August 2, 2023

Women's Leadership Center

Compatibility Report (18.0821.G (2):

Our proposed use of the property (Indoor Institutional – Intensive, 18.0308B and Residential Garage or Shed, 18.0315I) is consistent with the P & I zoning (Principal Land Uses Permitted by CUP and Accessory Uses Permitted by Right) and the Village's recently adopted Comprehensive Land Use Plan. Our property has been designated with P & I land use for many years. If the Women's Leadership Center project was building 20,000sf or less, the CUP requirement would not apply. To achieve the Women's Leadership Center program, we propose to build 24,894sf. The minor incremental difference in FAR (.053 to .068) will have a negligible impact on the surrounding neighborhood and the additional building area will not appreciably impact the site.

The project design respects the environmental corridor designation with impervious coverage of 19% (buildings and paving). We have tagged and surveyed 808 existing trees and propose to only remove 20% (does not include invasive and dead trees). The storm water control system is focused on water quality and infiltration that meets the regulatory requirements.

Our design team has carefully crafted a project, with site design and architecture, that respects the property by softly integrating the Women's Leadership Center program and related infrastructure, so it feels "at home" and connected to the uniqueness of the site. The placement of the three principal buildings and one accessory building on the site exceed the required setbacks from the property lines and Geneva Lake. The same is true for all vehicular paving. The design (mass, height and form) of the buildings is respectful of the natural character of the property and the surrounding area. The design and construction of the project is pursuing a LEED Gold designation.

The site layout, grading, storm water and utilities have been designed to harmonize and complement the site's natural land forms and minimize tree removal. The overall vision for the property is to encourage meeting attendees and staff to enjoy and explore the site at all times of the year. Most of the parking is located near Constance Blvd with an appropriate setback for landscape screening. Key landforms (Oak Savannah Knoll and Woodland Clearing) are preserved and enhanced to support low impact activities that meeting attendees can enjoy.

The development density (.068 FAR) of the Women's Leadership Center use is low to modest. Our traffic generation is low, with trips for attendees mostly happening by shuttling from local hotels or George Williams College using passenger vans (12-15 persons).

The property has wonderful topography and hundreds of existing trees. Throughout its previous ownership, maintenance and stewardship of the plant communities has been lacking or non-existent. Over the past 100 years or more, invasive woody and herbaceous plants have taken over the site. During the past year, the Women's Leadership Center took the first steps to reverse the decades of neglect by removing about 90 invasive trees and a majority of the invasive understory. Our goal is to restore the entire property to a high-quality southeast Wisconsin woodland. The plant list will primarily focus on native material (woody and herbaceous).

August 2, 2023

The Women's Leadership Center believes our project will enhance the desired character of Williams Bay. Our use is consistent with the existing zoning, the Comprehensive Land Use Plan and will support the local economy. The low-density development is being designed to complement and harmonize with the wooded site and the varied topography. We have sited our buildings to respect our neighbors and will restore the woodland site so that it will be a positive example in Williams Bay which also reflects the aspirations and heritage of the Kishwauketoe Nature Conservancy.

August 3, 2023

Women's Leadership Center
Conditional Use Permit Narrative: 18.1207.D(2)

The not-for-profit Women's Leadership Center at Williams Bay is a multidisciplinary hub where leaders from various fields will gather to learn, innovate, exchange ideas, and challenge existing paradigms to create new possibilities. The Center will primarily serve women leaders at the forefront of public and private enterprise, global supply chain, engineering and technology, infrastructure and design, and space and astrophysics. Once established, the Women's Leadership Center will serve as a platform for these leaders to engage in transformative conversations and meaningful collaborations which will have the opportunity to change the world.

The Woman's Leadership Center will be located on an 8.6-acre site on the shores of Geneva Lake more particularly described as follows:

> Lot 1 of Certified Survey Map No. 4998, recorded December 20, 2021, as Document No. 1053121, and being part of Block A and part of Block C of Assessor's Subdivision, being a part of the SE. 1/4 of the SW. 1/4 of Section 1 and the NE. 1/4 of the NW. 1/4 of Section 12, T.01N., R.16E., Village of Williams Bay, Walworth County, Wisconsin.
>
> Part of Tax Key No. WAS 00001A

The Center is contiguous to George Williams College of Aurora University and Yerkes Observatory and will be immersed in the site's natural beauty and rich history. Due to its close proximity to these two learning institutions, the Center is grounded in opportunity for cross-collaboration. The Women's Leadership Center team has also planned a restoration of the site with native vegetation to further pronounce the historical value and visual allure of the grounds. The Center, which will feature three unique buildings named The Lodge (13,150 SF), The Council (8,104 SF), and The Cabin (3,640 SF), will provide opportunities for various forms of programming including: summits, focused retreats, seminars, and roundtable discussions. The combined total conditioned space of the Center's buildings is 24,894 square feet. A small maintenance shed, located adjacent to the required on-site parking, is also being planned.

The three primary buildings, The Lodge, The Council and The Cabin are strategically organized to respect neighboring properties such that distinct programming can occur in each while still maintaining a harmonious relationship between the three spaces, the lake, and the surrounding natural environment. The Lodge and The Council, in particular, are designed to support a variety of meeting and gathering functions, catering to a range of group sizes and program

durations. The Cabin will have private accommodations for up to three guest artists or lecturers concurrently, to support on-site programming. The Center's campus is designed to be active year-round, hosting a range of activities from an engaging day-long board retreat for 15-20 attendees to a five day-long leadership summit for 60-80 attendees. Attendees will be provided overnight accommodations at either George Williams College or several of the local boutique hotels in the area and will be shuttled to the Center for activities. The general location of the three primary buildings and the maintenance shed is depicted on the site plan submitted with the Center's conditional use permit application.

The design of the Women's Leadership Center has been a highly resourced and skillful meeting of minds to execute. Two and a half years in the planning, the Women's Leadership Center is a combined effort of the award-winning architecture firm, Studio Gang Architects, the landscape design studio, OLIN, contractor Pepper Construction, arts management consultants AMS Planning & Research, and owner Ann Drake, and her knowledgeable team of advisors and staff. The Center, a cultural incubator by design, aspires to immerse itself into and enhance the vitality of arts, science, and culture already present in Williams Bay and the surrounding communities.

B. Natural Resources Site Evaluation Worksheet: This worksheet is intended to determine which areas of a site may be considered natural areas requiring protection and preservation, and which areas are most suited for development.

Figure 18.0404: Natural Resources Site Evaluation Worksheet	
Step 1: Determine the Gross Site Area (GSA) of the Site	
A. Total site area as determined by site survey.	8.63 acres
B. Sum up areas located within proposed street rights-of-way and within the proposed boundaries of public facilities designated in the Village's Comprehensive Plan and/or required for dedication per subdivision regulations.	0 acres
C. Sum up land that, although part of the same parcel, is not contiguous to or is not accessible from the road network proposed to serve the project	0 acres
D. Sum up land that is proposed for a different development option or a different zoning district	0 acres
E. Sum up areas covered by navigable waters (lakes & streams)	0 acres
F. Add up Rows B through E	0 acres
G. Subtract Row F from Row A (Row F – Row A) = Gross Site Area (GSA)	8.63 acres
Step 2: Determine the Required Resource Protection Area (RPA) of the Site:	
H. Portion of gross site area containing floodways	0 acres
I. Portion of gross site area containing floodplain areas	0 acres
J. Portion of gross site area containing floodfringes	0 acres
K. Portion of gross site area containing wetlands	0 acres
L. Portion of gross site area containing lakeshores	8.63 acres
M. Portion of gross site area containing woodlands	8.63 acres
N. Portion of gross site area containing steep slopes	4.34 acres
O. Add up Rows H through N = Required Resource Protection Area (RPA)	21.60 acres
Step 3: Determine the Net Developable Area (NDA) of the Site:	
P. Subtract Row O from Row G (Row G [GSA] – Row O [RPA]) = Net Developable Area (NDA)	-12.97 acres
Q. Multiply Row P by the Maximum Gross Intensity or Density allowable in the zoning district to calculate Maximum development potential for the site.	-3.89 acres

CONSIGNY LAW FIRM, S.C.

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WEBSITE: http://www.janesvillelaw.com

August 12, 2021

Sent via email: admin@williamsbay.org

Becky Tobin, Village Administrator
Village of Williams Bay
P. O. Box 580
Williams Bay, WI 53191-0580

RE: Natural Resources Site Evaluation Worksheet

Ms. Tobin,

Section 18.0404 of the Village of Williams Bay Zoning Ordinance deals with the subject of Natural Resources Site Evaluation in conjunction with the review of the appropriate density for residential and nonresidential development projects. In subpart B of the ordinance there is a Natural Resources Site Evaluation Worksheet. A question has been raised concerning the extent to which that worksheet controls the ability to develop a particular parcel or parcels of land.

To address that question, the village has conferred with Michael Slavney of the firm Vandewalle & Associates, which is the firm that assisted the village in creating the current zoning ordinance. Mr. Slavney provided the village with a memorandum dated August 5, 2021 providing his interpretation of the appropriate application of the worksheet. In my review of his memorandum, it is my understanding that Mr. Slavney is stating that the worksheet does not define the extent to which one or more parcels of land may be developed. Instead, it is a tool to be used by the village and landowner to assist in determining the appropriate density for development of the particular parcel or parcels. He also notes that pursuant to Section 18.0307. D., in every zoning district up to 30% of the woodlands can be removed in the area or areas in which the development on a parcel is to occur.

Based on my review of Sections 18.0401 through 18.0405 and Section 18.0307.D. of the Zoning Ordinance, I would agree with the interpretation contained within the memorandum of Mr. Slavney. If there are any further questions regarding this topic, please contact me.

Very truly yours,

CONSIGNY LAW FIRM, S.C.

By: Mark A. Schroeder

Mark A. Schroeder
email: mschroeder@janesvillelaw.com

MAS/kk

M E M O R A N D U M

To: Bonnie Schaeffer, Village of Williams Bay Zoning Administrator

From: Michael Slavney, FAICP, Vandewalle & Associates

Re: Application of Natural Resources Site Evaluation, Zoning Ordinance Section 18.0404

Date: August 5, 2021

This memo responds to your request for an explanation as to how the Natural Resources Site Evaluation Worksheet (NRSEW) is to be used in determining the development potential of a large vacant site in Williams Bay.

In a nutshell, the NRSEW is intended to be used as a tool to ensure that the implications of the Natural Resources Overlay Zoning Districts is understood. It is not a regulatory tool in and of itself. Specifically, the Purpose Statement for the NRSEW 18.0404.A describes the use of the overlay zoning districts to protect natural resource areas that are sensitive to disruption caused by development and other land use activities. Although the use of overlay zoning districts for floodplains and wetlands is universal in Wisconsin and throughout the country, Williams Bay is one of only a few communities in the state that protects upland natural resources such as mature woodlands and steep slopes with overlay zoning.

The worksheet itself is designed to ensure that all protected natural resource areas are mapped as the first step in considering development and preservation options for a parcel. Specifically, 18.0404.B states "This worksheet is intended to determine which areas of a site may be considered natural areas requiring protection and preservation, and which areas are most suited for development." The use of the word "may" in this section is intentional, and was meant to convey that the worksheet itself is not a regulatory instrument.

The detailed provisions for determining development potential are found in Section 18.0405. Subsection A.(4) states:

(4) The effect of protected natural resources on the development potential of the subject property should be evaluated. A Natural Resources Site Evaluation worksheet (see Figure 18.0404 above) should be completed for the site. All resources listed should be identified on the subject property, and the total area of the property (in acres) covered by those resources, (resource protection areas (RPA)) should be determined, as should the gross site area (GSA) and the net developable area (NDA) of the subject property.

Using the detailed environmental mapping sources cited in the Zoning Ordinance, it is clear that the subject property on the south side of Constance Boulevard is almost completely covered by Woodlands. The Selective Cutting land use in Section 18.0307.D (described on page 97) is permitted in every zoning district, and allows up to 30% of the combined woodland area on a site to be removed. When a Site Plan is prepared for Village Review, it must show the boundaries of a Development Pad that contains all areas of site disturbance including all areas of tree cutting, clearing, and grading. This Development Pad may not contain more than 30% of the combined woodland area on the parcel. For woodland removal over 30% and conditional use permit for Clear Cutting (Section 18.307.E) would be required. The review criteria for Clear Cutting is stringent.

Please let me know if you have any additional questions.

August 3, 2023

Planning Request Application - Statements

Statement of proposed use of property, with pertinent facts regarding the size of the area involved, extent of development, type of operation, etc.

The Women's Leadership Center property is 8.63 acres. The density of the development is quite low at .068 FAR. The placement of the three principal buildings and one accessory building on the site exceed the required setbacks from the property lines and Geneva Lake. The same is true for all vehicular paving.

The Council and Lodge buildings are where the meetings and dining will take place and these are located on the western portion of the site adjacent to George Williams College. The Cabin building is located on the eastern portion of the site adjacent to the residential zoning. The maximum meeting planned for either the Council or Lodge is 80 people (excluding staff and 3rd party food service). This 80-person group would occupy both buildings and the site during the day's activities. The Cabin would provide overnight accommodations for up to 3 presenters or lecturers or artists, for a period of 1 day to 2 weeks. There will be 3-6 Women's Leadership Center staff with office space at the Council building. The meeting sizes will range from 10-80 people, meetings will cover 1-5 days, with 1-3 meetings per week and operations covering 48 weeks a year. The goal is to provide 50-80 meetings a year.

Onsite parking is provided (in accordance with Village regulations) to support visitors and staff, and there is one loading area on the east side of the Lodge. The design and construction of the project is pursuing a LEED Gold designation.

Statement showing the compatibility of the proposed zoning district and/or use to the Village Comprehensive Plan.

Our proposed use of the property (Indoor Institutional – Intensive, 18.0308B and Residential Garage or Shed, 18.0315I) is consistent with the P & I zoning (Principal Land Uses Permitted by CUP and Accessory Uses Permitted by Right) and the Village's recently adopted Comprehensive Land Use Plan. Our property has been designated with P & I land use for many years. The adjacent properties to the north and west have P & I zoning, to the south is Geneva Lake and to the east is R-2 residential zoning. The design respects the environmental corridor designation with impervious coverage of 19% (buildings and paving).

We have tagged and surveyed 808 existing trees and propose to only remove 20% (does not include invasive and dead trees). The topography and trees are assets to the proposed development and to the character of Williams Bay. Our design team has carefully crafted a project, with site design and architecture, that respects the property by softly integrating the Women's Leadership Center program and related infrastructure, so it feels "at home" and connected to the uniqueness of the site.

If the Women's Leadership Center project was building 20,000sf or less, the CUP requirement would not apply. To achieve the Women's Leadership Center program, we propose to build 24,894sf. The minor incremental difference in FAR (.053 to .068) will have a negligible impact on the surrounding neighborhood and the additional building area will not appreciably impact the site.

August 3, 2023

Statement showing compatibility of the proposed zoning district and/or use with the adjacent properties and neighborhoods.

The design (mass, height and form) of the buildings is respectful of the natural character of the property and the surrounding area. Their locations on the site were selected to appreciate views of Geneva Lake and the beauty of the site itself. The exterior materials will harmonize and connect the buildings to the primary colors and textures of the property along with the surrounding area. Each building has incorporated windows that promote views and connect the visitors to the site. The technical design of the glass supports minimizing bird strikes.

The site layout, grading, storm water and utilities have been designed to harmonize and complement the site's natural land forms and minimize tree removal. The overall vision for the property is to encourage meeting attendees and staff to enjoy and explore the site at all times of the year. Key landforms (Oak Savannah Knoll and Woodland Clearing) are preserved and enhanced to support low impact activities that meeting attendees can enjoy. The property has wonderful topography and hundreds of existing trees. The landscape planting design will address the zoning requirements to screen the parking from Constance Blvd, provide a buffer planting along the eastern property line for the residential zoning and replace 1 for 1 any trees removed as part of developing the property. Our goal is to restore the entire property to a high-quality southeast Wisconsin woodland. The plant list will primarily focus on native material (woody and herbaceous).

The Women's Leadership Center believes our project will enhance the desired character of Williams Bay. The low-density development is being designed to complement and harmonize with the wooded site and the varied topography. We have sited our buildings to respect our neighbors and will restore the site so that it will be a positive example in Williams Bay which also reflects the aspirations and heritage of the Kishwauketoe Nature Conservancy.

Zoning Permit Application
Village of Williams Bay

250 Williams Street × PO Box 580 × Williams Bay, WI 53191
Phone: 262-245-2700 × Fax: 262-245-2705

Request:
Please check all that apply.

- ☐ **Residential Principal Use 1 or 2 Family** $175.00
- ☐ **Residential Addition** $75.00
- ☐ **Residential Accessory Use** $75.00
- ☐ **Fence** $75.00
- ☐ **Deck** $75.00
- ☐ **Swimming Pool** $100.00
- ☑ **Commercial Principal Use (includes multi-family)** $150.00
- ☐ **Commercial Addition** $100.00
- ☐ **Commercial Accessory Use** $100.00
- ☐ **Signage** $50.00 first 20 sq. ft. plus $.50 per sq. ft. thereafter
- ☐ **Lakefront and Shoreyard Projects** $75.00
- ☐ **Other:** _____ Fee: _____

Date application was received:

Fee Paid: _____

Please answer all applicable. Missing or incomplete information may deem this application "incomplete," delaying or prohibiting a review.

Owner's Name: Constance Woods LLC **Phone No.:** 262-741-1515

Mailing Address: 354 Seymour Court, Elkhorn, WI 53121

Applicant's Name: Constance Woods LLC **Phone No.** 262-741-1515

Mailing Address: 354 Seymour Court, Elkhorn, WI 53121

Physical Address of Site: 327 Constance Blvd. **Tax Parcel No:** WA499800001

Subdivision Name: Assessor's **Lot No.** 1 **Block No.** A and C

Current Zoning of Site: P & I **Current Overlay Districts of Site:** NA

Proposed type of structure: Meeting for up to 80 people

Proposed use of structure or site: Not for profit meeting/community center

Lot Area 376,112 **sq. ft.** **Proposed Bldg. / Structure Footprint Area** 24,894 **sq. ft.**

Existing Building Coverage on Site: 0 **%** **Proposed** 6.8 **%**

Existing Impervious Surface Coverage on Site: 0 **%** **Proposed** 19 **%**

Proposed Setbacks: **Front** 30' **Rear** 150' **Left** 15' **Right** 50'

Proposed Building Height 24'-8" **ft.**

Applicant's Signature: Ann M. Dachs **Date:** 8/4/2023

OFFICE USE ONLY:

PERMIT FEES:

Permit	$ _____
Admin Fee	$ _____
Other	$ _____
Total	$ _____

PERMIT ISSUED BY:

Name: _____ **Date:** _____

Tel: _____ **Permit No.** _____

CONDITIONS OF APPROVAL:

Planning Request Application
Village of Williams Bay

250 Williams Street • PO Box 580 • Williams Bay, WI 53191
www.vi.williamsbay.wi.gov
Phone: 262-245-2700

Request:
Please check all that apply.

- [X] **Site Plan** [§18.1206] - $200.00 plus $.04/sf floor area
- [X] **Conditional Use Permit (CUP)** [§18.1207] **-** $500.00
- [ ] **Certificate of Compliance** [§18.1211] **-** $200.00
- [ ] **Temporary Use Permit** [§18.1208] **-** $200.00
- [ ] **Preliminary Plat -** $200.00 plus $20.00 per lot
- [ ] **Certified Survey Map (CSM)** - $200.00 plus $20.00 per lot
- [ ] **Final Plat** - $100.00 plus $10.00 per lot
- [ ] **Planned Development Overlay (PDO)** [§18.0709] **-** $500.00
- [ ] **Planned Development Amendment -** $500.00
- [ ] **Zoning Text or Map Amendment** [§18.1204] **-** $500.00
- [ ] **Project Concept Review -** $200.00
- [ ] **Land Use Plan Amendment -** $500.00
- [ ] **Interpretation** [§18.1216] - $200.00
- [ ] **Appeal** [§18.1217] **-** $500.00
- [ ] **Other:** _____ Fee: _____

Date application was received:

Fee Paid:

Physical Address of Site: 327 Constance Boulevard, Williams Bay, WI 53191 (pending approval)

Tax Parcel Number: WA499800001

Project or Development Name: Women's Leadership Center

Applicant
Name: Constance Woods, LLC
Mailing Address: c/o Lisle W. Blackbourn, Godfrey, Leibsle, Blackbourn & Howarth, S.C.
354 Seymour Court, Elkhorn, WI 53121
eMail: lblackbourn@godfreylaw.com
Phone: 262-741-1515

Owner of Site
Name: Constance Woods, LLC
Mailing Address: c/o Lisle W. Blackbourn, Godfrey, Leibsle, Blackbourn & Howarth, S.C.
354 Seymour Court, Elkhorn, WI 53121
eMail: lblackbourn@godfreylaw.com
Phone: 262-741-1515

Legal Representative
Name: Lisle W. Blackbourn
Mailing Address: 354 Seymour Court
Elkhorn, WI 53121
eMail: lblackbourn@godfreylaw.com
Phone: 262-741-1515

Architect, Engineer, Contractor
Name: Studio Gang Architects c/o Chris Bennett
Mailing Address: 1520 W. Division St.

Chicago, IL 60642
eMail: cbennett@studiogang.com
Phone: 773-384-1212

Legal Description of Site (Attach separate sheet if additional space is needed)**:**
Lot 1 of Certified Survey Map No. 4998, recorded December 20, 2021, as Document No. 1053121, and being part of Block A and part of Block C of Assessor's Subdivision, being a part of the SE. 1/4 of the SW. 1/4 of Section 1 and the NE. 1/4 of the NW. 1/4 of Section 12, T.01N., R.16E., Village of Williams Bay, Walworth County, Wisconsin. Part of Tax Key No. WAS 00001A

Please answer all applicable. Missing or incomplete information may deem this application "incomplete," delaying or prohibiting a review.

Current Zoning of Site: P & I **Current Overlay Districts of Site:** None

Proposed Zoning of Site: P & I

Proposed type of structure of use: Meetings for up to 80 people.

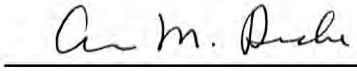
Proposed use of structure or site: Not-for-profit meeting / community center.

Statement of proposed use of property, with pertinent facts regarding the size of area involved, extent of development, type of operation, etc. (Attach separate sheet if additional space is needed)**:**
See attached.

Statement showing compatibility of proposed zoning district and/or proposed use to the Village Comprehensive Plan: (Attach separate sheet if additional space is needed)
See attached.

Statement showing compatibility of proposed zoning district and/or proposed use with adjacent properties and neighborhoods (Attach separate sheet if additional space is needed)**:**
See attached.

Print Applicant's Name: Constance Woods LLC

Signature of Applicant:  **Date:** 8/4/23

September 13, 2023

Women's Leadership Center

390-0821 Group Development and Large Development Standards. Summary of paragraph 6 and 8 per Village Administrator comment dated 9.13.23

CHAPTER **(6)**

Overall building design. The building exterior shall complement other buildings in the vicinity, and shall be of a design determined appropriate by the Plan Commission:

(a)

The building shall employ varying setbacks, heights, roof treatments, doorways, window openings, and other structural or decorative elements to reduce apparent size and scale of the building.

Response: All buildings (Lodge, Council, Cabin) employ varying design elements noted in 390-0821 (6a)

(b)

A minimum of 20% of the structure's facades that are visible from a public street shall employ actual protrusions or recesses with a depth of at least six feet. No uninterrupted facade shall extend more than 100 feet.

Response: All buildings (Lodge, Council, Cabin) employ varying design elements noted in 390-0821 (6b). No uninterrupted façade extends more than 100'

(c)

A minimum of 20% of all of the combined linear roof eave or parapet lines of the structure shall employ differences in height, with such differences being six feet or more as measured eave to eave or parapet to parapet.

Response: The combined linear roof eaves of the buildings employ more than 20% of varying heights noted in 390-0821 (6c)

(d)

Roofs with particular slopes may be required by the Village to complement existing buildings or otherwise establish a particular aesthetic objective.

Response: The Village has not issued any such requirement.

(e)

Ground-floor facades that face public streets shall have arcades (a series of outdoor spaces located under a roof or overhang and supported by columns or arches), display windows, entry areas, awnings, or other such features along no less than 60% of their horizontal length. The integration of windows into building design is required, and shall be transparent, clear glass (not tinted) between three to eight feet above the walkway along any facades facing a public street. The use of blinds shall be acceptable where there is a desire for opacity.

Response: NA

(f)

Building facades shall include a repeating pattern that includes no fewer than three of the following elements: color change; texture change; material modular change; and expression of architectural or structural bay through a change in plane no less than 24 inches in width, such as an offset, reveal, or projecting rib. At least one of these elements shall repeat horizontally. All elements shall repeat at intervals of no more than 30 feet, either horizontally or vertically.

Response: All building deploy repeating façade designed material patterns that change with offsets, reveals, heights, depths, proportions, and no pattern repeats more than 30 feet in height horizontal or vertical

(g)

Landscaped berm. For development exceeding 20,000 square feet in total gross floor area, and where the subject property abuts an area zoned or planned for residential or institutional use, a minimum six-foot-high berm shall be provided. The berm shall be planted with a double row of white, green, or blue spruce plantings, or similar species and varieties approved by the Village, spaced 15 feet on center.

Response: The site has hundreds of existing trees. The eastern portion of the site where the buffer would be created, is densely covered with numerous mature trees. Building an earth berm would damage these existing trees. The current landscape design has added more trees and shrubs to the buffer area and the landscape point value exceeds the Village requirements, see sheet L-901.

CHAPTER (8)

In general, existing natural features shall be integrated into the site design as a site and community amenity. Each development shall intentionally incorporate into site and building design elements that contribute to the long-term environmental sustainability of the development and the Village. Each development shall provide at least 1/2 of the following sustainability features:

(a)

Reuse an existing, previously developed building and/or site.

Response: NA

(b)

Utilize one or more rain gardens or bioswales, as described in the Village of Williams Bay Landscaping Guidelines, to capture and manage stormwater.

Response: Numerous features as requested have been incorporated into the site design. See C-500 Grading & Erosion Control Plan in the submitted documents

(c)

Incorporate stormwater management facilities that are designed to appear as natural features that can serve as attractive focal points for the development.

Response: Numerous features as requested have been incorporated into the site design. See C-500 Grading & Erosion Control Plan in the submitted documents and L-901 Planting Plan: Tree and Groundcovers

(d)

Install native/naturalized landscaping that minimizes requirements for irrigation/watering and provides natural habitat.

Response: Almost the entire site is being restored with native vegetation. See L-901 Planting Plan: Tree and Groundcovers

(e)

Deliberately design/retrofit the primary building with energy efficient systems, such as lighting, refrigeration, and HVAC systems.

Response: NA

(f)

Utilize paving and/or roof materials with a solar reflectance index of at least 29 for a minimum of 50% of the combined pavement and roof area on the site.

Response: The buildings are targeting LEED Gold and employ various roof types with high reflectivity including high reflective roof materials, green roofs, and gravel ballast roofs.

(g)

Recycle a minimum of 75% of the waste generated during building/site construction.

Response: This will be part of the contractors construction management plan.

(h)

Utilize a minimum of 25% recycled materials for building construction.

Response: The buildings are targeting LEED Gold and employ various types of recycled content for structural materials and finish materials.

(i)

Utilize a minimum of 50% regional materials for building construction (extracted, harvested, or recovered, and manufacturing from within 500 miles of the development site).

Response: The buildings will look to locally source materials to greatest extent possible as part of LEED certification.

(j)

Purchase a minimum of 50% of the development's energy from renewable sources, such as wind or solar.

Response: This will be reviewed with the WLC group

(k)

Integrate solar, geothermal, wind, or other on-site energy generation into the site and/or building design.

Response: The buildings take advantage of passive cooling, operable windows, and take advantage of natural shading from the tree canopy in the summer months.

(l)

Install a green roof or rooftop garden.

Response: The buildings will employ various roof types with high reflective roof materials, green roofs, and gravel ballast roofs. The Lodge and Cabin buildings will have rooftop terraces for small group gatherings.

(m)

Install systems that allow for the capture and later use of rainwater to water landscaping and for other permitted functions.

Response: Rainwater capture from roofs is currently under review with the WLC and design team.

(n)

Two additional sustainability features not listed above but approved by the Plan Commission to meet the Village's sustainability objectives, not including any feature already required by another section of this chapter.

Response: The structures of the buildings are utilizing timber construction where applicable which has a high embodied carbon. Additionally, low carbon concrete and steel with high recycled content are part of the design and engineering specifications.

September 15, 2023

Women's Leadership Center

Large Development Questionnaire, 18.0821B

Applicant Name: Constance Woods, LLC
Applicant Address: 354 Seymour Court
Elkhorn, WI 53121
Applicant Phone Number: 262-741-1515
Property Owner: Constance Woods, LLC
Developer: Women's Leadership Center
Contractor: Pepper Construction
Engineer: Ruekert – Mielke
Architect: Studio Gang
Planner: Studio Gang
Landscape Architect: OLIN Studio
Lighting Representative: Pritchard Peck

Total Site Area: 8.63 acres
Environmental Corridor Components -
Surface Water: 0
Wetlands: 0
100 year Flood Plain: 0
Steep Slopes (equal to or greater than 12%): 4.34 ac
Upland Woodlands: 8.63 ac (includes steep slope areas)

Williams Bay Comprehensive Land Use Plan:
Our proposed use of the property (Indoor Institutional – Intensive, 18.0308B and Residential Garage or Shed, 18.0315I) is consistent with the P & I zoning (Principal Land Uses Permitted by CUP and Accessory Uses Permitted by Right) and the Village's recently adopted Comprehensive Land Use Plan. Our property has been designated with P & I land use for many years. If the Women's Leadership Center project was building 20,000sf or less, the CUP requirement would not apply. To achieve the Women's Leadership Center program, we propose to build 24,894sf. The minor incremental difference in FAR (.053 to .068) will have a negligible impact on the surrounding neighborhood and the additional building area will not appreciably impact the site.

Future Land Use Plan:
The proposed use is compatible with the plan.

Transportation:
The development density (.068 FAR) of the Women's Leadership Center use is low to modest. Adjacent land uses to the north and west have higher occupancy and more parking. Our access point on Constance Blvd will only have one driveway. There is a future on street bike route planned for Constance Blvd. When this happens, there would be the opportunity for our site path system to be extended to the right of way. Our traffic generation is low, with trips for attendees mostly happening by shuttling from local hotels or George Williams College using passenger vans (12-15 persons).

September 15, 2023

Utilities and Community Facilities:
The density of our use (.068 FAR) is very low for the P & I zoning district. We will connect to the existing Village water and sewer lines, and have planned to upgrade the water main to 8" (from 6"). The site design includes storm water basins to address all requirements. Our low density (max. group is 80) will not burden existing public or private infrastructure.

Community Character:
The design of the Women's Leadership Center project will enhance the desired character of Williams Bay. Our use is consistent with the existing zoning, the Comprehensive Land Use Plan and will support the local economy. The low-density development is being designed to complement and harmonize with the wooded site and the varied topography. We have sited our buildings to respect our neighbors and will restore the woodland site so that it will be a positive example in Williams Bay which also reflects the aspirations and heritage of the Kishwauketoe Nature Conservancy.

Agricultural Resources:
The location and small size of the property and its existing woodland condition will not have any negative effects on other existing agricultural lands. The soil on our site is rated as the least productive class (Class IV-VIII) per the Soil Suitability for Agriculture map in the Comprehensive Land Use Plan.

Natural Resources:
Our project embraces the goals and objectives identified in the Comprehensive Land Use Plan. The topography and trees are assets to the proposed development and to the character of Williams Bay. The design team has carefully crafted a project, with site design and architecture, that respects the property by softly integrating the Women's Leadership Center program and related infrastructure, so it feels "at home" and connected to the uniqueness of the site. The design respects the environmental corridor designation with impervious coverage of 19% (buildings and paving). We have tagged and surveyed 808 existing trees and propose to only remove 23% or 186 trees (does not include invasive and dead trees). The Village ordinance allows up to 30% of the trees to be removed. The planting design has included 209 new trees in sizes that meet and exceed Village requirements.

The site layout, grading, storm water and utilities have been designed to harmonize and complement the site's natural land forms and minimize tree removal. The overall vision for the property is to encourage meeting attendees and staff to enjoy and explore the site at all times of the year. The storm water control system is focused on water quality and infiltration that meets the regulatory requirements. Key landforms (Oak Savannah Knoll and Woodland Clearing) are preserved and enhanced to support low impact activities that meeting attendees can enjoy. The landscape planting design has a primary goal to restore the entire property to a high-quality southeast Wisconsin woodland. The plant list will primarily focus on native material (woody and herbaceous).

Economic Development:
The Women's Leadership Center meeting attendees will stay in local hotels or George Williams College. Attendees will come from all 50 states and abroad. The Women's Leadership Center intends to use various local food service vendors to provide attendee meals and florists for table decorations and related items. It will also hire local companies to provide ongoing maintenance services for any owned vehicles, our buildings, grounds and pier.

September 15, 2023

Other Provisions of the Comprehensive Plan:
Cultural Resources – As proposed, the Women's Leadership Center project respects and supports the goals and objectives outlined in the Comprehensive Land Use Plan. Our location adjacent to George Williams College and Yerkes Future Foundation, expands the footprint of the long history that each of these organizations have in Williams Bay. This has been detailed in the response paragraphs within this questionnaire and other submitted narratives.

Williams Bay Park and Open Space Plan:
The Women's Leadership Center will continue to allow access and maintain the Lake Shore Path. The location of the property is not adjacent or near any other public recreation features or facilities.

Williams Bay Intergovernmental Agreements:
The Women's Leadership Center project and use are consistent with all aspects of the Village's Comprehensive Plan. To the extent other governmental bodies have relied on this plan for their own planning and agreements, the Women's Leadership Center project will not hinder the orderly progress and implementation of existing or future agreements.

State and County Land Use, Transportation and Park Plans:
The Women's Leadership Center is not aware of any regional plans where our use and low-density development approach would be in conflict with these documents.

Women's Leadership Center SWMP

Storm Water Management Report

09/11/2023

PREPARED FOR:

Constance Woods LLC

303 E Wacker Drive

Suite 315

Chicago, IL 60601

PREPARED BY:

Ruekert & Mielke, Inc.

W233 N2080 Ridgeview Parkway

Suite 300

Waukesha, WI 53188

TABLE OF CONTENTS

STORM WATER MANAGEMENT REPORT

PROJECT DESCRIPTION

The Women's Leadership Center is located in the Village of Williams Bay, Walworth County, Wisconsin. The project site is located on the northern side of Geneva Lake, to the south of Constance Boulevard. The site and it's storm water facilities will be owned and operated by Constance Woods LLC. The total project area that will contribute to the facilities is approximately 3.46 acres with the total disturbed area from construction being approximately 3.32 acres. For the purpose of evaluating storm water runoff the site has been divided into one existing drainage basin as shown on the existing conditions map, Exhibit 1. The property is currently undeveloped and is covered predominantly in woodlands., which drains to the south to Geneva Lake. Under the developed conditions the site will contain three proposed buildings, associated parking, driveways and a wide range of paths. The proposed storm water facilities for this site including three bio-infiltration basins, and an ADS underground system. The developed site was modeled with 10 drainage basins as shown on the proposed conditions map, Exhibit 2. The proposed BMPs are designed to meeting regulatory requirements by the controlling agencies for Quantity and Quality.

REQUIREMENTS

The erosion control measures and storm water management system for the proposed site will meet the following standards as required by Village of Williams Bay, Wisconsin Administrative Code NR 151, and WDNR Technical Standards.

Soil Loss

Soil erosion is calculated using the Universal Soil Loss Equation (USLE) and the project is required to reduce the soil losses to a maximum of 5.0 tons/acre, and provide erosion control measures to reduce any soil loss in excess of this amount.

Storm Water Quantity

Best Management Practices (BMP's) will be employed to reduce to the maximum extent practicable, post construction runoff to pre-developed conditions based on an average annual rainfall, as compared to no runoff management controls as required and shown in Table 1 below:

Table 1: Storm Water Quantity Regulations

WDNR		Village of Williams Bay	
Post Construction	Pre-Development	Post Construction	Pre-Development
1-yr	-	1-yr	-
2-yr	2-yr	2-yr	2-yr
10-yr	-	10-yr	10-yr
50-yr	-	50-yr	-
100-yr	-	100-yr	100-yr

Storm Water Quality

Best Management Practices (BMP's) will be employed to reduce to the maximum extent practicable, the total suspended solids load and the total suspended phosphorus load by based on an average annual rainfall, as compared to no runoff management controls as required and shown in Table 2 below.

Table 2: Storm Water Quality Regulations

	WDNR		Village of Williams Bay	
New Development	80% TSS Reduction	0% Phosphorus	80% TSS Reduction	0% Phosphorus

Infiltration

Infiltration requirements are governed by Wisconsin Administrative Code NR 15. Due to infiltration rates being less than 0.6 in/hr (0.5 in/hr), the site is exempt from infiltration requirements.

EXISTING CONDITONS

Existing Soils Conditions

Existing soils on the site are predominantly Miami Loam. The NRCS soil map and a Geotechnical Report for the project site are included in Appendix A.

Existing Wetlands and Waterways

WDNR Wetland Indicator Soil Map is attached in Appendix B. No indicator soils or other typical wetland indicators were identified on the site so a wetland delineation was not completed.

Existing Drainage Basins

The one existing basins is shown on the Existing Conditions Map, Exhibit 1 and are summarized below. Please note, the worst case scenario Tc of 5 min was used.

Existing Basin	Total Area	Composite CN	Tc	Outfall Location
Existing	3.46 AC	65	5 min	Geneva Lake

PROPOSED PROJECT

Proposed Storm Water Basins

The 10 proposed basins are shown on the Proposed Conditions Map, Exhibit 2 and are summarized below. Please note, the worst case scenario Tc of 5 min was used for all drainage basins.

Proposed Basin	Total Area	CN	Tc	BMPs	100-YR Event Contained
A-1	0.52 AC	85	5 min	BMP A	Yes
A-2	0.05 AC	65	5 min	BMP A	Yes
From Off Site	0.26 AC	65	5 min	BMP A	Yes
B-1	0.38 AC	87	5 min	BMP B	Yes
B-2	0.02 AC	65	5 min	BMP B	Yes
C-1	0.59 AC	92	5 min	ADS System	Yes
C-2	0.28 AC	65	5 min	ADS System	Yes
D-1	0.21 AC	93	5 min	BMP D	Yes
D-2	0.06 AC	65	5 min	BMP D	Yes
Undetained	1.09 AC	77	5 min	-	No

Surface Water Conveyance

In order to provide adequate drainage to proposed BMPs, surface drainage, including sheeting drainage, proposed swales, curb and gutter, along with a storm sewer system was designed as can be seen in Exhibit 3. Detailed calculations are included in Appendix C.

Bio - Infiltration Basin Construction

Bio - Infiltration basins will be constructed in Basins A, B and C.

The infiltration basins will be constructed with a maximum 3:1 side slope.. The site has been graded to provide overland flow in large rain events. See Construction Details in Exhibit 4 for more information.

Erosion Control

Erosion control measures will be installed prior to initial construction. Regular inspections will be conducted to ensure that the erosion control measures are maintained throughout the construction process. Erosion control measures shall remain in place until restoration is completed and 90 percent growth has been achieved. The full erosion control plan is shown on Exhibit 3 and includes proposed sequencing of construction activities.

POST-CONSTRUCTION PERFORMANCE

Soil Loss

The WDNR's Soil Loss & Sediment Discharge Calculation Tool WDNR Version 2.0 was utilized to verify that soil loss was reduced to less than the maximum of 5.0 tons/acre. The worst case scenario was determined to be south of the northernmost parking lot and is shown on Appendix D. By utilizing a tracking pad, silt fence, inlet protection, rip-rap, erosion matting and the bio-infiltration basins as sediment traps, the soil loss was able to be reduced to 2.0 tons/acre.

Storm Water Quantity

Hydrology for the site was modeled using HydroCAD 10.20-3c. Under the developed condition the site will consist primarily of rooftops, paved areas and landscaped areas. Curve numbers were determined for each basin by proposed land use. A summary of the results is shown in Table 4.

Table 3: Drainage Basins Summary

Basin	Roof (Ac, CN=)	Pond Surface (ac, CN=)	Drive/Walk (Ac, CN=)	Landscape (Ac, CN=)	% Impervious	Total (Ac)	Composite CN	Time of Concentration (Tc)	Outfall Location/BMP
A-1	-	0.05, 98	0.26, 98	0.21, 65	61.5	0.52	85	5 min	BMP A
A-2	-	-	-	0.05, 65	0.00	0.05	65	5 min	BMP A
From Off Site	-	-	-	0.26, 65	0.00	0.26	65	5 min	BMP A
B-1	-	0.05, 98	0.20, 98	0.13, 65	65.8	0.38	87	5 min	BMP B
B-2	-	-	-	0.02, 65	0.00	0.02	65	5 min	BMP B
C-1	0.21, 98	-	0.28, 98	0.10, 65	83.0	0.59	92	5 min	ADS System
C-2	-	-	-	0.28, 65	0.00	0.28	65	5 min	ADS System
D-1	-	0.04, 98	0.14, 98	0.03, 65	85.7	0.21	93	5 min	BMP D
D-2	-	-	-	0.06, 65	0.00	0.06	65	5 min	BMP D
Undetained	0.21, 98	-	0.17, 98	0.71, 65	34.9	1.09	77	5 min	-
TOTAL	0.42	0.14	1.05	1.85	46.5	3.46			

The installation of BMPs will reduce the peak flow of the water released from the site relative to the existing conditions. A summary of the results is shown on the next page in Tables 4 and 5, demonstrating that the post-construction peak flows meet regulatory requirements to the maximum extent practical. Note, Basin A is routed to Basin B, so Basin A's outflow is not shown in the Table 4.

Table 4: Storm Water Quantity Summary

	2 – yr Existing	2 -yr Proposed		10 – yr Existing	10 -yr Proposed		100 – yr Existing	100 -yr Proposed	
BASIN	(cfs)	No BMP (cfs)	BMP (cfs)	(cfs)	No BMP (cfs)	BMP (cfs)	(cfs)	No BMP (cfs)	BMP (cfs)
A	2.39	1.67	0.44	6.83	3.08	1.15	17.5	5.97	2.39
B		1.54	0.46		2.47	1.02		5.65	5.12
C		2.38	0.54		3.89	1.67		6.93	4.68
D		0.82	0.28		1.30	0.40		2.22	0.54
Undetained		2.82	2.02		3.93	3.93		7.87	7.87
TOTAL	2.39	9.23	3.00	6.83	14.7	5.44	17.5	28.6	17.6

Table 5: Storm Water BMP Summary

	BMP Elevations			Rain Event Maximum Elevations		
BMP	Discharge	Weir	Top of Bank	2-Yr	10-Yr	100-yr
A	925.00	-	929.50	927.23	928.07	928.99
B	922.41	-	927.75	925.75	926.06	926.29
ADS Sytem	915.25	919.75	-	916.99	917.77	918.81
D	919.91	-	924.25	922.06	922.51	923.22

Complete water quantity calculations and results are presented in Appendix E.

Storm Water Quality

WinSLAMM version 10.5 was used to evaluate the developed condition.

The proposed BMPs for this site will be sufficient to meet the requirements for suspended solids reduction for the site. A summary of the results is shown in Table 6. Please note, Basins A-2, B-2, C-2, D-2 and From Off Site are all undisturbed areas and were routed to be removed as the calculations do not need to take into account these basins. Note, Basin A is routed to Basin B, so Basin B's TSS generated = Basin B's TSS generated + Basin A's TSS released. This also causes the total addition to not add up, the correct total is shown.

Table 6: Storm Water Quality Summary

Basin	TSS Generated	TSS Released	Reduction %
A	184.3	17.4	90.55
B	137.6 + 17.4 = 155	14.11	90.9
C	225.1	20.4	90.9
D	86.9	4.34	95.0
Undetained	86.6	86.6	0
Total	733.3	125.5	82.9

Complete water quality calculations and results are provided in Appendix F.

SUMMARY

Through the installation of storm water facilities and erosion control measures, this site will meet all the requirements of the Village of Williams Bay, and the Wisconsin Department of Natural Resources. Post-construction performance standards including soil loss, stormwater quality, and infiltration have been addressed through the construction of onsite BMPs. With Stormwater quantity being reduced to the maximum extent practical.

EXHIBITS

Exhibit 1 – Existing Conditions Map

Exhibit 2 – Proposed Conditions Map

Exhibit 3 – Erosion Control Plan

Exhibit 4 – Construction Details

Exhibit 1 – Existing Conditions Map

WOMEN'S LEADERSHIP CENTER

259 Constance Blvd
Williams Bay, WI 53191

GENERAL NOTES

1. THE DRAWINGS, SPECIFICATIONS AND OTHER DOCUMENTS PREPARED BY THE ARCHITECTS FOR THIS PROJECT ARE INSTRUMENTS OF THE ARCHITECTS SERVICE FOR USE SOLELY WITH RESPECT TO THIS PROJECT AND UNLESS OTHERWISE PROVIDED THE ARCHITECT SHALL BE DEEMED THE AUTHOR OF THESE DOCUMENTS AND SHALL RETAIN ALL COMMON LAW, STATUTORY AND OTHER RESERVED RIGHTS, INCLUDING THE COPYRIGHT. REPRODUCTION IS PROHIBITED. COPYRIGHT 2023. STUDIO GANG.
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KEY PLAN:

SEAL:

NOT FOR CONSTRUCTION

NO.	ISSUE/SUBMISSION	DATE
1	VILLAGE ZONING	8/4/2023

ARCHITECT:

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PROJECT NO. :
DRAWN: GGD DATE: 08/04/2023
CHECKED: VVR SCALE:

SHEET TITLE:
EXISTING CONDITIONS

DRAWING NUMBER:
C-210

Exhibit 2 – Proposed Conditions Map

0 15 20 30 60
SCALE IN FEET

LEGEND

- BASIN A-1
- BASIN A-2
- FROM OFF SITE
- BASIN B-1
- BASIN B-2
- BASIN C-1
- BASIN C-2
- BASIN D-1
- BASIN D-2
- UNDETAINED

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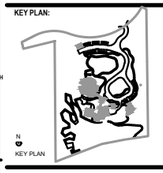
KEY PLAN:



SEAL:

NOT FOR CONSTRUCTION

NO.	ISSUE/ MILESTONE	DATE
1	DESIGN DEVELOPMENT	9/8/2023

ARCHITECT:

Studio Gang

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PROJECT NO. :

DRAWN: GGD DATE: 9/8/2023

CHECKED: VVR SCALE:

SHEET TITLE:

GRADING & EROSION CONTROL PLAN

DRAWING NUMBER:

C-500

Exhibit 3 – Erosion Control Plan

0 15 20 30 60
SCALE IN FEET

EROSION CONTROL

- PROPOSED INLET PROTECTION TYPE B
- PROPOSED SILT FENCE
- PROPOSED RIP RAP
- PROPOSED TRACKING PAD

NOTES:

1. TOTAL CSM COMBINED SITE AREA: 8.21 ACRES.
2. ESTIMATED AREA OF DISTURBANCE: 3.32 ACRES.
3. 100% OF PROJECT AREA IS IDENTIFIED AS MIAMI LOAM PER NATIONAL RESOURCES CONSERVATION SERVICE WEB SOIL SURVEY.
4. MAINTAIN EXISTING VEGETATION IN STREET RIGHT OF WAY.
5. THE SWALES SHALL BE STABILIZED WITHIN 14 DAYS OF BEING GRADED.
6. INSPECT ALL BMPS WITHIN TWENTY-FOUR (24) HOURS AFTER EACH RAIN OF 0.5 INCHES OR MORE AND AT LEAST ONCE A WEEK. MAKE NEEDED REPAIRS, INSTALL ADDITIONAL BMPS AS NECESSARY, AND DOCUMENT THE FINDINGS OF THE INSPECTION ON AN EROSION CONTROL LOG KEPT ON SITE WITH THE DATE OF INSPECTION, THE NAME OF THE PERSON CONDUCTING THE INSPECTION, A DESCRIPTION OF THE REPAIR NEEDED, AND DOCUMENTATION OF THE COMPLETED REPAIRS.

CONSTRUCTION SEQUENCE:

1. INSTALL AND MAINTAIN EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO ANY LAND DISTURBING ACTIVITIES, AS SHOWN ON DRAWINGS AND DIRECTED BY ENGINEER.
2. CLEAR AND GRUB VEGETATION AS SHOWN ON DRAWINGS OR AS DIRECTED BY ENGINEER.
3. STRIP TOPSOIL AND STOCKPILE IN LOCATION AS SHOWN ON DRAWINGS AND AS DIRECTED BY OWNER. INSTALL PERIMETER SILT FENCE AROUND DOWN SLOPE SIDE OF STOCKPILE. STABILIZE STOCKPILE IMMEDIATELY UPON LAYUP.
4. INSTALL, ADJUST AND MAINTAIN ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES NECESSARY FOR EACH ACTIVE STAGE. MAINTAIN MEASURES AT THE END OF EACH DAY.
5. STAGE CONSTRUCTION BY WORK LOCATION. SUBSEQUENT STEPS MAY BE COMPLETED IN ALTERNATE SEQUENCE DEPENDING UPON CONTRACTOR OPERATIONS.
6. COMPLETE ROUGH GRADING.
7. INSTALL UNDERGROUND SANITARY SEWER, WATER DISTRIBUTION, AND STORM SEWER UTILITIES.
8. INSTALL STRUCTURE.
9. PREPARE PAVEMENT SUBGRADE.
10. INSTALL NEW PAVEMENT AND BASE LAYERS.
11. INSTALL PAVEMENT MARKINGS.
12. INSTALL LAWN LANDSCAPING.
13. AREAS PLANNED TO BE INACTIVE FOR 7 DAYS OR LONGER SHALL BE TEMPORARILY STABILIZED FOLLOWING DNR TECHNICAL STANDARD 1059 SEEDING. THESE AREAS SHALL BE STABILIZED WITHIN 7 DAYS OF BEING INACTIVE.
14. AREAS BROUGHT TO FINAL GRADE SHALL BE PERMANENTLY STABILIZED WITHIN 7 DAYS.
15. COMPLETE FINAL RESTORATIONS INCLUDING BUT NOT LIMITED TO: TOPSOIL, TURF GRASS SEED, AND CLASS I TYPE B URBAN EROSION MATTING FOR ALL LAWN RESTORATION AND TOPSOIL, TURF GRASS SEED, AND CLASS II TYPE B EROSION MATTING FOR THE DRAINAGE SWALES AND SLOPES OF 4:1 OR MORE.
16. REMOVE TEMPORARY EROSION CONTROL DEVICES AFTER 80% GROWTH DENSITY HAS OCCURRED IN 100% OF RESTORATION AREAS. CONTRACTOR SHALL OBTAIN OWNER AND ENGINEER APPROVAL PRIOR TO REMOVING THE MEASURE(S). RESTORE DISTURBED AREAS AROUND REMOVED DEVICES AND CLEAN SITE.

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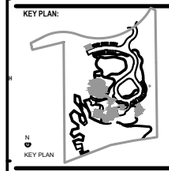
KEY PLAN:



SEAL:

NOT FOR CONSTRUCTION

NO.	ISSUED FOR:	DATE
2	DESIGN DEVELOPMENT	9/8/2023
1	VILLAGE ZONING	6/14/2023

ARCHITECT:

Studio Gang

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ACOUSTICS AND AV
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Suite 2080
Chicago, IL 60604
T 608.897.8641

PROJECT NO. :
DRAWN: GGD DATE: 9/8/2023
CHECKED: VVR SCALE:

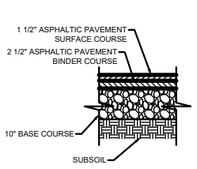
SHEET TITLE:

GRADING & EROSION CONTROL PLAN

DRAWING NUMBER:

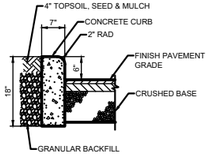
C-500

Exhibit 4 – Construction Details



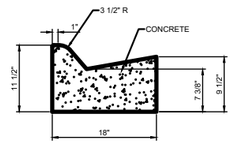
PAVEMENT CROSS SECTION NO SCALE

PV-SECT-07 12



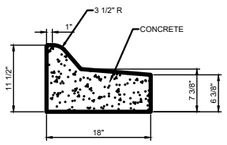
BARRIER CURB DETAIL NO SCALE

PV-CURB-06 12



SEMI-MOUNTABLE 18" CURB & GUTTER NO SCALE

PV-CURB-12 8

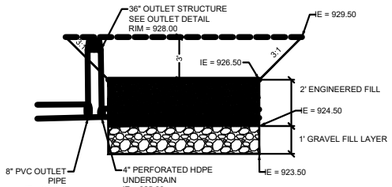


SEMI-MOUNTABLE 18" REJECT CURB & GUTTER NO SCALE

PV-CURB-12A 8

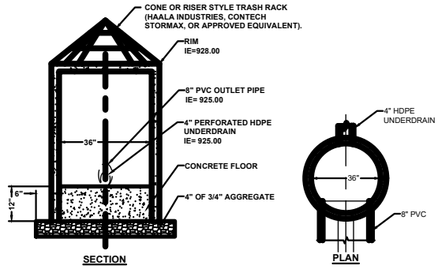
NOTES:
ENGINEERED FILL SPECIFICATION - 70% SAND, 30% COMPOST
1. SAND COMPONENT CONFORMING TO EITHER:
   a. USDA COARSE SAND (.02-.04 INCHES)
   b. ASTM C33 (FINE AGGREGATE CONCRETE SAND)
   c. STATE SPECIFICATION 501.2.5.3.4
2. COMPOST COMPONENT CONFORMING TO:
   a. WDNR TECHNICAL SPECIFICATION S100

GRAVEL FILL LAYER SPECIFICATION:
1. GRAVEL SHALL MEET COARSE AGGREGATE #2 OF STATE SPECIFICATION 501.2.5
2. GRAVEL SHALL BE DOUBLE WASHED PRIOR TO INSTALLATION



BIOFILTER A NO SCALE

Cgdt-Infiltration Basin 10



BIOFILTER A
CONCRETE OUTFALL STRUCTURE NO SCALE

Cgdt-Outlet Structure 2

NOTES:
ENGINEERED FILL SPECIFICATION - 70% SAND, 30% COMPOST
1. SAND COMPONENT CONFORMING TO EITHER:
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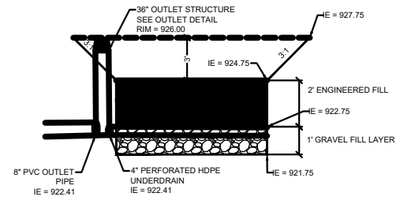
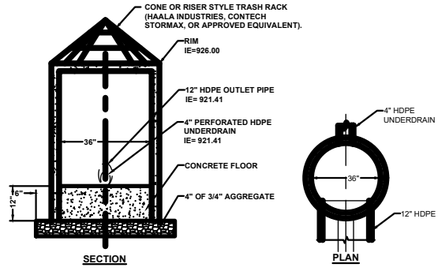


BIOFILTER B NO SCALE

Cgdt-Infiltration Basin 10



BIOFILTER B
CONCRETE OUTFALL STRUCTURE NO SCALE

Cgdt-Outlet Structure 2

NOTES:
ENGINEERED FILL SPECIFICATION - 70% SAND, 30% COMPOST
1. SAND COMPONENT CONFORMING TO EITHER:
   a. USDA COARSE SAND (.02-.04 INCHES)
   b. ASTM C33 (FINE AGGREGATE CONCRETE SAND)
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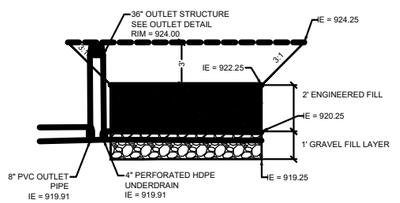
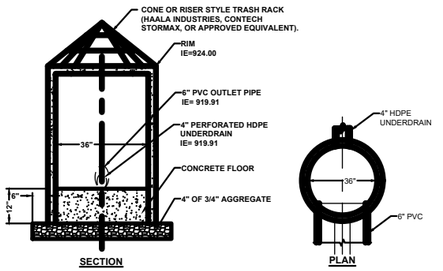
2. GRAVEL SHALL BE DOUBLE WASHED PRIOR TO INSTALLATION



BIOFILTER D NO SCALE

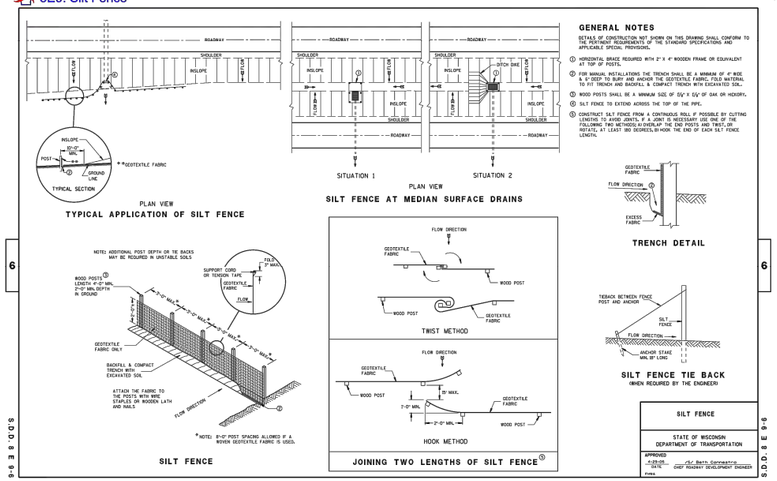
Cgdt-Infiltration Basin 10



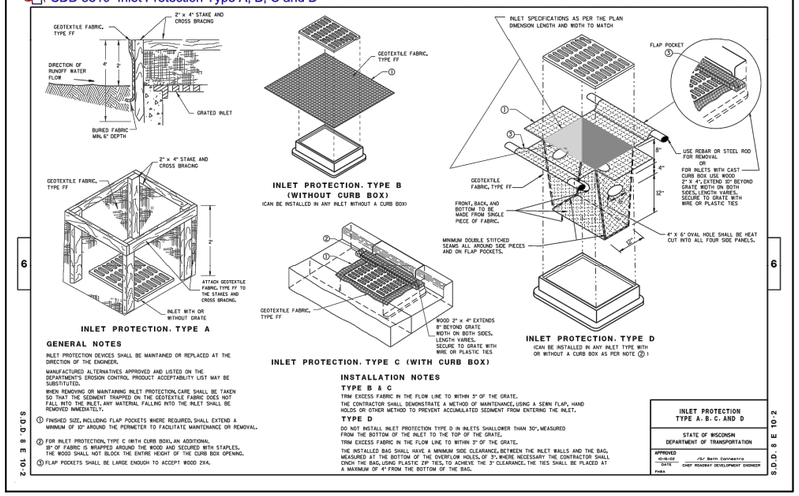
BIOFILTER D
CONCRETE OUTFALL STRUCTURE NO SCALE

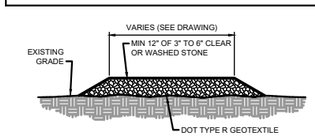
Cgdt-Outlet Structure 2

8E9: Silt Fence



SDD 8e10 Inlet Protection Type A, B, C and D

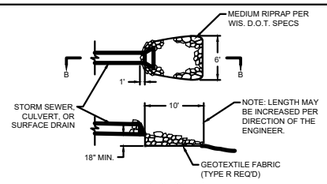




PAD MAY BE POSITIONED AS PERMANENT DRIVEWAY SUBBASE IF PLACED ON MINERAL SOIL AND IT MEETS BEARING & COMPACTION REQUIREMENTS BEFORE BASE PLACEMENT.

TRACKING PAD NO SCALE

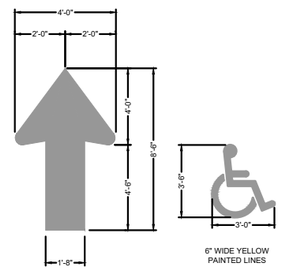
EC-GNL-03 1



SECTION B-B

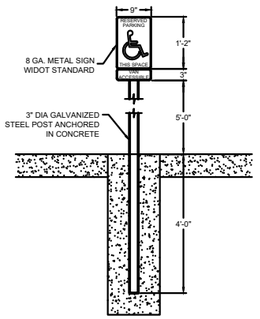
MEDIUM RANDOM RIP-RAP TREATMENT NO SCALE

EC-RR-03 96



PAINTED PAVEMENT SYMBOLS NO SCALE

PV-MARK-01 1



HANDICAP PARKING SIGN NO SCALE

PV-SIGN-01 1

GENERAL NOTES

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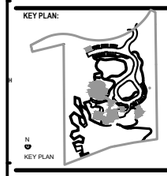
KEY PLAN:



KEY PLAN

SEAL:

NOT FOR CONSTRUCTION

NO.	ISSUE/DESCRIPTION	DATE
1	DESIGN DEVELOPMENT	9/8/2023

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PROJECT NO.	
DRAWN: GDD	DATE: 9/8/2023
CHECKED: VWR	SCALE:

SHEET TITLE:

CONSTRUCTION DETAILS

DRAWING NUMBER:

C-800

TABLE 1

Retaining Gland Restraint - Minimum Distances

Refer to File No. 47A Standard Specifications for Sewer & Water Construction in Wisconsin

Horizontal Bends			Joint Restraint Length (L) in Feet	
Material	**Size**	**Angle (degrees)**	**Length (for each side)**	
PVC	8"	11-1/4	3	
PVC	8"	22-1/2	5	
PVC	8"	45	11	
PVC	6"	11-1/4	2	
PVC	6"	22-1/2	4	
PVC	6"	45	8	
PVC	8"	90	25	
PVC	6"	90	19	
Dead End			**Joint Restraint Length (L) in Feet**	
Material	**Size**		**Length**	
PVC	8"		60	
PVC	6"		45	
Tess & Crosses			**Joint Restraint Length (L) in Feet**	
Material	**Size**	**Main (Lr)**	**Branch (b)**	
PVC	8" x 8"	5	17	
PVC	8" x 6"	5	37	
PVC	6" x 6"	5	24	
Reducer			**Joint Restraint Length (L) in Feet**	
Material	**Size**		**Length**	
PVC	8" x 6"		25	
Vertical Offset			**Joint Restraint Length (L) in Feet**	
Material	**Size**	**Angle (degrees)**	**Upper**	**Lower**
PVC	8"	11-1/4	12	4
PVC	8"	22-1/2	6	2
PVC	8"	45	25	7
PVC	6"	11-1/4	9	3
PVC	6"	22-1/2	5	2
PVC	6"	45	19	5

Notes:

1) All joints within Length "L" of fitting must be restrained.

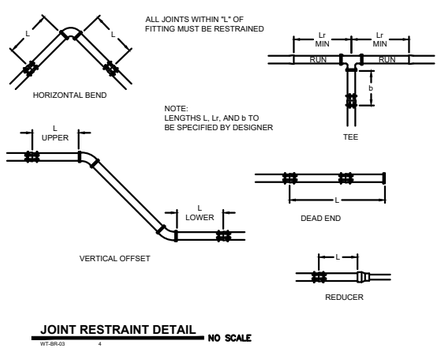
2) Restraint lengths calculating using EBBA iron restrained length calucator, Version 5.

3) Assumes: ML Soils - inorganic silts, very fine sands, rock flour, silty or clay fine sands (backfilled using native soil).

4) Assumes: Trench Type 3

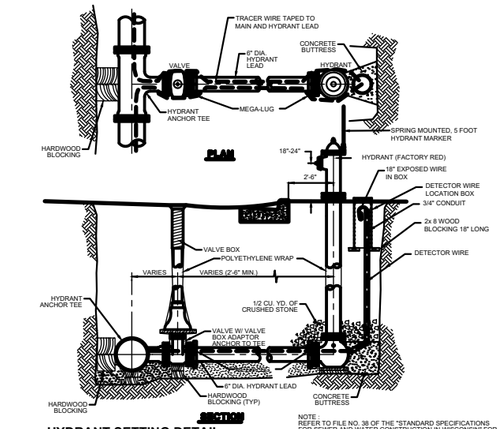
5) Assumes: Depth of Bury to be 5 feet of cover.

6) Assumes: Test Pressure of 150.



JOINT RESTRAINT DETAIL NO SCALE

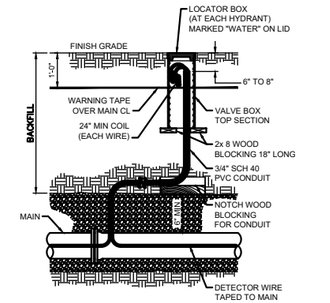
WT-BR-03 4



NOTE:
REFER TO FILE NO. 38 OF THE "STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN" FOR FURTHER INFORMATION

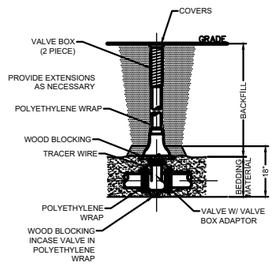
06-C HYDRANT SETTING DETAIL NO SCALE

CDD/THYD 24



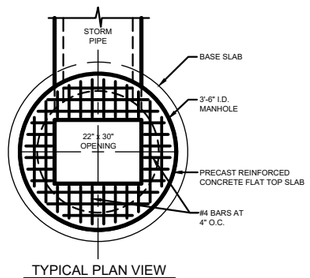
DETECTOR WIRE AND LOCATION BOX NO SCALE

WT-TW-01 16



STANDARD GATE VALVE BOX SETTING NO SCALE

WT-WV-02 24



TYPICAL PLAN VIEW

GENERAL NOTES:

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR UNDERGROUND DRAINAGE STRUCTURES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISIONS FOR EQUIVALENT CAPACITY AND STRENGTH.

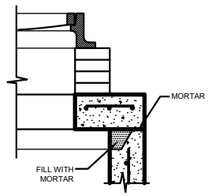
ALL PRECAST INLET UNITS SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF "AASHTO DESIGNATION M 199".

PRECAST REINFORCED BASES SHALL BE PLACED ON A BED OF MATERIAL AT LEAST 6" IN DEPTH, WHICH MEETS THE REQUIREMENTS FOR GRANULAR BACKFILL. THIS BEDDING SHALL BE COMPACTED AND PROVIDE UNIFORM SUPPORT FOR THE ENTIRE AREA OF THE BASE.

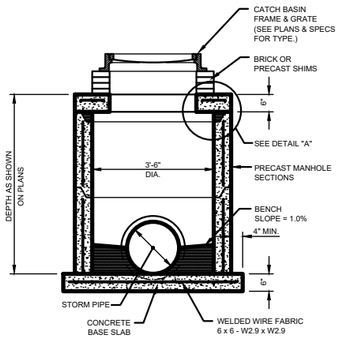
PRECAST REINFORCED CONCRETE FLAT SLAB TOPS MAY BE USED ON THE STRUCTURES. THE TOPS SHALL BE INSTALLED ON A BED OF MORTAR.

ALL BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 2" CLEAR UNLESS OTHERWISE SHOWN OR NOTED.

PRECAST REINFORCED CONCRETE RISERS SHALL BE PLACED WITH TONGUE DOWN.



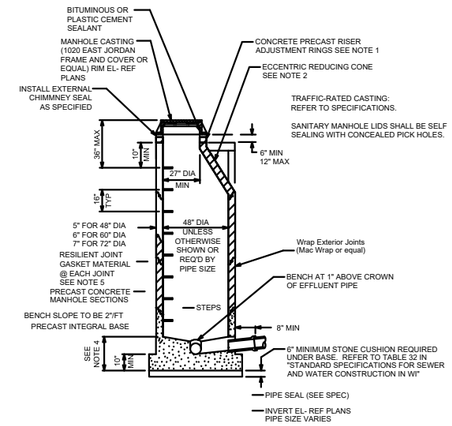
DETAIL "A"



SECTION
PRECAST REINFORCED CONCRETE CATCH BASIN

CATCH BASIN DETAILS NO SCALE

STO-CB-03 16



NOTES:

1. ADJUST FRAME TO GRADE WITH A MINIMUM OF TWO (2) 2" TO 4" THK PRECAST CONCRETE RISER RINGS.
2. TOP CONE SECTION SHALL BE USED ON 48" DIA MANHOLES, UNLESS MINIMUM HEIGHT CONDITIONS REQUIRE A FLAT TOP REDUCING SLAB. REDUCING SLAB MAY BE USED ON MANHOLES 60" IN DIA OR LARGER.
3. CONCRETE FOR CAST-IN-PLACE BASE SECTIONS SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3000 PSI. THE MINIMUM CEMENT CONTENT SHALL BE 5½2 BAGS PER CUBIC YARD OF CONCRETE. REINFORCING STEEL SHALL MEET THE REQUIREMENTS OF ASTM A615 GRADE 60.
4. JOINTS SHALL BE WATERTIGHT AND SHALL BE MADE USING BUTYL RUBBER GASKETS AND SEALED EXTERNALLY USING MACWRAP OR APPROVED EQUAL.
5. CONCRETE BLOCK OR BRICK MANHOLES NOT ALLOWED.

SANITARY MANHOLE DETAIL TYPE 1 NO SCALE

Cgd-Manhole Type 1 64

WOMEN'S LEADERSHIP CENTER

259 Constance Blvd
Williams Bay, WI 53191

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KEY PLAN:

SEAL:

NO.	ISSUED FOR:	DATE
1	VILLAGE ZONING	8/4/2023

NOT FOR CONSTRUCTION

ARCHITECT:

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Chicago, IL 60604
T 608.897.8641

PROJECT NO. :

DRAWN: GGD **DATE:** 08/04/2023

CHECKED: VVR **SCALE:**

SHEET TITLE:

CONSTRUCTION DETAILS

DRAWING NUMBER:

C-801

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

Advanced Drainage Systems, Inc.

ADS SiteAssist
FOR STORMTECH INSTALLATION INSTRUCTIONS VISIT OUR APP

WOMEN'S LEADERSHIP CENTER

WILLIAMS BAY, WI, USA

MC-7200 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-7200.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101.
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-7200 CHAMBER SYSTEM

1. STORMTECH MC-7200 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 12" (300 mm) BETWEEN ADJACENT CHAMBER ROWS.
10. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
11. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIAL BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
12. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-7200 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-7200 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

WOMEN'S LEADERSHIP CENTER

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CHECKED: VWR SCALE:

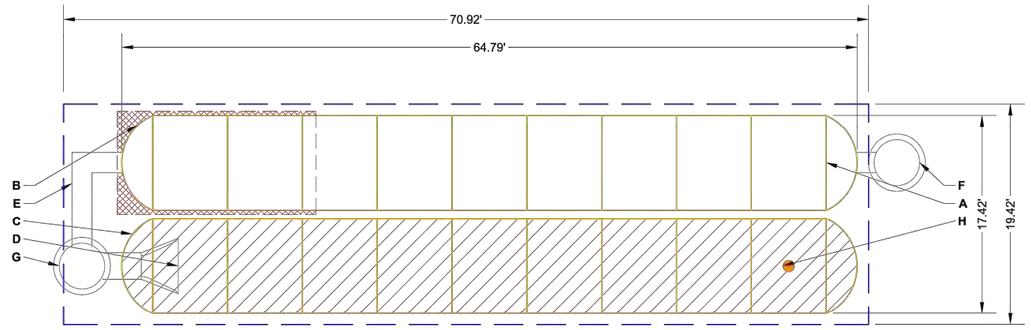
SHEET TITLE:
CONSTRUCTION DETAILS

DRAWING NUMBER:
C-802

PROPOSED LAYOUT		PROPOSED ELEVATIONS:	
18	STORMTECH MC-7200 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	928.00
4	STORMTECH MC-7200 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	923.50
12	STONE ABOVE (in)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	923.00
9	STONE BELOW (in)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	923.00
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	923.00
5713	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	922.00
		TOP OF MC-7200 CHAMBER:	921.00
		18" x 18" TOP MANIFOLD INVERT:	918.45
		24" ISOLATOR ROW PLUS INVERT:	916.19
1377	SYSTEM AREA (SF)	18" BOTTOM CONNECTION INVERT:	916.16
180.7	SYSTEM PERIMETER (ft)	BOTTOM OF MC-7200 CHAMBER:	916.00
		BOTTOM OF STONE:	915.25

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED END CAP	A	18" BOTTOM PARTIAL CUT END CAP, PART#: MC7200IEPP18B / TYP OF ALL 18" BOTTOM CONNECTIONS	1.97"	
PREFABRICATED END CAP	B	18" TOP PARTIAL CUT END CAP, PART#: MC7200IEPP18T / TYP OF ALL 18" TOP CONNECTIONS	29.36"	
PREFABRICATED END CAP	C	24" BOTTOM PARTIAL CUT END CAP, PART#: MC7200IEPP24B / TYP OF ALL 24" BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	2.26"	
FLAMP	D	INSTALL FLAMP ON 24" ACCESS PIPE / PART#: MCFLAMP		
MANIFOLD	E	18" x 18" TOP MANIFOLD, ADS N-12	29.36"	
CONCRETE STRUCTURE	F	OCS (DESIGN BY ENGINEER / PROVIDED BY OTHERS)		4.0 CFS OUT
CONCRETE STRUCTURE	G	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		5.5 CFS IN
INSPECTION PORT	H	4" SEE DETAIL		



ISOLATOR ROW PLUS
(SEE DETAIL)

PLACE MINIMUM 17.50' OF ADSPLUS175 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE #6.32 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.
- **NOT FOR CONSTRUCTION:** THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

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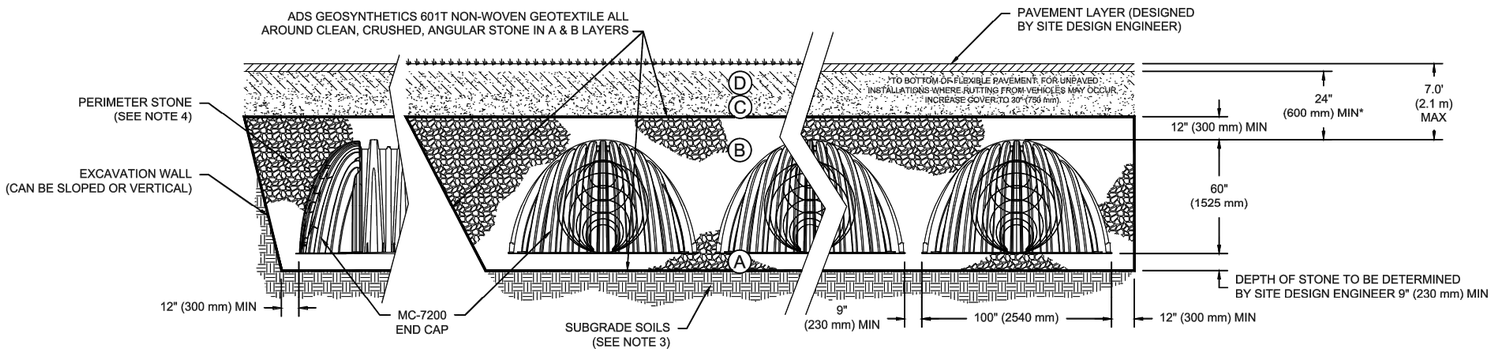
ACCEPTABLE FILL MATERIALS: STORMTECH MC-7200 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101
2. MC-7200 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
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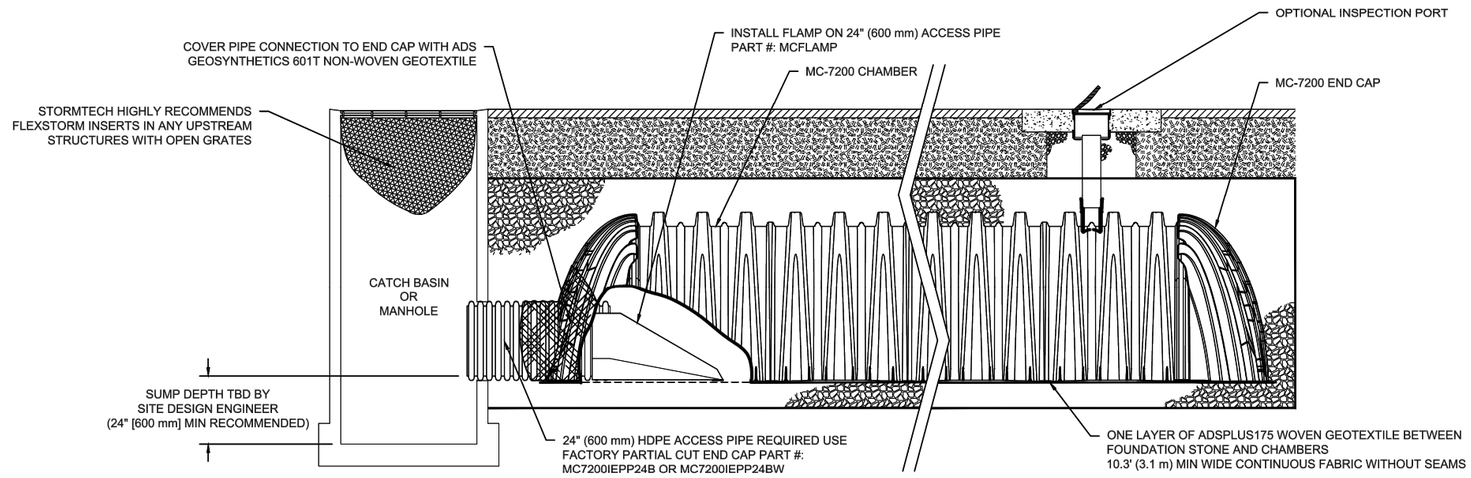


MC-7200 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

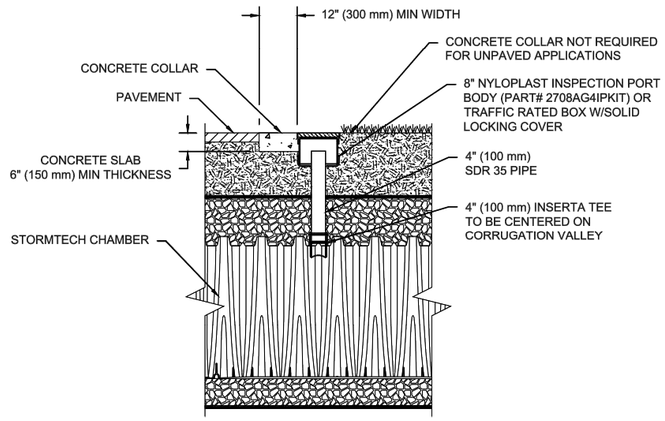
STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION VALLEY.

4" PVC INSPECTION PORT DETAIL
(MC SERIES CHAMBER)
NTS

WOMEN'S LEADERSHIP CENTER
WILLIAMS BAY, WI, USA
DATE:
PROJECT #:

	DATE	DRW	CHK	DESCRIPTION

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MC-7200 TECHNICAL SPECIFICATION

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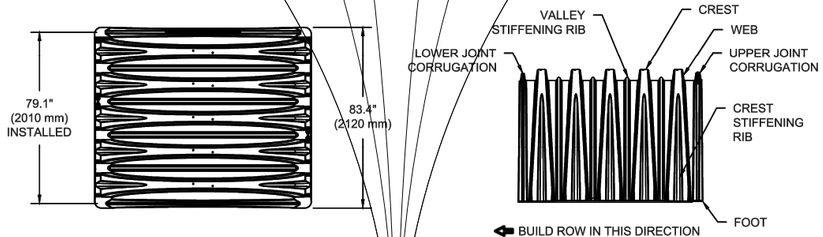
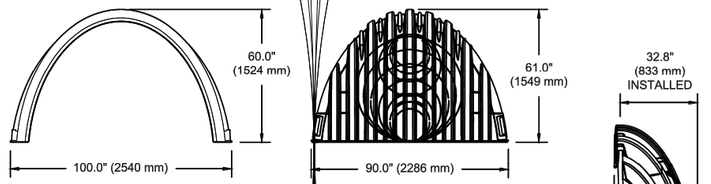
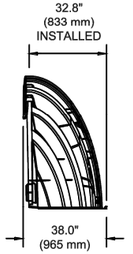






NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	100.0" X 60.0" X 79.1"	(2540 mm X 1524 mm X 2010 mm)
CHAMBER STORAGE	175.9 CUBIC FEET	(4.98 m³)
MINIMUM INSTALLED STORAGE*	267.3 CUBIC FEET	(7.56 m³)
WEIGHT (NOMINAL)	205 lbs.	(92.9 kg)

NOMINAL END CAP SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	90.0" X 61.0" X 32.8"	(2286 mm X 1549 mm X 833 mm)
END CAP STORAGE	39.5 CUBIC FEET	(1.12 m³)
MINIMUM INSTALLED STORAGE*	115.3 CUBIC FEET	(3.26 m³)
WEIGHT (NOMINAL)	90 lbs.	(40.8 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

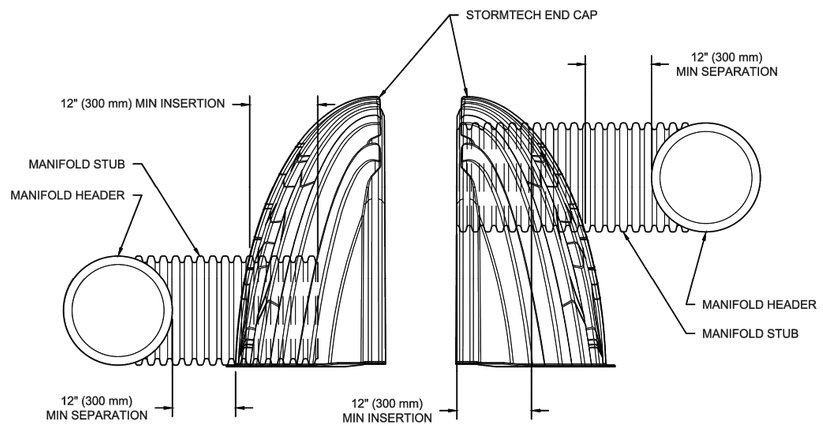
PART #	STUB	B	C
MC7200IEPP06T	6" (150 mm)	42.54" (1081 mm)	---
MC7200IEPP06B		---	0.86" (22 mm)
MC7200IEPP08T	8" (200 mm)	40.50" (1029 mm)	---
MC7200IEPP08B		---	1.01" (26 mm)
MC7200IEPP10T	10" (250 mm)	38.37" (975 mm)	---
MC7200IEPP10B		---	1.33" (34 mm)
MC7200IEPP12T	12" (300 mm)	35.69" (907 mm)	---
MC7200IEPP12B		---	1.55" (39 mm)
MC7200IEPP15T	15" (375 mm)	32.72" (831 mm)	---
MC7200IEPP15B		---	1.70" (43 mm)
MC7200IEPP18T	18" (450 mm)	29.36" (746 mm)	---
MC7200IEPP18TW			
MC7200IEPP18B		---	1.97" (50 mm)
MC7200IEPP18BW			
MC7200IEPP24T	24" (600 mm)	23.05" (585 mm)	---
MC7200IEPP24TW			
MC7200IEPP24B		---	2.26" (57 mm)
MC7200IEPP24BW			
MC7200IEPP30BW	30" (750 mm)	---	2.95" (75 mm)
MC7200IEPP36BW	36" (900 mm)	---	3.25" (83 mm)
MC7200IEPP42BW	42" (1050 mm)	---	3.55" (90 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL

CUSTOM PREFABRICATED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-7200 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

MC-SERIES END CAP INSERTION DETAIL

NTS



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

WOMEN'S LEADERSHIP CENTER
WILLIAMS BAY, WI, USA
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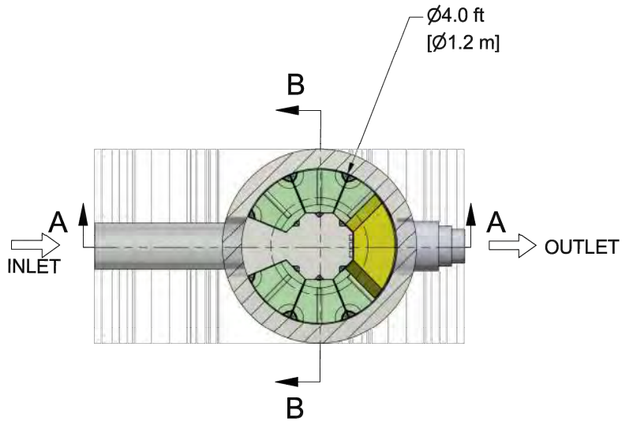
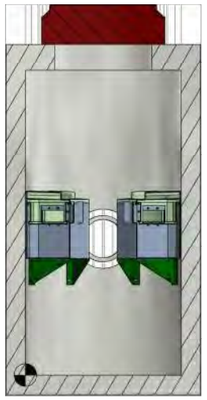
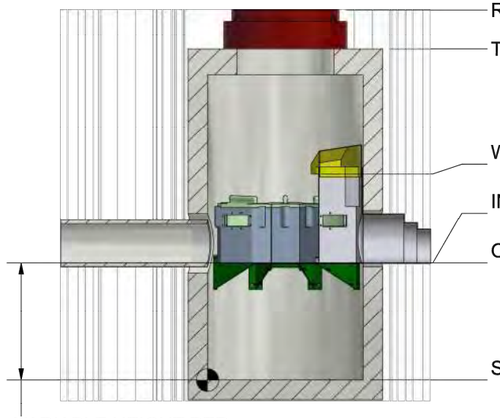
C-806





SECTION B-B



SECTION A-A

CAPACITIES:

- Minimum performance: 80% removal. Washington DOE/NJCAT verified at the peak treatment flow.
- Peak treatment flow:
  .033 CFS (0.9 LPS) (15 GPM) per module (Ribbons)
  .022 CFS (0.6 LPS) (10 GPM) per module (Long Ribbons)
  .056 CFS (1.6 LPS) (25 GPM) per module (CPZ)
- Maximum number of ribbon modules per outlet module: 36
- Maximum number of CPZ modules per outlet module: 18 (contract Hydro if more are required)

ADDITIONAL DESIGN INFORMATION:

- Normal operating W.S.E. is 26-30" (660-762mm) above the outlet invert
- Media Types Available: Ribbons, CPZ

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES.

TOLERENCES ARE:
FRACTIONS ± 1/16
DECIMALS:
X.X ± .06
X.XX ± .03
X.XXX ± .015
ANGLES: ± .5°

PROJECTION

COMMENTS:

1. STRUCTURE WALL AND SLAB THICKNESSES ARE NOT TO SCALE
2. CONTACT HYDRO INTERNATIONAL FOR A BOTTOM OF STRUCTURE ELEVATION PRIOR TO SETTING THE STRUCTURE
3. NOT FOR CONSTURCION CONTACT HYDRO FOR SITE SPECIFIC DRAWING
4. NOT ALL SIZES AVAILABLE IN ALL AREAS
5. SUMP DEPTH AVAILABLE IN 24" (610mm) CPZ, RIBBONS AND 36" (914mm) LONG RIBBONS DEPTH

REVISION HISTORY

REV	BY	DESCRIPTION	DATE
-	ER	FIRST RELEASE	6/17/2019

DATE: 6/17/2019
SCALE: NTS
DRAWN BY: ER
CHECKED BY:
APPROVED BY

Title
UP-FLO FILTER
4ft Manhole

6 MODULES MAX

Sizing Tool

Hydro International
94 Hutchins Drive
Portland, ME 04102
Tel: +1 (207) 756-6200
Fax: +1 (207) 756-6212
hydro-int.com

WEIGHT: N/A
MATERIAL:
NEXT ASSEMBLY: 4 MH-1
DRAWING NO.: 4 MH-UFF-1
SHEET SIZE: B
SHEET: 1 OF 1
Rev: -

WOMEN'S LEADERSHIP CENTER

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NYLOPLAST DRAIN BASIN

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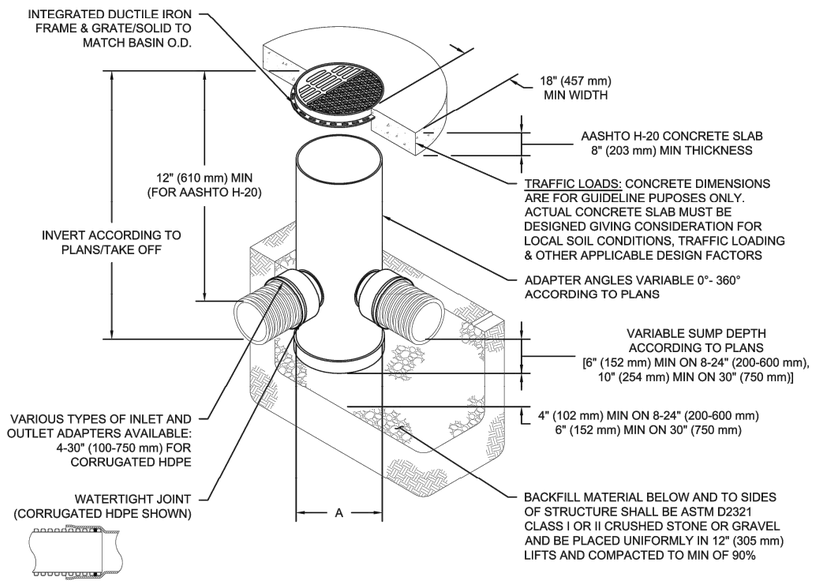

NOTES

1. 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
2. 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
5. FOR COMPLETE DESIGN AND PRODUCT INFORMATION: **WWW.NYLOPLAST-US.COM**
6. TO ORDER CALL: **800-821-6710**

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2808AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2810AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2812AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2815AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2818AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2824AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2830AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

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DRAWING NUMBER:
C-808

APPENDICES

APPENDIX A: NRCS Soils/Soil Borings Logs/Geotechnical Report

APPENDIX B: WDNR Wetland Indicator Soil Map

APPENDIX C: Storm Sewer Sizing Rational Method Worksheet

APPENDIX D: Soil Loss Calculations

APPENDIX E: Storm Water Quantity – Hydrograph Calculations

APPENDIX F: Storm Water Quality – WINSLAMM Calculations

APPENDIX G: Storm Water Management Maintenance Agreement

APPENDIX A: NRCS Soils/Geotechnical Report

Soil Map—Walworth County, Wisconsin

Map Scale: 1:1,510 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 1:15,800.

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: Walworth County, Wisconsin
Survey Area Data: Version 19, Sep 6, 2022

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

Date(s) aerial images were photographed: Jul 30, 2022—Aug 18, 2022

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MwD2	Miami loam, 12 to 20 percent slopes, eroded	8.2	99.5%
RsF	Rodman-Casco complex, 30 to 45 percent slopes	0.0	0.4%
W	Water	0.0	0.1%
Totals for Area of Interest		**8.2**	**100.0%**

Professional Service Industries, Inc.
821 Corporate Court, Waukesha, WI 53189
Phone: (262) 521-2125
Fax: (262) 521-2471

April 27, 2023

Blue Stem Design
503 S. 16th Street
St. Charles, IL

Attn: Mr. Peter Vargulich, RLA
President

Re: Subsurface Exploration and Evaluation
Women's Leadership Center
Constance Boulevard
William's Bay, WI
PSI Project No. 00523167

Dear Mr. Vargulich:

The subsurface exploration and evaluation for the referenced project has been completed. An electronic copy of the report is being provided via email. Paper copies can be issued upon request. After you have had the opportunity of reading the report, please call at any time with any questions or comments you may have. Professional Service Industries, Inc. (PSI), an Intertek Company, appreciates the opportunity to be of service on this project, and looks forward to continuing as your geotechnical consultant during the design and construction phases, as well as your upcoming projects.

Sincerely,

PROFESSIONAL SERVICE INDUSTRIES, INC.

Caige Tubic
Staff Geologist
Geotechnical Services

James M. Becco, P.E.
Regional Vice President

The above Professional Engineering Seal and signature is an electronic reproduction of the original seal and signature. Original hard copies can be provided upon request. This electronic reproduction shall not be construed as an original or certified document.

PRELIMINARY
SUBSURFACE EXPLORATION
AND EVALUATION

For the:

Women's Leadership Center
Constance Boulevard
William's Bay, WI

James M. Becco, P.E.
Regional Vice President

Prepared by:

Professional Service Industries, Inc.
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Staff Geologist
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April 27, 2023

PSI Project No. 00523167

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APPENDIX (in order of appearance)

INTRODUCTION

General

This report presents the results of the subsurface exploration for the proposed Women's Leadership Center located in William's Bay, Wisconsin. The work was performed for Blue Stem Design at the request of Mr. Peter Vargulich.

Purpose

The purpose of this study was to evaluate the subsurface conditions at specific boring locations on the site, and to establish parameters for use by the design engineers and architects in preparing the foundation, floor slab, pavement, and stormwater management designs for the proposed project.

Scope

The scope of services included a site reconnaissance, the subsurface exploration, a determination of soil characteristics by field and laboratory testing, and an evaluation and analysis of the data obtained. The scope of the field work, including the number, depth, and locations of the borings was determined by the client in consultation with PSI. A global stability evaluation was not requested or performed but may be necessary based on the proposed construction and existing site slopes.

Authorization

The description of services and authorization to perform this subsurface exploration and evaluation were in the form of signed acceptance copy of PSI Proposal No. 394335-R1, dated March 10, 2023. The general conditions for the performance of the work were referenced in the proposal. This report has been prepared on behalf of, and exclusively for the use of Blue Stem Design. The information contained in this report may not be relied upon by any other parties without the express written consent of PSI, and acceptance by such parties of PSI's General Conditions.

SITE AND PROJECT DESCRIPTION

Site Features

The project site is an approximately 8.7-acre parcel of land in Williams Bay,Wisconsin. The site currently consists of vacant, wooded land. The site is bordered on the north by Constance Boulevard and Geneva Lake on the south, Outina Street to the east, and George Williams College of Aurora University to the west. Aerial photos between the years 2002 and 2022 were reviewed on Google Earth. The photos generally indicate the site to be similar in overall appearance to that described above. However, some of the photos are grainy and it is difficult to discern details. The topography of the site was typically higher in elevation to the north of the

site, and is generally rolling in nature. Near Geneva Lake, there is a steeper slope to the south. The boring elevations range from EL. 905 to EL. 930 with an elevation difference of about 25 feet.

Project Description

Based on information and plans provided by the client, it is understood that the proposed project will consist of the development of three buildings, associated paved drives and parking areas, stormwater management areas, and an elevated boardwalk. The buildings include The Lodge, The Council and The Cabin. The Lodge building is planned to be a three-story building (two stories above grade) and to have a total footage of 13,000 square feet. It will include an elevator and a basement within the central and eastern portions of the building. The Council building is planned to be a one-story building with a planned square footage of 8,500 square feet. The Cabin building is planned to be a two-story building and to have a total footage of 3,300 square feet. No basements were planned for The Council or The Cabin structures. It is understood that the boardwalk is to be an elevated wooden structure supported by helical piers. Further design details were not provided for the boardwalk, or stormwater basins.

Based upon information provided by the client, the structures will have maximum design column loads of 45 kips and maximum design wall loads of 2.5 kips per lineal foot. The structures are anticipated to be supported by conventional spread footings. The boardwalk is planned to be supported by helical piers.

The following chart depicts the planned floor elevations and square footage at each of the buildings.

Planned Finished Floor Elevations by Building		
Building Type	**Planned Finished Floor Elevations**	**Square Footage (FT^2)**
The Lodge	Lower Level – EL. 913.5 First Floor – EL. 925.5 Upper Level – EL. 937.5	13,000
The Council	First Floor - EL. 926.5	8,500
The Cabin	First Floor – EL. 922.0 Second Floor – EL. 932.0	3,300

The planned first floor elevation of The Council structure is EL. 926.5. On the basis of the surface elevations at BS-5 and BS-6, which were performed in this area, fills of up to about 1.5 feet are estimated to be necessary. The planned first and basement floor elevations of The Lodge structure are EL. 925.5 and EL. 913.5. On the basis of the surface elevation at BS-1 (EL. 920), BS-2 (EL. 921), and BS-3 (EL. 924), which were performed within this area, fills of up to about 5.5 feet are estimated to be necessary to establish surface grades, and cuts of up to about 11.5 feet are estimated to be required in the basement area. The existing surface

elevation at BS-4, within the footprint of The Cabin building, was EL. 921. On the basis of the planned first floor elevation (EL. 922), nominal fills of about 1 foot are estimated to be necessary. However, some variation in the depths of cuts and fills is likely.

When any additional information becomes available, and/or if finished floor elevations or other details vary or change from those stated above, PSI must be informed so that any necessary re-evaluation or revisions to this report can be made.

EXPLORATION AND LABORATORY PROCEDURES

Scope Summary

The field and laboratory data utilized in the evaluation of the subsurface materials was obtained by drilling exploratory test borings, securing soil samples by the split-spoon sampling method, and subjecting the samples to standard laboratory testing.

Field Exploration

Ten (10) soil borings (BS-1 through BS-6, and BC-7 through BC-10) were performed for this project in areas of buildings, the boardwalk, and pavements to a planned depth of 5 to 20 feet below existing grades. Six (6) (BC-1 through BC-6) soil test borings were planned to be performed in the areas of the proposed stormwater management basins to a depth of about 15 feet below the existing surface. However, auger refusal on probable cobbles and/or boulders; or possible cobbles, boulders, or bedrock was experienced at depths of about 7 feet, 7.5 feet, and 5.5 feet (EL. 917, EL. 912.5, EL. 919.5) at BC-3, BS-1, and BS-6, respectively. Borings BC-3 and BS-6 were offset about 65 feet and 5 feet, respectively, from their initial locations and were able to be completed to their planned depth. The number, depth, and locations of the borings were determined by the client. The borings were located in the field by the drill crew by utilizing a consumer grade GPS device. They are estimated to be accurate to within several feet. The surface elevations shown on the logs were estimated by interpolation of a 1-foot contour map of the property, provided by the client. The elevations are estimated to be accurate to within about 1 foot.

The soil test borings were performed with a truck mounted rotary drilling rig utilizing continuous flight hollow stem augers to advance the holes. Representative samples were obtained by the Standard Penetration Test (SPT) method using split-spoon sampling procedures in general accordance with ASTM D-1586 procedures. Samples were generally collected at 2.5-foot intervals to 10 feet, and then at 5-foot intervals thereafter to the end of the borings. As an exception, samples were obtained at 2-foot intervals at the borings performed within the proposed stormwater management areas. The standard penetration value (N) is defined as the number of blows of a 140-pound hammer, falling thirty (30) inches, required to advance the split-spoon sampler one (1) foot into the soil. The sampler is lowered to the bottom of the drill hole and the number of blows recorded for each of the three (3) successive increments of six (6) inches penetration. The "N" value is obtained by adding the second and third incremental

numbers. The SPT provides a means of estimating the relative density of granular soils and comparative consistency of cohesive soils, thereby providing a method of evaluating the relative strength and compressibility characteristics of the subsoils.

The SPT soil samples were transferred into clean glass jars immediately after retrieval and returned to the laboratory upon completion of the field operations. Samples will be discarded unless other instructions are received. The soil samples were visually classified in general accordance with the Unified Soil Classification System (ASTM D- 2488-75). The soil samples obtained from proposed stormwater management area borings were visually classified in general accordance with USDA textural soil classification procedures. A description of the subsurface conditions encountered at each boring location is shown on the enclosed Soil Boring Logs. After completion of the borings, the auger holes were backfilled to the ground surface with bentonite chips.

A copy of the Soil Boring Logs and Boring Location Plan (Figure 1) are enclosed in the Appendix. The soil stratification shown on the logs represents the approximate soil conditions in the actual boring locations at the time of the exploration. The terms and symbols used on the logs are described in the General Notes found in the Appendix.

Laboratory Physical Testing

Soil samples obtained from the exploration were visually classified in the laboratory, and subjected to testing, which included moisture content determinations. The laboratory testing was performed in general accordance with the respective ASTM methods, as applicable, and the results are shown on the boring logs in the Appendix.

DESCRIPTION OF SUBSURFACE CONDITIONS

General

A description of the subsurface conditions encountered at the test boring locations is shown on the Soil Boring Logs. The lines of demarcation shown on the logs represent an approximate boundary between the various soil classifications. It must be recognized that the soil descriptions are considered representative estimates for the specific test hole location, but those variations may occur between and beyond the sampling intervals and boring locations. Soil depths, topsoil, and layer thicknesses, and demarcation lines utilized for preconstruction planning should not be expected to yield exact and final quantities. A summary of the major soil profile components is described in the following paragraphs.

Soil Conditions

Building, Pavement and Boardwalk Borings (BC-7 through BC-10, BS-1 through BS-6) - USCS Classification

The surface materials at the borings were about 3 to 7 inches of silty clay, silty sand and silt, classified as topsoil. The exception was BC-10 which had topsoil to a depth of about 3 feet below grade (EL. 902). Beneath the surface materials was brown lean clay to depths of about 3.5 to 6 feet (EL. 917.5 to EL. 919) underlain by brown to red silty sand and gravel to the termination of the borings. The natural granular soils were in a medium dense to extremely dense condition with N-values ranging from about 11 blows per foot (bpf) to 95 blows per 9 inches. The natural cohesive soils were in a stiff to hard condition with unconfined compressive strengths ranging from 1.7 to 6.2 tons per square foot (tsf).

Auger refusal was experienced at BS-1 and BS-6, at depths of about 7.5 and 5.5 feet (EL. 917.5 to EL.919), respectively on probable cobbles and/or boulders. Additionally, BS-1 was terminated at 7.5 feet (EL. 912.5) due to auger refusal on possible cobbles, boulders, or bedrock. BS-6 was offset about 5 feet to the south after the initial refusal.

Stormwater Management Area (BC-1 through BC-6) - USDA Classification

The surface materials encountered at the borings consisted of about 3 to 7 inches of silt loam, classified as topsoil. Beneath the surface materials was silty clay loam, sand and gravel, loamy sand and gravel, sand and loamy sand to the termination of the boring. The relative density of the natural granular soil was soft to very hard, with N-values between 12 blows per foot and 97 blows per 8 inches. The natural cohesive soils were in a soft to very stiff condition with unconfined compressive strengths ranging from 0.4 to 3.5 tons per square foot (tsf).

Auger refusal was experienced at BC-3, at a depth of about 7 feet (EL. 917) on probable cobbles and/or boulders. BC-3 was offset about 65 feet to the northeast after the initial refusal and due to an elevation difference from the initial boring of about 4 feet, it was extended to about 19 feet from the planned 15 feet.

The foregoing discussion of soil conditions on this site represents a generalized soil profile as determined at the test boring locations. A more detailed description and supporting data for each test location can be found on the individual soil boring logs

Groundwater Observations

Groundwater observations were made during the drilling operations, and in the open boreholes upon completion. No groundwater was encountered during auger advancement or upon completion of the borings and removal of the augers.

It must be recognized that groundwater levels fluctuate with time due to variations in seasonal precipitation, lateral drainage conditions, and soil permeability characteristics. Longer term monitoring would be required to further evaluate groundwater levels on this site.

CONSIDERATIONS AND RECOMMENDATIONS

General Development Considerations

In view of the subsurface conditions encountered in the test borings, together with the structural loading criteria and development grades anticipated, conventional spread footings can be used for support of the proposed buildings and helical piers can be used for the boardwalk.

It should be noted that auger refusal on probable cobbles and/or boulders; or possible cobbles, boulders, or bedrock was experienced at depths of about 7 feet, 7.5 feet, and 5.5 feet (EL. 917, EL. 912.5, EL. 919.5) at BC-3, BS-1, and BS-6, respectively. Additionally, dense to extremely dense granular soils were encountered in several of the borings. Substantial difficulty digging/drilling and longer excavation/installation times should be expected with increasing depth. Refusal or near refusal conditions may be experienced.

The floor slabs and pavements can be supported by the existing soils following proper preparation, which will include the removal of soft, unstable or unsuitable zones. Some instability and the need for undercutting may occur.

A discussion of the foundation design parameters, as well as the support conditions for the floor slab and pavement areas, is included in the following sections.

Site Preparation

The presence of organic topsoil and vegetation in the subgrade can adversely affect the serviceability of structural fills, foundations, floor slabs, pavements, and other structures placed upon them. Approximately 3 to 7 inches of topsoil was present on the surface of the site at the boring locations, the exception being BC-10 where about 3 feet (EL. 902) of topsoil was present. However, some variation should be anticipated. All topsoil, vegetation, trees, roots and other organic matter must be stripped from the areas of footings, floor slabs, pavements, sidewalks, and other structures.

After stripping the topsoil and cutting high areas of the site to the planned finished grade, and prior to the placement of new fill which may be placed to raise grades, the subgrade must be thoroughly proofrolled to detect unstable, yielding soils. This should consist of overlapping passes in a perpendicular grid pattern, with a fully-loaded tandem-axle dump truck, or other equipment of similar size and weight suitable for the surface conditions. Proofrolling should be performed in consultation with the geotechnical engineer at the time of construction. Some difficulty with subgrade preparation may be experienced, especially in wet or cold weather, or during thawing conditions. Additionally, instability can become more severe in silty and clayey materials, which are considered to be moderately to highly moisture sensitive. It is generally recommended that earthwork be carried out during relatively warm, dry weather. Any soft, wet, or otherwise unstable zones which cannot be improved by scarification and aeration, must be removed and replaced with compacted structural fill, such as clean crushed stone, possibly in conjunction with the use of a geotextile fabric. Lime, lime kiln dust, fly ash, or Portland cement

modification are additional remedial measures which can be considered for clayey and some silty soils. However, this must only be performed at the direction and under the supervision of the geotechnical engineer. A proper mix design must be performed prior to the performance of any modification. Substantial construction delays and difficulty with subgrade stabilization may be experienced during periods of wet and/or cool weather. Consideration should be given to installing construction roads to reduce disturbance to the sensitive subgrade soils.

Every effort must be made to keep excavations dry. If construction proceeds during wet weather, some additional over excavation may be necessary. If weather permits, the soil could be dried and recompacted. A crushed stone working mat, possibly in conjunction with a geotextile fabric, may also be feasible to help stabilize subgrades. Site grading runoff should be directed to catch basins, so that the potential for the softening of the foundation subgrade soils is reduced.

Where the removal of unsuitable bearing material is performed beneath the proposed footings/slab, the excavation must extend laterally beyond the perimeter of the foundation/slab for a distance at least equal to the thickness of the fill below the footing bottom. This general guideline also applies to instances where a raised structural fill pad is constructed to achieve a bearing elevation greater than existing grades. The influence zone of footing stresses can be represented as an imaginary 45° line extending downward and outward from the footing bottom. All fill placed within this zone after cutting to firm soil must be properly engineered, from the bottom of the cut, up to the floor slab subgrade elevation.

Where site grades are raised in excess of 2 feet, the first lift of new fill must be placed so as to extend a minimum lateral distance of 5 feet beyond the planned top building pad dimension (for fills less than 5 feet in thickness), or for a distance equal to at least 1 foot laterally beyond the top pad dimension for every foot of fill thickness (for fills greater than 5 feet in depth). Subsequent lifts can then be placed on an approximate 1H:1V slope back up to the planned top perimeter dimension of the pad.

When a firm and stable subgrade is established, low areas may be raised to planned grades with properly compacted structural fill. Any new fill should be a clean granular soil or a low-plasticity cohesive soil. If fine-grained soils, such as those with high silt or clay content are used, they should generally be placed over large open areas, where conditions are more favorable for the proper placement and compaction of such materials. It must be recognized that high silt or clay content materials are difficult to compact when placed at moisture contents beyond a few percent of the optimum moisture content. In addition, the near surface soils on this site are generally considered to be moisture sensitive; therefore, some difficulty with subgrade preparation should be expected, especially if they become wet during construction. Fill must be placed in layers of not more than nine (9) inches in thickness, at moisture contents at or near optimum, and be compacted to a minimum density of 95 percent of the maximum dry density as determined by ASTM designation D-698 (Standard Proctor). At least portions of the on-site soils beneath the topsoil and above the groundwater can be used as new fill to raise grades, generally over large open areas, which are more favorable for proper placement of fine-grained soils. However, substantial moisture conditioning may be required. Silt, clay and

wet granular soils are not suitable for reuse as compacted fill in trenches, or adjacent to foundation stem walls or retaining walls.

Proper moisture control is essential to reduce the amount of compactive effort necessary to achieve the desired densities. This is especially true of clayey soils, where scarification and aeration may be required to achieve near-optimum moisture levels prior to compaction. A sheepsfoot roller is generally required for compaction of clayey soils, whereas a vibratory smooth drum roller is preferred for granular material. Small hand-operated compactors should be used in confined areas; granular fills are generally more readily compacted to the required densities in such applications.

It is recommended that well-graded granular soils be utilized as backfill in new utility trenches and alongside below grade walls to reduce the potential for consolidation and settlement of the fill. All fill soils must be placed and compacted under engineering-controlled conditions, to provide suitable support for overlaying structures and roadways. Additional guidance can be provided at the time of construction in the selection process for grade-raising fill and trench backfill.

The selection of fill materials for various applications should be done in consultation with the soils engineer. Similarly, the evaluation of the subgrade and placement and compaction of fill for structural applications should be monitored and tested by a qualified representative of the soils engineer.

Foundation Evaluation

The Lodge building may be supported by a conventional spread foundation, bearing on suitable naturally occurring soils or within structural fill, prepared as discussed in a previous section. Based upon the planned finished first floor elevation of EL. 925.5, interior and exterior footings will bear at about EL. 924 and EL. 921.5, respectively. In the area of the basement footings (EL. 913.5) are estimated to bear at about EL. 911.5. Dense to extremely dense granular soils and stiff to very stiff cohesive soils were generally encountered within BS-1, BS-2 and BS-3 at these approximate elevations. In the area of the Lodge, conventional spread footings bearing upon suitable natural soils, or upon compacted structural fill (or lean mix concrete), may be designed for a net allowable soil pressure of 3,000 psf.

The Council building may be supported by a conventional spread foundation system, bearing on suitable naturally occurring soils or within structural fill, prepared as discussed in a previous section. Based upon the planned finished floor elevation of EL. 926.5, interior and exterior footings will bear at about EL. 925 and EL. 922.5, respectively. Medium dense granular soils and stiff cohesive soils were generally encountered within BS-5 and BS-6 at these approximate elevations. In the area of the Council, conventional spread footings bearing upon suitable natural soils, or upon compacted structural fill (or lean mix concrete), may be designed for a net allowable soil pressure of 3,000 psf.

The Cabin building may be supported by conventional spread foundation, bearing on suitable naturally occurring soils or within structural fill, prepared as discussed in a previous section. Based upon the planned finished floor elevation of EL. 922, interior and exterior footings will bear at about EL. 920.5 and EL. 918, respectively. Medium granular and stiff cohesive soils were generally encountered within BS-4 at these approximate elevations. In the area of the Cabin building, conventional spread footings bearing upon suitable natural soils, or upon compacted structural fill (or lean mix concrete), may be designed for a net allowable soil pressure of 3,000 psf. Some undercutting of soft, loose, or lower strength soils may be necessary to utilize these bearing pressures in at least isolated areas.

The suitability of the existing soils for support of the proposed foundation must be determined by testing by a qualified geotechnical engineer during construction, utilizing static cone penetrometer tests or dynamic cone penetrometer tests for cohesive and granular soils, respectively. Soft, loose, or otherwise unsuitable materials, not disclosed by the borings, may be encountered in the foundation excavations at the bearing elevation. If unsuitable existing soil is present, it must be removed throughout a zone extending one foot laterally for each two feet removed below the foundation, on either side of the planned footing. The over-excavated area must be backfilled with structural compacted fill.

It is recommended that the footings supporting individual columns have a minimum dimension of 24 inches, and continuous footings have a minimum width of 18 inches, even if the maximum recommended allowable bearing pressure is not fully utilized. In order to minimize the effects of any slight differential movement that may occur due to variations in the character of the supporting soils and any variations in seasonal moisture contents, it is recommended that all foundations be suitably reinforced to make them as rigid as needed.

In general, the performance of the foundation system on this site is dependent on the various factors discussed herein. The excavation, preparation, and concreting of foundations should be monitored and tested by a representative of the soils engineer.

Floor Slab and Pavement Subgrades

Prior to constructing the floor slabs or pavements, and prior to the placement of any fill used to raise grades, the exposed subgrade must be prepared utilizing the proofrolling procedures described previously. In areas that exhibit soft, yielding or unstable soil conditions, the following remedial measures are recommended to provide a stable subgrade. It is recommended that the proofcompacting and proofrolling operations be monitored by a representative of the geotechnical engineer to ensure that a firm, suitable subgrade is present prior to placement of new fills, or to construction of floor slabs and pavements. Extensive removal and replacement of fill may be necessary.

Localized wet, soft or unstable areas can be undercut to such depths determined necessary in the field to reach stable material, and the area backfilled with imported crushed stone, such as the 1¼-inch gradation specified in Section 305 of the WisDOT Standard Specifications, placed and compacted as recommended in the Site Preparation section of this report. If relatively thick

zones or areas of extensive yielding are observed, and they cannot be stabilized by normal discing, aeration and recompaction procedures, undercutting and replacement with crushed stone and geotextile fabric (if needed) may also be required in these areas.

The floor slabs may be designed utilizing an estimated modulus of subgrade reaction of 125 pci based on the presence of suitable soils, prepared as discussed in this report. However, this is based on common range values obtained from 1 ft. x 1 ft. plate load tests on specific soil types. Depending on how the slab load is applied, the value may need to be modified for larger areas using the following:

Modulus of Subgrade Reaction $k_s = (\frac{k}{B})$ for cohesive soil

$k_s = k\,(\frac{B+1}{2B})^2$ for cohesionless soil

where: k_s = coefficient of vertical subgrade reaction for loaded area
k = coefficient of vertical subgrade reaction for a 1x1 foot square area
B = width of area loaded, in feet

The final design and detailing should be performed by a qualified structural engineer based on the intended slab use, loading conditions and anticipated subgrade conditions.

A granular mat, which can be designed as a drainage layer, should be provided below the floor slab. This must be a minimum of six (6) inches in thickness and properly compacted**.** In moisture sensitive areas, a vapor retarder may be placed beneath the floor slab or base course, however, it is recommended that the architect be consulted in this regard. The proper use of a vapor retarder may not completely prevent moisture beneath or on top of slabs. If the base course contains sharp particles, a cushion layer of sand approximately 2 inches in thickness may be required to provide protection from puncture.

The floor slabs should be suitably reinforced to make them as rigid as necessary and proper joints provided at the junction of slabs and the foundation system so that a small amount of independent movement can occur without causing damage. Large floor areas must be provided with joints at frequent intervals (maximum spacing of 30 times the slab thickness, per ACI) to compensate for concrete volume changes (shrinkage). It is recommended that appropriate construction methods and curing procedures be used to minimize shrinkage and curling of the floor slabs.

General Helical Pier Foundation Recommendations

Helical piers are small diameter square or round shaft sections, including single or multiple helical shaped bearing plates, screwed into the ground with the application of torque to the design depth with the addition of extension shafts. The helical bearing plates are typically 6 to 14 inches in diameter and are spaced at about 3 times the plate diameter apart to avoid overlapping stresses from adjacent plates. Helical piers are used to resist axial compressive

and tensile forces, and to a much lesser degree, lateral forces. The tensile and compression capacity of the piers is developed from the bearing of the individual plates on the soils.

Helical pier foundations are design/build systems that must be designed and installed by a qualified contractor. Dependent upon the final design, bearing depths and helix diameters, additional deeper borings may be necessary (dependent upon the design requirement determined by the pier designer/installer).

It should be noted that auger refusal on probable cobbles and/or boulders; or possible cobbles, boulders, or bedrock was experienced at depths of about 7 feet, 7.5 feet, and 5.5 feet (EL. 917, EL. 912.5, EL. 919.5) at BC-3, BS-1, and BS-6, respectively. Additionally, dense to extremely dense granular soils were encountered in several of the borings. Substantial difficulty drilling and longer installation times should be expected with increasing depth. Refusal or near refusal conditions may be experienced.

It is recommended that installation of piers be monitored and documented by a representative of the geotechnical engineer.

Exterior/Unheated Area Slabs

Entry slabs, sidewalks, aprons, and other slabs in exterior or unheated areas may bear upon silty or clayey soils. Such materials can be highly frost susceptible and poorly drained. Slabs placed directly upon such soils are subject to heaving and subsequent settlement due to freeze/thaw cycles. This can result in cracking, misalignment, and other related effects (especially at joints). It is recommended that consideration be given to limited undercutting of the frost susceptible materials to a depth of 1 to 2 feet below the slab, and replacement with well graded, properly placed and compacted granular soils. A properly designed underdrain system connected to the municipal sewer (if permissible) or directed to on-site stormwater management areas should also be incorporated to reduce the potential effects of freeze/thaw cycles.

Utility Construction

In general, the on-site soils can be used for support of utility lines. However, some undercutting of unstable or otherwise unsuitable soils may be necessary. In addition, the placement of crushed stone or other suitable granular backfill may be necessary to establish a stable working mat and/or bearing subgrade. Substantial difficulty with the stability of utility trenches should be expected due to the presence of granular soils across the site, especially in the presence of water. The use of shoring, bracing, or trench boxes will be required. Utility construction should be performed in accordance with "The Standard Specifications for Sewer and Water Line Construction" for the State of Wisconsin.

It is recommended that well graded granular soils such as those specified in Tables 37 and 39 of the Standard Specification for Sewer and Water Construction be utilized as backfill in utility trenches to reduce the potential for consolidation and settlement of the backfill. All fill soils must

be properly placed and compacted under engineering controlled conditions to provide suitable support for overlaying structures and roadways. Silty and clayey soils, organic soils, and wet granular materials are not recommended for use as backfill within utility trenches due to the substantial difficulty of obtaining proper compaction in confined areas.

As with all excavation work, all open cut trenches must be properly shored and braced as required by applicable federal and state OSHA codes, and as necessary to protect life and property.

Below Grade Walls

It is recommended that any walls be backfilled for a lateral distance of 3 to 4 feet with a well-graded, free-draining granular material such as crushed stone. Silt and clay soils, wet granular materials, and organic soils are not suitable for use as backfill. Substantial importing of suitable granular soils may be necessary. Proper drainage systems are recommended to be incorporated into the wall designs. The selection of backfill material should be made in consultation with the geotechnical engineer. The backfill materials should be placed in lifts not exceeding 12 inches in thickness and be compacted to at least 95 percent of the maximum dry density as determined by ASTM designation D-698. The walls must be reinforced, and suitable joints should be placed at appropriate intervals. The designs must include all surcharge loads. Additionally, it is cautioned that the amount of movement required to activate full passive resistance can often be excessive. Therefore, the inclusion of passive resistance in design must be carefully considered by the structural engineer.

The following design parameters (Rankine) are based on the walls being backfilled to planned finished grade with well graded, free draining granular compacted fill, extending at an angle of at least 30° from vertical, away from the toe of the wall. They are based upon level backfill, and are exclusive of any surface surcharge loads, which must be considered in the design. A sample of the material planned for use in backfilling must be provided to PSI prior to construction in order to verify the design values are appropriate for the specific material.

Angle of Internal Friction of Backfill	32°
Coefficient of At-Rest Earth Pressure Behind Wall (Ko)	0.47
Coefficient of Active Earth Pressure Behind Wall (Ka)	0.31
Coefficient of Passive Earth Pressure at Toe of Wall (Kp)	3.25
Unit Weight of Backfill	130 pcf
Equivalent Fluid Pressure At-Rest Condition	60 psf/ft
Equivalent Fluid Pressure Active Condition	40 psf/ft

Resulting Equivalent Fluid Pressure

At-Rest Condition - Drained Condition	60 psf/ft
At-Rest Condition - Undrained Condition	95 psf/ft
Active Condition - Drained Condition	40 psf/ft
Active Condition - Undrained Condition	85 psf/ft

The coefficient of friction between the concrete and the clay is 0.3 and for concrete and sand it is 0.4. For the ease of design, it is recommended that a coefficient of friction of 0.35 be used throughout.

It is recommended that an underdrain system and drainage course be placed beneath the floor slab and that a drain tile system be placed alongside the basement foundation to prevent excessive lateral pressure on the walls. The drainage system must be connected to a sump for drainage and be properly discharged in accordance with all state and local discharge requirements. Drain tile should have a minimum diameter of four (4) inches and should be wrapped with an appropriate filter fabric. Drainage pipes should be surrounded by clean gravel and extend up to the near ground surface in window well areas. At least six (6) inches of clean ¾ inch stone should be utilized for the free draining layer beneath the floor areas.

The below grade walls must be backfilled for a lateral distance of 3 to 4 feet with a well-graded, free draining granular material. This should be placed in lifts not exceeding 12 inches in thickness and be compacted to at least 95 percent of the Standard Proctor density. Based upon the use of a clean, crushed stone fill, and a drained condition, an equivalent fluid pressure of 65 psf may be used as the horizontal component of earth pressure at rest. However, when a proposed fill material has been selected, a representative sample must be submitted to PSI for testing to verify the above value is associated recommendations. Silt and clay soils, organic soils, and wet granular materials are not suitable for use as backfill alongside basement walls. It must be recognized that the above value is exclusive of traffic and other surcharge loads near the walls, which must be factored into the design.

CONSTRUCTION CONSIDERATIONS

Groundwater Control

Groundwater observations were made during the drilling operations, and in the open boreholes upon completion. No groundwater was encountered at any of the borings during drilling or upon completion of drilling and removal of the augers.

Because no groundwater was encountered in the foundation, utility, and stormwater basin boreholes during the exploration, no major difficulties are expected during typical shallow pavement construction. A gravity drainage system and a filtered sump pump or other conventional dewatering procedures should be adequate to control low volume perched water if encountered. However, for deeper excavations, or for large volume perched zones, prolonged dewatering with a series of sumps or well points and high capacity sump pumps, or other more comprehensive means may be necessary to facilitate construction. Additionally, it should be noted that higher groundwater levels may be encountered encroaching upon Geneva Lake.

While no groundwater was encountered at the time the borings were drilled, seasonal variations in precipitation, site drainage conditions, soil permeability, and other factors can cause

groundwater to be present in the upper soils at other times of the year, including during construction.

Excavations and Site Drainage

Sloping, shoring or bracing of the excavation sidewalls will be necessary. Excavating may be difficult due to the instability of vertical slopes, and will therefore require a flattening of trench sides, or some other means of protection, to facilitate construction and to protect life and property. The degree of excavation instability problems is dependent upon the depth and length of time that excavations remain open, excavation bank slopes, water levels and the effectiveness of any dewatering systems. However, severe instability can be expected within granular or soft cohesive soils, especially encroaching upon and extending below the groundwater or perched zones. All excavation work must be performed in accordance with OSHA and local building code requirements.

All excavations must be performed with caution and utilize methods which will prevent undermining or destabilization of slopes, buildings, utilities, pavements, sidewalks or other structures. The use of a properly designed shoring and bracing, sheet piling, or underpinning system must be utilized as necessary to adequately protect existing buildings, utilities, pavements, and other structures. This must be performed by an experienced specialty contractor. Additionally, extreme care must be used during the installation of any bracing system, especially those using driven or vibratory methods, in order to avoid damaging existing buildings, utilities, and other structures. Consideration should be given to the performance of video and/or photographic documentation of the condition of nearby buildings, utilities, and other structures prior to installation.

Auger refusal on probable cobbles and/or boulders; or possible cobbles, boulders, or bedrock was experienced at depths of about 7 feet, 7.5 feet, and 5.5 feet (EL. 917, EL. 912.5, EL. 919.5) at BC-3, BS-1, and BS-6, respectively. Additionally, dense to extremely dense granular soils were encountered in several of the borings. Substantial difficulty digging/drilling and longer excavation/installation times should be expected with increasing depth (including during the installation of any necessary bracing systems and stormwater basins). Refusal or near refusal conditions may be experienced. Excavations and helical pier installations will encroach upon and/or extend below the refusal depths in at least some areas, including the area of the planned The Lodge basement. Therefore, additional subsurface exploration with backhoe test pits is recommended as part of design planning to further evaluate refusal depths, and the type and excavatability of the materials. Specialized removal techniques, such as ripping and/or blasting, may be required to establish the planned elevations for the proposed structure or to establish the invert elevations for utilities. If blasting is performed, it is recommended that a specialty contractor be utilized to perform the blasting operations. Blasting can cause noise and vibration disturbance to neighboring structures, and must be performed using extreme caution. Consideration should be given to the performance of video and/or photographic documentation of the condition of nearby buildings, utilities, and other structures prior to any blasting. Following the blasting, the exposed subgrade must be observed by the geotechnical engineer to ensure that disturbance of the overburden is not excessive and that the blasted rock is

sufficiently stable for piping, foundation or other support. It is possible that the blasting will result in several feet or more of "overblast", where larger sized rock requiring removal, will be present in the bottom of excavations. The larger rock must be removed and replaced with suitable granular fill, or must be crushed to suitable size for re-use. Proper placement and compaction will be necessary.

It is mandated that excavations, whether they be for utility trenches, basement excavations or footing excavations, be constructed in accordance with current Occupational Safety and Health Administration (OSHA) guidelines to protect workers and others during construction. PSI recommends that these regulations be strictly enforced; otherwise, workers could be in danger and the owner(s) and the contractor(s) could be liable for substantial penalties. The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations. PSI is providing this information solely as a service to our client. PSI does not assume responsibility for construction site safety or the contractor's or other parties' compliance with local, state, and federal safety or other regulations.

Since the subgrade soils are generally sensitive to moisture, every effort should be made to provide adequate drainage across the site during construction, and to prevent ponding of runoff on the subgrade. These soils are also subject to erosion caused by runoff, and erosion control measures should be implemented where needed or required by local ordinances.

Seismic Design Considerations

The soils encountered in the borings are considered to meet the criteria for Site Class D in accordance with 1613.2.5.2 of the International Building Code-2018 (which directs to the simplified design procedure outlined in ASCE 7 – Minimum Design Loads and Associated Criteria for Buildings and Other Structures).

PAVEMENT DESIGN

Pavements for this project are understood to consist of driveways and private areas, which are estimated to be primarily subjected to light passenger vehicle traffic, and occasional delivery trucks, and garage trucks.

The subgrade soils encountered at the borings consisted predominantly of natural lean clay with an estimated visual classification of A-6 by the AASHTO soil classification method. They are generally rated as poor for pavement subgrade support due to relatively high frost susceptibility, poor drainage characteristics, and relatively high susceptibility to strength loss when exposed to free water. Provided that the subgrade soils are prepared as outlined in the

Site Preparation section of this report the in-place subgrade soils and any new structural fill can be used for standard flexible or rigid pavement construction.

Evaluation of the visual soil classification has been made in estimating pertinent subgrade design coefficients as described in the Wisconsin Soils Manual for Pavement Design. Based on the soils encountered, and with proper subgrade preparation and drainage, the following pavement subgrade design parameters are recommended for the pavement section design. However, if soils with support characteristics different from the silty clay materials are encountered or are used to raise grades in new pavement areas, revised coefficients will need to be provided.

PAVEMENT SUBGRADE DESIGN COEFFICIENTS

AASHTO Soil Classification	A-6
Design Frost Index	F-3
Design Group Index	14
Soil Support Value	3.8
Estimated Subgrade Modulus (k)	125 pci

The subject site is located in an area that experiences annual freezing cycles and the subgrade soils encountered have been classified as highly susceptible to frost action when free water is present. In order to reduce the potential for frost action, it will be necessary to control surface runoff and water seepage, because complete removal and replacement of the frost susceptible subgrade soils is not considered economically feasible. It is recommended that underdrains be placed within the subgrade, just below the granular base, to help reduce the potential for trapping water within the aggregate base layer. Sufficient drain tiles extending radially outward an adequate distance from each interior catch basin must be installed. In addition, drain tiles should extend along curb lines, up the slope from curb inlets. The drain tile should be directly connected to the storm sewer manholes or catch basins (if permissible by local municipal or other applicable code). The drain tile should consist of perforated PVC pipe of adequate diameter placed beneath the base layer, extending a sufficient distance into the subgrade. The pipe should be surrounded by appropriately sized clean stone, with the pipe and stone being wrapped with a geotextile filter fabric to reduce the potential for soils to migrating into and obstruct the pipe. It is also recommended that roof drains be connected to the stormwater collection system to minimize the potential for this water to enter the base and subgrade.

STORMWATER MANAGEMENT AREA CONSIDERATIONS

As requested by the client, borings BC-1 through BC-6 were performed in the area of the proposed stormwater management areas. The subgrade soils encountered at these locations have been visually classified in general accordance with the USDA textural soil classification system. They generally consisted of silty clay loam, loamy sand, sand, loamy sand and gravel,

and gravel, sand and loamy sand to the termination depth of 15 feet below existing grade. Groundwater was not encountered during operations or upon removal of the augers.

With regard to the above soil and groundwater conditions encountered at the borings, NR 151.124(4)(c)1 and 2 – *Infiltration rate exemptions* indicates that infiltration practices located in an area where the infiltration rate of the soil encountered in the area of the infiltration system is less than 0.6 inches per hour using a scientifically credible field test method; or an area where the least permeable soil horizon to 5 feet below the proposed bottom of the infiltration system using the USDA method of soils analysis consists of silty clay loam, sand and gravel, sand and loamy sand may be credited toward meeting the requirements, but the decision to infiltrate under these conditions is optional. In addition, NR 151.124(4)(b)1 – *Separation distances* indicates that infiltration practices shall be located so that the characteristics of the soil and the separation distance between the bottom of the infiltration system and the elevation of seasonal high groundwater or the top of bedrock are in accordance with the following Table (reproduced from NR 151.124):

Table 3. Separation Distances and Soil Characteristics

Source Area	Separation Distance	Soil Characteristics
Industrial, Commercial, Institutional Parking Lots and Roads	5 feet or more	Filtering Layer*
Residential Arterial Roads	5 feet or more	Filtering Layer*
Roofs Draining to Surface Infiltration Practices	1 foot or more	Native or Engineered Soil with Particles Finer than Coarse Sand
Roofs Draining to Surface Infiltration Practices	Not Applicable	Not Applicable
All Other Impervious Source Areas	3 feet or more	Filtering Layer*

*Defined in NR 151.002(14r) as a "soil that has at least a 3-foot deep layer with at least 20 percent fines; or at least a 5-foot deep layer with at least 10 percent fines; or an engineered soil with an equivalent level of protection as determined by the regulatory authority for the site."

The information shown above is a selected excerpt from NR151 that is intended only as general guidance for considering stormwater management in conjunction with the encountered subsurface conditions at the borings. Basin design must be performed by a qualified and experienced firm. In addition, the entirety of Chapter NR151 of the Wisconsin Administrative Code, the Site Evaluation for Stormwater Infiltration (1002) document, and other applicable references; along with appropriate state, local or other municipal requirements must be consulted as part of site-specific stormwater design.

Stormwater management basins are not recommended to be placed in close proximity to basements or other below grade walls and structures. Proper and careful consideration of soils and subsurface conditions must be given during site and design planning, and extreme care

must be exercised during construction. Lateral migration of water may result in substantially increased sump pump activity and can quickly overcome the ability of such pumps to maintain a desirable water level, resulting in significant flooding. The potential for such conditions to occur can greatly increase when basement floors are below the elevation of basin bottoms and/or when basins are placed in close proximity to structures (strongly not recommended). In addition, the presence of granular or other generally permeable soils, which is typically necessary in the areas of structures for utility backfill, alongside basement walls, or within other development excavations/trenches can act as extensive migration channels to rapidly carry large volumes of water from basins and into nearby basements. Building codes or municipal regulations may require that basement floor elevations be a specified distance above the water level of nearby basins or other stormwater features. It is therefore recommended that the design engineer (or other appropriate representative) review applicable municipal or other regulatory requirements and verify the design normal and design high water elevations of stormwater basins/features with respect to planned basement slab elevations.

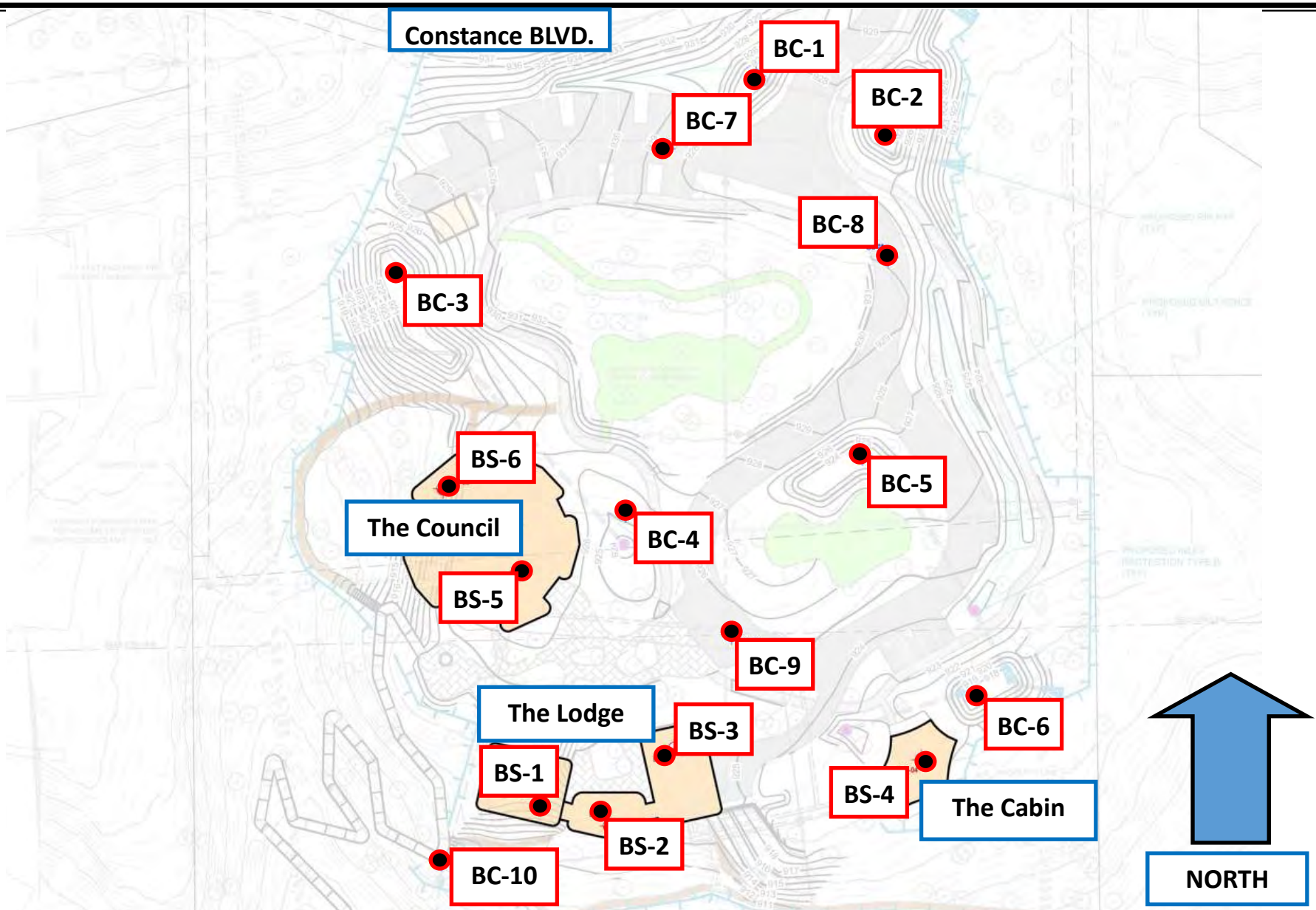
GENERAL COMMENTS

This subsurface exploration and evaluation has been prepared to aid in the evaluation of the subject site for general site development. The recommendations presented herein are based on the available soil information and the design information provided. Any changes in the design information or building locations should be brought to the attention of PSI to determine if modifications in the recommendations are required. The final design plans and specifications should also be reviewed by PSI to determine that the recommendations presented herein have been interpreted and implemented as intended.

The widely spaced soil borings performed for this preliminary exploration and site evaluation are considered suitable for preliminary planning and design purposes. Additional exploration and evaluation should be performed within the proposed building footprints. The conditions encountered by the additional explorations may warrant an alteration of the preliminary foundation and soil bearing design recommendations presented in this report. Specific foundation and floor slab recommendations can then be provided.

This geotechnical study has been conducted in a manner consistent with that level of care ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. The findings, recommendations and opinions contained herein have been promulgated in accordance with generally accepted practice in the fields of foundation engineering, soils mechanics, and engineering geology. No other representations expressed or implied, and no warranty or guarantee is included or intended in this report.

It is recommended that the earthwork and foundation operations be monitored by the soil engineer, to test and evaluate the subgrade stability, bearing capacities, and the selection, placement and compaction of controlled fills. The Wisconsin DOT Standard Specifications for Highway and Structure Construction can also serve as a guide in implementing the subgrade preparation and other earthwork operations.



intertek psi	Proposed Women's Leadership Center Constance Blvd. William's Bay, WI.	SCALE: 1 inch = 75 feet (approx.)
		DATE: 04/27/2023
	FIGURE 1: BORING LOCATION PLAN	PROJECT NUMBER: 00523167

BORING BC-1

DATE STARTED:	3/29/23	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/29/23	**DRILLER:** DT	**LOGGED BY:** AW
COMPLETION DEPTH	15.0 ft	**DRILL RIG:**	Marooka D-50 ATV - Rig #395
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	930 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	

REMARKS:

Water		
	While Drilling	Not Obsvd
	Upon Completion	Not Obsvd
	Delay	N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0					Topsoil, Brown Silty Loam, Moist (5"± Thick)				
						Dark Yellowish Brown Silty Clay Loam and Gravel, Moist			39	
				1	16			2-3-5-5 N=8	26	Q_r = 2.5 tsf
				2	12			2-3-5-8 N=8	13	Q_r = 1.4 tsf
925	5					Dark Yellowish Brown Sand and Gravel, Moist				
				3	4			50/4"	7	
				4	12			13-20-19-13 N=39	4	
						Yellowish Brown Loamy Sand, Moist				
920	10			5	14			11-13-12-16 N=25	6	
						Brown Sand and Gravel, Moist				
				6	14			11-18-16-21 N=34	3	
				7	14			10-10-10-12 N=20	2	
915	15					End of Boring at 15'				
						Cave-In at 6'				

STANDARD PENETRATION TEST DATA
N in blows/ft ◎
× Moisture ◪ PL ✚ LL
0 25 50
STRENGTH, tsf
▲ Qu ✳ Qp
0 2.0 4.0

intertek psi
Professional Service Industries, Inc.
821 Corporate Court, Suite 100
Waukesha, WI 53189
Telephone: (262) 521-2125

PROJECT NO.: 00523167
PROJECT: Proposed Women's Leadership Center
LOCATION: 259 Constance Blvd
Williams Bay, WI

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING BC-2

DATE STARTED:	3/29/23	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/29/23	**DRILLER:** DT	**LOGGED BY:** AW
COMPLETION DEPTH	15.0 ft	**DRILL RIG:**	Marooka D-50 ATV - Rig #395
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	923 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	
REMARKS:			

Water

While Drilling	Not Obsvd
Upon Completion	Not Obsvd
Delay	N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					Very Dark Brown Silt Loam, Moist (7"± Thick)			160	>>×	
						Dark Yellowish Brown Silty Clay Loam, Moist					
				1	7			2-4-5-5 N=9	27	◎ ✳ ×	
920											
				2	12			5-2-3-6 N=5	28	×	Q_r = 0.8 tsf
	5					Black Sand and Gravel, Moist					
				3	3			11-12-17-18 N=29	4	× ◎	
915				4	16			4-11-34-31 N=45	5	× ◎	
						Very Dark Gray Sand and Gravel, Moist					
	10			5	16			20-19-29-37 N=48		◎	
				6	1			50/6"		>>◎	
910											
				7	0			50/3"		>>◎	
	15					End of Boring at 15'					
						Cave-In at 6.5'					

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BORING BC-3

DATE STARTED:	3/31/23	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/31/23	**DRILLER:** DT	**LOGGED BY:** AW
COMPLETION DEPTH	19.0 ft	**DRILL RIG:**	Marooka D-50 ATV - Rig #395
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	924 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	

REMARKS:

Water		
	While Drilling	Not Obsvd
	Upon Completion	Not Obsvd
	Delay	N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0					Very Dark Brown Silt Loam, Moist (3"± Thick)			64	>>
						Dark Yellowish Brown Silty Clay Loam, Moist				
				1	14			3-13-10-9 N=23	17	
920				2	14			5-7-11-10 N=18	20	Q_t = 0.8 tsf
	5					Light Yellowish Brown Sand and Gravel, Moist				
				3	3			5-17-21-19 N=38		
						Dark Yellowish Brown Silty Clay Loam, Very Moist				
				4	14			4-5-6-6 N=11	23	Q_t = 0.4 tsf
915										
	10			5	14			4-4-6-8 N=10	21	Q_t = 0.9 tsf
				6	20			15-18-11-15 N=29	19	Q_t = 1.7 tsf
						Dark Yellowish Brown Loamy Sand and Gravel, Moist				
910				7	22			7-11-15-16 N=26	9	
	15					Yellowish Brown Sand and Gravel, Moist				
				8	14			23-26-37-38 N=63	2	>>
				9	12			24-25-39-40 N=64	3	>>
905						End of Boring at 19'				
						Auger Refusal at 7' on Probable Cobbles and/or Boulders				
						Offset 65' Northeast				
						Cave-In at 4.5'				

STANDARD PENETRATION TEST DATA
N in blows/ft ◎
× Moisture ◪ PL ✚ LL
0 25 50
STRENGTH, tsf
▲ Qu ✳ Qp
0 2.0 4.0

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Williams Bay, WI

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING BC-4

DATE STARTED:	3/31/23	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/31/23	**DRILLER:** DT	**LOGGED BY:** AW
COMPLETION DEPTH	15.0 ft	**DRILL RIG:**	Marooka D-50 ATV - Rig #395
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	926 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	

REMARKS:

Water		
	While Drilling	Not Obsvd
	Upon Completion	Not Obsvd
	Delay	N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					Very Dark Brown Silt Loam, Moist (3"± Thick)			62	>> ×	
925						Dark Yellowish Brown Silty Clay Loam, Moist					
				1	16			3-5-6-9 N=11	25		
				2	20			3-4-5-7 N=9	28		Q_t = 1.1 tsf
	5										
920				3	12			4-4-4-7 N=8	27		Q_t = 0.4 tsf
						Yellowish Brown Sand and Gravel					
				4	22			5-7-8-10 N=15	8		
	10			5	14			7-11-12-12 N=23	4		
915											
				6	14			93/10"	2	>>	
				7	12			97/8"	2	>>	
	15					End of Boring at 15'					
						Cave-In at 7'					

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BORING BC-5

DATE STARTED:	3/29/23	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/29/23	**DRILLER:** DT	**LOGGED BY:** AW
COMPLETION DEPTH	15.0 ft	**DRILL RIG:**	Marooka D-50 ATV - Rig #395
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	929 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	
REMARKS:			

Water

While Drilling	Not Obsvd
Upon Completion	Not Obsvd
Delay	N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					Topsoil, Very Dark Grayish Brown Silt Loam, Moist (5"± Thick)			53	>>×	
						Dark Yellowish Brown Silty Clay Loam, Moist					
				1	12			2-4-5-7 N=9	25		Q_r = 2.6 tsf
925				2	1			18-11-13-15 N=24	17		
	5					Dark Yellowish Brown Sand and Gravel, Moist					
				3	8			7-9-14-9 N=23	6		
						Yellowish Brown Loamy Sand and Gravel, Very Moist					
				4	12			4-8-5-7 N=13	8		
920											
	10			5	20			7-6-6-7 N=12	9		
						Yellowish Brown Sand and Gravel, Moist					
				6	10			7-12-13-12 N=25	4		
915				7	10			7-13-18-18 N=31	3		
	15					End of Boring at 15'					
						Cave-In at 7'					

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PROJECT NO.: 00523167
PROJECT: Proposed Women's Leadership Center
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Williams Bay, WI

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING BC-6

DATE STARTED:	3/29/23	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/29/23	**DRILLER:** DT	**LOGGED BY:** AW
COMPLETION DEPTH	15.0 ft	**DRILL RIG:**	Marooka D-50 ATV - Rig #395
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	921 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	

REMARKS:

Water		
	While Drilling	Not Obsvd
	Upon Completion	Not Obsvd
	Delay	N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0 25 50) STRENGTH, tsf ▲ Qu ✳ Qp (0 2.0 4.0)	Additional Remarks
	0					Topsoil, Very Dark Grayish Brown Silty Loam, Moist (6"± Thick)			97	>>×	
920						Dark Yellowish Brown Silty Clay Loam, Moist					
				1	14			2-3-4-5 N=7	25		Q_r = 3.5 tsf
				2	14			3-3-6-19 N=9	23		Q_r = 2.1 tsf
	5					Dark Yellowish Brown Sand and Gravel, Moist					
915				3	10			5-8-8-10 N=16	6		
				4	8			9-35-15-13 N=50	5		
						Dark Yellowish Brown Loamy Sand and Gravel, Moist					
	10			5	12			10-16-12-8 N=28	8		
910						Brownish Yellow Sand, Moist					
				6	10			8-10-18-13 N=28	3		
				7	10			7-9-10-13 N=19	3		
	15					End of Boring at 15'					
						Cave-In at 5.5'					

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BORING BC-7

DATE STARTED:	3/29/23	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/29/23	**DRILLER:** DT	**LOGGED BY:** AW
COMPLETION DEPTH	5.0 ft	**DRILL RIG:**	Marooka D-50 ATV - Rig #395
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	929 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	

REMARKS:

Water

While Drilling	Not Obsvd
Upon Completion	Not Obsvd
Delay	N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					Topsoil, Dark Brown Silty Clay, Trace Gravel, Very Moist (6"± Thick)	TPSL		49	×	
				1	14	Brown Lean Clay, Trace Gravel and Sand, Moist to Very Moist	CL	3-5-6 N=11	24	◎ ✳ ×	Q_t = 2.0 tsf
925				2	10			3-5-8 N=13	17	◎ × ✳	Q_t = 6.2 tsf
	5					End of Boring at 5'					
						Cave-In at 3'					

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BORING BC-8

DATE STARTED:	3/29/23	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/29/23	**DRILLER:** DT	**LOGGED BY:** AW
COMPLETION DEPTH	5.0 ft	**DRILL RIG:**	Marooka D-50 ATV - Rig #395
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	929 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	
REMARKS:			

Water

While Drilling	Not Obsvd
Upon Completion	Not Obsvd
Delay	N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0 25 50) STRENGTH, tsf ▲ Qu ✳ Qp (0 2.0 4.0)	Additional Remarks
	0					Topsoil, Dark Brown Silty Clay, Trace Gravel, Very Moist (5"± Thick)	TPSL		66	>>×	
				1	5	Brown Lean Clay With Gravel and Sand, Very Moist	CL	3-2-1 N=3	27	◎ ✳ ×	
925				2	6			3-3-5 N=8	15	◎ ✳ ×	
	5					End of Boring at 5'					

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BORING BC-9

DATE STARTED:	3/30/23	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/30/23	**DRILLER:** DT	**LOGGED BY:** AW
COMPLETION DEPTH	5.0 ft	**DRILL RIG:**	Marooka D-50 ATV - Rig #395
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	925 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	

REMARKS:

Water		
	While Drilling	Not Obsvd
	Upon Completion	Not Obsvd
	Delay	N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					Topsoil, Dark Brown Silty Clay, With Gravel and Sand, Very Moist (3"± Thick)	TPSL		179	>>×	
				1	12	Brown Lean Clay, With Sand and Gravel, Very Moist	CL	4-6-7 N=13	28	◎ × ✳	Q_r = 2.9 tsf
				2	10			3-4-6 N=10	28	◎ ×✳	
920	5					End of Boring at 5'					
						Cave-In at 2.5'					

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BORING BC-10

DATE STARTED:	3/30/23	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/30/23	**DRILLER:** DT	**LOGGED BY:** AW
COMPLETION DEPTH	15.0 ft	**DRILL RIG:**	Marooka D-50 ATV - Rig #395
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	905 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	
REMARKS:			

Water

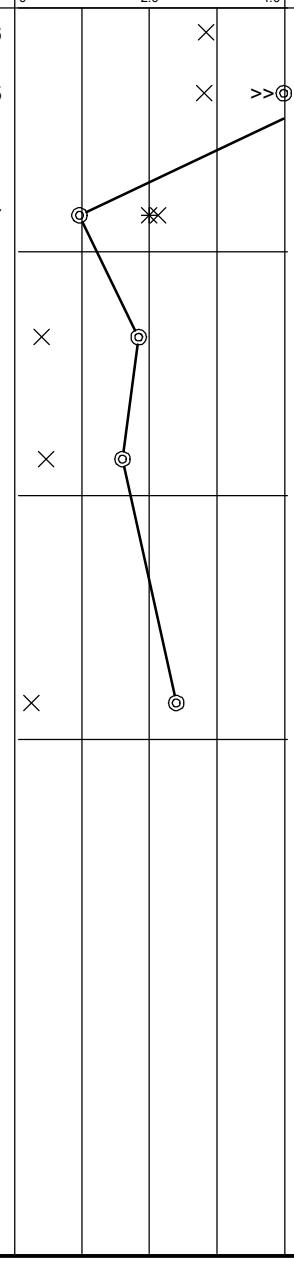
While Drilling	Not Obsvd
Upon Completion	Not Obsvd
Delay	N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %
	0					Topsoil, Dark Brown Silty Sand and Gravel, Moist			36
				1	5		TPSL	50/6"	35
						Brown Lean Clay and Gravel, Very Moist			
				2	6		CL	11-7-5 N=12	27
900	5								
						Brown Sand and Gravel, Moist to Damp			
				3	6			7-8-15 N=23	5
				4	8			10-8-12 N=20	6
895	10						SP		
				5	10			7-14-16 N=30	3
890	15					End of Boring at 15'			

STANDARD PENETRATION TEST DATA
N in blows/ft ◎
× Moisture ◪ PL ✚ LL
0 25 50
STRENGTH, tsf
▲ Qu ✳ Qp
0 2.0 4.0

Additional Remarks



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BORING BS-1

DATE STARTED:	3/30/23	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/30/23	**DRILLER:** DT	**LOGGED BY:** AW
COMPLETION DEPTH	6.0 ft	**DRILL RIG:**	Marooka D-50 ATV - Rig #395
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	920 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	
REMARKS:			

Water

While Drilling	Not Obsvd
Upon Completion	Not Obsvd
Delay	N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					Topsoil, Dark Brown Silty Sand and Clay, Trace Gravel, Moist (5"± Thick)	TPSL		67	>>×	
						Brown to Red Sand and Gravel, Moist					
				1	5			8-12-10 N=22	7	×	
				2	3		SP	13-17-31 N=48	5	×	
915	5			3	6			12-10-45 N=55	8	× >>◎	
						End of Boring at 7.5' Due to Auger Refusal on Possible Cobbles, Boulders, or Bedrock					

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BORING BS-2

DATE STARTED:	3/30/23	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/30/23	**DRILLER:** DT	**LOGGED BY:** AW
COMPLETION DEPTH	20.0 ft	**DRILL RIG:**	Marooka D-50 ATV - Rig #395
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	921 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	
REMARKS:			

Water

While Drilling	Not Obsvd
Upon Completion	Not Obsvd
Delay	N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
920	0					Topsoil, Dark Brown Silty Sand and Clay, Moist (7"± Thick)	TPSL				
				1	14	Brown Lean Clay, Trace Sand and Gravel, Moist	CL	2-5-5 N=10	31		
	5			2	10			8-13-7 N=20	25		
915				3	8	Brown Silty Sand and Gravel, Very Moist	SM	14-4-8 N=12	8		
				4	8	Brown Sand and Gravel, Moist to Damp		7-14-16 N=30	4		
910	10										
				5	8		SP	8-16-15 N=31	4		
905	15										
				6	12			11-11-15 N=26	2		
	20					End of Boring at 20' Cave-In at 6'					

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BORING BS-3

DATE STARTED:	3/30/23	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/30/23	**DRILLER:** DT	**LOGGED BY:** AW
COMPLETION DEPTH	20.0 ft	**DRILL RIG:**	Marooka D-50 ATV - Rig #395
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	924 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	
REMARKS:			

Water

While Drilling	Not Obsvd
Upon Completion	Not Obsvd
Delay	N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					Topsoil, Dark Brown Silty Sand and Trace Gravel, Moist (6"± Thick)	TPSL				
				1	14	Brown Lean Clay, Trace Sand and Gravel, Moist		6-12-18 N=30	25		
920							CL				
	5			2	14			2-4-13 N=17	27		
				3	10	Brown Silty Sand, With Gravel, Very Moist	SM	11-4-8 N=12	9		
915						Brown Silty Sand and Gravel, Moist to Damp					
	10			4	12			8-16-22 N=38	4		
910							SM				
	15			5	8			95/9"	2		
905											
	20			6	6			50/4"	3		
						End of Boring at 20'					
						Cave-In at 6.5'					

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BORING BS-4

DATE STARTED:	3/30/23	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/30/23	**DRILLER:** DT	**LOGGED BY:** AW
COMPLETION DEPTH	15.0 ft	**DRILL RIG:**	Marooka D-50 ATV - Rig #395
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	921 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	
REMARKS:			

Water

While Drilling	Not Obsvd
Upon Completion	Not Obsvd
Delay	N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %
920	0					Topsoil, Dark Brown Silt and Sand With Gravel, Moist (5"± Thick)	TPSL		43
				1	12	Brown Lean Clay, With Trace Sand and Gravel, Moist	CL	4-5-7 N=12	17
				2	8	Brown Silty Sand and Gravel, Moist to Very Moist		4-8-7 N=15	7
915	5			3	14			3-5-6 N=11	8
				4	12		SM	6-6-7 N=13	8
910	10			5	8	Brown Sand and Gravel, Damp	SP	7-12-21 N=33	3
	15					End of Boring at 15' Cave-In at 7'			

STANDARD PENETRATION TEST DATA
N in blows/ft ◎
× Moisture ◪ PL ✚ LL
0 25 50
STRENGTH, tsf
▲ Qu ✳ Qp
0 2.0 4.0

Additional Remarks

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BORING BS-5

DATE STARTED:	3/30/23	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/30/23	**DRILLER:** DT	**LOGGED BY:** AW
COMPLETION DEPTH	15.0 ft	**DRILL RIG:**	Marooka D-50 ATV - Rig #395
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	925 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	
REMARKS:			

Water		
	While Drilling	Not Obsvd
	Upon Completion	Not Obsvd
	Delay	N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					Topsoil, Dark Brown Silty Sand, With Clay, Wet (6"± Thick)	TPSL		112	>> ×	
				1	12	Brown Lean Clay, With Sand and Gravel, Moist	CL	4-4-5 N=9	25	◎ ✳ ×	Q_r = 1.7 tsf
				2	12	Brown Sand and Gravel, Moist to Damp		9-10-11 N=21	7	× ◎	
920	5			3	14			21-21-25 N=46	4	× ◎	
				4	10		SP	49-35-24 N=59	4	× >>◎	
915	10										
				5	12			42-37-29 N=66	4	× >>◎	
910	15					End of Boring at 15'					
						Cave-In at 7'					

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BORING BS-6

DATE STARTED:	3/30/23	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/30/23	**DRILLER:** DT	**LOGGED BY:** AW
COMPLETION DEPTH	15.0 ft	**DRILL RIG:**	Marooka D-50 ATV - Rig #395
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	925 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	
REMARKS:			

Water

While Drilling	Not Obsvd
Upon Completion	Not Obsvd
Delay	N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					Topsoil, Dark Brown Silty Sand, Trace Gravel, Moist (5"± Thick)	TPSL		57	>>×	
						Brown Lean Clay, Trace Gravel and Sand, Moist					
				1	14			5-6-6 N=12	24	◎ × ✳	Q_t = 3.5 tsf
							CL				
				2	10			3-3-3 N=6	23	◎ ✳	Q_t = 2.4 tsf
920	5					Brown Sand and Gravel, Moist					
				3	2			35-27-14 N=41	6	× ◎	
							SP				
				4	6			15-12-11 N=23	6	× ◎	
915	10										
						Brown Lean Clay With Gravel and Sand, Very Moist					
							CL				
				5	8			23-38-21 N=59	27	✳ × >>◎	
910	15					End of Boring at 15'					
						Auger Refusal at 5.5' on Probable Cobbles and/or Boulders					
						Offset 5' South					
						Cave-In at 5.5'					

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GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System (USCS), AASHTO 1988 and ASTM designations D2487 and D-2488 are used to identify the encountered materials unless otherwise noted. Coarse-grained soils are defined as having more than 50% of their dry weight retained on a #200 sieve (0.075mm); they are described as: boulders, cobbles, gravel or sand. Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are defined as silts or clay depending on their Atterberg Limit attributes. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size.

DRILLING AND SAMPLING SYMBOLS

SFA: Solid Flight Auger - typically 4" diameter flights, except where noted.
HSA: Hollow Stem Auger - typically 3¼" or 4¼ I.D. openings, except where noted.
M.R.: Mud Rotary - Uses a rotary head with Bentonite or Polymer Slurry
R.C.: Diamond Bit Core Sampler
H.A.: Hand Auger
P.A.: Power Auger - Handheld motorized auger

SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
ST: Shelby Tube - 3" O.D., except where noted.
RC: Rock Core
TC: Texas Cone
BS: Bulk Sample
PM: Pressuremeter
CPT-U: Cone Penetrometer Testing with Pore-Pressure Readings

SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. Split-Spoon.
N_{60}: A "N" penetration value corrected to an equivalent 60% hammer energy transfer efficiency (ETR)
Q_u: Unconfined compressive strength, TSF
Q_p: Pocket penetrometer value, unconfined compressive strength, TSF
w%: Moisture/water content, %
LL: Liquid Limit, %
PL: Plastic Limit, %
PI: Plasticity Index = (LL-PL),%
DD: Dry unit weight, pcf
▼,▽,▼ Apparent groundwater level at time noted

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Relative Density	N - Blows/foot
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50 - 80
Extremely Dense	80+

ANGULARITY OF COARSE-GRAINED PARTICLES

Description	Criteria
Angular:	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular:	Particles are similar to angular description, but have rounded edges
Subrounded:	Particles have nearly plane sides, but have well-rounded corners and edges
Rounded:	Particles have smoothly curved sides and no edges

GRAIN-SIZE TERMINOLOGY

Component	Size Range
Boulders:	Over 300 mm (>12 in.)
Cobbles:	75 mm to 300 mm (3 in. to 12 in.)
Coarse-Grained Gravel:	19 mm to 75 mm (¾ in. to 3 in.)
Fine-Grained Gravel:	4.75 mm to 19 mm (No.4 to ¾ in.)
Coarse-Grained Sand:	2 mm to 4.75 mm (No.10 to No.4)
Medium-Grained Sand:	0.42 mm to 2 mm (No.40 to No.10)
Fine-Grained Sand:	0.075 mm to 0.42 mm (No. 200 to No.40)
Silt:	0.005 mm to 0.075 mm
Clay:	<0.005 mm

PARTICLE SHAPE

Description	Criteria
Flat:	Particles with width/thickness ratio > 3
Elongated:	Particles with length/width ratio > 3
Flat & Elongated:	Particles meet criteria for both flat and elongated

RELATIVE PROPORTIONS OF FINES

Descriptive Term	% Dry Weight
Trace:	< 5%
With:	5% to 12%
Modifier:	>12%

GENERAL NOTES

(Continued)

CONSISTENCY OF FINE-GRAINED SOILS

Q_U - TSF	N - Blows/foot	Consistency
0 - 0.25	0 - 2	Very Soft
0.25 - 0.50	2 - 4	Soft
0.50 - 1.00	4 - 8	Firm (Medium Stiff)
1.00 - 2.00	8 - 15	Stiff
2.00 - 4.00	15 - 30	Very Stiff
4.00 - 8.00	30 - 50	Hard
8.00+	50+	Very Hard

MOISTURE CONDITION DESCRIPTION

Description	Criteria
Dry:	Absence of moisture, dusty, dry to the touch
Moist:	Damp but no visible water
Wet:	Visible free water, usually soil is below water table

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term	% Dry Weight
Trace:	< 15%
With:	15% to 30%
Modifier:	>30%

STRUCTURE DESCRIPTION

Description	Criteria
Stratified:	Alternating layers of varying material or color with layers at least ¼-inch (6 mm) thick
Laminated:	Alternating layers of varying material or color with layers less than ¼-inch (6 mm) thick
Fissured:	Breaks along definite planes of fracture with little resistance to fracturing
Slickensided:	Fracture planes appear polished or glossy, sometimes striated
Blocky:	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lensed:	Inclusion of small pockets of different soils
Layer:	Inclusion greater than 3 inches thick (75 mm)
Seam:	Inclusion 1/8-inch to 3 inches (3 to 75 mm) thick extending through the sample
Parting:	Inclusion less than 1/8-inch (3 mm) thick

SCALE OF RELATIVE ROCK HARDNESS

Q_U - TSF	Consistency
2.5 - 10	Extremely Soft
10 - 50	Very Soft
50 - 250	Soft
250 - 525	Medium Hard
525 - 1,050	Moderately Hard
1,050 - 2,600	Hard
>2,600	Very Hard

ROCK BEDDING THICKNESSES

Description	Criteria
Very Thick Bedded	Greater than 3-foot (>1.0 m)
Thick Bedded	1-foot to 3-foot (0.3 m to 1.0 m)
Medium Bedded	4-inch to 1-foot (0.1 m to 0.3 m)
Thin Bedded	1¼-inch to 4-inch (30 mm to 100 mm)
Very Thin Bedded	½-inch to 1¼-inch (10 mm to 30 mm)
Thickly Laminated	1/8-inch to ½-inch (3 mm to 10 mm)
Thinly Laminated	1/8-inch or less "paper thin" (<3 mm)

ROCK VOIDS

Voids	Void Diameter
Pit	<6 mm (<0.25 in)
Vug	6 mm to 50 mm (0.25 in to 2 in)
Cavity	50 mm to 600 mm (2 in to 24 in)
Cave	>600 mm (>24 in)

GRAIN-SIZED TERMINOLOGY

(Typically Sedimentary Rock)

Component	Size Range
Very Coarse Grained	>4.76 mm
Coarse Grained	2.0 mm - 4.76 mm
Medium Grained	0.42 mm - 2.0 mm
Fine Grained	0.075 mm - 0.42 mm
Very Fine Grained	<0.075 mm

ROCK QUALITY DESCRIPTION

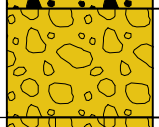
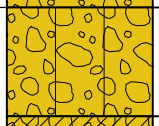
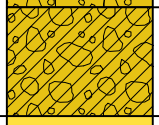
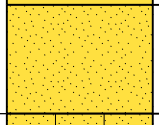
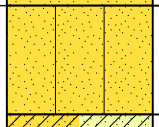
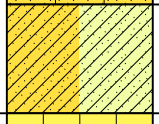
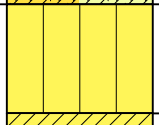
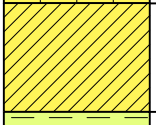
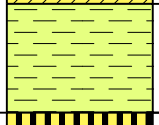
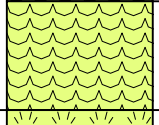
Rock Mass Description	RQD Value
Excellent	90 -100
Good	75 - 90
Fair	50 - 75
Poor	25 -50
Very Poor	Less than 25

DEGREE OF WEATHERING

Slightly Weathered:	Rock generally fresh, joints stained and discoloration extends into rock up to 25 mm (1 in), open joints may contain clay, core rings under hammer impact.
Weathered:	Rock mass is decomposed 50% or less, significant portions of the rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife.
Highly Weathered:	Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife.

SOIL CLASSIFICATION CHART

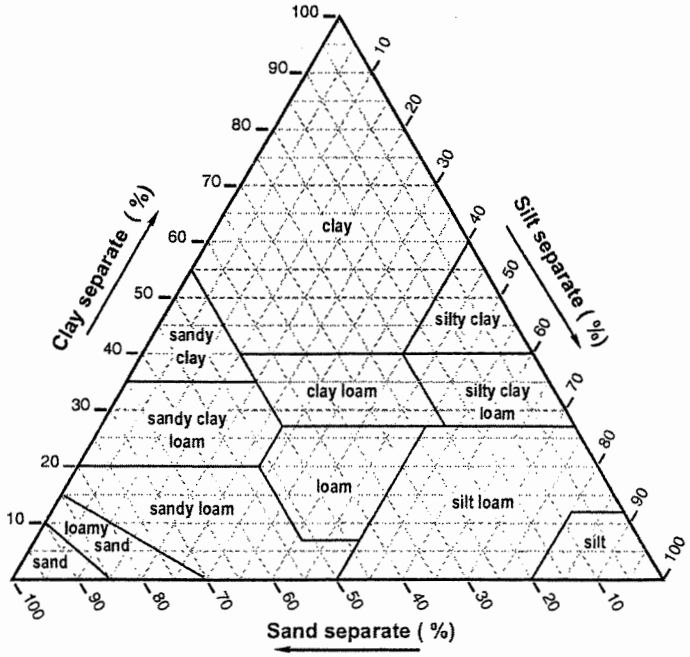
NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

intertek psi

Texture Triangle:

Fine Earth Texture Classes (——)



TEXTURE MODIFIERS - Conventions for using "Rock Fragment Texture Modifiers" and for using textural adjectives that convey the "% volume" ranges for **Rock Fragments - Size and Quantity**.

Fragment Content % By Volume	Rock Fragment Modifier Usage
< 15	No texture adjective is used (noun only; e.g., *loam*).
15 to < 35	Use adjective for appropriate size; e.g., *gravelly*.
35 to < 60	Use "very" with the appropriate size adjective; e.g., *very gravelly*.
60 to < 90	Use "extremely" with the appropriate size adjective; e.g., *extremely gravelly*.
≥ 90	No adjective or modifier. If ≤ 10% fine earth, use the appropriate noun for the dominant size class; e.g., *gravel*. Use **Terms in Lieu of Texture**.

(SOIL) TEXTURE

This is the numerical proportion (percent by weight) of sand, silt, and clay in a soil. Sand, silt, and clay content is estimated in the field by hand (or quantitatively measured in the office/lab by hydrometer or pipette) and then placed within the texture triangle to determine **Texture Class**. Estimate the **Texture Class**; e.g., *sandy loam*; or **Subclass**; e.g., *fine sandy loam* of the fine earth (≤ 2 mm) fraction, or choose a **Term in Lieu of Texture**; e.g., *gravel*. If appropriate, use a **Textural Class Modifier**; e.g., *gravelly silt loam*.

NOTE: **Soil Texture** encompasses only the fine earth fraction (≤ 2 mm). **Particle Size Distribution** (PSD) encompasses the whole soil, including both the fine earth fraction (≤ 2 mm; weight %) and rock fragments (> 2 mm; volume %).

TEXTURE CLASS

Texture Class or Subclass	Code	
	Conv.	NASIS
Coarse Sand	cos	COS
Sand	s	S
Fine Sand	fs	FS
Very Fine Sand	vfs	VFS
Loamy Coarse Sand	lcos	LCOS
Loamy Sand	ls	LS
Loamy Fine Sand	lfs	LFS
Loamy Very Fine Sand	lvfs	LVFS
Coarse Sandy Loam	cosl	COSL
Sandy Loam	sl	SL
Fine Sandy Loam	fsl	FSL
Very Fine Sandy Loam	vfsl	VFSL
Loam	l	L
Silt Loam	sil	SIL
Silt	si	SI
Sandy Clay Loam	scl	SCL
Clay Loam	cl	CL
Silty Clay Loam	sicl	SICL
Sandy Clay	sc	SC
Silty Clay	sic	SIC
Clay	c	C

TEXTURE MODIFIERS - *(adjectives)*

ROCK FRAGMENTS: Size & Quantity [1]	Code		Criteria: Percent (By Volume) of Total Rock Fragments and Dominated By (*name size*): [1]
	Conv.	PDP/ NASIS	
ROCK FRAGMENTS (> 2 mm; ≥ Strongly Cemented)			
Gravelly	GR	GR	≥ 15% but < 35% gravel
Fine Gravelly	FGR	GRF	≥15% but < 35% fine gravel
Medium Gravelly	MGR	GRM	≥15% but < 35% med. gravel
Coarse Gravelly	CGR	GRC	≥ 15% but < 35% coarse gravel
Very Gravelly	VGR	GRV	≥ 35% but < 60% gravel
Extremely Gravelly	XGR	GRX	≥ 60% but < 90% gravel
Cobbly	CB	CB	≥ 15% but < 35% cobbles
Very Cobbly	VCB	CBV	≥ 35% but < 60% cobbles
Extremely Cobbly	XCB	CBX	≥ 60% but < 90% cobbles
Stony	ST	ST	≥ 15% but < 35% stones
Very Stony	VST	STV	≥ 35% but < 60% stones
Extremely Stony	XST	STX	≥ 60% but < 90% stones
Bouldery	BY	BY	≥ 15% but < 35% boulders
Very Bouldery	VBY	BYV	≥ 35% but < 60% boulders
Extremely Bouldery	XBY	BYX	≥ 60% but < 90% boulders
Channery	CN	CN	≥ 15% but < 35% channers
Very Channery	VCN	CNV	≥ 35% but < 60% channers
Extremely Channery	XCN	CNX	≥ 60% but < 90% channers
Flaggy	FL	FL	≥ 15% but < 35% flagstones
Very Flaggy	VFL	FLV	≥ 35% but < 60% flagstones
Extremely Flaggy	XFL	FLX	≥ 60% but < 90% flagstones
PARAROCK FRAGMENTS (> 2 mm; < Strongly Cemented) [2, 3]			
Parabouldery	PBY	PBY	(same criteria as bouldery)
Very Parabouldery	VPBY	PBYV	(same criteria as very bouldery)
Extr. Parabouldery	XPBY	PBYX	(same criteria as ext. bouldery)
etc.	etc.	etc.	(same criteria as non-para)

[1] The "Quantity" modifier (e.g., *very*) is based on the total rock fragment content. The "Size" modifier (e.g., *cobbly*) is independently based on the largest, dominant fragment size. For a mixture of sizes (e.g., *gravel and stones*), a smaller size–class is named only if its quantity (%) sufficiently exceeds that of a larger size–class. For field texture determination, a smaller size-class must exceed 2 times the quantity (vol. %) of a larger size class before it is named (e.g., 30% gravel and 14% stones = *very gravelly*, but 20% gravel and 14% stones = *stony*). For more explicit naming criteria see NSSH-Part 618, Exhibit 618.11(Soil Survey Staff, 2001b).

Wis. Dept. of Safety and Professional Services
Division of Industry Services

SOIL EVALUATION - STORM

In accordance with SPS 382.365 & 385, Wis. Adm. Code and WDNR Standard 1002

Attach complete site plan on paper not less that 8 1/2 x 11 inches in size. Plan must include, but not limited to: vertical and horizontal reference point (BM), direction and percent slope, scale or dimensions, north arrow, and BM referenced to nearest road.

Please print all information.

Personal information you provide may be used for secondary purposes [Privacy Law, s. 15.04 (1) (m)].

County: Dane

Parcel I.D.:

Reviewed by:

Date:

Property Owner	Property Location: William's Bay, WI Govt. Lot

Property Owner's Mailing Address	Lot #	Block #	Subd. Name or CSM#

City	State	Zip Code	Phone Number	☐ City ☒ Village ☐ Town	Nearest Road
William's Bay	WI			William's Bay	Constance BLVD.

Drainage area _____ ☐ sq. ft. ☐ acres

Optional:

Test Site Suitable for (check all that apply)

☐ Irrigation ☐ Bioretention trench ☐ Trench(es)

☐ Rain Garden ☐ Grassed swale ☐ Reuse

☐ Infiltration trench ☐ SDS (> 15' wide) ☐ Other _____

Hydraulic Application Test Method:

☒ Morphological Evaluation

☐ Double Ring Infiltrometer

☐ Other (specify)

Soil Moisture

Date of Borings: March 30, 2023

USDA-NRCS WETS Value: 14

☐ **Dry =1;**

☒ **Normal = 2;**

☐ **Wet = 3.**

1 Obs. # ☒ Boring ☐ Pit BC-1

Ground surface elevation ± 930 Elevation of limiting factor:

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	% Fines	Hydraulic App. Rate Inches/Hr.
1	0-5	10YR 4/3		sil	0 cr	mfr		<15		0.13
2	5-60	10YR 4/4		sicl	1 f abk	mfi		<15		0.04
3	60-108	10YR 3/4		s	0 m	mfr		<15		3.6
4	108-132	10YR 5/4		ls	0 m	mfr		>15		1.63
5	132-180	10YR 3/3		s	0 m	mfr		<15		3.6

2 Obs. # ☒ Boring ☐ Pit BC-2

Ground surface elevation ± 923 Elevation of limiting factor: 1

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	% Fines	Hydraulic App. Rate Inches/Hr.
1	0-7	10YR 2/2		sil	0 cr	mfr		<15		0.13
2	7-84	10YR 5/4		sicl	1 f abk	mfi		<15		0.04
3	84-108	10YR 1/1		s	0 m	mfr		<15		3.6
4	108-180	10YR 5/4		s	0 m	mfr		>15		3.6

CST/PSS Name (Please Print)	Signature	CST/PSS/Geologist Number
Patrick J. Patterson		G-229
Address	**Date Evaluation Conducted**	**Telephone Number**
821 Corporate Court, Waukesha, WI 53189	4/1/2023	262 521 2125

3 Obs. # ☒ Boring ☐ Pit BC-3 Ground surface elevation ± 924 Elevation of limiting factor:

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	% Fines	Hydraulic App. Rate Inches/Hr.
1	0-8	10YR 2/2		sil	0 cr	mfr		<15		0.13
2	8-36	10YR 5/4		sicl	1 f abk	mfi		<15		0.04
3	36-84	10YR 6/4		s	0 m	mfr		<15		0.5
4	84-156	10YR 4/4		sil	0 m	mfr		>15		0.13
5	156-228	10YR 5/4		ls	0 m	mfr		<15		1.63

4 Obs. # ☒ Boring ☐ Pit BC-4 Ground surface elevation ± 926 Elevation of limiting factor:

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	% Fines	Hydraulic App. Rate Inches/Hr.
1	0-3	10YR 2/2		sil	0 cr	mfr		<15		0.13
2	3-84	10YR 4/4		sicl	1 f abk	mfi		<15		0.04
3	84-180	10YR 5/4		grs	0 m	mfr		<15		3.6

5 Obs. # ☒ Boring ☐ Pit BC-5 Ground surface elevation ± 929 Elevation of limiting factor

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	% Fines	Hydraulic App. Rate Inches/Hr.
1	0-5	10YR 3/2		sil	0 cr	mfr		<15		0.13
2	5-60	10YR 4/4		sicl	1 f abk	mfi		<15		0.04
3	60-84	10YR 4/5		s	0 m	mfr		<15		0.5
4	84-132	10YR 5/8		ls	0 m	mfr		<15		1.63
5	132-180	10YR 5/4		s	0 m	mfr		<15		0.5

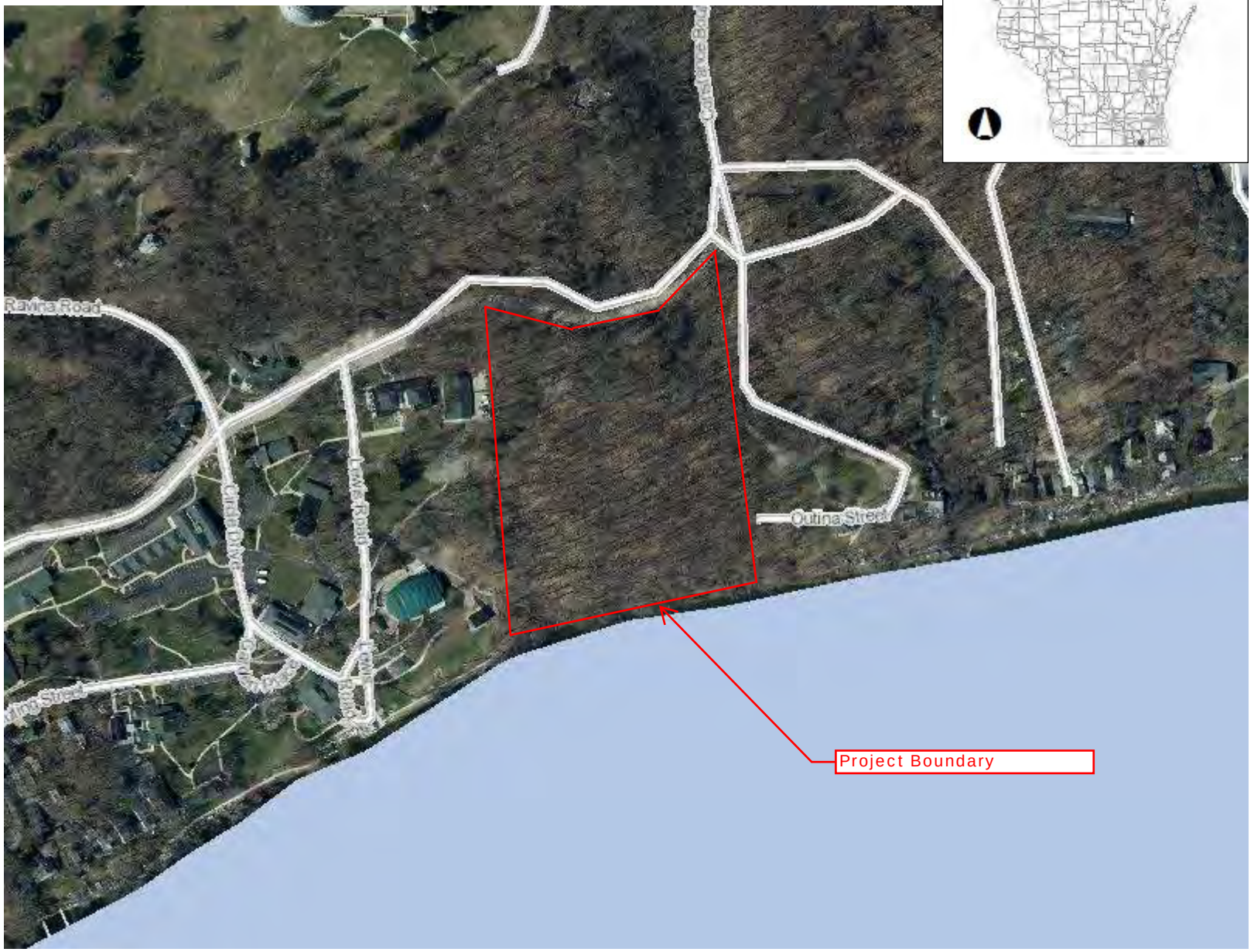
Comments:

6 Obs. # ☒ Boring ☐ Pit BC-6 Ground surface elevation ± 921 Elevation of limiting factor

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	% Fines	Hydraulic App. Rate Inches/Hr.
1	0-6	10YR 3/2		sil	0 cr	mfr		<15		0.13
2	6-60	10YR 4/4		sicl	1 f abk	mfi		<15		0.04
3	60-108	10YR 4/5		s	0 m	mfr		<15		0.5
4	108-132	10YR 6/6		ls	0 m	mfr		<15		1.63
5	132-180	10YR 6/6		s	0 m	mfr		<15		0.5

APPENDIX B: WDNR Wetland Indicator Soil Map

Surface Water Data Viewer Map



Legend

- Wetland Indicators
- Wetland Class Areas
- Wetland Class Points
  - Dammed pond
  - Excavated pond
  - Filled/drained wetland
  - Wetland too small to delineate
  - Filled excavated pond
- Filled Points
- Wetland Class Areas
- Filled Areas
- Wetland Class Areas
- Wetland Class Points
  - Dammed pond
  - Excavated pond
  - Filled/drained wetland
  - Wetland too small to delineate
  - Filled excavated pond
- Filled Points
- Wetland Class Areas
- Filled Areas
- Wetland Identifications and Confirmations
- NRCS Wetspots
- Municipality
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads

Notes

0.1 0 0.06 0.1 Miles

NAD_1983_HARN_Wisconsin_TM

1: 3,960

APPENDIX C: Storm Sewer Sizing Rational Method Worksheet

Area Method Worksheet for Storm Sewer Design

Women's Leadership Center

Last Updated: 8/3/2023

			Structures		Design Information								Pipe Information			
Length	Upstream Elevation	Downstream Elevation	Upstream Structure	Downstream Structure	Drainage Area	Design Storm	Roof Area	Pavement Area	Lawn Area	Direct Runoff	Other Runoff	Design Runoff	Storm Sewer Size	Storm Sewer Material	Slope of Storm Sewer (ft/ft)	Pipe Capacity Flowing Full
ft					Acres	Yr	Acres	Acres	Acres	GPM	GPM	GPM	in.		ft/ft	GPM
5.5	923.63	923.47	ROOF DRAIN	MH 3	0.200	10	0.200	0.000	0.000	335.08	0.00	335.08	6	PVC	0.0300	515.48
72.7	923.47	921.29	MH 3	INLET 1	0.145	10	0.000	0.008	0.137	68.10	335.08	403.18	8	PVC	0.0300	1110.14
59.6	921.29	919.50	INLET 1	MH 1	0.296	10	0.000	0.195	0.101	303.66	403.18	706.84	8	PVC	0.0300	1110.14
16.9	920.86	920.19	INLET 2	INLET 3	0.159	10	0.000	0.058	0.101	120.04	0.00	120.04	8	PVC	0.0400	1281.88
48.1	920.19	918.26	INLET 3	INLET 4	0.078	10	0.000	0.046	0.032	75.06	120.04	195.10	8	PVC	0.0400	1281.88
34.1	918.26	916.90	INLET 4	MH 1	0.058	10	0.013	0.024	0.021	62.74	195.10	257.84	8	PVC	0.0400	1281.88
27.5	916.90	915.25	MH 1	ADS SYSTEM	0.075	10	0.000	0.046	0.029	73.67	964.69	1038.35	8	PVC	0.0600	1569.98
58.5	922.90	922.50	INLET 5	END SECTION 1	0.180	10	0.000	0.121	0.059	186.89	0.00	186.89	8	PVC	0.0068	528.53
7.7	915.25	915.22	ADS SYSTEM	MH 2						875.00	0.00	875.00	12	HDPE	0.0032	1068.98
47.6	915.22	915.01	MH 2	MH 4						0.00	1085.95	1085.95	12	HDPE	0.0046	1281.66
101.4	915.01	914.60	MH 4	END SECTION 2							1085.95	1085.95	12	HDPE	0.0040	1195.16
54.2	925.00	924.75	BIOFILTER A OUTFALL	END SECTION 4									8	PVC	0.0046	434.71
36.7	922.41	922.00	BIOFILTER B OUTFALL	END SECTION 6									12	HDPE	0.0112	1999.88
36.9	919.91	919.00	BIOFILTER D OUTFALL	MH 4						210.95	0.00	210.95	6	PVC	0.0247	467.73
82.2	928.93	924.00	EXISTING CULVERT	END SECTION 8									17" X 23"	BOX RCP	0.0600	

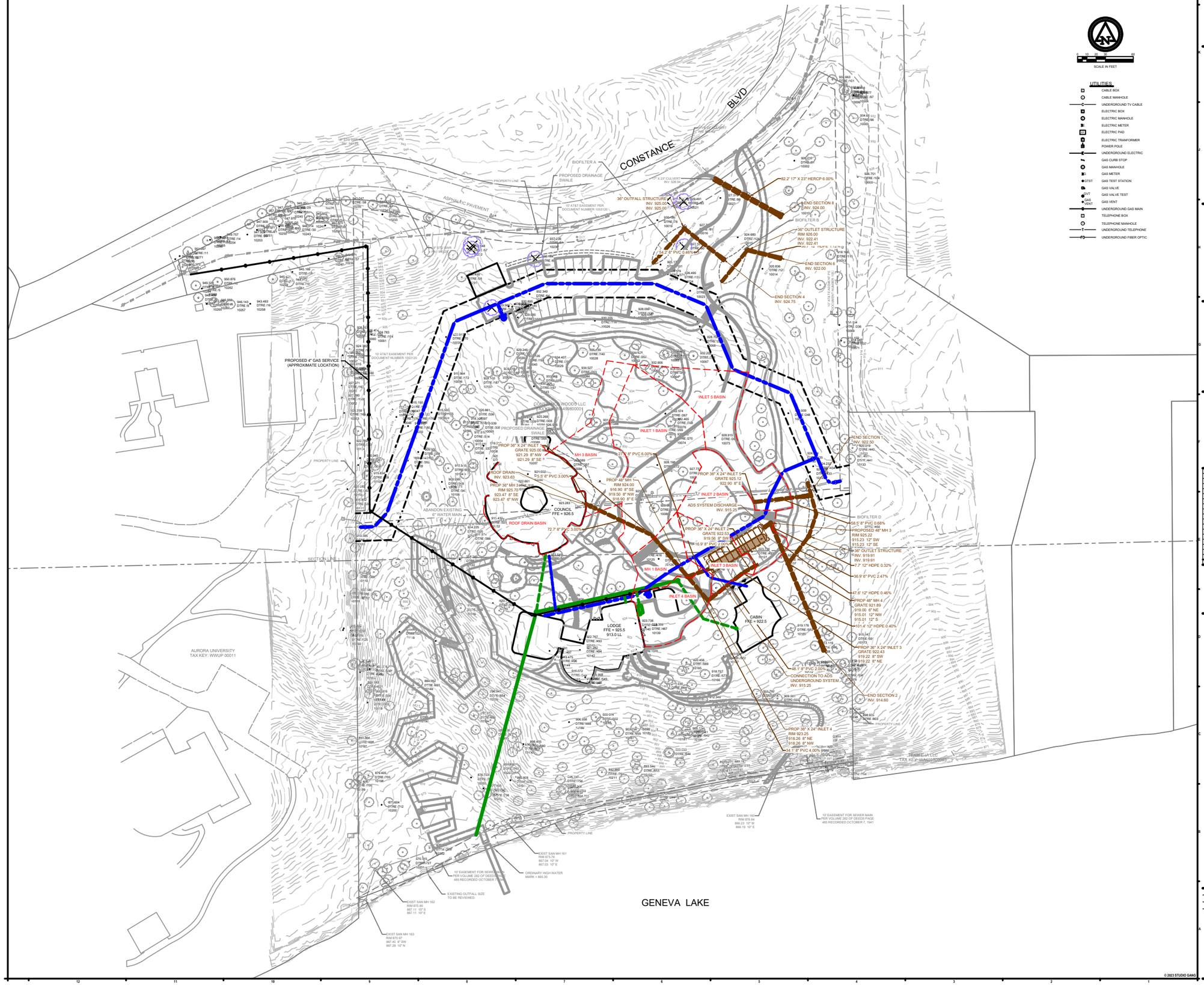
Assumptions:

1) Peak flow of stormwater was calculated using the 'Area method' as described in **SPS 382.36(5)(a)1**.

2) When calculating stormwater peak flow, the drainage area to each pipe run was divided by the described divisors in **SPS 382.36(5)(a)1.** For roofs the divisor is 26 sf/gpm. For paved or graveled ground surfaces the divisor is 32.5 sf/gpm. For lawns, parks, and similar land surfaces the divisor is 104 sf/gpm.

5) Pipe Capacity flowing flow was calculated using Manning's Equation

6) Manning's n-value = 0.011 for PVC and HDPE pipe



SCALE IN FEET

UTILITIES

- CABLE BOX
- CABLE MANHOLE
- UNDERGROUND TV CABLE
- ELECTRIC BOX
- ELECTRIC MANHOLE
- ELECTRIC METER
- ELECTRIC PAD
- ELECTRIC TRANFORMER
- POWER POLE
- UNDERGROUND ELECTRIC
- GAS CURB STOP
- GAS MANHOLE
- GAS METER
- GTST GAS TEST STATION
- GAS VALVE
- GVT GAS VALVE TEST
- GAS VENT
- UNDERGROUND GAS MAIN
- TELEPHONE BOX
- TELEPHONE MANHOLE
- UNDERGROUND TELEPHONE
- UNDERGROUND FIBER OPTIC

GENERAL NOTES

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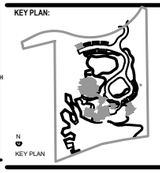
KEY PLAN:



KEY PLAN

SEAL:

NOT FOR CONSTRUCTION

NO.	DESIGN DESCRIPTION	DATE
1	DESIGN DEVELOPMENT	9/8/2023

ARCHITECT:

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PROJECT NO. :
DRAWN: GDD DATE: 9/8/2023
CHECKED: VVR SCALE:

SHEET TITLE:

PROPOSED SUBSURFACE UTILITY PLAN

DRAWING NUMBER:

C-700

APPENDIX D: Soil Loss Calculations

Soil Loss & Sediment Discharge Calculation Tool

for use on Construction Sites in the State of Wisconsin

WDNR Version 2.0 (06-29-2017)

WISCONSIN DEPT. OF NATURAL RESOURCES

YEAR 1

Developer:

Project: Women's Leadership Center

Date: 08/03/23

County: Walworth

Version 1.0

Activity (1)	Begin Date (2)	End Date (3)	Period % R (4)	Annual R Factor (5)	Sub Soil Texture (6)	Soil Erodibility K Factor (7)	Slope (%) (8)	Slope Length (ft) (9)	LS Factor (10)	Land Cover C Factor (11)	Soil loss A (tons/acre) (12)	SDF (13)	Sediment Control Practice (14)	Sediment Discharge (t/ac) (15)
Bare Ground	04/15/24	05/15/24	8.2%	140	Silt Loam	0.43	19.5%	10	1.28	1.00	6.3	0.483	Sediment Basin	0.6
Mulch or Erosion Mat	05/15/24	04/14/25	91.6%	140	Silt Loam	0.43	19.5%	10	1.28	0.20	14.1	0.483	Sediment Basin	1.4
End	04/14/25	-----	-----	-----	-------	-----	19.5%	10	1.28	------	-----	0.000		0.0
		-----	-----	-----	-------	-----	19.5%	10	1.28	-----	-----	0.000		0.0
		-----	-----	-----	-------	-----	19.5%	0	-----	-----	-----	0.000		0.0
		-----	-----	-----	-------	-----	0.0%	0	-----	-----	-----	0.000		0.0
										TOTAL	20.4		TOTAL	2.0
													% Reduction Required	NONE

Notes:

See Help Page for further descriptions of variables and items in drop-down boxes.
The last land disturbing activity on each sheet must be 'End'. This is either 12 months from the start of construction or final stabilization.
For periods of construction that exceed 12 months, please demonstrate that 5 tons/acre/year is not exceeded in any given 12 month period.

NOTE: THIS TOOL ONLY ADDRESSED SOIL EROSION DUE TO SHEET FLOW. MEASURES TO CONTROL CHANNEL EROSION MAY ALSO BE REQUIRED TO MEET SEDIMENT DISCHARGE REQUIREMENTS.

Recommended Permanent Seeding Dates:

4/1-5/15	and	8/7-8/29	Turf, introduced grasses and legumes
Thaw-6/30			Native Grasses, forbs, and legumes

Designed By:	VVR
Date	8/3/2023

Soil Loss & Sediment Discharge Calculation Tool

for use on Construction Sites in the State of Wisconsin

WDNR Version 2.0 (06-29-2017)

WISCONSIN DEPT. OF NATURAL RESOURCES

YEAR 2

Developer:

Project: Women's Leadership Center

Date: 8/3/2023

County: Walworth

Version 1.0

Activity (1)	Begin Date (2)	End Date (3)	Period % R (4)	Annual R Factor (5)	Sub Soil Texture (6)	Soil Erodibility K Factor (7)	Slope (%) (8)	Slope Length (ft) (9)	LS Factor (10)	Land Cover C Factor (11)	Soil loss A (tons/acre) (12)	SDF (13)	Sediment Control Practice (14)	Sediment Discharge (t/ac) (15)
Mulch or Erosion Mat	04/14/25	06/30/25	33.0%	140	Silt Loam	0.43	19.5%	10	1.28	0.20	5.1	0.483	Sediment Basin	0.5
End	06/30/25	-----	-----	-----	-------	-----	19.5%	10	1.28	------	-----	0.000		0.0
		-----	-----	-----	-------	-----	19.5%	10	1.28	-----	-----	0.000		0.0
		-----	-----	-----	-------	-----	19.5%	10	1.28	-----	-----	0.000		0.0
		-----	-----	-----	-------	-----	19.5%	0	-----	-----	-----	0.000		0.0
		-----	-----	-----	-------	-----	0.0%	0	-----	-----	-----	0.000		0.0
										TOTAL	**5.1**		**TOTAL**	**0.5**
													% Reduction Required	**NONE**

Notes:

See Help Page for further descriptions of variables and items in drop-down boxes.
The last land disturbing activity on each sheet must be 'End'. This is either 12 months from the start of construction or final stabilization.
For periods of construction that exceed 12 months, please demonstrate that 5 tons/acre/year is not exceeded in any given 12 month period.

NOTE: THIS TOOL ONLY ADDRESSED SOIL EROSION DUE TO SHEET FLOW. MEASURES TO CONTROL CHANNEL EROSION MAY ALSO BE REQUIRED TO MEET SEDIMENT DISCHARGE REQUIREMENTS.

Recommended Permanent Seeding Dates:

4/1-5/15	and	8/7-8/29	Turf, introduced grasses and legumes
Thaw-6/30			Native Grasses, forbs, and legumes

Designed By:	VVR
Date	8/3/2023

EROSION CONTROL

- PROPOSED INLET PROTECTION TYPE B
- PROPOSED SILT FENCE
- PROPOSED RIP RAP
- PROPOSED TRACKING PAD

NOTES:

1. TOTAL CSM COMBINED SITE AREA: 8.21 ACRES.
2. ESTIMATED AREA OF DISTURBANCE: 3.32 ACRES.
3. 100% OF PROJECT AREA IS IDENTIFIED AS MIAMI LOAM PER NATIONAL RESOURCES CONSERVATION SERVICE WEB SOIL SURVEY.
4. MAINTAIN EXISTING VEGETATION IN STREET RIGHT OF WAY.
5. THE SWALES SHALL BE STABILIZED WITHIN 14 DAYS OF BEING GRADED.
6. INSPECT ALL BMPS WITHIN TWENTY-FOUR (24) HOURS AFTER EACH RAIN OF 0.5 INCHES OR MORE AND AT LEAST ONCE A WEEK. MAKE NEEDED REPAIRS, INSTALL ADDITIONAL BMPS AS NECESSARY, AND DOCUMENT THE FINDINGS OF THE INSPECTION ON AN EROSION CONTROL LOG KEPT ON SITE WITH THE DATE OF INSPECTION, THE NAME OF THE PERSON CONDUCTING THE INSPECTION, A DESCRIPTION OF THE REPAIR NEEDED, AND DOCUMENTATION OF THE COMPLETED REPAIRS.

CONSTRUCTION SEQUENCE:

1. INSTALL AND MAINTAIN EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO ANY LAND DISTURBING ACTIVITIES, AS SHOWN ON DRAWINGS AND DIRECTED BY ENGINEER.
2. CLEAR AND GRUB VEGETATION AS SHOWN ON DRAWINGS OR AS DIRECTED BY ENGINEER.
3. STRIP TOPSOIL AND STOCKPILE IN LOCATION AS SHOWN ON DRAWINGS AND AS DIRECTED BY OWNER. INSTALL PERIMETER SILT FENCE AROUND DOWN SLOPE SIDE OF STOCKPILE. STABILIZE STOCKPILE IMMEDIATELY UPON LAYUP.
4. INSTALL, ADJUST AND MAINTAIN ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES NECESSARY FOR EACH ACTIVE STAGE. MAINTAIN MEASURES AT THE END OF EACH DAY.
5. STAGE CONSTRUCTION BY WORK LOCATION. SUBSEQUENT STEPS MAY BE COMPLETED IN ALTERNATE SEQUENCE DEPENDING UPON CONTRACTOR OPERATIONS.
6. COMPLETE ROUGH GRADING.
7. INSTALL UNDERGROUND SANITARY SEWER, WATER DISTRIBUTION, AND STORM SEWER UTILITIES.
8. INSTALL STRUCTURE.
9. PREPARE PAVEMENT SUBGRADE.
10. INSTALL NEW PAVEMENT AND BASE LAYERS.
11. INSTALL PAVEMENT MARKINGS.
12. INSTALL LAWN LANDSCAPING.
13. AREAS PLANNED TO BE INACTIVE FOR 7 DAYS OR LONGER SHALL BE TEMPORARILY STABILIZED FOLLOWING DNR TECHNICAL STANDARD 1059 SEEDING. THESE AREAS SHALL BE STABILIZED WITHIN 7 DAYS OF BEING INACTIVE.
14. AREAS BROUGHT TO FINAL GRADE SHALL BE PERMANENTLY STABILIZED WITHIN 7 DAYS.
15. COMPLETE FINAL RESTORATIONS INCLUDING BUT NOT LIMITED TO: TOPSOIL, TURF GRASS SEED, AND CLASS I TYPE B URBAN EROSION MATTING FOR ALL LAWN RESTORATION AND TOPSOIL, TURF GRASS SEED, AND CLASS II TYPE B EROSION MATTING FOR THE DRAINAGE SWALES AND SLOPES OF 4:1 OR MORE.
16. REMOVE TEMPORARY EROSION CONTROL DEVICES AFTER 80% GROWTH DENSITY HAS OCCURRED IN 100% OF RESTORATION AREAS. CONTRACTOR SHALL OBTAIN OWNER AND ENGINEER APPROVAL PRIOR TO REMOVING THE MEASURE(S). RESTORE DISTURBED AREAS AROUND REMOVED DEVICES AND CLEAN SITE.

WOMEN'S LEADERSHIP CENTER

259 Constance Blvd
Williams Bay, WI 53191

GENERAL NOTES

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KEY PLAN:

SEAL:

WISCONSIN VIOLET V. RAZO 41691 (ELWALKER) WI PROFESSIONAL ENGINEER
6/1/23

NOT FOR CONSTRUCTION

NO.	ISSUED FOR	DATE
1	VILLAGE ZONING	8/4/2023

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PROJECT NO. :
DRAWN: GGD DATE: 08/04/2023
CHECKED: VVR SCALE:

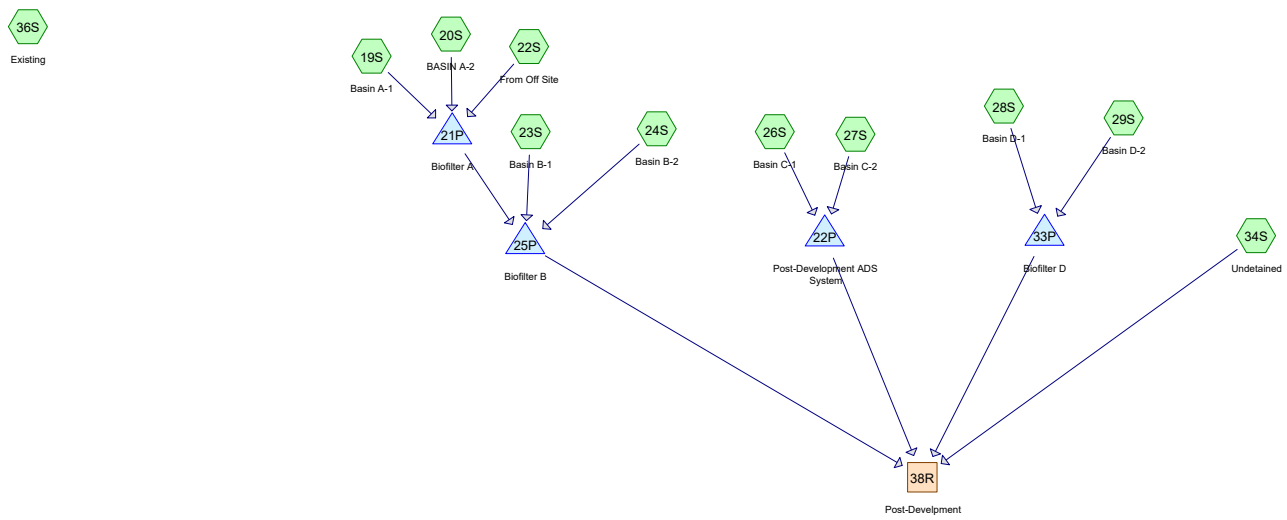
SHEET TITLE:

GRADING & EROSION CONTROL PLAN

DRAWING NUMBER:

C-500

APPENDIX E: Storm Water Quantity – Hydrograph Calculations



Subcat Reach Pond Link

Routing Diagram for Womens Leadership Hydrology
Prepared by Ruekert & Mielke, Inc, Printed 9/11/2023

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	MSE 24-hr	3	Default	24.00	1	2.82	2
2	10-yr	MSE 24-hr	3	Default	24.00	1	4.02	2
3	100-yr	MSE 24-hr	3	Default	24.00	1	6.30	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.110	65	Natural Paths (34S)
1.065	98	Pave (19S, 23S, 26S, 28S, 34S)
0.136	98	Pond Surface (19S, 23S, 28S)
0.416	98	Roof (26S, 34S)
0.056	65	Undistrubed Woodland (29S)
0.607	65	Undisturbed Woodland (20S, 22S, 24S, 27S)
4.524	65	Woodland (19S, 23S, 26S, 28S, 34S, 36S)
6.914	**73**	**TOTAL AREA**

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	21P	926.00	925.75	54.2	0.0046	0.011	0.0	8.0	0.0	
2	22P	915.25	914.75	156.7	0.0032	0.011	0.0	12.0	0.0	
3	25P	923.97	923.56	36.7	0.0112	0.011	0.0	12.0	0.0	
4	33P	921.47	920.56	36.9	0.0247	0.011	0.0	6.0	0.0	

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment19S: Basin A-1 Runoff Area=0.521 ac 59.88% Impervious Runoff Depth=1.44"
Tc=5.0 min CN=85 Runoff=1.47 cfs 0.062 af

Subcatchment20S: BASIN A-2 Runoff Area=0.047 ac 0.00% Impervious Runoff Depth=0.43"
Tc=5.0 min CN=65 Runoff=0.03 cfs 0.002 af

Subcatchment22S: From Off Site Runoff Area=0.261 ac 0.00% Impervious Runoff Depth=0.43"
Tc=5.0 min CN=65 Runoff=0.18 cfs 0.009 af

Subcatchment23S: Basin B-1 Runoff Area=0.382 ac 66.75% Impervious Runoff Depth=1.58"
Tc=5.0 min CN=87 Runoff=1.17 cfs 0.050 af

Subcatchment24S: Basin B-2 Runoff Area=0.020 ac 0.00% Impervious Runoff Depth=0.43"
Tc=5.0 min CN=65 Runoff=0.01 cfs 0.001 af

Subcatchment26S: Basin C-1 Runoff Area=0.590 ac 83.22% Impervious Runoff Depth=1.99"
Tc=5.0 min CN=92 Runoff=2.19 cfs 0.098 af

Subcatchment27S: Basin C-2 Runoff Area=0.279 ac 0.00% Impervious Runoff Depth=0.43"
Tc=5.0 min CN=65 Runoff=0.19 cfs 0.010 af

Subcatchment28S: Basin D-1 Runoff Area=0.205 ac 85.85% Impervious Runoff Depth=2.08"
Tc=5.0 min CN=93 Runoff=0.79 cfs 0.036 af

Subcatchment29S: Basin D-2 Runoff Area=0.056 ac 0.00% Impervious Runoff Depth=0.43"
Tc=5.0 min CN=65 Runoff=0.04 cfs 0.002 af

Subcatchment34S: Undetained Runoff Area=1.093 ac 35.04% Impervious Runoff Depth=0.95"
Tc=5.0 min CN=77 Runoff=2.02 cfs 0.086 af

Subcatchment36S: Existing Runoff Area=3.460 ac 0.00% Impervious Runoff Depth=0.43"
Tc=5.0 min CN=65 Runoff=2.39 cfs 0.123 af

Reach 38R: Post-Develpment Inflow=3.00 cfs 0.293 af
Outflow=3.00 cfs 0.293 af

Pond 21P: Biofilter A Peak Elev=927.23' Storage=0.026 af Inflow=1.67 cfs 0.073 af
Discarded=0.01 cfs 0.014 af Primary=0.43 cfs 0.059 af Outflow=0.44 cfs 0.073 af

Pond 22P: Post-DevelopmentADS System Peak Elev=916.99' Storage=1,508 cf Inflow=2.38 cfs 0.108 af
Discarded=0.02 cfs 0.019 af Primary=0.53 cfs 0.089 af Outflow=0.54 cfs 0.108 af

Pond 25P: Biofilter B Peak Elev=925.27' Storage=0.032 af Inflow=1.54 cfs 0.110 af
Discarded=0.01 cfs 0.016 af Primary=0.45 cfs 0.094 af Outflow=0.46 cfs 0.110 af

Pond 33P: Biofilter D Peak Elev=922.06' Storage=0.014 af Inflow=0.82 cfs 0.038 af
Discarded=0.01 cfs 0.013 af Primary=0.27 cfs 0.024 af Outflow=0.28 cfs 0.038 af

Total Runoff Area = 6.914 ac Runoff Volume = 0.479 af Average Runoff Depth = 0.83"
76.61% Pervious = 5.297 ac 23.39% Impervious = 1.617 ac

Summary for Subcatchment 19S: Basin A-1

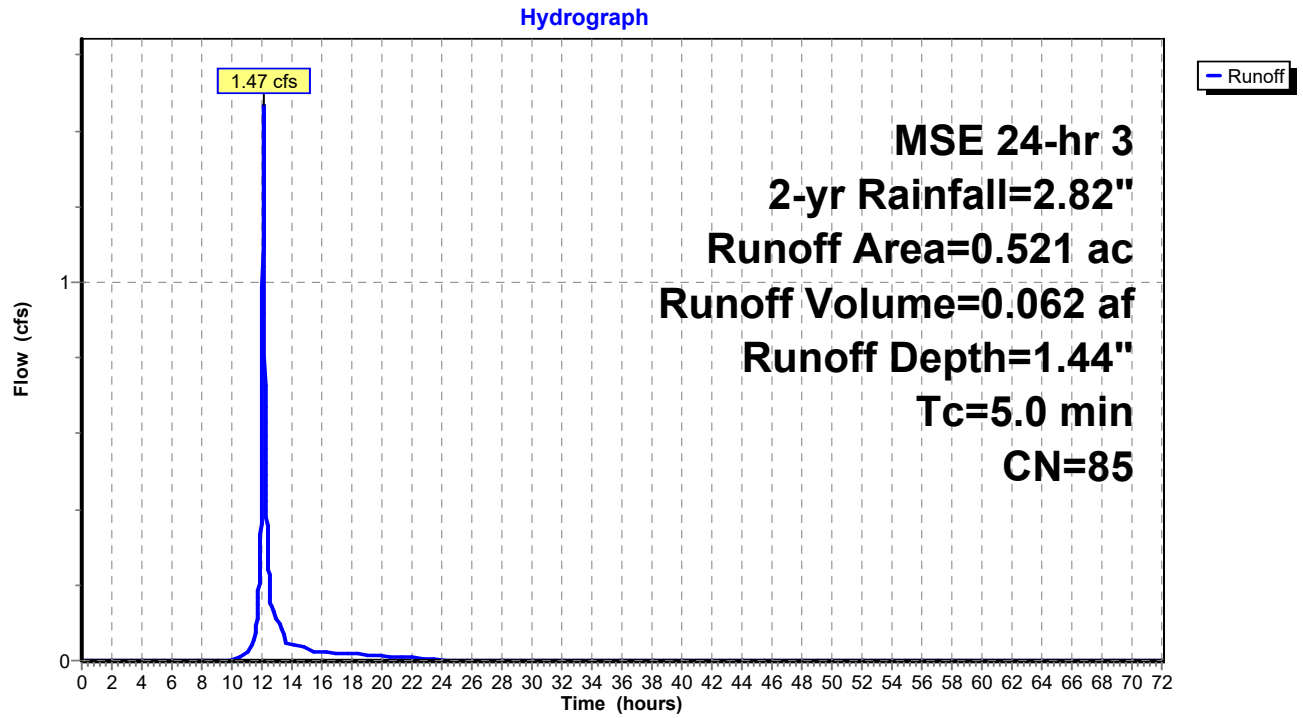
Runoff = 1.47 cfs @ 12.13 hrs, Volume= 0.062 af, Depth= 1.44"
Routed to Pond 21P : Biofilter A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.82"

	Area (ac)	CN	Description
*	0.265	98	Pave
*	0.209	65	Woodland
*	0.047	98	Pond Surface
	0.521	85	Weighted Average
	0.209		40.12% Pervious Area
	0.312		59.88% Impervious Area

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

Subcatchment 19S: Basin A-1



Hydrograph for Subcatchment 19S: Basin A-1

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	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.11	0.00	0.00
6.00	0.14	0.00	0.00
7.00	0.19	0.00	0.00
8.00	0.24	0.00	0.00
9.00	0.29	0.00	0.00
10.00	0.39	0.00	0.00
11.00	0.54	0.02	0.02
12.00	1.31	0.33	**0.62**
13.00	2.28	1.00	**0.11**
14.00	2.43	1.12	0.04
15.00	2.53	1.20	0.04
16.00	2.58	1.25	0.02
17.00	2.63	1.29	0.02
18.00	2.68	1.32	0.02
19.00	2.71	1.35	0.02
20.00	2.75	1.38	0.01
21.00	2.77	1.40	0.01
22.00	2.79	1.42	0.01
23.00	2.81	1.43	0.01
24.00	**2.82**	**1.44**	0.00
25.00	2.82	1.44	0.00
26.00	2.82	1.44	0.00
27.00	2.82	1.44	0.00
28.00	2.82	1.44	0.00
29.00	2.82	1.44	0.00
30.00	2.82	1.44	0.00
31.00	2.82	1.44	0.00
32.00	2.82	1.44	0.00
33.00	2.82	1.44	0.00
34.00	2.82	1.44	0.00
35.00	2.82	1.44	0.00
36.00	2.82	1.44	0.00
37.00	2.82	1.44	0.00
38.00	2.82	1.44	0.00
39.00	2.82	1.44	0.00
40.00	2.82	1.44	0.00
41.00	2.82	1.44	0.00
42.00	2.82	1.44	0.00
43.00	2.82	1.44	0.00
44.00	2.82	1.44	0.00
45.00	2.82	1.44	0.00
46.00	2.82	1.44	0.00
47.00	2.82	1.44	0.00
48.00	2.82	1.44	0.00
49.00	2.82	1.44	0.00
50.00	2.82	1.44	0.00
51.00	2.82	1.44	0.00
52.00	2.82	1.44	0.00
53.00	2.82	1.44	0.00
54.00	2.82	1.44	0.00
55.00	2.82	1.44	0.00
56.00	2.82	1.44	0.00
57.00	2.82	1.44	0.00
58.00	2.82	1.44	0.00
59.00	2.82	1.44	0.00
60.00	2.82	1.44	0.00
61.00	2.82	1.44	0.00
62.00	2.82	1.44	0.00
63.00	2.82	1.44	0.00
64.00	2.82	1.44	0.00
65.00	2.82	1.44	0.00
66.00	2.82	1.44	0.00
67.00	2.82	1.44	0.00
68.00	2.82	1.44	0.00
69.00	2.82	1.44	0.00
70.00	2.82	1.44	0.00
71.00	2.82	1.44	0.00
72.00	2.82	1.44	0.00

Summary for Subcatchment 20S: BASIN A-2

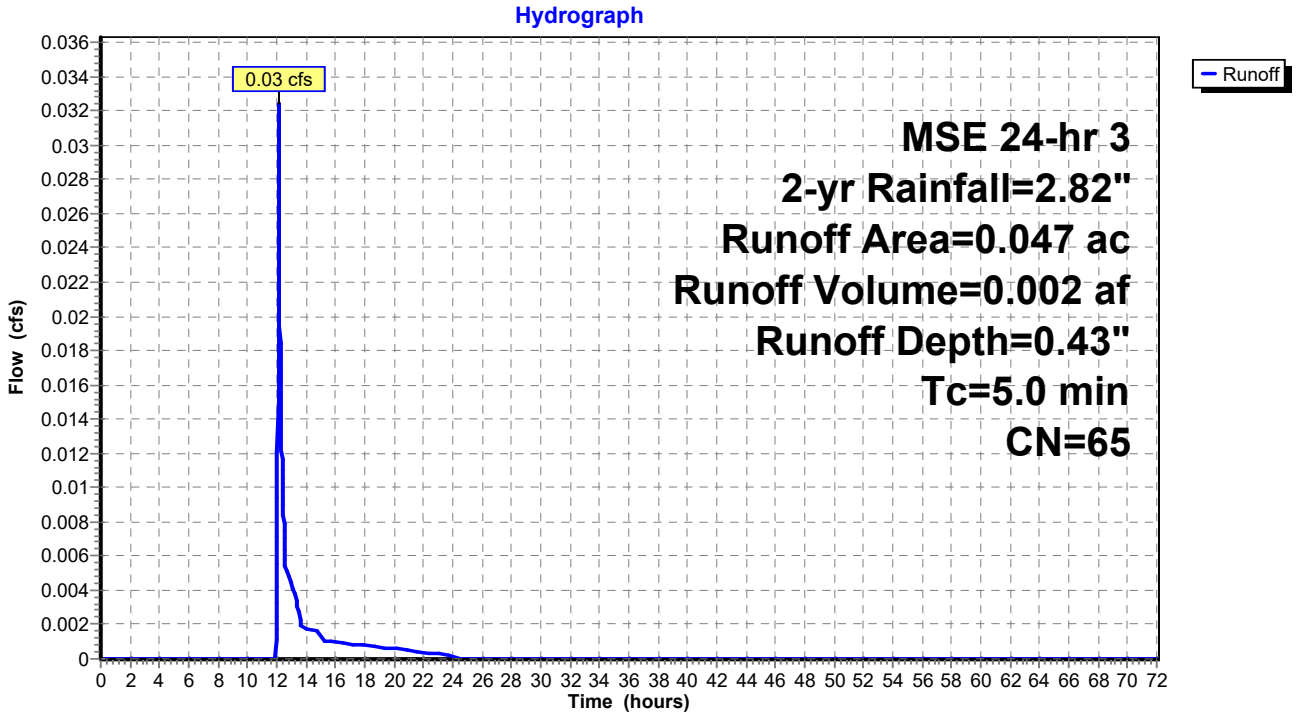
Runoff = 0.03 cfs @ 12.14 hrs, Volume= 0.002 af, Depth= 0.43"
Routed to Pond 21P : Biofilter A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.82"

	Area (ac)	CN	Description
*	0.047	65	Undisturbed Woodland
	0.047		100.00% Pervious Area

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

Subcatchment 20S: BASIN A-2



Hydrograph for Subcatchment 20S: BASIN A-2

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	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.11	0.00	0.00
6.00	0.14	0.00	0.00
7.00	0.19	0.00	0.00
8.00	0.24	0.00	0.00
9.00	0.29	0.00	0.00
10.00	0.39	0.00	0.00
11.00	0.54	0.00	0.00
12.00	1.31	0.01	**0.00**
13.00	2.28	0.22	**0.00**
14.00	2.43	0.27	0.00
15.00	2.53	0.31	0.00
16.00	2.58	0.33	0.00
17.00	2.63	0.35	0.00
18.00	2.68	0.37	0.00
19.00	2.71	0.38	0.00
20.00	2.75	0.40	0.00
21.00	2.77	0.41	0.00
22.00	2.79	0.42	0.00
23.00	2.81	0.42	0.00
24.00	**2.82**	**0.43**	0.00
25.00	2.82	0.43	0.00
26.00	2.82	0.43	0.00
27.00	2.82	0.43	0.00
28.00	2.82	0.43	0.00
29.00	2.82	0.43	0.00
30.00	2.82	0.43	0.00
31.00	2.82	0.43	0.00
32.00	2.82	0.43	0.00
33.00	2.82	0.43	0.00
34.00	2.82	0.43	0.00
35.00	2.82	0.43	0.00
36.00	2.82	0.43	0.00
37.00	2.82	0.43	0.00
38.00	2.82	0.43	0.00
39.00	2.82	0.43	0.00
40.00	2.82	0.43	0.00
41.00	2.82	0.43	0.00
42.00	2.82	0.43	0.00
43.00	2.82	0.43	0.00
44.00	2.82	0.43	0.00
45.00	2.82	0.43	0.00
46.00	2.82	0.43	0.00
47.00	2.82	0.43	0.00
48.00	2.82	0.43	0.00
49.00	2.82	0.43	0.00
50.00	2.82	0.43	0.00
51.00	2.82	0.43	0.00
52.00	2.82	0.43	0.00
53.00	2.82	0.43	0.00
54.00	2.82	0.43	0.00
55.00	2.82	0.43	0.00
56.00	2.82	0.43	0.00
57.00	2.82	0.43	0.00
58.00	2.82	0.43	0.00
59.00	2.82	0.43	0.00
60.00	2.82	0.43	0.00
61.00	2.82	0.43	0.00
62.00	2.82	0.43	0.00
63.00	2.82	0.43	0.00
64.00	2.82	0.43	0.00
65.00	2.82	0.43	0.00
66.00	2.82	0.43	0.00
67.00	2.82	0.43	0.00
68.00	2.82	0.43	0.00
69.00	2.82	0.43	0.00
70.00	2.82	0.43	0.00
71.00	2.82	0.43	0.00
72.00	2.82	0.43	0.00

Summary for Subcatchment 22S: From Off Site

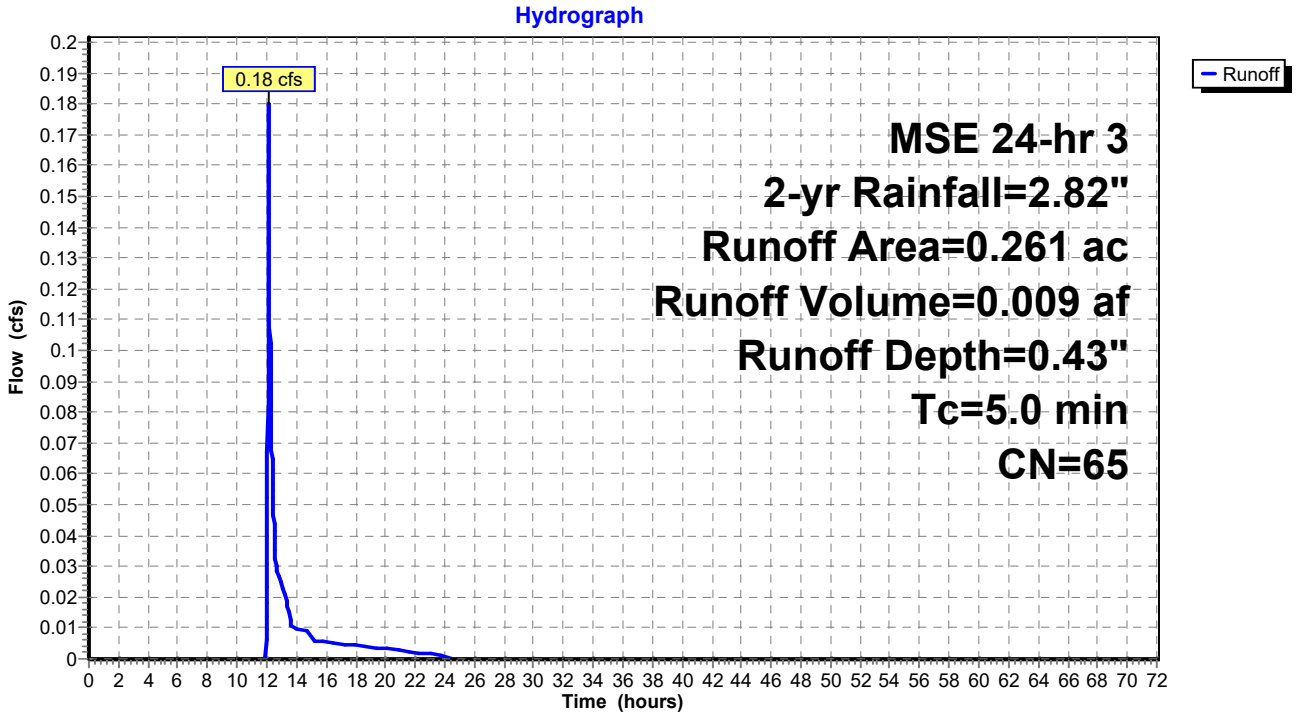
Runoff = 0.18 cfs @ 12.14 hrs, Volume= 0.009 af, Depth= 0.43"
Routed to Pond 21P : Biofilter A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.82"

	Area (ac)	CN	Description
*	0.261	65	Undisturbed Woodland
	0.261		100.00% Pervious Area

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

Subcatchment 22S: From Off Site



Hydrograph for Subcatchment 22S: From Off 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	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.11	0.00	0.00
6.00	0.14	0.00	0.00
7.00	0.19	0.00	0.00
8.00	0.24	0.00	0.00
9.00	0.29	0.00	0.00
10.00	0.39	0.00	0.00
11.00	0.54	0.00	0.00
12.00	1.31	0.01	**0.01**
13.00	2.28	0.22	**0.02**
14.00	2.43	0.27	0.01
15.00	2.53	0.31	0.01
16.00	2.58	0.33	0.01
17.00	2.63	0.35	0.00
18.00	2.68	0.37	0.00
19.00	2.71	0.38	0.00
20.00	2.75	0.40	0.00
21.00	2.77	0.41	0.00
22.00	2.79	0.42	0.00
23.00	2.81	0.42	0.00
24.00	**2.82**	**0.43**	0.00
25.00	2.82	0.43	0.00
26.00	2.82	0.43	0.00
27.00	2.82	0.43	0.00
28.00	2.82	0.43	0.00
29.00	2.82	0.43	0.00
30.00	2.82	0.43	0.00
31.00	2.82	0.43	0.00
32.00	2.82	0.43	0.00
33.00	2.82	0.43	0.00
34.00	2.82	0.43	0.00
35.00	2.82	0.43	0.00
36.00	2.82	0.43	0.00
37.00	2.82	0.43	0.00
38.00	2.82	0.43	0.00
39.00	2.82	0.43	0.00
40.00	2.82	0.43	0.00
41.00	2.82	0.43	0.00
42.00	2.82	0.43	0.00
43.00	2.82	0.43	0.00
44.00	2.82	0.43	0.00
45.00	2.82	0.43	0.00
46.00	2.82	0.43	0.00
47.00	2.82	0.43	0.00
48.00	2.82	0.43	0.00
49.00	2.82	0.43	0.00
50.00	2.82	0.43	0.00
51.00	2.82	0.43	0.00
52.00	2.82	0.43	0.00
53.00	2.82	0.43	0.00
54.00	2.82	0.43	0.00
55.00	2.82	0.43	0.00
56.00	2.82	0.43	0.00
57.00	2.82	0.43	0.00
58.00	2.82	0.43	0.00
59.00	2.82	0.43	0.00
60.00	2.82	0.43	0.00
61.00	2.82	0.43	0.00
62.00	2.82	0.43	0.00
63.00	2.82	0.43	0.00
64.00	2.82	0.43	0.00
65.00	2.82	0.43	0.00
66.00	2.82	0.43	0.00
67.00	2.82	0.43	0.00
68.00	2.82	0.43	0.00
69.00	2.82	0.43	0.00
70.00	2.82	0.43	0.00
71.00	2.82	0.43	0.00
72.00	2.82	0.43	0.00

Summary for Subcatchment 23S: Basin B-1

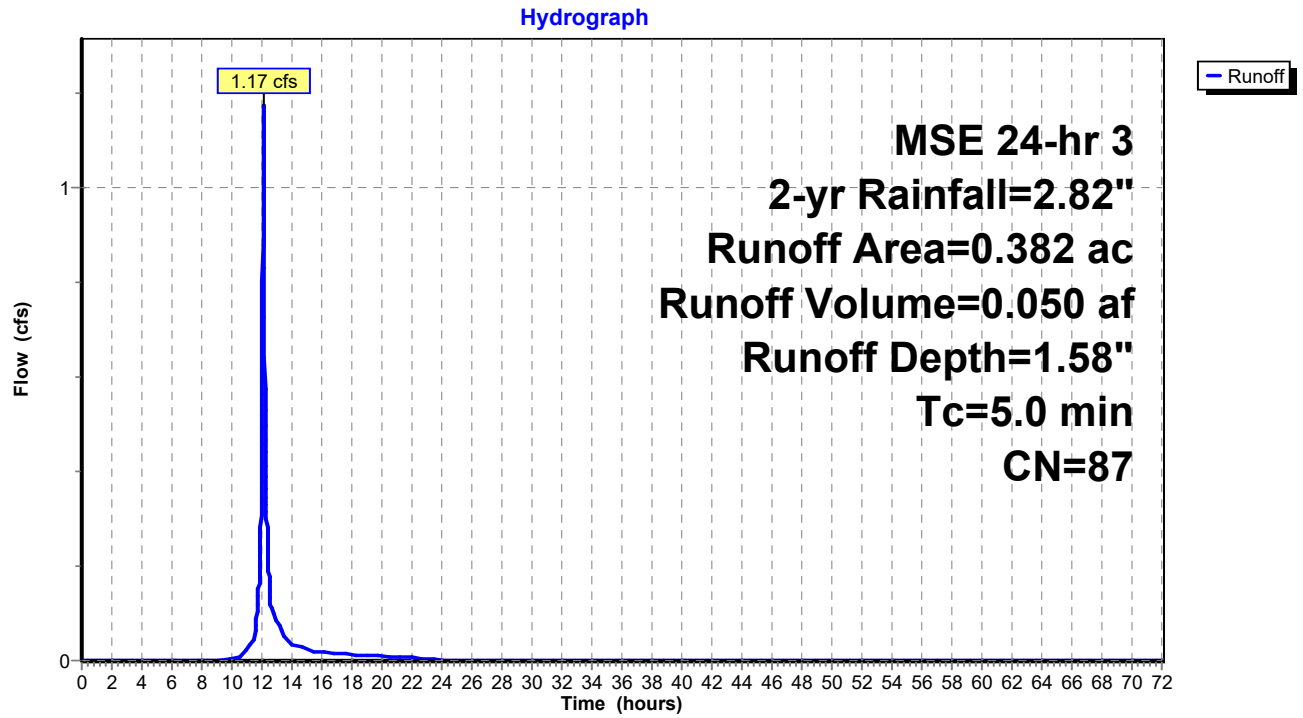
Runoff = 1.17 cfs @ 12.13 hrs, Volume= 0.050 af, Depth= 1.58"
Routed to Pond 25P : Biofilter B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.82"

	Area (ac)	CN	Description
*	0.205	98	Pave
*	0.127	65	Woodland
*	0.050	98	Pond Surface
	0.382	87	Weighted Average
	0.127		33.25% Pervious Area
	0.255		66.75% Impervious Area

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

Subcatchment 23S: Basin B-1



Hydrograph for Subcatchment 23S: Basin B-1

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	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.11	0.00	0.00
6.00	0.14	0.00	0.00
7.00	0.19	0.00	0.00
8.00	0.24	0.00	0.00
9.00	0.29	0.00	0.00
10.00	0.39	0.00	0.00
11.00	0.54	0.03	0.02
12.00	1.31	0.41	**0.52**
13.00	2.28	1.13	**0.09**
14.00	2.43	1.25	0.03
15.00	2.53	1.34	0.03
16.00	2.58	1.38	0.02
17.00	2.63	1.42	0.02
18.00	2.68	1.46	0.01
19.00	2.71	1.49	0.01
20.00	2.75	1.52	0.01
21.00	2.77	1.54	0.01
22.00	2.79	1.56	0.01
23.00	2.81	1.57	0.00
24.00	**2.82**	**1.58**	0.00
25.00	2.82	1.58	0.00
26.00	2.82	1.58	0.00
27.00	2.82	1.58	0.00
28.00	2.82	1.58	0.00
29.00	2.82	1.58	0.00
30.00	2.82	1.58	0.00
31.00	2.82	1.58	0.00
32.00	2.82	1.58	0.00
33.00	2.82	1.58	0.00
34.00	2.82	1.58	0.00
35.00	2.82	1.58	0.00
36.00	2.82	1.58	0.00
37.00	2.82	1.58	0.00
38.00	2.82	1.58	0.00
39.00	2.82	1.58	0.00
40.00	2.82	1.58	0.00
41.00	2.82	1.58	0.00
42.00	2.82	1.58	0.00
43.00	2.82	1.58	0.00
44.00	2.82	1.58	0.00
45.00	2.82	1.58	0.00
46.00	2.82	1.58	0.00
47.00	2.82	1.58	0.00
48.00	2.82	1.58	0.00
49.00	2.82	1.58	0.00
50.00	2.82	1.58	0.00
51.00	2.82	1.58	0.00
52.00	2.82	1.58	0.00
53.00	2.82	1.58	0.00
54.00	2.82	1.58	0.00
55.00	2.82	1.58	0.00
56.00	2.82	1.58	0.00
57.00	2.82	1.58	0.00
58.00	2.82	1.58	0.00
59.00	2.82	1.58	0.00
60.00	2.82	1.58	0.00
61.00	2.82	1.58	0.00
62.00	2.82	1.58	0.00
63.00	2.82	1.58	0.00
64.00	2.82	1.58	0.00
65.00	2.82	1.58	0.00
66.00	2.82	1.58	0.00
67.00	2.82	1.58	0.00
68.00	2.82	1.58	0.00
69.00	2.82	1.58	0.00
70.00	2.82	1.58	0.00
71.00	2.82	1.58	0.00
72.00	2.82	1.58	0.00

Summary for Subcatchment 24S: Basin B-2

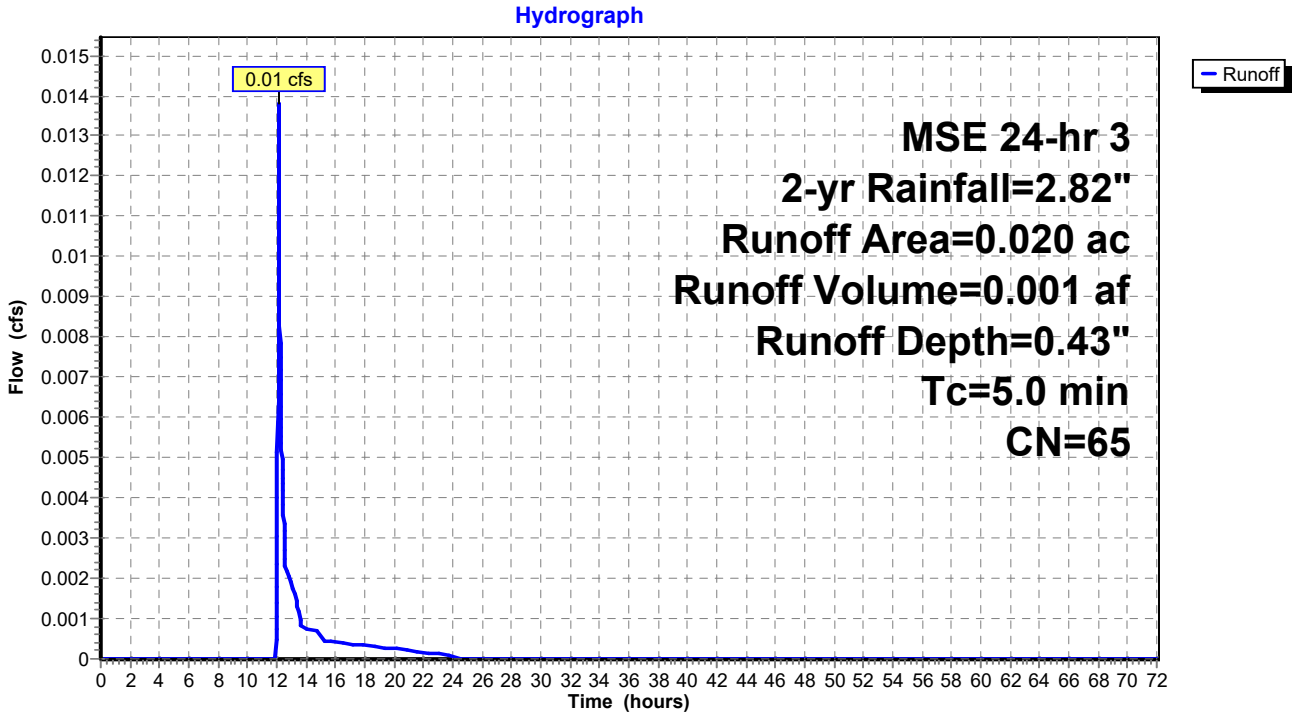
Runoff = 0.01 cfs @ 12.14 hrs, Volume= 0.001 af, Depth= 0.43"
Routed to Pond 25P : Biofilter B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.82"

	Area (ac)	CN	Description
*	0.020	65	Undisturbed Woodland
	0.020		100.00% Pervious Area

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

Subcatchment 24S: Basin B-2



Hydrograph for Subcatchment 24S: Basin B-2

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	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.11	0.00	0.00
6.00	0.14	0.00	0.00
7.00	0.19	0.00	0.00
8.00	0.24	0.00	0.00
9.00	0.29	0.00	0.00
10.00	0.39	0.00	0.00
11.00	0.54	0.00	0.00
12.00	1.31	0.01	**0.00**
13.00	2.28	0.22	**0.00**
14.00	2.43	0.27	0.00
15.00	2.53	0.31	0.00
16.00	2.58	0.33	0.00
17.00	2.63	0.35	0.00
18.00	2.68	0.37	0.00
19.00	2.71	0.38	0.00
20.00	2.75	0.40	0.00
21.00	2.77	0.41	0.00
22.00	2.79	0.42	0.00
23.00	2.81	0.42	0.00
24.00	**2.82**	**0.43**	0.00
25.00	2.82	0.43	0.00
26.00	2.82	0.43	0.00
27.00	2.82	0.43	0.00
28.00	2.82	0.43	0.00
29.00	2.82	0.43	0.00
30.00	2.82	0.43	0.00
31.00	2.82	0.43	0.00
32.00	2.82	0.43	0.00
33.00	2.82	0.43	0.00
34.00	2.82	0.43	0.00
35.00	2.82	0.43	0.00
36.00	2.82	0.43	0.00
37.00	2.82	0.43	0.00
38.00	2.82	0.43	0.00
39.00	2.82	0.43	0.00
40.00	2.82	0.43	0.00
41.00	2.82	0.43	0.00
42.00	2.82	0.43	0.00
43.00	2.82	0.43	0.00
44.00	2.82	0.43	0.00
45.00	2.82	0.43	0.00
46.00	2.82	0.43	0.00
47.00	2.82	0.43	0.00
48.00	2.82	0.43	0.00
49.00	2.82	0.43	0.00
50.00	2.82	0.43	0.00
51.00	2.82	0.43	0.00
52.00	2.82	0.43	0.00
53.00	2.82	0.43	0.00
54.00	2.82	0.43	0.00
55.00	2.82	0.43	0.00
56.00	2.82	0.43	0.00
57.00	2.82	0.43	0.00
58.00	2.82	0.43	0.00
59.00	2.82	0.43	0.00
60.00	2.82	0.43	0.00
61.00	2.82	0.43	0.00
62.00	2.82	0.43	0.00
63.00	2.82	0.43	0.00
64.00	2.82	0.43	0.00
65.00	2.82	0.43	0.00
66.00	2.82	0.43	0.00
67.00	2.82	0.43	0.00
68.00	2.82	0.43	0.00
69.00	2.82	0.43	0.00
70.00	2.82	0.43	0.00
71.00	2.82	0.43	0.00
72.00	2.82	0.43	0.00

Summary for Subcatchment 26S: Basin C-1

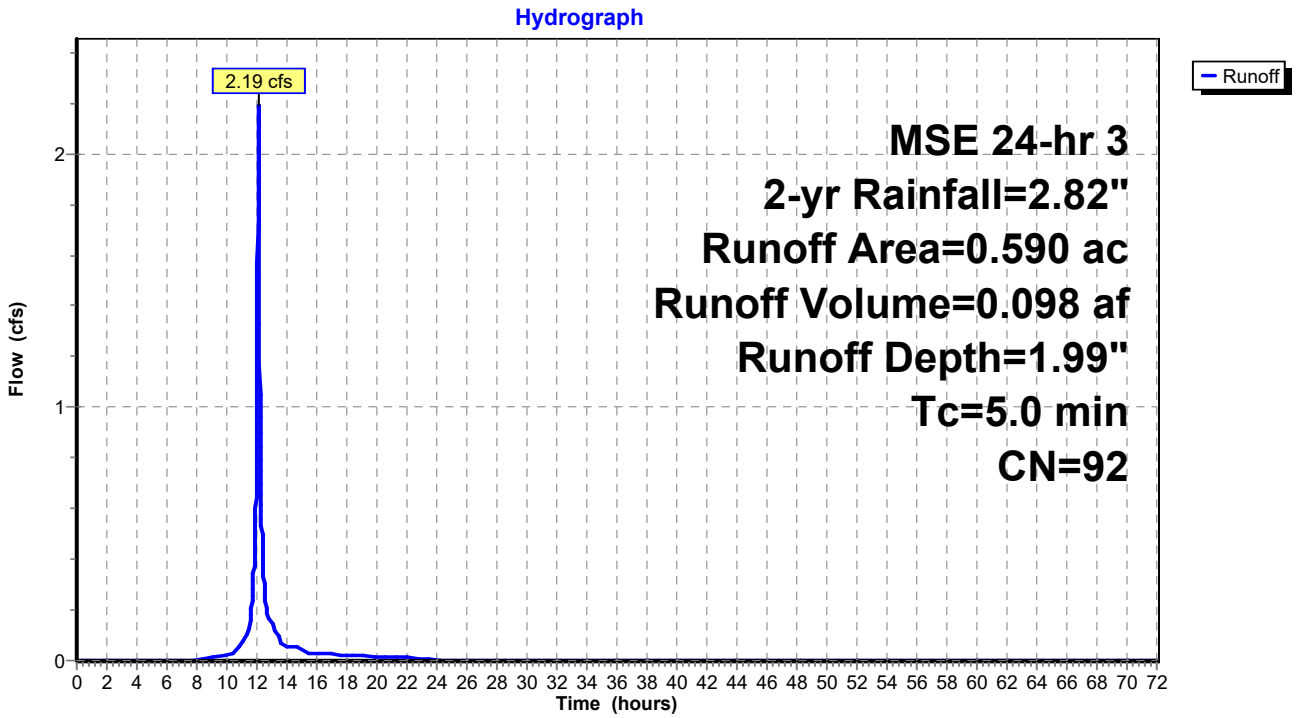
Runoff = 2.19 cfs @ 12.12 hrs, Volume= 0.098 af, Depth= 1.99"
Routed to Pond 22P : Post-Development ADS System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.82"

	Area (ac)	CN	Description
*	0.285	98	Pave
*	0.099	65	Woodland
*	0.206	98	Roof
	0.590	92	Weighted Average
	0.099		16.78% Pervious Area
	0.491		83.22% Impervious Area

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

Subcatchment 26S: Basin C-1



Hydrograph for Subcatchment 26S: Basin C-1

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	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.11	0.00	0.00
6.00	0.14	0.00	0.00
7.00	0.19	0.00	0.00
8.00	0.24	0.00	0.00
9.00	0.29	0.01	0.01
10.00	0.39	0.04	0.02
11.00	0.54	0.11	0.07
12.00	1.31	0.64	**1.05**
13.00	2.28	1.49	**0.15**
14.00	2.43	1.63	0.06
15.00	2.53	1.72	0.05
16.00	2.58	1.77	0.03
17.00	2.63	1.82	0.03
18.00	2.68	1.86	0.02
19.00	2.71	1.89	0.02
20.00	2.75	1.92	0.02
21.00	2.77	1.95	0.01
22.00	2.79	1.97	0.01
23.00	2.81	1.98	0.01
24.00	**2.82**	**1.99**	0.00
25.00	2.82	1.99	0.00
26.00	2.82	1.99	0.00
27.00	2.82	1.99	0.00
28.00	2.82	1.99	0.00
29.00	2.82	1.99	0.00
30.00	2.82	1.99	0.00
31.00	2.82	1.99	0.00
32.00	2.82	1.99	0.00
33.00	2.82	1.99	0.00
34.00	2.82	1.99	0.00
35.00	2.82	1.99	0.00
36.00	2.82	1.99	0.00
37.00	2.82	1.99	0.00
38.00	2.82	1.99	0.00
39.00	2.82	1.99	0.00
40.00	2.82	1.99	0.00
41.00	2.82	1.99	0.00
42.00	2.82	1.99	0.00
43.00	2.82	1.99	0.00
44.00	2.82	1.99	0.00
45.00	2.82	1.99	0.00
46.00	2.82	1.99	0.00
47.00	2.82	1.99	0.00
48.00	2.82	1.99	0.00
49.00	2.82	1.99	0.00
50.00	2.82	1.99	0.00
51.00	2.82	1.99	0.00
52.00	2.82	1.99	0.00
53.00	2.82	1.99	0.00
54.00	2.82	1.99	0.00
55.00	2.82	1.99	0.00
56.00	2.82	1.99	0.00
57.00	2.82	1.99	0.00
58.00	2.82	1.99	0.00
59.00	2.82	1.99	0.00
60.00	2.82	1.99	0.00
61.00	2.82	1.99	0.00
62.00	2.82	1.99	0.00
63.00	2.82	1.99	0.00
64.00	2.82	1.99	0.00
65.00	2.82	1.99	0.00
66.00	2.82	1.99	0.00
67.00	2.82	1.99	0.00
68.00	2.82	1.99	0.00
69.00	2.82	1.99	0.00
70.00	2.82	1.99	0.00
71.00	2.82	1.99	0.00
72.00	2.82	1.99	0.00

Summary for Subcatchment 27S: Basin C-2

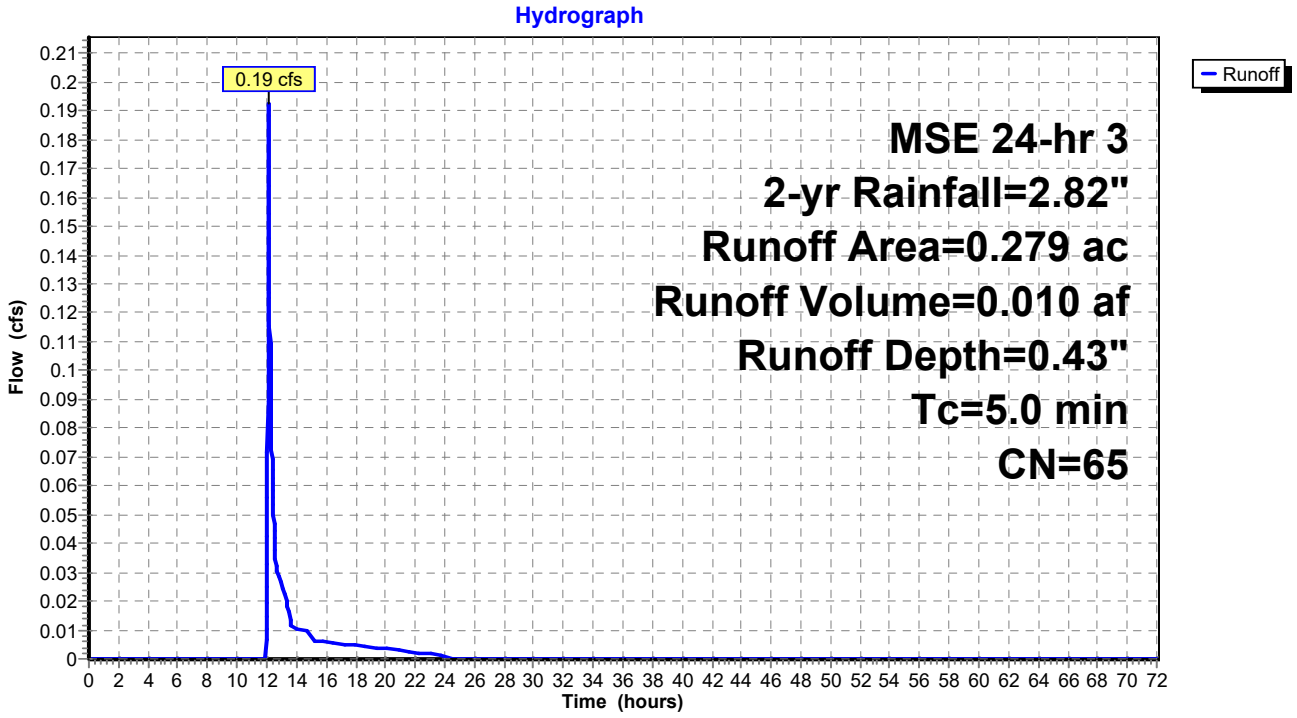
Runoff = 0.19 cfs @ 12.14 hrs, Volume= 0.010 af, Depth= 0.43"
Routed to Pond 22P : Post-Development ADS System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.82"

	Area (ac)	CN	Description
*	0.279	65	Undisturbed Woodland
	0.279		100.00% Pervious Area

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

Subcatchment 27S: Basin C-2



Hydrograph for Subcatchment 27S: Basin C-2

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	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.11	0.00	0.00
6.00	0.14	0.00	0.00
7.00	0.19	0.00	0.00
8.00	0.24	0.00	0.00
9.00	0.29	0.00	0.00
10.00	0.39	0.00	0.00
11.00	0.54	0.00	0.00
12.00	1.31	0.01	**0.01**
13.00	2.28	0.22	**0.03**
14.00	2.43	0.27	0.01
15.00	2.53	0.31	0.01
16.00	2.58	0.33	0.01
17.00	2.63	0.35	0.01
18.00	2.68	0.37	0.00
19.00	2.71	0.38	0.00
20.00	2.75	0.40	0.00
21.00	2.77	0.41	0.00
22.00	2.79	0.42	0.00
23.00	2.81	0.42	0.00
24.00	**2.82**	**0.43**	0.00
25.00	2.82	0.43	0.00
26.00	2.82	0.43	0.00
27.00	2.82	0.43	0.00
28.00	2.82	0.43	0.00
29.00	2.82	0.43	0.00
30.00	2.82	0.43	0.00
31.00	2.82	0.43	0.00
32.00	2.82	0.43	0.00
33.00	2.82	0.43	0.00
34.00	2.82	0.43	0.00
35.00	2.82	0.43	0.00
36.00	2.82	0.43	0.00
37.00	2.82	0.43	0.00
38.00	2.82	0.43	0.00
39.00	2.82	0.43	0.00
40.00	2.82	0.43	0.00
41.00	2.82	0.43	0.00
42.00	2.82	0.43	0.00
43.00	2.82	0.43	0.00
44.00	2.82	0.43	0.00
45.00	2.82	0.43	0.00
46.00	2.82	0.43	0.00
47.00	2.82	0.43	0.00
48.00	2.82	0.43	0.00
49.00	2.82	0.43	0.00
50.00	2.82	0.43	0.00
51.00	2.82	0.43	0.00
52.00	2.82	0.43	0.00
53.00	2.82	0.43	0.00
54.00	2.82	0.43	0.00
55.00	2.82	0.43	0.00
56.00	2.82	0.43	0.00
57.00	2.82	0.43	0.00
58.00	2.82	0.43	0.00
59.00	2.82	0.43	0.00
60.00	2.82	0.43	0.00
61.00	2.82	0.43	0.00
62.00	2.82	0.43	0.00
63.00	2.82	0.43	0.00
64.00	2.82	0.43	0.00
65.00	2.82	0.43	0.00
66.00	2.82	0.43	0.00
67.00	2.82	0.43	0.00
68.00	2.82	0.43	0.00
69.00	2.82	0.43	0.00
70.00	2.82	0.43	0.00
71.00	2.82	0.43	0.00
72.00	2.82	0.43	0.00

Summary for Subcatchment 28S: Basin D-1

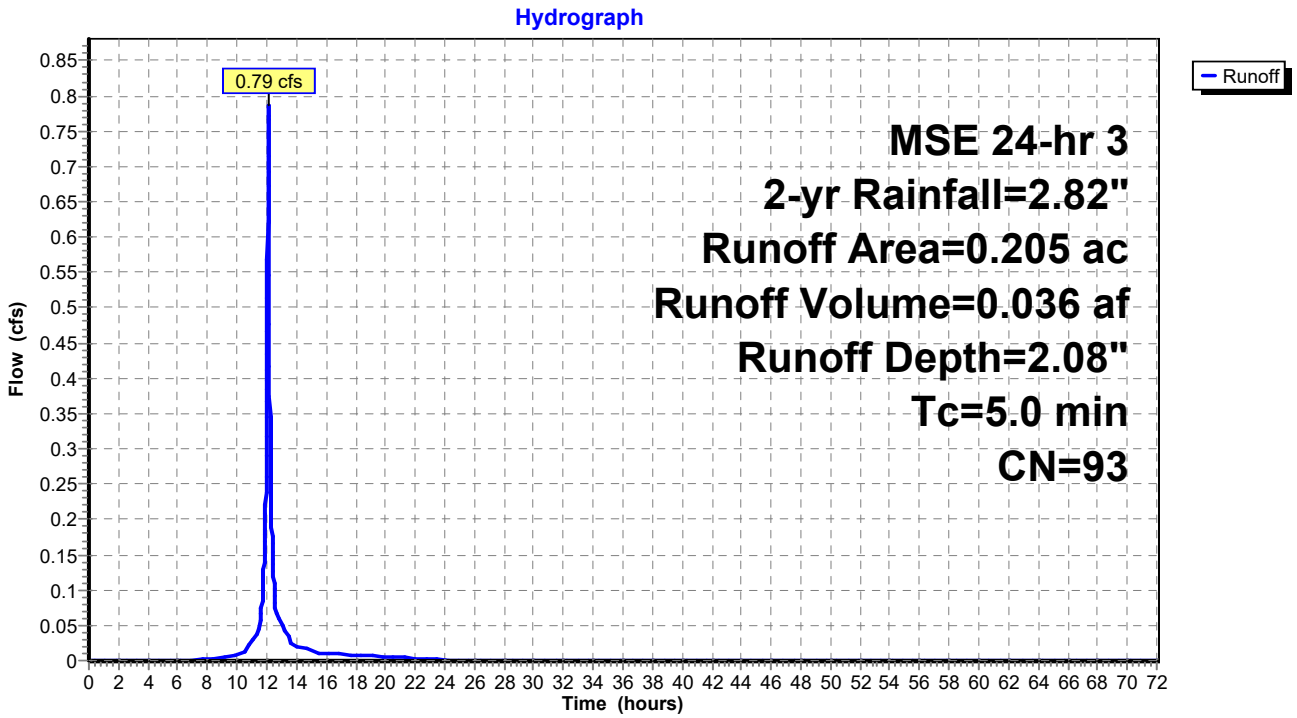
Runoff = 0.79 cfs @ 12.12 hrs, Volume= 0.036 af, Depth= 2.08"
Routed to Pond 33P : Biofilter D

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.82"

	Area (ac)	CN	Description
*	0.137	98	Pave
*	0.029	65	Woodland
*	0.039	98	Pond Surface
	0.205	93	Weighted Average
	0.029		14.15% Pervious Area
	0.176		85.85% Impervious Area

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

Subcatchment 28S: Basin D-1



Hydrograph for Subcatchment 28S: Basin D-1

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	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.11	0.00	0.00
6.00	0.14	0.00	0.00
7.00	0.19	0.00	0.00
8.00	0.24	0.01	0.00
9.00	0.29	0.02	0.00
10.00	0.39	0.06	0.01
11.00	0.54	0.13	0.03
12.00	1.31	0.70	**0.38**
13.00	2.28	1.57	**0.05**
14.00	2.43	1.72	0.02
15.00	2.53	1.81	0.02
16.00	2.58	1.86	0.01
17.00	2.63	1.90	0.01
18.00	2.68	1.95	0.01
19.00	2.71	1.98	0.01
20.00	2.75	2.01	0.01
21.00	2.77	2.04	0.00
22.00	2.79	2.06	0.00
23.00	2.81	2.07	0.00
24.00	**2.82**	**2.08**	0.00
25.00	2.82	2.08	0.00
26.00	2.82	2.08	0.00
27.00	2.82	2.08	0.00
28.00	2.82	2.08	0.00
29.00	2.82	2.08	0.00
30.00	2.82	2.08	0.00
31.00	2.82	2.08	0.00
32.00	2.82	2.08	0.00
33.00	2.82	2.08	0.00
34.00	2.82	2.08	0.00
35.00	2.82	2.08	0.00
36.00	2.82	2.08	0.00
37.00	2.82	2.08	0.00
38.00	2.82	2.08	0.00
39.00	2.82	2.08	0.00
40.00	2.82	2.08	0.00
41.00	2.82	2.08	0.00
42.00	2.82	2.08	0.00
43.00	2.82	2.08	0.00
44.00	2.82	2.08	0.00
45.00	2.82	2.08	0.00
46.00	2.82	2.08	0.00
47.00	2.82	2.08	0.00
48.00	2.82	2.08	0.00
49.00	2.82	2.08	0.00
50.00	2.82	2.08	0.00
51.00	2.82	2.08	0.00
52.00	2.82	2.08	0.00
53.00	2.82	2.08	0.00
54.00	2.82	2.08	0.00
55.00	2.82	2.08	0.00
56.00	2.82	2.08	0.00
57.00	2.82	2.08	0.00
58.00	2.82	2.08	0.00
59.00	2.82	2.08	0.00
60.00	2.82	2.08	0.00
61.00	2.82	2.08	0.00
62.00	2.82	2.08	0.00
63.00	2.82	2.08	0.00
64.00	2.82	2.08	0.00
65.00	2.82	2.08	0.00
66.00	2.82	2.08	0.00
67.00	2.82	2.08	0.00
68.00	2.82	2.08	0.00
69.00	2.82	2.08	0.00
70.00	2.82	2.08	0.00
71.00	2.82	2.08	0.00
72.00	2.82	2.08	0.00

Summary for Subcatchment 29S: Basin D-2

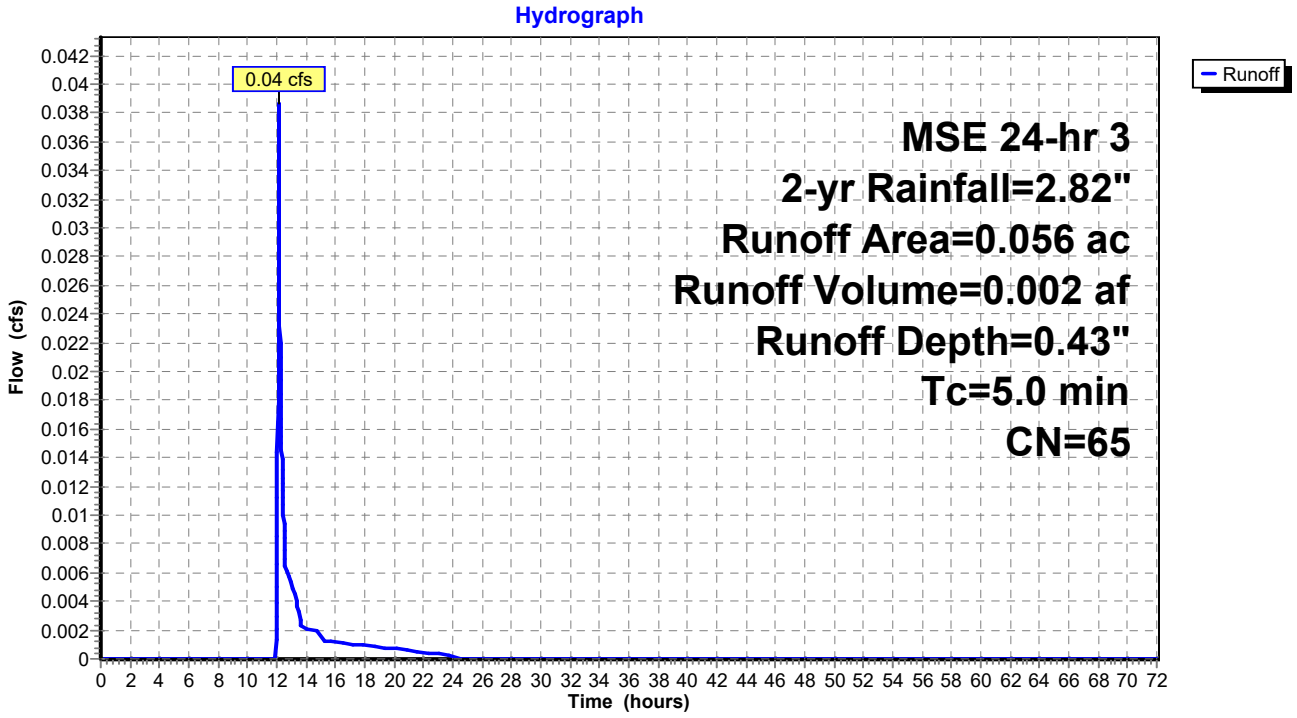
Runoff = 0.04 cfs @ 12.14 hrs, Volume= 0.002 af, Depth= 0.43"
Routed to Pond 33P : Biofilter D

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.82"

	Area (ac)	CN	Description
*	0.056	65	Undistrubed Woodland
	0.056		100.00% Pervious Area

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

Subcatchment 29S: Basin D-2



Hydrograph for Subcatchment 29S: Basin D-2

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	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.11	0.00	0.00
6.00	0.14	0.00	0.00
7.00	0.19	0.00	0.00
8.00	0.24	0.00	0.00
9.00	0.29	0.00	0.00
10.00	0.39	0.00	0.00
11.00	0.54	0.00	0.00
12.00	1.31	0.01	**0.00**
13.00	2.28	0.22	**0.01**
14.00	2.43	0.27	0.00
15.00	2.53	0.31	0.00
16.00	2.58	0.33	0.00
17.00	2.63	0.35	0.00
18.00	2.68	0.37	0.00
19.00	2.71	0.38	0.00
20.00	2.75	0.40	0.00
21.00	2.77	0.41	0.00
22.00	2.79	0.42	0.00
23.00	2.81	0.42	0.00
24.00	**2.82**	**0.43**	0.00
25.00	2.82	0.43	0.00
26.00	2.82	0.43	0.00
27.00	2.82	0.43	0.00
28.00	2.82	0.43	0.00
29.00	2.82	0.43	0.00
30.00	2.82	0.43	0.00
31.00	2.82	0.43	0.00
32.00	2.82	0.43	0.00
33.00	2.82	0.43	0.00
34.00	2.82	0.43	0.00
35.00	2.82	0.43	0.00
36.00	2.82	0.43	0.00
37.00	2.82	0.43	0.00
38.00	2.82	0.43	0.00
39.00	2.82	0.43	0.00
40.00	2.82	0.43	0.00
41.00	2.82	0.43	0.00
42.00	2.82	0.43	0.00
43.00	2.82	0.43	0.00
44.00	2.82	0.43	0.00
45.00	2.82	0.43	0.00
46.00	2.82	0.43	0.00
47.00	2.82	0.43	0.00
48.00	2.82	0.43	0.00
49.00	2.82	0.43	0.00
50.00	2.82	0.43	0.00
51.00	2.82	0.43	0.00
52.00	2.82	0.43	0.00
53.00	2.82	0.43	0.00
54.00	2.82	0.43	0.00
55.00	2.82	0.43	0.00
56.00	2.82	0.43	0.00
57.00	2.82	0.43	0.00
58.00	2.82	0.43	0.00
59.00	2.82	0.43	0.00
60.00	2.82	0.43	0.00
61.00	2.82	0.43	0.00
62.00	2.82	0.43	0.00
63.00	2.82	0.43	0.00
64.00	2.82	0.43	0.00
65.00	2.82	0.43	0.00
66.00	2.82	0.43	0.00
67.00	2.82	0.43	0.00
68.00	2.82	0.43	0.00
69.00	2.82	0.43	0.00
70.00	2.82	0.43	0.00
71.00	2.82	0.43	0.00
72.00	2.82	0.43	0.00

Summary for Subcatchment 34S: Undetained

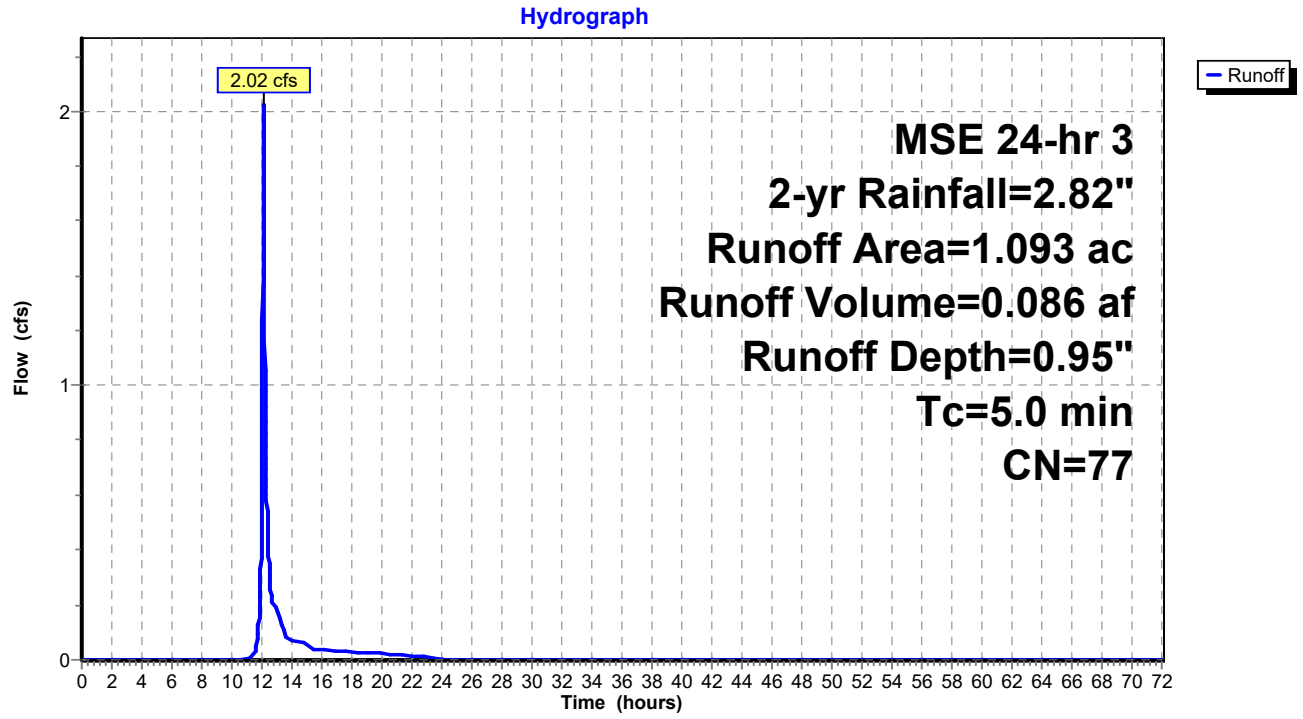
Runoff = 2.02 cfs @ 12.13 hrs, Volume= 0.086 af, Depth= 0.95"
Routed to Reach 38R : Post-Develpment

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.82"

	Area (ac)	CN	Description
*	0.210	98	Roof
*	0.173	98	Pave
*	0.600	65	Woodland
*	0.110	65	Natural Paths
	1.093	77	Weighted Average
	0.710		64.96% Pervious Area
	0.383		35.04% Impervious Area

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

Subcatchment 34S: Undetained



Hydrograph for Subcatchment 34S: 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	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.11	0.00	0.00
6.00	0.14	0.00	0.00
7.00	0.19	0.00	0.00
8.00	0.24	0.00	0.00
9.00	0.29	0.00	0.00
10.00	0.39	0.00	0.00
11.00	0.54	0.00	0.00
12.00	1.31	0.14	**0.70**
13.00	2.28	0.60	**0.18**
14.00	2.43	0.70	0.07
15.00	2.53	0.76	0.06
16.00	2.58	0.79	0.04
17.00	2.63	0.82	0.03
18.00	2.68	0.85	0.03
19.00	2.71	0.88	0.03
20.00	2.75	0.90	0.02
21.00	2.77	0.92	0.02
22.00	2.79	0.93	0.01
23.00	2.81	0.94	0.01
24.00	**2.82**	**0.95**	0.01
25.00	2.82	0.95	0.00
26.00	2.82	0.95	0.00
27.00	2.82	0.95	0.00
28.00	2.82	0.95	0.00
29.00	2.82	0.95	0.00
30.00	2.82	0.95	0.00
31.00	2.82	0.95	0.00
32.00	2.82	0.95	0.00
33.00	2.82	0.95	0.00
34.00	2.82	0.95	0.00
35.00	2.82	0.95	0.00
36.00	2.82	0.95	0.00
37.00	2.82	0.95	0.00
38.00	2.82	0.95	0.00
39.00	2.82	0.95	0.00
40.00	2.82	0.95	0.00
41.00	2.82	0.95	0.00
42.00	2.82	0.95	0.00
43.00	2.82	0.95	0.00
44.00	2.82	0.95	0.00
45.00	2.82	0.95	0.00
46.00	2.82	0.95	0.00
47.00	2.82	0.95	0.00
48.00	2.82	0.95	0.00
49.00	2.82	0.95	0.00
50.00	2.82	0.95	0.00
51.00	2.82	0.95	0.00
52.00	2.82	0.95	0.00
53.00	2.82	0.95	0.00
54.00	2.82	0.95	0.00
55.00	2.82	0.95	0.00
56.00	2.82	0.95	0.00
57.00	2.82	0.95	0.00
58.00	2.82	0.95	0.00
59.00	2.82	0.95	0.00
60.00	2.82	0.95	0.00
61.00	2.82	0.95	0.00
62.00	2.82	0.95	0.00
63.00	2.82	0.95	0.00
64.00	2.82	0.95	0.00
65.00	2.82	0.95	0.00
66.00	2.82	0.95	0.00
67.00	2.82	0.95	0.00
68.00	2.82	0.95	0.00
69.00	2.82	0.95	0.00
70.00	2.82	0.95	0.00
71.00	2.82	0.95	0.00
72.00	2.82	0.95	0.00

Summary for Subcatchment 36S: Existing

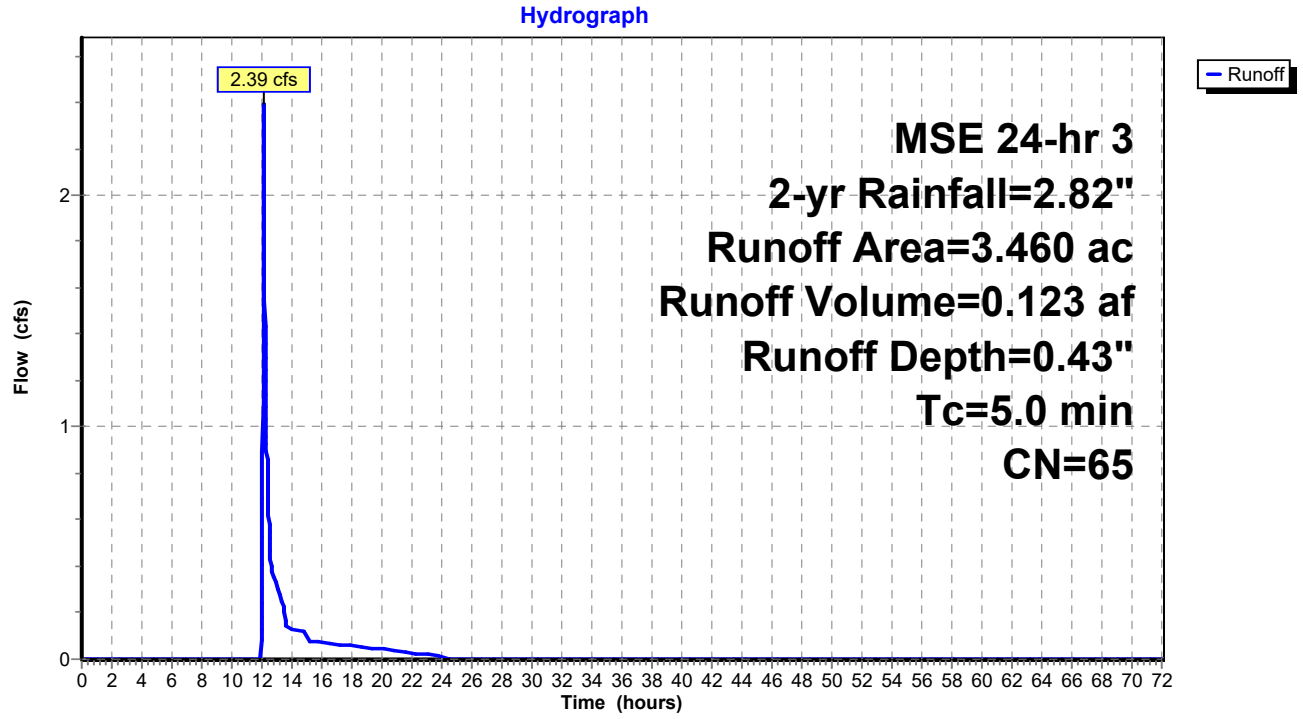
Runoff = 2.39 cfs @ 12.14 hrs, Volume= 0.123 af, Depth= 0.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.82"

	Area (ac)	CN	Description
*	3.460	65	Woodland
	3.460		100.00% Pervious Area

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

Subcatchment 36S: Existing



Hydrograph for Subcatchment 36S: Existing

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	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.11	0.00	0.00
6.00	0.14	0.00	0.00
7.00	0.19	0.00	0.00
8.00	0.24	0.00	0.00
9.00	0.29	0.00	0.00
10.00	0.39	0.00	0.00
11.00	0.54	0.00	0.00
12.00	1.31	0.01	**0.18**
13.00	2.28	0.22	**0.31**
14.00	2.43	0.27	0.13
15.00	2.53	0.31	0.12
16.00	2.58	0.33	0.07
17.00	2.63	0.35	0.06
18.00	2.68	0.37	0.06
19.00	2.71	0.38	0.05
20.00	2.75	0.40	0.04
21.00	2.77	0.41	0.04
22.00	2.79	0.42	0.03
23.00	2.81	0.42	0.02
24.00	**2.82**	**0.43**	0.01
25.00	2.82	0.43	0.00
26.00	2.82	0.43	0.00
27.00	2.82	0.43	0.00
28.00	2.82	0.43	0.00
29.00	2.82	0.43	0.00
30.00	2.82	0.43	0.00
31.00	2.82	0.43	0.00
32.00	2.82	0.43	0.00
33.00	2.82	0.43	0.00
34.00	2.82	0.43	0.00
35.00	2.82	0.43	0.00
36.00	2.82	0.43	0.00
37.00	2.82	0.43	0.00
38.00	2.82	0.43	0.00
39.00	2.82	0.43	0.00
40.00	2.82	0.43	0.00
41.00	2.82	0.43	0.00
42.00	2.82	0.43	0.00
43.00	2.82	0.43	0.00
44.00	2.82	0.43	0.00
45.00	2.82	0.43	0.00
46.00	2.82	0.43	0.00
47.00	2.82	0.43	0.00
48.00	2.82	0.43	0.00
49.00	2.82	0.43	0.00
50.00	2.82	0.43	0.00
51.00	2.82	0.43	0.00
52.00	2.82	0.43	0.00
53.00	2.82	0.43	0.00
54.00	2.82	0.43	0.00
55.00	2.82	0.43	0.00
56.00	2.82	0.43	0.00
57.00	2.82	0.43	0.00
58.00	2.82	0.43	0.00
59.00	2.82	0.43	0.00
60.00	2.82	0.43	0.00
61.00	2.82	0.43	0.00
62.00	2.82	0.43	0.00
63.00	2.82	0.43	0.00
64.00	2.82	0.43	0.00
65.00	2.82	0.43	0.00
66.00	2.82	0.43	0.00
67.00	2.82	0.43	0.00
68.00	2.82	0.43	0.00
69.00	2.82	0.43	0.00
70.00	2.82	0.43	0.00
71.00	2.82	0.43	0.00
72.00	2.82	0.43	0.00

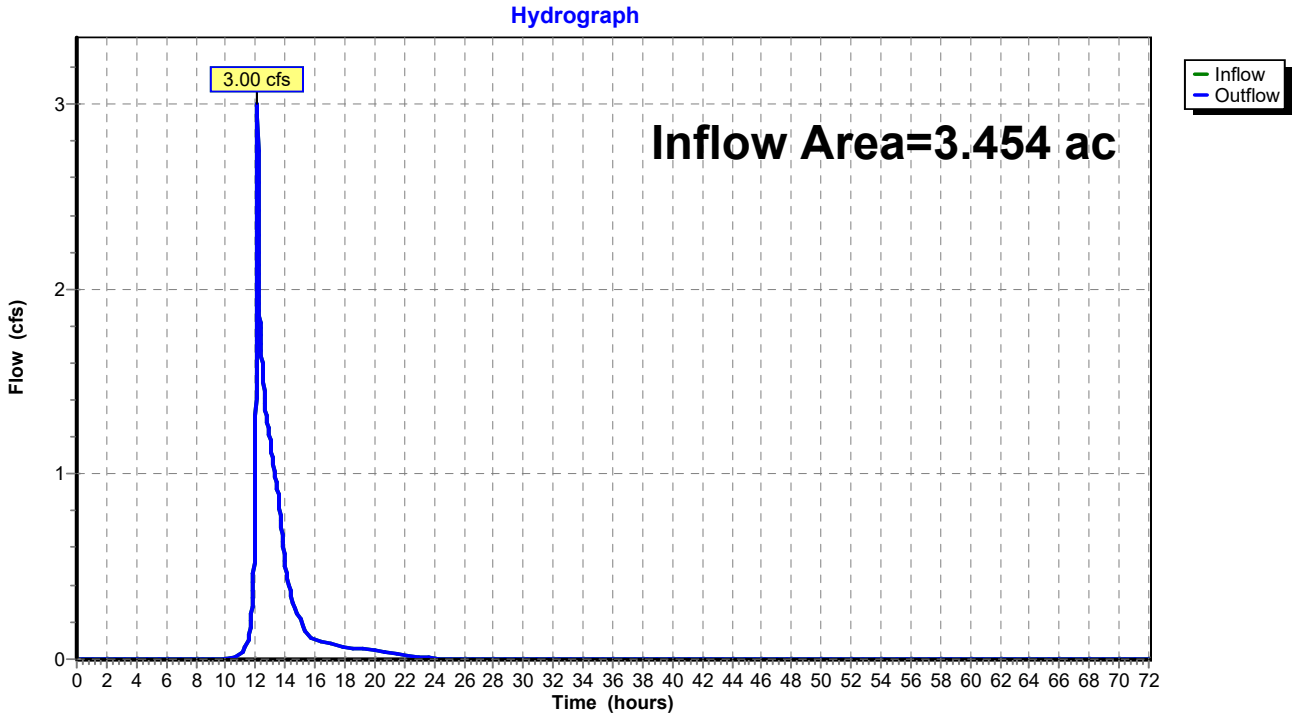
Summary for Reach 38R: Post-Develpment

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.454 ac, 46.82% Impervious, Inflow Depth = 1.02" for 2-yr event
Inflow = 3.00 cfs @ 12.13 hrs, Volume= 0.293 af
Outflow = 3.00 cfs @ 12.13 hrs, Volume= 0.293 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 38R: Post-Develpment



Hydrograph for Reach 38R: Post-Develpment

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	0.03		0.03
12.00	**1.15**		**1.15**
13.00	**1.16**		**1.16**
14.00	0.52		0.52
15.00	0.22		0.22
16.00	0.10		0.10
17.00	0.08		0.08
18.00	0.07		0.07
19.00	0.06		0.06
20.00	0.04		0.04
21.00	0.03		0.03
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
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 Pond 21P: Biofilter A

Inflow Area = 0.829 ac, 37.64% Impervious, Inflow Depth = 1.06" for 2-yr event
Inflow = 1.67 cfs @ 12.13 hrs, Volume= 0.073 af
Outflow = 0.44 cfs @ 12.34 hrs, Volume= 0.073 af, Atten= 73%, Lag= 12.6 min
Discarded = 0.01 cfs @ 12.34 hrs, Volume= 0.014 af
Primary = 0.43 cfs @ 12.34 hrs, Volume= 0.059 af
Routed to Pond 25P : Biofilter B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 927.23' @ 12.34 hrs Surf.Area= 0.021 ac Storage= 0.026 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 124.3 min (938.5 - 814.3)

Volume	Invert	Avail.Storage	Storage Description
#1	925.50'	0.103 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

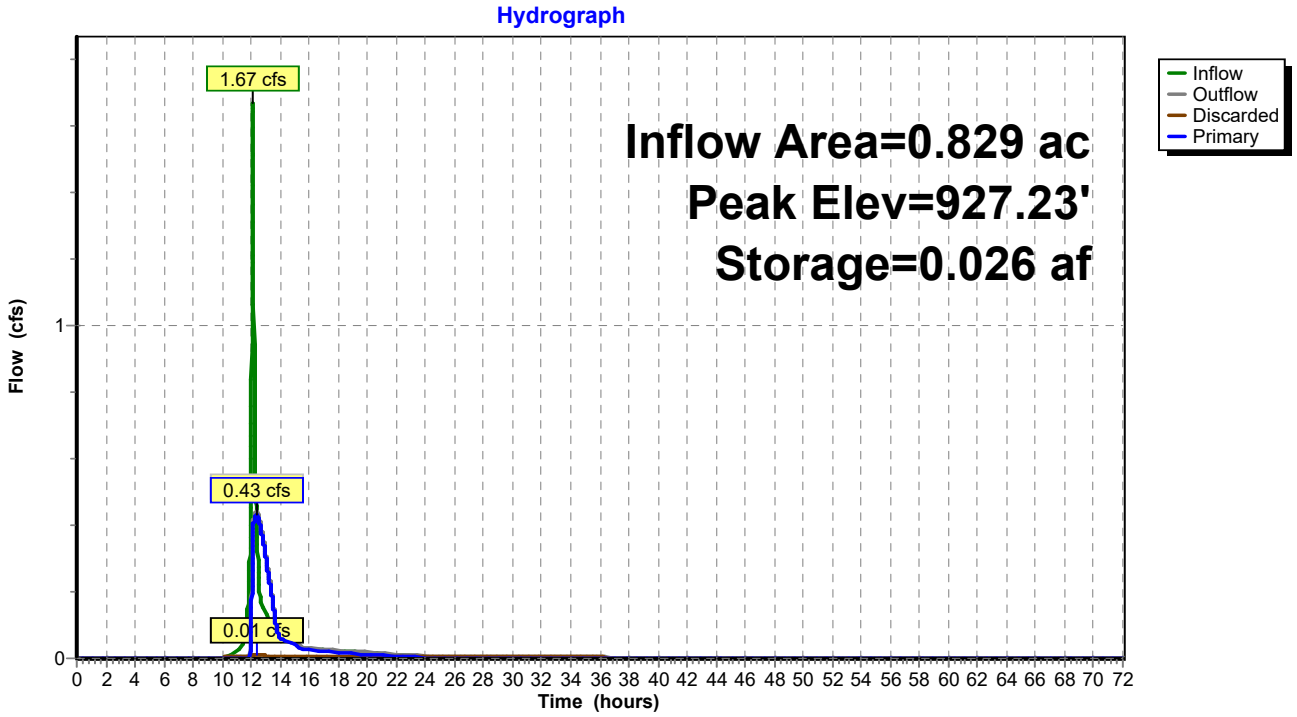
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
925.50	0.013	0.000	0.000
926.50	0.013	0.013	0.013
929.50	0.047	0.090	0.103

Device	Routing	Invert	Outlet Devices
#1	Primary	926.00'	**8.0" Round Culvert** L= 54.2' Ke= 0.500 Inlet / Outlet Invert= 926.00' / 925.75' S= 0.0046 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf
#2	Discarded	925.50'	**0.500 in/hr Exfiltration over Surface area**
#3	Device 1	926.00'	**4.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#4	Device 1	928.00'	**36.0" Horiz. Riser** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 12.34 hrs HW=927.23' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.43 cfs @ 12.34 hrs HW=927.23' TW=925.09' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.43 cfs of 1.34 cfs potential flow)
├**3=Underdrain** (Orifice Controls 0.43 cfs @ 4.97 fps)
└**4=Riser** (Controls 0.00 cfs)

Pond 21P: Biofilter A



Hydrograph for Pond 21P: Biofilter A

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	925.50	0.00	0.00	0.00
2.00	0.00	0.000	925.50	0.00	0.00	0.00
4.00	0.00	0.000	925.50	0.00	0.00	0.00
6.00	0.00	0.000	925.50	0.00	0.00	0.00
8.00	0.00	0.000	925.50	0.00	0.00	0.00
10.00	0.00	0.000	925.50	0.00	0.00	0.00
12.00	**0.64**	**0.009**	**926.19**	**0.08**	**0.01**	**0.08**
14.00	**0.05**	**0.009**	**926.17**	**0.07**	**0.01**	**0.06**
16.00	0.03	0.008	926.10	0.03	0.01	0.02
18.00	0.02	0.008	926.08	0.02	0.01	0.02
20.00	0.02	0.007	926.07	0.02	0.01	0.01
22.00	0.01	0.007	926.05	0.01	0.01	0.01
24.00	0.00	0.007	926.02	0.01	0.01	0.00
26.00	0.00	0.006	925.94	0.01	0.01	0.00
28.00	0.00	0.005	925.85	0.01	0.01	0.00
30.00	0.00	0.004	925.77	0.01	0.01	0.00
32.00	0.00	0.002	925.69	0.01	0.01	0.00
34.00	0.00	0.001	925.60	0.01	0.01	0.00
36.00	0.00	0.000	925.52	0.01	0.01	0.00
38.00	0.00	0.000	925.50	0.00	0.00	0.00
40.00	0.00	0.000	925.50	0.00	0.00	0.00
42.00	0.00	0.000	925.50	0.00	0.00	0.00
44.00	0.00	0.000	925.50	0.00	0.00	0.00
46.00	0.00	0.000	925.50	0.00	0.00	0.00
48.00	0.00	0.000	925.50	0.00	0.00	0.00
50.00	0.00	0.000	925.50	0.00	0.00	0.00
52.00	0.00	0.000	925.50	0.00	0.00	0.00
54.00	0.00	0.000	925.50	0.00	0.00	0.00
56.00	0.00	0.000	925.50	0.00	0.00	0.00
58.00	0.00	0.000	925.50	0.00	0.00	0.00
60.00	0.00	0.000	925.50	0.00	0.00	0.00
62.00	0.00	0.000	925.50	0.00	0.00	0.00
64.00	0.00	0.000	925.50	0.00	0.00	0.00
66.00	0.00	0.000	925.50	0.00	0.00	0.00
68.00	0.00	0.000	925.50	0.00	0.00	0.00
70.00	0.00	0.000	925.50	0.00	0.00	0.00
72.00	0.00	0.000	925.50	0.00	0.00	0.00

Summary for Pond 22P: Post-Development ADS System

Inflow Area = 0.869 ac, 56.50% Impervious, Inflow Depth = 1.49" for 2-yr event
Inflow = 2.38 cfs @ 12.12 hrs, Volume= 0.108 af
Outflow = 0.54 cfs @ 12.35 hrs, Volume= 0.108 af, Atten= 77%, Lag= 13.8 min
Discarded = 0.02 cfs @ 10.80 hrs, Volume= 0.019 af
Primary = 0.53 cfs @ 12.35 hrs, Volume= 0.089 af
Routed to Reach 38R : Post-Develpment

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 916.99' @ 12.35 hrs Surf.Area= 1,375 sf Storage= 1,508 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 28.8 min (821.0 - 792.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	915.25'	2,382 cf	**19.42'W x 70.79'L x 6.75'H Field A** 9,278 cf Overall - 3,324 cf Embedded = 5,954 cf x 40.0% Voids
#2A	916.00'	3,324 cf	**ADS_StormTech MC-7200 +Cap** x 18 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 18 Chambers in 2 Rows Cap Storage= 39.5 cf x 2 x 2 rows = 158.0 cf
		5,706 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	915.25'	**12.0" Round Culvert** L= 156.7' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 915.25' / 914.75' S= 0.0032 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Device 1	915.25'	**4.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	919.75'	**3.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Discarded	915.25'	**0.500 in/hr Exfiltration over Surface area**
#5	Device 1	917.25'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 10.80 hrs HW=915.32' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.53 cfs @ 12.35 hrs HW=916.99' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.53 cfs of 3.13 cfs potential flow)
  ├**2=Orifice** (Orifice Controls 0.53 cfs @ 6.04 fps)
  ├**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Pond 22P: Post-Development ADS System - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-7200 +Cap (ADS StormTech®MC-7200 with cap volume)
Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf
Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap
Cap Storage= 39.5 cf x 2 x 2 rows = 158.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

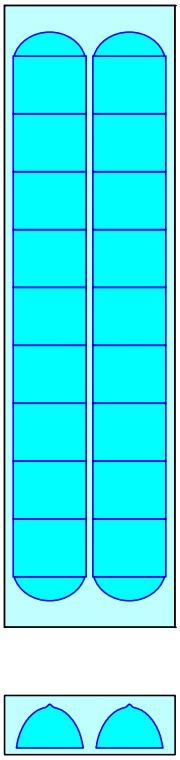
9 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 64.79' Row Length +36.0" End Stone x 2 = 70.79' Base Length
2 Rows x 100.0" Wide + 9.0" Spacing x 1 + 12.0" Side Stone x 2 = 19.42' Base Width
9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

18 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 2 Rows = 3,323.8 cf Chamber Storage

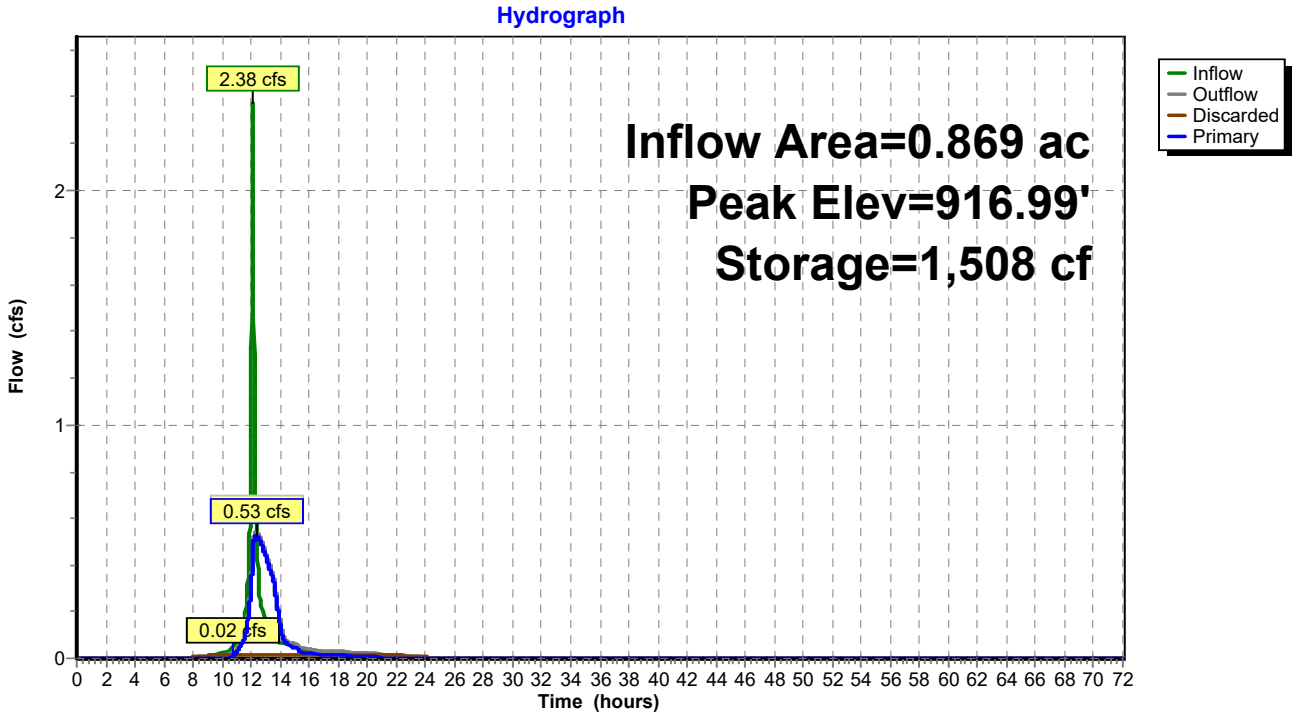
9,278.1 cf Field - 3,323.8 cf Chambers = 5,954.4 cf Stone x 40.0% Voids = 2,381.7 cf Stone Storage

Chamber Storage + Stone Storage = 5,705.5 cf = 0.131 af
Overall Storage Efficiency = 61.5%
Overall System Size = 70.79' x 19.42' x 6.75'

18 Chambers @ $ 1,200.00 /ea = $ 21,600.00
343.6 cy Field Excavation @ $ 1.00 /cy = $ 343.63
220.5 cy Stone @ $ 30.00 /cy = $ 6,615.97
Total Cost = $ 28,559.60



Pond 22P: Post-Development ADS System



Hydrograph for Pond 22P: Post-Development ADS System

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	915.25	0.00	0.00	0.00
2.00	0.00	0	915.25	0.00	0.00	0.00
4.00	0.00	0	915.25	0.00	0.00	0.00
6.00	0.00	0	915.25	0.00	0.00	0.00
8.00	0.00	0	915.25	0.00	0.00	0.00
10.00	0.02	5	915.26	0.02	**0.02**	0.00
12.00	**1.07**	**436**	**916.02**	**0.34**	**0.02**	**0.33**
14.00	**0.07**	**153**	**915.53**	**0.16**	0.02	**0.14**
16.00	0.03	52	915.34	0.04	0.02	0.02
18.00	0.03	40	915.32	0.03	0.02	0.01
20.00	0.02	28	915.30	0.02	0.02	0.01
22.00	0.01	9	915.27	0.02	0.02	0.00
24.00	0.01	0	915.25	0.00	0.00	0.00
26.00	0.00	0	915.25	0.00	0.00	0.00
28.00	0.00	0	915.25	0.00	0.00	0.00
30.00	0.00	0	915.25	0.00	0.00	0.00
32.00	0.00	0	915.25	0.00	0.00	0.00
34.00	0.00	0	915.25	0.00	0.00	0.00
36.00	0.00	0	915.25	0.00	0.00	0.00
38.00	0.00	0	915.25	0.00	0.00	0.00
40.00	0.00	0	915.25	0.00	0.00	0.00
42.00	0.00	0	915.25	0.00	0.00	0.00
44.00	0.00	0	915.25	0.00	0.00	0.00
46.00	0.00	0	915.25	0.00	0.00	0.00
48.00	0.00	0	915.25	0.00	0.00	0.00
50.00	0.00	0	915.25	0.00	0.00	0.00
52.00	0.00	0	915.25	0.00	0.00	0.00
54.00	0.00	0	915.25	0.00	0.00	0.00
56.00	0.00	0	915.25	0.00	0.00	0.00
58.00	0.00	0	915.25	0.00	0.00	0.00
60.00	0.00	0	915.25	0.00	0.00	0.00
62.00	0.00	0	915.25	0.00	0.00	0.00
64.00	0.00	0	915.25	0.00	0.00	0.00
66.00	0.00	0	915.25	0.00	0.00	0.00
68.00	0.00	0	915.25	0.00	0.00	0.00
70.00	0.00	0	915.25	0.00	0.00	0.00
72.00	0.00	0	915.25	0.00	0.00	0.00

Summary for Pond 25P: Biofilter B

Inflow Area = 1.231 ac, 46.06% Impervious, Inflow Depth = 1.07" for 2-yr event
Inflow = 1.54 cfs @ 12.13 hrs, Volume= 0.110 af
Outflow = 0.46 cfs @ 12.80 hrs, Volume= 0.110 af, Atten= 70%, Lag= 40.1 min
Discarded = 0.01 cfs @ 12.80 hrs, Volume= 0.016 af
Primary = 0.45 cfs @ 12.80 hrs, Volume= 0.094 af
Routed to Reach 38R : Post-Develpment

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 925.27' @ 12.80 hrs Surf.Area= 0.026 ac Storage= 0.032 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 72.5 min (887.6 - 815.1)

Volume	Invert	Avail.Storage	Storage Description
#1	923.75'	0.132 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

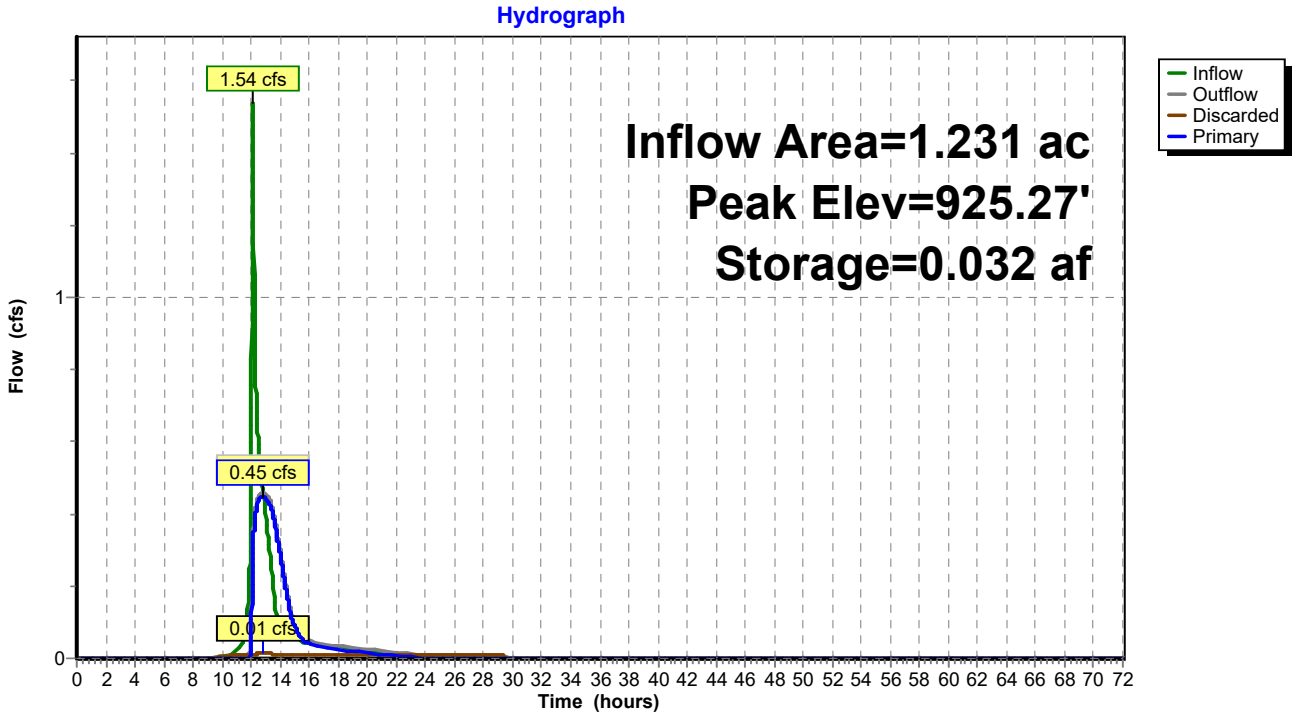
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
923.75	0.020	0.000	0.000
924.75	0.020	0.020	0.020
927.75	0.055	0.112	0.132

Device	Routing	Invert	Outlet Devices
#1	Discarded	923.75'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	923.97'	**12.0" Round Culvert** L= 36.7' Ke= 0.500 Inlet / Outlet Invert= 923.97' / 923.56' S= 0.0112 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#3	Device 2	923.97'	**4.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#4	Device 2	926.00'	**36.0" Horiz. Riser** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 12.80 hrs HW=925.27' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.45 cfs @ 12.80 hrs HW=925.27' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.45 cfs of 3.37 cfs potential flow)
  ├**3=Underdrain** (Orifice Controls 0.45 cfs @ 5.12 fps)
  └**4=Riser** (Controls 0.00 cfs)

Pond 25P: Biofilter B



Hydrograph for Pond 25P: Biofilter B

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	923.75	0.00	0.00	0.00
2.00	0.00	0.000	923.75	0.00	0.00	0.00
4.00	0.00	0.000	923.75	0.00	0.00	0.00
6.00	0.00	0.000	923.75	0.00	0.00	0.00
8.00	0.00	0.000	923.75	0.00	0.00	0.00
10.00	0.00	0.000	923.75	0.00	0.00	0.00
12.00	**0.60**	**0.008**	**924.13**	**0.07**	**0.01**	**0.06**
14.00	**0.10**	**0.017**	**924.60**	**0.29**	**0.01**	**0.28**
16.00	0.04	0.007	924.10	0.05	0.01	0.04
18.00	0.03	0.006	924.07	0.03	0.01	0.02
20.00	0.02	0.006	924.05	0.02	0.01	0.01
22.00	0.01	0.005	924.02	0.02	0.01	0.01
24.00	0.00	0.005	923.98	0.01	0.01	0.00
26.00	0.00	0.003	923.90	0.01	0.01	0.00
28.00	0.00	0.001	923.81	0.01	0.01	0.00
30.00	0.00	0.000	923.75	0.00	0.00	0.00
32.00	0.00	0.000	923.75	0.00	0.00	0.00
34.00	0.00	0.000	923.75	0.00	0.00	0.00
36.00	0.00	0.000	923.75	0.00	0.00	0.00
38.00	0.00	0.000	923.75	0.00	0.00	0.00
40.00	0.00	0.000	923.75	0.00	0.00	0.00
42.00	0.00	0.000	923.75	0.00	0.00	0.00
44.00	0.00	0.000	923.75	0.00	0.00	0.00
46.00	0.00	0.000	923.75	0.00	0.00	0.00
48.00	0.00	0.000	923.75	0.00	0.00	0.00
50.00	0.00	0.000	923.75	0.00	0.00	0.00
52.00	0.00	0.000	923.75	0.00	0.00	0.00
54.00	0.00	0.000	923.75	0.00	0.00	0.00
56.00	0.00	0.000	923.75	0.00	0.00	0.00
58.00	0.00	0.000	923.75	0.00	0.00	0.00
60.00	0.00	0.000	923.75	0.00	0.00	0.00
62.00	0.00	0.000	923.75	0.00	0.00	0.00
64.00	0.00	0.000	923.75	0.00	0.00	0.00
66.00	0.00	0.000	923.75	0.00	0.00	0.00
68.00	0.00	0.000	923.75	0.00	0.00	0.00
70.00	0.00	0.000	923.75	0.00	0.00	0.00
72.00	0.00	0.000	923.75	0.00	0.00	0.00

Summary for Pond 33P: Biofilter D

Inflow Area = 0.261 ac, 67.43% Impervious, Inflow Depth = 1.73" for 2-yr event
Inflow = 0.82 cfs @ 12.12 hrs, Volume= 0.038 af
Outflow = 0.28 cfs @ 12.25 hrs, Volume= 0.038 af, Atten= 66%, Lag= 7.6 min
Discarded = 0.01 cfs @ 11.01 hrs, Volume= 0.013 af
Primary = 0.27 cfs @ 12.25 hrs, Volume= 0.024 af
Routed to Reach 38R : Post-Develpment

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 922.06' @ 12.25 hrs Surf.Area= 0.017 ac Storage= 0.014 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 102.0 min (887.6 - 785.6)

Volume	Invert	Avail.Storage	Storage Description
#1	921.25'	0.073 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

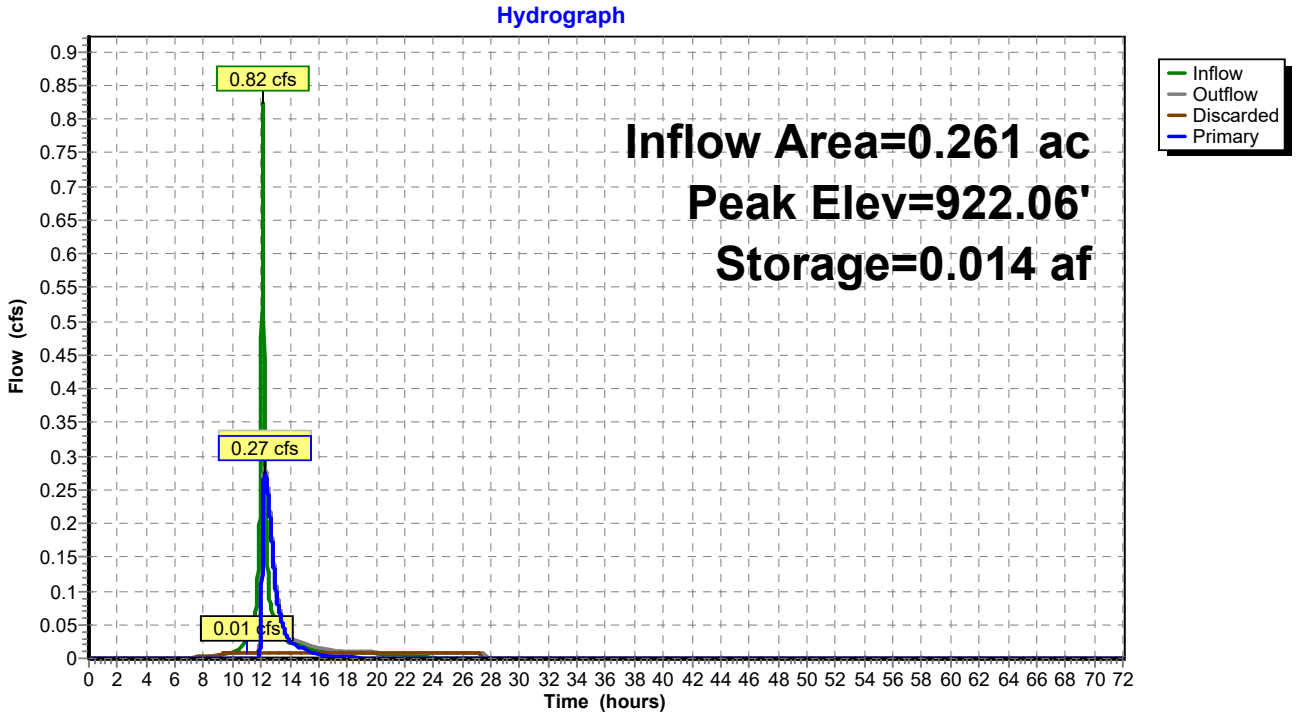
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
921.25	0.017	0.000	0.000
922.25	0.017	0.017	0.017
924.25	0.039	0.056	0.073

Device	Routing	Invert	Outlet Devices
#1	Discarded	921.25'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	921.47'	**6.0" Round Culvert** L= 36.9' Ke= 0.500 Inlet / Outlet Invert= 921.47' / 920.56' S= 0.0247 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf
#3	Device 2	921.47'	**4.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#4	Device 2	924.00'	**36.0" Horiz. Riser** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 11.01 hrs HW=921.28' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.27 cfs @ 12.25 hrs HW=922.06' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.27 cfs of 0.55 cfs potential flow)
  ├**3=Underdrain** (Orifice Controls 0.27 cfs @ 3.15 fps)
  └**4=Riser** (Controls 0.00 cfs)

Pond 33P: Biofilter D



Hydrograph for Pond 33P: Biofilter D

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	921.25	0.00	0.00	0.00
2.00	0.00	0.000	921.25	0.00	0.00	0.00
4.00	0.00	0.000	921.25	0.00	0.00	0.00
6.00	0.00	0.000	921.25	0.00	0.00	0.00
8.00	0.00	0.000	921.25	0.00	0.00	0.00
10.00	0.01	0.000	921.25	0.01	**0.01**	0.00
12.00	**0.39**	**0.007**	**921.64**	**0.07**	**0.01**	**0.07**
14.00	**0.02**	**0.005**	**921.57**	**0.03**	0.01	**0.02**
16.00	0.01	0.005	921.52	0.01	0.01	0.01
18.00	0.01	0.004	921.50	0.01	0.01	0.00
20.00	0.01	0.004	921.48	0.01	0.01	0.00
22.00	0.00	0.003	921.45	0.01	0.01	0.00
24.00	0.00	0.002	921.39	0.01	0.01	0.00
26.00	0.00	0.001	921.31	0.01	0.01	0.00
28.00	0.00	0.000	921.25	0.00	0.00	0.00
30.00	0.00	0.000	921.25	0.00	0.00	0.00
32.00	0.00	0.000	921.25	0.00	0.00	0.00
34.00	0.00	0.000	921.25	0.00	0.00	0.00
36.00	0.00	0.000	921.25	0.00	0.00	0.00
38.00	0.00	0.000	921.25	0.00	0.00	0.00
40.00	0.00	0.000	921.25	0.00	0.00	0.00
42.00	0.00	0.000	921.25	0.00	0.00	0.00
44.00	0.00	0.000	921.25	0.00	0.00	0.00
46.00	0.00	0.000	921.25	0.00	0.00	0.00
48.00	0.00	0.000	921.25	0.00	0.00	0.00
50.00	0.00	0.000	921.25	0.00	0.00	0.00
52.00	0.00	0.000	921.25	0.00	0.00	0.00
54.00	0.00	0.000	921.25	0.00	0.00	0.00
56.00	0.00	0.000	921.25	0.00	0.00	0.00
58.00	0.00	0.000	921.25	0.00	0.00	0.00
60.00	0.00	0.000	921.25	0.00	0.00	0.00
62.00	0.00	0.000	921.25	0.00	0.00	0.00
64.00	0.00	0.000	921.25	0.00	0.00	0.00
66.00	0.00	0.000	921.25	0.00	0.00	0.00
68.00	0.00	0.000	921.25	0.00	0.00	0.00
70.00	0.00	0.000	921.25	0.00	0.00	0.00
72.00	0.00	0.000	921.25	0.00	0.00	0.00

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment19S: Basin A-1 Runoff Area=0.521 ac 59.88% Impervious Runoff Depth=2.48"
Tc=5.0 min CN=85 Runoff=2.47 cfs 0.107 af

Subcatchment20S: BASIN A-2 Runoff Area=0.047 ac 0.00% Impervious Runoff Depth=1.04"
Tc=5.0 min CN=65 Runoff=0.09 cfs 0.004 af

Subcatchment22S: From Off Site Runoff Area=0.261 ac 0.00% Impervious Runoff Depth=1.04"
Tc=5.0 min CN=65 Runoff=0.52 cfs 0.023 af

Subcatchment23S: Basin B-1 Runoff Area=0.382 ac 66.75% Impervious Runoff Depth=2.66"
Tc=5.0 min CN=87 Runoff=1.92 cfs 0.085 af

Subcatchment24S: Basin B-2 Runoff Area=0.020 ac 0.00% Impervious Runoff Depth=1.04"
Tc=5.0 min CN=65 Runoff=0.04 cfs 0.002 af

Subcatchment26S: Basin C-1 Runoff Area=0.590 ac 83.22% Impervious Runoff Depth=3.14"
Tc=5.0 min CN=92 Runoff=3.35 cfs 0.154 af

Subcatchment27S: Basin C-2 Runoff Area=0.279 ac 0.00% Impervious Runoff Depth=1.04"
Tc=5.0 min CN=65 Runoff=0.55 cfs 0.024 af

Subcatchment28S: Basin D-1 Runoff Area=0.205 ac 85.85% Impervious Runoff Depth=3.24"
Tc=5.0 min CN=93 Runoff=1.19 cfs 0.055 af

Subcatchment29S: Basin D-2 Runoff Area=0.056 ac 0.00% Impervious Runoff Depth=1.04"
Tc=5.0 min CN=65 Runoff=0.11 cfs 0.005 af

Subcatchment34S: Undetained Runoff Area=1.093 ac 35.04% Impervious Runoff Depth=1.83"
Tc=5.0 min CN=77 Runoff=3.93 cfs 0.166 af

Subcatchment36S: Existing Runoff Area=3.460 ac 0.00% Impervious Runoff Depth=1.04"
Tc=5.0 min CN=65 Runoff=6.83 cfs 0.300 af

Reach 38R: Post-Develpment Inflow=5.44 cfs 0.553 af
Outflow=5.44 cfs 0.553 af

Pond 21P: Biofilter A Peak Elev=928.07' Storage=0.047 af Inflow=3.08 cfs 0.134 af
Discarded=0.02 cfs 0.016 af Primary=1.13 cfs 0.118 af Outflow=1.15 cfs 0.134 af

Pond 22P: Post-DevelopmentADS System Peak Elev=917.77' Storage=2,342 cf Inflow=3.89 cfs 0.178 af
Discarded=0.02 cfs 0.022 af Primary=1.66 cfs 0.156 af Outflow=1.67 cfs 0.178 af

Pond 25P: Biofilter B Peak Elev=926.06' Storage=0.056 af Inflow=2.47 cfs 0.204 af
Discarded=0.02 cfs 0.019 af Primary=1.00 cfs 0.185 af Outflow=1.02 cfs 0.204 af

Pond 33P: Biofilter D Peak Elev=922.51' Storage=0.022 af Inflow=1.30 cfs 0.060 af
Discarded=0.01 cfs 0.015 af Primary=0.39 cfs 0.045 af Outflow=0.40 cfs 0.060 af

Total Runoff Area = 6.914 ac Runoff Volume = 0.925 af Average Runoff Depth = 1.61"
76.61% Pervious = 5.297 ac 23.39% Impervious = 1.617 ac

Summary for Subcatchment 19S: Basin A-1

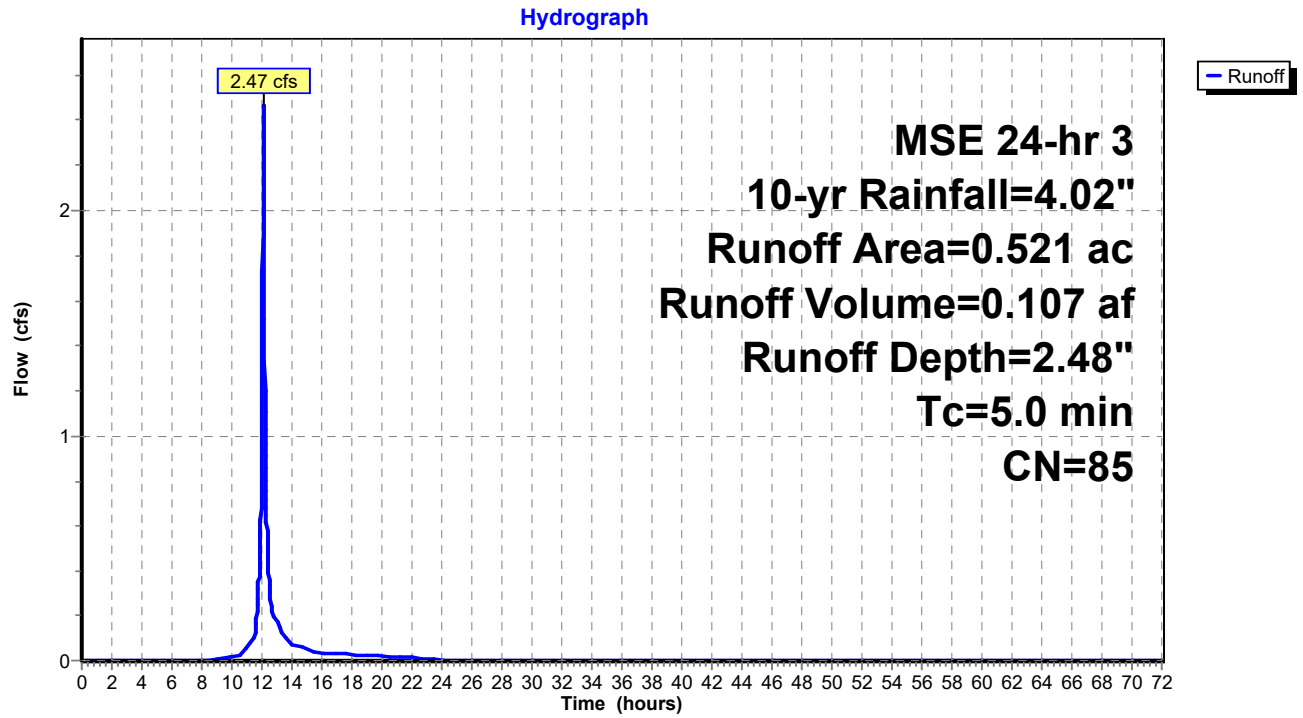
Runoff = 2.47 cfs @ 12.12 hrs, Volume= 0.107 af, Depth= 2.48"
Routed to Pond 21P : Biofilter A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.02"

	Area (ac)	CN	Description
*	0.265	98	Pave
*	0.209	65	Woodland
*	0.047	98	Pond Surface
	0.521	85	Weighted Average
	0.209		40.12% Pervious Area
	0.312		59.88% Impervious Area

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

Subcatchment 19S: Basin A-1



Hydrograph for Subcatchment 19S: Basin A-1

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	0.07	0.00	0.00
4.00	0.10	0.00	0.00
5.00	0.15	0.00	0.00
6.00	0.20	0.00	0.00
7.00	0.27	0.00	0.00
8.00	0.34	0.00	0.00
9.00	0.41	0.00	0.00
10.00	0.55	0.02	0.01
11.00	0.77	0.08	0.06
12.00	1.86	0.69	**1.13**
13.00	3.25	1.80	**0.18**
14.00	3.47	1.99	0.07
15.00	3.61	2.11	0.06
16.00	3.68	2.18	0.03
17.00	3.75	2.24	0.03
18.00	3.82	2.29	0.03
19.00	3.87	2.34	0.02
20.00	3.92	2.38	0.02
21.00	3.95	2.42	0.02
22.00	3.98	2.44	0.01
23.00	4.01	2.46	0.01
24.00	**4.02**	**2.48**	0.01
25.00	4.02	2.48	0.00
26.00	4.02	2.48	0.00
27.00	4.02	2.48	0.00
28.00	4.02	2.48	0.00
29.00	4.02	2.48	0.00
30.00	4.02	2.48	0.00
31.00	4.02	2.48	0.00
32.00	4.02	2.48	0.00
33.00	4.02	2.48	0.00
34.00	4.02	2.48	0.00
35.00	4.02	2.48	0.00
36.00	4.02	2.48	0.00
37.00	4.02	2.48	0.00
38.00	4.02	2.48	0.00
39.00	4.02	2.48	0.00
40.00	4.02	2.48	0.00
41.00	4.02	2.48	0.00
42.00	4.02	2.48	0.00
43.00	4.02	2.48	0.00
44.00	4.02	2.48	0.00
45.00	4.02	2.48	0.00
46.00	4.02	2.48	0.00
47.00	4.02	2.48	0.00
48.00	4.02	2.48	0.00
49.00	4.02	2.48	0.00
50.00	4.02	2.48	0.00
51.00	4.02	2.48	0.00
52.00	4.02	2.48	0.00
53.00	4.02	2.48	0.00
54.00	4.02	2.48	0.00
55.00	4.02	2.48	0.00
56.00	4.02	2.48	0.00
57.00	4.02	2.48	0.00
58.00	4.02	2.48	0.00
59.00	4.02	2.48	0.00
60.00	4.02	2.48	0.00
61.00	4.02	2.48	0.00
62.00	4.02	2.48	0.00
63.00	4.02	2.48	0.00
64.00	4.02	2.48	0.00
65.00	4.02	2.48	0.00
66.00	4.02	2.48	0.00
67.00	4.02	2.48	0.00
68.00	4.02	2.48	0.00
69.00	4.02	2.48	0.00
70.00	4.02	2.48	0.00
71.00	4.02	2.48	0.00
72.00	4.02	2.48	0.00

Summary for Subcatchment 20S: BASIN A-2

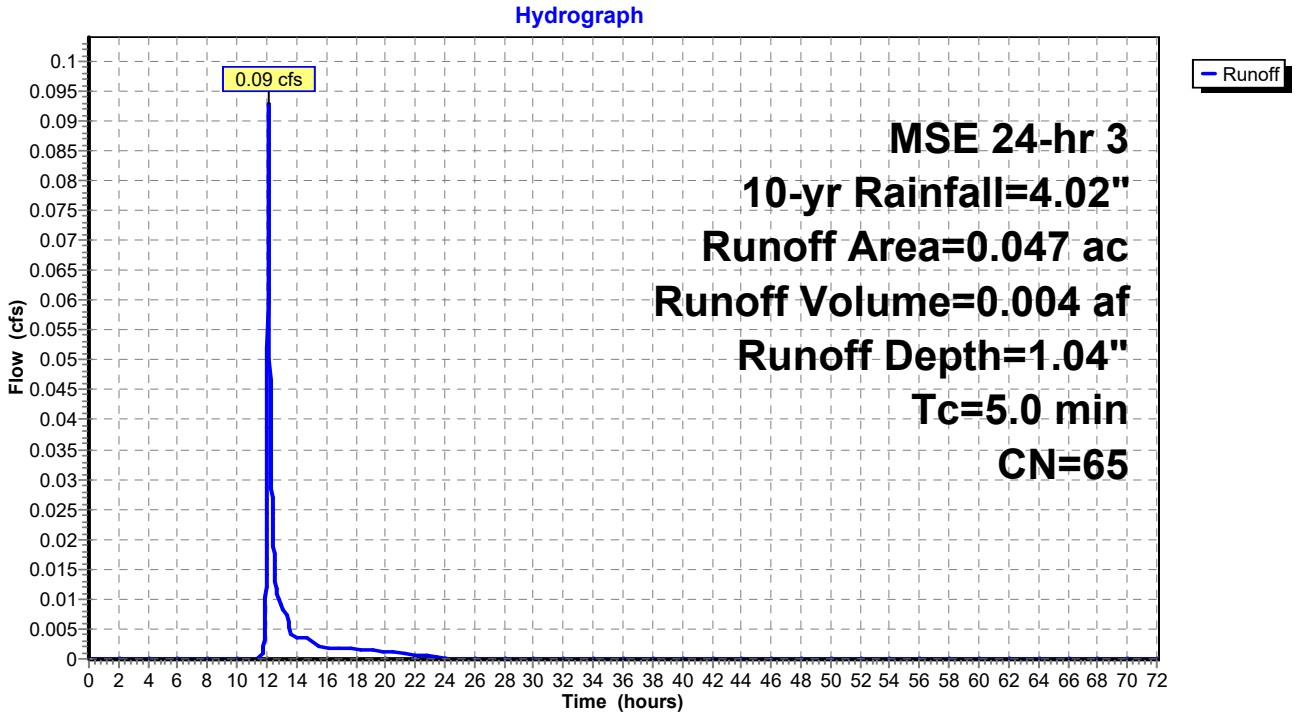
Runoff = 0.09 cfs @ 12.13 hrs, Volume= 0.004 af, Depth= 1.04"
Routed to Pond 21P : Biofilter A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.02"

	Area (ac)	CN	Description
*	0.047	65	Undisturbed Woodland
	0.047		100.00% Pervious Area

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

Subcatchment 20S: BASIN A-2



Hydrograph for Subcatchment 20S: BASIN A-2

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	0.07	0.00	0.00
4.00	0.10	0.00	0.00
5.00	0.15	0.00	0.00
6.00	0.20	0.00	0.00
7.00	0.27	0.00	0.00
8.00	0.34	0.00	0.00
9.00	0.41	0.00	0.00
10.00	0.55	0.00	0.00
11.00	0.77	0.00	0.00
12.00	1.86	0.10	**0.03**
13.00	3.25	0.62	**0.01**
14.00	3.47	0.74	0.00
15.00	3.61	0.81	0.00
16.00	3.68	0.85	0.00
17.00	3.75	0.89	0.00
18.00	3.82	0.92	0.00
19.00	3.87	0.95	0.00
20.00	3.92	0.98	0.00
21.00	3.95	1.00	0.00
22.00	3.98	1.02	0.00
23.00	4.01	1.03	0.00
24.00	**4.02**	**1.04**	0.00
25.00	4.02	1.04	0.00
26.00	4.02	1.04	0.00
27.00	4.02	1.04	0.00
28.00	4.02	1.04	0.00
29.00	4.02	1.04	0.00
30.00	4.02	1.04	0.00
31.00	4.02	1.04	0.00
32.00	4.02	1.04	0.00
33.00	4.02	1.04	0.00
34.00	4.02	1.04	0.00
35.00	4.02	1.04	0.00
36.00	4.02	1.04	0.00
37.00	4.02	1.04	0.00
38.00	4.02	1.04	0.00
39.00	4.02	1.04	0.00
40.00	4.02	1.04	0.00
41.00	4.02	1.04	0.00
42.00	4.02	1.04	0.00
43.00	4.02	1.04	0.00
44.00	4.02	1.04	0.00
45.00	4.02	1.04	0.00
46.00	4.02	1.04	0.00
47.00	4.02	1.04	0.00
48.00	4.02	1.04	0.00
49.00	4.02	1.04	0.00
50.00	4.02	1.04	0.00
51.00	4.02	1.04	0.00
52.00	4.02	1.04	0.00
53.00	4.02	1.04	0.00
54.00	4.02	1.04	0.00
55.00	4.02	1.04	0.00
56.00	4.02	1.04	0.00
57.00	4.02	1.04	0.00
58.00	4.02	1.04	0.00
59.00	4.02	1.04	0.00
60.00	4.02	1.04	0.00
61.00	4.02	1.04	0.00
62.00	4.02	1.04	0.00
63.00	4.02	1.04	0.00
64.00	4.02	1.04	0.00
65.00	4.02	1.04	0.00
66.00	4.02	1.04	0.00
67.00	4.02	1.04	0.00
68.00	4.02	1.04	0.00
69.00	4.02	1.04	0.00
70.00	4.02	1.04	0.00
71.00	4.02	1.04	0.00
72.00	4.02	1.04	0.00

Summary for Subcatchment 22S: From Off Site

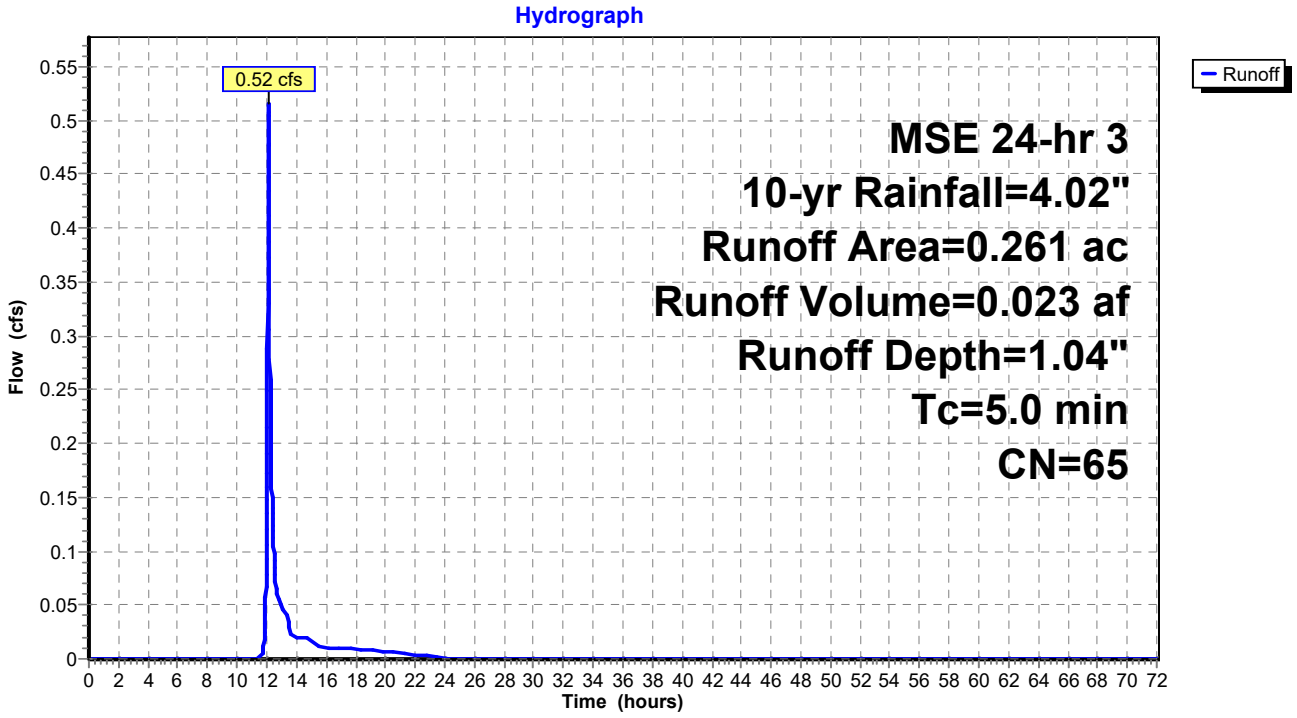
Runoff = 0.52 cfs @ 12.13 hrs, Volume= 0.023 af, Depth= 1.04"
Routed to Pond 21P : Biofilter A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.02"

	Area (ac)	CN	Description
*	0.261	65	Undisturbed Woodland
	0.261		100.00% Pervious Area

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

Subcatchment 22S: From Off Site



Hydrograph for Subcatchment 22S: From Off 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	0.07	0.00	0.00
4.00	0.10	0.00	0.00
5.00	0.15	0.00	0.00
6.00	0.20	0.00	0.00
7.00	0.27	0.00	0.00
8.00	0.34	0.00	0.00
9.00	0.41	0.00	0.00
10.00	0.55	0.00	0.00
11.00	0.77	0.00	0.00
12.00	1.86	0.10	**0.15**
13.00	3.25	0.62	**0.05**
14.00	3.47	0.74	0.02
15.00	3.61	0.81	0.02
16.00	3.68	0.85	0.01
17.00	3.75	0.89	0.01
18.00	3.82	0.92	0.01
19.00	3.87	0.95	0.01
20.00	3.92	0.98	0.01
21.00	3.95	1.00	0.01
22.00	3.98	1.02	0.00
23.00	4.01	1.03	0.00
24.00	**4.02**	**1.04**	0.00
25.00	4.02	1.04	0.00
26.00	4.02	1.04	0.00
27.00	4.02	1.04	0.00
28.00	4.02	1.04	0.00
29.00	4.02	1.04	0.00
30.00	4.02	1.04	0.00
31.00	4.02	1.04	0.00
32.00	4.02	1.04	0.00
33.00	4.02	1.04	0.00
34.00	4.02	1.04	0.00
35.00	4.02	1.04	0.00
36.00	4.02	1.04	0.00
37.00	4.02	1.04	0.00
38.00	4.02	1.04	0.00
39.00	4.02	1.04	0.00
40.00	4.02	1.04	0.00
41.00	4.02	1.04	0.00
42.00	4.02	1.04	0.00
43.00	4.02	1.04	0.00
44.00	4.02	1.04	0.00
45.00	4.02	1.04	0.00
46.00	4.02	1.04	0.00
47.00	4.02	1.04	0.00
48.00	4.02	1.04	0.00
49.00	4.02	1.04	0.00
50.00	4.02	1.04	0.00
51.00	4.02	1.04	0.00
52.00	4.02	1.04	0.00
53.00	4.02	1.04	0.00
54.00	4.02	1.04	0.00
55.00	4.02	1.04	0.00
56.00	4.02	1.04	0.00
57.00	4.02	1.04	0.00
58.00	4.02	1.04	0.00
59.00	4.02	1.04	0.00
60.00	4.02	1.04	0.00
61.00	4.02	1.04	0.00
62.00	4.02	1.04	0.00
63.00	4.02	1.04	0.00
64.00	4.02	1.04	0.00
65.00	4.02	1.04	0.00
66.00	4.02	1.04	0.00
67.00	4.02	1.04	0.00
68.00	4.02	1.04	0.00
69.00	4.02	1.04	0.00
70.00	4.02	1.04	0.00
71.00	4.02	1.04	0.00
72.00	4.02	1.04	0.00

Summary for Subcatchment 23S: Basin B-1

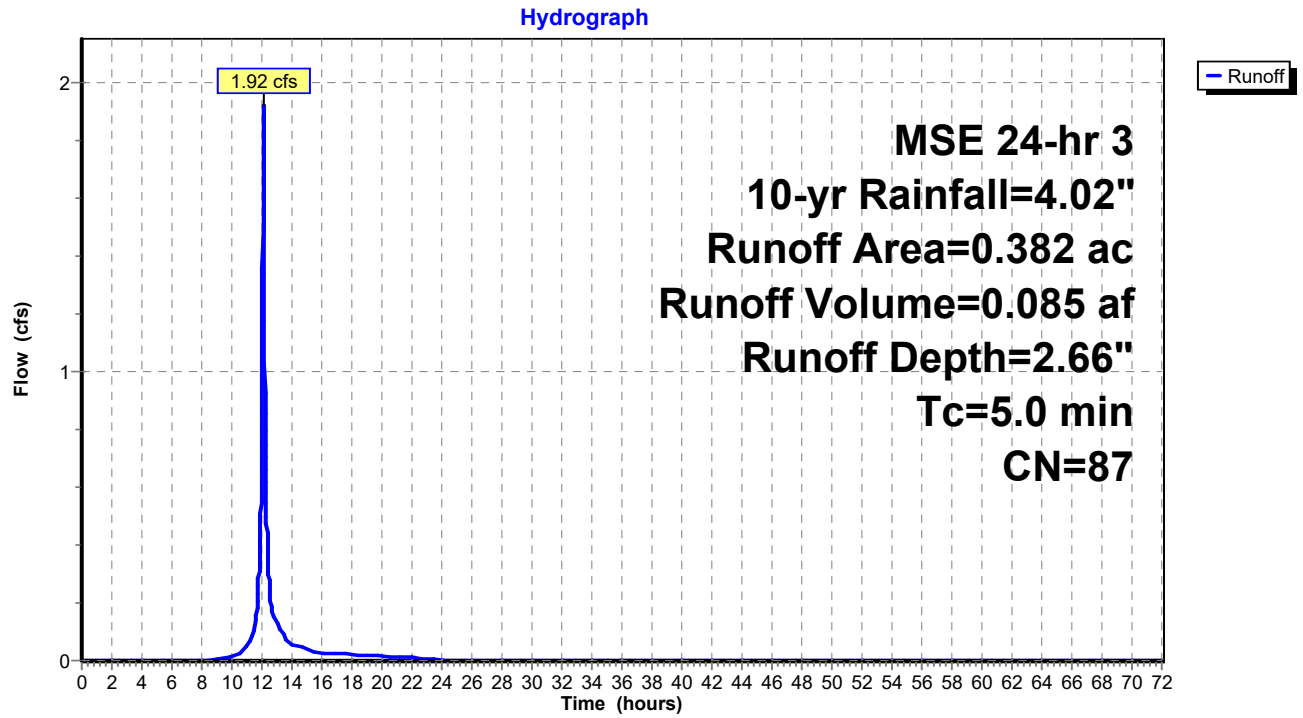
Runoff = 1.92 cfs @ 12.12 hrs, Volume= 0.085 af, Depth= 2.66"
Routed to Pond 25P : Biofilter B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.02"

	Area (ac)	CN	Description
*	0.205	98	Pave
*	0.127	65	Woodland
*	0.050	98	Pond Surface
	0.382	87	Weighted Average
	0.127		33.25% Pervious Area
	0.255		66.75% Impervious Area

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

Subcatchment 23S: Basin B-1



Hydrograph for Subcatchment 23S: Basin B-1

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	0.07	0.00	0.00
4.00	0.10	0.00	0.00
5.00	0.15	0.00	0.00
6.00	0.20	0.00	0.00
7.00	0.27	0.00	0.00
8.00	0.34	0.00	0.00
9.00	0.41	0.01	0.00
10.00	0.55	0.04	0.01
11.00	0.77	0.11	0.05
12.00	1.86	0.80	**0.90**
13.00	3.25	1.95	**0.13**
14.00	3.47	2.15	0.05
15.00	3.61	2.28	0.05
16.00	3.68	2.35	0.03
17.00	3.75	2.41	0.02
18.00	3.82	2.47	0.02
19.00	3.87	2.52	0.02
20.00	3.92	2.56	0.02
21.00	3.95	2.59	0.01
22.00	3.98	2.62	0.01
23.00	4.01	2.64	0.01
24.00	**4.02**	**2.66**	0.00
25.00	4.02	2.66	0.00
26.00	4.02	2.66	0.00
27.00	4.02	2.66	0.00
28.00	4.02	2.66	0.00
29.00	4.02	2.66	0.00
30.00	4.02	2.66	0.00
31.00	4.02	2.66	0.00
32.00	4.02	2.66	0.00
33.00	4.02	2.66	0.00
34.00	4.02	2.66	0.00
35.00	4.02	2.66	0.00
36.00	4.02	2.66	0.00
37.00	4.02	2.66	0.00
38.00	4.02	2.66	0.00
39.00	4.02	2.66	0.00
40.00	4.02	2.66	0.00
41.00	4.02	2.66	0.00
42.00	4.02	2.66	0.00
43.00	4.02	2.66	0.00
44.00	4.02	2.66	0.00
45.00	4.02	2.66	0.00
46.00	4.02	2.66	0.00
47.00	4.02	2.66	0.00
48.00	4.02	2.66	0.00
49.00	4.02	2.66	0.00
50.00	4.02	2.66	0.00
51.00	4.02	2.66	0.00
52.00	4.02	2.66	0.00
53.00	4.02	2.66	0.00
54.00	4.02	2.66	0.00
55.00	4.02	2.66	0.00
56.00	4.02	2.66	0.00
57.00	4.02	2.66	0.00
58.00	4.02	2.66	0.00
59.00	4.02	2.66	0.00
60.00	4.02	2.66	0.00
61.00	4.02	2.66	0.00
62.00	4.02	2.66	0.00
63.00	4.02	2.66	0.00
64.00	4.02	2.66	0.00
65.00	4.02	2.66	0.00
66.00	4.02	2.66	0.00
67.00	4.02	2.66	0.00
68.00	4.02	2.66	0.00
69.00	4.02	2.66	0.00
70.00	4.02	2.66	0.00
71.00	4.02	2.66	0.00
72.00	4.02	2.66	0.00

Summary for Subcatchment 24S: Basin B-2

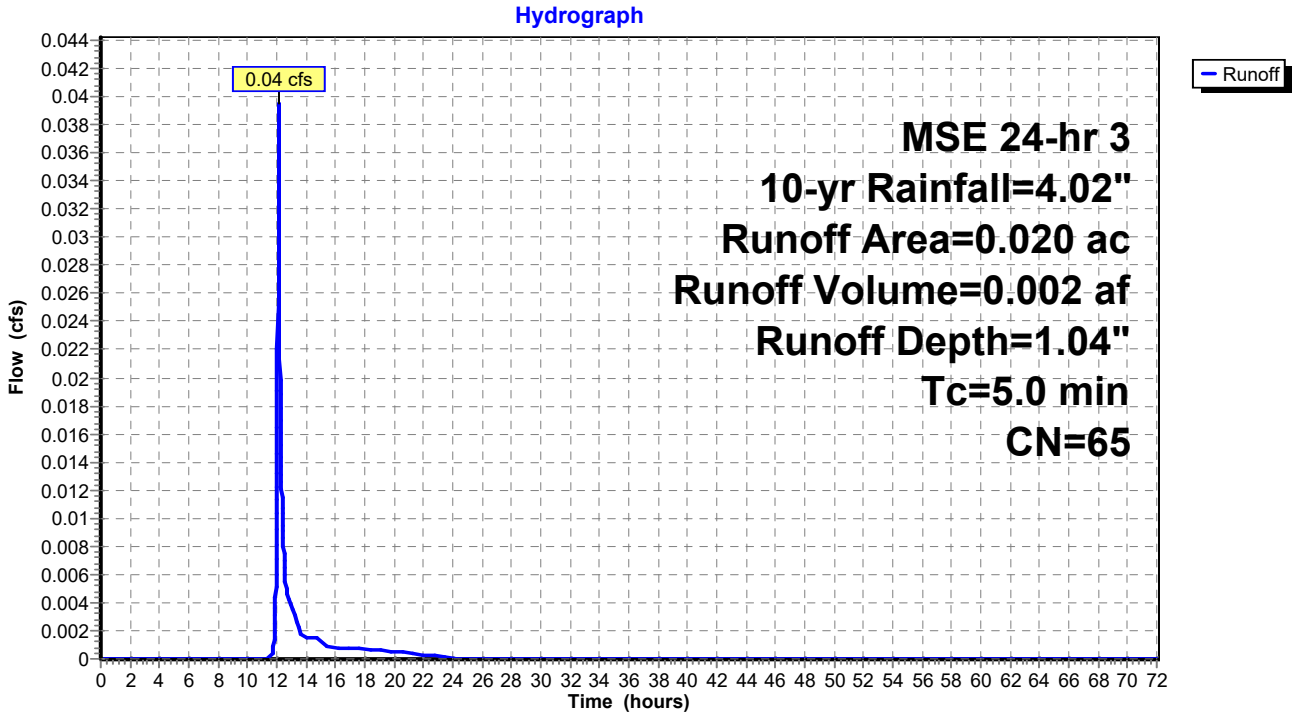
Runoff = 0.04 cfs @ 12.13 hrs, Volume= 0.002 af, Depth= 1.04"
Routed to Pond 25P : Biofilter B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.02"

	Area (ac)	CN	Description
*	0.020	65	Undisturbed Woodland
	0.020		100.00% Pervious Area

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

Subcatchment 24S: Basin B-2



Hydrograph for Subcatchment 24S: Basin B-2

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	0.07	0.00	0.00
4.00	0.10	0.00	0.00
5.00	0.15	0.00	0.00
6.00	0.20	0.00	0.00
7.00	0.27	0.00	0.00
8.00	0.34	0.00	0.00
9.00	0.41	0.00	0.00
10.00	0.55	0.00	0.00
11.00	0.77	0.00	0.00
12.00	1.86	0.10	**0.01**
13.00	3.25	0.62	**0.00**
14.00	3.47	0.74	0.00
15.00	3.61	0.81	0.00
16.00	3.68	0.85	0.00
17.00	3.75	0.89	0.00
18.00	3.82	0.92	0.00
19.00	3.87	0.95	0.00
20.00	3.92	0.98	0.00
21.00	3.95	1.00	0.00
22.00	3.98	1.02	0.00
23.00	4.01	1.03	0.00
24.00	**4.02**	**1.04**	0.00
25.00	4.02	1.04	0.00
26.00	4.02	1.04	0.00
27.00	4.02	1.04	0.00
28.00	4.02	1.04	0.00
29.00	4.02	1.04	0.00
30.00	4.02	1.04	0.00
31.00	4.02	1.04	0.00
32.00	4.02	1.04	0.00
33.00	4.02	1.04	0.00
34.00	4.02	1.04	0.00
35.00	4.02	1.04	0.00
36.00	4.02	1.04	0.00
37.00	4.02	1.04	0.00
38.00	4.02	1.04	0.00
39.00	4.02	1.04	0.00
40.00	4.02	1.04	0.00
41.00	4.02	1.04	0.00
42.00	4.02	1.04	0.00
43.00	4.02	1.04	0.00
44.00	4.02	1.04	0.00
45.00	4.02	1.04	0.00
46.00	4.02	1.04	0.00
47.00	4.02	1.04	0.00
48.00	4.02	1.04	0.00
49.00	4.02	1.04	0.00
50.00	4.02	1.04	0.00
51.00	4.02	1.04	0.00
52.00	4.02	1.04	0.00
53.00	4.02	1.04	0.00
54.00	4.02	1.04	0.00
55.00	4.02	1.04	0.00
56.00	4.02	1.04	0.00
57.00	4.02	1.04	0.00
58.00	4.02	1.04	0.00
59.00	4.02	1.04	0.00
60.00	4.02	1.04	0.00
61.00	4.02	1.04	0.00
62.00	4.02	1.04	0.00
63.00	4.02	1.04	0.00
64.00	4.02	1.04	0.00
65.00	4.02	1.04	0.00
66.00	4.02	1.04	0.00
67.00	4.02	1.04	0.00
68.00	4.02	1.04	0.00
69.00	4.02	1.04	0.00
70.00	4.02	1.04	0.00
71.00	4.02	1.04	0.00
72.00	4.02	1.04	0.00

Summary for Subcatchment 26S: Basin C-1

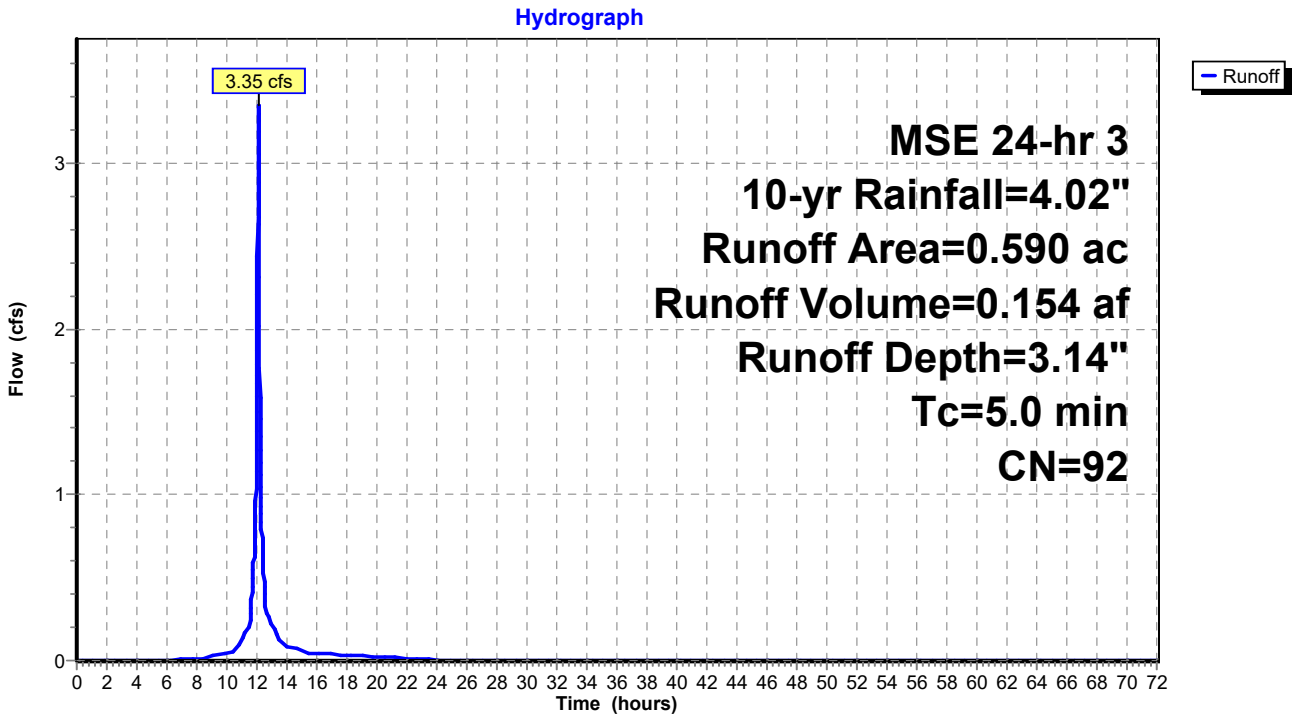
Runoff = 3.35 cfs @ 12.12 hrs, Volume= 0.154 af, Depth= 3.14"
Routed to Pond 22P : Post-Development ADS System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.02"

	Area (ac)	CN	Description
*	0.285	98	Pave
*	0.099	65	Woodland
*	0.206	98	Roof
	0.590	92	Weighted Average
	0.099		16.78% Pervious Area
	0.491		83.22% Impervious Area

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

Subcatchment 26S: Basin C-1



Hydrograph for Subcatchment 26S: Basin C-1

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	0.07	0.00	0.00
4.00	0.10	0.00	0.00
5.00	0.15	0.00	0.00
6.00	0.20	0.00	0.00
7.00	0.27	0.01	0.01
8.00	0.34	0.03	0.01
9.00	0.41	0.05	0.02
10.00	0.55	0.11	0.04
11.00	0.77	0.25	0.13
12.00	1.86	1.11	**1.67**
13.00	3.25	2.39	**0.22**
14.00	3.47	2.61	0.08
15.00	3.61	2.74	0.07
16.00	3.68	2.81	0.04
17.00	3.75	2.88	0.04
18.00	3.82	2.94	0.03
19.00	3.87	2.99	0.03
20.00	3.92	3.04	0.02
21.00	3.95	3.07	0.02
22.00	3.98	3.10	0.02
23.00	4.01	3.12	0.01
24.00	**4.02**	**3.14**	0.01
25.00	4.02	3.14	0.00
26.00	4.02	3.14	0.00
27.00	4.02	3.14	0.00
28.00	4.02	3.14	0.00
29.00	4.02	3.14	0.00
30.00	4.02	3.14	0.00
31.00	4.02	3.14	0.00
32.00	4.02	3.14	0.00
33.00	4.02	3.14	0.00
34.00	4.02	3.14	0.00
35.00	4.02	3.14	0.00
36.00	4.02	3.14	0.00
37.00	4.02	3.14	0.00
38.00	4.02	3.14	0.00
39.00	4.02	3.14	0.00
40.00	4.02	3.14	0.00
41.00	4.02	3.14	0.00
42.00	4.02	3.14	0.00
43.00	4.02	3.14	0.00
44.00	4.02	3.14	0.00
45.00	4.02	3.14	0.00
46.00	4.02	3.14	0.00
47.00	4.02	3.14	0.00
48.00	4.02	3.14	0.00
49.00	4.02	3.14	0.00
50.00	4.02	3.14	0.00
51.00	4.02	3.14	0.00
52.00	4.02	3.14	0.00
53.00	4.02	3.14	0.00
54.00	4.02	3.14	0.00
55.00	4.02	3.14	0.00
56.00	4.02	3.14	0.00
57.00	4.02	3.14	0.00
58.00	4.02	3.14	0.00
59.00	4.02	3.14	0.00
60.00	4.02	3.14	0.00
61.00	4.02	3.14	0.00
62.00	4.02	3.14	0.00
63.00	4.02	3.14	0.00
64.00	4.02	3.14	0.00
65.00	4.02	3.14	0.00
66.00	4.02	3.14	0.00
67.00	4.02	3.14	0.00
68.00	4.02	3.14	0.00
69.00	4.02	3.14	0.00
70.00	4.02	3.14	0.00
71.00	4.02	3.14	0.00
72.00	4.02	3.14	0.00

Summary for Subcatchment 27S: Basin C-2

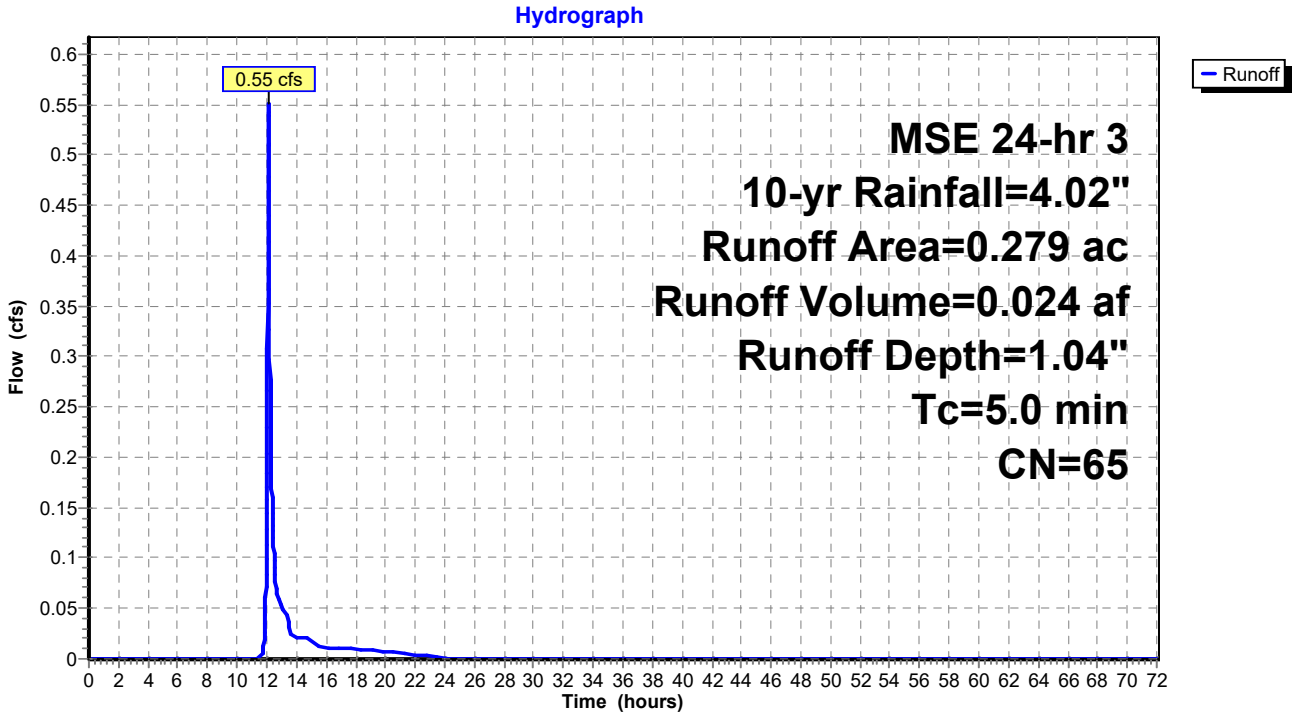
Runoff = 0.55 cfs @ 12.13 hrs, Volume= 0.024 af, Depth= 1.04"
Routed to Pond 22P : Post-Development ADS System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.02"

	Area (ac)	CN	Description
*	0.279	65	Undisturbed Woodland
	0.279		100.00% Pervious Area

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

Subcatchment 27S: Basin C-2



Hydrograph for Subcatchment 27S: Basin C-2

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	0.07	0.00	0.00
4.00	0.10	0.00	0.00
5.00	0.15	0.00	0.00
6.00	0.20	0.00	0.00
7.00	0.27	0.00	0.00
8.00	0.34	0.00	0.00
9.00	0.41	0.00	0.00
10.00	0.55	0.00	0.00
11.00	0.77	0.00	0.00
12.00	1.86	0.10	**0.16**
13.00	3.25	0.62	**0.05**
14.00	3.47	0.74	0.02
15.00	3.61	0.81	0.02
16.00	3.68	0.85	0.01
17.00	3.75	0.89	0.01
18.00	3.82	0.92	0.01
19.00	3.87	0.95	0.01
20.00	3.92	0.98	0.01
21.00	3.95	1.00	0.01
22.00	3.98	1.02	0.00
23.00	4.01	1.03	0.00
24.00	**4.02**	**1.04**	0.00
25.00	4.02	1.04	0.00
26.00	4.02	1.04	0.00
27.00	4.02	1.04	0.00
28.00	4.02	1.04	0.00
29.00	4.02	1.04	0.00
30.00	4.02	1.04	0.00
31.00	4.02	1.04	0.00
32.00	4.02	1.04	0.00
33.00	4.02	1.04	0.00
34.00	4.02	1.04	0.00
35.00	4.02	1.04	0.00
36.00	4.02	1.04	0.00
37.00	4.02	1.04	0.00
38.00	4.02	1.04	0.00
39.00	4.02	1.04	0.00
40.00	4.02	1.04	0.00
41.00	4.02	1.04	0.00
42.00	4.02	1.04	0.00
43.00	4.02	1.04	0.00
44.00	4.02	1.04	0.00
45.00	4.02	1.04	0.00
46.00	4.02	1.04	0.00
47.00	4.02	1.04	0.00
48.00	4.02	1.04	0.00
49.00	4.02	1.04	0.00
50.00	4.02	1.04	0.00
51.00	4.02	1.04	0.00
52.00	4.02	1.04	0.00
53.00	4.02	1.04	0.00
54.00	4.02	1.04	0.00
55.00	4.02	1.04	0.00
56.00	4.02	1.04	0.00
57.00	4.02	1.04	0.00
58.00	4.02	1.04	0.00
59.00	4.02	1.04	0.00
60.00	4.02	1.04	0.00
61.00	4.02	1.04	0.00
62.00	4.02	1.04	0.00
63.00	4.02	1.04	0.00
64.00	4.02	1.04	0.00
65.00	4.02	1.04	0.00
66.00	4.02	1.04	0.00
67.00	4.02	1.04	0.00
68.00	4.02	1.04	0.00
69.00	4.02	1.04	0.00
70.00	4.02	1.04	0.00
71.00	4.02	1.04	0.00
72.00	4.02	1.04	0.00

Summary for Subcatchment 28S: Basin D-1

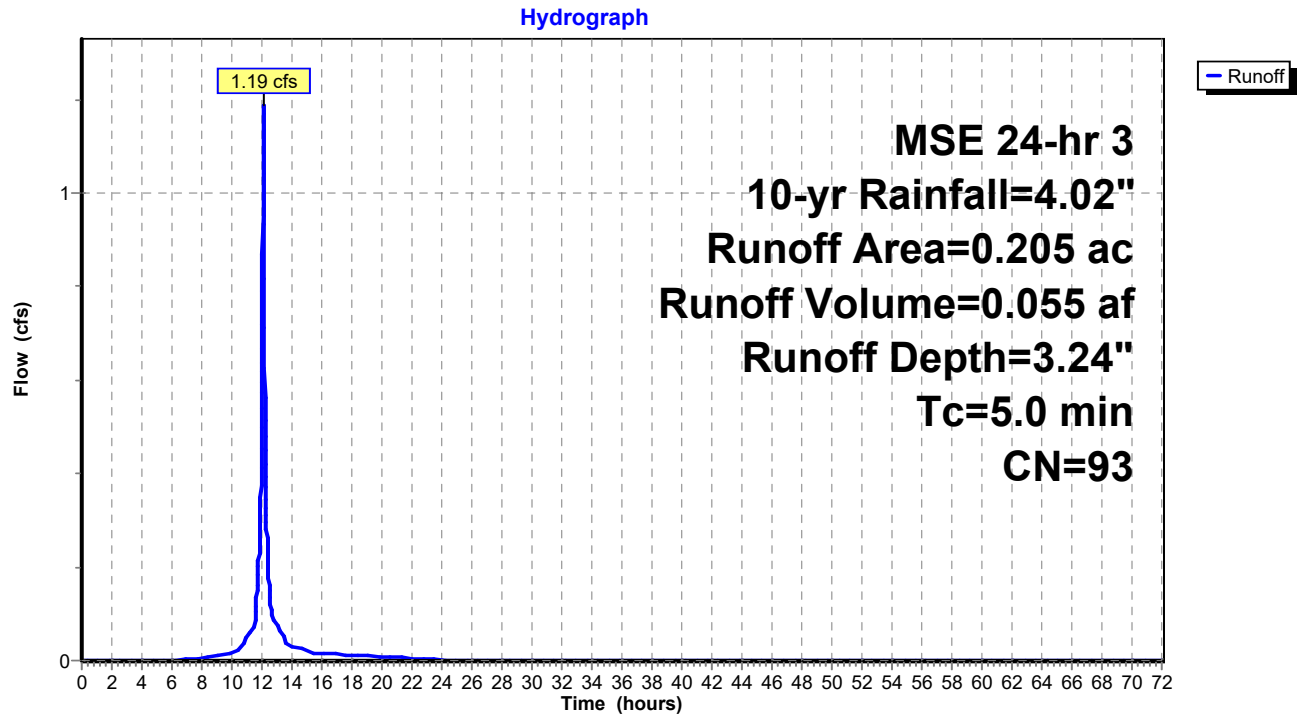
Runoff = 1.19 cfs @ 12.12 hrs, Volume= 0.055 af, Depth= 3.24"
Routed to Pond 33P : Biofilter D

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.02"

	Area (ac)	CN	Description
*	0.137	98	Pave
*	0.029	65	Woodland
*	0.039	98	Pond Surface
	0.205	93	Weighted Average
	0.029		14.15% Pervious Area
	0.176		85.85% Impervious Area

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

Subcatchment 28S: Basin D-1



Hydrograph for Subcatchment 28S: Basin D-1

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	0.07	0.00	0.00
4.00	0.10	0.00	0.00
5.00	0.15	0.00	0.00
6.00	0.20	0.00	0.00
7.00	0.27	0.02	0.00
8.00	0.34	0.04	0.01
9.00	0.41	0.07	0.01
10.00	0.55	0.14	0.02
11.00	0.77	0.28	0.05
12.00	1.86	1.19	**0.60**
13.00	3.25	2.49	**0.08**
14.00	3.47	2.70	0.03
15.00	3.61	2.84	0.03
16.00	3.68	2.91	0.01
17.00	3.75	2.98	0.01
18.00	3.82	3.04	0.01
19.00	3.87	3.09	0.01
20.00	3.92	3.14	0.01
21.00	3.95	3.17	0.01
22.00	3.98	3.20	0.01
23.00	4.01	3.23	0.00
24.00	**4.02**	**3.24**	0.00
25.00	4.02	3.24	0.00
26.00	4.02	3.24	0.00
27.00	4.02	3.24	0.00
28.00	4.02	3.24	0.00
29.00	4.02	3.24	0.00
30.00	4.02	3.24	0.00
31.00	4.02	3.24	0.00
32.00	4.02	3.24	0.00
33.00	4.02	3.24	0.00
34.00	4.02	3.24	0.00
35.00	4.02	3.24	0.00
36.00	4.02	3.24	0.00
37.00	4.02	3.24	0.00
38.00	4.02	3.24	0.00
39.00	4.02	3.24	0.00
40.00	4.02	3.24	0.00
41.00	4.02	3.24	0.00
42.00	4.02	3.24	0.00
43.00	4.02	3.24	0.00
44.00	4.02	3.24	0.00
45.00	4.02	3.24	0.00
46.00	4.02	3.24	0.00
47.00	4.02	3.24	0.00
48.00	4.02	3.24	0.00
49.00	4.02	3.24	0.00
50.00	4.02	3.24	0.00
51.00	4.02	3.24	0.00
52.00	4.02	3.24	0.00
53.00	4.02	3.24	0.00
54.00	4.02	3.24	0.00
55.00	4.02	3.24	0.00
56.00	4.02	3.24	0.00
57.00	4.02	3.24	0.00
58.00	4.02	3.24	0.00
59.00	4.02	3.24	0.00
60.00	4.02	3.24	0.00
61.00	4.02	3.24	0.00
62.00	4.02	3.24	0.00
63.00	4.02	3.24	0.00
64.00	4.02	3.24	0.00
65.00	4.02	3.24	0.00
66.00	4.02	3.24	0.00
67.00	4.02	3.24	0.00
68.00	4.02	3.24	0.00
69.00	4.02	3.24	0.00
70.00	4.02	3.24	0.00
71.00	4.02	3.24	0.00
72.00	4.02	3.24	0.00

Summary for Subcatchment 29S: Basin D-2

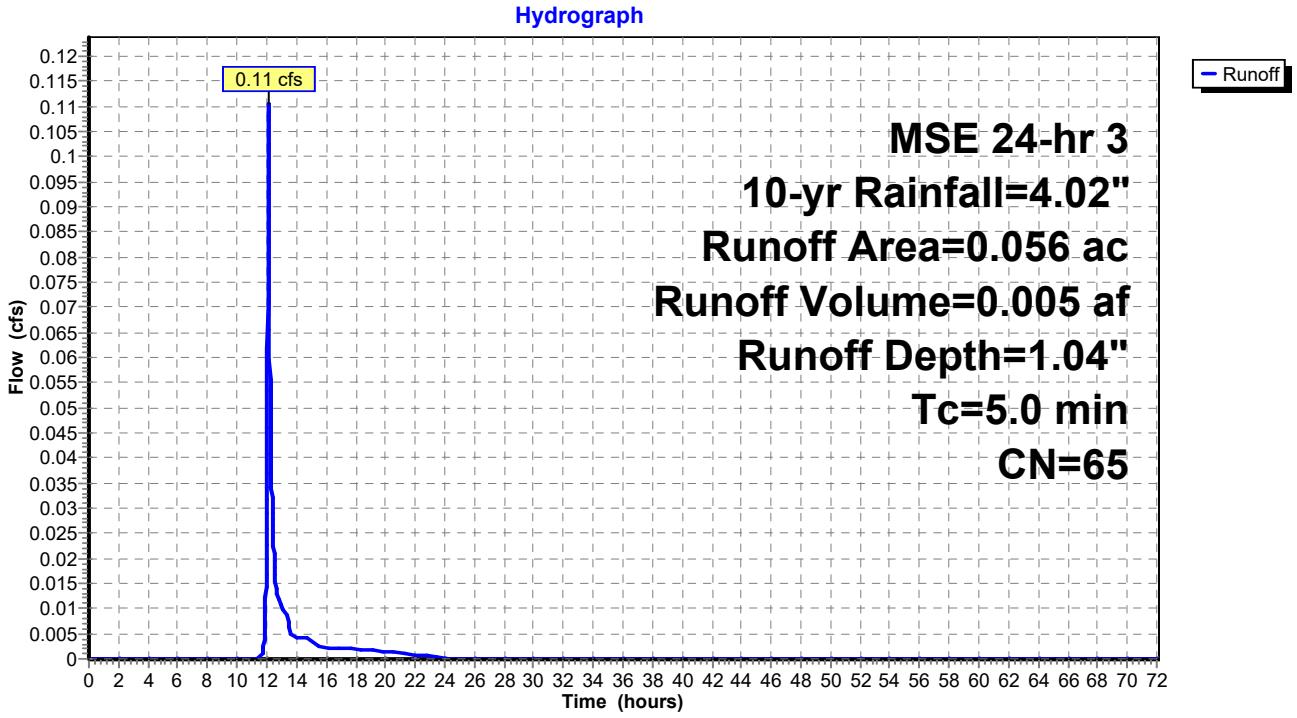
Runoff = 0.11 cfs @ 12.13 hrs, Volume= 0.005 af, Depth= 1.04"
Routed to Pond 33P : Biofilter D

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.02"

	Area (ac)	CN	Description
*	0.056	65	Undistrubed Woodland
	0.056		100.00% Pervious Area

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

Subcatchment 29S: Basin D-2



Hydrograph for Subcatchment 29S: Basin D-2

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	0.07	0.00	0.00
4.00	0.10	0.00	0.00
5.00	0.15	0.00	0.00
6.00	0.20	0.00	0.00
7.00	0.27	0.00	0.00
8.00	0.34	0.00	0.00
9.00	0.41	0.00	0.00
10.00	0.55	0.00	0.00
11.00	0.77	0.00	0.00
12.00	1.86	0.10	**0.03**
13.00	3.25	0.62	**0.01**
14.00	3.47	0.74	0.00
15.00	3.61	0.81	0.00
16.00	3.68	0.85	0.00
17.00	3.75	0.89	0.00
18.00	3.82	0.92	0.00
19.00	3.87	0.95	0.00
20.00	3.92	0.98	0.00
21.00	3.95	1.00	0.00
22.00	3.98	1.02	0.00
23.00	4.01	1.03	0.00
24.00	**4.02**	**1.04**	0.00
25.00	4.02	1.04	0.00
26.00	4.02	1.04	0.00
27.00	4.02	1.04	0.00
28.00	4.02	1.04	0.00
29.00	4.02	1.04	0.00
30.00	4.02	1.04	0.00
31.00	4.02	1.04	0.00
32.00	4.02	1.04	0.00
33.00	4.02	1.04	0.00
34.00	4.02	1.04	0.00
35.00	4.02	1.04	0.00
36.00	4.02	1.04	0.00
37.00	4.02	1.04	0.00
38.00	4.02	1.04	0.00
39.00	4.02	1.04	0.00
40.00	4.02	1.04	0.00
41.00	4.02	1.04	0.00
42.00	4.02	1.04	0.00
43.00	4.02	1.04	0.00
44.00	4.02	1.04	0.00
45.00	4.02	1.04	0.00
46.00	4.02	1.04	0.00
47.00	4.02	1.04	0.00
48.00	4.02	1.04	0.00
49.00	4.02	1.04	0.00
50.00	4.02	1.04	0.00
51.00	4.02	1.04	0.00
52.00	4.02	1.04	0.00
53.00	4.02	1.04	0.00
54.00	4.02	1.04	0.00
55.00	4.02	1.04	0.00
56.00	4.02	1.04	0.00
57.00	4.02	1.04	0.00
58.00	4.02	1.04	0.00
59.00	4.02	1.04	0.00
60.00	4.02	1.04	0.00
61.00	4.02	1.04	0.00
62.00	4.02	1.04	0.00
63.00	4.02	1.04	0.00
64.00	4.02	1.04	0.00
65.00	4.02	1.04	0.00
66.00	4.02	1.04	0.00
67.00	4.02	1.04	0.00
68.00	4.02	1.04	0.00
69.00	4.02	1.04	0.00
70.00	4.02	1.04	0.00
71.00	4.02	1.04	0.00
72.00	4.02	1.04	0.00

Summary for Subcatchment 34S: Undetained

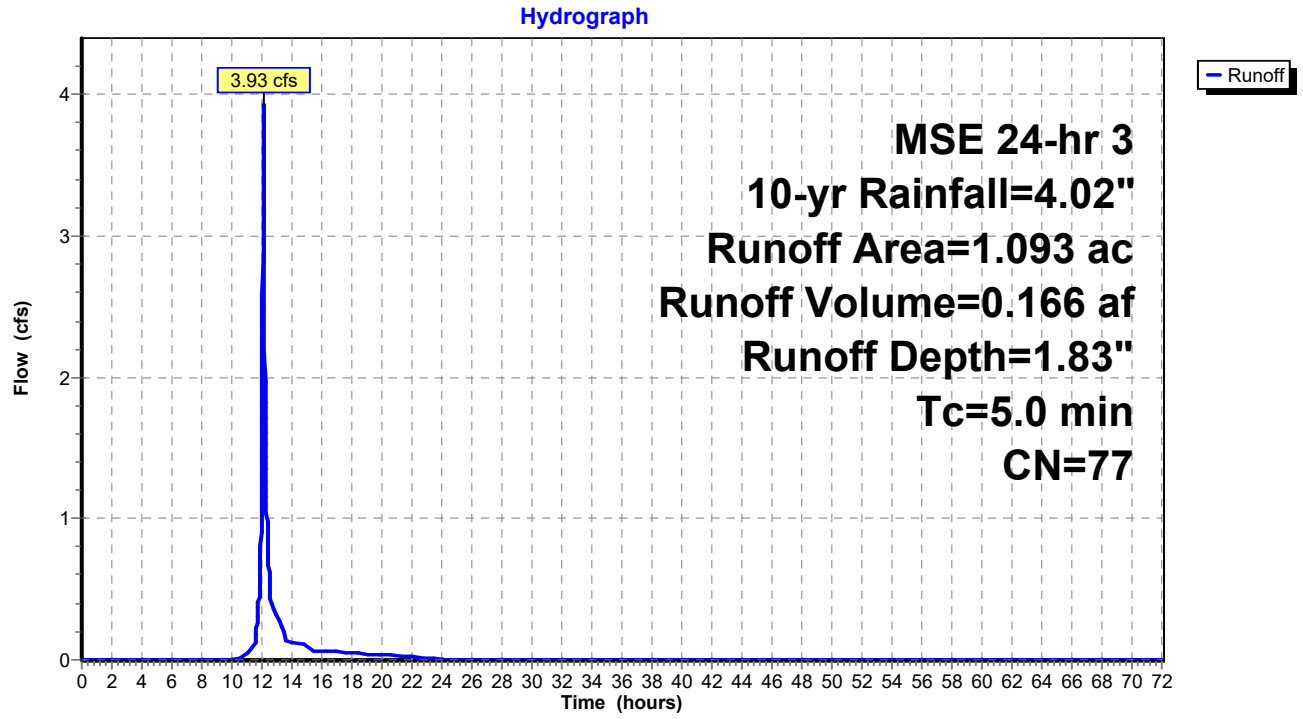
Runoff = 3.93 cfs @ 12.13 hrs, Volume= 0.166 af, Depth= 1.83"
Routed to Reach 38R : Post-Develpment

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.02"

	Area (ac)	CN	Description
*	0.210	98	Roof
*	0.173	98	Pave
*	0.600	65	Woodland
*	0.110	65	Natural Paths
	1.093	77	Weighted Average
	0.710		64.96% Pervious Area
	0.383		35.04% Impervious Area

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

Subcatchment 34S: Undetained



Hydrograph for Subcatchment 34S: 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	0.07	0.00	0.00
4.00	0.10	0.00	0.00
5.00	0.15	0.00	0.00
6.00	0.20	0.00	0.00
7.00	0.27	0.00	0.00
8.00	0.34	0.00	0.00
9.00	0.41	0.00	0.00
10.00	0.55	0.00	0.00
11.00	0.77	0.01	0.04
12.00	1.86	0.38	**1.59**
13.00	3.25	1.24	**0.31**
14.00	3.47	1.41	0.12
15.00	3.61	1.51	0.11
16.00	3.68	1.57	0.06
17.00	3.75	1.62	0.06
18.00	3.82	1.67	0.05
19.00	3.87	1.71	0.04
20.00	3.92	1.75	0.04
21.00	3.95	1.78	0.03
22.00	3.98	1.80	0.02
23.00	4.01	1.82	0.02
24.00	**4.02**	**1.83**	0.01
25.00	4.02	1.83	0.00
26.00	4.02	1.83	0.00
27.00	4.02	1.83	0.00
28.00	4.02	1.83	0.00
29.00	4.02	1.83	0.00
30.00	4.02	1.83	0.00
31.00	4.02	1.83	0.00
32.00	4.02	1.83	0.00
33.00	4.02	1.83	0.00
34.00	4.02	1.83	0.00
35.00	4.02	1.83	0.00
36.00	4.02	1.83	0.00
37.00	4.02	1.83	0.00
38.00	4.02	1.83	0.00
39.00	4.02	1.83	0.00
40.00	4.02	1.83	0.00
41.00	4.02	1.83	0.00
42.00	4.02	1.83	0.00
43.00	4.02	1.83	0.00
44.00	4.02	1.83	0.00
45.00	4.02	1.83	0.00
46.00	4.02	1.83	0.00
47.00	4.02	1.83	0.00
48.00	4.02	1.83	0.00
49.00	4.02	1.83	0.00
50.00	4.02	1.83	0.00
51.00	4.02	1.83	0.00
52.00	4.02	1.83	0.00
53.00	4.02	1.83	0.00
54.00	4.02	1.83	0.00
55.00	4.02	1.83	0.00
56.00	4.02	1.83	0.00
57.00	4.02	1.83	0.00
58.00	4.02	1.83	0.00
59.00	4.02	1.83	0.00
60.00	4.02	1.83	0.00
61.00	4.02	1.83	0.00
62.00	4.02	1.83	0.00
63.00	4.02	1.83	0.00
64.00	4.02	1.83	0.00
65.00	4.02	1.83	0.00
66.00	4.02	1.83	0.00
67.00	4.02	1.83	0.00
68.00	4.02	1.83	0.00
69.00	4.02	1.83	0.00
70.00	4.02	1.83	0.00
71.00	4.02	1.83	0.00
72.00	4.02	1.83	0.00

Summary for Subcatchment 36S: Existing

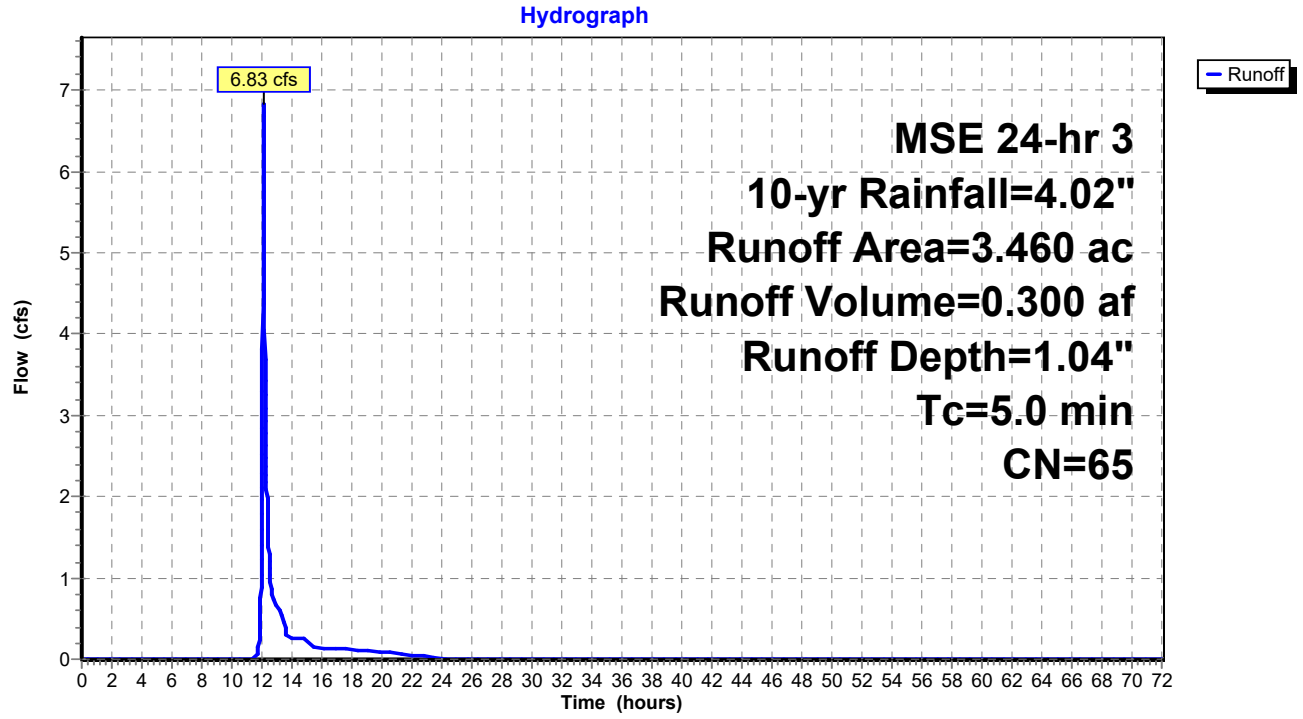
Runoff = 6.83 cfs @ 12.13 hrs, Volume= 0.300 af, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.02"

	Area (ac)	CN	Description
*	3.460	65	Woodland
	3.460		100.00% Pervious Area

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

Subcatchment 36S: Existing



Hydrograph for Subcatchment 36S: Existing

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	0.07	0.00	0.00
4.00	0.10	0.00	0.00
5.00	0.15	0.00	0.00
6.00	0.20	0.00	0.00
7.00	0.27	0.00	0.00
8.00	0.34	0.00	0.00
9.00	0.41	0.00	0.00
10.00	0.55	0.00	0.00
11.00	0.77	0.00	0.00
12.00	1.86	0.10	**1.96**
13.00	3.25	0.62	**0.66**
14.00	3.47	0.74	0.27
15.00	3.61	0.81	0.24
16.00	3.68	0.85	0.14
17.00	3.75	0.89	0.13
18.00	3.82	0.92	0.11
19.00	3.87	0.95	0.10
20.00	3.92	0.98	0.09
21.00	3.95	1.00	0.07
22.00	3.98	1.02	0.05
23.00	4.01	1.03	0.04
24.00	**4.02**	**1.04**	0.02
25.00	4.02	1.04	0.00
26.00	4.02	1.04	0.00
27.00	4.02	1.04	0.00
28.00	4.02	1.04	0.00
29.00	4.02	1.04	0.00
30.00	4.02	1.04	0.00
31.00	4.02	1.04	0.00
32.00	4.02	1.04	0.00
33.00	4.02	1.04	0.00
34.00	4.02	1.04	0.00
35.00	4.02	1.04	0.00
36.00	4.02	1.04	0.00
37.00	4.02	1.04	0.00
38.00	4.02	1.04	0.00
39.00	4.02	1.04	0.00
40.00	4.02	1.04	0.00
41.00	4.02	1.04	0.00
42.00	4.02	1.04	0.00
43.00	4.02	1.04	0.00
44.00	4.02	1.04	0.00
45.00	4.02	1.04	0.00
46.00	4.02	1.04	0.00
47.00	4.02	1.04	0.00
48.00	4.02	1.04	0.00
49.00	4.02	1.04	0.00
50.00	4.02	1.04	0.00
51.00	4.02	1.04	0.00
52.00	4.02	1.04	0.00
53.00	4.02	1.04	0.00
54.00	4.02	1.04	0.00
55.00	4.02	1.04	0.00
56.00	4.02	1.04	0.00
57.00	4.02	1.04	0.00
58.00	4.02	1.04	0.00
59.00	4.02	1.04	0.00
60.00	4.02	1.04	0.00
61.00	4.02	1.04	0.00
62.00	4.02	1.04	0.00
63.00	4.02	1.04	0.00
64.00	4.02	1.04	0.00
65.00	4.02	1.04	0.00
66.00	4.02	1.04	0.00
67.00	4.02	1.04	0.00
68.00	4.02	1.04	0.00
69.00	4.02	1.04	0.00
70.00	4.02	1.04	0.00
71.00	4.02	1.04	0.00
72.00	4.02	1.04	0.00

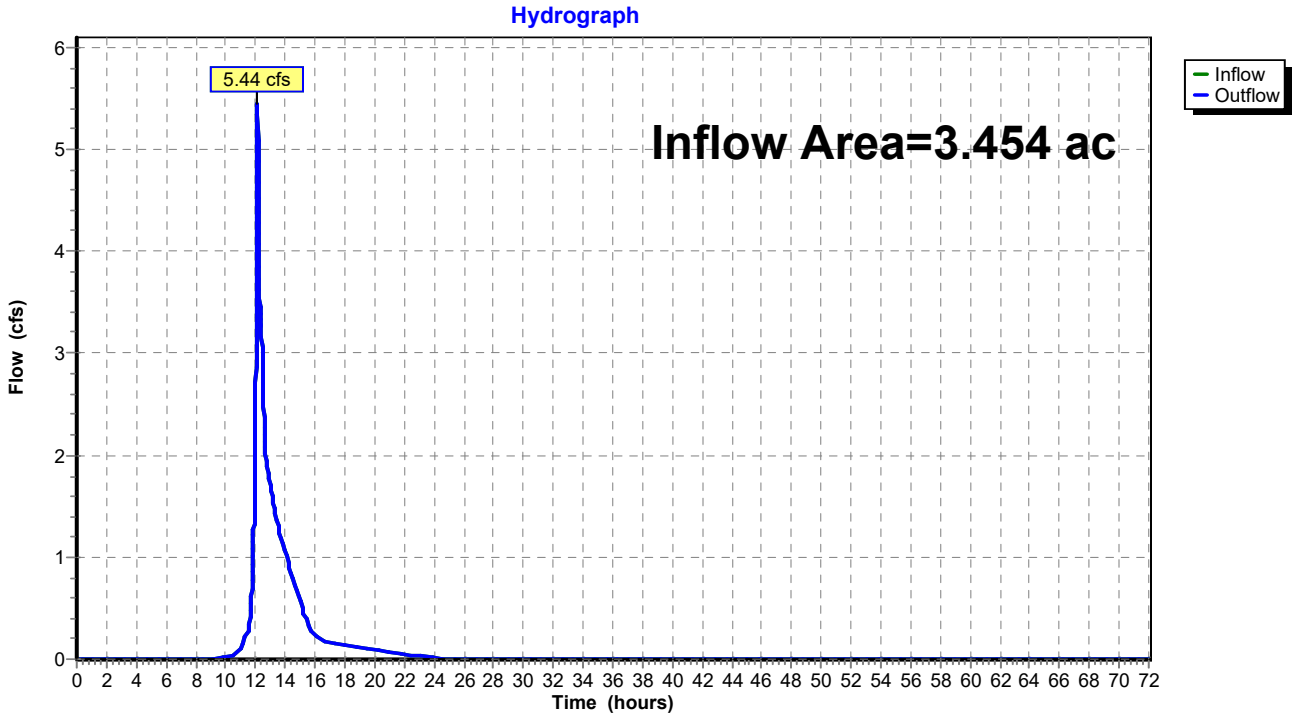
Summary for Reach 38R: Post-Develpment

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.454 ac, 46.82% Impervious, Inflow Depth = 1.92" for 10-yr event
Inflow = 5.44 cfs @ 12.14 hrs, Volume= 0.553 af
Outflow = 5.44 cfs @ 12.14 hrs, Volume= 0.553 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 38R: Post-Develpment



Hydrograph for Reach 38R: Post-Develpment

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	52.00	0.00		0.00
1.00	0.00		0.00	53.00	0.00		0.00
2.00	0.00		0.00	54.00	0.00		0.00
3.00	0.00		0.00	55.00	0.00		0.00
4.00	0.00		0.00	56.00	0.00		0.00
5.00	0.00		0.00	57.00	0.00		0.00
6.00	0.00		0.00	58.00	0.00		0.00
7.00	0.00		0.00	59.00	0.00		0.00
8.00	0.00		0.00	60.00	0.00		0.00
9.00	0.00		0.00	61.00	0.00		0.00
10.00	0.02		0.02	62.00	0.00		0.00
11.00	0.12		0.12	63.00	0.00		0.00
12.00	**2.49**		**2.49**	64.00	0.00		0.00
13.00	**1.71**		**1.71**	65.00	0.00		0.00
14.00	1.04		1.04	66.00	0.00		0.00
15.00	0.58		0.58	67.00	0.00		0.00
16.00	0.23		0.23	68.00	0.00		0.00
17.00	0.16		0.16	69.00	0.00		0.00
18.00	0.13		0.13	70.00	0.00		0.00
19.00	0.11		0.11	71.00	0.00		0.00
20.00	0.09		0.09	72.00	0.00		0.00
21.00	0.07		0.07				
22.00	0.05		0.05				
23.00	0.03		0.03				
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				
51.00	0.00		0.00				

Summary for Pond 21P: Biofilter A

Inflow Area = 0.829 ac, 37.64% Impervious, Inflow Depth = 1.94" for 10-yr event
Inflow = 3.08 cfs @ 12.13 hrs, Volume= 0.134 af
Outflow = 1.15 cfs @ 12.24 hrs, Volume= 0.134 af, Atten= 63%, Lag= 7.1 min
Discarded = 0.02 cfs @ 12.24 hrs, Volume= 0.016 af
Primary = 1.13 cfs @ 12.24 hrs, Volume= 0.118 af
Routed to Pond 25P : Biofilter B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 928.07' @ 12.24 hrs Surf.Area= 0.031 ac Storage= 0.047 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 87.7 min (891.0 - 803.3)

Volume	Invert	Avail.Storage	Storage Description
#1	925.50'	0.103 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

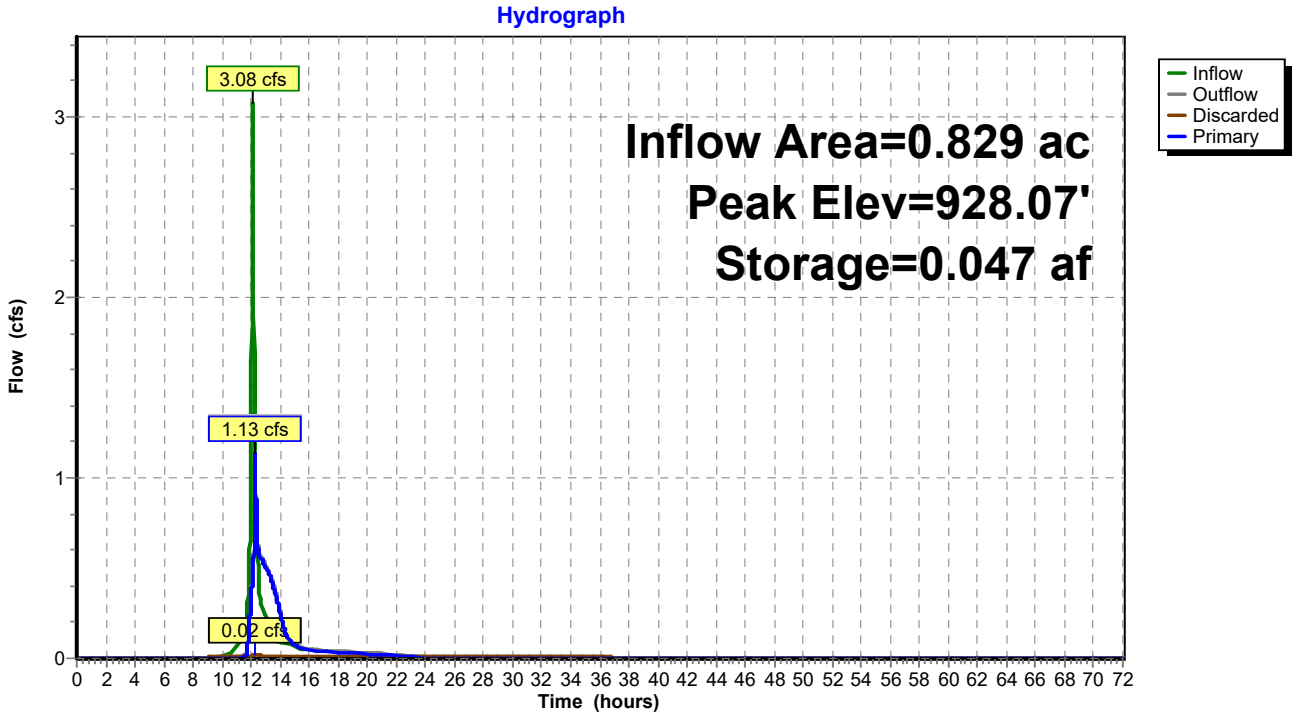
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
925.50	0.013	0.000	0.000
926.50	0.013	0.013	0.013
929.50	0.047	0.090	0.103

Device	Routing	Invert	Outlet Devices
#1	Primary	926.00'	**8.0" Round Culvert** L= 54.2' Ke= 0.500 Inlet / Outlet Invert= 926.00' / 925.75' S= 0.0046 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf
#2	Discarded	925.50'	**0.500 in/hr Exfiltration over Surface area**
#3	Device 1	926.00'	**4.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#4	Device 1	928.00'	**36.0" Horiz. Riser** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 12.24 hrs HW=928.07' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=1.13 cfs @ 12.24 hrs HW=928.07' TW=925.78' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.13 cfs of 1.90 cfs potential flow)
├**3=Underdrain** (Orifice Controls 0.58 cfs @ 6.64 fps)
└**4=Riser** (Weir Controls 0.55 cfs @ 0.86 fps)

Pond 21P: Biofilter A



Hydrograph for Pond 21P: Biofilter A

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	925.50	0.00	0.00	0.00
2.00	0.00	0.000	925.50	0.00	0.00	0.00
4.00	0.00	0.000	925.50	0.00	0.00	0.00
6.00	0.00	0.000	925.50	0.00	0.00	0.00
8.00	0.00	0.000	925.50	0.00	0.00	0.00
10.00	0.01	0.000	925.52	0.01	0.01	0.00
12.00	**1.30**	**0.017**	**926.80**	**0.34**	**0.01**	**0.33**
14.00	**0.09**	**0.013**	**926.51**	**0.25**	**0.01**	**0.25**
16.00	0.05	0.008	926.14	0.05	0.01	0.04
18.00	0.04	0.008	926.12	0.04	0.01	0.03
20.00	0.03	0.008	926.10	0.03	0.01	0.02
22.00	0.02	0.007	926.07	0.02	0.01	0.01
24.00	0.01	0.007	926.04	0.01	0.01	0.00
26.00	0.00	0.006	925.95	0.01	0.01	0.00
28.00	0.00	0.005	925.87	0.01	0.01	0.00
30.00	0.00	0.004	925.79	0.01	0.01	0.00
32.00	0.00	0.003	925.70	0.01	0.01	0.00
34.00	0.00	0.002	925.62	0.01	0.01	0.00
36.00	0.00	0.000	925.54	0.01	0.01	0.00
38.00	0.00	0.000	925.50	0.00	0.00	0.00
40.00	0.00	0.000	925.50	0.00	0.00	0.00
42.00	0.00	0.000	925.50	0.00	0.00	0.00
44.00	0.00	0.000	925.50	0.00	0.00	0.00
46.00	0.00	0.000	925.50	0.00	0.00	0.00
48.00	0.00	0.000	925.50	0.00	0.00	0.00
50.00	0.00	0.000	925.50	0.00	0.00	0.00
52.00	0.00	0.000	925.50	0.00	0.00	0.00
54.00	0.00	0.000	925.50	0.00	0.00	0.00
56.00	0.00	0.000	925.50	0.00	0.00	0.00
58.00	0.00	0.000	925.50	0.00	0.00	0.00
60.00	0.00	0.000	925.50	0.00	0.00	0.00
62.00	0.00	0.000	925.50	0.00	0.00	0.00
64.00	0.00	0.000	925.50	0.00	0.00	0.00
66.00	0.00	0.000	925.50	0.00	0.00	0.00
68.00	0.00	0.000	925.50	0.00	0.00	0.00
70.00	0.00	0.000	925.50	0.00	0.00	0.00
72.00	0.00	0.000	925.50	0.00	0.00	0.00

Summary for Pond 22P: Post-Development ADS System

Inflow Area = 0.869 ac, 56.50% Impervious, Inflow Depth = 2.46" for 10-yr event
Inflow = 3.89 cfs @ 12.12 hrs, Volume= 0.178 af
Outflow = 1.67 cfs @ 12.22 hrs, Volume= 0.178 af, Atten= 57%, Lag= 5.5 min
Discarded = 0.02 cfs @ 9.74 hrs, Volume= 0.022 af
Primary = 1.66 cfs @ 12.22 hrs, Volume= 0.156 af
Routed to Reach 38R : Post-Develpment

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 917.77' @ 12.22 hrs Surf.Area= 1,375 sf Storage= 2,342 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 30.1 min (814.4 - 784.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	915.25'	2,382 cf	**19.42'W x 70.79'L x 6.75'H Field A** 9,278 cf Overall - 3,324 cf Embedded = 5,954 cf x 40.0% Voids
#2A	916.00'	3,324 cf	**ADS_StormTech MC-7200 +Cap** x 18 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 18 Chambers in 2 Rows Cap Storage= 39.5 cf x 2 x 2 rows = 158.0 cf
		5,706 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	915.25'	**12.0" Round Culvert** L= 156.7' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 915.25' / 914.75' S= 0.0032 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Device 1	915.25'	**4.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	919.75'	**3.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Discarded	915.25'	**0.500 in/hr Exfiltration over Surface area**
#5	Device 1	917.25'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 9.74 hrs HW=915.32' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=1.66 cfs @ 12.22 hrs HW=917.77' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.66 cfs of 4.00 cfs potential flow)
  ├**2=Orifice** (Orifice Controls 0.64 cfs @ 7.39 fps)
  ├**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Orifice Controls 1.01 cfs @ 2.45 fps)

Pond 22P: Post-Development ADS System - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-7200 +Cap (ADS StormTech®MC-7200 with cap volume)
Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf
Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap
Cap Storage= 39.5 cf x 2 x 2 rows = 158.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

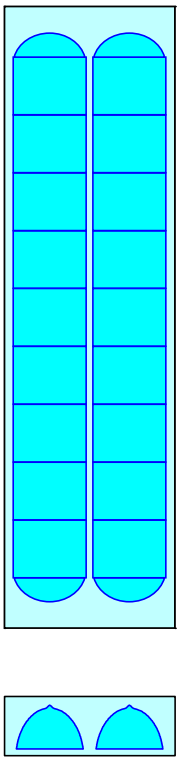
9 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 64.79' Row Length +36.0" End Stone x 2 = 70.79' Base Length
2 Rows x 100.0" Wide + 9.0" Spacing x 1 + 12.0" Side Stone x 2 = 19.42' Base Width
9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

18 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 2 Rows = 3,323.8 cf Chamber Storage

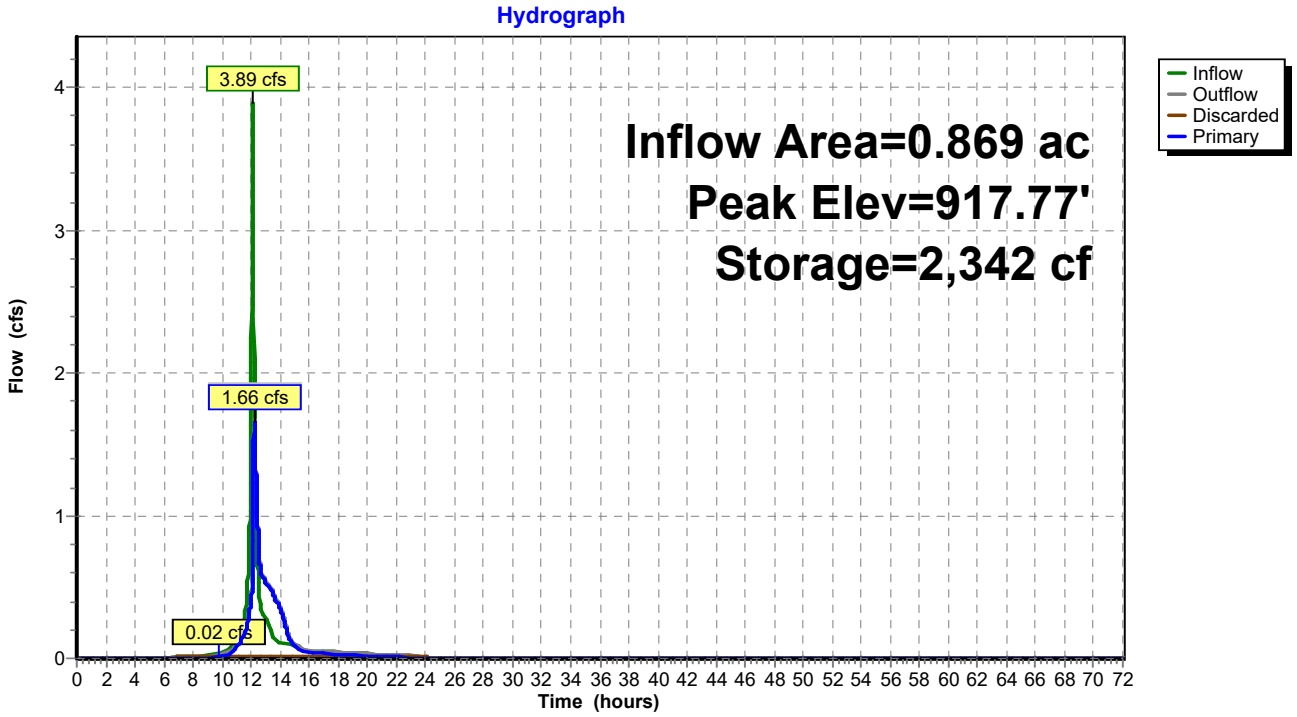
9,278.1 cf Field - 3,323.8 cf Chambers = 5,954.4 cf Stone x 40.0% Voids = 2,381.7 cf Stone Storage

Chamber Storage + Stone Storage = 5,705.5 cf = 0.131 af
Overall Storage Efficiency = 61.5%
Overall System Size = 70.79' x 19.42' x 6.75'

18 Chambers @ $ 1,200.00 /ea = $ 21,600.00
343.6 cy Field Excavation @ $ 1.00 /cy = $ 343.63
220.5 cy Stone @ $ 30.00 /cy = $ 6,615.97
Total Cost = $ 28,559.60



Pond 22P: Post-Development ADS System



Hydrograph for Pond 22P: Post-Development ADS System

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	915.25	0.00	0.00	0.00
2.00	0.00	0	915.25	0.00	0.00	0.00
4.00	0.00	0	915.25	0.00	0.00	0.00
6.00	0.00	0	915.25	0.00	0.00	0.00
8.00	0.01	0	915.25	0.01	**0.01**	0.00
10.00	0.04	48	915.34	0.03	**0.02**	0.02
12.00	**1.82**	**811**	**916.36**	**0.42**	0.02	**0.41**
14.00	**0.11**	**501**	**916.08**	**0.36**	0.02	**0.34**
16.00	0.05	73	915.38	0.06	0.02	0.04
18.00	0.04	61	915.36	0.04	0.02	0.03
20.00	0.03	47	915.34	0.03	0.02	0.02
22.00	0.02	29	915.30	0.02	0.02	0.01
24.00	0.01	0	915.25	0.01	0.01	0.00
26.00	0.00	0	915.25	0.00	0.00	0.00
28.00	0.00	0	915.25	0.00	0.00	0.00
30.00	0.00	0	915.25	0.00	0.00	0.00
32.00	0.00	0	915.25	0.00	0.00	0.00
34.00	0.00	0	915.25	0.00	0.00	0.00
36.00	0.00	0	915.25	0.00	0.00	0.00
38.00	0.00	0	915.25	0.00	0.00	0.00
40.00	0.00	0	915.25	0.00	0.00	0.00
42.00	0.00	0	915.25	0.00	0.00	0.00
44.00	0.00	0	915.25	0.00	0.00	0.00
46.00	0.00	0	915.25	0.00	0.00	0.00
48.00	0.00	0	915.25	0.00	0.00	0.00
50.00	0.00	0	915.25	0.00	0.00	0.00
52.00	0.00	0	915.25	0.00	0.00	0.00
54.00	0.00	0	915.25	0.00	0.00	0.00
56.00	0.00	0	915.25	0.00	0.00	0.00
58.00	0.00	0	915.25	0.00	0.00	0.00
60.00	0.00	0	915.25	0.00	0.00	0.00
62.00	0.00	0	915.25	0.00	0.00	0.00
64.00	0.00	0	915.25	0.00	0.00	0.00
66.00	0.00	0	915.25	0.00	0.00	0.00
68.00	0.00	0	915.25	0.00	0.00	0.00
70.00	0.00	0	915.25	0.00	0.00	0.00
72.00	0.00	0	915.25	0.00	0.00	0.00

Summary for Pond 25P: Biofilter B

Inflow Area = 1.231 ac, 46.06% Impervious, Inflow Depth = 1.99" for 10-yr event
Inflow = 2.47 cfs @ 12.13 hrs, Volume= 0.204 af
Outflow = 1.02 cfs @ 12.42 hrs, Volume= 0.204 af, Atten= 59%, Lag= 17.5 min
Discarded = 0.02 cfs @ 12.42 hrs, Volume= 0.019 af
Primary = 1.00 cfs @ 12.42 hrs, Volume= 0.185 af
Routed to Reach 38R : Post-Develpment

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 926.06' @ 12.42 hrs Surf.Area= 0.035 ac Storage= 0.056 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 66.1 min (879.6 - 813.5)

Volume	Invert	Avail.Storage	Storage Description
#1	923.75'	0.132 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

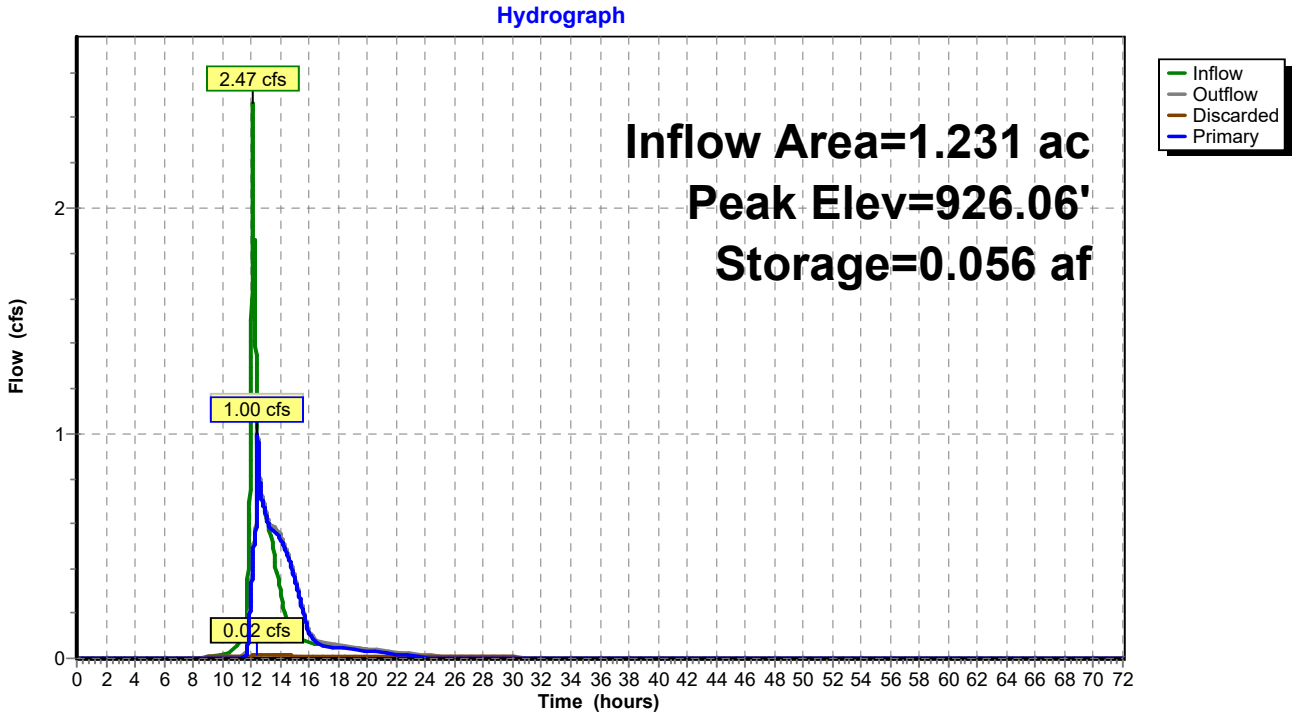
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
923.75	0.020	0.000	0.000
924.75	0.020	0.020	0.020
927.75	0.055	0.112	0.132

Device	Routing	Invert	Outlet Devices
#1	Discarded	923.75'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	923.97'	**12.0" Round Culvert** L= 36.7' Ke= 0.500 Inlet / Outlet Invert= 923.97' / 923.56' S= 0.0112 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#3	Device 2	923.97'	**4.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#4	Device 2	926.00'	**36.0" Horiz. Riser** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 12.42 hrs HW=926.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=1.00 cfs @ 12.42 hrs HW=926.06' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 1.00 cfs of 4.76 cfs potential flow)
  ├**3=Underdrain** (Orifice Controls 0.58 cfs @ 6.67 fps)
  └**4=Riser** (Weir Controls 0.42 cfs @ 0.78 fps)

Pond 25P: Biofilter B



Hydrograph for Pond 25P: Biofilter B

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	923.75	0.00	0.00	0.00
2.00	0.00	0.000	923.75	0.00	0.00	0.00
4.00	0.00	0.000	923.75	0.00	0.00	0.00
6.00	0.00	0.000	923.75	0.00	0.00	0.00
8.00	0.00	0.000	923.75	0.00	0.00	0.00
10.00	0.01	0.000	923.75	0.01	0.01	0.00
12.00	**1.25**	**0.017**	**924.62**	**0.30**	**0.01**	**0.29**
14.00	**0.30**	**0.046**	**925.74**	**0.55**	**0.02**	**0.53**
16.00	0.07	0.009	924.21	0.12	0.01	0.11
18.00	0.05	0.007	924.11	0.06	0.01	0.05
20.00	0.04	0.007	924.09	0.04	0.01	0.03
22.00	0.02	0.006	924.05	0.03	0.01	0.02
24.00	0.01	0.005	924.01	0.01	0.01	0.00
26.00	0.00	0.004	923.93	0.01	0.01	0.00
28.00	0.00	0.002	923.84	0.01	0.01	0.00
30.00	0.00	0.000	923.76	0.01	0.01	0.00
32.00	0.00	0.000	923.75	0.00	0.00	0.00
34.00	0.00	0.000	923.75	0.00	0.00	0.00
36.00	0.00	0.000	923.75	0.00	0.00	0.00
38.00	0.00	0.000	923.75	0.00	0.00	0.00
40.00	0.00	0.000	923.75	0.00	0.00	0.00
42.00	0.00	0.000	923.75	0.00	0.00	0.00
44.00	0.00	0.000	923.75	0.00	0.00	0.00
46.00	0.00	0.000	923.75	0.00	0.00	0.00
48.00	0.00	0.000	923.75	0.00	0.00	0.00
50.00	0.00	0.000	923.75	0.00	0.00	0.00
52.00	0.00	0.000	923.75	0.00	0.00	0.00
54.00	0.00	0.000	923.75	0.00	0.00	0.00
56.00	0.00	0.000	923.75	0.00	0.00	0.00
58.00	0.00	0.000	923.75	0.00	0.00	0.00
60.00	0.00	0.000	923.75	0.00	0.00	0.00
62.00	0.00	0.000	923.75	0.00	0.00	0.00
64.00	0.00	0.000	923.75	0.00	0.00	0.00
66.00	0.00	0.000	923.75	0.00	0.00	0.00
68.00	0.00	0.000	923.75	0.00	0.00	0.00
70.00	0.00	0.000	923.75	0.00	0.00	0.00
72.00	0.00	0.000	923.75	0.00	0.00	0.00

Summary for Pond 33P: Biofilter D

Inflow Area = 0.261 ac, 67.43% Impervious, Inflow Depth = 2.77" for 10-yr event
Inflow = 1.30 cfs @ 12.12 hrs, Volume= 0.060 af
Outflow = 0.40 cfs @ 12.26 hrs, Volume= 0.060 af, Atten= 69%, Lag= 8.5 min
Discarded = 0.01 cfs @ 12.26 hrs, Volume= 0.015 af
Primary = 0.39 cfs @ 12.26 hrs, Volume= 0.045 af
Routed to Reach 38R : Post-Develpment

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 922.51' @ 12.26 hrs Surf.Area= 0.020 ac Storage= 0.022 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 83.3 min (861.1 - 777.8)

Volume	Invert	Avail.Storage	Storage Description
#1	921.25'	0.073 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

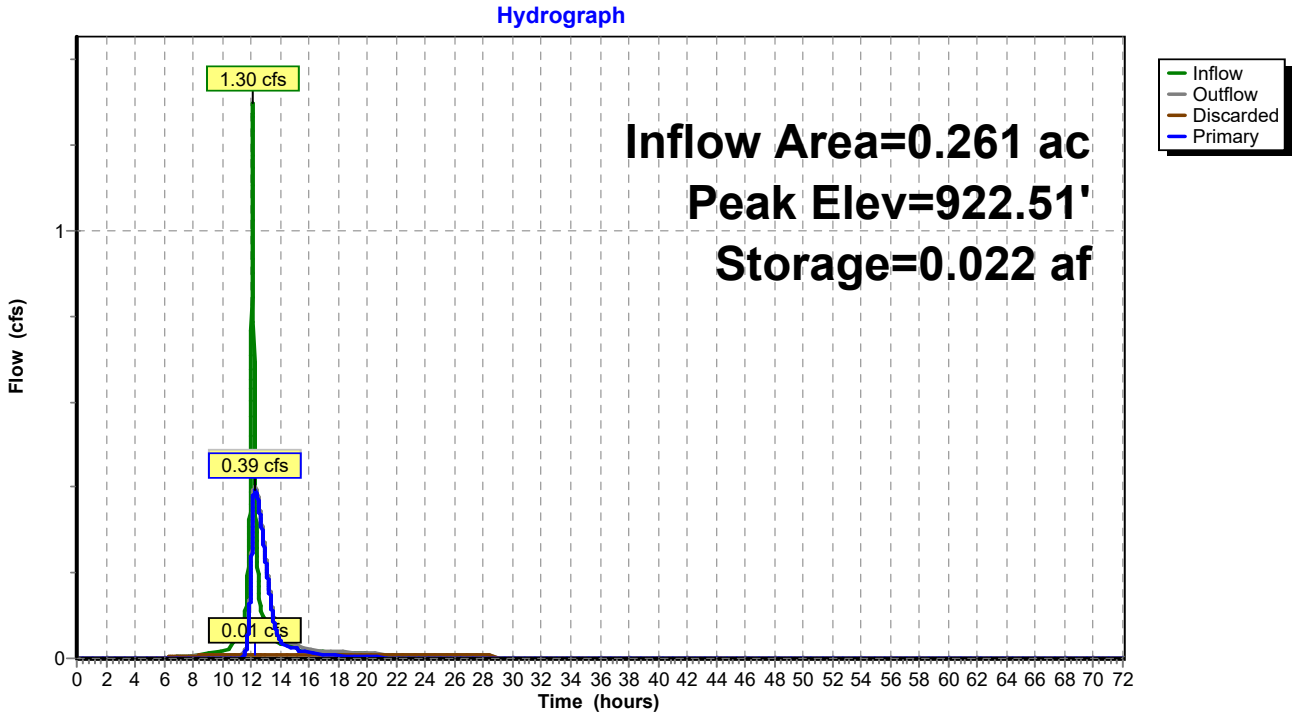
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
921.25	0.017	0.000	0.000
922.25	0.017	0.017	0.017
924.25	0.039	0.056	0.073

Device	Routing	Invert	Outlet Devices
#1	Discarded	921.25'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	921.47'	**6.0" Round Culvert** L= 36.9' Ke= 0.500 Inlet / Outlet Invert= 921.47' / 920.56' S= 0.0247 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf
#3	Device 2	921.47'	**4.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#4	Device 2	924.00'	**36.0" Horiz. Riser** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 12.26 hrs HW=922.51' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.39 cfs @ 12.26 hrs HW=922.51' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.39 cfs of 0.84 cfs potential flow)
  ├**3=Underdrain** (Orifice Controls 0.39 cfs @ 4.50 fps)
  └**4=Riser** (Controls 0.00 cfs)

Pond 33P: Biofilter D



Hydrograph for Pond 33P: Biofilter D

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	921.25	0.00	0.00	0.00
2.00	0.00	0.000	921.25	0.00	0.00	0.00
4.00	0.00	0.000	921.25	0.00	0.00	0.00
6.00	0.00	0.000	921.25	0.00	0.00	0.00
8.00	0.01	0.000	921.25	0.01	0.01	0.00
10.00	0.02	0.000	921.28	0.01	0.01	0.00
12.00	**0.63**	**0.010**	**921.86**	**0.21**	**0.01**	**0.20**
14.00	**0.03**	**0.006**	**921.61**	**0.05**	**0.01**	**0.04**
16.00	0.02	0.005	921.54	0.02	0.01	0.01
18.00	0.01	0.005	921.52	0.02	0.01	0.01
20.00	0.01	0.004	921.51	0.01	0.01	0.00
22.00	0.01	0.004	921.48	0.01	0.01	0.00
24.00	0.00	0.003	921.44	0.01	0.01	0.00
26.00	0.00	0.002	921.36	0.01	0.01	0.00
28.00	0.00	0.000	921.28	0.01	0.01	0.00
30.00	0.00	0.000	921.25	0.00	0.00	0.00
32.00	0.00	0.000	921.25	0.00	0.00	0.00
34.00	0.00	0.000	921.25	0.00	0.00	0.00
36.00	0.00	0.000	921.25	0.00	0.00	0.00
38.00	0.00	0.000	921.25	0.00	0.00	0.00
40.00	0.00	0.000	921.25	0.00	0.00	0.00
42.00	0.00	0.000	921.25	0.00	0.00	0.00
44.00	0.00	0.000	921.25	0.00	0.00	0.00
46.00	0.00	0.000	921.25	0.00	0.00	0.00
48.00	0.00	0.000	921.25	0.00	0.00	0.00
50.00	0.00	0.000	921.25	0.00	0.00	0.00
52.00	0.00	0.000	921.25	0.00	0.00	0.00
54.00	0.00	0.000	921.25	0.00	0.00	0.00
56.00	0.00	0.000	921.25	0.00	0.00	0.00
58.00	0.00	0.000	921.25	0.00	0.00	0.00
60.00	0.00	0.000	921.25	0.00	0.00	0.00
62.00	0.00	0.000	921.25	0.00	0.00	0.00
64.00	0.00	0.000	921.25	0.00	0.00	0.00
66.00	0.00	0.000	921.25	0.00	0.00	0.00
68.00	0.00	0.000	921.25	0.00	0.00	0.00
70.00	0.00	0.000	921.25	0.00	0.00	0.00
72.00	0.00	0.000	921.25	0.00	0.00	0.00

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment19S: Basin A-1 Runoff Area=0.521 ac 59.88% Impervious Runoff Depth=4.59"
Tc=5.0 min CN=85 Runoff=4.42 cfs 0.199 af

Subcatchment20S: BASIN A-2 Runoff Area=0.047 ac 0.00% Impervious Runoff Depth=2.57"
Tc=5.0 min CN=65 Runoff=0.24 cfs 0.010 af

Subcatchment22S: From Off Site Runoff Area=0.261 ac 0.00% Impervious Runoff Depth=2.57"
Tc=5.0 min CN=65 Runoff=1.32 cfs 0.056 af

Subcatchment23S: Basin B-1 Runoff Area=0.382 ac 66.75% Impervious Runoff Depth=4.80"
Tc=5.0 min CN=87 Runoff=3.35 cfs 0.153 af

Subcatchment24S: Basin B-2 Runoff Area=0.020 ac 0.00% Impervious Runoff Depth=2.57"
Tc=5.0 min CN=65 Runoff=0.10 cfs 0.004 af

Subcatchment26S: Basin C-1 Runoff Area=0.590 ac 83.22% Impervious Runoff Depth=5.36"
Tc=5.0 min CN=92 Runoff=5.52 cfs 0.264 af

Subcatchment27S: Basin C-2 Runoff Area=0.279 ac 0.00% Impervious Runoff Depth=2.57"
Tc=5.0 min CN=65 Runoff=1.41 cfs 0.060 af

Subcatchment28S: Basin D-1 Runoff Area=0.205 ac 85.85% Impervious Runoff Depth=5.48"
Tc=5.0 min CN=93 Runoff=1.94 cfs 0.094 af

Subcatchment29S: Basin D-2 Runoff Area=0.056 ac 0.00% Impervious Runoff Depth=2.57"
Tc=5.0 min CN=65 Runoff=0.28 cfs 0.012 af

Subcatchment34S: Undetained Runoff Area=1.093 ac 35.04% Impervious Runoff Depth=3.74"
Tc=5.0 min CN=77 Runoff=7.87 cfs 0.341 af

Subcatchment36S: Existing Runoff Area=3.460 ac 0.00% Impervious Runoff Depth=2.57"
Tc=5.0 min CN=65 Runoff=17.51 cfs 0.742 af

Reach 38R: Post-Develpment Inflow=17.59 cfs 1.110 af
Outflow=17.59 cfs 1.110 af

Pond 21P: Biofilter A Peak Elev=928.99' Storage=0.081 af Inflow=5.97 cfs 0.265 af
Discarded=0.02 cfs 0.018 af Primary=2.37 cfs 0.247 af Outflow=2.39 cfs 0.265 af

Pond 22P: Post-DevelopmentADS System Peak Elev=918.81' Storage=3,397 cf Inflow=6.93 cfs 0.324 af
Discarded=0.02 cfs 0.025 af Primary=4.66 cfs 0.298 af Outflow=4.68 cfs 0.324 af

Pond 25P: Biofilter B Peak Elev=926.29' Storage=0.065 af Inflow=5.65 cfs 0.404 af
Discarded=0.02 cfs 0.022 af Primary=5.11 cfs 0.383 af Outflow=5.12 cfs 0.404 af

Pond 33P: Biofilter D Peak Elev=923.22' Storage=0.039 af Inflow=2.22 cfs 0.106 af
Discarded=0.01 cfs 0.017 af Primary=0.53 cfs 0.088 af Outflow=0.54 cfs 0.106 af

Total Runoff Area = 6.914 ac Runoff Volume = 1.934 af Average Runoff Depth = 3.36"
76.61% Pervious = 5.297 ac 23.39% Impervious = 1.617 ac

Summary for Subcatchment 19S: Basin A-1

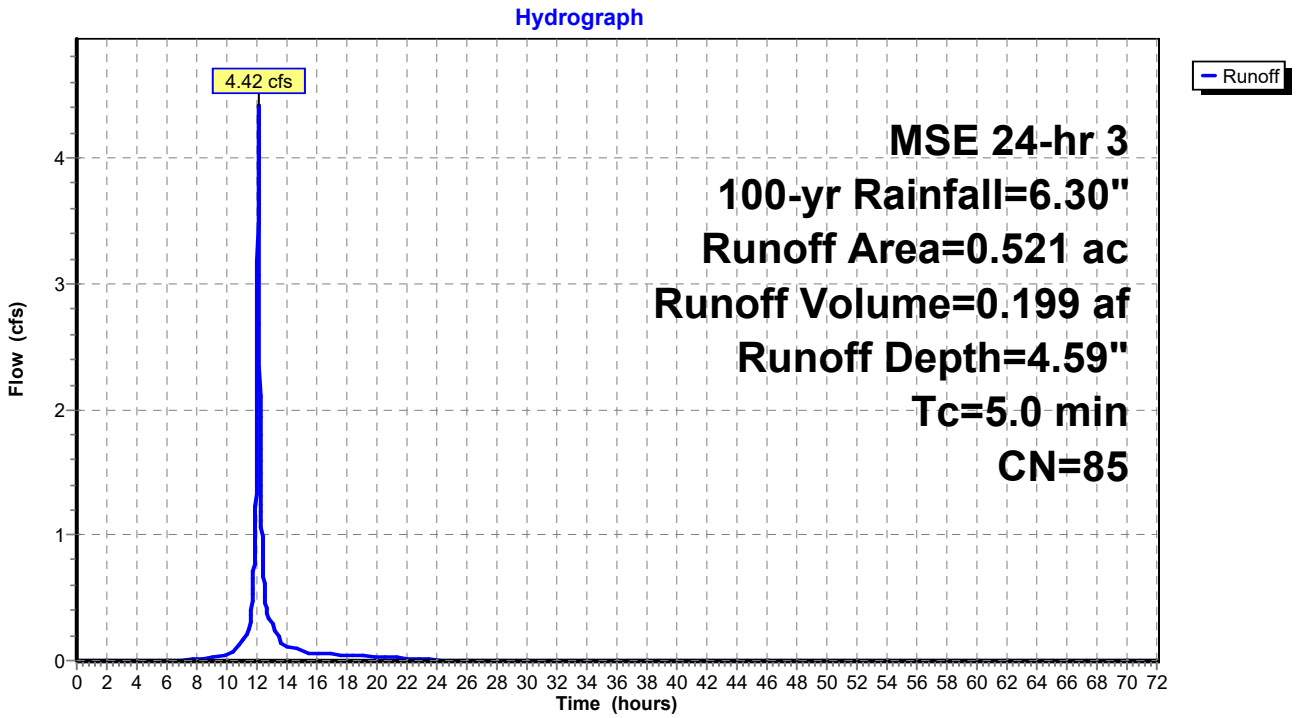
Runoff = 4.42 cfs @ 12.12 hrs, Volume= 0.199 af, Depth= 4.59"
Routed to Pond 21P : Biofilter A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=6.30"

	Area (ac)	CN	Description
*	0.265	98	Pave
*	0.209	65	Woodland
*	0.047	98	Pond Surface
	0.521	85	Weighted Average
	0.209		40.12% Pervious Area
	0.312		59.88% Impervious Area

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

Subcatchment 19S: Basin A-1



Hydrograph for Subcatchment 19S: Basin A-1

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	0.06	0.00	0.00
3.00	0.10	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.24	0.00	0.00
6.00	0.32	0.00	0.00
7.00	0.42	0.00	0.00
8.00	0.53	0.02	0.01
9.00	0.65	0.04	0.02
10.00	0.87	0.12	0.05
11.00	1.21	0.28	0.15
12.00	2.92	1.52	**2.15**
13.00	5.09	3.45	**0.30**
14.00	5.43	3.77	0.11
15.00	5.65	3.97	0.10
16.00	5.77	4.09	0.06
17.00	5.88	4.19	0.05
18.00	5.98	4.28	0.05
19.00	6.06	4.36	0.04
20.00	6.14	4.43	0.03
21.00	6.20	4.49	0.03
22.00	6.24	4.53	0.02
23.00	6.28	4.56	0.01
24.00	**6.30**	**4.59**	0.01
25.00	6.30	4.59	0.00
26.00	6.30	4.59	0.00
27.00	6.30	4.59	0.00
28.00	6.30	4.59	0.00
29.00	6.30	4.59	0.00
30.00	6.30	4.59	0.00
31.00	6.30	4.59	0.00
32.00	6.30	4.59	0.00
33.00	6.30	4.59	0.00
34.00	6.30	4.59	0.00
35.00	6.30	4.59	0.00
36.00	6.30	4.59	0.00
37.00	6.30	4.59	0.00
38.00	6.30	4.59	0.00
39.00	6.30	4.59	0.00
40.00	6.30	4.59	0.00
41.00	6.30	4.59	0.00
42.00	6.30	4.59	0.00
43.00	6.30	4.59	0.00
44.00	6.30	4.59	0.00
45.00	6.30	4.59	0.00
46.00	6.30	4.59	0.00
47.00	6.30	4.59	0.00
48.00	6.30	4.59	0.00
49.00	6.30	4.59	0.00
50.00	6.30	4.59	0.00
51.00	6.30	4.59	0.00
52.00	6.30	4.59	0.00
53.00	6.30	4.59	0.00
54.00	6.30	4.59	0.00
55.00	6.30	4.59	0.00
56.00	6.30	4.59	0.00
57.00	6.30	4.59	0.00
58.00	6.30	4.59	0.00
59.00	6.30	4.59	0.00
60.00	6.30	4.59	0.00
61.00	6.30	4.59	0.00
62.00	6.30	4.59	0.00
63.00	6.30	4.59	0.00
64.00	6.30	4.59	0.00
65.00	6.30	4.59	0.00
66.00	6.30	4.59	0.00
67.00	6.30	4.59	0.00
68.00	6.30	4.59	0.00
69.00	6.30	4.59	0.00
70.00	6.30	4.59	0.00
71.00	6.30	4.59	0.00
72.00	6.30	4.59	0.00

Summary for Subcatchment 20S: BASIN A-2

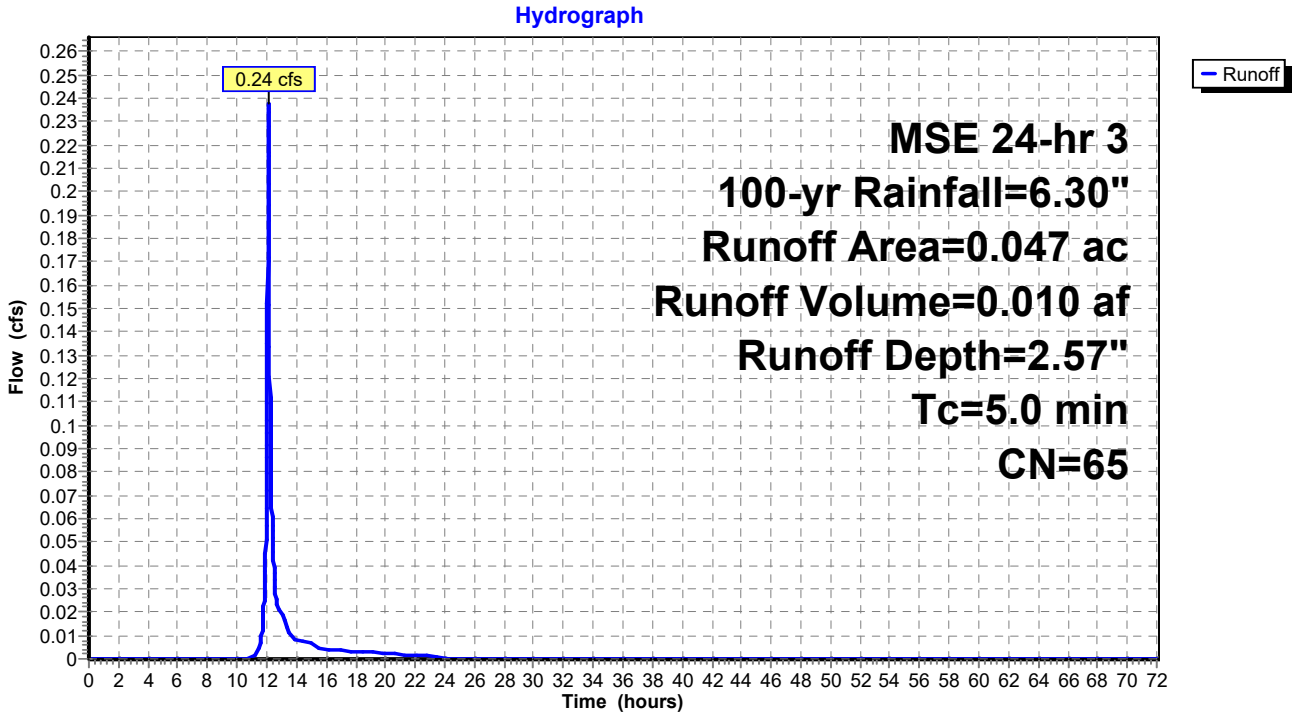
Runoff = 0.24 cfs @ 12.13 hrs, Volume= 0.010 af, Depth= 2.57"
Routed to Pond 21P : Biofilter A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=6.30"

	Area (ac)	CN	Description
*	0.047	65	Undisturbed Woodland
	0.047		100.00% Pervious Area

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

Subcatchment 20S: BASIN A-2



Hydrograph for Subcatchment 20S: BASIN A-2

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	0.06	0.00	0.00
3.00	0.10	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.24	0.00	0.00
6.00	0.32	0.00	0.00
7.00	0.42	0.00	0.00
8.00	0.53	0.00	0.00
9.00	0.65	0.00	0.00
10.00	0.87	0.00	0.00
11.00	1.21	0.00	0.00
12.00	2.92	0.47	**0.09**
13.00	5.09	1.71	**0.02**
14.00	5.43	1.95	0.01
15.00	5.65	2.10	0.01
16.00	5.77	2.19	0.00
17.00	5.88	2.27	0.00
18.00	5.98	2.34	0.00
19.00	6.06	2.40	0.00
20.00	6.14	2.45	0.00
21.00	6.20	2.49	0.00
22.00	6.24	2.53	0.00
23.00	6.28	2.56	0.00
24.00	**6.30**	**2.57**	0.00
25.00	6.30	2.57	0.00
26.00	6.30	2.57	0.00
27.00	6.30	2.57	0.00
28.00	6.30	2.57	0.00
29.00	6.30	2.57	0.00
30.00	6.30	2.57	0.00
31.00	6.30	2.57	0.00
32.00	6.30	2.57	0.00
33.00	6.30	2.57	0.00
34.00	6.30	2.57	0.00
35.00	6.30	2.57	0.00
36.00	6.30	2.57	0.00
37.00	6.30	2.57	0.00
38.00	6.30	2.57	0.00
39.00	6.30	2.57	0.00
40.00	6.30	2.57	0.00
41.00	6.30	2.57	0.00
42.00	6.30	2.57	0.00
43.00	6.30	2.57	0.00
44.00	6.30	2.57	0.00
45.00	6.30	2.57	0.00
46.00	6.30	2.57	0.00
47.00	6.30	2.57	0.00
48.00	6.30	2.57	0.00
49.00	6.30	2.57	0.00
50.00	6.30	2.57	0.00
51.00	6.30	2.57	0.00
52.00	6.30	2.57	0.00
53.00	6.30	2.57	0.00
54.00	6.30	2.57	0.00
55.00	6.30	2.57	0.00
56.00	6.30	2.57	0.00
57.00	6.30	2.57	0.00
58.00	6.30	2.57	0.00
59.00	6.30	2.57	0.00
60.00	6.30	2.57	0.00
61.00	6.30	2.57	0.00
62.00	6.30	2.57	0.00
63.00	6.30	2.57	0.00
64.00	6.30	2.57	0.00
65.00	6.30	2.57	0.00
66.00	6.30	2.57	0.00
67.00	6.30	2.57	0.00
68.00	6.30	2.57	0.00
69.00	6.30	2.57	0.00
70.00	6.30	2.57	0.00
71.00	6.30	2.57	0.00
72.00	6.30	2.57	0.00

Summary for Subcatchment 22S: From Off Site

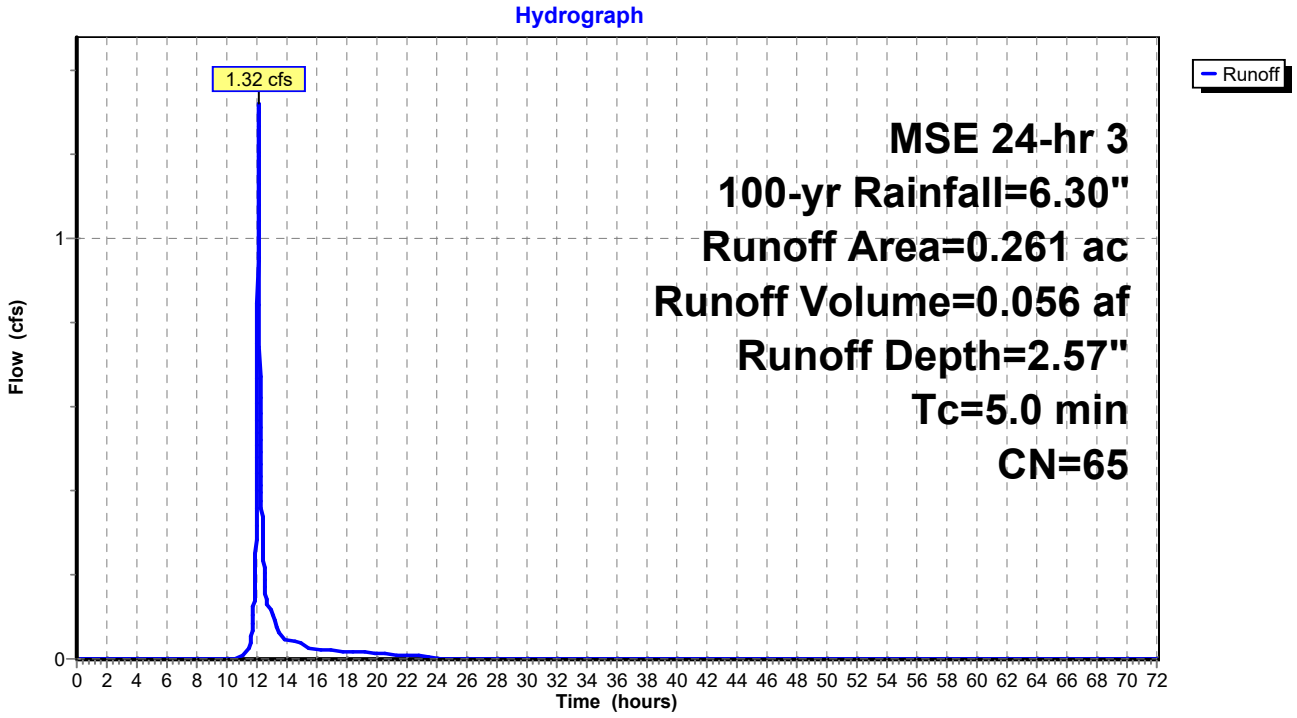
Runoff = 1.32 cfs @ 12.13 hrs, Volume= 0.056 af, Depth= 2.57"
Routed to Pond 21P : Biofilter A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=6.30"

	Area (ac)	CN	Description
*	0.261	65	Undisturbed Woodland
	0.261		100.00% Pervious Area

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

Subcatchment 22S: From Off Site



Hydrograph for Subcatchment 22S: From Off 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	0.06	0.00	0.00
3.00	0.10	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.24	0.00	0.00
6.00	0.32	0.00	0.00
7.00	0.42	0.00	0.00
8.00	0.53	0.00	0.00
9.00	0.65	0.00	0.00
10.00	0.87	0.00	0.00
11.00	1.21	0.00	0.00
12.00	2.92	0.47	**0.51**
13.00	5.09	1.71	**0.11**
14.00	5.43	1.95	0.04
15.00	5.65	2.10	0.04
16.00	5.77	2.19	0.02
17.00	5.88	2.27	0.02
18.00	5.98	2.34	0.02
19.00	6.06	2.40	0.02
20.00	6.14	2.45	0.01
21.00	6.20	2.49	0.01
22.00	6.24	2.53	0.01
23.00	6.28	2.56	0.01
24.00	**6.30**	**2.57**	0.00
25.00	6.30	2.57	0.00
26.00	6.30	2.57	0.00
27.00	6.30	2.57	0.00
28.00	6.30	2.57	0.00
29.00	6.30	2.57	0.00
30.00	6.30	2.57	0.00
31.00	6.30	2.57	0.00
32.00	6.30	2.57	0.00
33.00	6.30	2.57	0.00
34.00	6.30	2.57	0.00
35.00	6.30	2.57	0.00
36.00	6.30	2.57	0.00
37.00	6.30	2.57	0.00
38.00	6.30	2.57	0.00
39.00	6.30	2.57	0.00
40.00	6.30	2.57	0.00
41.00	6.30	2.57	0.00
42.00	6.30	2.57	0.00
43.00	6.30	2.57	0.00
44.00	6.30	2.57	0.00
45.00	6.30	2.57	0.00
46.00	6.30	2.57	0.00
47.00	6.30	2.57	0.00
48.00	6.30	2.57	0.00
49.00	6.30	2.57	0.00
50.00	6.30	2.57	0.00
51.00	6.30	2.57	0.00
52.00	6.30	2.57	0.00
53.00	6.30	2.57	0.00
54.00	6.30	2.57	0.00
55.00	6.30	2.57	0.00
56.00	6.30	2.57	0.00
57.00	6.30	2.57	0.00
58.00	6.30	2.57	0.00
59.00	6.30	2.57	0.00
60.00	6.30	2.57	0.00
61.00	6.30	2.57	0.00
62.00	6.30	2.57	0.00
63.00	6.30	2.57	0.00
64.00	6.30	2.57	0.00
65.00	6.30	2.57	0.00
66.00	6.30	2.57	0.00
67.00	6.30	2.57	0.00
68.00	6.30	2.57	0.00
69.00	6.30	2.57	0.00
70.00	6.30	2.57	0.00
71.00	6.30	2.57	0.00
72.00	6.30	2.57	0.00

Summary for Subcatchment 23S: Basin B-1

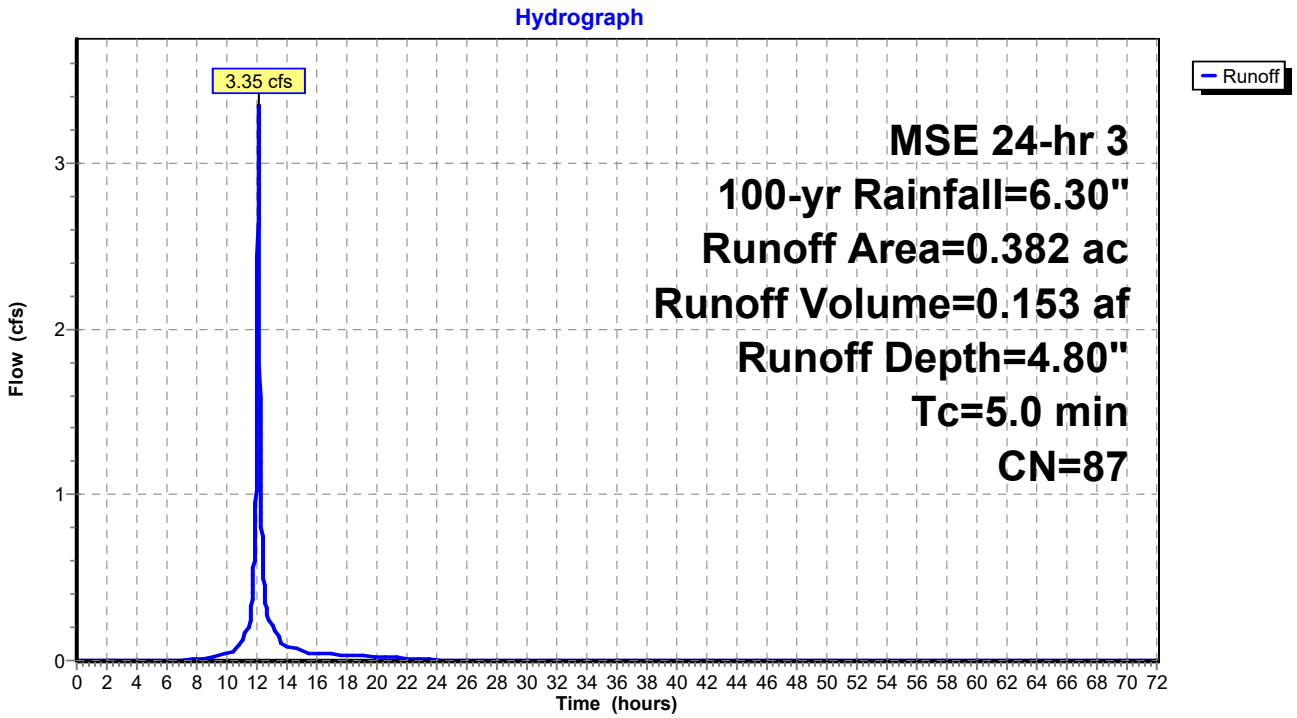
Runoff = 3.35 cfs @ 12.12 hrs, Volume= 0.153 af, Depth= 4.80"
Routed to Pond 25P : Biofilter B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=6.30"

	Area (ac)	CN	Description
*	0.205	98	Pave
*	0.127	65	Woodland
*	0.050	98	Pond Surface
	0.382	87	Weighted Average
	0.127		33.25% Pervious Area
	0.255		66.75% Impervious Area

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

Subcatchment 23S: Basin B-1



Hydrograph for Subcatchment 23S: Basin B-1

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	0.06	0.00	0.00
3.00	0.10	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.24	0.00	0.00
6.00	0.32	0.00	0.00
7.00	0.42	0.01	0.01
8.00	0.53	0.03	0.01
9.00	0.65	0.07	0.02
10.00	0.87	0.16	0.04
11.00	1.21	0.35	0.13
12.00	2.92	1.67	**1.65**
13.00	5.09	3.65	**0.22**
14.00	5.43	3.98	0.09
15.00	5.65	4.18	0.07
16.00	5.77	4.30	0.04
17.00	5.88	4.40	0.04
18.00	5.98	4.50	0.03
19.00	6.06	4.58	0.03
20.00	6.14	4.65	0.02
21.00	6.20	4.70	0.02
22.00	6.24	4.75	0.02
23.00	6.28	4.78	0.01
24.00	**6.30**	**4.80**	0.01
25.00	6.30	4.80	0.00
26.00	6.30	4.80	0.00
27.00	6.30	4.80	0.00
28.00	6.30	4.80	0.00
29.00	6.30	4.80	0.00
30.00	6.30	4.80	0.00
31.00	6.30	4.80	0.00
32.00	6.30	4.80	0.00
33.00	6.30	4.80	0.00
34.00	6.30	4.80	0.00
35.00	6.30	4.80	0.00
36.00	6.30	4.80	0.00
37.00	6.30	4.80	0.00
38.00	6.30	4.80	0.00
39.00	6.30	4.80	0.00
40.00	6.30	4.80	0.00
41.00	6.30	4.80	0.00
42.00	6.30	4.80	0.00
43.00	6.30	4.80	0.00
44.00	6.30	4.80	0.00
45.00	6.30	4.80	0.00
46.00	6.30	4.80	0.00
47.00	6.30	4.80	0.00
48.00	6.30	4.80	0.00
49.00	6.30	4.80	0.00
50.00	6.30	4.80	0.00
51.00	6.30	4.80	0.00
52.00	6.30	4.80	0.00
53.00	6.30	4.80	0.00
54.00	6.30	4.80	0.00
55.00	6.30	4.80	0.00
56.00	6.30	4.80	0.00
57.00	6.30	4.80	0.00
58.00	6.30	4.80	0.00
59.00	6.30	4.80	0.00
60.00	6.30	4.80	0.00
61.00	6.30	4.80	0.00
62.00	6.30	4.80	0.00
63.00	6.30	4.80	0.00
64.00	6.30	4.80	0.00
65.00	6.30	4.80	0.00
66.00	6.30	4.80	0.00
67.00	6.30	4.80	0.00
68.00	6.30	4.80	0.00
69.00	6.30	4.80	0.00
70.00	6.30	4.80	0.00
71.00	6.30	4.80	0.00
72.00	6.30	4.80	0.00

Summary for Subcatchment 24S: Basin B-2

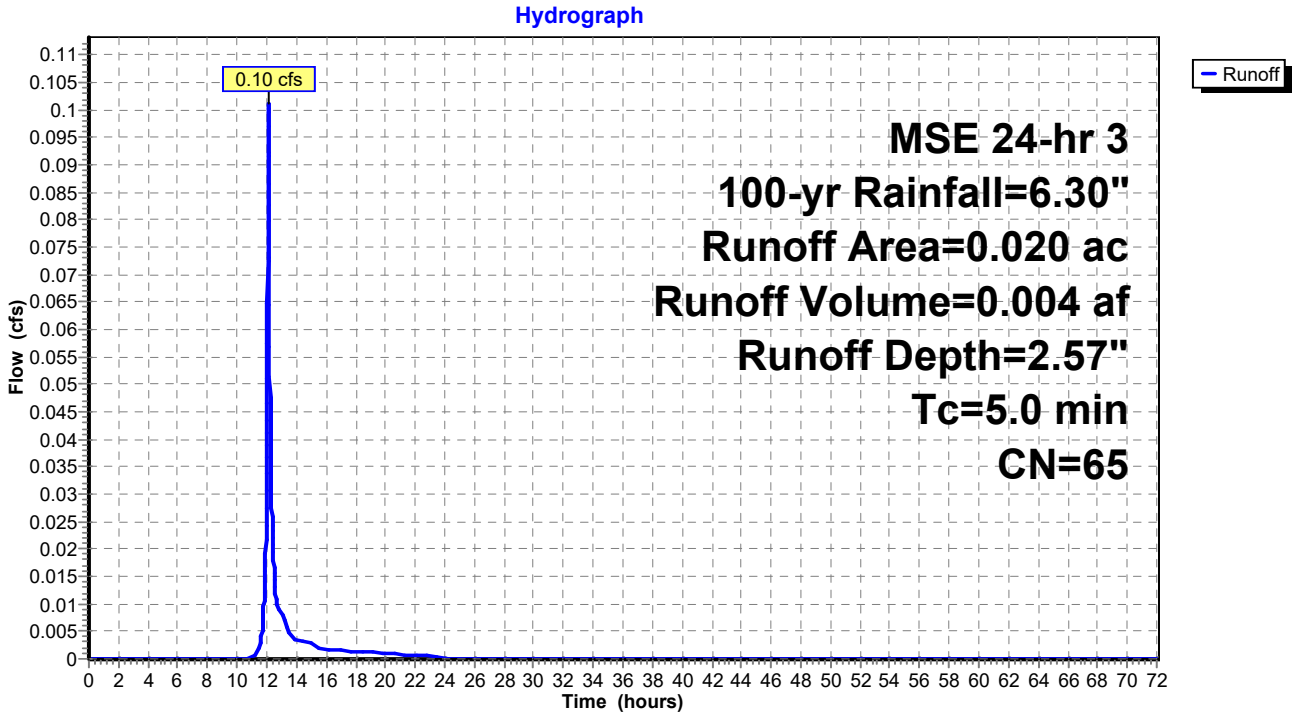
Runoff = 0.10 cfs @ 12.13 hrs, Volume= 0.004 af, Depth= 2.57"
Routed to Pond 25P : Biofilter B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=6.30"

	Area (ac)	CN	Description
*	0.020	65	Undisturbed Woodland
	0.020		100.00% Pervious Area

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

Subcatchment 24S: Basin B-2



Hydrograph for Subcatchment 24S: Basin B-2

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	0.06	0.00	0.00
3.00	0.10	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.24	0.00	0.00
6.00	0.32	0.00	0.00
7.00	0.42	0.00	0.00
8.00	0.53	0.00	0.00
9.00	0.65	0.00	0.00
10.00	0.87	0.00	0.00
11.00	1.21	0.00	0.00
12.00	2.92	0.47	**0.04**
13.00	5.09	1.71	**0.01**
14.00	5.43	1.95	0.00
15.00	5.65	2.10	0.00
16.00	5.77	2.19	0.00
17.00	5.88	2.27	0.00
18.00	5.98	2.34	0.00
19.00	6.06	2.40	0.00
20.00	6.14	2.45	0.00
21.00	6.20	2.49	0.00
22.00	6.24	2.53	0.00
23.00	6.28	2.56	0.00
24.00	**6.30**	**2.57**	0.00
25.00	6.30	2.57	0.00
26.00	6.30	2.57	0.00
27.00	6.30	2.57	0.00
28.00	6.30	2.57	0.00
29.00	6.30	2.57	0.00
30.00	6.30	2.57	0.00
31.00	6.30	2.57	0.00
32.00	6.30	2.57	0.00
33.00	6.30	2.57	0.00
34.00	6.30	2.57	0.00
35.00	6.30	2.57	0.00
36.00	6.30	2.57	0.00
37.00	6.30	2.57	0.00
38.00	6.30	2.57	0.00
39.00	6.30	2.57	0.00
40.00	6.30	2.57	0.00
41.00	6.30	2.57	0.00
42.00	6.30	2.57	0.00
43.00	6.30	2.57	0.00
44.00	6.30	2.57	0.00
45.00	6.30	2.57	0.00
46.00	6.30	2.57	0.00
47.00	6.30	2.57	0.00
48.00	6.30	2.57	0.00
49.00	6.30	2.57	0.00
50.00	6.30	2.57	0.00
51.00	6.30	2.57	0.00
52.00	6.30	2.57	0.00
53.00	6.30	2.57	0.00
54.00	6.30	2.57	0.00
55.00	6.30	2.57	0.00
56.00	6.30	2.57	0.00
57.00	6.30	2.57	0.00
58.00	6.30	2.57	0.00
59.00	6.30	2.57	0.00
60.00	6.30	2.57	0.00
61.00	6.30	2.57	0.00
62.00	6.30	2.57	0.00
63.00	6.30	2.57	0.00
64.00	6.30	2.57	0.00
65.00	6.30	2.57	0.00
66.00	6.30	2.57	0.00
67.00	6.30	2.57	0.00
68.00	6.30	2.57	0.00
69.00	6.30	2.57	0.00
70.00	6.30	2.57	0.00
71.00	6.30	2.57	0.00
72.00	6.30	2.57	0.00

Summary for Subcatchment 26S: Basin C-1

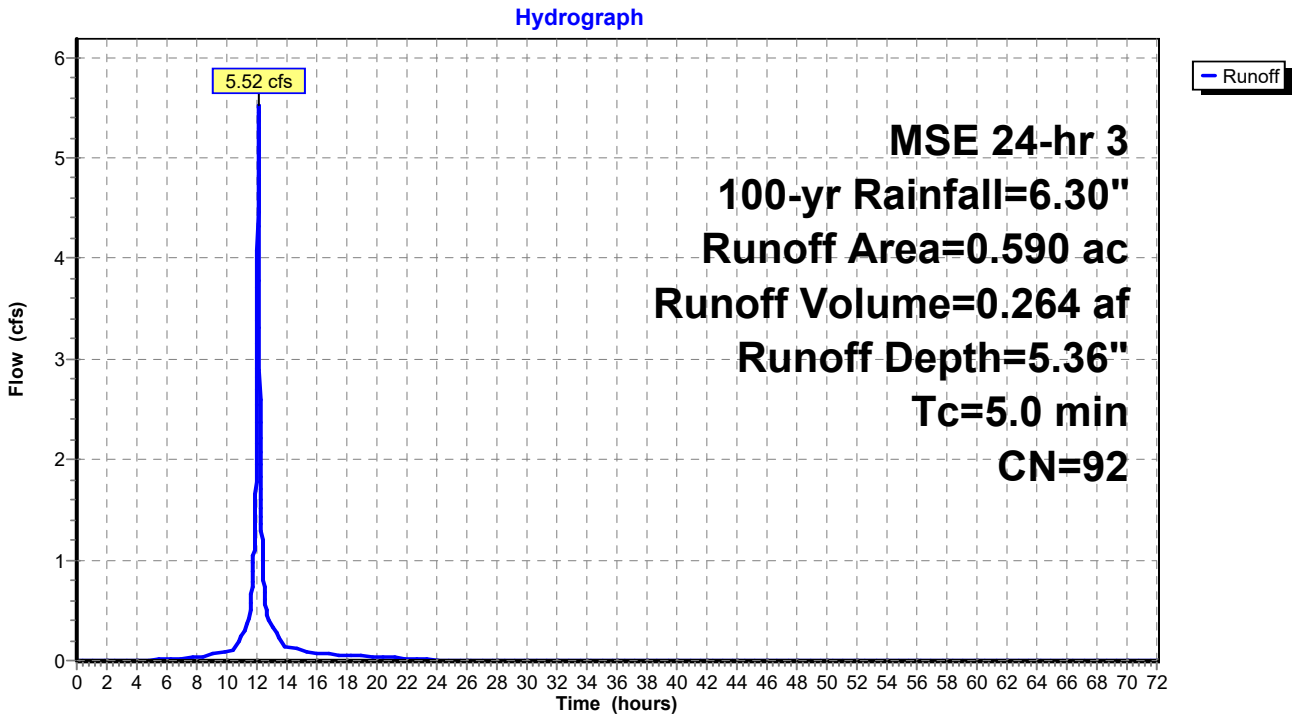
Runoff = 5.52 cfs @ 12.12 hrs, Volume= 0.264 af, Depth= 5.36"
Routed to Pond 22P : Post-Development ADS System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=6.30"

	Area (ac)	CN	Description
*	0.285	98	Pave
*	0.099	65	Woodland
*	0.206	98	Roof
	0.590	92	Weighted Average
	0.099		16.78% Pervious Area
	0.491		83.22% Impervious Area

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

Subcatchment 26S: Basin C-1



Hydrograph for Subcatchment 26S: Basin C-1

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	0.06	0.00	0.00
3.00	0.10	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.24	0.00	0.01
6.00	0.32	0.02	0.01
7.00	0.42	0.05	0.02
8.00	0.53	0.10	0.03
9.00	0.65	0.17	0.04
10.00	0.87	0.31	0.09
11.00	1.21	0.57	0.25
12.00	2.92	2.08	**2.82**
13.00	5.09	4.17	**0.36**
14.00	5.43	4.51	0.14
15.00	5.65	4.73	0.12
16.00	5.77	4.85	0.07
17.00	5.88	4.95	0.06
18.00	5.98	5.05	0.05
19.00	6.06	5.13	0.05
20.00	6.14	5.20	0.04
21.00	6.20	5.26	0.03
22.00	6.24	5.31	0.02
23.00	6.28	5.34	0.02
24.00	**6.30**	**5.36**	0.01
25.00	6.30	5.36	0.00
26.00	6.30	5.36	0.00
27.00	6.30	5.36	0.00
28.00	6.30	5.36	0.00
29.00	6.30	5.36	0.00
30.00	6.30	5.36	0.00
31.00	6.30	5.36	0.00
32.00	6.30	5.36	0.00
33.00	6.30	5.36	0.00
34.00	6.30	5.36	0.00
35.00	6.30	5.36	0.00
36.00	6.30	5.36	0.00
37.00	6.30	5.36	0.00
38.00	6.30	5.36	0.00
39.00	6.30	5.36	0.00
40.00	6.30	5.36	0.00
41.00	6.30	5.36	0.00
42.00	6.30	5.36	0.00
43.00	6.30	5.36	0.00
44.00	6.30	5.36	0.00
45.00	6.30	5.36	0.00
46.00	6.30	5.36	0.00
47.00	6.30	5.36	0.00
48.00	6.30	5.36	0.00
49.00	6.30	5.36	0.00
50.00	6.30	5.36	0.00
51.00	6.30	5.36	0.00
52.00	6.30	5.36	0.00
53.00	6.30	5.36	0.00
54.00	6.30	5.36	0.00
55.00	6.30	5.36	0.00
56.00	6.30	5.36	0.00
57.00	6.30	5.36	0.00
58.00	6.30	5.36	0.00
59.00	6.30	5.36	0.00
60.00	6.30	5.36	0.00
61.00	6.30	5.36	0.00
62.00	6.30	5.36	0.00
63.00	6.30	5.36	0.00
64.00	6.30	5.36	0.00
65.00	6.30	5.36	0.00
66.00	6.30	5.36	0.00
67.00	6.30	5.36	0.00
68.00	6.30	5.36	0.00
69.00	6.30	5.36	0.00
70.00	6.30	5.36	0.00
71.00	6.30	5.36	0.00
72.00	6.30	5.36	0.00

Summary for Subcatchment 27S: Basin C-2

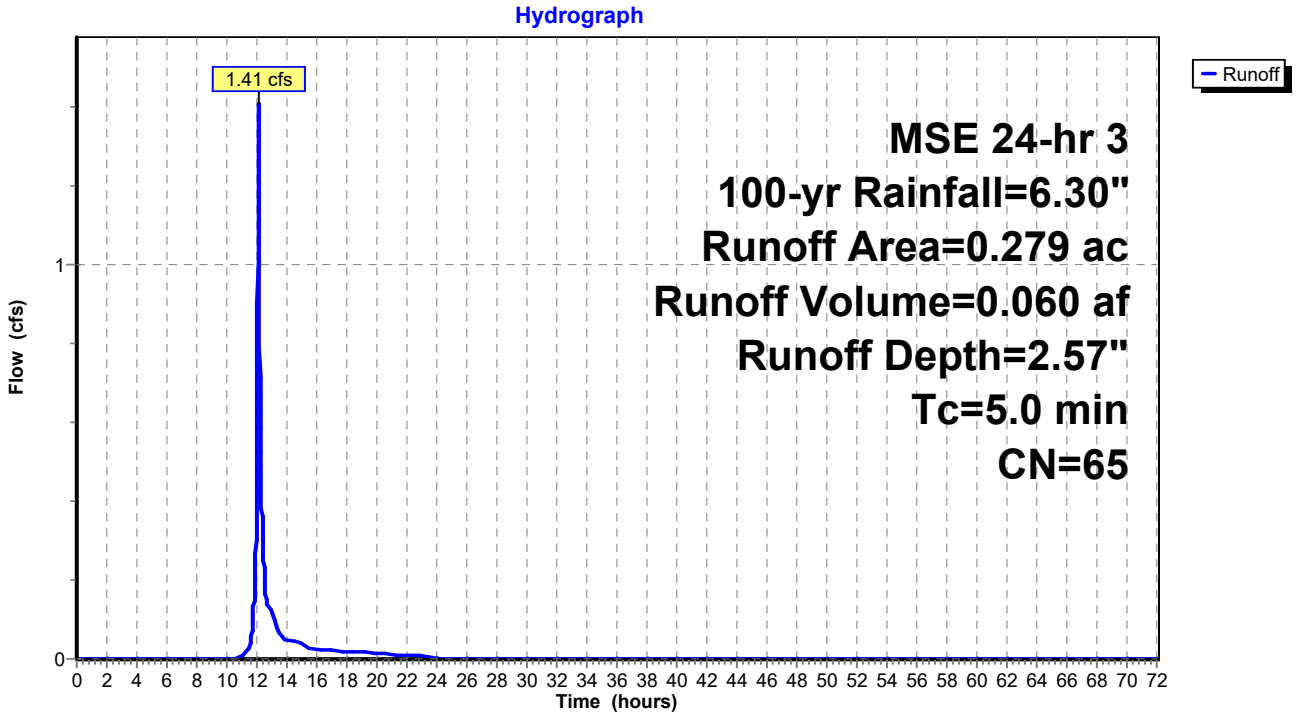
Runoff = 1.41 cfs @ 12.13 hrs, Volume= 0.060 af, Depth= 2.57"
Routed to Pond 22P : Post-Development ADS System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=6.30"

	Area (ac)	CN	Description
*	0.279	65	Undisturbed Woodland
	0.279		100.00% Pervious Area

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

Subcatchment 27S: Basin C-2



Hydrograph for Subcatchment 27S: Basin C-2

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	0.06	0.00	0.00
3.00	0.10	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.24	0.00	0.00
6.00	0.32	0.00	0.00
7.00	0.42	0.00	0.00
8.00	0.53	0.00	0.00
9.00	0.65	0.00	0.00
10.00	0.87	0.00	0.00
11.00	1.21	0.00	0.01
12.00	2.92	0.47	**0.54**
13.00	5.09	1.71	**0.11**
14.00	5.43	1.95	0.05
15.00	5.65	2.10	0.04
16.00	5.77	2.19	0.02
17.00	5.88	2.27	0.02
18.00	5.98	2.34	0.02
19.00	6.06	2.40	0.02
20.00	6.14	2.45	0.01
21.00	6.20	2.49	0.01
22.00	6.24	2.53	0.01
23.00	6.28	2.56	0.01
24.00	**6.30**	**2.57**	0.00
25.00	6.30	2.57	0.00
26.00	6.30	2.57	0.00
27.00	6.30	2.57	0.00
28.00	6.30	2.57	0.00
29.00	6.30	2.57	0.00
30.00	6.30	2.57	0.00
31.00	6.30	2.57	0.00
32.00	6.30	2.57	0.00
33.00	6.30	2.57	0.00
34.00	6.30	2.57	0.00
35.00	6.30	2.57	0.00
36.00	6.30	2.57	0.00
37.00	6.30	2.57	0.00
38.00	6.30	2.57	0.00
39.00	6.30	2.57	0.00
40.00	6.30	2.57	0.00
41.00	6.30	2.57	0.00
42.00	6.30	2.57	0.00
43.00	6.30	2.57	0.00
44.00	6.30	2.57	0.00
45.00	6.30	2.57	0.00
46.00	6.30	2.57	0.00
47.00	6.30	2.57	0.00
48.00	6.30	2.57	0.00
49.00	6.30	2.57	0.00
50.00	6.30	2.57	0.00
51.00	6.30	2.57	0.00
52.00	6.30	2.57	0.00
53.00	6.30	2.57	0.00
54.00	6.30	2.57	0.00
55.00	6.30	2.57	0.00
56.00	6.30	2.57	0.00
57.00	6.30	2.57	0.00
58.00	6.30	2.57	0.00
59.00	6.30	2.57	0.00
60.00	6.30	2.57	0.00
61.00	6.30	2.57	0.00
62.00	6.30	2.57	0.00
63.00	6.30	2.57	0.00
64.00	6.30	2.57	0.00
65.00	6.30	2.57	0.00
66.00	6.30	2.57	0.00
67.00	6.30	2.57	0.00
68.00	6.30	2.57	0.00
69.00	6.30	2.57	0.00
70.00	6.30	2.57	0.00
71.00	6.30	2.57	0.00
72.00	6.30	2.57	0.00

Summary for Subcatchment 28S: Basin D-1

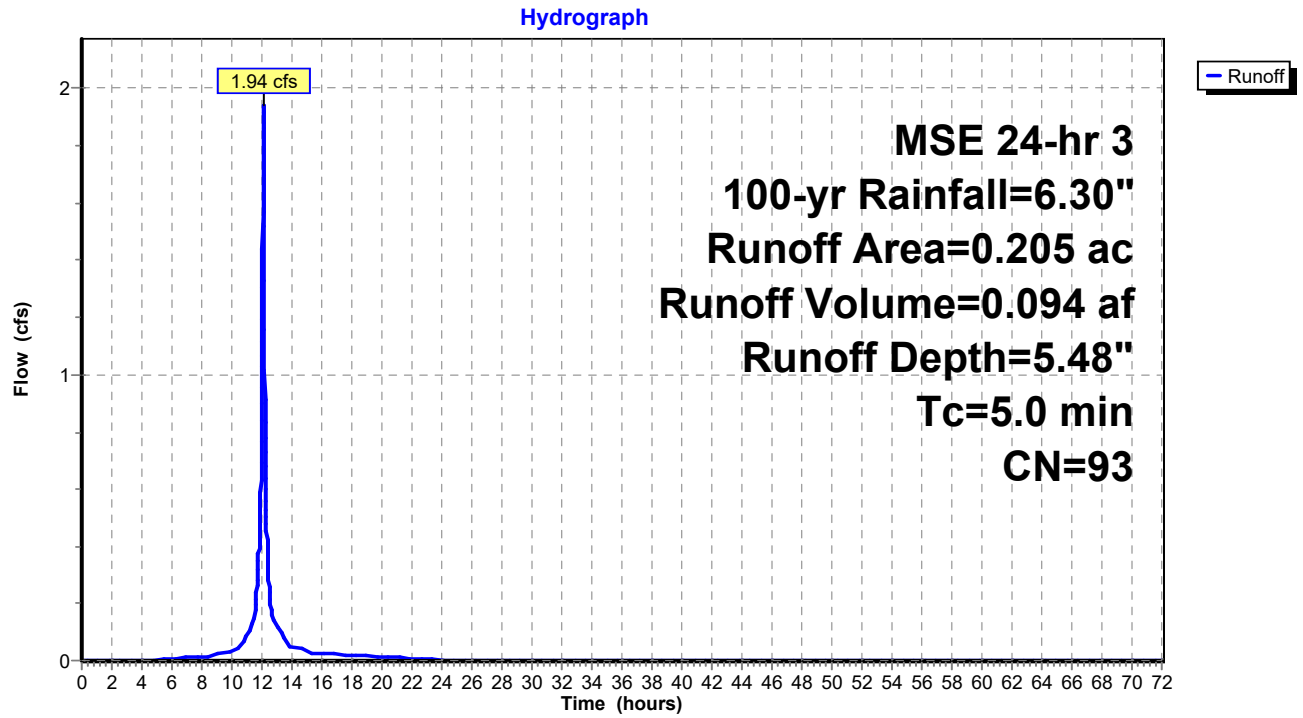
Runoff = 1.94 cfs @ 12.12 hrs, Volume= 0.094 af, Depth= 5.48"
Routed to Pond 33P : Biofilter D

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=6.30"

	Area (ac)	CN	Description
*	0.137	98	Pave
*	0.029	65	Woodland
*	0.039	98	Pond Surface
	0.205	93	Weighted Average
	0.029		14.15% Pervious Area
	0.176		85.85% Impervious Area

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

Subcatchment 28S: Basin D-1



Hydrograph for Subcatchment 28S: Basin D-1

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	0.06	0.00	0.00
3.00	0.10	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.24	0.01	0.00
6.00	0.32	0.03	0.01
7.00	0.42	0.07	0.01
8.00	0.53	0.13	0.01
9.00	0.65	0.20	0.02
10.00	0.87	0.35	0.03
11.00	1.21	0.62	0.09
12.00	2.92	2.17	**1.00**
13.00	5.09	4.28	**0.12**
14.00	5.43	4.62	0.05
15.00	5.65	4.84	0.04
16.00	5.77	4.96	0.02
17.00	5.88	5.07	0.02
18.00	5.98	5.16	0.02
19.00	6.06	5.25	0.02
20.00	6.14	5.32	0.01
21.00	6.20	5.38	0.01
22.00	6.24	5.42	0.01
23.00	6.28	5.46	0.01
24.00	**6.30**	**5.48**	0.00
25.00	6.30	5.48	0.00
26.00	6.30	5.48	0.00
27.00	6.30	5.48	0.00
28.00	6.30	5.48	0.00
29.00	6.30	5.48	0.00
30.00	6.30	5.48	0.00
31.00	6.30	5.48	0.00
32.00	6.30	5.48	0.00
33.00	6.30	5.48	0.00
34.00	6.30	5.48	0.00
35.00	6.30	5.48	0.00
36.00	6.30	5.48	0.00
37.00	6.30	5.48	0.00
38.00	6.30	5.48	0.00
39.00	6.30	5.48	0.00
40.00	6.30	5.48	0.00
41.00	6.30	5.48	0.00
42.00	6.30	5.48	0.00
43.00	6.30	5.48	0.00
44.00	6.30	5.48	0.00
45.00	6.30	5.48	0.00
46.00	6.30	5.48	0.00
47.00	6.30	5.48	0.00
48.00	6.30	5.48	0.00
49.00	6.30	5.48	0.00
50.00	6.30	5.48	0.00
51.00	6.30	5.48	0.00
52.00	6.30	5.48	0.00
53.00	6.30	5.48	0.00
54.00	6.30	5.48	0.00
55.00	6.30	5.48	0.00
56.00	6.30	5.48	0.00
57.00	6.30	5.48	0.00
58.00	6.30	5.48	0.00
59.00	6.30	5.48	0.00
60.00	6.30	5.48	0.00
61.00	6.30	5.48	0.00
62.00	6.30	5.48	0.00
63.00	6.30	5.48	0.00
64.00	6.30	5.48	0.00
65.00	6.30	5.48	0.00
66.00	6.30	5.48	0.00
67.00	6.30	5.48	0.00
68.00	6.30	5.48	0.00
69.00	6.30	5.48	0.00
70.00	6.30	5.48	0.00
71.00	6.30	5.48	0.00
72.00	6.30	5.48	0.00

Summary for Subcatchment 29S: Basin D-2

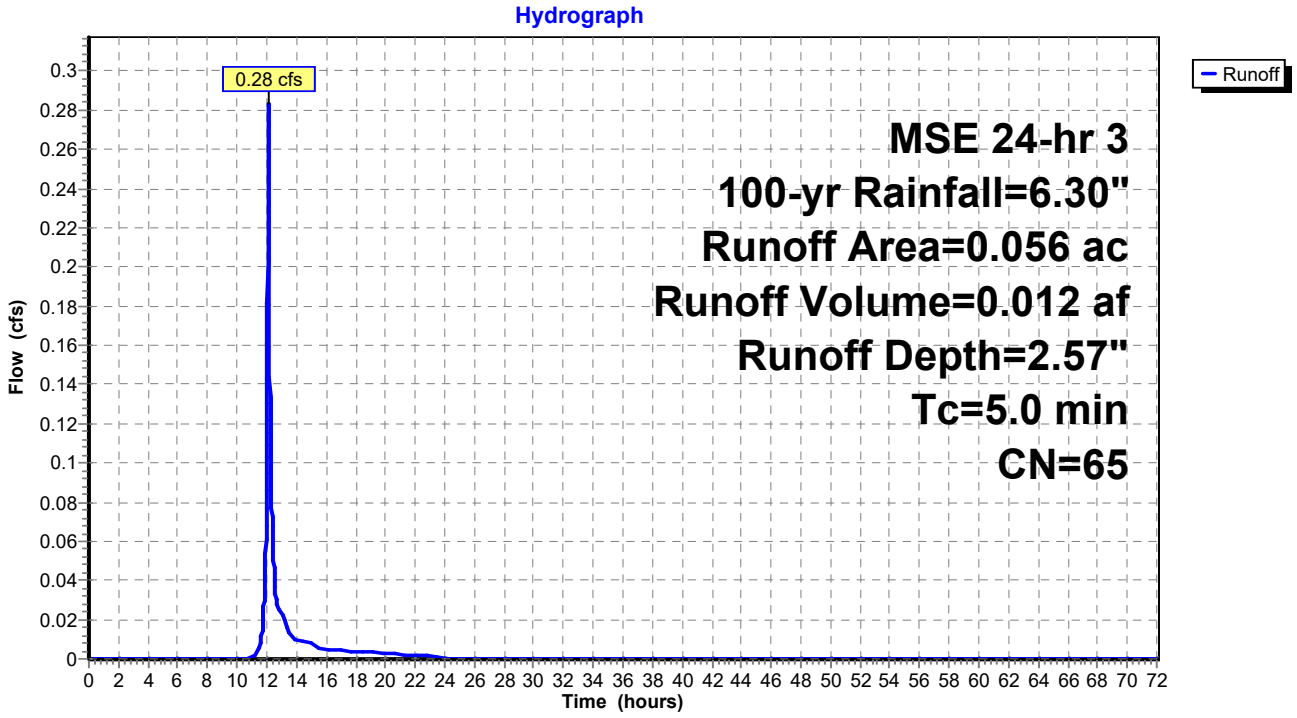
Runoff = 0.28 cfs @ 12.13 hrs, Volume= 0.012 af, Depth= 2.57"
Routed to Pond 33P : Biofilter D

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=6.30"

	Area (ac)	CN	Description
*	0.056	65	Undistrubed Woodland
	0.056		100.00% Pervious Area

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

Subcatchment 29S: Basin D-2



Hydrograph for Subcatchment 29S: Basin D-2

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	0.06	0.00	0.00
3.00	0.10	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.24	0.00	0.00
6.00	0.32	0.00	0.00
7.00	0.42	0.00	0.00
8.00	0.53	0.00	0.00
9.00	0.65	0.00	0.00
10.00	0.87	0.00	0.00
11.00	1.21	0.00	0.00
12.00	2.92	0.47	**0.11**
13.00	5.09	1.71	**0.02**
14.00	5.43	1.95	0.01
15.00	5.65	2.10	0.01
16.00	5.77	2.19	0.00
17.00	5.88	2.27	0.00
18.00	5.98	2.34	0.00
19.00	6.06	2.40	0.00
20.00	6.14	2.45	0.00
21.00	6.20	2.49	0.00
22.00	6.24	2.53	0.00
23.00	6.28	2.56	0.00
24.00	**6.30**	**2.57**	0.00
25.00	6.30	2.57	0.00
26.00	6.30	2.57	0.00
27.00	6.30	2.57	0.00
28.00	6.30	2.57	0.00
29.00	6.30	2.57	0.00
30.00	6.30	2.57	0.00
31.00	6.30	2.57	0.00
32.00	6.30	2.57	0.00
33.00	6.30	2.57	0.00
34.00	6.30	2.57	0.00
35.00	6.30	2.57	0.00
36.00	6.30	2.57	0.00
37.00	6.30	2.57	0.00
38.00	6.30	2.57	0.00
39.00	6.30	2.57	0.00
40.00	6.30	2.57	0.00
41.00	6.30	2.57	0.00
42.00	6.30	2.57	0.00
43.00	6.30	2.57	0.00
44.00	6.30	2.57	0.00
45.00	6.30	2.57	0.00
46.00	6.30	2.57	0.00
47.00	6.30	2.57	0.00
48.00	6.30	2.57	0.00
49.00	6.30	2.57	0.00
50.00	6.30	2.57	0.00
51.00	6.30	2.57	0.00
52.00	6.30	2.57	0.00
53.00	6.30	2.57	0.00
54.00	6.30	2.57	0.00
55.00	6.30	2.57	0.00
56.00	6.30	2.57	0.00
57.00	6.30	2.57	0.00
58.00	6.30	2.57	0.00
59.00	6.30	2.57	0.00
60.00	6.30	2.57	0.00
61.00	6.30	2.57	0.00
62.00	6.30	2.57	0.00
63.00	6.30	2.57	0.00
64.00	6.30	2.57	0.00
65.00	6.30	2.57	0.00
66.00	6.30	2.57	0.00
67.00	6.30	2.57	0.00
68.00	6.30	2.57	0.00
69.00	6.30	2.57	0.00
70.00	6.30	2.57	0.00
71.00	6.30	2.57	0.00
72.00	6.30	2.57	0.00

Summary for Subcatchment 34S: Undetained

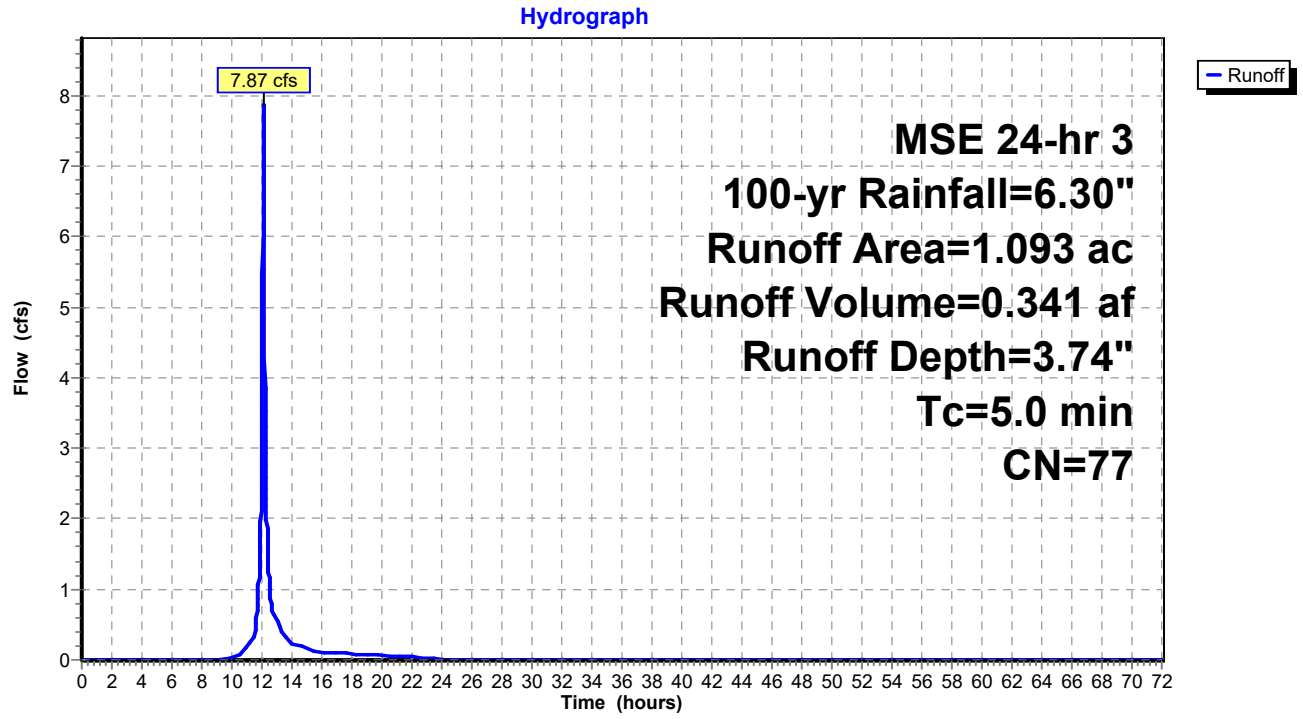
Runoff = 7.87 cfs @ 12.12 hrs, Volume= 0.341 af, Depth= 3.74"
Routed to Reach 38R : Post-Develpment

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=6.30"

	Area (ac)	CN	Description
*	0.210	98	Roof
*	0.173	98	Pave
*	0.600	65	Woodland
*	0.110	65	Natural Paths
	1.093	77	Weighted Average
	0.710		64.96% Pervious Area
	0.383		35.04% Impervious Area

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

Subcatchment 34S: Undetained



Hydrograph for Subcatchment 34S: 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	0.06	0.00	0.00
3.00	0.10	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.24	0.00	0.00
6.00	0.32	0.00	0.00
7.00	0.42	0.00	0.00
8.00	0.53	0.00	0.00
9.00	0.65	0.00	0.00
10.00	0.87	0.02	0.04
11.00	1.21	0.11	0.18
12.00	2.92	1.01	**3.55**
13.00	5.09	2.69	**0.57**
14.00	5.43	2.99	0.22
15.00	5.65	3.18	0.19
16.00	5.77	3.28	0.11
17.00	5.88	3.38	0.10
18.00	5.98	3.46	0.09
19.00	6.06	3.53	0.08
20.00	6.14	3.60	0.06
21.00	6.20	3.65	0.05
22.00	6.24	3.69	0.04
23.00	6.28	3.72	0.03
24.00	**6.30**	**3.74**	0.02
25.00	6.30	3.74	0.00
26.00	6.30	3.74	0.00
27.00	6.30	3.74	0.00
28.00	6.30	3.74	0.00
29.00	6.30	3.74	0.00
30.00	6.30	3.74	0.00
31.00	6.30	3.74	0.00
32.00	6.30	3.74	0.00
33.00	6.30	3.74	0.00
34.00	6.30	3.74	0.00
35.00	6.30	3.74	0.00
36.00	6.30	3.74	0.00
37.00	6.30	3.74	0.00
38.00	6.30	3.74	0.00
39.00	6.30	3.74	0.00
40.00	6.30	3.74	0.00
41.00	6.30	3.74	0.00
42.00	6.30	3.74	0.00
43.00	6.30	3.74	0.00
44.00	6.30	3.74	0.00
45.00	6.30	3.74	0.00
46.00	6.30	3.74	0.00
47.00	6.30	3.74	0.00
48.00	6.30	3.74	0.00
49.00	6.30	3.74	0.00
50.00	6.30	3.74	0.00
51.00	6.30	3.74	0.00
52.00	6.30	3.74	0.00
53.00	6.30	3.74	0.00
54.00	6.30	3.74	0.00
55.00	6.30	3.74	0.00
56.00	6.30	3.74	0.00
57.00	6.30	3.74	0.00
58.00	6.30	3.74	0.00
59.00	6.30	3.74	0.00
60.00	6.30	3.74	0.00
61.00	6.30	3.74	0.00
62.00	6.30	3.74	0.00
63.00	6.30	3.74	0.00
64.00	6.30	3.74	0.00
65.00	6.30	3.74	0.00
66.00	6.30	3.74	0.00
67.00	6.30	3.74	0.00
68.00	6.30	3.74	0.00
69.00	6.30	3.74	0.00
70.00	6.30	3.74	0.00
71.00	6.30	3.74	0.00
72.00	6.30	3.74	0.00

Summary for Subcatchment 36S: Existing

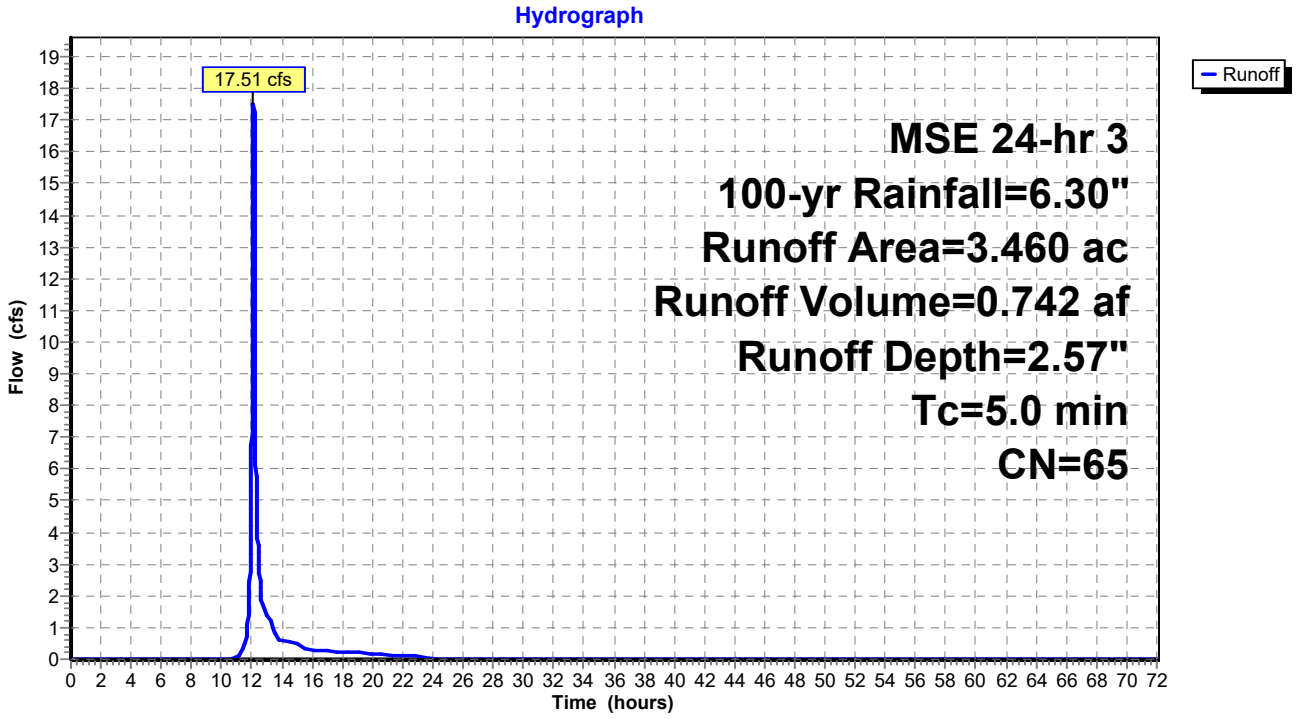
Runoff = 17.51 cfs @ 12.13 hrs, Volume= 0.742 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=6.30"

	Area (ac)	CN	Description
*	3.460	65	Woodland
	3.460		100.00% Pervious Area

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

Subcatchment 36S: Existing



Hydrograph for Subcatchment 36S: Existing

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	0.06	0.00	0.00
3.00	0.10	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.24	0.00	0.00
6.00	0.32	0.00	0.00
7.00	0.42	0.00	0.00
8.00	0.53	0.00	0.00
9.00	0.65	0.00	0.00
10.00	0.87	0.00	0.00
11.00	1.21	0.00	0.07
12.00	2.92	0.47	**6.75**
13.00	5.09	1.71	**1.43**
14.00	5.43	1.95	0.56
15.00	5.65	2.10	0.50
16.00	5.77	2.19	0.29
17.00	5.88	2.27	0.26
18.00	5.98	2.34	0.23
19.00	6.06	2.40	0.20
20.00	6.14	2.45	0.17
21.00	6.20	2.49	0.14
22.00	6.24	2.53	0.11
23.00	6.28	2.56	0.08
24.00	**6.30**	**2.57**	0.04
25.00	6.30	2.57	0.00
26.00	6.30	2.57	0.00
27.00	6.30	2.57	0.00
28.00	6.30	2.57	0.00
29.00	6.30	2.57	0.00
30.00	6.30	2.57	0.00
31.00	6.30	2.57	0.00
32.00	6.30	2.57	0.00
33.00	6.30	2.57	0.00
34.00	6.30	2.57	0.00
35.00	6.30	2.57	0.00
36.00	6.30	2.57	0.00
37.00	6.30	2.57	0.00
38.00	6.30	2.57	0.00
39.00	6.30	2.57	0.00
40.00	6.30	2.57	0.00
41.00	6.30	2.57	0.00
42.00	6.30	2.57	0.00
43.00	6.30	2.57	0.00
44.00	6.30	2.57	0.00
45.00	6.30	2.57	0.00
46.00	6.30	2.57	0.00
47.00	6.30	2.57	0.00
48.00	6.30	2.57	0.00
49.00	6.30	2.57	0.00
50.00	6.30	2.57	0.00
51.00	6.30	2.57	0.00
52.00	6.30	2.57	0.00
53.00	6.30	2.57	0.00
54.00	6.30	2.57	0.00
55.00	6.30	2.57	0.00
56.00	6.30	2.57	0.00
57.00	6.30	2.57	0.00
58.00	6.30	2.57	0.00
59.00	6.30	2.57	0.00
60.00	6.30	2.57	0.00
61.00	6.30	2.57	0.00
62.00	6.30	2.57	0.00
63.00	6.30	2.57	0.00
64.00	6.30	2.57	0.00
65.00	6.30	2.57	0.00
66.00	6.30	2.57	0.00
67.00	6.30	2.57	0.00
68.00	6.30	2.57	0.00
69.00	6.30	2.57	0.00
70.00	6.30	2.57	0.00
71.00	6.30	2.57	0.00
72.00	6.30	2.57	0.00

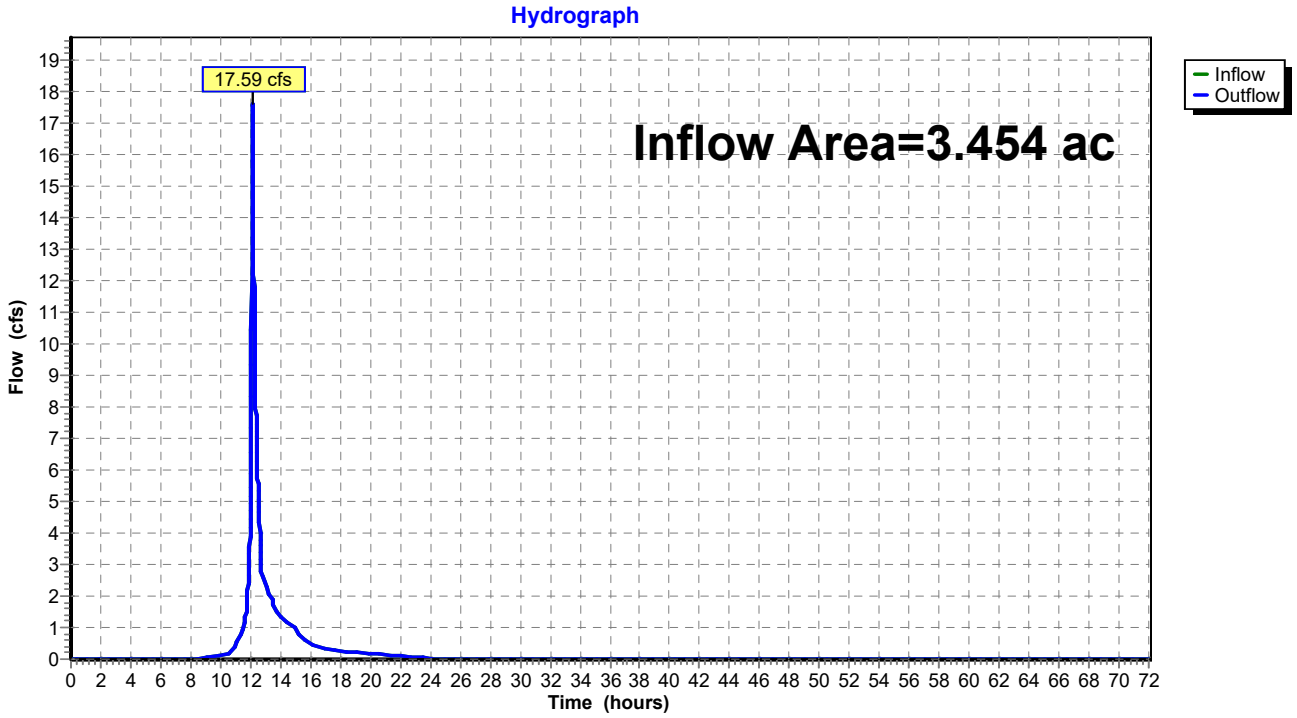
Summary for Reach 38R: Post-Develpment

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.454 ac, 46.82% Impervious, Inflow Depth = 3.86" for 100-yr event
Inflow = 17.59 cfs @ 12.14 hrs, Volume= 1.110 af
Outflow = 17.59 cfs @ 12.14 hrs, Volume= 1.110 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 38R: Post-Develpment



Hydrograph for Reach 38R: Post-Develpment

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	52.00	0.00		0.00
1.00	0.00		0.00	53.00	0.00		0.00
2.00	0.00		0.00	54.00	0.00		0.00
3.00	0.00		0.00	55.00	0.00		0.00
4.00	0.00		0.00	56.00	0.00		0.00
5.00	0.00		0.00	57.00	0.00		0.00
6.00	0.00		0.00	58.00	0.00		0.00
7.00	0.00		0.00	59.00	0.00		0.00
8.00	0.01		0.01	60.00	0.00		0.00
9.00	0.03		0.03	61.00	0.00		0.00
10.00	0.11		0.11	62.00	0.00		0.00
11.00	0.43		0.43	63.00	0.00		0.00
12.00	**4.93**		**4.93**	64.00	0.00		0.00
13.00	**2.36**		**2.36**	65.00	0.00		0.00
14.00	1.35		1.35	66.00	0.00		0.00
15.00	0.97		0.97	67.00	0.00		0.00
16.00	0.50		0.50	68.00	0.00		0.00
17.00	0.32		0.32	69.00	0.00		0.00
18.00	0.25		0.25	70.00	0.00		0.00
19.00	0.22		0.22	71.00	0.00		0.00
20.00	0.18		0.18	72.00	0.00		0.00
21.00	0.14		0.14				
22.00	0.10		0.10				
23.00	0.07		0.07				
24.00	0.03		0.03				
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				

Summary for Pond 21P: Biofilter A

Inflow Area = 0.829 ac, 37.64% Impervious, Inflow Depth = 3.84" for 100-yr event
Inflow = 5.97 cfs @ 12.12 hrs, Volume= 0.265 af
Outflow = 2.39 cfs @ 12.23 hrs, Volume= 0.265 af, Atten= 60%, Lag= 6.2 min
Discarded = 0.02 cfs @ 12.23 hrs, Volume= 0.018 af
Primary = 2.37 cfs @ 12.23 hrs, Volume= 0.247 af
Routed to Pond 25P : Biofilter B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 928.99' @ 12.23 hrs Surf.Area= 0.041 ac Storage= 0.081 af

Plug-Flow detention time= 56.7 min calculated for 0.265 af (100% of inflow)
Center-of-Mass det. time= 56.8 min (847.8 - 791.0)

Volume	Invert	Avail.Storage	Storage Description
#1	925.50'	0.103 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

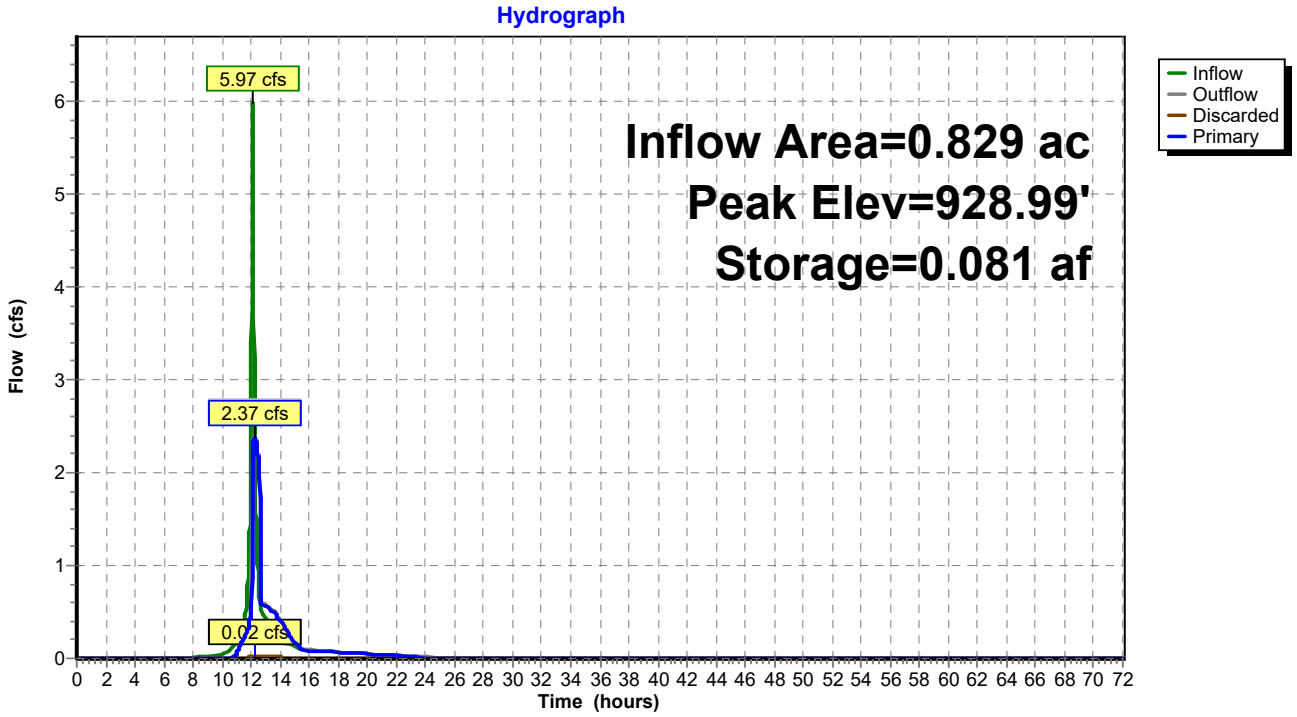
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
925.50	0.013	0.000	0.000
926.50	0.013	0.013	0.013
929.50	0.047	0.090	0.103

Device	Routing	Invert	Outlet Devices
#1	Primary	926.00'	**8.0" Round Culvert** L= 54.2' Ke= 0.500 Inlet / Outlet Invert= 926.00' / 925.75' S= 0.0046 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf
#2	Discarded	925.50'	**0.500 in/hr Exfiltration over Surface area**
#3	Device 1	926.00'	**4.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#4	Device 1	928.00'	**36.0" Horiz. Riser** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 12.23 hrs HW=928.99' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=2.37 cfs @ 12.23 hrs HW=928.99' TW=926.23' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 2.37 cfs @ 6.80 fps)
├**3=Underdrain** (Passes < 0.70 cfs potential flow)
└**4=Riser** (Passes < 30.44 cfs potential flow)

Pond 21P: Biofilter A



Hydrograph for Pond 21P: Biofilter A

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	925.50	0.00	0.00	0.00
2.00	0.00	0.000	925.50	0.00	0.00	0.00
4.00	0.00	0.000	925.50	0.00	0.00	0.00
6.00	0.00	0.000	925.50	0.00	0.00	0.00
8.00	0.01	0.000	925.51	0.01	0.01	0.00
10.00	0.05	0.003	925.74	0.01	0.01	0.00
12.00	**2.75**	**0.036**	**927.68**	**0.53**	**0.01**	**0.52**
14.00	**0.16**	**0.023**	**927.09**	**0.41**	**0.01**	**0.40**
16.00	0.08	0.009	926.20	0.09	0.01	0.08
18.00	0.07	0.009	926.17	0.07	0.01	0.06
20.00	0.05	0.008	926.14	0.05	0.01	0.04
22.00	0.03	0.008	926.11	0.03	0.01	0.03
24.00	0.01	0.007	926.06	0.02	0.01	0.01
26.00	0.00	0.006	925.97	0.01	0.01	0.00
28.00	0.00	0.005	925.88	0.01	0.01	0.00
30.00	0.00	0.004	925.80	0.01	0.01	0.00
32.00	0.00	0.003	925.72	0.01	0.01	0.00
34.00	0.00	0.002	925.63	0.01	0.01	0.00
36.00	0.00	0.001	925.55	0.01	0.01	0.00
38.00	0.00	0.000	925.50	0.00	0.00	0.00
40.00	0.00	0.000	925.50	0.00	0.00	0.00
42.00	0.00	0.000	925.50	0.00	0.00	0.00
44.00	0.00	0.000	925.50	0.00	0.00	0.00
46.00	0.00	0.000	925.50	0.00	0.00	0.00
48.00	0.00	0.000	925.50	0.00	0.00	0.00
50.00	0.00	0.000	925.50	0.00	0.00	0.00
52.00	0.00	0.000	925.50	0.00	0.00	0.00
54.00	0.00	0.000	925.50	0.00	0.00	0.00
56.00	0.00	0.000	925.50	0.00	0.00	0.00
58.00	0.00	0.000	925.50	0.00	0.00	0.00
60.00	0.00	0.000	925.50	0.00	0.00	0.00
62.00	0.00	0.000	925.50	0.00	0.00	0.00
64.00	0.00	0.000	925.50	0.00	0.00	0.00
66.00	0.00	0.000	925.50	0.00	0.00	0.00
68.00	0.00	0.000	925.50	0.00	0.00	0.00
70.00	0.00	0.000	925.50	0.00	0.00	0.00
72.00	0.00	0.000	925.50	0.00	0.00	0.00

Summary for Pond 22P: Post-Development ADS System

Inflow Area = 0.869 ac, 56.50% Impervious, Inflow Depth = 4.47" for 100-yr event
Inflow = 6.93 cfs @ 12.12 hrs, Volume= 0.324 af
Outflow = 4.68 cfs @ 12.17 hrs, Volume= 0.324 af, Atten= 32%, Lag= 3.0 min
Discarded = 0.02 cfs @ 8.03 hrs, Volume= 0.025 af
Primary = 4.66 cfs @ 12.17 hrs, Volume= 0.298 af
Routed to Reach 38R : Post-Develpment

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 918.81' @ 12.17 hrs Surf.Area= 1,375 sf Storage= 3,397 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 25.1 min (800.2 - 775.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	915.25'	2,382 cf	**19.42'W x 70.79'L x 6.75'H Field A** 9,278 cf Overall - 3,324 cf Embedded = 5,954 cf x 40.0% Voids
#2A	916.00'	3,324 cf	**ADS_StormTech MC-7200 +Cap** x 18 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 18 Chambers in 2 Rows Cap Storage= 39.5 cf x 2 x 2 rows = 158.0 cf
		5,706 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	915.25'	**12.0" Round Culvert** L= 156.7' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 915.25' / 914.75' S= 0.0032 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Device 1	915.25'	**4.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	919.75'	**3.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Discarded	915.25'	**0.500 in/hr Exfiltration over Surface area**
#5	Device 1	917.25'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 8.03 hrs HW=915.32' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=4.66 cfs @ 12.17 hrs HW=918.81' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 4.66 cfs of 4.92 cfs potential flow)
  ├**2=Orifice** (Orifice Controls 0.77 cfs @ 8.86 fps)
  ├**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Orifice Controls 3.89 cfs @ 4.95 fps)

Pond 22P: Post-Development ADS System - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-7200 +Cap (ADS StormTech®MC-7200 with cap volume)
Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf
Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap
Cap Storage= 39.5 cf x 2 x 2 rows = 158.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

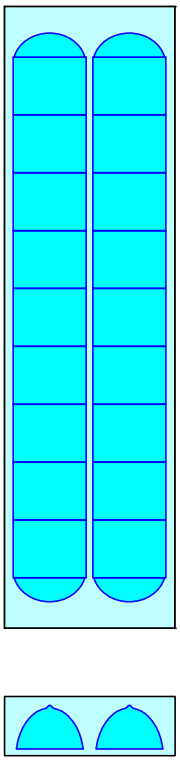
9 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 64.79' Row Length +36.0" End Stone x 2 = 70.79' Base Length
2 Rows x 100.0" Wide + 9.0" Spacing x 1 + 12.0" Side Stone x 2 = 19.42' Base Width
9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

18 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 2 Rows = 3,323.8 cf Chamber Storage

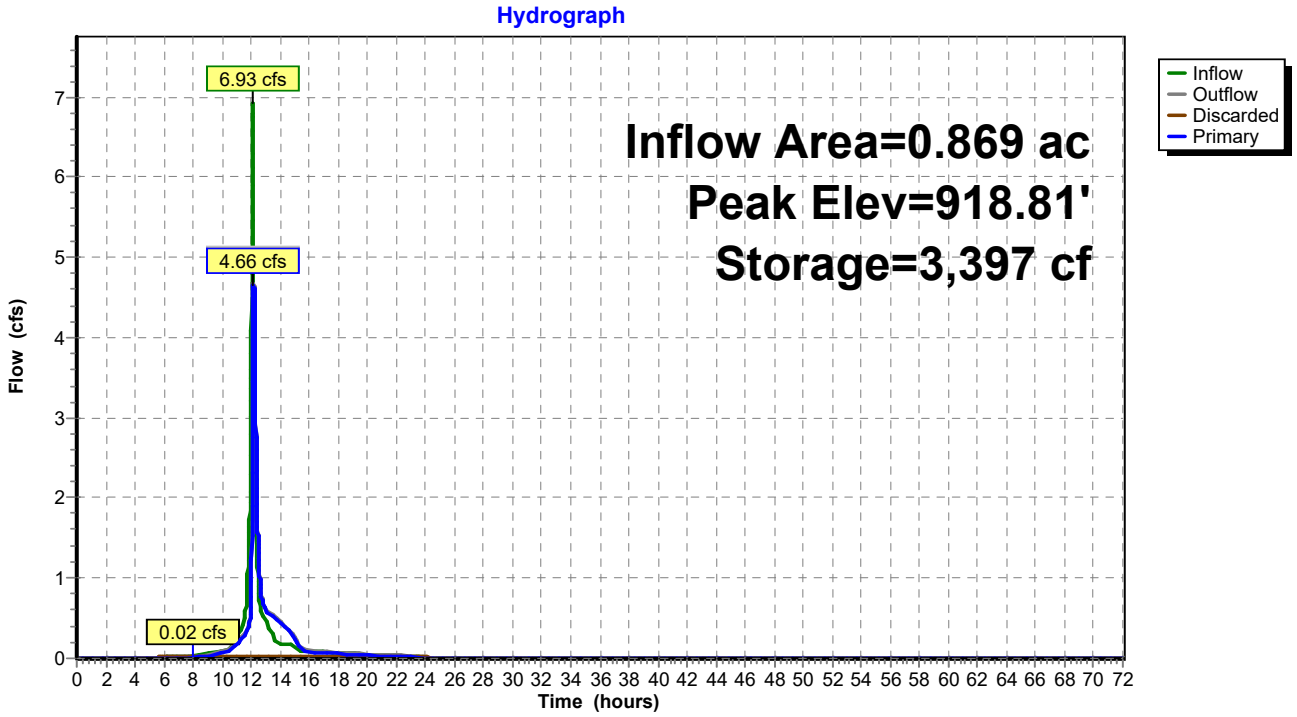
9,278.1 cf Field - 3,323.8 cf Chambers = 5,954.4 cf Stone x 40.0% Voids = 2,381.7 cf Stone Storage

Chamber Storage + Stone Storage = 5,705.5 cf = 0.131 af
Overall Storage Efficiency = 61.5%
Overall System Size = 70.79' x 19.42' x 6.75'

18 Chambers @ $ 1,200.00 /ea = $ 21,600.00
343.6 cy Field Excavation @ $ 1.00 /cy = $ 343.63
220.5 cy Stone @ $ 30.00 /cy = $ 6,615.97
Total Cost = $ 28,559.60



Pond 22P: Post-Development ADS System



Hydrograph for Pond 22P: Post-Development ADS System

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	915.25	0.00	0.00	0.00
2.00	0.00	0	915.25	0.00	0.00	0.00
4.00	0.00	0	915.25	0.00	0.00	0.00
6.00	0.01	0	915.25	0.01	0.01	0.00
8.00	0.03	36	915.32	0.03	**0.02**	0.01
10.00	0.09	100	915.43	0.09	**0.02**	0.07
12.00	**3.37**	**1,791**	**917.25**	**0.59**	0.02	**0.57**
14.00	**0.18**	**968**	**916.50**	**0.45**	0.02	**0.44**
16.00	0.09	108	915.45	0.10	0.02	0.08
18.00	0.07	90	915.41	0.07	0.02	0.06
20.00	0.05	72	915.38	0.06	0.02	0.04
22.00	0.03	51	915.34	0.04	0.02	0.02
24.00	0.01	21	915.29	0.02	0.02	0.00
26.00	0.00	0	915.25	0.00	0.00	0.00
28.00	0.00	0	915.25	0.00	0.00	0.00
30.00	0.00	0	915.25	0.00	0.00	0.00
32.00	0.00	0	915.25	0.00	0.00	0.00
34.00	0.00	0	915.25	0.00	0.00	0.00
36.00	0.00	0	915.25	0.00	0.00	0.00
38.00	0.00	0	915.25	0.00	0.00	0.00
40.00	0.00	0	915.25	0.00	0.00	0.00
42.00	0.00	0	915.25	0.00	0.00	0.00
44.00	0.00	0	915.25	0.00	0.00	0.00
46.00	0.00	0	915.25	0.00	0.00	0.00
48.00	0.00	0	915.25	0.00	0.00	0.00
50.00	0.00	0	915.25	0.00	0.00	0.00
52.00	0.00	0	915.25	0.00	0.00	0.00
54.00	0.00	0	915.25	0.00	0.00	0.00
56.00	0.00	0	915.25	0.00	0.00	0.00
58.00	0.00	0	915.25	0.00	0.00	0.00
60.00	0.00	0	915.25	0.00	0.00	0.00
62.00	0.00	0	915.25	0.00	0.00	0.00
64.00	0.00	0	915.25	0.00	0.00	0.00
66.00	0.00	0	915.25	0.00	0.00	0.00
68.00	0.00	0	915.25	0.00	0.00	0.00
70.00	0.00	0	915.25	0.00	0.00	0.00
72.00	0.00	0	915.25	0.00	0.00	0.00

Summary for Pond 25P: Biofilter B

Inflow Area = 1.231 ac, 46.06% Impervious, Inflow Depth = 3.94" for 100-yr event
Inflow = 5.65 cfs @ 12.13 hrs, Volume= 0.404 af
Outflow = 5.12 cfs @ 12.16 hrs, Volume= 0.404 af, Atten= 9%, Lag= 1.8 min
Discarded = 0.02 cfs @ 12.16 hrs, Volume= 0.022 af
Primary = 5.11 cfs @ 12.16 hrs, Volume= 0.383 af
Routed to Reach 38R : Post-Develpment

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 926.29' @ 12.16 hrs Surf.Area= 0.038 ac Storage= 0.065 af

Plug-Flow detention time= 43.2 min calculated for 0.404 af (100% of inflow)
Center-of-Mass det. time= 43.3 min (845.4 - 802.2)

Volume	Invert	Avail.Storage	Storage Description
#1	923.75'	0.132 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

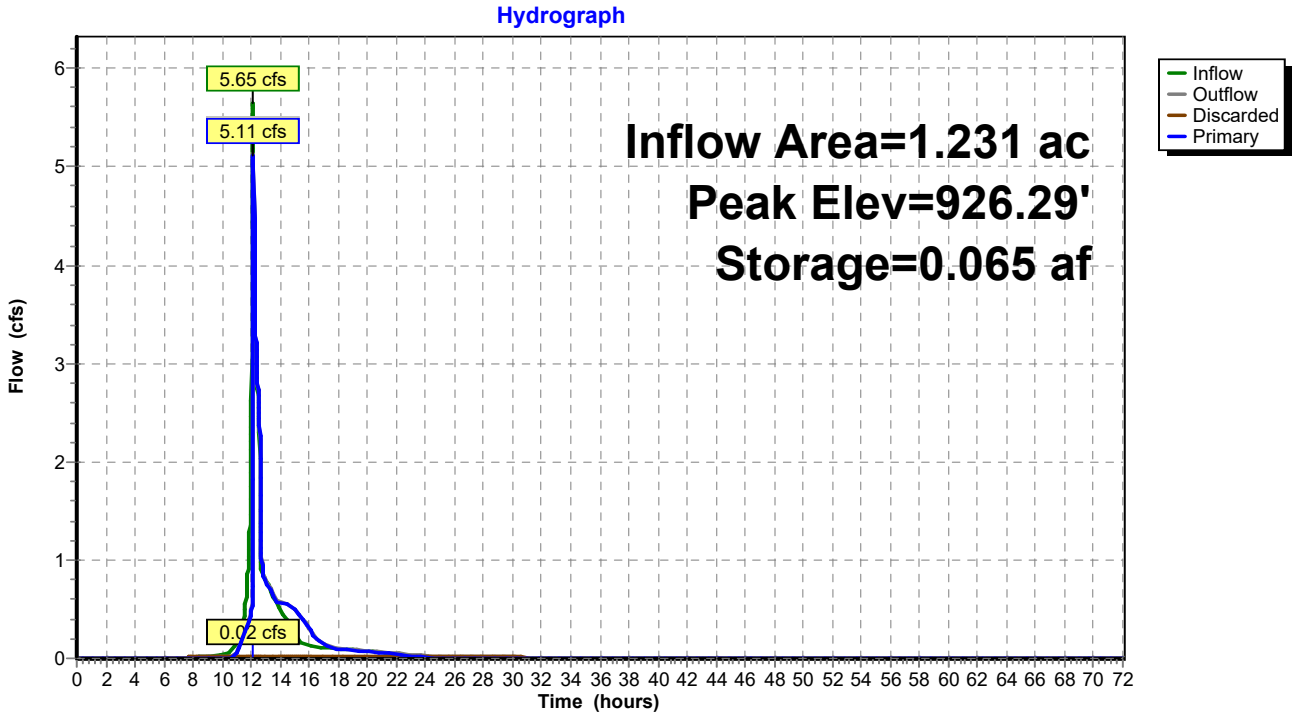
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
923.75	0.020	0.000	0.000
924.75	0.020	0.020	0.020
927.75	0.055	0.112	0.132

Device	Routing	Invert	Outlet Devices
#1	Discarded	923.75'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	923.97'	**12.0" Round Culvert** L= 36.7' Ke= 0.500 Inlet / Outlet Invert= 923.97' / 923.56' S= 0.0112 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#3	Device 2	923.97'	**4.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#4	Device 2	926.00'	**36.0" Horiz. Riser** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 12.16 hrs HW=926.29' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=5.10 cfs @ 12.16 hrs HW=926.29' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Inlet Controls 5.10 cfs @ 6.50 fps)
  ├**3=Underdrain** (Passes < 0.62 cfs potential flow)
  └**4=Riser** (Passes < 4.86 cfs potential flow)

Pond 25P: Biofilter B



Hydrograph for Pond 25P: Biofilter B

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	923.75	0.00	0.00	0.00
2.00	0.00	0.000	923.75	0.00	0.00	0.00
4.00	0.00	0.000	923.75	0.00	0.00	0.00
6.00	0.00	0.000	923.75	0.00	0.00	0.00
8.00	0.01	0.000	923.75	0.01	0.01	0.00
10.00	0.04	0.002	923.86	0.01	0.01	0.00
12.00	**2.21**	**0.038**	**925.48**	**0.50**	**0.01**	**0.49**
14.00	**0.49**	**0.053**	**925.96**	**0.58**	**0.02**	**0.57**
16.00	0.12	0.017	924.61	0.30	0.01	0.29
18.00	0.10	0.009	924.18	0.10	0.01	0.09
20.00	0.07	0.008	924.14	0.07	0.01	0.06
22.00	0.04	0.007	924.10	0.05	0.01	0.04
24.00	0.02	0.006	924.05	0.02	0.01	0.01
26.00	0.00	0.004	923.95	0.01	0.01	0.00
28.00	0.00	0.002	923.87	0.01	0.01	0.00
30.00	0.00	0.001	923.78	0.01	0.01	0.00
32.00	0.00	0.000	923.75	0.00	0.00	0.00
34.00	0.00	0.000	923.75	0.00	0.00	0.00
36.00	0.00	0.000	923.75	0.00	0.00	0.00
38.00	0.00	0.000	923.75	0.00	0.00	0.00
40.00	0.00	0.000	923.75	0.00	0.00	0.00
42.00	0.00	0.000	923.75	0.00	0.00	0.00
44.00	0.00	0.000	923.75	0.00	0.00	0.00
46.00	0.00	0.000	923.75	0.00	0.00	0.00
48.00	0.00	0.000	923.75	0.00	0.00	0.00
50.00	0.00	0.000	923.75	0.00	0.00	0.00
52.00	0.00	0.000	923.75	0.00	0.00	0.00
54.00	0.00	0.000	923.75	0.00	0.00	0.00
56.00	0.00	0.000	923.75	0.00	0.00	0.00
58.00	0.00	0.000	923.75	0.00	0.00	0.00
60.00	0.00	0.000	923.75	0.00	0.00	0.00
62.00	0.00	0.000	923.75	0.00	0.00	0.00
64.00	0.00	0.000	923.75	0.00	0.00	0.00
66.00	0.00	0.000	923.75	0.00	0.00	0.00
68.00	0.00	0.000	923.75	0.00	0.00	0.00
70.00	0.00	0.000	923.75	0.00	0.00	0.00
72.00	0.00	0.000	923.75	0.00	0.00	0.00

Summary for Pond 33P: Biofilter D

Inflow Area = 0.261 ac, 67.43% Impervious, Inflow Depth = 4.86" for 100-yr event
Inflow = 2.22 cfs @ 12.12 hrs, Volume= 0.106 af
Outflow = 0.54 cfs @ 12.32 hrs, Volume= 0.106 af, Atten= 76%, Lag= 11.6 min
Discarded = 0.01 cfs @ 12.32 hrs, Volume= 0.017 af
Primary = 0.53 cfs @ 12.32 hrs, Volume= 0.088 af
Routed to Reach 38R : Post-Develpment

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 923.22' @ 12.32 hrs Surf.Area= 0.028 ac Storage= 0.039 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 69.6 min (838.3 - 768.8)

Volume	Invert	Avail.Storage	Storage Description
#1	921.25'	0.073 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

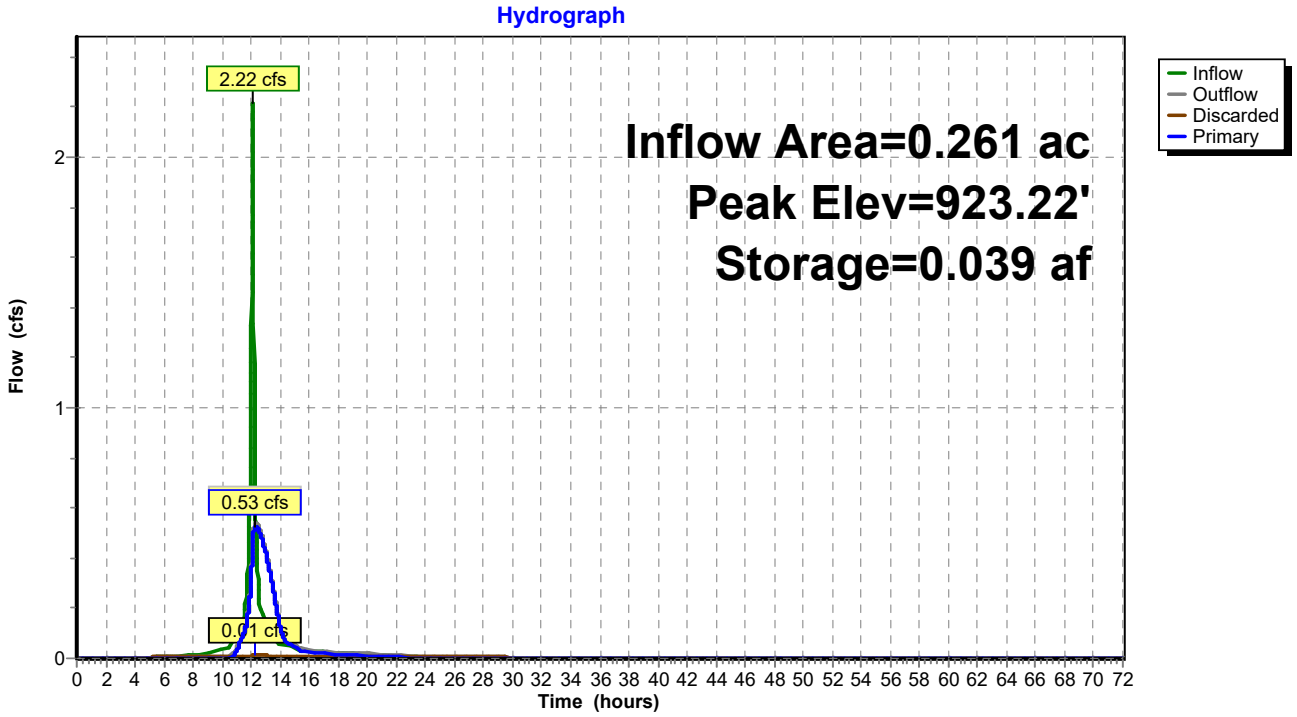
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
921.25	0.017	0.000	0.000
922.25	0.017	0.017	0.017
924.25	0.039	0.056	0.073

Device	Routing	Invert	Outlet Devices
#1	Discarded	921.25'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	921.47'	**6.0" Round Culvert** L= 36.9' Ke= 0.500 Inlet / Outlet Invert= 921.47' / 920.56' S= 0.0247 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf
#3	Device 2	921.47'	**4.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#4	Device 2	924.00'	**36.0" Horiz. Riser** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 12.32 hrs HW=923.22' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.53 cfs @ 12.32 hrs HW=923.22' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.53 cfs of 1.16 cfs potential flow)
├**3=Underdrain** (Orifice Controls 0.53 cfs @ 6.05 fps)
└**4=Riser** (Controls 0.00 cfs)

Pond 33P: Biofilter D



Hydrograph for Pond 33P: Biofilter D

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	921.25	0.00	0.00	0.00
2.00	0.00	0.000	921.25	0.00	0.00	0.00
4.00	0.00	0.000	921.25	0.00	0.00	0.00
6.00	0.01	0.000	921.25	0.01	0.01	0.00
8.00	0.01	0.000	921.26	0.01	0.01	0.00
10.00	0.03	0.002	921.40	0.01	0.01	0.00
12.00	**1.11**	**0.016**	**922.22**	**0.33**	**0.01**	**0.32**
14.00	**0.06**	**0.008**	**921.73**	**0.13**	**0.01**	**0.13**
16.00	0.03	0.005	921.57	0.03	0.01	0.02
18.00	0.02	0.005	921.55	0.02	0.01	0.02
20.00	0.02	0.005	921.53	0.02	0.01	0.01
22.00	0.01	0.004	921.51	0.01	0.01	0.00
24.00	0.00	0.004	921.48	0.01	0.01	0.00
26.00	0.00	0.003	921.40	0.01	0.01	0.00
28.00	0.00	0.001	921.31	0.01	0.01	0.00
30.00	0.00	0.000	921.25	0.00	0.00	0.00
32.00	0.00	0.000	921.25	0.00	0.00	0.00
34.00	0.00	0.000	921.25	0.00	0.00	0.00
36.00	0.00	0.000	921.25	0.00	0.00	0.00
38.00	0.00	0.000	921.25	0.00	0.00	0.00
40.00	0.00	0.000	921.25	0.00	0.00	0.00
42.00	0.00	0.000	921.25	0.00	0.00	0.00
44.00	0.00	0.000	921.25	0.00	0.00	0.00
46.00	0.00	0.000	921.25	0.00	0.00	0.00
48.00	0.00	0.000	921.25	0.00	0.00	0.00
50.00	0.00	0.000	921.25	0.00	0.00	0.00
52.00	0.00	0.000	921.25	0.00	0.00	0.00
54.00	0.00	0.000	921.25	0.00	0.00	0.00
56.00	0.00	0.000	921.25	0.00	0.00	0.00
58.00	0.00	0.000	921.25	0.00	0.00	0.00
60.00	0.00	0.000	921.25	0.00	0.00	0.00
62.00	0.00	0.000	921.25	0.00	0.00	0.00
64.00	0.00	0.000	921.25	0.00	0.00	0.00
66.00	0.00	0.000	921.25	0.00	0.00	0.00
68.00	0.00	0.000	921.25	0.00	0.00	0.00
70.00	0.00	0.000	921.25	0.00	0.00	0.00
72.00	0.00	0.000	921.25	0.00	0.00	0.00

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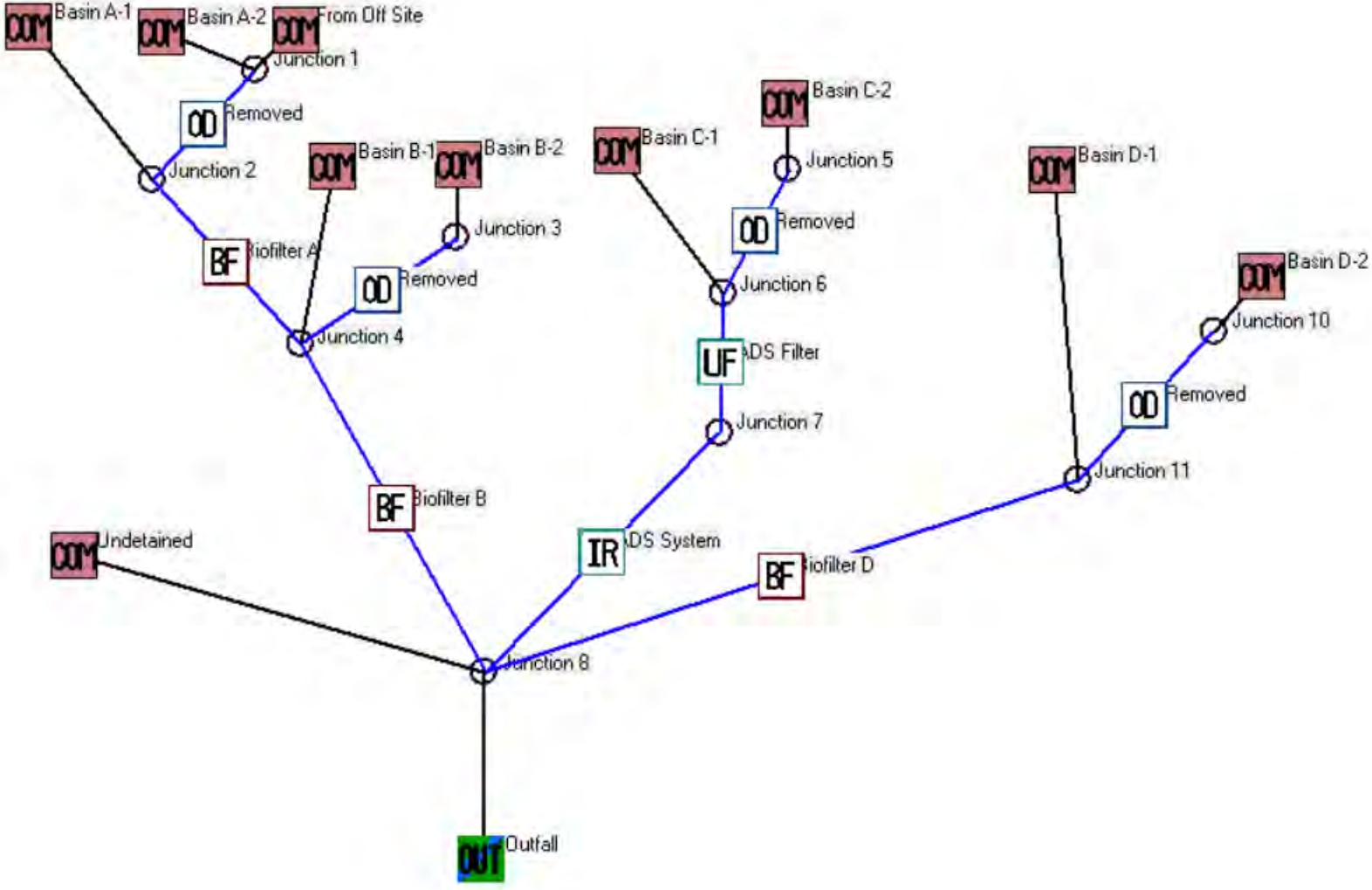
APPENDIX F: Storm Water Quality – WINSLAMM Calculations


Basin A-1
Basin A-2
From Off Site
Junction 1
Removed
Junction 2
Basin B-1
Basin B-2
Junction 3
Biofilter A
Removed
Junction 4
Basin C-2
Basin C-1
Junction 5
Removed
Junction 6
DS Filter
Junction 7
Basin D-1
Basin D-2
Junction 10
Removed
Junction 11
Biofilter B
DS System
Biofilter D
Undetained
Junction 8
Outfall

Data file name: R:\CLIENTS DATA\6201-10000 Womens Leadership Center\Womens Leadership Center\Modeling\Winslamm.mdb

WinSLAMM Version 10.5.0

Rain file name: C:\WinSLAMM Files\Rain Files\WI_Multi_rain\Madison\WisReg - Madison WI Annual 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: 09-11-2023 Time: 17:25:37

Site information:

LU# 1 - Commercial: Basin A-1 Total area (ac): 0.549

13 - Paved Parking 1: 0.265 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 0.237 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

70 - Water Body Areas: 0.047 ac. Source Area PSD File: C:\WinSLAMM Files\\Commercial Land Use

LU# 2 - Commercial: Basin A-2 Total area (ac): 0.047

57 - Undeveloped Areas 1: 0.047 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 3 - Commercial: From Off Site Total area (ac): 0.116

45 - Large Landscaped Areas 1: 0.116 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 4 - Commercial: Basin B-1 Total area (ac): 0.382

13 - Paved Parking 1: 0.205 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 0.127 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

70 - Water Body Areas: 0.050 ac. Source Area PSD File: C:\WinSLAMM Files\\Commercial Land Use

LU# 5 - Commercial: Basin B-2 Total area (ac): 0.020

57 - Undeveloped Areas 1: 0.020 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 6 - Commercial: Basin C-1 Total area (ac): 0.590

1 - Roofs 1: 0.206 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

13 - Paved Parking 1: 0.285 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 0.099 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 7 - Commercial: Basin C-2 Total area (ac): 0.279

57 - Undeveloped Areas 1: 0.279 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 8 - Commercial: Basin D-1 Total area (ac): 0.205

13 - Paved Parking 1: 0.137 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 0.029 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

70 - Water Body Areas: 0.039 ac. Source Area PSD File: C:\WinSLAMM Files\\Commercial Land Use

LU# 9 - Commercial: Basin D-2 Total area (ac): 0.056

57 - Undeveloped Areas 1: 0.056 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 10 - Commercial: Undetained Total area (ac): 1.229

1 - Roofs 1: 0.210 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

13 - Paved Parking 1: 0.179 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 0.700 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

71 - Other Pervious Areas 1: 0.140 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

Control Practice 1: Other Device CP# 1 (DS) - Removed

Fraction of drainage area served by device (ac) = 1.00

Particulate Concentration reduction fraction = 1.00

Filterable Concentration reduction fraction = 1.00

Runoff volume reduction fraction = 0

Control Practice 2: Biofilter CP# 1 (DS) - Biofilter A

1. Top area (square feet) = 2400
2. Bottom aea (square feet) = 575
3. Depth (ft): 6
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0.5

6. Random infiltration rate generation? No

7. Infiltration rate fraction (side): 0.001

8. Infiltration rate fraction (bottom): 1

9. Depth of biofilter that is rock filled (ft) 1

10. Porosity of rock filled volume = 0.33

11. Engineered soil infiltration rate: 3.6

12. Engineered soil depth (ft) = 2

13. Engineered soil porosity = 0.33

14. Percent solids reduction due to flow through engineered soil = 80

15. Biofilter peak to average flow ratio = 3.8

16. Number of biofiltration control devices = 1

17. Particle size distribution file: Not needed - calculated by program

18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil

User-Defined Media Type 1.000

Biofilter Outlet/Discharge Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 10
2. Weir crest width (ft): 10
3. Height of datum to bottom of weir opening: 5.99

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 3
2. Stand pipe height above datum (ft): 4.5

Outlet type: Drain Tile/Underdrain

1. Underdrain outlet diameter (ft): 0.33
2. Invert elevation above datum (ft): 1.5
3. Number of underdrain outlets: 1

Control Practice 3: Other Device CP# 2 (DS) - Removed

Fraction of drainage area served by device (ac) = 1.00

Particulate Concentration reduction fraction = 1.00

Filterable Concentration reduction fraction = 1.00

Runoff volume reduction fraction = 0

Control Practice 4: Biofilter CP# 2 (DS) - Biofilter B

1. Top area (square feet) = 2750
2. Bottom aea (square feet) = 875
3. Depth (ft): 6
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0.5
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 0.001
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 1
10. Porosity of rock filled volume = 0.33
11. Engineered soil infiltration rate: 3.6
12. Engineered soil depth (ft) = 2
13. Engineered soil porosity = 0.33
14. Percent solids reduction due to flow through engineered soil = 80
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil

User-Defined Media Type 1.000

Biofilter Outlet/Discharge Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 10

2. Weir crest width (ft): 10
3. Height of datum to bottom of weir opening: 5.99

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 3
2. Stand pipe height above datum (ft): 4.75

Outlet type: Drain Tile/Underdrain

1. Underdrain outlet diameter (ft): 0.33
2. Invert elevation above datum (ft): 0.66
3. Number of underdrain outlets: 1

Control Practice 5: Other Device CP# 3 (DS) - Removed

Fraction of drainage area served by device (ac) = 1.00

Particulate Concentration reduction fraction = 1.00

Filterable Concentration reduction fraction = 1.00

Runoff volume reduction fraction = 0

Control Practice 6: Upflo Filter CP# 1 (DS) - ADS Filter

Media Type: CPZ

Fraction of Area Served by Upflo Filters (0-1): 1.0

Height from Outlet Invert to Structure Top (ft): 5.3

Sump Depth (ft): 2.00

The program will determine the Sump Cleaning/Filter Replacement Frequency

Solve for Given Conditions

Number of filters: 4

Control Practice 7: Isolator Row CP# 1 (DS) - ADS System

Total available system length (ft) = 80

Total available system width (ft) = 25

Available height from chamber base to surface (ft) = 9.00

Number of isolator rows = 1

Native soil infiltration rate (in/hr) = 0.50

Assumed stone porosity () = 0.33

Sizing option: Use all available area

Selected Chamber Information

Chamber type: MC-4500

Chamber height (in): 60.00

Chamber width (in): 100.00

Chamber segment length (in): 48.30

Final storage volume (cf): 6420.6

Number of rows: 2

Row length (ft): 73.9

Total system length (ft): 144.9

Total system width (ft): 16.7

Number of chambers: 36

Overflow weir invert elevation (ft) = 4.50

Orifice 1 invert elevation (ft) = 0.00

Orifice 1 diameter (ft) = 0.50

Drain Tile Not Present

Control Practice 8: Biofilter CP# 3 (DS) - Biofilter D

1. Top area (square feet) = 1750
2. Bottom aea (square feet) = 750
3. Depth (ft): 5
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0.5
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 0.001
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 1

10. Porosity of rock filled volume = 0.33

11. Engineered soil infiltration rate: 3.6

12. Engineered soil depth (ft) = 2

13. Engineered soil porosity = 0.33

14. Percent solids reduction due to flow through engineered soil = 80

15. Biofilter peak to average flow ratio = 3.8

16. Number of biofiltration control devices = 1

17. Particle size distribution file: Not needed - calculated by program

18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil

User-Defined Media Type 1.000

Biofilter Outlet/Discharge Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 10
2. Weir crest width (ft): 10
3. Height of datum to bottom of weir opening: 4.99

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 3
2. Stand pipe height above datum (ft): 4.25

Outlet type: Drain Tile/Underdrain

1. Underdrain outlet diameter (ft): 0.33
2. Invert elevation above datum (ft): 0.66
3. Number of underdrain outlets: 1

Control Practice 9: Other Device CP# 4 (DS) - Removed

Fraction of drainage area served by device (ac) = 1.00

Particulate Concentration reduction fraction = 1.00

Filterable Concentration reduction fraction = 1.00

Runoff volume reduction fraction = 0

File Name:

R:\CLIENTS DATA\6201-10000 Womens Leadership Center\Womens Leadership Center\Modeling\Winslamm.mdb

Outfall Output Summary

	Runoff Volume (cu. ft.)	Percent Runoff Reduction	Runoff Coefficient (Rv)	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of All Land Uses without Controls	115731		0.29	101.5	733.3	
Outfall Total with Controls	46205	60.08 %	0.11	43.49	125.5	82.89 %
Current File Output: Annualized Total After Outfall Controls	46332	Years in Model Run:	1.00		125.8	

Print Output Summary to .csv File

Print Output Summary to Text File

Print Output Summary to Printer

Total Area Modeled (ac)

3.473

A biofilter will clog. Review biofilter control practice summary tab to determine which biofilter it is.

Total Control Practice Costs

Capital Cost	N/A
Land Cost	N/A
Annual Maintenance Cost	N/A
Present Value of All Costs	N/A
Annualized Value of All Costs	N/A

Perform Outfall Flow Duration Curve Calculations

Receiving Water Impacts Due To Stormwater Runoff

(CWP Impervious Cover Model)

	Calculated Rv	Approximate Urban Stream Classification
Without Controls	0.29	Poor
With Controls	0.11	Good

APPENDIX G: Storm Water Management Maintenance Agreement

VILLAGE OF WILLIAMS BAY
STORMWATER FACILITIES MAINTENANCE AGREEMENT

Document Title

THIS STORMWATER MAINTENANCE AGREEMENT
is between_____("Owner")
And the Village of Williams Bay ("Village")
on this date_____-_____-_____.

WHEREAS, the Owner has proposed to develop property lying within The Village of Williams Bay_____,
Walworth County, Wisconsin, described as follows:

LOT 1 CERTIFIED SURVEY NO 4998 RECORDED AS DOC #1053121 WCR. LOCATED IN SE1/4 SW1/4 SEC 1 T1N R16E & NE1/4 NW1/4 SEC 12 T1N R16E. 376112 SQ FT. VILLAGE OF WILLIAMS BAY; OMITTING WAS-1A

Recording Area

Name and return address

WA499800001

Parcel Identification Number (PIN).

WHEREAS, the Owner has submitted for approval by the County a permit application and Storm Water Management Plan, which require the construction and installation of stormwater management facilities pursuant to the Village of Williams Bay Stormwater Management Ordinance; and

WHEREAS, the Stormwater Management Ordinance requires, as a condition of permit approval, a financial guarantee and maintenance agreement between the Village and the Owner to ensure that the Owner will construct and maintain the stormwater facilities identified in the Stormwater Management Plan; and

WHEREAS, the Village and Owner have agreed to the estimated costs of the stormwater management facilities and the method of financial security to ensure the facilities will be constructed according to the plan.

NOW THEREFORE, THE UNDERSIGNED AGREE AS FOLLOWS:

1. **Identification of Facilities and Costs**. The Owner shall construct and install stormwater management facilities as depicted and shown on the Site Plan, [***ENTER SITE REFERENCE NUMBER FOR THE PLAN THAT SHOWS TYPE AND LOCATION OF STORMWATER FACILITIES TO BE MAINTAINED]*** Exhibit 3_____, in accordance with the plans and specifications contained in the Stormwater Management Plan dated ***[ENTER DATE OF APPROVED STORMWATER MANANGEMENT PLAN]***_____, on file with the Village, within two years from the date of this Agreement. The referenced documents are incorporated herein by reference.
2. **Financial Guarantee.** To ensure that the stormwater management improvements will be timely constructed according to plans and specifications in the Stormwater Management Plan and as a condition of approval of a permit, the Owner shall provide a financial guarantee in the amount of 100 percent of the estimated costs of construction. The form of the financial guarantee must be approved by the Village of Williams Bay Zoning Administrator.

3. **Maintenance**. The Owner shall maintain the stormwater management facilities in good working order in accordance with their design functions and the Stormwater Post-Construction Maintenance Plan. The Owner shall conduct regular inspections at least two times per year. The Operations and Maintenance Report attached to the Stormwater Post-Construction Maintenance Plan shall be used in connection with the regular inspections. The Owner shall keep the Operations and Maintenance Reports from past inspections and shall keep a log of all maintenance activities, including the date and type of maintenance performed. The reports and maintenance log shall be made available to the Village for review upon request. Deficiencies shall be noted in the Operations and Maintenance Reports.

4. The Owner hereby grants to the Village: the right to access the property to conduct inspections of the stormwater management facilities during construction; the right to access the property, upon reasonable notice to the Owner; to conduct inspections to determine whether the stormwater management facilities are maintained pursuant to the schedule of maintenance; to perform required maintenance if owner refuses or fails to perform maintenance within a reasonable timeframe. The Village may assess the cost of such maintenance against the Owner/property.

5. The Owner hereby agrees to restrict use of the property to protect the stormwater practices facilities. No building or structure (except for stormwater management) shall hereafter be erected, constructed, or moved into or onto any stormwater management facility including but not limited to detention or retention ponds, drainageways, drainage easements or vegetative buffers. No fill, grading or excavating (except for the construction and maintenance of the drainage facilities) shall be constructed within any detention or retention pond, drainageway, drainage easement, or vegetative buffer. There shall be no cultivation of crops, fruits, or vegetables; no dumping of ashes, waste, compost, or other garden, lawn, or domestic waste; nor any storage of vehicles, equipment, materials, or personal property of any kind in or on any detention or retention pond, drainageway, drainage easement, or vegetative buffer.

6. **Successors**. This Stormwater Facilities Maintenance Agreement shall bind the Owner, his, her or its successors and assigns, and shall inure to the benefit of the Village of Williams Bay.

WITNESS the following signatures and seals:

Owner Name: _____

By: _____

Printed Name:_____

Title:_____

STATE OF WISCONSIN)
: ss.
VILLAGE OF WILLIAMS BAY)

The foregoing Agreement was acknowledged before me this_____day of_____, 20___
By _____

_____
Notary Public, State of Wisconsin
My commission is/expires:_____

VILLAGE OF WILLIAMS BAY

By:_____
Zoning Administrator

ACKNOWLEDGMENT

State of Wisconsin
Village of Williams
Bay
Personally, came before me on_____, the above name, to me known to be the person who executed the foregoing instrument and acknowledged the same.

_____
Notary Signature
Printed Name:_____
Notary Public, State of Wisconsin
My commission expires:_____

Drafted By: Jordan Nolle, EIT

Maintenance Provisions

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 Village Engineer.

At a minimum, the storm sewer system shall be inspected annually and cleaned as needed to maintain design capacity.

Bio-Infiltration Basin(s)

Owner shall install a bio-infiltration system in accordance with plans approved by Village Engineer. Bio-infiltration basins shall be installed in accordance with WDNR Conservation Practice Standard #1004.

Any alterations to approved bio-infiltration system shall be approved by the Village Engineer.

Maintenance shall be required when system shows standing water beyond 72 hours of rain event. Cleaning shall consist of removal of sediment, two (2) foot undercut, undercut replacement with material consisting of 30% compost and 70% sand and restoration in-kind. Restoration of plant material shall be by plugging, not seeding alone.

Owner shall install and maintain the bio-infiltration systems in accordance with plans approved by the Village. Owner shall maintain records of installation, inspections, cleaning and any other maintenance all in accordance with the applicable Ordinances.

Visual Inspection of the bio-infiltration system shall be performed monthly to identify and repair eroded areas and remove liter and debris, if applicable.

The Owner shall maintain plants by watering, weeding, hand pulling and/or herbicide applications, restoring plant saucers around planting holes, tightening and repairing any guy supports, replacing flagging of guy wires, pruning and resetting plants to proper grades or vertical positions, as required to establish healthy, viable plantings. Herbicide treatments shall be performed by licensed applicators who are experienced with native and non-native plant identification. Herbicides will be used in full conformance with label requirements and application techniques will limit overspray and damage to off-target species.

The Owner is responsible for a spot selective invasive weed control treatment on the entire basin area once in the initial growing season, two times in the first full growing season after seeding, two times in the second full growing season after seeding, and three times in the third full growing season after seeding. This can include combinations of hand weed control and selective herbicide treatment. Herbicide treatment can be conducted with tools such as hand held or backpack sprayers. Examples of common invasive species to be controlled from spread are Narrow-leaved cattail and reed canary grass in wetland areas; Canada thistle, Flowering spurge, Common teasel, Sweet clover, Red clover, Wild parsnip are examples of more upland type species to be controlled. Applications to perennial weeds need to occur prior to seed formation of such species. If such species do go to seed, contractor is responsible for cutting the seed heads, bagging them, and removing them from the project site. Herbicide applications that are necessary must be performed by qualified personnel trained in the identification of native species and also licensed appropriately for herbicide applications in the state or region in which they are applying.
Watering shall be provided every day for the first 10 days after installation, if rainfall is not sufficient. If plantings are planted in spring, water for 3 to 6 weeks after seed placement. If plantings are planted in the fall, water for 3 to 6 weeks in the spring if dry conditions exist until established. Apply water in a manner to preclude puddling, washing and erosion. The equivalent of one-half inch of rainfall per week shall be considered the minimum until germination.

All areas of the bio-infiltration system where the mulch has been displaced shall be re-mulched as needed. Additional mulch shall be applied annually.

Snow shall not be dumped directly onto the bio-infiltration system.

Maintenance of the bio-infiltration system will conform to Wisconsin Department of Natural Resources Technical Standard 1004.

Hydro International Up-Flo Filter

1. An Up-Flo Filter manufactured by Hydro International of Portland, ME containing four filter modules with CPZ media mix shall be installed in the storm catch basin in accordance with plans approved by the Village Engineer.
2. Any alterations to the approved Up-Flo Filter system shall be approved by the Village Engineer.
3. Owner shall inspect and maintain unit in accordance with manufacturer's instructions and according to the following chart.

Activity	Frequency
Inspection	- Regularly during first year of installation. - Every 6 months after the first year of installation.
Floatables/Oils Removal	- Twice per year or as needed. - Following a contaminated spill in the drainage area.
Sediment Removal	- Twice annually after the first year of installation. - Every 6 to 12 months after the first year of installation, depending on past experience. - When sediment deposits reach 12" in depth. - Following a contaminated spill in the drainage area.
Media Pack Replacement	- Once per year. - Replacement is required any time inspection reveals that the high-water level indicator has been activated after two consecutive storms and the subsequent weighing of the Media Bags shows a wet weight greater than 40 lbs. - Following a contaminated spill in the drainage area.
Drain Down Filter Replacement	- Once per year with Media Pack replacement - Replacement is required anytime inspection reveals that the water level inside the vessel has not reached a level equal with the base of the Filter Modules approximately 36 hours after a 1-inch rainfall

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:

1) Locate the riser sections and cleanouts of the retention/detention system. The riser will typically be 24" in diameter or larger.
2) Remove the lid from a riser.
3) 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.
4) Inspect each manifold, all laterals, and outlet pipes for sediment build up, obstructions, or other problems. Obstructions should be removed at this time.
5) If measured sediment build up is 1-foot 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.
6) 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 Village Engineer.

Ruekert·Mielke W233 N2080 Ridgeview Parkway, Waukesha, WI 53188-1020 262-542-5733

September 15, 2023

Ms. Bonnie Schaeffer
Zoning Administrator
Village of Williams Bay
P.O. Box 580
250 Williams Street
Williams Bay, WI 53191

Re: Response to Village Review Comments
Women's Leadership Center, Williams Bay, WI

Village Engineer Review Comments dated September 1, 2023:

1. General:
   a. Provide a full set of civil plans. Several sheets are in the stormwater report but not in the plan set.
   Full civil plans included in resubmittal.
   b. Incorporate the Village's Standard Material List into the drawings.
   Material list added to plan sheet C-001 – General Notes.
   c. Provide a copy of the WDNR NOI permit when received.
   This will be provided when received.
   d. Provide a copy of the WDNR water main extension permit when received.
   This will be provided when received.
2. Sheet C-500 (Grading & Erosion Control Plan):
   a. Show drainage divides.
   Drainage divides have been added to Exhibit 3 of the Stormwater Management Report.
   b. Provide wider riprap/flow spreaders at pipe outlets to reduce channelized flow.
   Rip rap adjusted to be wider.
   c. Show basin emergency overflow locations.
   The basins are currently not designed to have overflows. If the systems become clogged, the overland flow paths of the biofilters will spill off site. See the overland flow paths for more details.
   d. The proposed shed is blocking an existing drainage path.
   The west side of the proposed shed and parking lot has been regraded to modify the existing drainage path, but in no way is the existing drainage path being obstructed by the proposed shed.
   e. Show flumes and erosion control measures where stormwater enters basins.
   Flumes added to sheet, rip rap is present at all outfalls into basins and base of flumes.
   f. Show large storm event overland flow paths.
   Black arrows have been added to Exhibit 3 of the Stormwater Management Report.
   g. Provide project benchmarks.
   Project benchmarks have been added to plan sheet C-200 – Existing Conditions.
3. Sheet C-700 (Proposed Subsurface Utility Plan):
   a. Provide a utility access and drainage easement per previous comments.
   Comment is being reviewed by the WLC team.
   b. Remove trees from the proposed water main easement.
   Trees have been removed.
   c. Provide a water main plan and profile.
   A profile for the proposed 8-inch water main has been included in plan sheet C-701 – Proposed Water Main Profile. Also per comment in page 4, hydrant H-1 has been moved and extended to Constance Boulevard for access by Village.

d. Make sanitary sewer repairs per previous comments.
Comment is being reviewed by the WLC team.

e. Provide a 20-foot easement for the existing sanitary sewer.
WLC will provide a 20-foot easement for the existing sanitary sewer.

f. Remove trees over the existing sanitary sewer.
Per the Village Engineer's email dated 9/13/23, no additional trees will be removed at this time.

4. Stormwater Management Report:

a. The areas shown on the "Proposed Conditions Map" don't match the areas listed in the narrative, Hydrocad calculations, and WinSLAMM calculations.
Exhibit 2 has been updated, (C and D colors were reversed).

b. Provide storm sewer and detention oversizing for future expansion of Constance Blvd. per previous comments.
Comment is being reviewed by the WLC team.

c. Provide the 10-year and 100-year Hydrocad calculations.
10-year and 100-year calculations have been added to Appendix E

d. Show the location of the "Hydro" suspended solids separation device on the plan.
Label has been added to Exhibits 2 and 3.

e. Biofilter basins should be designed with underdrains and overflow structures to provide proper infiltration and TSS removal per WDNR Technical Standard 1004. They are serving no purpose with outlet pipes located above the floor of the basins.
Underdrains have been added to all biofilters and Exhibit 4.

f. Provide the WinSLAMM input data for Biofilter D.
Appendix F has been updated with all input data.

g. Several 6-inch storm sewers are shown on the plans. We recommend minimum 8-inch storm sewers and preferably 12-inch. Clogging will become an issue with the number of branches, leaves, and animals in the area.
All 6" storm sewers, other than roof drain pipe, have been upsized to 8" storm sewers.

5. Review comment in Page 1: See the snip below for the latest concept; they are proposing to put a dock, storage shed and a system of boardwalks in the stormwater overland flow route for 30 acres of upstream land. This overland flow route may need to drain approximately 100 acres of land following a future reconstruction of Constance Boulevard.

We have reviewed the off-site drainage areas and are confident the shed location, the planned boardwalk and the existing dock will not impede the overland flow (off site and on site) within the ravine from reaching Geneva Lake. There is almost 70' of grade change from Constance Blvd. to the lake, making it nearly impossible for off-site and on-site surface water to be impeded and back up on to the ROW or properties upstream.

6. Review comment in Page 3: We still seek easements on the property for future sanitary sewer and drainage improvements between Constance Boulevard and Geneva Lake. We need a to legally be able to put more water on their property when we expand Constance Boulevard in the future. We also seek additional right-of-way to widen Constance Boulevard and provide a pedestrian path between the University and downtown to make this road safer.

The request for a drainage and sanitary sewer easement along the west property line is being reviewed by the WLC team. The request for additional right of way is being reviewed by the WLC team.

Please feel free to contact me if you have any questions.

Respectfully,

RUEKERT & MIELKE, INC.

Violet V. Razo, P.E. (WI)
Project Manager
vrazo@ruekert-mielke.com
VVR:sjs

September 15, 2023

Women's Leadership Center

Narrative addressing: Site Plan Review (18.1206), Zoning Permit (18.1209), Performance Standards (18.0800), Group Development and Large Development Standards (18.0821)

The Women's Leadership Center property is one of a few around Geneva Lake that has not seen previous development. The topography and trees are assets to the proposed development and to the character of Williams Bay. Our design team has carefully crafted a project, with site design and architecture, that respects the property by softly integrating the Women's Leadership Center program and related infrastructure, so it feels "at home" and connected to the uniqueness of the site.

Our proposed use of the property (Indoor Institutional – Intensive, 18.0308B and Residential Garage or Shed, 18.0315I) is consistent with the P & I zoning (Principal Land Uses Permitted by CUP and Accessory Uses Permitted by Right) and the Village's recently adopted Comprehensive Land Use Plan. Our property has been designated with P & I land use for many years. The design respects the environmental corridor designation with impervious coverage of 19% (buildings and paving). We have tagged and surveyed 808 existing trees and propose to only remove 23% or 186 (does not include invasive and dead trees). The existing water main will be upgraded to 8" (from 6") and we will connect to the existing sanitary line along the lake. The storm water control system is focused on water quality and infiltration that meets the regulatory requirements. The layout of the onsite vehicular circulation, parking and loading area meet the Village's standards and the requirements for emergency vehicle access. The submittal drawings provide detailed information about the design of the project and the site data table addresses the bulk standards. The design and construction of the project is pursuing a LEED Gold designation.

The placement of the three principal buildings and one accessory building on the site exceed the required setbacks from the property lines and Geneva Lake. The same is true for all vehicular paving. The design (mass, height and form) of the buildings is respectful of the natural character of the property and the surrounding area. Their locations on the site were selected to appreciate views of Geneva Lake and the beauty of the site itself. The exterior materials will harmonize and connect the buildings to the primary colors and textures of the property along with the surrounding area. Each building has incorporated windows that promote views and connect the visitors to the site. The technical design of the glass supports minimizing bird strikes.

The Council and Lodge buildings are where the meetings and dining will take place and these are located on the western portion of the site adjacent to George Williams College. The Cabin building is located on the eastern portion of the site adjacent to the residential zoning. The maximum meeting planned for either the Council or Lodge is 80 people (excluding staff and 3rd party food service). This 80-person group would occupy both buildings and the site during the day's activities. The Cabin would provide overnight accommodations for up to 3 presenters or lecturers or artists, for a period of 1 day to 2 weeks. There are 3 bedrooms (each with a bathroom) and some common areas (kitchen, dining and living room). There will be 3-6 Women's Leadership Center staff with office space at the Council building. The meeting sizes will range from 10-80 people, meetings will cover 1-5 days, with 1-3 meetings per week and operations covering 48 weeks a year. The goal is to provide 50-80 meetings a year. Meeting attendees will stay at George Williams College or local hotels and primarily be shuttled over and

back with a 12-15 person passenger van. Onsite parking is provided (in accordance with Village regulations) to support visitors and staff, and there is one loading area on the east side of the Lodge.

The site layout, grading, storm water and utilities have been designed to harmonize and complement the site's natural land forms and minimize tree removal. The overall vision for the property is to encourage meeting attendees and staff to enjoy and explore the site at all times of the year. Most of the parking is located near Constance Blvd with an appropriate setback for landscape screening. Key landforms (Oak Savannah Knoll and Woodland Clearing) are preserved and enhanced to support low impact activities that meeting attendees can enjoy. The curvilinear driveway system (layout and grading) creates visual sequences of the property before meeting attendees arrive at the drop off. An open sided covered walkway between the Council and Lodge buildings, provides shelter from the elements as meeting attendees arrive at the drop off, and while walking to and from either building. The primary pedestrian path system provides meeting attendees (and staff) a 387 linear foot walking path that meets ADA requirements. The boardwalk (from Base Camp and lower level of the Lodge to the dock and Lake Shore Path) traverses 55' of grade change, is 986 feet long and is also ADA accessible. These two path systems allow all users to "take a walk in the woods". Base Camp (between Council and Lodge) is intended to provide an informal space for breakouts, relaxing, small group yoga and viewing the lake and ravine. The Terraced Garden (south side of Lodge building) will support dining, lectures (using the terraces) and viewing the lake.

Site lighting is being accomplished with a variety of fixture types and is respectful of the Dark Sky's initiatives. The design uses downward facing fixtures that control the direction of the light so that the foot candle levels provide appropriate lighting for people to comfortably and safely use the property.

The garage will be unconditioned space. It will shelter a passenger van, two golf carts and outdoor furniture. Vehicles will be serviced off site and site maintenance will be contracted with a third party. Some mechanical equipment will be ground mounted on the north side of the Council and the east side of the Lodge. This equipment will be screened with fencing that matches or complements the building finishes. Inside the enclosure with the Lodge, will be a natural gas generator for emergency electrical power and a central location to handle all of the project's refuse. The proposed development shall comply with Sections 18.0812 thru 18.0820.

The property has wonderful topography and hundreds of existing trees. Throughout its previous ownership, maintenance and stewardship of the plant communities has been lacking or non-existent. Over the past 100 years or more, invasive woody and herbaceous plants have taken over the site. During the past year, the Women's Leadership Center took the first steps to reverse the decades of neglect by removing about 90 invasive trees and a majority of the invasive understory. The landscape planting design will address the zoning requirements to screen the parking from Constance Blvd, provide a buffer planting along the eastern property line for the residential zoning and replace 1 for 1 any trees removed as part of developing the property. Our goal is to restore the entire property to a high-quality southeast Wisconsin woodland. The site design has identified 186 trees (23%, allowed 30% max.) for removal and the design shows the installation of 209 new trees. The new trees will diversify the plant species community and these trees will meet and exceed the Village size requirements. The plant list will primarily focus on native material (woody and herbaceous). The mowed lawn areas will be limited portions of the Oak Savannah Knoll and Woodland Clearing use areas to support some group activities or temporary tents.

September 15, 2023

The Women's Leadership Center believes our project will enhance the desired character of Williams Bay. Our use is consistent with the existing zoning, the Comprehensive Land Use Plan and will support the local economy. The low-density development is being designed to complement and harmonize with the wooded site and the varied topography. We have sited our buildings to respect our neighbors and will restore the site so that it will be a positive example in Williams Bay which also reflects the aspirations and heritage of the Kishwauketoe Nature Conservancy.

Site Data

Site Area: 376,112sf (8.63 acres)

Adjacent Zoning
- North: P & I (Yerkes Future Foundation)
- South: Open Space (Geneva Lake)
- East: SF-2 (Single Family Residential)
- West: P & I (George Williams College)

Principal Buildings
- Council: 8,104sf
- Lodge: 13,150sf
- Cabin: 3,640sf

24,894sf

Accessory Building
- Garage: 875sf

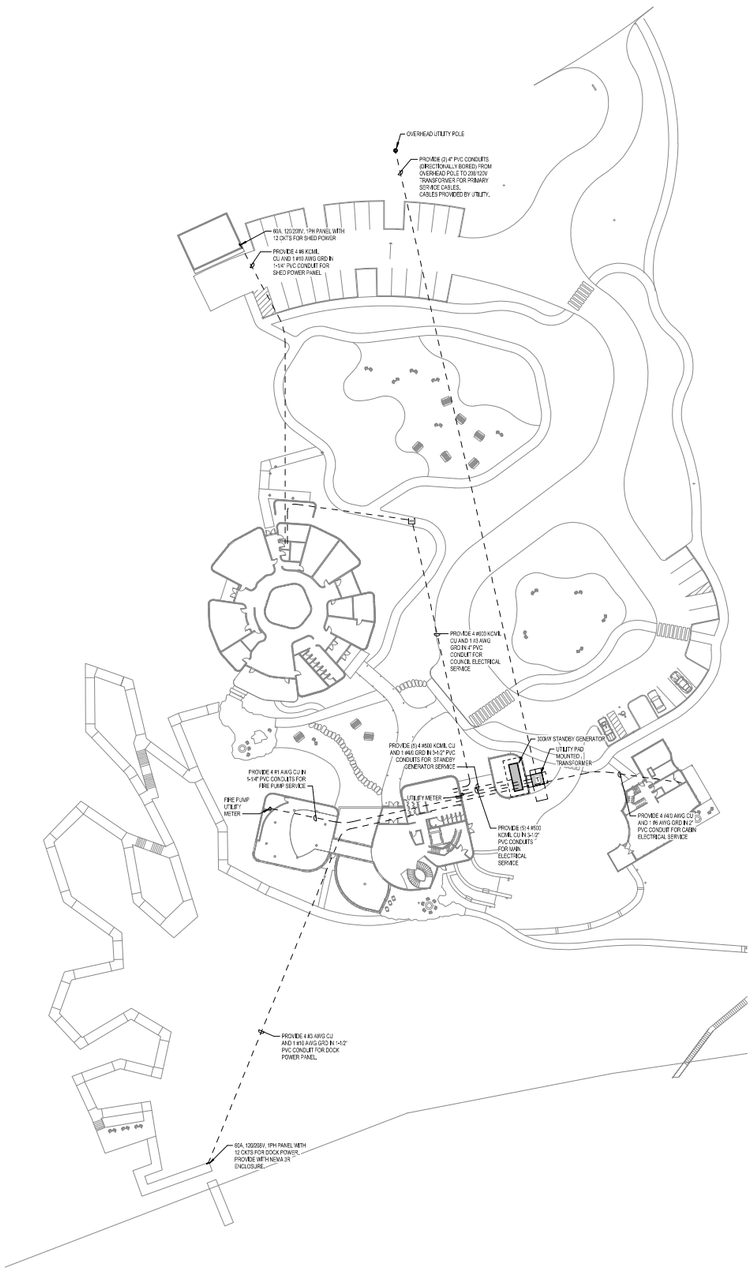
Building Setbacks (min.)
- Constance Blvd: 30'
- Geneva Lake: 150'
- East: 50'
- West: 15'

FAR: .068
Site Coverage: 19% (buildings and pavement)
Building Coverage: 6.8%
Landscape Surface Ratio: 81%
Maximum Building Height: 24'-8" (measured at the front of the Lodge)

Parking: 34 spaces (includes 2 ADA)
Loading: 1 dock/area

Water Usage
- Peak/Daily: 100 gpm/1gpm (average daily)
- Fire Flow: 500 gpm

Sewer Usage
- Peak/Daily: 2 gpm (peak daily)/ 1gpm (average daily)



1 ELECTRICAL SITE PLAN
1" = 30'-0"

GENERAL NOTES

1. REFER TO CIVIL DRAWINGS FOR EXACT LOCATION OF EXISTING UTILITY POLES, MANHOLES AND EQUIPMENT.
2. COORDINATE ALL NEW UNDERGROUND ELECTRICAL SERVICE ROUTING AND EXACT REQUIREMENTS WITH CIVIL DRAWINGS. UTILITY AND OTHER DISCIPLINES PRIOR TO INSTALLATION.
3. A SINGLE CONDUIT RUN SHALL NOT HAVE MORE THAN (3) 90 DEGREE BENDS. PROVIDE PRECAST CONCRETE OPEN BOTTOM HANDHOLES AS REQUIRED.
4. CONDUITS SHALL BE BURIED A MINIMUM OF 36" BELOW FINISH GRADE UNLESS OTHERWISE NOTED.
5. REFER TO RISER DIAGRAM FOR CONDUIT/CABLE SIZE AND QUANTITY. REFER TO SHEET E-403 FOR RISER DIAGRAM AND ADDITIONAL INFORMATION ON POWER DISTRIBUTION IN THE BUILDING.
6. COORDINATE EXACT LOCATION OF THE EQUIPMENT WITH CIVIL SITE PLAN.
7. ALL UNDERGROUND HANDHOLES SHALL BE HEAVY DUTY TRAFFIC GRADE PRECAST POLYMER CONCRETE. COORDINATE EXACT LOCATION OF HANDHOLES AND ROUTE OF THE CONDUITS WITH CIVIL DRAWINGS.
8. PROVIDE CONCRETE PAD FOR UTILITY TRANSFORMER. COORDINATE INSTALLATION OF PAD MOUNTED TRANSFORMER AND INSTALLATION OF SECONDARY CABLING PRIOR TO INSTALLATION.

WOMEN'S LEADERSHIP CENTER

327 Constance Blvd
Williams Bay, WI 53191

Lincoln Road Enterprises

GENERAL NOTES

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KEY PLAN

WISCONSIN
BENJAMIN RUBACH P.E
E-41816006
CHICAGO
PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

No.	Issued For	Date
1	VILLAGE ZONING	8/4/2023

ARCHITECT:

Studio Gang

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PROJECT NO.: 22013
DRAWN: TT
DATE: 8.4.2023
CHECKED: YAIRE
SCALE: 1" = 30'-0"

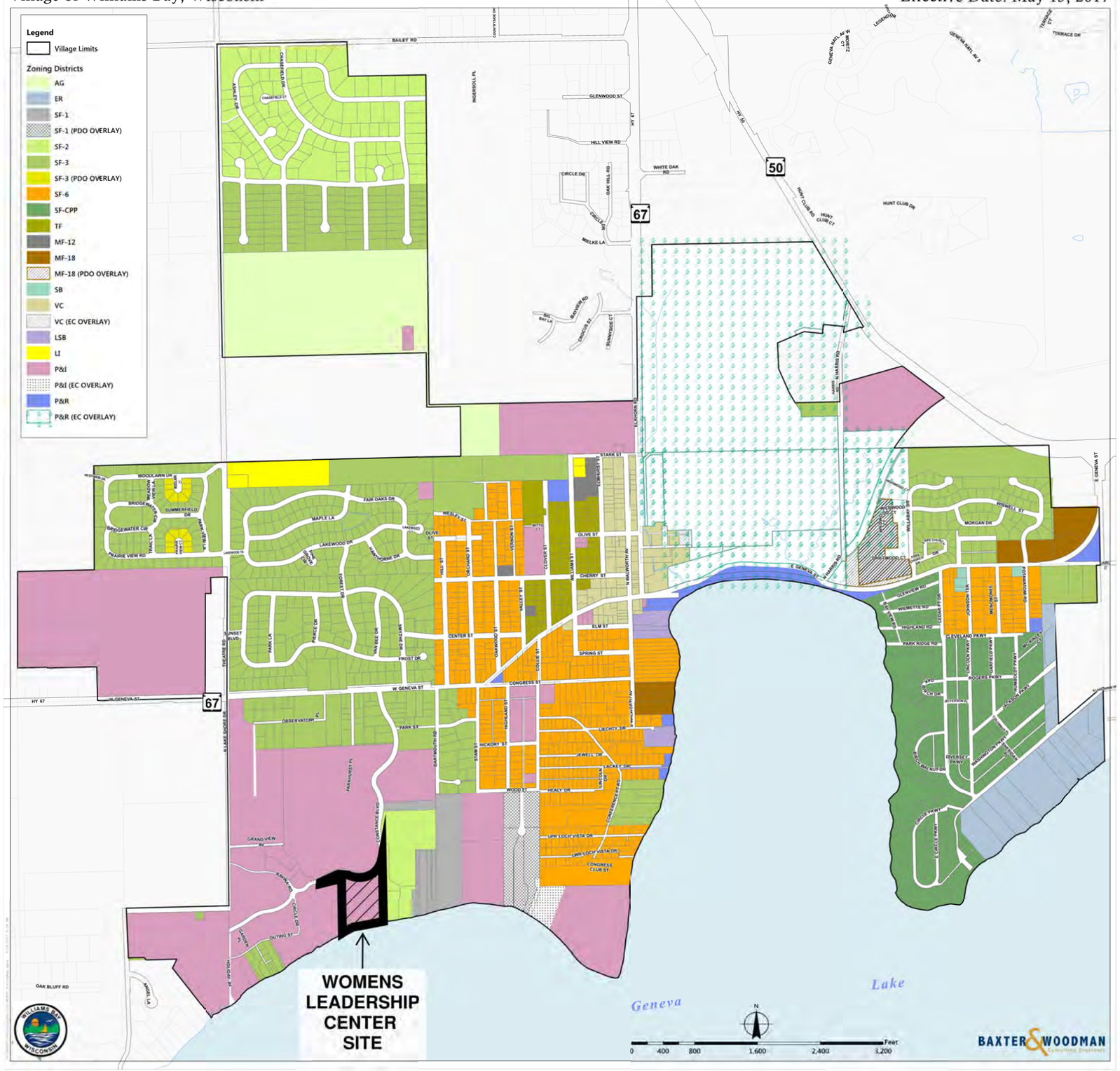
SHEET TITLE:
ELECTRICAL SITE PLAN

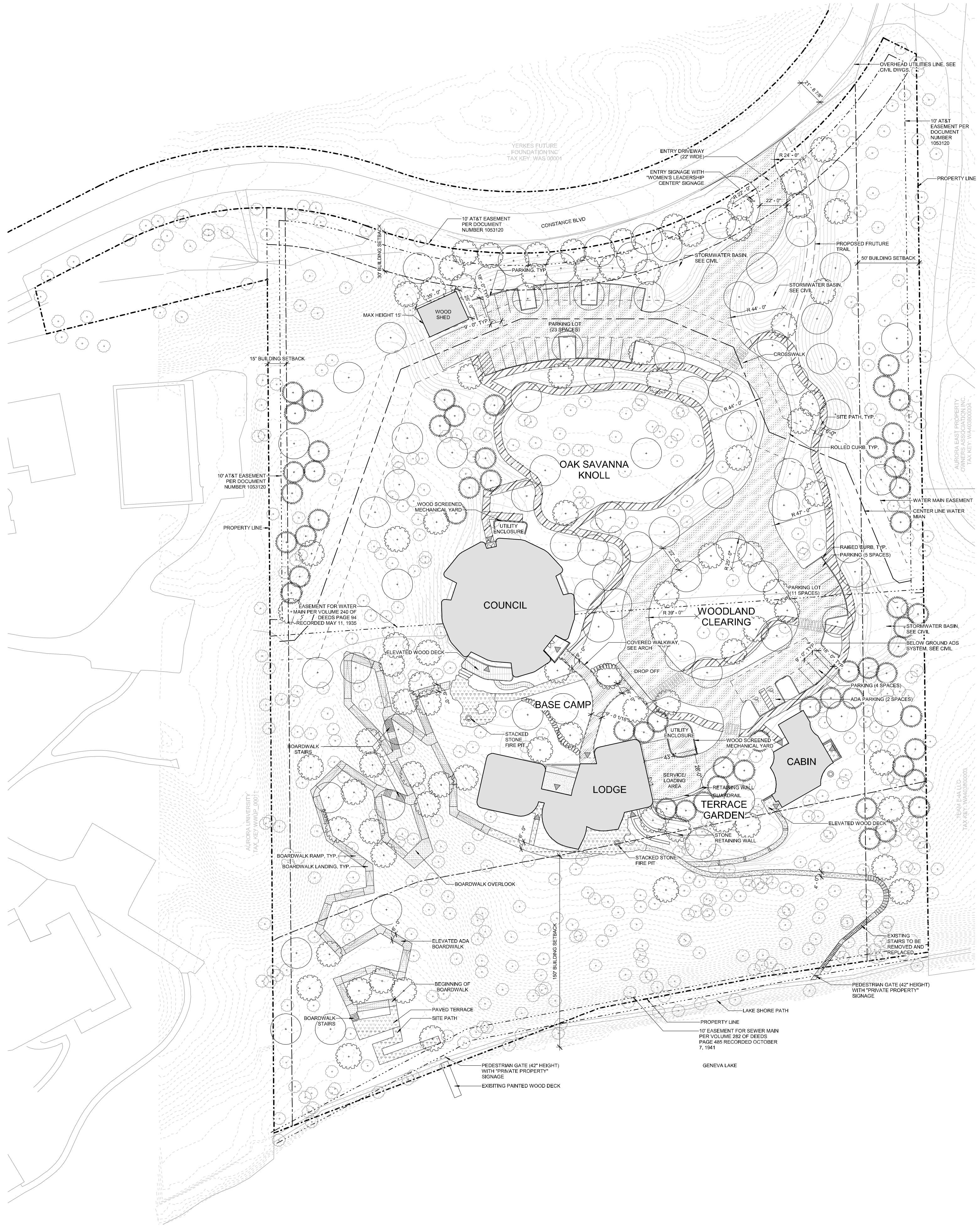
DRAWING NUMBER:
E.010

ZONING MAP

Village of Williams Bay, Wisconsin

Effective Date: May 15, 2017





1 L100 SITE PLAN

0' 15' 30' 60' 120'

LEGAL DESCRIPTION:

Lot 1 of Certified Survey Map No. 4998, recorded December 20, 2021, as Document No. 1053121, and being part of Block A and part of Block C of Assessor's Subdivision, being a part of the SE. 1/4 of the SW. 1/4 of Section 1 and the NE. 1/4 of the NW. 1/4 of Section 12, T.01N., R.16E., Village of Williams Bay, Walworth County, Wisconsin.
Part of Tax Key No. WAS 00001A

LEGEND

- PROPERTY LINE
- EASEMENT, SEE CIVIL DWGS.
- WATER MAIN LINE
- EXISTING TREE
- PROPOSED CANOPY TREE
- PROPOSED CONIFER TREE
- PROPOSED UNDERSTORY TREE
- VEHICULAR ASPHALT PAVING
- CUT STONE PAVING
- FLAGSTONE PAVING
- MULCH PATH
- LAKE SHORE PATH
- STAIRS
- BOARDWALK

NOTES

1. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES AND REGULATIONS GOVERNING THE WORK.

2. DO NOT SCALE OFF DRAWINGS, USE DRAWING DIMENSIONS ONLY. VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS IN THE FIELD PRIOR TO COMMENCEMENT OF WORK. BRING TO THE ATTENTION OF LANDSCAPE ARCHITECT ANY DISCREPANCIES BETWEEN FIELD CONDITIONS AND DRAWINGS PRIOR TO BEGINNING OF WORK. FIELD CONDITION DISCREPANCIES SHALL NT BE USED AS THE BASIS FOR CHANGE ORDER CLAIMS ONCE WORK HAS BEGUN.

3. EXISTING CONDITIONS BASED ON SURVEY PROVIDED BY RUEKERT & MIELKE, DATED FEBRUARY 8, 2023. VERIFY EXISTING CONDITIONS IN THE FIELD. ALL WORK PERFORMED IN PUBLIC RIGHT OF WAY SHALL MEET THE REUIREMENTS OF LOCAL ZONING AND CODES. THE CONTRACTOR SHALL MAINTAIN ALL NEW AND EXISTING UTILITIES IN GOOD WORKING ORDER AND PROTECT THEM FROM DAMAGE AT ALL TIMES UNTIL THE WORK IS COMPLETED AND ACCEPTED.

4. PRESERVE AND PROTECT ALL EXISTING STRUCTURES, FURNISHINGS, SURFACE MATERIALS, ABOVE AND BELOW - GRADE UTILITIES, FOOTINGS AND VEGETATION INDICATED TO REMAIN WITHIN AND ADJACENT TO LIMIT OF WORK DURING ALL PHASES OF DEMOLITION AND CONSTRUCTION.

5.ZONING SET BACK SUMMARY,
CONSTANCE BLVD: 30'
GENEVA LAKE: 150'
EAST: 50'
WEST: 15'

6. SEE CIVIL PLANS FOR UTILITIY PLAN, EROSION, STROMWATER AND GRADING PLANS

7. SEE L-901 FOR GROUNDCOVER PLANTING PLAN

SITE DATA

SITE AREA: 376,112SF (8.63 ACRES)

ADJACENT ZONING
NORTH:P & I (YERKES FUTURE FOUNDATION)
SOUTH: OPEN SPACE (GENEVA LAKE)
EAST: SF-2 (SINGLE FAMILY RESIDENTIAL)
WEST: P & I (GEORGE WILLIAMS COLLEGE)

PRINCIPAL BUILDINGS
COUNCIL: 8,104SF
LODGE: 13,150SF
CABIN: 3,640SF
TOTAL 24,894SF
ACCESSORY BUILDING
GARAGE: 875SF

BUILDING SETBACKS (MIN.)
CONSTANCE BLVD: 30'
GENEVA LAKE:150'
EAST: 50'
WEST: 15'

BUILDING HEIGHTS:
LODGE : 24'-8"
COUNCIL : 14'-6"
CABIN: 22'-0"

FAR: .07
SITE COVERAGE: 19% (BUILDINGS AND PAVEMENT)
BUILDING COVERAGE: 7%
LANDSCAPE SURFACE RATIO: 81%
MAXIMUM BUILDING HEIGHT: 24'-8" (MEASURED AT THE FRONT OF THE LODGE)

PARKING: 34 SPACES
LOADING: 1 DOCK/AREA

WOMEN'S LEADERSHIP CENTER

327 Constance Blvd
Williams Bay, WI 53191

GENERAL NOTES

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KEY PLAN:

SEAL:

WISCONSIN
SUSAN K. WEILER
LA-591-014
PHILADELPHIA, PA
LANDSCAPE ARCHITECT

8/4/2023

NOT FOR CONSTRUCTION

NO.	ISSUED FOR	DATE
1	VILLAGE ZONING	08/04/2023

ARCHITECT:

Studio Gang

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THRESHOLD ACOUSTICS
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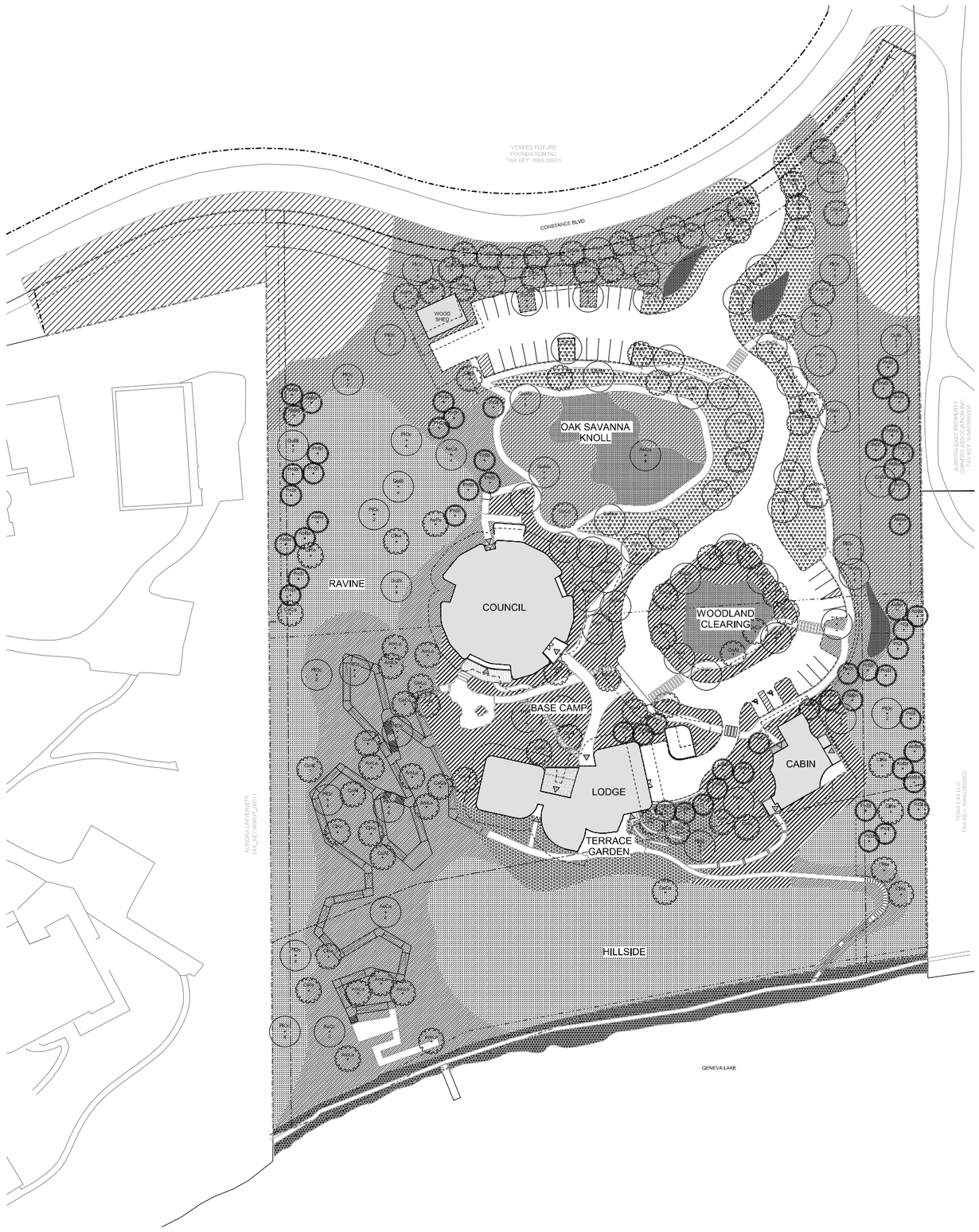
Chicago, IL 60604

PROJECT NO. : 22013
DRAWN: PG, AJ, ES DATE: 08/04/2023
CHECKED: SL SCALE: 1" = 30'-0"

SHEET TITLE:
SITE PLAN

DRAWING NUMBER:
L100



1 | L901 PLANTING PLAN - SHRUBS AND GROUNDCOVERS
1/32" = 1'-0"

LEGEND

- PROPERTY LINE
- LANDSCAPE POINTS CALCULATION AREA LINE
- OAK SAVANNA - LOW INTENSITY RESTORATION
- OAK SAVANNA - MEDIUM INTENSITY RESTORATION
- OAK SAVANNA - HIGH INTENSITY RESTORATION
- MESIC FOREST - LOW INTENSITY RESTORATION
- MESIC FOREST - MEDIUM INTENSITY RESTORATION
- MESIC FOREST - HIGH INTENSITY RESTORATION
- MESIC PRAIRIE - LAKE EDGE MEDIUM INTENSITY RESTORATION
- TERRACE GARDEN - HIGH INTENSITY RESTORATION
- LAWN (KENTUCKY BLUE GRASS)
- STORMWATER GARDEN - HIGH INTENSITY RESTORATION

LANDSCAPE POINTS

Building Foundations (Acres 0)		Mixed Woodlands (Acres 0)		Mixed Acres (sqft)		Developed Lots (sqft)		Buffer Yard (Acres 0)		
Large	0		0		43,560		14,374			0
Medium	0		0							0
Small	0		0							0
Linear	0		0							0
Total	0		0		43,560		31,860			0
Landscape Points Required	0	Landscape Points Required	0	Landscape Points Required	284	Landscape Points Required	496	Landscape Points Required	2,230	
40 Points Per 100 s.f of Building Foundation		40 Points Per 10,000 SF of Mixed Woodlands		80 Points Per 10,000 SF of Mixed Area		40 Points Per 1000 SF Building Footprint		1.25 (Linear Distance) 801 Feet Width - 200 Points Per 100 Linear Feet		
Est. % Points from Canopy Trees	60%	Est. % Points from Canopy Trees	60%	Est. % Points from Canopy Trees	20%	Est. % Points from Canopy Trees	20%	Est. % Points from Canopy Trees	10%	
Est. % Points from Trees	0%	Est. % Points from Trees	0%	Est. % Points from Trees	0%	Est. % Points from Trees	0%	Est. % Points from Trees	0%	
Est. % Points from Shrubs	40%	Est. % Points from Shrubs	40%	Est. % Points from Shrubs	80%	Est. % Points from Shrubs	80%	Est. % Points from Shrubs	90%	
Estimated Total Points:	0	Estimated Total Points:	0	Estimated Total Points:	227	Estimated Total Points:	397	Estimated Total Points:	2,007	

Mixed Woodlands (Acres 0)		Mixed Acres (sqft)		Developed Lots (sqft)		Buffer Yard (Acres 0)		
0		0		43,560		14,374		0
0		0						0
0		0						0
0		0						0
0		0		43,560		31,860		0
0	Landscape Points Required	0	Landscape Points Required	284	Landscape Points Required	496	Landscape Points Required	2,230
40 Points Per 10,000 SF of Mixed Woodlands		80 Points Per 10,000 SF of Mixed Area		40 Points Per 1000 SF Building Footprint		1.25 (Linear Distance) 801 Feet Width - 200 Points Per 100 Linear Feet		
60%	Est. % Points from Canopy Trees	20%	Est. % Points from Canopy Trees	20%	Est. % Points from Canopy Trees	10%	Est. % Points from Canopy Trees	50%
0%	Est. % Points from Trees	0%	Est. % Points from Trees	0%	Est. % Points from Trees	0%	Est. % Points from Trees	0%
40%	Est. % Points from Shrubs	80%	Est. % Points from Shrubs	80%	Est. % Points from Shrubs	90%	Est. % Points from Shrubs	50%
0	Estimated Total Points:	227	Estimated Total Points:	397	Estimated Total Points:	2,007	Estimated Total Points:	1,115

TREE SCHEDULE

TREE SCHEDULE - CONIFERS

Plant Code	Plant Scientific Name	Plant Common Name	Count	Installed Size	Comments
AbBa	*Abies balsamea*	Balsam Fir	19	7'	
PiGl	*Picea glauca 'Densata'*	Black Hills Spruce	11	8'	
PiSt	*Pinus strobus*	Eastern White Pine	23	7'	
ThOg	*Thuja 'Green Giant'*	Green Giant Arborvitae	4	8'	

Conifer Subtotal: 57

TREE SCHEDULE - UNDERSTORY

Plant Code	Plant Scientific Name	Plant Common Name	Count	Installed Size	Comments
AsRu	*Aesculus pavia*	Red Buckeye	5	7'	Multi-stem
ArnLa	*Amelanchier laevis*	Smooth Serviceberry	11	7'	Multi-stem
CeCa	*Cercis canadensis*	Eastern Redbud	25	7'	Form/4-5'
ClKe	*Cladrastis kentukea*	Kentucky Yellowwood	18	2.5" caliper	
CoAl	*Cornus alternifolia*	Pagoda Dogwood	16	2.5" caliper	
HaVi	*Hamamelis virginiana 'Sunglow'*	SunglowTM Common Witchhazel	8	7'	Multi-stem

Understory Subtotal: 83

TREE SCHEDULE - CANOPY

Plant Code	Plant Scientific Name	Plant Common Name	Count	Installed Size	Comments
AeCa	*"Aesculus x carnea 'Fort McNair'*	Fort McNair Horsechestnut	3	4" caliper	
CaCa	*Caprinus caroliniana*	American Hornbeam	5	4" caliper	
FaGr	*Fagus grandifolia*	American Beech	14	3" caliper	
NySa	*Nyssa sylvanica*	Black Tupelo	8	4" caliper	
OsVi	*Ostrya virginiana*	American Hophornbeam	11	4" caliper	
PlOc	*Platanus occidentalis*	American Sycamore	6	3" caliper	
PlOc	*Platanus occidentalis*	American Sycamore	14	4" caliper	
QuBi	*Quercus bicolor*	Swamp White Oak	3	2" caliper	
QuBi	*Quercus bicolor*	Swamp White Oak	2	4" caliper	
QuMa	*Quercus macrocarpa*	Bur Oak	5	4" caliper	
TiAm	*Tilia americana*	American Linden	7	4" caliper	

Canopy Subtotal: 78

Total Proposed Trees: 209

PLANT SCHEDULE

OAK SAVANNA - HIGH INTENSITY RESTORATION — Total Area: 19,973 sf (45%)

Plant Type	Scientific Name	Common Name	Percent of Unit	Area subtotal (sf)	Size	Spacing	Notes
Shrub	*Alnus serrulata*	Hazelnut	5%	999	#1 cont.	36" o.c.	
Shrub	*Viburnum lentago*	Nannyberry	5%	999	#1 cont.	36" o.c.	
Shrub	*Viburnum lentago*	Nannyberry	5%	999	#1 cont.	36" o.c.	
Grass / Sedge	*Andropogon gerardii*	Big Bluestem	15%	2997	LPM	18" o.c.	undisturbed grey / trees not prog.
Grass / Sedge	*Carex spp.*	Sedge	15%	2997	LPM	18" o.c.	undisturbed grey / trees not prog.
Grass / Sedge	*Elymus canadensis*	Canadian Wild Rye	15%	2997	LPM	18" o.c.	undisturbed grey / trees not prog.
Grass / Sedge	*Schizachyrium scoparium*	Little Bluestem	15%	2997	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Asclepias tuberosa*	Butterfly Weed	5%	999	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Asclepias tuberosa*	Butterfly Weed	5%	999	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Baptisia bracteata var. leucophaea*	Cream Prairie Indigo	5%	999	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Liatris aspera*	Rough Gayfeather	5%	999	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Rudbeckia hirta*	Black-Eyed Susan	5%	999	LPM	18" o.c.	undisturbed grey / trees not prog.
			100.00%				

OAK SAVANNA - MEDIUM INTENSITY RESTORATION — Total Area: 44,079 sf (45%)

Plant Type	Scientific Name	Common Name	Percent of Unit	Area subtotal (sf)	Size	Spacing	Notes
Shrub	*Alnus serrulata*	Hazelnut	5%	1656	#1 cont.	36" o.c.	
Shrub	*Viburnum lentago*	Nannyberry	5%	1656	#1 cont.	36" o.c.	
Shrub	*Viburnum lentago*	Nannyberry	5%	1656	#1 cont.	36" o.c.	
Grass / Sedge	*Andropogon gerardii*	Big Bluestem	15%	6612	LPM	18" o.c.	undisturbed grey / trees not prog.
Grass / Sedge	*Carex spp.*	Sedge	15%	6612	LPM	18" o.c.	undisturbed grey / trees not prog.
Grass / Sedge	*Elymus canadensis*	Canadian Wild Rye	15%	6612	LPM	18" o.c.	undisturbed grey / trees not prog.
Grass / Sedge	*Schizachyrium scoparium*	Little Bluestem	15%	6612	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Asclepias tuberosa*	Butterfly Weed	5%	2204	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Asclepias tuberosa*	Butterfly Weed	5%	2204	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Baptisia bracteata var. leucophaea*	Cream Prairie Indigo	5%	2204	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Liatris aspera*	Rough Gayfeather	5%	2204	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Rudbeckia hirta*	Black-Eyed Susan	5%	2204	LPM	18" o.c.	undisturbed grey / trees not prog.
			100.00%				

OAK SAVANNA - LOW INTENSITY RESTORATION — Total Area: 39,136 sf (40%)

Plant Type	Scientific Name	Common Name	Percent of Unit	Area subtotal (sf)	Size	Spacing	Notes
Shrub	*Alnus serrulata*	Hazelnut	5%	1957	#1 cont.	36" o.c.	
Shrub	*Viburnum lentago*	Nannyberry	5%	1957	#1 cont.	36" o.c.	
Grass / Sedge	*Andropogon gerardii*	Big Bluestem	15%	5871	Seed		
Grass / Sedge	*Carex spp.*	Sedge	15%	5871	Seed		
Grass / Sedge	*Elymus canadensis*	Canadian Wild Rye	5%	1957	Seed		
Grass / Sedge	*Schizachyrium scoparium*	Little Bluestem	15%	5871	Seed		
Perennial / Groundcover	*Asclepias tuberosa*	Butterfly Weed	10%	3914	Seed		
Perennial / Groundcover	*Baptisia bracteata var. leucophaea*	Cream Prairie Indigo	5%	1957	Seed		
Perennial / Groundcover	*Coreopsis lanceolata*	Lanceleaf Coreopsis	5%	1957	Seed		
Perennial / Groundcover	*Eryngium yuccifolium*	Rattlesnake Master	5%	1957	Seed		
Perennial / Groundcover	*Liatris aspera*	Rough Gayfeather	5%	1957	Seed		
Perennial / Groundcover	*Monarda fistulosa*	Wild Bergamot	5%	1957	Seed		
Perennial / Groundcover	*Rudbeckia hirta*	Black-Eyed Susan	5%	1957	Seed		
			100.00%				

MESIC FOREST - LAKE EDGE - HIGH INTENSITY RESTORATION — Total Area: 8,744 sf (45%)

Plant Type	Scientific Name	Common Name	Percent of Unit	Area subtotal (sf)	Size	Spacing	Notes
Shrub	*Aronia melanocarpa*	Black Chokeberry	15%	1312	#1 cont.	36" o.c.	
Shrub	*Sambucus canadensis*	American Elderberry	15%	1312	#1 cont.	36" o.c.	
Grass / Sedge	*Andropogon gerardii*	Big Bluestem	5%	437	LPM	18" o.c.	undisturbed grey / trees not prog.
Grass / Sedge	*Bromus latifol*	Pacific Bromus	5%	437	LPM	18" o.c.	undisturbed grey / trees not prog.
Grass / Sedge	*Panicum virgatum*	Switchgrass	5%	437	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Aquilegia canadensis*	Eastern Columbine	5%	437	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Asclepias incarnata*	Swamp Milkweed	5%	437	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Helianthus helianthoides*	Wide Sunflower	5%	437	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Lobelia spicata*	Spike Blazing Star	5%	437	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Penstemon hirsutus*	Hairy Beardtongue	5%	437	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Thalictrum dasycarpum*	Tall Meadow Rue	5%	437	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Verbena hastata*	Blue Vervain	5%	437	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Vernonia fasciculata*	Prairie Ironweed	5%	437	LPM	18" o.c.	undisturbed grey / trees not prog.
			100.00%				

MESIC FOREST - MEDIUM INTENSITY RESTORATION — Total Area: 15,311 sf (45%)

Plant Type	Scientific Name	Common Name	Percent of Unit	Area subtotal (sf)	Size	Spacing	Notes
Shrub	*Cornus alternifolia*	American Dogwood	10%	1531	#2 cont.	36" o.c.	
Shrub	*Alnus serrulata*	Hazelnut	10%	1531	#1 cont.	36" o.c.	
Shrub	*Amelanchier canadensis*	Shad / Serviceberry	10%	1531	#1 cont.	36" o.c.	
Grass / Sedge	*Carex spp.*	Sedge	10%	1531	LPM	18" o.c.	undisturbed grey / trees not prog.
Grass / Sedge	*Elymus virginicus*	Virginia Wildrye	10%	1531	LPM	18" o.c.	undisturbed grey / trees not prog.
Grass / Sedge	*Juncus effusus*	Soft Rush	10%	1531	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Geranium maculatum*	Canada Anemone	10%	1531	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Asclepias incarnata*	Swamp Milkweed	10%	1531	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Iris virginica*	Iris	10%	1531	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Liatris aspera*	Rough Gayfeather	10%	1531	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Cynoglossum virginianum*	Wild Comfrey	10%	1531	LPM	18" o.c.	undisturbed grey / trees not prog.
Perennial / Groundcover	*Solidago rigida*	Stiff Goldenrod	10%	1531	LPM	18" o.c.	undisturbed grey / trees not prog.
			100.00%				

MESIC FOREST - LOW INTENSITY RESTORATION — Total Area: 63,807 sf (40%)

Plant Type	Scientific Name	Common Name	Percent of Unit	Area subtotal (sf)	Size	Spacing	Notes
Shrub	*Rhus glabra*	Smooth Sumac	10%	6381	#1 cont.	36" o.c.	
Shrub	*Alnus serrulata*	Hazelnut	10%	6381	#1 cont.	36" o.c.	
Shrub	*Viburnum dentatum*	Arrowwood Viburnum	5%	319	#1 cont.	36" o.c.	
Grass / Sedge	*Carex spp.*	Sedge	10%	6381	Seed		
Grass / Sedge	*Schizachyrium scoparium*	Little Bluestem	15%	12762	Seed		
Grass / Sedge	*Elymus canadensis*	Canadian Wild Rye	10%	6381	Seed		
Perennial / Groundcover	*Asclepias tuberosa*	Butterfly Weed	10%	6381	Seed		
Perennial / Groundcover	*Coreopsis lanceolata*	Lanceleaf Coreopsis	10%	6381	Seed		
Perennial / Groundcover	*Eryngium yuccifolium*	Rattlesnake Master	5%	3190	Seed		
Perennial / Groundcover	*Liatris aspera*	Rough Gayfeather	5%	3190	Seed		
Perennial / Groundcover	*Monarda fistulosa*	Wild Bergamot	5%	3190	Seed		
Perennial / Groundcover	*Rudbeckia hirta*	Black-Eyed Susan	5%	3190	Seed		
			100.00%				

WOMEN'S LEADERSHIP CENTER

327 Constance Blvd
Williams Bay, WI 53191

GENERAL NOTES

1. THE DRAWINGS, SPECIFICATIONS AND OTHER DOCUMENTS PREPARED BY THE ARCHITECTS FOR THIS PROJECT ARE INSTRUMENTS OF THE ARCHITECTS SERVICE FOR USE SOLELY WITH RESPECT TO THIS PROJECT AND UNLESS OTHERWISE PROVIDED THE ARCHITECT SHALL BE DEEMED THE AUTHOR OF THESE DOCUMENTS AND SHALL RETAIN ALL COMMON LAW, STATUTORY AND OTHER RESERVED RIGHTS, INCLUDING THE COPYRIGHT. REPRODUCTION IS PROHIBITED. COPYRIGHT 2023, STUDIO GANG.
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KEY PLAN:

SEAL:

WISCONSIN — JAMES D. HUNT — LANDSCAPE ARCHITECT

8/4/2023

NO.	ISSUED FOR	DATE
1	VILLAGE ZONING	08/04/2023

NOT FOR CONSTRUCTION

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PROJECT NO.	22013
DRAWN:	PG, AJ, ES
DATE:	08/04/2023
CHECKED:	SL
SCALE:	1" = 30'-0"

SHEET TITLE:
PLANTING PLAN - TREE AND GROUNDCOVERS

DRAWING NUMBER:
L901

NOTES

1. ALL AREAS NOT COVERED BY BUILDINGS OR PAVEMENT AND WHICH HAVE BEEN GRADED OR OTHERWISE DISTURBED SHALL BE TOPSOILED AND SEEDED, UNLESS SHOWN OTHERWISE.
2. ALL TREES OUTSIDE THE BUILDING AND PAVED AREAS SHALL REMAIN AND BE PROTECTED DURING CONSTRUCTION, UNLESS SPECIFICALLY DESIGNATED TO BE REMOVED, PRIOR TO REMOVAL, THE CONTRACTOR SHALL ARRANGE AN ON-SITE MEETING WITH THE LANDSCAPE ARCHITECT TO REVIEW THE CLEARING LIMIT LINES. VERIFY LOCATIONS OF ALL UTILITIES PRIOR TO EXCAVATION OR PLANT PITS.
3. P.B. = PLANT BED. MULCH ALL PLANT BEDS TO A DEPTH OF 2". BEDS SHALL BE KEPT 1" MIN AWAY FROM TRUNK OF ALL TREES. SHRUBS, TREE FERNS, AND FOLIAGE OF ALL PERENNIALS.
4. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIAL IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTING SHOWN IN THE DRAWINGS.
5. CONTRACTOR SHALL REMOVE ALL HARD LUMPS OF CLAY, STONES OVER 1" IN DIAMETER, AND ALL CONSTRUCTION DEBRIS INCLUDING GRAVEL, ROOTS, LIMBS AND OTHER DELETERIOUS MATTER WHICH WOULD BE HARMFUL, OR PREVENT PROPER ESTABLISHMENT AND/OR MAINTENANCE OF LAWN AND PLANTING AREAS.
6. ALL TREES SHALL CONFORM TO GUIDELINES ESTABLISHED BY "THE AMERICAN STANDARD FOR NURSERY STOCK" PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN (LATEST EDITION).
7. NO TREES SHALL BE PLANTED BEFORE ACCEPTANCE OF ROUGH GRADING. TREES SHALL BEAR SAME RELATIONSHIP TO FINISHED GRADE AS TO ORIGINAL GRADE PRIOR TO DIGGING.
8. ALL PLANTS SHALL BE BALLED IN BURLAP OR CONTAINER GROWN UNLESS OTHERWISE NOTED IN THE PLANTING SCHEDULE.
9. ALL PLANTS SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO THEIR ARRIVAL ON THE SITE
10. THE CONTRACTOR SHALL LOCATE AND VERIFY UTILITY LINE LOCATIONS PRIOR TO PLANTING AND REPORT ANY CONFLICTS TO THE LANDSCAPE ARCHITECT.
11. THE LAYOUT OF PLANTS IN THE FIELDS TO BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO PLANTING.

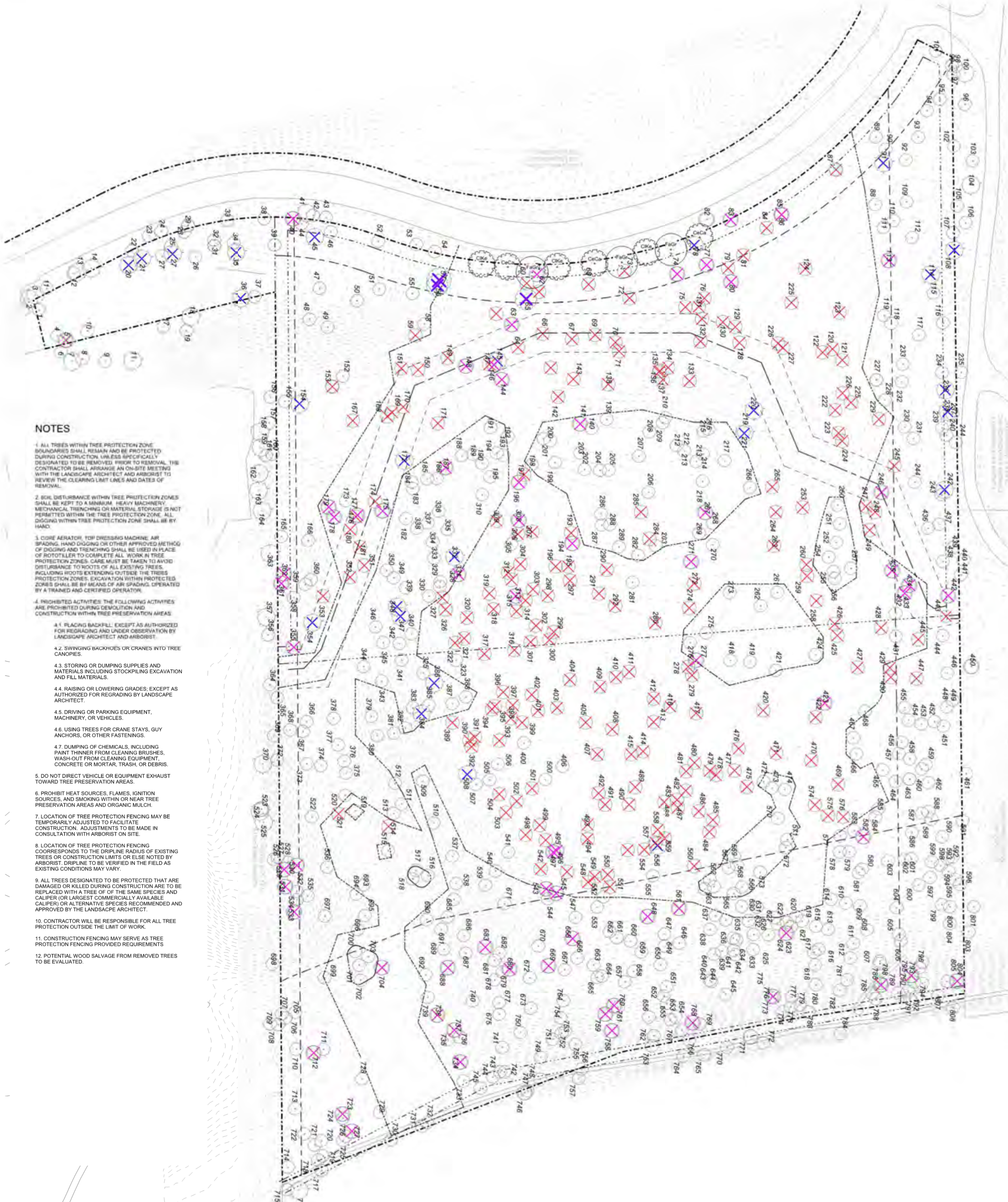
NOTES FOR PLANTING

HIGH INTENSITY INTERVENTION:
DISTURBED AREAS
-OR-
AREAS IMMEDIATELY ADJACENT TO ROADWAYS
-OR-
BUILDINGS THAT NEED TO BE FULLY REPLANTED:
- TREES TO BE 4-6" CAL.
- SHRUBS TO BE 3-5 GAL.
- GRASSES, GROUNDCOVERS, HERBACEOUS PLANTS TO BE QUARTS, PINTS, AND LANDSCAPE PLUGS
- INCLUDE OVERSEED
- DISTURBED SLOPES GREATER THAN 3:1 TO I NCLUDE EROSION CONTROL NETTING
- IRRIGATION TO BE INCLUDED FOR HIGH INTENSITY MESIC FOREST AND TERRACE GARDEN ONLY

MEDIUM INTENSITY INTERVENTION:
RESTORATION SCALE WORK AND STRATEGIC PLANTINGS OF UNDERSTORY SHRUBS AND TREES
- TREES TO BE 2-4" CAL.
- SHRUBS TO BE 1-3 GAL.
- GRASSES, GROUNDCOVERS, HERBACEOUS PLANTS TO BE LOCALLY SOURCED SEED MIXES
- DISTURBED SLOPES GREATER THAN 3:1 TO INCLUDE EROSION CONTROL NETTING

LOW INTENSITY INTERVENTION:
RESTORATION SCALE WORK - RESEEDING OR CUTTINGS
- CONTROLLED BURNS PRIOR TO CONSTRUCTION
- CLEARING OF INVASIVES PRIOR TO CONSTRUCTION AON DURING CONSTRUCTION
- TREES TO BE 2" CAL. OR WHIPS
- SHRUBS TO BE 1 GAL. OR WHIPS
- GRASSES, GROUNDCOVERS, HERACEOUS PLANTS TO BE LOCALLY SOURCED SEED MIXES
- DISTURBED SLOPES GREATER THAN 3:1 TO INCLUDE EROSION CONTROL NETTING.

0' 15' 30' 60' 120'



NOTES

1. ALL TREES WITHIN TREE PROTECTION ZONE BOUNDARIES SHALL REMAIN AND BE PROTECTED DURING CONSTRUCTION, UNLESS SPECIFICALLY DESIGNATED TO BE REMOVED. PRIOR TO REMOVAL, THE CONTRACTOR SHALL ARRANGE AN ON-SITE MEETING WITH THE LANDSCAPE ARCHITECT AND ARBORIST TO REVIEW THE CLEARING LIMIT LINES AND DATES OF REMOVAL.

2. SOIL DISTURBANCE WITHIN TREE PROTECTION ZONES SHALL BE KEPT TO A MINIMUM. HEAVY MACHINERY, MECHANICAL TRENCHING OR MATERIAL STORAGE IS NOT PERMITTED WITHIN THE TREE PROTECTION ZONE. ALL DIGGING WITHIN TREE PROTECTION ZONE SHALL BE BY HAND.

3. CORE AERATOR, TOP DRESSING MACHINE, AIR SPADING, HAND DIGGING OR OTHER APPROVED METHOD OF DIGGING AND TRENCHING SHALL BE USED IN PLACE OF ROTOTILLER TO COMPLETE ALL WORK IN TREE PROTECTION ZONES. CARE MUST BE TAKEN TO AVOID DISTURBANCE TO ROOTS OF ALL EXISTING TREES, INCLUDING ROOTS EXTENDING OUTSIDE THE TREES PROTECTION ZONES. EXCAVATION WITHIN PROTECTED ZONES SHALL BE BY MEANS OF AIR SPADING, OPERATED BY A TRAINED AND CERTIFIED OPERATOR.

4. PROHIBITED ACTIVITIES: THE FOLLOWING ACTIVITIES ARE PROHIBITED DURING DEMOLITION AND CONSTRUCTION WITHIN TREE PRESERVATION AREAS:

   4.1. PLACING BACKFILL; EXCEPT AS AUTHORIZED FOR REGRADING AND UNDER OBSERVATION BY LANDSCAPE ARCHITECT AND ARBORIST.

   4.2. SWINGING BACKHOES OR CRANES INTO TREE CANOPIES.

   4.3. STORING OR DUMPING SUPPLIES AND MATERIALS INCLUDING STOCKPILING EXCAVATION AND FILL MATERIALS.

   4.4. RAISING OR LOWERING GRADES; EXCEPT AS AUTHORIZED FOR REGRADING BY LANDSCAPE ARCHITECT.

   4.5. DRIVING OR PARKING EQUIPMENT, MACHINERY, OR VEHICLES.

   4.6. USING TREES FOR CRANE STAYS, GUY ANCHORS, OR OTHER FASTENINGS.

   4.7. DUMPING OF CHEMICALS, INCLUDING PAINT THINNER FROM CLEANING BRUSHES, WASH-OUT FROM CLEANING EQUIPMENT, CONCRETE OR MORTAR, TRASH, OR DEBRIS.

5. DO NOT DIRECT VEHICLE OR EQUIPMENT EXHAUST TOWARD TREE PRESERVATION AREAS.

6. PROHIBIT HEAT SOURCES, FLAMES, IGNITION SOURCES, AND SMOKING WITHIN OR NEAR TREE PRESERVATION AREAS AND ORGANIC MULCH.

7. LOCATION OF TREE PROTECTION FENCING MAY BE TEMPORARILY ADJUSTED TO FACILITATE CONSTRUCTION. ADJUSTMENTS TO BE MADE IN CONSULTATION WITH ARBORIST ON SITE.

8. LOCATION OF TREE PROTECTION FENCING COORRESPONDS TO THE DRIPLINE RADIUS OF EXISTING TREES OR CONSTRUCTION LIMITS OR ELSE NOTED BY ARBORIST. DRIPLINE TO BE VERIFIED IN THE FIELD AS EXISTING CONDITIONS MAY VARY.

9. ALL TREES DESIGNATED TO BE PROTECTED THAT ARE DAMAGED OR KILLED DURING CONSTRUCTION ARE TO BE REPLACED WITH A TREE OF OF THE SAME SPECIES AND CALIPER (OR LARGEST COMMERCIALLY AVAILABLE CALIPER) OR ALTERNATIVE SPECIES RECOMMENDED AND APPROVED BY THE LANDSACPE ARCHITECT.

10. CONTRACTOR WILL BE RESPONSIBLE FOR ALL TREE PROTECTION OUTSIDE THE LIMIT OF WORK.

11. CONSTRUCTION FENCING MAY SERVE AS TREE PROTECTION FENCING PROVIDED REQUIREMENTS

12. POTENTIAL WOOD SALVAGE FROM REMOVED TREES TO BE EVALUATED.

1 | L910 TREE PROTECTION & REMOVAL PLAN
REF: 1" = 30'-0"

TREE REMCVAL SCHEDULE

DEAD TREES TO BE REMOVE

TAG#	SPECIES	COMMON NAME	CONDITION	SIZE(DBH)
5	Robinia pseudoacacia	Black Locust	dead	11
61	Fraxinus pensylvanica	Green Ash	dead	19
63	Fraxinus pensylvanica	Green Ash	dead	19
74	Quercus rubra	Red Oak	dead	31
77	Fraxinus pensylvanica	Green Ash	dead	11
80	Fraxinus pensylvanica	Green Ash	dead	11
82	Quercus rubra	Red Oak	dead	27
83	Quercus rubra	Red Oak	dead	25
85	Fraxinus pensylvanica	Green Ash	dead	11
113	Quercus rubra	Red Oak	dead	33
127	Fraxinus pensylvanica	Green Ash	dead	10
141	Quercus rubra	Red Oak	dead	30
144	Quercus alba	White Oak	dead	11
146	Fraxinus pensylvanica	Green Ash	dead	11
148	Juglans nigra	Black Walnut	dead	15
173	Fraxinus pensylvanica	Green Ash	dead	21
177	Fraxinus pensylvanica	Green Ash	dead	18
178	Fraxinus pensylvanica	Green Ash	dead	11
179	Fraxinus pensylvanica	Green Ash	dead	14
187	Fraxinus pensylvanica	Green Ash	dead	18
194	Quercus rubra	Red Oak	dead	32
196	Fraxinus pensylvanica	Green Ash	dead	8
249	Quercus rubra	Red Oak	dead	18
267	Fraxinus pensylvanica	Green Ash	dead	13
271	Fraxinus pensylvanica	Green Ash	dead	11
277	Quercus rubra	Red Oak	dead	25
308	Fraxinus pensylvanica	Green Ash	dead	15
313	Fraxinus pensylvanica	Green Ash	dead	15
331	Fraxinus pensylvanica	Green Ash	dead	13
351	Fraxinus pensylvanica	Green Ash	dead	15
355	Fraxinus pensylvanica	Green Ash	dead	14
361	Fraxinus pensylvanica	Green Ash	dead	16
362	Fraxinus pensylvanica	Green Ash	dead	18
423	Quercus alba	White Oak	dead	22
433	Quercus rubra	Red Oak	dead	22
434	Quercus rubra	Red Oak	dead	24
435	Quercus rubra	Red Oak	dead	12
442	Quercus rubra	Red Oak	dead	22+20
450	Quercus alba	White Oak	dead	22
496	Juglans nigra	Black Walnut	dead	8
497	Quercus alba	White Oak	dead	14
523	Fraxinus pensylvanica	Green Ash	dead	16
529	Quercus rubra	Red Oak	dead	24
530	Juglans nigra	Black Walnut	dead	7
531	Quercus rubra	Red Oak	dead	23
533	Juglans nigra	Black Walnut	dead	7
543	Quercus alba	White Oak	dead	18
545	Prunus serotina	Black Cherry	dead	8
561	Fraxinus pensylvanica	Green Ash	dead	12
582	Quercus alba	White Oak	dead	10+9
623	Fraxinus pensylvanica	Green Ash	dead	14
649	Fraxinus pensylvanica	Green Ash	dead	8
668	Quercus rubra	Red Oak	dead	17
669	Fraxinus pensylvanica	Green Ash	dead	8
680	Ostrya virginiana	American Hophornbeam	dead	6
683	Quercus rubra	Red Oak	dead	20
688	Quercus rubra	Red Oak	dead	24
704	Quercus rubra	Red Oak	dead	19
712	Quercus rubra	Red Oak	dead	23
723	Fraxinus pensylvanica	Green Ash	dead	14
727	Juglans nigra	Black Walnut	dead	10
734	Quercus alba	White Oak	dead	20
737	Quercus rubra	Red Oak	dead	32
738	Quercus rubra	Red Oak	dead	30
766	Quercus rubra	Red Oak	dead	13
758	Ostrya virginiana	American Hophornbeam	dead	7
759	Quercus alba	White Oak	dead	14
760	Quercus alba	White Oak	dead	15
769	Fraxinus pensylvanica	Green Ash	dead	10
771	Quercus alba	White Oak	dead	15
773	Fraxinus pensylvanica	Green Ash	dead	9
786	Fraxinus pensylvanica	Green Ash	dead	16
795	Populus grandidentata	Big Tooth Aspen	dead	8
797	Fraxinus pensylvanica	Green Ash	dead	8
804	Fraxinus pensylvanica	Green Ash	dead	17+9

DAMAGED TREES TO BE REMOVE

TAG#	SPECIES	COMMON NAME	CONDITION	SIZE(DBH)
56	Quercus alba	White Oak	fair/poor	16
57	Ostrya virginiana	American Hophornbeam	fair	6
65	Catalpa speciosa	Northern Catalpa	blown over	17

INVASIVE TREES TO BE REMOVE

TAG#	SPECIES	COMMON NAME	CONDITION	SIZE(DBH)
2	Robinia pseudoacacia	Black Locust	fair	9
3	Robinia pseudoacacia	Black Locust	fair	9+7
7	Robinia pseudoacacia	Black Locust	fair/poor	12
11	Robinia pseudoacacia	Black Locust	fair	11
13	Acer platanoides	Norway Maple	fair	8
14	Robinia pseudoacacia	Black Locust	fair	15
19	Robinia pseudoacacia	Black Locust	fair	22
20	Robinia pseudoacacia	Black Locust	fair	10
21	Robinia pseudoacacia	Black Locust	fair/poor	12
27	Acer platanoides	Norway Maple	fair	8
31	Robinia pseudoacacia	Black Locust	fair/poor	18
36	Acer platanoides	Norway Maple	fair	15
41	Acer platanoides	Norway Maple	fair/poor	14
45	Robinia pseudoacacia	Black Locust	poor	12
76	Acer negundo	Boxelder	poor	6
81	Acer platanoides	Norway Maple	fair	7
100	Acer platanoides	Norway Maple	fair/poor	9
104	Acer platanoides	Norway Maple	fair	6+5+5
109	Acer platanoides	Norway Maple	fair	11
114	Acer platanoides	Norway Maple	fair	15
145	Acer platanoides	Norway Maple	fair	6
154	Acer negundo	Boxelder	poor	10
158	Robinia pseudoacacia	Black Locust	poor	14
159	Robinia pseudoacacia	Black Locust	poor	11
162	Robinia pseudoacacia	Black Locust	poor	11
163	Robinia pseudoacacia	Black Locust	poor	17
164	Robinia pseudoacacia	Black Locust	poor	19+17
172	Robinia pseudoacacia	Black Locust	poor	7
220	Acer platanoides	Norway Maple	fair/poor	16
221	Acer platanoides	Norway Maple	fair/poor	16
236	Acer platanoides	Norway Maple	fair	5
239	Acer platanoides	Norway Maple	fair/poor	5
242	Acer platanoides	Norway Maple	fair/poor	12
332	Acer negundo	Boxelder	poor	6
347	Acer platanoides	Norway Maple	fair	8
348	Acer platanoides	Norway Maple	fair	7+12
354	Acer platanoides	Norway Maple	poor	19
357	Acer platanoides	Norway Maple	fair	10
363	Morus alba	White Mulberry	poor	17
370	Acer platanoides	Norway Maple	fair	8
371	Acer negundo	Boxelder	fair/poor	9
384	Acer platanoides	Norway Maple	poor	6
386	Acer platanoides	Norway Maple	fair	7
508	Acer platanoides	Norway Maple	good	11
524	Morus alba	White Mulberry	poor	11
525	Acer platanoides	Norway Maple	good/fair	11
706	Acer platanoides	Norway Maple	fair	8
716	Robinia pseudoacacia	Black Locust	poor	15

SITE DESIGN TREES TO BE REMOVE

TAG#	SPECIES	COMMON NAME	CONDITION	SIZE(DBH)
59	Juglans nigra	Black Walnut	poor	11
60	Prunus serotina	Black Cherry	fair	10
62	Fraxinus pensylvanica	Green Ash	fair	8
63	Fraxinus pensylvanica	Green Ash	poor/dead	19
64	Carya ovata	Shagbark Hickory	good/fair	6
66	Prunus serotina	Black Cherry	fair/poor	9
67	Prunus serotina	Black Cherry	fair/poor	8
69	Carya ovata	Shagbark Hickory	poor	7
70	Fraxinus pensylvanica	Green Ash	poor	13
71	Carya ovata	Shagbark Hickory	poor	11
72	Juglans nigra	Black Walnut	poor	8
73	Juglans nigra	Black Walnut	poor	13
75	Quercus rubra	Red Oak	fair/poor	31
76	Quercus rubra	Red Oak	fair/poor	24
79	Quercus alba	White Oak	poor	19
81	Fraxinus pensylvanica	Green Ash	poor	6
84	Quercus alba	White Oak	poor	16+14
86	Fraxinus pensylvanica	Green Ash	poor	10
87	Quercus rubra	Red Oak	good/fair	29
120	Quercus alba	White Oak	good/fair	23
121	Carya ovata	Shagbark Hickory	fair/poor	6
122	Juglans nigra	Black Walnut	poor	5
123	Quercus alba	White Oak	fair/poor	23
124	Ulmus americana	American Elm	fair	5
128	Carya ovata	Shagbark Hickory	poor	5
129	Quercus alba	White Oak	fair	22
130	Fraxinus pensylvanica	Green Ash	fair	5
131	Carya ovata	Shagbark Hickory	good/fair	5
132	Quercus alba	White Oak	poor	20
133	Prunus serotina	Black Cherry	poor	6
134	Carya ovata	Shagbark Hickory	good/fair	5
135	Fraxinus pensylvanica	Green Ash	poor	13
136	Fraxinus pensylvanica	Green Ash	poor	10
137	Carya ovata	Shagbark Hickory	fair	5
138	Prunus serotina	Black Cherry	poor	8
142	Fraxinus pensylvanica	Green Ash	poor	7
143	Prunus serotina	Black Cherry	poor	8
147	Prunus serotina	Black Cherry	poor	9
149	Tilia americana	Basswood	good/fair	10+10+8
150	Juglans nigra	Black Walnut	good	19
151	Phellodendron amurense	Amur Corktree	good/fair	11
153	Fraxinus pensylvanica	Green Ash	fair	11
167	Quercus rubra	Red Oak	fair	33
168	Acer saccharum	Sugar Maple	good	12
169	Fraxinus pensylvanica	Green Ash	fair	14
171	Quercus alba	White Oak	fair/poor	19
174	Prunus serotina	Black Cherry	poor	8
180	Carya ovata	Shagbark Hickory	good/fair	6
181	Juglans nigra	Black Walnut	fair/poor	11
193	Juglans nigra	Black Walnut	poor	11
195	Tilia americana	Basswood	fair	11
197	Carya ovata	Shagbark Hickory	fair	6
222	Quercus macrocarpa	Bur Oak	fair/poor	21
223	Quercus macrocarpa	Bur Oak	good/fair	22
224	Quercus rubra	Red Oak	good	27
225	Quercus rubra	Red Oak	good	32
226	Quercus macrocarpa	Bur Oak	fair	32
227	Fraxinus pensylvanica	Green Ash	fair	5
229	Quercus macrocarpa	Bur Oak	fair	21
245	Quercus rubra	Red Oak	fair	23
247	Quercus rubra	Red Oak	good/fair	28
248	Quercus rubra	Red Oak	good/fair	21
253	Quercus alba	White Oak	good	18+20
258	Quercus alba	White Oak	fair/poor	17
259	Quercus alba	White Oak	poor	16
260	Quercus alba	White Oak	fair	18
263	Quercus alba	White Oak	fair	21
264	Quercus alba	White Oak	fair/poor	16
265	Carya ovata	Shagbark Hickory	poor	15
272	Carya ovata	Shagbark Hickory	good	6
274	Quercus alba	White Oak	poor	15
278	Quercus alba	White Oak	fair	24
279	Quercus alba	White Oak	fair	19
280	Quercus alba	White Oak	fair	23
284	Ostrya virginiana	American Hophornbeam	good	8+7+5
285	Carya ovata	Shagbark Hickory	good	8
290	Juglans nigra	Black Walnut	good	9
291	Quercus rubra	Red Oak	fair/poor	27
292	Prunus serotina	Black Cherry	fair/poor	6
297	Quercus alba	White Oak	fair	6
298	Quercus alba	White Oak	good/fair	10
299	Quercus alba	White Oak	fair/poor	26
300	Carya ovata	Shagbark Hickory	fair	5
301	Juglans nigra	Black Walnut	good	9
302	Carya ovata	Shagbark Hickory	good	8
303	Prunus serotina	Black Cherry	fair	11
304	Ostrya virginiana	American Hophornbeam	fair/poor	8
306	Carya ovata	Shagbark Hickory	fair/poor	8
307	Juglans nigra	Black Walnut	poor	6
309	Quercus alba	White Oak	fair	27
312	Quercus alba	White Oak	fair/poor	16
314	Carya ovata	Shagbark Hickory	fair	8
315	Juglans nigra	Black Walnut	good/fair	17
316	Tilia americana	Basswood	good	9
317	Quercus alba	White Oak	good/fair	20
318	Juglans nigra	Black Walnut	fair/poor	7
319	Carya ovata	Shagbark Hickory	fair/poor	7
320	Ostrya virginiana	American Hophornbeam	fair/poor	8+6+2
321	Ulmus americana	American Elm	poor	8
322	Quercus rubra	Red Oak	good	28
326	Quercus rubra	Red Oak	fair	30
327	Quercus alba	White Oak	fair	14
352	Prunus serotina	Black Cherry	poor	13
353	Acer saccharum	Sugar Maple	good	14
389	Quercus alba	White Oak	fair/poor	15
390	Carya ovata	Shagbark Hickory	fair	15
391	Quercus alba	White Oak	poor	9
393	Quercus rubra	Red Oak	good/fair	30
394	Quercus rubra	Red Oak	fair	19
395	Quercus alba	White Oak	fair	11
396	Quercus alba	White Oak	good	19
397	Quercus rubra	Red Oak	fair/poor	21
399	Quercus alba	White Oak	fair/poor	18
401	Ostrya virginiana	American Hophornbeam	good	5+3
402	Quercus alba	White Oak	fair/poor	14
403	Quercus rubra	Red Oak	good	23
404	Quercus alba	White Oak	good	17
405	Quercus alba	White Oak	good	19
406	Ostrya virginiana	American Hophornbeam	good	4+4+2
407	Quercus rubra	Red Oak	good	30
408	Quercus rubra	Red Oak	good	22
409	Carya ovata	Shagbark Hickory	good	15
410	Quercus alba	White Oak	fair	22
411	Quercus rubra	Red Oak	good/fair	30
412	Quercus rubra	Red Oak	good/fair	23
413	Quercus alba	White Oak	fair	18
414	Quercus rubra	Red Oak	good	28
415	Quercus rubra	Red Oak	good/fair	24
416	Quercus rubra	Red Oak	poor	7
417	Quercus rubra	Red Oak	fair/poor	16
420	Quercus alba	White Oak	good	28

TAG#	SPECIES	COMMON NAME	CONDITION	SIZE(DBH)
420	Quercus alba	White Oak	good	28
422	Quercus rubra	Red Oak	fair	32
425	Quercus alba	White Oak	good	21
427	Quercus alba	White Oak	fair/poor	18
426	Ulmus americana	American Elm	poor	5+5
428	Quercus rubra	Red Oak	good/fair	22+19
430	Prunus serotina	Black Cherry	poor	8
443	Quercus rubra	Red Oak	good/fair	28
445	Prunus serotina	Black Cherry	poor	9
447	Quercus alba	White Oak	fair	19
469	Quercus rubra	Red Oak	fair	24
470	Quercus rubra	Red Oak	good/fair	32
471	Ostrya virginiana	American Hophornbeam	fair	5
475	Carya ovata	Shagbark Hickory	fair	14
476	Quercus rubra	Red Oak	good	31
477	Quercus rubra	Red Oak	poor	23
478	Quercus rubra	Red Oak	fair/poor	28
479	Ostrya virginiana	American Hophornbeam	good/fair	5+4
480	Quercus alba	White Oak	fair	16
481	Quercus rubra	Red Oak	good/fair	33
482	Quercus alba	White Oak	fair	12
483	Quercus rubra	Red Oak	fair	26
484	Quercus rubra	Red Oak	fair	26
485	Ostrya virginiana	American Hophornbeam	good	5+4
486	Quercus rubra	Red Oak	fair	33
487	Ostrya virginiana	American Hophornbeam	fair/poor	6
489	Quercus rubra	Red Oak	good/fair	25
490	Quercus rubra	Red Oak	fair	23
491	Quercus alba	White Oak	fair	19
492	Quercus alba	White Oak	fair	20
493	Quercus rubra	Red Oak	fair/poor	27
494	Quercus rubra	Red Oak	poor	23
495	Quercus alba	White Oak	fair	17
498	Quercus alba	White Oak	fair	18
499	Quercus alba	White Oak	fair	15
501	Quercus rubra	Red Oak	fair	29
502	Quercus rubra	Red Oak	fair	31
503	Quercus alba	White Oak	fair	12
504	Quercus rubra	Red Oak	good/fair	23
514	Carya ovata	Shagbark Hickory	fair	6
542	Carya ovata	Shagbark Hickory	good	14
548	Quercus rubra	Red Oak	fair	24
549	Quercus rubra	Red Oak	fair	19
550	Quercus rubra	Red Oak	fair	18
551	Quercus alba	White Oak	fair/poor	18
552	Quercus alba	White Oak	fair/poor	14
554	Quercus alba	White Oak	fair/poor	15
557	Quercus alba	White Oak	poor	15
558	Quercus rubra	Red Oak	fair/poor	25
559	Juglans nigra	Black Walnut	fair/poor	6
560	Carya ovata	Shagbark Hickory	good/fair	17
571	Juglans nigra	Black Walnut	fair	15+13+9+9
572	Ostrya virginiana	American Hophornbeam	fair	5+4
574	Carya ovata	Shagbark Hickory	fair	12
575	Tilia americana	Basswood	good/fair	12+4
576	Quercus alba	White Oak	fair/poor	19

SUMMARY SITE DESIGN TREES TO BE REMOVE CONDITIONS:

poor	35
fair	58
fair/poor +poor/dead	36
good/ fair	28
good	29

Total: 186

(Note: 186 trees for removal is 23% of the total and the ordinance allows up to 30%.)

TREE SCHEDULE (For tree layout information, see L-901)

TREE SCHEDULE - CONIFERS (Note: 6' min. size required by ordinance)

Plant Code	Plant Scientific Name	Plant Common Name	Count	Installed Size	Comments
AbBa	*Abies balsamea*	Balsam Fir	19	7'	
PiGl	*Picea glauca 'Densata'*	Black Hills Spruce	11	8'	
PiSt	*Pinus strobus*	Eastern White Pine	23	7'	
ThGg	*Thuja 'Green Giant'*	Green Giant Arborvitae	4	8'	

Conifer Subtotal: 57

TREE SCHEDULE - UNDERSTORY (Note: 2" min. size required by ordinance)

Plant Code	Plant Scientific Name	Plant Common Name	Count	Installed Size	Comments
AePa	*Aesculus pavia*	Red Buckeye	5	7'	Multi-stem
AmLa	*Amelanchier laevis*	Smooth Serviceberry	11	7'	Multi-stem
CeCa	*Cercis canadensis*	Eastern Redbud	25	7'	<varies>
ClKe	*Cladrastis kentukea*	Kentucky Yellowwood	18	2.5" caliper	
CoAl	*Cornus alternifolia*	Pagoda Dogwood	16	2.5" caliper	
HaVi	*Hamamelis virginiana 'Sunglow'*	'Sunglow' Common Witchhazel	8	7'	Multi-stem

Understory Subtotal: 83

TREE SCHEDULE - CANOPY (Note: 2" min. size required by ordinance)

Plant Code	Plant Scientific Name	Plant Common Name	Count	Installed Size	Comments
AeCa	*" Aesculus x carnea 'Fort McNair'*	Fort McNair Horsechestnut	3	4" caliper	
CaCa	*Carpinus caroliniana*	American Hornbeam	5	4" caliper	
FaGr	*Fagus grandifolia*	American Beech	14	2" caliper	
NySs	*Nyssa sylvatica*	Black Tupelo	6	4" caliper	
OsVi	*Ostrya virginiana*	American Hophornbeam	11	4" caliper	
PlOc	*Platanus occidentalis*	American Sycamore	6	2" caliper	
PlOc	*Platanus occidentalis*	American Sycamore	14	4" caliper	
QuBi	*Quercus bicolor*	Swamp White Oak	3	2" caliper	
QuBi	*Quercus bicolor*	Swamp White Oak	2	4" caliper	
QuMa	*Quercus macrocarpa*	Bur Oak	5	4" caliper	
TiAm	*Tilia americana*	American Linden	7	4" caliper	

Canopy Subtotal: 78

Total Proposed Trees: 209

LEGEND

- PROPERTY LINE
- EASEMENT. SEE CIVIL DWGS.
- WATER MAIN LINE
- EXISTING TREE TO REMAIN
- DAMAGED TREE TO BE REMOVED 3
- INVASIVE TREE TO BE REMOVED 48
- DEAD TREE TO BE REMOVED 75
- SITE DESIGN TREE TO BE REMOVED 186
- TREE SURVEY LABEL (TAG#)
- TREE PROTECTION FENCE
- TREE PROTECTION ZONE

TOTAL REMOVD TREES: 310 (DEAD TREES: 75, DAMAGED TREES: 3, INVASIVE TREES: 48, SITE DESIGN REMOVED TREES: 186)

TOTAL EXISITING TREES: 808

SITE DESIGN REMOVAL PERCENT: 23%

TOTAL PROPOSED TREES: 209 (CANOPY TREE: 78, UNDERSTORY TREE: 83, CONIFER TREE: 57)

0' 15' 30' 60' 120'

WOMEN'S LEADERSHIP CENTER

259 Constance Blvd
Williams Bay, WI 53191

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KEY PLAN:

SEAL:

WISCONSIN ... LANDSCAPE ARCHITECT

8/4/2023

NOT FOR CONSTRUCTION

NO	ISSUED FOR	DATE
3	VILLAGE COMMENTS	[illegible]
2	DESIGN DEVELOPMENT	[illegible]
1	VILLAGE ZONING	[illegible]

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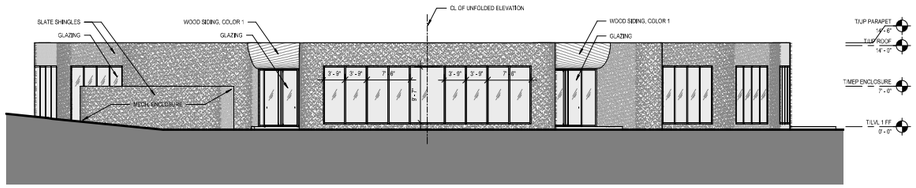
PROJECT NO. : 22013
DRAWN: PG, AJ, ES DATE: 08/04/2023
CHECKED: SL SCALE: 1" = 30'-0"

SHEET TITLE:
TREE PROTECTION & REMOVAL PLAN

DRAWING NUMBER:
L910



9 NORTHWEST ELEVATION AT XL CONF
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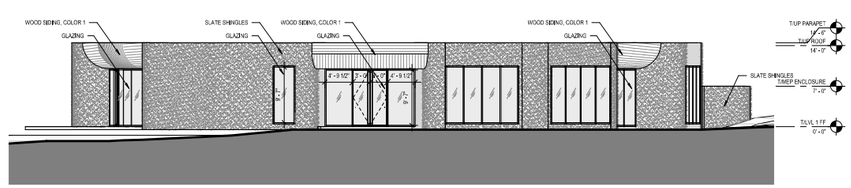

4 SOUTHEAST ELEVATION AT ENTRY
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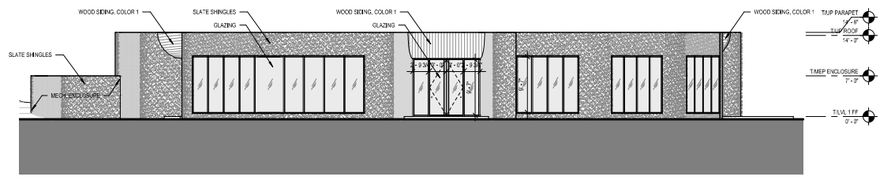

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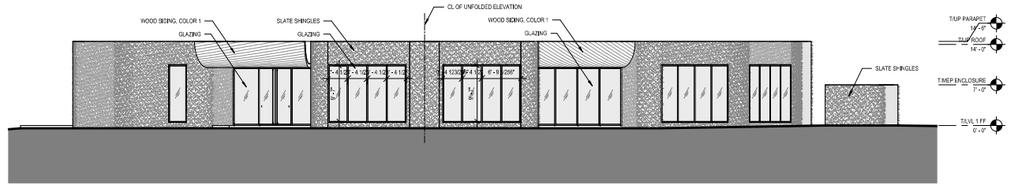

3 SOUTHEAST ELEVATION AT ADMIN
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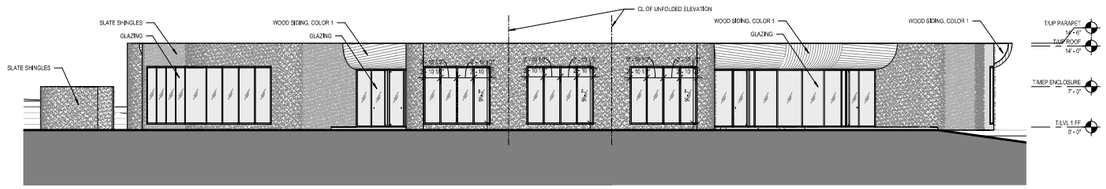

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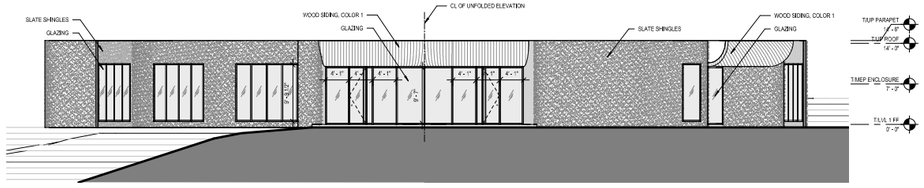

6 SOUTH ELEVATION AT CAFE
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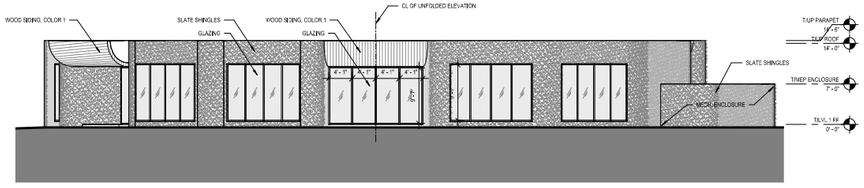

2 NORTHEAST ELEVATION AT SMALL CONF
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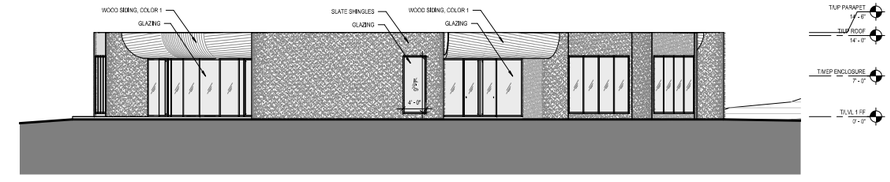
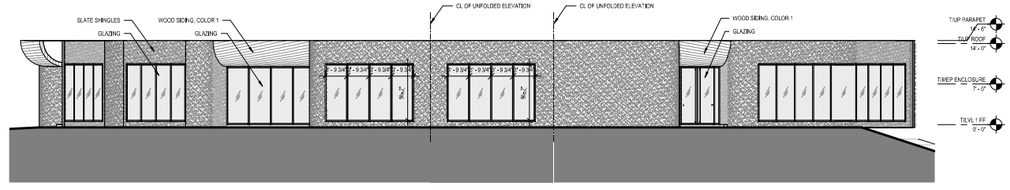


5 SOUTH ELEVATION AT RESTROOM
SCALE: 1/8" = 1'-0"



1 NORTHEAST ELEVATION AT MED CONFERENCE
SCALE: 1/8" = 1'-0"

EXTERIOR MATERIALS LEGEND

GLAZING: CLEAR, LOW-IRON IGU, WITH LOW-E COATING AND BIRD PROTECTION FRIT

SLATE SHINGLES: NATURAL SLATE STONE, TAPERED AND LAPPED, WITH DARK/MEDIUM GREY TONAL VARIATION

WOOD SIDING: NATURAL WOOD SIDING WITH VERTICAL SHIPLAPPED BOARDS, IN NEUTRAL COLOR TONE RANGE TBD (BROWNS, GREYS, BLACKS, BEIGES)

WOMEN'S LEADERSHIP CENTER

327 Constance Blvd
Williams Bay, WI 53191

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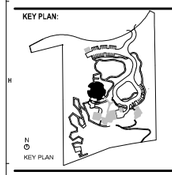
KEY PLAN:



SEAL:

WISCONSIN
JEANNE K. GANG
10734
REGISTERED ARCHITECT

NO.	ISSUED FOR	DATE
1	VILLAGE ZONING	06.04.2023

NOT FOR CONSTRUCTION

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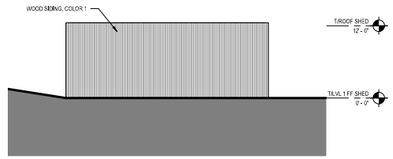
PROJECT NO.: 22013
DRAWN: XX
DATE: 08/04/2023
CHECKED: XX
SCALE: 1/8" = 1'-0"

SHEET TITLE:
BUILDING ELEVATIONS COUNCIL

DRAWING NUMBER:
A-200-CO-Z



3 SHED ELEVATION NORTH
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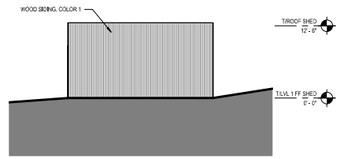
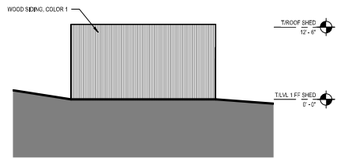


2 SHED ELEVATION EAST
SCALE: 1/8" = 1'0"

4 SHED ELEVATION SOUTH
SCALE: 1/8" = 1'0"



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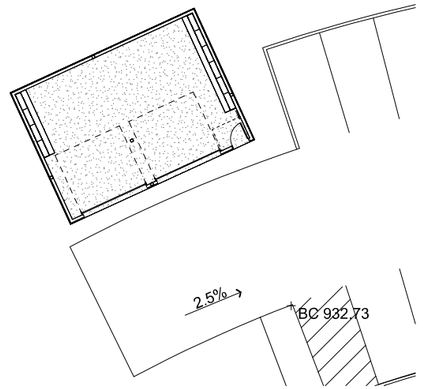
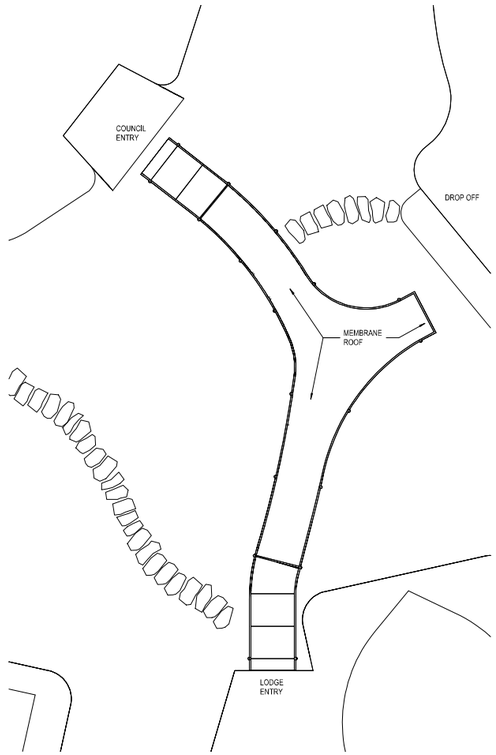


1 SHED OVERALL PLAN
SCALE: 1/8" = 1'0"

7 COVERED WALKWAY ELEVATION EAST
SCALE: 1/8" = 1'0"

8 COVERED WALKWAY ELEVATION WEST
SCALE: 1/8" = 1'0"



6 COVERED WALKWAY PLAN
SCALE: 1/8" = 1'0"

EXTERIOR MATERIALS LEGEND

GLAZING: CLEAR, LOW-IRON IGU, WITH LOW-E COATING AND BIRD PROTECTION FRIT

METAL: SMOOTH SURFACE CORROSION-RESISTANT PANELIZED

WOOD SIDING: NATURAL WOOD SIDING WITH VERTICAL SHIPLAPPED BOARDS, IN NEUTRAL COLOR TONE RANGE TBD (BROWNS, GREYS, BLACKS, BEIGES)

WOMEN'S LEADERSHIP CENTER

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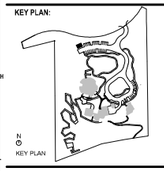
KEY PLAN:



SEAL:

NO.	ISSUED FOR	DATE
1	VILLAGE ZONING	06.04.2023

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ARCHITECT:

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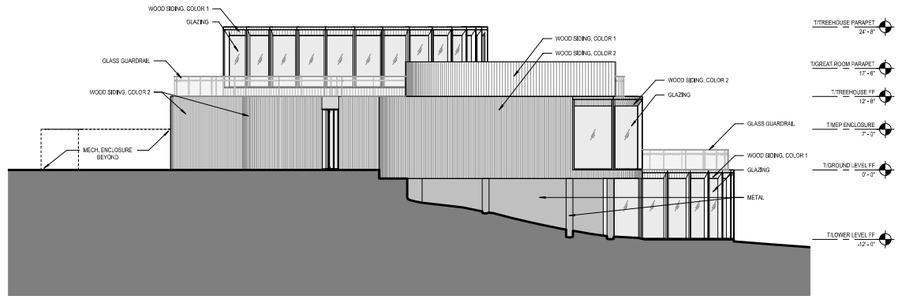
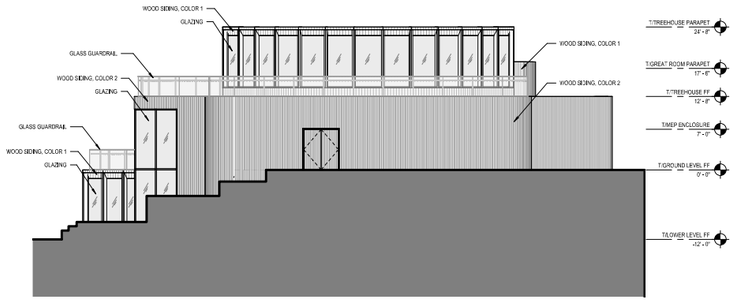
PROJECT NO.: 22013
DRAWN: Author **DATE:** 06/04/2023
CHECKED: Checker **SCALE:** 1/8" = 1'-0"

SHEET TITLE:
SITE STRUCTURES PLANS & ELEVATIONS

DRAWING NUMBER:
A-200-SITE-Z



4 WEST ELEVATION
SCALE: 1/8" = 1'-0"



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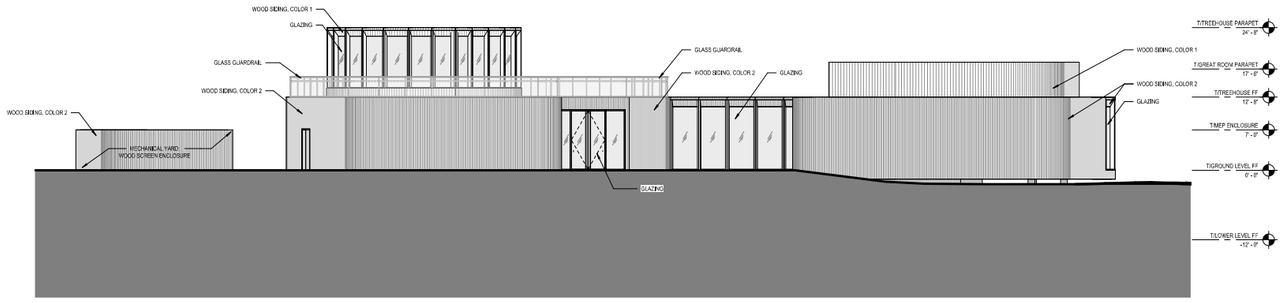
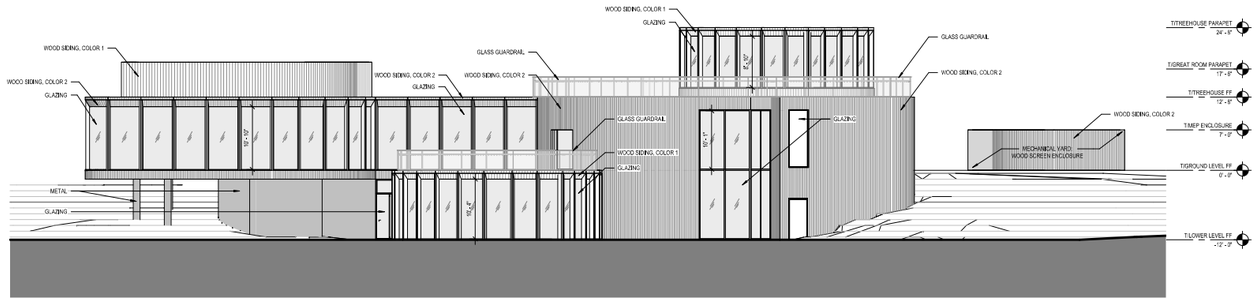
SCALE: 1/8" = 1'-0"



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



2 SOUTH ELEVATION
SCALE: 1/8" = 1'-0"

EXTERIOR MATERIALS LEGEND

GLAZING: CLEAR, LOW-IRON IGU, WITH LOW-E COATING AND BIRD PROTECTION FRIT

METAL: SMOOTH SURFACE CORROSION-RESISTANT PANELIZED

WOOD SIDING: NATURAL WOOD SIDING WITH VERTICAL SHIPLAPPED BOARDS, IN NEUTRAL COLOR TONE RANGE TBD (BROWNS, GREYS, BLACKS, BEIGES)

WOMEN'S LEADERSHIP CENTER

327 Constance Blvd
Williams Bay, WI 53191

GENERAL NOTES

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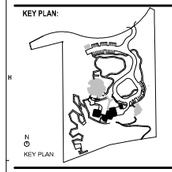
KEY PLAN:



SEAL:

NO.	ISSUED FOR:	DATE:
1	VILLAGE ZONING	08.04.2023

NOT FOR CONSTRUCTION

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PROJECT NO. : 22013
DRAWN: XX DATE: 08/04/2023
CHECKED: XX SCALE: 1/8" = 1'-0"

SHEET TITLE:
BUILDING ELEVATIONS LODGE

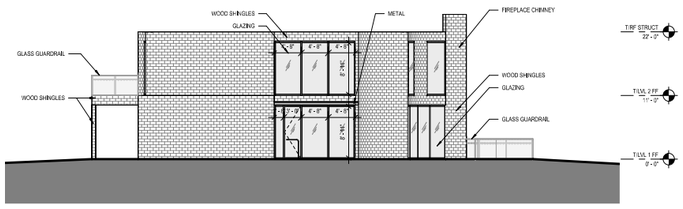
DRAWING NUMBER:
A-200-LO-Z

EXTERIOR MATERIALS LEGEND

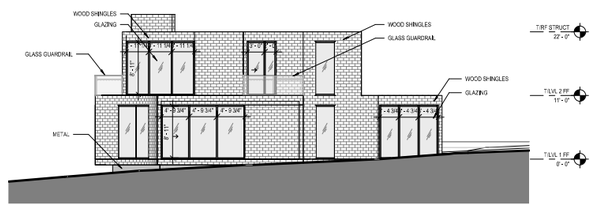
GLAZING: CLEAR, LOW-IRON IGU, WITH LOW-E COATING AND BIRD PROTECTION FRIT

METAL: SMOOTH SURFACE CORROSION-RESISTANT PANELIZED

WOOD SHINGLES: NATURAL WOOD SHINGLES, TAPERED AND LAPPED, IN NATURAL COLOR TONE RANGE FROM TBD (BROWNS, GREYS, BLACKS BEIGES)



4 NORTH ELEVATION
SCALE: 1/8" = 1'-0"



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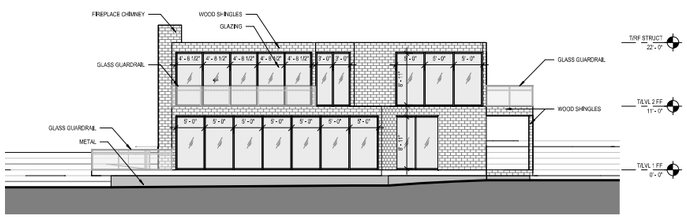
SCALE: 1/8" = 1'-0"



3 SOUTH ELEVATION
SCALE: 1/8" = 1'-0"

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

WOMEN'S LEADERSHIP CENTER

327 Constance Blvd
Williams Bay, WI 53191

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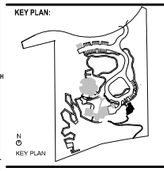

KEY PLAN

SEAL:

NO.	ISSUED FOR	DATE
1	VILLAGE ZONING	06.04.2023

NOT FOR CONSTRUCTION

ARCHITECT:

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PROJECT NO.: 22013
DRAWN: XX
DATE: 08/04/2023
CHECKED: XX
SCALE: 1/8" = 1'-0"

SHEET TITLE:
BUILDING ELEVATIONS CABIN

DRAWING NUMBER:
A-200-CA-Z

16' POLE LIGHT

LANDSCAPE FORMS - TUMBLER

13' POLE LIGHT

LANDSCAPE FORMS - TUMBLER

30" BOLLARD

BEGA - 77221

12" SOLAR BOLLARD

BEGA - 77221

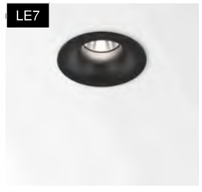
HANDRAIL LIGHT

KLIK - LEDPOD 40

TREE DOWNLIGHT

TARGETTI - BULLETTO

CANOPY DOWNLIGHT



DELTALIGHT - MINI REO 2"

ENTRY DOWNLIGHT

DELTALIGHT - MINI REO 2"

WALKWAY UPLIGHT

DELTALIGHT - LOGIC 60
RA MOON

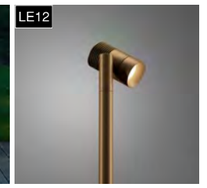
STEPLIGHT

DELTA LIGHT - LOGIC

CATENARY

TEAGAN - EXTON GLOBE W SHADE

LANDSCAPE LIGHT



BLIGHT - MAIA

DECORATIVE PENDANT

SELECTION PENDING (NOT EGRESS RELATED)

PORTABLE FLOOR LAMP

SELECTION PENDING (NOT EGRESS RELATED)

LIGHTING PLAN KEY NOTES

0. LIGHTING DESIGN PENDING DEVELOPMENT WITH BUILDING ARCHITECTURE
1. PROVIDE POWER FOR LIGHTING AT DOCK (LIGHTING BY OTHERS)
2. PROVIDE POWER PROVISIONS AND $5,000 ALLOWANCE FOR BRONAGE LIGHTING
3. PROVIDE $5,000 ALLOWANCE FOR ART LIGHTING

LE1
LE7
LE9
LE3
LE10
LE4
LE11
LE5
LE12
LE6
DLE1 / DLE2
DLE3

Women's Leadership Center

127 Constance Blvd
Williams Bay, WI 53191

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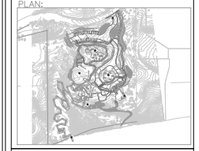

SEAL:

NOT FOR CONSTRUCTION

1	SITE PERMIT DRAFT	23.07.24

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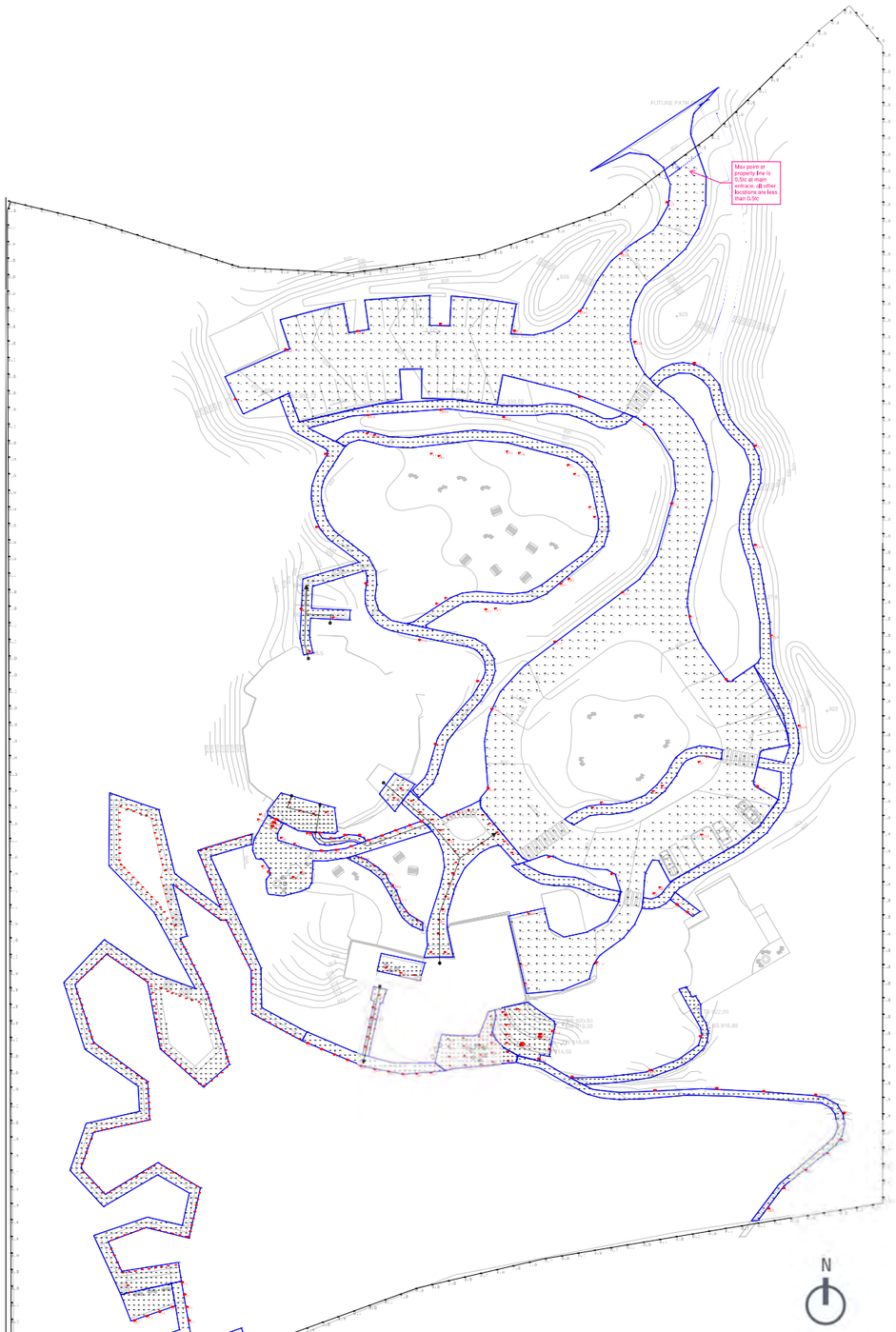
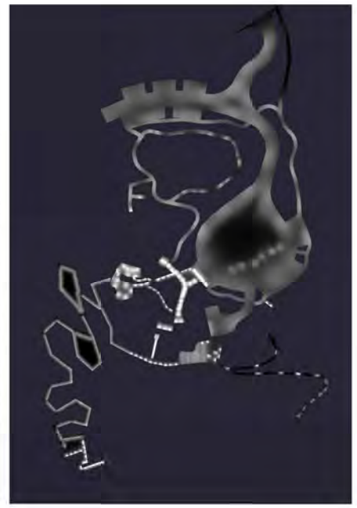
PROJECT NO.	Project Number		
DRAWN	CC	DATE:	08/04/2023
CHECKED	KP	SCALE:	1"=30'

SHEET TITLE:
OVERALL SITE LIGHTING

DRAWING NUMBER:
LP00.1





Calculation Summary					
Label	CalcType	Units	Avg	Max	Min
Boardwalk Deck_Top	Illuminance	Fc	9.22	17.2	0.3
Boardwalk_Deck_Top	Illuminance	Fc	1.28	37.6	0.0
Boardwalk_Top	Illuminance	Fc	1.18	5.2	0.4
Cabin_Entry_Top	Illuminance	Fc	5.38	15.1	0.5
Council Stone Path_Top	Illuminance	Fc	1.96	13.0	0.4
Council_Canopy_1_Top	Illuminance	Fc	3.40	7.1	1.4
Council_Egress_2_Top	Illuminance	Fc	3.60	7.8	1.0
Council_Entry_Top	Illuminance	Fc	3.57	9.3	0.8
Council_Ext_1_Top_1	Illuminance	Fc	2.38	15.5	0.5
Covered Walkway_Top	Illuminance	Fc	4.97	12.1	1.0
Lodge Ext_1_Top	Illuminance	Fc	3.86	7.7	1.5
Lodge Ext_5_Top	Illuminance	Fc	0.55	32.5	0.0
Lodge Path_2_Top	Illuminance	Fc	0.27	9.5	0.0
Lodge to Boardwalk_2_Top	Illuminance	Fc	1.97	10.5	0.3
Lodge_Entry_Top	Illuminance	Fc	5.03	23.2	1.2
Lodge_Steps_Top	Illuminance	Fc	1.26	8.9	0.1
Lodge_Terrace_Top	Illuminance	Fc	1.77	2.6	0.6
Pedestria Path_3_Top	Illuminance	Fc	0.94	1.2	0.7
Pedestrian_Path_1_Top	Illuminance	Fc	1.20	3.0	0.3
Pedestrian_Path_2_Top	Illuminance	Fc	1.48	7.8	0.3
Property Line	Illuminance	Fc	0.01	0.3	0.0
Road_1_Top (includes parking)	Illuminance	Fc	0.88	5.8	0.2
Savanna Knoll_1_Top	Illuminance	Fc	0.95	3.8	0.1
Woodland Clearing_1_Top	Illuminance	Fc	1.17	3.8	0.2
StatArea_1 (full site)	Illuminance	Fc	1.34	37.6	0.0

Target Light Levels

- **Primary Pathway**, 1fc min egress path, 3fc avg.
- **Primary Gathering Area**, 0.5fc min, 1fc avg.
- **Secondary Pathway**, 0.3fc min, 1fc avg.
- **Roadway**, 0.2fc min, 0.5fc avg.
- **Parking**, 0.2fc min, 0.5fc avg, to match roadway
- **Tertiary Pathway**, 0fc min, indicator lighting for navigation at night
- **Secondary Gathering Area**, 0fc min, landscape lighting for ambiance at night

Site Wide: Avg fc not to exceed 2.4fc

- - - - - - **42" Egress Path**, Architect to Verify

0.5fc min pertains to the main path of travel. At the boardwalk, light levels are maintained about the 0.3fc min for a continuous 4' path, Beyond that, the light levels do drop to 0.0fc, but as this is beyond the main path of travel, the lighting at this location meets the intent of the IES recommendation. Lighting intent is to contain lighting on the boardwalk surface and not light into the surrounding natural space.

Luminaire Schedule														
Symbol	Qty	Tag	Description	Label		Lumens	Watts	LLD	LDD	EOF	UDF	LLF	IES Class	BUG Rating
	7	LE10	DELTALIGHT_RECESSED STEP_LIGHT	304320183	@ 0.5' AFG	116	11	0.850	0.850	1.000	1.000	0.723	Type IV	B0-U1-G0
	26	LE11	TEGAN_CATENARY	tegan-lighting-exterior-exton_1	@ 10' AFG	205	5.3	0.850	0.850	1.000	1.000	0.723	Type V	B0-U2-G0
	13	LE4	BEGA_BOLLARD_LOW OUTPUT	77221_BEGA_IES_1	@ 2' AFG	643	10	0.850	0.850	1.000	0.500	0.361	Type III	B0-U0-G0
	2	LE14	TARGETTI_WALL MOUNT	1ES2R04K40	@ 10' AFG	452	7	0.850	0.850	1.000	1.000	0.723	Type II	B0-U1-G0
	14	LE8	DELTA LIGHT_MICRO DOWNLIGHT	BV8-G7H-930033-350	@ 10' AFG	667	8	0.850	0.850	1.000	0.800	0.578	Type VS	B1-U1-G0
	12	LE2	LANDSCAPE FORMS_13' POLE	IES_TML16B11IE_1	@ 13' AFG	2371	28	0.850	0.850	1.000	1.000	0.723	Type II	N.A.
	253	LE5	KLIKPOD_HANDRAIL LIGHT	LPOD40-Dir-PCLens-Asy	@ 2.5' AFG	130	2	0.850	0.850	1.000	0.400	0.289	Type III	N.A.
	20	LE7	DELTA LIGHT_MICRO DONWLIGHT	193519230_B-350	@ 10' AFG	479	7	0.850	0.850	1.000	1.000	0.723	Type VS	B1-U0-G0
	10	LE1B	LANDSCAPE FORMS_16' POLE	IES_TML16B11IV	@ 15.5' AFG	2387	40	0.850	0.850	1.000	1.000	0.723	Type VS	N.A.
	17	LE1A	LANDSCAPE FORMS_16' POLE	IES_TML16B11II	@ 15.5' AFG	2371	28	0.850	0.850	1.000	1.000	0.723	Type II	N.A.
	24	LE6	TARGETTI_MONOPOINT	BLTRPFEL2WF30	@ 12' AFG	689	12	0.850	0.850	1.000	0.500	0.361	Type V	N.A.
	13	LE12	BELUX_STAKE LIGHT	PLOS_F004H30A0XX	@ 2' AFG	252	5	0.850	0.850	1.000	0.800	0.578	Type VS	B0-U0-G0
	45	LE3	BEGA_BOLLARD	77221_BEGA_IES	@ 2.5' AFG	643	10	0.850	0.850	1.000	1.000	0.723	Type III	B0-U0-G0
	10	LE6	TARGETTI_MONOPOINTS	TARGT_BLTRPFEL2MP30	@ 12' AFG	704	12	0.850	0.850	1.000	0.920	0.665	Type V	N.A.

NOTES:
1. ILLUMINANCE CALCULATIONS ARE BASED ON PUBLISHED CALCULATION METHODS AND ARE FOR REFERENCE ONLY. FIELD MEASURED RESULTS MAY DIFFER FROM CALCULATED RESULTS AND ARE DEPENDANT ON A VARIETY OF FACTORS INCLUDING, BUT NOT LIMITED TO THE FOLLOWING: MANUFACTURER'S PHOTOMETRY DATA, LINE VOLTAGE, LUMINAIRE PERFORMANCE, TEMPERATURE, AND ACTUAL CONDITION OF FINISHES AND ENVIRONMENT.

William's Bay Additional Requirements

The following local code items (per section 390-0807) are being met through the result of this photometric study:

(E1) Exterior lighting will not be visible from a residential zone
All lighting well within property line, except at ends of path leading to the street and the lake. All lighting oriented inwards to the site
(E2) Exterior lighting will not be distracting to motorists
All fixtures are specification grade LED's with static output, so no flashing or flickering should occur

(F1) As measured at the property line, light levels shall not exceed .5 FCs above ambient moon light
The max value occurs at the street entrance. There is one location with 0.5fc at 5' from the property line, clearly noted on the plan.
(F2) Maximum Average lighting shall not exceed 2.4 FCs
The site average is 1.34fc
(F3) Not applicable, zoning is not residential
(F4) Not applicable, requirements met without exception needed
(F5) Fixture and luminaire requirements
(A) All fixtures are downward facing or fully cutoff by overhead building canopies
(B) No lighting is included in buffer yards
(C) Fixture meet 90° cutoff angles and BUG requirements
(D) All lighting across the site is specified at 3000K static white, the finishes of the fixtures will be consistent but hasn't been determined
(E) The max mounting height is 15.5 on the LE1A/LE1B fixtures, which is acceptable in a P&I zone
(F) Not applicable, but also all fixtures are over 3' from all lot lines
(G) Parking lot min is 0.3fc
(H) Not applicable to this calculation

Exterior Lighting Controls Recommendations

- System recommended to be Lutron Athena or Equal. System for interior and exterior recommended to be the same.
- All fixtures on exterior site to be dimmable, even if not required by NEC code.
- All fixtures to be controlled via a pre-set scene level, triggered by an astronomical time clock. Lighting to be reduced after hours utilizing time clock and motion sensors. All lighting to be off during daylight hours.
- All fixtures to be controlled from a centralized processor, recommended to be located in the facilities / maintenance office planned for the Council building. Access to control system via iPad has been requested by the Client.
- All scene control wall stations to have a minimum of 3 scene buttons and raise/lower/on/off control.
- Any keypad / wall station to have engravings on the keypad for ease of use.
- Fixtures of a like type in a like area to be zoned together. No fixtures of different types to be zoned together. Roadway, Pathways, Oak Savanah, Woodland, Basecamp, Terrace Garden, and Boardwalk to be considered separate areas with individual control in each.
- Outdoor receptacles to be provided at event spaces for temporary plug-in lighting.

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KEY PLAN:

SEAL:

1	Client Review	23.08.04

NOT FOR CONSTRUCTION

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PROJECT NO.
DRAWN:
DATE: 08/04/2023
CHECKED:
SCALE: 1" = 30'

SHEET TITLE:
PHOTOMETRIC REPORT

DRAWING NUMBER:
LP00.2

GENERAL NOTES:

1. CONTRACTOR TO CONTACT DIGGERS HOTLINE FOR UTILITY LOCATES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL VERIFY WITH UTILITY COMPANIES IF UTILITY COMPANY'S STAFF IS REQUIRED TO BE ON SITE WHEN CONSTRUCTION ACTIVITIES ARE NEAR UTILITY FACILITIES.
2. LOCATION OF ALL STRUCTURES, OBSTACLES, AND EXISTING FACILITIES SHOWN SHALL NOT BE TAKEN AS CONCLUSIVE. CONTRACTOR SHALL VERIFY LOCATIONS AS A CONDITION OF THEIR BID AND BE RESPONSIBLE FOR ALL DAMAGES RESULTING FROM THEIR ACTIVITIES.
3. CONTRACTOR SHALL TAKE CARE WHEN EXCAVATING AROUND EXISTING UTILITY LINES AND EQUIPMENT. VERIFY COVERAGE REQUIREMENTS WITH UTILITY COMPANIES.
4. EXISTING UTILITIES SHOWN ARE APPROXIMATE AND HAVE BEEN OBTAINED FROM AVAILABLE RESOURCES FOR FIELD LOCATES. THERE MAY BE ADDITIONAL UTILITIES NOT SHOWN. CONTRACTOR IS REQUIRED TO VERIFY LOCATION OF EXISTING UTILITIES.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS NECESSARY TO CARRY OUT THEIR WORK, UNLESS OTHERWISE NOTED.
6. CONTRACTOR SHALL PROVIDE STAKING AS NECESSARY TO LAYOUT AND PROVIDE GRADES FOR ANY SECTION OF THE WORK.
7. A COMPETENT REPRESENTATIVE WHO HAS AUTHORITY TO ACT FOR THE CONTRACTOR MUST BE AT THE SITE AT ALL TIMES.
8. STAGING AND MATERIAL STORAGE AREAS SHALL BE COORDINATED WITH THE OWNER AND SHALL BE DONE IN A MANNER TO AVOID INTERFERENCE WITH THE OWNER'S ACTIVITIES.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING PROPERTY CORNERS AND SURVEY MONUMENTS.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR BARRICADING AREAS OF CONSTRUCTION TO PROTECT AGAINST PERSONAL INJURY.
11. EXISTING FACILITIES TO REMAIN INCLUDING LANDSCAPING AND TREES SHALL BE PROTECTED DURING CONSTRUCTION.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING THEIR WORK FROM ALL DAMAGE INCLUDING THE PUBLIC, OTHER CONTRACTORS, AND THE ENVIRONMENT.
13. EXCESS MATERIALS SHALL BE REMOVED FROM THE SITE UNLESS OTHERWISE DIRECTED BY THE OWNER.

UTILITIES AND STORM SEWER:

1. ALL EXISTING SURFACE INFRASTRUCTURE INCLUDING HYDRANTS, VALVES, HANDHOLES, CASTINGS, IRRIGATION SYSTEMS, AND UTILITY PEDESTALS ARE REQUIRED TO BE ADJUSTED TO PROPOSED GRADE BY CONTRACTOR.
2. UTILITY MATERIALS AND INSTALLATION SHALL CONFORM TO LOCAL STANDARDS AND SPECIFICATIONS FOR UTILITY COMPANIES HAVING JURISDICTION.
3. CONTRACTOR SHALL COORDINATE INSTALLATION OF UTILITIES AND CONDUITS TO AVOID CONFLICTS AND TO PROVIDE MINIMUM REQUIRED DEPTHS OF COVER. ADDITIONAL BENDS AND ASSOCIATED MATERIALS ARE TO BE INSTALLED AS REQUIRED FOR WATER MAINS AND LATERALS.
4. STORM SEWER SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR SEWER & WATER CONSTRUCTION IN WISCONSIN AND THE STANDARDS OF THE WISCONSIN DEPARTMENT OF SAFETY AND PROFESSIONAL SERVICES FOR PRIVATE STORM SEWER CURRENT EDITIONS INCLUDING ANY ADDENDUMS.
5. STORM SEWER STRUCTURES SHALL BE PRECAST CONCRETE AND THE SIZE AS NOTED ON THE PLANS.
6. TRENCHES SHALL BE BACKFILLED WITH CRUSHED STONE BEDDING WITHIN 1:1 OF PAVEMENT AREAS AND WITH SPOIL IN LANDSCAPING AREAS.
7. STORM SEWER 8-INCHES OR SMALLER CONNECTED TO THE STORM SEWER SHALL BE PLACED HORIZONTALLY AT THE SPRING LINE OF THE PIPE WITH A WATER TIGHT CONNECTION.
8. CONNECTIONS TO EXISTING MANHOLES SHALL BE CORED AND A WATER TIGHT SEAL PROVIDED.
9. TRACER WIRE OR OTHER MEANS OF LOCATING UNDERGROUND PIPES SHALL BE INSTALLED ON ALL PIPING.
10. ALL DIMENSIONS ARE TO THE CENTERLINE OF UTILITIES AND STRUCTURES.

EROSION CONTROL:

1. CONSTRUCTION ACTIVITIES SHALL NOT COMMENCE UNTIL EROSION CONTROL DEVICES HAVE BEEN INSTALLED.
2. EROSION CONTROL DEVICES SHALL BE INSTALLED ACCORDING TO WDNR BEST MANAGEMENT PRACTICES.
3. EXISTING LANDSCAPING AND TREES TO REMAIN SHALL BE PRUNED TO REMOVE LOW HANGING, BROKEN, AND UNDESIRABLE GROWTH TO ENSURE HEALTHY AND SYMMETRICAL NEW GROWTH.
4. ALL AREAS DISTURBED BY CONTRACTOR OPERATIONS SHALL BE PREPARED FOR GRASS SEED BY LOOSENING RUTS AND WORKING THE SOIL AREAS TO A MINIMUM OF 6-INCHES PRIOR TO THE FINE GRADING AND SEEDING, AREAS SHALL HAVE A MINIMUM OF 4-INCHES OF TOPSOIL PLACED, SEEDED, AND MULCHED UNLESS OTHERWISE INDICATED.
5. INSPECTION OF ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE DONE BY CONTRACTOR ONCE PER WEEK AND WITHIN 24 HOURS OF EVERY PRECIPITATION EVENT OF 1/2-INCH OR GREATER.
6. CONTRACTOR SHALL REPAIR DEFICIENT EROSION AND SEDIMENT CONTROL MEASURES WITHIN 24-HOURS AFTER INSPECTION. ADDITIONAL EROSION AND SEDIMENT CONTROL DEVICES NOT SHOWN ON THIS PLAN MAY BE NECESSARY AS A RESULT OF CONSTRUCTION PRACTICES OR AS DIRECTED BY OWNER AND/OR ENGINEER.
7. CONTRACTOR SHALL NOTIFY AND OBTAIN WRITTEN ACCEPTANCE FROM ENGINEER OF PROPOSED CHANGES TO THE EROSION CONTROL PLAN AND/OR SEQUENCE PRIOR TO IMPLEMENTING THE CHANGE.
8. EXCESS MATERIAL THAT IS HAULED OFF SITE SHALL BE CONTRACTOR'S RESPONSIBILITY. CONTRACTOR SHALL OBTAIN PROPER PERMIT APPROVALS FOR EACH FILL SITE. EROSION AND SEDIMENT CONTROL MEASURES, RESTORATION, AND STABILIZATION AT FILL SITE IS CONTRACTOR'S RESPONSIBILITY. CONTRACTOR TO NOTIFY OWNER OF ALL FILL AND BORROW SITES.
9. CONTRACTOR SHALL SWEEP STREETS ADJACENT TO PROJECT AS NEEDED.
10. ALL INSTALLATION, MAINTENANCE, AND REMOVAL OF EROSION AND SEDIMENT CONTROL MEASURES SHALL COMPLY WITH THE WDNR TECHNICAL STANDARDS.
11. IF DEWATERING IS NECESSARY, CONTRACTOR SHALL PROVIDE PROPER DEWATERING SEDIMENT CONTROL DEVICES. DISCHARGE OF SEDIMENT LADEN WATER TO THE STORM OR SURFACE WATER IS PROHIBITED.
12. STABILIZE NEWLY GRADED AREAS WITHIN 3 DAYS OF BEING INACTIVE.
13. REMOVE EROSION AND SEDIMENT CONTROL DEVICES AFTER 80% OF VEGETATION HAS BEEN ESTABLISHED IN RESTORED AREAS.

GRADING AND PAVING:

1. ALL SITE CONSTRUCTION INCLUDING GRADING, EXCAVATION, AND PAVEMENT CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH THE LATEST ADDITION OF THE WISCONSIN DEPARTMENT OF TRANSPORTATION FOR HIGHWAY AND STRUCTURE CONSTRUCTION HEREIN REFERRED TO AS THE STANDARD SPECIFICATIONS EXCEPT AS MODIFIED. QUALITY CONTROL AND QUALITY ASSURANCE TESTING WILL NOT BE REQUIRED. TESTING WILL BE COMPLETED AT THE OWNER'S DIRECTION.
2. CONTRACTOR SHALL STRIP AND REMOVE TOPSOIL AND ORGANIC MATERIALS FOUND WITH THE SITE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. LANDSCAPING AREAS SHALL BE GRADED LOW TO ALLOW FOR TOPSOIL PLACEMENT.
3. MATERIAL TESTS CONDUCTED BY AN INDEPENDENT TESTING LAB MAY BE ORDERED AND PAID FOR BY THE OWNER. IF TESTING IS ORDERED, CONTRACTOR SHALL FURNISH SAMPLES FOR SAID TESTING. RETESTING AND CORRECTION OF FAILING MATERIAL SHALL BE COMPLETED AT THE CONTRACTOR'S EXPENSE.
4. SUBGRADE SHALL BE COMPACTED PRIOR TO PLACEMENT OF BASE AGGREGATE AS REQUIRED IN THE STANDARD SPECIFICATIONS. SUBGRADE SHALL BE PROOF ROLLED PRIOR TO PLACEMENT OF BASECOURSE. AREAS IDENTIFIED AS SOFT AND YIELDING SHALL BE IDENTIFIED FOR REMOVAL PRIOR TO PLACEMENT OF BASE AGGREGATE.
5. BACKFILL AND FILL MATERIALS SHALL BE PLACED IN LAYERS NOT MORE THAN 8-INCHES LOOSE IF COMPACTED WITH HEAVY EQUIPMENT AND NOT MORE THAN 4-INCHES LOOSE IF COMPACTED BY HAND EQUIPMENT.
6. BASE COURSE SHALL BE COMPACTED TO A MINIMUM OF 95% OF THE MODIFIED PROCTOR (AASHTO T-180).
7. ACCESSIBLE ROUTES AND HANDICAP PARKING SHALL BE CONSTRUCTED IN ACCORDANCE WITH ADA STANDARDS.
8. DESIGN AND CONSTRUCTION OF ALL CAST-IN-PLACE EXTERIOR CONCRETE SHALL CONFORM TO ACTI 330R-08.
9. ALL CONCRETE FLATWORK SHALL HAVE A LIGHT BROOMED FINISH.
10. EXTERIOR CONCRETE SHALL BE SEPARATED FROM BUILDINGS WITH A CONTINUOUS 0.5-INCH FIBER EXPANSION JOINT.
11. ALL ASPHALT AND SURFACE COURSE SHALL BE DESIGNED TO 96.0% OF MAXIMUM SPECIFIC GRAVITY AT NDES AND DURING FIELD PRODUCTION PERCENT OF MAXIMUM SPECIFICATION GRAVITY WILL BE INCREASED TO 97.0% PER THE STANDARD SPECIFICATIONS.
12. TWO PAINT COATS SHALL BE APPLIED ON NEW PAVEMENT. THE FIRST COAT SHALL BE AFTER PAVING OPERATIONS HAVE BEEN COMPLETED. THE SECOND COAT SHALL BE APPLIED 30 CALENDAR DAYS AFTER PAVING HAS BEEN COMPLETED.
13. ELEVATIONS ARE TO FLANGE.

2

WATER AND SANITARY SEWER MAIN SPECIFICATIONS (VILLAGE OF WILLIAMS BAY)

WATERMAIN:
CL-52 DUCTILE IRON PIPE OR AWWA CAST IRON O.D. C-909 OR PVC WATER PIPE WITH 10GA BLUE TRACER WIRE AND TRACER WIRE ACCESS BOXES

WATERMAIN FITTINGS:
COMPACT DUCTILE IRON MECHANICAL JOINT FITTINGS WITH COR-BLUE OR 304 SS NUTS AND BOLTS MUST BE AMERICAN MADE AWWA-C-153.

GATE VALVES:
4-12" MUELLER A2361 RESILIENT WEDGE VALVE 2" SQ. NUT OPEN LEFT NO ALTERNATES ALLOWED.

FIRE HYDRANTS:
A423 MUELLER CENTURION HYDRANT 6' TRENCH DEPTH, 6" MJ SHOE 1 1/2" PENTAGON OPERATING NUT, OPEN LEFT, NATIONAL STANDARD NOZZLES, WITH 5" STORZ CONNECTION PAINTED RED NO ALTERNATES ALLOWED ALL HYDRANT PARTS & EXTENSIONS MUST BE ORIGINAL MANUFACTURER PARTS.

VALVE BOXES & ADAPTER:
664S CAST IRON TWO PIECE BOX MUST BE AMERICAN MADE RUBBER VALVE BOX ADAPTER SHALL BE VALVE BOX ADAPTER II MANUFACTURED BY ADAPTER, INC. NO ALTERNATES ALLOWED.

TAPPING SLEEVE & VAL VES:
MUELLER H615 MECHANICAL JOINT TAPPING SLEEVE W/MUELLER A2361 FLG X MJ RESILIENT WEDGE VALVE NO ALTERNATES ALLOWED #665 SMITH BLAIR STAINLESS STEEL TAPPING SLEEVE ACCEPTABLE ONLY IN VAULTS OR IF IN NON-PAVED LOCATION.

REPAIR CLAMPS:
#226 SMITH BLAIR REPAIR CLAMP WITH STAINLESS STEEL BOLTS & NUTS

WATER SERVICE LINES:
SDR 9 POLYETHYLENE TUBING (CTS) 250 PSI AWWA C901 WITH STIFFENERS & 12GA TRACER WIRE.

1" WATER SERVICE FITTINGS:
1" H-15008 MUELLER COMPRESSION CORPORATION STOP 1" H-15155 MUELLER COMPRESSION CURB STOP 6" H-10300 MUELLER CURB BOX 1 1/4 X 39 ROD NO ALTERNATES ALLOWED.

1 1/2 AND 2" WATER SERVICE FITTINGS:
1 1/2-2" H-15013 MUELLER COMPRESSION CORPORATION STOP 1 1/2-2" B-25155 MUELLER COMPRESSION CURB STOP 6" H-10300 MUELLER CURB BOX 1 1/4 X 39 ROD #317 SMITH BLAIR EPOXY COATED SADDLE W/STAINLESS STEEL STRAPS OR JCM EQUAL.

SANITARY SEWER PIPE:
SDR 26 ASTM D-3034.

SANITARY SEWER LATERALS:
SDR 26 ASTM D-3034.

SERVICE FITTINGS:
GASKET JOINT WYE FITTINGS W/45° BEND ASTM D-3034.

MANHOLE COVERS:
1050 EAST JORDAN FRAME WITH 1020 COVER OR EQUAL IN ROADWAY 1020 EAST JORDAN FRAME WITH 1020 COVER OR EQUAL OFF ROADWAY.

LEGEND - CIVIL ENGINEERING DRAWINGS

CONTROL
- BENCHMARK
- CHISELED MARK
- CONTROL POINT
- IRON PIPE (GENERIC)
- IRON PIPE (1" DIA)
- IRON PIPE (2" DIA)
- IRON PIPE SET
- IRON ROD (GENERIC)
- IRON ROD (3/4" DIA)
- IRON ROD (1 1/4" DIA)
- MONUMENT
- NAIL
- PAINT MARK
- PK NAIL
- RAILROAD SPIKE
- RIS REFERENCE TIE
- SECTION CORNER
- SECTION CORNER MONUMENT
- TEMPORARY CONTROL POINT
- USGS MONUMENT

GROUND
- WATER ELEVATION
- WETLANDS (SURVEYED LOCATION)
- CROP/FIELD
- DITCH
- GUARD RAIL
- TOE OF SLOPE
- TOP OF BANK
- WETLAND BOUNDARY

EROSION CONTROL
- PROPOSED DITCH CHECK
- PROPOSED EROSION LOGS/EROSION WADDLES
- PROPOSED INLET PROTECTION TYPE A
- PROPOSED INLET PROTECTION TYPE B
- PROPOSED INLET PROTECTION TYPE C
- PROPOSED INLET PROTECTION TYPE D
- PROPOSED BARRIER FENCE
- PROPOSED SILT FENCE
- PROPOSED EROSION MAT
- PROPOSED RIP RAP
- PROPOSED TRACKING PAD

SANITARY SEWER
- SANITARY MANHOLE
- SEPTIC SYSTEM
- SEPTIC TANK COVER
- SEPTIC VENT
- SANITARY SEWER
- PROPOSED SANITARY MANHOLE
- PROPOSED SANITARY RISER
- CLEAN OUT
- PROPOSED SANITARY LATERAL
- PROPOSED SANITARY SEWER

STORM SEWER
- STORM CATCH BASIN
- STORM FIELD INLET
- STORM INLET
- STORM MANHOLE
- STORM YARD DRAIN
- STORM SEWER
- CULVERT (SIZE & TYPE NOTED)
- PROPOSED STORM INLCB
- PROPOSED STORM MANHOLE
- PROPOSED STORM LATERAL
- PROPOSED STORM SEWER

GENERAL
- AIR CONDITIONER
- CLEAN OUT
- DELINEATOR POST
- FLAG POLE
- GENERIC HAND HOLE
- GENERIC MANHOLE
- GENERIC METER
- GENERIC PEDESTAL
- GENERIC VALVE
- GENERIC VENT
- GUY POLE
- GUY WIRE
- LIGHT POLE
- MAIL BOX
- MARKER POST
- MW/EL MONITORING WELL
- PILING
- POST
- REVISION LABEL
- SOIL BORING
- UTILITY POLE
- YARD LIGHT

UTILITIES
- CABLE BOX
- CABLE MANHOLE
- UNDERGROUND TV CABLE
- ELECTRIC BOX
- ELECTRIC MANHOLE
- ELECTRIC METER
- ELECTRIC PAD
- ELECTRIC TRANFORMER
- POWER POLE
- UNDERGROUND ELECTRIC
- GAS CURB STOP
- GAS MANHOLE
- GAS METER
- GTST GAS TEST STATION
- GAS VALVE
- GVT GAS VALVE TEST
- GAS VENT
- UNDERGROUND GAS MAIN
- TELEPHONE BOX
- TELEPHONE MANHOLE
- UNDERGROUND TELEPHONE
- UNDERGROUND FIBER OPTIC

LANDSCAPE
- CONIFEROUS MULTIPLE TRUNK TREE
- CONIFEROUS TREE
- DECIDUOUS TREE
- DICIDUOUS MULTIPLE TRUNK TREE
- DICORATIVE ROCK
- STUMP
- EDGE OF PLANTER/LANDSCAPE BED
- EDGE OF TREES & BRUSH
- FENCE

RAILROAD
- RAILROAD SIGNAL BOX
- RAILROAD SIGNAL FLASHER
- RR RAILROAD SPIKE
- RAILROAD TRACKS

TRAFFIC SIGNAL
- CONTROL BOX/LIGHTING CABINET
- PULL BOX
- TRAFFIC SIGNAL
- UNDERGROUND LOOP DETECTOR

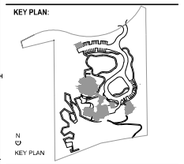
WATER MAIN
- EXISTING HYDRANT
- EXISTING LOCATOR BOX
- EXISTING SPRINKLER HEAD
- EXISTING WATER CURB STOP
- EXISTING WATER MAIN BEND
- EXISTING WATER MAIN CROSS
- EXISTING WATER MAIN OFFSET
- EXISTING WATER MAIN PLUG
- EXISTING WATER MAIN PLUG W/ AIR RELEASE
- EXISTING WATER MAIN REDUCER
- EXISTING WATER VALVE
- EXISTING WATER VALVE MANHOLE
- EXISTING WELL
- EXISTING YARD HYDRANT
- 1" WM EXISTING WATER MAIN
- EXISTING WATER SERVICE
- PROPOSED CURB STOP
- PROPOSED HYDRANT
- PROPOSED LOCATOR BOX
- PROPOSED WATER MAIN BEND (ANGLE NOTED)
- PROPOSED WATER MAIN CROSS
- PROPOSED WATER MAIN OFFSET
- PROPOSED WATER MAIN PLUG
- PROPOSED WATER MAIN PLUG W/AIR RELEASE
- PROPOSED WATER MAIN REDUCER
- PROPOSED WATER MAIN TEE
- PROPOSED WATER VALVE
- PROPOSED WATER VALVE MANHOLE
- PROPOSED YARD HYDRANT
- PROPOSED WATER MAIN
- PROPOSED WATER SERVICE

PAVEMENT
- EXISTING SIGN
- EDGE OF ASPHALT PAVEMENT
- EDGE OF GRAVEL PAVEMENT
- EDGE OF CONCRETE PAVEMENT
- PROPOSED DETECTABLE WARNING FIELD
- PROPOSED SIGN
- PROPOSED EDGE OF ASPHALT PAVEMENT
- PROPOSED EDGE OF CONCRETE PAVEMENT
- PROPOSED EDGE OF GRAVEL PAVEMENT
- PROPOSED SLOPE INTERCEPT

GENERAL NOTES

1. THE DRAWINGS, SPECIFICATIONS AND OTHER DOCUMENTS PREPARED BY THE ARCHITECTS FOR THIS PROJECT ARE INSTRUMENTS OF THE ARCHITECT'S SERVICE FOR USE SOLELY WITH RESPECT TO THIS PROJECT AND UNLESS OTHERWISE PROVIDED THE ARCHITECT SHALL BE DEEMED THE AUTHOR OF THESE DOCUMENTS AND SHALL RETAIN ALL COMMON LAW, STATUTORY AND OTHER RESERVED RIGHTS, INCLUDING THE COPYRIGHT. REPRODUCTION IS PROHIBITED. COPYRIGHT 2023, STUDIO GANG.
2. CONTRACTORS AND SUBCONTRACTORS SHALL VERIFY ALL FIGURES, DIMENSIONS AND CONDITIONS AT THE JOBSITE AND NOTIFY THE ARCHITECT OF ANY DIMENSIONAL ERRORS, OMISSIONS OR DISCREPANCIES BEFORE BEGINNING OR FABRICATION OF ANY WORK. DO NOT SCALE THESE DRAWINGS.

KEY PLAN:



SEAL:

NO.	ISSUED FOR	DATE
3	VILLAGE COMMENTS	9/15/2023
2	DESIGN DEVELOPMENT	9/8/2023
1	VILLAGE ZONING	8/4/2023

NOT FOR CONSTRUCTION

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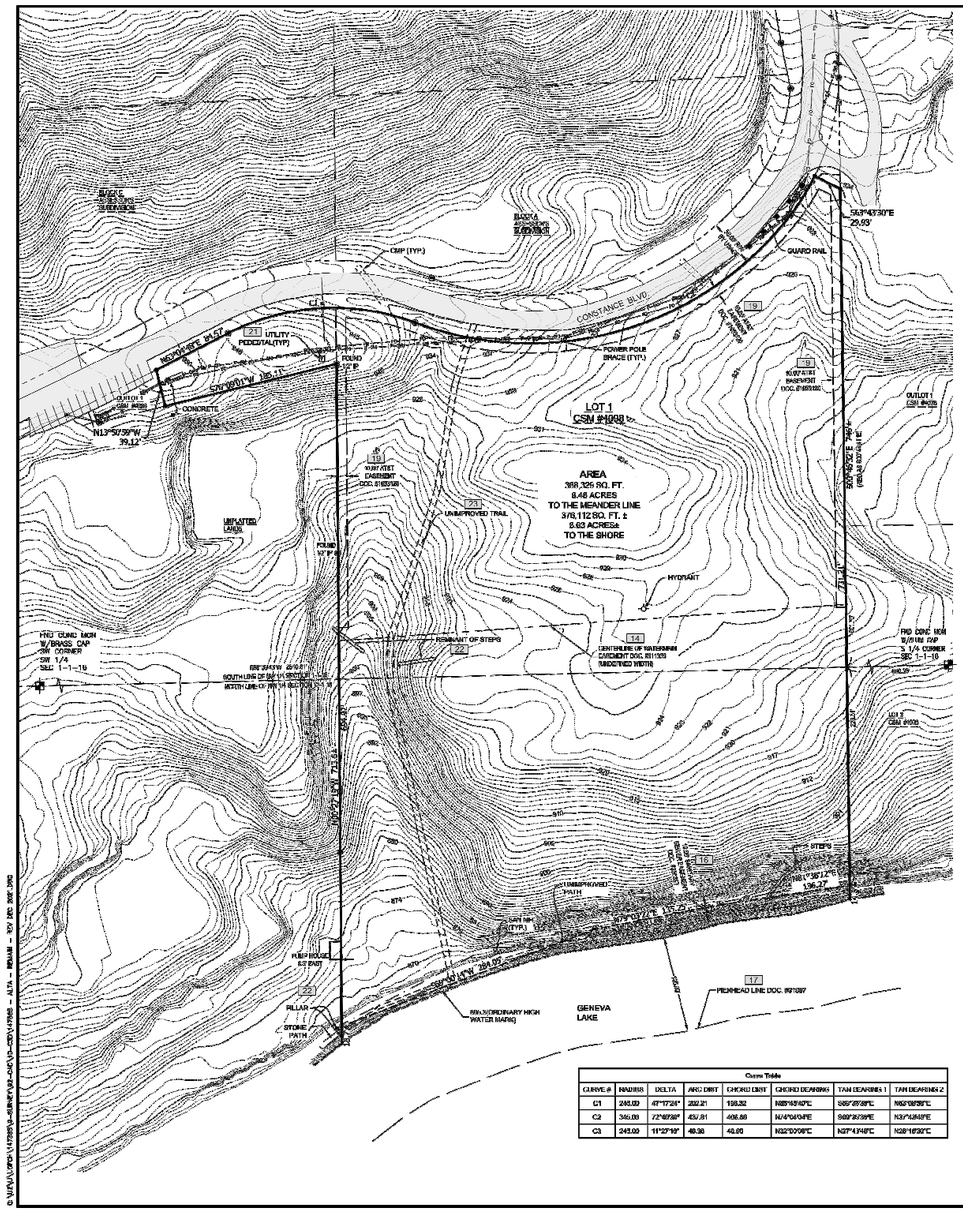
PROJECT NO.:
DRAWN: GDD DATE: 9/8/2023
CHECKED: VVR SCALE:

SHEET TITLE:
GENERAL NOTES

DRAWING NUMBER:
C-001



Curve Table							
CURVE #	RADIUS	DELTA	ARC DIST	CHORD DIST	CHORD BEARING	TAN BEARING 1	TAN BEARING 2
C1	245.00	47°17'24"	202.21	196.52	N89°16'42"E	S65°57'58"E	N62°39'58"E
C2	345.00	72°49'58"	438.51	409.86	N14°04'04"E	S62°39'58"E	N37°49'59"E
C3	245.00	11°27'19"	49.00	48.90	N32°06'09"E	N37°43'48"E	N26°16'30"E

LEGAL DESCRIPTION
PER COMMITMENT NO: WA-19859-Revision B

Lot 1 of Certified Survey Map No. 4088, recorded December 20, 2021, as Document No. 1053121, and being part of Block A and part of Block C of Assessor's Subdivision being a part of the SE. 1/4 of the SW. 1/4 of Section 1 and the NE. 1/4 of the NW. 1/4 of Section 12, T.01N., R.16E., Village of Williams Bay, Walworth County, Wisconsin.

EXCEPTIONS:
PER COMMITMENT NO: WA-19859-Revision B

10. Public rights of the United States, the State of Wisconsin or the City or County or any of their agencies in respect to that portion of the Land constituting the bed or the waters of Geneva Lake or the banks, shores or dock lines, wharves, piers, protective walls, bulkheads, or other structures pertaining thereto.

11. This policy does not insure the exact location of any portion of the Land created by gradual buildup of the shore (accretion) or the lowering of the water level (reliction), or the title to land not validly a change in the course of the water body (avulsion), or to artificially filled land.

12. Rights of the public in and to the lakefront or walkway on or near the embankment of water of Geneva Lake.

13. Rights of the public in any portion of the Land lying within the area commonly known as Constance Boulevard.

14. Easement(s) for the purpose(s) and rights incidental thereto, as granted in a document, granted to Village of Williams Bay, recorded on May 11, 1935, as Document No. 311585. (shown)

15. Easement(s) for the purpose(s) and rights incidental thereto, as granted in a document, granted to Village of Williams Bay, recorded on October 7, 1941, as Document No. 354386. (Not Expressly Reproducible)

16. Easement(s) for the purpose(s) and rights incidental thereto, as granted in a document, granted to Village of Williams Bay, recorded on October 7, 1941, as Document No. 352357. (shown)

17. Covenants, conditions and restrictions but omitting any covenants or restrictions, if any, including but not limited to those based upon race, color, religion, sex, sexual orientation, familial status, marital status, disability, handicap, national origin, ancestry, source of income, gender, gender identity, gender expression, medical condition or genetic information, as set forth in applicable state or federal laws, except to the extent that said covenant or restriction is permitted by applicable law, as set forth in the document recorded on June 23, 1980, as Document No. 512057. (shown)

18. Not survey related.

19. Easement(s) for the purpose(s) and rights incidental thereto, as granted in a document, granted to Wisconsin Bell Inc., d/b/a A161-Wisconsin, recorded on December 20, 2021, as Document No. 1053120.

20. Possible as shown on that certain monument survey/plat recorded on December 23, 2021, as Document No. 1053121. Reference is hereby made to said document for full particulars.

21. Rights of utility companies to maintain the transitional pad, underground gas line, overhead power lines, power poles, power pole fences, underground power line, underground fiber optic line, utility pedestal, and hydrant as referenced on an ALTA/NSPS Land Title Survey prepared by SEH, Inc., dated August 4, 2021, and last revised December 21, 2021, as Project No. 147585. ("the Survey").

22. Possible encroachments, if any, of a asphalt parking area, pump house, remnants of steps, and driveway as referenced on the Survey.

23. Possible rights of others, if any, in and to an "unimproved trail" as referenced on the Survey.(trail in shown)

GENERAL NOTES:

1. EASEMENT LOCATIONS BASED ON INFORMATION FURNISHED BY CHICAGO TITLE INSURANCE COMPANY, TITLE POLICY NO. WA-19859, DATED JULY 2, 2021 REVISION B DATED DECEMBER 6, 2021.

2. THE SURVEYOR TAKES NO RESPONSIBILITY FOR ANY UNDERGROUND STRUCTURES OR BURIED MATERIALS SUCH AS FOUNDATIONS, WELLS, SEPTIC, HOLDING TANKS, UTILITIES, HAZARDOUS MATERIALS, OR ANY OTHER ITEMS OF WHICH NO EVIDENCE CAN BE FOUND ON THE SURFACE BY A VISUAL INSPECTION. THE SURVEYOR WILL NOT ENTER ANY BUILDINGS ON OR OFF SITE.

3. PARCEL FALLS WITHIN ZONE X, AREAS OF MINIMAL FLOODING PER FLOOD INSURANCE RATE MAP, COMMUNITY PANEL NUMBER 55127C0088H, DATED 10-3-2008

4. TOPOGRAPHIC CONTOURS SHOWN PER WALWORTH COUNTY GIS DATA.

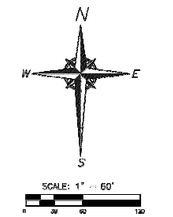
5. UTILITY LOCATIONS BASED ON OBSERVED EVIDENCE ON THE SURFACE OF THE PROPERTY DURING THE PROCESS OF CONDUCTING FIELD WORK AND MAPS PROVIDED BY DIGGERS HOTLINE.

To: CONTANCE WOODS LLC, a Wisconsin limited liability company
UNIVERSITY OF CHICAGO, an Illinois Corporation
CHICAGO TITLE INSURANCE COMPANY

This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2016 Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys, jointly established and adopted by ALTA and NSPS, and includes Items 1, 3, 4, 5 and 11(a) of Table A thereof. The field work was completed on July 2, 2020.

DATED THIS 12TH DAY OF NOVEMBER, 2021.
REVISED THIS 21ST DAY OF DECEMBER, 2021.

KEITH A. KINDRED, PLS S-2082



BEARINGS ARE REFERENCED TO THE WISCONSIN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (NAD 1927) GRID NORTH ON THE SOUTH LINE OF THE SW 1/4 OF SECTION 01-01-16 AS N89°36'19"E. VERTICAL DATUM NGVD 29.

LOCATION MAP

SW. 1/4 SEC. 01-T01N-R16E
WORK AREA
CONSTANCE BLVD
1"=200'

LEGEND
- CONC. MON. W/ BRASS CAP FND.
- 1" IRON PIPE FOUND (UNLESS OTHERWISE STATED)
- 11/16" HSMM SN, 20" LONG, WT. = 1.13 LBS./LIN. FT.
- CONCRETE MONUMENT FOUND
- UNDERGROUND POWER LINE
- UNDERGROUND GAS LINE
- UNDERGROUND FIBER OPTIC LINE

SURVEYOR:
KEITH A. KINDRED, PLS S-2082
SEH, INC.
201 MAPLE AVE.
DELAVAN, WI 53115
(414) 846-5519

SURVEY FOR:
UNIVERSITY OF CHICAGO
5233 S. HARPER ST.
SUITE 1220
CHICAGO, IL 60615

NO.	BY	DATE	REVISIONS
1	DW	11-12-21	REVISE ATT&T EASEMENT AT DEDICATION
2	DW	12-21-21	REVISED TITLE COMMITMENT

SEH FILE NO. LWCH_147585
PROJECT NO. 147585
ISSUE DATE 11/12/2021
DRAWN BY: DW
DESIGNED BY: ____
CHECKED BY: KAK

SEH
PHONE: 414.846.2562
201 MAPLE AVENUE
DELAVAN, WI 53115-2351
WWW.SEHINC.COM

ALTA/NSPS LAND TITLE SURVEY
PART OF BLOCK A AND PART OF BLOCK C OF ASSESSOR'S SUBDIVISION, BEING A PART OF THE SE. 1/4 OF THE SW. 1/4 OF SECTION 1 AND THE NE. 1/4 OF THE NW. 1/4 OF SECTION 12, T.01N., R.16E., VILLAGE OF WILLIAMS BAY, WALWORTH COUNTY, WISCONSIN.

SHEET
1

GENERAL NOTES

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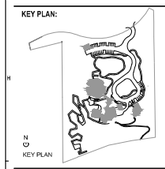
KEY PLAN:



SEAL:

WISCONSIN
VIOLET V. RAZO
41419
DELAVAN, WI
PROFESSIONAL ENGINEER
5/1/23

NO.	ISSUED FOR	DATE
3	VILLAGE COMMENTS	5/15/2023
2	DESIGN DEVELOPMENT	3/8/2023
1	VILLAGE ZONING	2/4/2023

NOT FOR CONSTRUCTION

ARCHITECT:

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PROJECT NO.:
DRAWN: GGD
DATE: 5/8/2023
CHECKED: VVR
SCALE:
SHEET TITLE:
TOPOGRAPHIC SURVEY

DRAWING NUMBER:
C-100

Point Table				
Point #	Raw Description	Elevation	Northing	Easting
14	CP 14 _ MAG&BUT 1ft ON PAV	940.301	210543.7000	2357829.1280
15	CP 15 _MAG&BUT 1ft on pavm@double upcib	933.777	210669.9550	2358149.1320

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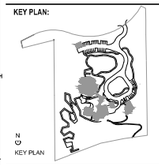

SEAL:

WISCONSIN
VIOLET V. RAZO
41419
MILWAUKEE, WI
PROFESSIONAL ENGINEER
Violet V Razo 5/1/23

NOT FOR CONSTRUCTION

NO.	ISSUED FOR	DATE
3	VILLAGE COMMENTS	9/15/2023
2	DESIGN DEVELOPMENT	9/8/2023
1	VILLAGE ZONING	8/4/2023

ARCHITECT:

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PROJECT NO.:
DRAWN: GGD DATE: 9/5/2023
CHECKED: VVR SCALE:

SHEET TITLE:
EXISTING CONDITIONS

DRAWING NUMBER:
C-200

0 15 30 60
SCALE IN FEET

NOTE:
1. SEE L030 FOR TREE REMOVAL PLAN.

GENERAL NOTES

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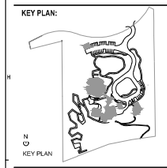

KEY PLAN

SEAL:

WISCONSIN
VIOLET V. RAZO
41419
MILWAUKEE, WI
PROFESSIONAL ENGINEER
5/4/23

NOT FOR CONSTRUCTION

NO.	ISSUED FOR	DATE
3	VILLAGE COMMENTS	9/15/2023
2	DESIGN DEVELOPMENT	9/8/2023
1	VILLAGE ZONING	8/4/2023

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PROJECT NO. :
DRAWN: GGD DATE: 9/8/2023
CHECKED: VVR SCALE:

SHEET TITLE:
REMOVAL AND DEMO PLAN

DRAWING NUMBER:
C-300

GENERAL NOTES

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KEY PLAN:

KEY PLAN

SEAL:

WISCONSIN VIOLET V. RAZO 41419 MILWAUKEE, WI PROFESSIONAL ENGINEER

Violet V Razo 5/1/23

NO.	ISSUED FOR	DATE
3	VILLAGE COMMENTS	9/15/2023
2	DESIGN DEVELOPMENT	9/8/2023
1	VILLAGE ZONING	8/4/2023

NOT FOR CONSTRUCTION

ARCHITECT:

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PROJECT NO.:

DRAWN: GGD DATE: 9/8/2023

CHECKED: VVR SCALE:

SHEET TITLE:

SITE PLAN - CIVIL

DRAWING NUMBER:

C-400

0 10 20 30 60
SCALE IN FEET

EROSION CONTROL

- PROPOSED INLET PROTECTION TYPE B
- PROPOSED SILT FENCE
- PROPOSED RIP RAP
- PROPOSED TRACKING PAD

NOTES:

1. TOTAL CSM COMBINED SITE AREA: 8.21 ACRES.
2. ESTIMATED AREA OF DISTURBANCE: 3.32 ACRES.
3. 100% OF PROJECT AREA IS IDENTIFIED AS MIAMI LOAM PER NATIONAL RESOURCES CONSERVATION SERVICE WEB SOIL SURVEY.
4. MAINTAIN EXISTING VEGETATION IN STREET RIGHT OF WAY.
5. THE SWALES SHALL BE STABILIZED WITHIN 14 DAYS OF BEING GRADED.
6. INSPECT ALL BMPS WITHIN TWENTY-FOUR (24) HOURS AFTER EACH RAIN OF 0.5 INCHES OR MORE AND AT LEAST ONCE A WEEK. MAKE NEEDED REPAIRS, INSTALL ADDITIONAL BMPS AS NECESSARY, AND DOCUMENT THE FINDINGS OF THE INSPECTION ON AN EROSION CONTROL LOG KEPT ON SITE WITH THE DATE OF INSPECTION, THE NAME OF THE PERSON CONDUCTING THE INSPECTION, A DESCRIPTION OF THE REPAIR NEEDED, AND DOCUMENTATION OF THE COMPLETED REPAIRS.

CONSTRUCTION SEQUENCE

1. INSTALL AND MAINTAIN EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO ANY LAND DISTURBING ACTIVITIES, AS SHOWN ON DRAWINGS AND DIRECTED BY ENGINEER.
2. CLEAR AND GRUB VEGETATION AS SHOWN ON DRAWINGS OR AS DIRECTED BY ENGINEER.
3. STRIP TOPSOIL AND STOCKPILE IN LOCATION AS SHOWN ON DRAWINGS AND AS DIRECTED BY OWNER. INSTALL PERIMETER SILT FENCE AROUND DOWN SLOPE SIDE OF STOCKPILE. STABILIZE STOCKPILE IMMEDIATELY UPON LAYUP.
4. INSTALL, ADJUST AND MAINTAIN ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES NECESSARY FOR EACH ACTIVE STAGE. MAINTAIN MEASURES AT THE END OF EACH DAY.
5. STAGE CONSTRUCTION BY WORK LOCATION. SUBSEQUENT STEPS MAY BE COMPLETED IN ALTERNATE SEQUENCE DEPENDING UPON CONTRACTOR OPERATIONS.
6. COMPLETE ROUGH GRADING.
7. INSTALL UNDERGROUND SANITARY SEWER, WATER DISTRIBUTION, AND STORM SEWER UTILITIES.
8. INSTALL STRUCTURE.
9. PREPARE PAVEMENT SUBGRADE.
10. INSTALL NEW PAVEMENT AND BASE LAYERS.
11. INSTALL PAVEMENT MARKINGS.
12. INSTALL LAWN LANDSCAPING.
13. AREAS PLANNED TO BE INACTIVE FOR 7 DAYS OR LONGER SHALL BE TEMPORARILY STABILIZED FOLLOWING DNR TECHNICAL STANDARD 1059 SEEDING. THESE AREAS SHALL BE STABILIZED WITHIN 7 DAYS OF BEING INACTIVE.
14. AREAS BROUGHT TO FINAL GRADE SHALL BE PERMANENTLY STABILIZED WITHIN 7 DAYS.
15. COMPLETE FINAL RESTORATIONS INCLUDING BUT NOT LIMITED TO: TOPSOIL, TURF GRASS SEED, AND CLASS I TYPE B URBAN EROSION MATTING FOR ALL LAWN RESTORATION AND TOPSOIL, TURF GRASS SEED, AND CLASS B TYPE B EROSION MATTING FOR THE DRAINAGE SWALES AND SLOPES OF 4:1 OR MORE.
16. REMOVE TEMPORARY EROSION CONTROL DEVICES AFTER 80% GROWTH DENSITY HAS OCCURRED IN 100% OF RESTORATION AREAS. CONTRACTOR SHALL OBTAIN OWNER AND ENGINEER APPROVAL PRIOR TO REMOVING THE MEASURE(S). RESTORE DISTURBED AREAS AROUND REMOVED DEVICES AND CLEAN SITE.

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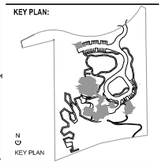

SEAL:

WISCONSIN
VIOLET V. RAZO
41419
MILWAUKEE, WI
PROFESSIONAL ENGINEER

Violet V. Razo 5/4/23

NOT FOR CONSTRUCTION

NO.	ISSUED FOR	DATE
3	VILLAGE COMMENTS	9/15/2023
2	DESIGN DEVELOPMENT	9/8/2023
1	VILLAGE ZONING	8/4/2023

ARCHITECT:

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PROJECT NO.:
DRAWN: GGD DATE: 9/8/2023
CHECKED: VVR SCALE:

SHEET TITLE:
GRADING & EROSION CONTROL PLAN

DRAWING NUMBER:
C-500

SCALE IN FEET

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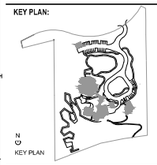

KEY PLAN

SEAL:

WISCONSIN PROFESSIONAL ENGINEERS
VIOLET V. RAZO
41419
MILWAUKEE, WI

Violet V. Razo 5/4/23

NO.	ISSUED FOR	DATE
3	VILLAGE COMMENTS	9/15/2023
2	DESIGN DEVELOPMENT	9/8/2023
1	VILLAGE ZONING	8/4/2023

NOT FOR CONSTRUCTION

ARCHITECT:

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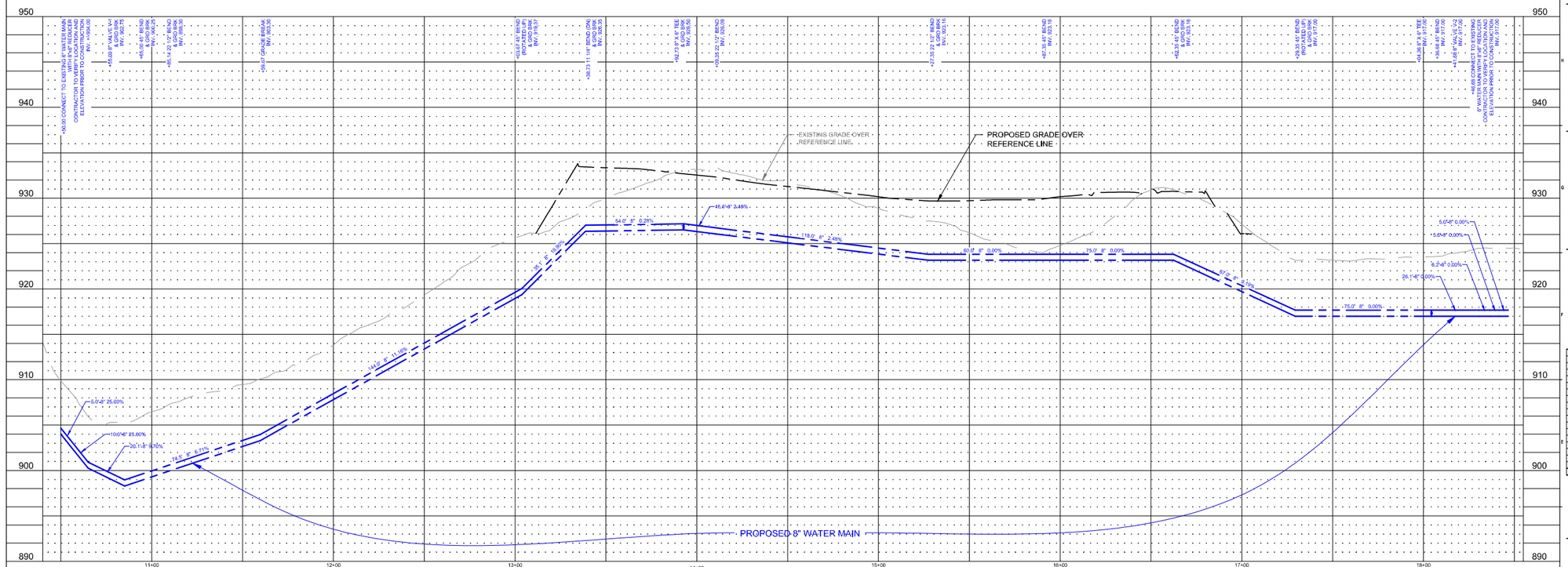
PROJECT NO.:
DRAWN: GGD DATE: 9/8/2023
CHECKED: VVR SCALE:

SHEET TITLE:
PROPOSED SUBSURFACE UTILITY PLAN

DRAWING NUMBER:
C-700



8" WATER MAIN PROFILE

HORZ 1" = 20', VERT 1" = 5'

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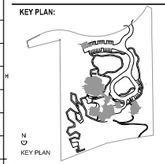
KEY PLAN:



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VIOLET V. RAZO
41419
MILWAUKEE, WI
PROFESSIONAL ENGINEER

5/4/23

NO.	ISSUED FOR	DATE
3	VILLAGE COMMENTS	9/15/2023
2	DESIGN DEVELOPMENT	9/8/2023
1	VILLAGE COMMENTS	6/15/2023

NOT FOR CONSTRUCTION

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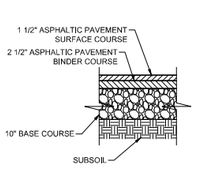
PROJECT NO. :
DRAWN: GGD
DATE: 9/8/2023
CHECKED: VVR
SCALE:

SHEET TITLE:

PROPOSED WATER MAIN PROFILE

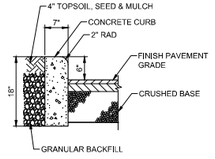
DRAWING NUMBER:

C-701



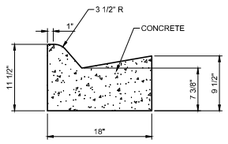
PAVEMENT CROSS SECTION NO SCALE

PV-SECT-37 12



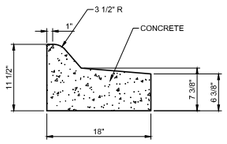
BARRIER CURB DETAIL NO SCALE

PV-CURB-06 12



SEMI-MOUNTABLE 18" CURB & GUTTER NO SCALE

PV-CURB-12 8

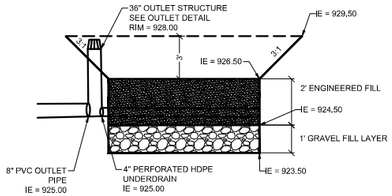


SEMI-MOUNTABLE 18" REJECT CURB & GUTTER NO SCALE

PV-CURB-12A 8

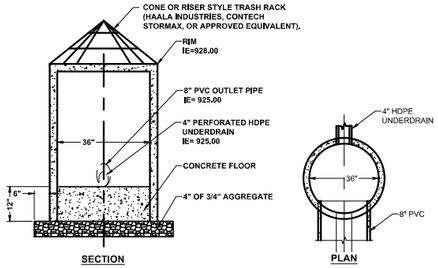
NOTES:
ENGINEERED FILL SPECIFICATION - 70% SAND, 30% COMPOST
1. SAND COMPONENT CONFORMING TO EITHER:
   a. USDA COARSE SAND (.02-.04 INCHES)
   b. ASTM C33 (FINE AGGREGATE CONCRETE SAND)
   c. STATE SPECIFICATION 501.2.5.3.4
2. COMPOST COMPONENT CONFORMING TO:
   a. WDNR TECHNICAL SPECIFICATION S100

GRAVEL FILL LAYER SPECIFICATION:
1. GRAVEL SHALL MEET COARSE AGGREGATE #2 OF STATE SPECIFICATION 501.2.5
2. GRAVEL SHALL BE DOUBLE WASHED PRIOR TO INSTALLATION



BIOFILTER A NO SCALE

Cpt04-Filtration Basin 10



BIOFILTER A
CONCRETE OUTFALL STRUCTURE NO SCALE

Cpt--Outlet Structure 2

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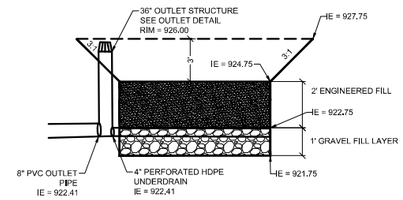
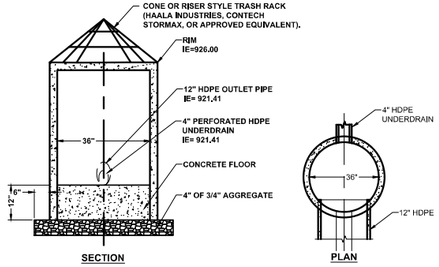


BIOFILTER B NO SCALE

Cpt04-Filtration Basin 10



BIOFILTER B
CONCRETE OUTFALL STRUCTURE NO SCALE

Cpt--Outlet Structure 2

NOTES:
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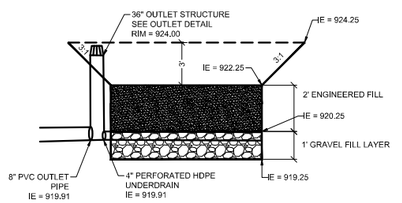
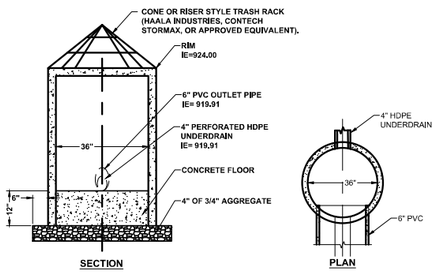


BIOFILTER D NO SCALE

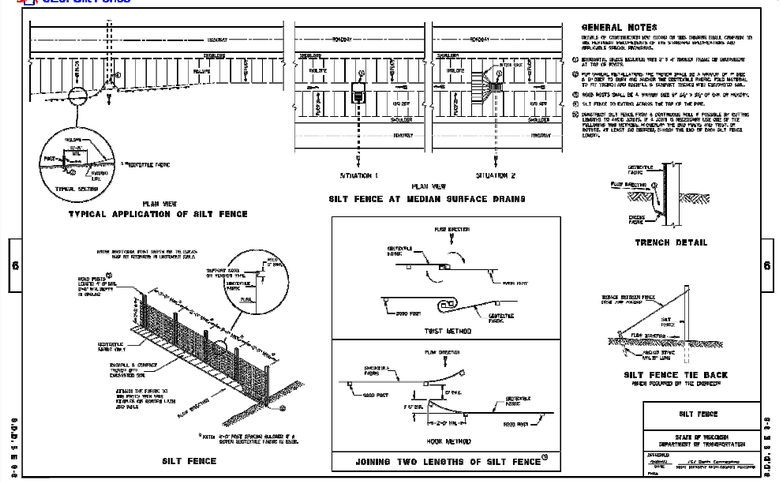
Cpt04-Filtration Basin 10



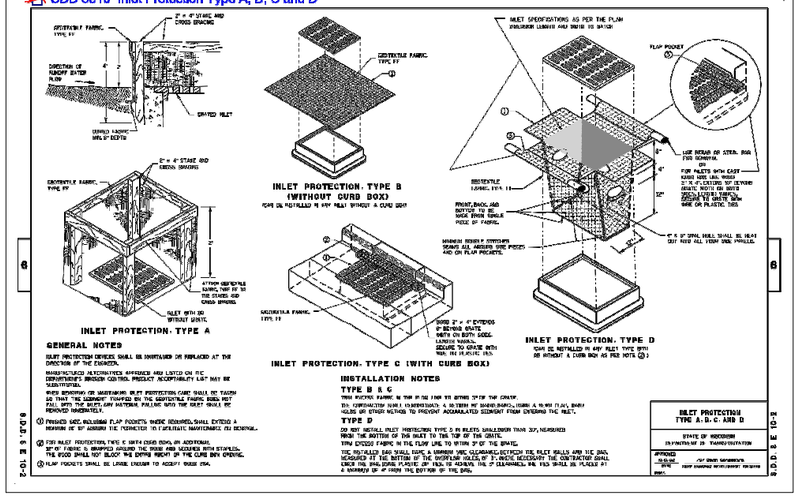
BIOFILTER D
CONCRETE OUTFALL STRUCTURE NO SCALE

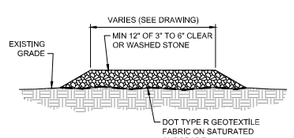
Cpt--Outlet Structure 2

8E9: Silt Fence



SDD 8e10 Inlet Protection Type A, B, C and D

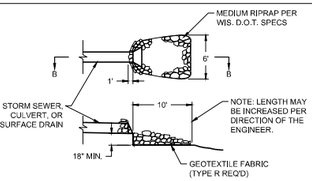




PAD MAY BE POSITIONED AS PERMANENT DRIVEWAY SUBBASE IF PLACED ON MINERAL SOIL AND IT MEETS BEARING & COMPACTION REQUIREMENTS BEFORE BASE PLACEMENT.

TRACKING PAD NO SCALE

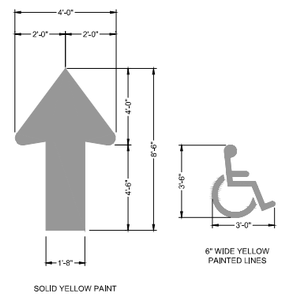
EC-GNL-05 1



SECTION B-B

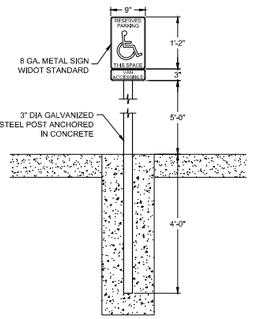
MEDIUM RANDOM RIP-RAP TREATMENT NO SCALE

EC--RR--03 96



PAINTED PAVEMENT SYMBOLS NO SCALE

PV-MARK-01 1



HANDICAP PARKING SIGN NO SCALE

PV-SIGN-01 1

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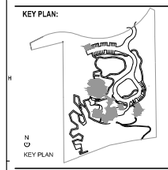

KEY PLAN

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Violet V. Razo
5/4/23

NO.	ISSUED FOR	DATE
3	VILLAGE COMMENTS	9/15/2023
2	DESIGN DEVELOPMENT	8/8/2023
1	VILLAGE ZONING	5/4/2023

NOT FOR CONSTRUCTION

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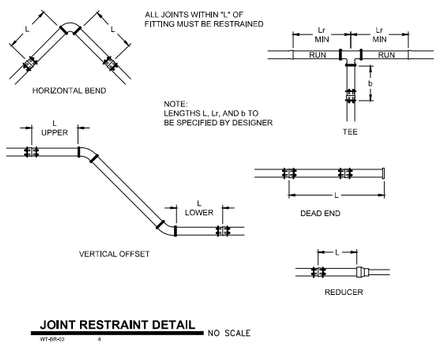
PROJECT NO.:
DRAWN: GGD DATE: 9/8/2023
CHECKED: VVR SCALE:

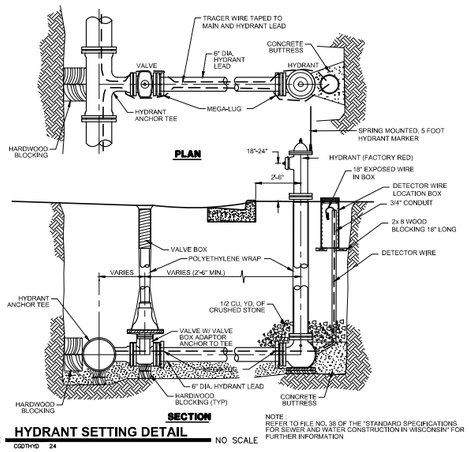
SHEET TITLE:
CONSTRUCTION DETAILS

DRAWING NUMBER:
C-800

TABLE 1				
Retaining Gland Restraint - Minimum Distances				
Refer to File No. 47A Standard Specifications for Sewer & Water Construction in Wisconsin				
Horizontal Bends			**Joint Restraint Length (L) in Feet**	
Material	**Size**	**Angle (degrees)**	**Length (for each side)**	
PVC	8"	11-1/4	3	
PVC	8"	22-1/2	5	
PVC	8"	45	11	
PVC	6"	11-1/4	2	
PVC	6"	22-1/2	4	
PVC	6"	45	8	
PVC	8"	90	25	
PVC	6"	90	19	
Dead End			**Joint Restraint Length (L) in Feet**	
Material	**Size**		**Length**	
PVC	8"		60	
PVC	6"		45	
Tess & Crosses			**Joint Restraint Length (L) in Feet**	
Material	**Size**	**Main (Lr)**	**Branch (b)**	
PVC	8" x 8"	5	17	
PVC	8" x 6"	5	37	
PVC	6" x 6"	5	24	
Reducer			**Joint Restraint Length (L) in Feet**	
Material	**Size**		**Length**	
PVC	8" x 6"		25	
Vertical Offset			**Joint Restraint Length (L) in Feet**	
Material	**Size**	**Angle (degrees)**	**Upper**	**Lower**
PVC	8"	11-1/4	12	4
PVC	8"	22-1/2	6	2
PVC	8"	45	25	7
PVC	6"	11-1/4	9	3
PVC	6"	22-1/2	5	2
PVC	6"	45	19	5
Notes:				
1) All joints within Length "L" of fitting must be restrained.				
2) Restraint lengths calculating using EBBA iron restrained length calucator, Version 5.				
3) Assumes: ML Soils - inorganic silts, very fine sands, rock flour, silty or clay fine sands (backfilled using native soil).				
4) Assumes: Trench Type 3				
5) Assumes: Depth of Bury to be 5 feet of cover.				
6) Assumes: Test Pressure of 150.				

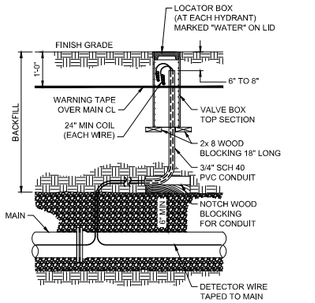


JOINT RESTRAINT DETAIL NO SCALE
WT-RR-03 4

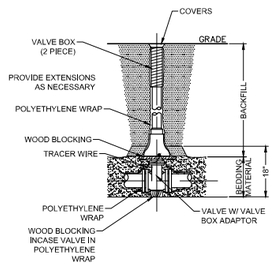


NOTE:
REFER TO FILE NO. 38 OF THE "STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN" FOR FURTHER INFORMATION

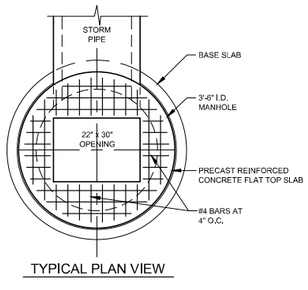
06-C HYDRANT SETTING DETAIL NO SCALE
CDDTHD 24



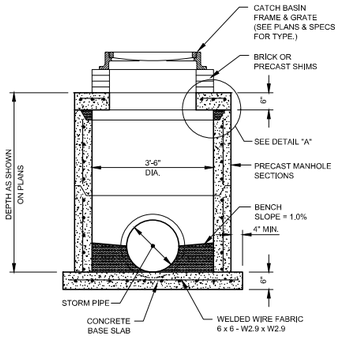
DETECTOR WIRE AND LOCATION BOX NO SCALE
WT-TW-01 16



STANDARD GATE VALVE BOX SETTING NO SCALE
WTVAV-02 24



TYPICAL PLAN VIEW



SECTION
PRECAST REINFORCED CONCRETE CATCH BASIN

CATCH BASIN DETAILS NO SCALE
STO-CB-03 16

GENERAL NOTES:

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR UNDERGROUND DRAINAGE STRUCTURES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISIONS FOR EQUIVALENT CAPACITY AND STRENGTH.

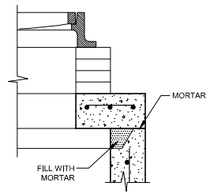
ALL PRECAST INLET UNITS SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF "AASHTO DESIGNATION M 199".

PRECAST REINFORCED BASES SHALL BE PLACED ON A BED OF MATERIAL AT LEAST 6" IN DEPTH, WHICH MEETS THE REQUIREMENTS FOR GRANULAR BACKFILL. THIS BEDDING SHALL BE COMPACTED AND PROVIDE UNIFORM SUPPORT FOR THE ENTIRE AREA OF THE BASE.

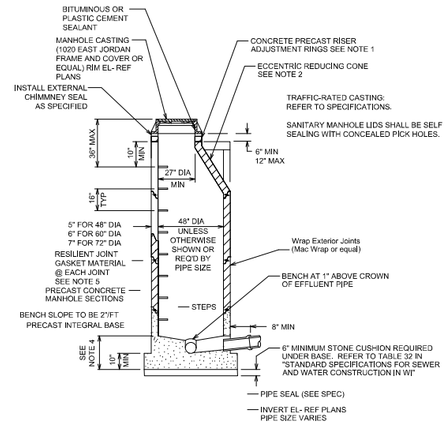
PRECAST REINFORCED CONCRETE FLAT SLAB TOPS MAY BE USED ON THE STRUCTURES. THE TOPS SHALL BE INSTALLED ON A BED OF MORTAR.

ALL BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 2" CLEAR UNLESS OTHERWISE SHOWN OR NOTED.

PRECAST REINFORCED CONCRETE RISERS SHALL BE PLACED WITH TONGUE DOWN.

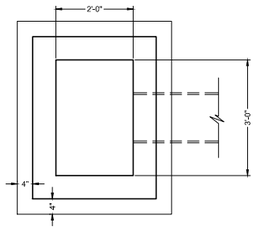


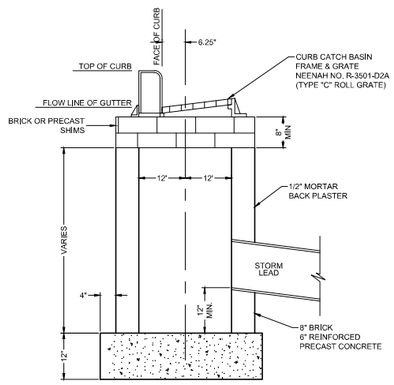
DETAIL "A"



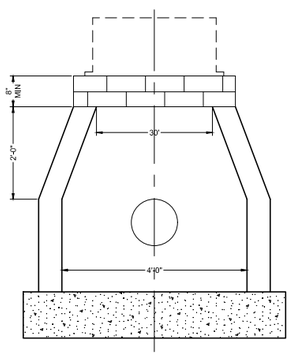
NOTES:
1. ADJUST FRAME TO GRADE WITH A MINIMUM OF TWO (2) 2" TO 4" THK PRECAST CONCRETE RISER RINGS.
2. TOP CONE SECTION SHALL BE USED ON 48" DIA MANHOLES. UNLESS MINIMUM HEIGHT CONDITIONS REQUIRE A FLAT TOP REDUCING SLAB. REDUCING SLAB MAY BE USED ON MANHOLES 60" IN DIA OR LARGER.
3. CONCRETE FOR CAST-IN-PLACE BASE SECTIONS SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3000 PSI. THE MINIMUM CEMENT CONTENT SHALL BE 5 1/2 BAGS PER CUBIC YARD OF CONCRETE. REINFORCING STEEL SHALL MEET THE REQUIREMENTS OF ASTM A615 GRADE 60.
4. JOINTS SHALL BE WATERTIGHT AND SHALL BE MADE USING BUTYL RUBBER GASKETS AND SEALED EXTERNALLY USING MACWRAP OR APPROVED EQUAL.
5. CONCRETE BLOCK OR BRICK MANHOLES NOT ALLOWED.

SANITARY MANHOLE DETAIL TYPE 1 NO SCALE
CpSAManhole Type 1 54





CATCH BASIN DETAIL NO SCALE
STO-CB-02 12



* FOR CATCH BASINS OVER 4' IN DEPTH INCREASE WIDTH AT BASE TO 4'

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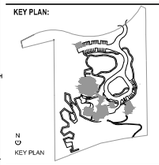

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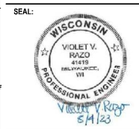

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2	DESIGN DEVELOPMENT	9/8/2023
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SHEET TITLE:
CONSTRUCTION DETAILS

DRAWING NUMBER:
C-801

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

Advanced Drainage Systems, Inc.

ADS SiteAssist™
FOR STORMTECH INSTALLATION INSTRUCTIONS VISIT OUR APP

WOMEN'S LEADERSHIP CENTER

WILLIAMS BAY, WI, USA

MC-7200 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-7200.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101.
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/% THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-7200 CHAMBER SYSTEM

1. STORMTECH MC-7200 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 12" (300 mm) BETWEEN ADJACENT CHAMBER ROWS.
10. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
11. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIAL BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
12. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-7200 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-7200 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

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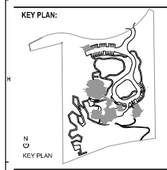

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PROJECT NO.:
DRAWN: GGD DATE: 9/6/2023
CHECKED: VVR SCALE:

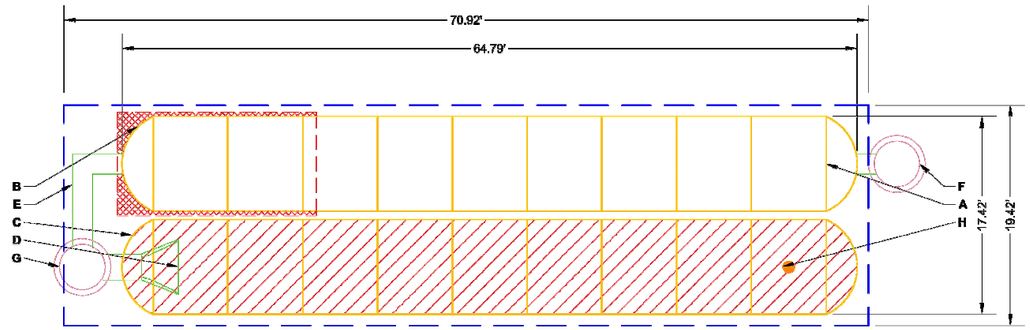
SHEET TITLE:
CONSTRUCTION DETAILS

DRAWING NUMBER:
C-802

	PROPOSED LAYOUT	PROPOSED ELEVATIONS:	
18	STORMTECH MC-7200 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	928.00
4	STORMTECH MC-7200 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	923.50
12	STONE ABOVE (in)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	923.00
9	STONE BELOW (in)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	923.00
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	923.00
5713	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	922.00
		TOP OF MC-7200 CHAMBER:	921.00
		18" x 18" TOP MANIFOLD INVERT:	918.45
		24" ISOLATOR ROW PLUS INVERT:	916.19
1377	SYSTEM AREA (SF)	18" BOTTOM CONNECTION INVERT:	916.16
180.7	SYSTEM PERIMETER (ft)	BOTTOM OF MC-7200 CHAMBER:	916.00
		BOTTOM OF STONE:	915.29

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED END CAP	A	18" BOTTOM PARTIAL CUT END CAP, PART#: MC7200IEPP18B / TYP OF ALL 18" BOTTOM CONNECTIONS	1.97"	
PREFABRICATED END CAP	B	18" TOP PARTIAL CUT END CAP, PART#: MC7200IEPP18T / TYP OF ALL 18" TOP CONNECTIONS	29.36"	
PREFABRICATED END CAP	C	24" BOTTOM PARTIAL CUT END CAP, PART#: MC7200IEPP24B / TYP OF ALL 24" BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	2.26"	
FLAMP	D	INSTALL FLAMP ON 24" ACCESS PIPE / PART#: MCFLAMP		
MANIFOLD	E	18" x 18" TOP MANIFOLD, ADS N-12	29.36"	
CONCRETE STRUCTURE	F	OCS (DESIGN BY ENGINEER / PROVIDED BY OTHERS)		4.0 CFS OUT
CONCRETE STRUCTURE	G	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		5.5 CFS IN
INSPECTION PORT	H	4" SEE DETAIL		



ISOLATOR ROW PLUS (SEE DETAIL)

PLACE MINIMUM 17.50' OF ADSPLUS175 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE #6.32 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.
- **NOT FOR CONSTRUCTION:** THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHERS. IT IS THE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS. REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE

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WILLIAMS BAY, WI, USA

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888-892-2694 | WWW.STORMTECH.COM

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HILLIARD, OH 43026
1-800-733-7473

0 10 20

SHEET
2 OF 5

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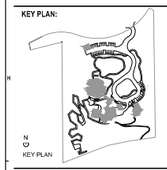

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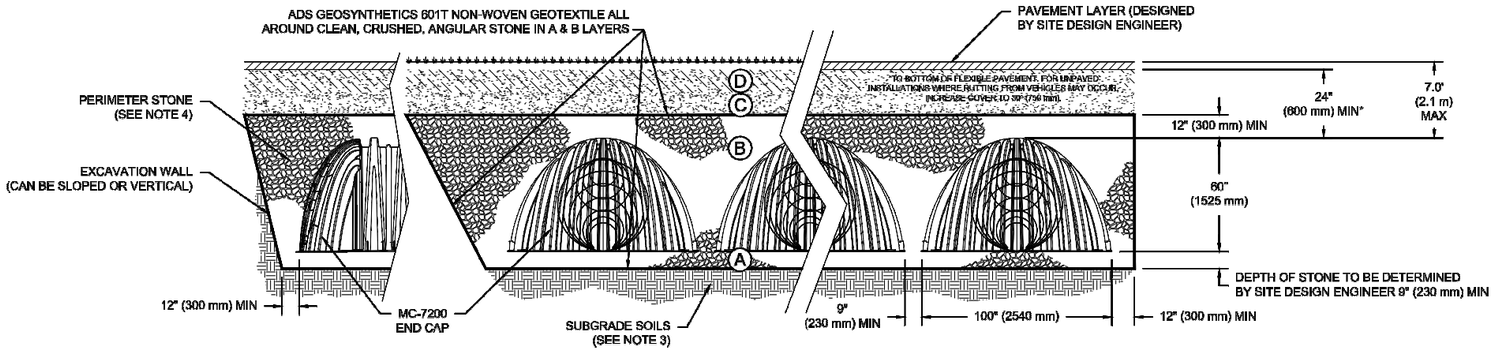
ACCEPTABLE FILL MATERIALS: STORMTECH MC-7200 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



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2. MC-7200 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

WOMEN'S LEADERSHIP CENTER
WILLIAMS BAY, WI, USA
DATE: | DRAWN: JN | PROJECT #: | CHECKED: N/A

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KEY PLAN:
KEY PLAN

SEAL:
WISCONSIN PROFESSIONAL ENGINEER VIOLET V. RAZO 41415 MILWAUKEE, WI
5/4/23

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NO.	ISSUED FOR	DATE
3	VILLAGE COMMENTS	9/15/2023
2	DESIGN DEVELOPMENT	9/8/2023
1	VILLAGE ZONING	8/4/2023

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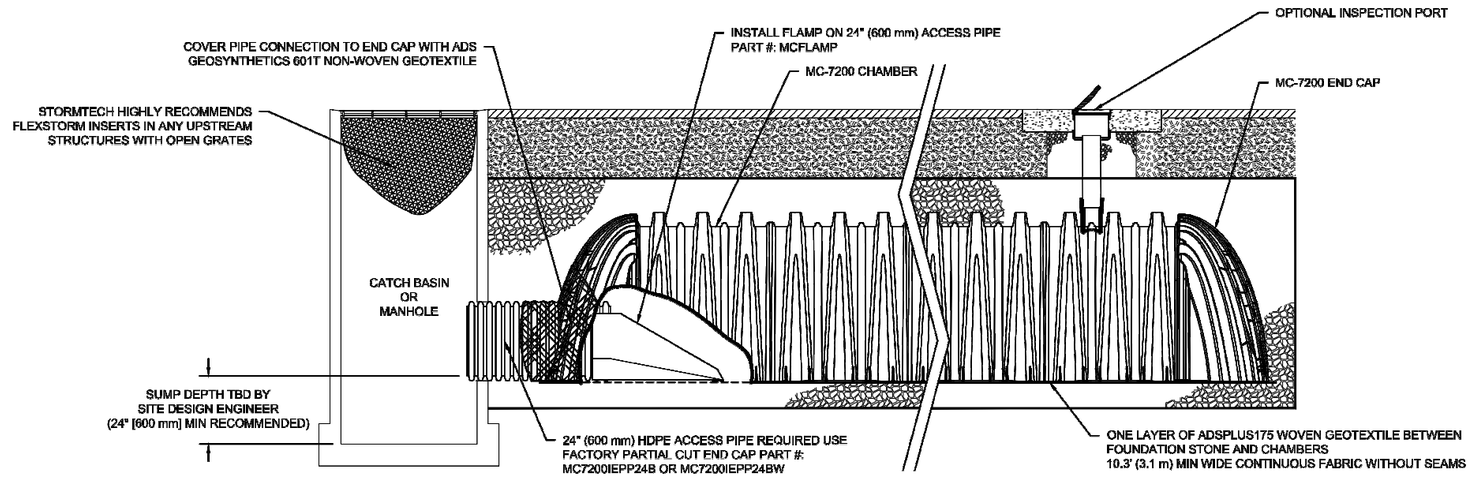
PROJECT NO.:
DRAWN: GGD DATE: 9/8/2023
CHECKED: VVR SCALE:
SHEET TITLE:
CONSTRUCTION DETAILS

DRAWING NUMBER:
C-804



MC-7200 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - II) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

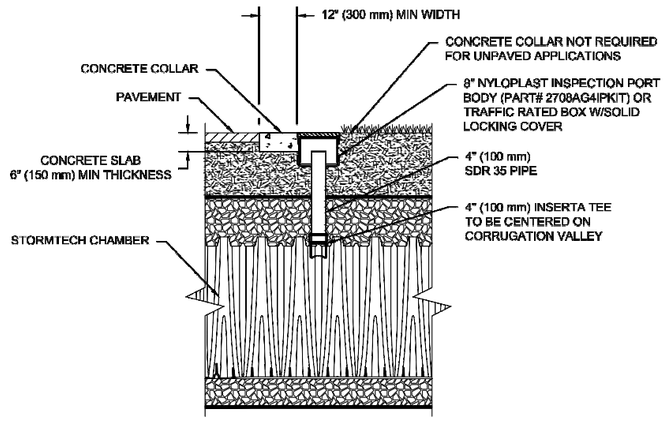
STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION VALLEY.

4" PVC INSPECTION PORT DETAIL
(MC SERIES CHAMBER)
NTS

WOMEN'S LEADERSHIP CENTER
WILLIAMS BAY, WI, USA
DATE:
DRAWN: JN
PROJECT #:
CHECKED: N/A

DATE	DRW	CHK	DESCRIPTION

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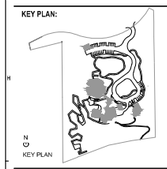

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MILWAUKEE, WI
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5/4/23

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DRAWING NUMBER:
C-805

MC-7200 TECHNICAL SPECIFICATION

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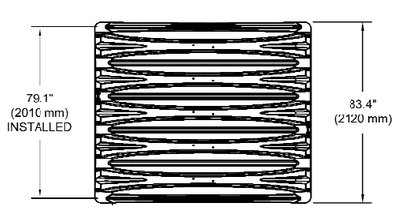
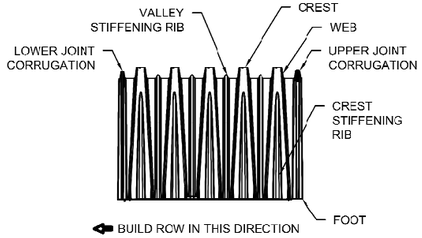
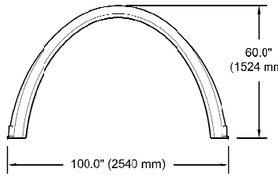
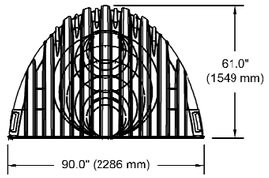
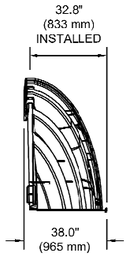










NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	100.0" X 60.0" X 79.1"	(2540 mm X 1524 mm X 2010 mm)
CHAMBER STORAGE	175.9 CUBIC FEET	(4.98 m³)
MINIMUM INSTALLED STORAGE*	267.3 CUBIC FEET	(7.56 m³)
WEIGHT (NOMINAL)	205 lbs.	(92.9 kg)

NOMINAL END CAP SPECIFICATIONS

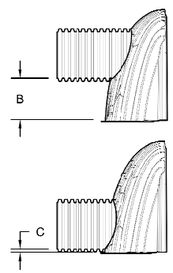
SIZE (W X H X INSTALLED LENGTH)	90.0" X 61.0" X 32.8"	(2286 mm X 1549 mm X 833 mm)
END CAP STORAGE	39.5 CUBIC FEET	(1.12 m³)
MINIMUM INSTALLED STORAGE*	115.3 CUBIC FEET	(3.26 m³)
WEIGHT (NOMINAL)	90 lbs.	(40.8 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC7200IEPP06T	6" (150 mm)	42.54" (1081 mm)	---
MC7200IEPP06B		---	0.86" (22 mm)
MC7200IEPP08T	8" (200 mm)	40.50" (1029 mm)	---
MC7200IEPP08B		---	1.01" (26 mm)
MC7200IEPP10T	10" (250 mm)	38.37" (975 mm)	---
MC7200IEPP10B		---	1.33" (34 mm)
MC7200IEPP12T	12" (300 mm)	35.69" (907 mm)	
MC7200IEPP12B		---	1.55" (39 mm)
MC7200IEPP15T	15" (375 mm)	32.72" (831 mm)	---
MC7200IEPP15B		---	1.70" (43 mm)
MC7200IEPP18T	18" (450 mm)	29.36" (746 mm)	---
MC7200IEPP18TW			
MC7200IEPP18B		---	1.97" (50 mm)
MC7200IEPP18BW			
MC7200IEPP24T	24" (600 mm)	23.05" (585 mm)	---
MC7200IEPP24TW			
MC7200IEPP24B		---	2.26" (57 mm)
MC7200IEPP24BW			
MC7200IEPP30BW	30" (750 mm)	---	2.95" (75 mm)
MC7200IEPP36BW	36" (900 mm)	---	3.25" (83 mm)
MC7200IEPP42BW	42" (1050 mm)	---	3.55" (90 mm)

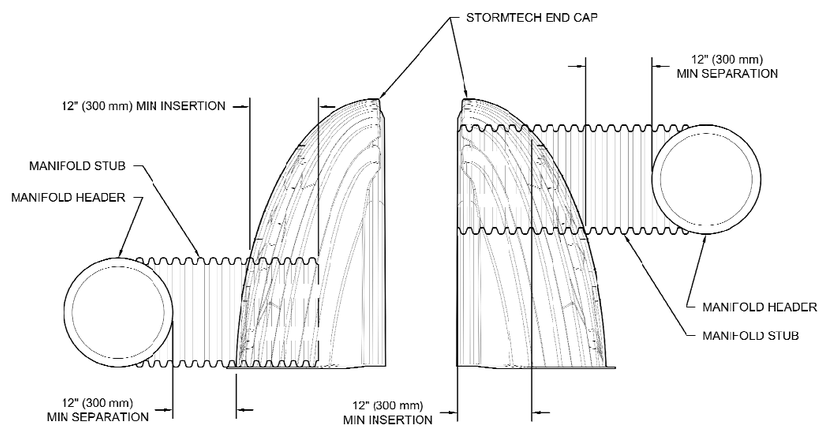
NOTE: ALL DIMENSIONS ARE NOMINAL



CUSTOM PREFABRICATED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-7200 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

MC-SERIES END CAP INSERTION DETAIL

NTS



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

WOMEN'S LEADERSHIP CENTER
WILLIAMS BAY, WI, USA
DATE: DRAWN: JN
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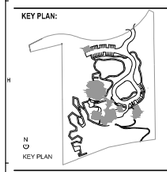

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MILWAUKEE, WI
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5/4/23

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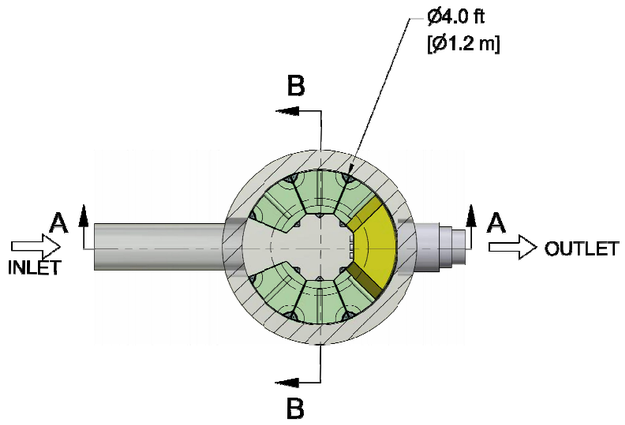
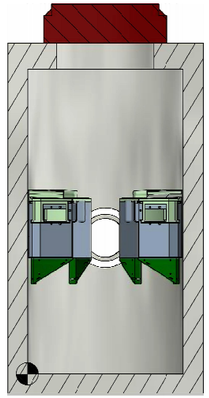
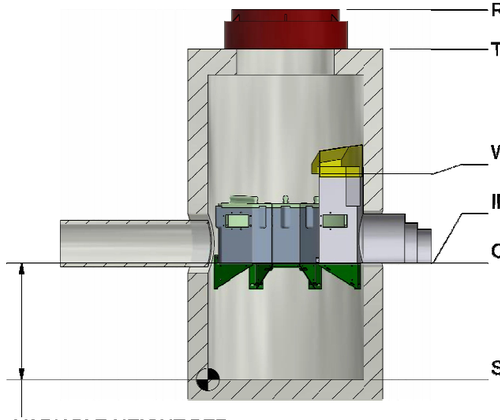
C-806





SECTION B-B



SECTION A-A

CAPACITIES:

- Minimum performance: 80% removal. Washington DOE/NJCAT verified at the peak treatment flow.
- Peak treatment flow:
  .033 CFS (0.9 LPS) (15 GPM) per module (Ribbons)
  .022 CFS (0.6 LPS) (10 GPM) per module (Long Ribbons)
  .056 CFS (1.6 LPS) (25 GPM) per module (CPZ)
- Maximum number of ribbon modules per outlet module: 36
- Maximum number of CPZ modules per outlet module: 18 (contract Hydro if more are required)

ADDITIONAL DESIGN INFORMATION:

- Normal operating W.S.E. is 26-30" (660-762mm) above the outlet invert
- Media Types Available: Ribbons, CPZ

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES.

TOLERENCES ARE:
FRACTIONS ± 1/16
DECIMALS:
X.X ± .06
X.XX ± .03
X.XXX ± .015
ANGLES: ± .5°

PROJECTION

COMMENTS:

1. STRUCTURE WALL AND SLAB THICKNESSES ARE NOT TO SCALE
2. CONTACT HYDRO INTERNATIONAL FOR A BOTTOM OF STRUCTURE ELEVATION PRIOR TO SETTING THE STRUCTURE
3. NOT FOR CONSTURCION CONTACT HYDRO FOR SITE SPECIFIC DRAWING
4. NOT ALL SIZES AVAILABLE IN ALL AREAS
5. SUMP DEPTH AVAILABLE IN 24" (610mm) CPZ, RIBBONS AND 36" (914mm) LONG RIBBONS DEPTH

REVISION HISTORY

REV	BY	DESCRIPTION	DATE
-	ER	FIRST RELEASE	6/17/2019

DATE: 6/17/2019 | SCALE: NTS

DRAWN BY: ER | CHECKED BY: | APPROVED BY

Title
UP-FLO FILTER
4ft Manhole

6 MODULES MAX

Sizing Tool

WEIGHT: N/A | MATERIAL:

NEXT ASSEMBLY: 4 MH-1

DRAWING NO.: 4 MH-UFF-1

SHEET SIZE: B | SHEET: 1 OF 1 | Rev: -

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94 Hutchins Drive
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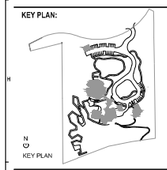

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WISCONSIN PROFESSIONAL ENGINEERS — VIOLET V. RAZO 41470 MILWAUKEE, WI

NO.	ISSUED FOR	DATE
3	VILLAGE COMMENTS	9/15/2023
2	DESIGN DEVELOPMENT	9/8/2023
1	VILLAGE ZONING	8/4/2023

NOT FOR CONSTRUCTION

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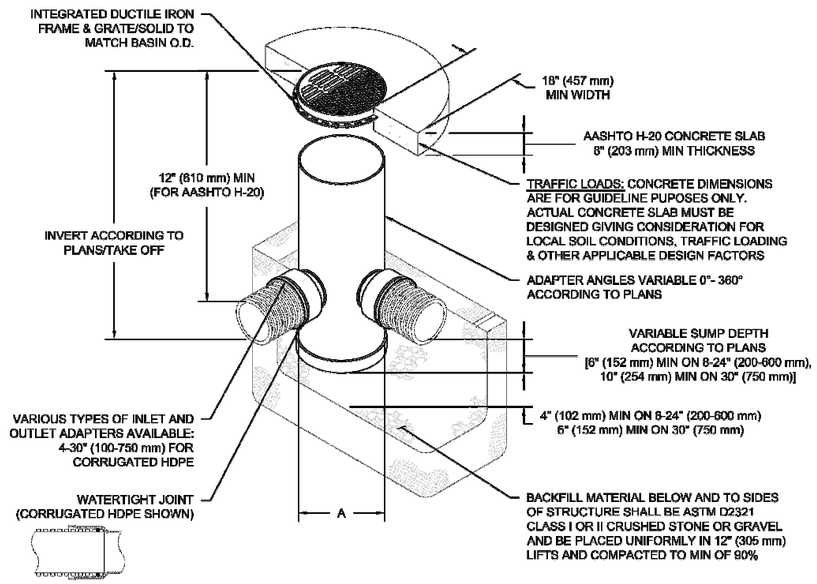
PROJECT NO.:
DRAWN: GGD | DATE: 9/8/2023
CHECKED: VVR | SCALE:

SHEET TITLE:
CONSTRUCTION DETAILS

DRAWING NUMBER:
C-807

NYLOPLAST DRAIN BASIN

NTS



NOTES

1. 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
2. 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
5. FOR COMPLETE DESIGN AND PRODUCT INFORMATION: **WWW.NYLOPLAST-US.COM**
6. TO ORDER CALL: **800-821-6710**

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2808AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2810AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2812AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2815AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2818AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2824AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2830AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

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DATE	DRW	CHK	DESCRIPTION

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6 OF 6

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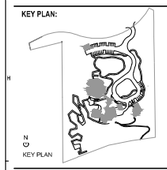
KEY PLAN:



KEY PLAN

SEAL:

WISCONSIN VIOLET V. RAZO 41470 MILWAUKEE, WI PROFESSIONAL ENGINEER

Violet V. Razo 5/1/23

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DRAWING NUMBER:
C-808

CABIN
View Looking North From Lake Slope
Women's Leadership Center

COUNCIL
View Looking Northwest From Dropoff
Women's Leadership Center

LODGE

View Looking Northeast From Lake Slope

Women's Leadership Center

September 27, 2023

Women's Leadership Center

Chapter 9 Landscaping requirements.

§ 390-0906 Landscaping requirements for regular developments

B.

Building foundations. As indicated in Figure 390-0906,[1] certain buildings or building additions constructed after the effective date of this chapter are required to be accented by a minimum amount of landscaping placed near the building foundation.

(1) Foundation landscaping shall be placed so that at maturity, the plant's drip line is located within 10 feet of the building foundation. Such landscaping shall not be located in those areas required for landscaping as street frontages, paved areas, protected green space areas, reforestation areas, or buffer yards. Foundation landscaping shall be installed and permanently maintained in conformity with the requirements of § 390-0912.

Response: Per zoning requirements for building foundation, our project is required to meet or exceed a minimum of 549 landscape points. We estimate that the design per plan would provide 3947 landscaping points. See calculations in chart on sheet L901.

(2) For each 100 feet of building foundation perimeter, the landscaping installed shall, at a minimum, meet the number of landscaping points specified in Figure 390-0906. The actual number of points required for such landscaping shall be computed on a prorated basis, and installed and permanently maintained per the requirements of § 390-0912.

Response: Per zoning requirements for building foundation, our project is required to meet or exceed a minimum of 549 landscape points.

(3) Shade trees and tall trees shall not be used to meet the foundation landscaping requirement. The intent of this section is to require a visual break in the mass of buildings and to require a visual screen of a minimum of six feet in height for all exterior perimeter appurtenances (such as HVAC/utility boxes, standpipes, stormwater discharge pipes and other pipes).

Response: No shade trees are counted in the building foundation landscape points requirements calculation. Landscaping points achieved were calculated using only medium trees and shrubs, refer to the sheet L901.

(4) If the officially approved site plan depicts a future building extension, the foundation landscaping requirement shall be calculated by measuring the length of the total perimeter. However, foundation plantings need only be installed based on the landscape points calculated from the portions of the building perimeter that will not be affected by building extension. If this results in a point requirement not met by the initial planting, then the requirement shall be met within five years after the issuance of the building permit or within such larger time period as established in writing by the Plan Commission.

Response: N/A (SGA to confirm).

C.

Street frontages. As indicated in Figure 390-0904, street frontages on certain lots developed after the effective date of this chapter contain a minimum amount of landscaping in those areas abutting the right-of-way of a public street.

(1) All landscaping used to meet street frontage requirements shall be located within 10 feet of the public right-of-way. Under no circumstances shall such landscaping be located within a public right-of-way. Landscaping shall not impede vehicle or pedestrian visibility and shall be installed and permanently maintained in conformity with the requirements of § 390-0912.

Response: Per zoning requirements, the landscape points were calculated within 10 feet of the public right of way.

(2) For every 100 linear feet of street frontage of a developed lot abutting a public street right-of-way, the landscape installed shall at a minimum meet the number of landscaping points specified in Figure 390-0906. The actual number of points required for such landscaping shall be computed on a prorated basis, and installed and maintained per the requirements of § 390-0912.

Response: Per zoning requirements for street frontage, our project is required to meet or exceed a minimum of 309 landscape points. We estimate that the design per plan would provide 405 landscape points. See calculations in the chart on sheet L901.

(3) Shrubs shall not be used to meet street frontage landscaping requirements. A minimum of 50% of all points shall be devoted to shade or tall trees, or a combination of such trees, and a minimum of 30% of all points shall be devoted to medium trees.

Response: The planting plan proposed 3 large trees (225 points) and 6 medium-sized shade trees (180 points) in the placement area. This totals 405 points, with large trees making up 55% and medium trees making up 45% of the proposed points.

D.

Paved areas. As indicated in Figure 390-0906, paved areas on certain lots developed after the effective date of this chapter must contain a minimum amount of landscaping within 10 feet of the paved area. The intent is to require a continuous visual screen of parking areas from public rights-of-way at a minimum height of 40 inches.

(1) A minimum of 360 square feet of landscaped area, which shall be located within 10 feet of the paved area, is required for the placement of every 100 paved area landscaping points. Said area does not have to be provided in one contiguous area. Sample configurations are depicted in Figure 390-0904 above. Plants used to fulfill this requirement shall visually screen parking, loading, and circulation areas from view from public streets. Paved area landscaping shall be installed and permanently maintained in conformity with the requirements § 390-0912.

Response: Per zoning requirements for paved areas, our project is required to meet or exceed a minimum of 264 landscape points and 951 square feet of landscape area. We estimate that the design per plan would provide 5031 landscaping points. See calculations in the chart on sheet L901.

(2) For every 20 off-street parking stalls or 10,000 square feet of pavement (whichever yields the greater landscaping requirement) located in a development, the landscaping installed shall at a minimum meet the number of landscaping points specified in Figure 390-0906. The actual number of points required for such landscaping shall be computed on a prorated basis, and installed and maintained per the requirements of § 390-0912.

Response: Per zoning requirements for paved area, our project is required to meet or exceed a minimum of 264 landscape points.

(3) A minimum of 30% of all points shall be devoted to shade or tall trees, or a combination of such trees, and a minimum of 40% of all points shall be devoted to shrubs.

Response: We estimate the design per plan would provide 7321 landscaping points. See calculations in the chart on sheet L901.

(4) Parking lot design shall employ interior landscaped islands with a minimum of 350 square feet at all parking aisle ends, and in addition, shall provide a minimum of one landscaped island of a minimum of 350 square feet in each parking aisle for every 20 cars in that aisle. Aisle-end islands shall count toward meeting this requirement. Landscaped medians shall be used to break large parking areas into distinct pods, with a maximum of 100 spaces in any one pod.

Response: Per zoning requirement, the proposed parking lot design include parking island very 4-6 parking stalls, detail plan see sheet L901.

E.

Developed lots. As indicated in Figure 390-0906, lots developed after the effective date of this chapter must contain a minimum amount of landscaping.

(1) Landscaping required by this subsection is most effective if located away from those areas required for landscaping as building foundations, street frontages, paved areas, protected green space areas, reforestation areas, or buffer yards.

Response: Per zoning requirements, calculation based on the tall deciduous and understory tree within the base camp high-internity planting area.

(2) The number of landscaping points specified in Figure 390-0906 shall be provided on a prorated basis for every 1,000 square feet of gross floor area, and installed and maintained per the requirements of 390-0912.

Response: Per zoning requirements for develop lots, our project is required to meet or exceed a minimum of 498 landscape points.

(3) The intent of this section is to provide yard shade and to require a visual screen of a minimum of six feet in height for all detached exterior appurtenances (such as HVAC, utility boxes, standpipes, stormwater discharge pipes and other pipes).

Response: Per zoning requirements, numerous trees and planting were proposed at the lodge loading and terrace garden areas to provide a visual screen from the arrival drop-off point and program area.

§ 390-0909 Buffer yard requirements.

A.

Purpose. This section provides the landscaping and width requirements for buffer yards on lots developed after the effective date of this chapter. A buffer yard is a combination of distance and a visual buffer or barrier. It includes an area, together with the combination of plantings, berms, and/or fencing that are required to eliminate or reduce existing or potential nuisances. These nuisances can often occur between adjacent zoning districts. Such nuisances are dirt; litter; noise; glare; signs; and incompatible land uses, buildings, or parking areas.

B.

Required locations for buffer yards. Buffer yards shall be located along (and within) the outer perimeter of a lot wherever two different zoning districts abut one another. Buffer yards shall not be required in front or street side yards

Response: According to zoning documents, the WLC site falls under the "P&I Public and Institutional" zoning district. To meet the buffer yard requirements, trees and planting have been proposed on the eastern side of the site, which is adjacent to a residential property. On the western side of the property, it abuts an institutional site that does not necessitate a buffer yard zone

C.

Determination of required buffer yard. The determination of buffer yard requirements is a two-staged process. First, the required level of buffer yard opacity is determined using Figure 390-0909A.[1] Opacity is a quantitatively derived measure that indicates the degree to which a particular buffer yard screens the adjoining property. The required level of opacity indicated by Figure 390-0909A is directly related to the degree to which the potential character of development differs between abutting zoning districts. The provisions of this section indicate the minimum requirements for buffer yards located along zoning district boundaries.

Response: Per zoning requirements for buffer yard, our project is required to meet 0.4 opacity.

D.

Identification of required level of opacity. Figure 390-0909A shall be used to determine the minimum level of opacity for the required buffer yard. The required level of opacity is determined by the value given in the cell of the table at which the column heading along the top row of the table (representing the subject property's zoning district) intersects with the row heading along the left hand side of the table (representing the adjacent property's zoning district). The value listed is the required level of opacity for the buffer yard on the subject property.

Response: Per zoning requirements for buffer yard, our project on the east side is required to meet 0.4 opacity. We estimate that the design per plan would provide over 299 landscaping points per 100 linear feet requirements. See calculations in chart on sheet L901