

**CITY OF EAST GRAND RAPIDS PLANNING COMMISSION
NOTICE OF PUBLIC HEARING**

A public hearing will be held at the date, time, and place below to consider a site plan review for the property at 1815 Hall St. SE. The Planning Commission will be reviewing a plan from Grace Episcopal Church to reduce the size of the existing parking lot to accommodate a rain garden. The proposed plans may be viewed in the Public Works Administration office at the Community Center, or by linking from this notice at www.eastgr.org/notices. Plans will be posted within seven days of the public hearing date.

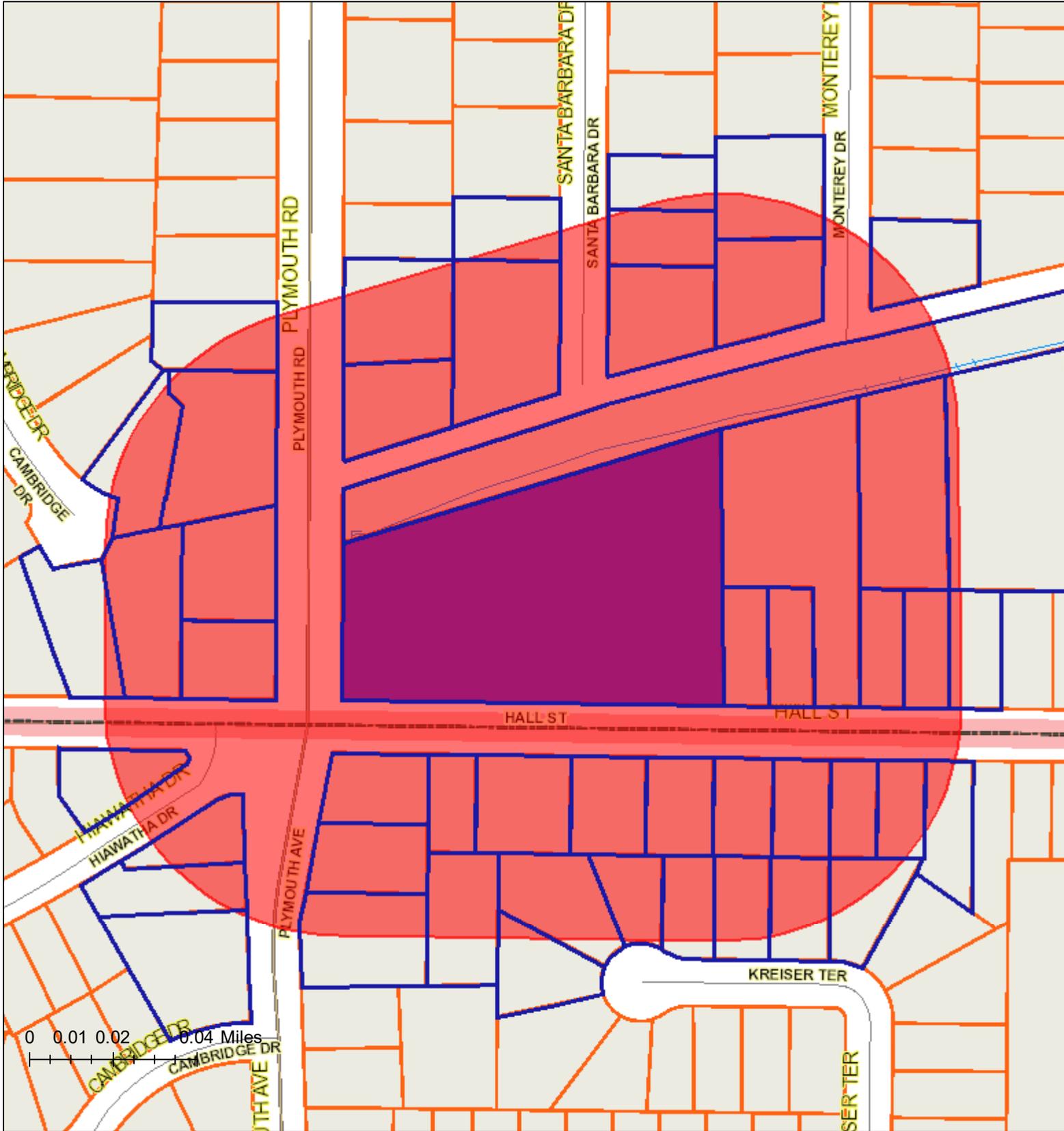
In accordance with the Michigan Planning Enabling Act, you are receiving this notice because you live or own property within 300' of this address. The Planning Commission invites those with any facts or evidence related to this request to present them at the scheduled meeting or by writing to the Planning Commission at 750 Lakeside Drive SE, East Grand Rapids, MI 49506. To be included in the hearing, written communications must contain the sender's name and address.

If you have any questions regarding this request, please contact the undersigned at (616)940-4817, or jgianotti@eastgr.org.

Date: Tuesday, May 13, 2025
Time: 5:30 p.m.
Place: East Grand Rapids Community Center Commission Chambers
750 Lakeside Drive SE, East Grand Rapids, MI 49506

Jay Gianotti, AICP
Zoning Administrator

1815 Hall Variance Mailing Area



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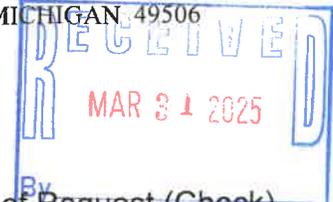
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CITY OF EAST GRAND RAPIDS

750 LAKESIDE DRIVE SE • EAST GRAND RAPIDS, MICHIGAN 49506



Zoning Review Application

Project Name Grace Episcopal Church Bioswale

Property Address 1815 Hall St SE, Grand Rapids, MI

Permanent Parcel No. 41-14-33-380-002

Zoning District SFR

Current Property Use SU - Church

Type of Request (Check)		Fee
<input type="checkbox"/>	Site Plan Review (Sketch Plan)	\$200
<input checked="" type="checkbox"/>	Site Plan Review (Complete)	\$500
<input type="checkbox"/>	Amendment or Rezoning Application	\$800
<input type="checkbox"/>	Special Use Permit	\$500
<input type="checkbox"/>	Planned Unit Development	\$1,000

Escrow fees are also required.
(\$1,000 initial deposit.)

Project Description The proposed work will retrofit the northern portion of the existing parking lot by replacing 3,000 sq ft of asphalt pavement with a landscaped rain garden. The rain garden will be designed to capture and infiltrate parking lot runoff from the 2-yr 24-hr storm which had previously discharged into Silver Creek. The existing drive aisle will be shifted south to accommodate the proposed rain garden resulting in the elimination of 10 parking spaces. This will reduce the total provided parking from 130 spaces to 120 spaces.
(Attach separate sheet if necessary.)
Based on City standards for Churches, 120 spaces are required. See attached sheets.

Contact Information (Please provide email addresses.)

	Company	Address	Contact Person	Daytime Phone
Applicant	Fishbeck	1515 Arboretum Dr SE Grand Rapids, MI 49506	Tony Heath	616.464.3979 theath@fishbeck.com
Owner	Grace Episcopal Church	1815 Hall St SE Grand Rapids, MI 49506		
Developer				
Designer	Fishbeck	1515 Arboretum Dr SE Grand Rapids, 49506	Tony Heath	616.464.3979 theath@fishbeck.com

See the back of this form for items that must be attached to this application at the time of submission.

Property Owner Signature
Stephen Sweetland, Sr. Warden.

3/30/25
Date

Applicant Signature (if different)

2025/03/31
Date

Technical Memo

SUBJECT: Grace Episcopal Church Bioswale
East Grand Rapids Request for Zoning Variance

DATE: February 21, 2025

PROJECT NO.: 241620

Project Overview

The proposed project is a partnership between Grace Episcopal Church (Church) and Plaster Creek Stewards. The project has received funding through a Michigan Department of Environment, Great Lakes, and Energy grant to improve water quality and reduce surface runoff within the Plaster Creek watershed. The proposed work will retrofit the northern portion of the existing parking lot by replacing approximately 3,000 square feet of asphalt pavement with a landscaped rain garden. This rain garden will be designed to capture and infiltrate parking lot runoff from the 2-year, 24-hour storm which previously discharged directly into Silver Creek. The existing drive aisle at the north end of the parking lot will be shifted to the south to accommodate the proposed rain garden resulting in the elimination of 10 parking spaces. This will reduce the total provided parking from 130 spaces to 120 spaces. Based on City of East Grand Rapids (City) requirements of 1 space per 3 seats or 6 feet of pew in the main unit of worship, 120 parking spaces are required.

Requested Variance

The maximum impervious surface ratio (ISR) for lots 12,000 square feet or larger in single family residential districts is 40 percent. The existing ISR on the Church property is 54 percent. The proposed project will eliminate 3,000 square feet of impervious surface. This will reduce the ISR to 52 percent, which still exceeds the allowable ISR as outlined in Section 5.28(A), Table 5.28-1a Maximum Lot Coverage of the City of East Grand Rapids Code of Ordinances. A variance is requested to the requirements of Section 5.28(A) to allow an impervious surface coverage of 52 percent.

Section 5.103(C) Criteria

1. The existing Church building and parking lot predate the City's current dimensional requirements. The Church building is a historic structure and cannot be altered. The parking lot cannot be reduced further without reducing the number of parking spaces below the required amount based on the size of the church.
2. When the existing Church was constructed and parking lot created, they were in conformance with all applicable requirements of the City.
3. The proposed variance is in line with the spirit of this chapter. The proposed variance will bring the site closer to compliance with the dimensional requirements of Section 5.28(A).
4. The proposed variance will reduce the extent to which the lot is non-conforming and bring it more in line with the requirements of Section 5.28(A).
5. The variance requested is the minimum necessary variance to grant relief.

Technical Memo

SUBJECT: Grace Episcopal Bioswale Basis of Design

DATE: January 7, 2025

PROJECT NO.: 241620

Introduction

Fishbeck has been contracted by the Plaster Creek Stewards to develop and submit plans and permits for a parking lot retrofit at Grace Episcopal Church to the Michigan Department of Environment, Great Lakes, and Energy for approval. This report summarizes the stormwater management design implemented at the project to site to capture and infiltrate runoff from the 2-year, 24-hour design storm and reduce total suspended solids (TSS) for the 90th percentile storm by 80%.

Project Site

The selected project is Grace Episcopal Church at 1815 Hall Street SE, Grand Rapids, Michigan. The project is located within the Silver Creek sub-basin of the Plaster Creek watershed. The project is located within the City of East Grand Rapids.

A 12-inch concrete overflow pipe that is part of the Silver Creek Drain, a Chapter 20 Drain of the Kent County Drain Commissioner, flows underneath the project site and discharges through the existing concrete spillway into Silver Creek. This pipe will be located and extended to daylight through the proposed outlet spillway at its present location. The main branch of the Silver Creek Drain flows south to Hall Street and around the Grace Episcopal Church property. A map of the Silver Creek Drain is included in Attachment 1.

A geotechnical investigation was completed at the site on November 6, 2024, by Materials Testing Consultants. They completed two borings and field infiltration tests within the bioswale footprint. The existing soil profile consists of 5 to 6 inches of hot mix asphalt, 4 inches of gravel base, and unconsolidated fill to a depth of 3 feet over brown, poorly graded sand to a depth of 15 feet or more. Groundwater was encountered at a depth of 4.8 feet, approximately elevation 715.6. Field infiltration tests measured 21.8 inches per hour in the northwest corner and 7.1 inches per hour in the northeast corner. A factor of safety of 2 was applied for a design infiltration rate of 3.55 inches per hour. The geotechnical data package is in Attachment 2.

The stormwater management area for this project is 1.27 acres.

Existing Conditions

The stormwater management area for this site is primarily impervious consisting of parking and drive aisles. The parking lot is divided into two sub-basins which flow to the northeast and northwest corners, respectively.

The northwest sub-basin includes most of the parking lot and has an area of 1.04 acres. The northeast sub-basin includes the remainder of the parking lot and a small brush-covered hill at the northeast site corner. The northeast sub-basin has an area of 0.24 acre. There is currently no stormwater management for the site and runoff sheet flows across the parking lot and discharges through spillways directly into Silver Creek.

The pre-settlement land cover for the entire project area was assumed to be Meadow with hydrologic soil group A soils. This results in a pre-settlement runoff volume of 0 cubic feet.

Proposed Conditions

The proposed stormwater improvements will consist of a multi-cell bioswale which will serve both sub-basins. The bioswale is located along the north edge of the existing parking lot. Curb scupper inlets will be located at the northeast and northwest corners. Sediment traps will be located at each curb scupper to help trap particulate debris from the parking lot. The bioswale will be sloped towards the existing concrete spillway at the northeast corner of the parking lot. This spillway will be the single discharge point from the site. The bioswale has been designed to capture and infiltrate the 2-year, 24-hour runoff volume and to reduce TSS loading in the 90th percentile storm by more than 80%. The outlet for the bioswale is a stabilized riprap weir through the existing concrete spillway into Silver Creek.

The volume was calculated according to the criteria of the Kent County Drain Commissioner. It is the sum of the storage volume and the volume infiltrated during the period of runoff. The storage volume was calculated as the sum of above-ground storage at the bioswale surface and the effective water capacity of the soils within 1 foot of the surface. The effective water capacity of loamy sand is 0.31 inch per inch. The infiltration area was assumed to be the entire footprint of the bioswale. Detailed calculations are in Attachment 3.

In addition, the bioswale was designed to ensure that it could pass the 10-year peak runoff without overtopping. The peak runoff from the 10-year, 24-hour storm is 4.60 cubic feet per second. Ditch capacity is controlled by the overflow weirs between each cell. These overflow weirs are broad-crested weirs with a width of 4 feet and length of 4 feet. Side slopes on the overflow weirs are 0.25 foot per foot. The 10-year peak runoff can be passed over these weirs with a flow depth of 0.42 foot. This results in 0.5 foot of freeboard or more at each weir. Weir flow capacity can be found in Attachment 4.

Summary

The proposed improvements will retain and infiltrate the entire 2-year, 24-hour runoff volume and reduce TSS loading in the 90th percentile storm by more than 80%. Stormwater management for the site will consist of a multi-celled bioswale with a total retention volume of 9,280 cubic feet. The 2-year, 24-hour runoff volume is 8,779 cubic feet. Once the design has been reviewed and finalized, Fishbeck will prepare a long-term maintenance plan for the proposed improvements and assist Plaster Creek Stewards with the development of a planting plan.

Attachment 1

Attachment 2



MATERIALS TESTING CONSULTANTS

November 6, 2024
Project No. 241751

Fishbeck
1515 Arboretum Drive SE
Grand Rapids, Michigan 49546

Attention: Tony Heath, P.E.
Senior Civil Engineer

Reference: Grace Episcopal Church – Green Infrastructure Retrofit
East Grand Rapids, Michigan

Dear Mr. Heath:

MTC has completed two (2) soil borings and two (2) infiltration tests in the asphalt surface lot located immediately east of Grace Episcopal Church at 1815 Hall Street SE in East Grand Rapids, Michigan as described in our Proposal No. 18661 and dated September 20, 2024. The completed boring logs, infiltration test reports and boring location plan are attached for your use. If you require any further assistance, please let us know and we would be glad to assist.

Should you have any questions, please contact our office at your earliest convenience.

Sincerely,

MATERIALS TESTING CONSULTANTS, INC.

Adam L. DePoy, P.E.
Project Manager

att: Figure 1 - Location Plan
Test Drilling and Sampling Procedures
Boring Log Terminology and Classification Outline
Boring Logs
Infiltration Test Reports



TITLE: BORING LOCATION PLAN		PROJECT: GRACE EPISCOPAL CHURCH - GREEN INFRASTRUCTURE RETROFIT	
SCALE: AS SHOWN	DATE: 11/06/2024	PROJECT NO.: 241751	
FIG. NO.: 1	DR. BY: AD	REV. BY: AD	
		 MTC MATERIALS TESTING CONSULTANTS	



TEST DRILLING AND SAMPLING PROCEDURES

Test Drilling Methods:

- Hollow stem auger, ASTM D6151
- Mud rotary, ASTM D5783
- Casing advancer, ASTM D5872
- Rock coring, ASTM D2113
- Core/Hand Auger

Note: Cone penetration test data can be used to interpret subsurface stratigraphy and can provide data on engineering properties of soils. The ASTM procedure does not include a procedure for determining soil classification from CPT testing. Soil classifications shown on CPT logs are based on published procedures and are not based on physical ASTM soil classification tests.

Sampling Methods:

- SPT, ASTM D1586, Auto hammer (140 lb., 30" drop, 2" OD split spoon sampler)
- Grab Samples

Note: The number of hammer blows required to drive the SPT sampler 12 inches, after seating 6 inches, is termed the soil N-value and provides an indication of the soil's relative density and strength parameters at the sample location. SPT blow counts in 6 inch increments are recorded on the boring logs.

Drill Rig:

- CME 55 (ATV)
- Acker Renegade (ATV)
- CME 45 Truck
- Geoprobe 7822 (ATV)
- Geoprobe Rotary Sonic

Boreholes Backfilled With:

- Excavated soil
- Cement bentonite grout
- Piezometer or Monitoring Well (see notes on logs)
- Concrete or asphalt patch where appropriate

Sample Handling and Disposition:

- Samples labeled, placed in jars, returned to MTC Laboratory
- Discard after 60 days



BORING LOG TERMINOLOGY AND ASTM D 2488 CLASSIFICATION OUTLINE

TERMS DESCRIBING CONSISTENCY OR CONDITION

COARSE-GRAINED SOILS (major portions retained on No. 200 sieve): includes (1) clean gravel and sands and (2) silty or clayey gravels and sands. Condition is rated according to relative density as determined by laboratory tests or standard penetration resistance tests.

Descriptive Terms	Relative Density	SPT Blow Count
Very loose	0 to 15 %	< 5
Loose	15 to 35 %	5 to 10
Medium dense	35 to 65 %	10 to 30
Dense	65 to 85 %	30 to 50
Very dense	85 to 100 %	> 50

Per ASTM D2487, the following conditions must be met based on laboratory testing to justify the label 'well graded' in a soil description.

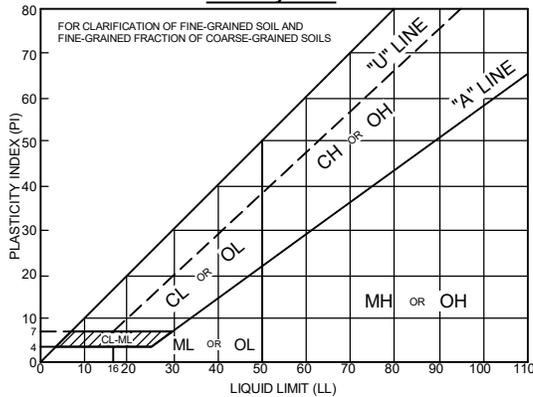
Gravel: $C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3

Sand: $C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3

FINE-GRAINED SOILS (major portions passing on No. 200 sieve): includes (1) inorganic and organic silts and clays, (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as indicated by penetrometer readings, SPT blow count, or unconfined compression tests.

Descriptive Terms	Unconfined Compressive Strength TSF	SPT Blow Count
Very soft	< 0.25	< 2
Soft	0.25 to 0.5	2 to 4
Medium stiff	0.5 to 1.0	4 to 8
Stiff	1.0 to 2.0	8 to 15
Very stiff	2.0 to 4.0	15 to 30
Hard	> 4.0	> 30

Plasticity Chart



MAJOR DIVISIONS			TYPICAL NAMES	
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LESS THAN 15% FINES	GW	WELL-GRADED GRAVELS WITH OR WITHOUT SAND
		GRAVELS WITH 15% OR MORE FINES	GP	POORLY-GRADED GRAVELS WITH OR WITHOUT SAND
			GM	SILTY GRAVELS WITH OR WITHOUT SAND
		GC	CLAYEY GRAVELS WITH OR WITHOUT SAND	
	SANDS MORE THAN HALF COARSE FRACTION IS FINER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LESS THAN 15% FINES	SW	WELL-GRADED SANDS WITH OR WITHOUT GRAVEL
			SP	POORLY-GRADED SANDS WITH OR WITHOUT GRAVEL
		SANDS WITH 15% OR MORE FINES	SP-SM	POORLY-GRADED SANDS WITH SILT WITH OR WITHOUT GRAVEL
			SM	SILTY SANDS WITH OR WITHOUT GRAVEL
		SC	CLAYEY SANDS WITH OR WITHOUT GRAVEL	
		FINE-GRAINED SOILS MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS	ML
CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY WITH OR WITHOUT SAND OR GRAVEL			
OL	ORGANIC SILTS OR CLAYS OF LOW TO MEDIUM PLASTICITY WITH OR WITHOUT SAND OR GRAVEL			
SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%	MH		INORGANIC SILTS OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL	
	CH		INORGANIC CLAYS OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL	
	OH		ORGANIC SILTS OR CLAYS OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL	
HIGHLY ORGANIC SOILS		PT/OL	PEAT AND OTHER HIGHLY ORGANIC SOILS	

GENERAL NOTES

- Classifications are based on the United Soil Classification System and include consistency, moisture, and color. Field descriptions have been modified to reflect results of laboratory tests where deemed appropriate.
- "Grades with" or "Grades without" may be used to describe soil when characteristics vary within a stratum.
- Preserved soil samples will be discarded after 60 days unless alternate arrangements have been made.

GROUNDWATER OBSERVATIONS:

- During - indicates water level encountered during the boring
- End- indicates water level immediately after drilling
- Date and Depth - Measurements at indicated date

SAMPLE TYPES AND NUMBERING

S	SPT, split barrel sample, ASTM D1586
U	Shelby tube sample, ASTM D1587
R	Rock core run
*S	Other than 2" split barrel sample
L	SPT with liner, ASTM D1586
A	Auger cuttings
G	Geoprobe liner

MINOR COMPONENT QUANTIFYING TERMS

Less than 5%	TRACE
5 to 10%	FEW
15 to 25%	LITTLE
30 to 40%	SOME
50 to 100%	MOSTLY

GRAIN SIZE

BOULDER	>12"
COBBLE	12" to 3"
COARSE GRAVEL	3" to 0.75"
FINE GRAVEL	0.75" to No. 4
COARSE SAND	No. 4 to No. 10
MEDIUM SAND	No. 10 to No. 40
FINE SAND	No. 40 to No. 200



LOG OF BORING

Project No.: 241751

Boring No.: B-1

Sheet: 1 of 1

Project: Grace Episcopal Church - Green Infrastructure Retrofit

Client: Fishbeck

Location: East Grand Rapids, Michigan

Drill Type: Geoprobe 7822

Crew Chief: DM **Field Eng.:** ST **Rev. By:** AD

Coordinates: N=527956.9 E=12786883.6 (MI South 1ft)

Elevation: 720.4 ft **Datum:** NAVD 88 (GPS Observation)

Notes:

Date Begin: 10/31/2024

Date End: 10/31/2024

Tooling	Type	Dia.	Groundwater, ft.	
Casing	HSA	4 1/4"	During	4.8
Sampler	SPT	2"	End	5
Core			Seepage	
Tube			Date	Depth, ft.
SPT Hammer	Auto			

Plugging Record: Backfilled borehole with compacted cuttings, patched pavement with cold patch. Cave in at 5.1 ft.

Depth Drilled: 15.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
719.4	1	S-1	1.5	3-2-2 N=4	SP-SM	6" HMA, 4" Gravel Base	0.8			Fill: 0.0 to 3'±
718.4	2					Brown to dark brown poorly graded SAND with silt; mostly fine sand, few silty fines, moist with black silt topsoil lenses, Fill	3.0			
717.4	3									
716.4	4	S-2	1.5	3-4-5 N=9	SP	Brown poorly graded SAND; mostly fine sand, trace silty fines, moist with occasional coarse to fine sand seams Grades wet at 4.8'±				
715.4	5									
714.4	6									
713.4	7	S-3	1.5	5-7-9 N=16	SP					
712.4	8									
711.4	9									
710.4	10	S-4	1.5	4-7-8 N=15	SP					
709.4	11									
708.4	12									
707.4	13	S-5	1.5	2-2-3 N=5	SP					
706.4	14									
705.4	15									

End of Boring

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



LOG OF BORING

Project No.: 241751

Boring No.: B-2

Sheet: 1 of 1

Project: Grace Episcopal Church - Green Infrastructure Retrofit

Client: Fishbeck

Location: East Grand Rapids, Michigan

Drill Type: Geoprobe 7822

Crew Chief: DM **Field Eng.:** ST **Rev. By:** AD

Coordinates: N=527981.8 E=12786991.2 (MI South 1ft)

Elevation: 721.5 ft **Datum:** NAVD 88 (GPS Observation)

Notes:

Date Begin: 10/31/2024

Date End: 10/31/2024

Tooling	Type	Dia.	Groundwater, ft.	
Casing	HSA	4 1/4"	During	6
Sampler	SPT	2"	End	6.5
Core			Seepage	
Tube			Date	Depth, ft.
SPT Hammer	Auto			

Plugging Record: Backfilled borehole with compacted cuttings, patched pavement with cold patch. Cave in at 6.5 ft

Depth Drilled: 15.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Penetration (Blows Per 6") ASTM D 1586	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
720.5	1	S-1	1.3	3-4-4 N=8	SP-SM	5" HMA, 4" Gravel Base	0.8			Fill: 0.0 to 3'±
719.5	2					Brown to dark brown poorly graded SAND with silt; mostly fine sand, few silty fines, moist, Fill	3.0			
718.5	3	S-2	1.5	4-6-7 N=13	SP	Brown poorly graded SAND; mostly fine sand, trace silty fines, moist				
717.5	4									
716.5	5									
715.5	6	S-3	1.5	4-6-7 N=13	SP	Grades wet				
714.5	7									
713.5	8									
712.5	9	S-4	1.5	3-3-5 N=8	SP					
711.5	10									
710.5	11									
709.5	12	S-5	1.5	3-3-3 N=6	CL	Grades gray	14.0	1.25		
708.5	13									
707.5	14									
706.5	15					Gray lean CLAY; mostly clayey fines, moist	15.0			

End of Boring

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



Double Ring Infiltration Test

Client:

Fishbeck
1515 Arboretum Drive SE
Grand Rapids, M 49546

Project:

241751.0
Grace Episcopal Church Green
Infrastructure Retrofit
1515 Arboretum Dr SE

Activity Information

Weather: Overcast

Low / High Temp, °F: 67 / 68

Activity Date: 10/31/2024

Tested By: Thompson, Scott

Test No.: IT-1

DOUBLE RING INFILTRATION TEST - SEMCOG METHOD

Pre-Test Soaking Duration (min): 131

Ground Surface Elev. (ft): 720.4

Water Level Drop in Last 30 Minutes of Presoak (in): 9.0

Test Elev. (ft): 716.4

Inner Diameter (in): 4.0

Groundwater Elev. (ft): 715.4

Outer Diameter (in): 6.0

Soil Description: Brown poorly graded SAND; mostly fine sand, trace silty fines, moist (SP)

Test Data

Time (min:sec)	Water Drop (in)	Time Interval (min)	Infiltration Rate (inches per hour)
10:00	5.5	10	33.0
20:00	5.3	10	31.5
30:00	5.1	10	30.4
40:00	4.1	10	24.4
50:00	3.9	10	23.3
60:00	3.8	10	22.5
70:00	3.8	10	22.9
80:00	3.8	10	22.5
90:00	3.8	10	22.9
100:00	3.7	10	22.1
120:00	3.6	10	21.8

Note: This test method provides a measure of infiltration rate, not hydraulic conductivity. Although the units of infiltration rate, and hydraulic conductivity are similar, there is a distinct difference between these two quantities. They cannot be directly related unless the hydraulic boundary conditions, such as hydraulic gradient and the extent of lateral flow of water are known or can be reliably estimated. Test results apply only to the specific test location, depth/elevation, and in-situ moisture content and density at time of test. An appropriate factor of safety should be applied to these results.

Remarks: Trimble coordinates: N 527956.9 E 12786883.6, El 720.4



Double Ring Infiltration Test

Client:

Fishbeck
1515 Arboretum Drive SE
Grand Rapids, M 49546

Project:

241751.0
Grace Episcopal Church Green
Infrastructure Retrofit
1515 Arboretum Dr SE

Activity Information

Weather: Overcast

Low / High Temp, °F: 67 / 68

Activity Date: 10/31/2024

Tested By: Thompson, Scott

Test No.: IT-2

DOUBLE RING INFILTRATION TEST - SEMCOG METHOD

Pre-Test Soaking Duration (min): 67

Ground Surface Elev. (ft): 721.4

Water Level Drop in Last 30 Minutes of Presoak (in): 10

Test Elev. (ft): 717.4

Inner Diameter (in): 4.0

Groundwater Elev. (ft): 715.0

Outer Diameter (in): 6.0

Soil Description: Brown poorly graded SAND; mostly fine sand, trace silty fines, moist (SP)

Test Data

Time (min:sec)	Water Drop (in)	Time Interval (min)	Infiltration Rate (inches per hour)
10:00	1.5	10	9.0
20:00	1.3	10	7.9
30:00	1.4	10	8.3
40:00	1.3	10	7.5
50:00	1.2	10	7.1
60:00	1.2	10	7.1
70:00	1.1	10	6.8
80:00	1.1	10	6.8
90:00	1.2	10	7.1

Note: This test method provides a measure of infiltration rate, not hydraulic conductivity. Although the units of infiltration rate, and hydraulic conductivity are similar, there is a distinct difference between these two quantities. They cannot be directly related unless the hydraulic boundary conditions, such as hydraulic gradient and the extent of lateral flow of water are known or can be reliably estimated. Test results apply only to the specific test location, depth/elevation, and in-situ moisture content and density at time of test. An appropriate factor of safety should be applied to these results.

Remarks: Test run west of B-2.

Attachment 3



LGROW Design Spreadsheet

City of Grand Rapids



Version 3.5

Instructions

- 1) After opening the spreadsheet you will need to enable the use of an embedded macro. Look for security warning above and click "Enable Content."
- 2) Data is entered in yellow cells. Green cells allow selection of items from pulldown menus or buttons.
- 3) To clear all input data entered in a worksheet, click the Clear Worksheet button at the top of the page (or press Ctrl+character) and hit the delete key.
- 4) Comments are indicated by red triangles in cells. Further direction is provided in the LGROW Design Spreadsheet Tutorial.
- 5) The spreadsheet can be used to model a single discharge point from the site including structural BMPs in series or parallel.

Project Description

Development Name	Parking Lot Retrofits - Grace Episcopal	Design Firm	Fishbeck
Address/Location	1815 Hall St SE	Engineer	Tony Heath
Developer/Owner	Plaster Creek Stewards	Date	11/15/2024

Run

	Select if Yes	Notes
Drainage District	<input type="checkbox"/>	
Watershed Policy	<input type="checkbox"/>	
Redevelopment/Addition	<input type="checkbox"/>	
MS4	<input type="checkbox"/>	
Hotspot	<input type="checkbox"/>	
Coldwater Stream	<input type="checkbox"/>	

Sensitive Areas

Description	Notes

Channel Protection Volume Basis

Pre-development Land Use Definition	Pre-Settlement	Notes
Not Required	<input type="checkbox"/>	
Provided Offsite	<input type="checkbox"/>	
Alternative Approach	<input type="checkbox"/>	

Subcatchment Connectivity

Number of Subcatchments

Subcatchment Name	Downstream Subcatchment	Subcatchment Description
Sub1	Sub3	NW Corner
Sub2	Sub3	NE Corner
Sub3	none	Outlet

Subcatchment Hydrology Summary

Subcatchment Name	Existing			Developed		
	Area [ac]	% Impervious	Average CN	Area [ac]	% Impervious	Average CN
Sub1	1.04	0%	30	1.04	91%	92
Sub2	0.24	0%	30	0.24	39%	60
Sub3	0.00	0%	30	0.00	0%	30
Site Totals and Averages:	1.27	0%	30	1.27	81%	86

Channel Protection Volume from Structural BMPs

Subcatchment Name	Channel Protection Volume [cft]			
	Required	Upstream	Credited	Unmet
Sub1	8,012	0	5,951	2,061
Sub2	767	0	538	229
Sub3	0	2,290	2,290	0
Total	8,779		8,779	

Percent of Channel Protection Volume met by Onsite Retention	100
Required Extended Detention Volume [cft]	0
Required Extended Detention Release Rate [cfs]	0.000
1-year Existing Peak Discharge [cfs]	0.00

Water Quality Volume and TSS Removal

Subcatchment Name	Water Quality Volume [cft]	Volume Met	TSS			
			Generated	Upstream	Total	Removed
Sub1	3,369	Yes	3,369	0	3,369	2,999
Sub2	323	Yes	323	0	323	287
Sub3	0	Yes	0	406	406	0
Total	3,692	Yes	3,692			3,286

TSS Removal Efficiency [%]	89
80% TSS removal met?	Yes

Sub1: NW Corner

Runoff

[Click here for documentation](#)

Existing Land Use	HSG	Area	Units	Curve Number	
				Existing	Pre-settlement
Meadow	A	43,727	sqft	30	30
Meadow	A	1,515	sqft	30	30
			sqft		
		1.04	acre	30	30

Developed Land Use	HSG	Area	Units	Curve Number	Notes
EXIST: Impervious (paved parking lot, roof, driveway, etc.)	A	41,257	sqft	98	
EXIST: Open spaces (grass cover) - good	A	1,515	sqft	39	
S-BMP: Meadow	A	2,470	sqft	30	Bioretention
		1.04	acre	92	

Notes:

Subcatchment Runoff Volume for Developed Land Use	Rainfall Frequency				
	1-year	2-year	10-year	25-year	100-year
Volume from this Subcatchment [cft]	6,851	8,012	12,159	15,226	20,825

Channel Protection Volume

[Click here for documentation](#)

Required Channel Protection Volume

Is Channel Protection Volume required? If no, provide reason. Yes No

	2-year Runoff Volumes [cft]	
	Developed	Pre-developed
Required this Subcatchment [cft]	8,012	0
Unmet from Upstream Subcatchments [cft]	0	
Required Channel Protection Volume [cft]	8,012	

Structural BMPs used to meet Channel Protection Volume

Structural BMP	A Infiltration Area [sqft]	V Storage Volume [cft]	i Design Infiltration Rate [in/hr]	Drain Time [hr]	Volume Retained [cft]
Bioretention / Rain Garden	2,830	2,110	3.55	2.52	5,951
				N.A.	
				N.A.	
				N.A.	
Totals		2,110			5,951
					Credited Channel Protection Volume
					5,951
Notes:					Percentage of Channel Protection Volume Met by Retention
					74%

Water Quality Volume

[Click here for documentation](#)

	Paved [ac]	Pitched Roofs [ac]	Flat Roofs/Unpaved [ac]
Sum of Directly Connected Impervious Area [ac]	0.95	0.95	
Sum of Directly Connected Disturbed Pervious Area [ac]	0.00		
Required Volume this Subcatchment [cft]	3,369		
Volume from Upstream Subcatchments [cft]	0		
Water Quality Volume to be Treated [cft]	3,369		
		TSS Generated this Subcatchment	3,369
		TSS from Upstream Subcatchments	0
		TSS to be Treated	3,369

TSS Accounting

BMPs Used in Treatment Train	Treated Water Volume [cft]	TSS Removal Efficiency			TSS Removed
		Tabulated	Third-Party	Effective	
RET: Bioretention/Rain Garden	5,926	89		89	2,999
					0
					0
					0
					0
Released Water Volume [cft]	0				Total TSS Removed
Water Quality Volume met?	Yes				2,999
					TSS Remaining
					371
Notes:					TSS Removal Efficiency [%]
					89

Sub2: NE Corner

Runoff

[Click here for documentation](#)

Existing Land Use	HSG	Area	Units	Curve Number	
				Existing	Pre-settlement
Meadow	A	10,238	sqft	30	30
Meadow	A		sqft	30	30
		0.24	acre	30	30

Developed Land Use	HSG	Area	Units	Curve Number	Notes
EXIST: Impervious (paved parking lot, roof, driveway, etc.)	A	3,949	sqft	98	
EXIST: Open spaces (grass cover) - good	A	4,660	sqft	39	
S-BMP: Meadow	A	1,629	sqft	30	
		0.24	acre	60	

Notes:

Subcatchment Runoff Volume for Developed Land Use	Rainfall Frequency				
	1-year	2-year	10-year	25-year	100-year
Volume from this Subcatchment [cft]	656	767	1,173	1,509	2,203

Channel Protection Volume

[Click here for documentation](#)

Required Channel Protection Volume

Is Channel Protection Volume required? If no, provide reason.

2-year Runoff Volumes [cft]

Required this Subcatchment [cft] **767** Developed: 767 Pre-developed: 0

Unmet from Upstream Subcatchments [cft] **0**

Required Channel Protection Volume [cft] 767

Structural BMPs used to meet Channel Protection Volume

Structural BMP	A Infiltration Area [sqft]	V Storage Volume [cft]	i Design Infiltration Rate [in/hr]	Drain Time [hr]	Volume Retained [cft]
Bioretention / Rain Garden	290	176	3.55	2.06	538
				N.A.	
				N.A.	
				N.A.	
Totals		176			538

Credited Channel Protection Volume **538**

Notes: Percentage of Channel Protection Volume Met by Retention **70%**

Impervious Loading Ratio: 13.9, Total Loading Ratio 14.3

Water Quality Volume

[Click here for documentation](#)

	Paved [ac]	Pitched Roofs [ac]	Flat Roofs/Unpaved [ac]
Sum of Directly Connected Impervious Area [ac]	0.09	0.09	
Sum of Directly Connected Disturbed Pervious Area [ac]	0.00		
Required Volume this Subcatchment [cft]	323	TSS Generated this Subcatchment 323	
Volume from Upstream Subcatchments [cft]	0	TSS from Upstream Subcatchments 0	
Water Quality Volume to be Treated [cft] 323		TSS to be Treated 323	

TSS Accounting

BMPs Used in Treatment Train	Treated Water Volume [cft]	TSS Removal Efficiency			TSS Removed
		Tabulated	Third-Party	Effective	
RET: Bioretention/Rain Garden	470	89		89	287
					0
					0
					0
					0
Released Water Volume [cft]	0	Total TSS Removed			287
Water Quality Volume met?	Yes	TSS Remaining			35
Notes:		TSS Removal Efficiency [%]			89

Sub3: Outlet

Runoff

[Click here for documentation](#)

Existing Land Use	HSG	Area	Units	Curve Number	
				Existing	Pre-settlement
Meadow	A	1	sqft	30	30
		0.00	acre	30	30

Developed Land Use	HSG	Area	Units	Curve Number	Notes
S-BMP: Meadow	A	1	sqft	30	
		0.00	acre	30	

Notes:

Subcatchment Runoff Volume for Developed Land Use	Rainfall Frequency				
	1-year	2-year	10-year	25-year	100-year
Volume from this Subcatchment [cft]	0	0	0	0	0

Channel Protection Volume

[Click here for documentation](#)

Required Channel Protection Volume

Is Channel Protection Volume required? If no, provide reason. Yes

	2-year Runoff Volumes [cft]	
	Developed	Pre-developed
Required this Subcatchment [cft]	0	0
Unmet from Upstream Subcatchments [cft]	2,290	
Required Channel Protection Volume [cft]	2,290	

Structural BMPs used to meet Channel Protection Volume

Structural BMP	A Infiltration Area [sqft]	V Storage Volume [cft]	i Design Infiltration Rate [in/hr]	Drain Time [hr]	Volume Retained [cft]
Bioretention / Rain Garden	1,195	1,048	3.55	2.97	2,791
				N.A.	
				N.A.	
				N.A.	
Totals		1,048			2,791
					Credited Channel Protection Volume
					2,290
Notes:					Percentage of Channel Protection Volume Met by Retention
					100%

Water Quality Volume

[Click here for documentation](#)

	Paved [ac]	Pitched Roofs [ac]	Flat Roofs/Unpaved [ac]
Sum of Directly Connected Impervious Area [ac]	0.00	0.00	
Sum of Directly Connected Disturbed Pervious Area [ac]	0.00		
Required Volume this Subcatchment [cft]	0		
Volume from Upstream Subcatchments [cft]	0		
Water Quality Volume to be Treated [cft]	0		
		TSS Generated this Subcatchment	0
		TSS from Upstream Subcatchments	406
		TSS to be Treated	406

TSS Accounting

BMPs Used in Treatment Train	Treated Water Volume [cft]	TSS Removal Efficiency			TSS Removed
		Tabulated	Third-Party	Effective	
					0
					0
					0
					0
					0
Released Water Volume [cft]	0				Total TSS Removed
Water Quality Volume met?	Yes				0
					TSS Remaining
					406
Notes:					TSS Removal Efficiency [%]
					0

Attachment 4

Weir Calcs

Prepared by Fishbeck, Thompson, Carr & Huber
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Rainfall file not specified

Printed 1/7/2025

Page 1

Summary for Pond 1P: (new Pond)

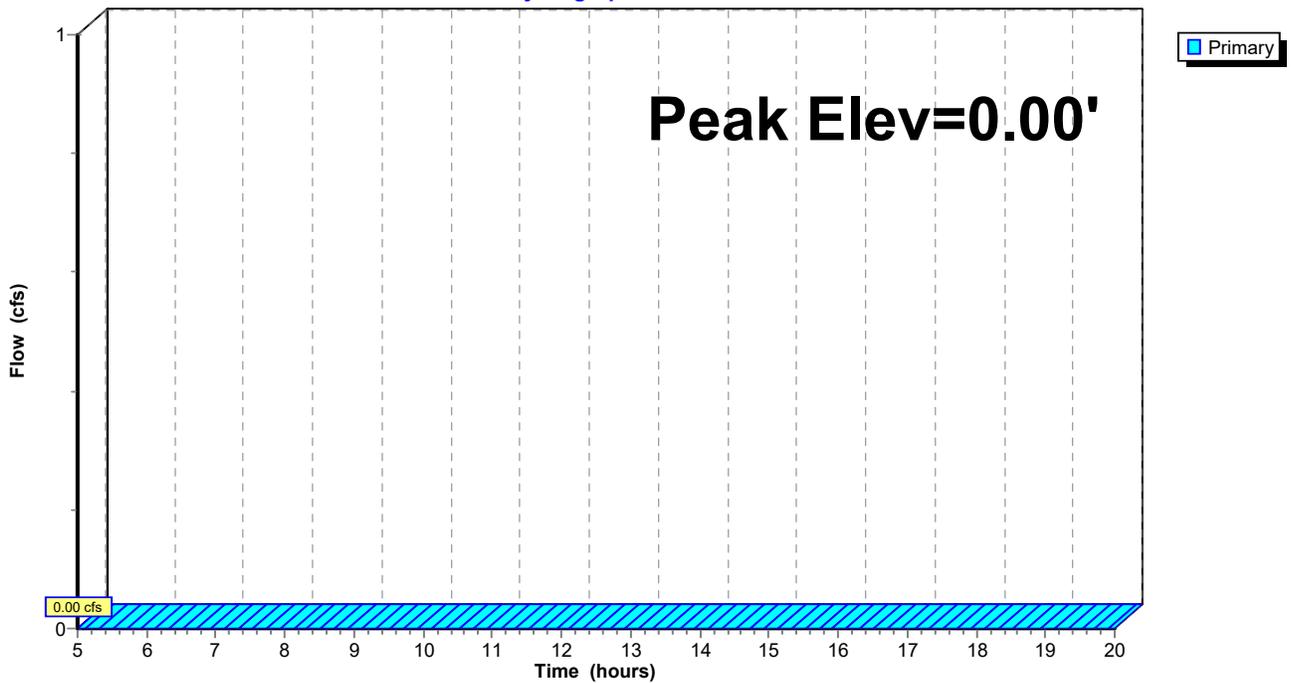
[43] Hint: Has no inflow (Outflow=Zero)

Device	Routing	Invert	Outlet Devices
#1	Primary	719.50'	Spillway, Cv= 2.62 (C= 3.28) Head (feet) 0.00 0.50 1.00 Width (feet) 4.00 8.00 12.00

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=0.00' (Free Discharge)
↑1=Spillway (Controls 0.00 cfs)

Pond 1P: (new Pond)

Hydrograph



Weir Calcs

Prepared by Fishbeck, Thompson, Carr & Huber
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Rainfall file not specified

Printed 1/7/2025

Page 2

Stage-Discharge for Pond 1P: (new Pond)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
719.50	0.00	720.02	6.96
719.51	0.01	720.03	7.20
719.52	0.04	720.04	7.44
719.53	0.07	720.05	7.69
719.54	0.11	720.06	7.95
719.55	0.15	720.07	8.21
719.56	0.20	720.08	8.47
719.57	0.26	720.09	8.74
719.58	0.32	720.10	9.01
719.59	0.38	720.11	9.29
719.60	0.45	720.12	9.57
719.61	0.52	720.13	9.85
719.62	0.60	720.14	10.14
719.63	0.68	720.15	10.43
719.64	0.76	720.16	10.73
719.65	0.85	720.17	11.04
719.66	0.95	720.18	11.34
719.67	1.04	720.19	11.65
719.68	1.14	720.20	11.97
719.69	1.25	720.21	12.29
719.70	1.36	720.22	12.61
719.71	1.47	720.23	12.94
719.72	1.59	720.24	13.28
719.73	1.71	720.25	13.61
719.74	1.84	720.26	13.96
719.75	1.97	720.27	14.30
719.76	2.10	720.28	14.66
719.77	2.23	720.29	15.01
719.78	2.38	720.30	15.37
719.79	2.52	720.31	15.74
719.80	2.67	720.32	16.11
719.81	2.82	720.33	16.48
719.82	2.98	720.34	16.86
719.83	3.14	720.35	17.25
719.84	3.30	720.36	17.64
719.85	3.47	720.37	18.03
719.86	3.64	720.38	18.43
719.87	3.82	720.39	18.83
719.88	4.00	720.40	19.24
719.89	4.19	720.41	19.65
719.90	4.37	720.42	20.07
719.91	4.57	720.43	20.49
719.92	4.76	720.44	20.92
719.93	4.96	720.45	21.35
719.94	5.17	720.46	21.79
719.95	5.38	720.47	22.23
719.96	5.59	720.48	22.67
719.97	5.81	720.49	23.12
719.98	6.03	720.50	23.58
719.99	6.25		
720.00	6.48		
720.01	6.72		

Plaster Creek Stewards Grace Episcopal Church Bioswale

1815 Hall Street SE
Grand Rapids, MI 49506

Issued for Zoning Review February 21, 2025
Project Number 241620



fishbeck.com 1515 Arboretum Drive
800.456.3824 Grand Rapids, Michigan

CIVIL

- C0 COVER
- C1 EXISTING CONDITIONS & SESC PLAN
- C2 DEMOLITION PLAN
- C3 SITE LAYOUT PLAN
- C4 GRADING PLAN
- C5 DETAILS

ZONING NOTES

PROPERTY ADDRESS: 1815 HALL ST. SE, GRAND RAPIDS, MI
PARCEL ID: 41-14-33-380-002
ZONING DISTRICT: SINGLE FAMILY RESIDENTIAL
CURRENT PROPERTY USE: SPECIAL USE - CHURCH

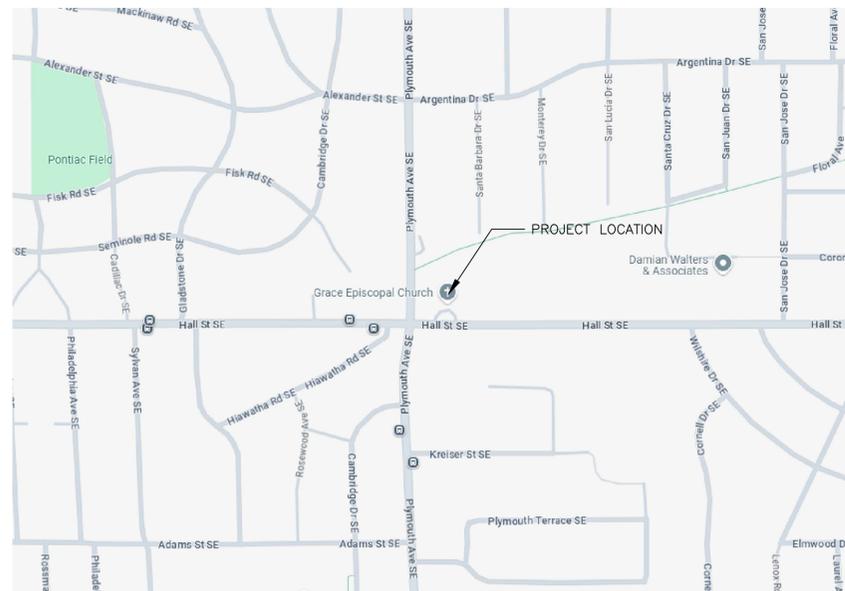
EXISTING IMPERVIOUS SURFACE RATIO (ISR): 54%
PROPOSED ISR: 52%
REQUIRED ISR: 40%

EXISTING PARKING: 130 SPACES
PROPOSED PARKING: 120 SPACES
REQUIRED PARKING: 120 SPACES

OWNER:
GRACE EPISCOPAL CHURCH
1815 HALL ST SE, GRAND RAPIDS, MI 49506
CONTACT PERSON: CHRIS LOWE, FACILITIES DIRECTOR
EMAIL: CLOWE@GRACECHURCHGR.ORG
PHONE: 616-375-3486

ENGINEER:
FISHBECK
1515 ARBORETUM DR SE, GRAND RAPIDS, MI 49506
CONTACT PERSON: TONY HEATH, PE
EMAIL: THEATH@FISHBECK.COM
PHONE: 616-464-3979

LOCATION MAP



UTILITY INFORMATION

THE EXISTING UTILITIES SHOWN ON THE FOLLOWING DRAWINGS HAVE BEEN LOCATED FROM UTILITY RECORD DRAWINGS. ACTUAL UTILITY LOCATIONS MAY VARY FROM WHAT IS SHOWN. ALL UTILITIES TO BE FIELD VERIFIED BY UTILITY OWNER PRIOR TO CONSTRUCTION.



Plaster Creek Stewards
1815 Hall St SE, Grand Rapids, MI 49506
Grace Episcopal Church Bioswale

REVISIONS

**NOT FOR
CONSTRUCTION**

11/21/2024 PRELIMINARY

Drawn By AODDO
Designer THEATH
Reviewer
Manager THEATH

Hard copy is intended to be 22"x34" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

PROJECT NO.
241620

SHEET NO.

C0

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REVISIONS
NOT FOR CONSTRUCTION

11/21/2024 PRELIMINARY
Drawn By AODDO
Designer THEATH
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PROJECT NO.
241620

SHEET NO.

C1

BENCH MARKS

BENCH MARK 200 ELEVATION: 723.53
CHISELED BOX ON EAST SIDE OF LIGHT POLE BASE, 282' NORTH OF APPROXIMATE CENTERLINE OF HALL STREET SOUTHEAST AND 109' EAST-NORTHEAST OF NORTHEAST CORNER OF BUILDING #1815 (GRACE EPISCOPAL CHURCH)

SYMBOL LEGEND

- BENCH MARK
- PROPERTY LINE
- ROW LINE
- LIGHT
- DECIDUOUS TREE
- TREE LINE
- CONTOUR MAJOR
- CONTOUR MINOR
- FENCE LINE
- PAVED SURFACE
- EXISTING CURB & GUTTER
- STORM SEWER
- SOIL BORING
- LIMITS OF DISTURBANCE
- SILT FENCE
- STRAW BALE FILTER

SURVEY NOTES

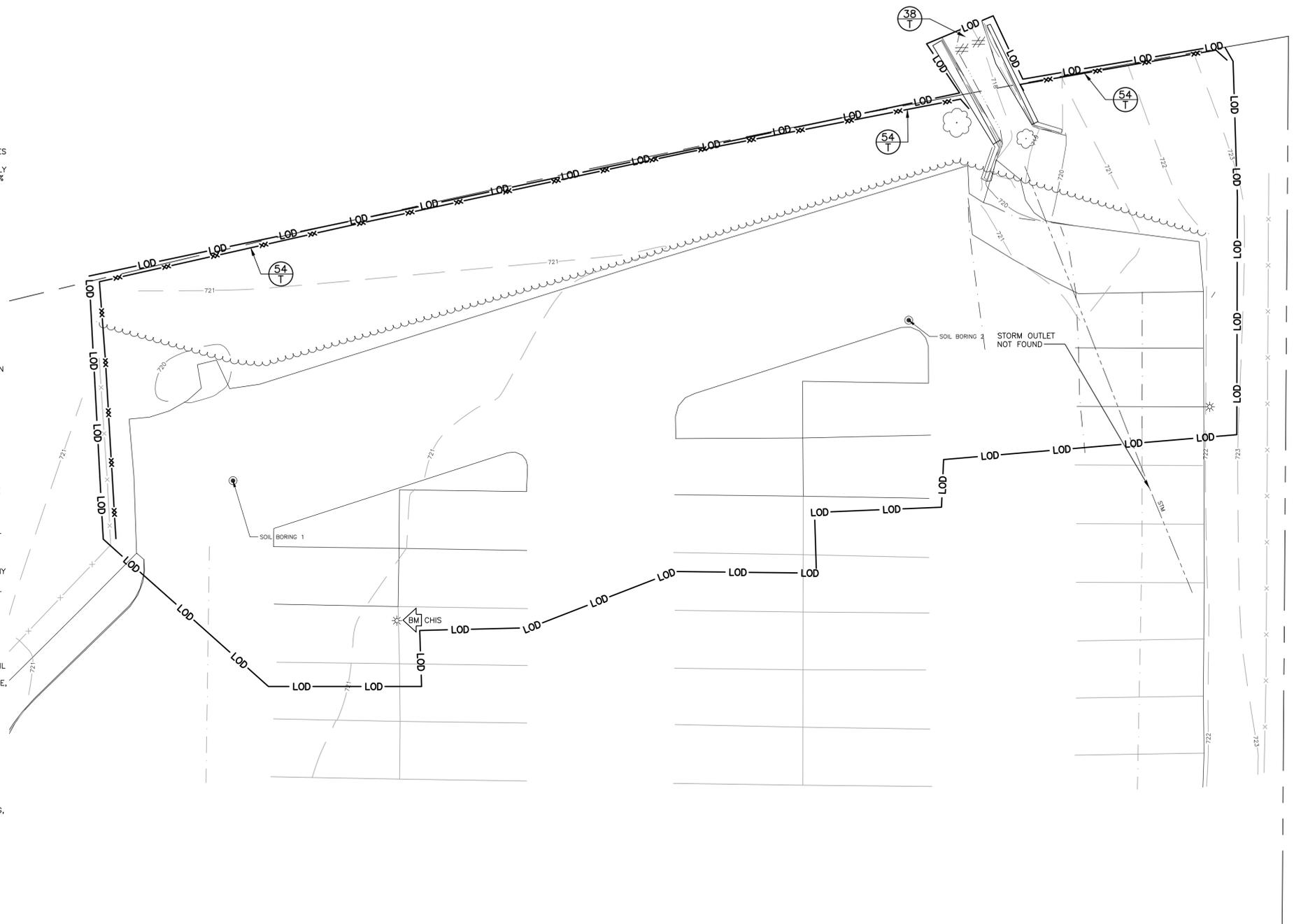
1. TOPOGRAPHIC SURVEY WAS COMPLETED BY FISHBECK IN OCTOBER, 2024 AND REFLECTS CONDITIONS AT THAT TIME. THE CONTRACTOR IS RESPONSIBLE FOR VISITING THE SITE PRIOR TO BIDDING TO CONFIRM EXISTING CONDITIONS AS SHOWN ON THE PLANS. REPORT ALL DISCREPANCIES TO THE ENGINEER.
2. THE HORIZONTAL AND VERTICAL INFORMATION PROVIDED IS BASED ON THE MICHIGAN STATE PLANE COORDINATE SYSTEM (SOUTH ZONE, INTERNATIONAL FEET) WITH NAD83 HORIZONTAL AND NAVD88 VERTICAL DATUM, RESPECTIVELY.
3. UNDERGROUND UTILITIES ARE SHOWN BASED ON SURFACE MANHOLE AND VALVE LOCATIONS, AND MAY NOT BE ACCURATE. CONTRACTOR SHALL CONTACT MISS DIG PRIOR TO ANY EXCAVATION. CONTACT ENGINEER IF UTILITIES ARE FOUND IN DIFFERENT CONDITIONS THAN SHOWN ON THESE PLANS.

GEOTECHNICAL NOTES

1. GEOTECHNICAL FIELD INVESTIGATION AND REPORT PREPARED BY MATERIALS TESTING CONSULTANTS IN NOVEMBER, 2024 AND REFLECT CONDITIONS AT THAT TIME.
2. SOIL BORINGS INDICATE 5 TO 6 IN OF HMA OVER 4 IN OF GRAVEL BASE AND 3 FT OF UNCOMPACTED SANDY FILL. SUBSOILS CONSIST OF BROWN POORLY GRADED SAND.
3. GROUNDWATER ENCOUNTERED AT ELEVATION 715.6 FT.
4. INFILTRATION RATES MEASURED VIA DOUBLE RING INFILTRATION TEST.
 - 4.1. SOIL BORING 1: 21.8 IN PER HOUR
 - 4.2. SOIL BORING 2: 7.1 IN PER HOUR

SESC NOTES

1. MAINTAIN A COPY OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) ON THE SITE FOR THE DURATION OF CONSTRUCTION, IF REQUIRED. ADHERE TO THE SWPPP DURING CONSTRUCTION OPERATIONS.
2. MAINTAIN AND REPAIR ALL SESC BEST MANAGEMENT PRACTICES (BMPs) DURING CONSTRUCTION UNTIL ALL VEGETATION IS ESTABLISHED. (ALL DISTURBED SOIL SURFACES ARE UNIFORMLY COVERED IN PERMANENT VEGETATION WITH A DENSITY OF 70% OR GREATER, OR AS DEFINED BY PERMIT.)
3. PERFORM ALL EARTH-DISTURBING CONSTRUCTION ACTIVITIES WITHIN THE LIMITS OF DISTURBANCE AS INDICATED ON THE DRAWINGS.
4. REVIEW THE LIMITS OF DISTURBANCE SHOWN ON THE DRAWINGS AND FIELD-STAKING THE LIMIT OF DISTURBANCE LINE PRIOR TO THE START OF CONSTRUCTION AND/OR CONTRACTORS OPERATIONS AT NO ADDITIONAL COST TO OWNER.
5. INSTALL PERIMETER EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO THE START OF ANY LAND CLEARING OR GRADING ACTIVITIES.
6. APPLY TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES AS SHOWN ON THE DRAWINGS AND/OR AS REQUIRED BY SESC PERMIT AND IMPLEMENT ADDITIONAL MEASURES AS DICTATED BY SITE CONDITIONS.
7. ENSURE THAT ANY SEDIMENTATION RESULTING FROM WORK ON THIS SITE IS CONTAINED ON THE SITE AND NOT ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATERWAYS.
8. LEAVE SLOPES IN A ROUGHENED CONDITION DURING THE GRADING PHASE TO REDUCE RUNOFF VELOCITIES AND EROSION.
9. LOCATE LAY DOWN, STAGING AND STOCKPILE AREAS WITHIN THE PERMITTED LIMITS OF DISTURBANCE.
10. INSTALL SILT FENCE OR SEDIMENT LOGS AROUND THE PERIMETER OF ON-SITE SOIL STOCKPILE AREAS IF RUNOFF CAN IMPACT A STABILIZED PART OF THE SITE, OR LEAVE THE SITE. ADDITIONALLY, INACTIVE PORTIONS OF THE STOCKPILE AREAS ARE TO BE STABILIZED AS REQUIRED BY PERMIT.
11. IMPLEMENT TEMPORARY STABILIZATION MEASURES ON ANY DISTURBED AREAS WHERE CONSTRUCTION ACTIVITIES WILL NOT RESUME FOR 14 DAYS OR MORE. IMPLEMENTATION OF TEMPORARY STABILIZATION MEASURES MUST BE INITIATED IMMEDIATELY AND COMPLETED WITHIN SEVEN (7) DAYS FROM WHEN CONSTRUCTION ACTIVITIES TEMPORARILY CEASED ON ANY PORTION OF THE SITE. APPLY 3-5 LBS/1000 SFT. TEMPORARY SEED AND STRAW MULCH OVER DISTURBED AREA.
12. TOPSOIL AND MULCH ALL EXPOSED AREAS WITHIN SEVEN (7) CALENDAR DAYS FOLLOWING THE CONCLUSION OF FINAL GRADING IN THAT AREA.
13. REGULARLY CHECK SEEDED AREAS TO SEE THAT A GOOD STAND OF VEGETATION IS "ESTABLISHED". VEGETATION WILL NOT BE CONSIDERED "ESTABLISHED" UNTIL 100% OF THE SOIL SURFACE IS UNIFORMLY COVERED WITH PERMANENT VEGETATION WITH A DENSITY OF 70% OR GREATER. FERTILIZE, WATER, RESEED AND MULCH AS NEEDED.
14. MINIMIZE TRACKING OF SOIL AND SEDIMENT ONTO OFF-SITE ROADWAYS THROUGH THE USE OF APPROPRIATE MEASURES. IMMEDIATELY REMOVE ANY SOIL OR SEDIMENT TRACKED ONTO THE ROADWAYS.
15. NO VEHICLES AND EQUIPMENT CLEANING IS ALLOWED AT LOCATIONS WHERE RUNOFF COULD FLOW DIRECTLY INTO A WATER COURSE OR DOWNSTREAM STORM SEWER.
16. CONTRACTOR TO USE APPROPRIATE MEASURES DURING CONSTRUCTION TO CONTROL AIRBORNE SEDIMENTATION INCLUDING WATERING EXPOSED SOILS, PLACING WIND FENCING, PLANTING TEMPORARY VEGETATION, ETC.
17. LIMITS OF DISTURBANCE: 0.26 ACRES
18. PROXIMITY TO NEAREST BODY OF WATER: < 500 FT



EXISTING CONDITIONS & SESC PLAN

SCALE: 1" = 10'
0 5 10 20

EGLE SOIL EROSION AND SEDIMENTATION CONTROL MEASURES

KEY	DETAIL	CHARACTERISTICS
38		Inexpensive and easy to construct. Can be located as necessary to collect sediment. May be used in conjunction with silt fence for added stability.
54		Use geotextile and posts or poles. May be constructed or prepackaged. Easy to construct and locate as necessary.

TEMPORARY MEASURE

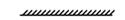
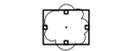
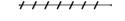
PERMANENT MEASURE

ESTIMATED QUANTITIES THIS SHEET		
ITEM DESCRIPTION	UNIT	TOTAL ESTIMATED QUANTITY
MOBILIZATION	LS	1
ALLOWANCE, TESTING	LS	1
SILT FENCE	LF	220
STRAW BALE FILTER	EA	2

BENCH MARKS

BENCH MARK 200 ELEVATION: 723.53
CHISELED BOX ON EAST SIDE OF LIGHT POLE BASE, 282' NORTH OF APPROXIMATE CENTERLINE OF HALL STREET SOUTHEAST AND 109' EAST-NORTHEAST OF NORTHEAST CORNER OF BUILDING #1815 (GRACE EPISCOPAL CHURCH)

SYMBOL LEGEND

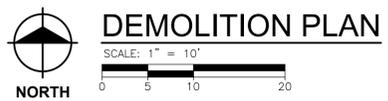
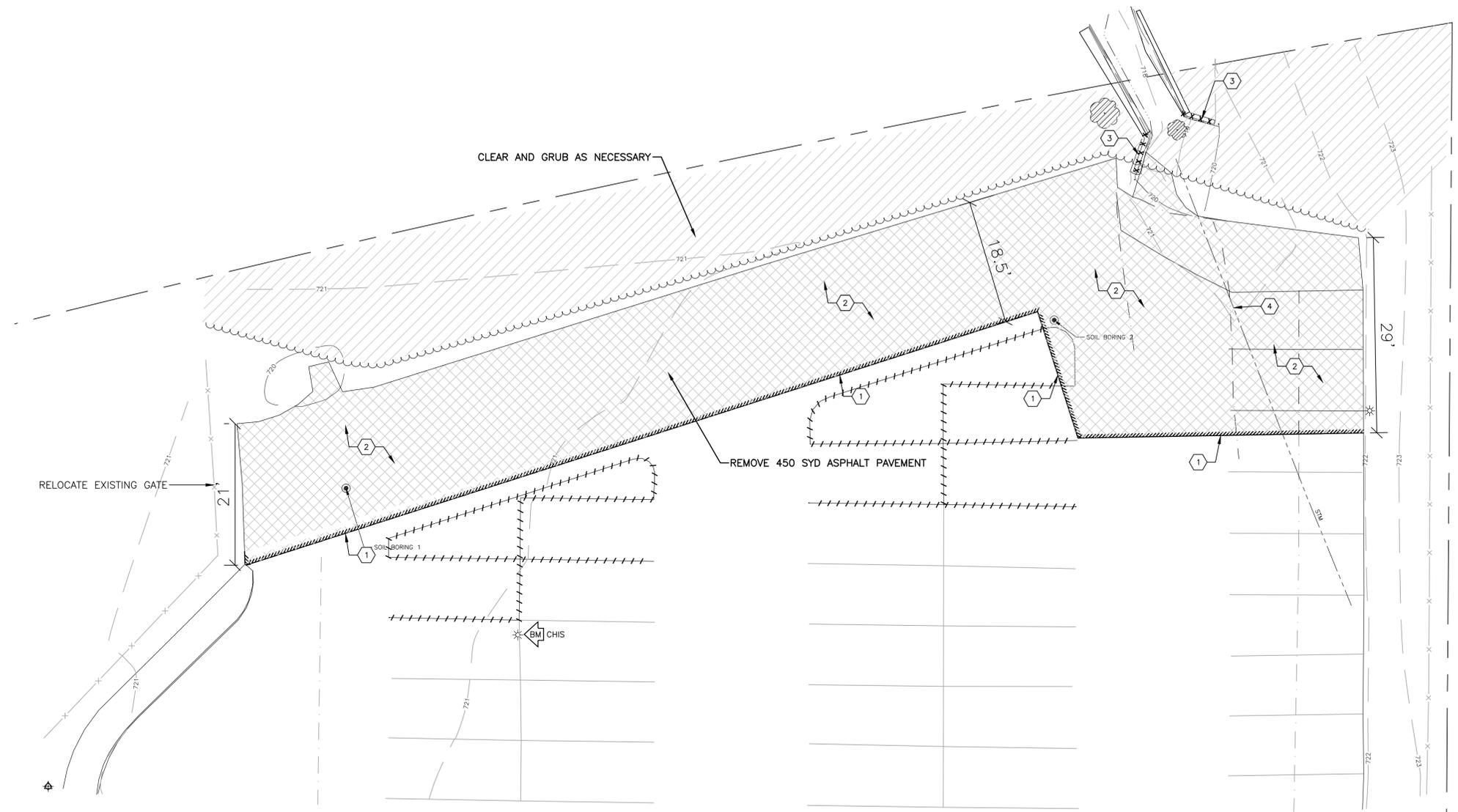
-  SAWCUT
-  REMOVE TREES & BRUSH
-  REMOVE ASPHALT PAVEMENT
-  TREE PROTECTION
-  TREE REMOVAL
-  REMOVE PAINT STRIPING

NOTES

1. FIELD VERIFY THE EXTENT OF REMOVALS AND DEMOLITION PRIOR TO CONSTRUCTION. NOTIFY ENGINEER OF ANY DEVIATIONS FROM INFORMATION SHOWN.
2. PRIOR TO CONSTRUCTION ALL FENCING, BARRICADES, ENCLOSURES, ETC., MUST BE INSTALLED AND APPROVED BY OWNER OR CONSTRUCTION MANAGER.
3. DISPOSE OF DEMOLITION AND EXCAVATION MATERIALS IN ACCORDANCE WITH CONTRACT DOCUMENTS.
4. SOIL EROSION AND SEDIMENTATION CONTROL MEASURES MUST BE IN PLACE PRIOR TO STARTING REMOVALS AND DEMOLITION.
5. UNLESS SPECIFICALLY NOTED FOR REMOVAL ON THE PLANS, PROTECT ALL SIDEWALKS, DRIVES, CULVERTS, DRAINAGE STRUCTURES, AND ABOVE AS WELL AS BELOW GRADE UTILITIES. REMOVE AND REPLACE ALL SUCH ITEMS DAMAGED OR DESTROYED DURING CONSTRUCTION WITH NEW AT NO ADDITIONAL COST TO THE OWNER.
6. PROTECT EXISTING TREES TO REMAIN WITH TEMPORARY FENCING AT THE DRIP LINE. NO GROUND DISTURBANCE OR STORAGE OF MATERIAL/EQUIPMENT SHALL OCCUR WITHIN THE DRIP LINE LIMITS.
7. COORDINATE REMOVAL OR REPLACEMENT OF ELECTRICAL, TELEPHONE, CABLE TV, WATER, FIBER OPTIC CABLE AND/OR GAS LINES WITH THE AFFECTED UTILITY COMPANY. PROVIDE ADEQUATE TIME SHALL BE PROVIDED FOR RELOCATION AND CLOSE COORDINATION WITH THE UTILITY COMPANY AS NECESSARY TO PROVIDE A SMOOTH TRANSITION IN UTILITY SERVICE. PAY CLOSE ATTENTION TO EXISTING UTILITIES WITHIN THE CONSTRUCTION LIMITS. GIVE NOTICE TO ALL UTILITY COMPANIES REGARDING DESTRUCTION AND REMOVAL OF ALL SERVICE LINES AND CAP ALL LINES BEFORE PROCEEDING WITH THE WORK.
8. PERFORM CLEARING, GRUBBING, TREE AND STUMP REMOVAL, TOPSOIL REMOVAL AND STOCKPILING IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
9. BEFORE REMOVING OR ABANDONING ANY UTILITY PIPES, VERIFY NEW UTILITY PIPE HAS BEEN INSTALLED, TESTED AND IS OPERATIONAL.
10. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THIS DRAWING HAVE BEEN DETERMINED FROM THE BEST INFORMATION AVAILABLE AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. VERIFY CRITICAL INVERT INFORMATION PRIOR TO BEGINNING CONSTRUCTION.
11. SAWCUT AND REPLACE DAMAGE CAUSED TO SURROUNDING AREA PAVEMENT OUTSIDE THE CONSTRUCTION LIMITS AT NO ADDITIONAL COST TO THE OWNER.
12. COORDINATE SEQUENCING AND PHASING OF DEMOLITION WITH CONSTRUCTION MANAGER.

DEMOLITION KEY NOTES

1. SAWCUT ASPHALT PAVEMENT
2. REMOVE ASPHALT PAVEMENT FULL DEPTH
3. REMOVE RETAINING WALLS AND ALL APPURTENANCES
4. PROTECT STORM PIPE



ESTIMATED QUANTITIES THIS SHEET		
ITEM DESCRIPTION	UNIT	TOTAL ESTIMATED QUANTITY
PAVEMENT REMOVAL, FULL DEPTH	SYD	450
RETAINING WALL REMOVAL	LS	1
CLEARING & GRUBBING	SYD	312
PAVEMENT MARKING REMOVAL	LF	318
RELOCATE EXISTING GATE	EA	1

PLOT INFO: 2/20/2024 16:20/CADD/CDC2_241620.DWG LAYOUT: DEMOLITION PLAN DATE: 2/19/2025 TIME: 1:04:47 PM USER: THEATH

Plaster Creek Stewards
1815 Hall St SE, Grand Rapids, MI 49506
Grace Episcopal Church Bioswale

REVISIONS
NOT FOR CONSTRUCTION

11/21/2024 PRELIMINARY
Drawn By: AODDO
Designer: THEATH
Reviewer:
Manager: THEATH

PROJECT NO.
241620
SHEET NO.

C2
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BENCH MARKS

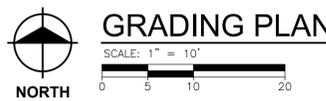
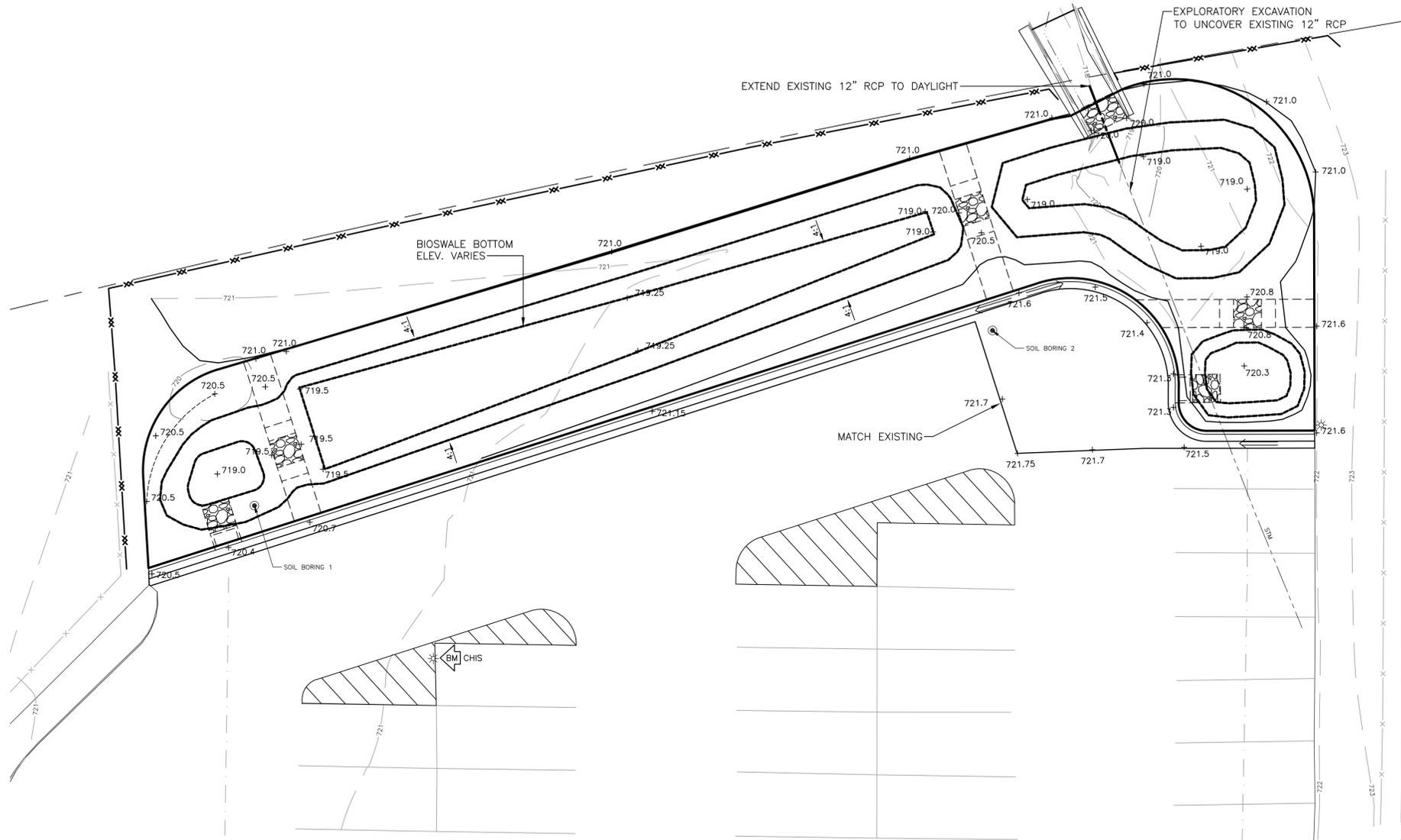
BENCH MARK 200 ELEVATION: 723.53
CHISELED BOX ON EAST SIDE OF LIGHT POLE BASE, 282' NORTH OF APPROXIMATE CENTERLINE OF HALL STREET SOUTHEAST AND 109' EAST-NORTHEAST OF NORTHEAST CORNER OF BUILDING #1815 (GRACE EPISCOPAL CHURCH)

SYMBOL LEGEND

- 725 — EXISTING MAJOR CONTOUR
- 724 — EXISTING MINOR CONTOUR
- 725** PROPOSED MAJOR CONTOUR
- 724** PROPOSED MINOR CONTOUR
- 724.50 XX** SPOT ELEVATION
- EM EDGE OF METAL
- EW EDGE OF WALK
- GR GRADE ELEVATION
- TOP TOP OF SLOPE
- BOT BOTTOM OF BIOSWALE
- EX EXISTING ELEVATION

NOTES

1. FINISH GRADE OF SOIL EDGES ALONG PAVEMENT TO MATCH EDGE OF PAVEMENT.
2. STRIP AND STOCKPILE TOPSOIL FROM GRADING AREAS. USE STOCKPILED TOPSOIL AND IMPORTED TOPSOIL AS NECESSARY FOR SURFACE RESTORATION.
3. GRADES SHOWN ARE FINAL SURFACE GRADES AFTER COMPLETION OF SURFACE IMPROVEMENTS AND PLACEMENT OF TOPSOIL AND MULCH.
4. GRADE AREAS AT SITE PERIMETER TO MATCH GRADES OF ADJACENT PARCELS.
5. REMOVE EXCESS SOIL FROM SITE AND DISPOSE OF PROPERLY IN ACCORDANCE WITH APPLICABLE REGULATIONS.
6. PROVIDE TEMPORARY GRADING FEATURES SUCH AS BERMS, SWALES, SUMPS AND BASINS TO MANAGE INTERIM STORM WATER RUNOFF DURING CONSTRUCTION PROCESS. STORM WATER RUNOFF LEAVING THE SITE SHALL MEET ALL FEDERAL, STATE AND LOCAL QUALITY REQUIREMENTS.



ESTIMATED QUANTITIES THIS SHEET		
ITEM DESCRIPTION	UNIT	TOTAL ESTIMATED QUANTITY
EXCAVATION & HAUL EARTH	CYD	69
SUBGRADE, UNDERCUTTING	CYD	167
REINFORCED CONCRETE PIPE, 12"	LF	12
EXPLORATORY EXCAVATION	LS	1

PLOT INFO: 2/20/2024 10:20:00 CAD/CDD/C4_241620.DWG LAYOUT: GRADING PLAN DATE: 2/19/2025 TIME: 10:45:53 PM USER: THEATH

Plaster Creek Stewards
1815 Hall St SE, Grand Rapids, MI 49506
Grace Episcopal Church Bioswale

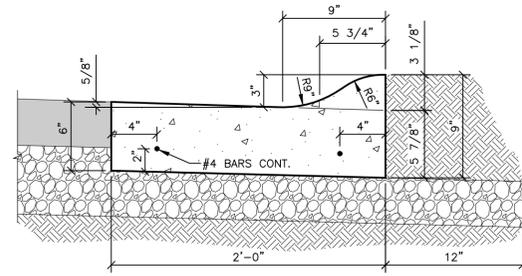
REVISIONS
NOT FOR CONSTRUCTION

11/21/2024 PRELIMINARY
Drawn By AODDO
Designer THEATH
Reviewer
Manager THEATH

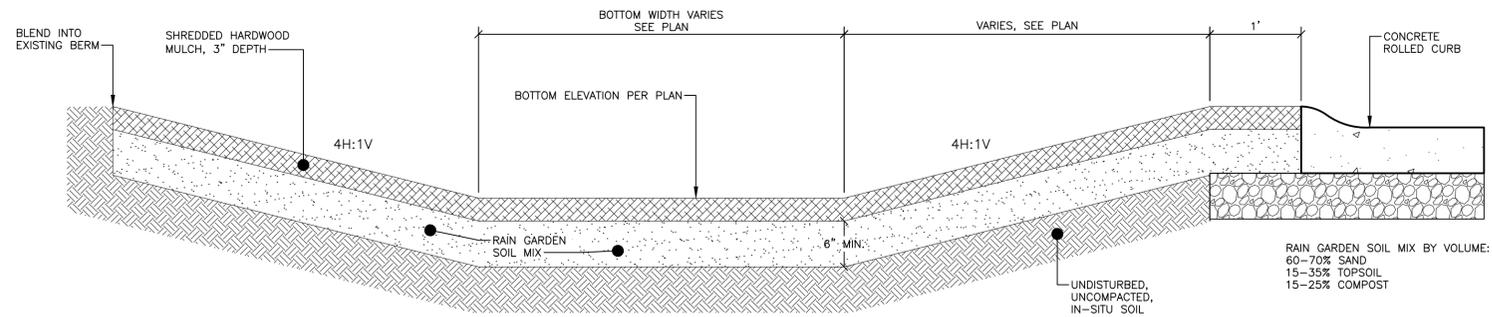
PROJECT NO.
241620

SHEET NO.

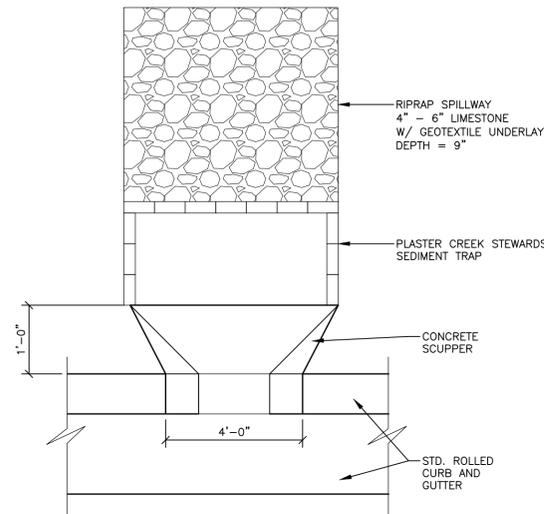
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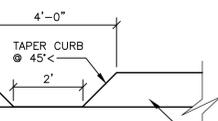
STANDARD ROLLED CURB & GUTTER
NO SCALE CO-003



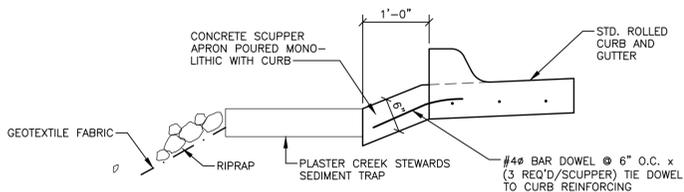
BIOSWALE CROSS SECTION
NO SCALE GI-005



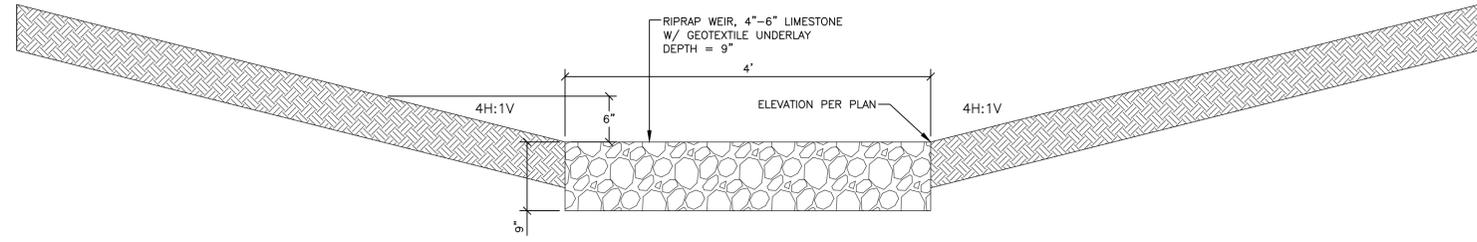
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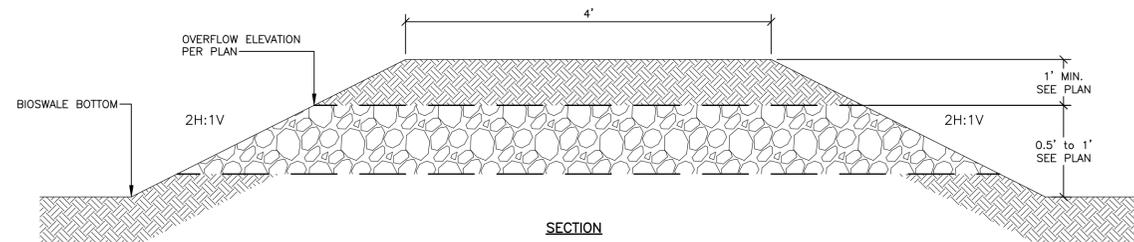
ELEVATION



CURB SCUPPER DETAIL
NO SCALE SI-007



ELEVATION



SECTION

RIPRAP WEIR DETAIL
NO SCALE RR-006

PLOT INFO: 2/20/24 2:16:20 AM LAYOUT: DETAILS DATE: 2/19/2025 TIME: 1:04:54 PM USER: THEATH

REVISIONS

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11/21/2024	PRELIMINARY
Drawn By	AODDO
Designer	THEATH
Reviewer	
Manager	THEATH

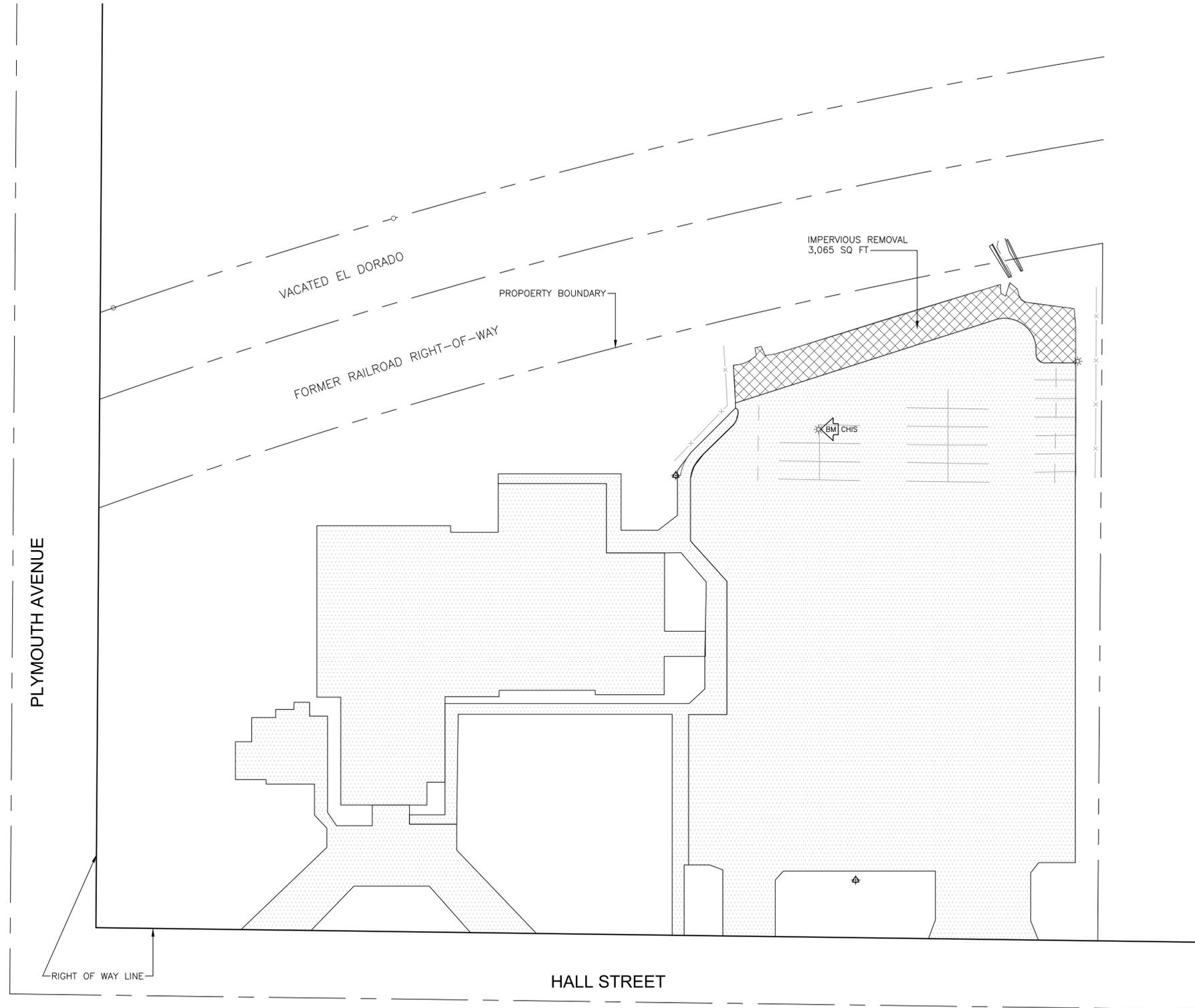
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PROJECT NO.
241620

SHEET NO.

C5

PLOT INFO: 2/20/24 04:16:20\CAD\PRECD\LOT COVERAGE EXHIBIT.DWG LAYOUT: LOT COVERAGE EXHIBIT DATE: 3/4/2025 TIME: 2:56:35 PM USER: THEATH



SYMBOL LEGEND

- IMPERVIOUS REMOVAL
- IMPERVIOUS SURFACE

LOT COVERAGE NOTES

PROPERTY ADDRESS: 1815 HALL ST. SE, GRAND RAPIDS, MI
 PARCEL ID: 41-14-33-380-002
 ZONING DISTRICT: SINGLE FAMILY RESIDENTIAL
 CURRENT PROPERTY USE: SPECIAL USE - CHURCH

LOT AREA: 3.18 ACRES (138,420 SQ FT)
 EXISTING IMPERVIOUS AREA: 1.72 ACRES (74,770 SQ FT)
 EXISTING LOT COVERAGE: 54%

PROPOSED IMPERVIOUS AREA: 1.65 ACRES (71,705 SQ FT)
 PROPOSED LOT COVERAGE: 52%

IMPERVIOUS SURFACE REDUCTION: 3,065 SQ FT

REVISIONS

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11/21/2024 PRELIMINARY

Drawn By TH
 Designer TH
 Reviewer TH
 Manager THEATH

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PROJECT NO.
 241620

SHEET NO.

A



Technical Memo

SUBJECT: Grace Episcopal Church Bioswale – Parking Calculations

DATE: March 27, 2025

PROJECT NO.: 241620

Introduction

The Grace Episcopal Bioswale is a partnership between Grace Episcopal Church and Plaster Creek Stewards to retrofit approximately 3,000 square feet of asphalt parking lot to create a rain garden and bioswale designed to capture, slow, and infiltrate runoff from the 2-year, 24-hour storm which previously discharged directly into Silver Creek. The project is located at the north end of the parking lot. The existing drive aisle will be shifted to the south to accommodate the proposed rain garden resulting in the elimination of 10 parking spaces. This will reduce the total provided parking from 130 spaces to 120 spaces. Based on City of East Grand Rapids (City) requirements of one space per three seats or six feet of pew in the main unit of worship, 120 parking spaces are required.

Minimum Parking Requirement

Off-street parking requirements are detailed in Title V, Article IX of the City Code of Ordinances. According to sections 5.76(B) 1 and 2, if the computation of the minimum number of parking spaces results in a fraction, any fractional amount of 0.5 or greater shall be rounded up to the next whole number. All other fractional results shall be rounded down to the previous whole number.

Section 5.77, Table A outlines residential and institutional use parking space requirements. For churches and similar places of worship one space for each three seats or six feet of pews in the main unit of worship are required.

Parking Study

Fishbeck completed a parking study on November 26, 2024. Based on aerial imagery there are currently 130 parking spaces, six of which are accessible in the Grace Episcopal Lot. The typical parking dimension for these spaces is 9 feet width by 19 or 20 feet long.

Measurements were taken in the main unit of worship of the linear feet of pew and choir seating on the dais. Seating in the main unit of worship is divided into four areas: central nave, side nave, balcony, and dais. These measurements are summarized in Table 1.

Table 1 – Seating Measurements

No. of Rows	Row Length [ft]	Total Seating [ft]
Central Nave		
1	11	11
18	15	270
2	7.5	15
15	15	225
2	12	24
Side Nave		
10	4.5	45
6	3	18
Balcony		
2	10.67	21.3
3	20.67	62
Total		691 linear feet of pew
Dais		15 seats

Required Spaces = (691 linear feet of pew / 6) + (15 seats / 3) = 120.17 spaces = 120 required spaces