

Village of Mukwonago
Notice of Meeting and Agenda

PLAN COMMISSION MEETING
Wednesday, October 7, 2020

Time: **5:00 pm**

Place: **Mukwonago Municipal Building, Board Room, 440 River Crest Ct**

1. Call to Order

2. Roll Call

3. Comments from the Public

Please be advised, per Wisconsin Statute Sec. 19.84(2), information and comment will be received from the public by the Plan Commission. The Public Comment Session is granted to the public at the start of each Plan Commission meeting. The Public Comment Session shall last no longer than fifteen (15) minutes and individual presentations are limited to three (3) minutes per speaker. However, these time limits may be extended at the discretion of the Chief Presiding Officer. The Plan Commission may not respond to or have any discussion on information received during the public comment session unless it is placed upon the Agenda for a subsequent meeting. Public comments should be addressed to the Plan Commission as a body. Presentations shall not deal in personalities personal attacks on members of the Plan Commission, the applicant for any project or Village Employees. Comments shall not be used to engage others in a debate in this forum. All comments, questions and concerns should be presented in a respectful professional manner. Any questions to an individual member of the Plan Commission or Staff will be deemed out of order by the Presiding Officer.

4. New Business

Discussion and Possible Action on the Following Items

- 4.1 Discussion and possible recommendation to the Village Board on **Resolution 2020-49** a Resolution to approve a CSM for Hill Court Partners, LLC
[Staff report for October 7 2020 CSM.pdf](#)
[RESOLUTION 2020-49 VOM Hill Ct CSM Resolution](#)
[HILL COURT-CSM-09-24-2020.pdf](#)
- 4.2 Discussion and possible recommendation to the Village Board on Hill Court Partners, LLC SWMA
[Hill Court Multi-Tenant - 09-28-2020 - SWMA.pdf](#)
[Hill Court Multitenant - 09-15-2020 - SWMP.pdf](#)
[Hill Court Multi-Tenant-Recommendation of Approval of Development Documents.pdf](#)
- 4.3 Discussion and possible recommendation to the Village Board regarding the Developer Guaranty Agreement with Hill Court Partners, LLC.
[Draft Developer Guarantee](#)
- 4.4 Discussion and possible recommendation to the Village Board regarding consenting to the sale of the property in the industrial park to Hill Court Partners, LLC.

5. Adjournment

It is possible that a quorum of, members of other governmental bodies of the municipality may be in attendance at the above stated meeting to gather information. No action will be taken by any governmental body at the above stated meeting other than the governmental body specifically referred to above in this notice. Please note, upon reasonable notice, efforts will be made to accommodate the needs of individuals with disabilities through appropriate aids and services. For additional information or to request this service, contact the Municipal Clerk's Office, (262) 363-6420.

CERTIFIED SURVEY MAP NO. _____

BEING A PART OF OUTLOT 1, CSM 4773, LOCATED IN THE NORTHEAST ¼, SOUTHEAST ¼, SOUTHWEST ¼, AND NORTHWEST ¼ OF THE NORTHEAST ¼, AND THE NORTHWEST ¼ OF THE SOUTHEAST ¼ OF SECTION 1, TOWNSHIP 4 NORTH, RANGE 18 EAST, VILLAGE OF MUKWONAGO, WALWORTH COUNTY, WISCONSIN.

- INDICATES IRON PIPE FOUND
- INDICATES 1 INCH DIA. IRON PIPE, 18 INCHES IN LENGTH, WEIGHING 1.13 LBS PER LINEAL FOOT, SET.

ALL DIMENSIONS SHOWN ARE MEASURED TO THE NEAREST HUNDREDTH OF A FOOT.

ALL BEARINGS SHOWN ARE REFER TO THE WEST LINE OF THE NORTHEAST 1/4 OF SECTION 1-4-18, WHICH HAS A WISCONSIN STATE PLANE COORDINATE SYSTEM GRID, SOUTH ZONE, BEARING OF N 00°23'00" W.

OWNERS:
VILLAGE OF MUKWONAGO
P.O. BOX 206
MUKWONAGO, WI 53149

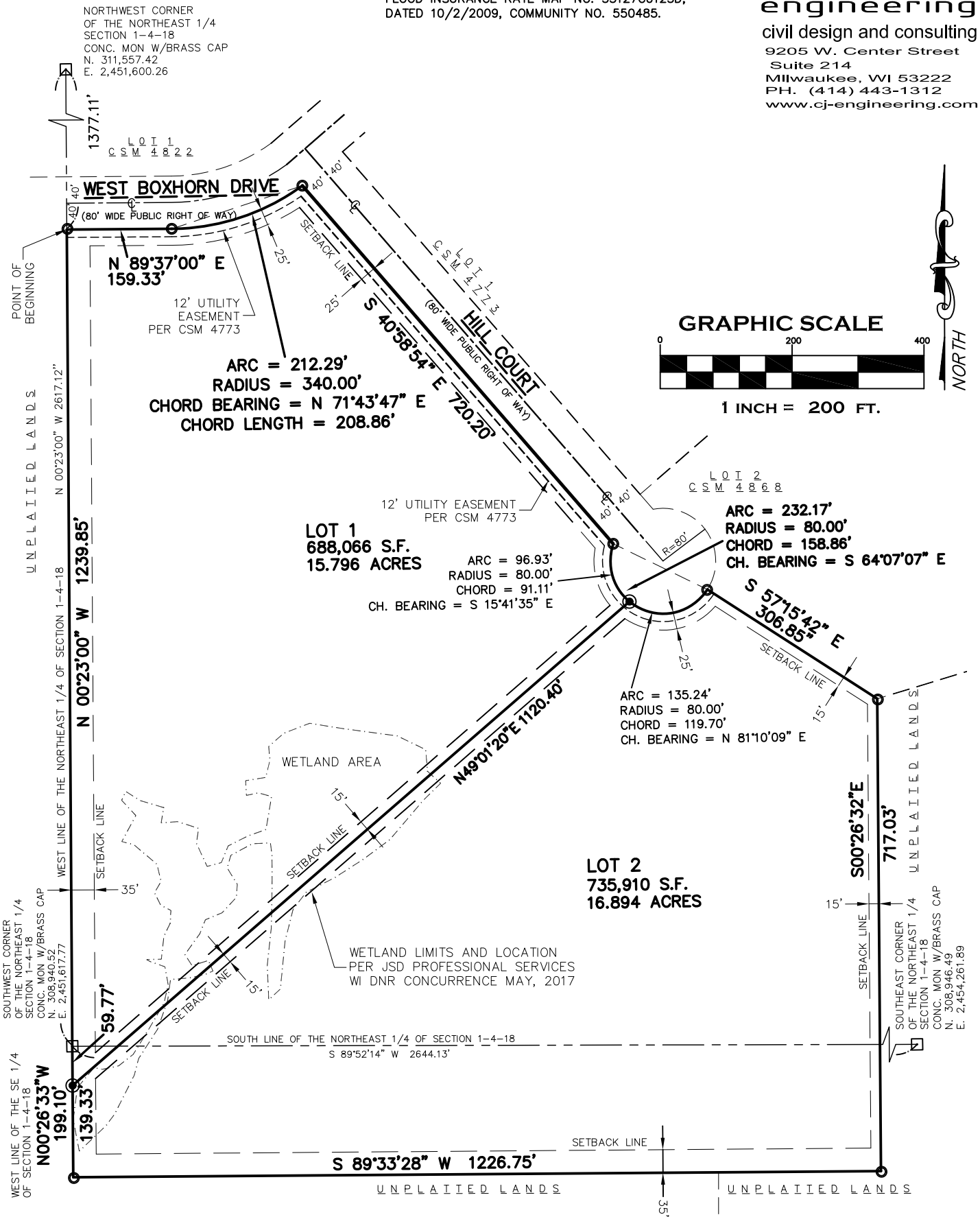
NOTE:
LOTS 1 & 2 ARE LOCATED WITHIN AN AREA HAVING A FLOOD PLAIN ZONE DESIGNATION "X": AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN PER INFORMATION FROM THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA), FLOOD INSURANCE RATE MAP NO. 55127C0125D, DATED 10/2/2009, COMMUNITY NO. 550485.



CJ
engineering

civil design and consulting

9205 W. Center Street
Suite 214
Milwaukee, WI 53222
PH. (414) 443-1312
www.cj-engineering.com



BEING A PART OF OUTLOT 1, CSM 4773, LOCATED IN THE NORTHEAST $\frac{1}{4}$, SOUTHEAST $\frac{1}{4}$, SOUTHWEST $\frac{1}{4}$, AND NORTHWEST $\frac{1}{4}$ OF THE NORTHEAST $\frac{1}{4}$, AND THE NORTHWEST $\frac{1}{4}$ OF THE SOUTHEAST $\frac{1}{4}$ OF SECTION 1, TOWNSHIP 4 NORTH, RANGE 18 EAST, VILLAGE OF MUKWONAGO, WALWORTH COUNTY, WISCONSIN.

The map shows Lot 1, a 15.796-acre parcel (688,066 S.F.), bounded by West Boxhorn Drive to the north and Hill Court to the east. A storm water management & access easement is shown as a stippled area on the western side of the lot. The easement boundary is defined by several bearings and distances: N00°23'00" W 204.43', N89°39'23" E 50.00', S00°20'37" E 191.33', S49°01'41" W 198.39', S41°37'42" E 65.46', S49°01'41" W 198.39', S89°39'23" W 87.00', S40°58'40" E 301.80', S38°18'12" W 81.85', and S89°37'14" W 210.19'. The western boundary of the lot is defined by N00°22'57" W 443.11'. The northern boundary of the lot is defined by a curve with L=101.74' and R=340.00'. The map also shows a north arrow and a scale of 1"=150'.

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SURVEYOR’S CERTIFICATE

I, CHRISTOPHER JACKSON, A PROFESSIONAL LAND SURVEYOR, HEREBY CERTIFY:

THAT I HAVE SURVEYED, DIVIDED AND MAPPED A PART OF THE NORTHEAST $\frac{1}{4}$, SOUTHEAST $\frac{1}{4}$, SOUTHWEST $\frac{1}{4}$, AND NORTHWEST $\frac{1}{4}$ OF THE NORTHEAST $\frac{1}{4}$, AND THE NORTHWEST $\frac{1}{4}$ OF THE SOUTHEAST $\frac{1}{4}$ OF SECTION 1, TOWNSHIP 4 NORTH, RANGE 18 EAST, VILLAGE OF MUKWONAGO, WALWORTH COUNTY, WISCONSIN, BOUNDED AND DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHWEST CORNER OF THE NORTHEAST $\frac{1}{4}$ OF SAID SECTION 1; THENCE S 00°23’00” E, ALONG THE WEST LINE OF NE $\frac{1}{4}$ OF SAID SECTION 1, 1377.11 FEET TO A POINT ON THE SOUTH R.O.W. LINE OF WEST BOXHORN DRIVE AND THE POINT OF BEGINNING; THENCE N 89°37’00” E, ALONG THE SOUTH R.O.W. LINE OF WEST BOXHORN DRIVE, 159.33 FEET; THENCE NORTHEASTERLY, ALONG SAID SOUTH R.O.W. LINE, 212.29 FEET ALONG THE ARC OF A CURVE WHOSE CENTER LIES TO THE NORTH, WHOSE RADIUS IS 340.00 FEET, AND WHOSE CHORD BEARS N 71°43’47” E, 208.86 FEET TO A POINT ON THE SOUTHWEST R.O.W. LINE OF HILL COURT; THENCE S 40°58’54” E, ALONG THE SOUTHWEST R.O.W. LINE OF HILL COURT, 720.20 FEET; THENCE SOUTHEASTERLY, ALONG SAID SOUTHWEST R.O.W. LINE, 232.17 FEET ALONG THE ARC OF A CURVE WHOSE CENTER LIES TO THE NORTHEAST, WHOSE RADIUS IS 80.00 FEET, AND WHOSE CHORD BEARS S 64°07’07” E, 158.86 FEET; THENCE S 57°15’42” E, 306.85 FEET; THENCE S 00°26’32” E, 717.03 FEET; THENCE S 89°33’28” W, 1226.75 FEET TO THE WEST LINE OF THE SOUTHEAST $\frac{1}{4}$ OF SAID SECTION 1; THENCE N 00°26’33” W, ALONG THE WEST LINE OF THE SOUTHEAST $\frac{1}{4}$ OF SAID SECTION 1, 199.10 FEET TO THE SOUTHWEST CORNER OF THE NORTHEAST $\frac{1}{4}$ OF SAID SECTION 1; THENCE N 00°23’00” W, ALONG THE WEST LINE OF THE NE $\frac{1}{4}$ OF SAID SECTION 1, 1239.85’ TO A POINT ON THE SOUTH R.O.W. LINE OF WEST BOXHORN DRIVE AND THE POINT OF BEGINNING.
SAID LANDS CONTAINING 1,423,976 SQ. FT (32.690 ACRES) MORE OR LESS.

THAT I HAVE MADE SUCH SURVEY, DIVISION AND MAP AT THE DIRECTION OF THE VILLAGE OF MUKWONAGO, OWNERS OF SAID LAND.

THAT SUCH MAP IS A CORRECT REPRESENTATION OF ALL EXTERIOR BOUNDARIES OF THE LAND SURVEYED AND THE COMBINATION THEREOF MADE.

THAT I HAVE FULLY COMPLIED WITH THE PROVISIONS OF CHAPTER 236.34 OF THE STATUTES OF THE STATE OF WISCONSIN AND THE VILLAGE OF MUKWONAGO IN SURVEYING, DIVIDING, AND MAPPING SAID LANDS.

DATED THIS _____ DAY OF _____, 20__.

CHRISTOPHER A. JACKSON
PROFESSIONAL LAND SURVEYOR, S-2851
STATE OF WISCONSIN

CERTIFIED SURVEY MAP NO. _____

BEING A PART OF OUTLOT 1, CSM 4773, LOCATED IN THE NORTHEAST ¼, SOUTHEAST ¼, SOUTHWEST ¼, AND NORTHWEST ¼ OF THE NORTHEAST ¼, AND THE NORTHWEST ¼ OF THE SOUTHEAST ¼ OF SECTION 1, TOWNSHIP 4 NORTH, RANGE 18 EAST, VILLAGE OF MUKWONAGO, WALWORTH COUNTY, WISCONSIN.

CORPORATE OWNER’S CERTIFICATE

THE VILLAGE OF MUKWONAGO, A MUNICIPAL CORPORATION DULY ORGANIZED AND EXISTING UNDER, AND BY VIRTUE OF, THE LAWS OF THE STATE OF WISCONSIN, AND AS OWNER(S), DO HEREBY CERTIFY THAT SAID MUNICIPAL CORPORATION, CAUSED THE LAND DESCRIBED ON THIS MAP TO BE SURVEYED, DIVIDED, MAPPED, AND DEDICATED AS REPRESENTED ON THIS MAP.

THE VILLAGE OF MUKWONAGO, DOES FURTHER CERTIFY THAT THIS CERTIFIED SURVEY MAP IS TO BE SUBMITTED TO THE FOLLOWING FOR APPROVAL OR OBJECTION:
(VILLAGE OF MUKWONAGO)

WITNESS THE HAND AND SEAL OF SAID OWNER(S) THIS _____ DAY OF _____.

IN THE PRESENCE OF:

FRED WINCHOWKY, VILLAGE PRESIDENT

DIANA DYKSTRA, VILLAGE CLERK–TREASURER

STATE OF WISCONSIN) SS
COUNTY OF _____)

PERSONALLY CAME BEFORE ME THIS _____ DAY OF _____, 20____, FRED WINCHOWKY, VILLAGE PRESIDENT AND DIANA DYKSTRA, VILLAGE CLERK–TREASURER OF THE ABOVE NAMED MUNICIPAL CORPORATION, TO ME KNOWN TO BE THE PERSONS WHO EXECUTED THE FOREGOING INSTRUMENT, AND TO ME KNOWN TO BE SUCH VILLAGE PRESIDENT AND VILLAGE CLERK OF SAID MUNICIPAL CORPORATION AND ACKNOWLEDGED THAT THEY EXECUTED THE FOREGOING INSTRUMENT AS SUCH OFFICER(S) AS THE DEED OF SAID MUNICIPAL CORPORATION, BY ITS AUTHORITY.

NOTARY PUBLIC, STATE OF WISCONSIN
MY COMMISSION EXPIRES _____, 20____

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VILLAGE BOARD CERTIFICATE

RESOLVED, THAT THIS CERTIFIED SURVEY MAP, IN THE VILLAGE OF MUKWONAGO, IS HEREBY APPROVED BY THE VILLAGE BOARD.

DATED THIS _____DAY OF _____

FRED WINCHOWKY, VILLAGE PRESIDENT

I HEREBY CERTIFY THAT THE FOREGOING IS A COPY OF A RESOLUTION ADOPTED BY THE VILLAGE OF MUKWONAGO BOARD

DIANA DYKSTRA, VILLAGE CLERK–TREASURER

VILLAGE PLANNING COMMISSION CERTIFICATE

RESOLVED, THAT THIS CERTIFIED SURVEY MAP, IN THE VILLAGE OF MUKWONAGO, IS HEREBY APPROVED BY THE VILLAGE PLANNING COMMISSION.

DATED THIS _____DAY OF _____

FRED WINCHOWKY, VILLAGE PRESIDENT

I HEREBY CERTIFY THAT THE FOREGOING IS A COPY OF A RESOLUTION ADOPTED BY THE PLANNING COMMISSION OF THE VILLAGE OF MUKWONAGO

DIANA DYKSTRA, VILLAGE CLERK–TREASURER

RESOLUTION 2020-49

**RESOLUTION APPROVING A CERTIFIED SURVEY MAP
VILLAGE OF MUKWONAGO, APPLICANT**

WHEREAS, pursuant to Article IV of the Land Division Ordinance, an application for a 2-Lot Certified Survey Map for the vacant property located along the Hill Court Parcel #A477300002, in the Village of Mukwonago, was filed in the office of the Village Clerk, Village of Mukwonago, Wisconsin, and

WHEREAS, the Certified Survey Map has been reviewed and recommended by the Village Plan Commission.

NOW, THEREFORE, BE IT RESOLVED by the Village Board of the Village of Mukwonago, Wisconsin hereby approves the 2-Lot Certified Survey Map dated September 24, 2020.

Passed and dated this 7th day of October 2020.

VILLAGE OF MUKWONAGO

By: _____
Fred Winchowky, Village President

Attest: _____
Diana Dykstra, Village Clerk

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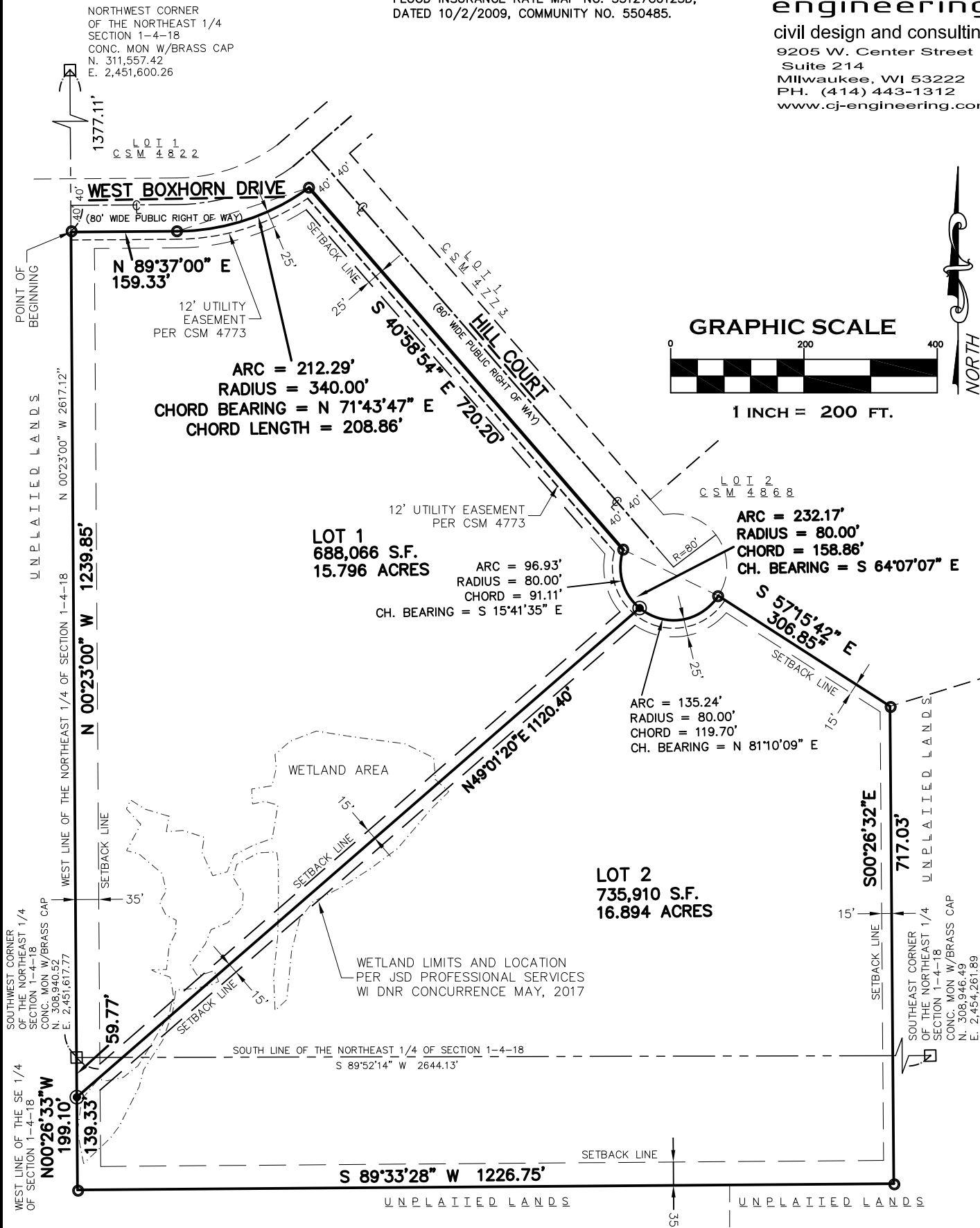
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OWNERS:
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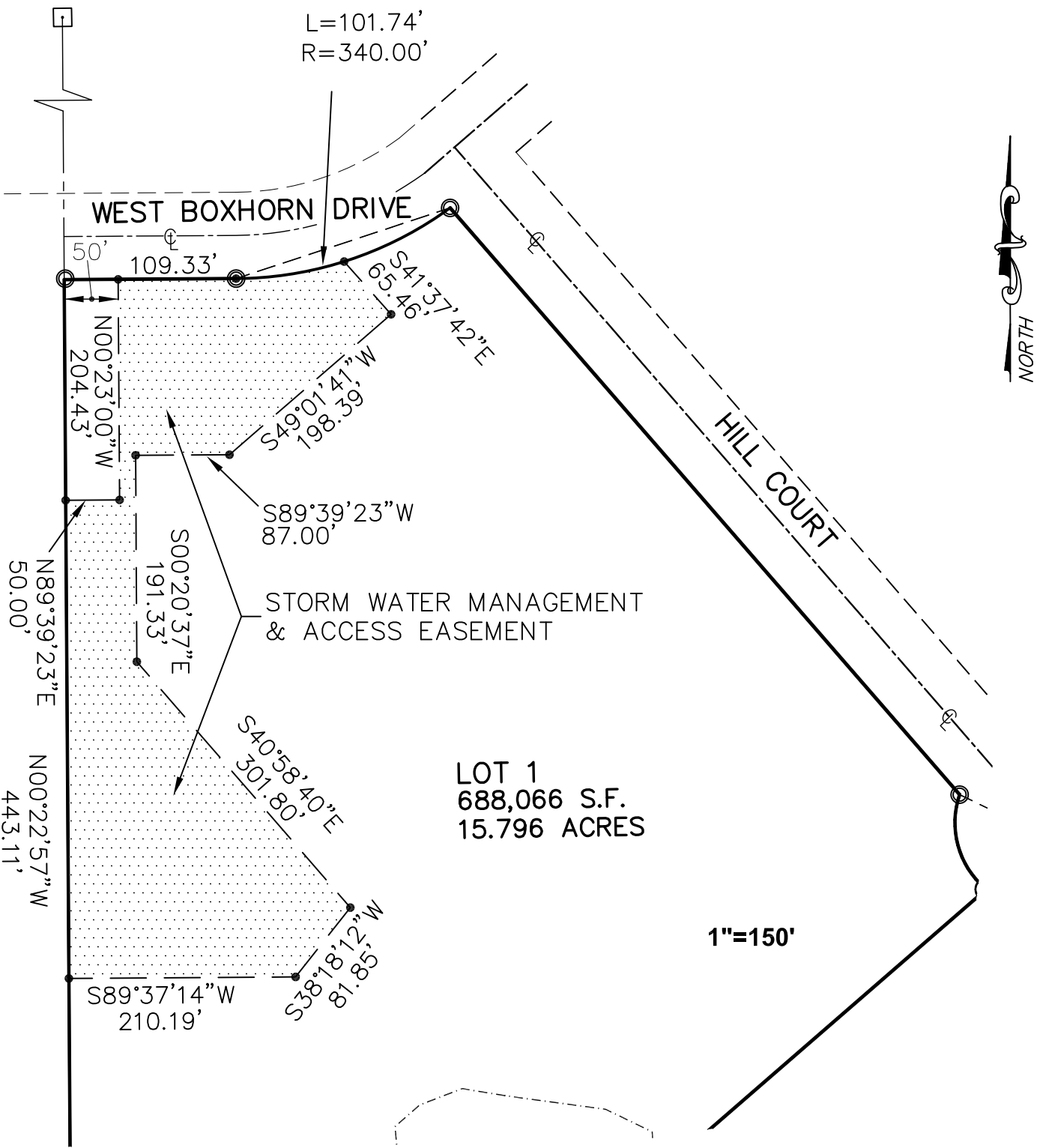
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CHANCE FLOOD PLAIN PER INFORMATION FROM THE
FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA),
FLOOD INSURANCE RATE MAP NO. 55127C0125D,
DATED 10/2/2009, COMMUNITY NO. 550485.



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STORM WATER MANAGEMENT
& ACCESS EASEMENT



CERTIFIED SURVEY MAP NO. _____

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DATED THIS _____ DAY OF _____, 20__.

CHRISTOPHER A. JACKSON
PROFESSIONAL LAND SURVEYOR, S-2851
STATE OF WISCONSIN

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CORPORATE OWNER’S CERTIFICATE

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IN THE PRESENCE OF:

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DIANA DYKSTRA, VILLAGE CLERK–TREASURER

STATE OF WISCONSIN) SS
COUNTY OF _____)

PERSONALLY CAME BEFORE ME THIS _____ DAY OF _____, 20____, FRED WINCHOWKY, VILLAGE PRESIDENT AND DIANA DYKSTRA, VILLAGE CLERK–TREASURER OF THE ABOVE NAMED MUNICIPAL CORPORATION, TO ME KNOWN TO BE THE PERSONS WHO EXECUTED THE FOREGOING INSTRUMENT, AND TO ME KNOWN TO BE SUCH VILLAGE PRESIDENT AND VILLAGE CLERK OF SAID MUNICIPAL CORPORATION AND ACKNOWLEDGED THAT THEY EXECUTED THE FOREGOING INSTRUMENT AS SUCH OFFICER(S) AS THE DEED OF SAID MUNICIPAL CORPORATION, BY ITS AUTHORITY.

NOTARY PUBLIC, STATE OF WISCONSIN
MY COMMISSION EXPIRES _____, 20____

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VILLAGE BOARD CERTIFICATE

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DATED THIS _____DAY OF _____

FRED WINCHOWKY, VILLAGE PRESIDENT

I HEREBY CERTIFY THAT THE FOREGOING IS A COPY OF A RESOLUTION ADOPTED BY THE VILLAGE OF MUKWONAGO BOARD

DIANA DYKSTRA, VILLAGE CLERK–TREASURER

VILLAGE PLANNING COMMISSION CERTIFICATE

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DIANA DYKSTRA, VILLAGE CLERK–TREASURER

Hill Court Multitenant
Storm Water Maintenance Agreement
Village of Mukwonago, County of Walworth, WI

_____, as “Owner” of the property described in Exhibit A, in accordance with Chapter 34 of the Village of Mukwonago Municipal Code, agrees to install and maintain storm water *management practices* on the subject property in accordance with approved plans and Storm Water Permit conditions. The Owner further agrees to the terms stated in this document to ensure that the storm water management practices continue serving the intended functions in perpetuity. This Agreement includes the following exhibits:

Exhibit A: Legal Description of the real estate for which this Agreement applies (“Property”).

Exhibit B: Location Map - shows an accurate location of each storm water management practice affected by this Agreement.

Exhibit C: Maintenance Plan - prescribes those activities that must be carried out to maintain compliance with this Agreement.

Exhibit D: Design Summary - contains a summary of key Engineering calculations and other data used to design the storm water management practices.

Exhibit E: As-built survey (to be recorded as an addendum) - shows a detailed “as-built” cross section and plan view of the storm water management practices.

Exhibit F: Engineering/Construction Verification (to be recorded as an addendum) - provides verification from a Professional Engineer that the design and construction of the storm water management practices complies with all applicable technical standards and the Village’s requirements.

NOTE: After construction verification has been accepted by the Village of Mukwonago, for all planned storm water management practices, an addendum(s) to this agreement shall be recorded by the Village showing construction details and construction verification. The addendum(s) may contain several additional exhibits, as described below.

Through this Agreement, the Owner hereby subjects the Property to the following covenants, conditions and restrictions:

1. Upon execution of this Agreement, the Village shall record the Agreement at the Walworth County or Walworth County Register of Deeds, as applicable. The recording of this Agreement shall be a condition for the issuance of a Storm Water Permit. An addendum to this Agreement shall be recorded upon project completion which shall include submittal of Exhibit E and Exhibit F in an acceptable form to the Village. The recording of Amendment #1 including Exhibit E and Exhibit F shall be a condition for the issuance of an occupancy permit.
2. The Owner shall construct, maintain and if necessary reconstruct the storm water management practices so as to maintain their compliance with applicable governmental, statutes, ordinances or rules. The Owner shall be responsible for the routine and extraordinary maintenance and repair of the storm water management practices identified in Exhibit B in accordance with the maintenance plan contained in Exhibit C.

3. The Owner shall, at their own cost inspect the storm water best management practices on an annual basis and maintain records of annual inspections and maintenance performed. Records shall be made available to the Village upon request within 30 days of written notice. Annual inspections shall be performed as detailed in Exhibit C Maintenance Plan of the storm water maintenance agreement and shall be performed to determine if the facility is functioning within the design parameters. Commencing in 2021 - and every five years thereafter the Owner shall, at their own cost, have a certification inspection of the storm water management practices conducted by a professional engineer, who shall then file a report with the Village of Mukwonago no later than December 31st of the same year. Upon written notification by Village of Mukwonago or its designee the Owner shall, at their own cost and within a reasonable time period determined by the Village of Mukwonago, have an inspection of the storm water management practices conducted by a professional engineer, who shall then file a report with the Village of Mukwonago. The Owner shall thereafter timely complete any maintenance or repair work recommended in any of the above reports. The Owner shall be liable for the failure to undertake any maintenance or repairs.
4. In addition, and independent of the requirements under paragraph 2 above, the Village of Mukwonago, or its designee, is authorized but not required to access the property as necessary to conduct inspections of the storm water management BMP's to ascertain compliance with the terms and intent of this Agreement and the activities prescribed in Exhibit C. The Village of Mukwonago may require work to be done which differs from the report(s) described in paragraph 3 above, if the Village of Mukwonago reasonably concludes that such work is necessary and consistent with the intent of this agreement and /or with Chapter 34 of the Village Code of Ordinances. Upon notification by the Village of Mukwonago of required maintenance or repairs, the Owner shall complete the specified maintenance or repairs within a reasonable time frame, as determined by the Village of Mukwonago.
5. If the Owner does not complete an inspection under 3 above or complete the required maintenance or repairs under 2 above within the specified time period, the Village of Mukwonago is authorized, but not required, to perform the specified inspections, maintenance or repairs. In the case of an emergency situation, as determined by the Village of Mukwonago, no notice shall be required prior to the Village of Mukwonago performing emergency maintenance or repairs.

The cost of inspections or measures undertaken by the Village pursuant to this agreement shall be first paid from the proceeds of any surety maintained to secure the performance by the Owner/Developer of its obligations under this agreement and the conditions of the use, site and architectural approval. In the event that the costs of said measures shall exceed the value of the surety or the surety has expired or been terminated, then in that event the cost of said measures shall be assessed as a special charge for current services pursuant to Wis Stat Sec. 66.0627. Any such assessment which is not paid within 60 days after billing shall be deemed a delinquent special charge and shall become a lien upon the parcel against which such charge has been assessed. Such delinquent charges shall be extended upon the current or next tax roll as a delinquent tax against the parcels for which payment has not been received by the Village and all proceedings in relation to the collection, return and sale of property for delinquent real estate taxes shall apply to such special charges. The Developer hereby consents to the levy of such charge and waives notice and the right to hearing.

6. This Agreement shall run with the property and be binding upon all heirs, successors and assigns. After the Village records this document, the Village of Mukwonago shall have the sole authority to modify this agreement contingent upon the Village of Mukwonago providing a 30 day written notice to the current Owner. Any modifications shall conform to the minimum requirements

of Chapter 34 (or its successor) and be written so as to ensure the long-term maintenance of the storm water BMP's.

7. The Owner/Developer agrees to pledge a surety in a form acceptable to the Village of Mukwonago to secure performance of the obligations arising from the construction and maintenance of the storm water BMPs provided for under this Agreement in the amount of 120% of the actual cost of the storm water BMPs. Said surety shall remain in effect for a period of three (3) years from the date of the execution of this Agreement or until drawn upon in full by the Village or one year (1) from the date of the certification of the storm water improvements whichever occurs first. Release of the surety prior to the deadlines stated herein shall be governed by Mukwonago Village code section 34-108(c) as amended
8. This Agreement shall be governed and construed in accordance with the laws of the State of Wisconsin.

Dated this ____ day of _____, 202____

Owner:

Authorized Representative of

(Printed Name of Authorized Representative)

State of Wisconsin:

County of Walworth

Personally came before me this ____ day of _____, 202____, the above named _____, as the authorized Representative of _____ for the purpose of signing this document, to me known to be the person who executed the foregoing instrument and acknowledged the same.

[Name]

Notary Public, Walworth County, WI

My commission expires: _____

Accepted by the Village of Mukwonago this ____ day of _____, 202____.

Fred Winchowky, Village President

Diana Dykstra, Village Clerk

This document was drafted by:
CJ Engineering, LLC
9205 W. Center St. Suite 214
Milwaukee, WI 53222

Exhibit A: Legal Description

COMMENCING AT THE NORTHWEST CORNER OF THE NORTHEAST $\frac{1}{4}$ OF SAID SECTION 1; THENCE S 00°23'00" E, ALONG THE WEST LINE OF NE $\frac{1}{4}$ OF SAID SECTION 1, 1377.11 FEET TO A POINT ON THE SOUTH R.O.W. LINE OF WEST BOXHORN DRIVE AND THE POINT OF BEGINNING; THENCE N 89°37'00" E, ALONG THE SOUTH R.O. W. LINE OF WEST BOXHORN DRIVE, 159.33 FEET; THENCE NORTHEASTERLY, ALONG SAID SOUTH R.O. W. LINE, 212.29 FEET ALONG THE ARC OF A CURVE WHOSE CENTER LIES TO THE NORTH, WHOSE RADIUS IS 340.00 FEET, AND WHOSE CHORD BEARS N 71°43'47" E, 208.86 FEET TO A POINT ON THE SOUTHWEST R.O.W. LINE OF HILL COURT; THENCE S 40°58'54" E, ALONG THE SOUTHWEST R.O. W. LINE OF HILL COURT, 720.20 FEET; THENCE SOUTHEASTERLY, ALONG SAID SOUTHWEST R.O.W. LINE, 232.17 FEET ALONG THE ARC OF A CURVE WHOSE CENTER LIES TO THE NORTHEAST, WHOSE RADIUS IS 80.00 FEET, AND WHOSE CHORD BEARS S 64°07'07" E, 158.86 FEET; THENCE S 57°15'42" E, 306.85 FEET; THENCE S 00°26'32" E, 717.03 FEET; THENCE S 89°33'28" W, 1226.75 FEET TO THE WEST LINE OF THE SOUTHEAST $\frac{1}{4}$ OF SAID SECTION 1; THENCE N 00°26'33" W, ALONG THE WEST LINE OF THE SOUTHEAST $\frac{1}{4}$ OF SAID SECTION 1, 199.10 FEET TO THE SOUTHWEST CORNER OF THE NORTHEAST $\frac{1}{4}$ OF SAID SECTION 1; THENCE N 00°23'00" W, ALONG THE WEST LINE OF THE NE $\frac{1}{4}$ OF SAID SECTION 1, 1239.85' TO A POINT ON THE SOUTH R.O.W. LINE OF WEST BOXHORN DRIVE AND THE POINT OF BEGINNING.

SAID LANDS CONTAINING 1,423,976 SQ. FT (32.690 ACRES) MORE OR LESS.

Exhibit B: Location Map

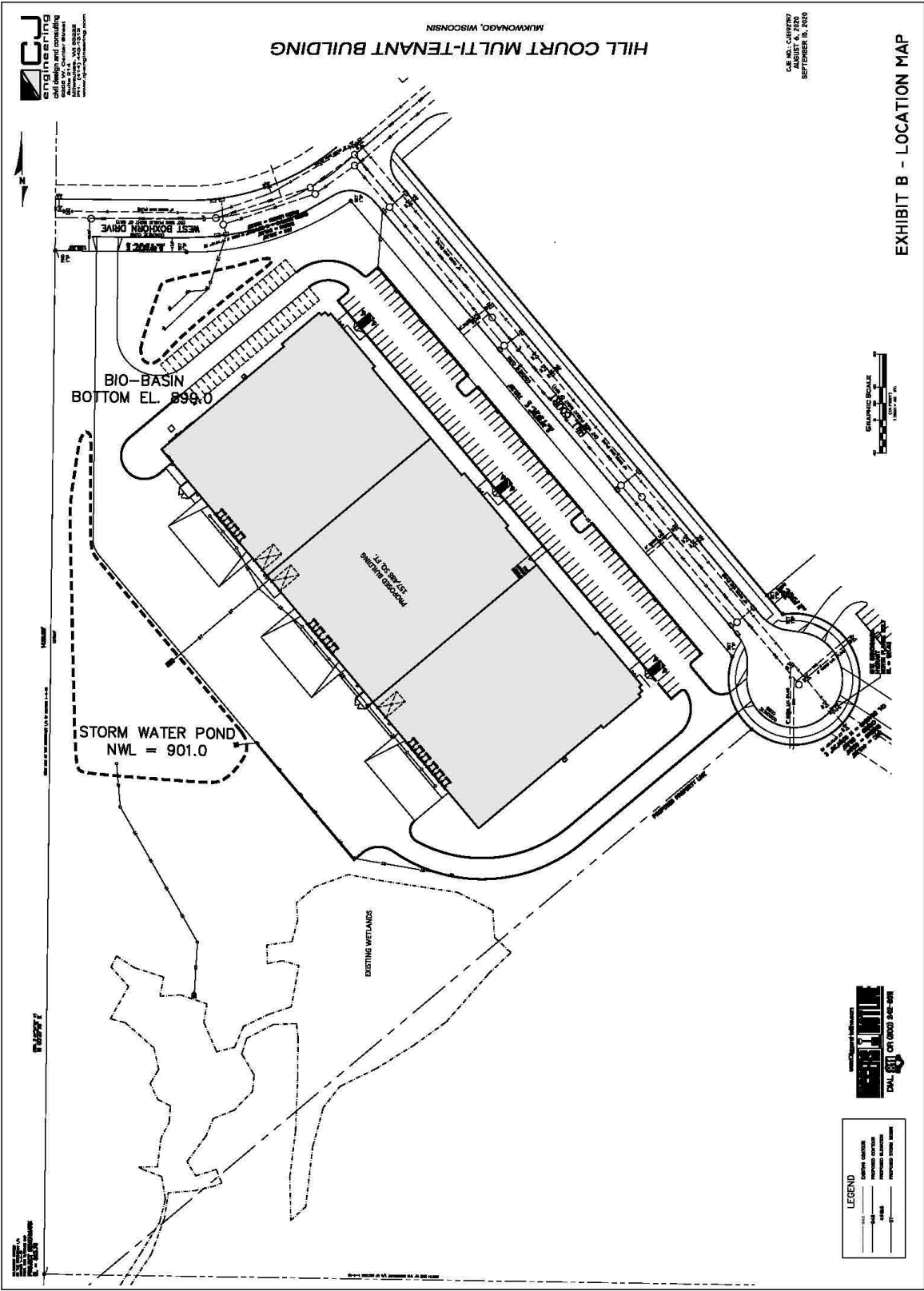


Exhibit B (continued): Location Map

CERTIFIED SURVEY MAP NO.

BEING A PART OF OUTLOT 1, CSM 4773, LOCATED IN THE NORTHEAST $\frac{1}{4}$, SOUTHEAST $\frac{1}{4}$, SOUTHWEST $\frac{1}{4}$, AND NORTHWEST $\frac{1}{4}$ OF THE NORTHEAST $\frac{1}{4}$, AND THE NORTHWEST $\frac{1}{4}$ OF THE SOUTHEAST $\frac{1}{4}$ OF SECTION 1, TOWNSHIP 4 NORTH, RANGE 18 EAST, VILLAGE OF MUKWONAGO, WALWORTH COUNTY, WISCONSIN.

- INDICATES IRON PIPE FOUND
- INDICATES 1 INCH DIA. IRON PIPE, 18 INCHES IN LENGTH, WEIGHING 1.13 LBS PER LINEAL FOOT, SET.

ALL DIMENSIONS SHOWN ARE MEASURED TO THE NEAREST HUNDREDTH OF A FOOT.

ALL BEARINGS SHOWN ARE REFER TO THE WEST LINE OF THE NORTHEAST 1/4 OF SECTION 1-4-18, WHICH HAS A WISCONSIN STATE PLANE COORDINATE SYSTEM GRID, SOUTH ZONE, BEARING OF N 00°23'00" W.

OWNERS:
VILLAGE OF MUKWONAGO
P.O. BOX 206
MUKWONAGO, WI 53149

NOTE:
LOTS 1 & 2 ARE LOCATED WITHIN AN AREA HAVING
A FLOOD PLAIN ZONE DESIGNATION "X": AREAS
DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL
CHANCE FLOOD PLAIN PER INFORMATION FROM THE
FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA),
FLOOD INSURANCE RATE MAP NO. 55127C0125D,
DATED 10/2/2009, COMMUNITY NO. 550485.

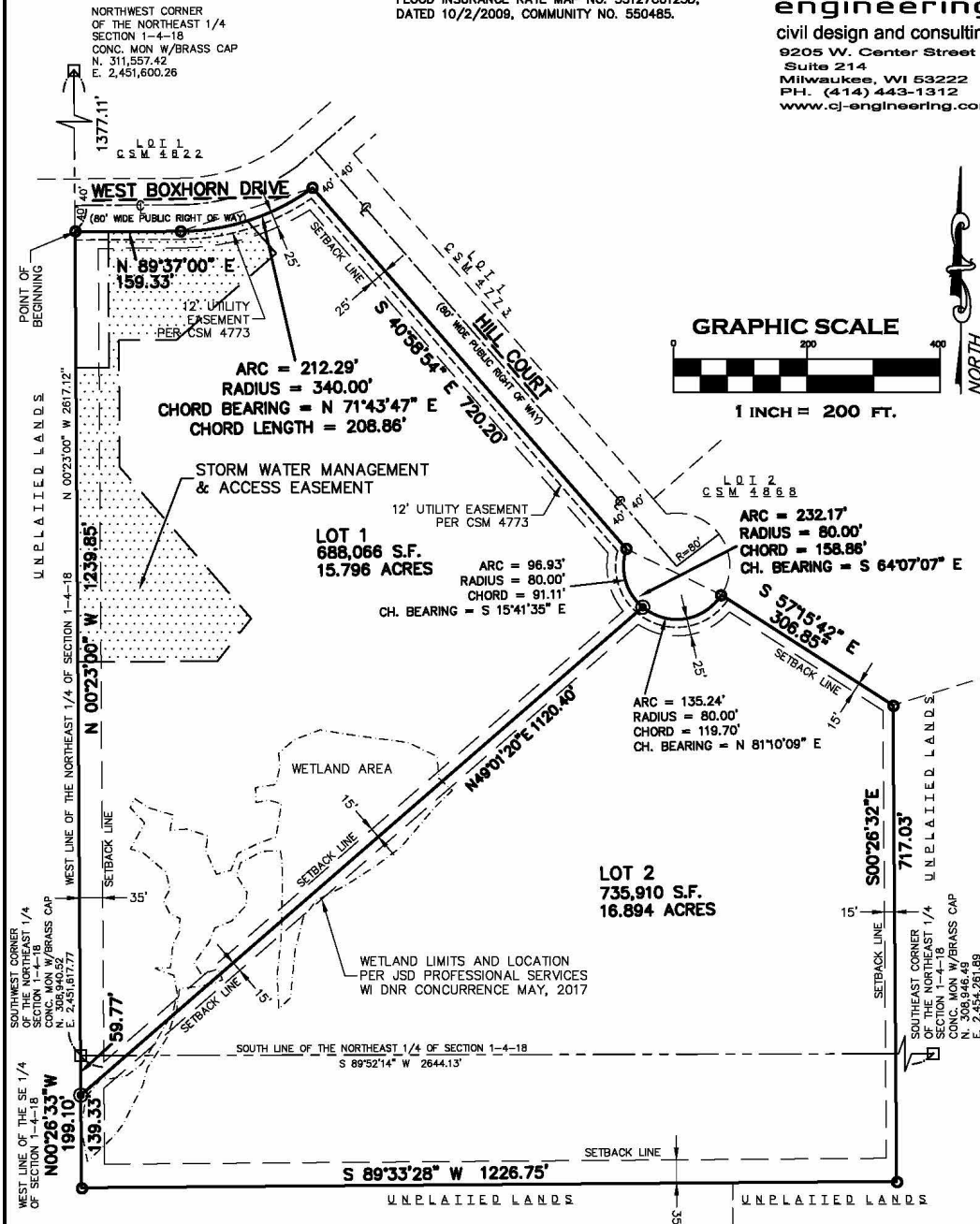


Exhibit B (continued): Location Map

CERTIFIED SURVEY MAP NO. _____

BEING A PART OF OUTLOT 1, CSM 4773, LOCATED IN THE NORTHEAST $\frac{1}{4}$, SOUTHEAST $\frac{1}{4}$, SOUTHWEST $\frac{1}{4}$, AND NORTHWEST $\frac{1}{4}$ OF THE NORTHEAST $\frac{1}{4}$, AND THE NORTHWEST $\frac{1}{4}$ OF THE SOUTHEAST $\frac{1}{4}$ OF SECTION 1, TOWNSHIP 4 NORTH, RANGE 18 EAST, VILLAGE OF MUKWONAGO, WALWORTH COUNTY, WISCONSIN.

**STORM WATER MANAGEMENT
& ACCESS EASEMENT**

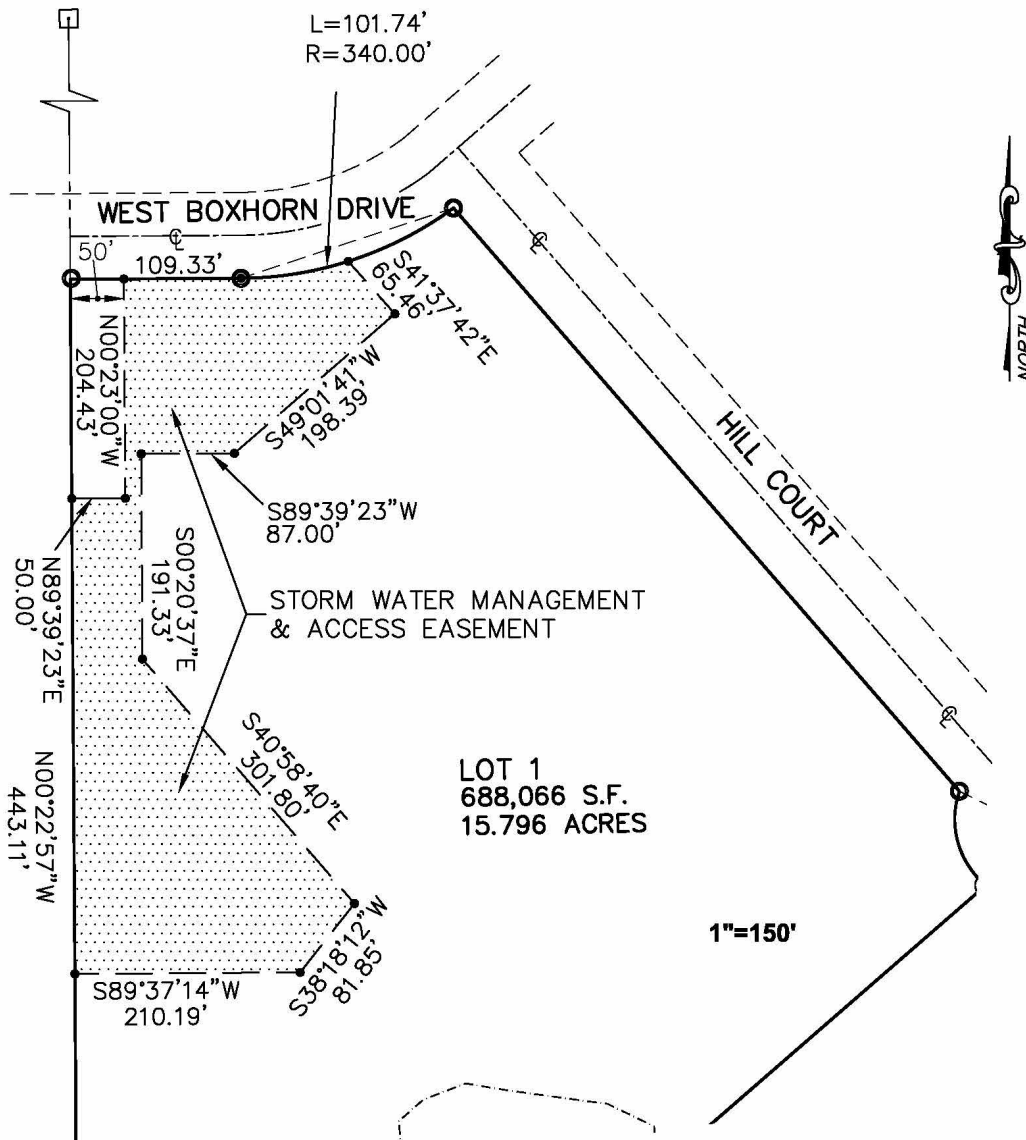


Exhibit C: Maintenance Plan

The maintenance activities listed below are aimed to ensure these practices continue serving their intended functions in perpetuity. The list of activities is not all-inclusive, but rather indicates the minimum type of maintenance that can be expected for this particular site.

WET DETENTION BASINS

System Description:

The wet detention basin is designed to remove Total Suspended Solids (TSS) in the site runoff and to reduce pre-development downstream peak flows. To function correctly, the pond size, water level and outlet structures must be maintained as specified in this Plan.

Minimum Maintenance Requirements:

To ensure the proper function of the storm water management practices described above, the following activities must be completed:

1. All outlet structures and pipes must be checked monthly to ensure there is no blockage from floating debris or ice, especially the washed stone in front of the orifices and the trash rack on the risers in the main part of the basins. Any blockage must be removed immediately. The washed stone must be replaced when it becomes clogged.
2. NO trees are to be planted or allowed to grow on the earthen berms. Tree root systems can reduce soil compaction and cause berm failure. The berms must be inspected annually and any woody vegetation removed.
3. If floating algae or weed growth becomes a nuisance (decay odors, etc.), it must be removed from the basin and deposited where it cannot drain back into the basin. Removal of the vegetation from the water reduces re-growth the following season (by harvesting the nutrients). Wetland vegetation must be maintained along the waters edge for safety and pollutant removal purposes.
4. The wet detention basins are to be inspected every five (5) years to determine the average depth of water in the center of the detention basins. The basins are to be cleaned out prior to the depth water being reduced by accumulated sediment to less than three (3) feet. All removed sediment must be placed in an appropriate upland disposal site and stabilized (grass cover) to prevent sediment from washing back into the basin.
5. No grading or filling of the basins or berms other than for sediment removal is allowed, unless otherwise approved by the Village of Mukwonago.
6. To promote more effective infiltration, mowing in the drainage ways, detention basins, and wetland fringe areas should be minimized. If mowing is deemed necessary, the mowing heights should be no shorter than six (6) inches. Restricting any mowing to late summer or autumn will minimize mortality to ground nesting birds. To discourage the presence of nuisance waterfowl (i.e. Canada Geese), a minimum 30-foot wide no-mow fringe shall be maintained around all detention basins, where possible.
7. After Vegetation is 70% established, the use of herbicides/pesticides is to be discontinued along the swales & basins.

BIORETENTION BASIN

System Description:

The storm water management facility includes a bioretention basin. The basin is designed to reduce peak flows and reduce runoff total suspended solids (TSS) from the site by intercepting the runoff and allowing it to seep (infiltrate) into the engineered soil layer and through the perforated under-drain pipe. To function correctly, the bioretention basin size, depth, outlet manhole and under-drain pipe must be maintained as specified in this Agreement.

Minimum Maintenance Requirements:

To ensure the proper function of the bioretention basin, the following list of maintenance activities are required to be performed by the owner or authorized qualified representative:

1. A minimum of 70% soil cover made up of plants must be maintained on the bioretention basin bottom. The basin sides shall be a turf grass. Maintain plants and grasses per qualified landscape contractor recommendations.
2. Seasonal (early spring) inspection of the soil surface for the presence of sodium accumulation due to the introduction of chlorides for winter maintenance of the parking lot should occur. It is also recommended that the soil be flushed with 1" of clean water 3-4 times each spring. Consider reducing sodium/salting or use sodium alternatives.
3. The basin and all components (outlet manhole, outlet pipe, vegetation and spillway) should be inspected after each heavy rain of 1.5" or more. If the basin is not draining properly (within 72 hours), further inspection may be required by persons with expertise in storm water management and/or soils.
 - If basin is not draining, the 6" drain tile should be cleared of any blockages or obstructions. Clear blockages in the underdrain pipe, if present through the underdrain cleanout. Expose the stone and soil immediately around the pipe, clear blockages and replace per approved design. Also examine outlet orifice through the dual treated planks within the pond outlet manhole. Remove any sediment accumulated within the manhole and orifice.
 - If soil testing shows that the soil surface has become crusted, sealed or compacted, Engineered soil should be replaced. Expose 6" drain tile and verify it is clear of obstructions. Remove and replace engineered soil per WDNR specifications. Replace bioretention plantings per approved Landscape Plan for the project.
 - If sedimentation is determined to be causing the failure, the accumulated sediment must be removed and the area replanted in accordance with the approved Landscape Plan for the project. Sediment removed shall be deposited offsite at an appropriate soil disposal facility.
4. All outlet pipes, other flow control devices within the basin outlet manhole must be kept free of debris. Any blockage must be removed immediately.
5. Any eroding areas must be repaired immediately to prevent premature sediment build-up in the system. Erosion matting is recommended for repairing grassed areas.
6. Heavy equipment and vehicles must be kept off of the bottom and side slopes of bioretention basin to prevent soil compaction. Soil compaction will reduce infiltration and may cause failure of the basin, resulting in ponding and possible growth of wetland plants.
7. No unauthorized trees are to be planted or allowed to grow on the earthen berms or bottom of the basin. On the berms, tree root systems can reduce soil compaction and cause berm failure. On the basin bottom, trees may shade out the native grasses. Woody vegetation must be removed.
8. Check for invasive species growth and remove per species specific recommended practices.
9. No grading or filling of the basin or berms other than for sediment removal is allowed.
10. Inspections should be performed per Village requirements. An inspection form must be completed and documented by a qualified person that represents the Owner. Any needed maintenance must be documented and scheduled for immediate repair. All repairs must be documented, preferably with photographs.
11. Snow shall not be dumped directly onto the conditioned planting bed.

12. See chart below for maintenance activity and frequency:

Activity	Frequency
Water Plants	As necessary during first growing season
Water as necessary during dry periods	As needed after first growing season
Re-mulch void areas	As needed
Treat diseased trees and shrubs	As needed
Inspect soil and repair eroded areas	Monthly
Remove litter and debris	Monthly
Add additional mulch	Once per year

Exhibit D: Design Summary**Project Name:** Hill Court Multitenant **Project Size:** 15.796 Acres**Watershed Area :** 8.672 acres**Public Land Survey Location:** NE1/4, SE ¼, SW ¼ and NW ¼ of the NE ¼ and the NW1/4 of the SE ¼ of Section 1, T4N R18E (Village of Mukwonago)

Summary Data Elements	Existing Conditions		Proposed Conditions		
Subcatchment	Sub. #4	Sub. #5	Sub. #1	Sub. #2	Sub. #3
Subcatchment Areas (acres)	5.495	3.177	7.546	0.655	0.471
Net Runoff Curve Numbers	CN = 61	CN = 61	CN = 91	CN = 80	CN = 61
Time of Concentration (Tc)	10.4 min.	10.4 min.	6.0 min.	6.0 min.	6.0 min.

Drainage Summary:

Area	1 Year Storm	2 Year Storm	10 Year Storm	100 Year Storm
Existing Conditions				
Subcatchment 4 (Existing Area to Wetlands)	0.51 cfs	1.12 cfs	5.12 cfs	19.83 cfs
Subcatchment 5 (Existing Area to ROW)	0.30 cfs	0.65 cfs	2.90 cfs	9.91 cfs
Reach-Total Existing Runoff	0.81 cfs	1.76 cfs	7.92 cfs	29.69 cfs
Proposed Conditions				
Subcatchment 1 (Area to Storm Water Pond)	20.13 cfs	23.57 cfs	36.32 cfs	63.26 cfs
Storm Water Pond	0.25 cfs	0.28 cfs	0.35 cfs	1.26 cfs
Subcatchment 2 (Proposed area to Bioretention Basin)	0.96 cfs	1.21 cfs	2.22 cfs	4.53 cfs
Bioretention Basin	0.38 cfs	0.55 cfs	1.03 cfs	1.24 cfs
Subcatchment 3 (Undetained)	0.05 cfs	0.12 cfs	0.54 cfs	1.78 cfs
Reach-Total Proposed Runoff	0.63 cfs	0.87 cfs	1.74 cfs	3.52 cfs
Allowable Runoff	0.81 cfs	1.76 cfs	1.76 cfs	7.92 cfs

Water Quality:

	Before Drainage System	After Controls	% Reduction
Particulate Solids	2,101 lbs	160.9 lbs	92.34%
Particulate Phosphorus	5.609 lbs	0.4419 lbs	92.12%



9205 W. Center Street, Suite 214
Milwaukee, WI 53222
Ph: (414) 443-1312

STORM WATER MANAGEMENT PLAN

FOR

Hill Court Multi-Tenant

Hill Court

Located Within TID #5 – Planned Business Park

Mukwonago, WI

August 6, 2020
September 15, 2020



PREPARED BY:

Christopher Jackson, PE
CJ Engineering
9205 W. Center Street Suite 214
Milwaukee, WI 53222
Ph. 414-443-1312

CJE Job No.: 1927R1



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Introduction:

The Proposed development located on the west side of Hill Court in the Village of Mukwonago will consist of the construction of a 157,488 s.f. multi-tenant building with asphalt paved parking and drives to the east of the building and asphalt drives with concrete loading dock areas to the west . This development is located in an existing business park designed for The Village of Mukonago by Ruekert & Mielke, Inc. Most areas in the planned business park is serviced by regional storm water facilities with pre-determined allowable CN values for development. The proposed development has areas being developed that will be designed to utilize said regional facilities as well as providing onsite storm water quality and quantity control before releasing runoff to areas that follow the existing runoff flow path.

In order to meet the storm water management requirements of the Village of Mukwonago and NR 151 for development for all the land disturbances that do not drain to the planned drainage areas which direct runoff to regional facilities, a proposed bio-retention basin and wet pond are being proposed for the site. A wet pond has been designed to the west of the building which will capture the runoff from the building as well as the south and west paved parking and drive areas through a series of storm sewer systems. Areas not captured by the storm sewer systems will sheet drain to the wet pond. The storm sewer located along the southwest area of the development has been designed to handle the 100-year storm event as no overland flow route exists in this area. The proposed wet pond consists of a 24" RCP standpipe with an 8" discharge pipe that will discharge to the existing wetlands. Runoff from the north paved drive will sheet drain to the proposed bio retention basin located adjacent to West Boxhorn Drive. The proposed bioretention basin consists of a 24" RCP standpipe with a 12" discharge pipe that discharges to an existing storm sewer system in Hill Court.

Regional Storm Water Facility:

The proposed development includes 115,781 s.f. of area with a proposed composite CN value of 79 that will directly drain to either Hill Court or West Boxhorn Drive in addition to the proposed discharge from the bioretention basin. This area is a part of the existing P-1 & P-6 drainage areas (part of the regional storm water design) which combined, allow up to 125,897 s.f. of area with a composite CN value of 93 based on the approved regional storm water management plan. The proposed development therefore meets the designed drainage requirements based on the proposed planned business park drainage area design by Ruekert & Mielke, Inc. This area has been analyzed separately to ensure the proposed design meets the storm water management approvals of the existing regional storm water facility and the results have been summarized below:

Drainage Summary for Regional Storm Water Subcatchment:

Area	1 Year Storm	2 Year Storm	10 Year Storm	100 Year Storm
Existing Conditions				
P-1 & P-6 Drainage Area to ROW	8.39 cfs	9.71 cfs	14.57 cfs	24.79 cfs
Proposed Conditions				
Drainage Area to ROW	3.65 cfs	4.95 cfs	9.50 cfs	19.11 cfs

Infiltration Requirements:

Per section NR151.124(4)(c) of the Wisconsin Administrative Code and WDNR 1002 guidelines, soils with an infiltration rate less than 0.6 in/hr are unsuitable for infiltration practices and shall be exempt from infiltration requirements. Based on the NRCS soil resource report, the soils on site have rates that fall within the threshold of 0.6 in/hr for infiltration exemption. In addition, based on soil borings performed by CGC Inc., the existing infiltration rates of the existing soils is between 0.07 and 0.13"/hr. Therefore, the existing onsite soils having unsuitable infiltration capacity and site infiltration will not be required.

Storm water requirements per the Village of Mukwonago:

Peak Discharge: The calculated post-development peak storm water discharge rate for the 100-year design storm shall not exceed the calculated pre-development discharge rate for the 10-year design storm; The calculated post-development peak storm water discharge rate for the 10-year design storm shall not exceed the calculated pre-development discharge rate for the 2-year design storm and the calculated post-development peak storm water discharge rate for the 1 and 2-year design storms shall not exceed the calculated pre-development discharge rates for the 1 and 2-year design storm.

Runoff Quality Control:

Total suspended solids (TSS) removal prior to discharge from post development as compared to no controls.

- 80% TSS removal requirement for new development

Developed Site: (See the Proposed Conditions Plan: Appendix "B").

Soil Types: Per Natural Resources Conservation Service, Web Soil Survey
MpB, McHenry Silt Loam, H.S.G. B
MpB2, McHenry Silt Loam, H.S.G. B
Ph, Pella silt loam, H.S.G. B
Per investigation by CGC Inc. soils are predominately

Cover & CN: CN 61, >75% Grass cover, Good, HSG B
CN 98, Roofs, Paved Parking, Walks, Pond Surface.

Area: **0.655 Acres (total area draining to bioretention basin)**
7.546 Acres (total area draining to wet pond)
0.471 Acres (total area undetained)

24-Hour Rainfall Values:

1-Year: 2.40"
2-Year: 2.70"
10-Year: 3.81"
100-Year: 6.18"

NRCS Rainfall Distributions per NEH Part 650, Chapter 2, Appendix 1

Method of Analysis:

The storm water runoff quantity was calculated using the methods outlines in TR-55 (“Urban Hydrology for Small Watersheds” by the U.S. Department of Agriculture’s Soil Conservation Services). Calculations were performed with the “HydroCAD 7.10” computer software. Water quality calculations were performed using WinSLAMM for Windows version 10.2.0.

Drainage Summary: (See Summary of Calculations in Appendix)

Area	1 Year Storm	2 Year Storm	10 Year Storm	100 Year Storm
Existing Conditions				
Subcatchment 4 (Existing Area to Wetlands)	0.51 cfs	1.12 cfs	5.12 cfs	19.83 cfs
Subcatchment 5 (Existing Area to ROW)	0.30 cfs	0.65 cfs	2.90 cfs	9.91 cfs
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Reach-Total Proposed Runoff	0.63 cfs	0.87 cfs	1.74 cfs	3.52 cfs
Allowable Runoff	0.81 cfs	1.76 cfs	1.76 cfs	7.92 cfs

Water Quality:

Based on the proposed construction of the storm water pond and bio-retention basin, the site exceeds the WDNR requirements and Village of Mukwonago for development for water quality by removing over 80% of the total suspended solids (TSS) prior to discharge off site, as quantified using WinSLAMM for Windows version 10.2.0 (See appendix for calculation results). The TSS and Phosphorus out of each area and total removal as a part of the series of site is as summarized below:

	Before Drainage System	After Controls	% Reduction
Particulate Solids	2,101 lbs	160.9 lbs	92.34%
Particulate Phosphorus	5.609 lbs	0.4419 lbs	92.12%

Conclusion:

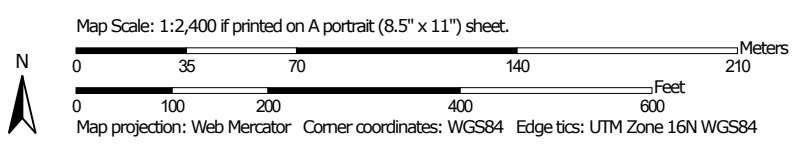
The proposed storm water management system consisting of a bio-retention basin and storm water pond have been designed to meet the storm water requirements of the Village of Mukwonago and the WI DNR for peak discharge. The future storm water wet pond in combination with the bio-retention pond will remove 92.34% of TSS from the post development runoff. With this storm water management plan, it can be seen that the site meets the storm water requirements of the Village of Mukwonago and NR 151.

APPENDIX

Soil Map—Walworth County, Wisconsin
(Hill Court Multi-Tenant)



Soil Map may not be valid at this scale.



Soil Map—Walworth County, Wisconsin
(Hill Court Multi-Tenant)

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 17, Jun 8, 2020

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

Date(s) aerial images were photographed: Apr 29, 2011—Mar 28, 2012

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
MpB	McHenry silt loam, 2 to 6 percent slopes	6.8	45.3%
MpB2	McHenry silt loam, 2 to 6 percent slopes, eroded	5.0	33.4%
Ph	Pella silt loam, 0 to 2 percent slopes	3.2	21.3%
Totals for Area of Interest		15.0	100.0%



LOG OF TEST BORING

Project Hill Court Multi-Tenant Building
Hill Court & W. Boxhorn Drive
 Location Mukwonago, Wisconsin

Boring No. 3
 Surface Elevation (ft) 906.6
 Job No. CM20173
 Sheet 1 of 1

336 S. Curtis Rd, West Allis, WI 53214 (414) 443-2000, FAX (414) 443-2099

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N		qu (qa) (tsf)	W	LL	PL	LOI
1		8	M	11	FILL: 7" Dark Brown Clayey Topsoil FILL: Dark Brown Lean Clay, Some Sand Medium Dense to Dense, Light Brown Sandy SILT; Little Fine to Caorse Gravel and Clay (ML)					
2		18	M	20						
3		18	M	12						
4		12	M/W	11						
5		1	M	38						
					End of Boring at 15 ft Backfilled with Bentonite Chips					

WATER LEVEL OBSERVATIONS					GENERAL NOTES				
While Drilling	∇	NW	Upon Completion of Drilling	NW	Start	8/17/20	End	8/17/20	
Time After Drilling					Driller	J&J	Chief	JP	Rig CME-45
Depth to Water					Logger	JP	Editor	JPS	
Depth to Cave in					Drill Method	2.25" HSA			

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



LOG OF TEST BORING

Project Hill Court Multi-Tenant Building
Hill Court & W. Boxhorn Drive
 Location Mukwonago, Wisconsin

Boring No. 4
 Surface Elevation (ft) 914.7
 Job No. CM20173
 Sheet 1 of 1

336 S. Curtis Rd, West Allis, WI 53214 (414) 443-2000, FAX (414) 443-2099

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N		qu (qa) (tsf)	W	LL	PL	LOI
					7" Dark Brown Clayey TOPSOIL (POSSIBLE FILL)					
1		14	M	13	Very Stiff, Brown Mottled Lean CLAY; Little Fine Gravel, Trace Sand (CL) (POSSIBLE FILL)	(2.5)				
2		18	M	22	Medium Dense, Light Brown Sandy SILT; Little Fine to Coarse Gravel and Clay (ML)					
3		18	M/W	13						
4		18	M/W	13						
5		0	M	23						
6		18	M/W	24						
					End of Boring at 20 ft Backfilled with Bentonite Chips					

WATER LEVEL OBSERVATIONS					GENERAL NOTES				
While Drilling	☒	NW	Upon Completion of Drilling	NW	Start	8/17/20	End	8/17/20	
Time After Drilling					Driller	J&J	Chief	JP	Rig CME-45
Depth to Water					Logger	JP	Editor	JPS	
Depth to Cave in					Drill Method	2.25" HSA			

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



LOG OF TEST BORING

Project Hill Court Multi-Tenant Building
Hill Court & W. Boxhorn Drive
 Location Mukwonago, Wisconsin

Boring No. 6
 Surface Elevation (ft) 916.7
 Job No. CM20173
 Sheet 1 of 1

336 S. Curtis Rd, West Allis, WI 53214 (414) 443-2000, FAX (414) 443-2099

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Depth (ft)	Rec (in.)	Moist	N		qu (qa) (tsf)	W	LL	PL	LOI
					FILL: 8" Dark Brown to Black Clayey Topsoil					
1		12	M	10	FILL: Hard, Dark Brown to Brown Lean Clay, Some Sand	(4.5+)				
2		18	M	13	Medium Dense to Dense, Light Brown Sandy SILT; Little Fine to Coarse Gravel and Clay (ML)					
3		18	M	38						
4		14	M	32						
					Boulder encountered at 10.5 ft					
5		2	M	32						
6A/B		13	W/M	22						
7		18	M	32						
					End of Boring at 25 ft Backfilled with Bentonite Chips					

WATER LEVEL OBSERVATIONS					GENERAL NOTES				
While Drilling	▽	14.0' ±	Upon Completion of Drilling	15.5'	Start	8/14/20	End	8/14/20	
Time After Drilling					Driller	J&J	Chief	JP	Rig CME-45
Depth to Water					Logger	JP	Editor	JPS	
Depth to Cave in					Drill Method	2.25" HSA			
The stratification lines represent the approximate boundary between soil types and the transition may be gradual.									



LOG OF TEST BORING

Project **Hill Court Multi-Tenant Building**
Hill Court & W. Boxhorn Drive
Location **Mukwonago, Wisconsin**

Boring No. **7**
Surface Elevation (ft) **905.9**
Job No. **CM20173**
Sheet **1** of **1**

336 S. Curtis Rd, West Allis, WI 53214 (414) 443-2000, FAX (414) 443-2099

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Rec (in.)	Moist	N	Depth (ft)		qu (qa) (tsf)	W	LL	PL	LOI
					FILL: 4" Dark Brown to Black Clayey Topsoil					
1	6	M	26		FILL: Very Stiff, Dark Brown Lean Clay, Some Sand	(2.5)				
2A/B	18	M	21		Medium Dense, Grayish Brown Clayey SILT; Little Fine Sand (CL-ML)					
				5	Medium Dense, Brown Fine to Coarse SAND; Little Silt and Fine Gravel (SP-SM)					
3	18	W	17		Medium Dense to Dense, Light Brown Sandy SILT; Little Fine to Coarse Gravel and Clay (ML)					
4	18	M	25							
				10						
5	18	M	45							
				15						
					End of Boring at 15 ft Backfilled with Bentonite Chips					
				20						
				25						
				30						

WATER LEVEL OBSERVATIONS					GENERAL NOTES	
While Drilling	▽ 5.5'	Upon Completion of Drilling	NW		Start	8/14/20 End 8/14/20
Time After Drilling	(perched)				Driller	J&J Chief JP Rig CME-45
Depth to Water				▼	Logger	JP Editor JPS
Depth to Cave in					Drill Method	2.25" HSA

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



LOG OF TEST BORING

Project Hill Court Multi-Tenant Building
Hill Court & W. Boxhorn Drive
Location Mukwonago, Wisconsin

Boring No. **P1**
Surface Elevation (ft) 905.5
Job No. **CM20173**
Sheet 1 of 1

336 S. Curtis Rd, West Allis, WI 53214 (414) 443-2000, FAX (414) 443-2099

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N		Depth (ft)	qu (qa) (tsf)	W	LL	PL	LOI
						6" Dark Brown Clayey TOPSOIL					
1		18	M	8		Very Stiff, Brown Mottled Lean CLAY; Trace Sand (CL)	(3.0-3.25)				
2		7	M	48		Loose to Dense, Light Brown Sandy SILT; Little Fine to Coarse Gravel and Clay (ML)					
					5						
3		0	M	9							
4A/B		18	W/M	6		Saturated layer directly above clay					
					10	Medium Stiff to Stiff, Gray and Brown Silty CLAY (CL-ML)	(1.0-1.5)				
5A/B		12	M	44		Medium Dense to Very Dense, Grayish Brown to Brown Sandy SILT; Little to Some Clay, Little Fine to Coarse Gravel (ML/CL-ML)					
					15						
6		7	M	100/ 12"							
7A/B		18	M	30							
8		18	M	46							
					20						
						End of Boring at 20 ft Backfilled with Bentonite Chips					
					25						
					30						
WATER LEVEL OBSERVATIONS						GENERAL NOTES					
While Drilling ☒ 8.0' ± Upon Completion of Drilling <u>NW</u>						Start <u>8/17/20</u> End <u>8/17/20</u>					
Time After Drilling <u>(perched)</u>						Driller <u>J&J</u> Chief <u>JP</u> Rig <u>CME-45</u>					
Depth to Water _____						Logger <u>JP</u> Editor <u>JPS</u>					
Depth to Cave in _____						Drill Method <u>2.25" HSA</u>					
The stratification lines represent the approximate boundary between soil types and the transition may be gradual.											



LOG OF TEST BORING

Project Hill Court Multi-Tenant Building
Hill Court & W. Boxhorn Drive
 Location Mukwonago, Wisconsin

Boring No. **P2**
 Surface Elevation (ft) **901.2**
 Job No. **CM20173**
 Sheet **1** of **1**

336 S. Curtis Rd, West Allis, WI 53214 (414) 443-2000, FAX (414) 443-2099

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N		qu (qa) (tsf)	W	LL	PL	LOI
					FILL: 8" Dark Brown Clayey Topsoil					
1		12	M	16	FILL: Hard, Dark Brown Lean Clay, Some Sand, Little Fine Gravel	(4.5+)				
2		15	M	23	Medium Dense to Dense, Brown Sandy SILT; Little Fine to Coarse Gravel and Clay (ML)					
					Possible fill to 6 ft ±					
3		12	M	36						
4		12	M	38						
5A/B		18	M	32						
6		18	M	35						
					End of Boring at 15 ft Backfilled with Bentonite Chips					

WATER LEVEL OBSERVATIONS					GENERAL NOTES				
While Drilling	▽	NW	Upon Completion of Drilling	NW	Start	8/17/20	End	8/17/20	
Time After Drilling					Driller	J&J	Chief	JP	Rig CME-45
Depth to Water					Logger	JP	Editor	JPS	
Depth to Cave in					Drill Method	2.25" HSA			
The stratification lines represent the approximate boundary between soil types and the transition may be gradual.									



LOG OF TEST BORING

Project Hill Court Multi-Tenant Building
Hill Court & W. Boxhorn Drive
Location Mukwonago, Wisconsin

Boring No. **P3**
Surface Elevation (ft) **906.5**
Job No. **CM20173**
Sheet **1** of **1**

336 S. Curtis Rd, West Allis, WI 53214 (414) 443-2000, FAX (414) 443-2099

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N		Depth (ft)	qu (qa) (tsf)	W	LL	PL	LOI
						8" Dark Brown Clayey TOPSOIL					
1A/B		12	M	17		Hard, Brown Lean CLAY; Some Fine Sand, Trace Gravel (CL)	(4.5+)				
2		18	M	20		Medium Dense, Gray and Brown Mottled Sandy SILT; Little Clay (ML)					
5						End of Boring at 5 ft Backfilled with Soil Cuttings					
10											
15											
20											
25											
30											

WATER LEVEL OBSERVATIONS					GENERAL NOTES	
While Drilling	☒ NW	Upon Completion of Drilling	☐ NW		Start	8/17/20 End 8/17/20
Time After Drilling					Driller	J&J Chief JP Rig CME-45
Depth to Water					Logger	JP Editor JPS
Depth to Cave in					Drill Method	2.25" HSA
The stratification lines represent the approximate boundary between soil types and the transition may be gradual.						

LOG OF TEST BORING

General Notes

Descriptive Soil Classification

GRAIN SIZE TERMINOLOGY

Soil Fraction	Particle Size	U.S. Standard Sieve Size
Boulders	Larger than 12"	Larger than 12"
Cobbles	3" to 12"	3" to 12"
Gravel: Coarse	3/4" to 3"	3/4" to 3"
Fine	4.76 mm to 3/4"	#4 to 3/4"
Sand: Coarse	2.00 mm to 4.76 mm	#10 to #4
Medium	0.42 to mm to 2.00 mm	#40 to #10
Fine	0.074 mm to 0.42 mm	#200 to #40
Silt	0.005 mm to 0.074 mm	Smaller than #200
Clay	Smaller than 0.005 mm	Smaller than #200

Plasticity characteristics differentiate between silt and clay.

GENERAL TERMINOLOGY

Physical Characteristics
Color, moisture, grain shape, fineness, etc.,
Major Constituents
Clay, silt, sand, gravel
Structure
Laminated, varved, fibrous, stratified,
cemented, fissured, etc.
Geologic Origin
Glacial, alluvial, eolian, residual, etc.

RELATIVE DENSITY

Term	"N" Value
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	Over 50

RELATIVE PROPORTIONS OF OF COHESIONLESS SOILS

Proportional Term	Defining Range by Percentage of Weight
Trace	0%-5%
Little	5%-12%
Some	12%-35%
And	35%-50%

ORGANIC CONTENT BY COMBUSTION METHOD

Soil Description	Loss on Ignition
Non Organic	Less than 4%
Organic Silt/Clay	4-12%
Sedimentary Peat	12-50%
Fibrous and Woody Peat	More than 50%

CONSISTENCY

Term	q _u -tons/sq. ft.
Very Soft	0.0 to 0.25
Soft	0.25 to 0.50
Medium	0.50 to 1.0
Stiff	1.0 to 2.0
Very Stiff	2.0 to 4.0
Hard	Over 4.0

PLASTICITY

Term	Plastic Index
None to Slight	0-4
Slight	5-7
Medium	8-22
High to Very High	Over 22

The penetration resistance, N, is the summation of the number of blows required to effect two successive 6" penetrations of the 2" split-barrel sampler. The sampler is driven with a 140 lb. weight falling 30" and is seated to a depth of 6" before commencing the standard penetration test.

SYMBOLS

DRILLING AND SAMPLING

CS--Continuous Sampling
RC--Rock Coring: Size AW, BW, NW, 2"W
RQD--Rock Quality Designator
RB--Rock Bit
FT--Fish Tail
DC--Drove Casing
C--Casing: Size 2 1/2", NW, 4", HW
CW--Clear Water
DM--Drilling Mud
HSA--Hollow Stem Auger
FA--Flight Auger
HA--Hand Auger
COA--Clean-Out Auger
SS--2" Diameter Split-Barrel Sample
2ST--2" Diameter Thin-Walled Tube Sample
3ST--3" Diameter Thin-Walled Tube Sample
PT--3" Diameter Piston Tube Sample
AS--Auger Sample
WS--Wash Sample
PTS--Peat Sample
PS--Pitcher Sample
NR--No Recovery
S--Sounding
PMT--Borehole Pressuremeter Test
VS--Vane Shear Test
WPT--Water Pressure Test

LABORATORY TESTS

q_a--Penetrometer Reading, tons/sq. ft.
q_u--Unconfined Strength, tons/sq. ft.
W--Moisture Content, %
LL--Liquid Limit, %
PL--Plastic Limit, %
SL--Shrinkage Limit, %
LI--Loss on Ignition, %
D--Dry Unit Weight, lbs/cu. ft.
pH--Measure of Soil Alkalinity or Acidity
FS--Free Swell, %

WATER LEVEL MEASUREMENT

▽ --Water Level at time shown
NW--No Water Encountered
WD--While Drilling
BCR--Before Casing Removal
ACR--After Casing Removal
CW--Caved and Wet
CM--Caved and Moist

Note: Water level measurements shown on the boring logs represent conditions at the time indicated and may not reflect static levels, especially in cohesive soils.

CGC, Inc.

Madison - Milwaukee

UNIFIED SOIL CLASSIFICATION SYSTEM

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)		
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% 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 (More than 12% fines)	
	GM	Silty gravels, gravel-sand-silt mixtures
	GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)	
	SW	Well-graded sands, gravelly sands, little or no fines
	SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	
	SM	Silty sands, sand-silt mixtures
	SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more 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 of 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 50% or greater	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
	CH	Inorganic clays of high plasticity, fat clays
	OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS	PT	Peat and other highly organic soils

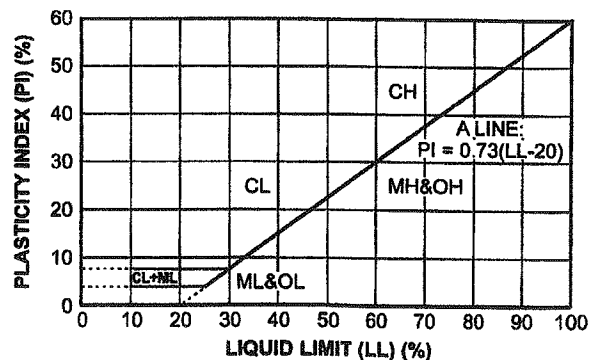
LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for GW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent GW, GP, SW, SP
 More than 12 percent GM, GC, SM, SC
 5 to 12 percent Borderline cases requiring dual symbols

PLASTICITY CHART



SOIL AND SITE EVALUATION - STORM

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

Attach complete site plan on paper not less than 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	Walworth
Parcel I.D.	A477300002
Review by	Date

Client Brion Design Group, LLC				Property Location Govt. Lot NW 1/4 SEC 1 T 4 N R 18 E			
Mailing Address 3885 N. Brookfield Road, Suite 200				Lot # 9	Block #	Development Bear Corporate Center	
City Brookfield	State WI	Zip Code 53045	Phone Number	☐ City Mukwonago	☒ Village	☐ Town	Nearest Road Hill Court

Drainage area: 13.8 ☐ sq. ft. ☒ acres	Hydraulic Application Test Method ☒ Morphological Evaluation ☐ Double-Ring Infiltrometer ☐ Other (Specify) _____	Soil Moisture Date of soil borings: 8/17/20 USDA-NRCS WETS Value: ☐ Dry = 1 ☒ Normal = 2 ☐ Wet = 3
Test Site Suitable for (check all that apply) ☐ Bioretention ☐ Subsurface Dispersal System ☐ Reuse ☐ Irrigation ☐ Other _____		

P1	Obs. #	☒ Boring ☐ Pit	Ground Surface Elev. 905.5 ft	Elevation of limiting factor 897.5 ft
----	--------	--	-------------------------------	---------------------------------------

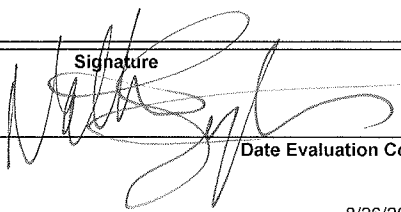
Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	% Fines	Hydraulic App. Rate Inches/Hr
1	0-6	10YR3/3	None	SIL	1fsbk	mfr	cw	<5	>60	0.13
2	6-30	10YR4/4	None	SIC	2fsbk	mvfi	cw	<10	>75	0.07
3	30-144	2.5Y5/6	None	SIL	0ma	mvfi	cw	<15	50-75	0.13
4	144-126	2.5Y5/4	None	SIC	2fsbk	mvfi	cw	<15	>75	0.07
5	126-240	2.5Y6/4	None	SIL	0ma	mvfi	-	<15	50-75	0.13

Comments: Perched groundwater encountered at 8 ft (Elev. 897.5 ft) while drilling.

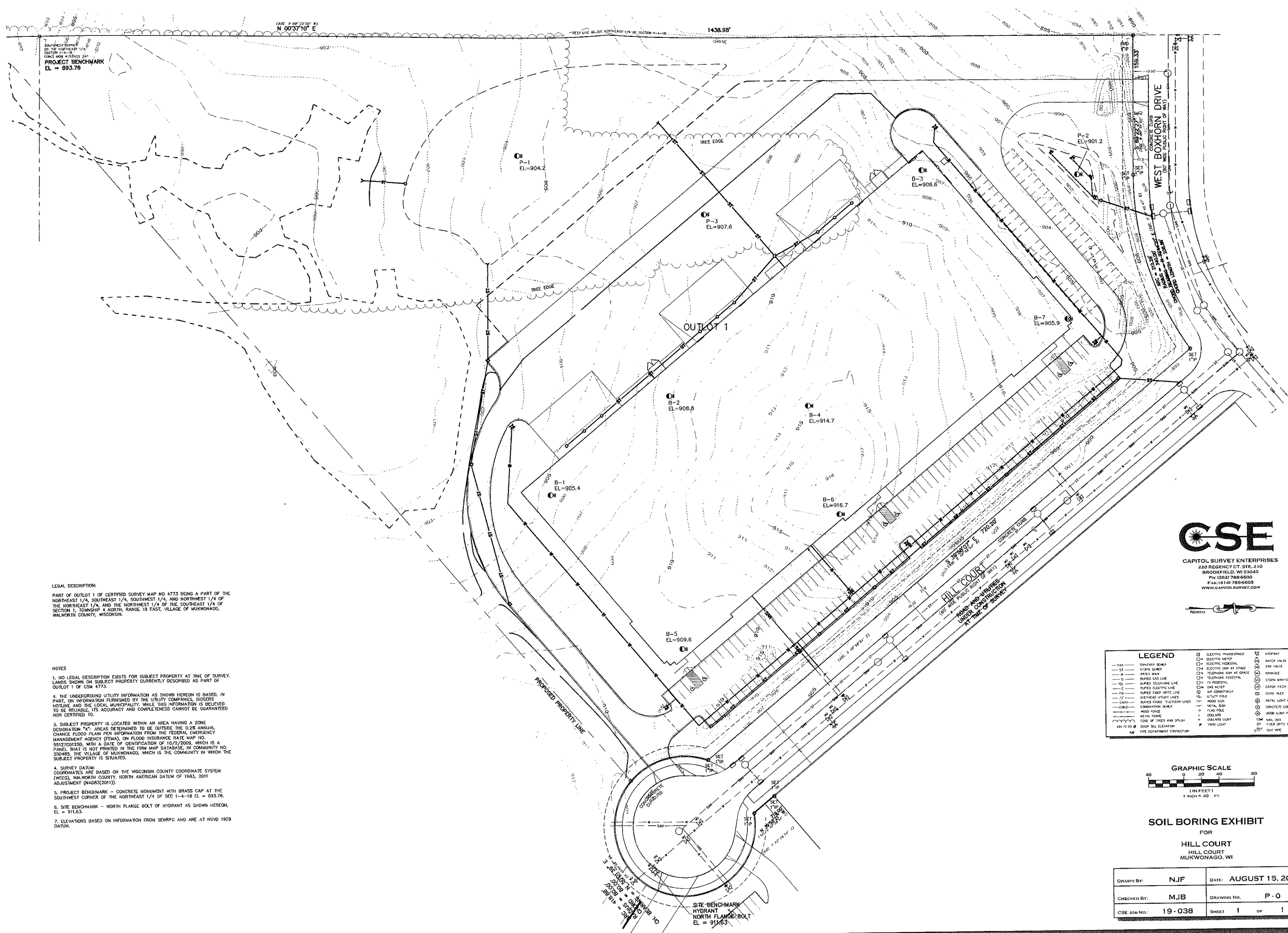
P2	Obs. #	☒ Boring ☐ Pit	Ground Surface Elev. 901.2 ft	Elevation of limiting factor Not Observed
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Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	% Fines	Hydraulic App. Rate Inches/Hr
1	0-8	10YR3/3	None	FILL: SIL	1fsbk	mfr	cw	<5	>60	0.13
2	8-36	10YR4/6	None	FILL: SIC	2fsbk	mrifi	cw	<15	>75	0.07
3	36-180	2.5Y5/4	None	SIL	0ma	mvfi	-	<15	50-75	0.13

Comments:

CST/PSS Name (Please Print) Nathan I. Springstead, CST	Signature 	CST Number SP-040900024
Address 336 S. Curtis Road, West Allis, WI 53214	Date Evaluation Conducted 8/26/20	Telephone Number (414) 443-2000

SBD-10793 (R.01/17)



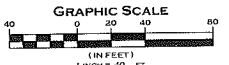
PROJECT BENCHMARK
EL = 893.76

LEGAL DESCRIPTION:
PART OF OUTLOT 1 OF CERTIFIED SURVEY MAP NO. 4773 BEING A PART OF THE
NORTHEAST 1/4, SOUTHWEST 1/4, AND NORTHWEST 1/4 OF THE SOUTHWEST 1/4 OF
SECTION 1, TOWNSHIP 4 NORTH, RANGE 18 EAST, VILLAGE OF MUKWONAGO,
WALWORTH COUNTY, WISCONSIN.

NOTES
1. NO LEGAL DESCRIPTION EXISTS FOR SUBJECT PROPERTY AT TIME OF SURVEY.
LANDS SHOWN ON SUBJECT PROPERTY CURRENTLY DESCRIBED AS PART OF
OUTLOT 1 OF CSM 4773.
2. THE UNDERGROUND UTILITY INFORMATION AS SHOWN HEREON IS BASED, IN
PART, ON INFORMATION FURNISHED BY THE UTILITY COMPANIES, DIGGERS,
HOTLINE AND THE LOCAL MUNICIPALITY. WHILE THIS INFORMATION IS BELIEVED
TO BE RELIABLE, ITS ACCURACY AND COMPLETENESS CANNOT BE GUARANTEED
NOR CERTIFIED TO.
3. SUBJECT PROPERTY IS LOCATED WITHIN AN AREA HAVING A ZONE
DESIGNATION "X". AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL
CHANCE FLOOD PLAIN FOR INFORMATION FROM THE FEDERAL EMERGENCY
MANAGEMENT AGENCY (FEMA), ON FLOOD INSURANCE RATE MAP NO.
55127001250, WITH A DATE OF IDENTIFICATION OF 10/2/2009, WHICH IS A
PANEL THAT IS NOT PRINTED IN THE FIRM MAP DATABASE, IN COMMUNITY NO.
556485, THE VILLAGE OF MUKWONAGO, WHICH IS THE COMMUNITY IN WHICH THE
SUBJECT PROPERTY IS SITUATED.
4. SURVEY DATUM:
COORDINATES ARE BASED ON THE WISCONSIN COUNTY COORDINATE SYSTEM
(WCCS), WALWORTH COUNTY, NORTH AMERICAN DATUM OF 1983, 2011
ADJUSTMENT (NAD83(2011)).
5. PROJECT BENCHMARK - CONCRETE MONUMENT WITH BRASS CAP AT THE
SOUTHWEST CORNER OF THE NORTHEAST 1/4 OF SEC 1-4-18 EL = 893.76.
6. SITE BENCHMARK - NORTH FLANGE BOLT OF HYDRANT AS SHOWN HEREON.
EL = 911.63.
7. ELEVATIONS BASED ON INFORMATION FROM SEWRPC AND ARE AT NGVD 1929
DATUM.

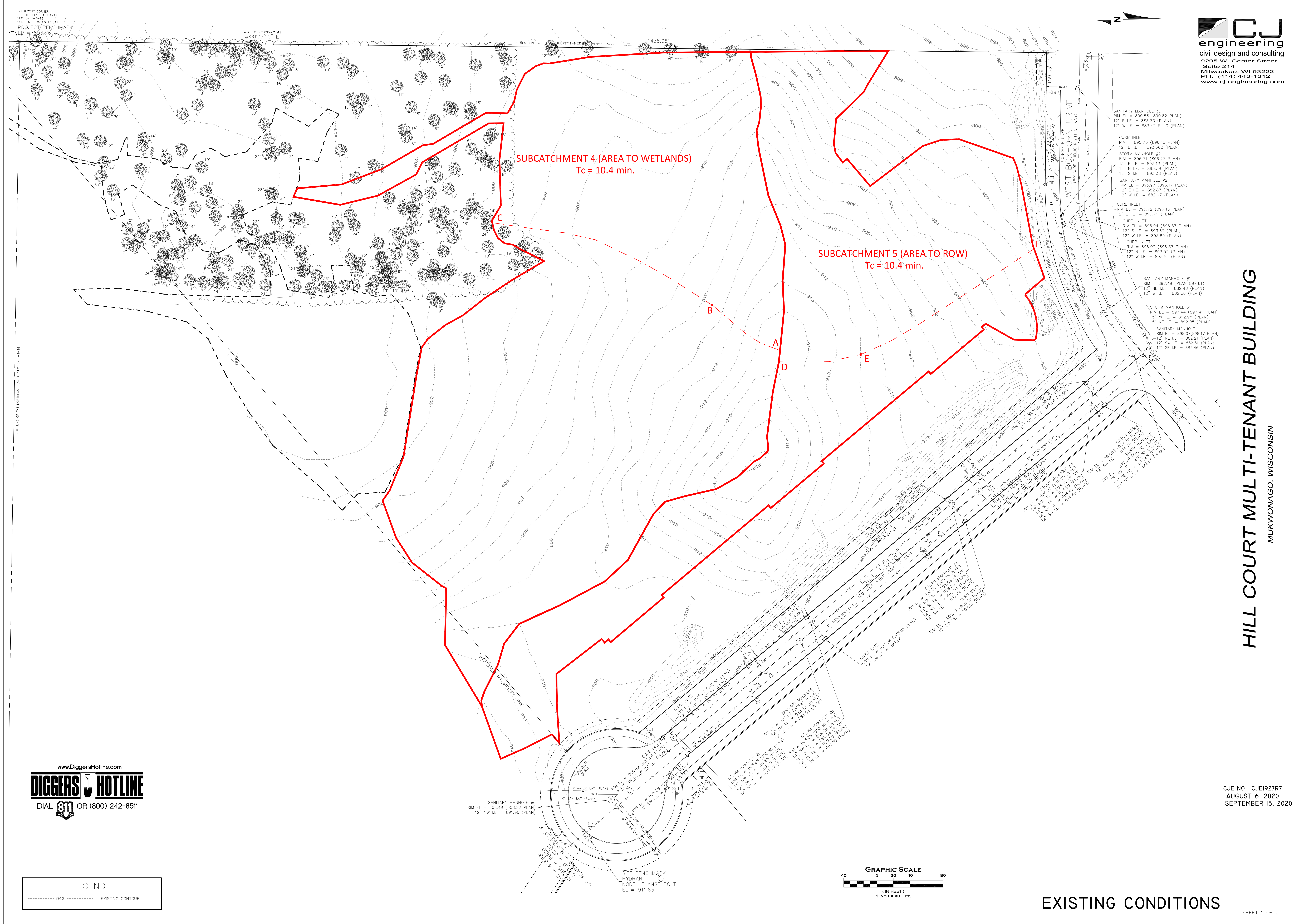
CSE
CAPITOL SURVEY ENTERPRISES
220 REGENCY CT. STE. 210
BROOKFIELD, WI 53005
PH: (262) 788-6600
FAX: (262) 788-6600
WWW.CAPITOLSURVEY.COM

LEGEND					
— SAN	SANITARY SEWER	— E	ELECTRIC TRANSFORMER	— W	WATER VALVE
— S1	SEWER	— E	ELECTRIC METER	— W	WATER VALVE
— S2	SEWER	— E	ELECTRIC METER	— W	WATER VALVE
— S3	SEWER	— E	ELECTRIC METER	— W	WATER VALVE
— S4	SEWER	— E	ELECTRIC METER	— W	WATER VALVE
— S5	SEWER	— E	ELECTRIC METER	— W	WATER VALVE
— S6	SEWER	— E	ELECTRIC METER	— W	WATER VALVE
— S7	SEWER	— E	ELECTRIC METER	— W	WATER VALVE
— S8	SEWER	— E	ELECTRIC METER	— W	WATER VALVE
— S9	SEWER	— E	ELECTRIC METER	— W	WATER VALVE
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— S98	SEWER	— E	ELECTRIC METER	— W	WATER VALVE
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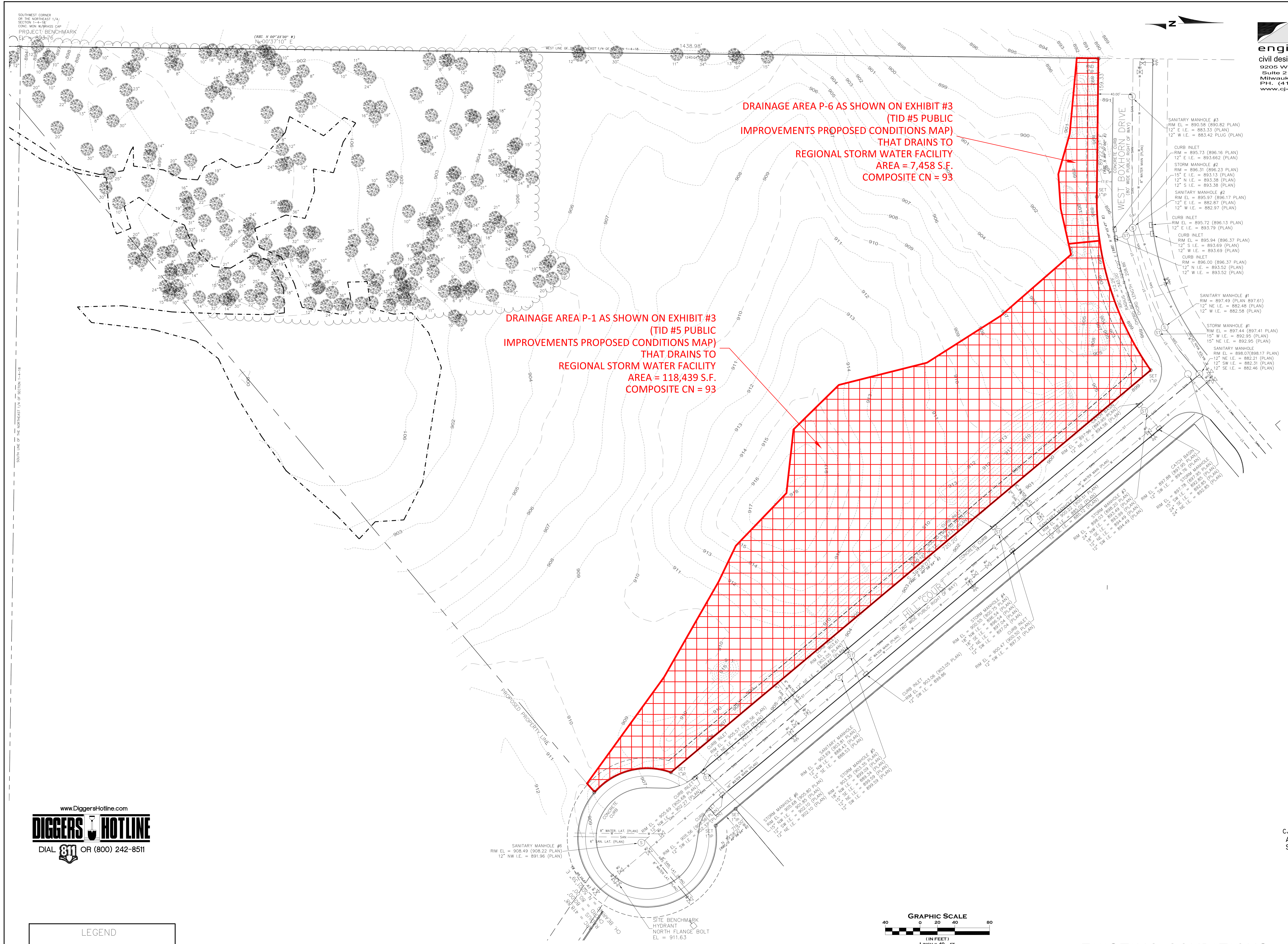


SOIL BORING EXHIBIT
FOR
HILL COURT
HILL COURT
MUKWONAGO, WI

DRAWN BY:	NJF	DATE:	AUGUST 15, 2020
CHECKED BY:	MJB	DRAWING NO.	P - 0
CSE JOB NO.:	19-038	SHEET	1 OF 1



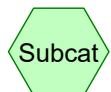
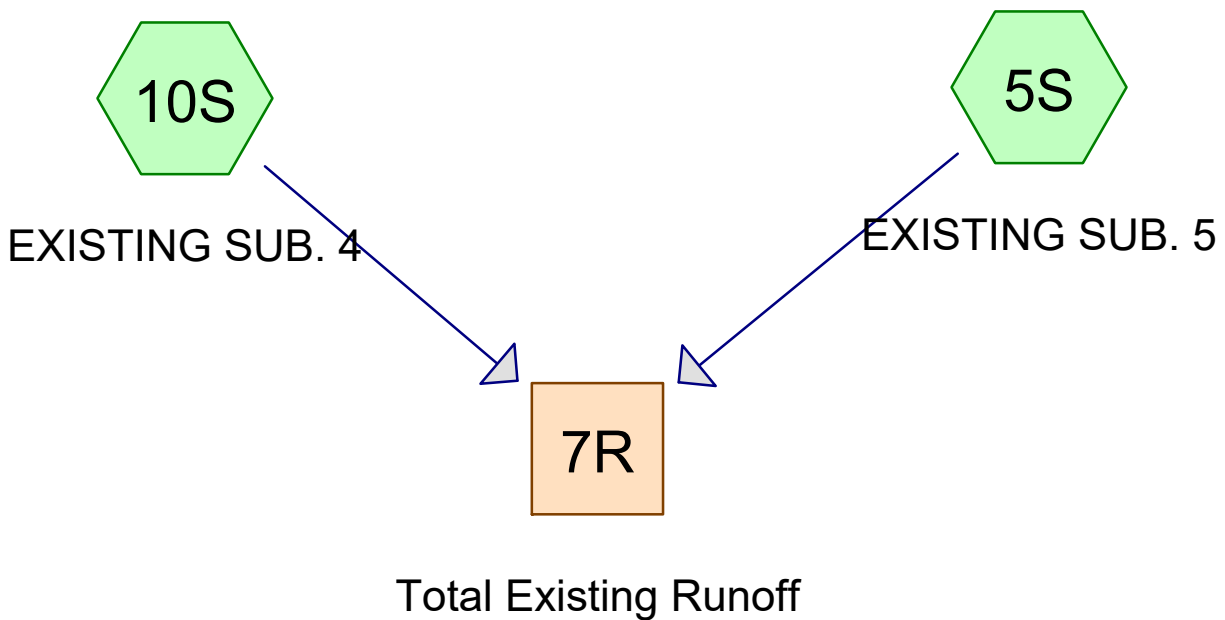
HILL COURT MULTI-TENANT BUILDING
MUKWONAGO, WISCONSIN



HILL COURT MULTI-TENANT BUILDING

MUKWONAGO, WISCONSIN

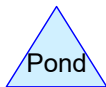
CJE NO.: CJEI927R7
AUGUST 6, 2020
SEPTEMBER 15, 2020



Subcat



Reach



Pond



Link

Routing Diagram for CJE1927r0 existing-proposed
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CJE1927r0 existing-proposed

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
8.672	61	>75% Grass cover, Good, HSG B (5S, 10S)
8.672	61	TOTAL AREA

CJE1927r0 existing-proposed

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Page 3

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
8.672	HSG B	5S, 10S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
8.672		TOTAL AREA

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Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	8.672	0.000	0.000	0.000	8.672	>75% Grass cover, Good	5S, 10S
0.000	8.672	0.000	0.000	0.000	8.672	TOTAL AREA	

CJE1927r0 existing-proposed*MSE 24-hr 3 1 year Rainfall=2.40"*

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 5S: EXISTING SUB. 5

Runoff Area=138,385 sf 0.00% Impervious Runoff Depth>0.15"
Flow Length=345' Tc=10.4 min CN=61 Runoff=0.30 cfs 0.040 af

Subcatchment 10S: EXISTING SUB. 4

Runoff Area=5.495 ac 0.00% Impervious Runoff Depth>0.15"
Flow Length=388' Tc=10.4 min CN=61 Runoff=0.51 cfs 0.068 af

Reach 7R: Total Existing Runoff

Inflow=0.81 cfs 0.108 af
Outflow=0.81 cfs 0.108 af

Total Runoff Area = 8.672 ac Runoff Volume = 0.108 af Average Runoff Depth = 0.15"
100.00% Pervious = 8.672 ac 0.00% Impervious = 0.000 ac

CJE1927r0 existing-proposed

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MSE 24-hr 3 1 year Rainfall=2.40"

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Summary for Subcatchment 5S: EXISTING SUB. 5

Runoff = 0.30 cfs @ 12.32 hrs, Volume= 0.040 af, Depth> 0.15"

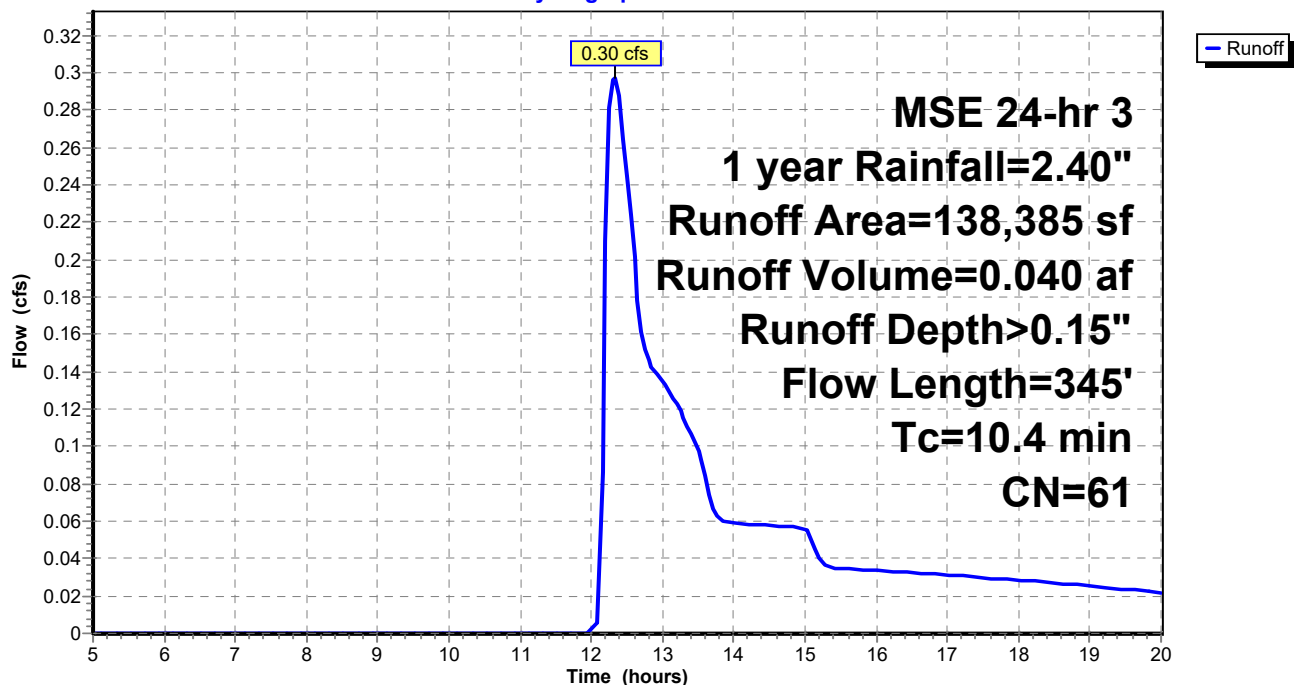
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1 year Rainfall=2.40"

Area (sf)	CN	Description
138,385	61	>75% Grass cover, Good, HSG B
138,385		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0290	0.18		Sheet Flow, D-E Grass: Short n= 0.150 P2= 2.70"
1.2	245	0.0429	3.33		Shallow Concentrated Flow, E-F Unpaved Kv= 16.1 fps
10.4	345	Total			

Subcatchment 5S: EXISTING SUB. 5

Hydrograph



CJE1927r0 existing-proposed

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MSE 24-hr 3 1 year Rainfall=2.40"

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Summary for Subcatchment 10S: EXISTING SUB. 4

Runoff = 0.51 cfs @ 12.32 hrs, Volume= 0.068 af, Depth> 0.15"

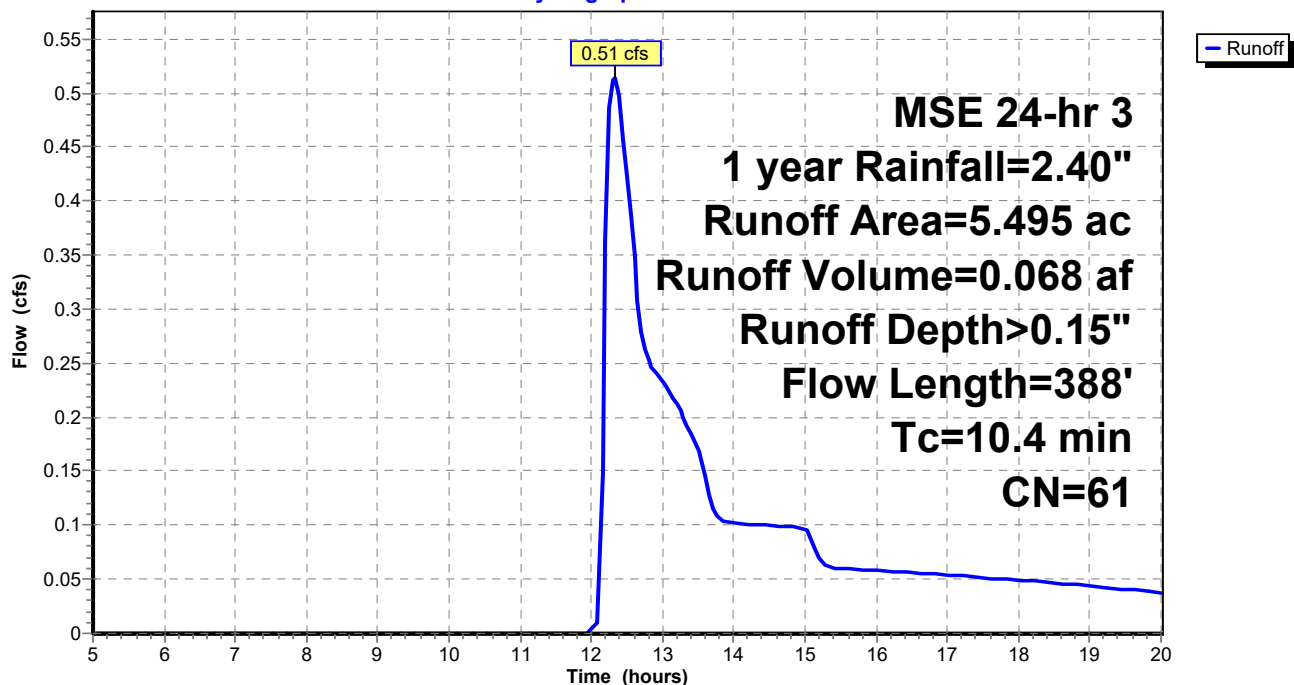
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1 year Rainfall=2.40"

Area (ac)	CN	Description
5.495	61	>75% Grass cover, Good, HSG B
5.495		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0400	0.21		Sheet Flow, A-B Grass: Short n= 0.150 P2= 2.70"
2.3	288	0.0174	2.12		Shallow Concentrated Flow, B-C Unpaved Kv= 16.1 fps
10.4	388	Total			

Subcatchment 10S: EXISTING SUB. 4

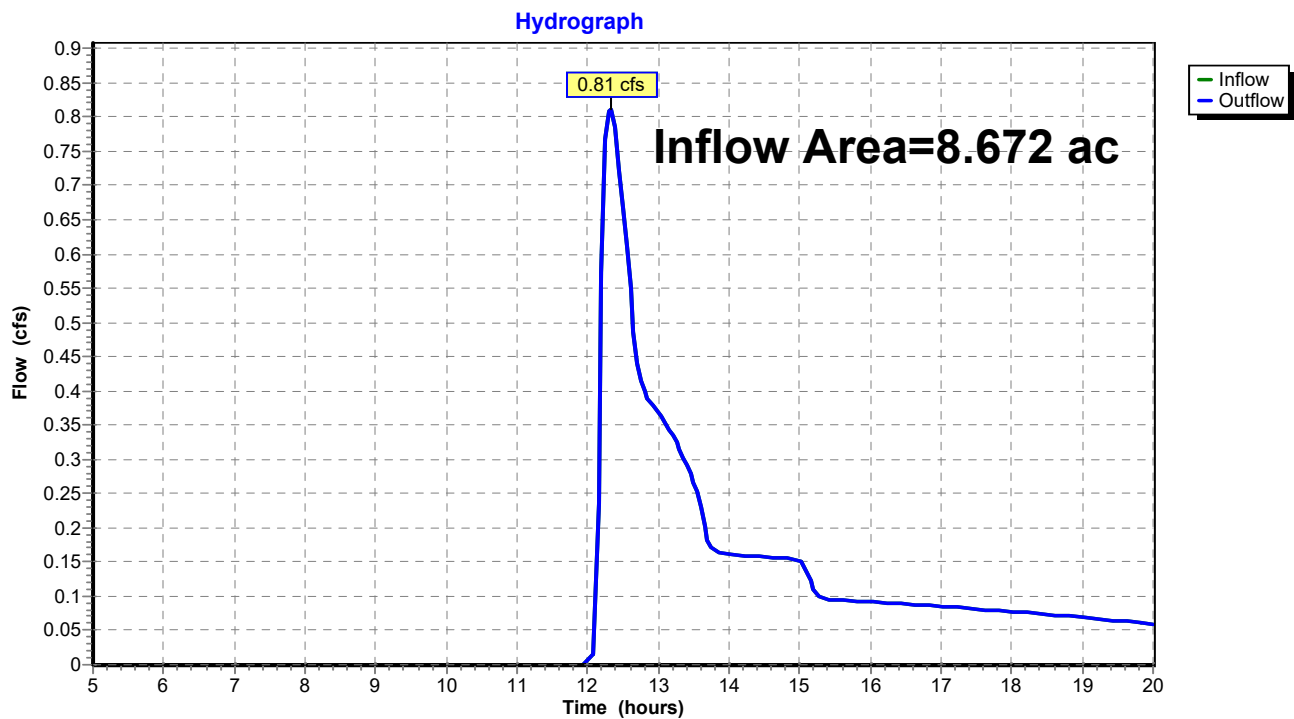
Hydrograph



Summary for Reach 7R: Total Existing Runoff

Inflow Area = 8.672 ac, 0.00% Impervious, Inflow Depth > 0.15" for 1 year event
Inflow = 0.81 cfs @ 12.32 hrs, Volume= 0.108 af
Outflow = 0.81 cfs @ 12.32 hrs, Volume= 0.108 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 7R: Total Existing Runoff

CJE1927r0 existing-proposed*MSE 24-hr 3 2 year Rainfall=2.70"*

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 5S: EXISTING SUB. 5Runoff Area=138,385 sf 0.00% Impervious Runoff Depth>0.23"
Flow Length=345' Tc=10.4 min CN=61 Runoff=0.65 cfs 0.062 af**Subcatchment 10S: EXISTING SUB. 4**Runoff Area=5.495 ac 0.00% Impervious Runoff Depth>0.23"
Flow Length=388' Tc=10.4 min CN=61 Runoff=1.12 cfs 0.107 af**Reach 7R: Total Existing Runoff**Inflow=1.76 cfs 0.169 af
Outflow=1.76 cfs 0.169 af**Total Runoff Area = 8.672 ac Runoff Volume = 0.169 af Average Runoff Depth = 0.23"**
100.00% Pervious = 8.672 ac 0.00% Impervious = 0.000 ac

CJE1927r0 existing-proposed

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MSE 24-hr 3 2 year Rainfall=2.70"

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Summary for Subcatchment 5S: EXISTING SUB. 5

Runoff = 0.65 cfs @ 12.25 hrs, Volume= 0.062 af, Depth> 0.23"

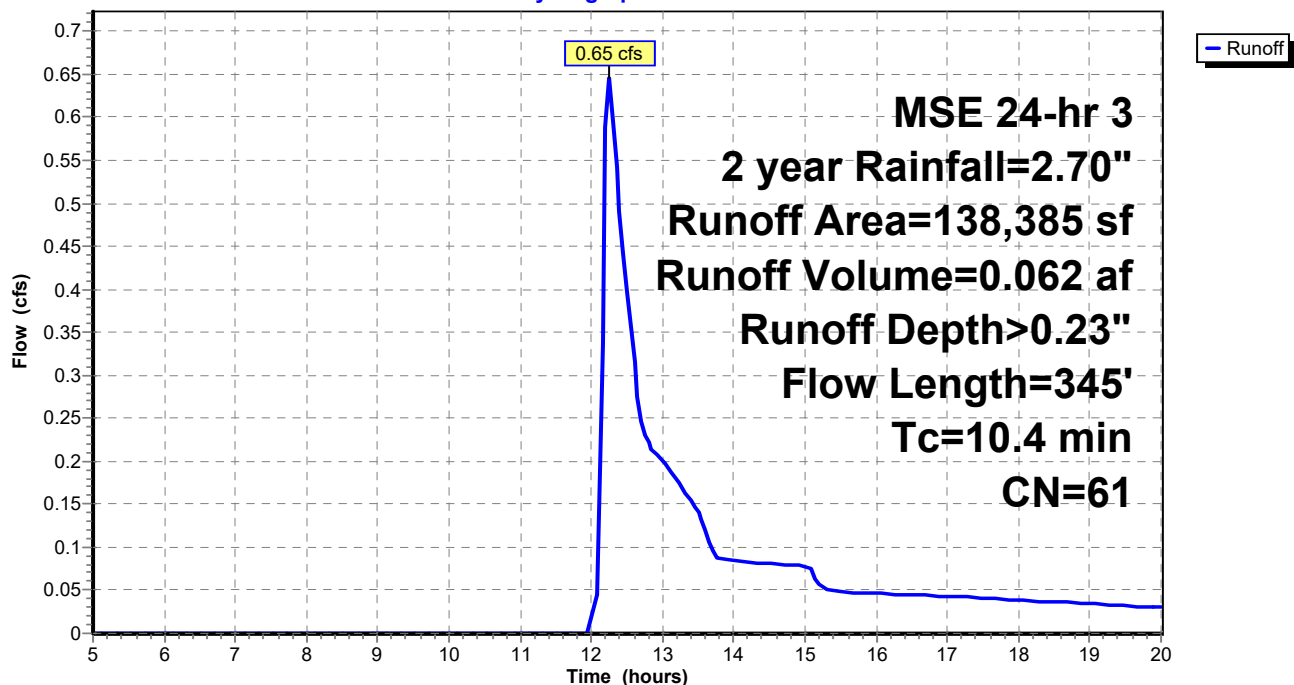
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2 year Rainfall=2.70"

Area (sf)	CN	Description
138,385	61	>75% Grass cover, Good, HSG B
138,385		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0290	0.18		Sheet Flow, D-E Grass: Short n= 0.150 P2= 2.70"
1.2	245	0.0429	3.33		Shallow Concentrated Flow, E-F Unpaved Kv= 16.1 fps
10.4	345	Total			

Subcatchment 5S: EXISTING SUB. 5

Hydrograph



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MSE 24-hr 3 2 year Rainfall=2.70"

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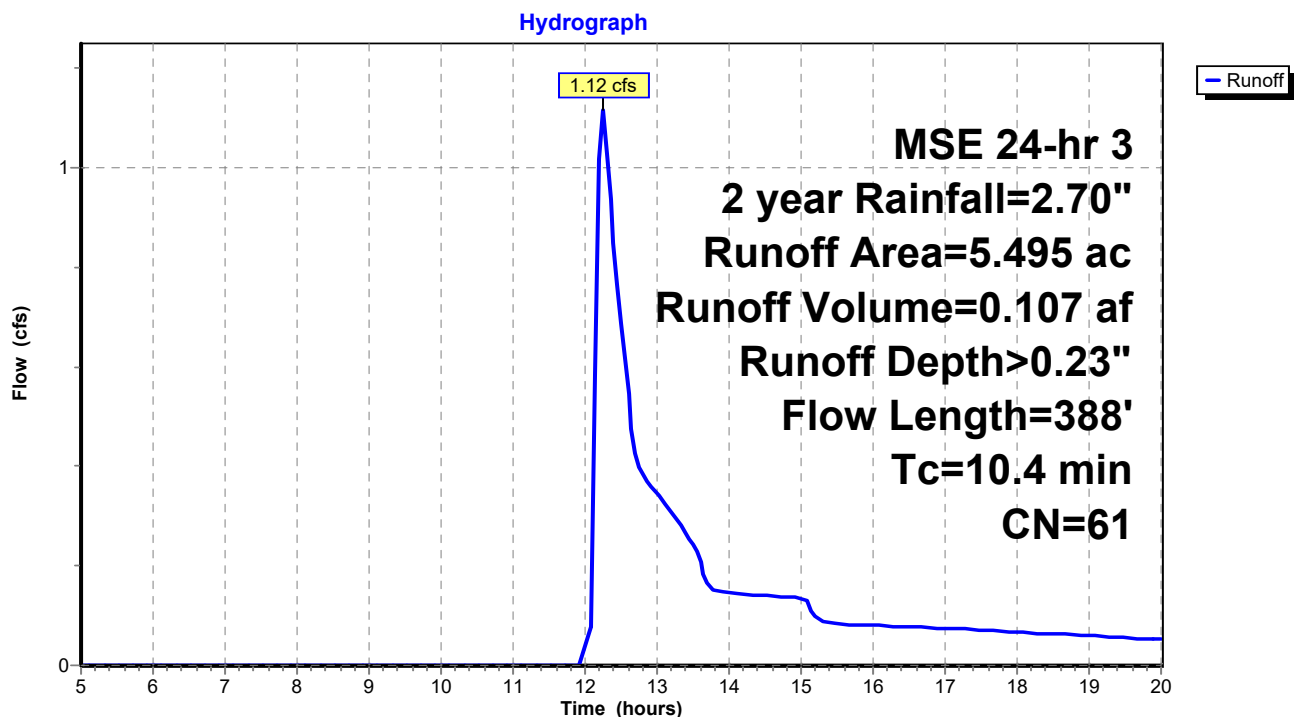
Summary for Subcatchment 10S: EXISTING SUB. 4

Runoff = 1.12 cfs @ 12.25 hrs, Volume= 0.107 af, Depth> 0.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2 year Rainfall=2.70"

Area (ac)	CN	Description
5.495	61	>75% Grass cover, Good, HSG B
5.495		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0400	0.21		Sheet Flow, A-B Grass: Short n= 0.150 P2= 2.70"
2.3	288	0.0174	2.12		Shallow Concentrated Flow, B-C Unpaved Kv= 16.1 fps
10.4	388	Total			

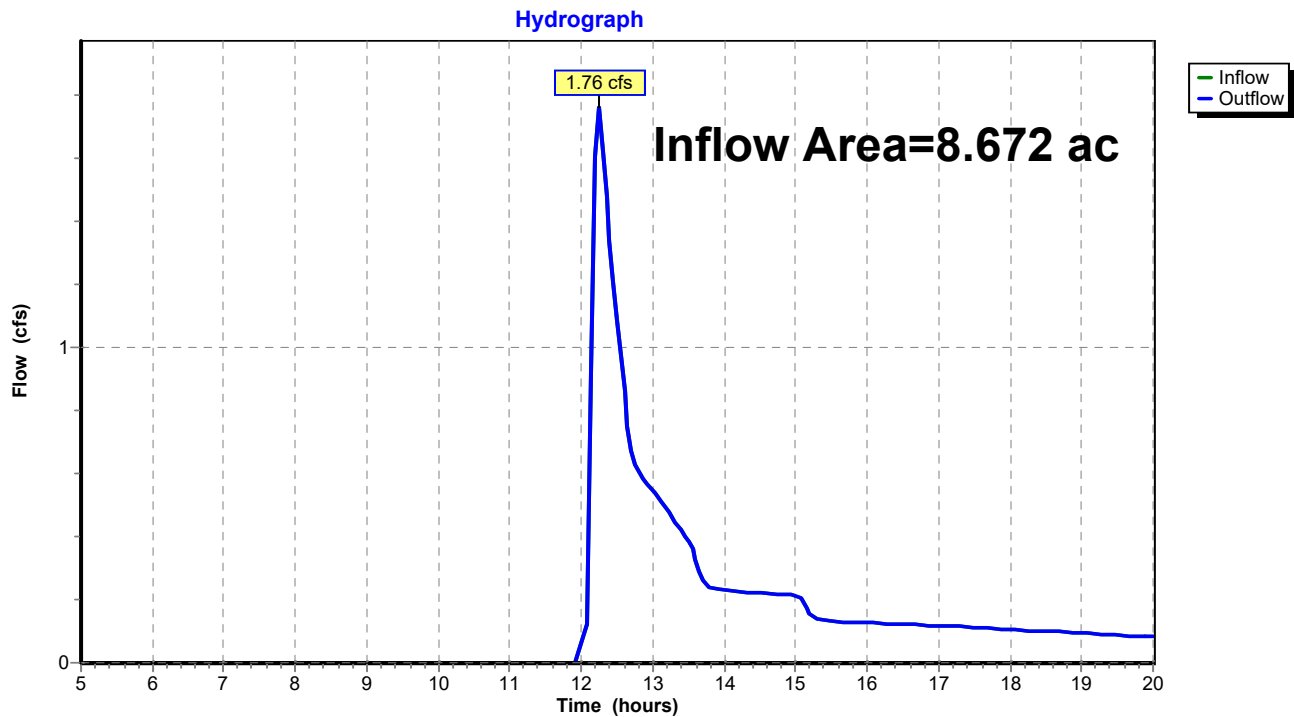
Subcatchment 10S: EXISTING SUB. 4

Summary for Reach 7R: Total Existing Runoff

Inflow Area = 8.672 ac, 0.00% Impervious, Inflow Depth > 0.23" for 2 year event
 Inflow = 1.76 cfs @ 12.25 hrs, Volume= 0.169 af
 Outflow = 1.76 cfs @ 12.25 hrs, Volume= 0.169 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 7R: Total Existing Runoff



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MSE 24-hr 3 10 year Rainfall=3.81"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 5S: EXISTING SUB. 5

Runoff Area=138,385 sf 0.00% Impervious Runoff Depth>0.67"
Flow Length=345' Tc=10.4 min CN=61 Runoff=2.90 cfs 0.177 af

Subcatchment 10S: EXISTING SUB. 4

Runoff Area=5.495 ac 0.00% Impervious Runoff Depth>0.67"
Flow Length=388' Tc=10.4 min CN=61 Runoff=5.02 cfs 0.306 af

Reach 7R: Total Existing Runoff

Inflow=7.92 cfs 0.482 af
Outflow=7.92 cfs 0.482 af

Total Runoff Area = 8.672 ac Runoff Volume = 0.482 af Average Runoff Depth = 0.67"
100.00% Pervious = 8.672 ac 0.00% Impervious = 0.000 ac

CJE1927r0 existing-proposed

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MSE 24-hr 3 10 year Rainfall=3.81"

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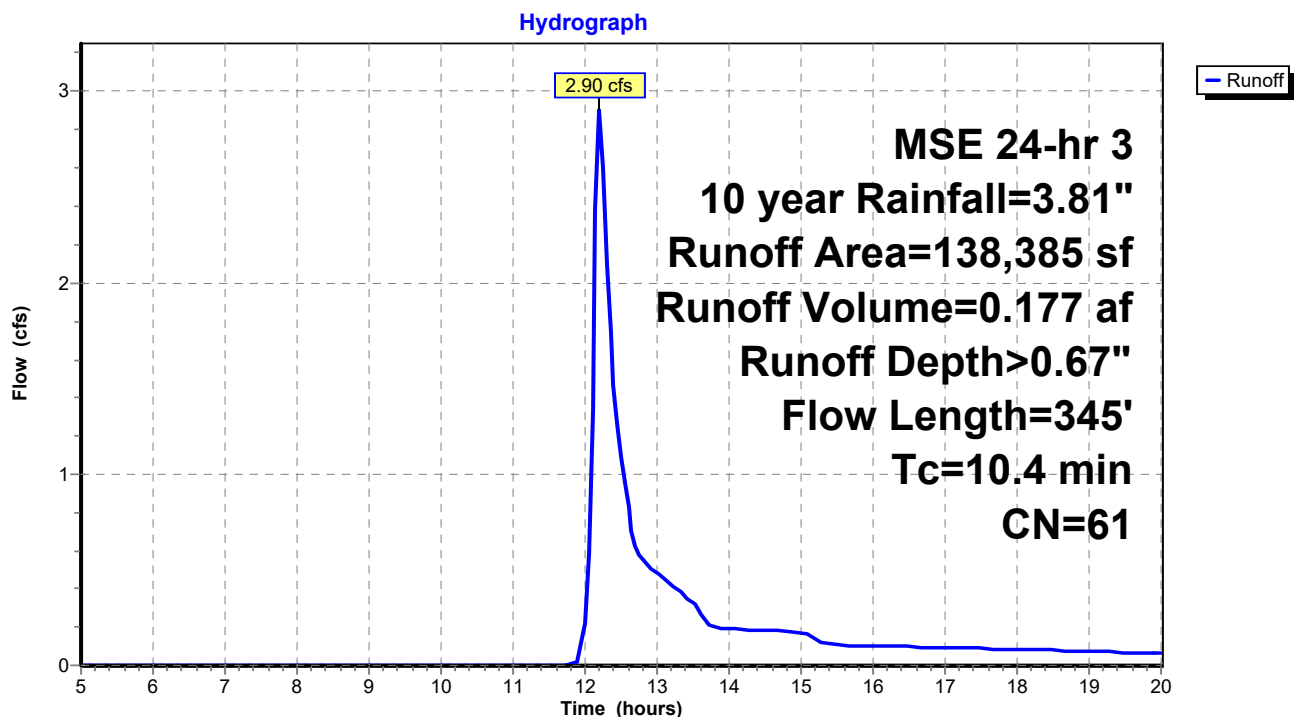
Summary for Subcatchment 5S: EXISTING SUB. 5

Runoff = 2.90 cfs @ 12.21 hrs, Volume= 0.177 af, Depth> 0.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10 year Rainfall=3.81"

Area (sf)	CN	Description
138,385	61	>75% Grass cover, Good, HSG B
138,385		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0290	0.18		Sheet Flow, D-E Grass: Short n= 0.150 P2= 2.70"
1.2	245	0.0429	3.33		Shallow Concentrated Flow, E-F Unpaved Kv= 16.1 fps
10.4	345	Total			

Subcatchment 5S: EXISTING SUB. 5

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MSE 24-hr 3 10 year Rainfall=3.81"

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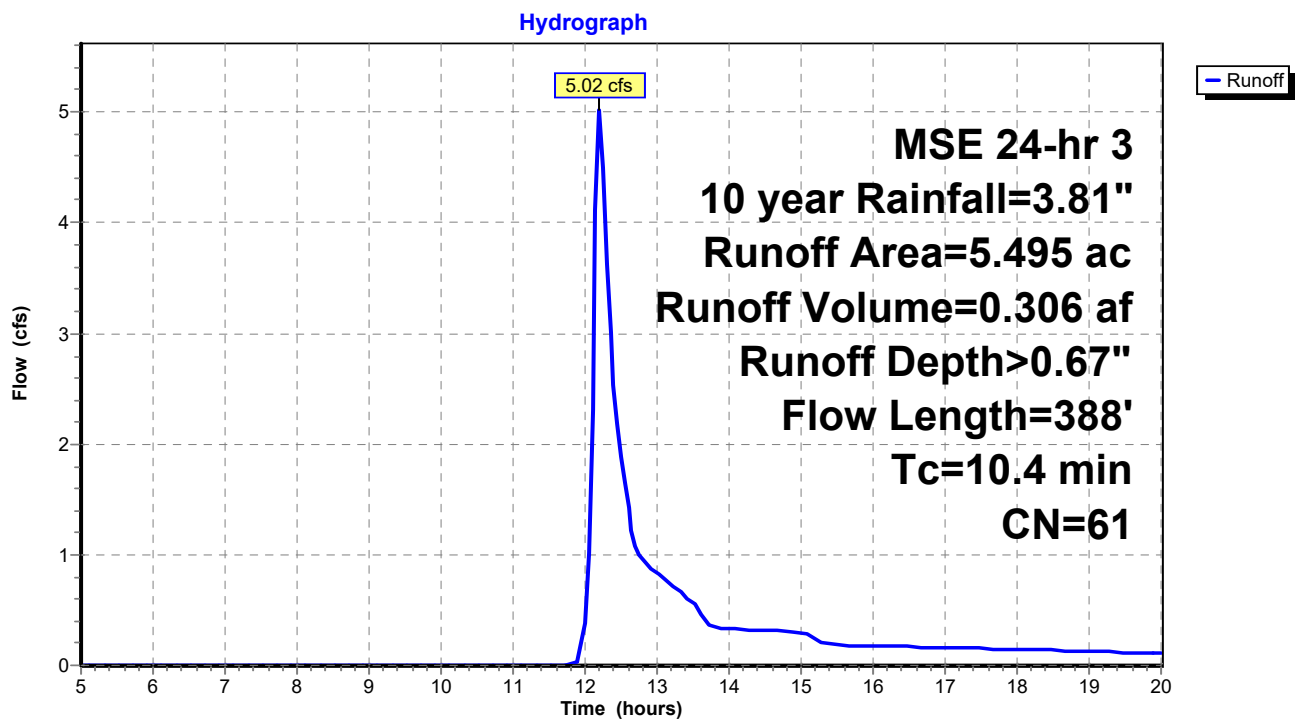
Summary for Subcatchment 10S: EXISTING SUB. 4

Runoff = 5.02 cfs @ 12.21 hrs, Volume= 0.306 af, Depth> 0.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10 year Rainfall=3.81"

Area (ac)	CN	Description
5.495	61	>75% Grass cover, Good, HSG B
5.495		100.00% Pervious Area

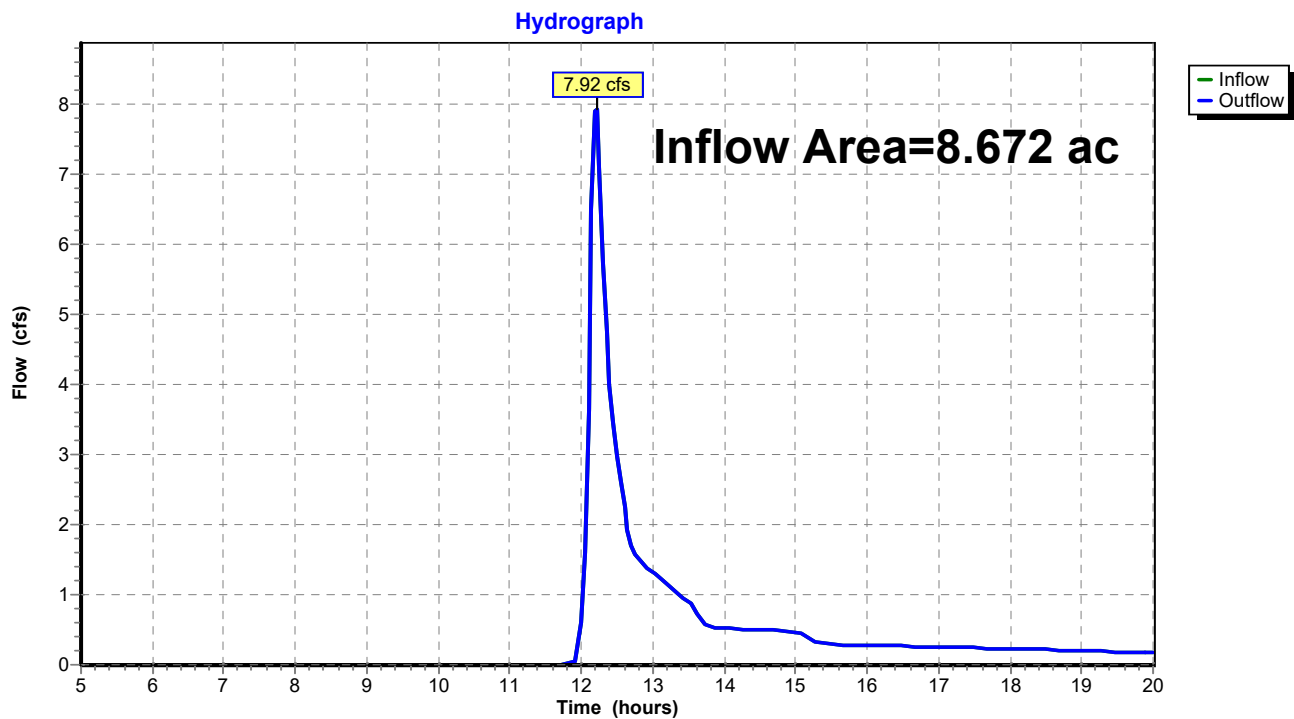
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0400	0.21		Sheet Flow, A-B Grass: Short n= 0.150 P2= 2.70"
2.3	288	0.0174	2.12		Shallow Concentrated Flow, B-C Unpaved Kv= 16.1 fps
10.4	388	Total			

Subcatchment 10S: EXISTING SUB. 4

Summary for Reach 7R: Total Existing Runoff

Inflow Area = 8.672 ac, 0.00% Impervious, Inflow Depth > 0.67" for 10 year event
Inflow = 7.92 cfs @ 12.21 hrs, Volume= 0.482 af
Outflow = 7.92 cfs @ 12.21 hrs, Volume= 0.482 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 7R: Total Existing Runoff

CJE1927r0 existing-proposed*MSE 24-hr 3 100 year Rainfall=6.18"*

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 5S: EXISTING SUB. 5

Runoff Area=138,385 sf 0.00% Impervious Runoff Depth>2.01"
Flow Length=345' Tc=10.4 min CN=61 Runoff=9.93 cfs 0.533 af

Subcatchment 10S: EXISTING SUB. 4

Runoff Area=5.495 ac 0.00% Impervious Runoff Depth>2.01"
Flow Length=388' Tc=10.4 min CN=61 Runoff=17.18 cfs 0.921 af

Reach 7R: Total Existing Runoff

Inflow=27.11 cfs 1.454 af
Outflow=27.11 cfs 1.454 af

Total Runoff Area = 8.672 ac Runoff Volume = 1.454 af Average Runoff Depth = 2.01"
100.00% Pervious = 8.672 ac 0.00% Impervious = 0.000 ac

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MSE 24-hr 3 100 year Rainfall=6.18"

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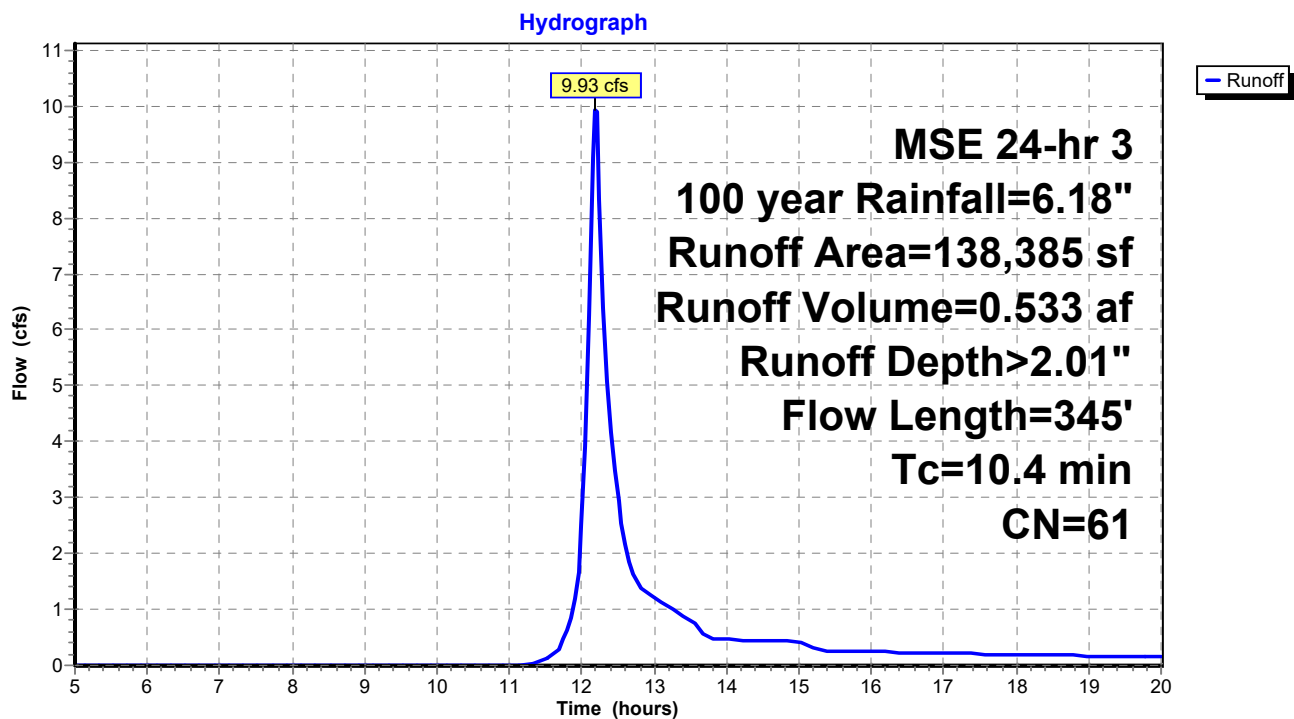
Summary for Subcatchment 5S: EXISTING SUB. 5

Runoff = 9.93 cfs @ 12.19 hrs, Volume= 0.533 af, Depth> 2.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100 year Rainfall=6.18"

Area (sf)	CN	Description
138,385	61	>75% Grass cover, Good, HSG B
138,385		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0290	0.18		Sheet Flow, D-E Grass: Short n= 0.150 P2= 2.70"
1.2	245	0.0429	3.33		Shallow Concentrated Flow, E-F Unpaved Kv= 16.1 fps
10.4	345	Total			

Subcatchment 5S: EXISTING SUB. 5

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MSE 24-hr 3 100 year Rainfall=6.18"

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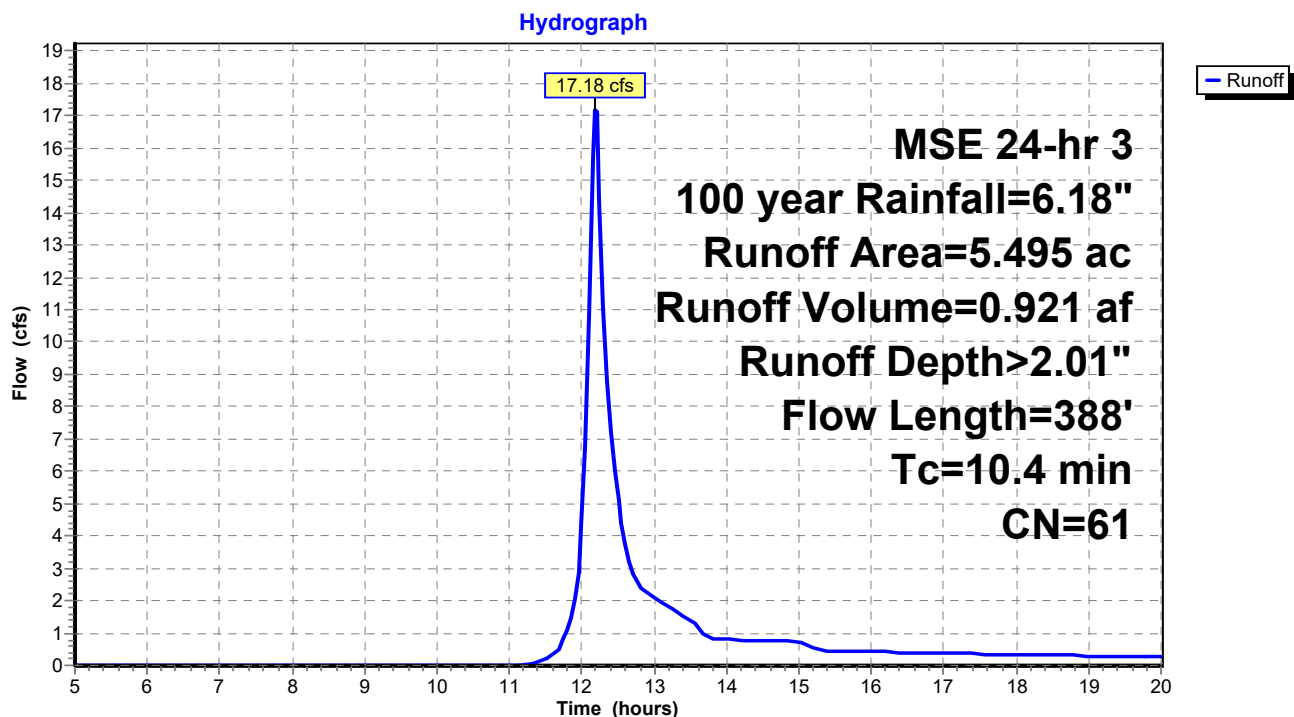
Summary for Subcatchment 10S: EXISTING SUB. 4

Runoff = 17.18 cfs @ 12.19 hrs, Volume= 0.921 af, Depth> 2.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100 year Rainfall=6.18"

Area (ac)	CN	Description
5.495	61	>75% Grass cover, Good, HSG B
5.495		100.00% Pervious Area

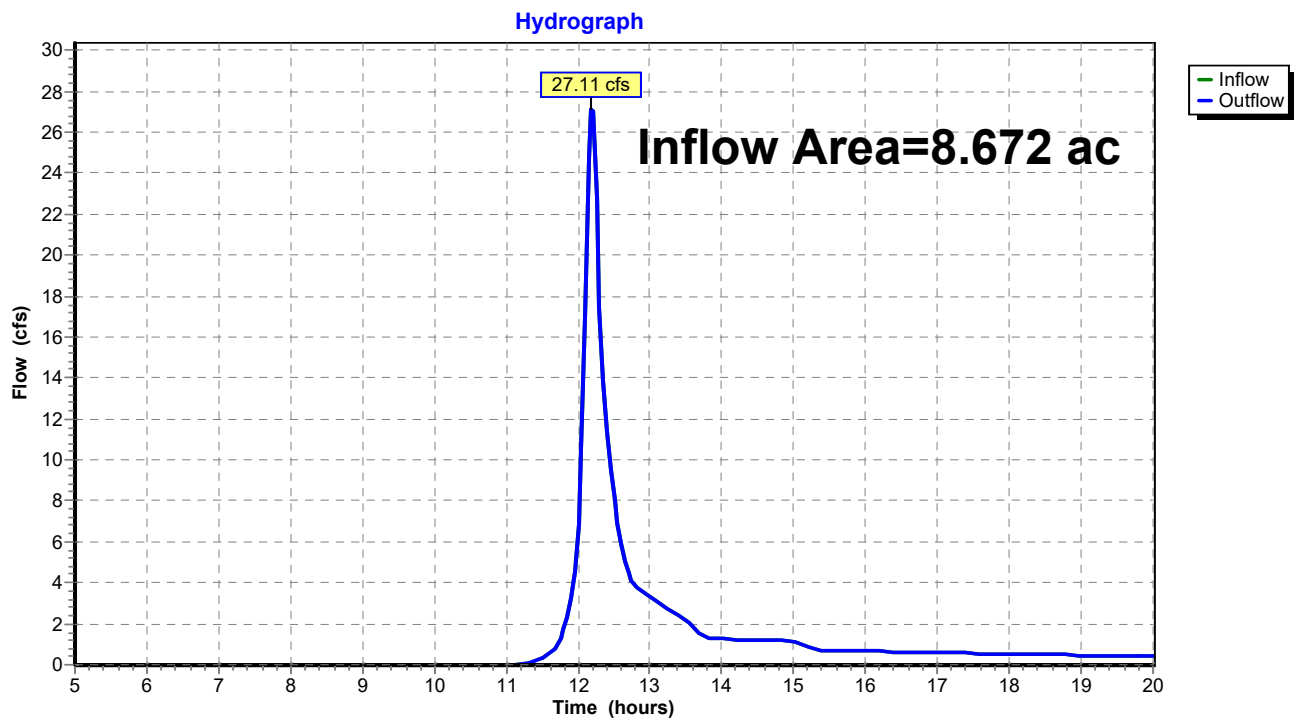
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0400	0.21		Sheet Flow, A-B Grass: Short n= 0.150 P2= 2.70"
2.3	288	0.0174	2.12		Shallow Concentrated Flow, B-C Unpaved Kv= 16.1 fps
10.4	388	Total			

Subcatchment 10S: EXISTING SUB. 4

Summary for Reach 7R: Total Existing Runoff

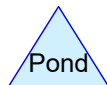
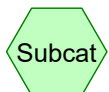
Inflow Area = 8.672 ac, 0.00% Impervious, Inflow Depth > 2.01" for 100 year event
Inflow = 27.11 cfs @ 12.19 hrs, Volume= 1.454 af
Outflow = 27.11 cfs @ 12.19 hrs, Volume= 1.454 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 7R: Total Existing Runoff



Existing Area as a part
of the Regional P1 & P6
Subcatchments



Routing Diagram for CJE1927r0 existing-proposed
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CJE1927r0 existing-proposed

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.890	93	>75% Grass cover, Good, HSG B (4S)
2.890	93	TOTAL AREA

CJE1927r0 existing-proposed

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Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
2.890	HSG B	4S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
2.890		TOTAL AREA

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Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	2.890	0.000	0.000	0.000	2.890	>75% Grass cover, Good	4S
0.000	2.890	0.000	0.000	0.000	2.890	TOTAL AREA	

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MSE 24-hr 3 1 year Rainfall=2.40"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Existing Area as a part Runoff Area=125,897 sf 0.00% Impervious Runoff Depth>1.63"
Tc=6.0 min CN=93 Runoff=8.39 cfs 0.391 af

Total Runoff Area = 2.890 ac Runoff Volume = 0.391 af Average Runoff Depth = 1.63"
100.00% Pervious = 2.890 ac 0.00% Impervious = 0.000 ac

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MSE 24-hr 3 1 year Rainfall=2.40"

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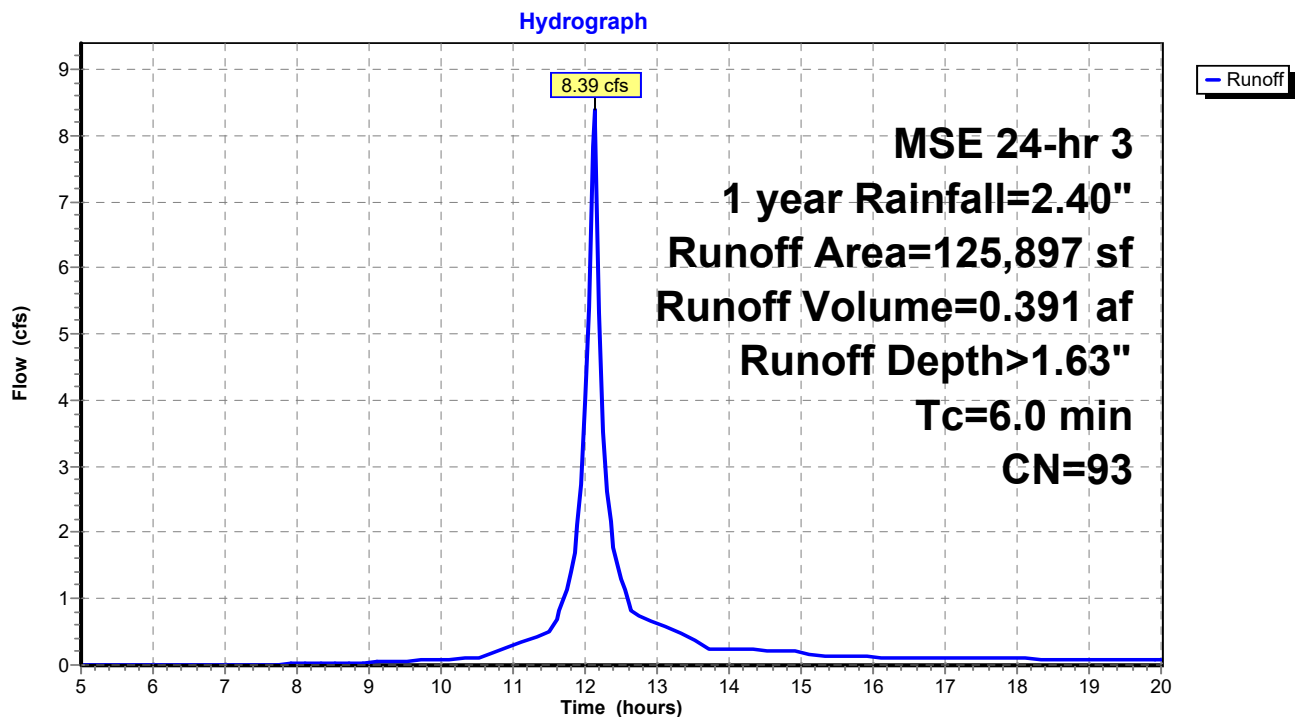
Summary for Subcatchment 4S: Existing Area as a part of the Regional P1 & P6 Subcatchments

Runoff = 8.39 cfs @ 12.13 hrs, Volume= 0.391 af, Depth> 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1 year Rainfall=2.40"

Area (sf)	CN	Description
* 125,897	93	>75% Grass cover, Good, HSG B
125,897		100.00% Pervious Area

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

Subcatchment 4S: Existing Area as a part of the Regional P1 & P6 Subcatchments

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MSE 24-hr 3 2 year Rainfall=2.70"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Existing Area as a part Runoff Area=125,897 sf 0.00% Impervious Runoff Depth>1.90"
Tc=6.0 min CN=93 Runoff=9.71 cfs 0.458 af

Total Runoff Area = 2.890 ac Runoff Volume = 0.458 af Average Runoff Depth = 1.90"
100.00% Pervious = 2.890 ac 0.00% Impervious = 0.000 ac

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MSE 24-hr 3 2 year Rainfall=2.70"

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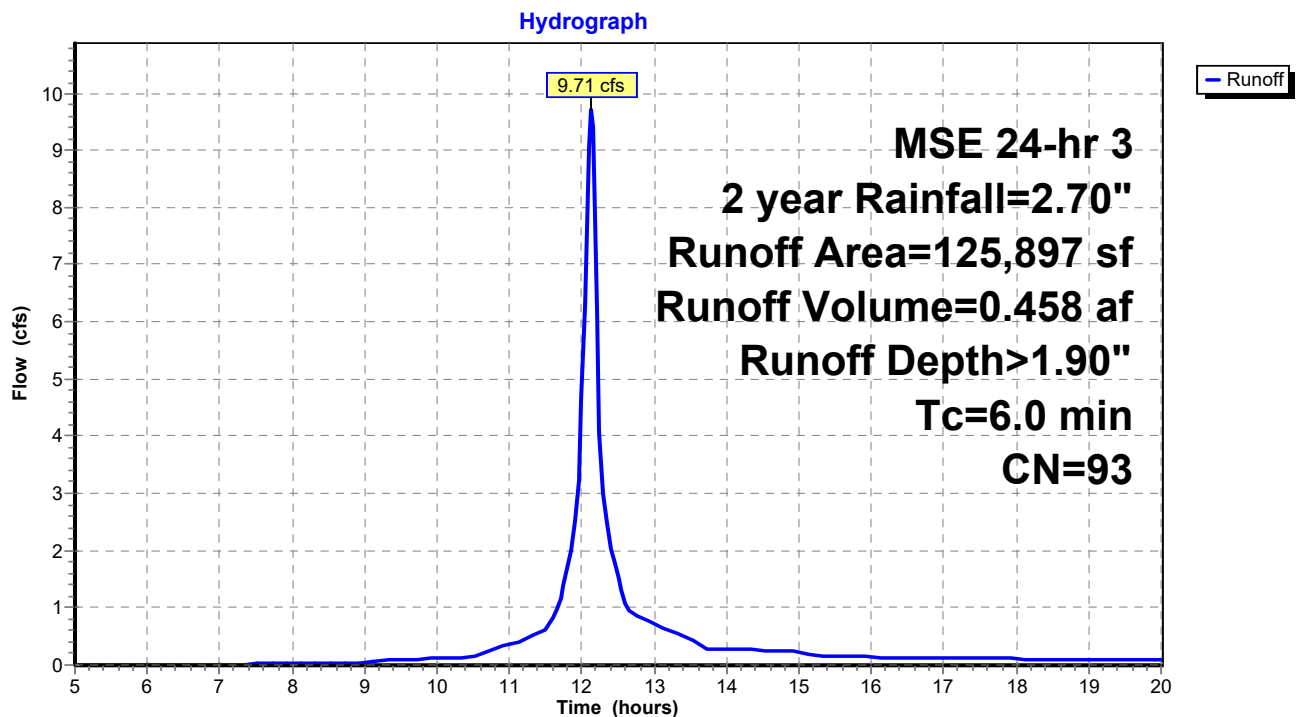
Summary for Subcatchment 4S: Existing Area as a part of the Regional P1 & P6 Subcatchments

Runoff = 9.71 cfs @ 12.13 hrs, Volume= 0.458 af, Depth> 1.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2 year Rainfall=2.70"

Area (sf)	CN	Description
* 125,897	93	>75% Grass cover, Good, HSG B
125,897		100.00% Pervious Area

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

Subcatchment 4S: Existing Area as a part of the Regional P1 & P6 Subcatchments

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MSE 24-hr 3 10 year Rainfall=3.81"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Existing Area as a part Runoff Area=125,897 sf 0.00% Impervious Runoff Depth>2.94"
Tc=6.0 min CN=93 Runoff=14.57 cfs 0.707 af

Total Runoff Area = 2.890 ac Runoff Volume = 0.707 af Average Runoff Depth = 2.94"
100.00% Pervious = 2.890 ac 0.00% Impervious = 0.000 ac

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MSE 24-hr 3 10 year Rainfall=3.81"

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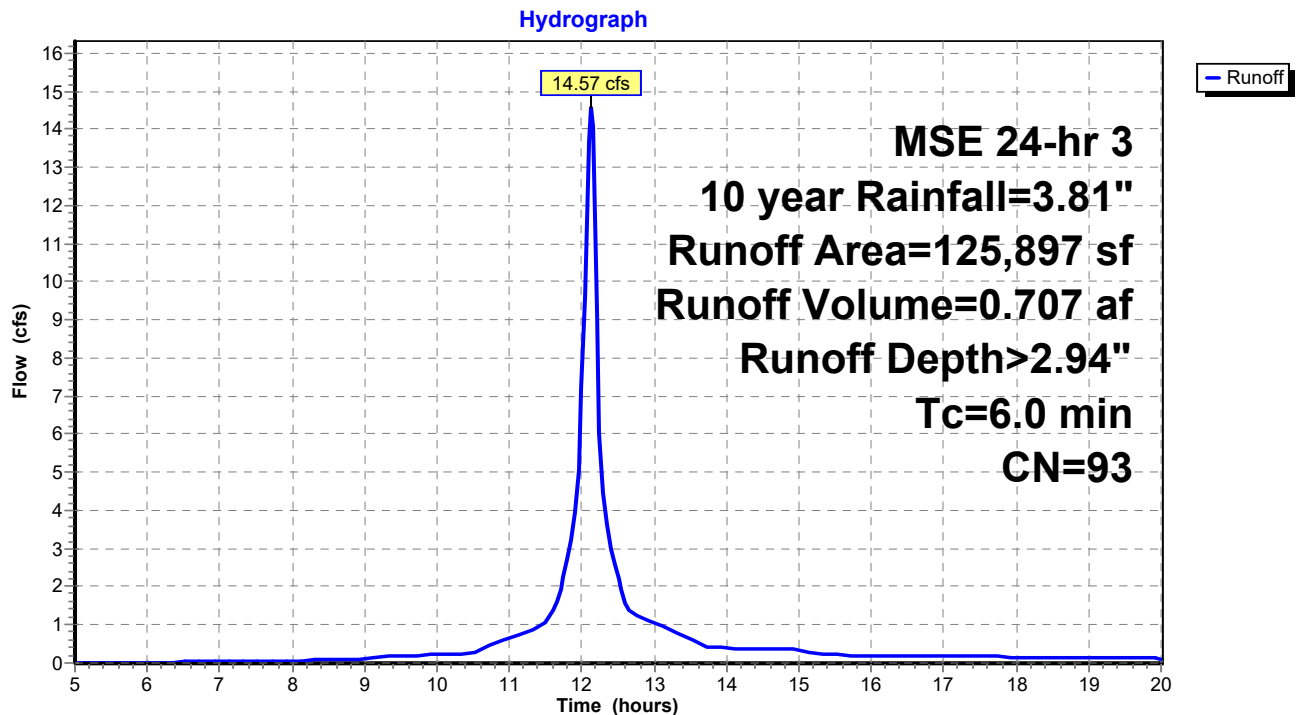
Summary for Subcatchment 4S: Existing Area as a part of the Regional P1 & P6 Subcatchments

Runoff = 14.57 cfs @ 12.13 hrs, Volume= 0.707 af, Depth> 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10 year Rainfall=3.81"

Area (sf)	CN	Description
* 125,897	93	>75% Grass cover, Good, HSG B
125,897		100.00% Pervious Area

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

Subcatchment 4S: Existing Area as a part of the Regional P1 & P6 Subcatchments

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MSE 24-hr 3 100 year Rainfall=6.18"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Existing Area as a part Runoff Area=125,897 sf 0.00% Impervious Runoff Depth>5.19"
Tc=6.0 min CN=93 Runoff=24.79 cfs 1.250 af

Total Runoff Area = 2.890 ac Runoff Volume = 1.250 af Average Runoff Depth = 5.19"
100.00% Pervious = 2.890 ac 0.00% Impervious = 0.000 ac

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MSE 24-hr 3 100 year Rainfall=6.18"

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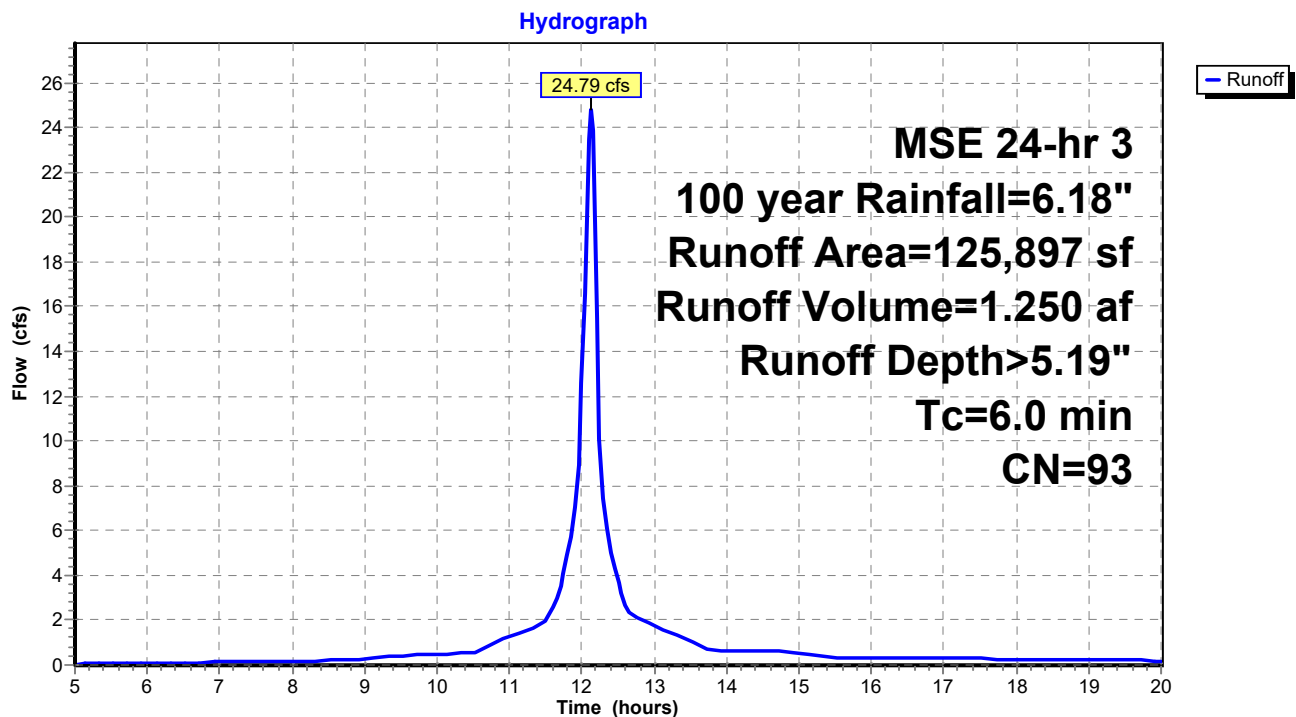
Summary for Subcatchment 4S: Existing Area as a part of the Regional P1 & P6 Subcatchments

Runoff = 24.79 cfs @ 12.13 hrs, Volume= 1.250 af, Depth> 5.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100 year Rainfall=6.18"

Area (sf)	CN	Description
* 125,897	93	>75% Grass cover, Good, HSG B
125,897		100.00% Pervious Area

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

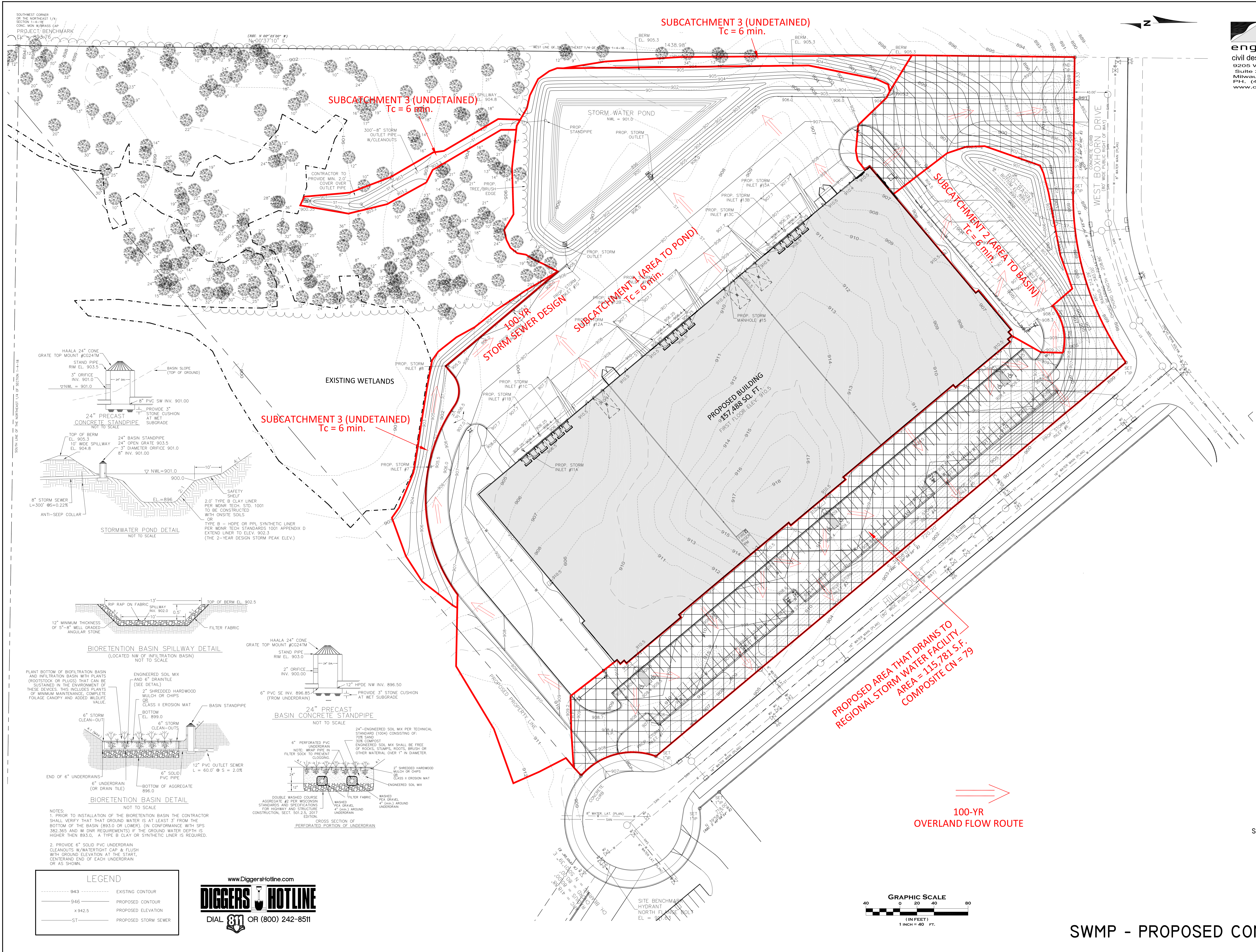
Subcatchment 4S: Existing Area as a part of the Regional P1 & P6 Subcatchments

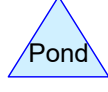
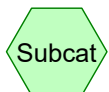
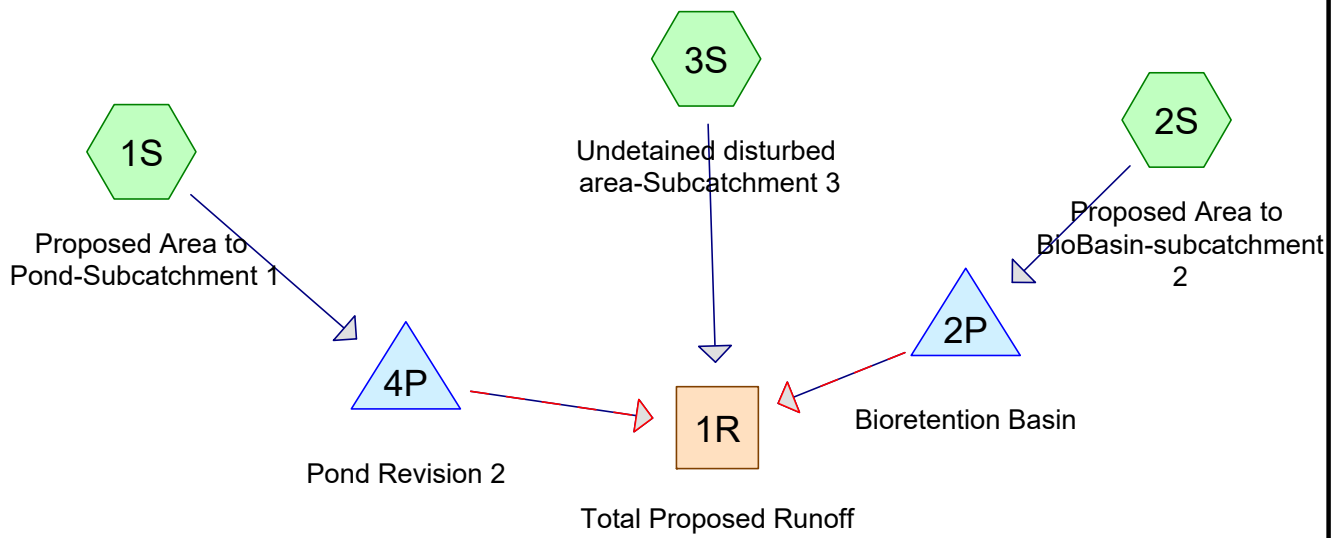
HILL COURT MULTI-TENANT BUILDING

MUKWONAGO, WISCONSIN

CJE NO.: CJE1927R7
AUGUST 6, 2020
SEPTEMBER 15, 2020

SWMP - PROPOSED CONDITIONS





Routing Diagram for CJE1927r0 existing-proposed
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CJE1927r0 existing-proposed

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.163	61	>75% Grass cover, Good, HSG B (1S, 2S, 3S)
0.149	98	Asphalt Drives (2S)
0.181	98	Future Parking (2S)
0.549	98	Pond Surface (1S)
3.615	98	Proposed Building (1S)
2.015	98	Proposed Pavement (1S)
8.672	89	TOTAL AREA

CJE1927r0 existing-proposed

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Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
2.163	HSG B	1S, 2S, 3S
0.000	HSG C	
0.000	HSG D	
6.509	Other	1S, 2S
8.672		TOTAL AREA

CJE1927r0 existing-proposed

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Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	2.163	0.000	0.000	0.000	2.163	>75% Grass cover, Good	1S, 2S, 3S
0.000	0.000	0.000	0.000	0.149	0.149	Asphalt Drives	2S
0.000	0.000	0.000	0.000	0.181	0.181	Future Parking	2S
0.000	0.000	0.000	0.000	0.549	0.549	Pond Surface	1S
0.000	0.000	0.000	0.000	3.615	3.615	Proposed Building	1S
0.000	0.000	0.000	0.000	2.015	2.015	Proposed Pavement	1S
0.000	2.163	0.000	0.000	6.509	8.672	TOTAL AREA	

CJE1927r0 existing-proposed

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MSE 24-hr 3 1 year Rainfall=2.40"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Proposed Area to	Runoff Area=7.546 ac 81.88% Impervious Runoff Depth>1.46" Tc=6.0 min CN=91 Runoff=20.13 cfs 0.919 af
Subcatchment 2S: Proposed Area to	Runoff Area=0.655 ac 50.38% Impervious Runoff Depth>0.78" Tc=6.0 min CN=80 Runoff=0.96 cfs 0.042 af
Subcatchment 3S: Undetained disturbed	Runoff Area=0.471 ac 0.00% Impervious Runoff Depth>0.15" Tc=6.0 min CN=61 Runoff=0.05 cfs 0.006 af
Reach 1R: Total Proposed Runoff	Inflow=0.63 cfs 0.204 af Outflow=0.63 cfs 0.204 af
Pond 2P: Bioretention Basin	Peak Elev=897.36' Storage=662 cf Inflow=0.96 cfs 0.042 af Primary=0.38 cfs 0.032 af Secondary=0.00 cfs 0.000 af Outflow=0.38 cfs 0.032 af
Pond 4P: Pond Revision 2	Peak Elev=902.28' Storage=0.761 af Inflow=20.13 cfs 0.919 af Primary=0.25 cfs 0.166 af Secondary=0.00 cfs 0.000 af Outflow=0.25 cfs 0.166 af
Total Runoff Area = 8.672 ac Runoff Volume = 0.967 af Average Runoff Depth = 1.34" 24.94% Pervious = 2.163 ac 75.06% Impervious = 6.509 ac	

CJE1927r0 existing-proposed

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MSE 24-hr 3 1 year Rainfall=2.40"

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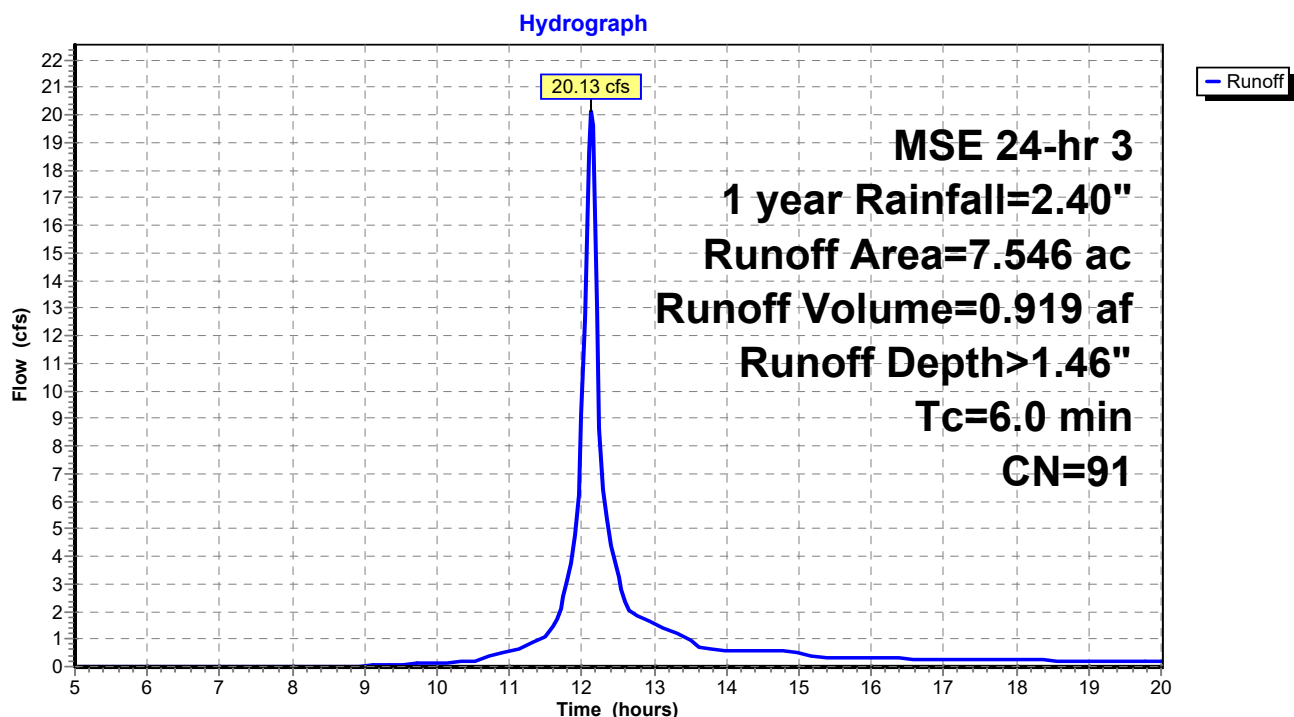
Summary for Subcatchment 1S: Proposed Area to Pond-Subcatchment 1

Runoff = 20.13 cfs @ 12.13 hrs, Volume= 0.919 af, Depth> 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1 year Rainfall=2.40"

Area (ac)	CN	Description
* 3.615	98	Proposed Building
* 2.015	98	Proposed Pavement
1.367	61	>75% Grass cover, Good, HSG B
* 0.549	98	Pond Surface
7.546	91	Weighted Average
1.367		18.12% Pervious Area
6.179		81.88% Impervious Area

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

Subcatchment 1S: Proposed Area to Pond-Subcatchment 1

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MSE 24-hr 3 1 year Rainfall=2.40"

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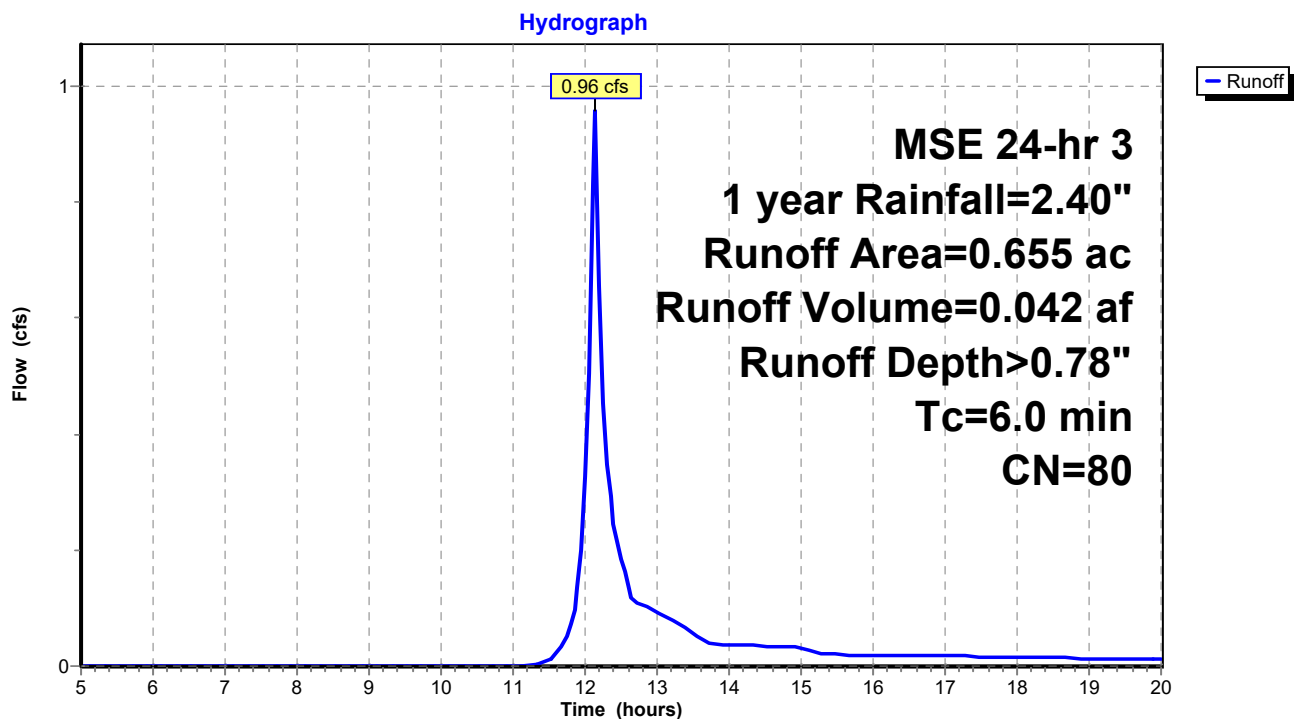
Summary for Subcatchment 2S: Proposed Area to BioBasin-subcatchment 2

Runoff = 0.96 cfs @ 12.14 hrs, Volume= 0.042 af, Depth> 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1 year Rainfall=2.40"

Area (ac)	CN	Description
* 0.149	98	Asphalt Drives
* 0.181	98	Future Parking
0.325	61	>75% Grass cover, Good, HSG B
0.655	80	Weighted Average
0.325		49.62% Pervious Area
0.330		50.38% Impervious Area

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

Subcatchment 2S: Proposed Area to BioBasin-subcatchment 2

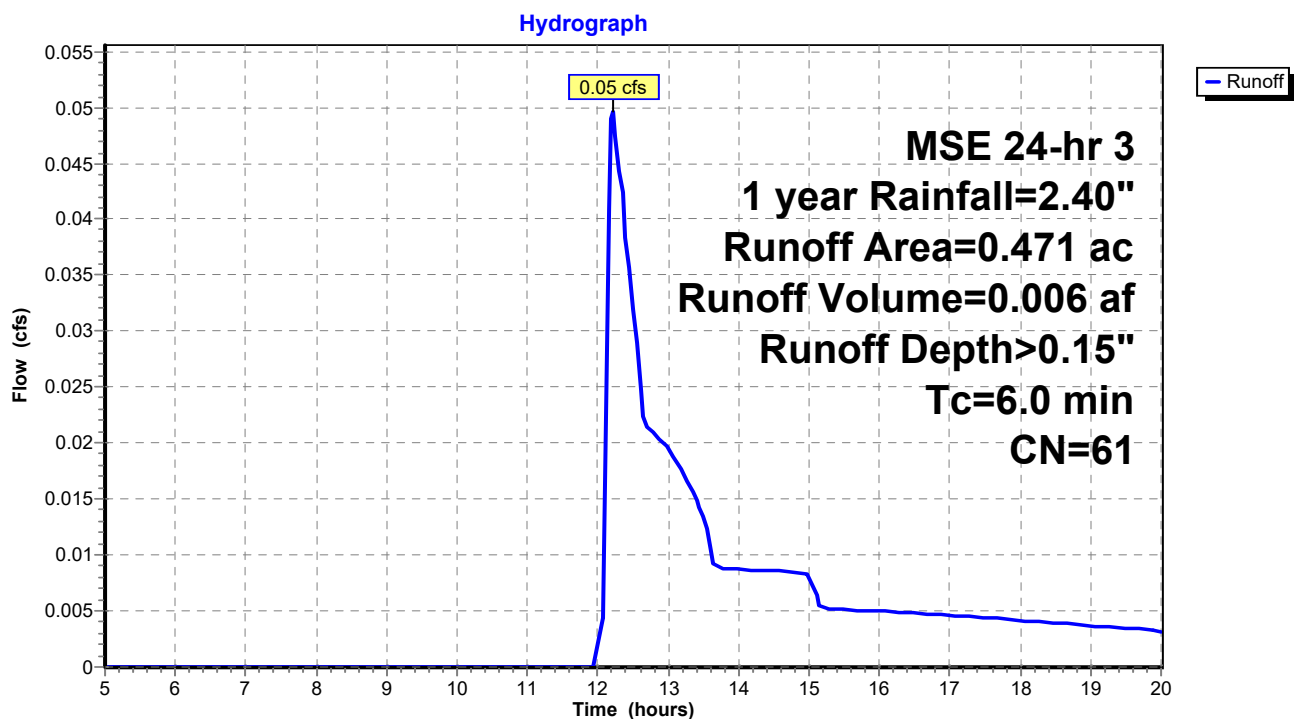
Summary for Subcatchment 3S: Undetained disturbed area-Subcatchment 3

Runoff = 0.05 cfs @ 12.22 hrs, Volume= 0.006 af, Depth> 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1 year Rainfall=2.40"

Area (ac)	CN	Description
0.471	61	>75% Grass cover, Good, HSG B
0.471		100.00% Pervious Area

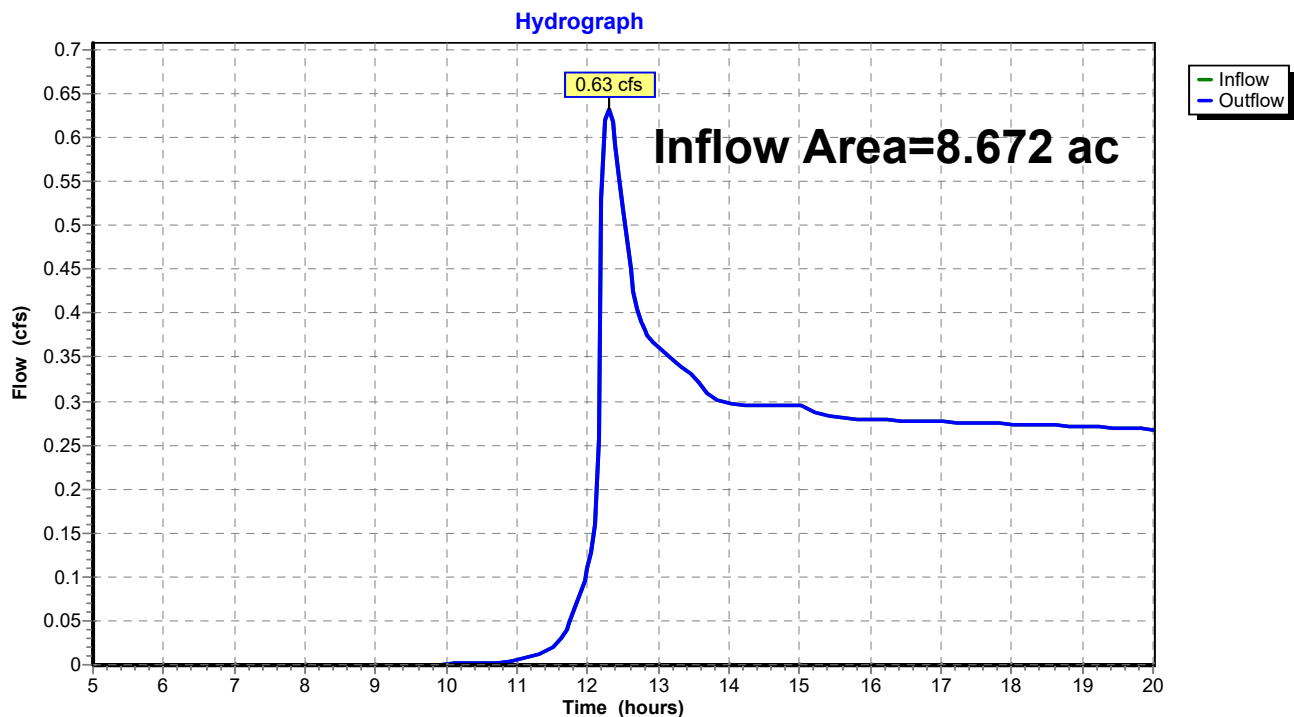
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Direct Entry

Subcatchment 3S: Undetained disturbed area-Subcatchment 3

Summary for Reach 1R: Total Proposed Runoff

Inflow Area = 8.672 ac, 75.06% Impervious, Inflow Depth > 0.28" for 1 year event
Inflow = 0.63 cfs @ 12.30 hrs, Volume= 0.204 af
Outflow = 0.63 cfs @ 12.30 hrs, Volume= 0.204 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 1R: Total Proposed Runoff

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MSE 24-hr 3 1 year Rainfall=2.40"

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Summary for Pond 2P: Bioretention Basin

Inflow Area = 0.655 ac, 50.38% Impervious, Inflow Depth > 0.78" for 1 year event
 Inflow = 0.96 cfs @ 12.14 hrs, Volume= 0.042 af
 Outflow = 0.38 cfs @ 12.29 hrs, Volume= 0.032 af, Atten= 60%, Lag= 9.1 min
 Primary = 0.38 cfs @ 12.29 hrs, Volume= 0.032 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 897.36' @ 12.29 hrs Surf.Area= 1,550 sf Storage= 662 cf

Plug-Flow detention time= 93.9 min calculated for 0.032 af (75% of inflow)
 Center-of-Mass det. time= 36.5 min (836.1 - 799.6)

Volume	Invert	Avail.Storage	Storage Description	
#1	896.00'	14,362 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
896.00	1,550	0.0	0	0
896.01	1,550	33.0	5	5
897.00	1,550	33.0	506	512
897.01	1,550	27.0	4	516
898.99	1,550	27.0	829	1,344
899.00	1,550	100.0	15	1,360
900.00	2,630	100.0	2,090	3,450
901.00	3,890	100.0	3,260	6,710
902.00	5,310	100.0	4,600	11,310
902.50	6,900	100.0	3,053	14,362

Device	Routing	Invert	Outlet Devices
#1	Primary	896.50'	12.0" Round Culvert L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 896.50' / 894.75' S= 0.0292 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	896.85'	6.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 896.85' / 896.75' S= 0.0200 ' /' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 1	900.00'	2.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	901.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	902.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

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Primary OutFlow Max=0.38 cfs @ 12.29 hrs HW=897.36' (Free Discharge)

1=Culvert (Passes 0.38 cfs of 2.26 cfs potential flow)

2=Culvert (Inlet Controls 0.38 cfs @ 1.93 fps)

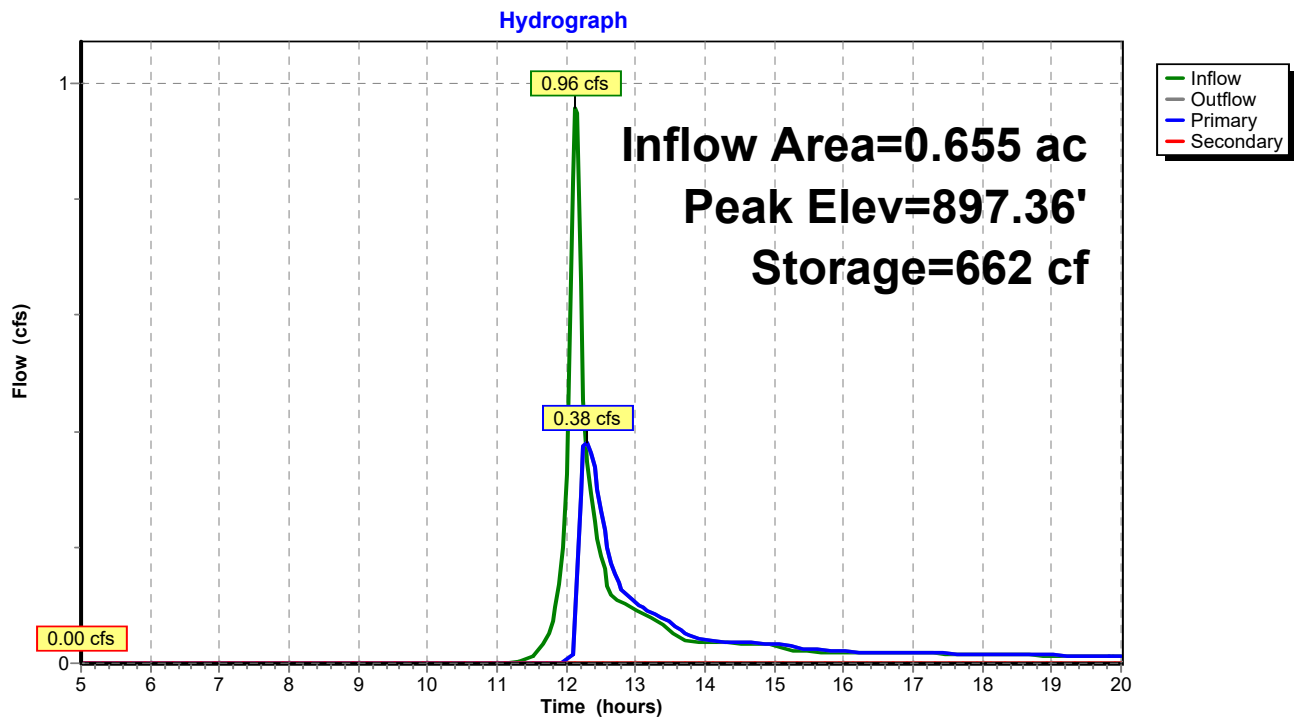
3=Orifice/Grate (Controls 0.00 cfs)

4=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=896.00' (Free Discharge)

5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 2P: Bioretention Basin



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Summary for Pond 4P: Pond Revision 2

Inflow Area = 7.546 ac, 81.88% Impervious, Inflow Depth > 1.46" for 1 year event
 Inflow = 20.13 cfs @ 12.13 hrs, Volume= 0.919 af
 Outflow = 0.25 cfs @ 17.51 hrs, Volume= 0.166 af, Atten= 99%, Lag= 322.9 min
 Primary = 0.25 cfs @ 17.51 hrs, Volume= 0.166 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 902.28' @ 17.51 hrs Surf.Area= 0.642 ac Storage= 0.761 af

Plug-Flow detention time= 276.1 min calculated for 0.166 af (18% of inflow)
 Center-of-Mass det. time= 188.2 min (962.0 - 773.8)

Volume	Invert	Avail.Storage	Storage Description
#1	901.00'	3.137 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
901.00	0.549	0.000	0.000
902.00	0.618	0.584	0.584
903.00	0.703	0.661	1.244
904.00	0.800	0.752	1.996
905.00	0.894	0.847	2.843
905.30	1.069	0.294	3.137

Device	Routing	Invert	Outlet Devices
#1	Primary	901.00'	8.0" Round Culvert L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 901.00' / 900.35' S= 0.0022 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	901.00'	3.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	903.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	904.80'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

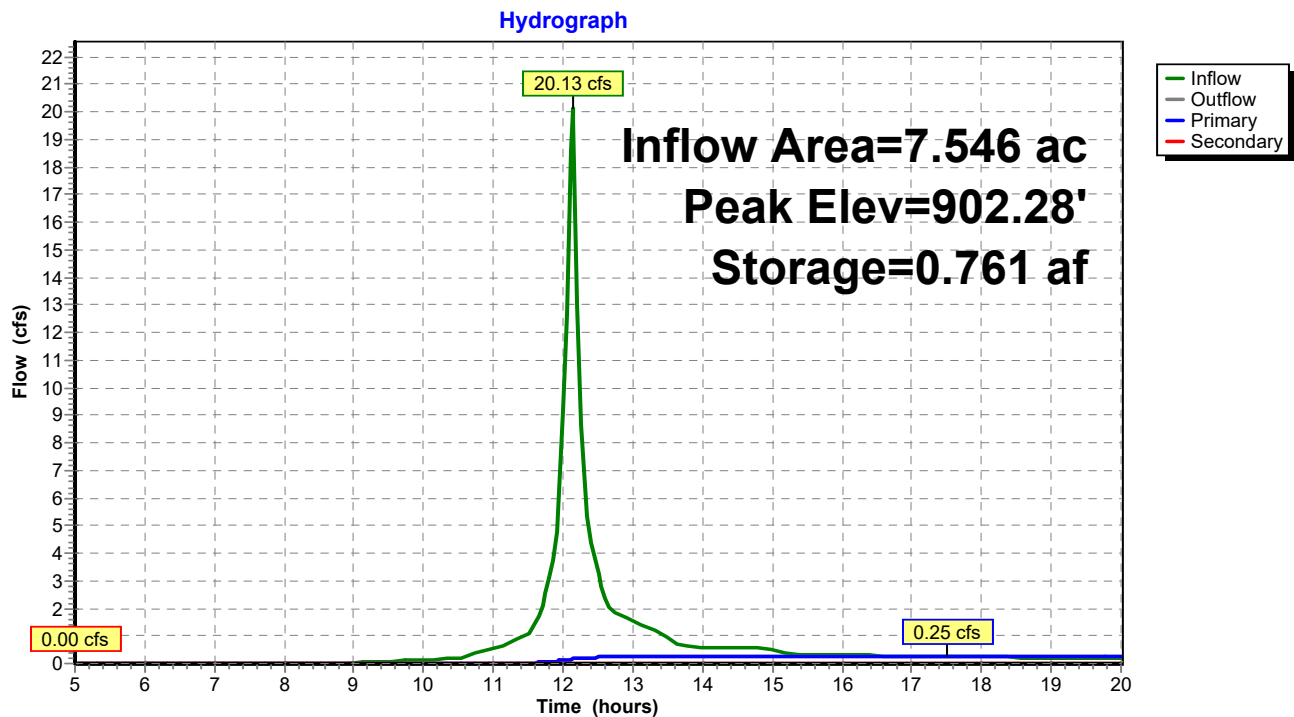
Primary OutFlow Max=0.25 cfs @ 17.51 hrs HW=902.28' (Free Discharge)

↑ **1=Culvert** (Passes 0.25 cfs of 0.75 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.25 cfs @ 5.18 fps)
 ↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=901.00' (Free Discharge)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: Pond Revision 2



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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Proposed Area to	Runoff Area=7.546 ac 81.88% Impervious Runoff Depth>1.73" Tc=6.0 min CN=91 Runoff=23.57 cfs 1.086 af
Subcatchment 2S: Proposed Area to	Runoff Area=0.655 ac 50.38% Impervious Runoff Depth>0.98" Tc=6.0 min CN=80 Runoff=1.21 cfs 0.053 af
Subcatchment 3S: Undetained disturbed	Runoff Area=0.471 ac 0.00% Impervious Runoff Depth>0.24" Tc=6.0 min CN=61 Runoff=0.12 cfs 0.009 af
Reach 1R: Total Proposed Runoff	Inflow=0.87 cfs 0.235 af Outflow=0.87 cfs 0.235 af
Pond 2P: Bioretention Basin	Peak Elev=897.65' Storage=784 cf Inflow=1.21 cfs 0.053 af Primary=0.55 cfs 0.043 af Secondary=0.00 cfs 0.000 af Outflow=0.55 cfs 0.043 af
Pond 4P: Pond Revision 2	Peak Elev=902.51' Storage=0.909 af Inflow=23.57 cfs 1.086 af Primary=0.28 cfs 0.183 af Secondary=0.00 cfs 0.000 af Outflow=0.28 cfs 0.183 af
Total Runoff Area = 8.672 ac Runoff Volume = 1.149 af Average Runoff Depth = 1.59" 24.94% Pervious = 2.163 ac 75.06% Impervious = 6.509 ac	

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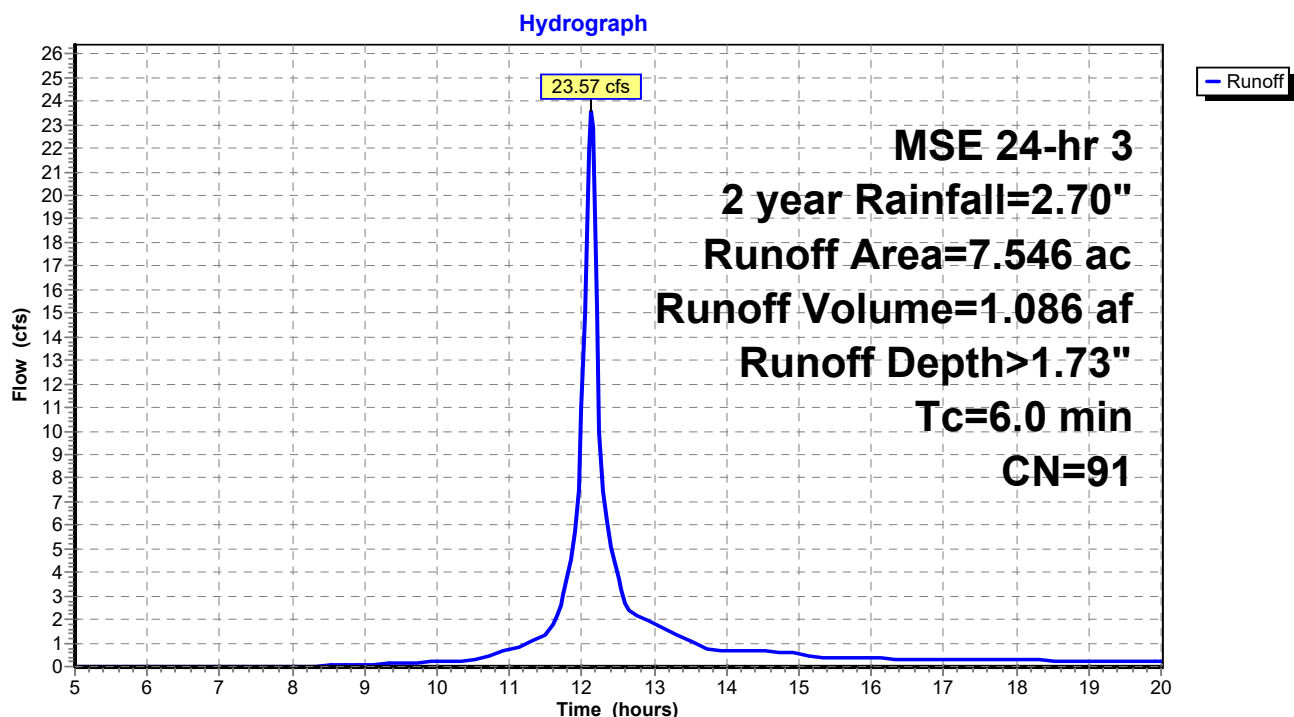
Summary for Subcatchment 1S: Proposed Area to Pond-Subcatchment 1

Runoff = 23.57 cfs @ 12.13 hrs, Volume= 1.086 af, Depth> 1.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2 year Rainfall=2.70"

Area (ac)	CN	Description
* 3.615	98	Proposed Building
* 2.015	98	Proposed Pavement
1.367	61	>75% Grass cover, Good, HSG B
* 0.549	98	Pond Surface
7.546	91	Weighted Average
1.367		18.12% Pervious Area
6.179		81.88% Impervious Area

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

Subcatchment 1S: Proposed Area to Pond-Subcatchment 1

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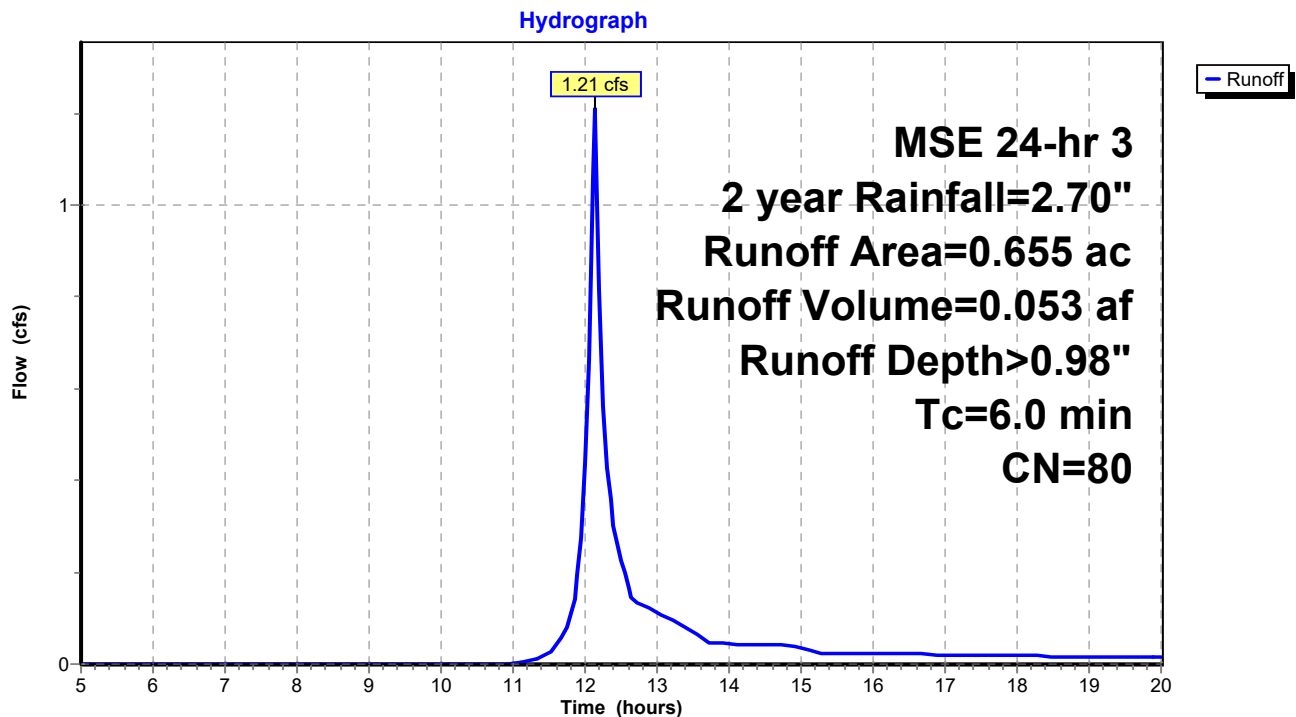
Summary for Subcatchment 2S: Proposed Area to BioBasin-subcatchment 2

Runoff = 1.21 cfs @ 12.14 hrs, Volume= 0.053 af, Depth> 0.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2 year Rainfall=2.70"

Area (ac)	CN	Description
* 0.149	98	Asphalt Drives
* 0.181	98	Future Parking
0.325	61	>75% Grass cover, Good, HSG B
0.655	80	Weighted Average
0.325		49.62% Pervious Area
0.330		50.38% Impervious Area

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

Subcatchment 2S: Proposed Area to BioBasin-subcatchment 2

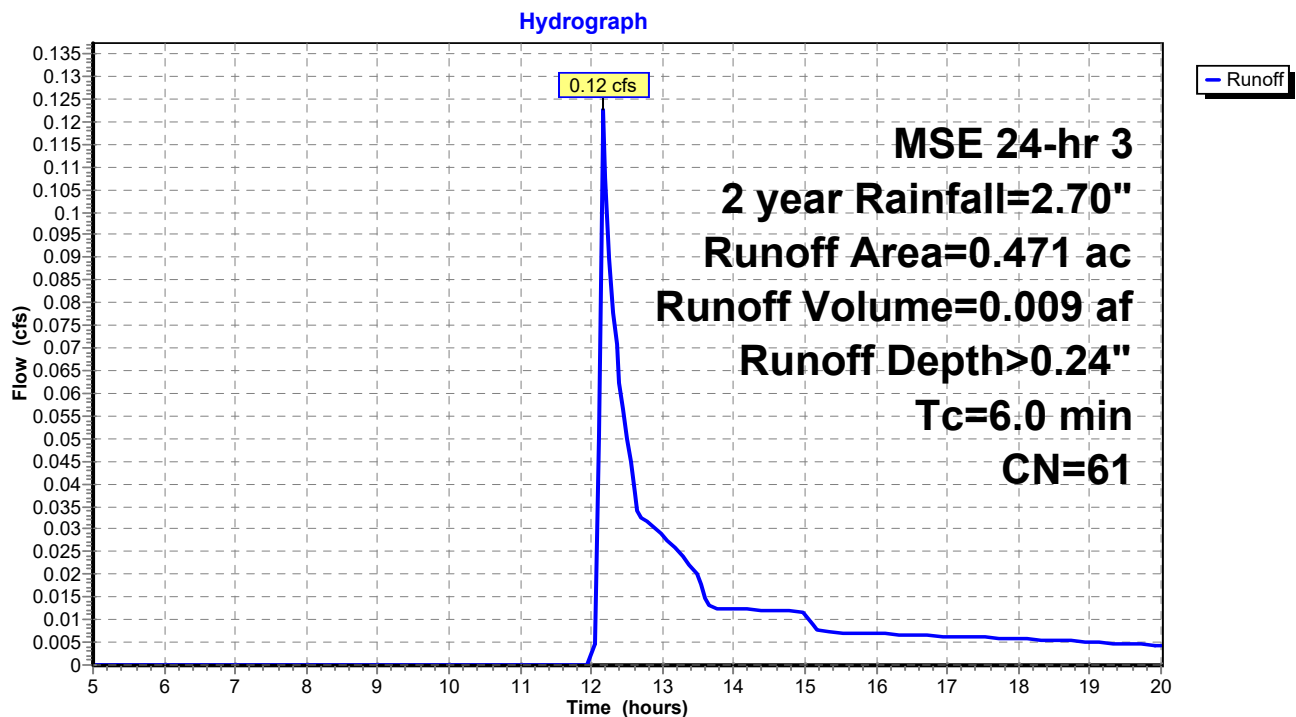
Summary for Subcatchment 3S: Undetained disturbed area-Subcatchment 3

Runoff = 0.12 cfs @ 12.17 hrs, Volume= 0.009 af, Depth> 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2 year Rainfall=2.70"

Area (ac)	CN	Description
0.471	61	>75% Grass cover, Good, HSG B
0.471		100.00% Pervious Area

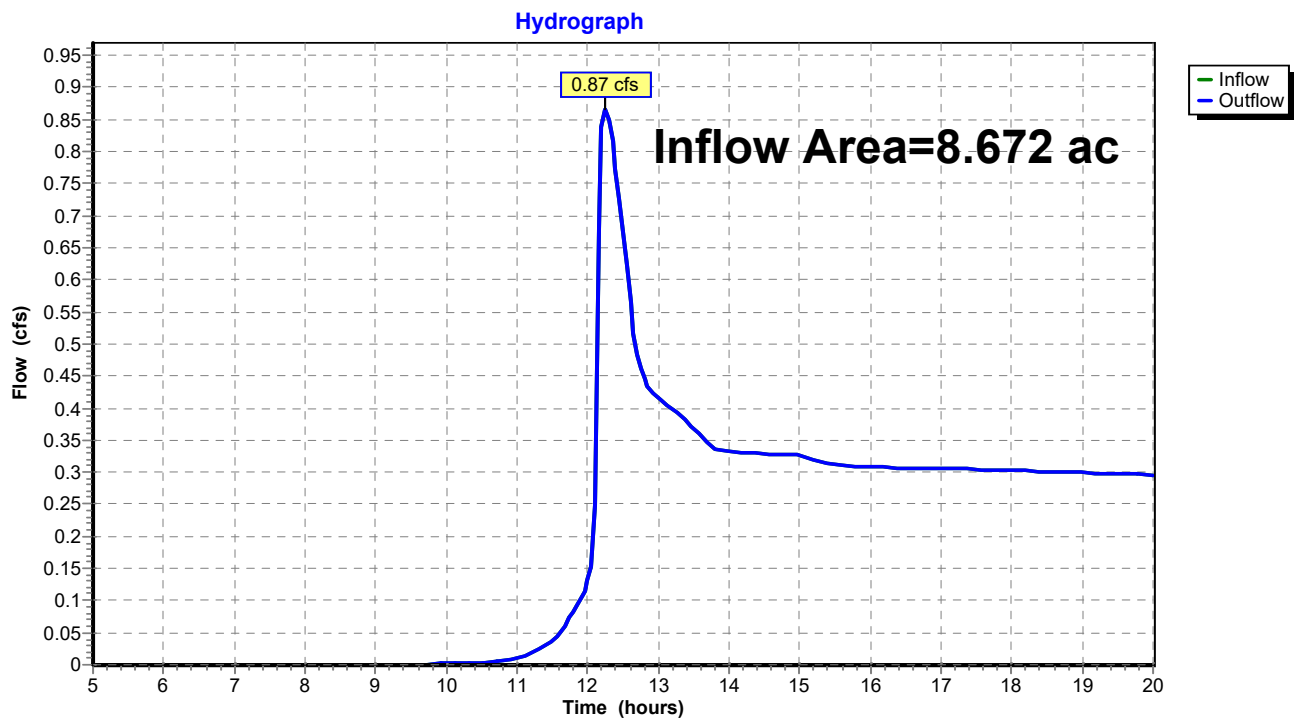
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Direct Entry

Subcatchment 3S: Undetained disturbed area-Subcatchment 3

Summary for Reach 1R: Total Proposed Runoff

Inflow Area = 8.672 ac, 75.06% Impervious, Inflow Depth > 0.33" for 2 year event
Inflow = 0.87 cfs @ 12.26 hrs, Volume= 0.235 af
Outflow = 0.87 cfs @ 12.26 hrs, Volume= 0.235 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 1R: Total Proposed Runoff

Summary for Pond 2P: Bioretention Basin

Inflow Area = 0.655 ac, 50.38% Impervious, Inflow Depth > 0.98" for 2 year event
 Inflow = 1.21 cfs @ 12.14 hrs, Volume= 0.053 af
 Outflow = 0.55 cfs @ 12.26 hrs, Volume= 0.043 af, Atten= 54%, Lag= 7.5 min
 Primary = 0.55 cfs @ 12.26 hrs, Volume= 0.043 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 897.65' @ 12.26 hrs Surf.Area= 1,550 sf Storage= 784 cf

Plug-Flow detention time= 79.8 min calculated for 0.043 af (80% of inflow)
 Center-of-Mass det. time= 29.4 min (825.1 - 795.7)

Volume	Invert	Avail.Storage	Storage Description	
#1	896.00'	14,362 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
896.00	1,550	0.0	0	0
896.01	1,550	33.0	5	5
897.00	1,550	33.0	506	512
897.01	1,550	27.0	4	516
898.99	1,550	27.0	829	1,344
899.00	1,550	100.0	15	1,360
900.00	2,630	100.0	2,090	3,450
901.00	3,890	100.0	3,260	6,710
902.00	5,310	100.0	4,600	11,310
902.50	6,900	100.0	3,053	14,362

Device	Routing	Invert	Outlet Devices
#1	Primary	896.50'	12.0" Round Culvert L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 896.50' / 894.75' S= 0.0292 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	896.85'	6.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 896.85' / 896.75' S= 0.0200 ' /' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 1	900.00'	2.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	901.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	902.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.55 cfs @ 12.26 hrs HW=897.64' (Free Discharge)

1=Culvert (Passes 0.55 cfs of 3.03 cfs potential flow)

2=Culvert (Inlet Controls 0.55 cfs @ 2.80 fps)

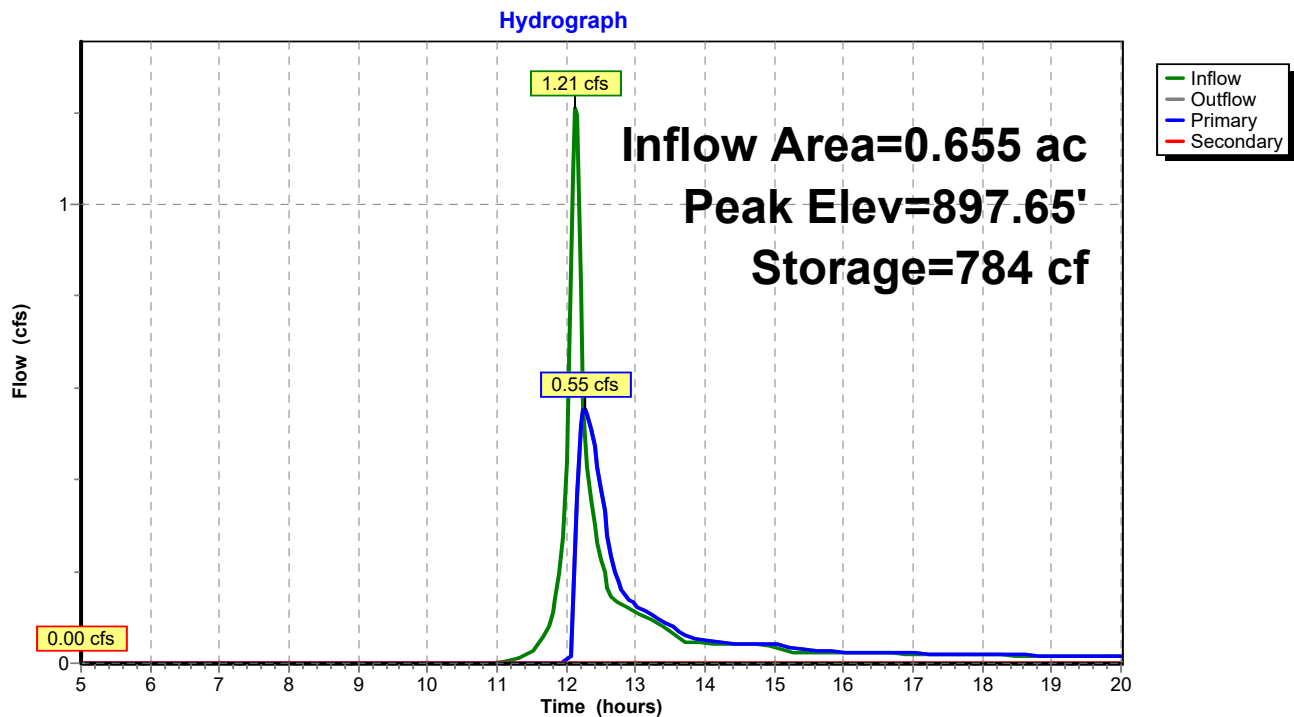
3=Orifice/Grate (Controls 0.00 cfs)

4=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=896.00' (Free Discharge)

5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 2P: Bioretention Basin



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Summary for Pond 4P: Pond Revision 2

Inflow Area = 7.546 ac, 81.88% Impervious, Inflow Depth > 1.73" for 2 year event
 Inflow = 23.57 cfs @ 12.13 hrs, Volume= 1.086 af
 Outflow = 0.28 cfs @ 17.88 hrs, Volume= 0.183 af, Atten= 99%, Lag= 344.7 min
 Primary = 0.28 cfs @ 17.88 hrs, Volume= 0.183 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 902.51' @ 17.88 hrs Surf.Area= 0.661 ac Storage= 0.909 af

Plug-Flow detention time= 283.6 min calculated for 0.183 af (17% of inflow)
 Center-of-Mass det. time= 189.0 min (960.0 - 771.0)

Volume	Invert	Avail.Storage	Storage Description
#1	901.00'	3.137 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
901.00	0.549	0.000	0.000
902.00	0.618	0.584	0.584
903.00	0.703	0.661	1.244
904.00	0.800	0.752	1.996
905.00	0.894	0.847	2.843
905.30	1.069	0.294	3.137

Device	Routing	Invert	Outlet Devices
#1	Primary	901.00'	8.0" Round Culvert L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 901.00' / 900.35' S= 0.0022 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	901.00'	3.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	903.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	904.80'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

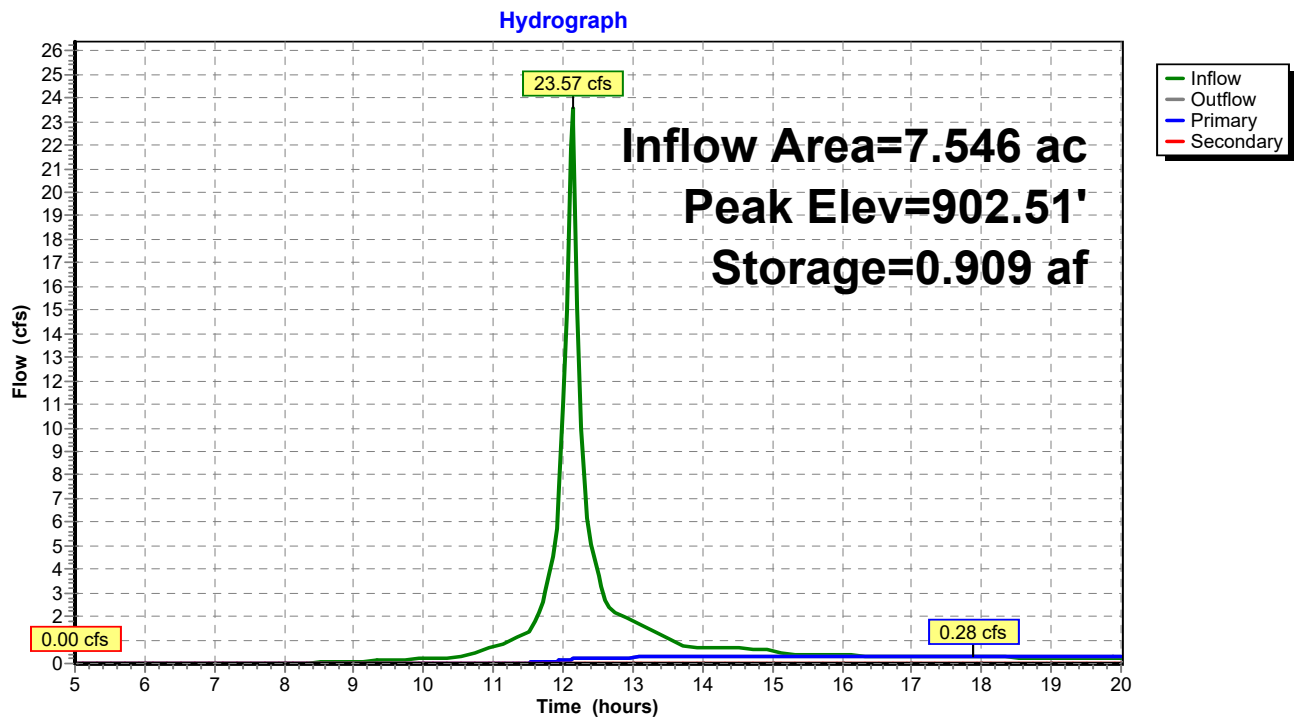
Primary OutFlow Max=0.28 cfs @ 17.88 hrs HW=902.51' (Free Discharge)

↑ **1=Culvert** (Passes 0.28 cfs of 0.81 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.28 cfs @ 5.67 fps)
 ↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=901.00' (Free Discharge)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: Pond Revision 2



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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Proposed Area to	Runoff Area=7.546 ac 81.88% Impervious Runoff Depth>2.74" Tc=6.0 min CN=91 Runoff=36.32 cfs 1.722 af
Subcatchment 2S: Proposed Area to	Runoff Area=0.655 ac 50.38% Impervious Runoff Depth>1.80" Tc=6.0 min CN=80 Runoff=2.22 cfs 0.098 af
Subcatchment 3S: Undetained disturbed	Runoff Area=0.471 ac 0.00% Impervious Runoff Depth>0.67" Tc=6.0 min CN=61 Runoff=0.54 cfs 0.026 af
Reach 1R: Total Proposed Runoff	Inflow=1.74 cfs 0.352 af Outflow=1.74 cfs 0.352 af
Pond 2P: Bioretention Basin	Peak Elev=899.00' Storage=1,357 cf Inflow=2.22 cfs 0.098 af Primary=1.03 cfs 0.087 af Secondary=0.00 cfs 0.000 af Outflow=1.03 cfs 0.087 af
Pond 4P: Pond Revision 2	Peak Elev=903.34' Storage=1.486 af Inflow=36.32 cfs 1.722 af Primary=0.35 cfs 0.238 af Secondary=0.00 cfs 0.000 af Outflow=0.35 cfs 0.238 af
Total Runoff Area = 8.672 ac Runoff Volume = 1.847 af Average Runoff Depth = 2.56" 24.94% Pervious = 2.163 ac 75.06% Impervious = 6.509 ac	

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MSE 24-hr 3 10 year Rainfall=3.81"

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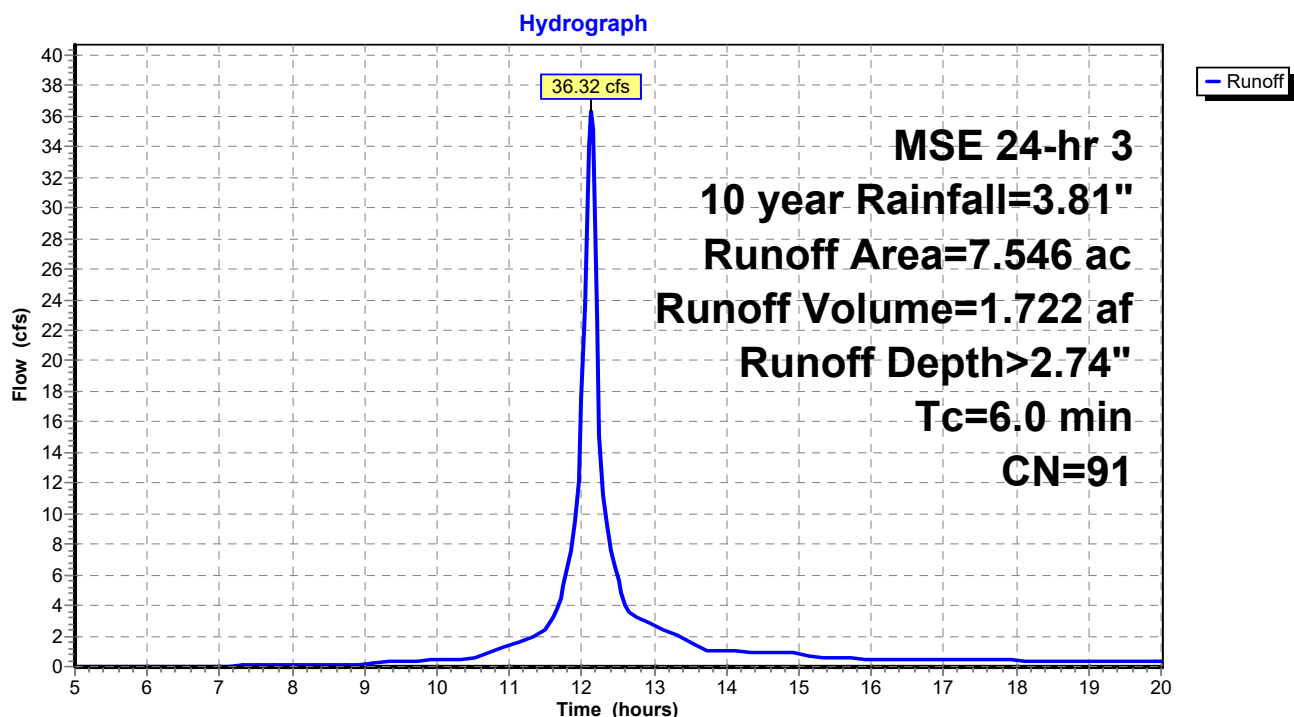
Summary for Subcatchment 1S: Proposed Area to Pond-Subcatchment 1

Runoff = 36.32 cfs @ 12.13 hrs, Volume= 1.722 af, Depth> 2.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10 year Rainfall=3.81"

Area (ac)	CN	Description
* 3.615	98	Proposed Building
* 2.015	98	Proposed Pavement
1.367	61	>75% Grass cover, Good, HSG B
* 0.549	98	Pond Surface
7.546	91	Weighted Average
1.367		18.12% Pervious Area
6.179		81.88% Impervious Area

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

Subcatchment 1S: Proposed Area to Pond-Subcatchment 1

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MSE 24-hr 3 10 year Rainfall=3.81"

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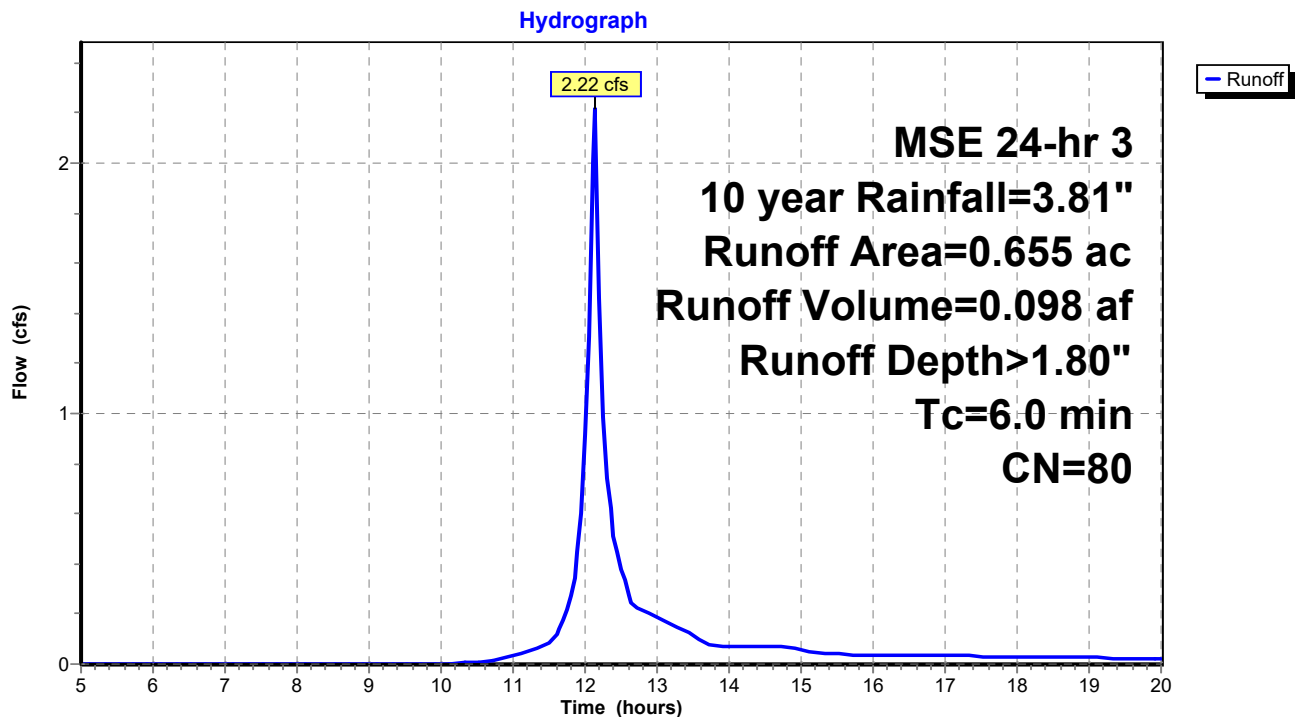
Summary for Subcatchment 2S: Proposed Area to BioBasin-subcatchment 2

Runoff = 2.22 cfs @ 12.13 hrs, Volume= 0.098 af, Depth> 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10 year Rainfall=3.81"

Area (ac)	CN	Description
* 0.149	98	Asphalt Drives
* 0.181	98	Future Parking
0.325	61	>75% Grass cover, Good, HSG B
0.655	80	Weighted Average
0.325		49.62% Pervious Area
0.330		50.38% Impervious Area

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

Subcatchment 2S: Proposed Area to BioBasin-subcatchment 2

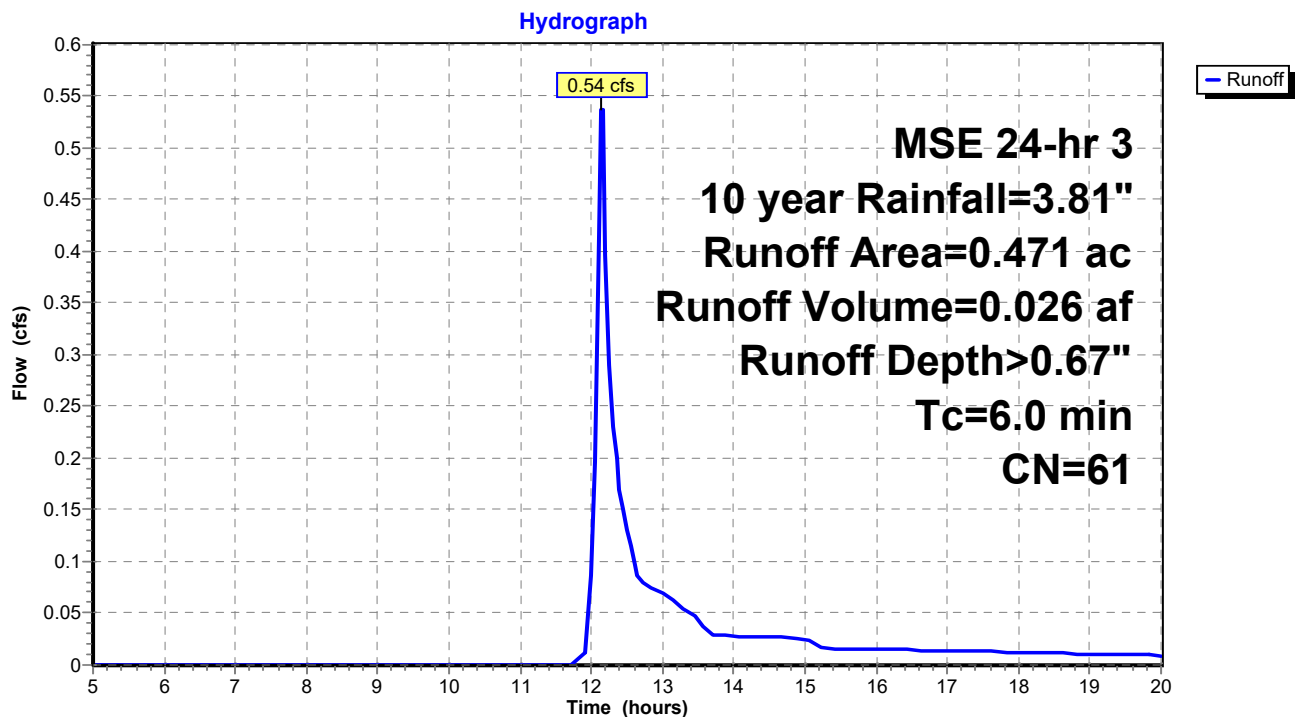
Summary for Subcatchment 3S: Undetained disturbed area-Subcatchment 3

Runoff = 0.54 cfs @ 12.15 hrs, Volume= 0.026 af, Depth> 0.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10 year Rainfall=3.81"

Area (ac)	CN	Description
0.471	61	>75% Grass cover, Good, HSG B
0.471		100.00% Pervious Area

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

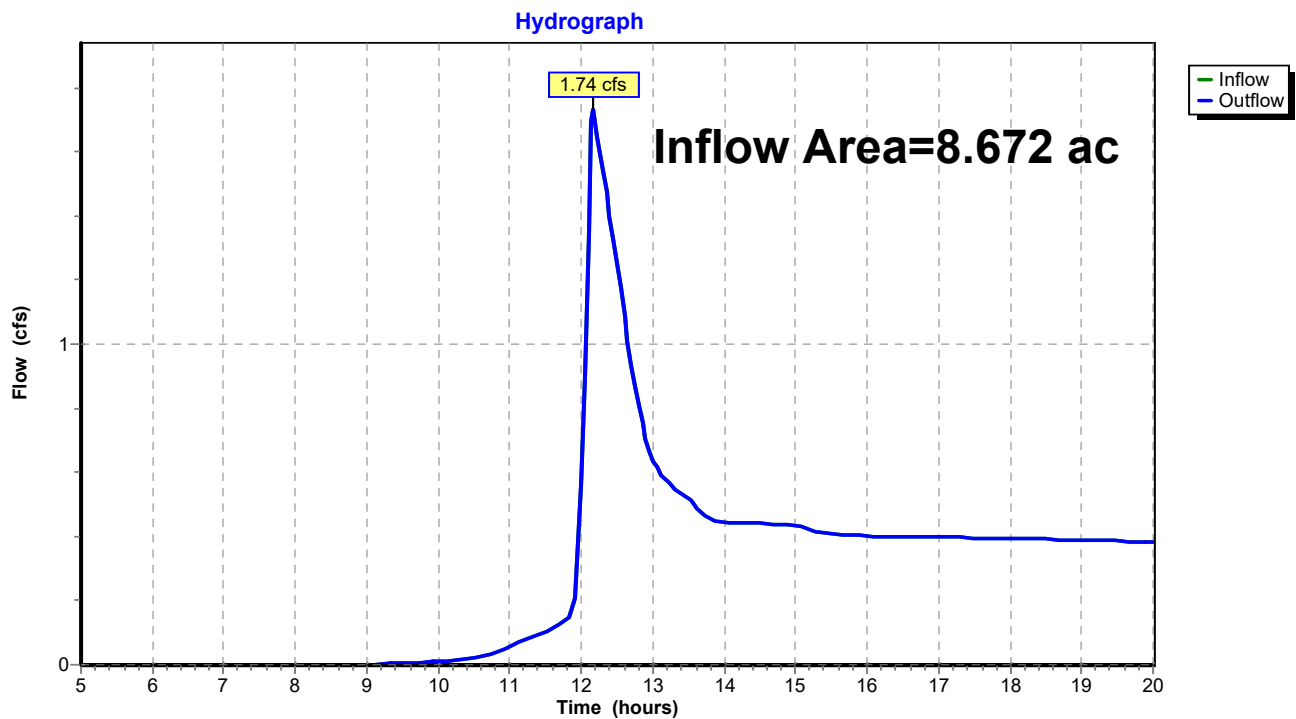
Subcatchment 3S: Undetained disturbed area-Subcatchment 3

Summary for Reach 1R: Total Proposed Runoff

Inflow Area = 8.672 ac, 75.06% Impervious, Inflow Depth > 0.49" for 10 year event
 Inflow = 1.74 cfs @ 12.17 hrs, Volume= 0.352 af
 Outflow = 1.74 cfs @ 12.17 hrs, Volume= 0.352 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 1R: Total Proposed Runoff



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MSE 24-hr 3 10 year Rainfall=3.81"

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Summary for Pond 2P: Bioretention Basin

Inflow Area = 0.655 ac, 50.38% Impervious, Inflow Depth > 1.80" for 10 year event
 Inflow = 2.22 cfs @ 12.13 hrs, Volume= 0.098 af
 Outflow = 1.03 cfs @ 12.25 hrs, Volume= 0.087 af, Atten= 54%, Lag= 7.2 min
 Primary = 1.03 cfs @ 12.25 hrs, Volume= 0.087 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 899.00' @ 12.25 hrs Surf.Area= 1,550 sf Storage= 1,357 cf

Plug-Flow detention time= 54.8 min calculated for 0.087 af (88% of inflow)
 Center-of-Mass det. time= 21.4 min (807.0 - 785.6)

Volume	Invert	Avail.Storage	Storage Description	
#1	896.00'	14,362 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
896.00	1,550	0.0	0	0
896.01	1,550	33.0	5	5
897.00	1,550	33.0	506	512
897.01	1,550	27.0	4	516
898.99	1,550	27.0	829	1,344
899.00	1,550	100.0	15	1,360
900.00	2,630	100.0	2,090	3,450
901.00	3,890	100.0	3,260	6,710
902.00	5,310	100.0	4,600	11,310
902.50	6,900	100.0	3,053	14,362

Device	Routing	Invert	Outlet Devices
#1	Primary	896.50'	12.0" Round Culvert L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 896.50' / 894.75' S= 0.0292 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	896.85'	6.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 896.85' / 896.75' S= 0.0200 ' /' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 1	900.00'	2.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	901.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	902.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

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Primary OutFlow Max=1.03 cfs @ 12.25 hrs HW=898.99' (Free Discharge)

1=Culvert (Passes 1.03 cfs of 5.34 cfs potential flow)

2=Culvert (Inlet Controls 1.03 cfs @ 5.23 fps)

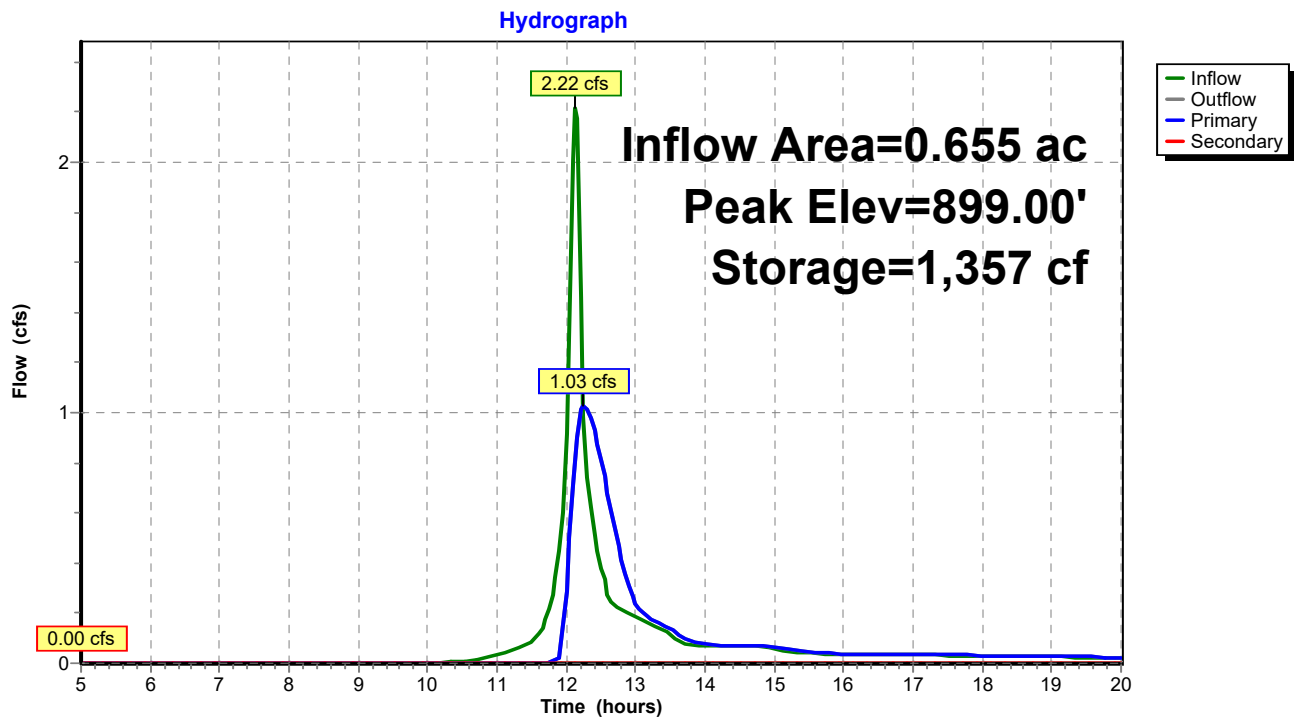
3=Orifice/Grate (Controls 0.00 cfs)

4=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=896.00' (Free Discharge)

5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 2P: Bioretention Basin



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MSE 24-hr 3 10 year Rainfall=3.81"

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Summary for Pond 4P: Pond Revision 2

Inflow Area = 7.546 ac, 81.88% Impervious, Inflow Depth > 2.74" for 10 year event
 Inflow = 36.32 cfs @ 12.13 hrs, Volume= 1.722 af
 Outflow = 0.35 cfs @ 18.95 hrs, Volume= 0.238 af, Atten= 99%, Lag= 409.0 min
 Primary = 0.35 cfs @ 18.95 hrs, Volume= 0.238 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 903.34' @ 18.95 hrs Surf.Area= 0.736 ac Storage= 1.486 af

Plug-Flow detention time= 307.5 min calculated for 0.238 af (14% of inflow)
 Center-of-Mass det. time= 188.8 min (951.9 - 763.0)

Volume	Invert	Avail.Storage	Storage Description
#1	901.00'	3.137 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
901.00	0.549	0.000	0.000
902.00	0.618	0.584	0.584
903.00	0.703	0.661	1.244
904.00	0.800	0.752	1.996
905.00	0.894	0.847	2.843
905.30	1.069	0.294	3.137

Device	Routing	Invert	Outlet Devices
#1	Primary	901.00'	8.0" Round Culvert L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 901.00' / 900.35' S= 0.0022 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	901.00'	3.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	903.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	904.80'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

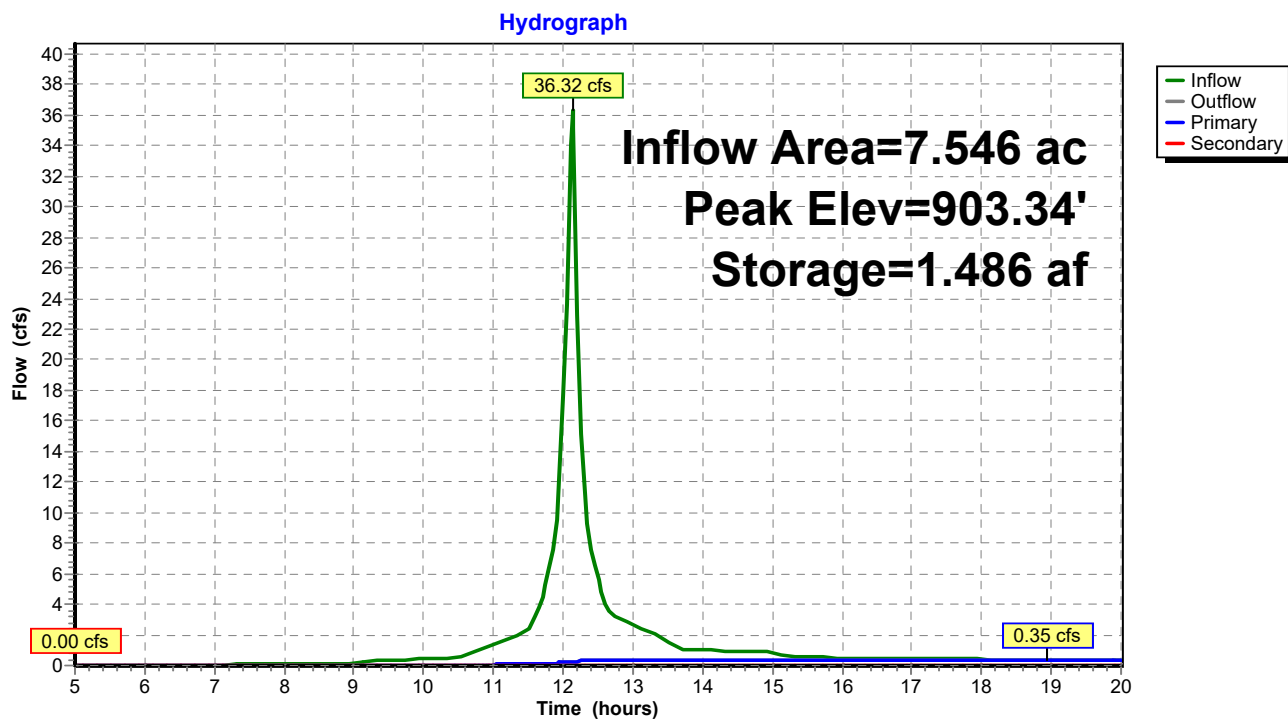
Primary OutFlow Max=0.35 cfs @ 18.95 hrs HW=903.34' (Free Discharge)

↑ **1=Culvert** (Passes 0.35 cfs of 1.02 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.35 cfs @ 7.16 fps)
 ↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=901.00' (Free Discharge)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: Pond Revision 2



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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Proposed Area to Runoff Area=7.546 ac 81.88% Impervious Runoff Depth>4.97"
Tc=6.0 min CN=91 Runoff=63.26 cfs 3.126 af

Subcatchment 2S: Proposed Area to Runoff Area=0.655 ac 50.38% Impervious Runoff Depth>3.79"
Tc=6.0 min CN=80 Runoff=4.53 cfs 0.207 af

Subcatchment 3S: Undetained disturbed Runoff Area=0.471 ac 0.00% Impervious Runoff Depth>2.02"
Tc=6.0 min CN=61 Runoff=1.78 cfs 0.079 af

Reach 1R: Total Proposed Runoff Inflow=3.52 cfs 1.116 af
Outflow=3.52 cfs 1.116 af

Pond 2P: Bioretention Basin Peak Elev=899.88' Storage=3,142 cf Inflow=4.53 cfs 0.207 af
Primary=1.24 cfs 0.196 af Secondary=0.00 cfs 0.000 af Outflow=1.24 cfs 0.196 af

Pond 4P: Pond Revision 2 Peak Elev=904.61' Storage=2.500 af Inflow=63.26 cfs 3.126 af
Primary=1.26 cfs 0.842 af Secondary=0.00 cfs 0.000 af Outflow=1.26 cfs 0.842 af

Total Runoff Area = 8.672 ac Runoff Volume = 3.412 af Average Runoff Depth = 4.72"
24.94% Pervious = 2.163 ac 75.06% Impervious = 6.509 ac

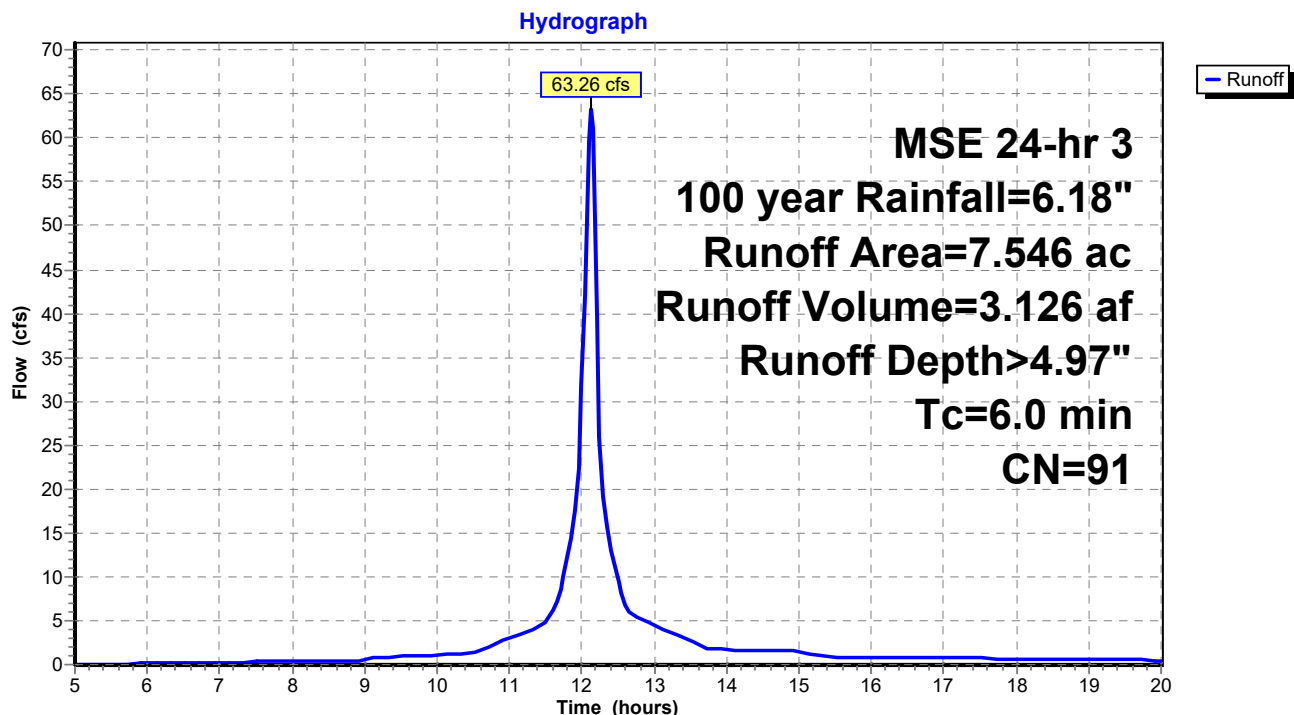
Summary for Subcatchment 1S: Proposed Area to Pond-Subcatchment 1

Runoff = 63.26 cfs @ 12.13 hrs, Volume= 3.126 af, Depth> 4.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100 year Rainfall=6.18"

Area (ac)	CN	Description
* 3.615	98	Proposed Building
* 2.015	98	Proposed Pavement
1.367	61	>75% Grass cover, Good, HSG B
* 0.549	98	Pond Surface
7.546	91	Weighted Average
1.367		18.12% Pervious Area
6.179		81.88% Impervious Area

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

Subcatchment 1S: Proposed Area to Pond-Subcatchment 1

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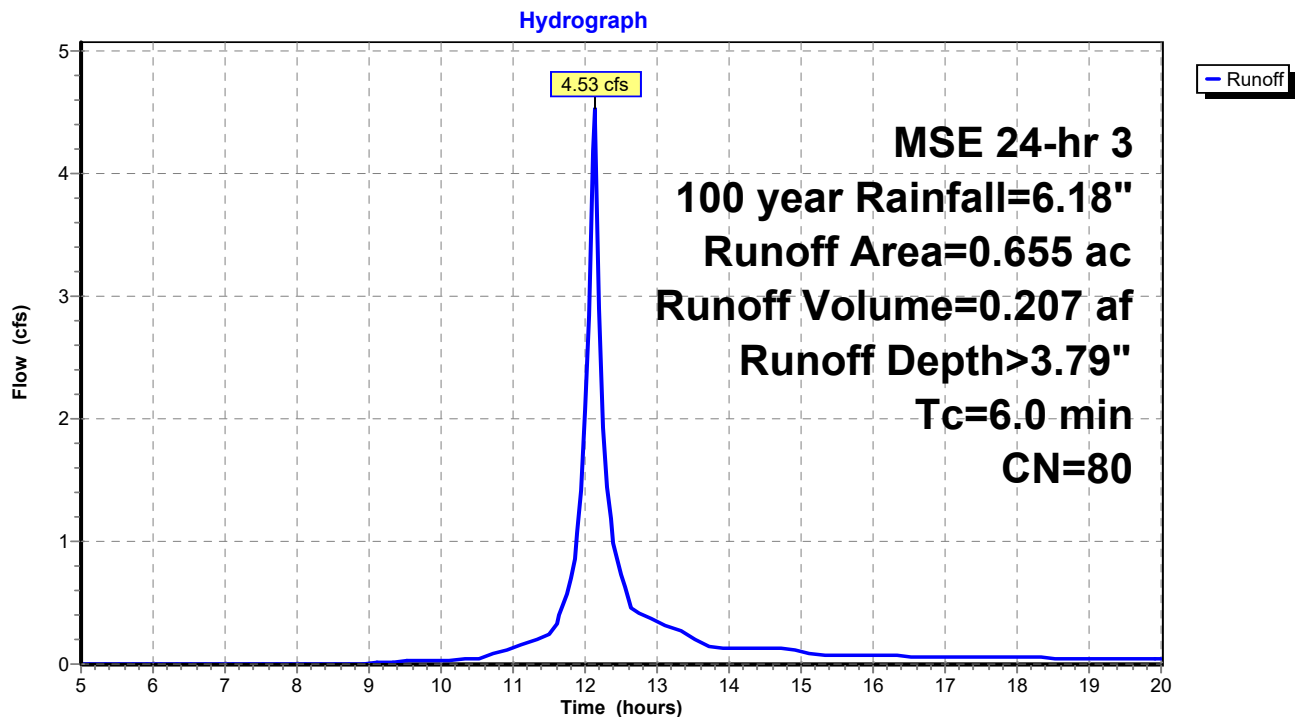
Summary for Subcatchment 2S: Proposed Area to BioBasin-subcatchment 2

Runoff = 4.53 cfs @ 12.13 hrs, Volume= 0.207 af, Depth> 3.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100 year Rainfall=6.18"

Area (ac)	CN	Description
* 0.149	98	Asphalt Drives
* 0.181	98	Future Parking
0.325	61	>75% Grass cover, Good, HSG B
0.655	80	Weighted Average
0.325		49.62% Pervious Area
0.330		50.38% Impervious Area

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

Subcatchment 2S: Proposed Area to BioBasin-subcatchment 2

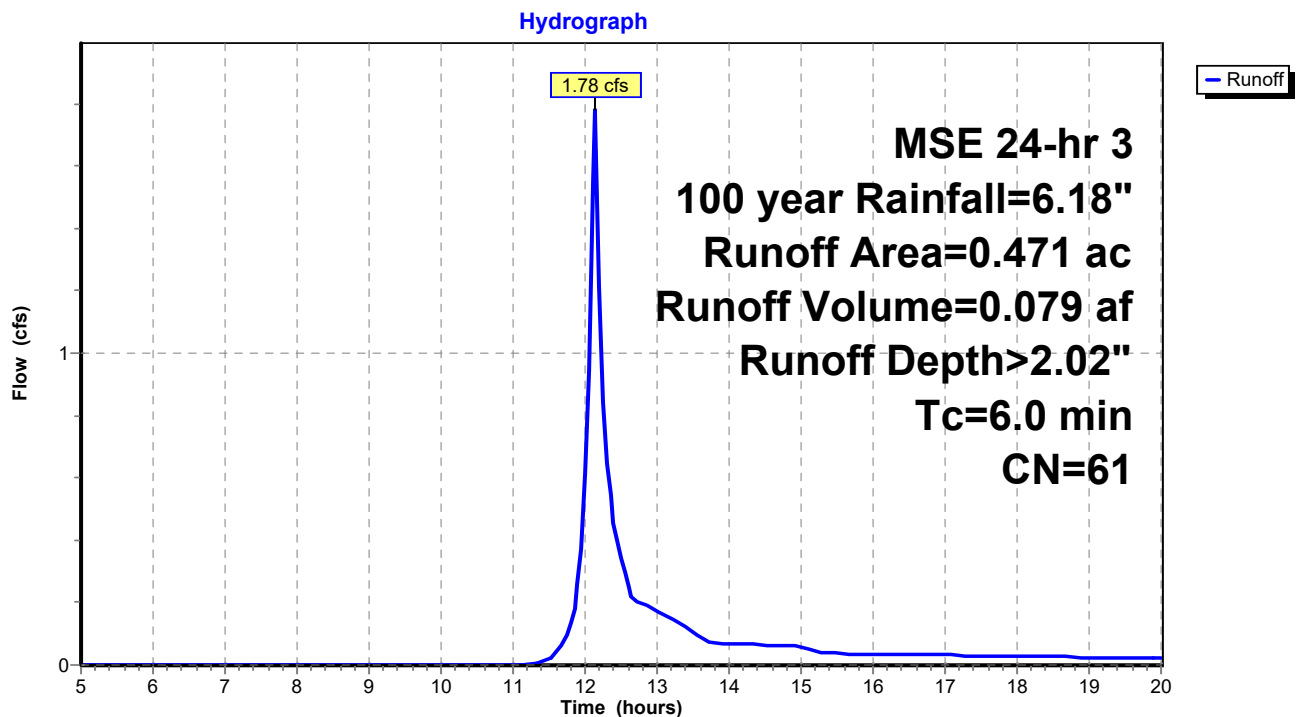
Summary for Subcatchment 3S: Undetained disturbed area-Subcatchment 3

Runoff = 1.78 cfs @ 12.14 hrs, Volume= 0.079 af, Depth> 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100 year Rainfall=6.18"

Area (ac)	CN	Description
0.471	61	>75% Grass cover, Good, HSG B
0.471		100.00% Pervious Area

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

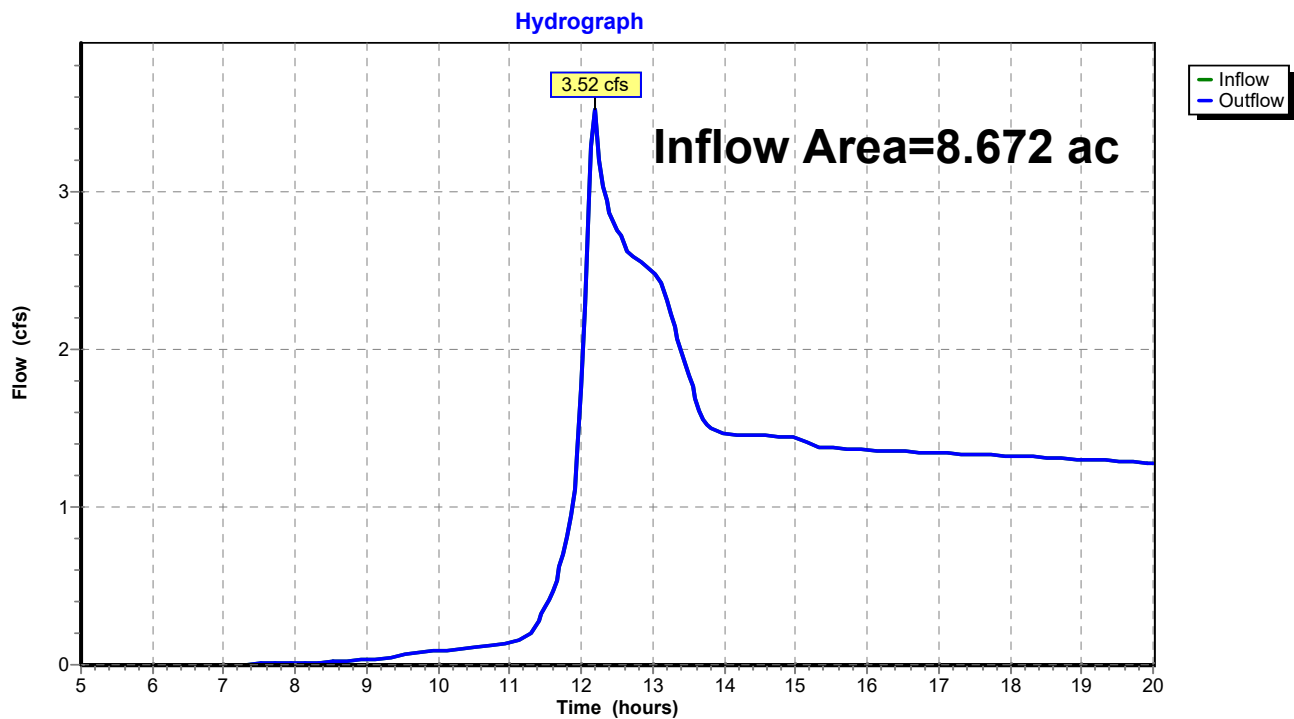
Subcatchment 3S: Undetained disturbed area-Subcatchment 3

Summary for Reach 1R: Total Proposed Runoff

Inflow Area = 8.672 ac, 75.06% Impervious, Inflow Depth > 1.54" for 100 year event
 Inflow = 3.52 cfs @ 12.20 hrs, Volume= 1.116 af
 Outflow = 3.52 cfs @ 12.20 hrs, Volume= 1.116 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 1R: Total Proposed Runoff



Summary for Pond 2P: Bioretention Basin

Inflow Area = 0.655 ac, 50.38% Impervious, Inflow Depth > 3.79" for 100 year event
 Inflow = 4.53 cfs @ 12.13 hrs, Volume= 0.207 af
 Outflow = 1.24 cfs @ 12.34 hrs, Volume= 0.196 af, Atten= 73%, Lag= 12.6 min
 Primary = 1.24 cfs @ 12.34 hrs, Volume= 0.196 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 899.88' @ 12.34 hrs Surf.Area= 2,501 sf Storage= 3,142 cf

Plug-Flow detention time= 45.7 min calculated for 0.196 af (94% of inflow)
 Center-of-Mass det. time= 26.1 min (799.5 - 773.3)

Volume	Invert	Avail.Storage	Storage Description	
#1	896.00'	14,362 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
896.00	1,550	0.0	0	0
896.01	1,550	33.0	5	5
897.00	1,550	33.0	506	512
897.01	1,550	27.0	4	516
898.99	1,550	27.0	829	1,344
899.00	1,550	100.0	15	1,360
900.00	2,630	100.0	2,090	3,450
901.00	3,890	100.0	3,260	6,710
902.00	5,310	100.0	4,600	11,310
902.50	6,900	100.0	3,053	14,362

Device	Routing	Invert	Outlet Devices
#1	Primary	896.50'	12.0" Round Culvert L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 896.50' / 894.75' S= 0.0292 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	896.85'	6.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 896.85' / 896.75' S= 0.0200 ' / ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 1	900.00'	2.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	901.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	902.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

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Primary OutFlow Max=1.24 cfs @ 12.34 hrs HW=899.88' (Free Discharge)

1=Culvert (Passes 1.24 cfs of 6.42 cfs potential flow)

2=Culvert (Inlet Controls 1.24 cfs @ 6.34 fps)

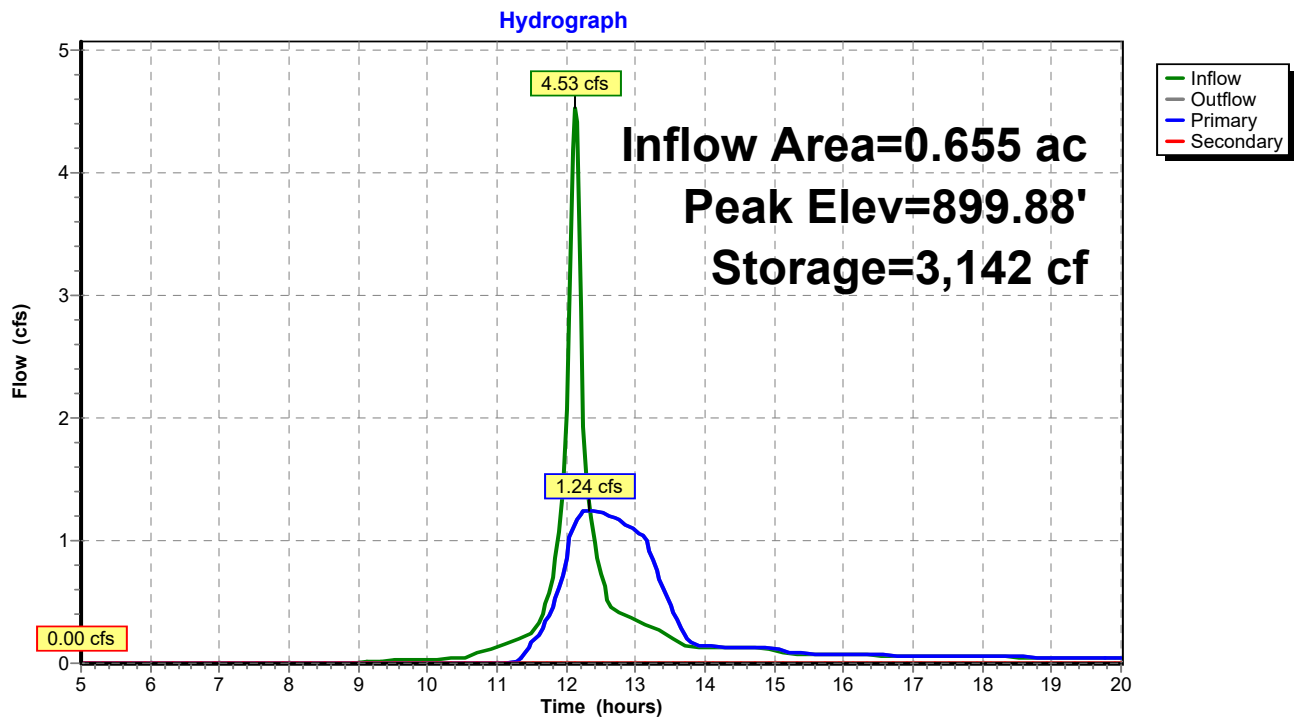
3=Orifice/Grate (Controls 0.00 cfs)

4=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=896.00' (Free Discharge)

5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 2P: Bioretention Basin



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MSE 24-hr 3 100 year Rainfall=6.18"

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Summary for Pond 4P: Pond Revision 2

Inflow Area = 7.546 ac, 81.88% Impervious, Inflow Depth > 4.97" for 100 year event
 Inflow = 63.26 cfs @ 12.13 hrs, Volume= 3.126 af
 Outflow = 1.26 cfs @ 15.08 hrs, Volume= 0.842 af, Atten= 98%, Lag= 176.8 min
 Primary = 1.26 cfs @ 15.08 hrs, Volume= 0.842 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 904.61' @ 15.08 hrs Surf.Area= 0.857 ac Storage= 2.500 af

Plug-Flow detention time= 297.6 min calculated for 0.839 af (27% of inflow)
 Center-of-Mass det. time= 199.9 min (952.6 - 752.6)

Volume	Invert	Avail.Storage	Storage Description
#1	901.00'	3.137 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
901.00	0.549	0.000	0.000
902.00	0.618	0.584	0.584
903.00	0.703	0.661	1.244
904.00	0.800	0.752	1.996
905.00	0.894	0.847	2.843
905.30	1.069	0.294	3.137

Device	Routing	Invert	Outlet Devices
#1	Primary	901.00'	8.0" Round Culvert L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 901.00' / 900.35' S= 0.0022 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	901.00'	3.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	903.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	904.80'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

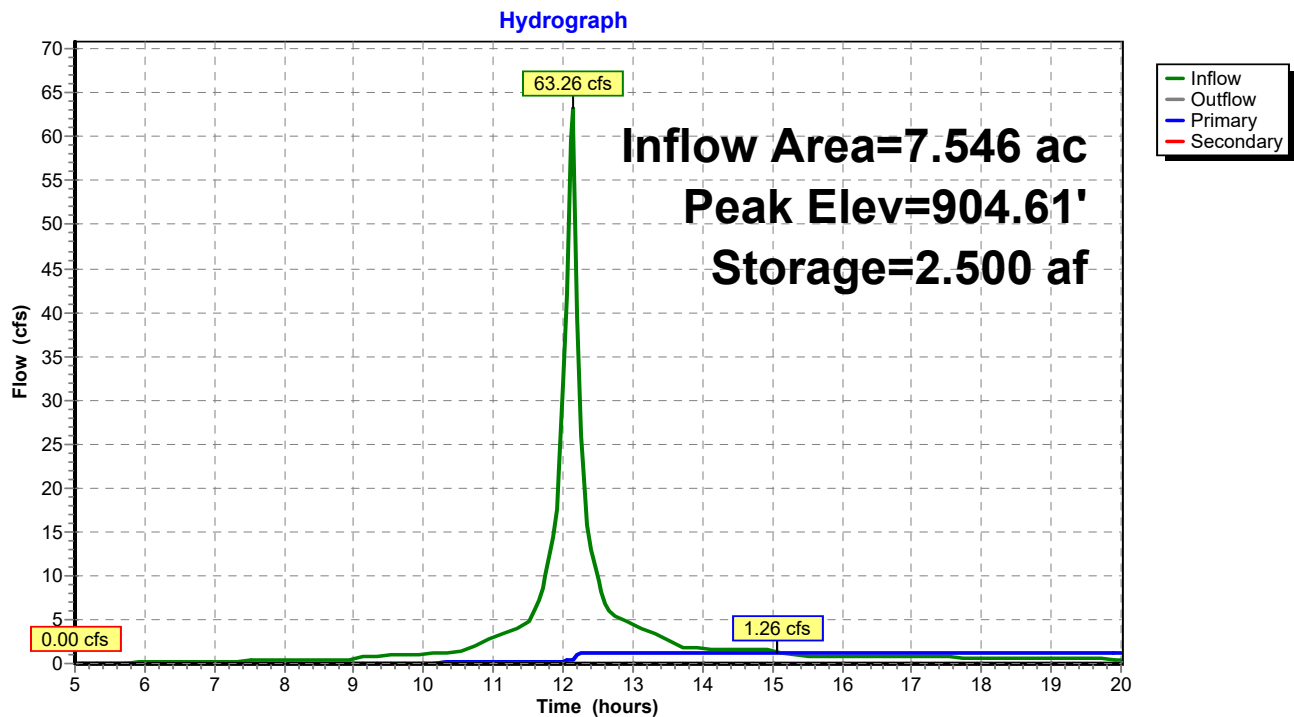
Primary OutFlow Max=1.26 cfs @ 15.08 hrs HW=904.61' (Free Discharge)

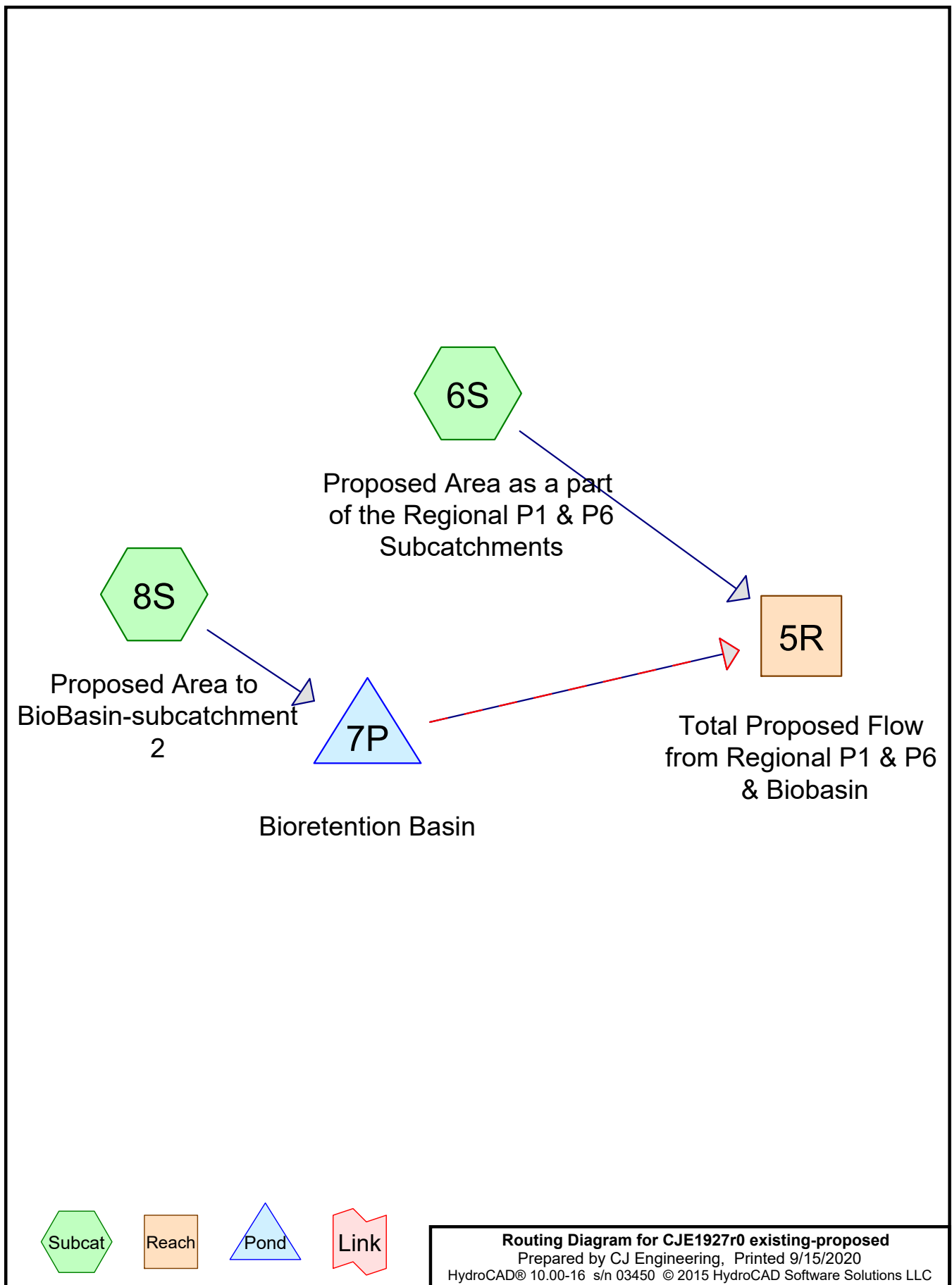
↑ **1=Culvert** (Barrel Controls 1.26 cfs @ 3.62 fps)
 ↑ **2=Orifice/Grate** (Passes < 0.44 cfs potential flow)
 ↑ **3=Orifice/Grate** (Passes < 15.93 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=901.00' (Free Discharge)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: Pond Revision 2





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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.691	61	>75% Grass cover, Good, HSG B (6S, 8S)
0.149	98	Asphalt Drives (8S)
0.181	98	Future Parking (8S)
1.292	98	Paved parking, HSG C (6S)
3.313	79	TOTAL AREA

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Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
1.691	HSG B	6S, 8S
1.292	HSG C	6S
0.000	HSG D	
0.330	Other	8S
3.313		TOTAL AREA

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Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	1.691	0.000	0.000	0.000	1.691	>75% Grass cover, Good	6S, 8S
0.000	0.000	0.000	0.000	0.149	0.149	Asphalt Drives	8S
0.000	0.000	0.000	0.000	0.181	0.181	Future Parking	8S
0.000	0.000	1.292	0.000	0.000	1.292	Paved parking	6S
0.000	1.691	1.292	0.000	0.330	3.313	TOTAL AREA	

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment6S: Proposed Area as a Runoff Area=115,781 sf 48.62% Impervious Runoff Depth>0.73"
Tc=6.0 min CN=79 Runoff=3.63 cfs 0.162 af

Subcatchment8S: Proposed Area to Runoff Area=0.655 ac 50.38% Impervious Runoff Depth>0.78"
Tc=6.0 min CN=80 Runoff=0.96 cfs 0.042 af

Reach 5R: Total Proposed Flow from Regional P1 & P6 & Biobasin Inflow=3.65 cfs 0.193 af
Outflow=3.65 cfs 0.193 af

Pond 7P: Bioretention Basin Peak Elev=897.36' Storage=662 cf Inflow=0.96 cfs 0.042 af
Primary=0.38 cfs 0.032 af Secondary=0.00 cfs 0.000 af Outflow=0.38 cfs 0.032 af

Total Runoff Area = 3.313 ac Runoff Volume = 0.204 af Average Runoff Depth = 0.74"
51.03% Pervious = 1.691 ac 48.97% Impervious = 1.622 ac

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MSE 24-hr 3 1 year Rainfall=2.40"

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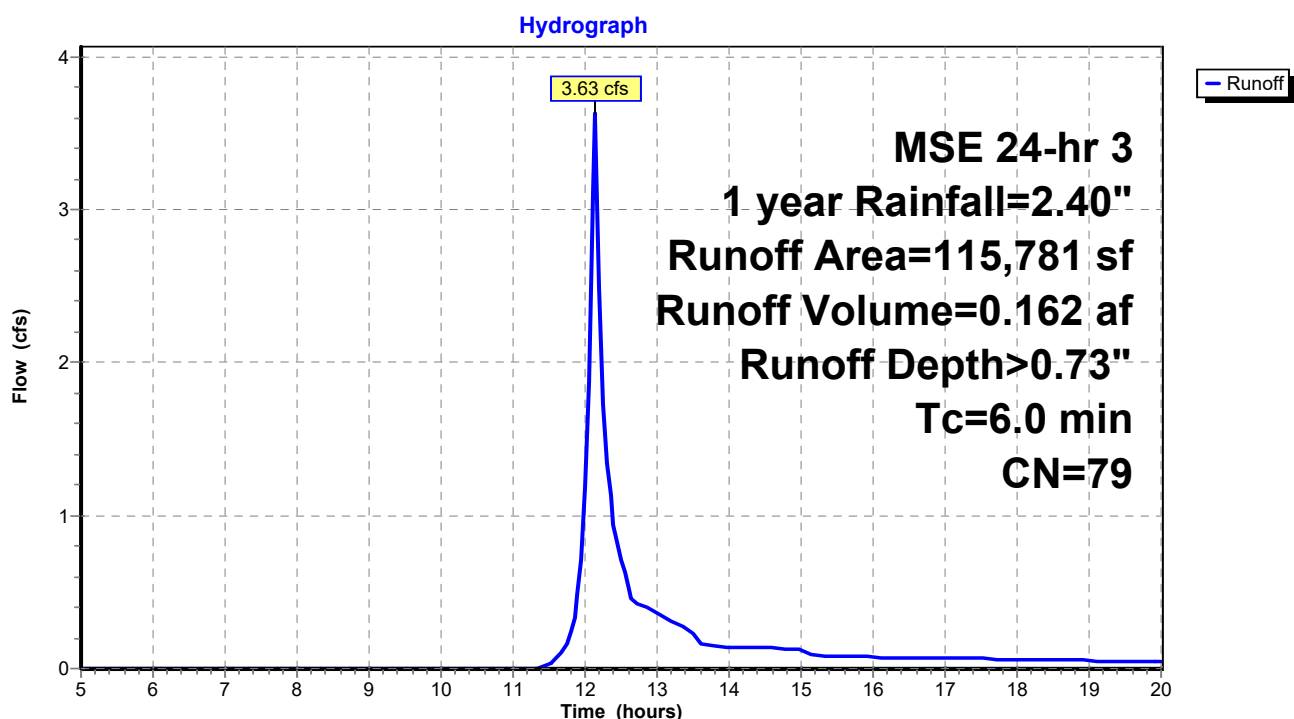
Summary for Subcatchment 6S: Proposed Area as a part of the Regional P1 & P6 Subcatchments

Runoff = 3.63 cfs @ 12.14 hrs, Volume= 0.162 af, Depth> 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1 year Rainfall=2.40"

Area (sf)	CN	Description
56,290	98	Paved parking, HSG C
59,491	61	>75% Grass cover, Good, HSG B
115,781	79	Weighted Average
59,491		51.38% Pervious Area
56,290		48.62% Impervious Area

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

Subcatchment 6S: Proposed Area as a part of the Regional P1 & P6 Subcatchments

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MSE 24-hr 3 1 year Rainfall=2.40"

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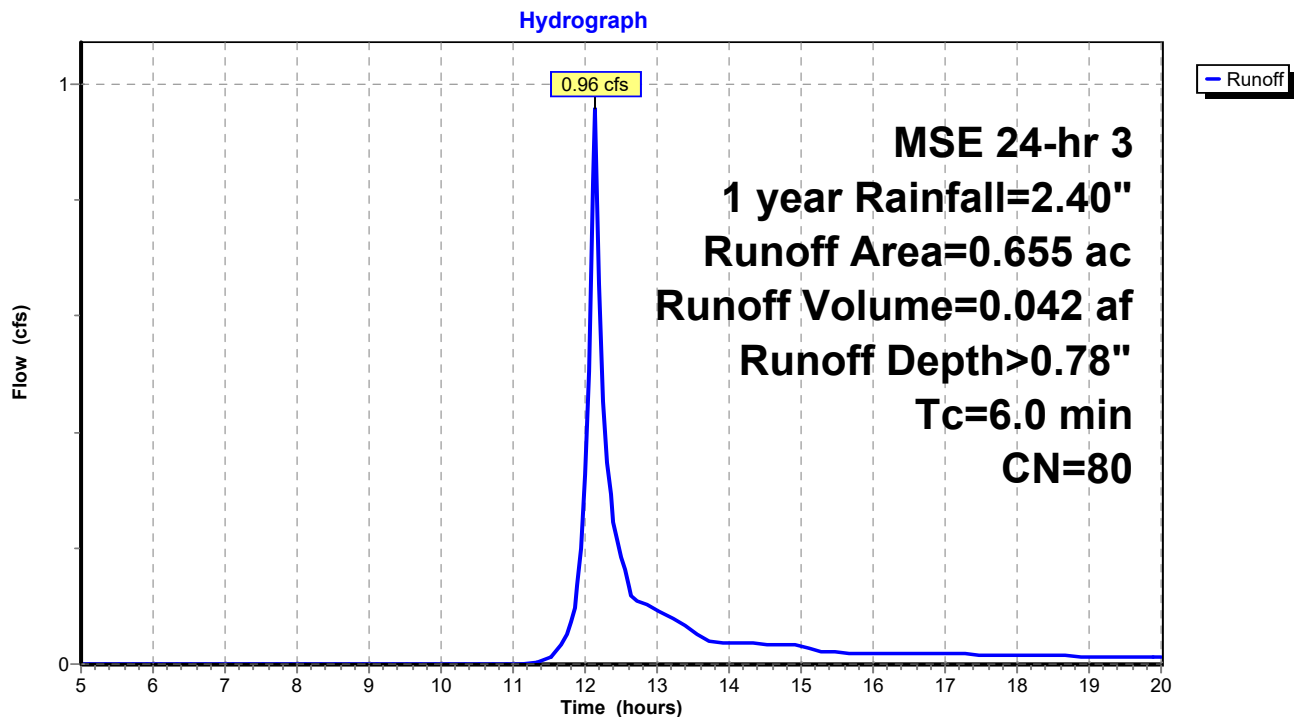
Summary for Subcatchment 8S: Proposed Area to BioBasin-subcatchment 2

Runoff = 0.96 cfs @ 12.14 hrs, Volume= 0.042 af, Depth> 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1 year Rainfall=2.40"

Area (ac)	CN	Description
* 0.149	98	Asphalt Drives
* 0.181	98	Future Parking
0.325	61	>75% Grass cover, Good, HSG B
0.655	80	Weighted Average
0.325		49.62% Pervious Area
0.330		50.38% Impervious Area

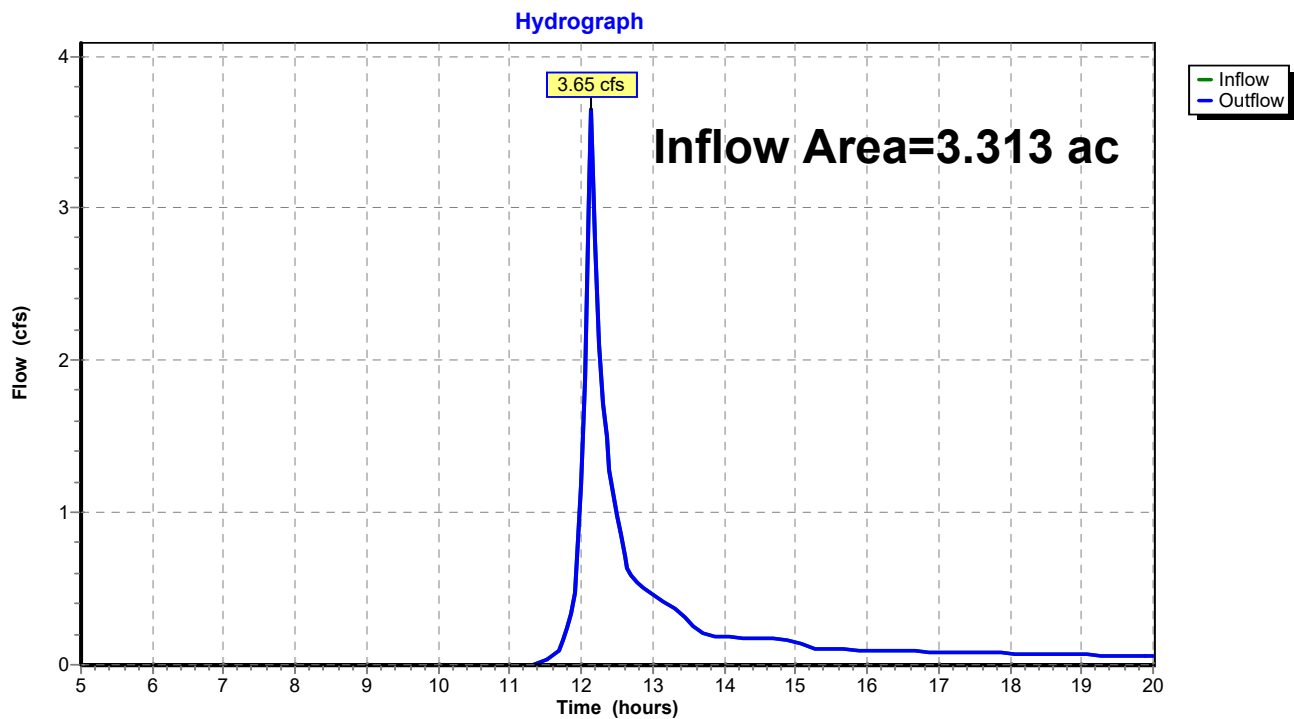
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Min tc

Subcatchment 8S: Proposed Area to BioBasin-subcatchment 2

Summary for Reach 5R: Total Proposed Flow from Regional P1 & P6 & Biobasin

Inflow Area = 3.313 ac, 48.97% Impervious, Inflow Depth > 0.70" for 1 year event
Inflow = 3.65 cfs @ 12.14 hrs, Volume= 0.193 af
Outflow = 3.65 cfs @ 12.14 hrs, Volume= 0.193 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: Total Proposed Flow from Regional P1 & P6 & Biobasin

Summary for Pond 7P: Bioretention Basin

Inflow Area = 0.655 ac, 50.38% Impervious, Inflow Depth > 0.78" for 1 year event
 Inflow = 0.96 cfs @ 12.14 hrs, Volume= 0.042 af
 Outflow = 0.38 cfs @ 12.29 hrs, Volume= 0.032 af, Atten= 60%, Lag= 9.1 min
 Primary = 0.38 cfs @ 12.29 hrs, Volume= 0.032 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 897.36' @ 12.29 hrs Surf.Area= 1,550 sf Storage= 662 cf

Plug-Flow detention time= 93.9 min calculated for 0.032 af (75% of inflow)
 Center-of-Mass det. time= 36.5 min (836.1 - 799.6)

Volume	Invert	Avail.Storage	Storage Description
#1	896.00'	14,362 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
896.00	1,550	0.0	0	0
896.01	1,550	33.0	5	5
897.00	1,550	33.0	506	512
897.01	1,550	27.0	4	516
898.99	1,550	27.0	829	1,344
899.00	1,550	100.0	15	1,360
900.00	2,630	100.0	2,090	3,450
901.00	3,890	100.0	3,260	6,710
902.00	5,310	100.0	4,600	11,310
902.50	6,900	100.0	3,053	14,362

Device	Routing	Invert	Outlet Devices
#1	Primary	896.50'	12.0" Round Culvert L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 896.50' / 894.75' S= 0.0292 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	896.85'	6.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 896.85' / 896.75' S= 0.0200 ' /' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 1	900.00'	2.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	901.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	902.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

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MSE 24-hr 3 1 year Rainfall=2.40"

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Primary OutFlow Max=0.38 cfs @ 12.29 hrs HW=897.36' (Free Discharge)

1=Culvert (Passes 0.38 cfs of 2.26 cfs potential flow)

2=Culvert (Inlet Controls 0.38 cfs @ 1.93 fps)

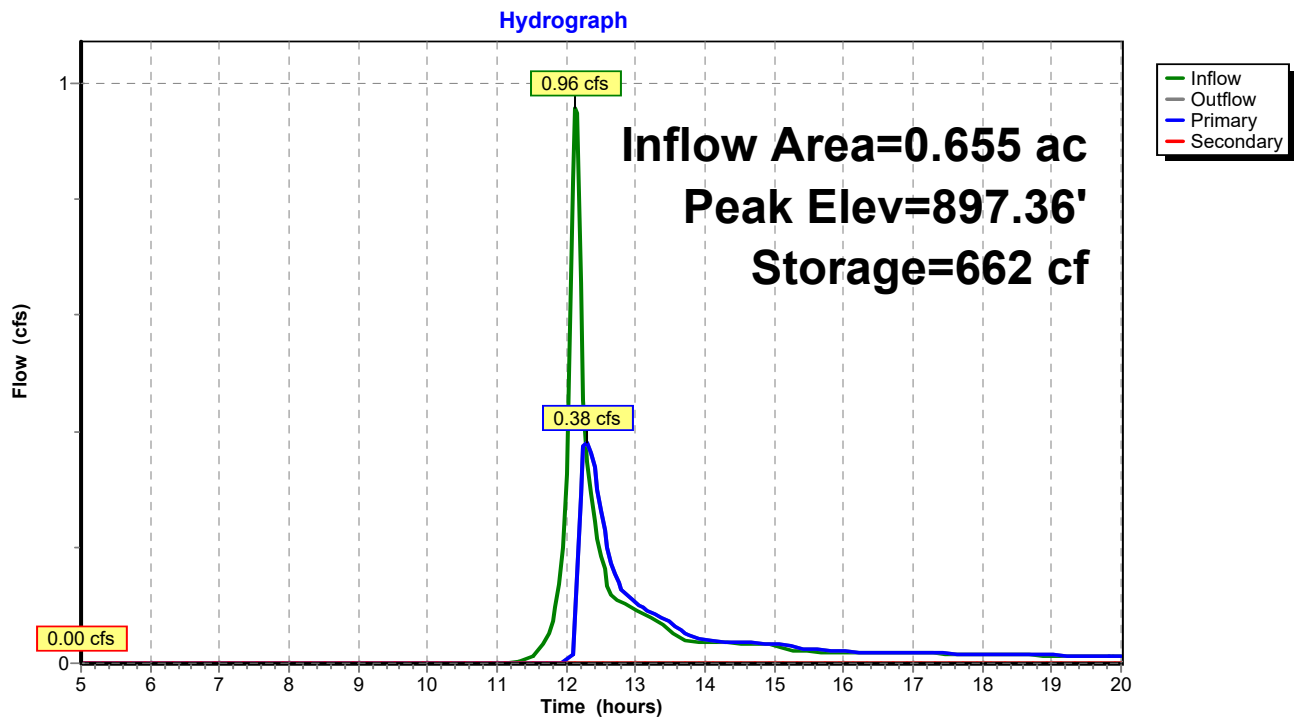
3=Orifice/Grate (Controls 0.00 cfs)

4=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=896.00' (Free Discharge)

5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 7P: Bioretention Basin



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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment6S: Proposed Area as a Runoff Area=115,781 sf 48.62% Impervious Runoff Depth>0.92"
Tc=6.0 min CN=79 Runoff=4.63 cfs 0.205 af

Subcatchment8S: Proposed Area to Runoff Area=0.655 ac 50.38% Impervious Runoff Depth>0.98"
Tc=6.0 min CN=80 Runoff=1.21 cfs 0.053 af

Reach 5R: Total Proposed Flow from Regional P1 & P6 & Biobasin Inflow=4.95 cfs 0.247 af
Outflow=4.95 cfs 0.247 af

Pond 7P: Bioretention Basin Peak Elev=897.65' Storage=784 cf Inflow=1.21 cfs 0.053 af
Primary=0.55 cfs 0.043 af Secondary=0.00 cfs 0.000 af Outflow=0.55 cfs 0.043 af

Total Runoff Area = 3.313 ac Runoff Volume = 0.258 af Average Runoff Depth = 0.93"
51.03% Pervious = 1.691 ac 48.97% Impervious = 1.622 ac

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MSE 24-hr 3 2 year Rainfall=2.70"

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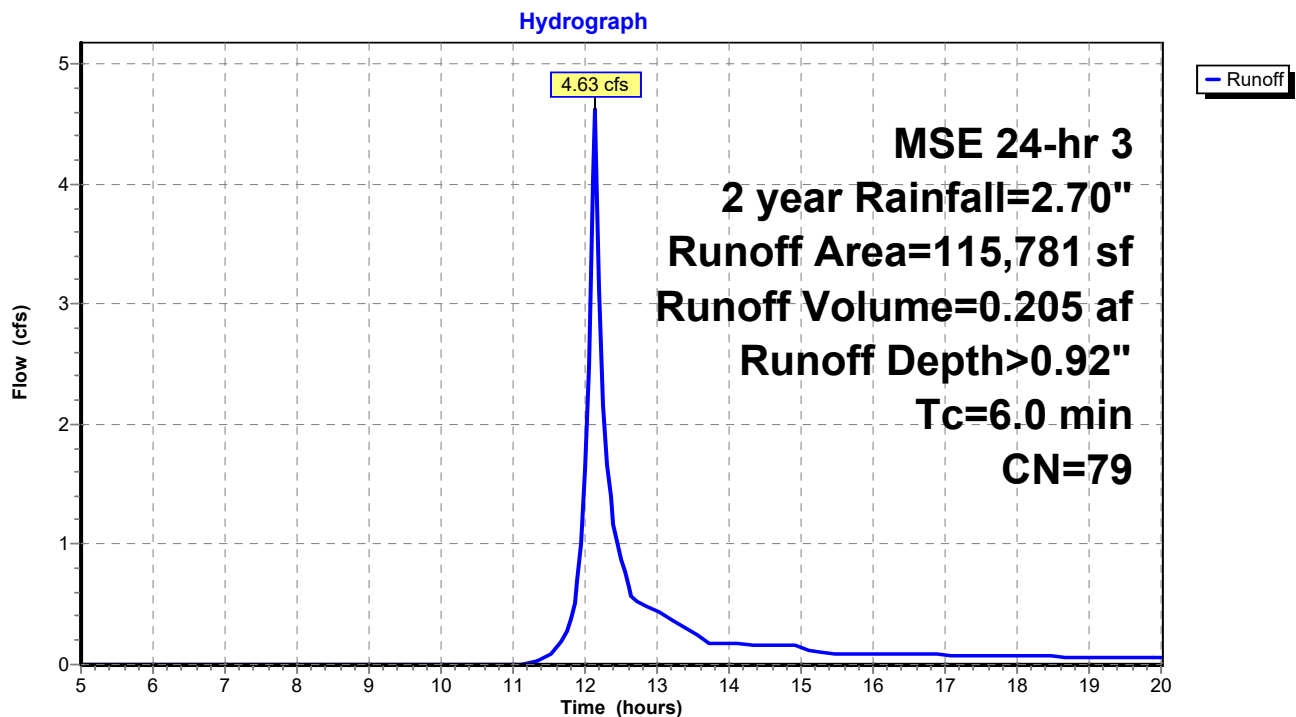
Summary for Subcatchment 6S: Proposed Area as a part of the Regional P1 & P6 Subcatchments

Runoff = 4.63 cfs @ 12.14 hrs, Volume= 0.205 af, Depth> 0.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2 year Rainfall=2.70"

Area (sf)	CN	Description
56,290	98	Paved parking, HSG C
59,491	61	>75% Grass cover, Good, HSG B
115,781	79	Weighted Average
59,491		51.38% Pervious Area
56,290		48.62% Impervious Area

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

Subcatchment 6S: Proposed Area as a part of the Regional P1 & P6 Subcatchments

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MSE 24-hr 3 2 year Rainfall=2.70"

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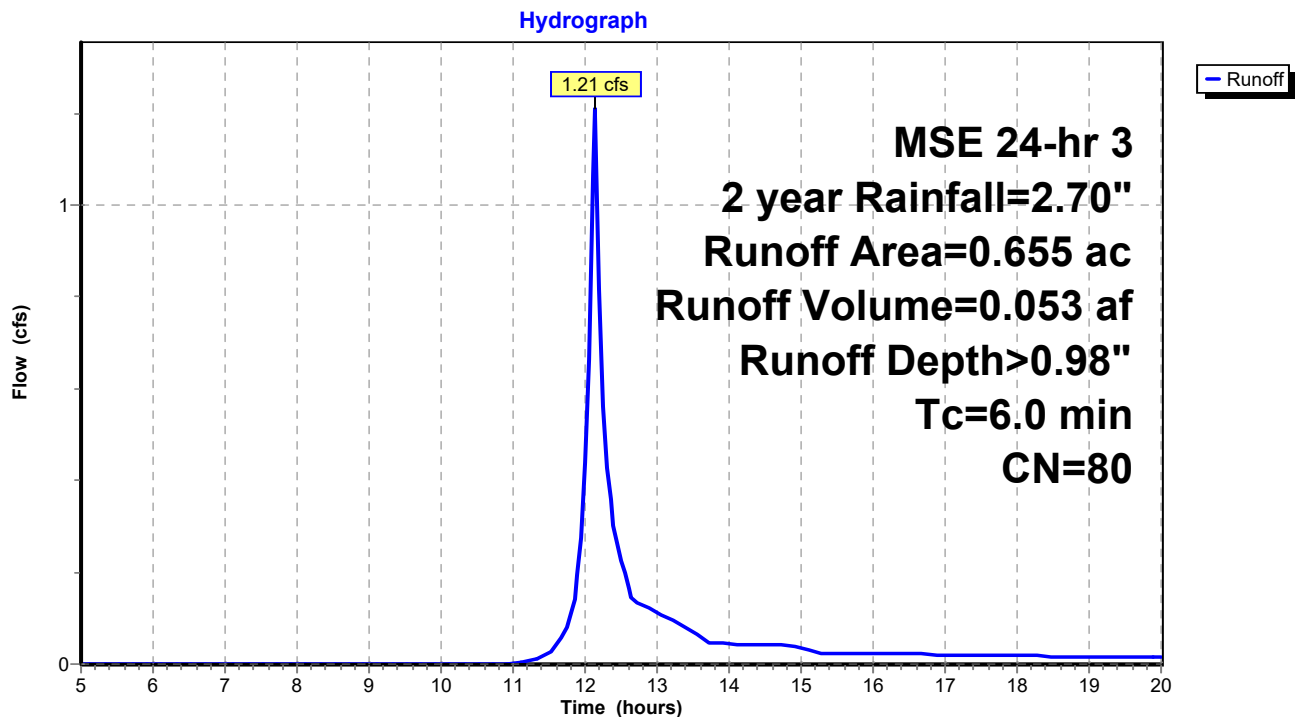
Summary for Subcatchment 8S: Proposed Area to BioBasin-subcatchment 2

Runoff = 1.21 cfs @ 12.14 hrs, Volume= 0.053 af, Depth> 0.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2 year Rainfall=2.70"

Area (ac)	CN	Description
* 0.149	98	Asphalt Drives
* 0.181	98	Future Parking
0.325	61	>75% Grass cover, Good, HSG B
0.655	80	Weighted Average
0.325		49.62% Pervious Area
0.330		50.38% Impervious Area

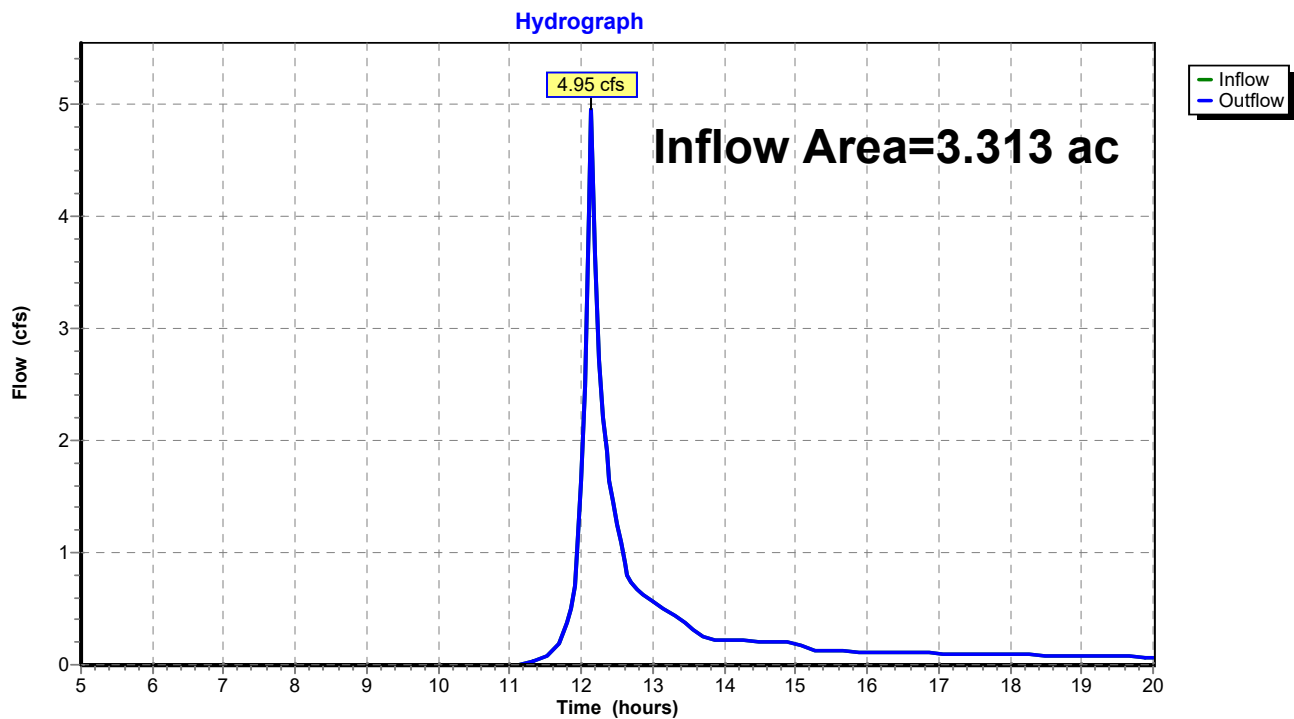
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Min tc

Subcatchment 8S: Proposed Area to BioBasin-subcatchment 2

Summary for Reach 5R: Total Proposed Flow from Regional P1 & P6 & Biobasin

Inflow Area = 3.313 ac, 48.97% Impervious, Inflow Depth > 0.90" for 2 year event
Inflow = 4.95 cfs @ 12.15 hrs, Volume= 0.247 af
Outflow = 4.95 cfs @ 12.15 hrs, Volume= 0.247 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: Total Proposed Flow from Regional P1 & P6 & Biobasin

Summary for Pond 7P: Bioretention Basin

Inflow Area = 0.655 ac, 50.38% Impervious, Inflow Depth > 0.98" for 2 year event
 Inflow = 1.21 cfs @ 12.14 hrs, Volume= 0.053 af
 Outflow = 0.55 cfs @ 12.26 hrs, Volume= 0.043 af, Atten= 54%, Lag= 7.5 min
 Primary = 0.55 cfs @ 12.26 hrs, Volume= 0.043 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 897.65' @ 12.26 hrs Surf.Area= 1,550 sf Storage= 784 cf

Plug-Flow detention time= 79.8 min calculated for 0.043 af (80% of inflow)
 Center-of-Mass det. time= 29.4 min (825.1 - 795.7)

Volume	Invert	Avail.Storage	Storage Description	
#1	896.00'	14,362 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
896.00	1,550	0.0	0	0
896.01	1,550	33.0	5	5
897.00	1,550	33.0	506	512
897.01	1,550	27.0	4	516
898.99	1,550	27.0	829	1,344
899.00	1,550	100.0	15	1,360
900.00	2,630	100.0	2,090	3,450
901.00	3,890	100.0	3,260	6,710
902.00	5,310	100.0	4,600	11,310
902.50	6,900	100.0	3,053	14,362

Device	Routing	Invert	Outlet Devices
#1	Primary	896.50'	12.0" Round Culvert L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 896.50' / 894.75' S= 0.0292 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	896.85'	6.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 896.85' / 896.75' S= 0.0200 ' / ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 1	900.00'	2.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	901.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	902.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.55 cfs @ 12.26 hrs HW=897.64' (Free Discharge)

1=Culvert (Passes 0.55 cfs of 3.03 cfs potential flow)

2=Culvert (Inlet Controls 0.55 cfs @ 2.80 fps)

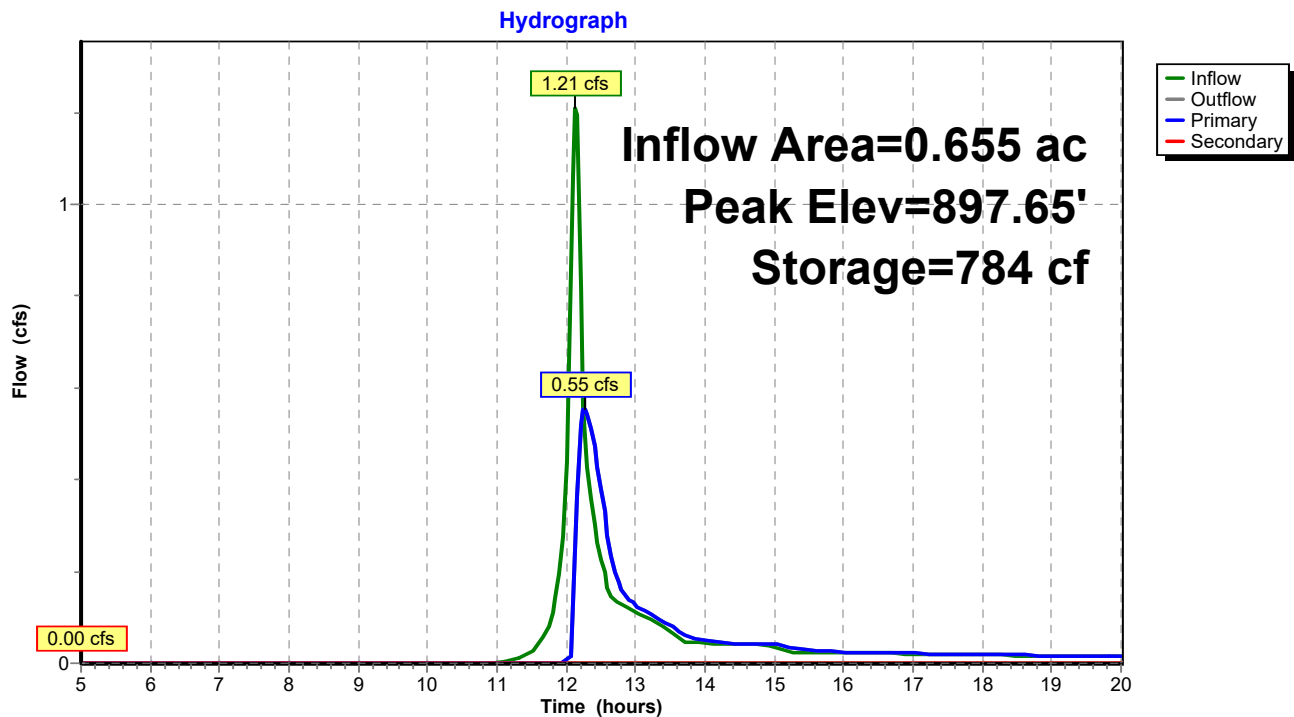
3=Orifice/Grate (Controls 0.00 cfs)

4=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=896.00' (Free Discharge)

5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 7P: Bioretention Basin



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MSE 24-hr 3 10 year Rainfall=3.81"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment6S: Proposed Area as a Runoff Area=115,781 sf 48.62% Impervious Runoff Depth>1.73"
Tc=6.0 min CN=79 Runoff=8.64 cfs 0.383 af

Subcatchment8S: Proposed Area to Runoff Area=0.655 ac 50.38% Impervious Runoff Depth>1.80"
Tc=6.0 min CN=80 Runoff=2.22 cfs 0.098 af

Reach 5R: Total Proposed Flow from Regional P1 & P6 & Biobasin Inflow=9.50 cfs 0.470 af
Outflow=9.50 cfs 0.470 af

Pond 7P: Bioretention Basin Peak Elev=899.00' Storage=1,357 cf Inflow=2.22 cfs 0.098 af
Primary=1.03 cfs 0.087 af Secondary=0.00 cfs 0.000 af Outflow=1.03 cfs 0.087 af

Total Runoff Area = 3.313 ac Runoff Volume = 0.481 af Average Runoff Depth = 1.74"
51.03% Pervious = 1.691 ac 48.97% Impervious = 1.622 ac

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MSE 24-hr 3 10 year Rainfall=3.81"

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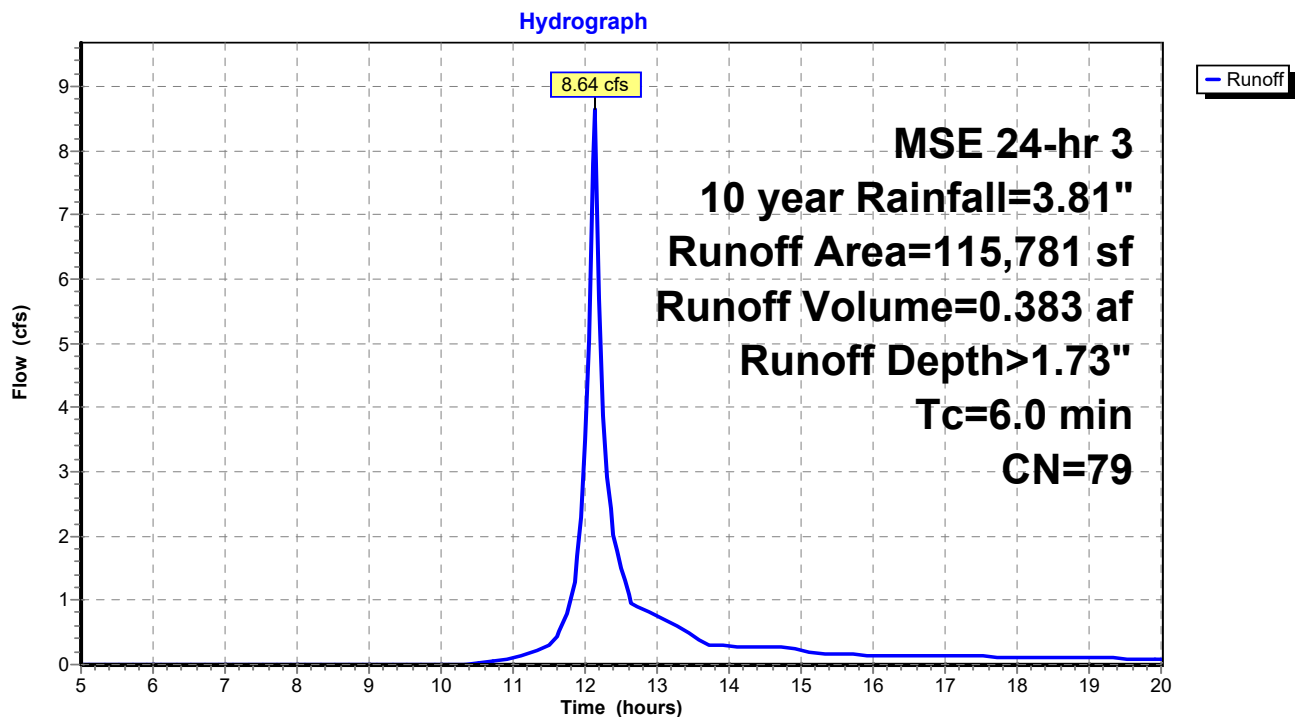
Summary for Subcatchment 6S: Proposed Area as a part of the Regional P1 & P6 Subcatchments

Runoff = 8.64 cfs @ 12.13 hrs, Volume= 0.383 af, Depth> 1.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10 year Rainfall=3.81"

Area (sf)	CN	Description
56,290	98	Paved parking, HSG C
59,491	61	>75% Grass cover, Good, HSG B
115,781	79	Weighted Average
59,491		51.38% Pervious Area
56,290		48.62% Impervious Area

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

Subcatchment 6S: Proposed Area as a part of the Regional P1 & P6 Subcatchments

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MSE 24-hr 3 10 year Rainfall=3.81"

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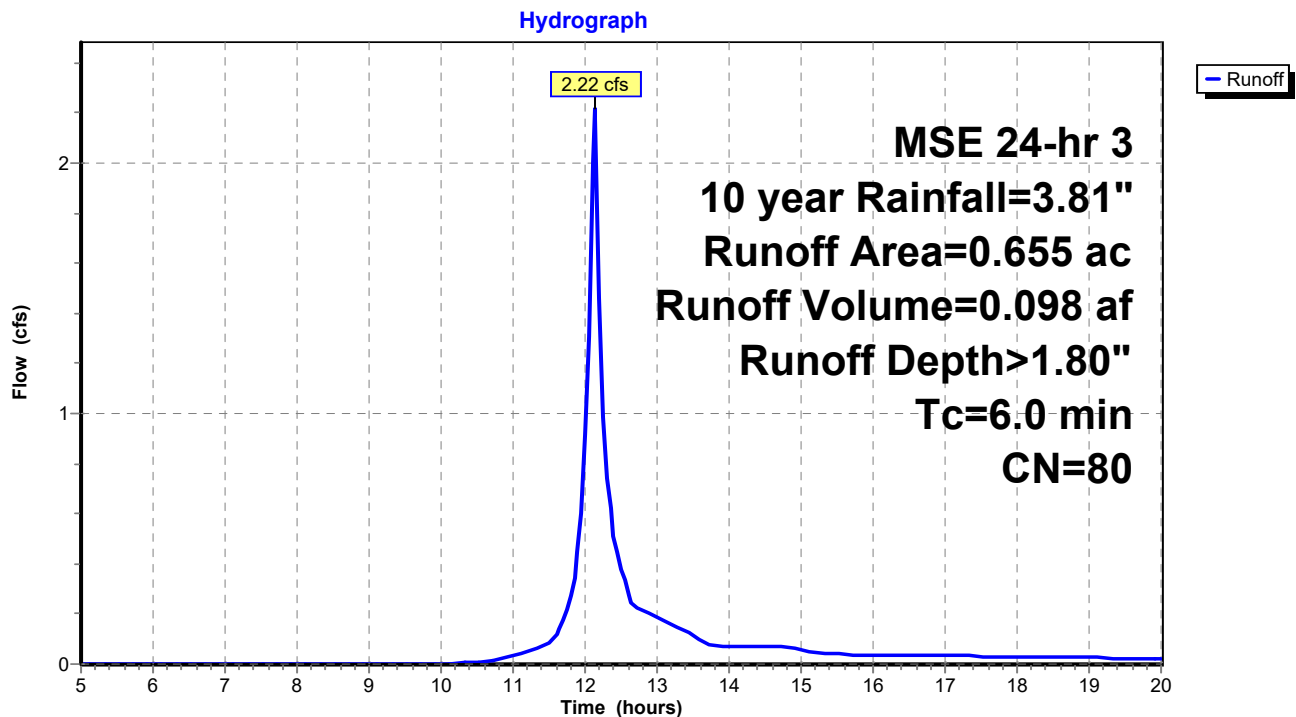
Summary for Subcatchment 8S: Proposed Area to BioBasin-subcatchment 2

Runoff = 2.22 cfs @ 12.13 hrs, Volume= 0.098 af, Depth> 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10 year Rainfall=3.81"

Area (ac)	CN	Description
* 0.149	98	Asphalt Drives
* 0.181	98	Future Parking
0.325	61	>75% Grass cover, Good, HSG B
0.655	80	Weighted Average
0.325		49.62% Pervious Area
0.330		50.38% Impervious Area

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

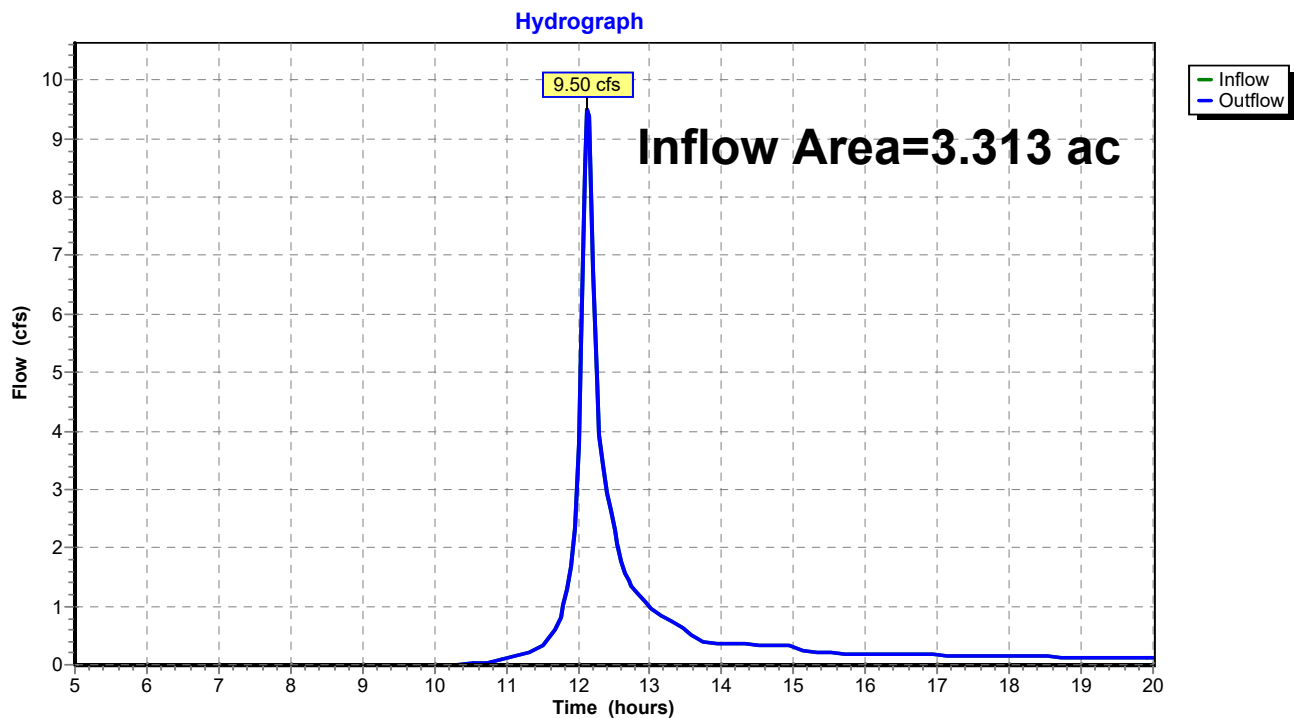
Subcatchment 8S: Proposed Area to BioBasin-subcatchment 2

Summary for Reach 5R: Total Proposed Flow from Regional P1 & P6 & Biobasin

Inflow Area = 3.313 ac, 48.97% Impervious, Inflow Depth > 1.70" for 10 year event
 Inflow = 9.50 cfs @ 12.14 hrs, Volume= 0.470 af
 Outflow = 9.50 cfs @ 12.14 hrs, Volume= 0.470 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: Total Proposed Flow from Regional P1 & P6 & Biobasin



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MSE 24-hr 3 10 year Rainfall=3.81"

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Summary for Pond 7P: Bioretention Basin

Inflow Area = 0.655 ac, 50.38% Impervious, Inflow Depth > 1.80" for 10 year event
 Inflow = 2.22 cfs @ 12.13 hrs, Volume= 0.098 af
 Outflow = 1.03 cfs @ 12.25 hrs, Volume= 0.087 af, Atten= 54%, Lag= 7.2 min
 Primary = 1.03 cfs @ 12.25 hrs, Volume= 0.087 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 899.00' @ 12.25 hrs Surf.Area= 1,550 sf Storage= 1,357 cf

Plug-Flow detention time= 54.8 min calculated for 0.087 af (88% of inflow)
 Center-of-Mass det. time= 21.4 min (807.0 - 785.6)

Volume	Invert	Avail.Storage	Storage Description	
#1	896.00'	14,362 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
896.00	1,550	0.0	0	0
896.01	1,550	33.0	5	5
897.00	1,550	33.0	506	512
897.01	1,550	27.0	4	516
898.99	1,550	27.0	829	1,344
899.00	1,550	100.0	15	1,360
900.00	2,630	100.0	2,090	3,450
901.00	3,890	100.0	3,260	6,710
902.00	5,310	100.0	4,600	11,310
902.50	6,900	100.0	3,053	14,362

Device	Routing	Invert	Outlet Devices
#1	Primary	896.50'	12.0" Round Culvert L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 896.50' / 894.75' S= 0.0292 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	896.85'	6.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 896.85' / 896.75' S= 0.0200 ' /' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 1	900.00'	2.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	901.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	902.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

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MSE 24-hr 3 10 year Rainfall=3.81"

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Primary OutFlow Max=1.03 cfs @ 12.25 hrs HW=898.99' (Free Discharge)

1=Culvert (Passes 1.03 cfs of 5.34 cfs potential flow)

2=Culvert (Inlet Controls 1.03 cfs @ 5.23 fps)

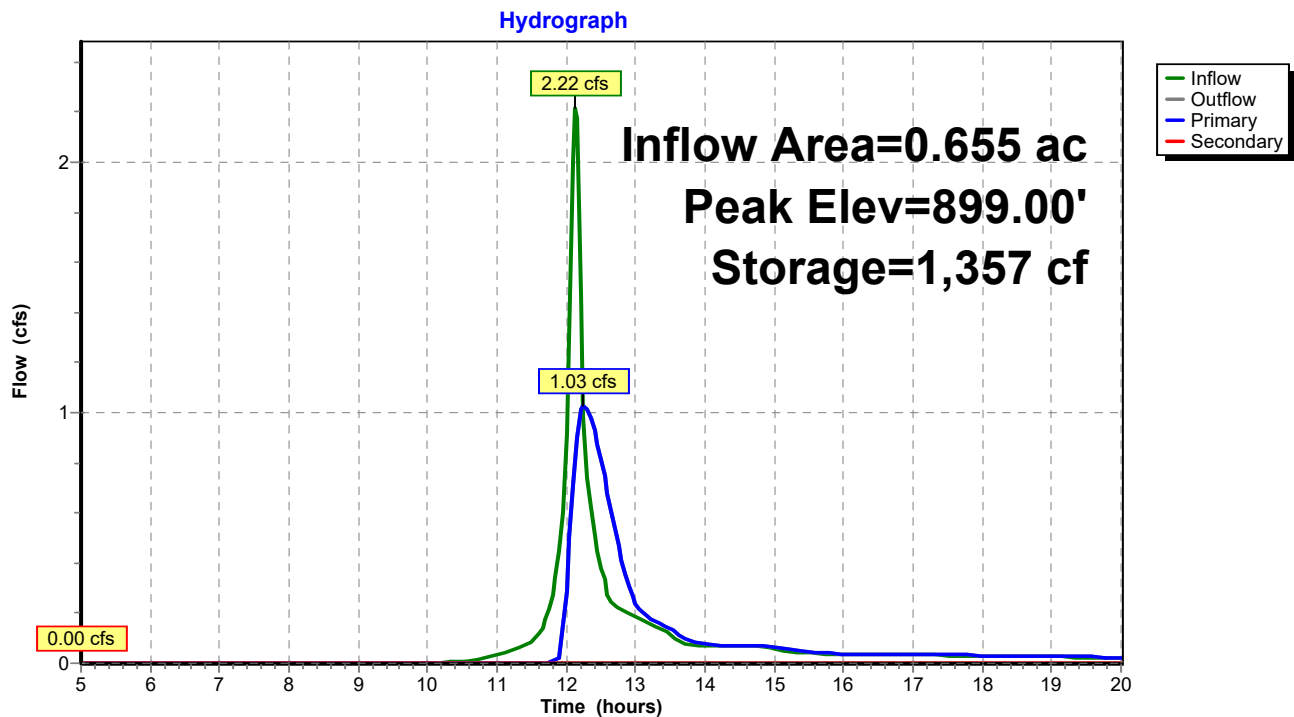
3=Orifice/Grate (Controls 0.00 cfs)

4=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=896.00' (Free Discharge)

5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 7P: Bioretention Basin



CJE1927r0 existing-proposed*MSE 24-hr 3 100 year Rainfall=6.18"*

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment6S: Proposed Area as a Runoff Area=115,781 sf 48.62% Impervious Runoff Depth>3.69"
Tc=6.0 min CN=79 Runoff=17.97 cfs 0.818 af

Subcatchment8S: Proposed Area to Runoff Area=0.655 ac 50.38% Impervious Runoff Depth>3.79"
Tc=6.0 min CN=80 Runoff=4.53 cfs 0.207 af

Reach 5R: Total Proposed Flow from Regional P1 & P6 & Biobasin Inflow=19.11 cfs 1.013 af
Outflow=19.11 cfs 1.013 af

Pond 7P: Bioretention Basin Peak Elev=899.88' Storage=3,142 cf Inflow=4.53 cfs 0.207 af
Primary=1.24 cfs 0.196 af Secondary=0.00 cfs 0.000 af Outflow=1.24 cfs 0.196 af

Total Runoff Area = 3.313 ac Runoff Volume = 1.025 af Average Runoff Depth = 3.71"
51.03% Pervious = 1.691 ac 48.97% Impervious = 1.622 ac

CJE1927r0 existing-proposed

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MSE 24-hr 3 100 year Rainfall=6.18"

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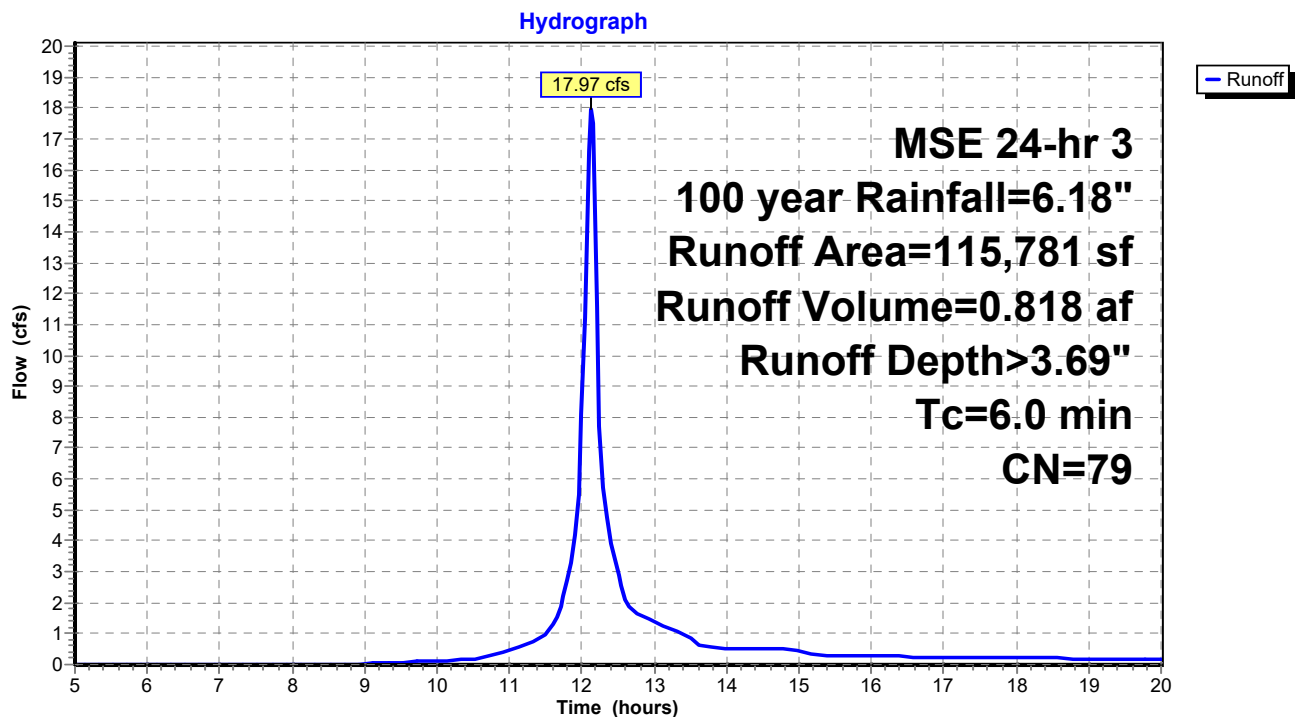
Summary for Subcatchment 6S: Proposed Area as a part of the Regional P1 & P6 Subcatchments

Runoff = 17.97 cfs @ 12.13 hrs, Volume= 0.818 af, Depth> 3.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100 year Rainfall=6.18"

Area (sf)	CN	Description
56,290	98	Paved parking, HSG C
59,491	61	>75% Grass cover, Good, HSG B
115,781	79	Weighted Average
59,491		51.38% Pervious Area
56,290		48.62% Impervious Area

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

Subcatchment 6S: Proposed Area as a part of the Regional P1 & P6 Subcatchments

CJE1927r0 existing-proposed

Prepared by CJ Engineering

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MSE 24-hr 3 100 year Rainfall=6.18"

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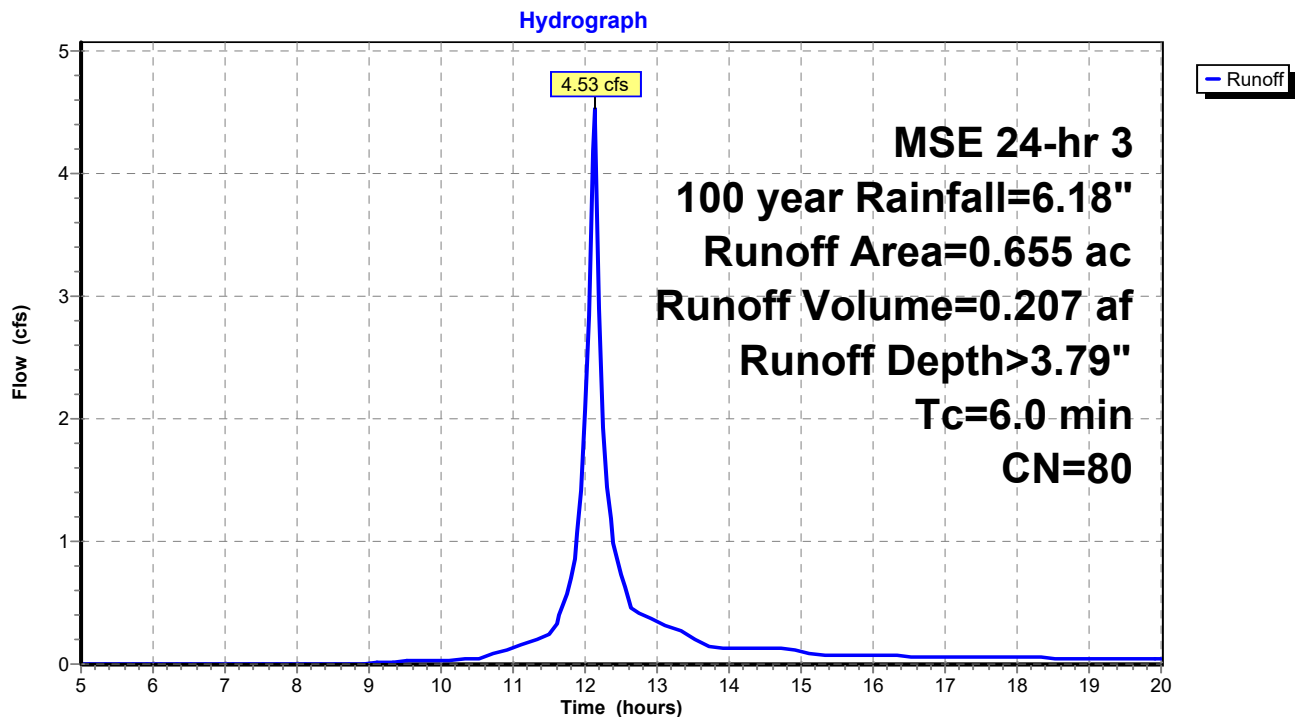
Summary for Subcatchment 8S: Proposed Area to BioBasin-subcatchment 2

Runoff = 4.53 cfs @ 12.13 hrs, Volume= 0.207 af, Depth> 3.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100 year Rainfall=6.18"

Area (ac)	CN	Description
* 0.149	98	Asphalt Drives
* 0.181	98	Future Parking
0.325	61	>75% Grass cover, Good, HSG B
0.655	80	Weighted Average
0.325		49.62% Pervious Area
0.330		50.38% Impervious Area

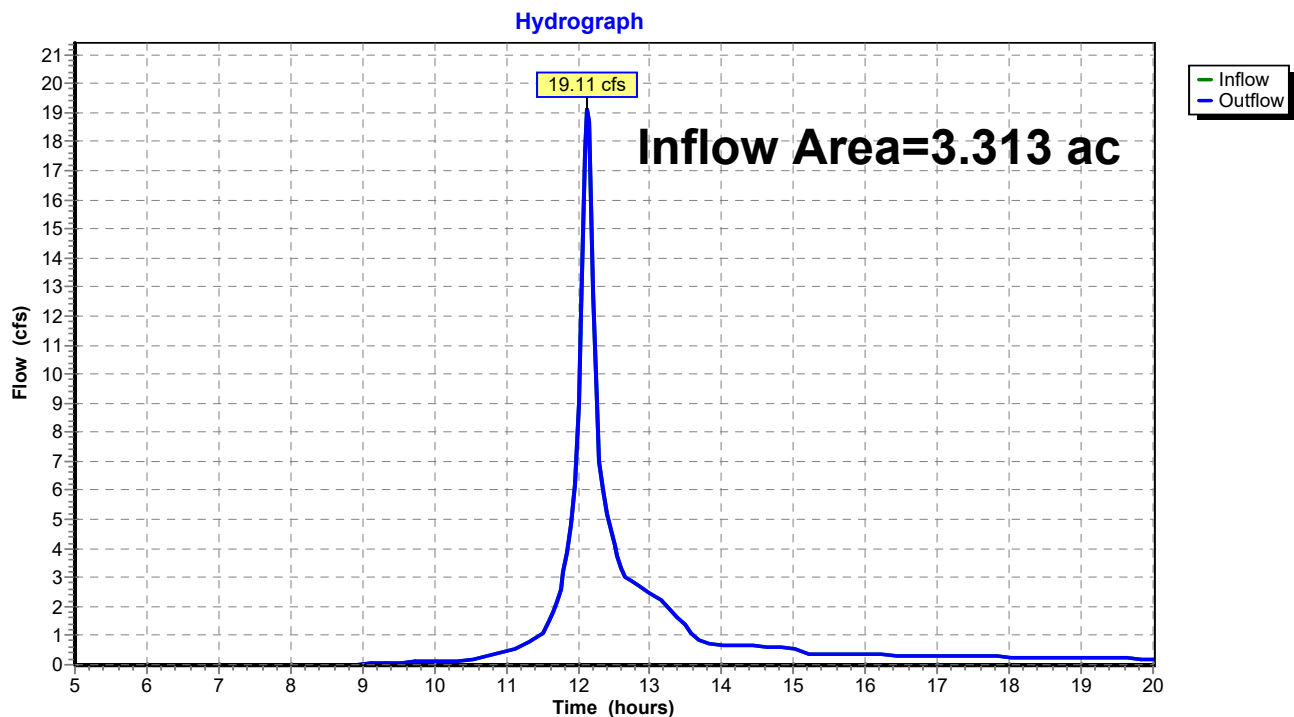
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Min tc

Subcatchment 8S: Proposed Area to BioBasin-subcatchment 2

Summary for Reach 5R: Total Proposed Flow from Regional P1 & P6 & Biobasin

Inflow Area = 3.313 ac, 48.97% Impervious, Inflow Depth > 3.67" for 100 year event
Inflow = 19.11 cfs @ 12.13 hrs, Volume= 1.013 af
Outflow = 19.11 cfs @ 12.13 hrs, Volume= 1.013 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: Total Proposed Flow from Regional P1 & P6 & Biobasin

Summary for Pond 7P: Bioretention Basin

Inflow Area = 0.655 ac, 50.38% Impervious, Inflow Depth > 3.79" for 100 year event
 Inflow = 4.53 cfs @ 12.13 hrs, Volume= 0.207 af
 Outflow = 1.24 cfs @ 12.34 hrs, Volume= 0.196 af, Atten= 73%, Lag= 12.6 min
 Primary = 1.24 cfs @ 12.34 hrs, Volume= 0.196 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 899.88' @ 12.34 hrs Surf.Area= 2,501 sf Storage= 3,142 cf

Plug-Flow detention time= 45.7 min calculated for 0.196 af (94% of inflow)
 Center-of-Mass det. time= 26.1 min (799.5 - 773.3)

Volume	Invert	Avail.Storage	Storage Description	
#1	896.00'	14,362 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
896.00	1,550	0.0	0	0
896.01	1,550	33.0	5	5
897.00	1,550	33.0	506	512
897.01	1,550	27.0	4	516
898.99	1,550	27.0	829	1,344
899.00	1,550	100.0	15	1,360
900.00	2,630	100.0	2,090	3,450
901.00	3,890	100.0	3,260	6,710
902.00	5,310	100.0	4,600	11,310
902.50	6,900	100.0	3,053	14,362

Device	Routing	Invert	Outlet Devices
#1	Primary	896.50'	12.0" Round Culvert L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 896.50' / 894.75' S= 0.0292 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	896.85'	6.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 896.85' / 896.75' S= 0.0200 ' / ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 1	900.00'	2.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	901.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	902.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

CJE1927r0 existing-proposed

Prepared by CJ Engineering

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MSE 24-hr 3 100 year Rainfall=6.18"

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Primary OutFlow Max=1.24 cfs @ 12.34 hrs HW=899.88' (Free Discharge)

1=Culvert (Passes 1.24 cfs of 6.42 cfs potential flow)

2=Culvert (Inlet Controls 1.24 cfs @ 6.34 fps)

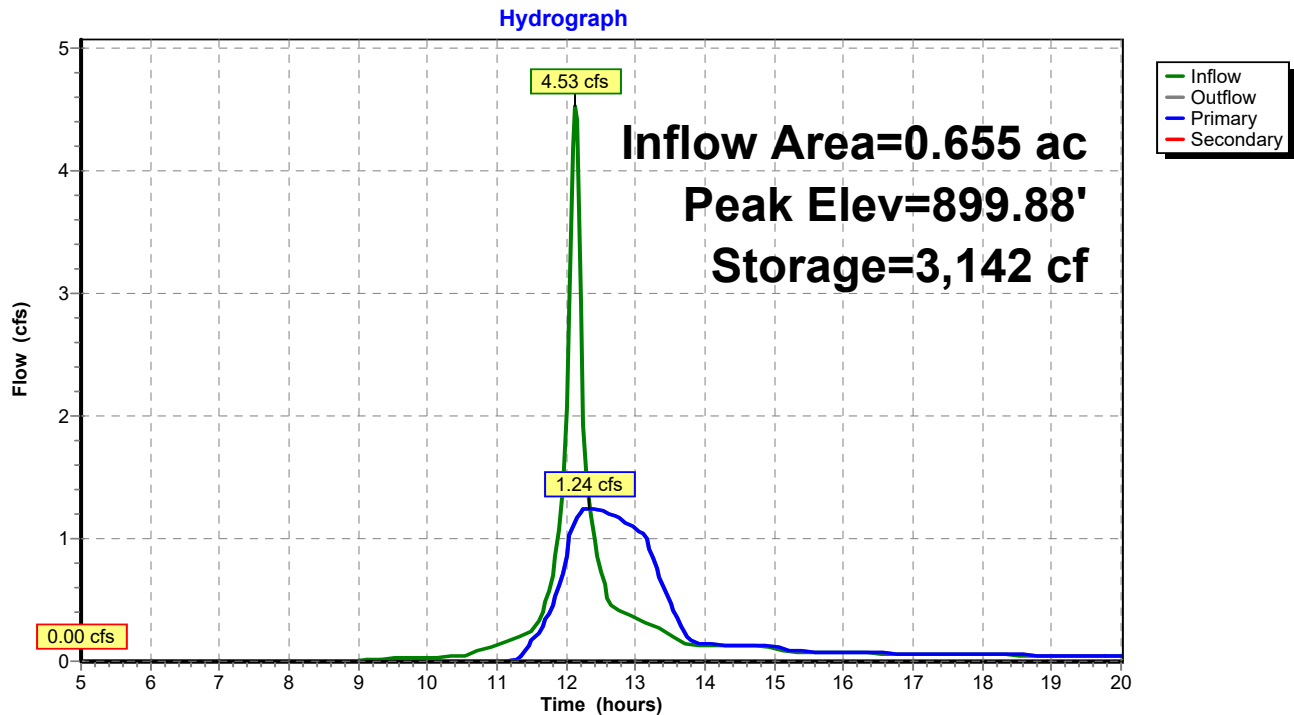
3=Orifice/Grate (Controls 0.00 cfs)

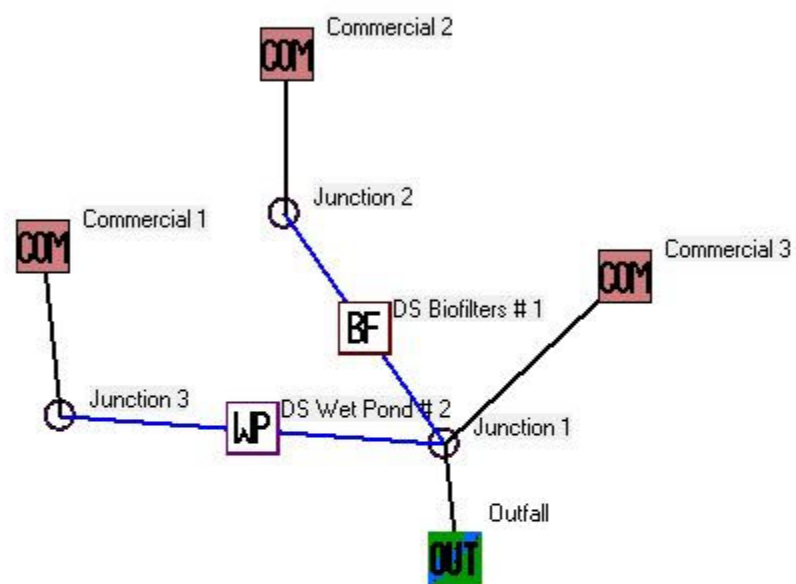
4=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=896.00' (Free Discharge)

5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 7P: Bioretention Basin





Data file name: Z:\WinSLAMM\CJE1927R1.mdb
WinSLAMM Version 10.2.0
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Milwaukee WI 1969.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\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: 01/05/69 Study period ending date: 12/31/69
Start of Winter Season: 12/06 End of Winter Season: 03/28
Date: 09-15-2020 Time: 14:34:18
Site information:

LU# 1 - Commercial: Commercial 2 Total area (ac): 0.655
13 - Paved Parking 1: 0.149 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
14 - Paved Parking 2: 0.181 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.325 ac. Normal Sandy Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 2 - Commercial: Commercial 3-Undetained Total area (ac): 0.471
45 - Large Landscaped Areas 1: 0.471 ac. Normal Sandy Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 3 - Commercial: Commercial 1 Total area (ac): 7.546
1 - Roofs 1: 3.615 ac. Flat Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 2.015 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 1.367 ac. Normal Sandy Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.549 ac. Source Area PSD File:

Control Practice 1: Biofilter CP# 1 (DS) - DS Biofilters # 1

1. Top area (square feet) = 6900
2. Bottom area (square feet) = 1550
3. Depth (ft): 6.5
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0.1
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 1
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 = 0.27
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 Soil 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: 6
- Outlet type: Vertical Stand Pipe
1. Stand pipe diameter (ft): 2
 2. Stand pipe height above datum (ft): 5.5
- Outlet type: Drain Tile/Underdrain
1. Underdrain outlet diameter (ft): 0.5
 2. Invert elevation above datum (ft): 1
 3. Number of underdrain outlets: 1

Control Practice 2: Wet Detention Pond CP# 1 (DS) - DS Wet Pond # 2

Particle Size Distribution file name: Not needed - calculated by program
Initial stage elevation (ft): 6
Peak to Average Flow Ratio: 3.8
Maximum flow allowed into pond (cfs): No maximum value entered
Outlet Characteristics:

- Outlet type: Orifice 1
1. Orifice diameter (ft): 0.25
 2. Number of orifices: 1
 3. Invert elevation above datum (ft): 6
- Outlet type: Broad Crested Weir
1. Weir crest length (ft): 10
 2. Weir crest width (ft): 10
 3. Height from datum to bottom of weir opening: 9.8
- Outlet type: Vertical Stand Pipe
1. Stand pipe diameter (ft): 2
 2. Stand pipe height above datum (ft): 8.5

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	1.00	0.2900	0.00	0.00
2	2.00	0.3150	0.00	0.00
3	3.00	0.3410	0.00	0.00
4	4.00	0.3680	0.00	0.00
5	5.00	0.3960	0.00	0.00
6	6.00	0.5490	0.00	0.00
7	7.00	0.6180	0.00	0.00
8	8.00	0.7030	0.00	0.00
9	9.00	0.8000	0.00	0.00
10	10.00	0.8940	0.00	0.00
11	10.30	1.0690	0.00	0.00

SLAMM for Windows Version 10.2.0
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Data file name: Z:\WinSLAMM\CJE1927R1.mdb

Data file description:

Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Milwaukee WI 1969.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

Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdxd

Start of Winter Season: 12/06 End of Winter Season: 03/28

Model Run Start Date: 01/05/69 Model Run End Date: 12/31/69

Date of run: 09-15-2020 Time of run: 14:32:40

Total Area Modeled (acres): 8.672

Years in Model Run: 0.99

	Runoff Volume (cu ft)	Percent Runoff Volume Reduction	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of all Land Uses without Controls:	534733	-	62.95	2101	-
Outfall Total with Controls:	517724	3.18%	4.978	160.9	92.34%
Annualized Total After Outfall Controls:	524914			163.1	

Pollutant	Concentration - No Controls	Concentration - With Controls	Conc. Units	Pollutant Yield No Controls	Pollutant Yield With Controls	Pol. Yield Units
Percent Reduction						
Particulate Solids	62.95	4.978	mg/L	2101	160.9	lbs 92.34 %
Particulate Phosphorus	0.1680	0.01367	mg/L	5.609	0.4419	lbs 92.12 %

PROJECT NAME	Hill Court Multi-Tenant
PROJECT NUMBER	CJE1927R1
DATE	8/6/2020
DESIGN METHOD	AREA METHOD

SYSTEM 1	INLET 1			INLET 2			INLET 3			INLET 4			INLET 5			INLET 6														
	TYPE	SF	ACRE	GPM	SF	ACRE	GPM	SF	ACRE	GPM	SF	ACRE	GPM	SF	ACRE	GPM	SF	ACRE	GPM											
	PAVED	4836	0.111	149	12657	0.291	389	5683	0.130	175	7645	0.176	235	9971	0.229	307	2880	0.066	89											
	BUILDING	0	0.000	0	0	0.000	0	0	0.000	0	0	0.000	0	0	0.000	0	0	0.000	0											
	OPEN	2900	0.067	28	4549	0.104	44	1754	0.040	17	1888	0.043	18	2971	0.068	29	560	0.013	5											
	TOTAL	7736	0.178	177	17206	0.395	433	7437	0.171	192	9533	0.219	253	12942	0.297	335	3440	0.079	94											
CUMULATIVE						610						802						1055						1390						1484

SYSTEM 2	INLET 7			INLET 8			INLET 9			INLET 10			
	TYPE	SF	ACRE	GPM	SF	ACRE	GPM	SF	ACRE	GPM	SF	ACRE	GPM
	PAVED	10798	0.248	332	5737	0.132	177	12701	0.292	391	4429	0.102	136
	BUILDING	0	0.000	0	0	0.000	0	0	0.000	0	0	0.000	0
	OPEN	19195	0.441	185	0	0.000	0	0	0.000	0	0	0.000	0
	TOTAL	29993	0.689	517	5737	0.132	177	12701	0.292	391	4429	0.102	136
	CUMULATIVE	693						1084			1220		

SYSTEM 3	INLET 11			INLET 12			INLET 13			BUILDING (14)			
	TYPE	SF	ACRE	GPM	SF	ACRE	GPM	SF	ACRE	GPM	SF	ACRE	GPM
	PAVED	4981	0.114	153	5070	0.116	156	5070	0.116	156	157488	3.615	4846
	BUILDING	0	0.000	0	0	0.000	0		0.000	0	0	0.000	0
	OPEN	1585	0.036	15	0	0.000	0	0	0.000	0	0	0.000	0
	TOTAL	6566	0.151	169	5070	0.116	156	5070	0.116	156	157488	3.615	4846
CUMULATIVE	324						5326						

Project Location Village of Mukwonago, Hill Court

Checked By CAJ Sheet 1 of 1

Date 09/01/20

Project Name Hill Court Multi-tenant
CJE Job No. CJE1927R7 Designed By RSB

[illegible]

Hill Court Multi-tenant Inlet Calculations:

Note:

1. All inlet total cfs taken from submitted storm sewer calculations.
2. Inlet cfs calculated by either the WI Plumbing Code Area Method or Rational Method
3. Inlet grate capacity was determined based on the *Neenah Foundry Inlet Grate Capacities Research Project for Gutter Flow and Ponded Water*. The provided charts show the inlet capacity in red at the minimum ponding depth of 0.3'.

Inlet #1

Total Flow = 177 GPM = 0.39 CFS

Grate R-3229-A

Inlet Capacity = 3.6 cfs

Inlet #7

Total Flow = 3.01 CFS

Grate R-3229-A

Inlet Capacity = 3.6 cfs

Inlet #2

Total Flow = 433 GPM = 0.96 CFS

Grate R-3229-A

Inlet Capacity = 3.6 cfs

Inlet #8

Total Flow = 1.05 CFS

Grate R-3229-A

Inlet Capacity = 3.6 cfs

Inlet #3

Total Flow = 192 GPM = 0.43 CFS

Grate R-3229-A

Inlet Capacity = 3.6 cfs

Inlet #9

Total Flow = 2.26 CFS

Grate R-3229-A

Inlet Capacity = 3.6 cfs

Inlet #4

Total Flow = 253 GPM = 0.56 CFS

Grate R-3229-A

Inlet Capacity = 3.6 cfs

Inlet #10

Total Flow = 0.77 CFS

Grate R-3229-A

Inlet Capacity = 3.6 cfs

Inlet #5

Total Flow = 335 GPM = 0.75 CFS

Grate R-3229-A

Inlet Capacity = 3.6 cfs

Inlet #11

Total Flow = 0.38 CFS

Grate R-2501

Inlet Capacity = 2.7 cfs

Inlet #6

Total Flow = 94 GPM = 0.21 CFS

Grate R-3229-A

Inlet Capacity = 3.6 cfs

Inlet #12 or #13

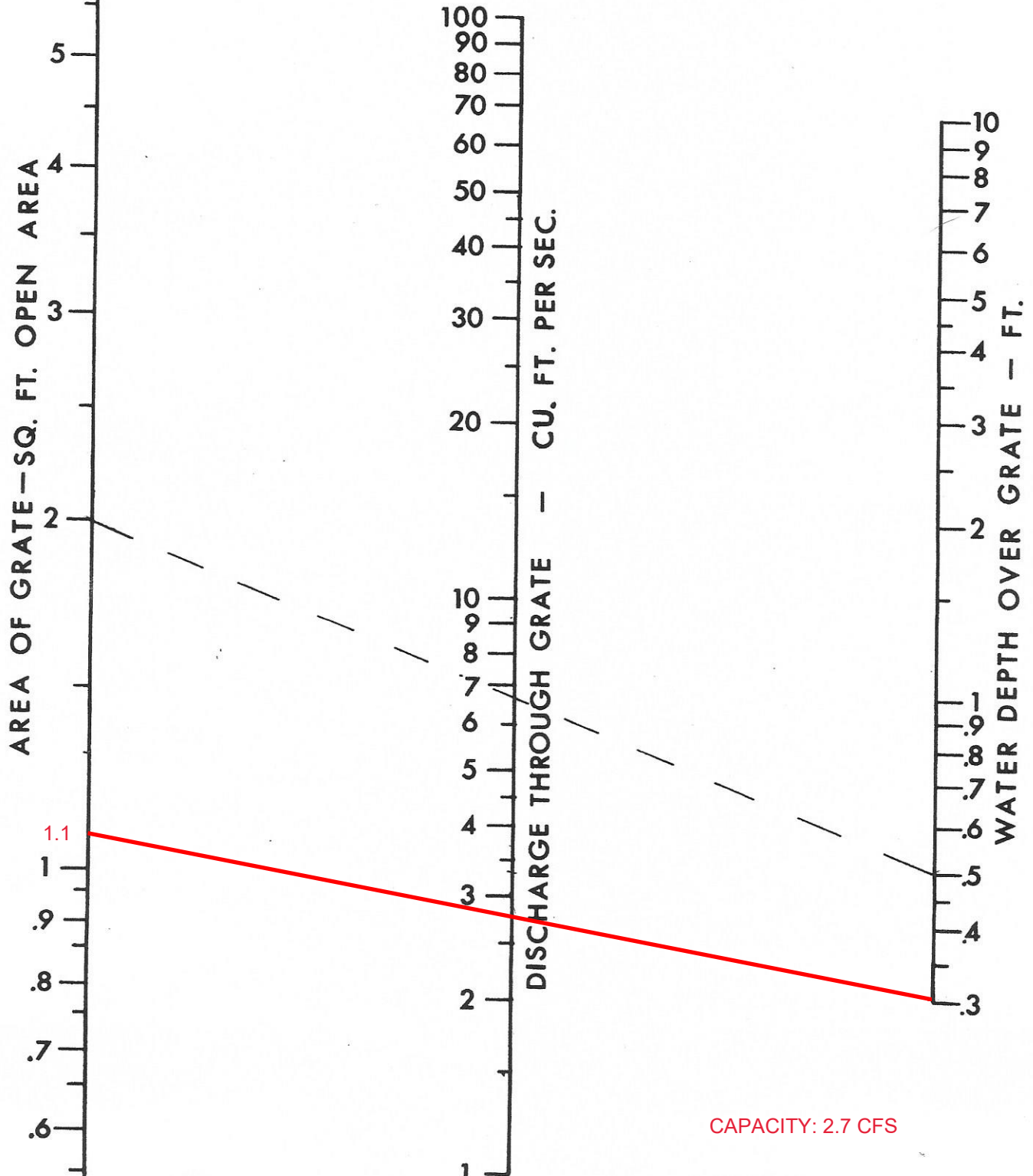
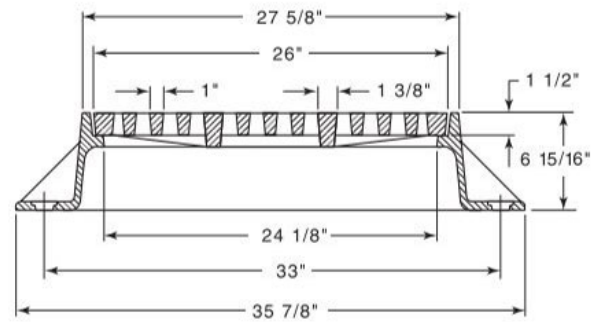
Total Flow = 0.35 CFS

Grate R-2501

Inlet Capacity = 2.7 cfs

R-2501
Inlet Frame, Grate
 INLETS
Heavy Duty

CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET
R-2501	G	1.1	6.8
R-2501	A	1.1	6.8
R-2501	C	1.2	6.8
R-2501	F	1.4	6.8



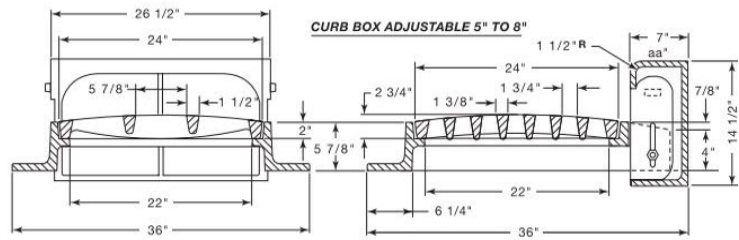
CAPACITY: 2.7 CFS

R-3229-A

Combination Inlet Frame, Convex Grate, Curb Box

INLETS

Heavy Duty



Standard Grate (shown): Type C

Alternate Grate(s):

CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET
R-3229-A	C	1.5	8.0
R-3229-A	R	1.6	8.0
R-3229-A	D	1.6	8.0



Type R



Type D

AREA OF GRATE—SQ. FT. OPEN AREA

DISCHARGE THROUGH GRATE — CU. FT. PER SEC.

WATER DEPTH OVER GRATE — FT.

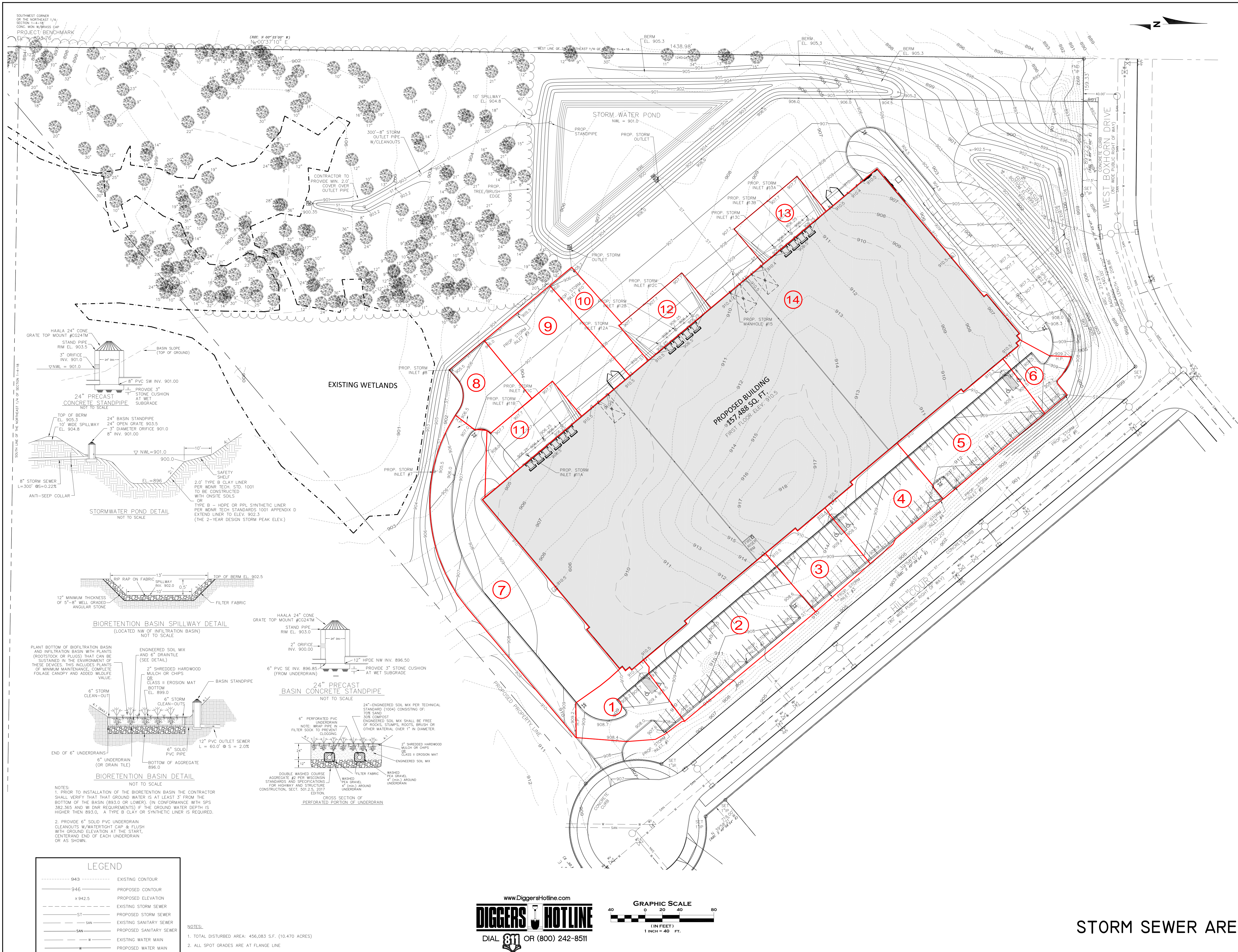
1.5

CAPACITY: 3.6 CFS

HILL COURT MULTI-TENANT BUILDING

MUKWONAGO, WISCONSIN

CJE NO.: CJE1927R7
SEPTEMBER 2, 2020
SEPTEMBER 15, 2020



Minimum Storm Water Practice Maintenance Requirements

The maintenance activities listed below are aimed to ensure these practices continue serving their intended functions in perpetuity. The list of activities is not all-inclusive, but rather indicates the minimum type of maintenance that can be expected for this particular site.

WET DETENTION BASINS

System Description:

The wet detention basin is designed to remove Total Suspended Solids (TSS) in the site runoff and to reduce pre-development downstream peak flows. To function correctly, the pond size, water level and outlet structures must be maintained as specified in this Plan.

Minimum Maintenance Requirements:

To ensure the proper function of the storm water management practices described above, the following activities must be completed:

1. All outlet structures and pipes must be checked monthly to ensure there is no blockage from floating debris or ice, especially the washed stone in front of the orifices and the trash rack on the risers in the main part of the basins. Any blockage must be removed immediately. The washed stone must be replaced when it becomes clogged.
2. NO trees are to be planted or allowed to grow on the earthen berms. Tree root systems can reduce soil compaction and cause berm failure. The berms must be inspected annually and any woody vegetation removed.
3. If floating algae or weed growth becomes a nuisance (decay odors, etc.), it must be removed from the basin and deposited where it cannot drain back into the basin. Removal of the vegetation from the water reduces re-growth the following season (by harvesting the nutrients). Wetland vegetation must be maintained along the waters edge for safety and pollutant removal purposes.
4. The wet detention basins are to be inspected every five (5) years to determine the average depth of water in the center of the detention basins. The basins are to be cleaned out prior to the depth water being reduced by accumulated sediment to less than three (3) feet. All removed sediment must be placed in an appropriate upland disposal site and stabilized (grass cover) to prevent sediment from washing back into the basin.
5. No grading or filling of the basins or berms other than for sediment removal is allowed, unless otherwise approved by the Village of Mukwonago.
6. To promote more effective infiltration, mowing in the drainage ways, detention basins, and wetland fringe areas should be minimized. If mowing is deemed necessary, the mowing heights should be no shorter than six (6) inches. Restricting any mowing to late summer or autumn will minimize mortality to ground nesting birds. To discourage the presence of nuisance waterfowl (i.e. Canada Geese), a minimum 30-foot wide no-mow fringe shall be maintained around all detention basins, where possible.
7. After Vegetation is 70% established, the use of herbicides/pesticides is to be discontinued along the swales & basins.

BIORETENTION BASIN

System Description:

The storm water management facility includes a bioretention basin. The basin is designed to reduce peak flows and reduce runoff total suspended solids (TSS) from the site by intercepting the runoff and allowing it to seep (infiltrate) into the engineered soil layer and through the perforated under-drain pipe. To function correctly, the bioretention basin size, depth, outlet manhole and under-drain pipe must be maintained as specified in this Agreement.

Minimum Maintenance Requirements:

To ensure the proper function of the bioretention basin, the following list of maintenance activities are required to be performed by the owner or authorized qualified representative:

1. A minimum of 70% soil cover made up of plants must be maintained on the bioretention basin bottom. The basin sides shall be a turf grass. Maintain plants and grasses per qualified landscape contractor recommendations.
2. Seasonal (early spring) inspection of the soil surface for the presence of sodium accumulation due to the introduction of chlorides for winter maintenance of the parking lot should occur. It is also recommended that the soil be flushed with 1" of clean water 3-4 times each spring. Consider reducing sodium/salting or use sodium alternatives.
3. The basin and all components (outlet manhole, outlet pipe, vegetation and spillway) should be inspected after each heavy rain of 1.5" or more. If the basin is not draining properly (within 72 hours), further inspection may be required by persons with expertise in storm water management and/or soils.
 - If basin is not draining, the 6" drain tile should be cleared of any blockages or obstructions. Clear blockages in the underdrain pipe, if present through the underdrain cleanout. Expose the stone and soil immediately around the pipe, clear blockages and replace per approved design. Also examine outlet orifice through the dual treated planks within the pond outlet manhole. Remove any sediment accumulated within the manhole and orifice.
 - If soil testing shows that the soil surface has become crusted, sealed or compacted, Engineered soil should be replaced. Expose 6" drain tile and verify it is clear of obstructions. Remove and replace engineered soil per WDNR specifications. Replace bioretention plantings per approved Landscape Plan for the project.
 - If sedimentation is determined to be causing the failure, the accumulated sediment must be removed and the area replanted in accordance with the approved Landscape Plan for the project. Sediment removed shall be deposited offsite at an appropriate soil disposal facility.
4. All outlet pipes, other flow control devices within the basin outlet manhole must be kept free of debris. Any blockage must be removed immediately.
5. Any eroding areas must be repaired immediately to prevent premature sediment build-up in the system. Erosion matting is recommended for repairing grassed areas.
6. Heavy equipment and vehicles must be kept off of the bottom and side slopes of bioretention basin to prevent soil compaction. Soil compaction will reduce infiltration and may cause failure of the basin, resulting in ponding and possible growth of wetland plants.
7. No unauthorized trees are to be planted or allowed to grow on the earthen berms or bottom of the basin. On the berms, tree root systems can reduce soil compaction and cause berm failure. On the basin bottom, trees may shade out the native grasses. Woody vegetation must be removed.
8. Check for invasive species growth and remove per species specific recommended practices.
9. No grading or filling of the basin or berms other than for sediment removal is allowed.
10. Inspections should be performed per Village requirements. An inspection form must be completed and documented by a qualified person that represents the Owner. Any needed maintenance must be documented and scheduled for immediate repair. All repairs must be documented, preferably with photographs.
11. Snow shall not be dumped directly onto the conditioned planting bed.

12. See chart below for maintenance activity and frequency:

Activity	Frequency
Water Plants	As necessary during first growing season
Water as necessary during dry periods	As needed after first growing season
Re-mulch void areas	As needed
Treat diseased trees and shrubs	As needed
Inspect soil and repair eroded areas	Monthly
Remove litter and debris	Monthly
Add additional mulch	Once per year

September 28, 2020

Mr. Fred Winchowky
Village President
Village of Mukwonago
440 River Crest Court
Mukwonago, WI 53149

Re: Hill Court Multi-Tenant Development
Recommendation of Approval of Development Documents

Dear President Winchowky:

We have reviewed the Storm Water Management Plan, Storm Water Maintenance Agreement and Construction Drawings for the Hill Court Multi-Tenant Development located in TID #5. The Storm Water Management Plan is dated September 15, 2020 and the Civil Plans and Storm Water Maintenance Agreement are dated September 28, 2020. All documents were received in our office on September 28, 2020. We believe the current submittal generally meets the intent of the Village Storm Water Ordinance, the Regional Storm Water Management Plan, is in accordance with the Village of Mukwonago's Standard Specifications, and follows standard engineering practice.

We, therefore, recommend the following actions of the documents to you and the Village Board:

1. Approval of the Construction Plans.
 - a. The latest version is attached to the email in which this letter is being transmitted.
2. Approval of the Storm Water Management Plan.
 - a. The latest version is attached to the email in which this letter is being transmitted.
3. Approval and execution of the Storm Water Maintenance Agreement.
 - a. The Storm Water Maintenance Agreement is attached to the email in which this letter is being transmitted such that, if it is approved, it can receive the appropriate signatures and be transferred to a form suitable for recording.

We recommend the above actions also be made subject to the following conditions:

1. A breakdown of the construction costs for all public improvements and storm water management devices should be provided to Ruekert & Mielke. Ruekert & Mielke will review the breakdown and provide a recommendation to the Village Board for a surety amount. A surety should then be established in the form of a Letter of Credit prior to the start of construction.
2. Prior to any land disturbing activity, hold a preconstruction conference with representatives of the design team, the construction team, Village and Utility Staff and Ruekert & Mielke to ensure all members of the design and construction team understand the installation of utilities and the storm water management and erosion control plan requirements.
3. During construction, the following conditions shall be followed:
 - b. Contractor shall have extreme care when conducting grading or any land disturbing activities in near proximity to the adjacent wetlands. This includes ensuring that any

work does not remove or destroy any erosion and sediment control measures without additional measures being first placed downstream of the affected devices.

- c. All dewatering shall be done in accordance with the approved plans. At no time, shall dewatering practices be located outside of any approved locations without being adequately protected downstream.
- d. Owner shall maintain approved plans on-site and readily available to the Village Erosion Control Inspector.
- e. On-site approved plans must reflect current construction conditions and compliance with the Village ordinance.
- f. On-site plans must reflect the current sequence of construction and all erosion and sediment control measures shall meet the Wisconsin Department of Natural Resources Technical Standards.
- g. Village ordinance requires inspection of the erosion control measures once every 7 days and within 24 hours of a rainfall of 0.5 inches or greater. Given the proximity of this development to sensitive natural resources, it is recommended that erosion and sediment control measures be inspected at the end of each working day to ensure compliance. All inspection reports **must** be available on-site and available to the Village at any time of day. Reports must contain the information required by the WDNR.
- h. Any construction within the public right-of-way, will conform to the Village Standard Specifications and Village standard details.
- i. Owner will provide erosion control measures and restore any private utility company land disturbance resulting from providing utilities to this site regardless of location.

Our review did not include a detailed check of all engineering and survey data indicated on the drawings. The accuracy of this data is the responsibility of CJ Engineering.

If you or any staff or board member should have any questions regarding this, please feel free to contact me at (262) 542-5733.

Respectfully,

RUEKERT & MIELKE, INC.



Peter W. Gesch
Project Engineer
pgesch@ruekertmielke.com

Mr. Fred Winchowky
Hill Court Multi-Tenant – Development Documents
September 28, 2020
Page 3

PWG:pwg

cc: Diana Dykstra, Village of Mukwonago
John Weidl, Village of Mukwonago
Bob Harley, Village of Mukwonago
Mark G. Blum, Village of Mukwonago
Dave Brown, Village of Mukwonago
Ron Bittner, Village of Mukwonago
Tim Schwecke, Village of Mukwonago
Paul Grzeszczak, Briohn Design Group, LLC
Jerad J. Wegner, P.E., Ruekert & Mielke, Inc.

**HIPPENMEYER, REILLY, BLUM,
SCHMITZER, FABIAN & ENGLISH S.C.**

MARK G. BLUM
THOMAS G. SCHMITZER
LORI J. FABIAN
RONALD E. ENGLISH III
MATTHEW R. GRALINSKI

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RICHARD S. HIPPENMEYER
(1911-1979)
WILLIAM F. REILLY
(1932-2007)

EMAIL: MGBLUM@HRBLAWFIRM.COM

September 30, 2020

Via Email (lwood@dkattorneys.com)

Attorney Lisa Kleiner Wood
Davis Kuelthau, S.C.
111 E. Kilbourn Ave., Ste. 1400
Milwaukee, WI 53202

Re: Village of Mukwonago/Hill Court Partners LLC

Dear Lisa:

Enclosed is a draft of the Developer Guaranty Agreement between the Village of Mukwonago and Hill Court Partners. You will note that the format follows that which we previously worked together on regarding Super Products. Please review this and then advise me of any questions or concerns you may have regarding it. Please note that the packet for the Village Board meeting closes tomorrow at Noon.

Regarding the development of the site in general, we are anticipating meeting with the Village President next Thursday morning after the Board meeting to hopefully be able to sign all the closing documents, as well as the documents on the Board Agenda for Wednesday evening, including the CSM, the SWMA and this Developer Agreement.

I would also note that in anticipation of the closing and the initiation of construction, the sureties for the project will need to be completed and in place. In that regard, I have heard from Peter Gesch with Ruekert & Mielke and he advises that he has not seen anything from your Engineer with regard to the costs they are projecting so that surety can be finalized. Please note that your client will not be able to begin construction until those sureties are in place. I believe the primary issue would be the storm water facility to be constructed on your client's property.

In addition, the Village requires a \$10,000.00 construction process surety, which will be drawn against for the fees of the Village Inspectors on the site and other matters related to the project. I also have been advised there is not a reimbursement agreement in place for Village Professional Fees. That will need to be signed and submitted prior to closing as well. Coordination for the payment of these matters can be made with the Village Clerk, Diana Dykstra, at (262) 363-6420.

Attorney Lisa Kleiner Wood

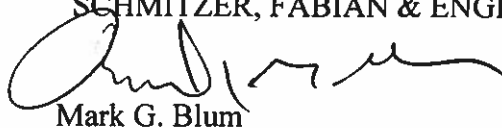
September 30, 2020

Page | 2

Thank you for your attention to these various matters.

Sincerely,

HIPPENMEYER, REILLY, BLUM,
SCHMITZER, FABIAN & ENGLISH, S.C.

A handwritten signature in black ink, appearing to read "Mark G. Blum", written over the printed name.

Mark G. Blum

MGB/jb

Enc.

Cc: Mr. John Weidl

DEVELOPER GUARANTY AGREEMENT

This Developer Guaranty Agreement (the "Agreement") Agreement is made and entered into this ____ day of _____, 2020, by and between the **VILLAGE OF MUKWONAGO**, a Wisconsin municipal corporation (hereinafter referred to as the "Village") and **HILL COURT PARTNERS, LLC**, and its successors and assigns, with its principal office and place of business located at _____, (hereinafter referred to as "Developer").

R E C I T A L S

WHEREAS, the Village and Developer have entered into a Vacant Land Offer to Purchase dated September ____, 2020 ("Purchase Agreement") for the Developer's purchase of approximately 15.796 acres of vacant land which is a part of the parcel known as Lot 1, Certified Survey Map No. 4773 as set forth as Lot 1 on the attached Certified Survey Map (the "Property"), a copy of which is attached hereto and incorporated herein as **Exhibit A**; and

WHEREAS, the Property is part of a larger parcel of land that the Village owns and has developed into an industrial park (the "Industrial Park"); and

WHEREAS, Pursuant to Section 66.1105, Wis. Stat. (the "Tax Increment Law"), the Village has created Tax Increment District No. 5 (the "District") and approved a project plan for redevelopment within the District (the "TID Project Plan"). The boundaries of the District include all of the Industrial Park, including the Property; and

WHEREAS, Subject to the Village's providing the financial assistance set forth herein, Developer intends to acquire the Property and construct a building and other improvements on the Property (collectively the "Facility") which Developer intends to use in connection with its manufacturing business. A preliminary site plan showing projected future development of the Property is attached hereto as **Exhibit B** (the "Preliminary Development Plan"), which is consistent with the current zoning of the Property. The Preliminary Development Plan is also consistent with the TID Project Plan; and

WHEREAS, the projected aggregate assessed valuation for Property, when fully developed, is anticipated to be approximately \$8,500,000; and

WHEREAS, the District will provide reimbursement to the Village for the acquisition costs of the Industrial Park and the Village's debt service expense for the public infrastructure to serve the Industrial Park; and

WHEREAS, the parties acknowledge that the Developer's development of the Property is a material inducement for the Village in acquiring the Property and conveying it to the Developer; and

WHEREAS, the construction of the Facility would not occur without the financial assistance provided herein; and

WHEREAS, The Village, pursuant to Village Board action dated October 7, 2020, has approved the terms of this Agreement and authorized the execution of the Agreement by the proper Village officers on the Village's behalf; and

WHEREAS, it is anticipated that construction of the Facility will be completed and be ready for occupancy by January 1, 2022; and

WHEREAS, it is now necessary that the Developer and the Village enter into this Agreement to provide for the manner and method by which the Property will be developed.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties do hereby covenant and agree as follows:

1. Responsibilities of the Village:

1.1. The Developer, at its expense, will record the Certified Survey Map ("CSM") attached hereto as Exhibit A, creating the Property, which CSM has been approved by the Developer.

1.2. The Village agrees to design and construct a roadway to serve the Property, as well as to provide sanitary sewer and water mains to the lot line of the Property at locations approved by Developer. The Village further has constructed a storm water management facility to service a portion of the Property and the balance of the Industrial Park, in accordance with the Ordinances of the Village of Mukwonago, as well as applicable State of Wisconsin Administrative Code and Wisconsin Statutes. Such storm water management facility is located on property in the Industrial Park other than the Property. The Property will be subject to a Storm Water Maintenance Agreement in the standard form utilized by the Village of Mukwonago for the portion of the property utilizing the Village's storm water pond. The Developer shall be responsible for constructing storm water BMPs to serve the balance of the property being acquired by Developer at the Developer's request..

1.3. The Developer will cause soil borings to be performed on the Property and the Village hereby consents to same. The locations of said borings will be identified by the Developer and the cost of such soil borings shall be borne by the Developer. The Developer agrees to indemnify and hold harmless the Village, its officers, employees, agents, successors and assigns as and against any and all claims, demands, actions, liens, costs and expenses including actual attorney fees arising from the taking of said soil borings or any other testing or inspection of the Property or the actions or omissions of the Developer and/or its agents on the Property.

1.4. The Village has obtained from the Department of Transportation ("DOT") access approval to State Highway 83 for the Property. The Village has completed construction of a public road from State Highway 83 to the Property with access to the Property at a location as shown on the approved CSM, Exhibit A, and as designated by the State of Wisconsin Department of Transportation (the "Public Road"). The Developer shall be entitled to use the Public Road for construction purposes.

1.5. The Village has provided public water and sanitary sewer infrastructure to the Property line of the Property along Boxhorn Drive and Hill Court.

1.6. The Village agrees to convey the Property to the Developer pursuant to the terms and conditions of the Purchase Agreement. The Property is comprised of approximately 15.796 acres for a total purchase price of \$1.00. The closing for this purchase shall occur on or before November 1, 2020.

1.7. Except as otherwise provided in the Purchase Agreement, the Developer shall be responsible for the closing costs of the transaction, including, but not limited to, the payment of title insurance premiums and recording fees (except those required to clear title).

2. Responsibilities of the Developer: Subject to satisfaction of the conditions set forth in this Agreement, Developer shall perform the following:

2.1. Developer and the Village have entered into a Purchase Agreement which provides that Developer shall purchase the Property from Village, subject to satisfaction of Developer's contingencies under the Purchase Agreement. The purchase of the Property shall occur as provided below on or before November 1, 2020. The Village agrees to pay to the Developer a Developer Incentive Payment in the sum of \$245,000.00, which shall be disbursed as follows: (i) \$81,666.66 upon the completion of the footing and foundation for the project; (ii) \$81,666.67 at the time of the closing-in of the structure; and (iii) \$81,666.67 upon the issuance of an Occupancy Permit.

2.2. Developer shall be responsible for the complete civil design for all site work contained within the Property.

2.3. Developer agrees, subject to unanticipated delays, delays by the Village and force majeure, to promptly commence, diligently pursue and complete the construction of the Facility on the Property such that the total assessed value for the Property shall, by January 1, 2022 be not less than \$8,500,000.00 (the "Guaranteed Tax Assessed Value"). The failure of the Developer to achieve the Guaranteed Tax Assessed Value by January 1, 2022 and thereafter maintain that value, for the balance of the term of this Agreement shall allow the Village to collect the shortfall pursuant to the guaranties referenced in this Agreement, which Guaranty Payment (as hereinafter defined) shall be deemed indebtedness of Developer to the Village.

2.4. Security for Construction Obligations. Security for Construction Obligations. To secure receipt by the Village of the annual Guaranty Payment, the Developer agrees to provide the Village with an Irrevocable Standby Letter of Credit in the initial amount of \$2,200,000.00. The Letter of Credit shall be in a form acceptable to the Village and shall be provided to the Village not later than closing of the purchase of the Property. In the event that the Developer fails to pay the Guaranty Payment during the term of this Agreement, the Village shall be entitled to submit an Affidavit of Default and Sight Draft to draw upon the Letter of Credit in the amount of the Guaranty Payment for the subject year. The amounts drawn upon the Letter of Credit by the Village will be applied to any deficiency of the Guaranty Payment by the Developer. Developer has agreed to construct a building pursuant to the plans submitted to and approved by the Village and Building Inspector and attached hereto as **Exhibit C** (the "Building"). Upon the earlier of (the "Termination Date") (i) the completion of construction of the Building as evidenced by the issuance of an occupancy permit by the Village Building Inspector and confirmation by the Village Building Inspector that the work has been completed in accordance with the plans and the Village Building Code; or (ii) upon Buyer's, or its successor's and assign's, payment of real estate taxes on the Property totaling

\$2,200,000.00, the Seller will release the unapplied Letter of Credit to the Buyer and the Letter of Credit shall be terminated.

2.5. Developer warrants and represents that the Property shall be owned by entities that are not exempt from real estate taxes, and that the Guaranteed Tax Assessed Value and the Guaranty Payment shall be maintained until the Termination Date. It shall be a further condition of this Agreement that ownership or occupancy of any portion of the Property may not be transferred to an entity which is exempt from real estate taxes without the prior written consent of the Village, which consent may be conditioned upon the execution by such new owner or occupant of an agreement to make payments in lieu of taxes in an amount of the then-existing non-exempt property tax assessment, multiplied by the applicable tax rate for the Village of Mukwonago. These obligations shall survive and continue until the Termination Date. In the event Developer receives an exemption from general real estate taxes prior to the Termination Date, the Village may exercise its right to require the Developer to make the Guaranty Payments as provided for under this Agreement.

2.6. Subject to force majeure, unanticipated delays, and delays caused by the Village, failure by the Developer to cause substantial and material completion of the Facility to occur pursuant to the terms, conditions and limitations of this Agreement and to fulfill its obligations, conditions, agreements or covenants under this Agreement shall constitute an event of default unless Developer makes the Guaranty Payments provided hereunder. Notwithstanding the foregoing, the Developer acknowledges that a worldwide pandemic related to the Novel Coronavirus, a/k/a COVID 19, exists at the time of the execution of this Agreement. The parties further acknowledge that the existence of said pandemic shall be considered a force majeure in and of itself unless there is an order issued by any governmental entity with jurisdiction which would directly prevent the performance of any of the terms of this Agreement.

2.7. Guaranty Payments. In the event an event of default occurs on account of the failure to pay real estate taxes based upon the Guaranteed Tax Assessed Value for any calendar year commencing on or after January 1, 2022, then, for the calendar year in which such event occurs, the Developer shall pay the Village an amount equal to the difference between the net real estate taxes from all taxing jurisdictions that would be payable based on the Guaranteed Tax Assessed Value and the actual real estate taxes due for such calendar year (the "Guaranty Payment"). The Guaranty Payment shall be due on June 20th in the year following the applicable tax year, commencing in 2023 and shall be paid in lieu of all other taxes for such year of default. In the event that Developer fails to make one or more Guaranty Payments described herein, the parties acknowledge that the Village shall have the right, with twenty-one (21) days prior written notice, to impose special assessments or charges for any amount to which it is entitled by virtue of this Agreement and otherwise consistent with the special assessment statute, Wisconsin Statute Section 66.0701, et. seq. Developer's obligation to make Guaranty Payments hereunder shall terminate on the Termination Date.

2.8. Special Assessments. Should the Village's right to any special assessments or charges arise under Section 2.7 above, special assessment rights hereunder may be exercised pursuant to this paragraph on the Property without a hearing. Developer does hereby waive hearing on such special assessment and agrees that an assessment to cover the Village's lost tax revenue is reasonable and benefits the Property. Such special assessments or charges shall be collected in the next succeeding tax roll or as other special assessments or special charges may be. This paragraph constitutes Developer's waiver of notice and its consent to the special assessment and special charges which may

be required by law to the extent of an amount equal to the then-remaining balance and any shortfall on the Guaranty Payments due under this Agreement.

2.9. The Developer agrees to work in conjunction with the Village to obtain the building use, site and architecture approvals with the Village. Developer agrees to be responsible for obtaining approval from the State DSPS for its building plans, as well as the DNR, and any required local permit submissions. Developer acknowledges that the Village's approval of this document does not necessarily indicate that other Village bodies with jurisdiction will necessarily approve the use, site and architecture of the site.

3. The parties acknowledge that the special assessment procedure noted herein is not the exclusive method of enforcement of the obligations of this Agreement, and that the Village shall be entitled to pursue those remedies which may be available to it according to law.

4. Term. The term of this Agreement shall commence upon its execution and shall continue until the Termination Date. This Agreement shall run with the land and be binding upon the successors and assigns of the parties hereto. The Termination Date shall be the date that the Village's debt for the acquisition of the property and the construction of the road and utilities is paid in full. Paragraphs 2.4, 2.5, 2.7, 9 and 10 shall survive the termination of this Agreement.

5. Assignment. The Developer shall be entitled to assign this Agreement to any party assuming the Developer's rights and obligations under the Purchase Agreement.

6. Default by Developer. Failure of the Developer to observe or perform any covenant, condition, obligation or agreement on its part to be observed or performed under this Agreement within thirty (30) days after receipt of written notice of default from the Village specifying such default shall be an event of default, provided that is such default cannot be cured within such thirty (30) day period, such thirty (30) period shall be extended to allow for such cure provided that Developer commences the cure within such thirty (30) day period and diligently pursues the same. In the event that the default is such that immediate harm may result from such default, then the Developer shall be given five (5) days written notice to cure such default.

7. Remedies of Default. Whenever an event of default referred to herein occurs and is continuing, the Village may take any one or more of the following actions:

- (i) The Village may suspend its performance under this Agreement until it receives assurances from the Developer, deemed reasonably adequate by the Village, that the Developer will cure its default and continue its performance of this Agreement;
- (ii) The Village may take any action, including legal or administrative action in law or equity, which may reasonably be necessary or desirable to enforce performance and the observance of the obligations hereunder.

These remedies shall not be deemed to be exclusive and the Village shall have the right to pursue all rights or remedies available to it under applicable Wisconsin law. No delay or omission in pursuing

any rights in the event of a default shall impair such right or power or shall be construed to be a waiver thereof. Such rights may be exercised from time to time as may be deemed expedient by the Village.

8. Enforcement Costs. Whenever an event of default by the Developer occurs and continues beyond the applicable cure period, and the Village shall employ attorneys or incur other expenses for the collection of payments due or to become due, or for the enforcement or performance or observance of any obligations or agreements on the part of the Developer herein contained, the Developer agrees it shall, on demand thereof, pay the Village the reasonable fees of such attorneys and such other expenses so incurred by the Village.

9. Developer Indemnity. Developer covenants and agrees that the Village, its governing body, members, officers, agents, including independent contractors, consultants, legal counsel, servants and employees, hereinafter collectively referred to as the "Village Indemnified Parties" shall not be liable for and Developer agrees to jointly and severally indemnify and hold harmless the Village Indemnified Parties against (i) any loss or damage to the Property, or (ii) any injury to or death of any person occurring at the Facility and resulting from any defect in the Facility during construction, or (iii) from any costs or claim, including reasonable attorney fees, which may result from the Developer's material breach of this Agreement, including but not limited to injuries or damage arising from the construction of the Facility, including construction liens, or (iv) any claim, demand, suit, action or other proceedings whatsoever by any person or entity whatsoever arising or purportedly arising from the actions or inactions of the Developer (or other persons acting on its behalf or under its direction or control) under this Agreement or the transactions contemplated hereby, including the acquisition, construction, installation, ownership and operation of the project, except for any of the foregoing arising from the willful misrepresentation, gross negligence, or any willful or wanton misconduct of the Village Indemnified Parties, .

10. Village Indemnity. The Village covenants and agrees that the Developer, its members, officers, agents, including independent contractors, consultants, legal counsel, servants and employees, hereinafter collectively referred to as the "Developer Indemnified Parties" shall not be liable for and Village agrees to jointly and severally indemnify and hold harmless the Developer Indemnified Parties against any costs or claim, including reasonable attorney fees, which may result from the Village's default under this Agreement, including but not limited to injuries or damage arising from the construction of the Industrial Park, including construction liens, except for any of the foregoing arising from the willful misrepresentation or any willful wanton misconduct of the Developer Indemnified Parties, the Village agrees to protect and defend the Developer Indemnified Parties now and forever and further agrees to hold the aforesaid Developer Indemnified Parties harmless from any claim, demand, suit, action or other proceedings whatsoever by any person or entity whatsoever arising or purportedly arising from the actions or inactions of the Village (or other persons acting on its behalf or under its direction or control) under this Agreement or the transactions contemplated hereby or the acquisition, construction, installation, ownership and operation of the project. Notwithstanding the foregoing, nothing contained within this Agreement is intended to be a waiver or estoppel of the Village or its insurer to rely upon the limitations, defenses and immunities contained under Wisconsin law, including those set forth in Wisconsin Statute Secs. 893.80, 895.52 and 345.05. To the extent that indemnification is available and enforceable, the Village or its insurer shall not be liable in indemnity or contribution for an amount greater than the limits of liability for municipal claims established under Wisconsin law.

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

12. Counter Parts. This Agreement may be signed in any number of counterparts with the same effect as if signatures thereto and hereto were on the same instrument.

13. Entire Agreement. This Agreement contains the entire agreement and understanding of the parties with respect to the subject matter hereof and may not be amended or modified except through an instrument executed by all parties hereto.

14. Severability. If any provision of this Agreement shall be held or deemed to be inoperative or unenforceable, the validity of any one or more phrases, sentences, causes or sections contained in this Agreement shall not affect the remaining provisions or portions of this Agreement.

15. Authority. The parties acknowledge that approval for the authority to execute this Agreement has been obtained by the governing body or members of each party.

Dated: _____

Dated: _____

VILLAGE:

Village of Mukwonago

VILLAGE:

Village of Mukwonago

By:

Fred Winchowky,
President

By:

Diana Dykstra,
Clerk/Treasurer

STATE OF WISCONSIN)
) ss.
COUNTY OF WAUKESHA)

Personally came before me, this ____ day of _____, 2020, the above-named Fred Winchowky and Diana Dykstra, to me known to be the person who executed the foregoing instrument and acknowledged the same.

Notary Public, State of Wisconsin

My Commission is permanent/expires: _____

Dated: _____

Dated: _____

DEVELOPER:
HILL COURT PARTNERS, LLC

DEVELOPER:
HILL COURT PARTNERS, LLC

By: _____
_____By: _____

STATE OF WISCONSIN)
) ss.
COUNTY OF WAUKESHA)

Personally came before me, this ____ day of _____, 2020, the above-named _____, to me known to be the person who executed the foregoing instrument and acknowledged the same.

Notary Public, State of Wisconsin

This document was drafted by:

Attorney Mark G Blum
Hippenmeyer, Reilly, Blum,
Schmitzer, Fabian & English, SC
720 Clinton St., PO Box 766
Waukesha, WI 53187-0766
Phone: (262) 549-8181
Email: mgbлум@hrblawfirm.com

EXHIBIT A
PROPOSED CERTIFIED SURVEY MAP

EXHIBIT B
PRELIMINARY SITE PLAN

EXHIBIT C
BUILDING PLANS