GENOA CHARTER TOWNSHIP
PLANNING COMMISSION PUBLIC HEARING
MARCH 11, 2019
6:30 P.M.
AGENDA

CALL TO ORDER:

PLEDGE OF ALLEGIANCE:

APPROVAL OF AGENDA:

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

OPEN PUBLIC HEARING # 1… Review of a site plan and impact assessment requesting preliminary site condominium approval for a proposed 19 unit site condominium. The property in question is located on approximately 30.8 acres at 4242 Bauer Road (parcel # 4711-26-200-002) on the west side of Bauer Road, between White Pines Drive and Challis Road. The request is petitioned by John Moretti.

A. Recommendation of Environmental Impact Assessment (1-25-19)
B. Recommendation of Preliminary Site Condominium Plan (1-18-19)

OPEN PUBLIC HEARING #2…Review of a rezoning application, PUD application, PUD agreement, Impact assessment, and conceptual PUD plan for a proposed planned industrial development with a new 67,000 sq. ft. indoor climate controlled storage building. The rezoning requested is from GCD to IND with a Planned Industrial District (PID) overlay located at 2528 Harte Drive, Brighton consisting of 10.62 acres on parcel 4711-13-300-009. The request is petitioned by James Pappas of Fusco, Shaffer and Pappas, Inc.

A. Recommendation of Rezoning and PUD Applications – GCD to IND (PID)
B. Recommendation of PUD Agreement (2-22-19)
C. Recommendation of Impact Assessment (January 2019)
D. Recommendation of Conceptual Plan (2-22-19)

OPEN PUBLIC HEARING #3… Review of a site plan amendment for a proposed private road project known as “Misty Meadows” located on a vacant to a previously approved project known as “Misty Meadows Private Road”.

A. Disposition of Site Plan Amendment (1-25-19)

OPEN PUBLIC HEARING #4…Review of sketch plan application and sketch plan for a proposed 8,142 sq. ft. addition for Michigan Rod Products located at 1326 Grand Oaks Drive. The request is petitioned by Asselin, McLane Architectural Group, LLC.

A. Disposition of Sketch Plan (2-20-19)

ADMINISTRATIVE BUSINESS:

- *Staff Report*
- *Approval of February 11, 2019 Planning Commission meeting minutes*
- *Member discussion*
- *Adjournment*

GENOA CHARTER TOWNSHIP

Application for Site Plan Review

TO THE GENOA TOWNSHIP PLANNING COMMISSION AND TOWNSHIP BOARD:

APPLICANT NAME & ADDRESS: John Moretti, 4242 Bauer Road, Brighton, Michigan 48116

If applicant is not the owner, a letter of Authorization from Property Owner is needed.

OWNER'S NAME & ADDRESS: John Moretti, 4242 Bauer Road, Brighton, Michigan 48116

SITE ADDRESS: 4242 Bauer Road, Brighton, Michigan 48116 PARCEL #(s): 4711-26-200-002

APPLICANT PHONE: (810) 217-4581 OWNER PHONE: (810) 217-4581

OWNER EMAIL: mrmconstruction2244@yahoo.com

LOCATION AND BRIEF DESCRIPTION OF SITE: 1,500 feet south of the Challis Road and Bauer Road intersection. 40.042 Acres. Partially wooded. On the south side of "Mudd Lake".

BRIEF STATEMENT OF PROPOSED USE: Site Condominium consisting of 19 lots and a Private Road.

THE FOLLOWING BUILDINGS ARE PROPOSED: 19 dwellings

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: Monument Engineering Group Associates

ADDRESS: 298 Veterans Drive, Fowlerville, Michigan 48836

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

I.) Philip A. Rasor, Jr. PE (Name) of Monument Engineering Group Associates, Inc. (Business Affiliation) at prasor@monumentengineering.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: SEE HARDCOPY DATE:

PRINT NAME: John Moretti PHONE: (810) 217-4581

ADDRESS: 4242 Bauer Road, Brighton, Michigan 48116

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

GENOA TOWNSHIP
FEB 20 2018
RECEIVED

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: John Moretti

OWNER ADDRESS: 4242 Bauer Road, Brighton, Michigan 48116

SITE ADDRESS: 4242 Bauer Road, Brighton, Michigan 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.

The private road is intended to serve 19 residential lots and intersects Bauer Road. Building the road to the public road standards would result in the removal of more trees more disturbance to the natural topography.

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.

There is no connection to Brighton Estates Subdivision. No continuity is available to this roadway system.

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 are 19 Lots to utilize this road, and they generate less than 50 trips per 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?

The site has natural sloping topography and is partially wooded. Design attempts to minimize impact to trees and natural topography.

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

A private road easement, maintenance agreement and funding requirement will be part of the Deed Documents for this PUD.

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: JOHN MORETTI

Address: 4242 Bauer Road Phone: 810-217-4581

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

1.) Philip A. Rasor, Jr. PE of Monument Engineering Group Associates, Inc. at ( )
Name *Business Affiliation* *Fax No.*
prasor@monumentengineering.com

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: Moretti Estates

PROJECT LOCATON & DESCRIPTION: 4242 Bauer Road Genoa Township Livingston County, MI 21 Lots being developed as a LRD/PUD on 40 acres

SIGNATURE: SEE HARDCOPY DATE:

PRINT NAME: John Moretti PHONE: 810-217-4581

COMPANY NAME & ADDRESS: John Moretti-4242 Bauer Road, Brighton, MI 48116

Commissioner McCreary would like to have Lot #25 contribute to the maintenance of the common areas, including the maintenance of the entrance to the development, etc. Commissioner Rickard agrees. Commissioners Mortensen and Dhaenens disagree. They would like to have Lot #25 pay for the road and storm sewer system maintenance, but not for any of the landscaping. Mr. Gronow does not believe it would be possible to charge Lot #25 for just the maintenance of the common areas, and not the landscaping, mowing, snow removal, etc.

After a brief discussion, Commissioners McCreary and Rickard believe that Lot #25 should pay for all common aspects of the association, such as the roads, the storm sewer system, common areas, site entrance maintenance, insurance, etc. and should only be exempt from the landscaping costs. Mr. Gronow and the Planning Commissioners agree.

The call to the public was made at 7:14 pm with no response.

Moved by Commissioner Mortensen, seconded by Commissioner Dhaenens, to recommend to the Township Board approval of final condominium site plan for Chestnut Springs, subject to the following:

- A revision to the master deed and by-laws reviewed this evening to the effect that Lot #25 will be excluded from homeowner association costs and/or assessments related only to the landscaping of the condominiums.
- Review by the Township attorney.

The motion carried unanimously.

OPEN PUBLIC HEARING # 2… Review of a site plan and impact assessment requesting preliminary site condominium approval for a proposed 19 unit site condominium. The property in question is located on approximately 30.8 acres at 4242 Bauer Road (Parcel #4711-26-200-002) on the west side of Bauer Road between White Pines Drive and Challis Road. The request is petitioned by John Moretti.

A. Recommendation of Environmental Impact Assessment (1-25-19)
B. Recommendation of Preliminary Site Plan (1-18-19)

Mr. John Moretti, the property owner, and Mr. Phillip Rasor, the civil engineer, were present.

Mr. Rasor showed the proposed site plan, which will consist of 19 units on approximately 30 acres. He reviewed the details of the lot sizes, the access roads,

common areas, the detention area, etc. They have designed the development to minimize the impact on trees and maintain the natural topography of the site.

Chairman Brown asked the applicant if they have received the review letter dated February 6, 2019 from the Township Planner, Brian Borden. Mr. Rasor stated they have.

The Planning Commissioners and the applicant discussed Item #3 in Mr. Borden's letter. There were concerns with the gates at each entrance of the development. Mr. Moretti wanted the development to be private and avoid people cutting through from the adjacent homes. Ms. VanMarter stated that 5hese gates could cause vehicles to back up on Bauer Road on one side as well as back up and block residential driveways on Quaint Ridge on the other. She noted that Mr. Borden suggested that the Township and/or emergency response agencies may require the applicant to enter into an indemnification/hold harmless agreement to protect these entities in the event a delay is caused by the gate or damage occurs to an emergency vehicle or the gate structure itself.

Mr. Rasor stated they will revisit this issue. They will comply with all of the other concerns raised by Mr. Borden.

Mr. Rasor stated they have received Mr. Markstrom's letter dated February 5, 2019. They will address all of his concerns during final site plan approval.

There was a discussion regarding the Fire Authority's requirement to have a 12,000-gallon fire suppression water tank. Ms. VanMarter stated that this requirement is part of the International Fire Code, which has been adopted by the Township, so it is part of the ordinance, thus a requirement of the Township.

Commissioner Mortensen does not believe this is ready to go to the Township Board for approval. He would like to see the gate issue resolved, and the fire suppression water tank and the storm water concerns raised by the Township Engineer addressed.

The call to the public was made at 8:19 pm with no response.

Moved by Commissioner Dhaenens, seconded by Commissioner McCreary, to postpone Public Hearing #2 for preliminary site condominium approval for a proposed 19 unit site condominium to allow the applicant to address items discussed this evening. **The motion carried unanimously**.

March 5, 2019

Planning Commission
Genoa Township
2911 Dorr Road
Brighton, Michigan 48116

Attention:	Kelly Van Marter, AICP Planning Director and Assistant Township Manager
Subject:	Moretti Estates – Preliminary Condominium Plan Review #3
Location:	4242 Bauer Road – west side of Bauer Road, between Brighton and Challis Roads
Zoning:	LDR Low Density Residential District

Dear Commissioners:

At the Township's request, we have reviewed the revised preliminary condominium plan (dated 2/20/19) for Moretti Estates, a 30.8-acre site on the west side of Bauer Road. The applicant proposes a 19-unit residential development with minimum 1-acre lots along a new private road.

We have reviewed the proposal in accordance with the applicable provisions of the Genoa Township Zoning Ordinance.

A. SUMMARY

1. If preliminary condominium approval is granted, the following items must be included with the final condominium submittal:
   a. Condominium documents (Master Deed and By-Laws);
   b. A detailed landscape plan;
   c. Building designs/renderings; and
   d. A detail of the residential entrance signage.
2. When submitted, we suggest the Township Attorney review the condominium documents.
3. We also suggest the applicant include language ensuring protection of the wetlands, natural feature setback and undisturbed wooded areas.
4. The applicant must provide a Private Road Maintenance Agreement, including the financial and maintenance assurances required by Ordinance.
5. We defer technical review of the private road to the Township Engineer.
6. The applicant must address any comments provided by the Township Engineer and/or Brighton Area Fire Authority.

B. PROPOSAL/PROCESS

The applicant proposes a 19-unit site condominium development along a new private road. The project includes lots of not less than 1-acre in area, per current zoning standards (LDR District).

Section 12.07 requires both preliminary and final approval for condominium plans. Procedurally, both reviews go through the Planning Commission for a recommendation to the Township Board, who has final approval authority.

The proposal was heard by the Commission at their February 11, 2019 meeting, but was tabled to accommodate further revisions to the plan (primarily due to the private road connection with the adjacent residential development, which is no longer proposed).

Aerial view of site and surroundings (looking north)

C. CONDOMINIUM PLAN REVIEW

1. **Submittal Requirements.** Provided the preliminary condominium plan is approved, the applicant will need to include the condominium documents (master deed and by-laws) with their final condominium plan submittal. Per our standard comment, we suggest review of these documents by the Township Attorney.

   As requested in our initial review, the previous submittal stated that the condominium documents will include language related to protection of the wetlands and natural feature setback areas.

2. **Dimensional Requirements.** The LDR District requires minimum lot sizes of 1-acre (area) and 150 feet (width). The dimensional table provided on Sheet C-1.0 indicates that all 19 lots meet or exceed these requirements.

   Additionally, building envelopes are depicted based on minimum LDR and natural feature setback requirements demonstrating a sufficient buildable area for each lot.

   Per the revised submittal, the existing accessory building on proposed Lot 17 will be removed as part of this project.

   Lastly, a 10-foot landscape buffer area is included along Lots 8 and 9 to create more conventional lot layouts given the presence of Bauer Road and White Pines Drive. (The initial version of the preliminary plan included multiple front yards for these lots and concerns were raised about the limitations for placement of accessory structures.)

3. **Pedestrian Circulation.** The plan identifies an existing asphalt pathway along the entire Bauer Road frontage.

   Given the proposed density, internal sidewalks are not required along the private road (Section 12.05).

4. **Private Road/Shared Residential Driveway/Gates.** The project includes a private road with 2 shared driveway extensions. The 2nd shared driveway was added in lieu of a connection to Quaint Ridge Trail, which was previously proposed, but created a number of concerns. One such concern was tied to the use of gates, which is also no longer proposed.

   With respect to the private road and shared driveways, the revised plan depicts the easement and road/drive widths required by Ordinance. As noted in our initial review, the applicant must provide a Private Road Maintenance Agreement demonstrating the financial and maintenance assurances.

   The private road is subject to the standards of Section 15.05 and we defer to the Township Engineer for a detailed technical review of the private road.

5. **Landscaping.** The revised landscape plan depicts 33 trees, 28 of which are located along the private road. The plan does not indicate the size or species of the proposed plantings.

   The applicant has indicated that a detailed landscape plan will be provided with the final condominium plan submittal. Per comments in our previous review letters, we suggest the applicant incorporate a mixture of tree species into the final landscape plan.

   Based on the revised grading plan, the applicant will be able to preserve much of the large wooded areas throughout the property. Per our initial review comments, we suggest the applicant incorporate tree protection language into the condominium documents to ensure preservation of these areas.

   Lastly, tree protection fencing must be provided around the wooded areas to be preserved.

6. **Natural Features.** Existing wetlands on the site must be protected according to both MDEQ regulations and the Genoa Township Wetland Protection Standards in Section 13.02.

   The revised grading plan (Sheet C-7.0) has reduced the extent of disturbance such that the 25-foot natural feature setback from the regulated wetland will remain undisturbed.

7. **Lighting.** As requested in our initial review, the revised submittal confirms that lighting is not proposed for this development.

8. **Buildings.** The applicant has indicated that architectural details will be provided with the final condominium plan submittal.

9. **Signs.** The applicant has indicated that details of a residential identification sign will be included with the final condominium plan submittal.

10. **Grading, Drainage, and Utilities.** We defer to the Township Engineer for review and comment on the site engineering elements of the proposal.

Should you have any questions concerning this matter, please do not hesitate to contact our office. We can be reached by phone at (248) 586-0505, or via e-mail at bborden@safebuilt.com and steve.hannon@safebuilt.com.

Respectfully,
SAFEBUILT STUDIO

Brian V. Borden, AICP
Planning Manager

Stephen Hannon, AICP
Planner

TETRA TECH

February 25, 2019

Ms. Kelly Van Marter
Genoa Township
2911 Dorr Road
Brighton, MI 48116

Re: Moretti Estates
Preliminary Site Condominium Review No. 3

Dear Ms. Van Marter:

Tetra Tech has conducted a third preliminary site condominium review of the Moretti Estates plans last updated February 20, 2019. The plans were submitted by Monument Engineering Group Associates, Inc. on behalf of John Moretti. The development includes 30.8 acres located on the west side of Bauer Road, 1,500 feet south of Challis Road. The petitioner is proposing to develop 19 lots through the site condominium process with a private road. We offer the following comments:

TRAFFIC/ROADWAYS

1. There is an existing house that is currently shown as not being a part of the site condominium, but has a driveway connecting to the proposed private drive. More information should be provided on how the existing property will contribute to the private drive or whether relocating the existing driveway off the private drive will be required.

2. The petitioner notes that an application for private road approach and sight distance review has been submitted to the LCRC. A copy of their approval should be provided for the Township's records.

3. A final grading and road construction plan will need to be submitted for review and approval.

DRAINAGE AND GRADING

1. The petitioner is proposing to use Mudd Lake as detention for their stormwater management and they are working with the Livingston County Drain Commissioner to determine the lake's ability to accommodate the new development. The petitioner should include a detail to show where the discharge will eventually be leaving Mudd Lake. The petitioner should determine the incremental rise in Mudd Lake's elevation due to additional impervious surface and any findings should be provided to the Township.

2. The final site plans should include the final stormwater management plan that outlines the drainage area.

Tetra Tech
401 South Washington Square, Suite 100, Lansing, MI 48933
Tel 517.316.3930 Fax 517.484.8140 www.tetratech.com

UTILITIES

1. The petitioner has submitted a hydrogeologic investigation report to the Livingston County Health Department. Documentation verifying the suitability of the soils for these systems should be submitted for the Township's records.

2. The petitioner acknowledged our comments regarding the proposed 12,000-gallon tank from our previous letter. It is our understanding that the tank will be the HOA's responsibility to maintain as part of the master deed. Details on how the tank will be filled, operated, and maintained need to be included on the site plan.

The updated preliminary plan shows adequate access to the site and a final site plan should be submitted with the necessary documents and agreements. The above preliminary site plan comments should be addressed in the final site plan documents and submitted for further review along with the MDEQ permits and other county agency permits.

Please call or email if you have any questions.

Sincerely,

Gary J. Markstrom, P.E.
Vice President

Shelby Scherdt
Project Engineer

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

March 4, 2019

Kelly VanMarter
Genoa Township
2911 Dorr Road
Brighton, MI 48116

RE: Moretti Estates
4242 Bauer Road
Genoa Twp., MI

Dear Kelly:

The Brighton Area Fire Department has reviewed the above mentioned site plan. The plans were received for review on February 21, 2019 and the drawings are dated February 20, 2019 with latest revisions dated January 25, 2019. The project is based on an existing 40.042 acres parcel to be subdivided into a 20-lot site condo development (19 new homes). The plan review is based on the requirements of the International Fire Code (IFC) 2018 edition.

1. The new site layout shows the 12,000-gallon tank beneath the cul-de-sac island. This placement is ideal for use by responders. Additionally, the applicant has met with the fire authority and discussed the tank and other alternatives including a well-hydrant and sprinklering of the homes. All three options are acceptable to the fire authority, the applicant needs to commit to one through further research. The Maintenance requirements for the alternative water supply shall be included in the Condominium By-Laws.

2. The development has been reconfigured at the direction of the planning commission. The dead-end gated connection have been eliminated from the design and replaced with a new hammerhead turnaround shared driveway. This hammerhead is compliant as an acceptable alternative to a cul-de-sac.

3. The dimensions of the roadway need to be reflected along the road and not just the construction detail. Each side of the one-way entrance shall be a minimum of 20-feet wide and the roadway a minimum of 26-feet wide. When scaled, neither meet this dimension.

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

IMPACT ASSESSMENT
FOR
MORETTI ESTATES
GENOA CHARTER TOWNSHIP
LIVINGSTON COUNTY, MICHIGAN

PREPARED BY

MONUMENT ENGIENERING GROUP ASSOCIATES, INC.
298 VETERANS DRIVE
FOWLERVILLE, MI 48836
517-223-3512

December 18, 2018
Revised January 25, 2019
Revised February 19, 2019

Monument Engineering Group Associates, Inc.

In accordance with Genoa Charter Township Ordinance Section 18.07, this Impact Assessment has been prepared to assist the Township in their review of the Site Plan for this Project. This report will detail the required information and give a project overview of the development demonstrating its compliance with current Township regulations.

1. PARTY RESPONSIBLE FOR PREPARATION OF IMPACT STATEMENT:

Prepared for John Moretti:

Moretti Construction Services
2244 Euler Road, Suite 102
Brighton, MI 48114
810-217-4581

Prepared by:

Monument Engineering Group Associates, Inc.
298 Veterans Drive
Fowlerville, MI 48836
517-223-3512

Monument Engineering Groups Associates, Inc. (MEGA), has prepared this impact assessment. MEGA is a professional consulting services corporation offering land surveying, civil engineering, and site planning services throughout the State of Michigan and the mid-west. We are licensed to provide engineering and surveying services in Michigan, as well as in Ohio, Indiana, Pennsylvania, Florida and Virginia. We have been providing these services for nearly 40 years to both public and private sector clients.

2. PROJECT SITE LOCATION:

The subject site contains approximately 30.842 acres for the Moretti Estates Development. The original single Parcel 4711-26-200-002 contains approximately 40.04 acres of land which will now be split into two parcels, the larger one for the Moretti Estates and the other retained by the current owner. The original parcel that contains the Moretti Estates site is in the S ½ of the NE ¼ of Section 26, T2N-R5 of Genoa Chartered Township, Livingston County, Michigan. This parcel is located along the western side of Bauer Road between the intersections of Bauer Road with Brighton Road to the south, and Bauer Road and Challis Road to the north. To the north of this parcel, it is bordered by Mudd Lake and Parcel 4711-26-200-005, owned by the Livingston County Road Commission (LCRC) and Parcel 4711-26-200-012 a private residence. Along its eastern edge, it is predominantly bordered by Bauer Road and its right-of-way, again owned by LCRC and a private residence

Parcel 4711-26-200-003. To the south and west, the subject site is bounded by Brighton Estates Subdivision, a platted subdivision.

Currently, the site is zoned as LDR (low density residential) and is immediately surrounded by LDR on the north, south and western boundaries. Across Bauer Road, a PRF zoning for Mt. Brighton Skiing Facility is present (PRF is public and recreational facilities). No change in zoning is required for this development.

Included in Exhibit A is a location map, Exhibit B is an aerial photograph, and Exhibit C is the Genoa Charter Township's current Zoning Map for this area. Exhibit D is the Soil Map for the area and Exhibit E is the Existing Drainage Characteristics Map. The final exhibit, Exhibit F, is the delineated Wetland's map for the site's area.

3. PROJECT IMPACT on NATURAL FEATURES:

The proposed site is 30.846 acres of mostly wooded land with about 25% of the land open grasslands. Bounded on the north by Mudd Lake, the east by Bauer Road and to the south and west by the existing Brighton Estates Subdivision, the developer is endeavoring to maintain as much natural vegetation and trees as possible. The regulated wetland along the shoreline of Mudd Lake (identified as Wetland A) will be maintained and not encroached upon, and the larger unregulated wetland (Wetland B) is no longer part of the subject parcel for the Moretti Estates. Wetland C, upland, will be filled-in as part of this project and a permit is in process with MDEQ to allow for this construction. The developer is currently in process with obtaining the necessary permits and concurrence from both the Livingston County Drain Commissioner (LCDC) and MDEQ for these activities.

Soils on the site consist primarily of Fox Sandy Loam and Fox-Boyer Complex Loams. These are best described as very deep, well drained soils. A soil map is included as Exhibit D.

As illustrated in Exhibit E, the site tends to drain towards the north to Mudd Lake with only the southwestern corner of the parcel draining towards Brighton Estates Subdivision. Storm water from the roadway system and some areas will be collected and directed to on-site sedimentation forebays, with an outlet structure that conveys this water to Mudd Lake. As was noted earlier in this document, the proposed method for both water quality and detention will be to use a sedimentation forebay with the lake as the detention basin. To this end, the Developer is working with both MDEQ and LCDC to accomplish this proposed method of treatment.

Landscape treatments will be utilized along the entrance to the site from Bauer Road and canopy trees will be provided to the individual lots that are not currently wooded themselves. In general, the developer intends to preserve much of the existing woodlands and the natural wetland features on the site. These will be used to enhance the natural aesthetic component of the proposed development.

4. PROJECT STORM WATER MANAGEMENT IMPACTS:

To effectively manage the proposed change to the stormwater pattern currently encountered on the site, the Developer is working with the Livingston County Drain Commissioner's (LCDC) Office to maintain the natural look and feel for this site by utilizing smaller sedimentation forebays as the water quality structures for this site, with outlet connecting to Mudd Lake, for detention. The outlet from Mudd Lake is the Brighton Estates Drain.

The Developer is currently evaluating, with the LCDC's direction, the use of Mudd Lake for actual detention of the design storm event for the Moretti Estates Storm Water Management Plan. The proposed system is to convey the site's storm water to a collection site/system to outlet this stormwater run-off into the sedimentation forebays and then to establish an outlet system into Mudd Lake which will eventually discharge into the Brighton Estates Drain and onto Walnut Hills Drain finally emptying into Ore Lake. This will require, in addition to permits from LCDC and MDEQ, easements with all the property owners around Mudd Lake for such use.

There are 4 property owners to be negotiated with, and the easements will be part of the Condominium's Documents recorded for all lots. Brighton Estates already has easements with the Drain Commissioner's Office therefore no easement is required from this platted subdivision for their concurrence on this method of storm water management.

Preliminary meetings indicate there is adequate capacity at the outlet from Mudd Lake into the Brighton Estates Drain to accommodate the site's run-off.

While the site is under construction, soil erosion and dust control measures will be implemented, and Best Management Practices followed. For dust control, water tankers will maintain the optimum moisture content of the soil to prevent dust from occurring to the greatest extent possible. For erosion control, silt fencing, check dams and inlet filter mechanisms will be installed and utilized during this time. Permanent restoration including top soiling and seeding with mulching and watering will occur after all mass grading and earthmoving activities are substantially complete.

For the Final Site Plan Submission, the Developer will also be securing LCDC's Soil Erosion and Sedimentation Control Permit to be in place prior to the start of any construction activities.

5. PROJECT IMPACT ON SURROUNDING LAND USES:

The development is in conformance with the future land use map and current zoning established for this portion of the township. The area is currently zoned for LDR and the proposed development meets this criterion with all lots exceeding 1.0 acre in area and minimum of 150 feet in width of the lot.

Access to this site has been revised to allow use of the private roadway for residents and guests from Bauer Road on the eastern side of the property with no access off-site being proposed for the western side of the development. A shared driveway is being added just west of the entrance to the cul-de-sac for this development eliminating this portion of the previously shown private road.

Noise Levels are expected to be typical of a single-family residential community and within Genoa Township Standards. No site lighting is proposed for this development.

6. PROJECT IMPACT ON PUBLIC FACILITIES and SERVICES:

The development proposes 19 single family residential lots after approval of the site plan. The addition of 19 new single-family homes is likely to have a mix of buyers due to the Developer's more upscale approach to managing the existing site and retaining woodlands and other natural features. Consequently, the anticipated mix will include empty nesters and those with no children in addition to families with children. The overall impact to public facilities, schools, police and fire service is expected to be minimal.

7. PROJECT IMPACT ON PUBLIC UTILITIES:

The development proposes all lots will be serviced by well and septic field systems. Soil Investigations for suitability of septic systems were performed in August of 2018 under the supervision of the Livingston County Health Department personnel and 3 test wells as required by LCHD standards were also drilled and tested. Final approval from the LCHD is anticipated soon for the use of well and septic within this development. Electric, Telephone and Natural Gas Services will be extended underground to the site from Bauer Road and provided for all lots within the development.

8. STORAGE and HANDLING of HAZARDOUS MATERIALS:

The storage and handling of hazardous materials within the site is not anticipated and will be noted as not permitted in the condominium documents for the development.

9. PROJECT IMPACT ON TRAFFIC:

The development proposed for Moretti Estates is to accommodate 19 lots in place of the current 1 large parcel with 1 residence. Bauer Road is an existing two (2)

lane cross section with a north bound and a south bound lane. Using ITE Trip Generation Manual, 7th ed. for Single Family Detached Housing based on the number of proposed dwelling units, the calculated trip generation using the average rate for A.M. and P.M. peak hours of traffic is calculated herein:

A.M. Peak Hour:

0.70 x (19 residences) + 12.05 = 25.35 trips
Exiting is 74% so (.74 x 25.35) = 18.76 directional trips

P.M. Peak Hour:

Ln(T)=0.89 x Ln (19 residences) + 0.61 = 3.23
e^ (3.32) = 25.27 trips x 64% (entering) = 16.17 directional trips

As shown from the above calculations, under fully developed conditions, this site will generate less than 20 directional trips in both A.M. and P.M. Peak Hours of Traffic. Reviewing the Township Zoning requirements of 18.07.09 with less than 50 directional trips during peak hour, no Traffic Impact Study is required.

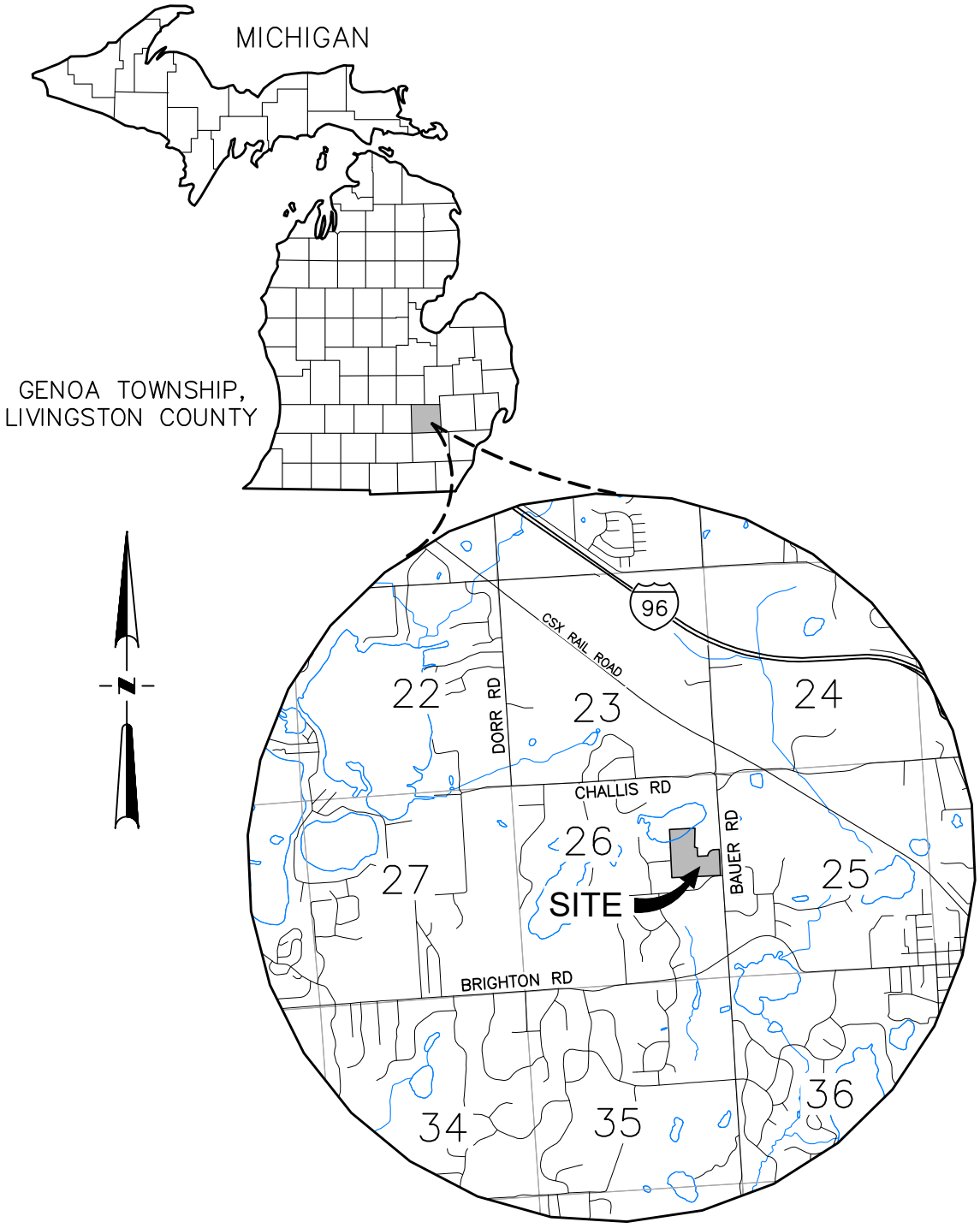
10. PROJECT IMPACT ON HISTORICAL and CULTURAL RESOURCES:

The development is not known to have any historic or cultural resources on this site, and it is not believed any historic or cultural resources will be affected by the proposed development. Mudd Lake is not a natural lake, so no anticipated cultural resources are expected around its shoreline.

11. SPECIAL PROVISIONS:

The development will need no special provisions as part of its development.

EXHIBIT A
LOCATION MAP



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298 VETERANS DRIVE
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MICHIGAN 48836
(OFFICE) 517-223-3512

PROJECT:

MORETTI ESTATES

NE 1/4, SEC. 26, T2N–R5E GENOA TWP

DATE: 1/25/2019		DR. BY:MLL	CHK: PR
SCALE: NTS	SHEET:1 of 7	FILE : 18–025_IMPACT EXH	JOB No. 18–025

EXHIBIT B
AERIAL

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MEGA

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(OFFICE) 517-223-3512

PROJECT:

MORETTI ESTATES

NE 1/4, SEC. 26, T2N–R5E GENOA TWP

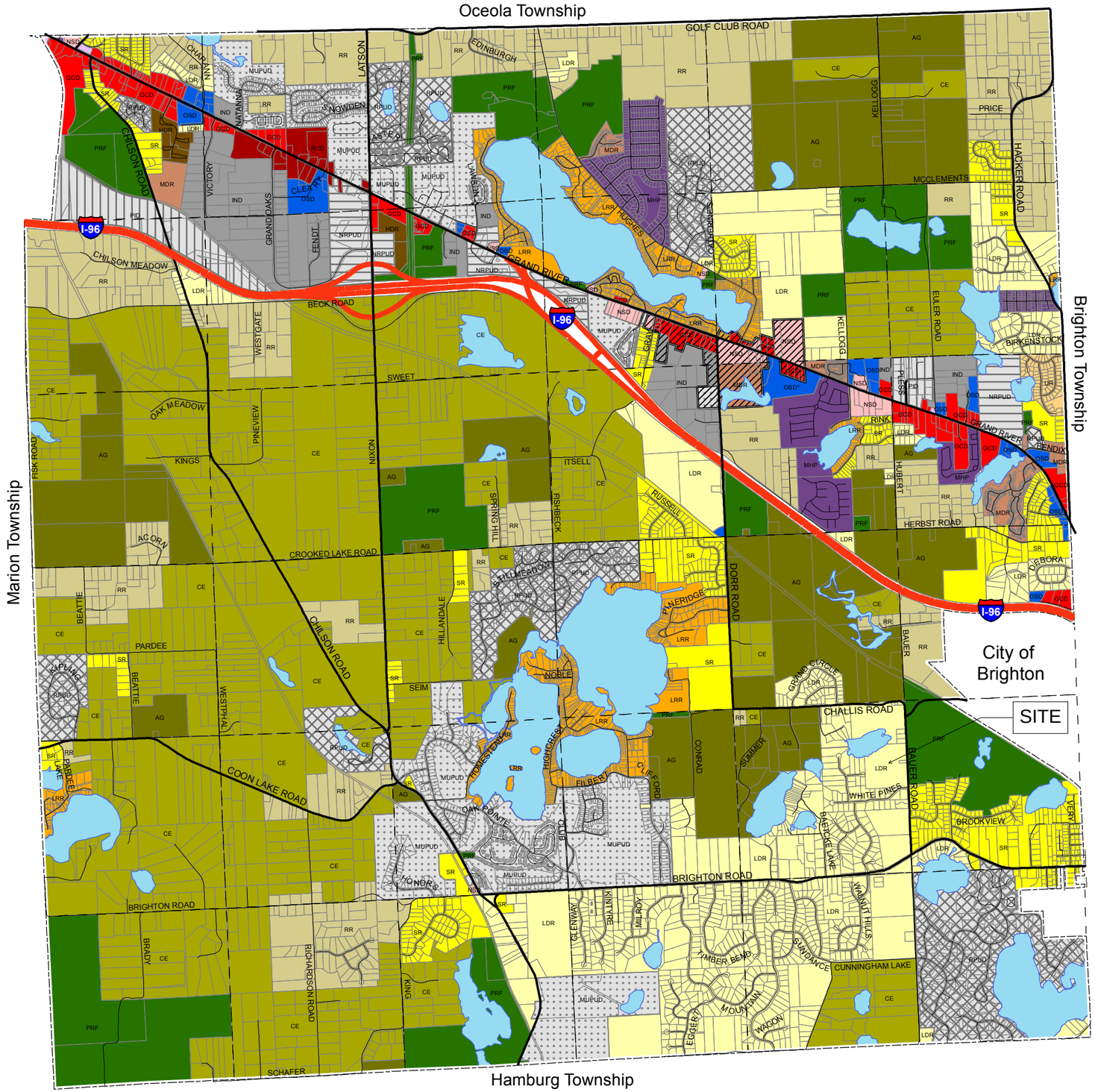
DATE: 1/25/2019 | DR. BY:MLL | CHK: PR

SCALE: 1" = 1,000' | SHEET:2 of 7 | FILE : 18-025_IMPACT EXH | JOB No. 18–025

EXHIBIT C

Zoning Map

Genoa Charter Township
Livingston County, Michigan



Legend

AG	RC
CE	GC
RR	NS
LDR	OS
SR	NRPUD
LRR	IND
UR	PID
MDR	PRF
HDR	MUPUD
RPUD	RDPUD
MHP	Town Center

Updates:
04/11/08 - Multiple Revisions (42 parcels)
09/12/08 - 4489 & 4495 Oak Pointe Drive (LRR)
02/25/11 - United Way Conditional Rezoning (OSD)
10/2/12 - Corrected Map re. court stipulation for Pet Ritz from 05/18/2006 (AG)
11/29/12 - Corrected Map re. Zeeb property approved 3/15/04 (MUPUD)
01/07/13 - Dakkota (14-100-014) Conditional Rezoning (OSD)
10/10/13- Corrected Map re. (29-200-036) - was rezoned 8/18/2003 (RPUD)
11/13/2014 - Removed Lucy Rd 425 Area, Rezone Latson Elementary (09-100-036;RR-NRPUD)
Correct Brighton Lake Rd. Error (RPUD-LDR)

N
W E
S

1 inch = 3,500 feet

Official Zoning Map
Adopted May 2, 2005
Created by: Kelly VanMarter
Basemap layers provided by:
Livingston County GIS

EXHIBIT D
SOIL MAP

Mega Engineering Group Associates, Inc.

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PROJECT:

MORETTI ESTATES

NE 1/4, SEC. 26, T2N–R5E GENOA TWP

DATE: 1/25/2019		DR. BY:MLL	CHK: PR
SCALE: 1" = 250'	SHEET:3 of 7	FILE : 18-025_IMPACT EXH	JOB No. 18–025

EXHIBIT D
SOIL MAP UNIT LEGEND

Livingston County, Michigan (MI093)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
BtB	Boyer-Oshtemo loamy sands, 2 to 6 percent slopes	1.75	4.38%
FoA	Fox sandy loam, 0 to 2 percent slopes	0.17	0.42%
FoB	Fox sandy loam, 2 to 6 percent slopes	6.56	16.39%
FoC	Fox sandy loam, 6 to 12 percent slopes	4.12	10.30%
FrB	Fox-Boyer complex, 2 to 6 percent slopes	6.18	15.45%
FrD	Fox-Boyer complex, 12 to 18 percent slopes	7.22	18.03%
FrE	Fox-Boyer complex, 18 to 25 percent slopes	4.89	12.20%
FrF	Fox-Boyer complex, 25 to 40 percent slopes	2.79	6.96%
Ho	Houghton muck, 0 to 1 percent slopes	1.96	4.89%
Md	Made land	1.32	3.29%
MoD	Miami loam, 12 to 18 percent slopes	0.02	0.04%
W	Water	3.07	7.66%
Totals for Area of Interest		40.04	100.00%

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PROJECT:

MORETTI ESTATES

NE 1/4, SEC. 26, T2N–R5E GENOA TWP

DATE: 1/25/2019 | DR. BY:MLL | CHK: PR

SCALE: 1" = 250' | SHEET:4 of 7 | FILE : 18-025_IMPACT EXH | JOB No. 18–025

EXHIBIT E
EXISTING DRAINAGE

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PROJECT:

MORETTI ESTATES

NE 1/4, SEC. 26, T2N–R5E GENOA TWP

DATE: 1/25/2019		DR. BY:MLL	CHK: PR
SCALE: 1" = 250'	SHEET:5 of 7	FILE : 18-025_IMPACT EXH	JOB No. 18–025

EXHIBIT F
WETLAND MAP

Engineering Group Associates, Inc.
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PROJECT:

MORETTI ESTATES

NE 1/4, SEC. 26, T2N–R5E GENOA TWP

DATE: 1/25/2019		DR. BY:MLL	CHK: PR
SCALE: 1" = 250'	SHEET:6 of 7	FILE : 18-025_IMPACT EXH	JOB No. 18–025

REVISED PRELIMINARY SITE PLAN FOR

MORETTI ESTATES

4242 BAUER ROAD

LEGAL DESCRIPTION (AS PROVIDED)

(Per survey by: Boss Engineering, Job No.: 16-398, Dated: 12-05-16)

Parcel Tax Number: 4711-26-200-002

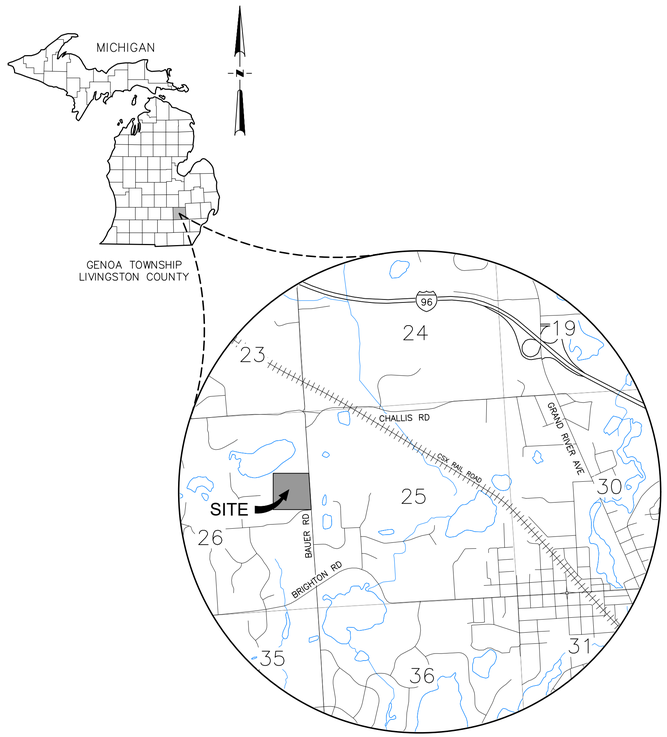
PARCEL 1:

A part of the S 1/2 of the NE 1/4 of Section 26, T2N-R5E, Genoa Township, Livingston County, Michigan, described as follows: Beginning at the East 1/4 corner of said Section 26; thence S89°24'43"W, 1332.50 feet; thence N00°33'49"W, 876.77 feet to the traverse point"B"; thence continuing N00°33'49"W, 444.16 feet; thence N89°02'01"E, 1039.53 feet to traverse point "A", said point bearing N63°57'38"E, 1133.31 feet from traverse point "B"; thence continuing N89°02'01"E, 293.00 feet to the East line of said Section and the centerline of Bauer Road; thence S00°33'49"E along said line 510.13 feet; thence S89°02'01"W, 250.00 feet; thence S00°33'49"E, 87.00 feet; thence N89°02'01"E, 250.00 feet to the East line of said Section and the centerline of Bauer Road; thence S00°33'49"E along said line 732.60 feet to the Point of Beginning, containing 40.04 acres more or less and subject to the rights of the public over the existing Bauer Road.

Also including the use of a 66 foot wide easement over part of White Pines Drive, as recorded in Liber 1115, Page 564, Livingston County Records

BEARING REFERENCE

Bearings are based on legal description as provided by: Boss Engineering, Job No.: 16-398, Dated: 12-05-16.



LOCATION MAP
N.T.S.

DESIGN ENGINEER/SURVEYOR

MONUMENT ENGINEERING GROUP ASSOCIATES, INC

ENGINEERS - SURVEYORS - CONSULTANTS
LANDSCAPE ARCHITECTS - LAND PLANNERS

298 VETERANS DR.,
FOWLERVILLE, MI 48836
PHONE: 517-223-3512

Developing Lifelong Relationships

CLIENT

JOHN MORETTI
4242 BAUER RD
BRIGHTON, MI 48116

SHEET INDEX

			PRELIMINARY SITE PLAN TO TOWNSHIP 1/2/2019	REVISED SITE PLAN TO TOWNSHIP 1/25/2019	REVISED SITE PLAN TO TOWNSHIP 2/20/2019
			INCLUDED SHEETS		
		GENERAL			
SHEET	G-1.0	COVER	●	●	●
		SURVEY			
SHEET	V-1.0	TOPOGRAPHIC SURVEY (EXISTING CONDITIONS)	●	●	●
SHEET	V-1.1	AERIAL PLAN	●	●	●
SHEET	V-1.2	SOILS EVALUATION	●	●	●
SHEET	V-1.3	SOIL BORING LOGS	●	●	●
		LAYOUT PLAN			
SHEET	C-1.0	OVERALL LAYOUT PLAN	●	●	●
		VEHICLE CIRCULATION			
SHEET	C-2.0	EMERGENCY VEHICLE CIRCULATION	●	●	●
		GRADING, SOIL EROSION & SEDIMENTATION CONTROL PLAN			
SHEET	C-7.0	OVERALL GRADING PLAN	●	●	●
		STORM WATER MANAGEMENT			
SHEET	C-9.0	STORM WATER MANAGEMENT PLAN	●	●	●
		LANDSCAPE			
SHEET	L-1.0	LANDSCAPE PLAN AND DETAILS	●	●	●
		GENOA TOWNSHIP, LIVINGSTON COUNTY STANDARD DETAILS			

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CLIENT :

JOHN MORETTI
4242 BAUER ROAD
BRIGHTON, MI 48116

COVER

MORETTI ESTATES
4242 BAUER ROAD
PART OF NE 1/4, SEC. 26, T2N-R5E
GENOA TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

PLAN SUBMITTALS/REVISIONS	DATE
PRELIMINARY SITE PLAN TO TOWNSHIP	1/2/2019
REVISED SITE PLAN TO TOWNSHIP	1/25/2019
REVISED SITE PLAN TO TOWNSHIP	2/20/2019

ORIGINAL ISSUE DATE: 1/2/2019

PROJECT NO: 18-025

SCALE: N/A
0 1/2" 1"

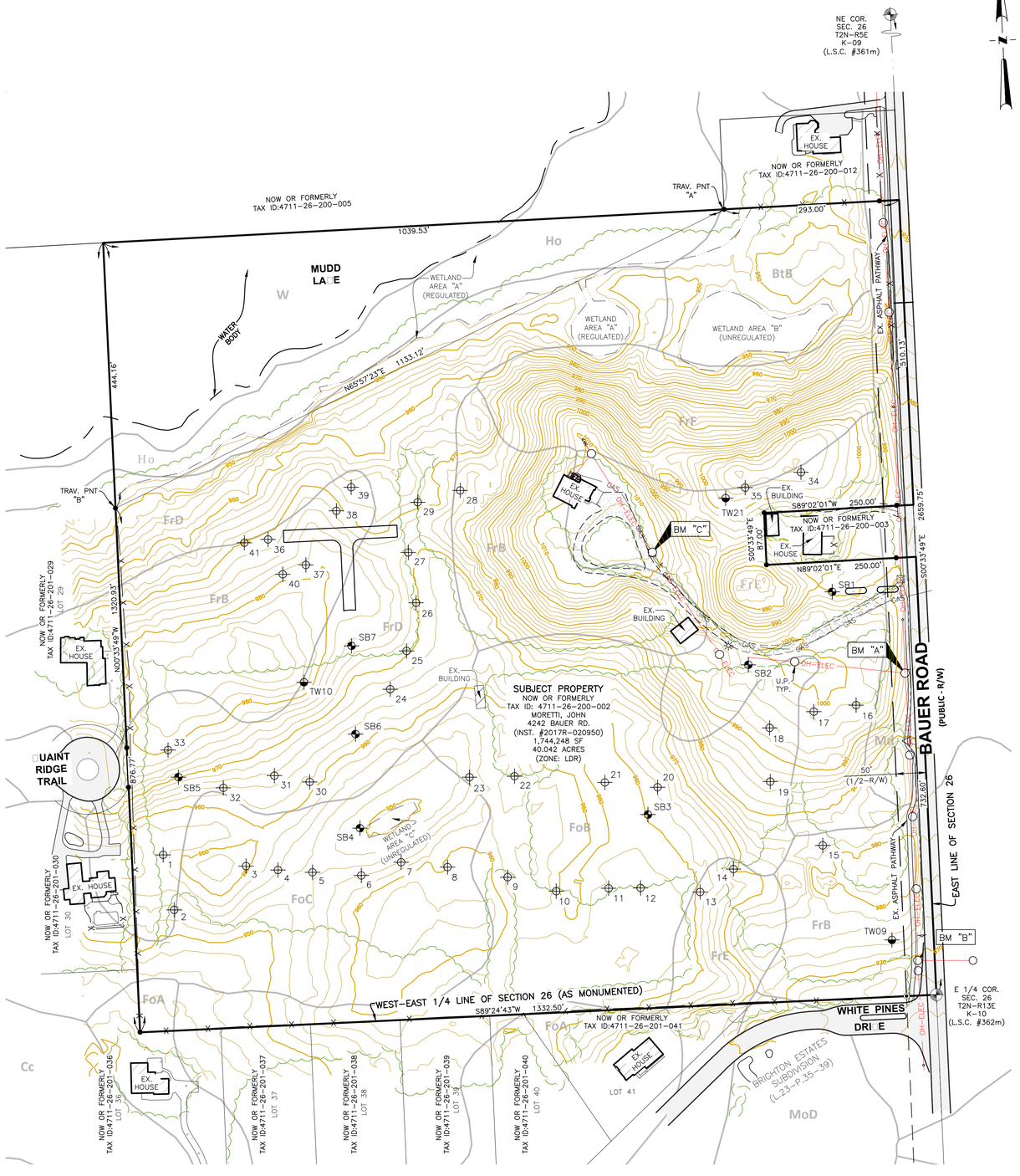
FIELD: SE
DRAWN BY: DC, ML
DESIGN BY: DD
CHECK BY: PR

G-1.0

NOT FOR CONSTRUCTION

MORETTI ESTATES

TOPOGRAPHIC SURVEY
EXISTING CONDITIONS



REFERENCE INFO

WM: Received:	GENOA TOWNSHIP N/A
SAN: Received:	GENOA TOWNSHIP N/A
STORM: Received:	TOWNSHIP/COUNTY N/A
GAS: Received:	CONSUMERS GAS 4/9/18
ELEC: Received:	DTE ENERGY 4/25/18
PHONE/CABLE: Received:	AT&T ~ COMCAST 4/12/18 ~ 4/10/18
DRAIN: Received:	LIVINGSTON CO. DRAIN COMMISSIONER 4/9/18

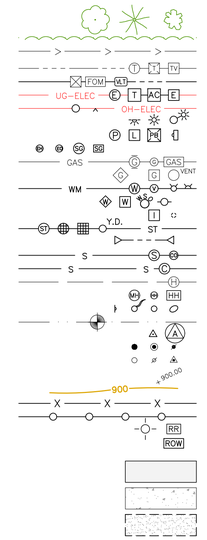
AERIAL PHOTOGRAMMETRY

TOPOGRAPHIC DATA COLLECTED FOR THE ENTIRE SITE.

TOPOGRAPHIC CONTOURS BASED ON AERIAL.

CONTOUR INTERVAL:	2 FOOT
VERTICAL DATUM:	NAVD88
DATE OF PHOTOGRAPHY:	4/24/2018

EXISTING LEGEND



DECIDUOUS TREE, CONIFEROUS TREE, SHRUB
TREE LINE/ CANOPY
DITCH/ DRAINING COURSE
UG TELE, MH, TELE PED, CABLE PED
UG FIBER, PED, LINE MARKER, VAULT
UG ELEC, MH, TRANSFORMER, AC UNIT, METER
OH ELEC, UTIL POLE, GUY WIRE
GROUND LIGHT, POLE, POLE W/ ARM LT
LIGHT MH, LT CTRL BOX, PH, BOOTH, PARK. METER
ELEC HAND HOLE, OUTLET, SIGNAL MH, SIGNAL BOX
UG GAS, MH, VALVE, LINE MARKER
GAS WELL, METER, VENT
WATER MAIN, MH, VALVE IN BOX, HYDRANT, FDC
WATER WELL, METER, STOP BOX, POST INDICATOR VALVE
IRRIGATION CONTROL VALVE, SPRINKLER HEAD
STORM SEWER, MH, CB, INLET, YARD DRAIN
CULVERT/ END SECTION
SANITARY SEWER, MH, CLEAN OUT
COMBINED SEWER, MH
STEAM LINE, MH
MISC. MANHOLE, HAND HOLE, HAND BOX
SIGN, FLAG POLE, GUARD POST, ROCK
SECTION LINE, SECTION CORNER
SURVEY CONTROL POINT, BENCHMARK
FOUND IRON ROD (FIR), FD MON, FD PK
SET IRON ROD (SIR), SET PK, MAG NAIL
SPOT ELEVATION
CONTOUR
FENCE
GUARD RAIL
RAILROAD SIGNAL, SIGNAL BOX
ROW MARKER
EX. ASPHALT
EX. CONCRETE
EX. GRAVEL

SOIL BORING LEGEND

SOIL BORINGS (SB#)
TEST WELLS (TW#)
PERCOLATION TEST SITE (#)

SOILS CLASSIFICATIONS

BtB	BOYER-OSHTEMO LOAM, 2-6% SLOPES
FoA	FOX SANDY LOAM, 0-2% SLOPES
FoB	FOX SANDY LOAM, 2-6% SLOPES
FoC	FOX SANDY LOAM, 6-12% SLOPES
FrB	FOX-BOYER COMPLEX, 2-6% SLOPES
FrD	FOX-BOYER COMPLEX, 12-18% SLOPES
FrE	FOX-BOYER COMPLEX, 18-25% SLOPES
FrF	FOX-BOYER COMPLEX, 25-40% SLOPES
Ho	HOUGHTON MUCK, 0-1% SLOPES
Md	MADE LAND
MoD	MIAMI LOAM, 12-18% SLOPES
W	WATER

BENCHMARKS

Datum: NAVD88

BM A:
RAIL ROAD SPIKE IN WEST FACE UTILITY POLE, 26'± WEST OF CENTERLINE OF BAUER ROAD & 539'± NORTH FROM SUBJECT'S SOUTH PROPERTY LINE.
Elev = 986.91

BM B:
RAIL ROAD SPIKE IN WEST FACE UTILITY POLE, 28'± WEST OF CENTERLINE OF BAUER ROAD & 58'± NORTH FROM SUBJECT'S SOUTH PROPERTY LINE.
Elev = 970.48

BM C:
RAIL ROAD SPIKE IN WEST FACE UTILITY POLE, 439'± WEST OF CENTERLINE OF BAUER ROAD & 565'± SOUTH FROM SUBJECT'S NORTH PROPERTY LINE.
Elev = 1013.57

FLOOD ZONE

FEMA map scales do not supply sufficient level of detail to plot accurately. Zones if plotted herein are approximate.

By scaled map location and graphic plotting only, the subject property appears to lie entirely in Zone (X) Area determined to be outside of the 0.2% annual chance flood plain according to the Flood Insurance Rate Map for the County of Livingston, Community Panel No. (26093C0340D), Effective Date 9/17/2008.

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CLIENT :

JOHN MORETTI
4242 BAUER ROAD
BRIGHTON, MI 48116

TOPOGRAPHIC SURVEY (EX. COND.)

MORETTI ESTATES
4242 BAUER ROAD
PART OF NE 1/4, SEC. 26, T2N–R5E
GENOA TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

PLAN SUBMITTALS/REVISIONS	DATE
PRELIMINARY SITE PLAN TO TOWNSHIP	1/2/2019
REVISED SITE PLAN TO TOWNSHIP	1/25/2019
REVISED SITE PLAN TO TOWNSHIP	2/20/2019

ORIGINAL ISSUE DATE: 1/2/2019

PROJECT NO: 18–025

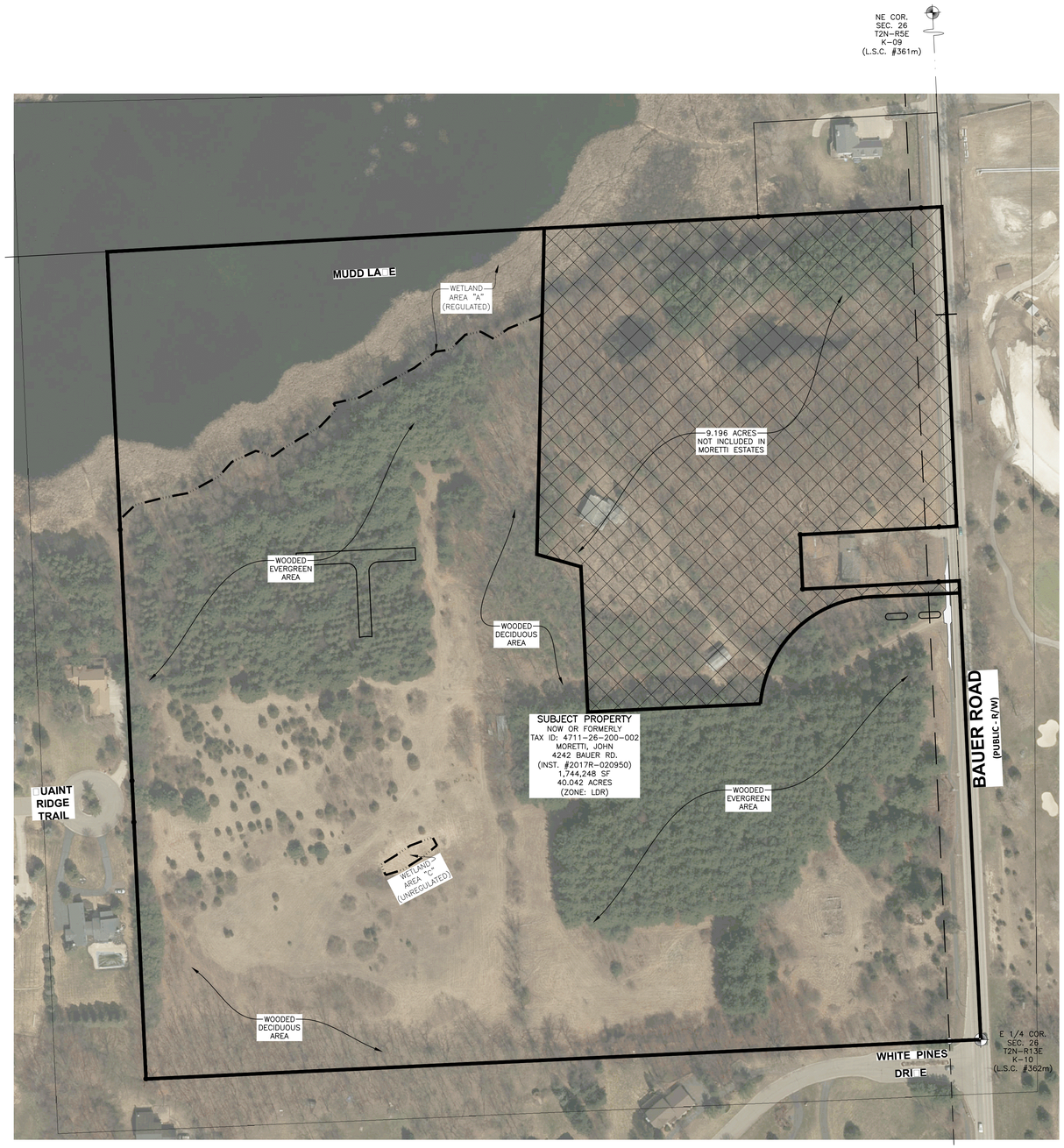
SCALE: 1" = 100'
0 1/2" 1"

FIELD: SE
DRAWN BY: DC, ML
DESIGN BY: DD
CHECK BY: PR

V-1.0

NOT FOR CONSTRUCTION

MORETTI ESTATES
AERIAL PLAN



NOTES

1. MORETTI ESTATES DEVELOPMENT IS 30.846 ACRES
2. REMAINING 9.196 ACRES OF SUBJECT PARCEL TO REMAIN AS IS.

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CLIENT :

JOHN MORETTI
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BRIGHTON, MI 48116

AERIAL PLAN

MORETTI ESTATES
4242 BAUER ROAD
PART OF NE 1/4, SEC. 26, T2N-R5E
GENOA TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

PLAN SUBMITTALS/REVISIONS	DATE
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REVISED SITE PLAN TO TOWNSHIP	2/20/2019

ORIGINAL ISSUE DATE: 1/2/2019

PROJECT NO: 18-025

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

FIELD: SE
DRAWN BY: DC, ML
DESIGN BY: DD
CHECK BY: PR

V-1.1

NOT FOR CONSTRUCTION

FILE:P:\Projects\2018\18-025 Moretti Estates\Dwg\Engineering\18-025_V-1.1_AerialPlan.dwg DATE:12/28/2018 1:48 PM

MORETTI ESTATES

SOILS E□ALUATION

SOIL BORING LEGEND

- SOIL BORINGS (SB#)
- TEST WELLS (TW#)
- PERCOLATION TEST SITE (#)

Moretti Estates

Westside of Bauer Rd. Between Challis and White Pines Dr.
Genoa Township, Section 26

Soils Logged by: Aaron Aumock, LCHD
Miranda, Monument Engineering
David, Monument Engineering

Developer: John Moretti

Conducted on: August 22, 2018 & August 29, 2018

PERCOLATION TEST SITES

1)	0 - .5'	Topsoil	7)	0 - .5'	Topsoil
	.5' – 2.5'	Sandy Loam		.5' – 4'	Sandy Loam
	2.5' – 4.5'	Loamy Sand		4' – 9'	Sandy Clay Loam
	4.5' – 8.5'	Sandy Loam	8)	0 - .5'	Topsoil
2)	0 - .5'	Topsoil		.5' – 2'	Sandy Clay Loam
	.5' – 9'	Loamy Sand		2' – 6'	Sandy Loam
3)	0 - .5'	Topsoil		6' – 9'	Loam
	.5 – 8.5'	Loamy Sand	9)	0 - .5'	Topsoil
4)	0 - .5'	Topsoil		.5' – 3'	Sandy Clay Loam
	.5 – 7'	Loamy Sand		3' – 8'	Medium Sand
	7' – 9.5'	Sandy Loam	10)	0 - .5'	Topsoil
5)	0 - .5'	Topsoil		.5 – 8'	Loamy Sand
	.5' – 3'	Loam	11)	0 - .5'	Topsoil
	3' – 9'	Sandy Loam		.5' – 5.5'	Clay Loam
6)	0 - .5'	Topsoil		5.5' – 9.5'	Loamy Sand
	.5 – 2'	Loam	12)	0 - .5'	Topsoil
	2' – 6'	Sandy Loam		.5' – 6'	Clay Loam
	6' – 8'	Sandy Clay Loam		6' – 10'	Loamy Sand
	8' – 9.5'	Clay Loam			
13)	0 - .5'	Topsoil	24)	0 - .5'	Topsoil
	.5' – 6'	Clay Loam		.5' – 7'	Clay Loam
	6' – 10'	Loamy Sand		7' – 10'	Sandy Loam
14)	0 - .5'	Topsoil	25)	0 - .5'	Topsoil
	.5' – 3'	Clay Loam		.5' – 5.5'	Sandy Clay Loam
	3' – 9'	Medium Sand		5.5' – 9'	Loamy Sand
15)	0 - .5'	Topsoil	26)	0 - .5'	Topsoil
	.5' – 8'	Clay Loam		.5' – 3'	Clay Loam (Fill)
16)	0 - .5'	Topsoil		3' – 4'	Peat
	.5' – 9'	Clay Loam		4' – 8.5'	Marl
17)	0 - .5'	Topsoil	27)	0 - .5'	Topsoil
	.5' – 9'	Clay Loam		.5' – 4'	Clay Loam
18)	0 - .5'	Topsoil		4' – 8'	Loamy Sand
	.5' – 11'	Clay Loam	28)	0 - .5'	Topsoil
19)	0 - .5'	Topsoil		.5' – 4'	Sandy Loam
	.5' – 3'	Sandy Clay Loam		4' – 9'	Loamy Sand
	3' – 8'	Coarse Sand	29)	0 - .5'	Topsoil
20)	0 - .5'	Topsoil		.5' – 4'	Sandy Loam
	.5' – 4.5'	Sandy Clay Loam		4' – 9'	Loamy Sand
	4.5' – 9'	Medium Sand	30)	0 - .5'	Topsoil
21)	0 - .5'	Topsoil		.5' – 2'	Sandy Loam
	.5 – 2'	Sandy Clay Loam		2' – 9'	Loamy Sand
	2' – 5'	Coarse Sand	31)	0 - .5'	Topsoil
	5' – 7'	Sandy Loam		.5' – 2'	Sandy Loam
	7' – 9'	Loamy Sand		2' – 9'	Loamy Sand
22)	0 - .5'	Topsoil	32)	0 - .5'	Topsoil
	.5' – 4'	Clay Loam		.5' – 2'	Sandy Loam
	4' – 8.5'	Loamy Sand		2' – 8'	Coarse Sand
23)	0 - .5'	Topsoil	33)	0 - .5'	Topsoil
	.5 – 6'	Clay Loam		.5 – 3.5'	Sandy Clay Loam
	6' – 10'	Sandy Loam		3.5' – 8.5'	Loamy Sand
34)	0 - .5'	Topsoil	44)	0 - .5'	Topsoil
	.5' – 3'	Sandy Loam		.5' – 2'	Sandy Clay Loam
	3' – 9'	Loamy Sand		2' – 8'	Medium Sand
35)	0 - .5'	Topsoil	45)	0 - .5'	Topsoil
	.5' – 4'	Sandy Loam		.5' – 5'	Sandy Clay Loam
	4' – 7'	Sandy Clay Loam		5' – 8'	Medium Sand
	7' – 10'	Coarse Sand			
36)	0 - .5'	Topsoil			
	.5' – 3'	Sandy Clay Loam			
	3' – 5'	Medium Sand			
	5' – 9'	Sandy Loam			
37)	0 - .5'	Topsoil			
	.5' – 4'	Sandy Clay Loam			
	4' – 9'	Loamy Sand			
38)	0 - .5'	Topsoil			
	.5' – 4'	Clay Loam			
	4' – 8'	Coarse Sand			
39)	0 - .5'	Topsoil			
	.5' – 4'	Clay Loam			
	4' – 8'	Coarse Sand			
40)	0 - .5'	Topsoil			
	.5' – 6'	Clay Loam			
	6' – 9'	Fine Sand			
41)	0 - .5'	Topsoil			
	.5' – 4'	Clay Loam			
	4' – 8'	Sandy Loam			
42)	0 - .5'	Topsoil			
	.5' – 4'	Sandy Loam			
	4' – 9'	Fine Sand			
43)	0 - .5'	Topsoil			
	.5 – 3.5'	Sandy Loam			
	3.5' – 8'	Loamy Sand			

*No Seasonal or actual water table found at time of Soil Evaluation unless noted.

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CLIENT :

□OHN MORETTI
4242 BAUER ROAD
BRIGHTON, MI 48116

SOILS EVALUATION

MORETTI ESTATES
4242 BAUER ROAD
PART OF NE 1/4, SEC. 26, T2N–R5E
GENOA TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

PLAN SUBMITTALS/REVISIONS	DATE
PRELIMINARY SITE PLAN TO TOWNSHIP	1/2/2019
REVISED SITE PLAN TO TOWNSHIP	1/25/2019
REVISED SITE PLAN TO TOWNSHIP	2/20/2019

ORIGINAL ISSUE DATE: 1/2/2019

PROJECT NO: 18–025

SCALE: 1" = 100'
0 1/2" 1"

FIELD: SE
DRAWN BY: DC, ML
DESIGN BY: DD
CHECK BY: PR

V-1.2

NOT FOR CONSTRUCTION

FILE:P:\Projects\2018\18-025 Moretti Estates\Dwg\Engineering\18-025_V-1.2_LCHD Soils Eval.dwg DATE:12/28/2018 11:22 AM

MORETTI ESTATES

SOIL BORING LOGS

McDOWELL & ASSOCIATES
Geotechnical, Environmental, & Hydrogeologic Services
21355 Hatcher Avenue • Ferndale, MI 48220
Phone: (248) 399-2066 • Fax: (248) 399-2157

LOG OF SOIL BORING NO. 1
PROJECT Soils Investigation
LOCATION Proposed Roadways; 4242 Bauer Road; Brighton, Michigan
JOB NO. 18-350
SURFACE ELEV. ____ **DATE** 11/20/2018

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1		0'8" Moist dark brown sandy TOPSOIL						
A SS	2		Slightly compact moist brown fine SAND with trace of gravel	2					
	3		2'2" Soft moist brown silty CLAY with traces of sand and pebbles and moist fine sand seams	2	13.7		*	(1500)	
	4		3'6"						
B SS	5		Very stiff moist brown silty CLAY with sand and pebbles and moist silt lenses	8 9	7.0				
	6		6'0"	13			*	(6000)	
C SS	7		Extremely compact moist brown clayey SILT with traces of sand and gravel	12 14					
	8		8'6"	16					
D SS	9		Extremely stiff moist brown silty CLAY with sand and pebbles and occasional moist fine sand seams	11 16					
	10		10'6"	16					
	11								
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

NOTE: Used track rig

TYPE OF SAMPLE
D. - DISTURBED
U/L - UNDIST. LINER
S/T. - SHELBY TUBE
S/S. - SPLIT SPOON
R/C. - ROCK CORE
( ) - PENETROMETER

REMARKS: *Calibrated Penetrometer

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30". Count Made at 6" Intervals

GROUND WATER OBSERVATIONS
G.W. ENCOUNTERED AT ____ FT. ____ INS.
G.W. ENCOUNTERED AT ____ FT. ____ INS.
G.W. AFTER COMPLETION ____ FT. ____ INS.
G.W. AFTER ____ HRS. ____ FT. ____ INS.
G.W. VOLUMES None

McDOWELL & ASSOCIATES
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Phone: (248) 399-2066 • Fax: (248) 399-2157

LOG OF SOIL BORING NO. 2
PROJECT Soils Investigation
LOCATION Proposed Roadways; 4242 Bauer Road; Brighton, Michigan
JOB NO. 18-350
SURFACE ELEV. ____ **DATE** 11/20/2018

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1		0'5" Moist gray CRUSHED STONE, fill 0'11" Moist dark brown fine sandy TOPSOIL with vegetation						
A SS	2		1'10" Compact moist brown fine SAND	3	4	13.5			
	3		Stiff moist brown silty CLAY with sand and pebbles and occasional moist fine sand seams	5			*	(2500)	
	4								
B SS	5		4'6" Compact moist brown clayey SILT with traces of sand and gravel 5'0"	6 4	10.8				
	6		Very compact moist brown fine SAND with moist silt seams						
C SS	7			8 9					
	8		7'6" Very compact moist brown fine to medium SAND with trace of gravel	14					
	9		8'6"						
D SS	10		Extremely compact moist brown fine SAND with trace of gravel 10'0"	16 25					
	11								
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

NOTE: Used track rig

TYPE OF SAMPLE
D. - DISTURBED
U/L - UNDIST. LINER
S/T. - SHELBY TUBE
S/S. - SPLIT SPOON
R/C. - ROCK CORE
( ) - PENETROMETER

REMARKS: *Calibrated Penetrometer

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30". Count Made at 6" Intervals

GROUND WATER OBSERVATIONS
G.W. ENCOUNTERED AT ____ FT. ____ INS.
G.W. ENCOUNTERED AT ____ FT. ____ INS.
G.W. AFTER COMPLETION ____ FT. ____ INS.
G.W. AFTER ____ HRS. ____ FT. ____ INS.
G.W. VOLUMES None

McDOWELL & ASSOCIATES
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LOG OF SOIL BORING NO. 3
PROJECT Soils Investigation
LOCATION Proposed Roadways; 4242 Bauer Road; Brighton, Michigan
JOB NO. 18-350
SURFACE ELEV. ____ **DATE** 11/20/2018

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1		0'11" Moist dark brown sandy TOPSOIL						
A SS	2		Slightly compact moist brown fine SAND with trace of gravel	1					
	3			1 2	7.0				
	4		3'9"						
B SS	5		Compact moist brown fine to medium SAND with traces of silt and gravel	3 5	8.7				
	6			7					
C SS	7			5 7					
	8		7'0" Stiff moist brown sandy CLAY with silt, and pebbles and occasional stones	9					
	9		8'6"						
D SS	10		Extremely compact moist brown fine SAND with trace of gravel 10'6"	7 13 16					
	11								
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

NOTE: Used track rig

TYPE OF SAMPLE
D. - DISTURBED
U/L - UNDIST. LINER
S/T. - SHELBY TUBE
S/S. - SPLIT SPOON
R/C. - ROCK CORE
( ) - PENETROMETER

REMARKS:

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30". Count Made at 6" Intervals

GROUND WATER OBSERVATIONS
G.W. ENCOUNTERED AT ____ FT. ____ INS.
G.W. ENCOUNTERED AT ____ FT. ____ INS.
G.W. AFTER COMPLETION ____ FT. ____ INS.
G.W. AFTER ____ HRS. ____ FT. ____ INS.
G.W. VOLUMES None

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LOG OF SOIL BORING NO. 4
PROJECT Soils Investigation
LOCATION Proposed Roadways; 4242 Bauer Road; Brighton, Michigan
JOB NO. 18-350
SURFACE ELEV. ____ **DATE** 11/20/2018

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1		0'7" Moist dark brown sandy TOPSOIL, fill						
A SS	2		Slightly compact moist to wet brown fine SAND, fill	2					
	3		2'6" Soft moist brown silty CLAY with wet fine sand lenses, fill	1	28.9		*	(500)	
	4		3'6" Soft moist dark brown clayey TOPSOIL with organics, fill						
B SS	5		4'6" Slightly compact wet clayey brown fine SAND with trace of gravel, and wet fine sand lenses, fill	3 2	21.7				
	6		6'0"						
C SS	7		Soft moist dark brown clayey MARL with some organics	1/12" ---	82.9				
	8			2/6"			*	(500)	
	9								
D SS	10		9'6" Medium compact wet gray fine SAND with trace of gravel, and occasional stones 10'6"	2 3 3	19.0				
	11								
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

NOTE: Used track rig

TYPE OF SAMPLE
D. - DISTURBED
U/L - UNDIST. LINER
S/T. - SHELBY TUBE
S/S. - SPLIT SPOON
R/C. - ROCK CORE
( ) - PENETROMETER

REMARKS: *Calibrated Penetrometer

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30". Count Made at 6" Intervals

GROUND WATER OBSERVATIONS
G.W. ENCOUNTERED AT 2 FT. 4 INS.
G.W. ENCOUNTERED AT ____ FT. ____ INS.
G.W. AFTER COMPLETION 3 FT. 0 INS.
G.W. AFTER ____ HRS. ____ FT. ____ INS.
G.W. VOLUMES

McDOWELL & ASSOCIATES
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LOG OF SOIL BORING NO. 5
PROJECT Soils Investigation
LOCATION 4242 Bauer Road; Brighton, Michigan
JOB NO. 18-350
SURFACE ELEV. ____ **DATE** 11/20/2018

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1		0'6" Moist dark brown sandy TOPSOIL						
A SS	2		Compact moist brown fine to medium SAND with traces of silt and gravel	2					
	3			5 6	19.1				
	4		4'6"						
B SS	5		Extremely compact moist brown fine SAND	8 12	2.7				
	6		6'0"	16					
C SS	7		Very compact moist brown fine SAND with trace of gravel	6 8					
	8		7'6"	12					
	9		Very compact moist brown fine SAND with trace of gravel, occasional stones and moist silty sand seams	8					
D SS	10		10'6"	10 12					
	11								
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

NOTE: Used track rig

TYPE OF SAMPLE
D. - DISTURBED
U/L - UNDIST. LINER
S/T. - SHELBY TUBE
S/S. - SPLIT SPOON
R/C. - ROCK CORE
( ) - PENETROMETER

REMARKS:

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30". Count Made at 6" Intervals

GROUND WATER OBSERVATIONS
G.W. ENCOUNTERED AT ____ FT. ____ INS.
G.W. ENCOUNTERED AT ____ FT. ____ INS.
G.W. AFTER COMPLETION ____ FT. ____ INS.
G.W. AFTER ____ HRS. ____ FT. ____ INS.
G.W. VOLUMES None

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Phone: (248) 399-2066 • Fax: (248) 399-2157

LOG OF SOIL BORING NO. 6
PROJECT Soils Investigation
LOCATION Proposed Roadways; 4242 Bauer Road; Brighton, Michigan
JOB NO. 18-350
SURFACE ELEV. ____ **DATE** 11/20/2018

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1		0'7" Moist dark brown sandy TOPSOIL						
A SS	2		Medium compact moist brown fine SAND with trace of gravel, and moist clayey sand seams	3 2	9.4				
	3			3					
	4		3'6"						
B SS	5		Medium compact moist brown fine to medium SAND with trace of silt	3 2	5.3				
	6			3					
C SS	7		7'0" Compact moist brown fine SAND	2 3 5					
	8								
	9		9'6" Very compact moist brown fine SAND with trace of gravel						
D SS	10		10'6"	7 11 14					
	11								
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

NOTE: Used track rig

TYPE OF SAMPLE
D. - DISTURBED
U/L - UNDIST. LINER
S/T. - SHELBY TUBE
S/S. - SPLIT SPOON
R/C. - ROCK CORE
( ) - PENETROMETER

REMARKS:

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30". Count Made at 6" Intervals

GROUND WATER OBSERVATIONS
G.W. ENCOUNTERED AT ____ FT. ____ INS.
G.W. ENCOUNTERED AT ____ FT. ____ INS.
G.W. AFTER COMPLETION ____ FT. ____ INS.
G.W. AFTER ____ HRS. ____ FT. ____ INS.
G.W. VOLUMES None

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Geotechnical, Environmental, & Hydrogeologic Services
21355 Hatcher Avenue • Ferndale, MI 48220
Phone: (248) 399-2066 • Fax: (248) 399-2157

LOG OF SOIL BORING NO. 7
PROJECT Soils Investigation
LOCATION 4242 Bauer Road; Brighton, Michigan
JOB NO. 18-350
SURFACE ELEV. ____ **DATE** 11/20/2018

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1		1'2" Moist dark brown sandy TOPSOIL						
A SS	2		Slightly compact moist brown silty fine to medium SAND with trace of gravel	1	8.1				
	3			1					
	4		3'6"						
B SS	5		4'6" Medium compact moist brown fine SAND with trace of gravel	2 3	14.6				
	6		Firm moist brown silty CLAY with trace of pebbles and occasional wet fine sand silt lenses 6'0"	4			*	(2000)	
C SS	7		Very stiff moist brown silty CLAY with sand and pebbles	5 6					
	8		8'6"	12					
	9		Extremely compact moist brown clayey fine SAND with silt and gravel						
D SS	10		10'6"	16 18 22					
	11								
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

NOTE: Used track rig

TYPE OF SAMPLE
D. - DISTURBED
U/L - UNDIST. LINER
S/T. - SHELBY TUBE
S/S. - SPLIT SPOON
R/C. - ROCK CORE
( ) - PENETROMETER

REMARKS: *Calibrated Penetrometer

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30". Count Made at 6" Intervals

GROUND WATER OBSERVATIONS
G.W. ENCOUNTERED AT ____ FT. ____ INS.
G.W. ENCOUNTERED AT ____ FT. ____ INS.
G.W. AFTER COMPLETION ____ FT. ____ INS.
G.W. AFTER ____ HRS. ____ FT. ____ INS.
G.W. VOLUMES None

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CLIENT :

JOHN MORETTI
4242 BAUER ROAD
BRIGHTON, MI 48116

SOIL BORING LOGS

MORETTI ESTATES
4242 BAUER ROAD
PART OF NE 1/4, SEC. 26, T2N-R5E
GENOA TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

PLAN SUBMITTALS/REVISIONS	DATE
PRELIMINARY SITE PLAN TO TOWNSHIP	1/2/2019
REVISED SITE PLAN TO TOWNSHIP	1/25/2019
REVISED SITE PLAN TO TOWNSHIP	2/20/2019

ORIGINAL ISSUE DATE: 1/2/2019

PROJECT NO: 18-025

SCALE: 1" = 100'
0 1/2" 1"

FIELD: SE
DRAWN BY: DC, ML
DESIGN BY: DD
CHECK BY: PR

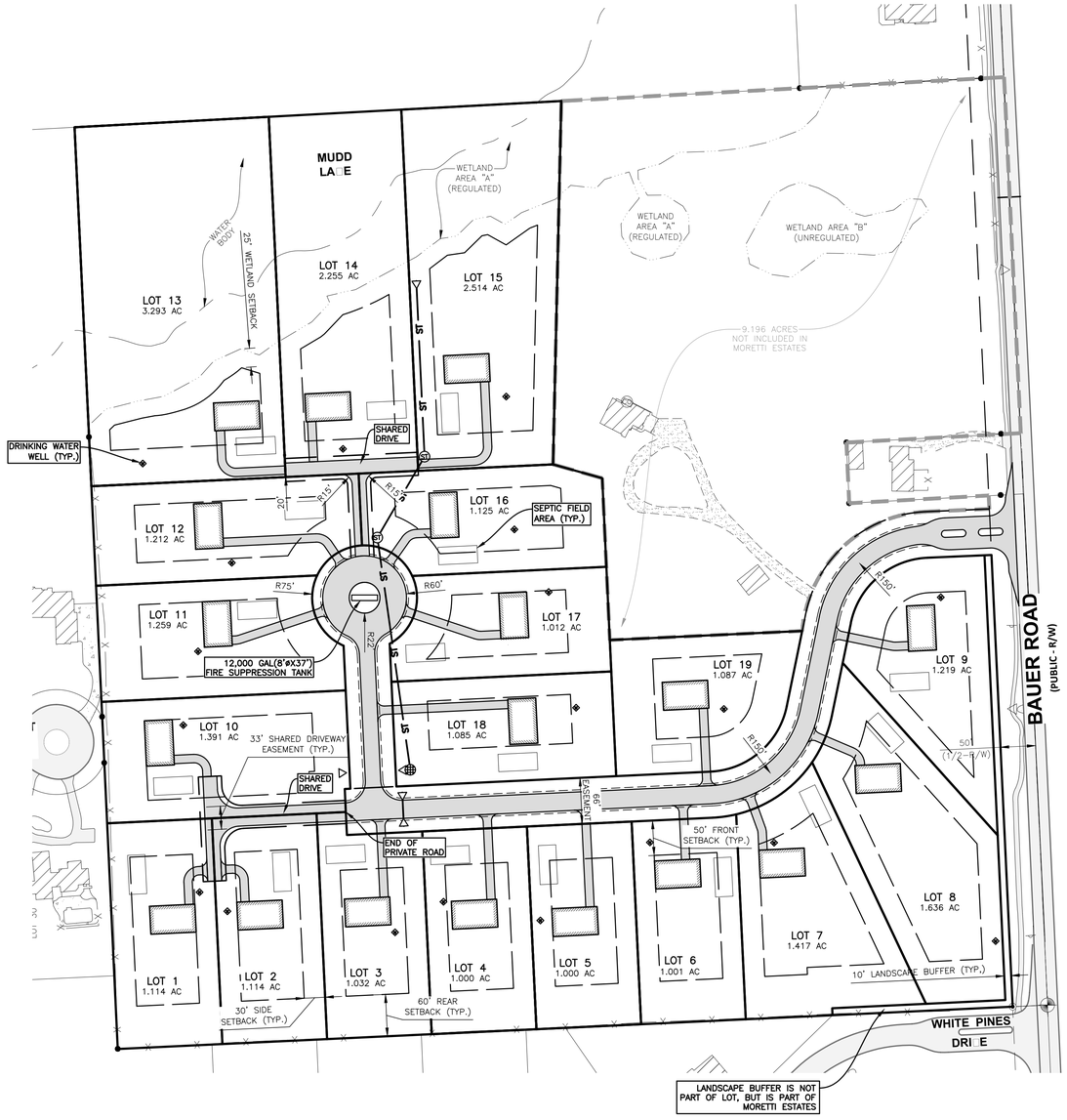
V-1.3

NOT FOR CONSTRUCTION

FILE:P:\Projects\2018\18-025 Moretti Estates\Dwg\Engineering\18-025_V-1.2_LCHD Soils Eval.dwg DATE:12/28/2018 11:22 AM

MORETTI ESTATES

OVERALL LAYOUT PLAN



PAVEMENT LEGEND

EX. ASPHALT

EX. CONCRETE

EX. GRAVEL

ASPHALT

ZONING INFORMATION

THIS ZONING INFORMATION IS TAKEN FROM GENOA TOWNSHIP ZONING ORDINANCE

SUBJECT PARCEL ZONING CLASSIFICATION:
(LDR - LOW DENSITY RESIDENTIAL)

BUILDING SETBACKS:

FRONT:	50'
SIDE:	30'
REAR:	60'
WETLAND:	25'
WATER BODY:	100'

SITE CONDO AREA: 30.84 ACRES

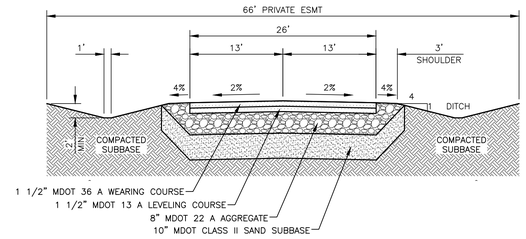
LOT COVERAGE:
CALCULATION: 5,500/77,715 SF = 7.08%
MAXIMUM SF: 2x GROSS GROUND FLOOR AREA OF PRINCIPAL STRUCTURE = 11,000 SF
MAX LOT COVERAGE: 11,000/77,715 SF = 14.15%

ADJACENT ZONING:

SIDE:	LDR
SOUTH:	LDR
EAST:	PRF (PUBLIC & RECREATIONAL FACILITIES)
WEST:	LDR

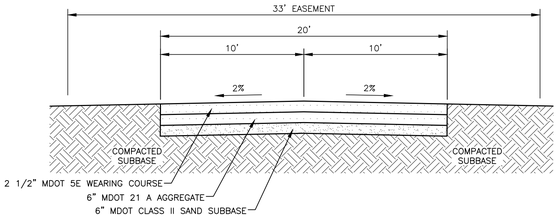
TYPICAL ROAD CROSS SECTION

NOT TO SCALE



TYPICAL SHARED DRIVEWAY SECTION

NOT TO SCALE



LOT DATA

Lot #	Total Area (SF)	Total Area (AC)	Lot Width (LF)	Open Water (SF)	Wetland (SF)	Upland (SF)	Upland+25% Wetland (SF)
1	48,526	1.114	150	0	0	48,526	48,526
2	48,526	1.114	150	0	0	48,526	48,526
3	44,962	1.032	150	0	0	44,962	44,962
4	43,575	1.000	150	0	0	43,575	43,575
5	43,575	1.000	150	0	0	43,575	43,575
6	43,611	1.001	150	0	0	43,611	43,611
7	61,731	1.417	150	0	0	61,731	61,731
8	71,266	1.636	159	0	0	71,266	71,266
9	53,099	1.219	222	0	0	53,099	53,099
10	60,613	1.391	174	0	0	60,613	60,613
11	54,829	1.259	170	0	0	54,829	54,829
12	52,803	1.212	159	0	0	52,803	52,803
13	143,457	3.293	278	77,784	25,552	40,121	46,509
14	98,209	2.255	190	31,794	18,551	47,864	52,502
15	109,511	2.514	197	11,512	26,850	71,149	77,861
16	49,021	1.125	166	0	0	49,021	49,021
17	44,080	1.012	155	0	0	44,080	44,080
18	47,250	1.085	150	0	2,125	45,125	45,657
19	47,328	1.087	267	0	0	47,328	47,328

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MICHIGAN 48836
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MONUMENTENGINEERING.COM

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PHILIP A. RASOR, JR.
ENGINEER
NO. [redacted]

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CLIENT :

JOHN MORETTI
4242 BAUER ROAD
BRIGHTON, MI 48116

PLAN SUBMITTALS/REVISIONS	DATE
PRELIMINARY SITE PLAN TO TOWNSHIP	1/2/2019
REVISED SITE PLAN TO TOWNSHIP	1/25/2019
REVISED SITE PLAN TO TOWNSHIP	2/20/2019

ORIGINAL ISSUE DATE: 1/2/2019

PROJECT NO: 18-025

SCALE: 1" = 100'
0 1/2" 1"

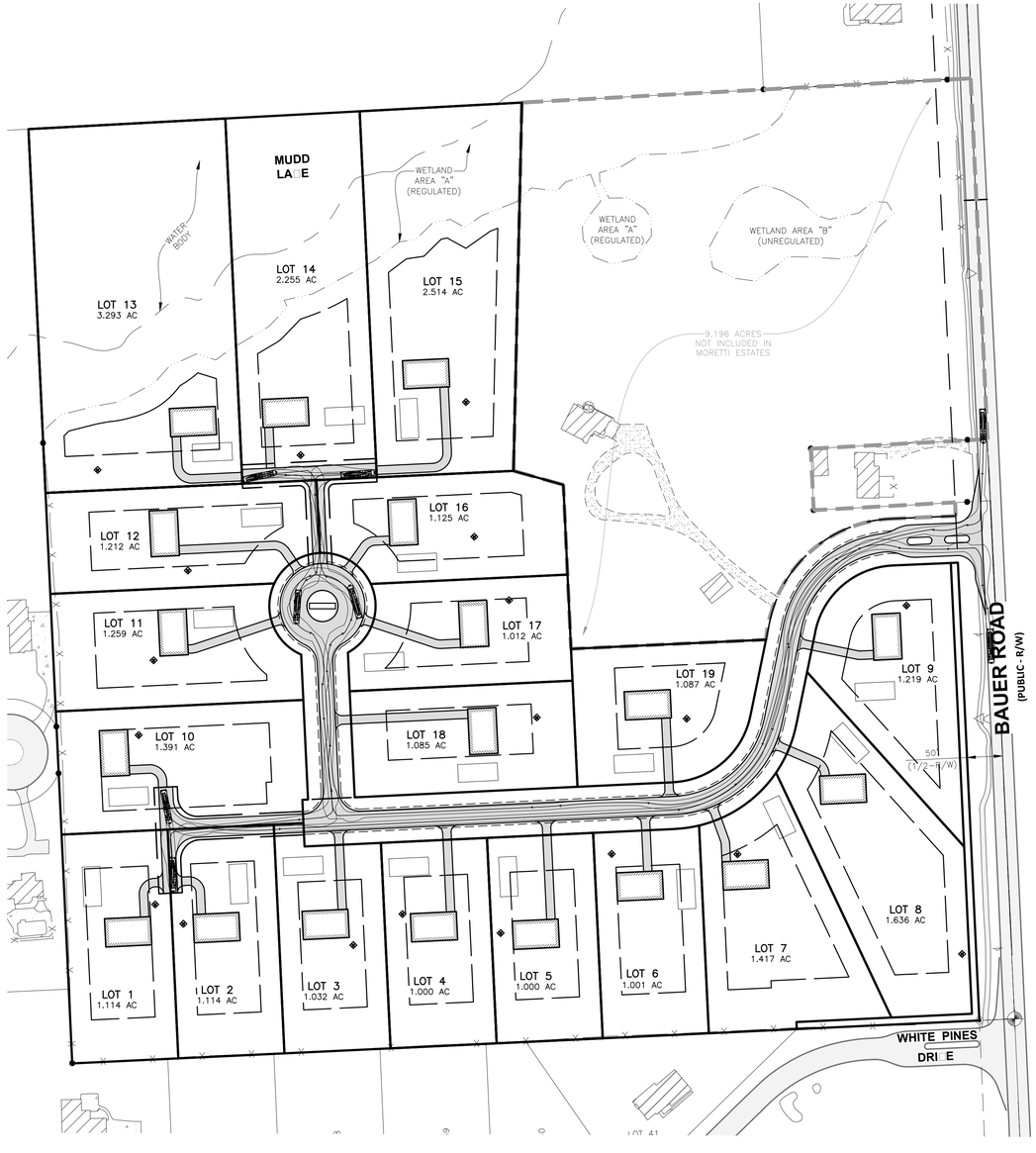
FIELD: SE
DRAWN BY: DC, ML
DESIGN BY: DD
CHECK BY: PR

C-1.0

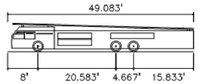
NOT FOR CONSTRUCTION

MORETTI ESTATES

EMERGENC□ □EHICLE CIRCULATION



EMERGENCY VEHICLE



Brighton 49' Fire Truck	
Overall Length	49.083ft
Overall Width	8.167ft
Overal 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°

FIRE TRUCK DETAIL
NOT TO SCALE

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4242 BAUER ROAD
BRIGHTON, MI 48116

EMERGENCY VEHICLE CIRCULATION

MORETTI ESTATES
4242 BAUER ROAD
PART OF NE 1/4, SEC. 26, T2N-R5E
GENOA TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

PLAN SUBMITTALS/REVISIONS	DATE
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PROJECT NO: 18-025

SCALE: 1" = 100'
0 1/2" 1"

FIELD: SE
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CHECK BY: PR

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NOT FOR CONSTRUCTION

SOIL EROSION AND SEDIMENTATION CONTROL SEQUENCE OF CONSTRUCTION

1. THE CONTRACTOR SHALL INSTALL SILT FENCE AS SHOWN ON APPROVED PLANS.
2. REMOVE ALL TOPSOIL AND ORGANIC MATTER. TOPSOIL MAY BE STORED ON SITE IN DESIGNATED AREA TO BE USED FOR FUTURE PLANTING AND FILL AREAS. TRUCK REMAINING TOP SOIL OFFSITE AND PROPERLY DISPOSE.
3. ROUGH GRADE AND INSTALL NEW UNDERGROUND UTILITIES INCLUDING SEDIMENTATION FOREBAY. PLACE INLET FILTERS AT PROPOSED CATCH BASINS THROUGHOUT SITE.
4. SEDIMENTATION FOREBAY SHALL BE EXCAVATED, TOP SOILED, AND SEEDED IMMEDIATELY AFTER DEMOLITION WORK IS COMPLETED.
5. CONSTRUCT BUILDINGS.
6. FINISH GRADE AROUND BUILDINGS AND STABILIZE AS SOON AS POSSIBLE. STABILIZE ALL DISTURBED AREAS WITH CLASS A SEED AND MULCH. IN AREAS OF SLOPES OF 1:4 OR STEEPER, CONTRACTOR TO SEED AND INSTALL PEGGED IN PLACE EROSION CONTROL BLANKETS.
7. REPAIR/CLEAN INLET FILTERS AS REQUIRED.
8. INSTALL FINAL LANDSCAPING PER SEPARATE LANDSCAPE PLAN.
9. STONE AROUND OUTLET STANDPIPE STRUCTURE SHALL BE REFRESHED.
10. REMOVE TEMPORARY SOIL EROSION MEASURES ONCE SEEDED VEGETATION HAS ESTABLISHED. CLEAN ALL AFFECTED STORM STRUCTURES AS NECESSARY.

BENCHMARKS

Datum: NAVD88

BM A:
RAIL ROAD SPIKE IN WEST FACE UTILITY POLE, 26'± WEST OF CENTERLINE OF BAUER ROAD & 539'± NORTH FROM SUBJECT'S SOUTH PROPERTY LINE.
Elev = 986.91

BM B:
RAIL ROAD SPIKE IN WEST FACE UTILITY POLE, 28'± WEST OF CENTERLINE OF BAUER ROAD & 58'± NORTH FROM SUBJECT'S SOUTH PROPERTY LINE.
Elev = 970.48

BM C:
RAIL ROAD SPIKE IN WEST FACE UTILITY POLE, 439'± WEST OF CENTERLINE OF BAUER ROAD & 565'± SOUTH FROM SUBJECT'S NORTH PROPERTY LINE.
Elev = 1013.57

GRADING LEGEND

940.00 TP	PROPOSED TOP OF PAVEMENT GRADE
940.00 SW	PROPOSED SIDEWALK GRADE
940.00 FG	PROPOSED FINISH GRADE
940.00 TC / 939.50 GP	PROPOSED TOP CURB GRADE / PROPOSED GUTTER PAN GRADE
940.0 MA	MATCH EXISTING
940.00 RIM	PROPOSED RIM GRADE
940.00 ADJ-RIM	ADJUSTED RIM GRADE
900	EXISTING CONTOUR
900	PROPOSED CONTOUR
	LIMITS OF DISTURBANCE

MORETTI ESTATES
OVERALL GRADING PLAN

AERIAL PHOTOGRAMMETRY

TOPOGRAPHIC CONTOURS BASED ON AERIAL.
CONTOUR INTERVAL: 2 FOOT
VERTICAL DATUM: NAVD88
DATE OF PHOTOGRAPHY: 4/24/2018

SESC LEGEND

SILT FENCE
MUD MAT

EROSION CONTROL QUANTITIES

Disturbed Area: 7.876 Acres

QTY	UNIT	ITEM
4,423	LF	SILT FENCE
1	EA	INLET FILTER

MDMB SOIL EROSION & SEDIMENTATION CONTROL MEASURES

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET (MDMB)

EROSION CONTROLS

KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
E6	MULCH		FOR USE IN AREAS SUBJECT TO EROSIVE SURFACE FLOWS OR SEVERE WIND OR ON NEWLY SEEDED AREAS.
E8	PERMANENT SEEDING		STABILIZATION METHOD UTILIZED ON SITES WHERE EARTH CHANGE HAS BEEN COMPLETED (FINAL GRADING ATTAINED).

SEDIMENT CONTROLS

KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
S51	SILT FENCE		USE ADJACENT TO CRITICAL AREAS, TO PREVENT SEDIMENT LADEN SHEET FLOW FROM ENTERING THESE AREAS.
S53	STABILIZED CONSTRUCTION ACCESS		USED AT EVERY POINT WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES A CONSTRUCTION SITE.
S55	SEDIMENT BASIN		AT THE OUTLET OF DISTURBED AREAS AND AT THE LOCATION OF A PERMANENT DETENTION BASIN.
S58	INLET PROTECTION FABRIC DROP		USE AT STORMWATER INLETS, ESPECIALLY AT CONSTRUCTION SITES.

EROSION & SEDIMENT CONTROLS

KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
ES31	CHECK DAM		USED TO REDUCE SURFACE FLOW VELOCITIES WITHIN CONSTRUCTED AND EXISTING FLOW CORRIDORS.

XX/T TEMPORARY XX/P PERMANENT

EROSION CONTROL STANDARDS

1. ALL EROSION AND SEDIMENT CONTROL WORK SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF LIVINGSTON COUNTY DRAIN COMMISSIONER'S OFFICE.
2. DAILY INSPECTION SHALL BE MADE BY THE CONTRACTOR FOR EFFECTIVENESS OF EROSION AND SEDIMENTATION CONTROL MEASURES, AND ANY NECESSARY REPAIRS SHALL BE PERFORMED WITHOUT DELAY.
3. EROSION AND ANY SEDIMENTATION FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDE BOTH NATURAL AND MAN-MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES AND PONDS.
4. CONTRACTOR SHALL APPLY TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES WHEN REQUIRED AND AS DIRECTED ON THESE PLANS. CONTRACTOR SHALL REMOVE TEMPORARY MEASURES AS SOON AS PERMANENT STABILIZATION OF SLOPES, DITCHES AND OTHER CHANGES HAS BEEN ACCOMPLISHED.
5. STAGING OF THE WORK WILL BE DONE BY THE CONTRACTOR AS DIRECTED IN THESE PLACES AND AS REQUIRED TO INSURE PROGRESSIVE STABILIZATION OF DISTURBED AREAS.
6. SOIL EROSION CONTROL PRACTICES WILL BE ESTABLISHED IN EARLY STAGES OF CONSTRUCTION BY THE CONTRACTOR. SEDIMENT CONTROL PRACTICES WILL BE APPLIED AS A PERIMETER DEFENSE AGAINST ANY TRANSPORTING OF SILT OFF THE SITE.
7. A CERTIFIED STORM WATER OPERATOR WILL BE NAMED ON THE MDEQ NOTICE OF COVERAGE FOR NPDES AS REQUIRED.

SOIL EROSION CONTROL MAINTENANCE SCHEDULE AND NOTES.

1. CONTRACTOR MUST OBTAIN A SOIL EROSION AND SEDIMENTATION CONTROL PERMIT FROM LIVINGSTON COUNTY DRAIN COMMISSIONER'S OFFICE PRIOR TO COMMENCING WORK.
2. EARTHWORK SHALL BE LIMITED TO THE PROPOSED SITE AS SHOWN ON THE PLAN.
3. CONTRACTOR SHALL INSPECT THE SOIL EROSION/SEDIMENTATION CONTROL DEVICES ONCE A WEEK AND/OR WITHIN 24 HOURS OF A RAINFALL EVENT WHICH RESULTS IN A STORM WATER DISCHARGE FROM THE SITE. ANY DAMAGE TO EROSION CONTROL MEASURES MUST BE REPAIRED IMMEDIATELY.
4. ALL MUD OR DEBRIS TRACKED ONTO EXISTING PUBLIC ROADS FROM THE SITE DUE TO CONSTRUCTION SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR.
5. SILT FENCE MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY BUILT-UP SEDIMENT WHEN THE SEDIMENT HEIGHT ACCUMULATES TO 1/3 TO 1/2 OF THE HEIGHT OF THE FENCE. THE CONTRACTOR IS RESPONSIBLE TO REMOVE, REPLACE, RETRENCH OR RE-BACKFILL THE SILTATION FENCE SHOULD IT FAIL OR BE DAMAGED DURING CONSTRUCTION.
6. PERMANENT STABILIZATION BUST BE COMPLETED WITHIN 30 DAYS OF FINAL GRADING.
7. ACCESS ROADS MUST BE MAINTAINED AS NECESSARY, TO KEEP THEM EFFECTIVE, NEW LAYERS OF STONE MAY BE ADDED AS OLD LAYERS BECOME COMPACTED. STEPS SHOULD ALSO BE TAKEN TO REPAIR THE ACCESS ROADS IF RUTS OR PONDING WATER APPEARS.
8. INLET FILTERS SHOULD BE INSPECTED FOR BUILDUP OF SILT AND OTHER DEBRIS. THIS IS EVIDENT IF GEOTEXTILE/SOD STRUCTURE IS CAUSING FLOODING. MAINTENANCE WOULD CONSIST OF REMOVING OF SEDIMENTS WITH A STIFF BRISTLE BROOM OR SQUARE POINT SHOVEL. IF INLET FILTER IS BEYOND THIS LEVEL OF REPAIR, IT MAY BE NECESSARY TO REPLACE BOTH THE SOD AND GEOTEXTILE FILTER.
9. IF SOIL EROSION/SEDIMENT CONTROL MEASURES ARE INADEQUATE FOR THE SITE. THE PROPER EROSION CONTROL AUTHORITY MUST BE NOTIFIED.

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CLIENT :
JOHN MORETTI
4242 BAUER ROAD
BRIGHTON, MI 48116

OVERALL GRADING PLAN
MORETTI ESTATES
4242 BAUER ROAD
PART OF NE 1/4, SEC. 26, T2N-R5E
GENOA TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

PLAN SUBMITTALS/REVISIONS	DATE
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REVISED SITE PLAN TO TOWNSHIP	1/25/2019
REVISED SITE PLAN TO TOWNSHIP	2/20/2019

ORIGINAL ISSUE DATE: 1/2/2019
PROJECT NO: 18-025
SCALE: 1" = 100'
FIELD: SE
DRAWN BY: DC, ML
DESIGN BY: DD
CHECK BY: PR

C-7.0

NOT FOR CONSTRUCTION

FILE:P:\Projects\2018\18-025 Moretti Estates\Dwg\Engineering\18-025_C-7.0_Grading.dwg DATE:12/22/2018 9:29 AM

MORETTI ESTATES

STORM WATER MANAGEMENT PLAN

STORM WATER CALCULATIONS

SITE DATA

Tributary Area (A):	40.54 Acres
Compound Runoff Coefficient (C):	0.26
Design Constant (K_1):	10.70
Maximum Permission Unit Outflow Rate:	0.20 CFS/Acres
Allowable Outflow Rate (Q_o):	8.11 CFS

COMPOUND RUNOFF COEFFICIENT

Surface	Area (Square Feet)	Area (Acres)	Runoff Coef. (C)	A x C
Ex Building	3,188	0.07	0.90	2,869
Ex Pavement	9,586	0.22	0.85	8,148
Pr Building	52,664	1.21	0.90	47,398
Pr Pavement	96,783	2.22	0.90	87,105
Natural Area	1,603,701	36.82	0.20	320,740

$$Compound\ (C) = \frac{Total\ A \times C}{TRIBUTARY\ AREA} = \mathbf{0.26}$$

DETENTION VOLUME (LIVINGSTON COUNTY DESIGN METHOD)

1	2	3	4	5	6	7
Duration (Minutes)	Duration (Seconds)	Intensity (100-yr Storm) (Inch/Hour)	Col. #2 x Col. #3 (Inches)	Inflow Volume Col. #4 x K_1 (Cubic Feet)	Outflow Volume Col. #2 x Q_o (Cubic Feet)	Storage Volume Col. 5 - Col. 6 (Cubic Feet)
5	300	9.167	2,750	29,436	2,432	27,003
10	600	7.857	4,714	50,461	4,865	45,596
15	900	6.875	6,188	66,230	7,297	58,933
20	1,200	6.111	7,333	78,495	9,730	68,765
30	1,800	5.000	9,000	96,335	14,594	81,740
60	3,600	3.235	11,647	124,668	29,189	**95,480**
90	5,400	2.391	12,913	138,219	43,783	94,436
120	7,200	1.897	13,655	146,163	58,378	87,785
180	10,800	1.341	14,488	155,075	87,566	67,509

$$Intensity\ (I) = \frac{275}{t + 25}$$

Sedimentation Volume

$V_{sed} = 5\% \times V_{100}$ = 4,774 Cubic Feet

PROPOSED FOREBAY VOLUME

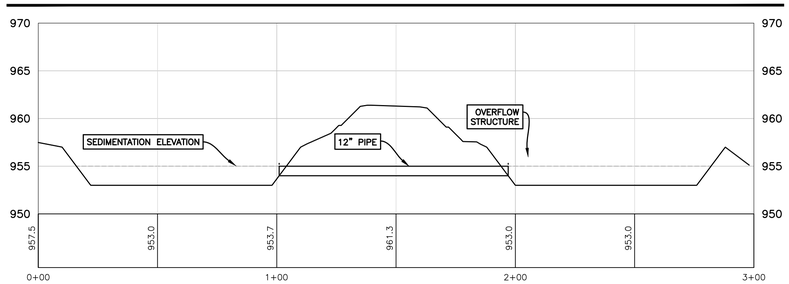
Elevation (Feet)	Area (Square Feet)	Average Area (Square Feet)	Incement Volume (Cubic Feet)	Total Volume (Cubic Feet)
				-
953	897			
		1,401		
954	1,906		1,401	1,401
		2,468		
955	3,029		2,468	3,869
		3,647		
956	4,265		3,647	7,516
		13,505		
957	22,746		13,505	21,021

Sedimentation Storage Elevation

Elevation 1	=	955.00	Volume 1	3,869
Elevation 2	=	956.00	Volume 2	7,516
			V_{sed}	4,774

SED ELEVATION (Zsed) = **955.12**

SEDIMENTATION FOREBAY DETAIL



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4242 BAUER ROAD
BRIGHTON, MI 48116

STORM WATER MANAGEMENT PLAN

MORETTI ESTATES
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0 1/2" 1"

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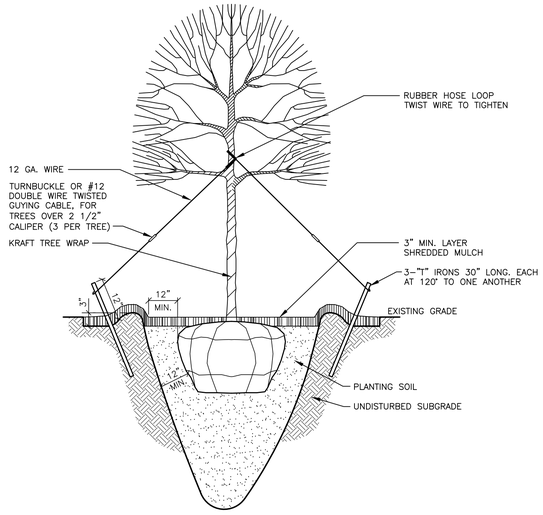

(2" AND SMALLER CALLIPER)
TREE PLANTING DETAIL
NO SCALE

(DETAIL TYP. FOR DECIDUOUS
OR CONIFEROUS SPECIES)

MORETTI ESTATES
LANDSCAPE PLAN

LANDSCAPE LEGEND

- DECIDUOUS TREE
- CONIFEROUS TREE
- ORNAMENTAL TREE
- SHRUB

GENERAL LANDSCAPE NOTES

1. The contractor(s) shall verify the location of all underground utilities prior to construction.
2. All existing vegetation shown is to be saved and protected during the demolition and construction process.
3. All landscape areas to be grass common to region except where other plant material is called for.
4. All trees and shrubs are to be planted in mulch beds with spade edge separating mulch from turf grass areas.
5. Any landscape areas disturbed by construction shall be scarified to a depth of 2", graded smooth to allow for positive drainage. For any landscape area so designated to remain whether on or off site, remove weeds, rocks, construction items, etc., scarify area, hydro seed, and fertilize. All R.O.W curb and gutters are to be cleaned of debris.
6. Plants shall conform to the sizes as shown on the drawings shall be of sound health. All measurements such as spread, ball size, height, caliper, and quality designations shall be conformance to the latest edition of the American Standards for Nursery Stock. All plant material shall be hardy to the Genoa Township Area, be free of disease and insects, and conform to the American Standard for Nursery Stock of the American Nurserymen.
7. All evergreen trees species are to be full, dense plants branched fully to the ground
8. Prune all dead and broken branches from all plants immediately after installation
9. Planting soil mixture shall be prepared on-site by mixing 3 parts topsoil to 1-part existing site soils to 1-part peat, adding 5 lbs. of superphosphate to each cubic yard of the mixture.
10. Organic mulch requirements: shade trees, ornamental trees, and evergreen trees - 6" of shredded bark; shrubs and shrub beds - 4" of shredded bark; perennial flowers - 2" of shredded bark.
11. Slope Stabilization: Temporary erosion control mat shall be place over all areas with a slope of 1:4 or greater. Contractor to repair all areas of erosion to satisfaction of Owner/City to establish proper turf within one year.
12. All landscaping shall be maintained in a healthy, neat, and orderly state following installation. Any and all plant material that dies or becomes diseased, shall be replaced within six months.
13. Residents to have options for trees. Except those prohibited by Section 12.02.10 of Genoa Township Zoning Ordinance
14. Landscape buffer to be planted in accordance to Section 12.02.03 of Genoa Township Zoning Ordinance.

PLANT KEY

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ME GA

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BRIGHTON, MI 48116

LANDSCAPE PLAN

MORETTI ESTATES
4242 BAUER ROAD
PART OF NE 1/4, SEC. 26, T2N-R5E
GENOA TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

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CHECK BY: PR

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GENOA TOWNSHIP

JAN 2 9 2019

RECEIVED

GENOA CHARTER TOWNSHIP
Application for Re-Zoning

APPLICANT NAME: James Pappas ADDRESS: 550 East Nine Mile Road Ferndale, MI 48220

OWNER NAME: James Harte ADDRESS: 2528 Harte Drive Brighton, MI 48114

PARCEL #(s): 4711-13-300-009 PRIMARY PHONE: (810) 499-7144

EMAIL 1: birkenstockconstructionllc@gmail.com EMAIL 2: NA

We, the undersigned, do hereby respectfully make application to and petition the Township Board to amend the Township Zoning Ordinance and change the zoning map of the township of Genoa as hereinafter requested, and in support of this application, the following facts are shown:

A. REQUIRED SUBMITTAL INFORMATION

1. A legal description and street address of the subject property, together with a map identifying the subject property in relation to surrounding properties;
2. The name, signature and address of the owner of the subject property, a statement of the applicant's interest in the subject property if not the owner in fee simple title, and proof of consent from the property owner;
3. It is desired and requested that the foregoing property be rezoned from:

   GCD - General Commercial District to PID - Planned Industrial Development.

4. A site plan illustrating existing conditions on the site and adjacent properties; such as woodlands, wetlands, soil conditions, steep slope, drainage patterns, views, existing buildings, sight distance limitations, relationship to other developed sites. and access points in the vicinity;
5. A conceptual plan demonstrating that the site could be developed with representative uses permitted in the requested zoning district meeting requirements for setbacks, wetland buffers access spacing, any requested service drives and other site design factors;
6. A written environmental impact assessment, a map of existing site features as described in Article 18 describing site features and anticipated impacts created by the host of uses permitted in the requested zoning district;
7. A written description of how the requested rezoning meets Sec. 22.04 "Criteria for Amendment of the Official Zoning Map."
8. The property in question shall be staked prior to the Planning Commission Public Hearing.

B. DESCRIBE HOW YOUR REQUESTED RE-ZONING MEETS THE ZONING ORDINANCE CRITERIA FOR AMENDING THE OFFICIAL ZONING MAP:

1. How is the rezoning consistent with the goals, policies and future land use map of the Genoa Township Master Plan, including any subareas or corridor studies. If not consistent, describe how conditions have changed since the Master Plan was adopted?

The subject parcel is Master Planned for Commercial Office. There is currently an existing office building on the site. The proposed climate controlled storage with sales office meets some of that criteria, as well. We have designed the exterior with a commercial office look, using flat roofs and high quality materials, commercial window patterns, etc.

8. Describe any deed restrictions which could potentially affect the use of the property.

NA

C. 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: James Harte, Birkenstock Enterprises, LLC 11/25/19

ADDRESS: 2528 Harte Drive, Brighton, MI 48114

SIGNATURE

The following contact should also receive review letters and correspondence:

Name: James Pappas Email: jpappas@fsparch.com

Business Affiliation: Fusco, Shaffer & Pappas, Inc. - Architects

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: Birkenstock Self Storage

PROJECT LOCATON & DESCRIPTION: Climate Control Storage with Sales Office on the South side of Grand River between S Hacker and Euler Road

SIGNATURE: DATE: 1.21.19

PRINT NAME: James Pappas PHONE: 248-543-4100

COMPANY NAME & ADDRESS: Fusco, Shaffer & Pappas, Inc.
550 East Nine Mile Road, Ferndale, MI 48220

GENOA CHARTER TOWNSHIP APPLICATION

Planned Unit Development (PUD)

GENOA TOWNSHIP

JAN 2 9 2019

RECEIVED

APPLICANT NAME: James Pappas, President, Fusco, Shaffer & Pappas, Inc.

APPLICANT EMAIL: jpappas@fsparch.com

APPLICANT ADDRESS & PHONE: 550 East Nine Mile Road Ferndale, MI 48220 (248) 543-4100

OWNER'S NAME: James Harte

OWNER ADDRESS & PHONE: 2528 Harte Drive Brighton, MI 48114 (810) 499-7144

TAX CODE(S): 4711-13-300-009

QUALIFYING CONDITIONS (To be filled out by applicant)

1. A PUD zoning classification may be initiated only by a petition.

2. It is desired and requested that the foregoing property be rezoned to the following type of PUD designation:

   - ☐ Residential Planned Unit Development (RPUD)
   - ☒ Planned Industrial District (PID)
   - ☐ Mixed Use Planned Unit Development (MUPUD)
   - ☐ Redevelopment Planned Unit Development (RDPUD)
   - ☐ Non-residential Planned Unit Development (NRPUD)
   - ☐ Town Center Planned Unit Development (TCPUD)

3. The planned unit development site shall be under the control of one owner or group of owners and shall be capable of being planned and developed as one integral unit.

EXPLAIN The property will be owned by one entity:
Birkenstock Self-Storage, LLC

4. The site shall have a minimum area of twenty (20) acres of contiguous land, provided such minimum may be reduced by the Township Board as follows:

   A. The minimum area requirement may be reduced to five (5) acres for sites served by both public water and public sewer.

   B. The minimum lot area may be waived for sites zoned for commercial use (NSD, GCD or RCD) where the site is occupied by a nonconforming commercial, office or industrial building, all buildings on such site are proposed to be removed and a new use permitted within the underlying zoning district is to be established. The Township Board shall only permit the PUD on the smaller site where it finds that the flexibility in dimensional standards is necessary to allow for innovative design in redeveloping the site and an existing blighted situation will be eliminated. A parallel plan shall be provided showing how the site could be redeveloped without the use of the PUD to allow the Planning Commission to evaluate whether the modifications to dimensional standards are the

4. The apparent demand for the types of uses permitted in the PUD;

See Impact Assessment and Self Storage Development Feasibility Study (10-15-18).

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: James Harte, Birkenstock Enterprises, LLC James Harte 1/25/19

ADDRESS: 2528 Harte Drive, Brighton, MI 48114

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

James Pappas (*Name*) of Fusco, Shaffer & Pappas, Inc. (*Business Affiliation*) at jpappas@fsparch.com (*E-mail*)

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: Birkenstock Self Storage

PROJECT LOCATON & DESCRIPTION: Climate Control Storage with Sales Office on the South side of Grand River between S Hacker and Euler Road

SIGNATURE: _____ DATE: 1.21.19

PRINT NAME: James Pappas PHONE: 248-543-4100

COMPANY NAME & ADDRESS: Fusco, Shaffer & Pappas, Inc.
550 East Nine Mile Road, Ferndale, MI 48220

GENOA TOWNSHIP

JAN 2 9 2019

RECEIVED

GENOA CHARTER TOWNSHIP
Application for Site Plan Review

TO THE GENOA TOWNSHIP PLANNING COMMISSION AND TOWNSHIP BOARD:

APPLICANT NAME & ADDRESS: James Pappas, Fusco, Shaffer & Pappas, Inc. 550 East Nine Mile Road, Ferndale, MI 48220

If applicant is not the owner, a letter of Authorization from Property Owner is needed.

OWNER'S NAME & ADDRESS: Jim Harte, 2528 Harte Drive, Brighton, MI 48114

SITE ADDRESS: 2528 Harte Drive, Brighton, MI 48114 PARCEL #(s): 4711-13-300-009

APPLICANT PHONE: (248) 543-4100 OWNER PHONE: (810) 499-7144

OWNER EMAIL: birkenstockconstructionllc@gmail.com

LOCATION AND BRIEF DESCRIPTION OF SITE: South side of Grand River between S Hacker and Euler Road. 10.62 acre site with an existing 1-story office building at the north end and heavy topography at the central area. Site plateau area at rear of site.

BRIEF STATEMENT OF PROPOSED USE: We are seeking a PID to develop the south end of the site for a 67,596 SF climate control storage facility.

THE FOLLOWING BUILDINGS ARE PROPOSED: We are proposing a single, predominately 1-story climate control self storage building at 67,596 SF with a 100 SF sales office and a second floor 1,500 SF managers unit above the office.

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: James Pappas

ADDRESS: 550 East Nine Mile Road, Ferndale, MI 48220

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

1.) James Pappas (Name) of Fusco, Shaffer & Pappas, Inc. (Business Affiliation) at jpappas@fsparch.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: 1.21.19

PRINT NAME: James Pappas PHONE: 248-543-4100

ADDRESS: 550 East Nine Mile Road, Ferndale, MI 48220

March 6, 2019

Planning Commission
Genoa Township
2911 Dorr Road
Brighton, Michigan 48116

Attention:	Kelly VanMarter, AICP Assistant Township Manager/Community Development Director
Subject:	Birkenstock Enterprises – PID Review #2
Location:	2528 Harte Drive – south side of Grand River, between Euler Road and Genoa Business Park Drive
Zoning:	GCD General Commercial District

Dear Commissioners:

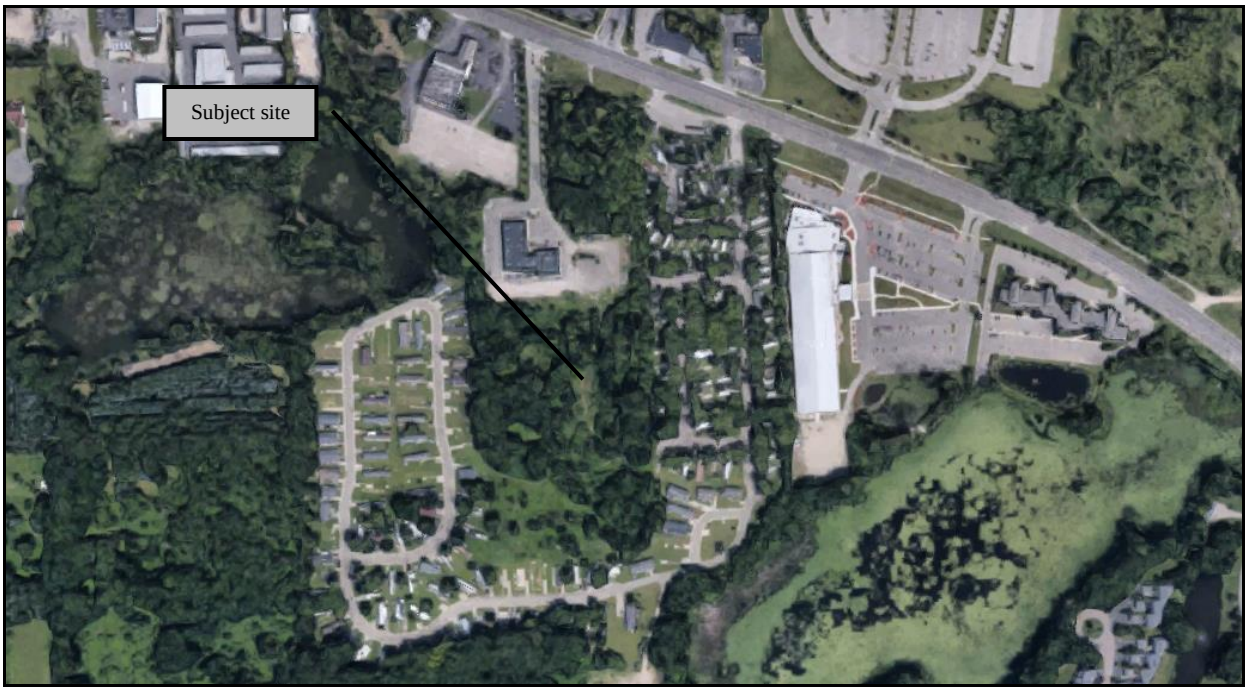
At the Township's request, we have reviewed the proposed rezoning, conceptual site plan (most recently dated 2/22/19), draft PUD Agreement and associated Impact Assessment (dated January 2019).

The 10.62-acre site currently contains a 12,816 square foot office building, though much of the site is undeveloped. The site and much of the Grand River frontage in this area of the Township are zoned GCD, though the site is also surrounded on 3 sides by MHP (both zoning and developed use).

We have reviewed the proposal in accordance with the applicable provisions of the Genoa Township Zoning Ordinance and Master Plan.

A. Summary

1. The proposal generally meets the PUD qualifying conditions; however, the Township Board must authorize a reduction in the conventional lot area requirement given the presence of public water and sanitary sewer.
2. Rezoning to IND on its own would not generally be considered compatible with the Township Master Plan; however, the inclusion of a request for the PID overlay mitigates this concern (in our opinion).
3. The proposed lot layout needs to be modified for compliance with the minimum area requirement or the applicant must seek deviations to be enumerated in the PUD Agreement.
4. The applicant must provide building material samples for the Commission's consideration. Information on the design/materials of the existing building must also be provided.
5. Given the extent of tree removal proposed, we encourage the applicant to retain additional healthy mature trees and/or possibly relocate them elsewhere on site.
6. The applicant requests a waiver from the wall/berm requirement for the Buffer Zone "B" areas.
7. The Planning Commission may allow an increase the sign area based upon the nature of the development. However, the sign height needs to be reduced or included in the PUD Agreement as a deviation.
8. Details of the electronic messaging center will be required with the final PUD plan.
9. The applicant must address any comments raised by the Township Engineer, Utilities Director or Brighton Area Fire Department.



Aerial view of site and surroundings (looking north)

B. Proposal

The applicant requests establishment of a Planned Industrial Development (PID) for the site. The proposal is for a new 66,000 square foot indoor climate controlled storage building, which includes space for office/sales and a manager. The existing building/use on the north side of the property will also remain.

Since the PID designation is an overlay of industrial zoning, the site must first be rezoned from GCD to IND, then the qualification/review standards of the PID can be applied.

C. Process

The review and approval process is outlined below. The applicant is at Step 1 in the process.

1. The Township Planning Commission makes a recommendation to the Township Board on the rezoning (IND as the base and the PID overlay), conceptual PUD plan, draft PUD Agreement and Impact Assessment following a public hearing.
2. The County Planning Commission reviews the rezoning and provides comments for consideration by the Township Board.
3. The Township Board acts on the rezoning, conceptual PUD plan, PUD Agreement and Impact Assessment.

D. PUD Qualifying Conditions

Section 10.02 identifies the following qualification requirements for all planned unit developments, including the PID overlay:

1. **Single Ownership.** The material submitted states that the site will be owned by one entity – Birkenstock Self-Storage, LLC.

2. **Initiated by Petition.** The request has been initiated by the submittal of applications for rezoning, PUD and Site Plan Review.

3. **Minimum Site Area.** The minimum lot area to qualify for a PUD is 20 acres; however, the Township Board may reduce this standard for sites served by both public water and sanitary sewer.

   The 10.62-acre site is served by both public water and sanitary sewer; therefore, the Township Board may allow establishment of a PUD on this site.

4. **Benefits.** The PUD site plan shall provide one or more of the following benefits not possible under the standards of conventional zoning, as determined by the Planning Commission:

   - preservation of significant natural or historic features;
   - a complementary mixture of uses or a variety of housing types;
   - common open space for passive or active recreational use;
   - mitigation to offset impacts; or,
   - redevelopment of a nonconforming site where creative design can address unique site constraints.

   The site contains a significant amount of mature wooded area, though the vast majority will be removed to accommodate the project. We encourage the applicant to retain additional healthy mature trees and/or relocate them elsewhere on site (if possible).

   Additionally, the site is relatively unusual with a narrow road frontage that is technically nonconforming due to its reduced lot width. The size/shape of the property pushes development far away from Grand River Avenue, thus creating some development constraints given a lack of visibility. The proposed development/use does not rely on pass-by traffic for business, which helps to mitigate these constraints.

5. **Sewer and Water.** The site has access to both public water and sanitary sewer. We defer to the Township Engineer for any specific comments under this criterion.

6. **Rezoning Standards**.

a. How is the rezoning consistent with the goals, policies and future land use map of the Genoa Township Master Plan, including any subareas or corridor studies. If not consistent, describe how conditions have changed since the Master Plan was adopted.

The Master Plan identifies the site as Office, which "includes various forms of office development, including professional offices, medical offices and banks."

The proposed IND rezoning does not directly equate to the Office category, although there is an office component to the proposal, including both the existing and proposed buildings.

In our opinion, it is the inclusion of the PID request that creates compatibility with the Master Plan.

More specifically, the PID overlay allows the same uses as OSD zoning (which is consistent with the Office category in the Master Plan). Furthermore, use of the PID allows the Township and applicant to negotiate a PUD Agreement with specific uses included (or excluded), as well as design considerations to help mitigate any potential off-site impacts.

Per our initial review comments, the applicant has revised the draft PUD Agreement to eliminate the more intensive IND uses, while retaining the OSD uses, from the proposed PID.

b. The compatibility of all the potential uses in the PUD with surrounding uses and zoning in terms of land suitability, impacts on the environment, density, nature of uses, traffic impacts, aesthetics, infrastructure, and potential influence on property values.

Similar to comments provided above, the applicant has modified the draft PUD Agreement such that the incompatible industrial uses otherwise allowed in IND will be prohibited within this PID.

c. The capacity of infrastructure and services sufficient to accommodate the uses permitted in the requested district without compromising the "health, safety, and welfare" of the Township.

As previously noted, the site has access to both public water and sanitary sewer and vehicular access is provided via the main commercial corridor through the Township. Generally speaking, these conditions lead us to believe that the capacity of infrastructure and services can accommodate the proposal.

Any concerns noted by the Township Engineer, Utilities Director or the Brighton Area Fire Authority under this criterion must also be addressed.

d. The apparent demand for the types of uses permitted in the PUD.

The general tone of the draft PUD Agreement revolves around the proposed climate controlled, self-storage use. The submittal includes a feasibility study for this use that concludes there is greater demand than supply in the "target area," which is defined as a 5-mile radius.

E. Conceptual PUD Site Plan Review

1. PID Standards:

a. Dimensional standards. Use of the PID overlay requires compliance with the minimum dimensional standards of the IND. The site data table on the conceptual PUD plan demonstrates compliance with these standards, including setbacks, building height and lot coverage (both by buildings and impervious surfaces).

b. Lot areas. The PID overlay requires lots of not less than 2 acres in area for future development. The overall site exceeds this standard; however, the parcel layout on Sheet C.306 depicts 2 parcels (out of 3) that do not meet this standard.

In our opinion, the proposed lot layout needs to be modified for compliance or the applicant must seek deviations to be enumerated in the PUD Agreement.

c. Design standards. The conceptual PUD plan identifies a tree-lined drive and incorporates new landscaping throughout the site.

By Ordinance, buildings are to be comprised primarily of masonry materials with a 25% limitation on metal paneling and plain CMU.

The material calculations provided on Sheets A.201 and A.202 keep the amount of metal within this standard; however, there is an abundance of composite siding and only the north elevation is "primarily" brick.

The draft PUD Agreement includes a request to modify the material requirements.

The applicant has indicated that they will present material samples at the upcoming meeting for the Commission's consideration, including information on the existing building.

2. **Uses Permitted.** The PID overlay allows permitted and special land uses of the IND and OSD zoning districts. As previously noted, the draft PUD Agreement (Article I, Paragraph B) lists specific uses that will be prohibited within this PID.

3. **Preservation of Natural Features.** The submittal includes a tree survey, noting over 350 existing trees on site. The proposed plans include retention of only 17 existing trees. We encourage the applicant to incorporate additional healthy mature trees as part of the site development plan.

4. **Vehicular and Pedestrian Circulation.** Existing vehicular access is provided via Harte Drive, which intersects with Grand River Avenue. The conceptual PUD plan proposes extension of Harte Drive towards the rear of the property and provides a ring-road/drive around the proposed building.

   Sidewalks are currently provided along Grand River Avenue and around the existing building, with a connection along the east side of Harte Drive. New sidewalks are depicted around the proposed building. Given the nature of the proposal, further sidewalk connections along the drive/road are not likely warranted.

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

5. **Parking.** Parking calculations on the conceptual PUD plan indicate that 49 spaces are required and provided for the proposed climate controlled storage use.

   Calculations for the existing building have also been provided, noting the need for 43 spaces. The plan includes 19 new spaces south of the existing building, which bring the total to 67 spaces. The amount of parking proposed for the existing building would be viewed as excessive (Section 14.02.06), although when the entire site is considered, the amount of parking is generally in compliance with current standards.

6. **Lighting.** The proposed lighting plan includes 15 light poles and 14 wall-mounted fixtures on the proposed building. Fixture details demonstrate the use of LED lighting that is downward directed and cut-off.

   The photometric plan provided lighting intensities that are within the maximum allowed by Ordinance (both on-site and along property lines).

   The revised plan also includes a pole detail, depicting the use of 20-foot tall steel light poles.

7. **Landscaping.** The submittal includes a general depiction of landscaping on the conceptual PUD plan, as well as a detailed landscape plan (Sheets LS1 and LS2).

   Generally speaking, the detailed landscape plan complies with Ordinance standards; however, the applicant requests that the Township waive the wall/berm requirement for the Buffer Zone "B" areas.

8. **Signage.** The plan identifies a new monument sign in the median island near the intersection of Harte Drive and Grand River Avenue, as well as a directional sign internal to the site given the vast separation between buildings.

   The monument sign has a height of 8 feet and an area of approximately 82 square feet, both of which exceed the conventional Ordinance standard.

   However, given the nature of the development, the Planning Commission has the authority to grant the increase in area. In our opinion, the height either needs to be reduced or included in the PUD Agreement as a deviation, if the Township is amenable.

Additionally, since the directional sign includes the name of the business, its area must be calculated within that allowed for the monument sign. If the Commission grants the full 50% increase, it appears that sign area will comply.

Lastly, the monument sign includes an electronic messaging center that comprises 20 square feet of area. The type and size ratio of this element comply with Ordinance standards; however, the applicant will need to provide additional details in accordance with Section 16.07.02 with the final PUD plan submittal.

9. Impact Assessment. The submittal includes an Impact Assessment (dated January 2019). In summary, the Assessment notes that the project is not anticipated to adversely impact natural features, public services/utilities, surrounding land uses or traffic.

Should you have any questions concerning this matter, please do not hesitate to contact our office. We can be reached by phone at (248) 586-0505, or via e-mail at bborden@safebuilt.com and steve.hannon@safebuilt.com.

Respectfully,
SAFEBUILT STUDIO

Brian V. Borden, AICP
Planning Manager

Stephen Hannon, AICP
Planner

TETRA TECH

March 1, 2019

Ms. Kelly Van Marter
Genoa Township
2911 Dorr Road
Brighton, MI 48116

Re: Birkenstock Storage
Site Plan Review No. 2

Dear Ms. Van Marter:

Tetra Tech conducted a second site plan review of the Birkenstock Office and Storage building plans last dated February 22, 2019. The plans were submitted by Fusco, Shaffer, & Pappas, Inc. on behalf of Jim Harte. The development includes a 10.62-acre site with an existing office building and is located on the south side of Grand River Avenue, between South Hacker Road and Euler Road. The petitioner is proposing to develop the south end of the site for a 67,596-square-foot climate-controlled storage facility. The petitioner is also proposing to rezone the property from general commercial district (GCD) to planned industrial development (PID).

The petitioner has addressed the majority of our comments from our previous letter. However, several are still in progress of being resolved, and those have been repeated in this letter.

GENERAL NOTES

1. The petitioner has noted that they are currently working on getting approval from adjacent properties for their temporary grading easement. Documentation for these easements should be provided for the Township's records.

UTILITIES

1. The water main improvements will be public infrastructure and will require construction plan review and MDEQ permitting through MHOG. The petitioner will be required to provide easement documentation for the proposed water main prior to MDEQ permitting. This can be done after site plan approval.

We recommend the petitioner address the above comments. Once all necessary documents have been received by the Township we will have no further engineering related concern to the proposed development.

Please call or email if you have any questions.

Sincerely,

Gary J. Markstrom, P.E.
Vice President

Shelby Scherdt
Project Engineer

Tetra Tech
401 South Washington Square, Suite 100, Lansing, MI 48933
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

March 4, 2019

Kelly VanMarter
Genoa Township
2911 Dorr Road
Brighton, MI 48116

RE: Birkenstock Self Storage
2528 Harte Dr.
Genoa Twp., MI

Dear Kelly:

The Brighton Area Fire Department has reviewed the above mentioned site plan. The plans were received for review on February 26, 2019 and the drawings are dated January 29, 2019 with latest revisions dated February 22, 2019. The project is an 10.62-acre parcel with an existing 12,816 square foot mixed-use office building. This review is for a proposed new construction 67,596 square foot climate control storage warehouse facility. The plan review is based on the requirements of the International Fire Code (IFC) 2018 edition.

All items cited on the initial review letter have been addressed on this recent submittal. The secondary access drive is being waived due to topographical impracticalities.

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

Harte Birkenstock Storage Building Impact Assessment - NFE K362-01 January 2019

The following is the applicants impact statement for the referenced project.

18.07.01 Preparer

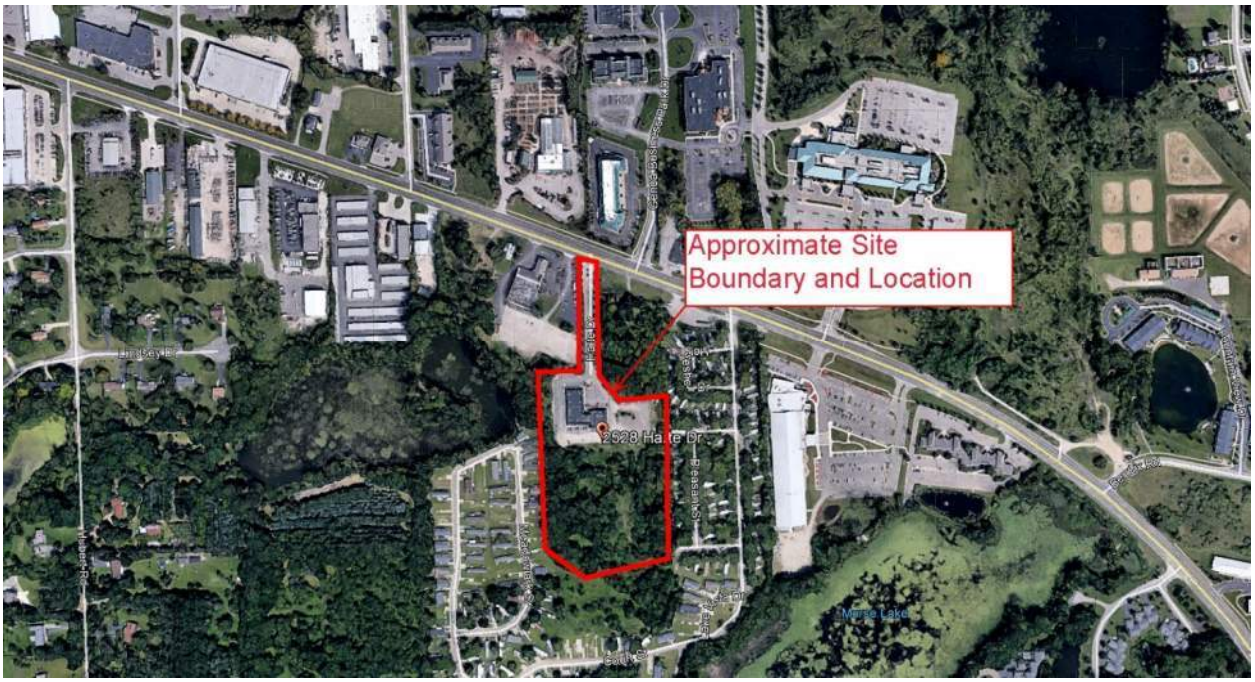
This statement was prepared by Michael D. Peterson, P.E., Civil Engineer, Nowak and Fraus Engineers, with input from Steve Roffi, RA, Architect, Fusco, Shaffer and Pappas. NFE has been doing business in SE Michigan for 50 years.

Nowak and Fraus Engineers
46777 Woodward Avenue
Pontiac, MI 48342
(248) 332-7931
Michael D. Peterson, P.E., Principal
mpeterson@nfe-engr.com

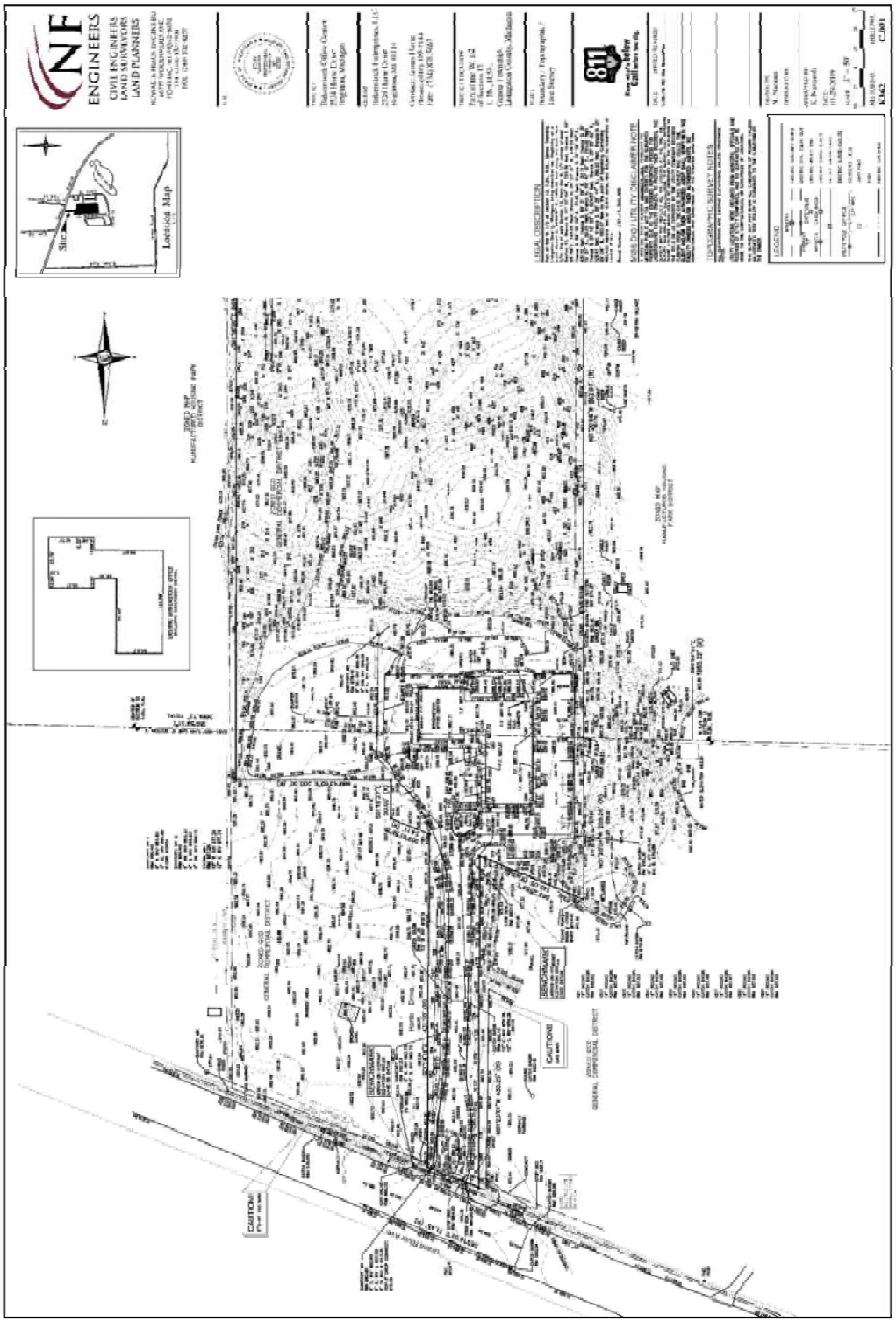
Fusco, Shaffer & Pappas, Inc.
550 E. Nine Mile Road
Ferndale, MI 48220
(248) 543-4100
Steve Roffi, RA
sroffi@fsparch.com

18.07.02 Location

The plans submitted with this application contain larger scale and more detailed information of the existing site/location/proposed improvements. The site is located at 2528 Harte Drive, on the south side of Grand River Avenue. The site is located between Hubert and Bendix Road. The property tax ID is 4711-13-300-009.




New Project Area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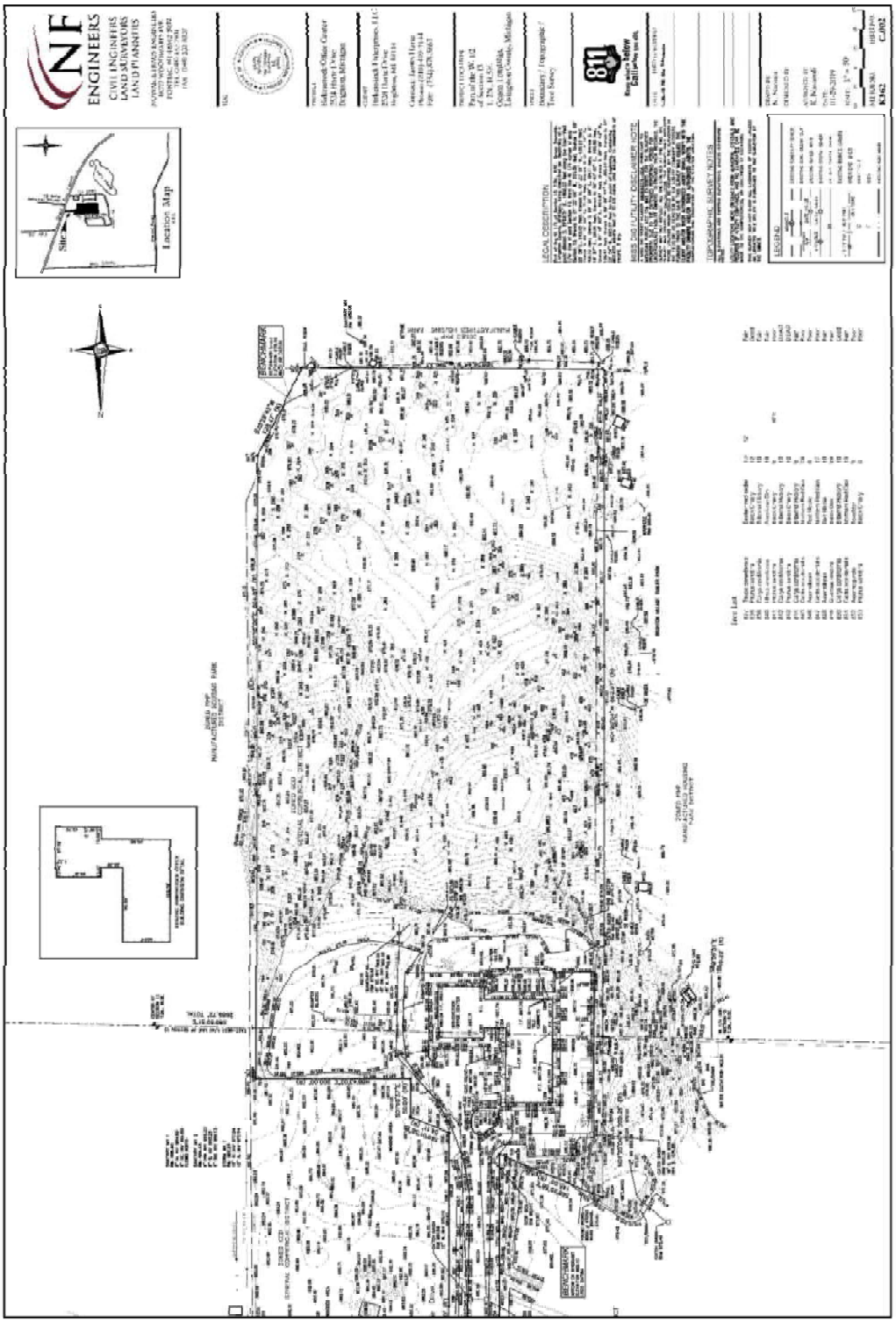


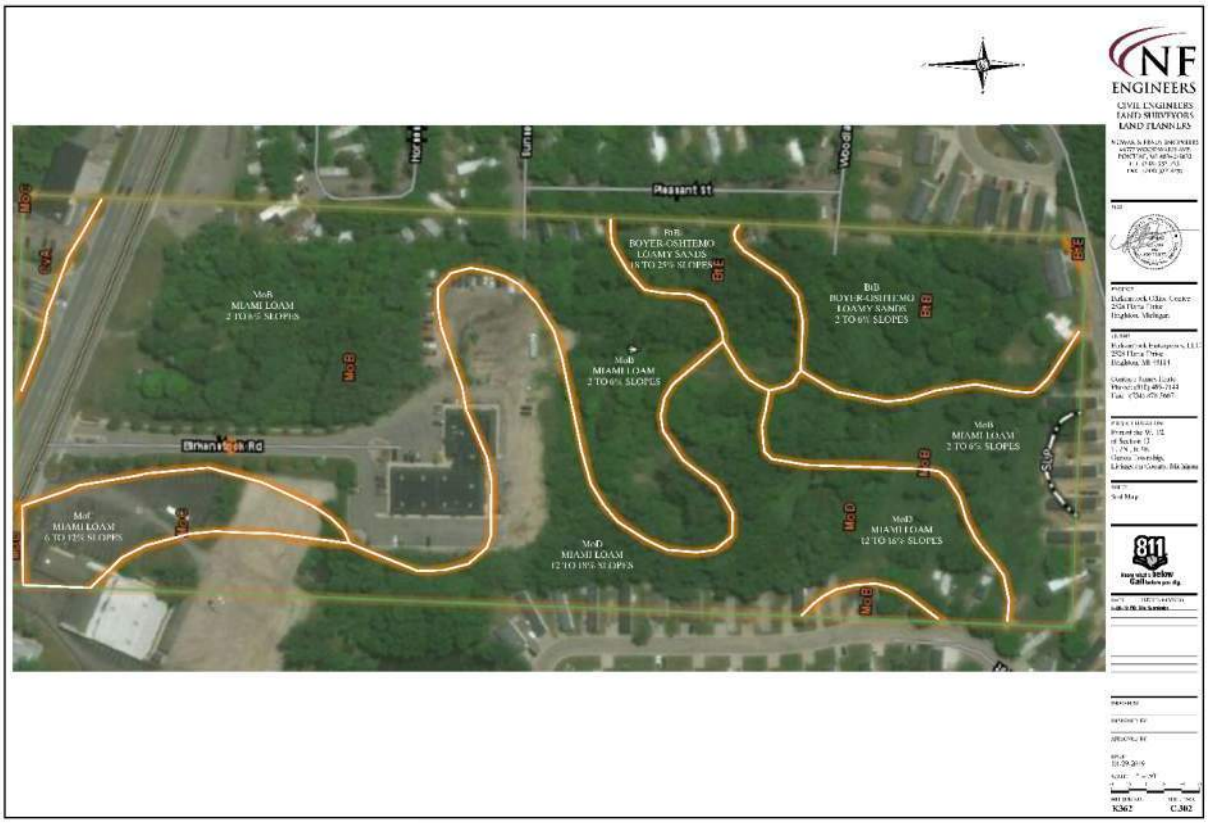
18.07.03 Impact on Natural Features

The site is approximately 10.61 acres in size. The front or north 1/3 to 1/2 of the site contains an office building with drive access from Grand River Avenue. The existing building is set back from Grand River approximately 500 feet.

The remainder of the property where the proposed improvements are to made can be considered "rolling" with changes in elevation of approximately 20 feet. The Owners intent is to make improvements that will utilize this relief/natural feature and to work with the land as much as possible with the proposed project.

Where the proposed improvements are to be made on the site, the east, south and west sides are bounded by a pre-manufactured development. The northwest portion of the site is bounded on the west side by and existing church which has been approved for improvements as well. The church property is proposing to relocate an ingress/egress point from Grand River to the existing Harte Drive.

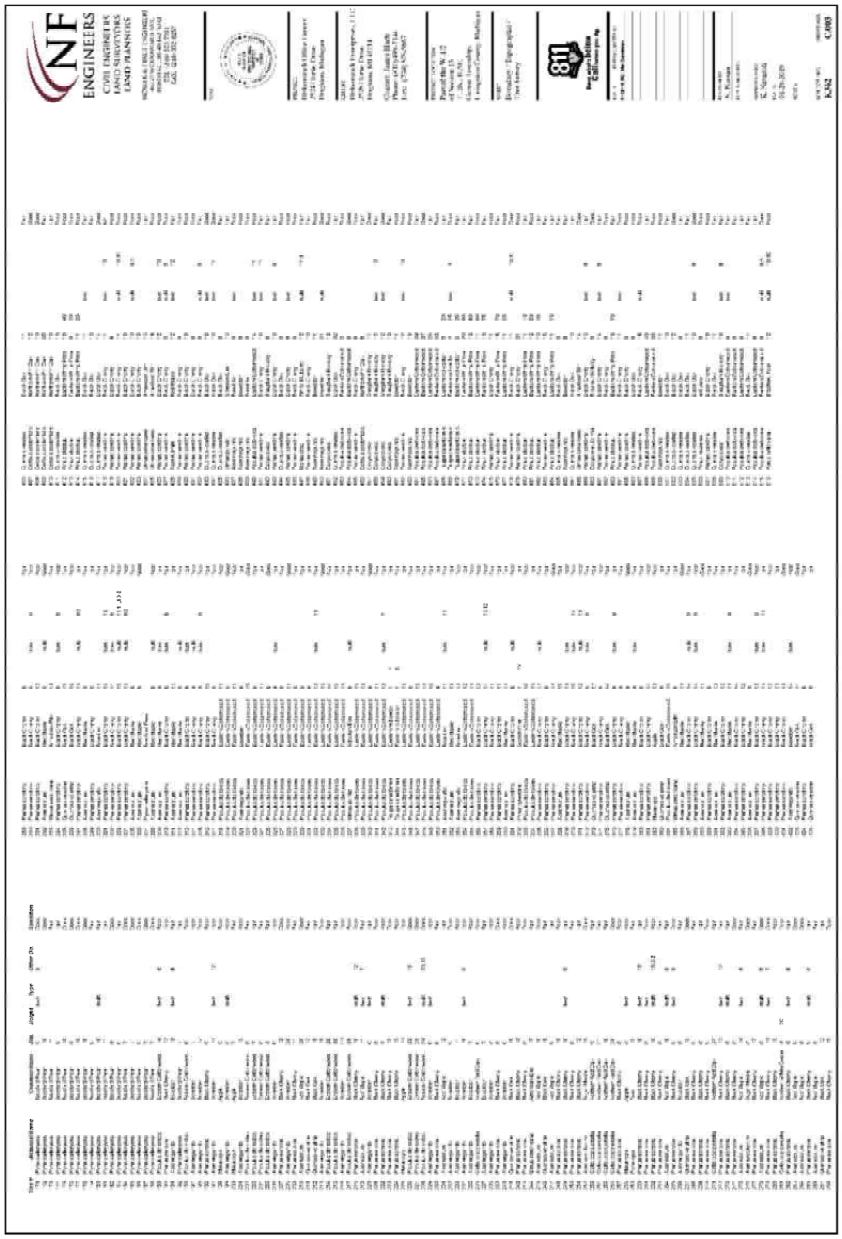
The soils specific to this site according to the USDA soils map are: MoB-Miami Loam, BtB-Boyer-Oshemo Loamy Sands, MoD-Miami Loam.



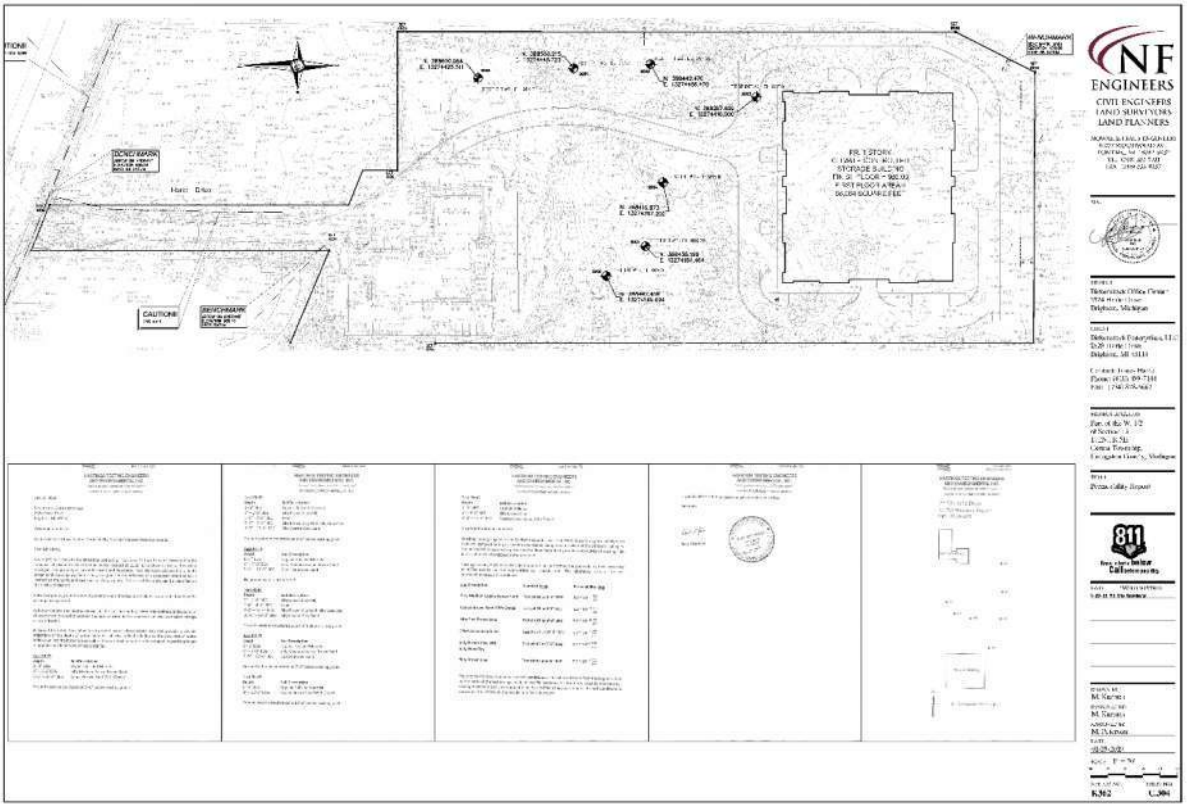
A larger depiction of this graphic can be found in the site plan documents submitted to the Township.

There is little wildlife on this site which has not been previously impacted by the other surrounding developments.

The plans submitted for this project contain a tree survey which identifies all of the trees 8” in caliper and larger. The majority of the trees on site are between 8” and 14” in diameter. The majority of the trees are in poor to fair condition. Most of the very large trees are in poor condition.

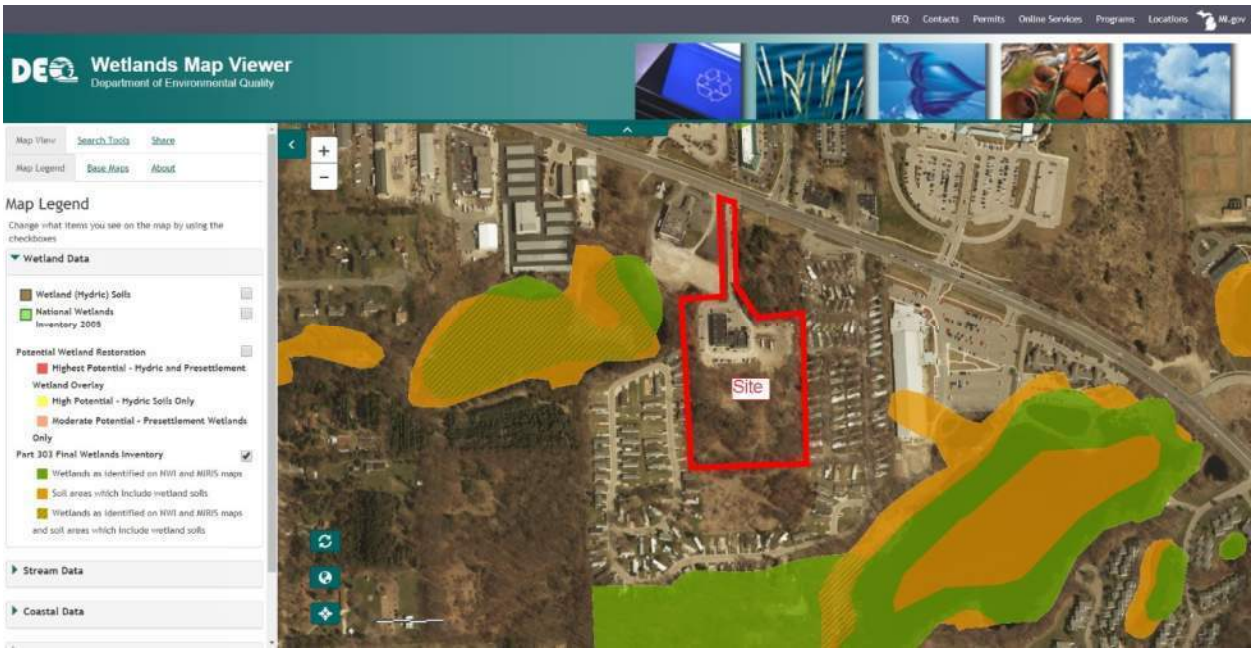


Test pits were dug on this site to assess the soil conditions and where the ground water may be located. The tests were performed by Hasting Testing Engineers and Environmental Inc. The test pits were dug in the areas of the proposed retention pond which will be area where there are existing low areas prior to development/improvement. No water has been observed to collect in this area and that is consistent with the soils found which is mainly medium to course sand. There are also some heavier/less permeable soils found in some areas/layers. The water table also varied in depth from the surface but is generally between elevation 947 and 950. This is approximately 10 feet or greater than the proposed pond bottom.



Water service to this property as well as the surrounding properties are provided by a City system. To our knowledge there are no wells in the area of this project/property.

There are no wetlands on this site. Below is a wetland map for the site and the area around the site.



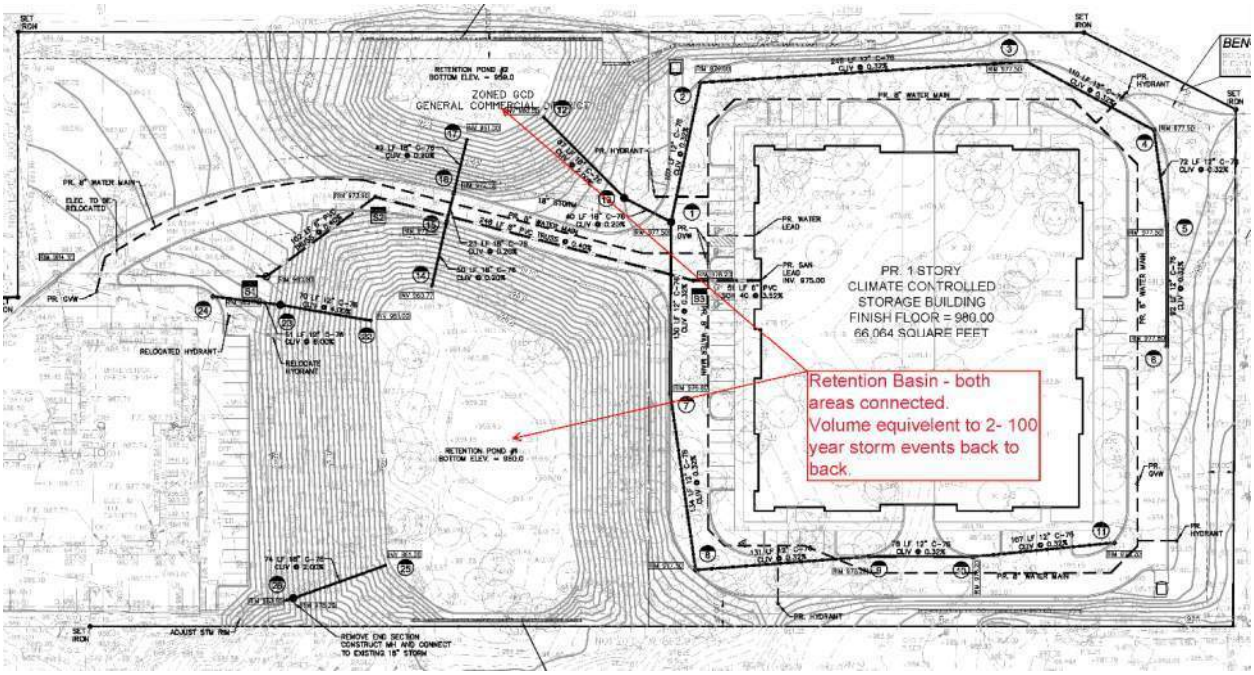
Storm water for this site percolates into the ground. There are a couple of low areas on the site that will be reshaped and used as a retention basin, (Retention, meaning no outlet). The basin has been designed to contain the volume of water that will be produced by 2 – 100 year back to back storms. This is in accordance with the requirements of the Township and the County Drain Commission. The frequency of a 100-year storm is once every 100 years.

There are no lakes, streams or ponds on the site. Therefore, none of these items will be affected by this development.

As discussed above, surface and ground water quality will not be affected with the proposed site improvements. The storm water in the ponds will be naturally filtered as it percolates into the ground. This is done in accordance with best management practices and the requirements of the Township and County.

18.07.04 Impact on Storm Water Management

As discussed, the storm water on this site either percolates into the ground and/or flows to the two low areas and percolates, evaporates and is picked up by vegetation. The intent is to continue this same practice, but, enlarge the low areas for more volume and a factor of safety (i.e. 2 – 100-year storm events back to back).



To reiterate, the volume of the pond is slightly greater than the volume of water that would be produced by 2 – 100-year storm events back to back. The probability of a 100-year storm is that such an event would occur once every 100 years. A retention pond is a pond that has no outlet and thus the requirement is to size it to handle 2 – 100-year storm events back to back. Water leaves the pond by percolating into the ground (soaking into the ground), by evaporation and by transpiration (water used by vegetation). No standing water has been observed in the existing depression areas and therefore it is assumed that the ground is adequate to allow the percolation of storm water.

County Drain Commissions throughout SE Michigan are now requiring that a portion if not all the storm water produced on a site be percolated back into the ground. This is part of evolving best management practices for dealing with storm water in areas where development occurs.

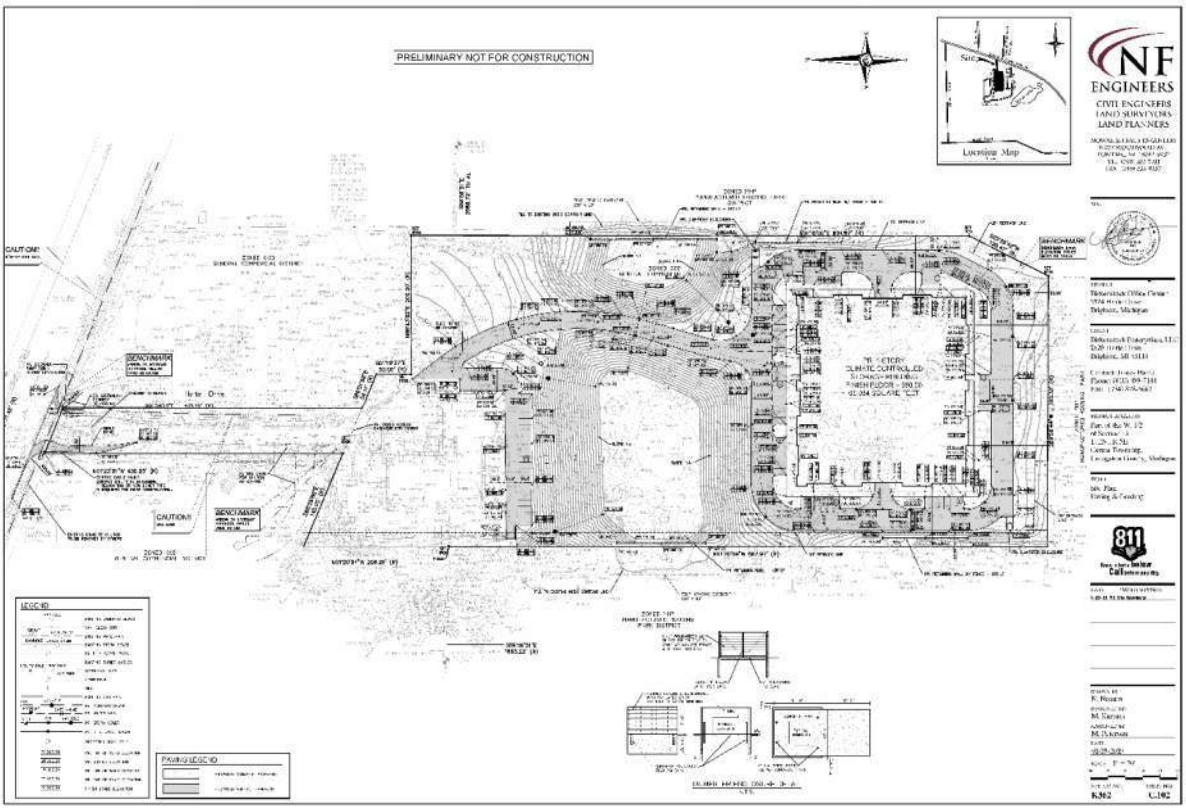
18.07.05 Impact on Surrounding Land Use

The subject parcel is Master Planned for commercial office. There is currently on site, an existing office building that will remain. This existing office is located in the front/northern 1/3 to 1/2 of the site. The proposed development/improvement will be a climate-controlled storage facility with a sales office. The project architect has designed the exterior of the new building with a commercial office look using flat roofs, high quality materials, window patterns, etc.

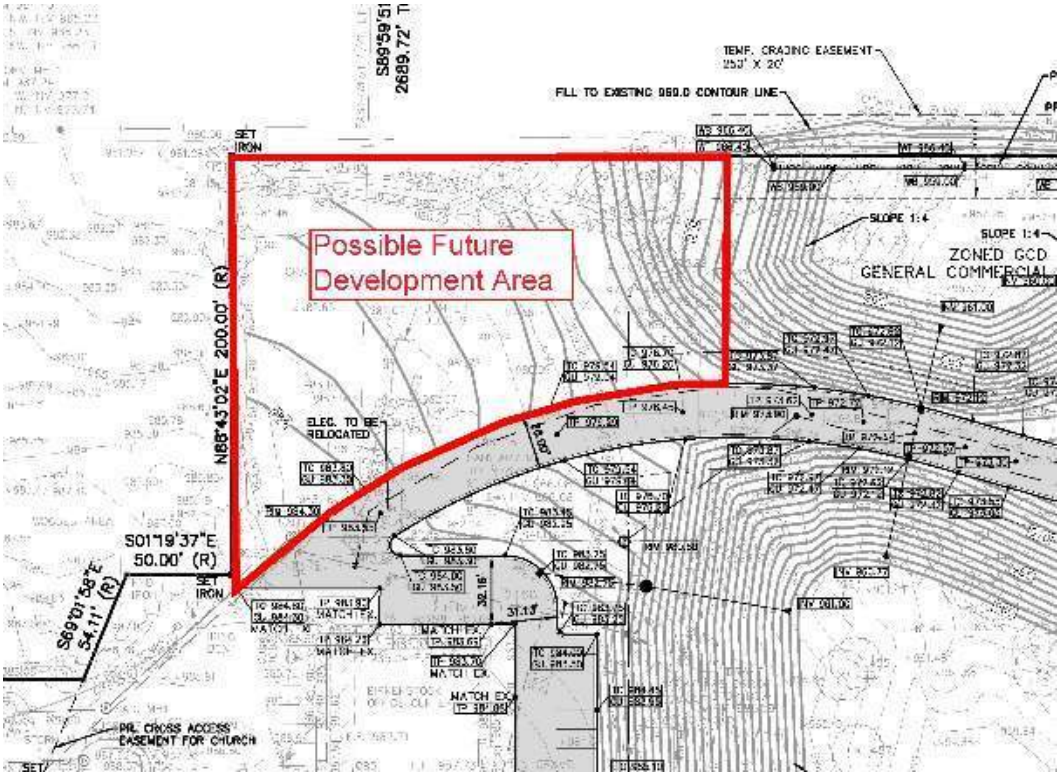
The proposed commercial use is compatible with the adjacent zoning/uses along Grand River Avenue. Low anticipated traffic volume (typical for this type of project) and negligible environmental effects, make for a low impact facility for the site and surrounding properties. Esthetics of the proposed design will blend and be harmonious with the adjacent properties. The existing MFP zoned areas along the East, South and West sides will be screened with a minimum 20-foot-wide buffer that will contain existing trees and planted vegetation.

The Township staff through meetings and discussion have suggested that this project be developed as a PID.

The 66,064 sf, climate-controlled storage building will be constructed on the southern half of the site as depicted in the project drawings. The building, pavement and utilities will be constructed at one time and will not be phased. Landscaping will be installed after the building and related appurtenances are completed.



The applicant has requested that the site and building be designed so that it is harmonious as possible with the existing land. The applicant has reserved the northeast portion of the site to possibly be developed/improved at a later date. This possible future improvement has been considered in the design and the site calculations.



No additional light impact is anticipated with the proposed project. No additional noise or air pollution is anticipated with this project.

It is anticipated that the site will be open for business between 8:00 AM and 6:00 PM. Outside lighting will be minimal as needed for security. Inside lighting will be subdued. A photometric plan will be prepared as part of the construction documents. These plans will be submitted to the Township and other applicable agencies having jurisdiction over the project for their review, approval and applicable permits. The lighting will conform to the Township's requirements.

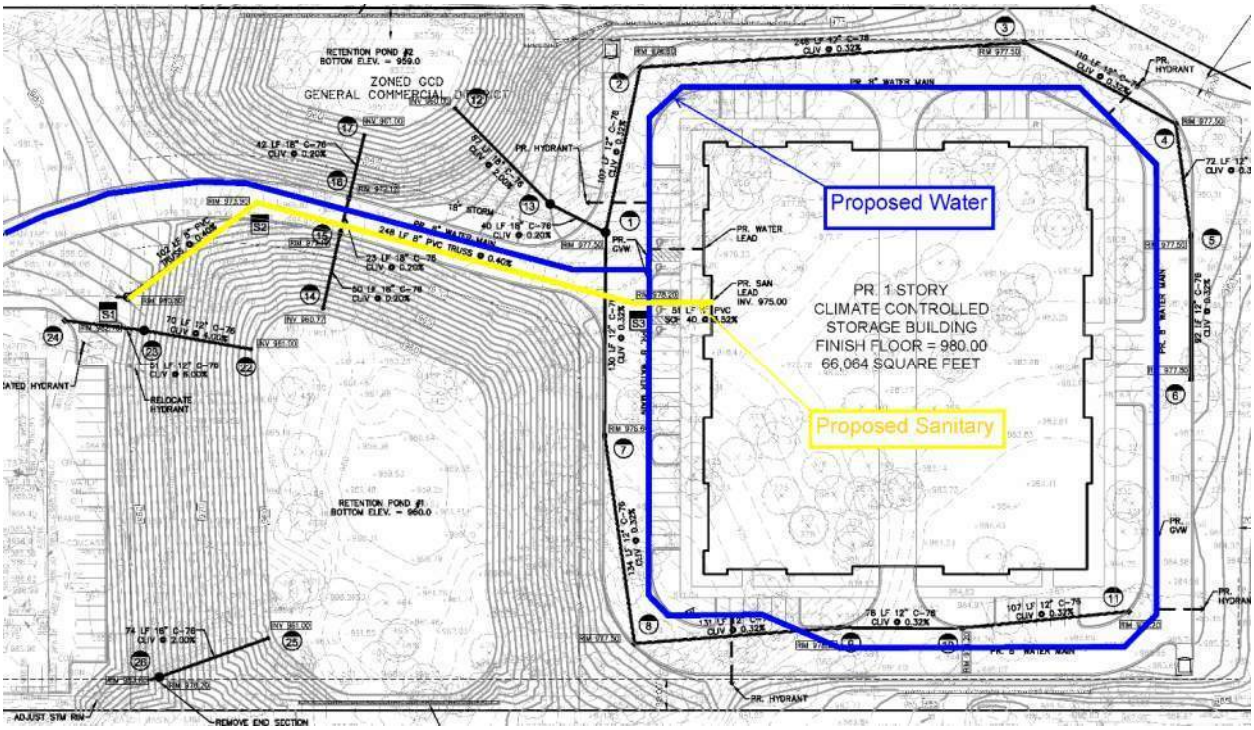
In regard to the performance standards as noted in Section 13.05 there shall be no: smoke, airborne solids, odor, gasses, vibration, noise, glare, radioactive materials, fire and safety hazards, underground storage tanks, above ground storage tanks, toxic or hazardous materials.

18.07.06 Impact on Public Facilities and Services

The will be no residents on site. There will be 3 employees on site. Visits to the site are anticipated to be 24 per day. There is no anticipated impact to schools and recreation facilities. There is no anticipated increase to police, fire and emergency services.

18.07.07 Impact Public Utilities

Water service will be provided through a connection to an existing water main located on site. Sanitary service will be provided through a connection to an existing sanitary sewer located on site. Use or volume of flow from and to the water and sanitary systems will be negligible. Calculations will be provided on the engineering construction documents at a later date and will conform to the requirements of the Township and the County.



As discussed previously, storm water will be collected (catch basins) and directed to the retention pond. The retention pond will have a volume equivalent to 2-100-yr storm events back to back.

During construction the runoff developed will be controlled as required by the Township and the County. The first construction activity on site will be to install the soil erosion and sedimentation control measures that will be depicted on the plans approved by the Township. The retention pond will be reshaped as the second item of construction and storm water directed to the area. Upon completion of the construction, the ponds and storm system will be cleaned, and vegetation established. Once the vegetation is established, the SESC measure will be removed.

As noted the site will be served with public water and sanitary service. Connection to those services will be on site. Calculations for use will be provided as part of the engineering/construction document submittal in accordance with the requirements of the Township. Franchise utilities serving the site will include: gas, electric, phone and data.

18.07.08 Storage and Handling of any Hazardous Materials

No hazardous materials are expected to be on site.

18.07.09 Traffic Impact Study

With the proposed low impact development and low trip generation for this type of use, the proposed project falls below the threshold for peak hour usage and below the threshold for a traffic impact study.

18.07.10 Historic and Cultural Resources

This project does not involve the alteration or demolition of historic structures.

18.07.11 Special Provisions

There are no deed restrictions or protective covenants on this property.

TOWNSHIP OF GENOA
PLANNED INDUSTRIAL DISTRICT AGREEMENT
FOR
BIRKENSTOCK SELF-STORAGE

THIS AGREEMENT is made as of the ___ day of _____, 2019, by and between the Genoa Charter Township, Livingston County, Michigan, (hereinafter called the "Township"), the offices of which are located at 2911 Dorr Road, Brighton, Michigan 48116 and Birkenstock Self-Storage, LLC, a Michigan limited liability company (hereinafter referred to as "Developer"), the address of which is 2528 Harte Drive, Brighton, Michigan 48114.

W I T N E S S E T H :

WHEREAS, Developer is the owner and developer of certain land located in the Township of Genoa, County of Livingston, State of Michigan, more particularly described on Exhibit A hereto and incorporated herein by reference (sometimes hereinafter referred to as the "Property"); and

WHEREAS, Developer desires to develop the Property as a climate controlled storage facility and sales office under a comprehensive development plan as a planned industrial district ("PID" or "Planned Industrial District") to be known as "Birkenstock Self-Storage"; and

WHEREAS, the Township's Planning Commission, after giving proper notice, held a public hearing on _____ , 2019, at which Developer's Application for a PID ("Application"), Conceptual PID Site Plan, Impact Statement and this PID Agreement was considered, comments and recommendations of the public were heard, and the Planning Commission recommendations were made to the Township Board; and

WHEREAS, on_____ , 2019, the Township Board reviewed the Application, Conceptual PID Site Plan, Impact Statement and this PID Agreement and made recommendations to Developer concerning the proposed development; and

WHEREAS, on _____ , 2019, Developer submitted to the Planning Commission an Application for Final Approval of the PID ("Final Application"), pursuant to the provisions of Article 10 of the Township's Zoning Ordinance ("Zoning Ordinance")' and

WHEREAS, the Planning Commission, after giving proper notice, held a public hearing on_____, 2019, as required by P.A. 184 of 1983, as amended, at which the Final Application was considered, comments and recommendations of the public were heard, and recommendations were made by the Planning Commission to the Township Board concerning the Final Application; and

WHEREAS, the uses permitted within a PID include uses permitted in the Industrial and Office-Service Districts and include a climate controlled storage facility and sales office; and

WHEREAS, the Township Planning Commission and the Township Board have reviewed the Final Site Development Plan, attached hereto as Exhibit B, and have approved the Final Site Development plan as to: (1) total acreage under consideration for the Planned Industrial District; (2) the general location and acreage therein for the proposed use in the specified zoning district (being climate controlled storage facility and sales office); and (3) the general site layout and infrastructure improvements; and

WHEREAS, the approved Final Site Development Plan for the PID is consistent with the purposes and objectives of the Township; and further, is consistent with the Township's Zoning Ordinance pertaining to permitted land uses, the intensity of such uses, site access and storm water management; and

WHEREAS, Developer has made its application for final approval of the PID to the Township Board pursuant to and in accordance with the provisions of Article 10 of the Township's zoning ordinance; and

WHEREAS, at a regular public meeting of the Township Board on _____ 2019, the Township Board approved the Final Application submitted by the Developer and rezoned the property to a PID Zoning District; and

WHEREAS, the Township's Zoning Ordinance requires the execution of a Planned Industrial District Agreement in connection with the approval of a PID which Agreement shall be binding on the Township and the Developer;

NOW, THEREFORE, the Developer and the Township, in consideration of the mutual covenants of the parties described herein, and with the express understanding that this Agreement (sometimes hereinafter and in other documents related to the proposed development as the "PID Agreement") contains important and essential terms as part of Final Approval of the Final Application, agree as follows:

I. GENERAL TERMS OF AGREEMENT

A. Township and Developer acknowledge and represent that the foregoing recitals are true and accurate and binding on the respective parties.

B. Township acknowledges and represents that the Property has been rezoned to a PID Zoning District. However, notwithstanding the approval of the PID rezoning and the approval of the proposed use of the Property herein as a climate controlled storage facility

with sales office, the following uses shall not be permitted on the Property: Conference centers; Funeral home or mortuary; Dry cleaning drop-off stations with drive-through service; Restaurants, taverns, bars, delicatessen, food carryout, coffee shops, and similar establishments serving food or beverages; Adult day care facilities; Banks, credit unions, savings and loan establishments and similar financial institutions; Hospitals; Medical urgent care facilities, medical centers and clinics; Veterinary hospitals; Veterinary clinics without boarding or overnight care; Dormitories or student apartments accessory to a college; Automotive assembly or manufacturing; Bottling and packaging except canning; Breweries, distilleries and wineries; Cement, concrete, gypsum, plaster and nonmetallic mineral products manufacturing; Cement and concrete product or ready-mix operations; Chemicals and allied products manufacturing; Extractive uses, such as sand and gravel mining; Food processing including canning, meat and dairy products processing; Foundry, smelting or refining of metals or ores, wrought iron, annealing or heat treating plants; Landfills; Lumber mills; Paper and allied products manufacturing; Petroleum refineries or storage facilities; Plastics manufacturing, molding and extrusion; Salvage yard or junk yard; Truck terminals; Any manufacturing use involving wet processes or the use of water in processing; Adult regulated uses; Central dry cleaning plants; Electric power stations and heating plants; and Accessory fuel storage or use of hazardous materials.

C. The PID shown and described in Exhibit A (legal description of the PID Site) and the Final Site Development Plan referenced herein as Exhibit B (and specifically captioned as "Construction Drawings for Birkenstock Self-Storage" consisting of Sheets C-1 through C-__, both inclusive, and Sheet ___) is hereby approved in accordance with the authority granted to and vested in the Township under and pursuant to Act 110 of 2006, being the Michigan Zoning Enabling Act, MCL 125.3101, et seq., and Act 33 of 2008, being the Michigan Planning Act, MCL 125.3801, et seq.; and in accordance with the Zoning Ordinance of Genoa Charter Township, enacted October 7, 1991, as amended, except as modified herein; subject to the terms of this Agreement and in compliance with Exhibit B, and all provisions of the Township Zoning Ordinance pertaining thereto (collectively referred to herein as the "Applicable Regulations"), according to the terms thereof as of the date of approval of the PID.

D. The Approved Plan for the PID ("Approved Plan") includes Exhibit A and Exhibit B. The Approved Plan was formulated by the Developer and approved by the Township based upon the material terms of the Impact Statement and Application materials, which were presented to the Township by the Developer.

E. The Developer and the Township acknowledge that the Approved Plan takes precedence over the terms of the foregoing documents.

E. Developer and Township acknowledge and agree that rezoning to PID of the Property described in Exhibit A constitutes approval of Exhibit B as it sets forth the general configuration of permitted land uses. Site plan review for the PID described in Exhibits A and B are not subject to any subsequent enactments or amendments to the Zoning ordinance or the Applicable Regulations and will be reviewed and approved in light of this Agreement including Exhibit B hereto, the Zoning Ordinance and Applicable Regulations as they exist at the date of this

Agreement. Developer shall comply with Article 13 of the Zoning Ordinance, as modified herein and as may be otherwise required, with respect to any site plan approved by Township at Developer's request. Any subsequent zoning action by the Township shall be in accordance with applicable constitutional law, the Michigan Zoning Enabling Act and the Zoning Ordinance.

F. The approval of the PID described herein and in Exhibit B, and the terms, provisions and conditions of this Agreement are and shall be deemed to be of benefit to the Property described on Exhibit A and shall run with and bind such Property and shall bind and inure to the benefit of the parties hereto and their successors and assigns.

II. SPECIFIC TERMS OF AGREEMENT REGARDING LAND USE AND LAND DEVELOPMENT

A. In all districts designated for planned industrial development, the permitted principal uses shall be consistent with Article 10 of the Genoa Township Zoning Ordinance, and Section 10.03.02 specifically, except as otherwise modified and approved herein.

B. Developer represents that it intends to develop the parcel of Property identified in the Final Site Development Plan as a climate controlled storage facility with sales office. The Final Site Development Plan (Exhibit B), including the exterior design, shall be constructed in a manner consistent with a commercial sales office, using a flat roof design, high quality building materials, commercial window patterns and site improvements consistent with the surrounding uses and aesthetic features both on and off site. A 20' landscape buffer, with existing trees, will be installed to screen the existing MHP – Manufactured Housing District use on the east, west and south sides of the property.

C. Developer shall be permitted to deviate from the specific requirements set forth in Article 12, Site Development Regulations, concerning Industrial District (IND) Exterior Building Wall Materials, and the Township hereby approves a variance from Sec. 12.01.03 for the minimum exterior building material percentage of brick on walls exposed to a public street, which shall be consistent with the brick, metal siding, composite siding and metal canopy percentages set forth in the Front Side Elevation (North) set forth in the submitted Architectural Design Package, Sheet 3 of 4, of the Final Site Development Plan as prepared by Fusco, Shaffer & Pappas, Inc.

F. In accordance with Article 10 of the Genoa Township Zoning Ordinance, the Genoa Township Planning Commission on _____ , 2019 has determined that the proposed PID, as presented, may provide community benefits, including but not limited to, a means of secondary access to the adjacent Community Bible Church property and a safe route of pedestrian travel from the adjacent manufactured housing community to the designated public school bus stop at Grand River.

G. The storm water retention/detention system for the PUD shall meet the requirements of the Livingston County Drain Commission and all applicable laws and regulations.

H. All utilities required in connection with the development of Birkenstock Self-Storage shall be installed underground.

III. MISCELLANEOUS TERMS OF THIS AGREEMENT

A. Any violation of the terms of this Agreement shall be a violation of the Zoning Ordinance. The remedies of Township for a violation shall be such remedies as are provided by and for violation of the Zoning Ordinance.

B. The parties hereto make this Agreement on behalf of themselves, their successors and assigns and the signers hereby warrant that they have the authority and capacity to make this contract. All references to Developer herein shall include any successor to the Developer who or which may act as Developer of the Property or any part thereof. So long as Developer shall not violate any of the terms of this Agreement, it shall be relieved of further responsibilities hereunder upon conveyance by it of the Property or any part thereof to a successor developer. This Agreement shall be recorded with the Livingston County Register of Deeds and the benefits and burdens set forth herein shall run with the Property described in Exhibit A.

C. This Agreement may be amended only by a written instrument executed and recorded by the parties hereto and their successors and assigns.

D. This Agreement may be executed in counterparts, each and all of which together shall constitute one and the same document.

IN WITNESS WHEREOF, the parties hereto have set their hands as of the date set forth at the outset of this Agreement.

TOWNSHIP OF GENOA,
a Michigan municipal corporation

By: _____
Supervisor

And

By: _____
Clerk

STATE OF MICHIGAN)
)SS.
COUNTY OF LIVINGSTON)

The foregoing Planned Unit Development Agreement was acknowledged before me this ___day of _____, 2019, by_____ and _____ , the Supervisor and Clerk respectively of the Genoa Charter Township, a Michigan municipal corporation, on behalf of the corporation.

_____
Notary Public,
Livingston County, Michigan
My Commission expires:

BIRKENSTOCK SELF-STORAGE, LLC,
a Michigan limited liability company

_____
By: James Harte
Its: Managing Member

STATE OF MICHIGAN)
)SS
COUNTY OF LIVINGSTON)

The foregoing Planned Unit Development Agreement was acknowledged before me this day of _____, 2019, by James Harte, Managing Member of Birkenstock Self-Storage, LLC, a Michigan limited liability company, on behalf of the limited liability company.

_____
Notary Public,
Livingston County, Michigan
My Commission expires:

This Instrument Drafted By:

Roger L. Myers
MYERS & MYERS, PLLC
915 N. Michigan Ave.
Howell, Michigan 48843

When recorded return to Drafter

CUTTINGEDGE
SELF STORAGE DEVELOPMENT

FEASIBILITY STUDY

Client: James Harte, Birkenstock Enterprises
Project: RV Storage Feasibility: Brighton, MI
Date: September 2018
Prepared By: **Andrew S. Ross**

Cutting Edge Self Storage Development
866-970-3343
www.selfstoragefeasibility.net/

CUTTINGEDGE
SELF STORAGE DEVELOPMENT

1. Self Storage Concept
2. Comments and Conclusions
3. Competition / Market Information
4. Target Area Supply and Demand
5. Unit Mix / Site Construction
6. 5 Year Recap, Entrepreneurial Profit
7. Explanation For Projections / Projections
8. Demographics
9. Articles
10. Partners Information

1

THE SELF-STORAGE CONCEPT

THE SELF-STORAGE CONCEPT

The self-Storage industry had its beginnings in Texas in 1954 and since the early 1970's the concept of storage as a true business began to emerge and it started to become a viable, worldwide business. Simply stated, the concept of self-Storage provides an attractive solution to the growing need for temporary additional space for the residential market and for both small and large businesses.

In the past, self-storage was most often thought of as an option for industrial businesses only. Today, self-storage is actually utilized more for retail or residential use, and is more accurately considered as a retail business. Why many assume that the daily management of a self storage facility is simple and the business itself a simple concept, it is also an industry full of unique nuances and how they are handled separate those facilities that are undermanaged and underperforming from those at the top of the industry that are well managed and highly profitable. It is understood industry-wide that today's self storage managers must be skilled professionals; gone is the caretaker role of the past. This type of manager has gone the way of first-generation facilities that served as a placeholder until the land could be used for some higher purpose. Additional income is generated at self-storage facilities by offering climate-controlled units, temperature-controlled units, tenants insurance, PO Boxes, locks and shipping boxes and packing supplies.

As with most commercial real estate, selecting the right location for a self-storage facility is very important. Choosing a self-storage site on a major arterial is beneficial to both residents and businesses in the immediate

neighborhood. High visibility to drive-by traffic also contributes significantly to the success of a self-storage facility with drive-by still being the number one reason people state as how they found a facility is Internet now being a close second.

Self-storage has proven to be a sound investment. There are approximately 41,000 self-storage facilities in the United States that are considered a Class C facility or better. Of these, only 14.96% are owned by the top ten operators in the nation. This lack of consolidation is one of the principal reasons the self-storage industry has become one of the most viable options of real estate investment.

Investors have been drawn to the self storage business because as a rule, consumers are willing to pay about as much on a per-square foot basis for self-storage as they pay for a rental apartment, according to Ryan Burke, an analyst with Green Street Advisors. At the same time, self-storage facilities are relatively cheap to build, ranging from roughly $40 to $45 a square foot for a one-story facility and from $50 to $65 a square foot for a multistory facility, according to Mako Steel, an engineering firm that specializes in self-storage. By contrast, apartments can cost between $170 a square foot for a simple garden apartments in inexpensive cities to more than $1,000 a square foot for high-rises in pricier cities, according to Alexander Goldfarb, an analyst at Sandler O'Neil l+ Partners LP.

A recent nationwide survey amply demonstrated how popular self-storage has become. The survey reported that 10% of the population is currently using some kind of self-storage, 22% have recently used self-storage, and another 15% have used self-storage at some time in the past. An additional 51% of the population is aware of what self-storage is, but has not yet had reason to use it. Only 3% of the survey did not know what self-storage was.

An article that appeared in a recent edition of the Storage Fact Book said that, "The Holy Grail of investments is their potential return. Sophisticated investors understand value is based not only on the *current cash flow* of a property, but also on its *future* or *residual value* when sold. Obviously, the returns in both categories must be measured against the actual investment made in the property.

"The best measure of total return is the overall capitalization rate (OCR) that is applied to properties recently sold in the marketplace. This number reflects the total annual return expected by the buyer when purchasing a property. The OCR encompasses both the *expected current return* plus the *residual value* of the property.

ADVANTAGES OF SELF-STORAGE

- Inherent with almost any other type of real estate investment, long-term leases carefully govern how rental rates can be increased over a given three to ten year period. With self-storage, however, tenants normally have a month-to-month lease which allows the landlord to increase (adjust?) rents more consistently with market trends instead of having to wait for long-term leases to expire.
- The average stay for self-storage tenants is 12.7 months for residential tenants and 21.7 months for commercial tenants. The rent roll of a self-storage facility turns over by an average of approximately 9%+per month. This turnover rate makes it easier for self-storage operators to react quickly to fluctuations in market conditions. This flexibility allows self-storage operators to easily adjust rental rates to new tenants when they move in and to raise rates to existing tenants every six to twelve months.
- Unlike office, retail, or multi-family real estate properties, a significant transaction for self-storage facility in a typical market usually does not exceed $6 to $7 million, with land cost a typical facility is averaging approximately $4.5 million. This relatively small investment in a single asset makes self-storage extremely attractive to investors. They are able to spread their risk across a market in several properties rather than having all their risk associated with a single asset.
- Operating expenses in self-storage are easily managed. Real estate taxes usually comprise 15 to 20 per cent of the total expenses. Payroll, the largest single expense item, averages between 25 and 30 percent of the total expenses not including property taxes. The remaining expenses are spread over management fees, utilities, advertising, insurance premiums,

costs for repairs and maintenance and miscellaneous office expense. As long as real estate taxes and payroll costs are carefully managed, the impact of an increase over budgeted levels in one or two of the other expense categories would be minimal.

- Self-storage is counter-cyclical. In times of slow economic growth, both business and residential tenants tend to downsize, but self-storage business tends to remain constant because tenants will use their self-storage units to store inventories, furniture and personal goods. During periods of strong economic growth, tenants will characteristically increase inventories, move into or build larger homes and offices and utilize their self-storage space during this transition. Tenants will often rent on a permanent basis an extra unit for storage of inventory items or household goods such as holiday decorations and other seasonal, bulky possessions.

2

COMMENTS & CONCLUSIONS

BRIGHTON, MI

COMMENTS AND CONCLUSIONS

We propose to develop in 2 phases a “state-of-the-art” self-storage facility totaling 45,600 net rentable square feet on approximate 3 of the 10.5 acres, located in Brighton, MI based on the following.

DEMOGRAPHIC INFORMATION

1. There is currently a higher demand than supply for storage if using the “target area” which has been determined to be a 5
2. -mile radius.

3. In the “target” area the average household income is excellent at $121,155 while the national average is $86,278 which means when this property increases rates it will have a minimal impact to the occupancy. The current “Self-Storage Demand stated that renter’s income were as follows; 17% over $125,000, 10% $100,000 to $125,000 and 13% $75,000 to $100,000, 9% $60,000 to $75,000, 7% $50,000 to $60,000, 10% $40,000 to $50,000, 8% $30,000 to $40,000, 13% $20,000 to $30,000 and 13% less than $20,000.

4. The % of renters spending $150 or more per month on storage has increased 8% since 2013.

5. The area's population in 2018 is 56,988 which was an increase of 5.41% from 2010 and is projected to increase another 2.55% in the next five years. The census bureau estimates nation growth of only 3.5% over the next five years.

6. Consumer self-storage penetration has increased since 2013 but has still not reached its 2007 level. However, due to population growth, the number of households renting self-storage units is at an all-time high of nearly 12 million. This is about 1.8 million more households than in 2005.

7. This is an area where the average household size of 2.56 people. Keep this in mind when building the apartment.

CONSTRUCTION INFORMATION

8. We propose to build Phase 1 on 3 acres and include the office and apartment with this phase.

9. We proposed to build Phase 2 on 2 additional acres.

10. We suggest building the rows of storage units parallel to the longest side of the building. This allows for more square footage and if the rows are perpendicular to the office gives the manager a view of every unit by walking down one side.

11. To stop water flow under the doors you should slope floors and have a 1 ½ inch step up into each unit.

12. You may want to consider moveable partitions to allow changing the unit mix for the demand.

13. When selecting latches for the doors, the optimum choice would be the use of cylinder locks as they enhance the look of the facility and requires that the tenant purchase a lock from you. You must train the manager on the benefits of the cylinder lock over the traditional lock to make this a success.

14. The unit mix is designed to include an average number of sizes since too many sizes tend to confuse the customer, clutter your layout and increase the complexity of construction.

15. In addition to an electronic gate install a monitored video surveillance system and door alarms. By having the bells and whistles it makes the property more desirable when selling if this becomes your exit strategy.

16. If you choose to install door alarms, it is much less expensive and simpler to do during construction rather than trying to retrofit them later.

17. When installing the key pad, it should be located with enough room to allow 3 cars bumper to bumper to line up. Also, it should be accessible from the vehicle window incase of inclimate weather.

18. Make sure the facility has bright security lighting on the grounds, so tenants feel safe at night.

19. Install timers or motion sensors in all hallways and any units with lighting. This will reduce the utilities expenses and will discourage tenants from trying to install their own outlets in the units.

20. It is recommended to install asphalt driveways instead of concrete. Concrete is approximately 500% higher in cost. Also repairs on concrete, which will crack are much more expensive than asphalt.

21. The property will need to be constructed and operated in such a manner as to attract its successful share of the market, and probably capture and maintain a substantial portion of it's inferior competitions market share.

22. At the end of the buildings most fire departments require a 35' inside turning radius and a 55' outside turning radius.

23. Remember to install bollards at the corners of the building and around the touch pads for the gate. This will reduce the damage caused by vehicles running into your buildings or gate equipment.

24. If using a metal building you might want to consider using split brick on the outside and metal partitions for the inside. It is my understanding that the REITS and companies like Extra Space Storage consider this type of construction superior and will offer a better price. This is important if selling is part of your exit strategy. Remember to have the roofs insulated on the inside, as the metal building tends to sweat when the temperature changes.

25. Where zoning will allow use some type of a reader board on your sign. This provides space for posting specials along with changing the message weekly and keeps people looking at your facility.

26. 50% of current renter are renting drive up storage units, however this number has decreased 7% since 2013.

27. In this area because of the humidity you will need to use a central air conditioner to cool the air and keep the humidity down.

28. For every 1,200 to 1,500 square feet you will need a 1-ton air conditioning unit.

29. If you do build an on-site apartment, build it above the office this allows them to separate the office time from home time as access to the apartment is limited. If you connect the apartment to the office on the same level, managers tend to go in their apartment during office hours to watch TV, do laundry and cook among other things.

30. When planning the layout for the temperature-controlled building larger units should be built close to the access doors making it easier for people to move into them.

31. Installing panic alarm buttons in the temperature-controlled area gives your customer peace of mind. These areas are typically long, dim hallways that are usually vacant and may make your customers feel vulnerable. By installing alarm buttons, music, using white doors and panels along with good lighting in these areas you make the temperature-controlled building more inviting. Surveys by the storage industry show that after the initial move in, women are typically the ones who visit the facility. The more comfortable you make them the longer they will stay and less likely they are to move based solely on price.

32. When the humidity rises to 90% or above items stored in traditional storage units can become damaged, therefore we recommend building some temperature-controlled units. Keep the temperature-controlled units above 60 degrees and not over 85 degrees.

MISCELLANEOUS

33. Nationally even with the additional square footage being added to the self storage market nationally in 2005 the average occupancy was 83.0% and in 2015 the average was 90.2%.

34. Currently the REITS account for 18% of all storage facilities in the U.S., the other top operators accounting for an additional 8% leaving 74% for the rest of the self-storage product.

35. Printed materials for direct mailers along with coupons should be made available and widely distributed before Grand Opening to maximize rent up. The cost for this initial marketing campaign is not in the budget. The line item for direct mail is for the mailing lists and postage to be used during the rent-up process.

36. You will want to use at least the amount of money each month that is outlined in the marketing budget. A facility will need additional marketing up front to produce a faster rent up. Keep in mind the average stay in storage is 12.7-21.7 months with the average number of move outs being approximately 10% of what the facility starts the month occupied with. This means the faster you can rent up before experiencing high move outs the faster the facility will obtain maturity.

37. It is very important to have a good web site. in 2007 the number of customers who said they found a facility was less than 1% and in 2015 that number had risen to 23% nearly one-fourth of all customers and is second only to drive by with 32% of new customers.

38. According to the "Self-Storage Demand Study" approximately 10% of the current population is using storage, 22% have used storage in the past 5 years and 15% have used storage more than 5 years ago. This means 47% of current U.S. households have some self-storage experience or which only 3% of ex renters say they would never rent again under any circumstances.

39. Having the apartment above the office allows you to place signage up higher on the wall and provides you with additional visibility for the facility.

40. On the "Entrepreneurial Report" based on an 7% cap rate the "Entrepreneurial Profit" is 43% or $1,717,740 after the 3rd year of operation. If this property was being appraised or sold in today's market it would demand a 5 cap and would have a 100% profit or $4,012,551.

41. Built into the projection cost is "Lease Up" interest to help the property cover the mortgage until the facility reaches maturity.

42. This property will break even and cover the debt service on phase 1 at 92% occupied and should be achieved by approximately the 7th month of operation. However once Phase 2 is built the property break even at 72% an should be achieved by approximately the 28th month of operation.

43. You should implement a program to accept credit cards along with monthly auto payment option for your tenants. Those tenants who automatically have their monthly payment charged to their credit cards stay longer. This is very useful because a substantial amount of your tenants will not live locally. The "Self-Storage Demand Study" states the means of payment as; 36% check or money order, 35% credit or debit card, 14% cash and 15% on-line or automatic deduction.

44. You should offer insurance programs for added peace-of-mind for prospective tenants.

45. Offering boxes and other packing materials can increase your monthly profit and provide another valuable service to your customers.

46. Retiring "baby boomers" tend to remain consumers who do not easily dispose of possessions; this increases the demand for self-storage.

47. The key to pricing is to have desirable pricing along with a move in special without driving the entire market pricing down.

48. The pricing has been based very conservatively and includes offering a move in special of ½ off the first month.

MANAGEMENT

49. In my experience it is easier to find managers when you have an on-site apartment. Most managers realize this is a great benefit if the apartment is built correctly. There is no commute time to work and they don't have to worry about paying rent or utilities. You can also typically hire a couple for little more than the cost for one full-time off-site manager. With two people the phone should always be answered instead of going to an answering machine. One person can show a unit and clean while one answers the phone. Normally $12 to $15 per hour per person is needed for a couple that lives on site.

50. Bear in mind that answering the phone is very important. Usually if a customer is calling for prices and they get an answering machine they will hang up and call the next number in the phone book. Most of the messages received are from current tenants. With the average stay in 2015 being 12.7 months and your average price per unit is $172.40. This means each missed phone call could cost you $2,189.48.

51. You need a good off site and on-site management team. Except for pricing which accounted for 83% of new rentals along with availability 69%, Location 34%, hours of operation 30%, Management/Features was the second reason someone stored at 26%.

52. It is VERY important to train the managers on the benefits of temperature-controlled storage.

53. Based on the good growth trends, high occupancy rates of the competition in the target area, the fact this facility should be built as a superior product compared to its competition and the fact the excess demand in this target area is 325,368 using the Michigan supply number and 321,948 using the US supply number of additional square feet needed as seen on the Demand calculations in section 4 of this report It is my belief that this location would be great for self-storage. The area should be able to support the addition of 45,600 square feet of storage.

54. This location is rated as a B+ to an A- with an excellent possibility of success.

55. I, Stephan Ross believe the proposed market area will support another self-storage facility. I believe by using the entire amount allocated for marketing, having the managers trained and promotional materials available for the Grand Opening along with utilizing the recommended move-in special, that the rent-up period for this location will be 31 months to reach 90% to 90% overall occupancy being built in 2 phases at which point the debt service coverage ratio will be a 1.31.

3

COMPETITION/ MARKET INFORMATION

COMPETITION

GENERAL

The population density in the target area determines how much square footage a market area needs,. How many competitors and how much square footage is already available, the class of competition in the area and the overall occupancies in the target area help determine what will be the impact of the subject facility being built in this market.

The success of a self-storage facility is based on the following factors: location (demographics and traffic count), visibility, management, security, and accessibility, curb appeal, appearance and building structure. A lacking in one area can be offset by strength in other areas. However, if there are weaknesses in a number of the factors or if the facility does not compare well with the competition, the project will be forced to use price as the main competing factor, thus potentially reducing the success of the facility. Bear in mind that having the highest count in one area does not always produce the optimum result, such as a traffic count at highway usage levels, of over 60,000 cars per day past the main entrance of a facility, particularly at high speeds, can actually discourage business. Most successful self-storage facilities are in areas either growing or stable economically and demographically. If you do not pick a stable area, you could have a lot of problems.

Also taken into consideration to determine the major competitors are any market barriers such as freeways, lakes, rivers, large open areas (airports, large recreation areas, landfills, etc), railways and any other hindrance that make the facility hard to reach or separates one facility from another by segregating their market area. The biggest barrier is if a property needs to be rezoned for any reason but if you take the time and get a property rezoned the probability of another competitor being built in your area is substantially less.

A personal visit and telephone call is made to each of the competitors being evaluated as having an impact on the proposed facility. The visit is to gather information on pricing, occupancy, unit mix (if possible), square footage available, security, and appearance of facility and to evaluate the managers. The telephone calls are used to evaluate the managers in their telephone techniques, which are critical to the success of a self-storage facility.

SPECIFICS

The following tables compare the major competitors on the major criteria for a successful self-storage facility. The scores are graded 1-10 with 10 being excellent. A table can be seen in this section.

MARKETING ATTRIBUTES

VISIBILITY

It is important that the facility can be seen from a high daily traffic count. The facility should be laid out so that it is recognizable as self-storage. Signage should be places so as to be visible to the highest possible traffic count and clearly state that it is a self-storage facility.

TRAFFIC COUNT

A high traffic count is repetitive advertisement to the potential customers in your target area. When the need arises they will likely seek information from a location with which they are familiar, especially if it is within a close proximity of their residence or business. This is rated as a "type" of artery i.e. surface street, main artery, highway, not by actual traffic count.

MANAGEMENT

There are several levels of management in self-storage. On site managers are preferable and a professional property management company can provide optimal performance. There are professional property management companies, which specialize in self-storage facilities. Aggressiveness of manager to close a sale is also important.

DEMOGRAPHICS

When selling a service to people, you have to be where the people are. Being centrally located in a high-density population area reduces the distance from your customers. This makes your potential tenants easier to reach, reducing advertising and marketing costs. It is also important that there is a good mix of multi-family residences, commercial business and single family homes.

SECURITY

People want to know that their goods will be safe while stored at your facility. They also want to feel secure while they are at your facility. The objective of your security system should be that only tenants can access your facility and that the managers know who is in the facility at all times. The managers should be required to make timely rounds through their facility. The facility should be well lighted inside and out.

ACCESSIBILITY

The facility should be designed for and located in a position along the street to give easy ingress and egress. It should be in a location that will be easy to reach for your perspective tenants. Also it should be easy to give tenants directions to the facility.

CURB APPEARANCE

Good design, landscaping, color combinations, cleanliness and maintenance of the grounds contribute to the general overall appearance of your facility. A well maintained facility gives the tenant a feeling of security and peace of mind that their goods will be kept in a clean safe manner, perceived to be professional and competent.

CLASS GRADE

Is the property a grade A,B,C or less? Potential customers feel good about buildings that look safe, secure and well maintained. People tend to believe that buildings with concrete are more secure than metal buildings, and that metal buildings are more secure than wooden buildings, even though locks, latches and doors are identical.

DO NOT USE CLASS "D" OR LOWER AS COMPETITION:

- **Class "A" EXCELLENT: These properties feature an above-average design and construction quality. Offer a retail area and have a security system along with computerized access. These sites typically have an on-site manager. Newer construction and well maintained with no deferred maintenance. These are clean and appealing. These also command a higher rental rate and have a superior location in terms of desirability or accessibility. Might have a high barrier to enter the market. Minimum size approximately 75,000 square feet.**

- **Class "B" GOOD: These properties usually have an adequate design and construction quality. Typically have no security but do have a computerized access along with an on-site manager. These properties have aging improvements but are well maintained and clean. These sites typically command average rental rates and are generally well maintained and desirable to most tenants. Minimum size of approximately 40,000 square feet.**

- **Class "C" AVERAGE: These properties offer adequate functionality but few amenities. The physical condition is acceptable but may have some deferred maintenance. Generally managed by the owner and may not have an on site office. These sites typically command below average rental rates and are in a less desirable location. Typically, inconsistent occupancy rates.**

SITE: BRIGHTON, MI **Date: AUGUST 2018**

COMPETITION COMPARISON PHASE 1 & 2

Site Name	Proposed	Best Storage	My Space	Cedar Closet	U-Store	
Address	2528 Harte Dr.	7286 W Grand River Ave	306 N 4th St	5670 E Grand River Ave	5850 Whitmore Lake Rd	
City	Brighton	Brighton	Brighton	Brighton	Brighton	
Phone Number		810.227.7050	844.611.1069	810.225.8510		
Approx.Current Occupancy		92+%	99+%	99+%	92%	
Approx. Rentable Sq. Feet	45,600	57,929	14,595	36,800	80,000	
Approx. Number of Units	332	550	135	350	800	
Heated or CC Units	Yes	No	Yes	No	No	
Class of Facility (A,B or C)	A	B	B-	B+	B-	
Approx. Distance (In Miles)		2.2	2.75	3.65	4.26	
Merchandise Area	Yes	No	Yes	Yes	No	
Multi-Story	No	No	Yes	No	No	
Resident Manager	Yes	No	Yes	Yes	No	
Computerized Access	Yes	No	Yes	Yes	No	
Fenced / Walled Permiter	Yes	Yes	Yes	Yes	Yes	
Cameras	Yes	Yes	Yes	Yes	No	
Door Alarms	Yes	No	No	No	No	
Truck Rentals	Yes	No	No	Yes	Yes	
Large Truck Access	Yes	No	Yes	Yes	Yes	
# Lanes of Traffic	4	4	2	4	2	
Access both directions	RIRO	Yes	Yes	Yes	Yes	
Visible 2 arteries	No	Yes	No	No	No	
Construction Material	Metal	Metal	Brick	Brick	Metal	
Access Hours (typical storage)	24 available	6:00-9:00	N/A	Same as the Office	6:00-10:00	
Access Hours (temperature controlled)	24 available	N/A	6:00-10:00	N/A	N/A	
Office Hours (M-F)	9:00-6:00	9:00-5:00	9:30-5:30	8:30-4:00	9:30-6:00	
Office Hours (Sat.)	9:00-6:00	9:00-12:00	9:30-5:30	8:30-12:00	8:30-5:00	
Office Hours (Sun.)	Closed	Closed	Closed	8:30-12:00	Closed	
Administrative Fee $	10	$0.00	$0.00	$14.00	$0.00	
Deposit $	0	$0.00	1 month	1 month	$0.00	
Require Insurance	Yes	No	No	Yes	Yes	
Pro Rate 1st Mth Rent	No	No	No	No	No	

PROPOSED PROPERTY ACCESS

PROPOSED

2528 Harte Dr
Brighton, MI

Visibility	10
Traffic Count	5
Management	10
Demographics	8
Security	10
Accessibility	10
Curb Appeal	10
Class Grade	10
Overall Average	**9.125**

Additional Information

Merchandise Area	Yes
Temperature Control Available	Yes
Drive Surface	Asphalt
Multi Story	No
Room For Expansion	No
Plans For Expansion	No

CUTTING EDGE
SELF STORAGE MANAGEMENT

BEST STORAGE

7286 Grand River Ave
Brighton, MI

Visibility	10
Traffic Count	7
Management	8
Demographics	8
Security	6.5
Accessibility	8
Curb Appeal	8
Class Grade	6
Overall Average	**7.6875**

Additional Information

Merchandise Area	No
Temperature Control Available	No
Drive Surface	Asphalt
Multi Story	No
Room For Expansion	No
Plans For Expansion	No

CUTTING EDGE
SELF STORAGE MANAGEMENT

MY SPACE

306 N 4th St
Brighton, MI

Visibility	10
Traffic Count	5
Management	6
Demographics	8
Security	9
Accessibility	8
Curb Appeal	6
Class Grade	5
Overall Average	**7.125**

Additional Information

Merchandise Area	Yes
Temperature Control Available	Yes
Drive Surface	Asphalt
Multi Story	Yes
Room For Expansion	Yes
Plans For Expansion	No

CUTTING EDGE
SELF STORAGE MANAGEMENT

CEDAR STORAGE

5670 E Grand River Ave
Brighton, MI

Visibility	10
Traffic Count	7
Management	10
Demographics	9
Security	9
Accessibility	10
Curb Appeal	8
Class Grade	7
Overall Average	**8.75**

Additional Information

Merchandise Area	Yes
Temperature Control Available	No
Drive Surface	Asphalt
Multi Story	No
Room For Expansion	No
Plans For Expansion	No

CUTTING EDGE
SELF STORAGE MANAGEMENT

U-STORE

5850 Whitmore Lake Rd.
Brighton, MI

Visibility	8
Traffic Count	5
Management	5
Demographics	9
Security	5
Accessibility	9
Curb Appeal	6
Class Grade	5
Overall Average	**6.5**

Additional Information

Merchandise Area	No
Temperature Control Available	No
Drive Surface	Asphalt
Multi Story	No
Room For Expansion	No
Plans For Expansion	No

CUTTING EDGE
SELF STORAGE MANAGEMENT

	COMPARATIVE PRICING ANALYSIS					
	SITE LOCATED: BRIGHTON, MI					
	RECOMMENDED PRICING					
NAME:	**Proposed**	Best Storage	My Space	U-Store	Cedar Closet	
	Facility					
CITY:						
UNIT	**Pricing In 2019**					
SIZES	**$**					
5X5		$45				
5X10		$65		$56		
10X10		$95		$95		
10X15		$105	$117	$127		
10X20		$130		$153	$139	
10X25		$160		$169		
10X30	**$239**	$180		$230		
TEMPERATURE OR CLIMATE						
CONTROLLED		None		None		
5X5	**$69**		$55			
5X10	**$89**		$75 - $80			
5X12			$90			
10X10	**$144**		$130		$139	
10X15	**$184**					
10X20	**$239**				$179	
10X25	**$289**		$240			
10X30						

4

DEMAND

TARGET AREA SUPPLY AND DEMAND

The self-storage industry has had numerous supply and demand studies completed over the past years. Most experienced and successful self storage developers have been able to determine supply and demand factors based on individual population, households, traffic counts, and rent-up history of competitors. Since self storage is a highly localized industry, conditions in the immediate market area surrounding the store can have a major impact on occupancy rates. Factors such as a depressed local economy or the opening of a new storage facility in the area can potentially lead to a decline in occupancy. On the other end of the spectrum, new home developments, an explosion in recruitment at local companies, and other dynamics are often met with sharp increases in occupancy rates.

Using the square feet per capita has become the industry standard to measure self-storage demand. This measurement along with the occupancy levels of a given market allows us to calculate future demand in an area and determine market equilibrium. When the average occupancy is lower than 80% in the market and continuing to drop the area is considered saturated. When average occupancy is in the range of 85% and up and neither increasing or decreasing, the market is at or nearing equilibrium. When the average occupancy is high steadily increasing, the market is considered a demand driven market.

The U.S. average is currently 7.06 square feet according to the 2018, 25th annual Self Storage Almanac.

SITE: BRIGHTON, MI

TARGET AREA DETERMINED TO BE A: 5 MILE RADIUS

DEMAND BASED ON POPULATION ONLY

The population in this area for the year	2018	56,988	Projected For	2023	58,441
The current U.S. supply of storage per person is		7.06			
In 2017 according to the 2018 Self-Storage Almanac the rentable sq. foot per person in the			Michigan	MSA	7.12

MARKET DEMAND
IN 2017

Square Footage using the U.S. I	U.S.	Demand for population is		402,335
Square Footage using the	Michigan	Demand for population is		405,755
Number of business in Target area:		1758		
Number of business renters at 11.1% penetration.			195.138	
Business national average is 2.1 units at 109 square feet average unit size.			44667.09	

Total Square Footage Demand	Michigan	450,422
Total Square Footage Demand	U.S	447,002

ESTIMATED RENTABLE SQUARE FEET OF STORAGE
MARKET SUPPLY

Competition	Square Feet Existing	Miles Away	% in Market	Square Feet In Market	Number Of Units	At % in Market
Best Storage	57,929	2.20	78%	45,185	550	429
My Space	14,595	2.75	73%	10,581	135	98
Cedar Closet	36,800	3.65	64%	23,368	350	222
U-Store	80,000	4.26	57%	45,920	800	459
Total:	189,324			125,054		1,208
Total Supply:				125,054		1,208

EXCESS DEMAND IN MARKET

		In 2018		In 2018
	U.S. Average Using	7.06	Michigan Average Using	7.12
Total Demand in Market		447,002		450,422
Total Supply in Market		125,054		125,054
Excess Demand in Market	Square Feet	321,948	Square Feet	**325,368**

BASED ON POPULATION ONLY

5

UNIT MIX / SITE CONSTRUCTION

BRIGHTON, MICHIGAN
UNIT MIX PRO-FORMA

Unit Sizes	% Of Total Units Built	PHASE 1	# Of Units	Rentable Square Feet	Rent Per Unit	Gross Potential Monthly Rent	Gross Potential Annual Rent	Rent Per Square Foot
5X5T	5%		10	250	**$69.00**	$690	$8,280	$33.12
5X10T	11%		18	900	**$89.00**	$1,602	$19,224	$21.36
10X10T	29%		54	5,400	**$144.00**	$7,776	$93,312	$17.28
10X15T	22%		35	5,250	**$184.00**	$6,440	$77,280	$14.72
10X20T	23%		33	6,600	**$239.00**	$7,887	$94,644	$14.34
10X25T	5%		8	2,000	**$289.00**	$2,312	$27,744	$13.87
10X30	5%		8	2,400	**$239.00**	$1,912	$22,944	$9.56
	100%	**Storage**	**166**	**22,800**		**$28,619**	**$343,428**	$15.06

STORAGE

BRIGHTON, MICHIGAN
UNIT MIX PRO-FORMA

Unit Sizes	% Of Total Units Built	PHASE 2	# Of Units	Rentable Square Feet	Rent Per Unit	Gross Potential Monthly Rent	Gross Potential Annual Rent	Rent Per Square Foot
5X5T	5%		10	250	**$69.00**	$690	$8,280	$33.12
5X10T	11%		18	900	**$89.00**	$1,602	$19,224	$21.36
10X10T	29%		54	5,400	**$144.00**	$7,776	$93,312	$17.28
10X15T	22%		35	5,250	**$184.00**	$6,440	$77,280	$14.72
10X20T	23%		33	6,600	**$239.00**	$7,887	$94,644	$14.34
10X25T	5%		8	2,000	**$289.00**	$2,312	$27,744	$13.87
10X30	5%		8	2,400	**$239.00**	$1,912	$22,944	$9.56
	100%	**Storage**	**166**	**22,800**		**$28,619**	**$343,428**	$15.06

STORAGE

SITE: BRIGHTON, MI

	PHASE 1 TOTAL PROJECT COSTS				Cost Per SF	30,044 % of Total
		Net Square Footage				
	Typical Storage square footage					
	Temperature Controlled square footage	22800				
	Total Net Storage units	22800				
	Office and Apartment	2000				
		24800				
1	**General Conditions**		**$ 48,070**			3.37%
	Direct costs associated with the GC. costs ie, Project manager, project engineer, superintendent, travel, tempory office clean up, job sign, etc.	$ 48,070		$	1.60	
2	**Site work**		**$ 130,691**			9.15%
	Site Work Fencing, Paving, Landscaping Site Fire Water, Utilities	$ 130,691		$	4.35	
3	**Concrete**		**$ 150,220**			10.52%
	Concrete	$ 150,220		$	5.00	
4	**Masonry**		**$ 51,075**			3.58%
	Masonry	$ 51,075		$	1.70	
5	**Steel**		**$ 530,577**			37.15%
	Steel	$ 136,700		$	4.55	
	Building System	$ 393,877		$	13.11	
6	**Rough Carpentry/Millwork**		**$ 9,013**			0.63%
	Framing (wood and Plastics)	$ 9,013		$	0.30	
7	**Thermal & Moisture Protection**		**$ 60,088**			4.21%
	Waterproofing / Insulation	$ 60,088		$	2.00	
8	**Doors & Windows**		**$ 12,018**			0.84%
	Doors & Windows	$ 12,018		$	0.40	
9	**Finishes**		**$ 44,465**			3.11%
	Drywall, Painting, Stucco	$ 44,465		$	1.48	
10	**Specialties**		**$ 3,004**			0.21%
	Equipment	$ 3,004		$	0.10	
11	**Conveying System**		**$ -**			0.00%
	Elevators			$	-	
12	**Mechanical**		**$ 96,330**			6.74%
	Fire Protection, Plumbing & HVAC	$ 96,330		$	3.25	
13	**Electrical**		**$ 99,145**			6.94%
	Electrical	$ 99,145		$	3.30	
14	**Other**		**$ 67,299**			4.71%
	Geotech,Gas	$ 67,299		$	2.24	
15	**Contractor Overhead**		**$ 126,185**			8.84%
	Profit, Insurance, Contingency	$ 126,185		$	4.20	
	SUB TOTAL		**$ 1,428,181**	$	47.54	100.00%
16	**Soft Costs**		**$ 123,180**			

	Permits, inspections, etc.	$	123,180		$	4.10	
17	**Design Agreement**			**$ 84,123**			
	Civil Design & Development Permit Prep	$	84,123		$	2.80	
	Alta Survey & Topo, Final Plat						
	Soils Reports, Landscape Plan						
	Architectural Plans & Elevations						
	Photometric Plans						
	Civil Engineering, Architectural						
	Structural Engineering,						
	Utility Coordination & Oversight						
	HVAC, Plumbing & Electrical Design						
square footage							
or number or units							
18	**Custom Building Costs**			**$ 80,000**			
	Outside Parking Costs	$	-		$	10.00	per sq. ft.
2,000	Office & Apartment EXTRA $40 per foot	$	80,000		$	40.00	per sq. ft.
19	**MISC. COSTS**			**$ 78,057**			
	Office Allowance	$	9,013		$	0.30	
	Gate	$	9,000		$	0.30	
	Sign and or flag pole	$	30,000		$	1.00	
	Security System	$	30,044		$	1.00	
	Development Fee	$	-		$	-	
	TOTAL CONSTRUCTION COSTS			**$ 1,793,541**			
20	**Land Cost (10.5 acres IS $1,200,000)**			**$ 342,857**			\
	using 3 acres so prorated value is $342,857						
21	**Holding Fee**			**$ 53,456**			
	Short Fall During Construction	**$**	**(17,819)**				
	First year short fall	$	(35,637)				
	Second year short fall						
	PROJCET COST			$ 2,189,854			
22	Closing Costs (1 point)			$ 21,899			
	TOTAL PROJECT COST			**$ 2,211,752**			

SITE: BRIGHTON, MI

	PHASE 2 TOTAL PROJECT COSTS					28,044 % of Total
		Net Square Footage			Cost Per SF	
	Typical Storage square footage					
	Temperature Controlled square footage	22800				
	Total Net Storage units	22800				
	Office and Apartment					
		22800				
1	**General Conditions**		**$ 44,870**			3.35%
	Direct costs associated with the GC. costs ie, Project manager, project engineer, superintendent, travel, tempory office clean up, job sign, etc.	$ 44,870		$	1.60	
2	**Site work**		**$ 121,991**			9.11%
	Site Work Fencing, Paving, Landscaping Site Fire Water, Utilities	$ 121,991		$	4.35	
3	**Concrete**		**$ 140,220**			10.47%
	Concrete	$ 140,220		$	5.00	
4	**Masonry**		**$ 47,675**			3.56%
	Masonry	$ 47,675		$	1.70	
5	**Steel**		**$ 495,257**			36.97%
	Steel	$ 127,600		$	4.55	
	Building System	$ 367,657		$	13.11	
6	**Rough Carpentry/Millwork**		**$ 8,413**			0.63%
	Framing (wood and Plastics)	$ 8,413		$	0.30	
7	**Thermal & Moisture Protection**		**$ 56,088**			4.19%
	Waterproofing / Insulation	$ 56,088		$	2.00	
8	**Doors & Windows**		**$ 11,218**			0.84%
	Doors & Windows	$ 11,218		$	0.40	
9	**Finishes**		**$ 41,505**			3.10%
	Drywall, Painting, Stucco	$ 41,505		$	1.48	
10	**Specialties**		**$ 2,804**			0.21%
	Equipment	$ 2,804		$	0.10	
11	**Conveying System**		**$ -**			0.00%
	Elevators			$	-	
12	**Mechanical**		**$ 96,330**			7.19%
	Fire Protection, Plumbing & HVAC	$ 96,330		$	3.25	
13	**Electrical**		**$ 92,545**			6.91%
	Electrical	$ 92,545		$	3.30	
14	**Other**		**$ 62,819**			4.69%
	Geotech,Gas	$ 62,819		$	2.24	
15	**Contractor Overhead**		**$ 117,785**			8.79%
	Profit, Insurance, Contingency	$ 117,785		$	4.20	
	SUB TOTAL		**$ 1,339,521**	$	47.76	100.00%
16	**Soft Costs**		**$ 114,980**			

	Permits, inspections, etc.	$	114,980		$	4.10	
17	**Design Agreement**			**$ 78,523**			
	Civil Design & Development Permit Prep	$	78,523		$	2.80	
	Alta Survey & Topo, Final Plat						
	Soils Reports, Landscape Plan						
	Architectural Plans & Elevations						
	Photometric Plans						
	Civil Engineering, Architectural						
	Structural Engineering,						
	Utility Coordination & Oversight						
	HVAC, Plumbing & Electrical Design						
square footage							
or number or units							
18	**Custom Building Costs**			**$ -**			
	Outside Parking Costs	$	-		$	10.00	per sq. ft.
-	Office & Apartment EXTRA $40 per foot	$	-		$	40.00	per sq. ft.
19	**MISC. COSTS**			**$ 28,044**			
	Office Allowance	$	-				
	Gate						
	Sign and or flag pole						
	Security System	$	28,044		$	1.00	
	Development Fee	$	-		$	-	
	TOTAL CONSTRUCTION COSTS			**$ 1,561,068**			
20	**Land Cost (10.5 acres IS $1,200,000)**			**$ 228,571**			\
	2 ADDITIONAL ACRES						
21	**Holding Fee**			**$ -**			
	Short Fall During Construction	**$**	**-**				
	First year short fall						
	Second year short fall						
	PROJCET COST			$ 1,789,639			
22	Closing Costs (1 point)			$ 17,896			
	TOTAL PROJECT COST			**$ 1,807,536**			

6

5 YEAR VALUATION / ENTREPRENEURIAL PROFIT

BRIGHTON, MI

5 YEAR RECAP WITH VALUATION

	PHASE 1 YEAR 1		PHASE 1 YEAR 2		PHASE 1 & 2 YEAR 3		PHASE 1 & 2 YEAR 4	PHASE 1 & 2 YEAR 5
		Month 12	10% rate increase	Month 24	10% rate increase	Month 36	10% rate increase	10% rate increase
Occupancy	96%	Income	96%	Income	90%	Income	90%	90%
Revenue	$ 301,680	$ 25,140	$ 330,264	$ 27,522	$ 608,748	$ 50,729	$ 669,623	$ 736,585
		Expenses	7% expense Increase	Expenses	7% expense Increase	Expenses	7% expense Increase	7% expense Increase
Expenses	$ 147,072	$ 12,256	$ 150,696	$ 12,558	$ 207,156	$ 17,263	$ 221,657	$ 237,173
Net Operating Income	$ 154,608		$ 179,568		$ 401,592		$ 447,966	$ 499,412
ESTIMATED VALUE	8 CAP		$ 2,244,600		$ 5,019,900		$ 5,599,574	$ 6,242,652
	7.5 CAP		$ 2,394,240		$ 5,354,560		$ 5,972,878	$ 6,658,829
	7 CAP		$ 2,565,257		$ 5,737,029		$ 6,399,513	$ 7,134,460
	6.5 CAP		$ 2,762,585		$ 6,178,338		$ 6,891,783	$ 7,683,264
	6 CAP		$ 2,992,800		$ 6,693,200		$ 7,466,098	$ 8,323,536
	5.5 CAP		$ 3,264,873		$ 7,301,673		$ 8,144,834	$ 9,080,221
	5 CAP		$ 3,591,360		$ 8,031,840		$ 8,959,318	$ 9,988,244

I HAVE BASED ALL NUMBERS ON THIS REPORT PROJECTING AT THE END OF 3 YEARS OF OPERATIONS THE CAP RATE WILL BE A 7.

IF THIS PROPERTY WAS ALREADY BUILT AND OPEN YOU COULD EXPECT A 5 CAP OR A VALUE TODAY OF: $ 8,031,840

ENTREPRENEURIAL PROFIT
BRIGHTON, MI

The secret to a profitable development of any type is to provide amenities for which the market will pay more than actual cost.
Therefore, this facility must meet the appropriate design criteria, while controlling costs.
I have used the following numbers as estimated cost per square foot.

Storage Area
Land Cost PHASE 1 $ 342,857

Total Gross Building **50,464**
Off Projected Costs

STORAGE AREA

	Total Building Cost	Plus Soft Cost	Plus Design Agreement	Plus Land Cost	Custom Building Cost	Misc. Cost	Closing Cost	Holding Fee	PHASE 2	Total Cost Of Facility
$ 42.00	$ 2,119,488	$ 123,180	$ 84,123	$ 342,857	$ 80,000	$ 78,057	$ 21,899	$ 53,456	$ 1,807,536	$ 4,710,596
$ 45.00	$ 2,270,880	$ 123,180	$ 84,123	$ 342,857	$ 80,000	$ 78,057	$ 21,899	$ 53,456	$ 1,807,536	$ 4,861,988
$ 47.54	$ 1,428,181	$ 123,180	$ 84,123	$ 342,857	$ 80,000	$ 78,057	$ 21,899	$ 53,456	$ 1,807,536	$ 4,019,289

Estimated Value at Stabilized Rates

At a 7 Cap $ 5,737,029

	Estimated Value	Cost of Facility	Percentage Profit
The Entrepreneurial Profiit is	$5,737,029	$ 4,019,289	43%

Created Value: **$1,717,740**

At a 5 Cap $ 8,031,840
at the end of 36 months

	Estimated Value	Cost of Facility	Percentage Profit
The Entrepreneurial Profiit is	$8,031,840	$ 4,019,289	100%

Created Value: **$4,012,551**

7

PROJECTIONS

BRIGHTON, MI

EXPLANATION FOR PROJECTIONS

- **Units at facility: Number of all units to be built according to Proposed Unit Mix.**
- **Projected Units Rented: Number of total occupied storage units.**
- **Projected Parking Rented: Number of total occupied parking spaces.**
- **Total Number of Units Rented: Total number of occupied units and parking spaces.**
- **Projected % Occupancy: Percent occupied by number of units.**
- **Rental Income: is the average amount charged per unit. We also take into consideration a 10% prior month vacancy and a move in special of ½ off the first months rent. The constant 10% off starting the 3rd month is for ongoing delinquencies.**
- **Late Fees (1%): 1% of rental income is the average amount collected per facility. I projected 0 for the first 2 months, as tenants will not have time to become delinquent.**
- **Administrative Fees: This is the $10 per new rental. This also takes into consideration a 10% vacate rate from the previous month.**
- **Truck Rental Commission: Projected at $500. This facility will rent U-Haul's.**
- **Lock & Merchandise Sales: This is a conservative projection of $500 per month.**
- **Insurance Commission Income: Your site will offer insurance with their payment; the insurance company will pay you a commission.**
- **Managers' Salary: One full time managers at 40 hours per week at $12 per hour.**
- **Relief Manager One manager 16 hours per week at $15.00 per hour.**
- **Performance Bonus: Projected at $0. This can be decided when a manager is hired.**
- **Merchandise Commission: Projected at $0. If you decide to give the managers some type of commission, they will usually sell more merchandise. Typically, this is 25% of gross if over $200 per month.**
- **Group Medical Insurance: Projected at $0. If possible, you may want to consider this to compete with the R.E.I.T.S. in storage.**
- **401k: Projected at $0. This is an additional benefit to your managers if they stay over 1 year. Typically, around 3% of gross income matched.**
- **Auto Allowance: Projected at $35 per month for 1 manager. This is gas and maintenance money for the use of their vehicle for work related duties. (bank deposits, getting supplies)**
- **Payroll & Burden: This includes all taxes and workers compensation for payroll.**
- **Management Fee: Fee for a management company who specializes in self-storage. The typical rate for complete management is 6% of gross income or a minimum of between $2,000 to $2,500 per month along with a one time $5,000 set up fee. Cutting Edge Management's charge for a facility this size is $2,000 or 5% with a ceiling of $5,000 per month and a (($5,000 set up fee (not on the monthly budget)).**
- **Yellow Pages: $0 not planning on anything but the line entry.**
- **Other Advertising: Budget amount for the first two months open for a direct mail campaign.**

- **Internet Advertising: Projected at $1,745 per month for pay per click and SEO with a $3,500 fee to have a web site built.**
- **Electricity and or Gas: Based on like property.**
- **Water & Sewer: Based on a like property.**
- **Office Supplies: Daily supplies needed for the property. This does not include set up.**
- **Postage/FedEx: Needed for billing, late letters and mailing of reports to Management Company.**
- **Bank Charges: This assumes 30% of total revenue paying credit cards at 1.78% with an additional $25 per month for service charges and NSF fees.**
- **Legal & Professional: Projected at $0. This would be used for items like disputing the property taxes or when you need an attorney if a tenant sues the property.**
- **Fees & Licenses: This would be for items like the Business License or subscription to an industry publication.**
- **Employee Relations/Training: Used for recognition items such as movie passes, or paying for their dinner, uniforms or sending them to a seminar.**
- **Telephone: Based on a like property.**
- **Computer Support: Based on standard industry software.**
- **Maintenance & Site Repairs: Based on average of like properties.**
- **Trash Removal: Based on like property.**
- **Elevator Maintenance: Budget at $0 as this facility is single story**
- **Pest Control: Based on like property.**
- **Fire / Security Monitoring: Projected at $80. Zoning may require fire alarm to be monitored in the Temperature Controlled and Condo buildings.**
- **Landscaping: Based on the set backs (size of green area) that will be required. The manager could do this during the slow times if you use mostly ground cover with minimal grass area.**
- **Kiosk Maintenance: Projected at $0.**
- **Auction Expense: The property will need to do auctions as it rents up. The higher the delinquency the more this line item will be.**
- **Lock & Merchandise Purchase: Based on a 100% mark up. If property sells $500 per month the facility will need to purchase $250 a month in merchandise.**
- **Moving Truck Rental: Projected at $0.**
- **Real Property Taxes: This is an estimate of 1.5% of total construction cost.**
- **Property & Casualty Insurance: This is an estimate depending on your deductibles. This includes $100,000 customer goods and wrongful sale and disposal, also 1 million general liabilities.**
- **Total Operating Expenses: Total of all expenses.**
- **Net Operation Income: Income minus expenses not including Capital Expenses or mortgage.**
- **Debt Service: Should be interest only for first 2 years.**
- **Debt Service Coverage Ratio. Ratio of coverage on the completed project.**

- **Starting 2nd year expected 7% increase in expenses every year.**

BRIGHTON, MI

1/2 OFF FIRST MONTH **USING 3 ACRES**

Month	TOTAL	1	2	3	4	5	6	7	8	9	10	11	12	
UNITS AT FACILITY	166													
PROJECTED UNITS RENTED	166	30	60	90	110	130	150	160	160	160	160	160	160	
PROJECTED % OCCUPANCY		18%	36%	54%	66%	78%	90%	96%	96%	96%	96%	96%	96%	
REVENUES														
RENTAL INCOME	$172.40	2,586	6,879	11,172	14,818	17,766	20,714	22,886	23,584	23,584	23,584	23,584	23,584	214,741
LATE FEES (1%)		0	0	112	148	178	207	229	236	236	236	236	236	2,053
ADMINISTRATIVE FEES	$10.00	300	330	360	290	310	330	250	160	160	160	160	160	2,970
TRUCK RENTAL COMMISSION		500	500	500	500	500	500	500	500	500	500	500	500	6,000
LOCK & MERCHANDISE SALES		500	500	500	500	500	500	500	500	500	500	500	500	6,000
INSURANCE COMMISION		30	60	90	110	130	150	160	160	160	160	160	160	1,530
OTHER INCOME														
TOTAL REVENUES		3,916	8,269	12,733	16,366	19,383	22,401	24,525	25,140	25,140	25,140	25,140	25,140	233,294
EXPENSES														
PAYROLL & BURDEN														
MANAGER'S SALARY		2,120	2,120	2,120	2,120	2,120	2,120	2,120	2,120	2,120	2,120	2,120	2,120	25,440
RELIEF PAYROLL		1,040	1,040	1,040	1,040	1,040	1,040	1,040	1,040	1,040	1,040	1,040	1,040	12,480
PERFORMANCE BONUS		0	0	0	0	0	0	0	0	0	0	0	0	0
MERCHANDISE COMMISSION		0	0	0	0	0	0	0	0	0	0	0	0	0
GROUP MEDICAL INSURANCE		0	0	0	0	0	0	0	0	0	0	0	0	0
401K		0	0	0	0	0	0	0	0	0	0	0	0	0
AUTO ALLOWANCE		35	35	35	35	35	35	35	35	35	35	35	35	420
PAYROLL BURDEN		632	632	632	632	632	632	632	632	632	632	632	632	7,584
TOTAL PAYROLL & BURDEN		3,827	3,827	3,827	3,827	3,827	3,827	3,827	3,827	3,827	3,827	3,827	3,827	45,924
MANAGEMENT FEE (5%) or $2,000		2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	24,000
ADVERTISING														
YELLOW PAGE ADVERTISING		0	0	0	0	0	0	0	0	0	0	0	0	0
OTHER ADVERTISING		5,000	5,000	0	0	0	0	0	0	0	0	0	0	10,000
INTERNET SEO/PAY PER CLICK		5,245	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	24,440
1ST MONTH WEB SITE DESIGN														
TOTAL ADVERTISING		10,245	6,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	34,440
UTILITIES														
ELECTRICITY AND OR GAS		291	291	291	291	291	291	291	291	291	291	291	291	3,486
WATER & SEWER		17	17	17	17	17	17	17	17	17	17	17	17	199
TOTAL UTILITIES		307	307	307	307	307	307	307	307	307	307	307	307	3,685
OFFICE EXPENSE														
OFFICE SUPPLIES		95	95	95	95	95	95	95	95	95	95	95	95	1,140
POSTAGE/FEDEX		60	60	60	60	60	60	60	60	60	60	60	60	720

BRIGHTON, MI

1/2 OFF FIRST MONTH **USING 3 ACRES**

Month	TOTAL	1	2	3	4	5	6	7	8	9	10	11	12	
UNITS AT FACILITY	166													
PROJECTED UNITS RENTED	166	30	60	90	110	130	150	160	160	160	160	160	160	
PROJECTED % OCCUPANCY		18%	36%	54%	66%	78%	90%	96%	96%	96%	96%	96%	96%	
BANK & CREDIT CARD CHARGES		46	69	93	112	129	145	156	159	159	159	159	159	1,546
LEGAL & PROFESSIONAL		0	0	0	0	0	0	0	0	0	0	0	0	0
FEES & LICENSES		40	40	40	40	40	40	40	40	40	40	40	40	475
EMPLOYEE RELATIONS/TRAINING		0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL OFFICE EXPENSE		241	264	288	307	323	339	351	354	354	354	354	354	3,881
TELEPHONE		180	180	180	180	180	180	180	180	180	180	180	180	2,160
COMPUTER SUPPORT		90	90	90	90	90	90	90	90	90	90	90	90	1,080
MAINTENANCE & REPAIRS														
MAINTENANCE & SITE REPAIRS		190	190	190	190	190	190	190	190	190	190	190	190	2,280
TRASH REMOVAL		76	76	76	76	76	76	76	76	76	76	76	76	912
ELEVATOR MAINTENANCE		0	0	0	0	0	0	0	0	0	0	0	0	0
PEST CONTROL		76	76	76	76	76	76	76	76	76	76	76	76	912
FIRE PREVENTION		79	79	79	79	79	79	79	79	79	79	79	79	950
SECURITY SYSTEM		79	79	79	79	79	79	79	79	79	79	79	79	950
LANDSCAPING		0	0	0	0	0	0	0	0	0	0	0	0	0
KIOSK MAINTENANCE		0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL MAINT. & REPAIRS		500	500	500	500	500	500	500	500	500	500	500	500	6,005
OTHER EXPENSES														
AUCTION EXPENSE		0	0	20	20	20	20	50	50	50	50	50	50	380
LOCK & MERCHANDISE PURCHASES		250	250	250	250	250	250	250	250	250	250	250	250	3,000
MOVING TRUCK RENTAL		0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL OTHER EXPENSES		250	250	270	270	270	270	300	300	300	300	300	300	3,380
REAL PROPERTY TAXES		2,765	2,765	2,765	2,765	2,765	2,765	2,765	2,765	2,765	2,765	2,765	2,765	33,176
PROPERTY & CASUALTY INS		188	188	188	188	188	188	188	188	188	188	188	188	2,257
Total Operating Expense		20,593	17,116	12,160	12,179	12,195	12,212	12,253	12,256	12,256	12,256	12,256	12,256	159,988
Net Operating Income		(16,677)	(8,847)	573	4,187	7,188	10,189	12,272	12,884	12,884	12,884	12,884	12,884	73,306
CAPITAL EXPENDITURES @ .07			0	0	0	0	0	0	0	0	0	0	0	0
Budgeted Net Cash Flow		(16,677)	(8,847)	573	4,187	7,188	10,189	12,272	12,884	12,884	12,884	12,884	12,884	73,306
TOTAL CONSTRUCTION	$2,211,752													
Debt Service 20% DOWN	$1,769,402	(8,847)	(8,847)	(8,847)	(8,847)	(8,847)	(8,847)	(8,847)	(8,847)	(8,847)	(8,847)	(8,847)	(8,847)	(106,164)
Interest Only First 2 years	6.00%													
Ending Cash		(25,524)	(17,694)	(8,274)	(4,660)	(1,659)	1,342	3,425	4,037	4,037	4,037	4,037	4,037	-32858
Debt service Principal & Interest	25 year am	(11,400)	(11,400)	(11,400)	(11,400)	(11,400)	(11,400)	(11,400)	(11,400)	(11,400)	(11,400)	(11,400)	(11,400)	
Debt Service Coverage Ratio		**-1.46**	**-0.78**	**0.05**	**0.37**	**0.63**	**0.89**	**1.08**	**1.13**	**1.13**	**1.13**	**1.13**	**1.13**	

BRIGHTON, MI

1/2 OFF FIRST MONTH **USING 3 ACRES**

Month	TOTAL	13	14	15	16	17	18	19	20	21	22	23	24	
UNITS AT FACILITY	166													
PROJECTED UNITS RENTED	166	160	160	160	160	160	160	160	160	160	160	160	160	
PROJECTED % OCCUPANCY		96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	
REVENUES														
RENTAL INCOME	$189.64	25,943	25,943	25,943	25,943	25,943	25,943	25,943	25,943	25,943	25,943	25,943	25,943	311,314
LATE FEES (1%)		253	253	259	259	259	259	259	259	259	259	259	259	3,100
ADMINISTRATIVE FEES	$10.00	160	160	160	160	160	160	160	160	160	160	160	160	1,920
TRUCK RENTAL COMMISSION		500	500	500	500	500	500	500	500	500	500	500	500	6,000
LOCK & MERCHANDISE SALES		500	500	500	500	500	500	500	500	500	500	500	500	6,000
INSURANCE COMMISION		160	160	160	160	160	160	160	160	160	160	160	160	1,920
OTHER INCOME														
TOTAL REVENUES		27,516	27,516	27,522	27,522	27,522	27,522	27,522	27,522	27,522	27,522	27,522	27,522	330,254
EXPENSES														
PAYROLL & BURDEN														
MANAGER'S SALARY		2,226	2,226	2,226	2,226	2,226	2,226	2,226	2,226	2,226	2,226	2,226	2,226	26,712
RELIEF PAYROLL		1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092	13,104
PERFORMANCE BONUS		0	0	0	0	0	0	0	0	0	0	0	0	0
MERCHANDISE COMMISSION		0	0	0	0	0	0	0	0	0	0	0	0	0
GROUP MEDICAL INSURANCE		0	0	0	0	0	0	0	0	0	0	0	0	0
401K		0	0	0	0	0	0	0	0	0	0	0	0	0
AUTO ALLOWANCE		35	35	35	35	35	35	35	35	35	35	35	35	420
PAYROLL BURDEN		664	664	664	664	664	664	664	664	664	664	664	664	7,963
TOTAL PAYROLL & BURDEN		4,017	4,017	4,017	4,017	4,017	4,017	4,017	4,017	4,017	4,017	4,017	4,017	48,199
MANAGEMENT FEE (5%) or $2,000		2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	24,000
ADVERTISING														
YELLOW PAGE ADVERTISING		0	0	0	0	0	0	0	0	0	0	0	0	0
OTHER ADVERTISING		0	0	0	0	0	0	0	0	0	0	0	0	0
INTERNET SEO/PAY PER CLICK		1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	20,940
1ST MONTH WEB SITE DESIGN														
TOTAL ADVERTISING		1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	20,940
UTILITIES														
ELECTRICITY AND OR GAS		310	310	310	310	310	310	310	310	310	310	310	310	3,717
WATER & SEWER		18	18	18	18	18	18	18	18	18	18	18	18	212
TOTAL UTILITIES		327	327	327	327	327	327	327	327	327	327	327	327	3,929
OFFICE EXPENSE														
OFFICE SUPPLIES		102	102	102	102	102	102	102	102	102	102	102	102	1,220
POSTAGE/FEDEX		64	64	64	64	64	64	64	64	64	64	64	64	768

BRIGHTON, MI

1/2 OFF FIRST MONTH **USING 3 ACRES**

Month	TOTAL	13	14	15	16	17	18	19	20	21	22	23	24	
UNITS AT FACILITY	166													
PROJECTED UNITS RENTED	166	160	160	160	160	160	160	160	160	160	160	160	160	
PROJECTED % OCCUPANCY		96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	
BANK & CREDIT CARD CHARGES		172	172	172	172	172	172	172	172	172	172	172	172	2,064
LEGAL & PROFESSIONAL		0	0	0	0	0	0	0	0	0	0	0	0	0
FEES & LICENSES		42	42	42	42	42	42	42	42	42	42	42	42	507
EMPLOYEE RELATIONS/TRAINING		0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL OFFICE EXPENSE		380	380	380	380	380	380	380	380	380	380	380	380	4,558
TELEPHONE		192	192	192	192	192	192	192	192	192	192	192	192	2,304
COMPUTER SUPPORT		96	96	96	96	96	96	96	96	96	96	96	96	1,152
MAINTENANCE & REPAIRS														
MAINTENANCE & SITE REPAIRS		203	203	203	203	203	203	203	203	203	203	203	203	2,440
TRASH REMOVAL		81	81	81	81	81	81	81	81	81	81	81	81	976
ELEVATOR MAINTENANCE		0	0	0	0	0	0	0	0	0	0	0	0	0
PEST CONTROL		81	81	81	81	81	81	81	81	81	81	81	81	976
FIRE PREVENTION		84	84	84	84	84	84	84	84	84	84	84	84	1,014
SECURITY SYSTEM		84	84	84	84	84	84	84	84	84	84	84	84	1,014
LANDSCAPING		0	0	0	0	0	0	0	0	0	0	0	0	0
KIOSK MAINTENANCE		0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL MAINT. & REPAIRS		535	535	535	535	535	535	535	535	535	535	535	535	6,419
OTHER EXPENSES														
AUCTION EXPENSE		50	50	50	50	50	50	50	50	50	50	50	50	600
LOCK & MERCHANDISE PURCHASES		250	250	250	250	250	250	250	250	250	250	250	250	3,000
MOVING TRUCK RENTAL		0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL OTHER EXPENSES		300	300	300	300	300	300	300	300	300	300	300	300	3,600
REAL PROPERTY TAXES		2,765	2,765	2,765	2,765	2,765	2,765	2,765	2,765	2,765	2,765	2,765	2,765	33,176
PROPERTY & CASUALTY INS		201	201	201	201	201	201	201	201	201	201	201	201	2,415
Total Operating Expense		12,558	12,558	12,558	12,558	12,558	12,558	12,558	12,558	12,558	12,558	12,558	12,558	150,693
Net Operating Income		14,958	14,958	14,964	14,964	14,964	14,964	14,964	14,964	14,964	14,964	14,964	14,964	179,561
CAPITAL EXPENDITURES @ .07			0	0	0	0	0	0	0	0	0	0	0	0
Budgeted Net Cash Flow		14,958	14,958	14,964	14,964	14,964	14,964	14,964	14,964	14,964	14,964	14,964	14,964	179,561
TOTAL CONSTRUCTION	$2,211,752													
Debt Service 20% DOWN	$1,769,402	(8,847)	(8,847)	(8,847)	(8,847)	(8,847)	(8,847)	(8,847)	(8,847)	(8,847)	(8,847)	(8,847)	(8,847)	(106,164)
Interest Only First 2 years	6.00%													
Ending Cash		6,111	6,111	6,117	6,117	6,117	6,117	6,117	6,117	6,117	6,117	6,117	6,117	73397
Debt service Principal & Interest	25 year am	(11,400)	(11,400)	(11,400)	(11,400)	(11,400)	(11,400)	(11,400)	(11,400)	(11,400)	(11,400)	(11,400)	(11,400)	
Debt Service Coverage Ratio		**1.31**	**1.31**	**1.31**	**1.31**	**1.31**	**1.31**	**1.31**	**1.31**	**1.31**	**1.31**	**1.31**	**1.31**	

BRIGHTON, MI

1/2 OFF FIRST MONTH **PHASE 2 BUILT**

Month	TOTAL	25	26	27	28	29	30	31	32	33	34	35	36	
UNITS AT FACILITY	332													
PROJECTED UNITS RENTED	332	180	200	220	240	260	280	300	300	300	300	300	300	
PROJECTED % OCCUPANCY		54%	60%	66%	72%	78%	84%	90%	90%	90%	90%	90%	90%	
REVENUES														
RENTAL INCOME	$189.64	27,649	30,892	34,135	37,378	40,621	43,864	47,107	48,643	48,643	48,643	48,643	48,643	504,859
LATE FEES (1%)		253	253	341	374	406	439	471	486	486	486	486	486	4,969
ADMINISTRATIVE FEES	$10.00	360	380	400	420	440	460	480	300	300	300	300	300	4,440
TRUCK RENTAL COMMISSION		500	500	500	500	500	500	500	500	500	500	500	500	6,000
LOCK & MERCHANDISE SALES		500	500	500	500	500	500	500	500	500	500	500	500	6,000
INSURANCE COMMISION		180	200	220	240	260	280	300	300	300	300	300	300	3,180
OTHER INCOME														
TOTAL REVENUES		29,442	32,725	36,097	39,412	42,727	46,042	49,358	50,729	50,729	50,729	50,729	50,729	529,448
EXPENSES														
PAYROLL & BURDEN														
MANAGER'S SALARY		2,337	2,337	2,337	2,337	2,337	2,337	2,337	2,337	2,337	2,337	2,337	2,337	28,048
RELIEF PAYROLL		1,147	1,147	1,147	1,147	1,147	1,147	1,147	1,147	1,147	1,147	1,147	1,147	13,761
PERFORMANCE BONUS		0	0	0	0	0	0	0	0	0	0	0	0	0
MERCHANDISE COMMISSION		0	0	0	0	0	0	0	0	0	0	0	0	0
GROUP MEDICAL INSURANCE		0	0	0	0	0	0	0	0	0	0	0	0	0
401K		0	0	0	0	0	0	0	0	0	0	0	0	0
AUTO ALLOWANCE		35	35	35	35	35	35	35	35	35	35	35	35	420
PAYROLL BURDEN		697	697	697	697	697	697	697	697	697	697	697	697	8,362
TOTAL PAYROLL & BURDEN		4,216	4,216	4,216	4,216	4,216	4,216	4,216	4,216	4,216	4,216	4,216	4,216	50,591
MANAGEMENT FEE (5%) or $2,000		2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,536	2,536	25,073
ADVERTISING														
YELLOW PAGE ADVERTISING		0	0	0	0	0	0	0	0	0	0	0	0	0
OTHER ADVERTISING		0	0	0	0	0	0	0	0	0	0	0	0	0
INTERNET SEO/PAY PER CLICK		1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	20,940
1ST MONTH WEB SITE DESIGN														
TOTAL ADVERTISING		1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	20,940
UTILITIES														
ELECTRICITY AND OR GAS		621	621	621	621	621	621	621	621	621	621	621	621	7,455
WATER & SEWER		36	36	36	36	36	36	36	36	36	36	36	36	426
TOTAL UTILITIES		657	657	657	657	657	657	657	657	657	657	657	657	7,881
OFFICE EXPENSE														
OFFICE SUPPLIES		210	210	210	210	210	210	210	210	210	210	210	210	2,525
POSTAGE/FEDEX		68	68	68	68	68	68	68	68	68	68	68	68	816

BRIGHTON, MI

1/2 OFF FIRST MONTH **PHASE 2 BUILT**

Month	TOTAL	25	26	27	28	29	30	31	32	33	34	35	36	
UNITS AT FACILITY	332													
PROJECTED UNITS RENTED	332	180	200	220	240	260	280	300	300	300	300	300	300	
PROJECTED % OCCUPANCY		54%	60%	66%	72%	78%	84%	90%	90%	90%	90%	90%	90%	
BANK & CREDIT CARD CHARGES		182	200	218	235	253	271	289	296	296	296	296	296	3,127
LEGAL & PROFESSIONAL		0	0	0	0	0	0	0	0	0	0	0	0	0
FEES & LICENSES		45	45	45	45	45	45	45	45	45	45	45	45	539
EMPLOYEE RELATIONS/TRAINING		0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL OFFICE EXPENSE		506	523	541	559	576	594	612	619	619	619	619	619	7,007
TELEPHONE		204	204	204	204	204	204	204	204	204	204	204	204	2,448
COMPUTER SUPPORT		102	102	102	102	102	102	102	102	102	102	102	102	1,224
MAINTENANCE & REPAIRS														
MAINTENANCE & SITE REPAIRS		421	421	421	421	421	421	421	421	421	421	421	421	5,050
TRASH REMOVAL		168	168	168	168	168	168	168	168	168	168	168	168	2,020
ELEVATOR MAINTENANCE		0	0	0	0	0	0	0	0	0	0	0	0	0
PEST CONTROL		168	168	168	168	168	168	168	168	168	168	168	168	2,020
FIRE PREVENTION		90	90	90	90	90	90	90	90	90	90	90	90	1,077
SECURITY SYSTEM		90	90	90	90	90	90	90	90	90	90	90	90	1,077
LANDSCAPING		0	0	0	0	0	0	0	0	0	0	0	0	0
KIOSK MAINTENANCE		0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL MAINT. & REPAIRS		937	937	937	937	937	937	937	937	937	937	937	937	11,244
OTHER EXPENSES														
AUCTION EXPENSE		50	50	50	50	50	50	50	50	50	50	50	50	600
LOCK & MERCHANDISE PURCHASES		250	250	250	250	250	250	250	250	250	250	250	250	3,000
MOVING TRUCK RENTAL		0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL OTHER EXPENSES		300	300	300	300	300	300	300	300	300	300	300	300	3,600
REAL PROPERTY TAXES		5,530	5,530	5,530	5,530	5,530	5,530	5,530	5,530	5,530	5,530	5,530	5,530	66,360
PROPERTY & CASUALTY INS		417	417	417	417	417	417	417	417	417	417	417	417	4,999
Total Operating Expense		16,613	16,630	16,648	16,666	16,684	16,701	16,719	16,726	16,726	16,726	17,263	17,263	201,367
Net Operating Income		12,829	16,095	19,448	22,746	26,043	29,341	32,639	34,003	34,003	34,003	33,466	33,466	328,081
CAPITAL EXPENDITURES @ .07			0	0	0	0	0	0	0	0	0	0	0	0
Budgeted Net Cash Flow		12,829	16,095	19,448	22,746	26,043	29,341	32,639	34,003	34,003	34,003	33,466	33,466	328,081
TOTAL CONSTRUCTION														
Debt Service 20% DOWN	$3,574,652	(17,873)	(17,873)	(17,873)	(17,873)	(17,873)	(17,873)	(17,873)	(17,873)	(17,873)	(17,873)	(17,873)	(17,873)	(214,479)
Interest Only First 2 years	6.00%													
Ending Cash		(5,044)	(1,779)	1,575	4,873	8,170	11,468	14,765	16,129	16,129	16,129	15,593	15,593	113602
Debt service Principal & Interest	25 year am	(23,032)	(23,032)	(23,032)	(23,032)	(23,032)	(23,032)	(23,032)	(23,032)	(23,032)	(23,032)	(23,032)	(23,032)	
Debt Service Coverage Ratio		**0.56**	**0.70**	**0.84**	**0.99**	**1.13**	**1.27**	**1.42**	**1.48**	**1.48**	**1.48**	**1.45**	**1.45**	

8

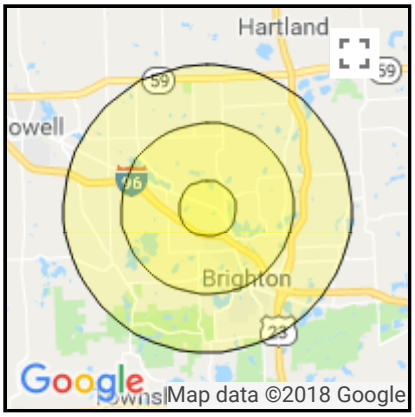
DEMOGRAPHICS

EASI Updated Site Selection Reports & Analysis
Professional Complete Report

Address: 2528 Harte Dr, Brighton, MI 48114

Latitude: 42° : 33' : 54"

Longitude: -83° : 48' : 23"



Description	1 Miles	3 Miles	5 Miles
Square Miles	2.066132	29.689801	80.904651
Population Density	1,269.5	812.7	704.4
POPULATION BY YEAR			
Population (4/1/1990)	1,856	15,516	32,283
Population (4/1/2000)	3,014	20,938	45,434
Population (4/1/2010)	2,457	22,950	54,061
Population (1/1/2018)	2,623	24,128	56,988
Population (1/1/2023)	2,687	24,733	58,441
Population Growth (2018/2010)	6.76	5.13	5.41
Population Forecast (2023/2018)	2.44	2.51	2.55
HOUSEHOLDS BY YEAR			
Households (4/1/1990)	789	5,618	11,174
Households (4/1/2000)	1,297	7,890	16,573
Households (4/1/2010)	1,148	9,207	20,763
Households (1/1/2018)	1,240	9,794	22,132
Households (1/1/2023)	1,291	10,201	23,062
Households Growth (2018/2010)	8.01	6.38	6.59
Households Forecast (2023/2018)	4.11	4.16	4.20
GENERAL FAMILY AND POPULATION TOTALS			
Population (1/1/2018)	2,623	24,128	56,988
Family Population	1,948	20,231	48,907
Non-Family Population	672	3,780	7,857
Total Group Quarters Population	3	117	224
HOUSEHOLDS BY FAMILY TYPE			
Households (1/1/2018)	1,240	9,794	22,132
Total Families	674	6,625	15,679
Total Non Family Households	566	3,169	6,453

FAMILES BY FAMILY TYPE			
Total Families	674	6,625	15,679
Total Married Families	475	5,441	13,024
Total Other Families	199	1,184	2,655
MARRIED FAMILIES BY FAMILY TYPE			
Total Married Families	475	5,441	13,024
Married Families Children Under 18	126	1,925	5,133
Married Families No Children Under 18	349	3,516	7,891
OTHER FAMILIES BY FAMILY TYPE			
Total Other Families	199	1,184	2,655
Male Householder, No Wife Present	74	444	958
Female Householder, No Husband Present	125	740	1,697
OTHER MALE FAMILIES BY FAMILY TYPE			
Male Householder, No Wife Present	74	444	958
Male Householder, No Wife Present with Children Under 18	44	276	591
Male Householder, No Wife Present with No Children Under 18	30	168	367
OTHER FEMALE FAMILIES BY FAMILY TYPE			
Female Householder, No Husband Present	125	740	1,697
Female Householder, No Husband Present with Children Under 18	65	411	967
Female Householder, No Husband Present with No Children Under 18	60	329	730
NON FAMILY HOUSEHOLDS BY GENDER			
Total Non Family Households	566	3,169	6,453
Non Family Male Householder, People Under 18 Present	4	17	59
Non Family Male Householder, No People Under 18 Present	251	1,561	3,112
Non Family Female Householder, People Under 18 Present	0	4	9
Non Family Female Householder, No People Under 18 Present	311	1,587	3,273
DETAILED POPULATION CHARACTERISTICS			
Urban	2,623	22,126	48,861
Rural	0	2,002	8,127
Gender			
Male	1,255	11,987	28,259
Female	1,368	12,141	28,729
Poverty			
Population, In Poverty	143	1,173	2,877
Veterans			
Population, Veterans	184	1,636	3,345
Age			
Median Age	50.2	45.4	42.3
Aged 0 to 5 Years	131	1,341	3,640
Aged 6 to 11 Years	156	1,904	4,886
Aged 12 to17 Years	170	2,078	5,226
Aged 18 to 24 Years	147	1,524	3,668
Aged 25 to 34 Years	263	2,058	5,588
Aged 35 to 44 Years	250	3,024	7,516
Aged 45 to 54 Years	374	3,800	8,884
Aged 55 to 64 Years	465	4,017	8,541
Aged 65 to 74 Years	399	2,778	5,733

Aged 75 to 84 Years	200	1,075	2,278
Aged 85 Years and Older	68	529	1,028
Male Population By Age			
Median Age	48.0	44.4	41.5
Aged 0 to 5 Years	67	689	1,826
Aged 6 to 11 Years	80	973	2,498
Aged 12 to17 Years	84	1,056	2,670
Aged 18 to 24 Years	81	821	1,943
Aged 25 to 34 Years	133	1,041	2,819
Aged 35 to 44 Years	127	1,502	3,677
Aged 45 to 54 Years	188	1,874	4,410
Aged 55 to 64 Years	210	1,977	4,216
Aged 65 to 74 Years	175	1,397	2,822
Aged 75 to 84 Years	78	476	1,018
Aged 85 Years and Older	32	181	360
Female Population By Age			
Median Age	52.5	46.2	43.1
Aged 0 to 5 Years	64	652	1,814
Aged 6 to 11 Years	76	931	2,388
Aged 12 to17 Years	86	1,022	2,556
Aged 18 to 24 Years	66	703	1,725
Aged 25 to 34 Years	130	1,017	2,769
Aged 35 to 44 Years	123	1,522	3,839
Aged 45 to 54 Years	186	1,926	4,474
Aged 55 to 64 Years	255	2,040	4,325
Aged 65 to 74 Years	224	1,381	2,911
Aged 75 to 84 Years	122	599	1,260
Aged 85 Years and Older	36	348	668
POPULATION BY RACE			
White Alone	2,480	23,063	54,390
Black Alone	13	194	433
Asian Alone	19	272	749
American Indian and Alaska Native Alone	27	95	189
Other Race Alone	16	102	265
Two or More Races	68	402	962
POPULATION BY ETHNICITY			
Hispanic	60	478	1,344
White Non-Hispanic	2,441	22,759	53,462
Median Age by Race			
White Median Age	51.0	45.8	42.9
Black Median Age	32.5	43.8	36.4
Asian Median Age	53.8	42.4	37.3
American Indian and Alaska Native Median Age	0.0	0.0	0.0
Other Race Median Age	0.0	0.0	0.0
Two or More Races Median Age	61.2	72.8	69.6
Median Age by Ethnicity			
Hispanic Median Age	33.0	29.4	26.8
White Non Hispanic Median Age	51.1	46.1	43.3
Marital Status (Pop 15+)			
Males Never Married	306	2,523	6,305

Males Married	560	6,012	13,526
Males Widowed	27	224	651
Males Divorced	177	1,017	2,070
Females Never Married	205	2,000	5,180
Females Married	547	6,049	13,458
Females Widowed	165	941	1,876
Females Divorced	269	1,057	2,729
Males Currently Married (Pop 15+)			
Males Married	560	6,012	13,526
Males Married and Together	553	5,867	13,057
Males Married and Separated	6	59	145
Males Married and Absent	1	86	324
Females Currently Married (Pop 15+)			
Females Married	547	6,049	13,458
Females Married and Together	546	5,965	13,175
Females Married and Separated	0	19	117
Females Married and Absent	1	65	166
Primary Language (Pop 5+)			
Speaks English	2,467	22,177	51,938
Speaks Spanish	25	230	651
Speaks Other Indo-European Languages	24	429	929
Speaks Asian or Pacific Island Language	0	144	471
Speaks Other Language	0	89	104
Citizenship			
Native	2,539	23,286	54,539
Foreign Born - Naturalized	42	504	1,478
Foreign Born - Not a Citizen	42	338	971
Group Quarters			
Total Group Quarters	3	117	224
Institutional Group Quarters	3	93	188
Non-Institutional Group Quarters	0	24	36
DETAILED HOUSEHOLD CHARACTERISTICS			
Household, Average Size	2.11	2.45	2.56
HOUSEHOLDS BY RACE			
White	1,198	9,486	21,421
Black	3	74	146
Asian	9	80	211
American Indian and Alaska Native	7	30	67
Other Race	3	23	69
Two or More Races	20	101	218
HOUSEHOLDS BY ETHNICITY			
Hispanic	20	124	338
White Non-Hispanic	1,183	9,397	21,167
Household by Age of Head			
Median Age	58.9	55.6	53.8
Aged Under 25 Years	36	221	563
Aged 25 to 34 Years	103	808	2,227
Aged 35 to 44 Years	135	1,495	3,676

Aged 45 to 54 Years	230	2,225	5,215
Aged 55 to 64 Years	300	2,384	5,003
Aged 65 to 74 Years	222	1,514	3,109
Aged 75 to 84 Years	158	769	1,601
Aged 85 Years and Over	56	378	738
Household by Size			
Median Size	2.3	2.6	2.7
1 Person	484	2,697	5,377
2 Person	449	3,672	8,138
3 Person	148	1,422	3,532
4 Person	93	1,205	3,051
5 Person	45	534	1,368
6 Person	14	173	415
7 or More Person	7	91	251
Household by Vehicles			
Median Vehicles	2.2	2.4	2.5
No Vehicles	23	424	803
1 Vehicle	492	2,640	5,904
2 Vehicles	498	4,079	9,204
3 Vehicles	178	1,871	4,379
4+ Vehicles	49	780	1,842
HOUSING UNITS BY OCCUPANCY			
Total Units	1,330	10,481	23,443
Occupied Units	1,240	9,794	22,132
Vacant Units	90	687	1,311
HOUSING UNITS BY TENURE			
Housing, Occupied Units	1,240	9,794	22,132
Housing, Owner Occupied	1,099	7,941	17,801
Housing, Renter Occupied	141	1,853	4,331
HOUSING UNITS BY VACANCY TYPE			
Housing, Vacant Units	90	687	1,311
Housing, Vacant Units For Rent	9	158	328
Housing, Vacant Units Rented, Not Occupied	1	7	20
Housing, Vacant Units For Sale	32	129	252
Housing, Vacant Units Sold, Not Occupied	11	32	61
Housing, Vacant Units Seasonal, Recreational, or Occasional Use	21	199	337
Housing, Vacant Units For Migrant Workers	0	0	0
Housing, Vacant Units Vacant Other	16	162	313
OCCUPIED HOUSING STRUCTURES			
Housing, Occupied Units	1,240	9,794	22,132
Housing, Occupied Structure with 1 Unit Detached	426	7,209	16,539
Housing, Occupied Structure with 1 Unit Attached	109	653	1,755
Housing, Occupied Structure with 2 Units	0	74	193
Housing, Occupied Structure with 3-4 Units	0	62	276
Housing, Occupied Structure with 5-9 Units	23	196	838
Housing, Occupied Structure with 10-19 Units	0	424	991
Housing, Occupied Structure with 20-49 Units	0	37	209
Housing, Occupied Structure with 50+ Units	0	271	399
Housing, Occupied Structure Trailer	682	868	932
Housing, Occupied Structure Other	0	0	0

OWNER OCCUPIED HOUSEHOLDS BY MORTAGE			
Housing, Owner Occupied	1,099	7,941	17,801
Housing, Owner Households, With Mortgage Any	555	5,832	13,553
Housing, Owner Households, With No Mortgage	544	2,109	4,248
OWNER OCCUPIED HOUSEHOLDS BY HOME VALUE			
Housing, Owner Occupied	1,099	7,941	17,801
Housing, Median Value Owner Households ($)	55,278	203,908	205,389
Housing, Owner Households Valued Less than $10,000	119	148	178
Housing, Owner Households Valued $10,000-$14,999	87	95	127
Housing, Owner Households Valued $15,000-$19,999	156	235	291
Housing, Owner Households Valued $20,000-$24,999	89	150	203
Housing, Owner Households Valued $25,000-$29,999	33	33	65
Housing, Owner Households Valued $30,000-$34,999	17	17	17
Housing, Owner Households Valued $35,000-$39,999	10	10	20
Housing, Owner Households Valued $40,000-$49,999	29	80	121
Housing, Owner Households Valued $50,000-$59,999	18	86	108
Housing, Owner Households Valued $60,000-$69,999	31	84	180
Housing, Owner Households Valued $70,000-$79,999	19	96	234
Housing, Owner Households Valued $80,000-$89,999	0	109	272
Housing, Owner Households Valued $90,000-$99,999	20	161	292
Housing, Owner Households Valued $100,000-$124,999	77	486	1,184
Housing, Owner Households Valued $125,000-$149,999	73	461	1,380
Housing, Owner Households Valued $150,000-$174,999	81	997	2,421
Housing, Owner Households Valued $175,000-$199,999	45	632	1,500
Housing, Owner Households Valued $200,000-$249,999	38	1,158	2,853
Housing, Owner Households Valued $250,000-$299,999	49	851	2,258
Housing, Owner Households Valued $300,000-$399,999	60	913	2,269
Housing, Owner Households Valued $400,000-$499,999	20	515	942
Housing, Owner Households Valued $500,000-$749,999	10	459	670
Housing, Owner Households Valued $750,000-$999,999	0	77	109
Housing, Owner Households Valued More than $1,000,000	18	88	107
RENTER OCCUPIED HOUSEHOLDS BY RENT VALUE			
Housing, Renter Occupied	141	1,853	4,331
Housing, Median Rent ($)	646	748	797
Housing, Rent less than $250	15	24	52
Housing, Rent $250-$499	34	206	358
Housing, Rent $500-$749	30	668	1,415
Housing, Rent $750-$999	43	483	1,450
Housing, Rent $1,000-$1,249	4	188	449
Housing, Rent $1,250-$1,499	2	68	133
Housing, Rent $1,500-$1,999	3	107	194
Housing, Rent $2,000+	2	39	143
Housing, No Cash Rent	8	70	137
HOUSING UNITS BY YEAR BUILD			
Total Housing Units	1,330	10,481	23,443
Housing, Median Year Built	1990	1990	1991
Housing, Built 2010 or Later	176	1,281	2,871
Housing, Built 2000 to 2009	107	1,962	5,037
Housing, Built 1990 to 1999	422	2,130	4,903
Housing, Built 1980 to 1989	190	1,160	2,656
Housing, Built 1970 to 1979	188	1,912	3,911
Housing, Built 1960 to 1969	131	709	1,447
Housing, Built 1950 to 1959	57	679	1,384
Housing, Built 1940 to 1949	8	257	485

Housing, Built 1939 or Earlier	51	391	749
Year Moved In			
Median Year Moved In	2005	2007	2008
Year Moved in 2010 or Later	516	4,449	10,309
Year Moved in 2000 to 2009	287	2,476	5,712
Year Moved in 1990 to 1999	284	1,844	3,711
Year Moved in 1980 to 1989	96	713	1,494
Year Moved in 1970 to 1979	51	248	761
Year Moved in 1969 or Earlier	6	64	145
HOUSEHOLDS BY TYPE OF HEATING FUEL USED			
Home Heating Fuel: Utility gas	1,123	8,800	19,258
Home Heating Fuel: Bottled, tank, or LP gas	37	345	1,084
Home Heating Fuel: Electricity	41	406	975
Home Heating Fuel: Fuel oil, kerosene, etc.	33	94	322
Home Heating Fuel: Coal or coke	0	0	0
Home Heating Fuel: Wood	6	94	306
Home Heating Fuel: Solar energy	0	0	0
Home Heating Fuel: Other fuel	0	47	170
Home Heating Fuel: No fuel used	0	8	17
DETAILED INCOME CHARACTERISTICS			
Total Personal Income ($)	88,853,830	1,185,427,569	2,691,992,630
Total Household Income ($)	88,500,376	1,181,834,309	2,681,400,475
Median Household Income ($)	62,589	99,980	99,393
Average Household Income ($)	71,371	120,669	121,155
Per Capita Household Income ($)	33,875	49,131	47,238
Household High Income Average ($)	245,754	290,726	307,778
Households By Income			
Less than $15,000	76	479	930
$15,000 to $24,999	91	433	939
$25,000 to $34,999	117	530	1,208
$35,000 to $49,999	194	842	2,023
$50,000 to $74,999	282	1,343	3,114
$75,000 to $99,999	193	1,271	2,923
$100,000 to $124,999	141	1,251	2,866
$125,000 to $149,999	79	986	2,353
$150,000 to $199,999	31	1,020	2,416
$200,000 and Over	36	1,639	3,360
DETAILED EMPLOYMENT CHARACTERISTICS			
Labor Force Characteristics (Pop 16+)			
Employment Potential	2,221	19,489	44,961
Civilian Total	1,264	11,116	26,676
Civilian Males	625	6,232	14,680
Civilian Females	639	4,884	11,996
Armed Forces Male	0	9	34
Armed Forces Female	0	0	0
Unemployed Male	21	207	487
Unemployed Female	21	162	396
Not in the Labor Force Male	367	3,207	6,895
Not in the Labor Force Female	548	4,788	10,473
Industry (Pop 16+)			
Total Civilian Employment	1,264	11,116	26,676

Employment, Agriculture, Forestry, Fishing and Hunting	21	53	84
Employment, Mining, Quarrying and Oil and Gas Extraction	0	13	13
Employment, Construction	49	473	1,494
Employment, Manufacturing	221	2,194	4,926
Employment, Wholesale Trade	30	538	1,061
Employment, Retail Trade(Pop 16+)	217	1,381	3,008
Employment, Transportation and Warehousing	2	175	564
Employment, Utilities	25	90	145
Employment, Information	12	144	397
Employment, Finance and Insurance	38	495	1,361
Employment, Real Estate and Rental and Leasing	53	244	496
Employment, Professional, Scientific, and Technical Services	20	917	1,966
Employment, Management of Companies and Enterprises	0	13	39
Employment, Administrative and Support and Waste Mgt. Services	87	291	894
Employment, Educational Services	108	980	2,285
Employment, Health Care and Social Assistance	113	1,188	3,038
Employment, Arts, Entertainment, and Recreation	28	234	479
Employment, Accommodation and Food Services, etc.	154	755	1,981
Employment, Other Services	22	494	1,314
Employment, Public Administration	64	444	1,131
Occupation (Pop 16+)			
Management, Business, and Financial Operations	162	2,193	5,188
Professional and Related	144	2,534	6,219
Service	351	1,599	4,073
Sales and Office	307	2,997	6,636
Farming, Fishing, and Forestry	1	20	37
Construction, Extraction, and Maintenance	62	613	1,818
Production, Transportation, and Material Moving	237	1,160	2,705
General Employment Characteristics (Pop 16+)			
Total Civilian Potential	1,264	11,116	26,676
White Collar	613	7,724	18,043
Blue Collar	299	1,773	4,523
Private for-Profit Wage and Salary Workers, Employee	927	7,866	19,072
Private for-Profit Wage and Salary Workers, Self	15	536	1,178
Private Not-for-Profit Wage and Salary Workers	92	800	1,856
Self-Employed Workers in Own Not Incorporated Business	78	686	1,676
Unpaid Family Workers	0	15	35
Local Government Workers	93	689	1,531
State Government Workers	59	368	1,016
Federal Government Workers	0	156	312
Transportation to Work (Empl 16+)			
Car, Truck, Van	1,202	10,237	24,777
Car, Truck, Van to Work Alone	1,108	9,586	22,952
Car, Truck, Van to Work Carpool	94	651	1,825
Public Transportation	0	9	35
Bus or Trolley Bus	0	0	26
Streetcar or Trolley Car	0	0	0
Subway or Elevated	0	0	0
Railroad	0	9	9
Ferry	0	0	0
Taxi	0	0	0
Motorcycle	0	13	51
Bicycle	4	4	34

Walked	1	114	217
Other Transportation	24	48	136
Travel Time to Work (Empl 16+)			
Less than 15 Min	319	2,564	5,999
15-29 Min	522	2,493	6,555
30-59 Min	286	4,190	9,903
60-89 Min	95	1,022	2,328
90+ Min	9	156	465
Work at Home	33	691	1,426
DETAILED EDUCATION CHARACTERISTICS			
Education Enrollment (Pop 3+)			
Education, Enrolled School (Pop 3+)	428	5,900	14,657
Education Male, Enrolled School (Pop 3+)	249	3,023	7,036
Education Female, Enrolled School (Pop 3+)	179	2,877	7,621
Enrolled Public School	364	4,845	12,391
Enrolled Private School	64	1,055	2,266
Enrolled Public Preprimary	0	140	340
Enrolled Private Preprimary	0	191	478
Enrolled Public Kindergarten	26	236	559
Enrolled Private Kindergarten	0	5	43
Enrolled Public Grades 1-4	24	1,075	2,741
Enrolled Private Grades 1-4	0	159	389
Enrolled Public Grades 5-8	104	1,316	2,851
Enrolled Private Grades 5-8	26	109	296
Enrolled Public Grades 9-12	119	1,223	3,020
Enrolled Private Grades 9-12	0	229	405
Enrolled Public Undergraduate College	91	791	2,549
Enrolled Private Undergraduate College	38	290	529
Enrolled Public Graduate or Professional School	0	64	331
Enrolled Private Graduate or Professional School	0	72	126
Not Enrolled in School	2,133	17,581	40,567
Education Attainment (Pop 25+)			
Less Than High School	195	662	1,584
High School	680	3,877	8,783
Some College	563	4,069	9,713
Associate's Degree	189	1,451	3,378
Bachelor's Degree	266	4,683	10,492
Master's Degree	126	1,957	4,423
Professional Degree	0	367	754
Doctorate Degree	0	215	441
DETAILED FAMILY CHARACTERISTICS			
Families By Size			
Median Size	2.90	3.04	3.18
1 Person	0	0	0
2 Person	373	3,259	7,212
3 Person	146	1,378	3,430
4 Person	89	1,190	3,008
5 Person	45	534	1,363
6 Person	14	173	415
7 or More Person	7	91	251
Families By Age			

Median Age	56.9	54.4	52.7
Aged Under 25 Years	19	79	218
Aged 25 to 34 Years	66	493	1,425
Aged 35 to 44 Years	85	1,152	3,002
Aged 45 to 54 Years	137	1,687	4,151
Aged 55 to 64 Years	154	1,703	3,703
Aged 65 to 74 Years	127	1,069	2,210
Aged 75 Years and Over	86	442	970
Family Income Characteristics			
Total Family Income($)	59,252,047	973,615,974	2,227,309,020
Median Income ($)	80,690	124,626	119,785
Average Income ($)	87,911	146,961	142,057
Per Capita Income ($)	30,417	48,125	45,542
High Income Average ($)	226,768	292,187	304,965
Families By Income			
Less than $15,000	12	104	237
$15,000 to $24,999	33	87	263
$25,000 to $34,999	35	148	459
$35,000 to $49,999	62	372	1,067
$50,000 to $74,999	162	830	2,014
$75,000 to $99,999	145	882	2,098
$100,000 to $124,999	97	903	2,150
$125,000 to $149,999	64	829	2,008
$150,000 to $199,999	30	936	2,260
$200,000 and Over	34	1,534	3,123
DETAILED NON-FAMILY CHARACTERISTICS			
Non-Families By Size			
Median Size	1.58	1.59	1.60
1 Person	484	2,697	5,377
2 Person	76	413	926
3 Person	2	44	102
4 Person	4	15	43
5 Person	0	0	5
6 Person	0	0	0
7 or More Person	0	0	0
Non-Families By Age			
Median Age	60.9	58.6	57.6
Aged Under 25 Years	17	142	345
Aged 25 to 34 Years	37	315	802
Aged 35 to 44 Years	50	343	674
Aged 45 to 54 Years	93	538	1,064
Aged 55 to 64 Years	146	681	1,300
Aged 65 to 74 Years	95	445	899
Aged 75 Years and Over	128	705	1,369
Non-Family Income Characteristics			
Total Income ($)	29,248,329	208,329,658	454,851,562
Median Income ($)	43,977	50,560	53,466
Average Income ($)	51,675	65,740	70,487
Per Capita Income ($)	43,524	55,114	57,891
High Income Average ($)	568,515	270,448	348,054
Non-Families By Income			

Less than $15,000	64	375	693
$15,000 to $24,999	58	346	676
$25,000 to $34,999	82	382	749
$35,000 to $49,999	132	470	956
$50,000 to $74,999	120	513	1,100
$75,000 to $99,999	48	389	825
$100,000 to $124,999	44	348	716
$125,000 to $149,999	15	157	345
$150,000 to $199,999	1	84	156
$200,000 and Over	2	105	237
RETAIL SALES ($000)			
Total Retail Sales (including Food Services)	90,559	639,106	1,335,904
Motor Vehicles Store Sales	76,991	221,365	394,879
Home Furnishings Store Sales	1,204	14,067	28,884
Electrical and Appliances Store Sales	276	24,490	51,283
Building Materials and Garden Store Sales	4,753	44,350	104,633
Food and Beverage Store Sales	575	27,704	66,671
Health and Personal Care Store Sales	715	18,810	46,286
Gasoline Stations Store Sales	801	39,751	87,919
Clothing and Accessories Store Sales	0	24,720	57,832
Sporting Goods Store Sales	549	19,417	38,457
General Merchandise Store Sales	132	101,310	238,141
Miscellaneous Store Sales	921	14,129	32,159
Nonstore Purchases Sales	1,974	39,590	80,395
Food Services	1,668	49,403	108,365
COST OF LIVING			
All Items - CPI (1982-84)	205.2	205.2	205.2
Apparel CPI	111.4	111.4	111.4
Education and Communications CPI	132.8	132.8	132.8
Food and Beverages CPI	198.8	198.8	198.8
Other Goods and Services CPI	350.1	350.1	350.1
Housing CPI	193.4	193.4	193.4
Medical Care CPI	351.6	351.6	351.6
Recreation CPI	117.7	117.7	117.7
Transportation CPI	211.1	211.1	211.1
EMPLOYMENT CHARACTERISTICS			
Employees, Total (by Place of Work)	1,362	10,947	22,756
Establishments, Total (by Place of Work)	140	858	1,758
Employees by Industry (Major)			
FORESTRY, FISHING, HUNTING, AND AGRICULTURE SUPPORT	0	0	0
MINING	0	0	2
UTILITIES	0	0	6
CONSTRUCTION	125	666	1,303
MANUFACTURING	150	1,737	3,151
WHOLESALE TRADE	60	576	990
RETAIL TRADE	166	1,662	3,938
TRANSPORTATION & WAREHOUSING	13	471	970
INFORMATION	10	96	205
FINANCE & INSURANCE	135	613	1,633
REAL ESTATE & RENTAL & LEASING	28	212	394
PROFESSIONAL, SCIENTIFIC & TECHNICAL SERVICES	128	754	1,946
MANAGEMENT OF COMPANIES & ENTERPRISES	5	44	63
ADMIN, SUPPORT, WASTE MGT, REMEDIATION SERVICES	105	400	783

EDUCATIONAL SERVICES	20	62	213
HEALTH CARE AND SOCIAL ASSISTANCE	266	1,714	3,043
ARTS, ENTERTAINMENT & RECREATION	22	339	680
ACCOMMODATION & FOOD SERVICES	31	1,032	2,291
OTHER SERVICES (EXCEPT PUBLIC ADMINISTRATION)	98	569	1,145
Establishments by Industry (Major)			
FORESTRY, FISHING, HUNTING, AND AGRICULTURE SUPPORT	0	0	0
MINING	0	0	1
UTILITIES	0	0	2
CONSTRUCTION	21	97	200
MANUFACTURING	3	44	94
WHOLESALE TRADE	10	61	117
RETAIL TRADE	14	119	257
TRANSPORTATION & WAREHOUSING	2	17	39
INFORMATION	2	12	24
FINANCE & INSURANCE	9	61	123
REAL ESTATE & RENTAL & LEASING	5	31	59
PROFESSIONAL, SCIENTIFIC & TECHNICAL SERVICES	26	120	230
MANAGEMENT OF COMPANIES & ENTERPRISES	1	5	8
ADMIN, SUPPORT, WASTE MGT, REMEDIATION SERVICES	9	50	101
EDUCATIONAL SERVICES	3	13	27
HEALTH CARE AND SOCIAL ASSISTANCE	17	96	186
ARTS, ENTERTAINMENT & RECREATION	2	17	36
ACCOMMODATION & FOOD SERVICES	4	49	110
OTHER SERVICES (EXCEPT PUBLIC ADMINISTRATION)	12	66	144
STANDARD OCCUPATION CLASSIFICATIONS			
SOC: All Occupations	1,340.60	10,270.41	22,099.68
SOC: Management Occupations	70.06	480.43	1,002.92
SOC: Business And Financial Operations Occupations	67.95	423.88	919.01
SOC: Computer And Mathematical Science Occupations	32.00	206.81	448.94
SOC: Architecture And Engineering Occupations	19.36	217.45	593.88
SOC: Life, Physical, And Social Science Occupations	18.39	54.41	115.43
SOC: Community And Social Services Occupations	9.89	157.72	258.84
SOC: Legal Occupations	9.82	44.27	82.92
SOC: Education, Training, And Library Occupations	80.65	131.88	673.71
SOC: Arts, Design, Entertainment, Sports, And Media Occupations	10.38	78.14	203.80
SOC: Healthcare Practitioners And Technical Occupations	82.44	418.97	832.88
SOC: Healthcare Support Occupations	60.71	313.32	634.56
SOC: Protective Service Occupations	3.79	30.19	88.06
SOC: Food Preparation And Serving Related Occupations	54.10	1,112.22	2,487.75
SOC: Building And Grounds Cleaning And Maintenance Occupations	58.22	274.87	551.68
SOC: Personal Care And Service Occupations	38.98	413.32	809.33
SOC: Sales And Related Occupations	147.25	1,515.48	3,601.77
SOC: Office And Administrative Support Occupations	240.99	1,585.62	3,445.58
SOC: Farming, Fishing, And Forestry Occupations	1.71	6.01	17.53
SOC: Construction And Extraction Occupations	91.32	511.11	1,018.00
SOC: Installation, Maintenance, And Repair Occupations	77.60	459.44	876.13
SOC: Production Occupations	86.02	1,076.47	1,967.26
SOC: Transportation And Material Moving Occupations	78.97	758.40	1,469.70
CONSUMER EXPENDITURES ($000)			
Total Annual Expenditures	75,201.4	736,603.5	1,659,580.7
Food	9,397.1	87,430.0	197,862.9
Food at home	5,270.9	46,274.1	105,049.2
Cereals and bakery products	677.8	5,889.6	13,379.8

Dairy products	545.8	4,775.8	10,882.0
Fruits and vegetables	1,021.6	9,141.5	20,763.4
Nonalcoholic beverages	510.5	4,349.5	9,841.5
Food prep (consumed out of town)	77.6	769.7	1,734.6
Food away from home	4,112.6	41,195.9	92,904.3
Food on out-of-town trips	398.7	4,378.6	9,796.5
Alcoholic beverages	645.2	6,834.2	15,324.8
Housing	24,274.2	229,279.2	518,535.7
Household operations	1,847.6	19,072.6	44,031.2
Housekeeping services	186.3	2,542.4	5,566.0
Household furnishings and equip	2,488.5	24,733.6	55,690.3
Household textiles	132.0	1,171.9	2,661.8
Furniture	590.6	6,025.4	13,579.5
Floor coverings	26.4	286.9	642.8
Major appliances	387.0	3,696.1	8,306.7
Small appliances	49.6	446.4	1,012.9
Miscellaneous household equip	1,175.2	11,877.4	26,736.8
Apparel and services	2,233.3	22,252.9	50,348.4
Men and boys	530.8	5,246.5	11,914.0
Men, 16 and over	411.3	4,106.9	9,279.2
Boys, 2 to 15	113.8	1,085.0	2,541.3
Women's and girls	855.9	8,190.2	18,524.6
Women, 16 and over	744.6	7,126.2	16,077.9
Girls 2 to 15	107.3	1,031.2	2,386.6
Children under 2	89.8	1,005.4	2,511.3
Footwear	463.3	4,414.5	10,025.9
Other apparel products and services	298.0	3,747.3	8,245.0
Transportation	11,919.7	108,617.9	246,143.1
Vehicle purchases (net outlay)	4,766.9	43,151.7	97,874.1
Gasoline and motor oil	2,484.4	21,391.7	48,711.1
Other vehicle expenses	3,841.6	34,603.2	78,439.1
Public transportation	777.9	9,544.9	21,200.5
Health Care	6,502.3	55,711.3	125,458.0
Health insurance	4,430.5	37,537.8	84,526.9
Medical services	1,205.3	10,977.6	24,818.2
Drugs	669.5	5,375.5	11,992.3
Medical supplies	208.8	1,883.3	4,207.7
Entertainment	3,938.9	38,544.9	86,776.1
Fees and admissions	905.5	10,924.9	24,404.4
Television, radios, sound equip	1,398.2	12,178.6	27,473.7
Pets, toys, and playground equip	1,051.9	9,670.1	21,893.1
Other entertainment supplies	573.3	5,903.8	13,279.6
Personal care products, services	916.4	8,816.7	19,853.6
Reading	166.4	1,532.7	3,422.8
Education	1,552.9	19,146.1	42,649.2
Tobacco products, supplies	428.6	3,381.6	7,673.1
Cash contributions	2,710.7	31,283.0	68,616.3
Personal insurance and pensions	9,006.7	104,936.9	235,388.9
EASI DEMOGRAPHIC PROFILES			
Above Average Education	67	129	124
Apartments (20 or more units)	71	83	81
Available Renting Units	53	56	53
Pre-School Profile	38	57	79
Below Average Education	93	40	41
Blue Collar Profile	134	80	87
Born in America	141	142	132

Expensive Homes	43	117	120
Few Teens	140	76	63
House for Sale	179	108	92
In the Armed Forces	86	91	89
Large Families	51	77	84
Long Time Residents	51	58	55
Lots of Cars	114	142	140
Median Age Profile	179	143	125
Median Income Profile	89	150	152
No Cars	42	46	45
Not in Labor Force Profile	119	103	83
Old and Rich Households	54	96	87
Old Homes	92	82	75
New Homes	137	90	83
Recent Movers	101	69	67
Retired Workers Profile	157	96	81
Service Employment Profile	169	79	86
Subway or Bus to Work	54	59	58
Trailer Park City	196	95	84
Unattached and Available	114	77	79
Unemployed Workers Profile	60	51	53
Very Asian	57	82	90
Wealthiest Asian Households	110	109	104
Wealthiest Black Households	77	109	90
Wealthiest Families	54	116	121
Wealthiest Hispanic Households	106	93	93
Wealthiest Households	57	121	127
Wealthiest Non-Family Households	60	89	115
Wealthiest White Households	62	124	130
Very Spanish	50	50	55
Work at Home	92	128	122
Young and Rich Households	65	65	65
EASI SALES POTENTIALS			
Culture Index	97	97	97
Amusement Index	103	111	112
Restaurant Index	80	108	107
Medical Index	112	109	107
Religion Index	168	133	117
Education Index	157	123	104
Bargain Seekers Market	122	70	66
Higher Priced Product Market	97	150	153
Luxury Priced Product Market	76	155	149
Mortality Index (All Causes)	154	96	82
EASI QUALITY OF LIFE			
EASI Quality of Life Index (US Avg=100)	67	70	69
Crime			
EASI Total Crime Index (US Avg=100; A=High)	132	71	63
Murder Index (US Avg=100; A=High)	136	69	65
Forcible Rape Index (US Avg=100; A=High)	110	91	90
Forcible Robbery Index (US Avg=100; A=High)	66	75	74
Aggravated Assault Index (US Avg=100; A=High)	138	71	58
Burglary Index (US Avg=100; A=High)	193	88	69
Larceny Index (US Avg=100; A=High)	155	97	83
Motor Vehicle Theft Index (US Avg=100; A=High)	139	91	84

Weather			
EASI Weather Index (US Avg=100)	34	34	34
Earthquake Movements (Land Movement Probability) Index	0.05	0.05	0.05
Annual Maximum Average Temperature (Degrees)	58	58	58
Annual Minimum Average Temperature (Degrees)	39	39	39
Annual Average Temperature (Degrees)	48.6	48.6	48.6
Annual Heating Degree Days (Tot Degrees < 65)	6,569	6,569	6,569
Annual Cooling Degree Days (Tot Degrees > 65)	626	626	626
Percent of Possible Sunshine	53	53	53
Mean Sky Cover (Sunrise to Sunset - Out of 10)	7	7	7
Mean Number of Days Clear (Out of 365 Days)	76	76	76
Mean Number of Days Rain (Out of 365 Days)	136	136	136
Mean Number of Days Snow (Of 365 Days)	13	13	13
Average Annual Precipitation (Total Inches)	33	33	33
Average Annual Snowfall (Total Inches)	41	41	41
BLOCK GROUP COUNT	3	17	37

Footnotes:
Easy Analytic Software, Inc. (EASI) is the source of all updated estimates. All other data are derived from the US Census and other official government sources. Consumer Expenditure data are derived from the Bureau of Labor Statistics.

All estimates are as of 1/1/2018 unless otherwise stated.

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9

ARTICLES

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Not Sexy, But Investors Should Consider The Simplicity Of Self-Storage

Brad Thomas, CONTRIBUTOR
I cover REIT investing. **FULL BIO**

Opinions expressed by Forbes Contributors are their own.

TWEET THIS

So why purchase shares of a REIT that focuses on the self-storage industry?

We all need storage.

The interior of Shurgard Storage self-storage in Seattle, Wash. (AP Photo/Kevin P. Casey)

Recently, the boring world of self-storage somehow became one of the most sought-after ways to invest in real estate.

It doesn't sound sexy, but, like anything with a good return, it actually is.

In days past, it used to be that those looking to invest in real estate were mostly interested in apartment property, real estate investment's "gold standard."

There are many reasons to branch out, one of which is, you guessed it, millennials.

Millennials, one of the largest groups in history, can't afford single-family homes (which are going up in price), but they still want to move out of their parents' houses. This brings the demand for apartments up, setting off an excess supply of apartment construction, in part due to the slowing of job expansion.

So why purchase shares of a REIT that focuses on the self-storage industry?

For one, it's recession-proof. This was proven by Forbes 400-member B. Wayne Hughes when he built a $2.4 billion fortune on self-storage. He was clearly doing something right. You can't argue with that.

In a bad economy, people start trading in luxury goods for, well, less luxury goods. Apparently, storage units, are - ding ding! - not luxury! *Which turns out to be their appeal.*

In fact, during the 2008 economic downturn, self-storage was the only REIT sector that posted a positive return of five percent including dividends. We think that's kind of big deal.

We all need storage. The demand for them is inelastic. Which is why, in 2015, self-storage was up 40 percent while other REIT sectors and stocks as a whole, were either flat or nothing to write home about. This year, self-storage is in third place among REITs in terms of returns. Again, we think this is kind of a big deal.

Storage facilities need little capital outlay or upkeep, their property taxes are modest, and net acquisitions in that sector have surged.

And so, in good times and in bad, kind of like marriage, good old storage units are like a trusty old spouse. They smell kind of bad, but they're not going anywhere.

In my newsletter, *Forbes Real Estate Investor*, I cover all of the self-storage REITs, including the big gorilla, **Public Storage** (PSA) that was cofounded by Wayne Hughes.

Self-storage REITs comprise roughly 8% of the REIT Index, i.e. the Vanguard REIT Index (VNQ). Within my self-storage index, I track these five REITs, which account for roughly $60 billion in market value: **CubeSmart** (CUBE) **Extra Space Storage** (EXR), **Public Storage** (PSA), **Life Storage** (LSI), and **National Storage** (NSA).

In the third quarter, earnings were better than anticipated: Extra Space Storage, CubeSmart and Life Storage beat funds from operations (FFO) expectations while Public Storage lagged. CUBE and EXR raised full-year guidance while LSI maintained guidance, and PSA does not provide guidance. Same-store metrics were slightly better than expected with average revenue growing 3.0% and net operating income growing 2.9%.

Retirement

APR 13, 2016 @ 12:00 PM 12,003 VIEWS

How Humdrum Self-Storage Became The Hottest Way To Invest In Real Estate

Joshua Rogers, CONTRIBUTOR

I explore novel and contrarian ways some smart, wealthy people invest. FULL BIO

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TWEET THIS

Break-even for self-storage is just 45% occupancy, far below that of other sectors.

self-storage REITs don't look ready to slow down anytime soon. That makes them truly a store of value.

You've run out of room to stash that old cherrywood table, your high school sports trophies, Grandma's wedding dress and those bulging boxes of tax records. What to do? Rent a 10-by-15-

with an attic, you have one now.

As commercial property goes, self-storage has none of the sex appeal of a gleaming office building or a ritzy shopping mall. There are more than 50,000 self-storage facilities in the U.S. — nondescript warehouses filled with cubicles where Americans keep the belongings that don't fit into their homes. But even though self-storage is about as unassuming an industry as you can get, it turns out to be a pretty solid investment — often better than other kinds of real estate.

Readers of this column know that I often take note when wealthy, savvy investors figure out new, unconventional ways to get a good investment return. For several years, their favorite kind of real estate investment was the apartment property. But in the last several months, they've shifted to self-storage, a property type that seems a little humdrum.

Why? It is recession-resistant. There are other interesting factors that I'll explain. But first, here's some good news. Though some of the most exciting types

investors can participate in the self-storage real estate market by purchasing shares of a real estate investment trust, or REIT, that concentrates on this industry. And even very wealthy investors can learn a lot about the sector by studying self-storage REITs and taking a cue from Forbes 400 member B. Wayne Hughes, who built his $2.4 billion fortune on self-storage.

The biggest REITs own vast pools of commercial property, such as offices, shopping centers or, in some cases, self-

type we're talking about are called equity REITs.) Their publicly traded shares usually offer nice dividend yields, paid for by tenants' rent. Unlike buying and selling a building or a stake in a self-storage property partnership, a cumbersome process involving deeds and brokers and lawyers, trading in and out of REIT shares is as easy as buying and selling stock on a stock exchange.

Of course, nothing in the investing world is invulnerable. Like any other asset, real estate values can fall, particularly in a recession. That's true of your home: Housing values, as measured by the S&P/Case-Shiller index, still haven't completely recovered from their plunge during the financial crisis. Back then, most REITs got walloped, too. The FTSE NAREIT All Equity REIT index lost almost 40% in 2008, even worse than the Standard & Poor's 500 index of stocks.

But not self-storage.

storage was the only REIT sector to post a positive total return of 5%, including dividends. That's quite a distinction, sort of like being the last contestant standing on *The Voice*.

Gallery

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The reason is that, in good times and bad, there is a need for these convenient repositories of clutter that no one can bear to toss out because, well, they might need it someday. In 2015, a flat year for stocks in general and a so-so one for REITs — equity REITs as a whole were up just 2.8% — self-storage had a boffo performance, up 40%, blowing away all other REIT sectors. This year, self-storage is in third place for returns among REITs.

In case you're wondering, as an investment class, equity REITs have done very well historically. Over five, 15, 20 and 25 years, equity REITs have outdone the S&P 500, the standard benchmark for stocks. Over 10 years, REITs trailed by a tiny amount, an annual 7.5%, compared to 7.7% for the S&P. So standing out in such a well-

Now, let's be clear: I'm not saying that self-storage is a magical wealth-creating machine. This is not a glamorous business, and occasionally self-storage REITs have a negative year. Just not often, and hardly ever in recession years. If they do dip amid a recession, historically it has been small and followed by a strong comeback.

Let's look at the largest self-storage REIT, Public Storage PSA +3.04% (PSA). Founded in 1972 by B. Wayne Hughes, the company has 2,200 locations in the U.S. and Europe, with 142 million square feet of rentable space. (Hughes still serves as the company's "chairman emeritus," and his two children serve on its board of directors.) Public Storage slumped 20% in 2008, when the entire world economic system almost collapsed. Then in early 2009, it exploded, up fivefold — far better than the S&P 500, for sure. It pays a 2.5% dividend yield, better than the 2% from the S&P.

Potential self-storage yields can range even higher, if you opt for a private REIT, which means its shares can't be purchased on an exchange. The goal of these nontraded REITs is to be bought, either by another REIT or by a private equity firm. Take SmartStop Self Storage, which pays out 6%. Extra Space Storage (EXT), a public REIT, purchased it last year for $1.3 billion. SmartStop CEO H. Michael Schwartz

five years.

Publicly traded REITs are probably the safest bet for most investors. That's because analysts closely follow them and they're transparent. Plus, there's no up-front fee to purchase them. For wealthier investors, nontraded REITs, which do charge up-front loads (but not necessarily if your advisor is fee-based only), are potentially interesting. After all, they're smaller and can pick away in sharpshooter fashion at a niche in the market that a behemoth like Public Storage can't be bothered with. Later, once a well-managed small REIT has assembled a significant portfolio, it can sell itself to a bigger player at a hefty premium.

With a private REIT, you can't cash out your investment instantly, as you can with a public REIT. You typically are locked in for a set period, maybe up to 10 years, although some allow you to withdraw piecemeal after a while. That confers some meaningful advantages. For example, the REIT doesn't have to worry about having to sell off properties to cover redemptions in a market panic. So if you're a wealthy, patient investor who values the idea of being involved with others like you, there may be a play here for you.

The self-storage sector has a lot of good news around it. Its key demographic driver will be strong for some time: the

bedroom house, they want to hang on to their beloved possessions, maybe to give them to their kids or to ship to a vacation home once they buy one.

Another ramification is a large and continuing migration to the Sun Belt, for both workers and retirees, and moves always mean households find how much excess they have. Further, in the wake of the recession, small businesses have awakened to self-storage as a great place to house excess inventory for less money than maintaining a warehouse.

One of the advantages of self-storage is that it involves little capital outlay, as compared to other kinds of commercial real estate, such as malls or offices or apartments. It also needs precious little upkeep. When an occupant moves out, management doesn't have to repaint or fix the plumbing. All that's needed is to sweep out the now-empty unit. Break-even for self-storage is just 45% occupancy, far below that of other sectors.

Self-storage is a classic mom-and-pop operation, owing to the low level of upkeep and capital spending required. That means it is ripe for consolidation by REITs. REITs bring economies of scale, with more money for marketing and thus better recruitment of space renters. Since 2012, NAREIT figures show that net acquisitions in the self-

The hot play among REITs lately has been in apartments, which benefit from their own demographic trend. Nevertheless, self-storage may be a superior investment for the long term. The reason is interesting.

The millennial generation is powering the surge in apartment REITs. Last year, this group became the most populous in the U.S., containing 75 million people. With single-family-home prices high and climbing, apartments are the habitat of choice for the young set. Hence, there's been a burst of growth for apartment REITs over the past five years. Once they can afford it, young adults leave their parents' place and head for apartments. And they keep renting for a long time. According to real estate site Zillow, first-time homebuyers these days rent for six years before buying; back in the 1970s, it was 2.6 years. That all suggests that more demand for apartments is coming.

Trouble is, all this crowding into rented housing has set off a boom in apartment construction. In 2016's first quarter, rents dipped 4% and vacancies nudged up. Thus, research firm Green Street Advisors projects a tapering of growth in revenue per available foot between now and 2020. It cites elevated supply and slowing of job expansion

While more self-storage units are also under construction, this is not a frenzy.

residential neighbors, who vote, self-storage seems tacky. Also, town councils rightfully see that a new self-storage locale won't be a job spur. The projects are easy to build, meaning no bonanza for local contractors, and only need a couple of guys to run the place. And they don't pay huge property taxes.

Could self-storage REITs be getting frothy, too? Sure. And there is some evidence that, at least with the top-tier self-storage REITs, valuations may be getting a bit rich. Green Street says that the biggest three self-storage REITs change hands at a 40% premium to net asset value.

The kingpin of self-storage REITs, Public Storage, with a $47 billion market cap, has a price-earnings multiple of 28 (where earnings are defined as funds from operations, which adds in depreciation and amortization expenses). On the other hand, the company has an enormous cash position and its 2.5% yield, while not stellar, is well-protected, meaning it has the financial resources to keep paying the dividend.

In short, self-storage REITs don't look ready to slow down anytime soon. That makes them truly a store of value.

THE WALL STREET JOURNAL.

http://www.wsj.com/articles/investors-gird-for-storage-wars-1434479932

REAL ESTATE | DEAL OF THE WEEK

Investors Gird for Storage Wars

The self-storage industry is attracting REITs and others eager to lock in stable returns

Vista Self Storage, a storage facility in Orlando, Fla., sold for $11.8 million after a bidding war among 18 potential buyers.
PHOTO: MARCUS & MILLICHAP

By **ROBYN A. FRIEDMAN**
June 16, 2015 2:38 p.m. ET

A new bidding war is breaking out in real estate. The targets of attention aren't luxury properties or waterfront land, but something far less fashionable: self-storage warehouses.

A 97,000-square-foot self-storage facility in Orlando, Fla., recently sold for $11.8 million to Westport Properties Inc., a self-storage operator, after a bidding battle among 18 potential purchasers, including several real-estate investment trusts, or REITs.

The seller, Vista Self Storage Co., received a price of about $121 a square foot, a significant premium over the $100-a-square-foot average sales price commanded by storage properties in the Orlando market.

"This is a perfect example of how hot the self-storage market is," said Michael Mele, senior director of the National Self-Storage Group at Marcus & Millichap, which brokered the deal. "I wouldn't consider this an A-quality facility or location, but we cornered over 18 offers," he said.

The self-storage sector differs from other types of commercial real estate because the market is fragmented, with 80% of the facilities owned by individuals or small investors, Mr. Mele said. While REITs would prefer to buy portfolios, "the reality is that most of the self-storage transactions are single-property deals," he said.

The self-storage industry is benefiting from a number of trends, including a scarcity of new supply coupled with population growth and a strengthening economy, which energize the housing market. A strong economy creates demand for storage by commercial users, while a robust housing market means more people will be moving and storing personal belongings.

Tight supply has led to increased occupancy at many properties, which fuels higher rents and attracts the interest of investors eager to lock in stable returns.

"From both an operations and investment perspective, self-storage is an exceptionally good investment," said David Blum, a Coral Springs, Fla.-based consultant to the self-storage industry. "We have not built any new product in a long time, and over the next two years we need another 3,000 facilities to keep up with the shortfall."

Also fueling demand for self-storage facilities by investors is the perception that the sector is recession-resistant, with demand for storage strong in both good economic times and bad. According to the National Association of Real Estate Investment Trusts, at the height of the recession and financial crisis in 2008, self-storage REITs delivered a 5.1% total return, which comprises price appreciation and dividends. In comparison, the FTSE Nareit All Equity REIT Index, which tracks all REITs, posted a negative return of 38% that year.

In recent years, self-storage REITs have continued to outperform the broader stock market and other REITs, producing a total return of 31% last year compared with 28% for all equity REITs and 14% for the S&P 500 index.

MORE IN PROPERTY REPORT

- A Glut of Mall Space Echoes in India
- Office Towers Aim for a Cooler Vibe
- Tyler Perry's House of Production Close to a Wrap

"Self-storage is the perfect storm of ideal investment qualities," said Jim Berry, managing member of RRB Development LLC in Atlanta, who is developing two Class A self-storage facilities with CubeSmart. "It consistently performs, it is resilient to economic turmoil, it has a unique ability to grow rents and thus returns, and it's safe."

To be sure, if interest rates rise, that could affect the returns investors receive, said Mr. Blum, the industry consultant. But many in the sector said there is such a shortage of facilities they don't see oversaturation as being an issue.

Drew Hoeven, president of the real-estate group at Irvine, Calif.-based Westport Properties, which acquired the Vista facility in Orlando, said his company has been developing and acquiring individual properties across the U.S. since 1985 and owns or operates 85. While he said he is bullish on the sector as a whole, he worries about the volume of capital entering the market from institutions and large investors such as REITs.

These investors, he said, are bidding up prices and making it "difficult finding a diamond in the rough." Plus, sellers are more likely to sign with buyers who have a track record in the industry and are more likely to fulfill the terms of the contract and close on time, he said.

"There is a laundry list of institutional guys trying to hop into our space, and the REITs have access to capital that is a lot cheaper than us," said Mr. Hoeven.

Some investors are building instead of buying. Jay Massirman, managing partner of Miami City Self Storage LLC, recently closed on the purchase of six parcels and plans to develop one million square feet of state-of-the-art facilities in urban areas in South Florida. He expects to break ground on five buildings in the next 60 days and has an additional 10 development deals in the pipeline.

"We're bullish on the industry, but we know there's competition impending or that economic changes could take place," he said. "So we're trying to move this business plan as far as we can ahead to accomplish our mission."

Mr. Massirman has a diversified exit strategy for his investments. If interest rates remain low, he said he might refinance his loans and hold the properties long term. If rates creep up, he would consider selling.

"The main thing for us right now is to secure the sites and build as quickly as possible," Mr. Massirman said. "Once we get them built, we're relatively comfortable that the sites we've chosen are good sites and that we'll be OK."

NEW YORK TOP UNDERSUPPLIED, OKLAHOMA CITY TOP OVERSUPPLIED MARKETS FOR SELF-STORAGE FACILITIES

The CBRE Self-Storage Metro Market Report ranks market conditions overlaid with a scoring model based on occupancy, income and cap rate data.

KEY FINDINGS

- The New York metropolitan area leads the list of top undersupplied markets with a score of 213.96 (average = 100 and is based on occupancy, income and cap rate) or 215% above the national average. San Jose, Los Angeles, San Diego and Baltimore round out the top-five undersupplied markets. Zoning regulations in some markets impact delivery of new construction.
- Oklahoma City is the top oversupplied market with a score below the national average. Based on occupancy, income and cap rate, Oklahoma City has an index of 61.0%. Memphis, Columbus, Kansas City and Salt Lake City round out the top-five oversupplied markets. Demand is affected by demographic variables, such as household income. There also are ancillary impacts on these rankings, such as low-density developments.
- Of 38 metro markets analyzed, 16 are characterized as undersupplied; 11are at equilibrium; and 11 are oversupplied.

The charts on the following two pages list the results of the Metro Market Report first by ranking and then alphabetially. This analysis is a useful tool for comparing major metro market conditions in the U.S. However, it is critical to note that the best analytics for the self-storage sector is by local trade area. From our investor surveys and zip code studies of existing facilities, it is clear the trade area for self-storage is relatively small, or a 3-mile radius. The metrics presented here should not be relied upon for local trade area analysis because for example, within an undersupplied metro, there can be pockets of oversupplied trade areas due to zoning, overbuilding or demographic trends. Therefore, we have created this ranking tool for use from a national perspective.

For metrics on new construction starts nationally and by major metro, please refer to our updated construction report under Publications on the CBRE Self-Storage Valuation website.

SELF-STORAGE VALUATION

has access to in-depth levels of market research such as this and real time data from our other lines of service. This market intelligence allows for the appraisers to employ the most current and detailed analysis of the market in our reports. Our self-storage specialists completed over 500 appraisals in 2015 and several self-storage portfolios across the country.

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METRO MARKET ANALYSIS - BY RANKING

Metro	Square Footage Per Person	Forecast Demand	Variance	Conclusion	Score	Index
New York Metro	3.52	3.24	-0.29	Undersupplied	213.96	215.0%
San Jose	4.46	5.17	0.71	Undersupplied	161.38	162.1%
Los Angeles	4.72	6.08	1.36	Undersupplied	158.43	159.2%
San Diego	6.22	7.55	1.33	Undersupplied	133.39	134.0%
Baltimore	4.90	5.43	0.53	Undersupplied	114.32	114.9%
Portland	5.50	7.16	1.66	Undersupplied	112.94	113.5%
Philadelphia	4.58	5.32	0.74	Undersupplied	101.88	102.4%
Minneapolis	5.04	5.49	0.45	Undersupplied	100.06	100.5%
Hartford	5.15	5.85	0.70	Undersupplied	89.86	90.3%
Orlando	7.00	7.95	0.95	Undersupplied	85.46	85.9%
Phoenix	6.12	7.12	1.01	Undersupplied	84.35	84.8%
Detroit	5.49	6.34	0.84	Undersupplied	84.04	84.4%
Cleveland	5.40	7.06	1.66	Undersupplied	79.28	79.7%
Charlotte	6.05	6.95	0.90	Undersupplied	74.81	75.2%
Cincinnati	3.99	6.86	2.88	Undersupplied	68.12	68.4%
Indianapolis	6.10	7.16	1.06	Undersupplied	67.77	68.1%
San Francisco	5.58	5.26	-0.31	Equilibrium	199.76	200.7%
Miami	6.65	6.92	0.27	Equilibrium	130.92	131.5%
Boston	4.73	5.10	0.37	Equilibrium	125.01	125.6%
Denver	6.57	6.19	-0.38	Equilibrium	116.27	116.8%
Chicago	5.71	5.16	-0.56	Equilibrium	97.59	98.1%
Sacramento	7.56	7.44	-0.13	Equilibrium	95.11	95.6%
San Bernardino/Riverside	7.42	8.20	0.78	Equilibrium	84.64	85.0%
Atlanta	7.06	6.40	-0.66	Equilibrium	78.36	78.7%
San Antonio	7.33	7.66	0.33	Equilibrium	78.22	78.6%
St. Louis	6.42	6.31	-0.11	Equilibrium	77.57	77.9%
Las Vegas	8.01	8.54	0.53	Equilibrium	75.33	75.7%
Seattle	7.05	5.87	-1.19	Oversupplied	123.18	123.8%
Tampa-St. Petersburg	7.61	7.12	-0.49	Oversupplied	94.03	94.5%
Dallas	7.88	6.27	-1.61	Oversupplied	88.91	89.3%
Austin	8.60	7.12	-1.48	Oversupplied	85.18	85.6%
Nashville	8.51	7.07	-1.43	Oversupplied	80.13	80.5%
Houston	8.98	6.38	-2.60	Oversupplied	78.22	78.6%
Salt Lake City	9.55	7.93	-1.62	Oversupplied	74.21	74.6%
Kansas City	7.87	6.68	-1.20	Oversupplied	72.62	73.0%
Columbus	8.75	7.13	-1.62	Oversupplied	72.44	72.8%
Memphis	8.87	8.04	-0.83	Oversupplied	63.57	63.9%
Oklahoma City	10.12	7.55	-2.57	Oversupplied	60.71	61.0%

Compiled by CBRE / Source: Almanac 2016 & REIS

METHODOLOGY

CBRE's Self-Storage Valuation Metro Market Report ranks current U.S. market conditions overlaid with a scoring model based on occupancy, income, and cap rate data in top metro markets. The result is a ranking of top metro markets for self-storage, segmented among top performers, market conditions (undersupply, oversupply or equilibrium).

The scoring model is based on REIS information, along with cap rate data from the CBRE's Q2 Self-Storage Investor Survey. Market conditions are determined by our proprietary econometric model that compares existing supply per person to four demographic variables: population, percent of renters, average household size and average household income.

CBRE

METRO MARKET ANALYSIS - ALPHABETICAL

Metro	Square Footage Per Person	Forecast Demand	Variance	Conclusion	Score	Index
Atlanta	7.06	6.40	-0.66	Equilibrium	78.36	78.7%
Austin	8.60	7.12	-1.48	Oversupplied	85.18	85.6%
Baltimore	4.90	5.43	0.53	Undersupplied	114.32	114.9%
Boston	4.73	5.10	0.37	Equilibrium	125.01	125.6%
Charlotte	6.05	6.95	0.90	Undersupplied	74.81	75.2%
Chicago	5.71	5.16	-0.56	Equilibrium	97.59	98.1%
Cincinnati	3.99	6.86	2.88	Undersupplied	68.12	68.4%
Cleveland	5.40	7.06	1.66	Undersupplied	79.28	79.7%
Columbus	8.75	7.13	-1.62	Oversupplied	72.44	72.8%
Dallas	7.88	6.27	-1.61	Oversupplied	88.91	89.3%
Denver	6.57	6.19	-0.38	Equilibrium	116.27	116.8%
Detroit	5.49	6.34	0.84	Undersupplied	84.04	84.4%
Hartford	5.15	5.85	0.70	Undersupplied	89.86	90.3%
Houston	8.98	6.38	-2.60	Oversupplied	78.22	78.6%
Indianapolis	6.10	7.16	1.06	Undersupplied	67.77	68.1%
Kansas City	7.87	6.68	-1.20	Oversupplied	72.62	73.0%
Las Vegas	8.01	8.54	0.53	Equilibrium	75.33	75.7%
Los Angeles	4.72	6.08	1.36	Undersupplied	158.43	159.2%
Memphis	8.87	8.04	-0.83	Oversupplied	63.57	63.9%
Miami	6.65	6.92	0.27	Equilibrium	130.92	131.5%
Minneapolis	5.04	5.49	0.45	Undersupplied	100.06	100.5%
Nashville	8.51	7.07	-1.43	Oversupplied	80.13	80.5%
New York Metro	3.52	3.24	-0.29	Undersupplied	213.96	215.0%
Oklahoma City	10.12	7.55	-2.57	Oversupplied	60.71	61.0%
Orlando	7.00	7.95	0.95	Undersupplied	85.46	85.9%
Philadelphia	4.58	5.32	0.74	Undersupplied	101.88	102.4%
Phoenix	6.12	7.12	1.01	Undersupplied	84.35	84.8%
Portland	5.50	7.16	1.66	Undersupplied	112.94	113.5%
Sacramento	7.56	7.44	-0.13	Equilibrium	95.11	95.6%
Salt Lake City	9.55	7.93	-1.62	Oversupplied	74.21	74.6%
San Antonio	7.33	7.66	0.33	Equilibrium	78.22	78.6%
San Bernardino/Riverside	7.42	8.20	0.78	Equilibrium	84.64	85.0%
San Diego	6.22	7.55	1.33	Undersupplied	133.39	134.0%
San Francisco	5.58	5.26	-0.31	Equilibrium	199.76	200.7%
San Jose	4.46	5.17	0.71	Undersupplied	161.38	162.1%
Seattle	7.05	5.87	-1.19	Oversupplied	123.18	123.8%
St. Louis	6.42	6.31	-0.11	Equilibrium	77.57	77.9%
Tampa-St. Petersburg	7.61	7.12	-0.49	Oversupplied	94.03	94.5%

Compiled by CBRE / Source: Almanac 2016 & REIS

METHODOLOGY

CBRE's Self-Storage Valuation Metro Market Report ranks current U.S. market conditions overlaid with a scoring model based on occupancy, income, and cap rate data in top metro markets. The result is a ranking of top metro markets for self-storage, segmented among top performers, market conditions (undersupply, oversupply or equilibrium).

The scoring model is based on REIS information, along with cap rate data from the CBRE's Q2 Self-Storage Investor Survey. Market conditions are determined by our proprietary econometric model that compares existing supply per person to four demographic variables: population, percent of renters, average household size and average household income.

CBRE

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PARTNERS INFORMATION

- Cutting Edge Management has compiled the information within this evaluation from several sources including personal observations, competitive employee representations, verbal confirmations by city officials and information provided by the client. Cutting Edge Management cannot attest to the accuracy or validity of information provided by the client or verbal representations made by competitive employees or by city officials. Stephan A. Ross has attempted to conduct an independent evaluation based on the forgoing.

- It should be noted that the competitive information contained with this report can and does change on a daily basis in a competitive market, and this report represents only a snapshot in time.

BIRKENSTOCK OFFICE/STORAGE BUILDING

GENOA TOWNSHIP, MICHIGAN

LIST OF DRAWINGS

CIVIL ENGINEERING

C.001	BOUNDARY / TOPOGRAPHIC / TREE SURVEY
C.002	BOUNDARY / TOPOGRAPHIC / TREE SURVEY
C.003	BOUNDARY / TOPOGRAPHIC / TREE SURVEY
C.004	BOUNDARY / TOPOGRAPHIC / TREE SURVEY
C.102	SITE PLAN PAVING & GRADING
C.201	SITE PLAN UTILITIES
C.302	SOIL MAP
C.303	TRUCK TURN PLAN
C.304	PERMEABILITY REPORT
C.305	LOT SPLIT PLAN
C.306	LOT SPLIT UTILITY PLAN

LANDSCAPING

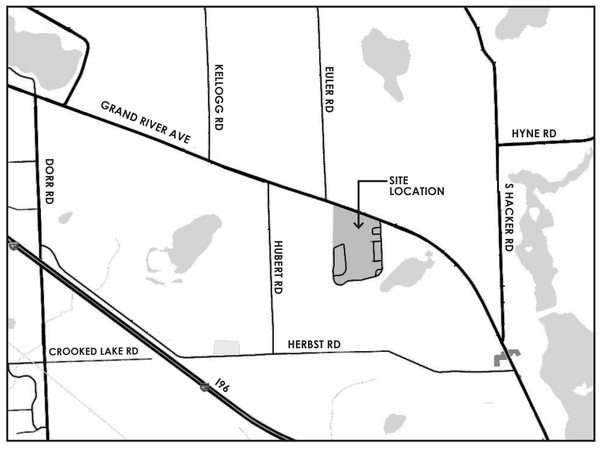
L.S.1	SITE LANDSCAPE PLAN
L.S.2	PLANTING DETAIL
LT.1	TREE REMOVAL PLAN
LT.2	TREE REMOVAL PLAN
L.901	SITE DETAILS

ARCHITECTURAL

A.S.101	CONCEPTUAL SITE PLAN
A.101	CONCEPTUAL FIRST FLOOR BUILDING PLAN & SIGNAGE
A.201	CONCEPTUAL FRONT & LEFT SIDE ELEVATIONS
A.202	CONCEPTUAL REAR & RIGHT ELEVATIONS

ELECTRICAL LIGHTING

EX.001	SITE PLAN - PHOTOMETRICS
EX.002	SITE PLAN - LIGHT FIXTURES



LOCATION MAP

PROJECT ADDRESS: **2528 HARTE DRIVE**
NO SCALE

NORTH

DEVELOPMENT TEAM

OWNER/DEVELOPER
BIRKENSTOCK ENTERPRISES, LLC
2528 HARTE DR.
BRIGHTON, MI 48114
810.499.7144

ARCHITECT/AGENT
FUSCO, SHAFFER & PAPPAS, INC.
550 E. NINE MILE RD
FERNDALE, MI 48220
248.543.4100

CIVIL ENGINEER
NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342
248.332.7931

LANDSCAPE ARCHITECT
HAGENBUCH WEIKALL
33203 BIDDESTONE
FARMINGTON HILLS, MI 48334
248.477.3600

LIGHTING DESIGN
MEEC, PC
1415 GOLDSMITH
PLYMOUTH, MI 48170
734.454.5516

DATE	ISSUE
01.29.19	P.I.D. SITE SUBMISSION
02.22.19	P.I.D. RE-SUBMISSION

FUSCO, SHAFFER & PAPPAS, INC.
ARCHITECTS AND PLANNERS

STATE OF MICHIGAN
JAMES T. PAPPAS
ARCHITECT
NO. 29064
LICENSED PROFESSIONAL ARCHITECT

SITE DATA

SITE AREA (GROSS)
MINIMUM 3 AC
PROVIDED ± 462,607 S.F. OR ± 10.62 AC

LOT WIDTH
MINIMUM 150 FT.
PROVIDED 450 FT.

ZONING
EXISTING GCD (GENERAL COMMERCIAL DISTRICT)
PROPOSED PID(PLANNED INDUSTRIAL DEVELOPMENT W/ IND BASE)

TOTAL BUILDING FOOTPRINT AREA

EXISTING	12,816 S.F.
PROPOSED	66,064 S.F.
TOTAL	78,880 S.F.

LOT COVERAGE (BUILDINGS)

MAXIMUM ALLOWED	185,042 S.F. (40%)
EXISTING	12,816 S.F. (2.7%)
PROPOSED (TOTAL INCL. EXIST'G.)	78, 880 S.F. (17%)

LOT COVERAGE (IMPERVIOUS SURFACE INCLUDING BUILDING)

MAXIMUM ALLOWED	393,215 S.F. (85%)
PROPOSED (TOTAL INC. EXIST'G)	208,921 S.F. (45.2%)

BUILDING HEIGHT

MAXIMUM ALLOWED	30 FEET - 2 STORY
PROPOSED	27 FEET - 2 STORY

BUILDING AREA (GROSS)

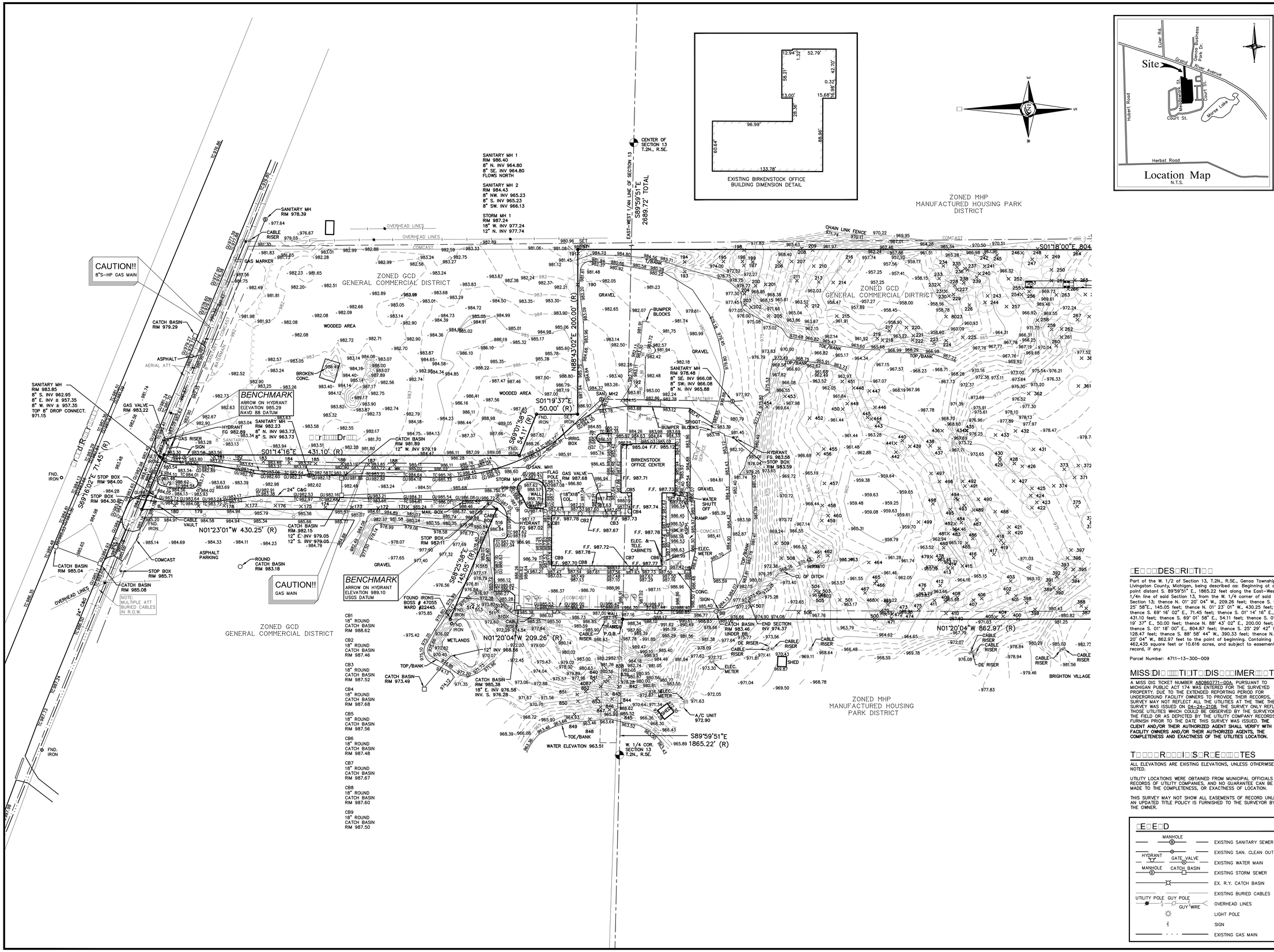
EXISTING OFFICE BLDG.	12,816 S.F.
PROPOSED STORAGE BLDG.	
STORAGE W/ SALES OFFICE (INCL. 1,000 S.F. SALES)	59,680 S.F.
MANAGERS UNIT	1,500 S.F.
TRUCK LOADING(ENCLOSED)	6,384 S.F.
TOTAL PROPOSED STORAGE BLDG.	67,564 S.F.
GRAND TOTAL(INCLUDING EXISTG.)	80,380 S.F.
STORAGE AREA(NET)	46,607 S.F.

PARKING

REQUIRED - NEW BLDG.	
STORAGE (1 C/1,500 S.F.)	43 SPACES
SALES OFFICE (1 C/300 S.F.)	4 SPACES
MANAGERS UNIT (2/UNIT)	2 SPACES
TOTAL	49 SPACES
REQUIRED - EXISTING BLDG(1C/300 S.F.)	43 SPACES
PROPOSED - NEW BLDG.	
STORAGE/SALES OFFICE(INCL. 4 P.H. SPACES)	49 SPACES
PROPOSED - EXISTING BLDG	67 SPACES

NOTES:

1. ALL INTENSITY AND DIMENSIONAL DATA NOTES AS "REQUIRED" OR "ALLOWABLE" IS BASED ON THE IND BASE ZONING STANDARDS (AS AMENDED).
2. THE BUILDING SHALL BE PROVIDED WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13.



NF ENGINEERS

CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257

SEAL

STATE OF MICHIGAN
KEVIN NAVAROLI
PROFESSIONAL SURVEYOR
NO. 53503
LICENSED PROFESSIONAL SURVEYOR

PROJECT

Birkenstock Office Center
2524 Harte Drive
Brighton, Michigan

CLIENT

Birkenstock Enterprises, LLC
2528 Harte Drive
Brighton, MI 48114

Contact: James Harte
Phone: (810) 499-7144
Fax: (734) 878-5667

PROJECT LOCATION

Part of the W. 1/2 of Section 13
T. 2N., R.5E.
Genoa Township,
Livingston County, Michigan

SHEET

Boundary / Topographic / Tree Survey

811 Know what's below Call before you dig.

DATE ISSUED/REVISED

1-29-19 PID Site Submission
2-22-19 PID Re-submission

DRAWN BY: N. Naoum

DESIGNED BY:

APPROVED BY: K. Navaroli

DATE: 02-22-2019

SCALE: 1" = 50'

50 25 0 25 50 75

NFE JOB NO. K362

SHEET NO. C.001

DESCRIPTION

Part of the W. 1/2 of Section 13, T.2N., R.5E., Genoa Township, Livingston County, Michigan, being described as: Beginning at a point distant S. 89°59'51" E., 1865.22 feet along the East–West 1/4m line of said Section 13, from the W. 1/4 corner of said Section 13; thence N. 01° 20' 04" W., 209.26 feet; thence S. 68° 25' 58" E., 145.05 feet; thence N. 01° 23' 01" W., 430.25 feet; thence S. 69° 16' 02" E., 71.45 feet; thence S. 01° 14' 16" E., 431.10 feet; thence S. 69° 01' 58" E., 54.11 feet; thence S. 01° 19' 37" E., 50.00 feet; thence N. 88° 43' 02" E., 200.00 feet; thence S. 01° 18' 00" E., 804.87 feet; thence S. 25° 29' 42" W., 128.47 feet; thence S. 88° 58' 44" W., 390.33 feet; thence N. 01° 20' 04" W., 862.97 feet to the point of beginning. Containing 462,435 square feet or 10.616 acres, and subject to easements of record, if any.

Parcel Number: 4711-13-300-009

MISSING TITLE DISCLAIMER NOTE

A MISS DIG TICKET NUMBER A80860771-00A, PURSUANT TO MICHIGAN PUBLIC ACT 174 WAS ENTERED FOR THE SURVEYED PROPERTY. DUE TO THE EXTENDED REPORTING PERIOD FOR UNDERGROUND FACILITY OWNERS TO PROVIDE THEIR RECORDS, THE SURVEY MAY NOT REFLECT ALL THE UTILITIES AT THE TIME THE SURVEY WAS ISSUED ON 04-24-2108. THE SURVEY ONLY REFLECTS THOSE UTILITIES WHICH COULD BE OBSERVED BY THE SURVEYOR IN THE FIELD OR AS DEPICTED BY THE UTILITY COMPANY RECORDS FURNISH PRIOR TO THE DATE THIS SURVEY WAS ISSUED. **THE CLIENT AND/OR THEIR AUTHORIZED AGENT SHALL VERIFY WITH THE FACILITY OWNERS AND/OR THEIR AUTHORIZED AGENTS, THE COMPLETENESS AND EXACTNESS OF THE UTILITIES LOCATION.**

TOPOGRAPHIC SURVEY NOTES

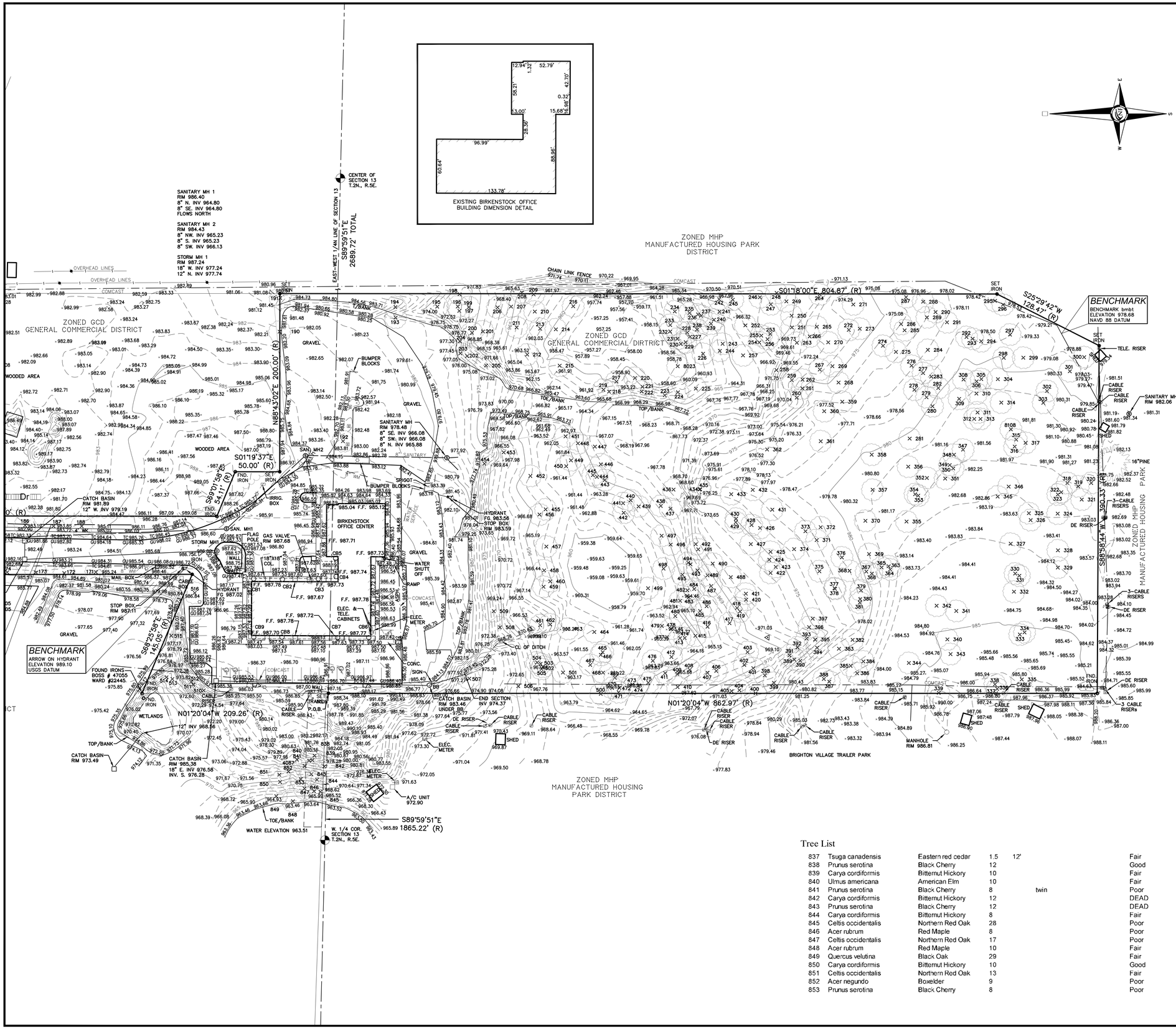
ALL ELEVATIONS ARE EXISTING ELEVATIONS, UNLESS OTHERWISE NOTED.

UTILITY LOCATIONS WERE OBTAINED FROM MUNICIPAL OFFICIALS AND RECORDS OF UTILITY COMPANIES, AND NO GUARANTEE CAN BE MADE TO THE COMPLETENESS, OR EXACTNESS OF LOCATION.

THIS SURVEY MAY NOT SHOW ALL EASEMENTS OF RECORD UNLESS AN UPDATED TITLE POLICY IS FURNISHED TO THE SURVEYOR BY THE OWNER.

LEGEND

- MANHOLE — EXISTING SANITARY SEWER
- HYDRANT / GATE VALVE — EXISTING SAN. CLEAN OUT
- MANHOLE / CATCH BASIN — EXISTING WATER MAIN
- EXISTING STORM SEWER
- EX. R.Y. CATCH BASIN
- UTILITY POLE / GUY POLE / GUY WIRE — EXISTING BURIED CABLES
- OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN



Tree List

837	Tsuga canadensis	Eastern red cedar	1.5	12'		Fair
838	Prunus serotina	Black Cherry	12			Good
839	Carya cordiformis	Bitternut Hickory	10			Fair
840	Ulmus americana	American Elm	10			Fair
841	Prunus serotina	Black Cherry	8		twin	Poor
842	Carya cordiformis	Bitternut Hickory	12			DEAD
843	Prunus serotina	Black Cherry	12			DEAD
844	Carya cordiformis	Bitternut Hickory	8			Fair
845	Celtis occidentalis	Northern Red Oak	28			Poor
846	Acer rubrum	Red Maple	8			Poor
847	Celtis occidentalis	Northern Red Oak	17			Poor
848	Acer rubrum	Red Maple	10			Fair
849	Quercus velutina	Black Oak	29			Fair
850	Carya cordiformis	Bitternut Hickory	10			Good
851	Celtis occidentalis	Northern Red Oak	13			Fair
852	Acer negundo	Boxelder	9			Poor
853	Prunus serotina	Black Cherry	8			Poor

□E□□□DES□RI□TI□□

Part of the W. 1/2 of Section 13, T.2N., R.5E., Genoa Township, Livingston County, Michigan, being described as: Beginning at a point distant S. 89°59'51" E., 1865.22 feet along the East–West 1/4th line of said Section 13, from the W. 1/4 corner of said Section 13; thence N. 01° 20' 04" W., 209.26 feet; thence S. 68° 25' 58"E., 145.05 feet; thence N. 01° 23' 01" W., 430.25 feet; thence S. 69° 16' 02" E., 71.45 feet; thence S. 01° 14' 16" E., 431.10 feet; thence S. 69° 01' 58" E., 54.11 feet; thence S. 01° 19' 37" E., 50.00 feet; thence N. 88° 43' 02" E., 200.00 feet; thence S. 01° 18' 00" E., 804.87 feet; thence S. 25° 29' 42" W., 128.47 feet; thence S. 88° 58' 44" W., 390.33 feet; thence N. 01° 20' 04" W., 862.97 feet to the point of beginning. Containing 462,435 square feet or 10.616 acres, and subject to easements of record, if any.

MISS□DI□ □□TI□T□DIS□□IMER□□TE

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T□□□□R□□□I□S□R□E□□□TES

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THIS SURVEY MAY NOT SHOW ALL EASEMENTS OF RECORD UNLESS AN UPDATED TITLE POLICY IS FURNISHED TO THE SURVEYOR BY THE OWNER.

□E□E□D

- MANHOLE — EXISTING SANITARY SEWER
- HYDRANT, GATE VALVE — EXISTING SAN. CLEAN OUT
- MANHOLE, CATCH BASIN — EXISTING WATER MAIN
- EXISTING STORM SEWER
- EX. R.Y. CATCH BASIN
- UTILITY POLE, GUY POLE, GUY WIRE — EXISTING BURIED CABLES
- OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN

NF ENGINEERS
CIVIL ENGINEERS
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LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257

SEAL

STATE OF MICHIGAN — KEVIN NAVAROLI — PROFESSIONAL SURVEYOR NO. 53503 — LICENSED PROFESSIONAL SURVEYOR

PROJECT
Birkenstock Office Center
2524 Harte Drive
Brighton, Michigan

CLIENT
Birkenstock Enterprises, LLC
2528 Harte Drive
Brighton, MI 48114

Contact: James Harte
Phone: (810) 499-7144
Fax: (734) 878-5667

PROJECT LOCATION
Part of the W. 1/2
of Section 13
T. 2N., R.5E.
Genoa Township,
Livingston County, Michigan

SHEET
Boundary / Topographic / Tree Survey

811 Know what's below Call before you dig.

DATE	ISSUED/REVISED
1–29–19	PID Site Submission
2–22–19	PID Re–submission

DRAWN BY: N. Naoum
DESIGNED BY:
APPROVED BY: K. Navaroli
DATE: 02-22-2019
SCALE: 1" = 50'
50 25 0 25 50 75

NFE JOB NO. K362
SHEET NO. C.002

Tree #	Botanical Name	Common Name	Dia.	Height	Type	Other Dia.	Condition
171	Pyrus calleryana	Bradford Pear	9		twin	6	Good
172	Pyrus calleryana	Bradford Pear	10				Good
173	Pyrus calleryana	Bradford Pear	11				Fair
174	Pyrus calleryana	Bradford Pear	9				Fair
175	Pyrus calleryana	Bradford Pear	10				Good
176	Pyrus calleryana	Bradford Pear	9				Good
177	Pyrus calleryana	Bradford Pear	10				Good
178	Pyrus calleryana	Bradford Pear	10				Good
179	Pyrus calleryana	Bradford Pear	9				Fair
180	Pyrus calleryana	Bradford Pear	10		multi		Fair
181	Pyrus calleryana	Bradford Pear	11				Fair
182	Pyrus calleryana	Bradford Pear	8				Good
183	Pyrus calleryana	Bradford Pear	6				Fair
184	Pyrus calleryana	Bradford Pear	7				Good
185	Pyrus calleryana	Bradford Pear	7				Good
186	Pyrus calleryana	Bradford Pear	9				Good
187	Pyrus calleryana	Bradford Pear	7				Good
188	Pyrus calleryana	Bradford Pear	7				Good
189	Populus deltoides	Eastern Cottonwood	14		twin	8	Poor
190	Prunus serotina	Black Cherry	13				Poor
191	Acer negundo	Boxelder	13		twin	8	Fair
192	Pyrus calleryana	Bradford Pear	7				Fair
193	Populus deltoides	Eastern Cottonwood	6				Poor
194	Acer negundo	Boxelder	7				Poor
195	Acer negundo	Boxelder	17				Poor
196	Prunus serotina	Black Cherry	9				Poor
197	Acer negundo	Boxelder	14		twin	12	Poor
198	Malus spp.	Apple	9				Poor
199	Acer negundo	Boxelder	8		multi		Poor
200	Malus spp.	Apple	7				Fair
201	Acer negundo	Boxelder	15				Poor
202	Populus deltoides	Eastern Cottonwood	8				Fair
203	Populus deltoides	Eastern Cottonwood	7				Fair
204	Populus deltoides	Eastern Cottonwood	8				Fair
205	Populus deltoides	Eastern Cottonwood	8				Fair
206	Acer negundo	Boxelder	6				Poor
207	Prunus serotina	Black Cherry	12				Good
208	Acer negundo	Boxelder	20				Poor
209	Prunus serotina	Black Cherry	11				Fair
210	Acer rubrum	Red Maple	26				Good
211	Quercus velutina	Black Oak	17				Fair
212	Quercus velutina	Black Oak	16				Fair
213	Acer negundo	Boxelder	16				Poor
214	Populus deltoides	Eastern Cottonwood	20				Fair
215	Populus deltoides	Eastern Cottonwood	30				Fair
216	Acer negundo	Boxelder	24				Poor
217	Populus deltoides	Eastern Cottonwood	26				Poor
218	Prunus serotina	Black Cherry	16		multi	12	Poor
219	Acer rubrum	Red Maple	11		twin	7	Fair
220	Acer negundo	Boxelder	6		twin		Fair
221	Prunus serotina	Black Cherry	8				Poor
222	Prunus serotina	Black Cherry	9		multi		Poor
223	Prunus serotina	Black Cherry	12				Poor
224	Prunus serotina	Black Cherry	15				Poor
225	Malus spp.	Apple	14				Poor
226	Populus deltoides	Eastern Cottonwood	22		twin	15	Good
227	Populus deltoides	Eastern Cottonwood	25				Good
228	Populus deltoides	Eastern Cottonwood	24		multi	23,15	Good
229	Acer negundo	Boxelder	6		twin		Poor
230	Prunus serotina	Black Cherry	6				Fair
231	Acer rubrum	Red Maple	12				Fair
232	Acer negundo	Boxelder	9				Poor
233	Acer negundo	Boxelder	11				Poor
234	Acer negundo	Boxelder	16		twin	8	Poor
235	Acer negundo	Boxelder	7				Poor
236	Celtis occidentalis	Northern Red Oak	6				Poor
237	Acer negundo	Boxelder	7				Fair
238	Acer negundo	Boxelder	8				Poor
239	Prunus serotina	Black Cherry	8				Good
240	Acer negundo	Boxelder	6				Poor
241	Quercus velutina	Black Oak	10				Good
242	Prunus serotina	Black Cherry	18				Poor
243	Prunus serotina	Black Cherry	8				Poor
244	Ulmus americana	American Elm	17				Fair
245	Acer rubrum	Red Maple	16				Poor
246	Quercus velutina	Black Oak	16				Fair
247	Acer rubrum	Red Maple	9				Fair
248	Prunus serotina	Black Cherry	16				Poor
249	Prunus serotina	Black Cherry	16		twin	8	Fair
250	Prunus serotina	Black Cherry	8				Fair
251	Prunus serotina	Black Cherry	12				Fair
252	Acer saccharum	Sugar Maple	15				Good
253	Celtis occidentalis	Northern Red Oak	9				Fair
254	Celtis occidentalis	Northern Red Oak	21				Fair
255	Celtis occidentalis	Northern Red Oak	10				Fair
256	Celtis occidentalis	Northern Red Oak	26				Good
257	Prunus serotina	Black Cherry	8				Poor
258	Malus spp.	Apple	8		twin		Poor
259	Pyrus spp.	Pear	12				Fair
260	Prunus serotina	Black Cherry	10		twin	10	Fair
261	Prunus serotina	Black Cherry	8		twin		Poor
262	Prunus serotina	Black Cherry	16		multi	10,8,8	Poor
263	Prunus serotina	Black Cherry	8				Fair
264	Acer rubrum	Red Maple	10		multi	8	Fair
265	Prunus serotina	Black Cherry	9		twin	9	Poor
266	Acer negundo	Boxelder	8				Fair
267	Quercus velutina	Black Oak	15				Good
268	Prunus serotina	Black Cherry	9				Fair
269	Prunus serotina	Black Cherry	8				Fair
270	Prunus serotina	Black Cherry	9				Poor
271	Celtis occidentalis	Northern Red Oak	27				Fair
272	Prunus serotina	Black Cherry	13		twin	12	Fair
273	Prunus serotina	Black Cherry	8		multi		Fair
274	Prunus serotina	Black Cherry	8				Good
275	Acer rubrum	Red Maple	14		twin	8	Fair
276	Acer saccharum	Sugar Maple	8				Good
277	Prunus serotina	Black Cherry	17				Fair
278	Acer rubrum	Red Maple	8		multi	8	Good
279	Prunus serotina	Black Cherry	14		twin	7	Good
280	Prunus serotina	Black Cherry	15				Poor
281	Celtis occidentalis	Northern White Cedar	4	20'			Poor
282	Prunus serotina	Black Cherry	8		twin	8	Fair
283	Acer rubrum	Red Maple	9				Good
284	Acer rubrum	Red Maple	8				Good
285	Prunus serotina	Black Cherry	9		multi	8	Fair
286	Acer rubrum	Red Maple	8				Fair
287	Quercus velutina	Black Oak	12				Fair
288	Prunus serotina	Black Cherry	13				Poor
289	Prunus serotina	Black Cherry	8				Fair
290	Prunus serotina	Black Cherry	8		twin	8	Poor
291	Prunus serotina	Black Cherry	12				Poor
292	Acer rubrum	Red Maple	8		multi		Good
293	Ulmus americana	American Elm	10				Fair
294	Prunus serotina	Black Cherry	8		twin	8	Poor
295	Quercus velutina	Black Oak	15				Fair
296	Quercus velutina	Black Oak	16				Poor
297	Prunus serotina	Black Cherry	10		multi	8,8	Fair
298	Acer rubrum	Red Maple	9				Fair
299	Prunus serotina	Black Cherry	8				Fair
300	Acer negundo	Boxelder	11				Fair
301	Prunus serotina	Black Cherry	16		twin	13	Fair
302	Prunus serotina	Black Cherry	14		twin	8	Poor
303	Prunus serotina	Black Cherry	15		multi	11,11,10,8	Poor
304	Prunus serotina	Black Cherry	13		multi	8,8	Poor
305	Acer rubrum	Red Maple	8				Poor
306	Acer rubrum	Red Maple	8				Good
307	Pyrus calleryana	Bradford Pear					
308	Acer rubrum	Red Maple	8		multi		Poor
309	Acer rubrum	Red Maple	9		twin		Fair
310	Prunus serotina	Black Cherry	8		twin	8	Fair
311	Acer rubrum	Red Maple	11				Fair
312	Acer rubrum	Red Maple	8		multi		Fair
313	Prunus serotina	Black Cherry	9		twin		Fair
314	Prunus serotina	Black Cherry	9		multi		Poor
315	Prunus serotina	Black Cherry	9		twin	9	Poor
316	Prunus serotina	Black Cherry	18				Fair
317	Prunus serotina	Black Cherry	8				Poor
318	Populus deltoides	Eastern Cottonwood	11				Poor
319	Populus deltoides	Eastern Cottonwood	8				Good
320	Populus deltoides	Eastern Cottonwood	11				Poor
321	Acer negundo	Boxelder	9				Fair
322	Populus deltoides	Eastern Cottonwood	15				Good
323	Populus deltoides	Eastern Cottonwood	9				Fair
324	Populus deltoides	Eastern Cottonwood	11				Fair
325	Populus deltoides	Eastern Cottonwood	8				Good
326	Populus deltoides	Eastern Cottonwood	9		twin		Fair
327	Populus deltoides	Eastern Cottonwood	9				Fair
328	Populus deltoides	Eastern Cottonwood	11				Good
329	Populus deltoides	Eastern Cottonwood	8				Fair
330	Populus deltoides	Eastern Cottonwood	9				Fair
331	Populus deltoides	Eastern Cottonwood	9				Fair
332	Populus deltoides	Eastern Cottonwood	10		twin	10	Fair
333	Populus deltoides	Eastern Cottonwood	16				Good
334	Populus deltoides	Eastern Cottonwood	14				Fair
335	Populus deltoides	Eastern Cottonwood	18				Fair
336	Populus deltoides	Eastern Cottonwood	18				Fair
337	Ulmus pumila	Siberian Elm	8		multi		Fair
338	Populus deltoides	Eastern Cottonwood	16				Fair
339	Populus deltoides	Eastern Cottonwood	19				Fair
340	Populus deltoides	Eastern Cottonwood	9				Good
341	Populus deltoides	Eastern Cottonwood	11				Fair
342	Populus deltoides	Eastern Cottonwood	10		twin	7	Fair
343	Tsuga canadensis	Eastern red cedar	1	7'			Fair
344	Tsuga canadensis	Eastern red cedar	1	8'			Fair
345	Populus deltoides	Eastern Cottonwood	15				Fair
346	Populus deltoides	Eastern Cottonwood	8				Fair
347	Populus deltoides	Eastern Cottonwood	15				Fair
348	Populus deltoides	Eastern Cottonwood	10				Fair
349	Populus deltoides	Eastern Cottonwood	16				Fair
350	Populus deltoides	Eastern Cottonwood	9				Fair
351	Acer negundo	Boxelder	11		twin	11	Fair
352	Acer rubrum	Red Maple	13				Fair
353	Acer negundo	Boxelder	10				Poor
354	Populus deltoides	Eastern Cottonwood	12				Fair
355	Populus deltoides	Eastern Cottonwood	10				Poor
356	Prunus serotina	Black Cherry	10				Poor
357	Prunus serotina	Black Cherry	14		multi	13,12	Poor
358	Prunus serotina	Black Cherry	11				Fair
359	Prunus serotina	Black Cherry	11				Fair
360	Acer rubrum	Red Maple	10				Fair
361	Prunus serotina	Black Cherry	8		multi		Poor
362	Pinus sylvestris	Scotch Pine	1	15'			Fair
363	Populus deltoides	Eastern Cottonwood	16				Poor
364	Populus deltoides	Eastern Cottonwood	16				Fair
365	Prunus serotina	Black Cherry	12		multi		Fair
366	Prunus serotina	Black Cherry	9				Fair
367	Prunus serotina	Black Cherry	12				Good
368	Acer rubrum	Red Maple	15				Fair
369	Prunus serotina	Black Cherry	10		twin		Poor
370	Prunus serotina	Black Cherry	15		twin	14	Poor
371	Prunus serotina	Black Cherry	12		multi	10	Poor
372	Prunus serotina	Black Cherry	8		twin	8	Fair
373	Quercus velutina	Black Oak	17				Fair
374	Prunus serotina	Black Cherry	8				Poor
375	Quercus velutina	Black Oak	14				Fair
376	Prunus serotina	Black Cherry	9		twin	9	Fair
377	Prunus serotina	Black Cherry	9				Fair
378	Acer rubrum	Red Maple	9				Good
379	Acer rubrum	Red Maple	9		twin		Fair
380	Prunus serotina	Black Cherry	8				Fair
381	Prunus serotina	Black Cherry	14				Poor
382	Malus spp.	Apple	10				Poor
383	Quercus velutina	Black Oak	8				Fair
384	Populus deltoides	Eastern Cottonwood	15				Fair
385	Ulmus americana	American Elm	8				Fair
386	Acer rubrum	Red Maple	10				Good
387	Prunus serotina	Black Cherry	14		multi	9	Fair
388	Prunus serotina	Black Cherry	14		twin	8	Poor
389	Acer rubrum	Red Maple	11				Good
390	Prunus serotina	Black Cherry	8				Fair
391	Acer rubrum	Red Maple	10				Fair
392	Prunus serotina	Black Cherry	12				Fair
393	Acer rubrum	Red Maple	10		twin	9	Fair
394	Prunus serotina	Black Cherry	14				Fair
395	Prunus serotina	Black Cherry	12				Fair
396	Acer rubrum	Red Maple	9				Good
397	Prunus serotina	Black Cherry	10		twin	9	Poor
398	Prunus serotina	Black Cherry	13		twin	11	Fair
399	Prunus serotina	Black Cherry	12				Poor
400	Prunus serotina	Black Cherry	10				Fair
401	Prunus serotina	Black Cherry	10				Good
402	Acer negundo	Boxelder	14		twin		Poor
403	Quercus velutina	Black Oak	14				Good
404	Prunus serotina	Black Cherry	8				Fair
405	Quercus velutina	Black Oak	8				Fair
406	Quercus velutina	Black Oak	14				Fair
407	Celtis occidentalis	Northern Pin Oak	12				Good
408	Celtis occidentalis	Northern Pin Oak	10				Good
409	Celtis occidentalis	Northern Pin Oak	25				Fair
410	Celtis occidentalis	Northern Pin Oak	10				Fair
411	Quercus velutina	Black Oak	10				Poor
412	Pinus strobus	Eastern White Pine	10	40'			Poor
413	Pinus strobus	Eastern White Pine	9	30'			Poor
414	Pinus strobus	Eastern White Pine	11	30'			Poor
415	Quercus velutina	Black Oak	14		twin		Fair
416	Quercus velutina	Black Oak	10				Fair
417	Quercus velutina	Black Oak	14				Good
418	Prunus serotina	Black Cherry	11		twin	10	fair
419	Prunus serotina	Black Cherry	9				Poor
420	Prunus serotina	Black Cherry	14		multi	13,10	Poor
421	Prunus serotina	Black Cherry	10				Poor
422	Prunus serotina	Black Cherry	10		multi	9,8	Poor
423	Prunus serotina	Black Cherry	10				Poor
424	Ulmus americana	American Elm	16				Fair
425	Ulmus americana	American Elm	16				Poor
426	Prunus serotina	Black Cherry	12		twin	10	Poor
427	Prunus serotina	Black Cherry	8		multi	8	Poor
428	Acer rubrum	Red Maple	12		twin	12	Fair
429	Prunus serotina	Black Cherry	9				Poor
430	Prunus serotina	Black Cherry	10				Poor
431	Prunus serotina	Black Cherry	8				Poor
432	Prunus serotina	Black Cherry	9		multi	8	Fair
433	Quercus velutina	Black Oak	10		twin		Good
434	Quercus velutina	Black Oak	13		twin	11	Good
435	Quercus velutina	Black Oak	9				Fair
436	Ulmus pumila	Siberian Elm	13				Fair
437	Acer negundo	Boxelder	9		twin		Poor
438	Acer negundo	Boxelder	8				Poor
439	Acer negundo	Boxelder	9				Poor
440	Populus deltoides	Eastern Cottonwood	14		twin	11	Poor
441	Prunus serotina	Black Cherry	18		twin	14	Fair
442	Carya ovata	Shagbark Hickory	8				Fair
443	Prunus serotina	Black Cherry	10		twin	9	Fair
444	Quercus velutina	Black Oak	9				Poor
445	Prunus serotina	Black Cherry	8		twin		Poor
446	Prunus serotina	Black Cherry	8				Poor
447	Morus alba	White Mulberry	12		multi	11,11	Fair
448	Prunus serotina	Black Cherry	10				Fair
449	Acer negundo	Boxelder	11				Poor
450	Acer negundo	Boxelder	21		multi		Good
451	Carya ovata	Shagbark Hickory	13				Poor
452	Quercus velutina	Black Oak	32				Fair
453	Populus deltoides	Eastern Cottonwood	8				Poor
454	Populus deltoides	Eastern Cottonwood	9				Good
455	Prunus serotina	Black Cherry	8				Poor
456	Celtis occidentalis	Northern Pin Oak	8				Fair
457	Carya ovata	Shagbark Hickory	11				Good
458	Carya ovata	Shagbark Hickory	12		twin	12	Fair
459	Carya ovata	Shagbark Hickory	12		twin		Good
460	Carya ovata	Shagbark Hickory	10				Fair
461	Acer negundo	Boxelder	11				Poor
462	Prunus serotina	Black Cherry	12		twin	10	Poor
463	Acer negundo	Boxelder	13				Poor
464	Populus deltoides	Eastern Cottonwood	39				Fair
465	Populus deltoides	Eastern Cottonwood	37				Good
466	Populus deltoides	Eastern Cottonwood	25				Fair
467	Populus deltoides	Eastern Cottonwood	23				Poor
468	Tsuga canadensis	Eastern red cedar	5	20'			Fair
469	Tsuga canadensis	Eastern red cedar	4	25'	twin	4	Poor
470	Tsuga canadensis	Eastern red cedar	6	35'			Fair
471	Pinus strobus	Eastern White Pine	20	80'			Fair
472	Pinus strobus	Eastern White Pine	13	80'			Fair
473	Pinus strobus	Eastern White Pine	14	80'			Poor
474	Pinus strobus	Eastern White Pine	10	75'			Fair
475	Prunus serotina	Black Cherry	11				Poor
476	Pinus strobus	Eastern White Pine	15	70'			Fair
477	Pinus strobus	Eastern White Pine	11	65'			Poor
478	Prunus serotina	Black Cherry	14		multi	13,12	Good
479	Prunus serotina	Black Cherry	21				Poor
480	Pinus strobus	Eastern White Pine	11	70'			Fair
481	Pinus strobus	Eastern White Pine	13	50'			Poor
482	Pinus strobus	Eastern White Pine	13	45'			Fair
483	Prunus serotina	Black Cherry	15				Fair
484	Pinus strobus	Eastern White Pine	11	70'			Fair
485	Quercus velutina	Black Oak	8				Fair
486	Acer negundo	Boxelder	8				Fair
487	Quercus velutina	Black Oak	16				Fair
488	Ulmus americana	American Elm	14				Good
489	Prunus serotina	Black Cherry	16		twin	8	Fair
490	Carya cordiformis	Bitternut Hickory	9				Good
491	Prunus serotina	Black Cherry	14		twin	8	Fair
492	Prunus serotina	Black Cherry	9				Poor
493	Pinus strobus	Eastern White Pine	13	70'			Fair
494	Prunus serotina	Black Cherry	11		twin		Poor
495	Prunus serotina	Black Cherry	9				Poor
496	Quercus velutina	Black Oak	8				Poor
497	Prunus serotina	Black Cherry	15		multi		Poor
498	Populus deltoides	Eastern Cottonwood	40				Fair
499	Populus deltoides	Eastern Cottonwood	38				Poor
500	Acer negundo	Boxelder	11				Poor
501	Quercus velutina	Black Oak	10				Fair
502	Quercus velutina	Black Oak	12				Good
503	Quercus velutina	Black Oak	9				Fair
504	Quercus velutina	Black Oak	11				Fair
505	Quercus velutina	Black Oak	10		twin	8	Good
506	Pinus resinosa	red pine	9				Poor
507	Prunus serotina	Black Cherry	18				Poor
508	Quercus velutina	Black Oak	11				Fair
509	Carya ovata	Shagbark Hickory	10		twin	8	Fair
510	Populus deltoides	Eastern Cottonwood	8		twin		Fair
511	Populus deltoides	Eastern Cottonwood	8				Fair
512	Populus deltoides	Eastern Cottonwood	9				Fair
513	Quercus velutina	Black Oak	11				Fair
514	Populus deltoides	Eastern Cottonwood	8				Fair
515	Populus deltoides	Eastern Cottonwood	9		multi	8,8	Good
516	Pyrus calleryana	Bradford Pear	12		multi	10,10	Poor

NF ENGINEERS

CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257

SEAL

STATE OF MICHIGAN
KEVIN NAVAROLI
PROFESSIONAL SURVEYOR
NO. 53503
LICENSED PROFESSIONAL SURVEYOR

PROJECT

Birkenstock Office Center
2524 Harte Drive
Brighton, Michigan

CLIENT

Birkenstock Enterprises, LLC
2528 Harte Drive
Brighton, MI 48114

Contact: James Harte
Phone: (810) 499-7144
Fax: (734) 878-5667

PROJECT LOCATION

Part of the W. 1/2
of Section 13
T. 2N., R.5E.
Genoa Township,
Livingston County, Michigan

SHEET

Boundary / Topographic /
Tree Survey

811
Know what's below
Call before you dig.

DATE	ISSUED/REVISED
1-29-19	PID Site Submission
2-22-19	PID Re-submission

DRAWN BY: N. Naoum

DESIGNED BY:

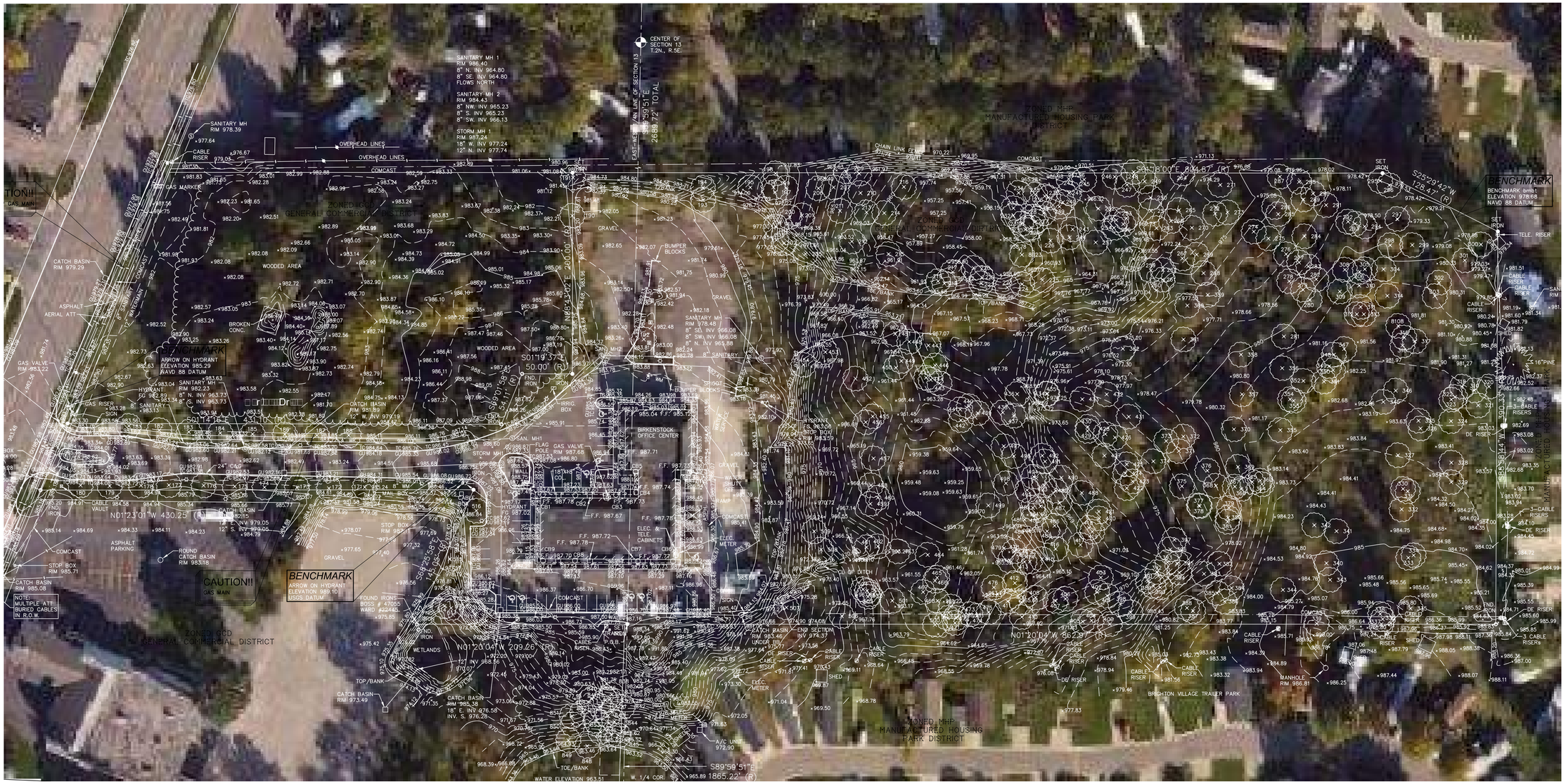
APPROVED BY: K. Navaroli

DATE: 02-22-2019

SCALE:

NFE JOB NO. **K362**

SHEET NO. **C.003**



NF ENGINEERS

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LAND SURVEYORS
LAND PLANNERS

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PONTIAC, MI 48342-5032
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SEAL

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KEVIN NAVAROLI
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PROJECT LOCATION
Part of the W. 1/2
of Section 13
T. 2N., R.5E.
Genoa Township,
Livingston County, Michigan

SHEET
Boundary / Topographic / Aerial Overlay

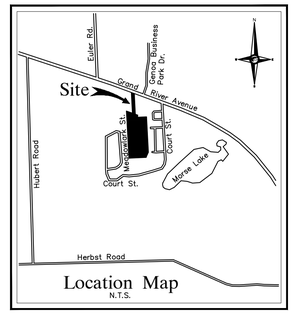
811 Know what's below Call before you dig.

DATE	ISSUED/REVISED
1-29-19	PID Site Submission
2-22-19	PID Re-submission

DRAWN BY: N. Naoum
DESIGNED BY:
APPROVED BY: K. Navaroli
DATE: 02-22-2019
SCALE: 1" = 50'
50 25 0 25 50 75

NFE JOB NO. **K362**
SHEET NO. **C.004**

□RE□IMI□□R□□□T□□□R□□□□STR□□TI□□



Location Map
N.T.S.

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
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SEAL

STATE OF MICHIGAN
MICHAEL P. KURMAS
ENGINEER
NO. 6201064137
REGISTERED PROFESSIONAL ENGINEER

PROJECT
Birkenstock Office Center
2524 Harte Drive
Brighton, Michigan

CLIENT
Birkenstock Enterprises, LLC
2528 Harte Drive
Brighton, MI 48114

Contact: James Harte
Phone: (810) 499-7144
Fax: (734) 878-5667

PROJECT LOCATION
Part of the W. 1/2
of Section 13
T. 2N., R.5E.
Genoa Township,
Livingston County, Michigan

SHEET
Site Plan
Paving & Grading

811
Know what's below
Call before you dig.

DATE	ISSUED/REVISED
1-29-19	PID Site Submission
2-22-19	PID Re-submission

DRAWN BY:
N. Naoum

DESIGNED BY:
M. Kurmas

APPROVED BY:
M. Peterson

DATE:
02-22-2019

SCALE: 1" = 50'
50 25 0 25 50 75

NFE JOB NO. K362
SHEET NO. C.102

□E□E□D

- MANHOLE — EXISTING SANITARY SEWER
- HYDRANT, GATE VALVE — SAN. CLEAN OUT
- MANHOLE, CATCH BASIN — EXISTING WATERMAIN
- EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- UTILITY POLE, GUY POLE — EXISTING BURIED CABLES
- GUY WIRE — OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN
- C.O., MANHOLE, HYDRANT, GATE VALVE — PR. SANITARY SEWER
- PR. WATER MAIN
- INLET, C.B., MANHOLE — PR. STORM SEWER
- PR. R. Y. CATCH BASIN
- PROPOSED LIGHT POLE
- TC 600.00 — PR. TOP OF CURB ELEVATION
- GU 600.00 — PR. GUTTER ELEVATION
- TW 600.00 — PR. TOP OF WALK ELEVATION
- TP 600.00 — PR. TOP OF PVMT. ELEVATION
- FG 600.00 — FINISH GRADE ELEVATION

□□□I□□ □E□E□D

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

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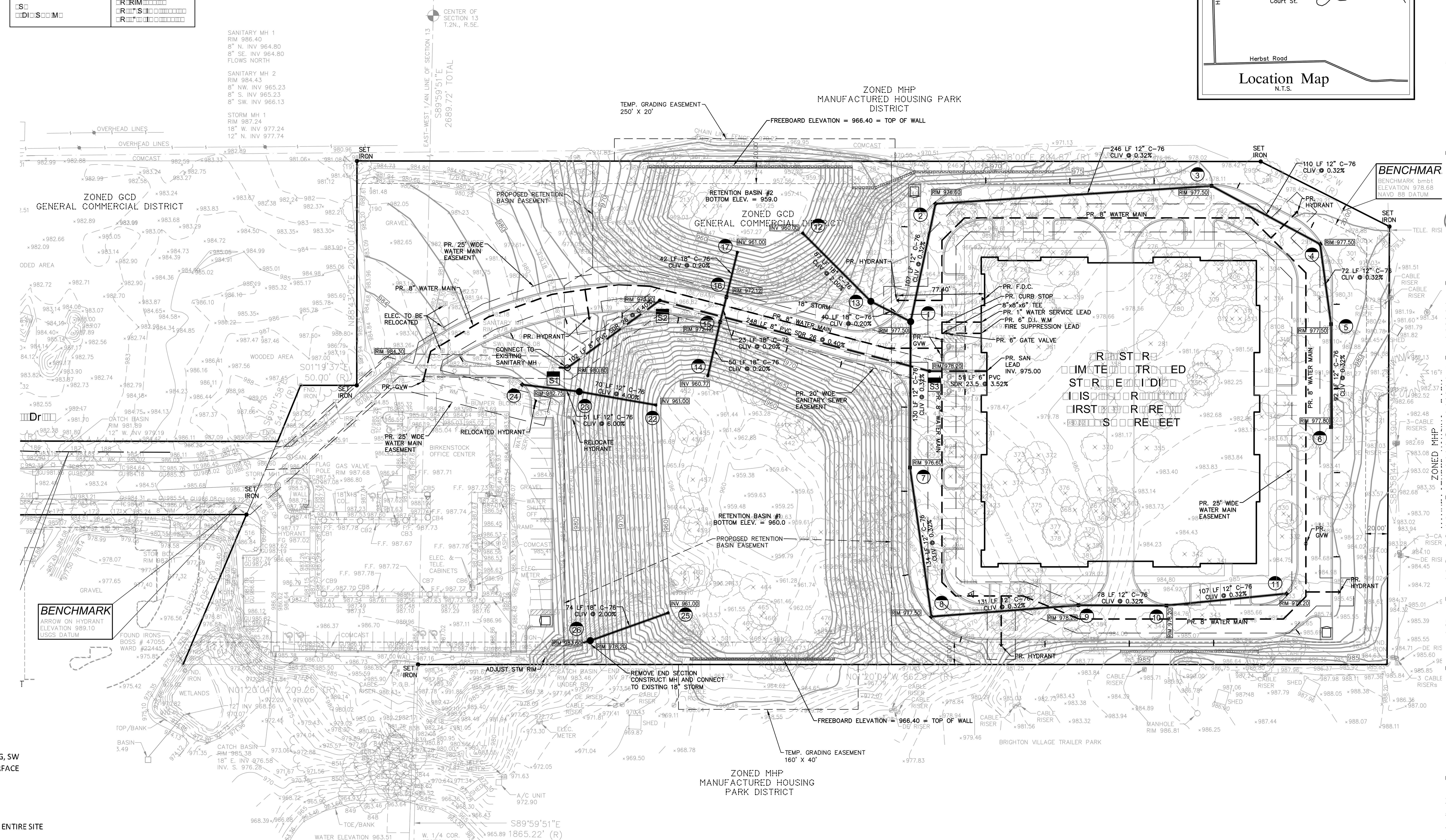

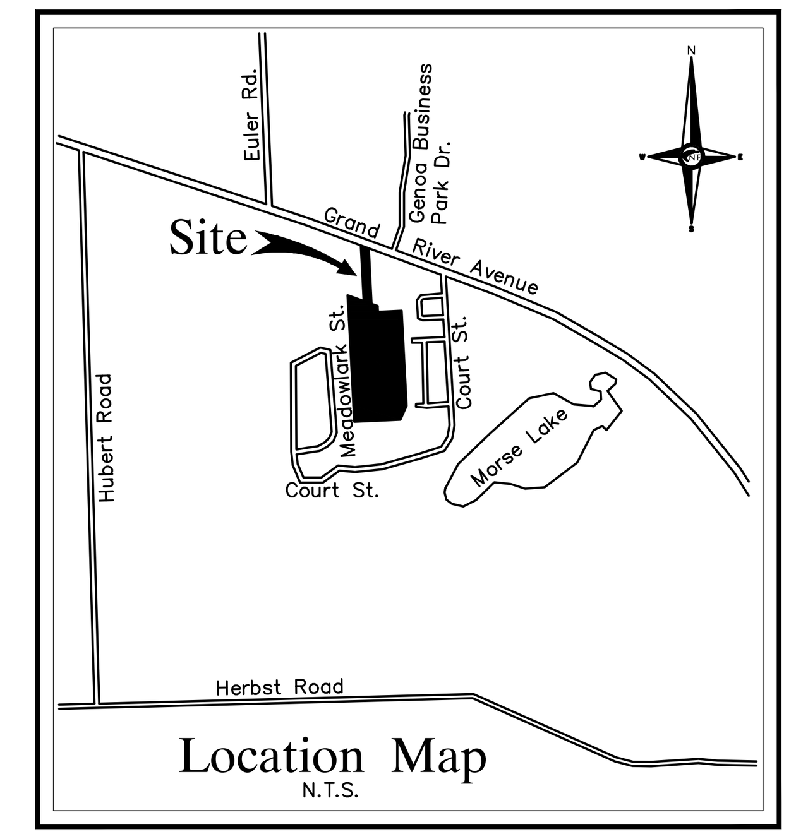

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STATE OF MICHIGAN
MICHAEL P. KURMAS
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NO.
6201064137
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Genoa Township,
Livingston County, Michigan

SHEET
Site Plan
Utilities

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

DATE	ISSUED/REVISED
1-29-19	PID Site Submission
2-22-19	PID Re-submission

DRAWN BY:
M. Kurmas
DESIGNED BY:
M. Kurmas
APPROVED BY:
M. Peterson
DATE:
02-22-2019
SCALE: 1" = 50'

NFE JOB NO. K362
SHEET NO. C.201

BIRKENSTOCK RETENTION CALCULATIONS

AREA (ACRES)	IMPERVIOUS FACTOR	ACRE IMPERVIOUS	
3.46	0.20	0.69	LAWN
6.15	0.90	5.54	PVMT, BLDG, SW
1.00	1.00	1.00	WATER SURFACE

FACTORED C: 0.68
TOTAL DRAINAGE AREA: 10.61

REQUIRED RETENTION POND VOLUME PER GENOA TWP. STANDARDS = 2 INCHES OVER ENTIRE SITE

0.1666 FT x 10.61 AC x 43,560 SQ. FT. / AC = 76998 CUBIC FEET OF STORAGE

RETENTION POND #1 STORAGE PROVIDED

ELEV.	AREA (SFT)	DEPTH (FT)	VOLUME (FT^3)	TOTAL VOLUME (FT^3)
966	48622	1	47105	239901
965	45588	1	44126	192796
964	42663	1	41249	148670
963	39835	1	38469	107421
962	37103	1	35822	68952
961	34540	1	33131	33131
960	31721	1	0	0

RETENTION POND #2 STORAGE PROVIDED

ELEV.	AREA (SFT)	DEPTH (FT)	VOLUME (FT^3)	TOTAL VOLUME (FT^3)
966	15348	1	14717	78959
965	14086	1	13484	64242
964	12881	1	12305	50758
963	11728	1	11177	38454
962	10626	1	10101	27277
961	9575	1	9075	17176
960	8575	1	8101	8101
959	7627	1	0	0

COMBINED VOLUME PONDS #1 AND #2

ELEV.	TOTAL VOLUME (FT^3)
966	318859
965	257037
964	199428
963	145875
962	96229
961	50307
960	8101
959	0

STORAGE PROVIDED WITH 3 FEET OF FREEBOARD AT ELEV. 963.40 = 167296 CUBIC FEET

167,296 CUBIC FEET OF STORAGE = 4.345 INCHES OF RAINFALL OVER ENTIRE SITE

STORAGE PROVIDED AT ELEV. 966.0 (0.4 FEET BELOW FREEBOARD) = 318,859 CF OR 8.282 INCHES OVER ENTIRE SITE

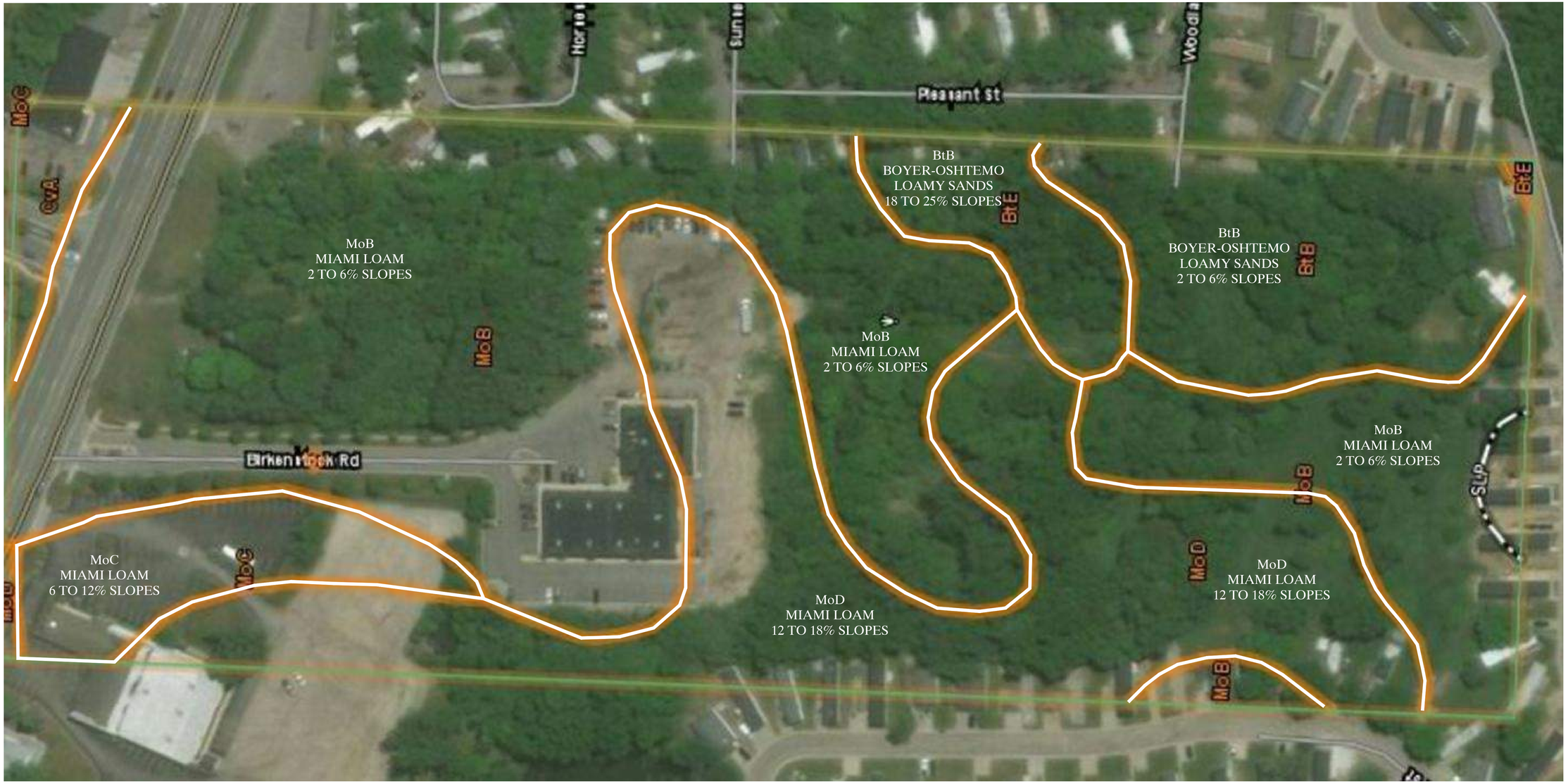
Storm Water Design Narrative:

Storm water storage for the proposed site is designed to be handled by use of 2 retention basins connected by equalizing pipes. Per Genoa Township requirements, retention basins shall be sized to accommodate two inches of runoff from the entire tributary area. Due to the lack of a natural overflow route to an off-site water body, the retention basins have been conservatively designed to accommodate 4.345 inches of water over the entire site before reaching the required 3 feet of freeboard. In the most extreme storm events, the retention basins are capable of handling 8.282 inches of water over the entire site before reaching a water elevation of 966.0 which is still 0.4 feet below proposed freeboard elevation.

The retention basins will drain through evaporation and infiltration over an extended period of time. Test hole locations and a corresponding permeability report completed by Hastings Testing Engineers and Environmental Inc. are included as part of the site plan submittal (sheet C.304). Test holes #2 and #4 show a layer of peat starting at El. 957.75 and El. 955.75 respectively and extending 2.5 to 3.5 feet deep which are believed to be formed over many years of accumulated organic matter being deposited by storm water runoff to the natural low point. These pockets of peat soil appear to be isolated based on adjacent test pits showing sandy soils down to elevation 952.0 and will be called out to be removed as part of retention basin grading. The remainder of the test pits show sandy soils conducive to infiltration.

LEGEND

- MANHOLE — EXISTING SANITARY SEWER
- SAN. CLEAN OUT
- HYDRANT, GATE VALVE — EXISTING WATER MAIN
- MANHOLE, CATCH BASIN — EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- EXISTING BURIED CABLES
- UTILITY POLE, GUY POLE, GUY WIRE — OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN
- C.O., MANHOLE — PR. SANITARY SEWER
- HYDRANT, GATE VALVE — PR. WATER MAIN
- INLET, C.B., MANHOLE — PR. STORM SEWER
- PR. R. Y. CATCH BASIN
- SAND BACKFILL (95 % DENSITY)
- PROPOSED LIGHT POLE



NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257

SEAL

STATE OF MICHIGAN
MICHAEL P. KURMAS
ENGINEER
NO. 6201064137
REG. PROFESSIONAL ENGINEER

PROJECT
Birkenstock Office Center
2524 Harte Drive
Brighton, Michigan

CLIENT
Birkenstock Enterprises, LLC
2528 Harte Drive
Brighton, MI 48114

Contact: James Harte
Phone: (810) 499-7144
Fax: (734) 878-5667

PROJECT LOCATION
Part of the W. 1/2
of Section 13
T. 2N., R.5E.
Genoa Township,
Livingston County, Michigan

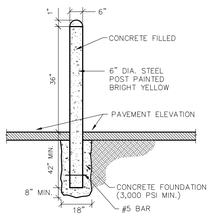
SHEET
Soil Map

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

DATE	ISSUED/REVISED
1-29-19	PID Site Submission
2-22-19	PID Re-submission

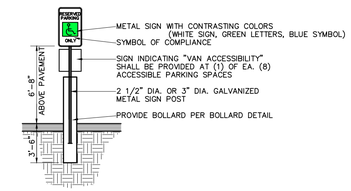
DRAWN BY: M. Kurmas
DESIGNED BY: M. Kurmas
APPROVED BY: M. Peterson
DATE: 02-22-2019
SCALE: 1" = 50'
50 25 0 25 50 75

NFE JOB NO. **K362**
SHEET NO. **C.302**



□□ □□□RD□DET□□

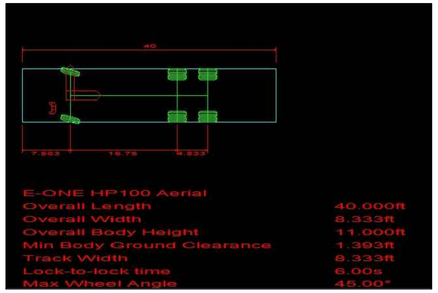
N.T.S.

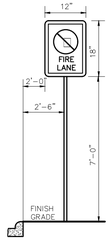


□□RRIER□REE□□R□□□SI□□DET□□

N.T.S.

Provide (1) for each accessible parking space





□□□□R□□□□SI□□DET□□□

N.T.S.

S□E□□□□TI□□S

METAL PANELS 0.081 INCH THICK NO. 6061-T6 ALUMINUM

SIGN SHEET REFLECTORIZED FWHA 6.306

POST GALVANIZED SQUARE TUBING WITH CONTINUOUS 7.16 ROUND HOLES ON 1 CENTERS, ALL 4 SIDES ENTIRE LENGTH – UNISTRUT OR APPROVED EQUAL – 1-3/4 SQUARE

LETTER SIZE 2 INCH

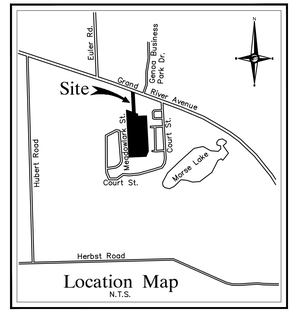
SIGN SPACING 75 FEET (MAX.)

NOTES:

ACCESS ROAD TO SITE SHALL BE PROVIDED AND MAINTAINED DURING CONSTRUCTION.

ACCESS ROAD SHALL BE CONSTRUCTED TO BE CAPABLE OF SUPPORTING THE IMPOSED LOAD OF FIRE APPARATUS WEIGHING AT LEAST 84,000 LBS.

THE ACCESS ROAD SHALL BE COMPLETED AND FIRE HYDRANTS INSTALLED AND LIVE PRIOR TO BUILDING CONSTRUCTION COMMENCING.



NF ENGINEERS

CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
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PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257

SEAL

STATE OF MICHIGAN
MICHAEL P. KURMAS
ENGINEER
NO. 6201064137
PROFESSIONAL ENGINEER

PROJECT

Birkenstock Office Center
2524 Harte Drive
Brighton, Michigan

CLIENT

Birkenstock Enterprises, LLC
2528 Harte Drive
Brighton, MI 48114

Contact: James Harte
Phone: (810) 499-7144
Fax: (734) 878-5667

PROJECT LOCATION

Part of the W. 1/2
of Section 13
T. 2N., R.5E.
Genoa Township,
Livingston County, Michigan

SHEET

Fire Truck Access,
Stringer Dimension &
Signage Plan

811 Know what's below Call before you dig.

DATE	ISSUED/REVISED
1-29-19	PID Site Submission
2-22-19	PID Re-submission

DRAWN BY: N. Naoum

DESIGNED BY: M. Kurmas

APPROVED BY: M. Peterson

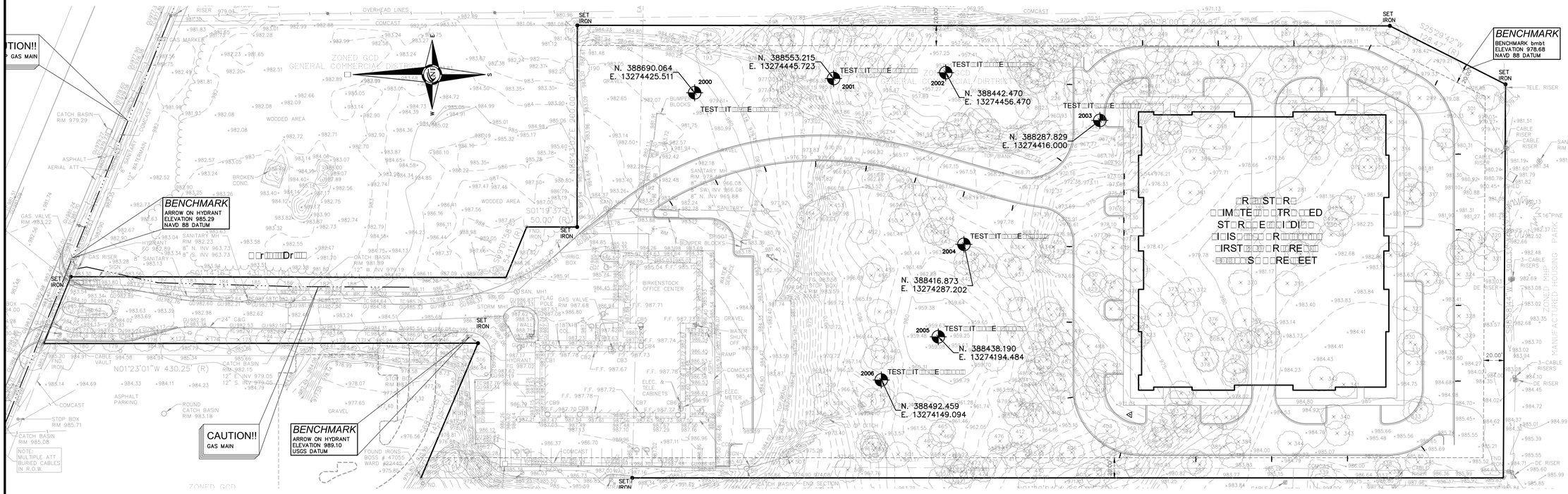
DATE: 02-22-2019

SCALE: 1" = 50'

50 25 0 25 50 75

NFE JOB NO. **K362**

SHEET NO. **C.303**



FAX (517) 546-1478

HASTINGS TESTING ENGINEERS AND ENVIRONMENTAL INC.

"Testing to keep America on a firm foundation"

4641 GOLF CLUB ROAD • HOWELL, MI 48843

July 16, 2018

Birkenstock Construction LLC
2528 Harte Drive
Brighton, MI 48114

Attention: Jim Harte

RE: Birkenstock Office Center - Permeability Testing Proposed Retention Ponds

Dear Mr. Harte,

Seven (07) soil test pits designated as soil test pit locations #1 thru #7 were excavated in the influence of planned new retention ponds located at 2528 Harte Drive in Genoa Township, Michigan. The property is currently vacant and vegetated. Test pits were advanced to a depth of ten to thirteen below the existing site grade in the influence of a proposed retention basin located on the north and east sides of the property. The test pit locations can be identified on the enclosed diagram.

Soil descriptions, ground water observations and the results of field tests are to be found on the accompanying report.

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

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

Test Pit #1

Depth	Soil Description
0 - 8" BEG	Organic Soil and Material
8" – 3'-6" BEG	Silty Medium Coarse Brown Sand
3'-6" – 10'-0" BEG	Coarse Brown Sand With Gravel

Ground water encountered at 5'-0" below existing grade.

FAX (517) 546-1478

HASTINGS TESTING ENGINEERS AND ENVIRONMENTAL INC.

"Testing to keep America on a firm foundation"

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Test Pit #2

Depth	Soil Description
0 - 6" BEG	Organic Soil and Material
6" – 1'-6" BEG	Silty Brown Clay (Fill)
1'-6" – 5'-0" BEG	Peat
5'-0" – 9'-0" BEG	Silty Brown Clay With Silty Gray Clay
9'-0" – 13'-0" BEG	Silty Coarse Gray Sand

Ground water encountered at 9'-0" below existing grade.

Test Pit #3

Depth	Soil Description
0 - 4" BEG	Organic Soil and Material
4" – 5'-0" BEG	Silty Medium Coarse Brown Sand
5'-0" – 13'-0" BEG	Silty Fine Brown Sand

No ground water encountered.

Test Pit #4

Depth	Soil Description
0" – 1'-6" BEG	Silty Brown Clay (Fill)
1'-6" – 4'-0" BEG	Peat
4'-0" – 10'-0" BEG	Silty Brown Clay With Silty Gray Clay
10'-0" – 13'-0" BEG	Silty Coarse Gray Sand

Ground water encountered at 10'-0" below existing grade.

Test Pit #5

Depth	Soil Description
0 - 6" BEG	Organic Soil and Material
6" – 2'-0" BEG	Silty Medium Coarse Brown Sand
2'-0" – 10'-0" BEG	Coarse Brown Sand

Ground water encountered at 6'-0" below existing grade.

Test Pit #6

Depth	Soil Description
0 - 4" BEG	Organic Soil and Material
4" – 12'-6" BEG	Coarse Brown Sand With Gravel

Ground water encountered at 10'-0" below existing grade.

FAX (517) 546-1478

HASTINGS TESTING ENGINEERS AND ENVIRONMENTAL INC.

"Testing to keep America on a firm foundation"

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Test Pit #7

Depth	Soil Description
0 - 6" BEG	Asphalt Millings
6" – 9'-0" BEG	Silty Brown Clay
9'-0" – 13'-0" BEG	Coarse Brown Sand With Gravel

No ground water encountered.

Hastings Testing Engineers and Environmental Inc. was requested to perform permeability tests from soil sampled during excavating operations. Samples were taken of the different soil types. The permeability tests were performed to determine the hydraulic conductivity of existing soils in the influence of proposed retention pond.

Hastings Testing Engineers and Environmental Inc. performed the permeability tests according to ASTM D2434 for the appropriate soil classification. The laboratory tests of the soil permeability rates are as follows:

Soil Description	Sampled Area	Permeability Rate
Silty Medium Coarse Brown Sand	Test pit #1 at 2'-0" BEG	$8.8 * 10^{-3} \frac{cm}{sec}$
Coarse Brown Sand With Gravel	Test pit #6 at 6-0" BEG	$1.2 * 10^{-1} \frac{cm}{sec}$
Silty Fine Brown Sand	Test pit #3 at 8'-0" BEG	$5.2 * 10^{-5} \frac{cm}{sec}$
Silty Coarse Gray Sand	Test Pit #4 at 12'-0" BEG	$1.7 * 10^{-4} \frac{cm}{sec}$
Silty Brown Clay with Silty Gray Clay	Test pit #2 at 7'-0" BEG	$2.1 * 10^{-8} \frac{cm}{sec}$
Silty Brown Clay	Test pit #7 at 5'-0" BEG	$7.3 * 10^{-7} \frac{cm}{sec}$

Experience indicates that actual subsoil conditions at the site could vary from those generalized on the basis of the test borings made at specific locations. It is therefore essential that Hastings Testing Engineers and Environmental Inc. be notified of any variation of the soil conditions to determine the effects on the results noted in this report.

FAX (517) 546-1478

HASTINGS TESTING ENGINEERS AND ENVIRONMENTAL INC.

"Testing to keep America on a firm foundation"

4641 GOLF CLUB ROAD • HOWELL, MI 48843

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

Sincerely,

Gary J Harris PE

STATE OF MICHIGAN
GARY JOEL HARRIS
ENGINEER
No. 45240
PROFESSIONAL ENGINEER

(517) 546-6121
FAX (517) 546-1478

HASTINGS TESTING ENGINEERS AND ENVIRONMENTAL INC.

"Testing to keep America on a firm foundation"

4641 GOLF CLUB ROAD • HOWELL, MI 48843

2528 Harte Drive
Soil Test Pit Location Diagram
Date : 07-06-2018

NF ENGINEERS

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SEAL

STATE OF MICHIGAN
MICHAEL P. KURMAS
ENGINEER
NO. 6201064137
PROFESSIONAL ENGINEER

PROJECT
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CLIENT
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PROJECT LOCATION
Part of the W. 1/2
of Section 13
T. 2N., R.5E.
Genoa Township,
Livingston County, Michigan

SHEET
Permeability Report

811 Know what's below Call before you dig.

DATE	ISSUED/REVISED
1-29-19	PID Site Submission
2-22-19	PID Re-submission

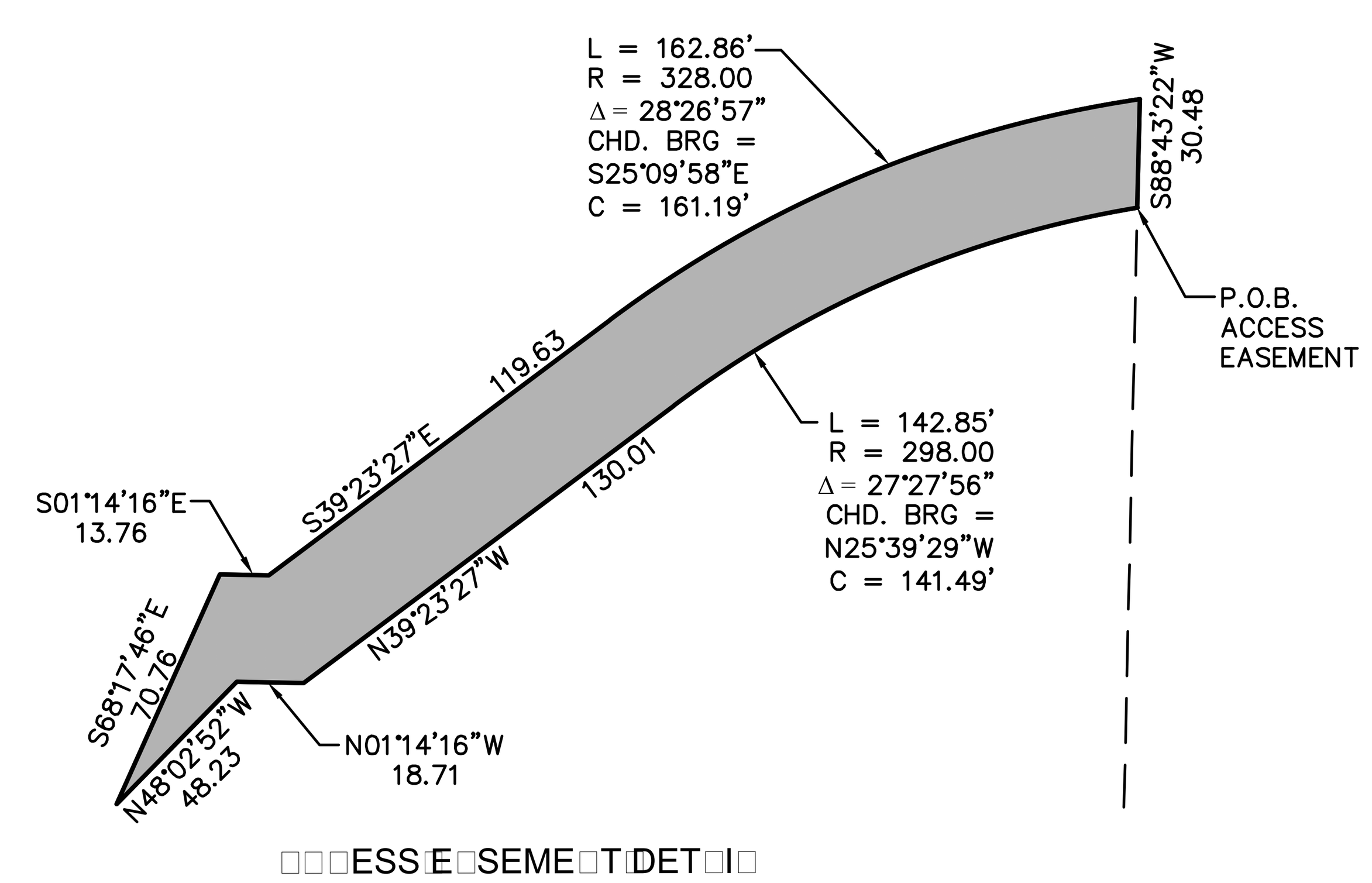
DRAWN BY: M. Kurmas
DESIGNED BY: M. Kurmas
APPROVED BY: M. Peterson
DATE: 02-22-2019
SCALE: 1" = 50'

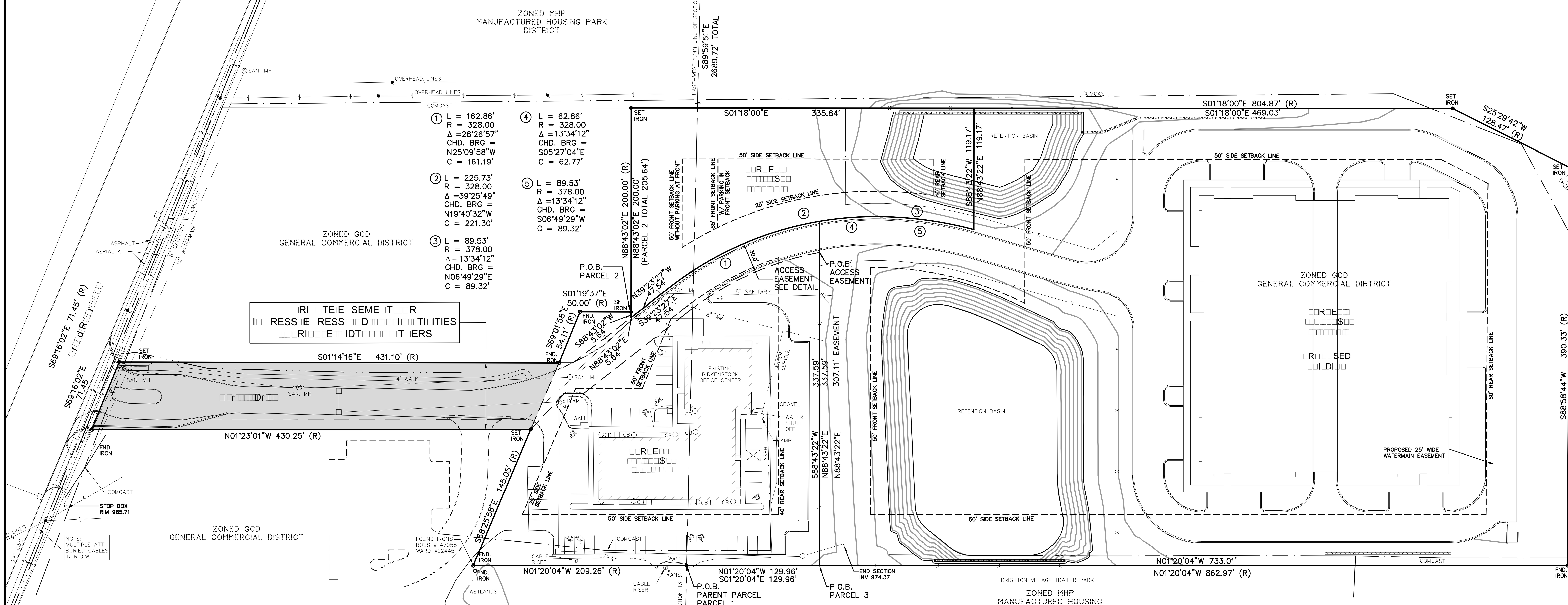
50 25 0 25 50 75

NFE JOB NO. **K362**
SHEET NO. **C.304**

□E□□□DES□RI□TI□□□□□□ESS E□SEME□T

Part of the SW. 1/4 of Section 13, T.2N., R.5E., Genoa Township, Livingston County, Michigan, being described as: Commencing at the W. 1/4 corner of said Section 13; thence S. 89°59'51" E., 1865.22 feet along the East–West 1/4 line of said Section 13; thence S. 01° 20' 04" E., 129.96 feet; thence N. 88° 43' 22" E., 307.11 feet to the point of beginning; thence 142.85 feet along an arc of a curve to the left, (Radius 298.00 feet, central angle 27°27'56", chord bears N. 25° 39' 29" W., 141.49 feet); thence N 39° 23' 27" W, 130.01 feet; thence N. 01° 14' 16" W., 18.71 feet; thence N. 48° 02' 52" W., 48.23 feet; thence S. 68° 17' 46" E., 70.76 feet; thence S. 01° 14' 16" E., 13.76 feet; thence S. 39° 23' 27" E., 119.63 feet; thence 162.86 feet along an arc of a curve to the right, (Radius 328.00 feet, central angle 28°26'57", chord bears S. 25° 09' 58" E., 161.19 feet; thence S. 88° 43' 22" W., 30.48 feet to the point of beginning.





□E□□□DES□RI□TI□□□□RE□T□□R□E□

Part of the W. 1/2 of Section 13, T.2N., R.5E., Genoa Township, Livingston County, Michigan, being described as: Beginning at a point distant S. 89°59'51" E., 1865.22 feet along the East–West 1/4 line of said Section 13, from the W. 1/4 corner of said Section 13; thence N. 01° 20' 04" W., 209.26 feet; thence S. 68° 25' 58"E., 145.05 feet; thence N. 01° 23' 01" W., 430.25 feet; thence S. 69° 16' 02" E., 71.45 feet; thence S. 01° 14' 16" E., 431.10 feet; thence S. 69° 01' 58" E., 54.11 feet; thence S. 01° 19' 37" E., 50.00 feet; thence N. 88° 43' 02" E., 200.00 feet; thence S. 01° 18' 00" E., 804.87 feet; thence S. 25° 29' 42" W., 128.47 feet; thence S. 88° 58' 44" W., 390.33 feet; thence N. 01° 20' 04" W., 862.97 feet to the point of beginning. Containing 462,435 square feet or 10.616 acres.

Parcel Number: 4711–13–300–009

□E□□□DES□RI□TI□□□□R□E□□

Part of the W. 1/2 of Section 13, T.2N., R.5E., Genoa Township, Livingston County, Michigan, being described as: Beginning at a point distant S. 89°59'51" E., 1865.22 feet along the East–West 1/4 line of said Section 13, from the W. 1/4 corner of said Section 13; thence N. 01° 20' 04" W., 209.26 feet; thence S. 68° 25' 58" E., 145.05 feet; thence N. 01° 23' 01" W., 430.25 feet; thence S. 69° 16' 02" E., 71.45 feet; thence S. 01° 14' 16" E., 431.10 feet; thence S. 69° 01' 58" E., 54.11 feet; thence S. 01° 19' 37" E., 50.00 feet; thence S. 88° 43' 02" W., 5.64 feet; thence S. 39° 23' 27" E., 47.54 feet; thence 162.86 feet along an arc of a curve to the right, (radius 328.00 feet, central angle 28°26'57", chord bears S. 25° 09' 58" E., 161.19 feet); thence S. 88° 43' 22" W., 337.59'; thence N. 01° 20' 04" W., 129.96 feet to the point of beginning. Containing 109,346 square feet or 2.510 acres.

□E□□□DES□RI□TI□□□□R□E□□

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□E□□□DES□RI□TI□□□□R□E□□

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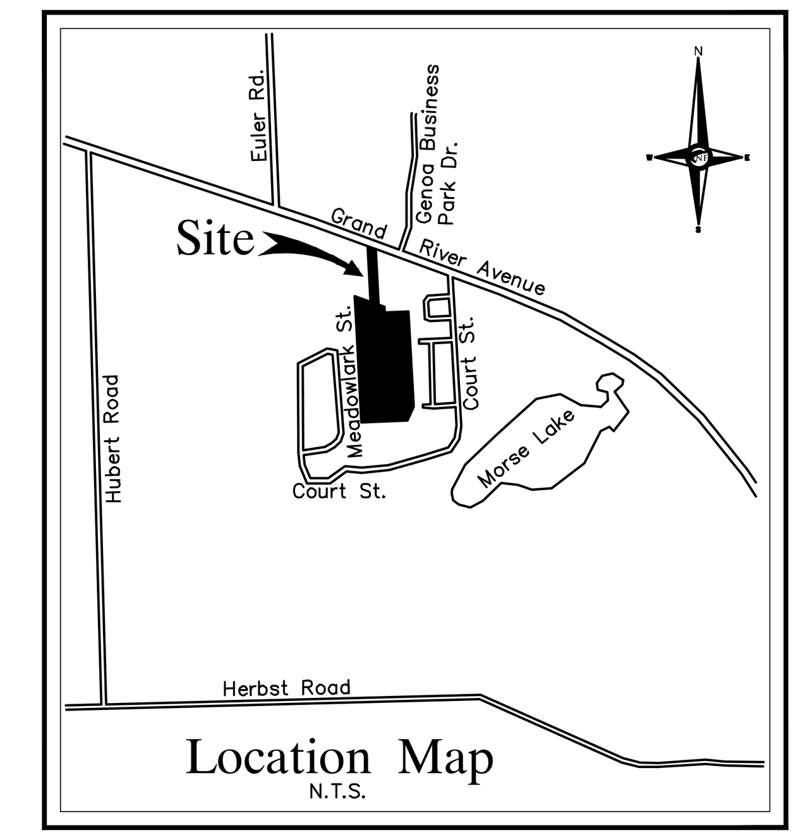


NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS
NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257

SEAL

STATE OF MICHIGAN KEVIN NAVAROLI PROFESSIONAL SURVEYOR No. 53503 LICENSED PROFESSIONAL SURVEYOR

PROJECT
Birkenstock Office Center
2524 Harte Drive
Brighton, Michigan

CLIENT
Birkenstock Enterprises, LLC
2528 Harte Drive
Brighton, MI 48114

Contact: James Harte
Phone: (810) 499-7144
Fax: (734) 878-5667

PROJECT LOCATION
Part of the W. 1/2 of Section 13
T. 2N., R.5E.
Genoa Township,
Livingston County, Michigan

SHEET
Parcel Split

811 Know what's below Call before you dig.

DATE	ISSUED/REVISED
2-22-19	Submit for review

DRAWN BY: N. Naoum

DESIGNED BY:

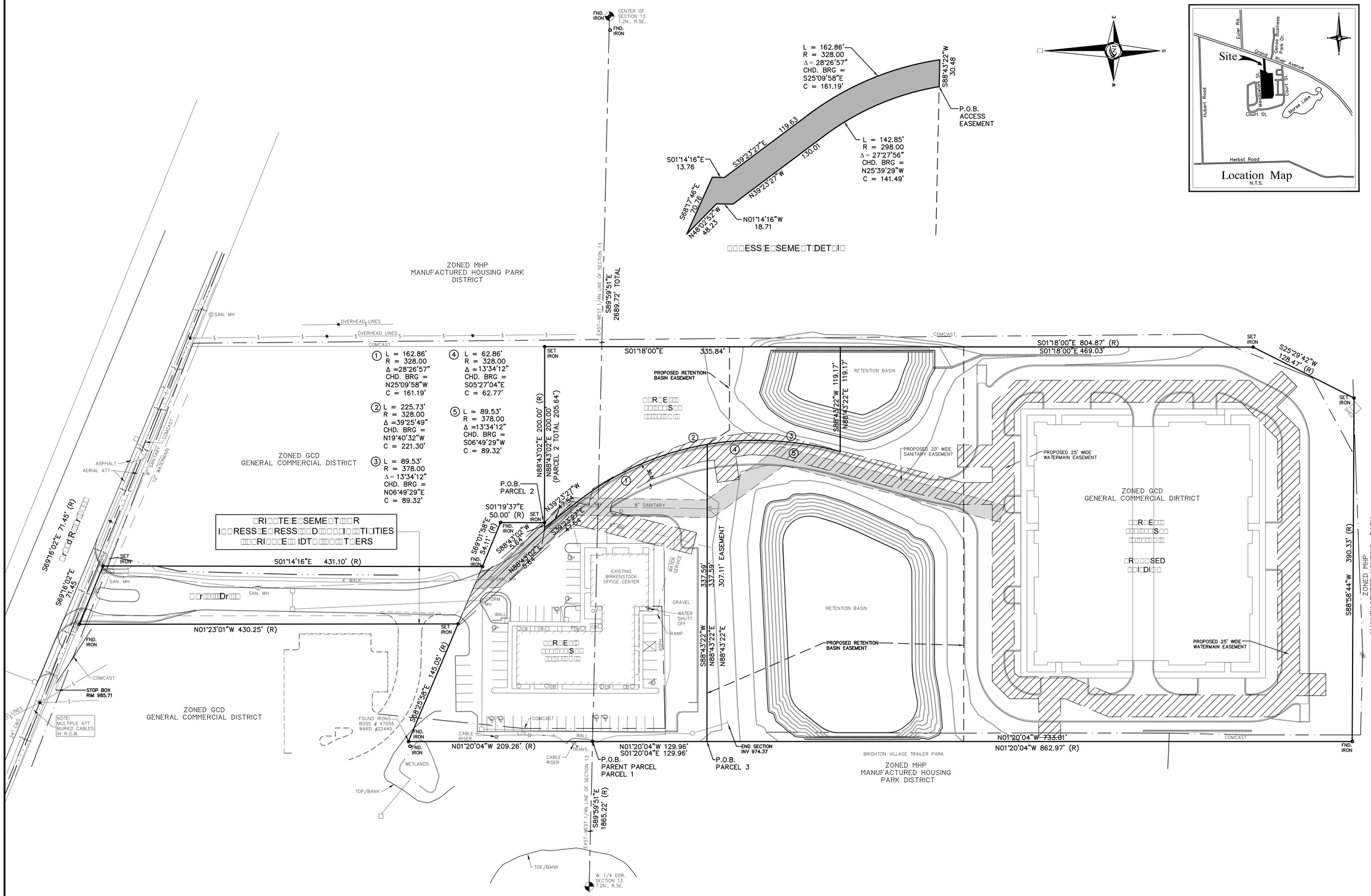
APPROVED BY: K. Navaroli

DATE: 02-22-2019

SCALE: 1" = 50'

NFE JOB NO. K362

SHEET NO. C.305



NF ENGINEERS

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TEL. (248) 332-7931
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SEAL

STATE OF MICHIGAN
KEVIN NAVAROLI
PROFESSIONAL SURVEYOR
No. 53503
LICENSED PROFESSIONAL SURVEYOR

PROJECT

Birkenstock Office Center
2524 Harte Drive
Brighton, Michigan

CLIENT

Birkenstock Enterprises, LLC
2528 Harte Drive
Brighton, MI 48114

Contact: James Harte
Phone: (810) 499-7144
Fax: (734) 878-5667

PROJECT LOCATION

Part of the W. 1/2
of Section 13
T. 2N., R.5E.
Genoa Township,
Livingston County, Michigan

SHEET

Parcel Split
Proposed Storm, Sanitary
and Water Main Easements

811 Know what's below Call before you dig.

DATE	ISSUED/REVISED
2-22-19	Submit for review

DRAWN BY: N. Naoum

DESIGNED BY:

APPROVED BY: K. Navaroli

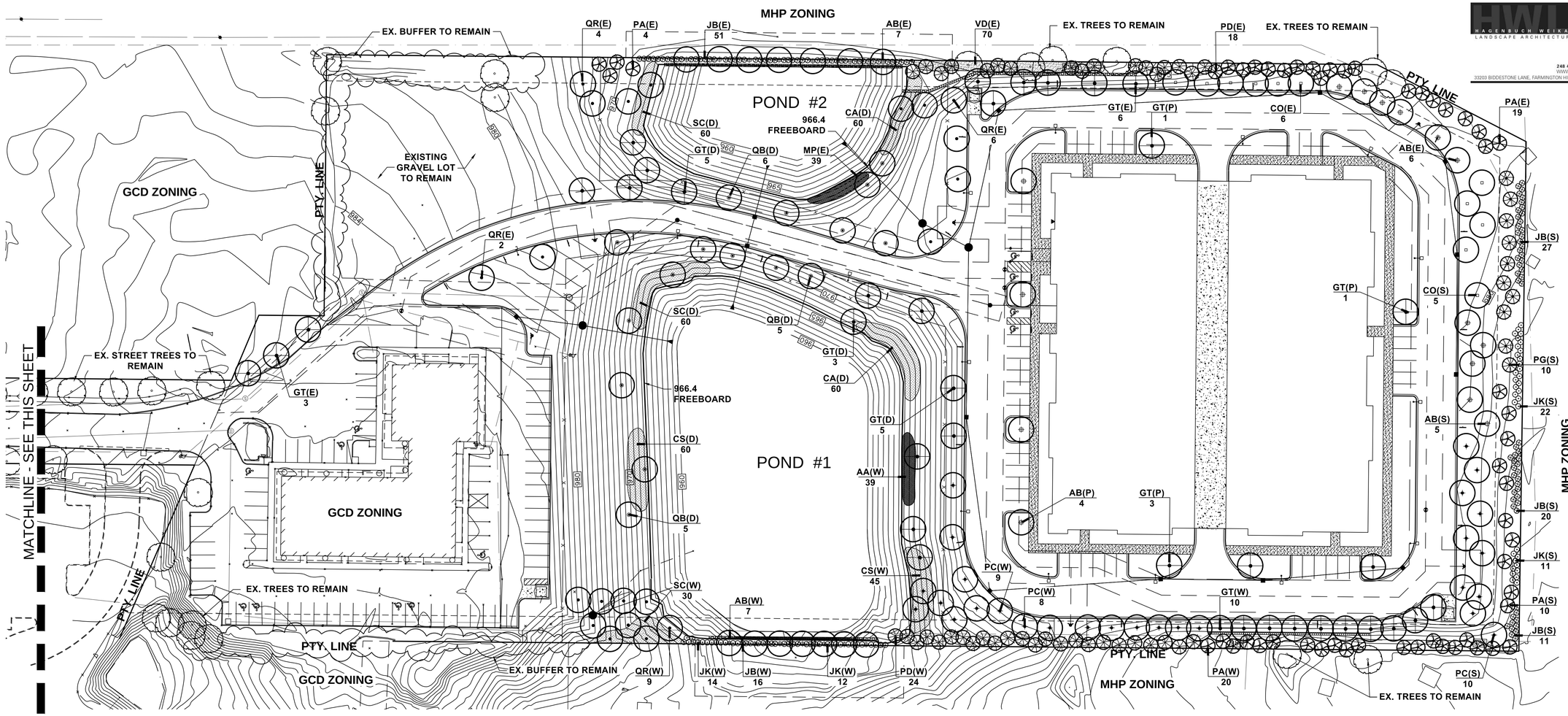
DATE: 02-22-2019

SCALE: 1" = 50'

50 25 0 25 50 75

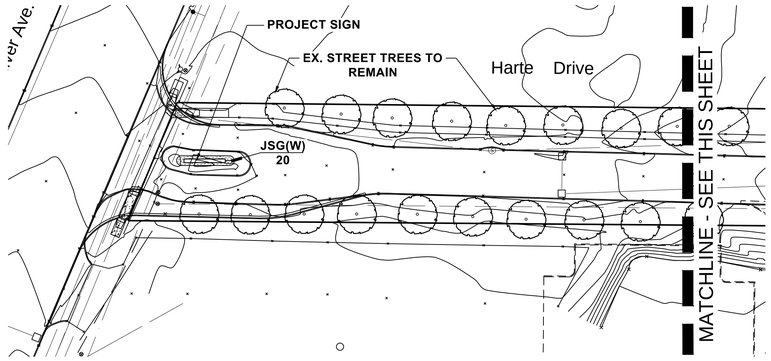
NFE JOB NO. **K362**

SHEET NO. **C.306**



SITE PLANTING PLAN

SCALE 1" = 40' NORTH



SITE PLANTING PLAN

SCALE 1" = 40' NORTH

PLANT MIX

ALL PLANTING/ PERENNIAL BEDS TO RECEIVE:

(1) 6 CU FT. ORGANIC COMPOST

(1) 40LB BAG COMPOSTED POULTRY MANURE "CHICK MAGIC" 5-3-2 WWW.CHICKMAGIC.NET (262)495-6220

(1) 5 LB BAG SHEMINS 13-13-13 MULTI PURPOSE FERTILIZER

PER 100 SQ FT BED AREA.

HAND TILL INTO SOIL TO A DEPTH OF 12" MINIMUM

LAWNS:

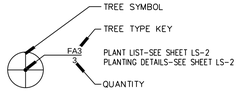
ALL LAWNS TO BE IRRIGATED SEED LAWN

MULCH

MULCH IS DOUBLE SHREDDED HARDWOOD BARK MULCH

NO GROUND WOOD PALETTE MULCH PERMITTED

PLANTING KEY:



GENERAL PLANTING NOTES:

(A) ALL TREES TO HAVE CLAY OR LOAM BALLS, TREES WITH SAND BALLS **WILL BE REJECTED**.

(B) ALL SINGLE STEM SHADE TREES TO HAVE STRAIGHT TRUNKS AND SYMMETRICAL CROWNS.

(C) ALL SINGLE TRUNK SHADE TREES TO HAVE A CENTRAL LEADER, TREES WITH FORKED OR IRREGULAR TRUNKS **WILL NOT BE ACCEPTED.**

(D) ALL MULTI-STEM TREES SHALL BE HEAVILY BRANCHED AND HAVE SYMMETRICAL CROWNS. ONE SIDED TREES OR THOSE WITH THIN OR OPEN CROWNS SHALL **NOT BE ACCEPTED.**

(E) ALL EVERGREEN TREES SHALL BE HEAVILY BRANCHED AND FULL TO THE GROUND, SYMMETRICAL IN SHAPE AND NOT SHEARED FOR THE LAST FIVE GROWING SEASONS.

(F) NO MACHINERY IS TO BE USED WITHIN THE DRIPLINE OF EXISTING TREES. HAND GRADE ALL LAWN AREAS WITHIN DRIPLINE OF EXISTING TREES.

(G) ALL TREE LOCATIONS SHALL BE STAKED BY LANDSCAPE CONTRACTOR AND ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION OF THE PLANT MATERIAL.

(H) IT IS MANDATORY THAT POSITIVE DRAINAGE IS PROVIDED AWAY FROM ALL BUILDINGS, WALKS AND PAVED AREAS.

(I) ALL PLANTING BEDS SHALL RECEIVE SHREDDED BARK MULCH. SEE PLANTING DETAILS FOR DEPTH.

(J) SEE SPECIFICATIONS FOR ADDITIONAL COMMENTS, REQUIREMENTS, PLANTING PROCEDURES AND WARRANTY STANDARDS.

PLANT BED PREPARATION

EXCAVATE PLANT BEDS TO DEPTH SHOWN ON DETAILS – DISPOSE OF SPOILS OFF SITE.

ALL PLANT BEDS TO RECEIVE **CONTINUOUS** PLANT MIX AS SPECIFIED (NOT INDIVIDUAL PLANT PITS)

PLANTING BEDS AND PLANT PITS TO RECEIVE:
A MIXTURE OF 70% LOAM TOPSOIL, 10% COMPOST, 20% SAND

HWLA
HAGENBUCH WEIKAL
LANDSCAPE ARCHITECTURE
248 477 3600 TEL
WWW.NW-LA.COM
33203 BIDDESTONE LANE, FARMINGTON HILLS, MI 48334

FSP FUSCO, SHAFFER & PAPPAS, INC.
ARCHITECTS AND PLANNERS
550 E. NINE MILE ROAD
FERNDALE, MICHIGAN, 48220
PHONE 248.543.4100 FAX 248.543.4141

SEAL

STATE OF MICHIGAN
KENNETH S. WEIKAL
LANDSCAPE ARCHITECT
No. 1022
REGISTERED LANDSCAPE ARCHITECT

BIRKENSTOCK OFFICE / STORAGE BUILDING

GENOA TOWNSHIP MICHIGAN

DATE	ISSUE
02-22-2019	PID SITE RE-SUBMISSION
01-29-2019	PID SITE SUBMISSION

KEY PLAN

FSP PROJECT NO.
HAR17.032

DRAWING TITLE
SITE LANDSCAPE PLAN

DRAWING NUMBER
LS1

HWLA
HAGENBUCH WEIKAL
LANDSCAPE ARCHITECTURE
248 477 3600 TEL
WWW.WWLA.COM
33203 BIDDESTONE LANE, FARMINGTON HILLS, MI 48334

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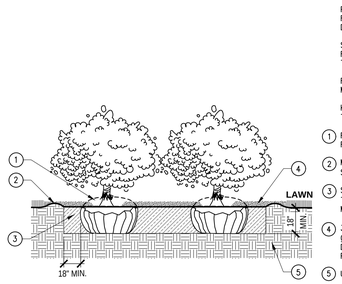


PRUNE BRANCHES TO THIN OR MATCH. RETAIN NORMAL PLANT SHAPE. PRUNE DEAD BRANCHES

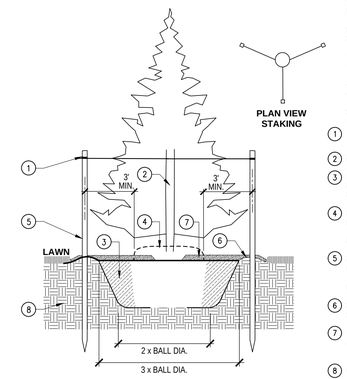
SHRUBS SHALL BEAR THE SAME RELATIONSHIP TO FINISH GRADE AS THEY BORE TO ORIGINAL GRADE.

REMOVE ALL FIBER, PLASTIC OR METAL CONTAINERS.

KNIFE SLIT SIDE OF ROOT BALL 6 TIMES, 1" DEEP EACH

1. REMOVE ALL OF BURLAP FROM ROOTBALL
2. MOUND TO FORM SAUCER – FORM SOIL SAUCER WITH 3" HT. CONTINUOUS RIM
3. SPECIFIED PLANTING MIX – WATER & TAMP TO REMOVE AIR POCKETS – 18" MIN. DEPTH OR DEPTH OF ROOT BALL.
4. 3" DEPTH MULCH – DO NOT BURY CROWN OF PLANT. PROVIDE A 4" DIAMETER CLEAR AREA AROUND PLANT CROWN
5. UNDISTURBED SUBSOIL

1 SHRUB BED PLANTING DETAIL
NOT TO SCALE



REMOVE ALL TAGS, STRINGS, PLASTICS AND OTHER MATERIALS WHICH ARE UNSIGHTLY OR COULD CAUSE GIRDLING

PLANT SO THAT TOP OF ROOT FLARE IS EVEN WITH THE FINISHED GRADE

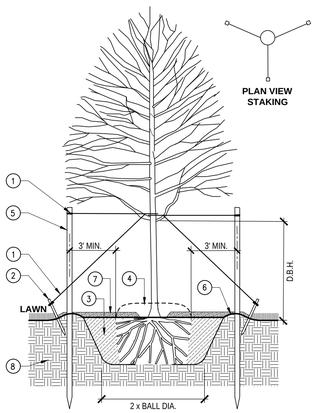
STAKE ALL EVERGREEN TREES UNDER 12' HT.

GUY ALL EVERGREEN TREES 12' HT. AND OVER

KNIFE SLIT SIDE OF ROOT BALL 6 TIMES, 1" DEEP EACH

1. "ARBORTIE" NYLON STRAPS
2. NEVER CUT LEADER
3. AMEND SOIL PER SPECIFICATION REQUIREMENTS, WATER AND TAMP TO REMOVE AIR POCKETS
4. REMOVE ±4"–8" OF SOIL FROM TOP OF ROOT BALL TO EXPOSE ROOT FLARE. SOIL CAN BE USED IN PLANT MIX. REMOVE ALL OF BASKET AND BURLAP
5. HARDWOOD STAKES (3) STAKES 2"X2" DRIVEN (MIN. 18") FIRMLY INTO SUBGRADE PRIOR TO BACKFILLING. REMOVE AFTER 1 YEAR
6. FORM SOIL SAUCER 3" HT., AT EDGE OF PLANT PIT
7. 3" DEEP SHREDDED BARK MULCH LEAVE 6" DIA. CIRCLE OF BARE SOIL AT TRUNK – DO NOT BURY TRUNK BASE
8. UNDISTURBED SUBSOIL

2 EVERGREEN TREE PLANTING
NOT TO SCALE



STAKE ALL TREES UNDER 4"
GUY ALL TREES 4" AND OVER

PRUNE ONLY TO REMOVE BROKEN OR DAMAGED BRANCHES

PLANT SO THAT TOP OF ROOT FLARE IS EVEN WITH THE FINISHED GRADE

NEVER CUT LEADER

KNIFE SLIT SIDE OF ROOT BALL 6 TIMES, 1" DEEP EACH

1. "ARBORTIE" NYLON STRAPS

STAKE ABOVE FIRST BRANCHES OR AS NECESSARY FOR FIRM SUPPORT

2. FOR TREES OVER 4" CAL., (3) 2"X4"X24" PRESS. TREATED STAKES TOP OF STAKE 6" ABOVE GROUND
3. AMEND SOIL PER SPECIFICATION REQUIREMENTS, WATER AND TAMP TO REMOVE AIR POCKETS
4. REMOVE ±4"–8" OF SOIL FROM TOP OF ROOT BALL TO EXPOSE ROOT FLARE. SOIL CAN BE USED IN PLANT MIX. REMOVE ALL OF BASKET AND BURLAP
5. HARDWOOD STAKES (3) STAKES 2"X2" DRIVEN (MIN. 18") FIRMLY INTO SUBGRADE PRIOR TO BACKFILLING. REMOVE AFTER 1 YEAR
6. FORM SAUCER 3" HT. AT EDGE OF PLANT PIT
7. 3" DEEP SHREDDED BARK MULCH LEAVE 6" DIA. CIRCLE OF BARE SOIL AT TRUNK – DO NOT BURY TRUNK BASE
8. UNDISTURBED SUBSOIL

1 DECIDUOUS TREE PLANTING
NOT TO SCALE

LANDSCAPE REQUIREMENTS

A. BUFFERS

BUFFER TYPE B -
GRC ZONING ADJACENT TO RESIDENTAL MHP

EAST BUFFER (E) - 800 LF

	REQUIRED	PROVIDED
DECIDUOUS TREES	40	**40**
EVERGREEN TREES	40	**40**
SHRUBS	160	**160**

SOUTH BUFFER (S) - 388 LF

	REQUIRED	PROVIDED
DECIDUOUS TREES	20	**20**
EVERGREEN TREES	20	**20**
SHRUBS	80	**80**

WEST BUFFER (W) - 870 LF

	REQUIRED	PROVIDED
DECIDUOUS TREES	44	**44**
EVERGREEN TREES	44	**44**
SHRUBS	176	**176**

B. PARKING (P) - 49 SPACES

	REQUIRED	PROVIDED
DECIDUOUS TREES	5	**9**

C. DETENTION (D) - POND #1 - 870 LF PERIMETER

	REQUIRED	PROVIDED
DECIDUOUS TREES	18	**18**
SHRUBS	180	**180**

DETENTION (D) - POND #2 - 520 LF PERIMETER

	REQUIRED	PROVIDED
DECIDUOUS TREES	11	**11**
SHRUBS	110	**110**

PLANT LIST - EAST BUFFER (E)

QUAN.	KEY	COMMON/ BOTANICAL NAME	SIZE	SPEC.
13	AB	Autumn Blaze Maple *Acer x. fremanii 'Autumn Blaze'*	2.5" Cal.	B&B
6	CO	Hackberry *Celtis occidentalis*	2.5" Cal.	B&B
9	GT	Thornless Honeylocust *Gleditsia 'Skyline'*	2.5" Cal.	B&B
12	QR	Northern Red Oak *Quercus rubra*	2.5" Cal.	B&B
22	PA	Norway Spruce *Picea Abies*	6' Ht.	B&B
18	PD	Black Hills Spruce *Picea g. 'Densata'*	6' Ht.	B&B
51	JB	Brodie Red Cedar *J. virginiana 'Brodie'*	4' Ht.	B&B
39	MP	Bayberry *Myrica pensylvanica*	24" ht.	Cont.
70	VD3	Arrowood Viburnum *Viburnum dentatum*	24" Ht.	Cont.

PLANT LIST - SOUTH BUFFER (S)

QUAN.	KEY	COMMON/ BOTANICAL NAME	SIZE	SPEC.
5	AB	Autumn Blaze Maple *Acer x. fremanii 'Autumn Blaze'*	2.5" Cal.	B&B
5	CO	Hackberry *Celtis occidentalis*	2.5" Cal.	B&B
0	GT	Thornless Honeylocust *Gleditsia 'Skyline'*	2.5" Cal.	B&B
10	PC	Columbia London Plane Tree *Platanus x. acerifolia 'Columbia'*	2.5" Cal.	B&B
10	PA	Norway Spruce *Picea Abies*	6' Ht.	B&B
10	PG	White Spruce *Picea glauca*	6' Ht.	B&B
33	JK	Ketler Juniper *J. 'Ketlerii'*	4' Ht.	B&B
47	JB	Brodie Red Cedar *J. virginiana 'Brodie'*	4' Ht.	B&B

PLANT LIST - WEST BUFFER (W)

QUAN.	KEY	COMMON/ BOTANICAL NAME	SIZE	SPEC.
7	AB	Autumn Blaze Maple Acer x. fremanii 'Autumn Blaze'	2.5" Cal.	B&B
10	GT	Thornless Honeylocust *Gleditsia 'Skyline'*	2.5" Cal.	B&B
18	PC	Columbia London Plane Tree *Platanus x. acerifolia 'Columbia'*	2.5" Cal.	B&B
9	QR	Northern Red Oak *Quercus rubra*	2.5" Cal.	B&B
20	PA	Norway Spruce *Picea Abies*	6' Ht.	B&B
24	PD	Black Hills Spruce *Picea g. 'Densata'*	6' Ht.	B&B
39	AA	Red Chokeberry *Aronia arbutifolia 'Brilliantissima'*	24" Ht.	Cont.
45	CS	Redtwig Dogwood *Cornus sericea*	24" Ht.	Cont.
26	JK	Ketler Juniper *J. 'Ketlerii'*	4' Ht.	B&B
16	JB	Brodie Red Cedar *J. virginiana 'Brodie'*	4' Ht.	B&B
30	SC	Common Elderberry *Sambucus canadensis*	24" Ht.	Cont.
20	JSG	Sea GreenJuniper *J. 'Sea Green'*	24" Spr.	Cont.

PLANT LIST - PARKING (P)

QUAN.	KEY	COMMON/ BOTANICAL NAME	SIZE	SPEC.
4	AB	Autumn Blaze Maple *Acer x. fremanii 'Autumn Blaze'*	2.5" Cal.	B&B
5	GT	Thornless Honeylocust *Gleditsia 'Skyline'*	2.5" Cal.	B&B

PLANT LIST - DETENTION POND #1 (D)

QUAN.	KEY	COMMON/ BOTANICAL NAME	SIZE	SPEC.
8	GT	Thornless Honeylocust *Gleditsia 'Skyline'*	2.5" Cal.	B&B
10	QB	Swamp White Oak *Quercus bicolor*	2.5" Cal.	B&B
60	CA	Buttonbush *Cephalanthus occidentalis*	24" Ht.	Cont.
60	CS	Redtwig Dogwood *Cornus sericea*	24" Ht.	Cont.
60	SC	Common Elderberry *Sambucus canadensis*	24" Ht.	Cont.

PLANT LIST - DETENTION POND #2 (D)

QUAN.	KEY	COMMON/ BOTANICAL NAME	SIZE	SPEC.
5	GT	Thornless Honeylocust *Gleditsia 'Skyline'*	2.5" Cal.	B&B
6	QB	Swamp White Oak *Quercus bicolor*	2.5" Cal.	B&B
60	CA	Buttonbush *Cephalanthus occidentalis*	24" Ht.	Cont.
50	SC	Common Elderberry *Sambucus canadensis*	24" Ht.	Cont.

BIRKENSTOCK OFFICE / STORAGE BUILDING

GENOA TOWNSHIP MICHIGAN

DATE	ISSUE
02-22-2019	PID SITE RE-SUBMISSION
01-29-2019	PID SITE SUBMISSION

KEY PLAN

FSP PROJECT NO.
HAR17.032

DRAWING TITLE
PLANTING DETAIL

DRAWING NUMBER
LS2

HAGENBUCH WEIKAL
LANDSCAPE ARCHITECTURE
248 477 3600 TEL
WWW.KW-LA.COM
33203 BIDDESTONE LANE FARMINGTON HILLS, MI 48334

FSP FUSCO, SHAFFER & PAPPAS, INC.
ARCHITECTS AND PLANNERS
550 E. NINE MILE ROAD
FERNDALE, MICHIGAN, 48220
PHONE 248.543.4100 FAX 248.543.4141

SEAL

STATE OF MICHIGAN
KENNETH S. WEIKAL
LANDSCAPE ARCHITECT
No. 1022
REGISTERED LANDSCAPE ARCHITECT

BIRKENSTOCK OFFICE / STORAGE BUILDING

GENOA TOWNSHIP MICHIGAN

LIMIT OF GRADING

TREES TO REMAIN
SEE TREE LIST SHT. LT2

ZONED MHP
MANUFACTURED HOUSING PARK
DISTRICT

ZONED GCD
GENERAL COMMERCIAL DISTRICT

ZONED GCD
GENERAL COMMERCIAL DIRTRICT

TREE REMOVAL AREA

BENCHMARK
BENCHMARK bmbt
ELEVATION 978.68
NAVD 88 DATUM

BENCHMARK
ARROW ON HYDRANT
ELEVATION 985.29
NAVD 88 DATUM

BENCHMARK
ARROW ON HYDRANT
ELEVATION 989.10
USGS DATUM

Harte Drive

ZONED MHP
MANUFACTURED HOUSING PARK

ZONED MHP
MANUFACTURED HOUSING
PARK DISTRICT

NOTE:
MULTIPLE ATT
BURIED CABLES
IN R.O.W.

SITE TREE REMOVAL PLAN

SCALE 1" = 50' NORTH

TREE LIST OFF SITE TREES NEAR SHED TO REMAIN

837	Tsuga canadensis	Eastern red cedar	1.5	12'	Fair
838	Prunus serotina	Black Cherry	12		Good
839	Carya cordiformis	Bittemut Hickory	10		Fair
840	Ulmus americana	American Elm	10		Fair
841	Prunus serotina	Black Cherry	8	twin	Poor
842	Carya cordiformis	Bittemut Hickory	12		DEAD
843	Prunus serotina	Black Cherry	12		DEAD
844	Carya cordiformis	Bittemut Hickory	8		Fair
845	Celtis occidentalis	Northern Red Oak	28		Poor
846	Acer rubrum	Red Maple	8		Poor
847	Celtis occidentalis	Northern Red Oak	17		Poor
848	Acer rubrum	Red Maple	10		Fair
849	Quercus velutina	Black Oak	29		Fair
850	Carya cordiformis	Bittemut Hickory	10		Good
851	Celtis occidentalis	Northern Red Oak	13		Fair
852	Acer negundo	Boxelder	9		Poor
853	Prunus serotina	Black Cherry	8		Poor

DATE	ISSUE
02-22-2019	PID SITE RE-SUBMISSION
01-29-2019	PID SITE SUBMISSION

KEY PLAN

FSP PROJECT NO.
HAR17.032

DRAWING TITLE
TREE REMOVAL PLAN

DRAWING NUMBER
LT1

TREE LIST

TREES TO BE REMOVED

Tree #	Botanical Name	Common Name	Dia.	Height	Type	Other Dia.	Condition
171	Pyrus calleryana	Bradford Pear	9		twin	6	Good
172	Pyrus calleryana	Bradford Pear	10				Good
173	Pyrus calleryana	Bradford Pear	11				Fair
174	Pyrus calleryana	Bradford Pear	9				Fair
175	Pyrus calleryana	Bradford Pear	10				Good
176	Pyrus calleryana	Bradford Pear	9				Good
177	Pyrus calleryana	Bradford Pear	10				Good
178	Pyrus calleryana	Bradford Pear	10				Good
179	Pyrus calleryana	Bradford Pear	9				Fair
180	Pyrus calleryana	Bradford Pear	10		multi		Fair
181	Pyrus calleryana	Bradford Pear	11				Fair
182	Pyrus calleryana	Bradford Pear	8				Good
183	Pyrus calleryana	Bradford Pear	6				Fair
184	Pyrus calleryana	Bradford Pear	7				Good
185	Pyrus calleryana	Bradford Pear	7				Good
186	Pyrus calleryana	Bradford Pear	9				Good
187	Pyrus calleryana	Bradford Pear	7				Good
188	Pyrus calleryana	Bradford Pear	7				Good
189	Populus deltoides	Eastern Cottonwood	14		twin	8	Poor
190	Prunus serotina	Black Cherry	13				Poor
191	Acer negundo	Boxelder	13		twin	8	Fair
192	Pyrus calleryana	Bradford Pear	7				Fair
193	Populus deltoides	Eastern Cottonwood	6				Poor
194	Acer negundo	Boxelder	7				Poor
195	Acer negundo	Boxelder	17				Poor
196	Prunus serotina	Black Cherry	9				Poor
197	Acer negundo	Boxelder	14		twin	12	Poor
198	Malus spp.	Apple	9				Poor
199	Acer negundo	Boxelder	8		multi		Poor
200	Malus spp.	Apple	7				Fair
201	Acer negundo	Boxelder	15				Poor
202	Populus deltoides	Eastern Cottonwood	8				Fair
203	Populus deltoides	Eastern Cottonwood	7				Fair
204	Populus deltoides	Eastern Cottonwood	8				Fair
205	Populus deltoides	Eastern Cottonwood	8				Fair
206	Acer negundo	Boxelder	6				Poor
207	Prunus serotina	Black Cherry	12				Good
208	Acer negundo	Boxelder	20				Poor
209	Prunus serotina	Black Cherry	11				Fair
210	Acer rubrum	Red Maple	26				Good
211	Quercus velutina	Black Oak	17				Fair
212	Quercus velutina	Black Oak	16				Fair
213	Acer negundo	Boxelder	16				Poor
214	Populus deltoides	Eastern Cottonwood	20				Fair
215	Populus deltoides	Eastern Cottonwood	30				Fair
216	Acer negundo	Boxelder	24				Poor
217	Populus deltoides	Eastern Cottonwood	26				Poor
218	Prunus serotina	Black Cherry	16		multi	12	Poor
219	Acer rubrum	Red Maple	11		twin	7	Fair
220	Acer negundo	Boxelder	6		twin		Fair
221	Prunus serotina	Black Cherry	8				Poor
222	Prunus serotina	Black Cherry	9		multi		Poor
223	Prunus serotina	Black Cherry	12				Poor
224	Prunus serotina	Black Cherry	15				Poor
225	Malus spp.	Apple	14				Poor
226	Populus deltoides	Eastern Cottonwood	22		twin	15	Good
227	Populus deltoides	Eastern Cottonwood	25				Good
228	Populus deltoides	Eastern Cottonwood	24		multi	23,15	Good
229	Acer negundo	Boxelder	6		twin		Poor
230	Prunus serotina	Black Cherry	6				Fair
231	Acer rubrum	Red Maple	12				Fair
232	Acer negundo	Boxelder	9				Poor
233	Acer negundo	Boxelder	11				Poor
234	Acer negundo	Boxelder	16		twin	8	Poor
235	Acer negundo	Boxelder	7				Poor
236	Celtis occidentalis	Northern Red Oak	6				Poor
237	Acer negundo	Boxelder	7				Fair
238	Acer negundo	Boxelder	8				Poor
239	Prunus serotina	Black Cherry	8				Good
240	Acer negundo	Boxelder	6				Poor
241	Quercus velutina	Black Oak	10				Good
242	Prunus serotina	Black Cherry	18				Poor
243	Prunus serotina	Black Cherry	8				Poor
244	Ulmus americana	American Elm	17				Fair
245	Acer rubrum	Red Maple	16				Poor
246	Quercus velutina	Black Oak	16				Fair
247	Acer rubrum	Red Maple	9				Fair
248	Prunus serotina	Black Cherry	16				Poor
249	Prunus serotina	Black Cherry	16		twin	8	Fair
250	Prunus serotina	Black Cherry	8				Fair
251	Prunus serotina	Black Cherry	12				Fair
252	Acer saccharum	Sugar Maple	15				Good
253	Celtis occidentalis	Northern Red Oak	9				Fair
254	Celtis occidentalis	Northern Red Oak	21				Fair
255	Celtis occidentalis	Northern Red Oak	10				Fair
256	Celtis occidentalis	Northern Red Oak	26				Good
257	Prunus serotina	Black Cherry	8				Poor
258	Malus spp.	Apple	8		twin		Poor
259	Pyrus spp.	Pear	12				Fair
260	Prunus serotina	Black Cherry	10		twin	10	Fair
261	Prunus serotina	Black Cherry	8		twin		Poor
262	Prunus serotina	Black Cherry	16		multi	10,8,8	Poor
263	Prunus serotina	Black Cherry	8				Fair
264	Acer rubrum	Red Maple	10		multi	8	Fair
265	Prunus serotina	Black Cherry	9		twin	9	Poor
266	Acer negundo	Boxelder	8				Fair
267	Quercus velutina	Black Oak	15				Good
268	Prunus serotina	Black Cherry	9				Fair
269	Prunus serotina	Black Cherry	8				Fair
270	Prunus serotina	Black Cherry	9				Poor
271	Celtis occidentalis	Northern Red Oak	27				Fair
272	Prunus serotina	Black Cherry	13		twin	12	Fair
273	Prunus serotina	Black Cherry	8		multi		Fair
274	Prunus serotina	Black Cherry	8				Good
275	Acer rubrum	Red Maple	14		twin	8	Fair
276	Acer saccharum	Sugar Maple	8				Good
277	Prunus serotina	Black Cherry	17				Fair
278	Acer rubrum	Red Maple	8		multi	8	Good
279	Prunus serotina	Black Cherry	14		twin	7	Good
280	Prunus serotina	Black Cherry	15				Poor
281	Celtis occidentalis	Northern White Cedar	4	20'			Poor
282	Prunus serotina	Black Cherry	8		twin	8	Fair
283	Acer rubrum	Red Maple	9				Good
284	Acer rubrum	Red Maple	8				Good
285	Prunus serotina	Black Cherry	9		multi	8	Fair
286	Acer rubrum	Red Maple	8				Fair
287	Quercus velutina	Black Oak	12				Fair
288	Prunus serotina	Black Cherry	13				Poor
289	Prunus serotina	Black Cherry	8				Fair
290	Prunus serotina	Black Cherry	8		twin	8	Poor
291	Prunus serotina	Black Cherry	12				Poor
292	Acer rubrum	Red Maple	8		multi		Good
293	Ulmus americana	American Elm	10				Fair
294	Prunus serotina	Black Cherry	8		twin	8	Poor
295	Quercus velutina	Black Oak	15				Fair
296	Quercus velutina	Black Oak	16				Poor
297	Prunus serotina	Black Cherry	10		multi	8,8	Fair
298	Acer rubrum	Red Maple	9				Fair
299	Prunus serotina	Black Cherry	8				Fair
300	Acer negundo	Boxelder	11				Fair
301	Prunus serotina	Black Cherry	16		twin	13	Fair
302	Prunus serotina	Black Cherry	14		twin	8	Poor
303	Prunus serotina	Black Cherry	15		multi	11,11,10,8	Poor
304	Prunus serotina	Black Cherry	13		multi	8,8	Poor
305	Acer rubrum	Red Maple	8				Poor
306	Acer rubrum	Red Maple	8				Good
307	Pyrus calleryana	Bradford Pear					
308	Acer rubrum	Red Maple	8		multi		Poor
309	Acer rubrum	Red Maple	9		twin		Fair
310	Prunus serotina	Black Cherry	8		twin	8	Fair
311	Acer rubrum	Red Maple	11				Fair
312	Acer rubrum	Red Maple	8		multi		Fair
313	Prunus serotina	Black Cherry	9		twin		Fair
314	Prunus serotina	Black Cherry	9		multi		Poor
315	Prunus serotina	Black Cherry	9		twin	9	Poor
316	Prunus serotina	Black Cherry	18				Fair
317	Prunus serotina	Black Cherry	8				Poor
318	Populus deltoides	Eastern Cottonwood	11				Poor
319	Populus deltoides	Eastern Cottonwood	8				Good
320	Populus deltoides	Eastern Cottonwood	11				Poor
321	Acer negundo	Boxelder	9				Fair
322	Populus deltoides	Eastern Cottonwood	15				Good
323	Populus deltoides	Eastern Cottonwood	9				Fair
324	Populus deltoides	Eastern Cottonwood	11				Fair
325	Populus deltoides	Eastern Cottonwood	8				Good
326	Populus deltoides	Eastern Cottonwood	9		twin		Fair
327	Populus deltoides	Eastern Cottonwood	9				Fair
328	Populus deltoides	Eastern Cottonwood	11				Good
329	Populus deltoides	Eastern Cottonwood	8				Fair
330	Populus deltoides	Eastern Cottonwood	9				Fair
331	Populus deltoides	Eastern Cottonwood	9				Fair
332	Populus deltoides	Eastern Cottonwood	10		twin	10	Fair
333	Populus deltoides	Eastern Cottonwood	16				Good
334	Populus deltoides	Eastern Cottonwood	14				Fair
335	Populus deltoides	Eastern Cottonwood	18				Fair
336	Populus deltoides	Eastern Cottonwood	18				Fair
337	Ulmus pumila	Siberian Elm	8		multi		Fair
338	Populus deltoides	Eastern Cottonwood	16				Fair
339	Populus deltoides	Eastern Cottonwood	19				Fair
340	Populus deltoides	Eastern Cottonwood	9				Good
341	Populus deltoides	Eastern Cottonwood	11				Fair
342	Populus deltoides	Eastern Cottonwood	10		twin	7	Fair
343	Tsuga canadensis	Eastern red cedar	1	7'			Fair
344	Tsuga canadensis	Eastern red cedar	1	8'			Fair
345	Populus deltoides	Eastern Cottonwood	15				Fair
346	Populus deltoides	Eastern Cottonwood	8				Fair
347	Populus deltoides	Eastern Cottonwood	15				Fair
348	Populus deltoides	Eastern Cottonwood	10				Fair
349	Populus deltoides	Eastern Cottonwood	16				Fair
350	Populus deltoides	Eastern Cottonwood	9				Fair
351	Acer negundo	Boxelder	11		twin	11	Fair
352	Acer rubrum	Red Maple	13				Fair
353	Acer negundo	Boxelder	10				Poor
354	Populus deltoides	Eastern Cottonwood	12				Fair
355	Populus deltoides	Eastern Cottonwood	10				Poor
356	Prunus serotina	Black Cherry	10				Poor
357	Prunus serotina	Black Cherry	14		multi	13,12	Poor
358	Prunus serotina	Black Cherry	11				Fair
359	Prunus serotina	Black Cherry	11				Fair
360	Acer rubrum	Red Maple	10				Fair
361	Prunus serotina	Black Cherry	8		multi		Poor
362	Pinus sylvestris	Scotch Pine	1	15'			Fair
363	Populus deltoides	Eastern Cottonwood	16				Poor
364	Populus deltoides	Eastern Cottonwood	16				Fair
365	Prunus serotina	Black Cherry	12		multi		Fair
366	Prunus serotina	Black Cherry	9				Fair
367	Prunus serotina	Black Cherry	12				Good
368	Acer rubrum	Red Maple	15				Fair
369	Prunus serotina	Black Cherry	10		twin		Poor
370	Prunus serotina	Black Cherry	15		twin	14	Poor
371	Prunus serotina	Black Cherry	12		multi	10	Poor
372	Prunus serotina	Black Cherry	8		twin	8	Fair
373	Quercus velutina	Black Oak	17				Fair
374	Prunus serotina	Black Cherry	8				Poor
375	Quercus velutina	Black Oak	14				Fair
376	Prunus serotina	Black Cherry	9		twin	9	Fair
377	Prunus serotina	Black Cherry	9				Fair
378	Acer rubrum	Red Maple	9				Good
379	Acer rubrum	Red Maple	9		twin		Fair
380	Prunus serotina	Black Cherry	8				Fair
381	Prunus serotina	Black Cherry	14				Poor
382	Malus spp.	Apple	10				Poor
383	Quercus velutina	Black Oak	8				Fair
384	Populus deltoides	Eastern Cottonwood	15				Fair
385	Ulmus americana	American Elm	8				Fair
386	Acer rubrum	Red Maple	10				Good
387	Prunus serotina	Black Cherry	14		multi	9	Fair
388	Prunus serotina	Black Cherry	14		twin	8	Poor
389	Acer rubrum	Red Maple	11				Good
390	Prunus serotina	Black Cherry	8				Fair
391	Acer rubrum	Red Maple	10				Fair
392	Prunus serotina	Black Cherry	12				Fair
393	Acer rubrum	Red Maple	10		twin	9	Fair
394	Prunus serotina	Black Cherry	14				Fair
395	Prunus serotina	Black Cherry	12				Fair
396	Acer rubrum	Red Maple	9				Good
397	Prunus serotina	Black Cherry	10		twin	9	Poor
398	Prunus serotina	Black Cherry	13		twin	11	Fair
399	Prunus serotina	Black Cherry	12				Poor
400	Prunus serotina	Black Cherry	10				Fair
401	Prunus serotina	Black Cherry	10				Good
402	Acer negundo	Boxelder	14		twin		Poor
403	Quercus velutina	Black Oak	14				Good
404	Prunus serotina	Black Cherry	8				Fair
405	Quercus velutina	Black Oak	8				Fair
406	Quercus velutina	Black Oak	14				Fair
407	Celtis occidentalis	Northern Pin Oak	12				Good
408	Celtis occidentalis	Northern Pin Oak	10				Good
409	Celtis occidentalis	Northern Pin Oak	25				Fair
410	Celtis occidentalis	Northern Pin Oak	10				Fair
411	Quercus velutina	Black Oak	10				Poor
412	Pinus strobus	Eastern White Pine	10	40'			Poor
413	Pinus strobus	Eastern White Pine	9	30'			Poor
414	Pinus strobus	Eastern White Pine	11	30'			Poor
415	Quercus velutina	Black Oak	14		twin		Fair
416	Quercus velutina	Black Oak	10				Fair
417	Quercus velutina	Black Oak	14				Good
418	Prunus serotina	Black Cherry	11		twin	10	fair
419	Prunus serotina	Black Cherry	9				Poor
420	Prunus serotina	Black Cherry	14		multi	13,10	Poor
421	Prunus serotina	Black Cherry	10				Poor
422	Prunus serotina	Black Cherry	10		multi	9,8	Poor
423	Prunus serotina	Black Cherry	10				Poor
424	Ulmus americana	American Elm	16				Fair
425	Ulmus americana	American Elm	16				Poor
426	Prunus serotina	Black Cherry	12		twin	10	Poor
427	Prunus serotina	Black Cherry	8		multi	8	Poor
428	Acer rubrum	Red Maple	12		twin	12	Fair
429	Prunus serotina	Black Cherry	9				Poor
430	Prunus serotina	Black Cherry	10				Poor
431	Prunus serotina	Black Cherry	8				Poor
432	Prunus serotina	Black Cherry	9		multi	8	Fair
433	Quercus velutina	Black Oak	10		twin		Good
434	Quercus velutina	Black Oak	13		twin	11	Good
435	Quercus velutina	Black Oak	9				Fair
436	Ulmus pumila	Siberian Elm	13				Fair
437	Acer negundo	Boxelder	9		twin		Poor
438	Acer negundo	Boxelder	8				Poor
439	Acer negundo	Boxelder	9				Poor
440	Populus deltoides	Eastern Cottonwood	14		twin	11	Poor
441	Prunus serotina	Black Cherry	18		twin	14	Fair
442	Carya ovata	Shagbark Hickory	8				Fair
443	Prunus serotina	Black Cherry	10		twin	9	Fair
444	Quercus velutina	Black Oak	9				Poor
445	Prunus serotina	Black Cherry	8		twin		Poor
446	Prunus serotina	Black Cherry	8				Poor
447	Morus alba	White Mulberry	12		multi	11,11	Fair
448	Prunus serotina	Black Cherry	10				Fair
449	Acer negundo	Boxelder	11				Poor
450	Acer negundo	Boxelder	21		multi		Good
451	Carya ovata	Shagbark Hickory	13				Poor
452	Quercus velutina	Black Oak	32				Fair
453	Populus deltoides	Eastern Cottonwood	8				Poor
454	Populus deltoides	Eastern Cottonwood	9				Good
455	Prunus serotina	Black Cherry	8				Poor
456	Celtis occidentalis	Northern Pin Oak	8				Fair
457	Carya ovata	Shagbark Hickory	11				Good
458	Carya ovata	Shagbark Hickory	12		twin	12	Fair
459	Carya ovata	Shagbark Hickory	12		twin		Good
460	Carya ovata	Shagbark Hickory	10				Fair
461	Acer negundo	Boxelder	11				Poor
462	Prunus serotina	Black Cherry	12		twin	10	Poor
463	Acer negundo	Boxelder	13				Poor
464	Populus deltoides	Eastern Cottonwood	39				Fair
465	Populus deltoides	Eastern Cottonwood	37				Good
466	Populus deltoides	Eastern Cottonwood	25				Fair
467	Populus deltoides	Eastern Cottonwood	23				Poor
468	Tsuga canadensis	Eastern red cedar	5	20'			Fair
469	Tsuga canadensis	Eastern red cedar	4	25'	twin	4	Poor
470	Tsuga canadensis	Eastern red cedar	6	35'			Fair
471	Pinus strobus	Eastern White Pine	20	80'			Fair
472	Pinus strobus	Eastern White Pine	13	80'			Fair
473	Pinus strobus	Eastern White Pine	14	80'			Poor
474	Pinus strobus	Eastern White Pine	10	75'			Fair
475	Prunus serotina	Black Cherry	11				Poor
476	Pinus strobus	Eastern White Pine	15	70'			Fair
477	Pinus strobus	Eastern White Pine	11	65'			Poor
478	Prunus serotina	Black Cherry	14		multi	13,12	Good
479	Prunus serotina	Black Cherry	21				Poor
480	Pinus strobus	Eastern White Pine	11	70'			Fair
481	Pinus strobus	Eastern White Pine	13	50'			Poor
482	Pinus strobus	Eastern White Pine	13	45'			Fair
483	Prunus serotina	Black Cherry	15				Fair
484	Pinus strobus	Eastern White Pine	11	70'			Fair
485	Quercus velutina	Black Oak	8				Fair
486	Acer negundo	Boxelder	8				Fair
487	Quercus velutina	Black Oak	16				Fair
488	Ulmus americana	American Elm	14				Good
489	Prunus serotina	Black Cherry	16		twin	8	Fair
490	Carya cordiformis	Bitternut Hickory	9				Good
491	Prunus serotina	Black Cherry	14		twin	8	Fair
492	Prunus serotina	Black Cherry	9				Poor
493	Pinus strobus	Eastern White Pine	13	70'			Fair
494	Prunus serotina	Black Cherry	11		twin		Poor
495	Prunus serotina	Black Cherry	9				Poor
496	Quercus velutina	Black Oak	8				Poor
497	Prunus serotina	Black Cherry	15		multi		Poor
498	Populus deltoides	Eastern Cottonwood	40				Fair
499	Populus deltoides	Eastern Cottonwood	38				Poor
500	Acer negundo	Boxelder	11				Poor
501	Quercus velutina	Black Oak	10				Fair
502	Quercus velutina	Black Oak	12				Good
503	Quercus velutina	Black Oak	9				Fair
504	Quercus velutina	Black Oak	11				Fair
505	Quercus velutina	Black Oak	10		twin	8	Good
506	Pinus resinosa	red pine	9				Poor
507	Prunus serotina	Black Cherry	18				Poor
508	Quercus velutina	Black Oak	11				Fair
509	Carya ovata	Shagbark Hickory	10		twin	8	Fair
510	Populus deltoides	Eastern Cottonwood	8		twin		Fair
511	Populus deltoides	Eastern Cottonwood	8				Fair
512	Populus deltoides	Eastern Cottonwood	9				Fair
513	Quercus velutina	Black Oak	11				Fair
514	Populus deltoides	Eastern Cottonwood	8				Fair
515	Populus deltoides	Eastern Cottonwood	9		multi	8,8	Good
516	Pyrus calleryana	Bradford Pear	12		multi	10,10	Poor

HWLA
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LANDSCAPE ARCHITECTURE
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33203 BIDDESTONE LANE, FARMINGTON HILLS, MI 48334

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ARCHITECTS AND PLANNERS
550 E. NINE MILE ROAD
FERNDALE, MICHIGAN, 48220
PHONE 248.543.4100 FAX 248.543.4141

SEAL

STATE OF MICHIGAN
KENNETH S. WEIKAL
LANDSCAPE ARCHITECT
No. 1022
REGISTERED LANDSCAPE ARCHITECT

BIRKENSTOCK OFFICE / STORAGE BUILDING

GENOA TOWNSHIP MICHIGAN

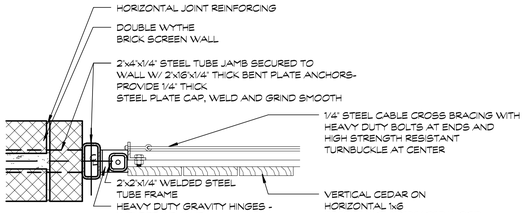
DATE	ISSUE
02-22-2019	PID SITE RE-SUBMISSION
01-29-2019	PID SITE SUBMISSION

KEY PLAN

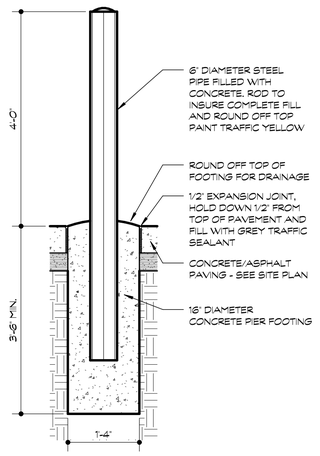
FSP PROJECT NO.
HAR17.032

DRAWING TITLE
TREE REMOVAL PLAN

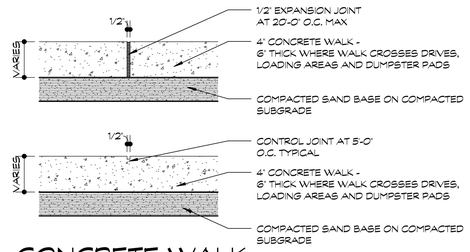
DRAWING NUMBER
LT2



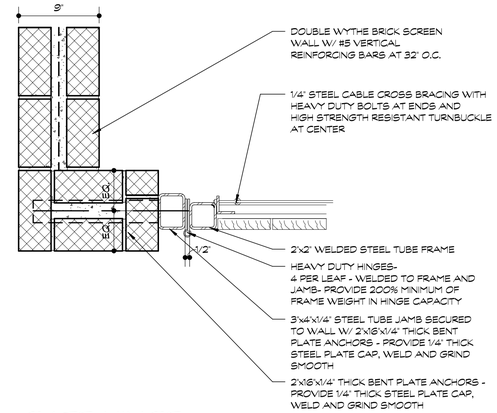
3 / L.901 **GATE SECTION**
SCALE: 1 1/2" = 1'-0"



10 / L.901 **PIPE BOLLARD**
SCALE: 3/4" = 1'-0"



6 / L.901 **CONCRETE WALK SECTIONS**
SCALE: 1" = 1'-0"



3 / L.901 **GATE HINGE SECTION**
SCALE: 1 1/2" = 1'-0"

FSP FUSCO, SHAFFER & PAPPAS, INC.
ARCHITECTS AND PLANNERS

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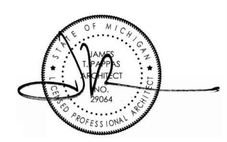
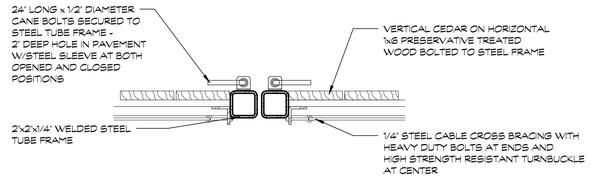
SEAL

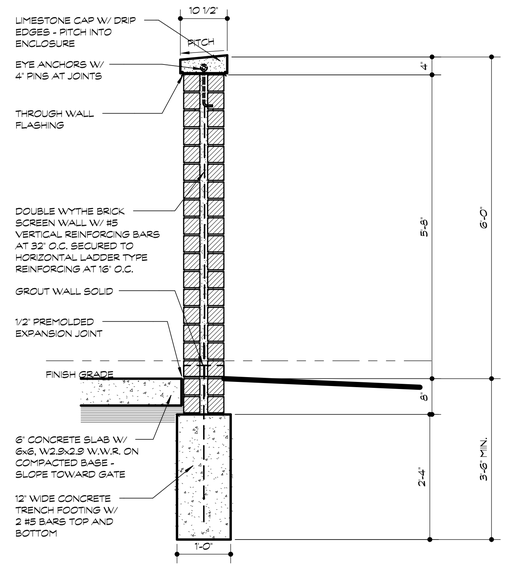


BIRKENSTOCK OFFICE/STORAGE BUILDING

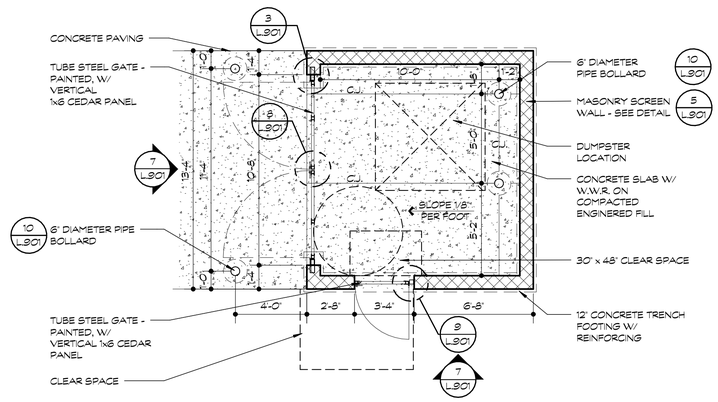
GENOA TOWNSHIP | MICHIGAN



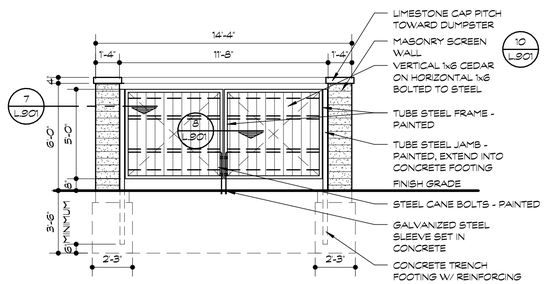
8 / L.901 **GATE LATCH SECTION**
SCALE: 1 1/2" = 1'-0"



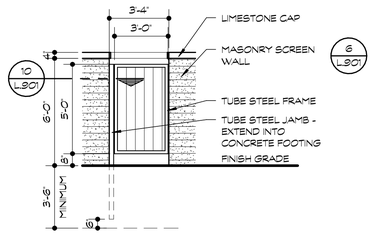
5 / L.901 **SCREEN WALL SECTION**
SCALE: 3/4" = 1'-0"



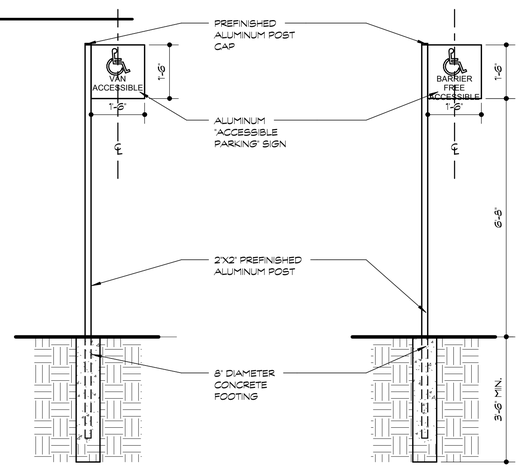
2 / L.901 **DUMPSTER ENCLOSURE PLAN**
SCALE: 1/4" = 1'-0"



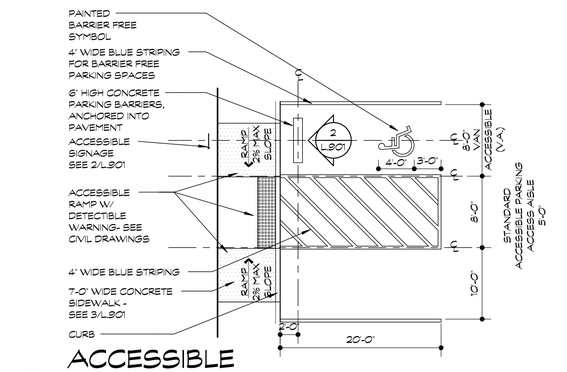
7 / L.901 **DUMPSTER ENCLOSURE GATE ELEVATION**
SCALE: 1/4" = 1'-0"



MAN GATE



4 / L.901 **ACCESSIBLE SIGN ELEVATION**
SCALE: 1/2" = 1'-0"



1 / L.901 **ACCESSIBLE STRIPING PLAN**
SCALE: 1/8" = 1'-0"

DATE	ISSUE
02.22.19	PID RE-SUBMISSION
01.29.19	PID SITE SUBMISSION

KEY PLAN

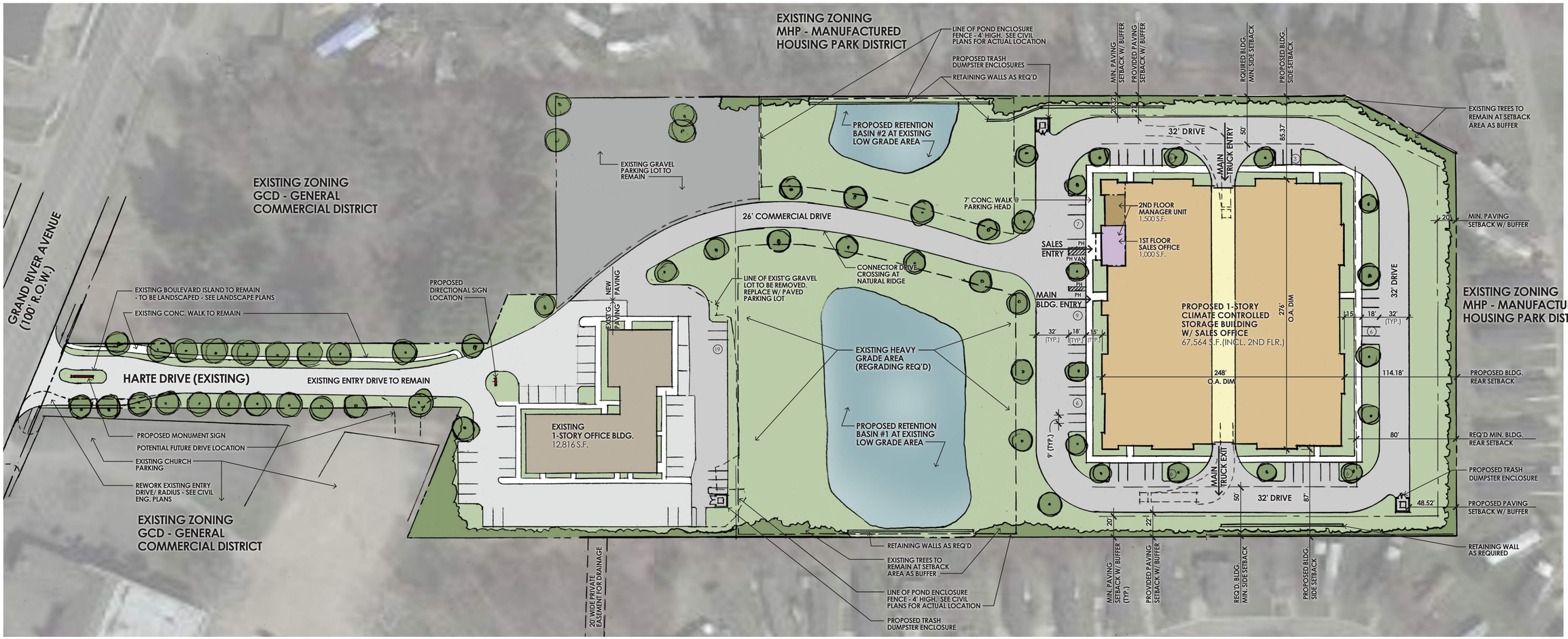
FSP PROJECT NO. HAR17.032

DRAWING TITLE

SITE DETAILS

DRAWING NUMBER

L.901



NORTH

CONCEPTUAL SITE PLAN

SCALE: 1" = 50'-0"

0 25' 50' 100'

SITE DATA

SITE AREA (GROSS)

MINIMUM	3 AC
PROVIDED	± 462,607 S.F. OR ± 10.62 AC

LOT WIDTH

MINIMUM	150 FT.
PROVIDED	450 FT.

ZONING

EXISTING	GCD (GENERAL COMMERCIAL DISTRICT)
PROPOSED	PID(PLANNED INDUSTRIAL DEVELOPMENT W/ IND BASE)

TOTAL BUILDING FOOTPRINT AREA

EXISTING	12,816 SF.
PROPOSED	66,064 SF.
TOTAL	78,880 SF.

LOT COVERAGE (BUILDINGS)

MAXIMUM ALLOWED	185,042 S.F. (40%)
EXISTING	12,816 S.F. (2.7%)
PROPOSED (TOTAL INCL. EXIST'G.)	78,880 S.F. (17%)

LOT COVERAGE (IMPERVIOUS SURFACE INCLUDING BUILDING)

MAXIMUM ALLOWED	393,215 S.F. (85%)
PROPOSED (TOTAL INC. EXIST'G)	208,921 S.F. (45.2%)

BUILDING HEIGHT

MAXIMUM ALLOWED	30 FEET - 2 STORY
PROPOSED	27 FEET - 2 STORY

BUILDING AREA (GROSS)

EXISTING OFFICE BLDG.	12,816 S.F.
PROPOSED STORAGE BLDG.	
STORAGE W/ SALES OFFICE (INCL. 1,000 S.F. SALES)	59,680 S.F.
MANAGERS UNIT	1,500 S.F.
TRUCK LOADING(ENCLOSED)	6,384 S.F.
TOTAL PROPOSED STORAGE BLDG.	67,564 S.F.
GRAND TOTAL(INCLUDING EXISTG.)	80,380 S.F.
STORAGE AREA(NET)	46,607 S.F.

PARKING

REQUIRED - NEW BLDG.	
STORAGE (1 C/1,500 S.F.)	43 SPACES
SALES OFFICE (1 C/300 S.F.)	4 SPACES
MANAGERS UNIT (2/UNIT)	2 SPACES
TOTAL	49 SPACES
REQUIRED - EXISTING BLDG(1C/300 S.F.)	43 SPACES
PROPOSED - NEW BLDG.	
STORAGE/SALES OFFICE(INCL. 4 P.H. SPACES)	49 SPACES
PROPOSED - EXISTING BLDG	67 SPACES

EXISTING ZONING
MHP - MANUFACTURED
HOUSING PARK DISTRICT

NOTES:

1. ALL INTENSITY AND DIMENSIONAL DATA NOTES AS "REQUIRED" OR "ALLOWABLE" IS BASED ON THE IND BASE ZONING STANDARDS (AS AMENDED).
2. THE BUILDING SHALL BE PROVIDED WITH ALL AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13.

BIRKENSTOCK
OFFICE/STORAGE BUILDING

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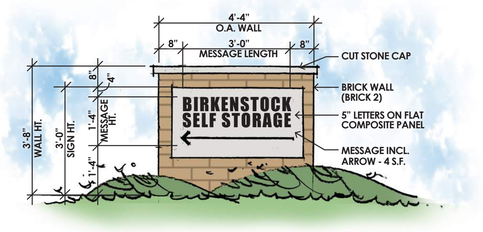
CONSULTANT REVIEW
JANUARY 25, 2019
P.I.D. SITE SUBMISSION
JANUARY 29, 2019
P.I.D. RE-SUBMISSION
FEBRUARY 22, 2019

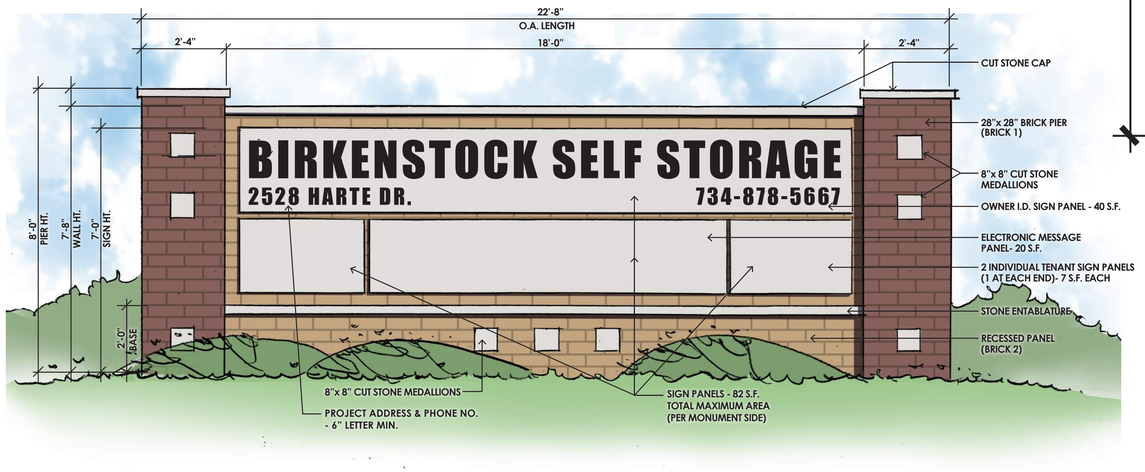
A.S.101



DIRECTIONAL SIGN ELEVATION

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

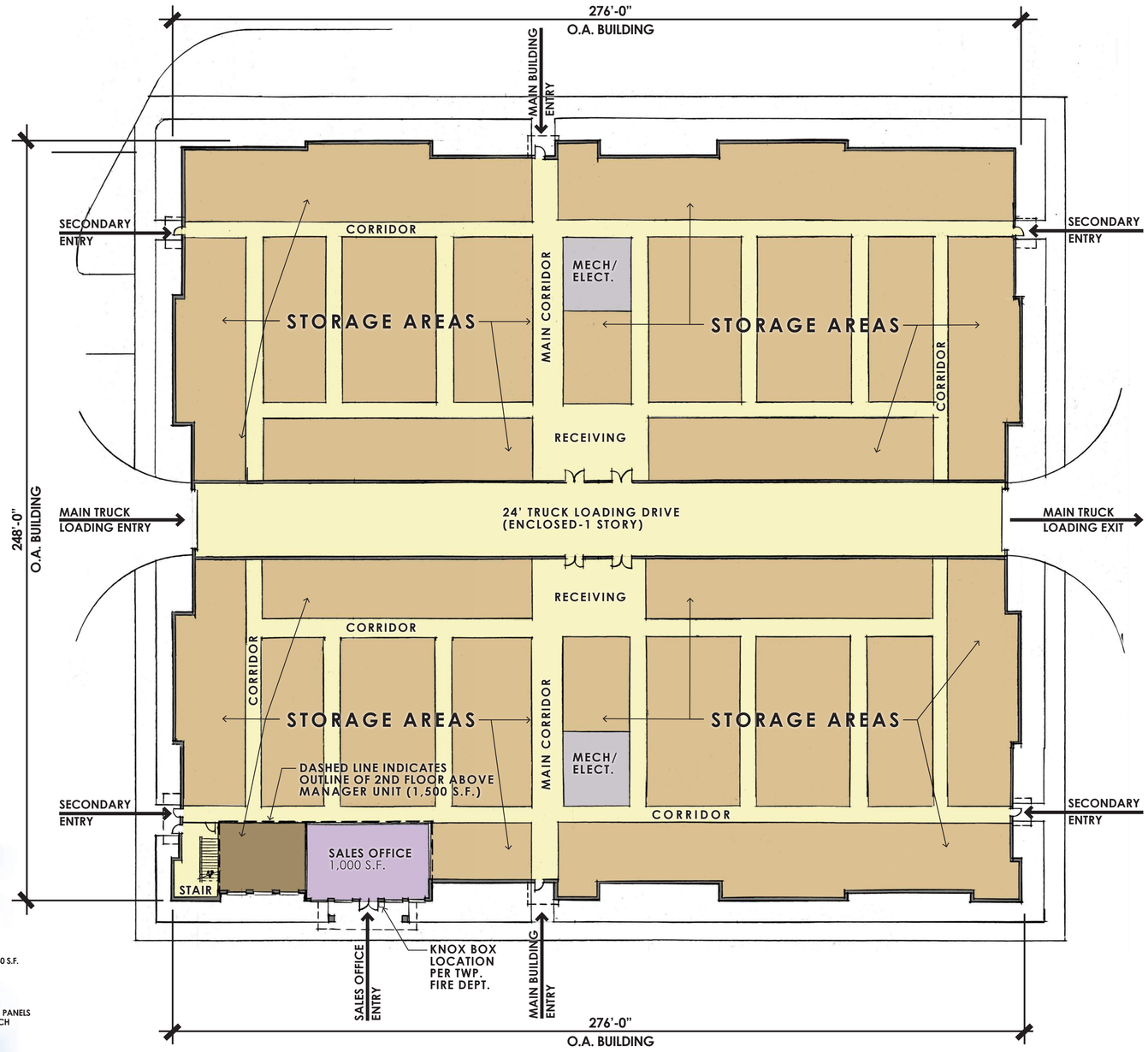
ONE-SIDED SIGN



CONCEPTUAL ENTRY MONUMENT SIGN ELEVATION

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

OPPOSITE SIDE SIMILAR



NORTH

CONCEPTUAL FIRST FLOOR BUILDING PLAN

SCALE: 1" = 20'-0"

67,596 S.F. TOTAL
46,607 S.F. STORAGE AREA

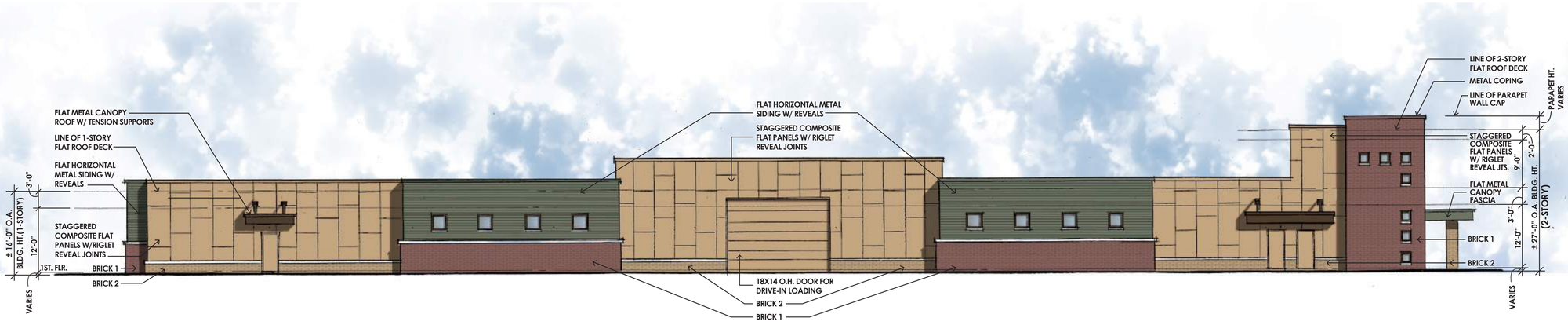
BIRKENSTOCK

OFFICE/STORAGE BUILDING

GENOA TOWNSHIP, MICHIGAN

FSP FUSCO, SHAFFER & PAPPAS, INC.
ARCHITECTS & PLANNERS
550 E. NINE MILE RD.
FERNDALE, MICHIGAN 48220
PHONE 248.543.4100 FAX 248.543.4141
www.fsparchitects.com

CONSULTANT REVIEW
JANUARY 25, 2019
P.I.D. SITE SUBMISSION
JANUARY 29, 2019
P.I.D. RE-SUBMISSION
FEBRUARY 22, 2019



CONCEPTUAL LEFT SIDE ELEVATION(EAST)

SCALE: 3/32" = 1'-0"

0 5 10 20

EXTERIOR BUILDING MATERIAL % - EAST SIDE (LEFT)

MATERIAL	MAX % ALLOWED	PROVIDED %
BRICK	100%(MIN. 50%)	28.7%
METAL SIDING	25%	21.3%
COMPOSITE SIDING	25%	48.9%
METAL CANOPY	25%	1.1%
TOTAL		100%

CONCEPTUAL FRONT SIDE ELEVATION(NORTH)

SCALE: 3/32" = 1'-0"

0 5 10 20

EXTERIOR BUILDING MATERIAL % - NORTH SIDE (FRONT)

MATERIAL	MAX % ALLOWED	PROVIDED %
BRICK	100%(MIN. 50%)	71.6%
METAL SIDING	25%	17.2%
COMPOSITE SIDING	25%	9.6%
METAL CANOPY	25%	1.6%
TOTAL		100%

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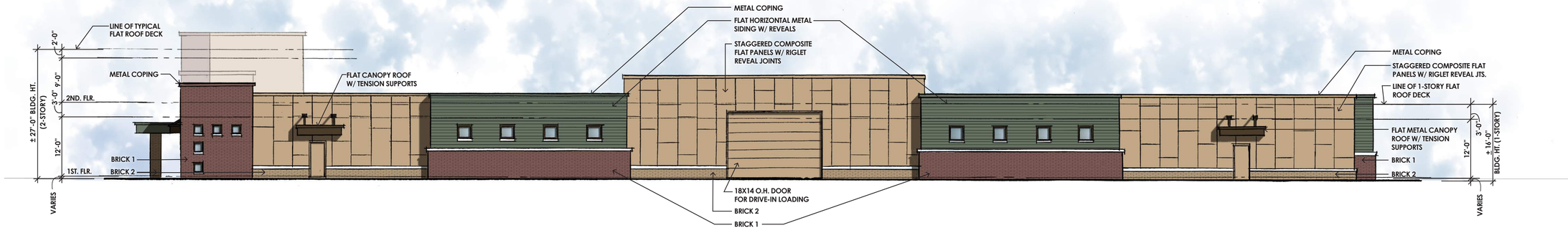
CONSULTANT REVIEW
JANUARY 25, 2019

P.I.D. SITE SUBMISSION
JANUARY 29, 2019

P.I.D. RE-SUBMISSION
FEBRUARY 22, 2019

A.201



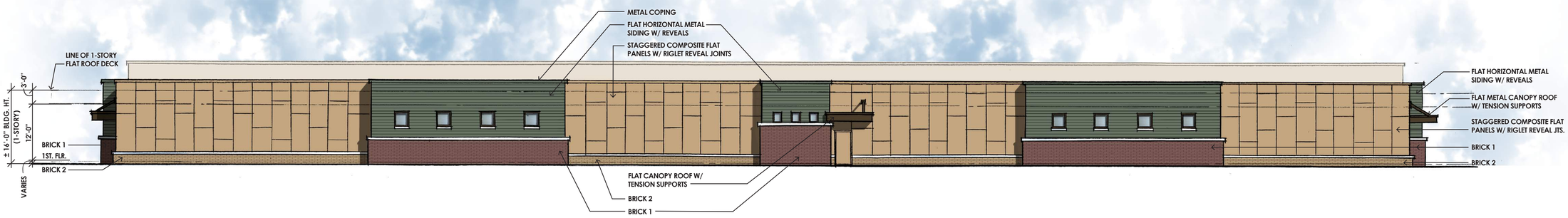
CONCEPTUAL RIGHT SIDE ELEVATION(WEST)

SCALE: 3/32" = 1'-0"

0 5 10 20

EXTERIOR BUILDING MATERIAL % - WEST SIDE (RIGHT)

MATERIAL	MAX % ALLOWED	PROVIDED %
BRICK	100%(MIN. 50%)	27.6%
METAL SIDING	25%	23.4%
COMPOSITE SIDING	25%	48.2%
METAL CANOPY	25%	0.8%
TOTAL		100%



CONCEPTUAL REAR SIDE ELEVATION(SOUTH)

SCALE: 3/32" = 1'-0"

0 5 10 20

EXTERIOR BUILDING MATERIAL % - SOUTH SIDE (REAR)

MATERIAL	MAX % ALLOWED	PROVIDED %
BRICK	100%(MIN. 50%)	24%
METAL SIDING	25%	24.3%
COMPOSITE SIDING	25%	51.3%
METAL CANOPY	25%	0.4%
TOTAL		100%

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GENOA TOWNSHIP, MICHIGAN

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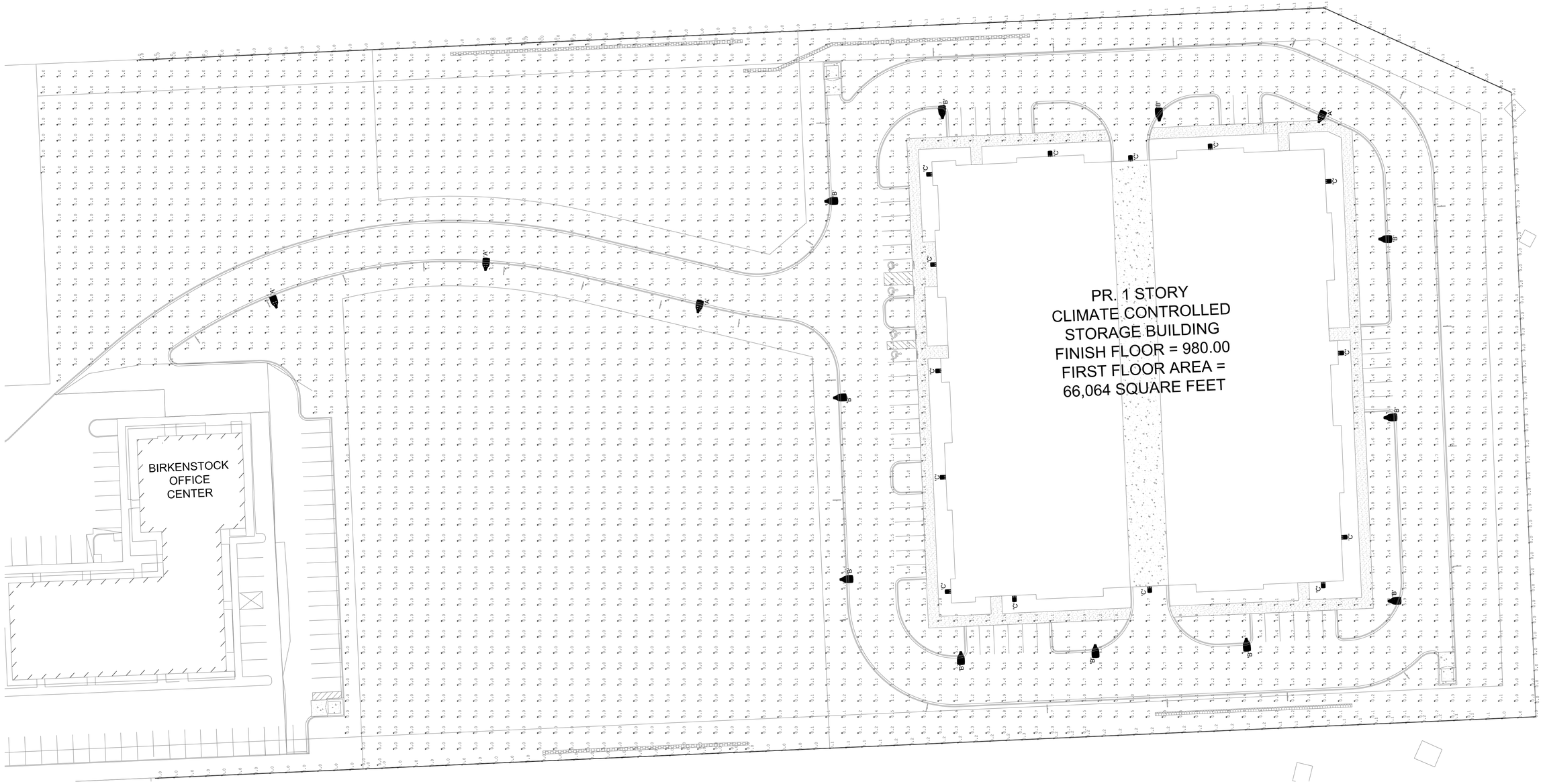
CONSULTANT REVIEW
JANUARY 25, 2019

P.I.D. SITE SUBMISSION
JANUARY 29, 2019

P.I.D. RE-SUBMISSION
FEBRUARY 22, 2019

A.202



N

SITE PLAN - PHOTOMETRICS

SCALE 1" = 30'-0"

0 30' 60'

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
CalcPts_1	Illuminance	Fc	0.76	6.8	0.0	N.A.	N.A.
PROPERTY LINE	Illuminance	Fc	0.05	0.3	0.0	N.A.	N.A.
Entry Drive	Illuminance	Fc	1.98	6.8	0.2	9.90	34.00
Parking Drive	Illuminance	Fc	2.09	6.7	0.2	10.45	33.50

Luminaire Schedule									
Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description	Total Watts	BUG Rating	Lum. Watts
	4	A	SINGLE	N.A.	0.950	VISIONAIRE VSX-1-T2-15L-4K-VOLT SINGLE @ 20' MTG. HT.	408	B3-U0-G3	102
	11	B	SINGLE	N.A.	0.950	VISIONAIRE VSX-1-T3-15L-4K-VOLT SINGLE @ 20' MTG. HT.	1122	B3-U0-G3	102
	14	C	SINGLE	N.A.	0.950	VISIONAIRE VSC-1-T3-16LC-3-4K-VOLT WM @ 15' MTG. HT.	252	B1-U0-G1	18

FUSCO, SHAFFER & PAPPAS, INC.
ARCHITECTS AND PLANNERS

550 E. NINE MILE ROAD
FERNDALE, MICHIGAN, 48220
PHONE 248.543.4100 FAX 248.543.4141

SEAL

STATE OF MICHIGAN
JORDAN KOENIG
ENGINEER
No. 59789
LICENSED PROFESSIONAL ENGINEER
02/22/19

BIRKENSTOCK
OFFICE / STORAGE BUILDING

GENOA TOWNSHIP

MICHIGAN

DATE	ISSUE
02-22-19	PID Re-submission
01-28-19	PID Site submission

KEY PLAN

FSP PROJECT NO.

DRAWING TITLE

SITE PLAN - PHOTOMETRICS

DRAWING NUMBER

EX.001

mechanical electrical engineering consultants pc
1415 Goldsmith
Plymouth, MI 48170
P 734-454-5516
F 734-454-5517

MEEC JOB # 724-19-014

FSP FUSCO, SHAFFER & PAPPAS, INC.
ARCHITECTS AND PLANNERS

550 E. NINE MILE ROAD
FERNDALE, MICHIGAN, 48220
PHONE 248.543.4100 FAX 248.543.4141

SEAL

VSX LED Specifications

Project Name:

Catalog Number:

Type:

The VSX LED Series offers clean, functional styling that is defined by its sleek low profile design and rugged construction. It combines LED performance and advanced LED thermal management technology and provides outdoor lighting that is both energy efficient and aesthetically pleasing.

The LED's performance and the driver's life are maximized by enclosing them in two separate cast aluminum housings. Easy captive screw access for mounting and maintenance.

The LED light assemblies come with 16 to 48 LEDs. Eight optical distribution patterns are available. Choose between 3000, 4000 or 5000 Kelvin temperature of the LEDs.

A durable polyester powder coat finish is guaranteed for five years; and is available in standard or custom colors.

The VSX LED series is an exceptional choice for commercial parking lots, office complexes, architectural projects, and other general lighting projects.

Ordering Information

MODEL	OPTICS	LEDs	CURRENT	KELVIN	VOLTAGE	MOUNTING	FINISH	OPTIONS	OPTIONS
VSX-1	T1	16LC	3 350mA	3K 3000K	UNV *120-277V	AM Arm Mount	BZ Bronze	PCR-120 Photocell & Receptacle	RPP3 For 3"Ø Pole - Round Pole Plate Adaptor
	T2	32LC	5 530mA	4K 4000K	8 347V	WM Wall Mount *Requires BAWP	BK Black	PCR-208 Photocell & Receptacle	RPP4 For 4"Ø Pole - Round Pole Plate Adaptor
	T3	48LC	7 700mA	5K 5000K	5 480V	Round Pole Plate Adaptors (RPP) are to be ordered separately.	SBK Smooth Black	PCR-240 Photocell & Receptacle	RPP5 For 5"Ø Pole - Round Pole Plate Adaptor
	T4		10 1050mA			BAWP to be ordered separately.	WH White	PCR-277 Photocell & Receptacle	UPMA Universal Pole Mount Adaptor
	T4A						SWH Smooth White	PCR-480 Photocell & Receptacle	UPMA-R Universal Round Pole Mount Adaptor
	T5						GP Graphite	PER 3 Pin Photo Receptacle w/shorting cap	BAWP Cast Wall Plate
	T5W						GY Grey	5PINPER 5 Pin Photo Receptacle w/shorting cap Requires Dimming Driver	ROT-R Rotated Optics Right Side
	T5WR						SL Silver Metallic	7PINPER 7 Pin Photo Receptacle w/shorting cap Requires Dimming Driver	ROT-L Rotated Optics Left Side
							CC Custom Color	DIM 0-10v Dimming Driver	CLS Back Side Cutoff Louver Shield
								WSC-8 Motion Sensor 8' Mounting Height	RCLS Right Side Cutoff Louver Shield
								WSC-20 Motion Sensor 9-20' Mounting Height	LCLS Left Side Cutoff Louver Shield
								WSC-40 Motion Sensor 21-40' Mounting Height This option will require (1) FSIR 100 remote for programing	
								VWC Visionaire Wireless Controls *Consult Factory	

VISIONAIRE LIGHTING

VSC LED Specifications

Project Name:

Catalog Number:

Type:

The VSC LED wall mount Series continues the unique contemporary design that is inspired by the V-Collection light series. It combines LED performance and advanced LED thermal management technology and provides lighting that is energy efficient and aesthetically pleasing.

The LED performance and the driver's life are maximized by enclosing them in two separate cast aluminum housings. Easy access for mounting and maintenance.

The LED light assemblies come with 16, 32, or 48 LEDs.

Six optical distribution pattern are available. Choose between 3000, 4000 or 5000 Kelvin temperature for the LEDs.

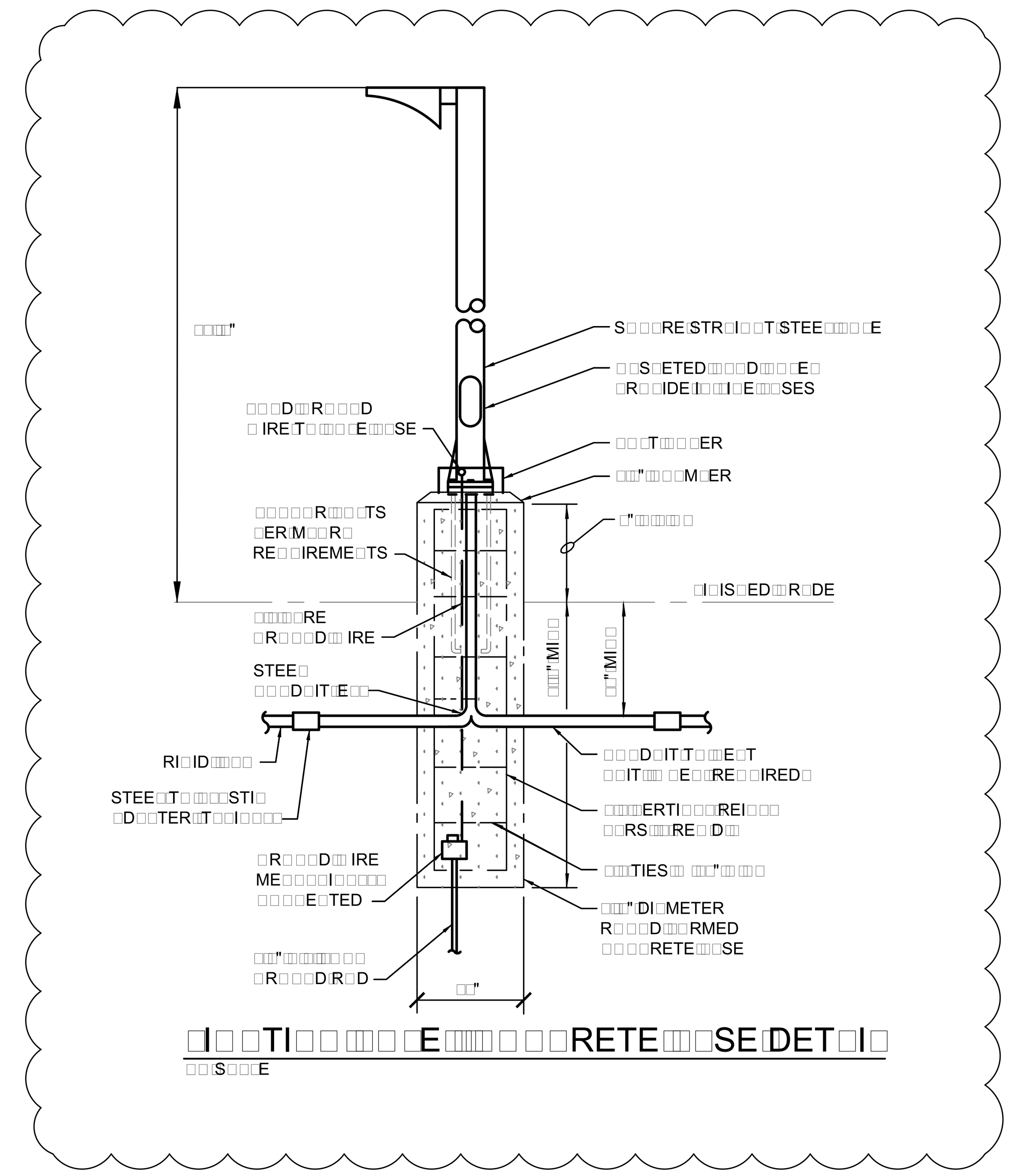
A durable polyester powder coat finish is guaranteed for five years; and is available in standard or custom colors.

The VSC Series is an exceptional choice for office complexes, schools, commercial buildings, and many architectural projects.

Ordering Information

MODEL	OPTICS	SOURCE	CURRENT	KELVIN	VOLTAGE	MOUNTING	FINISH	OPTIONS
VSC-1	T1	16LC	3 350mA	3K 3000K	UNV *120-277V	WM Wall Mount	BZ Bronze	PC-120 Button Type Photocell
	T2	32LC	5 530mA	4K 4000K		VCB Conduit Box Mounting Plate with (2) 1/2" Threaded Conduit Holes.	BK Black	PC-208 Button Type Photocell
	T3	48LC	7 700mA	5K 5000K			SBK Smooth Black	PC-240 Button Type Photocell
	T4		10 1050mA Not Available in 48LC				WH White	PC-277 Button Type Photocell
	T5						SWH Smooth White	WSC-8 Motion Sensor 8' Mounting Height
	T5W						GP Graphite	WSC-20 Motion Sensor 9-20' Mounting Height
							GY Grey	WSC-40 Motion Sensor 21-40' Mounting Height This option will require (1) FSIR 100 remote for programing
							SL Silver Metallic	DIM 0-10v Dimming Driver
							CC Custom Color	EBPL Emergency Battery Pack
								UP Up-Light Orientation
								BP Back Plate
								CLS Back Side Cutoff Louver Shield
								RCLS Right Side Cutoff Louver Shield
								LCLS Left Side Cutoff Louver Shield

VISIONAIRE LIGHTING



MICHIGAN

BIRKENSTOCK
OFFICE / STORAGE BUILDING

GENOA TOWNSHIP

DATE	ISSUE
02-22-19	PID Re-submission
01-29-19	PID Site submission

KEY PLAN

FSP PROJECT NO.

DRAWING TITLE

SITE PLAN - LIGHT FIXTURES

mechanical electrical engineering consultants pc
1415 Goldsmith
Plymouth, MI 48170
P 734-454-5516
F 734-454-5517

MEEC JOB

DRAWING NUMBER

EX.002

MISTY MEADOWS
REVISED SITE PLAN REQUEST
Submitted: January 23, 2019

Guy F. Genzel respectfully submits a request to change the approved asphalt roadway to a gravel surface road. Specifically, Mr. Genzel is requesting approval by the Planning Commission as an amendment to the approved site plan pursuant to Section 18.10. Drawings from Boss Engineering will be available for review. These new drawings simply remove the requirement for the asphalt surface. That is the only change requested.

In consulting with our current realtor, we are confident there will remain significant value and interest in purchase of the remaining lots, even without the asphalt. Therefore, it should have no impact on moving the project forward in this respect. As an alternative, the homeowners association can ask for approval of a hard surface at a later time.

The main reason for this request is budgetary concerns for the project. Several unexpected expenses have occurred putting this project well over budget. This has significantly delayed the timeline of completing the project as well. The goal for the project of course to obtain building permits so lot owners can begin the development of their respective properties.

Mr. Genzel is confident that this deviation will allow the project to move forward with lots being sold and developed as early as next spring. Moving forward of course in the best interest of all parties involved, the Township, neighboring properties, and Mr. Genzel.

Respectfully Submitted,

Keith Genzel on behalf of Guy Genzel

March 6, 2019

Planning Commission
Genoa Township
2911 Dorr Road
Brighton, Michigan 48116

Attention:	Kelly Van Marter, AICP Planning Director and Assistant Township Manager
Subject:	Misty Meadows – Amendment to Approved Private Road Plan (Review #1)
Location:	West side of S. Latson Road – south of Crooked Lake Road
Zoning:	RR Rural Residential District

Dear Commissioners:

As requested, we have reviewed the proposed amendment to the private road plan for Misty Meadows, which was approved in 2016.

Per the cover letter included with the submittal, the amendment entails only a change in the road surface from asphalt (previously approved) to gravel (proposed).

A. Summary

1. Given the number of units served and the size of the lots proposed, Section 15.05 allows consideration of gravel surfacing.
2. The applicant must address any comments provided by the Township Engineer.

B. Proposal/Process

The applicant requests to amend their private road plan (approved in 2016) for the Misty Meadows residential development. The proposal entails a change from asphalt surfacing to gravel.

In accordance with Article 18, Planning Commission has review and approval authority over site plans for private roads.

C. Review

Private roads are regulated by Section 15.05 of the Township Zoning Ordinance. As previously noted, the private road was approved in 2016 and the applicant now proposes to change the road surface from asphalt to gravel.

In accordance with Section 15.05.03, private roads may be surfaced with gravel when their function is that of a local street and where no more than 18 lots of at least 2 acres in area each are served.

The approved Misty Meadows development includes 9 lots, each of which exceeds 2 acres in lot area.

We defer to the Township Engineer for a technical review of the revised road plans.

As suggested in our 2016 review of the private road, the applicant has planted trees on the south side of the road near the intersection with S. Latson to protect the adjacent residence from any potential impacts.

Aerial view of site and surroundings (looking north)

Should you have any questions concerning this matter, please do not hesitate to contact our office. We can be reached by phone at (248) 586-0505, or via e-mail at bborden@safebuilt.com and steve.hannon@safebuilt.com.

Respectfully,
SAFEBUILT STUDIO

Brian V. Borden, AICP
Planning Manager

Stephen Hannon, AICP
Planner

From:	Scherdt, Shelby
To:	Kelly VanMarter
Cc:	Markstrom, Gary; Amy Ruthig
Subject:	Misty Meadows Site Plan Amendment
Date:	Wednesday, February 13, 2019 4:46:47 PM
Attachments:	image003.png

Kelly,

We reviewed the Misty Meadows Amendment per the transmittal dated February 7, 2019. The petitioner is proposing to change the previously approved asphalt roadway to a gravel road. According to section 15.05.03 “Private Road Design Standards”, subsection C, a private road may be gravel if lot sizes are two acres or more and if it is serving 18 or fewer lots. The proposed private road for this development is serving nine lots, all above two acres and therefore meets the requirements of the township zoning ordinance to use a gravel road material. We have no engineering related concerns to the proposed site plan amendment.

Let us know if you have any questions or would like any further discussion on the proposed site plan amendment.

Thank you,

Shelby Scherdt, EIT | Project Engineer
Main **+1 (517) 316-3952** | Shelby.Scherdt@tetratech.com

Tetra Tech | Complex World, Clear Solutions™ | United States Infrastructure
401 S. Washington Square, Ste 100 | Lansing, MI 48933 | tetratech.com

TETRA TECH

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

February 21, 2019

Kelly VanMarter
Genoa Township
2911 Dorr Road
Brighton, MI 48116

RE: Misty Meadows Private Road
Misty Meadows Drive
Genoa Twp., MI
Site Plan Review

Dear Kelly:

The Brighton Area Fire Department has reviewed the above mentioned site plan. The plans were received for review on February 8, 2019 and the drawings are dated March 23, 2016 with latest revisions dated January 25, 2019. The project is for a private road for a 9 lot single-family residential development.

The plan review is based on the requirements of the International Fire Code (IFC) 2018 edition.

> The fire authority has no objection to the change from bituminous pavement to gravel. The access roads shall be constructed to be capable of supporting the imposed load of fire apparatus weighing at least 75,000 pounds and must be a maintained all weather surface.
>
> **IFC 503.2.3**

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

Ayes – Ledford, Smith, Hunt, Rowell, Mortensen, Skolarus and McCririe. Nays – None. Absent – None.

6. Consideration of a request to approve the Environmental Impact Assessment (5-19-16) corresponding to a site plan for the proposed Misty Meadows Drive private road located on the west side of S. Latson Road, south of Crooked Lake Road. The private road will serve 9 lots. The request is petitioned by GFG Investments Properties.

Moved by Skolarus and supported by Smith to approve the environmental impact assessment for Misty Meadows Drive private road with the following conditions: The private road maintenance agreement shall be approved by the township attorney; the applicant shall comply with the private road construction process as described in the May 17, 2016 memo from the Township Engineer. The motion carried unanimously.

7. Consider request to approve a Resolution of Intent calling a public hearing regarding the creation of a Local Development Finance Authority in the Latson Interchange area.

Moved by Smith and supported by Ledford to approve the Resolution of Intent setting the public hearing for Monday, July 18, 2016 at 6:30 p.m. at the Genoa Charter Township Hall regarding the creation of a Local Development Finance Authority as requested. The motion carried by roll call vote as follows: Ayes – Ledford, Smith, Hunt, Rowell, Mortensen, Skolarus and McCririe. Nays – None. Absent – None.

8. Consider request to approve a SMART Zone application to the Michigan Economic Development Corporation for the Latson Interchange Area.

Moved by Hunt and supported by Skolarus to table until the next regular meeting of the board on June 20, 2016. The motion carried unanimously.

9. Consider going into closed session to discuss pending litigation pursuant to MCL 15.268 § 8 (e).

Moved by Skolarus and supported by Rowell to move to closed session at 7:01 p.m. as requested. The motion carried by roll call vote as follows: Ayes – Ledford, Smith, Hunt, Rowell, Mortensen, Skolarus and McCririe. Nays – None. Absent – None.

The closed session was adjourned at the board returned to the open meeting at 7:15.

- Correspondence regarding the 97 acre Herbst Farm was discussed with no action taken by the board.
- St. George Lutheran Church approved the sale of cemetery lots to the township

again sell the property to someone who will develop it. Mr. Moore addressed the concerns of the planner, engineer and the Brighton Area Fire Authority's review letters.

Mr. Borden stated he is recommending approval of the extension; however, he wants the applicant to be aware that if any changes to the ordinance are made in the future, they will need to be addressed and the site plan will need to be amended.

Commissioner Mortensen asked Mr. Moore if he is agreeable of not allowing parking on any street. He stated he is and it will become part of the master deed.

Commissioner Mortensen stated that the item noted in the Brighton Area Fire Authority's letter regarding the on-site water needs and the suggestion of the Township requiring well-filled cisterns should be determined by the developer and property owners and not part of the site plan approval.

The call to the public was made at 6:46 pm with no response.

Moved by Commissioner Mortensen, seconded by Commissioner Figurski, to approve the Site Plan Extension for Mountain Top Estates with the following conditions:

- The master deed will be amended to prohibit on-street parking.
- The letter from Ace Civil Engineering, Inc. shall be reviewed by the Township engineer to ensure it meets their requirements.
- The requirement for on-site water, such as cisterns, will be optional and be considered by the developer and home owners.

The motion carried unanimously

OPEN PUBLIC HEARING #2…Review of an Impact Assessment and Site Plan and for the proposed Misty Meadows Drive private road located on the west side of S. Latson Road, south of Crooked Lake Road. The private road will serve nine lots. The request is petitioned by GFG Investments Properties.

Planning Commission disposition of petition:

A. Recommendation of Environmental Impact Assessment (3-23-16)
B. Disposition of Site Plan (4-20-16)

Chairman Brown stated that the Site Plan does not need to be approved by the Planning Commission as it meets the requirements of the Subdivision Act. The private road needs to be approved.

Mr. Brent LaVanway of Boss Engineering and Mr. Guy Genzel, the property owner, were present.

Mr. LaVanway gave a brief history and description of the property and project. He stated the Livingston County Road Commission has approved the location of the road. He addressed the cistern requirement in the Brighton Area Fire Authority's letter. He would like to address this at a later date to determine if the demand is there, and if so, then it can be installed. They will install evergreen trees as a buffer between the road and the property to the south as requested by Mr. Borden. They can submit a plan to staff for their review.

Mr. Borden feels the conditions are present that warrant consideration of a private road not built to Road Commission standards. He also recommended that a "Private Road Maintenance Agreement" be provided. He noted that this was given to the Commissioners by the applicant this evening.

Commissioner Grajek questioned the need for cisterns for homes greater than 3,600 square feet as recommended by the Brighton Area Fire Authority. Commissioner Mortensen stated he has been on the Planning Commission for 20 years and the Township has never required a cistern. He would recommend making this optional for consideration by the developer and future homeowners. Commissioner Grajek wants to ensure that the Township is in compliance with the BAFA. Commissioner Mortensen stated the Fire Authority is making a recommendation.

Ms. VanMarter stated that this comment on the letters from the BAFA for both items on tonight's agenda were a surprise to staff. She has set up a meeting with them to discuss these new requirements and to determine who has jurisdiction and how they should be addressed. She noted that adding municipal water and sewer to these developments could change the rural nature of the Township.

Chairman Brown suggested that the applicant strike the second sentence to the response in Item "F" of the Environmental Impact Assessment. Mr. LaVanway agrees.

Moved by Commissioner McManus, seconded by Commissioner Figurski, to recommend to the Township Board approval of the Environmental Impact Assessment for Misty Meadows dated March 23, 2016 with the removal of the second sentence of the response to Item "F". **The motion carried unanimously**.

Moved by Commissioner Mortensen, seconded by Commissioner Lowe, to approve the Site Plan for Misty Meadows dated April 20, 2016 with the following conditions:

- The Private Road Maintenance Agreement provided this evening shall be reviewed and approved by the Township Attorney.
- Evergreen plantings shall be provided along the roadway adjacent to the road at the southeast corner of the property and reviewed and approved by Township Staff.
- The requirement in the Brighton Area Fire Authority's letter dated May 14, 2016, Paragraph 1, regarding the water related fire suppression issues are to be regarded as optional by the Township, subject to review by Township Staff and the Township Attorney.

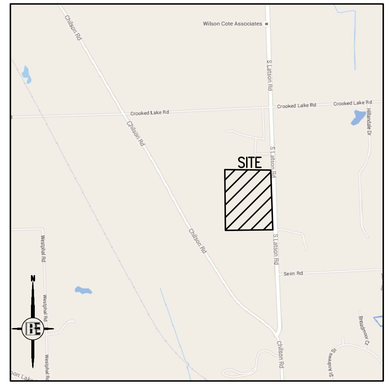
The motion carried unanimously.

Administrative Business:

- Staff Report

Mr. VanMarter stated there will be two items on next month's agenda.

SITE PLAN / CONSTRUCTION PLANS
FOR
MISTY MEADOW DRIVE
PART OF NORTHEAST QUARTER, SECTION 20, T2N-R5E
GENOA TOWNSHIP, LIVINGSTON COUNTY, MI



LOCATION MAP
NO SCALE

PROPERTY DESCRIPTION:

Part of the Northeast 1/4 of Section 20, T2N-R5E, Genoa Township, Livingston County, Michigan, more particularly described as follows: Commencing at the East 1/4 Corner of Section 20; thence along the centerline of Nixon Road (66 foot wide Right of Way) and the East line of Section 20, N 00°02'53" W, 289.01 feet, to the POINT OF BEGINNING of the Parcel to be described; thence S 89°33'31" W, 828.66 feet; thence S 00°02'05" E, 288.87 feet; thence along the East-West 1/4 line of Section 20, S 89°34'08" W (recorded as S 89°35'15" W), 814.30 feet; thence N 00°02'50" E, 459.34 feet (recorded as N 00°03'00" E, 458.81 feet); thence N 89°58'17" W (recorded as West), 587.38 feet; thence along the centerline of Chilson Road (66 foot wide Right of Way), N 25°18'00" W, 36.50 feet; thence S 89°58'17" E (recorded as East), 603.19 feet; thence N 00°21'50" E (recorded as N 00°22'00" E), 200.42 feet; thence N 89°58'31" W, 699.20 feet (recorded as West, 699.21 feet); thence along the centerline of Chilson Road (66 foot wide Right of Way), N 25°18'00" W, 364.83 feet; thence N 89°26'00" E, 531.82 feet; thence N 00°21'50" E, 307.94 feet; thence N 89°30'53" E, 1197.11 feet; thence S 00°02'42" E, 758.09 feet (recorded as S 00°01'34" E, 759.50 feet); thence N 89°46'09" E, 764.35 feet (recorded as N 89°44'46" E, 765.00 feet); thence along the centerline of Nixon Road and the East line of Section 20, S 00°02'53" E, 289.84 feet, to the POINT OF BEGINNING, containing 40.34 acres, more or less, and subject to the rights of the public over the existing Nixon Road and Chilson Road. Also subject to any other easements or restrictions of record.

Bearings were established from a Previous Survey by Boss Engineering, Job No. 3600, dated 1-26-73, as recorded in Liber 633, Page 194, Livingston County Records.

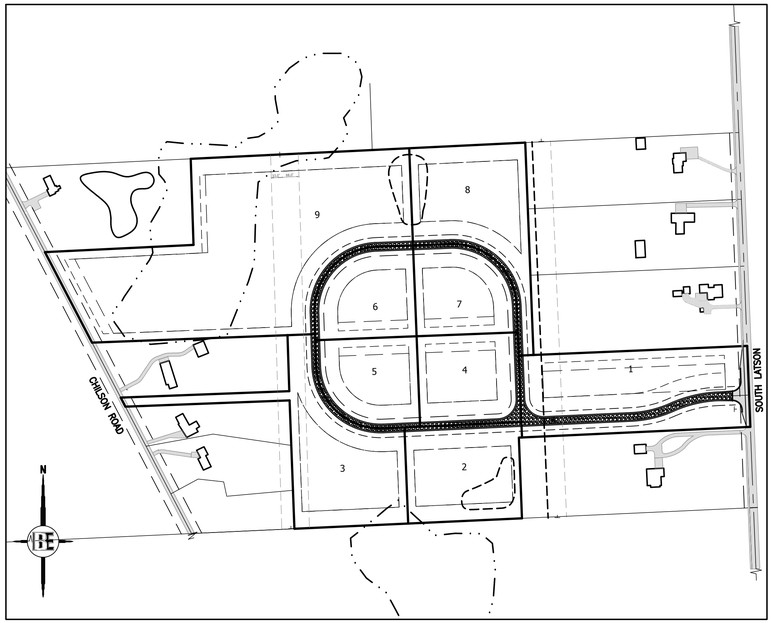
CONSTRUCTION NOTES

THE CONTRACTOR SHALL COMPLY WITH THE FOLLOWING NOTES AND ANY WORK INVOLVED SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.

1. 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.
2. DO NOT SCALE THESE DRAWINGS AS IT IS A REPRODUCTION AND SUBJECT TO DISTORTION.
3. A GRADING PERMIT FOR SOIL EROSION-SEDIMENTATION CONTROL SHALL BE OBTAINED FROM THE GOVERNING AGENCY PRIOR TO THE START OF CONSTRUCTION.
4. IF DUST PROBLEM OCCURS DURING CONSTRUCTION, CONTROL WILL BE PROVIDED BY AN APPLICATION OF WATER, EITHER BY SPRINKLER OR TANK TRUCK.
5. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH LOCAL MUNICIPAL STANDARDS AND SPECIFICATIONS.
6. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED TOWNSHIP, COUNTY, AND STATE OF MICHIGAN PERMITS.
7. PAVED SURFACES, WALKWAYS, SIGNS, LIGHTING AND OTHER STRUCTURES SHALL BE MAINTAINED IN A SAFE, ATTRACTIVE CONDITION AS ORIGINALLY DESIGNED AND CONSTRUCTED.
8. ALL BARRIER-FREE FEATURES SHALL BE CONSTRUCTED TO MEET ALL LOCAL, STATE AND A.D.A. REQUIREMENTS.
9. 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 BEFORE BEGINNING CONSTRUCTION.
10. THE CONTRACTOR SHALL CONTACT ALL OWNERS OF EASEMENTS, UTILITIES AND RIGHTS-OF-WAY, PUBLIC OR PRIVATE, PRIOR TO THE START OF CONSTRUCTION.
11. 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.
12. THE CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE UPON COMPLETION OF THE PROJECT.
13. 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.
14. THE CONTRACTOR SHALL KEEP THE AREA OUTSIDE THE "CONSTRUCTION LIMITS" BROOM CLEAN AT ALL TIMES.
15. THE CONTRACTOR SHALL CALL MISS DIG A MINIMUM OF 72 HOURS PRIOR TO THE START OF CONSTRUCTION.
16. ALL EXCAVATION UNDER OR WITHIN 3 FEET OF PUBLIC PAVEMENT, EXISTING OR PROPOSED SHALL BE BACKFILLED AND COMPACTED WITH SAND (MDOT CLASS II).
17. 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.
18. THE CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGE TO EXISTING UTILITIES.
19. 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.
20. DURING THE CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL NOT PERFORM WORK BY PRIVATE AGREEMENT WITH PROPERTY OWNERS ADJACENT TO THE PROJECT.
21. 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.
22. NO TREES ARE TO BE REMOVED UNTIL MARKED IN THE FIELD BY THE ENGINEER.
23. 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.
24. 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.
25. ALL ROOTS, STUMPS AND OTHER OBJECTIONABLE MATERIALS SHALL BE REMOVED AND THE HOLE BACKFILLED WITH SUITABLE MATERIAL. WHERE GRADE CORRECTION I S REQUIRED, THE SUBGRADE SHALL BE CUT TO CONFORM TO THE CROSS-SECTION AS SHOWN IN THE PLANS.
26. 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.
27. 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.
28. AFTER REMOVAL OF TOPSOIL, THE SUBGRADE SHALL BE COMPACTED TO 95% OF ITS UNIT WEIGHT.
29. 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.
30. NO SEEDING SHALL BE DONE AFTER OCTOBER 15 WITHOUT APPROVAL OF THE ENGINEER.
31. ANY EXISTING APPURTENANCES SUCH AS MANHOLES, GATE VALVES, ETC. SHALL BE ADJUSTED TO THE PROPOSED GRADE AND SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.
32. SOIL EROSION MEASURES SHALL BE MAINTAINED BY THE CONTRACTOR UNTIL VEGETATION HAS BEEN RE-ESTABLISHED.
33. 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.

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.



OVERALL SITE MAP
NO SCALE

SHEET INDEX

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	EXISTING CONDITIONS
3	SITE PLAN
4	GRADING PLAN
5	DRAINAGE PLAN
6	SOIL EROSION CONTROL PLAN
7	CONSTRUCTION DETAILS
8	STORM SEWER CALCULATIONS
9	PRIVATE ROAD PROFILE – STA 0+00 TO STA 11+50
10	PRIVATE ROAD PROFILE – STA 11+50 TO STA 20+00
11	PRIVATE ROAD PROFILE – STA 20+00 TO 26+00
12	PRIVATE ROAD PROFILE – STA 26+00 TO INTERSECTION
13	STORM SEWER PROFILE
14	STORM SEWER PROFILE

MISTY MEADOW

PREPARED FOR:

GFG INVESTMENT PROPERTIES, LLC
15264 BAILEY
TAYLOR, MI 48180
CONTACT: GUY GENZEL
PHONE: (734) 795-0078

CONTRACTOR:

BHI CONTRACTING INC.
2365 FOREST HILLS DR.
LAKE ORION, MI 48359
CONTACT: STEVE BACIK
PHONE: (248) 249-7935

PREPARED BY:

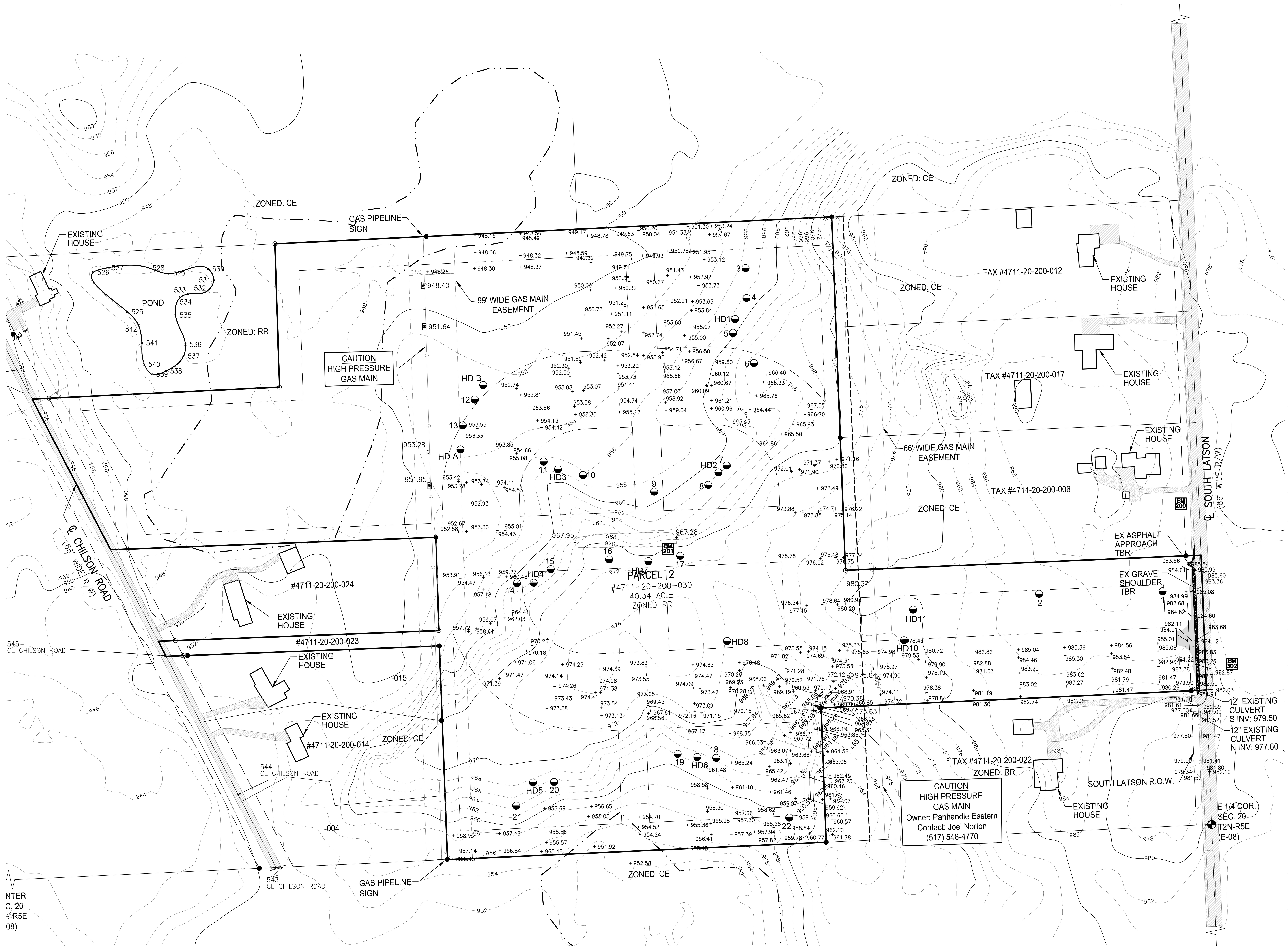
BE BOSS Engineering
Engineers Surveyors Planners Landscape Architects
3121 E. GRAND RIVER AVE.
HOWELL, MI. 48843
800.246.6735 FAX 517.548.1670

NO	BY	CK	REVISION	DATE
8	TE		CONCRETE SLAB PER UTILITIES	7/13/17
7	KS		STORM SEWER PER CLIENT	02/23/17
6	KS		STORM SEWER PER L.C.D.C.	10/27/16
5	KS		DRAINAGE EASEMENT PER L.C.R.C	10/14/16
4	KS		PHASING	8/5/16
3	KS		L.C.R.C. REVIEW	7/1/16
2	KS		TOWNSHIP REVIEW	5/19/16
1	KS		TOWNSHIP REVIEW	4/20/16

NO	BY	CK	REVISION	DATE
16				
15				
14				
13				
12				
11				
10				
9	JA		GRAVEL RD PER CLIENT	1/25/19

ISSUE DATE: 03/23/16
JOB NO. 15-179

1



SCALE: 1 INCH = 100 FEET

LEGEND

- 900 — EXISTING CONTOUR
- EXISTING RIGHT-OF-WAY
- SOIL BORING
- 922.00 — EXISTING SPOT ELEVATION
- POWER POLE
- U.G. GAS MARKER
- SIGN
- ASPHALT
- GRAVEL
- TBR — TO BE REMOVED
- ST — STORM SEWER
- G — GAS MAIN

SOIL INFORMATION

SB-1
0-1' Clay Loam Topsoil
1' -15' Clay Loam
15'-18' Fine Sandy Loam

SB-2
0-1' Clay Loam Topsoil
1' -11' Clay Loam
11'-12' Fine Sandy Loam
12'-14' Clay Loam
14'-18' Med Sand

SB-3
0-1' Sandy Loam Topsoil
1' -7' Loamy Sand to Sandy Loam

SB-4
0-1' Sandy Loam Topsoil
1' -9' Sandy Loam with Clay Loam inclusions
9'-13' Gravelly Sand

SB-5
0-1' Sandy Loam Topsoil
1' -9' Sandy Loam with Clay Loam inclusions
9'-13' Gravelly Sand

SB-6
0-1' Sandy Loam Topsoil
1' -9' Sandy Loam with Clay Loam inclusions
9'-13' Gravelly Sand

SB-7
0-1' Sandy Loam Topsoil
1' -8' Clay Loam
8'-15' Sandy Loam with Clay Loam inclusions

SB-8
0-1' Sandy Loam Topsoil
1' -8' Clay Loam
8'-12' Med Sand

SB-9
0-1' Loam Topsoil
1' -7' Cobley Loamy Sand to Sandy Loam
6'-13' Clay Loam

SB-10
0-1' Loam Topsoil
1' -6' Clay Loam
6'-11' Coarse Sand and Gravel

SB-11
0-1' Sandy Loam Topsoil
1' -3' Sandy Loam
3'-7' Very Coarse Sand and Gravel

SB-12
0-1' Loamy Sand Topsoil
1' -7' Med Sand

SB-13
0-1' Loam Topsoil
1' -3' Clay Loam
3'-8' Med Sand

SB-14
0-1' Loam Topsoil
1' -3' Clay Loam
3'-8' Med Sand

SB-15
0-1' Clay Loam Topsoil
1' -11' Clay Loam
11'-15' Gravelly Coarse Sand

SB-16
0-1' Clay Loam Topsoil
1' -11' Clay Loam
11'-15' Gravelly Coarse Sand

SB-17
0-1' Clay Loam Topsoil
1' -11' Clay Loam
11'-14' Med Sand

SB-18
0-1' Clay Loam Topsoil
1' -7' Clay Loam
7'-9' Gravelly Coarse Sand
9'-14' Med Sand

SB-19
0-1' Loam Topsoil
1' -9' Clay Loam
9'-14' Gravelly Coarse Sand

SB-20
0-1' Clay Loam Topsoil
1' -5' Clay Loam
5'-10' Gravelly Coarse Sand

SB-21
0'-1' Loamy Sand Topsoil
1' -5' Clay Loam
5'-10' Gravelly Coarse Sand

SB-22
0'-1' Loamy Sand Topsoil
1'-10' Clay Loam
10'-20' Loamy Sand

HD-1
0'-1' Topsoil
1'-3.5' Sandy Loam
3.5'-8' Clay Loam
8'-12' Medium Sand

HD-2
0'-1' Topsoil
1'-9' Clay Loam
9'-11' Sandy Clay Loam
11'-14' Loamy Sand

HD-3
0'-1' Topsoil
1'-2' Sandy Loam
2'-5' Clay Loam
5'-10' Loamy Sand

HD-4
0'-1' Topsoil
1'-10' Clay Loam
10'-14' Loamy Sand

HD-5
0'-1' Topsoil
1'-7' Clay Loam
7'-11' Fine Sand

HD-6
0'-1' Topsoil
1'-2' Clay Loam
2'-4' Sandy Clay Loam
4'-6' Medium Sand
6'-10' Fine Sand

HD-7
0'-1' Topsoil
1'-11' Clay Loam
11'-15' Fine Sand

HD-8
0'-1' Topsoil
1'-14.5' Clay Loam
14.5'-18' Fine Sand

HD-10
0'-1' Topsoil
1'-14' Clay Loam
14'-18' Fine Sand

HD-11
0'-1' Topsoil
1'-8' Clay Loam
16'-19' Fine Sand

HD-A
0'-1' Topsoil
1'-8' Clay Loam
8'-9' Sandy Loam (mottled)
9'-11- Clay Loam

HD-B
0'-1' Topsoil
1'-4' Clay Loam
4'-5' Sandy Loam (mottled)
5'-10' Clay Loam
10'-12' Loamy Sand (wet)

BENCHMARK INFORMATION

BM #200: NAIL IN S/S OF POWER POLE ALONG LOTS AND ROAD SOUTH OF #3370
ELEVATION = 986.28 NAVD88

BM#201: NAIL ON SOUTH SIDE OF 22" CHERRY LOCATED ON EAST END OF THE E-W TREE ROW IN MIDDLE OF SITE
ELEVATION = 972.40' NAVD88

BM#302: R.R. SPIKE IN WEST FACE OF UTILITY POLE 15' NORTH OF NORTH EDGE OF DRIVE FOR #3473 LATSON, 50' EAST OF ROAD
ELEVATION = 984.34 NAVD88

BOSS Engineering
Engineers Surveyors Planners Landscape Architects
3121 E. GRAND RIVER AVE.
HOWELL, MI. 48843
800.246.6735 FAX 517.548.1670

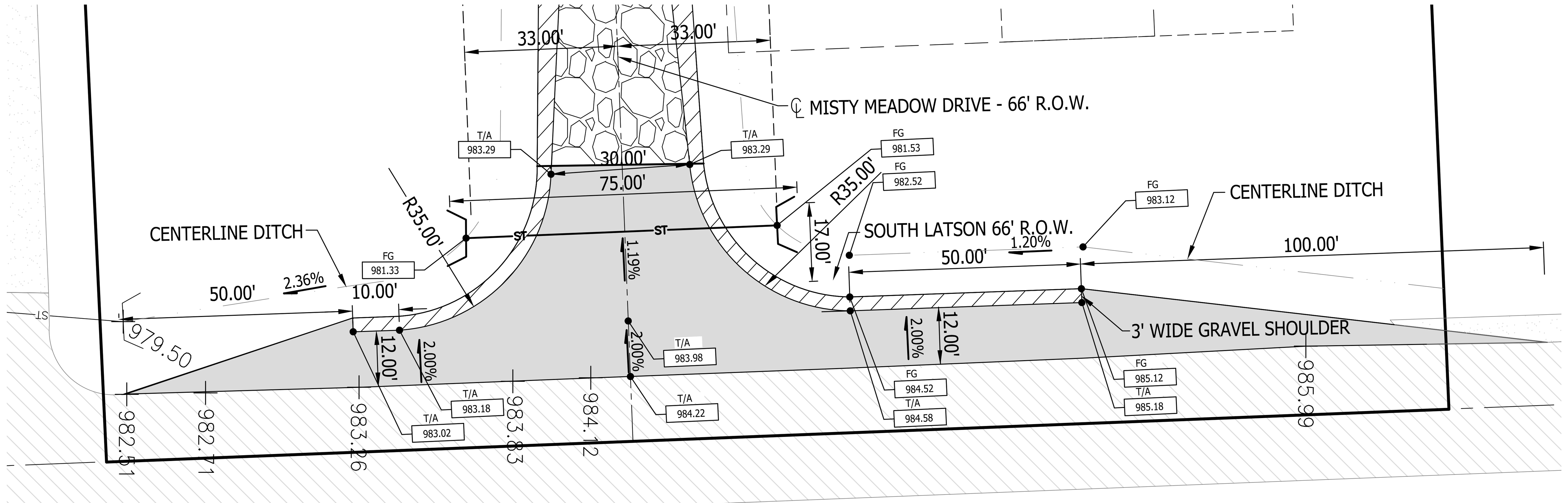
PROJECT: MISTY MEADOW

PREPARED FOR: GFG INVESTMENT PROPERTIES, LLC
15264 BAILEY
TAYLOR, MI 48180
(734) 795-0078

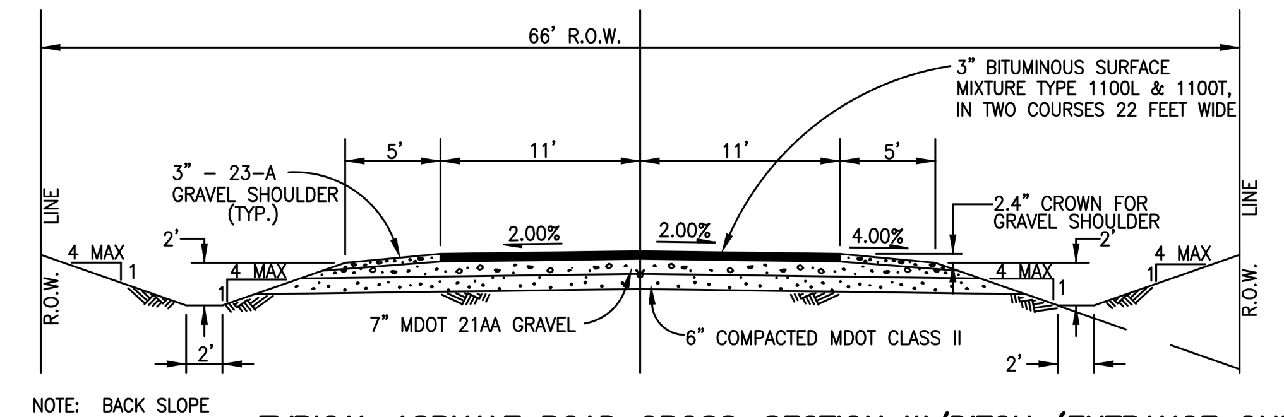
TITLE: EXISTING CONDITIONS

NO	BY	REVISION PER	DATE
3	KS	L.C.R.C. REVIEW	7/1/16
2	KS	TOWNSHIP REVIEW	5/19/16
1	KS	TOWNSHIP REVIEW	4/20/16

DESIGNED BY: KS
DRAWN BY: KS
CHECKED BY:
SCALE 1" = 100'
JOB NO. 15-179
DATE 03/23/16
SHEET NO. 2

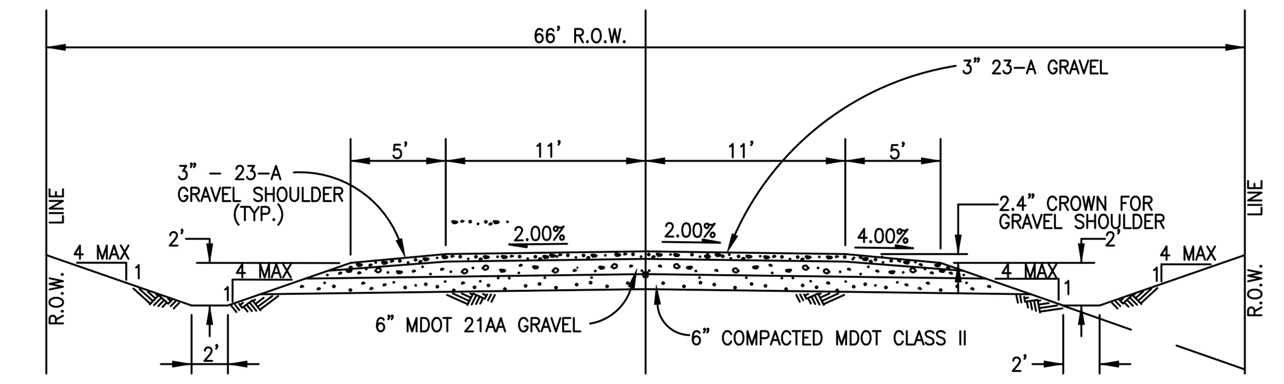


SOUTH LATSON PRIVATE ROAD ENTRANCE DETAIL
(SCALE: 1"=20')



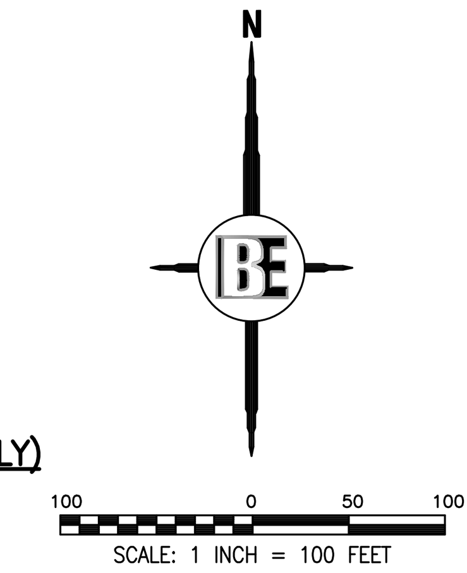
NOTE: BACK SLOPE SHALL BE ADJUSTED TO ALLOW CONSTRUCTION OF PUBLIC UTILITIES AND SIDEWALKS WITHOUT BENCHING

TYPICAL ASPHALT ROAD CROSS-SECTION W/DITCH (ENTRANCE ONLY)
(NO SCALE)



NOTE: BACK SLOPE SHALL BE ADJUSTED TO ALLOW CONSTRUCTION OF PUBLIC UTILITIES AND SIDEWALKS WITHOUT BENCHING

TYPICAL GRAVEL ROAD CROSS-SECTION W/DITCH
(NO SCALE)



LEGEND

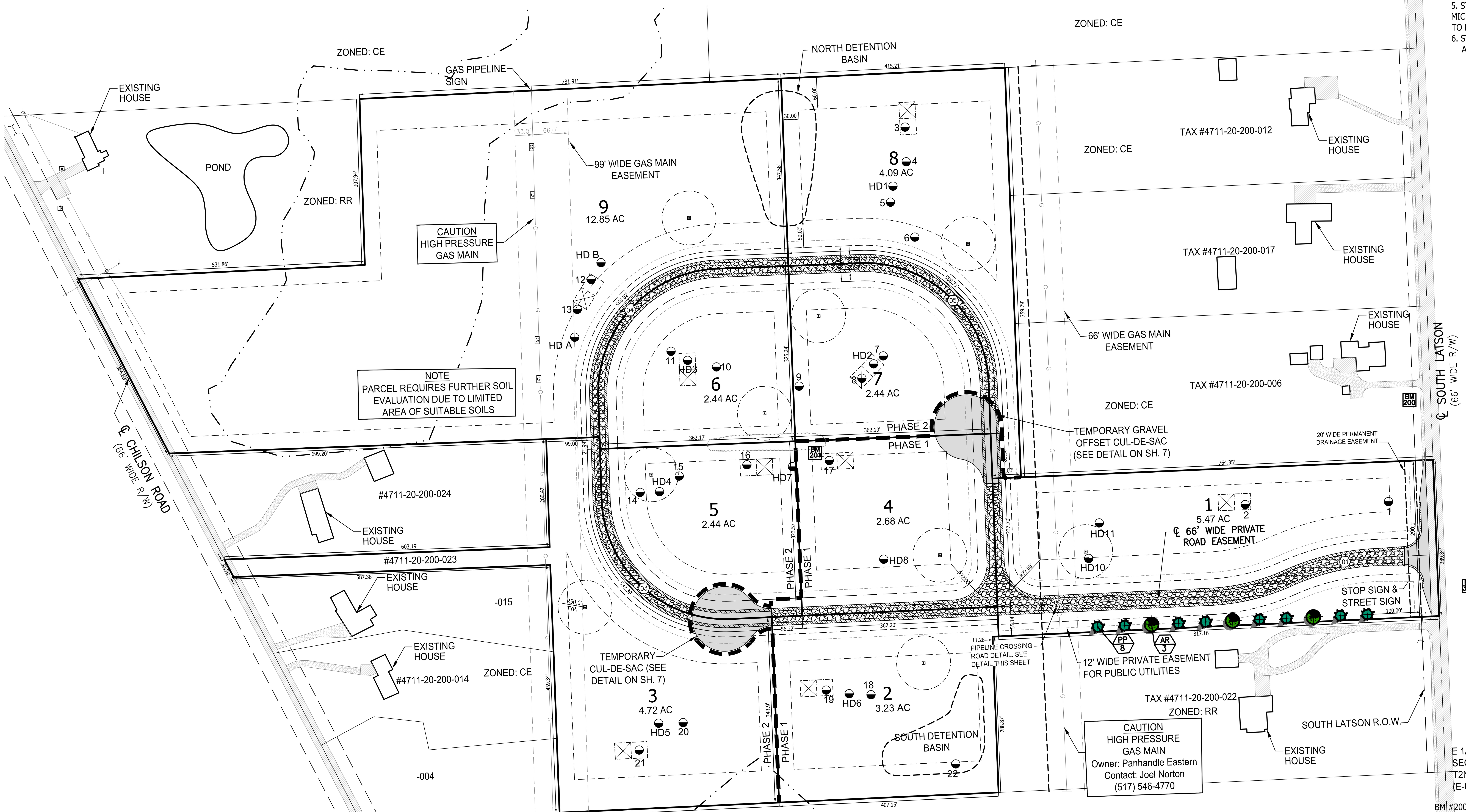
PROPOSED (PR) — EXISTING (EX)

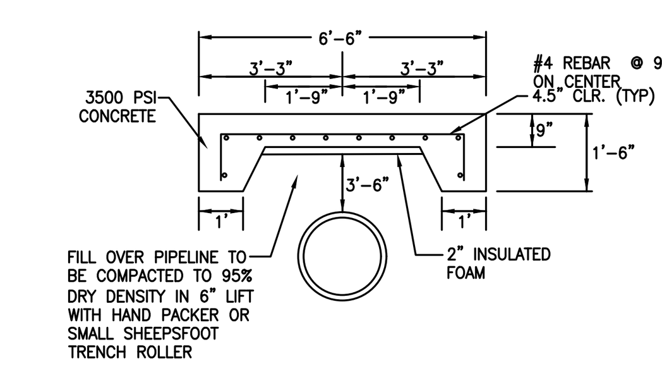
- EXISTING RIGHT-OF-WAY
- SETBACK
- SEPTIC FIELD ACTIVE/RESERVE
- WELL
- ASPHALT
- GRAVEL
- WETLAND
- DETENTION/RETENTION BASIN
- HORIZONTAL CURVE
- GAS MAIN
- EVERGREEN TREE
- DECIDUOUS TREE
- PHASE LINE

SITE PLAN NOTES

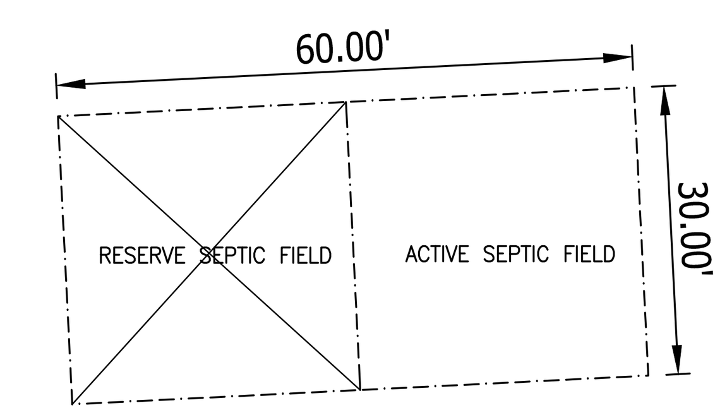
1. NO PARKING SHALL BE PERMITTED ON THE ROAD
2. BUILDINGS SHALL PROVIDE ADDRESS NUMBERS AT A MINIMUM 4" IN HEIGHT TO BE VISIBLE FROM THE ROAD.
3. ACCESS ROADS SHALL BE CONSTRUCTED TO BE CAPABLE OF SUPPORTING AT LEAST 75,000 LBS.
4. 15 FT. OF OVERHEAD TREE CLEARANCE TO BE PROVIDED WITHIN THE WIDTH OF THE PAVEMENT.
5. STOP SIGN AND STREET SIGN TO BE IN ACCORDANCE WITH THE MICHIGAN UNIFORM TRAFFIC CONTROL DEVICES AND CONFORM TO ROAD COMMISSION REQUIREMENTS.
6. STREET NAME HAS BEEN SUBMITTED TO THE ROAD COMMISSION AND IS ACCEPTABLE.

SITE DATA	
PARCEL NUMBER	4711-20-200-030
ZONING	RR: RURAL RESIDENTIAL
SITE AREA	40.34 AC
SETBACKS	REQUIRED
FRONT	50 FT.
SIDE	30 FT.
REAR	60 FT.
MINIMUM LOT AREA	2 ACRES
MINIMUM LOT WIDTH	200 FT.
RIGHT-OF-WAY	66 FT.





PIPELINE ROAD CROSSING CROSS-SECTION
(NO SCALE)



SEPTIC FIELD DETAIL
(SCALE: 1"=20')

HORIZONTAL CURVE DATA				
CURVE #	RADIUS (FT)	ARC LENGTH (FT)	PC (STA)	PT (STA)
01	450	172.05	0+95.37	2+67.42
02	400	150.15	2+67.42	4+17.57
03	230	364.51	13+04.66	16+69.18
04	230	359.64	18+58.90	22+18.54
05	230	361.28	24+82.22	28+43.50

PLANT LIST

KEY	QUAN.	BOTANICAL NAME	COMMON NAME	SIZE	REMARK
TREES					
PP	11	Picea pungens var. 'Glauca'	Colorado Blue Spruce	6'–8' ht.	B–B
AR	3	Acer rubrum	Red Maple	2.5" cal.	B–B

BENCHMARK INFORMATION

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ELEVATION = 986.28 NAVD88

BM#201: NAIL ON SOUTH SIDE OF 22" CHERRY LOCATED ON EAST END OF THE E-W TREE ROW IN MIDDLE OF SITE
ELEVATION = 972.40' NAVD88

BM#302: R.R. SPIKE IN WEST FACE OF UTILITY POLE 15' NORTH OF NORTH EDGE OF DRIVE FOR #3473 LATSON, 50' EAST OF ROAD
ELEVATION = 984.34 NAVD88

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
800.246.6735 FAX 517.548.1670

PROJECT: MISTY MEADOW

PREPARED FOR: GFG INVESTMENT PROPERTIES, LLC
15284 BAILEY
TAYLOR, MI 48180
(734) 795-0078

TITLE: SITE PLAN

NO	BY	REVISION PER	DATE
9	JA	GRAVEL RD PER CLIENT	1/25/19
6	KS	ST SEWER PER L.C.D.C.	10/27/16
5	KS	DRAINAGE EASEMENT	10/14/16
4	KS	PHASING	8/5/16
3	KS	L.C.R.C. REVIEW	7/1/16
2	KS	TOWNSHIP REVIEW	5/19/16
1	KS	TOWNSHIP REVIEW	4/20/16

DESIGNED BY: KS
DRAWN BY: KS
CHECKED BY:
SCALE 1" = 100'
JOB NO. 15-179
DATE 03/23/16
SHEET NO. 3

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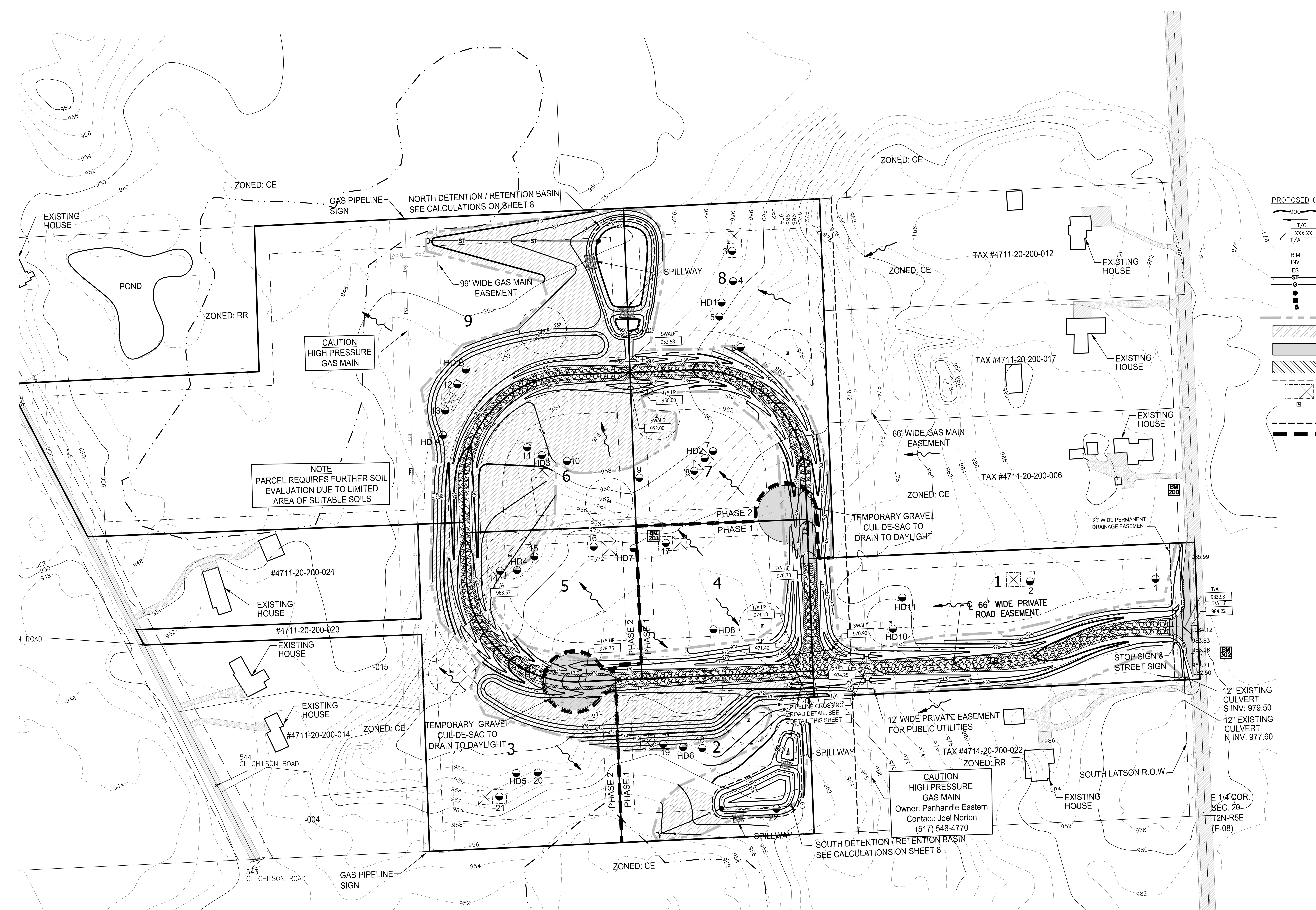


DETENTION/RETENTION BASIN SOIL INFORMATION
SB-3
0-1' Sandy Loam Topsoil
1' -7' Loamy Sand to Sandy Loam
SB-4
0-1' Sandy Loam Topsoil
1' -9' Sandy Loam with Clay Loam inclusions
9'-13' Gravelly Sand
SB-5
0-1' Sandy Loam Topsoil
1' -9' Sandy Loam with Clay Loam inclusions
9'-13' Gravelly Sand
SB-21
0'-1' Loamy Sand Topsoil
1' -5' Clay Loam
5'-10' Gravelly Coarse Sand
SB-22
0'-1' Loamy Sand Topsoil
1'-10' Clay Loam
10'-20' Loamy Sand
HD-1
0'-1' Topsoil
1'-3.5' Sandy Loam
3.5'-8' Clay Loam
8'-12' Medium Sand

NOTE
ALL PROPOSED DITCHES FOR THE PRIVATE ROAD AND WITHIN THE LATSON ROAD RIGHT-OF-WAY SHALL NOT EXCEED A 1:4 GRADE ON FORESLOPES AND BACKSLOPES

BENCHMARK INFORMATION

BM #200: NAIL IN S/S OF POWER POLE ALONG LOTS AND ROAD SOUTH OF #3370
ELEVATION = 986.28 NAVD88

BM#201: NAIL ON SOUTH SIDE OF 22" CHERRY LOCATED ON EAST END OF THE E-W TREE ROW IN MIDDLE OF SITE
ELEVATION = 972.40' NAVD88

BM#302: R.R. SPIKE IN WEST FACE OF UTILITY POLE 15' NORTH OF NORTH EDGE OF DRIVE FOR #3473 LATSON, 50' EAST OF ROAD
ELEVATION = 984.34 NAVD88

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 UTILITIES 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
800.246.6735 FAX 517.548.1670

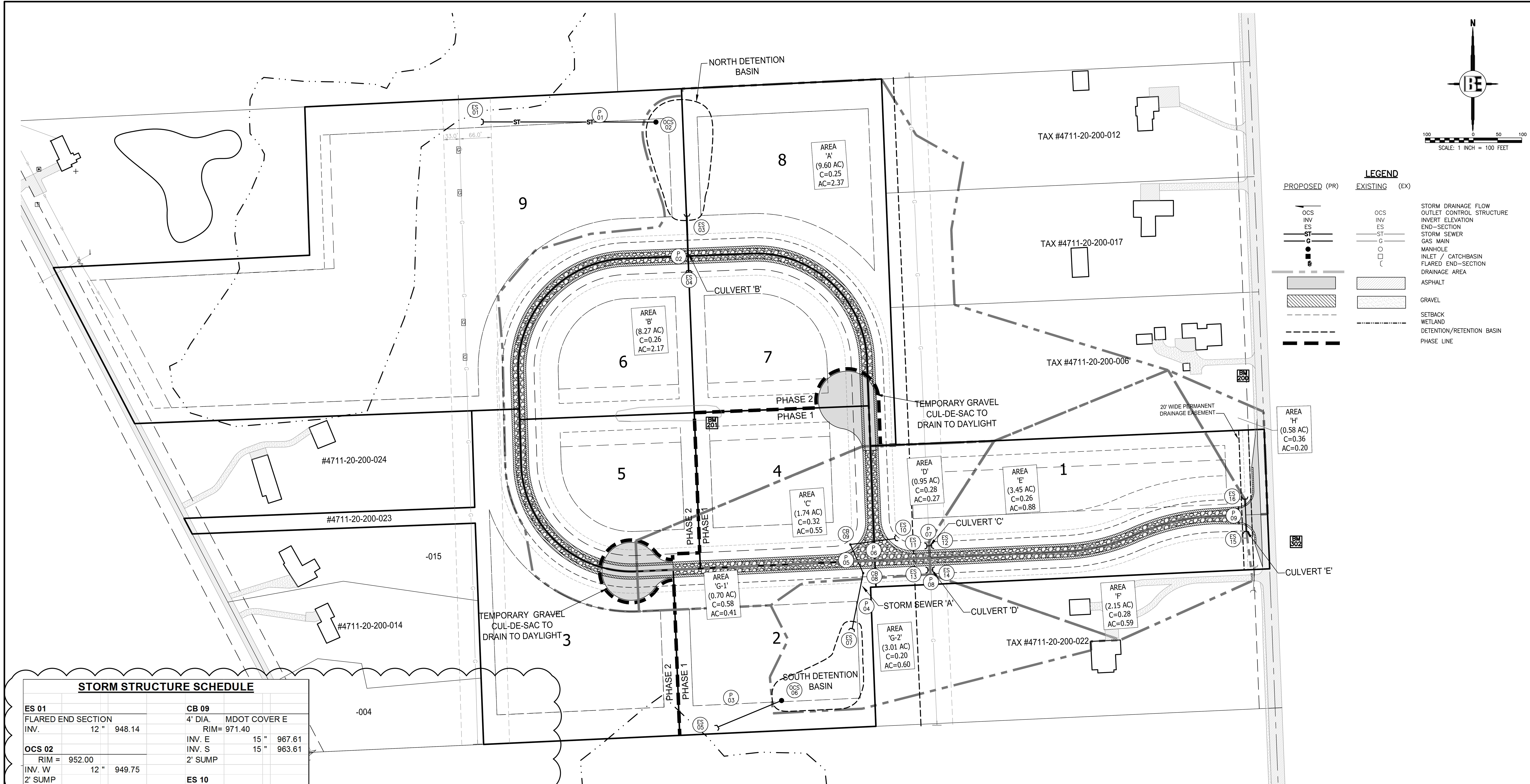
PROJECT: **MISTY MEADOW**

PREPARED FOR: **GFG INVESTMENT PROPERTIES, LLC**
15264 BAILEY
TAYLOR, MI 48180
(734) 795-0078

TITLE: **GRADING PLAN**

NO	BY	REVISION PER	DATE
9	JA	GRAVEL RD PER CLIENT	1/25/19
8	TE	CONC. SLAB PER UTILITIES	7/13/17
7	KS	ST SEWER PER CLIENT	02/23/16
6	KS	ST SEWER PER L.C.D.C.	10/27/16
5	KS	DRAINAGE EASEMENT	10/14/16
4	KS	PHASING	8/5/16
3	KS	L.C.R.C. REVIEW	7/1/16
2	KS	TOWNSHIP REVIEW	5/19/16
1	KS	TOWNSHIP REVIEW	4/20/16

DESIGNED BY: KS
DRAWN BY: KS
CHECKED BY:
SCALE 1" = 100'
JOB NO. 15-179
DATE 03/23/16
SHEET NO. 4



STORM STRUCTURE SCHEDULE

ES 01				**CB 09**		
FLARED END SECTION				4' DIA.	MDOT COVER E	
INV.	12 "	948.14		RIM=	971.40	
				INV. E	15 "	967.61
OCS 02				INV. S	15 "	963.61
RIM =	952.00			2' SUMP		
INV. W	12 "	949.75				
2' SUMP				**ES 10**		
				FLARED END SECTION		
ES 03				INV.	15 "	970.90
FLARED END SECTION						
INV.	18 "	951.15		**ES 11**		
				FLARED END SECTION		
ES 04				INV.	15 "	973.72
FLARED END SECTION						
INV.	18 "	952.17		**ES 12**		
				FLARED END SECTION		
ES 05				INV.	15 "	973.82
FLARED END SECTION						
INV.	12 "	954.77		**ES 13**		
				FLARED END SECTION		
OCS 06				INV.	15 "	973.72
RIM =	958.00					
INV. SW	12 "	955.25		**ES 14**		
2' SUMP				FLARED END SECTION		
				INV.	15 "	973.82
ES 07						
FLARED END SECTION				**ES 15**		
INV.	24 "	956.00		FLARED END SECTION		
				INV.	12 "	981.33
CB 08						
4' DIA.	MDOT COVER E			**ES 16**		
RIM=	971.50			FLARED END SECTION		
INV. S	24 "	956.74		INV.	12 "	981.54
INV. N	15 "	961.34				
2' SUMP						

DRAINAGE AREA STRUCTURE SUMMARY

STRUCTURE	DRAINAGE AREA(S)	AREA (AC)
STORM SEWER A	D,E,C,G-1	6.84
CULVERT B	B	8.27
CULVERT C	E	3.45
CULVERT D	F	2.15
CULVERT E	H	0.58

STORM PIPE SCHEDULE

PIPE	LENGTH	SIZE	TYPE	SLOPE
1	358	12	ADS N-12 WT	0.45%
2	113	18	C-76 CL V RCP	0.90%
3	151	12	ADS N-12 WT	0.32%
4	98	24	ADS N-12 WT	0.75%
5	65	15	ADS N-12 WT	3.50%
6	94	15	C-76 CL V RCP	3.50%
7	8	15	C-76 CL V RCP	1.19%
8	8	15	C-76 CL V RCP	1.19%
9	67	12	C-76 CL V RCP	0.32%

DRAINAGE AREA SUMMARY

NORTH BASIN DRAINAGE AREAS			
SECTION	AREA (AC)	C	AxC
A	9.60	0.25	2.37
B	8.27	0.26	2.17
TOTAL (AC)=	17.87		
SOUTH BASIN DRAINAGE AREAS			
SECTION	AREA (AC)	C	AxC
C	1.74	0.32	0.55
D	0.95	0.28	0.27
E	3.45	0.26	0.88
F	2.15	0.28	0.59
G-1	0.70	0.58	0.41
G-2	2.95	0.20	0.59
TOTAL (AC)=	11.93		

DETENTION/RETENTION BASIN NOTES

1. THE NORTH BASIN IS TO OUTLET INTO AN EXISTING WETLAND TO THE NORTHWEST.
2. THE SOUTH BASIN IS TO OUTLET INTO AN EXISTING WETLAND TO THE SOUTH.

BENCHMARK INFORMATION

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PROJECT: MISTY MEADOW

PREPARED FOR: GFG INVESTMENT PROPERTIES, LLC
15284 BAILEY
TAYLOR, MI 48180
(734) 795-0078

TITLE: DRAINAGE AREAS

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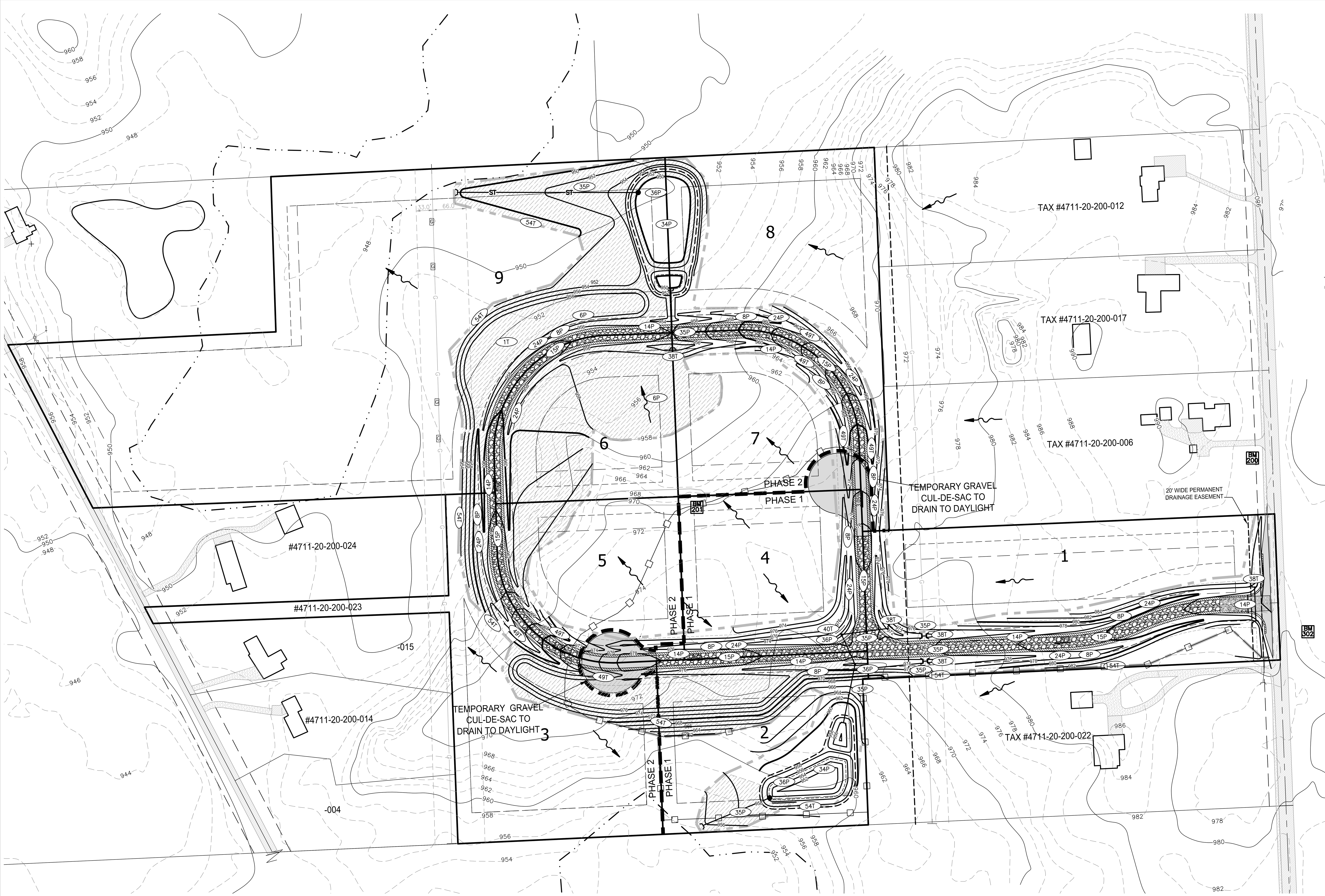

LEGEND

PROPOSED (PR)	EXISTING (EX)	
		CONTOUR
		STORM DRAINAGE FLOW
ST	ST	STORM SEWER
G	G	GAS MAIN
		MANHOLE
		INLET / CATCHBASIN
		FLARED END-SECTION
54T		SOIL EROSION CONTROL MEASURE (P=PERMANENT, T=TEMPORARY)
		SILT FENCE
		LIMITS OF GRADING/CLEARING
		FILL AREA
		ASPHALT
		GRAVEL
		SETBACK
		WETLAND
		DETENTION/RETENTION BASIN
		PHASE LINE

INSTALLED CURRENTLY IS THE SILT FENCE FOR PHASE 1 CONSTRUCTION AS SHOWN ON PLANS. OTHER TEMPORARY MEASURES TO BE INSTALLED WHEN STORM SEWER IS PLACED (SILT SACKS) AND ROAD DITCHES ESTABLISHED (CHECK DAMNS AND STRAW BALE FILTER).

SOIL EROSION CONTROL NOTES

1. SOD TO BE PEGGED IN PLACE FOR AREAS WHERE THE CENTERLINE OF DITCH/SWALE EXCEEDS 3.0% SLOPE.
2. TEMPORARY CHECK DAMNS TO BE INSTALLED FOR AREAS WHERE THE CENTERLINE OF DITCH EXCEEDS 3.0% SLOPE. MEASURE TO BE REMOVED ONCE SUFFICIENT STABILIZATION HAS BEEN ESTABLISHED.

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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
8	SODDING	PROVIDES IMMEDIATE PROTECTION CAN BE USED ON STEEP SLOPES WHERE SEED MAY BE DIFFICULT TO ESTABLISH EASY TO PLACE, MAY BE REPAIRED IF DAMAGED 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
24	GRASSED WATERWAY	MUCH MORE STABLE FORM OF DRAINAGEWAY THAN BARE CHANNEL GRASS TENDS TO SLOW RUNOFF AND FILTER OUT SEDIMENT USED WHERE BARE CHANNEL WOULD BE ERODED
34	SEDIMENT BASIN	TRAPS SEDIMENT RELEASES RUNOFF AT NON-EROSIVE RATES CONTROLS RUNOFF AT SYSTEM OUTLETS CAN BE VISUAL AMENITIES
35	STORM SEWER (C.B. C.B.)	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
38	STRAW BALE FILTER	INEXPENSIVE AND EASY TO CONSTRUCT CAN BE LOCATED AS NECESSARY TO COLLECT SEDIMENT MAY BE USED IN CONJUNCTION WITH SNOW FENCE FOR ADDED STABILITY
40	INLET SEDIMENT FILTER	EASY TO SHAPE COLLECTS SEDIMENT MAY BE CLEANED AND EXPANDED AS NEEDED
49	CHECK DAMS	REDUCES FLOW VELOCITY CATCHES SEDIMENT CAN BE CONSTRUCTED OF LOGS, STRAW, HAY, ROCK, LUMBER, MASONRY OR SAND BAGS
54	SILT FENCE	USES GEOTEXTILE FABRIC AND POST OR POLES. EASY TO CONSTRUCT AND LOCATE AS NECESSARY. (SEE DETAIL THIS SHEET)

P = PERMANENT, T = TEMPORARY
TOTAL DISTURBED AREA = 14.86 AC (647,483 SF)
PHASE 1 DISTURBED AREA = 6.14 AC (267,676 SF)
PHASE 2 DISTURBED AREA = 8.72 AC (379,807 SF)

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PROJECT
MISTY MEADOW

PREPARED FOR
GFG INVESTMENT PROPERTIES, LLC
15264 BAILEY
TAYLOR, MI 48180
(734) 795-0078

TITLE
SOIL EROSION CONTROL PLAN

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JOB NO. 15-179
DATE 03/23/16
SHEET NO. 6

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 4 HORIZONTAL TO 1 VERTICAL SIDE SLOPES, 4:1.
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 4 HORIZONTAL TO 1 VERTICAL SHALL NOT BE USED EXCEPT WITH A MECHANICAL DEVICE SUCH AS A RETAINING WALL, TERRACING, OR OTHER PRIOR APPROVED DEVICE.
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 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.
23. 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.
24. 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.
25. 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.
26. 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.
27. 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

28. 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.
29. IN THE NON-GROWING SEASON, TEMPORARY STABILIZATION OF MASSIVELY EXPOSED AREAS FOR WINTER STABILIZATION SHALL BE DONE WITH STRAW MATTING.
30. 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.
31. 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.
32. 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.
33. PER THE LIVINGSTON COUNTY DRAIN COMMISSIONER THE SEEDING, FERTILIZER AND MULCH MINIMUM QUANTITIES SHALL BE AS FOLLOWS:

TOP-SOIL	3" IN DEPTH
GRASS SEED	210 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

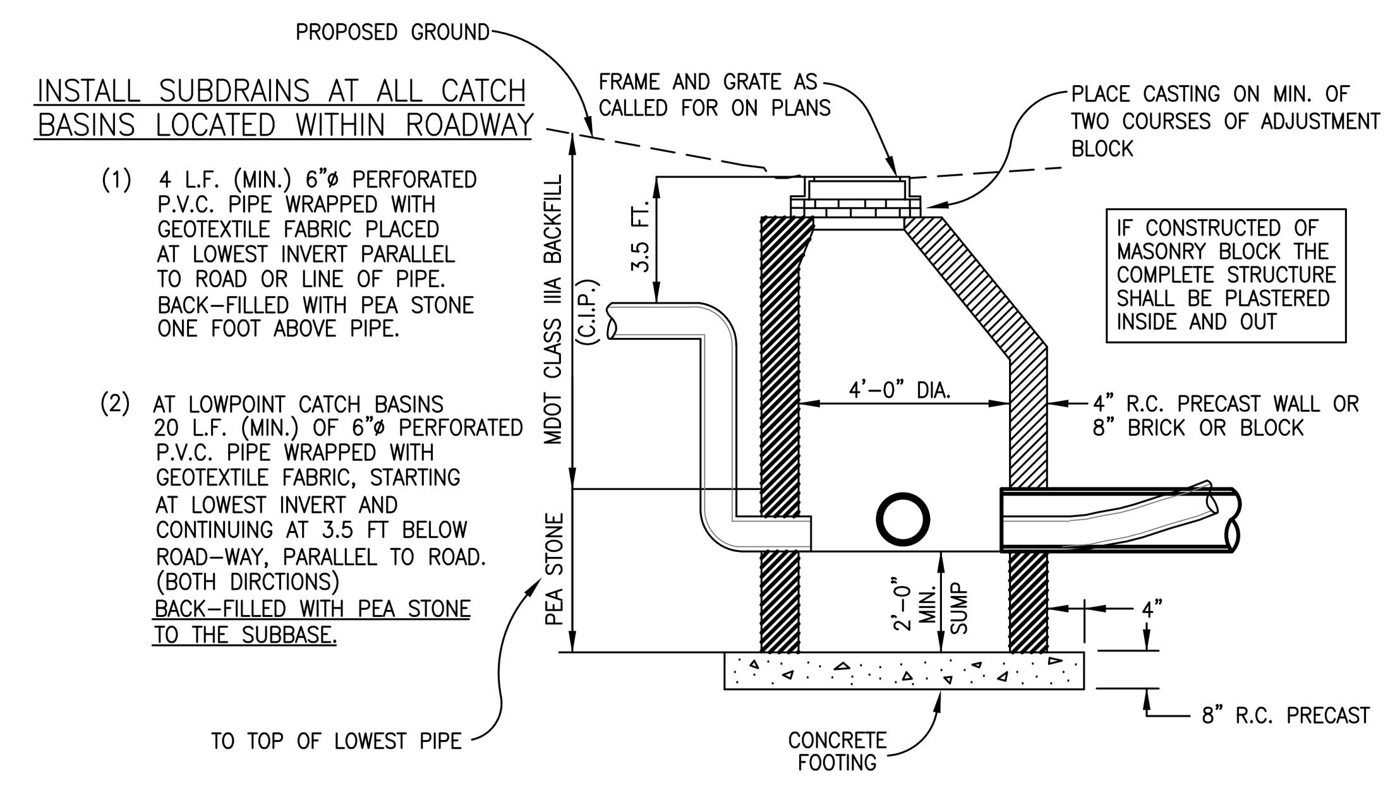
1. SILT FENCE SHALL BE INSPECTED WEEKLY AND AFTER EACH MAJOR STORM EVENT. MAINTENANCE SHALL INCLUDE REMOVAL OF ACCUMULATED SILT AND REPLACEMENT OF TORN SECTIONS. SILT FENCE SHALL BE REMOVED WHEN ALL CONTRIBUTING AREAS HAVE BEEN STABILIZED.
2. TRACKING PAD SHALL BE INSPECTED MONTHLY FOR ACCUMULATED DIRT. 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. COMMON AREAS SHALL BE STABILIZED NO LATER THAN 15 DAYS AFTER GRADE WORK, PURSUANT TO RULE 1709 (5).
5. CATCH BASINS SHALL BE INSPECTED ANNUALLY FOR ACCUMULATION OF SEDIMENT. ALL SEDIMENT MUST BE REMOVED AND DISPOSED OF PROPERLY WHEN THE SUMP IS FULL.

CONTROLS & MEASURES NARRATIVE

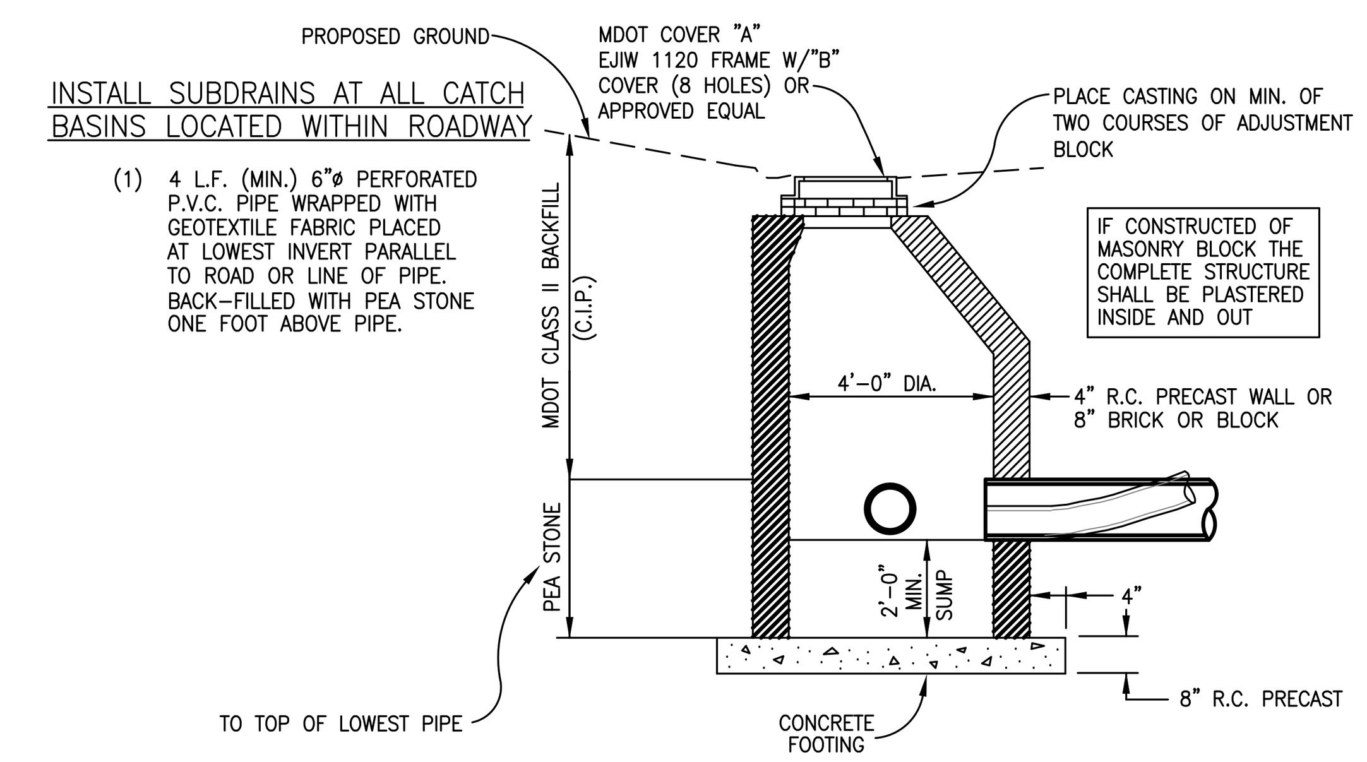
ACTIVITY	DESCRIPTION
MAINTAIN LANDSCAPING, REPLACE MULCH	COLLECT GRASS, TREE, AND SHRUB CLIPPINGS. DISPOSE IN APPROVED CONTAINER. REPLACE DEAD SOD, TREES AND SHRUBS.
CLEAN INLETS	REMOVE LITTER, SEDIMENT, AND DEBRIS. DISPOSE OF IN APPROVED LANDFILL.
COLLECT LITTER	DISPOSE OF WITH INLET DEBRIS.
SWEEP PARKING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

CONTROLS & MEASURES POST CONSTRUCTION SEQUENCE

ACTIVITY	DAILY	WEEKLY	MONTHLY	AS REQUIRED
MAINTAIN LANDSCAPING, REPLACE MULCH		X	X	X
CLEAN INLETS		X	X	X
COLLECT LITTER		X		X
SWEEP PAVED AREAS		X	X	X
SCRAPE PAVED AREAS	X			X



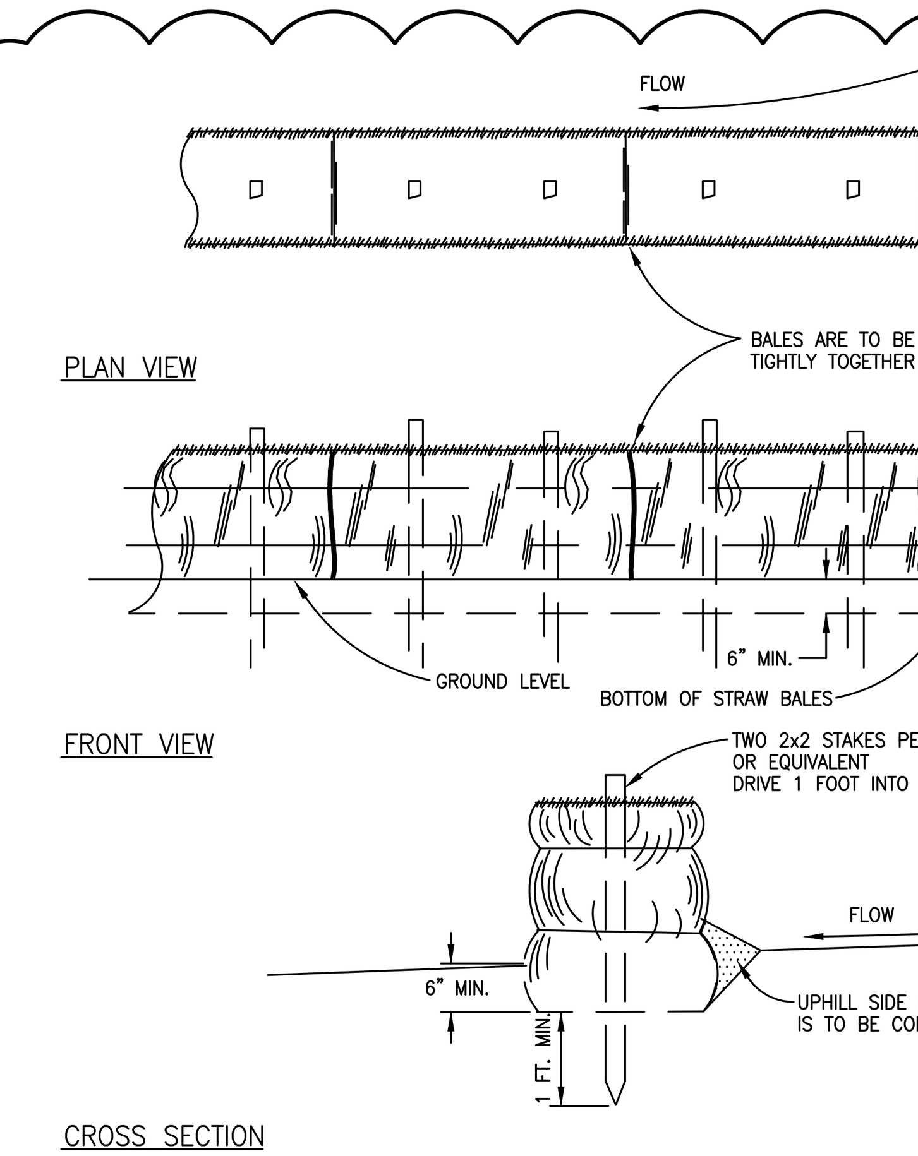
4 FT. DIA. CATCH BASIN W/SUMP
NO SCALE



4 FT. DIA. STORM MANHOLE W/SUMP
NO SCALE

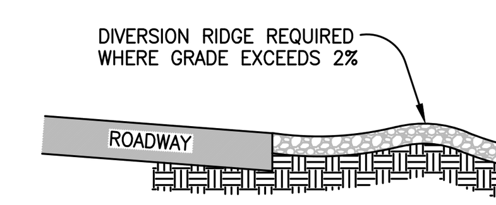
STRUCTURE FRAMES & COVERS

COVER	TYPE	USE	MANUFACTURER OR EQUAL: EAST JORDAN	MANUFACTURER OR EQUAL: NEENAH	TYPE OF COVER OR GRATE
A	MH	ALL	1120	R-1415	SANITARY-SELF SEALING STORM-VENTED
E	CB & INLET	LAWN AREA OR DITCH	1020-01		BEEHIVE GRATE 4" HIGH

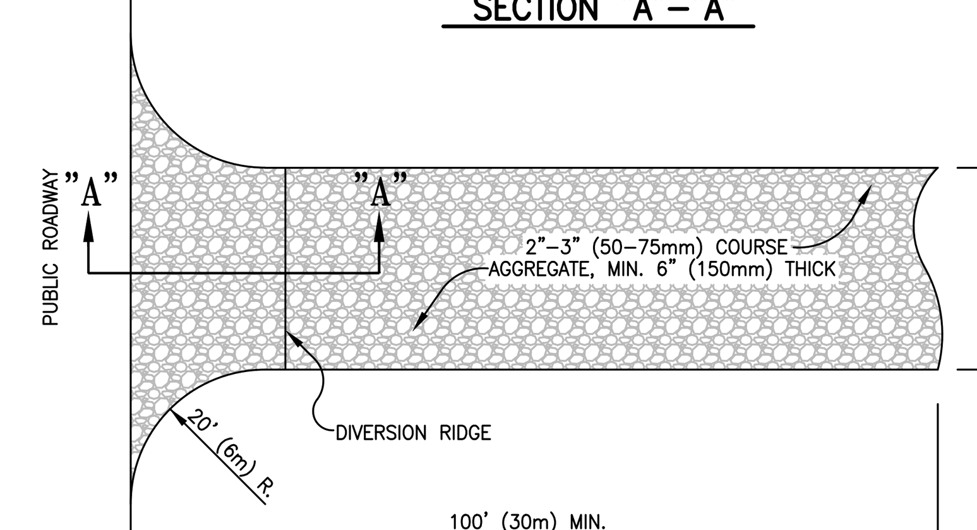


NOTE: STRAW BALE FILTERS SHALL BE STAKED AT ALL UPSTREAM CULVERTS TO PREVENT SILTING UP OF CULVERTS DURING CONSTRUCTION.

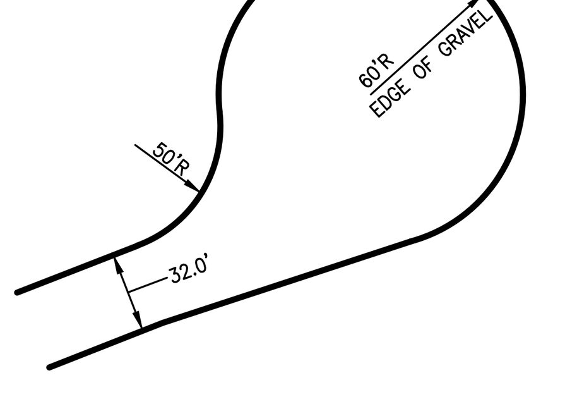
STRAW BALE INLET FILTER
NO SCALE



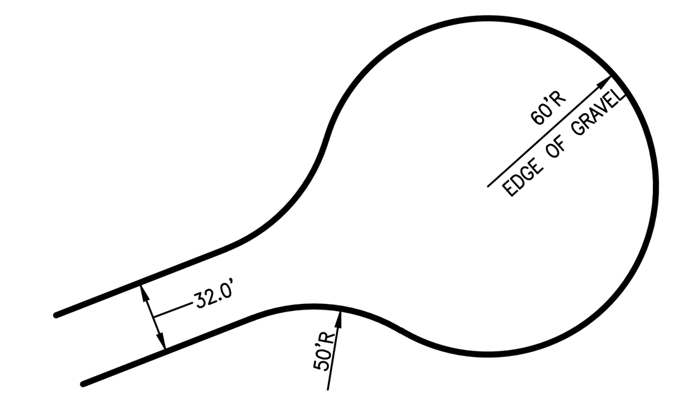
SECTION "A"-"A"



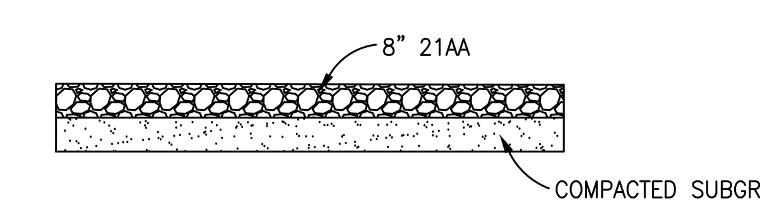
TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT
NO SCALE



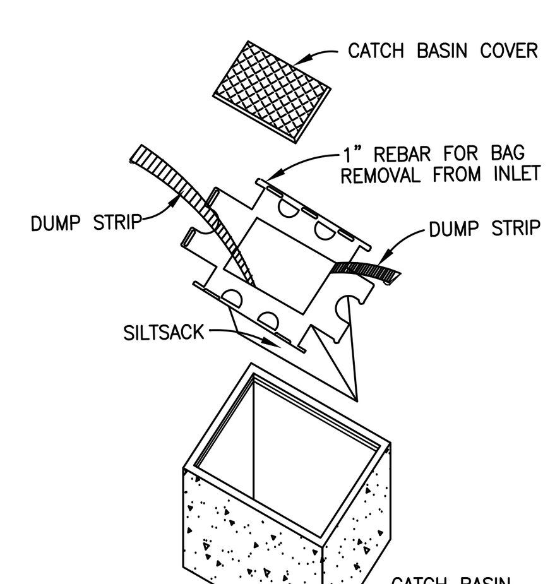
TEMPORARY OFFSET CUL-DE-SAC
(NO SCALE)

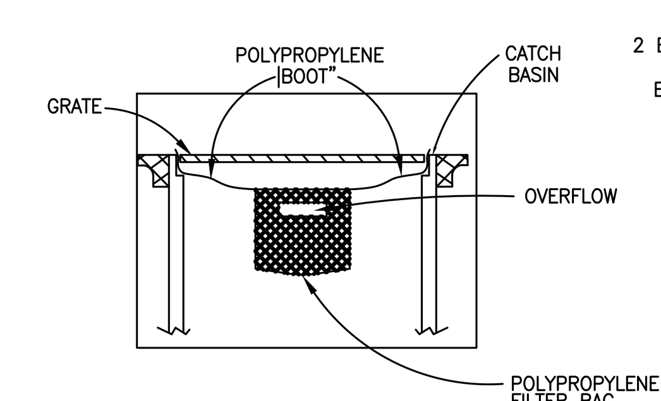


TEMPORARY CUL-DE-SAC
(NO SCALE)

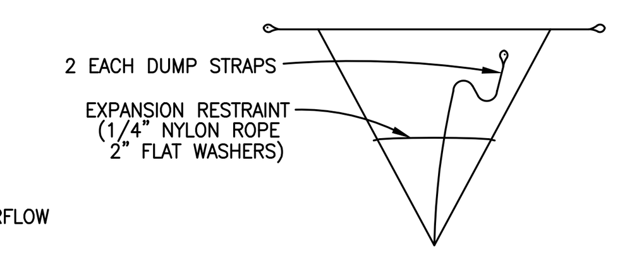


TEMPORARY CUL-DE-SAC CROSS-SECTION
(NO SCALE)

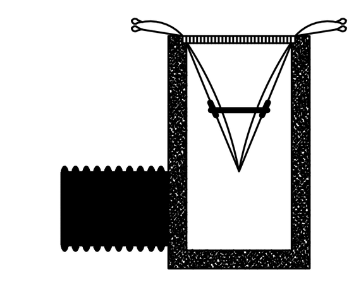




INLET SEDIMENT FILTER TEMPORARY
NO SCALE

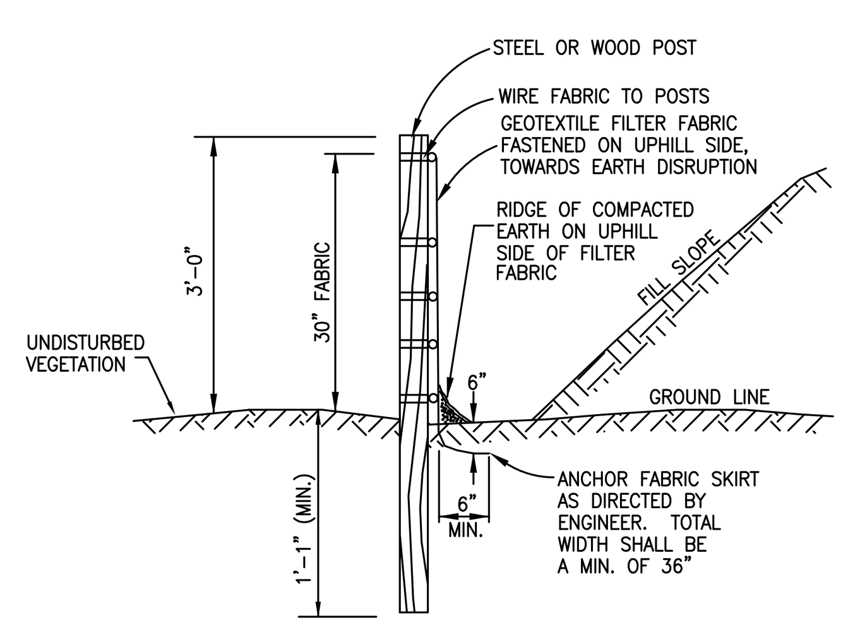


BAG DETAIL

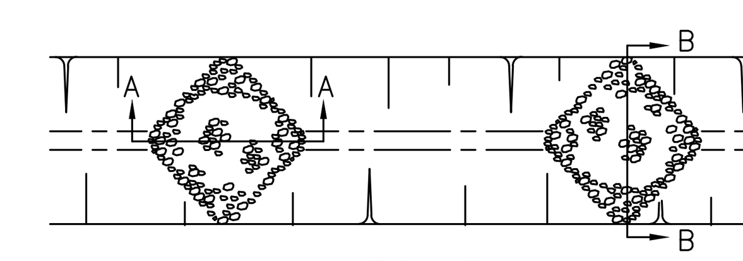


INSTALLATION DETAIL

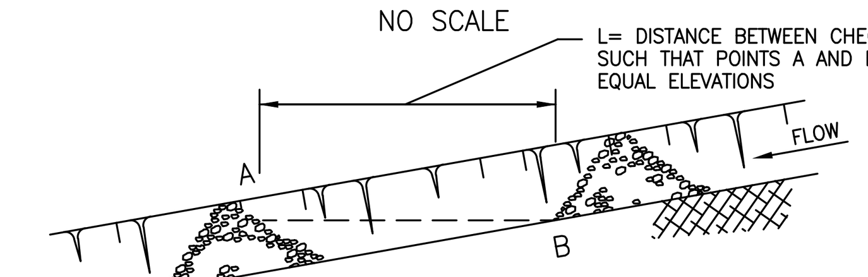
NOTE:
TEMPORARY INLET SEDIMENT FILTER TO BE INSTALLED ON ALL PAVEMENT CATCH BASINS INLET FILTER TO BE SIMILAR TO "STREAMGUARD" AS MANUFACTURED BY STORMWATER SERVICES CORPORATION (206-767-0441) OR "SILTSACK" AS MANUFACTURED BY ATLANTIC CONSTRUCTION FABRICS IN (800-448-3636). CLEAN FILTER AS NEEDED.



SILT FENCE DETAIL
NO SCALE

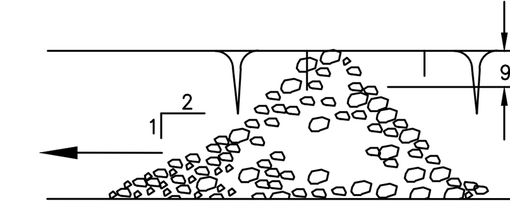


CHECK DAM PLAN VIEW
NO SCALE

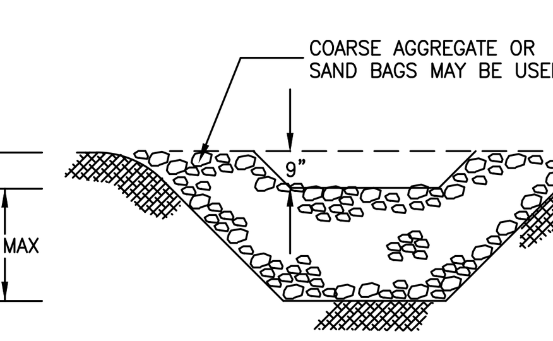


CHECK DAM CROSS-SECTION

NOTE: CHECK DAMS GREATER THAN TWO FEET IN DEPTH MAY SERIOUSLY IMPACT THE FLOW CHARACTERISTICS OF THE DITCH.



CHECK DAM SECTION A-A
NO SCALE



CHECK DAM SECTION B-B
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
800.246.6735 FAX 517.548.1670

PROJECT: MISTY MEADOW

PREPARED FOR: GFG INVESTMENT PROPERTIES, LLC
15264 BAILEY
TAYLOR, MI 48180
(734) 795-0078

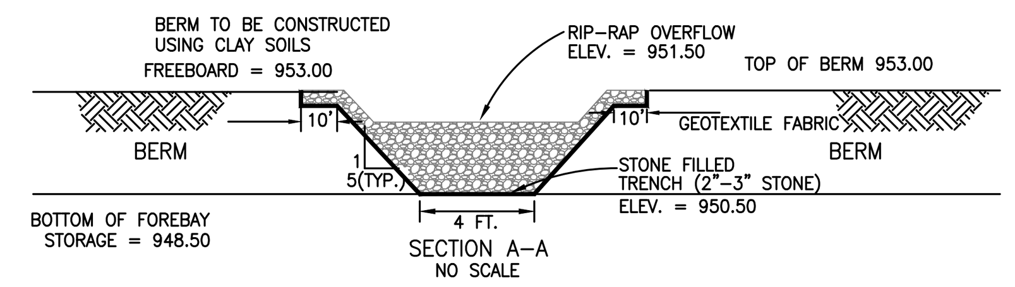
TITLE: CONSTRUCTION DETAILS

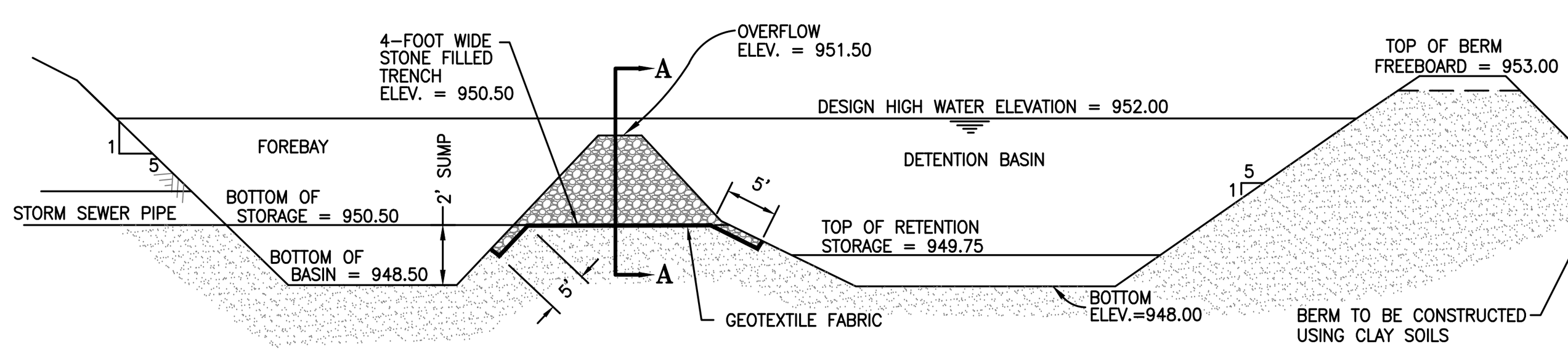
NO	BY	REVISION PER	DATE
6	KS	ST SEWER PER L.C.D.C.	10/27/16
4	KS	PHASING	8/5/16
3	KS	L.C.R.C. REVIEW	7/1/16
2	KS	TOWNSHIP REVIEW	5/19/16
1	KS	TOWNSHIP REVIEW	4/20/16

DESIGNED BY: KS
DRAWN BY: KS
CHECKED BY:
SCALE
JOB NO. 15-179
DATE 03/23/16
SHEET NO. 7

STORM SEWER DESIGN CALCULATIONS

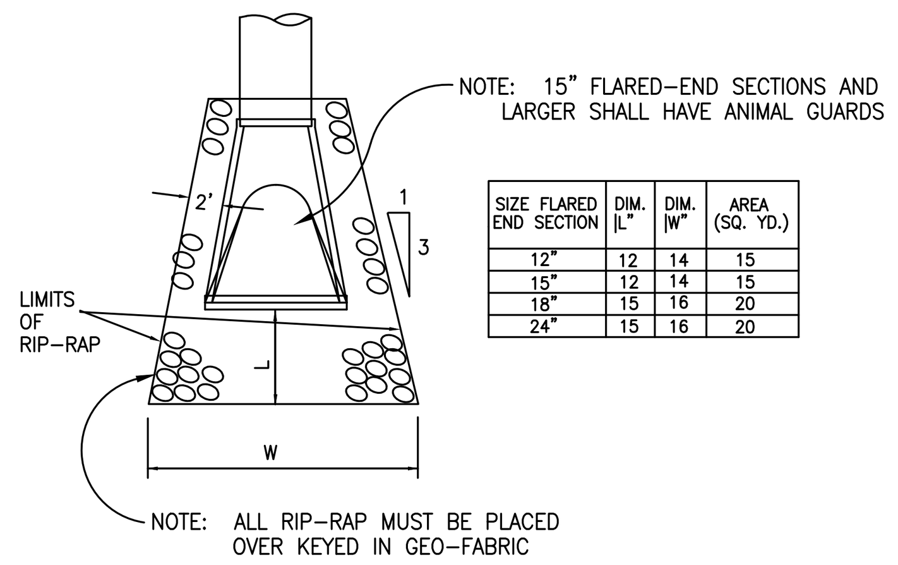
FROM	TO	DRAIN AREA	ACRES A	AREA IMPERV 0.9	AREA PERV 0.2	RUNOFF COEFF C	EQUIV. AREA A * C	INTEN-SITY I	TIME OF CONC. T_C	ADD'L RUNOFF Q	RUNOFF (CFS) Q	PIPE LENGTH (LF)	PIPE DIA. (IN)	VELOCITY FLOWING FULL (FPS)	HYDRAULIC GRADIENT SLOPE %	ACTUAL SLOPE USED	MANNING FLOW CAPACITY	MANNING'S VELOCITY (FT/SEC)	TIME (MIN)	HG ELEV UPPER END	HG ELEV LOWER END	RIM ELEV UPPER END	INVERT UPPER END	INVERT LOWER END	DROP DISTANCE (FT)	RIM-INV	RIM-HG >1	PIPE COVER >2.667	FLOW THRU COVER
ES10	CB09	D	0.95	0.11	0.84	0.28	0.27	6.88	15.00	6.06	7.91	94	15	6.45	1.49%	3.50%	12.12	9.87	0.16	971.90	968.61	974.90	970.90	967.61	4.00	4.00	3.00	2.75	1.85
CB09	CB08	C	1.74	0.11	1.63	0.25	0.43	6.85	15.16		10.83	65	15	8.83	2.80%	3.50%	12.12	9.87	0.11	964.61	962.34	971.40	963.61	961.34	4.00	7.79	6.79	2.54	2.92
CB08	ES07	G	0.70	0.38	0.32	0.58	0.41	4.35	15.27	4.06	16.66	118	24	5.30	0.54%	0.63%	17.93	5.71	0.34	958.34	957.60	971.50	956.74	956.00		14.76	13.16	8.91	1.77
ES12	ES11	E	3.45	0.27	3.17	0.26	0.88	6.88	15.00		6.06	8	15	4.94	0.88%	1.19%	7.07	5.76	0.02	974.82	974.72	975.82	973.82	973.72		2.00	1.00	0.75	6.06
ES14	ES13	E	2.15	0.23	1.91	0.28	0.59	6.88	15.00		4.06	8	15	3.31	0.39%	1.19%	7.07	5.76	0.02	974.82	974.72	975.82	973.82	973.72		2.00	1.00	0.75	4.06
ES04	ES03	B	8.27	0.74	7.53	0.26	2.17	6.88	15.00		14.91	113	18	8.44	2.00%	0.90%	9.99	5.65	0.33	954.61	952.35	956.00	952.17	951.15		3.83	1.39	2.33	14.91
OCS02	ES01					0.00	0	6.88	15.00		1.79	358	12	2.28	0.25%	0.45%	2.40	3.05	1.96	950.55	948.94	952.00	949.75	948.14		2.25	1.45	1.25	0.00
OCS 06	ES05					0.00	0	6.88	15.00		1.19	143	12	1.52	0.11%	0.34%	2.07	2.63	0.91	956.05	955.57	958.00	955.25	954.77		2.75	1.95	1.75	0.00
ES16	ES15	H	0.58	0.13	0.45	0.36	0.20	6.88	15.00		1.40	67	12	1.79	0.15%	0.32%	2.02	2.57	0.43	982.34	982.13	983.75	981.54	981.33		2.21	1.41	1.21	1.40





NORTH DETENTION/RETENTION BASIN CROSS SECTION

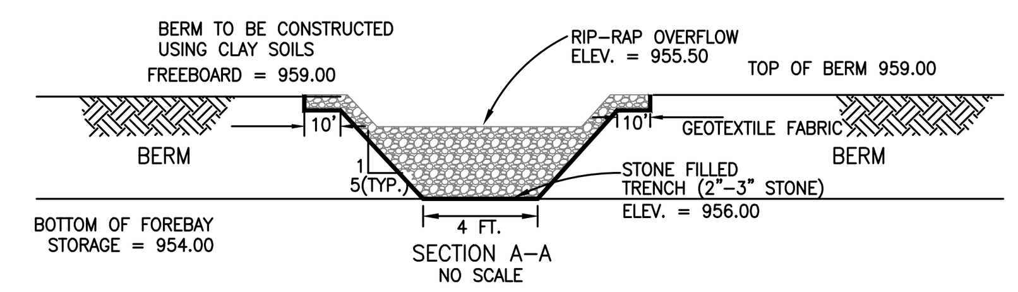
NOT TO SCALE

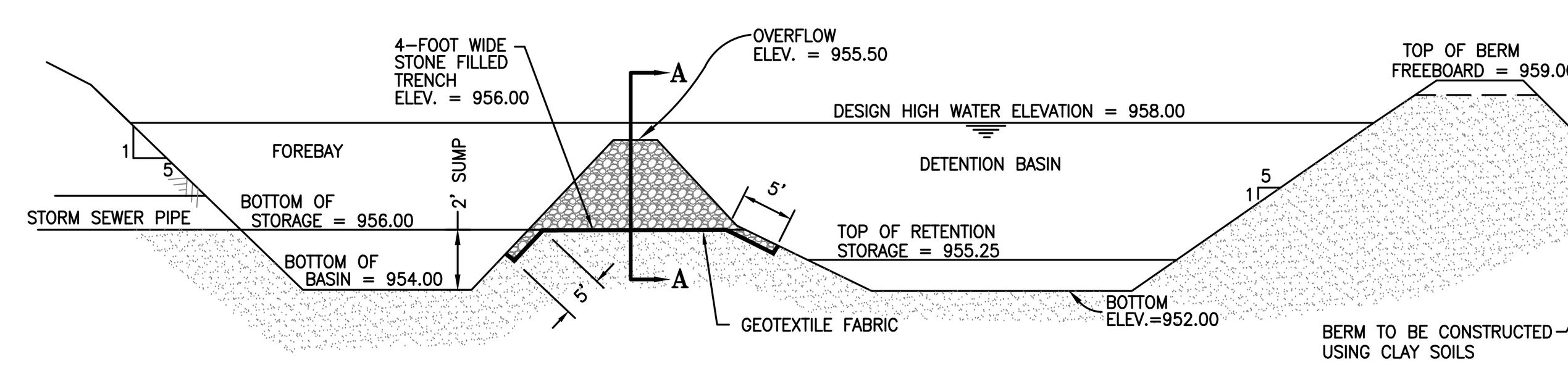


SIZE FLARED END SECTION	DIM. "L"	DIM. "W"	AREA (SQ. YD.)
12"	12	14	15
15"	12	14	15
18"	15	16	20
24"	15	16	20

TYPICAL RIP-RAP DETAIL

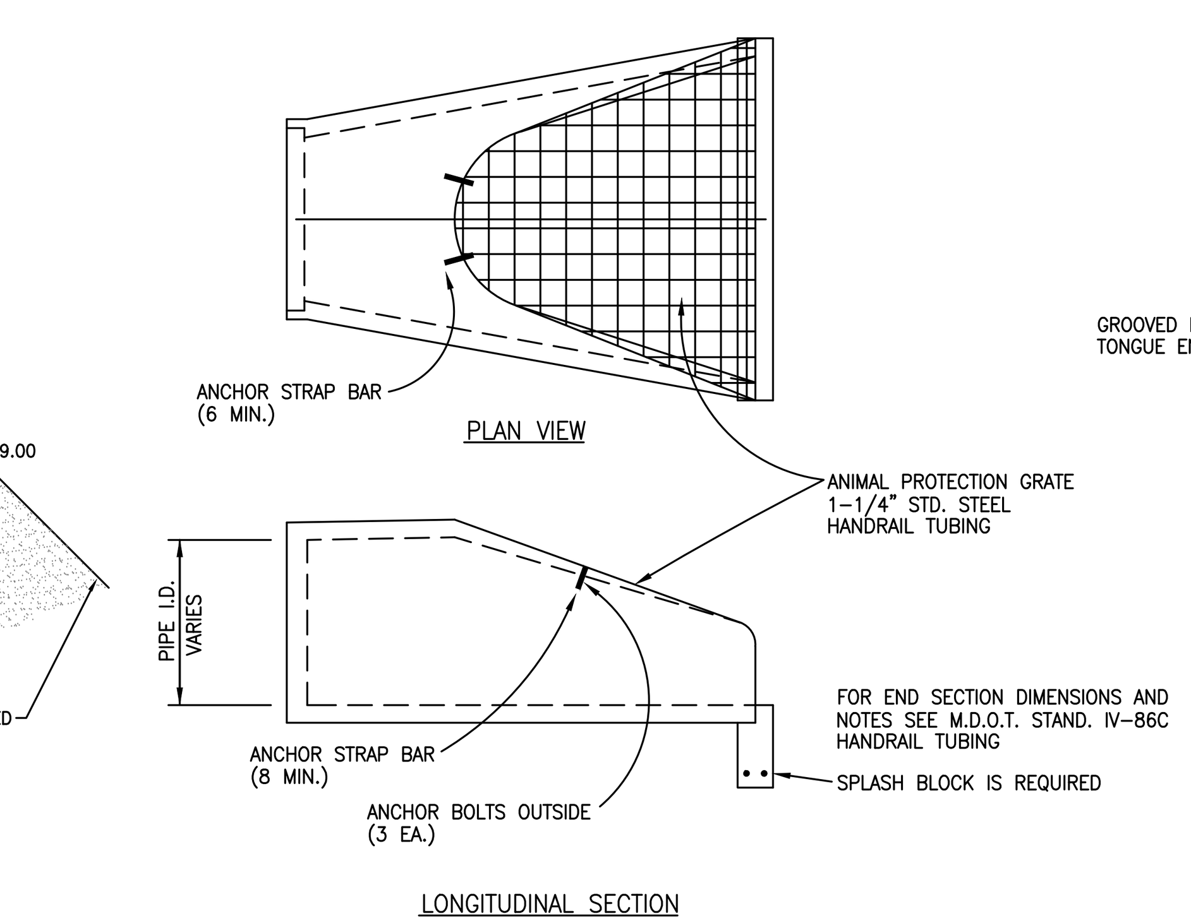
(SCALE: NONE)





SOUTH DETENTION/RETENTION BASIN CROSS SECTION

NOT TO SCALE



PRECAST CONCRETE END SECTION FOR PIPE CULVERT W/ ANIMAL GRATE

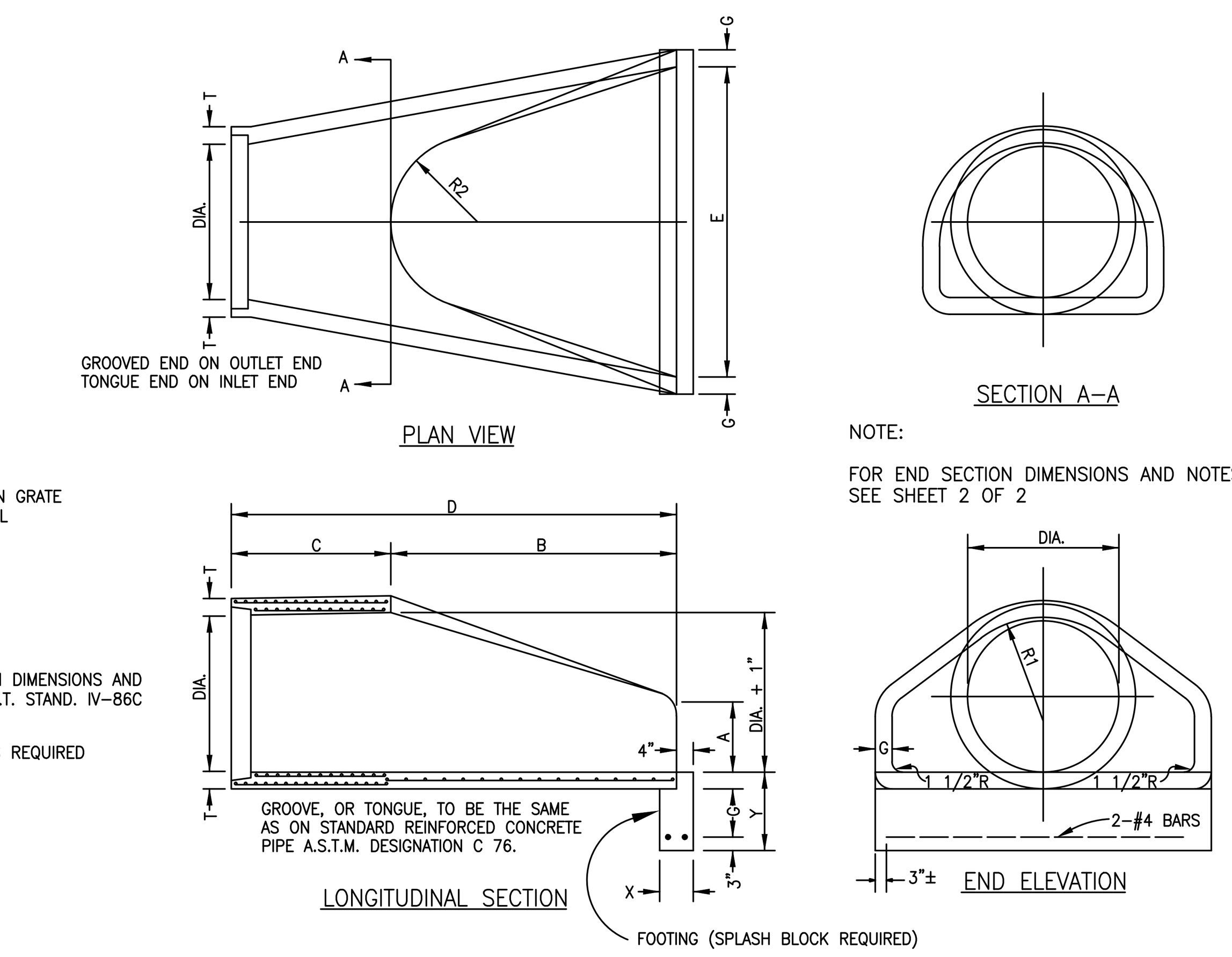
(NO SCALE)

DIA.	T(MIN.)	A(MIN.)	B*	C*	D*	E*	G	R1	R2	X	Y	APPROX. WT. LBS.
12"	2"	5"	23"	51"	74"	24"	2"	10-1/8"	9"	8"	18"	800
15"	2-1/4"	7"	27"	48"	75"	30"	2-1/4"	12-1/2"	11"	8"	18"	1100
18"	2-1/2"	11"	25"	49"	74"	36"	2-1/2"	15-1/2"	12"	8"	18"	1300
24"	3"	12"	43"	32"	75"	48"	3"	16-3/16"	14"	8"	18"	1800

* TOLERANCE ± 1"

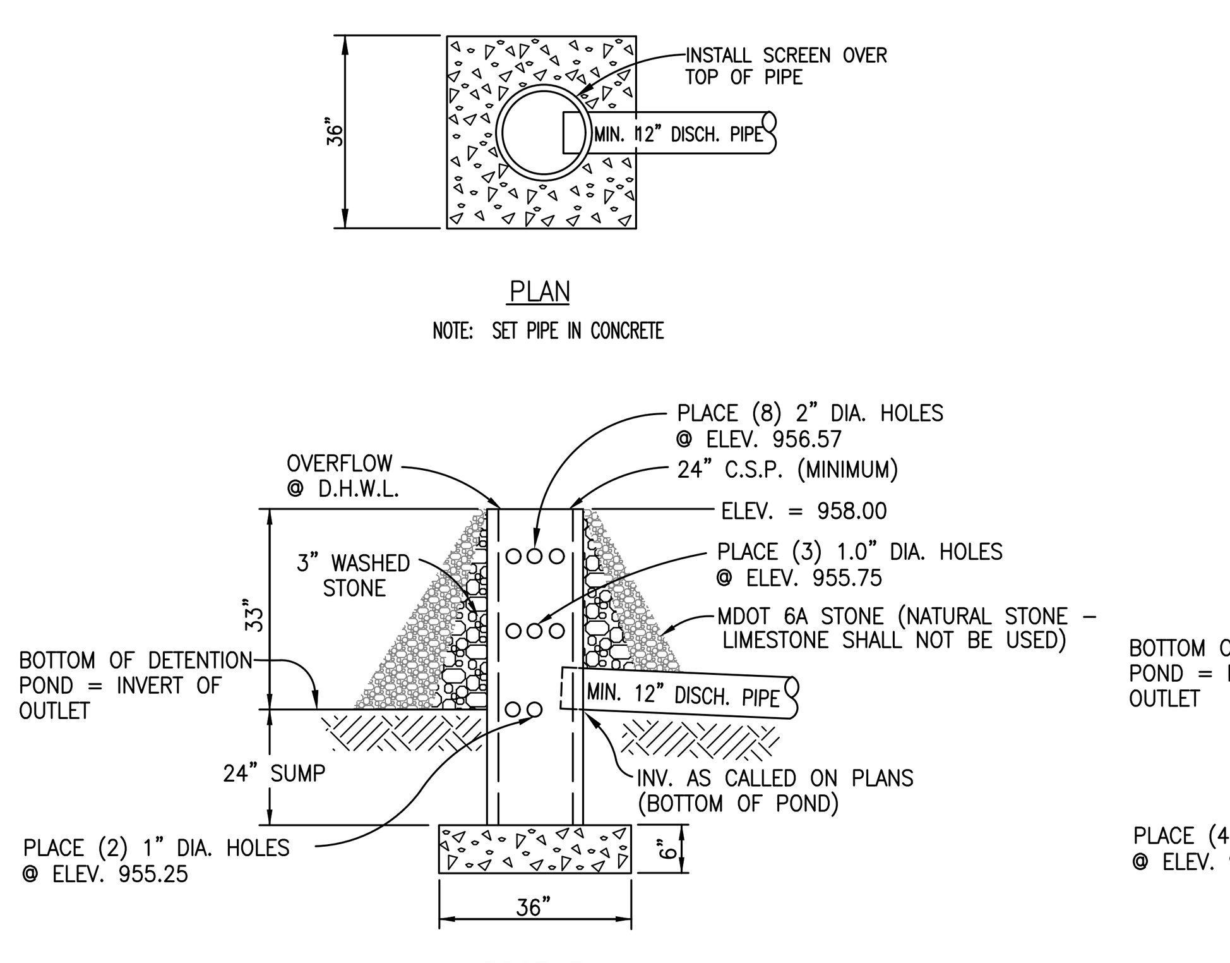
RADIUS AS FURNISHED BY THE MANUFACTURER

WEIGHT SHOWN DOES NOT INCLUDE CONCRETE FOOTING



PRECAST CONCRETE END SECTION FOR PIPE CULVERT

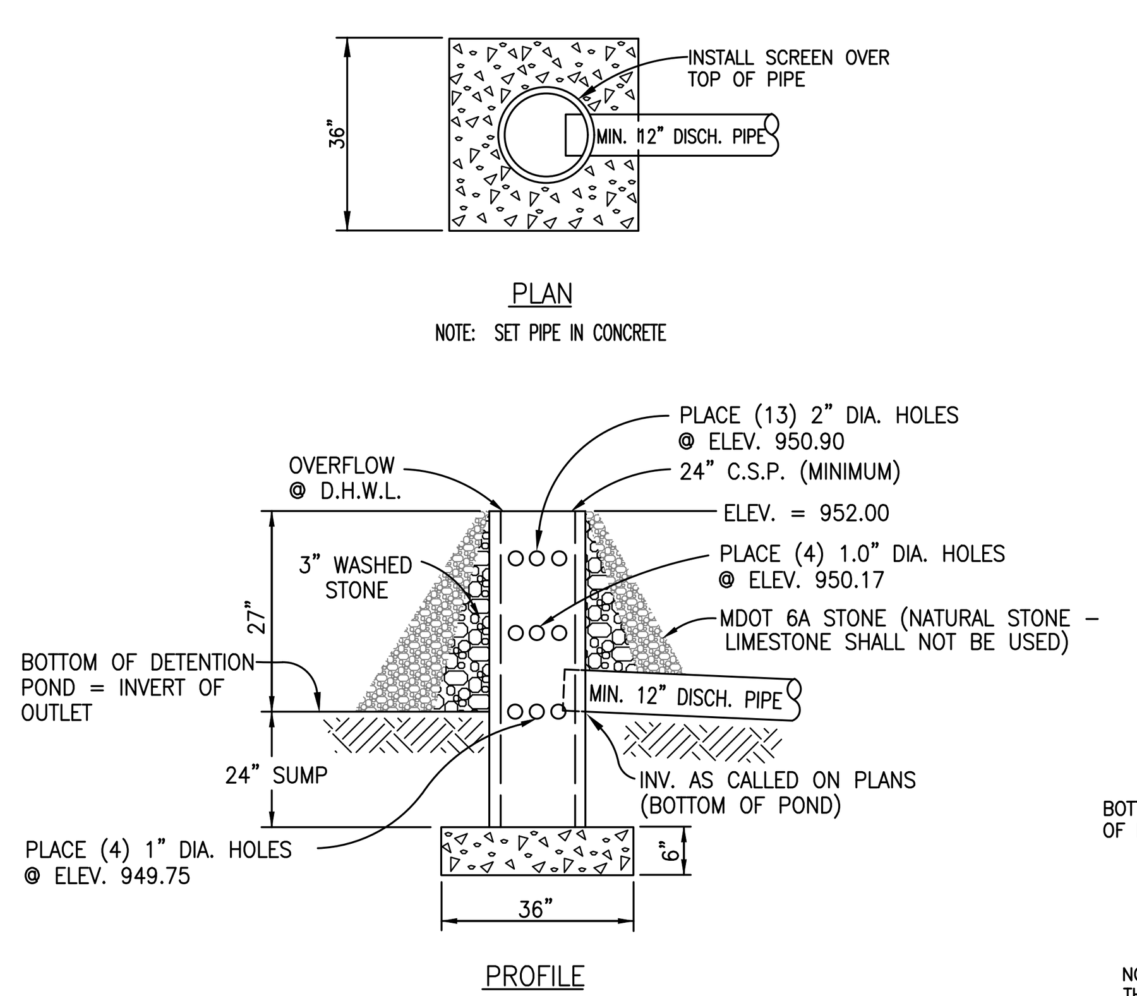
(REF. MDOT DETAIL IV-86C)



NOTE: UPON COMPLETION OF CONSTRUCTION STONE AROUND THE STRUCTURE SHALL BE REFRESHED WITH CLEAN STONE.

SOUTH DETENTION/RETENTION POND OUTLET CONTROL STRUCTURE

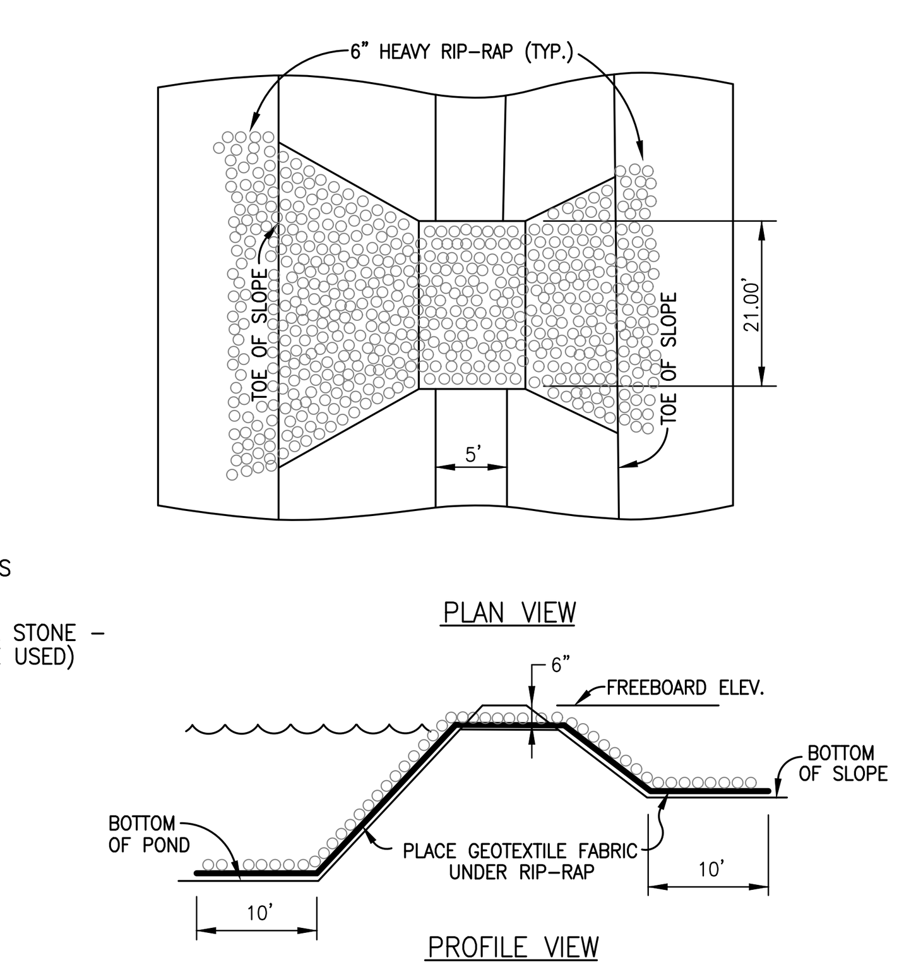
(NO SCALE)



NOTE: UPON COMPLETION OF CONSTRUCTION STONE AROUND THE STRUCTURE SHALL BE REFRESHED WITH CLEAN STONE.

NORTH DETENTION/RETENTION POND OUTLET CONTROL STRUCTURE

(NO SCALE)



NOTES:
THE FOLLOWING EQUATION WAS USED TO CALCULATE THE DIMENSIONS OF THE EMERGENCY SPILLWAY BASED ON A 100-YEAR STORM EVENT:

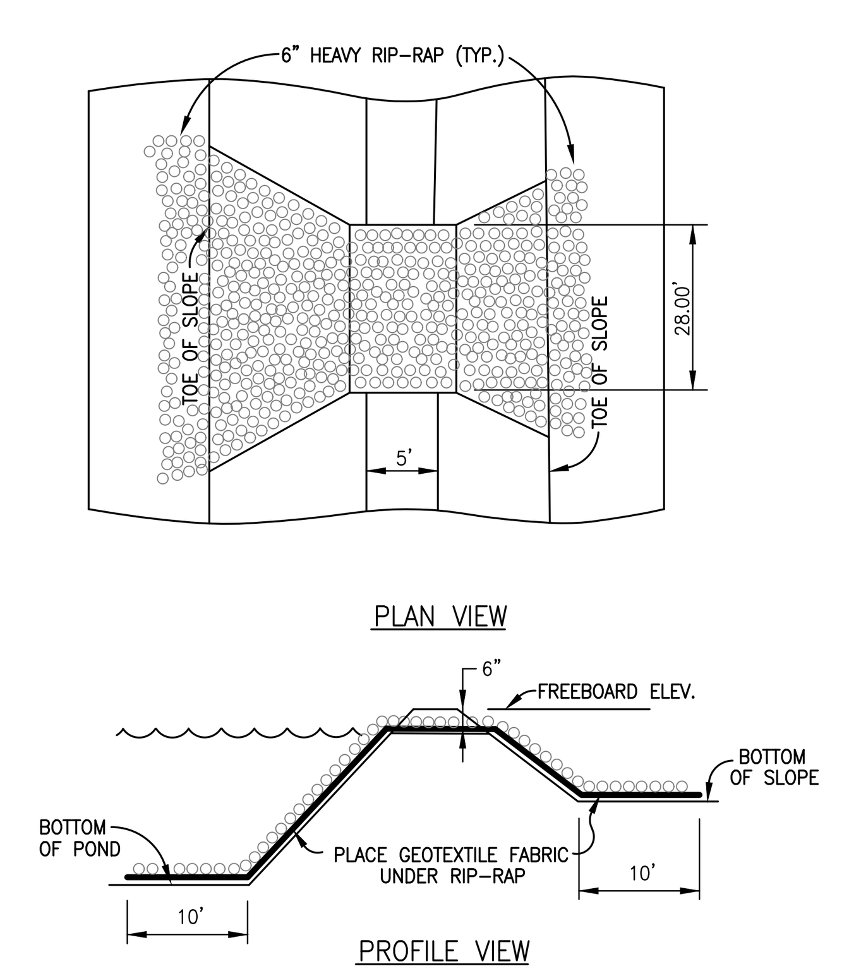
$Q=3.33(B-0.2H)H^{1.5}$

A 100-YEAR STORM EVENT HAS A WATER FLOW RATE OF 24.28 CFS.

HEIGHT (H) = 0.50 FT.
LENGTH (B) = 21.00 FT
WATER FLOW RATE (Q) = 24.61 CFS

SOUTH DETENTION/RETENTION POND EMERGENCY SPILLWAY

NO SCALE



NOTES:
THE FOLLOWING EQUATION WAS USED TO CALCULATE THE DIMENSIONS OF THE EMERGENCY SPILLWAY BASED ON A 100-YEAR STORM EVENT:

$Q=3.33(B-0.2H)H^{1.5}$

A 100-YEAR STORM EVENT HAS A WATER FLOW RATE OF 32.53 CFS.

HEIGHT (H) = 0.50 FT.
LENGTH (B) = 28.00 FT
WATER FLOW RATE (Q) = 32.84 CFS

NORTH DETENTION/RETENTION POND EMERGENCY SPILLWAY

NO SCALE

STORM WATER CALCULATION NARRATIVE

THE CALCULATIONS INCLUDE PRE-DEVELOPMENT AND POST-DEVELOPMENT 100-YEAR DETENTION BASIN STORAGE REGULATIONS. THE DIFFERENCE BETWEEN THE TWO IS ACCOUNTED FOR IN RETENTION VOLUME TO ENSURE THAT NO INCREASE IN STORM WATER IS LEAVING THE SITE.

NORTH DETENTION/RETENTION BASIN CALCULATIONS

LIVINGSTON COUNTY DETENTION BASIN CALCULATIONS

EXISTING CONDITIONS

AREA (ACRES)	IMPERVIOUS FACTOR	ACRE IMPERVIOUS
0.00	0.9	0.00
0.00	0.7	0.00
17.87	0.2	3.57

COMPOUND C: 0.20
TOTAL DRAINAGE AREA: 17.87 ACRES

K1 = AxC (Design Constant) 3.574
Qa = MAX ALLOW OUTFLOW (0.10 CFS / ACRE) 1.787 CFS

DURATION MINUTES	DURATION SECONDS	INTENSITY (IN/HR)	INCHES	INFLOW VOLUME IN. RUNOFF x AxC	OUTFLOW DURATION x Qo	STORAGE VOLUME INFLOW - OUTFLOW
5	300	9.17	2750	9829	536	9292
10	600	7.86	4714	16849	1072	15777
15	900	6.88	6188	22114	1608	20506
20	1200	6.11	7333	26209	2144	24065
30	1800	5.00	9000	32166	3217	28949
60	3600	3.24	11647	41627	6433	35193
90	5400	2.39	12913	46151	9650	36501
120	7200	1.90	13655	48804	12866	35937
180	10800	1.34	14488	51779	19300	32480

EXISTING 100 YEAR DETENTION VOLUME = 36501 CF

PROPOSED CONDITIONS

AREA (ACRES)	IMPERVIOUS FACTOR	ACRE IMPERVIOUS
1.39	0.9	1.25
0.37	0.7	0.26
16.11	0.2	3.22

COMPOUND C: 0.26
TOTAL DRAINAGE AREA: 17.87 ACRES

K1 = AxC (Design Constant) 4.6462
Qa = MAX ALLOW OUTFLOW (0.10 CFS / ACRE) 1.787 CFS

DURATION MINUTES	DURATION SECONDS	INTENSITY (IN/HR)	INCHES	INFLOW VOLUME IN. RUNOFF x AxC	OUTFLOW DURATION x Qo	STORAGE VOLUME INFLOW - OUTFLOW
5	300	9.17	2750	12777	536	12241
10	600	7.86	4714	21904	1072	20831
15	900	6.88	6188	28748	1608	27140
20	1200	6.11	7333	34072	2144	31928
30	1800	5.00	9000	41816	3217	38599
60	3600	3.24	11647	54115	6433	47681
90	5400	2.39	12913	59997	9650	50347
120	7200	1.90	13655	63445	12866	50578
180	10800	1.34	14488	67313	19300	48014

PROPOSED 100 YEAR DETENTION VOLUME = 50578 CF

REQUIRED 100 YEAR DETENTION VOLUME = 36501 CF
REQUIRED 100 YEAR RETENTION VOLUME = 14077 CF

FOREBAY VOLUME
V(F) = 5% OF THE 100-YEAR STORM VOLUME BASED ON THE AREA TRIBUTARY TO THE INLET

V(F)= (.05)(V100)
V(F)= 2529 CF
FOREBAY STORAGE VOLUME REQUIRED: 2529 CF

FOREBAY STORAGE VOLUME PROVIDED:

ELEV	AREA	VOLUME	CUMMULATIVE VOLUME
952	2688	2241	3391
951	1793	799	1150
950.5	1404	351	351
950			
948.5			

BANKFULL FLOOD VOLUME
V_{BF} = 5160 x A x C= 18442 CF

FIRST FLUSH VOLUME
V_{FF} = 1815 x A x C= 6487 CF

BASIN STORAGE PROVIDED

ELEV.	AREA (FT^2)	DEPTH (FT)	VOLUME (FT^3)	TOTAL VOLUME (FT^3)	
953	26927	1	23,523	62,473	FREEBOARD ELEVATION
952	20119	1	18,847	38,950	DESIGN HIGHWATER ELEVATION
951	17575	1	16,380	20,103	
950	15185	0.25	3,723	3,723	
949.75	14602	0	0	0	
949.75	14602	0.75	10,319	16,776	PERMANENT WATER ELEVATION
949	12914	1	6,457	6,457	
948	0	0	0	0	

BOTTOM OF BASIN = 949.75
FIRST FLUSH X_{FF} = 950.17
BANKFULL X_{BF} = 950.90
100 YEAR X_{100} = 951.87

OUTLET CONTROL STRUCTURE

FIRST FLUSH OF RUNOFF
THE AVERAGE ALLOWABLE RELEASE RATE FOR RUNOFF IS 0.5" OVER AREA OF SITE IN 24 HRS.

$Q_{FF} = V_{FF}$ x (1/24HRS) x (1HR/3600SEC)= 0.075 CFS

PLACE OPENINGS IN STANDPIPE AT BOTTOM OF BASIN = 949.75

HEAD = $h_{FF} = X_{FF}$ - BOTTOM BASIN ELEV = 0.42 FT

$A = Q_{FF} / (0.62 \times (2 \times 32.2 \times h_{FF})^{0.5})$ = 0.023 FT^2

A 1 INCH DIAMETER ORIFICE HAS AN AREA OF 0.0055 SF

A/ 0.0055 = 4.28

THEREFORE, USE THE FOLLOWING NUMBER OF 1 INCH DIAMETER HOLES
4.00 HOLES, AT ELEV. 949.75
Q_{FF}MAX = 0.158 CFS

BANKFULL FLOOD
FOR THE ALLOWABLE RELEASE RATE OF 24-40 HOURS, CHECK THE DISCHARGE THROUGH THE FIRST FLUSH ORIFICE TO SEE IF ADDITIONAL HOLES ARE NECESSARY.

HEAD = h = X_{BF} - BOTTOM OF BASIN = 1.15 FT

$Q_{90.0}$ = 0.62x #HOLES x (AREA EACH HOLE$_{FF}$) x $(2 \times 32.2 \times h)^{0.5}$ = 0.116 CFS
$T_{90.0}$ = (1SEC / $Q_{90.0}$) x V_{BF} x (1HR / 3600SEC) = 44.04 HRS

BECAUSE THE HOLDING TIME EXCEEDS 40 HRS, ADDITIONAL ORIFICES IN THE STANDPIPE ARE REQUIRED.

VOLUME THROUGH 4 1 INCH DIAMETER HOLES IN 24 HOURS:
V=Q90.0x24HRSx3600SEC/HR = 10051 CF
REMAINING VOL. = 8391 CF
QBF = REMAINING VOLUME x (1 / 24HRS) x (1 / 3600SEC) = 0.097 CFS

PLACE OPENINGS AT FIRST FLUSH ELEVATION = 950.17
HEAD = hBF = XBF -XFF = 0.73 FT
A = QBF / (0.62 * (2*32.2*hBF)^0.5) = 0.023 SF

A 1 INCH DIAMETER ORIFICE HAS AN AREA OF 0.0055 SF
A/ 0.0055 = 4.19
THEREFORE, USE 4 1 INCH DIAMETER HOLES AT ELEV. = 950.17
Q_{BF}MAX = 0.142 CFS

100 YEAR FLOOD

Q_a = ALLOWABLE RELEASE RATE x AREA SITE IN ACRES= 1.787 CFS

Q_a IS A PEAK OR MAXIMUM FLOW. CALCULATE THE MAXIMUM FLOW PASSING THROUGH FIRST FLUSH AND BANKFULL ORIFICES, USING THE TOTAL HEAD, AND SUBTRACT FROM Q_a TO DETERMINE THE ORIFICE SIZE TO RELEASE THE 100 YEAR STORM VOLUME:

Q_{FF}MAX+Q_{BF}MAX = 0.30 CFS

Q_a - (Q_{FF}MAX + Q_{BF}MAX) = 1.49 CFS

$A= Q_a / (0.62 * (2 * 32.2 * (X_{100}-X_{BF}))^{0.5})$ = 0.303 SF

A 2 INCH DIAMETER ORIFICE HAS AN AREA OF 0.022 SF

A/ 0.022 = 13.90

THEREFORE, USE THE FOLLOWING NUMBER OF 2 INCH DIAMETER HOLES:
13 HOLES AT ELEV. = 950.90

Q_{100} = 1.391 CFS
$Q_O = Q_{100} + Q_{BF}MAX + Q_{FF}MAX$ 1.691 CFS

SUMMARY OF REQUIRED STANDPIPE HOLES:

ELEVATION	# OF HOLES	DIAMETER OF HOLES	
950.90	13	2	INCHES
950.17	4	1	INCHES
949.75	4	1	INCHES

SOUTH DETENTION/RETENTION BASIN CALCULATIONS

LIVINGSTON COUNTY DETENTION BASIN CALCULATIONS

EXISTING CONDITIONS

AREA (ACRES)	IMPERVIOUS FACTOR	ACRE IMPERVIOUS
0.11	0.9	0.10
0.00	0.7	0.00
11.82	0.2	2.36

COMPOUND C: 0.21
TOTAL DRAINAGE AREA: 11.93 ACRES

K1 = AxC (Design Constant) 2.5053
Qa = MAX ALLOW OUTFLOW (0.10 CFS / ACRE) 1.193 CFS

DURATION MINUTES	DURATION SECONDS	INTENSITY (IN/HR)	INCHES	INFLOW VOLUME IN. RUNOFF x AxC	OUTFLOW DURATION x Qo	STORAGE VOLUME INFLOW - OUTFLOW
5	300	9.17	2750	6890	358	6532
10	600	7.86	4714	11811	716	11095
15	900	6.88	6188	15502	1074	14428
20	1200	6.11	7333	18372	1432	16941
30	1800	5.00	9000	22548	2147	20400
60	3600	3.24	11647	29179	4295	24885
90	5400	2.39	12913	32351	6442	25909
120	7200	1.90	13655	34210	8590	25621
180	10800	1.34	14488	36296	12884	23412

EXISTING 100 YEAR DETENTION VOLUME = 25909 CF

PROPOSED CONDITIONS

AREA (ACRES)	IMPERVIOUS FACTOR	ACRE IMPERVIOUS
1.28	0.9	1.15
0.50	0.7	0.35
10.15	0.2	2.03

COMPOUND C: 0.30
TOTAL DRAINAGE AREA: 11.93 ACRES

K1 = AxC (Design Constant) 3.579
Qa = MAX ALLOW OUTFLOW (0.10 CFS / ACRE) 1.193 CFS

DURATION MINUTES	DURATION SECONDS	INTENSITY (IN/HR)	INCHES	INFLOW VOLUME IN. RUNOFF x AxC	OUTFLOW DURATION x Qo	STORAGE VOLUME INFLOW - OUTFLOW
5	300	9.17	2750	9842	358	9484
10	600	7.86	4714	16872	716	16157
15	900	6.88	6188	22145	1074	21071
20	1200	6.11	7333	26246	1432	24814
30	1800	5.00	9000	32211	2147	30064
60	3600	3.24	11647	41685	4295	37390
90	5400	2.39	12913	46216	6442	39774
120	7200	1.90	13655	48872	8590	40282
180	10800	1.34	14488	51852	12884	38967

PROPOSED 100 YEAR DETENTION VOLUME = 40282 CF

REQUIRED 100 YEAR DETENTION VOLUME = 25909 CF
REQUIRED 100 YEAR RETENTION VOLUME = 14373 CF

FOREBAY VOLUME
V(F) = 5% OF THE 100-YEAR STORM VOLUME BASED ON THE AREA TRIBUTARY TO THE INLET

V(F)= (.05)(V100)
V(F)= 2014 CF
FOREBAY STORAGE VOLUME REQUIRED: 2014 CF

FOREBAY STORAGE VOLUME PROVIDED:

ELEV	AREA	VOLUME	CUMMULATIVE VOLUME
957.5	2569	1059	2357
957	1667	1298	1298
956	929	465	
955	0	0	
954	0		

BANKFULL FLOOD VOLUME
V_{BF} = 5160 x A x C= 12927 CF

FIRST FLUSH VOLUME
V_{FF} = 1815 x A x C= 4547 CF

BASIN STORAGE PROVIDED

ELEV.	AREA (FT^2)	DEPTH (FT)	VOLUME (FT^3)	TOTAL VOLUME (FT^3)	
959	20335	1	17,303	48,030	FREEBOARD ELEVATION
958	14270	1	13,107	30,728	DESIGN HIGHWATER ELEVATION
957	11943	1	10,860	17,621	
956	9776	0.75	6,762	6,762	
955.25	8255		0	0	
955.25	8255	0.25	2,003	16,035	PERMANENT WATER ELEVATION
955	7766	1	6,841	14,032	
954	5916	1	5,075	7,191	
953	4233	1	2,117	2,117	
952	0		0	0	

BOTTOM OF BASIN = 955.25
FIRST FLUSH X_{FF} = 955.75
BANKFULL X_{BF} = 956.57
100 YEAR X_{100} = 957.63

OUTLET CONTROL STRUCTURE

FIRST FLUSH OF RUNOFF
THE AVERAGE ALLOWABLE RELEASE RATE FOR RUNOFF IS 0.5" OVER AREA OF SITE IN 24 HRS.

$Q_{FF} = V_{FF}$ x (1/24HRS) x (1HR/3600SEC)= 0.053 CFS

PLACE OPENINGS IN STANDPIPE AT BOTTOM OF BASIN = 955.25

HEAD = $h_{FF} = X_{FF}$ - BOTTOM BASIN ELEV = 0.50 FT

$A = Q_{FF} / (0.62 \times (2 \times 32.2 \times h_{FF})^{0.5})$ = 0.015 FT^2

A 1 INCH DIAMETER ORIFICE HAS AN AREA OF 0.0055 SF

A/ 0.0055 = 2.73

THEREFORE, USE THE FOLLOWING NUMBER OF 1 INCH DIAMETER HOLES
2.00 HOLES, AT ELEV. 955.25
Q_{FF}MAX = 0.084 CFS

BANKFULL FLOOD
FOR THE ALLOWABLE RELEASE RATE OF 24-40 HOURS, CHECK THE DISCHARGE THROUGH THE FIRST FLUSH ORIFICE TO SEE IF ADDITIONAL HOLES ARE NECESSARY.

HEAD = h = X_{BF} - BOTTOM OF BASIN = 1.32 FT

$Q_{90.0}$ = 0.62x #HOLES x (AREA EACH HOLE$_{FF}$) x $(2 \times 32.2 \times h)^{0.5}$ = 0.062 CFS
$T_{90.0}$ = (1SEC / $Q_{90.0}$) x V_{BF} x (1HR / 3600SEC) = 57.64 HRS

BECAUSE THE HOLDING TIME EXCEEDS 40 HRS, ADDITIONAL ORIFICES IN THE STANDPIPE ARE REQUIRED.

VOLUME THROUGH 2 1 INCH DIAMETER HOLES IN 24 HOURS:
V=Q90.0x24HRSx3600SEC/HR = 5383 CF
REMAINING VOL. = 7544 CF
QBF = REMAINING VOLUME x (1 / 24HRS) x (1 / 3600SEC) = 0.087 CFS

PLACE OPENINGS AT FIRST FLUSH ELEVATION = 955.75
HEAD = hBF = XBF -XFF = 0.81 FT
A = QBF / (0.62 * (2*32.2*hBF)^0.5) = 0.019 SF

A 1 INCH DIAMETER ORIFICE HAS AN AREA OF 0.0055 SF
A/ 0.0055 = 3.57
THEREFORE, USE 3 1 INCH DIAMETER HOLES AT ELEV. = 955.75
Q_{BF}MAX = 0.112 CFS

100 YEAR FLOOD

Q_a = ALLOWABLE RELEASE RATE x AREA SITE IN ACRES= 1.193 CFS

Q_a IS A PEAK OR MAXIMUM FLOW. CALCULATE THE MAXIMUM FLOW PASSING THROUGH FIRST FLUSH AND BANKFULL ORIFICES, USING THE TOTAL HEAD, AND SUBTRACT FROM Q_a TO DETERMINE THE ORIFICE SIZE TO RELEASE THE 100 YEAR STORM VOLUME:

Q_{FF}MAX+Q_{BF}MAX = 0.20 CFS

Q_a - (Q_{FF}MAX + Q_{BF}MAX) = 1.00 CFS

$A= Q_a / (0.62 * (2 * 32.2 * (X_{100}-X_{BF}))^{0.5})$ = 0.194 SF

A 2 INCH DIAMETER ORIFICE HAS AN AREA OF 0.022 SF

A/ 0.022 = 8.91

THEREFORE, USE THE FOLLOWING NUMBER OF 2 INCH DIAMETER HOLES:
8 HOLES AT ELEV. = 956.57

Q_{100} = 0.896 CFS
$Q_O = Q_{100} + Q_{BF}MAX + Q_{FF}MAX$ 1.091 CFS

SUMMARY OF REQUIRED STANDPIPE HOLES:

ELEVATION	# OF HOLES	DIAMETER OF HOLES	
956.57	8	2	INCHES
955.75	3	1	INCHES
955.25	2	1	INCHES

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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
800.246.6735 FAX 517.548.1670

PROJECT
MISTY MEADOW

PREPARED FOR
GFG INVESTMENT PROPERTIES, LLC
15264 BAILEY
TAYLOR, MI 48180
(734) 795-0078

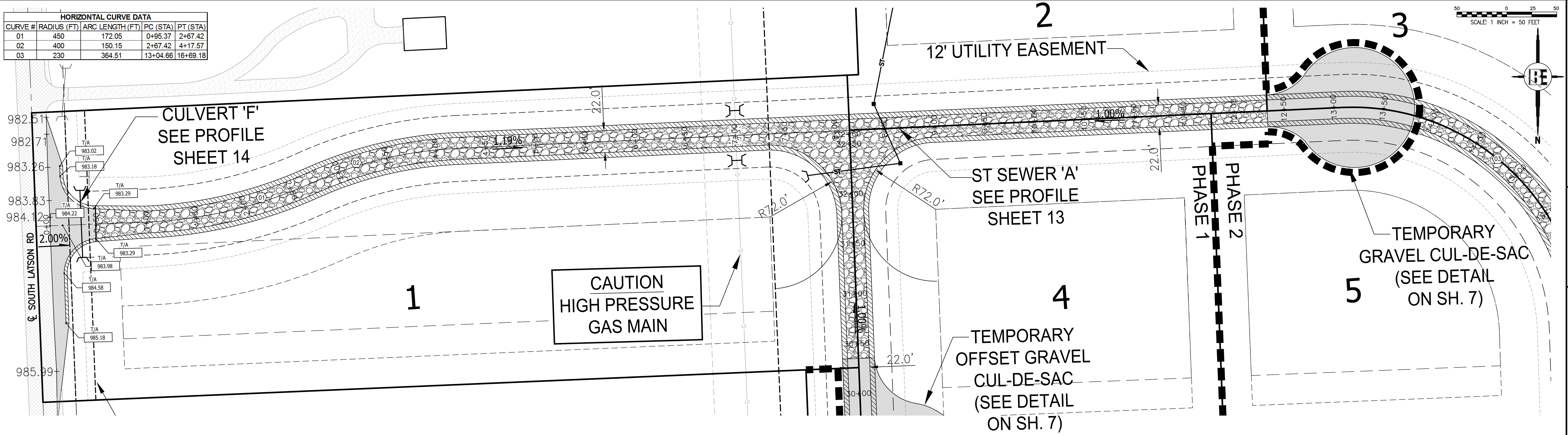
TITLE
STORM SEWER CALCULATIONS

NO	BY	REVISION PER	DATE
8	TE	CONC. SLAB PER UTILITIES	7/13/17
7	KS	ST SEWER PER CLIENT	02/23/16
6	KS	ST SEWER PER L.C.D.C.	10/27/16
4	KS	PHASING	8/5/16
3	KS	L.C.R.C. REVIEW	7/1/16
2	KS	TOWNSHIP REVIEW	5/19/16
1	KS	TOWNSHIP REVIEW	4/20/16

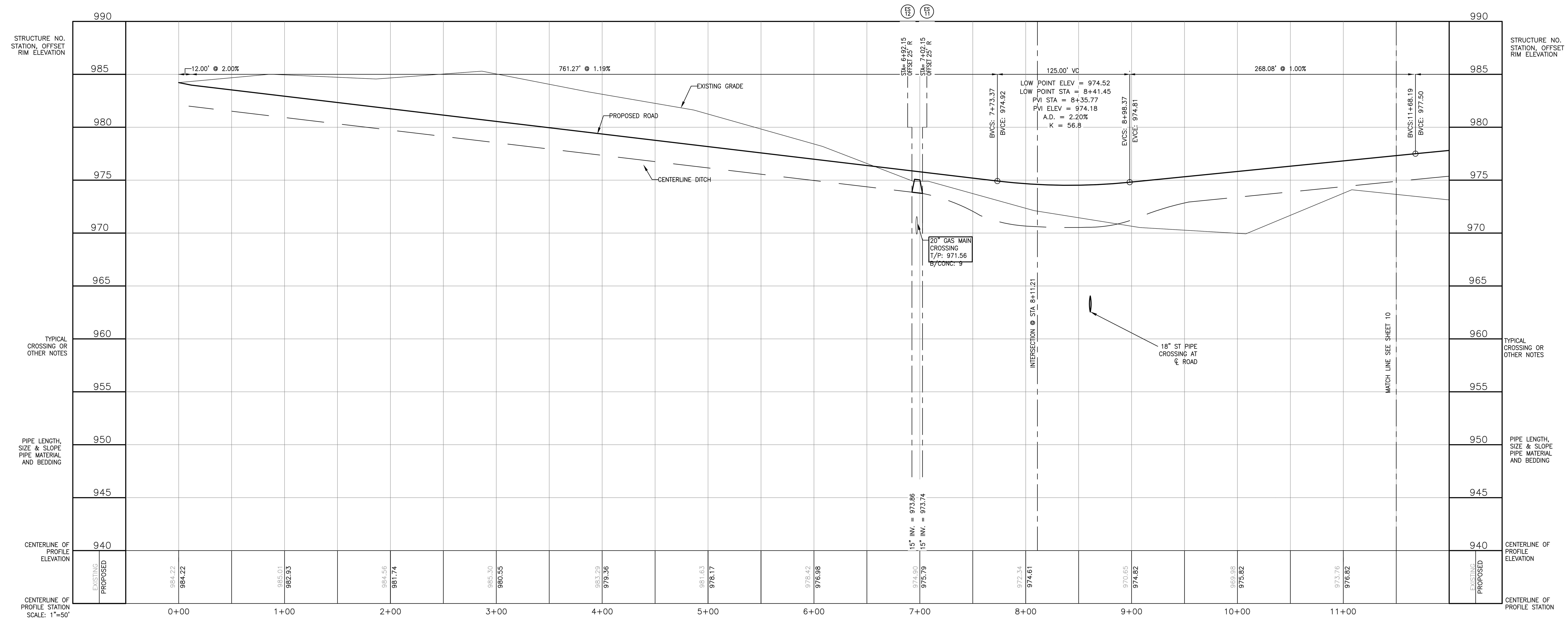
DESIGNED BY: KS
DRAWN BY: KS
CHECKED BY:
SCALE
JOB NO. 15-179
DATE 03/23/16
SHEET NO. 8

HORIZONTAL CURVE DATA

CURVE #	RADIUS (FT)	ARC LENGTH (FT)	PC (STA)	PT (STA)
01	450	172.05	0+95.37	2+67.42
02	400	150.15	2+67.42	4+17.57
03	230	364.51	13+04.66	16+69.18



MISTY MEADOW DRIVE - STA 0+00 TO 11+50



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PROJECT: **MISTY MEADOW**

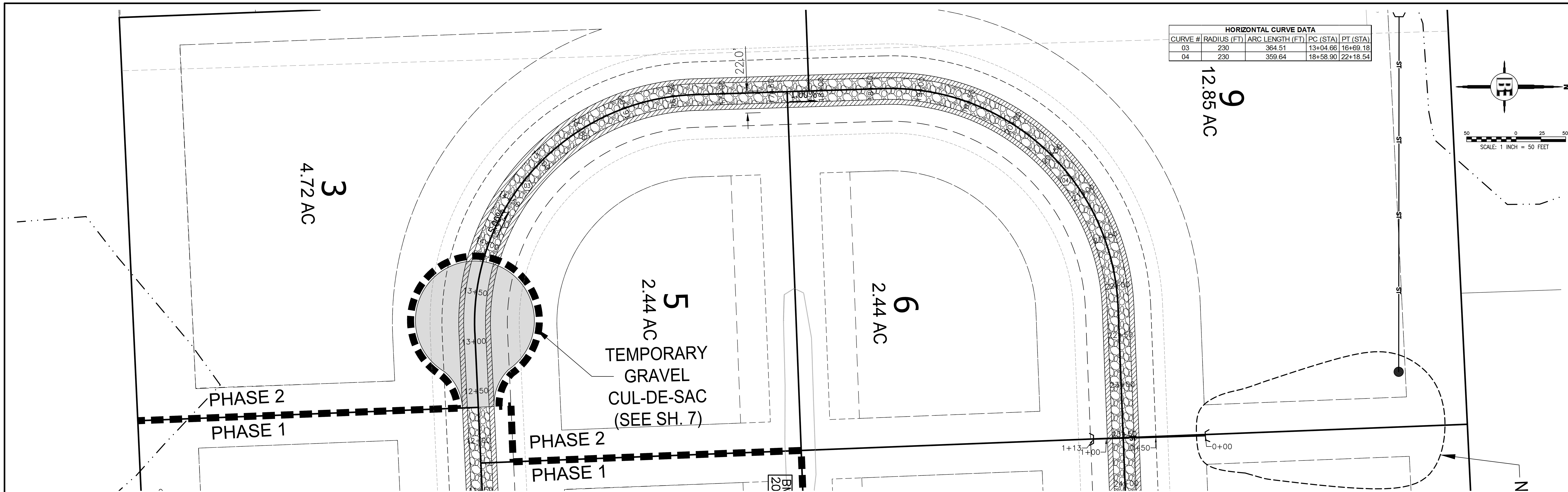
PREPARED FOR: **GFG INVESTMENT PROPERTIES, LLC**
15264 BAILEY
TAYLOR, MI 48180
(734) 795-0078

TITLE: **PRIVATE ROAD PROFILE**

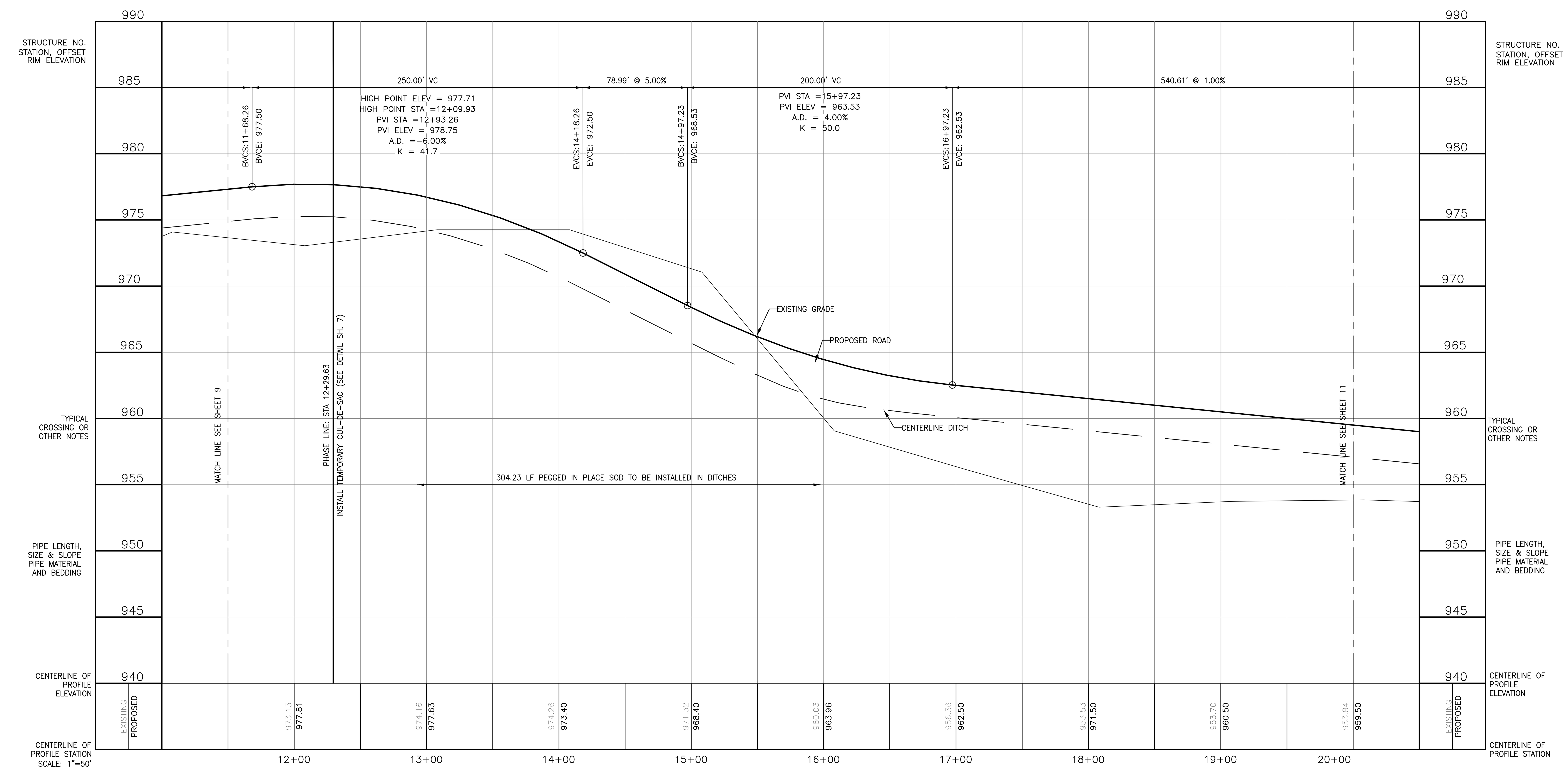
NO	BY	REVISION PER	DATE
9	JA	GRAVEL RD PER CLIENT	1/25/19
6	KS	ST SEWER PER L.C.D.C.	10/27/16
4	KS	PHASING	8/5/16
3	KS	L.C.R.C. REVIEW	7/1/16
2	KS	TOWNSHIP REVIEW	5/19/16
1	KS	TOWNSHIP REVIEW	4/20/16

DESIGNED BY: KS
DRAWN BY: KS
CHECKED BY:
SCALE 1" = 50'
JOB NO. 15-179
DATE 3/23/2016
SHEET NO. 9

HORIZONTAL CURVE DATA				
CURVE #	RADIUS (FT)	ARC LENGTH (FT)	PC (STA)	PT (STA)
03	230	364.51	13+04.66	16+69.18
04	230	359.64	18+58.90	22+18.54



MISTY MEADOW DRIVE - STA 11+50 TO 20+00



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3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG

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HOWELL, MI. 48843
800.246.6735 FAX 517.548.1670

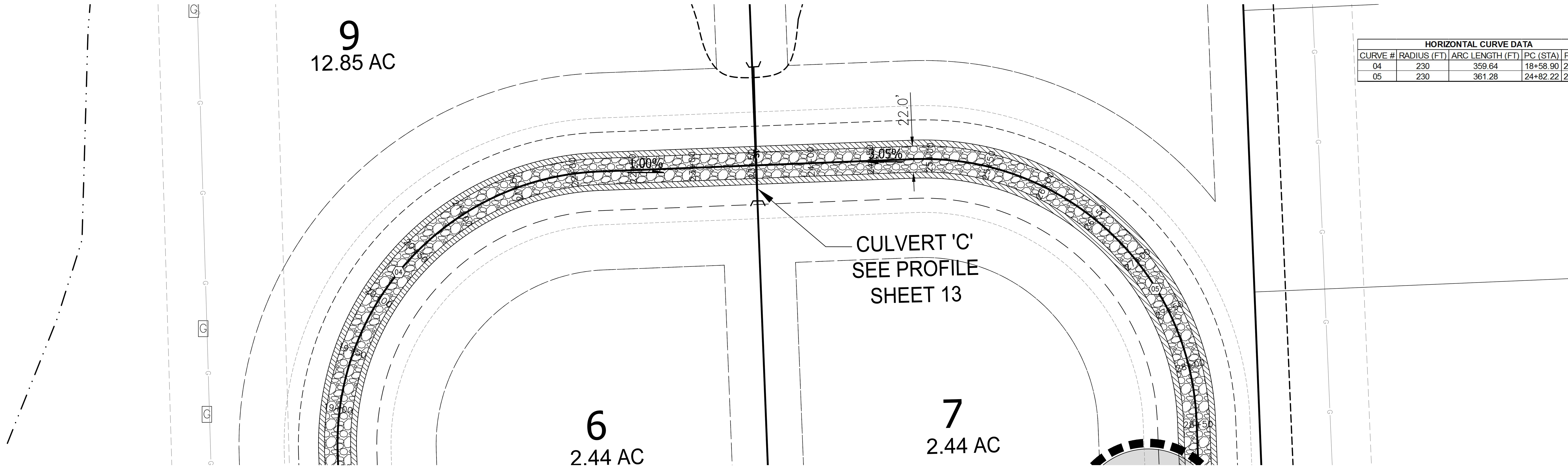
PROJECT: MISTY MEADOW

PREPARED FOR: GFG INVESTMENT PROPERTIES, LLC
15284 BAILEY
TAYLOR, MI 48180
(734) 795-0078

TITLE: PRIVATE ROAD PROFILE

NO	BY	REVISION PER	DATE
9	JA	GRAVEL RD PER CLIENT	1/25/19
4	KS	PHASING	8/5/16
3	KS	L.C.R.C. REVIEW	7/1/16
2	KS	TOWNSHIP REVIEW	5/19/16
1	KS	TOWNSHIP REVIEW	4/20/16

DESIGNED BY: KS
DRAWN BY: KS
CHECKED BY:
SCALE 1" = 50'
JOB NO. 15-179
DATE 3/23/2016
SHEET NO. 10

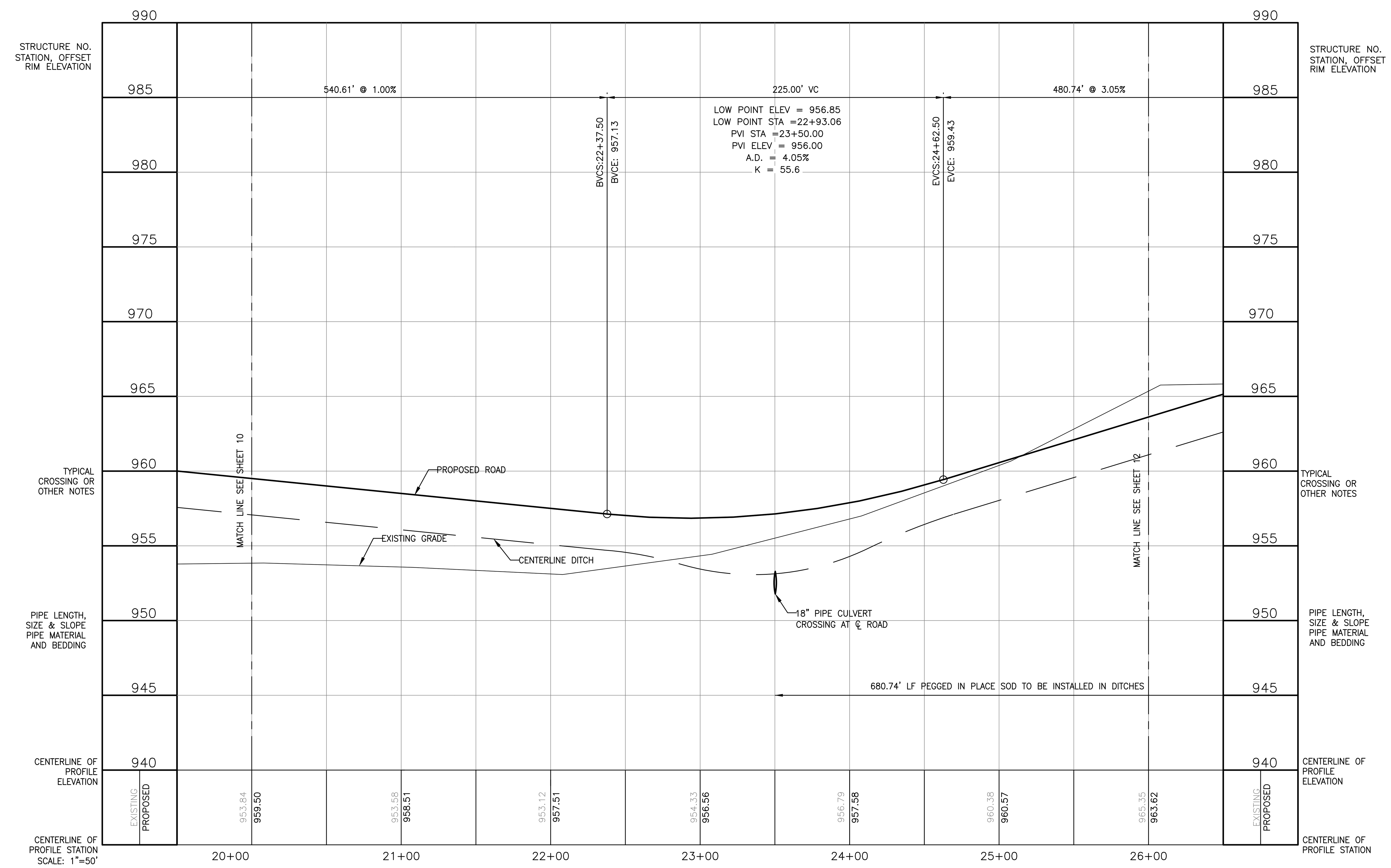


HORIZONTAL CURVE DATA				
CURVE #	RADIUS (FT)	ARC LENGTH (FT)	PC (STA)	PT (STA)
04	230	359.64	18+58.90	22+18.54
05	230	361.28	24+82.22	28+43.50

N

SCALE: 1 INCH = 50 FEET

MISTY MEADOW DRIVE - STA 20+00 TO 26+00



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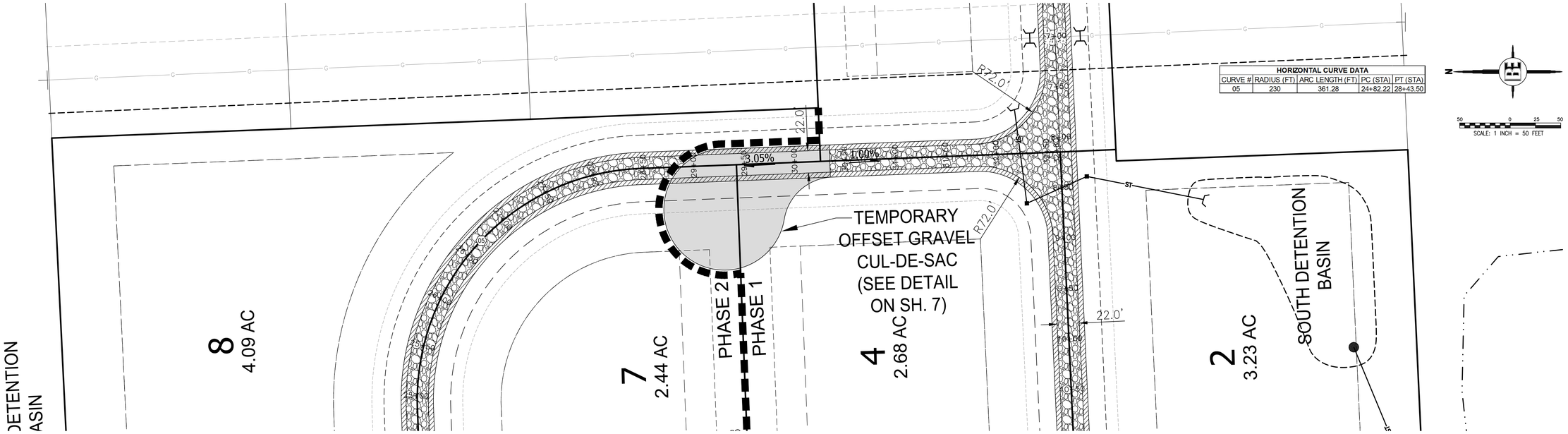
PROJECT
MISTY MEADOW

PREPARED FOR
GFG INVESTMENT PROPERTIES, LLC
15264 BAILEY
TAYLOR, MI 48180
(734) 795-0078

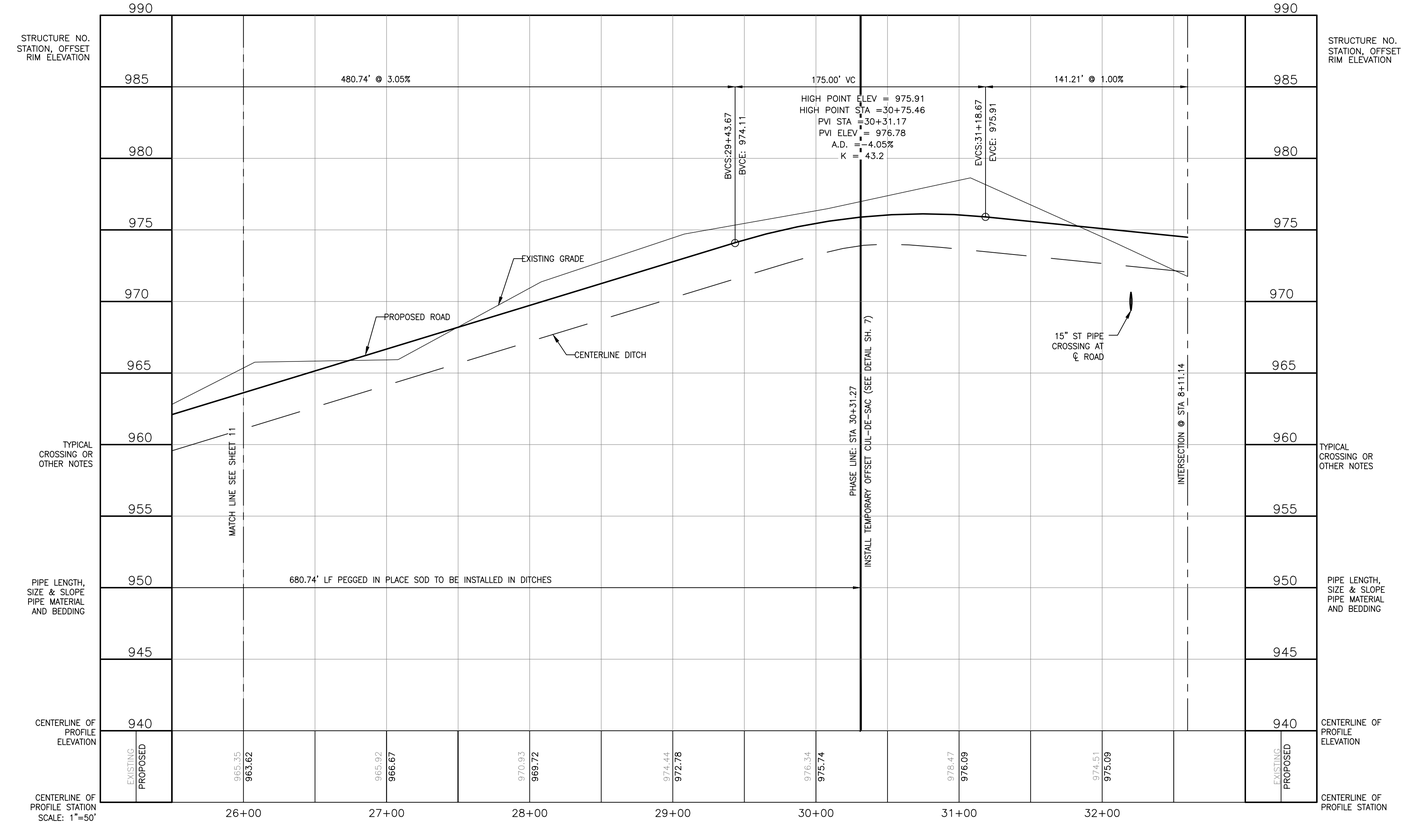
TITLE
PRIVATE ROAD PROFILE

NO	BY	REVISION PER	DATE
9	JA	GRAVEL RD PER CLIENT	1/25/19
4	KS	PHASING	8/5/16
3	KS	L.C.R.C. REVIEW	7/1/16
2	KS	TOWNSHIP REVIEW	5/19/16
1	KS	TOWNSHIP REVIEW	4/20/16

DESIGNED BY: KS
DRAWN BY: KS
CHECKED BY:
SCALE 1" = 50'
JOB NO. 15-179
DATE 3/23/2016
SHEET NO. 11



MISTY MEADOW DRIVE - STA 26+00 TO INTERSECTION



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3 WORKING DAYS
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1-800-482-7171
OR VISIT WWW.MISSDIG.ORG

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800.246.6735 FAX 517.548.1670

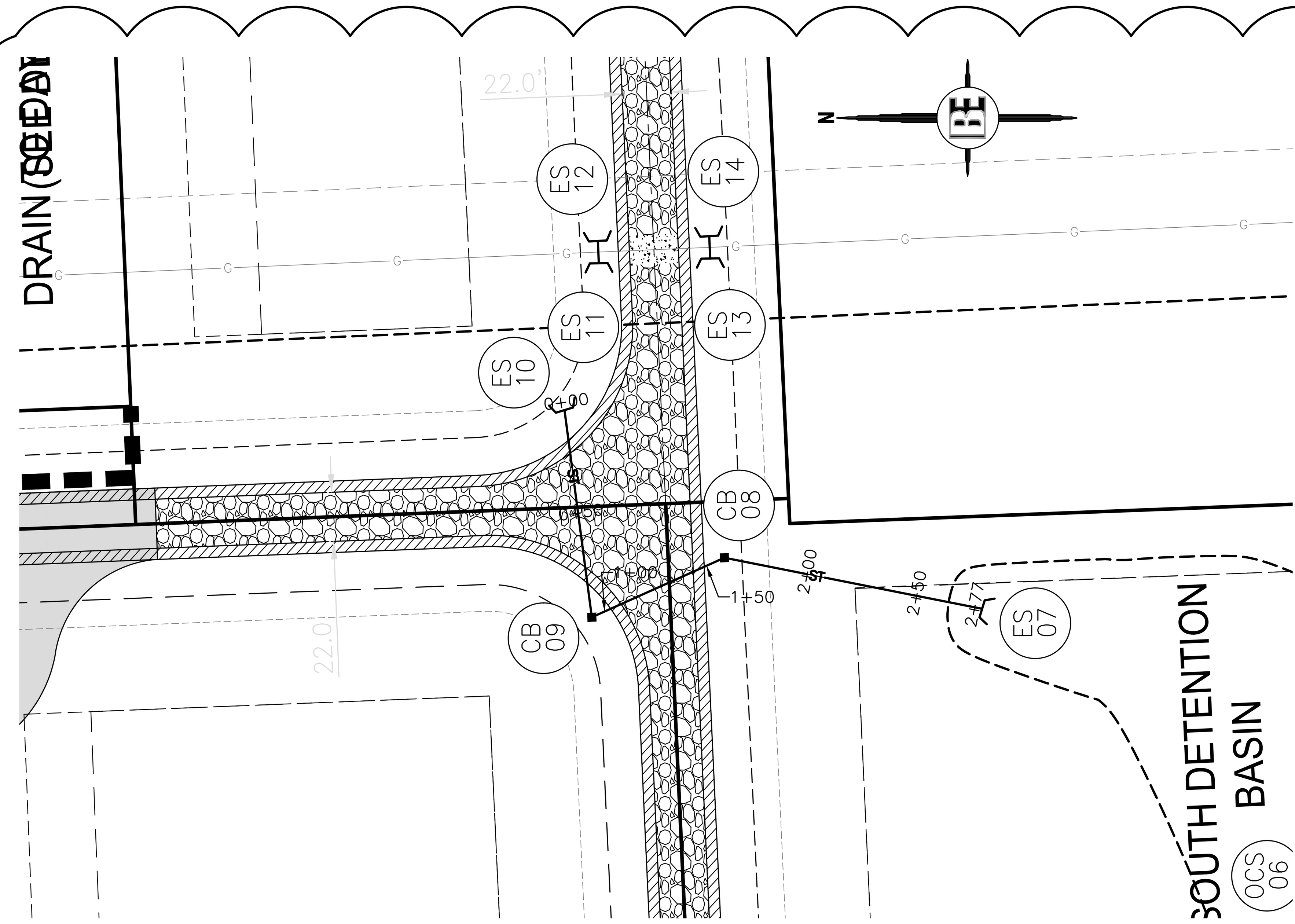
PROJECT: MISTY MEADOW

PREPARED FOR: GFG INVESTMENT PROPERTIES, LLC
16264 BAILEY
TAYLOR, MI 48180
(734) 795-0078

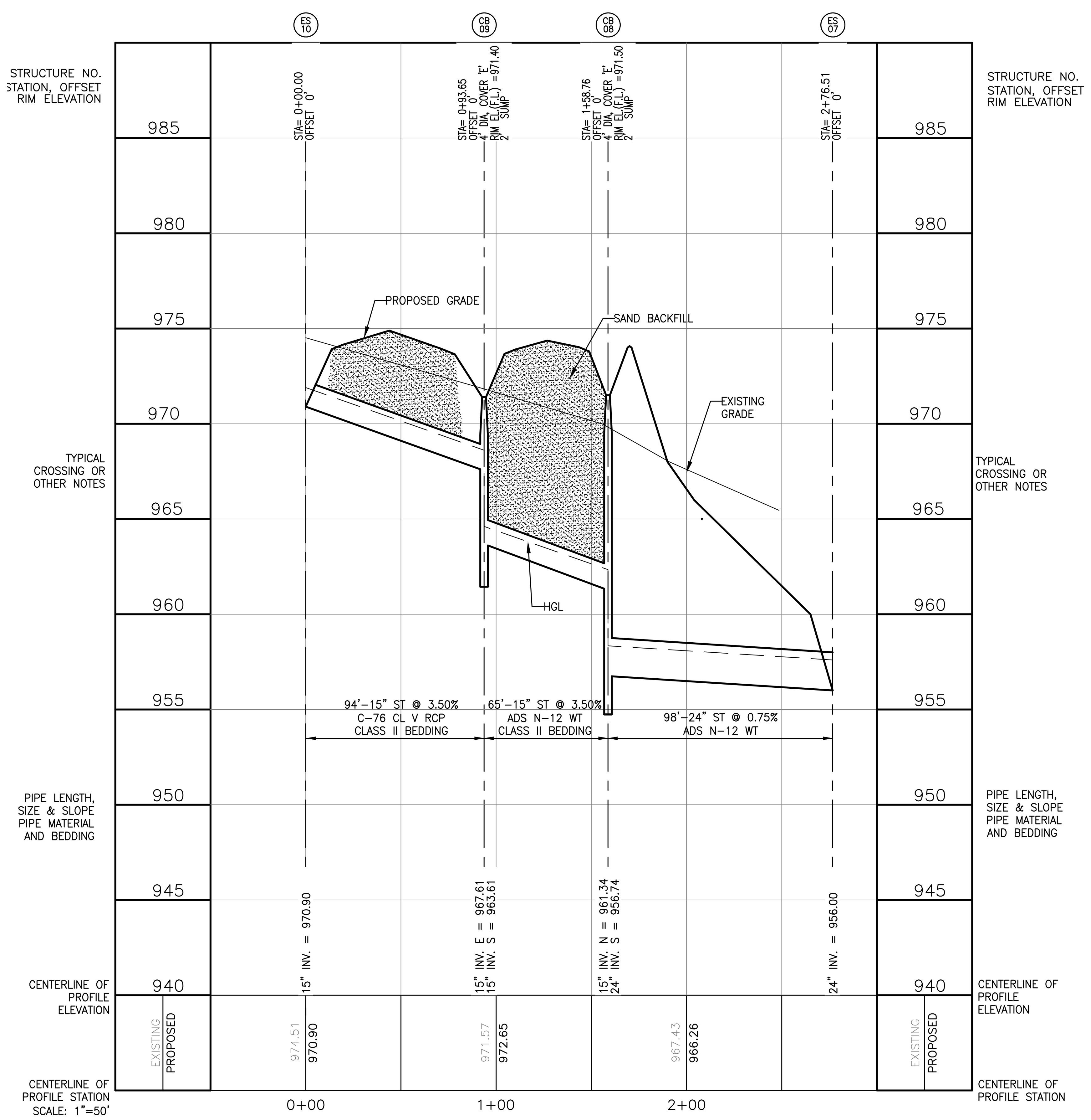
TITLE: PRIVATE ROAD PROFILE

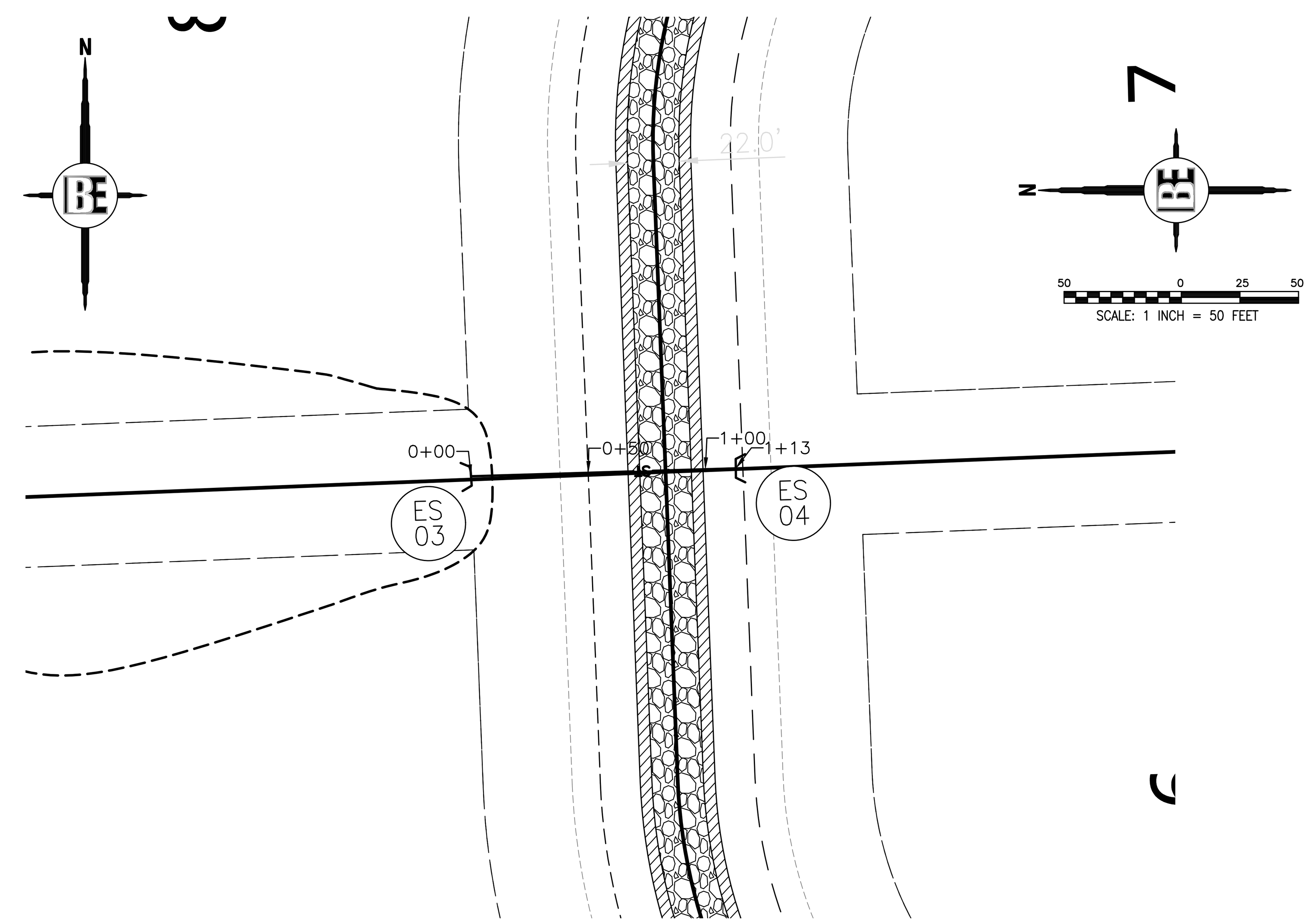
NO	BY	REVISION PER	DATE
9	JA	GRAVEL RD PER CLIENT	1/25/19
4	KS	PHASING	8/5/16
3	KS	L.C.R.C. REVIEW	7/1/16
2	KS	TOWNSHIP REVIEW	5/19/16
1	KS	TOWNSHIP REVIEW	4/20/16

DESIGNED BY: KS
DRAWN BY: KS
CHECKED BY:
SCALE 1" = 50'
JOB NO. 15-179
DATE 03/23/16
SHEET NO. 12

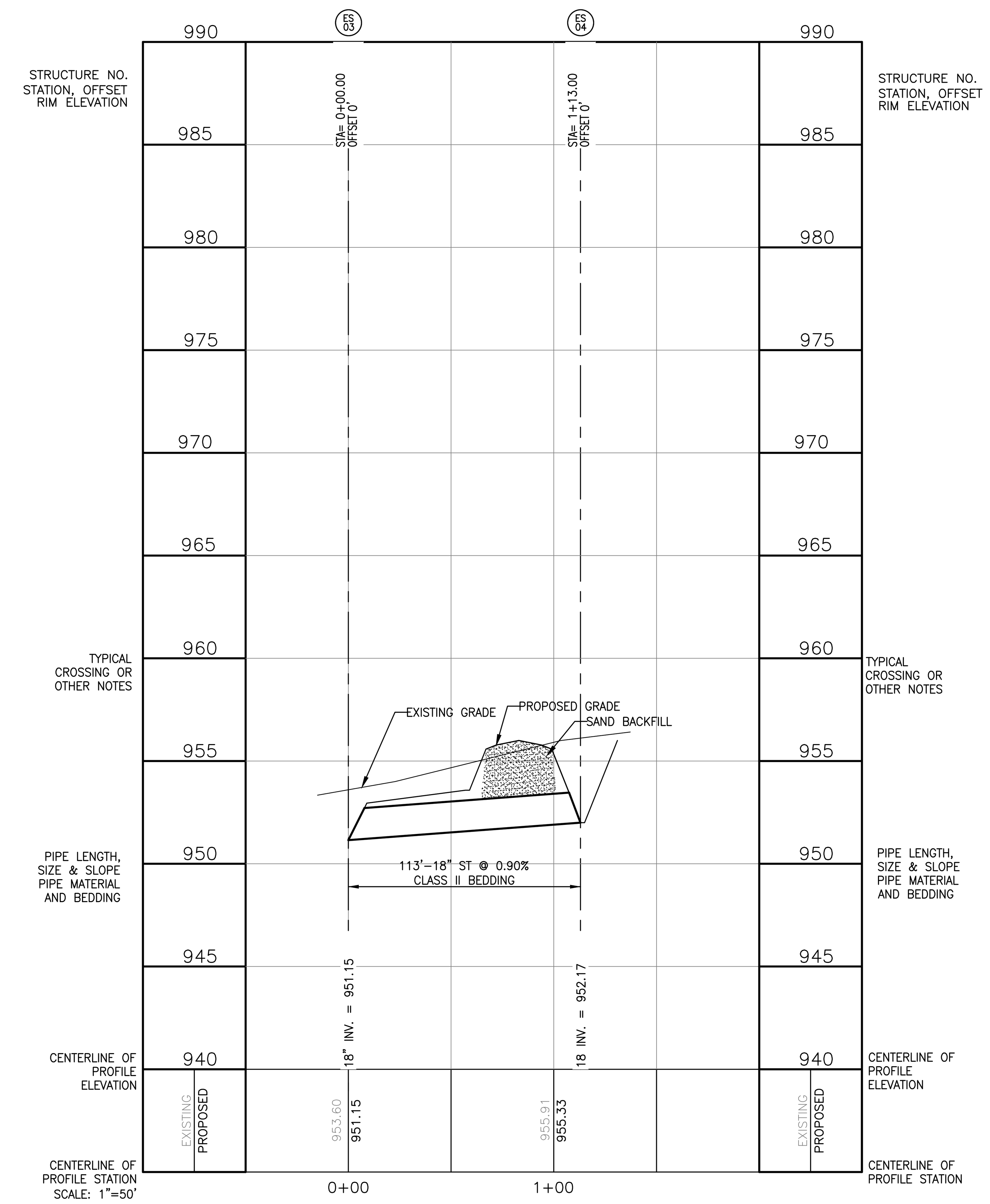


STORM SEWER 'A'
ES 10 TO ES 07





CULVERT 'B'
ES 04 TO ES 03



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800.246.6735 FAX 517.548.1670

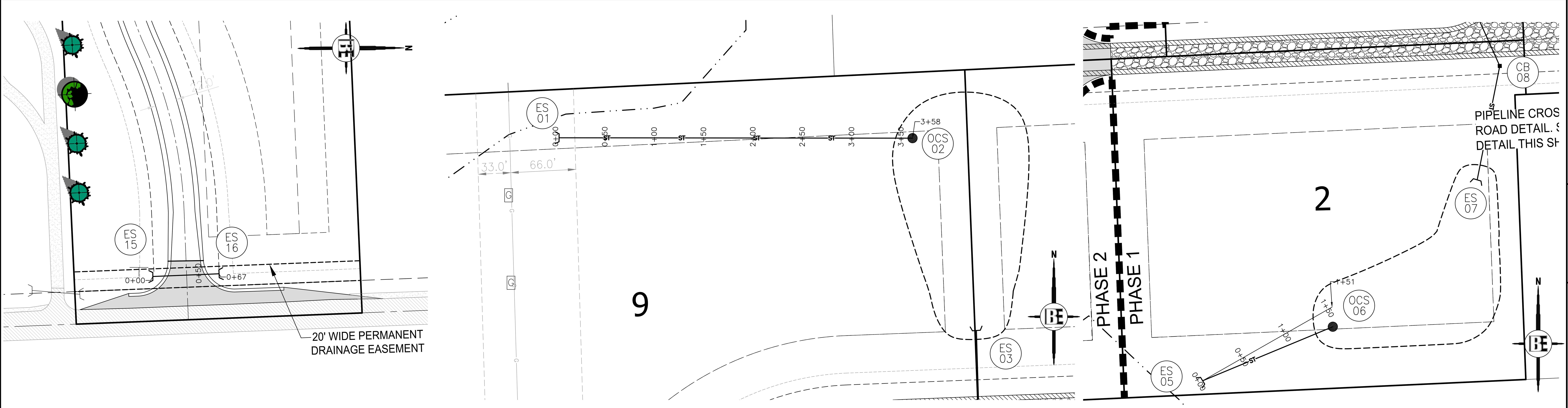
PROJECT: MISTY MEADOW

PREPARED FOR: GFG INVESTMENT PROPERTIES, LLC
15264 BAILEY
TAYLOR, MI 48180
(734) 795-0078

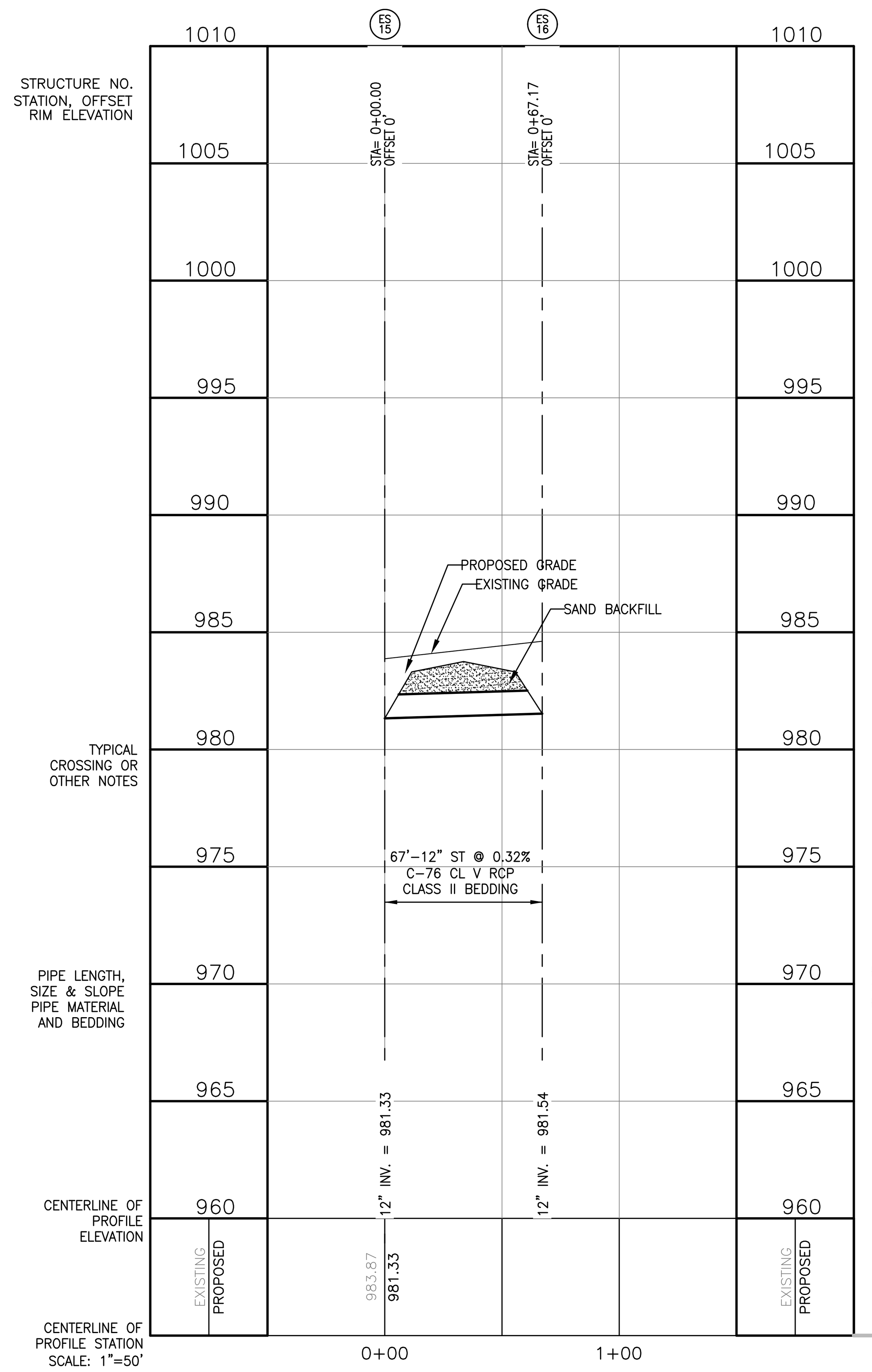
TITLE: STORM SEWER PROFILE

NO	BY	REVISION PER	DATE
9	JA	GRAVEL RD PER CLIENT	1/25/19
8	TE	CONC. SLAB PER UTILITIES	7/13/17
7	KS	ST SEWER PER CLIENT	02/23/16
6	KS	ST SEWER PER L.C.D.C.	10/27/16
4	KS	PHASING	8/5/16
3	KS	L.C.R.C. REVIEW	7/1/16
2	KS	TOWNSHIP REVIEW	5/19/16
1	KS	TOWNSHIP REVIEW	4/20/16

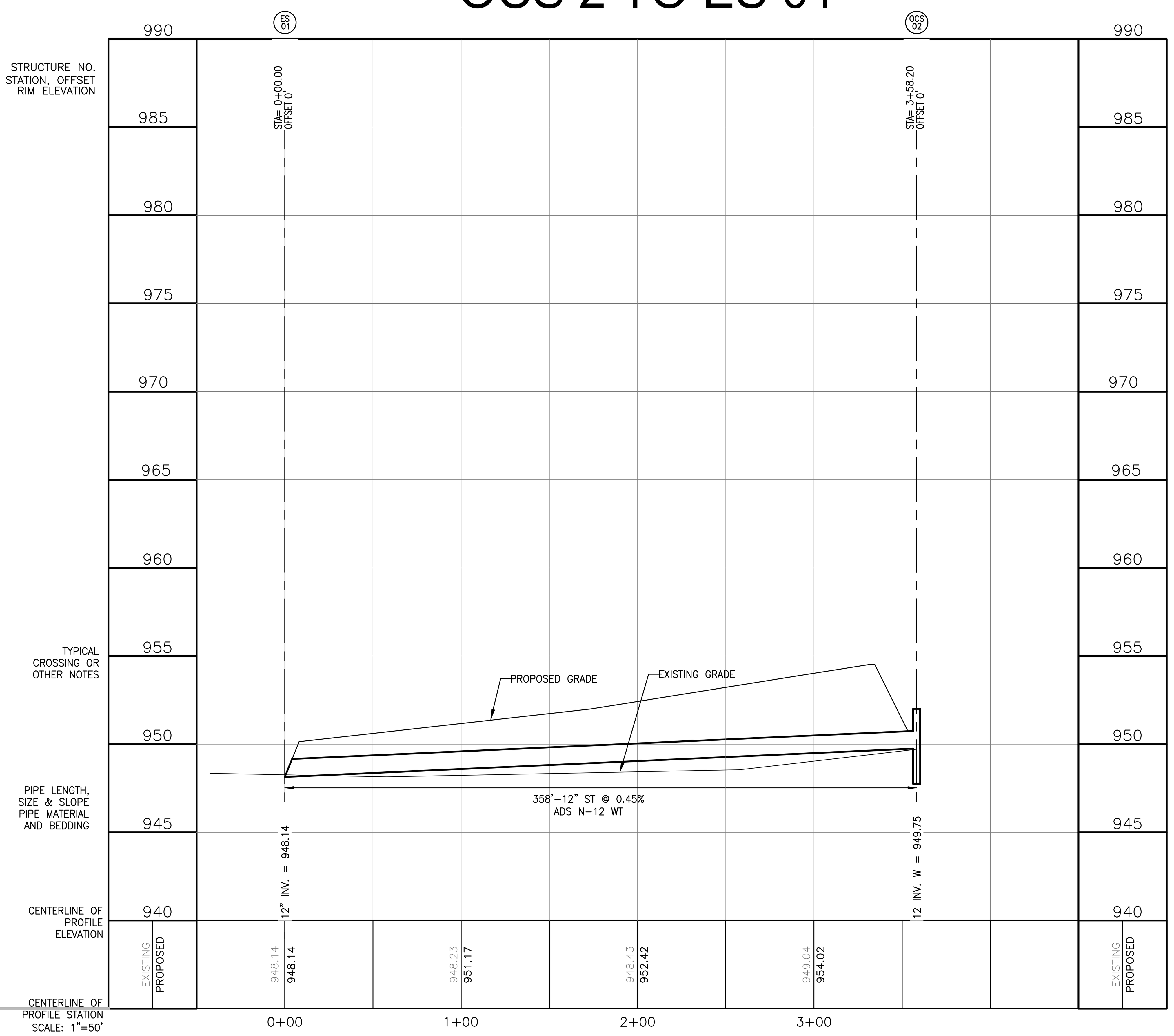
DESIGNED BY: KS
DRAWN BY: KS
CHECKED BY:
SCALE 1" = 50'
JOB NO. 15-179
DATE 3/23/2016
SHEET NO. 13



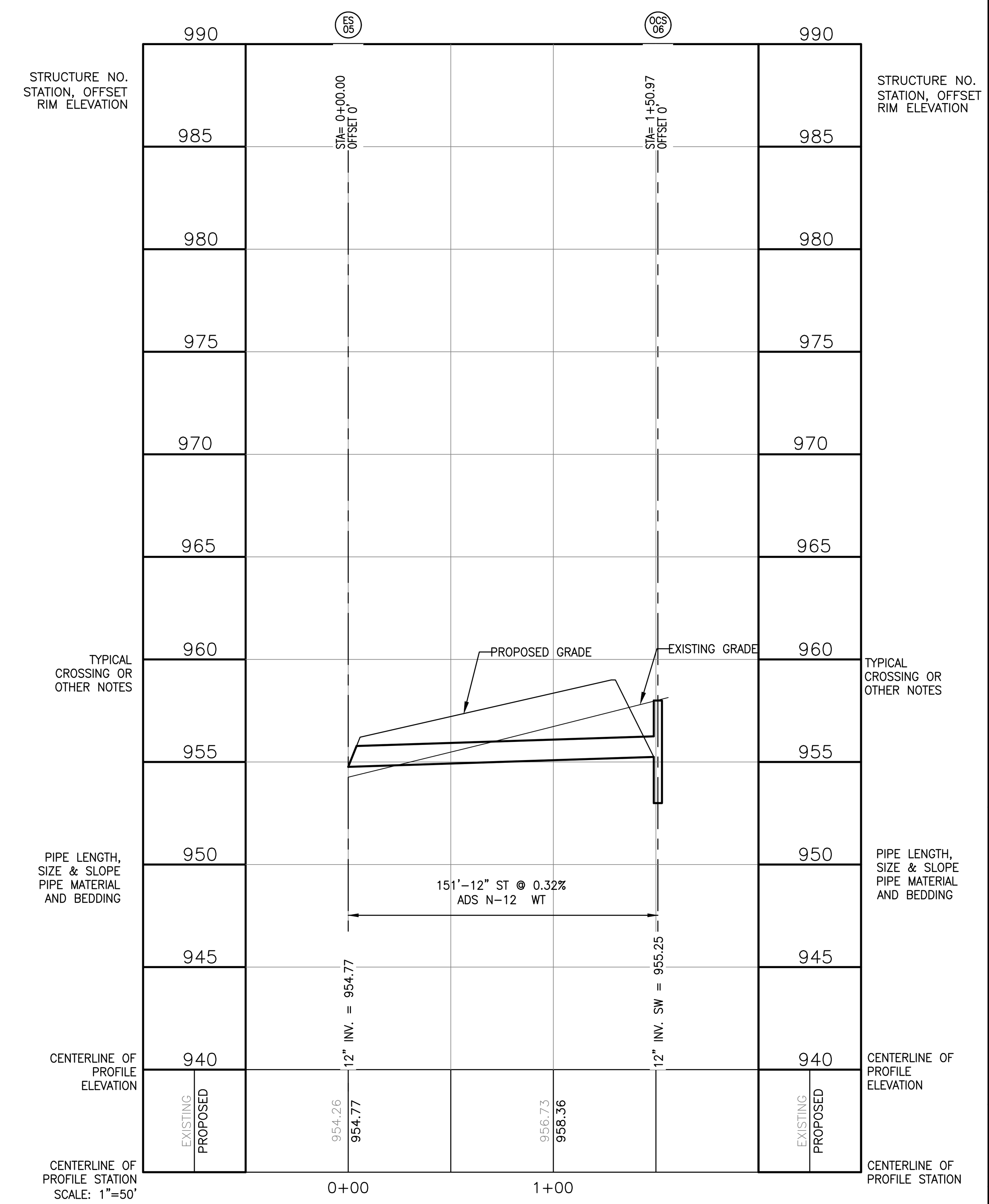
CULVERT 'E'
ES 16 TO ES 15



OCS 2 TO ES 01



OCS 06 TO ES 05



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
800.346.6739 FAX 517.548.1670

PROJECT
MISTY MEADOW

PREPARED FOR
GFG INVESTMENT PROPERTIES, LLC
15284 BAILEY
TAYLOR, MI 48180
(734) 795-0078

TITLE
STORM SEWER PROFILE

NO	BY	REVISION PER	DATE
9	JA	GRAVEL RD PER CLIENT	1/25/19
4	KS	PHASING	8/5/16
3	KS	L.C.R.C. REVIEW	7/1/16
2	KS	TOWNSHIP REVIEW	5/19/16
1	KS	TOWNSHIP REVIEW	4/20/16

DESIGNED BY: KS
DRAWN BY: KS
CHECKED BY:
SCALE 1" = 50'
JOB NO. 15-179
DATE 3/23/2016
SHEET NO. 14

G:\15-179\dwg\15-179-Base_1-25-19 UPDATE.dwg, 1/25/2019 3:58:22 PM, DWG To PDF.pc3

GENOA CHARTER TOWNSHIP APPLICATION

Sketch Plan Review

GENOA TOWNSHIP

FEB 2 9 2019

RECEIVED

TO THE GENOA TOWNSHIP PLANNING COMMISSION:

APPLICANT NAME & ADDRESS: Asselin, McLane Architectural Group, LLC 4488 W. Bristol Road, Flint, MI 48507

If applicant is not the owner, a letter of Authorization from Property Owner is needed.

OWNER'S NAME & ADDRESS: Michigan Rod Products, Inc., 1326 Grand Oaks Dr., Howell, mi 48843

SITE ADDRESS: 1326 Grand Oaks Dr., Howell, MI 48843 PARCEL #(s): 4711-08-100-011

APPLICANT PHONE: (810)230-9311 OWNER PHONE: (517) 552-9812

LOCATION AND BRIEF DESCRIPTION OF SITE:

West side of Grand Oaks Drive wooded 20 acre parcel with existing building, between Grand River Avenue and I-96

BRIEF STATEMENT OF PROPOSED USE:

Fabrication of steel components for automotive industry (manufacturing)

THE FOLLOWING IMPROVEMENTS ARE PROPOSED:

8,142 sq. ft. addition

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: Raymond L. Embach IV (AMAG)

ADDRESS: 4488 W. Bristol Rd., Flint, MI 48507

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

1.) Raymond L. Embach IV (Name) of Asselin, McLane Architectural Group (Business Affiliation) at rembach@amagarch.com (Email Address)

FEE EXCEEDANCE AGREEMENT

All sketch plans are allocated one (1) consultant review 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 for a Land Use Permit. By signing below, applicant indicates agreement and full understanding of this policy.

SIGNATURE: DATE: 02-20-19

PRINT NAME: Raymond L Enbach IV PHONE: 810-230-9311

Michigan Rod Products

1326 Grand Oaks Drive – Howell, Michigan 48843 – Phone: (517) 552-9812 – Fax: (517) 552-9813

March 29, 2016

To Whom It May Concern,

I authorize John L. Asselin, Jr. and/or Raymond L. Embach, IV of Asselin, McLane Architectural Group, LLC to act on my behalf in matters pertaining to obtaining required approvals from various authorities having jurisdiction for the construction of an addition to our facility located at 1326 Grand Oaks Drive, Genoa Township, MI.

Sincerely,

T. Brown

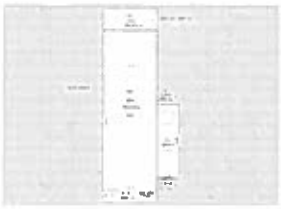
Tim Brown

VP of Manufacturing

Michigan Rod Products

1326 GRAND OAKS DR HOWELL, MI 48843 (Property Address)

Parcel Number: 4711-08-100-011



Item **5** of **5** 4 Images / 1 Sketch

Property Owner: MICHIGAN ROD PRODUCTS, INC.

Summary Information

- > Commercial/Industrial Building Summary
  - Yr Built: 1997
  - # of Buildings: 1
  - Total Sq.Ft.: 166,550
- > Property Tax information found
- > Assessed Value: $3,043,700 | Taxable Value: $2,375,854
- > Building Department information found

Important Message

⊕ Attention FireFox Users

Owner and Taxpayer Information

GENOA TOWNSHIP
FEB 2 9 2019
RECEIVED

Owner	MICHIGAN ROD PRODUCTS, INC. 1326 GRAND OAKS DR HOWELL, MI 48843	**Taxpayer**	SEE OWNER INFORMATION

General Information for Tax Year 2018

Property Class	301 INDUSTRIAL-IMPROVED	**Unit**	4711 GENOA CHARTER TOWNSHIP
School District	HOWELL	**Assessed Value**	$3,043,700
MAP #	1244GOD	**Taxable Value**	$2,375,854
USER NUM IDX	216	**State Equalized Value**	$3,043,700
USER ALPHA 1	*Not Available*	**Date of Last Name Change**	01/27/2005
USER ALPHA 3	*Not Available*	**Notes**	*Not Available*
Historical District	*Not Available*	**Census Block Group**	*Not Available*
USER ALPHA 2	*Not Available*	**Exemption**	*No Data to Display*

Principal Residence Exemption Information

Homestead Date *No Data to Display*

Principal Residence Exemption	June 1st	Final
2018	0.0000 %	0.0000 %

Previous Year Information

Year	MBOR Assessed	Final SEV	Final Taxable
2017	$2,983,600	$2,983,600	$2,326,988
2016	$2,808,600	$2,808,600	$2,072,437
2015	$2,468,700	$2,468,700	$1,987,774
2014	$2,449,300	$2,449,300	$1,956,470
2013	$1,791,100	$1,791,100	$1,693,573
2012	$1,672,400	$1,672,400	$1,653,880
2011	$1,610,400	$1,610,400	$1,610,400
2010	$2,308,500	$2,308,500	$2,308,500
2009	$3,158,800	$3,158,800	$3,158,800
2008	$3,692,300	$3,692,300	$3,272,791
2007	$3,548,200	$3,548,200	$3,199,210
2006	$3,774,200	$3,774,200	$3,085,063
2005	$3,777,700	$3,777,700	$2,986,509
2004	$3,724,300	$3,724,300	$2,919,364
2003	$3,707,300	$3,707,300	$2,853,729

Land Information

Zoning Code	IND	**Total Acres**	19.998
Land Value	$217,800	**Land Improvements**	$104,545
Renaissance Zone	No	**Renaissance Zone Expiration Date**	*No Data to Display*
ECF Neighborhood	3020 IND. BLDGS OVER 50,000 SQ. FT	**Mortgage Code**	00000
Lot Dimensions/Comments	*No Data to Display*	**Neighborhood Enterprise Zone**	No

Lot(s)	Frontage	Depth
No lots found.		
	Total Frontage: 0.00 ft	**Average Depth: 0.00 ft**

Legal Description

SEC 8 T2N R5E, COMM N 1/4 COR, TH S 87°12'58"W 496.99 FT, TH S 02° 06'23"E 739.81 FT TO POB, TH S 02°06'23"E 650.12 FT, TH S 88°02' 55"W 989 FT, TH N 49°45'12"W 967.88 FT, TH N 89°08'E 1702.61 FT TO POB 20 AC M/L 1984 SPLIT FR 001

Land Division Act Information

Date of Last Split/Combine	*No Data to Display*	**Number of Splits Left**	0
Date Form Filed	*No Data to Display*	**Unallocated Div.s of Parent**	0
Date Created	*No Data to Display*	**Unallocated Div.s Transferred**	0
Acreage of Parent	0.00	**Rights Were Transferred**	*Not Available*
Split Number	0	**Courtesy Split**	*Not Available*
Parent Parcel	*No Data to Display*		

Sale History

Sale Date	Sale Price	Instrument	Grantor	Grantee	Terms of Sale	Liber/Page
04/23/1998	$4,157,659.00	WD	RING SCREW WORKS	MICH. ROD PRODUCTS	ARMS-LENGTH	2344-0706
05/10/1996	$450,000.00	WD	MASCO CORPORATION		ARMS-LENGTH	2044-0928

Building Information - 166550.00 sq ft Industrial - Light Manufacturing (Commercial)

Floor Area	166,550 sq ft	**Estimated TCV**	$5,512,629
Occupancy	Industrial - Light Manufacturing	**Class**	C
Stories Above Ground	1	**Average Story Height**	22 ft
Basement Wall Height	*Not Available*	**Identical Units**	*Not Available*
Year Built	1997	**Year Remodeled**	*Not Available*
Percent Complete	100%	**Heat**	Space Heaters, Radiant
Physical Percent Good	76%	**Functional Percent Good**	100%
Economic Percent Good	100%	**Effective Age**	12 yrs

March 6, 2019

Planning Commission
Genoa Township
2911 Dorr Road
Brighton, Michigan 48116

Attention:	Kelly Van Marter, AICP Planning Director and Assistant Township Manager
Subject:	Michigan Rod Products –Sketch Plan Review #1
Location:	1326 Grand Oaks Drive – west side of Grand Oaks, south of Cleary Drive
Zoning:	IND Industrial District

Dear Commissioners:

At the Township's request, we have reviewed the sketch plan submittal from Michigan Rod Products (dated 2/20/19) for expansion of the existing industrial building.

A. Summary

1. The applicant should be required to update the parking calculations on Sheet C101 to include the proposed building addition.
2. We request the applicant inform the Township of the any increase in employees anticipated in conjunction with the proposed building addition. This may (or may not) impact the land-banked parking plan approved in 2016.
3. If the approved landscape plan was not fully implemented or if landscaping has died since planting, the applicant should be required to make improvements accordingly.
4. If new lighting is proposed with the building addition, details must be provided.
5. The applicant must address any concerns raised by the Township Engineer or Brighton Area Fire Authority.

B. Proposal/Process

The applicant proposes an 8,142 square foot addition on the north side of the existing industrial building. Given the scope of the proposal, Article 18 of the Township Zoning Ordinance allows the project to go through the sketch plan review process (as opposed to a full site plan review). Procedurally, the Planning Commission has review and approval authority over sketch plans.

C. Sketch Plan Review

1. **Dimensional Requirements.** The proposed addition is along the north side of the existing building and is situated well outside of required IND setbacks. The height of the addition matches the existing building, which is compliant with height restrictions. Lastly, the notes on Sheet C101 indicate that the site remains well within allowable coverage limitations (both building and impervious surface coverage).

2. **Building Materials and Design.** The proposed addition will match the existing building in terms of materials and color palette. Materials include decorative scored block on the lower half and metal siding above.

Aerial view of site and surroundings (looking north)

3. **Parking.** In accordance with the 2016 approval, the site provides 131 parking spaces with another 143 spaces land-banked for future construction.

   The proposed expansion results in the need for an additional 12 spaces. The parking table on Sheet C101 should be updated accordingly. Furthermore, the land-banked parking was authorized based on the employee count by shift. We request the applicant inform the Township of any increase in the number of employees anticipated as a result of this project.

   If there is a significant increase and/or any parking issues have been documented for this site, the Township may require construction of some or all of the land-banked parking. Conversely, if the current amount of parking remains sufficient for the anticipated employee count, the land-banked parking plan may remain in place.

4. **Landscaping**. The plan does not include any new landscaping. If the approved landscape plan from the 2016 project was not fully implemented or if any landscaping has died, the Township may wish to require improvements.

5. **Exterior Lighting.** The plan does not identify any new exterior site lighting. If lighting is proposed with the building addition, the applicant must provide details.

Should you have any questions concerning this matter, please do not hesitate to contact our office. We can be reached by phone at (248) 586-0505, or via e-mail at bborden@safebuilt.com and steve.hannon@safebuilt.com.

Respectfully,
SAFEBUILT STUDIO

Brian V. Borden, AICP
Planning Manager

Stephen Hannon, AICP
Planner

TETRA TECH

March 1, 2019

Ms. Kelly Van Marter
Genoa Township
2911 Dorr Road
Brighton, MI 48116

Re: Michigan Rod Products
Proposed Building Addition
Site Plan Review No. 1

Dear Ms. Van Marter:

Tetra Tech conducted a site plan review of the Michigan Rod Products Proposed Addition plans last dated February 20, 2019. The plans were submitted by Asselin, McLane Architectural Group, LLC on behalf of Michigan Rod Products. Michigan Rod Products is located on a 20.6-acre parcel on the west side of Grand Oaks Drive. The petitioner is proposing an 8,142-square-foot building addition on the north face of the existing building in an existing green space.

We offer the following comments:

GENERAL NOTES

1. The proposed building addition is very close to the existing drive on the northwest and northeast corners of the addition. The petitioner should consider the use of protective bollards to protect the proposed building addition.
2. The Petitioner should ensure that there is adequate fire hydrant coverage for the proposed addition. Any structure on site must be within a 250-foot radius of a fire hydrant.

DRAINAGE AND GRADING

1. The proposed building addition creates 8,142 additional square feet of impervious surface. Detention calculations should be performed to ensure the existing detention pond can accommodate the increased impervious surface. These calculations should be included in the plans.

We recommend the petitioner address the above comments and resubmit the site plan for review.
Please call or email if you have any questions.

Sincerely,

Gary J. Markstrom, P.E.
Vice President

Shelby Scherdt
Project Engineer

Tetra Tech
401 South Washington Square, Suite 100, Lansing, MI 48933
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

February 27, 2019

Kelly VanMarter
Genoa Township
2911 Dorr Road
Brighton, MI 48116

RE: Michigan Rod Products Addition
1326 Grand Oaks Drive
Howell, MI 48843

Dear Kelly:

The Brighton Area Fire Department has reviewed the above mentioned site plan. The plans were received for review on February 21, 2019 and the drawings are dated February 20, 2019. The project is based on a proposed 8,142 square foot addition to an existing 166,466 square foot F-2 occupancy with accessory office and storage. The plan review is based on the requirements of the International Fire Code (IFC) 2012 edition.

1. During the plan review process for previous additions to the structure, the fire authority addressed fire flow and fire hydrant placement on site through a compromise with the applicant to add a wall-hydrant supplied by the facility fire pump. The wall-hydrant was installed on the western third of the existing building in what is now the shadow of the new proposed addition is being constructed. The wall hydrant must be relocated to the front corner (Northwest) of the new addition.

   It should also be noted that it is the recommendation of the fire authority that the water main be extended an additional 450-feet along the drive and a new fire hydrant be placed across from the new addition in lieu of the wall hydrant. This will also provide water main for any future expansion or additional structures on the site, and allows the wall hydrant piping to be used for the new addition sprinkler protection.

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

Proposed Addition for:

Michigan Rod Products

1326 Grand Oaks Drive, Genoa Township, Livingston Co. MI

PROJECT TEAM

OWNER:

MICHIGAN ROD PRODUCTS, INC
1326 GRAND OAKS DRIVE, HOWELL, MI 48843
PHONE: (517) 552-9812

ARCHITECT:

ASSELIN, MCLANE ARCHITECTURAL GROUP, LLC (AMAG)
4488 WEST BRISTOL ROAD, FLINT, MI 48507
PHONE: (810) 230-9311

CONTRACTOR:

RHOADS & JOHNSON CONSTRUCTION
101 N ALLOW DRIVE, FENTON, MI 48430
PHONE: (810) 750-7630

CODE INFORMATION

CODE ENFORCED: MICHIGAN BUILDING CODE 2015
MICHIGAN FIRE CODE 2015
MICHIGAN PLUMBING CODE 2015
MICHIGAN MECHANICAL CODE 2015
MICHIGAN ELECTRICAL CODE 2015
NATIONAL ELECTRICAL CODE 2014

USE GROUP F-2 W/ ACCESSORY USE

USE SEPARATION N/A

CONSTRUCTION TYPE: IIB (602.4 & TABLE 601)

FIRE PROTECTION: FULLY SUPPRESED

BLDG. HEIGHT & AREA: F-2

AREA ALLOWED = UNLIMITED (SECTION 507.3)
PROVIDED = EXISTING: 166,466 +/- S.F.
NEW: 8,142 S.F.
TOTAL: 174,608 +/- S.F.

ALLOWED HEIGHT = 75'-0" (TABLE 504.3)
PROVIDED = 23'-6" +/- (EXISTING)

ALLOWED STORIES ABOVE GRADE = 4 (TABLE 504.4)
PROVIDED = 1

OCCUPANT LOAD: PER TABLE 1004.1.2

B USE

8,000 / 100 = 80

F-2 USE

166,608 / 100 = 1667

OVERALL TOTAL OCCUPANT LOAD = 1747

ACCESSIBILITY: ACCESSIBLE ROUTES: SEE PLAN

EGRESS: COMMON PATH OF TRAVEL: (TABLE 1006.2.1)

B = 100 FEET
F-2 = 100 FEET

MAXIMUM TRAVEL DISTANCE (TABLE 1017.2)

F-2 = 400 FEET
B = 300 FEET

NUMBER OF EXITS REQUIRED (TABLE 1006.3.1)

B USE:

REQUIRED = 2
PROVIDED = 2

F-2 USE:

REQUIRED = 3
PROVIDED = 11

EGRESS WIDTH (1005.1)

B USE:

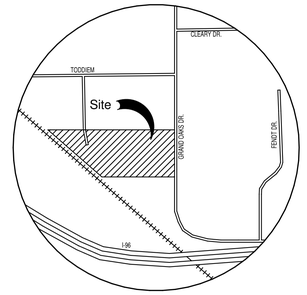
REQUIRED: 80 (0.2) = 16.0" REQUIRED
PROVIDED: 72"

F-2 USE:

REQUIRED: 1667 (0.2) = 333.4" REQUIRED
PROVIDED: 396"

PLUMBING FIXTURES: EXISTING TO REMAIN

VICINITY MAP



LOCATION MAP
SCALE: N.T.S.

LEGAL DESCRIPTION

SEC 8 T2N R5E, COMM N 1/4 COR, TH S 87°12'58"W 496.99 FT, TH S 02° 06'23"E 739.81 FT TO POB, TH S 02°06'23"E 650.12 FT, TH S 88°02' 55"W 989 FT, TH N 49°45'12"W 967.88 FT, TH N 89°08'E 1702.61 FT TO POB 20 AC M/L 1984 SPLIT FR 001

SCHEDULE OF DRAWINGS

Sht. No.	Sheet Name	Date	Rev.
CVR	COVER SHEET	02-20-19	1
C101	OVERALL & ENLARGED SITE PLANS	02-20-19	1
A101	FLOOR PLAN & ELEVATIONS	02-20-19	1

SYMBOL LEGEND

SIM 1 A101	SECTION REFERENCE	101	DOOR NUMBER
SIM 1 A101	DETAIL REFERENCE		SPOT ELEVATION
SIM 1 A101	EXTERIOR ELEVATION	Name Elevation	DATUM
Ref 1 1 A101 1 Ref 1 Ref	INTERIOR ELEVATION		NORTH ARROW
SIM 1 A101	CALLOUT REFERENCE	#	KEYNOTE
Room name 101	ROOM NAME / NUMBER	B-1	MATERIAL KEYNOTE

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

Architect: AMAG
4488 West Bristol Road, Suite 200, Flint, MI 48507 PH: (810) 230-9311

Contractor: Rhoads & Johnson
www.rhoadsjohnson.com

Proposed Addition for:
Michigan Rod Products
1326 Grand Oaks Drive, Genoa Township, Livingston Co. MI

Project Phase:
Design ■
Permit □
Construction □

Date 02-20-19

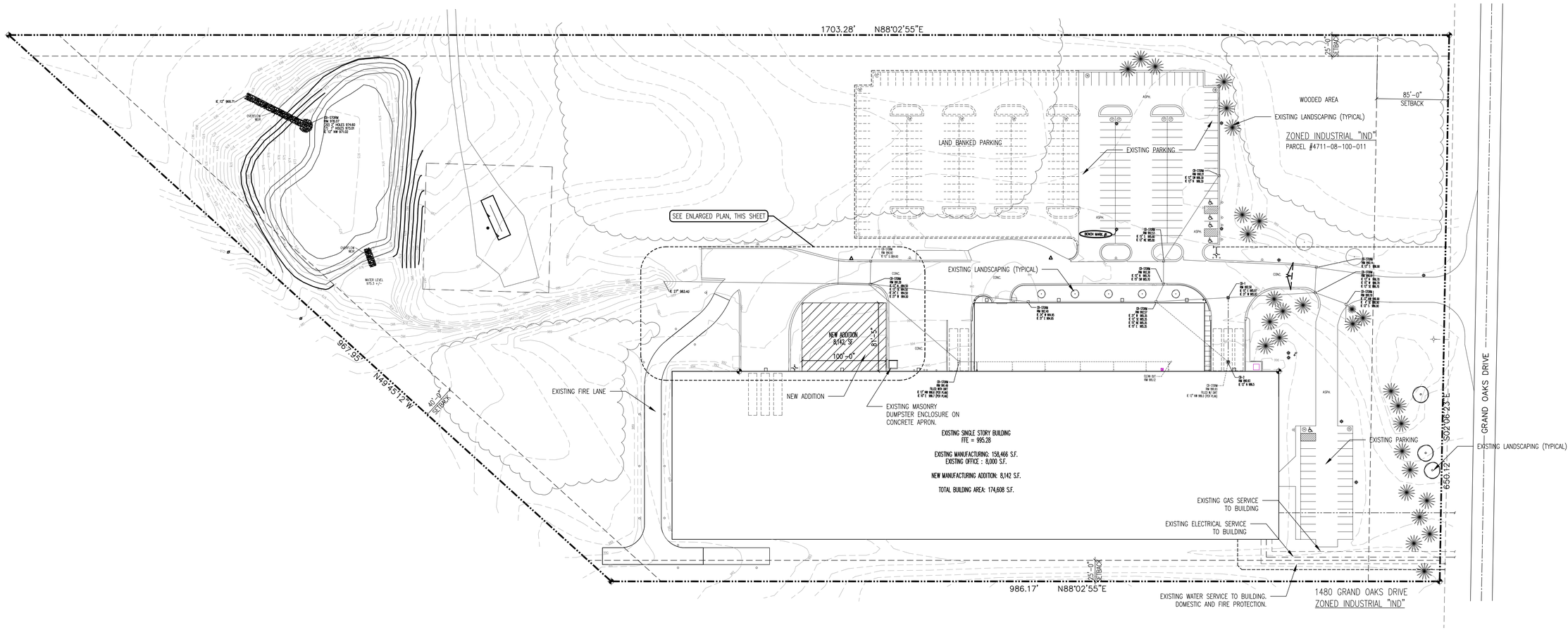
Rev.	Description	Date
1	SITE PLAN REVIEW	2/20/2019 9:01:37 AM

Revised Last Issue: 2/20/2019 9:01:37 AM

Project # 19014
Drawn by: Author
Checked by: Checker

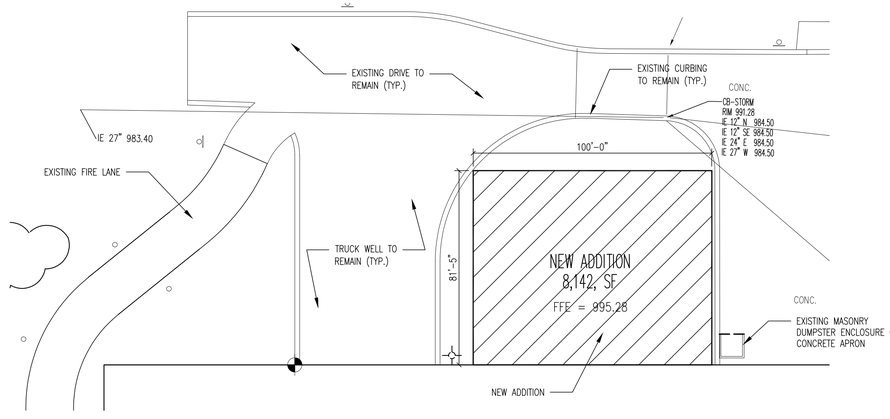
COVER SHEET

Sheet
CVR



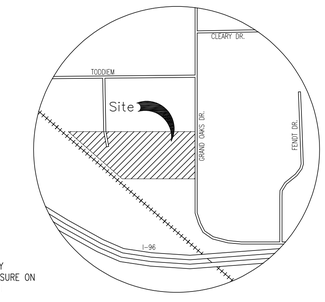
OVERALL SITE PLAN

SCALE : 1" = 60'-0"



ENLARGED SITE PLAN

SCALE : 1" = 30'-0"



LOCATION MAP

SCALE: N.T.S.

DEMOLITION NOTES

** NOTE: THIS IS SELECTIVE DEMOLITION!

1. ALL DEMOLITION WORK SHALL CONFORM TO ALL LOCAL CODES AND ORDINANCES

2. THE GENERAL CONTRACTOR SHALL DISCUSS WITH THE OWNER PRIOR TO CONSTRUCTION, THE USAGE OF ALL UTILITIES TO COMMENCE WORK. THE CONTRACTOR SHALL PROVIDE A SAFE AREA WITH UTILITIES. ALL TURNOFF OF UTILITIES SHALL BE NOTIFIED TO THE OWNER, PRIOR TO NEW CONSTRUCTION.

3. ALL DEMOLITION MATERIAL SHALL BE PROPERLY REMOVED FROM THE SITE AND DISPOSED OF IN A LEGALLY DESIGNATED DISPOSAL AREA. NO ON-SITE BURRING WILL BE PERMITTED. PERMITS AND FEES FOR DISPOSAL OF DEMOTION MATERIAL SHALL BE OBTAINED AND PAID FOR BY THE GENERAL CONTRACTOR.

4. THE GENERAL CONTRACTOR IS RESPONSIBLE IN NOTIFYING ALL PROPER DEPARTMENTS PRIOR TO COMMENCEMENT OF ALL WORK, AND OBTAIN ALL NECESSARY PERMITS FOR ALL WORK.

5. AT THE CONCLUSION OF THE DEMOLITION OPERATIONS, THE ENTIRE WORK AREA SHALL BE LEFT IN A CLEAN CONDITION WITH PROTECTIVE DEVICES AND BARRIERS REMOVED.

3 Working Days
Before You Dig
Call Miss Dig
1 (800) 482-7171
(Toll Free)
for the location of underground facilities

GENERAL NOTES

1) DO NOT SCALE DRAWINGS!!! ALL NECESSITY DIMENSIONS ARE GIVEN. SHOULD ANY QUESTIONS ARISE REGARDING DIMENSIONS THEY SHOULD BE DIRECTED TO THE ATTENTION OF THE ARCHITECT
2) ALL SITE INFORMATION WAS TAKEN FROM AN ARCHITECTURAL SURVEY
3) ALL WORK TO BE DONE ACCORDING TO ALL APPLICABLE CODES AND ORDINANCES AS WELL AS THE BEST PRACTICE AND STANDARDS OF THE TRADE. ALL SUBCONTRACTORS SHALL BE RESPONSIBLE FOR OBTAINING PROPER PERMITS AND PAYING ALL APPLICABLE FEES.
4) WATER SERVICE IS EXISTING TO REMAIN
5) SANITARY SERVICE IS EXITING TO REMAIN
6) AREA OF PARCEL: 20.06 ACRES
7) BUILDING AREA:
   EXISTING OFFICE = 8,000 S.F.
   EXISTING MANUFACTURING = 158,466 S.F.
   PROPOSED MANUFACTURING = 8,142 S.F.
   TOTAL BUILDING AREA = 174,608 S.F.
8) EXISTING LAND USE: LIGHT MANUFACTURING
   PROPOSED LAND USE: LIGHT MANUFACTURING
9) PARKING:
   1.5 SPACE PER 1000 G.S.F. (IND)(238) + 1/300 OFFICE (27)
   PARKING REQUIRED = 265 SPACES (PER ORDINANCE)
   EXISTING PARKING PROVIDED = 131 SPACES
   TOTAL EMPLOYEE COUNT = 75 ((46) 1ST SHFT, (27) 2ND SHFT AND (2) 3RD SHFT). TO MINIMIZE WATER RUNOFF LAND BANKING OF UNNECESSARY PAVING IS PROPOSED.
   LAND BANKED SPACES PROVIDED = 143
   TOTAL PARKING SPACES SHOWN = 274
10) LOT COVERAGE
   BUILDING COVERAGE ALLOWED = 40%
   BUILDING COVERAGE PROVIDED = 20% (NEW & EXISTING)
   TOTAL IMPERVIOUS COVERAGE ALLOWED = 85%
   TOTAL IMPERVIOUS COVERAGE PROVIDED = 32% (NEW & EXISTING)
11) BUILIDING HEIGHT
   HEIGHT ALLOWED = 30'
   HEIGHT PROVIDED = 22'-6"
12) ADDITIONAL IMPERVIOUS = 8,142 S.F. (3.0% INCREASE)
13) SITE IS ZONED: INDUSTIRAL "IND"
14) ALL LANDSCAPE AND GREEN BELTS ARE EXISTING TO REMAIN
15) NO NEW SIGNAGE OTHER THAN THE REQUIRED BUILDING ADDRESS AND FIRE LANE SIGNS ARE PROPOSED AS PART OF THIS PROJECT

LEGAL DESCRIPTION

SEC 8 T2N R5E, COMM N 1/4 COR, TH S 87°12'58"W 496.99 FT, TH S 02° 06'23"E 739.81 FT TO POB, TH S 02°06'23"E 650.12 FT, TH S 88°02' 55"W 989 FT, TH N 49°45'12"W 967.88 FT, TH N 89°08'E 1702.61 FT TO POB 20 AC M/L 1984 SPLIT FR 001

Architect:
AMAG
4486 WEST BRISTOL ROAD, SUITE 200, FLINT, MI 48507 PH: (810) 230-9311

Contractor:
Rhoads & Johnson
www.rhoadsjohnson.com

Proposed Addition for:
Michigan Rod Products
1326 Grand Oaks Drive, Genoa Township, Livingston Co, MI

Project Phase:
Design ■
Permit □
Construction □

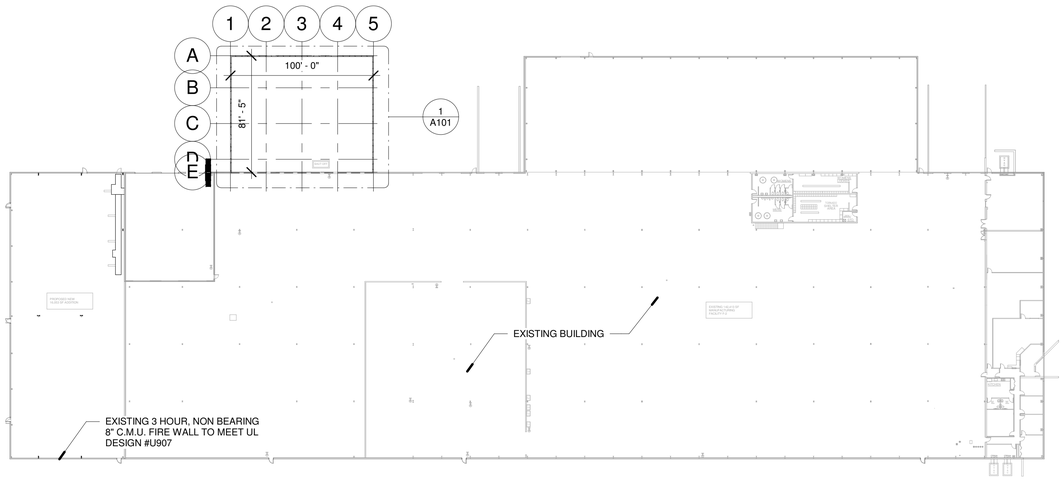
Date
02-20-19

Rev.	Description	Revises Last Issue:
1	SITE PLAN REVIEW	

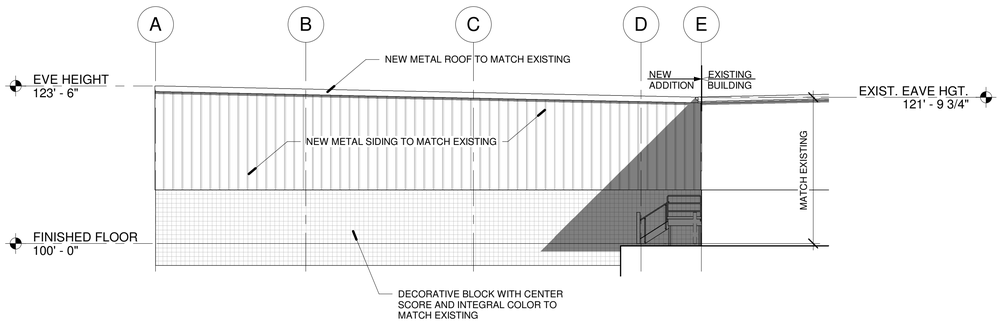
Project #	19014
Drawn by:	rle
Checked by:	jla

SITE PLAN

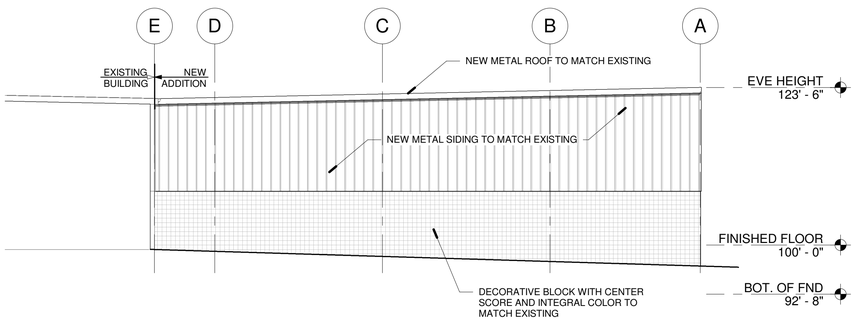
Sheet
C101



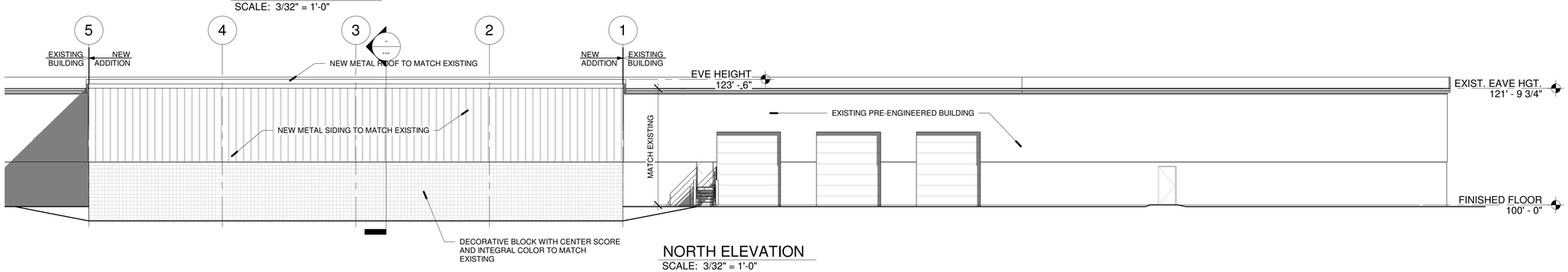
OVERALL FLOOR PLAN
SCALE: 1" = 50'-0"



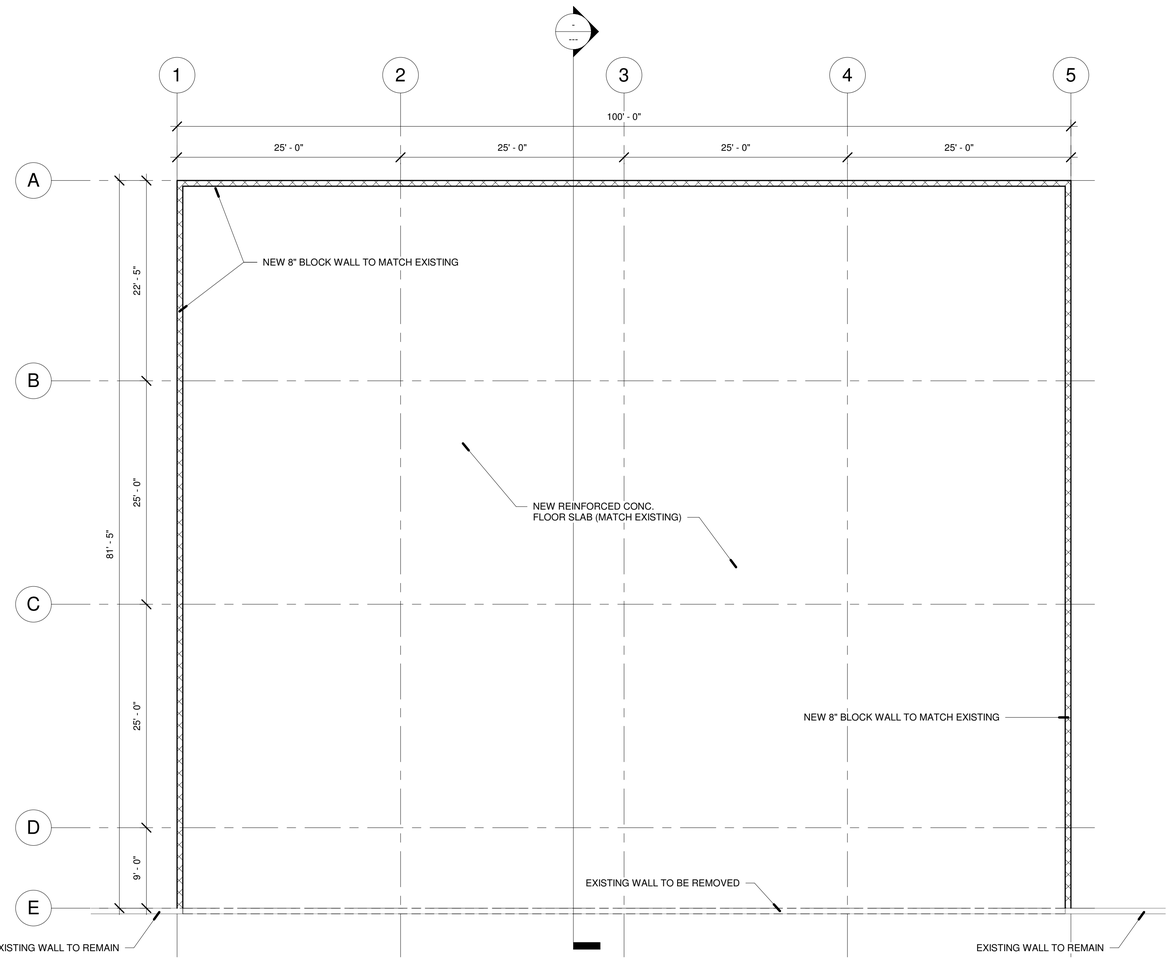
WEST ELEVATION
SCALE: 3/32" = 1'-0"



EAST ELEVATION
SCALE: 3/32" = 1'-0"



NORTH ELEVATION
SCALE: 3/32" = 1'-0"



1 / A101 ENLARGED FLOOR PLAN
SCALE: 1/8" = 1'-0"

Architect:
AMAG
4488 West Bristol Road, Suite 200, Flint, MI 48507 PH: (810) 230-9311

Contractor:
Rhoads & Johnson
www.rhoadsjohnson.com

Proposed Addition for:
Michigan Rod Products
1326 Grand Oaks Drive, Genoa Township, Livingston Co. MI

Project Phase:
- Design ■
- Permit
- Construction

Date
02-20-19

Rev:	Description	Revised Last Issue:
1	SITE PLAN REVIEW	2/20/2019 9:45:57 AM

Project #	19014
Drawn by:	rle
Checked by:	jla

FLOOR PLAN & ELEVATIONS

Sheet
A101

GENOA CHARTER TOWNSHIP
PLANNING COMMISSION
PUBLIC HEARING
February 11, 2019
6:30 P.M.
MINUTES

CALL TO ORDER: The meeting of the Genoa Charter Township Planning Commission was called to order at 6:31 p.m. Present were Chairman Doug Brown, Chris Grajek, Jeff Dhaenens, Jill Rickard, Marianne McCreary, and Jim Mortensen. Absent was Eric Rauch. Also present was Kelly VanMarter, Community Development Director/Assistant Township Manager, and Gary Markstrom of Tetra Tech. There was one audience member present.

PLEDGE OF ALLEGIANCE: The pledge of allegiance was recited.

APPROVAL OF AGENDA:

Moved by Commissioner McCreary, seconded by Commissioner Grajek, to approve the agenda as presented.

CALL TO THE PUBLIC: The call to the public was made at 6:32 pm with no response.

OPEN PUBLIC HEARING # 1… Review of revisions to the master deed and bylaws associated with recommendation for final site condominium approval for Chestnut Springs. The property in question is located on approximately 61 acres involving parcels 11-33-400-003 and 11-34-300-005 on the east side of Chilson Road, south of Brighton Road along the southern Township boundary with Hamburg Township. The request is petitioned by Chestnut Development LLC.

A. Recommendation of final condominium site plan.

Mr. Steve Gronow, the property owner, was present. Per the discussion at last month's Planning Commission meeting, his attorney has reverted the language for the master deed and bylaws back to how they were originally written. He has reviewed the comments from the Township attorney in his letter dated February 7, 2019 and agrees to make his requested changes.

The Planning Commission suggested that Lot #25 contribute to the storm sewer system because that runoff is from the road, and they are required to contribute to the road maintenance. Mr. Gronow will have that added.

Commissioner McCreary would like to have Lot #25 contribute to the maintenance of the common areas, including the maintenance of the entrance to the development, etc. Commissioner Rickard agrees. Commissioners Mortensen and Dhaenens disagree. They would like to have Lot #25 pay for the road and storm sewer system maintenance, but not for any of the landscaping. Mr. Gronow does not believe it would be possible to charge Lot #25 for just the maintenance of the common areas, and not the landscaping, mowing, snow removal, etc.

After a brief discussion, Commissioners McCreary and Rickard believe that Lot #25 should pay for all common aspects of the association, such as the roads, the storm sewer system, common areas, site entrance maintenance, insurance, etc. and should only be exempt from the landscaping costs. Mr. Gronow and the Planning Commissioners agree.

The call to the public was made at 7:14 pm with no response.

Moved by Commissioner Mortensen, seconded by Commissioner Dhaenens, to recommend to the Township Board approval of final condominium site plan for Chestnut Springs, subject to the following:

- A revision to the master deed and by-laws reviewed this evening to the effect that Lot #25 will be excluded from homeowner association costs and/or assessments related only to the landscaping of the condominiums.
- Review by the Township attorney.

The motion carried unanimously.

OPEN PUBLIC HEARING # 2… Review of a site plan and impact assessment requesting preliminary site condominium approval for a proposed 19 unit site condominium. The property in question is located on approximately 30.8 acres at 4242 Bauer Road (Parcel #4711-26-200-002) on the west side of Bauer Road between White Pines Drive and Challis Road. The request is petitioned by John Moretti.

A. Recommendation of Environmental Impact Assessment (1-25-19)
B. Recommendation of Preliminary Site Plan (1-18-19)

Mr. John Moretti, the property owner, and Mr. Phillip Rasor, the civil engineer, were present.

Mr. Rasor showed the proposed site plan, which will consist of 19 units on approximately 30 acres. He reviewed the details of the lot sizes, the access roads,

common areas, the detention area, etc. They have designed the development to minimize the impact on trees and maintain the natural topography of the site.

Chairman Brown asked the applicant if they have received the review letter dated February 6, 2019 from the Township Planner, Brian Borden. Mr. Rasor stated they have.

The Planning Commissioners and the applicant discussed Item #3 in Mr. Borden's letter. There were concerns with the gates at each entrance of the development. Mr. Moretti wanted the development to be private and avoid people cutting through from the adjacent homes. Ms. VanMarter stated that 5hese gates could cause vehicles to back up on Bauer Road on one side as well as back up and block residential driveways on Quaint Ridge on the other. She noted that Mr. Borden suggested that the Township and/or emergency response agencies may require the applicant to enter into an indemnification/hold harmless agreement to protect these entities in the event a delay is caused by the gate or damage occurs to an emergency vehicle or the gate structure itself.

Mr. Rasor stated they will revisit this issue. They will comply with all of the other concerns raised by Mr. Borden.

Mr. Rasor stated they have received Mr. Markstrom's letter dated February 5, 2019. They will address all of his concerns during final site plan approval.

There was a discussion regarding the Fire Authority's requirement to have a 12,000-gallon fire suppression water tank. Ms. VanMarter stated that this requirement is part of the International Fire Code, which has been adopted by the Township, so it is part of the ordinance, thus a requirement of the Township.

Commissioner Mortensen does not believe this is ready to go to the Township Board for approval. He would like to see the gate issue resolved, and the fire suppression water tank and the storm water concerns raised by the Township Engineer addressed.

The call to the public was made at 8:19 pm with no response.

Moved by Commissioner Dhaenens, seconded by Commissioner McCreary, to postpone Public Hearing #2 for preliminary site condominium approval for a proposed 19 unit site condominium to allow the applicant to address items discussed this evening. **The motion carried unanimously**.

ADMINISTRATIVE BUSINESS

Staff Report
Ms. VanMarter stated there will be a Planning Commission meeting in March.

There is a proposed development requesting to build three lots per acre; however, there is no zoning district for this density. She is suggesting to adjust the Urban Residential district to allow flexibility so this density can be developed in the Township.

Approval of the January 14, 2019 Planning Commission meeting minutes
There were some typographical errors in the draft minutes.

Moved by Commissioner McCreary, seconded by Commissioner Grajek, to approve the minutes of the January 14, 2019 Planning Commission Meeting as amended. **The motion carried unanimously.**

Annual Report 2018
Ms. VanMarter noted this was included in the packet.

Member Discussion
There were no items to discuss this evening.

Adjournment
Moved by Commissioner Grajek, seconded by Commissioner Mortensen, to adjourn the meeting at 8:41 pm. **The motion carried unanimously.**

Respectfully Submitted,

Patty Thomas, Recording Secretary