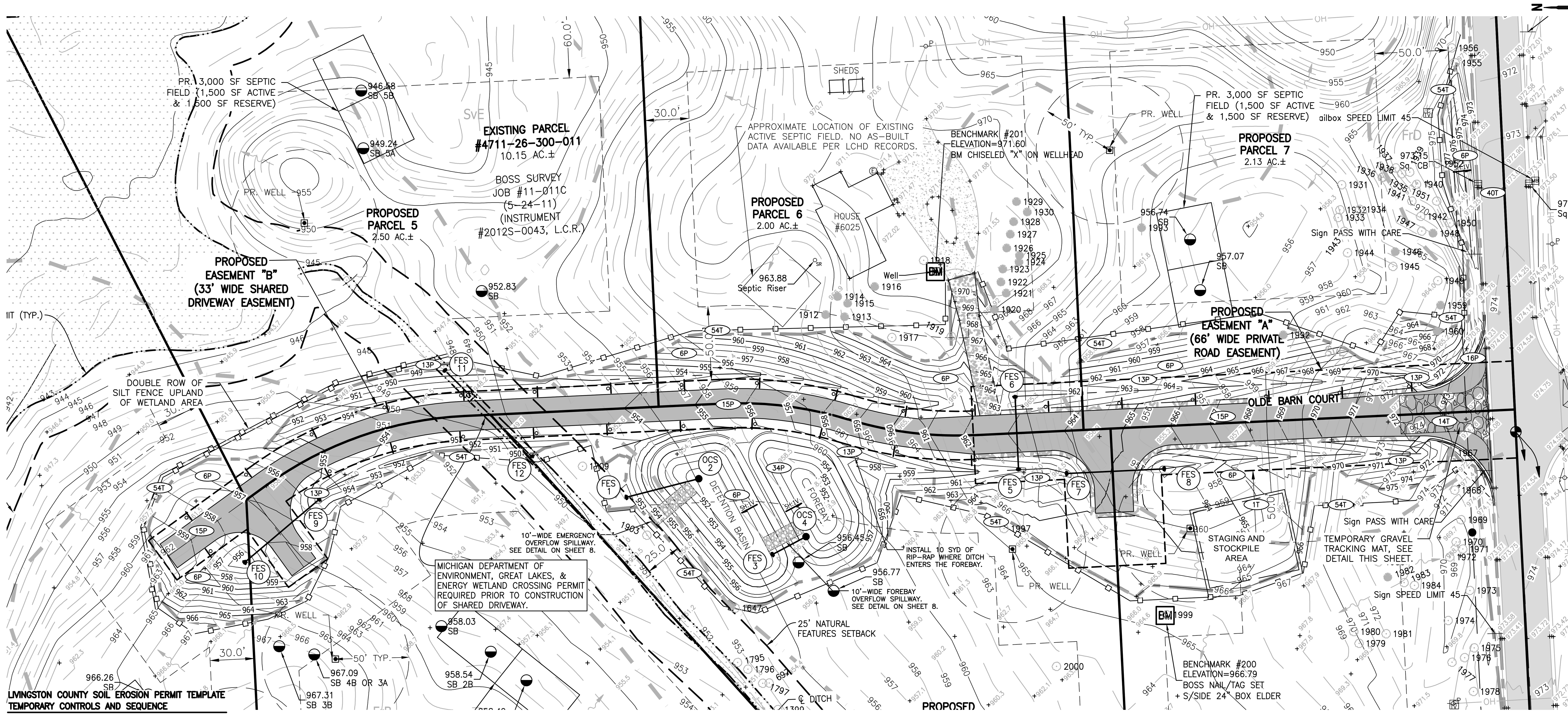
SHEET NO. 7A



SEE SHEET 2 FOR GENERAL NOTES AND LEGEND

NRCS EXISTING SOILS DATA:

CarabA	CARLISLE MUCK, 0-2% SLOPES
FoB	FOX SANDY LOAM, 2-6% SLOPES
FrB	FOX-BOYER COMPLEX, 2-6% SLOPES
FrC	FOX-BOYER COMPLEX, 6-12% SLOPES
FrD	FOX-BOYER COMPLEX, 12-18% SLOPES
FrE	FOX-BOYER COMPLEX, 18-25% SLOPES
SvE	SPINKS-OAKVILLE LOAMY SANDS, 18-25% SLOPES
Wh	WASHTENAW SILT LOAM

SOIL EROSION CONTROL MEASURES

1	STRIPPING & STOCKPILING TOPSOIL	TOPSOIL MAY BE STOCKPILED ABOVE BORROW AREAS TO ACT AS A DIVERSION STOCKPILE SHOULD BE TEMPORARILY SEEDED
6	SEEDING WITH MULCH AND/OR MATTING	FACILITATES ESTABLISHMENT OF VEGETATIVE COVER EFFECTIVE FOR DRAINAGEWAYS WITH LOW VELOCITY EASILY PLACED IN SMALL QUANTITIES BY INEXPERIENCED PERSONNEL SHOULD INCLUDE PREPARED TOPSOIL BED
13	RIP-RAP, RUBBLE, GABIONS	USED WHERE VEGETATION IS NOT EASILY ESTABLISHED EFFECTIVE FOR HIGH VELOCITIES OR HIGH CONCENTRATIONS PERMITS RUNOFF TO INFILTRATE SOIL DISSIPATES ENERGY FLOW AT SYSTEM OUTLETS
14	AGGREGATE COVER	STABILIZES SOIL SURFACE, THUS MINIMIZING EROSION PERMITS CONSTRUCTION TRAFFIC IN ADVERSE WEATHER MAY BE USED AS PART OF PERMANENT BASE CONSTRUCTION OF PAVED AREAS
15	PAVING	PROTECTS AREAS WHICH CANNOT OTHERWISE BE PROTECTED, BUT INCREASES RUNOFF VELOCITY IRREGULAR SURFACE WILL HELP SLOW VELOCITY
16	CURB & GUTTER	KEEPS HIGH VELOCITY RUNOFF ON PAVED AREAS FROM LEAVING PAVED SURFACE COLLECTS AND CONDUCTS RUNOFF TO ENCLOSED DRAINAGE SYSTEM OR PREPARED DRAINAGEWAY
34	SEDIMENT BASIN	TRAPS SEDIMENT RELEASES RUNOFF AT NON-EROSIVE RATES CONTROLS RUNOFF AT SYSTEM OUTLETS CAN BE VISUAL AMENITIES
40	INLET SEDIMENT FILTER	EASY TO SHAPE COLLECTS SEDIMENT MAY BE CLEANED AND EXPANDED AS NEEDED
54	SILT FENCE	USES GEOTEXTILE FABRIC AND POST OR POLES. EASY TO CONSTRUCT AND LOCATE AS NECESSARY. (SEE DETAIL THIS SHEET)

T= TEMPORARY, P= PERMANENT
TOTAL DISTURBED AREA= 2.52 AC.

NOTES:

- LIVINGSTON COUNTY DRAIN COMMISSION SESC PERMIT SHALL BE OBTAINED PRIOR TO CONSTRUCTION.
- THE SESC PERMIT IS VALID FOR THE MASS EARTH MOVEMENT AND INSTALLATION OF ROADS, DRAINS, AND UTILITIES ONLY. THE PERMIT IS NOT FOR INDIVIDUAL BUILDING UNITS. IT IS REQUIRED THAT TEMPORARY STABILIZATION OF THE ENTIRE SITE BE COMPLETED AND APPROVAL FROM THE LIVINGSTON COUNTY DRAIN COMMISSIONER'S OFFICE MUST BE OBTAINED PRIOR TO THE ISSUANCE OF PERMITS FOR INDIVIDUAL BUILDING UNITS.
- ANY DEWATERING REQUIRED SHALL HAVE A DEWATERING PLAN SUBMITTED PRIOR TO STARTING THE ACTIVITY AND MAY REQUIRE EGLE APPROVAL.
- DITCHES/ SWALES WITH GRADES 3% AND GREATER WILL NEED CHECK DAMS (SEE BELOW DETAIL) TO PREVENT SCOURING OF THE DITCH BOTTOMS.
- HYDRO-SEEDING IS NOT ACCEPTABLE FOR SLOPES EXCEEDING 1%. ON SLOPES OVER 1%, STABILIZATION SHALL BE DONE WITH SEED & STRAW MULCH WITH A TACKIFIER, OR STRAW BLANKETS PEGGED IN PLACE.

LIVINGSTON COUNTY SOIL EROSION PERMIT TEMPLATE TEMPORARY CONTROLS AND SEQUENCE

1. NOTIFY LIVINGSTON COUNTY DRAIN COMMISSIONER'S OFFICE 24 HOURS PRIOR TO START OF GRADE WORK.
2. IN ACCORDANCE WITH PUBLIC ACT NO. 53, OF 1974 THE PERMIT HOLDER SHALL CALL MISS DIG FOR STAKING AND LOCATING OF UTILITIES, AT LEAST 72 HOURS IN ADVANCE OF THE START OF ANY WORK.

PERMITTING STANDARDS

3. (IMPORTANT NOTICE) RETENTION/DETENTION PONDS SHALL BE EXCAVATED, TOPSOILED, SEEDED, MULCHED AND TACKED PRIOR TO THE START OF MASSIVE EARTH DISRUPTION. INGRESS/EGRESS MUST HAVE LARGE CRUSHED ROCK TO REDUCE THE TRACKING OF SOIL ONTO THE PUBLIC TRAFFIC AREAS. SEE DETAIL ITEMS BELOW.
4. 36" M.D.O.T SPECIFICATION TYPE SILT FABRIC FENCE AS SHOWN ON PLANS SHALL BE PLACED AND MAINTAINED ALONG PERIMETER ON ALL LOW LYING AREAS OF THE CONSTRUCTION SITE TO FILTER RUNOFF BEFORE LEAVING PROJECT SITE.
5. ALL TEMPORARY EROSION CONTROL DEVICES AS NOTED ON PLANS SHALL BE INSTALLED PRIOR TO THE START OF MASSIVE EARTH DISTRIBUTION.
6. PLAN DOES DENOTE A DETAILED EROSION CONTROL DEVICE TO RESTRICT TRACKING OF MATERIAL ONTO THE HIGHWAY. STONE DIAPERS SHALL BE INSTALLED AT ALL INGRESS/EGRESS AREAS OF THE SITE PRIOR TO THE START OF MASSIVE EARTH DISRUPTION. DIAPERS SHALL BE OF CRUSHED STONE AND SHALL HAVE A MINIMUM LENGTH OF 100' LINEAL FEET.

RETENTION PONDS

7. RETENTION/DETENTION/SEDIMENTATION PONDS SHALL BE EXCAVATED, TOPSOILED, SEEDED, MULCHED AND TACKED PRIOR TO THE START OF MASSIVE EARTH DISRUPTION.
8. DETENTION POND OUTLETS SHALL BE OF THE STANDPIPE AND STONE FILTER SYSTEM, WITH TRASH SCREEN. OUTLET FLOW SHALL NOT EXCEED 0.20 CUBIC FEET OF WATER PER SECOND/PER ACRE. POND DIKES SHALL HAVE A MINIMUM OF ONE (1) FOOT OF FREEBOARD. AN EMERGENCY SPILLWAY SHALL BE CONSTRUCTED WITHIN THE FREEBOARD LEVEL.
9. THE EMERGENCY SPILLWAY FROM THE DETENTION POND SHALL BE SODDED AND PEGGED, OR RIP RAPPED, 15 FEET PAST THE TOE OF THE SLOPE OF THE BERM.
10. DIKES AND BERMS SHALL BE FREE OF ALL ORGANIC MATTER.
11. RETENTION/DETENTION PONDS SHALL BE FENCED WITH A 4' CHAIN LINK FENCE, INCLUDING A 12' ACCESS GATE FOR MAINTENANCE UNLESS MINIMUM 5 FT. HORIZONTAL TO 1 FT. VERTICAL SIDE SLOPES ARE PROVIDED. THE FENCE SHALL BE INSTALLED AT THE OUTER PORTION OF THE BERM, TO ALLOW FOR MAINTENANCE WORK TO BE DONE INSIDE THE FENCE.
12. ALL UNIMPROVED DISTURBED AREAS SHALL BE STRIPPED OF TOPSOIL WHICH WILL BE STORED ONSITE DURING THE EXCAVATING STAGE. TOPSOIL PILES SHALL BE SEEDED AND MULCHED, OR MATTED WITH STRAW IN THE NON-GROWING SEASON, IMMEDIATELY AFTER THE STRIPPING PROCESS IS COMPLETED, TO PREVENT WIND AND WATER EROSION.
13. SOIL EROSION CONTROLS SHALL BE MONITORED DAILY BY THE ON-SITE ENGINEER, OR CONTRACTOR, WHICHEVER CASE APPLIES.

SLOPES AND DITCHES

14. ON SITE DITCHES SHALL BE OF THE FLAT BOTTOM TYPE MINIMUM WIDTH OF 2' WITH A MINIMUM OF 3 HORIZONTAL TO 1 VERTICAL SIDE SLOPES, 3:1.
15. DITCHES WITH STEEP SLOPES WILL NEED FLOW CHECKS TO PREVENT SCOURING OF THE DITCH BOTTOM. THESE SHALL BE INSTALLED AS DIRECTED BY THE ENGINEER OR INSPECTOR.
16. SLOPES IN EXCESS OF 3 HORIZONTAL TO 1 VERTICAL SHALL NOT BE USED EXCEPT WITH A MECHANICAL DEVICE SUCH AS A RETAINING WALL, TERRACING, OR OTHER PRIOR APPROVED DEVICE.

STORM DRAINS

17. ALL STORM WATER STRUCTURES, CATCH BASINS AND/OR MANHOLES, IF BLOCK, SHALL BE PLASTERED ON BOTH THE INSIDE AND OUTSIDE OF THE STRUCTURES. GROUTING AND POINTING WILL BE NECESSARY AT THE CASTING AND STRUCTURE JOINT TO PREVENT LEAKAGE AND THE RESULTING SOIL MOVEMENT, AROUND THE STRUCTURE.
18. COUNTY CODE REQUIRES A MINIMUM PIPE SIZE OF 12" IN DIAMETER. IF SMALLER PIPE IS NEEDED FOR OUTLET PURPOSES THE 12" CAN BE BAFFLED TO THE CORRECT SIZE. ALL PIPE SHALL MEET THE 12" DIAMETER CODE SIZE.
19. ALL STORM DRAIN OUTLETS 15" IN DIAMETER OR LARGER SHALL HAVE ANIMAL GUARDS INSTALLED TO PREVENT ENTRANCE TO THE SYSTEM.
20. ALL STORM DRAINAGE PIPE 30" IN DIAMETER OR LARGER SHALL BE POINTED, AT THE JOINTS ON THE INSIDE WITH MORTAR, AFTER BACKFILLING.
21. ALL STORM DRAIN OUTLETS THAT DO NOT EMPTY INTO THE RETENTION/DETENTION POND SHALL HAVE A TEMPORARY 5'X10'X3' SUMP INSTALLED AT THE TERMINATION OF THE STORM SEWER. UPON COMPLETION OF THE STABILIZATION WORK THE SUMP AREA SHALL BE FILLED AND RIP RAPPED WITH STONE. SILT TRAPS SHALL BE INSPECTED AFTER EACH STORM.
22. STORM WATER OUTLETS DO DENOTE RIP RAP. ALL OUTLETS SHALL BE RIP RAPPED OVER KEYED FILTER FABRIC WITH A MINIMUM OF 15 SQ. YARDS OF 6" OR LARGER STONE.
23. RIP RAP AS NOTED ON THE PLAN SHALL BE OF A FUNNEL SHAPE CONSTRUCTION, WIDTH SHALL INCREASE AS DISTANCE FROM THE OUTLET POINT INCREASES AT A 3:1 RATIO.
24. RIP RAP SHALL BE 6" IN DIAMETER OR LARGER. GROUTING MAY BE NECESSARY, AND SHALL BE A MINIMUM OF 6" IN DEPTH WITH THE STONE SET IN THE CEMENT SLURRY.
25. STORM WATER OUTLET IS IN NEED OF A SPLASH BLOCK WHICH IS NOT NOTED ON THE PLAN. INSTALL SPLASH BLOCK IF SLOPE OF THE PIPE IS 4% OR GREATER.
26. IT WILL BE NECESSARY FOR THE DEVELOPER TO HAVE THE STORM DRAINAGE LINES CLEANED PRIOR TO FINAL INSPECTION BY THE LIVINGSTON COUNTY DRAIN COMMISSIONER'S OFFICE. IF REQUIRED, THIS WORK SHALL BE DONE BY A PROFESSIONAL SEWER CLEANING FIRM AND CERTIFIED IN WRITING BY THE PROJECT ENGINEER. ALL SUMPS AND TEMPORARY SILT TRAPS SHALL ALSO BE CLEANED AT THIS TIME.

STABILIZATION

27. ALL UNIMPROVED DISTURBED AREAS SHALL BE RE-TOP SOILED, WITH A MINIMUM OF 3" OF MATERIAL, SEEDED, MULCHED AND TACKED WITHIN 15 DAYS OF THE COMPLETION OF THE MASSIVE EARTH DISRUPTION. IN THE NON-GROWING SEASON STRAW MATTING WILL SUFFICE. HYDROSEEDING WILL BE AN ACCEPTABLE ALTERNATE FOR MULCHING. EXTREME CARE SHOULD BE EXERCISED IN SPRING AND FALL PERIODS AS A FROST WILL BREAK THE BIND OF THE HYDROSEEDING, WHICH WILL AFFECT THE EFFECTIVENESS OF THIS PROCEDURE.
28. IN THE NON-GROWING SEASON, TEMPORARY STABILIZATION OF MASSIVELY EXPOSED AREAS FOR WINTER STABILIZATION SHALL BE DONE WITH STRAW MATTING.
29. PERIODIC INSPECTIONS WILL BE MADE THROUGHOUT THE COURSE OF THE PROJECT. IT WILL BE THE RESPONSIBILITY OF THE MANAGERS OF THE PROJECT TO CONTACT THIS OFFICE FOR THE FINAL INSPECTION AT THE END OF THE PROJECT.
30. THIS COMMERCIAL PERMIT IS VALID FOR THE MASS EARTH MOVEMENT, THE INSTALLATION OF ROADS, DRAINS, AND UTILITIES AND IS NOT FOR ANY SINGLE FAMILY RESIDENCE. ALL RESIDENTIAL BUILDERS WILL NEED TO SECURE WAIVERS AND OR PERMITS AS NECESSARY FOR EACH LOT IN THIS DEVELOPMENT AT THE TIME APPLICATION FOR SINGLE FAMILY RESIDENCE IS MADE.
31. THE ISSUING BUILDING DEPARTMENT SHALL NOT ISSUE THE CERTIFICATE OF OCCUPANCY UNTIL THE FINAL INSPECTION LETTER FROM THE LIVINGSTON COUNTY DRAIN COMMISSIONER'S OFFICE HAS BEEN OBTAINED.
32. PER THE LIVINGSTON COUNTY DRAIN COMMISSIONER THE SEEDING, FERTILIZER AND MULCH MINIMUM QUANTITIES SHALL BE AS FOLLOWS:
    - TOP-SOIL 3" IN DEPTH
    - GRASS SEED 218 LBS. PER ACRE
    - FERTILIZER 150 LBS. PER ACRE
    - STRAW MULCH 3" IN DEPTH 1.5 TO 2 TONS PER ACRE (ALL MULCHING MUST HAVE A TIE DOWN, SUCH AS TACKIFIER, NET BINDING, ETC.)
    - HYDRO-SEEDING HYDRO-SEEDING IS NOT ACCEPTABLE FOR SLOPES EXCEEDING 1%, IN SUCH CASES STABILIZATION SHALL BE DONE WITH SEED AND STRAW MULCH WITH A TACKIFIER.

SANITARY SEWERS

33. SANITARY SEWER TAP TO THE ________________________ SANITARY COUNTY DRAIN, SHALL ONLY BE MADE AFTER SECURING IN WRITING CLEARANCE FROM THE _________________ TOWNSHIP AND A SEWER TAP PERMIT FROM THE LIVINGSTON COUNTY DEPARTMENT OF BUILDING & SAFETY.
34. A TAP PERMIT WILL BE NEEDED BY THE OWNER/DEVELOPER OF THIS PROJECT TO TAP TO THE LEGALLY ESTABLISHED COUNTY STORM DRAIN. THE OWNER/DEVELOPER SHALL MAKE A WRITTEN REQUEST TO THE DRAIN COMMISSIONER TO REQUEST THE TAP TO THE STORM SEWER. THE FEES FOR SUCH TAP ARE AS FOLLOWS:

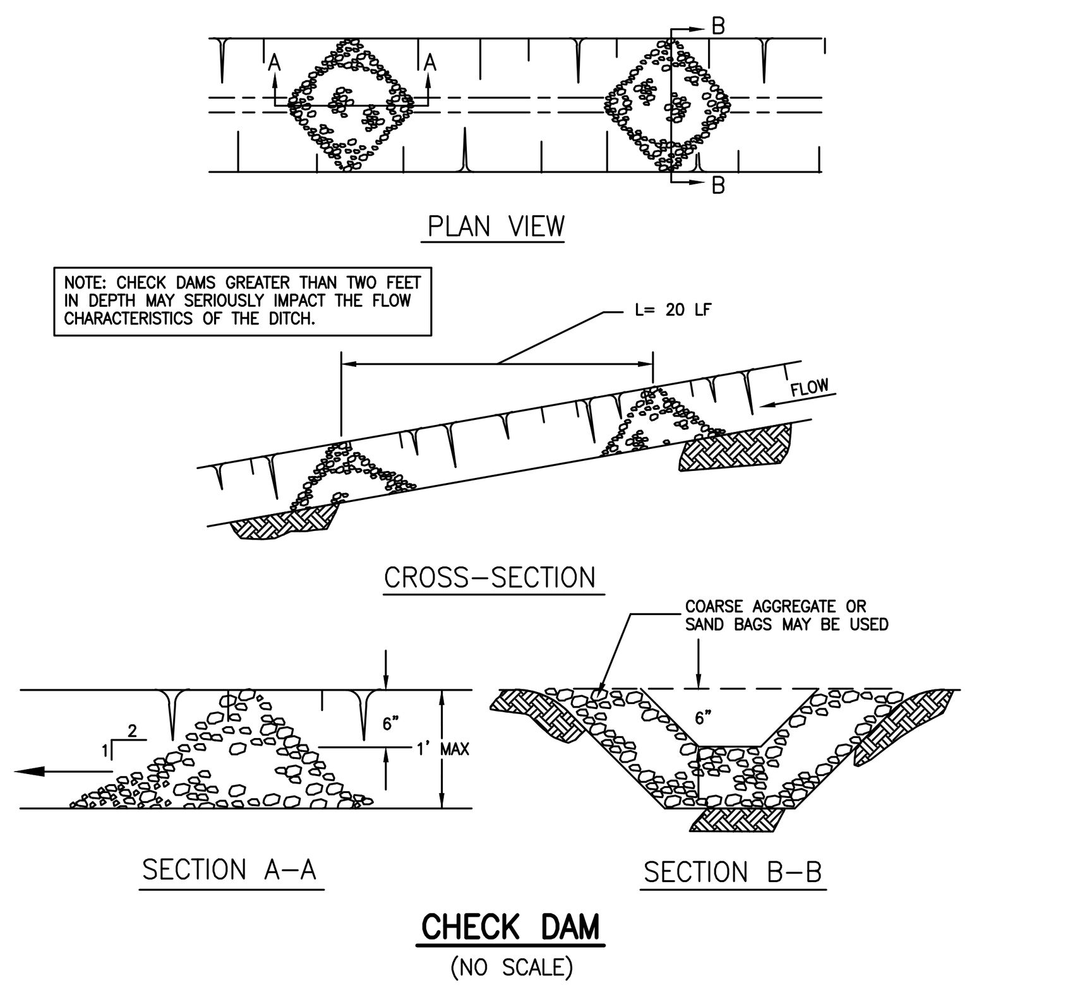
A. NON REFUNDABLE ADMINISTRATIVE FEE OF $50.00, TO BE PAID AT THE TIME OF APPLICATION.
B. INSPECTION FEES ARE BASED ON TIME AND MATERIAL BASIS FROM PORT TO PORT FOR THE ON-SITE INSPECTOR. INSPECTORS RATE, VEHICLE MILEAGE, AND 0.5 HOURS OF REPORT PREPARATION TIME WILL BE CHARGED, AS WELL AS ANY NECESSARY MATERIALS. TIME AND MATERIAL FEES ARE PAID AT THE COMPLETION OF THE TAP INSTALLATION.

SINGLE FAMILY RESIDENCE CONSTRUCTION

37. PRIOR TO THE START OF SINGLE FAMILY RESIDENCES, THE BUILDER OR HOMEOWNER SHALL INSTALL A STRAW BALE BARRIER AND/OR SILT FENCE BEHIND THE CURB, OR BEHIND THE CROWN OF THE ROAD DITCH BACK SLOPE. PRIOR TO THE START OF THE DWELLING, THE HOMEOWNER OR BUILDER SHALL INSTALL THE DRIVEWAY CULVERT AND AGGREGATE MATERIAL TO ALLOW FOR ENTRANCE TO THE LOT.
38. IF THE LIVINGSTON COUNTY HEALTH DEPARTMENT REQUIRES A MOUNDED SEPTIC FIELD, THE HOMEOWNER/BUILDER SHALL INSTALL POSITIVE DRAINAGE FROM THE MOUNDED AREA SO AS NOT TO ALLOW EXCESSIVE FLOW ONTO ADJACENT LOTS.
39. DRAINAGE EASEMENTS WITHIN THE SUBDIVISION SHALL NOT BE ENCROACHED UPON. OPEN SWALES SHALL NOT BE FILLED OR ENCROACHED UPON. STRAW BALE BARRIERS OR SILT FENCES SHALL BE INSTALLED BETWEEN THE CONSTRUCTION AND THE OPEN DRAIN TO PREVENT SILTATION OF THE SYSTEM. ENCLOSED DRAINS WILL HAVE PERIODIC CATCH BASINS OR MANHOLES, LOT GRADES SHALL NOT BE RAISED OVER THE ESTABLISHED STRUCTURE TOPS.

MAINTENANCE SCHEDULE FOR SOIL EROSION CONTROLS

1. SILT FENCE SHALL BE INSPECTED WEEKLY AND AFTER EACH MAJOR STORM EVENT. MAINTENANCE SHALL INCLUDE REMOVAL OF ACCUMULATED SILT AND REPLACEMENT OF TORN SECTIONS. SILT FENCE SHALL BE REMOVED WHEN ALL CONTRIBUTING AREAS HAVE BEEN STABILIZED.
2. TRACKING PAD SHALL BE INSPECTED MONTHLY FOR ACCUMULATED DIRT. TRACKING PAD SHALL BE REPLACED WHEN THE STONES ARE CHOKED WITH DIRT. TRACKING PAD SHALL BE REMOVED IMMEDIATELY PRIOR TO THE FIRST COURSE OF ASPHALT BEING LAID.
3. DETENTION/RETENTION POND SHALL BE INSPECTED QUARTERLY ON A PERMANENT BASIS. MAINTENANCE SHALL INCLUDE SEDIMENT REMOVAL, EMBANKMENT STABILIZATION AND MAINTAINING THE OUTLET STRUCTURE IN GOOD CONDITION. NO TREES SHALL BE ALLOWED TO GROW ON THE EMBANKMENT.
4. CATCH BASINS SHALL BE INSPECTED ANNUALLY FOR ACCUMULATION OF SEDIMENT. ALL SEDIMENT MUST BE REMOVED AND DISPOSED OF PROPERLY WHEN THE SUMP IS FULL.
5. COMMON AREAS SHALL BE STABILIZED NO LATER THAN 15 DAYS AFTER GRADE WORK, PURSUANT TO RULE 1709 (5).



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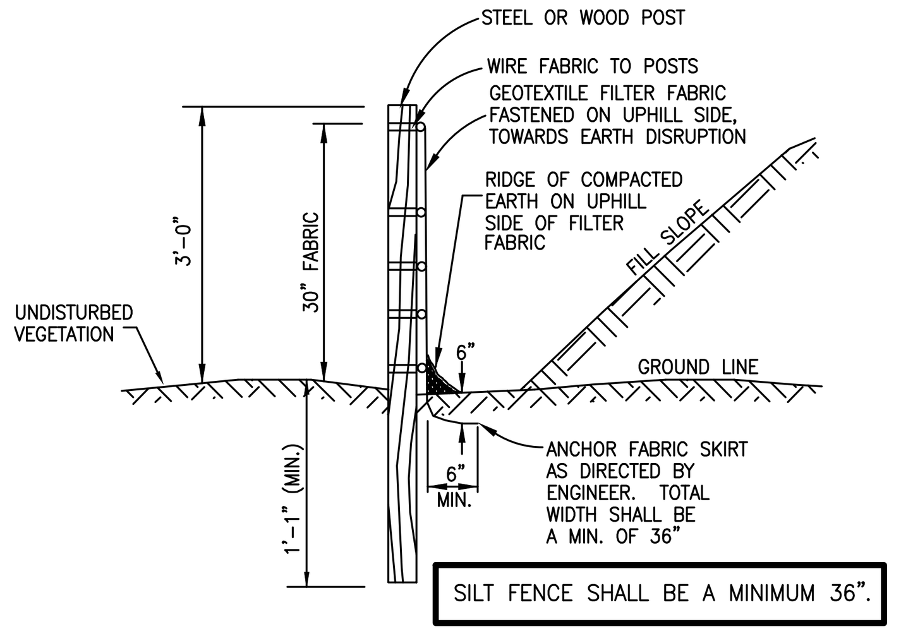

SILT FENCE DETAIL
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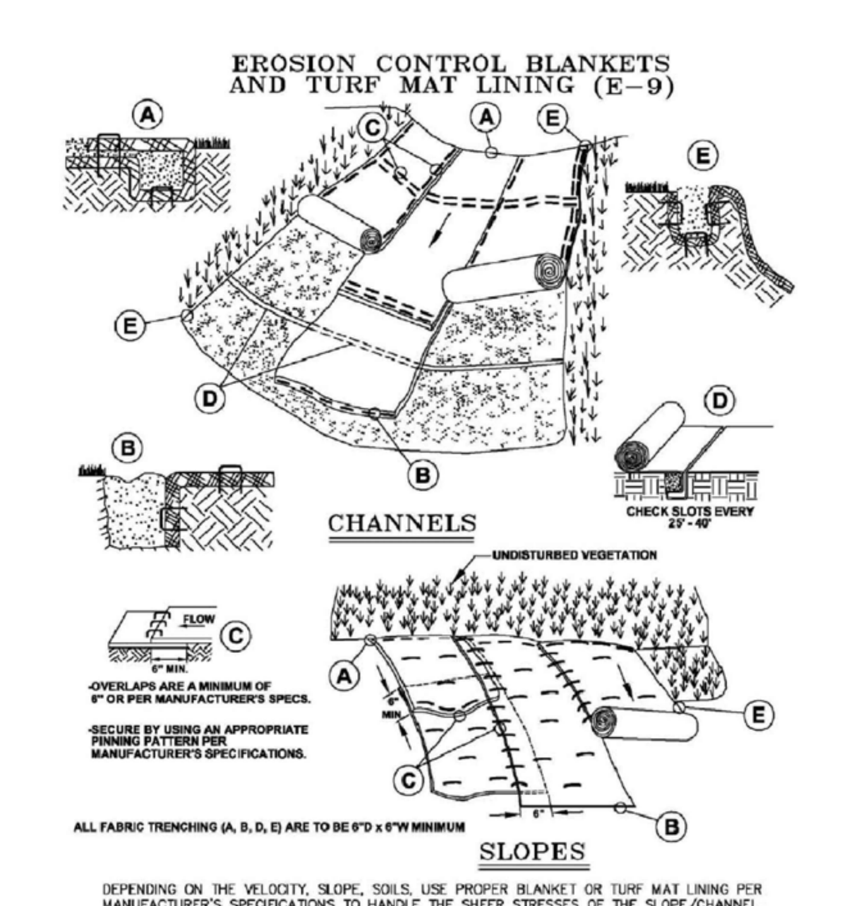
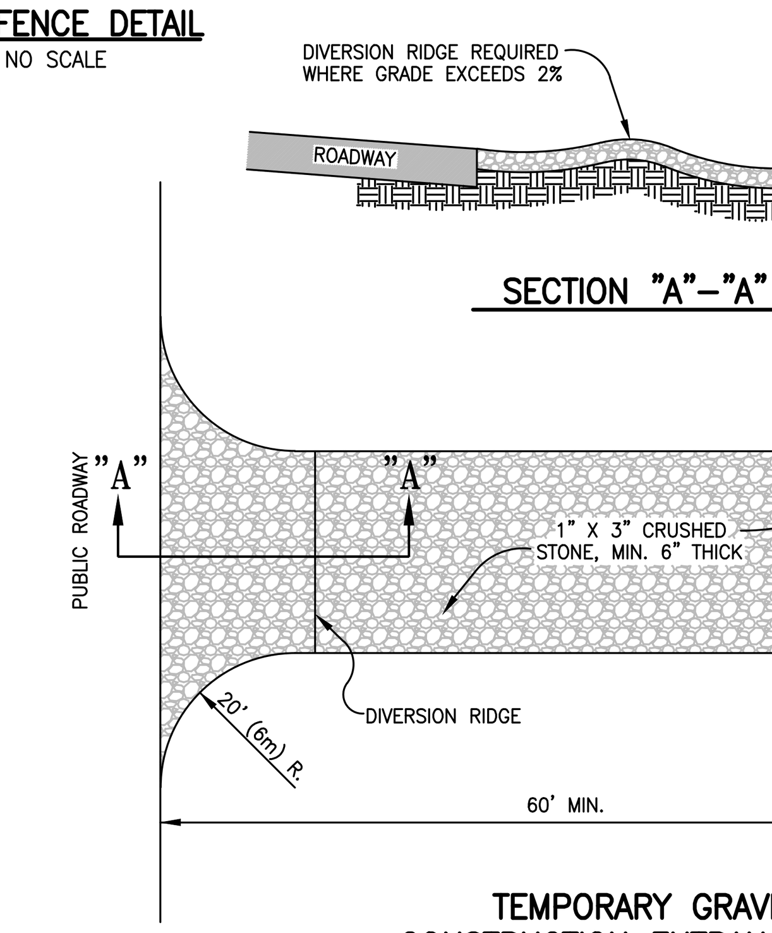


MULCH BLANKET NOTES:
MULCH BLANKET TO BE HANES-GEO STRAW EROSION CONTROL BLANKETS OR APPROVED EQUAL.

1. BEFORE PLACING, PREPARE THE SOIL SURFACE BY RAKING, SEEDING, AND FERTILIZING. MAKE SURE SURFACE HAS NO RILLS, GULLIES, OR VOIDS THAT WILL CAUSE THE BLANKET NOT TO BE IN CONTACT WITH THE GROUND.
2. FOLLOW MANUFACTURER'S SPECIFICATIONS IN THE PLACEMENT OF STAPLES/STAKES TO SECURE THE BLANKET TO THE SLOPE.
3. ALL ANCHORING TRENCHES, OVERLAPS, OR CHECK SLOTS SHALL BE 6" MINIMUM.
4. PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED TO INSURE THAT THE EROSION CONTROL BLANKETS AND TURF MAT LINING OPERATE EFFICIENTLY.



TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT
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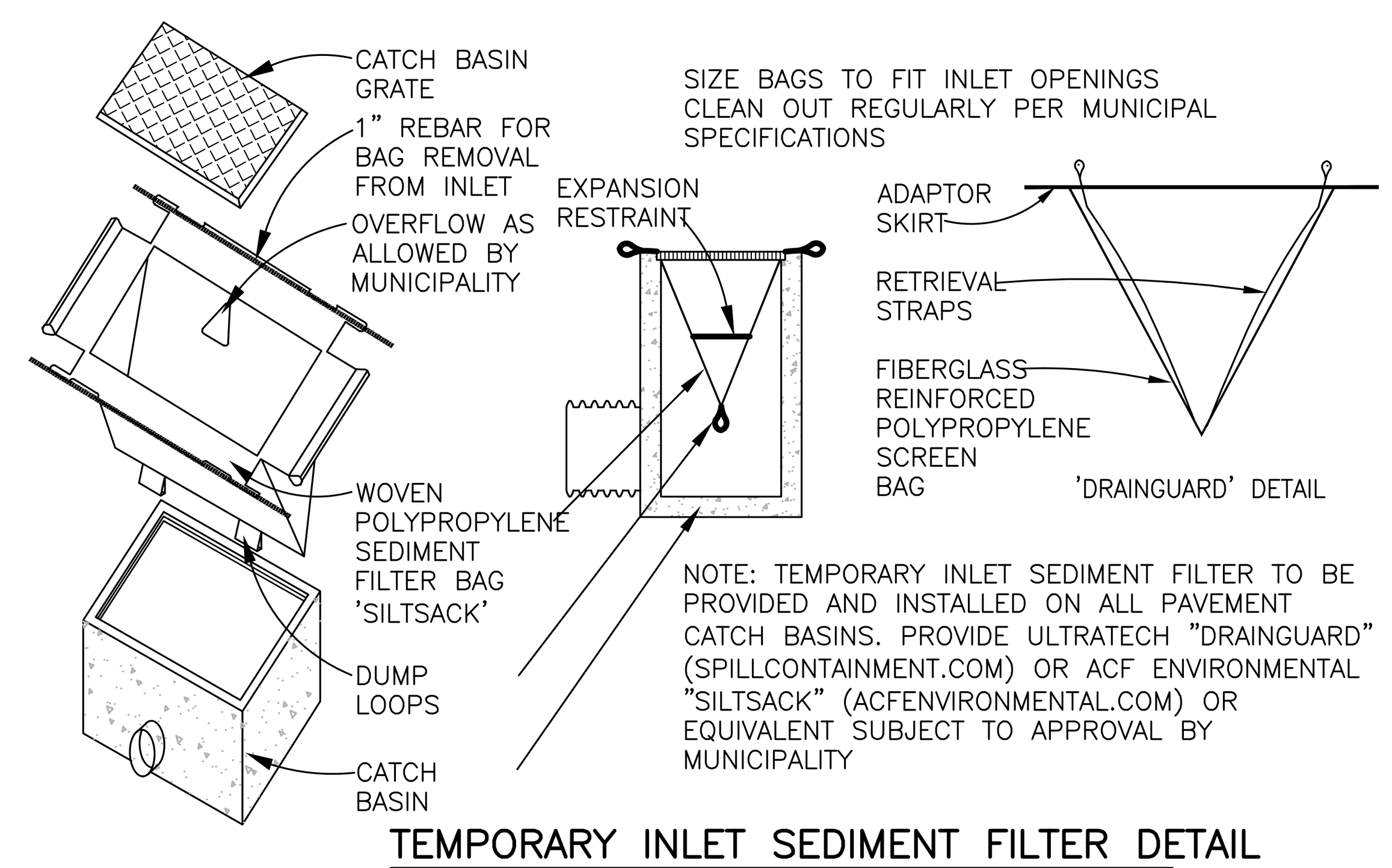

NOTE: TEMPORARY INLET SEDIMENT FILTER TO BE PROVIDED AND INSTALLED ON ALL PERMANENT CATCH BASINS. PROVIDE ULTRATECH "DRAINGUARD" (SPILLCONTAINMENT.COM) OR ACF ENVIRONMENTAL "SILTSACK" (ACFENVIRONMENTAL.COM) OR EQUIVALENT SUBJECT TO APPROVAL BY MUNICIPALITY

TEMPORARY INLET SEDIMENT FILTER DETAIL
(NO SCALE)

PROPOSED CONST. SCHEDULE FOR THE YEAR 2025

ACTIVITY	JUNE	JULY	AUG	SEP	OCT
DEMO & CLEAR*		—			
MASS GRADING		—	—		
ROAD CONST.			—		
FINAL GRADING				—	
SEED & MULCH				—	

*IMMEDIATELY AFTER INSTALLATION OF THE SESC MEASURES AND THE CLEARING WORK THE BASIN SHALL BE EXCAVATED, TOP SOILED, SEEDED AND MULCH BLANKETED, AND RINGED WITH SILT FENCE PRIOR TO THE MASS EARTH DISRUPTION.

SURFACE WATER & COUNTY DRAINS
WETLAND – ON SITE
LAKES – APPROXIMATELY 585 FT NE TO BAETCKE LAKE
STREAMS – N/A
BASINS – ON SITE
DRAINS – APPROXIMATELY 350 FT SW TO BOULDER CREEK TWP DRAIN
PONDS – APPROXIMATELY 410 FT E AT 4920 BRIGHTON OAKS TRAIL

CONTROLS & MEASURES POST CONSTRUCTION SEQUENCE

ACTIVITY	WEEKLY	MONTHLY	AS REQUIRED
MAINTAIN LANDSCAPING, REPLACE MULCH	X	X	X
CLEAN INLETS		X	X
COLLECT LITTER	X		X
SWEEP PARKING LOT		X	X

CONTROLS & MEASURES NARRATIVE

ACTIVITY	DESCRIPTION
MAINTAIN LANDSCAPING, REPLACE MULCH	COLLECT GRASS, TREE, AND SHRUB CLIPPINGS. DISPOSE IN APPROVED CONTAINER. REPLACE DEAD SOD, TREES AND SHRUBS.
CLEAN INLETS	REMOVE LITTER, SEDIMENT, AND DEBRIS. DISPOSE OF IN APPROVED LANDFILL.
COLLECT LITTER	DISPOSE OF WITH INLET DEBRIS.
SWEEP PARKING LOT	REMOVE MUD, DIRT, GREASE AND OIL WITH PERIODIC SWEEPING
DUST CONTROL	SPRINKLE WATER AS NEEDED

CONSTRUCTION SEQUENCE

THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT EROSION IS MINIMIZED AND THAT COMPLIANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS, REGULATIONS, AND ORDINANCES IS MAINTAINED THROUGHOUT EXECUTION OF THIS PROJECT.

1 DAYS	1.	INSTALL SILT FENCE AS SHOWN ON PLANS.
20 DAYS	2.	ROUGH GRADE AND INSTALL STORM DRAINAGE.
1 DAY	3.	INSTALL INLET PROTECTION ON STORM INLETS.
4 DAYS	4.	INSTALL PAVEMENT & GRAVEL ROAD SURFACE
4 DAYS	5.	FINE GRADE AROUND SITE, SPREAD TOPSOIL, SEED OR SOD AS APPLICABLE.
1 DAY	6.	REMOVE ALL EROSION CONTROL STRUCTURES.
1 DAY	7.	REMOVE ACCUMULATED SILT FROM ALL EXISTING DRAINAGE.

THE LOCATION AND ELEVATION OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE DRAWINGS ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION AND ELEVATION OF EXISTING UTILITIES AND PROPOSED UTILITY CROSSINGS IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF ANY CONFLICTS ARE APPARENT OR IF THE LOCATION OR DEPTH DIFFERS SIGNIFICANTLY FROM THE PLANS.

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 (TOLL FREE) FOR THE LOCATION OF UNDERGROUND FACILITIES

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

PROJECT: THE FARM

PREPARED FOR: MR. KEVIN VAN KANNEL
65300 OLD HICKORY
BRIGHTON, MI 48116
(810) 355-6300

TITLE: SOIL EROSION & SEDIMENTATION CONTROL PLAN

NO	BY	REVISION PER	DATE
2	NL	B.A.F.A., L.C.R.C., & TWP ENG REVIEW	7/22/25
1	NL	INITIAL TWP REVIEW	5/20/25

DESIGNED BY:	NL
DRAWN BY:	NL
CHECKED BY:	BL
SCALE:	1" = 50'
JOB NO:	24-380
DATE:	4/21/25
SHEET NO.	7B

BOSS BE Engineering

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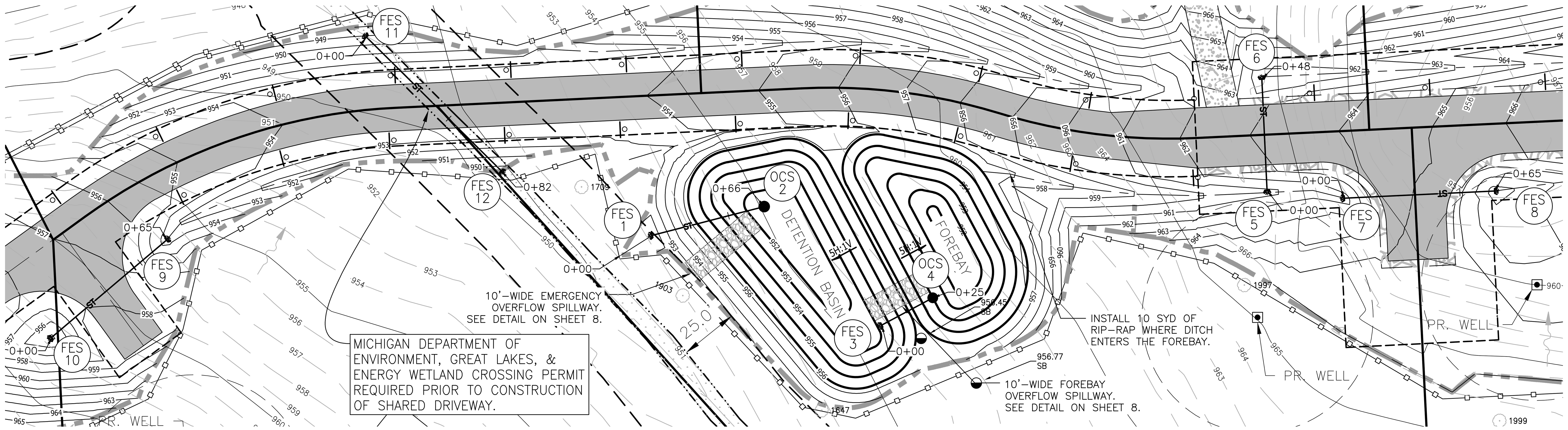
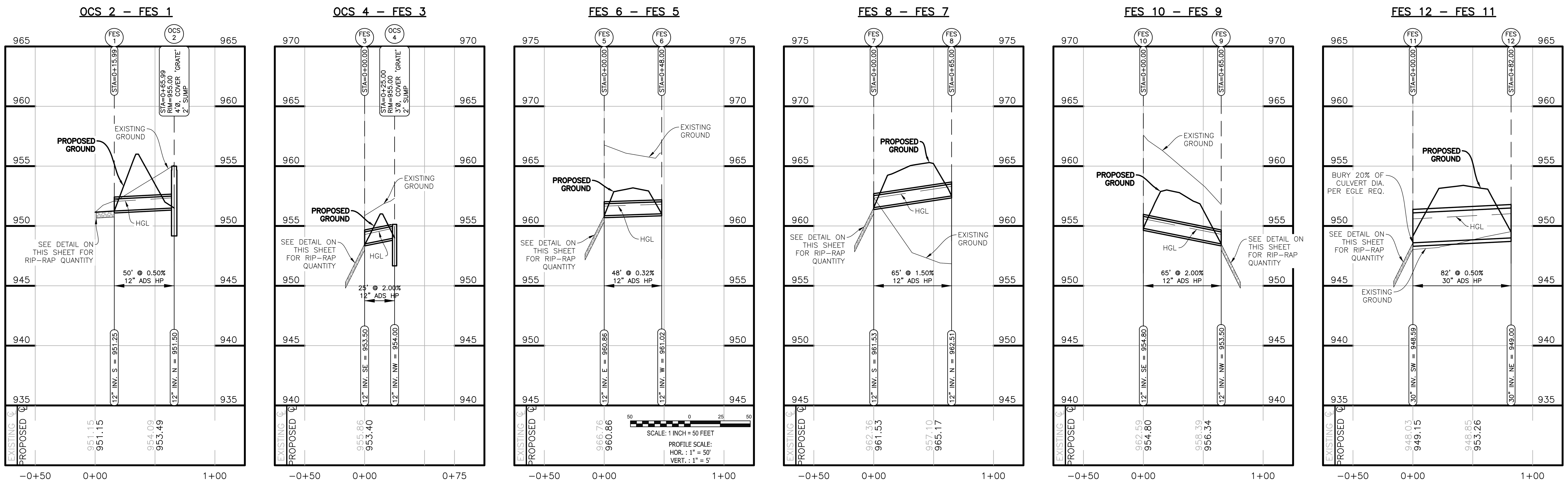


SEE SHEET 2 FOR GENERAL NOTES AND LEGEND



FROM	TO	DRAIN AREA	ACRES A	RUNOFF COEFF C	EQUIV. AREA A * C	INTEN-SITY I	TIME OF CONC. T_C	ADD'L RUNOFF Q	RUNOFF (CFS) Q	PIPE LENGTH (LF)	PIPE DIA. (IN)	VELOCITY FLOWING FULL (FPS)	HYDRAULIC GRADIENT SLOPE %	ACTUAL SLOPE USED	MANNING COEFFICIENT	MANNING FLOW CAPACITY	MANNING'S VELOCITY (FT/SEC)	TIME (MIN)	HG ELEV UPPER END	HG ELEV LOWER END	RIM ELEV UPPER END	RIM ELEV LOWER END	INVERT UPPER END	INVERT LOWER END
2	1	TOTALS	1.40	0.37	0.51	4.38	15.00		2.24	50	12	3.45	0.58%	0.50%	0.012	2.74	3.48	0.24	952.34	952.05	955.00	-	951.50	951.25
4	3	TOTALS	1.40	0.37	0.51	4.38	15.00		2.24	25	12	5.57	1.50%	2.00%	0.012	5.47	6.97	0.06	954.80	954.30	955.00	-	954.00	953.50
6	5	EAST	0.26	0.55	0.14	4.38	15.00		0.62	48	12	2.09	0.21%	0.32%	0.012	2.19	2.79	0.29	961.81	961.66	-	-	961.01	960.86
8	7	WEST	0.57	0.34	0.20	4.38	15.00		0.86	65	12	4.03	0.78%	1.50%	0.012	4.74	6.03	0.18	963.31	962.33	-	-	962.51	961.53
10	9	-	-	-	-	-	15.00		0.00	65	12	-	-	2.00%	0.012	5.47	6.97	0.16	955.60	954.30	-	-	954.80	953.50
12	11	WETLAND	20.62	0.25	5.15	4.38	15.00		22.55	82	30	6.10	0.53%	0.50%	0.012	31.51	6.42	0.21	951.02	950.59	-	-	949.00	948.59

LIVINGSTON COUNTY DETENTION BASIN CALCULATIONS

AREA (ACRES)	IMPERVIOUS FACTOR	ACRE IMPERVIOUS
0.28	0.9	0.25
0.08	0.7	0.05
1.05	0.2	0.21

COMPOUND C: 0.37
TOTAL DRAINAGE AREA: 1.40 ACRES

WATER QUALITY VOLUME V_{WQ}

V_{WQ} = 3,630(C)(A) = 1880 FT^3
Are upstream infiltration BMP's provided? NO
V_F = 0.15(V_{WQ}) = 282 FT^3

WATER QUALITY RATE FOR MECHANICAL STRUCTURE

T_C = MAX TIME OF CONCENTRATION = 15.00 MIN
Q_{WQ} = (C)(A)30.2/$(T_C+9.17)^{.81}$ = 1.19 CFS

CHANNEL PROTECTION VOLUME CONTROL - REQUIRED

V_{CP-R} = 4,719(C)(A) = 2444 FT^3

CHANNEL PROTECTION VOLUME CONTROL - PROVIDED

In-Situ Infiltration rate = 1 IN/HR
Are upstream infiltration BMP's provided? NO
Basin Footrpint Infiltration Area Required = 978 FT^2
V_{CP-P} = 0 FT^3

CHANNEL PROTECTION RATE CONTROL (EXTENDED DETENTION VOLUME)

V_{ED} = 6,897(C)(A) = 3573 FT^3

EXTENDED DETENTION OUTLET RATE

Q_{ED} = V_{ED}/(48hr) = 0.021 CFS
H_{ED} = $V_{ED}/4{,}800\,(H)^{1/2}$ = 1.0 1" HOLES
H = 3.50 FT
$ELEV_{ED}$ = 953.66 FT

100-YEAR ALLOWABLE OUTLET RATE

Q_{DRAIN} = Restricted Drain Rate = 0.1 CFS/ACRE
Q_{VRR} = 1.1055 - 0.206LN(A) = 1.000 CFS/ACRE
Q_{100P} = (LESSER OF Q_{DRAIN} & Q_{VRR})*A = 0.140 CFS

100-YEAR DETENTION VOLUME

V_{100R} = 18985 (C)(A) = 9834 FT^3
Q_{100IN} = (C)(A)83.3/$(T_c+9.17)^{0.81}$ = 3.27 CFS
R = 0.206-.15(ln(Q_{100P}/Q_{100IN}) = 0.6786
V_{100D} = V_{100R}*R-V_{CP-P} = 6674 FT^3
Is $V_{100D} \geq V_{ED}$? YES
V_{100D} = 6674 FT^3

FOREBAY STORAGE VOLUME PROVIDED:

ELEVATION	AREA	VOLUME	TOTALVOLUME	
956	4676	4,059	6,963	
955	3442	2,904	**2,904**	**DHWL**
954	2365	0	0	**BOTTOM OF STORAGE**
953	1421		0	SUMP
952	678		0	SUMP
951	159		0	SUMP

BASIN STORAGE PROVIDED

ELEVATION	AREA (FT^2)	DEPTH (FT)	VOLUME (FT^3)	TOTAL VOLUME (FT^3)	
956	6098	1	5,356	13,806	**FREEBOARD**
955	4614	1	3,951	**8,450**	**DHWL**
954	3288	1	2,704	4,499	.
953	2119	1	1,548	1,796	
952	977	0.5	248	248	
951.5	13	0	0	0	**BOTTOM OF STORAGE**

PROVIDED FOOTPRINT OF BASIN BOTTOM AREA 990 FT^2

OUTLET CONTROL STRUCTURE

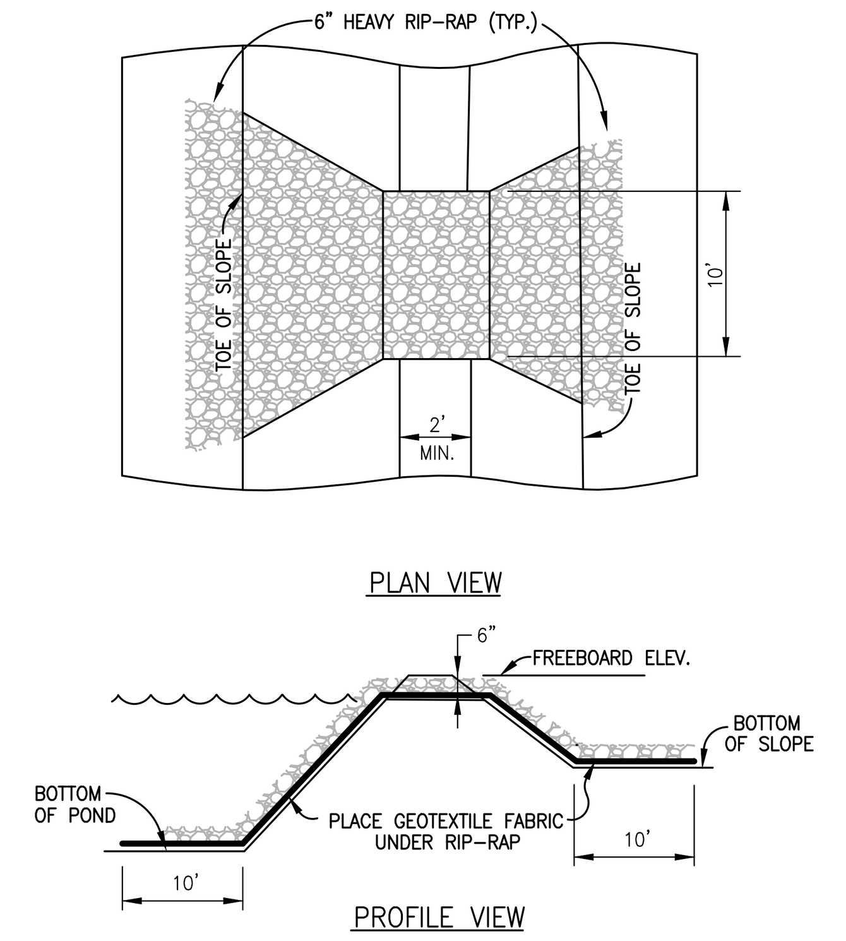
Q_{ED} ACTUAL
H_{ED} = 1 (1" HOLES)
A_{ED} = 0.0055 FT^2
$Q_{ED\text{-}ACTUAL}$ = $(A_{ED})(0.62 \times (2 \times 32.2 \times h)^{0.5})$ = 0.051 CFS

Q_{100ALL} OUTLET
$Q_{100\text{-}ACTUAL}$ = Q_{100P} - $Q_{ED\text{-}ACTUAL}$ = 0.089 CFS
A_{100} = $Q_{100\text{-}ACTUAL}$ / (0.62 * (2 *32.2 * $(ELEV_{DHWL} - ELEV_{ED}))^{0.5}$) = 0.015 FT^2
AREA OF 1 INCH DIAMETER ORIFICE = 0.005 FT^2
ORIFICES = A100 / 0.005 = 2.0 ORIFICES

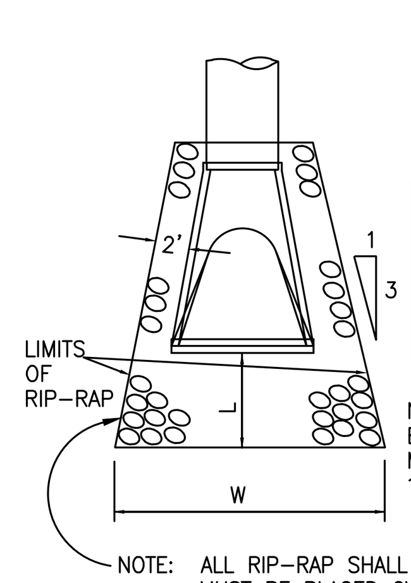
OVERFLOW SPILLWAY DESIGN

Design Flow Rate: Q_{100IN} = 3.27 CFS
Depth of Spillway: D_{SPILL} = 6 INCHES
Width of Spillway: W_{SPILL} = $Q_{100IN}/3.33D_{SPILL}^{3/2}$= 2.8 FT

BASIN DESIGN SUMMARY		
FOREBAY SIZE REQUIRED =	1880	FT^3
FOREBAY SIZE PROVIDED =	2904	FT^3
BASIN SIZE REQUIRED =	6674	FT^3
BASIN SIZE PROVIDED =	11,354	FT^3
ORIFICE DESIGN SUMMARY		
BASIN OUTLET CONTROL STRUCTURE:		
ELEVATION	# OF HOLES	DIAMETER OF HOLES
951.50	1.0	1 -INCH
953.66	2.0	1 -INCH
FOREBAY OUTLET CONTROL STRUCTURE:		
ELEVATION	# OF HOLES	DIAMETER OF HOLES
954.00	1.0	1 -INCH
WIDTH OF OVERFLOW SPILLWAY =	10	FT



EMERGENCY SPILLWAY DETAIL
NO SCALE

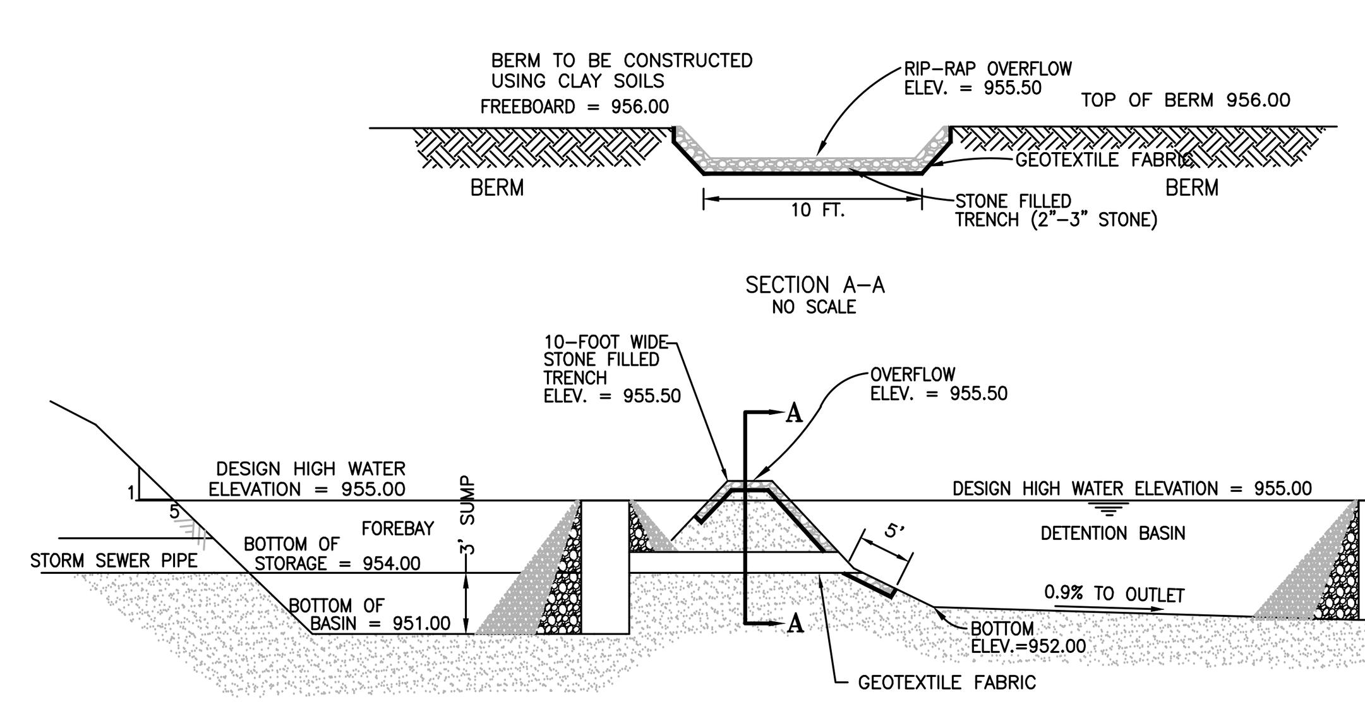


STRUCTURE NAME	OUTLET DIA.	DISCHARGE (CFS)	PIPE SLOPE	DIM. L'	DIM. W'	AREA (SQ. YD.)
FES 1	12"	2.24	0.50%	15	9	10.0
FES 3	12"	2.24	2.00%	15	9	10.0
FES 5	12"	0.62	0.32%	15	9	10.0
FES 7	12"	0.86	1.50%	15	9	10.0
FES 9	12"	–	2.00%	15	9	10.0
FES 11	30"	22.55	0.50%	17	14	20.3

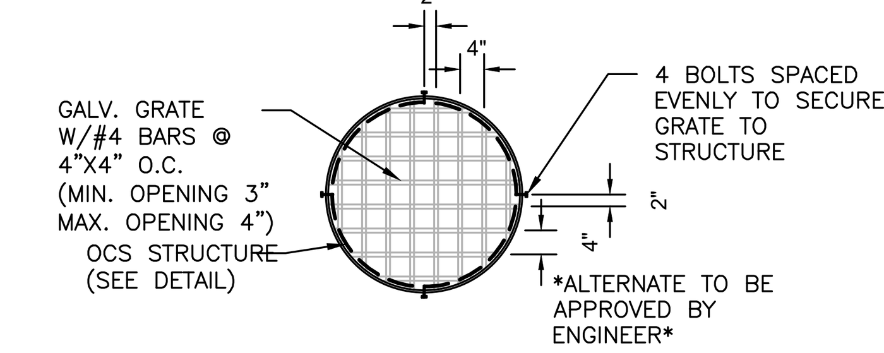
NOTE: LENGTH & WIDTH CALCULATION BASED ON EGLE NONPOINT SOURCE BEST MANAGEMENT PRACTICES MANUAL. MINIMUM 10 S.Y. RIP-RAP PER LCDC STANDARDS.

NOTE: ALL RIP-RAP SHALL HAVE MIN. 6" STONE SIZE AND MUST BE PLACED OVER KEYED IN GEO-FABRIC

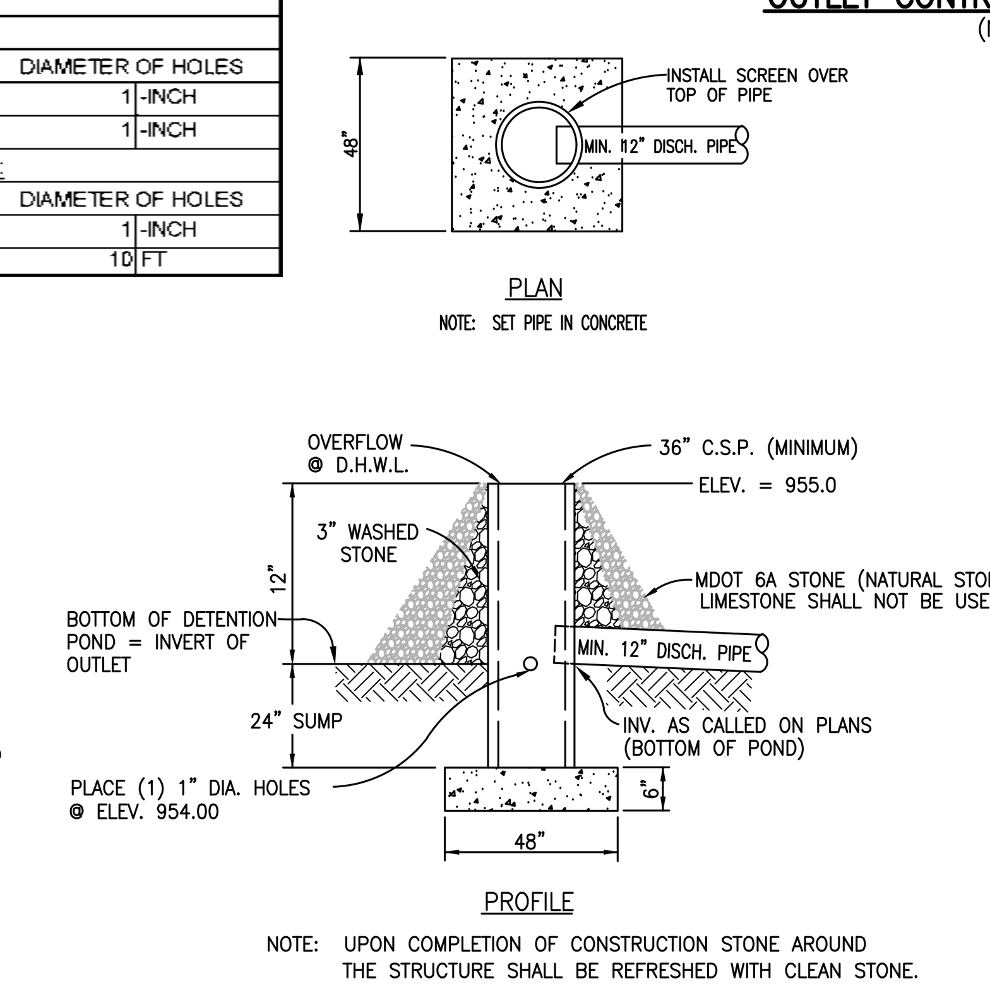
TYPICAL RIP-RAP DETAIL
(SCALE: NONE)



DETENTION BASIN CROSS SECTION
NOT TO SCALE

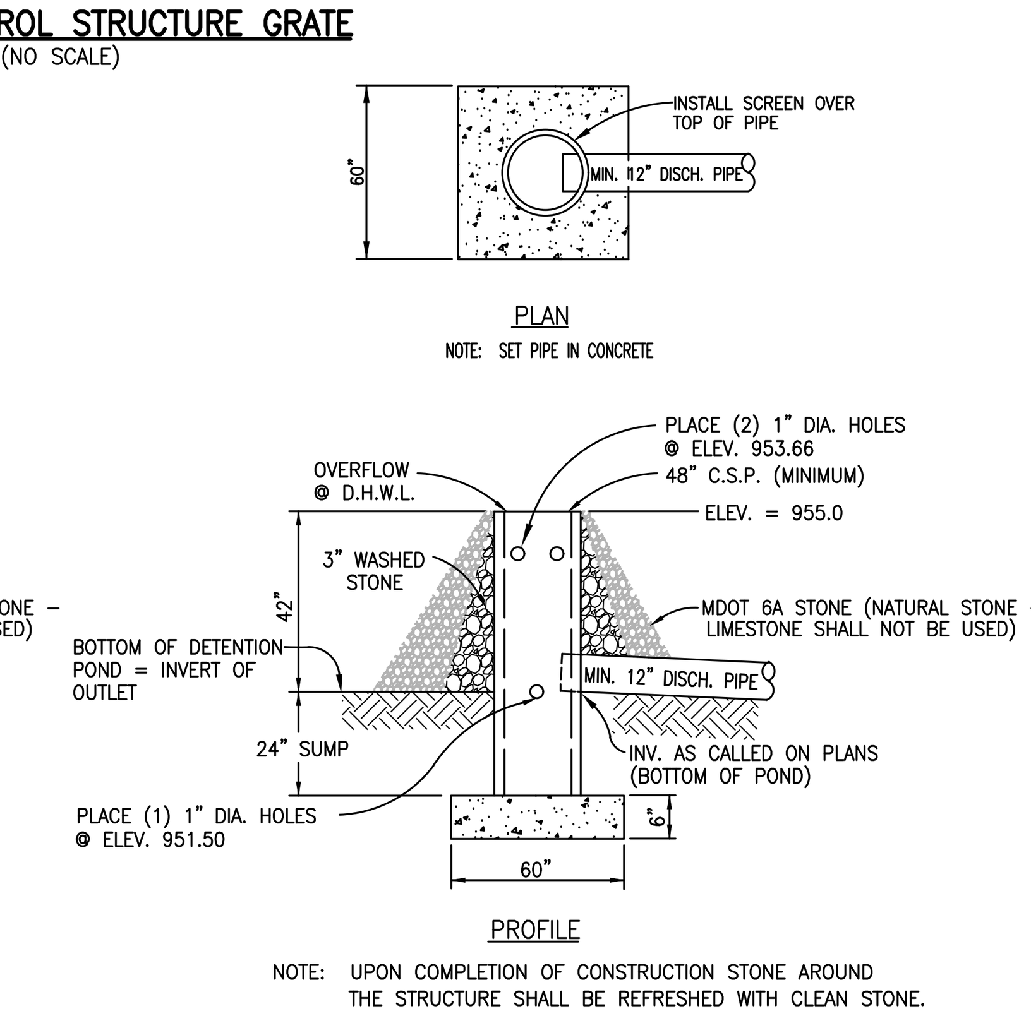


OUTLET CONTROL STRUCTURE GRATE
(NO SCALE)



NOTE: UPON COMPLETION OF CONSTRUCTION STONE AROUND THE STRUCTURE SHALL BE REFRESHED WITH CLEAN STONE.

LCDC FOREBAY OUTLET CONTROL STRUCTURE – OCS 4
(NO SCALE)



NOTE: UPON COMPLETION OF CONSTRUCTION STONE AROUND THE STRUCTURE SHALL BE REFRESHED WITH CLEAN STONE.

LCDC DETENTION POND OUTLET CONTROL STRUCTURE – OCS 2
(NO SCALE)

THE LOCATION AND ELEVATION OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE DRAWINGS ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION AND ELEVATION OF EXISTING UTILITIES AND PROPOSED UTILITY CROSSINGS IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF ANY CONFLICTS ARE APPARENT OR IF THE LOCATION OR DEPTH DIFFERS SIGNIFICANTLY FROM THE PLANS.

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171

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

PROJECT: THE FARM

PREPARED FOR: MR. KEVIN VAN KANNEL, 6530 OLD HICKORY, BRIGHTON, MI 48116, (810) 355-6300

TITLE: STORMWATER MANAGEMENT CALCS & DETAILS

NO	BY	REVISION PER	DATE
1	NL	INITIAL TWP REVIEW	5/20/25
2	NL	B.A.F.A., L.C.R.C., & TWP ENG REVIEW	7/22/25

DESIGNED BY: NL
DRAWN BY: NL
CHECKED BY: BL
SCALE: AS NOTED
JOB NO: 24–380
DATE: 4/21/25
SHEET NO. 8

ARTICLE 21
ADMINISTRATION AND ENFORCEMENT

Sec. 21.01 DUTIES OF ZONING ADMINISTRATOR & OTHERS

21.01.01 **Zoning Administrator:** Except where herein otherwise stated, the provisions of this Ordinance shall be administered by the Zoning Administrator or the Zoning Administrator's designee; provided that site plan review shall be carried out by the Township Planning Commission, and special land uses by the Township Board and shall precede an issuance of permits.

21.01.02 **Zoning Compliance:** The Zoning Administrator shall have the power to grant zoning compliance permits, to make inspection of buildings or premises necessary to carry out his duties in the enforcement of this Ordinance.

21.01.04 **Ordinance Requirements:** Under no circumstances is the Zoning Administrator permitted to make changes to this Ordinance nor to vary the terms of this Ordinance in carrying out his duties as Zoning Administrator.

21.01.05 **Compliance With Ordinance:** The Zoning Administrator shall not refuse to issue a permit when conditions imposed by this Ordinance are complied with by the applicant, despite violations of contracts, such as covenants or private agreements, which may occur upon the granting of said permit.

21.01.06 **Discontinuance of Illegal Uses:** The Zoning Administrator shall order discontinuance of illegal uses of land, buildings or structures, removal of illegal buildings or structures, discontinuance of any illegal construction, or shall take any other lawful action authorized by this Ordinance to ensure compliance with, or prevent violations of its provisions.

Sec. 21.02 REQUIREMENT FOR PERMIT

21.02.01 **Land Use Permits:** A land use permit shall be secured from the Zoning Administrator prior to activities regulated by this Zoning Ordinance. In reviewing a request for a land use permit, the Zoning Administrator shall determine that such activity or use is in accordance with the requirements of this Ordinance. The Zoning Administrator may issue such permit following determination that appropriate action, sanctioning such use, has been taken by the Zoning Board of Appeals; and further provided that Site Review has been completed, where such review is required by this Ordinance.

The land use permit signifies that, in the opinion of the Zoning Administrator, the intended use, building or structure complies with all provisions of this zoning ordinance. Any change in the use of land, type of use or occupancy of any non-residential building or structure shall require a land use permit. Where a building permit is also required, application for a land use permit shall precede the application for building permit. In cases in which a building permit is not required for construction of a new or enlarged building or structure, the application for a land use permit shall be made prior to the date when construction is intended to begin.

21.02.02 **Special Land Use Permits:** A separate Special Land Use Permit is required for certain uses, as described in Article 19.

21.02.03 **County Permits:** No application shall be made to the Livingston County Building Department or Department of Health for appropriate permits until the Land Use Permit has been secured.

21.02.04 **Permits for New Use of Land:** A certificate of occupancy shall be required before any vacant or occupied land may be used or occupied by a new or different use.

21.02.05 **Permits for New Use of Buildings:** No building or structure or use for which a building or land use permit has been issued shall be used or occupied until the building official has, after final inspection, issued a certificate of occupancy. The issuance of a certificate of occupancy shall in no case be construed as waiving any provisions of this chapter.

21.02.06 **Permits Required:** No building or structure, or part thereof shall be hereafter erected, altered, moved or repaired unless a land use permit shall have been first issued for such work and a building permit shall have been first issued for such work. The terms "altered" or "repaired" shall include any changes in structural parts, stairways, fences, type of construction, type, class or kind of occupancy, light or ventilation, means of egress and ingress, or other changes affecting or regulated by the Township of Genoa, except for minor repairs or changes not involving any of the aforesaid features.

21.02.07 **Sewer and Water Permits:** Where public sewer and/or water is provided or required, a permit shall be issued prior to installation of such facilities only after review and approval of the construction plans by the Township Engineer.

Sec. 21.03 PERFORMANCE GUARANTEE

To ensure compliance with the provisions of this Ordinance and any conditions imposed by the Township Board, Zoning Board of Appeals, Planning Commission or Zoning Administrator, the Township may require that a performance guarantee be deposited with the Township to ensure faithful completion of improvements. The performance guarantee shall meet the following requirements:

21.03.01 **Performance Guarantee:** The performance guarantee may be in the form of a cash deposit, irrevocable letter of credit, certified check, cash escrow, or similar instrument acceptable to the Township. If the applicant posts a letter of credit, the credit shall require only that the Township present the credit with a sight draft and an affidavit signed by the Township Attorney attesting to the Township's right to draw funds under the credit. If the applicant posts a cash escrow, the escrow instructions shall provide that the escrow agent shall have a legal duty to deliver the funds to the Township whenever the Township Attorney presents an affidavit to the agent attesting to the Township's right to receive funds whether or not the applicant protests that right.

21.03.02 **Submittal:** The performance guarantee shall be submitted at the time of issuance of the permit authorizing the activity or project. The performance guarantee shall be in a form found acceptable to the Township.

21.03.03 **Amount:** The amount of the performance guarantee shall be sufficient to cover the estimated cost of the improvements associated with a project for which site plan approval is sought. The applicant shall provide an itemized schedule of estimated costs to complete all such improvements.

21.03.04 **Refund:** The entire performance guarantee, including interest accrued, shall be returned to the applicant upon satisfactory and timely completion of the required improvements. The applicant may request that the performance guarantee be returned as work progresses in reasonable proportion to the ratio of work completed on the required improvements, provided that a minimum of ten percent (10%) shall be held back on each element until satisfactory completion of the entire project.

21.03.05 **Improvements not Completed:** Whenever required improvements are not installed or maintained in accordance with the standards set forth in this Ordinance and an approved site plan, the Township may complete the necessary improvements itself or by contract to an independent developer, and assess all costs of completing said improvements against the performance bond or other surety, including any interest accrued on said bond or surety. Prior to completing said improvements, the Township shall notify the owner, site plan review applicant, and/or other firm or individual responsible for completion of the required improvements.

Sec. 21.04 VIOLATIONS AND PENALTIES

21.04.01 **Violation a Nuisance:** Any building erected, altered, moved, razed, or converted, or any use of land or premises carried on in violation of any provision of this Ordinance is declared to be a nuisance per se, and may be abated by order of any court of competent jurisdiction.

21.04.02 **Inspection of Violation:** The Code Officer shall inspect each alleged violation and shall order correction, in writing, of all conditions found to be in violation of this Ordinance. The order to correct a violation shall be issued by serving personally, or by sending, by registered mail, return receipt requested, such order to the last known address of the owner of the property upon which the violation occurs, or when applicable, the violator. A party who has failed to accept such registered mail shall be deemed to have been served.

21.04.03 **Cease and Desist Orders:** The Code Officer shall have the authority to issue a cease and desist order in the form of a written notice for the violation of any provisions of this Zoning Ordinance. A cease and desist order may be issued to any person that is subject to the requirements of this ordinance. Such cease and desist order shall become effective once it has been posted on the property where the violation has occurs and a copy of the notice has been sent to the person involved by first class mail at the person's last known address. Once a cease and desist order is effective, any use or work done in violation of the Zoning Ordinance shall stop immediately and shall not be recommenced until the Code Officer issues written notice dissolving the cease and desist order. Any person who violates a cease and desist order shall be guilty of a municipal civil infraction as authorized below. Any decision of the Code Officer regarding a cease and desist order may be appealed to the Zoning Board of Appeals. A cease and desist order shall be in addition to the other violation penalties and remedies provided in this Ordinance.

21.04.04 **Penalties:** Every person, corporation or firm who violates, disobeys, or omits, neglects or refuses to comply with any provision of this Ordinance or any permit, license or exception granted hereunder, or any lawful order of the Zoning Administrator, Code Officer, Board of Appeals or Township Board issued in pursuance of this Ordinance shall be guilty of a municipal civil infraction and upon conviction thereof shall be fined not more than $500.00 for each such violation. The rights and remedies provided in this Ordinance are cumulative and are in addition to all other remedies provided by law. All monies received from penalties assessed shall be paid into the Township treasury on or before the first Monday of the month

next following receipt thereof by the court of jurisdiction. All fines collected shall belong to the Township and shall be deposited in the general fund.

The owner of record or tenant of any building, structure premises, or part thereof, and any architect, builder, contractor, agent or person who commits, participates in, assists in, or maintains such violation may each be found guilty of a separate offense. The imposition of any penalty shall not exempt the violator from compliance with the provisions of this Ordinance.

21.04.05 **Remedies:** The Zoning Administrator, the Code Officer, the Township Board, the Planning Commission, the Zoning Board of Appeals or the Township Attorney, or any interested party, may institute injunction, mandamus, abatement or other appropriate proceedings to prevent, enjoin, abate or remove any unlawful erection, alteration, maintenance or use. The rights and remedies herein provided are civil in nature. (as amended 12/31/06)

21.04.06 **Scope of Remedies:** The rights and remedies provided in this Ordinance are cumulative and are in addition to all other remedies provided by law. All monies received from penalties assessed shall be paid into the Township treasury on or before the first Monday of the month next following receipt thereof by the court of jurisdiction. All fines collected shall belong to the Township and shall be deposited in the general fund.

Sec. 21.05 PUBLIC HEARING NOTICES

In instances where a public hearing is required under state law with the Township Board, Planning Commission or the Zoning Board of Appeals, written notice of the public hearing shall be as follows:

21.05.01 **Notice Content:** The notice shall do all of the following:

(a) Describe the nature of the request.

(b) Indicate the property that is the subject of the request. The notice shall include a listing of all existing street addresses within the property. Street addresses do not need to be created and listed if no such addresses currently exist within the property. If there are no street addresses, other means of identification may be used. If there are no street addresses, other means of identification may be used.

(c) State when and where the request will be considered.

(d) Indicate when and where written comments will be received concerning the request.

21.05.02 **Notice Publication and Delivery:** Notice shall be published and delivered no less than fifteen (15) days prior to the public hearing as follows:

(a) Notice of the request shall be published in a newspaper of general circulation in the Township.

(b) Notice shall be sent by mail or personal delivery to the owners of property for which approval is being considered.

(c) Notice shall also be sent to all persons to whom real property is assessed within three hundred (300) feet of the property and to the occupants of all structures within three

hundred (300) feet of the property regardless of whether the property or occupant is located in the zoning jurisdiction. If the name of the occupant is not known, the term "occupant" may be used in making notification under this subsection.

21.05.03 **Ordinance Amendments and Rezonings of More Than 10 Properties:** Public hearings for an amendment to the zoning ordinance, or the zoning map that affects more than ten (10) properties shall only require notice in a newspaper, which shall not be required to indicate the property subject to the request under 21.05.01(b) above, and notice shall not be required to be mailed to individual properties under 21.05.02(b) and (c) above.

21.05.04 **ZBA Interpretations and Appeals:** Public hearings for ordinance interpretations and appeals of administrative decisions by the Zoning Board of Appeals shall only require notice in a newspaper, as required in 21.05.02(a) above and if the interpretation or appeal of an administrative decision involves a specific property, notice shall also be given to the person bringing the appeal, as required in 21.05.02(b) above. Variances shall require full notification under 21.05.02(a) through (c) above.

21.05.05 **Property Posting Requirements:** A sign shall be posted on property that has submitted application for a development, rezoning or special land use by the applicant indicating the proposed project in accordance with the following:

(a) The sign shall be six (6) feet in width by six feet (6) in height and constructed of durable and weather resistant materials.

(b) The sign shall be erected in full public view ten (10) feet from the private or public road right of way. If property is located at an intersection, a sign for each road frontage shall be provided which must be readable from the adjacent roadway.

(c) Sign location must ensure that sign is fully visible and the area should be kept clear from obstructions.

(d) Sign shall be erected at least twenty-one (21) days prior to the first scheduled public hearing.

(e) Applicant shall be responsible for erecting and maintaining the signs through the public hearing dates and removing the sign. The sign shall be removed within seven (7) days after final approval is received from the Township Board of Trustees.

(f) Sign lettering size shall be eight (8) inches for the first line announcing the project and four (4) inches for all other text and must be readable from the adjacent roadway.

(g) Sign shall include the following information:

1. Sign shall state one of the following “THIS PROPERTY IS PROPOSED TO BE DEVELOPED, REZONED AND/OR SPECIAL LAND USE”.

2. Current and proposed zoning and/or brief description of proposed project.

3. Generalized map of property shall be included on the sign.

4. Area in acres of the property shall be included the sign.

5. Sign shall indicate to contact the Planning Department for information regarding the date, time and location of the Planning Commission/Township Board public hearing as well as phone number and contact information for the Planning Director.

Sec. 21.06 MORATORIUMS

21.06.01 **Moratorium by Resolution.** The Township Board, by resolution, may impose a temporary moratorium upon the review or issuance of any and all applications, permits, rezonings, licenses, or approvals for special or other land uses in the Township if the Township Board desires to review, enact, or amend provisions of the master plan or zoning ordinance to regulate existing or emerging land uses that may impact the health, safety or welfare of township residents or property.

21.06.02 **Purpose and Findings.** The resolution must state the purpose of the moratorium and include findings of the Township Board in support of the moratorium.

21.06.03 **Length of Moratorium.** Any resolution adopted pursuant to this Section must specify the length of the moratorium which may not exceed twelve (12) months. The resolution may provide for one (1) extension of the moratorium, by resolution, for up to six (6) months.

21.06.04 **Notice.** Notice of the resolution must be published within seven (7) days of its adoption. The notice must include the following:

(a) A summary of the resolution's effect.

(b) The length of the moratorium and whether an extension is possible.

(c) Where the public may inspect the resolution enacting the moratorium.

GENOA CHARTER TOWNSHIP
PLANNING COMMISSION
PUBLIC HEARING
JUNE 9, 2025
MONDAY
6:30 P.M.

AGENDA

CALL TO ORDER: Chairman Grajek called the meeting of the Genoa Charter Township Planning Commission to order at 6:30 p.m. Present were Chris Grajek, Tim Chouinard, Glynis McBain, Marianne McCreary, and Bill Reiber. Absent were Eric Rauch and Greg Rassel. Also present was Planning Director, Amy Ruthig.

PLEDGE OF ALLEGIANCE: The pledge of allegiance was recited.

APPROVAL OF AGENDA:

Moved by Commissioner McCreary, supported by Commissioner Chouinard, to approve the agenda as presented. **The motion carried unanimously.**

DECLARATION OF CONFLICT OF INTEREST: None

CALL TO THE PUBLIC: (*Note: The Board reserves the right to not begin new business after 10:00 p.m.)*

A call to the public was made at 6:31 pm with the following responses:

Melanie Johnson, 3990 Chilson Road, she stated that she had a hard time hearing at the last meeting especially the applicants. She asked if everyone could keep their microphones close so that everyone at home could hear too.

Ben Tasich, 3492 Lakewood Shores Drive, he stated that he serves on the Livingston County Transportation Coalition and he is a strong supporter of public transportation. He reviewed the Township Master Plan and he could only find sidewalks, trails and roads. He asked why the Township does not have anything regarding public transportation. He would like to begin discussions on transportation in regards to whose responsibility it is to provide public transportation. He is hopeful that or did 19 other municipalities play a role in public transportation during the upcoming Master Plan update.

Call to the public was closed at 6:34 pm.

OPEN PUBLIC HEARING #1… (Staff is requesting the proposed amendment as a discussion item only) Consideration of an ordinance amendment to Article 13 entitled “Environmental Protection Regulations.”

A. Recommendation of Zoning Ordinance Amendments to Article 13 entitled “Environmental Protection Regulations”.

Ms. Ruthig gave a brief overview of the proposed zoning ordinance amendments to Article 13. Staff was asked to put more standards in place in regards to tree clearing to be able to preserve the Township’s landmark trees and woodlands. More guidelines were added to the wetlands section of Article 13 and to

clarify some issues regarding trails and recreational areas located in the 25-foot natural features buffer. Staff is requesting to add a requirement for permanent demarcation signs for the 25-foot natural features buffer. Additional requirements were added for above ground and below fuel storage especially in regards to increasing the allowed gallons and tanks. In addition, adding safety requirements for temporary above ground fuel storage during construction projects.

Ms. Ruthig stated Included in the amendment is increasing the number of tanks to two (2) 500-gallon size tanks in place of one (1) 300-gallon size tank. Applicants are still required to apply for special use approval for permanent fuel storage. Temporary storage would be required to receive a permit and comply with the proposed ordinance.

Commissioner McCreary asked if the definition of agricultural/farm use should include animals. Ms. Ruthig stated that she will have it match the Michigan Department of Agriculture definition.

Commissioner McBain read the draft ordinance amendment twice. She felt that it was pretty thorough. She wanted to clarify that residential occupied lots are exempt unless they remove more than 25% of 4-inch caliper trees or more would require a land use permit. If someone wanted to construct a pole barn, then the trees being removed in the building envelope would be exempt. Ms. Ruthig stated that is correct.

Commissioner Reiber asked for clarification on which takes precedence master deed and bylaws or the Township zoning ordinances. Ms. Ruthig stated that the Township cannot enforce the master deed and bylaws of a development.

Commissioner Reiber had concerns on the definition of trees which will be removed. Commissioner Reiber questioned what the purpose of a tree inventory is. Ms. Ruthig stated that the if a property owner requested to clear more than 25% of trees minus the proposed exemptions, a tree inventory would be required. He has concerns about the size in the caliber of a tree.

Commissioners discussed what tree caliber should be included on a tree inventory. Commissioner Chouinard stated that there should be a cutoff in the caliber size and if the caliber is smaller, it would make it more difficult and costlier for surveys. Staff was directed to review other communities' ordinance and reach out to the Township Attorney. Commissioner Reiber would like the amendment to be stricter in the removal of trees.

Chairman Grajek stated that typically people purchase property for the trees, do not cut them down. Property owners around lakes will cut down trees to have a view of the lake.

Ms. Ruthig stated that she would like to add pear trees to the list of prohibited trees.

Ms. Ruthig stated that included in the amendment for the natural features buffer is the requirement for demarcation signs and what type of trail would be allowed within the buffer. In addition, the requirement that fertilizers would not be allowed in the buffer.

Ms. Ruthig stated that included in the proposed amendment is the requirement for any structures of buildings will be required to be 35-feet from the regulated wetland. Commissioners agreed with the 35-foot setback for buildings and structures and the removal of allowing recreation areas in the buffer.

Commissioners requested that the required size, distance and number of signs be included in the amendment.

Ms. Ruthig stated that in regards to the performance standards as it relates to above ground and below ground fuel storage, the State of Michigan and International Fire Code has less strict requirements for fuel storage.

Commissioners were agreement with the proposed size of fuel storage tanks to allow two (2) 500-hundred-gallon tanks.

Commissioner Reiber asked if there are any requirements for the removal or moving of a tank. Ms. Ruthig stated that there is not currently.

Commissioners requested that requirements be added for tank removal such as moving an empty tank and it should be conducted by a licensed professional. In addition, a permit extension would be required for temporary fuel storage if it is over 12-months and must follow State of Michigan and Fire Department guidelines.

Commissioners requested a requirement that abandoned below ground tanks for more than a year. Must be removed.

A call to the public was called at 7:44 pm with the following responses:

Denise Pollicella, 4200 Sweet Road, she thanked the Commissioners for their review of the amendments. As a resident, she appreciates ordinances that protect the trees. She stated that the Livingston County Press and Argus recently conducted a poll of what residents like about living in the county. The number one answer was the rural nature of the community. She indicated that the definition of clear-cut is very narrow, it should be reviewed and made easier to enforce. Two things that should be thought about as far as enforcement would be putting in a provision that the homeowner would be required to pay a fine and cost of the enforcement. Not reading an ordinance is no excuse. People that do not want ordinances, should move to Texas since they do have ordinances. Ordinance tickets should be a misdemeanor on record, that might get someone's attention. Ms. Pollicella suggested reviewing Royal Oak's ordinance in regards to their tree ordinance. She requested that the 25-foot natural features buffer be increased to 50 feet and she would like to see better enforcement mechanisms for what happens if somebody doesn't move the underground storage wells. Currently there is no enforcement mechanism at the local municipal level, unfortunately it is up to the state, and respectfully they do a horrendous job.

Deb Beattie, 3109 Pine View Trail, she would like to know who would approve permits for the removal of landmark trees. In regards to the natural features buffer, she would like to see it increased to 100 feet and left completely untouched and no pesticides or fertilizers to be used. Would like as much protection from all water, wetlands and wells including smaller unregulated wetlands in regards to the below and above ground fuel storage. She stated that trees could be saved on in the building envelope by changing the building enveloped slightly.

Melanie Johnson, 3990 Chilson Road, she agrees with the prohibition of Bradford pear trees. She stated that Brighton Township attempted to adopt a tree ordinance after the Dominion clear-cut their subdivision and the residents were angry with the proposed ordinance. She recommended that the national wetland inventory maps are a good resource. She stated that the 7-11 in Brighton Township located at Pleasant Valley and Grand River had issues with their underground storage and to shut down for a year to install triple-lined tanks. She would like to see the 25-foot natural features buffer increased. When someone is cutting their grass, they are blowing it into the buffer. She asked if an emergency response plan was required.

ADMINISTRATIVE BUSINESS:

Staff Report

Ms. Ruthig stated that she will not be at the July 14, 2025 Planning Commission Meeting and there are currently Legacy Hills, final PUD approval, and 1111 S. Latson Road, next to Mister Car Wash, is seeking approval for a drive-through restaurant.

Approval of May 12, 2025 Planning Commission meeting minutes

Moved by Commissioner McCreary, supported by Commissioner Chouinard, to approve the May 12, 2025 Planning Commission meeting as submitted. **Motion carried unanimously.**

Member discussion

Commissioner McCreary inquired about the status of Mister Car Wash. Ms. Ruthig stated that she has not received any information since the accident.

Adjournment

Moved by Commissioner McCreary, supported by Commission Chouinard to adjourn the meeting at 8:15 pm.

Respectfully Submitted,

Amy Ruthig
Planning Director