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March 16th, 2022

Ms. Kelly VanMarter, AICP
Genoa Township Planning Commission
2911 Dorr Road
Brighton, Michigan 48116

Re: Bible Baptist Church-Special Land Use and Site Plan Review

Dear Ms. VanMarter,

Please find enclosed a revised project submittal for the Bible Baptist Church project. Included are revised site plans, a revised impact assessment, and an additional Special Use permit application for the encroachment in the 25' natural features setback.

The Environmental Impact Assessment has been updated to include the information from the traffic impact study. The project plans have been updated in a few ways as mentioned below:

1) The landscape plans have been revised for the discrepancy at the north forebay and screening at the southern parking lot.
2) A note has been added to the plans indicating the site lighting shall be timer controlled to be off when no activities are occurring. We will note that we desire the site to be safe as well. So minimal site lighting, and maybe only the building lighting remains on for safety purposes.
3) More detail has been added to the mechanical pretreatment structure detail as requested.
4) Storm Structure and pipe sizes have been added to the utility plan.
5) The concrete sidewalk detail has been modified to indicate 6" Class II sand per the Twp Design Standards.
6) The site approach at Golf Club Road has been modified to include the right turn lane that would be required for the Phase II, per the traffic study. Striping/arrows are shown to provide clarity on turning movements at the approach.
7) A sheet has been added near the end of the plan set specifically for the natural features setback encroachments. This sheet notes all locations of encroachments as well as areas of encroachment delineated for grading purposes.
8) We have seen comments on the location of the parking lot and dumpster enclosure in relation to the adjacent residential properties to the south. Although the layout as previously submitted met the Townships setback requirements per the Ordinance, we have re-evaluated this area to determine how we can increase this separation. The geometrics of the southern half of the parking lot to the west of the church has been revised to pull the parking lot nearly 100' away from the property line. A few spaces were added to the ends of each of the parking rows to offset the parking spots that were removed from the southern portion of the lot. In total there is 1 additional parking space provided. Additionally, the orientation of the dumpster has changed to not be angled towards the residential to the south. Screening is still proposed on the south side of the parking lot.
9) The Planners letter has requested information on the Church Operations as well as the use for the single-family residence and existing barn. The single-family home and barn currently have a life lease and will continue to be used as was used historically. With respect to church operations, the Church anticipates 2 worship services on Sunday mornings, and the church will be utilized one weeknight for youth group activities. During the average weekday, there may be miscellaneous small group bible studies and church staff on site.

Feel free to contact us should you have any questions, or if you are in need of any additional information.

Sincerely,

BOSS ENGINEERING COMPANY

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Scott Tousignant, PE
Project Manager

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: Bible Baptist Church c/o Pastor Tim Christoson, 2258 E. Highland Rd., Howell, MI 48843
Submit a letter of Authorization from Property Owner if application is signed by Acting Agent.

APPLICANT PHONE: (517) 715-9233 EMAIL: tim.christoson@howellchurch.org

OWNER NAME & ADDRESS: Same As Above

SITE ADDRESS: 3850 Golf Club Road, Howell, MI 48843 PARCEL #(s): 4711-05-200-002

OWNER PHONE: (517) 715-9233 EMAIL: tim.christoson@howellchurch.org

Location and brief description of site and surroundings:
Site is located on the southwest corner of LAtson Road and Golf Club Road and is zoned LDR. The north side of teh site contains a 3 acre + pond and single-family residence; the south side of the site contains steep topography and trees; the northern property line is the northern limits of Genoa Township. On the east by Latson Road is zone RR and RPU zoning; to the south is an existing subdivision in MUPUD zoning; and on the west are single family residences in RR zoning.

Proposed Use:
The site plans is for a Phase 1 of Bible Baptist Church' campus. The purpose of this special use is specifically for the encroachments into the Townships 25' natural features setbacks with grading as well as the placement of a retaining wall and storm water structures.

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

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

The special use of encroachment within the natural features setback is in accordance with the goals of the Master Plan and Zoning district as it does not burden public infrastructure, it preserves the natural resources by ensuring no encroachment within the wetland limits, encroachment in the setback has no impact on generating excess traffic, nor does it interfere with utilization of single family dwellings in the district.

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

As stated above, the disturbances do not occur within the wetlands, only the wetland setbacks. Historically, the property has been maintained(cut grass) up to the edge of the wetlands at the north end of the site. The proposed plan, once constructed, will return these areas back to a condition with similar vegetative grass cover. The character of the area is maintained by avoiding construction encroaching within the wetland limits.

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?

Special Use for encroachment into the 25' natural features setback does not impact any of the above mentioned services other than drainage structures. Included in the encroachment of the natural features setbacks are the drainage structures necessary to carry out the storm water management for the development.

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?

Encroachment of the natural features setbacks has no impact on traffic, noise, vibration, smoke, fumes, odors, glare, etc.

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.

The special use for encroachment in the natural features setback does not have specific criteria listed in the Zoning Ordinance in Sections 3.03.02, 7.02.02,or 8.02.02.

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

BY: Tim Christoson

ADDRESS: 2258 E. Highland Rd, Howell, MI 48843

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

Scott Tousignant, PE	of Boss Engineering	at scottt@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: Tim Christoson DATE: 3/16/2022

PRINT NAME: Tim Christoson PHONE: 517-715-9233

Revised 08-15-13, kasp

PERMIT INFORMATION

The Department of Environmental Quality (DEQ) has prepared a list of key questions to help identify what departmental permits, licenses, or approvals of a permit-like nature may be needed for a project. By contacting the appropriate offices listed below, you will help reduce the possibility that your project or activity will be delayed due to the untimely discovery of additional permitting requirements later in the process. While this list covers the existence of permits and approvals required from the DEQ, it is not a comprehensive list of all legal responsibilities (i.e. planning requirements and chemical storage regulations may apply). A useful way to learn whether any other requirements will apply is to go through the Self Environmental Assessment in the Michigan Manufacturers Guide, online at: http://www.michigan.gov/deq/0,1607,7-135-3310_4148-15820--,00.html.

KEY QUESTIONS: (DEQ Permit and Licensing Guidebook Chapter)	Yes ☐	No ☐	If "Yes," refer to the DEQ Permit and Licensing Guidebook Section(s), the Web Page, or Call the Program:
CONSTRUCTION PERMITS			
Permit to Install: Does the project involve installation, construction, reconstruction, relocation, or alteration of any process equipment (including **air pollution control equipment**) which has the potential to emit air contaminants? (Permit Guidebook Chapter 5.1.3)	Y☐	N☑	Web, AQD, Permit Section, 517-373-7023
Asbestos Notification: Does the project involve renovating or demolishing all or portions of a building? (Notification is required for all renovations and demolitions, even if the structure never contained asbestos.)	Y☐	N☑	Web, AQD Asbestos NESHAP Program 517-373-7064
Soil Erosion and Sedimentation Control (SESC): Does the project involve an earth change activity within 500 feet of a lake or stream, or will the project disturb an area greater than one acre in size? (Permit Guidebook Chapter 5.3.5)	Y☑	N☐	Contact Your Local SESC Agency: http://www.deq.state.mi.us/sesca/ Web, WB, SESC Program, 517-335-3178
Does the project involve **construction** which will disturb one or more acre that comes into contact with **storm water** that enters a storm sewer, drain, lake, stream, or other surface water? (Permit Guidebook Chapter 5.2.1)	Y☑	N☐	Web, WB, Permits Section, 517-241-8993 or appropriate DEQ District Office
Does the project involve **construction** or alteration of any **sewage collection or treatment** facility? (Permit Guidebook Chapter 5.3.1)	Y☑	N☐	Web, Appropriate District Office, WB, Part 41 Construction Permit Program
Does the project involve **construction** of a **community water supply** well or the extension of a water supply from an existing water system? (Permit Guidebook Chapter 5.3.2)	Y☑	N☐	Web, Appropriate DEQ District Office, WB, Community Water Supply Program
Does the project involve **construction** of a **water supply well** (a private, irrigation, process, or public water well)?	Y☐	N☑	Contact a Registered Well Driller, Web, Local Health Department Contacts, Non Community Water Supply, Web
Does the project involve construction of a facility that landfills, transfers, or processes of any type of **solid non-hazardous waste** on-site, or places **industrial residuals/sludge** into or onto the ground? (Permit Guidebook Chapter 5.4.1)	Y☐	N☑	Web, Appropriate DEQ District Office, WHMD 517-335-4035
Does the project involve the construction of an on-site treatment, storage, or disposal facility for **hazardous waste**? (Permit Guidebook Chapter 5.4.2)	Y☐	N☑	Web 5.4.2, WHMD, Hazardous Waste Section, 517-373-9875
CONSTRUCTION PERMITS (LAND/WATER FEATURE)			
Does the project involve filling, dredging, placement of structures, draining, or use of a **wetland**? (Permit Guidebook Chapter 5.5.6)	Y☐	N☑	(Permit Application, Web), Web Land & Water Management Division (LWMD), Permit Consolidation Unit, 517-373-9244
Storm Water Discharge to Wetlands: Will storm water be collected, stored, or treated in a wetland area from a public road, industrial, commercial, or multi-unit residential development? (Permit Guidebook Chapter 5.5.6)	Y☑	N☐	(Permit Application, Web), Web LWMD, Permit Consolidation Unit, 517-373-9244

Great Lakes: Does the project involve construction, filling, or dredging below the Ordinary High Water Mark of one of the Great Lakes? (Permit Guidebook Chapter 5.5.1)	Y☐ N☑	(Permit Application Web), Web, LWMD, Permit Consolidation Unit, 517-373-9244
Inland Lakes and Streams: Does the project involve any dredging, filling, placement of structures, or the operation of a marina within an inland waterbody (e.g. lake, river, stream, drain, creek, ditch, or canal), enlargement of a waterbody, or excavation of a pond within 500 feet of a waterbody? (Permit Guidebook Chapter 5.5.7)	Y☐ N☑	(Permit Application Web), Web, LWMD, Permit Consolidation Unit, 517-373-9244
Storm Water Ponds and Discharges to Inland Lakes/Streams, or Great Lakes: Will storm water from any road or any other part of the development be discharged either directly or ultimately to an inland waterbody, or one of the Great Lakes; or will a storm water pond be constructed within 500 feet of an inland waterbody? (Permit Guidebook Chapters 5.5.7 & 5.5.1)	Y☐ N☑	(Permit Application Web), Web5.5.7, Web5.5.1 LWMD, Permit Consolidation Unit, 517-373-9244
Does the project involve placement of fill, earth moving, or placement of structures within the 100-year **floodplain** of a watercourse? (Permit Guidebook Chapter 5.5.2)	Y☐ N☑	(Pemit Application Web), Web, LWMD, Permit Consolidation Unit, 517-373-9244
Does the project involve construction of a building or septic system in a designated Great Lakes **high risk erosion area**? (Permit Guidebook Chapter 5.5.4)	Y☐ N☑	(Permit Application Web), Web LWMD, Permit Consolidation Unit, 517-373-9244
Does the project involve dredging, filling, grading, or other alteration of the soil, vegetation, or natural drainage, or placement of permanent structures in a designated **environmental area**? (Permit Guidebook Chapter 5.5.4)	Y☐ N☑	(Permit Application Web), Web5.5.1, Web5.5.4, Web5.5.6, LWMD, Permit Consolidation Unit, 517-373-9244
Does the project propose any development, construction, silvicultural activities or contour alterations within a designated **critical dune area**? (Permit Guidebook Chapter 5.5.5)	Y☐ N☑	(Permit Application Web), Web, LWMD, Permit Consolidation Unit, 517-373-9244
Does the project involve construction of a **dam**, weir or other structure to impound flow? (Permit Guidebook Chapters 5.5.7) & 5.5.8)	Y☐ N☑	(Permit Application Web), Web5.5.7, Web5.5.8, LWMD, Dam Safety Program, 517-241-9862
CONSTRUCTION PERMITS (SECTOR SPECIFIC)		
Does the project involve a **subdivision or site condominium** project utilizing individual on-site subsurface disposal systems or individual wells? (Permit Guidebook Chapter 5.3.4)	Y☐ N☑	Web, WB, DWEHS, 517-241-1345
Does the project involve the construction or modification of a **campground**? (Permit Guidebook Chapter 5.3.6)	Y☐ N☑	Web, WB, DWEHS, 517-241-1340
Does the project involve the construction or modification of a **public swimming pool**? (Permit Guidebook Chapter 5.3.3)	Y☐ N☑	Web DEQ, WB, Drinking Water & Environmental Health Section (DWEHS), 517-241-1340
OPERATIONAL PERMITS		
Renewable Operating Permit: Does your facility have the potential to **emit** any of the following: 100 tons per year or more of any criteria pollutant; 10 tons per year or more of any hazardous **air pollutant**; or 25 tons per year or more of any combination of hazardous **air pollutants**? (Permit Guidebook Chapter 5.1.2)	Y☐ N☑	Web, AQD, Permit Section, 517-373-7023
NPDES: Does the project involve the **discharge of any type of wastewater** to a storm sewer, drain, lake, stream, or other **surface water**? (Permit Guidebook Chapter 5.2.1)	Y☐ N☑	Web, WB, Appropriate District Office, or National Pollutant Discharge Elimination (NPDES) Permit Program 517-241-1346
Does the facility have **industrial** activity that comes into contact with **storm water** that enters a storm sewer, drain, lake, stream, or other surface water? (Permit Guidebook Chapter 5.2.1)	Y☐ N☑	Web, WB, Permits Section, 517-241-8993 or appropriate DEQ District Office

Does the project involve the **discharge of wastewaters** into or onto the **ground** (e.g. subsurface disposal or irrigation)? (Permit Guidebook Chapter 5.2.2)	Y☐ N☑	Web, WB, Groundwater Permits Program, 517-373-8148
Does the project involve the drilling or deepening of **wells for waste disposal**? (Permit Guidebook Chapter 5.7.8)	Y☐ N☑	Web, OGS, Minerals and Mapping Unit, 517-241-1532
Does the project involve landfilling, transferring, or processing of any type of **solid non-hazardous waste** on-site, or placing **industrial residuals/sludge** into or onto the ground? (Permit Guidebook Chapter 4.4.2)	Y☐ N☑	Web, Appropriate DEQ District Office, WHMD 517-335-4035
Does the project involve the on-site treatment, storage, or disposal of **hazardous waste**? (Permit Guidebook Chapters 4.4.3,& 4.4.4)	Y☐ N☑	Web, WHMD, Hazardous Waste Section, 517-373-9875
Does the project require a **site identification number** (EPA number) for regulated waste activities (used oil, liquid waste, hazardous waste, universal waste, PCBs)? (Web Site)	Y☐ N☑	WHMD, Appropriate DEQ District Office
Does the project involve the receipt, possession, manufacture, use, storage, transport, transfer, release, or disposal of **radioactive material** in any form?	Y☐ N☑	Web, WHMD, Radioactive Material and Standards Unit, 517-241-1275
Do you desire to develop a **withdrawal** of over 2,000,000 gallons of **water** per day from any source other than the Great Lakes and their connecting waterways? Or, do you desire to develop a withdrawal of over 5,000,000 gallons of water per day from the Great Lakes or their connecting waterways? (Permit Guidebook Chapter 5.2.6)	Y☐ N☑	Web, WB, DWEHS, Source Water Protection Unit, 517-241-1318
CHEMICAL ADDITION PROJECTS		
Are you using **chemicals** or materials in, or in contact with, **drinking water** at any point in the **water works system**? (Permit Guidebook Chapter 5.2.3)	Y☐ N☑	Web, WB, Appropriate District Office, Public Water Supply Program 517-241-1318
Are you applying a chemical treatment for the purpose of **aquatic nuisance control** (pesticide/herbicide etc) in a water body (i.e. lake, pond or river)? (Permit Guidebook Chapter 5.2.4)	Y☐ N☑	Web, WB, Aquatic Nuisance Control and Remedial Action Unit 517-241-7734
Are you applying materials to a water body for a **water resource management project** (i.e. mosquito control treatments, dye testing, or fish reclamation projects)? (Permit Guidebook Chapter 5.2.5)	Y☐ N☑	Web, WB, Surface Water Assessment Section 517-373-2190
OPERATIONAL PERMITS (SECTOR SPECIFIC)		
Does the project involve the **transport** of some other facility's non-hazardous **liquid waste**? (Permit Guidebook Chapter 4.2.4)	Y☐ N☑	Web, WHMD, Transporter Program, 586-753-3850
Does the project involve the **transport hazardous waste**? (Permit Guidebook Chapter 4.2.3)	Y☐ N☑	Web, WHMD, Transporter Program, 586-753-3850
Does your facility have an **electric generating unit** that sells electricity to the grid and burns a fossil fuel? (Permit Guidebook Chapter 5.1.1)	Y☐ N☑	Web, AQD, Acid Rain Permit Program, 517-373-7023
Is the project a **dry cleaning establishment** utilizing perchloroethylene or a flammable solvent in the cleaning process? (Permit Guidebook Chapter 4.1.2)	Y☐ N☑	Web, DEQ, Air Quality Division (AQD), 517-241-1324
Does your **laboratory test potable water** as required for compliance and monitoring purposes of the Safe Drinking Water Act? (Permit Guidebook Chapter 4.1.4)	Y☐ N☑	Web, ESSD, Laboratory Services Section 517-335-9800

Does the project involve the generation of **medical waste** or a facility that treats medical waste prior to its disposal? (Permit Guidebook Chapter 4.1.5)	Y☐ N☑	Web, Waste and Hazardous Materials Division (WHMD), Medical Waste Regulatory Program 517-241-1320
Does the project involve transport of septic tank, cesspool, or dry well contents or the discharge of **septage** or sewage sludge into or onto the ground? (Permit Guidebook Chapter 4.2.1)	Y☐ N☑	Web, WB, DWEHS, Septage Program 517-241-1318
Do you store, haul, shred or process **scrap tires**? (Permit Guidebook Chapters 4.2.2 or 4.4.1)	Y☐ N☑	Web, WHMD, Storage Tank and Solid Waste Section 517-241-2924
Does the project involve the operation of a **public swimming pool**? (Permit Guidebook Chapter 4.1.3)	Y☐ N☑	Web DEQ, WB, Drinking Water & Environmental Health Section (DWEHS), 517-241-1340
Does the project involve the operation of a **campground**? (Permit Guidebook Chapter 4.1.6)	Y☐ N☑	Web, WB, DWEHS, 517-241-1340
Do you engage in the business of **hauling bulk water** for drinking or household purposes (except for your own household use)? (Permit Guidebook Chapter 4.2.5)	Y☐ N☑	Web, WB, DWEHS, Noncommunity Unit, 517-241-1370
Does the project involve composting over 200 cubic yards of yard clippings? (Permit Guidebook Chapter 4.4.5)	Y☐ N☑	Web, WHMD, Storage Tank and Solid Waste Section 517-241-2924
STORAGE TANKS (CONSTRUCTION AND OPERATION)		
Does the project involve the installation of an **aboveground storage tank** for a flammable or combustible liquid (under 200 degrees Fahrenheit)? (Permit Guidebook Chapter 4.3.1)	Y☐ N☑	Web, WHMD, Storage Tank and Solid Waste Section (STSWS), 517-335-7211
Does the project involve the installation of a **compressed natural gas dispensing station** with storage? (Permit Guidebook Chapter 4.3.2)	Y☐ N☑	Web, WHMD, STSWS, 517-335-7211
Does the project involve the installation of a **liquefied petroleum gas** container filling location or storage location that has a tank with a capacity of more than 2,000 gallons or has two (2) or more tanks with an aggregate capacity of more than 4,000 gallons? (Permit Guidebook Chapter 4.3.3)	Y☐ N☑	Web, WHMD, STSWS, 517-335-7211
Does the project involve the installation, removal, or upgrade of an **underground storage tank** containing a petroleum product or a hazardous substance? (Permit Guidebook Chapter 4.3.4)	Y☐ N☑	Web, WHMD, STSWS, 517-335-7211
Does the project involve the **installation** of a **hydrogen system**?	Y☐ N☑	WHMD STSWS, 517-335-7211
PERSONAL LICENSES/CERTIFICATIONS		
Are you designated by your facility to be the **Certified Operator** to fulfill the requirements of a wastewater discharge permit (**NPDES including Storm Water or Groundwater**)? (Permit Guidebook Chapters 3.1, 3.2,& 3.5)	Y☑ N☐	Hotlink to Program Web Page (Web) Web3.1, Web3.2, Environmental Science and Services Division (ESSD), Operator Training 517-373-4755 and, Web3.5 Water Bureau (WB), Storm Water Program 517-241-8993
Are you a **drinking water operator** in charge of a water treatment or water distribution system, back-up operator, or shift operator? (Permit Guidebook Chapter 3.3)	Y☐ N☑	Web, ESSD, Operator Training 517-241-7199
Are you a **water well** drilling contractor, pump installer, **dewatering well** contractor or dewatering well pump installer? (Permit Guidebook Chapter 3.4)	Y☐ N☑	Web, WB, Well Construction Unit 517-241-1377

OIL, GAS AND MINING		
Do you want to operate a **central production facility** (applies to oil and gas production facilities where products of diverse ownership are commingled)? (Permit Guidebook Chapter 4.1.1)	Y☐ N☑	Web, Office of Geological Survey (OGS), Petroleum Geology and Production Unit 517-241-1515
Does the project involve the removal of sand from a **sand dune area** within two (2) miles of a Great Lakes shoreline? (Permit Guidebook Chapter 5.6.1)	Y☐ N☑	Web, Office of Geological Survey (OGS), Minerals and Mapping Unit, 517-241-1542
Does the project involve the diversion and control of water for the mining and processing of **low-grade iron ore**? (Permit Guidebook Chapter 5.6.2)	Y☐ N☑	Web, OGS, Minerals and Mapping Unit, 517-241-1542
Does the project involve the surface or open-pit mining of **metallic mineral deposits**? (Permit Guidebook Chapter 5.6.3)	Y☐ N☑	Web, OGS, Minerals and Mapping Unit, 517-241-1542
Does the project involve the mining of **nonferrous mineral deposits** at the surface or in underground mines? (Permit Guidebook Chapter 5.6.4)	Y☐ N☑	Web, OGS, Minerals and Mapping Unit, 517-241-1542
Does the project involve mining **coal**? (Permit Guidebook Chapter 5.6.5)	Y☐ N☑	Web, OGS, Minerals and Mapping Unit, 517-241-1542
Do you want to change the status of an **oil or gas** well (i.e. plug the well)? (Permit Guidebook Chapter 5.7.1)	Y☐ N☑	Web, OGS, Permits and Bonding Unit, 517-241-1528
Does the project involve drilling of **oil, gas, brine disposal, secondary recovery, or hydrocarbon** storage wells? (Permit Guidebook Chapter 5.7.2)	Y☐ N☑	Web, OGS, Permits and Bonding Unit, 517-241-1528
Does the project involve plugging or deepening of an **oil or gas** well, or conveying rights in the well as an owner to another person? (Permit Guidebook Chapter 5.7.3, 5.7.4 & 5.7.5)	Y☐ N☑	Web, OGS, Permits and Bonding Unit, 517-241-1528
Does the project involve changing the status or plugging of a **mineral well**? (Permit Guidebook Chapter 5.7.6 & 5.7.7)	Y☐ N☑	Web, OGS, Minerals and Mapping Unit, 517-241-1532
Does the project involve the drilling or deepening of **wells for brine production, solution mining, storage, or as test wells**? (5.7.8)	Y☐ N☑	Web, OGS, Minerals and Mapping Unit, 517-241-1532
Does the project involve decommissioning or decontamination of tanks, piping, and/or appurtenances that may have **radioactive levels** above background?	Y☐ N☑	WHMD Radioactive Material and Standards Unit, 517-241-1275

ENVIRONMENTAL ASSISTANCE CENTER: 1-800-662-9278

GENOA TOWNSHIP IMPACT ASSESSMENT

Prepared for:

Owner / Applicant
Bible Baptist Church
2258 E. Highland Rd.
Howell, Michigan 48843

Prepared by:

Jennifer M. Austin, PLA

BOSS ENGINEERING

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

February 1, 2022

Revised: February 23, 2022
Revised: March 16, 2022

INTRODUCTION

The purpose of this Impact Assessment (IA) Report is to show the effect that the proposed church campus development has on various factors in the general vicinity of the use. 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:

Jennifer M. Austin, PLA
Professional Landscape Architect and Project Manager
Boss Engineering
3121 E Grand River
Howell, MI 48843

Prepared for:

Owner/Applicant:
Bible Baptist Church
2258 E. Highland Rd.
Howell, MI 48843

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

The project site is on parcel # 4711-05-200-002 in the NE ¼ of Section 5, Genoa Township, Livingston County, MI, and which the parcel at the southwest corner of Golf Club Road and Latson Road.

The subject site is bordered:

- To the north is the Genoa Township-Oceola Township line along Golf Club Road. The northern half of the subject property contains a 3+/- acre pond, a wetland and single family residence.
- To the east are RR and RPUD zoning on the opposite side of Latson Road.
- To the south is MUPUD zoning which contains the Rolling Ridge site condominium.
- To the west is RR zoning with single family residences.

Current zoning of the subject site is Low Density Residential (LDR),1 unit/acre. This new zoning designation was approved by the Genoa Township Planning Commission at the July 20, 2020 meeting. Sewer and Water are along entire the Easterly line (Latson Road) of the subject parcel and accessible at the Southerly property line at Sugarbush Drive.

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.

GENERAL OVERVIEW

AREA 1

The Northwesterly 10 acres of the site are the location of the existing residence. This area consists of two parts: The House, located on the top of a gently rolling hill, and the pond adjacent to the house along the southerly and westerly portions. The private entrance road to the proposed church campus will cross the easterly portion of this area.

AREA 2

The Northeasterly 10 acres of the site are relatively flat of which approximately 5 acres is a wetland. There are 2 man-made ditches within this wetland that flow northerly under Golf Club Road into a small wetland in Oceola Township. Stormwater management for this project will mostly be managed in this area by forebays to filter stormwater before discharge into the wetlands and/or pond.

AREA 3

The Southerly 26+ acres are gently sloped to moderately steep slopes. The entire area is heavily wooded with a mixture of evergreens and hardwoods. The northerly portion of Area 3 flows naturally north to the existing lake and/or the existing wetland. The southerly portion of Area 3 flows generally southeast into an existing drainage area along Latson Road.

The church campus and a portion of the driveway will be located in this area. Clearing of trees will be kept to a minimum by use of curb and gutter for the commercial drive.

WETLAND SETBACKS

The regulated wetlands on-site contain a 25-foot wetland setback per Township Ordinance. The proposed development includes grading within the 25-foot wetland setback at the east wetland, the open water pond as well as for the two upland wetland pockets. Also included within the wetland setbacks are a retaining wall and multiple storm water structures. The areas of disturbance within the setback on the east wetland and the open water pond will have no impact on the wetlands. Currently, the land is maintained up to the wetland limits in these areas with grass, in which the 25' is open. The disturbance will not disrupt crucial vegetation in this instance and the area will be reseeded with grass post construction, consistent with its pre-development condition. Given the location of the wetlands and their proximity to each other, as well as their proximity to other existing structures on site, in order for the commercial drive to run southerly to access the developable portion of the parcel, work within the setback will be required.

There are two upland pocket wetlands near the proposed church and parking lots. Disturbance is proposed to occur within the 25' wetland setback on both upland wetland pockets. Based on the topography and visual inspection, the eastern upland wetland has very minimal water ponding as water typically flows through this area to ultimately pond at the western upland wetland pocket. The wetland vegetation quality is low, and the minimal trees within the wetland limits are dead. The wetland is of low quality and grading within the setback of this wetland does not impact the overall stormwater management on the site. Water is continuing to be directed to the western of the two upland wetland pockets, prior to discharging northerly towards the existing pond on-site.

The retaining wall located within the wetland setback is proposed to limit disturbance and avoid disturbance within the wetland limits. The proposed drainage structures proposed within the wetland setbacks are utilized for the sites storm water management system. Water is being directed in a manner consistent with the current overall drainage patterns on the site.

SPECIFIC OVERVIEW
The soils and natural features throughout the site are specified on the Existing Conditions and Natural Features Sheets 2 and 3.

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

The preliminary site plan indicates stormwater management forebay and mechanical pretreatment units to be constructed during the infrastructure construction. These forebays and mechanical pretreatment units will pre-treat the stormwater prior to discharge to the pond and wetland at the north half of the site. The discharges and pond storage is permitted in MDEGLE permit WRP026826. The detailed construction plans will be reviewed by the Township Engineer and the Soil Erosion Control permit will be reviewed and issued by the Livingston County Drain Commissioner. Silt fence will be used to stop erosion from impacting the wetlands.

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.

Phase I of this project will include a commercial drive approach on Golf Club Road, proceeding southerly to the church campus at the southeast corner of the parcel. This development will have little, if any, impact on the northerly 15 acres of the site. The development will require maintaining a significant portion of the existing forested property along the west, east and south property lines. These natural buffers will minimize lighting and noise to existing developed, adjacent properties. The low-density residential development will have no air pollution impact.

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 Site Plan for this phased development is for a 506-seat church sanctuary and associated parking, a new commercial driveway, a soccer field, and stormwater forebay in Phase I. Phase II will allow for an expansion of the church with approximately 500 more seats and associated parking, a potential new access drive off Latson Road, and potentially five single-family low-density residential lots.

The church will require connecting to water and sewer along Latson Road. Police and fire protection services, and schools should not be impacted by this church project.

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.

As noted above, the church will need to connect to the public sanitary and MHOG water along Latson Road for Phase I. A watermain easement will be provided to the southern property line for potential future looping with the existing Rolling Ridge development.

The stormwater management plan utilizes enclosed pipe and open swales to transmit water to either a mechanical pretreatment unit (for the primary stormwater management treating the majority of the developed site) and a forebay for the remainder of the storm water runoff on the north end of the site. The forebay and mechanical pretreatment unit filter runoff prior to release into the existing pond and wetlands that are on site.

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

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

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

A traffic study has been prepared for this site. The summary of the study is that all intersections currently operate at an LOS D or better during all peak hours and minor increases in delay will not be discernible. The required improvements to the Road network and proposed site approach are the following:

1) A center left turn lane and a right turn lane on Golf Club Road will be required.
2) If the church expands in Phase II, then a right turn lane would be needed on the proposed drive approach at Golf Club Road.
3) If a Laston Road approach is not installed, then special timing plans for the intersection of Latson Road and Golf Club Road associated with the Sunday service times should be coordinated with the LCRC. Should a Latson Road entrance be constructed, the signalization timing change is not warranted.

The Traffic Impact Study utilized the ITE Trip Generation Manual, 11th Edition, Church Land Use. The site trip generation for the 506-seat church is shown in the tables below and was extracted from the Traffic Impact Study.

Table 6: Phase I ITE Site Trip Generation

Land Use	ITE Code	Amount	Units	Average Daily Traffic	AM Peak Hour			PM Peak Hour			SUN Peak Hour		
					In	Out	Total	In	Out	Total	In	Out	Total
Church	560	506	Seats	454	21	14	35	23	28	51	121	125	246

Table 7: Phase I Sunday Site Trip Generation

Land Use	ITE Code	Amount	Units	SUN INBOUND Peak			SUN OUTBOUND PEAK		
				In	Out	Total	In	Out	Total
Church	560	506	Seats	121	25	146	24	125	149

The traffic study is to be submitted to the LCRC for review and approval in conjunction with the proposed project. The Livingston County Road Commission will be required to review and approve the commercial driveway approach at Golf Club Road as it relates to their standards and findings within the traffic study. At this time, the project plans include:

1) extending the Golf Club Road center left turn lane through the proposed approach on Golf Club Road,

2) providing a right turn(deceleration) lane and taper on the Golf Club Road approach,
3) providing a right turn lane on the approach as would be required in the Phase II traffic recommendations.

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

There is a document addressing shared maintenance and access to the existing pond on the subject property between Bible Baptist Church and the adjacent owner to the northwest to allow maintenance activities on the pond operations.

K. Description of all sources:

- Genoa Township Zoning Ordinance
- "Soil Survey of Livingston County Michigan" Soil Conservation Services, USDA
- Bible Baptist Church Traffic Impact Study – prepared by Bergmann

SITE PLAN
FOR
BIBLE BAPTIST CHURCH
PART OF NE QUARTER, SECTION 5
GENOA TOWNSHIP, LIVINGSTON COUNTY, MI

PROPERTY DESCRIPTION:

PARCEL: 4711-05-200-002

Part of the Northeast 1/4 of the Northeast Fractional 1/4 of Section 5, T2N-R5E, Genoa Township, Livingston County, Michigan, more particularly described as follows: BEGINNING at the Northeast corner of Section 5; thence along the centerline of Latson Road (33 foot wide 1/2 Right of Way) and the East line of Section 5, S 01°15'41" E, 1627.92 feet; thence along the North line of "ROLLING RIDGE I", Livingston County Condominium Subdivision Plan No. 134, as recorded in Livingston County Records and the South line of the Northeast 1/4 of the Northeast fractional 1/4 of Section 5, as previously surveyed and monumented, S 87°47'59" W, 1284.34 feet; thence along the common property line per Agreement recorded in Liber 1098, Page 22, Livingston County Records, N 02°36'49" W, 1107.42 feet; thence N 88°30'30" E (recorded as East), 200.00 feet; thence N 02°36'49" W (recorded as North), 536.70 feet; thence along the centerline of Golf Club Road (66 foot wide Right of Way) and the North line of Section 5, as previously surveyed and monumented, N 88°30'31" E, 1122.98 feet, to the POINT OF BEGINNING, containing 46.50 acres, more or less, and subject to the rights of the public over the existing Latson Road and Golf Club Road. Also subject to any other easements or restrictions of record.

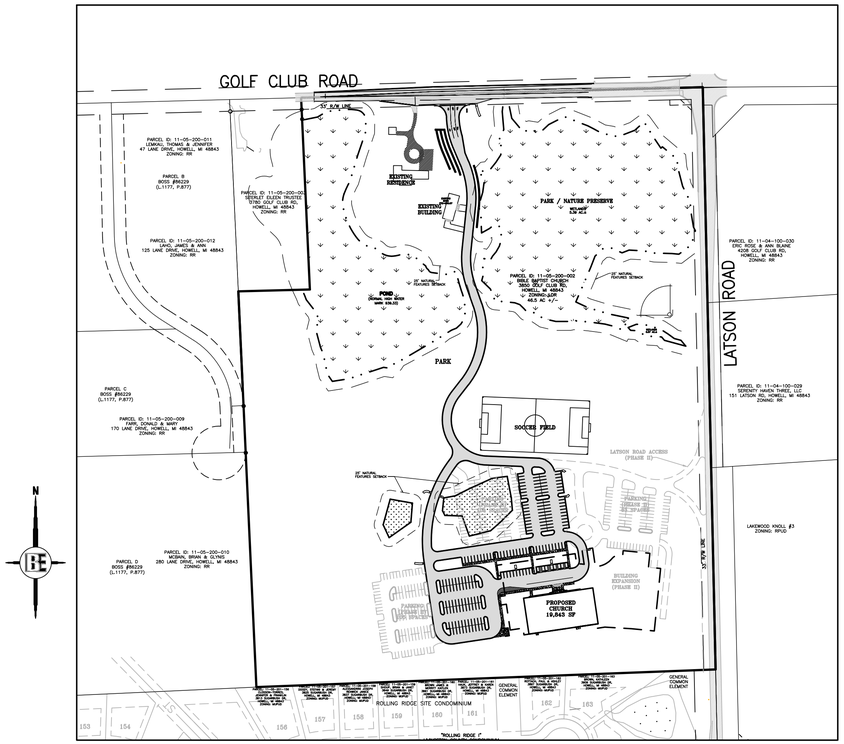
CONSTRUCTION NOTES

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.
34. ACCESS ROADS TO THE SITE SHALL BE MAINTAINED DURING CONSTRUCTION AND SHALL BE CONSTRUCTED TO BE CAPABLE OF SUPPORTING THE IMPOSED LOAD OF FIRE APPARATUS WEIGHING AT LEAST 75,000 POUNDS.

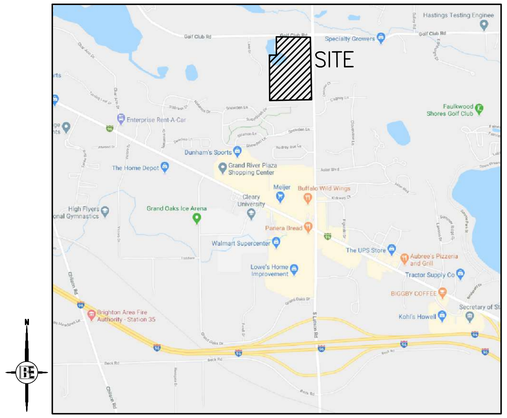
INDEMNIFICATION STATEMENT

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



LOCATION MAP

NO SCALE

SHEET INDEX

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	EXISTING CONDITIONS & DEMOLITION PLAN
3	NATURAL FEATURES PLAN
4	OVERALL SITE PLAN
5	CHURCH SITE PLAN
6	UTILITY PLAN
7	GRADING PLAN
8	DRAINAGE PLAN
9	SESC PLAN
10	LANDSCAPE PLAN
11	GOLF CLUB ROAD APPROACH
12	FOREBAY DETAILS
13	WETLAND SETBACK DISTURBANCE
14	CONSTRUCTION DETAILS
15	MHOG STANDARD WATERMAIN DETAILS
16	MHOG STANDARD WATERMAIN DETAILS
	LIGHTING PLANS – GASSER BUSH
1	PHOTOMETRIC PLAN
2	PHOTOMETRIC PLAN
	ARCHITECTURAL PLANS – JEFFREY PARKER ARCHITECTS
A1.0	FLOOR PLAN
A3.0	EXTERIOR ELEVATIONS

APPLICANT/OWNER:

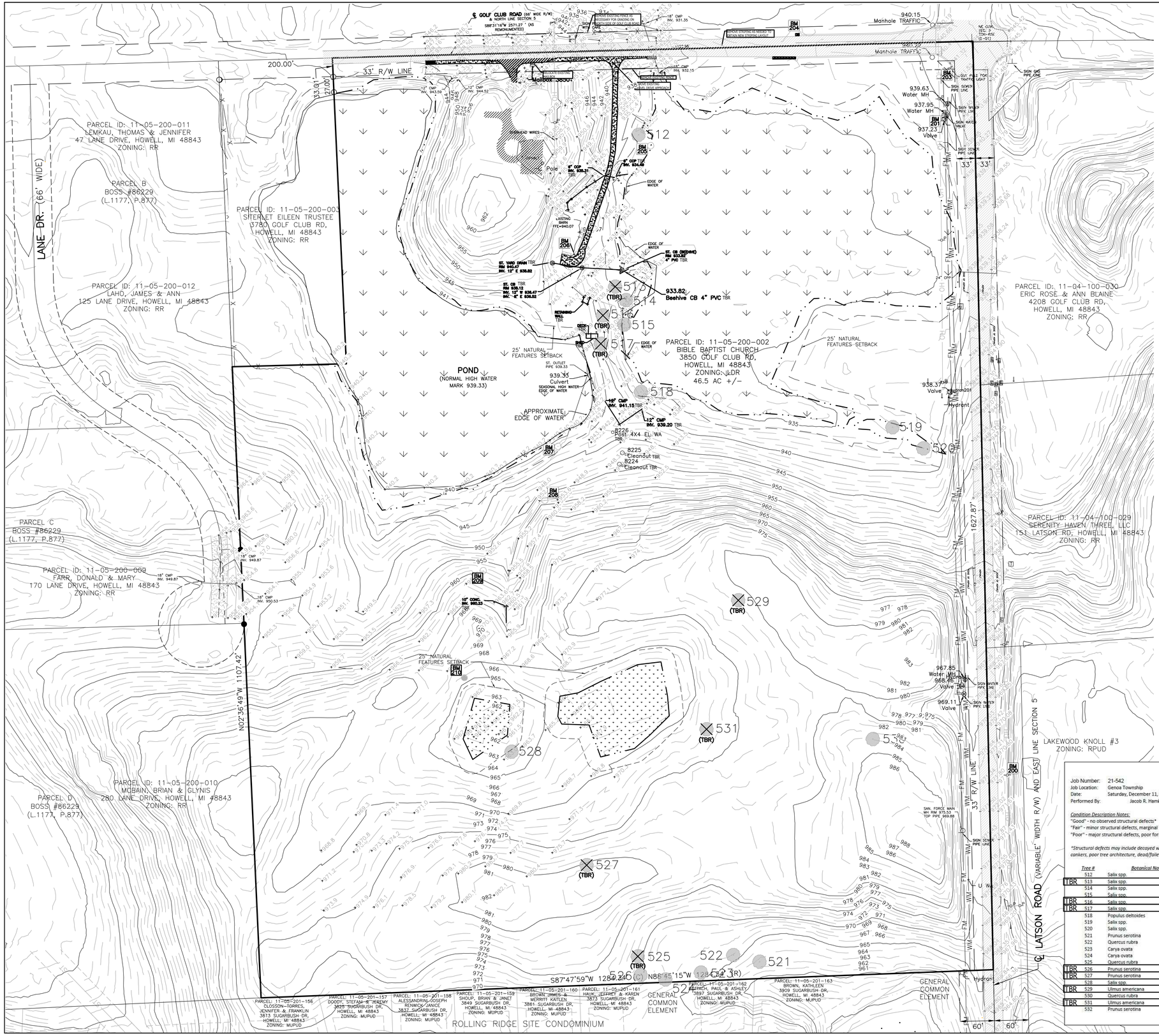
BIBLE BAPTIST CHURCH
2258 EAST HIGHLAND ROAD
HOWELL, MI 48843
CONTACT: MR. TIM CHRISTOSON
PHONE: 517-715-9233

PREPARED BY:

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

FOR SITE PLAN APPROVAL ONLY!
NOT TO BE USED AS CONSTRUCTION DRAWINGS

NO	BY	CK	REVISION	DATE	
					1
2	ST		PER TOWNSHIP REVIEW	3/16/22	
1	ST		PER TOWNSHIP REVIEW	2/23/22	ISSUE DATE: 2/1/2022
					JOB NO. 21-542



N

BE

80 0 40 80

SCALE: 1 INCH = 80 FEET

LEGEND

- 900 EXISTING CONTOUR
- 922.00 EXISTING SPOT ELEVATION
- POWER POLE
- GUY WIRE
- LIGHT POLE
- HYDRANT
- ⊗ WATER GATE VALVE
- Ⓦ WATER MANHOLE
- ○ MANHOLE
- ⊟ STORM CATCH BASIN (SQUARE)
- STORM INVERT
- TELEPHONE RISER
- CABLE TV RISER
- U.G. CABLE TV MARKER
- MAILBOX
- SIGN
- DECIDUOUS TREE
- ● CONIFEROUS TREE
- ● STEEL ROD OR PIPE FOUND
- □ WOOD LATH SET
- SECTION CORNER
- TBR TO BE REMOVED

GENERAL SURVEY NOTES:

1. WETLANDS FLAGGED AND TIED OUT BY BOSS ENGINEERING SPRING 2019.
2. BEARINGS ARE BASED ON MICHIGAN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE.
3. 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.
4. EASEMENTS OR RESTRICTIONS OF RECORD NOT DEPICTED ON THIS DRAWING MAY EXIST.
5. ELEVATIONS WERE ESTABLISHED FROM GPS OBSERVATION, AND USING OPUS POST–PROCESS SYSTEM. (NAVD88 DATUM)
6. CONTOURS ARE SHOWN AT 1 FOOT INTERVALS.
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.
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.

SITE BENCHMARKS (NAVD88 DATUM):

–BM #200 = NAIL/TAG W/S P.POLE E/S LASTON RD. 785'± NORTH OF CONOVER CT.. ELEV.=971.41

–BM #201 = ARROW ON HYD W/S OF LASTON RD. 135'± SOUTH OF GOLF CLUB RD.. ELEV.=939.50

–BM #203 = FD. R.R. E/S OF GUY POLE W/S OF LASTON RD. 44'± SOUTH OF GOLF CLUB RD.. ELEV.=942.12

–BM #205 = PK NAIL/TAG W/S 40" WILLOW TREE 170'± SOUTH OF GOLF CLUB RD. & 160'± NORTH OF BARN. ELEV.=935.10

–BM #206 = LANDSCAPE SPIKE SET S/E CORNER OF POLE BARN. ELEV.=940.32

–BM #207 = PK NAIL/TAG S/S 12" MAPLE TREE S/S OF POND. ELEV.=945.31

–BM #208 = PK NAIL/TAG SET 10" PINE TREE 50'± EAST OF TWO TRACK RUNNING N&S & 150'± SOUTH OF POND, N/S OF TWO TRACK RUNNING E&W. ELEV.=954.73

–BM #209 = PK NAIL/TAG S/S 12" ELM TREE 142'± SOUTH OF POND. ELEV.=959.69

–BM #210 = PK NAIL/TAG E/S 8" PINE TREE 330'± SOUTH OF POND. ELEV.=966.83

TOPOGRAPHIC SURVEY NOTE:

TOPOGRAPHIC SURVEY OF GOLF CLUB ROAD AND LATSON ROAD PREPARED BY BOSS ENGINEERING.
TOPOGRAPHY FOR THE SUBJECT SITE IS GENERATED FROM THE LIVINGSTON COUNTY GIS TOPO.

Inventory of Significant Trees within Project Area

Job Number: 21-542 Bible Baptist Church
Job Location: Genoa Township
Date: Saturday, December 11, 2021
Performed By: Jacob R. Hamilton Forestry Registration No. 46119

Condition Description Notes:
"Good" - no observed structural defects*
"Fair" - minor structural defects, marginal form, some insect activity noted*
"Poor" - major structural defects, poor form, insect infested*

**Structural defects may include decayed wood, cracks, root problems, weak branch unions cankers, poor tree architecture, dead/failed branches due to various causes.*

	Tree #	Botanical Name	Common Name	Dia.	Type	Other Dia.	Condition	Comments
	512	Salix spp.	Willow Sp.	53			Good	
TBR	513	Salix spp.	Willow Sp.	37			Poor	Major lean, cankers, epicormic branching
	514	Salix spp.	Willow Sp.	41			Fair	Leaning
	515	Salix spp.	Willow Sp.	36	Twin	20	Good	Leaning
TBR	516	Salix spp.	Willow Sp.	36			Good	
TBR	517	Salix spp.	Willow Sp.	37			Fair	Lost large twin, canker
	518	Populus deltoides	Eastern Cottonwood	24			Good	
	519	Salix spp.	Willow Sp.	28			Good	
	520	Salix spp.	Willow Sp.	25			Good	
	521	Prunus serotina	Black Cherry	35			Good	
	522	Quercus rubra	Red Oak	26			Good	
	523	Carya ovata	Shagbark Hickory	25			Good	
	524	Carya ovata	Shagbark Hickory	32			Good	
	525	Quercus rubra	Red Oak	24			Good	
TBR	526	Prunus serotina	Black Cherry	34			Poor	Major canker, dieback
TBR	527	Prunus serotina	Black Cherry	26			Good	
	528	Salix spp.	Willow Sp.	28			Good	
TBR	529	Ulmus americana	American Elm	24			Good	
	530	Quercus rubra	Red Oak	26			Good	
TBR	531	Ulmus americana	American Elm	27			Good	
	532	Prunus serotina	Black Cherry	31			Poor	Major dieback, canker rot, lost limbs

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

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

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

PROJECT
BIBLE BAPTIST CHURCH

PREPARED FOR
BIBLE BAPTIST CHURCH
2258 EAST HIGHLAND ROAD
HOWELL, MI 48843
517–715–9233

TITLE
EXISTING CONDITIONS & DEMOLITION PLAN

NO	BY	REVISION PER	DATE
1	ST	PER TWP REVIEW	2/23/22
2	ST	PER TWP REVIEW	3/16/22

DESIGNED BY: ST
DRAWN BY: JS
CHECKED BY:
SCALE 1" = 80'
JOB NO. 21–542
DATE 2/1/2022
SHEET NO.
2

BOSS BE Engineering

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NATURAL FEATURES NARRATIVE:

SEVERAL NATURAL FEATURES WERE IDENTIFIED DURING AN ON-SITE VISIT TO THE PROPERTY ON AUGUST 23, 2019 THAT INCLUDE WETLANDS AND A VARIETY OF WOODLAND STANDS. BELOW IS A BRIEF DESCRIPTION OF EACH NATURAL FEATURE, LABELED AS ZONES “A-V”. ALTHOUGH THE TOTAL SITE IS MEASURED AT 46.88 ACRES, THE ZONES DESCRIBED BELOW ARE APPROXIMATELY 41.11 ACRES WHEN ADDED TOGETHER. NOTE THAT EACH ZONE IS MEASURED TO AN APPROXIMATE SIZE AND THAT ZONES ARE SEPARATED BY A PATH THAT IS ROUGHLY 12' WIDE AND IS NOT ACCOUNTED FOR IN THE CALCULATIONS.

ZONE “A”

AN ESTIMATED 4.62 ACRE “FRESHWATER POND”, AS DESCRIBED BY THE NATIONAL WETLANDS INVENTORY, IS POSITIONED ON SITE AND CONTINUES ONTO THE NEIGHBORING LOT TO THE WEST. THE ON-SITE ACREAGE IS ESTIMATED TO BE 3.88 ACRES. THE POND EDGE IS MOWN LAWN AND HAS A SOUTHERN BORDER OF NORWAY MAPLE TREES, AND A WESTERN BORDER OF BLACK CHERRY, AMERICAN ELM, VARIOUS OAKS AND SPRUCE TREES, SIZES RANGING FROM 4-18” AT DBH WITH TREES BEING SPACED AN AVERAGE OF 12' APART. THE POND COLLECTS STORMWATER FROM ROUGHLY 9 ACRES OF LAND FROM THE WEST AND SOUTH, WITH SLOPES RANGING FROM 10-20%.

ZONE “B”

AT APPROXIMATELY 0.9 ACRES IN SIZE, THIS ZONE IS COMPOSED OF WAWASEE LOAM SOILS WITH SLOPES BETWEEN 6-12%. TREE SPECIES INCLUDE AN EQUAL MIX OF BLACK WALNUT, BLACK CHERRY, AMERICAN ELM, COTTONWOOD, AND BITTERNUT HICKORY SIZES RANGING FROM 6”-30” AND AVERAGING ABOUT 10” DBH. THE UNDERSTORY IS MOSTLY NON-EXISTENT BUT CONTAINS A SCATTERING OF HONEYSUCKLE AND VARIOUS PATCHES OF HERBACEOUS MATERIAL. AN ADDITIONAL AND APPROXIMATE 2.17 ACRES OF MANAGED PRIVATE PROPERTY IS FOUND TO THE WEST AND SOUTH OF THIS ZONE AND CONTAINS WAWASEE LOAM SOIL THAT SLOPES AT 6-12% TOWARDS THE POND IN ZONE "A." A PORTION OF VEGETATION IN THIS AREA WILL BE REMOVED FOR THE DRIVEWAY AND/OR RETAINING WALLS.

ZONE “C”

ZONE "C" IS A SMALL WOODLAND POCKET APPROXIMATELY 0.17 ACRES IS SIZE IS COMPOSED OF BLACK LOCUST, VARIOUS LARGE WILLOWS, AND BOXELDERS. TREES RANGE FROM 4-22” AT DBH. THIS POCKET IS IN A FLAT AREA THAT BORDERS FRESHATER EMERGENT WETLANDS TO THE EAST, AND CONTAINS CARLISLE MUCK SOILS, WHICH ARE HYDRIC IN NATURE.

ZONE “D”

ZONE "D" IS SET WITHIN A MANAGED SPACE NEXT TO AN OUTBUILDING, IS APPROXIMATELY 0.13 ACRES IN SIZE, AND HAS MOWN LAWN AS AN UNDERSTORY. SOILS ARE COMPOSED OF WAWASEE LOAMS AND THERE IS A STAND OF MATURE NORWAY SPRUCE TREES THAT ARE ROUGHLY 12” AT DBH AND SPACED OUT ABOUT 10-15' APART. A PORTION OF VEGETATION IN THIS AREA WILL BE REMOVED FOR THE DRIVEWAY AND/OR RETAINING WALLS.

ZONE “E”

A FRESHWATER EMERGENT WETLAND THAT IS APPROXIMATELY 5.45 ACRES IN SIZE WAS IDENTIFIED IN ZONE "E". THE AREA IS COMPOSED OF CARLISLE MUCK SOILS AND IS DOMINATED BY REED CANARY GRASS, PHRAGMITES, BROADLEAF CATTAIL, AND A VARIETY OF FORBES AND RUSHES. THIS WETLAND COLLECTS A LARGE AMOUNT OF STORMWATER RUNOFF FROM THE CONIFER STAND TO THE SOUTH, AND FROM THE ADJACENT ROAD SYSTEMS. MANICURED LAWN BORDERS THE NORTHERN AND EASTERN EDGES OF THIS ZONE AND MAKE UP APPROXIMATELY 1.22 ACRES.

ZONE “F”

ZONE "F" IS ANOTHER MANAGED AREA WITH MANICURED LAWN THAT IS APPROXIMATELY 0.43 ACRES IN SIZE AND HAS A SERIES OF NORWAY SPRUCE TREES PLANTED IN A DOUBLE ROW. THE TREES ARE ROUGHLY 12” AT DBH AND SPACED ROUGHLY 15' APART. SOILS ARE WAWASEE LOAMS AND SLOPING EAST TOWARDS THE WETLAND IN ZONE “E”. AT THE EASTERN EDGE OF THIS ZONE, THERE ARE SEVERAL LARGE WILLOW TREES AND BLACK WALNUTS, SOME OF WHICH MAY QUALIFY AS LANDMARK TREES. A PORTION OF VEGETATION IN THIS AREA WILL BE REMOVED FOR THE DRIVEWAY AND/OR RETAINING WALLS.

ZONE “G”

ZONE "G" IS A FILL AREA OF APPROXIMATELY 1.16 ACRES THAT WAS FORMERLY USED AS A SPORTS FIELD. IT HAS SINCE BECOME OVERGROWN WITH A VARIETY OF MEADOW FORBES AND GRASSES.

ZONE “H”

ZONE “H” IS AN APPROXIMATELY 0.07 ACRE FRESHWATER EMERGENT/FORESTED WETLAND. THERE ARE POCKETS OF LARGE COTTONWOOD TREES AND WILLOWS WITH SOME SEDGES AND WETLAND FORBES WITHIN THE DELINEATED AREA. THIS ZONE COLLECTS STORMWATER RUNOFF FROM THE SOUTHERN HILLSIDE OF THE PROPERTY AND SLOWLY DRAINS WATER TO THE WEST INTO THE LARGER WETLAND IN ZONE “E”.

ZONE “I”

ZONE “I” IS A LARGE AREA, APPROXIMATELY 7.63 ACRES IN SIZE, AND COMPOSED ALMOST ENTIRELY OF NORWAY SPRUCE TREES RANGING FROM 5-18” AT DBH, SPACED 10-15' APART, AND MAKE UP ROUGHLY 90% OF THE TREE POPULATION. THE REMAINING 10% OF TREE COVER IS COMPOSED OF BLACK CHERRY, BLACK LOCUST, RED OAK, AND AMERICAN ELM, ALL OF WHICH ARE BETWEEN 6-18” AT DBH. THE UNDERSTORY IS ALMOST NON-EXISTENT. THE EASTERN 75% OF THIS ZONE IS COMPOSED OF MIAMI LOAM SOILS WITH SLOPES RANGING FROM 25-35%, AND THE WESTERN 25% IS A FOX-BOYER COMPLEX WITH SLOPES RANGING FROM 12-18%. A PORTION OF VEGETATION IN THIS AREA WILL BE REMOVED FOR THE DRIVEWAY AND/OR SOCCER FIELD.

ZONE “J”

ZONE “J” IS APPROXIMATELY 2.38 ACRES IN SIZE AND IS A SLIGHT TRANSITION FROM THE ZONE “I” CONIFEROUS COMMUNITY TO A MORE DECIDUOUS FOREST STAND. THE DOMINANT SPECIES HERE ARE RED AND WHITE OAK, SHAGBARK AND BITTERNUT HICKORY, BLACK CHERRY, AND AMERICAN ELM. THERE ARE SEVERAL LARGE NORWAY SPRUCE TREES, BUT THEY ARE NO LONGER THE DOMINANT SPECIES. ALL OF THESE TREES ARE MATURE AND ARE 6-18” AT DBH AND SPACED ROUGHLY 10' APART. AN UNDERSTORY OF GREEN ASH, HICKORY, AND HONEYSUCKLE IS PRESENT, THOUGH NOT OVERBEARING. SOILS ARE A FOX-BOYER COMPLEX WITH 18-25% SLOPES THAT DRAIN TO THE LARGE POND IN ZONE “A”.

ZONE “K”

ZONE "K" IS APPROXIMATELY 2.85 ACRES IN SIZE AND BORDERS MUCH OF THE SOUTHERN AND WESTERN BOUNDARIES OF THE SITE. THIS FOREST STAND IS ALMOST ENTIRELY DECIDUOUS AND CONTAINS MATURE RED OAKS, BLACK CHERRY, AMERICAN ELM, HICKORY, AND VARIOUS MAPLE TREES RANGING FROM 5-18” AT DBH, THOUGH THERE ARE SEVERAL LANDMARK TREES IN THIS ZONE THAT MUST BE NOTED. THE TREES ARE SPACED ROUGHLY 15' APART. THE SOILS ARE MIAMI LOAMS WITH 18-25% SLOPES THAT SHED WATER TOWARDS THE SOUTHERN BOUNDARIES OF THE SITE.

ZONES “L”, “M”, “N”

THESE THREE ZONES MAKE UP A LARGER OPEN SPACE, APPROXIMATELY 1.68 ACRES IN SIZE AND IS ALMOST ENTIRELY FREE OF TREE SPECIES. INSTEAD, THE AREA IS POPULATED WITH A DOMINANCE OF GREY DOGWOOD SHRUBS, VARIOUS MEADOW FORBES, GRASSES, AND VINES. THERE ARE A FEW LARGE BUT DEAD ELM TREES AT THE EASTERN EDGE OF ZONE “N”, AND SEVERAL NORWAY MAPLE TREES AT THE NORTHERN PORTION OF ZONE “N”. THE LAND IS MUCH FLATTER IN THIS AREA WHERE SOILS ARE A FOX-BOYER COMPLEX WITH SLOPES AT 2-6% THAT GENTLY DRAIN TO THE WEST. A PORTION OF VEGETATION IN THIS AREA WILL BE REMOVED FOR THE DRIVEWAY AND/OR PARKING.

ZONES “O” AND “P”

THESE ZONES MAKE UP APPROXIMATELY 1.31 ACRES OF THE SITE AND ARE LARGE STANDS OF DECIDUOUS TREES THAT INCLUDE SHAGBARK AND BITTERNUT HICKORY, AMERICAN ELM, BLACK CHERRY, AND BLACK LOCUST. THE TREES ARE SPACED ROUGHLY 15' APART AND RANGE FROM 4-12” AT DBH, THOUGH THERE ARE SEVERAL LANDMARK TREES IN THIS AREA THAT MUST BE NOTED. THESE ZONES ARE AT ONE OF THE HIGHEST POINTS OF THE SITE WITH WAWASEE LOAMS SLOPING 2-6% TO THE WEST. A PORTION OF VEGETATION IN THIS AREA WILL BE REMOVED FOR PARKING.

ZONE “Q”

THIS ZONE IS APPROXIMATELY 1.57 ACRES IN SIZE AND HAS A DOMINANCE OF BLACK LOCUST TREES THAT MAKE UP 70% OF THE FOREST STAND. THE REMAINING TREE SPECIES ARE AMERICAN ELM, BLACK CHERRY, AND HICKORY. ALL TREES ARE MATURE RANGING FROM 5-18” AT DBH AND SPACED 15' APART ON AVERAGE. THE EASTERN EDGE OF THIS ZONE IS SLOPING STEEPLY AT 25-35% TO THE EAST TOWARDS LATSON ROAD AND TO THE NORTH TOWARDS ZONE “H”. THE WESTERN AND SOUTHERN PORTIONS OF ZONE “Q” ARE RELATIVELY FLAT. THE SOILS ARE A MIX OF WAWASEE LOAMS AND MIAMI LOAMS.

ZONE “R”

SIMILAR TO ZONE “Q”, ZONE “R”, WHICH IS APPROXIMATELY 2.60 ACRES IN SIZE, IS DOMINATED BY BLACK LOCUST TREES WHICH MAKE UP 70% OF THE FOREST STAND, WHILE THE REMAINING 30% COVER IS COMPOSED OF AMERICAN ELM, BLACK LOCUST, AND BLACK CHERRY TREES. ALL TREES RANGE FROM 4-18” AT DBH AND AVERAGE ABOUT 10” AT DBH SPACED ROUGHLY 15' APART. THE UNDERSTORY IS MADE UP OF SEVERAL DECIDUOUS SAPLINGS AND SOME HONEYSUCKLE, BUT OTHERWISE OPEN. STEEP SLOPES OF 25-35% RUN EAST TOWARDS LATSON ROAD, WHILE THE SOUTHERN EDGE OF THIS ZONE SLOPES MORE GENTLY TO THE SOUTH AT ROUGHLY 10%. THE SOILS ARE A MIX OF MIAMI LOAM AND WAWASEE LOAM. A PORTION OF VEGETATION IN THIS AREA WILL BE REMOVED FOR PARKING.

ZONE “S”

SIZED AT APPROXIMATELY 1.73 ACRES, ZONE “S” IS A LARGE CONIFER STAND COMPOSED MOSTLY OF NORWAY SPRUCE TREES. THE SOUTHERN PORTION OF THIS ZONE IS PLANTED WITH ROWS OF WHITE FIR TREES. ALL TREES IN THIS AREA ARE BETWEEN 4-18” AT DBH AND PLANTED BETWEEN 6-12' APART ON AVERAGE. THE LANDSCAPE SLOPES GENTLY TO THE WEST AT ROUGHLY 2-6%. THE SOILS ARE MOSTLY WAWASEE LOAMS, THOUGH THE SOUTHERN PORTION IS A FOX-BOYER COMPLEX SOIL. A PORTION OF VEGETATION IN THIS AREA WILL BE REMOVED FOR CHURCH BUILDING.

ZONE “T”

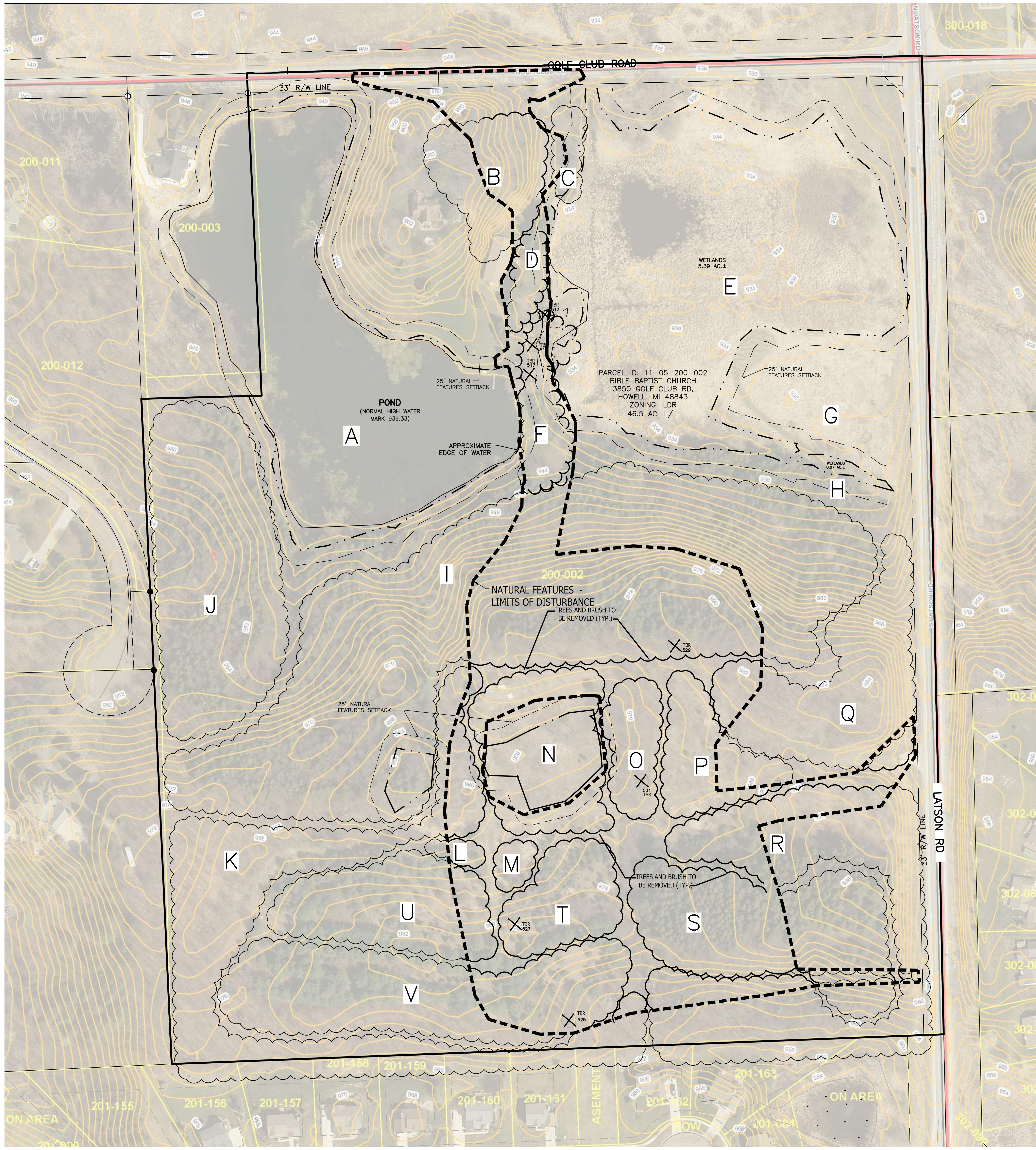
ZONE “T” IS A SMALLER AND MORE OPEN AREA THAT IS APPROXIMATELY 0.64 ACRES IN SIZE. IT IS POPULATED WITH YOUNGER FRASIER FIR AND SCOTCH PINE TREES THAT ARE NOT MUCH LARGER THAN 8” AT DBH. GRASSES AND FORBES OCCUPY THE SPACES IN BETWEEN. THIS ZONE HAS A MIX OF FOX-BOYER COMPLEX SOILS, AND WAWASEE LOAMS THAT SLOPE TO THE NORTHEAST AT ROUGHLY 2-6%. A PORTION OF VEGETATION IN THIS AREA WILL BE REMOVED FOR PARKING AND THE CHURCH BUILDING.

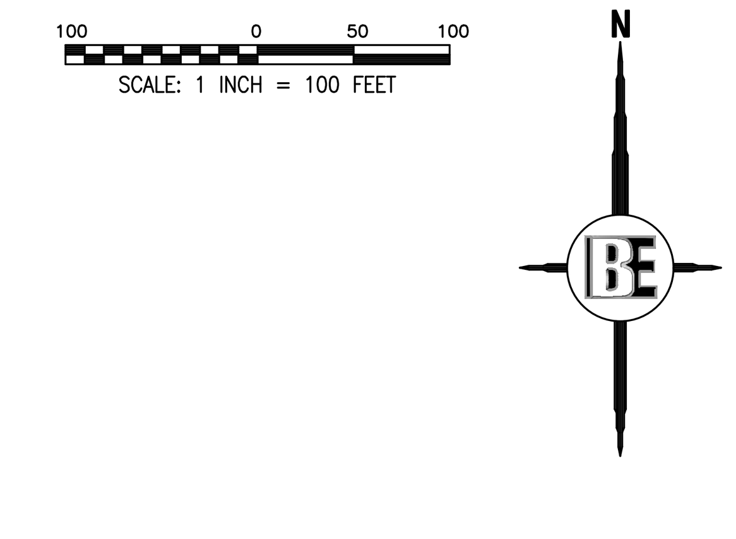
ZONE “U”

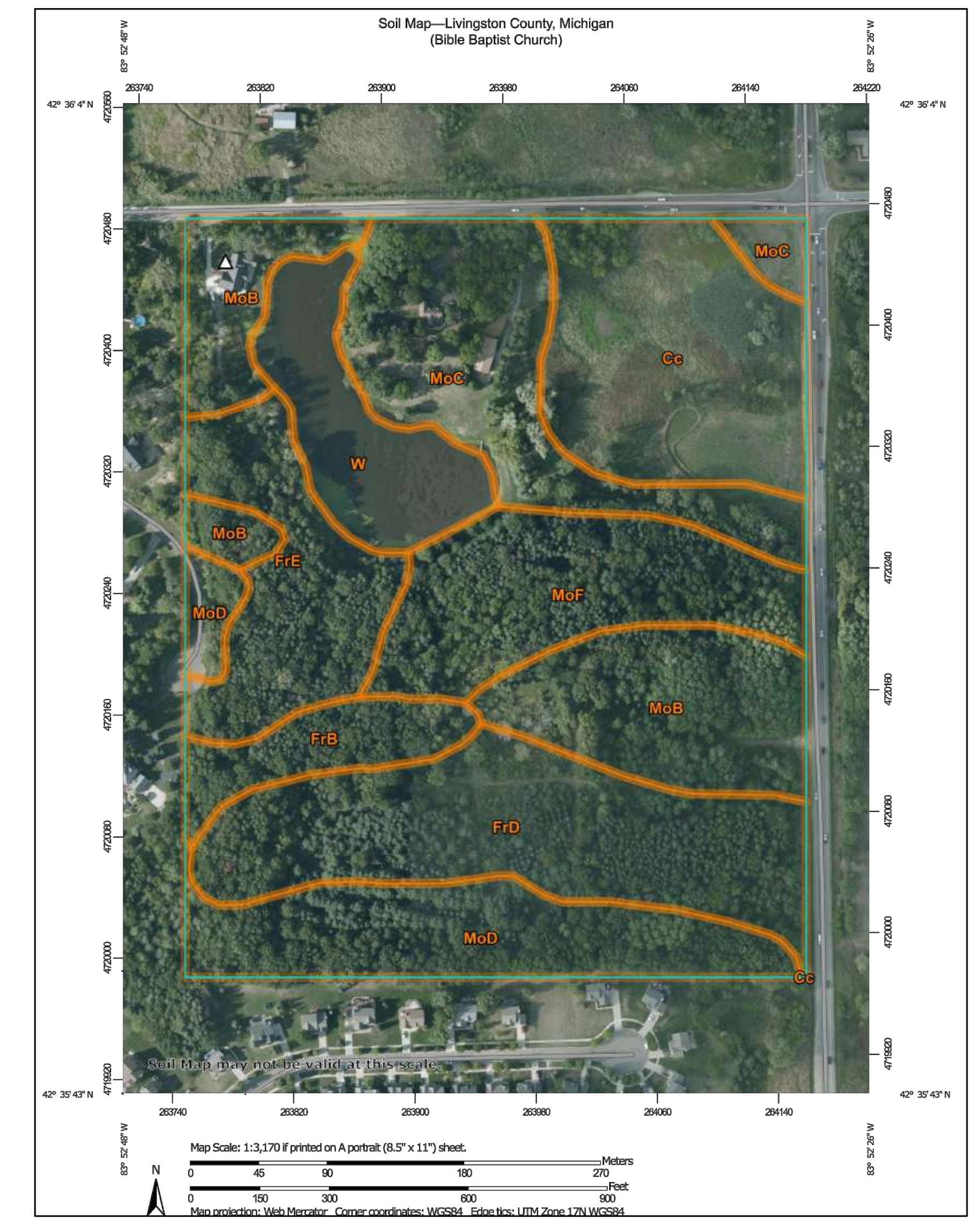
ZONE “U” IS APPROXIMATELY 1.10 ACRES IN SIZE AND POPULATED WITH SCOTCH PINE TREES AND SEVERAL NORWAY SPRUCE TREES THAT RANGE BETWEEN 6-12” AT DBH AND ARE SPACED ABOUT 15' APART. SOILS ARE MIAMI LOAMS AND FOX-BOYER COMPLEX SOILS THAT SLOPE TO THE NORTH AT ABOUT 12%. THE UNDERSTORY IS MINIMAL, THOUGH SOME SMALLER DECIDUOUS SPECIES ARE SPROUTING. A PORTION OF VEGETATION IN THIS AREA WILL BE REMOVED FOR PARKING.

ZONE “V”

ZONE "V" IS APPROXIMATELY 2.04 ACRES IN SIZE AND POPULATED WITH WHITE PINE TREES THAT ARE PLANTED IN ROWS ON THE SOUTHERN EDGE, WITH A MIX OF SCOTCH PINE AND WHITE PINE ON THE NORTHERN PORTION. THESE TREES ARE BETWEEN 6-18” AT DBH AND SPACED 15' APART WITH NO UNDERSTORY OBSERVED. THE TREES ARE PLANTED ON A RIDGE WITH MIAMI LOAM SOILS TO THE SOUTH, AND FOX-BOYER COMPLEX SOILS TO THE NORTH WITH SLOPES RANGING FROM 2-6%. A PORTION OF VEGETATION IN THIS AREA WILL BE REMOVED FOR PARKING.







SOIL CLASSIFICATION

ACCORDING TO USDA NRCS WEB SOIL SURVEY DATA:

Map Unit Symbol	Map Unit Name
Cc	Carlisle muck, 0 to 2 percent slopes
FrB	Fox-Boyer complex, 2 to 6 percent slopes
FrD	Fox-Boyer complex, 12 to 18 percent slopes
FrE	Fox-Boyer complex, 18 to 25 percent slopes
MoB	Wawasee loam, 2 to 6 percent slopes
MoC	Wawasee loam, 6 to 12 percent slopes
MoD	Miami loam, 12 to 18 percent slopes
MoF	Miami loam, 25 to 35 percent slopes
W	Water
Totals for Area of Interest	

SURROUNDING AREAS MAP

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

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

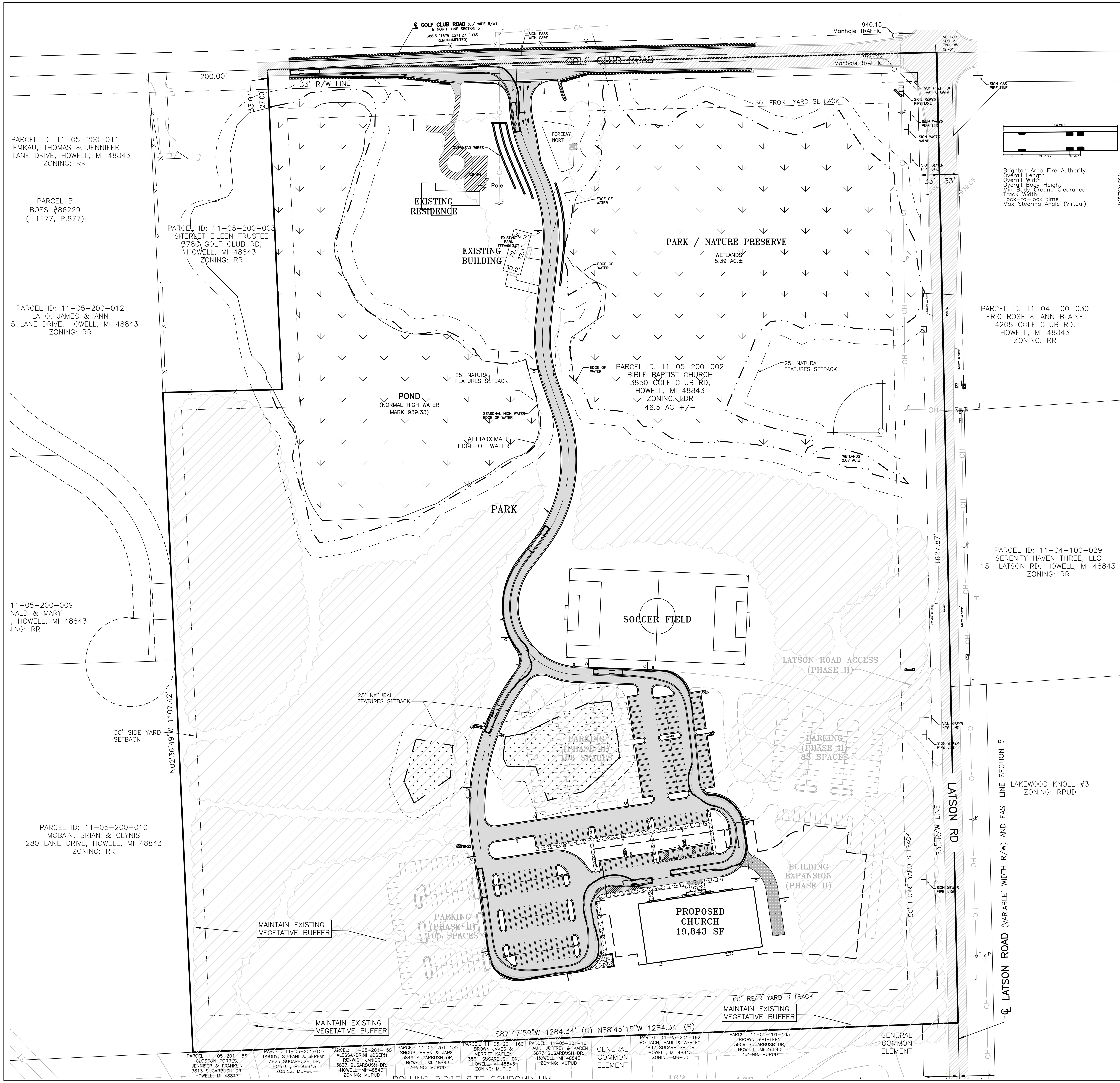
PROJECT: **BIBLE BAPTIST CHURCH**

PREPARED FOR: **BIBLE BAPTIST CHURCH**
2258 EAST HIGHLAND ROAD
HOWELL, MI 48843
517-715-9233

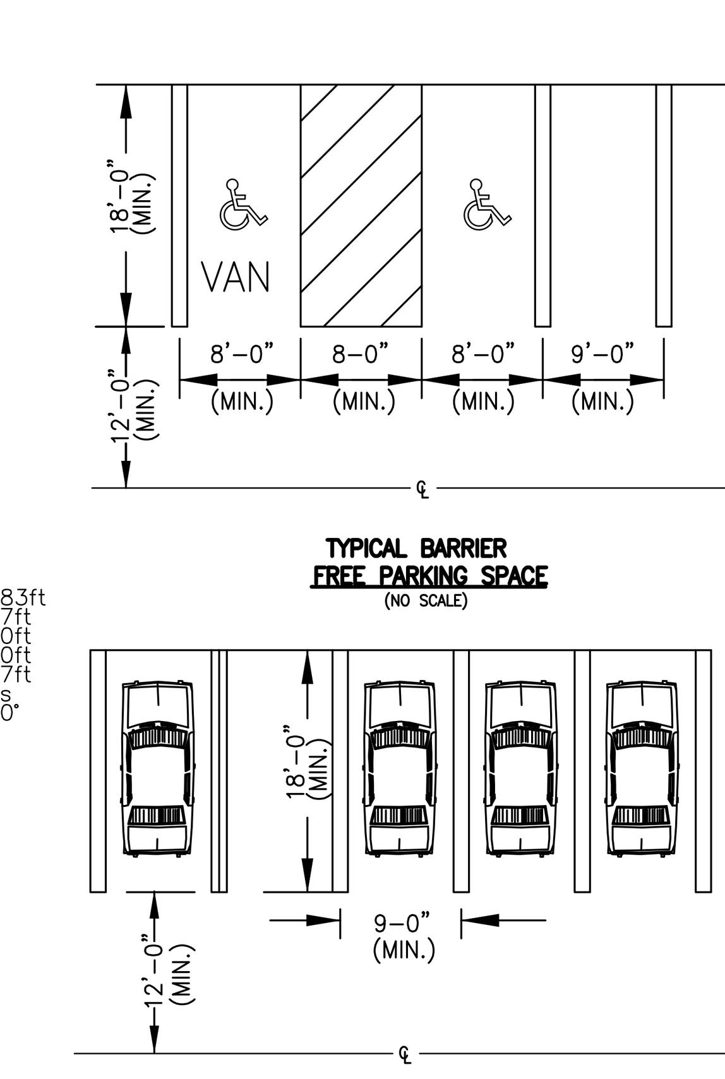
TITLE: **NATURAL FEATURES PLAN**

NO	BY	REVISION PER	DATE
2	ST	PER TWP REVIEW	3/16/22
1	ST	PER TWP REVIEW	2/23/22

DESIGNED BY: JH
DRAWN BY: JS
CHECKED BY:
SCALE 1” = 100’
JOB NO. 21-542
DATE 2/1/2022
SHEET NO. 3



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



TYPICAL BARRIER FREE PARKING SPACE
(NO SCALE)

TYPICAL PARKING SPACE
(NO SCALE)

LEGEND

PROPOSED (PR)	EXISTING (EX)	
900	900	CONTOUR
		STORM DRAINAGE FLOW
T/C XXX.XX	+ 922.08	SPOT 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
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
X	X	FENCE
	⊥	SIGN
TBR		TO BE REMOVED
CB 1		STORM SEWER LABEL
GV 1		WATER MAIN LABEL
		LIMITS OF GRADING/CLEARING
		WETLAND BOUNDARY
		LIMITS OF CLEARANCE/DISTURBANCE

SCALE: 1 INCH = 80 FEET

SITE DETAILS

PARCEL # 4711-05-200-002
3850 GOLF CLUB RD.
HOWELL, MI 48843
46.5 AC +/-
GENOA TOWNSHIP

ZONING DISTRICT: LDR (LOW DENSITY RESIDENTIAL)

PROPOSED USE: CHURCH (SPECIAL USE REQUIRED)

MAX. LOT COVERAGE: N/A

MINIMUM LOT AREA FOR CHURCHES: 3 ACRES, PLUS 15,000 SF FOR EACH 100 PERSONS OF SEATING CAPACITY

MAX. BUILDING HEIGHT: 2 STORIES / 35 FEET; IF GREATER THEN FRONT, SIDE AND REAR YARDS ARE INCREASED ABOVE THE MINIMUM REQUIRED YARDS BY ONE FOOT FOR EACH FOOT OF BUILDING HEIGHT THAT EXCEEDS THE MAXIUM HEIGHT ALLOWED. THE MAX HEIGHT OF A STEEPLE SHALL BE 60 FEET.

SETBACKS FOR LDR

	REQUIRED	PROVIDED
FRONT:	50' (MEASURED FROM THE RIGHT OF WAY)	1358'
SIDE:	SMALLEST SIDE 30', 60' FOR BOTH	292.4'
REAR:	60'	118'

NATURAL FEATURES SETBACK: 25' FROM ALL REGULATED WETLANDS, PONDS, STREAMS SUBJECT TO SECTION 13.02
LANDSCAPE BUFFERS: GREENBELTS ALONG THE RIGHT-OF-WAY AND A LANDSCAPED BUFFER ZONE BASED ON ADJACENT ZONING SHALL BE PROVIDED AS REQUIRED IN SECTION 12.02. SEE SHEET 6.
PARKING SETBACK: WHEREVER AN OFF-STREET PARKING AREA IS ADJACENT TO A RESIDENTIAL DISTRICT, THERE SHALL BE A MINIMUM PARKING LOT SETBACK OF 50 FEET WITH A CONTINUOUS OBSCURING WALL, FENCE AND/OR LANDSCAPED AREA AT LEAST 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.

PARKING REQUIREMENTS:
CHURCHES
- 1 SPACE FOR EACH 3 SEATS OR 6 FEET OF PEWS IN THE MAIN UNIT OF WORSHIP
- DIMENSIONS FOR 90 DEGREE ARE 9 FT X 18 FT WITH 24 FOOT TWO-WAY DRIVE AISLE
- 506 SEATS / 3 SEATS = 168.66 PARKING SPACES REQUIRED
- 187 PROPOSED PARKING SPACES (8 ADA INCLUDED)

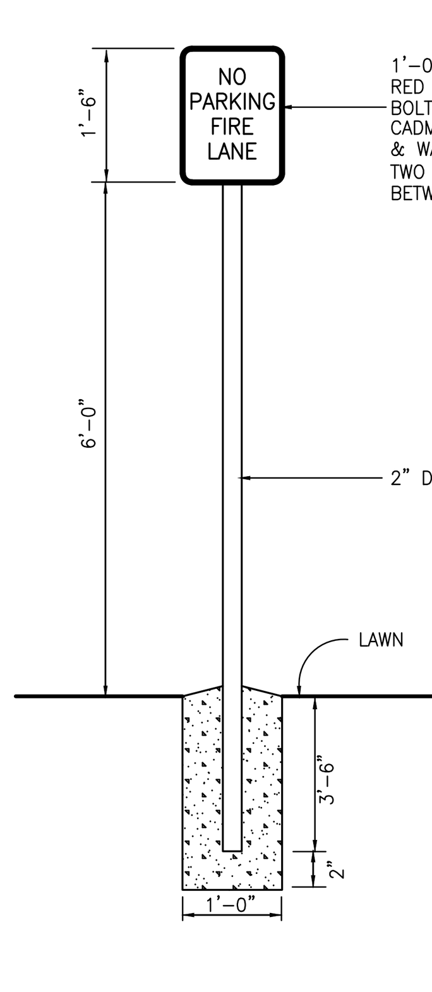
ACCORDING TO ORDINANCE RESIDENTIAL DISTRICTS ARTICLE 3.03.02 (L) --
CHURCHES, TEMPLES AND SIMILAR PLACES OF WORSHIP AND RELATED FACILITIES SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS:

(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.

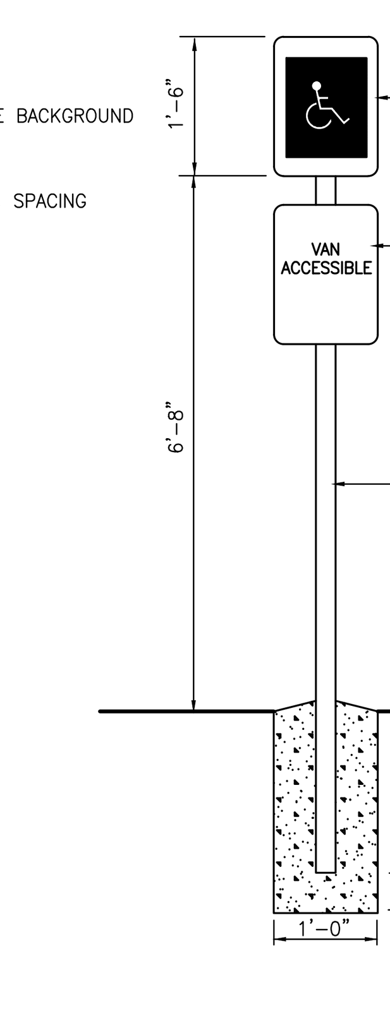
(2) BUILDINGS OF GREATER THAN THE MAXIMUM HEIGHT ALLOWED IN SECTION 3.04, DIMENSIONAL STANDARDS, MAY BE ALLOWED PROVIDED FRONT, SIDE AND REAR YARDS ARE INCREASED ABOVE THE MINIMUM REQUIRED YARDS BY ONE FOOT FOR EACH FOOT OF BUILDING HEIGHT THAT EXCEEDS THE MAXIMUM HEIGHT ALLOWED. THE MAXIMUM HEIGHT OF A STEEPLE SHALL BE SIXTY (60) FEET.

(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.

(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.



NO PARKING SIGN DETAIL
(NO SCALE)



HANDICAP PARKING SIGN DETAIL
(NO SCALE)

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PROJECT: BIBLE BAPTIST CHURCH

PREPARED FOR: BIBLE BAPTIST CHURCH
2258 EAST HIGHLAND ROAD
HOWELL, MI 48843
517-715-9233

TITLE: OVERALL SITE PLAN

NO	BY	REVISION PER	DATE
2	ST	PER TWP REVIEW	3/16/22
1	ST	PER TWP REVIEW	2/23/22

DESIGNED BY: ST
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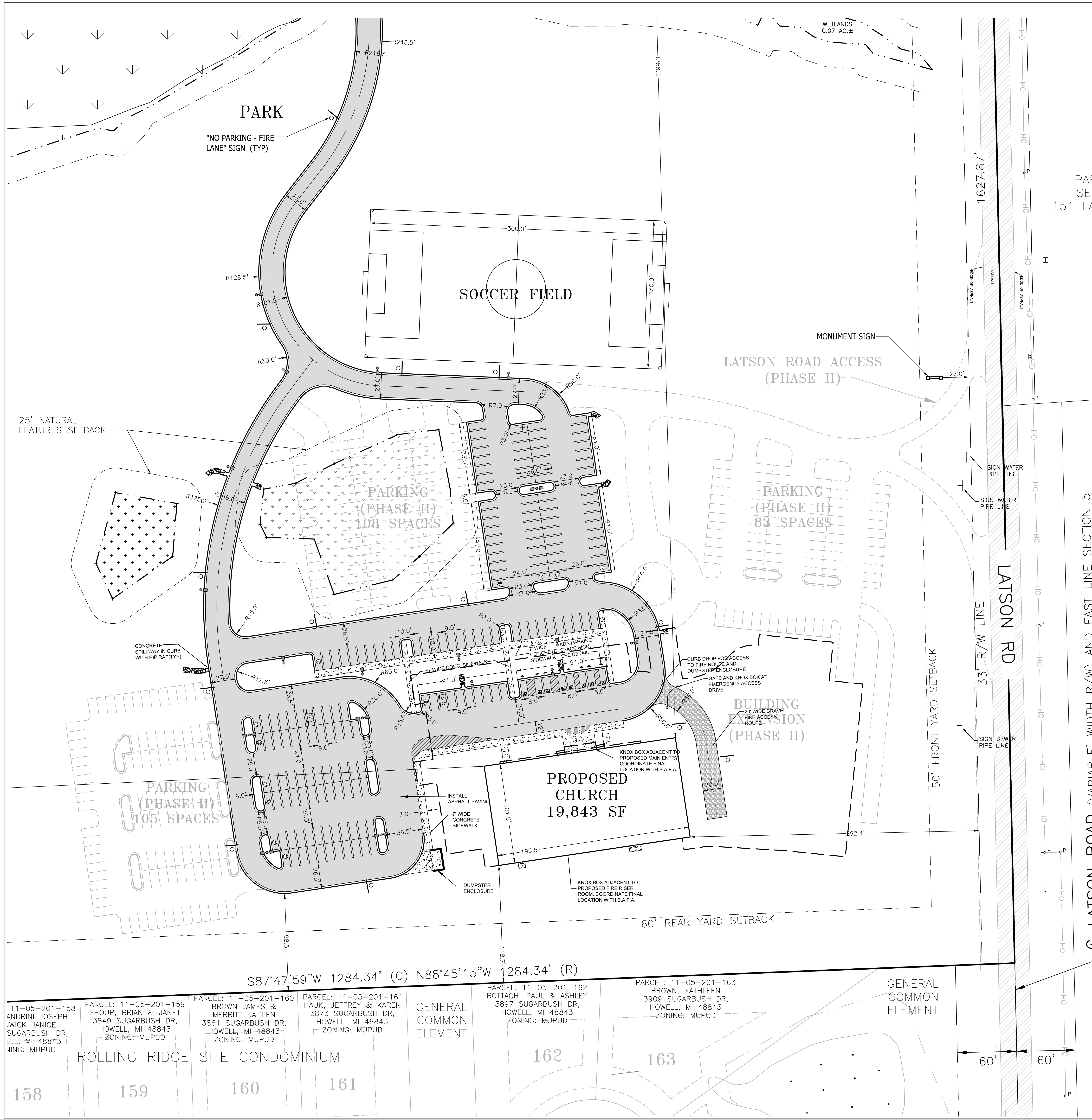
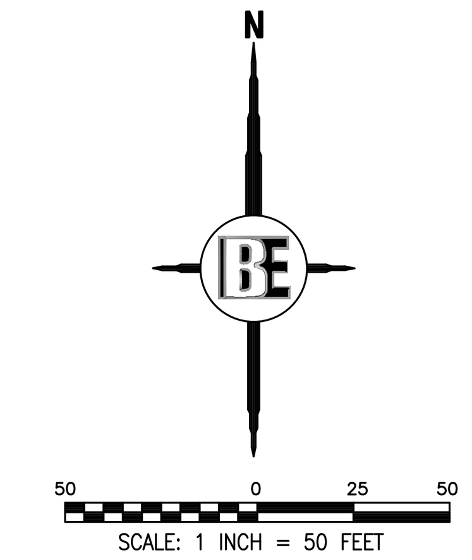


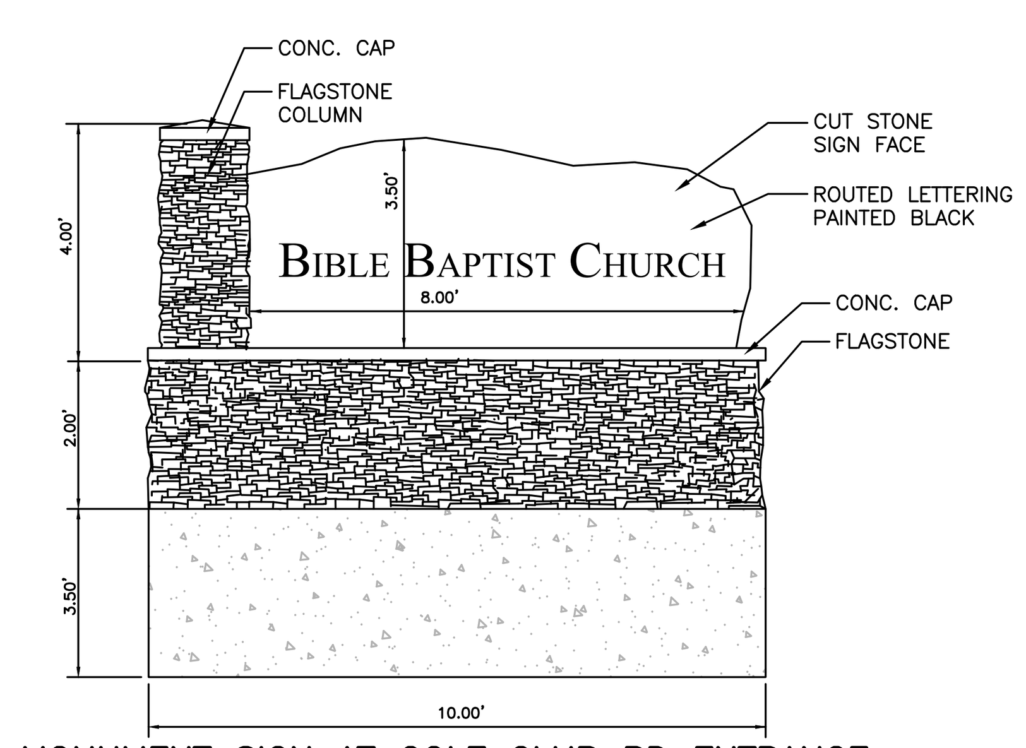


LEGEND

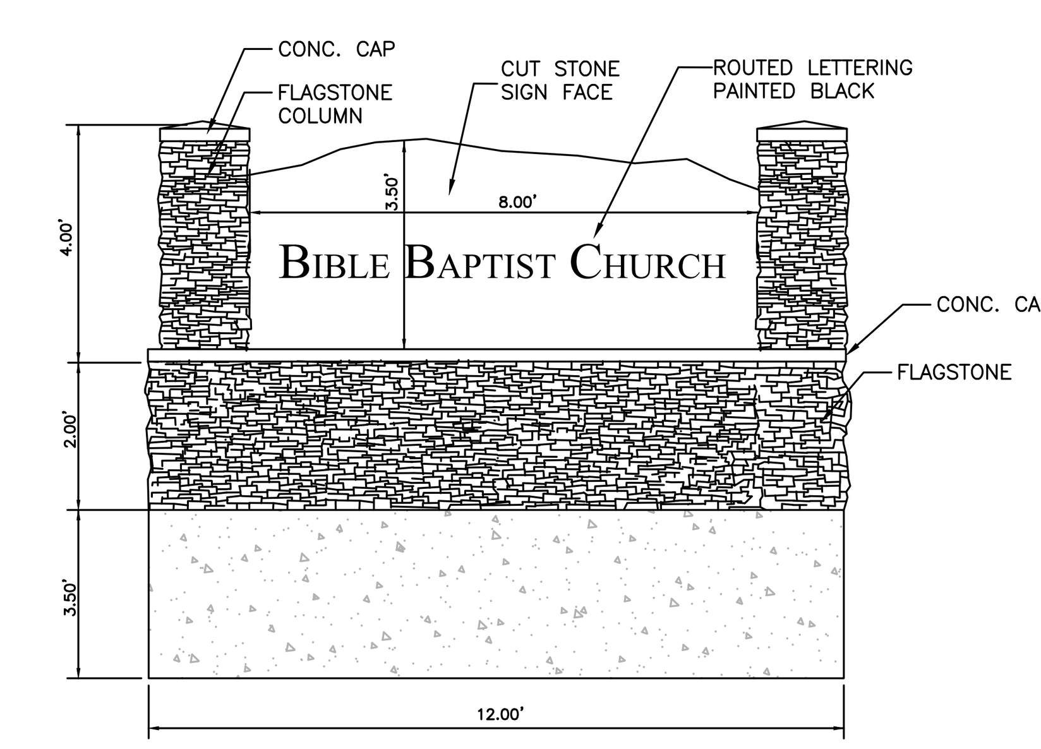
PROPOSED (PR)	EXISTING (EX)	
		CONTOUR
		STORM DRAINAGE FLOW
T/C XXX.XX	× 922.08	SPOT ELEVATION
FG	FG	FINISHED GRADE ELEVATION
T/A	T/A	TOP OF ASPHALT
T/C	T/C	TOP OF CURB / CONCRETE
T/W	T/W	TOP OF WALK
F/L	F/L	FLOW LINE
T/P	T/P	TOP OF PIPE
B/P	B/P	BOTTOM OF PIPE
RIM	RIM	RIM ELEVATION
INV	INV	INVERT ELEVATION
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	SANITARY SEWER
	FM	FORCE MAIN
	ST	STORM SEWER
	WM	WATER MAIN
	WL	WATER LEAD
	OH	OVERHEAD WIRE
	C	CABLE
	E	ELECTRIC
	G	GAS
	T	TELEPHONE
		MANHOLE
		INLET / CATCHBASIN
		FLARED END-SECTION
		GATE VALVE
		HYDRANT
		UTILITY POLE
X	X	FENCE
		SIGN
TBR		TO BE REMOVED
		STORM SEWER LABEL
		WATER MAIN LABEL
		LIMITS OF GRADING/CLEARING
		WETLAND BOUNDARY
		LIMITS OF CLEARANCE/DISTURBANCE

GENERAL NOTES

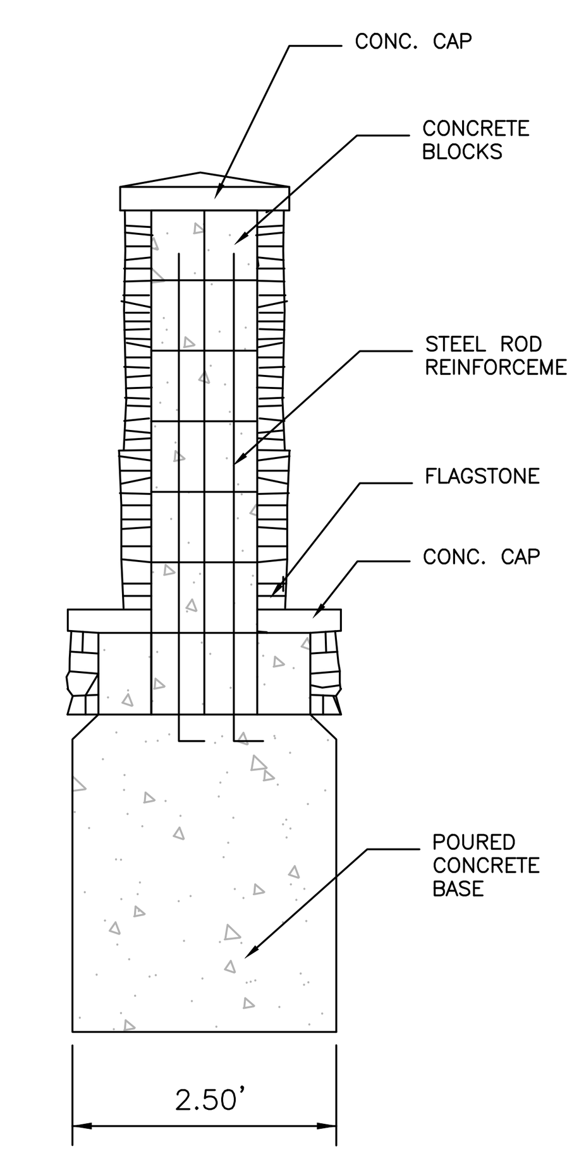
1. ALL OUTDOOR LIGHTS SHALL BE SHIELDED TO REDUCE GLARE AND SHALL BE ARRANGED TO NOT INTERFERE WITH THE VISION OF PERSONS ON ADJACENT ROADWAYS OR ADJACENT PROPERTY.
2. ALL SIGNS SHALL MEET LOCAL MUNICIPALITY ORDINANCE REQUIREMENTS.
3. FUTURE ACCESS DRIVE FROM LATSON ROAD TO CONFORM TO BAFA'S ACCESS STANDARDS.
4. THE CHURCH SHALL INCLUDE THE BUILDING ADDRESS A MINIMUM 6" HIGH LETTERS OF CONTRASTING COLORS AND BE CLEARLY VISIBLE FROM THE STREET. THE LOCATION AND SIZE SHALL BE VERIFIED PRIOR TO INSTALLATION.
5. ONE SIDE OF THE STREET SHALL BE MARKED AS A FIRE LANE AND SHALL HAVE APPROPRIATE SIGNAGE.
6. ACCESS ROADS TO THE SITE SHALL BE PROVIDED AND MAINTAINED DURING CONSTRUCTION.
7. ACCESS ROADS SHALL BE CONSTRUCTED TO BE CAPABLE OF SUPPORTING THE IMPOSED LOAD OF FIRE APPARATUS WEIGHING AT LEAST 84,000 POUNDS.
8. A MINIMUM VERTICAL CLEARANCE OF 13.5 FEET SHALL BE MAINTAINED THROUGHOUT THE SITE. THIS INCLUDES ENCROACHMENTS FROM LARGE TREE CANOPIES, LIGHTING, ETC.
9. DURING THE CONSTRUCTION PROCESS, THE BUILDING WILL BE EVALUATED FOR EMERGENCY RESPONDER RADIO SIGNAL STRENGTH. IF COVERAGE IS FOUND TO BE QUESTIONABLE OR INADEQUATE; AN APPROVED CONTRACTOR SHALL BE HIRED TO PERFORM A GRID TEST OF THE FACILITY. IF THE SIGNAL STRENGTH COVERAGE IS FOUND TO BE NON-COMPLIANT, AN APPROVED EMERGENCY RESPONDER RADIO COVERAGE SYSTEM SHALL BE PROVIDED IN THE BUILDING.
10. SITE LIGHTING SHALL BE PLACED ON TIMERS TO BE OFF DURING NON-USE HOURS TO THE EXTENT POSSIBLE WHILE MAINTAINING SITE SAFETY.



MONUMENT SIGN AT GOLF CLUB RD ENTRANCE & FUTURE LATSON RD ENTRANCE
(NO SCALE)



MONUMENT SIGN AT GOLF CLUB/LATSON INTERSECTION
(NO SCALE)



SECTION

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

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

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

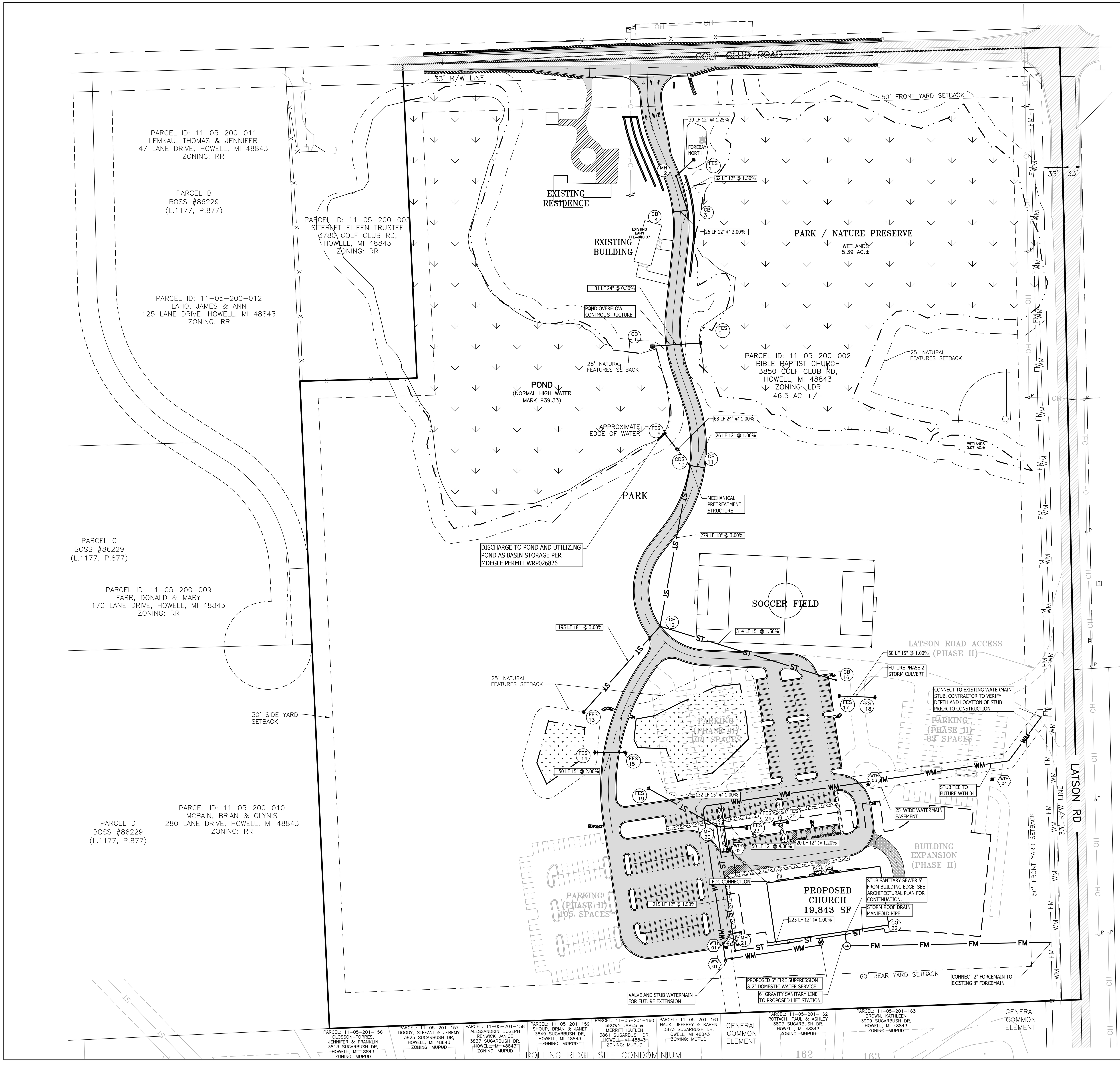
PROJECT: **BIBLE BAPTIST CHURCH**

PREPARED FOR: **BIBLE BAPTIST CHURCH**
2258 EAST HIGHLAND ROAD
HOWELL, MI 48843
517-715-9233

TITLE: **CHURCH CAMPUS SITE PLAN**

NO	BY	REVISION PER	DATE
2	ST	PER TWP REVIEW	3/16/22
1	ST	PER TWP REVIEW	2/23/22

DESIGNED BY: ST
DRAWN BY: JS
CHECKED BY:
SCALE 1" = 50'
JOB NO. 21-542
DATE 2/01/2022
SHEET NO. 5



LEGEND

PROPOSED (PR)	EXISTING (EX)	
		CONTOUR
		STORM DRAINAGE FLOW
T/C XXX.XX	+ 922.08	SPOT 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
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
X	X	FENCE
		SIGN
TBR		TO BE REMOVED
CB 1		STORM SEWER LABEL
GV 1		WATER MAIN LABEL
		WETLAND BOUNDARY

SCALE: 1 INCH = 80 FEET

NOTES

1. A WATERMAIN PERMIT (ACT 399) SHALL BE OBTAINED PRIOR TO CONSTRUCTION.
2. ALL WORK SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF GENOA TOWNSHIP, LIVINGSTON COUNTY, AND THE STATE OF MICHIGAN.
3. THREE WORKING DAYS BEFORE YOU DIG, CALL MISS DIG TOLL FREE 1-800-482-7171.
4. ALL LENGTHS SHOWN ARE FROM ℄ TO ℄ OF STRUCTURE OR FROM ℄ OF STRUCTURE TO DISCHARGE END OF FLARED END SECTION.
5. ALL STORM SEWER UNDER THE ROADBED AND WITHIN GREEN SPACE SHALL BE ADS HP WITH WATERTIGHT PREMIUM JOINTS, UNLESS OTHERWISE NOTED ON PLAN.
6. ALL OPEN INLET OR OUTLET END OF STORM SEWER AND CULVERTS SHALL INCLUDE PREFAB FLARED-END SECTION AND MINIMUM 15 SQ. YD. OF PLAIN COBBLESTONE RIP-RAP (6 INCH MIN. SIZE), UNLESS OTHERWISE SPECIFIED.
7. APPROPRIATE SOIL EROSION CONTROL MEASURES SHALL BE ESTABLISHED PRIOR TO BEGINNING CONSTRUCTION AND CONTINUOUSLY MAINTAINED BY CONTRACTOR UNTIL VEGETATION HAS BEEN RE-ESTABLISHED.
8. ALL CATCH BASIN RIM ELEVATIONS ARE AT FLOW LINE.
9. ALL CURB SHALL BE "HIGH BACK" CURB. ENTRANCE SHALL BE "B2" CURB, UNLESS OTHERWISE NOTED.
10. FOR ALL WORK WITHIN ROAD RIGHT-OF-WAY, SEE STANDARDS AND SPECIFICATIONS, LIVINGSTON COUNTY ROAD COMMISSION STANDARD DETAILS FOR RESIDENTIAL STREETS.
11. MINIMUM 10' HORIZONTAL SEPARATION AND 18" VERTICAL SEPARATION SHALL BE MAINTAINED BETWEEN UTILITIES AT ALL TIMES. A CONCRETE COLLAR SHALL BE USED WHEREVER THE MINIMUM 18" VERTICAL SEPARATION CANNOT BE MET BETWEEN STORM SEWER AND SANITARY MAIN. SEE STORM SEWER CONSTRUCTION DETAIL SHEET FOR CONCRETE COLLAR DETAIL.
12. SEE STANDARDS AND SPECIFICATIONS ON WATER MAIN STANDARD NOTES AND WATER MAIN STANDARD DETAILS SHEETS.
13. WATER MAIN SHALL BE 8" DUCTILE IRON PIPE CLASS 52.
14. WATER MAIN SHALL HAVE MINIMUM 5 1/2 FEET OF COVER AND MAX 8 1/2' COVER.
15. HYDRANTS AT CURB TO BE A MINIMUM OF 3' & MAXIMUM 10' OFF BACK OF CURB (TYP.)
16. PER MHOG STANDARDS, GATE VALVES AND BOXES ARE TO BE UTILIZED ON WATERMAIN 12 INCHES AND SMALLER.
17. A FULL PIPE LENGTH (20') IS TO BE INSTALLED AT ALL WATERMAIN PIPE CROSSINGS, CENTERED UNDER THE CONFLICTING PIPE.
18. ALL PIPE THAT IS TO BE INSTALLED ABOVE THE EXISTING GROUND SHALL BE BACKFILLED WITH ENGINEERING FILL COMPACTED TO 95% MAX DRY UNIT WEIGHT.

STORM STRUCTURE TABLE

STRUCTURE NAME	STRUCTURE DETAILS
CB3 48Ø COVER TYPE 'C' 2' SUMP	RIM = 938.86 SUMP = 2' 12" INV IN = 933.92 12" INV OUT = 933.92
CB4 24Ø COVER TYPE 'C' 2' SUMP	RIM = 938.86 SUMP = 2' 12" INV OUT = 934.44
CB6 24Ø COVER TYPE 'GRATE' 2' SUMP	RIM = 940.50 SUMP = 2' 24" INV OUT = 935.27
CB11 24Ø COVER TYPE 'C' 2' SUMP	RIM = 946.48 SUMP = 2' 12" INV IN = 942.48
CB12 48Ø COVER TYPE 'C' 2' SUMP	RIM = 964.42 SUMP = 2' 18" INV IN = 959.45 15" INV IN = 960.15 21" INV OUT = 953.45
CB16 48Ø COVER TYPE 'E' 2' SUMP	RIM = 970.00 SUMP = 2' 15" INV OUT = 964.86
CDS10 96 Ø COVER TYPE 'C' 6' SUMP	RIM = 961.65 SUMP = 6' 21" INV IN = 945.08 12" INV OUT = 942.74 24" INV OUT = 941.68
CO22 24Ø COVER TYPE 'A' 2' SUMP	RIM = 979.80 SUMP = 2' 12" INV OUT = 975.80
FES1	18" INV IN = 932.50
FES5	24" INV IN = 934.86
FES9	24" INV IN = 941.00
FES13	18" INV OUT = 965.30
FES14	15" INV IN = 964.00
FES15	15" INV OUT = 965.00
FES17	15" INV IN = 971.00

STORM STRUCTURE TABLE

STRUCTURE NAME	STRUCTURE DETAILS
FES18	15" INV OUT = 971.60
FES19	15" INV IN = 968.00
FES23	12" INV OUT = 975.27
FES24	12" INV IN = 976.28
FES25	12" INV OUT = 976.52
MH2 48Ø COVER TYPE 'A' 0' SUMP	RIM = 939.42 SUMP = 0' 12" INV IN = 932.99 18" INV OUT = 932.99
MH20 48Ø COVER TYPE 'A' 2' SUMP	RIM = 978.94 SUMP = 2' 12" INV IN = 973.27 12" INV IN = 970.02 15" INV OUT = 969.32
MH21 48Ø COVER TYPE 'A' 2' SUMP	RIM = 979.00 SUMP = 2' 12" INV IN = 973.25 12" INV OUT = 973.25

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HOWELL, MI. 48843
517.546.4836 FAX 517.548.1670

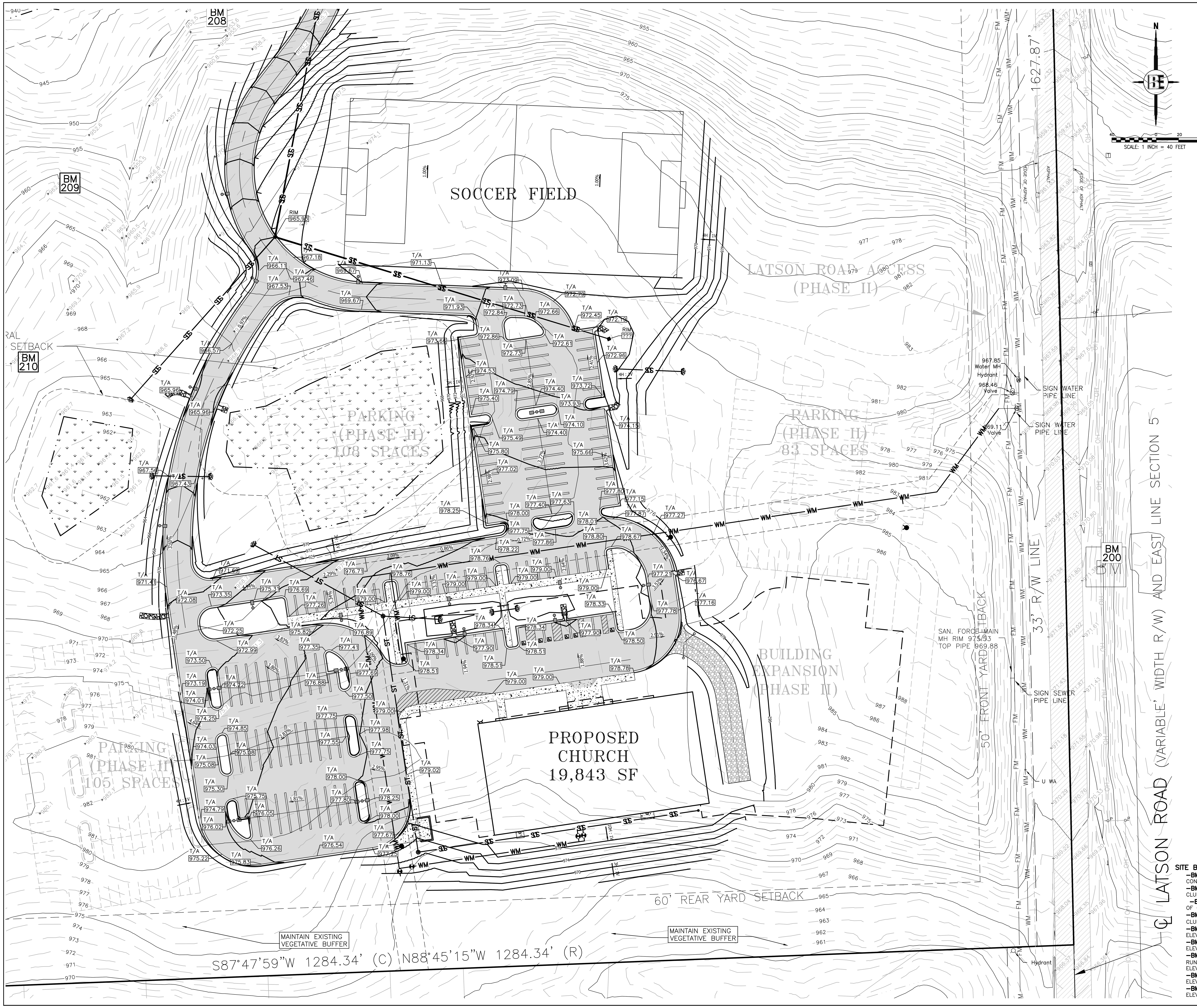
PROJECT: BIBLE BAPTIST CHURCH

PREPARED FOR: BIBLE BAPTIST CHURCH
2258 EAST HIGHLAND ROAD
HOWELL, MI 48843
517-715-9233

TITLE: UTILITY PLAN

NO	BY	REVISION PER	DATE
2	ST	PER TWP REVIEW	3/16/22
1	ST	PER TWP REVIEW	2/23/22

DESIGNED BY: ST
DRAWN BY: JS
CHECKED BY:
SCALE 1" = 80'
JOB NO. 21-542
DATE 2/1/2022
SHEET NO. 6



LEGEND

PROPOSED (PR)	EXISTING (EX)	
900	900	CONTOUR
		STORM DRAINAGE FLOW
T/C XXX.XX	+ 922.08	SPOT 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
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
X	X	FENCE
	⊥	SIGN
TBR		TO BE REMOVED
CB 1		STORM SEWER LABEL
GV 1		WATER MAIN LABEL
		WETLAND BOUNDARY
		LIMITS OF CLEARANCE/DISTURBANCE

SITE BENCHMARKS (NAVD88 DATUM):

- **BM #200** = NAIL/TAG W/S P.POLE E/S LASTON RD. 785'± NORTH OF CONOVER CT.. ELEV.=971.41
- **BM #201** = ARROW ON HYD W/S OF LASTON RD. 135'± SOUTH OF GOLF CLUB RD.. ELEV.=939.50
- **BM #203** = FD. R.R. E/S OF GUY POLE W/S OF LASTON RD. 44'± SOUTH OF GOLF CLUB RD.. ELEV.=942.12
- **BM #205** = PK NAIL/TAG W/S 40" WILLOW TREE 170'± SOUTH OF GOLF CLUB RD. & 160'± NORTH OF BARN. ELEV.=935.10
- **BM #206** = LANDSCAPE SPIKE SET S/E CORNER OF POLE BARN. ELEV.=940.32
- **BM #207** = PK NAIL/TAG S/S 12" MAPLE TREE S/S OF POND. ELEV.=945.31
- **BM #208** = PK NAIL/TAG SET 10" PINE TREE 50'± EAST OF TWO TRACK RUNNING N&S & 150'± SOUTH OF POND, N/S OF TWO TRACK RUNNING E&W. ELEV.=954.73
- **BM #209** = PK NAIL/TAG S/S 12" ELM TREE 142'± SOUTH OF POND. ELEV.=959.69
- **BM #210** = PK NAIL/TAG E/S 8" PINE TREE 330'± SOUTH OF POND. ELEV.=966.83

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

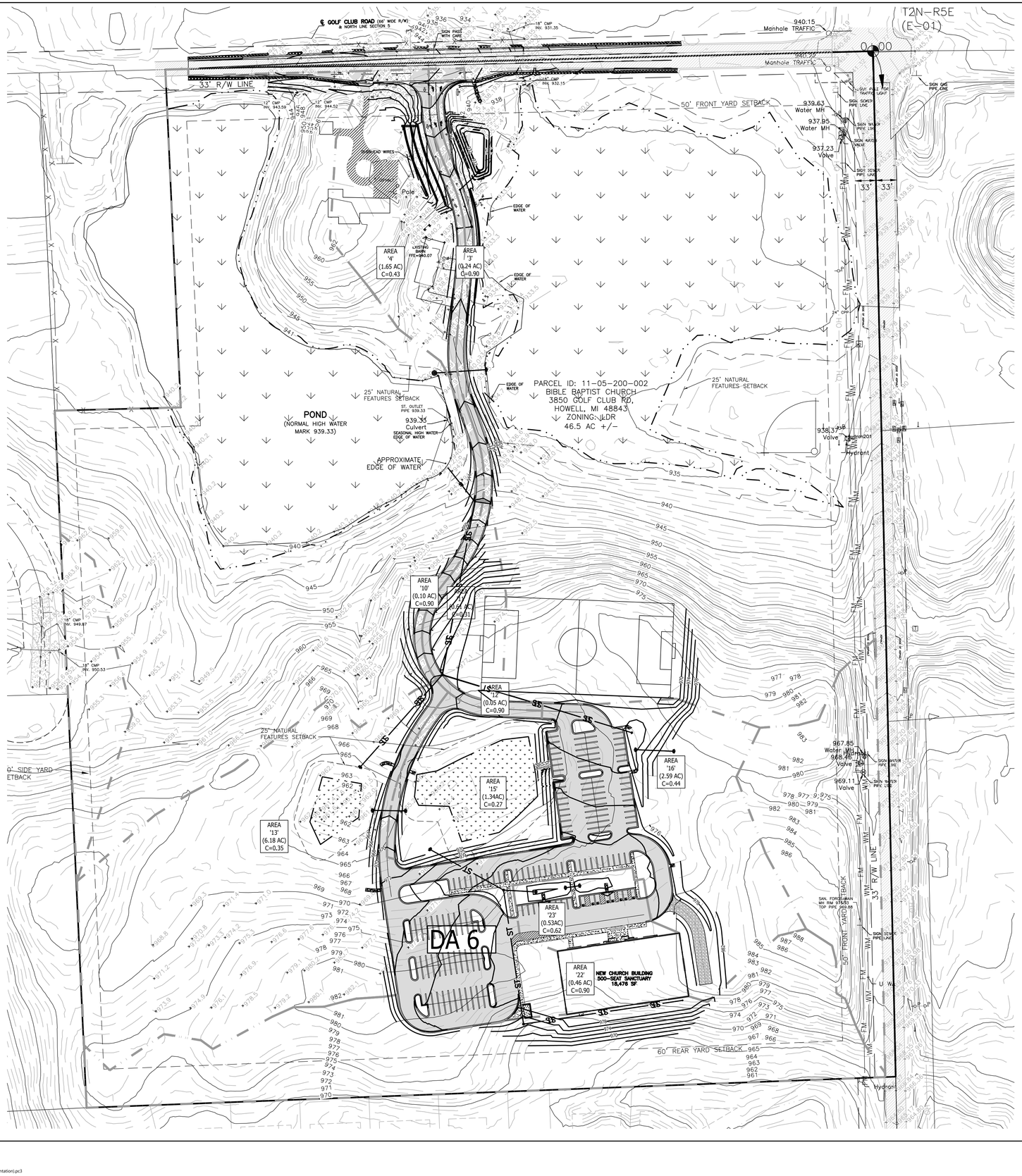
PROJECT: BIBLE BAPTIST CHURCH

PREPARED FOR: BIBLE BAPTIST CHURCH
2258 EAST HIGHLAND ROAD
HOWELL, MI 48843
517-715-9233

TITLE: GRADING PLAN

NO	BY	REVISION PER	DATE
2	ST	PER TWP REVIEW	3/16/22
1	ST	PER TWP REVIEW	2/23/22

DESIGNED BY: ST
DRAWN BY: JS
CHECKED BY:
SCALE 1" = 40'
JOB NO. 21-542
DATE 12/01/2021
SHEET NO. 7



LEGEND

PROPOSED (PR)	EXISTING (EX)	
900	900	CONTOUR
		STORM DRAINAGE FLOW
T/C XXX.XX	+ 922.08	SPOT 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
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
X	X	FENCE
		SIGN
TBR		TO BE REMOVED
SP		STORM SEWER LABEL
GV 1		WATER MAIN LABEL
		WETLAND BOUNDARY
		PROPOSED DRAINAGE AREA

THE LOCATION AND ELEVATION OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE DRAWINGS ARE ONLY APPROXIMATE. BEFORE ANY EXCAVATION IS BEGUN, THE CONTRACTOR SHALL REMOVE ALL DOUBT AS TO THE EXACT LOCATION AND ELEVATION OF ALL EXISTING UTILITIES AND PROPOSED UTILITIES AS SHOWN ON THESE PLANS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF ANY CONFLICTS ARE FOUND TO EXIST BETWEEN PROPOSED AND EXISTING UTILITIES AS SHOWN ON THE PLANS.

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 It's a state of Michigan mandate

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

DRAINAGE NARRATIVE:

PRE-DEVELOPMENT:
IN GENERAL, THE SITE SLOPES NORTHERLY TOWARDS AN EXISTING OPEN WATER POND AND WETLAND AT THE NORTH PORTION OF THE PROPERTY. WATER FROM THE OPEN WATER POND DISCHARGES THROUGH AN EXISTING STANDPIPE EASTERLY TO THE EXISTING WETLAND AND THEN RUNS NORTHERLY UNDERNEATH GOLF CLUB ROAD. A SMALL PORTION OF THE PROPERTY SLOPES EASTERLY DIRECTLY TO LATSON ROAD RIGHT OF WAY AS WELL AS SOME AREA SLOPING DIRECTLY SOUTHERLY TO THE EXISTING ROLLING RIDGE SITE CONDO.

POST-DEVELOPMENT:
THE OVERALL DRAINAGE PATTERNS ON THE SITE AFTER DEVELOPMENT REMAIN GENERALLY THE SAME. THERE WILL A REDUCTION IN DRAINAGE AREA DIRECTLY DISCHARGING TO THE ROLLING RIDGE SITE CONDO TO THE SOUTH. THE DIRECT DRAINAGE TO LATSON ROAD RIGHT OF WAY WILL REMAIN UNCHANGED. THE PROPOSED CHURCH AND ALL IMPERVIOUS SURFACES WILL BE DIRECTED VIA A COMBINATION OF ENCLOSED STORM SEWER AS WELL AS OPEN SWALES NORTHERLY TO A MECHANICAL PRETREATMENT UNIT. THE MECHANICAL PRETREATMENT UNIT WILL TREAT THE STORMWATER FROM THE FIRST FLUSH PER NEW LCDC STANDARDS AND DISCHARGE TO THE EXISTING POND ON THE NORTHWEST PORTION OF THE PROPERTY. STORAGE IS WITHIN THE OPEN WATER POND PRIOR TO DISCHARGE INTO THE EAST WETLAND, WHICH IS PERMITTED UNDER MDEGLE PERMIT #WRP026826. THERE IS A NORTH FOREBAY WHOSE DRAINAGE AREAS IS LIMITED TO THE NORTHERN PORTION OF THE PROPOSED COMMERCIAL DRIVE. THIS NORTHERN FOREBAY DISCHARGES DIRECTLY TO THE EAST WETLAND AND IS PERMITTED UNDER MDEGLE PERMIT #WRP026826.

FUTURE DEVELOPMENT:
THE PLANS FOR A CHURCH EXPANSION ARE ANTICIPATED AT A LATER DATE, WITH A REASONABLE EXPECTED LAYOUT PROVIDED AT THIS TIME FOR THIS FUTURE EXPANSION. SINCE THIS FUTURE EXPANSION IS KNOWN, THE STORM SEWER CALCULATIONS AND FOREBAY/MECHANICAL PRETREATMENT UNITS HAVE BEEN SIZED ACCORDINGLY TO ACCOUNT FOR FUTURE CHURCH DEVELOPMENT, THUS MITIGATING UNNECESSARY DISTURBANCE DURING THE EXPANSION PROJECT. AS WAS THE CASE IN THE POST-DEVELOPED CONDITION, THE DRAINAGE AREA DISCHARGING DIRECTLY TO THE ROLLING RIDGE SITE CONDO TO THE SOUTH WILL BE REDUCED YET AGAIN IN THE FUTURE CONDITION. THE DRAINAGE TO THE LATSON ROAD RIGHT OF WAY WILL NEED TO BE APPROVED BY LCRC.

PROJECT
BIBLE BAPTIST CHURCH

PREPARED FOR
BIBLE BAPTIST CHURCH
2258 EAST HIGHLAND ROAD
HOWELL, MI 48843
517-715-9233

TITLE
DRAINAGE PLAN

NO	BY	REVISION PER	DATE
2	ST	PER TWP REVIEW	3/16/22
1	ST	PER TWP REVIEW	2/23/22

DESIGNED BY: ST
DRAWN BY: JS
CHECKED BY:
SCALE 1" = 80'
JOB NO. 21-542
DATE 2/1/2022
SHEET NO. 8

BOSS Engineering

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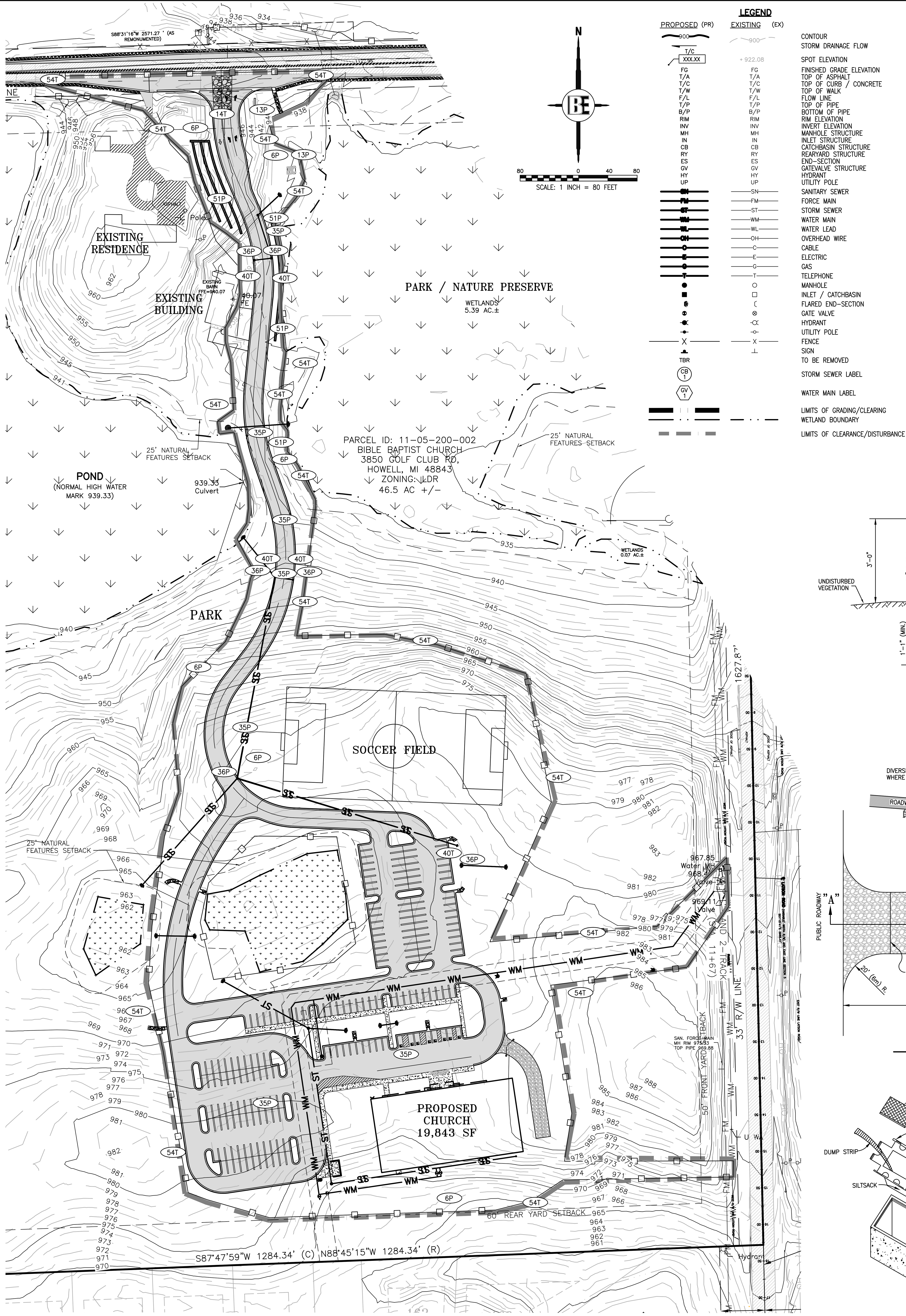


SOIL EROSION CONTROL MEASURES

No.	Measure	Description
1	STRIPPING & STOCKPILING TOPSOIL	TOPSOIL MAY BE STOCKPILED ABOVE BORROW AREAS TO ACT AS A DIVERSION STOCKPILE SHOULD BE TEMPORARILY SEEDED
6	SEEDING WITH MULCH AND/OR MATTING	FACILITATES ESTABLISHMENT OF VEGETATIVE COVER EFFECTIVE FOR DRAINAGEWAYS WITH LOW VELOCITY EASILY PLACED IN SMALL QUANTITIES BY INEXPERIENCED PERSONNEL SHOULD INCLUDE PREPARED TOPSOIL BED
13	RIP-RAP, RUBBLE, GABIONS	USED WHERE VEGETATION IS NOT EASILY ESTABLISHED EFFECTIVE FOR HIGH VELOCITIES OR HIGH CONCENTRATIONS PERMITS RUNOFF TO INFILTRATE SOIL DISSIPATES ENERGY FLOW AT SYSTEM OUTLETS
14	AGGREGATE COVER	STABILIZES SOIL SURFACE, THUS MINIMIZING EROSION PERMITS CONSTRUCTION TRAFFIC IN ADVERSE WEATHER MAY BE USED AS PART OF PERMANENT BASE CONSTRUCTION OF PAVED AREAS
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
51	RETAINING WALL	REDUCES GRADIENT WHERE SLOPES ARE EXTREMELY STEEP PERMITS RETENTION OF EXISTING VEGETATION, KEEPING SOIL STABLE IN CRITICAL AREAS MINIMIZES MAINTENANCE
54	SILT FENCE	USES GEOTEXTILE FABRIC AND POST OR POLES. EASY TO CONSTRUCT AND LOCATE AS NECESSARY. (SEE DETAIL THIS SHEET)

T=TEMPORARY, P=PERMANENT
TOTAL DISTURBED AREA = 11.65 AC

SURFACE WATER & COUNTY DRAINS

WETLAND – ON SITE
LAKES – APPROXIMATELY 5,710 FT SE TO LAKE CHEMUNG
STREAMS – APPROXIMATELY 660 FT N OF GOLF CLUB RD.
BASINS – APPROXIMATELY 1,872 FT W OF PARCEL
DRAINS – APPROXIMATELY 1,024 FT EAST TO GENOA NO. 5 DRAIN NO. X
PONDS – ON SITE

CONSTRUCTION SEQUENCE

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

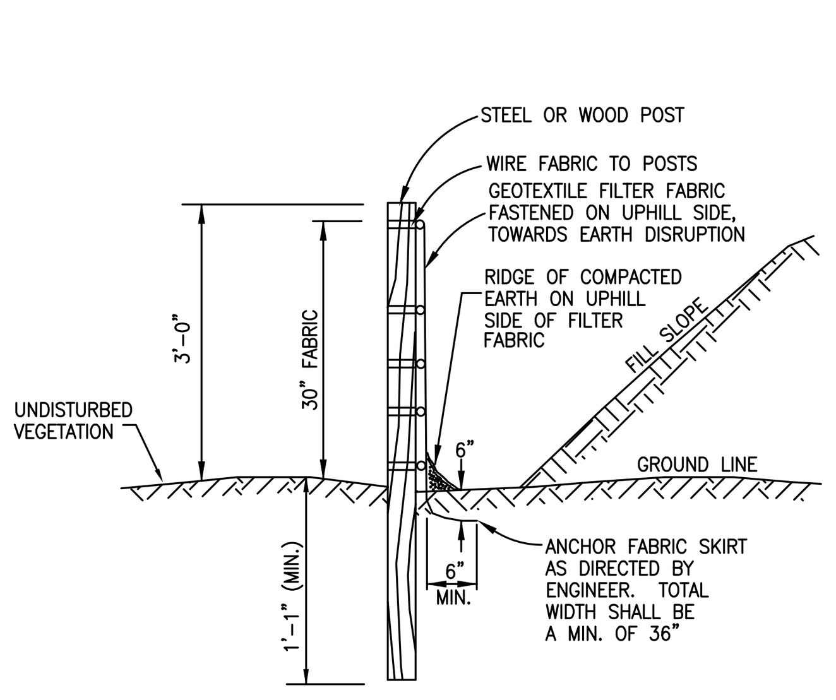
1 DAY	1.	INSTALL SILT FENCE AS SHOWN ON PLANS.
30 DAYS	2.	ROUGH GRADE AND INSTALL STORM DRAINAGE.
1 DAY	3.	INSTALL INLET PROTECTION ON STORM INLETS.
4 DAYS	5.	INSTALL PAVEMENT
5 DAYS	6.	FINE GRADE, SPREAD TOPSOIL, SEED OR SOD AS APPLICABLE.
1 DAY	7.	REMOVE ALL EROSION CONTROL STRUCTURES.
1 DAY	8.	REMOVE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

CONTROLS & MEASURES POST CONSTRUCTION SEQUENCE

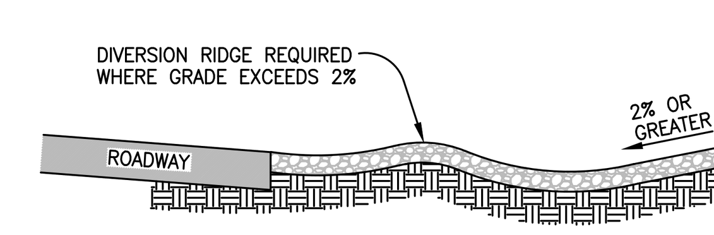
ACTIVITY	WEEKLY	MONTHLY	AS REQUIRED
MAINTAIN LANDSCAPING, REPLACE MULCH	X	X	X
CLEAN INLETS		X	X
COLLECT LITTER	X		X
SWEEP PARKING LOT		X	X

CONTROLS & MEASURES NARRATIVE

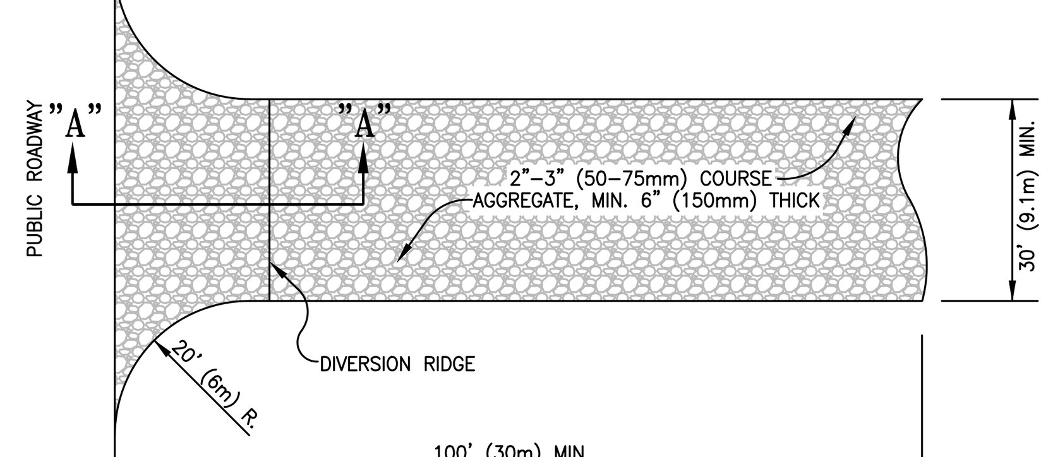
ACTIVITY	DESCRIPTION
MAINTAIN LANDSCAPING, REPLACE MULCH	COLLECT GRASS, TREE, AND SHRUB CLIPPINGS. DISPOSE IN APPROVED CONTAINER. REPLACE DEAD SOD, TREES AND SHRUBS.
CLEAN INLETS	REMOVE LITTER, SEDIMENT, AND DEBRIS. DISPOSE OF IN APPROVED LANDFILL.
COLLECT LITTER	DISPOSE OF WITH INLET DEBRIS.
SWEEP PARKING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



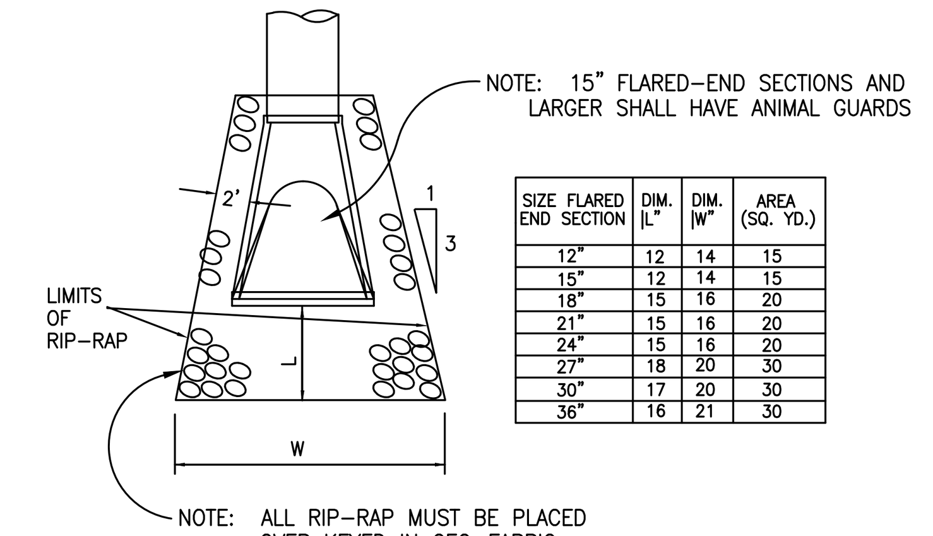
SILT FENCE DETAIL
NO SCALE



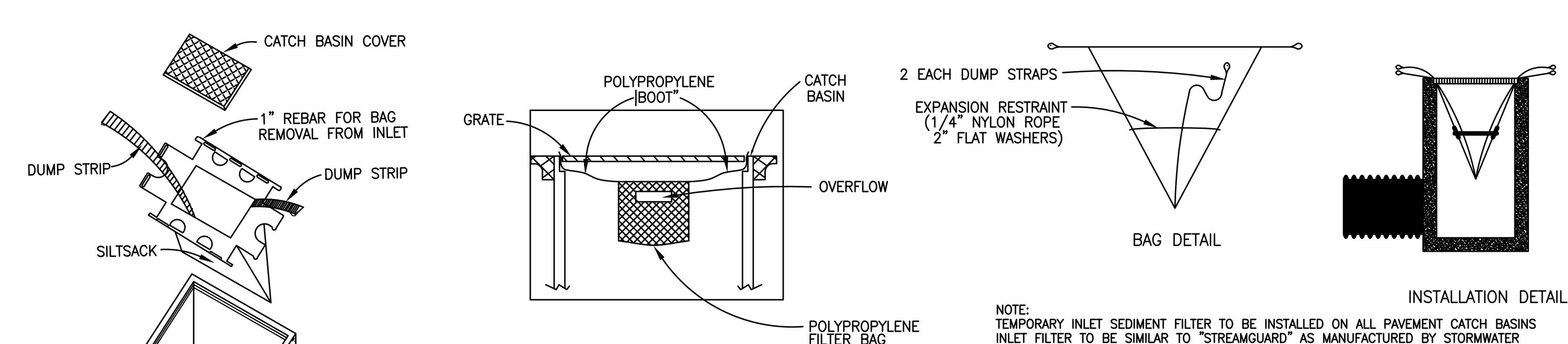
SECTION "A"-"A"



TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT
NO SCALE



TYPICAL RIP-RAP DETAIL
(SCALE: NONE)



INLET SEDIMENT FILTER TEMPORARY
NO SCALE

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.

LIVINGSTON COUNTY SOIL EROSION PERMIT TEMPLATE TEMPORARY CONTROLS AND SEQUENCE

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

PERMITTING STANDARDS

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

RETENTION PONDS

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

SLOPES AND DITCHES

14. ON SITE DITCHES SHALL BE OF THE FLAT BOTTOM TYPE MINIMUM WIDTH OF 2' WITH A MINIMUM OF 3 HORIZONTAL TO 1 VERTICAL SIDE SLOPES, 3:1.
15. DITCHES WITH STEEP SLOPES WILL NEED FLOW CHECKS TO PREVENT SCOURING OF THE DITCH BOTTOM. THESE SHALL BE INSTALLED AS DIRECTED BY THE ENGINEER OR INSPECTOR.
16. SLOPES IN EXCESS OF 3 HORIZONTAL TO 1 VERTICAL SHALL NOT BE USED EXCEPT WITH A MECHANICAL DEVICE SUCH AS A RETAINING WALL, TERRACING, OR OTHER PRIOR APPROVED DEVICE. STORM DRAINS
17. ALL STORM WATER STRUCTURES, CATCH BASINS AND/OR MANHOLES, IF BLOCK, SHALL BE PLASTERED ON BOTH THE INSIDE AND OUTSIDE OF THE STRUCTURES. GROUTING AND POINTING WILL BE NECESSARY AT THE CASTING AND STRUCTURE JOINT TO PREVENT LEAKAGE AND THE RESULTING SOIL MOVEMENT, AROUND THE STRUCTURE.
18. STORM WATER INLETS SHALL HAVE AS A TEMPORARY CONTROL A STRAW BALE BARRIER AND STONE FILTER INSTALLED AROUND THE INLET DURING CONSTRUCTION. AS AN ALTERNATIVE TO THE STRAW BALE BARRIER, A BURLAP AND PEA STONE FILTER MAY BE USED. THREE LAYERS OF BURLAP FIBER AND A FILTER OF PEA STONE MINIMUM 1 FT. IN DEPTH CAN BE USED. DUE TO THE POROSITY OF THE BURLAP FILTER THE MINIMUM OF 1
FT. OF STONE IS VERY IMPORTANT. THE CONTROL SHALL BE INSTALLED AS SOON AS THE STRUCTURE IS BUILT AND INSPECTED DAILY.
19. BURLAP AND PEA STONE FILTERS WILL NEED TO BE CHANGED AFTER EACH RAINFALL.
20. COUNTY CODE REQUIRES A MINIMUM PIPE SIZE OF 12" IN DIAMETER. IF SMALLER PIPE IS NEEDED FOR OUTLET PURPOSES THE 12" CAN BE BAFFLED TO THE CORRECT SIZE. ALL PIPE SHALL MEET THE 12" DIAMETER CODE SIZE.
21. ALL STORM DRAIN OUTLETS 15" IN DIAMETER OR LARGER SHALL HAVE ANIMAL GUARDS INSTALLED TO PREVENT ENTRANCE TO THE SYSTEM.
22. ALL STORM DRAINAGE PIPE 30" IN DIAMETER OR LARGER SHALL BE POINTED, AT THE JOINTS ON THE INSIDE WITH MORTAR, AFTER BACKFILLING.
23. ALL STORM DRAIN OUTLETS THAT DO NOT EMPTY INTO THE RETENTION/DETENTION POND SHALL HAVE A TEMPORARY 5'X10'X3' SUMP INSTALLED AT THE TERMINATION OF THE STORM SEWER. UPON COMPLETION OF THE STABILIZATION WORK THE SUMP AREA SHALL BE FILLED AND RIP RAPPED WITH COBBLE STONE. SILT TRAPS SHALL BE INSPECTED AFTER EACH STORM.
24. STORM WATER OUTLETS DO DENOTE RIP RAP. ALL OUTLETS SHALL BE RIP RAPPED OVER KEYED FILTER FABRIC WITH A MINIMUM OF 15 SQ. YARDS OF 6" OR LARGER COBBLE STONE.
25. RIP RAP AS NOTED ON THE PLAN SHALL BE OF A FUNNEL SHAPE CONSTRUCTION, WIDTH SHALL INCREASE AS DISTANCE FROM THE OUTLET POINT INCREASES AT A 3:1 RATIO.
26. RIP RAP SHALL BE OF COBBLE STONE, 6" IN DIAMETER OR LARGER. GROUTING MAY BE NECESSARY, AND SHALL BE A MINIMUM OF 6" IN DEPTH WITH THE COBBLE SET IN THE CEMENT SLURRY.
27. STORM WATER OUTLET IS IN NEED OF A SPLASH BLOCK WHICH IS NOT NOTED ON THE PLAN. INSTALL SPLASH BLOCK IF SLOPE OF THE PIPE IS 4% OR GREATER.
28. IT WILL BE NECESSARY FOR THE DEVELOPER TO HAVE THE STORM DRAINAGE LINES CLEANED PRIOR TO FINAL INSPECTION BY THE LIVINGSTON COUNTY DRAIN COMMISSIONER'S OFFICE. IF REQUIRED, THIS WORK SHALL BE DONE BY A PROFESSIONAL SEWER CLEANING FIRM AND CERTIFIED IN WRITING BY THE PROJECT ENGINEER. ALL SUMPS AND TEMPORARY SILT TRAPS SHALL ALSO BE CLEANED AT THIS TIME.

STABILIZATION

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

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

MAINTENANCE SCHEDULE FOR SOIL EROSION CONTROLS

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

SILT FENCE SHALL BE A MINIMUM 36".

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

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

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

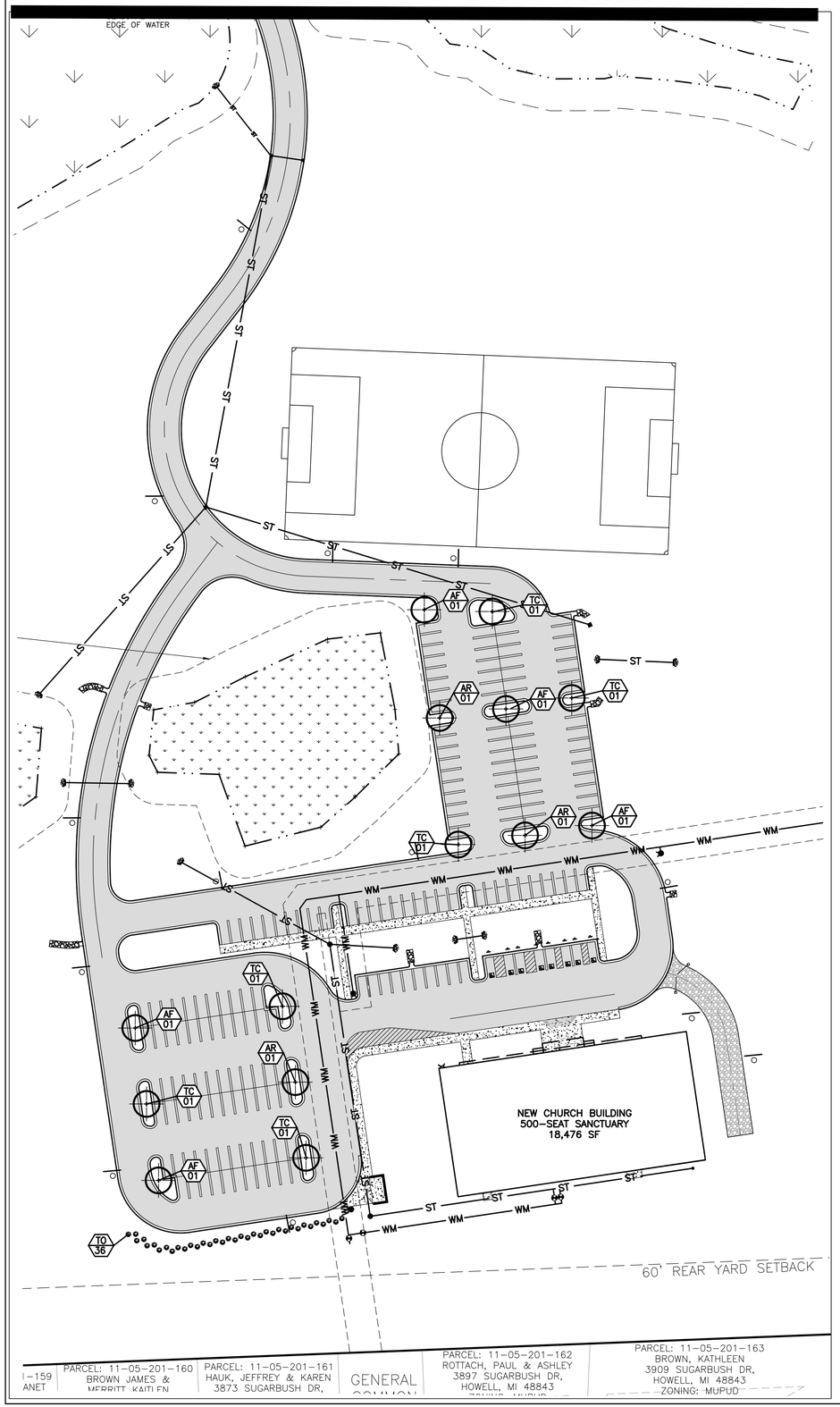
PROJECT: BIBLE BAPTIST CHURCH

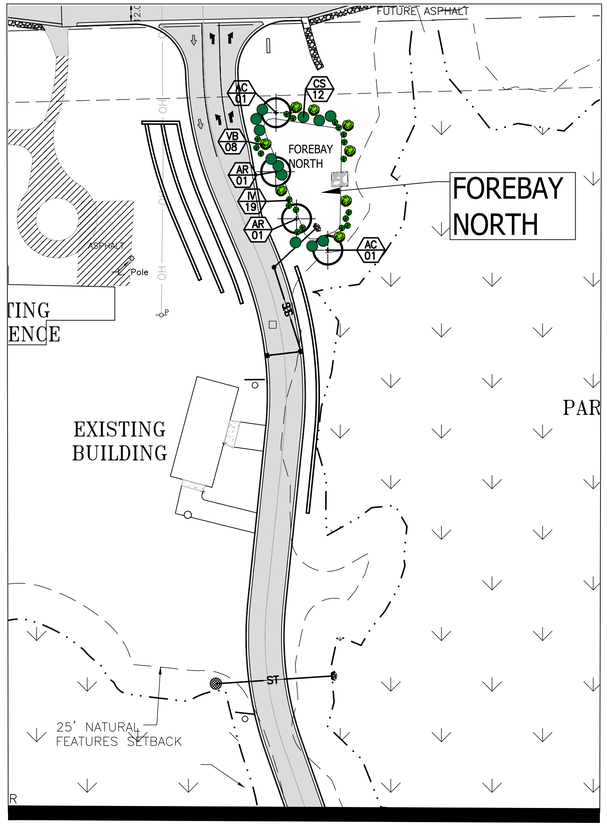
PREPARED FOR: BIBLE BAPTIST CHURCH
2258 EAST HIGHLAND ROAD
HOWELL, MI 48843
517-715-9233

TITLE: SOIL EROSION & SEDIMENTATION CONTROL PLAN

NO	BY	REVISION PER	DATE
2	ST	PER TWP REVIEW	3/16/22
1	ST	PER TWP REVIEW	2/23/22

DESIGNED BY: ST
DRAWN BY: JS
CHECKED BY:
SCALE 1" = 80'
JOB NO. 21-542
DATE 2/1/2022
SHEET NO. 9





LEGEND

PROPOSED (PR)	EXISTING (EX)	
900	900	CONTOUR
T/C		STORM DRAINAGE FLOW
XXX.XX	+ 922.08	SPOT 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
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
X	X	FENCE
		SIGN
TBR		TO BE REMOVED
CB 1		STORM SEWER LABEL
GV 1		WATER MAIN LABEL
		WETLAND BOUNDARY

N

LANDSCAPE LEGEND

- EXISTING DECIDUOUS TREE
- EXISTING EVERGREEN TREE
- PROPOSED DECIDUOUS TREE
- PROP. LARGE DECIDUOUS SHRUB
- PROP. MEDIUM/LARGE DECID. SHRUB
- PROP. SMALL DECIDUOUS SHRUB
- PROP. SMALL EVERGREEN SHRUB

LANDSCAPE REQUIREMENTS PER ORDINANCE AND CALCULATIONS

1. MULTIPLE MATURE TREES OVER THREE (3) INCHES CALIPER AND IN GOOD CONDITION ALONG THE DRIVEWAY TO REMAIN.

2. DETENTION/RETENTION POND LANDSCAPING
   a. FREE FORM AS POSSIBLE, SIDE SLOPES NOT TO EXCEED 1 FOOT VERTICAL FOR EVERY THREE FEET HORIZONTAL
   b. 1 DECIDUOUS SHADE OR EVERGREEN TREE AND 10 SHRUBS FOR EVERY FIFTY LINEAL FEET OF POND PERIMETER AS MEASURED ALONG THE TOP OF THE BANK ELEVATION. LANDSCAPE TO BE LIMITED TO ABOVE FREEBOARD LEVEL.
   REQUIRED FOREBAY NORTH: 193 LF/50=3.86 TREES AND 3.86*10=38.6 SHRUBS
   PROVIDED FOREBAY NORTH: 4 TREES AND 39 SHRUBS

3. REQUIRED PARKING AREA LANDSCAPING
   a. AREAS CONTAINING TEN OR MORE PARKING SPACES SHALL BE PROVIDED WITH LANDSCAPING --101 THROUGH 200 SPACES: 1 CANOPY TREE AND 100 SF OF LANDSCAPED AREA PER 12 SPACES.
   REQUIRED: 186 SPACES / 12 = 15.5 TREES AND 1,550 SF LANDSCAPED AREA
   PROVIDED: 16 TREES, AND 5,145 SF LANDSCAPED AREA

4. PARKING SETBACK: WHEREVER AN OFF-STREET PARKING AREA IS ADJACENT TO A RESIDENTIAL DISTRICT, THERE SHALL BE A MINIMUM PARKING LOT SETBACK OF 50 FEET WITH A CONTINUOUS OBSCURING WALL, FENCE AND/OR LANDSCAPED AREA AT LEAST 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.
   PROVIDED: 36 SHRUBS PLANTED AT 4' TALL AT SOUTH EDGE OF PARKING LOT.

5. LANDSCAPE BUFFERS
   GREENBELTS ALONG THE RIGHT-OF-WAY AND A LANDSCAPED BUFFER ZONE BASED ON ADJACENT ZONING SHALL BE PROVIDED AS REQUIRED IN SECTION 12.02.
   REQUIRED: GREENBELT ALONG R.O.W. 20' WIDE, 1 CANOPY TREE FOR EVERY 40 LINEAR FEET OF FRONTAGE
   PROVIDED: LOCATION OF EXISTING WETLAND TO THE NORTH ALONG GOLF CLUB DR. PREVENTS PLANTING OF TREES ALONG R.O.W. EXISTING WOODLAND BUFFER ALONG LATSON ROAD R.O.W. TO REMAIN.

   REQUIRED: BUFFER TO MIXED USE PUD DISTRICT TO THE SOUTH
   PROVIDED: DENSE EXISTING 30'-60' WIDE BUFFER TO ADJACENT ZONING AT THE SOUTH WILL REMAIN. PLANTING ROW OF PLANTINGS ALONG THE SOUTHERN END OF THE SOUTHWEST PARKING LOT ADJACENT TO THE RESIDENTIAL TO THE SOUTH WHERE THE EXISTING VEGETATION REMAINING IS 30' WIDE.

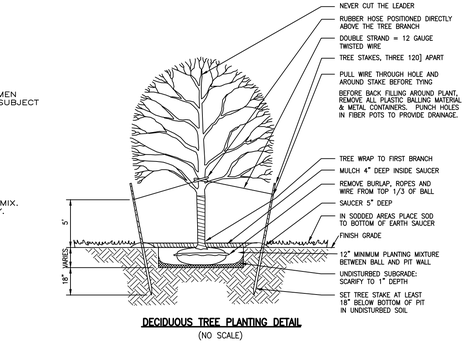
   REQUIRED: BUFFER TO RURAL RESIDENTIAL DISTRICT TO THE WEST
   PROVIDED: ADJACENT ZONING TO WEST IS SCREENED BY EXISTING WOODLANDS THROUGHOUT THE SITE (SEE OVERALL SITE PLAN SHEET 4)

GENERAL LANDSCAPE NOTES:

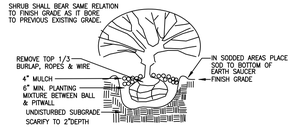
1. ALL PLANT MATERIAL SHALL CONFORM TO THE REQUIREMENTS AND SPECIFICATIONS OF THE GOVERNING MUNICIPALITY AND SHALL BE NURSERY GROWN. ALL SIZES AND MEASUREMENTS SHALL CONFORM TO ANSI Z60 STANDARDS. ALL PLANT MATERIAL SHALL BE OF SELECTED SPECIMEN QUALITY AND HAVE A NORMAL HABIT OF GROWTH. ALL PLANT MATERIAL IS SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT.
2. ALL PLANT MATERIALS SHALL BE BALLED AND BURLAPPED STOCK OR CONTAINER STOCK. NO BARE ROOT STOCK IS PERMITTED. ALL PLANT BALLS SHALL BE FIRM, INTACT AND SECURELY WRAPPED AND BOUND.
3. ALL PLANT BEDS SHALL BE EXCAVATED OF ALL BUILDING MATERIALS AND OTHER EXTRANEOUS OBJECTS AND POOR SOILS TO A MINIMUM DEPTH OF 12 INCHES AND BACKFILLED TO GRADE WITH PLANTING MIX (SEE BELOW).
4. PLANTING MIXTURE SHALL CONSIST OF 4 PARTS TOPSOIL FROM ON SITE, 1 PART PEAT, AND 5 POUNDS OF SUPERPHOSPHATE PER CUBIC YARD OF MIX. INGREDIENTS SHALL BE THOROUGHLY BLENDED TO A UNIFORM CONSISTENCY.
5. ALL PLANT BEDS AND INDIVIDUAL PLANTS SHALL BE MULCHED WITH A 3 INCH LAYER OF SHREDDED BARK MULCH.
6. ALL PLANTS AND PLANT BEDS SHALL BE THOROUGHLY WATERED UPON COMPLETION OF PLANTING AND STAKING OPERATIONS.
7. 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 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 REQUIREMENTS.
8. ALL LANDSCAPE BEDS SHALL BE EDGED WITH BLACK ALUMINUM EDGING, 1/8" X 4". INSTALL PER MANUFACTURER'S INSTRUCTIONS. ALL EDGING SHALL BE INSTALLED IN STRAIGHT LINES OR SMOOTH CURVES WITHOUT IRREGULARITIES.
9. SOD SHALL BE DENSE, WELL ROOTED TURF, FREE OF WEEDS. IT SHALL BE COMPRISED OF A BLEND OF AT LEAST TWO KENTUCKY BLUEGRASSES AND ONE FESCUE. IT SHALL HAVE A UNIFORM THICKNESS OF 3/4 INCH, 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 ONE MONTH SHALL BE REPLACED BY THE CONTRACTOR, AT NO COST TO THE OWNER.
10. ALL AREAS OF THE SITE THAT BECOME DISTURBED DURING CONSTRUCTION AND ARE NOT TO BE PAVED, STONED, LANDSCAPED, OR SODDED SHALL BE SEEDED AND MULCHED.
    SEED MIXTURE SHALL BE AS FOLLOWS:

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

    THE ABOVE SEED MIXTURE SHALL BE SOWN AT A RATE OF 250 POUNDS PER ACRE. PRIOR TO SEEDING, THE TOPSOIL LAYER SHALL BE FERTILIZED WITH A COMMERCIAL FERTILIZER WITH A 10-0-10 ANALYSIS:
    10% NITROGEN; A MINIMUM OF 25% FROM A UREAFORMALDEHYDE SOURCE
    0% PHOSPHATE
    10% POTASH; SOURCE TO BE POTASSIUM SULFATE OR POTASSIUM NITRATE.
    THE FIRST FERTILIZER APPLICATION SHALL BE AT A RATE OF 10 POUNDS OF BULK FERTILIZER PER 1000 SQUARE FEET.
    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 RESEEDED AND SUCH RESEEDING SHALL CONTINUE UNTIL A DENSE LAWN IS ESTABLISHED. DAMAGE TO SEEDED AREAS RESULTING FROM EROSION SHALL BE REPAIRED BY THE CONTRACTOR.
11. ALL PLANT MATERIALS SHALL BE FREE OF WEEDS, INSECTS AND DISEASE.



DECIDUOUS TREE PLANTING DETAIL
(NO SCALE)



SHRUB PLANTING DETAIL
(NO SCALE)

FOREBAY NORTH PLANT LIST

KEY	QUAN.	BOTANICAL NAME	COMMON NAME	SIZE	REMARK
TREES					
AC	02	Amelanchier canadensis	Serviceberry	2.5" cal.	B-B
AR	02	Acer rubrum 'October Glory'	Red Maple 'October Glory'	2.5" cal.	B-B
SHRUBS					
CS	12	Cornus sericea	Red Osier Dogwood	30" ht.	B-B
IV	19	Ilex verticillata	Winterberry	24" ht.	B-B
VB	8	Viburnum trilobum	American cranberrybush viburnum	30" ht.	B-B

PLANT LIST

KEY	QUAN.	BOTANICAL NAME	COMMON NAME	SIZE	REMARK
TREES					
AF	05	Acer x freemanii	Autumn Blaze Maple	2.5" cal.	B-B
AR	03	Acer rubrum 'October Glory'	Red Maple 'October Glory'	2.5" cal.	B-B
TC	06	Tilia cordata	Little-leaf Linden	2.5" cal.	B-B
SHRUBS					
TO	36	Thuja Occidentalis 'Nigra'	Black Arborvitae	48" ht.	B-B

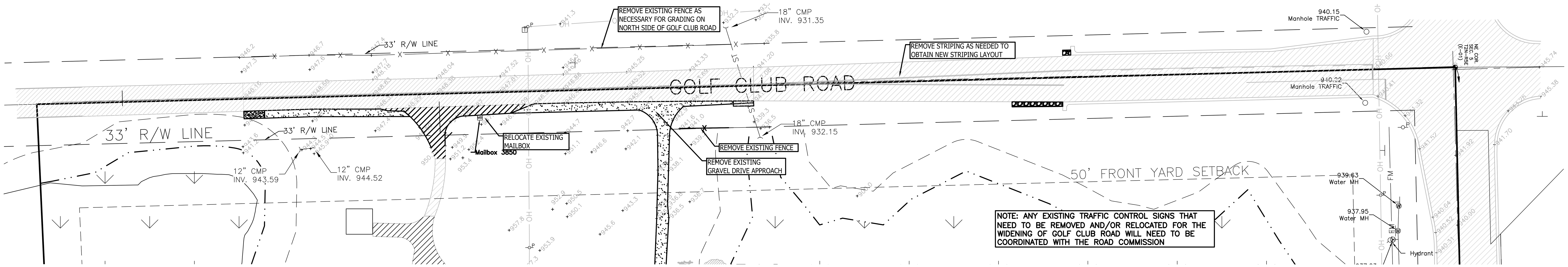
BE BOSS Engineering
Engineers Surveyors Planners Landscape Architects
3121 E. GRAND RIVER AVE.
HOWELL, MI. 48843
517.546.4836 FAX 517.548.1670

PROJECT: PHASE I BIBLE BAPTIST CHURCH CAMPUS
PREPARED FOR: BIBLE BAPTIST CHURCH
2258 EAST HIGHLAND ROAD
HOWELL, MI 48843
517-715-9233

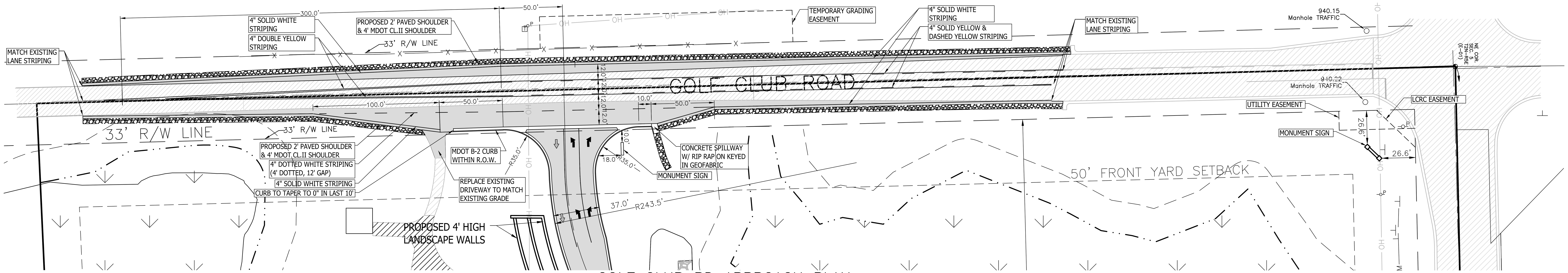
TITLE: LANDSCAPE PLAN

NO	BY	REVISION PER	DATE
2	ST	PER TWP REVIEW	3/16/22
1	ST	PER TWP REVIEW	2/23/22

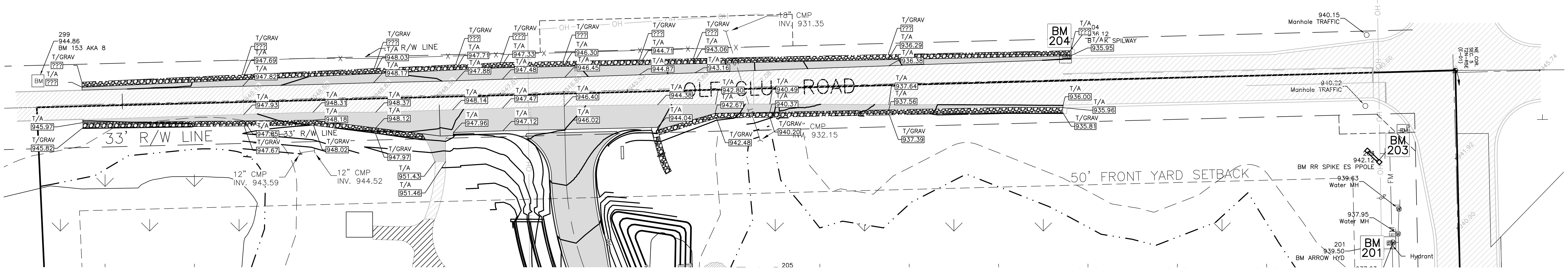
DESIGNED BY: JA
DRAWN BY: JA
CHECKED BY: ST
SCALE 1" = 50'
JOB NO. 21-542
DATE 2/1/2022
SHEET NO. 10



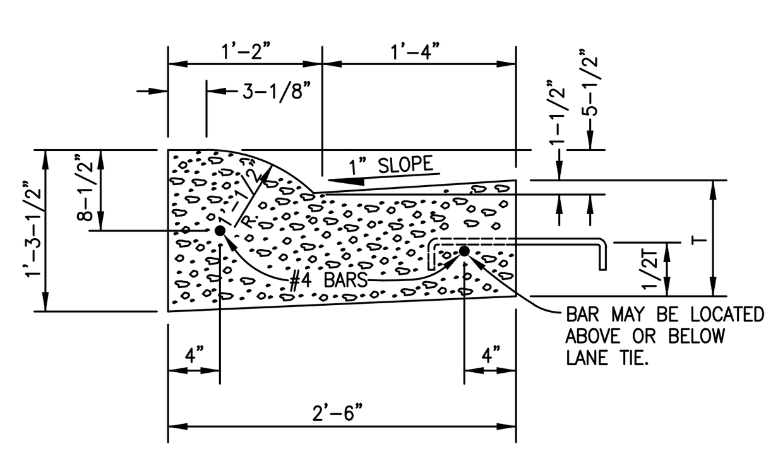
EXISTING CONDITIONS & DEMOLITION PLAN
SCALE: 1" = 40'



GOLF CLUB RD APPROACH PLAN
SCALE: 1" = 40'

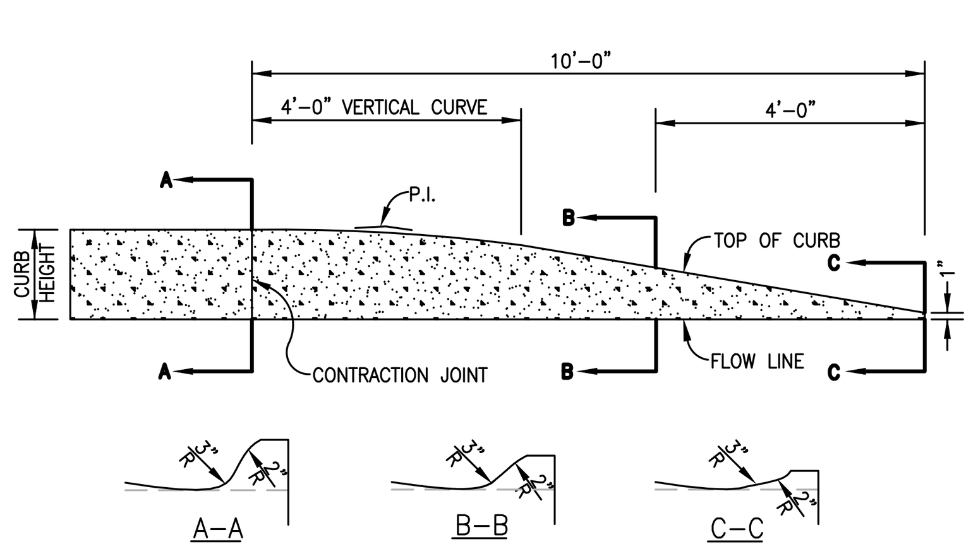


GOLF CLUB RD GRADING PLAN
SCALE: 1" = 40'

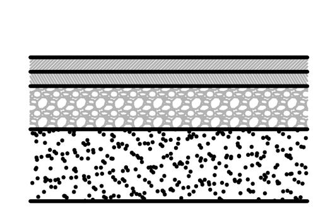


DETAIL	DIMEN. T	LANE TIES	CONCRETE CU.YD./LIN.FT.
B1	9"	AS SHOWN	0.0900
B2	9"	OMITTED	0.0900
B3	10"	AS SHOWN	0.0941

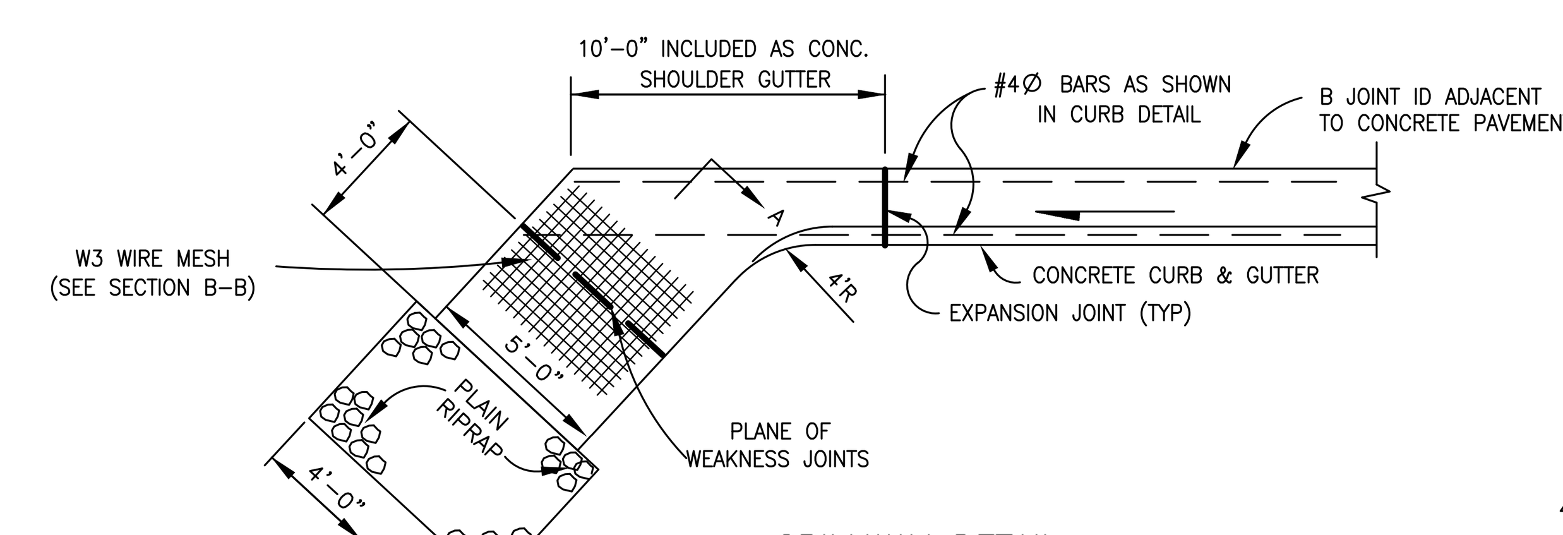
MDOT B-2 CURB DETAIL
(NO SCALE)
(GOLF CLUB RD. ROW)



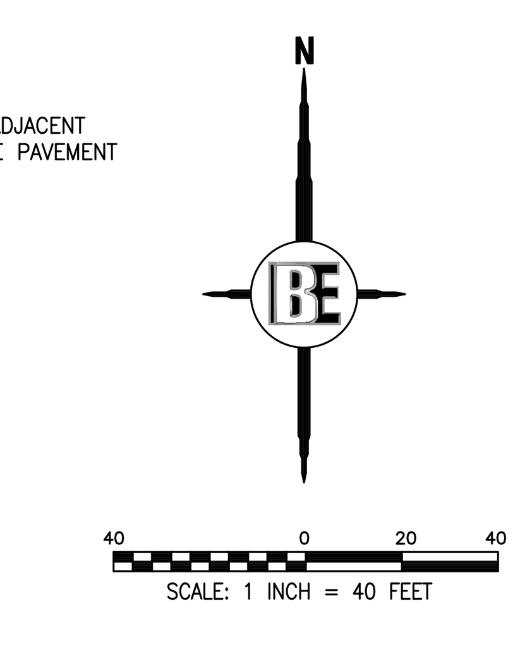
CONCRETE CURB AND GUTTER ENDINGS
(NO SCALE)

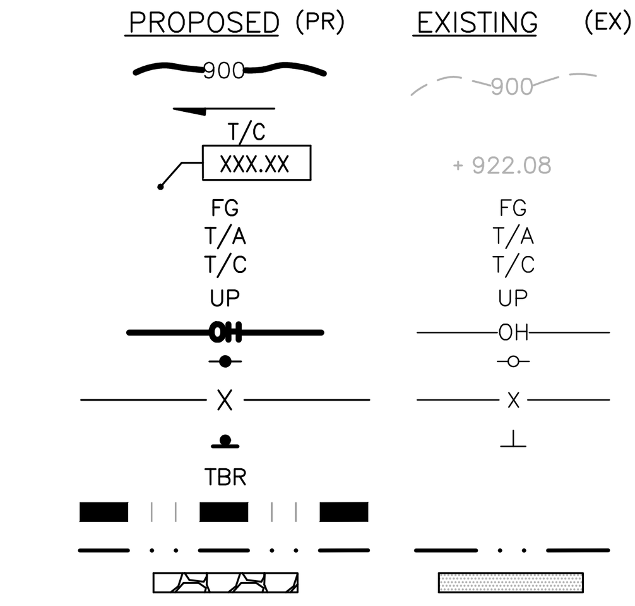


ASPHALT SECTION WITHIN GOLF CLUB ROAD R.O.W.
(NO SCALE)



SPILLWAY DETAIL
FOR USE AT END OF CURB
(ANGLED)





LEGEND

PROPOSED (PR)	EXISTING (EX)	
900	900	CONTOUR
		STORM DRAINAGE FLOW
XXX.XX	+ 922.08	SPOT ELEVATION
FG	FG	FINISHED GRADE ELEVATION
T/A	T/A	TOP OF ASPHALT
T/C	T/C	TOP OF CURB / CONCRETE
UP	UP	UTILITY POLE
OH	OH	OVERHEAD WIRE
		UTILITY POLE
X	X	FENCE
		SIGN
TBR		TO BE REMOVED
		LIMITS OF GRADING/CLEARING
		WETLAND BOUNDARY
		GRAVEL
		ASPHALT

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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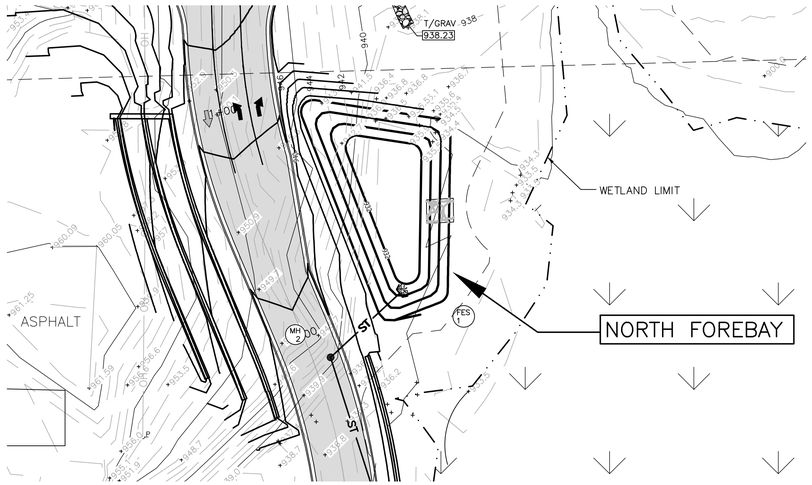
PROJECT
BIBLE BAPTIST CHURCH

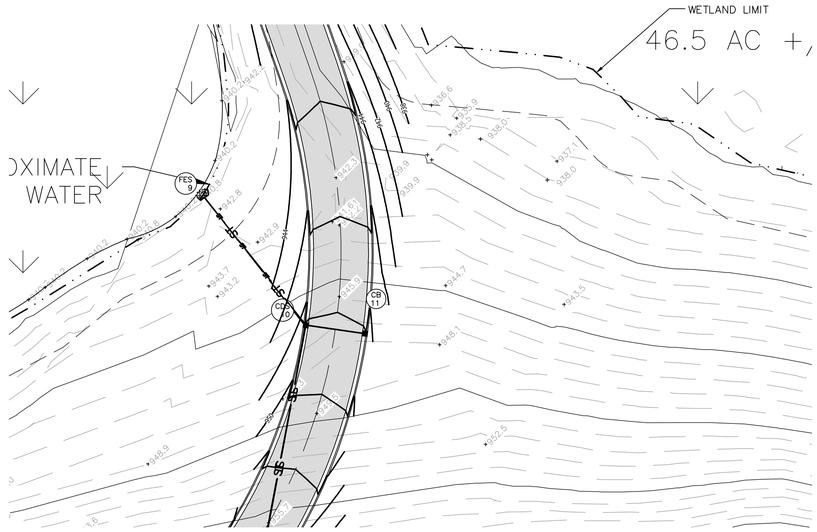
PREPARED FOR
BIBLE BAPTIST CHURCH
2258 EAST HIGHLAND ROAD
HOWELL, MI 48843
517-715-9233

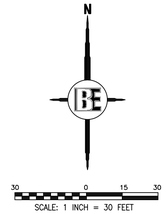
TITLE
GOLF CLUB ROAD APPROACH

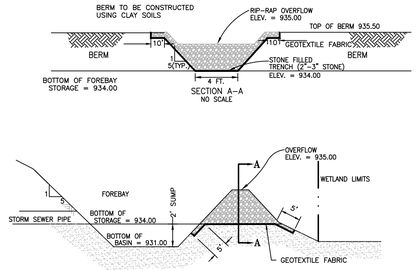
NO	BY	REVISION PER	DATE
2	ST	PER TWP REVIEW	3/16/22
1	ST	PER TWP REVIEW	2/23/22

DESIGNED BY: ST
DRAWN BY: JS
CHECKED BY: ST
SCALE 1" = 40
JOB NO. 21-542
DATE 2/1/2022
SHEET NO. 11









NORTH FOREBAY CROSS SECTION
NOT TO SCALE

LIVINGSTON COUNTY DETENTION BASIN CALCULATIONS - NORTH FOREBAY

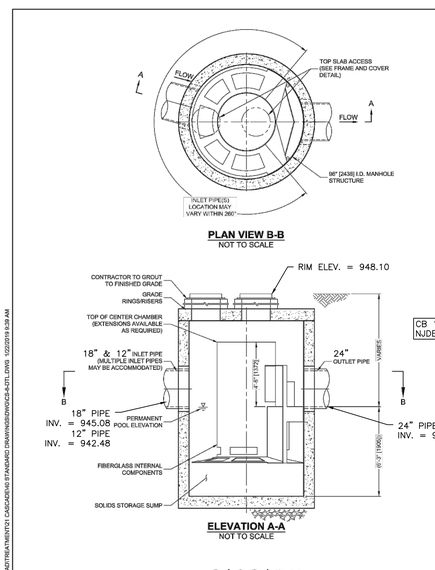
AREA (ACRES)	IMPERVIOUS FACTOR	ACRE IMPERVIOUS
0.73	0.9	0.66
0.00	0.7	0.00
1.16	0.2	0.23

COMPOUND C: 0.47
TOTAL DRAINAGE AREA: 1.89 ACRES

WATER QUALITY VOLUME
V_{WQ} = 3,630(C)(A) 3225 CF

FOREBAY STORAGE VOLUME PROVIDED:

ELEV	AREA	VOLUME	CUMMULATIVE VOLUME	
935	3913	3401	3401	
934	2898	2446		BOTTOM OF STORAGE
933	2003	1632		SUMP
932	1260			SUMP
931	0			SUMP



CB 10: 7.2 CFS PER NJDEP CRITERIA

FRAME AND COVER
(DIAMETER VARIES)
NOT TO SCALE

CASCADE SEPARATOR DESIGN NOTES

THE STANDARD CS-8 CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (cfs [L/s])			
PEAK FLOW RATE (cfs [L/s])			
RETURN PERIOD OF PEAK FLOW (yrs)			
RIM ELEVATION			
PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
NOTES / SPECIAL REQUIREMENTS:			

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CASCADE SEPARATOR WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. CASCADE SEPARATOR STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2' [610], AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. CASCADE SEPARATOR STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C478 AND AASHTO LOAD FACTOR DESIGN METHOD.
6. ALTERNATE UNITS ARE SHOWN IN MILLIMETERS [mm].

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CASCADE SEPARATOR MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CASCADE separator™

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CS-8
CASCADE SEPARATOR
STANDARD DETAIL

LIVINGSTON COUNTY DETENTION BASIN CALCULATIONS

AREA (ACRES)	IMPERVIOUS FACTOR	ACRE IMPERVIOUS
3.60	0.9	3.24
3.50	0.9	3.15
5.72	0.2	1.14

COMPOUND C: 0.59
TOTAL DRAINAGE AREA: 12.83 ACRES

WATER QUALITY VOLUME
V_{WQ} = 3,630(C)(A) 27478 CF

CHANNEL PROTECTION VOLUME
V_{CPVC} = 4,719(C)(A) 35721 CF

CHANNEL PROTECTION RATE CONTROL VOLUME
V_{CPRC} = 6,897 (C)(A) 52208 CF

EXTENDED DETENTION OUTLET RATE
V_{ED} = (1"/12")(43560)(C)(A)(P) = 52208 CF
Q_{ED} = V_{ED}/(48hr) 0.302 CFS
H_{ED} = V_{ED}/4,800 $(H)^{1/2}$ 5.8 1" HOLES
H = 3.5 FT
$ELEV_{ED}$ = 945.49

100-YEAR POST CONSTRUCTION INLET RATE
Q_{100in} = $(C)(A)30.2033x100^{(1-22/32)}/(T_c+9.1747)^{(1.8/32)}$ 48.25 CFS

100-YEAR ALLOWABLE OUTLET RATE
Q_{DRAIN} = 0.2 (A) 2.566 CFS
Q_{VRR} = 1.1055 - 0.205LN(A) 0.580 CFS
Q_{100ALL} = LESSER OF Q_{DRAIN} & Q_{VRR} 0.580 CFS

100-YEAR DETENTION VOLUME
R = 0.206- 15(ln(Q_{100all}/Q_{100IN}) 0.6461
V_{100in} = 18985 (C)(A) 143711 CF
V_{100det} = V_{100in}*R-V_{cp} 92853 CF

FROM	TO	ACRES A	RUNOFF COEFF C	EQUIV AREA A * C	INTEN-SITY I	TIME OF CONC T_C	ADD'L RUNOFF Q	RUNOFF (CFS) Q	PIPE LENGTH (LF)	PIPE DIA (IN)	VELOCITY FLOWING FULL (FPS)	HYDRAULIC GRADIENT SLOPE %	ACTUAL SLOPE USED	MANNING FLOW CAPACITY	MANNING'S VELOCITY (FT/SEC)	TIME (MIN)	HG ELEV UPPER END	HG ELEV LOWER END	RIM ELEV UPPER END	INVERT UPPER END	INVERT LOWER END	DROP DISTANCE (FT)	RIM-INV	RIM-HG >1	PIPE COVER >2.667	FLOW THRU COVER
4	3	1.6535	0.41	0.6762	4.38	15.00		2.96	26	12	3.77	0.69%	2.00%	5.05	6.43	0.07	935.24	934.72	938.80	934.44	933.92		4.36	3.56	3.36	2.96
3	2	0.2401	0.90	0.2161	4.37	15.07		3.90	62	12	4.97	1.19%	1.50%	4.38	5.57	0.19	934.72	933.79	938.80	933.92	932.99		4.88	4.08	3.88	0.94
2	1	0	0.00	0	4.35	15.2524		3.90	39	12	4.97	1.19%	1.25%	3.99	5.09	0.13	933.79	933.30	939.42	932.99	932.50		6.43	5.63	5.43	0.00
6	5	0	0.00	0	4.38	15.00		0.00	81	24	0.00	0.00%	0.50%	16.04	5.11	0.26	936.87	936.46	940.50	935.27	934.86		5.23	3.63	3.23	0.00
22	21	0.4555	0.90	0.41	4.38	15.00		1.79	255	12	2.28	0.25%	1.00%	3.57	4.55	0.93	976.60	974.05	979.75	975.80	973.25		3.95	3.15	2.95	1.79
21	20	0	0.00	0	4.28	15.93		1.79	215	12	2.28	0.25%	1.50%	4.38	5.57	0.64	974.05	970.82	979.00	973.25	970.02	0.50	5.75	4.95	4.75	0.00
20	19	0	0.00	0	4.21	16.58	1.53	3.32	132	15	2.71	0.26%	1.00%	6.48	5.28	0.42	970.32	969.00	979.02	969.32	968.00		9.70	8.70	8.45	0.00
25	24	0.2975	0.59	0.1748	4.38	15.00		0.76	20	12	0.97	0.05%	1.20%	3.91	4.98	0.07	977.32	977.08	976.27	976.52	976.28		-0.25	-1.05	**-1.25**	0.76
23	20	0.5949	0.59	0.3496	4.38	15.00		1.53	50	12	1.95	0.18%	4.00%	7.14	9.10	0.09	976.07	974.07	975.27	975.27	973.27	3.75	0.00	-0.80	**-1.00**	1.53
15	14	1.3414	0.27	0.3576	4.38	15.00	3.32	4.89	50	15	3.98	0.57%	2.00%	9.16	7.46	0.11	966.00	965.00	968.00	965.00	964.00		3.00	2.00	**1.75**	1.56
13	12	6.3413	0.37	2.3322	4.38	15.00	4.89	15.09	195	18	8.54	2.05%	3.00%	18.24	10.32	0.31	966.53	960.68	964.33	965.33	959.48	6.00	-1.00	-2.20	**-2.50**	10.20
12	10	0.0548	0.90	0.0493	4.34	15.31	5.03	20.33	279	18	11.51	3.73%	3.00%	18.24	10.32	0.45	956.71	946.31	966.00	953.48	945.11	3.00	12.52	9.29	11.02	0.21
10	9	0.1024	0.90	0.0922	4.35	15.19	0.85	21.59	71	24	6.87	0.91%	1.00%	22.68	7.22	0.16	943.31	942.60	948.10	941.71	941.00		6.39	4.79	4.39	0.40
11	10	0.6251	0.31	0.195	4.38	15.00		0.85	26	12	1.09	0.06%	1.00%	3.57	4.55	0.10	943.57	943.31	948.10	942.77	942.51		5.33	4.53	4.33	0.85
18	17	0	0.00	0	4.38	15.00		0.00	60	15	0.00	0.00%	1.00%	6.48	5.28	0.19	972.60	972.00	971.60	971.60	971.00		0.00	-1.00	**-1.25**	0.00
16	12	2.5924	0.44	1.1497	4.38	15.00		5.03	314	15	4.10	0.60%	1.50%	7.93	6.46	0.81	965.89	961.18	970.00	964.89	960.18	6.50	5.11	4.11	3.86	5.03

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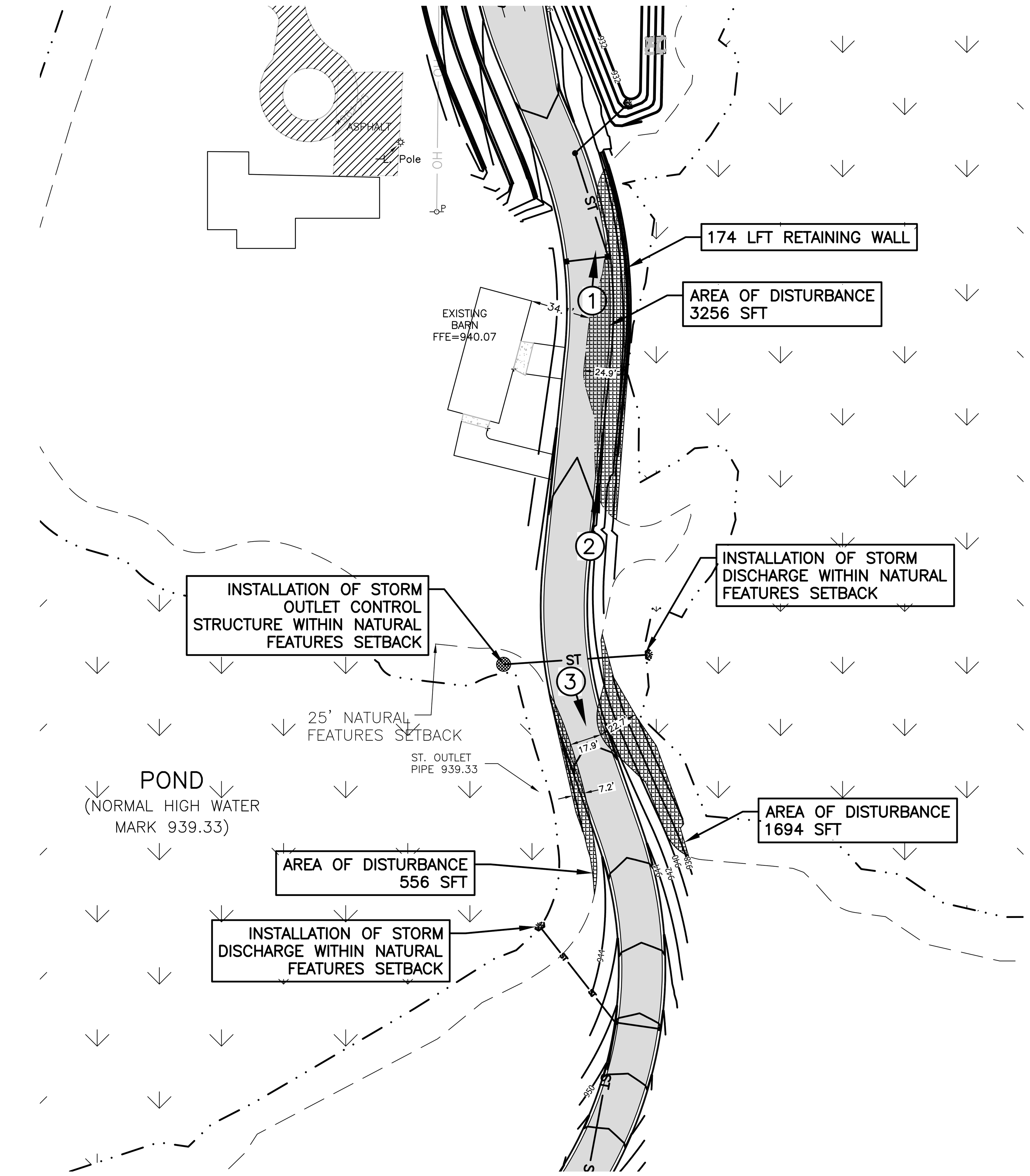
PROJECT: BIBLE BAPTIST CHURCH
PREPARED FOR: BIBLE BAPTIST CHURCH
2258 EAST HIGHLAND ROAD
HOWELL, MI. 48843
517-715-9233
TITLE: FOREBAY DETAILS

NO	BY	REVISION PER	DATE
1	ST	PER TWP REVIEW	3/16/22
2	ST	PER TWP REVIEW	2/23/22

DESIGNED BY: ST
DRAWN BY: JS
CHECKED BY:
SCALE 1" = 30'
JOB NO. 21-542
DATE 2/1/2022
SHEET NO. 12



NORTHERLY NATURAL FEATURES SETBACK ENCROACHMENTS

NATURAL FEATURES SETBACK DISTURBANCE NARRATIVE:

NORTH SIDE:

DESCRIPTION:
ON THE NORTH SIDE OF THE DEVELOPMENT, THERE ARE THREE AREAS OF NATURAL FEATURES SETBACK DISTURBANCES FOR GRADING ACTIVITIES AND THREE ENCROACHMENTS FOR INSTALLATION OF STORM SEWER CONTROL STRUCTURES AND END SECTIONS. THE THREE AREAS OF GRADING DISTURBANCE VARY IN WIDTH WITH THE WIDEST AREA THE FULL WIDTH OF THE SETBACK. THE LOCATION OF THE THREE CONTROL STRUCTURE/END SECTIONS ALL OCCUR AT THE EDGE OF THE WETLAND AND THUS HAVE A 25' ENCROACHMENT INTO THE NATURAL FEATURES SETBACK. LASTLY, THERE IS A PROPOSED RETAINING WALL LOCATED WITHIN THE NATURAL FEATURES SETBACK AND IS LOCATED AT THE EDGE OF THE WETLAND.

NECESSITY:
EACH OF THESE NATURAL FEATURES SETBACK DISTURBANCE AREAS ARE NECESSARY FOR ACCESS TO THE APPROXIMATELY 18 ACRES OF DEVELOPABLE PROPERTY AT THE SOUTH END OF THE PARCEL. THERE IS APPROXIMATELY 34' OF SEPARATION FROM THE EXISTING BARN STRUCTURE AND EXISTING WETLAND SETBACK AND ONLY 17.9' BETWEEN THE TWO WETLAND SETBACK LINES AT THE POND. THERE SIMPLY IS NOT ENOUGH HORIZONTAL SPACE TO LOCATE A DRIVE WITHOUT DISTURBANCE AT THESE LOCATIONS. THE GRADE WAS MATCHED AS CLOSELY AS IS FEASIBLE TO MINIMIZE THE ENCROACHMENT.

THE THREE ENCROACHMENTS FOR THE STORM WATER OUTLET CONTROL STRUCTURE AND END SECTIONS ARE NEEDED FOR THE REQUIRED SITES STORM WATER MANAGEMENT SYSTEM. GIVEN THE TOPOGRAPHY OF THE SITE, THE END SECTIONS NEED TO BE LOCATED CLOSELY TO THE WETLAND LOCATIONS TO MINIMIZE CHANCES OF EROSION ON SLOPES BETWEEN THE END SECTIONS AND THE WETLAND/POND. UTILIZATION OF THE POND FOR DETENTION STORAGE AS WELL AS THE STORM WATER DISCHARGE LOCATIONS AND STRUCTURES HAVE BEEN APPROVED BY MDEGLE IN PERMIT WRP026826. THE RETAINING WALL WITHIN THE WETLAND SETBACK IS NECESSARY TO AVOID GRADING/FILL WITHIN THE WETLAND AREA.

IMPACT:
AS YOU CAN SEE IN THE PICTURES ON THIS SHEET, THE GROUNDS HAVE HISTORICALLY BEEN MAINTAINED TO THE EDGE OF THE WETLAND WITH GRASS. THERE IS NO EXISTING VEGETATION BUFFER/TRANSITION TO THE WETLAND. SINCE THIS IS THE CASE, ONLY GRASS AREAS ARE BEING DISTURBED. ONCE THE PROPOSED DISTURBANCES ARE CONSTRUCTED, THE GROUND WILL BE RESEEDED WITH GRASS AND RETURNED TO ITS CURRENT GROUND COVER, THUS THERE IS NO LONG TERM IMPACT TO THE WETLANDS DUE TO THESE DISTURBANCES. IN THE SHORT TERM, THE SITE WILL BE REQUIRED TO OBTAIN A COUNTY SESC PERMIT AND NPDES PERMIT TO CONTROL SOIL EROSION ON SITE DURING CONSTRUCTION, AGAIN TO MINIMIZE IMPACTS TO THE WETLAND. ALSO, THE STORM WATER MANAGEMENT SYSTEM CONTAINS PRE-TREATMENT OF STORM WATER PRIOR TO DISCHARGE INTO THE EXISTING POND/DETENTION BASIN TO ENSURE WATER QUALITY STANDARDS ARE MET PER MDEGLE AND COUNTY REQUIREMENTS.

HYDROLOGY:
HYDROLOGY IS BEING MAINTAINED ON SITE. STORM WATER ON THE SOUTHERN PORTION OF THE SITE FLOWS TO THE WETLAND POCKET TO THE WEST OF THE PROPOSED PARKING LOT. THIS WETLAND CONTAINS AN EXISTING DRAIN TILE THAT DIRECTS STORM WATER NORTHERLY TO THE EXISTING POND. THE STORM WATER IN THE POND CURRENTLY DISCHARGES THROUGH AN EXISTING OUTLET PIPE DISCHARGING TO THE WETLAND ON THE NORTHEAST QUADRANT OF THE SITE. THE PROPOSED DIRECTION OF STORM WATER FLOW MAINTAINS THIS DRAINAGE PATTERN. UTILIZING THE EXISTING POND AS DETENTION STORAGE IS PERMITTED PER MDEGLE PERMIT WRP026826.

PHOTO 1 – FACING NORTHERLY TOWARD GOLF CLUB ROAD

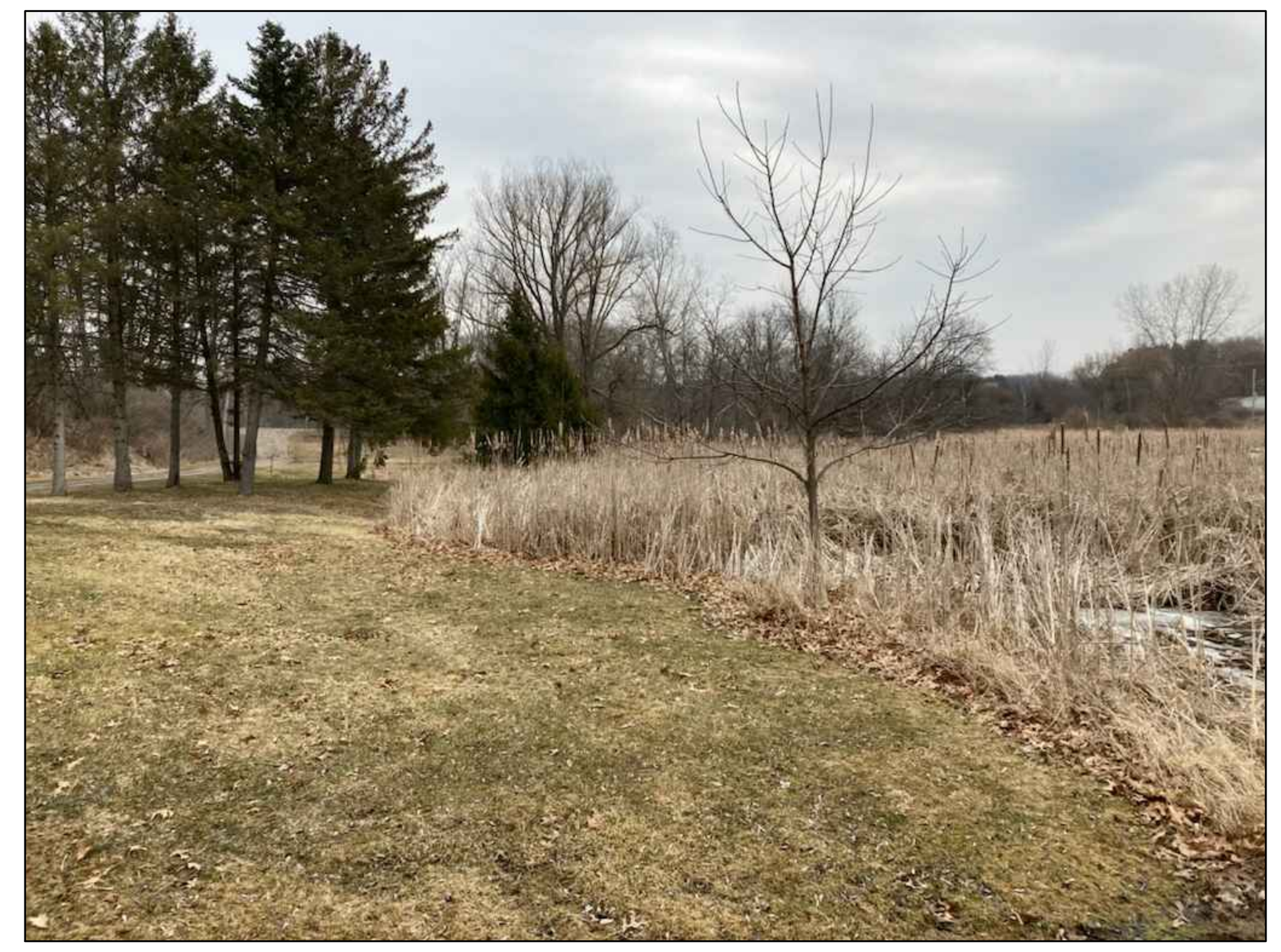


PHOTO 2 – FACING NORTHERLY TOWARD GOLF CLUB ROAD

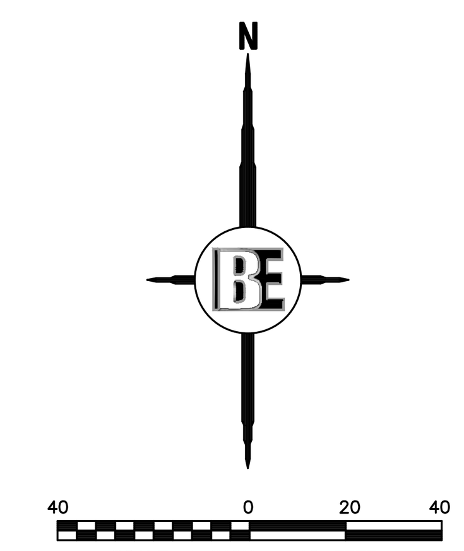
PHOTO 3 – FACING SOUTHERLY

PHOTO 4 – FACING NORTHERLY

PHOTO 5 – FACING NORTHERLY TOWARD GOLF CLUB ROAD

LEGEND

PROPOSED (PR)	EXISTING (EX)	
900	900	CONTOUR
CB 1		STORM SEWER LABEL
GV 1		WATER MAIN LABEL
		WETLAND BOUNDARY
		LIMITS OF CLEARANCE/DISTURBANCE
		WETLAND SETBACK FILL AREA
1		WETLAND PHOTO NUMBER/DIRECTION



SCALE: 1 INCH = 40 FEET

NATURAL FEATURES SETBACK DISTURBANCE NARRATIVE:

SOUTH SIDE:

DESCRIPTION:
ON THE SOUTH SIDE OF THE DEVELOPMENT, THERE ARE FOUR AREAS OF NATURAL FEATURES SETBACK DISTURBANCES FOR GRADING ACTIVITIES AND TWO ENCROACHMENTS FOR INSTALLATION OF STORM SEWER CONTROL STRUCTURES AND END SECTIONS. PARKING LOT ACCESS DRIVE AND SPILLWAY IS ALSO LOCATED WITHIN THE EASTERN UPLAND WETLAND POCKET SETBACK. THE FOUR AREAS OF GRADING DISTURBANCE VARY IN WIDTH WITH THE WIDEST AREA BEING APPROXIMATELY 22' WITHIN THE SETBACK. THE LOCATION OF THE TWO STORM WATER END SECTIONS ARE LOCATED JUST WITHIN THE NATURAL FEATURES SETBACK.

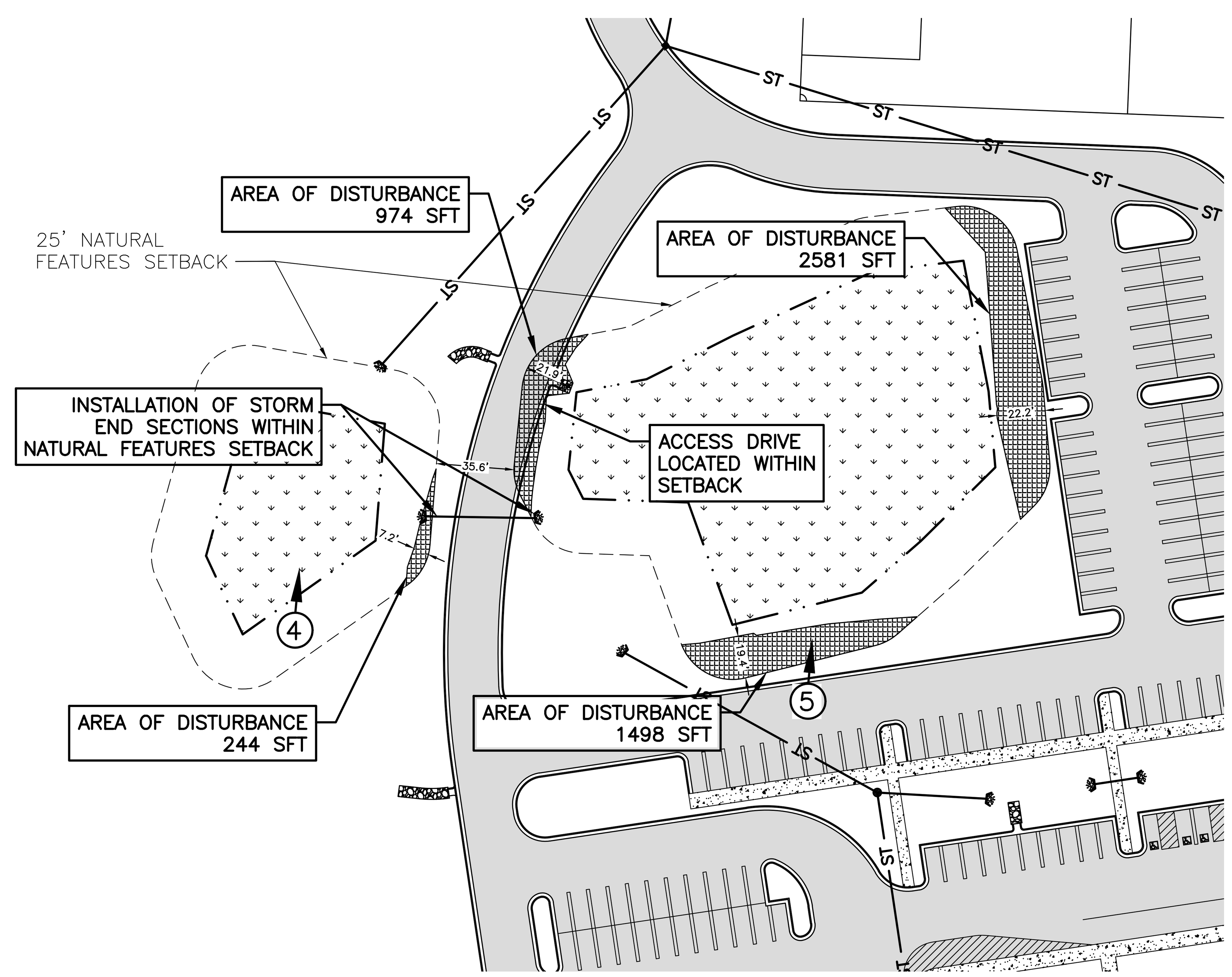
NECESSITY:
THE TWO GRADING DISTURBANCE AREAS ON THE WEST ARE DUE TO THE APPROXIMATELY 36' OF HORIZONTAL SPACE BETWEEN THE TWO WETLAND SETBACKS. THIS DRIVE IS 27' WIDE FROM BACK OF CURB TO BACK OF CURB. THE DISTURBANCE AREAS IS NECESSARY TO GRADE DOWN FROM THIS DRIVE TO THE EXISTING GRADE. THE SLOPES IN THIS STRETCH OF DRIVE HAVE BEEN MAXIMIZED IN ORDER TO MINIMIZE THE FILL/ENCROACHMENT NEEDED. IT WAS DETERMINED THAT DUE TO THE HYDROLOGY OF THE WESTERN UPLAND WETLAND POCKET COLLECTING THE WATER PRIOR TO AN EXISTING PIPED DISCHARGE TO THE NORTH, THAT THIS WETLAND IS OF MORE IMPORTANCE TO MINIMIZE ENCROACHMENT THAT IS THE EASTERN UPLAND WETLAND POCKET. FOR THIS REASON, THE ACCESS DRIVE WAS LOCATED SUCH THAT IT PRIMARILY ENCROACHES ON THE EASTERN UPLAND WETLAND SETBACK

THE TWO REMAINING ENCROACHMENTS FROM GRADING ARE ALSO NECESSARY DUE TO TOPOGRAPHIC CONSTRAINTS. EVEN THOUGH THE SOUTH SIDE OF THE SITE IS MOST PRACTICAL TO DEVELOP, THERE STILL REMAINS SOME CHALLENGING TOPOGRAPHIC CONDITIONS IN THIS AREA. THE PROPOSED ELEVATIONS OF THE SITE ARE APPROPRIATE IN TERMS OF ACCOMMODATING THE SITES TOPOGRAPHIC CONDITIONS IN ITS ENTIRETY. TO AVOID THESE TWO ENCROACHMENTS ON THE WEST WETLAND WOULD REQUIRE EITHER SIGNIFICANT ALTERATIONS TO THE PARKING LOT(WHICH COULD AFFECT THE OVERALL SITE CIRCULATION) AS WELL AS REQUIRE THE PROPOSED CHURCH BUILDING TO BE SHIFTED SOUTHERLY. THE LATTER IS NOT PREFERABLE EITHER AS THE CHURCH IS SEEKING TO MAINTAIN AS LARGE A NATURAL BUFFER AS FEASIBLE TO THE ADJACENT RESIDENTIAL PARCELS TO THE SOUTH.

IMPACT:
THESE TWO UPLAND WETLANDS ARE LOW QUALITY WETLANDS AS DETERMINED DURING THE WETLAND DELINEATION. THE WESTERN WETLAND POCKET CONTAINS DEADFALL AND MOWED PATHS WITHIN PORTIONS OF ITS WETLAND SETBACK WHILE THE EASTERN WETLAND CONTAINS PRIMARILY BRUSH AND SOME MOWED TRAILS. GIVEN THE WETLANDS ARE LOW QUALITY AND DISTURBANCE IS LIMITED TO WITHIN THE SETBACK AND NOT WITHIN THE WETLAND, THE NATURE OF THE WETLAND IS STILL BEING PRESERVED. A SIGNIFICANT AMOUNT OF SITE AREA IS BEING PRESERVED WHICH PROVIDES A NATURE CORRIDOR FOR WILDLIFE ON THE SITE.

HYDROLOGY:
THE WESTERN OF THE TWO WETLANDS IS A LOW POCKET THAT COLLECTS WATER FROM THE SOUTHERN PORTION OF THIS PARCEL. THERE IS AN EXISTING DRAIN PIPE THAT DRAINS THE WATER FROM THIS WESTERN WETLAND POCKET AND DRAINS IT NORTHERLY TOWARDS THE POND AT THE NORTHWEST QUADRANT OF THE PARCEL. THE EASTERN OF THESE TWO WETLANDS IS A FLOW THROUGH WETLAND. THERE IS A NATURAL WIDE 'DRAW' OF TOPOGRAPHY THROUGH THE AREA THAT DIRECTS WATER TOWARDS THE WESTERN WETLAND POCKET.

WITH THE CONSTRUCTION OF THE PROPOSED DRIVE AND PARKING LOTS, THE EASTERN OF THE TWO WETLANDS WILL BE SURROUNDED BY DEVELOPMENT. THIS DOES REDUCE THE AREA DRAINING THROUGH IT BY APPROXIMATELY 2.7 ACRES. BUT AGAIN, THE PRIMARY HYDROLOGY FOR THIS EASTERN WETLAND IS CONVEYING WATER TOWARDS THE WESTERN WETLAND POCKET, WHICH IT WILL CONTINUE TO DO VIA A STORM CULVERT UNDERNEATH THE DRIVE. THE WESTERN WETLAND POCKET WILL STILL COLLECT STORM WATER AND BE ABLE TO POND TO AN ELEVATION OF THE PROPOSED END SECTION OUTLET. THIS NEW END SECTION WILL DIRECT STORM WATER NORTHERLY TO THE POND IN THE NORTHWEST, AS IT CURRENTLY DOES. THESE UPLAND WETLAND AREAS ARE BEING UTILIZED IN A MANNER THAT IS CONSISTENT WITH THE DESIRED APPROACH/INTENT OF THE NEW LCDC STORM WATER STANDARDS WHERE INFILTRATION IS ENCOURAGE PRIOR TO DETENTION SYSTEMS VIA THE USE OF POCKET AREA, OPEN DITCHES, BIOSWALES, ETC.



SOUTHERLY NATURAL FEATURES SETBACK ENCROACHMENTS

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
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(TOLL FREE)
FOR THE LOCATION OF UNDERGROUND FACILITIES

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

PROJECT: BIBLE BAPTIST CHURCH

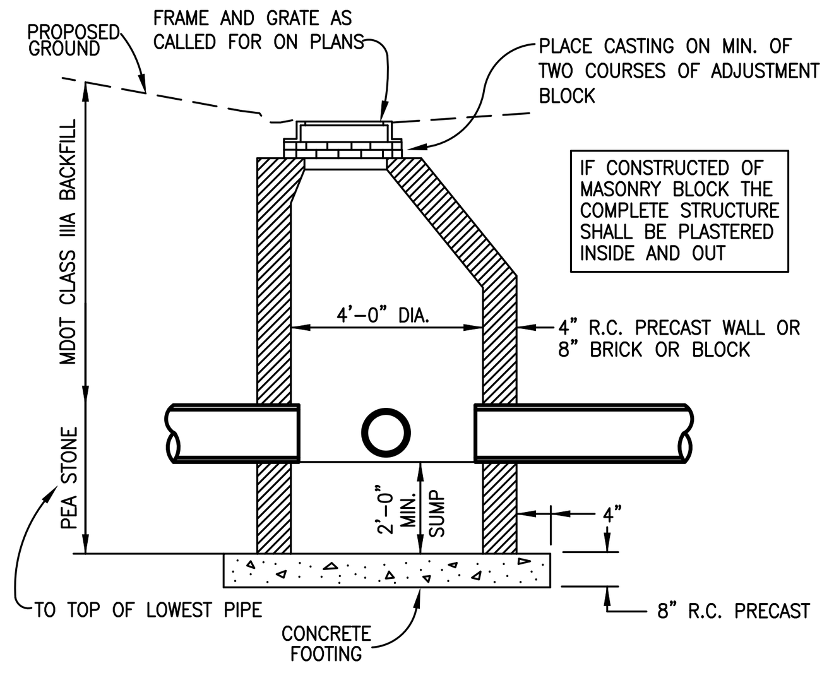
PREPARED FOR: BIBLE BAPTIST CHURCH
2258 EAST HIGHLAND ROAD
HOWELL, MI 48843
517-715-9233

TITLE: NATURAL FEATURES SETBACK DISTURBANCE

NO	BY	REVISION PER	DATE
1	ST	PER TWP REVIEW	2/23/22
2	ST	PER TWP REVIEW	3/16/22

DESIGNED BY: ST
DRAWN BY: MD
CHECKED BY:
SCALE 1" = 50'
JOB NO. 21-542
DATE 12/01/2021
SHEET NO. 13

BOSS Engineering



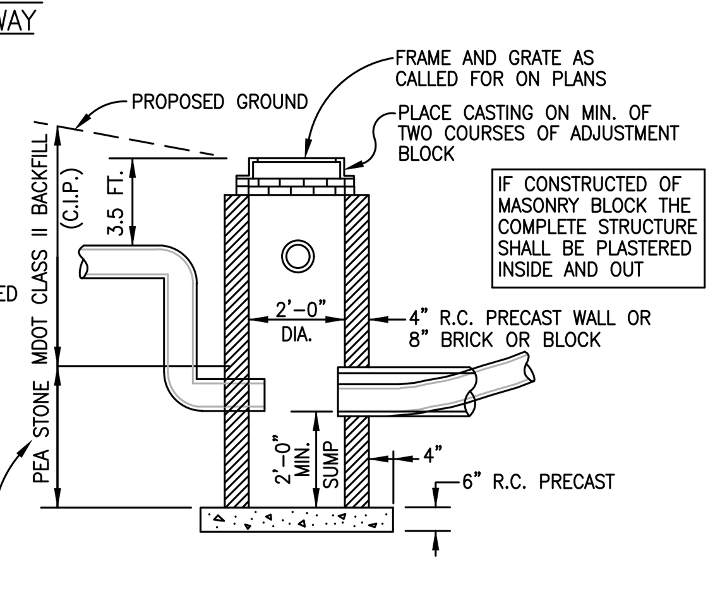
4 FT. DIA. CATCH BASIN W/SUMP

NO SCALE

INSTALL SUBDRAINS AT ALL CATCH BASINS LOCATED WITHIN ROADWAY

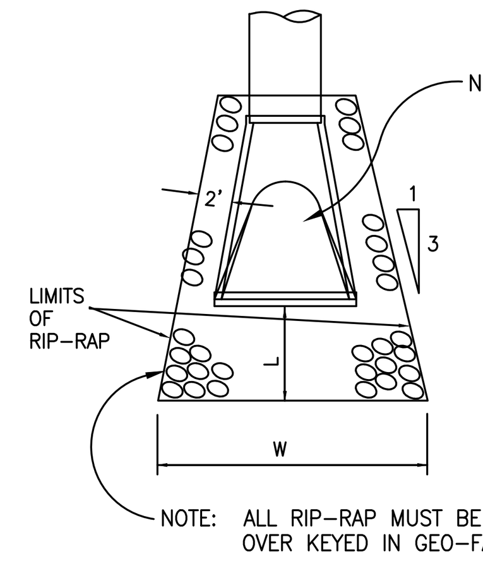
(1) 4 L.F. (MIN.) 6" Ø PERFORATED P.V.C. PIPE WRAPPED WITH GEOTEXTILE FABRIC PLACED AT LOWEST INVERT PARALLEL TO ROAD OR LINE OF PIPE. BACK-FILLED WITH PEA STONE ONE FOOT ABOVE PIPE.

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



2 FT. DIA. CATCH BASIN W/SUMP

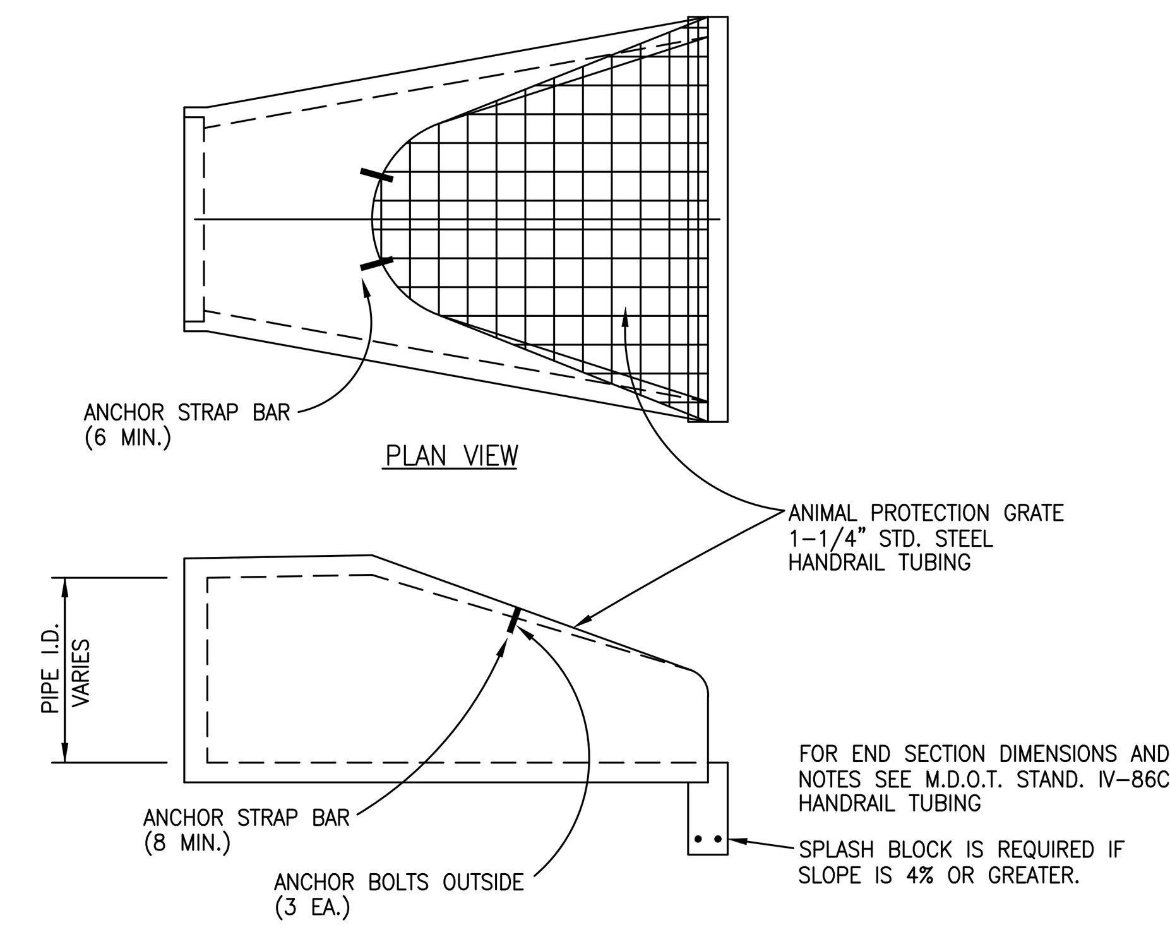
NO SCALE



SIZE FLARED END SECTION	DIM. "L"	DIM. "W"	AREA (SQ. YD.)
12"	12	14	15
15"	12	14	15
18"	15	16	20
21"	15	16	20
24"	15	16	20
27"	18	20	30
30"	17	20	30
36"	16	21	30

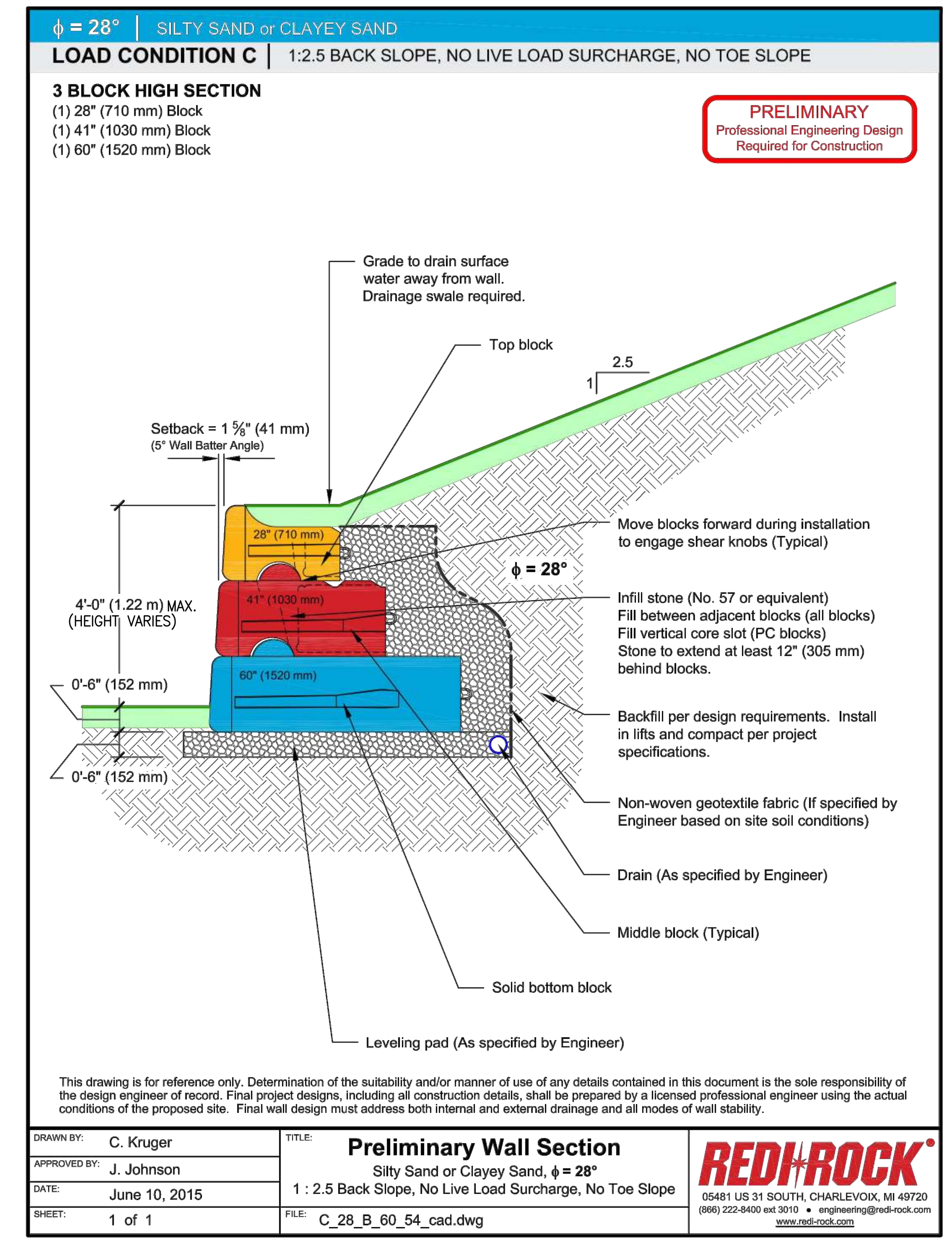
TYPICAL RIP-RAP DETAIL

(SCALE: NONE)



PRECAST CONCRETE END SECTION FOR PIPE CULVERT W/ ANIMAL GRATE

(NO SCALE)

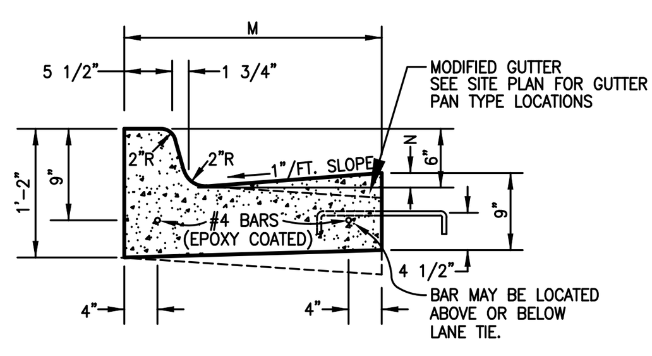


LANDSCAPE WALL DETAIL

SCALE: NONE

COVER	TYPE	USE	MANUFACTURER OR EQUAL: EAST JORDAN	MANUFACTURER OR EQUAL: NEENAH	TYPE OF COVER OR GRATE
A	MH	ALL	1120	R-1415	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-M1 5105-M1	R-2560-D	FLAT GRATE
E	CB & INLET	LAWN AREA OR DITCH	1020-01		BEEHIVE GRATE 4" HIGH

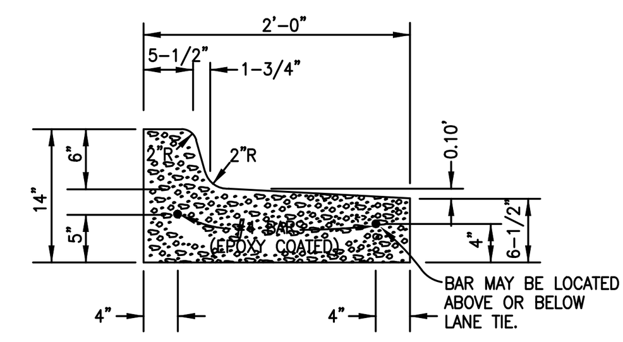
STRUCTURE FRAMES & COVERS



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

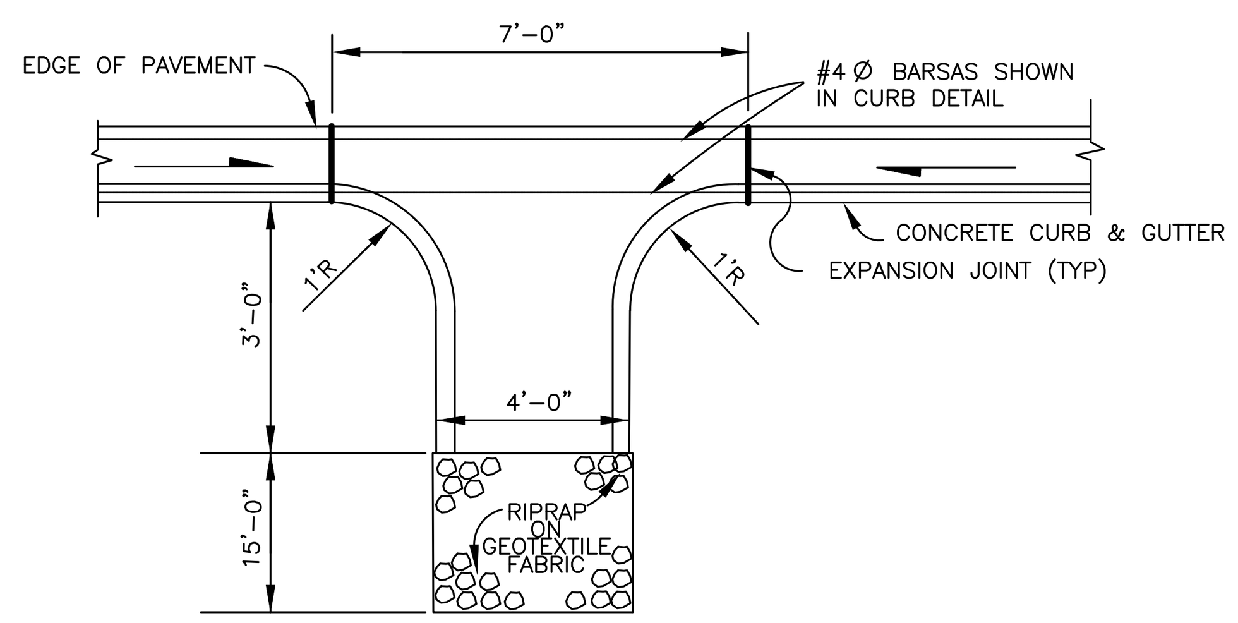
CONCRETE CURB & GUTTER TYPE F

(NO SCALE)



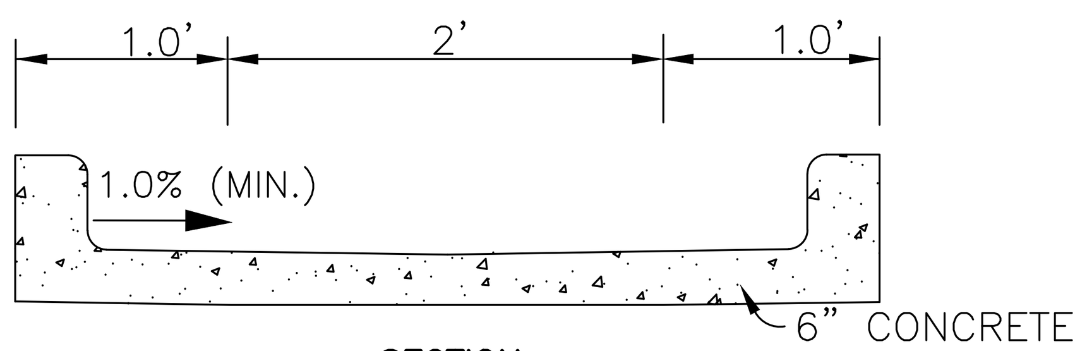
MODIFIED BARRIER (M.D.O.T. TYPE F4) (FOR ISLANDS ONLY)

(NO SCALE)

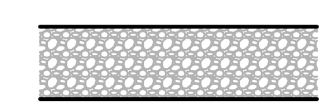


SPILLWAY DETAIL

NO SCALE

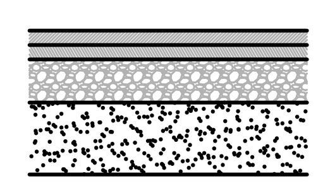


SECTION



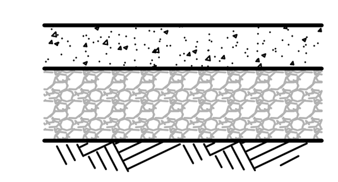
GRAVEL EMERGENCY FIRE ACCESS DRIVE

(NO SCALE)



COMMERCIAL DRIVE ASPHALT SECTION

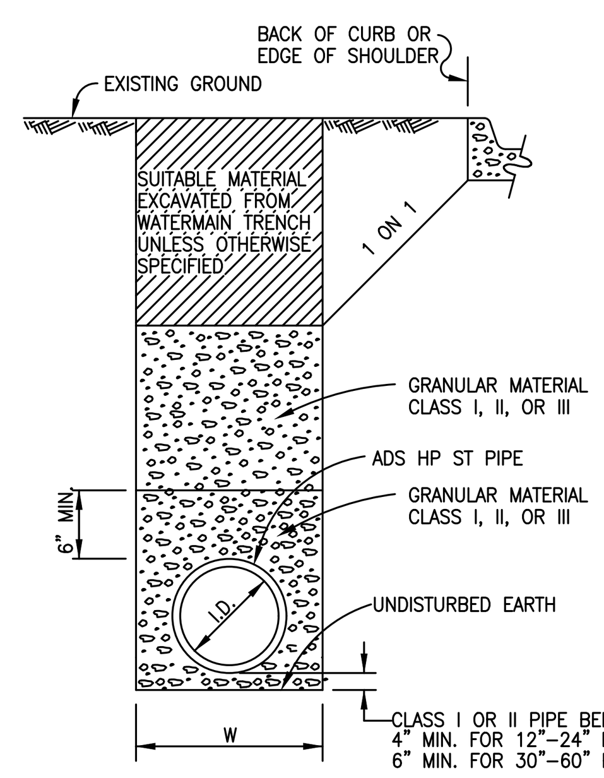
(NO SCALE)



CONCRETE PAVEMENT CROSS SECTION

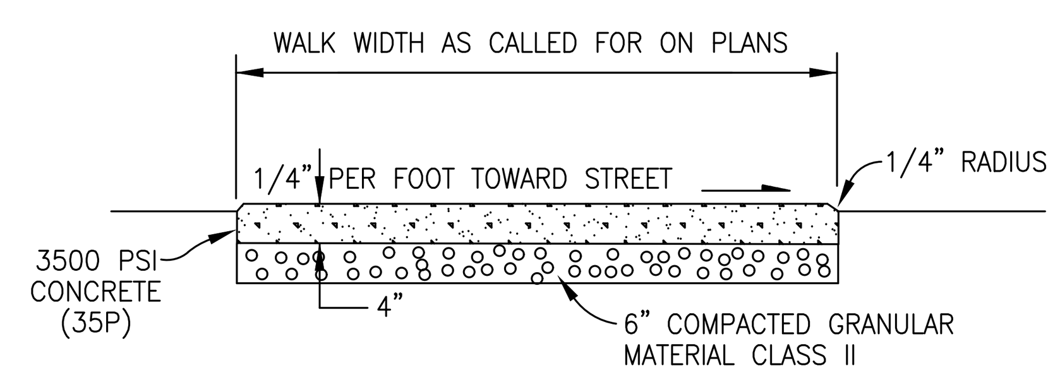
NOTE: FOR DUMPSTER PAD

(NO SCALE)



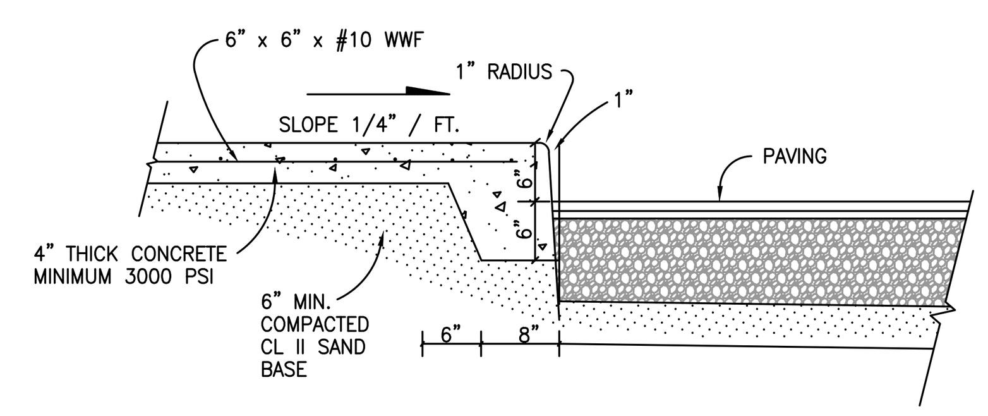
ADS HP ST PIPE TRENCH DETAIL OPEN SPACE/INFLUENCE OF ROADBED

NO SCALE



4" CONCRETE SIDEWALK

(NO SCALE)



INTEGRAL CONCRETE WALK / CURB DETAIL

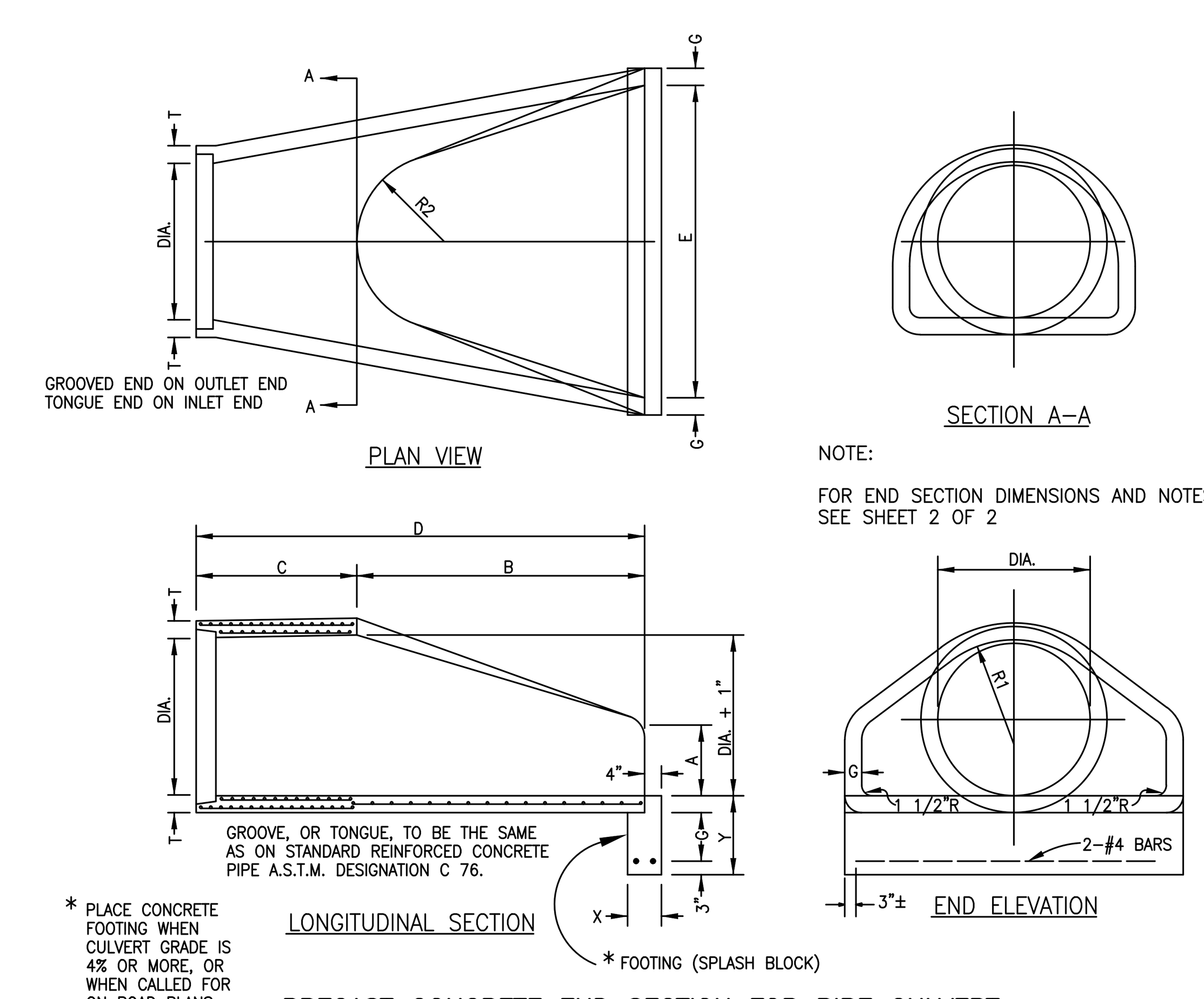
(NO SCALE)

DIA.	T(MIN.)	A(MIN.)	B*	C*	D*	E*	G	R1	R2	X	Y	APPROX. WT. LBS.
12"	2"	5"	23"	51"	74"	24"	2"	10-1/8"	9"	8"	18"	800
15"	2-1/4"	7"	27"	48"	75"	30"	2-1/4"	12-1/2"	11"	8"	18"	1100
18"	2-1/2"	11"	25"	49"	74"	36"	2-1/2"	15-1/2"	12"	8"	18"	1300
21"	2-3/4"	11"	33"	42"	75"	42"	2-3/4"	16-1/8"	13"	8"	18"	1500
24"	3"	12"	43"	32"	75"	48"	3"	16-3/16"	14"	8"	18"	1800
30"	3-1/2"	14"	53"	22"	75"	60"	3-1/2"	18-1/2"	15"	8"	18"	2400
36"	4"	17"	62"	37"	99"	72"	4"	24-5/16"	20"	8"	18"	4200
42"	4-1/2"	22"	62"	37"	99"	78"	4-1/2"	27-1/2"	22"	10"	24"	5600
48"	5"	24"	72"	26"	98"	84"	5"	28-1/2"	22"	10"	24"	7400
54"	5-1/2"	27"	65"	33-1/4"-35"	98-1/4"-100"	90"	5"	☐	☐	10"	24"	8040
60"	6"	30"	60"	39"	99"	96"	5"	☐	☐	12"	24"	8730
66"	6-1/2"	24"	72"-78"	21"-27"	99"	102"	5-1/2"	☐	☐	12"	24"	10,630
72"	7"	24"	78"	21"	99"	108"	6"	☐	☐	12"	24"	12,520
78"	7-1/2"	24"	78"	21"	99"	114"	6-1/2"	☐	☐	12"	24"	14,430
84"	8"	36"	90-1/2"	21"	111-1/2"	120"	6-1/2"	☐	☐	12"	24	18,160

* TOLERANCE ± 1"

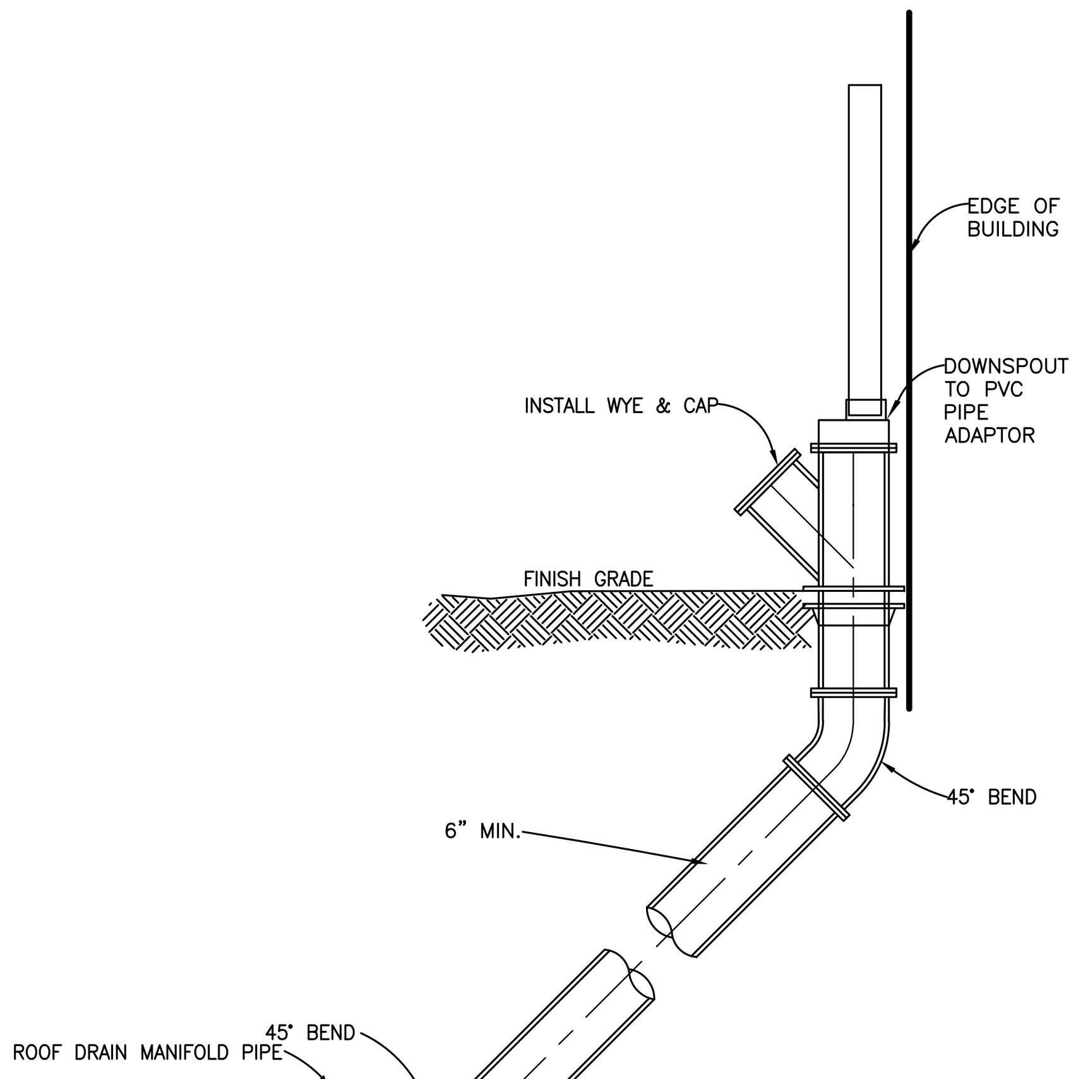
☐ RADIUS AS FURNISHED BY THE MANUFACTURER

WEIGHT SHOWN DOES NOT INCLUDE CONCRETE FOOTING



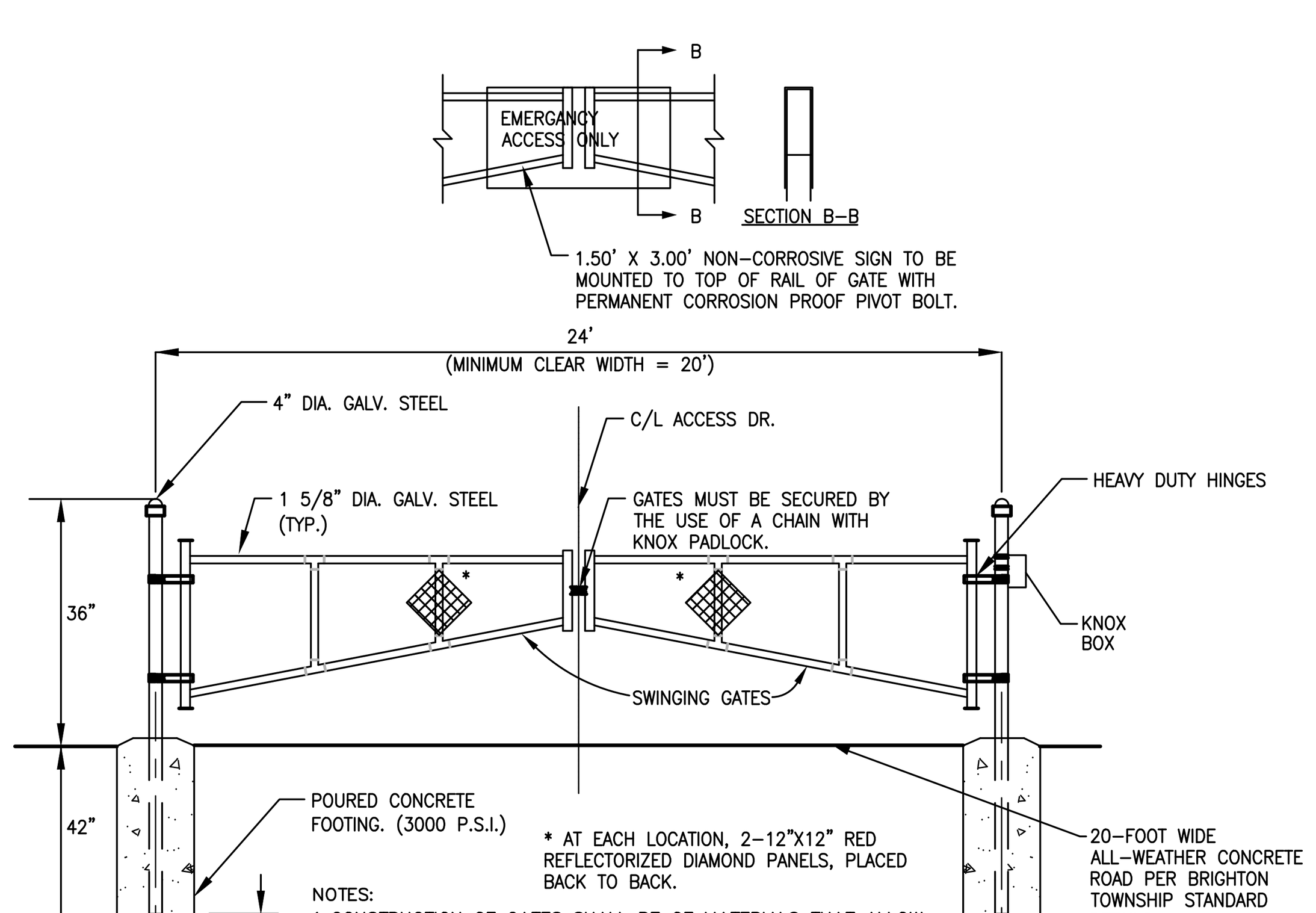
PRECAST CONCRETE END SECTION FOR PIPE CULVERT

(REF. MDOT DETAIL IV-86C)



ROOF DRAIN CLEANOUT DETAIL

NO SCALE

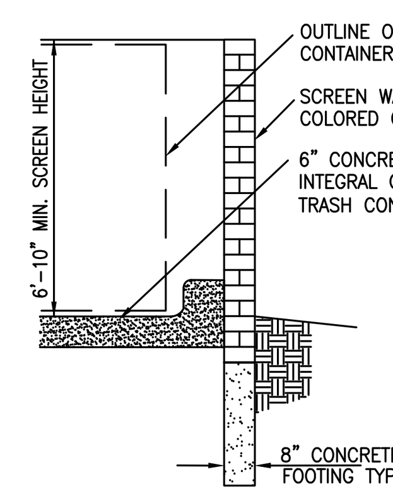


NOTES:

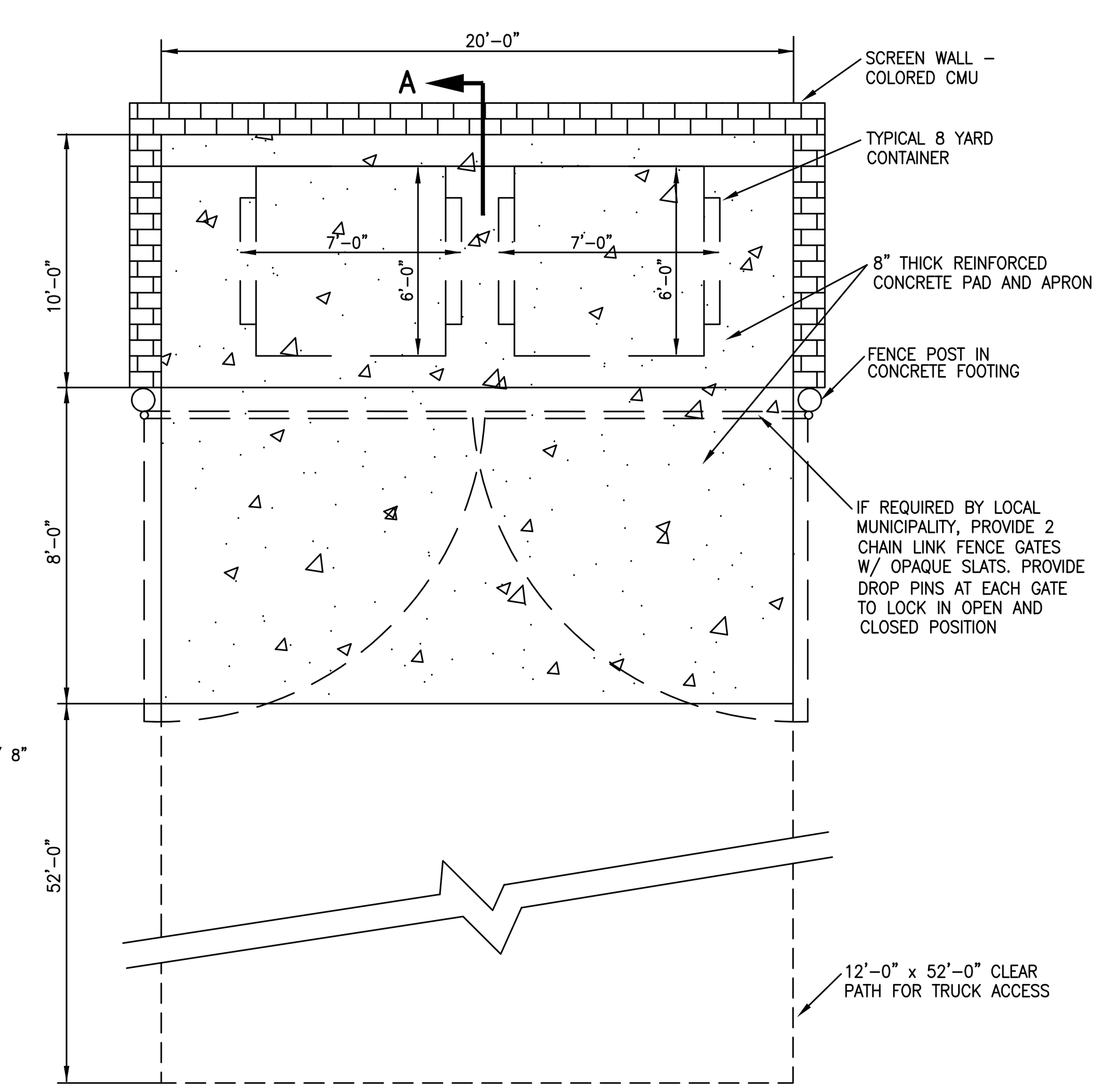
1. CONSTRUCTION OF GATES SHALL BE OF MATERIALS THAT ALLOW MANUAL OPERATIONS BY ONE PERSON.
2. GATE COMPONENTS SHALL BE MAINTAINED IN OPERATIVE CONDITION AT ALL TIMES AND REPLACED OR REPAIRED WHEN DEFECTIVE.
3. THE ACCESS DRIVE AND GATE SHALL BE ACCESSIBLE AT ALL TIMES (I.E. SNOW REMOVAL) AND POSTED AS A FIRE LANE.
4. THE USE OF THE KNOX RAPID ENTRY SYSTEM PADLOCK IS REQUIRED.
5. THE ACCESS DRIVE SHALL BE CONSTRUCTED SO IT CAN SUPPORT UP TO 100,000 POUND FIRE APPARATUS.

EMERGENCY FIRE ACCESS DRIVE GATE DETAIL

SCALE: NONE



SECTION A



DOUBLE CONTAINER CORRAL

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

PROJECT: BIBLE BAPTIST CHURCH

PREPARED FOR: BIBLE BAPTIST CHURCH, 2258 EAST HIGHLAND ROAD, HOWELL, MI 48843, 517-715-9233

TITLE: CONSTRUCTION DETAILS

NO	BY	REVISION PER	DATE
2	ST	PER TWP REVIEW	3/16/22
1	ST	PER TWP REVIEW	2/23/22

DESIGNED BY: ST
DRAWN BY: JS
CHECKED BY:
SCALE: NO SCALE
JOB NO. 21-542
DATE: 2/2/2022
SHEET NO. 14

PIPE RESTRAINT SCHEDULE

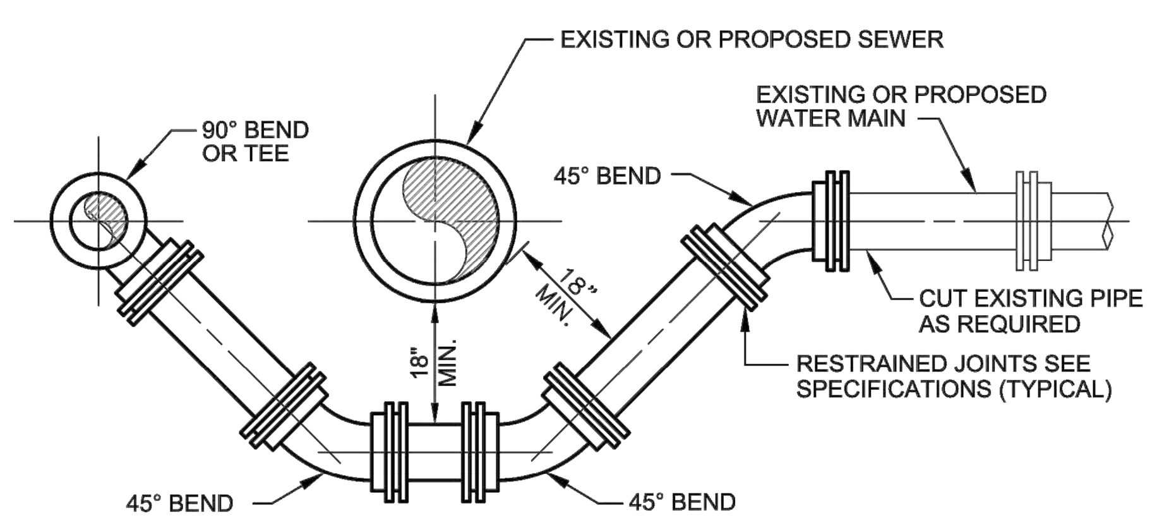
GROUND BURIED PRESSURE PIPE - POLYETHYLENE ENCASED DUCTILE IRON PIPE

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

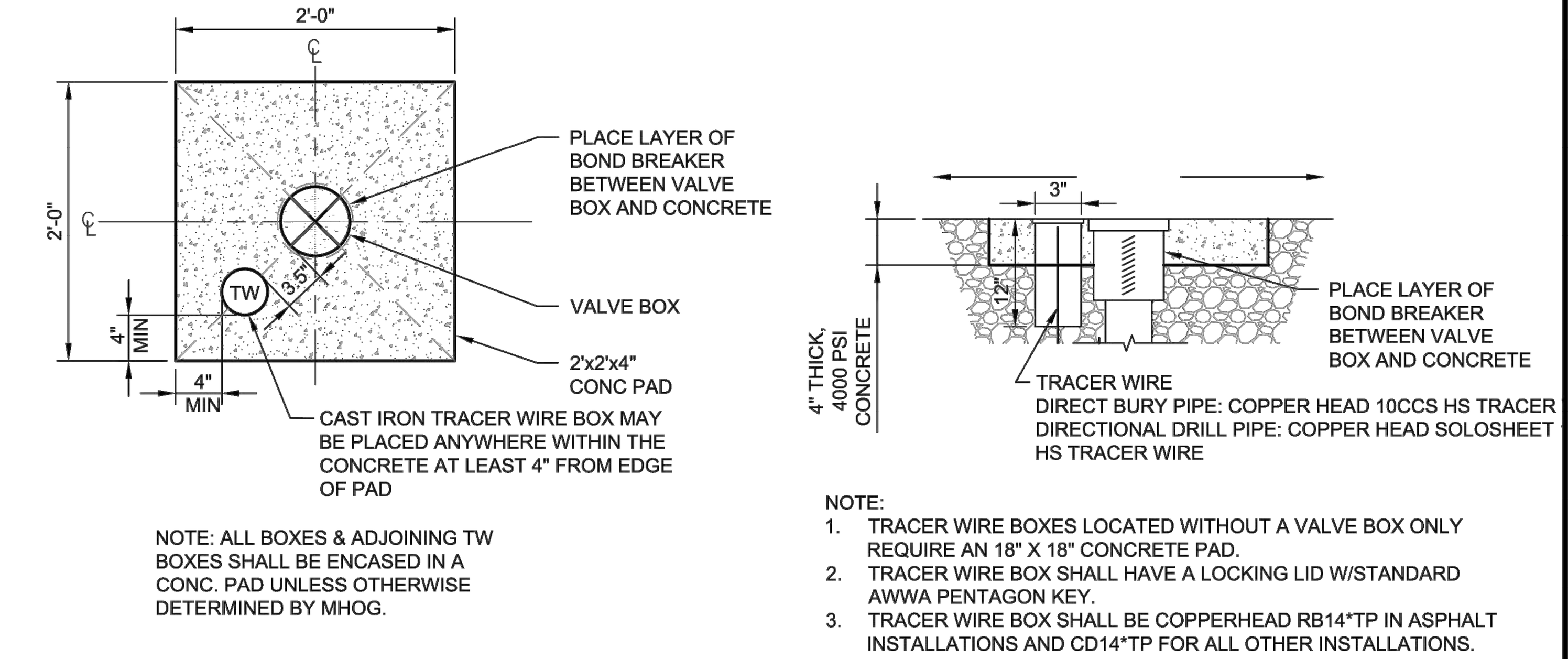
1. LENGTHS OF PIPE RESTRAINT ARE GIVEN IN FEET.
2. IF REQUIRED PIPE DIAMETER IS NOT LISTED IN THIS TABLE, THE NEXT LARGEST PIPE DIAMETER SHALL BE USED.
3. THIS TABLE IS BASED ON A TEST PRESSURE OF 180 PSI (OPERATING PRESSURE PLUS WATER HAMMER. FOR OTHER TEST PRESSURES, ALL VALUES TO BE INCREASED OR DECREASED 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

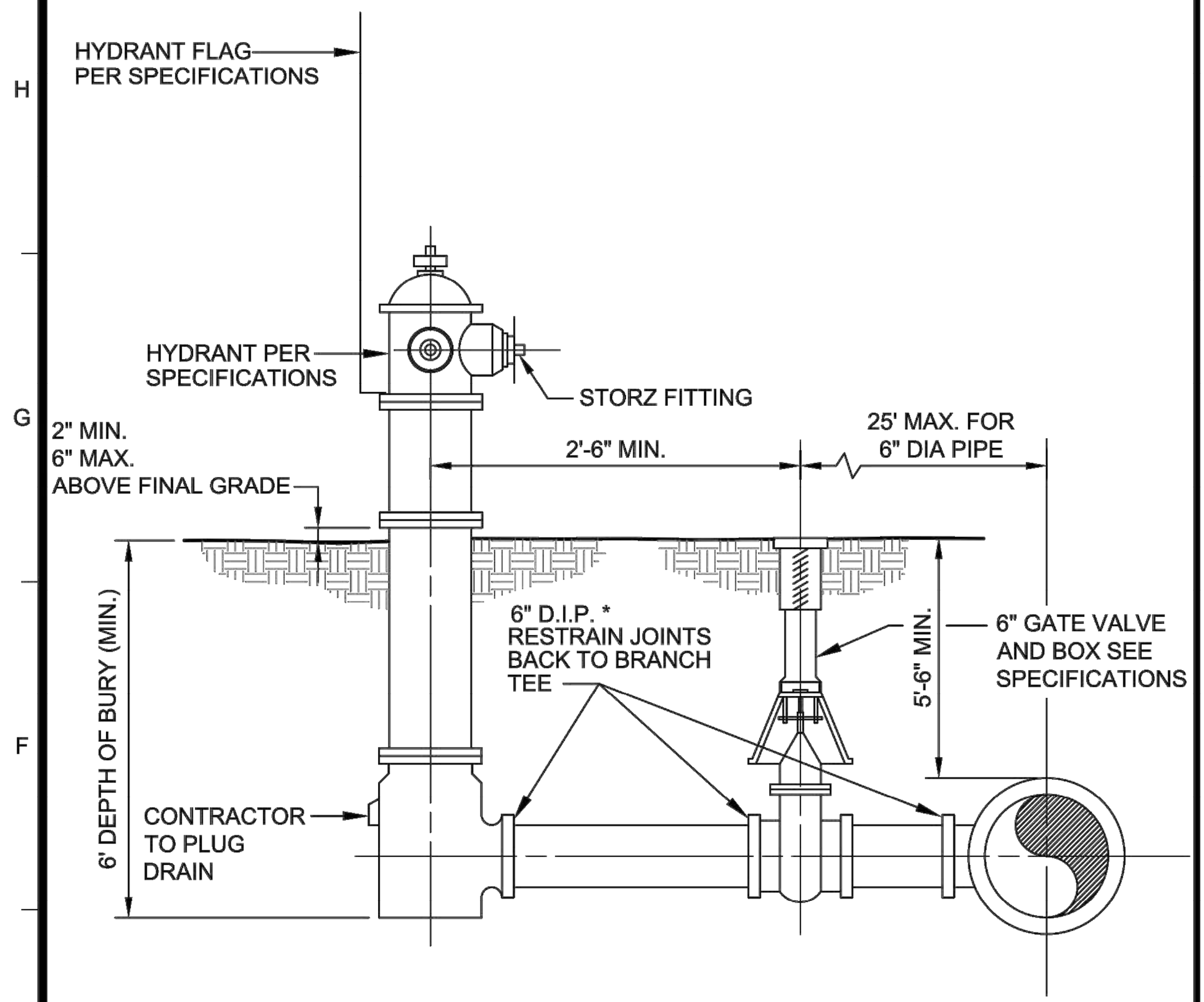


WATER MAIN UTILITY OFFSET



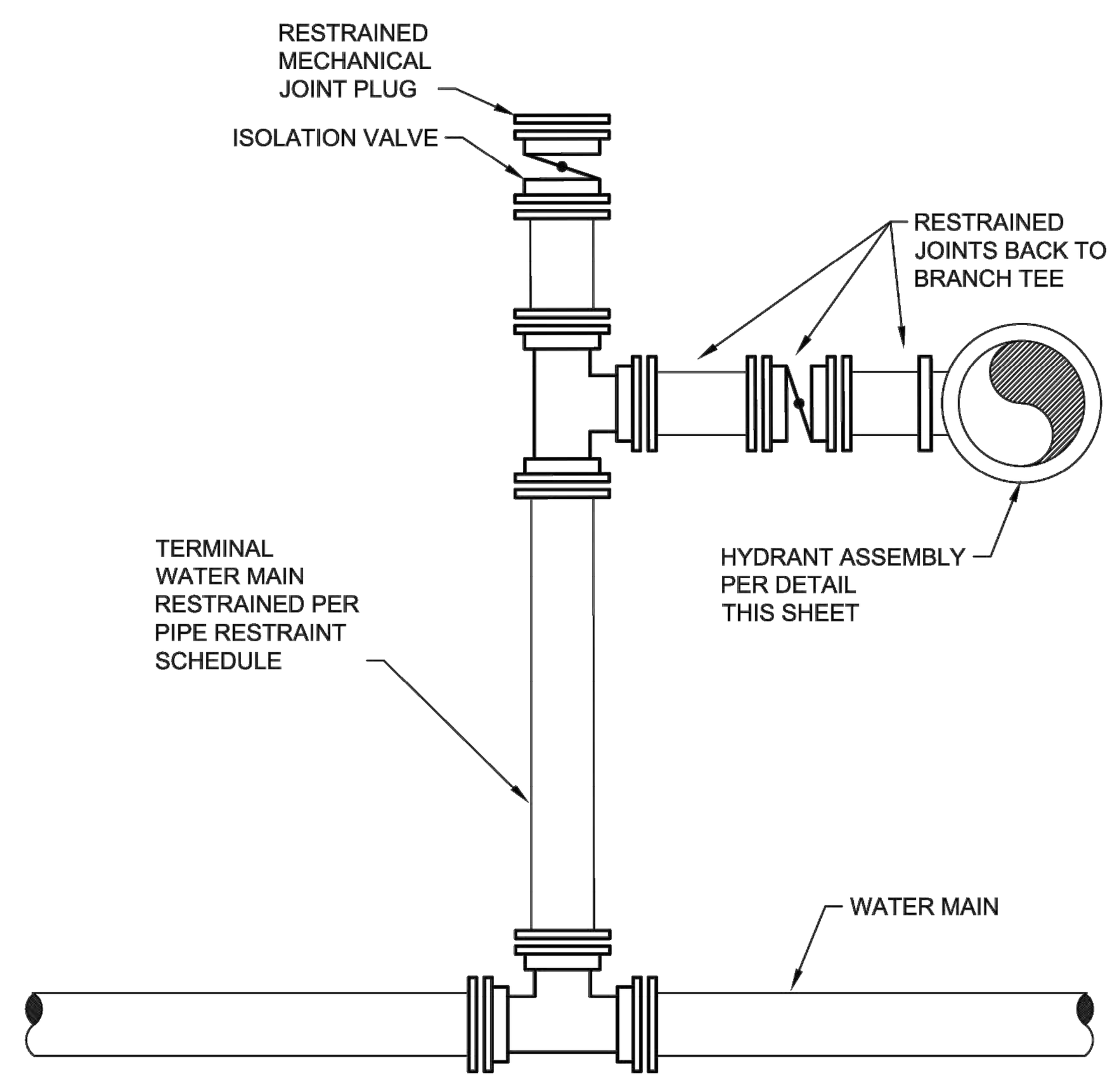
VALVE/TRACER WIRE BOX IN CONCRETE DETAIL

NO SCALE

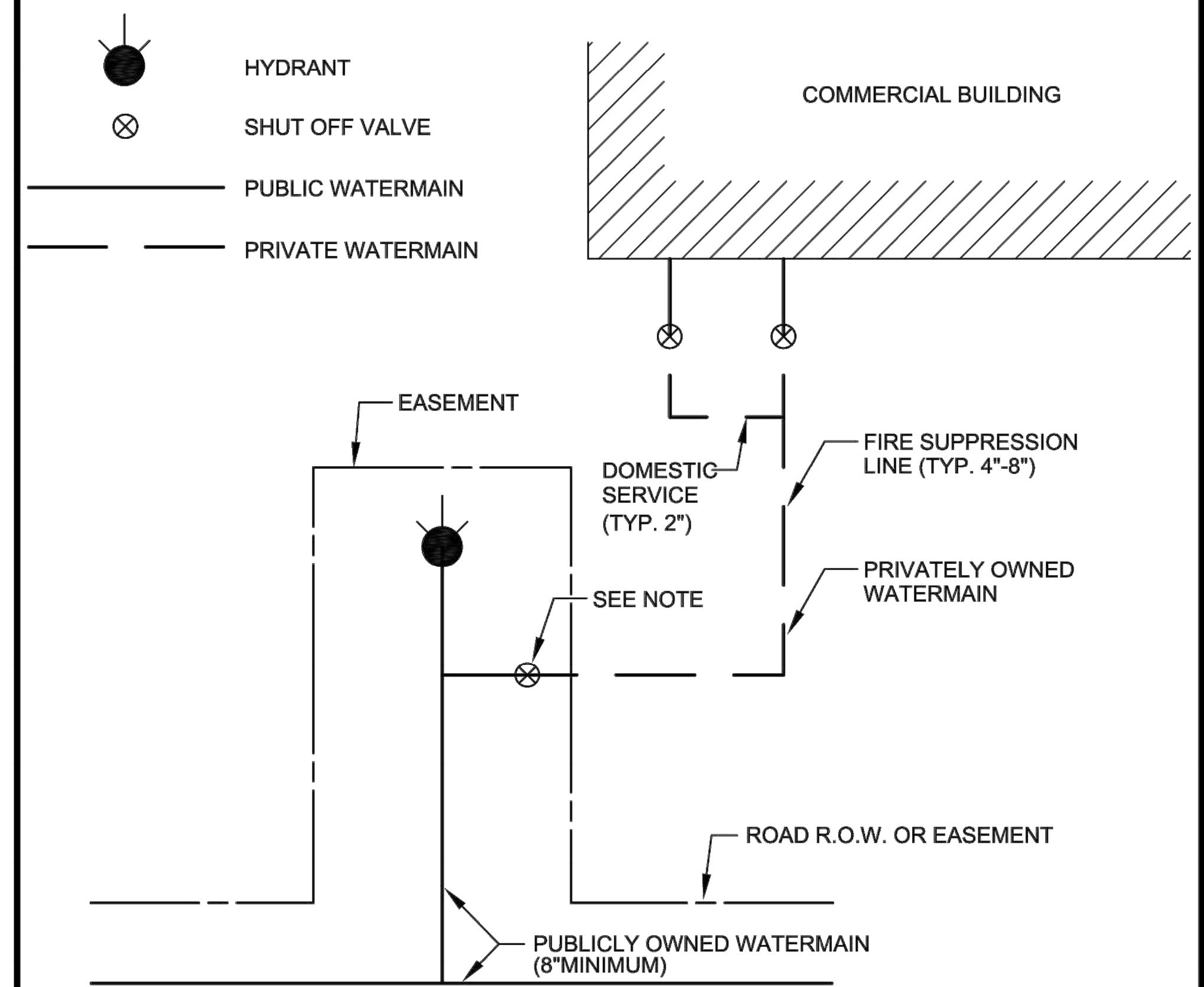


* THE LENGTH OF 6" PIPE FROM THE MAIN TO THE HYDRANT ASSEMBLY CANNOT EXCEED 25'. ANY PIPE OVER 25 FEET SHALL BE 8" DIAMETER MINIMUM AND DESIGNED PER MHOG SPECIFICATIONS.

FIRE HYDRANT ASSEMBLY

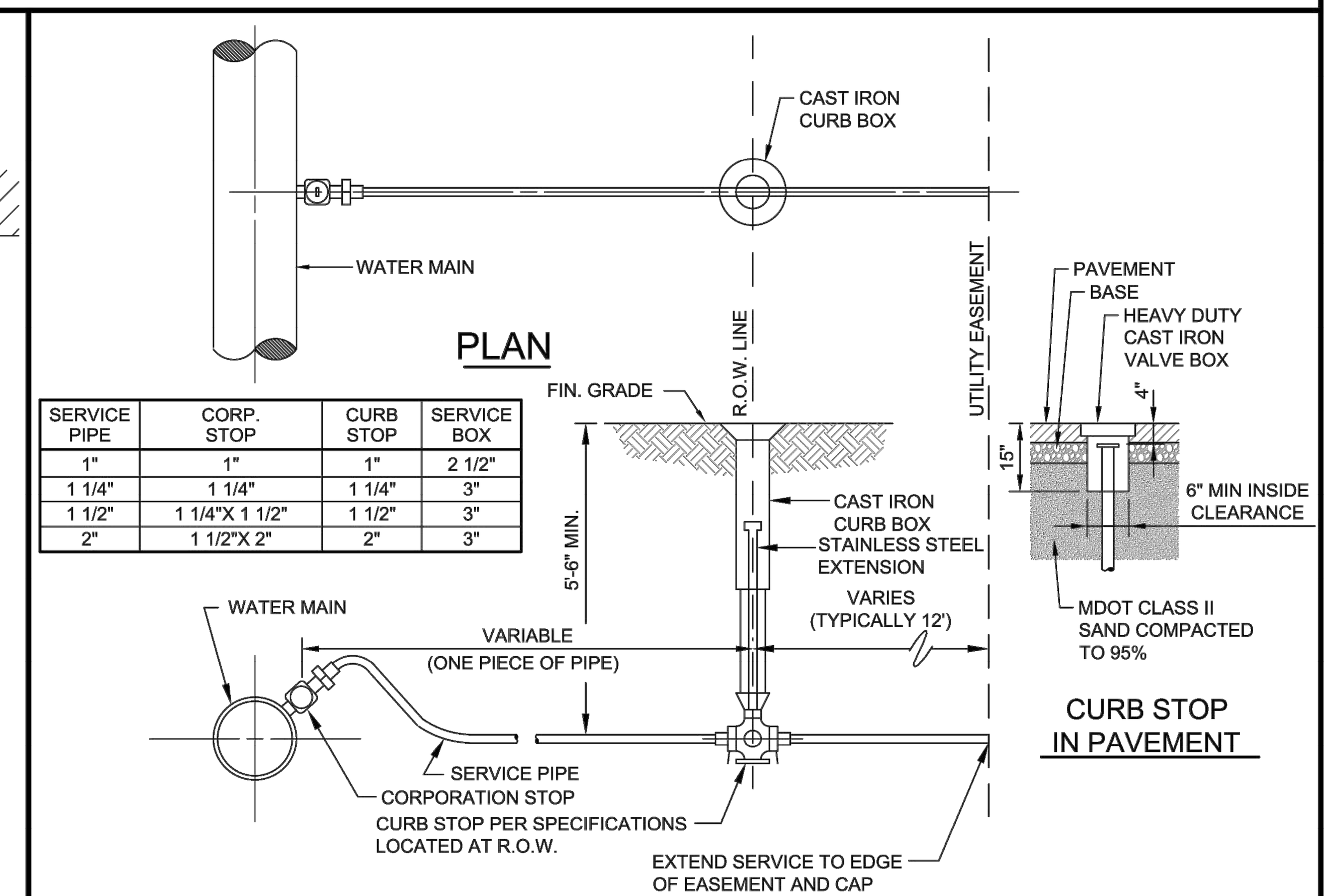


TERMINAL HYDRANT DETAIL



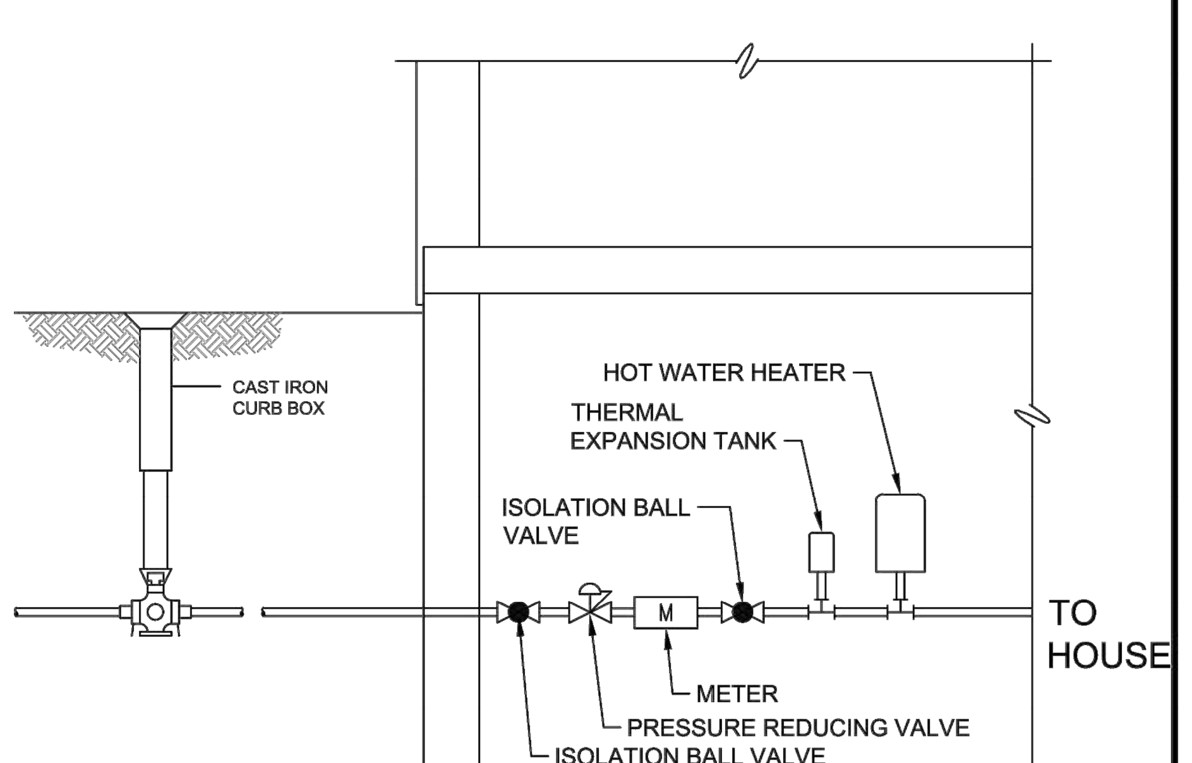
NOTE: PUBLICLY OWNED SHUT OFF VALVE TO BE LOCATED IN EASEMENT.

COMMERCIAL BUILDING WATER SERVICE LAYOUT

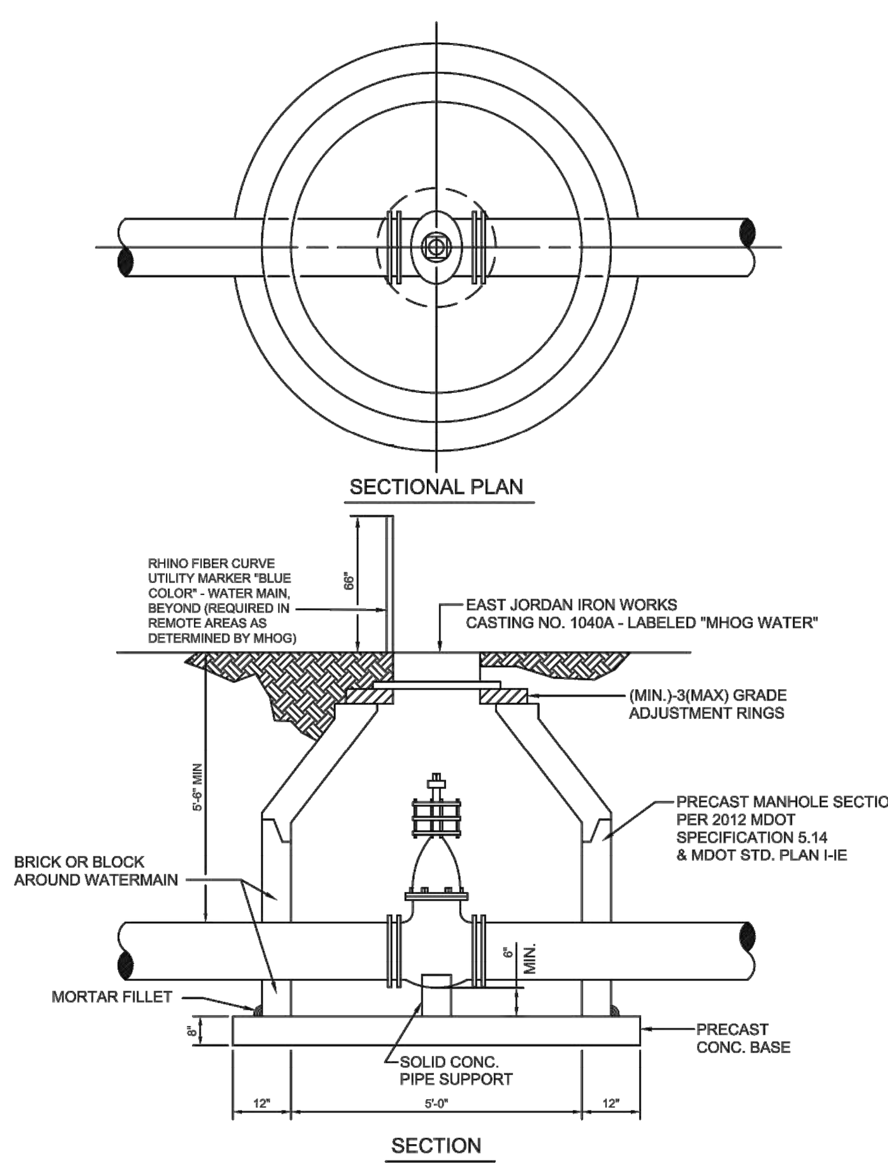


SERVICE PIPE	CORP. STOP	CURB STOP	SERVICE BOX
1"	1"	1"	2 1/2"
1 1/4"	1 1/4"	1 1/4"	3"
1 1/2"	1 1/4"X 1 1/2"	1 1/2"	3"
2"	1 1/2"X 2"	2"	3"

SECTION
WATER SERVICE LATERAL

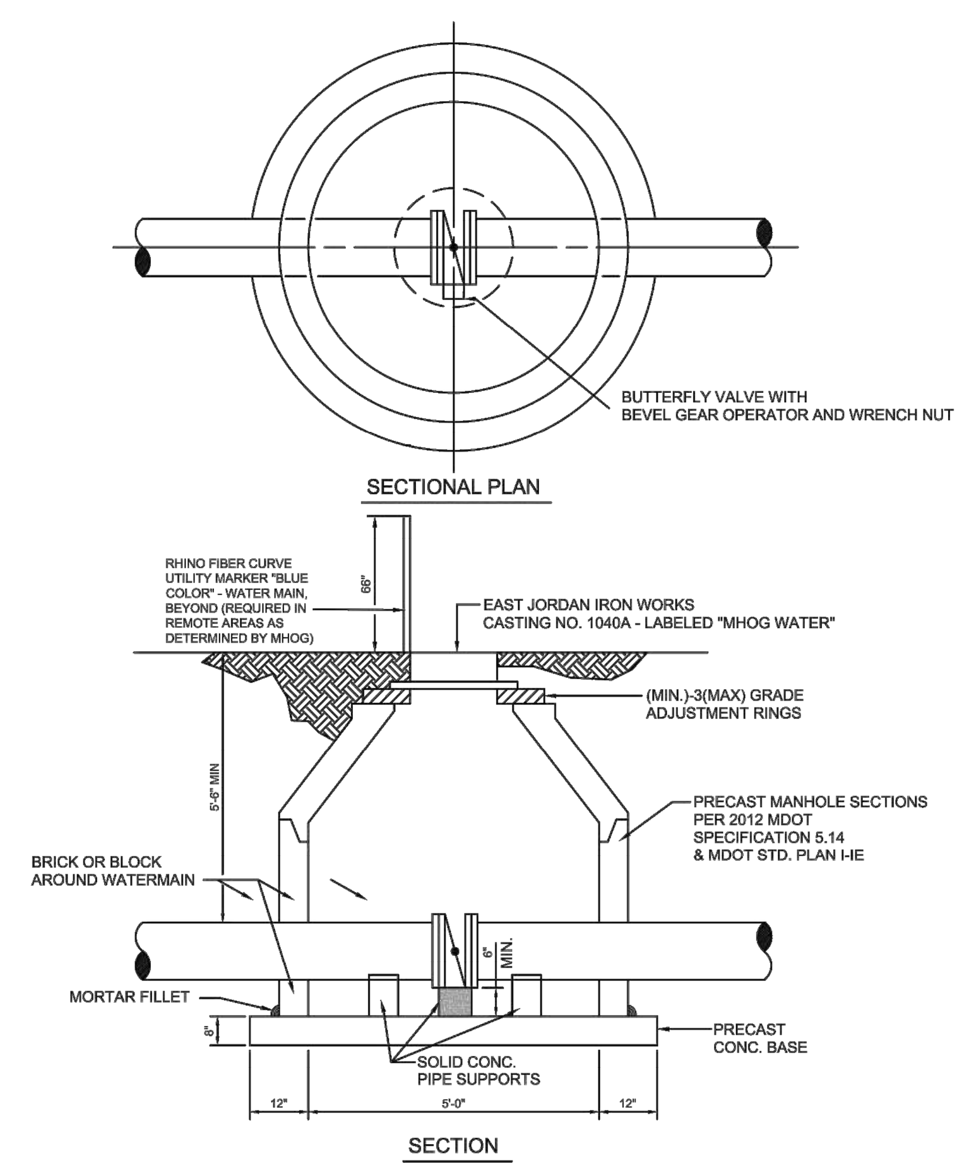


PRIVATE RESIDENCE
PRESSURE REDUCING VALVE (PRV)



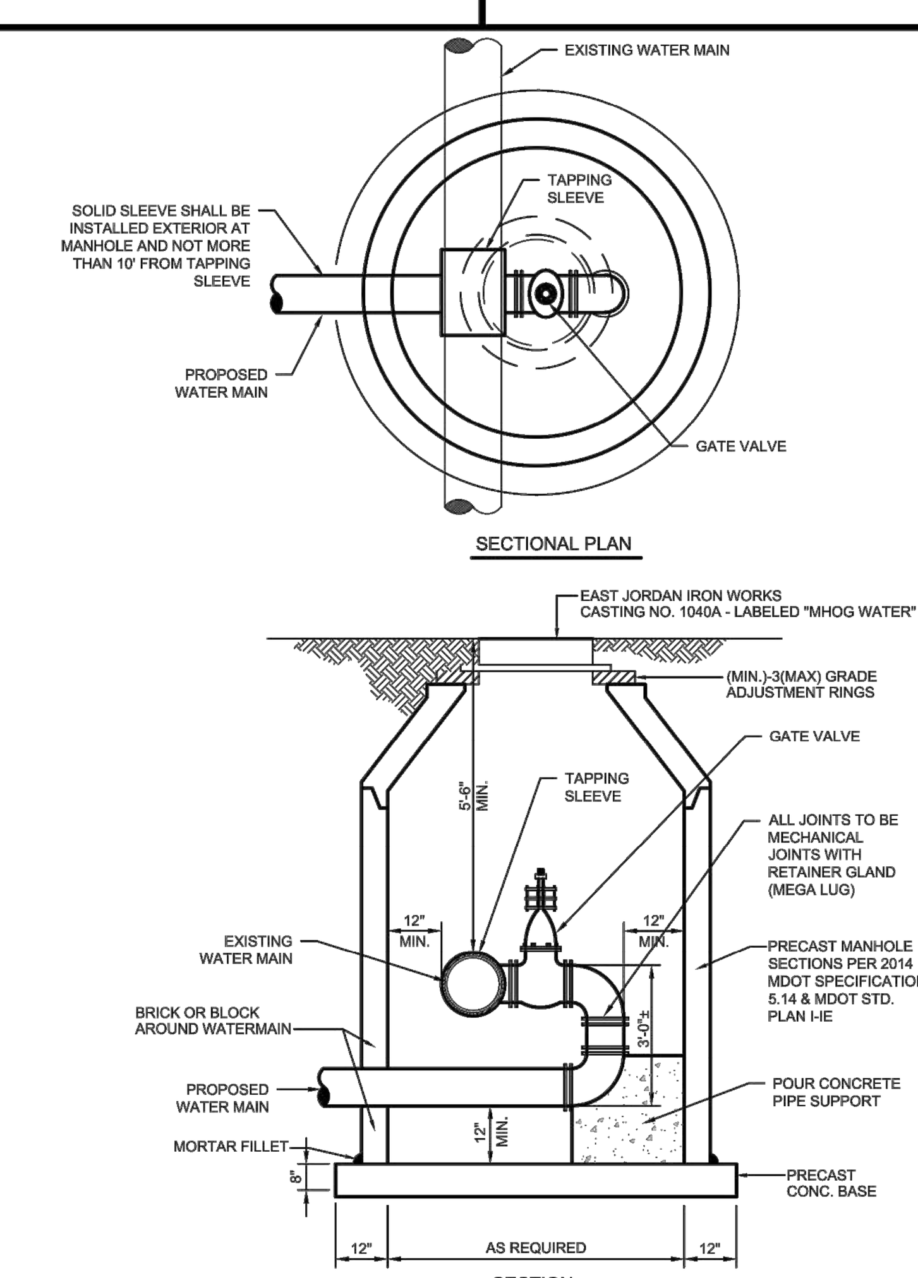
NOTES:
1. ALL LIFT HOLES AND JOINTS SHALL BE MORTARED BOTH INSIDE AND OUTSIDE.
2. BLOCK MANHOLES TO BE USED ONLY WITH ENGINEERS PERMISSION.
3. NO STEPS PERMITTED.

VALVE AND GATE WELL



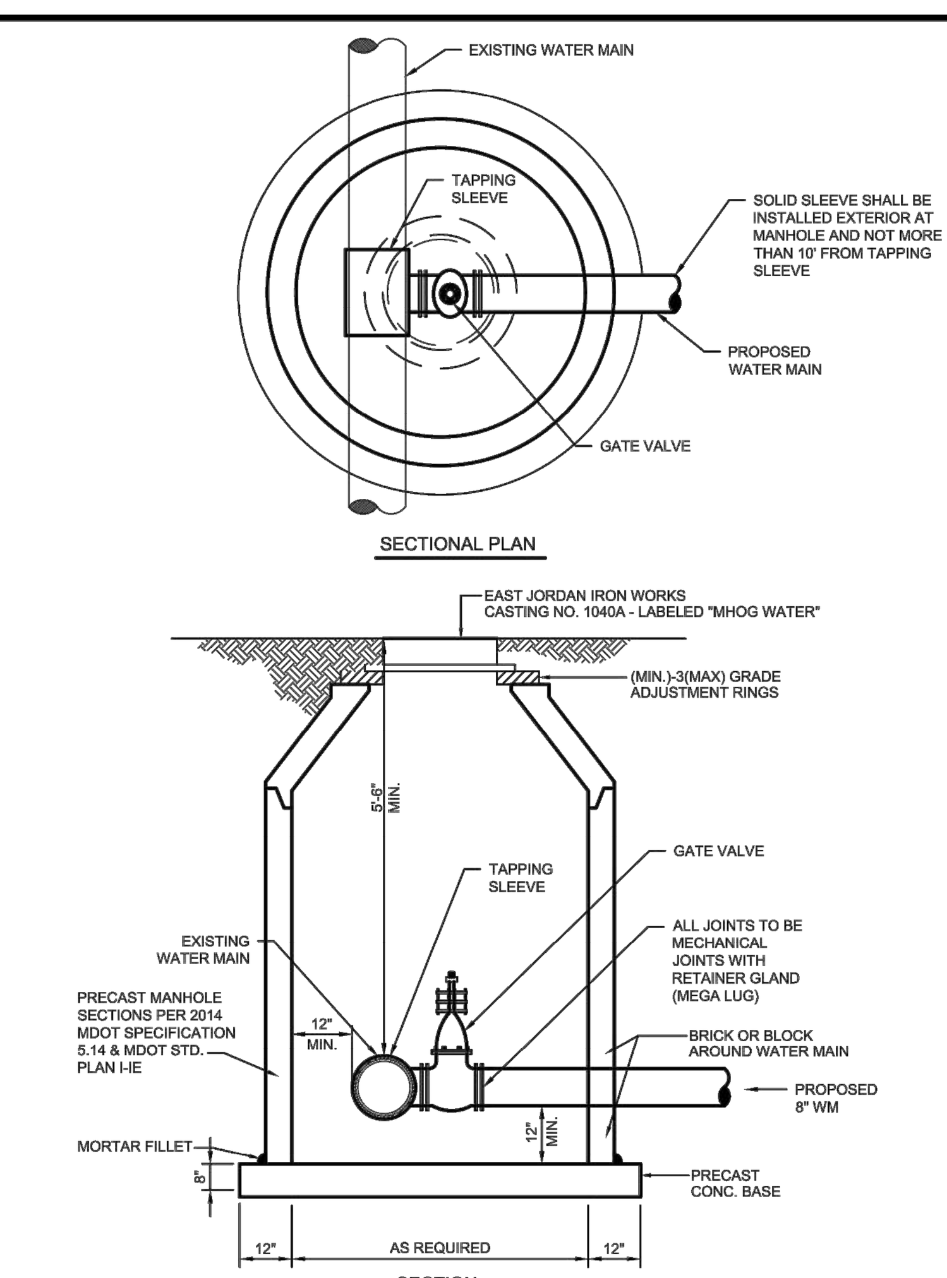
NOTES:
1. ALL LIFT HOLES AND JOINTS SHALL BE MORTARED BOTH INSIDE AND OUTSIDE.
2. BLOCK MANHOLES TO BE USED ONLY WITH ENGINEERS PERMISSION.
3. NO STEPS PERMITTED.

BUTTERFLY VALVE AND WELL



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

REVERSE TAP GATE WELL



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

REGULAR TAP GATE WELL

MARION HOWELL OCEOLA GENOA
Sewer and Water Authority

STANDARD DETAILS

Scale: NONE
Issued Date JANUARY - 2014
UPDATED: MAY 2015
UPDATED: FEBRUARY 2016
UPDATED: APRIL 2016
UPDATED: OCTOBER 2017
UPDATED: FEBRUARY 2019

Tuesday, February 26, 2019 4:02:14 PM DRAWING: P:\ER\12719\200-12719-00-000\CAD\SheetFiles\Mhog-std.DWG

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

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

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

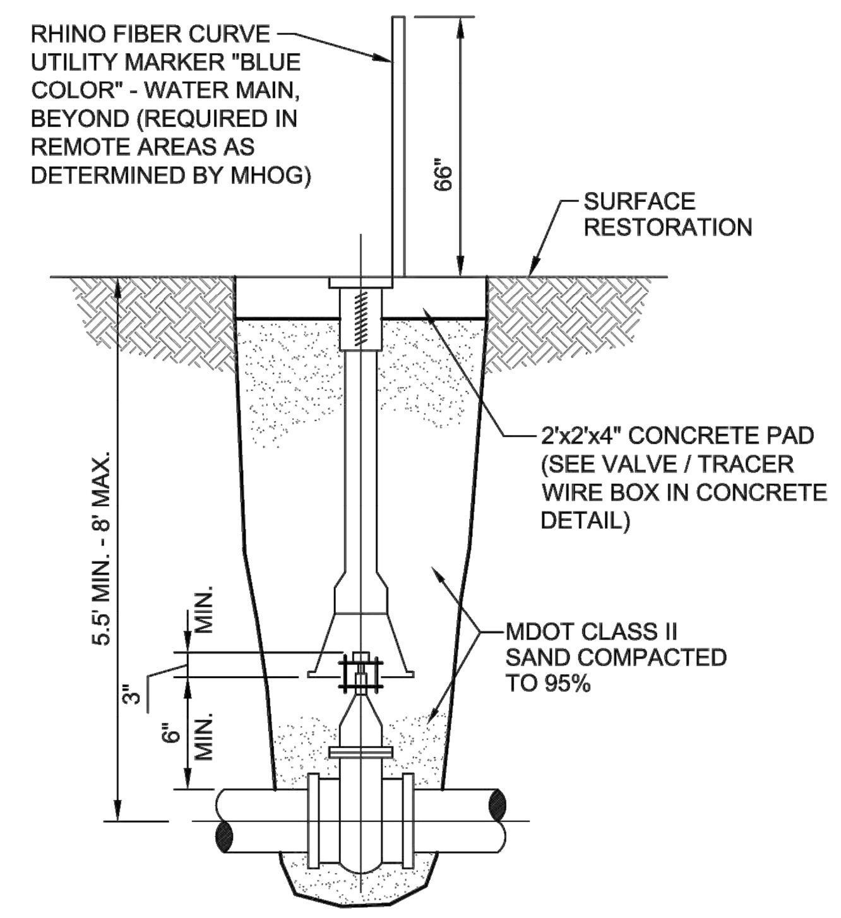
PROJECT: BIBLE BAPTIST CHURCH

PREPARED FOR: BIBLE BAPTIST CHURCH
2258 EAST HIGHLAND ROAD
HOWELL, MI 48843
517-715-9233

TITLE: MHOG STANDARD WATERMAIN DETAILS (1)

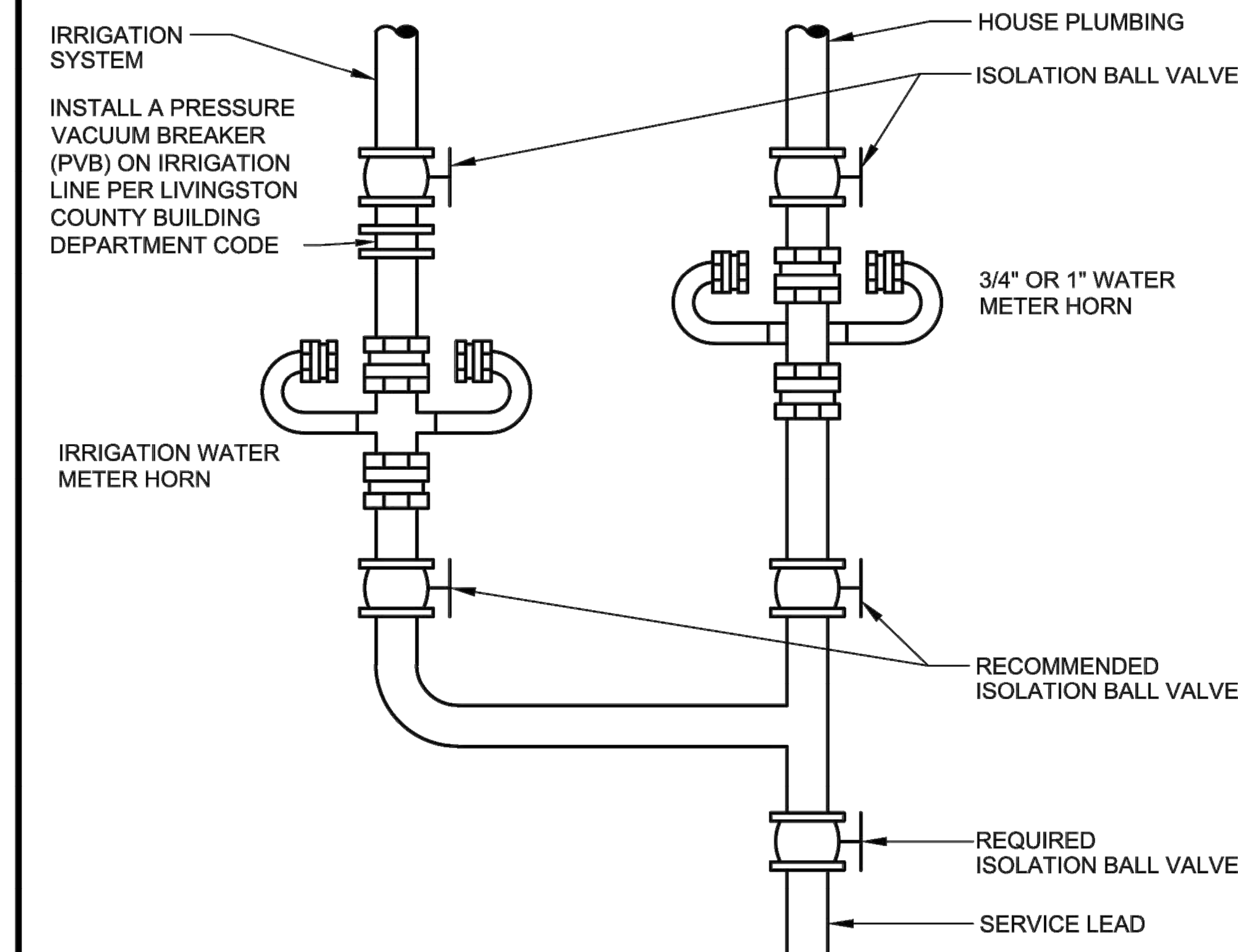
NO	BY	REVISION PER	DATE
2	ST	PER TWP REVIEW	3/16/22
1	ST	PER TWP REVIEW	2/23/22

DESIGNED BY: ST
DRAWN BY: JS
CHECKED BY:
SCALE
JOB NO. 21-542
DATE 12/01/2021
SHEET NO. 15



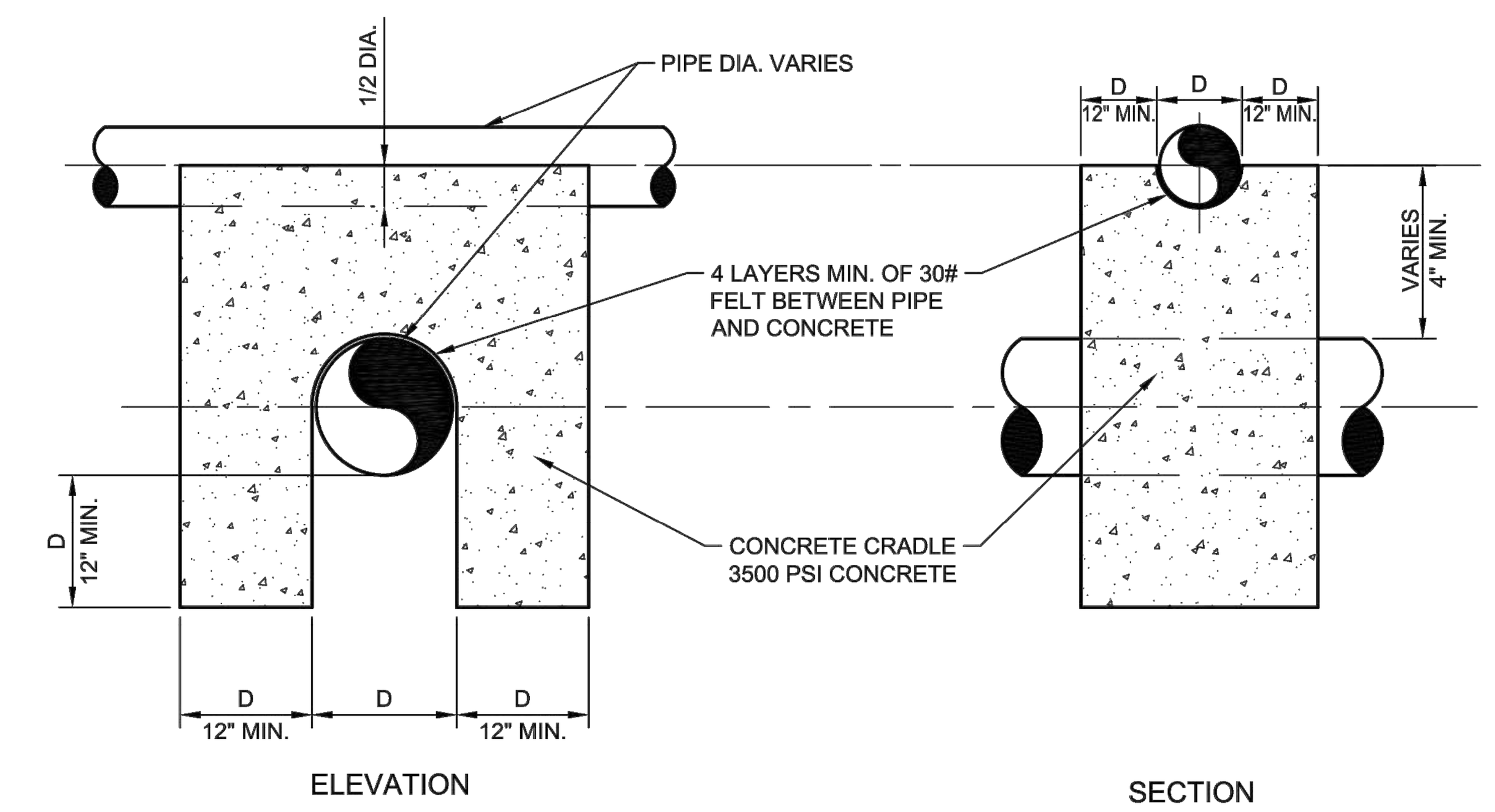
NOTES:
1. VALVE BOX SHALL NOT REST ON VALVE OR MAIN LINE PIPE.
2. A VALVE STEM EXTENSION WITH CENTERING RING IS REQUIRED FOR VALVES BURIED DEEPER THAN 6'.

GATE VALVE AND BOX



NOTES:
1. ALL METERS ARE TO BE INSTALLED HORIZONTALLY IN A DRY, CLEAN, SANITARY LOCATION THAT IS READILY ACCESSIBLE. THIS DRAWING IS NOT TO SCALE & IS ONLY A REPRESENTATION OF HOW THE 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



CONCRETE CRADLE DETAIL

SCALE: NONE

MHOG CASTING DETAIL

NO SCALE

MARION HOWELL OCEOLA GENOA
Sewer and Water Authority

STANDARD DETAILS

Scale: NONE
Issued Date JANUARY - 2014
UPDATED: MAY 2015
UPDATED: FEBRUARY 2016
UPDATED: APRIL 2016
UPDATED: OCTOBER 2017
UPDATED: FEBRUARY 2019

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

PROJECT: BIBLE BAPTIST CHURCH

PREPARED FOR: BIBLE BAPTIST CHURCH
2258 EAST HIGHLAND ROAD
HOWELL, MI 48843
517-715-9233

TITLE: MHOG STANDARD WATERMAIN DETAILS (2)

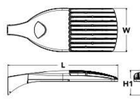
NO	BY	REVISION PER	DATE
2	ST	PER TWP REVIEW	3/16/22
1	ST	PER TWP REVIEW	2/23/22

DESIGNED BY: ST
DRAWN BY: JS
CHECKED BY:
SCALE
JOB NO. 21-542
DATE 2/1/2022
SHEET NO. 16

Friday, February 8, 2019 9:13:59 AM DRAWING: P:\IER\12719\200-12719-00-000\CAD\SheetFiles\Mhog-std.DWG

D-Series Size 1
LED Area Luminaire

Buy American



Specifications

EPA:	1.01 ft² (0.09 m²)
Length:	33" (83.8 cm)
Width:	13" (33.0 cm)
Height H1:	7-1/2" (19.0 cm)
Height H2:	3-1/2"
Weight (max):	27 lbs (12.2 kg)

Catalog Number

Notes

Type

Hit the Tab key or mouse over the page to see all interactive elements

Introduction

The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment. The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire.

The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing up to 750W metal halide in pedestrian and area lighting applications with typical energy savings of 65% and expected service life of over 100,000 hours.

Ordering Information

EXAMPLE: DSX1 LED P7 40K T3M MVOLT SPA NLTAIR2 PIRHN DDBXD

DSX1 LED

Series	LEDs	Color temperature	Distribution	Voltage	Mounting
DSX1 LED	**Forward optics** P1 P4[1] P7[1] P2 P5[1] P8[1] P3 P6[1] P9[1] **Rotated optics** P10[1] P12[1] P11[1] P13[1]	30K 3000 K 40K 4000 K 50K 5000 K	T1S Type I short (Automotive) T2S Type II short T2M Type II medium T3S Type III short T3M Type III medium T4M Type IV medium TFTM Forward throw medium T5VS Type V very short[1] T5S Type V short[1] T5M Type V medium[1] T5W Type V wide[1] BLC Backlight control[4] LCCO Left corner cutoff[4] RCCO Right corner cutoff[4]	MVOLT[1,2] XVOLT (277V-480V)[1,2,3] 120[1] 208[1] 240[1] 277[1] 347[1] 480[1]	**Shipped included** SPA Square pole mounting RPA Round pole mounting[5] WBA Wall bracket[5] SPUMBA Square pole universal mounting adaptor[5] RPUMBA Round pole universal mounting adaptor[5] **Shipped separately** KMA8 DDBXD U Mast arm mounting bracket adaptor (specify finish)[5,6]

Control options		Other options		Finish (required)	
Shipped installed		**Shipped installed**		DDBXD	Dark bronze
NLTAIR2 nLight AIR generation 2 enabled[7,8]	PIR High/low, motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 5fc[9,10,11]	HS House-side shield[12]		DBLXD	Black
PIRHN Network, high/low motion/ambient sensor[10]	PIRH High/low, motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 3fc[9,10]	SF Single fuse (120, 277, 347V)[13]		DNAXD	Natural aluminum
PER NEMA twist-lock receptacle only (controls ordered separately)[13]	PIR1FC3V High/low, motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 1fc[9,10]	DF Double fuse (208, 240, 480V)[13]		DWHXD	White
PER5 Five-pin receptacle only (controls ordered separately)[13,14]	PIRH1FC3V Bi-level, motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 1fc[9,10,11]	L90 Left rotated optics[13]		DDBTXD	Textured dark bronze
PER7 Seven-pin receptacle only (controls ordered separately)[13,14]	FAO Field adjustable output[9,15]	R90 Right rotated optics[13]		DBLBXD	Textured black
DMG 0-10v dimming wires pulled outside fixture (for use with an external control, ordered separately)[13]		HA 50°C ambient operation[13]		DNATXD	Textured natural aluminum
DS Dual switching[16,17,18]		BAA Buy America(n) Act Compliant		DWHGXD	Textured white
		Shipped separately			
		BS Bird spikes[19]			
		EGS External glare shield			

WST LED
Architectural Wall Sconce

Buy American

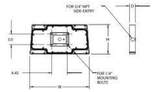
Specifications

Luminaire

Height:	8-1/2" (21.59 cm)
Width:	17" (43.18 cm)
Depth:	10-3/16" (25.9 cm)
Weight:	20 lbs (9.1 kg)

Optional Back Box (PBBW)

Height:	8.49" (21.56 cm)
Width:	17.01" (43.21 cm)
Depth:	1.70" (4.32 cm)



Optional Back Box (BBW)

Height:	4" (10.2 cm)
Width:	5-1/2" (14.0 cm)
Depth:	1-1/2" (3.8 cm)

Catalog Number

Notes

Type

Hit the Tab key or mouse over the page to see all interactive elements

Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and system-level interoperability.

- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is A+ Certified when ordered with DTL® controls marked by a shaded background. DTL DLL equipped luminaires meet the A+ specification for luminaire to photocontrol interoperability1
- This luminaire is part of an A+ Certified solution for ROAM® or XPoint™ Wireless control networks, providing out-of-the-box control compatibility with simple commissioning, when ordered with drivers and control options marked by a shaded background.

To learn more about A+, visit www.acuitybrands.com/aplus.

See ordering tree for details.

A+ Certified Solutions for ROAM require the order of one ROAM node per luminaire. Sold Separately: Link to Roam; Link to DTL DLL.

Schedule

Symbol	Label	Quantity	Manufacturer	Catalog Number	Description	Lamp	Lumens Per Lamp	Light Loss Factor	Wattage
	A	5	Lithonia Lighting	DSX1 LED P4 40K T5W MVOLT	DSX1 LED P4 40K T5W MVOLT	LED	14943	0.9	250
	B	8	Lithonia Lighting	DSX1 LED P4 40K T2M MVOLT	DSX1 LED P4 40K T2M MVOLT	LED	14457	0.9	125
	C	6	Lithonia Lighting	DSX1 LED P4 40K TFTM MVOLT	DSX1 LED P4 40K TFTM MVOLT	LED	14487	0.9	125
	D	2	Lithonia Lighting	WST LED P2 40K VW MVOLT	WST LED P2 40K VW MVOLT	LED	3511	0.9	25

Statistics

Description	Symbol	Avg	Max	Min	Avg/Min	Max/Min
Grade @ 0'	+	0.4 fc	7.3 fc	0.0 fc	N/A	N/A
North Parking and Drives	✳	1.7 fc	4.9 fc	0.3 fc	5.7:1	16.3:1
Property Line	+	0.0 fc	0.0 fc	0.0 fc	N/A	N/A
South Parking	✳	2.1 fc	5.3 fc	0.5 fc	4.2:1	10.6:1

General Note

1. SEE DRAWING FOR LUMINAIRE MOUNTING HEIGHT.
2. CALCULATIONS ARE SHOWN IN FOOTCANDLES AT: 0' - 0"
3. LIGHTING ALTERNATES REQUIRE NEW PHOTOMETRIC CALCULATION AND RESUBMISSION TO CITY FOR APPROVAL.

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

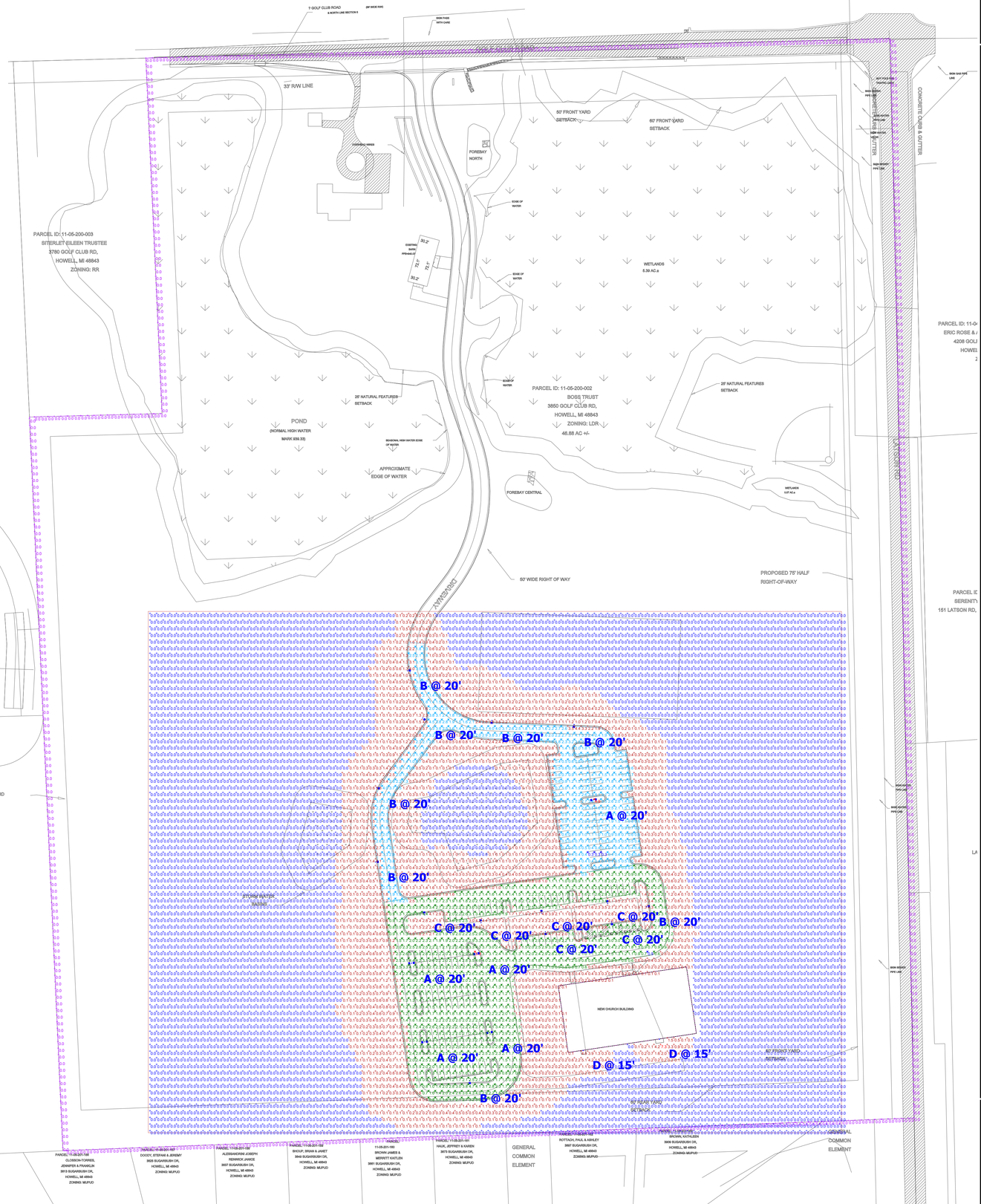
THESE LIGHTING CALCULATIONS ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM SUITABILITY AND SAFETY. THE ENGINEER AND/OR ARCHITECT IS RESPONSIBLE TO REVIEW FOR MICHIGAN ENERGY CODE AND LIGHTING QUALITY COMPLIANCE.

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

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

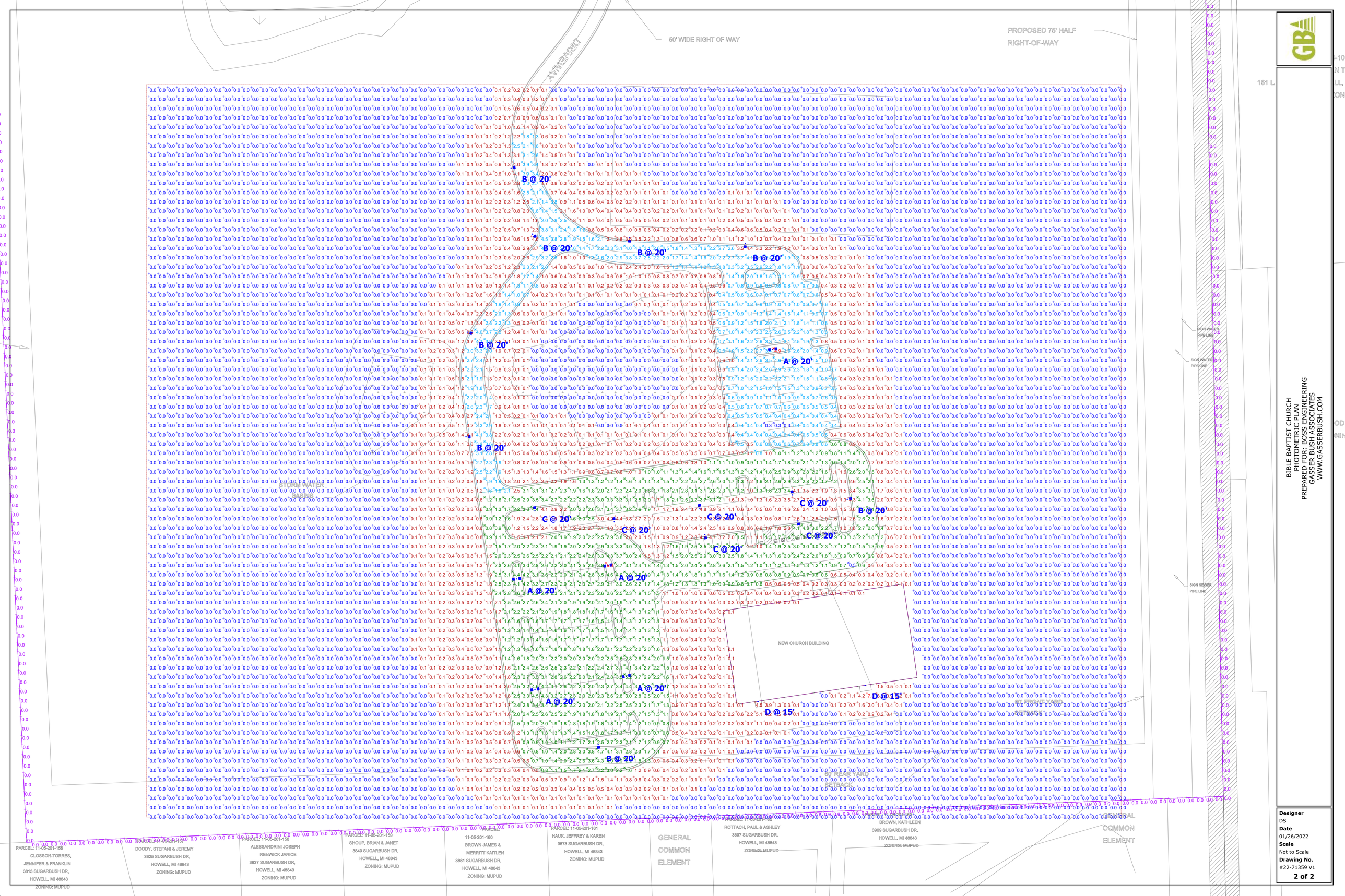
THIS DRAWING WAS GENERATED FROM AN ELECTRONIC IMAGE FOR ESTIMATION PURPOSE ONLY. LAYOUT TO BE VERIFIED IN FIELD BY OTHERS.

MOUNTING HEIGHT IS MEASURED FROM GRADE TO FACE OF FIXTURE. POLE HEIGHT SHOULD BE CALCULATED AS THE MOUNTING HEIGHT LESS BASE HEIGHT.



BIBLE BAPTIST CHURCH
PHOTOMETRIC PLAN
PREPARED FOR: BOSS ENGINEERING
GASSER BUSH ASSOCIATES
WWW.GASSERBUSH.COM

Designer
DS
Date
01/26/2022
Scale
Not to Scale
Drawing No.
#22-71359 V1
1 of 2



BIBLE BAPTIST CHURCH
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PREPARED FOR: BOSS ENGINEERING
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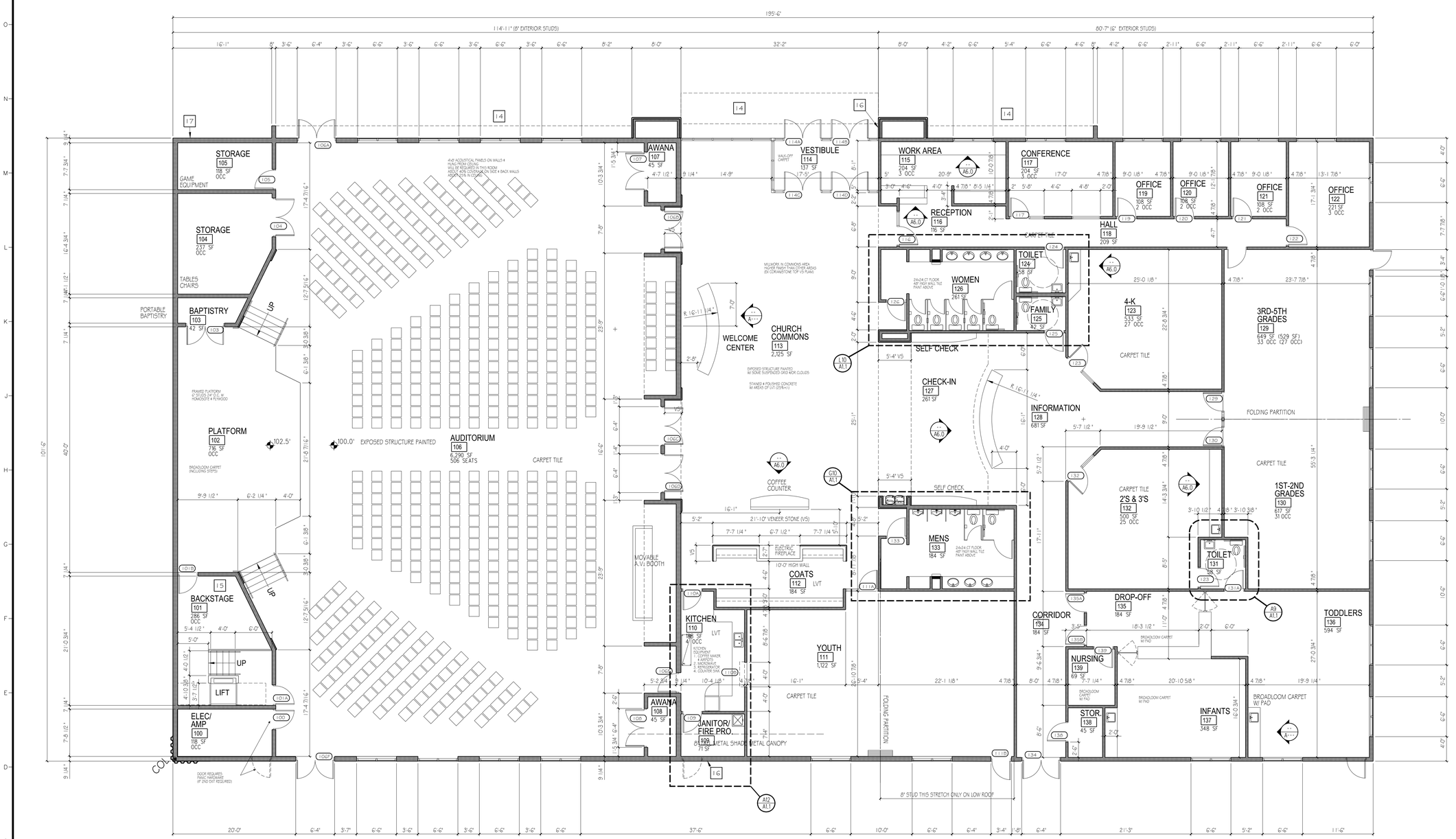
WWW.GASSERBUSH.COM

Designer
DS
Date
01/26/2022
Scale
Not to Scale
Drawing No.
#22-71359 V1
2 of 2



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

GENERAL NOTES

1. ALL DIMENSIONS ARE TO FACE OF FINISHED SURFACE OR COLUMN CENTER LINE UNLESS NOTED OTHERWISE
2. COORDINATE w/ MECH. & ELEC DRAWINGS FOR ALL FLOOR/WALL/ROOF PENETRATIONS NOT SHOWN ON ARCHITECTURAL PLANS. COORDINATE WITH C.M.
3. FIELD PAINT ALL MECHANICAL GRILLES & CABINETS TO MATCH ADJACENT SURFACES
4. SITE DATUM: MAIN LEVEL FINISH FLOOR
   ASSUMED= 100'-0"
   ACTUAL = XXX'-X"
5. PROVIDE BLOCKING IN WALLS FOR ALL HANDRAILS CABINETS, BRACKETS, AVL EQUIPMENT AS REQUIRED (PROVIDE NON-COM WHERE REQUIRED)
6. PROVIDE FIRESTOPPING AS REQUIRED AT ALL PENETRATIONS OF RATED ASSEMBLIES
7. PROVIDE PROPER FLASHING AT ALL PENETRATIONS, DOORS, WINDOWS, & DISSIMILAR MATERIAL JOINTS

KEY NOTES

1. 36" GRAB BAR
2. 42" GRAB BAR
3. 18" VERTICAL GRAB BAR
4. TOILET PAPER DISPENSER
5. PAPER TOWEL DISPENSER
6. RECESSED PAPER TOWEL DISPENSER & DISPOSAL UNIT
7. FEMININE NAPKIN DISPOSAL
8. 2x3 FRAMED MIRROR
9. FRAMELESS MIRROR- SEE ELEVATION FOR SIZE
10. URINAL SCREEN W/ CONT BRACKET
11. BABY CHANGER
12. COAT ROD & SHELF- MOUNT ROD @ 54" AFF
13. BULKHEAD ABOVE- SEE REFLECTED CEILING PLAN
14. CANOPY ABOVE
15. FIRE EXTINGUISHER w/ BRACKET
16. KNOX BOX
17. FIRE DEPARTMENT CONNECTION

WALL TYPES

NOTE-REFER TO SECTIONS & DETAILS FOR EXTEIOR WALLS

- A — 6" STUDS @ A1: 5/8" GYPSUM WALLBOARD; 3 5/8" METAL STUDS @ 16" O.C.; 3" ACOUSTICAL BLANKETS; 5/8" GYPSUM WALLBOARD
- B — 6" STUDS @ b1: 5/8" GYPSUM WALLBOARD; 3 5/8" METAL STUDS @ 16" O.C.; 5/8" GYPSUM WALLBOARD
- C: 5/8" GYPSUM WALLBOARD; 3 5/8" METAL STUDS @ 16" O.C. (ALL SHAFT WALLS & BULKHEADS)
- D

NOTES:
1. REFER TO STRUCTURAL DRAWING FOR CROSS BRACING LOCATIONS
2. GYPSUM WALLBOARD TO EXTEND DECK ABOVE CEILING UNLESS NOTED OTHERWISE
3. ALL EXPOSED CMU CORNERS TO BE BULLNOSE CORNERS
4. ALL WALLS TO BE EXTENDED TIGHT TO STRUCTURE ABOVE W/ SLIP TRACK U.N.O.
5. ALL WOOD FRAMING & SHEATHING IN A 1/B CONSTRUCTION IS REQUIRED TO BE NON-COMBUSTIBLE
6. PROVIDE DAMPERS AS REQUIRED IN ALL RATED ASSEMBLIES. COORDINATE WITH MECHANICAL CONTRACTOR
7. PROVIDE CONTROL JOINTS IN GYPSUM WALLBOARD 30'-0" O.C. MAX AT ALL WALLS
8. WATER RESISTANT GYPSUM WALLBOARD IN TOILET ROOMS & KITCHENS FROM FLOOR TO 4'-0" AFF MIN

Mark	Description	Date
	FOR INITIAL BUDGETING	01/04/22
	SITE PLAN APPROVAL	01/24/22
	30% BUDGETTING	02/28/22

Jeffrey Parker architects
ARCHITECTURE PLANNING ENGINEERING
855 28th Street SE
Grand Rapids MI 49508
Phone: 616-241-0090
Fax: 616-241-0098

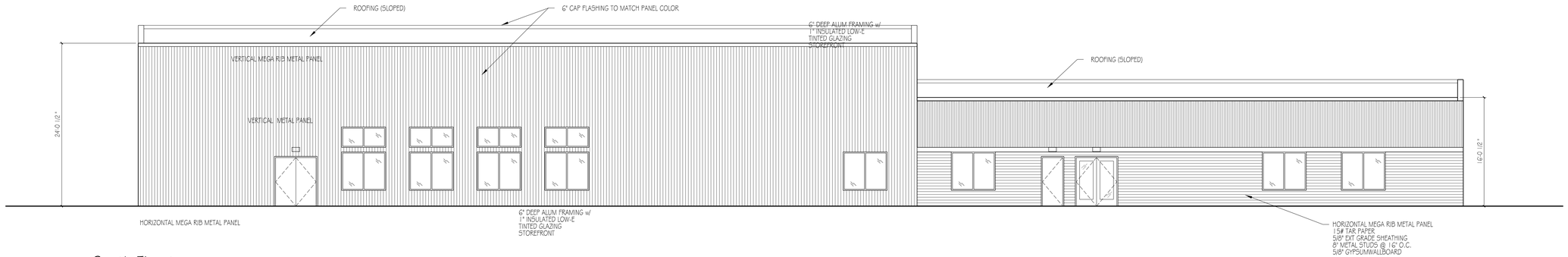
New Facility For:

Bible Baptist Church

Howell, Michigan

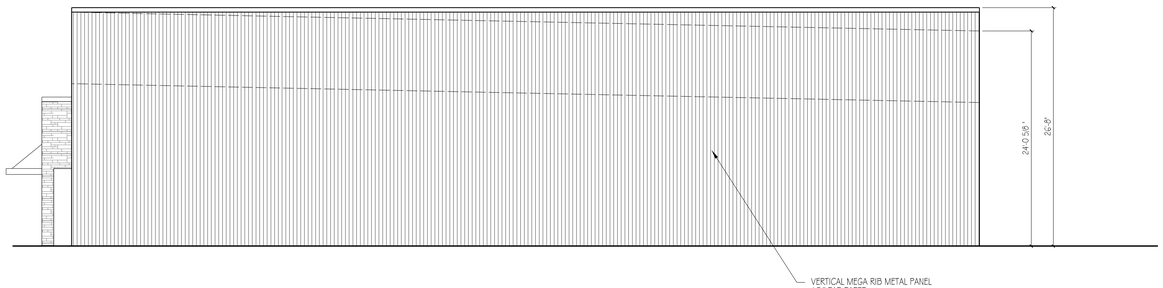
Floor Plan

Issued	Drawing No.
-	A1.0
Project No. 21111	



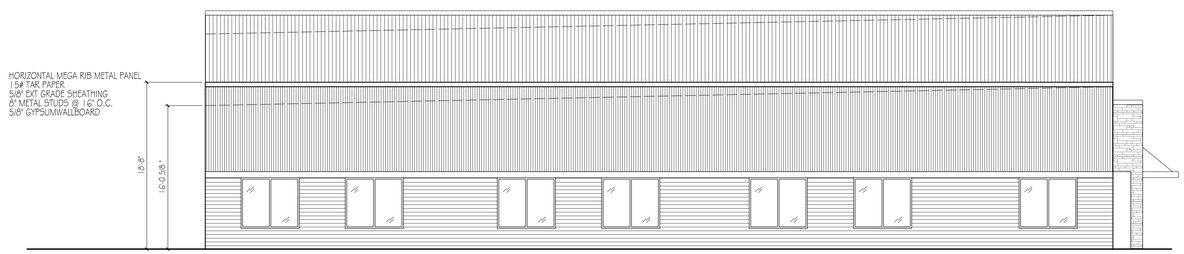
South Elevation

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



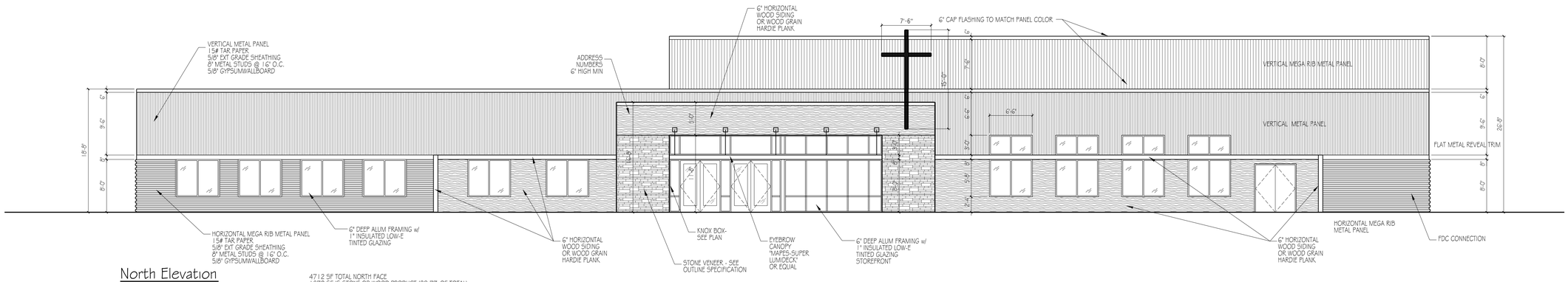
East Elevation

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



West Elevation

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



North Elevation

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

4712 SF TOTAL NORTH FACE
1870 SF IS STONE OR WOOD PRODUCT (39.7% OF TOTAL)

Mark	Description	Date
	FOR INITIAL BUDGETING	01/04/22
	SITE PLAN APPROVAL	01/24/22
	30% BUDGETING	02/28/22

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New Facility For:

Bible Baptist Church

Howell, Michigan

Exterior Elevations

Issued: -

Project No.: 21111

Drawing No.: A3.0


BIBLE BAPTIST CHURCH