Stormwater Management Plan

St. Juan Diego Pilgrim House
City of La Crosse, Wisconsin

Prepared For:
Shrine of Our Lady of Guadalupe, Inc.
5250 Justin Road, PO 1237
La Crosse, WI 54601

Prepared By:
Vierbicher
999 Fourier Drive, Suite 201
Madison, Wisconsin 53717

Prepared On:
September 13, 2024
Project #200196

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Narrative

NARRATIVE

1.1 Introduction

The project site is located at 6025 County Road MM in the City of La Crosse (NE ¼ of the NW ¼ of Section 26 Town 15N Range 7W). The site is east of Mormon Creek and bound by County Road MM on the west. The existing site is home to the Shrine of Our Lady of Guadalupe Church with associated drive lanes, sidewalks, and utilities. The existing parcel contains 74.7 acres but the project site only includes 0.88 acres. The church is proposing a building addition to create a 6-story retreat center that will replace some of the existing pavement areas.

Existing drainage patterns will be maintained for this project. The site drains internally to private storm sewer which flow to three small detention ponds near the entrance of the site. The detention ponds outlet to a culvert under CTH MM with all site runoff eventually making its way to Mormon Creek. There are no floodplains located on the site. There are no wetland indicators present on the site per DNR's Surface Water Data Viewer.

The site is required to meet City of La Crosse post construction stormwater management requirements for new development as requested by the City. These requirements include sediment control, runoff rate control, and infiltration. These requirements will be met to the maximum extent practicable with a proposed underground detention system.

1.2 Soils Description

The U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) online Web Soil Survey, indicates the proposed project site primarily contains Churchtown Silt Load (116E2), Hydrologic Soil Group "B".

Chosen Valley Testing (CVT) completed a soils evaluation May 14, 2021. This report is located in section 3.2. In it, CVT concludes the underlying soils are dominated by loessial (wind deposited) silts and clays. To avoid settlement and collapse of the loessial soils, infiltration of runoff must not be permitted.

1.3 Design Criteria

Stormwater Management Requirements	
Design Frequency	2 and 10-Year, 24-hour storm events using the MSE3 or MSE4 NRCS Rainfall Distribution
Rainfall Data	3.00, 4.44-inch/24-hour
Curve Number	Pre-Developed Maximum: Woodland 55 Post-Developed: Impervious 98, Grass/Landscape 61
Peak Rate Control	Meet the pre-developed runoff rate for the 2 and 10-year, 24-hour events
Sediment Control	80% Reduction, as compared to no controls
Infiltration	Infiltrate 75% of the pre-developed volume of average annual rainfall

1.4 Summary of Results

Peak Runoff Rate Control
The site must maintain the pre-developed peak runoff rate control for the 2 and10-year, 24-hour events. This requirement is met with an underground detention system.

The runoff from the site is routed to an underground detention system and discharges to an on-site wooded ravine. Because the project is located on a hill, fringe area within the disturbed limits of the site will not able to be detained. Because of this, the peak runoff under proposed conditions is slightly higher than the peak runoff under predeveloped conditions. Undetained fringe area consists of pervious grass and landscape area and utility pads. All other impervious surfaces, including driveways, parking, and roof, are detained. The peak runoff rate control calculations are in section 4 of this report. The following two tables summarize routing through the detention facility.

Run-on into the detention facility has been taken into account in the modeling. The run-on consists of 0.15 acre of nearby roof and landscape area.

The site must maintain the pre-developed peak runoff rate control for the 2, and 10-year, 24-hour events. The site meets these requirements to the maximum extent practicable. The table below summarizes the peak runoff rate control calculations for the development.

Storm Frequency (Year)	Pre-Developed (0.99 acres) CFS	No Controls Post-Developed (0.99 acres) CFS	Controls Post-Developed (0.99 acres) CFS	Controls Post-Developed, From Detention Only (0.99 acres) CFS
2	0.15	2.67	0.16	0.06
10	0.85	4.50	0.90	0.78

Sediment Control
The site will be required to reduce TSS from the site by eighty percent (80%), as compared to no controls. The table below summarizes the results of the TSS modeling.

No Controls (lbs)	After Stormwater w/ Controls (lbs)	TSS Removed from Site (lbs)	% Reduction
280.4	48.01	232.39	82.88%

The site is required to meet 80% TSS reduction from a no control standpoint. The stormwater management facilities have been designed to treat runoff and will achieve an 82.88% TSS removal rate. TSS was modeled with WinSLAMM v. 10.5 and calculations are within section 5 of this report.

Infiltration
The site is considered to have moderate imperviousness and is required to infiltrate 75% of the pre-developed infiltration volume in the post-developed condition for the average annual rainfall. However, due to the nature of the project, the geotechnical report states that infiltration must not be permitted in order to avoid settlement and collapse of the loessial soils. Therefore, no infiltration is designed for the site.

Erosion Control

The project is anticipated to begin November 2024 and will be restored by Spring 2026. Erosion control measures will consist of a double row of silt fence downstream of all construction activity, a tracking pad located at the entrance/exit of the project site, and erosion mat over slopes 4:1 or greater. All erosion control measures will be in place prior to land disturbing activities.

1.5 Conclusions

All stormwater management design criteria that were required by the City and State up are met by an underground detention system. The site should be exempt from infiltration per recommendation in the geotechnical report.

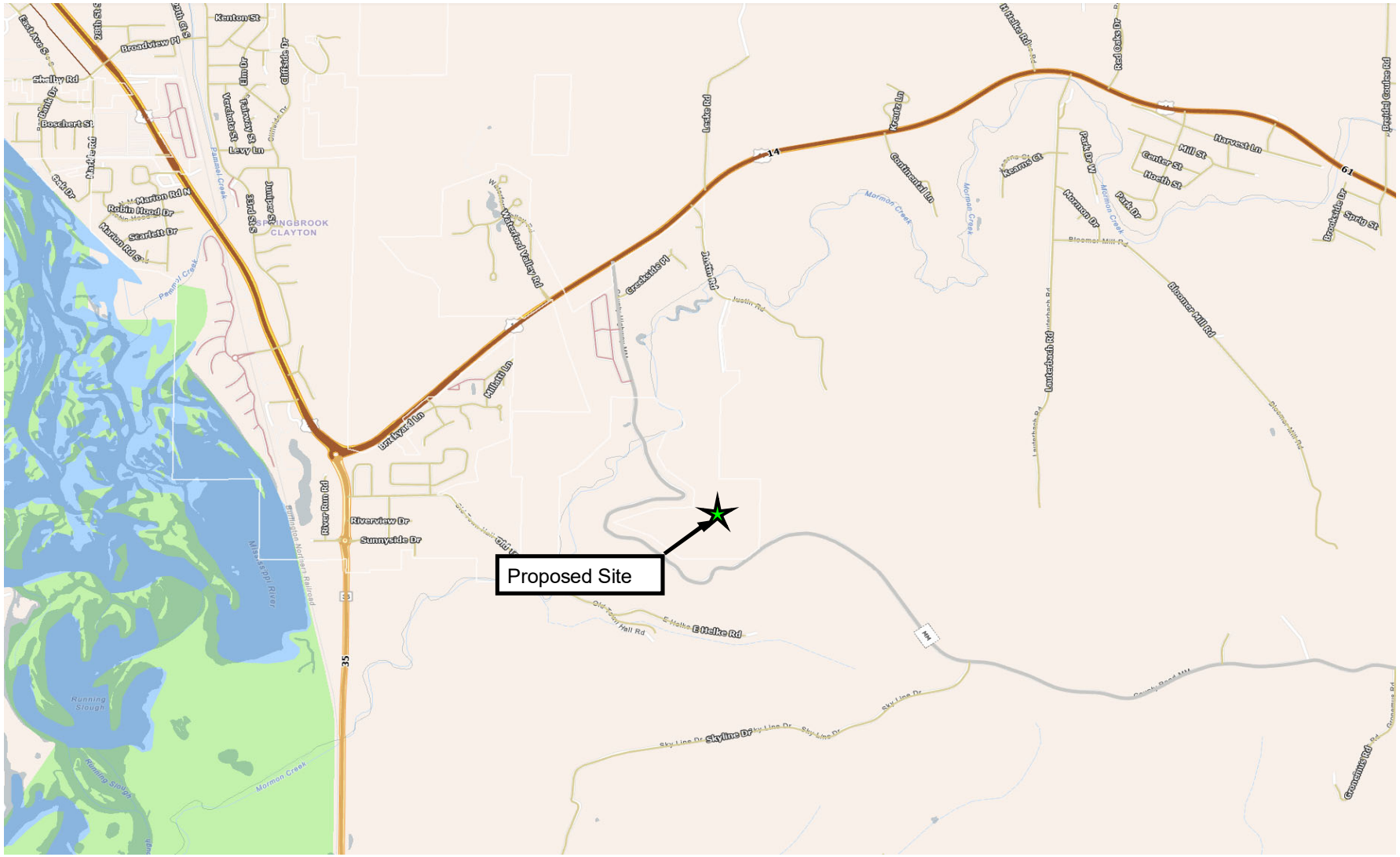
1.6 Permits

The following is a list of anticipated stormwater permits or reviews that have been or will be applied for:

- City of La Crosse Stormwater Permit
- La Crosse Sewer Service Area Water Quality Management Plan Sewer Service Extensions & Conformance Review.

Maps

2.1 Location Map



Source: La Crosse County Inveractive Map Viewer

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Map 2.1: Location Map
Project Name: SOLOG La Crosse Retreat Center
Project Location: 5250 Justin Rd, La Crosse, WI 54601

2.2 Aerial Map

Source: La Crosse County Interactive Map Viewer

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Map 2.2: Aerial Map
Project Name: SOLOG La Crosse Retreat Center
Project Location: 5250 Justin Rd, La Crosse, WI 54601

2.3 USGS Quad Map

Source: La Crosse County Interactive Map Viewer

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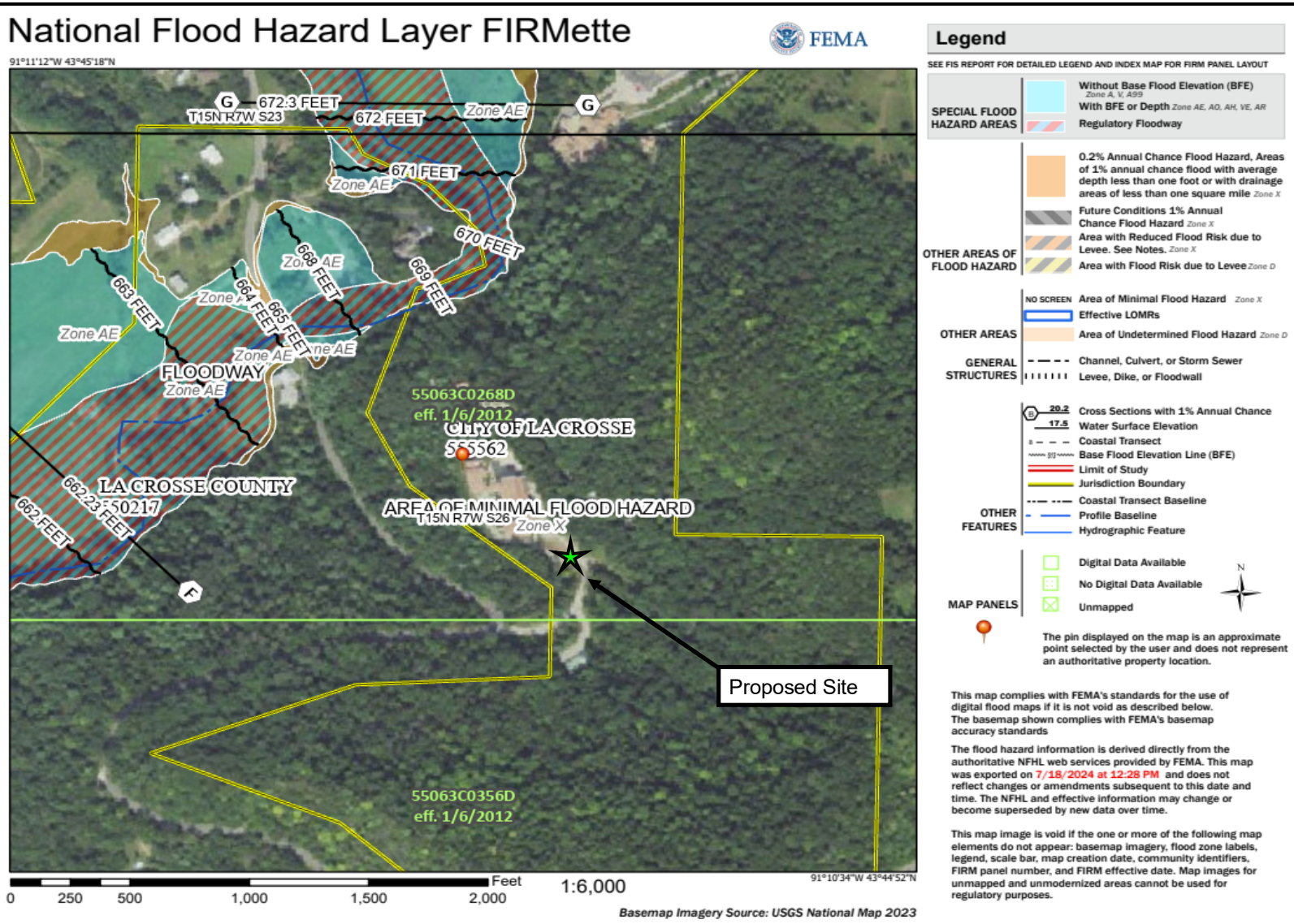
Map 2.2: Aerial Map
Project Name: SOLOG La Crosse Retreat Center
Project Location: 5250 Justin Rd, La Crosse, WI 54601

2.4 FEMA Map



Source: FEMA Flood Map

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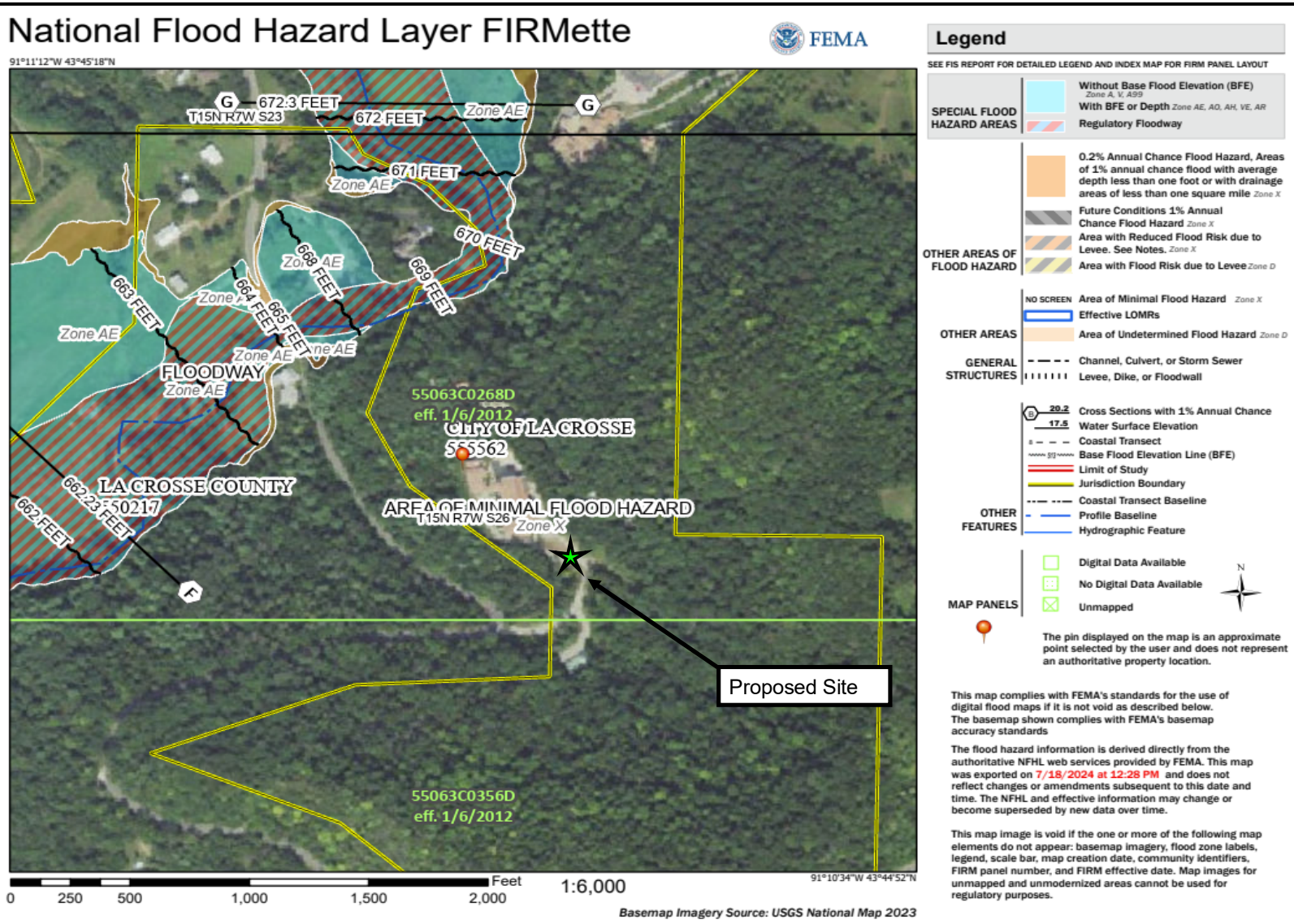
Map 2.4: FEMA Flood Map
Project Name: SOLOG La Crosse Retreat Center
Project Location: 5250 Justin Rd, La Crosse, WI 54601

2.5 Wetland Indicators Map



Source: FEMA Flood Map

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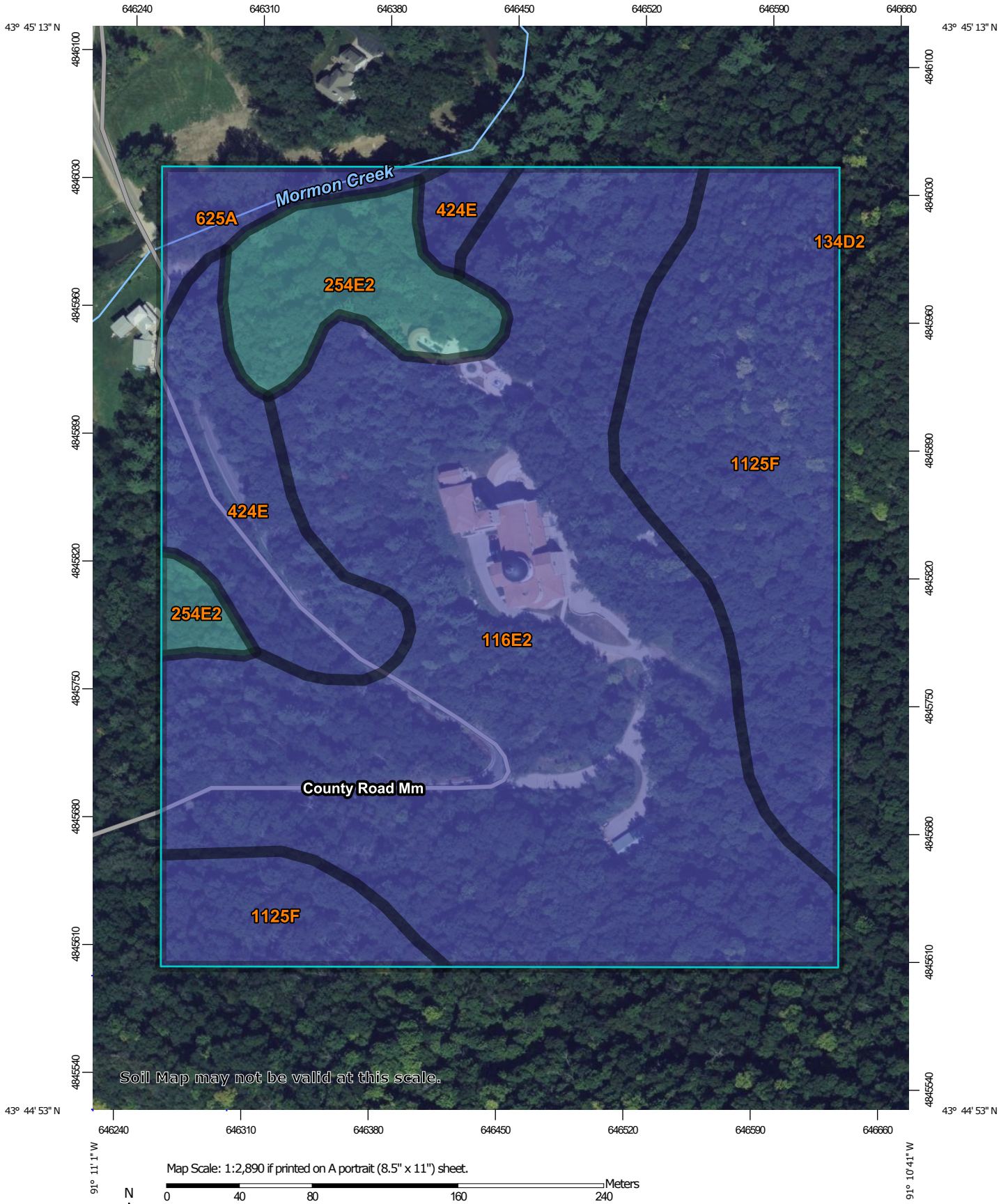
Map 2.4: FEMA Flood Map
Project Name: SOLOG La Crosse Retreat Center
Project Location: 5250 Justin Rd, La Crosse, WI 54601

Soils Information

3.1 Soils Map

Hydrologic Soil Group—La Crosse County, Wisconsin
(Shrine Parcel)



Map Scale: 1:2,890 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: La Crosse County, Wisconsin
Survey Area Data: Version 22, Sep 8, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 31, 2020—Sep 2, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
116E2	Churchtown silt loam, 20 to 30 percent slopes, moderately eroded	B	22.6	55.9%
134D2	Lamoille silt loam, 12 to 20 percent slopes, moderately eroded	C	0.0	0.0%
254E2	Norden silt loam, 20 to 30 percent slopes, moderately eroded	C	3.1	7.7%
424E	Merit silt loam, 20 to 45 percent slopes	B	4.0	9.8%
625A	Arenzville silt loam, channeled, 0 to 2 percent slopes, occasionally flooded	B	1.1	2.8%
1125F	Dorerton, very stony-Elbaville complex, 30 to 60 percent slopes	B	9.6	23.8%
Totals for Area of Interest			**40.5**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

3.2 Geotechnical Report

C V T

Chosen Valley Testing

Design Phase Geotechnical Report:

Proposed Retreat Center
Shrine of Our Lady of Guadalupe
CTH MM
La Crosse, Wisconsin

Prepared for:

Shrine of Our Lady of Guadalupe
c/o Thomas Stroka
Duncan G. Stroik Architects LLC

July 28 14, 2021
17665.20.WIL

I hereby certify that this report was prepared by me or under my direct supervision, and that I am a duly registered engineer under the laws of the State of Wisconsin.

Colby T. Verdegan, PE
Geotechnical Engineer
Registration Number 36326
Date: July 28, 2021

Chosen Valley Testing, Inc.

Geotechnical Engineering and Testing • 1019 2nd Ave. SW, Onalaska, WI 54650 • Phone (608) 782-5505 • Fax (608) 785-2818
E-mail: lacrosse@chosenvalleytesting.com

Mr. Thomas Stroka
Duncan G. Stroik Architect LLC
218 West Washington Street, Suite 1200
South Bend, IN 46601
thomas@stroik.com

July 28, 2021

Re: Geotechnical Exploration and Evaluation
Proposed Retreat Center
Our Lady of Guadalupe
CTH MM
La Crosse, Wisconsin
CVT Proposal Number: 17665.20.WIL

Mr. Stroka:

As requested, we have completed the additional exploration for the Proposed Retreat Center for the Shrine of Our Lady of Guadalupe on CTH MM in La Crosse, Wisconsin. We have updated our previously issued report to include the new information as well as to incorporate comments from the prior report. To expedite planning, the preliminary logs were issued in advance. If you have any questions about our report, please feel free to contact us at (608) 782-5505.

Sincerely,
Chosen Valley Testing, Inc.

Frederick Schuster, PE
Geotechnical Engineer

Colby T. Verdegan, PE
Sr. Geotechnical/Materials Engineer

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Design Phase Geotechnical Evaluation
Proposed Retreat Center
Our Lady of Guadalupe
CTH MM
La Crosse, Wisconsin

CVT Project Number: 17665.20.WIL
Date: July 28, 2021

A. Introduction

The intent of this report is to present our results to the client in the same logical sequence that led us to arrive at the opinions and recommendations expressed. Since our services must often be completed before the design, assumptions are sometimes needed to prepare a proper evaluation and to analyze the data. A complete and thorough review of this entire document, including the assumptions and the appendices, should be undertaken immediately upon receipt.

A.1. Purpose

This report was prepared for proposed Retreat Center for the Shrine of Our Lady of Guadalupe on CTH MM in La Crosse, Wisconsin. Our services were authorized by the Diocese of La Crosse. This report replaces our report issued May 14, 2021, and updated the report to include the results of the additional borings and as well as additional design information.

A.2. Scope

To obtain data for analysis, we were initially authorized to perform six standard penetration test borings and two manual borings. The machine borings were drilled to depths of about 35 to 50 feet while the manual borings were performed to depths of about 15 feet. After these borings were completed, four additional borings were authorized to be drilled to depths of 100 feet or at least 30 feet into bedrock. Our scope consisted of providing our opinions and recommendations for the various geotechnical aspects of the project per the RFP.

A.3. Boring Locations and Elevations

The general boring locations were indicated to Chosen Valley Testing on site plans provided by Duncan G. Stroik Architect LLC within the RFP. Some locations were offset due to site access and utility location constraints – such as Boring B-1A which was shifted because of overhead interference from trees and B-3A because of the proximity of a gas line and other utilities. The ***Boring Location Sketch*** in the Appendix shows the approximate boring locations as drilled. The borings drilled earlier in 2021 are labelled S-1 through S-8, while the borings added in July are labelled B-1A through B-4A. The estimated relative locations of prior borings in or near the improvements by CVT are also indicated and are labelled A, D, E, B-3 and B-5. Copies of Logs sheets from the prior borings are also included in the Appendix and are also reference in discussions.

Ground surface elevations were estimated using a laser level. Finished floor of the existing building at the southeast door was used as a benchmark, and was understood to be at elevation 806.5 feet.

A.4. Geologic Background

A geotechnical report is based on subsurface data collected for the specific structure or problem. Available geologic data from the region can help interpretation of the data and is briefly summarized in this section.

Geologic maps and our prior exploration suggest that the natural soils in the area are primarily dominated by loessial (wind deposited) silts and silty clays with some colluvial (gravity deposited) mixtures of clays, silts, sands and gravels, overlying highly weather residual materials derived from the bedrock. Significant earthwork is occurred across the much of the site associated with the construction of the existing Shrine and Rectory. This consisted primarily of removing the loessial soils from the support zone of the buildings and replacing it with compacted limestone screenings, as well as necessary grading for paving and utilities.

Geologic maps indicate underlying bedrock is from the Prairie du Chien Group. From a review of well logs in the area, the bedrock is mostly likely from the bottom of Oneota Formation (the Stockton Hill Member) of the Prairie du Chien Group. This material is rather variable and tends to be of dolomitic sandstone, silty and sandy dolomite and dolomite. This is underlain by the much more uniform Jordan Sandstone Formation. From the well logs, the contact between the bottom of the Oneota and the top of the Jordan was crudely interpolated as being near elevation 740 feet.

B. Subsurface Data

Methods: Most of the borings were performed using penetration test procedures (Method of Test D1586 of the American Society for Testing and Materials). This procedure allows for the extraction of intact soil specimen from deep in the ground. With this method, a hollow-stem auger is drilled to the desired sampling depth. A 2-inch OD sampling tube is then screwed onto the end of a sampling rod, inserted through the hole in the auger's tip, and then driven into the soil with a 140-pound hammer dropped repeatedly from a height of 30 inches above the sampling rod. The sampler is driven 18-inches into the soil unless the material is too hard. The samples are generally taken at 2½ to 5-foot intervals. The core of soil obtained is classified and logged by the driller and a representative portion is then sealed in a jar and delivered to the soils engineer for review.

The manual borings were drilled with a 3-inch bucket auger. Prior to sampling a manual DCP was used to obtain strength data, and the resulting values were converted to estimated N-values.

B.1. Stratification

The surficial materials at most locations consisted of paving materials.

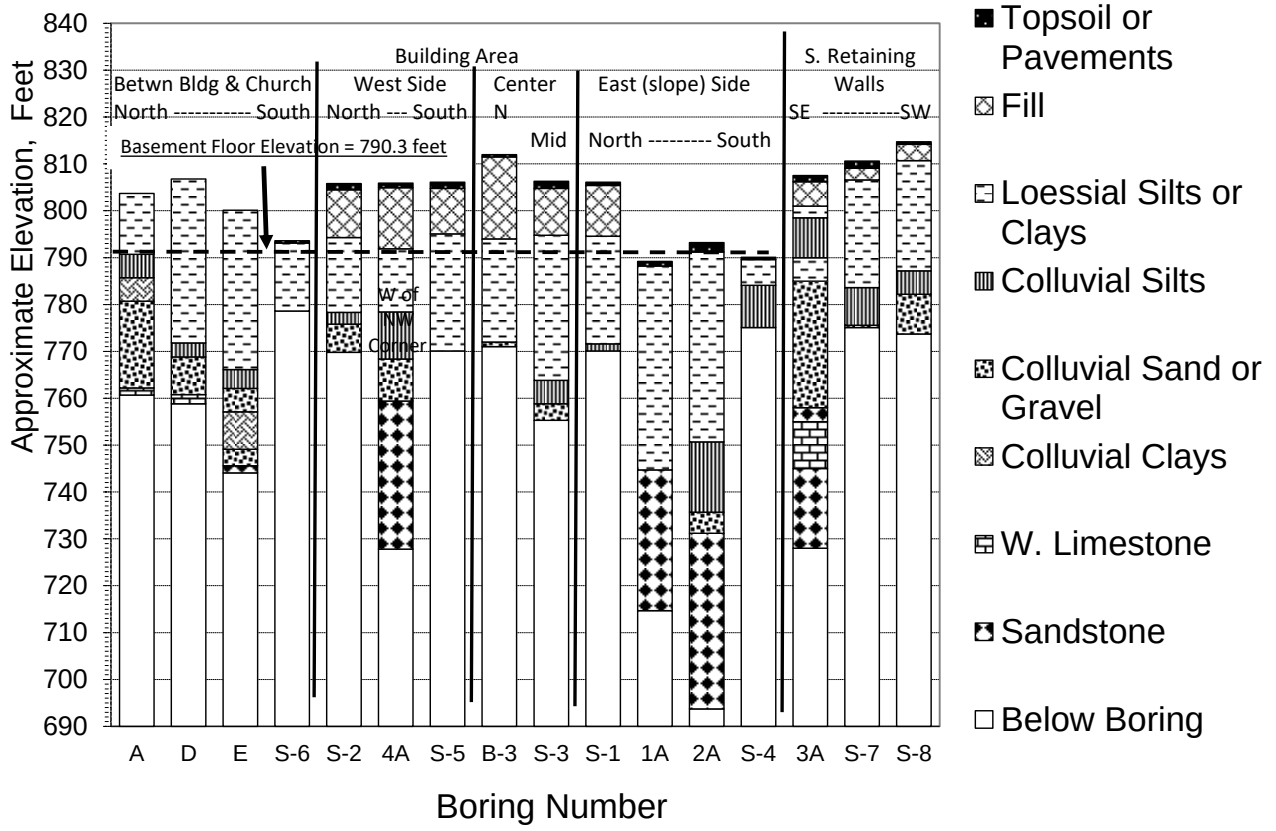
As expected from the site history, the uppermost soils at most of the boring locations drilled in 2021 consisted of fill materials which extended to depths ranging from about 5 to 18 feet.

The underlying soils were then dominated by loessial silts and clays. As might be expected, the bottom of the loessial soils appeared to become lower progressing downhill to the west, but also somewhat towards the south. The boring closest to the planned southeast building corner terminated in these soils at about 36 feet. The southwest building area boring encountered the loessial materials to a depth of about 44 ½ feet.

A couple borings terminated in the loessial soils. Most extended deeper and penetrated into firmer colluvial soils consist of silts, clay, sands, silty sand and gravel.

The four most recent borings, B-1A through B-4A, were extended deeper to penetrate into the underlying rock materials. These borings encountered materials judged to be bedrock at depths of about 45 to 62 feet. The rock materials consisted primarily of sandstone. The uppermost rock in the boring drilled for the retaining wall, south of the Retreat Center, met about 10 feet of limestone near the top of the bedrock profile.

For the readers convenience, the boring data has been summarized on the cross-section following this paragraph. The results of the prior borings referenced have been including for illustration purposes and terminated in or on materials judged to be bedrock. Most of prior borings were done largely before any grading, in which case the loessial soils were partly or completely replaced by fill. The reader is referred to the Log of Boring sheets in the Appendix for location specific information. The ground surface elevations at the older borings are shown at estimated elevations, relative to the datum for this project.



B.2. Penetration Test Results

The number of blows needed for the hammer to advance the penetration test sampler is an indicator of soil characteristics. The number of blows to advance the sampler 1 foot is called the penetration resistance or "N"-value. The results tend to be more meaningful for natural mineral soils, than for fill soils. In fill soils, compaction tests are more meaningful.

Penetration resistance values (N-values) of 2 to 21 Blows per Foot (BPF) were encountered in the fill

materials, indicating they were somewhat variable and possibly at times uncompacted. The loessial soils returned values of 2 to 15 BPF, indicating they were very soft to rather stiff, but mostly rather soft and potentially collapsible.

The colluvial silts and clays returned values of 7 to 32 BPF with most values indicating relatively stiff or dense materials. The colluvial or residual sands and gravels had values ranging from 8 BPF to 5 blows for 5 inches of penetration indicating they were loose to very dense but mostly medium dense to dense.

Penetration test values in the weathered rock materials ranged from about 50 blows for 9 inches of penetration to 50 blows for 0 inches of penetration.

A key to the descriptors used to qualify the relative density of soil (such as *soft, stiff, loose,* and *dense*) can be found on the Legend to Soil Description in the Appendix.

B.4. Groundwater Data

During the drilling operation, the drillers may note the presence of moisture on the sampling instrument, in the cuttings, or within the boreholes. These observations are recorded on the boring logs. The water level may vary with weather; time of year and other factors and the presence or absence of water during the drilling is subject to interpretation and is not always conclusive.

Water was not observed in all any of the borings and none of the samples appeared to be overly wet or saturated. Water is often observed seeping along the surface of bedrock materials but was not noted. A piezometer installed at the was dry when installed, and still dry when checked a week later.

C. Design Data

Because each structure has a different loading configuration and intensity, different grades, and different structural or performance tolerances, the results of a geotechnical exploration will mean different things for different facilities. If the design of the facility changes, the soils engineer should be contacted to discuss the possible implications of the changes. Without a chance to review such changes, the recommendations of the soils engineer may no longer be valid or appropriate.

Our current understanding is that the new facility is planned to be about 6 stories tall with an additional story below grade. The building perimeter is to be constructed primarily of structural masonry and concrete with post-tensioned concrete slabs. Maximum structural loads were estimated to be on the order of 660 kips per column. Maximum wall loads were estimated to be about 43 kips per foot. Our understanding is the 7 ½-inch diameter micro-piles are planned and would have typical capacities on the order of 100 kips.

Lowest level slab elevation is indicated to be at about elevation 790.3 feet. This is about 16 feet below existing grades.

Retaining wall are planned at the perimeter of the site. Maximum exposed wall heights are expected to be on the order of 16 feet.

Surface water drainage is planned to be temporarily storage in below grade vault type structures between the existing building and the addition. The water will presumably be drained away by pumping or gravity.

D. Analysis

D.1. Building and Retaining Wall Foundation Support

D.1.a. General Support: Based on the data, the soils at bearing conditions for the structure are expected to be dominated by highly compressible and potentially collapsible loessial soils. Allowable bearing pressures on these soils are normally limited to 1,500 psf. Use of such low pressures is not feasible and does not significant impact potential for collapse. Under the circumstances, we are of the opinion that all foundations will need to be supported on/in the underlying bedrock.

Allowable bearing pressures for footings on the bedrock materials are commonly limited to about 20 to 40 tons per square foot and are complicated by depositional and erosional variations in the rock. Based on the information collected for the prior structures, the rock materials appear to be at least 20 feet and potentially 50 feet or more below low planned slab grades, so spread footings are not feasible and deep foundation options would be needed. Due to the nature of the existing structure and site conditions, driven piling and other options with significant vibrations (including rammed aggregates) are not recommended.

D.1.b. Support Options: The bedrock materials encountered in our prior exploration were rather variable, appeared to be sloping rather sharply, and are believed to be near a stratification change in the geology. For these reasons, if drilled piers were used, they would need to be socketed to provide added assurance against changing support issues at depth – unless additional probing is done at virtually all location to confirm support conditions.

Because of the impracticalities of implementing investigative assurances below drilled piers, we are of the opinion that micropiles are likely the most feasible alternative for all columns bearing locations, at the perimeter foundations and retaining walls. These can be more easily deepened than driller piers and disturbance caused by deepening should be limited. Micro piles have a much smaller diameter in relation to their expected length than drilled piers. The design will need to consider the limited lateral support afforded by the loessial soils. The bottom of the micropiles should be socketed into the weather sandstone encountered below the site. Negative skin friction is not a significant concern and, in our opinion, does not need to be considered.

The anticipated foundation loads are not particularly large in relation to expected capacities derived from bonding between the micropile system and the bedrock materials. With the present information, we would anticipate such piling could plausibly attained the desired capacities at rather short embedments into the rock. With the present information, we would anticipate all such piling extending at least 10 feet into the rock. The micropiles should be subjected to load testing during construction.

D.2. Slab Areas

D.2.a. Pile Support to Address Collapse Potential: Due to the long-term potential for collapse, slabs areas would also ideally be supported on deep foundations. Whereas the loessial soils were removed from below the existing structures, those slabs were laid directly on the replacement limestone screening fill or a layer of sand over the screenings.

D.2.b. Alternative Slab Support and Surficial Protection of Loessial Soils: The consequences of slab settlement is much less than that of foundations, to the extent that "floating" the slabs over these soils could be considered depending on the function of the lower-level areas. This being said, if the slab areas are not supported on deep foundations (and even if they are), precautionary grading at the surface is recommended to prevent rutting and disturbance of the sensitive loessial soils when exposed to weather and traffic. To this end, we would recommend removing the loessial soils to a depth of at least 2 feet below bottom of slab elevation. A high strength geosynthetic or geogrid should then be laid, followed a protective layer of sand or aggregate. If utilities will be placed below the slab, we suggest increasing the depth of the layer as needed so that the utility work will be accomplished above the geosynthetic materials.

D.2.c. Filling and Compaction: For ease in compaction, the protective layer is recommended to consist primarily of gravelly sand having less than 12% particles passing a #200 sieve or possibly at thick layer of WisDOT dense graded base over sand. As noted before, the fill beneath the existing structures consists primarily of limestone screenings. Such materials could plausible be used as protective fill but would have to be reviewed. The fill should be compacted to at least 95% of its standard Proctor density.

D.3.Additional Design and Grading Considerations

D.3.a. Frost Protection: The dominant silty soils are highly frost susceptible. We recommend placing foundations for heated structures at least 48 inches below the exposed ground surface for frost protection. For unheated structures, we recommend 60 inches of frost cover. Surface water should be directed away from the foundations to limit the potential for frost action.

D.3.b. Lateral Support/Resistance: We recommend using clean sands or gravels having less than 10% particles passing a #200 sieve as fill against below-grade walls. All backfill should be compacted to at least 95% of its maximum standard Proctor density (ASTM D 698). The sand should be capped with a layer of clay topsoil or pavement and sloped away from foundations to prevent water from infiltrating and collecting behind walls. The table below includes recommended support values for clean sands.

Poorly Graded Sands (SP) 95% standard Proctor density	
Internal Friction Angle (degrees)	34
Cohesion (psf)	0
Coefficient of Friction between Concrete and Soil	0.50
Moist Unit Weight (pcf)	120

Some of the basement walls or retention systems will presumably be formed against existing loessial soils or silty fill. The table below includes estimated strength parameter for the silty materials.

Silt	
Internal Friction Angle (degrees)	22
Cohesion (psf)	0
Moist Unit Weight (pcf)	110

Some tendons or anchors retention systems may extend into the compacted the limestone screening fill below the existing structures. If such materials are detected during installation, the following parameters have been estimated for those materials.

Compacted Limestone Screening	
Internal Friction Angle (degrees)	30
Cohesion (psf)	0
Moist Unit Weight (pcf)	130

D.3.c. Stormwater/Infiltration

Due to the collapse potential of the loessial soils, infiltration of ground water on the site must be avoided, lest it result in collapse and settlement. Our understanding is that the final design calls for stormwater to be stored below grade in a fashion which will prevent infiltration. During construction, the surface grades should be protected in a fashion which similarly limits localized infiltration.

E. General Recommendations

E.1. Excavation

The existing loessial soils and silty fill are extremely sensitive soil types and will become very unstable and rut under traffic or if exposed to traffic. If that occurs, the softened and rutted soils will likely have to be removed. Soil removals will ideally be done using a backhoe with a smooth lipped buck, and back-casting excavated soils into trucks for removal. Replacement fill will ideally be pushed ahead of dozers, so that traffic including compactors doesn't operate directly on the surface of the silty soils and encourage instability.

E.2. Sideslopes

The contractor will be required to slope or shore the excavations as needed to meet OSHA requirements for safety. The dominant soils will likely classify as Type C soils as defined by OSHA. Trench boxes or other stabilization methods may be necessary when excavating close to property limits or structures.

E.3. Groundwater/Dewatering

Ground water is not expected to be encountered in the excavations, though the sloping terrain and existing fill and construction is plausibly conducive to perched water. Such moisture would likely be of nominal volume and could likely be removed with sumps, though we believe such moisture would more likely consist of pockets of saturated soils.

E.4. Reuse of On-site Materials

The excavated soils are not expected to be reusable to any significant degree and site limits would likely prevent on-site storage of reserve materials.

E.5. Filling and Compacting

Fill should be placed in lifts adjusted to the compactor being used and the material being compacted. We recommend limiting lifts to no more than 1/2-foot – assuming most fill will have to be placed by small equipment.

E.6. Cold Weather Construction

If earthwork occurs during freezing temperatures, good winter construction practices should be used. Frozen fill should not be used and fill should not be placed on frozen ground. Slab areas should be completely thawed prior to placing any concrete.

E.7. Construction Testing and Documentation

Excavations, grading and deep foundation installations should be evaluated and documented by geotechnical personnel. Proposed engineered fill should be evaluated for conformance to the project gradation recommendations before its use and should be tested for compaction during construction. If the construction proceeds during periods of freezing weather, full-time testing and observations should be considered to help confirm that imported fill is thawed prior to and during compaction, that all snow/ice has been removed before placement of the fill, and that other materials affected by temperatures are being properly protected.

Although our firm offers testing services relating to civil and structural components of the building (such as concrete testing, reinforcement observations, etc.) specification of such services is beyond our work scope and the designer should be consulted as to such requirements.

F. Level of Care

The services provided for this project have been conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in this area, under similar budget and time constraints. This is our professional responsibility. No other warranty, expressed or implied, is made.

Appendix

Chosen Valley Testing, Inc.

Legend

Boring Location

N

Boring Location Sketch

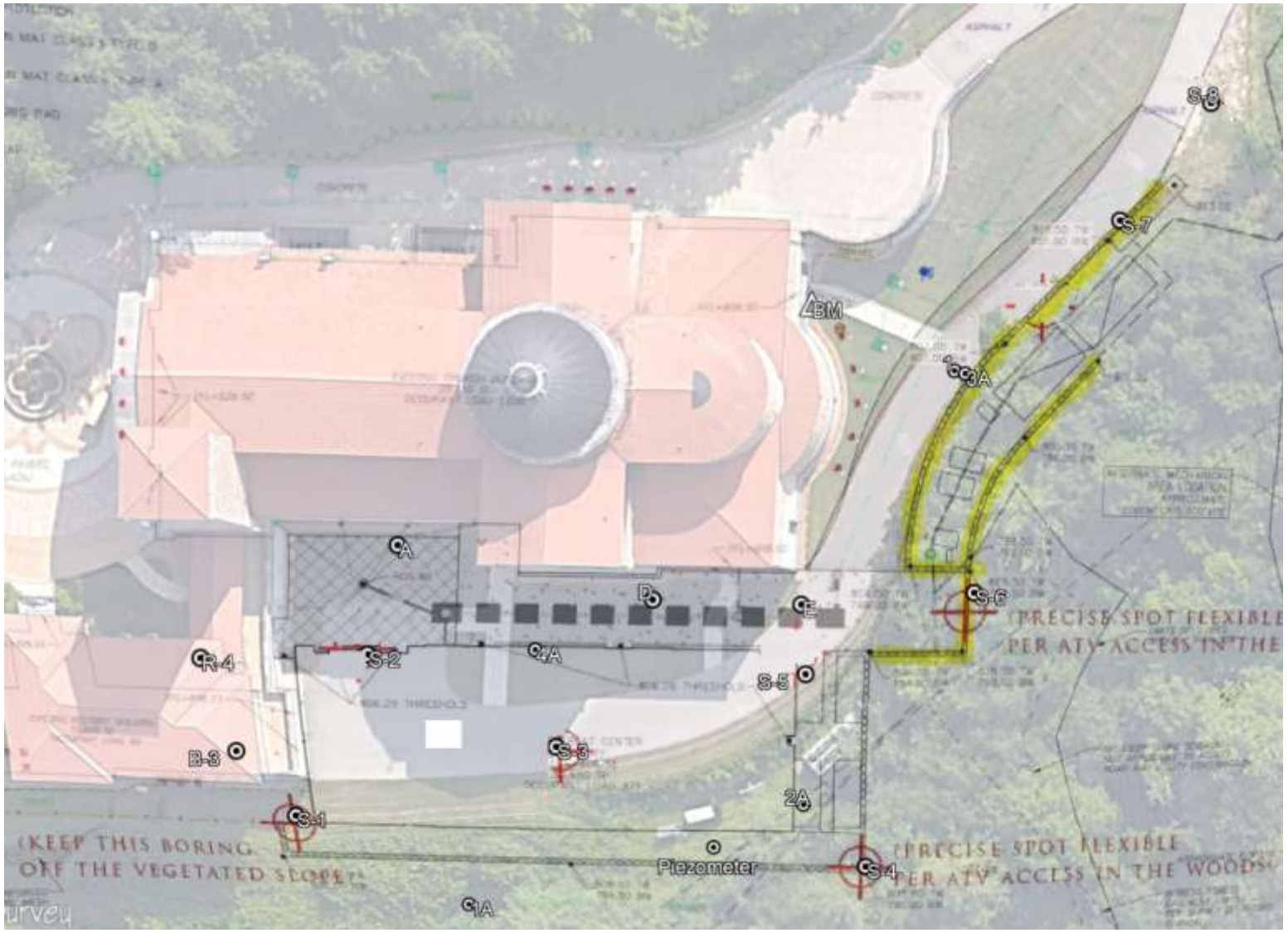
Proposed Retreat Center

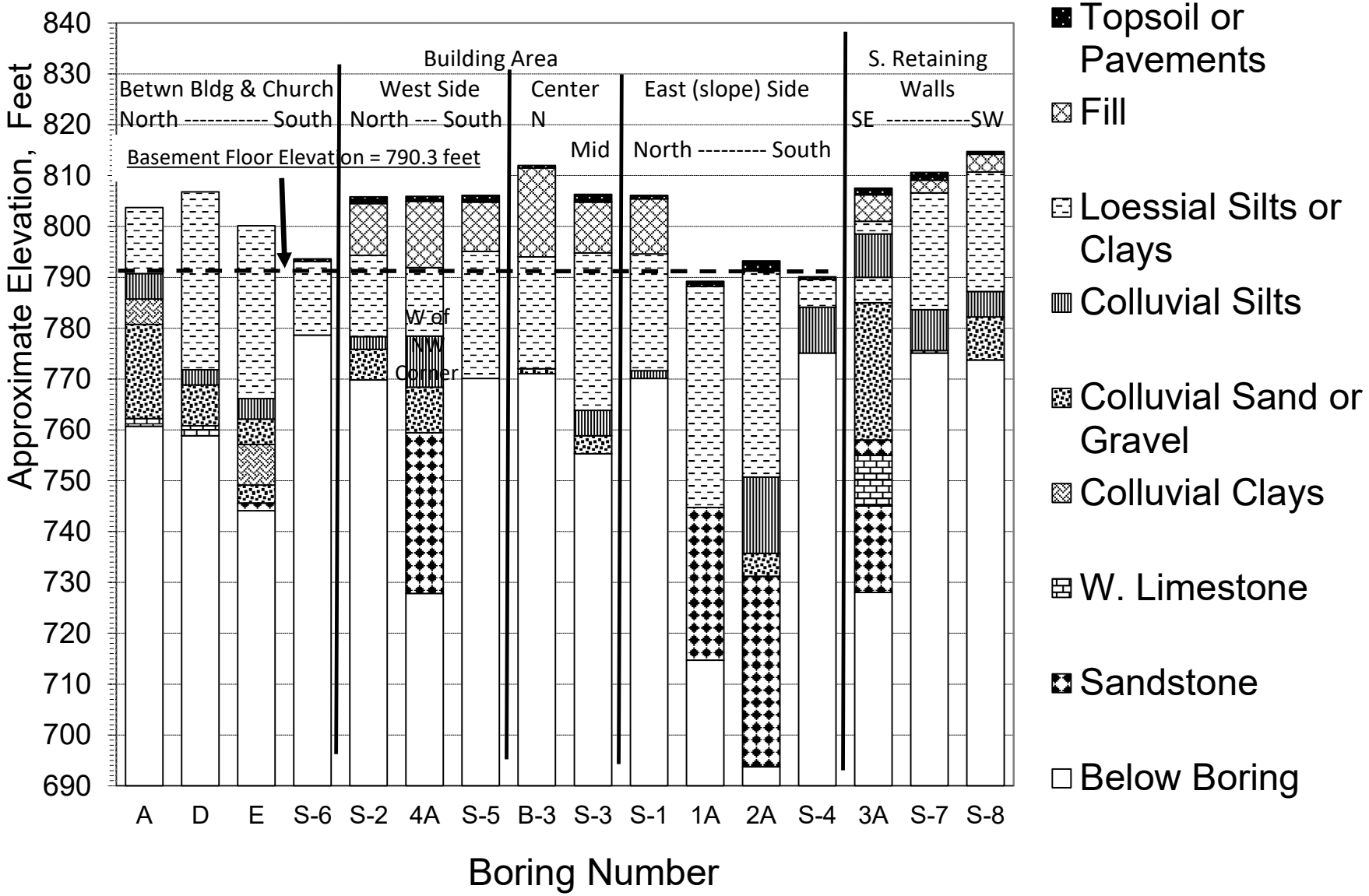
Our Lady of Guadalupe

CTH MM

La Crosse, Wisconsin

17665.20.WIL




Approximate Elevation, Feet
840
830
820
810
800
790
780
770
760
750
740
730
720
710
700
690
Building Area
Betwn Bldg & Church
North ---------- South
West Side
North --- South
Center
N
Mid
East (slope) Side
North --------- South
S. Retaining
Walls
SE ----------SW
Basement Floor Elevation = 790.3 feet
W of
NW
Corner
A
D
E
S-6
S-2
4A
S-5
B-3
S-3
S-1
1A
2A
S-4
3A
S-7
S-8
Boring Number
Topsoil or Pavements
Fill
Loessial Silts or Clays
Colluvial Silts
Colluvial Sand or Gravel
Colluvial Clays
W. Limestone
Sandstone
Below Boring

LOG OF BORING

CHOSEN VALLEY TESTING

PROJECT: 17665.20.WIL
Design Phase Geotechnical Evaluation
Proposed Retreat Center
CTH MM
La Crosse, Wisconsin

BORING: **B-1A**

LOCATION:
See attached sketch

DATE: 7/8/21

SCALE: 1" = 8'

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
789.2	0.0					
788.2	1.0	ML	**Slightly Organic SILT** dark brown.			Benchmark: Top nut of the fire hydrant southwest of boring B-4A, understood elevation 809.9 feet.
		OL	(Topsoil)			
		ML	**SILT** brown, wet, medium to rather stiff. (Loess)	12		PP = 3.0 tsf, MC = 16.1%
				8		PP = 2.0 tsf
780.2	9.0			7		
		ML	**SILT with SAND** light brown, wet, medium to very stiff. (Loess)	6		PP = 1.0 tsf, MC = 13.3%
				13		
				13		PP = 0.75 tsf, MC = 13.6%
766.7	22.5			16		
		ML	**SILT** light brown, wet, rather stiff to very stiff. (Loess)	17		PP = 2.25 tsf, MC = 16.3%
				18		
				15		PP = 1.5 tsf
			Gray below 37.5'. Very wet below 37.5'.	9		PP = 0.25 tsf, MC = 23.5%
744.7	44.5					
		SP SM	**WEATHERED SANDSTONE**, poorly graded sand with silt, fine grained, yellowish brown, very dense. White below 47.5'.	*		* 28 / 50 = 5" Hard drilling below 45.5'.
				*		* 50 = 4" (set)
				*		* 50 = 0.5" (set)
731.7	57.5					
		SP	**WEATHERED SANDSTONE**, poorly graded sand, fine grained, yellowish brown, very dense.			

(SEE REPORT AND STANDARD PLATES FOR EVALUATION AND DESCRIPTIVE TERMINOLOGY.)

LOB 17665.20.WIL (OUR LADY OF GUADALUPE RETREAT CENTER)

LOG OF BORING

CHOSEN VALLEY TESTING

PROJECT:	BORING: **B-1A (cont.)**
17665.20.WIL Design Phase Geotechnical Evaluation Proposed Retreat Center CTH MM La Crosse, Wisconsin	LOCATION: See attached sketch
	DATE: 7/8/21 — SCALE: 1" = 8'

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
				*		* 50 = 0.5" (set)
				*		* 50 = 0.5" (set)
				*		* 50 = 0.25" (set)
714.7	74.5					
			End of boring. Boring sealed upon completion.	*		* 50 = 0" (set)

LOB 17665.20.WIL (OUR LADY OF GUADALUPE RETREAT CENTER).GPJ STANDARD PLATES FOR EVALUATION AND DESCRIPTIVE TERMINOLOGY.)

LOG OF BORING

CHOSEN VALLEY TESTING

PROJECT: 17665.20.WIL Design Phase Geotechnical Evaluation Proposed Retreat Center CTH MM La Crosse, Wisconsin	BORING: **B-2A** LOCATION: See attached sketch DATE: 7/12/21 SCALE: 1" = 8'

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
793.2	0.0					
791.2	2.0	ML OL	**Slightly Organic SILT** dark brown. (Topsoil)			Benchmark: Top nut of the fire hydrant southwest of boring B-4A, understood elevation 809.9 feet.
		ML	**SILT** brown, wet, medium. (Loess)	8		PP = 1.25 tsf, MC = 14.7%
				6		
784.2	9.0			8		PP = 0.25 tsf
		ML	**SILT with SAND** light brown, wet, rather stiff. (Loess)	9		
				10		PP = 0.5 tsf, MC = 10.3%
				9		PP = 1.0 tsf
				11		
765.7	27.5			11		PP = 1.0 tsf, MC = 12.9%
		ML	**SILT** light brown, wet, rather stiff. (Loess)	10		
				10		
750.7	42.5			12		PP = 1.25 tsf, MC = 15.5%
		ML	**SILT** trace gravel, brown, wet, stiff. (Colluvium)	13		PP = 1.25 tsf, MC = 17.6%
745.7	47.5					
		ML	**SANDY SILT** trace gravel, brown, wet, medium to rather stiff. (Colluvium)	7		PP = 1.0 tsf
				10		PP = 1.25 tsf, MC = 14.3%
735.7	57.5					
		SM	**SILTY SAND with GRAVEL** fine to medium grained, brown, moist, medium dense.			

(SEE REPORT AND STANDARD PLATES FOR EVALUATION AND DESCRIPTIVE TERMINOLOGY.)

LOB 17665.20.WIL (OUR LADY OF GUADALUPE RETREAT CENTER).GPJ

LOG OF BORING

CHOSEN VALLEY TESTING

PROJECT: 17665.20.WIL Design Phase Geotechnical Evaluation Proposed Retreat Center CTH MM La Crosse, Wisconsin	BORING: **B-2A (cont.)** LOCATION: See attached sketch DATE: 7/12/21 SCALE: 1" = 8'

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
			(Colluvium)	18		
731.2	62.0	SP	**WEATHERED SANDSTONE**, poorly graded sand, fine grained, white, very dense.			Hard drilling below 62'.
				*		* 50 = 1" (set)
			Yellowish brown below 67.5'.			
				*		* 50 = 0.5" (set)
				*		* 50 = 0" (set)
				*		* 50 = 0.5" (set)
				*		* 50 = 0" (set)
				*		* 50 = 0.25" (set)
			White below 92.5'.			
				*		* 50 = 0" (set)
693.7	99.5		End of boring. Boring sealed upon completion.	*		* 50 = 0" (set)

(SEE REPORT AND STANDARD PLATES FOR EVALUATION AND DESCRIPTIVE TERMINOLOGY.)

LOB 17665.20.WIL (OUR LADY OF GUADALUPE RETREAT CENTER).GPJ 7/15/21

LOG OF BORING

CHOSEN VALLEY TESTING

PROJECT: 17665.20.WIL
Design Phase Geotechnical Evaluation
Proposed Retreat Center
CTH MM
La Crosse, Wisconsin

BORING: **B-3A**

LOCATION:
See attached sketch

DATE: 7/8/21

SCALE: 1" = 8'

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
807.5	0.0					
807.2	0.3		**4" ASPHALT**			Benchmark: Top nut of the fire hydrant southwest of boring B-4A, understood elevation 809.9 feet.
806.2	1.3	SM	**12" AGGREGATE BASE** **FILL**, silty sand, trace asphalt, trace gravel, fine to medium grained, light brown, moist, loose to medium dense.	8		
801.0	6.5			10		
798.5	9.0	ML	**SILT** gray, wet, stiff. (Loess)	13		PP = 1.5 tsf, MC = 14.3%
790.0	17.5	ML	**SANDY SILT** trace gravel, brown, wet, rather stiff to very stiff. (Colluvium) Seams of sand around 10'.	12 22 24		PP = 1.0 tsf, MC = 12.9% PP = 1.5 tsf
785.0	22.5	ML	**SILT with SAND** light brown, wet, very stiff. (Loess)	17		MC = 10.4%
780.0	27.5	SM	**SILTY SAND with GRAVEL** fine to medium grained, light brown, moist, very dense. (Colluvium)	52		Hard drilling below 23'.
775.0	32.5	SP	**POORLY GRADED SAND with GRAVEL** fine grained, yellowish brown, moist, very dense. (Colluvium)	*		* 50 = 5" (set)
765.0	42.5	SM	**SILTY SAND with GRAVEL** seams of sandy silt, fine to medium grained, light brown, moist, medium dense to dense. (Colluvium)	36 10		
758.0	49.5	SM	**SILTY SAND** trace gravel, fine grained, greenish brown. (Colluvium)	24		
755.0	52.5	SM	**WEATHERED SANDSTONE**, silty sand, greenish brown, very dense.	*		* 50 = 1" (set)
		GP	**WEATHERED LIMESTONE**, poorly graded gravel, light brown, very dense.	*		* 50 = 0.5" (set)

(SEE REPORT AND STANDARD PLATES FOR EVALUATION AND DESCRIPTIVE TERMINOLOGY.)

LOB 17665.20.WIL (OUR LADY OF GUADALUPE RETREAT CENTER) 8/5/21

LOG OF BORING

CHOSEN VALLEY TESTING

PROJECT:	17665.20.WIL Design Phase Geotechnical Evaluation Proposed Retreat Center CTH MM La Crosse, Wisconsin	BORING:	**B-3A (cont.)**
		LOCATION:	See attached sketch
		DATE:	7/8/21
		SCALE:	1" = 8'

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
				*		* 50 = 0.25" (set)
745.0	62.5	SP	**WEATHERED SANDSTONE**, poorly graded sand, fine grained, light brown, very dense.	*		* 50 = 0" (set)
			White around 70'.	*		* 50 = 0.25" (set)
				*		* 50 = 0" (set)
728.0	79.5		End of boring. Boring sealed upon completion.	*		* 50 = 0" (set)

LOB 17665.20.WIL (OUR LADY OF GUADALUPE RETREAT CENTER).GPJ STANDARD PLATES FOR EVALUATION AND DESCRIPTIVE TERMINOLOGY.)

LOG OF BORING

CHOSEN VALLEY TESTING

PROJECT: 17665.20.WIL
Design Phase Geotechnical Evaluation
Proposed Retreat Center
CTH MM
La Crosse, Wisconsin

BORING: **B-4A**

LOCATION:
See attached sketch

DATE: 7/6/21

SCALE: 1" = 8'

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
805.9	0.0					
804.9	1.0	ML	**Slightly Organic SILT** dark brown.			Benchmark: Top nut of the fire hydrant southwest of boring B-4A, understood elevation 809.9 feet.
		OL	(Topsoil)			
		ML	**FILL**, silt, brown, wet, medium to stiff.	13		PP = 2.25 tsf, MC = 17.3%
				8		PP = 1.0 tsf
798.4	7.5					
796.9	9.0	SM	**FILL**, silty sand with gravel, fine to medium grained, light brown, moist, medium dense.	16		PP = 1.5 tsf
		ML	**FILL**, silty sand, trace gravel, brown, wet, stiff.	15		PP = 1.0 tsf, MC = 14.9%
793.4	12.5					
791.9	14.0	SM	**FILL**, silty sand, trace gravel, fine to medium grained, light brown, moist, medium dense.	12		PP = 1.75 tsf
		ML	**SILT** brown, wet, medium. (Loess)	7		PP = 2.0 tsf
				6		PP = 2.0 tsf, MC = 20.4%
783.4	22.5					
		ML	**SILT with SAND** light brown, wet, stiff. (Loess)	16		PP = 1.5 tsf, MC = 15.7%
778.4	27.5					
		ML	**SANDY SILT** trace gravel, brown, wet, rather stiff. (Colluvium)	10		PP = 1.5 tsf, MC = 20.5%
				11		PP = 2.0 tsf
768.4	37.5					
		SM	**SILTY SAND** trace gravel, light brown, moist, medium dense to very dense. (Colluvium)	28		
				52		
759.4	46.5					
		SM	**WEATHERED SANDSTONE**, silty sand, fine grained, brown, very dense.	*		Hard drilling below 46.5'.
				*		* 50 = 0" (set)
						* 50 = 0" (set)
				*		* 50 = 0" (set)

(SEE REPORT AND STANDARD PLATES FOR EVALUATION AND DESCRIPTIVE TERMINOLOGY.)

LOB 17665.20.WIL (OUR LADY OF GUADALUPE RETREAT CENTER) 7/6/21

LOG OF BORING

CHOSEN VALLEY TESTING

PROJECT: 17665.20.WIL
Design Phase Geotechnical Evaluation
Proposed Retreat Center
CTH MM
La Crosse, Wisconsin

BORING: **B-4A (cont.)**

LOCATION:
See attached sketch

DATE: 7/6/21 SCALE: 1" = 8'

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
				*		* 50 = 0" (set)
			Greenish brown below 62.5'.	*		* 50 = 0" (set)
738.4	67.5	SP	**WEATHERED SANDSTONE**, poorly graded sand, fine grained, yellowish brown, very dense.	*		* 50 = 0" (set)
				*		* 50 = 0" (set)
727.8	78.1		Light brown below 76.5'.			
			End of boring. Boring sealed upon completion.			* 50 = 0" (set)

(SEE REPORT AND STANDARD PLATES FOR EVALUATION AND DESCRIPTIVE TERMINOLOGY.)

LOB 17665.20.WIL (OUR LADY OF GUADALUPE RETREAT CENTER) 7/6/21

LOG OF BORING

CHOSEN VALLEY TESTING

PROJECT: 17665.20.WIL
Design Phase Geotechnical Evaluation
Proposed Retreat Center
CTH MM
La Crosse, Wisconsin

BORING: **S-1**

LOCATION:
See attached sketch

DATE: 2/23/21

SCALE: 1" = 7'

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
806.1	0.0					
805.4	0.7	CL OL	**Slightly Organic LEAN CLAY** black. (Topsoil / Fill)			Benchmark: Finished floor of the existing building at the southeast door, understood elevation 806.5 feet.
		SM	**SILTY SAND** trace gravel, fine to medium grained, light brown, moist, medium dense. (FIll)	14 20		
798.6	7.5	ML	**SILT** brown, wet, soft to rather soft. (Fill)	4 3		PP = 0.75 tsf PP = 0.75 tsf, MC = 24.0%
794.6	11.5	ML	**SANDY SILT** trace gravel, brown, wet, rather soft to medium. (Colluvium)	7 4		PP = 0.5 tsf PP = 0.5 tsf, MC = 24.6%
788.6	17.5	ML	**SANDY SILT** brown to gray, wet, rather stiff. (Loess)	11 10 11		PP = 2.25 tsf PP = 0.5 tsf, MC = 20.2%
771.1	35.0					
770.1	36.0	ML	**SANDY SILT** trace gravel, gray, wet, stiff. (Colluvium)	13		
			End of boring. Boring sealed upon completion.			

(SEE REPORT AND STANDARD PLATES FOR EVALUATION AND DESCRIPTIVE TERMINOLOGY.)

LOB 17665.20.WIL (OUR LADY OF GUADALUPE RETREAT CENTER) 3/1/21

LOG OF BORING

CHOSEN VALLEY TESTING

PROJECT: 17665.20.WIL
Design Phase Geotechnical Evaluation
Proposed Retreat Center
CTH MM
La Crosse, Wisconsin

BORING: **S-2**

LOCATION:
See attached sketch

DATE: 2/23/21

SCALE: 1" = 7'

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
805.8	0.0					
805.5	0.3		**3'' ASPHALT**			
804.7	1.1	ML	**10'' AGGREGATE BASE**			
			SANDY SILT trace gravel, brown, wet, rather soft to medium.	8		PP = 1.5 tsf
			(Fill)	4		PP = 1.25 tsf, MC = 18.5%
			No gravel around 5'. Gray below 6.5'. Pockets of topsoil around 7.5'.	5		PP = 0.5 tsf, MC = 22.9
794.3	11.5		Trace roots around 10'.	4		PP = 0.5 tsf
		CL ML	**SILTY CLAY** brown, wet, medium to stiff. (Loess)	13		PP = 2.0 tsf, MC = 23.0%
				7		PP = 1.5 tsf
788.3	17.5	ML	**SILT** brown, wet, medium to rather stiff. (Loess)	8		PP = 1.0 tsf, MC = 14.8%
				10		PP = 1.5 tsf
778.3	27.5	ML	**SANDY SILT** trace gravel, brown, wet, stiff. (Colluvium)			
775.8	30.0	SM	**SILTY SAND** trace gravel, fine to medium grained, brown, moist, medium dense. (Colluvium)	16		PP = 1.5 tsf, MC = 13.3%
773.3	32.5	SP	**POORLY GRADED SAND with GRAVEL** fine to medium grained, light brown, moist, medium dense. (Residuum)	14		
769.8	36.0		End of boring. Boring sealed upon completion.			

(SEE REPORT AND STANDARD PLATES FOR EVALUATION AND DESCRIPTIVE TERMINOLOGY.)

LOB 17665.20.WIL (OUR LADY OF GUADALUPE RETREAT CENTER) 3/1/21

LOG OF BORING

CHOSEN VALLEY TESTING

PROJECT: 17665.20.WIL
Design Phase Geotechnical Evaluation
Proposed Retreat Center
CTH MM
La Crosse, Wisconsin

BORING: **S-3**

LOCATION:
See attached sketch

DATE: 2/23/21

SCALE: 1" = 7'

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
806.3	0.0					
806.0	0.3		**4" ASPHALT**			
804.8	1.5	ML	**14" AGGREGATE BASE**			
			SANDY SILT trace gravel, pockets of silty clay, brown, wet, medium to rather stiff. (Fill)	10		PP = 1.0 tsf
			No silty clay pockets below 4'.	7		MC = 18.8%
			Trace roots below 6.5'.			
			Gray below 6.5'.	8		PP = 1.5 tsf
			Trace wood around 7.5'.			
			Pockets of topsoil around 10'.	7		PP = 2.0 tsf
794.8	11.5	ML	**SILT** brown, wet, rather soft to rather stiff. (Loess)	5		PP = 0.75 tsf, MC = 14.3$
				6		MC = 10.0%
				4		MC = 11.3%
				5		PP = 1.0 tsf, MC = 13.2%
				11		MC = 16.0%
				10		PP = 1.25 tsf
				8		PP = 1.0 tsf, MC = 20.5%
763.8	42.5	ML	**SANDY SILT** trace gravel, brown, very wet, medium. (Colluvium)	7		PP = 1.0 tsf, MC = 16.3%
758.8	47.5	SM	**SILTY SAND** trace gravel, greenish brown, moist, medium dense. (Colluvium)	22		Hard drilling below 47.5'.
755.3	51.0		End of boring. Boring sealed upon completion.			

(SEE REPORT AND STANDARD PLATES FOR EVALUATION AND DESCRIPTIVE TERMINOLOGY.)

LOB 17665.20.WIL (OUR LADY OF GUADALUPE RETREAT CENTER).GPJ 3/1/21

LOG OF BORING

CHOSEN VALLEY TESTING

PROJECT: 17665.20.WIL
Design Phase Geotechnical Evaluation
Proposed Retreat Center
CTH MM
La Crosse, Wisconsin

BORING: **S-4**

LOCATION:
See attached sketch

DATE: 2/23/21

SCALE: 1" = 7'

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
790.1	0.0					
789.6	0.5	ML OL	**Slightly Organic SILT** dark brown. (Topsoil)	*		* Frost encountered to 14".
		ML	**SILT** brown, wet. (Loess)	11 11 9 8		MC = 19.2% N-values for Boring B-4 are estimated from DCP values.
784.1	6.0			5		MC = 8.4%
		ML	**SANDY SILT** brown, wet. (LOESS)	7 6 7 7 9 9 9		MC = 10.7%
775.1	15.0			8 7		
			End of hand auger probe. Probe sealed upon completion.			

LOB 17665.20.WIL (OUR LADY OF GUADALUPE RETREAT CENTER.GPJ STANDARD PLATES FOR EVALUATION AND DESCRIPTIVE TERMINOLOGY.)

LOG OF BORING

CHOSEN VALLEY TESTING

PROJECT: 17665.20.WIL
Design Phase Geotechnical Evaluation
Proposed Retreat Center
CTH MM
La Crosse, Wisconsin

BORING: **S-5**

LOCATION:
See attached sketch

DATE: 2/23/21

SCALE: 1" = 7'

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
806.1	0.0					
805.8	0.3		**4" ASPHALT**			
804.8	1.3	SM	**12" AGGREGATE BASE**			
			SILTY SAND trace gravel, medium to coarse grained, light brown, moist, medium dense. (Fill)	17		
801.1	5.0			8		
		ML	**SILT** brown, wet, medium to rather stiff. (Fill)			PP = 2.0 tsf, MC = 17.0%
797.1	9.0			10		Poor sample return.
		ML	**SANDY SILT** trace gravel, brown, wet, rather soft to medium. (Loess)	13		
				7		MC = 16.6%
				4		MC = 19.0%
788.6	17.5					
		ML	**SANDY SILT** brown, wet, medium to rather stiff. (Loess)	7		PP = 0.5 tsf
				6		MC = 11.0%
				10		
770.1	36.0			7		PP = 1.25 tsf, MC = 17.0%
			End of boring. Boring sealed upon completion.			

(SEE REPORT AND STANDARD PLATES FOR EVALUATION AND DESCRIPTIVE TERMINOLOGY.)

LOB 17665.20.WIL (OUR LADY OF GUADALUPE RETREAT CENTER).GPJ

LOG OF BORING

CHOSEN VALLEY TESTING

PROJECT: 17665.20.WIL Design Phase Geotechnical Evaluation Proposed Retreat Center CTH MM La Crosse, Wisconsin	BORING: **S-6** LOCATION: See attached sketch DATE: 2/23/21 SCALE: 1" = 7'

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
793.6	0.0					
793.1	0.5	ML	**Slightly Organic SILT** dark brown.	*		* Frost encountered to 12".
792.1	1.5	OL	(Topsoil)	3		MC = 25.2%
791.1	2.5	ML	**SILT** brown, wet.	9		MC = 21.1%
		CL	(Loess)	10		
		ML	**SILTY CLAY** brown, wet.	9		
		ML	(Loess)	8		MC = 8.7%
786.1	7.5			8		
		ML	**SILT** light brown, wet.	6		
			(Loess)	9		
			SANDY SILT light brown, wet.	9		
			(Loess)	12		MC = 13.7%
				15		
				15		
778.6	15.0			13		
			End of hand auger probe.	15		N-values for Boring B-6 are
			Probe sealed upon completion.			estimated from DCP values.

(SEE REPORT AND STANDARD PLATES FOR EVALUATION AND DESCRIPTIVE TERMINOLOGY.)

LOB 17665.20.WIL (OUR LADY OF GUADALUPE RETREAT CENTER).GPJ GINT STD US.GDT

LOG OF BORING

CHOSEN VALLEY TESTING

PROJECT: 17665.20.WIL
Design Phase Geotechnical Evaluation
Proposed Retreat Center
CTH MM
La Crosse, Wisconsin

BORING: **S-7**

LOCATION:
See attached sketch

DATE: 2/23/21

SCALE: 1" = 7'

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
810.6	0.0					
810.3	0.3		**4" ASPHALT**			
809.1	1.5	CL	**14" AGGREGATE BASE**			
		ML	**SILTY CLAY** pockets of topsoil, brown, wet, rather stiff.	12		PP = 1.5 tsf
806.6	4.0	CL	(Fill)	10		PP = 2.0 tsf, MC = 16.0%
804.1	6.5	ML	**LEAN CLAY** brown, wet, rather stiff. (Loess)	7		PP = 1.25 tsf
			SILT brown, wet, medium to stiff. (Loess)	6		MC = 14.9%
			Light brownish gray below 11.5'.	8		PP = 1.5 tsf
				10		MC = 15.5%
			Brown below 17.5'.	13		PP = 1.25 tsf
				10		PP = 0.75 tsf
783.1	27.5	ML	**SANDY SILT** trace gravel, brown, wet, very stiff to hard. (Colluvium)	31		PP = 2.0 tsf, MC = 10.6%
775.1	35.5			24		PP = 2.0 tsf
774.6	36.0	SM	**SILTY SAND** trace gravel, fine grained, greenish brown, moist, medium dense. (Colluvium)			
			End of boring. Boring sealed upon completion.			

(SEE REPORT AND STANDARD PLATES FOR EVALUATION AND DESCRIPTIVE TERMINOLOGY.)

LOB 17665.20.WIL (OUR LADY OF GUADALUPE RETREAT).GPJ GINT STD US.GDT

LOG OF BORING

CHOSEN VALLEY TESTING

PROJECT: 17665.20.WIL
Design Phase Geotechnical Evaluation
Proposed Retreat Center
CTH MM
La Crosse, Wisconsin

BORING: **S-8**

LOCATION:
See attached sketch

DATE: 2/23/21

SCALE: 1" = 7'

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
814.7	0.0					
814.2	0.5	ML	**6" AGGREGATE BASE**			
			SANDY SILT brown, wet. (Fill)	*		MC = 13.9%
810.7	4.0	CL ML	**SILTY CLAY** brown, wet, very stiff. (Loess)	29		PP = 2.5 tsf, MC = 20.7%
808.2	6.5	ML	**SILT** brown, wet, medium to rather stiff. (Loess)	10		PP = 0.75 tsf
				7		PP = 0.75 tsf
				9		PP = 1.0 tsf, MC = 14.4%
				11		PP = 0.5 tsf
				11		PP = 1.25 tsf
792.2	22.5	ML	**SILT with SAND** trace gravel, brown, wet, rather stiff. (Colluvium)	10		PP = 0.75 tsf, MC = 21.8%
787.2	27.5	SM	**SILTY SAND** seams of lean clay, trace gravel, fine grained, greenish brown, moist, medium dense. (Colluvium)	21		
778.7	36.0			19		
			End of boring. Boring sealed upon completion.			

(SEE REPORT AND STANDARD PLATES FOR EVALUATION AND DESCRIPTIVE TERMINOLOGY.)

LOB 17665.20.WIL (OUR LADY OF GUADALUPE RETREAT CENTER).GPJ

LOG OF BORING

CHOSEN VALLEY TESTING

PROJECT: L2007.017
Design Phase Geotechnical Evaluation
Proposed Church for Shrine of Our Lady of Guadalupe
County Highway MM
La Crosse, Wisconsin

BORING: **B-3**

LOCATION:
See attached sketch.

DATE: 02/14/07

SCALE: 1" = 6'

Approx. Elev: 812

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
84.9	0.0					
84.4	0.5	ML	**6" RECYCLED BITUMINOUS**, fabric under bituminous.			
			SILT to SANDY SILT, rare gravel, brown to light brown, frozen to about 2 feet then moist to about 11 feet then wet, medium to very stiff. (Fill)	15		
				9		
				14		
				21		
				6		
66.9	18.0					
		ML	**SILT**, with wood, light gray to light brown, very wet, soft. (Fill)	2		
61.9	23.0					
		ML	**SILT**, trace clay, brown to light brown, moist to wet, stiff. (Loess)	14		
56.9	28.0					
		ML	**SANDY SILT**, tan, moist, medium to stiff. (Loess)	7		
				12		
44.9	40.0					
43.9	41.0	GM	**SILTY SAND with GRAVEL**, fine grained sand, dolostone gravel, light brown to yellowish orange, moist, medium dense. (Colluvium)	14		
			End of Boring. Boring dry upon completion. Boring sealed with bentonite grout upon completion.			

(SEE REPORT AND STANDARD PLATES FOR EVALUATION AND DESCRIPTIVE TERMINOLOGY.)

LOG L2007 - GPJ 03/2/07

LOG OF BORING

CHOSEN VALLEY TESTING

PROJECT: L2007.017
Design Phase Geotechnical Evaluation
Proposed Church for Shrine of Our Lady of Guadalupe
County Highway MM
La Crosse, Wisconsin

BORING: **B-5**

LOCATION:
See attached sketch.

DATE: 08/20/03

SCALE: 1" = 6'

Approx. Elev. 782

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
55.0	0.0					
54.3	0.7	ML	**SILT**, dark brown, dry. (Topsoil)			
		ML	**SILT**, brown, moist, very loose to medium dense. (Loess)	7		
				6		
				4		
				3		
				6		
				6		
				12		
32.5	22.5	SS	**WEATHERED SANDSTONE**, light brown, moist.	*		* 56 = 9" (set)
25.9	29.1		End of Boring. Water not observed while drilling. Boring then grouted.	**		** 50 = 1" (set)

(SEE REPORT AND STANDARD PLATES FOR EVALUATION AND DESCRIPTIVE TERMINOLOGY.)

LOB L2007--1.GPJ 03.02.07

LOG OF BORING

CHOSEN VALLEY TESTING

PROJECT: L2003.187
Design Phase Geotechnical Evaluation
Proposed Shrine for Our Lady of Guadalupe Church
County Highway MM
LaCrosse, Wisconsin

BORING: A

LOCATION:
See attached sketch

DATE: 01/14/03

SCALE: 1" = 8'

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
803.7	0.0	ML	**SILT**, tan to light brown, moist, rather stiff to stiff. (Loess)	9		
				14		
790.7	13.0	ML	**SILT**, with limestone gravel, light brown, moist, hard. (Colluvium)	30		
785.7	18.0	CL	**SANDY LEAN CLAY**, with silt and limestone gravel, brown to green, moist, hard. (Colluvium)	35		Some grinding on auger at 18 feet.
780.7	23.0	GM	**SILTY SAND and GRAVEL**, trace green clay, tan to pale yellow, moist, medium dense to very dense. (Residuum)	43		
				21		
766.7	37.0			*		* 50=5" (set)
		GM	**SILTY SAND and GRAVEL**, with clay layers, tan to green, moist, loose. (Residuum)	8		
762.2	41.5					
760.7	43.0		**WEATHERED LIMESTONE**, tan to pale yellow.	**		Grinding on auger at 41.5 feet.
			End of boring. Auger refusal at 43 feet, presumably on fresh limestone. Cave in at 31.5 feet after auger withdrawal. Boring backfilled upon completion.			** 50=0" (set)

(SEE REPORT AND STANDARD PLATES FOR EVALUATION AND DESCRIPTIVE TERMINOLOGY.)

LOB L2003-187.GPJ 02/01/04

LOG OF BORING

CHOSEN VALLEY TESTING

PROJECT: L2003.187
Design Phase Geotechnical Evaluation
Proposed Shrine for Our Lady of Guadalupe Church
County Highway MM
LaCrosse, Wisconsin

BORING: D

LOCATION:
See attached sketch

DATE: 01/14/03

SCALE: 1" = 8'

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
806.8	0.0	ML	**SILT**, tan to light brown, moist, medium to rather stiff. (Loess)	12		
				6		
771.8	35.0			23		Some grinding on auger at 35 feet.
		ML	**SILT**, with limestone gravel, light brown, moist, very stiff. (Colluvium)			
768.8	38.0	GM	**SILTY SAND and GRAVEL**, with clay layers, green to pale yellow, moist, dense. (Residuum)	30		
760.8	46.0			44		
758.8	48.0		**WEATHERED LIMESTONE**, tan to pale yellow.			Grinding on auger at 46 feet.
			End of boring. Auger refusal at 48 feet, presumably on fresh limestone. Boring backfilled upon completion.	*		* 50=1/4" (set)

(SEE REPORT AND STANDARD PLATES FOR EVALUATION AND DESCRIPTIVE TERMINOLOGY.)

LOB L2003-187.GPJ 02/01/04

LOG OF BORING

CHOSEN VALLEY TESTING

PROJECT: L2003.187
Design Phase Geotechnical Evaluation
Proposed Shrine for Our Lady of Guadalupe Church
County Highway MM
LaCrosse, Wisconsin

BORING: E

LOCATION:
See attached sketch

DATE: 01/14/03

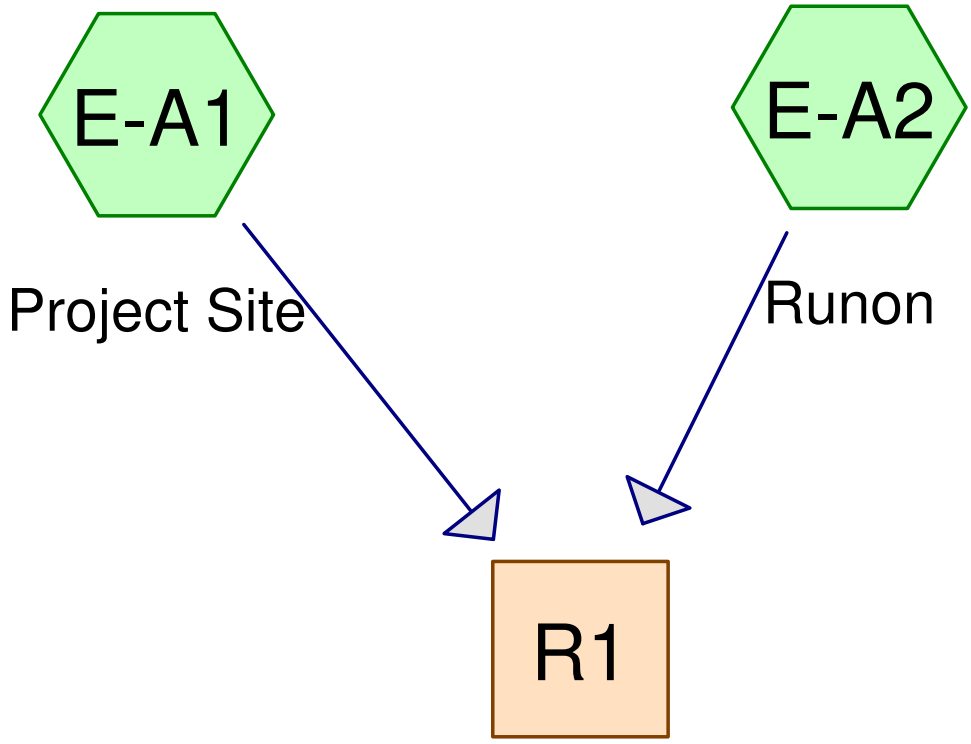
SCALE: 1" = 8'

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
800.1	0.0	CL	**LEAN CLAY**, brown to light brown, wet, rather stiff to stiff. (Loess)	13		
				10		
794.1	6.0	ML	**SILT**, tan to light brown, moist, rather stiff to very stiff. (Loess)	11		
				16		
				15		
				15		
				24		
				15		
766.1	34.0	ML	**SILT**, with limestone gravel, light brown, moist, hard. (Colluvium)	32		Some grinding on auger at 34 feet.
762.1	38.0	GM	**SILTY SAND and GRAVEL**, with green clay, tan to pale yellow, moist, dense. (Residuum/Colluvium)	41		
757.1	43.0	CL	**SANDY LEAN CLAY**, with limestone gravel, pale green to pale yellow, wet, medium dense to dense. (Residuum/Colluvium)	26		
749.1	51.0	SP	**POORLY GRADED SAND**, fine grained, tan to white, moist, medium dense. (Residuum)	13		
745.6	54.5		**WEATHERED SANDSTONE**, tan to pale yellow.	*		* 50=1" (set)
745.1	55.0		End of boring. Auger refusal at 55 feet, presumably on fresh sandstone. Cave in at 47 feet after auger withdrawal. Boring backfilled upon completion.			

(SEE REPORT AND STANDARD PLATES FOR EVALUATION AND DESCRIPTIVE TERMINOLOGY.)

LOB L2003-187.GPJ 02/01/04

4 Peak Runoff Rate Control Calculations



Existing Conditions

Subcat Reach Pond Link

Routing Diagram for Retreat Center - Copy3
Prepared by Vierbicher Associates, Printed 9/16/2024

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.019	58	Woods/grass comb., Good, HSG B (E-A1, E-A2)

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
1.019	HSG B	E-A1, E-A2
0.000	HSG C	
0.000	HSG D	
0.000	Other	

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	1.019	0.000	0.000	0.000	1.019	Woods/grass comb., Good	E-A1, E-A2

Summary for Subcatchment E-A1: Project Site

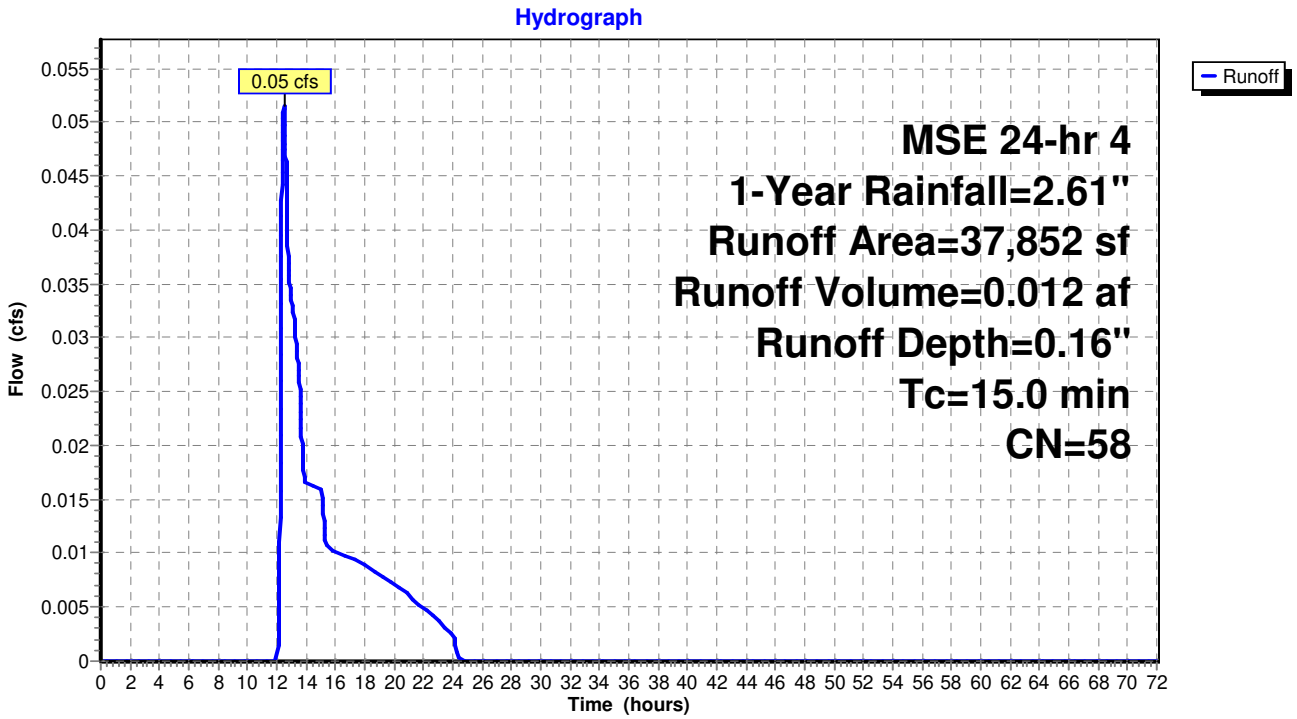
Runoff = 0.05 cfs @ 12.48 hrs, Volume= 0.012 af, Depth= 0.16"
Routed to Reach R1 : Existing Conditions

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 1-Year Rainfall=2.61"

Area (sf)	CN	Description
37,852	58	Woods/grass comb., Good, HSG B
37,852		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

Subcatchment E-A1: Project Site



Hydrograph for Subcatchment E-A1: Project Site

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.01	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.06	0.00	0.00
4.00	0.08	0.00	0.00
5.00	0.12	0.00	0.00
6.00	0.16	0.00	0.00
7.00	0.21	0.00	0.00
8.00	0.26	0.00	0.00
9.00	0.32	0.00	0.00
10.00	0.41	0.00	0.00
11.00	0.56	0.00	0.00
12.00	1.22	0.00	**0.00**
13.00	2.05	0.05	**0.03**
14.00	2.20	0.07	0.02
15.00	2.29	0.09	0.02
16.00	2.35	0.10	0.01
17.00	2.40	0.11	0.01
18.00	2.45	0.12	0.01
19.00	2.49	0.13	0.01
20.00	2.53	0.14	0.01
21.00	2.55	0.15	0.01
22.00	2.58	0.15	0.00
23.00	2.60	0.16	0.00
24.00	**2.61**	**0.16**	0.00
25.00	2.61	0.16	0.00
26.00	2.61	0.16	0.00
27.00	2.61	0.16	0.00
28.00	2.61	0.16	0.00
29.00	2.61	0.16	0.00
30.00	2.61	0.16	0.00
31.00	2.61	0.16	0.00
32.00	2.61	0.16	0.00
33.00	2.61	0.16	0.00
34.00	2.61	0.16	0.00
35.00	2.61	0.16	0.00
36.00	2.61	0.16	0.00
37.00	2.61	0.16	0.00
38.00	2.61	0.16	0.00
39.00	2.61	0.16	0.00
40.00	2.61	0.16	0.00
41.00	2.61	0.16	0.00
42.00	2.61	0.16	0.00
43.00	2.61	0.16	0.00
44.00	2.61	0.16	0.00
45.00	2.61	0.16	0.00
46.00	2.61	0.16	0.00
47.00	2.61	0.16	0.00
48.00	2.61	0.16	0.00
49.00	2.61	0.16	0.00
50.00	2.61	0.16	0.00
51.00	2.61	0.16	0.00
52.00	2.61	0.16	0.00
53.00	2.61	0.16	0.00
54.00	2.61	0.16	0.00
55.00	2.61	0.16	0.00
56.00	2.61	0.16	0.00
57.00	2.61	0.16	0.00
58.00	2.61	0.16	0.00
59.00	2.61	0.16	0.00
60.00	2.61	0.16	0.00
61.00	2.61	0.16	0.00
62.00	2.61	0.16	0.00
63.00	2.61	0.16	0.00
64.00	2.61	0.16	0.00
65.00	2.61	0.16	0.00
66.00	2.61	0.16	0.00
67.00	2.61	0.16	0.00
68.00	2.61	0.16	0.00
69.00	2.61	0.16	0.00
70.00	2.61	0.16	0.00
71.00	2.61	0.16	0.00
72.00	2.61	0.16	0.00

Summary for Subcatchment E-A2: Runon

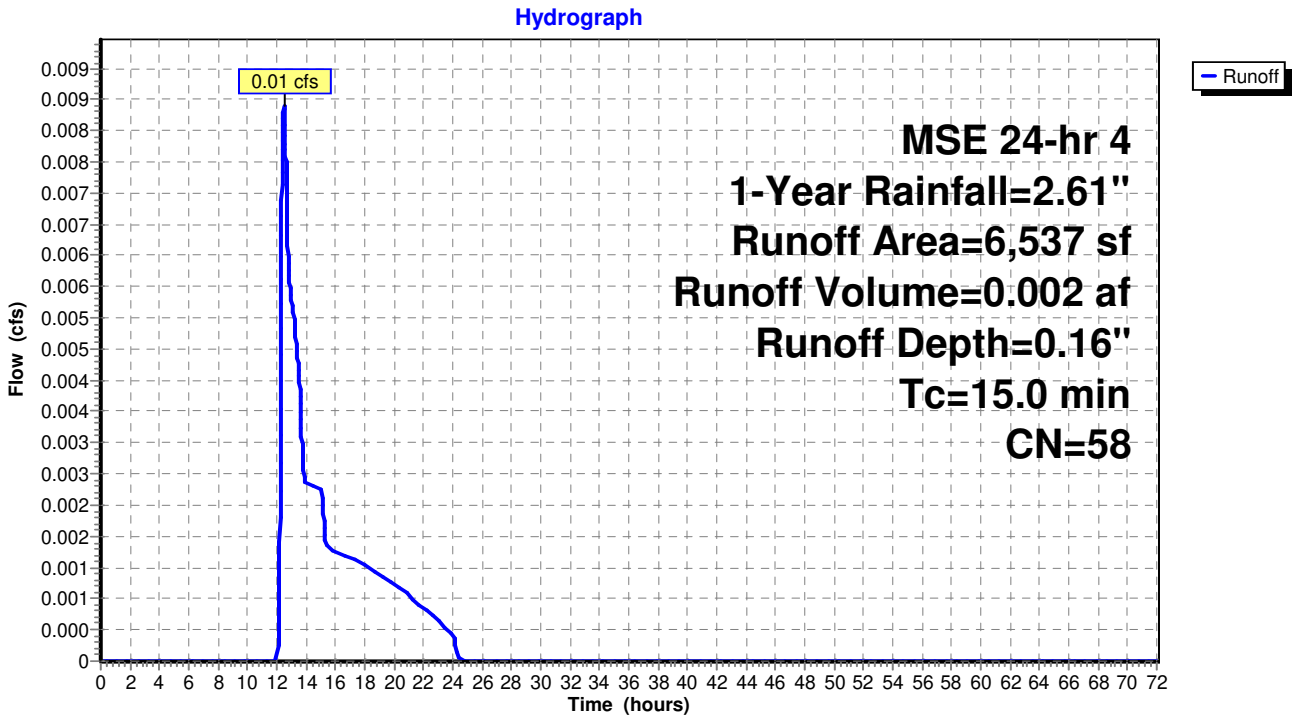
Runoff = 0.01 cfs @ 12.48 hrs, Volume= 0.002 af, Depth= 0.16"
Routed to Reach R1 : Existing Conditions

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 1-Year Rainfall=2.61"

Area (sf)	CN	Description
6,537	58	Woods/grass comb., Good, HSG B
6,537		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

Subcatchment E-A2: Runon



Hydrograph for Subcatchment E-A2: Runon

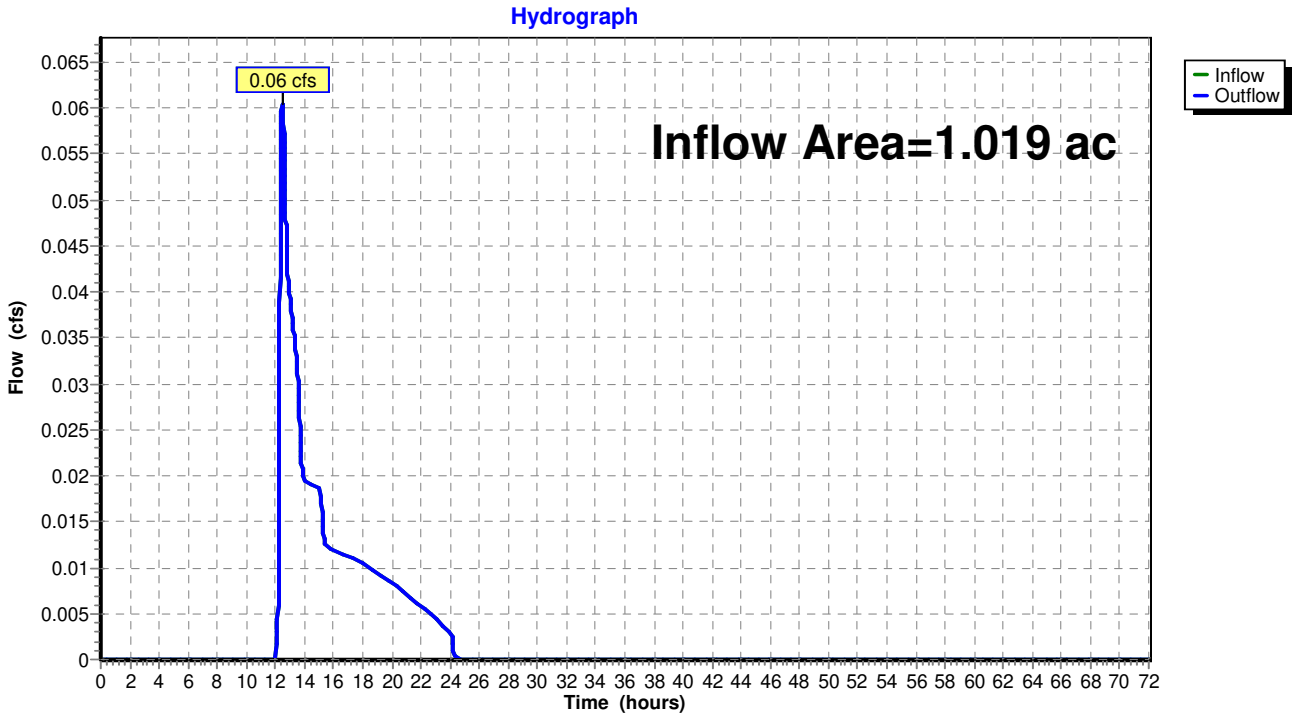
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.01	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.06	0.00	0.00
4.00	0.08	0.00	0.00
5.00	0.12	0.00	0.00
6.00	0.16	0.00	0.00
7.00	0.21	0.00	0.00
8.00	0.26	0.00	0.00
9.00	0.32	0.00	0.00
10.00	0.41	0.00	0.00
11.00	0.56	0.00	0.00
12.00	1.22	0.00	**0.00**
13.00	2.05	0.05	**0.01**
14.00	2.20	0.07	0.00
15.00	2.29	0.09	0.00
16.00	2.35	0.10	0.00
17.00	2.40	0.11	0.00
18.00	2.45	0.12	0.00
19.00	2.49	0.13	0.00
20.00	2.53	0.14	0.00
21.00	2.55	0.15	0.00
22.00	2.58	0.15	0.00
23.00	2.60	0.16	0.00
24.00	**2.61**	**0.16**	0.00
25.00	2.61	0.16	0.00
26.00	2.61	0.16	0.00
27.00	2.61	0.16	0.00
28.00	2.61	0.16	0.00
29.00	2.61	0.16	0.00
30.00	2.61	0.16	0.00
31.00	2.61	0.16	0.00
32.00	2.61	0.16	0.00
33.00	2.61	0.16	0.00
34.00	2.61	0.16	0.00
35.00	2.61	0.16	0.00
36.00	2.61	0.16	0.00
37.00	2.61	0.16	0.00
38.00	2.61	0.16	0.00
39.00	2.61	0.16	0.00
40.00	2.61	0.16	0.00
41.00	2.61	0.16	0.00
42.00	2.61	0.16	0.00
43.00	2.61	0.16	0.00
44.00	2.61	0.16	0.00
45.00	2.61	0.16	0.00
46.00	2.61	0.16	0.00
47.00	2.61	0.16	0.00
48.00	2.61	0.16	0.00
49.00	2.61	0.16	0.00
50.00	2.61	0.16	0.00
51.00	2.61	0.16	0.00
52.00	2.61	0.16	0.00
53.00	2.61	0.16	0.00
54.00	2.61	0.16	0.00
55.00	2.61	0.16	0.00
56.00	2.61	0.16	0.00
57.00	2.61	0.16	0.00
58.00	2.61	0.16	0.00
59.00	2.61	0.16	0.00
60.00	2.61	0.16	0.00
61.00	2.61	0.16	0.00
62.00	2.61	0.16	0.00
63.00	2.61	0.16	0.00
64.00	2.61	0.16	0.00
65.00	2.61	0.16	0.00
66.00	2.61	0.16	0.00
67.00	2.61	0.16	0.00
68.00	2.61	0.16	0.00
69.00	2.61	0.16	0.00
70.00	2.61	0.16	0.00
71.00	2.61	0.16	0.00
72.00	2.61	0.16	0.00

Summary for Reach R1: Existing Conditions

Inflow Area = 1.019 ac, 0.00% Impervious, Inflow Depth = 0.16" for 1-Year event
Inflow = 0.06 cfs @ 12.48 hrs, Volume= 0.014 af
Outflow = 0.06 cfs @ 12.48 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach R1: Existing Conditions



Hydrograph for Reach R1: Existing Conditions

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	51.00	0.00		0.00
1.00	0.00		0.00	52.00	0.00		0.00
2.00	0.00		0.00	53.00	0.00		0.00
3.00	0.00		0.00	54.00	0.00		0.00
4.00	0.00		0.00	55.00	0.00		0.00
5.00	0.00		0.00	56.00	0.00		0.00
6.00	0.00		0.00	57.00	0.00		0.00
7.00	0.00		0.00	58.00	0.00		0.00
8.00	0.00		0.00	59.00	0.00		0.00
9.00	0.00		0.00	60.00	0.00		0.00
10.00	0.00		0.00	61.00	0.00		0.00
11.00	0.00		0.00	62.00	0.00		0.00
12.00	**0.00**		**0.00**	63.00	0.00		0.00
13.00	**0.04**		**0.04**	64.00	0.00		0.00
14.00	0.02		0.02	65.00	0.00		0.00
15.00	0.02		0.02	66.00	0.00		0.00
16.00	0.01		0.01	67.00	0.00		0.00
17.00	0.01		0.01	68.00	0.00		0.00
18.00	0.01		0.01	69.00	0.00		0.00
19.00	0.01		0.01	70.00	0.00		0.00
20.00	0.01		0.01	71.00	0.00		0.00
21.00	0.01		0.01	72.00	0.00		0.00
22.00	0.01		0.01				
23.00	0.00		0.00				
24.00	0.00		0.00				
25.00	0.00		0.00				
26.00	0.00		0.00				
27.00	0.00		0.00				
28.00	0.00		0.00				
29.00	0.00		0.00				
30.00	0.00		0.00				
31.00	0.00		0.00				
32.00	0.00		0.00				
33.00	0.00		0.00				
34.00	0.00		0.00				
35.00	0.00		0.00				
36.00	0.00		0.00				
37.00	0.00		0.00				
38.00	0.00		0.00				
39.00	0.00		0.00				
40.00	0.00		0.00				
41.00	0.00		0.00				
42.00	0.00		0.00				
43.00	0.00		0.00				
44.00	0.00		0.00				
45.00	0.00		0.00				
46.00	0.00		0.00				
47.00	0.00		0.00				
48.00	0.00		0.00				
49.00	0.00		0.00				
50.00	0.00		0.00				

Summary for Subcatchment E-A1: Project Site

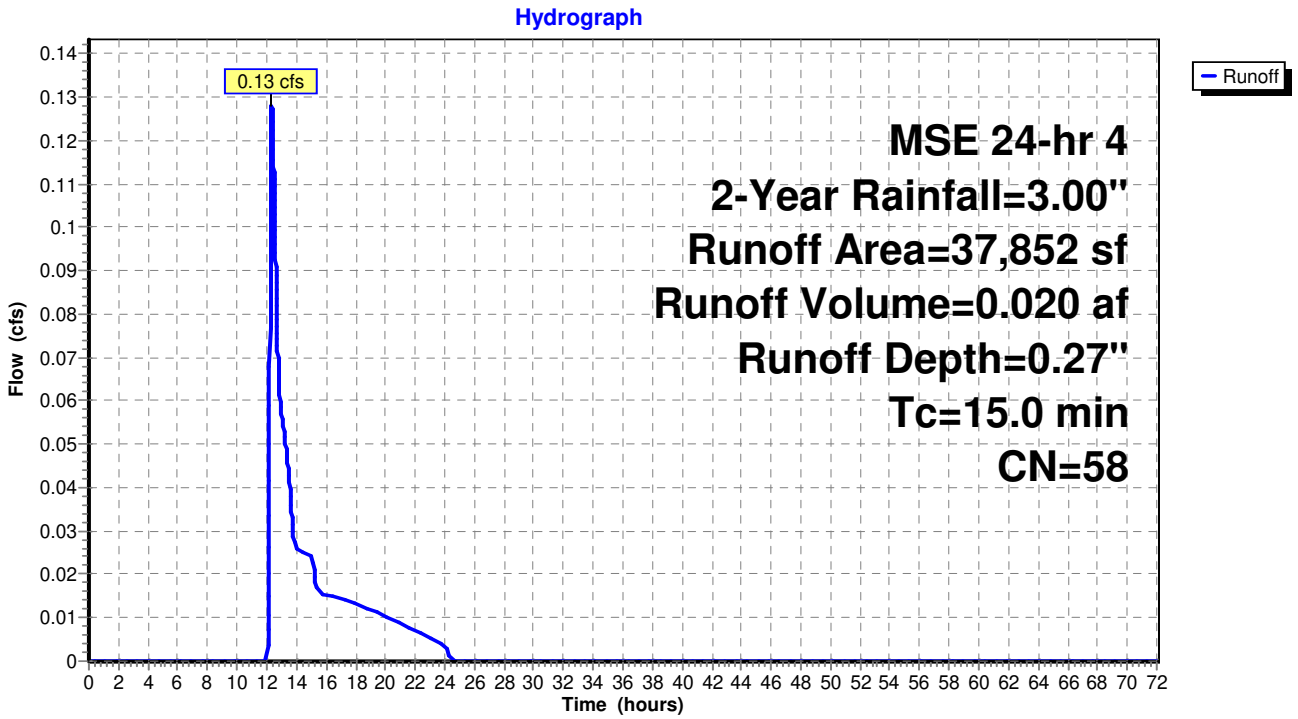
Runoff = 0.13 cfs @ 12.34 hrs, Volume= 0.020 af, Depth= 0.27"
Routed to Reach R1 : Existing Conditions

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 2-Year Rainfall=3.00"

Area (sf)	CN	Description
37,852	58	Woods/grass comb., Good, HSG B
37,852		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

Subcatchment E-A1: Project Site



Hydrograph for Subcatchment E-A1: Project Site

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.01	0.00	0.00
2.00	0.04	0.00	0.00
3.00	0.06	0.00	0.00
4.00	0.10	0.00	0.00
5.00	0.14	0.00	0.00
6.00	0.18	0.00	0.00
7.00	0.24	0.00	0.00
8.00	0.30	0.00	0.00
9.00	0.36	0.00	0.00
10.00	0.48	0.00	0.00
11.00	0.65	0.00	0.00
12.00	1.41	0.00	**0.00**
13.00	2.35	0.10	**0.06**
14.00	2.52	0.14	0.03
15.00	2.64	0.17	0.02
16.00	2.70	0.19	0.02
17.00	2.76	0.20	0.01
18.00	2.82	0.22	0.01
19.00	2.86	0.23	0.01
20.00	2.90	0.24	0.01
21.00	2.94	0.25	0.01
22.00	2.96	0.26	0.01
23.00	2.99	0.27	0.01
24.00	**3.00**	**0.27**	0.00
25.00	3.00	0.27	0.00
26.00	3.00	0.27	0.00
27.00	3.00	0.27	0.00
28.00	3.00	0.27	0.00
29.00	3.00	0.27	0.00
30.00	3.00	0.27	0.00
31.00	3.00	0.27	0.00
32.00	3.00	0.27	0.00
33.00	3.00	0.27	0.00
34.00	3.00	0.27	0.00
35.00	3.00	0.27	0.00
36.00	3.00	0.27	0.00
37.00	3.00	0.27	0.00
38.00	3.00	0.27	0.00
39.00	3.00	0.27	0.00
40.00	3.00	0.27	0.00
41.00	3.00	0.27	0.00
42.00	3.00	0.27	0.00
43.00	3.00	0.27	0.00
44.00	3.00	0.27	0.00
45.00	3.00	0.27	0.00
46.00	3.00	0.27	0.00
47.00	3.00	0.27	0.00
48.00	3.00	0.27	0.00
49.00	3.00	0.27	0.00
50.00	3.00	0.27	0.00
51.00	3.00	0.27	0.00
52.00	3.00	0.27	0.00
53.00	3.00	0.27	0.00
54.00	3.00	0.27	0.00
55.00	3.00	0.27	0.00
56.00	3.00	0.27	0.00
57.00	3.00	0.27	0.00
58.00	3.00	0.27	0.00
59.00	3.00	0.27	0.00
60.00	3.00	0.27	0.00
61.00	3.00	0.27	0.00
62.00	3.00	0.27	0.00
63.00	3.00	0.27	0.00
64.00	3.00	0.27	0.00
65.00	3.00	0.27	0.00
66.00	3.00	0.27	0.00
67.00	3.00	0.27	0.00
68.00	3.00	0.27	0.00
69.00	3.00	0.27	0.00
70.00	3.00	0.27	0.00
71.00	3.00	0.27	0.00
72.00	3.00	0.27	0.00

Summary for Subcatchment E-A2: Runon

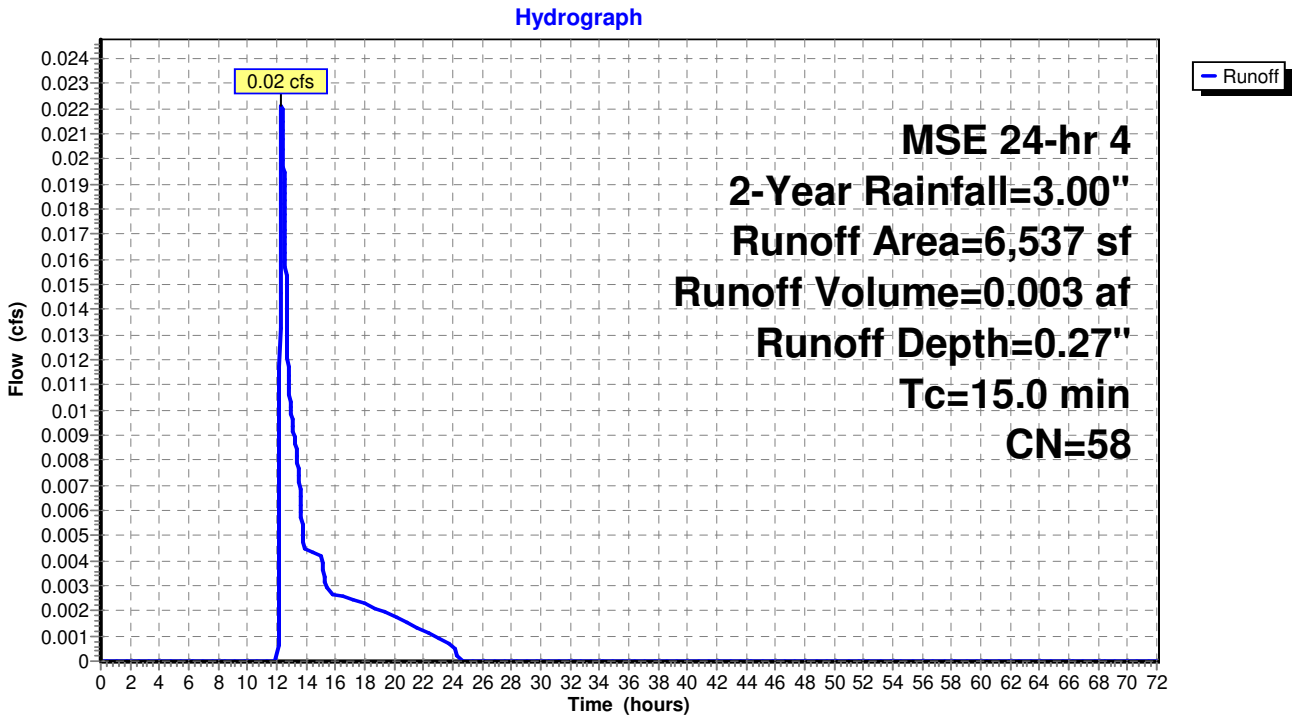
Runoff = 0.02 cfs @ 12.34 hrs, Volume= 0.003 af, Depth= 0.27"
Routed to Reach R1 : Existing Conditions

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 2-Year Rainfall=3.00"

Area (sf)	CN	Description
6,537	58	Woods/grass comb., Good, HSG B
6,537		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

Subcatchment E-A2: Runon



Hydrograph for Subcatchment E-A2: Runon

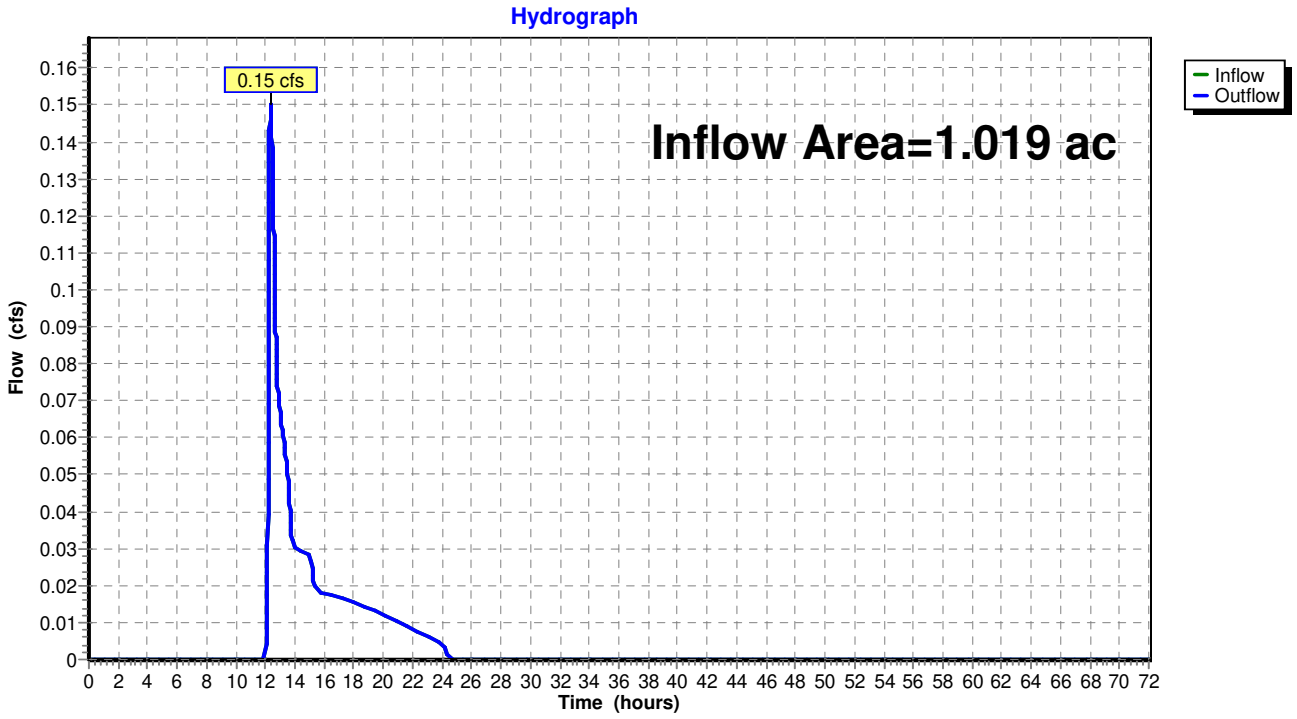
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.01	0.00	0.00
2.00	0.04	0.00	0.00
3.00	0.06	0.00	0.00
4.00	0.10	0.00	0.00
5.00	0.14	0.00	0.00
6.00	0.18	0.00	0.00
7.00	0.24	0.00	0.00
8.00	0.30	0.00	0.00
9.00	0.36	0.00	0.00
10.00	0.48	0.00	0.00
11.00	0.65	0.00	0.00
12.00	1.41	0.00	**0.00**
13.00	2.35	0.10	**0.01**
14.00	2.52	0.14	0.00
15.00	2.64	0.17	0.00
16.00	2.70	0.19	0.00
17.00	2.76	0.20	0.00
18.00	2.82	0.22	0.00
19.00	2.86	0.23	0.00
20.00	2.90	0.24	0.00
21.00	2.94	0.25	0.00
22.00	2.96	0.26	0.00
23.00	2.99	0.27	0.00
24.00	**3.00**	**0.27**	0.00
25.00	3.00	0.27	0.00
26.00	3.00	0.27	0.00
27.00	3.00	0.27	0.00
28.00	3.00	0.27	0.00
29.00	3.00	0.27	0.00
30.00	3.00	0.27	0.00
31.00	3.00	0.27	0.00
32.00	3.00	0.27	0.00
33.00	3.00	0.27	0.00
34.00	3.00	0.27	0.00
35.00	3.00	0.27	0.00
36.00	3.00	0.27	0.00
37.00	3.00	0.27	0.00
38.00	3.00	0.27	0.00
39.00	3.00	0.27	0.00
40.00	3.00	0.27	0.00
41.00	3.00	0.27	0.00
42.00	3.00	0.27	0.00
43.00	3.00	0.27	0.00
44.00	3.00	0.27	0.00
45.00	3.00	0.27	0.00
46.00	3.00	0.27	0.00
47.00	3.00	0.27	0.00
48.00	3.00	0.27	0.00
49.00	3.00	0.27	0.00
50.00	3.00	0.27	0.00
51.00	3.00	0.27	0.00
52.00	3.00	0.27	0.00
53.00	3.00	0.27	0.00
54.00	3.00	0.27	0.00
55.00	3.00	0.27	0.00
56.00	3.00	0.27	0.00
57.00	3.00	0.27	0.00
58.00	3.00	0.27	0.00
59.00	3.00	0.27	0.00
60.00	3.00	0.27	0.00
61.00	3.00	0.27	0.00
62.00	3.00	0.27	0.00
63.00	3.00	0.27	0.00
64.00	3.00	0.27	0.00
65.00	3.00	0.27	0.00
66.00	3.00	0.27	0.00
67.00	3.00	0.27	0.00
68.00	3.00	0.27	0.00
69.00	3.00	0.27	0.00
70.00	3.00	0.27	0.00
71.00	3.00	0.27	0.00
72.00	3.00	0.27	0.00

Summary for Reach R1: Existing Conditions

Inflow Area = 1.019 ac, 0.00% Impervious, Inflow Depth = 0.27" for 2-Year event
Inflow = 0.15 cfs @ 12.34 hrs, Volume= 0.023 af
Outflow = 0.15 cfs @ 12.34 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach R1: Existing Conditions



Hydrograph for Reach R1: Existing Conditions

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00
1.00	0.00		0.00
2.00	0.00		0.00
3.00	0.00		0.00
4.00	0.00		0.00
5.00	0.00		0.00
6.00	0.00		0.00
7.00	0.00		0.00
8.00	0.00		0.00
9.00	0.00		0.00
10.00	0.00		0.00
11.00	0.00		0.00
12.00	**0.00**		**0.00**
13.00	**0.07**		**0.07**
14.00	0.03		0.03
15.00	0.03		0.03
16.00	0.02		0.02
17.00	0.02		0.02
18.00	0.02		0.02
19.00	0.01		0.01
20.00	0.01		0.01
21.00	0.01		0.01
22.00	0.01		0.01
23.00	0.01		0.01
24.00	0.00		0.00
25.00	0.00		0.00
26.00	0.00		0.00
27.00	0.00		0.00
28.00	0.00		0.00
29.00	0.00		0.00
30.00	0.00		0.00
31.00	0.00		0.00
32.00	0.00		0.00
33.00	0.00		0.00
34.00	0.00		0.00
35.00	0.00		0.00
36.00	0.00		0.00
37.00	0.00		0.00
38.00	0.00		0.00
39.00	0.00		0.00
40.00	0.00		0.00
41.00	0.00		0.00
42.00	0.00		0.00
43.00	0.00		0.00
44.00	0.00		0.00
45.00	0.00		0.00
46.00	0.00		0.00
47.00	0.00		0.00
48.00	0.00		0.00
49.00	0.00		0.00
50.00	0.00		0.00
51.00	0.00		0.00
52.00	0.00		0.00
53.00	0.00		0.00
54.00	0.00		0.00
55.00	0.00		0.00
56.00	0.00		0.00
57.00	0.00		0.00
58.00	0.00		0.00
59.00	0.00		0.00
60.00	0.00		0.00
61.00	0.00		0.00
62.00	0.00		0.00
63.00	0.00		0.00
64.00	0.00		0.00
65.00	0.00		0.00
66.00	0.00		0.00
67.00	0.00		0.00
68.00	0.00		0.00
69.00	0.00		0.00
70.00	0.00		0.00
71.00	0.00		0.00
72.00	0.00		0.00

Summary for Subcatchment E-A1: Project Site

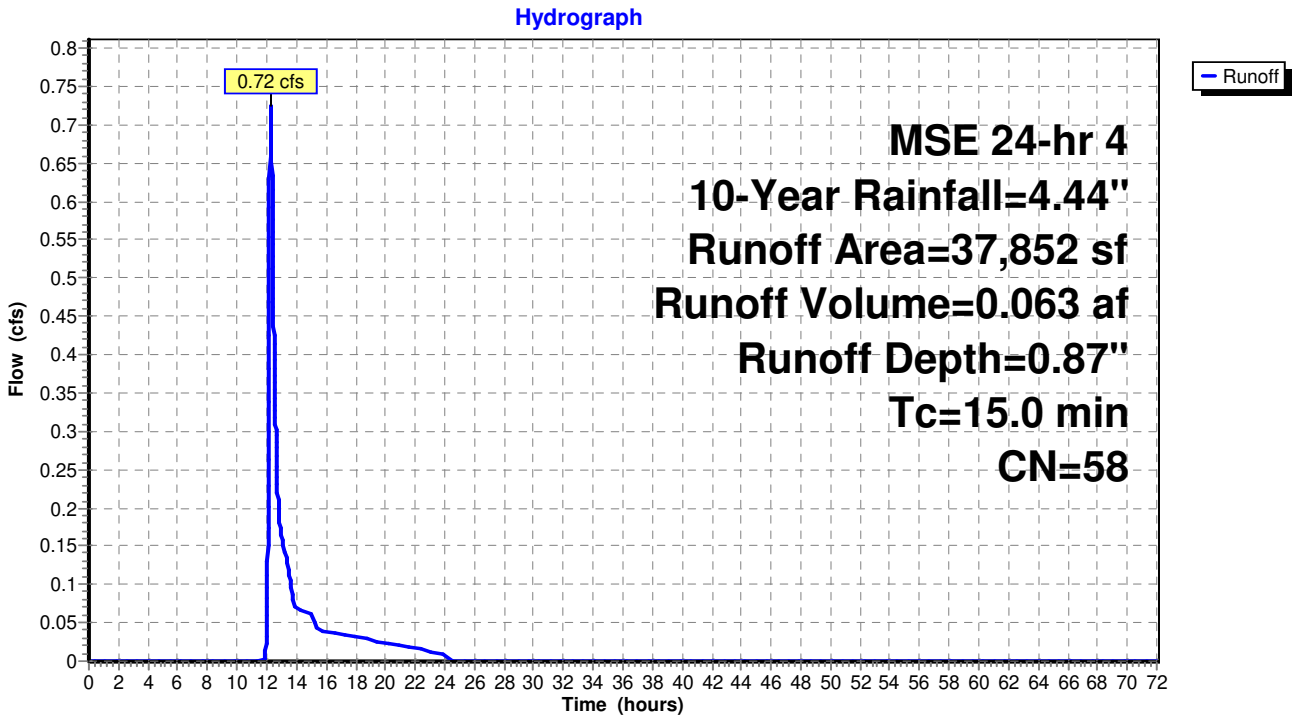
Runoff = 0.72 cfs @ 12.26 hrs, Volume= 0.063 af, Depth= 0.87"
Routed to Reach R1 : Existing Conditions

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 10-Year Rainfall=4.44"

Area (sf)	CN	Description
37,852	58	Woods/grass comb., Good, HSG B
37,852		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

Subcatchment E-A1: Project Site



Hydrograph for Subcatchment E-A1: Project Site

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.05	0.00	0.00
3.00	0.09	0.00	0.00
4.00	0.14	0.00	0.00
5.00	0.20	0.00	0.00
6.00	0.27	0.00	0.00
7.00	0.35	0.00	0.00
8.00	0.44	0.00	0.00
9.00	0.54	0.00	0.00
10.00	0.70	0.00	0.00
11.00	0.96	0.00	0.00
12.00	2.08	0.05	**0.05**
13.00	3.48	0.45	**0.16**
14.00	3.74	0.55	0.07
15.00	3.90	0.62	0.06
16.00	4.00	0.66	0.04
17.00	4.09	0.71	0.03
18.00	4.17	0.74	0.03
19.00	4.24	0.77	0.03
20.00	4.30	0.80	0.02
21.00	4.35	0.83	0.02
22.00	4.39	0.85	0.02
23.00	4.42	0.86	0.01
24.00	**4.44**	**0.87**	0.01
25.00	4.44	0.87	0.00
26.00	4.44	0.87	0.00
27.00	4.44	0.87	0.00
28.00	4.44	0.87	0.00
29.00	4.44	0.87	0.00
30.00	4.44	0.87	0.00
31.00	4.44	0.87	0.00
32.00	4.44	0.87	0.00
33.00	4.44	0.87	0.00
34.00	4.44	0.87	0.00
35.00	4.44	0.87	0.00
36.00	4.44	0.87	0.00
37.00	4.44	0.87	0.00
38.00	4.44	0.87	0.00
39.00	4.44	0.87	0.00
40.00	4.44	0.87	0.00
41.00	4.44	0.87	0.00
42.00	4.44	0.87	0.00
43.00	4.44	0.87	0.00
44.00	4.44	0.87	0.00
45.00	4.44	0.87	0.00
46.00	4.44	0.87	0.00
47.00	4.44	0.87	0.00
48.00	4.44	0.87	0.00
49.00	4.44	0.87	0.00
50.00	4.44	0.87	0.00
51.00	4.44	0.87	0.00
52.00	4.44	0.87	0.00
53.00	4.44	0.87	0.00
54.00	4.44	0.87	0.00
55.00	4.44	0.87	0.00
56.00	4.44	0.87	0.00
57.00	4.44	0.87	0.00
58.00	4.44	0.87	0.00
59.00	4.44	0.87	0.00
60.00	4.44	0.87	0.00
61.00	4.44	0.87	0.00
62.00	4.44	0.87	0.00
63.00	4.44	0.87	0.00
64.00	4.44	0.87	0.00
65.00	4.44	0.87	0.00
66.00	4.44	0.87	0.00
67.00	4.44	0.87	0.00
68.00	4.44	0.87	0.00
69.00	4.44	0.87	0.00
70.00	4.44	0.87	0.00
71.00	4.44	0.87	0.00
72.00	4.44	0.87	0.00

Summary for Subcatchment E-A2: Runon

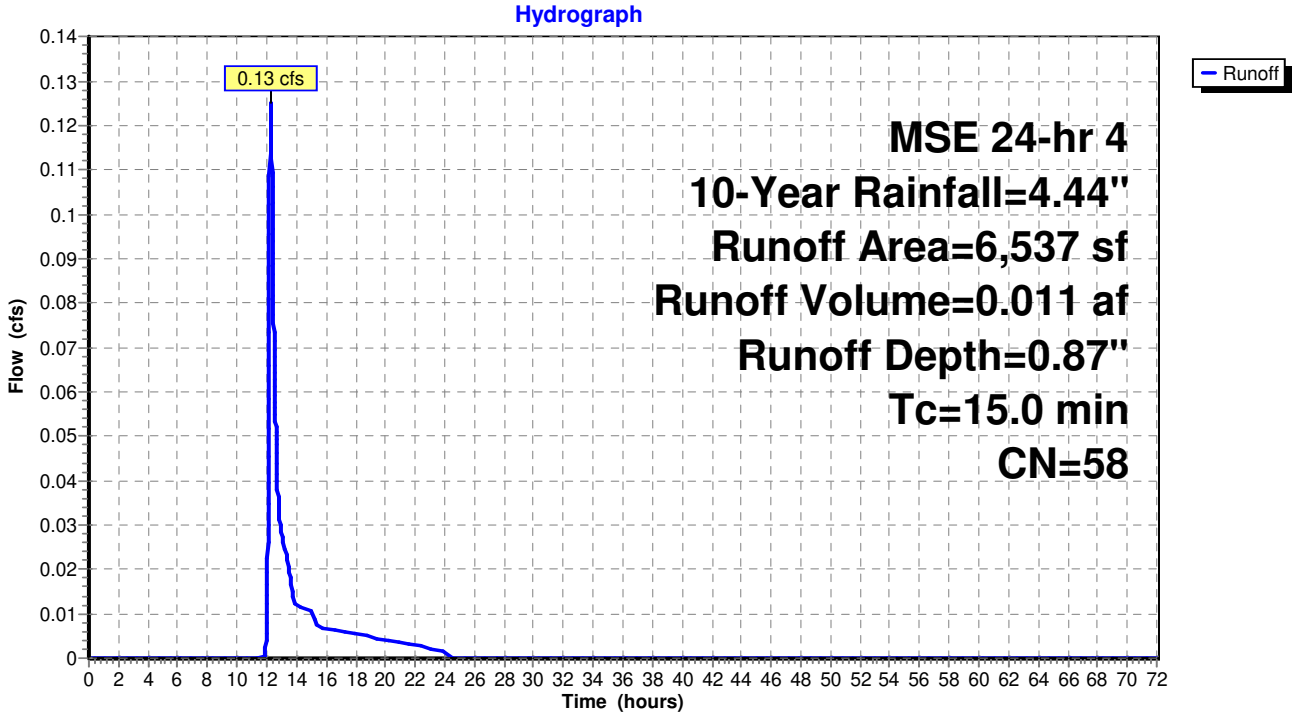
Runoff = 0.13 cfs @ 12.26 hrs, Volume= 0.011 af, Depth= 0.87"
Routed to Reach R1 : Existing Conditions

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 10-Year Rainfall=4.44"

Area (sf)	CN	Description
6,537	58	Woods/grass comb., Good, HSG B
6,537		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

Subcatchment E-A2: Runon



Hydrograph for Subcatchment E-A2: Runon

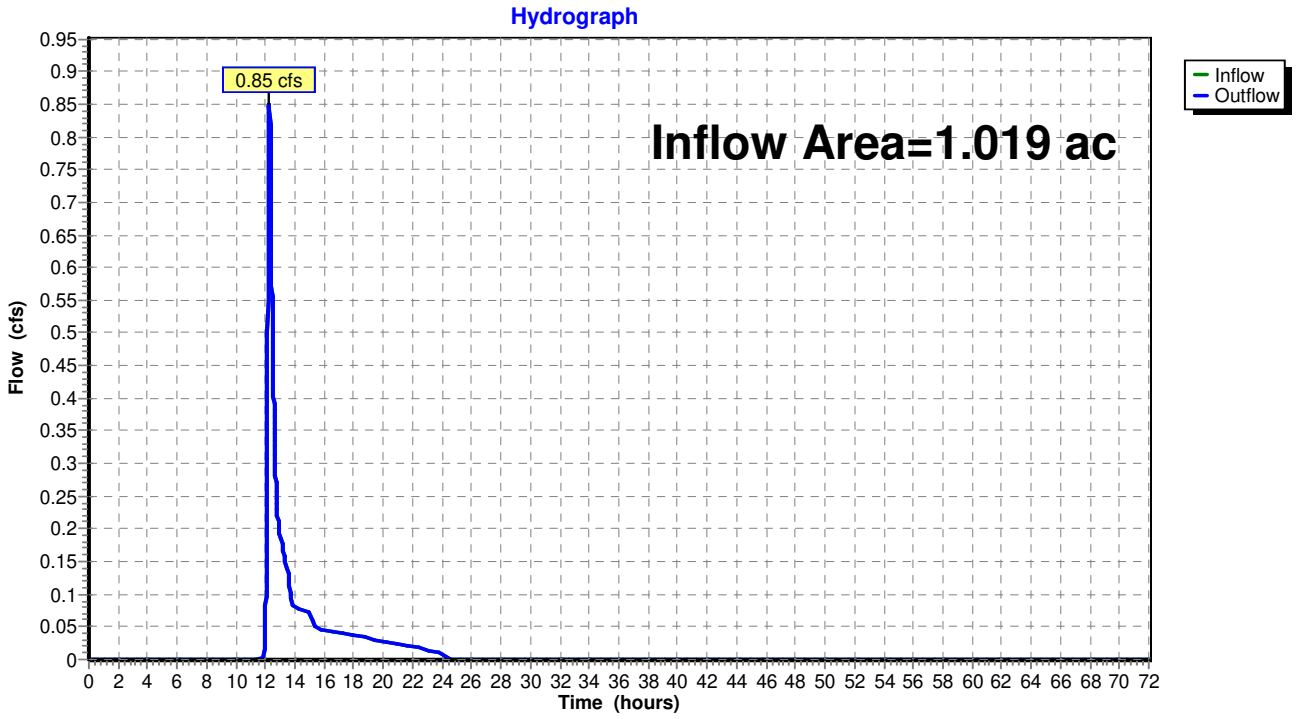
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.05	0.00	0.00
3.00	0.09	0.00	0.00
4.00	0.14	0.00	0.00
5.00	0.20	0.00	0.00
6.00	0.27	0.00	0.00
7.00	0.35	0.00	0.00
8.00	0.44	0.00	0.00
9.00	0.54	0.00	0.00
10.00	0.70	0.00	0.00
11.00	0.96	0.00	0.00
12.00	2.08	0.05	**0.01**
13.00	3.48	0.45	**0.03**
14.00	3.74	0.55	0.01
15.00	3.90	0.62	0.01
16.00	4.00	0.66	0.01
17.00	4.09	0.71	0.01
18.00	4.17	0.74	0.01
19.00	4.24	0.77	0.00
20.00	4.30	0.80	0.00
21.00	4.35	0.83	0.00
22.00	4.39	0.85	0.00
23.00	4.42	0.86	0.00
24.00	**4.44**	**0.87**	0.00
25.00	4.44	0.87	0.00
26.00	4.44	0.87	0.00
27.00	4.44	0.87	0.00
28.00	4.44	0.87	0.00
29.00	4.44	0.87	0.00
30.00	4.44	0.87	0.00
31.00	4.44	0.87	0.00
32.00	4.44	0.87	0.00
33.00	4.44	0.87	0.00
34.00	4.44	0.87	0.00
35.00	4.44	0.87	0.00
36.00	4.44	0.87	0.00
37.00	4.44	0.87	0.00
38.00	4.44	0.87	0.00
39.00	4.44	0.87	0.00
40.00	4.44	0.87	0.00
41.00	4.44	0.87	0.00
42.00	4.44	0.87	0.00
43.00	4.44	0.87	0.00
44.00	4.44	0.87	0.00
45.00	4.44	0.87	0.00
46.00	4.44	0.87	0.00
47.00	4.44	0.87	0.00
48.00	4.44	0.87	0.00
49.00	4.44	0.87	0.00
50.00	4.44	0.87	0.00
51.00	4.44	0.87	0.00
52.00	4.44	0.87	0.00
53.00	4.44	0.87	0.00
54.00	4.44	0.87	0.00
55.00	4.44	0.87	0.00
56.00	4.44	0.87	0.00
57.00	4.44	0.87	0.00
58.00	4.44	0.87	0.00
59.00	4.44	0.87	0.00
60.00	4.44	0.87	0.00
61.00	4.44	0.87	0.00
62.00	4.44	0.87	0.00
63.00	4.44	0.87	0.00
64.00	4.44	0.87	0.00
65.00	4.44	0.87	0.00
66.00	4.44	0.87	0.00
67.00	4.44	0.87	0.00
68.00	4.44	0.87	0.00
69.00	4.44	0.87	0.00
70.00	4.44	0.87	0.00
71.00	4.44	0.87	0.00
72.00	4.44	0.87	0.00

Summary for Reach R1: Existing Conditions

Inflow Area = 1.019 ac, 0.00% Impervious, Inflow Depth = 0.87" for 10-Year event
Inflow = 0.85 cfs @ 12.26 hrs, Volume= 0.074 af
Outflow = 0.85 cfs @ 12.26 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach R1: Existing Conditions



Hydrograph for Reach R1: Existing Conditions

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	51.00	0.00		0.00
1.00	0.00		0.00	52.00	0.00		0.00
2.00	0.00		0.00	53.00	0.00		0.00
3.00	0.00		0.00	54.00	0.00		0.00
4.00	0.00		0.00	55.00	0.00		0.00
5.00	0.00		0.00	56.00	0.00		0.00
6.00	0.00		0.00	57.00	0.00		0.00
7.00	0.00		0.00	58.00	0.00		0.00
8.00	0.00		0.00	59.00	0.00		0.00
9.00	0.00		0.00	60.00	0.00		0.00
10.00	0.00		0.00	61.00	0.00		0.00
11.00	0.00		0.00	62.00	0.00		0.00
12.00	**0.06**		**0.06**	63.00	0.00		0.00
13.00	**0.19**		**0.19**	64.00	0.00		0.00
14.00	0.08		0.08	65.00	0.00		0.00
15.00	0.07		0.07	66.00	0.00		0.00
16.00	0.04		0.04	67.00	0.00		0.00
17.00	0.04		0.04	68.00	0.00		0.00
18.00	0.04		0.04	69.00	0.00		0.00
19.00	0.03		0.03	70.00	0.00		0.00
20.00	0.03		0.03	71.00	0.00		0.00
21.00	0.02		0.02	72.00	0.00		0.00
22.00	0.02		0.02				
23.00	0.01		0.01				
24.00	0.01		0.01				
25.00	0.00		0.00				
26.00	0.00		0.00				
27.00	0.00		0.00				
28.00	0.00		0.00				
29.00	0.00		0.00				
30.00	0.00		0.00				
31.00	0.00		0.00				
32.00	0.00		0.00				
33.00	0.00		0.00				
34.00	0.00		0.00				
35.00	0.00		0.00				
36.00	0.00		0.00				
37.00	0.00		0.00				
38.00	0.00		0.00				
39.00	0.00		0.00				
40.00	0.00		0.00				
41.00	0.00		0.00				
42.00	0.00		0.00				
43.00	0.00		0.00				
44.00	0.00		0.00				
45.00	0.00		0.00				
46.00	0.00		0.00				
47.00	0.00		0.00				
48.00	0.00		0.00				
49.00	0.00		0.00				
50.00	0.00		0.00				

Summary for Subcatchment E-A1: Project Site

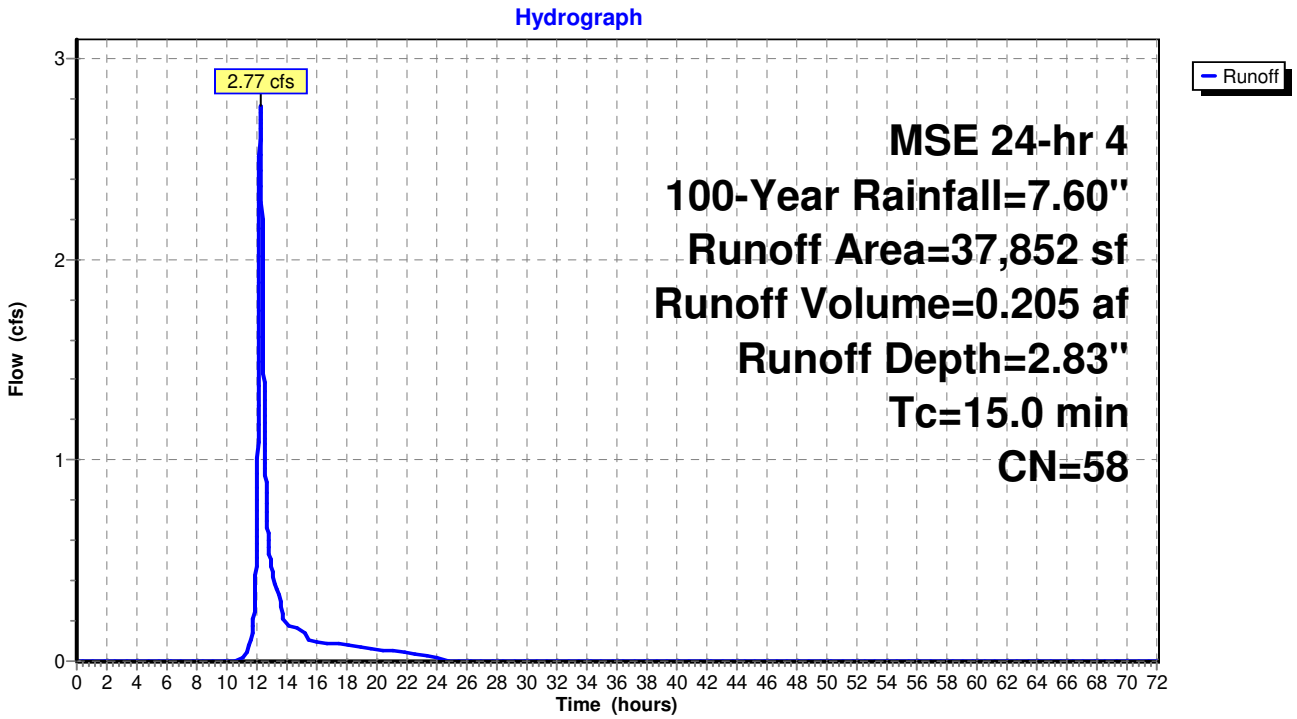
Runoff = 2.77 cfs @ 12.24 hrs, Volume= 0.205 af, Depth= 2.83"
Routed to Reach R1 : Existing Conditions

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 100-Year Rainfall=7.60"

Area (sf)	CN	Description
37,852	58	Woods/grass comb., Good, HSG B
37,852		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

Subcatchment E-A1: Project Site



Hydrograph for Subcatchment E-A1: Project Site

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.16	0.00	0.00
4.00	0.25	0.00	0.00
5.00	0.35	0.00	0.00
6.00	0.47	0.00	0.00
7.00	0.60	0.00	0.00
8.00	0.75	0.00	0.00
9.00	0.92	0.00	0.00
10.00	1.20	0.00	0.00
11.00	1.64	0.01	0.01
12.00	3.56	0.48	**0.66**
13.00	5.96	1.73	**0.45**
14.00	6.40	2.01	0.18
15.00	6.68	2.19	0.16
16.00	6.85	2.31	0.10
17.00	7.00	2.41	0.09
18.00	7.13	2.50	0.08
19.00	7.25	2.58	0.07
20.00	7.35	2.65	0.06
21.00	7.44	2.71	0.05
22.00	7.51	2.76	0.04
23.00	7.56	2.80	0.03
24.00	**7.60**	**2.83**	0.02
25.00	7.60	2.83	0.00
26.00	7.60	2.83	0.00
27.00	7.60	2.83	0.00
28.00	7.60	2.83	0.00
29.00	7.60	2.83	0.00
30.00	7.60	2.83	0.00
31.00	7.60	2.83	0.00
32.00	7.60	2.83	0.00
33.00	7.60	2.83	0.00
34.00	7.60	2.83	0.00
35.00	7.60	2.83	0.00
36.00	7.60	2.83	0.00
37.00	7.60	2.83	0.00
38.00	7.60	2.83	0.00
39.00	7.60	2.83	0.00
40.00	7.60	2.83	0.00
41.00	7.60	2.83	0.00
42.00	7.60	2.83	0.00
43.00	7.60	2.83	0.00
44.00	7.60	2.83	0.00
45.00	7.60	2.83	0.00
46.00	7.60	2.83	0.00
47.00	7.60	2.83	0.00
48.00	7.60	2.83	0.00
49.00	7.60	2.83	0.00
50.00	7.60	2.83	0.00
51.00	7.60	2.83	0.00
52.00	7.60	2.83	0.00
53.00	7.60	2.83	0.00
54.00	7.60	2.83	0.00
55.00	7.60	2.83	0.00
56.00	7.60	2.83	0.00
57.00	7.60	2.83	0.00
58.00	7.60	2.83	0.00
59.00	7.60	2.83	0.00
60.00	7.60	2.83	0.00
61.00	7.60	2.83	0.00
62.00	7.60	2.83	0.00
63.00	7.60	2.83	0.00
64.00	7.60	2.83	0.00
65.00	7.60	2.83	0.00
66.00	7.60	2.83	0.00
67.00	7.60	2.83	0.00
68.00	7.60	2.83	0.00
69.00	7.60	2.83	0.00
70.00	7.60	2.83	0.00
71.00	7.60	2.83	0.00
72.00	7.60	2.83	0.00

Summary for Subcatchment E-A2: Runon

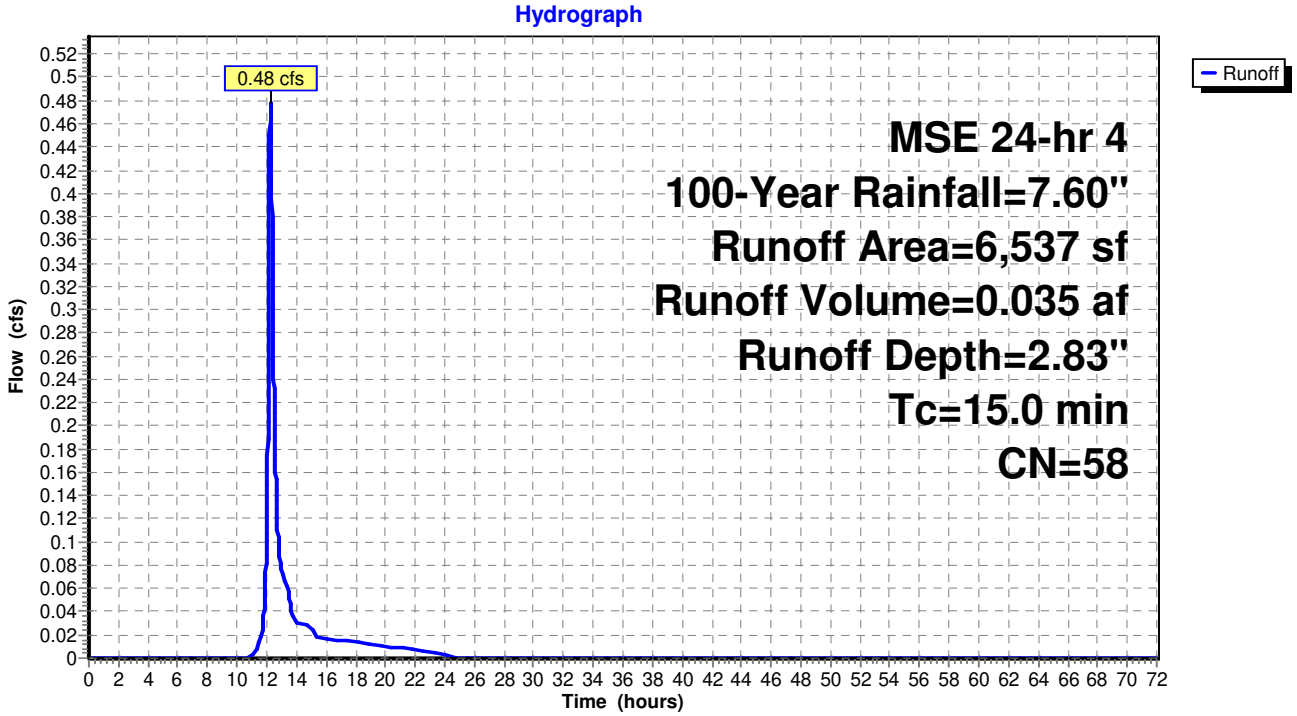
Runoff = 0.48 cfs @ 12.24 hrs, Volume= 0.035 af, Depth= 2.83"
Routed to Reach R1 : Existing Conditions

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 100-Year Rainfall=7.60"

Area (sf)	CN	Description
6,537	58	Woods/grass comb., Good, HSG B
6,537		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

Subcatchment E-A2: Runon



Hydrograph for Subcatchment E-A2: Runon

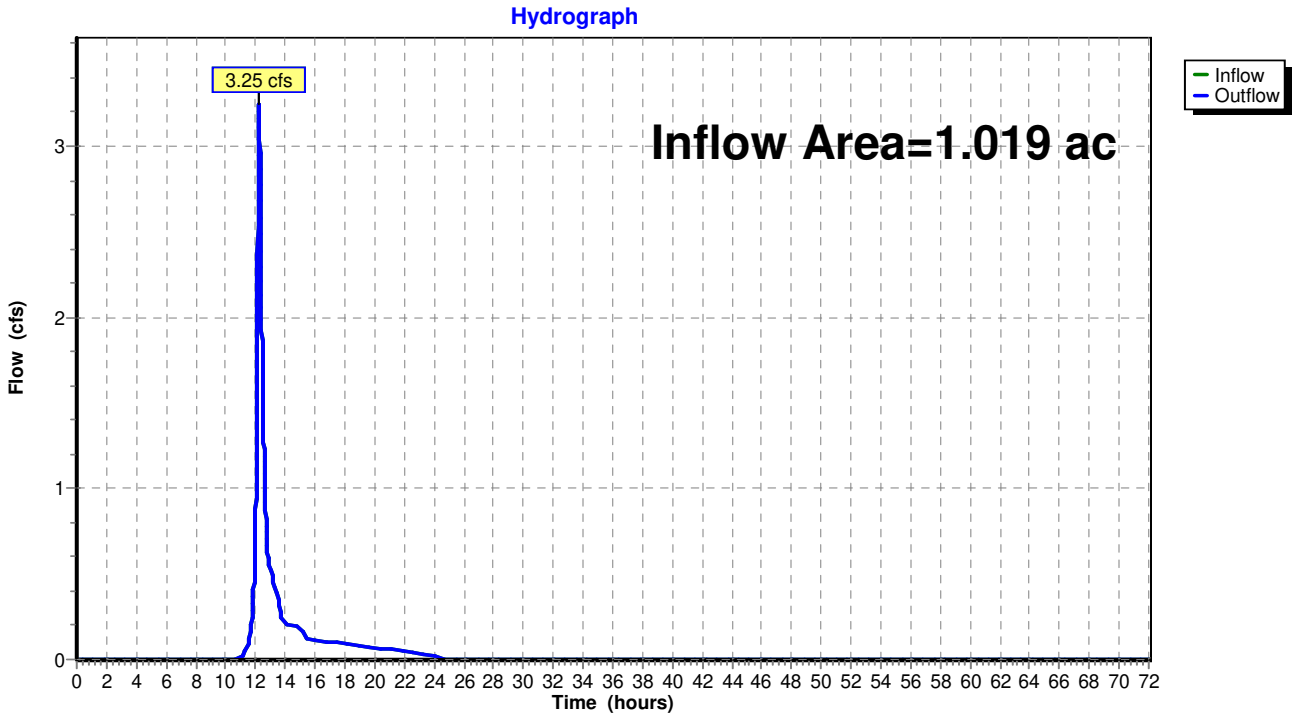
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.16	0.00	0.00
4.00	0.25	0.00	0.00
5.00	0.35	0.00	0.00
6.00	0.47	0.00	0.00
7.00	0.60	0.00	0.00
8.00	0.75	0.00	0.00
9.00	0.92	0.00	0.00
10.00	1.20	0.00	0.00
11.00	1.64	0.01	0.00
12.00	3.56	0.48	**0.11**
13.00	5.96	1.73	**0.08**
14.00	6.40	2.01	0.03
15.00	6.68	2.19	0.03
16.00	6.85	2.31	0.02
17.00	7.00	2.41	0.02
18.00	7.13	2.50	0.01
19.00	7.25	2.58	0.01
20.00	7.35	2.65	0.01
21.00	7.44	2.71	0.01
22.00	7.51	2.76	0.01
23.00	7.56	2.80	0.01
24.00	**7.60**	**2.83**	0.00
25.00	7.60	2.83	0.00
26.00	7.60	2.83	0.00
27.00	7.60	2.83	0.00
28.00	7.60	2.83	0.00
29.00	7.60	2.83	0.00
30.00	7.60	2.83	0.00
31.00	7.60	2.83	0.00
32.00	7.60	2.83	0.00
33.00	7.60	2.83	0.00
34.00	7.60	2.83	0.00
35.00	7.60	2.83	0.00
36.00	7.60	2.83	0.00
37.00	7.60	2.83	0.00
38.00	7.60	2.83	0.00
39.00	7.60	2.83	0.00
40.00	7.60	2.83	0.00
41.00	7.60	2.83	0.00
42.00	7.60	2.83	0.00
43.00	7.60	2.83	0.00
44.00	7.60	2.83	0.00
45.00	7.60	2.83	0.00
46.00	7.60	2.83	0.00
47.00	7.60	2.83	0.00
48.00	7.60	2.83	0.00
49.00	7.60	2.83	0.00
50.00	7.60	2.83	0.00
51.00	7.60	2.83	0.00
52.00	7.60	2.83	0.00
53.00	7.60	2.83	0.00
54.00	7.60	2.83	0.00
55.00	7.60	2.83	0.00
56.00	7.60	2.83	0.00
57.00	7.60	2.83	0.00
58.00	7.60	2.83	0.00
59.00	7.60	2.83	0.00
60.00	7.60	2.83	0.00
61.00	7.60	2.83	0.00
62.00	7.60	2.83	0.00
63.00	7.60	2.83	0.00
64.00	7.60	2.83	0.00
65.00	7.60	2.83	0.00
66.00	7.60	2.83	0.00
67.00	7.60	2.83	0.00
68.00	7.60	2.83	0.00
69.00	7.60	2.83	0.00
70.00	7.60	2.83	0.00
71.00	7.60	2.83	0.00
72.00	7.60	2.83	0.00

Summary for Reach R1: Existing Conditions

Inflow Area = 1.019 ac, 0.00% Impervious, Inflow Depth = 2.83" for 100-Year event
Inflow = 3.25 cfs @ 12.24 hrs, Volume= 0.240 af
Outflow = 3.25 cfs @ 12.24 hrs, Volume= 0.240 af, Atten= 0%, Lag= 0.0 min

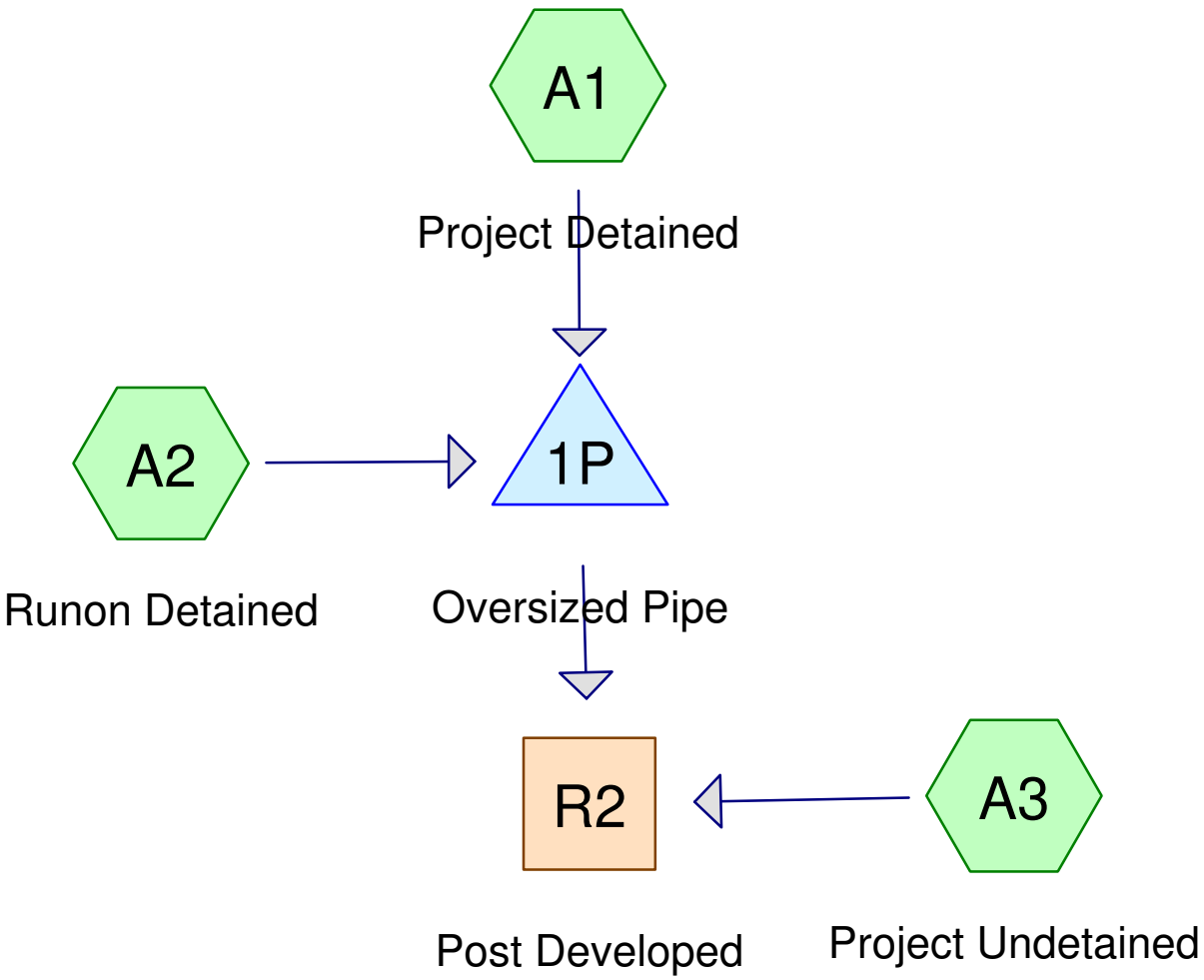
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach R1: Existing Conditions



Hydrograph for Reach R1: Existing Conditions

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	51.00	0.00		0.00
1.00	0.00		0.00	52.00	0.00		0.00
2.00	0.00		0.00	53.00	0.00		0.00
3.00	0.00		0.00	54.00	0.00		0.00
4.00	0.00		0.00	55.00	0.00		0.00
5.00	0.00		0.00	56.00	0.00		0.00
6.00	0.00		0.00	57.00	0.00		0.00
7.00	0.00		0.00	58.00	0.00		0.00
8.00	0.00		0.00	59.00	0.00		0.00
9.00	0.00		0.00	60.00	0.00		0.00
10.00	0.00		0.00	61.00	0.00		0.00
11.00	0.01		0.01	62.00	0.00		0.00
12.00	**0.77**		**0.77**	63.00	0.00		0.00
13.00	**0.53**		**0.53**	64.00	0.00		0.00
14.00	0.21		0.21	65.00	0.00		0.00
15.00	0.19		0.19	66.00	0.00		0.00
16.00	0.11		0.11	67.00	0.00		0.00
17.00	0.10		0.10	68.00	0.00		0.00
18.00	0.09		0.09	69.00	0.00		0.00
19.00	0.08		0.08	70.00	0.00		0.00
20.00	0.07		0.07	71.00	0.00		0.00
21.00	0.06		0.06	72.00	0.00		0.00
22.00	0.05		0.05				
23.00	0.04		0.04				
24.00	0.02		0.02				
25.00	0.00		0.00				
26.00	0.00		0.00				
27.00	0.00		0.00				
28.00	0.00		0.00				
29.00	0.00		0.00				
30.00	0.00		0.00				
31.00	0.00		0.00				
32.00	0.00		0.00				
33.00	0.00		0.00				
34.00	0.00		0.00				
35.00	0.00		0.00				
36.00	0.00		0.00				
37.00	0.00		0.00				
38.00	0.00		0.00				
39.00	0.00		0.00				
40.00	0.00		0.00				
41.00	0.00		0.00				
42.00	0.00		0.00				
43.00	0.00		0.00				
44.00	0.00		0.00				
45.00	0.00		0.00				
46.00	0.00		0.00				
47.00	0.00		0.00				
48.00	0.00		0.00				
49.00	0.00		0.00				
50.00	0.00		0.00				



Subcat Reach Pond Link

Routing Diagram for Retreat Center - Copy3
Prepared by Vierbicher Associates, Printed 9/16/2024

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.366	61	>75% Grass cover, Good, HSG B (A1, A2, A3)
0.315	98	Paved parking, HSG B (A1)
0.321	98	Roof (A1, A2)
0.017	98	Unconnected pavement, HSG B (A3)

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.698	HSG B	A1, A2, A3
0.000	HSG C	
0.000	HSG D	
0.321	Other	A1, A2

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.366	0.000	0.000	0.000	0.366	>75% Grass cover, Good	A1, A2, A3
0.000	0.315	0.000	0.000	0.000	0.315	Paved parking	A1
0.000	0.000	0.000	0.000	0.321	0.321	Roof	A1, A2
0.000	0.017	0.000	0.000	0.000	0.017	Unconnected pavement	A3

Summary for Subcatchment A1: Project Detained

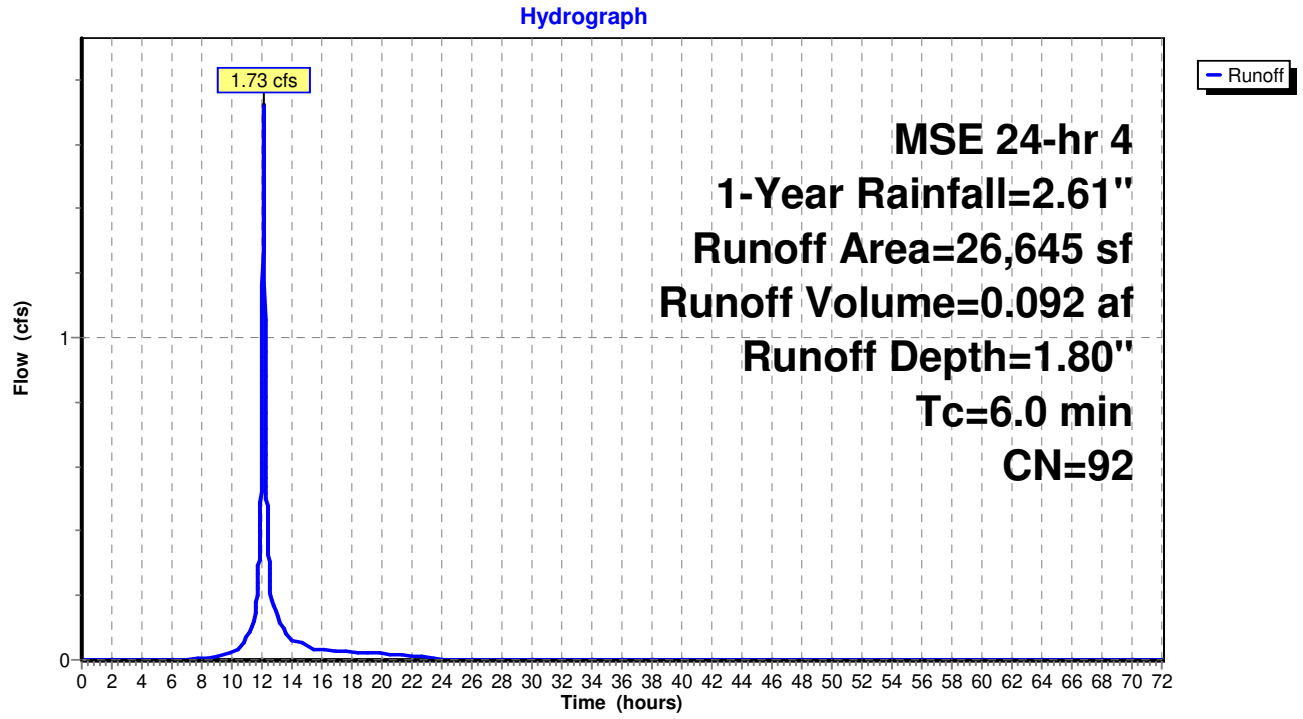
Runoff = 1.73 cfs @ 12.13 hrs, Volume= 0.092 af, Depth= 1.80"
Routed to Pond 1P : Oversized Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 1-Year Rainfall=2.61"

	Area (sf)	CN	Description
	13,722	98	Paved parking, HSG B
*	8,443	98	Roof
	4,480	61	>75% Grass cover, Good, HSG B
	26,645	92	Weighted Average
	4,480		16.81% Pervious Area
	22,165		83.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A1: Project Detained



Hydrograph for Subcatchment A1: Project Detained

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.01	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.06	0.00	0.00
4.00	0.08	0.00	0.00
5.00	0.12	0.00	0.00
6.00	0.16	0.00	0.00
7.00	0.21	0.00	0.00
8.00	0.26	0.01	0.01
9.00	0.32	0.02	0.01
10.00	0.41	0.05	0.02
11.00	0.56	0.12	0.07
12.00	1.22	0.57	**0.82**
13.00	2.05	1.28	**0.14**
14.00	2.20	1.41	0.06
15.00	2.29	1.50	0.05
16.00	2.35	1.56	0.03
17.00	2.40	1.60	0.03
18.00	2.45	1.65	0.03
19.00	2.49	1.68	0.02
20.00	2.53	1.72	0.02
21.00	2.55	1.74	0.02
22.00	2.58	1.77	0.01
23.00	2.60	1.78	0.01
24.00	**2.61**	**1.80**	0.01
25.00	2.61	1.80	0.00
26.00	2.61	1.80	0.00
27.00	2.61	1.80	0.00
28.00	2.61	1.80	0.00
29.00	2.61	1.80	0.00
30.00	2.61	1.80	0.00
31.00	2.61	1.80	0.00
32.00	2.61	1.80	0.00
33.00	2.61	1.80	0.00
34.00	2.61	1.80	0.00
35.00	2.61	1.80	0.00
36.00	2.61	1.80	0.00
37.00	2.61	1.80	0.00
38.00	2.61	1.80	0.00
39.00	2.61	1.80	0.00
40.00	2.61	1.80	0.00
41.00	2.61	1.80	0.00
42.00	2.61	1.80	0.00
43.00	2.61	1.80	0.00
44.00	2.61	1.80	0.00
45.00	2.61	1.80	0.00
46.00	2.61	1.80	0.00
47.00	2.61	1.80	0.00
48.00	2.61	1.80	0.00
49.00	2.61	1.80	0.00
50.00	2.61	1.80	0.00
51.00	2.61	1.80	0.00
52.00	2.61	1.80	0.00
53.00	2.61	1.80	0.00
54.00	2.61	1.80	0.00
55.00	2.61	1.80	0.00
56.00	2.61	1.80	0.00
57.00	2.61	1.80	0.00
58.00	2.61	1.80	0.00
59.00	2.61	1.80	0.00
60.00	2.61	1.80	0.00
61.00	2.61	1.80	0.00
62.00	2.61	1.80	0.00
63.00	2.61	1.80	0.00
64.00	2.61	1.80	0.00
65.00	2.61	1.80	0.00
66.00	2.61	1.80	0.00
67.00	2.61	1.80	0.00
68.00	2.61	1.80	0.00
69.00	2.61	1.80	0.00
70.00	2.61	1.80	0.00
71.00	2.61	1.80	0.00
72.00	2.61	1.80	0.00

Summary for Subcatchment A2: Runon Detained

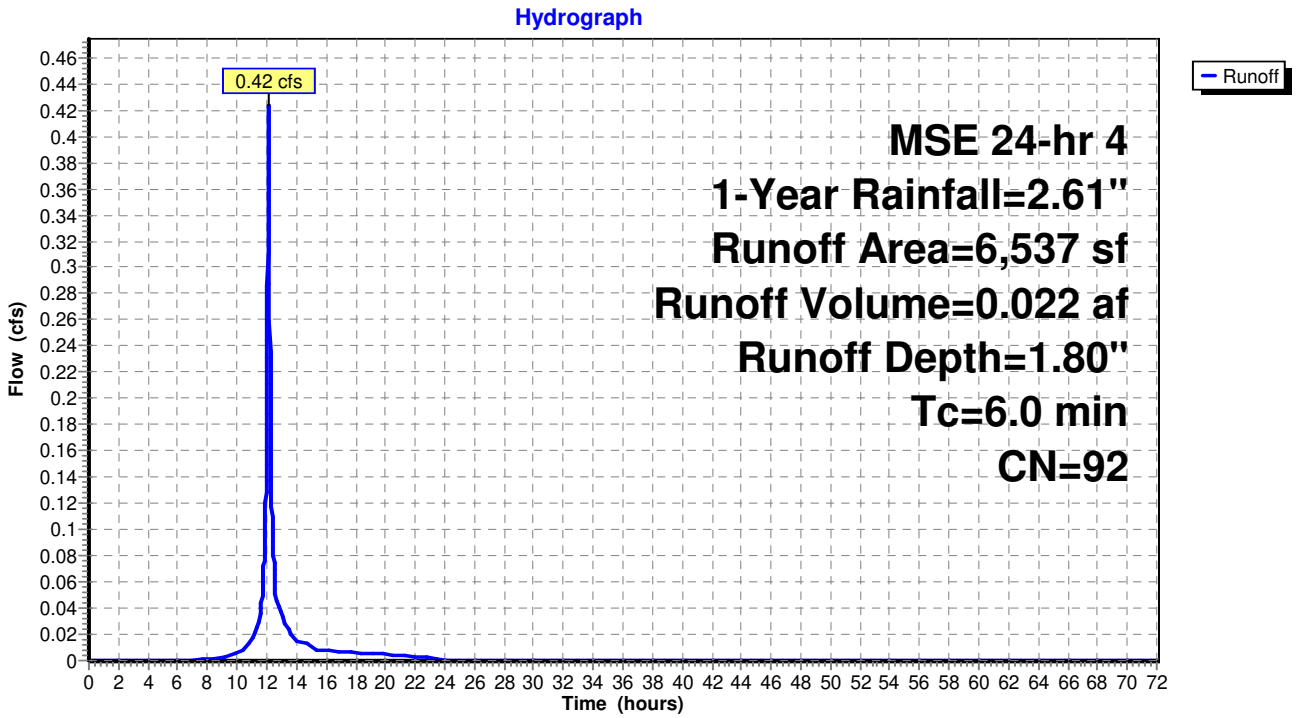
Runoff = 0.42 cfs @ 12.13 hrs, Volume= 0.022 af, Depth= 1.80"
Routed to Pond 1P : Oversized Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 1-Year Rainfall=2.61"

	Area (sf)	CN	Description
*	5,529	98	Roof
	1,008	61	>75% Grass cover, Good, HSG B
	6,537	92	Weighted Average
	1,008		15.42% Pervious Area
	5,529		84.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A2: Runon Detained



Hydrograph for Subcatchment A2: Runon Detained

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.01	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.06	0.00	0.00
4.00	0.08	0.00	0.00
5.00	0.12	0.00	0.00
6.00	0.16	0.00	0.00
7.00	0.21	0.00	0.00
8.00	0.26	0.01	0.00
9.00	0.32	0.02	0.00
10.00	0.41	0.05	0.01
11.00	0.56	0.12	0.02
12.00	1.22	0.57	**0.20**
13.00	2.05	1.28	**0.04**
14.00	2.20	1.41	0.01
15.00	2.29	1.50	0.01
16.00	2.35	1.56	0.01
17.00	2.40	1.60	0.01
18.00	2.45	1.65	0.01
19.00	2.49	1.68	0.01
20.00	2.53	1.72	0.00
21.00	2.55	1.74	0.00
22.00	2.58	1.77	0.00
23.00	2.60	1.78	0.00
24.00	**2.61**	**1.80**	0.00
25.00	2.61	1.80	0.00
26.00	2.61	1.80	0.00
27.00	2.61	1.80	0.00
28.00	2.61	1.80	0.00
29.00	2.61	1.80	0.00
30.00	2.61	1.80	0.00
31.00	2.61	1.80	0.00
32.00	2.61	1.80	0.00
33.00	2.61	1.80	0.00
34.00	2.61	1.80	0.00
35.00	2.61	1.80	0.00
36.00	2.61	1.80	0.00
37.00	2.61	1.80	0.00
38.00	2.61	1.80	0.00
39.00	2.61	1.80	0.00
40.00	2.61	1.80	0.00
41.00	2.61	1.80	0.00
42.00	2.61	1.80	0.00
43.00	2.61	1.80	0.00
44.00	2.61	1.80	0.00
45.00	2.61	1.80	0.00
46.00	2.61	1.80	0.00
47.00	2.61	1.80	0.00
48.00	2.61	1.80	0.00
49.00	2.61	1.80	0.00
50.00	2.61	1.80	0.00
51.00	2.61	1.80	0.00
52.00	2.61	1.80	0.00
53.00	2.61	1.80	0.00
54.00	2.61	1.80	0.00
55.00	2.61	1.80	0.00
56.00	2.61	1.80	0.00
57.00	2.61	1.80	0.00
58.00	2.61	1.80	0.00
59.00	2.61	1.80	0.00
60.00	2.61	1.80	0.00
61.00	2.61	1.80	0.00
62.00	2.61	1.80	0.00
63.00	2.61	1.80	0.00
64.00	2.61	1.80	0.00
65.00	2.61	1.80	0.00
66.00	2.61	1.80	0.00
67.00	2.61	1.80	0.00
68.00	2.61	1.80	0.00
69.00	2.61	1.80	0.00
70.00	2.61	1.80	0.00
71.00	2.61	1.80	0.00
72.00	2.61	1.80	0.00

Summary for Subcatchment A3: Project Undetained

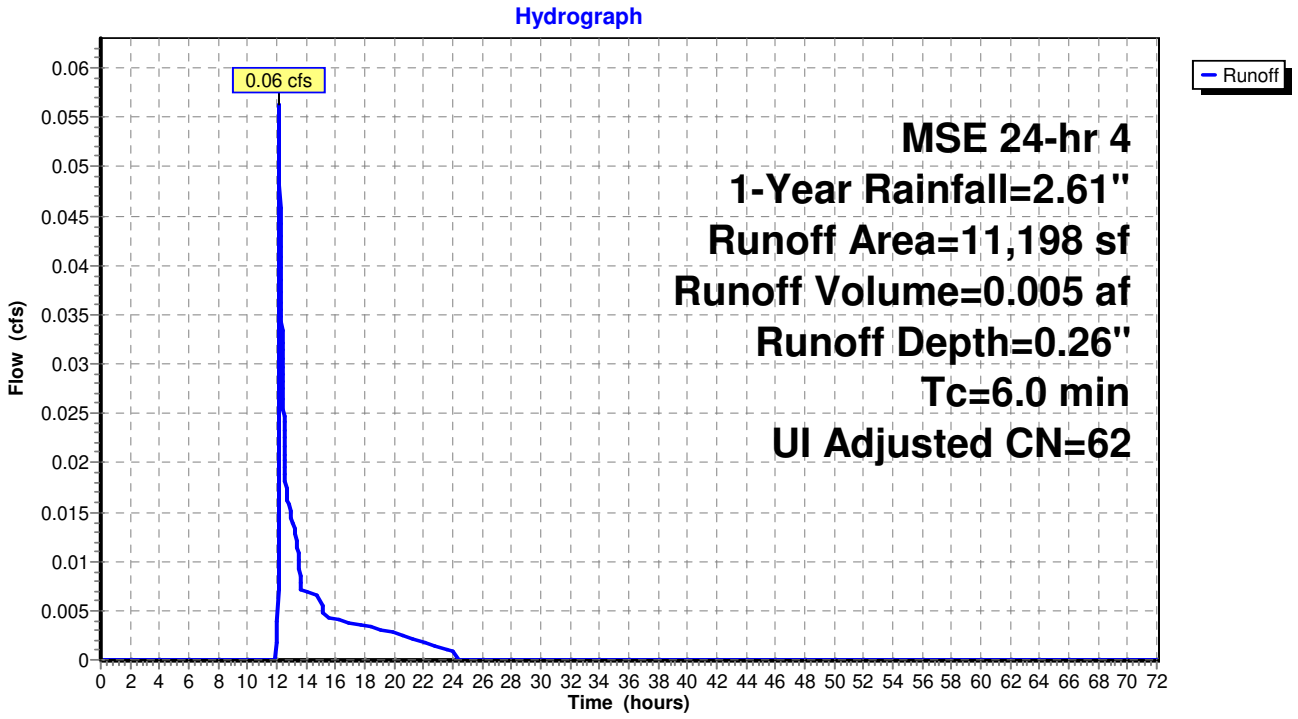
Runoff = 0.06 cfs @ 12.16 hrs, Volume= 0.005 af, Depth= 0.26"
Routed to Reach R2 : Post Developed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 1-Year Rainfall=2.61"

Area (sf)	CN	Adj	Description
739	98		Unconnected pavement, HSG B
10,459	61		>75% Grass cover, Good, HSG B
11,198	63	62	Weighted Average, UI Adjusted
10,459			93.40% Pervious Area
739			6.60% Impervious Area
739			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A3: Project Undetained



Hydrograph for Subcatchment A3: Project Undetained

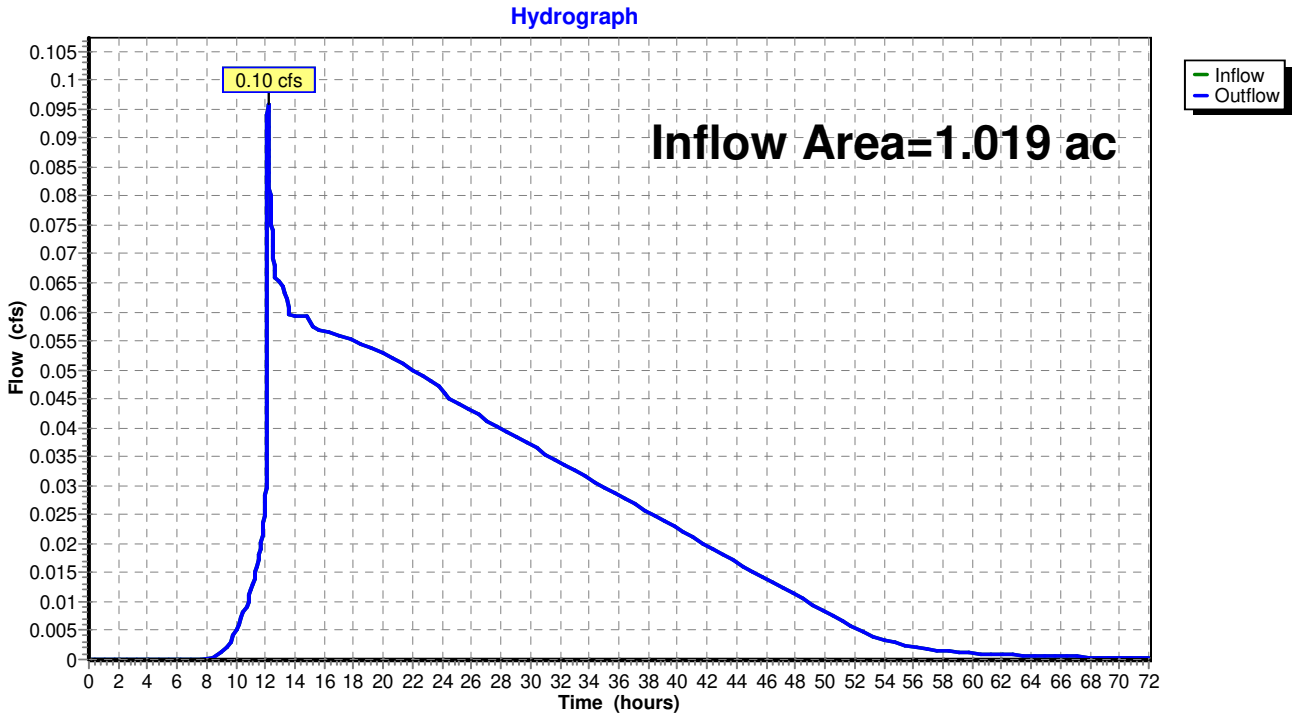
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.01	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.06	0.00	0.00
4.00	0.08	0.00	0.00
5.00	0.12	0.00	0.00
6.00	0.16	0.00	0.00
7.00	0.21	0.00	0.00
8.00	0.26	0.00	0.00
9.00	0.32	0.00	0.00
10.00	0.41	0.00	0.00
11.00	0.56	0.00	0.00
12.00	1.22	0.00	**0.00**
13.00	2.05	0.10	**0.01**
14.00	2.20	0.13	0.01
15.00	2.29	0.16	0.01
16.00	2.35	0.17	0.00
17.00	2.40	0.19	0.00
18.00	2.45	0.20	0.00
19.00	2.49	0.22	0.00
20.00	2.53	0.23	0.00
21.00	2.55	0.24	0.00
22.00	2.58	0.24	0.00
23.00	2.60	0.25	0.00
24.00	**2.61**	**0.26**	0.00
25.00	2.61	0.26	0.00
26.00	2.61	0.26	0.00
27.00	2.61	0.26	0.00
28.00	2.61	0.26	0.00
29.00	2.61	0.26	0.00
30.00	2.61	0.26	0.00
31.00	2.61	0.26	0.00
32.00	2.61	0.26	0.00
33.00	2.61	0.26	0.00
34.00	2.61	0.26	0.00
35.00	2.61	0.26	0.00
36.00	2.61	0.26	0.00
37.00	2.61	0.26	0.00
38.00	2.61	0.26	0.00
39.00	2.61	0.26	0.00
40.00	2.61	0.26	0.00
41.00	2.61	0.26	0.00
42.00	2.61	0.26	0.00
43.00	2.61	0.26	0.00
44.00	2.61	0.26	0.00
45.00	2.61	0.26	0.00
46.00	2.61	0.26	0.00
47.00	2.61	0.26	0.00
48.00	2.61	0.26	0.00
49.00	2.61	0.26	0.00
50.00	2.61	0.26	0.00
51.00	2.61	0.26	0.00
52.00	2.61	0.26	0.00
53.00	2.61	0.26	0.00
54.00	2.61	0.26	0.00
55.00	2.61	0.26	0.00
56.00	2.61	0.26	0.00
57.00	2.61	0.26	0.00
58.00	2.61	0.26	0.00
59.00	2.61	0.26	0.00
60.00	2.61	0.26	0.00
61.00	2.61	0.26	0.00
62.00	2.61	0.26	0.00
63.00	2.61	0.26	0.00
64.00	2.61	0.26	0.00
65.00	2.61	0.26	0.00
66.00	2.61	0.26	0.00
67.00	2.61	0.26	0.00
68.00	2.61	0.26	0.00
69.00	2.61	0.26	0.00
70.00	2.61	0.26	0.00
71.00	2.61	0.26	0.00
72.00	2.61	0.26	0.00

Summary for Reach R2: Post Developed

Inflow Area = 1.019 ac, 64.07% Impervious, Inflow Depth > 1.40" for 1-Year event
Inflow = 0.10 cfs @ 12.16 hrs, Volume= 0.119 af
Outflow = 0.10 cfs @ 12.16 hrs, Volume= 0.119 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach R2: Post Developed



Hydrograph for Reach R2: Post Developed

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00
1.00	0.00		0.00
2.00	0.00		0.00
3.00	0.00		0.00
4.00	0.00		0.00
5.00	0.00		0.00
6.00	0.00		0.00
7.00	0.00		0.00
8.00	0.00		0.00
9.00	0.00		0.00
10.00	0.01		0.01
11.00	0.01		0.01
12.00	**0.03**		**0.03**
13.00	**0.06**		**0.06**
14.00	0.06		0.06
15.00	0.06		0.06
16.00	0.06		0.06
17.00	0.06		0.06
18.00	0.06		0.06
19.00	0.05		0.05
20.00	0.05		0.05
21.00	0.05		0.05
22.00	0.05		0.05
23.00	0.05		0.05
24.00	0.05		0.05
25.00	0.04		0.04
26.00	0.04		0.04
27.00	0.04		0.04
28.00	0.04		0.04
29.00	0.04		0.04
30.00	0.04		0.04
31.00	0.04		0.04
32.00	0.03		0.03
33.00	0.03		0.03
34.00	0.03		0.03
35.00	0.03		0.03
36.00	0.03		0.03
37.00	0.03		0.03
38.00	0.03		0.03
39.00	0.02		0.02
40.00	0.02		0.02
41.00	0.02		0.02
42.00	0.02		0.02
43.00	0.02		0.02
44.00	0.02		0.02
45.00	0.02		0.02
46.00	0.01		0.01
47.00	0.01		0.01
48.00	0.01		0.01
49.00	0.01		0.01
50.00	0.01		0.01
51.00	0.01		0.01
52.00	0.01		0.01
53.00	0.00		0.00
54.00	0.00		0.00
55.00	0.00		0.00
56.00	0.00		0.00
57.00	0.00		0.00
58.00	0.00		0.00
59.00	0.00		0.00
60.00	0.00		0.00
61.00	0.00		0.00
62.00	0.00		0.00
63.00	0.00		0.00
64.00	0.00		0.00
65.00	0.00		0.00
66.00	0.00		0.00
67.00	0.00		0.00
68.00	0.00		0.00
69.00	0.00		0.00
70.00	0.00		0.00
71.00	0.00		0.00
72.00	0.00		0.00

Summary for Pond 1P: Oversized Pipe

Inflow Area = 0.762 ac, 83.46% Impervious, Inflow Depth = 1.80" for 1-Year event
Inflow = 2.15 cfs @ 12.13 hrs, Volume= 0.114 af
Outflow = 0.05 cfs @ 15.09 hrs, Volume= 0.113 af, Atten= 98%, Lag= 177.3 min
Primary = 0.05 cfs @ 15.09 hrs, Volume= 0.113 af
Routed to Reach R2 : Post Developed

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Starting Elev= 784.00' Surf.Area= 0.041 ac Storage= 0.111 af
Peak Elev= 786.01' @ 15.09 hrs Surf.Area= 0.036 ac Storage= 0.192 af (0.080 af above start)

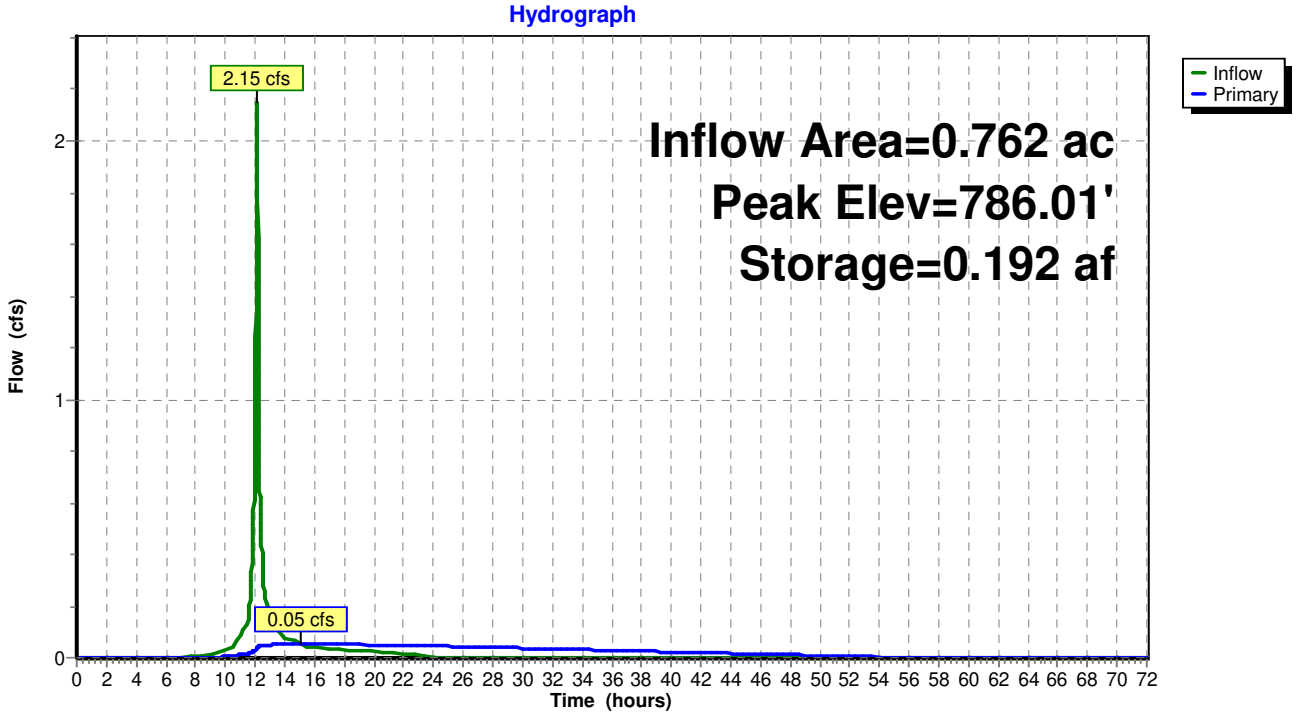
Plug-Flow detention time= 2,987.6 min calculated for 0.002 af (2% of inflow)
Center-of-Mass det. time= 831.1 min (1,626.8 - 795.8)

Volume	Invert	Avail.Storage	Storage Description
#1	780.50'	0.243 af	**90.0" Round Pipe Storage** L= 240.0'

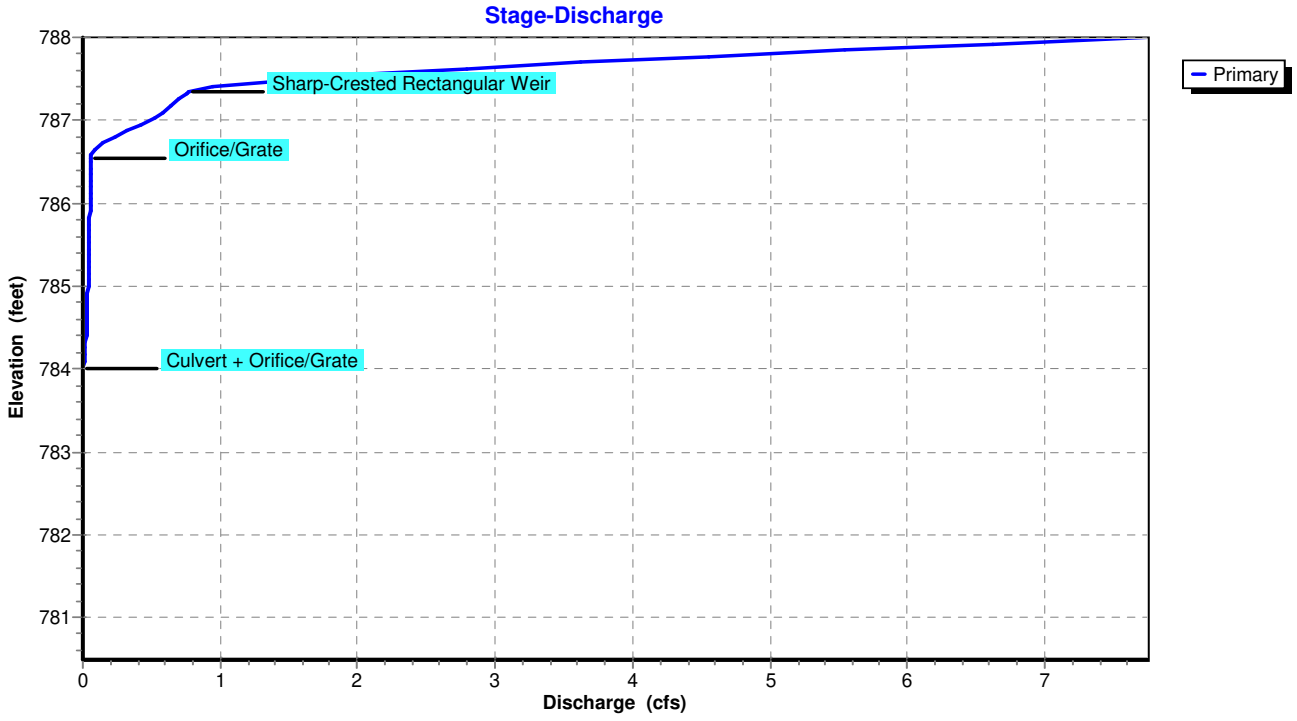
Device	Routing	Invert	Outlet Devices
#1	Primary	784.00'	**18.0" Round Culvert** L= 19.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 784.00' / 783.75' S= 0.0132 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Device 1	784.00'	**1.2" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	786.55'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	787.35'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.05 cfs @ 15.09 hrs HW=786.01' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.05 cfs of 8.42 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.05 cfs @ 6.74 fps)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

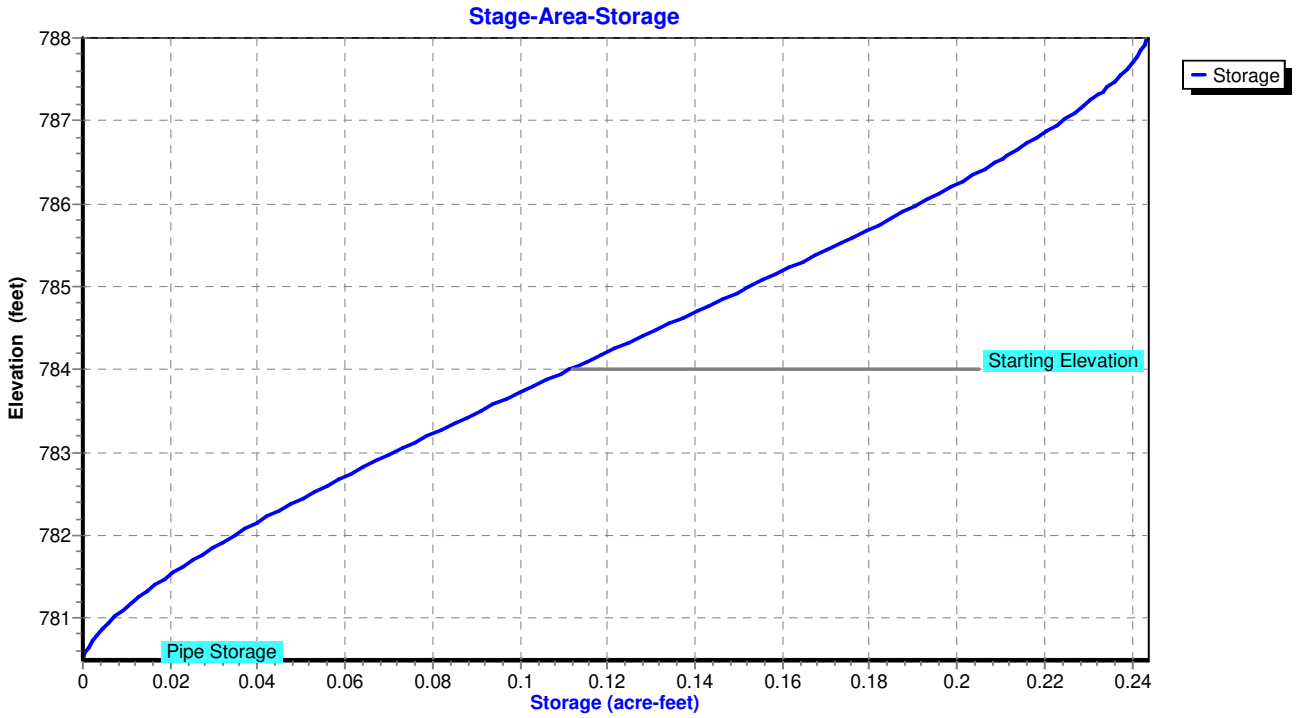
Pond 1P: Oversized Pipe



Pond 1P: Oversized Pipe



Pond 1P: Oversized Pipe



Hydrograph for Pond 1P: Oversized Pipe

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.111	784.00	0.00
2.00	0.00	0.111	784.00	0.00
4.00	0.00	0.111	784.00	0.00
6.00	0.00	0.111	784.00	0.00
8.00	0.01	0.112	784.01	0.00
10.00	0.03	0.114	784.07	0.01
12.00	**1.02**	0.137	784.61	0.03
14.00	**0.07**	**0.190**	**785.97**	**0.05**
16.00	0.04	**0.191**	**785.98**	**0.05**
18.00	0.03	0.188	785.91	0.05
20.00	0.02	0.184	785.80	0.05
22.00	0.02	0.179	785.67	0.05
24.00	0.01	0.173	785.52	0.05
26.00	0.00	0.166	785.34	0.04
28.00	0.00	0.159	785.16	0.04
30.00	0.00	0.153	785.01	0.04
32.00	0.00	0.147	784.86	0.03
34.00	0.00	0.141	784.73	0.03
36.00	0.00	0.137	784.61	0.03
38.00	0.00	0.132	784.50	0.03
40.00	0.00	0.128	784.41	0.02
42.00	0.00	0.125	784.32	0.02
44.00	0.00	0.122	784.25	0.02
46.00	0.00	0.119	784.19	0.01
48.00	0.00	0.117	784.14	0.01
50.00	0.00	0.115	784.10	0.01
52.00	0.00	0.114	784.07	0.01
54.00	0.00	0.114	784.05	0.00
56.00	0.00	0.113	784.04	0.00
58.00	0.00	0.113	784.04	0.00
60.00	0.00	0.113	784.03	0.00
62.00	0.00	0.112	784.03	0.00
64.00	0.00	0.112	784.02	0.00
66.00	0.00	0.112	784.02	0.00
68.00	0.00	0.112	784.02	0.00
70.00	0.00	0.112	784.02	0.00
72.00	0.00	0.112	784.02	0.00

Stage-Discharge for Pond 1P: Oversized Pipe

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
780.50	0.00	783.05	0.00	785.60	0.05
780.55	0.00	783.10	0.00	785.65	0.05
780.60	0.00	783.15	0.00	785.70	0.05
780.65	0.00	783.20	0.00	785.75	0.05
780.70	0.00	783.25	0.00	785.80	0.05
780.75	0.00	783.30	0.00	785.85	0.05
780.80	0.00	783.35	0.00	785.90	0.05
780.85	0.00	783.40	0.00	785.95	0.05
780.90	0.00	783.45	0.00	786.00	0.05
780.95	0.00	783.50	0.00	786.05	0.05
781.00	0.00	783.55	0.00	786.10	0.05
781.05	0.00	783.60	0.00	786.15	0.05
781.10	0.00	783.65	0.00	786.20	0.06
781.15	0.00	783.70	0.00	786.25	0.06
781.20	0.00	783.75	0.00	786.30	0.06
781.25	0.00	783.80	0.00	786.35	0.06
781.30	0.00	783.85	0.00	786.40	0.06
781.35	0.00	783.90	0.00	786.45	0.06
781.40	0.00	783.95	0.00	786.50	0.06
781.45	0.00	784.00	0.00	786.55	0.06
781.50	0.00	784.05	0.00	786.60	0.07
781.55	0.00	784.10	0.01	786.65	0.09
781.60	0.00	784.15	0.01	786.70	0.13
781.65	0.00	784.20	0.01	786.75	0.17
781.70	0.00	784.25	0.02	786.80	0.23
781.75	0.00	784.30	0.02	786.85	0.29
781.80	0.00	784.35	0.02	786.90	0.36
781.85	0.00	784.40	0.02	786.95	0.43
781.90	0.00	784.45	0.02	787.00	0.49
781.95	0.00	784.50	0.03	787.05	0.54
782.00	0.00	784.55	0.03	787.10	0.58
782.05	0.00	784.60	0.03	787.15	0.63
782.10	0.00	784.65	0.03	787.20	0.67
782.15	0.00	784.70	0.03	787.25	0.70
782.20	0.00	784.75	0.03	787.30	0.74
782.25	0.00	784.80	0.03	787.35	0.77
782.30	0.00	784.85	0.03	787.40	0.95
782.35	0.00	784.90	0.03	787.45	1.24
782.40	0.00	784.95	0.04	787.50	1.62
782.45	0.00	785.00	0.04	787.55	2.05
782.50	0.00	785.05	0.04	787.60	2.53
782.55	0.00	785.10	0.04	787.65	3.06
782.60	0.00	785.15	0.04	787.70	3.63
782.65	0.00	785.20	0.04	787.75	4.24
782.70	0.00	785.25	0.04	787.80	4.88
782.75	0.00	785.30	0.04	787.85	5.55
782.80	0.00	785.35	0.04	787.90	6.25
782.85	0.00	785.40	0.04	787.95	6.99
782.90	0.00	785.45	0.04	788.00	**7.74**
782.95	0.00	785.50	0.05		
783.00	0.00	785.55	0.05		

Stage-Area-Storage for Pond 1P: Oversized Pipe

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
780.50	0.000	783.05	0.073	785.60	0.176
780.55	0.000	783.10	0.075	785.65	0.178
780.60	0.001	783.15	0.077	785.70	0.180
780.65	0.001	783.20	0.079	785.75	0.182
780.70	0.002	783.25	0.081	785.80	0.184
780.75	0.002	783.30	0.083	785.85	0.186
780.80	0.003	783.35	0.085	785.90	0.188
780.85	0.004	783.40	0.087	785.95	0.189
780.90	0.005	783.45	0.089	786.00	0.191
780.95	0.006	783.50	0.091	786.05	0.193
781.00	0.007	783.55	0.093	786.10	0.195
781.05	0.008	783.60	0.095	786.15	0.197
781.10	0.009	783.65	0.097	786.20	0.198
781.15	0.010	783.70	0.099	786.25	0.200
781.20	0.011	783.75	0.101	786.30	0.202
781.25	0.013	783.80	0.103	786.35	0.204
781.30	0.014	783.85	0.105	786.40	0.205
781.35	0.015	783.90	0.107	786.45	0.207
781.40	0.017	783.95	0.109	786.50	0.209
781.45	0.018	784.00	0.111	786.55	0.210
781.50	0.019	784.05	0.113	786.60	0.212
781.55	0.021	784.10	0.116	786.65	0.214
781.60	0.022	784.15	0.118	786.70	0.215
781.65	0.024	784.20	0.120	786.75	0.217
781.70	0.025	784.25	0.122	786.80	0.218
781.75	0.027	784.30	0.124	786.85	0.220
781.80	0.028	784.35	0.126	786.90	0.221
781.85	0.030	784.40	0.128	786.95	0.223
781.90	0.031	784.45	0.130	787.00	0.224
781.95	0.033	784.50	0.132	787.05	0.226
782.00	0.035	784.55	0.134	787.10	0.227
782.05	0.036	784.60	0.136	787.15	0.228
782.10	0.038	784.65	0.138	787.20	0.229
782.15	0.040	784.70	0.140	787.25	0.231
782.20	0.041	784.75	0.142	787.30	0.232
782.25	0.043	784.80	0.144	787.35	0.233
782.30	0.045	784.85	0.146	787.40	0.234
782.35	0.047	784.90	0.148	787.45	0.235
782.40	0.048	784.95	0.150	787.50	0.236
782.45	0.050	785.00	0.152	787.55	0.237
782.50	0.052	785.05	0.155	787.60	0.238
782.55	0.054	785.10	0.157	787.65	0.239
782.60	0.056	785.15	0.159	787.70	0.240
782.65	0.058	785.20	0.161	787.75	0.241
782.70	0.060	785.25	0.163	787.80	0.242
782.75	0.061	785.30	0.165	787.85	0.242
782.80	0.063	785.35	0.166	787.90	0.243
782.85	0.065	785.40	0.168	787.95	0.243
782.90	0.067	785.45	0.170	788.00	**0.243**
782.95	0.069	785.50	0.172		
783.00	0.071	785.55	0.174		

Summary for Subcatchment A1: Project Detained

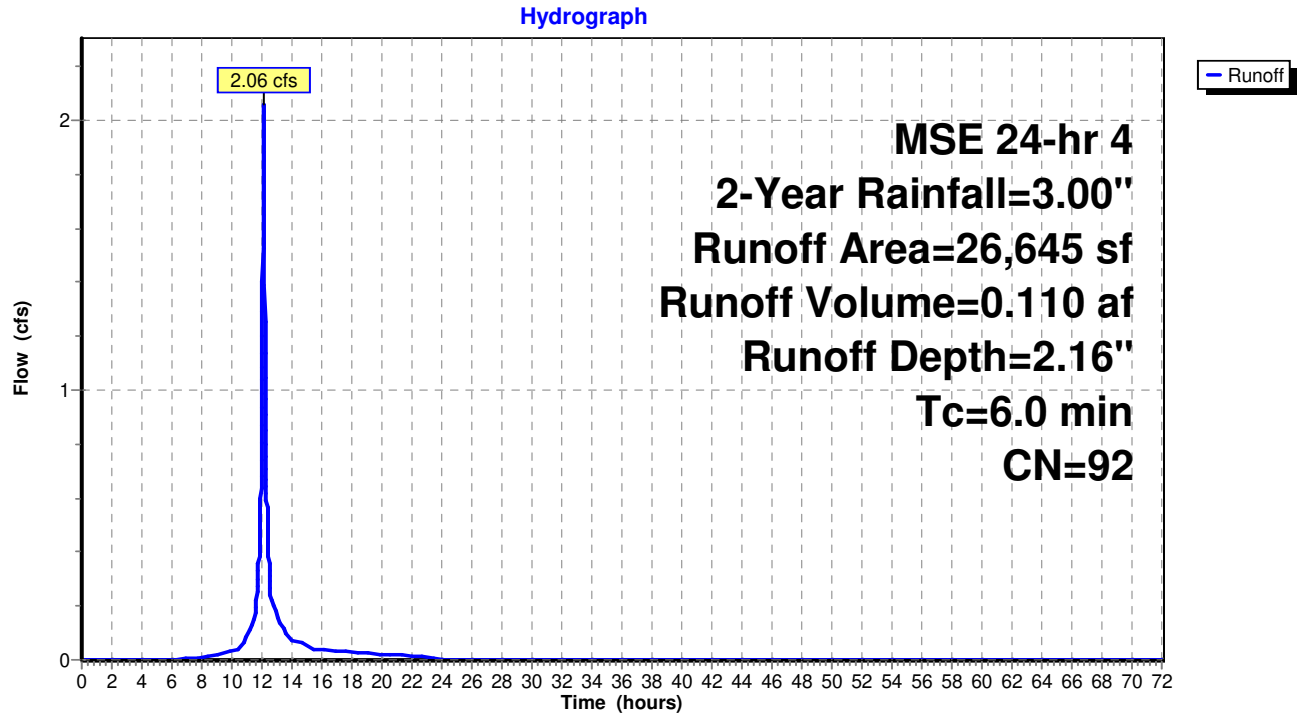
Runoff = 2.06 cfs @ 12.13 hrs, Volume= 0.110 af, Depth= 2.16"
Routed to Pond 1P : Oversized Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 2-Year Rainfall=3.00"

	Area (sf)	CN	Description
	13,722	98	Paved parking, HSG B
*	8,443	98	Roof
	4,480	61	>75% Grass cover, Good, HSG B
	26,645	92	Weighted Average
	4,480		16.81% Pervious Area
	22,165		83.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A1: Project Detained



Hydrograph for Subcatchment A1: Project Detained

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.01	0.00	0.00
2.00	0.04	0.00	0.00
3.00	0.06	0.00	0.00
4.00	0.10	0.00	0.00
5.00	0.14	0.00	0.00
6.00	0.18	0.00	0.00
7.00	0.24	0.00	0.00
8.00	0.30	0.02	0.01
9.00	0.36	0.03	0.01
10.00	0.48	0.08	0.03
11.00	0.65	0.17	0.09
12.00	1.41	0.72	**0.99**
13.00	2.35	1.56	**0.17**
14.00	2.52	1.72	0.07
15.00	2.64	1.82	0.06
16.00	2.70	1.88	0.04
17.00	2.76	1.94	0.03
18.00	2.82	1.99	0.03
19.00	2.86	2.03	0.03
20.00	2.90	2.07	0.02
21.00	2.94	2.10	0.02
22.00	2.96	2.13	0.01
23.00	2.99	2.15	0.01
24.00	**3.00**	**2.16**	0.01
25.00	3.00	2.16	0.00
26.00	3.00	2.16	0.00
27.00	3.00	2.16	0.00
28.00	3.00	2.16	0.00
29.00	3.00	2.16	0.00
30.00	3.00	2.16	0.00
31.00	3.00	2.16	0.00
32.00	3.00	2.16	0.00
33.00	3.00	2.16	0.00
34.00	3.00	2.16	0.00
35.00	3.00	2.16	0.00
36.00	3.00	2.16	0.00
37.00	3.00	2.16	0.00
38.00	3.00	2.16	0.00
39.00	3.00	2.16	0.00
40.00	3.00	2.16	0.00
41.00	3.00	2.16	0.00
42.00	3.00	2.16	0.00
43.00	3.00	2.16	0.00
44.00	3.00	2.16	0.00
45.00	3.00	2.16	0.00
46.00	3.00	2.16	0.00
47.00	3.00	2.16	0.00
48.00	3.00	2.16	0.00
49.00	3.00	2.16	0.00
50.00	3.00	2.16	0.00
51.00	3.00	2.16	0.00
52.00	3.00	2.16	0.00
53.00	3.00	2.16	0.00
54.00	3.00	2.16	0.00
55.00	3.00	2.16	0.00
56.00	3.00	2.16	0.00
57.00	3.00	2.16	0.00
58.00	3.00	2.16	0.00
59.00	3.00	2.16	0.00
60.00	3.00	2.16	0.00
61.00	3.00	2.16	0.00
62.00	3.00	2.16	0.00
63.00	3.00	2.16	0.00
64.00	3.00	2.16	0.00
65.00	3.00	2.16	0.00
66.00	3.00	2.16	0.00
67.00	3.00	2.16	0.00
68.00	3.00	2.16	0.00
69.00	3.00	2.16	0.00
70.00	3.00	2.16	0.00
71.00	3.00	2.16	0.00
72.00	3.00	2.16	0.00

Summary for Subcatchment A2: Runon Detained

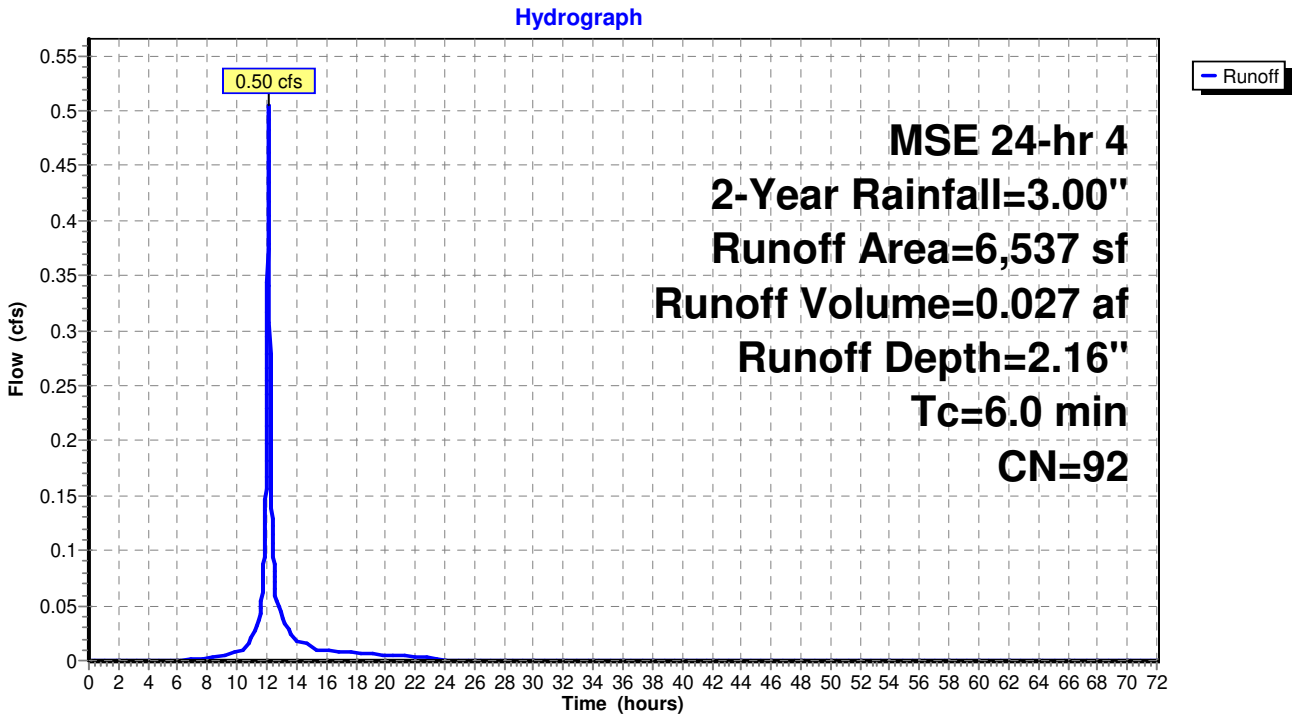
Runoff = 0.50 cfs @ 12.13 hrs, Volume= 0.027 af, Depth= 2.16"
Routed to Pond 1P : Oversized Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 2-Year Rainfall=3.00"

	Area (sf)	CN	Description
*	5,529	98	Roof
	1,008	61	>75% Grass cover, Good, HSG B
	6,537	92	Weighted Average
	1,008		15.42% Pervious Area
	5,529		84.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A2: Runon Detained



Hydrograph for Subcatchment A2: Runon Detained

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.01	0.00	0.00
2.00	0.04	0.00	0.00
3.00	0.06	0.00	0.00
4.00	0.10	0.00	0.00
5.00	0.14	0.00	0.00
6.00	0.18	0.00	0.00
7.00	0.24	0.00	0.00
8.00	0.30	0.02	0.00
9.00	0.36	0.03	0.00
10.00	0.48	0.08	0.01
11.00	0.65	0.17	0.02
12.00	1.41	0.72	**0.24**
13.00	2.35	1.56	**0.04**
14.00	2.52	1.72	0.02
15.00	2.64	1.82	0.01
16.00	2.70	1.88	0.01
17.00	2.76	1.94	0.01
18.00	2.82	1.99	0.01
19.00	2.86	2.03	0.01
20.00	2.90	2.07	0.01
21.00	2.94	2.10	0.00
22.00	2.96	2.13	0.00
23.00	2.99	2.15	0.00
24.00	**3.00**	**2.16**	0.00
25.00	3.00	2.16	0.00
26.00	3.00	2.16	0.00
27.00	3.00	2.16	0.00
28.00	3.00	2.16	0.00
29.00	3.00	2.16	0.00
30.00	3.00	2.16	0.00
31.00	3.00	2.16	0.00
32.00	3.00	2.16	0.00
33.00	3.00	2.16	0.00
34.00	3.00	2.16	0.00
35.00	3.00	2.16	0.00
36.00	3.00	2.16	0.00
37.00	3.00	2.16	0.00
38.00	3.00	2.16	0.00
39.00	3.00	2.16	0.00
40.00	3.00	2.16	0.00
41.00	3.00	2.16	0.00
42.00	3.00	2.16	0.00
43.00	3.00	2.16	0.00
44.00	3.00	2.16	0.00
45.00	3.00	2.16	0.00
46.00	3.00	2.16	0.00
47.00	3.00	2.16	0.00
48.00	3.00	2.16	0.00
49.00	3.00	2.16	0.00
50.00	3.00	2.16	0.00
51.00	3.00	2.16	0.00
52.00	3.00	2.16	0.00
53.00	3.00	2.16	0.00
54.00	3.00	2.16	0.00
55.00	3.00	2.16	0.00
56.00	3.00	2.16	0.00
57.00	3.00	2.16	0.00
58.00	3.00	2.16	0.00
59.00	3.00	2.16	0.00
60.00	3.00	2.16	0.00
61.00	3.00	2.16	0.00
62.00	3.00	2.16	0.00
63.00	3.00	2.16	0.00
64.00	3.00	2.16	0.00
65.00	3.00	2.16	0.00
66.00	3.00	2.16	0.00
67.00	3.00	2.16	0.00
68.00	3.00	2.16	0.00
69.00	3.00	2.16	0.00
70.00	3.00	2.16	0.00
71.00	3.00	2.16	0.00
72.00	3.00	2.16	0.00

Summary for Subcatchment A3: Project Undetained

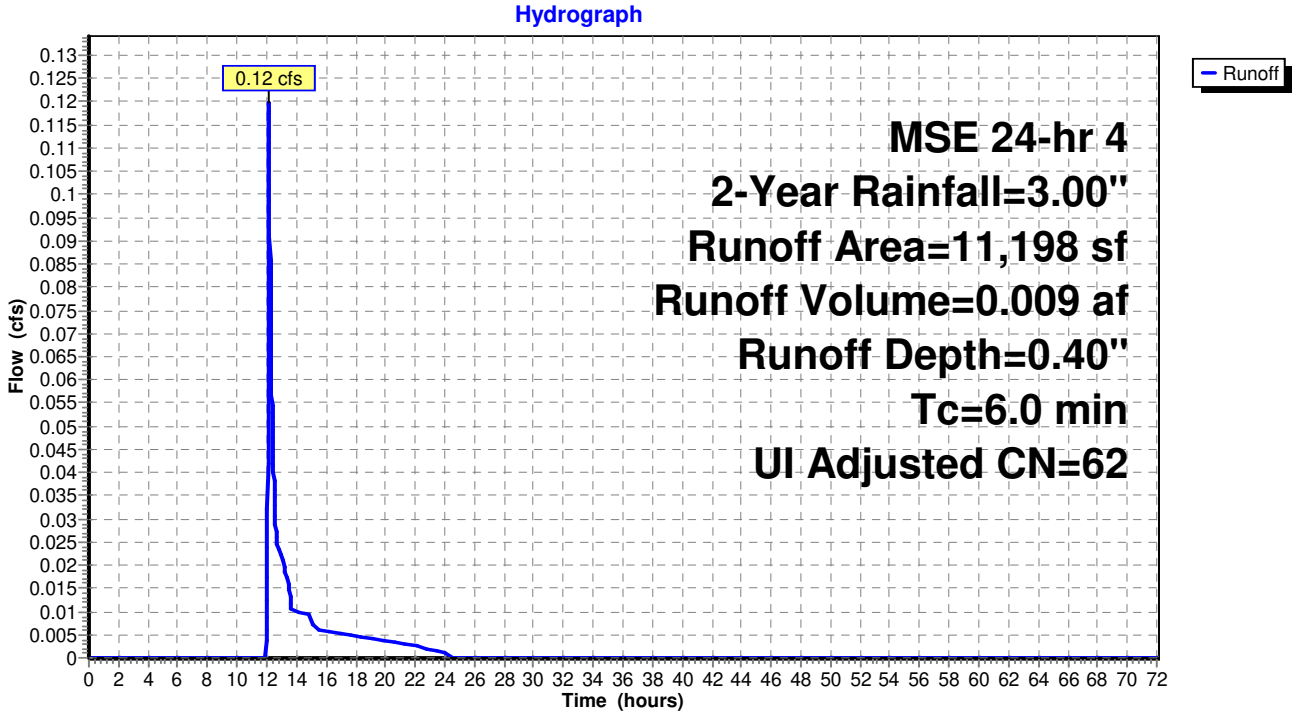
Runoff = 0.12 cfs @ 12.15 hrs, Volume= 0.009 af, Depth= 0.40"
Routed to Reach R2 : Post Developed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 2-Year Rainfall=3.00"

Area (sf)	CN	Adj	Description
739	98		Unconnected pavement, HSG B
10,459	61		>75% Grass cover, Good, HSG B
11,198	63	62	Weighted Average, UI Adjusted
10,459			93.40% Pervious Area
739			6.60% Impervious Area
739			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A3: Project Undetained



Hydrograph for Subcatchment A3: Project Undetained

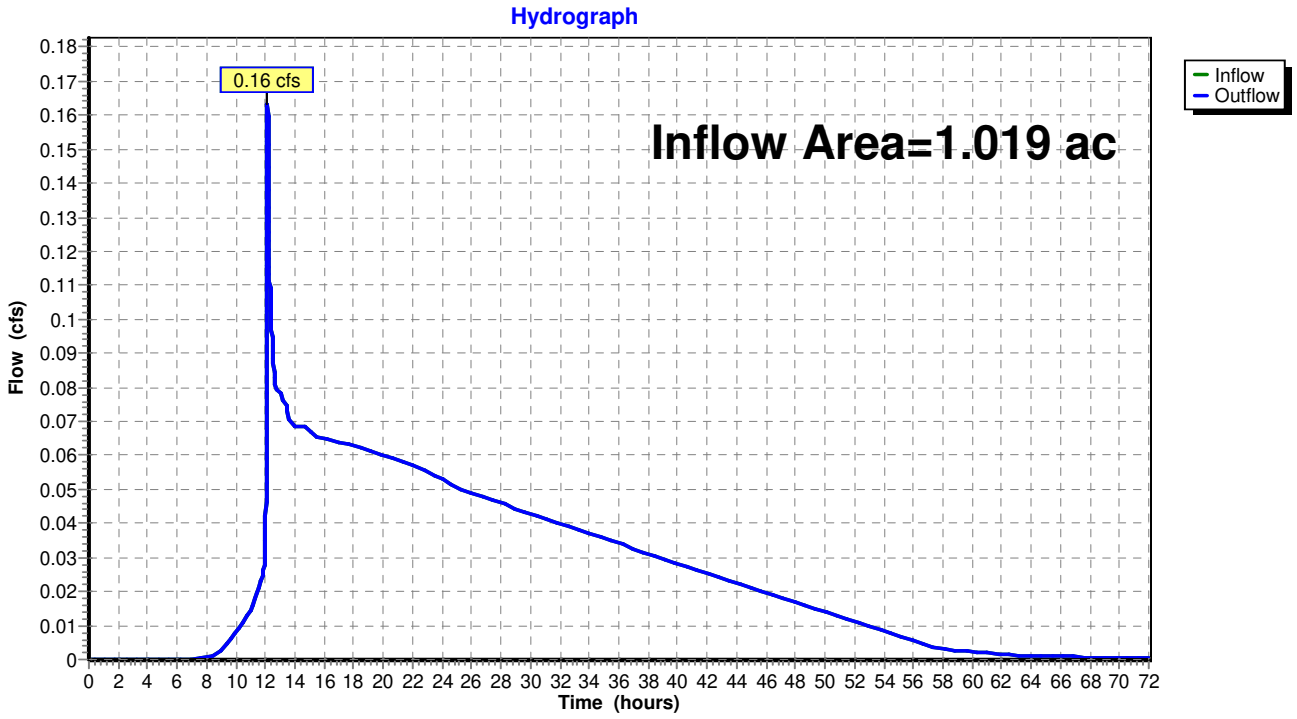
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.01	0.00	0.00
2.00	0.04	0.00	0.00
3.00	0.06	0.00	0.00
4.00	0.10	0.00	0.00
5.00	0.14	0.00	0.00
6.00	0.18	0.00	0.00
7.00	0.24	0.00	0.00
8.00	0.30	0.00	0.00
9.00	0.36	0.00	0.00
10.00	0.48	0.00	0.00
11.00	0.65	0.00	0.00
12.00	1.41	0.01	**0.00**
13.00	2.35	0.17	**0.02**
14.00	2.52	0.23	0.01
15.00	2.64	0.26	0.01
16.00	2.70	0.29	0.01
17.00	2.76	0.31	0.01
18.00	2.82	0.33	0.00
19.00	2.86	0.34	0.00
20.00	2.90	0.36	0.00
21.00	2.94	0.37	0.00
22.00	2.96	0.38	0.00
23.00	2.99	0.39	0.00
24.00	**3.00**	**0.40**	0.00
25.00	3.00	0.40	0.00
26.00	3.00	0.40	0.00
27.00	3.00	0.40	0.00
28.00	3.00	0.40	0.00
29.00	3.00	0.40	0.00
30.00	3.00	0.40	0.00
31.00	3.00	0.40	0.00
32.00	3.00	0.40	0.00
33.00	3.00	0.40	0.00
34.00	3.00	0.40	0.00
35.00	3.00	0.40	0.00
36.00	3.00	0.40	0.00
37.00	3.00	0.40	0.00
38.00	3.00	0.40	0.00
39.00	3.00	0.40	0.00
40.00	3.00	0.40	0.00
41.00	3.00	0.40	0.00
42.00	3.00	0.40	0.00
43.00	3.00	0.40	0.00
44.00	3.00	0.40	0.00
45.00	3.00	0.40	0.00
46.00	3.00	0.40	0.00
47.00	3.00	0.40	0.00
48.00	3.00	0.40	0.00
49.00	3.00	0.40	0.00
50.00	3.00	0.40	0.00
51.00	3.00	0.40	0.00
52.00	3.00	0.40	0.00
53.00	3.00	0.40	0.00
54.00	3.00	0.40	0.00
55.00	3.00	0.40	0.00
56.00	3.00	0.40	0.00
57.00	3.00	0.40	0.00
58.00	3.00	0.40	0.00
59.00	3.00	0.40	0.00
60.00	3.00	0.40	0.00
61.00	3.00	0.40	0.00
62.00	3.00	0.40	0.00
63.00	3.00	0.40	0.00
64.00	3.00	0.40	0.00
65.00	3.00	0.40	0.00
66.00	3.00	0.40	0.00
67.00	3.00	0.40	0.00
68.00	3.00	0.40	0.00
69.00	3.00	0.40	0.00
70.00	3.00	0.40	0.00
71.00	3.00	0.40	0.00
72.00	3.00	0.40	0.00

Summary for Reach R2: Post Developed

Inflow Area = 1.019 ac, 64.07% Impervious, Inflow Depth > 1.71" for 2-Year event
Inflow = 0.16 cfs @ 12.15 hrs, Volume= 0.145 af
Outflow = 0.16 cfs @ 12.15 hrs, Volume= 0.145 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach R2: Post Developed



Hydrograph for Reach R2: Post Developed

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00
1.00	0.00		0.00
2.00	0.00		0.00
3.00	0.00		0.00
4.00	0.00		0.00
5.00	0.00		0.00
6.00	0.00		0.00
7.00	0.00		0.00
8.00	0.00		0.00
9.00	0.00		0.00
10.00	0.01		0.01
11.00	0.01		0.01
12.00	**0.04**		**0.04**
13.00	**0.08**		**0.08**
14.00	0.07		0.07
15.00	0.07		0.07
16.00	0.06		0.06
17.00	0.06		0.06
18.00	0.06		0.06
19.00	0.06		0.06
20.00	0.06		0.06
21.00	0.06		0.06
22.00	0.06		0.06
23.00	0.06		0.06
24.00	0.05		0.05
25.00	0.05		0.05
26.00	0.05		0.05
27.00	0.05		0.05
28.00	0.05		0.05
29.00	0.04		0.04
30.00	0.04		0.04
31.00	0.04		0.04
32.00	0.04		0.04
33.00	0.04		0.04
34.00	0.04		0.04
35.00	0.04		0.04
36.00	0.03		0.03
37.00	0.03		0.03
38.00	0.03		0.03
39.00	0.03		0.03
40.00	0.03		0.03
41.00	0.03		0.03
42.00	0.03		0.03
43.00	0.02		0.02
44.00	0.02		0.02
45.00	0.02		0.02
46.00	0.02		0.02
47.00	0.02		0.02
48.00	0.02		0.02
49.00	0.02		0.02
50.00	0.01		0.01
51.00	0.01		0.01
52.00	0.01		0.01
53.00	0.01		0.01
54.00	0.01		0.01
55.00	0.01		0.01
56.00	0.01		0.01
57.00	0.00		0.00
58.00	0.00		0.00
59.00	0.00		0.00
60.00	0.00		0.00
61.00	0.00		0.00
62.00	0.00		0.00
63.00	0.00		0.00
64.00	0.00		0.00
65.00	0.00		0.00
66.00	0.00		0.00
67.00	0.00		0.00
68.00	0.00		0.00
69.00	0.00		0.00
70.00	0.00		0.00
71.00	0.00		0.00
72.00	0.00		0.00

Summary for Pond 1P: Oversized Pipe

Inflow Area = 0.762 ac, 83.46% Impervious, Inflow Depth = 2.16" for 2-Year event
Inflow = 2.56 cfs @ 12.13 hrs, Volume= 0.137 af
Outflow = 0.06 cfs @ 15.10 hrs, Volume= 0.136 af, Atten= 98%, Lag= 177.9 min
Primary = 0.06 cfs @ 15.10 hrs, Volume= 0.136 af
Routed to Reach R2 : Post Developed

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Starting Elev= 784.00' Surf.Area= 0.041 ac Storage= 0.111 af
Peak Elev= 786.52' @ 15.10 hrs Surf.Area= 0.033 ac Storage= 0.209 af (0.098 af above start)

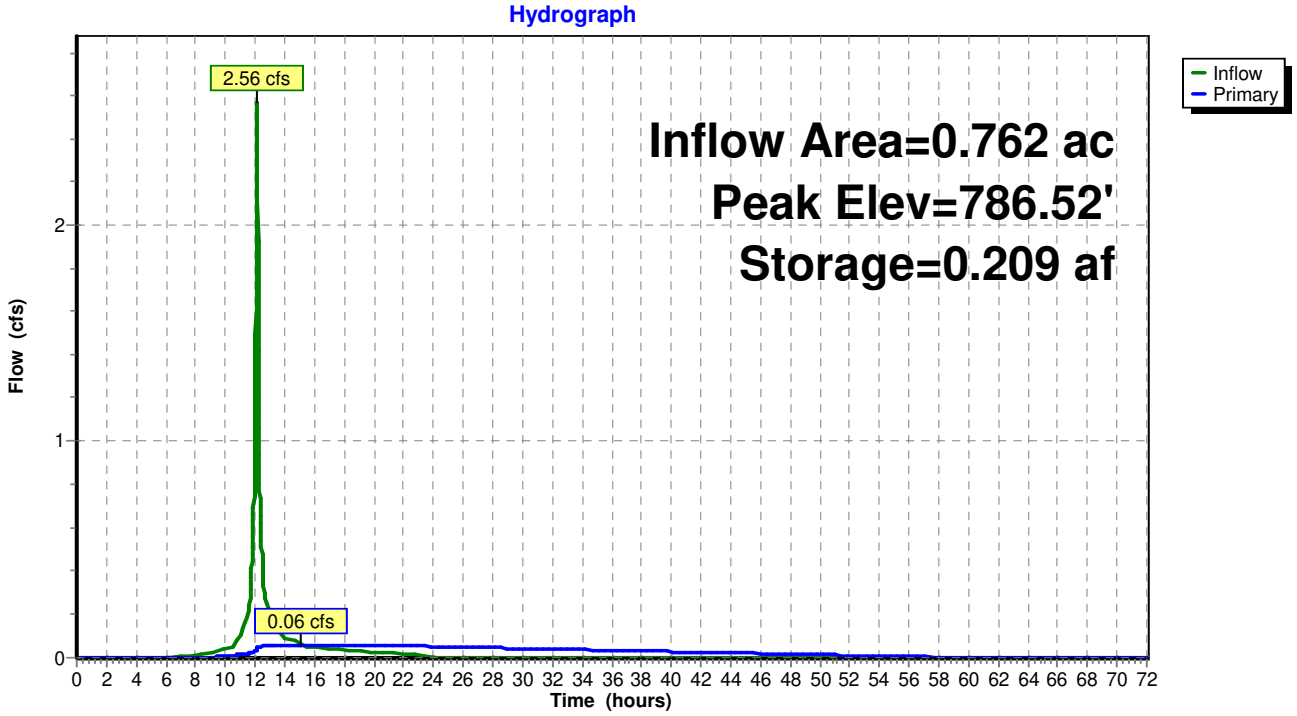
Plug-Flow detention time= 2,185.8 min calculated for 0.025 af (18% of inflow)
Center-of-Mass det. time= 901.2 min (1,692.6 - 791.4)

Volume	Invert	Avail.Storage	Storage Description
#1	780.50'	0.243 af	**90.0" Round Pipe Storage** L= 240.0'

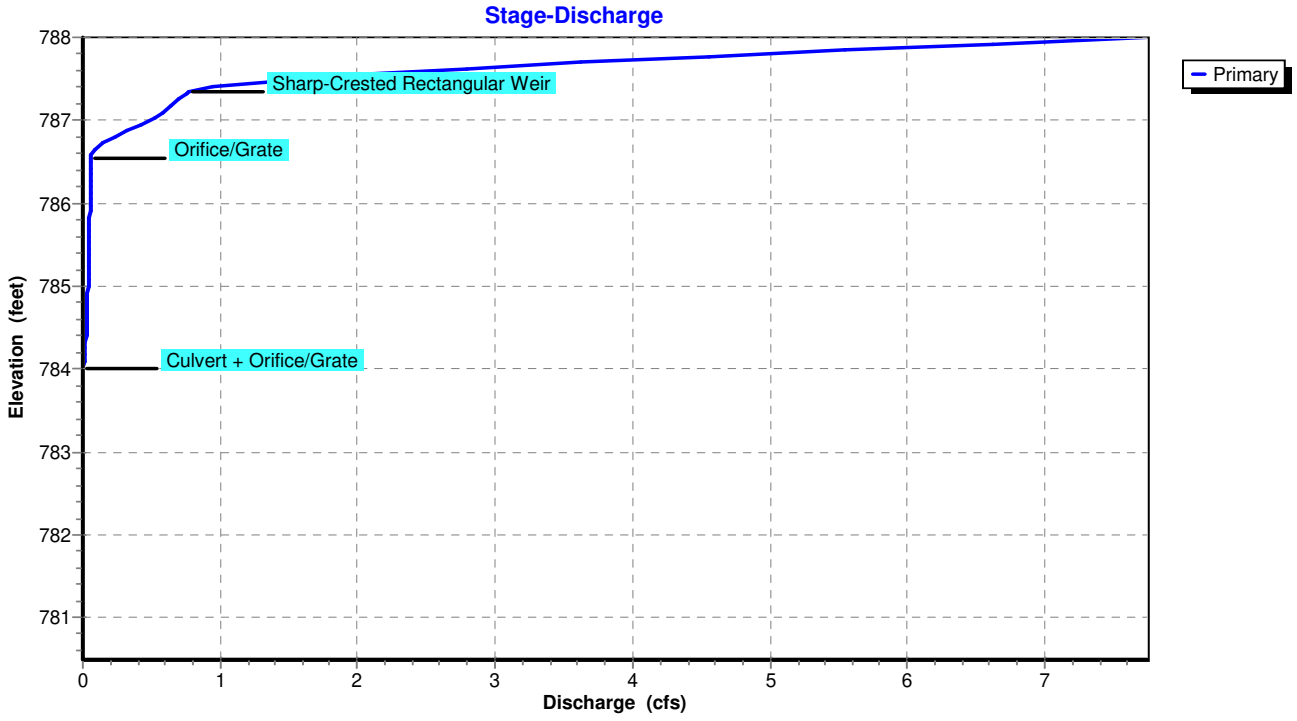
Device	Routing	Invert	Outlet Devices
#1	Primary	784.00'	**18.0" Round Culvert** L= 19.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 784.00' / 783.75' S= 0.0132 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Device 1	784.00'	**1.2" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	786.55'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	787.35'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.06 cfs @ 15.10 hrs HW=786.52' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.06 cfs of 9.99 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.06 cfs @ 7.57 fps)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

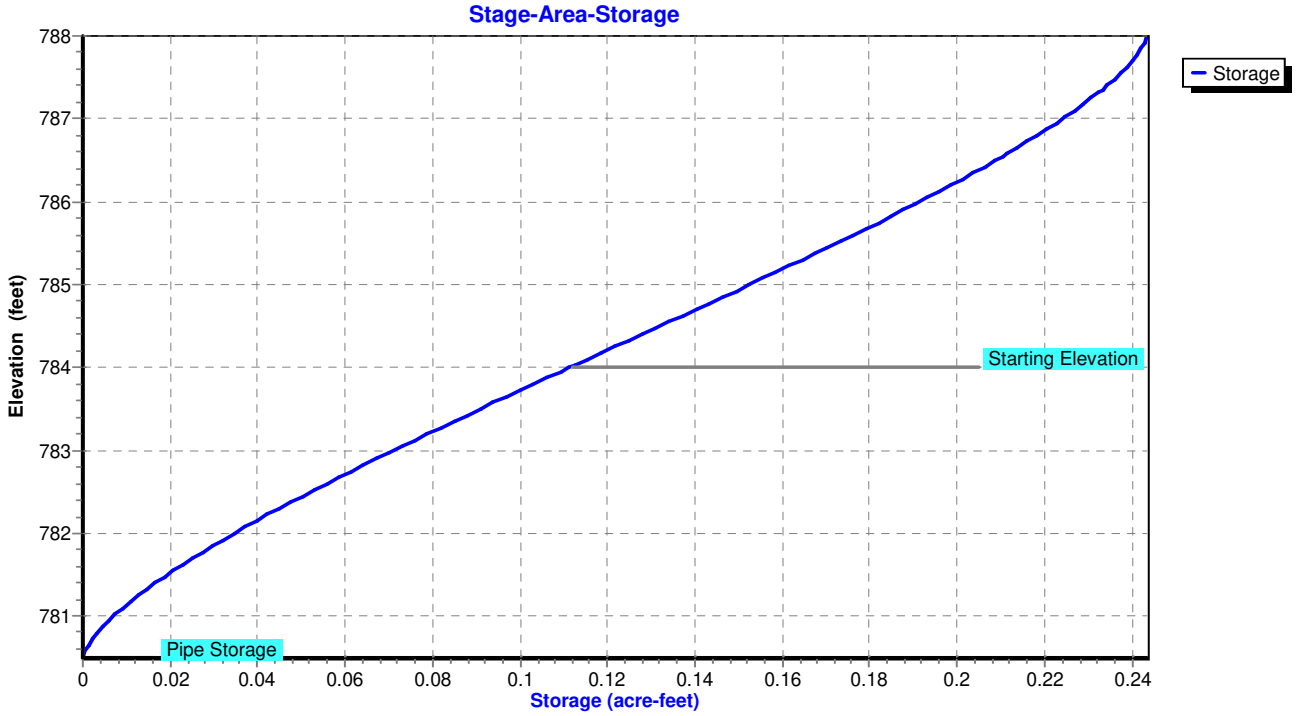
Pond 1P: Oversized Pipe



Pond 1P: Oversized Pipe



Pond 1P: Oversized Pipe



Hydrograph for Pond 1P: Oversized Pipe

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.111	784.00	0.00
2.00	0.00	0.111	784.00	0.00
4.00	0.00	0.111	784.00	0.00
6.00	0.00	0.111	784.00	0.00
8.00	0.01	0.112	784.02	0.00
10.00	0.04	0.115	784.10	0.01
12.00	**1.23**	0.143	784.77	0.03
14.00	**0.09**	**0.207**	**786.46**	**0.06**
16.00	0.05	**0.209**	**786.49**	**0.06**
18.00	0.04	0.206	786.41	0.06
20.00	0.03	0.201	786.28	0.06
22.00	0.02	0.196	786.13	0.05
24.00	0.01	0.189	785.95	0.05
26.00	0.00	0.181	785.73	0.05
28.00	0.00	0.173	785.52	0.05
30.00	0.00	0.166	785.34	0.04
32.00	0.00	0.159	785.16	0.04
34.00	0.00	0.153	785.01	0.04
36.00	0.00	0.147	784.86	0.03
38.00	0.00	0.141	784.73	0.03
40.00	0.00	0.137	784.61	0.03
42.00	0.00	0.132	784.50	0.03
44.00	0.00	0.128	784.41	0.02
46.00	0.00	0.125	784.32	0.02
48.00	0.00	0.122	784.25	0.02
50.00	0.00	0.119	784.19	0.01
52.00	0.00	0.117	784.14	0.01
54.00	0.00	0.115	784.10	0.01
56.00	0.00	0.114	784.07	0.01
58.00	0.00	0.114	784.05	0.00
60.00	0.00	0.113	784.04	0.00
62.00	0.00	0.113	784.03	0.00
64.00	0.00	0.113	784.03	0.00
66.00	0.00	0.112	784.03	0.00
68.00	0.00	0.112	784.02	0.00
70.00	0.00	0.112	784.02	0.00
72.00	0.00	0.112	784.02	0.00

Stage-Discharge for Pond 1P: Oversized Pipe

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
780.50	0.00	783.05	0.00	785.60	0.05
780.55	0.00	783.10	0.00	785.65	0.05
780.60	0.00	783.15	0.00	785.70	0.05
780.65	0.00	783.20	0.00	785.75	0.05
780.70	0.00	783.25	0.00	785.80	0.05
780.75	0.00	783.30	0.00	785.85	0.05
780.80	0.00	783.35	0.00	785.90	0.05
780.85	0.00	783.40	0.00	785.95	0.05
780.90	0.00	783.45	0.00	786.00	0.05
780.95	0.00	783.50	0.00	786.05	0.05
781.00	0.00	783.55	0.00	786.10	0.05
781.05	0.00	783.60	0.00	786.15	0.05
781.10	0.00	783.65	0.00	786.20	0.06
781.15	0.00	783.70	0.00	786.25	0.06
781.20	0.00	783.75	0.00	786.30	0.06
781.25	0.00	783.80	0.00	786.35	0.06
781.30	0.00	783.85	0.00	786.40	0.06
781.35	0.00	783.90	0.00	786.45	0.06
781.40	0.00	783.95	0.00	786.50	0.06
781.45	0.00	784.00	0.00	786.55	0.06
781.50	0.00	784.05	0.00	786.60	0.07
781.55	0.00	784.10	0.01	786.65	0.09
781.60	0.00	784.15	0.01	786.70	0.13
781.65	0.00	784.20	0.01	786.75	0.17
781.70	0.00	784.25	0.02	786.80	0.23
781.75	0.00	784.30	0.02	786.85	0.29
781.80	0.00	784.35	0.02	786.90	0.36
781.85	0.00	784.40	0.02	786.95	0.43
781.90	0.00	784.45	0.02	787.00	0.49
781.95	0.00	784.50	0.03	787.05	0.54
782.00	0.00	784.55	0.03	787.10	0.58
782.05	0.00	784.60	0.03	787.15	0.63
782.10	0.00	784.65	0.03	787.20	0.67
782.15	0.00	784.70	0.03	787.25	0.70
782.20	0.00	784.75	0.03	787.30	0.74
782.25	0.00	784.80	0.03	787.35	0.77
782.30	0.00	784.85	0.03	787.40	0.95
782.35	0.00	784.90	0.03	787.45	1.24
782.40	0.00	784.95	0.04	787.50	1.62
782.45	0.00	785.00	0.04	787.55	2.05
782.50	0.00	785.05	0.04	787.60	2.53
782.55	0.00	785.10	0.04	787.65	3.06
782.60	0.00	785.15	0.04	787.70	3.63
782.65	0.00	785.20	0.04	787.75	4.24
782.70	0.00	785.25	0.04	787.80	4.88
782.75	0.00	785.30	0.04	787.85	5.55
782.80	0.00	785.35	0.04	787.90	6.25
782.85	0.00	785.40	0.04	787.95	6.99
782.90	0.00	785.45	0.04	788.00	**7.74**
782.95	0.00	785.50	0.05		
783.00	0.00	785.55	0.05		

Stage-Area-Storage for Pond 1P: Oversized Pipe

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
780.50	0.000	783.05	0.073	785.60	0.176
780.55	0.000	783.10	0.075	785.65	0.178
780.60	0.001	783.15	0.077	785.70	0.180
780.65	0.001	783.20	0.079	785.75	0.182
780.70	0.002	783.25	0.081	785.80	0.184
780.75	0.002	783.30	0.083	785.85	0.186
780.80	0.003	783.35	0.085	785.90	0.188
780.85	0.004	783.40	0.087	785.95	0.189
780.90	0.005	783.45	0.089	786.00	0.191
780.95	0.006	783.50	0.091	786.05	0.193
781.00	0.007	783.55	0.093	786.10	0.195
781.05	0.008	783.60	0.095	786.15	0.197
781.10	0.009	783.65	0.097	786.20	0.198
781.15	0.010	783.70	0.099	786.25	0.200
781.20	0.011	783.75	0.101	786.30	0.202
781.25	0.013	783.80	0.103	786.35	0.204
781.30	0.014	783.85	0.105	786.40	0.205
781.35	0.015	783.90	0.107	786.45	0.207
781.40	0.017	783.95	0.109	786.50	0.209
781.45	0.018	784.00	0.111	786.55	0.210
781.50	0.019	784.05	0.113	786.60	0.212
781.55	0.021	784.10	0.116	786.65	0.214
781.60	0.022	784.15	0.118	786.70	0.215
781.65	0.024	784.20	0.120	786.75	0.217
781.70	0.025	784.25	0.122	786.80	0.218
781.75	0.027	784.30	0.124	786.85	0.220
781.80	0.028	784.35	0.126	786.90	0.221
781.85	0.030	784.40	0.128	786.95	0.223
781.90	0.031	784.45	0.130	787.00	0.224
781.95	0.033	784.50	0.132	787.05	0.226
782.00	0.035	784.55	0.134	787.10	0.227
782.05	0.036	784.60	0.136	787.15	0.228
782.10	0.038	784.65	0.138	787.20	0.229
782.15	0.040	784.70	0.140	787.25	0.231
782.20	0.041	784.75	0.142	787.30	0.232
782.25	0.043	784.80	0.144	787.35	0.233
782.30	0.045	784.85	0.146	787.40	0.234
782.35	0.047	784.90	0.148	787.45	0.235
782.40	0.048	784.95	0.150	787.50	0.236
782.45	0.050	785.00	0.152	787.55	0.237
782.50	0.052	785.05	0.155	787.60	0.238
782.55	0.054	785.10	0.157	787.65	0.239
782.60	0.056	785.15	0.159	787.70	0.240
782.65	0.058	785.20	0.161	787.75	0.241
782.70	0.060	785.25	0.163	787.80	0.242
782.75	0.061	785.30	0.165	787.85	0.242
782.80	0.063	785.35	0.166	787.90	0.243
782.85	0.065	785.40	0.168	787.95	0.243
782.90	0.067	785.45	0.170	788.00	**0.243**
782.95	0.069	785.50	0.172		
783.00	0.071	785.55	0.174		

Summary for Subcatchment A1: Project Detained

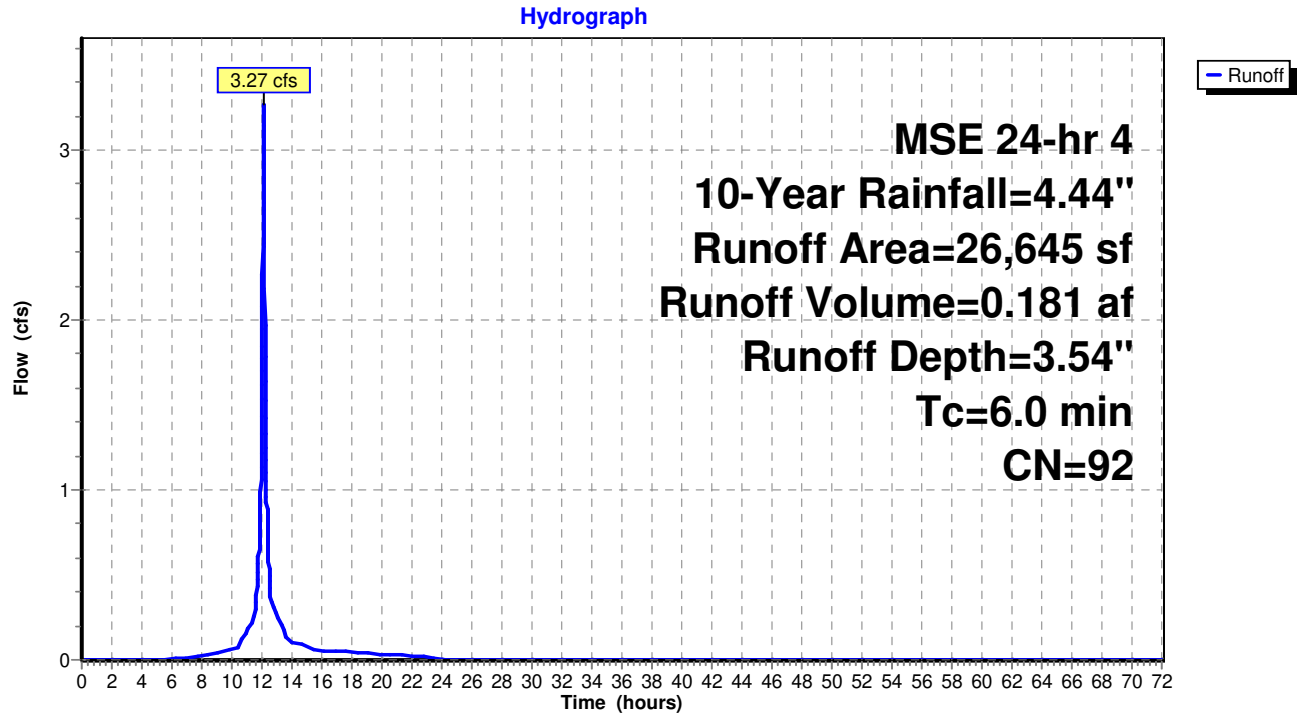
Runoff = 3.27 cfs @ 12.13 hrs, Volume= 0.181 af, Depth= 3.54"
Routed to Pond 1P : Oversized Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 10-Year Rainfall=4.44"

	Area (sf)	CN	Description
	13,722	98	Paved parking, HSG B
*	8,443	98	Roof
	4,480	61	>75% Grass cover, Good, HSG B
	26,645	92	Weighted Average
	4,480		16.81% Pervious Area
	22,165		83.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A1: Project Detained



Hydrograph for Subcatchment A1: Project Detained

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.05	0.00	0.00
3.00	0.09	0.00	0.00
4.00	0.14	0.00	0.00
5.00	0.20	0.00	0.00
6.00	0.27	0.01	0.01
7.00	0.35	0.03	0.02
8.00	0.44	0.06	0.02
9.00	0.54	0.11	0.03
10.00	0.70	0.20	0.07
11.00	0.96	0.37	0.17
12.00	2.08	1.31	**1.62**
13.00	3.48	2.62	**0.26**
14.00	3.74	2.86	0.11
15.00	3.90	3.02	0.09
16.00	4.00	3.12	0.06
17.00	4.09	3.20	0.05
18.00	4.17	3.28	0.04
19.00	4.24	3.35	0.04
20.00	4.30	3.40	0.03
21.00	4.35	3.45	0.03
22.00	4.39	3.49	0.02
23.00	4.42	3.52	0.02
24.00	**4.44**	**3.54**	0.01
25.00	4.44	3.54	0.00
26.00	4.44	3.54	0.00
27.00	4.44	3.54	0.00
28.00	4.44	3.54	0.00
29.00	4.44	3.54	0.00
30.00	4.44	3.54	0.00
31.00	4.44	3.54	0.00
32.00	4.44	3.54	0.00
33.00	4.44	3.54	0.00
34.00	4.44	3.54	0.00
35.00	4.44	3.54	0.00
36.00	4.44	3.54	0.00
37.00	4.44	3.54	0.00
38.00	4.44	3.54	0.00
39.00	4.44	3.54	0.00
40.00	4.44	3.54	0.00
41.00	4.44	3.54	0.00
42.00	4.44	3.54	0.00
43.00	4.44	3.54	0.00
44.00	4.44	3.54	0.00
45.00	4.44	3.54	0.00
46.00	4.44	3.54	0.00
47.00	4.44	3.54	0.00
48.00	4.44	3.54	0.00
49.00	4.44	3.54	0.00
50.00	4.44	3.54	0.00
51.00	4.44	3.54	0.00
52.00	4.44	3.54	0.00
53.00	4.44	3.54	0.00
54.00	4.44	3.54	0.00
55.00	4.44	3.54	0.00
56.00	4.44	3.54	0.00
57.00	4.44	3.54	0.00
58.00	4.44	3.54	0.00
59.00	4.44	3.54	0.00
60.00	4.44	3.54	0.00
61.00	4.44	3.54	0.00
62.00	4.44	3.54	0.00
63.00	4.44	3.54	0.00
64.00	4.44	3.54	0.00
65.00	4.44	3.54	0.00
66.00	4.44	3.54	0.00
67.00	4.44	3.54	0.00
68.00	4.44	3.54	0.00
69.00	4.44	3.54	0.00
70.00	4.44	3.54	0.00
71.00	4.44	3.54	0.00
72.00	4.44	3.54	0.00

Summary for Subcatchment A2: Runon Detained

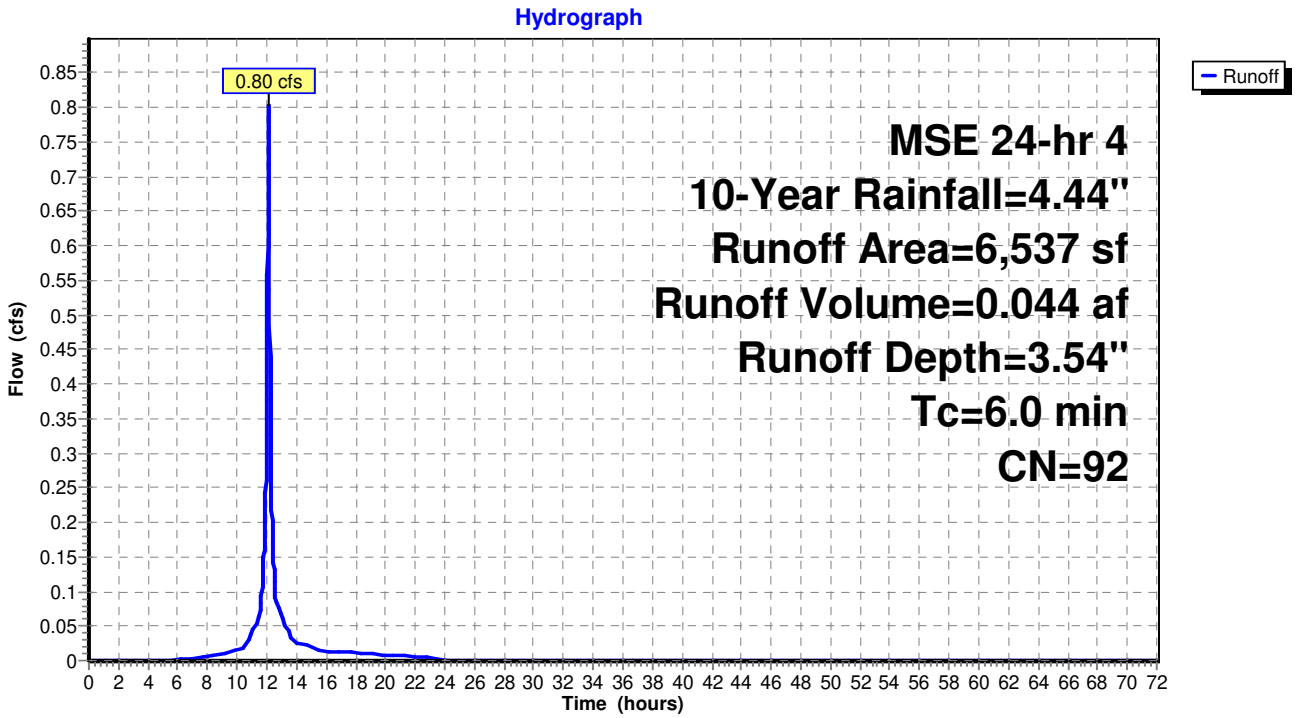
Runoff = 0.80 cfs @ 12.13 hrs, Volume= 0.044 af, Depth= 3.54"
Routed to Pond 1P : Oversized Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 10-Year Rainfall=4.44"

	Area (sf)	CN	Description
*	5,529	98	Roof
	1,008	61	>75% Grass cover, Good, HSG B
	6,537	92	Weighted Average
	1,008		15.42% Pervious Area
	5,529		84.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A2: Runon Detained



Hydrograph for Subcatchment A2: Runon Detained

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.05	0.00	0.00
3.00	0.09	0.00	0.00
4.00	0.14	0.00	0.00
5.00	0.20	0.00	0.00
6.00	0.27	0.01	0.00
7.00	0.35	0.03	0.00
8.00	0.44	0.06	0.01
9.00	0.54	0.11	0.01
10.00	0.70	0.20	0.02
11.00	0.96	0.37	0.04
12.00	2.08	1.31	**0.40**
13.00	3.48	2.62	**0.06**
14.00	3.74	2.86	0.03
15.00	3.90	3.02	0.02
16.00	4.00	3.12	0.01
17.00	4.09	3.20	0.01
18.00	4.17	3.28	0.01
19.00	4.24	3.35	0.01
20.00	4.30	3.40	0.01
21.00	4.35	3.45	0.01
22.00	4.39	3.49	0.01
23.00	4.42	3.52	0.00
24.00	**4.44**	**3.54**	0.00
25.00	4.44	3.54	0.00
26.00	4.44	3.54	0.00
27.00	4.44	3.54	0.00
28.00	4.44	3.54	0.00
29.00	4.44	3.54	0.00
30.00	4.44	3.54	0.00
31.00	4.44	3.54	0.00
32.00	4.44	3.54	0.00
33.00	4.44	3.54	0.00
34.00	4.44	3.54	0.00
35.00	4.44	3.54	0.00
36.00	4.44	3.54	0.00
37.00	4.44	3.54	0.00
38.00	4.44	3.54	0.00
39.00	4.44	3.54	0.00
40.00	4.44	3.54	0.00
41.00	4.44	3.54	0.00
42.00	4.44	3.54	0.00
43.00	4.44	3.54	0.00
44.00	4.44	3.54	0.00
45.00	4.44	3.54	0.00
46.00	4.44	3.54	0.00
47.00	4.44	3.54	0.00
48.00	4.44	3.54	0.00
49.00	4.44	3.54	0.00
50.00	4.44	3.54	0.00
51.00	4.44	3.54	0.00
52.00	4.44	3.54	0.00
53.00	4.44	3.54	0.00
54.00	4.44	3.54	0.00
55.00	4.44	3.54	0.00
56.00	4.44	3.54	0.00
57.00	4.44	3.54	0.00
58.00	4.44	3.54	0.00
59.00	4.44	3.54	0.00
60.00	4.44	3.54	0.00
61.00	4.44	3.54	0.00
62.00	4.44	3.54	0.00
63.00	4.44	3.54	0.00
64.00	4.44	3.54	0.00
65.00	4.44	3.54	0.00
66.00	4.44	3.54	0.00
67.00	4.44	3.54	0.00
68.00	4.44	3.54	0.00
69.00	4.44	3.54	0.00
70.00	4.44	3.54	0.00
71.00	4.44	3.54	0.00
72.00	4.44	3.54	0.00

Summary for Subcatchment A3: Project Undetained

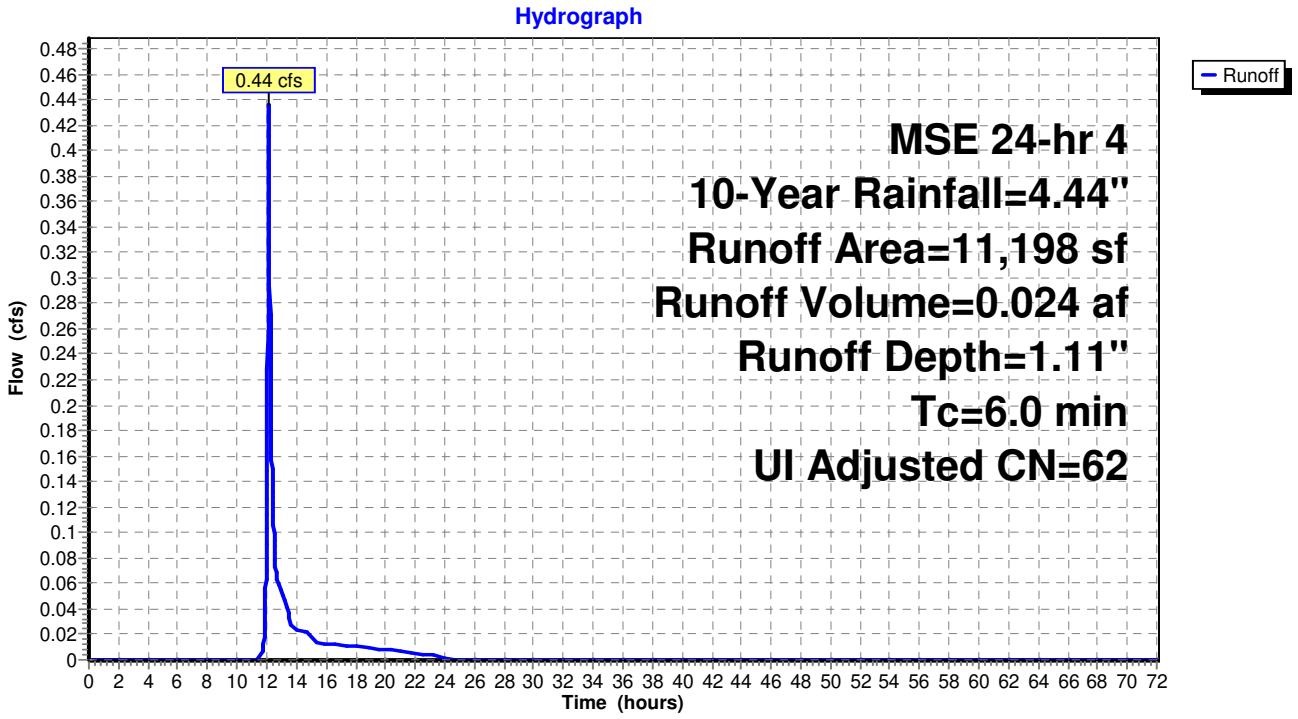
Runoff = 0.44 cfs @ 12.14 hrs, Volume= 0.024 af, Depth= 1.11"
Routed to Reach R2 : Post Developed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 10-Year Rainfall=4.44"

Area (sf)	CN	Adj	Description
739	98		Unconnected pavement, HSG B
10,459	61		>75% Grass cover, Good, HSG B
11,198	63	62	Weighted Average, UI Adjusted
10,459			93.40% Pervious Area
739			6.60% Impervious Area
739			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A3: Project Undetained



Hydrograph for Subcatchment A3: Project Undetained

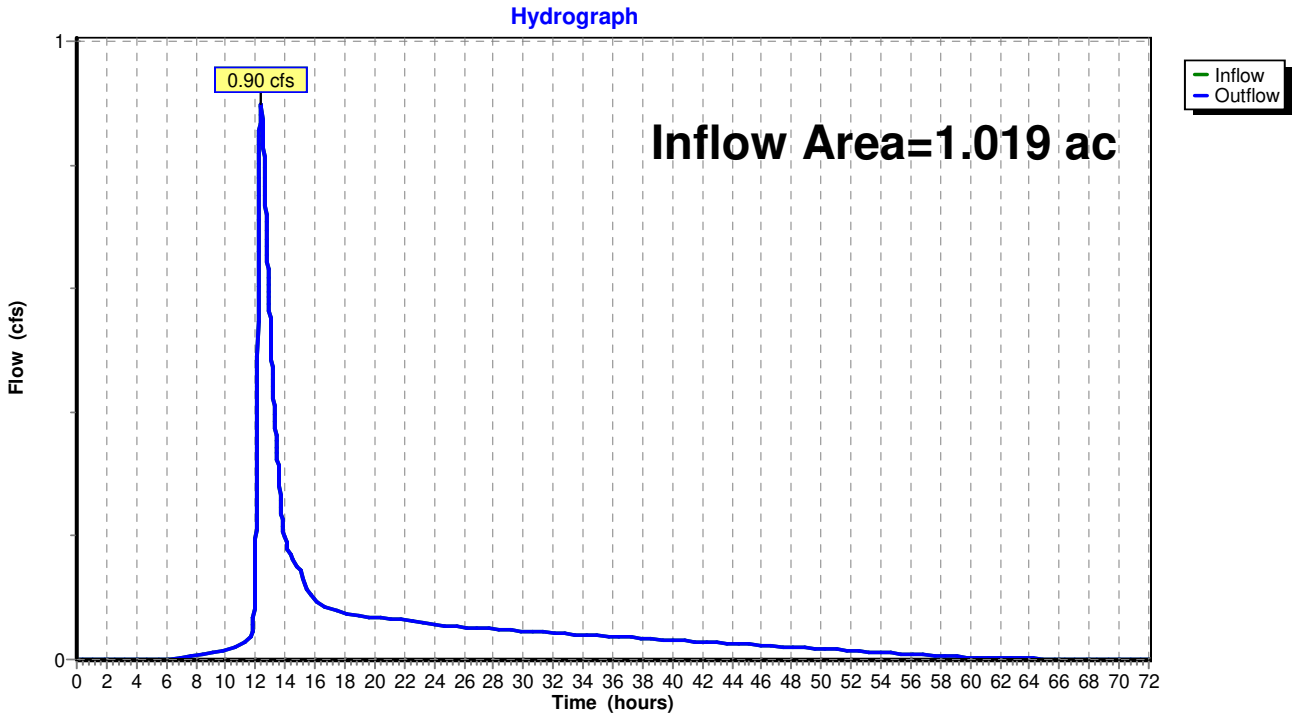
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.05	0.00	0.00
3.00	0.09	0.00	0.00
4.00	0.14	0.00	0.00
5.00	0.20	0.00	0.00
6.00	0.27	0.00	0.00
7.00	0.35	0.00	0.00
8.00	0.44	0.00	0.00
9.00	0.54	0.00	0.00
10.00	0.70	0.00	0.00
11.00	0.96	0.00	0.00
12.00	2.08	0.10	**0.13**
13.00	3.48	0.61	**0.05**
14.00	3.74	0.73	0.02
15.00	3.90	0.81	0.02
16.00	4.00	0.86	0.01
17.00	4.09	0.91	0.01
18.00	4.17	0.95	0.01
19.00	4.24	0.99	0.01
20.00	4.30	1.02	0.01
21.00	4.35	1.05	0.01
22.00	4.39	1.08	0.01
23.00	4.42	1.09	0.00
24.00	**4.44**	**1.11**	0.00
25.00	4.44	1.11	0.00
26.00	4.44	1.11	0.00
27.00	4.44	1.11	0.00
28.00	4.44	1.11	0.00
29.00	4.44	1.11	0.00
30.00	4.44	1.11	0.00
31.00	4.44	1.11	0.00
32.00	4.44	1.11	0.00
33.00	4.44	1.11	0.00
34.00	4.44	1.11	0.00
35.00	4.44	1.11	0.00
36.00	4.44	1.11	0.00
37.00	4.44	1.11	0.00
38.00	4.44	1.11	0.00
39.00	4.44	1.11	0.00
40.00	4.44	1.11	0.00
41.00	4.44	1.11	0.00
42.00	4.44	1.11	0.00
43.00	4.44	1.11	0.00
44.00	4.44	1.11	0.00
45.00	4.44	1.11	0.00
46.00	4.44	1.11	0.00
47.00	4.44	1.11	0.00
48.00	4.44	1.11	0.00
49.00	4.44	1.11	0.00
50.00	4.44	1.11	0.00
51.00	4.44	1.11	0.00
52.00	4.44	1.11	0.00
53.00	4.44	1.11	0.00
54.00	4.44	1.11	0.00
55.00	4.44	1.11	0.00
56.00	4.44	1.11	0.00
57.00	4.44	1.11	0.00
58.00	4.44	1.11	0.00
59.00	4.44	1.11	0.00
60.00	4.44	1.11	0.00
61.00	4.44	1.11	0.00
62.00	4.44	1.11	0.00
63.00	4.44	1.11	0.00
64.00	4.44	1.11	0.00
65.00	4.44	1.11	0.00
66.00	4.44	1.11	0.00
67.00	4.44	1.11	0.00
68.00	4.44	1.11	0.00
69.00	4.44	1.11	0.00
70.00	4.44	1.11	0.00
71.00	4.44	1.11	0.00
72.00	4.44	1.11	0.00

Summary for Reach R2: Post Developed

Inflow Area = 1.019 ac, 64.07% Impervious, Inflow Depth > 2.92" for 10-Year event
Inflow = 0.90 cfs @ 12.37 hrs, Volume= 0.248 af
Outflow = 0.90 cfs @ 12.37 hrs, Volume= 0.248 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach R2: Post Developed



Hydrograph for Reach R2: Post Developed

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00
1.00	0.00		0.00
2.00	0.00		0.00
3.00	0.00		0.00
4.00	0.00		0.00
5.00	0.00		0.00
6.00	0.00		0.00
7.00	0.00		0.00
8.00	0.01		0.01
9.00	0.01		0.01
10.00	0.02		0.02
11.00	0.02		0.02
12.00	**0.17**		**0.17**
13.00	**0.54**		**0.54**
14.00	0.19		0.19
15.00	0.15		0.15
16.00	0.10		0.10
17.00	0.08		0.08
18.00	0.08		0.08
19.00	0.07		0.07
20.00	0.07		0.07
21.00	0.07		0.07
22.00	0.06		0.06
23.00	0.06		0.06
24.00	0.06		0.06
25.00	0.05		0.05
26.00	0.05		0.05
27.00	0.05		0.05
28.00	0.05		0.05
29.00	0.05		0.05
30.00	0.05		0.05
31.00	0.04		0.04
32.00	0.04		0.04
33.00	0.04		0.04
34.00	0.04		0.04
35.00	0.04		0.04
36.00	0.04		0.04
37.00	0.04		0.04
38.00	0.03		0.03
39.00	0.03		0.03
40.00	0.03		0.03
41.00	0.03		0.03
42.00	0.03		0.03
43.00	0.03		0.03
44.00	0.03		0.03
45.00	0.02		0.02
46.00	0.02		0.02
47.00	0.02		0.02
48.00	0.02		0.02
49.00	0.02		0.02
50.00	0.02		0.02
51.00	0.02		0.02
52.00	0.01		0.01
53.00	0.01		0.01
54.00	0.01		0.01
55.00	0.01		0.01
56.00	0.01		0.01
57.00	0.01		0.01
58.00	0.01		0.01
59.00	0.00		0.00
60.00	0.00		0.00
61.00	0.00		0.00
62.00	0.00		0.00
63.00	0.00		0.00
64.00	0.00		0.00
65.00	0.00		0.00
66.00	0.00		0.00
67.00	0.00		0.00
68.00	0.00		0.00
69.00	0.00		0.00
70.00	0.00		0.00
71.00	0.00		0.00
72.00	0.00		0.00

Summary for Pond 1P: Oversized Pipe

Inflow Area = 0.762 ac, 83.46% Impervious, Inflow Depth = 3.54" for 10-Year event
Inflow = 4.07 cfs @ 12.13 hrs, Volume= 0.225 af
Outflow = 0.78 cfs @ 12.44 hrs, Volume= 0.224 af, Atten= 81%, Lag= 18.3 min
Primary = 0.78 cfs @ 12.44 hrs, Volume= 0.224 af
Routed to Reach R2 : Post Developed

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Starting Elev= 784.00' Surf.Area= 0.041 ac Storage= 0.111 af
Peak Elev= 787.36' @ 12.44 hrs Surf.Area= 0.023 ac Storage= 0.233 af (0.122 af above start)

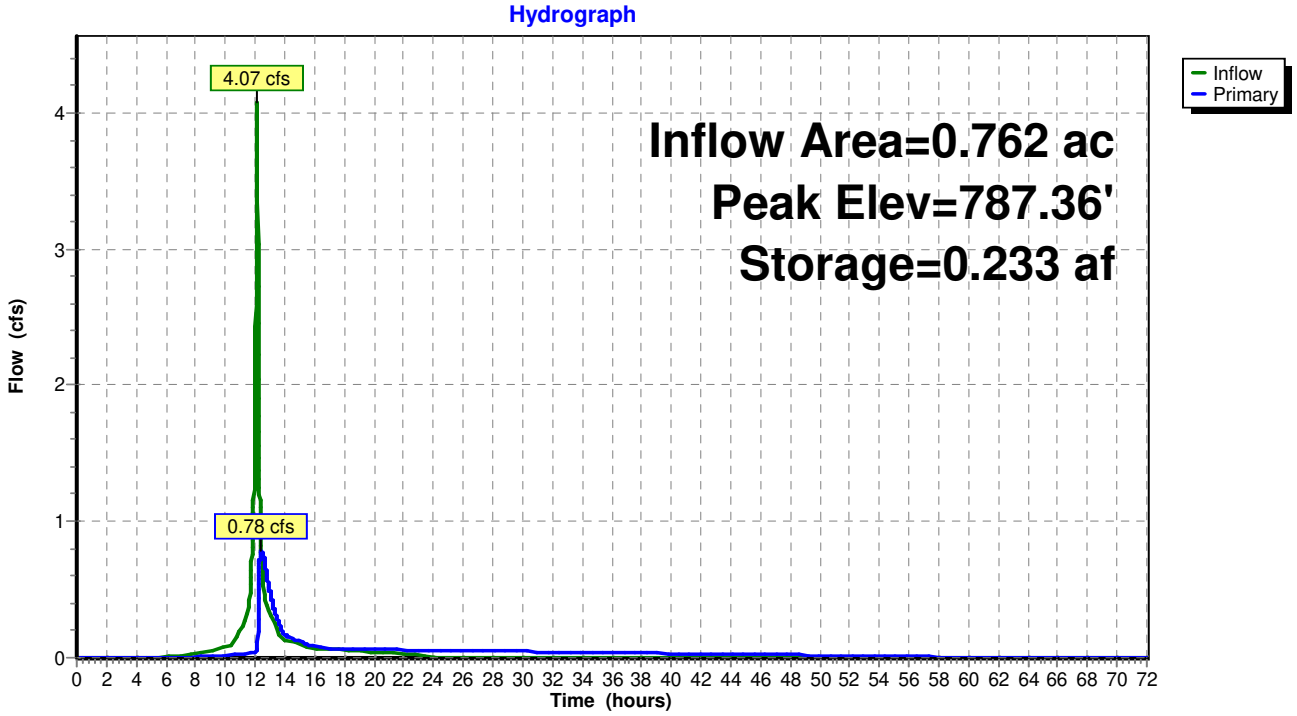
Plug-Flow detention time= 1,324.2 min calculated for 0.113 af (50% of inflow)
Center-of-Mass det. time= 639.9 min (1,419.8 - 779.9)

Volume	Invert	Avail.Storage	Storage Description
#1	780.50'	0.243 af	**90.0" Round Pipe Storage** L= 240.0'

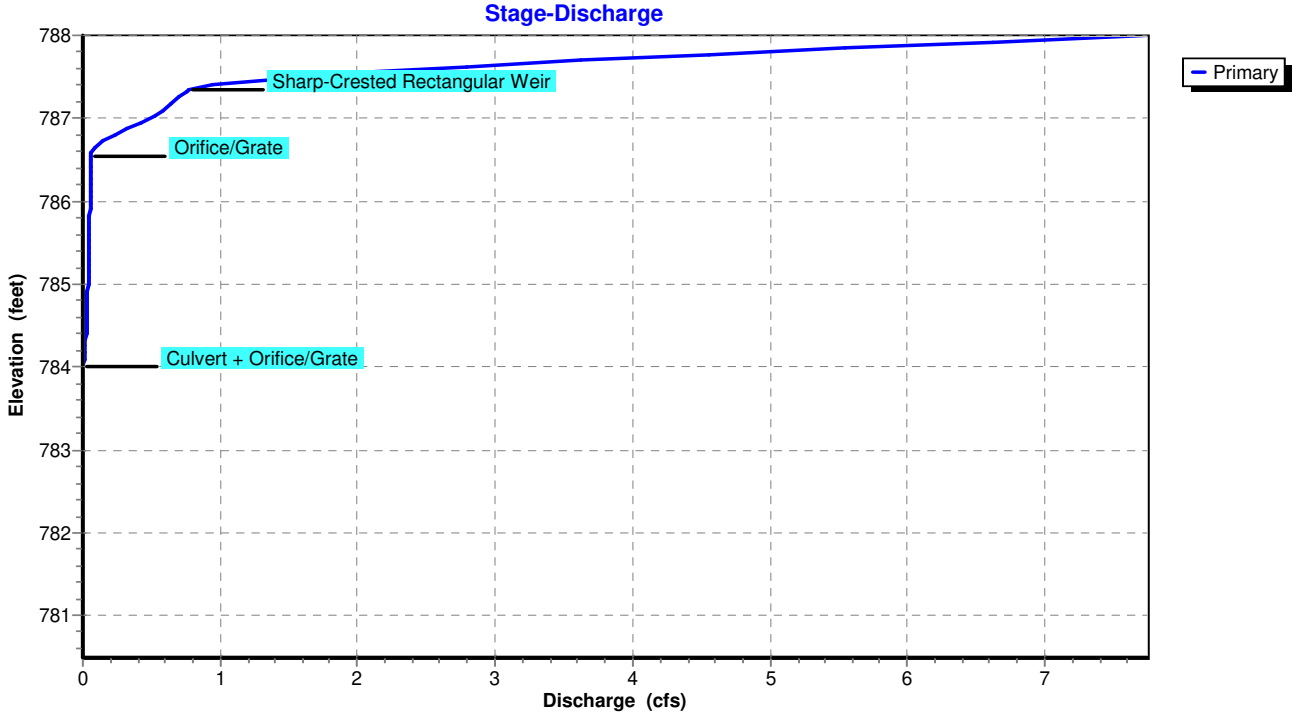
Device	Routing	Invert	Outlet Devices
#1	Primary	784.00'	**18.0" Round Culvert** L= 19.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 784.00' / 783.75' S= 0.0132 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Device 1	784.00'	**1.2" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	786.55'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	787.35'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.78 cfs @ 12.44 hrs HW=787.36' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.78 cfs of 12.12 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.07 cfs @ 8.76 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.71 cfs @ 3.59 fps)
  └**4=Sharp-Crested Rectangular Weir** (Weir Controls 0.01 cfs @ 0.26 fps)

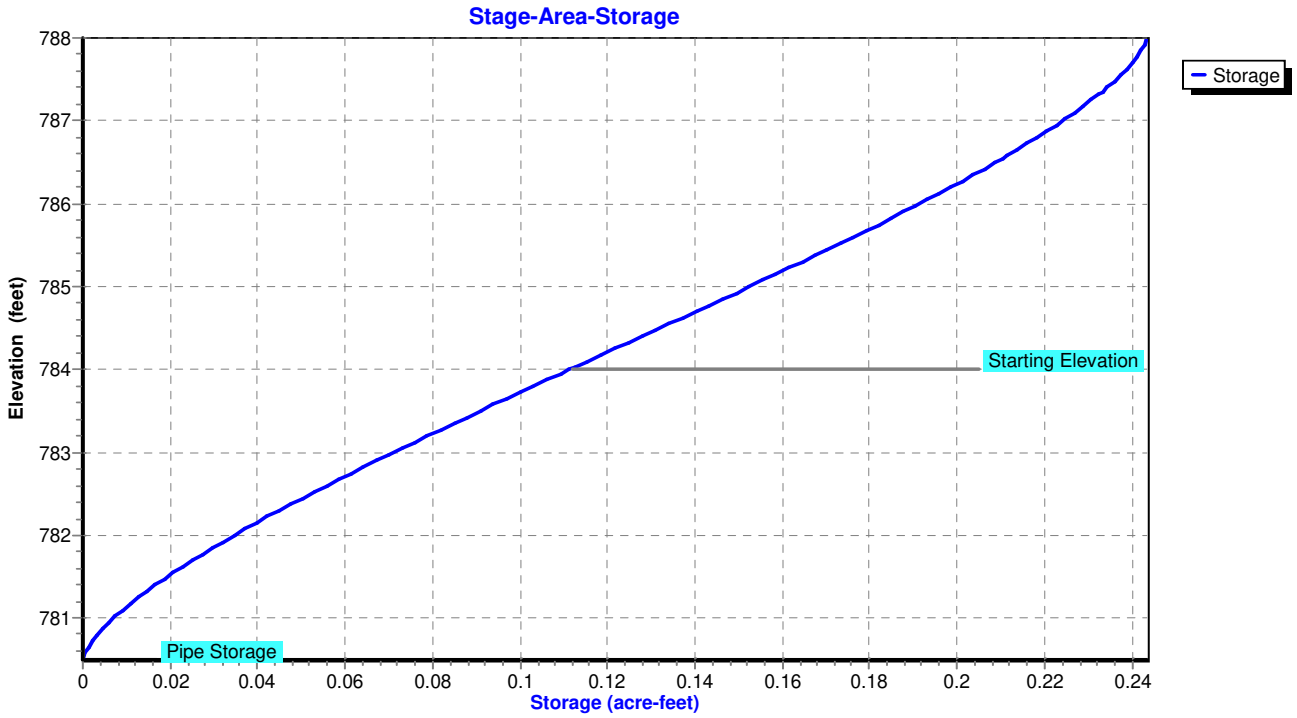
Pond 1P: Oversized Pipe



Pond 1P: Oversized Pipe



Pond 1P: Oversized Pipe



Hydrograph for Pond 1P: Oversized Pipe

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.111	784.00	0.00
2.00	0.00	0.111	784.00	0.00
4.00	0.00	0.111	784.00	0.00
6.00	0.01	0.112	784.01	0.00
8.00	0.03	0.115	784.08	0.01
10.00	0.08	0.121	784.24	0.02
12.00	**2.02**	**0.171**	**785.45**	**0.04**
14.00	**0.13**	**0.217**	**786.75**	**0.17**
16.00	0.07	0.213	786.64	0.08
18.00	0.06	0.212	786.59	0.06
20.00	0.04	0.210	786.52	0.06
22.00	0.03	0.206	786.40	0.06
24.00	0.01	0.200	786.23	0.06
26.00	0.00	0.191	785.98	0.05
28.00	0.00	0.182	785.76	0.05
30.00	0.00	0.174	785.55	0.05
32.00	0.00	0.167	785.36	0.04
34.00	0.00	0.160	785.19	0.04
36.00	0.00	0.154	785.03	0.04
38.00	0.00	0.148	784.88	0.03
40.00	0.00	0.142	784.75	0.03
42.00	0.00	0.137	784.63	0.03
44.00	0.00	0.133	784.52	0.03
46.00	0.00	0.129	784.42	0.02
48.00	0.00	0.125	784.33	0.02
50.00	0.00	0.122	784.26	0.02
52.00	0.00	0.119	784.19	0.01
54.00	0.00	0.117	784.14	0.01
56.00	0.00	0.116	784.10	0.01
58.00	0.00	0.114	784.07	0.01
60.00	0.00	0.114	784.06	0.00
62.00	0.00	0.113	784.04	0.00
64.00	0.00	0.113	784.04	0.00
66.00	0.00	0.113	784.03	0.00
68.00	0.00	0.112	784.03	0.00
70.00	0.00	0.112	784.02	0.00
72.00	0.00	0.112	784.02	0.00

Stage-Discharge for Pond 1P: Oversized Pipe

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
780.50	0.00	783.05	0.00	785.60	0.05
780.55	0.00	783.10	0.00	785.65	0.05
780.60	0.00	783.15	0.00	785.70	0.05
780.65	0.00	783.20	0.00	785.75	0.05
780.70	0.00	783.25	0.00	785.80	0.05
780.75	0.00	783.30	0.00	785.85	0.05
780.80	0.00	783.35	0.00	785.90	0.05
780.85	0.00	783.40	0.00	785.95	0.05
780.90	0.00	783.45	0.00	786.00	0.05
780.95	0.00	783.50	0.00	786.05	0.05
781.00	0.00	783.55	0.00	786.10	0.05
781.05	0.00	783.60	0.00	786.15	0.05
781.10	0.00	783.65	0.00	786.20	0.06
781.15	0.00	783.70	0.00	786.25	0.06
781.20	0.00	783.75	0.00	786.30	0.06
781.25	0.00	783.80	0.00	786.35	0.06
781.30	0.00	783.85	0.00	786.40	0.06
781.35	0.00	783.90	0.00	786.45	0.06
781.40	0.00	783.95	0.00	786.50	0.06
781.45	0.00	784.00	0.00	786.55	0.06
781.50	0.00	784.05	0.00	786.60	0.07
781.55	0.00	784.10	0.01	786.65	0.09
781.60	0.00	784.15	0.01	786.70	0.13
781.65	0.00	784.20	0.01	786.75	0.17
781.70	0.00	784.25	0.02	786.80	0.23
781.75	0.00	784.30	0.02	786.85	0.29
781.80	0.00	784.35	0.02	786.90	0.36
781.85	0.00	784.40	0.02	786.95	0.43
781.90	0.00	784.45	0.02	787.00	0.49
781.95	0.00	784.50	0.03	787.05	0.54
782.00	0.00	784.55	0.03	787.10	0.58
782.05	0.00	784.60	0.03	787.15	0.63
782.10	0.00	784.65	0.03	787.20	0.67
782.15	0.00	784.70	0.03	787.25	0.70
782.20	0.00	784.75	0.03	787.30	0.74
782.25	0.00	784.80	0.03	787.35	0.77
782.30	0.00	784.85	0.03	787.40	0.95
782.35	0.00	784.90	0.03	787.45	1.24
782.40	0.00	784.95	0.04	787.50	1.62
782.45	0.00	785.00	0.04	787.55	2.05
782.50	0.00	785.05	0.04	787.60	2.53
782.55	0.00	785.10	0.04	787.65	3.06
782.60	0.00	785.15	0.04	787.70	3.63
782.65	0.00	785.20	0.04	787.75	4.24
782.70	0.00	785.25	0.04	787.80	4.88
782.75	0.00	785.30	0.04	787.85	5.55
782.80	0.00	785.35	0.04	787.90	6.25
782.85	0.00	785.40	0.04	787.95	6.99
782.90	0.00	785.45	0.04	788.00	**7.74**
782.95	0.00	785.50	0.05		
783.00	0.00	785.55	0.05		

Stage-Area-Storage for Pond 1P: Oversized Pipe

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
780.50	0.000	783.05	0.073	785.60	0.176
780.55	0.000	783.10	0.075	785.65	0.178
780.60	0.001	783.15	0.077	785.70	0.180
780.65	0.001	783.20	0.079	785.75	0.182
780.70	0.002	783.25	0.081	785.80	0.184
780.75	0.002	783.30	0.083	785.85	0.186
780.80	0.003	783.35	0.085	785.90	0.188
780.85	0.004	783.40	0.087	785.95	0.189
780.90	0.005	783.45	0.089	786.00	0.191
780.95	0.006	783.50	0.091	786.05	0.193
781.00	0.007	783.55	0.093	786.10	0.195
781.05	0.008	783.60	0.095	786.15	0.197
781.10	0.009	783.65	0.097	786.20	0.198
781.15	0.010	783.70	0.099	786.25	0.200
781.20	0.011	783.75	0.101	786.30	0.202
781.25	0.013	783.80	0.103	786.35	0.204
781.30	0.014	783.85	0.105	786.40	0.205
781.35	0.015	783.90	0.107	786.45	0.207
781.40	0.017	783.95	0.109	786.50	0.209
781.45	0.018	784.00	0.111	786.55	0.210
781.50	0.019	784.05	0.113	786.60	0.212
781.55	0.021	784.10	0.116	786.65	0.214
781.60	0.022	784.15	0.118	786.70	0.215
781.65	0.024	784.20	0.120	786.75	0.217
781.70	0.025	784.25	0.122	786.80	0.218
781.75	0.027	784.30	0.124	786.85	0.220
781.80	0.028	784.35	0.126	786.90	0.221
781.85	0.030	784.40	0.128	786.95	0.223
781.90	0.031	784.45	0.130	787.00	0.224
781.95	0.033	784.50	0.132	787.05	0.226
782.00	0.035	784.55	0.134	787.10	0.227
782.05	0.036	784.60	0.136	787.15	0.228
782.10	0.038	784.65	0.138	787.20	0.229
782.15	0.040	784.70	0.140	787.25	0.231
782.20	0.041	784.75	0.142	787.30	0.232
782.25	0.043	784.80	0.144	787.35	0.233
782.30	0.045	784.85	0.146	787.40	0.234
782.35	0.047	784.90	0.148	787.45	0.235
782.40	0.048	784.95	0.150	787.50	0.236
782.45	0.050	785.00	0.152	787.55	0.237
782.50	0.052	785.05	0.155	787.60	0.238
782.55	0.054	785.10	0.157	787.65	0.239
782.60	0.056	785.15	0.159	787.70	0.240
782.65	0.058	785.20	0.161	787.75	0.241
782.70	0.060	785.25	0.163	787.80	0.242
782.75	0.061	785.30	0.165	787.85	0.242
782.80	0.063	785.35	0.166	787.90	0.243
782.85	0.065	785.40	0.168	787.95	0.243
782.90	0.067	785.45	0.170	788.00	**0.243**
782.95	0.069	785.50	0.172		
783.00	0.071	785.55	0.174		

Summary for Subcatchment A1: Project Detained

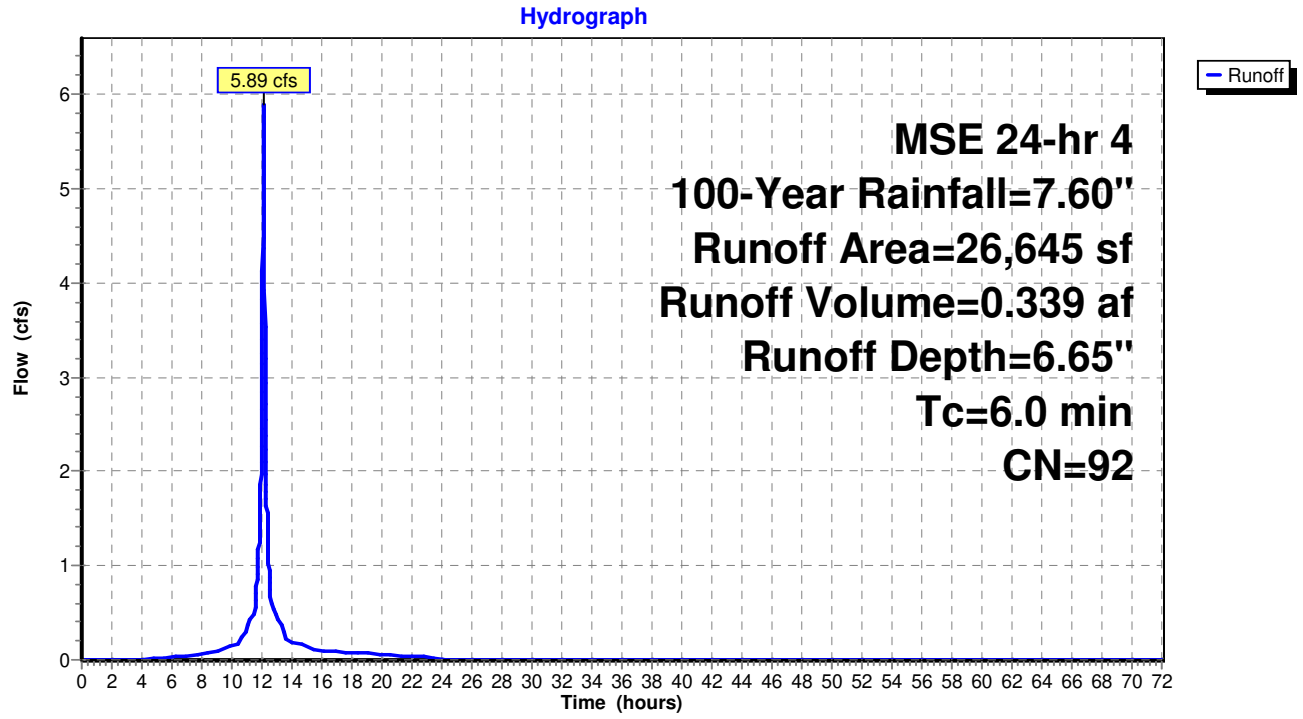
Runoff = 5.89 cfs @ 12.13 hrs, Volume= 0.339 af, Depth= 6.65"
Routed to Pond 1P : Oversized Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 100-Year Rainfall=7.60"

	Area (sf)	CN	Description
	13,722	98	Paved parking, HSG B
*	8,443	98	Roof
	4,480	61	>75% Grass cover, Good, HSG B
	26,645	92	Weighted Average
	4,480		16.81% Pervious Area
	22,165		83.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A1: Project Detained



Hydrograph for Subcatchment A1: Project Detained

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.16	0.00	0.00
4.00	0.25	0.01	0.01
5.00	0.35	0.03	0.02
6.00	0.47	0.07	0.03
7.00	0.60	0.14	0.05
8.00	0.75	0.23	0.06
9.00	0.92	0.34	0.08
10.00	1.20	0.56	0.14
11.00	1.64	0.92	0.35
12.00	3.56	2.70	**3.00**
13.00	5.96	5.03	**0.46**
14.00	6.40	5.46	0.19
15.00	6.68	5.74	0.16
16.00	6.85	5.90	0.10
17.00	7.00	6.05	0.09
18.00	7.13	6.19	0.08
19.00	7.25	6.30	0.07
20.00	7.35	6.40	0.06
21.00	7.44	6.49	0.05
22.00	7.51	6.56	0.04
23.00	7.56	6.61	0.03
24.00	**7.60**	**6.65**	0.02
25.00	7.60	6.65	0.00
26.00	7.60	6.65	0.00
27.00	7.60	6.65	0.00
28.00	7.60	6.65	0.00
29.00	7.60	6.65	0.00
30.00	7.60	6.65	0.00
31.00	7.60	6.65	0.00
32.00	7.60	6.65	0.00
33.00	7.60	6.65	0.00
34.00	7.60	6.65	0.00
35.00	7.60	6.65	0.00
36.00	7.60	6.65	0.00
37.00	7.60	6.65	0.00
38.00	7.60	6.65	0.00
39.00	7.60	6.65	0.00
40.00	7.60	6.65	0.00
41.00	7.60	6.65	0.00
42.00	7.60	6.65	0.00
43.00	7.60	6.65	0.00
44.00	7.60	6.65	0.00
45.00	7.60	6.65	0.00
46.00	7.60	6.65	0.00
47.00	7.60	6.65	0.00
48.00	7.60	6.65	0.00
49.00	7.60	6.65	0.00
50.00	7.60	6.65	0.00
51.00	7.60	6.65	0.00
52.00	7.60	6.65	0.00
53.00	7.60	6.65	0.00
54.00	7.60	6.65	0.00
55.00	7.60	6.65	0.00
56.00	7.60	6.65	0.00
57.00	7.60	6.65	0.00
58.00	7.60	6.65	0.00
59.00	7.60	6.65	0.00
60.00	7.60	6.65	0.00
61.00	7.60	6.65	0.00
62.00	7.60	6.65	0.00
63.00	7.60	6.65	0.00
64.00	7.60	6.65	0.00
65.00	7.60	6.65	0.00
66.00	7.60	6.65	0.00
67.00	7.60	6.65	0.00
68.00	7.60	6.65	0.00
69.00	7.60	6.65	0.00
70.00	7.60	6.65	0.00
71.00	7.60	6.65	0.00
72.00	7.60	6.65	0.00

Summary for Subcatchment A2: Runon Detained

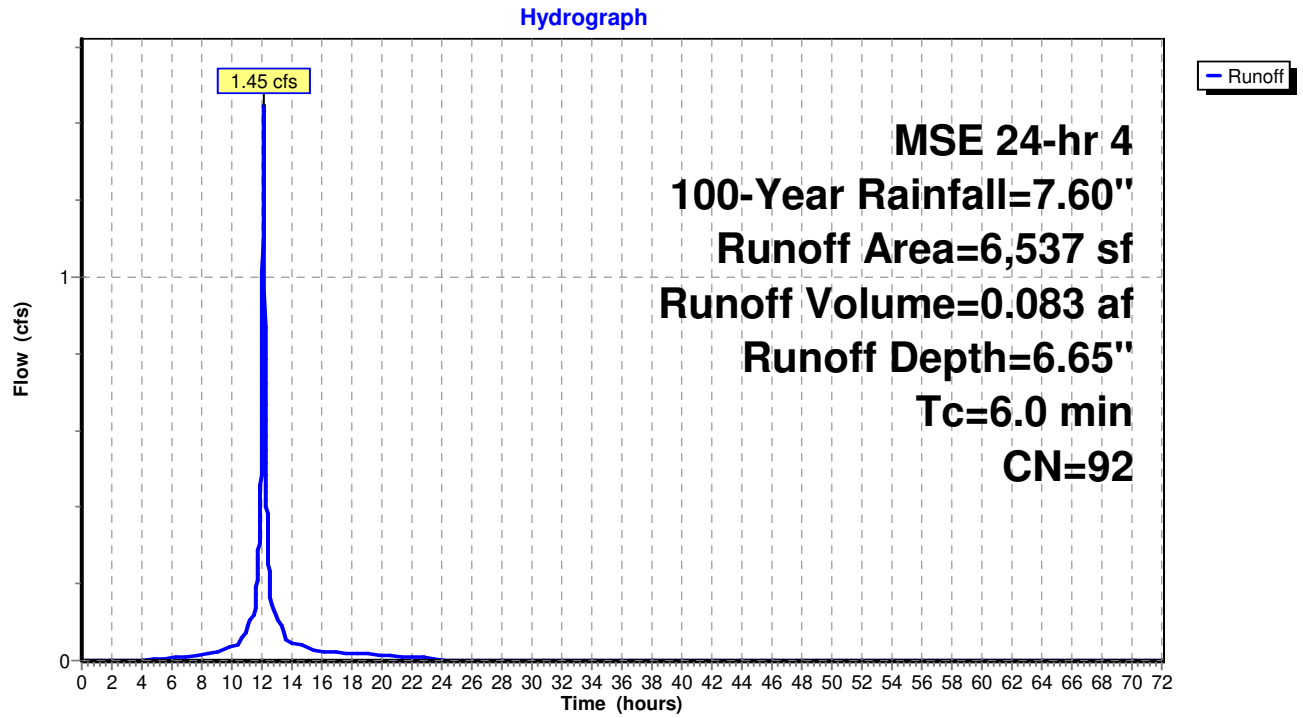
Runoff = 1.45 cfs @ 12.13 hrs, Volume= 0.083 af, Depth= 6.65"
Routed to Pond 1P : Oversized Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 100-Year Rainfall=7.60"

	Area (sf)	CN	Description
*	5,529	98	Roof
	1,008	61	>75% Grass cover, Good, HSG B
	6,537	92	Weighted Average
	1,008		15.42% Pervious Area
	5,529		84.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A2: Runon Detained



Hydrograph for Subcatchment A2: Runon Detained

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.16	0.00	0.00
4.00	0.25	0.01	0.00
5.00	0.35	0.03	0.00
6.00	0.47	0.07	0.01
7.00	0.60	0.14	0.01
8.00	0.75	0.23	0.02
9.00	0.92	0.34	0.02
10.00	1.20	0.56	0.04
11.00	1.64	0.92	0.08
12.00	3.56	2.70	**0.74**
13.00	5.96	5.03	**0.11**
14.00	6.40	5.46	0.05
15.00	6.68	5.74	0.04
16.00	6.85	5.90	0.02
17.00	7.00	6.05	0.02
18.00	7.13	6.19	0.02
19.00	7.25	6.30	0.02
20.00	7.35	6.40	0.01
21.00	7.44	6.49	0.01
22.00	7.51	6.56	0.01
23.00	7.56	6.61	0.01
24.00	**7.60**	**6.65**	0.00
25.00	7.60	6.65	0.00
26.00	7.60	6.65	0.00
27.00	7.60	6.65	0.00
28.00	7.60	6.65	0.00
29.00	7.60	6.65	0.00
30.00	7.60	6.65	0.00
31.00	7.60	6.65	0.00
32.00	7.60	6.65	0.00
33.00	7.60	6.65	0.00
34.00	7.60	6.65	0.00
35.00	7.60	6.65	0.00
36.00	7.60	6.65	0.00
37.00	7.60	6.65	0.00
38.00	7.60	6.65	0.00
39.00	7.60	6.65	0.00
40.00	7.60	6.65	0.00
41.00	7.60	6.65	0.00
42.00	7.60	6.65	0.00
43.00	7.60	6.65	0.00
44.00	7.60	6.65	0.00
45.00	7.60	6.65	0.00
46.00	7.60	6.65	0.00
47.00	7.60	6.65	0.00
48.00	7.60	6.65	0.00
49.00	7.60	6.65	0.00
50.00	7.60	6.65	0.00
51.00	7.60	6.65	0.00
52.00	7.60	6.65	0.00
53.00	7.60	6.65	0.00
54.00	7.60	6.65	0.00
55.00	7.60	6.65	0.00
56.00	7.60	6.65	0.00
57.00	7.60	6.65	0.00
58.00	7.60	6.65	0.00
59.00	7.60	6.65	0.00
60.00	7.60	6.65	0.00
61.00	7.60	6.65	0.00
62.00	7.60	6.65	0.00
63.00	7.60	6.65	0.00
64.00	7.60	6.65	0.00
65.00	7.60	6.65	0.00
66.00	7.60	6.65	0.00
67.00	7.60	6.65	0.00
68.00	7.60	6.65	0.00
69.00	7.60	6.65	0.00
70.00	7.60	6.65	0.00
71.00	7.60	6.65	0.00
72.00	7.60	6.65	0.00

Summary for Subcatchment A3: Project Undetained

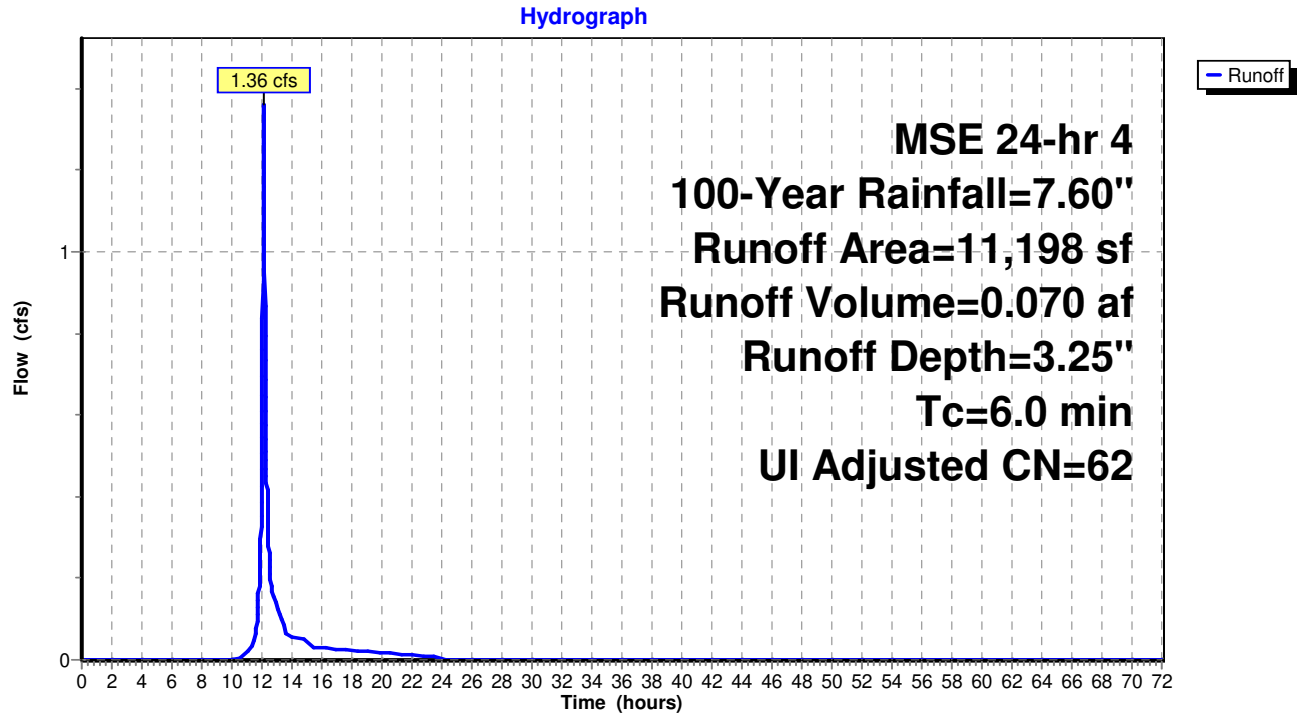
Runoff = 1.36 cfs @ 12.14 hrs, Volume= 0.070 af, Depth= 3.25"
Routed to Reach R2 : Post Developed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 100-Year Rainfall=7.60"

Area (sf)	CN	Adj	Description
739	98		Unconnected pavement, HSG B
10,459	61		>75% Grass cover, Good, HSG B
11,198	63	62	Weighted Average, UI Adjusted
10,459			93.40% Pervious Area
739			6.60% Impervious Area
739			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A3: Project Undetained



Hydrograph for Subcatchment A3: Project Undetained

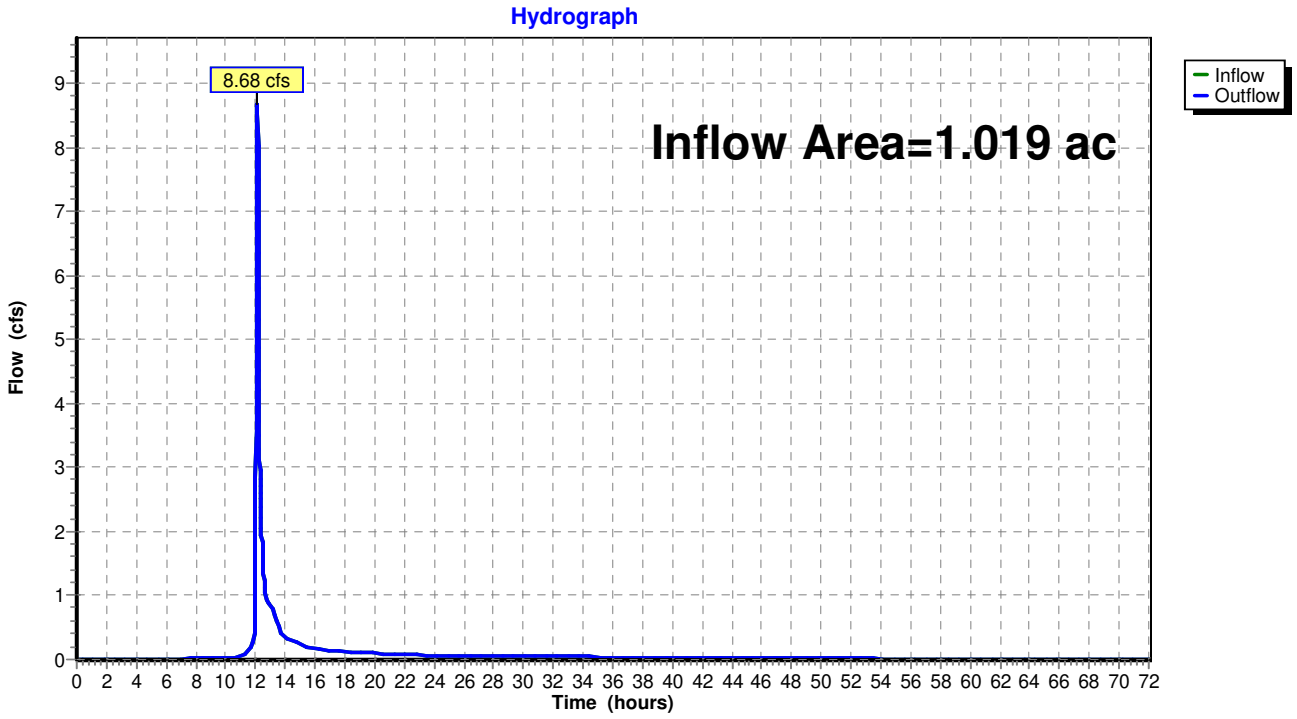
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.16	0.00	0.00
4.00	0.25	0.00	0.00
5.00	0.35	0.00	0.00
6.00	0.47	0.00	0.00
7.00	0.60	0.00	0.00
8.00	0.75	0.00	0.00
9.00	0.92	0.00	0.00
10.00	1.20	0.00	0.00
11.00	1.64	0.03	0.02
12.00	3.56	0.64	**0.54**
13.00	5.96	2.06	**0.13**
14.00	6.40	2.37	0.06
15.00	6.68	2.57	0.05
16.00	6.85	2.69	0.03
17.00	7.00	2.80	0.03
18.00	7.13	2.90	0.02
19.00	7.25	2.99	0.02
20.00	7.35	3.06	0.02
21.00	7.44	3.13	0.02
22.00	7.51	3.18	0.01
23.00	7.56	3.22	0.01
24.00	**7.60**	**3.25**	0.01
25.00	7.60	3.25	0.00
26.00	7.60	3.25	0.00
27.00	7.60	3.25	0.00
28.00	7.60	3.25	0.00
29.00	7.60	3.25	0.00
30.00	7.60	3.25	0.00
31.00	7.60	3.25	0.00
32.00	7.60	3.25	0.00
33.00	7.60	3.25	0.00
34.00	7.60	3.25	0.00
35.00	7.60	3.25	0.00
36.00	7.60	3.25	0.00
37.00	7.60	3.25	0.00
38.00	7.60	3.25	0.00
39.00	7.60	3.25	0.00
40.00	7.60	3.25	0.00
41.00	7.60	3.25	0.00
42.00	7.60	3.25	0.00
43.00	7.60	3.25	0.00
44.00	7.60	3.25	0.00
45.00	7.60	3.25	0.00
46.00	7.60	3.25	0.00
47.00	7.60	3.25	0.00
48.00	7.60	3.25	0.00
49.00	7.60	3.25	0.00
50.00	7.60	3.25	0.00
51.00	7.60	3.25	0.00
52.00	7.60	3.25	0.00
53.00	7.60	3.25	0.00
54.00	7.60	3.25	0.00
55.00	7.60	3.25	0.00
56.00	7.60	3.25	0.00
57.00	7.60	3.25	0.00
58.00	7.60	3.25	0.00
59.00	7.60	3.25	0.00
60.00	7.60	3.25	0.00
61.00	7.60	3.25	0.00
62.00	7.60	3.25	0.00
63.00	7.60	3.25	0.00
64.00	7.60	3.25	0.00
65.00	7.60	3.25	0.00
66.00	7.60	3.25	0.00
67.00	7.60	3.25	0.00
68.00	7.60	3.25	0.00
69.00	7.60	3.25	0.00
70.00	7.60	3.25	0.00
71.00	7.60	3.25	0.00
72.00	7.60	3.25	0.00

Summary for Reach R2: Post Developed

Inflow Area = 1.019 ac, 64.07% Impervious, Inflow Depth = 5.78" for 100-Year event
Inflow = 8.68 cfs @ 12.13 hrs, Volume= 0.491 af
Outflow = 8.68 cfs @ 12.13 hrs, Volume= 0.491 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach R2: Post Developed



Hydrograph for Reach R2: Post Developed

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00
1.00	0.00		0.00
2.00	0.00		0.00
3.00	0.00		0.00
4.00	0.00		0.00
5.00	0.00		0.00
6.00	0.01		0.01
7.00	0.01		0.01
8.00	0.02		0.02
9.00	0.02		0.02
10.00	0.03		0.03
11.00	0.06		0.06
12.00	**1.41**		**1.41**
13.00	**0.83**		**0.83**
14.00	0.34		0.34
15.00	0.26		0.26
16.00	0.16		0.16
17.00	0.14		0.14
18.00	0.13		0.13
19.00	0.11		0.11
20.00	0.10		0.10
21.00	0.09		0.09
22.00	0.07		0.07
23.00	0.07		0.07
24.00	0.06		0.06
25.00	0.06		0.06
26.00	0.06		0.06
27.00	0.05		0.05
28.00	0.05		0.05
29.00	0.05		0.05
30.00	0.05		0.05
31.00	0.05		0.05
32.00	0.05		0.05
33.00	0.04		0.04
34.00	0.04		0.04
35.00	0.04		0.04
36.00	0.04		0.04
37.00	0.04		0.04
38.00	0.04		0.04
39.00	0.04		0.04
40.00	0.03		0.03
41.00	0.03		0.03
42.00	0.03		0.03
43.00	0.03		0.03
44.00	0.03		0.03
45.00	0.03		0.03
46.00	0.03		0.03
47.00	0.02		0.02
48.00	0.02		0.02
49.00	0.02		0.02
50.00	0.02		0.02
51.00	0.02		0.02
52.00	0.02		0.02
53.00	0.02		0.02
54.00	0.01		0.01
55.00	0.01		0.01
56.00	0.01		0.01
57.00	0.01		0.01
58.00	0.01		0.01
59.00	0.01		0.01
60.00	0.01		0.01
61.00	0.00		0.00
62.00	0.00		0.00
63.00	0.00		0.00
64.00	0.00		0.00
65.00	0.00		0.00
66.00	0.00		0.00
67.00	0.00		0.00
68.00	0.00		0.00
69.00	0.00		0.00
70.00	0.00		0.00
71.00	0.00		0.00
72.00	0.00		0.00

Summary for Pond 1P: Oversized Pipe

Inflow Area = 0.762 ac, 83.46% Impervious, Inflow Depth = 6.65" for 100-Year event
Inflow = 7.34 cfs @ 12.13 hrs, Volume= 0.422 af
Outflow = 7.32 cfs @ 12.13 hrs, Volume= 0.421 af, Atten= 0%, Lag= 0.3 min
Primary = 7.32 cfs @ 12.13 hrs, Volume= 0.421 af
Routed to Reach R2 : Post Developed

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Starting Elev= 784.00' Surf.Area= 0.041 ac Storage= 0.111 af
Peak Elev= 787.97' @ 12.13 hrs Surf.Area= 0.005 ac Storage= 0.243 af (0.132 af above start)

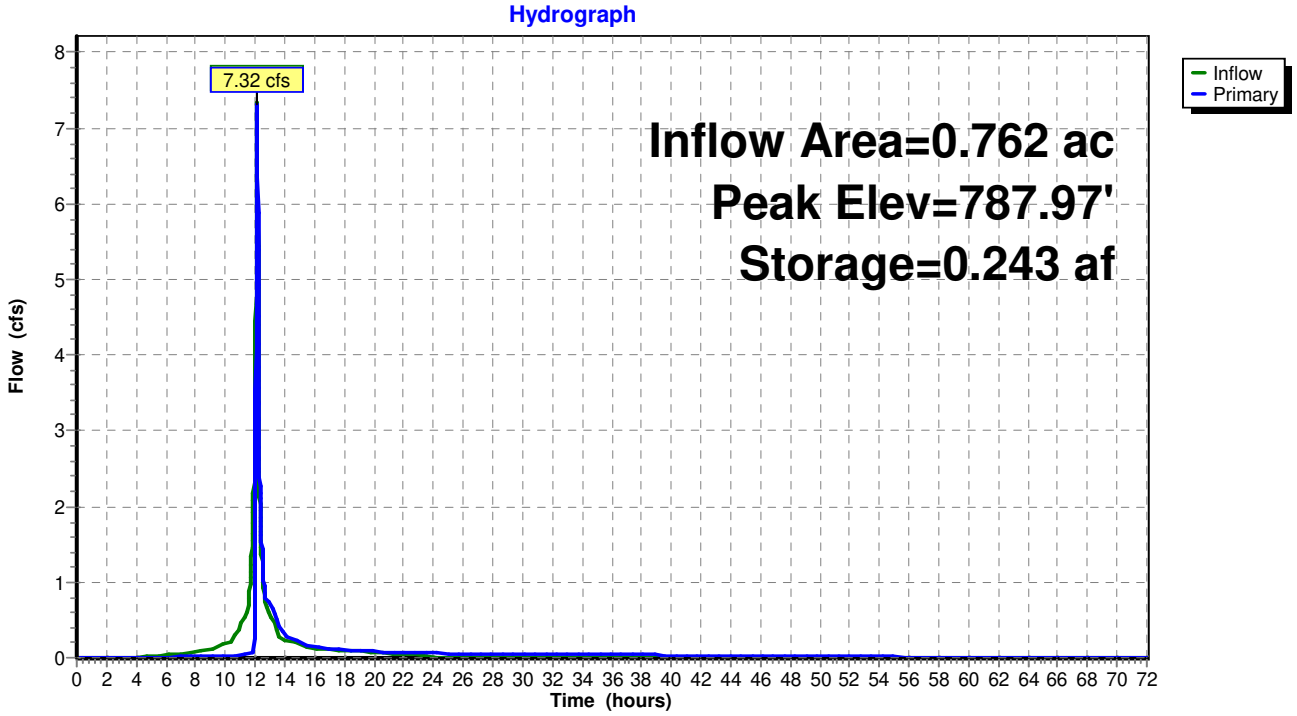
Plug-Flow detention time= 617.2 min calculated for 0.310 af (73% of inflow)
Center-of-Mass det. time= 384.0 min (1,150.1 - 766.2)

Volume	Invert	Avail.Storage	Storage Description
#1	780.50'	0.243 af	**90.0" Round Pipe Storage** L= 240.0'

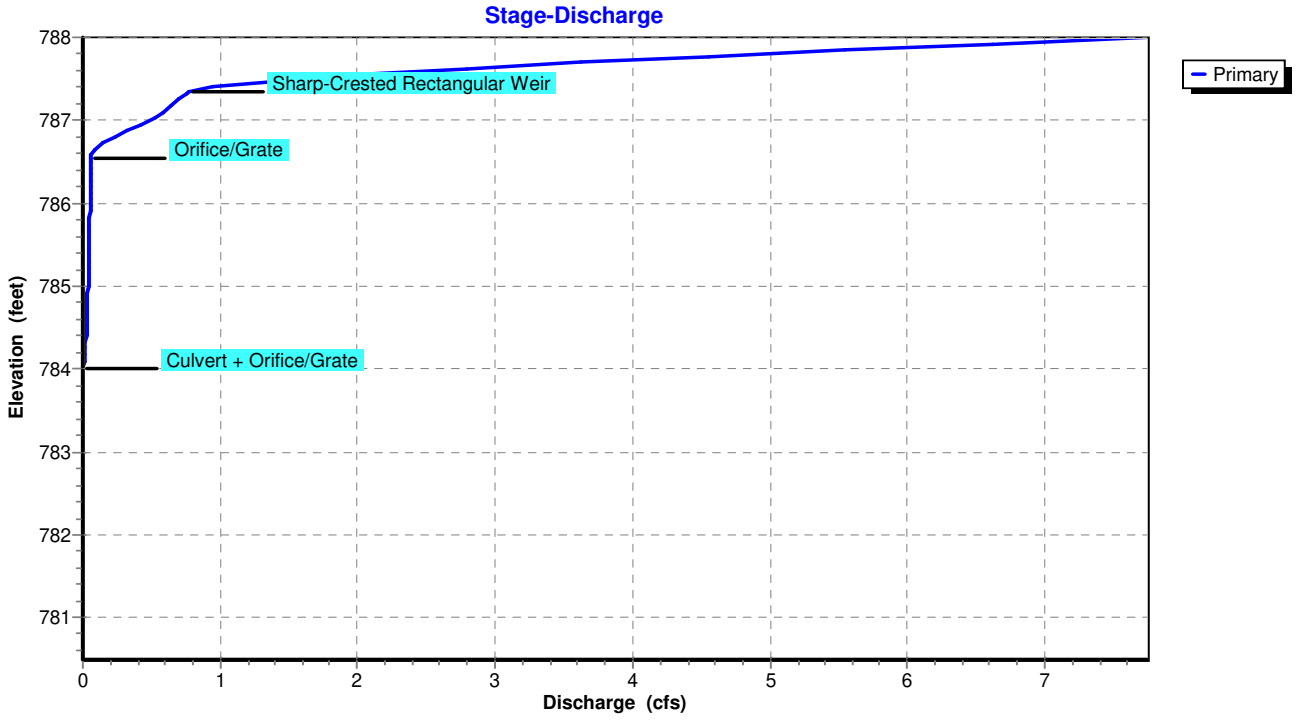
Device	Routing	Invert	Outlet Devices
#1	Primary	784.00'	**18.0" Round Culvert** L= 19.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 784.00' / 783.75' S= 0.0132 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Device 1	784.00'	**1.2" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	786.55'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	787.35'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=7.30 cfs @ 12.13 hrs HW=787.97' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 7.30 cfs of 13.47 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.07 cfs @ 9.53 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 1.02 cfs @ 5.21 fps)
  └─**4=Sharp-Crested Rectangular Weir** (Weir Controls 6.20 cfs @ 2.58 fps)

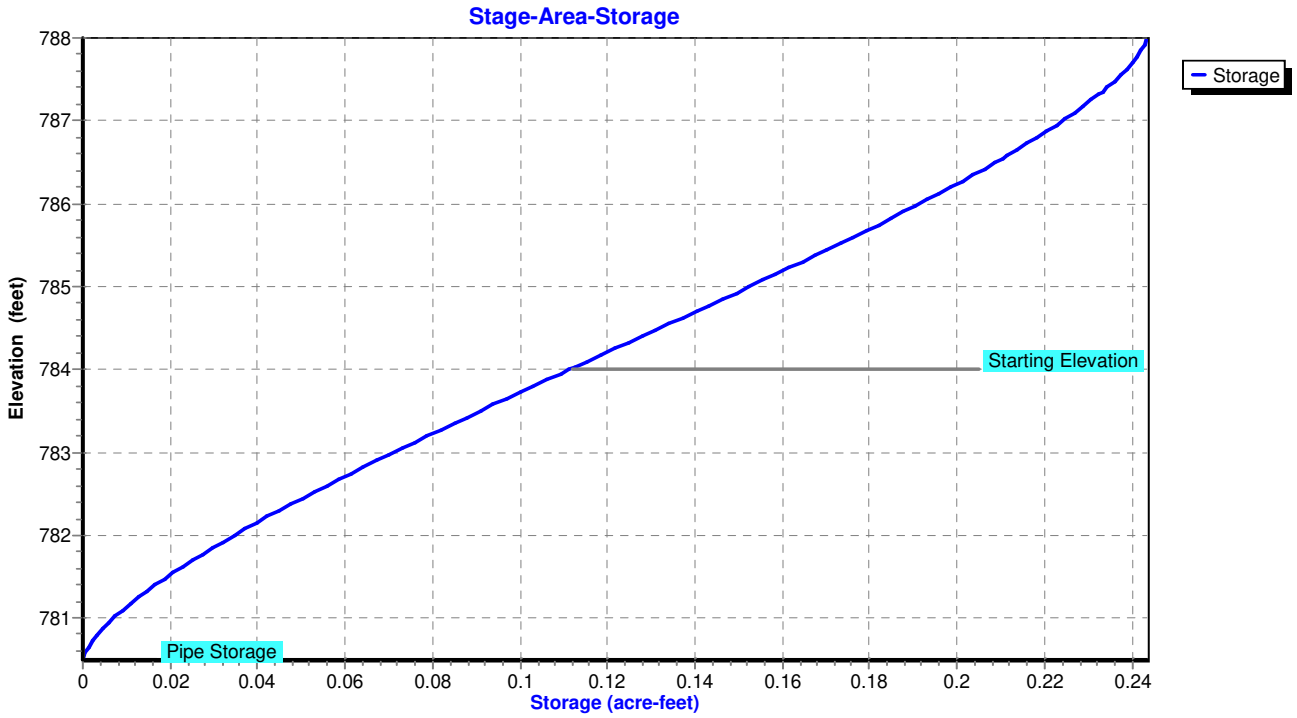
Pond 1P: Oversized Pipe



Pond 1P: Oversized Pipe



Pond 1P: Oversized Pipe



Hydrograph for Pond 1P: Oversized Pipe

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.111	784.00	0.00
2.00	0.00	0.111	784.00	0.00
4.00	0.01	0.112	784.01	0.00
6.00	0.04	0.115	784.10	0.01
8.00	0.08	0.123	784.28	0.02
10.00	0.18	0.139	784.67	0.03
12.00	**3.73**	**0.234**	**787.38**	**0.87**
14.00	**0.23**	**0.220**	**786.85**	**0.29**
16.00	0.12	0.215	786.71	0.13
18.00	0.10	0.214	786.67	0.10
20.00	0.07	0.213	786.63	0.08
22.00	0.05	0.211	786.58	0.06
24.00	0.02	0.207	786.46	0.06
26.00	0.00	0.198	786.19	0.06
28.00	0.00	0.189	785.94	0.05
30.00	0.00	0.181	785.72	0.05
32.00	0.00	0.173	785.52	0.05
34.00	0.00	0.166	785.33	0.04
36.00	0.00	0.159	785.16	0.04
38.00	0.00	0.153	785.00	0.04
40.00	0.00	0.147	784.86	0.03
42.00	0.00	0.141	784.73	0.03
44.00	0.00	0.136	784.61	0.03
46.00	0.00	0.132	784.50	0.03
48.00	0.00	0.128	784.40	0.02
50.00	0.00	0.125	784.32	0.02
52.00	0.00	0.122	784.25	0.02
54.00	0.00	0.119	784.18	0.01
56.00	0.00	0.117	784.14	0.01
58.00	0.00	0.115	784.10	0.01
60.00	0.00	0.114	784.07	0.01
62.00	0.00	0.114	784.05	0.00
64.00	0.00	0.113	784.04	0.00
66.00	0.00	0.113	784.03	0.00
68.00	0.00	0.113	784.03	0.00
70.00	0.00	0.112	784.03	0.00
72.00	0.00	0.112	784.02	0.00

Stage-Discharge for Pond 1P: Oversized Pipe

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
780.50	0.00	783.05	0.00	785.60	0.05
780.55	0.00	783.10	0.00	785.65	0.05
780.60	0.00	783.15	0.00	785.70	0.05
780.65	0.00	783.20	0.00	785.75	0.05
780.70	0.00	783.25	0.00	785.80	0.05
780.75	0.00	783.30	0.00	785.85	0.05
780.80	0.00	783.35	0.00	785.90	0.05
780.85	0.00	783.40	0.00	785.95	0.05
780.90	0.00	783.45	0.00	786.00	0.05
780.95	0.00	783.50	0.00	786.05	0.05
781.00	0.00	783.55	0.00	786.10	0.05
781.05	0.00	783.60	0.00	786.15	0.05
781.10	0.00	783.65	0.00	786.20	0.06
781.15	0.00	783.70	0.00	786.25	0.06
781.20	0.00	783.75	0.00	786.30	0.06
781.25	0.00	783.80	0.00	786.35	0.06
781.30	0.00	783.85	0.00	786.40	0.06
781.35	0.00	783.90	0.00	786.45	0.06
781.40	0.00	783.95	0.00	786.50	0.06
781.45	0.00	784.00	0.00	786.55	0.06
781.50	0.00	784.05	0.00	786.60	0.07
781.55	0.00	784.10	0.01	786.65	0.09
781.60	0.00	784.15	0.01	786.70	0.13
781.65	0.00	784.20	0.01	786.75	0.17
781.70	0.00	784.25	0.02	786.80	0.23
781.75	0.00	784.30	0.02	786.85	0.29
781.80	0.00	784.35	0.02	786.90	0.36
781.85	0.00	784.40	0.02	786.95	0.43
781.90	0.00	784.45	0.02	787.00	0.49
781.95	0.00	784.50	0.03	787.05	0.54
782.00	0.00	784.55	0.03	787.10	0.58
782.05	0.00	784.60	0.03	787.15	0.63
782.10	0.00	784.65	0.03	787.20	0.67
782.15	0.00	784.70	0.03	787.25	0.70
782.20	0.00	784.75	0.03	787.30	0.74
782.25	0.00	784.80	0.03	787.35	0.77
782.30	0.00	784.85	0.03	787.40	0.95
782.35	0.00	784.90	0.03	787.45	1.24
782.40	0.00	784.95	0.04	787.50	1.62
782.45	0.00	785.00	0.04	787.55	2.05
782.50	0.00	785.05	0.04	787.60	2.53
782.55	0.00	785.10	0.04	787.65	3.06
782.60	0.00	785.15	0.04	787.70	3.63
782.65	0.00	785.20	0.04	787.75	4.24
782.70	0.00	785.25	0.04	787.80	4.88
782.75	0.00	785.30	0.04	787.85	5.55
782.80	0.00	785.35	0.04	787.90	6.25
782.85	0.00	785.40	0.04	787.95	6.99
782.90	0.00	785.45	0.04	788.00	**7.74**
782.95	0.00	785.50	0.05		
783.00	0.00	785.55	0.05		

Stage-Area-Storage for Pond 1P: Oversized Pipe

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
780.50	0.000	783.05	0.073	785.60	0.176
780.55	0.000	783.10	0.075	785.65	0.178
780.60	0.001	783.15	0.077	785.70	0.180
780.65	0.001	783.20	0.079	785.75	0.182
780.70	0.002	783.25	0.081	785.80	0.184
780.75	0.002	783.30	0.083	785.85	0.186
780.80	0.003	783.35	0.085	785.90	0.188
780.85	0.004	783.40	0.087	785.95	0.189
780.90	0.005	783.45	0.089	786.00	0.191
780.95	0.006	783.50	0.091	786.05	0.193
781.00	0.007	783.55	0.093	786.10	0.195
781.05	0.008	783.60	0.095	786.15	0.197
781.10	0.009	783.65	0.097	786.20	0.198
781.15	0.010	783.70	0.099	786.25	0.200
781.20	0.011	783.75	0.101	786.30	0.202
781.25	0.013	783.80	0.103	786.35	0.204
781.30	0.014	783.85	0.105	786.40	0.205
781.35	0.015	783.90	0.107	786.45	0.207
781.40	0.017	783.95	0.109	786.50	0.209
781.45	0.018	784.00	0.111	786.55	0.210
781.50	0.019	784.05	0.113	786.60	0.212
781.55	0.021	784.10	0.116	786.65	0.214
781.60	0.022	784.15	0.118	786.70	0.215
781.65	0.024	784.20	0.120	786.75	0.217
781.70	0.025	784.25	0.122	786.80	0.218
781.75	0.027	784.30	0.124	786.85	0.220
781.80	0.028	784.35	0.126	786.90	0.221
781.85	0.030	784.40	0.128	786.95	0.223
781.90	0.031	784.45	0.130	787.00	0.224
781.95	0.033	784.50	0.132	787.05	0.226
782.00	0.035	784.55	0.134	787.10	0.227
782.05	0.036	784.60	0.136	787.15	0.228
782.10	0.038	784.65	0.138	787.20	0.229
782.15	0.040	784.70	0.140	787.25	0.231
782.20	0.041	784.75	0.142	787.30	0.232
782.25	0.043	784.80	0.144	787.35	0.233
782.30	0.045	784.85	0.146	787.40	0.234
782.35	0.047	784.90	0.148	787.45	0.235
782.40	0.048	784.95	0.150	787.50	0.236
782.45	0.050	785.00	0.152	787.55	0.237
782.50	0.052	785.05	0.155	787.60	0.238
782.55	0.054	785.10	0.157	787.65	0.239
782.60	0.056	785.15	0.159	787.70	0.240
782.65	0.058	785.20	0.161	787.75	0.241
782.70	0.060	785.25	0.163	787.80	0.242
782.75	0.061	785.30	0.165	787.85	0.242
782.80	0.063	785.35	0.166	787.90	0.243
782.85	0.065	785.40	0.168	787.95	0.243
782.90	0.067	785.45	0.170	788.00	**0.243**
782.95	0.069	785.50	0.172		
783.00	0.071	785.55	0.174		

5 Sediment Reduction Calculations

Data file name: M:\Duncan G. Stroik Architect\200196_LaCrosse Retreat Center\Design Development\Stormwater and Erosion Control\Modeling\TSS Modeling\Undergr
WinSLAMM Version 10.5.0
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
Seed for random number generator: -42
Study period starting date: 01/01/81 Study period ending date: 12/31/81
Start of Winter Season: 12/02 End of Winter Season: 03/12
Date: 08-14-2024 Time: 12:21:13
Site information:

LU# 1 - Institutional: Project Detained A1 Total area (ac): 0.705
1 - Roofs 1: 0.198 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.051 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
25 - Driveways 1: 0.230 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.033 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 0.193 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 2 - Institutional: Runon Detained A2 Total area (ac): 0.110
1 - Roofs 1: 0.074 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.013 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 0.023 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 3 - Institutional: Project Undetained A3 Total area (ac): 0.182
57 - Undeveloped Areas 1: 0.167 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
78 - Other Part Con Imp Areas 1: 0.015 ac. Disconnected Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Fi

Control Practice 1: Wet Detention Pond CP# 1 (DS) - DS Wet Pond # 1
Particle Size Distribution file name: Not needed - calculated by program
Initial stage elevation (ft): 3.5
Peak to Average Flow Ratio: 3.8
Maximum flow allowed into pond (cfs): No maximum value entered
Outlet Characteristics:
Outlet type: Orifice 1
1. Orifice diameter (ft): 0.08
2. Number of orifices: 1
3. Invert elevation above datum (ft): 3.5
Outlet type: Orifice 2
1. Orifice diameter (ft): 0.5
2. Number of orifices: 1
3. Invert elevation above datum (ft): 5
Outlet type: Broad Crested Weir
1. Weir crest length (ft): 0.01
2. Weir crest width (ft): 0.01
3. Height from datum to bottom of weir opening: 7.49
Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.0402	0.00	0.00
2	0.50	0.0402	0.00	0.00
3	1.00	0.0402	0.00	0.00
4	1.50	0.0402	0.00	0.00
5	2.00	0.0402	0.00	0.00
6	2.50	0.0402	0.00	0.00
7	3.00	0.0402	0.00	0.00
8	3.50	0.0402	0.00	0.00
9	4.00	0.0402	0.00	0.00
10	4.50	0.0402	0.00	0.00
11	5.00	0.0402	0.00	0.00
12	5.50	0.0402	0.00	0.00
13	6.00	0.0402	0.00	0.00
14	7.00	0.0402	0.00	0.00
15	7.50	0.0402	0.00	0.00

SLAMM for Windows Version 10.5.0

Data file name: M:\Duncan G. Stroik Architect\200196_LaCrosse Retreat Center\Design Development\Stormwater and Erosion Control\Modeling\TSS Modeling\Undergr
WinSLAMM Version 10.5.0
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
Seed for random number generator: -42
Study period starting date: 01/01/81 Study period ending date: 12/31/81
Start of Winter Season: 12/02 End of Winter Season: 03/12
Model Run Start Date: 01/01/81 Model Run End Date: 12/31/81
Date of run: 08-14-2024 Time of run: 12:19:28
Total Area Modeled (acres): 0.997
Years in Model Run: 1.00

	Runoff Volume (cu ft)	Percent Runoff Volume Reduction	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of all Land Uses without Controls:	53392	-	87.15	290.5	-
Outfall Total with Controls:	53470	-0.15%	13.42	44.79	84.58%
Annualized Total After Outfall Controls:	53616			44.91	

Exhibits

8.1 Stormwater Maintenance Agreement

DECLARATION OF CONDITIONS, COVENANTS AND RESTRICTIONS FOR MAINTENANCE OF STORMWATER MANAGEMENT MEASURES

This space is reserved for recording data

Return to:

City of La Crosse
Engineering Department
400 La Crosse Street
La Crosse, Wisconsin 54601

Tax Parcel No.: 17-50365 -100

RECITALS:

A. Shrine of Our Lady of Guadalupe, Inc. is the owner of the property located at 5250 Justin Road in the City La Crosse, more particularly described on Exhibit A attached hereto ("Property").

B. Owner desires to construct buildings and/or parking facilities on the Property in accordance with certain plans and specifications approved by the City.

C. The City requires Owner to record this Declaration regarding maintenance of stormwater management measures to be located on the Property. Owner agrees to maintain the stormwater management measures and to grant to the City the rights set forth below.

NOW, THEREFORE, in consideration of the declarations herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the owner agrees as follows:

1. Maintenance. Owner and its successors and assigns shall be responsible to repair and maintain the stormwater management measures located on the Property in good condition and in working order and such that the measures comply with the approved plans on file with the City Engineer. Said maintenance shall be at the Owner's sole cost and expense. Owner will conduct such maintenance or repair work in accordance with all applicable laws, codes, regulations, and similar requirements, and pursuant to the Maintenance Provisions attached hereto as Exhibit B.

2. Easement to City. If Owner fails to maintain the stormwater management measures as required in Section 1, then City shall have the right, after providing Owner with written notice of the maintenance issue ("Maintenance Notice") and thirty (30) days to comply with the City's maintenance request, to enter the Property in order to conduct the maintenance specified in the Maintenance Notice. City will conduct such maintenance work in accordance with all applicable laws, codes, regulations, and similar requirements and will not unreasonably interfere with Owner's use of the Property. All costs and expenses incurred by the City in conducting such maintenance may be charged to the owner of the Property by placing the amount on the tax roll for the Property as a special charge in accordance with Section 66.0627, Wis. Stats.

3. Term/Termination. The term of this Agreement shall commence on the date that this Agreement is filed of record with the Register of Deeds Office for La Crosse County, Wisconsin, and except as otherwise herein specifically provided, shall continue in perpetuity. Notwithstanding the foregoing, this Agreement may be terminated by recording with the Register of Deeds Office for La Crosse County, Wisconsin, a written instrument of termination signed by the City and all of the then-owners of the Property.

4. Miscellaneous.

(a) Notices. Any notice, request or demand required or permitted under this Agreement shall be in writing and shall be deemed given when personally served or three (3) days after the same has been deposited with the United States Post Office, registered or certified mail, return receipt requested, postage prepaid and addressed as follows:

If to Owner: Shrine of Our Lady of Guadalupe, Inc.
5250 Justin Rd.
PO Box 1237
La Crosse, WI 54601

If to City: City of La Crosse
Engineering Department
400 La Crosse Street
La Crosse, WI 54601
Attention: City Engineer

Any party may change its address for the receipt of notice by written notice to the other.

(b) Governing Law. This Agreement shall be governed and construed in accordance with the laws of the State of Wisconsin.

(c) Amendments or Further Agreements to be in Writing. This Agreement may not be modified in whole or in part unless such agreement is in writing and signed by all parties bound hereby.

(d) Covenants Running with the Land. All of the easements, restrictions, covenants and agreements set forth in this Agreement are intended to be and shall be construed as covenants running with the land, binding upon, inuring to the benefit of, and enforceable by the parties hereto and their respective successors and assigns.

(e) Partial Invalidity. If any provisions, or portions thereof, of this Agreement or the application thereof to any person or circumstance shall, to any extent, be invalid or unenforceable, the remainder of this Agreement, or the application of such provision, or portion thereof, to any other persons or circumstances shall not be affected thereby and each provision of this Agreement shall be valid and enforceable to the fullest extent permitted by law.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of _____, 20_____.

_____ _____

STATE OF WISCONSIN)
COUNTY OF LA CROSSE) SS

Personally came before me this _____ day of _____, 20_____, the above named _____, to me known to be the person(s) who executed the foregoing instrument and acknowledged the same.

_____
NOTARY PUBLIC

My Commission Expires:_____

Drafted by: City of La Crosse
Engineering Department
400 La Crosse Street
La Crosse, Wisconsin 54601

EXHIBIT A

Part of the Northeast quarter of the Northwest quarter (NE/NW), Section 26, Township 15 North, Range 7 West, and also part of the Southeast quarter of the Southwest quarter (SE/SW), and part of the Southwest quarter of the Southeast quarter (SW /SE), and part of the Northwest quarter of the Southeast quarter (NW/SE) of Section 23, Township l5 North, Range 7 West. all located in the Town of Shelby, La Crosse County, Wisconsin, described as follows: Beginning at the South quarter corner of said Section 23, thence along the East line of said NE/NW, S01˚51’01”W 330.00 feet; thence N35˚06’45”W 411.61 feet to the North line of said NE/NW; thence N40˚38’51”E 582.72 feet; thence S89˚09’l7”E 209.98 feet; thence N00˚01’17”W 134.69 feet; thence N05˚1l’52”W 469.34 feet to the beginning of a 600.00 foot radius curve, concave to the Southeast; thence 332.56 feet along the arc of said curve, the chord of which bears N10˚40’50.5”E 328.32 feet to the end of said curve; thence N26˚33’33”E 103.23 feet; thence N17˚38’18”E 140.11 feet to the arc of a 439 foot radius curve, concave to the Northeast, on the South right of way line of Justin Road; thence along said right of way line, 66.35 feet along the arc of said curve, the chord of which bears S77˚42’23.5”E 66.29 feet; thence S17˚38’18”W 151.44 feet; thence S26˚33’33”W 108.38 feet to the beginning of a 534.00 foot radius curve concave to the Southeast; thence 295.98 feet along the arc of said curve, the chord of which bears S10˚40’50.5”W 292.20 feet to the end of said curve; thence S05˚11’52”E 472.32 feet; thence S00˚01’l7”E 138.67 feet; thence S89˚09’17”E 216.39 feet; thence S00˚12’20”E 180.00 feet; thence S47˚21’47”W 400.00 feet to the South line of said SW/SE; thence along said South line N88˚24’26”W 331.01 feet to the point of beginning. Said parcel contains 8.90 acres, and is subject to all easements. implied or recorded.

EXHIBIT B
Maintenance Provisions

An initial installation certification (as-built) stamped by a P.E. registered in the State of Wisconsin shall be submitted to the City Engineer upon completion of construction. The as-built shall be of sufficient detail to show the system was constructed and is functioning as designed. A statement by the certifying P.E. along with a drawing and digital photographs will suffice.

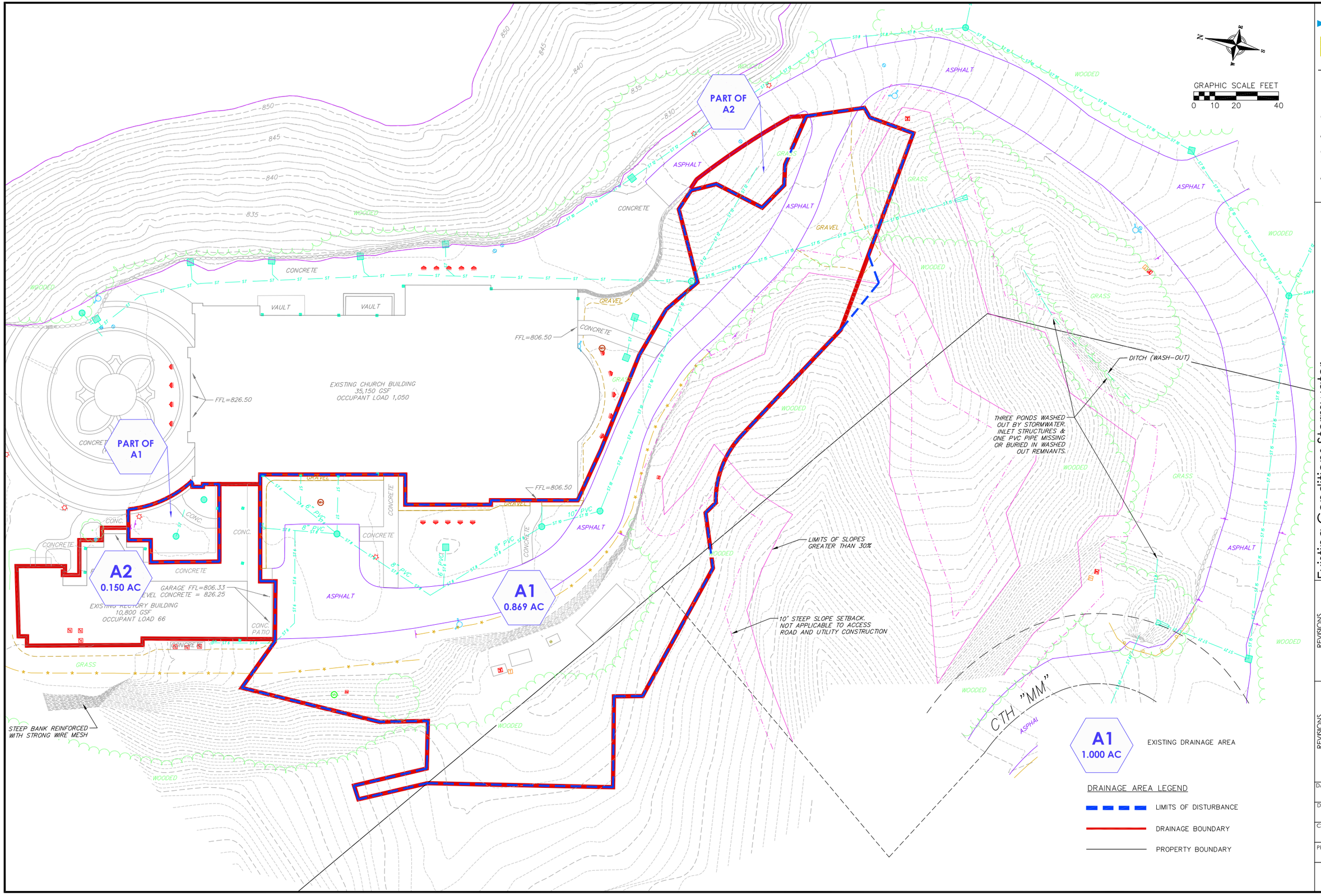
STORM SEWER SYSTEM

- The owner shall maintain all components of the storm sewer system located onsite.
- Installation and maintenance shall be in accordance with the manufacturer's guidelines. Any alterations to the approved storm sewer shall be approved by the City Engineer.
- At a minimum, the storm sewer system shall be inspected annually and cleaned as needed to maintain design capacity.
- Owner shall maintain records of inspections, cleaning and replacement of the storm sewer system all in accordance with Chapter 105 of the La Crosse General Ordinances.

UNDERGROUND STORAGE SYSTEM

- Regular inspections shall be completed at a minimum of once per year, typically in spring. This information will be used to determine the sediment build up within the system. Annual inspections should include the following:
    - Locate the riser sections and cleanouts of the retention/detention system. The riser will typically be 24" in diameter or larger.
    - Remove the lid from a riser.
    - Measure the sediment buildup at each riser and cleanout location. Only certified confined space entry personnel having appropriate equipment should be permitted to enter the retention/detention System.
    - Inspect each manifold, all laterals, and outlet pipes for sediment build up, obstructions, or other problems. Obstructions should be removed at this time.
    - If measured sediment build up is 6 inches or more, cleaning should be performed at the earliest opportunity. A thorough cleaning of the system (manifolds and laterals) shall be performed by either manual methods or by a vacuum truck.
    - All material removed from the system is considered hazardous waste and should be disposed of properly.
- Any alterations to approved underground storage system shall be reviewed and approved by the City Engineer. Owner shall maintain records of inspections, cleaning and replacement of the Underground Storage System all in accordance with Chapter 105 of the La Crosse General Ordinances.

8.2 Pre-Developed Drainage Map



vierbicher
planners | engineers | advisors
Phone: (800) 261-3898

Existing Conditions Stormwater

St. Juan Diego Pilgrim House
City of La Crosse
La Crosse County, WI

REVISIONS			
NO.	DATE	REMARKS	

REVISIONS			
NO.	DATE	REMARKS	

DATE 08/09/2024
DRAFTER CKNA/CSHE
CHECKED JKAS
PROJECT NO. 200196

EXH

16 Sep 2024 - 3:45p M:\Duncan G. Stroik Architect\200196_LaCrosse Retreat Center\CADD\200196 - Stormwater.dwg by: ckna

8.3 Post-Developed Drainage Map

DRAINAGE AREA – A1 DISTURBED AND DETAINED			
PHASE	PERV/IMP	AREA (AC)	CN
PROPOSED	IMPERVIOUS	0.51	98
	PERVIOUS	0.10	61
	TOTAL	0.61	92

DRAINAGE AREA – A2 UNDISTURBED AND DETAINED			
PHASE	PERV/IMP	AREA (AC)	CN
PROPOSED	IMPERVIOUS	0.13	98
	PERVIOUS	0.02	61
	TOTAL	0.15	92

DRAINAGE AREA – A3 DISTURBED AND UNDETAINED			
PHASE	PERV/IMP	AREA (AC)	CN
PROPOSED	IMPERVIOUS	0.02	98
	PERVIOUS	0.24	61
	TOTAL	0.26	63

PART OF A2

PART OF A1

A1
0.612 AC

A2
0.150 AC

A3
0.257 AC

EXISTING CHURCH BUILDING
35,150 GSF
OCCUPANT LOAD 1,050

GARAGE FFL=806.33
CONCRETE = 826.25
BUILDING
OCCUPANT LOAD 66

OCCUPANT LOAD 871

FFL=826.50

FFL=806.50

FFL=806.50

VAULT

VAULT

CONCRETE

ASPHALT

GRASS

GRAVEL

WOODED

STEEP BANK REINFORCED WITH STRONG WIRE MESH

53.5%

29.3%

40.2%

22.0%

18.3%

10.0'

10.0'

LIMITS OF SLOPES GREATER THAN 30%

10' STEEP SLOPE SETBACK. NOT APPLICABLE TO ACCESS ROAD AND UTILITY CONSTRUCTION

DITCH (WASH-OUT)

THREE PONDS WASHED OUT BY STORMWATER. INLET STRUCTURES & ONE PVC PIPE MISSING OR BURIED IN WASHED OUT REMNANTS.

CTH "MM"

GRAPHIC SCALE FEET
0 10 20 40

DRAINAGE AREA LEGEND

A1
1.000 AC
PROPOSED DRAINAGE AREA

LIMITS OF DISTURBANCE

DRAINAGE BOUNDARY

PROPERTY BOUNDARY

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Proposed Conditions Stormwater

St. Juan Diego Pilgrim House
City of La Crosse
La Crosse County, WI

REVISIONS			
NO.	DATE	REMARKS	

REVISIONS			
NO.	DATE	REMARKS	

DATE
08/09/2024

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JKAS

PROJECT NO.
200196

EXH

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8.4 Construction Plans

TOPOGRAPHIC SYMBOL LEGEND

- EXISTING SIGN (TYPE NOTED)
- EXISTING ENDWALL
- EXISTING FIELD INLET RECTANGULAR
- EXISTING FIELD INLET
- EXISTING ROOF DRAIN CLEANOUT
- EXISTING ROOF DRAIN
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING FIRE HYDRANT
- EXISTING FIRE DEPARTMENT CONNECTION
- EXISTING WATER MAIN VALVE
- EXISTING CURB STOP
- EXISTING GAS VALVE
- EXISTING GAS METER
- EXISTING AIR CONDITIONING PEDESTAL
- EXISTING ELECTRIC PEDESTAL
- EXISTING TRANSFORMER
- EXISTING ELECTRIC METER
- EXISTING GENERIC LIGHT
- EXISTING TELEPHONE PEDESTAL
- EXISTING UNIDENTIFIED MANHOLE
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE

TOPOGRAPHIC LINEWORK LEGEND

- EXISTING UNDERGROUND TELEPHONE
- EXISTING RETAINING WALL
- EXISTING IRON FENCE
- EXISTING GAS LINE
- EXISTING UNDERGROUND ELECTRIC LINE
- EXISTING SANITARY FORCE MAIN
- EXISTING SANITARY SEWER LINE (SIZE NOTED)
- EXISTING STORM SEWER LINE (SIZE NOTED)
- EXISTING EDGE OF TREES
- EXISTING WATER MAIN
- EXISTING GUARD RAIL
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR

GRAPHIC SCALE FEET
0 10 20 40

STORM STRUCTURE PER UTILITY MAP (SOMETHING MAGNETICALLY DETECTED UNDER ASPHALT DURING SURVEY)

BENCHMARK #2
TOP NUT/HYD
EL=814.83

S8-FIN
RIM EL=805.84
IE's N&E&SW=802.89

S12-FINR
RIM EL=824.28
IE NW=818.83
IE SE=818.68

S7-STMH
RIM EL=810.53
IE N=798.33
IE SE=805.48
IE S=797.73
IE NW=798.32

S9-FINR
RIM EL=793.21
IE's NE&SW=790.01

RCP ENDW IE=791.90

BENCHMARK #3
TOP NUT/HYD
EL=796.93

S10-FIN
RIM EL=784.03
IE NE=780.43
IE SE=780.38
IE S=780.48
IE W=780.33

IE=776.88

S13-FIN
RIM EL=826.59
IE SW=821.39

S6-FINR
RIM EL=805.54
IE SW=803.64

FFL=806.50

S5-FINR
RIM EL=805.59
IE SW=803.59

EXISTING CHURCH BUILDING
35,150 GSF
OCCUPANT LOAD 1,050

FFL=826.50

S1-FIN
RIM EL=805.43
IE N&SW=801.90
IE NE=801.88

EX. 15" SQ FIN
RIM EL=825.16
IE E=+/-821

S4-FIN
RIM EL=805.41
IE N=801.40
IE SE=799.86

S3-FIN
RIM EL=805.60
IE E=801.28 PLUGGED
IE S=801.08
IE NW=801.36

FFL=806.50

S2-FINR
RIM EL=804.61
IE W=801.71

BENCHMARK #1
TOP NUT/HYD
EL=809.87

FFL=826.25

GARAGE FFL=806.33
UPPER LEVEL CONCRETE = 826.25
EXISTING RECTORY BUILDING
10,800 GSF
OCCUPANT LOAD 66

SANITARY LIFT STATION
RIM EL=800.50

HVAC ON CONCRETE PAD

GAS METER ON CONCRETE

GENERATOR ON CONCRETE

TRANSFORMER ON CONCRETE

CONCRETE AND PAVER (PLAZA)

VAULT

VAULT

DITCH (WASH-OUT)

THREE PONDS WASHED OUT BY STORMWATER. INLET STRUCTURES & ONE PVC PIPE MISSING OR BURIED IN WASHED OUT REMNANTS.

LIMITS OF SLOPES GREATER THAN 30%

10' STEEP SLOPE SETBACK. NOT APPLICABLE TO ACCESS ROAD AND UTILITY CONSTRUCTION

STEEP BANK REINFORCED WITH STRONG WIRE MESH

STEEP BANK REINFORCED WITH STRONG WIRE MESH

APPROXIMATE R/W LINE (TYPICAL)

INGRESS/EGRESS EASEMENT LIMITS PER DOC. NO. 1243459 & SURVEY OF RECORD (TYPICAL)

APPROXIMATE PROPERTY LINE PER EXISTING ROAD CENTERLINE & SURVEY OF RECORD (TYPICAL)

APPROXIMATE DISTURBANCE LIMIT OF PREVIOUS PROJECTS

EXISTING PARCEL LINE PER SURVEY OF RECORD (TYPICAL)

CTH "MM"

CTH "MM"

-53.5%
-29.3%
-40.2%
-22.0%
-18.3%

IE=760.03
RCP ENDW IE=758.96
CMP IE=758.66

S11-FINR
RIM EL=767.97
IE N=760.97
IE E=762.67

CMP IE=753.11

NOTES:

1. All underground utilities have been located per markings placed on the ground or maps provided by the utilities (owners) and or their authorized representatives. Markings are per Digger's Hotline Ticket # 20203221647. Vierbicher does not warrant the locations marked or mapped by others.
2. Field work for this map was completed on 8-13-2020. Any physical changes after this date on the site within the survey limits are not reflected on this map.
3. This map is referenced to the Wisconsin County Coordinate System, LaCrosse Zone NAD 83 (2011). Elevations are referenced to NAVD 88 datum. Field data was obtained using Robotic Total Station and GPS.
4. The parcel lines shown on this map are based on found property corners and surveys of record.
5. The sewer and water structures shown were surveyed and measured. The underground piping shown is largely taken from UTILITY PLAN, SHEET # C004, KEN SAIKI DESIGN & PARAGON ASSOCIATES, dated 4/26/04. Storm sewer piping on the south and west sides of the building, are based on survey evidence collected from viewing the piping inside the storm structures.
6. This map was prepared at the request of Thomas Stroka, Duncan G. Stroik, Architect, LLC, 218 West Washington St., Suite 1200, South Bend, IN.

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Existing Conditions Plan

St. Juan Diego Retreat House
City of La Crosse
La Crosse County, WI

REVISIONS			
NO.	DATE	REMARKS	
NO.	DATE	REMARKS	

SCALE 1: 20
DATE 08/09/2024
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DEMOLITION PLAN LEGEND

- CURB AND GUTTER REMOVAL
- ASPHALT REMOVAL
- CONCRETE REMOVAL
- BUILDING REMOVAL
- TREE REMOVAL
- SAWCUT
- UTILITY STRUCTURE REMOVAL
- UTILITY LINE REMOVAL

GRAPHIC SCALE FEET
0 10 20 40

SAWCUT (TYP.)
REMOVE GRAVEL (TYP.)
REMOVE FENCE, CLEAR AND GRUB AS NEEDED
REMOVE STORM SEWER (TYP.)
REMOVE CONCRETE (TYP.)
REMOVE LIGHT (TYP.)
REMOVE LIGHT POLE
REMOVE UNDERGROUND UTILITIES (TYP.)
REMOVE ASPHALT (TYP.)
REMOVE CONCRETE PAD AND UTILITY EQUIPMENT
REMOVE SANITARY SEWER (TYP.)
REMOVE FENCE
REMOVE HYDRANT
REMOVE CONCRETE PAD AND UTILITY EQUIPMENT
REMOVE LIFT STATION
TREE REMOVAL LIMITS

EXISTING CHURCH BUILDING
35,150 GSF
OCCUPANT LOAD 1,050

EXISTING RECTORY BUILDING
10,800 GSF
OCCUPANT LOAD 66

CONCRETE AND PAVER (PLAZA)
VAULT
VAULT
FFL=826.50
FFL=806.50
FFL=826.25
GARAGE FFL=806.33
UPPER LEVEL CONCRETE = 826.25
CONC. PATIO
SANITARY LIFT STATION
RIM EL=800.50
STEEP BANK REINFORCED WITH STRONG WIRE MESH
GAS METER ON CONCRETE
GENERATOR ON CONCRETE
TRANSFORMER ON CONCRETE
LIMITS OF SLOPES GREATER THAN 30%
10' STEEP SLOPE SETBACK. NOT APPLICABLE TO ACCESS ROAD AND UTILITY CONSTRUCTION
APPROXIMATE R/W LINE (TYPICAL)
INGRESS/EGRESS EASEMENT LIMITS PER DOC. NO. 1243459 & SURVEY OF RECORD (TYPICAL)
APPROXIMATE PROPERTY LINE PER EXISTING ROAD CENTERLINE & SURVEY OF RECORD (TYPICAL)
EXISTING PARCEL LINE PER SURVEY OF RECORD (TYPICAL)
CTH "MM"
CTH "MM"
ASPHALT
CONCRETE
GRAVEL
GRASS
WOODED

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Demolition Plan

St. Juan Diego Retreat House
City of La Crosse
La Crosse County, WI

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C200

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SITE PLAN LEGEND

- PROPERTY BOUNDARY
- CURB AND GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONCRETE
- PROPOSED ASPHALT
- PROPOSED SIGN
- PROPOSED LIGHT POLE
- PROPOSED BOLLARD
- PROPOSED HANDICAP PARKING

GRAPHIC SCALE FEET
0 10 20 40

TRANSITION TO FULL CURB HEAD
18" CURB AND GUTTER
GUARDRAIL (SEE DETAIL)
CONCRETE PADS FOR CHILLERS, PROPOSED AND RELOCATED
CONCRETE PAD FOR CHILLERS AND GAS REGULATOR
SECURITY GATE WITH CONTROL LOOP AND POSTS. SEE ARCHITECTURAL PLANS FOR DETAILS.
ADA PARKING STALL AND SIGNAGE
OVERHEAD WALKWAY AND COLUMNS, 13.5' CLEARANCE. SEE ARCH. PLANS FOR DETAILS.
RAISED GRANITE CURB. SEE ARCH. PLANS FOR DETAILS (TYP.)
CONCRETE PADS FOR PROPOSED GENERATORS & TRANSFORMER
2' CURB TAPER
12' GATE. SEE ARCH. PLANS FOR DETAILS (TYP.)
LIMITS OF SLOPES GREATER THAN 30%
GRANITE OVER CONCRETE SUB SLAB. SEE ARCH. PLANS FOR DETAILS.
PROPOSED PAVEMENT MARKINGS (TYP.)
10' STEEP SLOPE SETBACK. NOT APPLICABLE TO ACCESS ROAD AND UTILITY CONSTRUCTION
WALLED COURTYARD. SEE ARCH. PLANS FOR DETAILS.
APPROXIMATE R/W LINE (TYPICAL)
INGRESS/EGRESS EASEMENT LIMITS PER DOC. NO. 1243459 & SURVEY OF RECORD (TYPICAL)
APPROXIMATE PROPERTY LINE PER EXISTING ROAD CENTERLINE & SURVEY OF RECORD (TYPICAL)
EXISTING PARCEL LINE PER SURVEY OF RECORD (TYPICAL)

EXISTING CHURCH BUILDING
35,150 GSF
OCCUPANT LOAD 1,050

NEW RETREAT CENTER
6-STORY
FF = 806.33
50,680 GSF
OCCUPANT LOAD 871

EXISTING RECTORY BUILDING
10,800 GSF
OCCUPANT LOAD 66

GARAGE FFL=806.33
UPPER LEVEL CONCRETE = 826.25

CONCRETE AND PAVER (PLAZA)

FFL=826.50
FFL=806.50
FFL=826.25

CTH "MM"

WOODED
ASPHALT
GRASS
CONCRETE
VAULT
CONC.

22.0' 18.0' 8.5' R30.0' R7.5' 20.0' 22.5' 8.5' 5.0' R120.0' R66.5' R6.5' R6.0' 47.0' 32.2' 20.1' 22.1' 29.5' 6.0' 24.0' 20.0' 8.0' 21.4' 20.0' 10.0' 10.0'

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Site Plan

St. Juan Diego Pilgrim House
City of La Crosse
La Crosse County, WI

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C300

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GRADING LEGEND

- 820 — EXISTING MAJOR CONTOURS
- 818 — EXISTING MINOR CONTOURS
- 820 — PROPOSED MAJOR CONTOURS
- 818 — PROPOSED MINOR CONTOURS
- SILT FENCE
- DISTURBED LIMITS
- STEEP SLOPE LIMITS
- STEEP SLOPE SETBACK
- PROPOSED SLOPE ARROWS
- 1048.61 EXISTING SPOT ELEVATIONS
- 1048.61 PROPOSED SPOT ELEVATIONS
- STONE WEEPER
- INLET PROTECTION
- EROSION MAT CLASS I TYPE B
- EROSION MAT CLASS II TYPE A
- TRACKING PAD
- RIP RAP

STEEP SLOPE AREAS	
LAND TYPE	AREA (SQ. FT.)
DISTURBED	3605
UNDISTURBED	21228
TOTAL	24833

GRAPHIC SCALE FEET
0 10 20 40

TRACKING PAD
EROSION MAT CLASS I TYPE B
VAULT
VAULT
FFL=806.50
EXISTING CHURCH BUILDING
35,150 GSF
OCCUPANT LOAD 1,050
INLET PROTECTION (TYP.)
FFL=826.50
CONCRETE AND PAVER (PLAZA)
FFL=826.25
CONC.
CONCRETE
GARAGE FFL=806.33
UPPER LEVEL CONCRETE = 826.25
EXISTING RECTORY BUILDING
10,800 GSF
OCCUPANT LOAD 66
NEW RETREAT CENTER
6-STORY
FF = 806.33
50,680 GSF
OCCUPANT LOAD 871
FFL=806.50
LIMITS OF DISTURBANCE
DOUBLE ROW OF SILT FENCE (TYP.)
LIMITS OF SLOPES GREATER THAN 30%
EMERGENCY OVERFLOW SCUPPER IN WALL
805.97 EP/TW
RIPRAP
10' STEEP SLOPE SETBACK. NOT APPLICABLE TO ACCESS ROAD AND UTILITY CONSTRUCTION
STEEP BANK REINFORCED WITH STRONG WIRE MESH
APPROXIMATE DISTURBANCE LIMIT OF PREVIOUS PROJECTS
EXISTING PARCEL LINE PER SURVEY OF RECORD (TYPICAL)
APPROXIMATE R/W LINE (TYPICAL)
INGRESS/EGRESS EASEMENT LIMITS PER DOC. NO. 1243459 & SURVEY OF RECORD (TYPICAL)
APPROXIMATE PROPERTY LINE PER EXISTING ROAD CENTERLINE & SURVEY OF RECORD (TYPICAL)
RESTORE EX DETENTION PONDS PER ORIGINAL PERMIT PLANS (TO BE PROVIDED BY OWNER)
DITCH (WASH-OUT)
THREE PONDS WASHED OUT BY STORMWATER. INLET STRUCTURES & ONE PVC PIPE MISSING OR BURIED IN WASHED OUT REMNANTS.
CTH "MM"
CTH "MM"
53.5%
29.3%
10.0'
40.2%
22.0%
18.3%
ASPHALT
GRASS
GRAVEL
CONCRETE
WOODED

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Grading and Erosion Control Plan

St. Juan Diego Pilgrim House
City of La Crosse
La Crosse County, WI

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SCALE 1: 20
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PROJECT NO. 200196

C400

GRADING LEGEND

- 820 — EXISTING MAJOR CONTOURS
- 818 — EXISTING MINOR CONTOURS
- 820 — PROPOSED MAJOR CONTOURS
- 818 — PROPOSED MINOR CONTOURS
- SILT FENCE
- DISTURBED LIMITS
- STEEP SLOPE LIMITS
- STEEP SLOPE SETBACK
- PROPOSED SLOPE ARROWS
- 1048.61 EXISTING SPOT ELEVATIONS
- 1048.61 PROPOSED SPOT ELEVATIONS
- STONE WEEPER
- INLET PROTECTION
- EROSION MAT CLASS I TYPE B
- EROSION MAT CLASS II TYPE A
- TRACKING PAD
- RIP RAP

GRAPHIC SCALE FEET
0 5 10 20

806.10 GR
805.90 EP
805.65 RIM LP
805.75 RIM LP
806.00 HP
806.47 EP
805.75 RIM LP
805.81 EP
805.77 RIM
805.67 RIM LP
806.10 EP/TW
792.00 BW
806.10 RIM
806.26
806.10 EP
806.29 THRESHOLD
806.29 THRESHOLD
805.80 RIM
806.20 RIM
806.10 EP/TW
788.00 BW
806.10 EP/TW
790.00 BW
806.15 TW
788.00 BW
805.80 RIM
806.20 RIM
806.00 GR
794.29 THRESHOLD
795.00 GR
805.85 TW
791.20 BW
794.10 RIM
793.55 RIM
791.15 RIM
790.00 RIM
22.0%

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Grading Plan

St. Juan Diego Pilgrim House
City of La Crosse
La Crosse County, WI

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REVISIONS		
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GRADING LEGEND

- EXISTING MAJOR CONTOURS
- EXISTING MINOR CONTOURS
- PROPOSED MAJOR CONTOURS
- PROPOSED MINOR CONTOURS
- SILT FENCE
- DISTURBED LIMITS
- STEEP SLOPE LIMITS
- STEEP SLOPE SETBACK
- PROPOSED SLOPE ARROWS
- EXISTING SPOT ELEVATIONS
- PROPOSED SPOT ELEVATIONS
- STONE WEEPER
- INLET PROTECTION
- EROSION MAT CLASS I TYPE B
- EROSION MAT CLASS II TYPE A
- TRACKING PAD
- RIP RAP

GRAPHIC SCALE FEET
0 5 10 20

805.83 EP
805.90 EP
806.15 EP MATCH
806.29 EP MATCH
807.30 EP
810.65 EP
814.30 EP
815.10 EP
817.20 EP
814.75 EP/TW 814.50 BW
814.53 P
814.26 P
815.12 EP/TW 804.50 BW
805.81 FL 806.31 TC
805.55 RIM/FL
805.71 FL 805.71 TC
805.62 RIM/FL
805.86 FL 806.36 TC
807.01 FL 807.51 TC
810.36 FL 810.86 TC
811.58 FL 812.02 TC
812.44 FL 812.94 TC
813.47 FL 813.97 TC
813.62 EP
811.76 TW 803.00 BW
813.77 EP/TW 805.25 BW
806.00 TW 804.00 BW
807.56 TW 803.00 BW
812.12 TW 803.00 BW
814.77 EP/TW 807.50 BW
814.39 EP/TW 812.00 BW
814.19 EP/TW 811.00 BW
802.50 TW 790.00 BW
802.50 TW 795.00 BW
802.50 TW 797.50 BW
802.50 TW 800.42 BW
801.40 TW 801.40 BW
801.33 LP
813.90 TW 805.00 BW

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Grading Plan

St. Juan Diego Pilgrim House
City of La Crosse
La Crosse County, WI

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REVISIONS

NO.	DATE	REMARKS

SCALE 1: 20
DATE 08/09/2024
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C402

PROPOSED UTILITY LEGEND

- STORM SEWER PIPE
- STORM SEWER MANHOLE
- STORM SEWER ENDWALL
- STORM SEWER CURB INLET
- STORM SEWER FIELD INLET
- ROOF DRAIN CLEANOUT
- SANITARY SEWER PIPE (GRAVITY)
- SANITARY SEWER PIPE (FORCE MAIN)
- SANITARY SEWER MANHOLE
- SANITARY SEWER CLEANOUT
- WATER MAIN
- WATER SERVICE LATERAL PIPE
- FIRE HYDRANT
- WATER VALVE
- PROPOSED PIPE INSULATION
- GAS MAIN
- ELECTRIC SERVICE

ABBREVIATIONS

STMH – STORM MANHOLE
FI – FIELD INLET
CI – CURB INLET
CB – CATCH BASIN
EW – ENDWALL
SMH – SANITARY MANHOLE

GRAPHIC SCALE FEET
0 10 20 40

STORM STRUCTURE PER UTILITY MAP (SOMETHING MAGNETICALLY DETECTED UNDER ASPHALT DURING SURVEY)
S8–FIN RIM EL=805.84 IE's N&E&SW=802.89
S12–FINR RIM EL=824.28 IE NW=818.83 IE SE=818.68
S7–STMH RIM EL=810.53 IE N=798.33 IE SE=805.48 IE S=797.73 IE NW=798.32
S9–FINR RIM EL=793.21 IE's NE&SW=790.01
S13–FIN RIM EL=826.59 IE SW=821.39
S6–FINR RIM EL=805.54 IE SW=803.64
S5–FINR RIM EL=805.59 IE SW=803.59
S10–FIN RIM EL=784.03 IE NE=780.43 IE SE=780.38 IE S=780.48 IE W=780.33
S11–FINR RIM EL=767.97 IE N=760.97 IE E=762.67
RCP ENDW IE=791.90
IE=778.88
EXISTING STORM IE AT WALL APPROX. 796.88
APPROXIMATE TELCOM & ELECTRIC ROUTE TO UTILITY STRUCTURES AND RETREAT CENTER. TO BE CONFIRMED WITH UTILITY CO.
RELOCATED EXISTING GAS LINE TO EXISTING RECTORY BUILDING. LOCATION NOT MARKED. COORDINATE WITH UTILITY COMPANY
NEW OR RELOCATED CHILLERS, GAS REGULATOR, GENERATORS, AND TRANSFORMER (TYP)
RELOCATE EX HYDRANT
CONNECT TO EXISTING MAIN
CONNECT TO EX 10" STORM SEWER W/ 48" MH IE = 799.86
APPROXIMATE LOCATION OF CHILLED & HOT GLYCOL CONNECTION TO BUILDING. SEE PLUMBING PLANS FOR DETAILS.
140' – 4" PVC SAN @ 1.04%
88' – 10" PVC STORM @ 1.04%
101' – 10" PVC STORM @ 1.04%
SANITARY SEWER IN CASING BENEATH OVERHEAD WALKWAY
4" SANITARY LATERAL CONNECTION. APPROX. IE=797.78 CONFIRM SIZE, INVERT, & LOCATION WITH PLUMBING PLANS.
25' – 4" SANITARY LATERAL @ 1.04%
EXISTING CHURCH BUILDING 35,150 GSF OCCUPANT LOAD 1,050
2'x3' INLET RIM=805.62 IE=801.05
34' – 10" PVC STORM @ 1.04%
2'x3' INLET RIM=805.52 IE=800.70
PREFABRICATED FIBERGLASS DUPLEX LIFT STATION WITH CONTROL PANEL (SEE FORCE MAIN PLAN)
16' – 10" PVC STORM @ 1.04%
25' – 4" PVC SAN @ 1.04%
48" STORM INLET RIM=805.85 IE=800.53
SANITARY MANHOLE RIM=803.50 IE=797.37 W IE=795.76 NW IE=795.66 E
18' – 12" PVC STORM @ 1.04%
(2) – 9" GLYCOL PIPES (TYP.)
10' STEEP SLOPE SETBACK. NOT APPLICABLE TO ACCESS ROAD AND UTILITY CONSTRUCTION
SANITARY CLEANOUT RIM=806.05 IE=787.73
39' – 4" PVC SAN @ 1.04%
STORM INLET RIM=805.80 IE=799.99
25' – 12" PVC STORM @ 2.08%
4" SANITARY LATERAL CONNECTION. APPROX. IE=788.00 CONFIRM SIZE, INVERT, & LOCATION WITH PLUMBING PLANS.
STORM INLET RIM=805.80 IE=799.40
16' –6" PVC STORM @ 1.04%
STORM INLET RIM=806.20 IE=799.24 E,S IE=785.56 W
27' – 12" PVC STORM @ 2.08%
IE=785.00
STORM RISER RIM=793.55
STORM RISER RIM=791.15
26' – 12" PVC STORM @ 1.04%
48" SANITARY MH RIM=805.90 IE=797.52 4" E IE=797.32 4" NW IE=797.22 4" S
NEW RETREAT CENTER 6–STORY FF = 806.33 50,680 GSF OCCUPANT LOAD 871
STORM MANHOLE RIM=806.00 IE=800.34
STORM INLET RIM=806.20 IE=799.82
28' – 12" PVC STORM @ 2.08%
6" D.I. WATER SERVICE (TYP.)
BUILDING STORM LATERAL
ROUTE EXISTING RECTORY BUILDING ROOF DOWNSPOUTS THROUGH RETREAT BUILDING STORM SEWER
41' – 8" PVC STORM @ 10.56%
IE=785.00
STORM RISER RIM=794.10
IE=784.50
35' – 12" PVC STORM @ 1.43%
CONTECH SYSTEM 3X80'–90" CMP @ 0.00% WET DETENTION SYSTEM WATER EL. =784.00 IE = 780.50
STORM RISER RIM=790.00
EXISTING PARCEL LINE PER SURVEY OF RECORD (TYPICAL)
STORM INLET RIM=805.75 IE=800.03
STORM INLET RIM=805.75 IE=800.58
FFL=806.50
STORM INLET RIM=805.75 IE=801.50
24' – 8" PVC STORM @ 1.04%
44' – 4" PVC SAN @ 1.04%
24' – 8" PVC STORM @ 1.04%
STORM INLET RIM=806.07 IE=802.00
STORM MH RIM=805.65 IE=801.08
STORM INLET RIM=805.65 IE=801.75
ROUTE EX DOWNSPOUTS TO NEW 8" STORM PIPE
FFL=826.25
GARAGE FFL=806.33 UPPER LEVEL CONCRETE = 826.25
EXISTING RECTORY BUILDING 10,800 GSF OCCUPANT LOAD 66
CONCRETE AND PAVER (PLAZA)
STEEP BANK REINFORCED WITH STRONG WIRE MESH
THREE PONDS WASHED OUT BY STORMWATER. INLET STRUCTURES & ONE PVC PIPE MISSING OR BURIED IN WASHED OUT REMNANTS.
DITCH (WASH–OUT)
APPROXIMATE R/W LINE (TYPICAL)
INGRESS/EGRESS EASEMENT LIMITS PER DOC. NO. 1243459 & SURVEY OF RECORD (TYPICAL)
APPROXIMATE PROPERTY LINE PER EXISTING ROAD CENTERLINE & SURVEY OF RECORD (TYPICAL)
CTH "MM"
IE=760.03 RCP ENDW IE=758.96 CMP IE=758.89
CMP IE=753.11
WOODED
GRASS
ASPHALT
CONCRETE
VAULT

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Utility Plan
St. Juan Diego Pilgrim House
City of La Crosse
La Crosse County, WI

REVISIONS NO.	DATE	REMARKS

REVISIONS NO.	DATE	REMARKS

SCALE 1: 20
DATE 08/09/2024
DRAFTER CKNA/CSHE
CHECKED JKAS
PROJECT NO. 200196

C500

EXISTING SANITARY MANHOLE
RIM=842.43
IE=833.00 S
IE=832.86 FM SW
IE=834.18 NE
BENCH=834.88

0+00.00
PI: 0+34.30
0+00
0+50
1+00
1+50
2+00
2+50
3+00
3+50
4+00
4+50
5+00
5+50
6+00
6+50
7+00
7+50
8+00
8+50
9+00
9+50
10+00

34'–4" HDPE SAN FM @ 0.35%
45° BEND
IE=832.88
IE=832.88
121'–4" HDPE SAN FM @ 0.35%
11.25° BEND
IE=832.45
IE=832.45
PI: 1+55.77
122'–4" HDPE
SAN FM @ 0.35%
72'–4" HDPE
SAN FM @ 6.34%
PI: 2+78.10
PI: 3+50.31
51'–4" HDPE
SAN FM @ 8.16%
PI: 4+01.77
22.5° BEND
IE=823.25
IE=823.25
45° BEND
IE=832.03
IE=832.03
45° BEND
IE=827.45
IE=827.45
92'–4" HDPE SAN FM @ 10.33%
204'–4" HDPE
SAN FM @ 4.14%
22.5° BEND
IE=814.82
IE=814.82
PI: 6+05.40
45° BEND
IE=805.32
IE=805.32
12'–4" HDPE
SAN FM @ 10.33%
PI: 6+97.41
PI: 7+09.26
45° BEND
IE=804.09
IE=804.09
64'–4" HDPE SAN FM @ 10.33%
PI: 7+75.56
45° BEND
IE=797.45
IE=797.45
36'–4" HDPE SAN FM @ 1.98%
PI: 8+09.54
45° BEND
IE=796.74
IE=796.74
33'–4" HDPE SAN FM @ 5.61%
PI: 8+42.98
22.5° BEND
IE=794.86
IE=794.86
65'–4" HDPE SAN FM @ 0.10%
PI: 9+07.46
PREFABRICATED FIBERGLASS
DUPLEX LIFT STATION
WITH CONTROL PANEL
RIM=803.00
IE=795.52 NW
IE=794.80 E

GRAPHIC SCALE FEET
0 15 30 60

PROPOSED UTILITY LEGEND

- STORM SEWER PIPE
- STORM SEWER MANHOLE
- STORM SEWER ENDWALL
- STORM SEWER CURB INLET
- STORM SEWER FIELD INLET
- ROOF DRAIN CLEANOUT
- SANITARY SEWER PIPE (GRAVITY)
- SANITARY SEWER PIPE (FORCE MAIN)
- SANITARY SEWER MANHOLE
- SANITARY SEWER CLEANOUT
- WATER MAIN
- WATER SERVICE LATERAL PIPE
- FIRE HYDRANT
- WATER VALVE
- PROPOSED PIPE INSULATION
- GAS MAIN
- ELECTRIC SERVICE

ABBREVIATIONS

STMH – STORM MANHOLE
FI – FIELD INLET
CI – CURB INLET
CB – CATCH BASIN
EW – ENDWALL
SMH – SANITARY MANHOLE

EXISTING SANITARY MANHOLE
0+00.0, 0.0'
RIM=842.43
IE=833.00 S
IE=832.86 FM SW
IE=834.18 NE
BENCH=834.88

0+34.3, 0.0'
IE=832.88
IE=832.88
1+55.8, 0.0'
IE=832.45
IE=832.45
2+78.1, 0.0'
IE=832.03
IE=832.03
3+50.3, 0.0'
IE=827.45
IE=827.45
4+01.8, 0.0'
IE=823.25
IE=823.25
6+05.4, 0.0'
IE=814.82
IE=814.82
6+97.4, 0.0'
IE=805.32
IE=805.32
7+09.3, 0.0'
IE=804.09
IE=804.09
7+73.6, 0.0'
IE=797.45
IE=797.45
8+09.5, 0.0'
IE=796.74
IE=796.74
8+42.9, 0.0'
IE=794.86
IE=794.86
PREFABRICATED FIBERGLASS
DUPLEX LIFT STATION
(WET WELL/VALVE VAULT
IN–GROUND STRUCTURE)
WITH CONTROL PANEL
9+07.5, 0.0'
RIM=803.00
IE=795.52 NW
IE=794.80 E

EXISTING SURFACE
PROPOSED SURFACE

P13: 34'–4" HDPE SAN FM @ 0.35%
P14: 121'–4" HDPE SAN FM @ 0.35%
P15: 122'–4" HDPE SAN FM @ 0.35%
P16: 72'–4" HDPE SAN FM @ 6.34%
P17: 51'–4" HDPE SAN FM @ 8.16%
P18: 204'–4" HDPE SAN FM @ 4.14%
P19: 92'–4" HDPE SAN FM @ 10.33%
P20: 12'–4" HDPE SAN FM @ 10.33%
P21: 64'–4" HDPE SAN FM @ 10.33%
P22: 36'–4" HDPE SAN FM @ 1.98%
P23: 33'–4" HDPE SAN FM @ 5.61%
P24: 65'–4" HDPE SAN FM @ 0.10%

Elevation
860 850 840 830 820 810 800 790 780

823.90 820.38 812.81 810.79 807.36 804.16 797.67 794.24

–0+50 0+00 0+50 1+00 1+50 2+00 2+50 3+00 3+50 4+00 4+50 5+00 5+50 6+00 6+50 7+00 7+50 8+00 8+50 9+00 9+50 10+00

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Utility Plan - Force Main
St. Juan Diego Pilgrim House
City of La Crosse
La Crosse County, WI

REVISIONS
NO. DATE REMARKS

REVISIONS
NO. DATE REMARKS

SCALE 1: 30
DATE 08/09/2024
DRAFTER CKNA/CSHE
CHECKED JKAS
PROJECT NO. 200196

C501

16 Sep 2024 - 1:40p M:\Duncan G. Stroik Architect\200196_LaCrosse Retreat Center\CADD\200196 - Base Eng.dwg by: ckna

GENERAL NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE CAUSED DURING CONSTRUCTION TO PUBLIC PROPERTY, PRIVATE PROPERTY OR UTILITIES.
2. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR REVIEW BY THE ENGINEER, PRIOR TO PLACING AN ORDER OF ANY SUCH ITEM.
3. EXISTING TOPOGRAPHIC INFORMATION IS BASED ON FIELD OBSERVATIONS AND/OR PLAN OF RECORD DRAWINGS. CONTRACTOR SHALL VERIFY TOPOGRAPHIC INFORMATION PRIOR TO STARTING CONSTRUCTION.
4. PROPERTY LINES ARE APPROXIMATE. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING PROPERTY CORNER MONUMENTATION. ANY MONUMENTS DISTURBED BY CONTRACTOR SHALL BE REPLACED AT THE CONTRACTORS EXPENSE.
5. CONTRACTOR SHALL COORDINATE WITH DRY UTILITY COMPANYS REGARDING ANY POTENTIAL CONFLICTS AND COORDINATE RELOCATIONS AS MAY BE REQUIRED. CONTRACTOR SHALL ALSO COORDINATE THE PROPOSED INSTALLATION OF NEW FACILITIES AS REQUIRED.

DEMOLITION NOTES:

1. CONTRACTOR SHALL KEEP ALL PUBLIC ROADWAYS FREE AND CLEAR OF CONSTRUCTION RELATED DIRT/DUST/DEBRIS.
2. COORDINATE EXISTING UTILITY REMOVAL/ABANDONMENT WITH LOCAL AUTHORITIES AND UTILITY COMPANIES HAVING JURISDICTION.
3. ALL SAWCUTTING SHALL BE FULL DEPTH TO PROVIDE A CLEAN EDGE TO MATCH NEW CONSTRUCTION. MATCH EXISTING ELEVATIONS AT POINTS OF CONNECTION FOR NEW AND EXISTING PAVEMENT, CURB, SIDEWALKS, ETC. ALL SAWCUT LOCATIONS SHOWN ARE APPROXIMATE AND MAY BE FIELD ADJUSTED TO ACCOMMODATE CONDITIONS, JOINTS, MATERIAL TYPE, ETC. REMOVE MINIMUM AMOUNT NECESSARY FOR INSTALLATION OF PROPOSED IMPROVEMENTS.
4. CONTRACTOR SHALL PROVIDE AND SHALL BE RESPONSIBLE FOR ANY NECESSARY TRAFFIC CONTROL SIGNAGE AND SAFETY MEASURES DURING DEMOLITION AND CONSTRUCTION OPERATIONS WITHIN OR NEAR THE PUBLIC ROADWAY.
5. COORDINATE TREE REMOVAL WITH LANDSCAPE ARCHITECT. ALL TREES TO BE REMOVED SHALL BE REMOVED IN THEIR ENTIRETY AND STUMPS SHALL BE GROUND TO 12" BELOW PROPOSED SUBGRADE.
6. IF APPLICABLE, PROVIDE TREE PROTECTION FENCING PRIOR TO CONSTRUCTION OPERATIONS. MAINTAIN THROUGHOUT CONSTRUCTION.
7. ALL LIGHT POLES TO BE REMOVED FROM PRIVATE PROPERTY SHALL BE REMOVED IN THEIR ENTIRETY, INCLUDING BASE AND ALL APPURTENANCES. COORDINATE ABANDONMENT OF ELECTRICAL LINES WITH ELECTRICAL ENGINEER AND OWNER PRIOR TO DEMOLITION.
8. CONTRACTOR SHALL OBTAIN ANY NECESSARY DEMOLITION AND UTILITY PLUGGING PERMITS.
9. ANY DAMAGE TO THE CITY PAVEMENT, INCLUDING DAMAGE RESULTING FROM CURB REPLACEMENT, WILL REQUIRE RESTORATION IN ACCORDANCE WITH THE CITY ENGINEERING PATCHING CRITERIA.

SITE PLAN NOTES:

1. CONCRETE TO BE 5" THICK, CONSTRUCTED ON A BASE OF 4" COMPACTED SAND OR CRUSHED STONE.
2. CONCRETE FOR DRIVEWAYS AND SIDEWALK AT DRIVEWAY ENTRANCES SHALL BE 7" THICK, CONSTRUCTED ON A BASE OF 5" COMPACTED SAND OR CRUSHED STONE.
3. ALL DIMENSIONS WITH CURB & GUTTER ARE REFERENCED TO THE FACE OF CURB.
4. CONTRACTOR SHALL DEEP TILL ANY DISTURBED AREAS AFTER CONSTRUCTION IS COMPLETE AND BEFORE RESTORING.
5. CONTRACTOR TO OBTAIN ANY NECESSARY DRIVEWAY CONNECTION, RIGHT OF WAY AND EXCAVATION PERMITS PRIOR TO CONSTRUCTION.
6. ALL ABANDONED DRIVEWAYS ADJACENT TO THE SITE SHALL BE REPLACED WITH CURB AND THE TERRACE SHALL BE RESTORED WITH GRASS.
7. ANY SIDEWALK AND CURB & GUTTER ABUTTING THE PROPERTY SHALL BE REPLACED IF IT IS DAMAGED DURING CONSTRUCTION OR IF THE **CITY OF LA CROSSE** ENGINEERING DEPARTMENT DETERMINES THAT IT IS NOT AT A DESIRABLE GRADE, REGARDLESS OF WHETHER THE CONDITION EXISTED PRIOR TO BEGINNING CONSTRUCTION.

GRADING NOTES:

1. CONTOURS ARE SHOWN FOR PURPOSES OF INDICATING ROUGH GRADING. FINAL GRADE SHALL BE ESTABLISHED ON PAVED SURFACES BY USING SPOT GRADES ONLY.
2. ALL GRADES SHOWN REFERENCE FINISHED ELEVATIONS.
3. CROSS SLOPE OF SIDEWALKS SHALL BE 1.5% UNLESS OTHERWISE NOTED.
4. ACCESSIBLE ROUTES SHALL BE 5.0% MAX LONGITUDINAL SLOPE AND 1.5% MAX CROSS SLOPE. ACCESSIBLE LOADING AREAS OR LANDINGS SHALL BE 2.0% MAX SLOPE IN ANY DIRECTION. RAMPS SHALL BE 8.33% MAX SLOPE.
5. NO LAND DISTURBANCE ACTIVITIES SHALL BEGIN UNTIL ALL EROSION CONTROL BMP'S ARE INSTALLED.
6. SEE DETAIL SHEETS FOR EROSION CONTROL NOTES AND CONSTRUCTION SEQUENCE.

UTILITY NOTES:

1. CONTRACTOR SHALL OBTAIN ANY NECESSARY WORK IN RIGHT OF WAY, EXCAVATION, UTILITY CONNECTION, PLUGGING AND ABANDONMENT PERMITS PRIOR TO CONSTRUCTION.
2. CONTRACTOR TO VERIFY EXISTING UTILITY LOCATIONS AND ELEVATIONS PRIOR TO STARTING WORK.
3. SANITARY & STORM SEWER LENGTHS SHOWN ARE FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE. STORM SEWER END SECTIONS ARE INCLUDED IN THE LENGTH AND SLOPE OF THE PIPE.
4. CONTRACTOR SHALL INVESTIGATE ALL UTILITY CROSSINGS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY CONFLICTS.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTING ALL UTILITY STRUCTURES TO FINISHED GRADE (MANHOLE RIMS, WATER VALVES, AND CURB STOPS), IF NECESSARY.
6. IF DEWATERING OPERATIONS EXCEED 70 GALLONS PER MINUTE OF PUMPING CAPACITY, A DEWATERING WELL PERMIT SHALL BE OBTAINED PRIOR TO STARTING ANY DEWATERING ACTIVITIES.
7. A COPY OF THE APPROVED UTILITY PLANS, SPECIFICATIONS AND PLUMBING PERMIT APPROVAL LETTER SHALL BE ON-SITE DURING CONSTRUCTION AND OPEN TO INSPECTION BY AUTHORIZED REPRESENTATIVES OF THE DEPARTMENT OF SAFETY AND PROFESSIONAL SERVICES AND OTHER LOCAL INSPECTORS.
8. PROPOSED UTILITY SERVICE LINES SHOWN ARE APPROXIMATE. COORDINATE THE EXACT LOCATIONS WITH THE PLUMBING DRAWINGS. COORDINATE THE LOCATION WITH THE PLUMBING CONTRACTOR AND/OR OWNER'S CONSTRUCTION REPRESENTATIVE PRIOR TO INSTALLATION OF ANY NEW UTILITIES.
9. STORM BUILDING SEWER PIPE SHALL CONFORM TO ONE OF THE STANDARDS LISTED IN TABLE 384.30-6 OF SPS 384.30(3)(c).
10. UNDERGROUND DRAIN AND VENT PIPE/TUBING SHALL CONFORM TO ONE OF THE STANDARDS LISTED IN TABLE 384.30-2 OF SPS 384.30(2).
11. PRIVATE WATER SERVICES AND PRIVATE WATER MAINS SHALL CONFORM TO ONE OF THE STANDARDS LISTED IN TABLE 384.30-7 OF SPS 384.30(4)(d).
12. PRIVATE SANITARY SEWER AND LATERALS SHALL BE POLYVINYL CHLORIDE (PVC) ASTM D3034 – SDR 35 OR APPROVED EQUAL MATERIAL THAT CONFORMS TO ONE OF THE STANDARDS LISTED IN TABLE 384.30-3 OF SPS 384.30(2)(c).
13. A MEANS TO LOCATE BURIED UNDERGROUND EXTERIOR NON METALLIC SEWERS/MAINS AND WATER SERVICES/MAINS MUST BE PROVIDED WITH TRACER WIRE OR OTHER METHODS IN ORDER TO BE LOCATED PER SPS 382.10(11)(h) AND SPS 382.40(8)(k).
14. EXTERIOR WATER SUPPLY PIPING SETBACKS AND CROSSINGS SHALL BE IN ACCORDANCE WITH SPS 382.40(8)(b.).
15. NO PERSON MAY ENGAGE IN PLUMBING WORK IN THE STATE UNLESS LICENSED TO DO SO BY THE DEPARTMENT OF SAFETY AND PROFESSIONAL SERVICES PER S.145.06.
16. SITE CONTRACTOR SHALL LEAVE SANITARY AND WATER LATERALS FIVE (5) FEET SHORT (HORIZONTALLY) FROM THE BUILDING. BUILDING PLUMBER SHALL VERIFY SIZE, LOCATION, AND INVERT ELEVATION OF PROPOSED SANITARY AND WATER LATERALS.
17. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THAT THE EXISTING VALVES WILL HOLD THE PRESSURE TEST PRIOR TO CONNECTION. THE CITY IS NOT RESPONSIBLE FOR ANY COSTS INCURRED DUE TO THE CONTRACTOR NOT VERIFYING THAT THE EXISTING VALVE WILL HOLD THE PRESSURE TEST PRIOR TO CONNECTION. IF A NEW VALVE IS REQUIRED, THE APPLICANT WILL BE REQUIRED TO INSTALL ONE AT THEIR EXPENSE, AT THE POINT OF CONNECTION.
18. CONTRACTOR TO CHLORINATE AND BACTERIA TEST BEFORE DOMESTIC SUPPLY PURPOSES
19. CLEAN OUT ALL EXISTING AND PROPOSED STORM INLETS AND CATCH BASINS AT THE COMPLETION OF CONSTRUCTION.
20. SANITARY SEWER MAIN AT BURY DEPTHS GREATER THAN 15' SHALL BE SDR 26. ALL OTHER SANITARY SEWER MAIN SHALL BE SDR 35.
21. CONTRACTOR SHALL COORDINATE WITH DRY UTILITY COMPANY'S REGARDING ANY POTENTIAL CONFLICTS AND COORDINATE RELOCATIONS AS MAY BE REQUIRED. CONTRACTOR SHALL ALSO COORDINATE THE PROPOSED INSTALLATION OF NEW FACILITIES AS REQUIRED.
22. ALL WATER MAIN AND SERVICES SHALL BE INSTALLED AT A MINIMUM DEPTH OF 6.5' FROM TOP OF FINISHED GRADE ELEVATION TO TOP OF MAIN. PROVIDE 1.5' CLEAR SEPARATION IF WATER CROSSES BELOW SEWER AND MINIMUM 0.5' IF WATER CROSSES ABOVE.
23. SANITARY MANHOLES WITH SEWER MAIN CONNECTIONS GREATER THAN 2' ABOVE THE LOWEST INVERT SHALL BE CONSTRUCTED WITH AN EXTERNAL DROP. MANHOLES WITH SEWER LATERAL CONNECTIONS GREATER THAT 2' ABOVE THE LOWEST INVERT SHALL BE CONSTRUCTED WITH AN INTERNAL DROP.
24. INSTALL 1 SHEET OF 4'x8'x4" HIGH DENSITY STYROFOAM INSULATION AT ALL LOCATIONS WHERE STORM SEWER CROSSES WATER MAIN OR WATER LATERALS.

EROSION CONTROL MEASURES

1. EROSION CONTROL SHALL BE IN ACCORDANCE WITH THE **CITY OF LA CROSSE** EROSION CONTROL ORDINANCE AND CHAPTER NR 216 OF THE WISCONSIN ADMINISTRATIVE CODE.
2. CONSTRUCT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH WISCONSIN DNR TECHNICAL STANDARDS AND WISCONSIN CONSTRUCTION SITE BEST MANAGEMENT PRACTICE HANDBOOK.
3. INSTALL SEDIMENT CONTROL PRACTICES (TRACKING PAD, PERIMETER SILT FENCE, SEDIMENT BASINS, ETC.) PRIOR TO INITIATING OTHER LAND DISTURBING CONSTRUCTION ACTIVITIES.
4. THE CONTRACTOR IS REQUIRED TO MAKE EROSION CONTROL INSPECTIONS AT THE END OF EACH WEEK AND WHEN 0.5 INCHES OF RAIN FALLS WITHIN 24 HOURS. INSPECTION REPORTS SHALL BE PREPARED AND FILED AS REQUIRED BY THE DNR AND/OR **CITY**. ALL MAINTENANCE WILL FOLLOW AN INSPECTION WITHIN 24 HOURS.
5. EROSION CONTROL IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ACCEPTANCE OF THIS PROJECT. EROSION CONTROL MEASURES AS SHOWN SHALL BE THE MINIMUM PRECAUTIONS THAT WILL BE ALLOWED. ADDITIONAL EROSION CONTROL MEASURES, AS REQUESTED IN WRITING BY THE STATE OR LOCAL INSPECTORS, OR THE DEVELOPER'S ENGINEER, SHALL BE INSTALLED WITHIN 24 HOURS.
6. A 3" CLEAR STONE TRACKING PAD SHALL BE INSTALLED AT THE END OF ROAD CONSTRUCTION LIMITS TO PREVENT SEDIMENT FROM BEING TRACKED ONTO THE ADJACENT PAVED PUBLIC ROADWAY. SEDIMENT TRACKING PAD SHALL CONFORM TO WisDNR TECHNICAL STANDARD 1057. SEDIMENT REACHING THE PUBLIC ROAD SHALL BE REMOVED BY STREET CLEANING (NOT HYDRAULIC FLUSHING) BEFORE THE END OF EACH WORK DAY.
7. CHANNELIZED RUNOFF: FROM ADJACENT AREAS PASSING THROUGH THE SITE SHALL BE DIVERTED AROUND DISTURBED AREAS.
8. STABILIZED DISTURBED GROUND: ANY SOIL OR DIRT PILES WHICH WILL REMAIN IN EXISTENCE FOR MORE THAN 7-CONSECUTIVE DAYS, WHETHER TO BE WORKED DURING THAT PERIOD OR NOT, SHALL NOT BE LOCATED WITHIN 25-FEET OF ANY ROADWAY, PARKING LOT, PAVED AREA, OR DRAINAGE STRUCTURE OR CHANNEL (UNLESS INTENDED TO BE USED AS PART OF THE EROSION CONTROL MEASURES). TEMPORARY STABILIZATION AND CONTROL MEASURES (SEEDING, MULCHING, TARPING, EROSION MATTING, BARRIER FENCING, ETC.) ARE REQUIRED FOR THE PROTECTION OF DISTURBED AREAS AND SOIL PILES, WHICH WILL REMAIN UN-WORKED FOR A PERIOD OF MORE THAN 7-CONSECUTIVE CALENDAR DAYS. THESE MEASURES SHALL REMAIN IN PLACE UNTIL SITE HAS STABILIZED.
9. SITE DE-WATERING: WATER PUMPED FROM THE SITE SHALL BE TREATED BY TEMPORARY SEDIMENTATION BASINS OR OTHER APPROPRIATE CONTROL MEASURES. SEDIMENTATION BASINS SHALL HAVE A DEPTH OF AT LEAST 3 FEET, BE SURROUNDED BY SNOWFENCE OR EQUIVALENT BARRIER AND HAVE SUFFICIENT SURFACE AREA TO PROVIDE A SURFACE SETTLING RATE OF NO MORE THAN 750 GALLONS PER SQUARE FOOT PER DAY AT THE HIGHEST DEWATERING PUMPING RATE. WATER MAY NOT BE DISCHARGED IN A MANNER THAT CAUSES EROSION OF THE SITE, A NEIGHBORING SITE, OR THE BED OR BANKS OF THE RECEIVING WATER. POLYMERS MAY BE USED AS DIRECTED BY DNR TECHNICAL STANDARD 1061 (DE-WATERING).
10. SEE DETAIL SHEETS FOR RIP-RAP SIZING. RIP-RAP SHALL NOT BE SMALLER THAN 3" TO 6".
11. INLET FILTERS ARE TO BE PLACED IN STORMWATER INLET STRUCTURES AS SOON AS THEY ARE INSTALLED. ALL PROJECT AREA STORM INLETS NEED WISCONSIN D.O.T. TYPE D INLET PROTECTION. THE FILTERS SHALL BE MAINTAINED UNTIL THE **CITY** HAS ACCEPTED THE BINDER COURSE OF ASPHALT.
12. RESTORATION (SEED, FERTILIZE AND MULCH) SHALL BE PER SPECIFICATIONS ON THIS SHEET (NOTE: ADD SEEDING RATE STANDARD OF DETAIL BLOCK TO PLAN) UNLESS SPECIAL RESTORATION IS CALLED FOR ON THE LANDSCAPE PLAN OR THE DETENTION BASIN DETAIL SHEET.
13. TERRACES SHALL BE RESTORED WITH 6" TOPSOIL, PERMANENT SEED, FERTILIZER AND MULCH. LOTS SHALL BE RESTORED WITH 6" TOPSOIL, TEMPORARY SEED, FERTILIZER AND MULCH.
14. SEED, FERTILIZER AND MULCH SHALL BE APPLIED WITHIN 7 DAYS AFTER FINAL GRADE HAS BEEN ESTABLISHED. IF DISTURBED AREAS WILL NOT BE RESTORED IMMEDIATELY AFTER ROUGH GRADING, TEMPORARY SEED SHALL BE PLACED.
15. FOR THE FIRST SIX WEEKS AFTER RESTORATION (E.G. SEED & MULCH, EROSION MAT, SOD) OF A DISTURBED AREA, INCLUDE SUMMER WATERING PROVISIONS OF ALL NEWLY SEEDED AND MULCHED AREAS WHENEVER 7 DAYS ELAPSE WITHOUT A RAIN EVENT.
16. SOIL STABILIZERS SHALL BE APPLIED TO DISTURBED AREAS WITH SLOPES BETWEEN 10% AND 3:1 (DO NOT USE IN CHANNELS). SOIL STABILIZERS SHALL BE TYPE B, PER WISCONSIN D.O.T. P.A.L. (PRODUCT ACCEPTABILITY LIST), OR EQUAL. APPLY AT RATES AND METHODS SPECIFIED PER **MANUFACTURER**. SOIL STABILIZERS SHALL BE RE-APPLIED WHENEVER VEHICLES OR OTHER EQUIPMENT TRACK ON THE AREA.
17. SILT FENCE OR EROSION MAT SHALL BE INSTALLED ALONG THE CONTOURS AT 100 FOOT INTERVALS DOWN THE SLOPE ON THE DISTURBED SLOPES STEEPER THAN 5% AND MORE THAN 100 FEET LONG THAT SHEET FLOW TO THE ROADWAY UNLESS SOIL STABILIZERS ARE USED.
18. SILT FENCE TO BE USED ACROSS AREAS OF THE LOT THAT SLOPE TOWARDS A PUBLIC STREET OR WATERWAY. SEE DETAILS.
19. SEDIMENT SHALL BE CLEANED FROM CURB AND GUTTER AFTER EACH RAINFALL AND PRIOR TO PROJECT ACCEPTANCE.
20. ACCUMULATED CONSTRUCTION SEDIMENT SHALL BE REMOVED FROM ALL PERMANENT BASINS TO THE ELEVATION SHOWN ON THE GRADING PLAN FOLLOWING THE STABILIZATION OF DRAINAGE AREAS.
21. ALL CONSTRUCTION ENTRANCES SHALL HAVE TEMPORARY ROAD CLOSED SIGNS THAT WILL BE IN PLACE WHEN THE ENTRANCE IS NOT IN USE AND AT THE END OF EACH DAY.
22. THE **CITY**, OWNER AND/OR ENGINEER MAY REQUIRE ADDITIONAL EROSION CONTROL MEASURES AT ANY TIME DURING CONSTRUCTION.

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planners | engineers | advisors
Phone: (800) 261-3898

Construction Notes
St. Juan Diego Pilgrim House
City of La Crosse
La Crosse County, WI

REVISIONS			
NO.	DATE	REMARKS	

REVISIONS			
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DATE 08/09/2024
DRAFTER CKNA/CSHE
CHECKED JKAS
PROJECT NO. 200196

C600

CONSTRUCTION SEQUENCE:

1. INSTALL EROSION CONTROL MEASURES
2. STRIP TOPSOIL
3. ROUGH GRADE
4. CONSTRUCT UNDERGROUND UTILITIES
5. INSTALL INLET PROTECTION
6. CONSTRUCT REMAINING IMPROVEMENTS
7. RESTORE DISTURBED AREAS
8. REMOVE EROSION CONTROL MEASURES AFTER DISTURBED AREAS ARE RESTORED

SEEDING RATES:

TEMPORARY:
1. USE ANNUAL OATS AT 3.0 LB./1,000 S.F. FOR SPRING AND SUMMER PLANTINGS.
2. USE WINTER WHEAT OR RYE AT 3.0 LB./1,000 SF FOR FALL PLANTINGS STARTED

   AFTER SEPTEMBER 15.

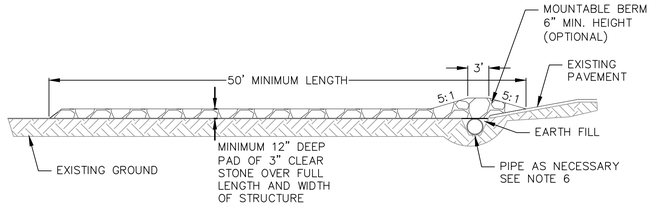
PERMANENT:
1. USE WISCONSIN D.O.T. SEED MIX #40 AT 2 LB./1,000 S.F.

FERTILIZING RATES:

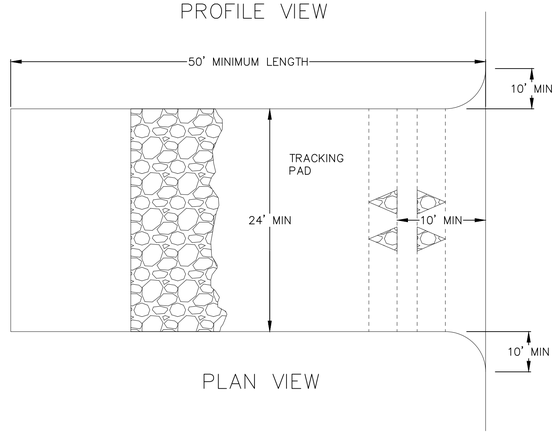
TEMPORARY AND PERMANENT:
USE WISCONSIN D.O.T. TYPE A OR B AT 7 LB./1,000 S.F.

MULCHING RATES:

TEMPORARY AND PERMANENT:
USE ½" TO 1–½" STRAW OR HAY MULCH, CRIMPED PER SECTION 607.3.2.3, OR OTHER RATE AND METHOD PER SECTION 627, WISCONSIN D.O.T. STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION

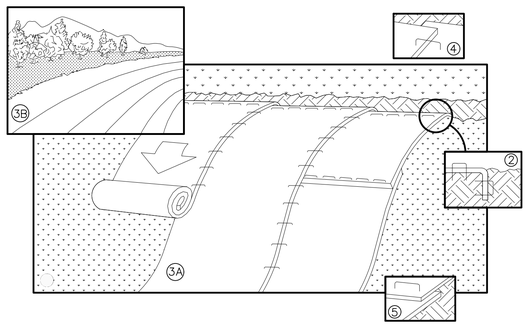


PROFILE VIEW



PLAN VIEW

1. FOLLOW WISCONSIN DNR TECHNICAL STANDARD 1057 FOR FURTHER DETAILS AND INSTALLATION.
2. LENGTH – MINIMUM OF 50'
3. WIDTH – 24' MINIMUM, SHOULD BE FLARED AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
4. ON SITES WITH A HIGH GROUND WATER TABLE OR WHERE SATURATED CONDITIONS EXIST, GEOTEXTILE FABRIC SHALL BE PLACED OVER EXISTING GROUND PRIOR TO PLACING STONE. FABRIC SHALL BE WISDOT TYPE–HR GEOTEXTILE FABRIC.
5. STONE – CRUSHED 3" CLEAR STONE SHALL BE PLACED AT LEAST 12" DEEP OVER THE ENTIRE LENGTH AND WIDTH OF ENTRANCE.
6. SURFACE WATER – ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARDS CONSTRUCTION ENTRANCES SHALL BE PIPED THROUGH THE ENTRANCE. MAINTAINING POSITIVE DRAINAGE. PIPE INSTALLED THROUGH THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE PROTECTED WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND MINIMUM OF 6" STONE OVER THE PIPE. PIPE SHALL BE SIZED ACCORDING TO THE DRAINAGE REQUIREMENTS. WHEN THE ENTRANCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY A PIPE SHALL NOT BE NECESSARY. THE MINIMUM PIPE DIAMETER SHALL BE 6". CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF SAID PIPE.
7. LOCATION – A STABILIZED CONSTRUCTION ENTRANCE SHALL BE LOCATED WHERE CONSTRUCTION TRAFFIC ENTERS AND/OR LEAVES THE CONSTRUCTION SITE. VEHICLES LEAVING THE SITE MUST TRAVEL OVER THE ENTIRE LENGTH OF THE TRACKING PAD.

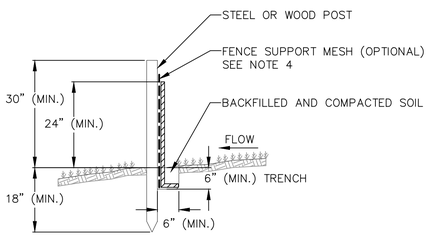


NOTE: REFER TO GENERAL STAPLE PATTERN GUIDE FOR CORRECT STAPLE PATTERN RECOMMENDATIONS FOR SLOPE INSTALLATIONS.

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF FERTILIZER AND SEED.
   NOTE: WHEN USING CELL–O–SEED, DO NOT SEED PREPARED AREA. CELL–O–SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
3. ROLL THE BLANKETS <A.> DOWN, OR <B.> HORIZONTALLY ACROSS THE SLOPE.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2" OVERLAP.
5. WHEN BLANKETS MUST BE SPLICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 4" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART.
6. ALL BLANKETS MUST BE SECURELY FASTENED TO THE SLOPE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS RECOMMENDED BY THE MANUFACTURER.

1 C401 EROSION MAT
NOT TO SCALE

2 C401 TRACKING PAD
NOT TO SCALE



NOTES:

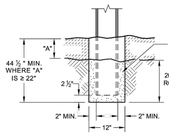
1. INSTALL SILT FENCE TO FOLLOW THE GROUND CONTOURS AS CLOSELY AS POSSIBLE.
2. CURVE THE SILT FENCE UP THE SLOPE TO PREVENT WATER FROM RUNNING AROUND THE ENDS.
3. POST SPACING WITH FENCE SUPPORT MESH = 10 FT. (MAX.)

   POST SPACING WITHOUT FENCE SUPPORT MESH = 6 FT. (MAX.)
4. SILT FENCE SUPPORT MESH CONSISTS OF 14–GAUGE STEEL WIRE WITH A MESH SPACING OF 6 IN. X 6 IN. OR PREFABRICATED POLYMERIC MESH OF EQUIVALENT STRENGTH

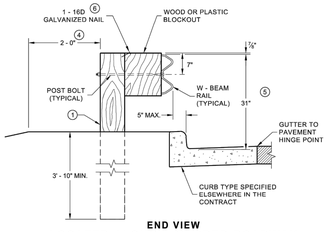
3 C401 SILT FENCE
NOT TO SCALE

SDD 14B42-a Midwest Guardrail System (MGS) Guardrail

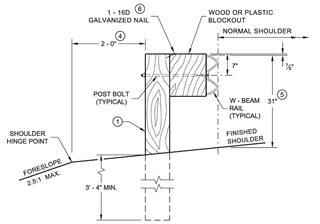
1. WOOD OR STEEL POSTS (w6X9 OR w6X8.5) MAY BE USED. DO NOT INTERMIX WOOD AND STEEL POSTS. INSTALL STEEL POSTS WITH HOLES ON APPROACHING TRAFFIC SIDE.
2. USE WOOD OR APPROVED PLASTIC BLOCKOUTS. WOOD BLOCKOUTS MAY BE CONSTRUCTED OUT OF TWO OR MORE WOOD BLOCKOUTS. SEE ALTERNATE WOOD BLOCKOUT DETAIL. DIMENSIONS OF APPROVED PLASTIC BLOCKOUTS MAY VARY.
3. IF ROCK IS ENCOUNTERED DURING EXCAVATION, PROVIDE A HOLE 12 INCHES IN DIAMETER EXTENDING 20 INCHES DEEP INTO THE ROCK. PLACE APPROXIMATELY 2 1/2" INCHES OF GRANULAR MATERIAL IN THE BOTTOM OF THE HOLE. CUT THE POSTS THE TO LENGTH AMD INSTALL. BACKFILL WITH EXCAVATED MATERIAL AND COMPACT. BACKFILL IS TO BE FREE OF LARGE ROCKS.
4. WHEN THE DISTANCE FROM BACK OF POST TO SHOULDER HINGE POINT IS LESS THAN 2 FEET INSTALL LONGER POST AT HALF POST SPACING (K).
5. FOR NEW MGS INSTALLATION TOP OF W-BEAM RAIL TOLERANCE IS ±1". FOR EXISTING MGS INSTALLATION TOP OF W-BEAM IS BETWEEN 27 ¾" TO 32".
6. WHEN USING STEEL POST AND WOOD BLOCKOUTS INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.
7. TOTAL POST LENGTH FOR TYPE K IS 7' - 0".
   TOTAL POST LENGTH FOR OTHER MGS TYPES IS 6' - 0".



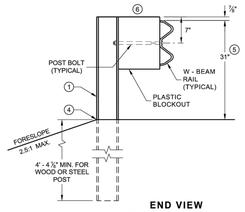
END VIEW
SETTING STEEL OR WOOD POST IN ROCK ③



END VIEW
LOCATED ALONG A CURBED ROADWAY

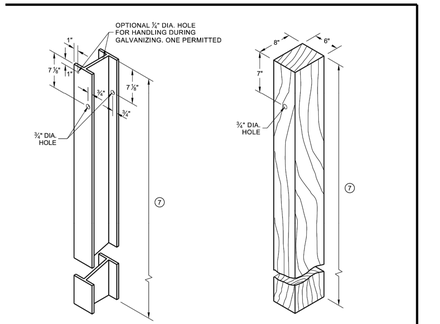


END VIEW
LOCATED ALONG A ROADWAY SHOULDER
STANDARD INSTALLATION



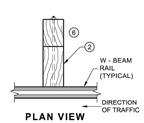
END VIEW
MGS LONGER POST AT HALFPOST
SPACING W BEAM (K)

SDD 14B42 - 07a

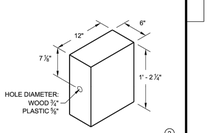


STEEL POST & HOLE PUNCHING DETAIL (W 6 X 9) ①

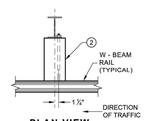
WOOD POST (6" X 8") NOMINAL ①



PLAN VIEW
WOOD POST, BLOCKOUT & BEAM



WOOD OR PLASTIC BLOCKOUT ②



PLAN VIEW
STEEL POST, PLASTIC BLOCKOUT & BEAM

MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

SDD 14B42 - 07a

4 C401 GUARDRAIL
NOT TO SCALE

6

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Construction Details
St. Juan Diego Pilgrim House
City of La Crosse
La Crosse County, WI

REVISIONS			
NO.	DATE	REMARKS	

REVISIONS			
NO.	DATE	REMARKS	

DATE 08/09/2024
DRAFTER CKNA/CSHE
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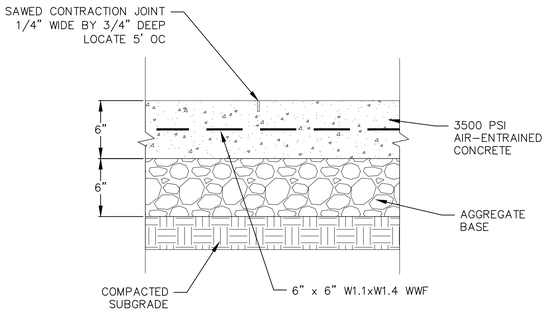
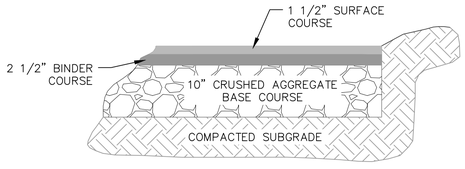
PROJECT NO. 200196

C601

16 Sep 2024 - 1:41p M:\Duncan G. Stroik Architect\200196_LaCrosse Retreat Center\CADD\200196 - Details.dwg by: ckna

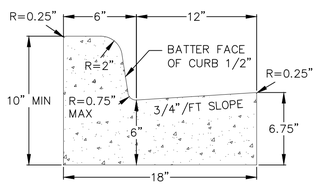


1 C402 CONCRETE PAD
NOT TO SCALE



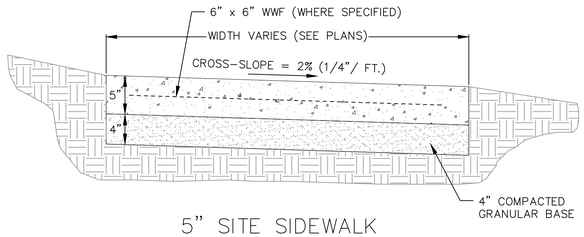
BITUMINOUS PAVEMENT

2 C402 SITE PAVEMENT
NOT TO SCALE

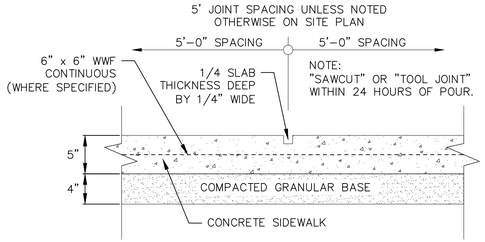


CURB AND GUTTER
CROSS SECTION

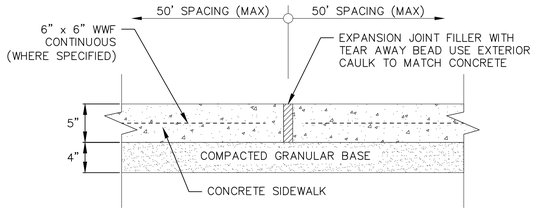
3 C402 18" CONCRETE CURB AND GUTTER
NOT TO SCALE



5" SITE SIDEWALK

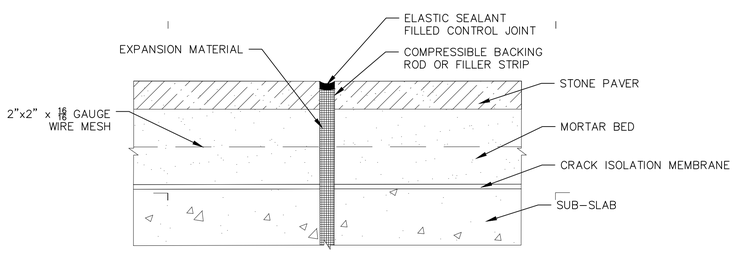


SIDEWALK CONTROL JOINT

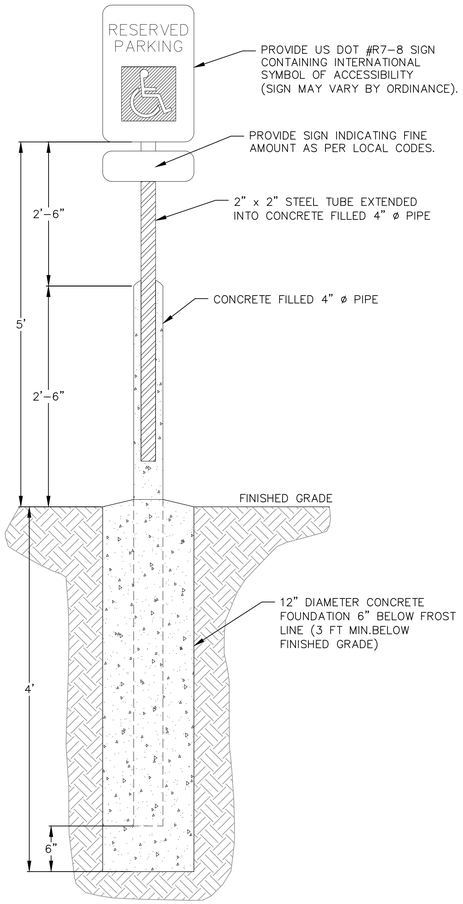


SIDEWALK EXPANSION JOINT

4 C402 5" SIDEWALK
NOT TO SCALE



5 C402 FULL MORTAR BED WITH MEMBRANE AND EXPANSION JOINT
NOT TO SCALE



6 C402 HANDICAP PARKING SIGN
NOT TO SCALE

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Construction Details

St. Juan Diego Pilgrim House
City of La Crosse
La Crosse County, WI

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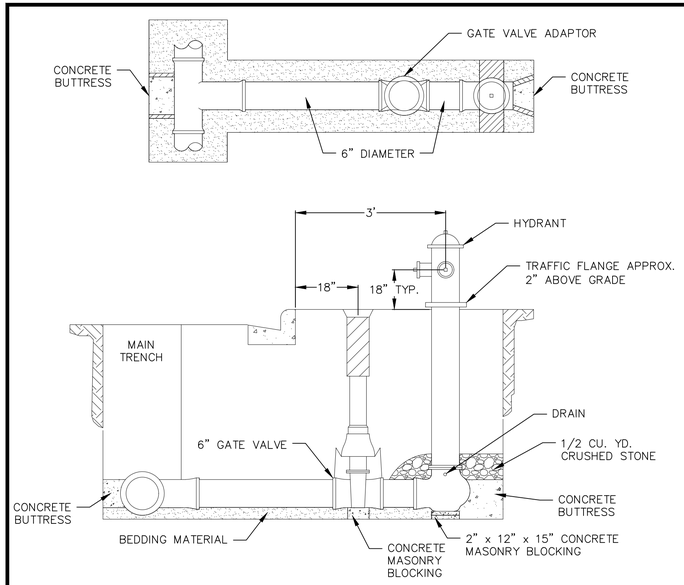
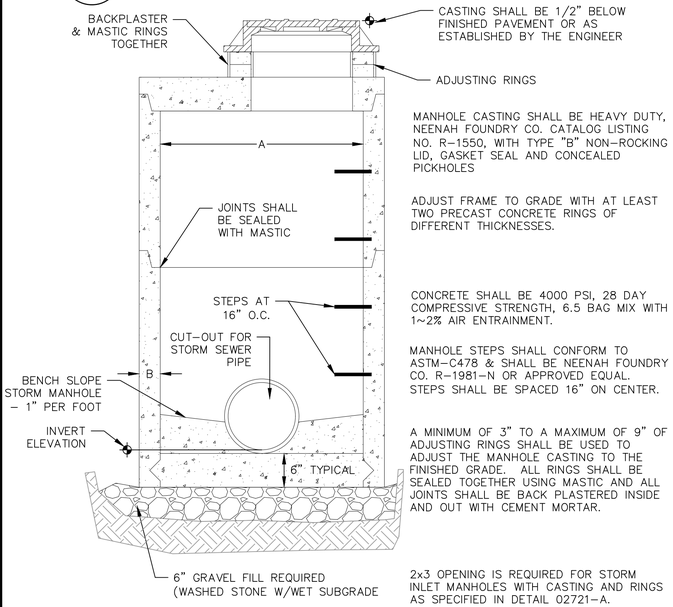
C602

16 Sep 2024 - 1:41p M:\Duncan G. Stroik Architect\200196_LaCrosse Retreat Center\CADD\200196 - Details.dwg by: ckna



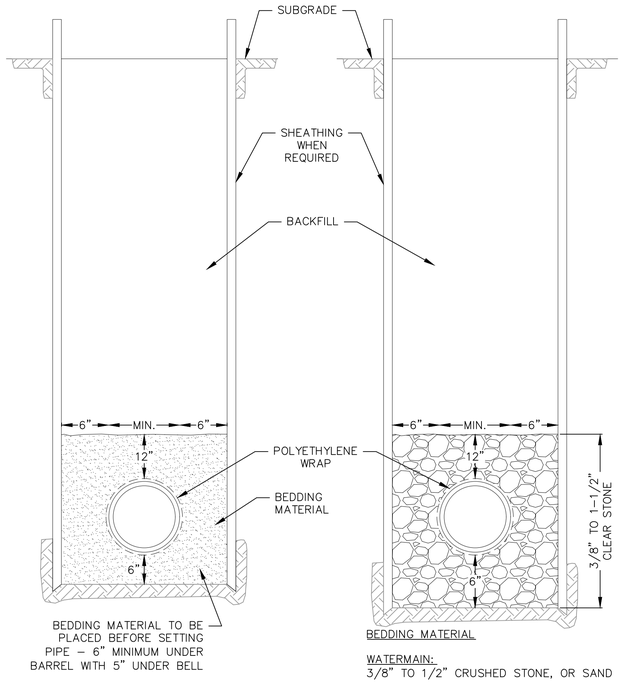
1 / C403 **STANDARD HYDRANT SETTING**
NOT TO SCALE



STORM MANHOLE DIMENSIONS

MANHOLE SIZE	DIMENSION	
	A	B (MIN.)
48"	48"	5"
60"	60"	6"
72"	72"	7"
84"	84"	7"
96"	96"	9"

2 / C403 **STORM SEWER MANHOLE**
NOT TO SCALE



DRY TRENCH CONDITION

WET OR UNSTABLE CONDITION

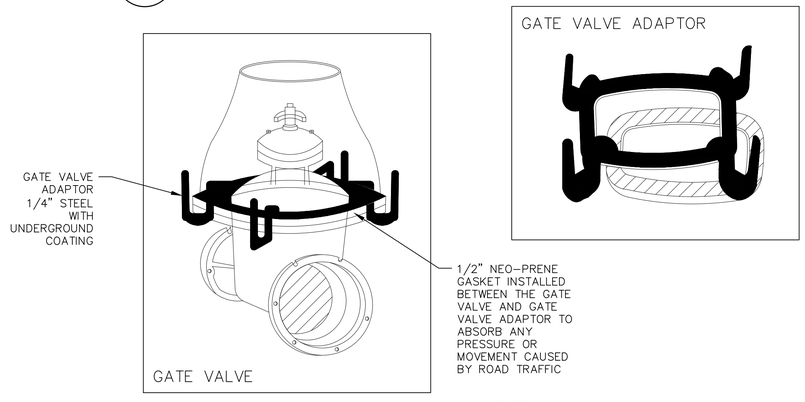
BEDDING MATERIAL

WATERMAIN:
3/8" TO 1/2" CRUSHED STONE, OR SAND

SANITARY SEWER:
3/8" TO 1–1/2" CLEAR STONE

STORM SEWER:
3/4" TO 1–1/2" CRUSHED STONE

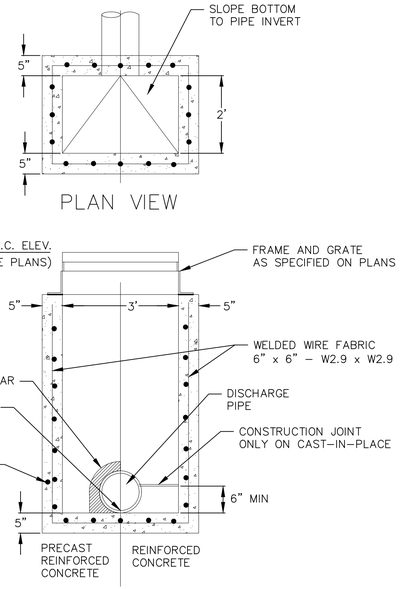
3 / C403 **STANDARD TRENCH SECTION**
NOT TO SCALE



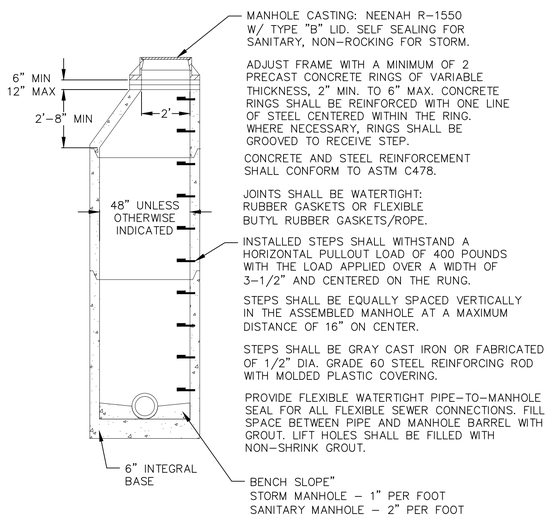
NOTE: GATE VALVE ADAPTORS ARE MANDITORY IN THE VILLAGE OF DEFOREST

MANUFACTURED BY ADAPTOR, INC. 3642 E. AMERICAN AVE. MILWAUKEE, WI 53154

4 / C403 **GATE VALVE AND GATE VALVE ADAPTOR**
NOT TO SCALE



5 / C403 **CURB INLET – TYPE 3, 2' x 3' BASIN**
NOT TO SCALE



6 / 403 **PRECAST CONCRETE MANHOLE**
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Construction Details
St. Juan Diego Pilgrim House
City of La Crosse
La Crosse County, WI

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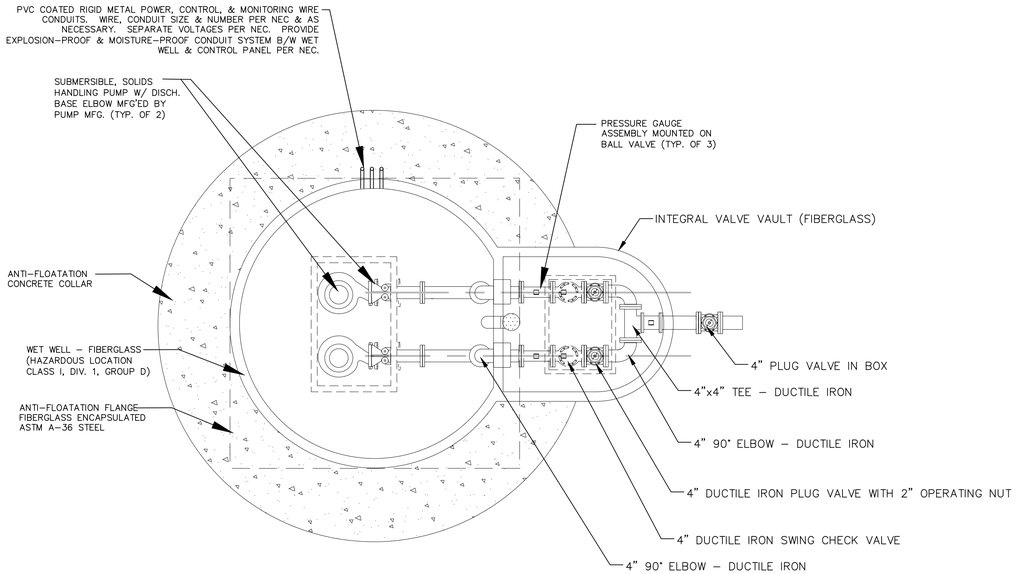
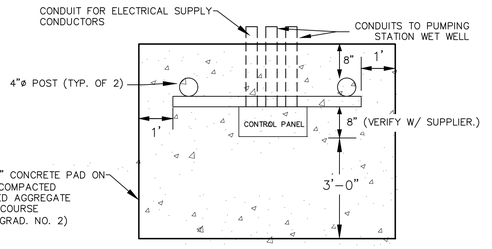
C603

16 Sep 2024 - 1:41p M:\Duncan G. Stroik Architect\200196_ LaCrosse Retreat Center\CADD\200196 - Details.dwg by: ckna

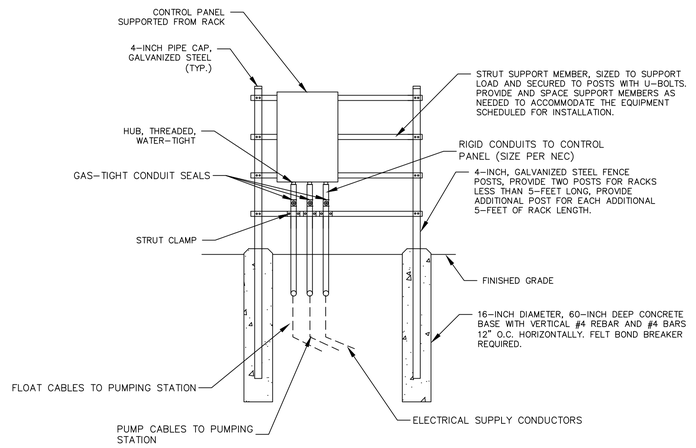


1 / C604 WASTEWATER PUMPING STATION PLAN

NOT TO SCALE



PLAN VIEW

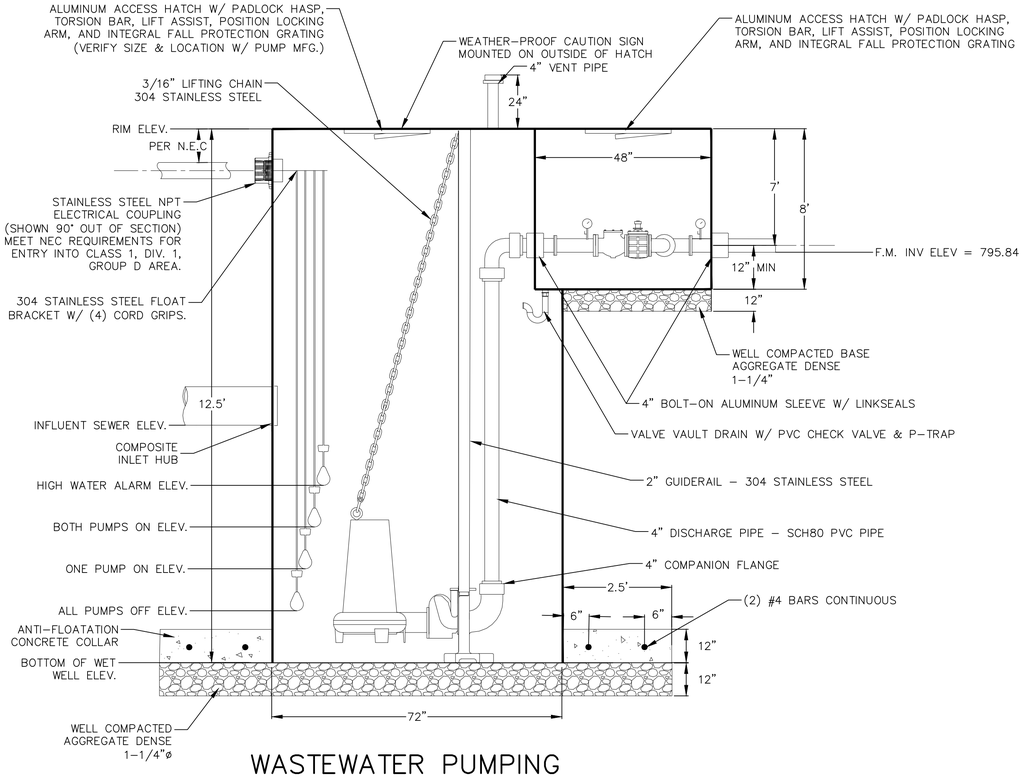


NOTE: THIS DESIGN ASSUMES THE BACKUP POWER IS ROUTED THROUGH THE RETREAT CENTER BUILDING, PRIOR TO SERVING THE CONTROL PANEL AND PUMPING STATION.

NOTES:
1. CONTRACTOR SHALL VERIFY THAT SELECTED COMPONENTS ARE SUITABLE FOR THE WEIGHT OF THE MOUNTED EQUIPMENT.
2. SUPPORT MEMBERS SHALL BE CONSTRUCTED OF GALVANIZED STEEL. ALL HARDWARE SHALL BE CONSTRUCTED OF STAINLESS STEEL.

3 / C604 CONTROL PANEL -WASTEWATER PUMPING STATION

NOT TO SCALE



2 / C604 WASTEWATER PUMPING STATION SECTION

NOT TO SCALE

WASTEWATER PUMPING STATION REQUIREMENTS TABLE	
-Flows -	
Estimated Average Flow	39 gpm
Estimated Peak Flow	155 gpm
-Pumps -	
Brand	Hydromatic
Model	S4HVX
Type	Solids Handling, Semi-open Vortex
Minimum Solids Passage	3.00 inches
Impeller Diameter (inches)	5 3/8
Pumping Rate	120 gpm
Piping System TDH @ Pumping Rate	60 ft.
Motor Horse Power	10.0
Motor Speed	3,500 rpm
Motor Voltage & Phase	200/230 VAC, 3 - Φ *
Motor Protection	Bi-metallic, temperature sensitive disc, sized to open at 130°C & automatically reset @ 96-68°C differential
Mechanical Seals	Carbon/Ceramic/Nitrile, Type 21
-Piping -	
Lift Station Piping Diameter	4.00 inches
Force Main Diameter	4.00 inches
-Wet Well -	
Diameter	72 inches
Material	Fiberglass (Topp Industries O.A.E.)
LEVELS:	
Wet Well Rim	803.00
Discharge Pipe Invert Elevation	795.84
Influent Sewer Invert Elevation	794.58
High Water Alarm	794.08
Both Pumps On	793.75
One Pump On	793.25
All Pumps Off	792.66
Bottom of Wet Well	790.50
Wet Well Depth	12.50 ft.
-Control System -	
Manufacture / Model	USEMCO / Power Pack or approved equal.
Enclosure	Stainless Steel NEMA 4X with lockable latch.
Pump Motor Protection & Starters	Circuit Breaker, IEC rated FVNR Motor Starter, Seal Fail/Moisture Sensor, Thermal Cutout with Auto Reset (2 sets)
Level Control System	Float Based Solid State Duplex Pump Controller with automatic pump alternator and inputs for overtemperature & seal failure sensors
Level Sensors	Non-Mercury Float Switches (4) with Intrinsic Safety Barrier
Pump Switches	Hand-Off-Auto Selector Switch (2)
Pump Meters	Run Time Meter (2)
Indicator Lights	Power On, Pump Run, Pump Fail, Seal Fail, Over-temperature (2 sets)
Alarms	Power Failure, Pump Failure, Overtemperature, High Water, Seal Failure.
Alarm System	Alarm Light mounted on top of Enclosure. Alarm Horn. Silence Push Button. Uninterruptable Power Supply.
Other Features	Lightning Arrestor, Phase Monitor, Anti-Condensation Heater with thermostat, Main Disconnect
Manufacturer's Representative	L.W. Allen Pump Systems. John Lyne - Sales Manager. (414) 426-6036. jlyne@lwallen.com

*** Verify available voltage with electrical plans.**

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Phone: (800) 261-3898

Wastewater Pumping Station Details

St. Juan Diego Pilgrim House
City of La Crosse
La Crosse County, WI

REVISIONS NO.	DATE	REMARKS

REVISIONS NO.	DATE	REMARKS

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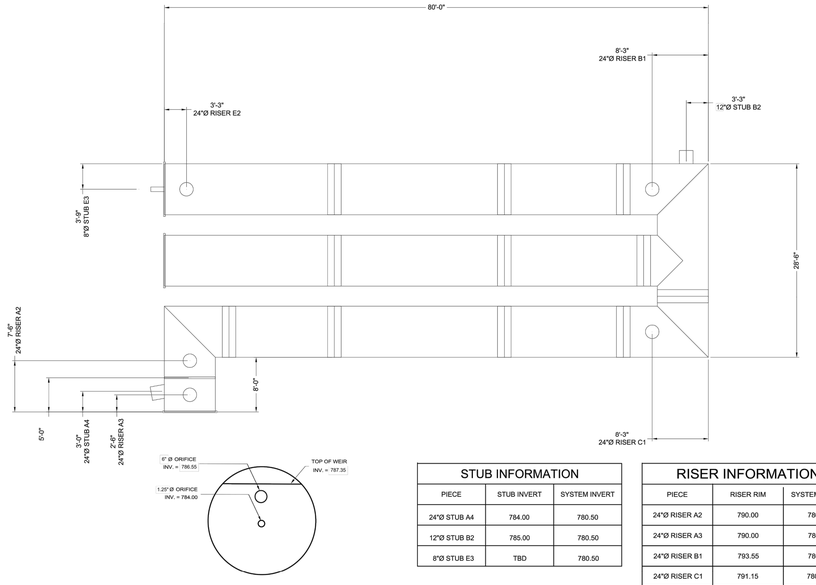
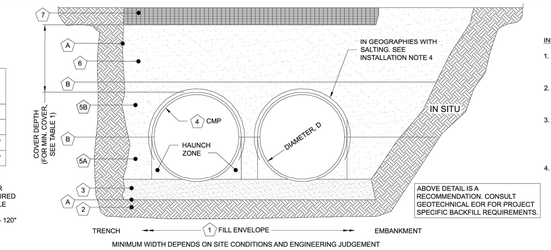
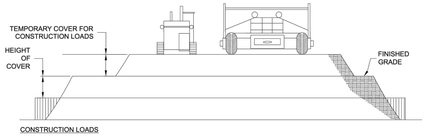
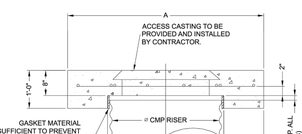
PROJECT NO. 200196

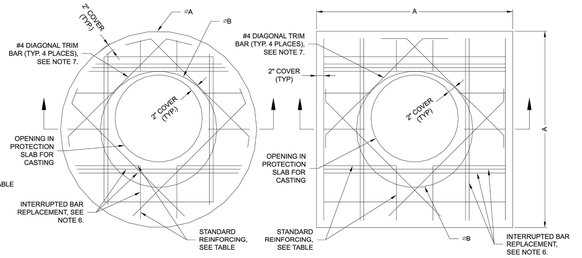
C604

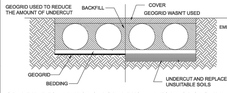


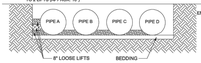


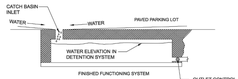












PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 254 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = N/A
- PIPE STORAGE VOLUME = 11,221 CF
- BACKFILL STORAGE VOLUME = 0 CF
- TOTAL STORAGE PROVIDED = 11,221 CF

PIPE DETAILS
- DIAMETER = 90"
- CORRUGATION = 5x1
- GAGE = 14
- COATING = ALT2
- WALL TYPE = SOLID
- BARREL SPACING = 36"

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

NOTES

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

WEIR PLATE B5 DETAIL
N.T.S.

ASSEMBLY
SCALE: 1" = 10'

STUB INFORMATION

PIECE	STUB INVERT	SYSTEM INVERT
24"Ø STUB A4	784.00	780.50
12"Ø STUB B2	785.00	780.50
8"Ø STUB E3	TBD	780.50

RISER INFORMATION

PIECE	RISER RIM	SYSTEM INVERT
24"Ø RISER A2	790.00	780.50
24"Ø RISER A3	790.00	780.50
24"Ø RISER B1	793.55	780.50
24"Ø RISER C1	791.15	780.50
24"Ø RISER E2	794.10	780.50

DATE	REVISION DESCRIPTION	BY

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

CONTECH CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

DYO58621 St. Juan Diego Retreat House
90" CMP Wet Pond
La Crosse, WI
DETENTION SYSTEM

PROJECT No.: 41358	SEQ. No.: 58621	DATE: 9/9/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

TABLE 1:

DIAMETER, D	MIN. COVER	CORR. PROFILE
6"-10"	12"	1 1/2" x 1/4"
12"-48"	12"	2 2/3" x 1/2"
>48"-96"	12"	3" x 1", 5" x 1"
>96"	D/8	3" x 1", 5" x 1"

- STRUCTURAL BACKFILL MUST EXTEND TO LIMITS OF THE TABLE
- TOTAL HEIGHT OF COMPACTED COVER FOR CONVENTIONAL HIGHWAY LOADS IS MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT
- ULTRAFLO ALSO AVAILABLE FOR SIZES 18" - 120" WITH 3/4"x 3/4"x 7 1/2" CORRUGATION

MINIMUM WIDTH DEPENDS ON SITE CONDITIONS AND ENGINEERING JUDGEMENT

INSTALLATION NOTES

1. WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES.
2. OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.
3. BACKFILL USING CONTROLLED LOW-STRENGTH MATERIAL (CLSM, "FLASH FILL" OR "FLOWABLE FILL") MAY BE USED WHEN THE SPACING BETWEEN THE PIPES WILL NOT ALLOW FOR PLACEMENT AND ADEQUATE COMPACTION OF THE BACKFILL. CONTACT CONTECH FOR FURTHER EVALUATION.
4. IF SALTING AGENTS FOR SNOW AND ICE REMOVAL ARE USED ON OR NEAR THE PROJECT, A GEOMEMBRANE BARRIER IS RECOMMENDED OVER THE UPPER HALF OF THE PIPE. THE GEOMEMBRANE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM A CHANGE IN THE SURROUNDING ENVIRONMENT OVER A PERIOD OF TIME. PLEASE REFER TO THE CORRUGATED METAL PIPE DETENTION DESIGN GUIDE FOR ADDITIONAL INFORMATION.

TABLE 2: SOLID STANDARD

CMP DETENTION AND CMP DRAINAGE STANDARD BACKFILL SPECIFICATIONS

	MATERIAL LOCATION	MATERIAL SPECIFICATION	DESCRIPTION	
1	FILL ENVELOPE WIDTH	PER ENGINEER OF RECORD	MINIMUM TRENCH WIDTH MUST ALLOW ROOM FOR PROPER COMPACTION OF HAUNCH MATERIALS UNDER THE PIPE. THE SUGGESTED MINIMUM TRENCH WIDTH, OR EOR RECOMMENDATION: PIPE ≤ 12": D + 16" PIPE > 12": 1.5D + 12"	MINIMUM EMBANKMENT WIDTH (IN FEET) FOR INITIAL FILL ENVELOPE: PIPE < 24": 3.0D PIPE 24" - 144": D + 4'0" PIPE > 144": D + 10'0"
2	FOUNDATION	**AASHTO 26.5.2** OR PER ENGINEER OF RECORD	PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND FOUNDATION BROUGHT BACK TO GRADE WITH A FILL MATERIAL APPROVED BY THE ENGINEER OF RECORD.	
3	BEDDING	**AASHTO M 43: 3, 357, 4, 467, 5, 56, 57** (APPROVED REGIONAL EQUIVALENTS INCLUDE CA-7)	ENGINEER OF RECORD TO DETERMINE IF BEDDING IS REQUIRED. PIPE MAY BE PLACED ON THE TRENCH BOTTOM OF A RELATIVELY LOOSE, NATIVE SUITABLE WELL GRADED GRANULAR MATERIAL THAT IS ROUGHLY SHAPED TO FIT THE BOTTOM OF THE PIPE, 2" MIN DEPTH. THE BEDDING MATERIAL MAY BE SUITABLE FOUNDATION SOILS CONFORMING TO AASHTO SOIL CLASSIFICATIONS A1, A2, OR A3 WITH MAXIMUM PARTICLE SIZE OF 3" PER AASHTO 26.3.8.1	
4	CORRUGATED METAL PIPE			
5A	CRITICAL BACKFILL	**AASHTO M 145: A-1, A-2, A-3 ***	HAUNCH ZONE MATERIAL SHALL BE HAND SHOVELED OR SHOVEL SLICED INTO PLACE TO ALLOW FOR PROPER COMPACTION WITHOUT SOFT SPOTS. BACKFILL SHALL BE PLACED IN 8" +/- LOOSE LIFTS AND COMPACTED TO 90% STANDARD PROCTOR PER AASHTO T 99. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A THREE LIFT (24") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHOULD BE ADVANCED ALONG THE LENGTH OF THE SYSTEM TO AVOID DIFFERENTIAL LOADING. WELL GRADED GRANULAR MATERIAL WHICH MAY CONTAIN SMALL AMOUNTS OF SILT OR CLAY AND MAXIMUM PARTICLE SIZE OF 3" (PER AASHTO 26.3.8.1 AND 12.4-1.3).	
5B	BACKFILL	**AASHTO M 145: A-1, A-2, A-3**		
6	COVER MATERIAL	UP TO MIN. COVER - SEE 5A AND 5B ABOVE ABOVE MIN. COVER - PER ENGINEER OF RECORD	COVER MATERIAL MAY INCLUDE NON-BITUMINOUS, GRANULAR ROAD BASE MATERIAL WITHIN MIN COVER LIMITS	
7	RIGID OR FLEXIBLE PAVEMENT (IF APPLICABLE)	PER ENGINEER OF RECORD	FLEXIBLE PAVEMENT SHOULD NOT BE COUNTED AS PART OF THE FILL HEIGHT OVER THE CMP. FINAL BACKFILL MATERIAL SELECTION AND COMPACTION REQUIREMENTS SHALL FOLLOW THE PROJECT PLANS AND SPECIFICATIONS PER THE ENGINEER OF RECORD.	
A	OPTIONAL SIDE GEOTEXTILE	NONE	GEOTEXTILE LAYER IS RECOMMENDED ON SIDES OF EXCAVATION TO PREVENT SOIL MIGRATION.	
B	OPTIONAL GEOTEXTILE BETWEEN LAYERS	NONE	IF SOIL TYPES DIFFER AT ANY POINT ABOVE PIPE INVERT, A GEOTEXTILE LAYER IS RECOMMENDED TO BE PLACED BETWEEN THE LAYERS TO PREVENT SOIL MIGRATION.	

NOTES:
- FOR MULTIPLE BARREL INSTALLATIONS, THE RECOMMENDED STANDARD SPACING BETWEEN PARALLEL PIPE RUNS SHALL BE THE PIPE DIAMETER /2 BUT NO LESS THAN 12" FOR DIAMETERS <72". FOR 72" AND LARGER DIAMETERS, THE MINIMUM SPACING IS 36". CONTACT YOUR CONTECH REPRESENTATIVE FOR NONSTANDARD SPACING.

* APPROVED REGIONAL EQUIVALENTS FOR SECTION 5A INCLUDE CA-7, CODOT #67, MIDOT 2G, 34G, OR 21AA STONE OR GRAVEL; #8; #57; MIDOT 6A, 2G, 3G, 34G.

MANUFACTURER RECOMMENDED BACKFILL

NOT TO SCALE

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CONTECH CMP DETENTION SYSTEMS CONTECH DYODS DRAWING
DYO58621 St. Juan Diego Retreat House 90" CMP Wet Pond La Crosse, WI DETENTION SYSTEM
PROJECT No.: 41358 SEQ. No.: 58621 DATE: 9/9/2024 DESIGNED: DYO DRAWN: DYO CHECKED: DYO APPROVED: DYO SHEET NO.: 1

CONSTRUCTION LOADS

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

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

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

CONSTRUCTION LOADING DIAGRAM

SCALE: N.T.S.

SPECIFICATION FOR DESIGNED DETENTION SYSTEM:

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

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

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

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

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

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

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

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

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

GALVANIZED: AASHTO M-36 OR ASTM A-760

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

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

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

NOTE:
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SECTION VIEW

REINFORCING TABLE

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

** ASSUMED SOIL BEARING CAPACITY

ROUND OPTION PLAN VIEW

SQUARE OPTION PLAN VIEW

NOTES:

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

MANHOLE CAP DETAIL

SCALE: N.T.S.

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CMP DETENTION INSTALLATION GUIDE

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

FOUNDATION

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

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

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

GEOMEMBRANE BARRIER

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

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

IN-SITU TRENCH WALL

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

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

BACKFILL PLACEMENT

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

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

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

TYPICAL BACKFILL SEQUENCE

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

CONSTRUCTION LOADING

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

ADDITIONAL CONSIDERATIONS

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

CMP DETENTION SYSTEM INSPECTION AND MAINTENANCE

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

INSPECTION

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

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

MAINTENANCE

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

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

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

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

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

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CONTECH CMP DETENTION SYSTEMS CONTECH DYODS DRAWING
DYO58621 St. Juan Diego Retreat House 90" CMP Wet Pond La Crosse, WI DETENTION SYSTEM
PROJECT No.: 41358 SEQ. No.: 58621 DATE: 9/9/2024 DESIGNED: DYO DRAWN: DYO CHECKED: DYO APPROVED: DYO SHEET NO.: 1

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vierbicher
planners | engineers | advisors
Phone: (800) 261-3898

Underground Detention Details
St. Juan Diego Pilgrim House
City of La Crosse
La Crosse County, WI

REVISIONS

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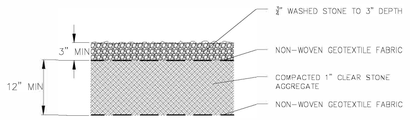


1
1 WASHED STONE
NOT TO SCALE

LANDSCAPE MATERIAL NOTES:

1. CONTRACTOR SHALL PROVIDE A SUITABLE AMENDED TOPSOIL BLEND FOR ALL PLANTING AREAS WHERE SOIL CONDITIONS ARE UNSUITABLE FOR PLANT GROWTH. TOPSOIL SHALL CONFORM TO QUALITY REQUIREMENTS AS PER SECTION 625.2(1) OF THE "STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION." PROVIDE A MINIMUM OF 18" OF TOPSOIL IN ALL PLANTING AREAS AND 6" OF TOPSOIL IN AREAS TO BE SEEDED/SODDED.
2. SUBSOIL UNDER TURF AND PLANTING BEDS MUST BE FREE DRAINING AND LOOSE TO ALLOW ROOT PENETRATION AND DRAINAGE. LANDSCAPE CONTRACTOR SHOULD NOTIFY GENERAL CONTRACTOR IF SUBSURFACE COMPACTION IS UNFIT FOR PLANTING. LANDSCAPE CONTRACTOR IS NOT RESPONSIBLE FOR SUBSURFACE SOIL PREPARATION.
3. LANDSCAPE BEDS TO BE MULCHED WITH UNDYED SHREDDED HARDWOOD BARK MULCH TO 3" DEPTH MIN. DO NOT ALLOW MULCH TO TOUCH STEMS OR TRUNKS OF INSTALLED PLANTS. NO LANDSCAPE FABRIC TO BE INSTALLED WITHIN PLANTED AREAS.
4. AREAS IDENTIFIED AS WASHED STONE ARE TO BE INSTALLED USING 1-2" WASHED STONE TO A DEPTH OF 3" MINIMUM. INSTALL 1" OF COMPACTED 1" CLEAR AGGREGATE STONE BELOW WASHED STONE. WASHED STONE AND CLEAR AGGREGATE STONE SEPARATED BY COMMERCIAL GRADE NON-WOVEN GEOTEXTILE FABRIC. LAY COMMERCIAL GRADE NON-WOVEN GETEXTILE FABRIC BETWEEN GRADE AND STONE. APPROVE STONE PRODUCT WITH CLIENT PRIOR TO INSTALLATION.
5. AREAS IDENTIFIED AS 3/4" RAVEN BLACK STONE ARE TO BE INSTALLED USING 3/4" "RAVEN BACK" AS SUPPLIED BY HALQUIST STONE OR EQUAL. APPROVED PRODUCT: TO A DEPTH OF 3" MINIMUM. LAY COMMERCIAL GRADE LANDSCAPE FABRIC BETWEEN GRADE AND STONE. APPROVE STONE PRODUCTS WITH CLIENT PRIOR TO INSTALLATION.

SEEDING AND PLUG PLANTING NOTES:

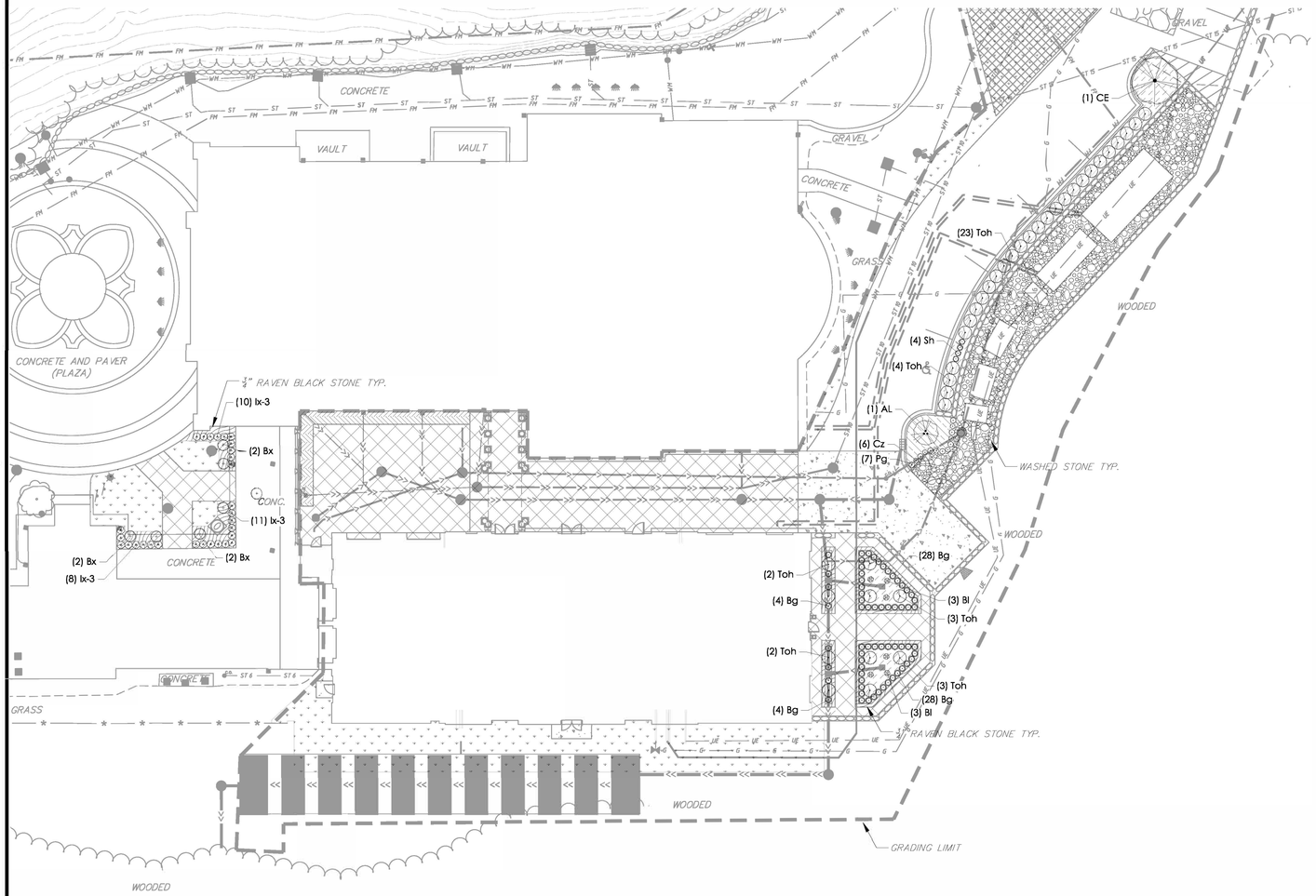
1. ALL AREAS SHOWN AS TURF GRASS TO BE SEEDED WITH 'MADISON PARKS' SEED MIX BY LA CROSSE SEED OR EQUIVALENT. ALL SEEDED AREAS ARE TO BE WATERED DAILY TO MAINTAIN ADEQUATE SOIL MOISTURE FOR PROPER GERMINATION. AFTER VIGOROUS GROWTH IS ESTABLISHED, APPLY 1" WATER TWICE WEEKLY UNTIL FINAL ACCEPTANCE. (PRIOR TO ROUTINE MAINTENANCE SCHEDULE ESTABLISHMENT, MOWING SHOULD OCCUR TO MAINTAIN A TURF HEIGHT OF 3"-6".) PRIOR TO SEEDING APPLY A MINIMUM OF 4" TOPSOIL TO ENTIRE AREA. FOLLOWING SEEDING APPLY A MULCH LAYER OF STRAW OR STRAW MAT.
2. INSTALL GROUNDCOVERS (GC) AS 2" X 2" X 4", 2.25" X 2.25" X 5" OR 2.5" X 2.5" X 3.5" ROOT MASS PLUGS OR EQUAL. PLUGS TO BE INSTALLED 10" ON CENTER IN A TRIANGULAR GRID PATTERN. PLANT SPECIES RANDOMLY THROUGHOUT SPECIFIED AREA, MAINTAINING A REPRESENTATIVE RATIO OF SPECIES AS SHOWN IN THE CONCEPT PLANT SCHEDULE THROUGHOUT PLANTING. PLUG NUMBERS ARE APPROXIMATE BASED ON AREA, CONTRACTOR TO CONFIRM QUANTITIES. QUANTITIES IN SCHEDULE REPRESENT TOTAL PLUGS PER SPECIES FOR ALL GROUNDCOVER AREAS SHOWN. EACH AREA TO RECEIVE A REPRESENTATIVE FRACTION OF PLUGS BASED ON THE SQUARE FOOTAGE OF EACH RESPECTIVE PLANTING LOCATION SPECIFIED. WHERE SHRUBS/TREES ARE SHOWN WITHIN GROUNDCOVER AREAS, SUBSTITUTE SHRUB/TREE FOR PLUGS AND SPACE SURROUNDING PLUGS 10" FROM SHRUB/TREE ROOT MASS, PATTERN ACCORDING. APPLY 1/2" WATER DAILY FOR 4 WEEKS FOLLOWING INSTALLATION. APPLY AN INITIAL APPLICATION OF PRE-EMERGENT HERBICIDE PER MANUFACTURER'S INSTRUCTIONS AND STATE REGULATIONS. APPLY 2" OF CEDAR MULCH AT TIME OF PLANTING.
3. ALL UNLABELED DISTURBED AREAS ADJACENT TO EXISTING WOODED VEGETATION TO BE SEEDED WITH 'SHADE SEED MIX' BY AGRECOL OR EQUIVALENT, PER MANUFACTURER'S SPECIFICATIONS.

GENERAL LANDSCAPE NOTES:

1. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR ANY RIGHT OF WAY WORK.
2. CONTRACTOR SHALL VERIFY ALL UTILITIES WITHIN SCOPE OF CONTRACT.
3. CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER CONTRACTORS AT SITE AND COMPLETE WORK PER SCHEDULE.
4. CONTRACTOR SHALL CLEAN ALL PAVEMENT AREAS WITHIN SITE AFTER COMPLETION. CONTRACTOR SHALL CLEAN ANY AFFECTED PAVED AREAS OUTSIDE OF DISTURBANCE DELINEATION DAILY.
5. ALL MATERIAL QUANTITIES AND AREA MEASUREMENTS SHOWN ON LANDSCAPE PLAN ARE TO BE CONFIRMED BY LANDSCAPE CONTRACTOR. LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR VERIFYING AND ADJUSTING FOR ANY QUANTITATIVE DISCREPANCIES BETWEEN PLAN, SCHEDULES, AND PREPARED CONDITIONS PRIOR TO INSTALLATION.
6. PLANTS SHALL BE INSTALLED WHEN ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED WITHIN THE IMMEDIATE VICINITY.
7. ANY PREPARED SITE CONDITIONS THAT CONTRADICT THE LANDSCAPE PLAN AND NEGATIVELY AFFECT THE SUCCESS OF PLANTINGS SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT.
8. LANDSCAPE CONTRACTOR TO PROVIDE 60 DAYS OF INITIAL MAINTENANCE PERIOD FOLLOWING LANDSCAPE INSTALLATION. CONTRACTOR IS RESPONSIBLE FOR WATERING ALL SEEDINGS AND PLANTINGS, AS WELL AS MOWING, WEEDING AND MATERIAL CLEAN UP.

PLANT MATERIAL NOTES:

1. ALL PLANTINGS SHALL CONFORM TO QUALITY REQUIREMENTS AS PER ANSI Z60.1.
2. ALL PLANT MATERIAL SHALL BE TRUE TO SPECIES, VARIETY AND SIZE SPECIFIED, NURSERY GROWN IN ACCORDANCE WITH GOOD HORTICULTURAL PRACTICES, AND UNDER CLIMATIC CONDITIONS SIMILAR TO THOSE OF THE PROJECT SITE.
3. CONTACT LANDSCAPE ARCHITECT, IN WRITING, TO REQUEST ANY PLANT MATERIAL SUBSTITUTIONS DUE TO AVAILABILITY ISSUES.
4. ALL PLANTS SHALL BE GUARANTEED TO BE IN HEALTHY AND FLOURISHING CONDITION DURING THE GROWING SEASON FOLLOWING INSTALLATION. ALL PLANT MATERIAL SHALL BE GUARANTEED FOR ONE YEAR FROM THE TIME OF INSTALLATION.
5. EXACT LOCATIONS OF EACH PLANT ARE GIVEN IN PLAN. WHILE SLIGHT DEVIATIONS ARE ACCEPTABLE, OVERALL SCHEMATIC/ORIENTATION TO BE ADHERED TO AS ACCURATELY AS POSSIBLE. NOTIFY LANDSCAPE ARCHITECT OF ANY CONFLICTS.

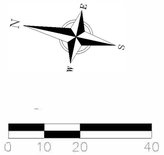


PLANT SCHEDULE

CODE	BOTANICAL / COMMON NAME	ROOT COND.	SIZE	QTY
UNDERSTORY TREES				
AL	Amelanchier laevis / Allegheny Serviceberry	B & B	5` ht.	1
CE	Cercis canadensis / Eastern Redbud Multi-trunk	B & B	6` ht.	1
EVERGREEN SHRUBS				
Bg	Buxus x 'Green Gem' / Green Gem Boxwood	Cont.	5 Gal.	64
Bx	Buxus x 'Green Mountain' / Green Mountain Boxwood	Cont.	5 Gal.	7
Ix-3	Ilex glabra 'SMNIGAB17' / Gem Box® Inkberry Holly	Cont.	3 Gal.	29
Toh	Thuja occidentalis `Holmstrup` / Holmstrup Cedar	B & B	5` ht.	37
PERENNIALS				
Bl	Baptisia alba / White Wild Indigo	Cont.	1 Gal.	6
Cz	Coreopsis tripteris / Tall Coreopsis	Cont.	1 Gal.	6
Pg	Panicum virgatum / Switch Grass	Cont.	1 Gal.	7
Sh	Sporobolus heterolepis / Prairie Dropseed	Cont.	1 Gal.	4

CONCEPT PLANT SCHEDULE

3/4" RAVEN BLACK STONE		522 sf
GC #1		759 sf
	Antennaria plantaginifolia / Pussytoes	397
	Sedum ternatum / Wild Stonecrop	737
GC #2		135 sf
	Carex brevior / Oval Sedge	57
	Liatris aspera / Rough Blazing Star	16
	Lupinus perennis / Wild Lupine	8
	Pycnanthemum virginianum / Mountain Mint	6
	Sporobolus heterolepis / Prairie Dropseed	115
GC #3		302 sf
	Carex albicans / White-tinged Sedge	226
	Sedum ternatum / Wild Stonecrop	226
TURF		4,057 sf
WASHED STONE		1,574 sf



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St. Juan Diego Retreat
City of La Crosse
La Crosse County, WI

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