GENOA CHARTER TOWNSHIP
PLANNING COMMISSION PUBLIC HEARING
OCTOBER 10, 2017
TUESDAY
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 special use application, site plan application, environmental impact assessment and site plan for a proposed K-12 Livingston Christian School to be located within the Brighton Church of the Nazarene at 7669 Brighton Road, Brighton. The request is petitioned by Livingston Christian Schools.

Planning Commission Recommendation of Petition:

A. Recommendation of Special Use Application.
B. Recommendation of Environmental Impact Assessment.
C. Recommendation of Site Plan.

OPEN PUBLIC HEARING #2… Review of site plan application, environmental impact assessment and site plan for proposed 123-bed student housing apartment building, located on the south side of Grand River Avenue and east side of Grand Oaks Drive, at 3750 Cleary Drive, Howell. The property is located in the Cleary University Planned Unit Development. The request is petitioned by Cleary University.

Planning Commission Recommendation of Petition:

A. Recommendation of Environmental Impact Assessment.
B. Recommendation of Site Plan.

ADMINISTRATIVE BUSINESS:

- *Staff Report*
- *Approval of September 11, 2017 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: LIVINGSTON CHRISTIAN SCHOOL 8877 MAIN ST WHITMORE LAKE, MI 48189
If applicant is not the owner, a letter of Authorization from Property Owner is needed.

OWNER'S NAME & ADDRESS: BRIGHTON NAZARENE CHURCH 7664 BRIGHTON RD BRIGHTON, MI 48116

SITE ADDRESS: 7664 BRIGHTON RD PARCEL #(s): 4711-25-400-059

APPLICANT PHONE: (313) 710-4306 OWNER PHONE: (810) 227-6600

OWNER EMAIL: THEMAZ@THEMAZ.ORG

LOCATION AND BRIEF DESCRIPTION OF SITE: WILL UTILIZE SPACE INSIDE EXISTING BRIGHTON NAZARENE CHURCH WHICH IS LOCATED NORTH OF BRIGHTON RD JUST EAST OF LAKE FOREST BOULEVARD.

BRIEF STATEMENT OF PROPOSED USE: A PRIVATE CHRISTIAN SCHOOL

THE FOLLOWING BUILDINGS ARE PROPOSED: NO PROPOSED BUILDINGS

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

BY: _____

ADDRESS: _____

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

1.) CAMERON HORVATH of ROSS ENGINEERING at CAMERONH@ROSSENG.COM
Name | Business Affiliation | 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: 8/30/17

PRINT NAME: ROBERT WIKLAND PHONE: 503-710-431

ADDRESS: _____

GENOA CHARTER TOWNSHIP
Special Land Use Application

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

APPLICANT NAME & ADDRESS: LIVINGSTON CHRISTIAN SCHOOLS 8577 HAVEN ST WHITMORE LAKE, MI 48189
Submit a letter of Authorization from Property Owner if application is signed by Acting Agent.

APPLICANT PHONE: (503) 710-4306 EMAIL: RWIEGAND@LIVINGSTONCHRISTIANSCHOOLS.ORG

OWNER NAME & ADDRESS: BRIGHTON NAZARENE CHURCH 7669 BRIGHTON RD BRIGHTON, MI 48116

SITE ADDRESS: 7669 BRIGHTON RD BRIGHTON, MI 48116 PARCEL #(s): 4711-25-400-059

OWNER PHONE: (810) 227-6600 EMAIL: THEMAZ@THEMAZ.ORG

Location and brief description of site and surroundings:
WILL UTILIZE SPACE INSIDE EXISTING BRIGHTON NAZARENE CHURCH WHICH IS LOCATED NORTH OF BRIGHTON RD JUST EAST OF LAKE FOREST BOULEVARD.

Proposed Use:
A PRIVATE CHRISTIAN SCHOOL

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

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

PRIVATE SCHOOLS ARE LISTED AS A SPECIAL USE FOR THE CURRENT ZONING AND SINCE IT IS A PRIVATE CHRISTIAN SCHOOL IT FITS WITH THE EXISTING CHURCH ON-SITE. IT OFFERS THE TOWNSHIP ANOTHER SCHOOLING OPTION FOR THOSE LOOKING FOR THAT TYPE OF EDUCATION.

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

NOTHING MAJOR NEEDS TO BE CONSTRUCTED. THE GOAL IS TO MOVE INTO AN EXISTING CHURCH BUILDING WITH MINIMAL CHANGES TO THE SITE.

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

ALL OF THE ESSENTIAL INFRASTRUCTURE IS ALREADY IN PLACE. THE TRAFFIC AND USE OF SURROUNDING ROADS WILL INCREASE AND THAT STUDY HAS BEEN INCLUDED IN THIS SUBMITTAL.

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

NO.

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

PRIVATE SCHOOLS ARE LISTED AS A SPECIAL USE UNDER THE SITES CURRENT ZONING OF SR.

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

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

BY: _____

ADDRESS: _____

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

CAMERON HORVATH of BOSS ENGINEERING at CAMERON@BOSSENG.COM

Name Business Affiliation Email

FEE EXCEEDANCE AGREEMENT

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

SIGNATURE: _____ DATE: 8/30/17

PRINT NAME: ROBERT WIGGAND PHONE: 503-710-4306

Revised 08-15-13, kasp

THE NAZ

love God.love all people.love in action

June 20, 2017

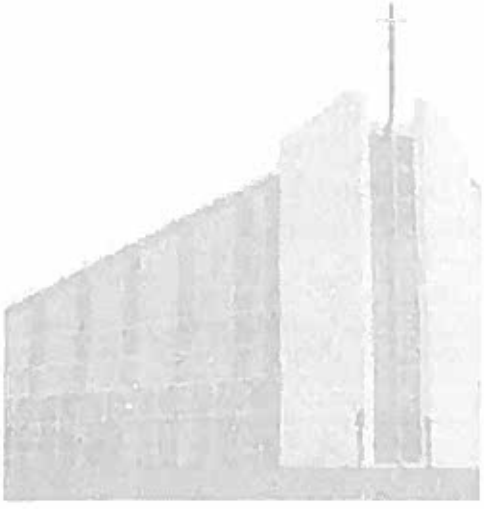
To Whom It May Concern,

Livingston Christian School has a lease agreement in place with Brighton Nazarene Church. Livingston Christian School has permission to gain occupancy of Brighton Nazarene Church.

Sincerely,

Pastor Ben D. Walls

Pastor Ben D. Walls



Brighton Nazarene Church
7669 Brighton Rd. Brighton, MI 48116
810.227.6600 www.thenaz.org

LSL Planning
A SAFEbuilt. Company

October 5, 2017

Planning Commission
Genoa Township
2911 Dorr Road
Brighton, Michigan 48116

Attention:	Kelly Van Marter, AICP Planning Director and Assistant Township Manager
Subject:	Livingston Christian Schools – Special Land Use and Site Plan Review #2
Location:	7669 Brighton Road – northwest corner of Brighton and Aljoann Roads
Zoning:	SR Suburban Residential

Dear Commissioners:

At the Township's request, we have reviewed the revised submittal from Livingston Christian Schools requesting special land use (application dated 8/30/17) and site plan (plans dated 9/20/17) review and approval. The project entails use of existing space within the main building owned by the Brighton Church of the Nazarene for a private school.

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

A. Summary

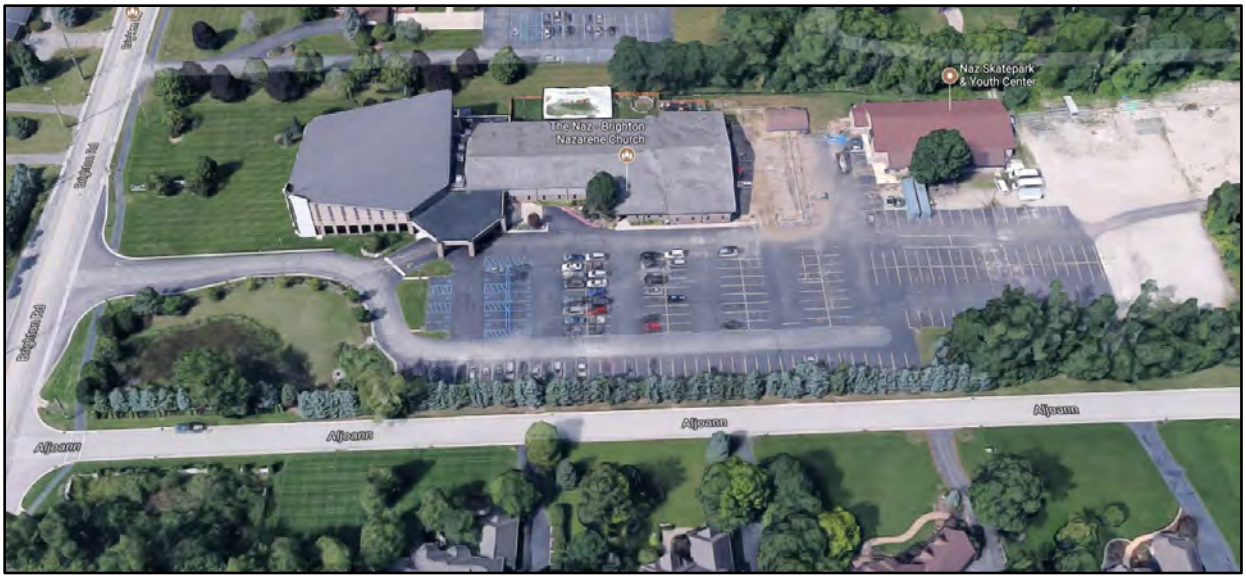
1. Pending any concerns identified by the Township Engineer or Fire Department, we are of the opinion that the general special land use standards of Section 19.03 are met.
2. We recommend the applicant and property owner develop a process to ensure events and activities are well coordinated so as to avoid overlap.
3. The proposal is generally compliant with the specific use conditions of Section 3.03.02(l).
4. The revised site plan notes a slight increase in building coverage (from 6.99% to 8.19%), although no modifications are proposed to the building. The applicant must correct this note.
5. The amount of parking provided meets Ordinance standards provided the existing and proposed uses operate at different peak times and do not have events that overlap.
6. The Township may wish to require double-striped (looped) spaces for the modified parking area.
7. When future signage is proposed, the applicant must obtain approval and a permit from the Township prior to installation.

B. Proposal/Process

In accordance with Section 3.03.02(l), private schools are allowed as an accessory use to a church, while churches and similar places of worship are listed as special land uses (Table 3.03). The revised submittal identifies an enrollment of 200 students for the proposed private school.

Based upon Section 19.06, the request constitutes a major amendment to an existing special land use; therefore, a new application for special land use approval is required. Additionally, site plan review and approval is required for all new special land uses.

Procedurally, the Planning Commission is to review the special land use, site plan and impact assessment and provide a recommendation on each to the Township Board (following a public hearing). The Township Board has the final review/approval authority.



Aerial view of site and surroundings (looking west)

C. Special Land Use Review

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

1. **Master Plan.** The Township Master Plan identifies the subject site, as well as the adjacent properties to the east and west, as Low Density Residential. This designation is intended for single family residential uses on lots of at least 1-acre in size.

   The description of the Low Density Residential category does not specifically mention institutional uses; however, one of the Plan's land use goals is to "accommodate a variety of land uses that are located in a logical pattern and complement community goals, the surrounding land uses, environment, capacity of roads and the sanitary sewer, and public water system capabilities."

   Provided favorable findings are made on the remaining special land use criteria, the case can be made that the proposal is consistent with the Master Plan.

2. **Compatibility.** The subject area contains a mixture of uses, including institutional and residential. Given the presence of other schools in the area, the proposal includes start and end of school times that are spaced at least 30 minutes from the start/end times for these other schools to minimize potential traffic impacts.

   The revised submittal includes a letter from a representative of the property owner indicating that they have informed the company operating the drivers training program that they can no longer use the church parking lot. The letter notes a 3 to 4 month timeframe within which the company needs to find an alternative site.

3. **Public Facilities and Services.** As a developed site along a main roadway, we anticipate necessary public facilities and services are in place to support the proposal; however, the Commission should consider any comments provided ty the Township Engineer and Brighton Area Fire Department under this criterion.

4. **Impacts.** From our perspective, the proposal entails two important considerations with respect to the overall impact of the use – an increase in traffic and increased use of the site in general.

With respect to the traffic impacts, the applicant included a revised traffic study (prepared by Fleis & Vanderbrink, dated 9/19/17). The revised study is based on a student enrollment of 200 and includes several recommendations to ensure proper traffic flow to, on and from the site. The revised site plan incorporates the recommended site improvements, as well as a plan to educate staff, students and parents of the parking operations plan.

The Commission should also consider any additional comments provided by the Township Engineer with respect to the revised traffic study.

As for overall use of the site, there is an established principal use in the form of a church. General impacts, including traffic, will be lessened if the existing (church) and proposed (school) uses can operate at different peak times.

The revised plans include a note stating that "the school and church would function at different times during the week and conflicts would be minimal." However, we recommend the applicant and property owner develop a process to ensure events and activities are well coordinated so as to avoid overlap.

5. **Mitigation.** The Township may require mitigation necessary to limit or alleviate any potential adverse impacts as a result of the proposal.

D. Use Conditions

Churches and similar places of worship are subject to the following use conditions of Section 3.03.02(l):

1. **Minimum lot area shall be three (3) acres plus an additional fifteen thousand (15,000) square feet for each one hundred (100) persons of seating capacity.**

The primary use of the property is a church, which has a worship area with 520 seats. This condition results in the need for 4.7 acres of lot area, while the subject site has a gross lot area of 16.43 acres.

2. **Buildings of greater than the maximum height allowed in Section 3.04, Dimensional Standards, may be allowed provided front, side and rear yards are increased above the minimum required yards by one foot for each foot of building height that exceeds the maximum height allowed. The maximum height of a steeple shall be sixty (60) feet.**

The project does not entail exterior building modifications. While the submittal does not identify building heights, based on review of previous requests for this site, we believe this condition is met.

3. **Wherever an off-street parking area is adjacent to a residential district, there shall be a minimum parking lot setback of fifty (50) feet with a continuous obscuring wall, fence and/or landscaped area at least four (4) feet in height shall be provided. The Township Board may reduce this buffer based on the provision of landscaping, the presence of existing trees or in consideration of topographic conditions.**

This condition applies to both the east and west side lot lines.

The existing parking along the east side of the subject site does not comply with this condition; however, this is an existing condition that is not being modified as a result of the proposal. Additionally, there is existing screening between these parking spaces and the adjacent residential district in the form of landscaping and a 6-foot tall privacy fence.

The parking space nearest the west side lot line provides a 50-foot setback and the adjacent property (also an institutional use) has dense, mature vegetation along their side lot line. The Township may require screening in this area, although it may be deemed unnecessary given existing conditions both on- and off-site.

4. **Private schools and child day care centers may be allowed as an accessory use to churches, temples and similar places of worship where the site has access to a paved public roadway.**

Vehicular access to the subject site is provided via Brighton Road, which is a paved public roadway.

E. Site Plan Review

1. **Dimensional Requirements.** The district allows a maximum impervious surface ratio of 35%, while the table on Sheet 3 notes that 24.15% will be provided. Additionally, the table also shows an increase in building coverage (from 6.99% to 8.19%), although no modifications are proposed to the building. The applicant must correct this information.

2. **Building Materials and Design.** No exterior changes are proposed to the existing building(s).

3. **Parking.** The parking calculations on the site plan demonstrate that as separate uses, the church requires more parking (174) than the school (122). The revised parking lot layout provides 180 spaces.

   Similar to comments in our review of the special land use above, provided the two uses operate at different peak times, the amount of parking provided should suffice; however, we recommend coordination to ensure events and activities do not overlap.

   Lastly, given the reconfiguration of a portion of the parking lot, the Township may wish to require double-striped (looped) spaces for the modified parking area.

4. **Pedestrian and Vehicular Circulation.** The overall circulation pattern for drop-off/pick-up will be a counter clockwise movement around the parking lot with two egress lanes (one for drop-off/pick-up and one for bypass) along the east side of the building.

   Curbed islands are to be installed between the parking lot and drop-off/pick-up lanes; thus, creating a physical barrier between the two (as recommended by the traffic study). Additionally, pavement striping will be added between a portion of the two egress lanes, as well as adjacent to the sidewalk/building entrances.

   A striped crosswalk is also provided between the parking lot and sidewalk adjacent to the main building entrance, as well as between rows of parking.

   The revised plan also includes modifications to the parking lot, such that the spaces in the center of the lot will be re-oriented from north/south to east/west (also per the traffic study).

5. **Landscaping**. The revised landscape plan (Sheet 6) includes new plantings in the form of 2 deciduous trees and 4 shrubs.

   The trees are located on the south side of the modified parking lot, while the shrubs are on the north side. Two trees will also be removed as a result of the modified parking lot.

6. **Waste Receptacle and Enclosure.** The submittal does not propose any changes to the existing waste receptacle and enclosure, which were approved as part of the 2013 project undertaken by the church.

7. **Exterior Lighting.** A note on the revised plan (Sheet 6) states that no changes are proposed to existing site lighting.

8. **Signs.** The submittal states that no new signage is proposed, though the site plan identifies a "potential area for LCS signage" in front of the building. If/when new signage is desired, the applicant will need to obtain approval and a permit from the Township prior to installation.

   For the applicant's reference, the Township's sign regulations are found in Article 16 of the Zoning Ordinance.

9. **Impact Assessment.** The submittal includes a revised Impact Assessment prepared by Boss Engineering (dated 9/20/17). In summary, the Assessment notes that the project is not anticipated to adversely impact natural features, public services/utilities, surrounding land uses or traffic.

   Similar to comments made previously, we suggest the Impact Assessment be amended to identify a coordination plan/process to help avoid multiple events occurring at the same time.

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

Respectfully,
LSL PLANNING, A SAFEBUILT COMPANY

Brian V. Borden, AICP
Planning Manager

TETRA TECH

October 4, 2017

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

Re: Livingston Christian Schools Site Plan Review #2

Dear Ms. Van Marter:

Tetra Tech conducted a site plan review of the revised plans, dated September 20, 2017, submitted by Boss Engineering on behalf of Livingston Christian Schools. The applicant is proposing to use the existing Brighton Nazarene Church as a private Christian school, which is a special land use of the Suburban Residential zoned property. The site is located at 7669 Brighton Road between Lake Forest Boulevard and Aljoann Street.

One comment from the first review requires attention:

1. The traffic count collection was completed on August 9, 2017, when schools were not in session. The LCRC requested that either 2015 traffic counts be used or new data collected. The petitioner has presented traffic counts using the May 2015 data. Due to significant development and on-going construction in May of 2015, the traffic counts do not accurately represent present day data and new traffic counts should be collected.

Excluding the traffic count data, the revised plans have addressed all of the initial review comments. Once the above comment is addressed the petitioner can revise and resubmit the documents for review.

Sincerely,

Gary J. Markstrom, P.E.
Unit Vice President

Marguerite K. Davenport
Project Engineer

copy: Brent LaVanway. P.E., Boss Engineering, Inc.

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

September 28, 2017

Kelly VanMarter
Genoa Township
2911 Dorr Road
Brighton, MI 48116

RE: Livingston Christian Schools
7669 Brighton Rd.
Genoa Twp., MI

Dear Kelly:
The Brighton Area Fire Department has reviewed the above mentioned site plan. The plans were received for review on September 27, 2017 and the drawings are dated August 30, 2017 with latest revisions dated September 20, 2017. The project is for the alteration of the access drives to accommodate the traffic flow of a proposed new school to be administered in an existing Assembly/Educational Occupancy. The plan review is based on the requirements of the International Fire Code (IFC) 2015 edition.

Since the previous submittal, the applicant has contacted the fire authority to discuss the vehicle stacking and drop-off plan. Discussions pertained directly to proposed obstruction of the fire lane along the east side of the structure, the number of proposed vehicles obstructing the fire lane, emergency vehicle circulation beneath the porte-cochere and width of access.

It appears that all previous areas of concern have been addressed, including a revised number of vehicles in stacking and drop-off lanes, emergency vehicle circulation and access drives.

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

Cordially,

Rick Boisvert
Fire Marshal

Livingston County Road Commission (LCRC)
Review Comments (September 28, 2017)

Livingston Christian School
Site Access and Circulation Evaluation

Below are LCRC comments with respect to the revised site access and circulation evaluation, prepared by Fleis and VandenBrink, dated September 19, 2017, for the proposed Livingston Christian School (LCS) in Genoa Township.

The LCRC accepts the findings and conclusions of the report with the following conditions:

1. Despite no anticipated work within the Brighton Road right-of-way, a new or revised driveway approach permit is required from LCRC due to a change in use of the driveway through the addition of a school.
2. The new driveway permit will be conditioned upon the approved traffic assessment, with a maximum of 200 students and start and dismissal times of 8 AM and 3 PM, respectively.
3. Any changes to school enrollment or operations that can affect site circulation are subject to review and approval by LCRC as part of the permit conditions. This may require a new traffic assessment.

THE NAZ
love God.love all people.love in action

GENOA TOWNSHIP
SEP 20 2017
RECEIVED

September 12, 2017

To Whom It May Concern:

I have told the owners of AK Services, that have run their State drivers licensing services to the area, that they need to find another location. I told them that they have 3-4 months to find an alternative spot.
If there are other questions, please feel free to call me.

Pastor Ben Walls

Pastor Ben Walls

Brighton Nazarene Church

Brighton Nazarene Church
7669 Brighton Rd. Brighton, MI 48116
810.227.6600 www.thenaz.org

BRIGHTON FIRST
United Methodist Church

September 25, 2017

Genoa Township Planning Commission
Genoa Township Hall
2911 Dorr Road
Brighton, MI 48116

Dear Members of the Genoa Township Planning Commission,

This letter is in regard to the Special Land Use Permit requested by Brighton Nazarene Church (Parcel No. 4711-25-400-058). The public hearing is scheduled for Tuesday, October 10 at 6:30 p.m.

We write on behalf of the Board of Trustees of First United Methodist Church of Brighton. Our church owns the house located in Mt. Brighton Subdivision at 7608 Brookview Court. The house and lot are directly adjacent to the Nazarene property and is the home of Rev. Dr. Sherry Parker-Lewis and Rev. George Lewis.

The Board of Trustees and Dr. Parker-Lewis support the granting of a Special Land Use Permit so that Livingston Christian School may be located within the Brighton Nazarene Church.

Sincerely,

Dr. Deb de Laski-Smith, Board of Trustees

Ms. Mary Margaret Whitely, Board of Trustees

Rev. Dr. Sherry Parker-Lewis

Amy Ruthig

From: Skip Blunt <skipb48@comcast.net>
Sent: Thursday, September 28, 2017 1:31 PM
To: Amy Ruthig
Subject: Oct. 10th Public Meeting

Unfortunately I'm not going to be able to attend October 10 meeting concerning the school to be located in the Brighton Church of the Nazarene, but would like to speak to the congestion this is going to add to that section of the road. I live in the Pine Creek Villas just across the street from the three churches contiguous churches on the road. As I'm sure you are all aware we are next-door to the Brighton High School and the congestion currently caused when the children are entering the school property leaving it makes it very difficult at certain times of day for us to enter and leave our subdivision. Adding more schools with entrances and exits to Brighton Road at this point would only exacerbate the problem.

Getting more and more teenage drivers on this small portion of road would create increased propensity for accidents during the time school is starting and ending. I do not believe more schools at the site is in the best interest of the whole community.

Lewis Blunt

7426 Pine Vista Dr.

Brighton, MI 48116

LEASE AGREEMENT

1. THIS LEASE made this 25th day of November, 2014 by and between:

Brighton Church of the Nazarene, a domestic nonprofit corporation
7669 Brighton Rd
Brighton, MI 48116

the **Lessor**, hereinafter designated as the **Landlord**, and

Livingston Christian Schools, a domestic nonprofit corporation
550 E Hamburg St
Pinckney, MI 48169

the **Lessee**, hereinafter designated as the **Tenant.**

2. **DESCRIPTION:** Witnesseth: The Landlord, in consideration of the rents to be paid and the covenants and agreements to be performed by the Tenant, does hereby lease unto the Tenant a designated part of the following described premises situated in the Township of Genoa, County of Livingston, State of Michigan, to be operated during Tenant's normal school calendar year and special events, to-wit:

7669 Brighton Rd, Brighton, MI 48116, including designated classrooms; office space; restrooms; kitchen; gym; playground equipment as approved by the Landlord; parking as designated by the Landlord; lakefront property, shared with the Landlord, with Tenant's adult supervision for recreation of children during normal school hours and the Tenant's school calendar year; and from time to time, the use of the Landlord's main sanctuary for special occasions, as approved by the Landlord.

3. **TERM:** The term of this lease shall be for five (5) years, which shall commence on June 1, 2015. The term shall be fully completed and ended, the Tenant yielding and paying during the continuance of this lease unto the Landlord for rent of said premises for said term, in lawful money of the United States, payable in advance totaling Three Hundred Thousand and 00/100 Dollars ($300,000.00), payable in monthly installments upon the 1st day of each and every month, in the amount of Five Thousand and 00/100 ($5000.00) dollars, with a five (5) day grace period. After the fifthteenth (15) day, a late fee of $250.00 shall be assessed to the Tenant. Upon the execution of this lease agreement, Tenant agrees to pay a lump sum of Sixty

Seven Thousand Dollars and 00/100 ($67,000), which shall be credited as pre-paid rent; a pre-paid rent credit of Fifty Thousand Dollars and 00/100 ($50,000) is acknowledged by the Landlord for labor and tile material being donated by a Livingston Christian School family for the benefit of the Tenant; and a pre-paid rent credit of Fifty Three Thousand and 00/100 Dollars ($53,000) having been paid to Landlord by a family attending the Brighton Nazarene Church for the benefit of the Tenant. With payment of the above, totaling One Hundred Seventy Thousand and 00/100 Dollars ($170,000), rent shall be deemed to be pre-paid for the first 34 months of this Lease Agreement. Thereafter, monthly installments of Five Thousand and 00/100 Dollars ($5000) per month shall be payable by Tenant beginning in month 35 and continuing through and including month 60, to the complete tenure of this Lease Agreement.

4. **RENT:** The Tenant hereby hires the said premises for the said term as above mentioned and covenants they will and truly pay, or cause to be paid unto the Landlord at the dates and times above mentioned, the rent above reserved, the Landlord hereby acknowledges receipt of the above referenced payments totaling One Hundred Seventy Thousand and 00/100 Dollars ($170,000) paid in advance as pre-paid rent. Landlord acknowledges that no security deposit shall be paid by the Tenant upon the execution of this lease. In additional consideration of the rent herein, Tenant hereby agrees to provide a 20% discount to all regular attenders of the Brighton Nazarene Church, whose students are enrolled with Livingston Christian School, provided they are regularly attending the Landlord's church, from early childhood up to the 12th grade. A regular attender of the Brighton Nazarene Church is defined as having attended at least 30 weekly services in the prior 52 week period. If a family is receiving tuition assistance from Livingston Christian School and is receiving a discount for various reasons offered by the Tenant, then the greater of the 20% discount or the tuition assistance or discount amount already being offered by the Tenant, shall be applied to the tuition, but not both discounts.

5. **INSURANCE:** In addition to the rental hereinbefore specified, the Tenant shall NOT be responsible for reimbursement to the Landlord of any increase on premiums for insurance against loss by fire that may be charged during the term of the Lease on the amount of insurance covering the demised premises and on the improvements situated on said premises. The Tenant hereby acknowledges that the Landlord does NOT provide insurance coverage for any of the Tenant's business personal property or loss of use of the premises, due to an insured loss, whether the fault or negligence of the Tenant or Landlord. It shall be the Tenant's responsibility to secure

insurance for their business personal property, including comprehensive general liability insurance. The Landlord shall be named as an additional named insured on Tenant's policy for Section II, with a minimum limit of liability of $1,000,000 per occurrence and $2,000,000 in the aggregate. In addition, the Tenant shall at all times maintain worker's compensation insurance policy. The Tenant shall also provide a certificate of insurance to the Landlord, evidencing comprehensive general liability and workers compensation insurance, prior to occupying the premises and shall provide such certificate of insurance on the annual anniversary date of this lease agreement.

6. **PLACE OF PAYMENT:** All payments of rent or other sums to be made to the Landlord shall be made at such place as the Landlord shall designate in writing from time to time.

7. **ASSIGNMENT:** The Tenant covenants not to assign or transfer the Lease or hypothecate of mortgage the same or sublet said premises or any part thereof without written consent of the Landlord. Landlord will not withhold consent unreasonably. Any assignments, transfer hypothecation, mortgage or subletting without said written consent shall give the Landlord the right to terminate this Lease and to re-enter and repossess the leased premises.

8. **BANKRUPTCY AND INSOLVENCY:** The Tenant agrees that if the estate created hereby shall be taken in execution, or by other process of law or if the Tenant shall be declared bankrupt or insolvent, according to law, or any receiver be appointed for the business and property of the Tenant, or if any assignment shall be made of the Tenants property for the benefit of creditors, then and in such event this Lease may be cancelled at the option of the Landlord.

9. **RIGHT TO MORTGAGE:** The Landlord reserves the right to subject and subordinate this Lease at all times to the lien of any mortgage or mortgages now or hereafter placed upon the Landlord's interests in the said premises and on the land and buildings of which the leased premises form a part. And the Tenant covenants and agrees to execute and deliver upon demand such further instruments subordinating this Lease to the lien of any such mortgage or mortgages as shall be desired by the Landlord and any mortgagee or proposed mortgages within ten (10) days after Landlord's request.

10. **USE AND OCCUPANCY:** It is understood and agreed between the parties hereto the said premises during the continuance of the Lease shall be

used and occupied as an academic school and for no other purpose or purposes, without the written consent of the Landlord, and the Tenant will not use the premises for any other purpose in violation of any law, municipal ordinance or regulation, and that on any breach of this agreement, the Landlord may at its option terminate this Lease forthwith and re-enter and repossess the leased premises.

11. **FIRE:** It is understood and agreed that if the premises hereby leased be damaged or destroyed in whole or in part by fire or other casualty during the term hereof, the Landlord will repair and restore the same to good tenantable condition with reasonable dispatch, and that the rent herein provided for shall abate entirely in case a part only is untenable and pro rata for the portion rendered untenable, in case a part only is untenable, until the same shall be restored to a tenantable condition; provided, however, that if the Tenant shall fail to adjust his own insurance or to remove damaged goods, wares, equipment or property within ten (10) days after Landlord's request, and as a result thereof the repairing and restoration is delayed, there shall be no abatement of rental during the period of such resulting delay, and provided further that there shall be no abatement of rental if such fire or other cause damaging or destroying the leased premises shall result from the negligence or willful act of the Tenant, his agents or employees, and provided further that if the Tenant shall use any part of the leased premises for storage during the period of repair, a reasonable charge shall be made therefore against the Tenant, and provided further that in case the leased premises, or the building of which they are a part, shall be destroyed to the extent of more than one-half of the value thereof, the Landlord may at their option terminate this Lease forthwith by a written notice to the other party. Any repairs made by the Landlord shall be done as soon as reasonably feasible.

12. **REPAIRS:** The Landlord shall make all necessary repairs and replacements to the building, heating, air conditioning, plumbing, and electrical systems located therein, and Landlord shall also make repairs to the demised premises which are structural in nature or required due to fire, casualty, or any other act of God; provided, during the term of the Lease however that Tenant shall make all repair and replacements arising from its act, neglect, or default. Except as provided above, Tenant shall keep the demised premises in good repair, including any special equipment installed by the Landlord or Tenant, and Tenant shall upon the expiration of the term of this Lease, yield and deliver up the demised premises in like condition as when taken, reasonable use and wear thereof required to be made by Landlord excepted. If Landlord does not respond within ten (10) days of Tenants written request, then Tenant shall have the right to make such

repairs and deduct the cost from monthly rent next due, after agreed upon by the Landlord.

13. **TENANT TO INDEMNIFY AND HOLD HARMLESS:** The Tenant hereby desires and wishes to hold harmless the Landlord and its successors and/or assigns, from any and all liabilities, loss, claims, judgments, lawsuits, fines, penalties, demands or expenses including but not limited to all reasonable costs for defense and investigation thereof (including, but not limited to attorney fees, court costs and expert fees) claimed by anyone by reason of injury or damage to persons or property sustained in or around the operation of the Tenant's school as a proximate result of acts or omissions of the Landlord, its agents, successors and/or assigns or arising out of the operation or the actions of the Landlord upon or about the Tenant as a school, except when such liability may arise from the sole negligence of the Landlord, its officers, director, agents, servants and/or employees; provided however, that upon the filing of any claim with the Tenant for damages arising out of incidents for which the Landlord herein agrees to hold the Tenant harmless, then and in that event the Tenant shall notify the Landlord of such claim and the Landlord shall have the right to settle, compromise, and/or defend the same.

14. **REPAIRS AND ALTERATIONS:** Except as provided in paragraph 12 hereof, the Tenant further covenants and agrees that they will, at their own expense, during the continuation of this lease, keep the said premises and every part thereof in as good repair and at the expiration of the term, yield and deliver up the same in like condition as when taken, reasonable use and wear thereof and damage by the elements excepted. The Tenant shall not make any alterations, additions, or improvements to said premises without the Landlord's written consent, and all alterations, additions or improvements made by either of the parties hereto upon the premises, shall be the property of the Landlord, and shall remain upon and be surrendered with the premises at the termination of this Lease, without molestation or injury. If any alterations are made by the Tenant without the Landlord's written approval, then Tenant agrees to make the Landlord whole as if alterations had not been made, and Landlord may assess reasonable liquidated damages.

15. **EMINENT DOMAIN:** If the whole or any part of the premises hereby leased shall be taken by any public authority under the power of eminent domain, the term of this lease shall cease on the part so taken, from the day of possession of that part shall be required for any public purpose and the rent shall, paid up to that day and from the day the Tenant shall have the right either to cancel this Lease and declare the same null and void or to be continued in the possession of the remainder of the same under the terms

herein provided, except that the rent shall be reduced in proportion to the amount of the premise taken. All damages awarded for such taking shall belong to the property of the Landlord whether such damages shall be awarded as compensation for diminution in value to the leasehold or the fee of the premises herein leased.

16. **CARE OF PREMISES:** The Tenant shall not perform any acts or carry on any practices which may injure or damage the building and shall keep the premises under their control, clean and free from rubbish at all times, and it is further agreed that in the event the Tenant shall not comply with these provisions, the Landlord may enter upon said premises and have rubbish removed in which event the Tenant agrees to pay all charges that the Landlord shall pay for hauling rubbish. Said charges shall be paid to the Landlord by the Tenant as soon as a bill is presented to them and the Landlord shall have the same remedy as is provided in paragraph 3 of this Lease in the event of Tenants failure to pay. Furthermore, the Tenant shall at their own expense under penalty of the forfeiture and damages, promptly comply with all lawful laws, orders, regulations or ordinances of all municipal, county and state authorities affecting the premises hereby leased and the cleanliness, safety, occupation and use of same. The Landlord will deliver the building in condition for occupancy by the Tenant and in compliance with all existing municipal and state building codes and ordinances. The Landlord shall arrange for the maintenance of the premise, including lawn care and snow and ice removal.

The Landlord shall provide janitorial services by a contractor or employee(s) of their choice, for the benefit of the Tenant's leased premise. The Tenant shall contribute to the actual costs of janitorial services to the Landlord, for a minimum of 30 labor hours per week, at a reasonable hourly cost to be determined by the Landlord. This contribution is exclusive of the contribution of utility cost as noted herein. The Tenant shall reimburse the Landlord within 30 days of a billing notice by the Landlord. Janitorial services shall be assessed from September 1st to June 30th of each year. Janitorial services provided during the months of July and August of each year shall be assessed to the Tenant, based on the actual needs of the Tenant.

17. **CONTIGUOUS PROPERTY:** The Landlord shall not be responsible or liable to the Tenant for any loss or damage that may be occasioned by or through the acts or omissions of persons occupying any part of any premises adjacent to or connected with the premises hereby leased, or any part of the building which the leased premises are a part of for any loss or damage resulting to the Tenant of their property from bursting, stoppage or leaking of water, gas, sewer or steam pipes.

18. **RENEWAL:** This Lease Agreement shall be reviewed by both parties at the end of year three (3) for the purpose of continuation of this agreement, to the satisfaction of both parties. The tenure and any modification of the terms herein of any extension or renewal of this Lease Agreement shall be determined by the parties herein, at the time of the negotiated renewal. If a satisfactory review of the lease or tenancy herein cannot be ascertained at that time by either party, then this lease shall terminate at the end of five years (5) years or specifically at the end of the 60th month of this Lease Agreement, and notice of such shall be given to the Tenant by the Landlord, in writing, no later than 90 days after the end of the three year initial period of this Lease Agreement.

19. **HOLDING OVER:** It is hereby agreed that in the event the Tenant holds over after the termination of this lease, the Landlord acknowledges that the tenancy of the leased premises shall be from month to month in the absence of a written agreement to the contrary, not to exceed sixty (60) days from the end of this Lease Agreement or any renewal thereof.

20. **UTILITIES:** The Tenant shall be responsible for all utilities, including but not limited to electric, gas service, water and sewer, rubbish removal and snow removal services. The Tenant's responsibility for such utilities shall be incurred starting September 1st of each year and shall end June 30th of each year. No contribution of utilities on the part of Tenant shall occur from July 1st to August 31st. Landlord shall provide lawn care service and Tenant will not be responsible for reimbursement thereof. Tenant's contribution in the first year of occupancy shall be 50% of the Landlord's actual utility costs. Tenant shall reimburse the Landlord of said utilities within 30 days' notice to the Tenant. The contribution of costs of utilities shall be re-evaluated by the Landlord at the end of each annual anniversary date of this Lease Agreement.

The Tenant shall provide their own internet service and computer equipment for their exclusive use, independent of Landlord's internet and computer service, without expense or cost to the Landlord. The Landlord shall not be liable or responsible for any failure of the Tenant's computer equipment.

21. **ACCESS TO THE PREMISES:** The Landlord shall have the right to enter upon the exclusive office space of the Tenant upon twenty-four (24) hours notice for the purpose of inspecting the same. If the Landlord deems any repairs (except Landlord repairs) necessary, the Landlord may demand the Tenant make the same, and if the Tenant refuses or neglects forthwith to commence such repairs and complete the same with reasonable dispatch

the Landlord may make or cause to be made such repairs and shall not be responsible to the Tenant for any loss or damage that may accrue. If the Landlord makes or causes to be made such repairs, the Tenant agrees that they will forthwith on demand, pay to the Landlord the cost thereof.

22. **RE-ENTRY:** In case any rent shall be due and unpaid or if the default be made in any of the covenants herein contained, or if said leased premises shall be deserted or vacated, then it shall be lawful for the Landlord, its certain attorney, heirs, representatives and/or assigns, to re-enter into, re-possess the said leased premises and the Tenant and each and every demised premises for the term aforesaid.

23. **QUIET ENJOYMENT:** The Landlord covenants to the said Tenant, on payment of all the aforesaid installments and performing all the covenants aforesaid, shall and may peacefully and quietly have, hold and enjoy the said demised premises for the term aforesaid.

24. **EXPENSES-DAMAGES UPON RE-ENTRY:** In the event the Landlord shall, during the period covered by this lease, obtain possession of said premises by re-entry, summary proceedings, or otherwise, the Tenant hereby agrees to pay the Landlord the expenses incurred in obtaining possession of said premises, including reasonable attorney fees, and also all reasonable expenses and commissions which may be paid in and about the letting of the same and all other damages.

25. **REMEDIES NOT EXCLUSIVE:** It is agreed that each and every right, remedy and benefit provided by this Lease shall be cumulative, and shall not be exclusive of any other said rights, remedies and benefits, or any other rights, remedies or benefits allowed by law. In the event any covenant, provision and/or restriction is found by a court of competent jurisdiction to be unenforceable, such provision shall be modified, rewritten or interpreted as much of its nature and scope as will render it enforceable. In the event it cannot be so modified, rewritten or interpreted to be enforceable in any respect, it will not be given effect, and the remainder of this agreement shall be enforced as if such provision was not included.

26. **WAIVER:** One or more waivers of any covenant or condition by the Landlord shall not be construed as a waiver of a further breach of the same covenant or condition. The failure of any party at any time to require performance of any provision or resort to any remedy provided under the provisions of this agreement shall in no way affect the right of that party to require the performance or resort to a remedy anytime thereafter. A waiver

shall not be effective unless it is in writing and signed by the party against whom the waiver is being enforced.

27. **DELAY OF POSSESSION:** It is understood that if the Tenant shall be unable to enter into and occupy the premises hereby leased at the time above provided, by reason of the said premises not being ready for occupancy, or by the reason of the holding over of any previous occupant of said premises, or as a result of any cause or reason beyond the direct control of the Landlord, the Landlord shall not be liable in damages to the Tenant therefore, but during the period the Tenant shall be unable to occupy said premises as hereinbefore provided, the rents therefore shall be abated and the Landlord is to use reasonable discretion as to when the premises are ready for occupancy.

28. **NOTICES:** Whenever under this Lease a provision is made for notice of any kind, it shall be deemed sufficient notice and service thereof if such notice to the Tenant is in writing addressed to the Tenant at the last known Post Office address or at the Leased premises and deposited in the mail with postage prepaid, return requested or Federal Express certified upon receipt. Notice need be sent by certified mail to only one Tenant or Landlord where the Tenant or Landlord is more than one person. Any notice required to be given as noted in this Lease Agreement by the Tenant, shall be addressed to and directed to the Senior Pastor of the Landlord's church.

29. **SIGNAGE:** Any exterior signs required or requested by the Tenant, shall be approved in writing by the Landlord, before the installation of a sign, including placement of the sign, size and font of the sign. The Tenant shall be responsible for all costs associated with the installation, maintenance and removal of their sign, including all appropriate permit fees.

30 **SUCCESSORS AND ASSIGNS:** The covenants, conditions and agreements made and entered into by the parties hereto are declared binding on their respective heirs, successors, representatives or assigns.

31. **LEGAL APPROVAL:** This lease has been prepared by the Landlord or its authorized representation for submission to Tenant for approval. No representation or recommendation is made by the Landlord as to the legal sufficiency, legal effect or tax consequences of this Lease or the transaction relating thereto, and the parties shall rely solely upon the advice of their own legal counsel as to the legal and tax consequences of this Lease.

IN WITNESS WHEREOF, the parties have hereunto set their hands and seals this _____ day of _____, 2014. The undersigned warrant that they are the authorized and legal representatives of each party herein.

WITNESSED:

NAME: Vicki Kennedy

Tenant: **Livingston Christian Schools**, Theodore Nast, Principal

NAME: Keith Jones

Landlord: **Brighton Church of The Nazarene**, Ben Walls, Pastor

Dated: 11-25-14

Promissory Note and Acknowledgement

Whereas a lease agreement having been signed between the Brighton Church of the Nazarene and the Livingston Christian Schools, dated November 25, 2014, that for and in consideration of the pre-paid rent credit enumerated in paragraph 3 of the lease agreement, the parties hereto do hereby stipulate and agree to the following:

1. That Livingston Christian School does hereby acknowledge that the pre-paid rent credit of Fifty Thousand Dollars and 00/100 ($50,000) for labor and tile material to be donated by a Livingston Christian School family has not been provided and credited to the lease as prepaid rent. When the labor and tile material have been installed and provided, the Brighton Church of the Nazarene will provide Livingston Christian Schools with a receipt thereof.

2. That the pre-paid rent credit of Fifty Three Thousand Dollars and 00/100 ($53,000) to be paid to the Brighton Nazarene Church by a family attending the church, has not yet been paid to the church and has not yet been credited as pre-paid rent to the lease. When the payment is received, the Brighton Church of the Nazarene will provide Livingston Christian Schools with a receipt thereof.

3. That if either or both of the above referenced pre-paid rent credits are not received by the Brighton Church of the Nazarene on or before May 1, 2015, then Livingston Christian Schools shall forthwith provide the cash equivalent of the pre-paid rent credit(s) to the Brighton Church of the Nazarene on or before June 1, 2015.

4. That the Brighton Church of the Nazarene acknowledges receipt and payment of $67,000 by the Livingston Christian Schools, in cash as pre-paid rent credit of the lease dated November 25, 2014.

IN WITNESS WHEREOF, the parties have hereunto set their hands and seals this _____ day of _____, 2014. The undersigned warrant that they are the authorized and legal representatives of each party herein.

WITNESSED:

NAME: Vickie Kennedy

NAME: Keith Jones

Livingston Christian Schools,
Theodore Nast, Principal

Brighton Church of The
Nazarene, Ben Walls, Pastor

IMPACT ASSESSMENT
FOR
SITE PLAN PETITION
"LIVINGSTON CHRISTIAN SCHOOLS"
GENOA TOWNSHIP, LIVINGSTON COUNTY
MICHIGAN

Prepared for:

LIVINGSTON CHRISTIAN SCHOOLS
8877 MAIN ST
WHITMORE LAKE, MICHIGAN 48189
(734) 449-4715

Prepared by:

BOSS ENGINEERING COMPANY
3121 E. GRAND RIVER
HOWELL, MI 48843
(517) 546-4836

August 30, 2017
Revised: 9-20-17

17-315EIA

INTRODUCTION

The purpose of this Impact Assessment (IA) report is to show the effect that this proposed development may have on various factors in the general vicinity of the project. The format used for presentation of this report conforms to the *Submittal Requirements For Impact Assessment* guidelines in accordance with Section 18.07 of the published Zoning Ordinance for Genoa Township, Livingston County, Michigan.

DISCUSSION ITEMS

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

Prepared By :
Brent W. LaVanway, P.E.
BOSS ENGINEERING COMPANY
Civil Engineers, Land Surveyors, Landscape Architects and Planners
3121 E. Grand River
Howell, MI 48843
(517) 546-4836

Prepared For :
Livingston Christian Schools
Client
8877 Main St
Whitmore Lake, MI 48189
(734) 449-4715

B. Map(s) and written description / analysis of the project site including all existing structures, manmade facilities, and natural features. The analysis shall also include information for areas within 10 feet of the property. An aerial photograph or drawing may be used to delineate these areas.

The site is located on the north side of Brighton Road immediately west of the Worden Lake Woods development and slightly west of the entrance to Brighton High School. The subject property is currently the Brighton Nazarene Church Facility. There is the existing church building, parking lot, detention basin and parsonage. The north end of the property is heavily wooded. There are established tree row buffers on the east and west property lines. The subject property and both adjacent properties are zoned Suburban Residential (SR). The Brighton Nazarene Church also owns the contiguous parcel to the north.

C. Impact on natural features: A written description of the environmental characteristics of the site prior to development and following development, i.e., topography, soils, wildlife, woodlands, mature trees (eight inch caliper or greater), wetlands, drainage, lakes, streams, creeks or ponds. Documentation by a qualified wetland specialist shall be required wherever the Township determines that there is a potential regulated wetland. Reduced copies of the Existing Conditions Map(s) or aerial photographs may accompany written material.

The total site area is 16.43 acres. The front (south) portion of the site is the existing Church facility, associated parking lot, detention basin and parsonage. The developed site slopes south toward Brighton Road and the remainder of the site slopes north toward Worden Lake. The undeveloped portion of the site is predominantly wooded with the north end of the parcel terminating at Worden Lake. The USDA Soil Conservation Service soil classification for the site is Boyer-Oshtemo Loamy Sand.

There are no new buildings and parking improvements are proposed but minimal and will cause the removal of some parking lot trees (2 trees being removed).

D. Impact on storm water management: Description of measures to control soil erosion and sedimentation during grading and construction operations and until a permanent ground cover is established. Recommendations for such measures may be obtained from County Soil Conservation Service.

Since this project is unique in the fact that the school is moving into an already existing structure, no storm water management is being proposed. The site as a whole currently manages storm water through existing catch basins and pipes that discharge into an existing detention basin located towards the front of the site. Although, construction on site will be minimal soil erosion control measures will still be needed to ensure soil is not leaving the site.

At the time of construction of the parking lot improvements, there may be some temporary dust, noise, vibration and smoke, but these conditions will be of relatively short duration and shall be controlled by applying appropriate procedures to minimize the effects, such as watering if necessary for dust control.

The Site Plan documents show the proposed locations of all site improvements along with detailed soil erosion control information.

E. Impact on surrounding land use: Description of the types of proposed uses and other man made facilities, including any project phasing, and an indication of how the proposed use conforms or conflicts with existing and potential development patterns. A description shall be provided of any increases of light, noise or air pollution which could negatively impact adjacent properties.

As previously stated the site is the current home of the Brighton Nazarene Church. During the school year a portion of the Church is proposed to be occupied by the Livingston Christian School (LCS).

There will be no increase in light or air pollution. There may be some increased noise during school drop-off and pick-up times which, are very brief periods in the morning and afternoon.

F. Impact on public facilities and services: Description of number of expected residents, employees, visitors, or patrons, and the anticipated impact on public schools, police protection and fire protection. Letters from the appropriate agencies may be provided, as appropriate.

The current use of the facility is for Sunday Church services however additional activities take place throughout the week. These activities vary from small group meetings to additional worship services. Typically these occur during off peak traffic hours thus do not significantly impact the traffic on Brighton Road. The site is serviced by public water and a septic system. The public water is provided by the City of Brighton. The septic system is under the jurisdiction of the Livingston County Health Department.

LCS is proposing to occupy a portion of the Church during the school year as a private Christian School. The hours of operation have been scheduled to minimize traffic impacts on Brighton Rd. For this submittal an enrollment of 200 students was used however, the current enrollment numbers are less than 200 students.

There will be minimal impact on Brighton Area Schools and very minimal impact on the police and fire departments.

G. Impact on public utilities: Description of the method to be used to service the development with water and sanitary sewer facilities, the method to be used to control drainage on the site and from the site, including runoff control during periods of construction. For sites service with sanitary sewer, calculations for pre- and post development flows shall be provided in equivalents to a single family home. Where septic systems are proposed, documentation or permits from the Livingston County Health Department shall be provided.

The development is currently served by both public water and septic system. With regards to storm water management, the project will be required to meet all local, county, and state storm water and erosion control requirements. No modification of the detention basin near Brighton Rd is needed based upon minimal changes to the site. All of the existing information is included in the Site Plan documents.

H. Storage or handling of any hazardous materials: Description of any hazardous substances expected to be used, stored or disposed of on the site. The information shall describe the type of materials, location within the site and method of containment. Documentation of compliance with federal and state requirements, and a Pollution Incident Prevention Plan (PIPP) shall be submitted, as appropriate.

There will be no hazardous materials used or disposed of on this site.

I. Impact on traffic and pedestrians: A description of the traffic volumes to be generated based on national reference documents, such as the most recent edition of the Institute of Transportation Engineers Trip Generation Manual, other published studies or actual counts of similar uses in Michigan.

Please see the revised Site Access and Circulation Evaluation prepared by Fleis & Vandenbrink (Appendix A).

J. A detailed traffic impact study shall be submitted for any site over ten (10) acres in size which would be expected to generate 100 directional vehicle trips (i.e. 100 inbound or 100 outbound trips) during the peak hour of traffic of the generator or on the adjacent streets.

Prior analysis has been completed by the Livingston County Road Commission and Fleis & Vandenbrink have more recently provided an updated Site Access and Circulation Evaluation dated 9-19-17 (see Appendix A).

K. Special Provisions: General description of any deed restrictions, protective covenants, master deed or association bylaws.

The School requires a Special Use Permit to operate in a residentially zoned district.

L. A list of all sources shall be provided.

Genoa Township's *Submittal Requirements For Impact Assessment*

Genoa Township Zoning Ordinances

Soil Survey of Livingston County, Michigan, U.S.D.A. Soil Conservation Service

National Wetland Inventory Plan, United States Department of the Interior, Fish and Wildlife Service

APPENDIX A

FLEIS&VANDENBRINK
DESIGN. BUILD. OPERATE.

Memo

VIA EMAIL

To: Mr. Robert Wiegand
Livingston Christian Schools

From: Michael J. Labadie, PE
Steven J. Russo, PE
Fleis & VandenBrink

Date: September 19, 2017

Re: Livingston Christian School
Genoa Township, Michigan
Site Access and Circulation Evaluation

Introduction

This memorandum presents the results of the site access and circulation evaluation for the proposed Livingston Christian School (LCS) in Genoa Township, Michigan. The project site is located on the north side of Brighton Road approximately 300 feet west of the signalized Brighton High School driveway and is currently occupied by the Brighton Nazarene Church. The proposed development plans include the addition of a school which will occupy a portion of the existing Church. Site access is currently provided via a single site driveway to Brighton Road and is not proposed to change as part of the development plans. The school is expected to open in 2017 and will have a maximum enrollment of 200 students. The Township has requested a site access and circulation evaluation to analyze future operations of the site driveway to Brighton Road and on-site operations.

The scope of this study was developed to address the traffic related impacts of the school addition and provide recommendations for any road improvements and/or traffic management plans that would be required to mitigate any traffic impacts. Additionally, F&V provided analysis and recommendations for on-site traffic circulation to adequately accommodate parent pick-up / drop-off activities. This study was conducted in accordance with accepted traffic engineering practice to provide information and recommendations to LCS and address concerns of Genoa Township and the Livingston County Road Commission (LCRC).

Data Collection

The proposed LCS start time is 8:00 AM and the dismissal time is 3:00 PM for all grades. These times will provide a minimum 30 minute separation between the start and end times of the nearby Brighton High School (7:25 AM to 2:25 PM), Maltby Middle School (8:30 AM to 3:31 PM), and Hornung Elementary School (8:47 AM to 3:50 PM). Therefore, the analysis for this study focuses on the AM student arrival hour (7:15 AM to 8:15 AM) and the PM student dismissal hour (2:30 PM to 3:30 PM), when traffic volumes generated by the school are at their peaks.

The existing weekday turning movement traffic volume data were collected on Wednesday, May 13, 2015. Intersection turning movement counts were collected during the weekday AM (7:00 AM to 8:30 AM) and PM (2:00 PM to 4:00 PM) peak periods that coincide with the proposed arrival and dismissal times. This data was collected during a non-holiday week while schools were in session and was used as a baseline to establish existing traffic conditions without the proposed development.

Schools typically experience strong peaking characteristics with 80% or more of school related traffic arriving and departing within a peak 30 minute period. As the proposed school start and end times provide a

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P: 248.536.0080

minimum 30 minute separation from the neighboring Brighton High School, the peak hour volumes from 7:30 AM to 8:30 AM and 2:45 PM to 3:45 PM were utilized for this study as the peak 30 minute periods for the proposed LCS and Brighton High School will not coincide. These volumes were agreed upon and approved for use by LCRC.

Additionally, due to the proximity of the site driveway to the signalized intersection of Brighton Road & Brighton High School Drive, this intersection was also included in the analysis for simulation purposes only as vehicle queues from this intersection could have adverse impacts on site driveway operations and the signal may help to facilitate gaps along Brighton Road. Turning movement count data collected on Wednesday, May 13, 2015 was also utilized for this intersection. The resulting existing traffic volumes are summarized on the attached Figure 2.

Peak Hour Factors (PHFs) at the study intersections were also calculated based on the requirements of MDOT's *Electronic Traffic Control Device Guidelines.* Typically PHFs are calculated by approach and PHFs less than 0.60 and greater than 0.95 should not be utilized; however, given the subject site is a school with strong peaking characteristics, PHFs were calculated by movement at the study site driveway and a PHF of 0.4 was used for all movements in and out of the site driveway consistent with the peaking characteristics of other schools in southeast Michigan. A default PHF of 0.92 was utilized for through traffic along Brighton Road which was agreed upon and approved by LCRC.

Background Conditions

Historical traffic volumes from LCRC on Brighton Road adjacent to the site were reviewed to calculate an applicable growth rate for the existing traffic volumes to the projected maximum enrollment year of 2019. The historical traffic volumes indicate that traffic volumes along Brighton Road between 2010 and 2017 have experienced periods of growth and decline, but overall have remained stagnant in the seven year period. Therefore, background traffic conditions ***without the proposed school*** are assumed to be equal to existing conditions.

In addition to background traffic growth, it is important to account for traffic that will be generated by developments within the vicinity of the study area that have yet to be constructed or are currently under construction. At the time of this study, no background developments were identified within the study area.

Site Trip Generation

The number of AM and PM peak hour trips that would be generated by the proposed school was forecast based on existing trip generation and student enrollment information provided by LCS. The existing trip generation information was then extrapolated to the future maximum enrollment of 200 students. The resulting trip generation forecast is summarized in Table 1 and is broken down by driver type. The existing trip generation information is also attached to this memorandum.

Table 1: Site Trip Generation

Land Use	Amount	Units	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Livingston Christian School	**200**	**Students**	**131**	**101**	**232**	**101**	**125**	**226**
Parents			*101*	*101*	*202*	*101*	*101*	*202*
Student Drivers			*17*	*0*	*17*	*0*	*17*	*17*
Staff			*13*	*0*	*13*	*0*	*7*	*7*

The peak hour site generated trips shown in Table 1 were assigned to the adjacent road network based on address information for current LCS families provided by LCS. This information indicates the site trip distribution summarized in Table 2.

Table 2: Site Trip Distribution

To / From	via	AM / PM
East	Brighton Road	35%
West	Brighton Road	65%
		100%

The site generated trips are shown on Figure 3 and were added to the existing traffic volumes shown on Figure 2 to calculate the future peak hour traffic volumes shown on Figure 4.

Future Conditions

Future peak hour vehicle delays and LOS ***with the proposed school*** were calculated based on the existing lane use and traffic control, the proposed site access, the future traffic volumes, and the methodologies presented in the *Highway Capacity Manual, 6th Edition* (HCM6). Typically, LOS D is considered acceptable, with LOS A representing minimal delay, and LOS F indicating failing conditions. The results of the analysis of future conditions are attached and are summarized in Table 3.

Table 3: Future Intersection Operations

			AM Peak		PM Peak	
Intersection	Control	Approach	Delay (s/veh)	LOS	Delay (s/veh)	LOS
1. Brighton Road & Site Drive	STOP (Minor)	EB LT	9.1	A	10.3	B
		WB	Free		Free	
		SB	88.5	F	28.3	D

The future conditions results indicate that the STOP controlled egress left turn movement from the site driveway to eastbound Brighton Road will operate at a LOS F and E during the AM and PM peak hours, respectively. However, the HCM analysis does not take into account the effects of upstream signalized intersections. Therefore, SimTraffic simulations were utilized to further evaluate network operations including the effects of the signalized Brighton High School driveway on the site driveway operations.

Review of the SimTraffic network simulations indicates acceptable traffic operations during both peak hours and significant vehicle queues are not observed. The signalized Brighton High School driveway helps to provide gaps in the Brighton Road traffic stream to facilitate egress left turns. 95th percentile queue lengths for the STOP controlled site driveway approach based on SimTraffic simulations are calculated to be 51 feet (2 vehicles) and 153 feet (6 vehicles) during the AM and PM peak hours, respectively, which is not significant and will not extend back into the pick-up / drop-off area. Therefore, no improvements are recommended for the existing site driveway to Brighton Road.

On-Site Facilities

In order to accommodate school traffic volumes on-site, proper vehicle facilities must be provided for pick-up / drop-off activities. Providing the necessary on-site operations minimizes the impact to adjacent off-site traffic operations. The recommended site access for pick-up / drop-off facilities are summarized below.

Pick-Up / Drop-Off Area

Data collected by F&V staff for previous school studies indicate that 80% of AM peak hour traffic typically arrives in a peak 20 minute period and 70% of PM peak hour traffic typically arrives in a peak 30 minute period. During the AM peak period a minimum of 85 feet of on-site loading space should be provided, based on an average drop-off rate of 45 seconds per vehicle. During the PM peak period, a minimum of 365 feet of on-site loading space should be provided, based on an average pick-up rate of 5.5 minutes per vehicle.

In order to accommodate pick-up and drop-off activities, 265 feet of on-site loading space should be provided. Based on the most recent site plan, the pick-up / drop-off zone should be striped along the entire length of the east side of the building extending from the canopy to the rear of the school.

The pick-up / drop-off loading area should be designed with a one-way counterclockwise circulation with a width of 24 feet. This design will provide for student loading on the passenger side of the vehicle and allow for vehicle passing in the loading zone with minimal vehicle-pedestrian conflicts. Parents should be instructed to pull into the next available space in the pick-up / drop-off area and park along the curb while the child enters / exits the vehicle. Once loading is complete the parent can then pull away from the curb and use the drive lane to exit the site.

Additionally, the pick-up / drop zone should be physically separated from the adjacent parking lot to prevent vehicles from entering or exiting the loading zone early. To achieve this, it is recommended that the parking

layout east of the building be reconfigured to have the parking aisles run parallel with the building. With this reconfiguration the row of parking directly adjacent to the student pick-up / drop-off zone should be configured with angle parking along the one way drive aisle.

It is important that parents do not wait in line to pick-up / drop-off their child at the front door. This will result in poor traffic operations and long vehicle queues which will spill out of the site onto adjacent streets.

Conclusions

1. Turning movement count data collected on May 15, 2015 was utilized for this study. The analysis periods were identified to be from 7:30 AM to 8:30 AM and 2:45 PM to 3:45 PM.
2. Based on historical traffic volumes along the study section of Brighton Road obtained from the LCRC traffic count database, traffic volumes have remained stagnant between 2010 and 2017. Therefore, background conditions ***without the proposed school*** were assumed equal to existing conditions.
3. The proposed school at maximum enrollment is projected to generate 232 AM peak hour trips (131 inbound and 101 outbound) and 226 PM peak hour trips (101 inbound and 125 outbound).
4. The STOP controlled egress left turn movement from the site driveway to Brighton Road will operate at a LOS F and E during the AM and PM peak hours, respectively.
5. Review of the SimTraffic network simulations indicates acceptable traffic operations during both peak hours and significant vehicle queues are not observed. The signalized Brighton High School driveway helps to provide gaps in the Brighton Road traffic stream to facilitate egress left turns. 95th percentile queue lengths for the STOP controlled site driveway approach are calculated to be 51 feet (2 vehicles) and 153 feet (6 vehicles) during the AM and PM peak hours, respectively, which is not significant and will not extend back into the pick-up / drop-off area.

Recommendations

1. Create a one-way counter-clockwise vehicle circulation loop for student drop-off / pick-up activities, extending from the canopy to the rear of the school. A minimum of 265 feet of on-site loading space should be provided for the pick-up / drop-off area.
2. Physically separate the pick-up / drop-off zone to prevent vehicles from entering or exiting the loading zone early.
3. Reconfigure the parking layout east of the building to have all parking aisles run parallel with the building.

Additionally, the following should be encouraged to improve use of the student loading facilities:

4. Site circulation instructions should be distributed to the parents prior to the start of school each year and/or when changes are made in the operation.
5. Allocate staff to direct drivers in the loading zones and encourage efficient entrance/exiting procedures.
6. An informational meeting should be considered to distribute a pamphlet and discuss with parents and staff outlining the curb loading zones, circulation pattern, proposed traffic operations and parking restrictions.
7. Students should enter/exit their parent's vehicles only on the passenger side.

Any questions related to this memorandum, study, analyses, and results should be addressed to Fleis & VandenBrink.

Attached: Figure 1 – 4
Traffic Volume Data
Trip Generation Data
Synchro / SimTraffic Results

SJR:mjl

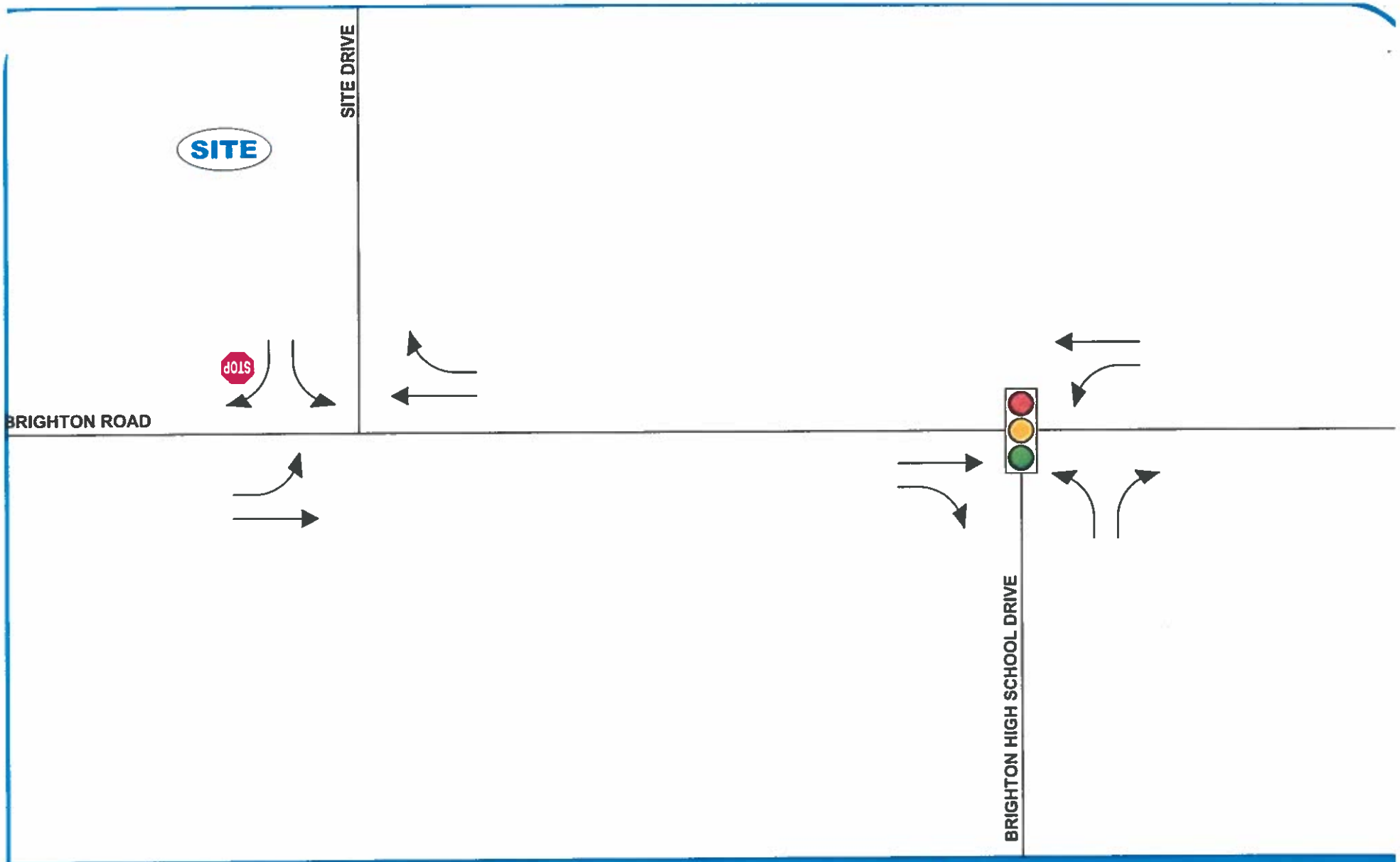


FIGURE 1
LANE USE AND TRAFFIC CONTROL

LIVINGSTON CHRISTIAN SCHOOL - GENOA TOWNSHIP, MI

LEGEND

- SIGNALIZED INTERSECTION
- UNSIGNALIZED INTERSECTION
- ROADS
- LANE USE

NORTH

SCALE: NOT TO SCALE

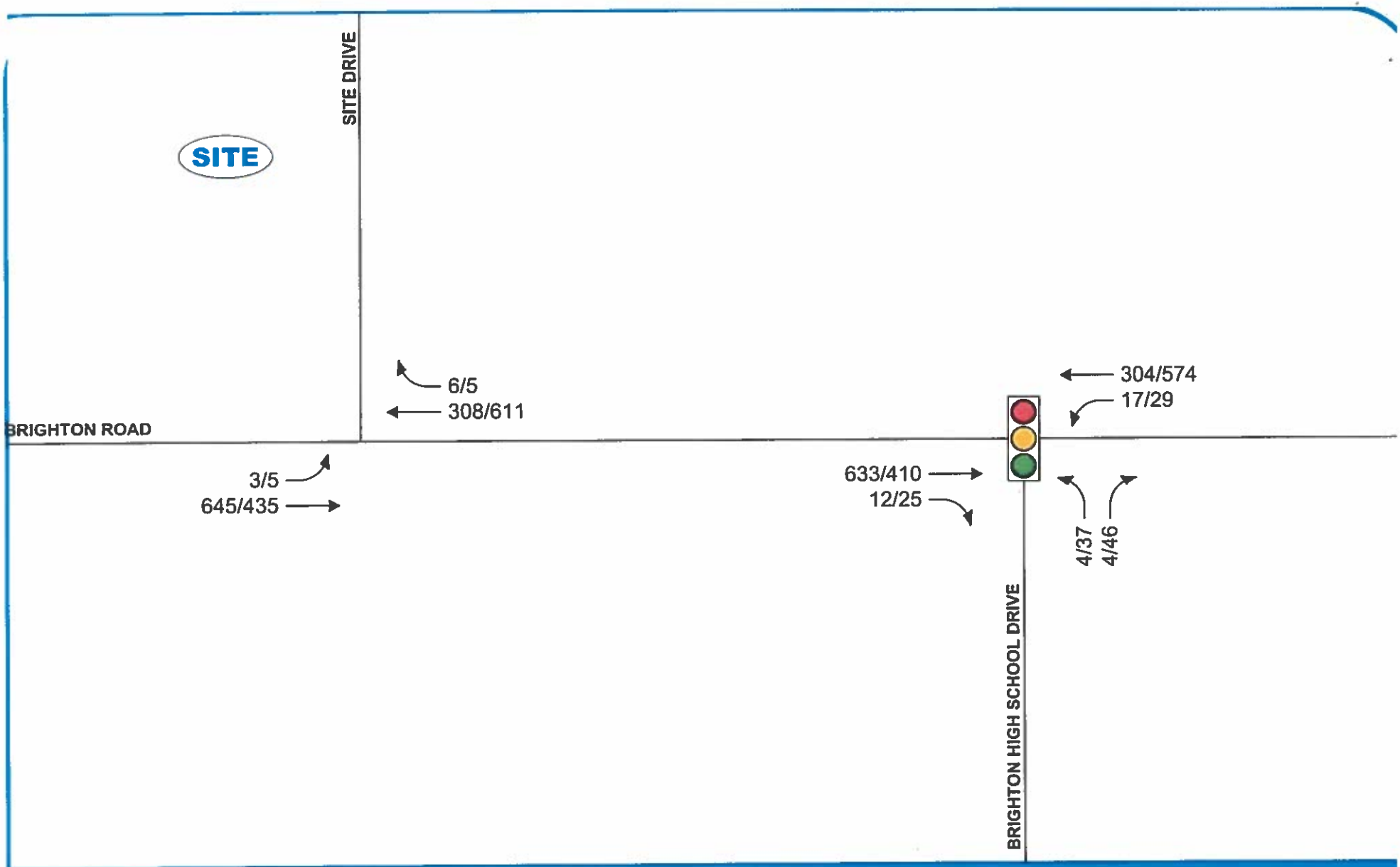


FIGURE 2
EXISTING TRAFFIC VOLUMES

LIVINGSTON CHRISTIAN SCHOOL - GENOA TOWNSHIP, MI

LEGEND

- SIGNALIZED INTERSECTION
- UNSIGNALIZED INTERSECTION
- TRAFFIC VOLUMES (AM/PM)
- ROADS

NORTH

SCALE: NOT TO SCALE

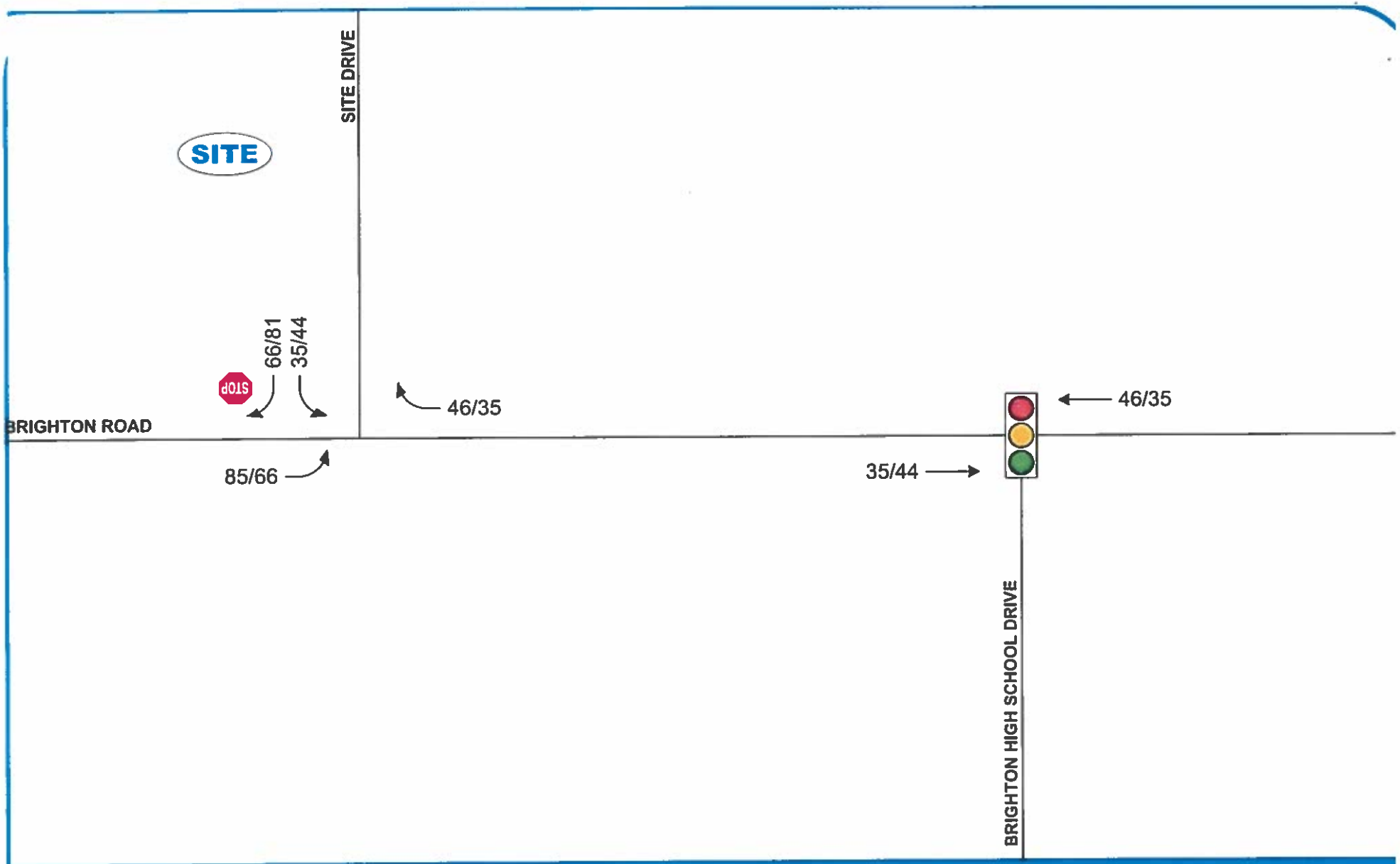


FIGURE 3
SITE-GENERATED TRAFFIC VOLUMES

LIVINGSTON CHRISTIAN SCHOOL - GENOA TOWNSHIP, MI

LEGEND

- SIGNALIZED INTERSECTION
- UNSIGNALIZED INTERSECTION
- TRAFFIC VOLUMES (AM/PM)
- ROADS

NORTH

SCALE: NOT TO SCALE

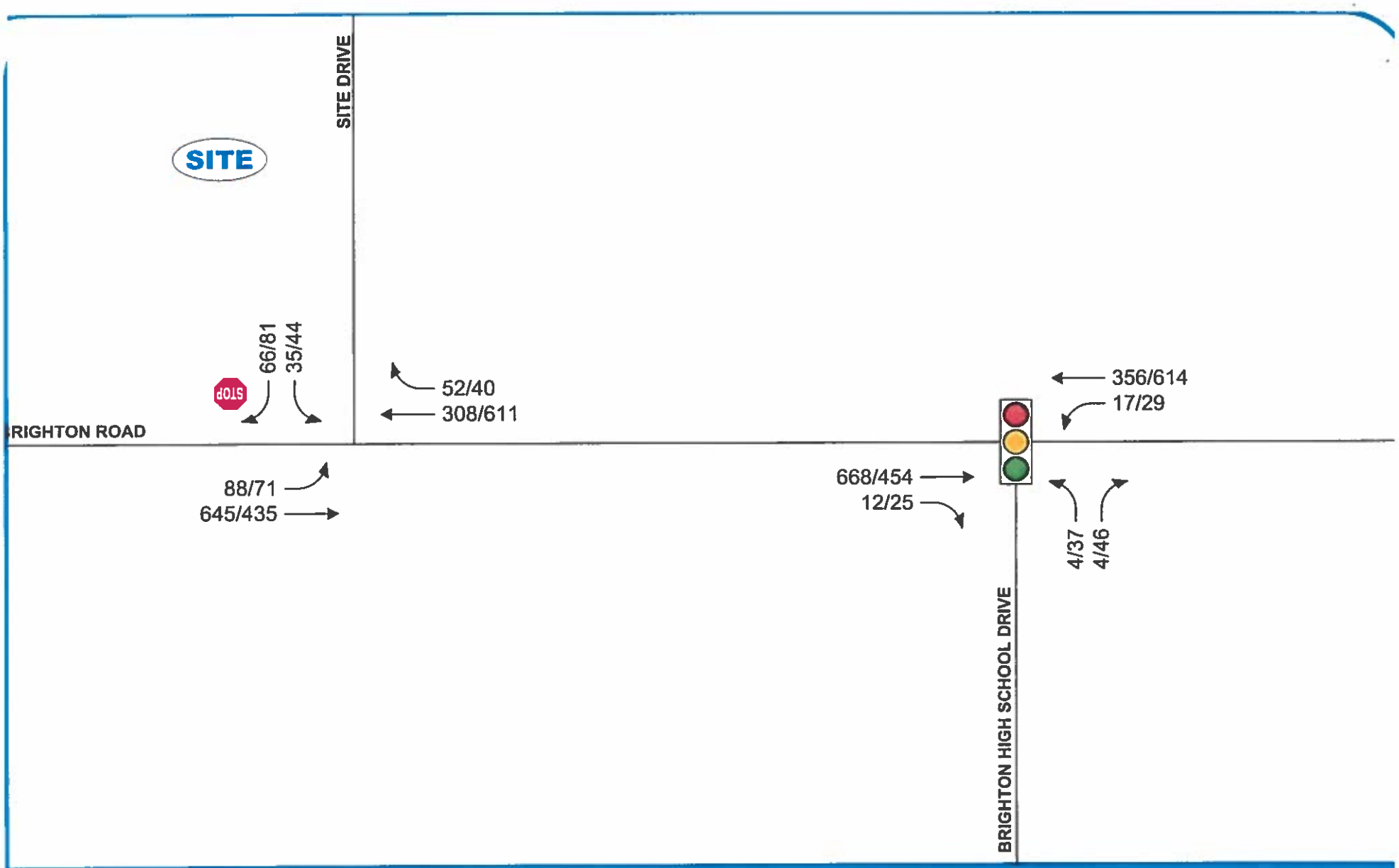


FIGURE 4
FUTURE TRAFFIC VOLUMES

LIVINGSTON CHRISTIAN SCHOOL - GENOA TOWNSHIP, MI

LEGEND

- SIGNALIZED INTERSECTION
- UNSIGNALIZED INTERSECTION
- TRAFFIC VOLUMES (AM/PM)
- ROADS

NORTH

SCALE: NOT TO SCALE

Traffic Counts Taken Wednesday, May 13, 2015
Brighton Road/Nazarene Church

	Westbound	Eastbound	Right Turn	Left Turn
2:00-2:15	55	68	3	1
2:15-2:30	92	85	4	5
2:30-2:45	238	75	3	2
2:45-3:00	130	104	3	3
3:00-3:15	124	104	2	2
3:15-3:30	153	79	0	0
3:30-3:45	167	148	0	1
3:45-4:00	150	116	0	1

Traffic Counts Taken Wednesday, May 13, 2015
Brighton Road/Nazarene Church

	Westbound	Eastbound	Right Turn	Left Turn
7:00-7:15	45	333	1	
7:15-7:30	62	193		
7:30-7:45	67	110	1	2
7:45-8:00	73	137	3	
8:00-8:15	101	151	1	
8:15-8:30	67	247	1	1

Traffic Counts Taken Wednesday, May 13, 2015
Brighton Road/High School

	Westbound	Eastbound	Brighton Rd Right Turn	Brighton Rd Left Turn
7:00-7:15	26	159	112	175
7:15-7:30	49	117	75	47
7:30-7:45	52	109	2	2
7:45-8:00	68	142	0	2
8:00-8:15	91	143	3	6
8:15-8:30	64	219	7	7

	High School Right Turn	High School Left Turn
7:00-7:15	9	8
7:15-7:30	2	16
7:30-7:45	2	0
7:45-8:00	0	1
8:00-8:15	0	0
8:15-8:30	2	3

Traffic Counts Taken Wednesday, May 13, 2015
Brighton Road/High School

	Westbound	Eastbound	Brighton Rd Right Turn	Brighton Rd Left Turn
2:00-2:15	93	78	5	5
2:15-2:30	65	84	6	84
2:30-2:45	167	73	11	13
2:45-3:00	127	85	8	7
3:00-3:15	138	100	10	10
3:15-3:30	162	86	4	6
3:30-3:45	152	124	3	6
3:45-4:00	183	137	6	7

	High School Right Turn	High School Left Turn
2:00-2:15	3	5
2:15-2:30	20	3
2:30-2:45	168	124
2:45-3:00	19	15
3:00-3:15	8	12
3:15-3:30	9	6
3:30-3:45	10	4
3:45-4:00	3	1

2014-2015 (140 +/- Students)

A.M. Arrivals/Dropoff	
Parent/Carpool	71
Student Drivers	12
Staff	18 (50% during peak hour)
	101 Total Vehicles arriving
	71 Vehicles Exiting

P.M. Pickup	
Parent/Carpool	71
Student Drivers	12
Staff	18 (25% during peak hour)
	101 Total Vehicles exiting
	71 Vehicles arriving

Level of Service Criteria for Stop Sign Controlled Intersections

The level of service criteria are given in Table 17-2. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in queue.

The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. . . .

Exhibit 17-2. Level of Service Criteria for TWSC Intersections

LEVEL OF SERVICE	AVERAGE CONTROL DELAY (sec/veh)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Average total delay less than 10 sec/veh is defined as Level of Service (LOS) A. Follow-up times of less than 5 sec have been measured when there is no conflicting traffic for a minor street movement, so control delays of less than 10 sec/veh are appropriate for low flow conditions. To remain consistent with the AWSC intersection analysis procedure described later in this chapter, a total delay of 50 sec/veh is assumed as the break point between LOS E and F.

The proposed level of service criteria for TWSC intersections are somewhat different from the criteria used in Chapter 16 for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, several driver behavior considerations combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, where drivers on the minor approaches to unsignalized intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized than signalized intersections. For these reasons, it is considered that the total delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection. . . .

LOS F exists when there are insufficient gaps of suitable size to allow a side street demand to cross safely through a major street traffic stream. This level of service is generally evident from extremely long total delays experienced by side street traffic and by queueing on the minor approaches. The method, however, is based on a constant critical gap size - that is, the critical gap remains constant, no matter how long the side street motorist waits. LOS F may also appear in the form of side street vehicles' selecting smaller-than-usual gaps. In such cases, safety may be a problem and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior. The latter is more difficult to observe on the field than queueing, which is more obvious.

Source: Highway Capacity Manual, 2010. Transportation Research Board, National Research Council

Level of Service for Signalized Intersections

Level of service for signalized intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average stopped delay per vehicle for a 15-min analysis period. The criteria are given in Exhibit 16-2. Delay may be measured in the field or estimated using procedures presented later in this chapter. Delay is a complex measure and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the *v/c* ratio for the lane group in question.

LOS A describes operations with very low delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

LOS B describes operations with delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.

Exhibit 16-2. Level-of-Service Criteria for Signalized Intersections

LEVEL OF SERVICE	STOPPED DELAY PER VEHICLE (SEC)
A	≤10.0
B	> 10.0 and ≤20.0
C	> 20.0 and ≤ 35.0
D	> 35.0 and ≤ 55.0
E	> 55.0 and ≤ 80.0
F	>80.0

LOS C describes operations with delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

LOS D describes operations with delay greater than 35 and up to 55 sec per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high *v/c* ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

LOS E describes operations with delay greater than 55 and up to 80 sec per vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high *v/c* ratios. Individual cycle failures are frequent occurrences.

LOS F describes operations with delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high *v/c* ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Source: Highway Capacity Manual, 2010. Transportation Research Board, National Research Council

Intersection						
Int Delay, s/veh	14.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	88	645	308	52	35	66
Future Vol, veh/h	88	645	308	52	35	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	25	60	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	40	92	92	40	40	40
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	220	701	335	130	88	165

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	465	0	-	0	1476	335
Stage 1	-	-	-	-	335	-
Stage 2	-	-	-	-	1141	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1107	-	-	-	140	712
Stage 1	-	-	-	-	729	-
Stage 2	-	-	-	-	307	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1107	-	-	-	112	712
Mov Cap-2 Maneuver	-	-	-	-	~ 78	-
Stage 1	-	-	-	-	584	-
Stage 2	-	-	-	-	307	-

Approach	EB	WB	SB
HCM Control Delay, s	2.2	0	88.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1107	-	-	-	78	712
HCM Lane V/C Ratio	0.199	-	-	-	1.122	0.232
HCM Control Delay (s)	9.1	-	-	-	233.6	11.6
HCM Lane LOS	A	-	-	-	F	B
HCM 95th %tile Q(veh)	0.7	-	-	-	6.4	0.9

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	71	435	611	40	43	79
Future Vol, veh/h	71	435	611	40	43	79
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	25	60	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	40	92	92	40	40	40
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	178	473	664	100	108	198

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	764	0	-	0	1493	664
Stage 1	-	-	-	-	664	-
Stage 2	-	-	-	-	829	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	858	-	-	-	137	464
Stage 1	-	-	-	-	516	-
Stage 2	-	-	-	-	432	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	858	-	-	-	109	464
Mov Cap-2 Maneuver	-	-	-	-	189	-
Stage 1	-	-	-	-	409	-
Stage 2	-	-	-	-	432	-

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	28.3
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	858	-	-	-	189	464
HCM Lane V/C Ratio	0.207	-	-	-	0.569	0.426
HCM Control Delay (s)	10.3	-	-	-	46.6	18.4
HCM Lane LOS	B	-	-	-	E	C
HCM 95th %tile Q(veh)	0.8	-	-	-	3	2.1

Intersection: 1: Brighton Road & Site Drive

Movement	EB	WB	WB	SB	SB
Directions Served	L	T	R	L	R
Maximum Queue (ft)	65	6	28	65	66
Average Queue (ft)	18	0	2	19	21
95th Queue (ft)	49	4	12	51	47
Link Distance (ft)		284			540
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200		25	60	
Storage Blk Time (%)		0	0	2	0
Queuing Penalty (veh)		0	0	2	0

Zone Summary

Zone wide Queuing Penalty: 3

Intersection: 1: Brighton Road & Site Drive

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	88	25	105	257
Average Queue (ft)	22	1	32	49
95th Queue (ft)	59	12	90	153
Link Distance (ft)				570
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	200	25	60	
Storage Blk Time (%)		0	13	3
Queuing Penalty (veh)		0	22	3

Zone Summary

Zone wide Queuing Penalty: 26

SITE PLAN
FOR
LIVINGSTON CHRISTIAN SCHOOLS
PART OF SE 1/4 SEC. 25, T.2N., R.5E.
GENOA TOWNSHIP, LIVINGSTON COUNTY, MI

LOCATION MAP
NO SCALE

PROPERTY DESCRIPTION:

A part of the SE 1/4 of Section 25. T2N–R5E thence N 89°08'13" E 663.28 feet to Point of Beginning, thence continue E 331.64 feet, thence N 01°21'30" W 1341.53 feet, thence S 89°03'20" E 332.74 feet, thence S 01°24'19" E 1341.56 feet to Point of Beginning and also Section 25, T2N–R5E Beginning at the SE 1/4 corner, thence N 01° W 1340.63 feet thence N 89° E 823.63 feet to Point of Beginning, thence N 01° W 891.73 feet, thence N 88° E 400.81 feet, thence S 01° E 893.61 feet, thence S 89° W 400.83 feet to Point of Beginning, containing 16.43 acres, more or less split on 01/23/2012 with 4711–25–400–027 into 4711–25–400–058

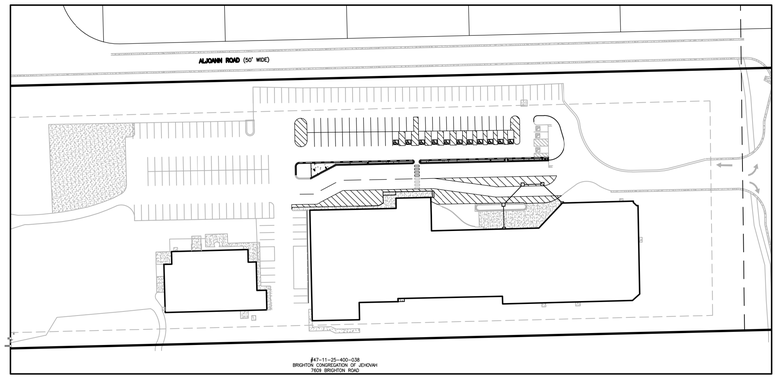
CONSTRUCTION NOTES

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.



N

OVERALL SITE MAP
NO SCALE

SHEET INDEX

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	EXISTING CONDITIONS/DEMOLITION PLAN
3	SITE/TRAFFIC CIRCULATION PLAN
4	GRADING & SEC PLAN
5	UTILITY PLAN
6	LANDSCAPE & LIGHTING PLAN (NO NEW LIGHTING PROPOSED PHOTOMETRIC PLAN NOT INCLUDED)

*THERE ARE NO ARCHITECTURAL DRAWINGS AS THERE ARE NO BUILDING IMPROVEMENTS PROPOSED

LIVINGSTON CHRISTIAN SCHOOLS
PREPARED FOR:

LIVINGSTON CHRISTIAN SCHOOLS
8877 WHITMORE LAKE RD
WHITMORE LAKE, MI 48189
CONTACT: ROBERT WIEGAND
(734) 878-9818

PREPARED BY:

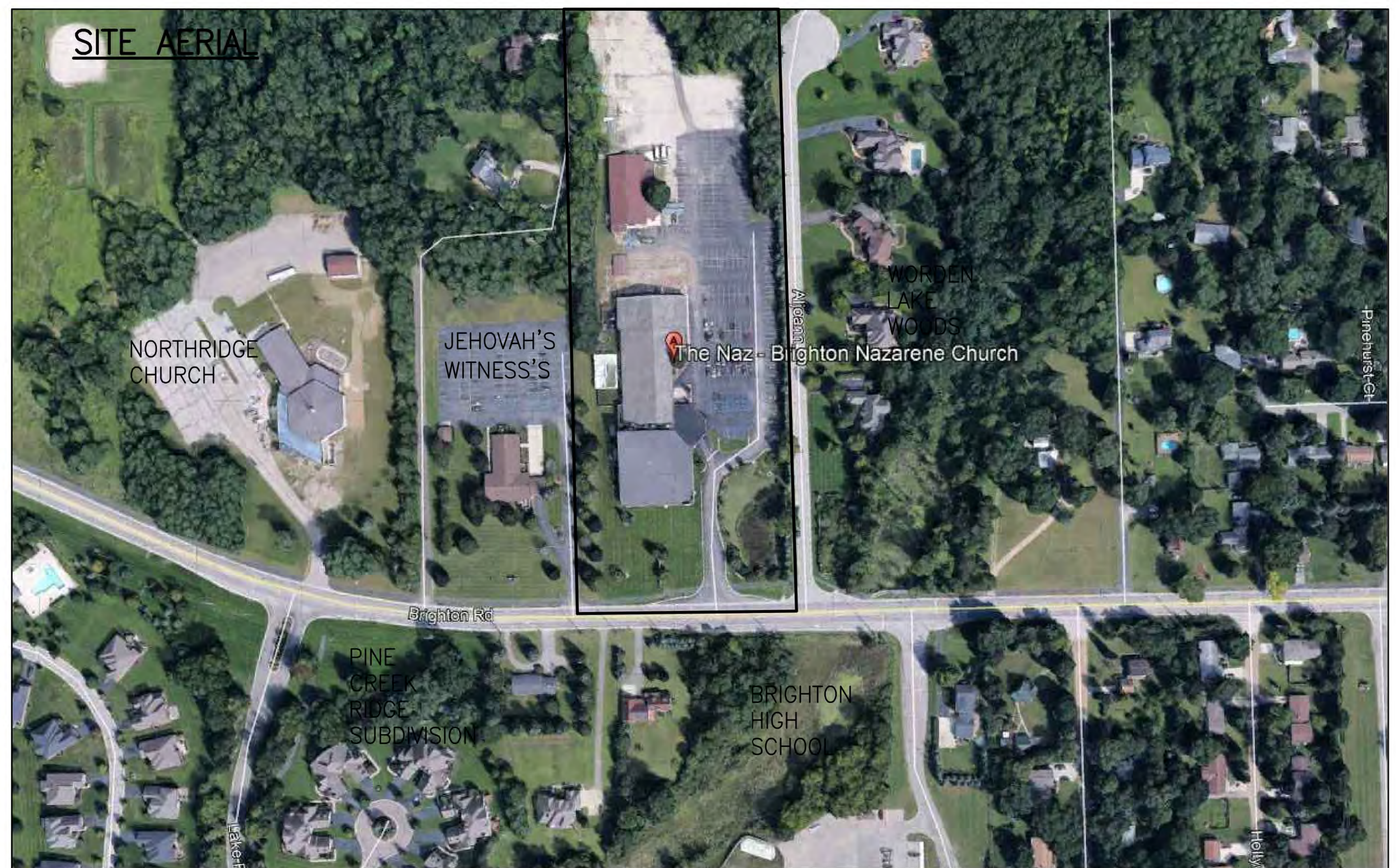
BOSS ENGINEERING
ENGINEERS • SURVEYORS • PLANNERS
LANDSCAPE ARCHITECTS
(E-MAIL: be@bosseng.com)
3121 E. GRAND RIVER AVE.
HOWELL, MI. 48843
(800) 246-6735 FAX (517) 548-1670

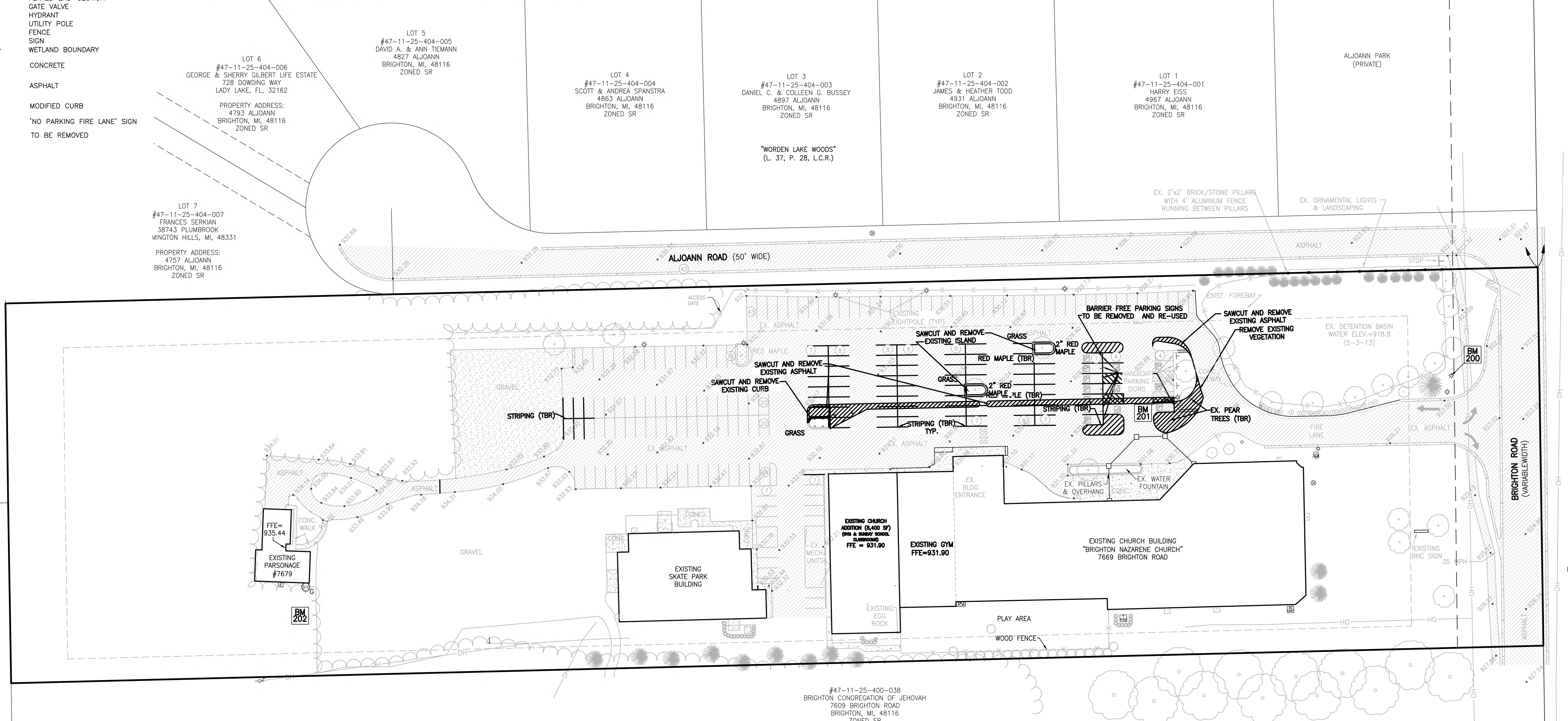
NO	BY	CK	REVISION	DATE	JOB NO. 17-315
1	CH	CK	PER TOWNSHIP REVIEW	9-20-17	ISSUE DATE: 8/30/17

1

LEGEND

PROPOSED (PR)	EXISTING (EX)	
FF	FF	FINISHED FLOOR ELEVATION
FG	FG	FINISHED GRADE ELEVATION
T/A	T/A	TOP OF ASPHALT
T/C	T/C	TOP OF CURB / CONCRETE
T/W	T/W	TOP OF WALK
F/L	F/L	FLOW LINE
T/P	T/P	TOP OF PIPE
B/P	B/P	BOTTOM OF PIPE
RIM	RIM	RIM ELEVATION
INV	INV	INVERT ELEVATION
MH	MH	MANHOLE STRUCTURE
IN	IN	INLET STRUCTURE
CB	CB	CATCHBASIN STRUCTURE
RY	RY	REARYARD STRUCTURE
ES	ES	END-SECTION
GV	GV	GATEVALVE STRUCTURE
HY	HY	HYDRANT
UP	UP	UTILITY POLE
SN	SN	SANITARY SEWER
SL	SL	SANITARY LEAD
FM	FM	FORCE MAIN
PS	PS	PRESSURE SEWER
ST	ST	STORM SEWER
WM	WM	WATER MAIN
WL	WL	WATER LEAD
FO	FO	FIBER OPTIC
OH	OH	OVERHEAD WIRE
C	C	CABLE
E	E	ELECTRIC
G	G	GAS
T	T	TELEPHONE
		MANHOLE
		INLET / CATCHBASIN
		FLARED END-SECTION
		GATE VALVE
		HYDRANT
		UTILITY POLE
		FENCE
		SIGN
		WETLAND BOUNDARY
		CONCRETE
		ASPHALT
		MODIFIED CURB
		"NO PARKING FIRE LANE" SIGN
TBR		TO BE REMOVED





"MT. BRIGHTON SUBDIVISION NO. 2"
(L. 13, P. 12, L.C.R.)

SITE BENCHMARKS: (NGVD29 DATUM)

BENCHMARK #200
BOSS NAIL/TAG SET N/S LIGHT POLE, 20'± EAST OF BACK OF CURB, ENTRANCE TO BRIGHTON NAZARENE & 62'± NORTH OF ℄ BRIGHTON ROAD.
ELEV. = 924.79

BENCHMARK #201
CHISELED "X" N/S CONC. LIGHT POLE BASE, 59'± EAST & 108'± NORTH OF SOUTHEAST CORNER OF CHURCH.
ELEV. = 931.41

BENCHMARK #202
BOSS NAIL/TAG SET S/S 24" OAK, 15'± WEST OF SW CORNER OF PARSONAGE.
ELEV. = 933.32

GENERAL SURVEY NOTES:

1. BEARINGS WERE ESTABLISHED FROM THE PLAT OF "MT. BRIGHTON SUBDIVISION NO. 2", AS RECORDED IN LIBER 13 OF PLATS, PAGE 12, LIVINGSTON COUNTY RECORDS.
2. SUBSURFACE UTILITIES NOT LOCATED FOR THIS SURVEY MAY EXIST. IT IS THE RESPONSIBILITY OF THE OWNER OF THE RESPECTIVE UTILITY TO ACCURATELY LOCATE SUCH UTILITIES.
3. EASEMENTS OR RESTRICTIONS OF RECORD NOT DEPICTED ON THIS DRAWING MAY EXIST.
4. ELEVATIONS WERE ESTABLISHED FROM BENCHMARK INFORMATION AS SHOWN ON BOSS ENGINEERING AS-BUILT PLANS FOR WORDEN LAKE WOODS UNDER JOB NO. 98011, AS-BUILT DATE OF 4-6-2000. (NGVD29 DATUM)
5. CONTOURS ARE SHOWN AT 1 FOOT INTERVALS.
6. ALL ELEVATIONS ARE SHOWN TO THE NEAREST 0.01 FOOT; HOWEVER SOFT-SURFACE ELEVATIONS CAN ONLY BE PRESUMED ACCURATE TO THE NEAREST 0.1 FOOT.
7. THE LOCATIONS OF STORM SEWER, SANITARY SEWER & WATERMAIN, AS SHOWN ON THIS DRAWING ARE APPROXIMATE. THE LOCATIONS ARE BASED ON PHYSICAL FIELD LOCATIONS OF STRUCTURES ALONG WITH RECORD DRAWINGS. SEPTIC TANKS, PUMP CHAMBER & FIELD AS SHOWN ON THIS SURVEY ARE DEPICTED FROM A PREVIOUS SITE PLAN BY BOSS ENGINEERING, JOB NO. 88603, DATED 10-25-89. LOCATIONS AS SHOWN ARE APPROXIMATE AND WILL NEED FIELD VERIFICATION.
8. ALL WORK SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE MUNICIPALITY, THE COUNTY, AND THE STATE OF MICHIGAN.
9. ALLOW THREE WORKING DAYS BEFORE YOU DIG, CALL MISS DIG TOLL FREE 1-800-482-7171.

DESCRIPTION OF PARCEL #4711-25-400-058:

A part of the SE 1/4 of Section 25. T2N-R5E thence N 89°08'13" E 663.28 feet to Point of Beginning, thence continue E 331.64 feet, thence N 01°21'30" W 1341.53 feet, thence S 89°03'20" E 332.74 feet, thence S 01°24'19" E 1341.56 feet to Point of Beginning and also Section 25, T2N-R5E Beginning at the SE 1/4 corner, thence N 01° W 1340.63 feet thence N 89° E 823.63 feet to Point of Beginning, thence N 01° W 891.73 feet, thence N 88° E 400.81 feet, thence S 01° E 893.61 feet, thence S 89° W 400.83 feet to Point of Beginning, containing 16.43 acres, more or less split on 01/23/2012 with 4711-25-400-027 into 4711-25-400-058

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(800) 246-6735 FAX (517) 548-1670

PROJECT: LIVINGSTON CHRISTIAN SCHOOL

PREPARED FOR: LIVINGSTON CHRISTIAN SCHOOLS
8877 WHITMORE LAKE RD
WHITMORE LAKE, MI 48189
(734) 878-9818

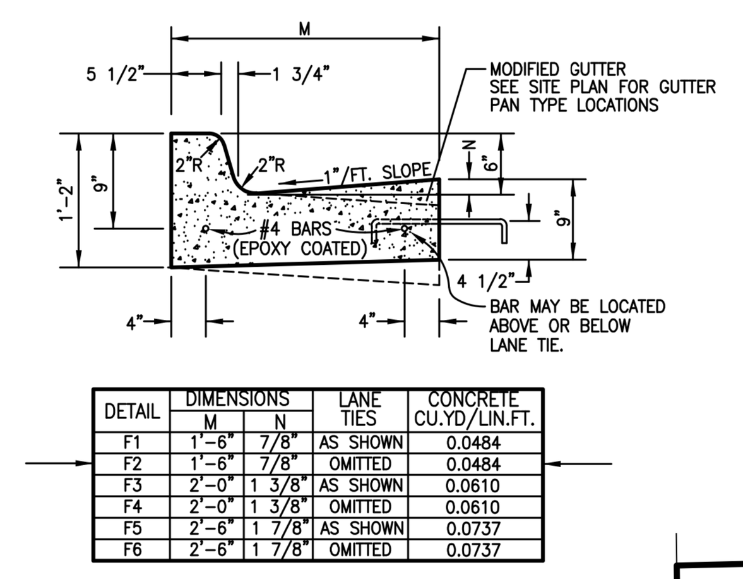
TITLE: EXISTING CONDITIONS/DEMOLITION PLAN

NO	BY	REVISION PER	DATE
	CH BY	PER TOWNSHIP REVIEW	9-20-17

DESIGNED BY: ST
DRAWN BY: AEB
CHECKED BY:
SCALE 1" = 50'
JOB NO. 17-315
DATE 8-30-17
SHEET NO. 2

LEGEND

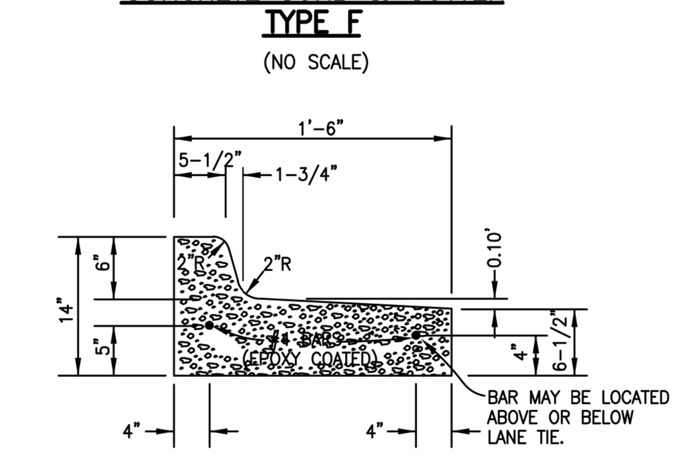
PROPOSED (PR)	EXISTING (EX)	
FF	FF	FINISHED FLOOR ELEVATION
FG	FG	FINISHED GRADE ELEVATION
T/A	T/A	TOP OF ASPHALT
T/C	T/C	TOP OF CURB / CONCRETE
T/W	T/W	TOP OF WALK
F/L	F/L	FLOW LINE
T/P	T/P	TOP OF PIPE
B/P	B/P	BOTTOM OF PIPE
RIM	RIM	RIM ELEVATION
INV	INV	INVERT ELEVATION
MH	MH	MANHOLE STRUCTURE
IN	IN	INLET STRUCTURE
CB	CB	CATCHBASIN STRUCTURE
RY	RY	REARYARD STRUCTURE
ES	ES	END-SECTION
GV	GV	GATEVALVE STRUCTURE
HY	HY	HYDRANT
UP	UP	UTILITY POLE
SN	SN	SANITARY SEWER
SL	SL	SANITARY LEAD
FM	FM	FORCE MAIN
PS	PS	PRESSURE SEWER
ST	ST	STORM SEWER
WM	WM	WATER MAIN
WL	WL	WATER LEAD
FO	FO	FIBER OPTIC
OH	OH	OVERHEAD WIRE
C	C	CABLE
E	E	ELECTRIC
G	G	GAS
T	T	TELEPHONE
		MANHOLE
		INLET / CATCHBASIN
		FLARED END-SECTION
		GATE VALVE
		HYDRANT
		UTILITY POLE
		FENCE
		SIGN
		WETLAND BOUNDARY
		CONCRETE
		ASPHALT
		MODIFIED CURB
		"NO PARKING FIRE LANE" SIGN



CONCRETE CURB & GUTTER TYPE F

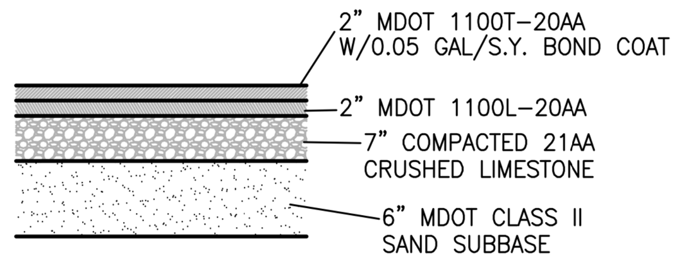
(NO SCALE)

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

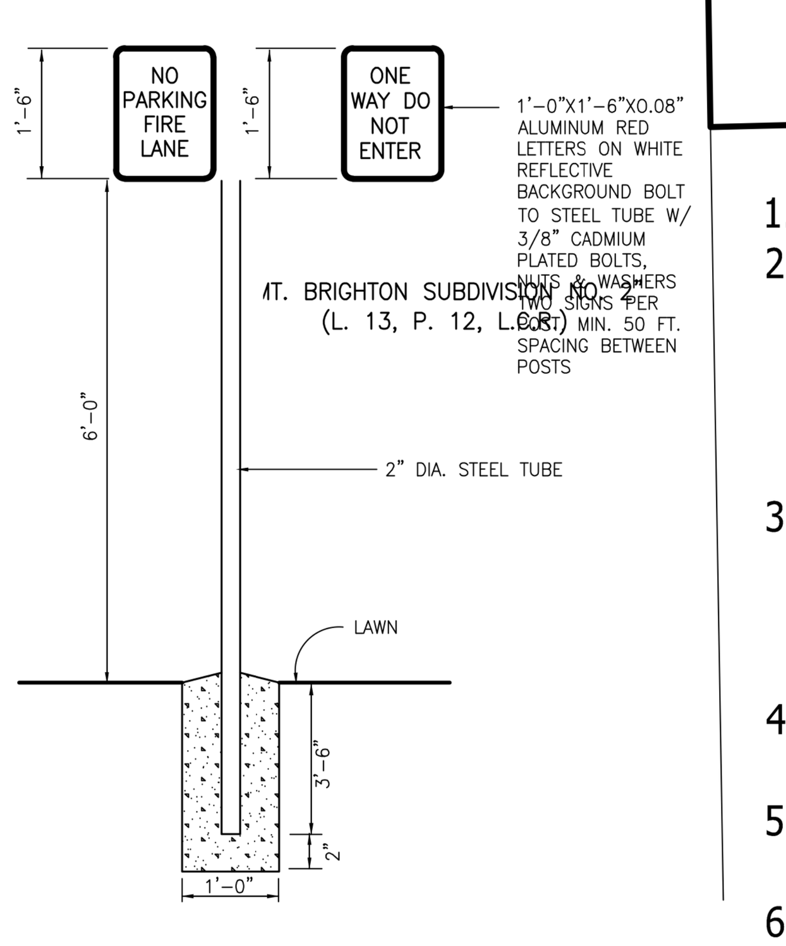


MODIFIED CURB TYPE F

(NO SCALE)



ASPHALT SECTION



NO PARKING/NOT ENTER SIGN DETAIL (NO SCALE)

CHURCH SITE DATA

	EXISTING/REQUIRED	PROPOSED
ZONING	SUBURBAN RESIDENTIAL(SR)	SUBURBAN RESIDENTIAL(SR)
AREA (GROSS)	3 ACRES(+15000SQFT PER 100 PERSON SEATING CAPACITY)	16.43 ACRES
AREA (NET)	3 ACRES(+15000SQFT PER 100 PERSON SEATING CAPACITY)	15.86 ACRES
LOT WIDTH	100 FT	331.64 FT
USE	CHURCH	CHURCH
SETBACKS		
FRONT	40 FT	207.2 FT
SIDE	20 FT	26.83 FT
REAR	50 FT	214.6 FT
PARKING	50 FT	50.05 FT
MAX. LOT COVERAGE	20% BUILDING (6.99%)	8.19%
	35% IMPERVIOUS (23.07%)	24.15%

PARKING – 1 SPACE PER 3 SEATS IN WORSHIP AREA (520 SEATS/3 = 174 SPACES)
174 SPACES — 180 SPACES
5 BARRIER FREE SPACES — 14 BARRIER FREE SPACES
(FOR MAX CAPACITY SERVICES ARRANGEMENTS ARE MADE TO UTILIZE BRIGHTON HIGH SCHOOLS PARKING LOT)

SOILS (PER U.S.D.A. SOIL SURVEY)
BOYER–OSHTEMO LOAMY SANDS, 0 TO 2 PERCENT SLOPES

NO NEW SIGNAGE PROPOSED

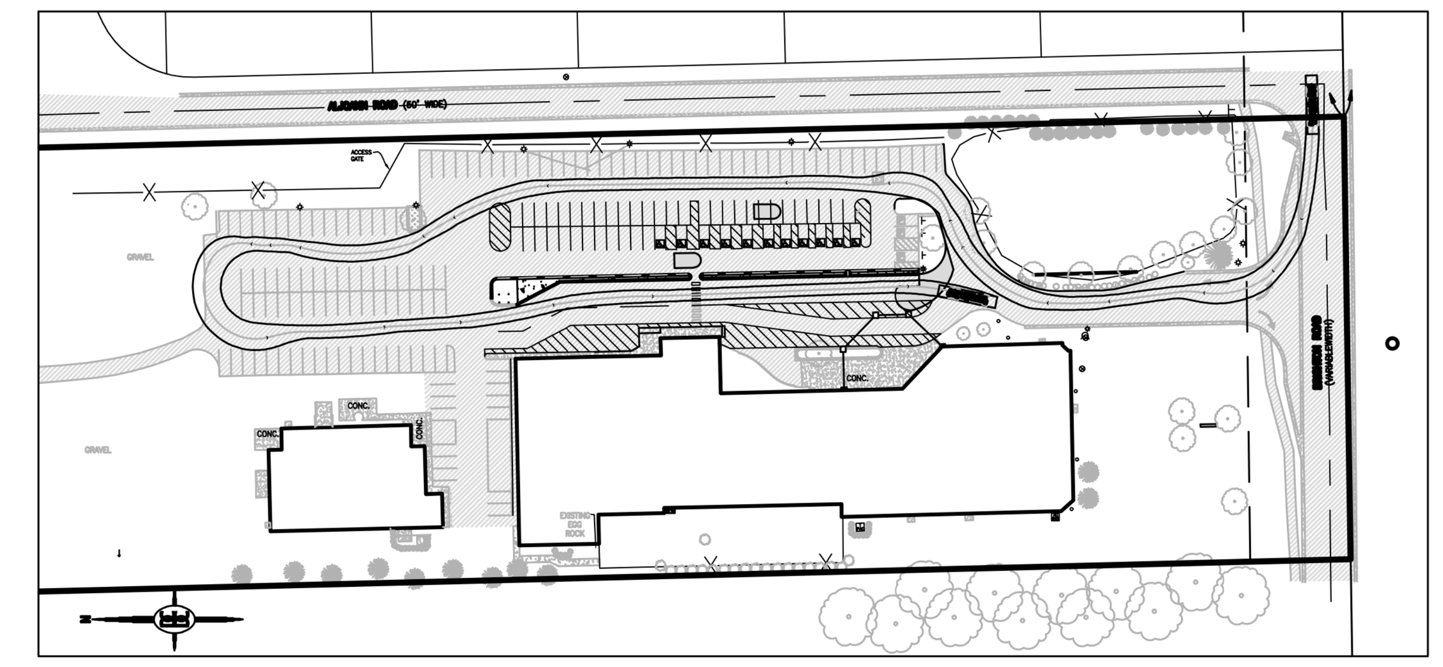
SCHOOL SITE DATA (200 STUDENTS)

	EXISTING/REQUIRED	PROPOSED
ZONING	SUBURBAN RESIDENTIAL(SR)	SUBURBAN RESIDENTIAL(SR)
AREA (GROSS)	SEE LEFT	SEE LEFT
AREA (NET)	SEE LEFT	SEE LEFT
LOT WIDTH	SEE LEFT	SEE LEFT
USE	PRIVATE SCHOOL	PRIVATE SCHOOL
SETBACKS	SEE LEFT	SEE LEFT
MAX. LOT COVERAGE	SEE LEFT	SEE LEFT

PARKING SCHOOL – 1 SPACE PER TEACHER, FACULTY, ADMINISTRATOR AND FOR EACH 10 STUDENTS, IN ADDITION TO THE REQUIREMENTS FOR AUDITORIUM:
(200 STUDENTS/10=20) + 25 FACULTY= 45 SPACES — 45 SPACES

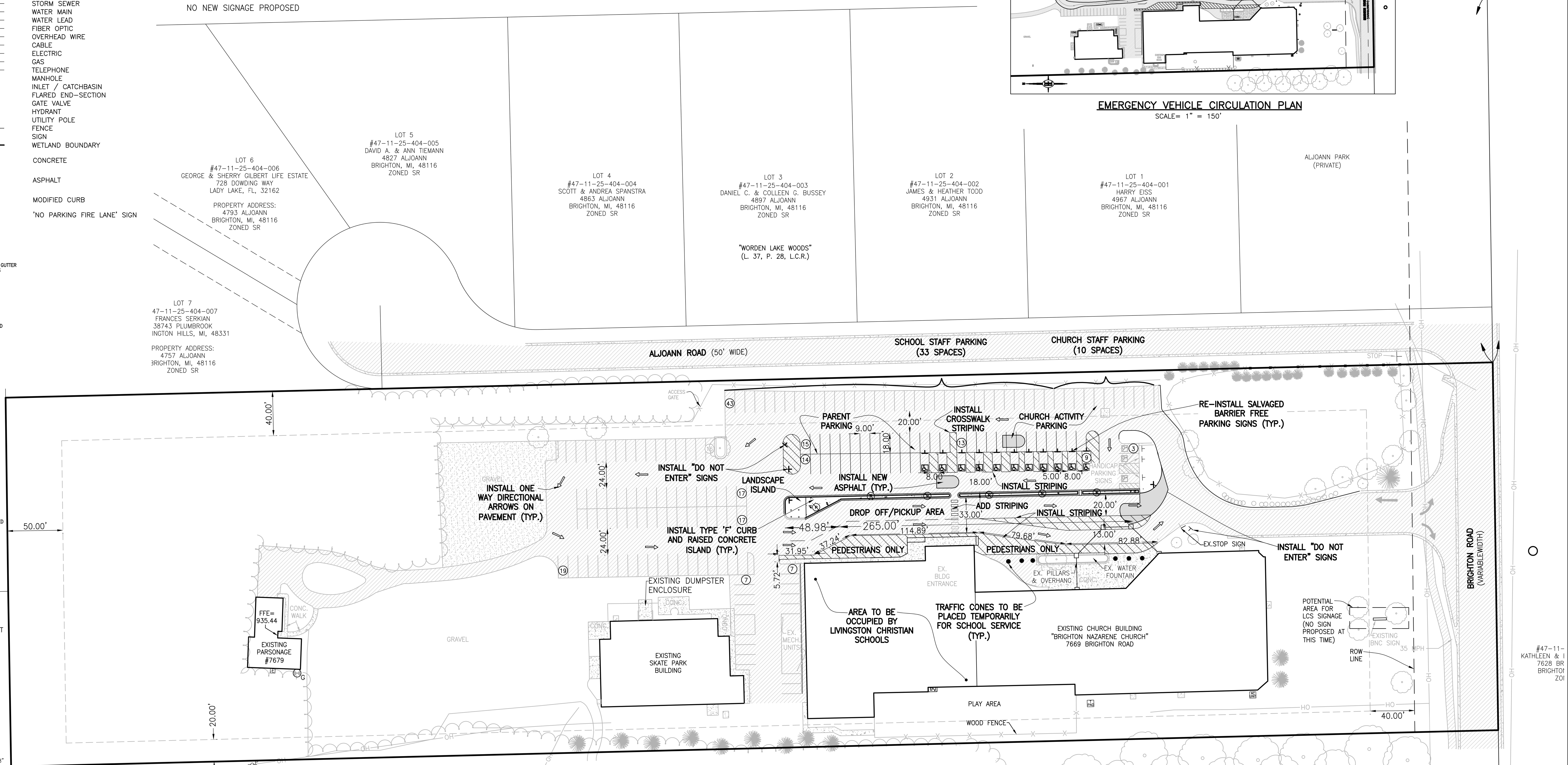
PARKING AUDITORIUM– 1 SPACE PER EACH 3 SEATS OR 6 FEET OF BLEACHERS:
(230 SEATS MAX. /3= 77 SPACES
TOTAL SPACES REQUIRED: 162 — TOTAL SPACES PROVIDED: 180

SCALE: 1 INCH = 50 FEET



EMERGENCY VEHICLE CIRCULATION PLAN

SCALE= 1" = 150'



NOTES:

1. ALL ORANGE TRAFFIC CONES TO BE PLACED 9' ON CENTER
2. TRAFFIC CONES WILL BE PLACED TEMPORARILY TO ASSIST WITH SCHOOL SERVICE PICK-UP AND DROP-OFF. TRAFFIC CONES WILL THEN BE REMOVED FOR ANY CHURCH SERVICE OR RELATED ACTIVITY UNLESS OTHERWISE NOTED.
3. PROPOSED SCHOOL START AND END TIMES WILL 8:00AM AND 3:00PM RESPECTIVELY PROVIDING A 30 MINUTE SEPARATION OF START AND END TIMES OF BRIGHTON HIGH SCHOOL WHICH IS IN CLOE PROXIMITY.
4. VOLUNTEER PARKING LOT ATTENDANTS WILL BE AVAILABLE TO HELP COORDINATE TRAFFIC PROCEDURES.
5. STUDENTS SHALL EXIT THEIR VEHICLES ON THE PASSENGER SIDE ONLY.
6. INSTRUCTIONAL PAMPHLETS SHALL BE DISTRIBUTED TO PARENTS EXPLAINING SITE CIRCULATION AND PROCEDURES BEFORE THE START OF EACH SCHOOL YEAR.

SITE PLAN NARRATIVE

THE PROPOSED SITE PLAN DEPICTS A LAYOUT THAT IS CONSISTENT WITH THE RECOMMENDATIONS MADE BY FLIES & VANDENBRINK IN THEIR SITE ACCESS AND CIRCULATION EVALUATION DATED SEPTEMBER 19TH, 2017. THIS EVALUATION IS BASED UPON A 200 STUDENT ENROLLMENT WHICH CURRENTLY EXCEEDS THE NUMBER OF ENROLLED STUDENTS.THE PARKING LAYOUT HAS BEEN REVISED TO CREATE ONE-WAY CIRCULATION ON SITE AND A CURB ISLAND IS PROPOSED AS A MEANS OF PHYSICAL SEPARATION BETWEEN THE PARKING AREA AND THE DROP OFF/PICK-UP AREA. ADDITIONALLY, THE MINIMUM OF TWO HUNDRED AND SIXTY FIVE (265) FEET OF ON-SITE LOADING SPACE HAS NOT ONLY BEEN MET BUT EXCEEDED BY ROUGHLY FORTY NINE (49) FEET. THROUGH THE USE OF INFORMATIONAL PAMPHLETS, PARKING LOT ATTENDANT VOLUNTEERS, AND A BEFORE THE SCHOOL YEAR MEETING EFFORT WILL BE MADE TO ENSURE SAFE AND EFFICIENT CIRCULATION THROUGH THE PROPOSED SITE. THE INTENT OF THIS SITE IS FOR LIVINGSTON CHRISTIAN SCHOOLS TO OCCUPY A PORTION OF SPACE WITHIN THE EXISTING BRIGHTON NAZERENE CHURCH LEAVING SITE IMPROVEMENTS TO A MINIMUM CONSIDERING ALL INFRASTRUCTURE IS ALREADY IN PLACE. THE SCHOOL AND CHURCH WOULD FUNCTION AT DIFFERENT TIMES DURING THE WEEK AND CONFLICTS WOULD BE MINIMAL.

SUMMARY OF AVAILABLE QUEUING/PARKING SPACES:

LEFT TURN STORAGE ONTO BRIGHTON RD ≈ 50 FEET
DROP-OFF/PICK-UP QUEUING SPACE= 313.98 FEET (265' REQUIRED)
PARKING RESERVED FOR STAFF = 33 SPACES
PARKING RESERVED FOR STUDENTS= 33 SPACES
PARKING RESERVED FOR PARENTS= 83 SPACES (6 BARRIER FREE SPACES INCLUDED)
PARKING RESERVED FOR CHURCH USE= 31 SPACES (8 BARRIER FREE SPACES INCLUDED)
TOTAL = 180 SPACES

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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

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PREPARED FOR: LIVINGSTON CHRISTIAN SCHOOLS
8877 WHITMORE LAKE RD
WHITMORE LAKE, MI 48189
(734) 878-9818

TITLE: SITE PLAN/TRAFFIC CIRCULATION PLAN

NO	BY	REVISION PER	DATE
	CH	PER TOWNSHIP REVIEW	9-20-17

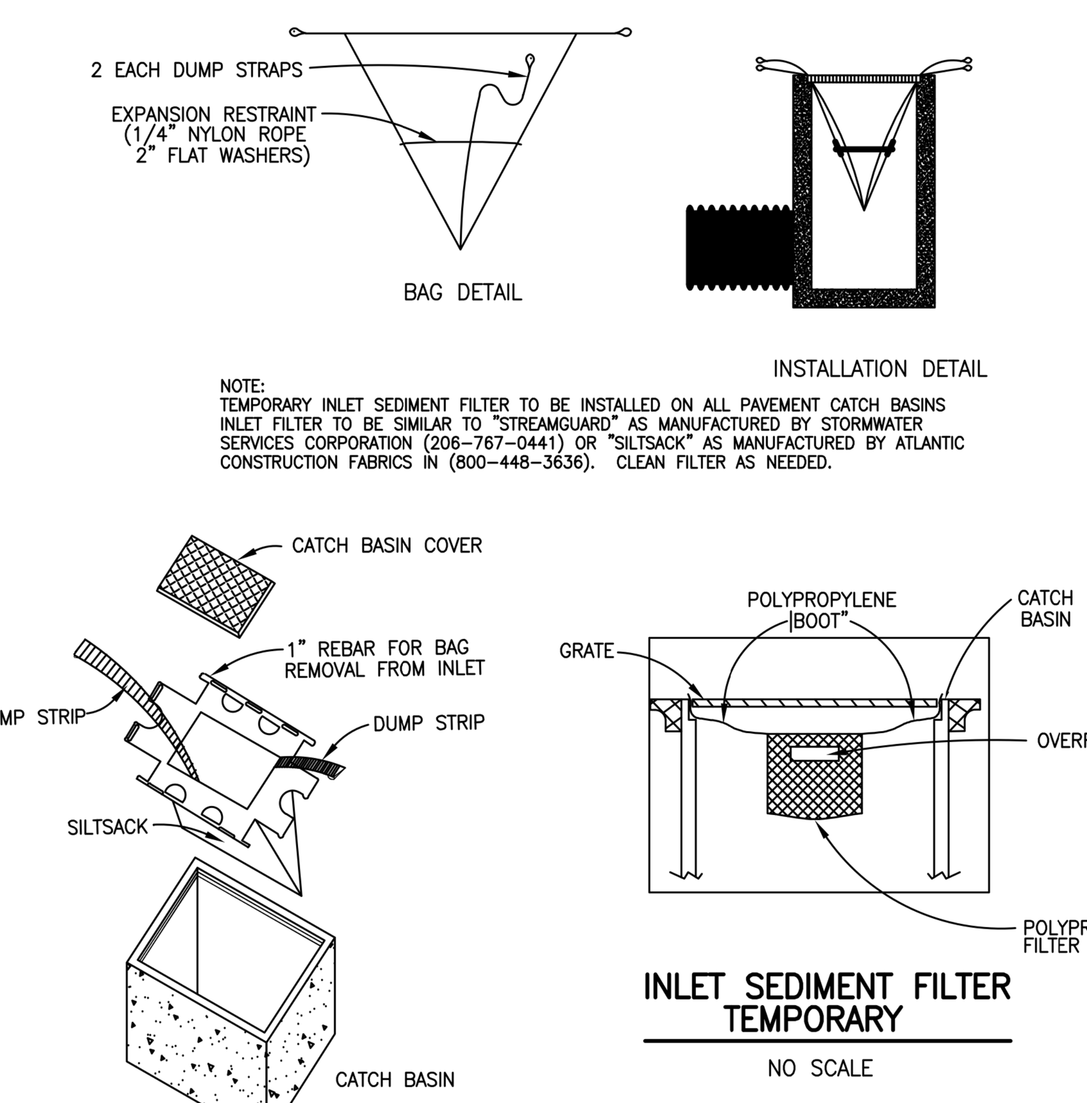
DESIGNED BY: ST
DRAWN BY: AEB
CHECKED BY:
SCALE 1" = 50'
JOB NO. 17-315
DATE 8-30-17
SHEET NO. 3

LEGEND

PROPOSED (PR)	EXISTING (EX)	
900	900	CONTOUR
		STORM DRAINAGE FLOW
T/C XXX.XX	+ 922.08	SPOT ELEVATION
FF	FF	FINISHED FLOOR ELEVATION
FG	FG	FINISHED GRADE ELEVATION
T/A	T/A	TOP OF ASPHALT
T/C	T/C	TOP OF CURB / CONCRETE
T/W	T/W	TOP OF WALK
F/L	F/L	FLOW LINE
T/P	T/P	TOP OF PIPE
B/P	B/P	BOTTOM OF PIPE
RIM	RIM	RIM ELEVATION
INV	INV	INVERT ELEVATION
MH	MH	MANHOLE STRUCTURE
IN	IN	INLET STRUCTURE
CB	CB	CATCHBASIN STRUCTURE
RY	RY	REARYARD STRUCTURE
ES	ES	END–SECTION
GV	GV	GATEVALVE STRUCTURE
HY	HY	HYDRANT
UP	UP	UTILITY POLE
SN	SN	SANITARY SEWER
SL	SL	SANITARY LEAD
FM	FM	FORCE MAIN
ST	ST	STORM SEWER
WM	WM	WATER MAIN
WL	WL	WATER LEAD
OH	OH	OVERHEAD WIRE
C	C	CABLE
E	E	ELECTRIC
G	G	GAS
T	T	TELEPHONE
●	○	MANHOLE
■	□	INLET / CATCHBASIN
		FLARED END–SECTION
	⊗	GATE VALVE
		HYDRANT
		UTILITY POLE

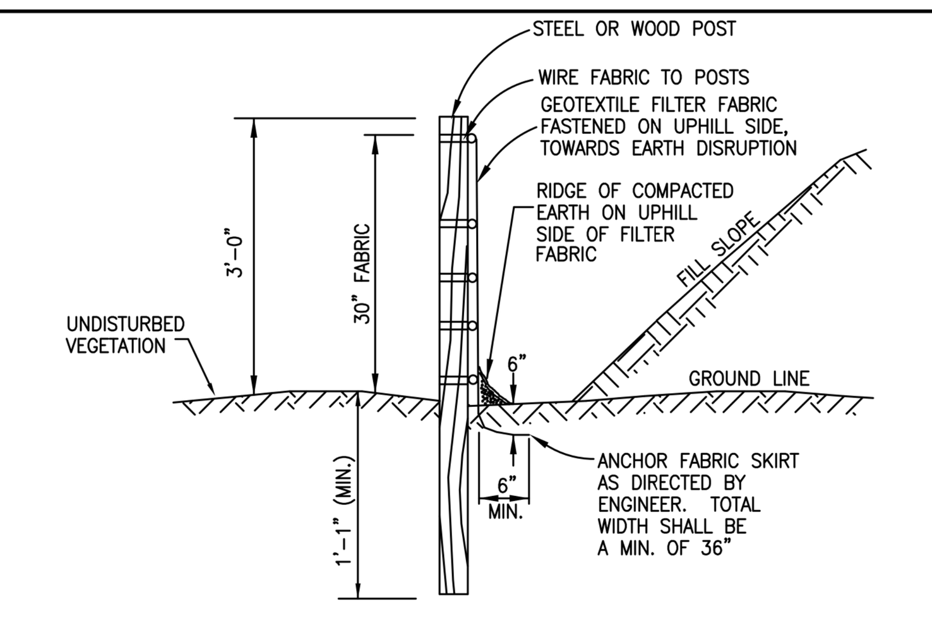
LEGEND

PROPOSED (PR)	EXISTING (EX)	
		FENCE
		SIGN
	NFV	NOT FIELD VERIFIED
TBR		TO BE REMOVED
CSB		COMPACTED SAND BACKFILL
SAN #1		SANITARY SEWER LABEL
CB 01		STORM SEWER LABEL
GV 12		WATER MAIN LABEL
54T		SOIL EROSION CONTROL MEASURE
		SILT FENCE
		LIMITS OF GRADING/CLEARING
		CONCRETE
		ASPHALT
		GRAVEL



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.

INLET SEDIMENT FILTER
TEMPORARY
NO SCALE



SILT FENCE DETAIL
NO SCALE

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 SHALL BE REMOVED IMMEDIATELY PRIOR TO THE FIRST COURSE OF ASPHALT BEING LAID.
3. DETENTION POND SHALL BE INSPECTED QUARTERLY ON A PERMANENT BASIS. MAINTENANCE SHALL INCLUDE SEDIMENT REMOVAL, EMBANKMENT STABILIZATION AND MAINTAINING THE OUTLET STRUCTURE IN GOOD CONDITION. NO TREES SHALL BE ALLOWED TO GROW ON THE EMBANKMENT.
4. CATCH BASINS SHALL BE INSPECTED ANNUALLY FOR ACCUMULATION OF SEDIMENT. ALL SEDIMENT MUST BE REMOVED AND DISPOSED OF PROPERLY WHEN THE SUMP IS FULL.
5. COMMON AREAS SHALL BE STABILIZED NO LATER THAN 15 DAYS AFTER GRADE WORK, PURSUANT TO RULE 1709 (5).

No.	Detail	Description
15	PAVING	PROTECTS AREAS WHICH CANNOT OTHERWISE BE PROTECTED, BUT INCREASES RUNOFF VELOCITY IRREGULAR SURFACE WILL HELP SLOW VELOCITY
16	CURB & GUTTER	KEEPS HIGH VELOCITY RUNOFF ON PAVED AREAS FROM LEAVING PAVED SURFACE COLLECTS AND CONDUCTS RUNOFF TO ENCLOSED DRAINAGE SYSTEM OR PREPARED DRAINAGEWAY
40	INLET SEDIMENT FILTER	EASY TO SHAPE COLLECTS SEDIMENT MAY BE CLEANED AND EXPANDED AS NEEDED
54		USES GEOTEXTILE FABRIC AND POST OR POLES. EASY TO CONSTRUCT AND LOCATE AS NECESSARY. (SEE DETAIL THIS SHEET)

T= TEMPORARY P=PERMANENT

CONTROLS & MEASURES NARRATIVE

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

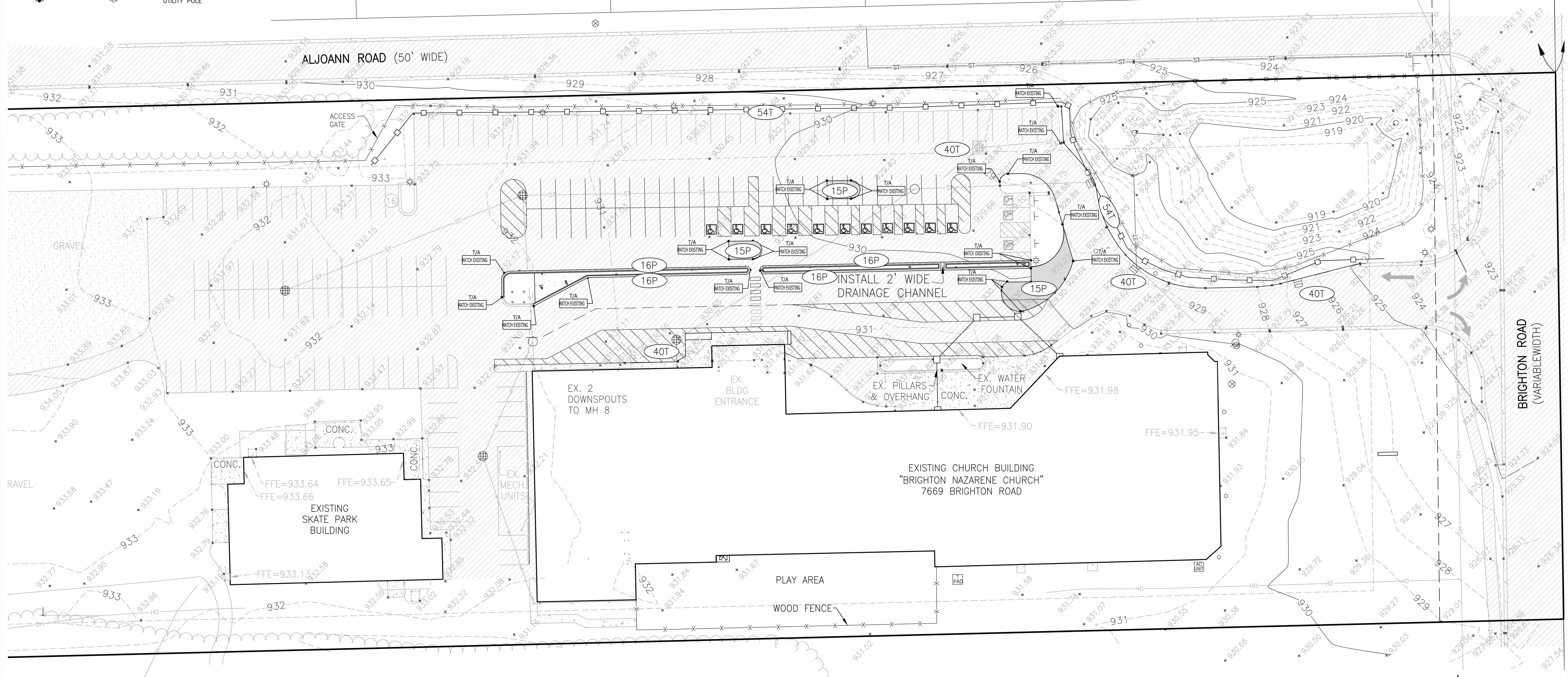
CONSTRUCTION SEQUENCE

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

0.25 DAY	1.	INSTALL SILT FENCE AND INLET PROTECTION AS SHOWN ON PLANS.
2 DAYS	2	INSTALL PAVEMENT
2 DAYS	6.	FINE GRADE AROUND BUILDING, SPREAD TOPSOIL, SEED OR SOD AS APPLICABLE.
0.25 DAY	7.	REMOVE ALL EROSION CONTROL STRUCTURES.
1 DAY	8.	REMOVE ACCUMULATED SILT FROM ALL EXISTING DRAINAGE.

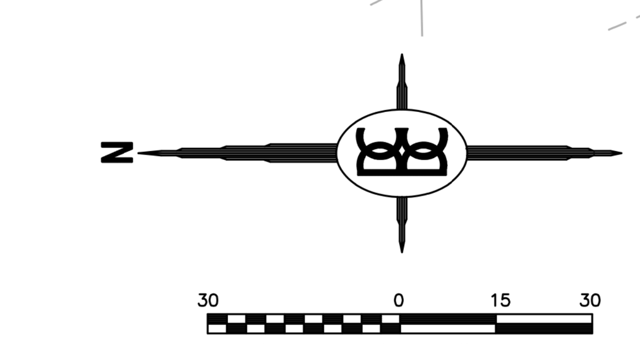
CONTROLS & MEASURES POST CONSTRUCTION SEQUENCE

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



SITE GRADING NARRATIVE

THE EXTENT OF THE SITE GRADING IS LIMITED TO THE INSTALLATION OF NEW ASPHALT TO MATCH EXISTING SURROUNDING GRADES. SINCE THE ORIGINAL PARKING CONFIGURATION WAS MODIFIED, THE RELOCATION OF THE BARRIER FREE SPACES WAS A HIGH PRIORITY SO SPACES STILL MEET ADA REQUIREMENTS. BECAUSE THE SITE IS RELATIVELY FLAT THE BARRIER FREE SPACES WERE ABLE TO BE MOVED AND STILL MEET ADA REQUIREMENTS WITH OUT RE-GRADING THE EXISTING PARKING LOT.



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
(E-MAIL: boss@bosseng.com)
3121 E. GRAND RIVER AVE.
HOWELL, MI. 48843
(800) 246-6735 FAX (517) 548-1670

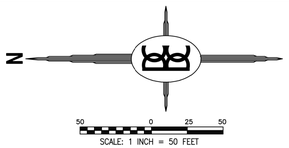
PROJECT: LIVINGSTON CHRISTIAN SCHOOL

PREPARED FOR: LIVINGSTON CHRISTIAN SCHOOLS
8877 WHITMORE LAKE RD
WHITMORE LAKE, MI 48189
(734) 878-9818

TITLE: GRADING & SEC PLAN

NO	BY	REVISION PER	DATE
	CH	PER TOWNSHIP REVIEW	9-20-17

DESIGNED BY: ST
DRAWN BY: AEB
CHECKED BY:
SCALE 1" = 30'
JOB NO. 17-315
DATE 8-30-17
SHEET NO. 4



SCHOOL REU CALCULATION

(PER CITY OF BRIGHTON REU TABLE)
-14 CLASSROOMS ANTICIPATED x 1.0 REU PER CLASSROOM = 14 REU

UTILITY NOTE:

-PER TOWNSHIP ENGINEER HEALTH DEPARTMENT APPROVAL OF THE EXISTING SEPTIC SYSTEM IS REQUIRED BEFORE OCCUPANCY.

LEGEND

PROPOSED (PR)	EXISTING (EX)	
900	900	CONTOUR
T/C XXX.XX	+ 922.08	STORM DRAINAGE FLOW / SPOT ELEVATION
FF	FF	FINISHED FLOOR ELEVATION
FG	FG	FINISHED GRADE ELEVATION
T/A	T/A	TOP OF ASPHALT
T/C	T/C	TOP OF CURB / CONCRETE
T/W	T/W	TOP OF WALK
F/L	F/L	FLOW LINE
T/P	T/P	TOP OF PIPE
B/P	B/P	BOTTOM OF PIPE
RIM	RIM	RIM ELEVATION
INV	INV	INVERT ELEVATION
MH	MH	MANHOLE STRUCTURE
IN	IN	INLET STRUCTURE
CB	CB	CATCHBASIN STRUCTURE
RY	RY	REARYARD STRUCTURE
ES	ES	END-SECTION
GV	GV	GATEVALVE STRUCTURE
HY	HY	HYDRANT
UP	UP	UTILITY POLE

LEGEND

PROPOSED (PR)	EXISTING (EX)	
SN	SN	SANITARY SEWER
SL	SL	SANITARY LEAD
FM	FM	FORCE MAIN
ST	ST	STORM SEWER
WM	WM	WATER MAIN
WL	WL	WATER LEAD
OH	OH	OVERHEAD WIRE
		SILT FENCE
		LIMITS OF GRADING/CLEARING
		CONCRETE
		ASPHALT
		GRAVEL

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(E-MAIL: be@bosseng.com)
3121 E. GRAND RIVER AVE.
HOWELL, MI. 48843
(800) 246-6735 FAX (517) 548-1670

PROJECT
LIVINGSTON CHRISTIAN SCHOOL

PREPARED FOR
LIVINGSTON CHRISTIAN SCHOOLS
8877 WHITMORE LAKE RD
WHITMORE LAKE, MI 48189
(734) 878-3818

TITLE
UTILITY PLAN

NO	BY	REVISION PER	CH	BY	PER TOWNSHIP REVIEW	DATE
						9-20-17

DESIGNED BY: ST
DRAWN BY: AEB
CHECKED BY:
SCALE 1" = 50'
JOB NO. 17-315
DATE 8-30-17
SHEET NO. 5

STORM SEWER INVENTORY:

OUTLET CONTROL STRUCTURE #1 (OCS 1)
RIM = 924.11
INV. = 919.04 (24" Conc.)

OUTLET CONTROL STRUCTURE #2 (OCS 2)
RIM = 925.21
INV. S = 922.98 (24" Conc.)

STORM CATCH BASIN #1 (CB 1) (SQUARE)
RIM = 926.56 (FLOW LINE)
INV. N = 922.71 (12" Conc.)

STORM CATCH BASIN #2 (CB 2) (SQUARE)
RIM = 928.82 (FLOW LINE)
INV. S = 922.22 (12" Conc.)
INV. E = 922.22 (12" Conc.)
INV. SW = 922.42 (12" PVC)
INV. W = 924.77 (8" PVC)

STORM CATCH BASIN #3 (CB 3) (ROUND)
RIM = 928.80
INV. S = 926.17 (10" PVC)
INV. NW = 926.19 (10" PVC) (COULD NOT LOCATE WESTERLY END)

STORM CATCH BASIN #4 (CB 4) (SQUARE)
RIM = 927.79 (FLOW LINE)
INV. SE = 922.59 (18" Conc.)
INV. N = 922.67 (15" Conc.)

STORM MANHOLE #1 (MH 1)
RIM = 929.14
INV. S = 924.54 (15" Conc.)
INV. N = 924.39 (15" Conc.)
INV. NW = 926.94 (10" PVC)

STORM CATCH BASIN #5 (CB 5) (ROUND)
RIM = 930.41
INV. SE = 928.81 (10" PVC)
INV. W = 928.91 (6" PVC)

STORM CATCH BASIN #6 (CB 6) (ROUND)
RIM = 931.66
INV. S = 926.06 (15" Conc.)
INV. NW = 926.11 (15" Conc.)

STORM CATCH BASIN #7 (CB 7) (ROUND)
RIM = 931.31
INV. SE = 927.31 (15" Conc.)

SITE BENCHMARKS: (NGVD29 DATUM)

BENCHMARK #200
BOSS NAIL/TAG SET N/S LIGHT POLE, 20'± EAST OF BACK OF CURB, ENTRANCE TO BRIGHTON NAZARENE & 62'± NORTH OF ℄ BRIGHTON ROAD.
ELEV. = 924.79

BENCHMARK #201
CHISELED "X" N/S CONC. LIGHT POLE BASE, 59'± EAST & 108'± NORTH OF SOUTHEAST CORNER OF CHURCH.
ELEV. = 931.41

BENCHMARK #202
BOSS NAIL/TAG SET S/S 24" OAK, 15'± WEST OF SW CORNER OF PARSONAGE.
ELEV. = 933.32

"MT. BRIGHTON SUBDIVISION NO. 2"
(L. 13, P. 12, L.C.R.)

LOT 6
#47-11-25-404-006
GEORGE & SHERRY GILBERT LIFE ESTATE
728 DOWDING WAY
LADY LAKE, FL, 32162

PROPERTY ADDRESS:
4793 ALJOANN
BRIGHTON, MI, 48116
ZONED SR

LOT 5
#47-11-25-404-005
DAVID A. & ANN TIEMANN
4827 ALJOANN
BRIGHTON, MI, 48116
ZONED SR

LOT 4
#47-11-25-404-004
SCOTT & ANDREA SPANSTRA
4863 ALJOANN
BRIGHTON, MI, 48116
ZONED SR

LOT 3
#47-11-25-404-003
DANIEL C. & COLLEEN G. BUSSEY
4897 ALJOANN
BRIGHTON, MI, 48116
ZONED SR

"WORDEN LAKE WOODS"
(L. 37, P. 28, L.C.R.)

LOT 2
#47-11-25-404-002
JAMES & HEATHER TODD
4931 ALJOANN
BRIGHTON, MI, 48116
ZONED SR

LOT 1
#47-11-25-404-001
HARRY EISS
4967 ALJOANN
BRIGHTON, MI, 48116
ZONED SR

ALJOANN PARK
(PRIVATE)

LOT 7
#47-11-25-404-007
FRANCES SERKIAN
38743 PLUMBROOK
FARMINGTON HILLS, MI, 48331

PROPERTY ADDRESS:
4757 ALJOANN
BRIGHTON, MI, 48116
ZONED SR

ALJOANN ROAD (50' WIDE)

BRIGHTON ROAD
(VARIABLE WIDTH)

#47-11-3
KATHLEEN & EI
7628 BRIG
BRIGHTON,
ZONI

ACCESS GATE

EX. 8" WATERMAIN

EXISTING 25' PRIVATE WATERMAIN EASEMENT

EX. 25' PRIVATE WATERMAIN EASEMENT

HANDICAP PARKING SIGNS

EX. 2 DOWNSPOUTS TO MH 8

EX. 10" PVC C.O. 931.19

FFE=931.98

FFE=931.90

FFE=931.95

CONC.

CONC. WALK

GRAVEL

FFE=933.64
FFE=933.66

FFE=933.65

FFE=933.13

EX. 6" WELL

EXISTING SANITARY SEWER

EX. 4" PVC C.O.

EX. 4" PVC C.O.

EX. 4" PVC C.O. 931.64

EX. 8" WATERMAIN

EX. WATER SERVICE CONNECTION POINT

EX. 3,320 GALLON SEPTIC TANK

EX. 1,500 GAL. SEPTIC TANK

EX. 1,500 GAL SEPTIC TANK

EX. 4" PVC C.O.

EX. 1,000 GAL PUMP CHAMBER

EXIST. SEPTIC FIELD 40'X90'

EX. 4,660 GALLON SURGE TANK W/ DOSING PUMP

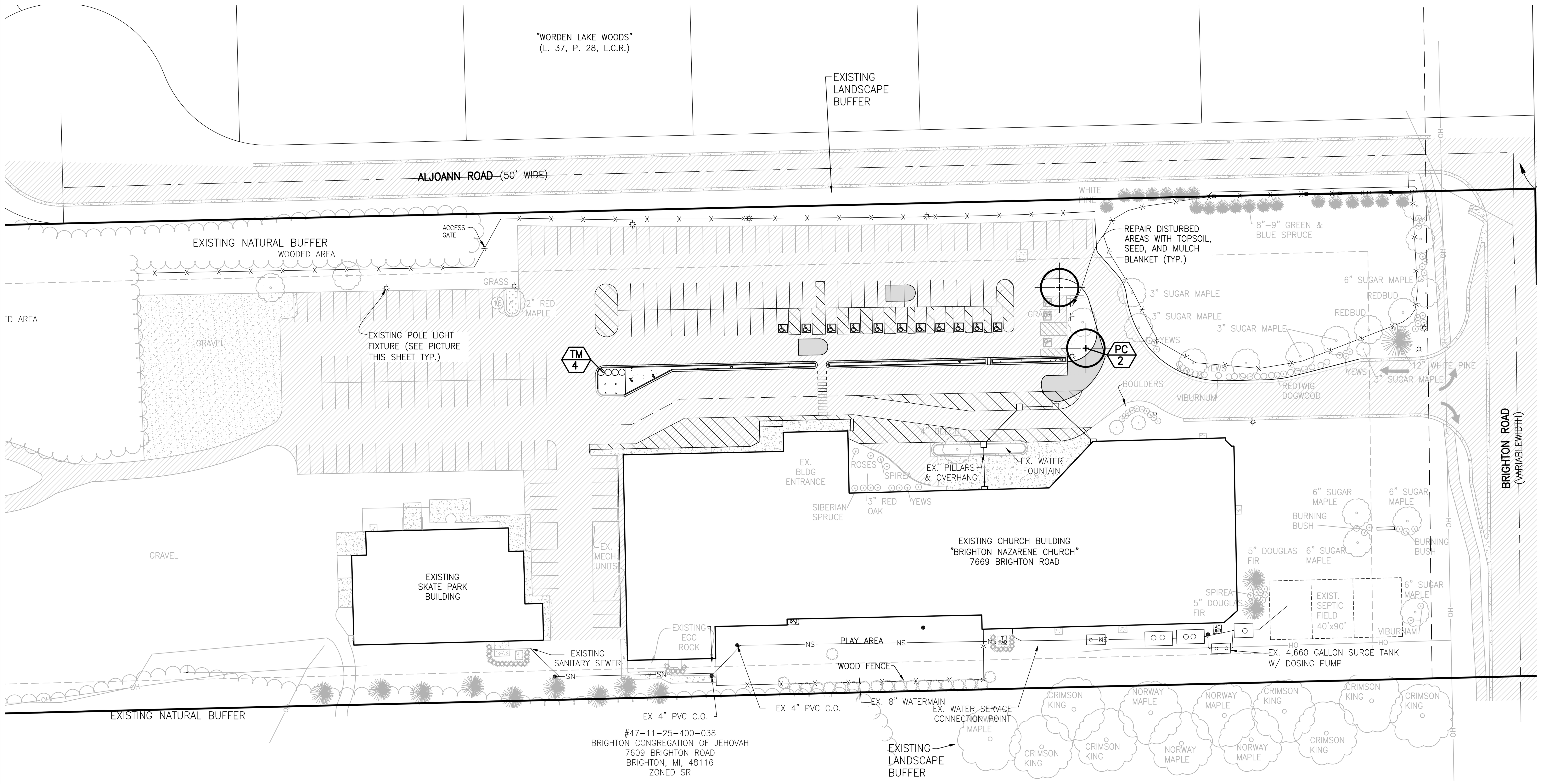
EXISTING BNC SIGN

35 MPH

EX. 4" SANITARY SEWER

#47-11-25-400-038
BRIGHTON CONGREGATION OF JEHOVAH
7609 BRIGHTON ROAD
BRIGHTON, MI, 48116
ZONED SR

EX CB1 EX CB2 EX CB3 EX CB4 EX CB5 EX CB6 EX CB7 EX CB8 EX CB9 EX MH1 EX MH8 EX OCS1 EX OCS2



LEGEND

PROPOSED (PR)	EXISTING (EX)	
900	900	CONTOUR
		STORM DRAINAGE FLOW
T/C XXX.XX	+ 922.08	SPOT ELEVATION
FF	FF	FINISHED FLOOR ELEVATION
FG	FG	FINISHED GRADE ELEVATION
T/A	T/A	TOP OF ASPHALT
T/C	T/C	TOP OF CURB / CONCRETE
T/W	T/W	TOP OF WALK
F/L	F/L	FLOW LINE
T/P	T/P	TOP OF PIPE
B/P	B/P	BOTTOM OF PIPE
RIM	RIM	RIM ELEVATION
INV	INV	INVERT ELEVATION
MH	MH	MANHOLE STRUCTURE
IN	IN	INLET STRUCTURE
CB	CB	CATCHBASIN STRUCTURE
RY	RY	REARYARD STRUCTURE
ES	ES	END-SECTION
GV	GV	GATEVALVE STRUCTURE
HY	HY	HYDRANT
UP	UP	UTILITY POLE
SN	SN	SANITARY SEWER
SL	SL	SANITARY LEAD
FM	FM	FORCE MAIN
PS	PS	PRESSURE SEWER
ST	ST	STORM SEWER
WM	WM	WATER MAIN
WL	WL	WATER LEAD
FO	FO	FIBER OPTIC
OH	OH	OVERHEAD WIRE
C	C	CABLE
E	E	ELECTRIC
G	G	GAS
T	T	TELEPHONE
		MANHOLE
		INLET / CATCHBASIN
		FLARED END-SECTION
		GATE VALVE
		HYDRANT
		UTILITY POLE
		FENCE
		SIGN
		CONCRETE
		ASPHALT

LIGHTING NOTE:

-NO NEW LIGHTING IS PROPOSED FOR THE SITE. EXISTING LIGHT FIXTURES WILL REMAIN AS IS. A PHOTOMETRIC PLAN HAS NOT BEEN INCLUDED SINCE SITE LIGHTING WILL REMAIN AS EXISTS.

PLANT LIST

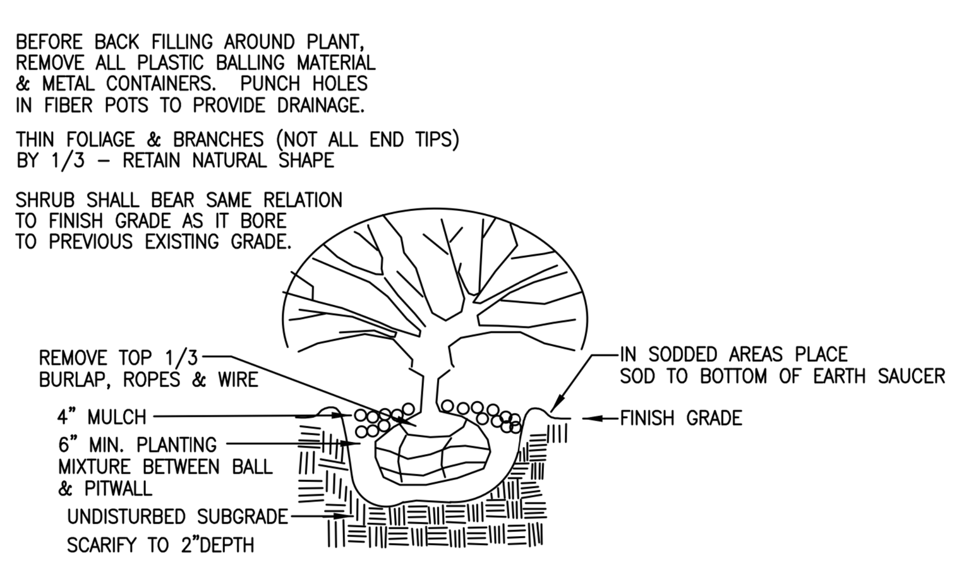
KEY	QUAN.	BOTANICAL NAME	COMMON NAME	SIZE	REMARK
TREES					
PC	2	Pyrus calleryana 'Bradford'	Bradford Callery Pear	2 1/2" cal.	B-B
SHRUBS					
TM	4	Taxus x media 'Hicksii'	Hick's Yew	36" ht.	B-B

LANDSCAPE CALCULATIONS

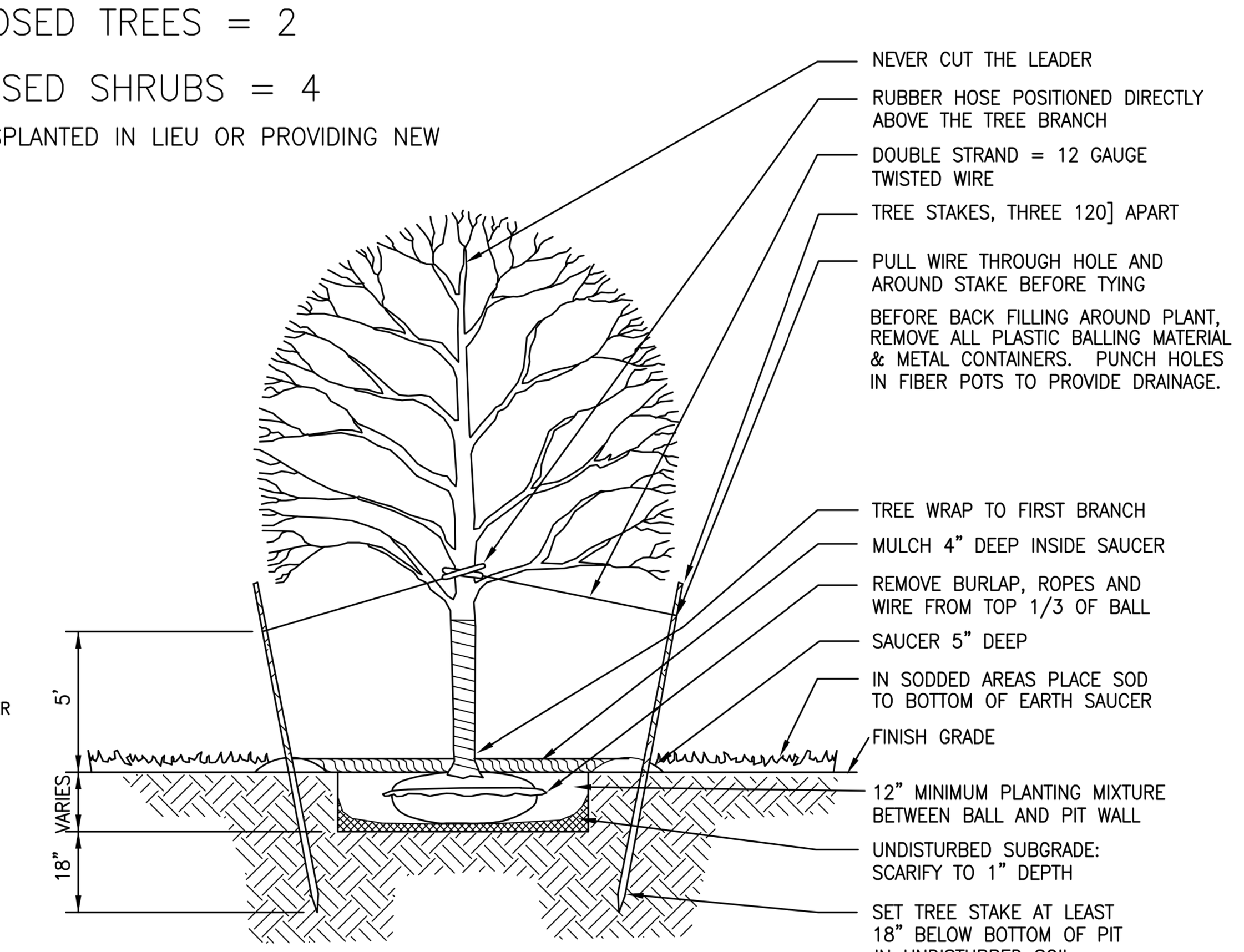
EXISTING TREES REMOVED = 2 PROPOSED TREES = 2

EXISTING SHRUBS REMOVED = 0 PROPOSED SHRUBS = 4

*TREES DEEMED IN GOOD HEALTHY CONDITION BY THE CONTRACTOR MAY TRANSPLANTED IN LIEU OR PROVIDING NEW PLANT MATERIAL.



SHRUB PLANTING DETAIL
(NO SCALE)



DECIDUOUS TREE PLANTING DETAIL
(NO SCALE)

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3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171

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LANDSCAPE ARCHITECTS
(E-MAIL: boss@bosseng.com)
3121 E. GRAND RIVER AVE.
HOWELL, MI. 48843
(800) 246-6735 FAX (517) 548-1670

PROJECT: **LIVINGSTON CHRISTIAN SCHOOL**

PREPARED FOR: **LIVINGSTON CHRISTIAN SCHOOLS**
8877 WHITMORE LAKE RD
WHITMORE LAKE, MI 48189
(734) 878-9818

TITLE: **LANDSCAPE & LIGHTING PLAN**

REVISION PER	DATE	BY	CH
PER TOWNSHIP REVIEW	9-20-17		

DESIGNED BY:	TD
DRAWN BY:	TD
CHECKED BY:	
SCALE	1" = 40'
JOB NO.	17-315
DATE	8-30-17
SHEET NO.	6

GENOA CHARTER TOWNSHIP
Application for Site Plan Review

TO THE GENOA TOWNSHIP PLANNING COMMISSION AND TOWNSHIP BOARD:

APPLICANT NAME & ADDRESS: Jayson Boyers
If applicant is not the owner, a letter of Authorization from Property Owner is needed.

OWNER'S NAME & ADDRESS: Cleary University, 3750 Cleary Dr, Howell, MI 48843

SITE ADDRESS: 3750 Cleary Drive, Howell, MI 48843 PARCEL #(s): 4711-05-400-062

APPLICANT PHONE: (800) 686-1883 OWNER PHONE: (800) 686-1883

OWNER EMAIL: jboyers@cleary.edu

LOCATION AND BRIEF DESCRIPTION OF SITE: Cleary University-Livingston campus is located on south side of Grand River in Howell. Site is currently used for university classes and student housing.

BRIEF STATEMENT OF PROPOSED USE: Proposed student housing building with 123 beds at southeast corner of site. South of current student housing building.

THE FOLLOWING BUILDINGS ARE PROPOSED: Proposed 3-story, 123 bed student housing building.

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: Jayson M. Boyers

ADDRESS: 3750 Cleary Dr. Howell MI 48843

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

1.) BRENT LaVANWAY, PE of BOSS ENGINEERING at brentl@bosseng.com
Name | Business Affiliation | 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: [signature] DATE: 8-29-17

PRINT NAME: Jayson Rogers President PHONE: 800-686-1883 x+1011

ADDRESS: 3750 Cleary Dr. Howell MI 48843

LSL Planning
A SAFEbuilt. Company

October 5, 2017

Planning Commission
Genoa Township
2911 Dorr Road
Brighton, Michigan 48116

Attention:	Kelly Van Marter, AICP Planning Director and Assistant Township Manager
Subject:	Cleary University student housing – PUD Site Plan Review #2
Location:	3750 Cleary Drive – south side of Grand River, between Grand Oaks and Latson Road
Zoning:	MUPUD Mixed Use Planned Unit Development

Dear Commissioners:

At the Township's request, we have reviewed the revised PUD site plan (dated 9/18/17) proposing a new student housing apartment building for Cleary University.

The 29.6-acre site is currently developed with Cleary's Livingston Campus, which was approved as a MUPUD in 2015. We have reviewed the proposal in accordance with the applicable provisions of the Genoa Township Zoning Ordinance and the PUD Agreement for this property.

A. Summary

1. The proposed elevations, including colors and materials, are subject to review and approval by the Planning Commission.
2. The proposed building materials do not comply with the standards of Section 12.01.03.
3. In accordance with the decision to approve the first student housing building, we recommend the applicant be required to either:
   a) Utilize building materials that comply with Section 12.01.03; or
   b) Increase the landscape screening buffer for the property to the south.
4. There are minor inconsistencies between the landscape plan and plant list that must be corrected.

B. Proposal/Process

The applicant requests site plan review/approval for a new student housing apartment building. The 3-story building has a footprint of 12,786 square feet and will provide for 129 beds. The project is the second such building to be constructed on campus and mirrors the first building in the southeast corner of the site.

Exhibit C of the PUD Agreement lists "dormitories or student apartments accessory to a college" as a permitted use within this MUPUD.

Procedurally, the Planning Commission is to make a recommendation to the Township Board. The Township Board has the final review/approval authority over the proposal.

Aerial view of site and surroundings (looking north)

C. Site Plan Review

1. **Dimensional Requirements.** The dimensions provided on the proposed site plan are consistent with both the approved PUD concept plan and PUD Agreement, including setbacks, building height and lot coverage ratios.

2. **Building Materials and Design.** The proposed elevations, including colors and materials, are subject to review and approval by the Planning Commission. The revised submittal includes a color rendering of the building for the Commission's consideration. The applicant should also be prepared to present a material sample board to the Commission at their upcoming meeting.

   The revised building elevation drawings note the use of split face block veneer (72.7% of entire building) and EIFS (27.3%). Based on the total building coverage, the amount of both split face block and EIFS exceed the maximum percentage allowed by Section 12.01.03 (25% each).

   Section 12.01.04 gives the Planning Commission discretion to allow the building materials as proposed based on the character of the surrounding area. In this instance, the materials match those used on the first student housing apartment building.

   With that being said, the Planning Commission's meeting minutes from approval of the first building state that "in the event the second building is brought forward, the applicant should be aware that higher level building materials may be required and/or additional screening for the property to the south may be required."

   We recommend the applicant either utilize higher quality materials (brick and stone) per the Ordinance or add significant landscape screening to the landscape plan south of the building.

3. **Parking.** Section 14.04 requires 65 parking spaces for the proposed student housing apartment building, while 68 are provided. This includes the 3 required barrier-free spaces.

Additionally, the design and dimensions of parking spaces and drive aisles meet or exceed the dimensional requirements of the Zoning Ordinance.

4. **Pedestrian Circulation.** The site plan includes sidewalks around the proposed building and along the parking lot with connections to existing walkways.

5. **Vehicular Circulation.** The project includes a driveway extension that will connect the southeast corner of the property to Cleary Drive, providing a full vehicular loop around this portion of campus.

6. **Landscaping**. The landscape plan (Sheet 8) includes plantings within the parking lot, as well as around the building and within the courtyard created by the two buildings. The plan includes 18 deciduous trees, 5 evergreen trees, 64 coniferous shrubs, 202 deciduous shrubs and a mix of perennials and ornamental grasses.

   Our only comments are tied to minor inconsistencies between the landscape plan and plant list, which must be corrected. Specifically, the quantities do not match for the Redosier Dogwood (CS), Koreanspice Viburnum (VC), Densiform Spreading Yew (TM), Knock Out Sunny Shrubs Rose (RKO), Miss Kim Lilac (SP), Blue Mammoth Hosta (HBM) and Pardon Me Daylily (HPM).

7. **Waste Receptacle and Enclosure.** The first student housing apartment building included a compliant waste receptacle and enclosure area. This area was designed to accommodate both the existing and proposed student housing buildings.

8. **Exterior Lighting.** The lighting plan (Sheet 9) proposes 7 light poles throughout the parking lot, as well as 4 wall mounted fixtures at building entrances.

   The light poles have a maximum height of 22 feet, the maximum on-site intensity is 9.7 foot-candles and the proposed fixtures are downward directed and cut-off, all of which comply with Ordinance standards.

9. **Impact Assessment.** The submittal includes a revised Impact Assessment (dated 9/18/17). 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. I can be reached by phone at (248) 586-0505, or via e-mail at borden@lslplanning.com.

Respectfully,
LSL PLANNING, A SAFEBUILT COMPANY

Brian V. Borden, AICP
Planning Manager

TETRA TECH

September 28, 2017

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

Re: Clearly Student Housing Phase 2 Site Plan Review #2

Dear Ms. Van Marter:

Tetra Tech conducted a site plan review of the revised Cleary Student Housing Phase 2 plans submitted by Boss Engineering. The plans are dated September 18, 2017, and the applicant is proposing a 3-story, 123 bed student housing building on the existing Cleary University Property.

Tetra Tech's initial review resulted in one comment pertaining to the stormwater drainage course downstream of the proposed detention pond outlet. After review, Boss Engineering has rerouted the stormwater drainage to a different, well defined, drainage course adjacent to the property and within an established drainage easement. With this revision we have no engineering related objections to approval of the site plan.

Sincerely,

Gary J. Markstrom, P.E.
Unit Vice President

Marguerite K. Davenport
Project Engineer

copy: Brent LaVanway. P.E., Boss Engineering, Inc.

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

September 28, 2017

Kelly VanMarter
Genoa Township
2911 Dorr Road
Brighton, MI 48116

RE: Cleary Residence Hall - Phase 2
3750 Cleary Drive
Genoa Twp., MI

Dear Kelly,

The Brighton Area Fire Department has reviewed the above mentioned site plan. The plans were received for review on September 27, 2017 and the drawings are dated August 30, 2017 with latest revisions dated September 18, 2017. The project is based on a new proposed (R-2) student housing building that will accommodate 123 residents. The square footage is not listed with the submittal, however, the building will be three-stories in height. The plan review is based on the requirements of the International Fire Code (IFC) 2015 edition.

1. Include the new building address on future submittals**. (Noted to be included once assigned)**

2. The building shall be provided with an automatic sprinkler system in accordance with NFPA 13, *Standard for the Installation of Automatic Sprinkler Systems, or 13R, Standard for the Installation of Automatic Sprinkler Systems in Residential Occupancies Up to and Including Four-Stories in Height*. **(Noted as required to be installed)**

   IFC 903

   A. The proposed FDC location is sufficient as submitted, but will require coordination with the fire suppression contractor.

3. Future project submittals shall include the address and street name of the project in the title block. **(Current address noted, actual address will be included once assigned)**

   IFC 105.4.2

4. The building address shall be a **minimum of 6"** high letters of contrasting colors and be clearly visible from the street. The location and size shall be verified prior to installation. **(Noted to be installed, location and size will be determined prior to final occupancy)**

   IFC 505.1

5. The south-side of the structure must be provided with fire lane signage on both sides of the drive. **(Signage and detail are now shown on sheet 4)**

6. The location of a key box (Knox Box) shall be indicated on future submittals. The Knox box will be located adjacent to the main entrance door of the structure. **(Knox box is shown on sheet 4)**

   IFC 506.1

7. During the construction process the building will be evaluated for approved emergency responder radio coverage. If coverage is found to be inadequate, the contractor building

owner will be required to provide an approved system in the building. **(Noted that the building will require evaluation during construction)**

IFC 510

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
Fire Marshal

IMPACT ASSESSMENT
FOR
"CLEARY UNIVERSITY STUDENT HOUSING APARTMENT #2"
GENOA TOWNSHIP
LIVINGSTON COUNTY, MI

Prepared for:

UNIVERSITY HOUSING SOLUTIONS, LLC
c/o Mr. Alan Price
90 Hidden Ravines Drive
Powell, OH 43065

Prepared by:

BOSS ENGINEERING COMPANY
3121 E. GRAND RIVER
HOWELL, MICHIGAN 48843
517-546-4836
BE Project No. 17-348

August 30, 2017
Revised 9-18-2017

INTRODUCTION

The purpose of this Impact Assessment (IA) report is to show the effect that this proposed development has on various factors in the general vicinity of the project. The format used for presentation of this report conforms to the *Submittal Requirements For Impact Assessment/Impact Statement* guidelines in accordance with Section 13.05 of the published Zoning Ordinance for Genoa Township, Livingston County, Michigan.

DISCUSSION ITEMS

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

Prepared By :
BOSS ENGINEERING COMPANY
3121 E. Grand River
Howell, Michigan 48843
Phone: 517-546-4836

Prepared For:
Mr. Alan Price
University Housing Solutions, LLC
90 Hidden Ravines Drive
Powell, OH 43065

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

The subject site is located on the south side of Grand River Avenue, southeast of Cleary Drive and east of Grand Oaks Drive. The site improvement is located ON property owned by Cleary University. The acreage of the property affected is 29.60 acres. The property is located in the Northwest ¼ of Section 5, T2N-R5E, Genoa Township, Livingston County, Michigan. Current zoning of the site is MUPUD (Mixed Use Planned Unit Development).

The site is gently rolling with areas of steeper slopes and generally slopes from the Southeast to Northwest. Elevations vary between 1010.0± and 999.0±, respectively. Storm water management for the site includes storm sewer into an existing detention pond that was constructed as a part of the first student housing apartment. From the detention basin, the storm water is discharged at a controlled rate per Livingston County Drain Commissioner standards into an existing storm sewer that discharges to the wooded area in the southwest quadrant of the site.

Existing on-site utilities include overhead wires, a gravity sanitary sewer system, gas and electric services. An 8" watermain was stubbed at the southern end of the first student housing apartment for future connection.

An existing student housing building has been constructed in 2015/2016 and sits just north of the proposed second student housing building.

Adjacent properties include:
- South – GenTech Industrial Park (zoned IND)
- North – Belle Tire, Aco Hardware, Wendy's, McDonalds, KFC (zoned RCD)
- East – Walmart (zoned NRPUD)
- West – Industrial Buildings (zoned IND)

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

As previously mentioned, subject site is gently rolling with areas of steeper slopes and generally slopes from the Southeast to the Northwest. Site elevations vary between 1010.0± and 999.0±. The USDA Soil Conservation Service "Soil Survey of Livingston County, Michigan", indicates native site soils consist of:

1. MIAMI LOAM (MoB), 2% to 6% slopes. Surface runoff is slow, permeability is moderate, and erosion hazard is slight.
2. MIAMI LOAM (MoE), 18% to 25% slopes. Surface runoff is rapid, permeability is moderate, and erosion hazard is severe.

Vegetative cover for the site includes lawn, low brush cover, and moderate canopy cover with a mixture of evergreen and deciduous trees.

The National Wetland Inventory Plan prepared by the United States Department of the Interior, Fish and Wildlife Service indicates that there are no wetlands located on the site.

Site drainage from the proposed site will utilize both swales and storm sewer. The existing detention basin that was constructed as a part of the first student housing apartment project will be filled and a new basin constructed in the southwest quadrant of the site. The outlet of the proposed detention basin will release storm water at a controlled rate and discharge into the natural drainage course at the southwest corner of the subject property.

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

Surface runoff during periods of construction will be controlled by proper methods set forth by the Livingston County Drain Commissioner. These methods shall include silt fence, silt sacks, and seeding with mulch and/or matting.

At the time of construction, there may be some temporary dust, noise, vibration and smoke, but these conditions will be of relatively short duration and shall be controlled by applying appropriate procedures to minimize the effects, such as watering if necessary for dust control.

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

The applicant is proposing to construct a new 129 bed student housing apartment and parking lot. The property on which site development is located is MUPUD (Mixed Use Planned Unit Development). The proposed building conforms to the existing and potential land development patterns in the area.

Proposed improvements will enhance current site conditions. The proposed project will have an access drive that finishes a loop for much improved site circulation as well as improved circulation of emergency vehicles. Additionally, the watermain is proposed to follow said access drive and connect to an existing watermain thereby completing a watermain loop. Loops in watermain enhance water circulation and reliability. There is a significant amount of trees/brush south of the existing parking lot that will need to be cleared. There are no significant natural features on site. Site improvements planned with the residence hall and parking lot, include the establishment of an open lawn space and landscaped areas. The landscaping meets the Genoa Township standards.

The layout was prepared taking into account the topography in order to balance the amount of earthwork required for proposed use. Site drainage will be controlled via swales and storm sewers and will be restricted to Livingston County Drain Commission standard outlet rates. The proposed

basin will accommodate the site improvements from the first student housing apartment as well as this new development as the previous detention basin is to be filled and a new one constructed. The storm water management plan utilizes the existing topographical features of the site by constructing a berm on the down gradient portion of a large natural drainage swale to create storm water storage. This method will allow nearly all trees to remain in the footprint of the basin other than those required for removal for the construction of said berm. The final outlet of the site storm water is a county drain.

Cleary Drive presently experiences a medium volume of traffic along with associated noise level generated from commercial vehicles. It is anticipated the proposed student housing apartment will cause no significant increase in traffic volume. The proposed residence hall is expected to accommodate some of the growth of the student enrollment as well as some of the existing students whom commute. The classrooms and other university facilities are centrally located and within close proximity which will reduce the use of vehicles by the residences.

Additional lighting is proposed on site and is to be directed away from adjacent properties to limit adverse affects of lighting. Existing and proposed landscaping along the property boundary will help serve as a visual buffer and as a noise buffer. Additional noise created by the residence will be minimal and due to the nature of the adjacent properties, rear of Walmart building to the east and Industrial facilities to the south, there will be no impact. There will be no increase in the amount of odor emanating from the site.

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

The student housing apartment is proposed to consist of 129 beds. This is an immediate increase of the number of people on site, other than typical university class hours. Normal police and fire protection services are anticipated.

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

There are new water and storm sewer drainage services proposed for the student housing apartment. A storm water system is proposed throughout the proposed parking lot and release into a proposed basin to the west of the student housing apartment. Watermain is proposed to connect to a stub that was constructed as a apart of the first student housing building and travel westerly and then northerly where it will connect to an existing 16" watermain. An alternative for watermain looping exists by connection the watermain to the existing watermain on the adjacent Wal-Mart property to the east. The adjacent property owner would not allow an easement for connection previously. There is an existing gravity sanitary sewer system that was constructed as a part of the first student housing project. A lead for the proposed building has been installed and must only be extended to the proposed building.

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

Cleary University will not be storing or handling any hazardous materials in this building.

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

The proposed student housing apartment will house students who currently live in apartment complexes in the surrounding community. The proposed student housing apartment will be dedicated to housing these local commuter students first. This will reduce the trips generated to and from campus. Based on the Institute of Transportation Engineers, Trip Generation 6th edition, an average student on weekdays generates 2.38 trip ends. The housing apartments are proposed to have 129

beds therefore creating a site reduction of 307 trips (129 students x 2.38 trips/student). The reduction will be on Grand River Avenue. Students will have pedestrian access to Wal-Mart and nearby restaurants. Site circulation will be improved due to the connection of the proposed parking lot to the Cleary Drive intersection that is central to the site.

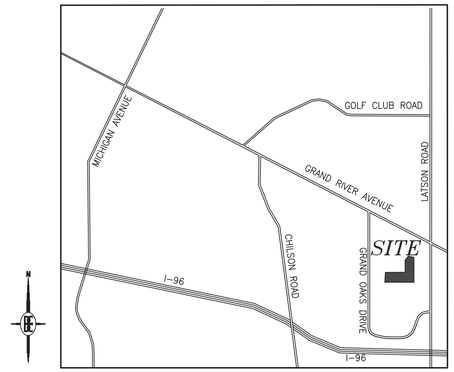
J. Special provisions: Deed restrictions, protective covenants, etc.

There are no special provisions for this development.

K. Description of all sources:

- Genoa Township Zoning Ordinance
- "Soil Survey of Livingston County, Michigan" Soil Conservation Services, U.S.D.A.
- National Wetlands Inventory, U.S. Department of Interior, Fish and Wildlife Service
- Cleary University Topographic Surveys (BE #04148 - April 2004) (BE #14-175 – July 2014)
- ITE, Trip Generation Manual, 6th edition

SITE PLAN
FOR
CLEARY UNIVERSITY STUDENT HOUSING APARTMENT #2
PART OF SE 1/4, SECTION 5, T2N-R5E
GENOA TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN
3750 CLEARY DRIVE, HOWELL, MI 48843



LOCATION MAP
NO SCALE

PROPERTY DESCRIPTION:

Part of the Southeast 1/4 of Section 5, T2N-R5E, Genoa Township, Livingston County, Michigan, more particularly described as follows: Beginning at the South 1/4 Corner of Section 5; thence along the North-South 1/4 line of Section 5 and the East line of Amended Plat of "Grand Oaks Commercial Park", as recorded in Liber 25 of Plats, Pages 40-41, Livingston County Records, N 02°17'10" E, 1094.27 feet (recorded as N 02°18'30" E, 1094.51 feet); thence S 82 34'46" E, 2.26 feet (recorded as S 86 44'03" E, 2.26 feet; thence S 88°40'21" E, 350.12 feet (recorded as S 88°45'00" E, 350.84 feet); thence S 01°15'00" W, 200.00 feet; thence S 88°31'00" E, 243.35 feet; thence N 01°27'55" E, 72.00 feet; thence S 60°51'00" E, 137.35 feet; thence N 29°12'13" E, 522.97 feet (recorded as N 29°09'00" E, 523.23 feet); thence along the Southerly Right of Way line of Grand River Avenue (100 foot wide Right of Way), S 60°48'55" E, 215.54 feet (recorded as S 60°51'00" E, 216.00 feet); thence S 20°42'05" W, 133.37 feet (recorded as S 20°49'00" W, 133.34 feet); thence southerly on an arc left, having a length of 77.61 feet, a radius of 230.00 feet, a central angle of 19°19'40", and a long chord which bears S 11°02'04" W, 77.22 feet; thence S 01°22'04" W (recorded as S 01°29'00" W), 358.87 feet; thence S 60°51'00" E, 193.29 feet; thence S 01°32'54" W (recorded as S 01°29' W), 598.48 feet; thence along the South line of Section 5, N 89°16'17" W, 1282.22 feet (recorded as N 89°18'11" W, 1281.80 feet), to the POINT OF BEGINNING, containing 29.60 acres, more or less, and subject to the rights of the public over the existing Grand River Avenue. Also subject to and including the use of Cleary Drive (66 foot wide Right of Way). Also subject to any other easements or restrictions of record.

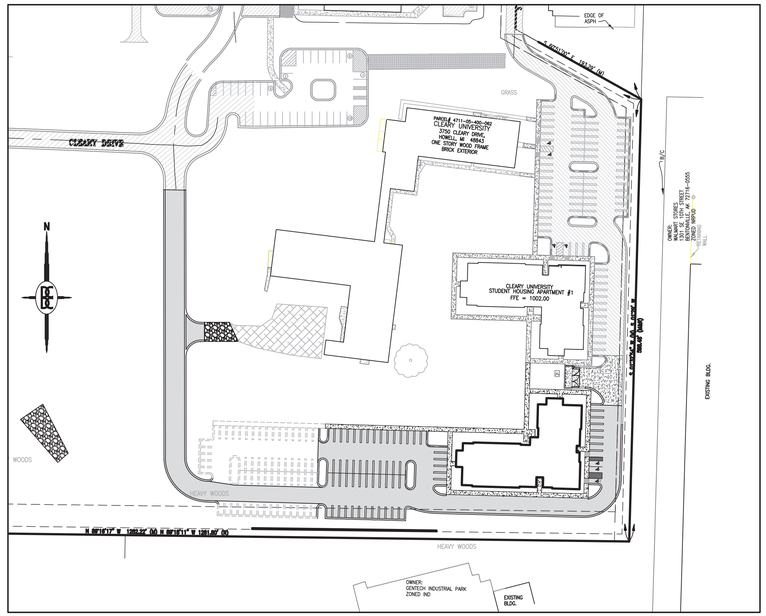
CONSTRUCTION NOTES

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 IS 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 & DEMOLITION PLAN
3	OVERALL SITE PLAN
4	SITE PLAN
5	GRADING & SOIL EROSION CONTROL PLAN
6	DRAINAGE PLAN
7	UTILITY PLAN
8	LANDSCAPE PLAN
9	LIGHTING PLAN
10	CONSTRUCTION DETAILS
11	WATER MAIN STANDARD DETAILS
12	SANITARY SEWER STANDARD DETAILS
ARCHITECTURAL SHEETS	
A-001	FIRST FLOOR PLAN
A-002	SECOND & THIRD FLOOR PLAN
A-201	ELEVATIONS
A-202	RENDERINGS

CLEARY UNIVERSITY
STUDENT HOUSING APARTMENT #2

PREPARED FOR:

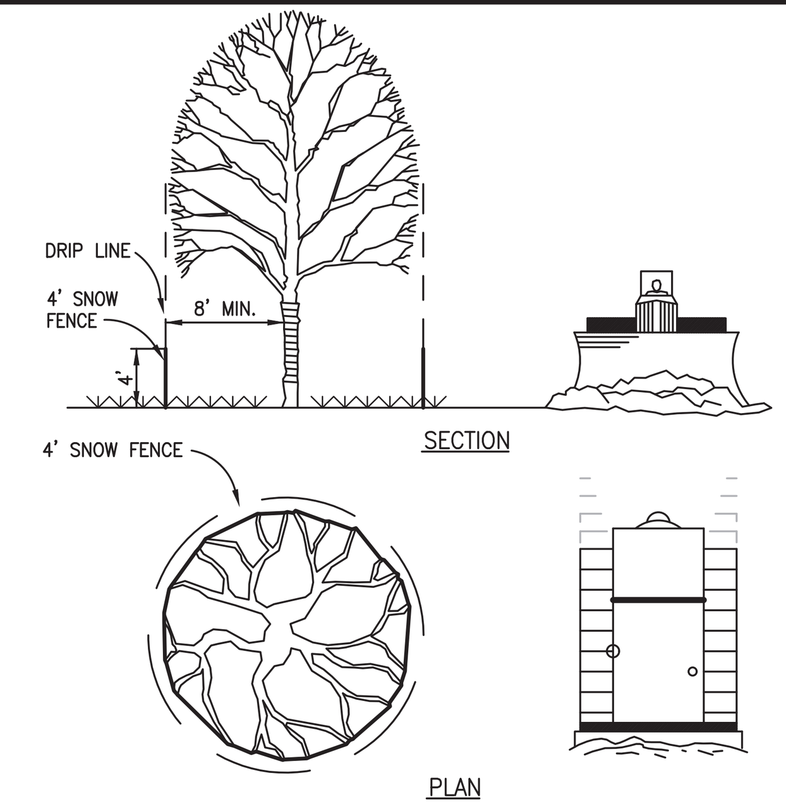
UNIVERSITY HOUSING SOLUTIONS, LLC
90 HIDDEN RAVINES DRIVE
POWELL, OH 43065
CONTACT: MR. ALAN PRICE
866.711.7786

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	JOB NO. 17-348
1	ST	BL	REVISION PER TWP REVIEW	9-18-17	ISSUE DATE: 8/30/17

1



SNOW FENCE PROTECTION DETAIL
(NO SCALE)

SOILS INFORMATION:
MIAMI LOAM (MoB), 2% TO 6% SLOPES
-ACCOUNTS FOR MOST OF SITE
MIAMI LOAM (MoE), 18% TO 25% SLOPES
-SLOPES LEADING TO STORM PIPE FLOWING UNDER BUILDING

GENERAL SURVEY NOTES:

1. BEARINGS WERE ESTABLISHED FROM A PREVIOUS SURVEY BY BOSS ENGINEERING, JOB NO. 04148, DATED 4-23-04.
2. SUBSURFACE UTILITIES NOT LOCATED FOR THIS SURVEY MAY EXIST. IT IS THE RESPONSIBILITY OF THE OWNER OF THE RESPECTIVE UTILITY TO ACCURATELY LOCATE SUCH UTILITIES.
3. EASEMENTS OR RESTRICTIONS OF RECORD NOT DEPICTED ON THIS DRAWING MAY EXIST.
4. ELEVATIONS WERE ESTABLISHED RELATIVE TO BENCHMARK INFORMATION AS SHOWN ON PREVIOUS SURVEYS BY BOSS ENGINEERING, JOB NO. 04148, DATED 4-23-04 & JOB NO. 04141-1, DATED 4-5-04. (NGVD29 DATUM)
5. CONTOURS ARE SHOWN AT 1 FOOT INTERVALS.
6. ALL ELEVATIONS ARE SHOWN TO THE NEAREST 0.01 FOOT; HOWEVER SOFT-SURFACE ELEVATIONS CAN ONLY BE PRESUMED ACCURATE TO THE NEAREST 0.1 FOOT.
7. ALL WORK SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE MUNICIPALITY, THE COUNTY, AND THE STATE OF MICHIGAN.
8. ALLOW THREE WORKING DAYS BEFORE YOU DIG, CALL MISS DIG TOLL FREE 1-800-482-7171.

N

50 0 25 50
SCALE: 1 INCH = 50 FEET

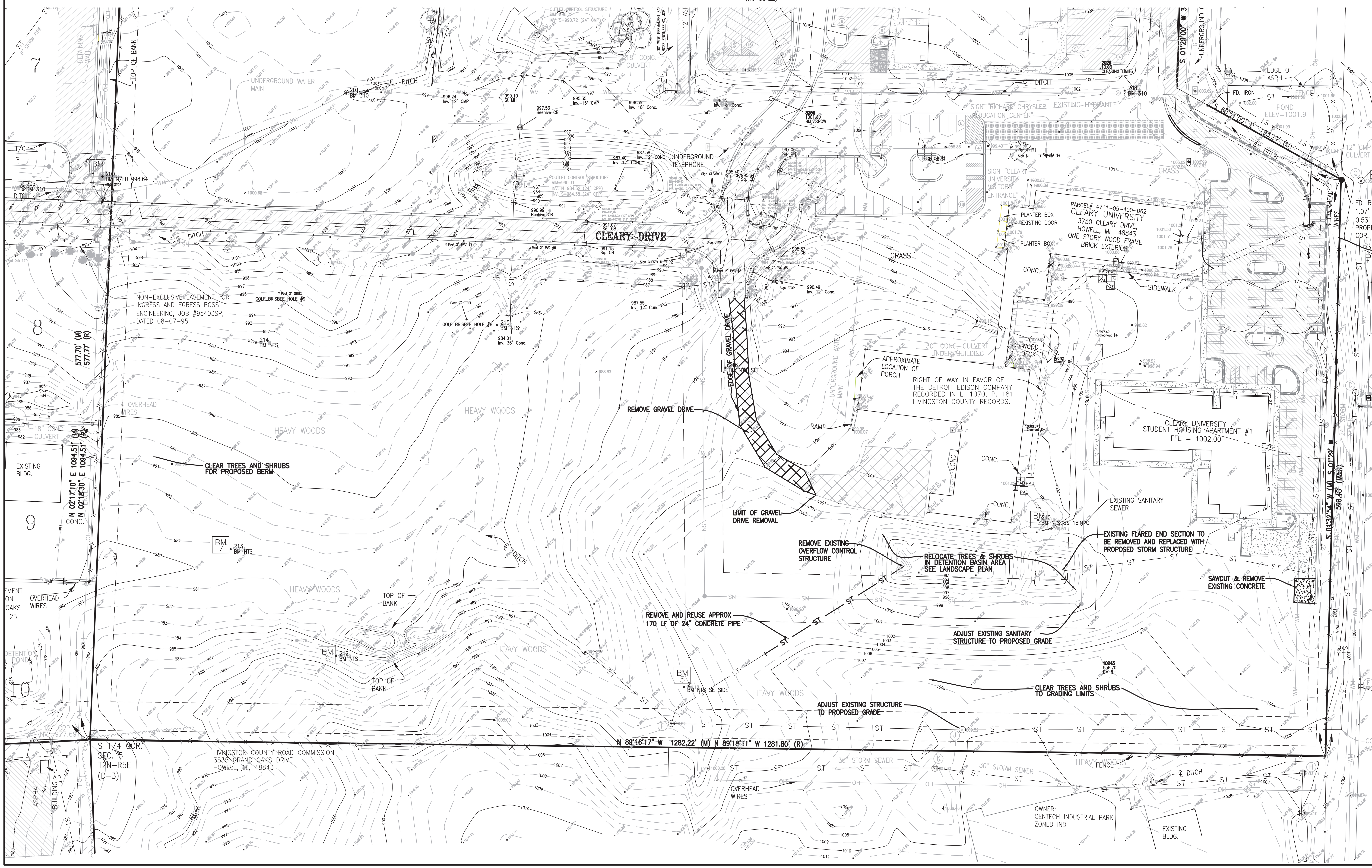
BENCHMARKS

BM 4 — SET NAIL/TAG IN S/S 18" OAK ±30' EAST OF SE CORNER MAIN BLDG. ELEV.: 1003.19

BM 5 — SET NAIL/TAG IN S/S 12" OAK IN NORTH LINE OF EASEMENT ±50' EAST OF ROCK DITCH ELEV.: 999.16

BM 6 — SET NAIL/TAG IN SW/S 9" POPLAR ±30' NORTH OF EASEMENT ±250' EAST OF PROPERTY LINE ELEV.: 987.19

BM 7 — SET NAIL/TAG IN NW/S 8" PINE ON LINE FROM 24-25 ELEV.: 980.39



LEGEND

- EXISTING CONTOUR
- EXISTING SPOT ELEVATION
- STORM DRAINAGE FLOW
- POWER POLE
- GUY WIRE
- HYDRANT
- GATE VALVE
- WATER MANHOLE
- MANHOLE
- STORM CATCH BASIN (BEEHIVE)
- STORM CATCH BASIN (SQUARE)
- STORM INVERT
- WELL
- TRANSFORMER PAD
- TELEPHONE RISER
- U.G. TELEPHONE MARKER
- GAS METER
- GAS RISER
- U.G. GAS MARKER
- ELECTRICAL RISER
- U.G. ELECTRIC MARKER
- MAILBOX
- AIR CONDITIONING UNIT
- LIGHT POLE
- SIGN
- DECIDUOUS TREE
- CONIFEROUS TREE
- IRON SET
- IRON FOUND
- MONUMENT
- SECTION CORNER
- —SN— SANITARY SEWER
- —WM— WATER MAIN
- —ST— STORM SEWER
- —G— GAS MAIN
- —E— ELECTRIC
- —T— TELEPHONE
- —OH— OVERHEAD WIRES
- —X— FENCE
- CONC. CONCRETE
- SAN MH SANITARY MANHOLE
- ST MH STORM MANHOLE
- ℄ CENTERLINE
- L. LIBER
- P. PAGE
- L.C.R. LIVINGSTON COUNTY RECORDS
- (R&M) RECORD AND MEASURED
- P.O.B. POINT OF BEGINNING
- HANDICAP SYMBOL

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: **CLEARY UNIVERSITY STUDENT HOUSING APARTMENT #2**

PREPARED FOR: **UNIVERSITY HOUSING SOLUTIONS, LLC**
90 HIDDEN RAVINES DRIVE
POWELL, OH 43065
(866) 711-7786

TITLE: **EXISTING CONDITIONS & DEMOLITION PLAN**

NO	BY	REVISION PER	DATE
1	ST	PER TWP REVIEW	9-18-17

DESIGNED BY: ST
DRAWN BY: ST
CHECKED BY:
SCALE 1" = 50'
JOB NO. 17-348
DATE 8/30/17
SHEET NO. 2

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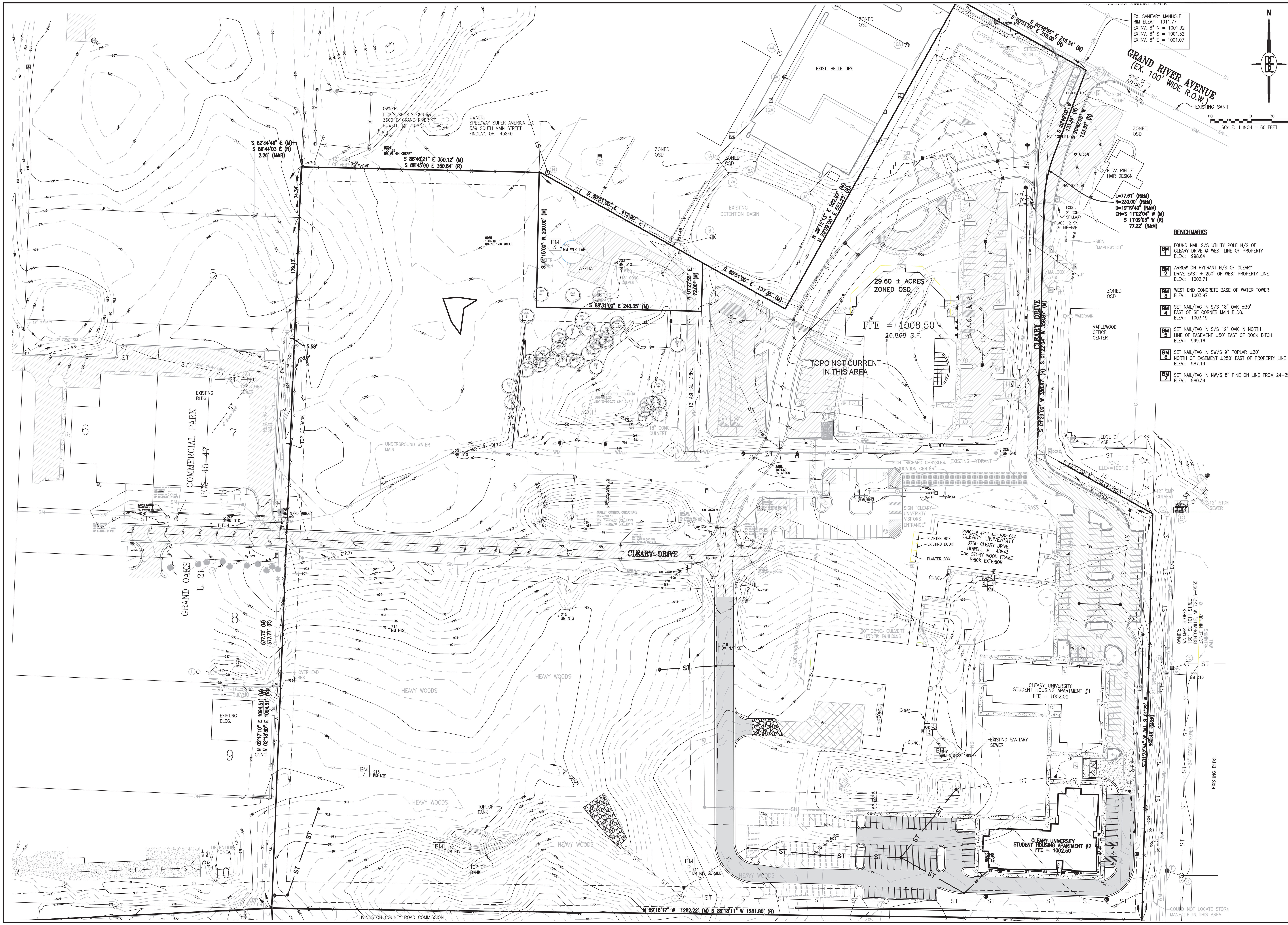

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HOWELL, MI. 48843
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PROJECT
CLEARY UNIVERSITY STUDENT HOUSING APARTMENT #2

PREPARED FOR
UNIVERSITY HOUSING SOLUTIONS, LLC
90 HIDDEN RAVINES DRIVE
POWELL, OH 43065
(866) 711-7786

TITLE
OVERALL SITE PLAN

NO	BY	REVISION PER	DATE
1	ST	PER TWP REVIEW	9-18-17

DESIGNED BY: ST
DRAWN BY: ST
CHECKED BY:
SCALE 1" = 60'
JOB NO. 17-348
DATE 8/30/17
SHEET NO. 3

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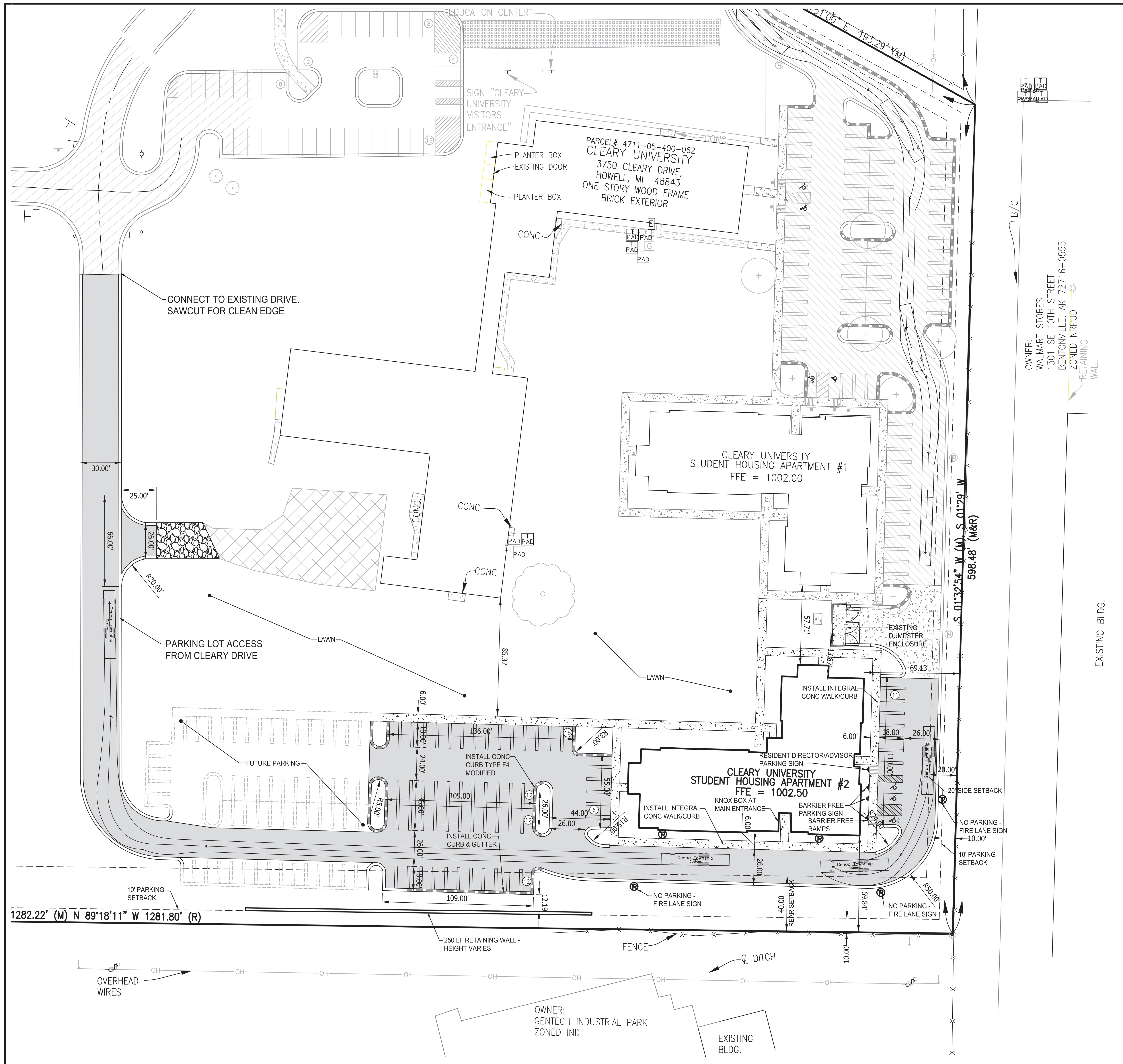

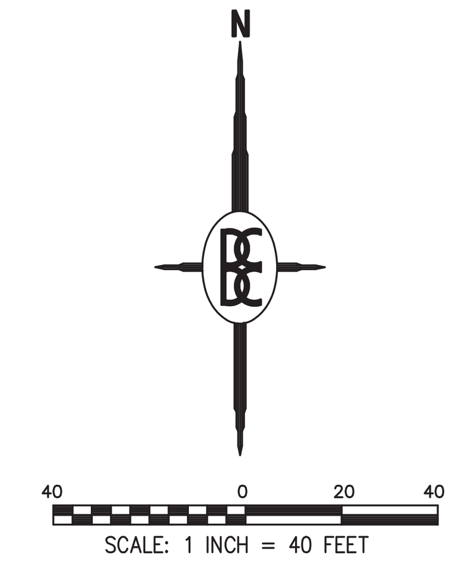

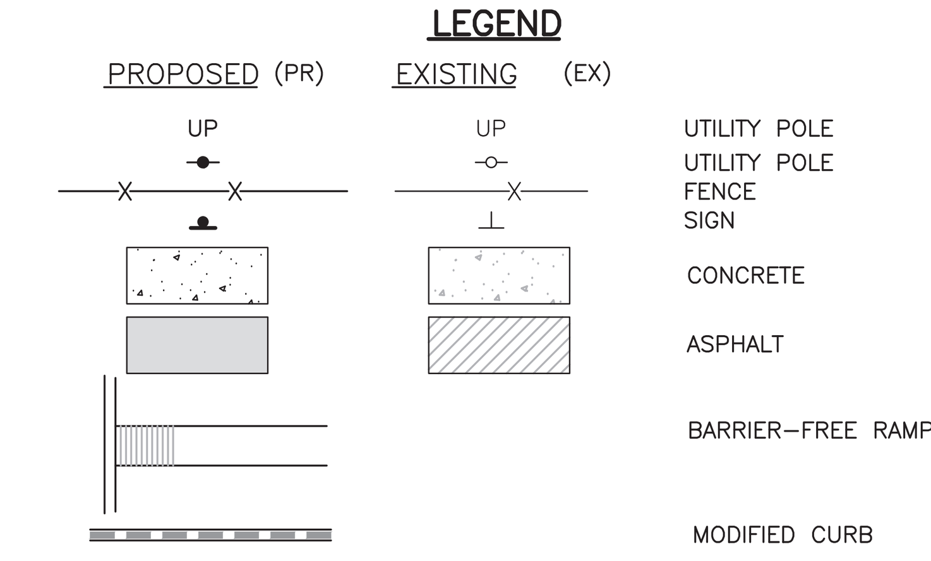

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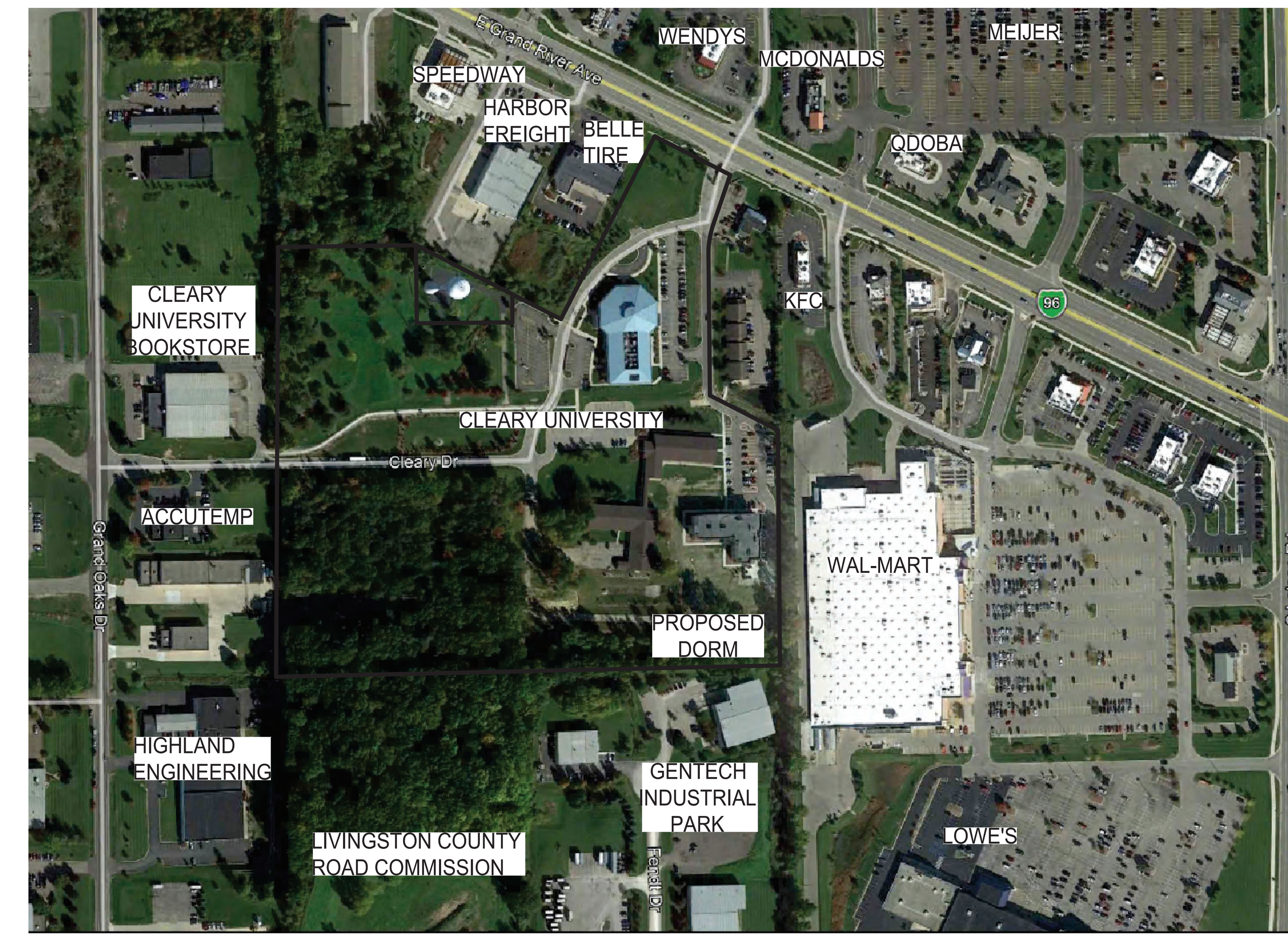


SURROUNDING SITE INFO
NO SCALE

SITE/BUILDING DATA

PARCEL SIZE:	29.60 AC.
EXISTING ZONING:	MUPUD
EXISTING USE:	UNIVERSITY BUILDINGS
PROPOSED USE:	UNIVERSITY STUDENT HOUSING APARTMENT
REQUIRED FRONT SETBACK:	70 FT.
PROPOSED FRONT SETBACK:	1059.2 FT.
REQUIRED SIDE SETBACK:	20 FT.
PROPOSED SIDE SETBACK:	69.1 FT.
REQUIRED REAR SETBACK:	40 FT.
PROPOSED REAR SETBACK:	69.8 FT.
PARKING LOT SETBACK:	10.00 FT. (SIDE/REAR)
PROPOSED PARKING SETBACK:	15.00 FT. (SIDE)
MAX. BUILDING HEIGHT:	2.5 STORIES/35 FT ** **60 FT MAX, PROVIDED THE FRONT, SIDE, AND REAR YARDS ARE MORE THAN THE BUILDING HEIGHT (ORDINANCE 11.01.05 (a))

PROPOSED BUILDING HEIGHT
STUDENT HOUSING APARTMENT 2 — 3 STORY / 30 FT.

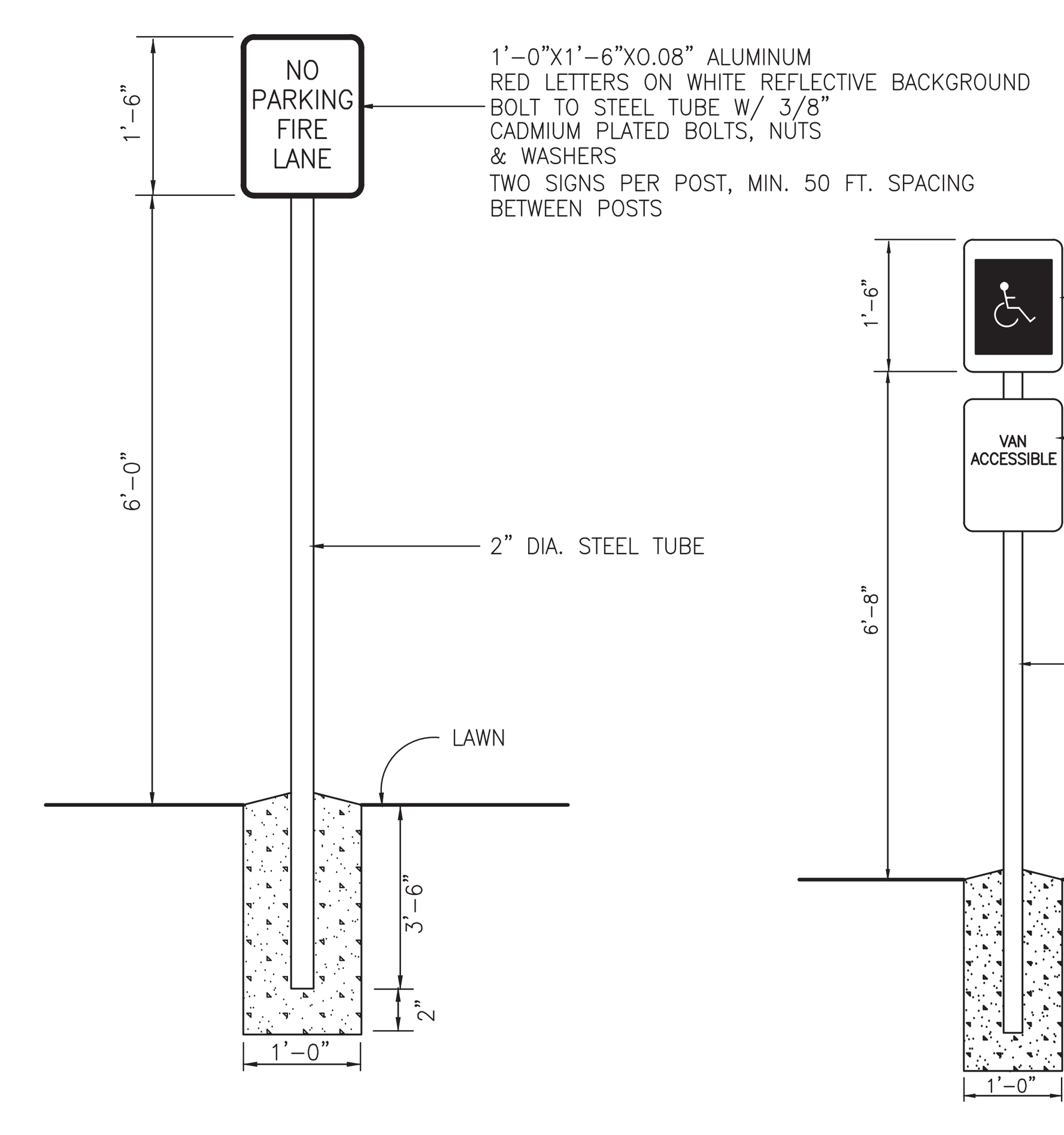
MAX. LOT COVERAGE — 35% BUILDING, 60% IMPERVIOUS

PROPOSED BUILDING FOOTPRINT

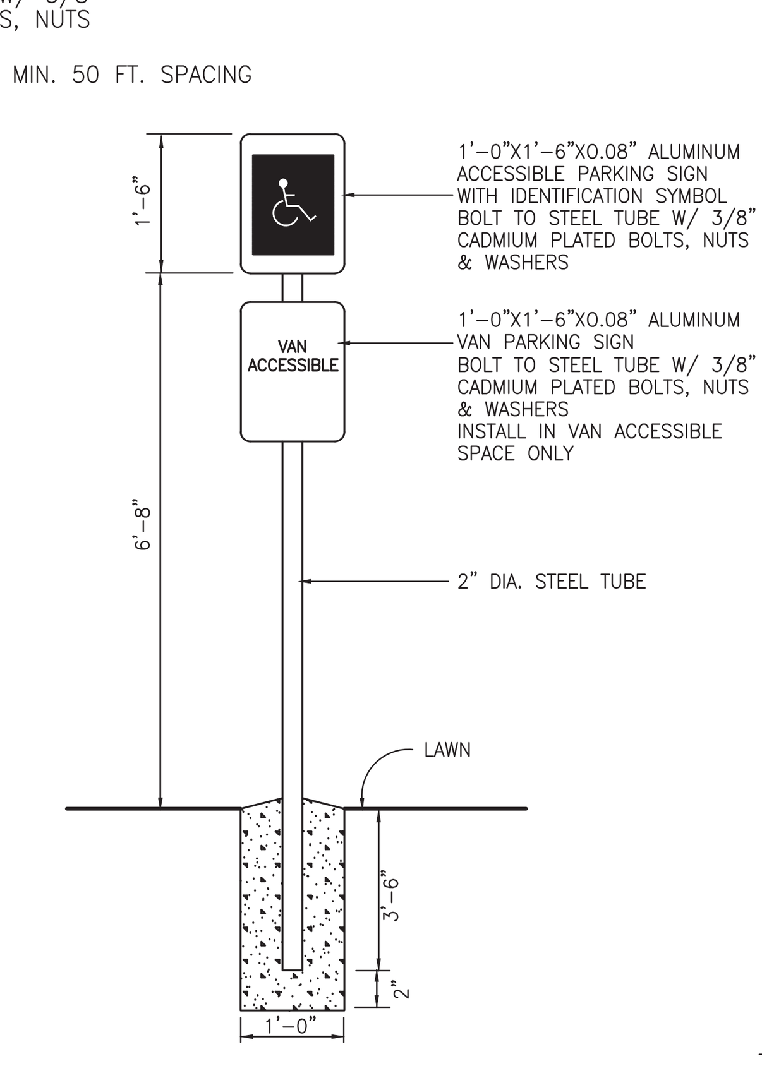
STUDENT HOUSING APARTMENT 1:	12,786 S.F.
EXISTING BUILDINGS:	71,106 S.F.
TOTAL	83,892 S.F. (6.50%)

IMPERVIOUS COVERAGE

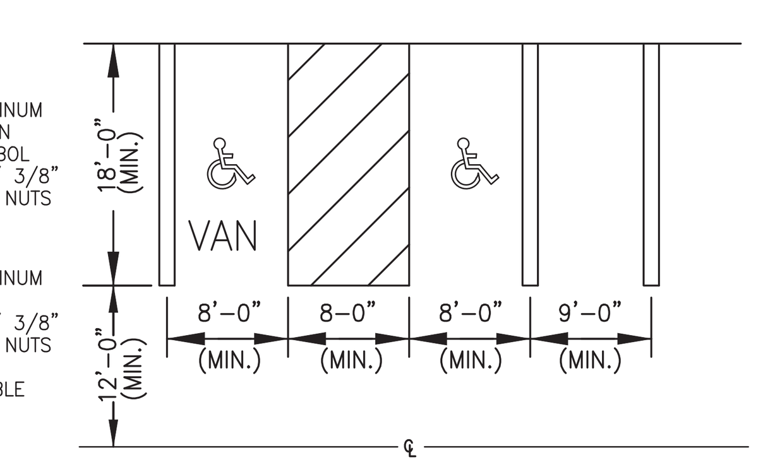
EXISTING IMPERVIOUS:	256,014 S.F.
PROPOSED IMPERVIOUS:	66,800 S.F.
TOTAL	322,814 S.F. (25.0%)



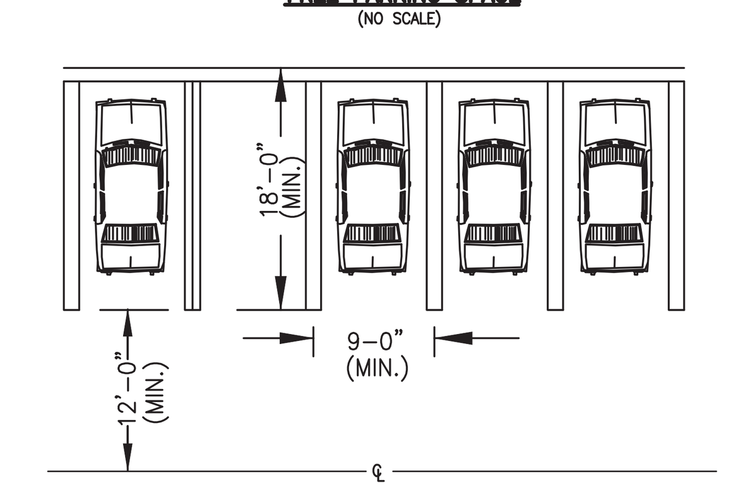
NO PARKING SIGN DETAIL
(NO SCALE)



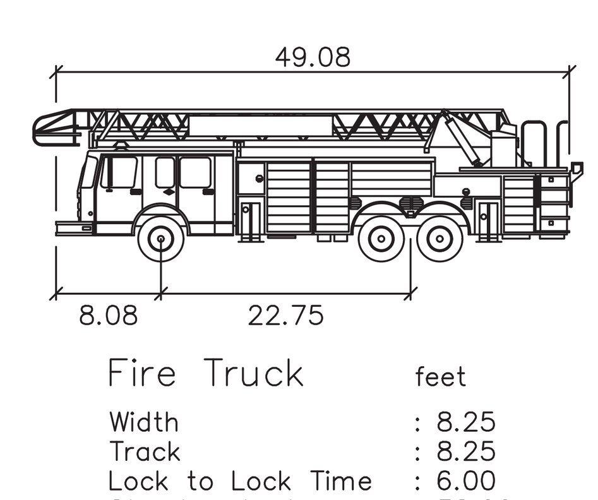
HANDICAP PARKING SIGN DETAIL
(NO SCALE)



TYPICAL BARRIER FREE PARKING SPACE
(NO SCALE)



TYPICAL PARKING SPACE
(NO SCALE)



FIRE APPARATUS FOR TURNING TEMPLATE
(NO SCALE)

GENERAL NOTES

1. ALL OUTDOOR LIGHTS SHALL BE SHIELDED TO REDUCE GLARE AND SHALL BE ARRANGED TO NOT INTERFERE WITH THE VISION OF PERSONS ON ADJACENT ROADWAYS OR ADJACENT PROPERTY.
2. ALL SIGNS SHALL MEET LOCAL MUNICIPALITY ORDINANCE REQUIREMENTS.
3. ACCESS ROADS TO SITE SHALL BE PROVIDED AND MAINTAINED DURING CONSTRUCTION. ACCESS ROADS SHALL BE CONSTRUCTED TO BE CAPABLE OF SUPPORTING THE IMPOSED LOAD OF FIRE APPARATUS OF 75,000 POUNDS.
4. THE BUILDING IS TO HAVE AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13.
5. THE BUILDING ADDRESS SHALL BE A MINIMUM OF 6" HIGH LETTERS OF CONTRASTING COLORS AND BE CLEARLY VISIBLE FROM THE STREET. THE LOCATION AND SIZE ARE TO BE VERIFIED PRIOR TO INSTALLATION.
6. THE EXISTING DUMPSTER ENCLOSURE BETWEEN THE TWO STUDENT HOUSING BUILDINGS WAS DESIGNED TO ACCOMMODATE THE PROPOSED BUILDING.

PARKING DATA

PARKING REQUIRED:
STUDENT HOUSING APARTMENT 2 :
1 SPACES / 2 BEDS --> 129 BEDS / 2 = 65 SPACES

TOTAL PARKING REQUIRED: 65 SPACES REQUIRED (3 BARRIER-FREE SPACES REQUIRED)

TOTAL PARKING PROPOSED: 68 SPACES (INCLUDES 3 BARRIER-FREE PARKING SPACES)

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PREPARED FOR
UNIVERSITY HOUSING SOLUTIONS, LLC
90 HIDDEN RAVINES DRIVE
POWELL, OH 43065
(866) 711-7786

TITLE
SITE PLAN

NO	BY	REVISION PER	DATE
1	ST	PER TWP REVIEW	9-18-17

DESIGNED BY: ST
DRAWN BY: ST
CHECKED BY:
SCALE 1" = 40'
JOB NO. 17-348
DATE 8/30/17
SHEET NO. 4

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PIPE	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	RIM-INV	RIM-HG >1	PIPE COVER >2.667	FLOW THRU COVER
EXISTING	9	8	9	0.43	0.39	0.0397	0.84	0.3605	4.38	15.00		1.58	61	12	2.01	0.19%	0.32%	2.02	2.57	0.40	996.70	996.51	999.50	995.90	995.71	3.60	2.80	2.60	1.58
EXISTING	8	7	8	0.41	0.28	0.1257	0.68	0.2768	4.33	15.40	1.57	4.35	55	18	2.46	0.17%	0.20%	4.71	2.67	0.34	996.51	996.40	999.50	995.31	995.20	4.19	2.99	2.69	1.20
EXISTING	7	6	7	0.19	0.00	0.1926	0.20	0.0385	4.30	15.74		4.51	108	18	2.55	0.18%	0.20%	4.71	2.67	0.68	996.40	996.18	998.80	995.20	994.98	3.60	2.40	2.10	0.17
EXISTING	6	5	6	0.33	0.20	0.1339	0.62	0.2037	4.23	16.41		5.37	124	21	2.23	0.11%	0.16%	6.36	2.64	0.78	996.18	996.00	999.75	994.78	994.58	4.97	3.57	3.22	0.86
EXISTING	5	4	5	-	-	-	-	-	4.15	17.20	1.33	6.70	111	21	2.79	0.18%	0.16%	6.36	2.64	0.70	996.00	995.81	1000.88	994.58	994.41	6.30	4.88	4.55	0.00
EXISTING	4	103	4	0.10	0.04	0.0575	0.49	0.0475	4.08	17.90	1.16	8.05	148	24	2.56	0.13%	0.14%	8.49	2.70	0.91	995.81	995.60	1000.50	994.21	994.00	6.29	4.69	4.29	0.19
PROPOSED	103	102	103	1.27	0.04	1.2312	0.22	0.2824	3.99	18.81		9.18	129	24	2.92	0.16%	0.60%	17.57	5.59	0.38	995.44	994.67	999.50	993.84	993.07	5.66	4.06	3.50	1.13
PROPOSED	102	101	102	0.55	0.43	0.1124	0.76	0.4134	3.96	19.19	1.77	12.59	119	24	4.01	0.31%	1.00%	22.68	7.22	0.27	994.67	993.48	999.40	993.07	991.88	6.33	4.73	4.33	1.64
PROPOSED	101	100	101	0.49	0.43	0.0583	0.82	0.4026	3.94	19.47		14.17	108	24	4.51	0.39%	1.00%	22.68	7.22	0.25	993.48	992.40	999.40	991.88	990.80	7.52	5.92	5.52	1.58
EXISTING	100	1	-	-	-	-	-	-	3.91	19.72		14.17	110	24	4.51	0.39%	1.00%	22.68	7.22	0.25	992.40	991.30	1001.50	990.80	989.70	10.70	9.10	8.70	0.00
EXISTING	1	EX	-	-	-	-	-	-	3.89	19.97		14.17	14	24	4.51	0.39%	1.00%	22.68	7.22	0.03	991.30	991.16	996.50	989.70	989.56	6.80	5.20	4.80	0.00
EXISTING	10	8	10	0.77	0.29	0.471	0.47	0.3592	4.38	15.00		1.57	140	12	2.00	0.19%	1.00%	3.57	4.55	0.51	997.91	996.51	1001.25	997.11	995.71	4.14	3.34	3.14	1.57
EXISTING	11	5	11	0.63	0.25	0.378	0.48	0.3036	4.38	15.00		1.33	61	12	1.69	0.14%	1.00%	3.57	4.55	0.22	996.59	995.98	999.75	995.79	995.18	3.96	3.16	2.96	1.33
EXISTING	ROOF 1	4	ROOF 1	0.29	0.29	0	0.90	0.2642	4.38	15.00		1.16	166	8	3.31	0.91%	1.00%	1.21	3.47	0.80	997.19	995.60	1001.75	996.66	995.00	5.09	4.56	4.42	1.16
PROPOSED	ROOF 2	104	ROOF 2	0.29	0.29	0	0.90	0.2642	4.38	15.00		1.16	295	8	3.31	0.91%	1.75%	1.60	4.59	1.07	1000.90	995.74	1002.25	1000.37	995.21	1.88	1.35	1.21	1.16
PROPOSED	104	102	104	0.29	0.13	0.1613	0.51	0.1448	4.26	16.07		1.77	107	12	2.26	0.25%	1.00%	3.57	4.55	0.39	995.74	994.67	1000.00	994.94	993.87	5.06	4.26	4.06	0.62
PROPOSED	107	106	107	0.09	0.09	0	0.90	0.0808	4.38	15.00		0.35	30	18	0.20	0.00%	1.00%	10.53	5.96	0.08	992.80	992.50	997.66	991.60	991.30	6.06	4.86	4.56	0.35
PROPOSED	106	105	106	0.09	0.09	0	0.90	0.0808	4.37	15.08		0.71	80	18	0.40	0.00%	1.00%	10.53	5.96	0.22	992.50	991.70	997.66	991.30	990.50	6.36	5.16	4.86	0.35
PROPOSED	110	109	-	-	-	-	-	0	4.38	15.00		3.34	135	36	0.47	0.00%	1.00%	66.88	9.46	0.24	982.40	981.05	984.00	980.00	978.65	4.00	1.60	1.00	0.00
PROPOSED	109	108	-	-	-	-	-	0	4.35	15.24		3.34	18	36	0.47	0.00%	1.00%	66.88	9.46	0.03	981.05	980.87	985.00	978.65	978.47	6.35	3.95	3.35	0.00

SOIL EROSION CONTROL MEASURES

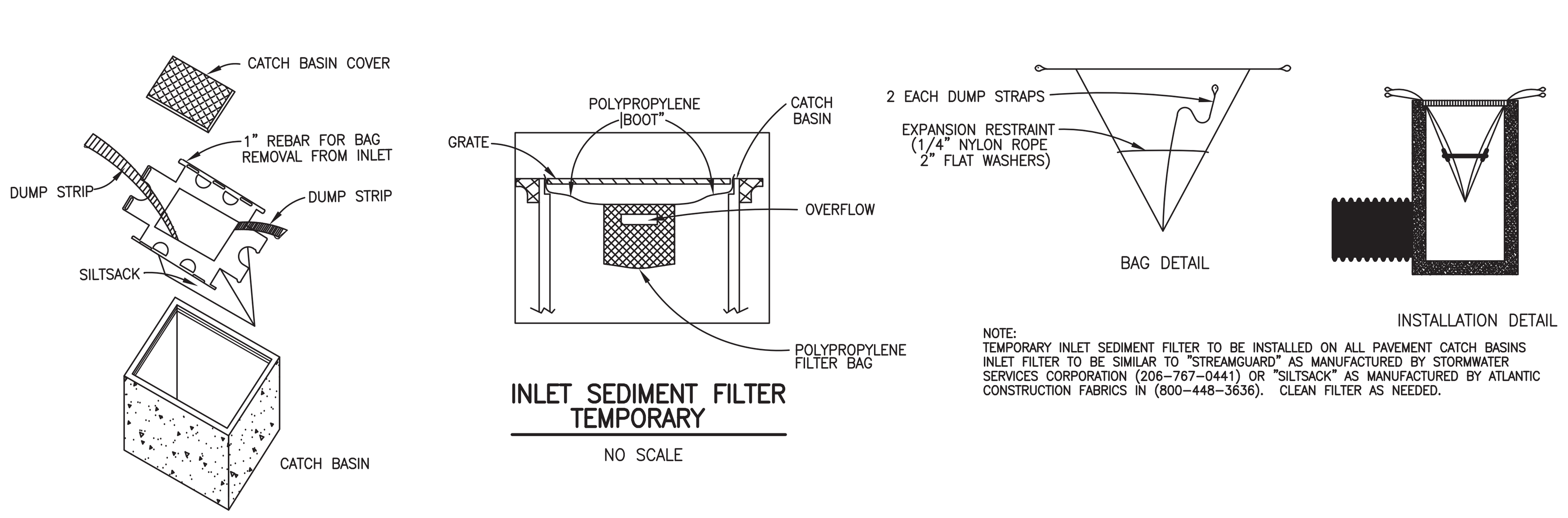
No.	Measure	Description
1	STRIPPING & STOCKPILING TOPSOIL	TOPSOIL MAY BE STOCKPILED ABOVE BORROW AREAS TO ACT AS A DIVERSION STOCKPILE SHOULD BE TEMPORARILY SEEDED
6	SEEDING WITH MULCH AND/OR MATTING	FACILITATES ESTABLISHMENT OF VEGETATIVE COVER EFFECTIVE FOR DRAINAGEWAYS WITH LOW VELOCITY EASILY PLACED IN SMALL QUANTITIES BY INEXPERIENCED PERSONNEL SHOULD INCLUDE PREPARED TOPSOIL BED
14	AGGREGATE COVER	STABILIZES SOIL SURFACE, THUS MINIMIZING EROSION PERMITS CONSTRUCTION TRAFFIC IN ADVERSE WEATHER MAY BE USED AS PART OF PERMANENT BASE CONSTRUCTION OF PAVED AREAS
15	PAVING	PROTECTS AREAS WHICH CANNOT OTHERWISE BE PROTECTED, BUT INCREASES RUNOFF VELOCITY IRREGULAR SURFACE WILL HELP SLOW VELOCITY
16	CURB & GUTTER	KEEPS HIGH VELOCITY RUNOFF ON PAVED AREAS FROM LEAVING PAVED SURFACE COLLECTS AND CONDUCTS RUNOFF TO ENCLOSED DRAINAGE SYSTEM OR PREPARED DRAINAGEWAY
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
40	INLET SEDIMENT FILTER	EASY TO SHAPE COLLECTS SEDIMENT MAY BE CLEANED AND EXPANDED AS NEEDED
54		USES GEOTEXTILE FABRIC AND POST OR POLES. EASY TO CONSTRUCT AND LOCATE AS NECESSARY. (SEE DETAIL THIS SHEET)

P=PERMANENT T=TEMPORARY

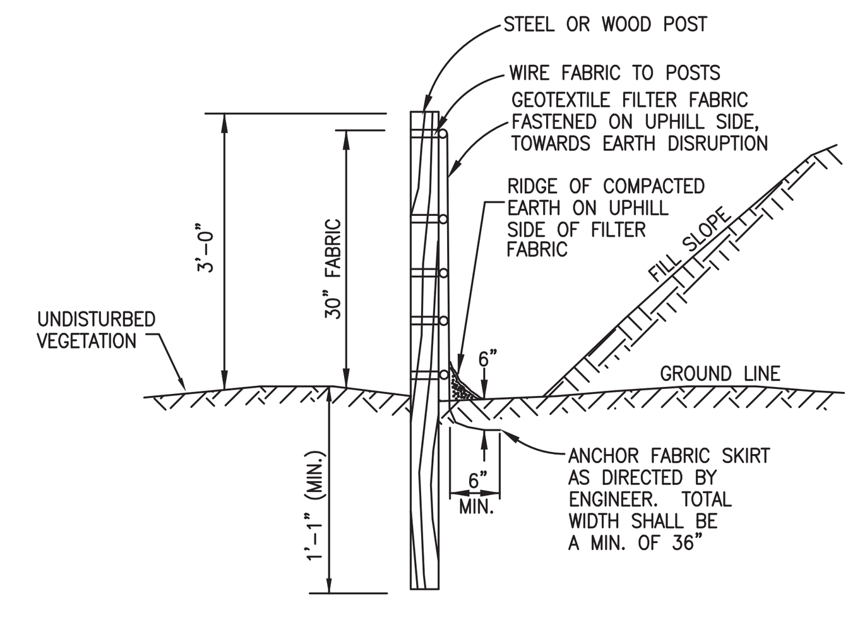
TOTAL DISTURBED AREA = 4.52 AC

LEGEND

PROPOSED (PR)	EXISTING (EX)	
900	900	CONTOUR
		STORM DRAINAGE FLOW
T/C XXX.XX	+ 922.08	SPOT ELEVATION
FF	FF	FINISHED FLOOR ELEVATION
FG	FG	FINISHED GRADE ELEVATION
T/A	T/A	TOP OF ASPHALT
T/C	T/C	TOP OF CURB / CONCRETE
T/W	T/W	TOP OF WALK
RIM	RIM	RIM ELEVATION
INV	INV	INVERT ELEVATION
MH	MH	MANHOLE STRUCTURE
IN	IN	INLET STRUCTURE
CB	CB	CATCHBASIN STRUCTURE
GV	GV	GATEVALVE STRUCTURE
HY	HY	HYDRANT
UP	UP	UTILITY POLE
SN	SN	SANITARY SEWER
SL	SL	SANITARY LEAD
FM	FM	FORCE MAIN
ST	ST	STORM SEWER
WM	WM	WATER MAIN
WL	WL	WATER LEAD
OH	OH	OVERHEAD WIRE
E	E	ELECTRIC
G	G	GAS
T	T	TELEPHONE
		MANHOLE
		INLET / CATCHBASIN
		FLARED END-SECTION
		GATE VALVE
		HYDRANT
		UTILITY POLE
X	X	FENCE
		SIGN
SAN #1		SANITARY SEWER LABEL
CB 09		STORM SEWER LABEL
GV 12		WATER MAIN LABEL
54T		SOIL EROSION CONTROL MEASURE (P=PERMANENT, T=TEMPORARY)
		SILT FENCE
		LIMITS OF GRADING/CLEARING



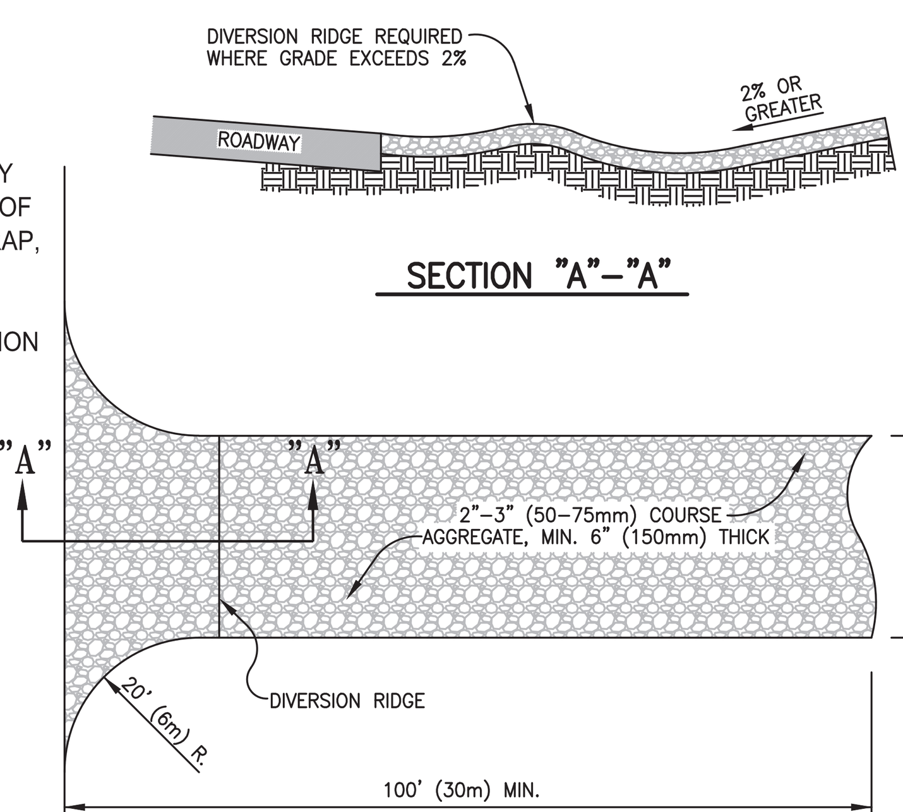
INLET SEDIMENT FILTER
TEMPORARY
NO SCALE



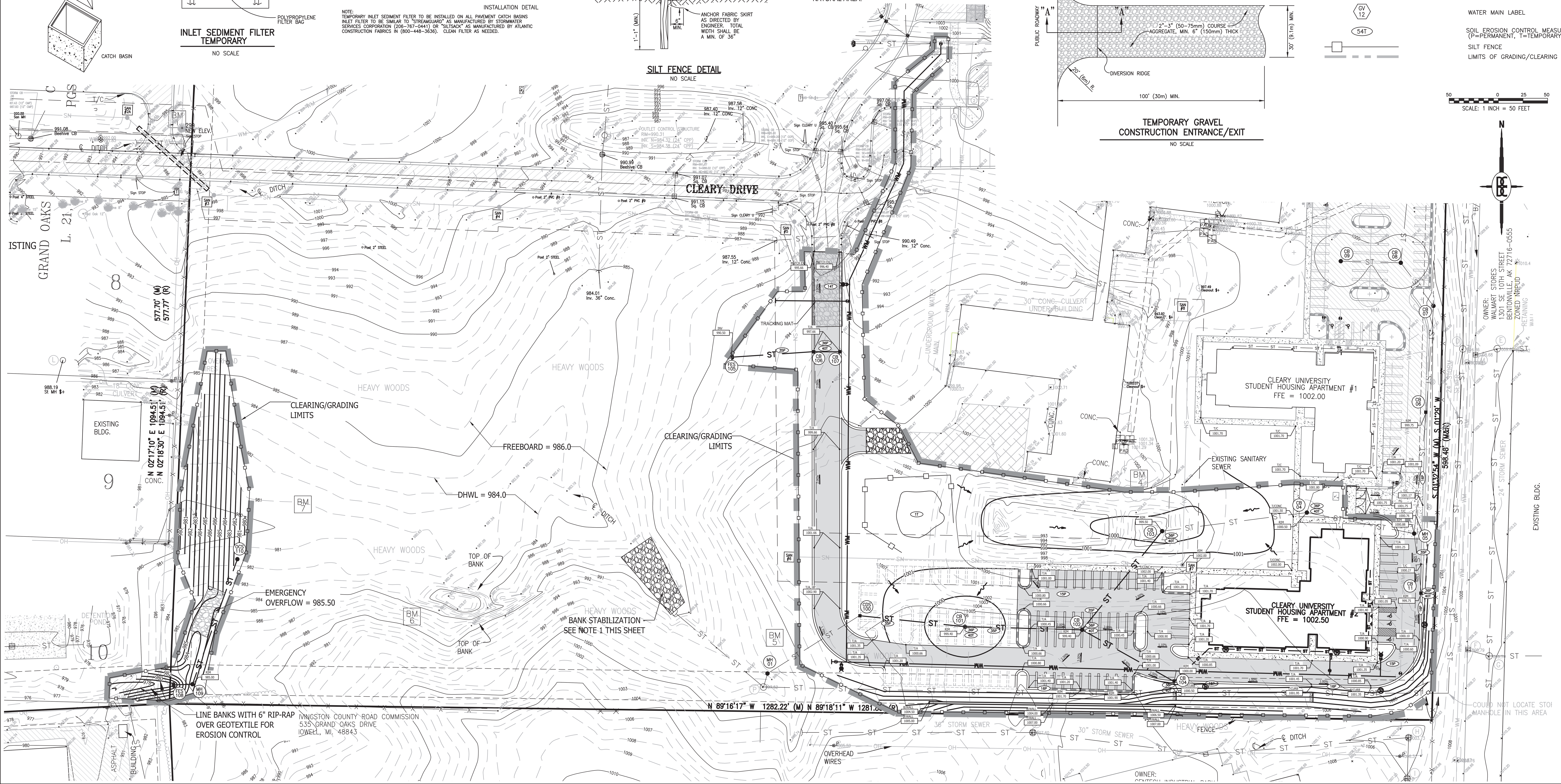
SILT FENCE DETAIL
NO SCALE

BANK STABILIZATION NOTES

1. THE 36" DIAMETER OUTLET PIPE FROM THE WAL-MART PROPERTY IS EXPERIENCING BANK EROSION AT THE END SECTION ON THE CLEARY UNIVERSITY PROPERTY. THE SWALE SHALL BE REGRADED AS NECESSARY FOR PROPER STABILIZATION. STABILIZATION SHALL INCLUDE THE LAYING OF A WOVEN GEOTEXTILE FABRIC UNDERNEATH A LAYER OF GROUTED RIP-RAP, MINIMUM 6" IN SIZE. THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER ON THE LIMITS OF THE EROSION AND STABILIZATION DURING CONSTRUCTION. THE CONSTRUCTION METHODS USED IN THE STABILIZATION SHALL CONSIST OF THOSE WHICH HAVE MINIMAL DISTURBANCE TO THE NATURAL AREA.



TEMPORARY GRAVEL
CONSTRUCTION ENTRANCE/EXIT
NO SCALE



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

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POWELL, OH 43065
(866) 711-7786

TITLE: GRADING & SOIL EROSION CONTROL PLAN

NO	BY	REVISION PER	DATE
1	ST	PER TWP REVIEW	9-18-17

DESIGNED BY: ST
DRAWN BY: ST
CHECKED BY:
SCALE 1" = 50'
JOB NO. 17-348
DATE 8/30/17
SHEET NO. 5

LIVINGSTON COUNTY DETENTION BASIN CALCULATIONS

AREA (ACRES)	IMPERVIOUS FACTOR	ACRE IMPERVIOUS
4.08	0.9	3.67
0.00	0.7	0.00
12.62	0.2	2.52

COMPOUND C: 0.37
TOTAL DRAINAGE AREA: 16.70 ACRES

K1 = AxC (Design Constant) 6.179
Qa = MAX ALLOW OUTFLOW (0.20 CFS / ACRE 3.340 CFS

DURATION MINUTES	DURATION SECONDS	INTENSITY (IN/HR)	INCHES	INFLOW VOLUME IN. RUNOFF xAxC	OUTFLOW DURATION x Qo	STORAGE VOLUME INFLOW - OUTFLOW
5	300	9.17	2750	16992	1002	15990
10	600	7.86	4714	29130	2004	27126
15	900	6.88	6188	38233	3006	35227
20	1200	6.11	7333	45313	4008	41305
30	1800	5.00	9000	55611	6012	49599
60	3600	3.24	11647	71967	12024	59943
90	5400	2.39	12913	79790	18036	61754
120	7200	1.90	13655	84375	24048	60327
180	10800	1.34	14488	89520	36072	53448

REQUIRED 100 YEAR DETENTION VOLUME = 61754 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)= 3088 CF

FOREBAY STORAGE VOLUME REQUIRED: 3088 CF
MECHANICAL PRETREATMENT TO TAKE PLACE OF FOREBAY

BANKFULL FLOOD VOLUME
V_{BF} = 5160 x A x C= **31884 CF**

FIRST FLUSH VOLUME
V_{FF} = 1815 x A x C= **11215 CF**

BASIN STORAGE PROVIDED

ELEV.	AREA (FT^2)	DEPTH (FT)	VOLUME (FT^3)	TOTAL VOLUME (FT^3)	
986	100856	1	90,268	254,799	FREEBOARD ELEVATION
985	79680	1	68,249	164,531	FREEBOARD ELEVATION
984	56817	1	47,372	**96,282**	**DESIGN HIGHWATER ELEVATION**
983	37927	1	29,547	48,910	
982	21167	1	14,443	19,363	
981	7719	0.5	3,388	4,920	
980.5	5831	0.5	1,533	1,533	
980	300				

BOTTOM OF BASIN = 980.00

FIRST FLUSH X_{FF} = 981.44

BANKFULL X_{BF} = 982.42

100 YEAR X_{100} = 983.27

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)= 0.130 CFS

PLACE OPENINGS IN STANDPIPE AT BOTTOM OF BASIN = **980.00**

HEAD = $h_{FF} = X_{FF}$ - BOTTOM BASIN ELEV = 1.44 FT

$A = Q_{FF} / (0.62 \times (2 \times 32.2 \times h_{FF})^{0.5})$ = 0.022 FT^2

A 1 INCH DIAMETER ORIFICE HAS AN AREA OF 0.0055 SF

A/ 0.0055 = 3.99

THEREFORE, USE THE FOLLOWING NUMBER OF 1 INCH DIAMETER HOLES
3.00 HOLES, AT ELEV. 980.00
$Q_{FF}MAX$ = 0.147 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 = 2.42 FT

$Q_{90.0}$ = 0.62x #HOLES x (AREA EACH $HOLE_{FF}$) x $(2 \times 32.2 \times h)^{0.5}$ = 0.127 CFS
$T_{90.0}$ = (1SEC / $Q_{90.0}$) x V_{BF} x (1HR / 3600SEC) = 69.88 HRS

BECAUSE THE HOLDING TIME EXCEEDS 40 HRS, ADDITIONAL ORIFICES IN THE STANDPIPE ARE REQUIRED.

VOLUME THROUGH 3 1 INCH DIAMETER HOLES IN 24 HOURS:
V=Q90.0x24HRSx3600SEC/HR = 10951 CF
REMAINING VOL. = 20933 CF
QBF = REMAINING VOLUME x (1 / 24HRS) x (1 / 3600SEC) = 0.242 CFS

PLACE OPENINGS AT FIRST FLUSH ELEVATION = 981.44
HEAD = hBF = XBF -XFF = 0.99 FT
A = QBF / (O.62 * (2*32.2*hBF)^0.5) = 0.049 SF

A 1 INCH DIAMETER ORIFICE HAS AN AREA OF 0.0055 SF
A/ 0.0055 = 8.98
THEREFORE, USE 8 1 INCH DIAMETER HOLES AT ELEV. = 981.44
$Q_{BF}MAX$ = 0.294 CFS

100 YEAR FLOOD

Q_a = ALLOWABLE RELEASE RATE x AREA SITE IN ACRES= 3.340 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:

$Q_{FF}MAX + Q_{BF}MAX$ = 0.44 CFS

$Q_a - (Q_{FF}MAX + Q_{BF}MAX)$ = 2.90 CFS

$A = Q_a / (0.62 * (2 * 32.2 * (X_{100} - X_{BF}))^{0.5})$ = 0.633 SF

A 2.5 INCH DIAMETER ORIFICE HAS AN AREA OF 0.034 SF

A/ 0.034 = 18.57

THEREFORE, USE THE FOLLOWING NUMBER OF 2.5 INCH DIAMETER HOLES:
19 HOLES AT ELEV. = 982.42

Q_{100} = 2.966 CFS
$Q_O = Q_{100} + Q_{BF}MAX + Q_{FF}MAX$ 3.408 CFS

SUMMARY OF REQUIRED STANDPIPE HOLES:			
ELEVATION	# OF HOLES	DIAMETER OF HOLES	
982.42	19	2.5	INCHES
981.44	8	1	INCHES
980.00	3	1	INCHES

DRAINAGE AREAS

NAME		AREA (ACRES)	PERVIOUS AREA (ACRES)	IMPERVIOUS AREA (ACRES)	COMPOSITE C VALUE
BASIN		7.32	7.32	0.00	0.20
CHRYSLER BLDG		3.01	2.24	0.77	0.38
CB	4	0.10	0.06	0.04	0.49
CB	6	0.33	0.13	0.20	0.62
CB	7	0.19	0.19	0.00	0.20
CB	8	0.41	0.13	0.28	0.68
CB	9	0.43	0.04	0.39	0.84
CB	10	0.77	0.47	0.29	0.47
CB	11	0.63	0.38	0.25	0.48
CDS	100	0.00	0.00	0.00	0.00
CB	101	0.64	0.15	0.49	0.74
CB	102	0.55	0.11	0.43	0.76
CB	103	1.27	1.23	0.04	0.22
CB	104	0.29	0.16	0.13	0.51
CB	106	0.09	0.00	0.09	0.90
CB	107	0.09	0.00	0.09	0.90
	ROOF 2	0.29	0.00	0.29	0.90
	ROOF 1	0.29	0.00	0.29	0.90
	TOTAL	16.70	12.62	4.08	0.37

STORM WATER NARRATIVE

EXISTING CONDITIONS:
THERE IS AN EXISTING DETENTION BASIN IN THE SOUTHEAST PORTION OF THE SITE THAT WAS CONSTRUCTED AS A PART OF THE STUDENT HOUSING APARTMENTS PROJECT IN 2015. THE BASIN WAS DESIGNED WITH A VOLUME OF APPROXIMATELY 23,900 CFT. THIS BASIN COLLECTS THE STORMWATER FROM THE FIRST STUDENT HOUSING APARTMENT BUILDING AS WELL AS ALL OF THE GREEN SPACE TO THE SOUTH WHERE THE PROPOSED SECOND STUDENT HOUSING APARTMENT WILL BE LOCATED. FROM THE DETENTION BASIN, THE STORM WATER IS OUTLET INTO AN EXISTING STORM SEWER THAT RUNS PARALLEL TO THE SOUTHERN PROPERTY LINE WHERE IT DISCHARGES INTO THE WOODS IN THE SOUTHWEST QUADRANT OF THE SITE. THE STORM WATER CONTINUES IN A DITCH THROUGH THE WOODS TO THE SOUTHWEST PROPERTY CORNER WHERE IT CONTINUES OFF-SITE.
THERE IS CURRENTLY AN EASEMENT FOR STORM WATER ON THE CLEARY UNIVERSITY PROPERTY FROM THE WAL-MART PROPERTY. THE STORM PIPE IS THE OUTLET PIPE OF TWO DETENTION BASINS ON THE WAL-MART PROPERTY. IT IS BELIEVED THAT THE WAL-MART PIPE IS SIZED FOR EMERGENCY OVERFLOW CONDITIONS FROM THE BASINS. WAL-MART HAS PROVIDED STORAGE VOLUME ON THEIR SITE FOR THE STORMWATER AND RELEASE IT AT A CONTROLLED RATE ONTO THE CLEARY UNIVERSITY PROPERTY.

PROPOSED CONDITIONS:
THE EXISTING DETENTION BASIN IS TO BE FILLED IN AND A NEW 'NATURAL' BASIN IS TO BE UTILIZED IN THE WOODED PORTION OF THE SITE IN THE SOUTHWEST CORNER. THERE IS A LARGE NATURAL SWALE THAT CONVEYS STORMWATER TO THE SOUTHWEST PROPERTY CORNER WHERE IT IS DISCHARGING OFF-SITE. A BERM IS PROPOSED TO BE CONSTRUCTED WITHIN THE PROPERTY NEAR THE OFF-SITE DISCHARGE POINT IN ORDER TO CREATE A DETENTION STORAGE WITHIN THE WOODED AREA. THIS DESIGN WILL HAVE MINIMAL IMPACT ON THE NATURAL FEATURES OF THE SITE COMPARED TO CLEAR CUTTING TO MAKE ROOM FOR A CONVENTIONAL GRADED DETENTION BASIN. AN OUTLET CONTROL STRUCTURE WILL BE UTILIZED TO CONTROL THE RATE OF DISCHARGE FROM THE BASIN TO THE DISCHARGE POINT. ADDITIONALLY, A MECHANICAL PRETREATMENT UNIT WILL BE UTILIZED ON THE PROPOSED DEVELOPMENT FOR PRETREATMENT TO ELIMINATE THE NEED FOR A FOREBAY AND TO FURTHER REDUCE THE IMPACT AND LIMITS OF DISTURBANCE. THE NEW 'NATURAL' BASIN WILL ACCEPT STORMWATER FROM THE FIRST STUDENT HOUSING HOUSING AREAS AS WELL AS THE SECOND STUDENT HOUSING BUILDING AREA. ADDITIONALLY, IT WILL COLLECT STORMWATER FROM THE ENTIRE AREA WHERE THE CHRYSLER BUILDING IS LOCATED AS WELL AS THE WOODED PORTION OF THE SITE THAT THE BASIN WILL BE. IN ALL, THE NEW 'NATURAL' BASIN WILL HAVE A TRIBUTARY AREA OF 16.70 ACRES, OF WHICH MOST IS UNDEVELOPED(PERVIOUS). THE BASIN IS REQUIRED TO HAVE A VOLUME OF 61,717 CFT PER LIVINGSTON COUNTY DRAIN COMMISSIONER STANDARDS. THE 'NATURAL' BASIN IS PROPOSED TO HAVE A VOLUME 94,750 CFT WITH A FREEBOARD VOLUME OF 253,266 CFT. THE EXCESS STORAGE MAY BE UTILIZED FOR FUTURE DEVELOPMENT OF THE CAMPUS WITHOUT THE NEED TO CONTINUOUSLY IMPROVE THE BASIN. THE BERM THAT IS TO BE CONSTRUCTED TO CREATE THE 'NATURAL' BASIN WILL CONTAIN AN EMERGENCY OVERFLOW SPILLWAY AT AN ELEVATION OF 985.50. THIS EMERGENCY OVERFLOW WILL DISCHARGE INTO THE DITCH WHERE IT CURRENTLY DRAINS.

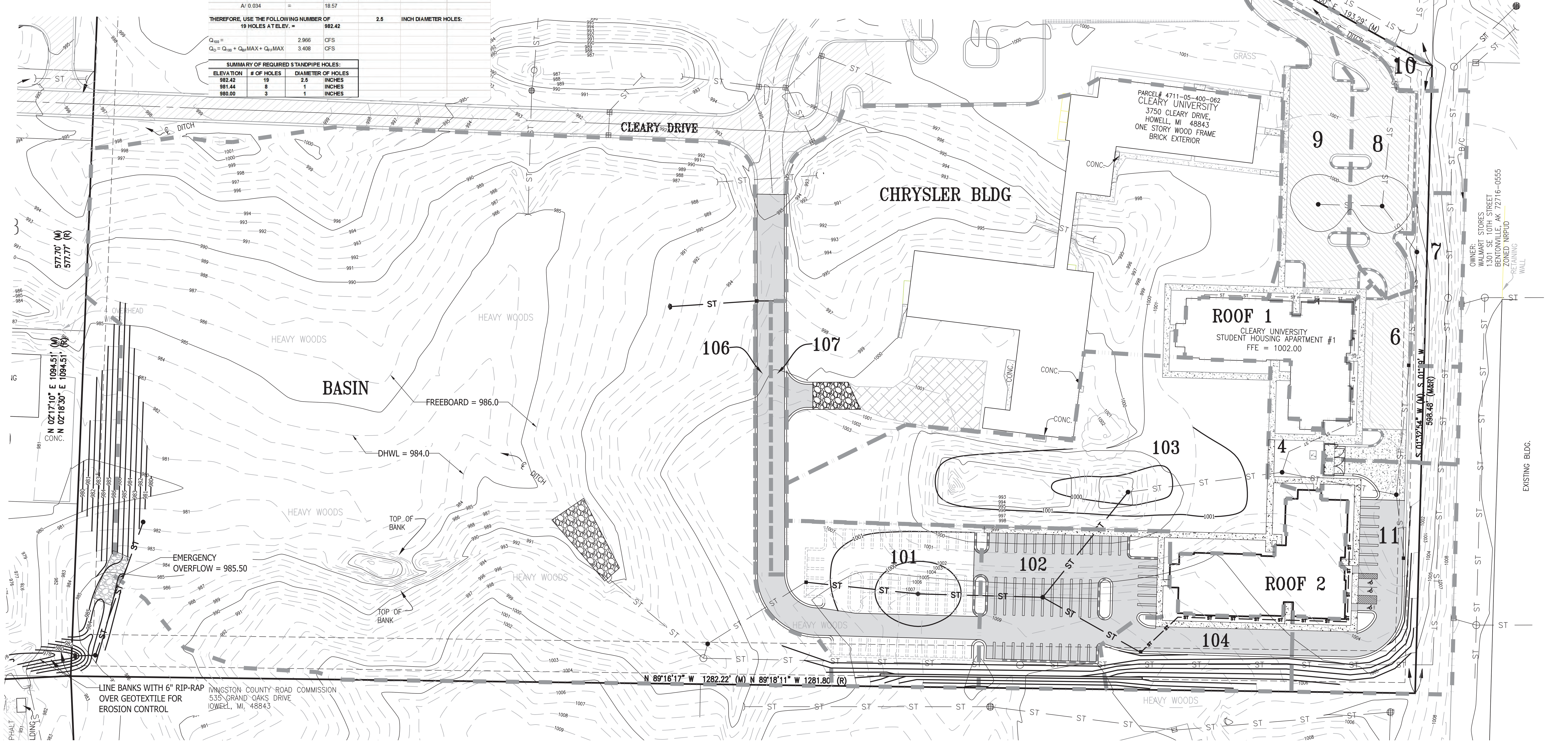
LEGEND

PROPOSED (PR)	EXISTING (EX)	
900	900	CONTOUR
		STORM DRAINAGE FLOW
T/C XXX.XX	+ 922.08	SPOT ELEVATION
FF	FF	FINISHED FLOOR ELEVATION
FG	FG	FINISHED GRADE ELEVATION
T/A	T/A	TOP OF ASPHALT
T/C	T/C	TOP OF CURB / CONCRETE
T/W	T/W	TOP OF WALK
RIM	RIM	RIM ELEVATION
INV	INV	INVERT ELEVATION
MH	MH	MANHOLE STRUCTURE
IN	IN	INLET STRUCTURE
CB	CB	CATCHBASIN STRUCTURE
GV	GV	GATEVALVE STRUCTURE
HY	HY	HYDRANT
UP	UP	UTILITY POLE
SN	SN	SANITARY SEWER
ST	ST	STORM SEWER
WM	WM	WATER MAIN
X	X	FENCE
●	○	MANHOLE
■	□	INLET / CATCHBASIN
		FLARED END-SECTION
CB 01		STORM SEWER LABEL
		LIMITS OF DRAINAGE

50 0 25 50
SCALE: 1 INCH = 50 FEET

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: CLEARY UNIVERSITY STUDENT HOUSING APARTMENT #2

PREPARED FOR: UNIVERSITY HOUSING SOLUTIONS, LLC
90 HIDDEN RAVINES DRIVE
POWELL, OH 43065
(866) 711-7786

TITLE: DRAINAGE PLAN

NO	BY	REVISION PER	DATE
1	ST	PER TMP REVIEW	9-18-17

DESIGNED BY: ST
DRAWN BY: ST
CHECKED BY:
SCALE 1" = 50'
JOB NO. 17-348
DATE 8/30/17
SHEET NO. 6

WATERMAIN NOTE:

1. APPLICANT WAS UNABLE TO OBTAIN AN EASEMENT FROM THE WAL-MART PARCEL TO LOOP THE WATERMAIN PREVIOUSLY. THE WATERMAIN SHALL BE LOOPED WITHIN THE APPLICANTS PROPERTY.
2. WATERMAIN TO BE WITHIN EASEMENT TO PROVIDE ACCESS FOR FUTURE MAINTENANCE AND REPAIR OF THE DEDICATED PUBLIC UTILITY.

STORM NOTE

1. THE PROPOSED STORMWATER MANAGEMENT SYSTEM SHALL BE PRIVATELY OWNED AND PROPERLY MAINTAINED BY THE PROPERTY OWNER.

STORM STRUCTURE SCHEDULE

(A) SQUARE CATCH BASIN
FLOW LINE = 991.29
INV. 12" W CONC. = 987.32

(B) OUTLET CONTROL STRUCTURE
RIM ELEV.: 999.95
INV. 6" NE PLASTIC= 997.55
INV. 12" SW CMP = 997.53

(C) SQUARE CATCH BASIN
FLOW LINE = 1007.82
INV. 12" NE PLASTIC = 1002.64

(D) STORM MANHOLE
RIM ELEV.: 1004.86
INV. 24" N PLASTIC = 998.45
INV. 24" S PLASTIC = 998.48

(E) STORM MANHOLE
RIM ELEV.: 1009.63
INV. 12" SW PLASTIC = 1004.3
INV. 12" S PLASTIC = 1003.87
INV. 12" E PLASTIC = 1004.10

(F) SQUARE CATCH BASIN
RIM ELEV.: 1008.79
INV. 12" SE PLASTIC = 1004.59

(G) STORM MANHOLE
RIM ELEV.: 1009.70
INV. 12" N PLASTIC = 1003.73
INV. 12" NW PLASTIC = 1003.83
INV. 12" E PLASTIC = 1004.4
INV. 12" S PLASTIC = 1003.64

(H) BEEHIVE CATCH BASIN
RIM ELEV.: 1003.73
INV. 24" S PLASTIC = 999.93
INV. 24" W PLASTIC = 999.93

(I) OUTLET CONTROL STRUCTURE
RIM ELEV.: 1005.10
INV. 24" N PLASTIC = 1001.80

(J) STORM MANHOLE
RIM ELEV.: 1009.52
INV. 36" E CMP = 993.40
INV. 36" W CMP = 993.10

(K) BEEHIVE CATCH BASIN
RIM ELEV.: 1007.60
INV. 30" E PLASTIC = 998.27
INV. 36" W PLASTIC = 997.94

(L) STORM MANHOLE
RIM ELEV.: 988.19

(M) SQUARE CATCH BASIN
RIM ELEV.: 1008.68
INV. 12" NE PLASTIC = 1004.24

(N) STORM MANHOLE
RIM ELEV.: 1003.60
INV. 12" NW CMP = 998.64
INV. 12" E CMP = 998.50

(O) SQUARE CATCH BASIN
FLOW LINE = 1002.40
INV. 12" E CONC. = 1000.40

(P) STORM MANHOLE
RIM ELEV.: 997.52
INV. 36" E CMP = 989.80
INV. 36" NW CMP = 989.12

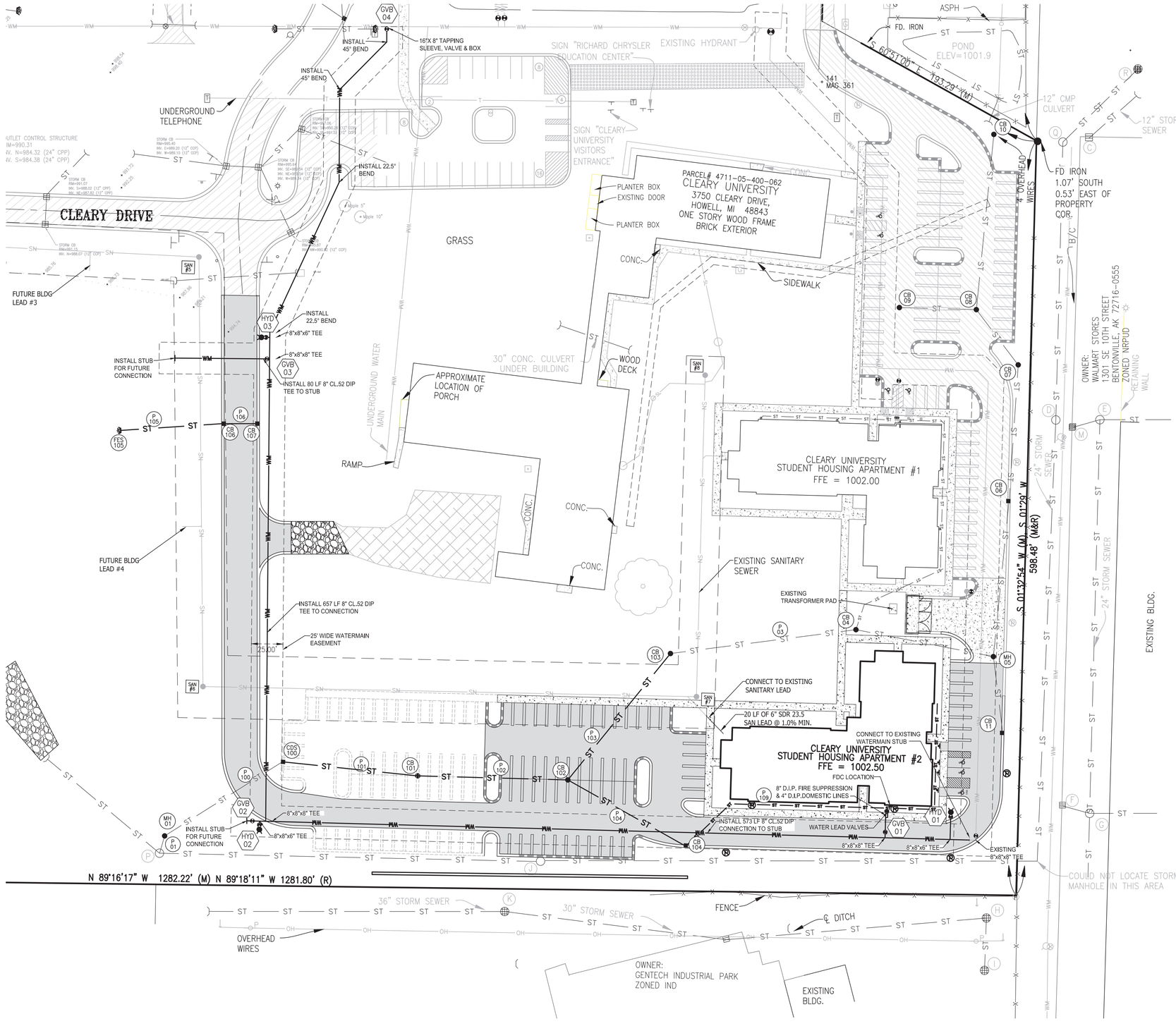
(Q) STORM MANHOLE
RIM ELEV.: 1005.94

(R) BEEHIVE CATCH BASIN
RIM ELEV.: 1005.04

STORM STRUCTURE SCHEDULE		
EXISTING MH 01		
EXISTING STRUCTURE		
RIM	996.50	
EX. INV. SW	24"	989.70
EX. INV. NE	24"	989.70
NO SUMP		
CDS 100		
6' DIA CDS STRUCTURE, COVER "K"		
RIM	1001.50	
EX. INV. SW	24"	990.80
INV. E	24"	990.80
2' SUMP		
CB101		
4' DIA CATCH BASIN, COVER "D"		
RIM	999.40	
INV. W	24"	991.88
INV. E	24"	991.88
2' SUMP		
CB102		
4' DIA CATCH BASIN, COVER "D"		
RIM	999.40	
INV. W	24"	993.07
INV. NE	24"	993.07
INV. SE	12"	993.87
2' SUMP		
CB103		
4' DIA CATCH BASIN, COVER "E"		
RIM	999.50	
INV. SW	24"	993.84
EX. INV. NE	24"	994.00
2' SUMP		

STORM STRUCTURE SCHEDULE		
CB104		
4' DIA CATHC BASIN, COVER 'K'		
RIM	1000.00	
INV. NW	12"	994.94
INV. NE	8"	995.21
2' SUMP		
FES105		
FLARED END SECTION, W/ ANIMAL GRATE		
INV. E	18"	990.50
CB106		
4' DIA CATCH BASIN, COVER "K"		
RIM	997.66	
INV. W	18"	991.30
INV. E	18"	991.30
2' SUMP		
CB107		
4' DIA MANHOLE, COVER "K"		
RIM	997.66	
INV. W	18"	991.60
2' SUMP		
FES108		
FLARED END SECTION, W/ ANIMAL GRATE		
INV. E	36"	978.47
MH 109		
RIM	984.00	
INV. W	36"	978.65
INV. NE	36"	978.65
NO SUMP		
OCS110		
4' DIA. CMP OCS WITH GRATE		
RIM	984	
INV. SW	36"	980.00
2' SUMP		

STORM PIPE SCHEDULE				
PIPE	SIZE	LENGTH	SLOPE	MATERIAL
100	24	110	EXISTING PIPE	
101	24	108	1.00%	RCP CL IV.
102	24	119	1.00%	RCP CL IV.
103	24	129	0.60%	RCP CL IV.
104	12	107	1.00%	RCP CL IV.
105	18	80	1.00%	RCP CL IV.
106	18	30	1.00%	RCP CL IV.
107	36	135	1.00%	ADS N-12
108	36	18	1.00%	ADS N-12
109	8	295	1.75%	PVC SCH 40



LEGEND

PROPOSED (PR)	EXISTING (EX)	
900	900	CONTOUR
T/C		STORM DRAINAGE FLOW
XXX.XX	+ 922.08	SPOT ELEVATION
FF	FF	FINISHED FLOOR ELEVATION
FG	FG	FINISHED GRADE ELEVATION
T/A	T/A	TOP OF ASPHALT
T/C	T/C	TOP OF CURB / CONCRETE
T/W	T/W	TOP OF WALK
F/L	F/L	FLOW LINE
T/P	T/P	TOP OF PIPE
B/P	B/P	BOTTOM OF PIPE
RIM	RIM	RIM ELEVATION
INV	INV	INVERT ELEVATION
MH	MH	MANHOLE STRUCTURE
IN	IN	INLET STRUCTURE
CB	CB	CATCHBASIN STRUCTURE
RY	RY	REARYARD STRUCTURE
ES	ES	END-SECTION
GV	GV	GATEVALVE STRUCTURE
HY	HY	HYDRANT
UP	UP	UTILITY POLE
SN	SN	SANITARY SEWER
SL	SL	SANITARY LEAD
FM	FM	FORCE MAIN
PS	PS	PRESSURE SEWER
ST	ST	STORM SEWER
WM	WM	WATER MAIN
WL	WL	WATER LEAD
FO	FO	FIBER OPTIC
OH	OH	OVERHEAD WIRE
C	C	CABLE
E	E	ELECTRIC
G	G	GAS
T	T	TELEPHONE
●	○	MANHOLE
■	□	INLET / CATCHBASIN
◖	(	FLARED END-SECTION
⊗	⊗	GATE VALVE
⊗	⊗	HYDRANT
⊗	⊗	UTILITY POLE
X X	X X	FENCE
⊥	⊥	SIGN
TBR	NFV	NOT FIELD VERIFIED TO BE REMOVED
CSB		COMPACTED SAND BACKFILL
SAN #1		SANITARY SEWER LABEL
ST 01		STORM SEWER LABEL
GV 12		WATER MAIN LABEL

BOSS Engineering
Engineers Surveyors Planners Landscape Architects
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HOWELL, MI. 48843
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PROJECT: CLEARY UNIVERSITY STUDENT HOUSING APARTMENT #2
PREPARED FOR: UNIVERSITY HOUSING SOLUTIONS, LLC
90 HIDDEN RAVINES DRIVE
POWELL, OH 43065
(866) 711-7786

TITLE: UTILITY PLAN

NO	BY	REVISION PER	DATE
1	ST	PER TWP REVIEW	9-18-17

DESIGNED BY: ST
DRAWN BY: ST
CHECKED BY:
SCALE: 1" = 40'
JOB NO. 17-348
DATE: 8/30/17
SHEET NO. 7

GENERAL LANDSCAPE SPECIFICATIONS:

1. ALL PLANT MATERIAL SHALL CONFORM TO THE REQUIREMENTS AND SPECIFICATIONS OF THE GOVERNING MUNICIPALITY. ALL STOCK SHALL BE NURSERY GROWN, CONFORMING TO ANSO Z60.1 "AMERICAN STANDARD FOR NURSERY STOCK", AND IN ACCORDANCE WITH GOOD HORTICULTURAL PRACTICE. STOCK SHALL EXHIBIT NORMAL GROWTH HABIT AND BE FREE OF DISEASE, INSECTS, EGGS, LARVAE, AND DEFECTS SUCH AS KNOTS, SUN-SCALD, INJURIES, ABRASIONS, OR DISFIGUREMENT. ALL PLANT MATERIAL SHALL BE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT.

2. ALL PLANT MATERIALS SHALL BE BALLED AND BURLAPPED OR CONTAINER STOCK. NO BARE ROOT STOCK IS PERMITTED. ALL PLANT BALLS SHALL BE FIRM, INTACT, AND SECURELY WRAPPED AND BOUND.

3. ALL PLANT BED MATERIALS SHALL BE EXCAVATED OF ALL BUILDING MATERIALS, OTHER EXTRANEOUS OBJECTS, AND POOR SOILS TO A MINIMUM DEPTH OF 12-INCHES AND BACKFILLED TO GRADE WITH SPECIFIED PLANTING MIX (SEE BELOW).

4. PLANTING MIXTURE SHALL CONSIST OF 5 PARTS TOPSOIL FROM ON-SITE (AS APPROVED), 4 PARTS COARSE SAND, 1 PART SPHAGNUM PEAT MOSS (OR APPROVED COMPOST), AND 5 LBS OF SUPERPHOSPHATE FERTILIZER PER CU. YD. OF MIX. INGREDIENTS SHALL BE THOROUGHLY BLENDED FOR UNIFORM CONSISTENCY.

5. ALL PLANT BEDS AND INDIVIDUAL PLANTS, NOT OTHERWISE NOTED SHALL BE MULCHED WITH A 4-INCH LAYER OF SHREDDED BARK MULCH. EDGE OF MULCH BEDS AS SHOWN. TREES IN LAWN AREAS SHALL RECEIVE A 5-FT DIAMETER CIRCLE OF MULCH UNLESS OTHERWISE NOTED.

6. LANDSCAPE STONE SHALL BE INSTALLED WHERE NOTED OR INDICATED (HATCHED). STONE SHALL MATCH EXISTING ADJACENT LANDSCAPE STONE ON SITE AND SHALL BE INSTALLED IN A MINIMUM DEPTH OF 3-INCHES.

7. ALL LANDSCAPE BEDS, UNLESS OTHERWISE NOTED SHALL BE INSTALLED OVER WEED BARRIER FABRIC - WATER PERMEABLE FILTRATION FABRIC OF NON-WOVEN POLYPROPYLENE OR POLYESTER FABRIC. FABRIC SHALL BE OF SUITABLE THICKNESS FOR APPLICATION.

8. ALL PLANTS AND PLANT BEDS SHALL BE THOROUGHLY WATERED UPON COMPLETION OF PLANTING AND STAKING OPERATIONS.

9. THE CONTRACTOR SHALL GUARANTEE ALL PLANT MATERIALS FOR A PERIOD OF 1 YEAR FROM THE DATE THE WORK IS ACCEPTED, IN WRITING, BY THE LANDSCAPE ARCHITECT. THE CONTRACTOR SHALL REPLACE, WITHOUT COST TO THE OWNER, WITHIN A SPECIFIED PERIOD OF TIME, ALL DEAD PLANTS, AND ALL PLANTS NOT IN A VIGOROUS, THRIVING CONDITION, AS DETERMINED BY THE LANDSCAPE ARCHITECT, DURING AND AT THE END OF THE GUARANTEE PERIOD. REPLACEMENT STOCK SHALL CONFORM TO THE ORIGINAL SPECIFICATIONS.

10. EDGING SHALL BE PROVIDED FOR ALL LANDSCAPE BEDS NOT ADJACENT TO CONCRETE PAVEMENT. EDGING SHALL BE BLACK ALUMINUM EDGING, 3/16-INCH X 4-INCH. INSTALL PER MANUFACTURER'S INSTRUCTIONS, ALL EDGING SHALL BE INSTALLED IN STRAIGHT LINES OR SMOOTH CURVES WITHOUT IRREGULARITIES.

11. SOD SHALL BE DENSE, WELL ROOTED TURF, FREE OF WEEDS. IT SHALL BE COMPRISED OF A BLEND OF AT LEAST TWO KENTUCKY BLUE GRASSES AND ONE FESCUE. IT SHALL HAVE A UNIFORM THICKNESS OF 3/4-INCH AT TIME OF PLANTING, AND CUT IN UNIFORM STRIPS NOT LESS THAN 10-INCHES BY 18-INCHES. SOD SHALL BE KEPT MOIST AND LAID WITHIN 36-HOURS AFTER CUTTING.

    IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH A DENSE LAWN OF PERMANENT GRASSES, FREE OF LUMPS AND DEPRESSIONS. ALL SODDED AREAS THAT BROWN-OUT OR HAVE NOT FIRMLY KNITTED TO THE SOIL BASE WITHIN A PERIOD OF 1 MONTH SHALL BE REPLACED BY THE CONTRACTOR, AT NO COST TO THE OWNER.

12. ALL AREAS OF THE SITE THAT BECOME DISTURBED DURING CONSTRUCTION AND ARE NOT TO BE PAVED, STONED, ' LANDSCAPED, OR SODDED SHALL BE SEEDED AND MULCHED.

    SEE MIXTURE SHALL BE AS FOLLOWS:

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

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

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

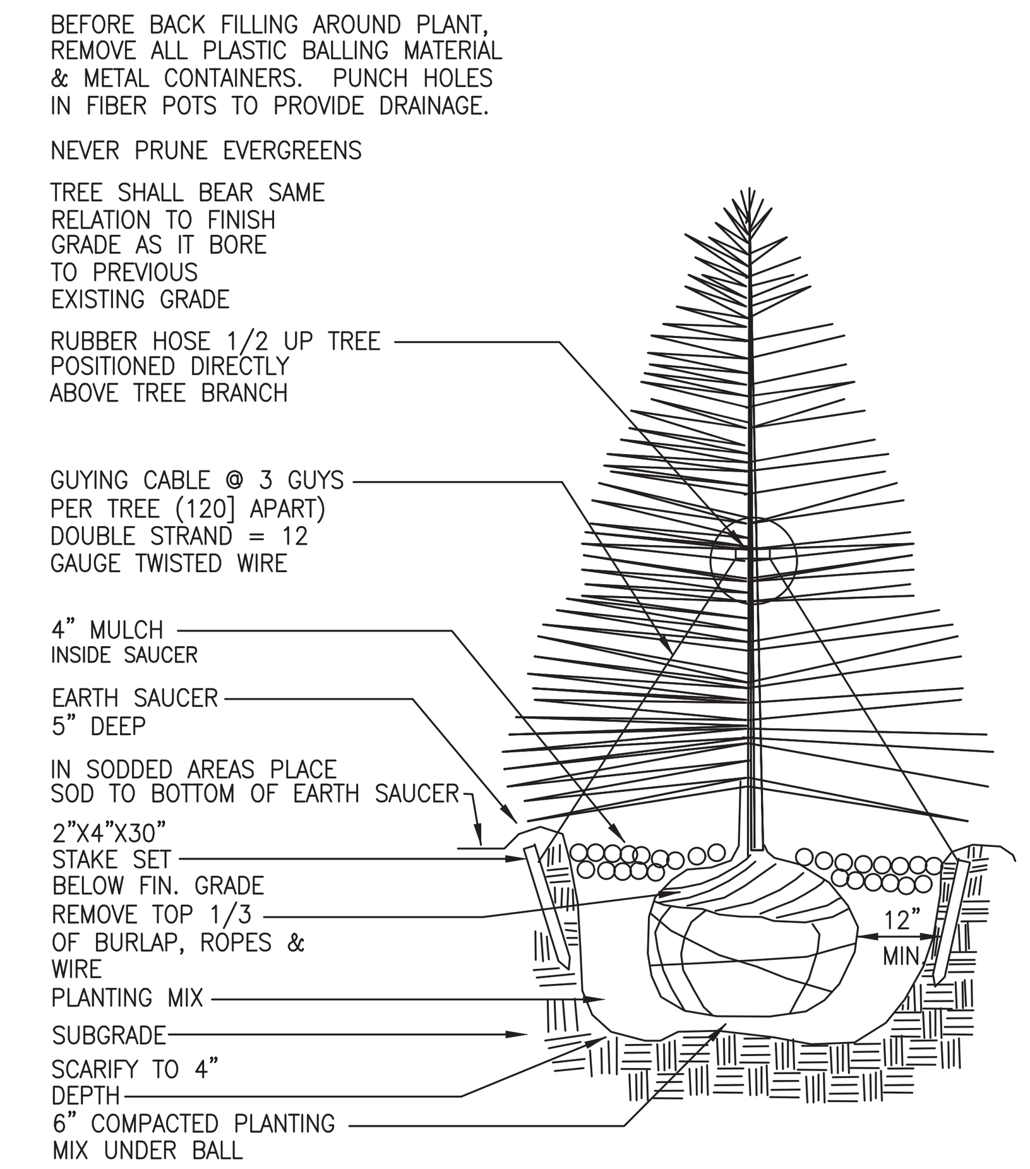
    THE FIRST FERTILIZER APPLICATION SHALL BE AT A RATE OF 10 LBS PER 1000 SQ FT OF BULK FERTILIZER.

    IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH A DENSE LAWN OF PERMANENT GRASSES, FREE OF LUMPS AND DEPRESSIONS. ANY PART OF THE AREA THAT FAILS TO SHOW A UNIFORM GERMINATION SHALL BE RE-SEEDED AND SUCH RE-SEEDING SHALL CONTINUE UNTIL A DENSE LAWN IS ESTABLISHED. DAMAGE TO SEEDED AREAS RESULTING FROM EROSION SHALL BE REPAIRED BY THE CONTRACTOR.

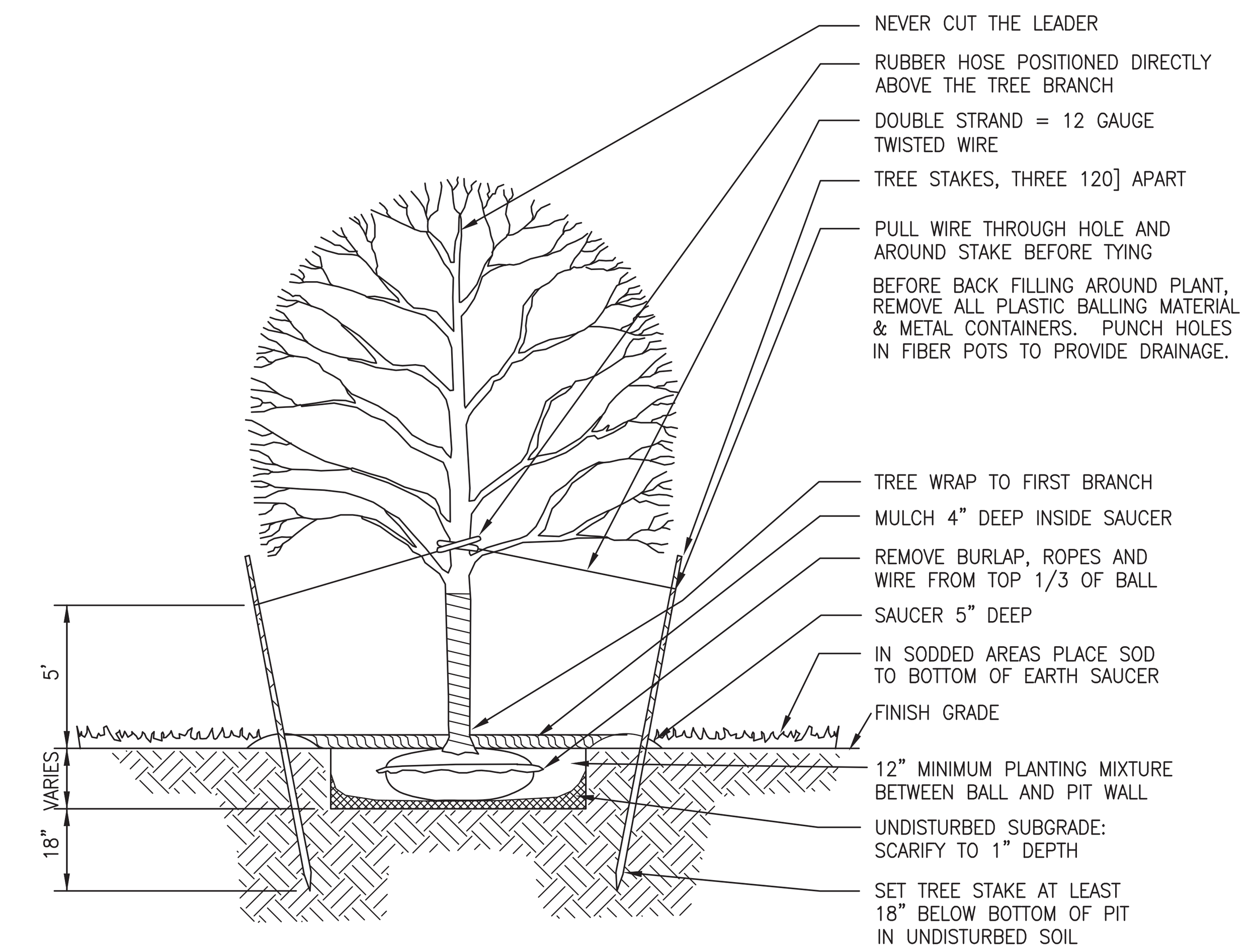
13. ALL AREAS OF THE SITE SCHEDULED FOR SEEDING OR SODDING SHALL FIRST RECEIVE A 6-INCH LAYER OF CLEAN, FRIABLE TOPSOIL. THE SOIL SHALL BE DISCED AND SHALL BE GRADED IN CONFORMANCE WITH THE GRADING PLAN.

14. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION OF ALL UTILITIES AND TO INFORM THE LANDSCAPE ARCHITECT OF ANY CONFLICTS PRIOR TO COMMENCING LANDSCAPING.

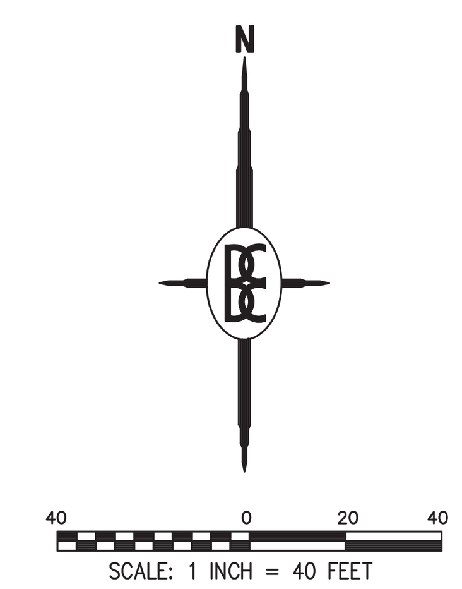
15. ALL LANDSCAPED AREAS WITHIN PROJECT AREA SHALL BE PROVIDED WITH AN UNDERGROUND AUTOMATIC SPRINKLER SYSTEM.

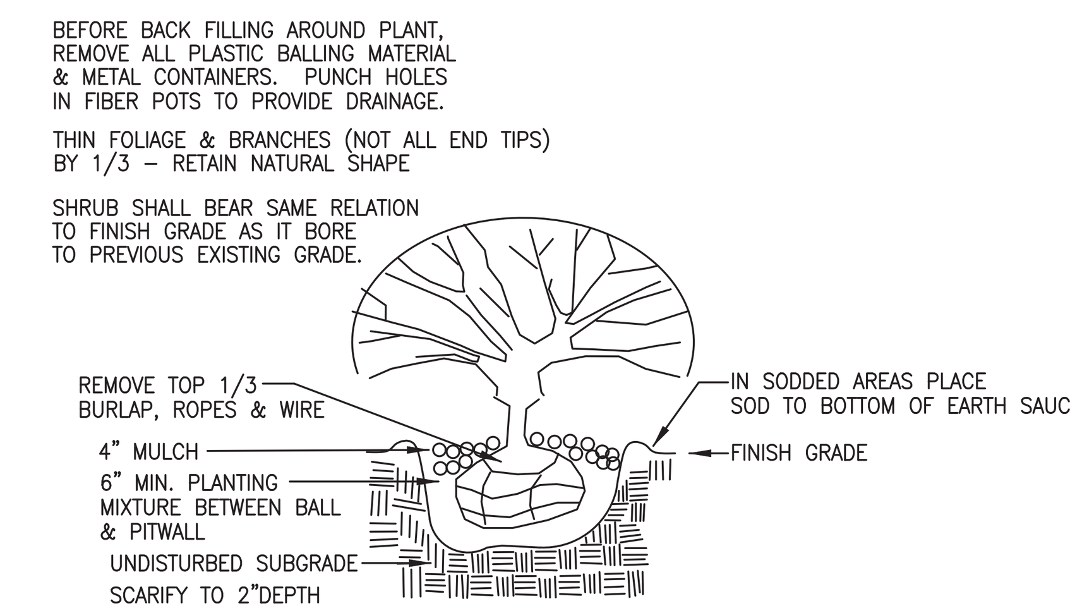


EVERGREEN TREE PLANTING DETAIL
(NO SCALE)



DECIDUOUS TREE PLANTING DETAIL
(NO SCALE)





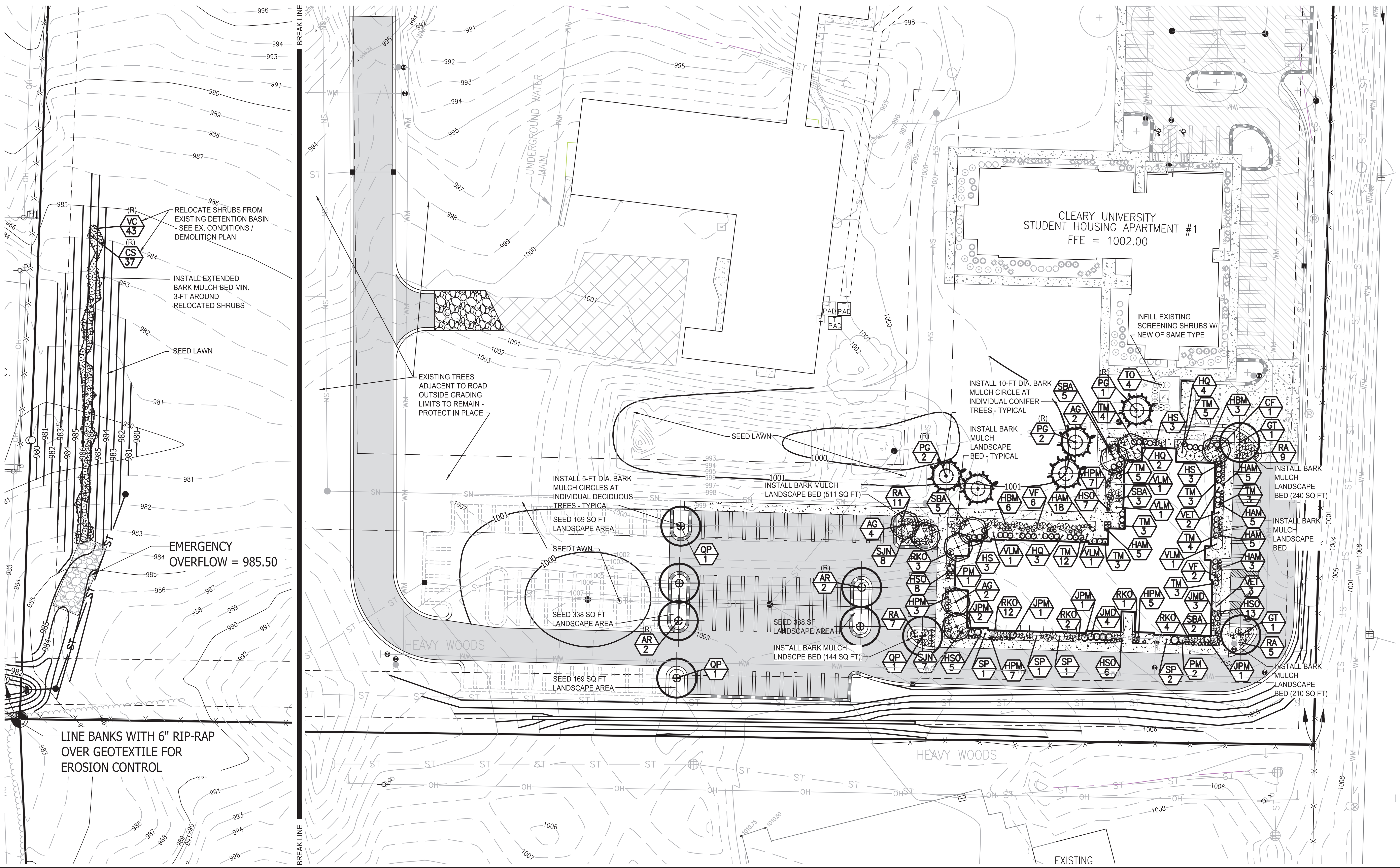
SHRUB PLANTING DETAIL
(NO SCALE)

LANDSCAPE LEGEND

- EXISTING DECIDUOUS TREE
- PROPOSED DECIDUOUS TREE
- PROPOSED CONIFER TREE
- PROPOSED ORNAMENTAL TREE
- PROPOSED CONIFER SHRUB
- PROPOSED DECIDUOUS SHRUB
- PROPOSED PERENNIAL FORB

LANDSCAPE REQUIREMENTS

1. ZONING: OFFICE SERVICE DISTRICT
2. PARKING LOT - 63 SPACES REQUIRED, 66 PROVIDED
   REQUIRED: 1 CANOPY TREE & 100 SQ FT LANDSCAPED AREA / 10 PARKING SPACES
   = 7 CANOPY TREES & 700 SQ FT LANDSCAPED AREA
   PROPOSED:
   RELOCATING 4 (AR) CANOPY TREES FROM EX. DETENTION BASIN + 3 (QP) & 1 (GT) CANOPY TREES & TOTAL OF 2119 SQ FT LANDSCAPED AREAS - INCL LAWN OR SHRUBS (RA)
3. DETENTION BASIN
   REQUIRED: 1 DECIDUOUS OR EVERGREEN TREE + 10 SHRUBS / 50 LF OF BASIN PERIMETER
   PROPOSED: EXISTING LOW AREA WITH DENSE TREE COVER TO BE UTILIZED FOR PROPOSED DETENTION BASIN. PROPOSED BASIN END BERM TO BE PLANTED WITH 80 RELOCATED SHRUBS FROM EXISTING BASIN. REMAINDER TO UTILIZE EXISTING TREE COVER



PLANT LIST

(R) = EXISTING TREE/SHRUB TO BE RELOCATED

KEY	QUAN.	BOTANICAL NAME	COMMON NAME	SIZE	REMARK
DECIDUOUS TREES					
AR (R)	4	Acer rubrum 'Red Sunset'	Red Sunset Maple	Existing	EX.
AG	8	Amelanchier x grandiflora 'Autumn Brilliance'	Autumn Brilliance Serviceberry	2" cal.	B-B
CF	1	Cornus florida 'Cherokee Chief'	Cherokee Chief Flowering Dogwood	2" cal.	B-B
GT	2	Gleditsia triacanthos var inermis 'Skyline'	Skyline Honeylocust	2-1/2" cal.	B-B
QP	3	Quercus palustris	Pin Oak	2-1/2" cal.	B-B
CONIFER TREES					
PG (R)	5	Picea glauca	White Spruce	Existing	EX.
CONIFER SHRUBS					
JMD	7	Juniperus x media 'Daub's Frosted'	Daub's Frosted Juniper	36" ht./#5	Cont.
JPM	5	Juniperus x pfitzeriana Monsan	Sea Of Gold Juniper	36" ht./#5	Cont.
PM	3	Pinus mugo var Pumilio	Dwarf Mugo Pine	36" ht./#5	B-B
TM	45	Taxus x media 'Densiformis'	Densiform Spreading Yew	30" ht./#3	Cont.
TO	4	Thuja occidentalis 'Techny'	Mission Arborvitae	48" ht.	B-B
DECIDUOUS SHRUBS					
CS (R)	37	Cornus Sercicea	Redosier Dogwood	Existing	EX.
HQ	9	Hydrangea Quercifolia 'Brenhill'	Gatsby Gal Oakleaf Hydrangea	36" ht./#5	Cont.
HS	9	Hydrangea Serrata 'mak20' Ppaf	Mountain Tuff Stuff Hydrangea	36" ht./#5	Cont.
RA	32	Ribes alpinum 'Green Mound'	Green Mound Currant	24" ht./#3	Cont.
RKO	20	Rosa x Knock Out Sunny	Knock Out Sunny Shrub Rose	18" ht./#3	Cont.
SBA	15	Spiraea x bumalda 'Anthony Waterer'	Anthony Waterer Spirea	24" ht./#3	Cont.
SJN	15	Spiraea japonica 'Neon Flash'	Neon Flash Spirea	24" ht./#3	Cont.
SP	4	Syringa Patula 'Miss Kim'	Miss Kim Lilac	36" ht./#5	Cont.
VC (R)	43	Viburnum carlesii 'Compactum'	Comp. Koreanspice Viburnum	Existing	EX.
VF	8	Viburnum farreri nanum	Fragrant Dwarf Viburnum	24" ht./#3	Cont.
VET	5	Viburnum x Emerald Triumph	Emerald Triumph Viburnum	36" ht./#5	Cont.
VLM	5	Viburnum lantana 'Mohican'	Mohican Wayfaring Viburnum	36" ht./#5	Cont.
PERENNIALS					
HAM	41	Hosta undulata 'Albo Marginata'	Albo Marginata Hosta	No.3	Cont.
HBM	9	Hosta 'Blue Mammoth'	Blue Mammoth Hosta	No.3	Cont.
HPM	22	Hemerocalis 'Pardon Me'	Pardon Me Daylily	No.1	Cont.
HSO	39	Hemerocalis 'Stella De Oro'	Stella De Oro Daylily	No.1	Cont.

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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: CLEARY UNIVERSITY STUDENT HOUSING APARTMENT #2

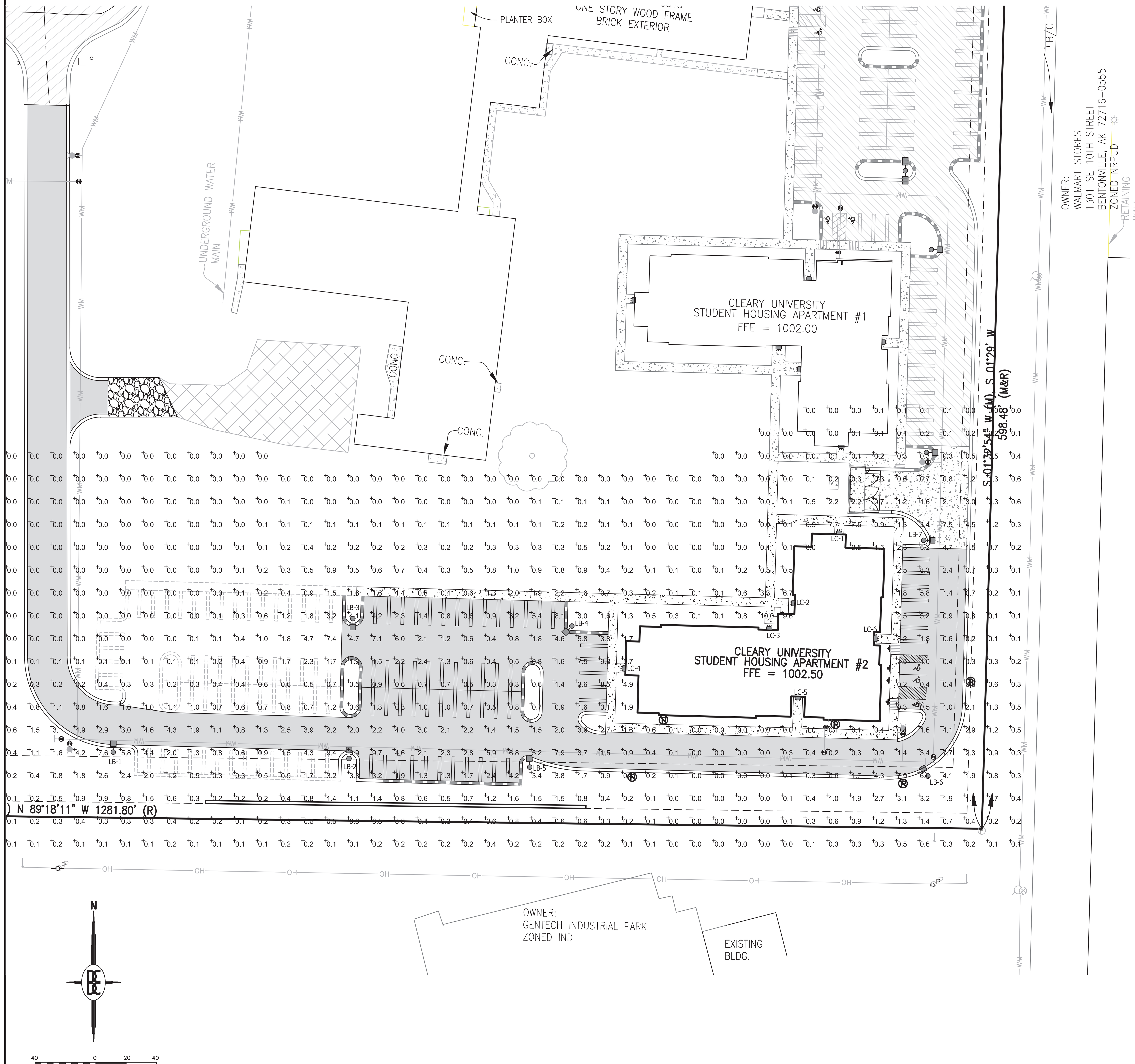
PREPARED FOR: UNIVERSITY HOUSING SOLUTIONS, LLC
90 HIDDEN RAVINES DRIVE
POWELL, OH 43065
(866) 711-7786

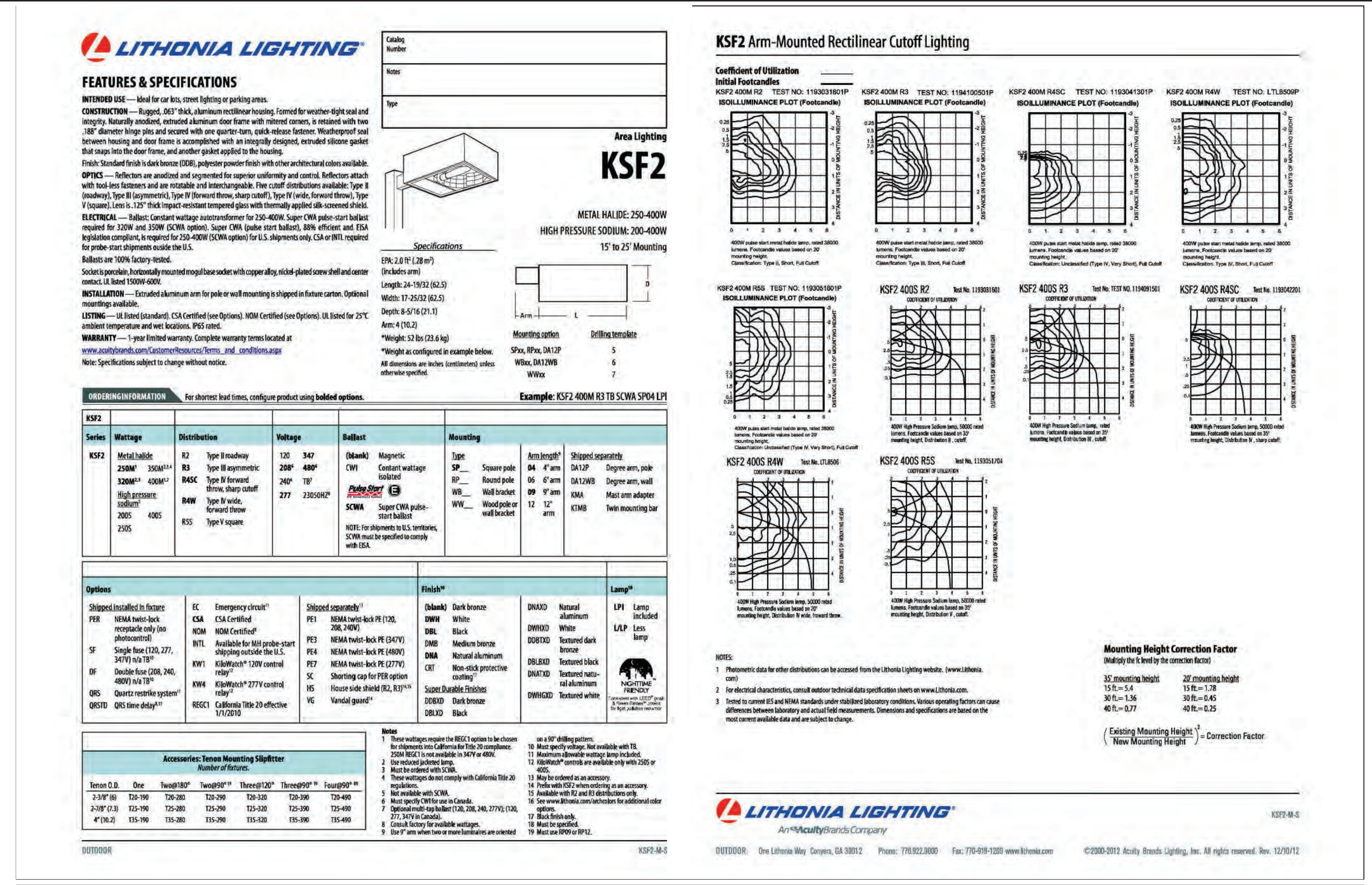
TITLE: LANDSCAPE PLAN

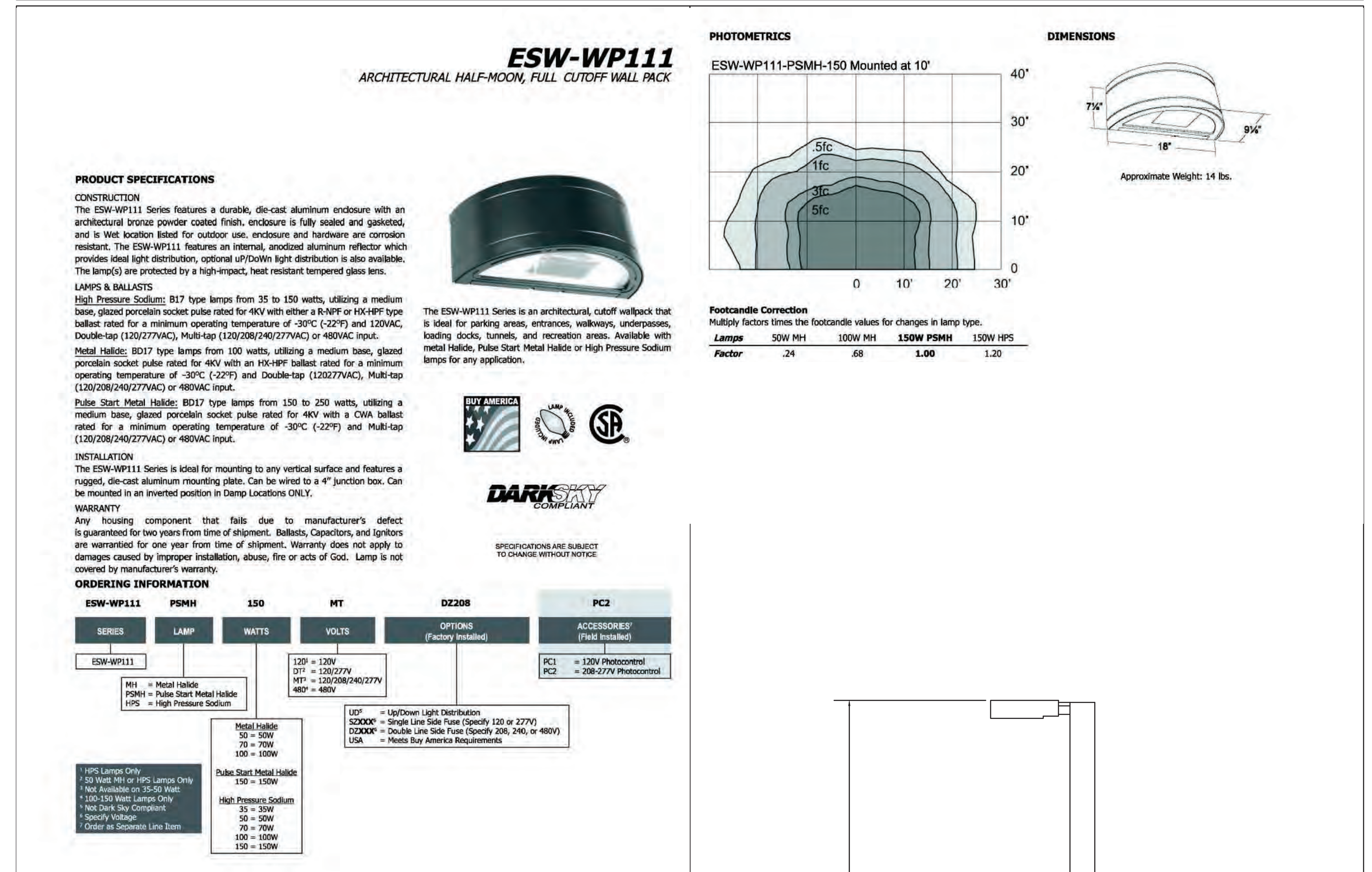
NO	BY	REVISION PER	DATE
1	PC	PER TWP REVIEW	9-20-17

DESIGNED BY: PC
DRAWN BY: PC
CHECKED BY:
SCALE 1" = 40'
JOB NO. 17-348
DATE 8/30/17
SHEET NO. 8

BOSS Engineering







SITE LIGHTING SUMMARY

LIGHTING LEVELS ARE SHOWN IN FOOTCANDLES AT GRADE

MAX. LIGHT LEVEL AT THE PROPERTY LINE: 1.30 FC.
MIN. LIGHT LEVEL AT THE PROPERTY LINE: 0.00 FC.

GENERAL LIGHTING NOTES

1. THE LIGHTING PATTERN REPRESENTS ILLUMINATION LEVELS CALCULATED FROM LABORATORY DATA TAKEN UNDER CONTROLLED CONDITIONS IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY APPROVED METHODS. ACTUAL PERFORMANCE OF ANY MANUFACTURER'S LUMINAIRE MAY VARY DUE TO VARIATION IN ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, AND OTHER VARIABLE FIELD CONDITIONS.
2. ALL POLES ARE TO BE MOUNTED ON CONCRETE PEDESTALS 2' ABOVE GRADE IN PARKING LOTS AS SHOWN IN DETAIL.
3. ALL POLES LOCATED OUTSIDE OF THE PARKING AREA SHALL BE LOCATED 3' FROM BACK OF CURB OR EDGE OF SIDEWALKS.
4. SHOP DRAWINGS FOR THE ELECTRICAL WIRING OF THE POLES NEED TO BE SUBMITTED TO THE ENGINEER FOR COORDINATION OF UNDERGROUND CONDUIT AND APPROVAL OF LAYOUT.

LUMINAIRE SCHEDULE

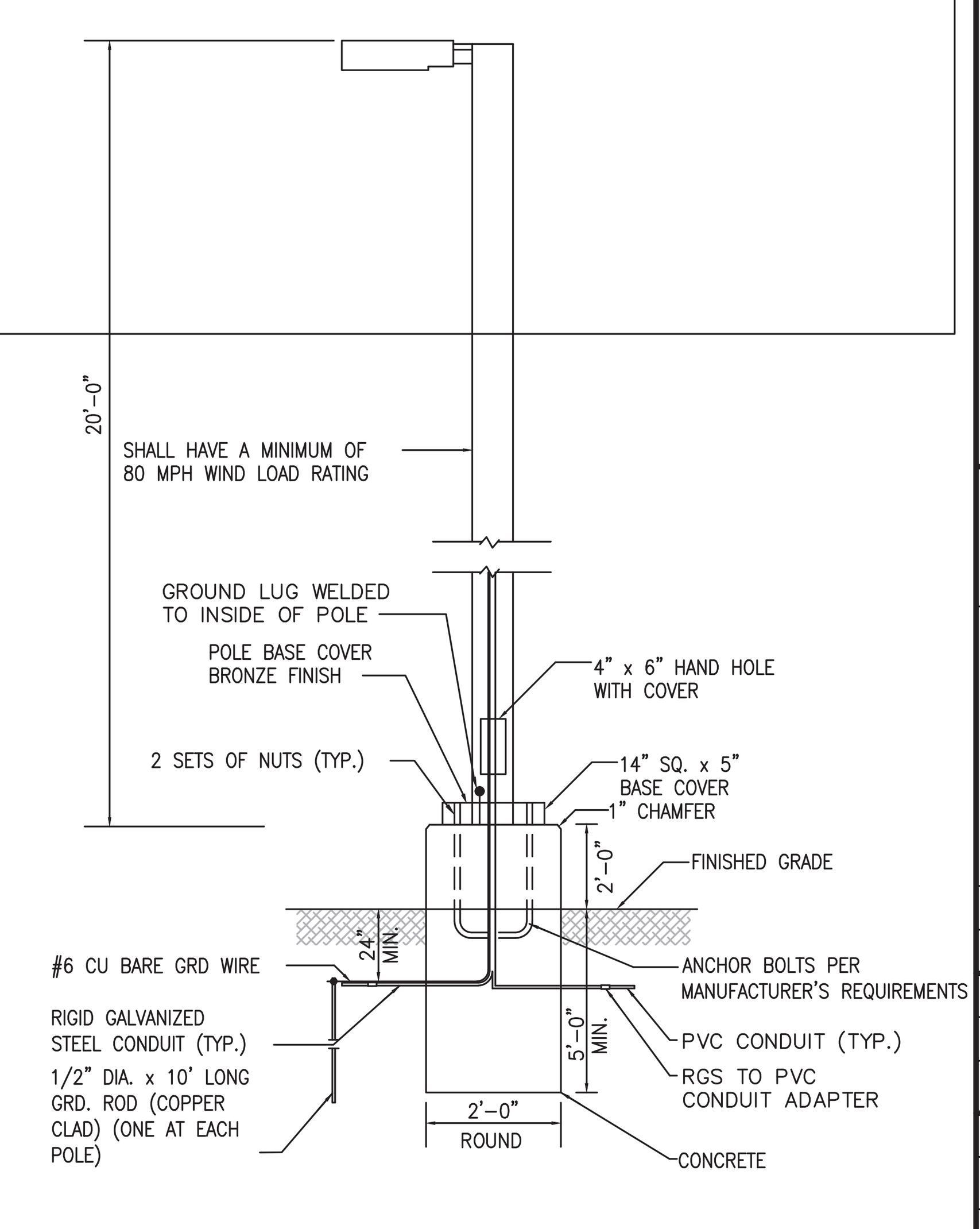
SYMBOL	LABEL	QTY.	DESCRIPTION	CATALOG NUMBER	LAMP	FILE	LUMENS	LLF	POLE DESCRIPTION	POLE HEIGHT	BASE HEIGHT	TOTAL HEIGHT
	LB	7	LITHONIA SPECIFICATION AREA LUMINAIRE, 400W METAL HALIDE, R2 REFLECTOR, FULL CUTOFF	KSF2 400M R2	400 WATT CLEAR ED28 PULSE START METAL HALIDE	KSF2 400M R2.IES	38,000	.72	SSA-20-4G-T25-DM19-DDB	20'	2'	22'
	LC	6	ESW WP111A ARCHITECTURAL HALF-MOON, FULL CUTOFF WALL PACK	ESW-WP111A PSMH 150W MT	150 WATT BD17 TYPE LAMPS PULSE START METAL HALIDE		14,000	.72	WALL MOUNTED	12'	0'	12'

ALL IES FILES PROVIDED BY MANUFACTURER FOR CALCULATION OF LIGHTING LEVEL.

LEGEND

PROPOSED (PR) EXISTING (EX)

MANHOLE
INLET / CATCHBASIN
FLARED END-SECTION
GATE VALVE
HYDRANT
UTILITY POLE
FENCE
SIGN
DOUBLE FIXTURE LIGHT POLE
SINGLE FIXTURE LIGHT FIXTURE
WALL MOUNTED LIGHT FIXTURE
GROUND LIGHT FIXTURE
FOOT CANDLES ON SITE
FOOT CANDLES OFF SITE



BOX LIGHT FIXTURE DETAIL (TYP.)
(NO SCALE)

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3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171

BOSS Engineering
Engineers Surveyors Planners Landscape Architects
3121 E. GRAND RIVER AVE.
HOWELL, MI. 48843
800.246.6735 FAX 517.548.1670

PROJECT: CLEARY UNIVERSITY STUDENT HOUSING APARTMENT #2

PREPARED FOR: UNIVERSITY HOUSING SOLUTIONS, LLC
90 HIDDEN RAVINES DRIVE
POWELL, OH 43065
(866) 711-7786

TITLE: LIGHTING PLAN

NO	BY	REVISION PER	DATE
1	CH	PER TWP REVIEW	9-18-17

DESIGNED BY: CH
DRAWN BY: CH
CHECKED BY:
SCALE 1" = 40'
JOB NO. 17-348
DATE 8/30/17
SHEET NO. 9

LIVINGSTON COUNTY SOIL EROSION PERMIT TEMPLATE
TEMPORARY CONTROLS AND SEQUENCE

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

PERMITTING STANDARDS

3. (IMPORTANT NOTICE) RETENTION/DETENTION PONDS SHALL BE EXCAVATED, TOPSOILED, SEEDED, MULCHED AND TACKED PRIOR TO THE START OF MASSIVE EARTH DISRUPTION. INGRESS/EGRESS MUST HAVE LARGE CRUSHED ROCK TO REDUCE THE TRACKING OF SOIL ONTO THE PUBLIC TRAFFIC AREAS. SEE DETAIL ITEMS BELOW.
4. 36" M.D.O.T SPECIFICATION TYPE SILT FABRIC FENCE AS SHOWN ON PLANS SHALL BE PLACED AND MAINTAINED ALONG PERIMETER ON ALL LOW LYING AREAS OF THE CONSTRUCTION SITE TO FILTER RUNOFF BEFORE LEAVING PROJECT SITE.

5. ALL TEMPORARY EROSION CONTROL DEVICES AS NOTED ON PLANS SHALL BE INSTALLED PRIOR TO THE START OF MASSIVE EARTH DISTRIBUTION.
6. PLAN DOES DENOTE A DETAILED EROSION CONTROL DEVICE TO RESTRICT TRACKING OF MATERIAL ONTO THE HIGHWAY. STONE DIAPERS SHALL BE INSTALLED AT ALL INGRESS/EGRESS AREAS OF THE SITE PRIOR TO THE START OF MASSIVE EARTH DISRUPTION. DIAPERS SHALL BE OF CRUSHED STONE AND SHALL HAVE A MINIMUM LENGTH OF 100' LINEAL FEET.

RETENTION PONDS

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

SLOPES AND DITCHES

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

STORM DRAINS

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

STABILIZATION

29. ALL UNIMPROVED DISTURBED AREAS SHALL BE RE-TOP SOILED, WITH A MINIMUM OF 3" OF MATERIAL, SEEDED, MULCHED AND TACKED WITHIN 15 DAYS OF THE COMPLETION OF THE MASSIVE EARTH DISRUPTION. IN THE NON-GROWING SEASON STRAW MATTING WILL SUFFICE. HYDROSEEDING WILL BE AN ACCEPTABLE ALTERNATE FOR MULCHING. EXTREME CARE SHOULD BE EXERCISED IN SPRING AND FALL PERIODS AS A FROST WILL BREAK THE BIND OF THE HYDROSEEDING, WHICH WILL AFFECT THE EFFECTIVENESS OF THIS PROCEDURE.
30. IN THE NON-GROWING SEASON, TEMPORARY STABILIZATION OF MASSIVELY EXPOSED AREAS FOR WINTER STABILIZATION SHALL BE DONE WITH STRAW MATTING.
32. 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.
33. 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.
34. 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.

35. PER THE LIVINGSTON COUNTY DRAIN COMMISSIONER THE SEEDING, FERTILIZER AND MULCH MINIMUM QUANTITIES SHALL BE AS FOLLOWS:

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

MAINTENANCE SCHEDULE FOR SOIL EROSION CONTROLS

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

CONSTRUCTION SEQUENCE

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

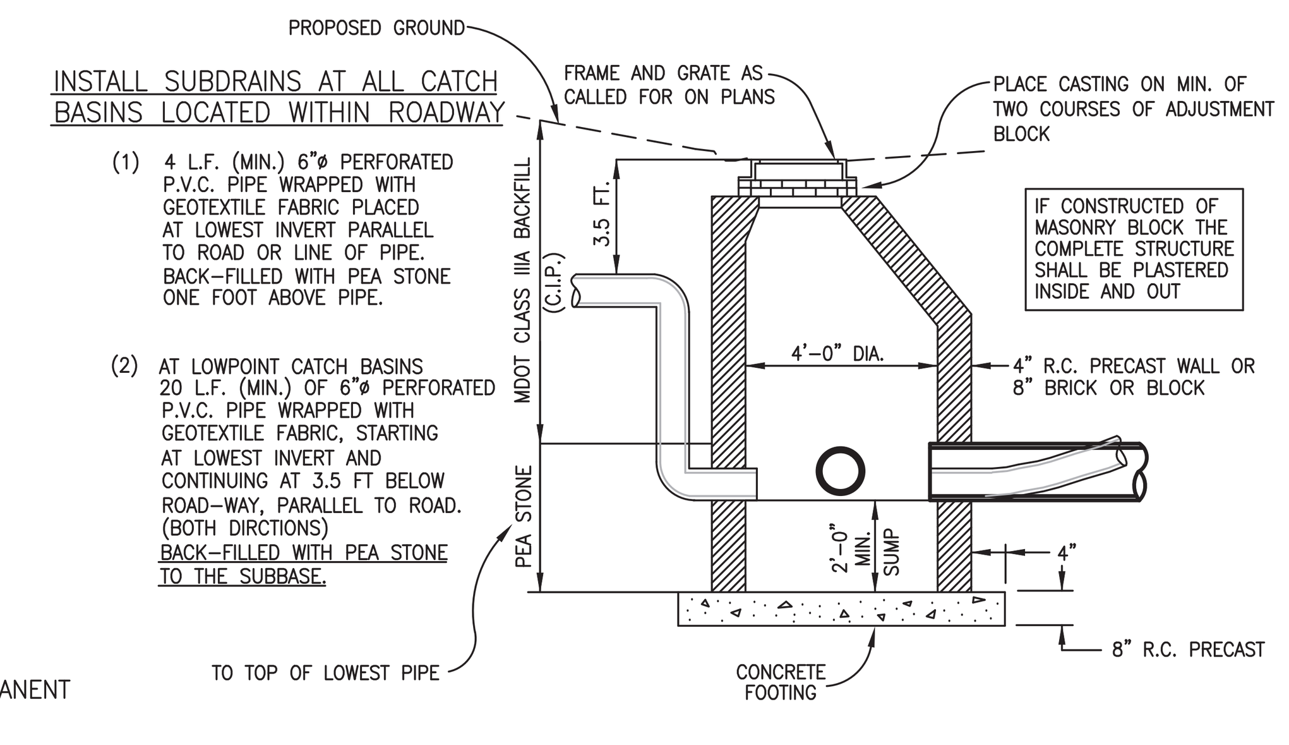
14 DAYS	1.	TREE AND SHRUB CLEARING TO CLEARING LIMITS
1 DAYS	2.	INSTALL SILT FENCE AS SHOWN ON PLANS
5 DAYS	3.	SITE DEMO
28 DAYS	4.	ROUGH GRADE AND INSTALL STORM DRAINAGE AND UTILITIES.
1 DAY	5.	INSTALL INLET PROTECTION ON STORM INLETS.
180 DAY	6.	START BLDG. CONSTRUCTION
14 DAYS	7.	INSTALL PAVEMENT, CURB & GUTTER, AND SIDEWALK
4 DAYS	8.	FINE GRADE AROUND BUILDING, SPREAD TOPSOIL, SEED OR SOD AS APPLICABLE.
1 DAY	9.	REMOVE ALL EROSION CONTROL STRUCTURES.
1 DAY	10.	REMOVE ACCUMULATED SILT FROM ALL EXISTING DRAINAGE.

CONTROLS & MEASURES POST CONSTRUCTION SEQUENCE

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

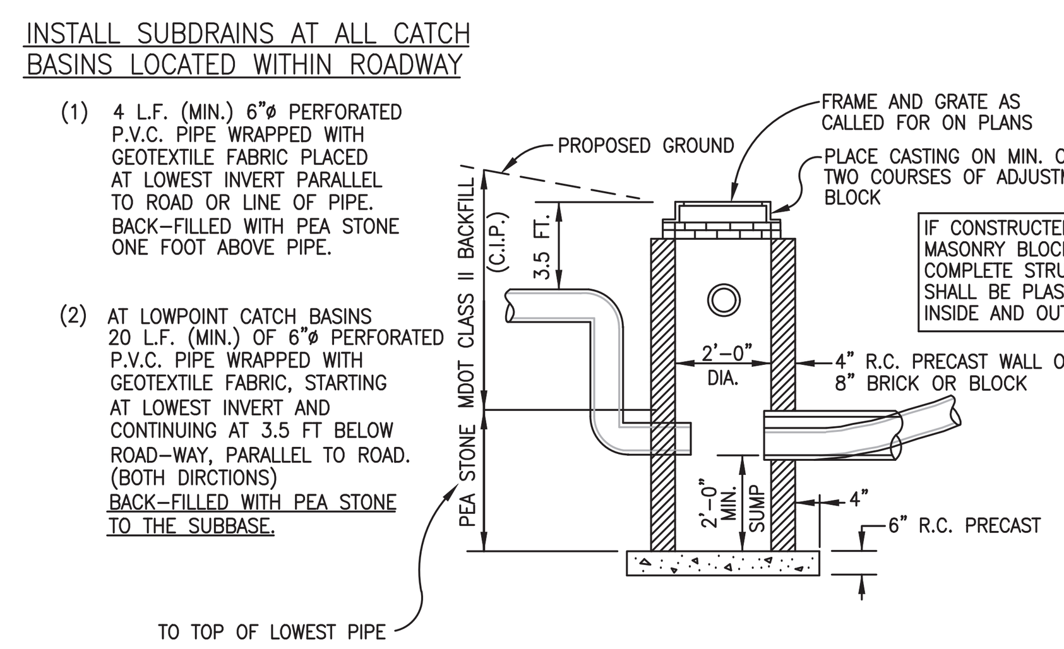
CONTROLS & MEASURES NARRATIVE

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



4 FT. DIA. CATCH BASIN W/SUMP

NO SCALE

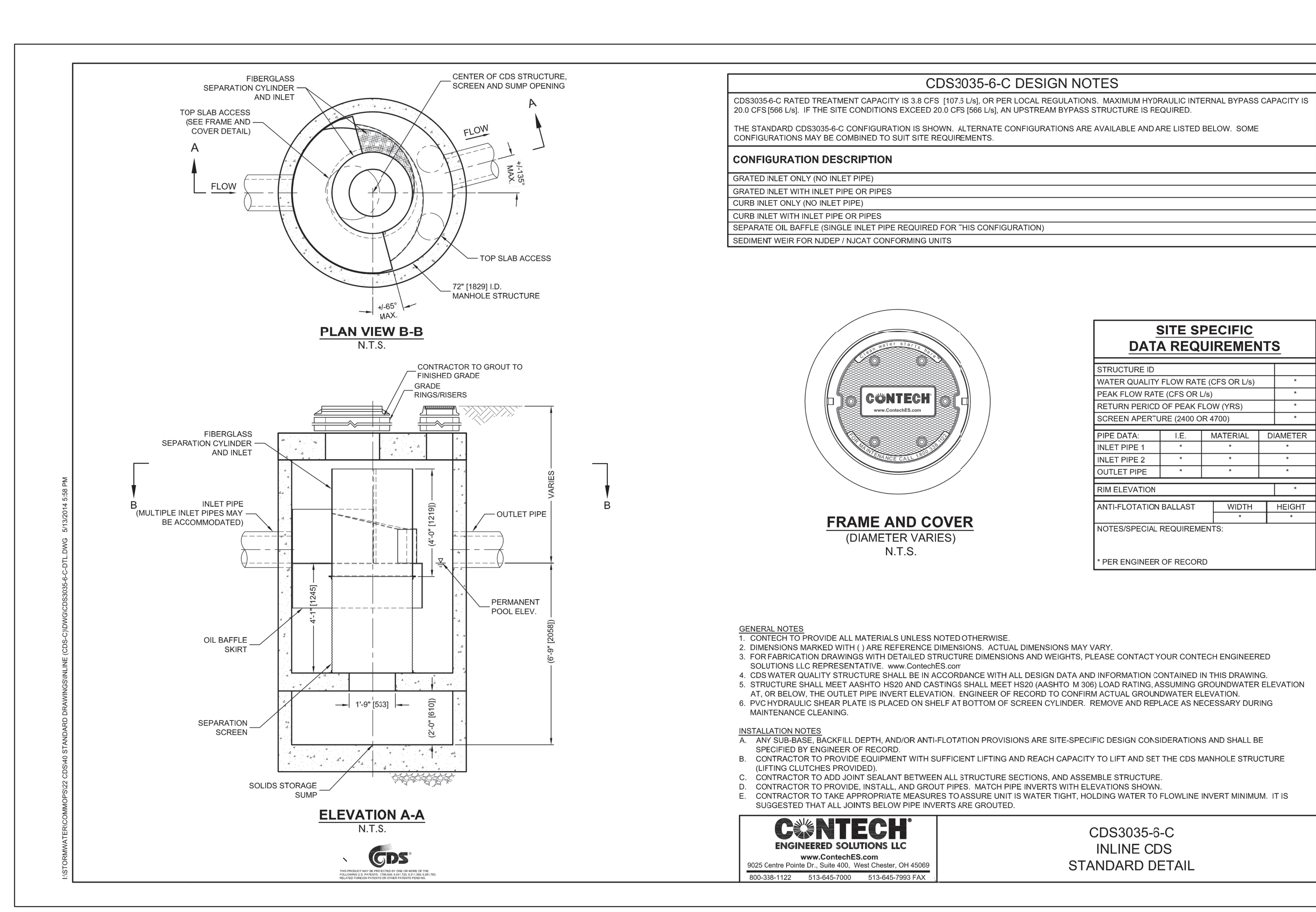


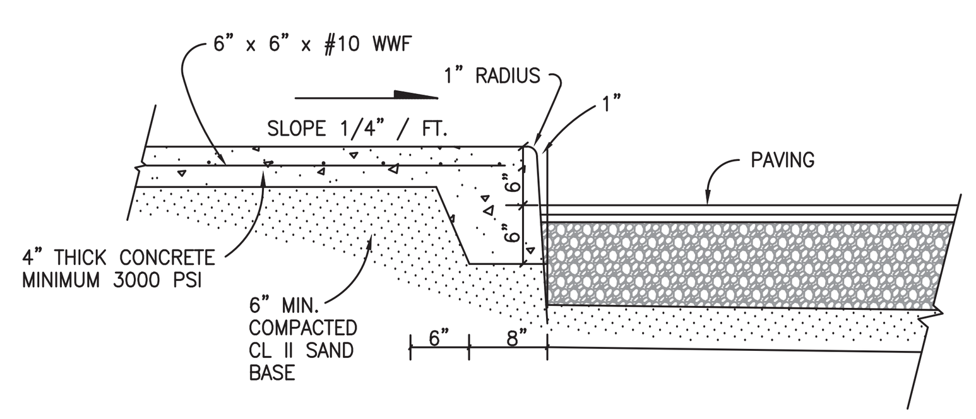
2 FT. DIA. CATCH BASIN W/SUMP

NO SCALE

STRUCTURE FRAMES & COVERS

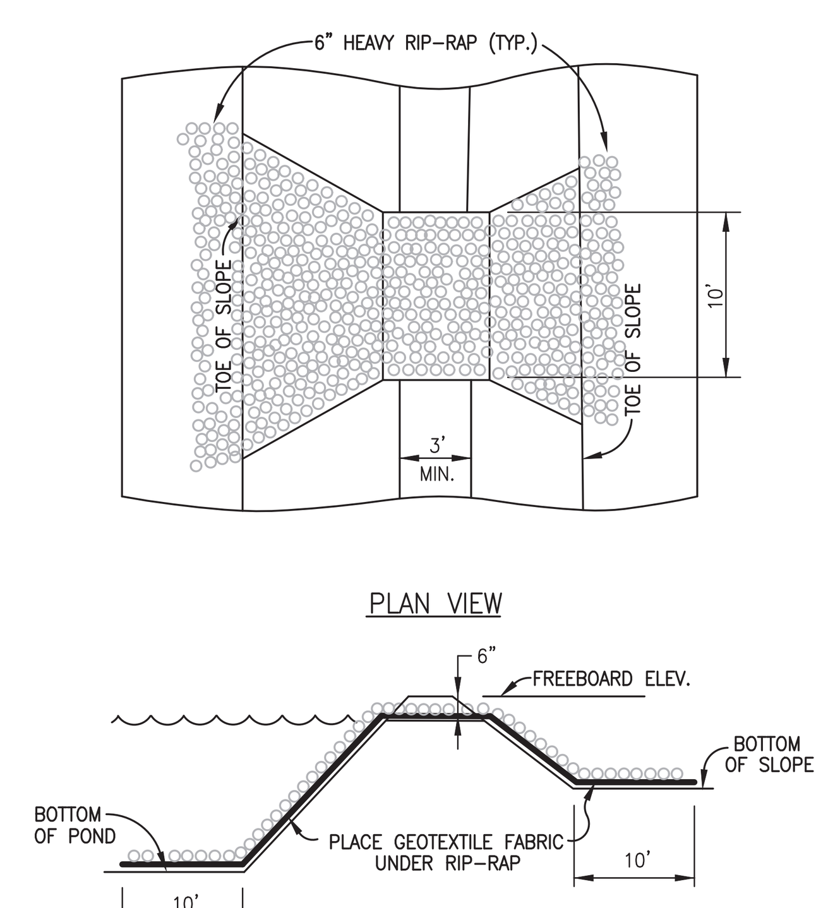
COVER	TYPE	USE	MANUFACTURER OR EQUAL: EAST JORDAN	MANUFACTURER OR EQUAL: NEENAH	TYPE OF COVER OR GRATE
A	MH	ALL	1120	R-1415	SANITARY-SELF SEALING STORM-VENTED
~~B~~	~~CB & INLET~~	~~TYPE B2 CURB~~	~~7085~~	~~R-3038-A~~	
K	CB & INLET	TYPE C & F CURB	7045	R-3031-B	FLAT GRATE WITH VERT. 4" OPEN THROAT
~~C~~	~~CB & INLET~~	~~VALLEY CURB~~	~~7065~~	~~R-3034-B~~	
D	CB & INLET	PARKING LOTS	1020-MI	R-2560-D	FLAT GRATE
E	CB & INLET	LAWN AREA OR DITCH	1020-01		BEEHIVE GRATE 4" HIGH





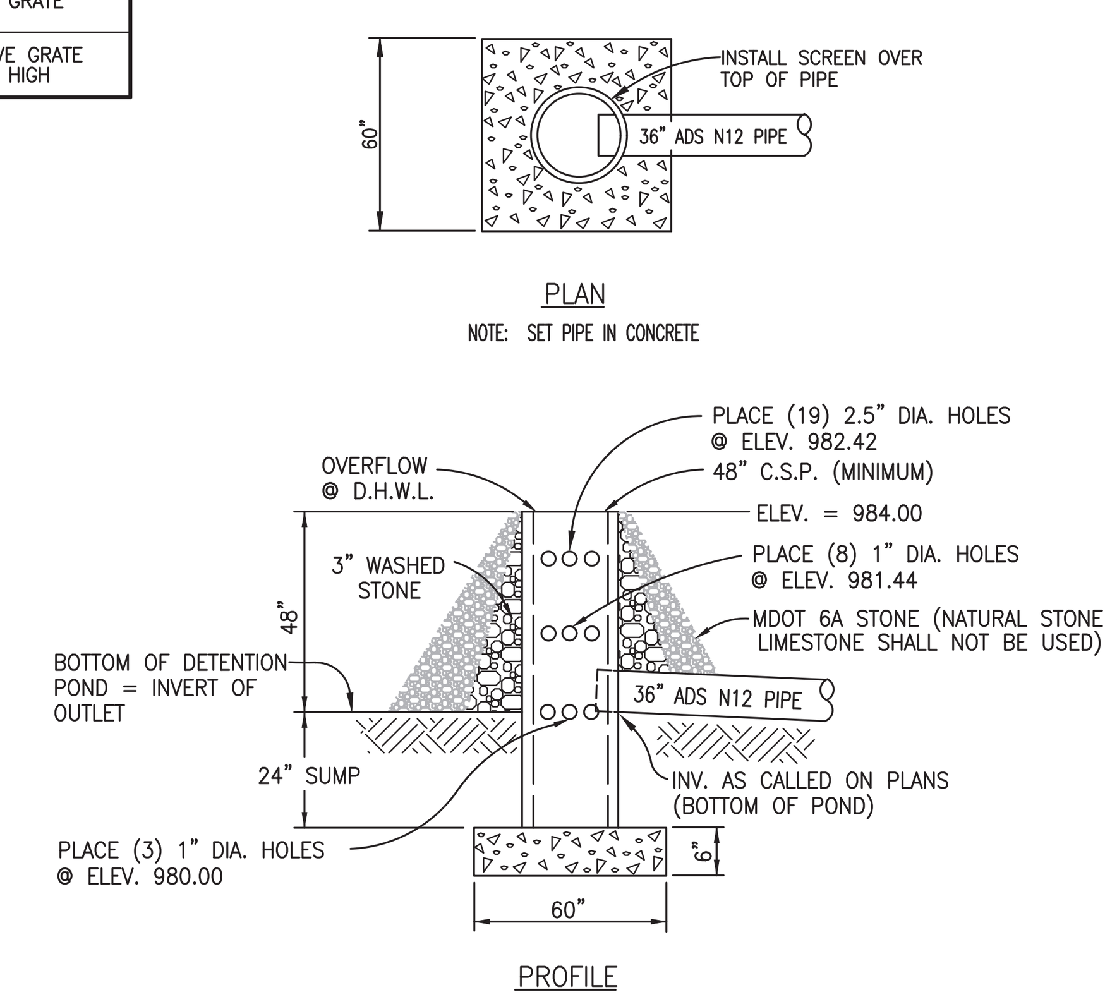
INTEGRAL CONCRETE WALK / CURB DETAIL

(NO SCALE)



EMERGENCY SPILLWAY DETAIL

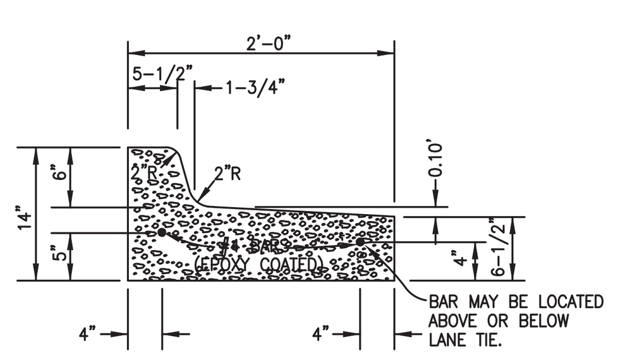
NO SCALE



NOTE: UPON COMPLETION OF CONSTRUCTION STONE AROUND THE STRUCTURE SHALL BE REFRESHED WITH CLEAN STONE.

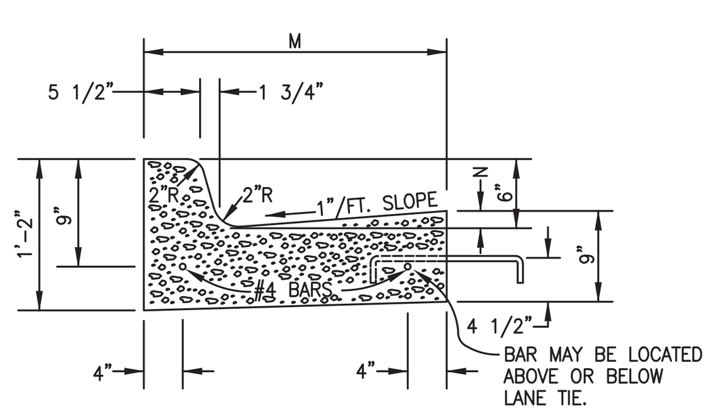
LCDC DETENTION/SEDIMENTATION POND OUTLET CONTROL STRUCTURE

(NO SCALE)



MODIFIED BARRIER
(M.D.O.T. TYPE F4) (FOR ISLANDS ONLY)

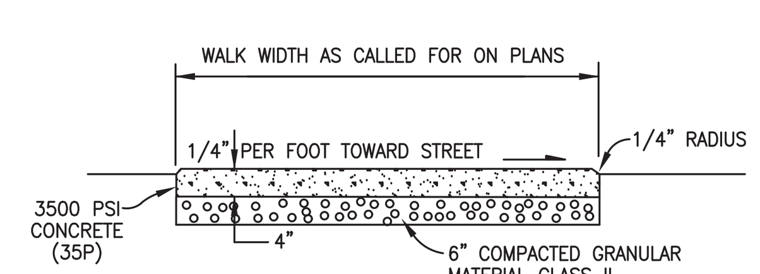
(NO SCALE)



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

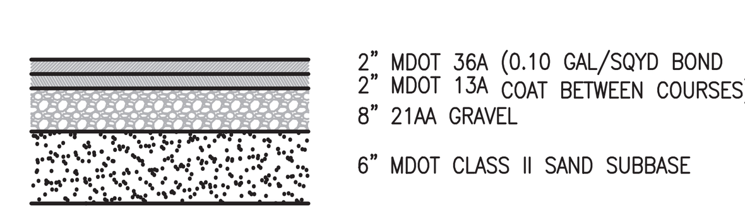
CONCRETE CURB & GUTTER TYPE F

(NO SCALE)



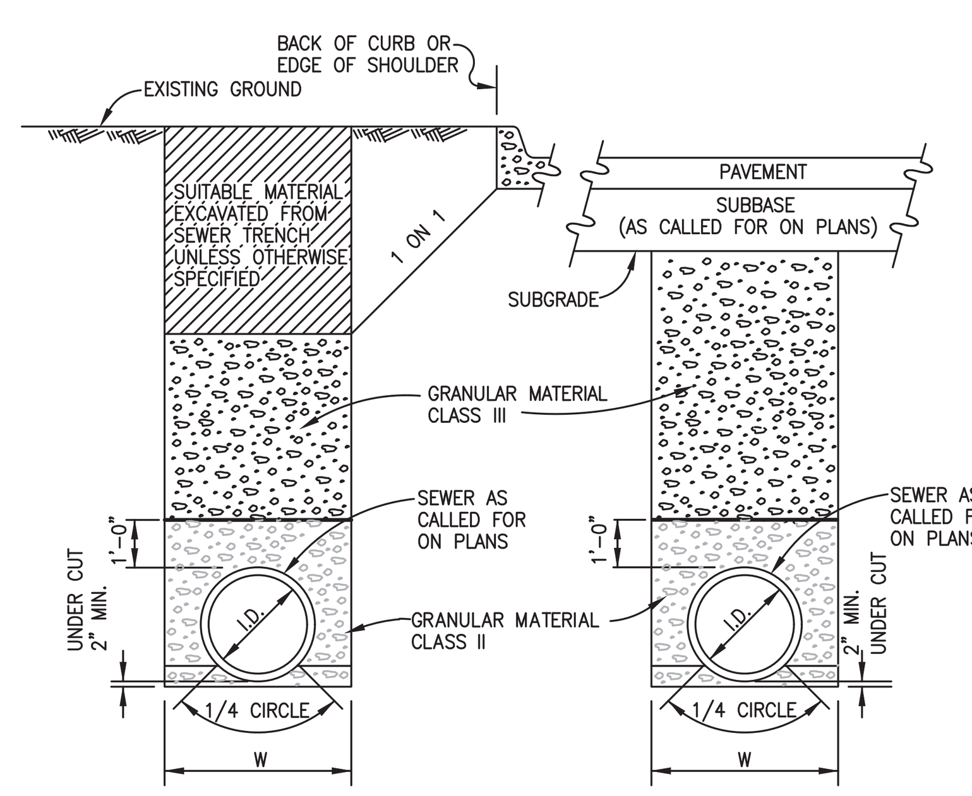
4" CONCRETE SIDEWALK

(NO SCALE)



ASPHALT SECTION

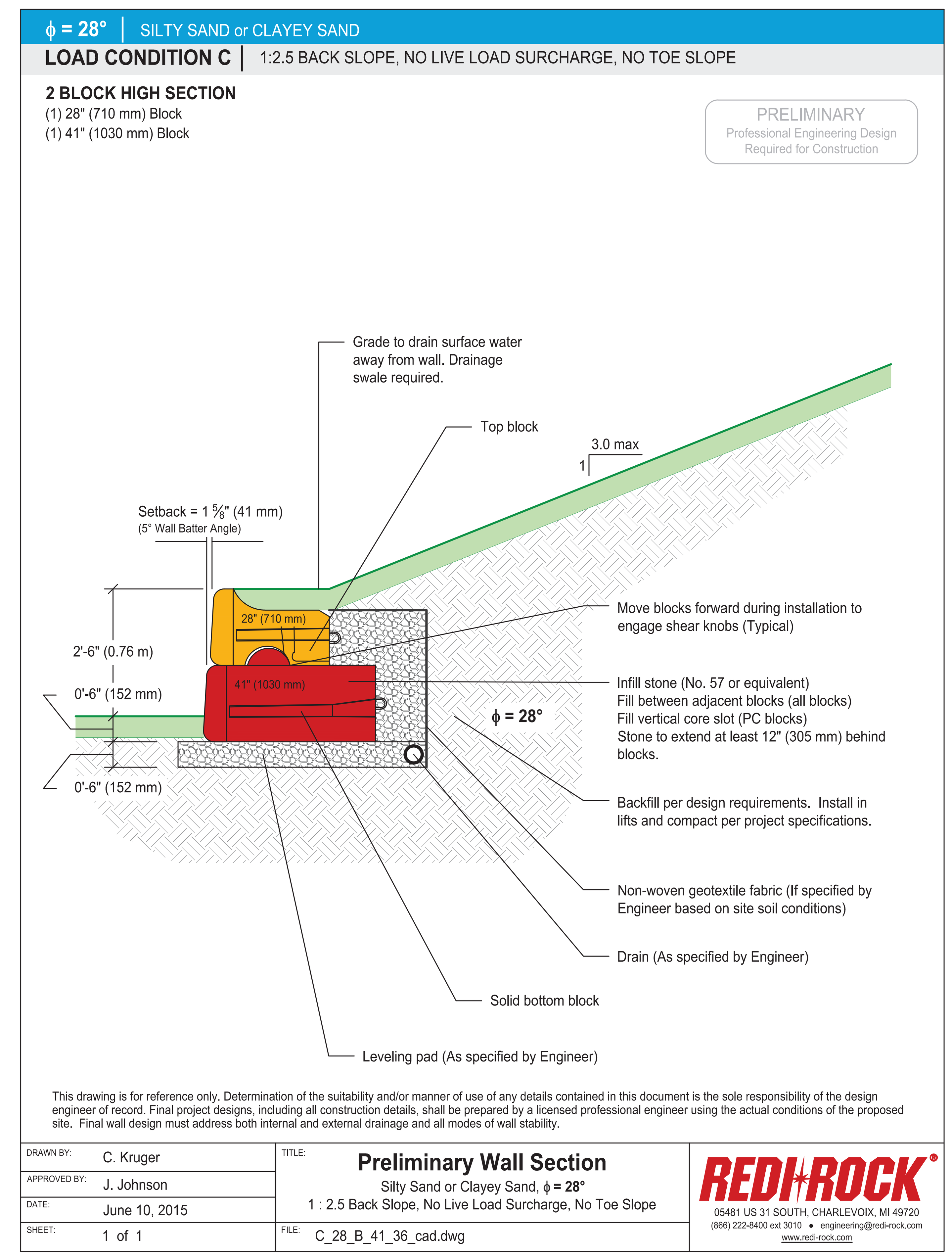
(NO SCALE)



SEWER UNDER ROADBED OR WITHIN INFLUENCE OF ROADBED

(REF. MDOT DETAIL IV-830)

NO SCALE



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BOSS Engineering
Engineers Surveyors Planners Landscape Architects
3121 E. GRAND RIVER AVE.
HOWELL, MI. 48843
800.246.6735 FAX 517.548.1670

PROJECT: CLEARY UNIVERSITY STUDENT HOUSING APARTMENT #2

PREPARED FOR: UNIVERSITY HOUSING SOLUTIONS, LLC
90 HIDDEN RAVINES DRIVE
POWELL, OH 43065
(866) 711-7786

TITLE: CONSTRUCTION DETAILS

NO	BY	REVISION PER	DATE
1	ST	PER TWP REVIEW	9-18-17

DESIGNED BY: ST
DRAWN BY: ST
CHECKED BY:
SCALE NTS
JOB NO. 17-348
DATE 8/30/17
SHEET NO. 10

PIPE RESTRAINT SCHEDULE

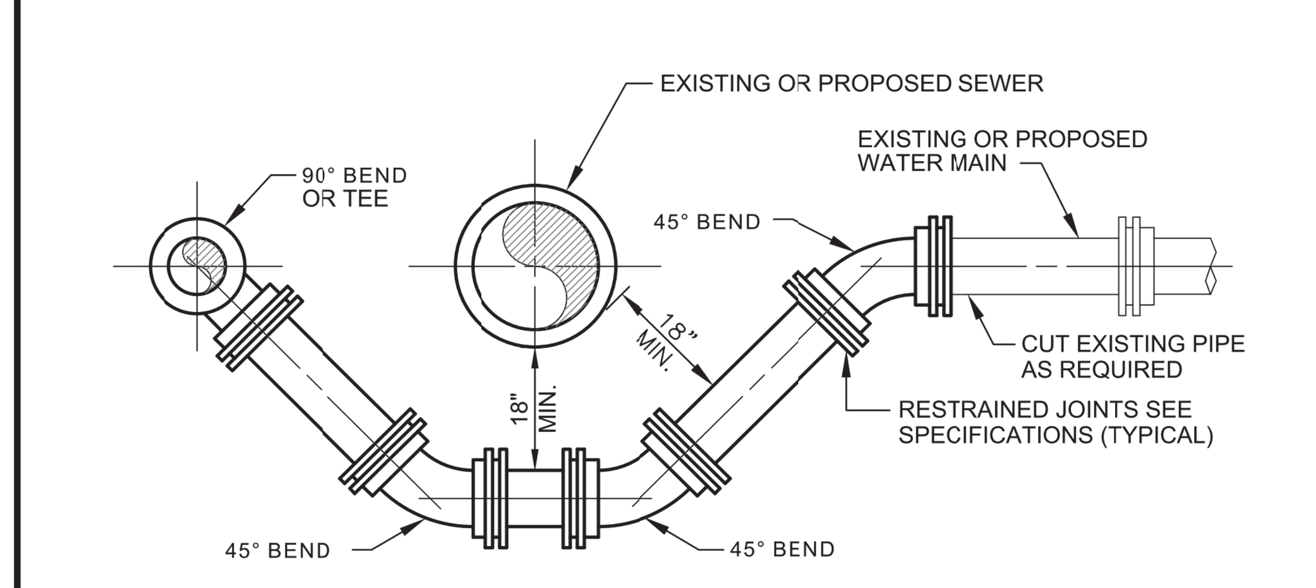
GROUND BURIED PRESSURE PIPE - POLYETHYLENE ENCASED DUCTILE IRON PIPE

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

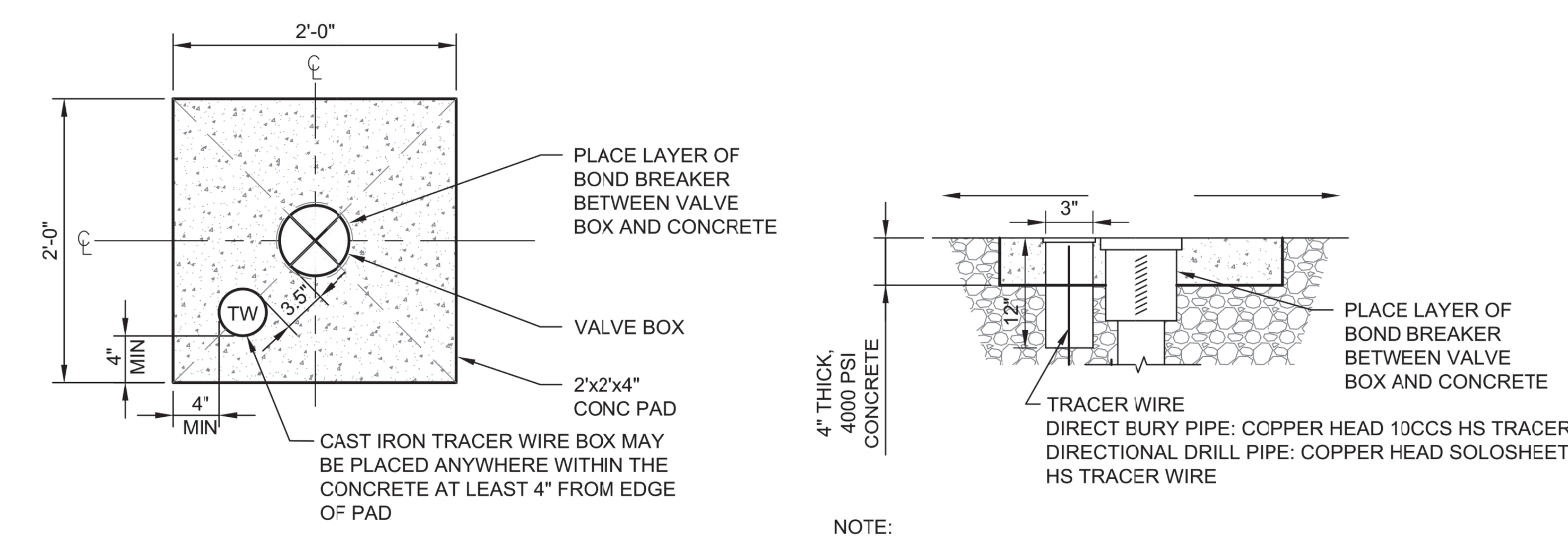
1. LENGTHS OF PIPE RESTRAINT ARE GIVEN IN FEET.
2. IF REQUIRED PIPE DIAMETER IS NOT LISTED IN THIS TABLE, THE NEXT LARGEST PIPE DIAMETER SHALL BE USED.
3. THIS TABLE IS BASED ON A TEST PRESSURE OF 180 PSI (OPERATING PRESSURE PLUS WATER HAMMER. FOR OTHER TEST PRESSURES, ALL VALUES TO BE INCREASED OR DECREASED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

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

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



WATER MAIN UTILITY OFFSET



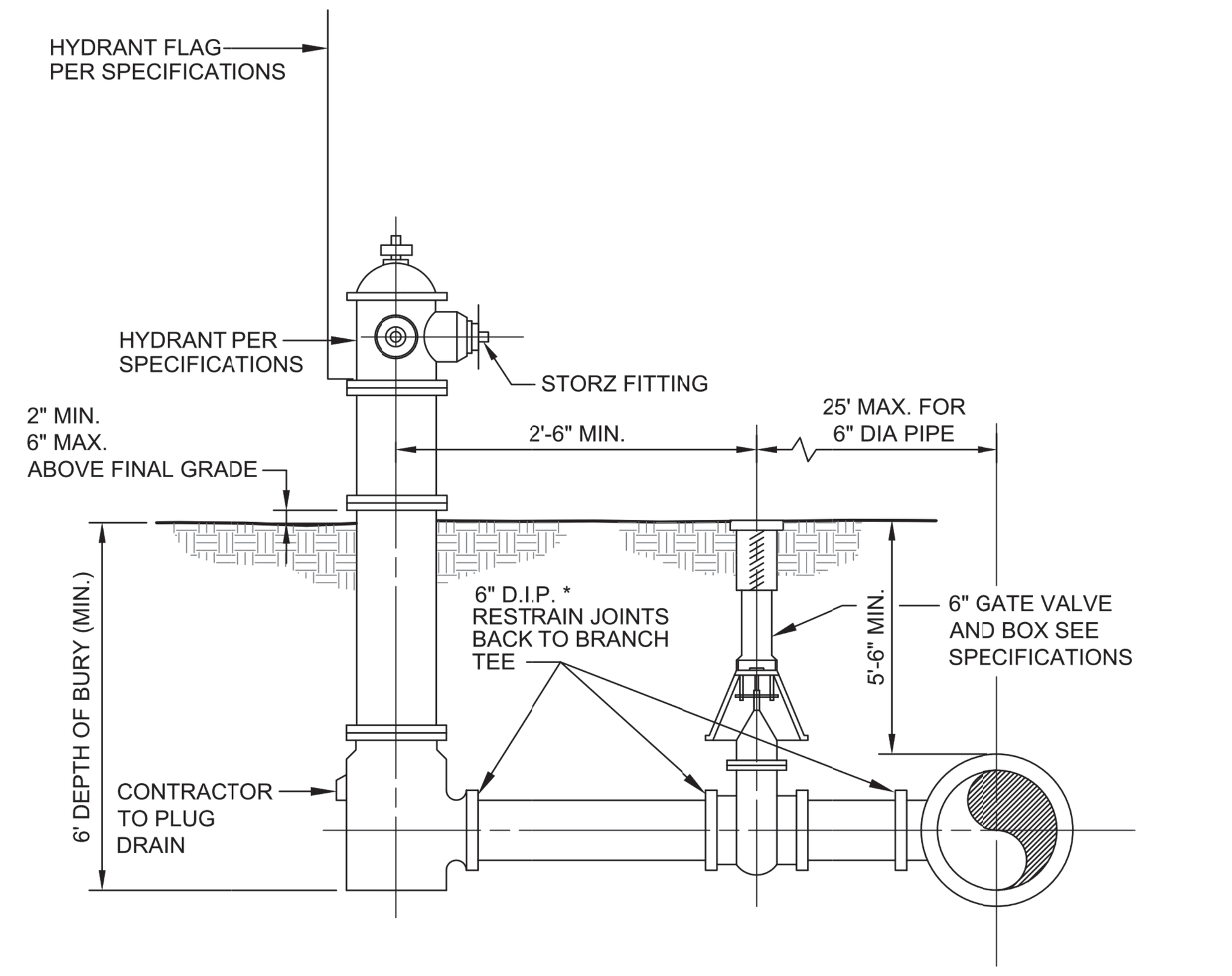
NOTE: ALL BOXES & ADJOINING TW BOXES SHALL BE ENCASED IN A CONC. PAD UNLESS OTHERWISE DETERMINED BY MHOG.

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

PLAN — SECTION

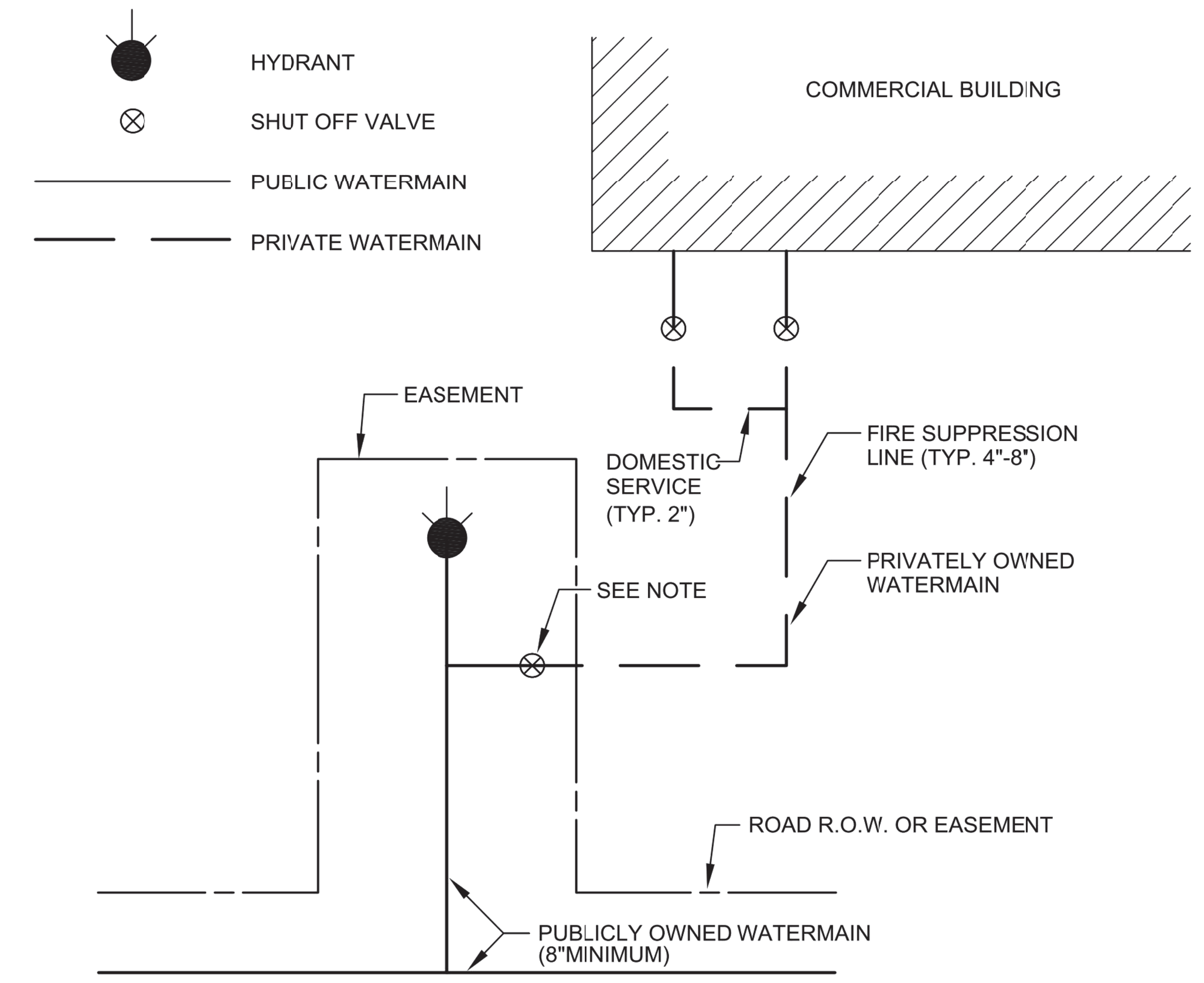
VALVE/TRACER WIRE BOX IN CONCRETE DETAIL

NO SCALE



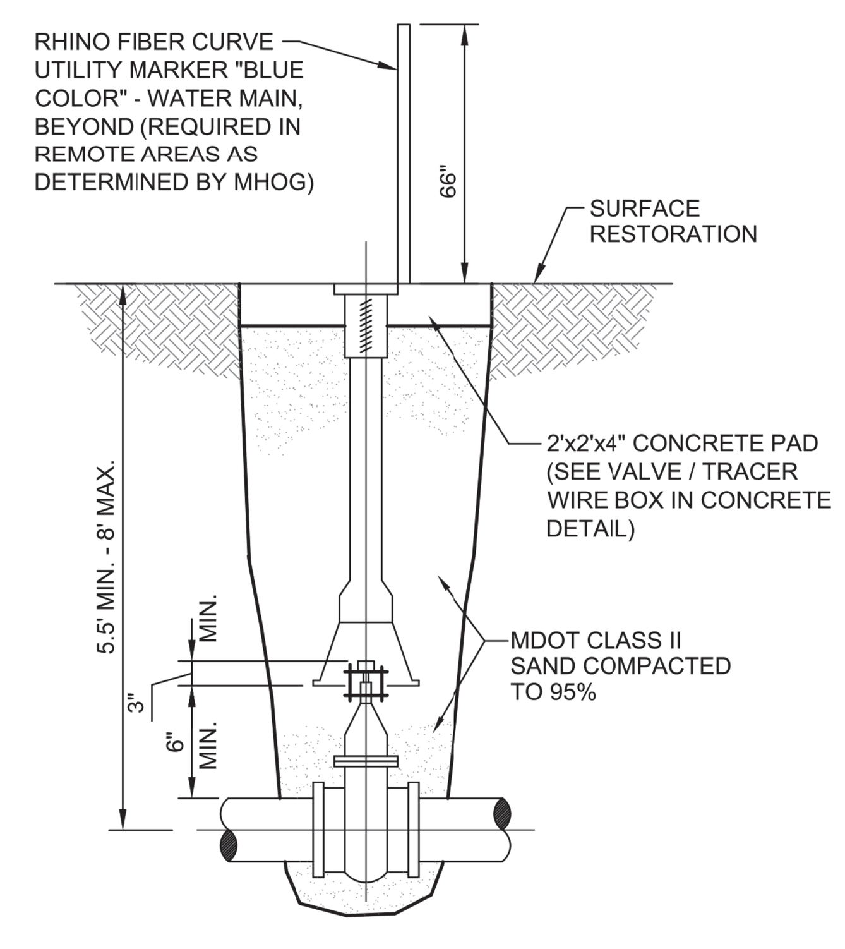
* THE LENGTH OF 6" PIPE FROM THE MAIN TO THE HYDRANT ASSEMBLY CANNOT EXCEED 25'. ANY PIPE OVER 25 FEET SHALL BE 8" DIAMETER MINIMUM AND DESIGNED PER MHOG SPECIFICATIONS.

FIRE HYDRANT ASSEMBLY



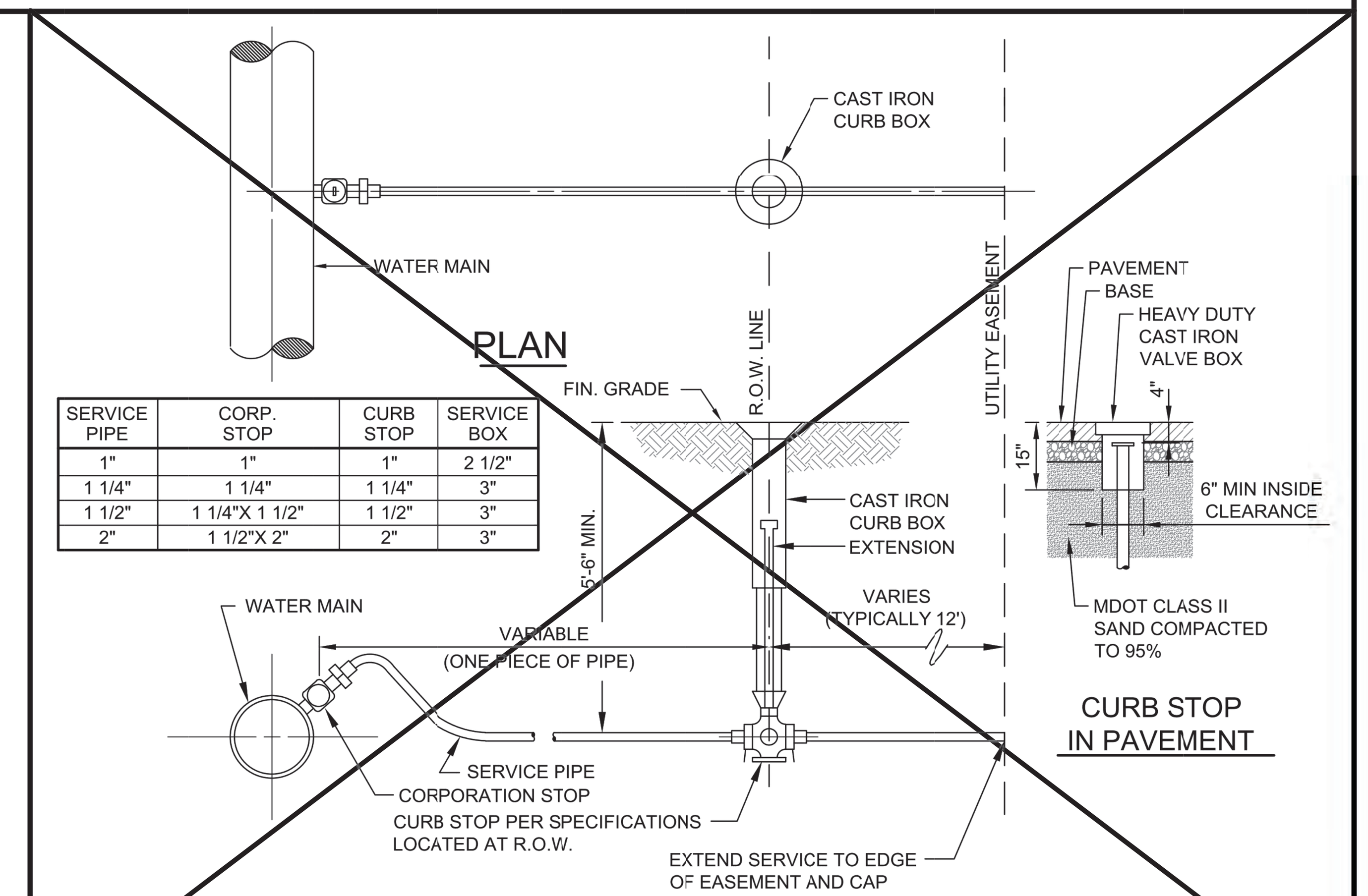
NOTE: PUBLICLY OWNED SHUT OFF VALVE TO BE LOCATED IN EASEMENT.

COMMERCIAL BUILDING WATER SERVICE LAYOUT



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

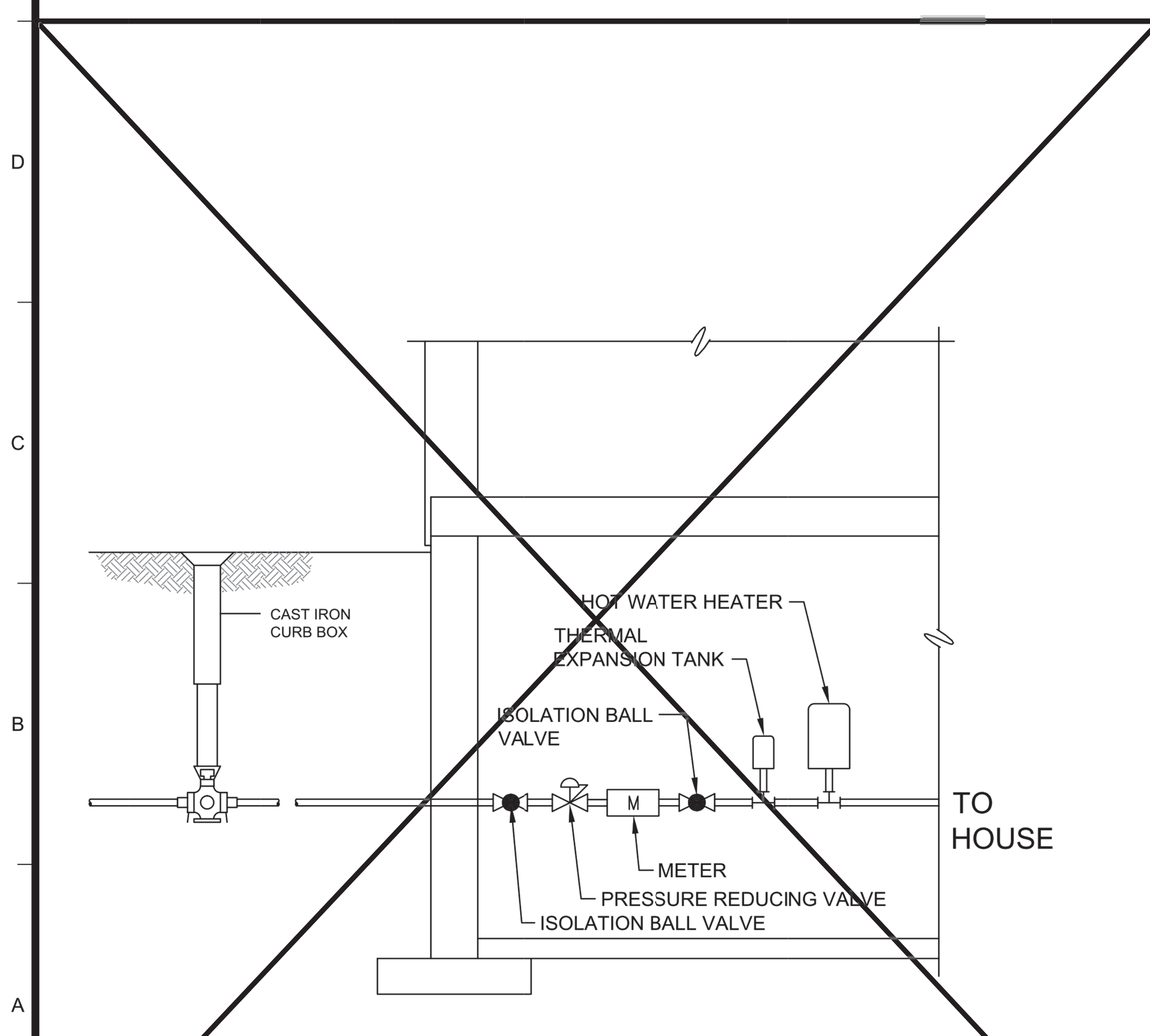
GATE VALVE AND BOX



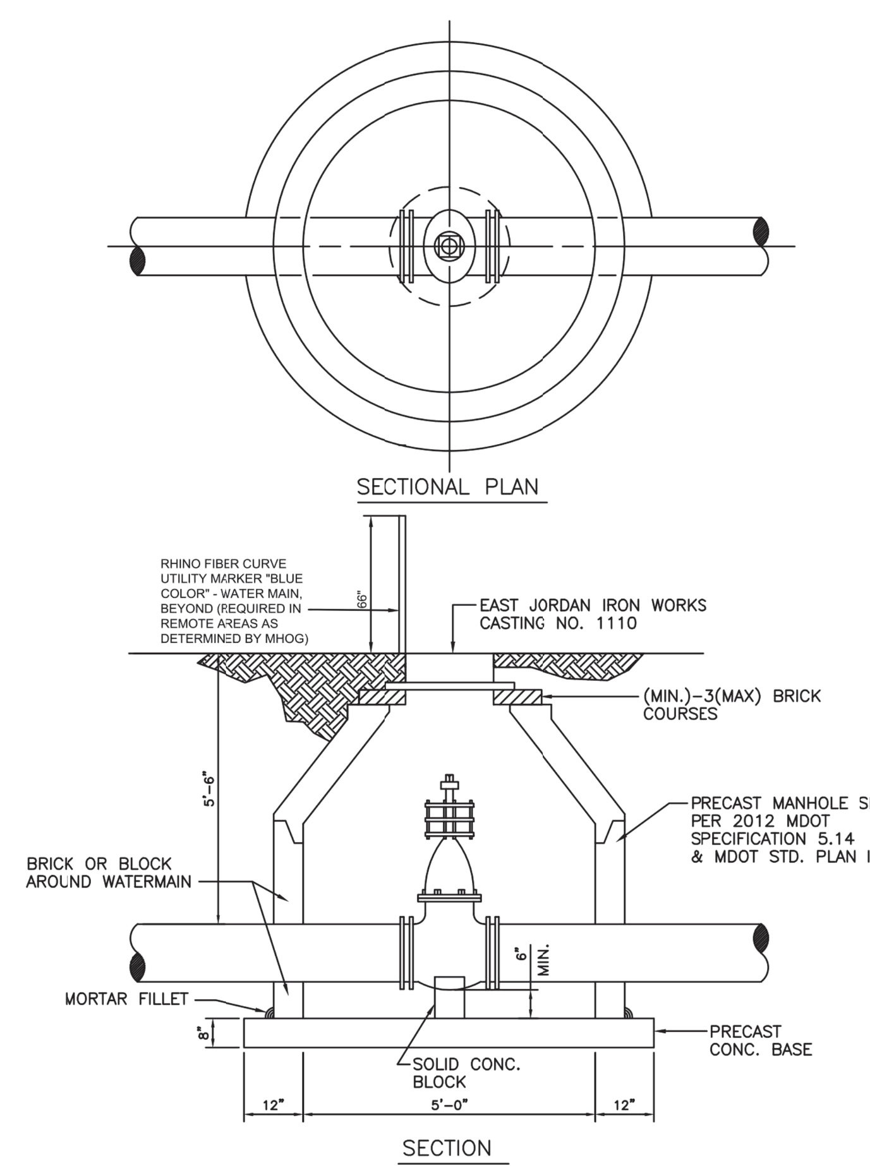
SERVICE PIPE	CORP. STOP	CURB STOP	SERVICE BOX
1"	1"	1"	2 1/2"
1 1/4"	1 1/4"	1 1/4"	3"
1 1/2"	1 1/4"X 1 1/2"	1 1/2"	3"
2"	1 1/2"X 2"	2"	3"

SECTION

WATER SERVICE LATERAL

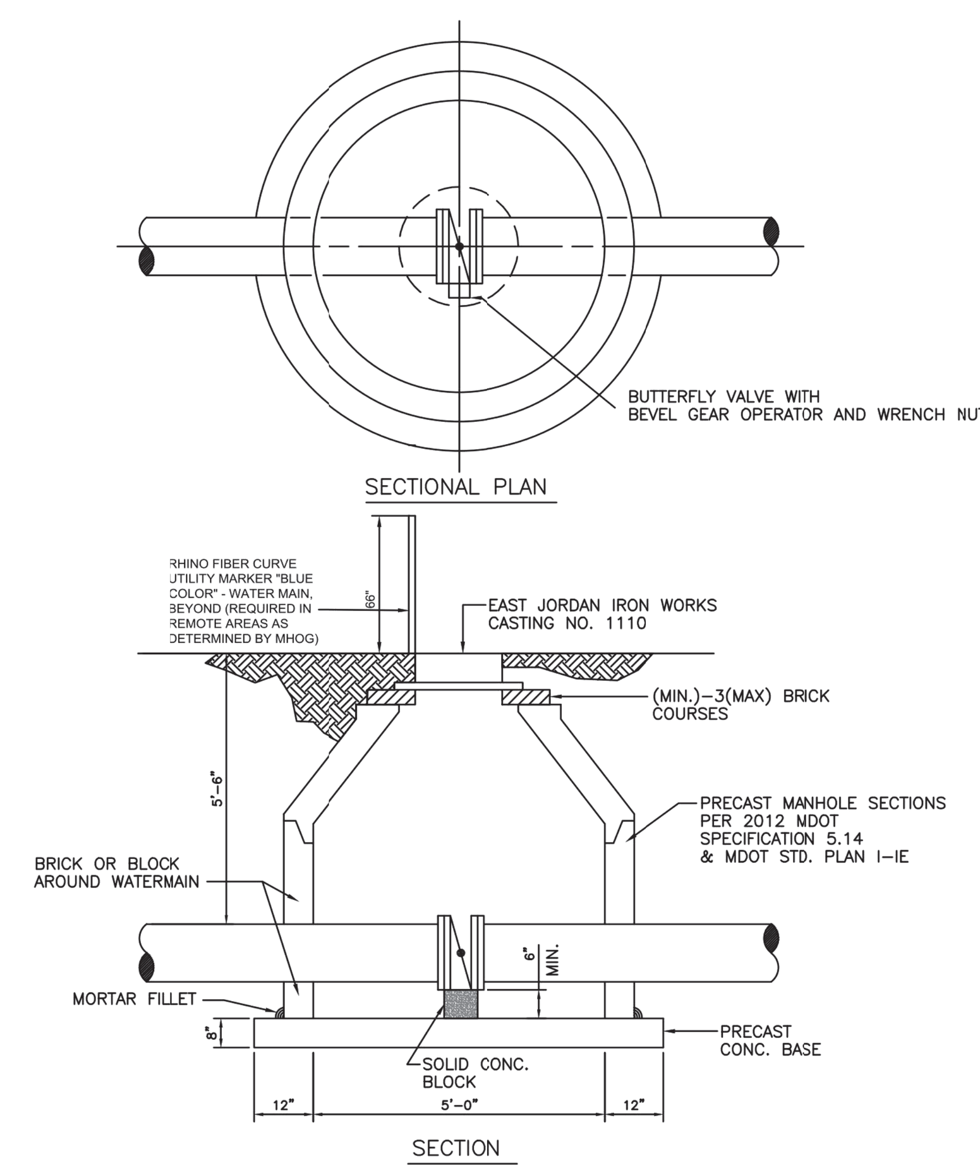


PRIVATE RESIDENCE PRESSURE REDUCING VALVE (PRV)



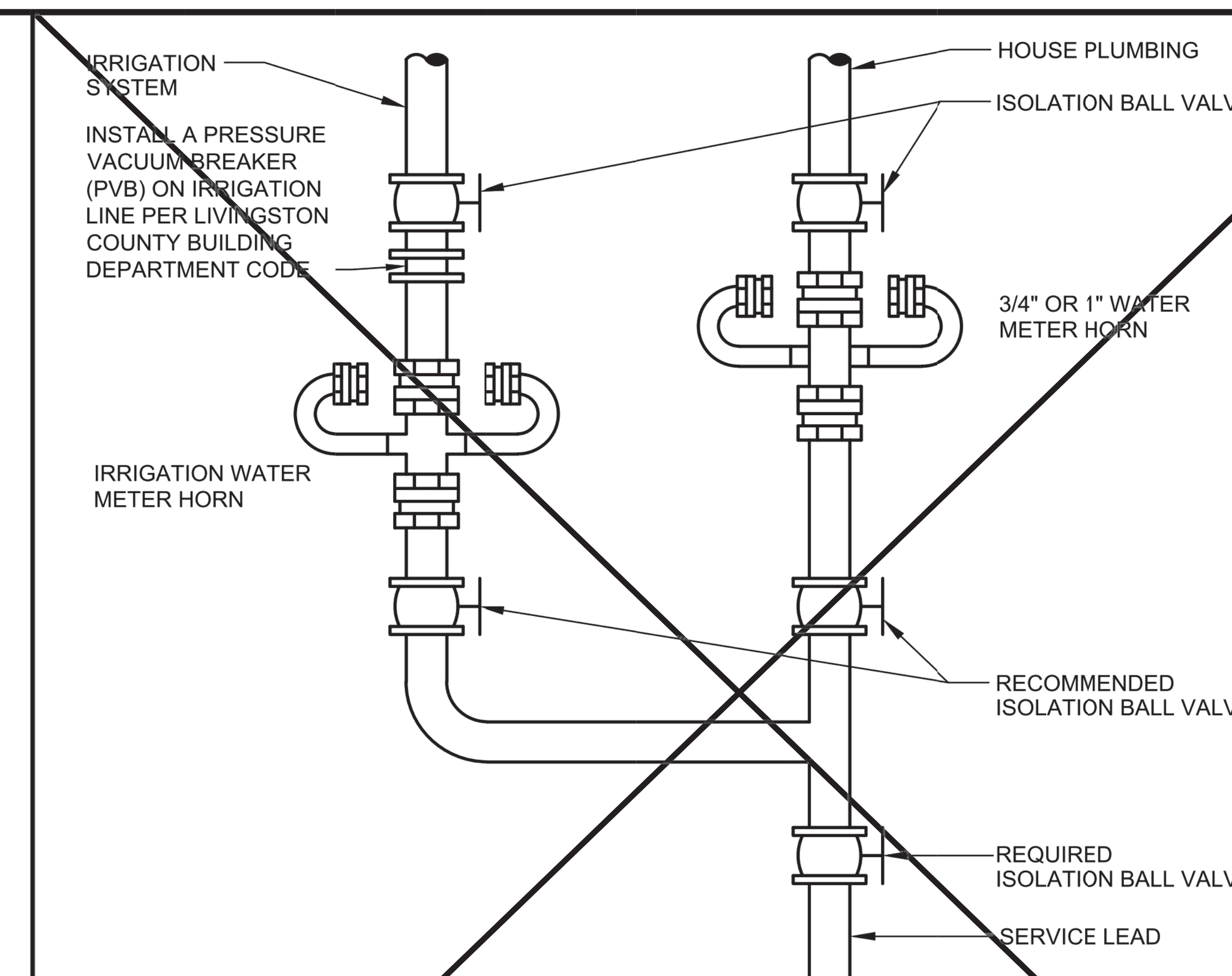
NOTES:
1. ALL LIFT HOLES AND JOINTS SHALL BE MORTARED BOTH INSIDE AND OUTSIDE.
2. BLOCK MANHOLES TO BE USED ONLY WITH ENGINEERS PERMISSION.
3. NO STEPS PERMITTED.

GATE VALVE AND WELL



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

BUTTERFLY VALVE AND WELL



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

TYPICAL METER HORN INSTALLATION

MARION HOWELL OCEOLA GENOA
Sewer and Water Authority

STANDARD DETAILS

Scale: NONE
Issued Date: JANUARY - 2014
UPDATED: MAY 2015
UPDATED: FEBRUARY 2016
UPDATED: APRIL 2016

Thursday, April 14, 2016 3:00:20 PM DRAWING: \\ERS073FS1\Projects\ER\12719\200-12719-14005\CAD\SheetFiles\Mhog-std.DWG

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HOWELL, MI. 48843
800.246.6735 FAX 517.548.1670

PROJECT: CLEARY UNIVERSITY STUDENT HOUSING APARTMENT #2

PREPARED FOR: UNIVERSITY HOUSING SOLUTIONS, LLC
90 HIDDEN RAVINES DRIVE
POWELL, OH 43065
(866) 711-7786

TITLE: WATER MAIN STANDARD DETAILS

NO	BY	REVISION PER	DATE
-	-	-	-

DESIGNED BY:
DRAWN BY:
CHECKED BY:
SCALE: NTS
JOB NO. 17-348
DATE: 8/30/17
SHEET NO. 11

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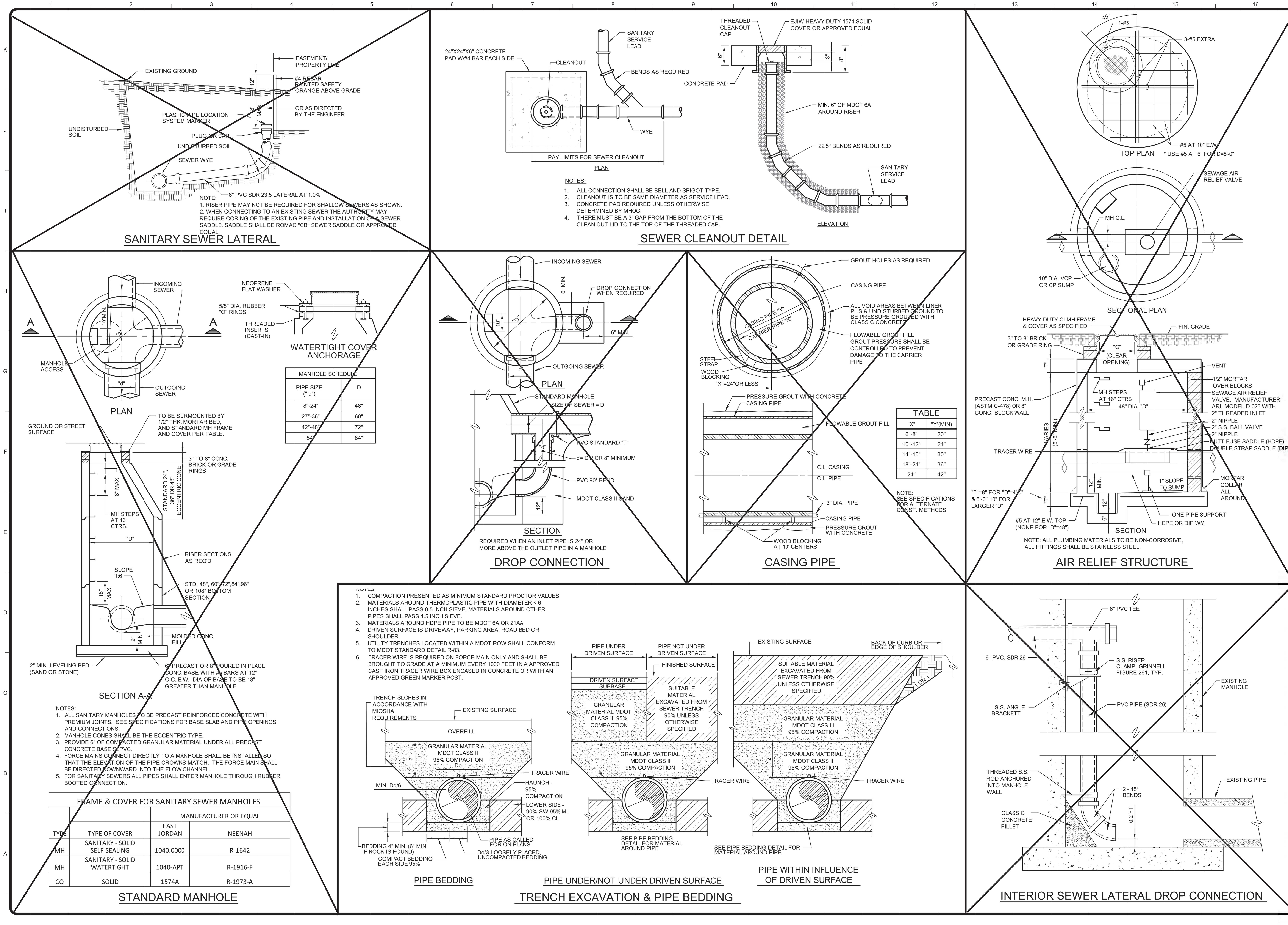

MANHOLE SCHEDULE	
PIPE SIZE (" d")	D
8"-24"	48"
27"-36"	60"
42"-48"	72"
54"	84"

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

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

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

STANDARD MANHOLE

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

MARION HOWELL OCEOLA GENOA
Sewer and Water Authority
M.H.O.G. Sewer & Water Utilities

STANDARD DETAILS

Scale:	NONE
Issued Date	JANUARY - 2014
Updated	MAY 2015
Updated	APRIL 2016
Updated	NOV - 2016
Updated	FEB - 2017

Thursday, February 23, 2017 10:48:49 AM DRAWING: P:\IER\12719\200-12719-00-000\CAD\SheetFiles\Mhog-std.DWG

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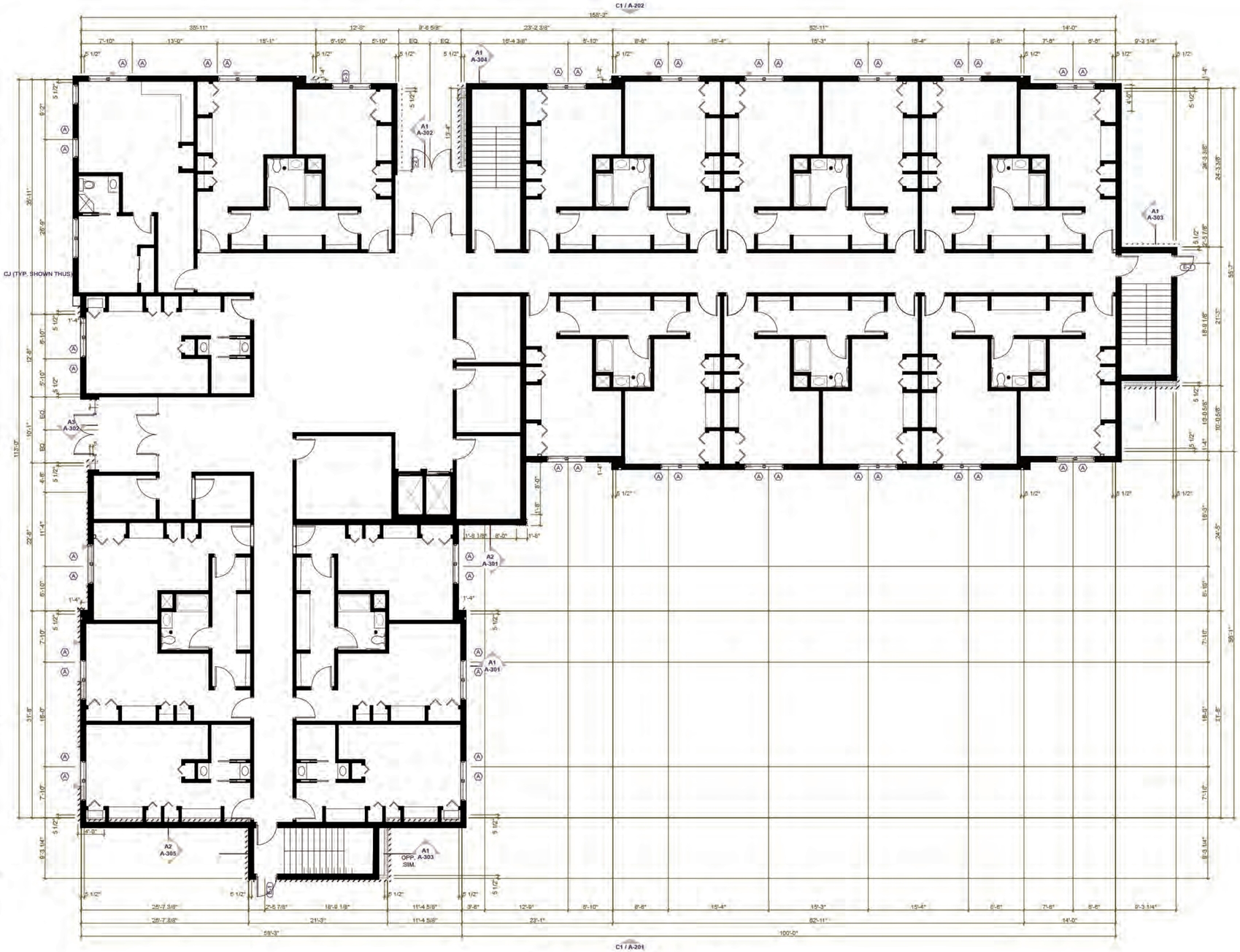
90 HIDDEN RAVINES DRIVE
POWELL, OH 43065
(866) 711-7786

TITLE: SANITARY SEWER STANDARD DETAILS

NO	BY	REVISION PER	DATE
-	-	-	-

DESIGNED BY:
DRAWN BY:
CHECKED BY:
SCALE NTS
JOB NO. 17-348
DATE 8/30/17
SHEET NO. 12



FIRST FLOOR PLAN

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

MKC | ASSOCIATES

90 Hidden Ravines Drive
Powell, Ohio 43065

740|657|3202

www.mkcinc.com

CONSULTANTS

NEW RESIDENTIAL BUILDING AT
CLEARY UNIVERSITY
FOR

UNIVERSITY HOUSING SOLUTIONS

HOWELL, MICHIGAN

SUBMITTED: 09/19/2017

A-001

First Floor Plan

MKC JOB #: 17-055

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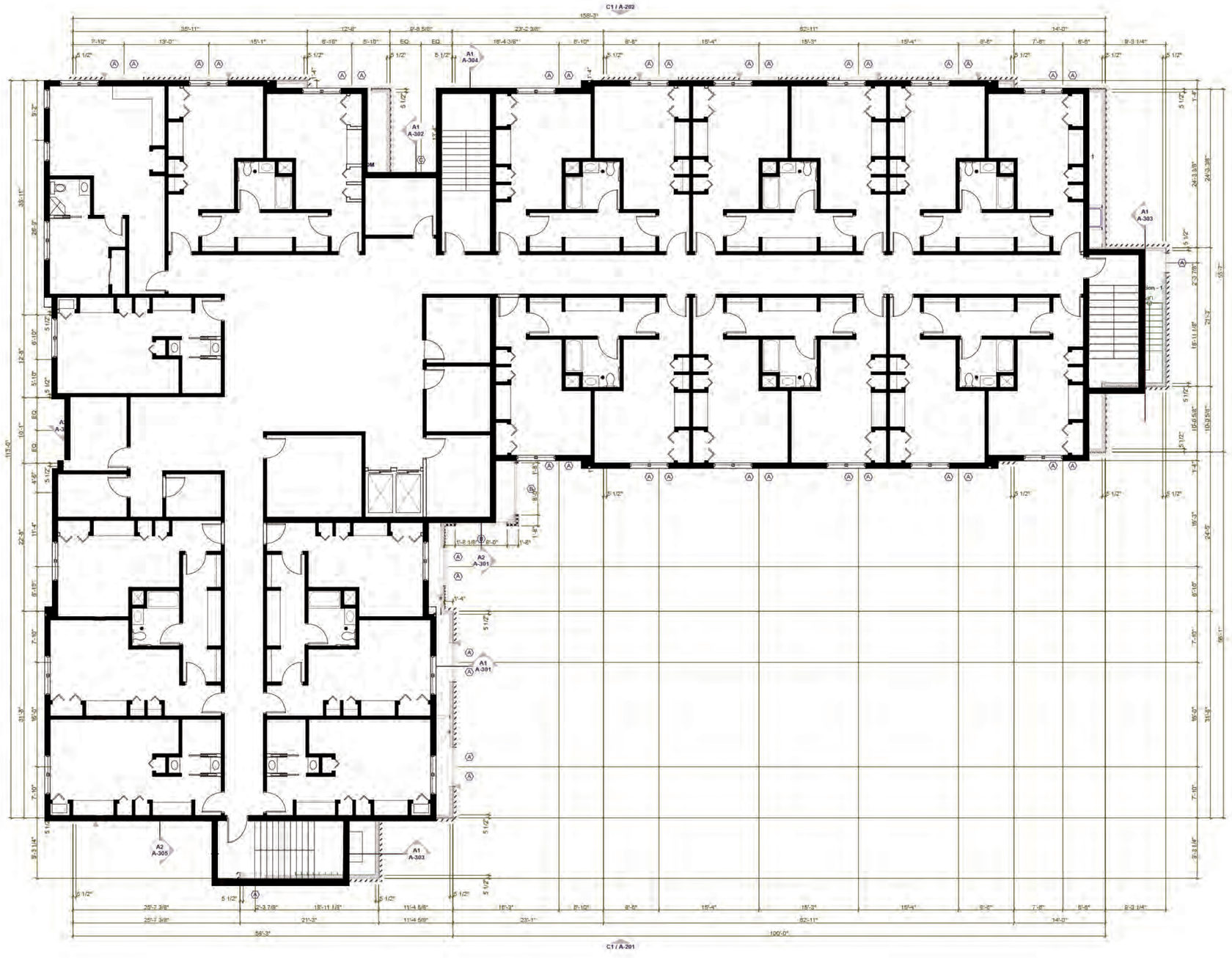

SECOND & THIRD FLOOR PLAN

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

MKC | ARCHITECTS

90 Hidden Ravines Drive
Powell, Ohio 43065

740|657|3202

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CONSULTANTS

NEW RESIDENTIAL BUILDING AT
CLEARY UNIVERSITY
FOR

UNIVERSITY HOUSING SOLUTIONS

HOWELL, MICHIGAN

SUBMITTED: 09/19/2017

A-002

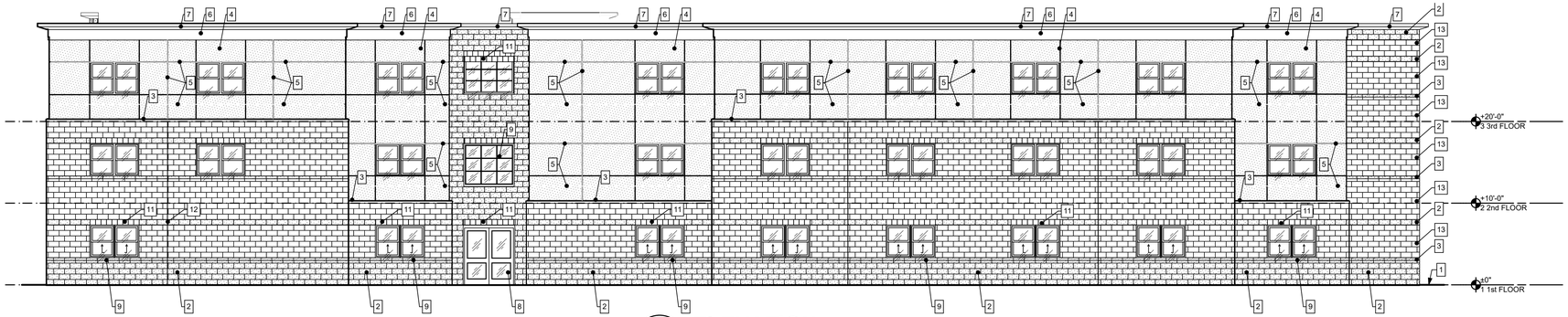
SECOND & THIRD FLOOR PLANS

MKC JOB #: 17-055

9/19/2017 5:10 PM

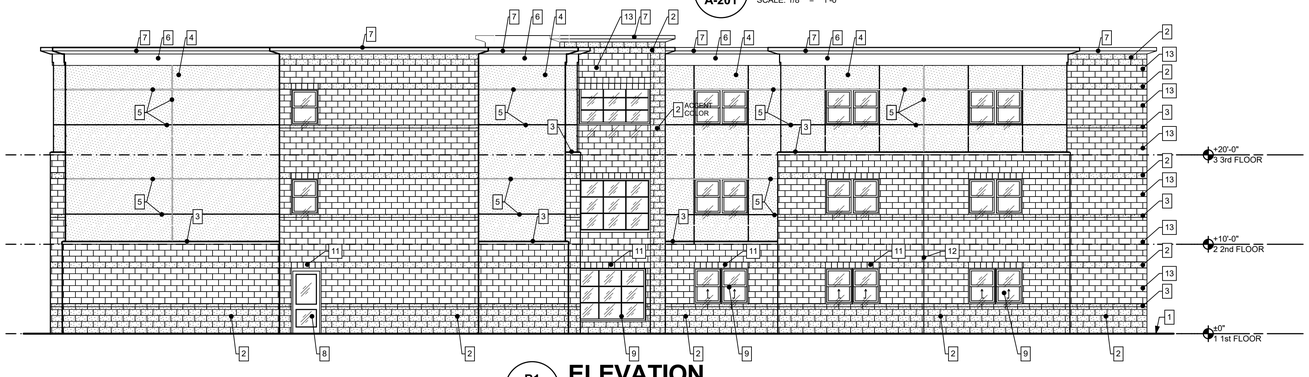
D1 A-201 **ELEVATION**

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



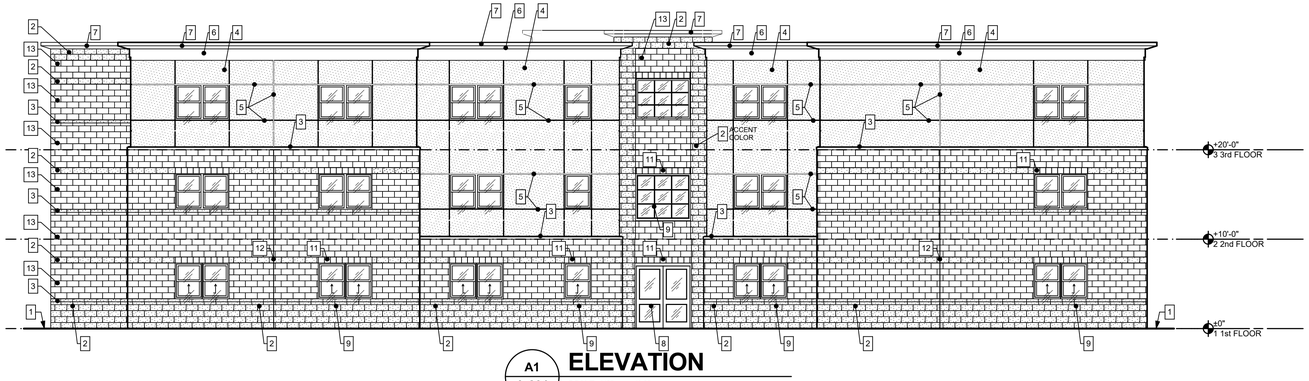
C1 A-201 **ELEVATION**

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



B1 A-201 **ELEVATION**

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



A1 A-201 **ELEVATION**

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

ELEVATIONS KEYNOTES:

1. FINISH GRADE
2. SPLIT FACE CONCRETE MASONRY UNITS
3. 4" H SPLIT FACE CMU SILL (ACCENT COLOR)
4. 1 1/2" EIFS SYSTEM ON DRAINAGE BOARD
5. 3/4" 'V' GROOVE
6. METAL CLAD FRIEZE BOARD
7. METAL CLAD COPING
8. HOLLOW METAL DOOR AND FRAME
9. VINYL WINDOW
10. METAL DOWNSPOUT
11. SMOOTH FACE CONCRETE MASONRY HEADER
12. MASONRY CONTROL JOINT
13. "GRAND BLANC" GROUND FACED ARCHITECTURAL BURNISHED MASONRY

EXTERIOR ENVELOPE MATERIALS:

EIFS: 4,500 SF
SPLIT FACE BLOCK VENEER: 12,000 SF

BRIGHTON AREA FIRE DEPARTMENT COMMENTS:

-Building will be provided with an automatic sprinkler system in accordance with NFPA 13, or NFPA 13R. Plans will be submitted separately.
-The building address will be a minimum of 6" high letters of contrasting color which will be clearly visible from the street. Location will be submitted for approval.
-show knox box location next to door facing west parking lot. (south side of building)

DESIGN INTENT:

The building design is to mirror the existing building on the site. The footprint of the building will be the same but mirrored. The Owner wants the exterior building to math the existing building on the site. Existing building was designed as a compliment to the Johnson Center.

PRELIMINARY - NOT FOR CONSTRUCTION

ARCHITECT OF RECORD
BRIAN BAUER
EXPIRATION ##/##/####

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HOWELL
MICHIGAN

SUBMITTED: 10/01/2014

REVISIONS

MARK	DATE	DESCRIPTION
1		
2		
3		
4		

DRAWN BY: PROJ. MGR:

SHEET CONTENT

Elevations

JOB NO. 14-095

SHEET A-201

Printed 10/15/2014

PROPOSED NORTH ELEVATION

PROPOSED SOUTH ELEVATION

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SUBMITTED: 10/01/2014

REVISIONS

MARK	DATE	DESCRIPTION
1		
2		
3		
4		

DRAWN BY: PROJ. MGR:

SHEET CONTENT

Renderings

JOB NO. 14-095

SHEET A-202

Printed 10/15/2014

GENOA CHARTER TOWNSHIP
PLANNING COMMISSION
PUBLIC HEARING
September 11, 2017
6:30 P.M.
MINUTES

CALL TO ORDER: The meeting of the Genoa Charter Township Planning Commission was called to order at 6:30 p.m. Present were Chairman Doug Brown, Eric Rauch, John McManus, Chris Grajek, James Mortensen and Jill Rickard. Absent was Barbara Figurski. Also present was Kelly VanMarter, Community Development Director/Assistant Township Manager, Brian Borden from LSL Planning and an audience of 10.

PLEDGE OF ALLEGIANCE: The pledge of allegiance was recited. There was also a moment of silence in remembrance of the terrorist attacks of September 11, 2011.

APPROVAL OF AGENDA:

Moved by McManus, seconded by Mortensen, to approve the agenda as presented.

CALL TO THE PUBLIC: The call to the public was made at 6:33 pm with no response.

OPEN PUBLIC HEARING #1… Review of a request to amend conditions of a previously-approved Special Land Use and Site Plan for the Brighton Church of the Nazarene located at 7669 Brighton Road, Brighton. The request is petitioned by Brighton Church of the Nazarene.

Planning Commission disposition of petition:

A. Recommendation of amendment to Special Lane Use and Site Plan Conditions

Pastor Ben Wallace, Jim Burgos, and Josh Latson were present.

Pastor Wallace stated they are asking for a revised plan for the trees. They are aware that the trees put in by the contractor have died. As part of their previous approval, they were required to maintain the trees. An arborist came out and determined that they were planted too close together and are fighting for nutrients. There is also a disease in the soil affecting the blue spruces. The trees need to be thinned out and a 15-foot perimeter needs to be around each one. They would like to take out the dead trees and put in new ones, within the parameters of the 15 feet. Because of the security issues, it was suggested by the Planning Commission to put up a fence. They have done this to prevent kids from the skate park cutting through the trees and into the adjacent neighborhood.

They would like to amend the landscape design plan requirements. They will be removing 16 trees and planting 5 new trees and ask that the neighbors on the residential street adjacent to their church maintain the trees on their properties.

Additionally, since the fence has been put up, there have not been any incidences reported of kids cutting through the trees and climbing the fence. Therefore, they would also like to remove the requirement of having a security guard on site when the skate park is open.

Commissioner Mortensen noted that some of the area in question does not belong to the church or the association. It is Right-of-Way along a Livingston County road. He believes the church should only be responsible for the trees on their property and the homeowner's association should be responsible for any trees that are located in the ROW.

There was a brief discussion regarding the maintenance of all of the trees in this area. It was a condition of a previous approval that the church would maintain all of the trees in this tree line. Mr. Burgos stated they have spent $50,000 to maintain it. At this point, they would like to remove any trees that area dead, even if they are not on their property, and restore the area to level so that the homeowners have something manageable to maintain going forward.

Mr. Borden reviewed his letter of September 6, 2017.

Because this is not a minor amendment to a previously-approved plan, it must be approved by the Township Board. The Planning Commission will only be making a recommendation this evening.

- He requested a report of the condition of the trees that are said to be dead or dying as well as what is being proposed to be planted. The applicant submitted this report to Mr. Borden and the Planning Commission this evening.
- The applicant should also provide a more detailed amended landscape plan, such as when a formal site plan is submitted. He would like the Planning Commission and residents to know exactly what to expect.
- He believes that the applicant has provided the rationale as to why they should no longer be required to maintain the trees that are not on their property as well as why a security guard is no longer needed. The decision to agree to amend these conditions of the previous approval would ultimately be decided by the Planning Commission and the Township Board.

Commissioner McManus agrees with Mr. Borden. If he was a resident on the adjacent street, he would like to have a detail of what is being taken out, what is being put in, and what he would be required to maintain.

Commissioner Rauch stated that the Livingston County Road Commission should have input as to the removing and planting of trees.

Chairman Brown suggested the church and the residents meet to come to an agreement as to what will be done along the tree line. Commissioner Mortensen agrees; and the meeting should include a landscape architect. He believes this is an issue between the church and the homeowners.

Commissioner Rickard asked staff if these trees were planted by the developer as part of the site plan approval. Ms. VanMarter has researched this and there were no requirements placed on the developer by the Township to plant these trees.

Commissioner Rickard would like to see a landscape plan as suggested by Mr. Borden.

The Call to the Public was made at 7:21 pm.

Mr. Jay Johnston of 4931 Aljoann stated that one of the homeowners' concerns is that as part of previous approvals for expansions for the church, they were required to maintain the trees and they did not do this. They did not care for the trees when they were dying. He stated that a previous arborist suggested that 46 trees be removed and a mixture of deciduous and pine trees should be planted. He and other homeowner's feel that there are an additional 11 trees that will need to be removed in the next few years.

The fence has been an improvement. He does not agree that removing 16 trees and planting 5 new trees will be sufficient.

Chairman Brown asked Mr. Johnston if he would be agreeable to meeting with representatives of the church to come to an agreement on a landscape plan that can be presented to the Planning Commission and Township Board. Mr. Johnston stated he has spoken to them; however, he is willing to meet again.

Commissioner Rickard understands that these trees are not all on the church's property; however, at this time, per the condition of the previous approvals, they are required to maintain the entire tree line.

Ms. Sandy Stogdill of 4793 Aljoann stated that different landscapers have had different opinions regarding these trees so they may have a different opinion than what was put in Leppek's report and presented to the Township.

Rob Stogdill of 4793 Aljoann does not feel that a security guard is needed at this time; however, he would like to keep it open for discussion if incidents do occur.

The call to the public was closed at 7:32 pm.

Commissioner Grajek stated that not all of the conditions put on the previous approvals regarding these trees have been met. He thinks this is an opportunity to make this right.

Moved by Commissioner Mortensen, seconded by Commissioner Grajek, to table the request from the Church of the Nazarene to amend the Special Land Use and Site Pan Conditions. **The motion carried unanimously**.

Administrative Business:

- Staff Report

Ms. VanMarter stated there will be an October Planning Commission meeting.

- Approval of the June 12, 2017 Planning Commission meeting minutes

Moved by Commissioner McManus, seconded by Commissioner Rauch, to approve the minutes of the June 12, 2017 Planning Commission Meeting with the minor changes noted. **The motion carried unanimously.**

- Member Discussion

There was a brief discussion regarding why the driving school is still allowed in the Church of the Nazarene parking lot. Ms. VanMarter and the Planning Commissioners agree that it is not an appropriate use in a residential zoning area.

- Adjournment

Moved by Commissioner McManus, seconded by Commissioner Mortensen, to adjourn the meeting at 7:47 pm. **The motion carried unanimously.**