Via Electronic Mail

December 17, 2025

Mr. Alec Bass
City of Concord Planning Division
41 Green Street
3rd Floor
Concord, NH 03301

Re: Radius Recycling, Inc. (25 Sandquist St.) Minor Site Plan Application

Dear Mr. Bass:

On November 7, 2025, Woodard & Curran submitted a Major Site Plan Application for the proposed stormwater improvements at 25 Sandquist St. on behalf of Radius Recylcing.

Following discussions with the City, we confirmed the project qualifies as a minor site plan under Section 28-9-4(d)(1) and (2) of the Zoning Ordinance."

We have rescinded the Major Site Plan application and we are submitting a Minor Site Plan Application via the City of Concord Citizen Self Service Portal.

We would like to note the following interpretations regarding the applicability of conditional use permit thresholds and related requirements under the City of Concord Zoning Ordinance.

1. Shoreland Buffer Conditional Use Permit

   After reviewing Section 28-3-3 of the Zoning Ordinance, we have determined that a conditional use permit is not required for the proposed project. The above-ground storage tank is specifically designed for stormwater storage and will incorporate spill protection, containment, and control measures as part of the site's Stormwater Pollution Prevention Plan (SWPPP). Although the work limit extends to within 75 feet of the reference line, no disturbance to existing vegetation within the natural vegetative buffer is proposed.

2. Bluff and Buffer Requirements

   The bank of the Merrimack River adjacent to the proposed project does not meet the definition of a "bluff" as defined in the Zoning Ordinance Glossary. Slopes steeper than one foot vertically for every three feet horizontally do not exceed a vertical distance of twenty-five feet. Therefore, the bluff-related requirements under Section 28-4-4 do not apply.

3. Wetland Buffers and Setbacks

   The wetland scientist flagged the Merrimack River reference line, and no other wetlands were identified on site. The proposed scope of work will not occur within 50 feet of the identified wetlands; therefore, the requirements under Section 28-4-3 for wetland buffers and setbacks do not apply.

4. Flood Hazard District Requirements

   The site is partially located within the Five-Hundred (500) Year Floodplain. The requirements under Section 28-3-2 of the Zoning Ordinance have been considered in this application. The project does not propose the storage of toxic or hazardous materials within the floodplain.

Please contact us with any questions regarding this letter or the submitted Minor Site Plan Application.

Regards,

WOODARD & CURRAN, INC.

Ross Tsantoulis

Ross Tsantoulis
Senior Technical Leader

Cc: Gary Raddatz, Radius Recycling
Jose Cedeno, Radius Recycling

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www.woodardcurran.com

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VIA ELECTRONIC MAIL

February 18, 2025

City of Concord NH
Community Development Department, Planning Division
41 Green St
3rd Floor
Concord, NH 03301

Re: Request for Waiver of Screening Fencing for Project Number 2025-151, for proposed Project located at 25 Sandquist St., Concord, NH

To Whom it May Concern,

On behalf of Prolerized New England Company LLC (Applicant), this letter has been prepared to request a waiver for the requirement of a solid and opaque fence for the southern area of the property, per the comments in the Staff Report prepared by the City of Concord's Planning Division for Project Number 2025-151, for the proposed project at 25 Sandquist St.

Per comment 3.14 of the Staff Report prepared by the Planning Division for the January 21, 2026 Planning Board Meeting, the comment notes "*The applicant has proposed a chain link fence with screening next to the stormwater facility to provide additional screening and benefit for the abutting residential use to the south. However, the chain link fence with screening shall be replaced with a solid and opaque fence of at least 6-feet in height. This change shall be noted on the site plans, as well as the details on Sheet C-901.*"

As discussed during the January 21st public hearing, the proposed retaining wall is intended to replace the existing stack of conex containers that provides screening from the industrial activities within the facility for the abutting residential properties. The proposed chain link fence prohibits pedestrian access to the stormwater treatment system from the abutting properties. Due to the existing vegetation screening present along the southern property border, an opaque fence is not anticipated to provide a meaningful difference in screening.

In summary, we believe the proposed chain link fence provides the necessary screening and would not need to be replaced with a solid and opaque fence as indicated in comment 3.14.

We believe this letter provides adequate explanation for the waiver of the requested fencing per Comment 3.14 of the Staff Report, and follows the waiver requirements as set forth in the City's Zoning Code, and we appreciate the City's consideration of this waiver request. Please contact me at rtsantoulis@woodardcurran.com or (978) 775-3042 with any questions or concerns.

Sincerely,

WOODARD & CURRAN, INC.

Ross Tsantoulis

Ross Tsantoulis, PE
Senior Technical Leader

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VIA ELECTRONIC MAIL

February 18, 2025

City of Concord NH
Community Development Department, Planning Division
41 Green St
3rd Floor
Concord, NH 03301

Re: Request for Waiver of Transportation Impact Fees for Project Number 2025-151, for proposed Project located at 25 Sandquist St., Concord, NH

To Whom it May Concern,

On behalf of Prolerized New England Company LLC (Applicant), this letter has been prepared to request a waiver for the Impact Fees, per Chapter 29.2 of the City Zoning Ordinance, for the proposed project at 25 Sandquist St., Concord, NH (Project Number 2025-151). Per comment 1.1 of the Staff Report prepared by the Planning Division for the January 21, 2026 Planning Board Meeting, "any person or entity which seeks to undertake new development within the City of Concord, shall pay impact fees to the City in the manner and in the amounts set forth in the ordinance." The Staff Report also indicated that the "applicant for the development of permitted nonresidential uses shall qualify for a waiver of the transportation impact fees." Our office has reviewed the Section 29.2 of the City's Zoning Ordinance, and have prepared this letter which includes information to support our request for the Impact Fees.

Per Section 29.2-1-2 of the City's Zoning Ordinance, the City requires Impact Fees to be paid for New Development. The City's definition of New Development is noted as follows, per Section 29.2-1-1 (Definitions):

- The construction, erection, or creation of new or additional nonresidential floor area;
- The construction, erection, or creation of one or more new dwelling units, including the installation or siting of a mobile home;
- The conversion of an existing use to another use;
- The conversion of a seasonal dwelling to a year-round dwelling;
- The construction, erection, or creation of one hundred fifty (150) or more square feet of gross living area in or attached to a dwelling unit; or
- The expansion of an existing use that will result in an increase in the demand for public capital facilities that are the subject of this ordinance.

As noted in the Project Narrative that was submitted as part of the Minor Site Plan Application, the scope of this project will be for the replacement of the existing on-site stormwater infrastructure. The proposed stormwater infrastructure includes new conveyance piping, oil-water separator, diversion structure, storage tank, and a water quality treatment system, with the storage tank and water quality treatment system to be above-grade while all other

infrastructure will be subsurface. We believe the proposed above-grade infrastructure does not fall under the City's criteria of having Floor Area, as defined in Section 29.2-1-1, as they are not "covered areas that are only partially enclosed by walls and outside sales areas." It shall be noted that the existing buildings (which have Floor Area) for the site will remain undisturbed during the project; therefore, there will be no change to the total gross floor area of the property for this project.

In summary, based on our office's understanding of the City's Zoning Code Section 29.2, we believe this project would be exempt from the requirement of impact fees as the project would not be considered New Development.

We believe this letter provides adequate explanation for the waiver of the Impact Fee, that follows the waiver requirements as set for in the City's Zoning Code, and we appreciate the City's consideration of this waiver request. Please contact me at rtsantoulis@woodardcurran.com or (978) 775-3042 with any questions or concerns.

Sincerely,

WOODARD & CURRAN, INC.

Ross Tsantoulis

Ross Tsantoulis, PE
Senior Technical Leader

PROJECT NARRATIVE

The project proposes stormwater management improvements at the existing facility for Radius Recycling (Applicant), located at 25 Sandquist St., Concord, NH. The facility is regulated under the United States Environmental Protection Agency (EPA) Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (MSGP) that became effective on March 1, 2021. The permit applies in areas of the country where EPA is the NPDES permitting authority, including New Hampshire. This project will replace the existing on-site stormwater infrastructure with new proposed conveyance, storage, and treatment systems to provide sufficient water quality treatment to consistently meet the MSGP benchmarks for target pollutants, which include total suspended solids (TSS), chemical oxygen demand (COD), and metals (aluminum, copper, lead, zinc) from runoff.

The Facility is located on a 6.9 acre parcel and includes approximately 5.1 acres of impervious area. The Facility is bounded to the north by an automotive salvage yard, to the west by commercial property, to the south by a residential neighborhood, and to the east by the Merrimack River. The Facility is used for activities related to scrap metal recycling. The Facility consists of an office, a processing building, a turning building, warehouse buildings, and covered storage areas. Portions of the property are unpaved, and therefore not subject to industrial operations, including the areas between the southern/southeastern edges of the paved area and the southern/southeastern property boundaries.

The total area of disturbance will be 1.2 acres. Existing pervious areas on the southern portion of the property will be paved to accommodate the proposed stormwater storage and treatment infrastructure, as well as to provide a paved vehicular maintenance access pathway. No wetlands will be disturbed for this project, and the limit of disturbance will be outside of the 50' wetland buffer. The proposed stormwater system has been designed for the stormwater runoff in the post-development conditions to not exceed the pre-development conditions in compliance with the City of Concord requirements. Design calculations and drainage analyses are supplemented by the site plans which are provided in this submission, and include construction details for erosion and sediment control and proposed drainage improvements and infrastructure.

The State of New Hampshire
Department of Environmental Services

Robert R. Scott, Commissioner

December 08, 2025

PROLERIZED NEW ENGLAND COMPANY LLC
69 ROVER ST
EVERETT MA 02149

Re: Request for More Information – Shoreland Permit Application (RSA 483-B)
NHDES File Number: 2025-03045
Subject Property: 25 Sandquist, Concord, Tax Map/Block/Lot(s): 793Z/no block/9

Dear Applicant:

On December 8, 2025, the New Hampshire Department of Environmental Services (NHDES) Shoreland Program reviewed the above-referenced Shoreland Permit Application (Application). Pursuant to RSA 483-B:5-b, V(a), the NHDES Shoreland Program determined the following additional information is required to complete its evaluation of the Application:

1. In accordance with RSA 483-B:5-b, IV-a, submit postal receipts or copies verifying all abutters, the Upper Merrimack River Local Advisory Committee (UMRLAC), and the governing body of the municipality in which the property is located have been notified of the application by certified mail. Please also submit a signed copy of the application to the UMRLAC as required by Env-Wq 1406.13(b)(4). Note the applicant may be required to address comments made by UMRLAC.
2. Pursuant to Env-Wq 1406.12(g), submit an updated DataCheck Report to address the potential for the presence of sensitive species in the area. The provided report expired on August 6, 2025. An updated report can be obtained online using the NHDES DataCheck Tool. Please note that mitigation requirements may change to reflect recommendations made by NHB or other parties such as NH Fish and Game.
3. Pursuant to RSA 483-B:9, V(a) and Env-Wq 1406.10(f) for any project involving work within the waterfront buffer, even if no trees would be removed, provide the following:
    a. A plan showing each segment, which are 25 feet along the reference line by 50 feet inland starting at either the northerly or easterly boundary of the property, of waterfront buffer that will be impacted by the project;
    b. The location and diameter of all existing trees and saplings, at least up to that which is sufficient to meet the point requirement specified in RSA 483-B:9, V(a)(2); and
    c. A designation of the trees to be cut during the project, if any, including:
        i. The diameter of all trees and saplings at 4-½ feet from the ground; and
        ii. The names of the existing species, using either the scientific names or common names.
4. Pursuant to Env-Wq 1406.09(g), submit a revised plan which shows the locations of all areas to remain as Natural Woodland between 50 and 150 feet landward of the reference line. Include a label to indicate the square footage of each area. Note Natural Woodland may not be reduced below the minimum standards required by RSA 483-B:9, V(b).

Pursuant to RSA 483-B:5-b, V(a), **this information must be received by the NHDES Shoreland Program within 60 days of the date of this request, or the Application will be denied**. Therefore, please submit the required information to the NHDES Shoreland Program as soon as practicable and no later than February 6, 2026. Please include NHDES file number 2025-03045 on your submission. Pursuant to RSA-B:5-b, V(b), the NHDES Shoreland Program will approve or deny the Application within 30 days of receipt of all required information. If, after submitting the requested information, you would like to request an extension pursuant to RSA 483-B:5-b, V(b)(3) to allow for review of the materials to confirm that all required information has been provided please make a written request to the file that includes the reason for the extension and the length of the extension requested.

If you have any questions, please contact me directly at Salvatore.A.Ferragine@des.nh.gov or (603) 271-4058.

Sincerely,



Salvatore Ferragine
Shoreland Permitting, Shoreland Program
Wetlands Bureau, Land Resources Management
Water Division

Copied: Upper Merrimack River Local Advisory Committee

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VIA ELECTRONIC MAIL

February 18, 2026

City of Concord Community Development Department
Planning Division
41 Green St.
Concord, NH 03301

Re: Response to Comments from Staff Report for Planning Board for Minor Site Plan Application for Project Number 2025-151 (Radius Recycling - 25 Sandquist, Concord, NH)

Dear Whomever it May Concern,

On January 13, 2026, Prolerized New England Company LLC (Applicant) received a Staff Report for Planning Board from the City of Concord's Community Development Department Planning Division regarding the project number 2025-151 associated with the proposed project at 25 Sandquist Street, Concord, New Hampshire. On behalf of the Applicant, enclosed you will find our responses to the comments provided in the Staff Report. The original comments are *italicized*, and the corresponding responses are highlighted in **bold**. Supplemental information to support the comment responses are provided under the attachments section of this letter.

Staff Report for Planning Board – January 21, 2026:

1. Project Details and Zoning Ordinance Compliance

   1.1. *Per Section 29.2-1-2(a)(1) of the Zoning Ordinance, any person or entity which seeks to undertake new development within the City of Concord, shall pay impact fees to the City in the manner and in the amounts set forth in the ordinance. An applicant for the development of permitted nonresidential uses shall qualify for a waiver of the transportation facilities impact fees, but the waiver request must be received prior to the Clerk's calculation of the impact fees. The Clerk determines the impact fee at the time of building permit application, and the applicant must request the waiver prior to the date of the determination.*

   Response: A waiver request letter for the transportation impact fees is enclosed in this submittal.

2. *General Comments:*

   2.1. *Per Section 6.01(4) of the Site Plan Regulations, staff was unaware of any nonconformities with the Zoning Ordinance at the time the abutter notifications were mailed.*

   Response: Acknowledged.

2.2. *Per Section 6.01(5) of the Site Plan Regulations, a completed conditional use permit application if required shall be made at the same time as the site plan application. The project does not require any conditional use permit applications, and no conditional use permits were submitted.*

Response: Acknowledged.

2.3. *Per Section 12.01 Research of the Site Plan Regulations, applicants are responsible for familiarizing themselves with all city, state, and federal regulations relative to zoning, site plan design and approval, land sales, utilities, drainage, health, buildings, roads, and other pertinent data so that the applicants are aware of the obligations, standards expected, and documents to be submitted.*

Response: Acknowledged.

2.4. *Per Section 25.01 Nonmunicipal Utilities General Requirements of the Site Plan Regulations, the applicant is responsible for all coordination with the utility companies to ensure that utilities are installed in accordance with the Board-approved plans. Staff recommends that the applicant coordinate with all nonmunicipal utilities providing services to the site to ensure the existing services are adequate. Any changes to the utilities after the Board's conditional approval will require either administrative approval or an amendment to the conditional approval depending upon the changes proposed.*

Response: Acknowledged.

2.5. *Per Section 15.03 Existing Condition Plan, where minimal changes are proposed to the site, the Clerk may allow the applicant to reduce the amount or extent of the information required from Section 15.03 to be shown on the existing conditions plan provided that the proposed extent and impacts of the proposed improvements to the site, and City at large, can be satisfactorily reviewed and sufficient information is provided on the plan for the Planning Board to act on the application. Accordingly, as the majority of the site remains unchanged, the Planning Board Clerk has determined to reduce the amount or extent required from Section 15.03 as noted below:*

   a. *Section 15.03(7) Buildings and Structures*
   b. *Section 15.03(8) Parking, Loading, and Access*
   c. *Section 15.03(13) Flood Hazard*
   d. *Section 15.03(17) Solid Waste and Outside Storage*
   e. *Section 15.03(18) Lighting*
   f. *Section 15.03(22) Abutting properties*

g. Section 15.03(23) Tabulations

Response: Acknowledged.

2.6. Per Section 15.04 Proposed Site Plan, where minimal changes are proposed to the site, the Clerk may allow the applicant to reduce the amount or extent of the information to be required from Section 15.04 to be shown on the site plan provided that the proposed extent and impacts of the proposed use and improvements to be made to the site can be satisfactorily reviewed and sufficient information has been provided for the Planning Board to act on the application. Accordingly, and whereas the majority of the site remains unchanged, the Planning Board Clerk has determined to reduce the amount or extent required from Section 15.04 as noted below:

a. Section 15.04(10) Buildings and Structures

b. Section 15.04(11) Parking, Loading, and Access

c. Section 15.04(20) Flood Hazard

e. Section 15.04(26) Lighting

f. Section 15.04(27) Abutting properties

g. Section 15.04(28) Tabulations

Response: Acknowledged.

2.7. The Engineering Services Division general comments are noted in the attached 7-page memo to Alec Bass from Paul Gildersleeve and Pete Kohalmi, dated December 30, 2025.

Response: Responses to the Engineering Services Division comments are provided in this submittal under City of Concord Engineering Services Division Comments per Memorandum Dated December 30th, 2025.

3. Site Plan Regulations Determination of Completeness Comments:

3.1. Section 12.02(1)(b) requires the name and address of the owner and applicant to be provided on the title block of each sheet in the plan set. Specifically, the name and address of the owner is not provided on the title block of each sheet and shall be provided.

Response: Title block has been revised to include name and address of the owner.

3.2. Section 12.03(1) requires a Licensed Land Surveyor shall prepare, sign, and seal the existing conditions plan. Specifically, the signature and seal on the existing conditions plan is of the licensed professional engineer and not a licensed land

surveyor, which shall be added.

Response: Signature and seal of the licensed land surveyor has been added to the existing conditions plan.

3.3. *Section 12.03(5) requires a where wetland boundaries are required to be delineated, the delineation shall be performed by a New Hampshire Certified Wetland Scientist who shall sign and seal the plan upon which the wetland boundaries are mapped. Specifically, the signature and seal of the wetland scientist who made the delineation shall be added to the existing conditions plan and site plan.*

Response: Signature and seal of the certified wetland scientist has been added to the existing conditions plan.

3.4. *Section 12.04 Location Plan requires each site plan application shall have on the site plan, or a cover sheet, a detailed location plan prepared at a minimum scale of 1" = 400' showing clearly the information required by 12.04(1) through 12.04(10). Specifically, a location plan showing the required information is missing and shall be added, or the Site Location Map on the cover sheet shall be revised to satisfy these requirements.*

Response: Site Location Map has been revised to include the information required by 12.04(1) through 12.04(10).

3.5. *Section 12.05 Vicinity Plan requires each site plan shall have on the site plan or the cover sheet a vicinity plan prepared at a scale between 1" =1000' and 1" =2000' clearly showing the location of the property to be developed; and, streets, water bodies, city limits, parks, schools, and other significant physical and man-made features. Specifically, a vicinity plan showing the required information is missing and shall be added, or the Project Location Map on the cover sheet shall be revised to satisfy these requirements.*

Response: Project Location Map on the cover sheet has been revised to include the required information.

3.6. *Section 12.06(1) Certificate of Ownership requires a certificate of ownership identifying each parcel, including which property is owned by each owner, and a deed citation for each deed from the Merrimack County Registry of Deeds. Specifically, a certificate of ownership note shall be added to the site plan and existing conditions plan.*

Response: Certificate of Ownership note has been added to the site plans.

3.7. *Section 12.07 Wetland Delineations requires wetland delineations are to be*

prepared by a New Hampshire Certified Wetland Scientist who shall sign and seal the existing condition plan and site plan. The date of the wetland delineation shall be noted on the plans. Specifically, the NH Certified Wetland Scientist shall sign and seal the existing conditions and site plan and a note shall be added to both sheets adding the date of the delineation.

Response: Signature and seal of the certified wetland scientist has been added to the existing conditions plan.

3.8. *Section 13.01(6) State and Federal Permits requires a copy of any application made to a State or Federal agency required for the approval of this site plan. Specifically, a note shall be added to the site plan indicating any State or Federal permits required as part of this site plan. A copy of those applications will be required to be submitted to the City of Concord Planning office.*

Response: Copies of the NHDES Alteration of Terrain and Shoreland Protection Permit Applications have been included in this submittal. The permit applications are currently under review by NHDES.

3.9. *Section 15.03(1) Abutters and Section 15.03(22) Abutting Properties requires on the existing conditions plan the Tax Assessor's Map-Block-Lot number for each abutting parcel to be provided on the existing conditions plan. This information is missing and shall be added.*

Response: The Tax Assessor's Map-Block-Lot number for each abutting parcel has been added to the existing conditions plan.

3.10. *Section 15.04(2) Abutting Property requires on the site plan existing abutting properties including intersecting property lines, buildings, wells and septic systems, owners name and address, property address, and Tax Assessors Map-Block-Lot number. Specifically, the Map-Block-Lot number shall be added for all abutting properties.*

Response: The Tax Assessor's Map-Block-Lot number for each abutting parcel has been added to the existing conditions plan.

3.11. *Section 15.04(3) Parcel Information requires on the site plan the City Tax Assessors Map-Block- Lot number for each parcel involved in the development along with the name and address of all property owners, and the most current deed reference noting the book and page numbers from the Merrimack County Registry of Deeds. Specifically, the Map-Block-Lot number for the property and the current deed reference with book and page needs to be added to the site plan.*

Response: The Tax Assessor's Map-Block-Lot number for each abutting

parcel has been added to the existing conditions plan.

3.12. *Section 15.04(4) Proposed Use requires on the site plan each site plan shall clearly identify each existing and proposed use planned for the site. This information is missing and shall be added to the site plan.*

Response: The existing and proposed use has been added to Sheets C-002 and CI-100.

3.13. Section 15.04(5) *Addresses* requires on the site plan the address of each existing and proposed building and unit shall be noted on the plan. This information is missing and shall be added to the site plan. The applicant shall confirm with City Engineering if any new addressing is required for the treatment system building.

Response: The address of each existing building has been added to the site plan. Per the correspondence with City Engineering Department, new addressing will not be required for the treatment system building.

3.14. *Section 26.05 Residential Uses in Mixed Use or Non-residential Zones states the Planning Board may require buffers around all, or part of, a non-residential use proposed adjacent to an existing or proposed residential use in a non-residential or mixed-use district as set forth in Article 28-4-2, Buffer Requirements for Residential District Boundaries of the City of Concord Zoning Ordinance. Staff notes that there is about 40-feet between the proposed stormwater treatment facility and a residential use abutting the property to the south. An existing vegetation line takes up close to 30-feet of this space on the parcel, with the rest being restricted by a stormwater pipe and easement. The applicant has proposed a chain link fence with screening next to the stormwater facility to provide additional screening and benefit for the abutting residential use to the south. However, the chain link fence with screening shall be replaced with a solid and opaque fence of at least 6-feet in height. This change shall be noted on the site plans, as well as the details on Sheet C-901.*

Response: A waiver request letter to maintain the proposed chain link fence instead of a solid and opaque fence is enclosed in this submittal.

3.15. *The Engineering Services Division general comments are noted in the attached 7-page memo to Alec Bass from Paul Gildersleeve and Pete Kohalmi, dated December 30, 2025.*

Response: Responses to the Engineering Services Division comments are provided in this submittal under City of Concord Engineering Services Division Comments per Memorandum Dated December 30th, 2025.

City of Concord Engineering Services Division Comments per Memorandum Dated December 30th, 2025:

1. Drainage Report

   a. *Provide calculations and analysis for the 100-year storm, pursuant to the City of Concord Site Plan Regulation (CSPR) 22.07(1) and (3).*

      Response: The drainage report has been revised to include calculations and analysis for the 100-year storm event.

   b. *Provide the volume for the 10-year storm event, pursuant to CSPR 22.07(3).*

      Response: The drainage report includes the off-site volumes for the 10-year storm event, located at discharge point DP-2. Pre-development 10-year volume is 1,927 cf, and post-development 10-year volume is 316 cf for DP-2; therefore, the volume of discharge post-development does not exceed volume of discharge of the pre-development conditions.

2. General Information

   a. *Provide all State and Federal Permits to the Engineering Division, pursuant to CSPR 13.02(8).*

      Response: The NHDES Alteration of Terrain and Shoreland Protection Permit Applications have been included in this submittal. The permit applications are currently under review by NHDES.

   b. *Within the entire plan set, including the cover sheet and within the title block on every sheet, and within the General Notes on Sheet C-002, please include the property owner's information and mailing address.*

      Response: The property owner's information and mailing address have been included in the title block of all sheets in the plan set.

   c. *Within the plan set, including the cover sheet and within the title block on every sheet, please include the main address of the facility. The City's GIS indicates that several addresses may be associated with several buildings on the property: 17 Sandquist, 18 Sandquist, 21 Sandquist, and 25 Sandquist. On the Civil Existing Conditions Plan, Sheet C-100, please label each building associated with an address.*

      Response: Sheet C-100 has been updated to label each building and their associated address within the property.

d. *The termini of the existing 24" storm drain pipe on the south side of the property needs to be found and depicted. This pipe is an overflow for the proposed drainage system. Please investigate.*

Response: Due to existing snow cover, the Applicant has not been able to locate the two termini on the existing 24" storm drain pipe. The locations will be investigated when the site has been cleared of snow and will provide an updated drawing set indicating the two termini. The Applicant requests this item to be considered as a condition of Site Plan approval.

3. General Sheet Index (Sheet G-001)

   a. *Increase the size of the Sheet Index table and font to make it easier to read. Alternatively, this table can be placed on the cover and this sheet eliminate.*

   Response: The Sheet Index table has been revised with an increased font size.

4. Abbreviations and Legend

   a. *Add CCB, concrete catch basin, to the list under Abbreviations.*

   Response: CCB has been added to the abbreviations in the plans.

5. General Notes (Sheet C-002)

   a. *General Notes (3) states the Zone AE is at 230'. However, the floodplain line shown on Sheet C-100 is shown at various elevations. Please redraw this line at elevation 230', pursuant to CSPR 22.09.*

   Response: The floodplain line at elevation 230' has been added to Sheet C-100.

   b. *Add to the end of Demolition Notes (2), "…and NHDES Hazardous Waste Bureau."*

   Response: Note has been revised to include this language.

   c. *Replace Sedimentation & Erosion Control Notes (14), with the requirements in City of Concord Site Plan Regulations (CSPR) 27.09 (2, 3, and 5).*

   Response: The note has been replaced with notes #2, 3, and 5 per CSPR 27.09.

d. *Replace Grading and Drainage Notes (3) with, "The requirements of the City of Concord Construction Standards and Details Section (CCSD) 2(5) for Backfill and Compaction will be followed."*

Response: The note has been revised to include this language.

e. *General Note 1 on Sheet C-002 states that the existing conditions have been provided from an aerial survey performed by Civil Design Consultants and a field survey performed by SEC & Associates. The LLS stamped, existing conditions plan prepared by SEC & Associates should be included in the submitted plan set. The aerial survey performed by Civil Design Consultants should also be included in the plan set as several notes on Sheet C-100 specifically refer to it.*

Response: Sheet C-100 has been revised to include the stamped plans from the surveyor.

6. Existing Conditions Plan (Sheet C-100)

a. *For all abutting properties, please include owner's names, assessors map and lot info, property address, owner's mailing address, and deed references.*

Response: The information about the abutting properties has been added.

b. *Many property lines are missing boundary information, including the frontage along the Merrimack River. Along with some property lines missing boundary information, some property lines have boundary information that is covered by or obscured by other notes.*

Response: Boundary information along the Merrimack River has been added to the plan, and text leaders including boundary information has been relocated to not be obscured.

c. *Along the southerly property line, there is a note for an existing 10-ft wide drainage easement. Please include the MCRD deed reference for the easement.*

Response: The MCRD deed reference has been added.

7. Site Preparation and Erosion Control Plan (Sheet CD-100)

a. *Draw the construction entrance to the dimensions in the CCSD Detail E-1, such as covering the entire exit/entrance and being at least 50' long.*

Response: The stabilized construction entrance has been revised to meet the standards of CCSD Detail E-1.

b. *Lighten the hatching on the south side of the property to allow viewing of detail underneath.*

Response: The hatching has been revised to a lighter opacity.

c. *A survey note on the south corner of the lot states the City of Concord is an MS4 city. However, Concord's population is below 50,000 people and is not yet an MS4 city. Please remove the reference to MS4.*

Response: References to the MS4 have been removed.

d. *Again, on the south corner of the lot, a callout states, "See Sheet CD-101 for notes in this area"; however, no notes about this area are located on Sheet CD-101. Please remove the callout or place these notes on Sheet CD-101.*

Response: The callout has been removed.

e. *At the SMH just west of the Limit of Work in Sandquist Street, with a RIM of 231.01. change the label of the manhole to 4096 to match the City of Concord GIS numbering system. At the next higher SMH inside the limits of work, with a RIM of 231.06, change the label to 4097.*

Response: The label has been revised per the comment.

8. Overall Layout and Materials Plan (Sheet CI-101)

a. *Repaving on the north side of the project area shows new pavement covering parking stall striping. Place a note stating these affected stalls will be restriped, and place CCSD Detail M-4 on a detail sheet, pursuant to CSPR 18.09.*

Response: A note has been added to state the affected stall will be replaced, and CCSD Detail M-4 has been added to Sheet C-904.

b. *Repaving overlaps the scale location. Please state how the scale will be protected, or revise the repaving to avoid the scale.*

Response: The scale will be protected during construction, with the trench for the storm drain replacement to not disturb the existing scale.

c. *Turn on the storm line.*

Response: The storm line layer has been added to Sheet CI-101.

9. Overall Grading and Drainage Plan (Sheet CG-100)

   a. *Move the Diversion Structure callout to prevent obstructing text.*

      Response: The text leader has been moved to prevent obstruction.

   b. *Provide CCSD Detail SD-6 for the catch basins.*

      Response: CCSD Detail SD-6 has been provided on Sheet C-901.

   c. *Add spot grades approximately every 100', and at corners and tangents for the areas of new concrete and bituminous asphalt.*

      Response: Additional spot grades have been added for areas in Sheets CG-101 to CG-103.

   d. *Call-outs for drainage profiles references wrong sheet #s.*

      Response: The text leaders have been revised to provide the correct references to the drainage profiles.

10. Stormwater Treatment and Storage Area Grading and Drainage Plan (Sheet CG-101)

    a. *In the Diversion Structure callout, change the OWS callout from invert in to invert out. In the invert out callout, change the invert from 226.38' to 226.30' to match the Diversion Manhole Detail on Sheet C-902.*

       Response: The diversion structure callout has been revised to match the diversion manhole detail on Sheet C-902.

11. Grading and Drainage Plan and Profile 1 (Sheet CG-102)

    a. *At each structure in the profile, match crowns of pipes, with a minimum drop between invert in and invert out of 1 inch/ft., pursuant to CCSD Section 6(3)(E)(3)(iv).*

       Response: Due to the limited available vertical profile across the site, it is not feasible to provide a drop across the inlet and outlet inverts at each drainage structure. We cannot accommodate this request.

    b. At the Retaining Wall shown on the profile, show the bottom-of-wall and top-of-pipe elevations to gauge clearance.

       Response: Bottom of wall and top of wall elevations have been provided for the retaining wall.

    c. *Show force main in profile view near diversion structure.*

Response: The force main is now shown on the profiles.

d. *It is noted that at many locations there is a lack of clearance between the top of a proposed pipe and the structure castings. For example, at DMH 10 the top of the 30" RCP would be at elevation 230.0 and the cover elevation is 231.57. Is the designer sure that a top and castings for the structure can be installed this way?*

Response: Comment acknowledged. We anticipate that the precast supplier will need to develop a custom solution to accommodate this low clearance, and may result in the top slab exposed at grade with a DMH cover frame cast within the concrete.

12. Details 1 (Sheet C-900)

a. *Replace the Stabilized Construction Exit Detail with CCSD Detail E-1.*

Response: The stabilized construction detail has been replaced with CCSD Detail E-1 on Sheet C-900.

13. Details 2 (Sheet C-901)

a. *The Temporary Soil Stockpile Detail calls out silt fence. Please include a silt fence detail.*

Response: A silt fence detail has been provided on Sheet C-901.

b. *Show a callout for the Berm Detail on plan view, or removed the detail from this sheet.*

Response: A text leader callout for the berm is provided on Sheet CG-101.

c. *Revise 4" of compacted screened loam to 6", pursuant to CSPR 27.09(3).*

Response: The depth of compacted screened loam has been revised to 6".

d. *In the Bituminous Concrete Pavement Section and Bituminous Concrete Pavement Butt Joint Details, show the proposed pavement, crushed gravel, and gravel depths matching existing, pursuant to CCSD Section 3(3)(H). If existing depths are unknown or cannot be discerned, suggest utilizing the Asphalt Access Road detail.*

Response: The depths have been revised to be pursuant to CCSD Section 3(3)(H).

e. *On the Asphalt Access Road Detail, revise the minimum depths to 1.5" for the pavement wear course, 1.5" for the pavement binder course, 6" for the crushed*

gravel, and 12" for the gravel, pursuant to CCSD Detail D-8.

Response: The depths for the access road detail have been revised to the depths noted in the comment.

f. For the Concrete Repair Detail, for longevity, consider revising the concrete thickness from 4" to 6", add 6" of ¾" crushed gravel, and add 12" of ¾" gravel. Under notes (1), change ½" to 1.5", pursuant to CCSD 3(3)(O)(4) and Detail M-8. Revise the concrete strength from 3000 psi to 4000 psi, pursuant to CCSD Section 3(3)(I).

Response: The detail has been revised to the depth noted in the comment.

14. Details 3 (Sheet C-902)

a. In the Diversion Manhole Detail, revise the Section view to show the butt end of the weir, not the side view. State the invert may be concrete or a brick shelf, pursuant to CCSD Details SD-2 and SD-3. Eliminate the option for the compacted bank run gravel and use the ¾" crushed stone bedding instead, pursuant to CCSD Detail SD-3. In the General Notes, add notes 3-6 from CCSD Detail SD-3.

Response: The general notes for the diversion manhole detail has been updated to include notes 3 through 5 from CCSD Detail SD-3.

b. In the Above Ground Storage Tank Detail add the elevations of the two force mains and the overflow storm drain shown on Sheet CG-101 to this detail. Sheet M-903 only shows two pipes connecting to this tank while Sheet CG- 101 shows 3 pipes. Please revise to match. Please revise the unknown "x" dimensions on the tank.

Response: The Above Ground Storage Tank detail has been revised to match, and dimensions have been updated.

c. Plan CG-101 calls out a 30" invert into DMH 1 while the detail on this sheet shows a 24" RCP going to DMH 1 from the diversion MH. Please ensure plans, profiles and details all match.

Response: The plans and profiles have been revised to match the invert elevations.

15. Details 4 (Sheet C-903)

a. Under the Manhole Frame and Cover Detail, add a dimension of 30" to the diameter, pursuant to CCSD Detail SD-3.

Response: The 30" dimension has been added to the manhole frame and cover detail.

b. *Replace the Trench Detail with CCSD Details SD-1 and U-1.*

Response: The trench detail has been replaced with CCSD Detail SD-1 on Sheet C-904.

c. *Under the Precast Concrete Drainage Manhole Detail, at the "12" Compacted Gravel Bedding or…" callout, remove "Compacted Gravel Bedding or." Under Notes, insert notes 1, and 3-6 from CCSD Detail SD-3.*

Response: The notes for the precast concrete drainage manhole has been revised with notes 1, and 3-6 from CCSD Detail SD-3.

d. *In the Highland Oil Water Separator Detail, no 30" openings are shown on the ceiling of the structure. However, on Sheet CG-101, two of these openings are shown. Please revise to match. Also, ensure this detail abides by the requirements of CCSD Section 4(3)(E) and Detail SS-8.*

Response: The Highland Oil Water Separator provides two 24" access openings and the site plan and detail has been revised accordingly. Please note that this is a proprietary system, and abides by the requirements of CCSD Section 4(3) and Detail SS-8 to the maximum extent practicable.

e. *Because some of the storm structures will be kept at areas of repavement, such as existing catch basin CB-9, add CCSD Detail SD-5, Adjusting Frames to Grade.*

Response: Acknowledged, CCDS Detail SD-5 has been added to sheet C-904.

We believe the responses satisfy the comments as presented in the Planning Division's Staff Report and the Engineering Services Division comments. for approval of the Site Plan Application. Please contact me at rtsantoulis@woodardcurran.com or (978) 775-3042 with any questions or concerns.

Sincerely,

WOODARD & CURRAN, INC.

Ross Tsantoulis

Ross Tsantoulis
Senior Technical Leader

Alteration of Terrain (AoT) Permit Application

25 Sandquist St. Concord, NH Proposed Stormwater Improvements

Woodard & Curran, Inc.
138 River Road | Suite 212
Andover, Massachusetts 01810
800.426.4262

woodardcurran.com

November 7, 2025

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ALTERATION OF TERRAIN PERMIT APPLICATION & CHECKLIST

ALTERATION OF TERRAIN PERMIT APPLICATION

Water Division / Land Resources Management

Check the status of your application

RSA / Rule: RSA 485-A:17, Env-Wq 1500

Administrative Use Only	Administrative Use Only	Administrative Use Only	File Number: Check No. Amount: Initials:

1. APPLICANT INFORMATION (INTENDED PERMIT HOLDER)		
Applicant Name: Radius Recycling	Contact Name: Gary Raddatz	
Email: graddatz@rdus.com	Daytime Telephone: 617-233-2664	
Mailing Address: 25 Sandquist Street		
Town/City: Concord	State: NH	ZIP Code: 03301
2. APPLICANT'S AGENT INFORMATION If none, check here: ■		
Agent's Name:	Contact Name:	
Email:	Daytime Telephone:	
Address:		
Town/City:	State:	ZIP Code:
3. PROPERTY OWNER INFORMATION (IF DIFFERENT FROM APPLICANT) Check here if more than one property owner, and attach additional sheets as necessary: ☐		
Owner's Name:	Contact Name:	
Email:	Daytime Telephone:	
Mailing Address:		
Town/City:	State:	ZIP Code:
4. PROPERTY OWNER'S AGENT INFORMATION If none, check here: ■		
Business Name:	Contact Name:	
Email:	Daytime Telephone:	
Address:		
Town/City:	State:	ZIP Code:
5. CONSULTANT INFORMATION If none, check here: ☐		
Engineering Firm: Woodard & Curran	Contact Name: Ross Tsantoulis, PE	
Email: rtsantoulis@woodardcurran.com	Daytime Telephone: (978) 775-3042	
Address: 40 Shattuck Road, Suite 110		
Town/City: Andover	State: MA	ZIP Code: 01810

6. PROJECT TYPE

☐ Excavation Only ☐ Residential ☐ Commercial ☐ Golf Course ☐ School ☐ Municipal
☐ Agricultural ☐ Land Conversion ■ Other: Site Improvement

7. PROJECT LOCATION INFORMATION

Project Name: Radius Recycling Sandquist Facility Stormwater Improvements

Street/Road Address: 25 Sandquist Street

Town/City: Concord	County:		
Tax Map: 793Z	Block: 9	Lot Number:	Unit: 9

Post-development, will the proposed project withdraw from or directly discharge to any of the following? If yes, identify the purpose.

1. Stream or Wetland Purpose:	☐ Yes ■ No	☐ Withdrawal	☐ Discharge
2. Artificial pond created by impounding a stream or wetland Purpose:	☐ Yes ■ No	☐ Withdrawal	☐ Discharge
3. Unlined pond dug into the water table Purpose:	☐ Yes ■ No	☐ Withdrawal	☐ Discharge

Post-development, will the proposed project discharge to:

- Within one-quarter mile of a surface water impaired for phosphorus and/or nitrogen? ■ No ☐ **Yes**
- Within one-quarter mile of a Class A surface water or within the watershed area of an Outstanding Resource Water? ■ No ☐ **Yes**
- Within one-quarter mile of a lake or pond not covered previously? ■ No ☐ **Yes**

Is the project a High Load area? ■ Yes ☐ No
If yes, specify the type of high load land use or activity: Industrial facility subject to NPNHDES Multi-Sector General Permit

Is the project within a Water Supply Intake Protection Area (WSIPA)? ☐ Yes ■ No
Is the project within a Groundwater Protection Area (GPA)? ☐ Yes ■ No
Will the well setbacks identified in Env-Wq 1508.02 be met? ☐ Yes ■ No
For more details on the restrictions in these areas, read Chapter 3.1 in Volume 2 of the NH Stormwater Manual.

Is any part of the property within the 100-year floodplain? ☐ Yes ■ No
If yes: Cut volume: cubic feet within the 100-year floodplain.
Fill volume: cubic feet within the 100-year floodplain.

■ Project *is* within **¼ mile of a designated river** Name of River: Merrimack River
☐ Project *is not* within ¼ mile of a designated river.

☐ Project *is* within a Coastal/Great Bay Region community.
■ Project *is not* within a Coastal/Great Bay Region community.

8. BRIEF PROJECT DESCRIPTION (PLEASE DO NOT REPLY "SEE ATTACHED")

Radius Recycling is a metals recycling facility located on 25 Sandquist Street in Concord, NH. The facility is regulated under the United States Environmental Protection Agency (EPA) Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (MSGP). The intent of the project is to capture and treat the first inch of stormwater runoff from the areas of operation in the facility, and provide sufficient water quality treatment to consistently meet the MSGP benchmarks for total suspended solids (TSS), chemical oxygen demand (COD), and heavy metals.

9. IF APPLICABLE, DESCRIBE ANY WORK STARTED PRIOR TO RECEIVING PERMIT.

N/A

10. ADDITIONAL REQUIRED INFORMATION

A. Date a copy of the application was sent to the municipality, as required by Env-Wq 1503.05(e) (Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the governing body of each municipality in which the project is proposed):

(Attach proof of delivery)

B. Date a copy of the application was sent to the local river advisory committee, if required by Env-Wq 1503.05(e) (Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the Local River Advisory Committee, if the project is within ¼ mile of a designated river):

(Attach proof of delivery)

C. Type of plan required: ■ Land Conversion ☐ Detailed Development ☐ Excavation, Grading and Reclamation ☐ Steep Slope

D. Additional plans required: ■ Stormwater Drainage and Hydrologic Soil Groups ☐ Source Control ☐ Chloride Management

E. Total area of disturbance, in square feet 50,839.30

F. Additional impervious cover as a result of the project, in square feet (use "-"to indicate a net reduction in impervious coverage).

Total final impervious cover, in square feet 2,906

G. Total undisturbed cover, in square feet 249,884

H. Number of lots proposed: N/A

I. Total length of roadway, in linear feet: N/A

J. Name(s) of receiving water(s): Merrimack River

K. Identify all other NHDES permits required for the project. For each, indicate whether an application has been filed and is pending. If the required approval has been issued, provide the permit number, registration date, or approval letter number, as applicable.

Type of Approval	Application Filed?	Pending?	If Issued
1. Water Supply Approval	☐ Yes ☐ No ■ N/A	☐	Permit number:
2. Wetlands Permit	☐ Yes ☐ No ■ N/A	☐	Permit number:
3. Shoreland Permit	■ Yes ☐ No ☐ N/A	Yes	Registration date:
4. UIC Registration	☐ Yes ☐ No ■ N/A	☐	Approval letter date:
5. Large/Small Community Well Approval	☐ Yes ☐ No ■ N/A	☐	Permit number:
6. Large Groundwater Withdrawal Permit	☐ Yes ☐ No ■ N/A	☐	Permit number:
7. Other:	☐ Yes ■ No		

L. List all species identified by the Natural Heritage Bureau as threatened or endangered or of concern:

TBD

M. Using the NHDES OneStop Data Mapper with the Surface Water Impairment layer turned on, list the impairments identified for each receiving water. If no pollutants are listed, enter "N/A."

N/A

N. Did the applicant or applicant's agent have a pre-application meeting with Alteration of Terrain Bureau staff?

☒ Yes ☐ No If yes, name of staff member: Mike Schlosser

O. Will blasting of bedrock be required? ☐ Yes ☒ No If yes, estimated quantity of blast rock in cubic yards:
If yes, standard blasting Best Management Practices notes must be placed on the plans.

NOTE: If greater than 5,000 cubic yards of blast rock will be generated, a groundwater monitoring program must be developed and submitted to NHDES. Contact Alteration of Terrain Bureau staff for additional detail.

11. CHECK ALL APPLICATION ATTACHMENTS THAT APPLY (SUBMIT WITH APPLICATION IN THE ORDER LISTED BELOW)

LOOSE:

- ■ Signed application form, with attached proof(s) of delivery.
- ■ Check for the application fee, calculated using the fee schedule available on the NHDES Land Development page.
- ■ Color copy of a USGS map with the property boundaries outlined (1" = 2,000' scale).
- ☐ If the applicant is not the property owner, proof that the applicant will have a legal right to undertake the project on the property if a permit is issued to the applicant.

BOUND, IN A REPORT, IN THE FOLLOWING ORDER:

- ■ Copy of the signed application form and application checklist.
- ■ Copy of the check.
- ■ Copy of the USGS map with the property boundaries outlined (1" = 2,000' scale).
- ■ Narrative of the project with a summary table of the peak discharge rate for the off-site discharge points.
- ■ Printout of NHDES OneStop Mapper with "Surface Water Impairments" layer turned on.
- ■ Printout of NHDES OneStop Mapper with Alteration of Terrain screening layers turned on.
- ■ Printout of Natural Heritage Bureau DataCheck Tool letter and any relevant correspondence with New Hampshire Fish and Game.
- ■ USDA Web Soil Survey Map with project's watershed outlined.
- ■ Aerial photograph (1" = 2,000' scale with the site boundaries outlined).
- ■ Photographs representative of the site.
- ☐ Groundwater recharge volume calculations (include one Best Management Practices worksheet per permit application).
- ■ Drainage analysis, stamped by a professional engineer (see "Application Checklist" at the end of this document).
- ☐ Riprap apron or other energy dissipation or stability calculations. **Not Applicable**
- ☐ Site Specific Soil Survey report, stamped and with a certification note prepared by the soil scientist that the survey was done in accordance with the Site Specific Soil Mapping standards of the Society of Soil Scientists of Northern New England. **Not Applicable**
- ☐ Infiltration Feasibility Report (example online) [Env-Wq 1503.08(f)(3)]. **Not Applicable**
- ☐ Registration and Notification Form for Stormwater Infiltration to Groundwater (UIC Registration-for underground systems only, including drywells and trenches). **Not Applicable**
- ■ Inspection and maintenance manual with, if applicable, long term maintenance agreements [Env-Wq 1503.08(g)].
- ■ Source control plan.

PLANS:

- ■ One set of design plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details).
- ■ Pre- and post-development color-coded soil plans on 11" x 17" (see Application Checklist for details).
- ■ Pre- and post-construction drainage area plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details).

100-YEAR FLOODPLAIN REPORT:

- ☐ All information required in Env-Wq 1503.09, submitted as a separate report. **Not Applicable**

ADDITIONAL INFORMATION RE: NUTRIENTS, CLIMATE

- ☐ See Application Checklist (Attachment A) for details.

- ■ **REVIEW APPLICATION FOR COMPLETENESS. CONFIRM INFORMATION LISTED ON THE APPLICATION IS INCLUDED WITH SUBMITTAL.**

12. REQUIRED SIGNATURES

By signing below, I certify that:

- The information contained in or otherwise submitted with this application is true, complete, and not misleading to the best of my knowledge and belief;
- I understand that the submission of false, incomplete, or misleading information constitutes grounds for the department to deny the application, revoke any permit that is granted based on the information, and/or refer the matter to the board of professional engineers established by RSA 310-A:3 if I am a professional engineer; and
- I understand that I am subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641:3.

☒ **APPLICANT** ☐ **APPLICANT'S AGENT:**

Signature: _____ Date: October 31, 2025

Name (print or type): Gary Raddatz Title: Environmental Manager

☐ PROPERTY OWNER ☐ PROPERTY OWNER'S AGENT:

Signature: _____ Date:

Name (print or type): Title:

ALTERATION OF TERRAIN PERMIT ATTACHMENT A: APPLICATION CHECKLIST

Check each box to indicate the item has been provided, or indicate why it does not apply.

DESIGN PLANS

- [x] Plans printed on 34 - 36" by 22 - 24" white paper.
- [x] Professional Engineer stamp.
- [x] Wetland delineation.
- [x] Temporary erosion control measures.
- [x] Treatment for all stormwater runoff from impervious surfaces such as roadways (including gravel roadways), parking areas, and nonresidential roof runoff. Guidance on treatment BMPs can be found in Volume 2, Chapter 4 of the New Hampshire Stormwater Management Manual.
- [x] Pre-existing 2-foot contours.
- [x] Proposed 2-foot contours.
- [x] Drainage easements protecting the drainage/treatment structures.
- [ ] Compliance with state statute governing fill and dredge in wetlands, RSA 482- A. Note that artificial detention in wetlands is prohibited.
- [x] Compliance with the New Hampshire Shoreland Protection Act, RSA 483-B.
- [ ] Benching – needed if you have more than 20 feet change in elevation on a 2:1 slope, 30 feet change in elevation on a 3:1 slope, 40 feet change in elevation on a 4:1 slope.
- [ ] Check to see if any proposed ponds require state dam permits.

DETAILS

- [ ] Typical roadway cross-section.
- [ ] Detention basin with inverts noted on the outlet structure.
- [ ] Stone berm level spreader.
- [ ] Outlet protection – riprap aprons.
- [x] A general installation detail for an erosion control blanket.
- [x] Silt fences or mulch berm.
- [ ] Storm drain inlet protection. Note that since hay bales must be embedded 4 inches into the ground, they are not to be used on hard surfaces such as pavement.
- [ ] Hay bale barriers.
- [x] Stone check dams.
- [x] Gravel construction exit.
- [ ] Temporary sediment trap.
- [x] The treatment BMPs proposed.
- [x] Any innovative BMPs proposed.

CONSTRUCTION SEQUENCE / EROSION CONTROL

☐ Note that the project must be managed to meet the requirements and intent of RSA 430:53 and Agr 3800 relative to invasive species.

☐ Note that perimeter controls shall be installed prior to earth moving operations.

☐ Note that temporary water diversion (swales, basins, etc.) must be used as necessary until areas are stabilized.

☐ Note that ponds and swales shall be installed early on in the construction sequence (before rough grading the site).

☐ Note that all ditches and swales shall be stabilized prior to directing runoff to them.

☐ Note that all roadways and parking lots shall be stabilized within 72 hours of achieving finished grade.

☐ Note that all cut and fill slopes shall be seeded or loamed within 72 hours of achieving finished grade

☐ Note that all erosion controls shall be inspected weekly AND after every half-inch of rainfall.

☐ Note the limits on the open area allowed, see Env-Wq 1505.02 for detailed information.

Example note: The smallest practical area shall be disturbed during construction, but in no case shall exceed 5 acres at any one time before disturbed areas are stabilized.

☐ Note the definition of the word “stable.”

Example note: An area shall be considered stable if one of the following has occurred:

- Base course gravels have been installed in areas to be paved.
- A minimum of 85 percent vegetated growth has been established.
- A minimum of 3 inches of non-erosive material such stone or riprap has been installed.
- Or, erosion control blankets have been properly installed.

☐ Note the limit of time an area may be exposed.

Example note: All areas shall be stabilized within 45 days of initial disturbance.

☐ Provide temporary and permanent seeding specifications. Note that although reed canary grass is listed in the Green Book; it is a problematic species according to the Wetlands Bureau and therefore should not be specified.

☐ Provide winter construction notes that meet or exceed our standards.

Standard Winter Notes:

- All proposed vegetated areas that do not exhibit a minimum of 85 percent vegetative growth by October 15, or which are disturbed after October 15, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting, elsewhere. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events.
- All ditches or swales which do not exhibit a minimum of 85 percent vegetative growth by October 15, or which are disturbed after October 15, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions.
- After October 15, incomplete road or parking surfaces where work has stopped for the winter season shall be protected with a minimum of 3 inches of crushed gravel per NHDOT item 304.3.

☐ Note at the end of the construction sequence that “Lot disturbance, other than that shown on the approved plans, shall not commence until after the roadway has the base course to design elevation and the associated drainage is complete and stable.” – This note is applicable to single/duplex family subdivisions, when lot development is not part of the permit.

DRAINAGE ANALYSES

Please provide double-side 8 ½" × 11" sheets where possible but, **do not** reduce the text such that more than one page fits on one side.

☒ Professional Engineer stamp.

☒ Rainfall amount obtained from the Northeast Regional Climate Center. Include extreme precipitation table as obtained from this source.

☒ Drainage analyses, in the following order:

- Pre-development analysis: Drainage diagram.
- Pre-development analysis: Area Listing and Soil Listing.
- Pre-development analysis: Node listing 1-year (if applicable), 2-year, 10-year and 50-year.
- Pre-development analysis: Full summary of the 10-year storm.
- Post-development analysis: Drainage diagram.
- Post-development analysis: Area Listing and Soil Listing.
- Post-development analysis: Node listing for the 2-year, 10-year and 50-year.
- Post-development analysis: Full summary of the 10-year storm.

☒ Review the Area Listing and Soil Listing reports

- Hydrologic Soil Groups (HSG) match the HSGs on the soil maps provided.
- There is the same or less HSG A soil area after development (check for each HSG).
- There is the same or less "woods" cover in the post-development.
- Undeveloped land was assumed to be in "good" condition.
- The amount of impervious cover in the analyses is correct.

Note: A good check is to subtract the total impervious area used in the pre-analysis from the total impervious area used in the post-analysis. For residential projects without demolition occurring, a good check is to take this change in impervious area, subtract out the roadway and divide the remaining by the number of houses or units proposed. Do these numbers make sense?

☒ Check the storage input used to model the ponds.

☐ Check to see if the artificial berms pass the 50-year storm, i.e., make sure the constructed berms on ponds are not overtopped.

☒ Check the outlet structure proposed and make sure it matches that modeled.

☒ Check to see if the total areas in the pre and post analyses are same.

☒ Confirm the correct NRCS storm type was modeled (Coos, Carroll and Grafton counties are Type II, all others Type III).

PRE- AND POST-CONSTRUCTION DRAINAGE AREA PLANS

☒ Plans printed on 34 - 36" by 22 - 24" on white paper.

☒ Submit these plans separate from the soil plans.

☒ A north arrow.

☒ A scale.

☒ Labeled subcatchments, reaches and ponds.

- [x] Tc lines.
- [x] A clear delineation of the subcatchment boundaries.
- [ ] Roadway station numbers.
- [ ] Culverts and other conveyance structures.

PRE- AND POST-CONSTRUCTION COLOR-CODED SOIL PLANS

- [x] 11” × 17” sheets suitable, as long as it is readable.
- [x] Submit these plans separate from the drainage area plans.
- [x] A north arrow.
- [x] A scale.
- [x] Name of the soil scientist who performed the survey and date the soil survey took place.
- [x] 2-foot contours (5-foot contours if application is for a gravel pit) as well as other surveyed features.
- [x] Delineation of the soil boundaries and wetland boundaries.
- [x] Delineation of the subcatchment boundaries.
- [x] Soil series symbols (e.g., 26).
- [x] A key or legend identifying each soil series symbol and its associated soil series name (for example: 26 = Windsor).
- [x] The hydrologic soil group color coding (A = Green, B = yellow, C= orange, D=red, Water=blue, and Impervious = gray).

Please note that excavation projects (including gravel pits) have similar requirements to those above, with the following common exceptions or additions:

- [ ] Drainage report is not needed if site does not have off-site flow.
- [ ] 5-foot contours are allowed rather than 2-foot.
- [ ] No Professional Engineer stamp is needed on the plans.
- [ ] Add a note to the plans that the applicant must provide NHDES a written update of the project and revised plans documenting the project status every five years from the date of the Alteration of Terrain permit.
- [ ] Add reclamation notes.
- [ ] A description of the subsurface conditions to the planned depth of excavation, including the elevation of the location of the Seasonal High Water Table (SHWT), as observed and described by a certified soil scientist, or an individual holding a valid permit as a permitted designer as issued by the department’s Subsurface Systems Bureau.

For more resources, refer to the Natural Resources Conservation Service’s Vegetating New Hampshire Sand and Gravel Pits publication.

APPENDIX A: COPY OF APPLICATION FEE CHECK

TD BANK, NA
PORTLAND, MAINE

52-7445
2112

385693

Woodard & Curran

October 30, 2025

Account #: TAX ID# 01-0363222

AMOUNT

Five Thousand and 00/100 Dollars

5,000.00

PAY
TO THE
ORDER
OF

STATE OF NEW HAMPSHIRE
NH DRA
PO BOX 1265
CONCORD, NH 03302-1265

⑈385693⑈ ⑆211274450⑆ 242766258⑈

Woodard & Curran

12 Mountfort Street
Portland, ME 04101

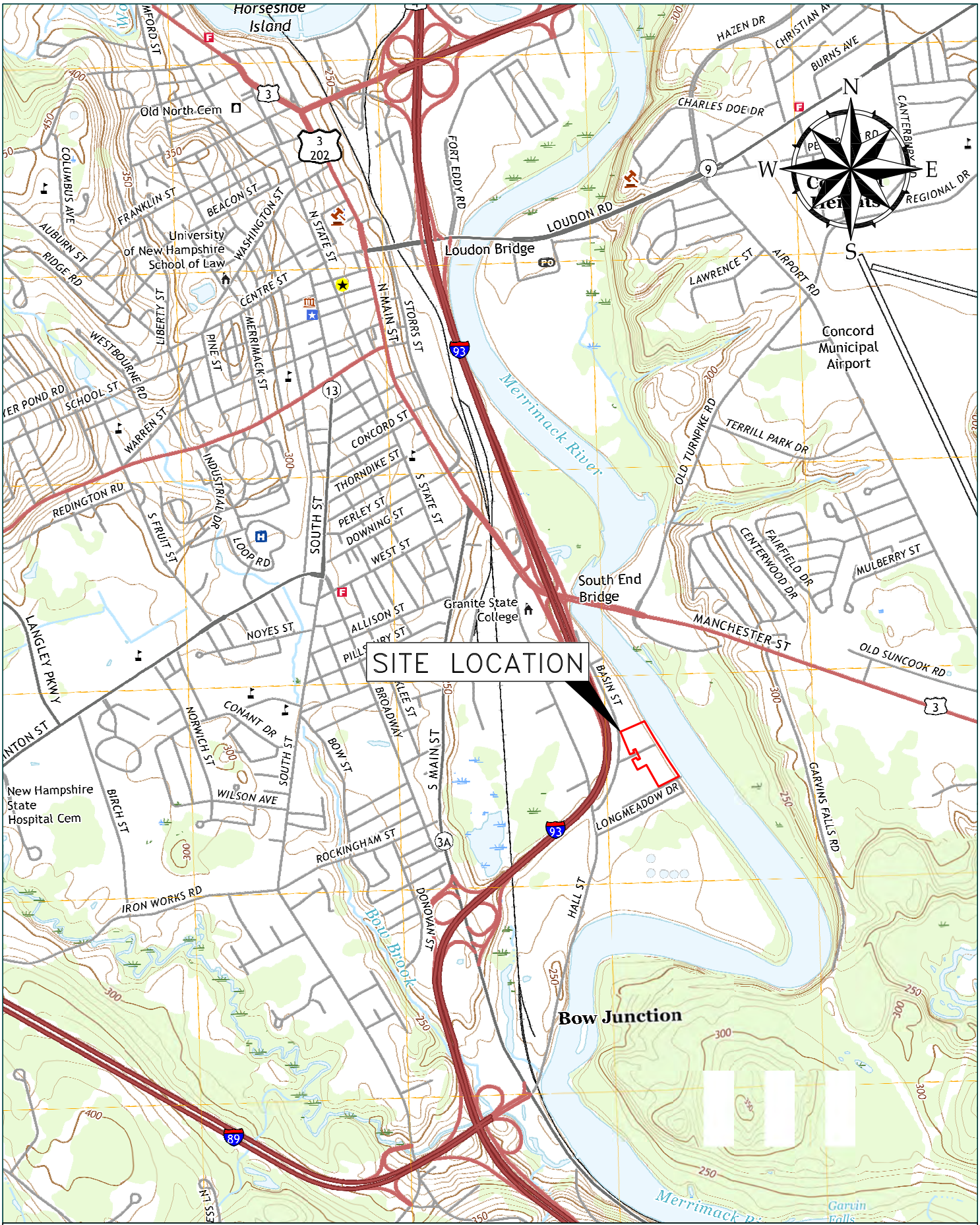
T 800.426.4262
T 207.774.2112

385693

Check Date: 10/30/2025

Invoice Number	Date	Voucher	Amount	Discounts	Previous Pay	Net Amount
State of NH-1	10/29/2025	000000809717	5,000.00			5,000.00
STATE OF NEW HAMPSHIRE		TOTAL	5,000.00			5,000.00
TDBANK AP - WC	2	067404				

APPENDIX B: USGS MAP



Woodard & Curran	Client Info: RADIUS RECYCLING 25 SANDQUIST STREET CONCORD, NH 03301	Job No: 0224539.48 Date: July 2024 Scale: 1" = 2,000' Des by: JM Drn by: JM Chk by: YI	Drawing Title USGS MAP	Source USGS US TOPO 7.5 - MINUTE SERIES CONCORD QUADRANGLE - MERRIMACK COUNTY SCALE: 1:24,000 2021 VERSION

APPENDIX C: PROJECT NARRATIVE AND DRAINAGE ANALYSIS

1. PROJECT NARRATIVE

1.1 Project Introduction

This Alteration of Terrain (AoT) permit application is for proposed stormwater management improvements at the existing facility for Radius Recycling (Applicant), located at 25 Sandquist St., Concord, NH. The facility is regulated under the United States Environmental Protection Agency (EPA) Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (MSGP) that became effective on March 1, 2021. The permit applies in areas of the country where EPA is the NPDES permitting authority, including New Hampshire. This project will replace the existing on-site stormwater infrastructure with new proposed conveyance, storage, and treatment systems to provide sufficient water quality treatment to consistently meet the MSGP benchmarks for target pollutants, which include total suspended solids (TSS), chemical oxygen demand (COD), and metals (aluminum, copper, lead, zinc) from runoff.

The Facility is located on a 6.9 acre parcel and includes approximately 5.1 acres of impervious area. The Facility is bounded to the north by an automotive salvage yard, to the west by commercial property, to the south by a residential neighborhood, and to the east by the Merrimack River. The Facility is used for activities related to scrap metal recycling. The Facility consists of an office, a processing building, a turning building, warehouse buildings, and covered storage areas. Portions of the property are unpaved, and therefore not subject to industrial operations, including the areas between the southern/southeastern edges of the paved area and the southern/southeastern property boundaries.

The total area of disturbance will be 1.2 acres, with an increase in impervious area by 2,906 square feet, as existing pervious areas on the southern portion of the property will be paved to accommodate the proposed stormwater storage and treatment infrastructure, as well as to provide a paved vehicular maintenance access pathway. No wetlands will be disturbed for this project; however, as the facility is within 250 feet of the shoreland, a shoreland protection permit will be required. The increase in impervious area for the site will be outside of the 250-foot shoreland protection buffer.

Pre-development and post-development drainage analyses have been prepared for this project. This report has been developed to demonstrate that the proposed stormwater improvements have been designed to match the pre-development conditions of the site in compliance with the AoT permit requirements. This includes pre-development and post-development drainage analyses and water quality treatment design calculations. Design calculations and drainage analyses are supplemented by the site plans which are appended in this report, and include typical construction details for erosion and sediment control and proposed drainage improvements and infrastructure.

1.2 Analysis Methods

In analyzing the impact of the proposed development on downstream waters, peak runoff rates were calculated for the 2, 10, and 50-year storm events over a 24-hour period, in accordance with Env-Wq 1504.09 of the Alteration of Terrain Permit section within the New Hampshire Code of Administrative rules. The calculations were performed to demonstrate the post-development runoff rates based on the proposed conditions were not in exceedance of the pre-development runoff rates under existing conditions for all modeled storm events.

Runoff depths for each storm event were calculated based upon standards set forth by the United States Department of Agriculture Soil Conservation Service (SCS) Technical Release 55, Urban Hydrology for Small

Watersheds (TR-55), dated June 1986 and the TR-20 method. The methodology set forth in TR-55 considers a multitude of characteristics for watershed areas including soil types, soil permeability, vegetative cover, time of concentration, topography, rainfall intensity, ponding areas, etc. The hydrologic model was created with HydroCAD version 10.20-2g. The model calculates the hydrologic analysis for each subcatchment of the watershed and develops peak flow rates and total runoff volume for each design storm event.

2. DRAINAGE ANALYSIS

2.1 Pre-Development Conditions

A pre-development conditions hydrologic model was established to determine the total stormwater runoff under the existing conditions of the site. The site is a total of 6.9 acres and the majority consists of impervious surfaces, with largely concrete pavement, covered buildings and an office. The southern areas are largely pervious areas with largely overgrown grass, with a run of vertically stacked conex containers that run from near the southwestern edge of the site to the 15' high metal fence on the eastern edge of the site that separates the facility from the bank along the Merrimack River to the east. An approximately 2' retaining wall runs from east to west along the southern portion of the site, and serves as a separation of the operational areas of the facility (i.e., metals recycling activity and logistics for vehicles) and the pervious area of the facility, where no operational activities are conducted.

Runoff from the paved areas flow to existing catch basins, and runoff areas from grassed areas currently discharge to the southwestern portion of the facility off-site. A total of 12 subcatchments were analyzed, with 11 subcatchments discharging to Design Point #1, to the City MS4, and one subcatchment for the runoff that discharge off-site, Desing Point #2. The runoff from the grassed areas to the south of the paved areas are split, due to the existing stacked conex containers that also serve as a retaining wall. Runoff to the north of the conex containers runoff to the paved areas and enter the catch basins, and runoff to the south of the conext containers discharge off-site. The site consists of an existing 36" HDPE subsurface detention system and a diversion structure that also serves as an oil-separator for storage and treatment of the water quality volume. An existing drainage area map that provides drainage areas for each subcatchment, time of concentrations, and their flow paths is provided under Appendix Q of this report.

Table 1 below provides a pre-development conditions summary of the flow rates for each discharge point for the 2, 10, and 50-year storm events.

TABLE 1: PRE-DEVELOPMENT CONDITIONS PEAK FLOW SUMMARY

Discharge Point	2-year (cfs)	10-year (cfs)	50-year (cfs)
DP-1	13.45	19.92	29.94
DP-2	0.22	0.45	0.81
Total	13.67	20.37	30.75

2.2 Post-Development Conditions

The post-development conditions remain the same as the pre-development conditions for the majority of the site, as the areas north of the existing retaining wall will not include any net change of impervious surfaces. For the areas south of the existing retaining wall, the conex containers will be removed, the area will be regraded, and a collection of above-grade and below-grade stormwater infrastructure will be installed, along with a paved maintenance access pathway. The existing retaining wall will be replaced by a 15' tall precast barrier wall to serve as a separation between the operational areas of the facility and the proposed stormwater infrastructure.

Under the proposed conditions, stormwater runoff will be captured on site through a series of catch basins and routed to a diversion structure, where up to 1-inch runoff treatment volume will be pretreated by an oil-water separator and diverted to a lift station. The lift station will pump the treatment volume and be

conveyed to an aboveground storage tank. The aboveground storage tank will be sized to store 150% of the water quality volume. The captured volume in the storage tank will then be pumped to an above-grade advanced treatment facility (ATS) where stormwater will be treated to meet permit benchmarks and then be discharged to the local MS4 system. The diversion structure upstream of the lift station will allow stormwater flows exceeding the water quality event to bypass the storage tank and ATS. The treated stormwater from the ATS, as well as any bypassed flows, will then be discharged to the local existing MS4 infrastructure which discharges to the Merrimack River. A proposed drainage area map that provides drainage areas for each subcatchment, time of concentrations, and their flow paths is provided under Appendix R of this report.

Table 2 below provides a post-development conditions summary of the flow rates for each discharge point for the 2, 10, and 50-year storm events.

TABLE 2: POST-DEVELOPMENT CONDITIONS PEAK FLOW SUMMARY

Discharge Point	2-year (cfs)	10-year (cfs)	50-year (cfs)
DP-1	8.00	14.89	28.79
DP-2	0.01	0.05	0.12
Total	8.01	14.94	28.91

2.3 Pre vs Post-Development Conditions Comparison

Table 3 provides a comparison of the pre-development and post-development conditions flow rates for the 2, 10, and 50-year storm events. Based on the net reduction of peak flow rates for each analyzed storm events, the site has been designed to not have adverse impacts to downstream conditions and their discharge points. The analysis also demonstrates that due to the large amount of water quality volume that is captured by the aboveground storage tank (and, treated by the active treatment system), a significant reduction in peak flows for the 2-year and 10-year storm events are expected.

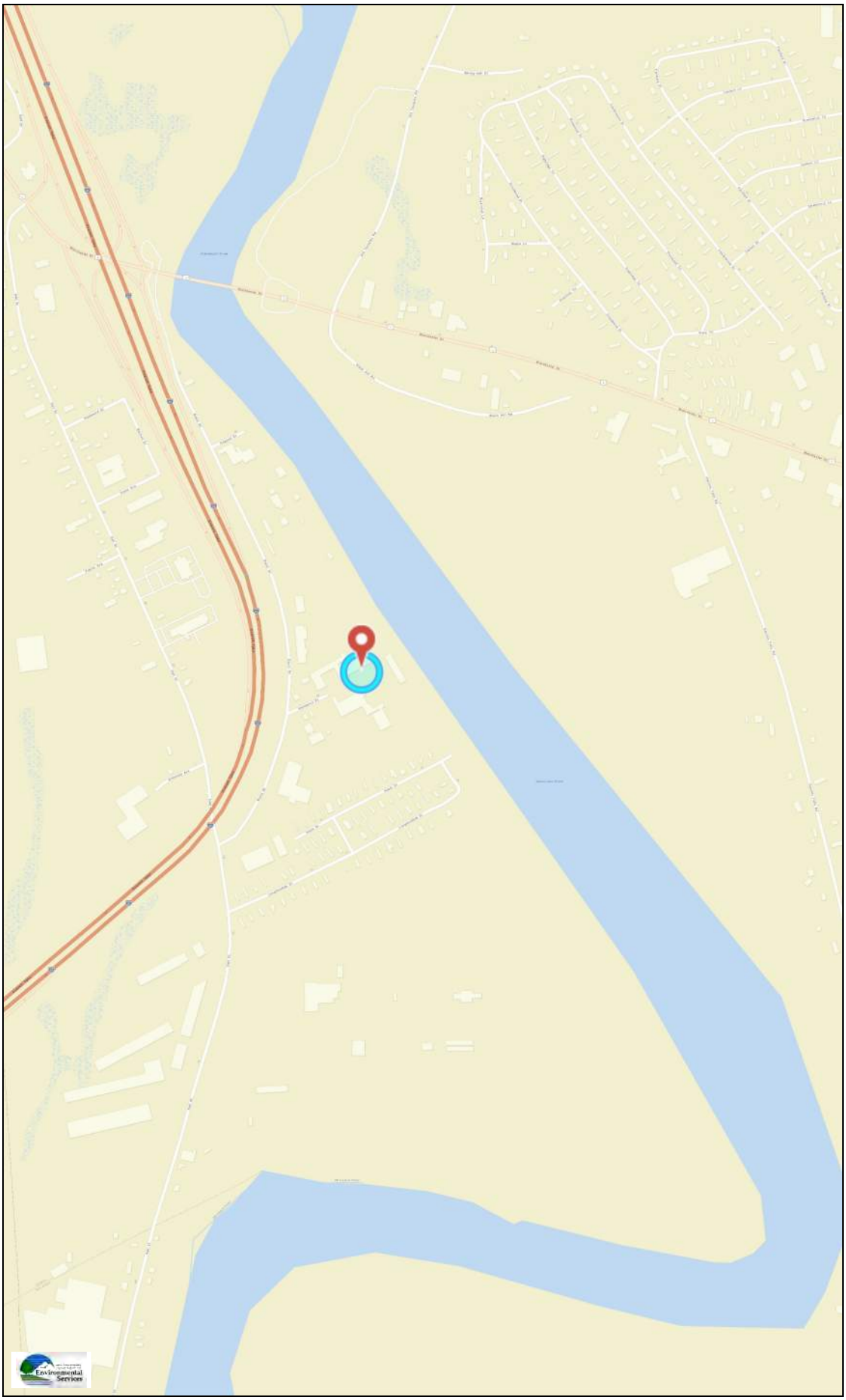
TABLE 3: PRE VS POST DEVELOPMENT FLOW RATE COMPARISON

Storm Event	Pre-Development Total (cfs)	Post-Development Total (cfs)	Net Total (cfs)	% Change (Pre vs. Post)
2-year	13.67	8.01	-5.66	-41%
10-year	20.37	14.94	-5.43	-27%
50-year	30.75	28.91	-1.84	-6%

In summary, the drainage analysis of the existing and proposed conditions indicate that the site will not experience an increase in peak runoff flow rate under the proposed conditions compared to the existing conditions. A complete HydroCAD report with analysis of each storm event for existing and proposed conditions is provided under Appendix J of this report.

APPENDIX D: SURFACE WATER IMPAIRMENTS

25 Sandquist Street - Surface Water Impairments



Legend

Surface Waters with Impairn with Quarter Mile Buffer

Map Scale

1: 10,000

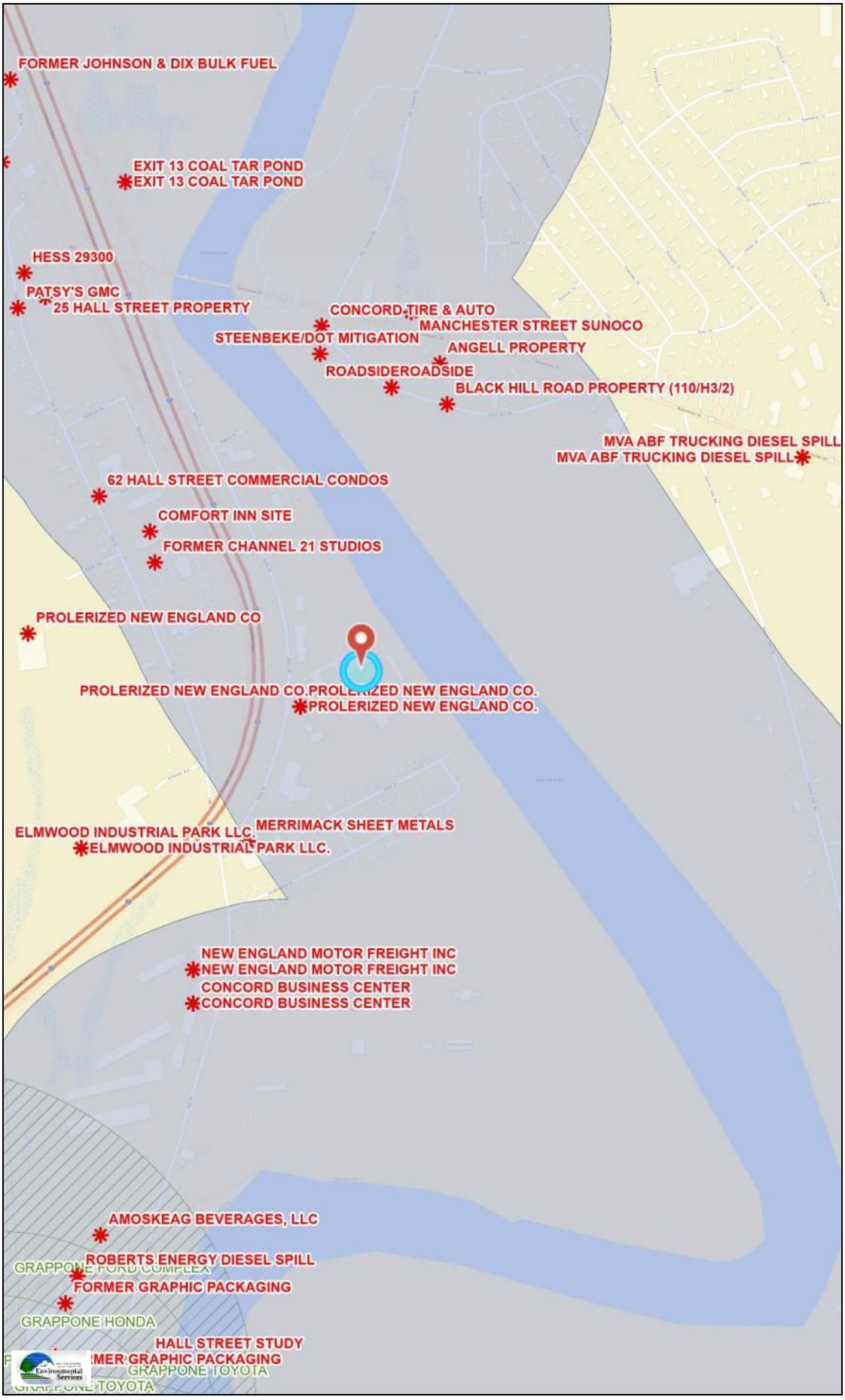
© NH DES, http://des.nh.gov

Map Generated: 7/18/2024

Notes

APPENDIX E: ALTERATION OF TERRAIN SCREENING

25 Sandquist Street - Alteration of Terrain



Legend

- Remediation Sites
- Designated Rivers Quarterm Buffer
- Wellhead Protection Areas

Map Scale

1: 10,000

© NH DES, http://des.nh.gov

Map Generated: 7/18/2024

Notes

APPENDIX F: NATIONAL HERITAGE BUREAU (NHB) DATACHECK

New Hampshire Natural Heritage Bureau
NHB DataCheck Results Letter

To: Omar Perez
800 Westchester Ave
Suite N507
Rye Brook, NY 10573

From: NH Natural Heritage Bureau
Date: 8/6/2024 (valid until 8/6/2025)
Re: Review by NH Natural Heritage Bureau of request submitted 7/25/2024
Permits: NHDES - Alteration of Terrain Permit, NHDES - Shoreland Standard Permit

NHB ID: **NHB24-2318** **Applicant:** Omar Perez

Location: Concord
25 Sandquist Street

Project Description: This is a planned stormwater retrofit project that will consist of replacement of the existing stormwater conveyance system with the installation of new storm drain piping, an active stormwater treatment system and an aboveground storage tank. The limit of disturbance is approximately 56,760 square feet and is anticipated to begin construction in 2025.

The NH Natural Heritage database has been checked by staff of the NH Natural Heritage Bureau and/or the NH Nongame and Endangered Species Program for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government.

It was determined that, although there was a NHB record (e.g., rare wildlife, plant, and/or natural community) present in the vicinity, we do not expect that it will be impacted by the proposed project. This determination was made based on the project information submitted via the NHB Datacheck Tool on 7/25/2024 3:39:04 PM, and cannot be used for any other project.

Based on the information submitted, no further consultation with the NH Fish and Game Department pursuant to Fis 1004 is required.

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

New Hampshire Natural Heritage Bureau
NHB DataCheck Results Letter

MAP OF PROJECT BOUNDARIES FOR: **NHB24-2318**



Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

APPENDIX G: WEB SOIL SURVEY

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Merrimack and Belknap Counties, New Hampshire

25 Sandquist Street



July 14, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:1,980 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 25 50 100 150

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

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

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

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

Soil Survey Area: Merrimack and Belknap Counties, New Hampshire
Survey Area Data: Version 29, Aug 22, 2023

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

Date(s) aerial images were photographed: Oct 6, 2022—Oct 22, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

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
498A	Urban land-Pootatuck complex, 0 to 3 percent slopes	7.5	89.0%
W	Water	0.9	11.0%
Totals for Area of Interest		**8.5**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Merrimack and Belknap Counties, New Hampshire

498A—Urban land-Pootatuck complex, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9dl7
Elevation: 200 to 1,970 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 100 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 45 percent
Pootatuck, occasionally flooded, and similar soils: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Typical profile

H1 - 0 to 6 inches: variable

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Description of Pootatuck, Occasionally Flooded

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and/or coarse-loamy alluvium derived from granite, gneiss or schist

Typical profile

H1 - 0 to 14 inches: very fine sandy loam
H2 - 14 to 60 inches: fine sandy loam
H3 - 60 to 65 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F144BY120ME - Small Floodplain Riparian Complex (reserved)
Hydric soil rating: No

Minor Components

Rippowam, frequently flooded
Percent of map unit: 7 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: Yes

Saco, frequently flooded
Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Windsor
Percent of map unit: 5 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Occum, occasionally flooded
Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

W—Water

Map Unit Setting
National map unit symbol: wm74
Elevation: 200 to 2,610 feet
Farmland classification: Not prime farmland

Map Unit Composition
Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

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APPENDIX H: AERIAL IMAGERY

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map OnDemand Topo

7.5-MINUTE TOPO QUADRANGLE
Custom Extent
7.5-MINUTE TOPO

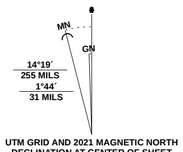


Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 19T

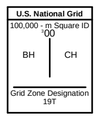
Data is provided by The National Map (TNM), is the best available at the time of map generation, and includes data content from supporting themes of Elevation, Hydrography, Geographic Names, Boundaries, Transportation, Structures, Land Cover, and Orthoimagery. Refer to associated Federal Geographic Data Committee (FGDC) Metadata for additional source data information.

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands. Temporal changes may have occurred since these data were collected and some data may no longer represent actual surface conditions.

Learn About The National Map: https://nationalmap.gov



UTM GRID AND 2021 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET



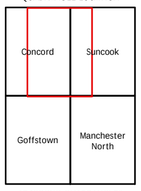
SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988
CONTOUR SMOOTHNESS = Medium



QUADRANGLE LOCATION



ADJOINING QUADRANGLES

ROAD CLASSIFICATION

Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

7.5-MINUTE TOPO, NH
2024

APPENDIX I: PHOTO LOGS

Site Photographs



Photo 1: Recycling scales, facing Northeast.



Photo 2: Two-story metal frame building, facing West.



Photo 3: One-story metal frame building, facing West.



Photo 4: Approximate location of existing subsurface stormwater system, facing Northeast.



Photo 5: Conex boxes, facing Northeast.



Photo 7: Refuse pile, facing East.

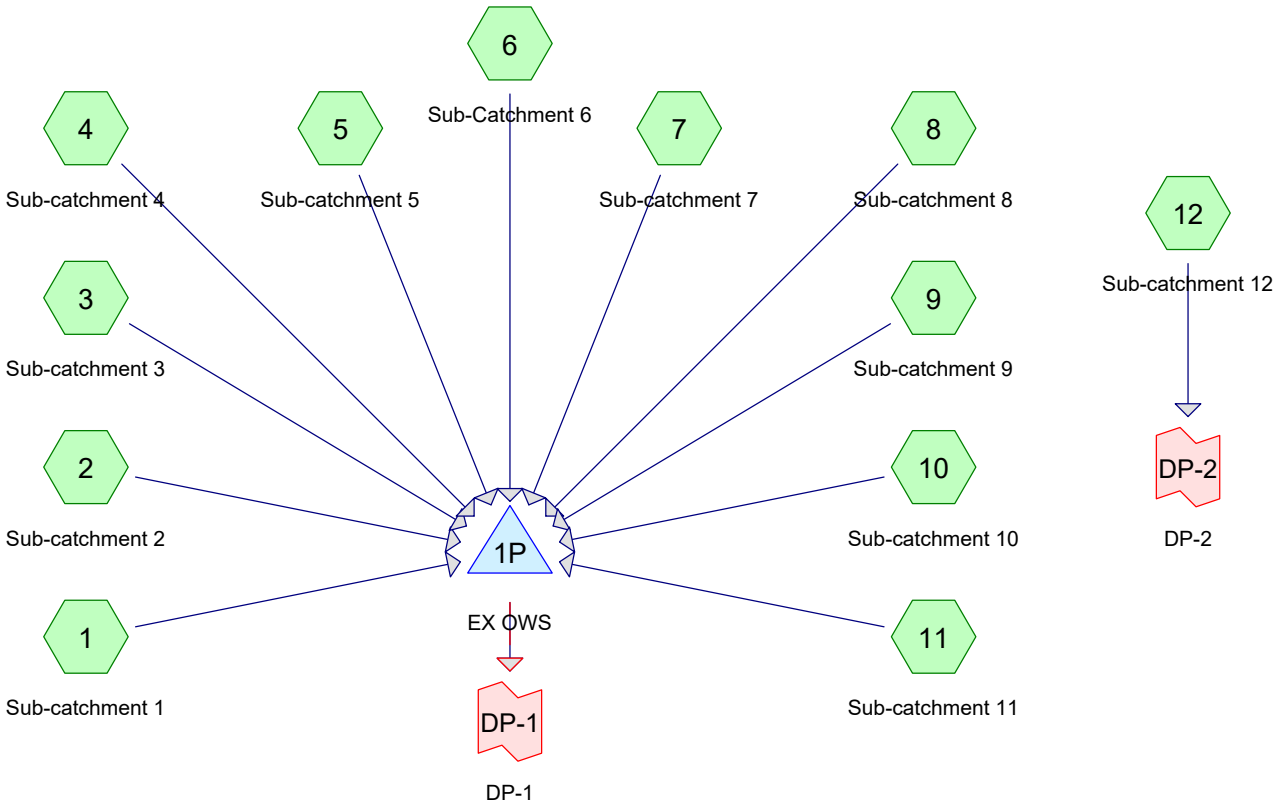


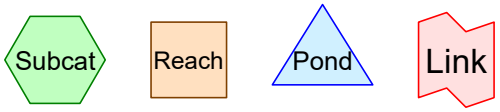
Photo 7: Eastern covered storage area, facing East.



Photo 8: Northern covered storage area and Two-story metal frame building, facing West.

APPENDIX J: PRE-DEVELOPMENT AND POST-DEVELOPMENT DRAINAGE ANALYSIS





Routing Diagram for Sandquist Existing Conditions
Prepared by Woodard & Curran, Inc, Printed 10/17/2025
HydroCAD® 10.20-5c s/n 01204 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	WQV	NRCC 24-hr	D	Default	24.00	1	1.27	2
2	2-Year	NRCC 24-hr	D	Default	24.00	1	2.82	2
3	10-Year	NRCC 24-hr	D	Default	24.00	1	4.16	2
4	50-Year	NRCC 24-hr	D	Default	24.00	1	6.15	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
24,528	79	<50% Grass cover, Poor, HSG B (9, 10, 12)
45,609	98	Roofs, HSG B (1, 2, 3, 4, 5, 7, 8, 10, 11)
176,002	98	Unconnected pavement, HSG B (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12)
246,139	**96**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
246,139	HSG B	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
0	HSG C	
0	HSG D	
0	Other	
246,139		**TOTAL AREA**

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	1P	227.14	227.10	36.0	0.0011	0.010	0.0	16.0	0.0	

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

Subcatchment1: Sub-catchment1 Runoff Area=33,590 sf 100.00% Impervious Runoff Depth=1.05"
Tc=6.0 min CN=98 Runoff=0.84 cfs 2,951 cf

Subcatchment2: Sub-catchment2 Runoff Area=7,467 sf 100.00% Impervious Runoff Depth=1.05"
Tc=6.0 min CN=98 Runoff=0.19 cfs 656 cf

Subcatchment3: Sub-catchment3 Runoff Area=7,120 sf 100.00% Impervious Runoff Depth=1.05"
Tc=6.0 min CN=98 Runoff=0.18 cfs 625 cf

Subcatchment4: Sub-catchment4 Runoff Area=57,605 sf 100.00% Impervious Runoff Depth=1.05"
Tc=6.0 min CN=98 Runoff=1.44 cfs 5,060 cf

Subcatchment5: Sub-catchment5 Runoff Area=14,314 sf 100.00% Impervious Runoff Depth=1.05"
Tc=6.0 min CN=98 Runoff=0.36 cfs 1,257 cf

Subcatchment6: Sub-Catchment6 Runoff Area=20,333 sf 100.00% Impervious Runoff Depth=1.05"
Tc=6.0 min CN=98 Runoff=0.51 cfs 1,786 cf

Subcatchment7: Sub-catchment7 Runoff Area=23,381 sf 100.00% Impervious Runoff Depth=1.05"
Tc=6.0 min CN=98 Runoff=0.58 cfs 2,054 cf

Subcatchment8: Sub-catchment8 Runoff Area=25,531 sf 100.00% Impervious Runoff Depth=1.05"
Tc=6.0 min CN=98 Runoff=0.64 cfs 2,243 cf

Subcatchment9: Sub-catchment9 Runoff Area=11,753 sf 73.89% Impervious Runoff Depth=0.67"
Tc=6.0 min CN=93 Runoff=0.20 cfs 656 cf

Subcatchment10: Sub-catchment10 Runoff Area=32,181 sf 67.40% Impervious Runoff Depth=0.61"
Tc=6.0 min CN=92 Runoff=0.50 cfs 1,639 cf

Subcatchment11: Sub-catchment11 Runoff Area=1,822 sf 100.00% Impervious Runoff Depth=1.05"
Tc=6.0 min CN=98 Runoff=0.05 cfs 160 cf

Subcatchment12: Sub-catchment12 Runoff Area=11,042 sf 0.67% Impervious Runoff Depth=0.16"
Flow Length=285' Tc=13.6 min CN=79 Runoff=0.02 cfs 148 cf

Pond 1P: EX OWS Peak Elev=230.19' Storage=3,570 cf Inflow=5.47 cfs 19,088 cf
Primary=1.58 cfs 19,020 cf Secondary=0.30 cfs 68 cf Outflow=1.88 cfs 19,088 cf

Link DP-1: DP-1 Inflow=1.88 cfs 19,088 cf
Primary=1.88 cfs 19,088 cf

Link DP-2: DP-2 Inflow=0.02 cfs 148 cf
Primary=0.02 cfs 148 cf

Total Runoff Area = 246,139 sf Runoff Volume = 19,235 cf Average Runoff Depth = 0.94"
9.97% Pervious = 24,528 sf 90.03% Impervious = 221,611 sf

Summary for Subcatchment 1: Sub-catchment 1

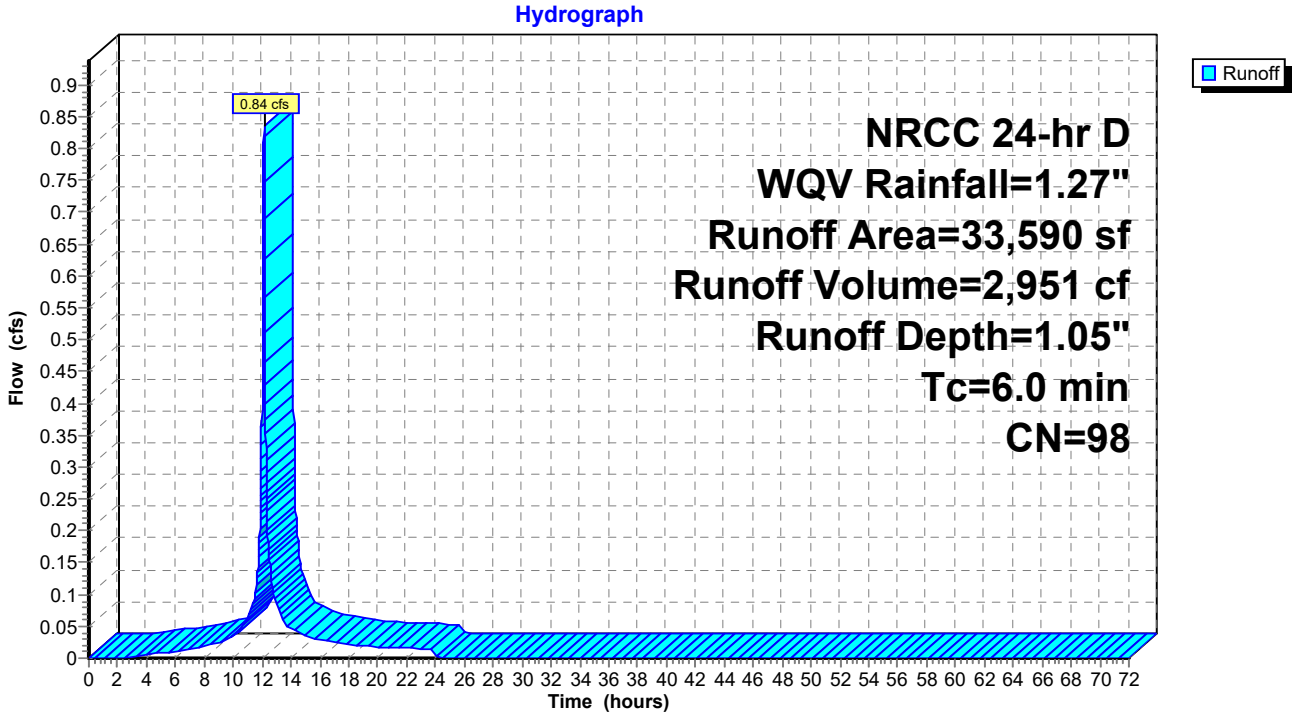
Runoff = 0.84 cfs @ 12.13 hrs, Volume= 2,951 cf, Depth= 1.05"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
15,206	98	Roofs, HSG B
18,384	98	Unconnected pavement, HSG B
33,590	98	Weighted Average
33,590		100.00% Impervious Area
18,384		54.73% Unconnected

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

Subcatchment 1: Sub-catchment 1



Summary for Subcatchment 2: Sub-catchment 2

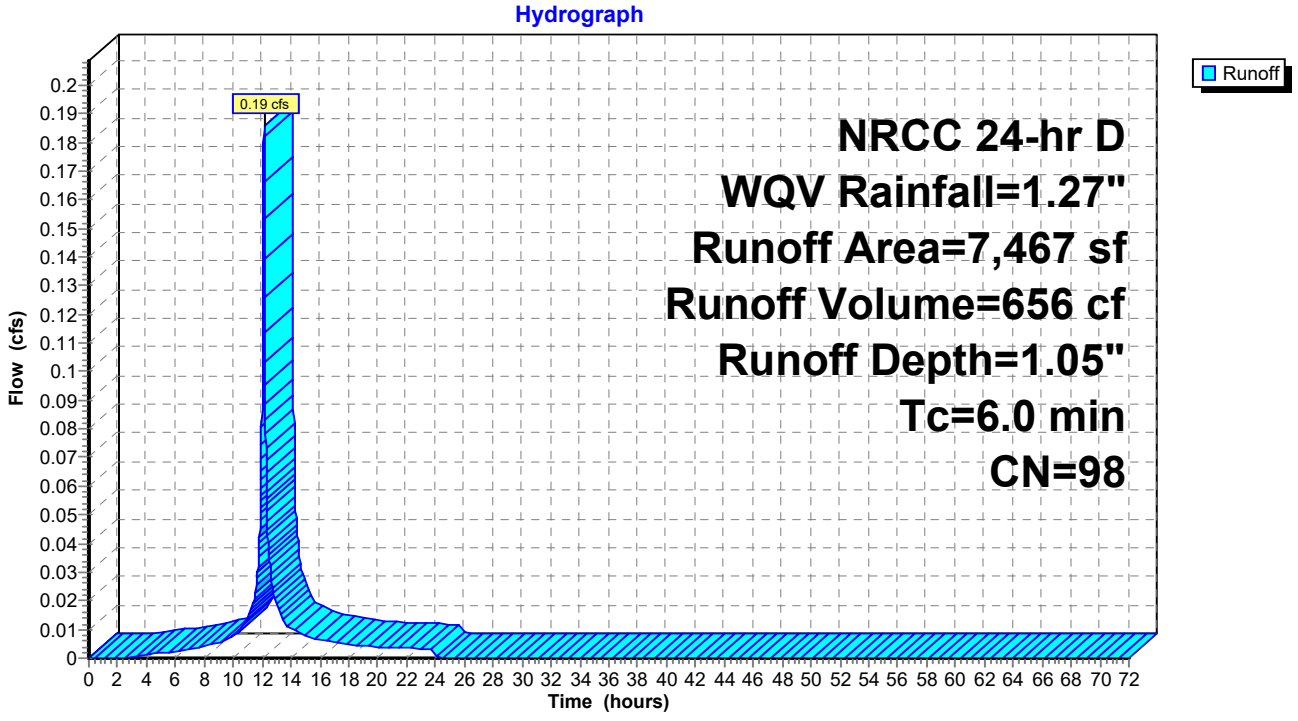
Runoff = 0.19 cfs @ 12.13 hrs, Volume= 656 cf, Depth= 1.05"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
2,936	98	Roofs, HSG B
4,531	98	Unconnected pavement, HSG B
7,467	98	Weighted Average
7,467		100.00% Impervious Area
4,531		60.68% Unconnected

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

Subcatchment 2: Sub-catchment 2



Summary for Subcatchment 3: Sub-catchment 3

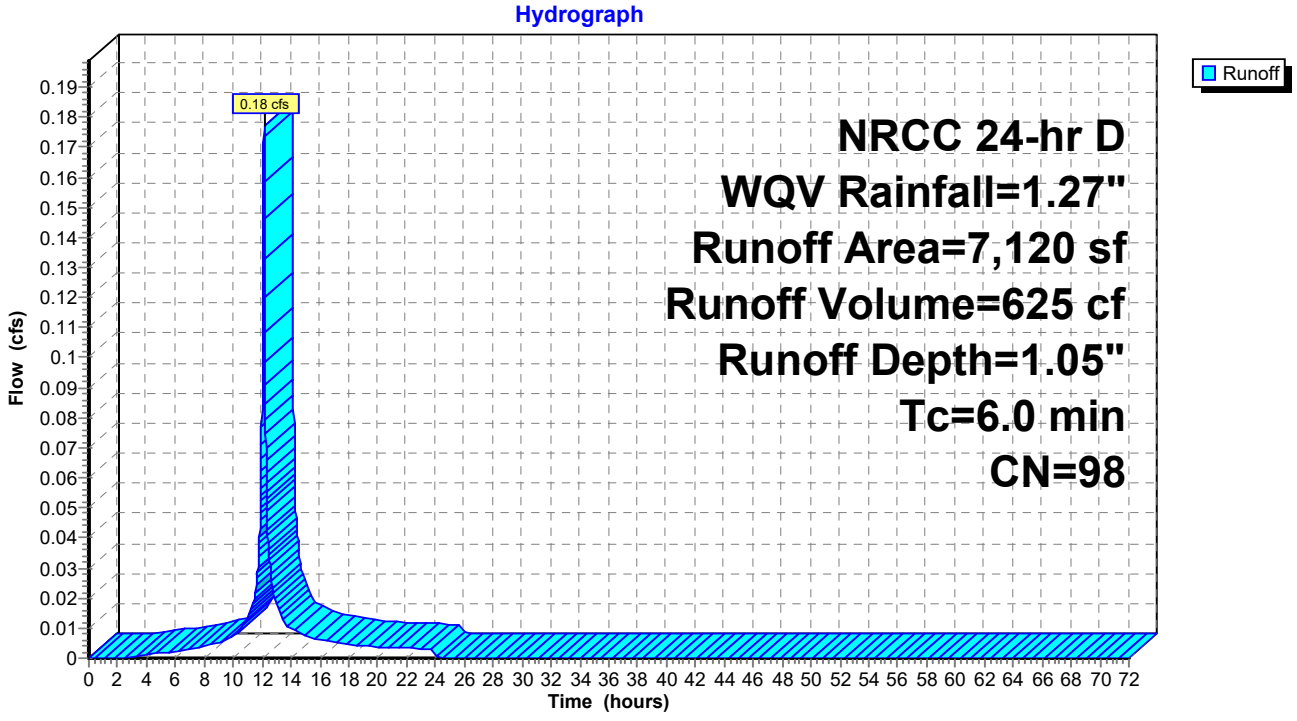
Runoff = 0.18 cfs @ 12.13 hrs, Volume= 625 cf, Depth= 1.05"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
2,543	98	Roofs, HSG B
4,577	98	Unconnected pavement, HSG B
7,120	98	Weighted Average
7,120		100.00% Impervious Area
4,577		64.28% Unconnected

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

Subcatchment 3: Sub-catchment 3



Summary for Subcatchment 4: Sub-catchment 4

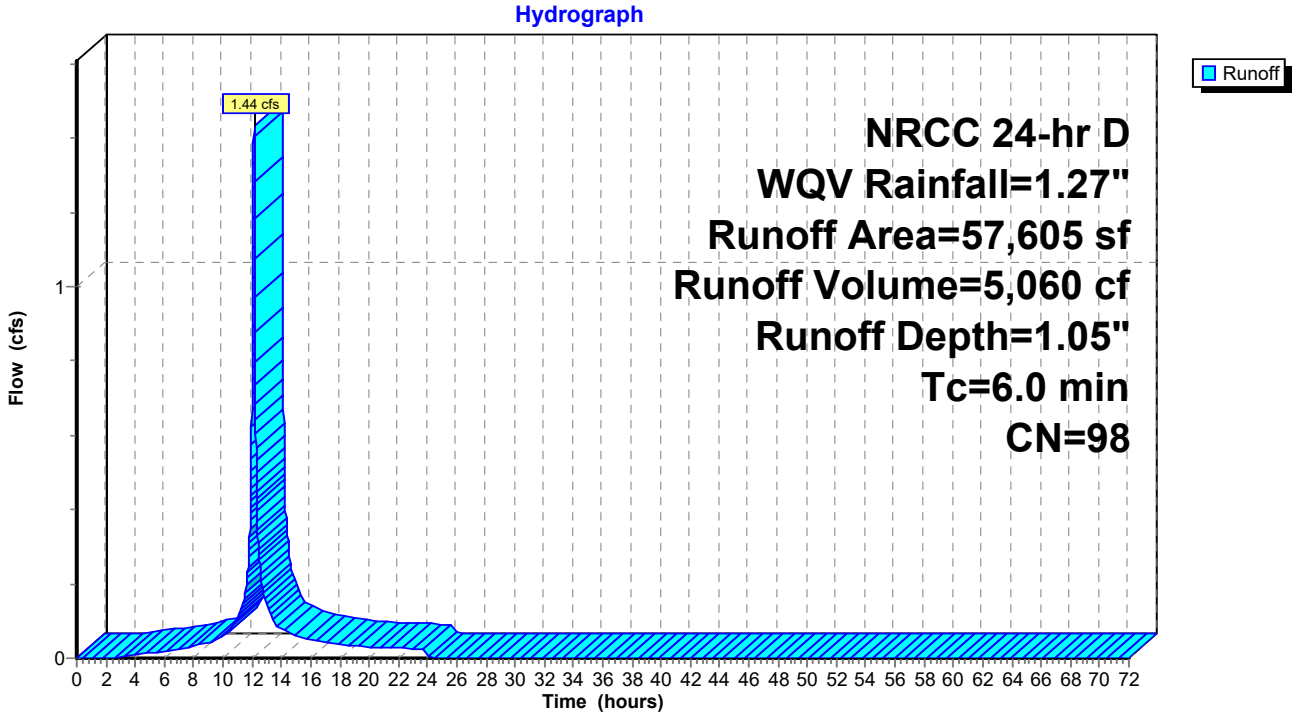
Runoff = 1.44 cfs @ 12.13 hrs, Volume= 5,060 cf, Depth= 1.05"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
5,329	98	Roofs, HSG B
52,276	98	Unconnected pavement, HSG B
57,605	98	Weighted Average
57,605		100.00% Impervious Area
52,276		90.75% Unconnected

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

Subcatchment 4: Sub-catchment 4



Summary for Subcatchment 5: Sub-catchment 5

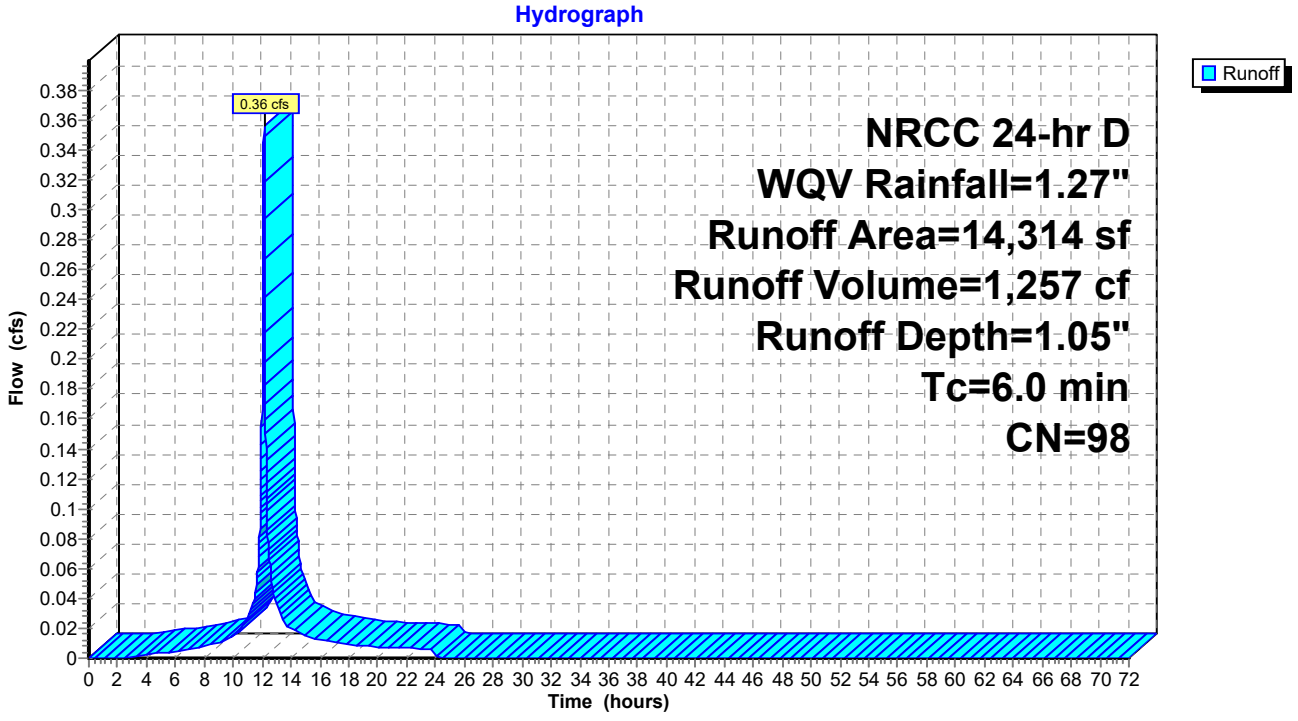
Runoff = 0.36 cfs @ 12.13 hrs, Volume= 1,257 cf, Depth= 1.05"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
5,500	98	Roofs, HSG B
8,814	98	Unconnected pavement, HSG B
14,314	98	Weighted Average
14,314		100.00% Impervious Area
8,814		61.58% Unconnected

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

Subcatchment 5: Sub-catchment 5



Summary for Subcatchment 6: Sub-Catchment 6

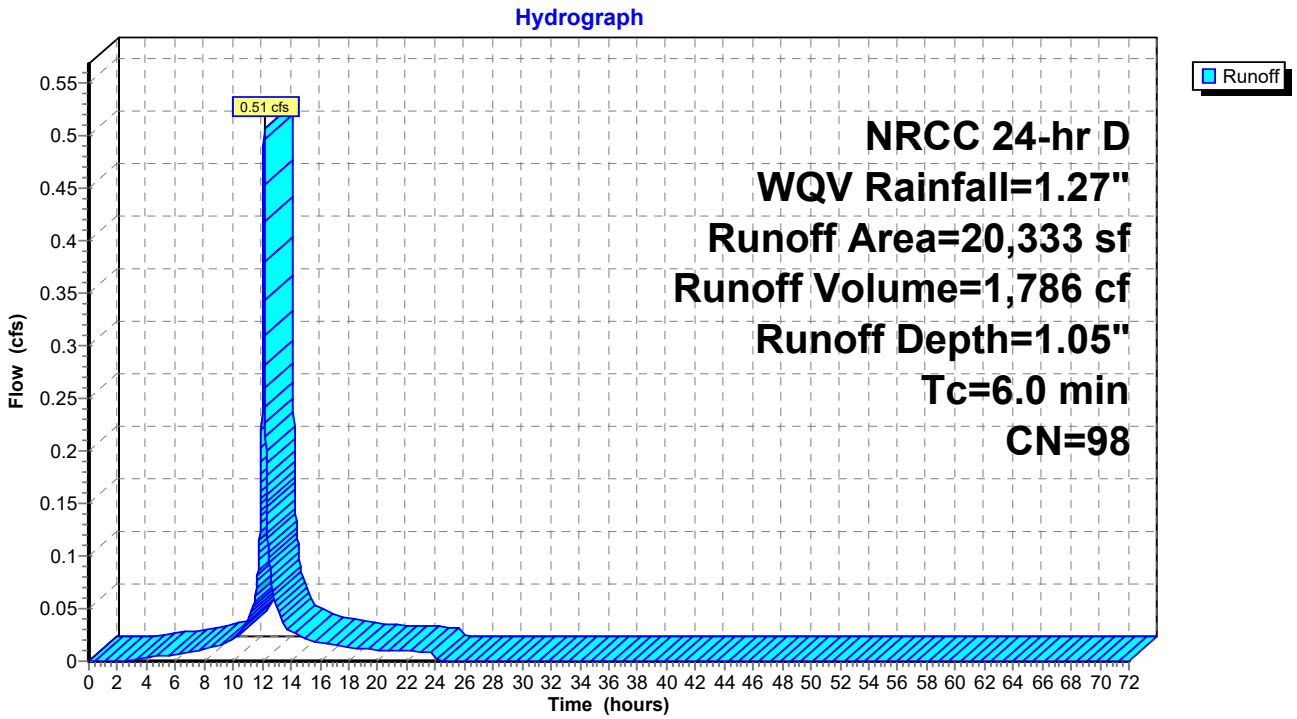
Runoff = 0.51 cfs @ 12.13 hrs, Volume= 1,786 cf, Depth= 1.05"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
20,333	98	Unconnected pavement, HSG B
20,333		100.00% Impervious Area
20,333		100.00% Unconnected

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

Subcatchment 6: Sub-Catchment 6



Summary for Subcatchment 7: Sub-catchment 7

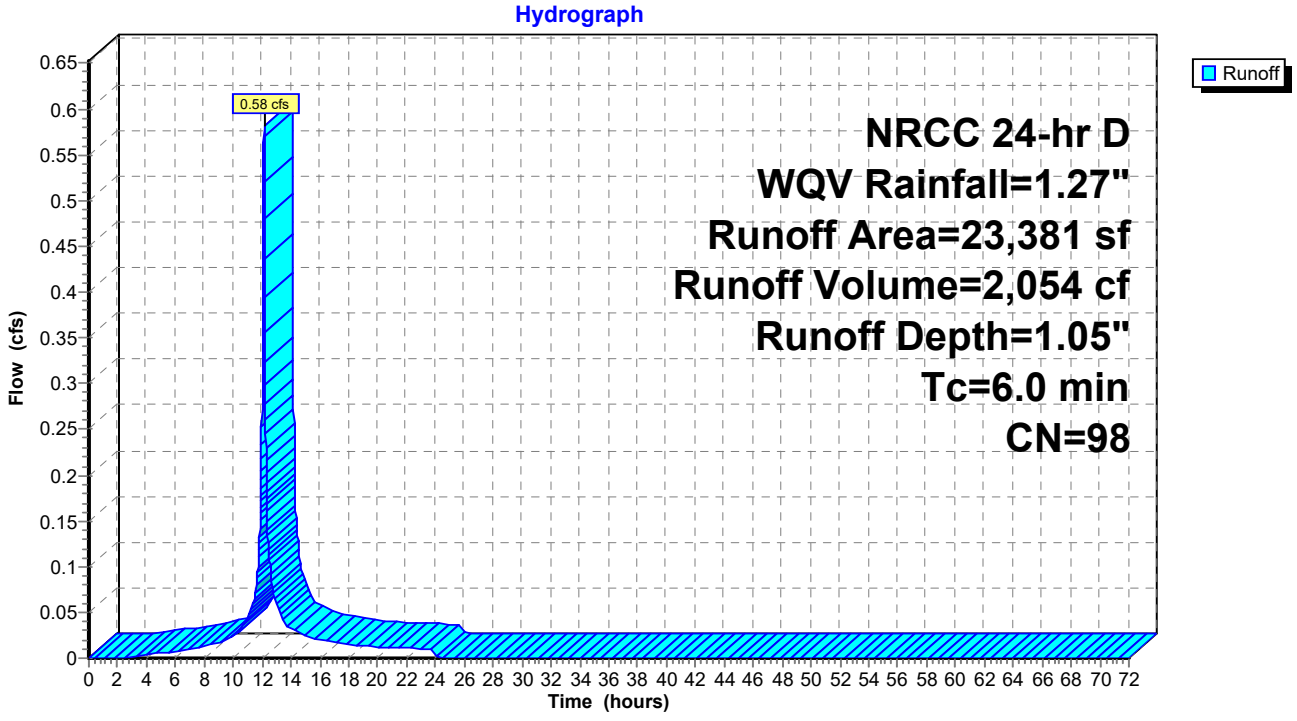
Runoff = 0.58 cfs @ 12.13 hrs, Volume= 2,054 cf, Depth= 1.05"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
3,396	98	Roofs, HSG B
19,985	98	Unconnected pavement, HSG B
23,381	98	Weighted Average
23,381		100.00% Impervious Area
19,985		85.48% Unconnected

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

Subcatchment 7: Sub-catchment 7



Summary for Subcatchment 8: Sub-catchment 8

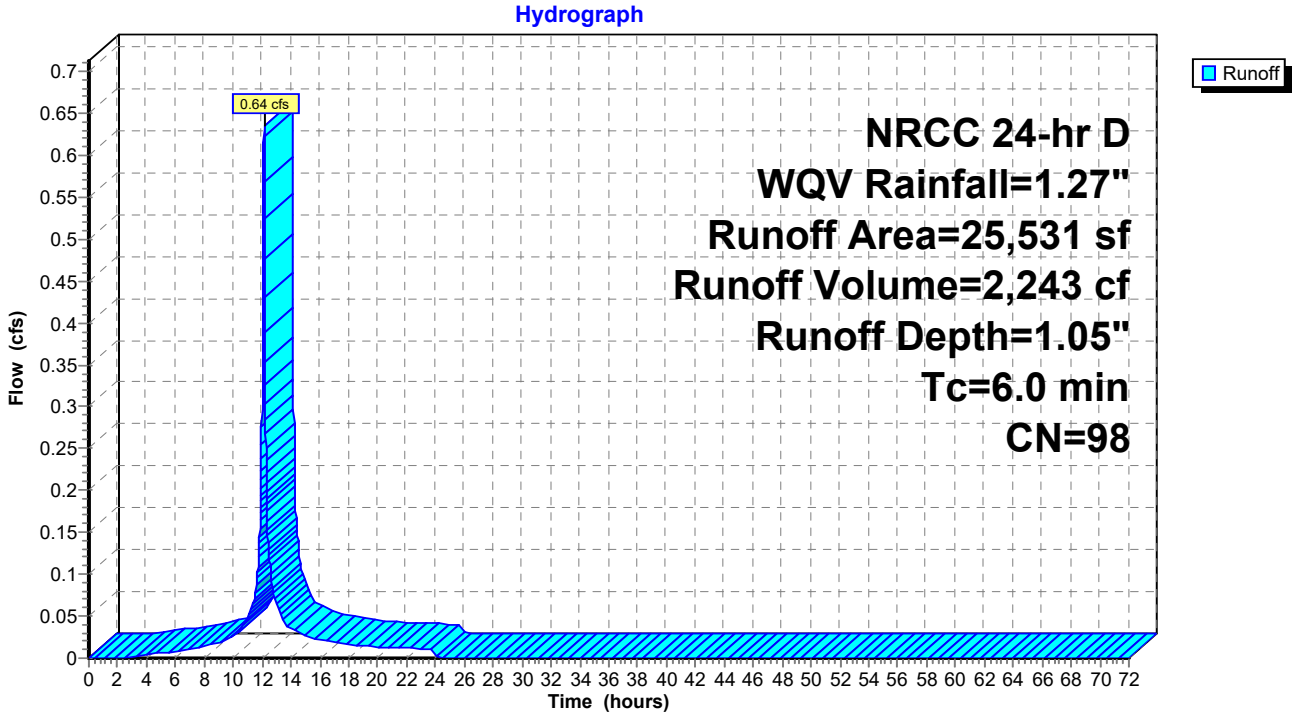
Runoff = 0.64 cfs @ 12.13 hrs, Volume= 2,243 cf, Depth= 1.05"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
2,117	98	Roofs, HSG B
23,414	98	Unconnected pavement, HSG B
25,531	98	Weighted Average
25,531		100.00% Impervious Area
23,414		91.71% Unconnected

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

Subcatchment 8: Sub-catchment 8



Summary for Subcatchment 9: Sub-catchment 9

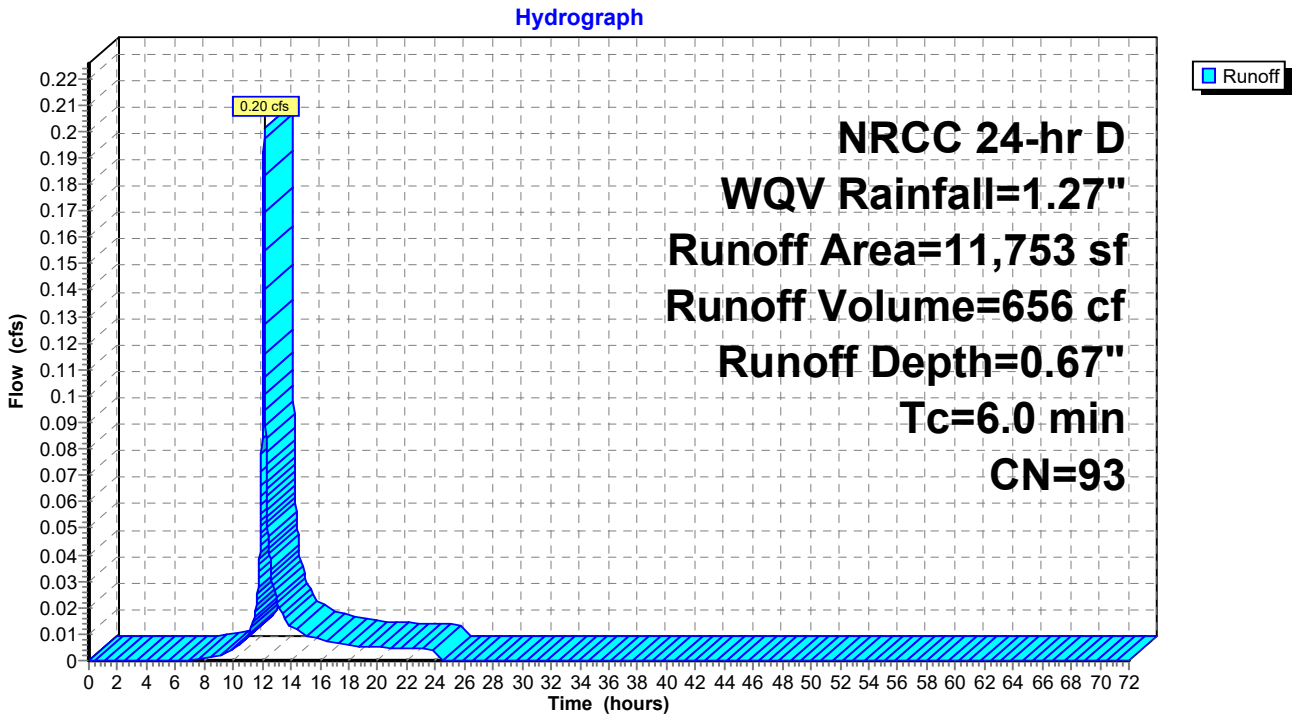
Runoff = 0.20 cfs @ 12.13 hrs, Volume= 656 cf, Depth= 0.67"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
3,069	79	<50% Grass cover, Poor, HSG B
8,684	98	Unconnected pavement, HSG B
11,753	93	Weighted Average
3,069		26.11% Pervious Area
8,684		73.89% Impervious Area
8,684		100.00% Unconnected

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

Subcatchment 9: Sub-catchment 9



Summary for Subcatchment 10: Sub-catchment 10

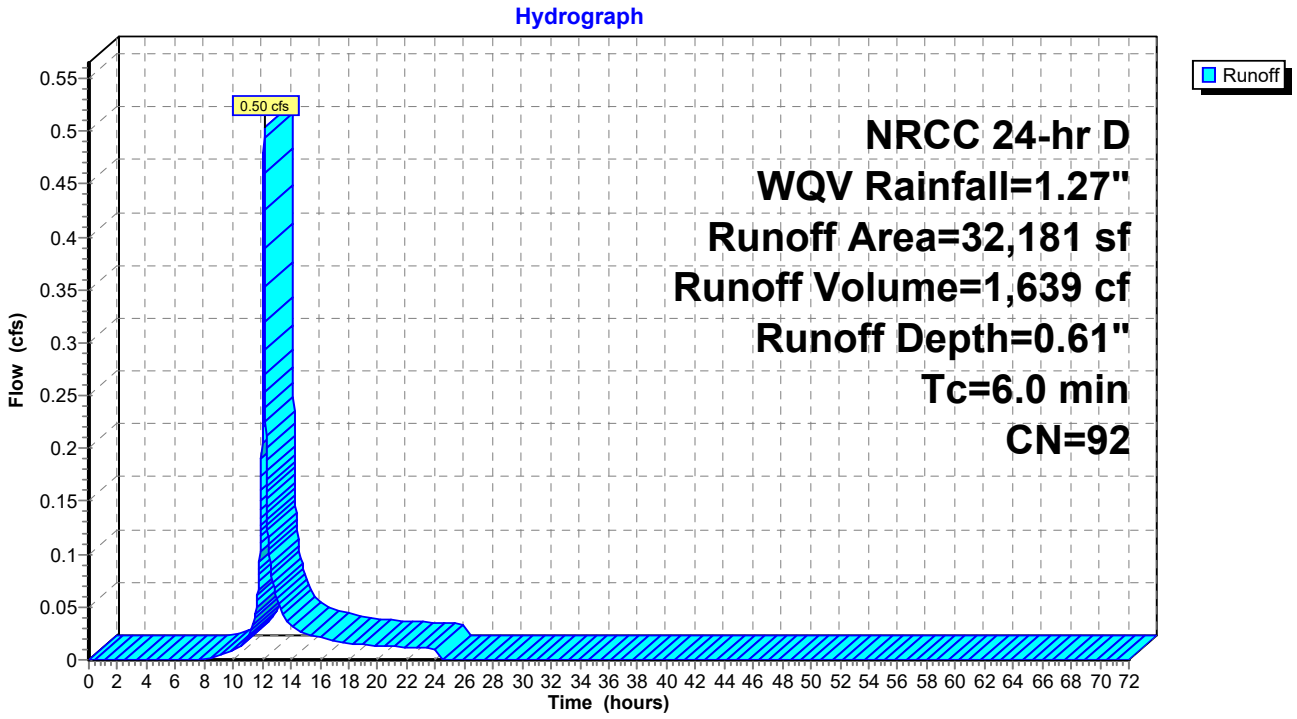
Runoff = 0.50 cfs @ 12.13 hrs, Volume= 1,639 cf, Depth= 0.61"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
10,491	79	<50% Grass cover, Poor, HSG B
6,760	98	Roofs, HSG B
14,930	98	Unconnected pavement, HSG B
32,181	92	Weighted Average
10,491		32.60% Pervious Area
21,690		67.40% Impervious Area
14,930		68.83% Unconnected

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

Subcatchment 10: Sub-catchment 10



Summary for Subcatchment 11: Sub-catchment 11

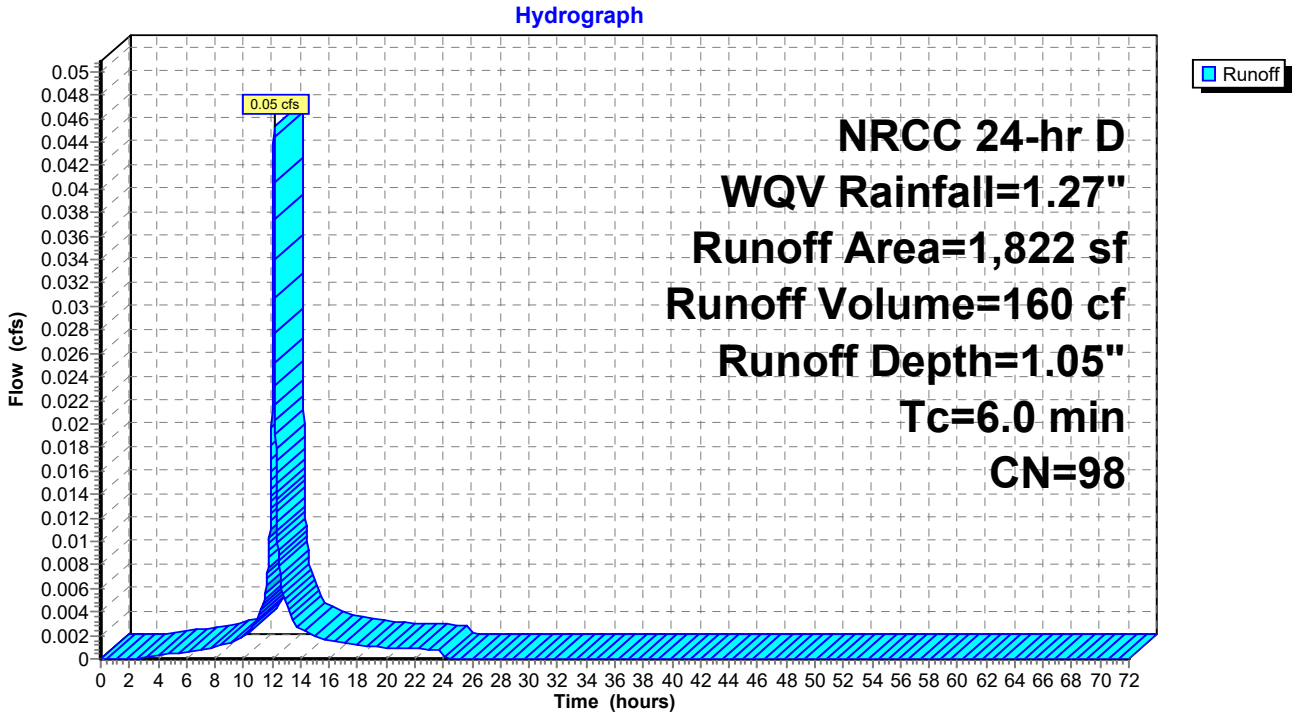
Runoff = 0.05 cfs @ 12.13 hrs, Volume= 160 cf, Depth= 1.05"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
1,822	98	Roofs, HSG B
1,822		100.00% Impervious Area

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

Subcatchment 11: Sub-catchment 11



Summary for Subcatchment 12: Sub-catchment 12

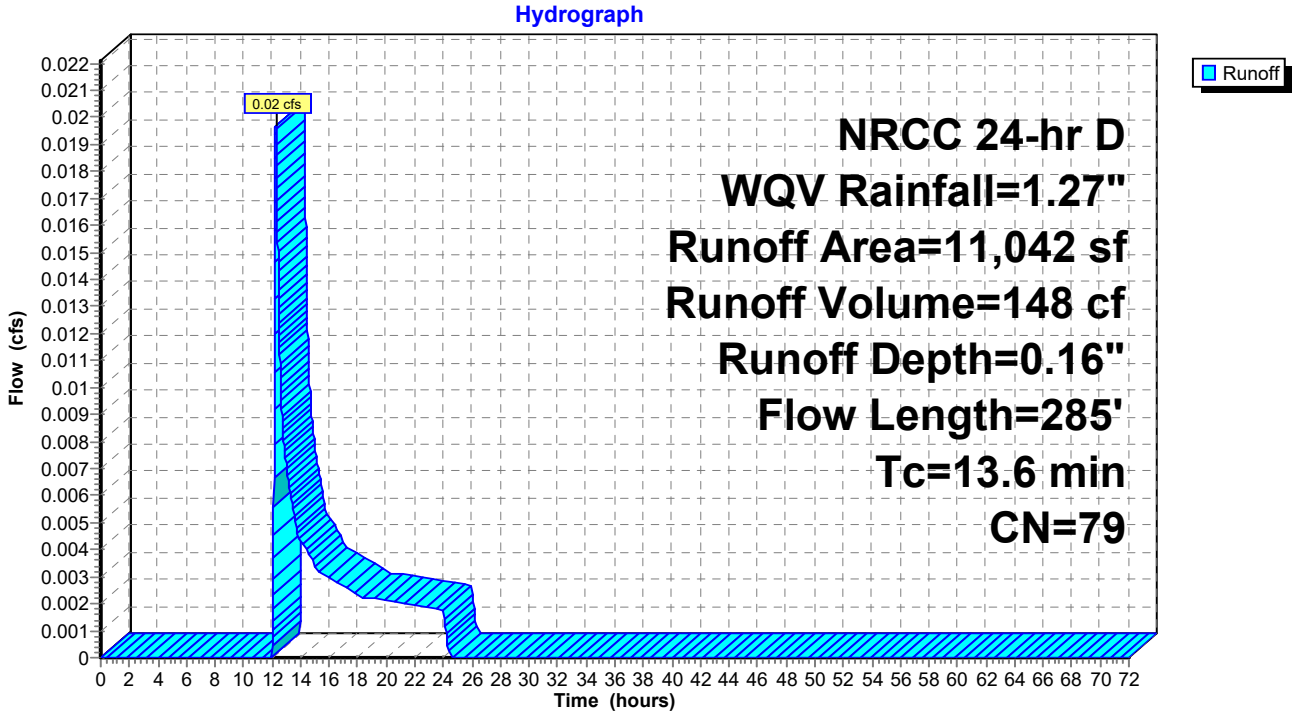
Runoff = 0.02 cfs @ 12.26 hrs, Volume= 148 cf, Depth= 0.16"
Routed to Link DP-2 : DP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
74	98	Unconnected pavement, HSG B
10,968	79	<50% Grass cover, Poor, HSG B
11,042	79	Weighted Average
10,968		99.33% Pervious Area
74		0.67% Impervious Area
74		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.0120	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
1.6	185	0.0150	1.97		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.6	285	Total			

Subcatchment 12: Sub-catchment 12



Summary for Pond 1P: EX OWS

Inflow Area = 235,097 sf, 94.23% Impervious, Inflow Depth = 0.97" for WQV event
Inflow = 5.47 cfs @ 12.13 hrs, Volume= 19,088 cf
Outflow = 1.88 cfs @ 12.28 hrs, Volume= 19,088 cf, Atten= 66%, Lag= 9.3 min
Primary = 1.58 cfs @ 12.28 hrs, Volume= 19,020 cf
Routed to Link DP-1 : DP-1
Secondary = 0.30 cfs @ 12.28 hrs, Volume= 68 cf
Routed to Link DP-1 : DP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 230.19' @ 12.28 hrs Surf.Area= 2,775 sf Storage= 3,570 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 13.7 min (812.0 - 798.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	227.14'	0 cf	**53.75'W x 51.62'L x 4.00'H Field A** 11,098 cf Overall - 4,587 cf Embedded = 6,511 cf x 0.0% Voids
#2A	227.14'	3,676 cf	**ADS N-12 36"** x 20 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf Row Length Adjustment= +1.62' x 7.10 sf x 10 rows 50.75' Header x 7.10 sf x 2 = 720.6 cf Inside
		3,676 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	227.14'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	227.14'	**16.0" Round Culvert** L= 36.0' Ke= 0.500 Inlet / Outlet Invert= 227.14' / 227.10' S= 0.0011 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.40 sf
#3	Device 2	230.14'	**9.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.58 cfs @ 12.28 hrs HW=230.19' TW=0.00' (Dynamic Tailwater)
↑└**1=Orifice/Grate** (Orifice Controls 1.58 cfs @ 8.06 fps)

Secondary OutFlow Max=0.29 cfs @ 12.28 hrs HW=230.19' TW=0.00' (Dynamic Tailwater)
↑└**2=Culvert** (Passes 0.29 cfs of 10.38 cfs potential flow)
↑└**3=Broad-Crested Rectangular Weir** (Weir Controls 0.29 cfs @ 0.64 fps)

Pond 1P: EX OWS - Chamber Wizard Field A

Chamber Model = ADS N-12 36" (ADS N-12® Pipe)
Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf
Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf
Row Length Adjustment= +1.62' x 7.10 sf x 10 rows

42.0" Wide + 21.0" Spacing = 63.0" C-C Row Spacing

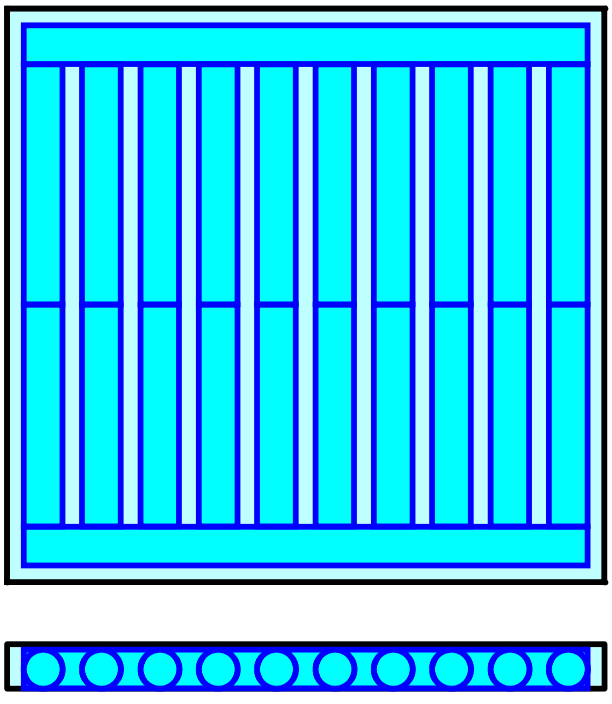
2 Chambers/Row x 20.00' Long +1.62' Row Adjustment +3.50' Header x 2 = 48.62' Row Length +18.0" End Stone x 2 = 51.62' Base Length
10 Rows x 42.0" Wide + 21.0" Spacing x 9 + 18.0" Side Stone x 2 = 53.75' Base Width
42.0" Chamber Height + 6.0" Stone Cover = 4.00' Field Height

20 Chambers x 142.0 cf +1.62' Row Adjustment x 7.10 sf x 10 Rows + 50.75' Header x 7.10 sf x 2 = 3,675.7 cf Chamber Storage
20 Chambers x 177.1 cf +1.62' Row Adjustment x 8.86 sf x 10 Rows + 50.75' Header x 8.86 sf x 2 = 4,585.4 cf Displacement

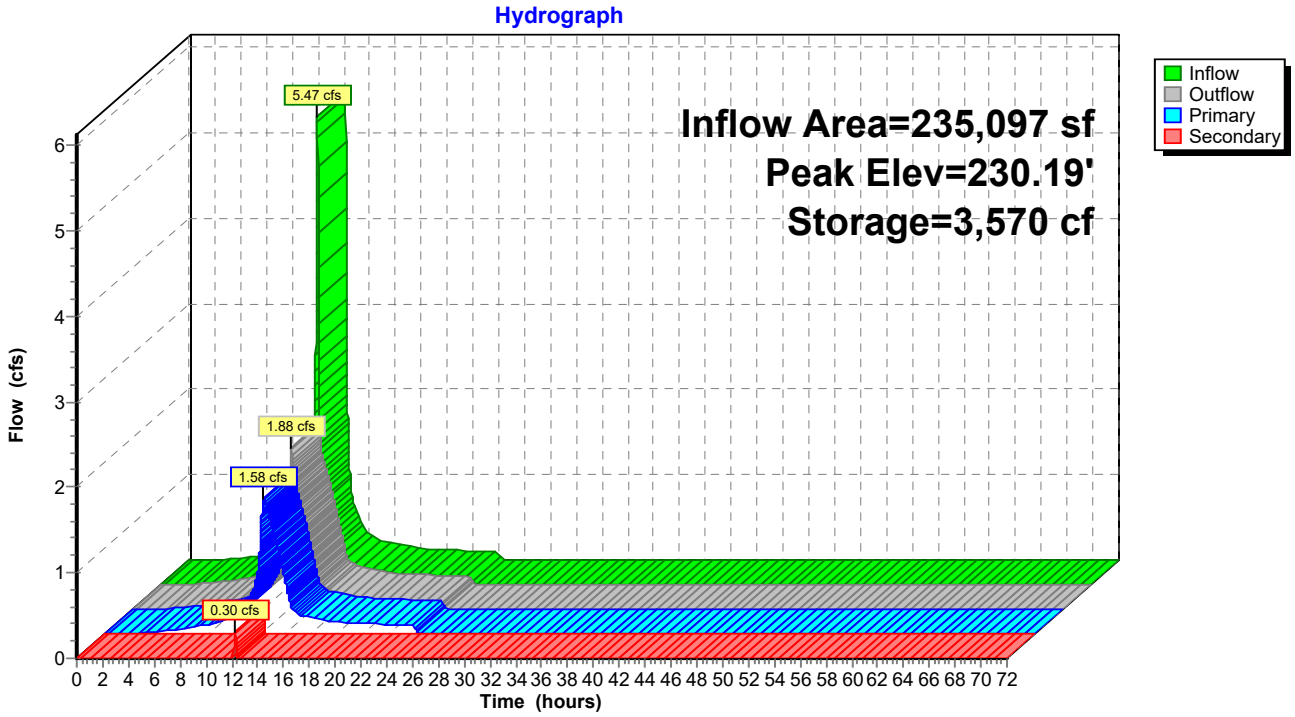
11,098.3 cf Field - 4,585.4 cf Chambers = 6,512.9 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 3,675.7 cf = 0.084 af
Overall Storage Efficiency = 33.1%
Overall System Size = 51.62' x 53.75' x 4.00'

20 Chambers
411.0 cy Field
241.2 cy Stone



Pond 1P: EX OWS

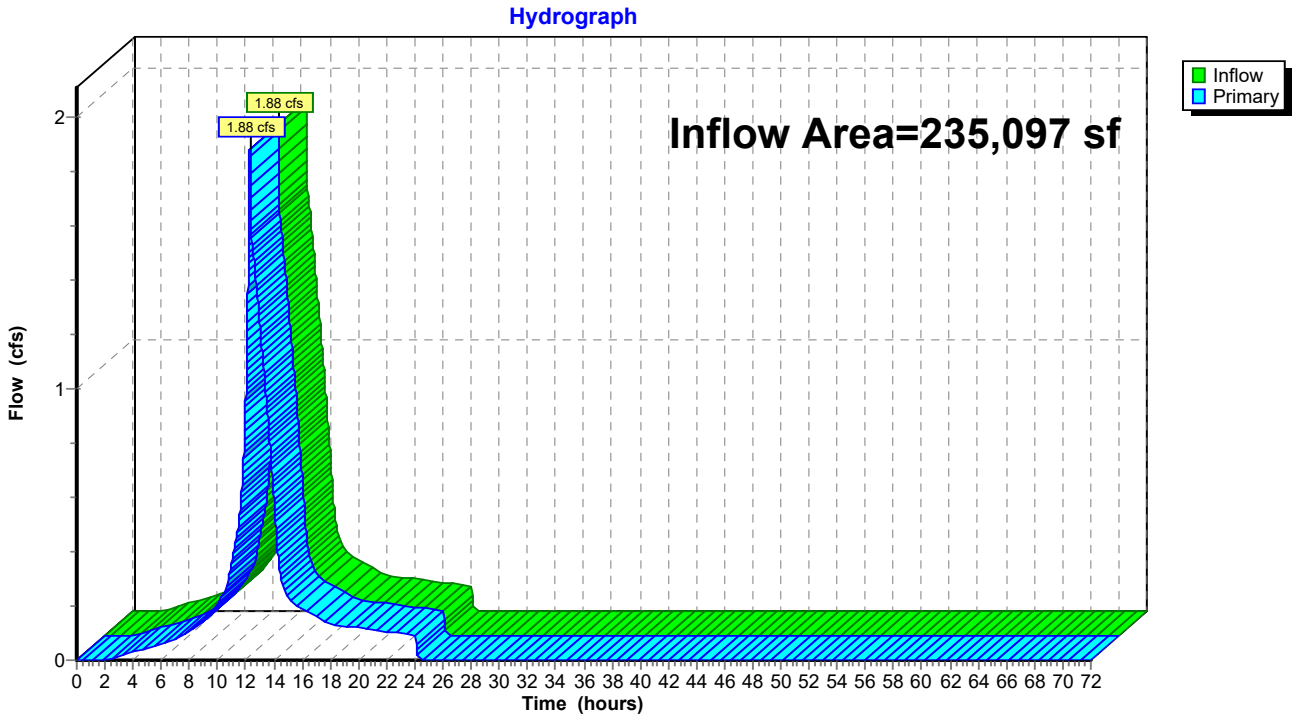


Summary for Link DP-1: DP-1

Inflow Area = 235,097 sf, 94.23% Impervious, Inflow Depth = 0.97" for WQV event
Inflow = 1.88 cfs @ 12.28 hrs, Volume= 19,088 cf
Primary = 1.88 cfs @ 12.28 hrs, Volume= 19,088 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: DP-1

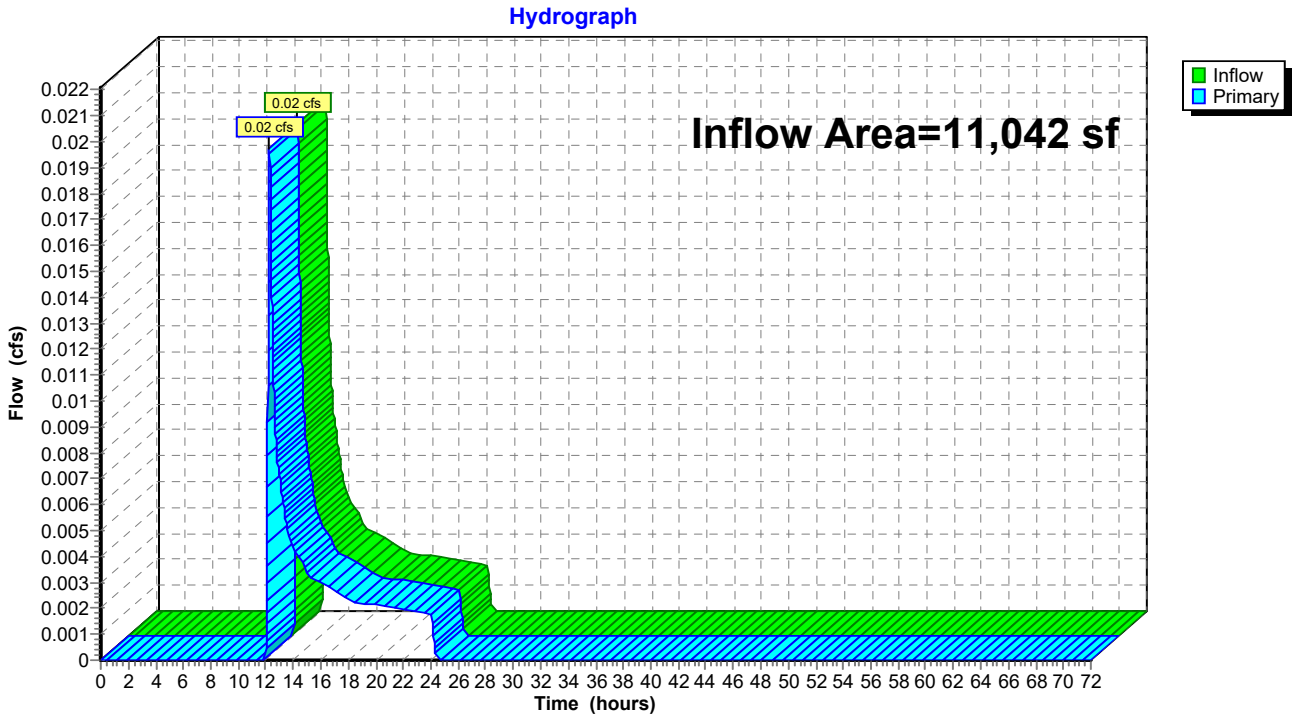


Summary for Link DP-2: DP-2

Inflow Area = 11,042 sf, 0.67% Impervious, Inflow Depth = 0.16" for WQV event
Inflow = 0.02 cfs @ 12.26 hrs, Volume= 148 cf
Primary = 0.02 cfs @ 12.26 hrs, Volume= 148 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: DP-2



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

Subcatchment1: Sub-catchment1 Runoff Area=33,590 sf 100.00% Impervious Runoff Depth=2.59"
Tc=6.0 min CN=98 Runoff=1.95 cfs 7,247 cf

Subcatchment2: Sub-catchment2 Runoff Area=7,467 sf 100.00% Impervious Runoff Depth=2.59"
Tc=6.0 min CN=98 Runoff=0.43 cfs 1,611 cf

Subcatchment3: Sub-catchment3 Runoff Area=7,120 sf 100.00% Impervious Runoff Depth=2.59"
Tc=6.0 min CN=98 Runoff=0.41 cfs 1,536 cf

Subcatchment4: Sub-catchment4 Runoff Area=57,605 sf 100.00% Impervious Runoff Depth=2.59"
Tc=6.0 min CN=98 Runoff=3.34 cfs 12,429 cf

Subcatchment5: Sub-catchment5 Runoff Area=14,314 sf 100.00% Impervious Runoff Depth=2.59"
Tc=6.0 min CN=98 Runoff=0.83 cfs 3,088 cf

Subcatchment6: Sub-Catchment6 Runoff Area=20,333 sf 100.00% Impervious Runoff Depth=2.59"
Tc=6.0 min CN=98 Runoff=1.18 cfs 4,387 cf

Subcatchment7: Sub-catchment7 Runoff Area=23,381 sf 100.00% Impervious Runoff Depth=2.59"
Tc=6.0 min CN=98 Runoff=1.36 cfs 5,045 cf

Subcatchment8: Sub-catchment8 Runoff Area=25,531 sf 100.00% Impervious Runoff Depth=2.59"
Tc=6.0 min CN=98 Runoff=1.48 cfs 5,508 cf

Subcatchment9: Sub-catchment9 Runoff Area=11,753 sf 73.89% Impervious Runoff Depth=2.08"
Tc=6.0 min CN=93 Runoff=0.60 cfs 2,039 cf

Subcatchment10: Sub-catchment10 Runoff Area=32,181 sf 67.40% Impervious Runoff Depth=1.99"
Tc=6.0 min CN=92 Runoff=1.59 cfs 5,341 cf

Subcatchment11: Sub-catchment11 Runoff Area=1,822 sf 100.00% Impervious Runoff Depth=2.59"
Tc=6.0 min CN=98 Runoff=0.11 cfs 393 cf

Subcatchment12: Sub-catchment12 Runoff Area=11,042 sf 0.67% Impervious Runoff Depth=1.06"
Flow Length=285' Tc=13.6 min CN=79 Runoff=0.22 cfs 974 cf

Pond 1P: EX OWS Peak Elev=230.82' Storage=3,676 cf Inflow=13.29 cfs 48,625 cf
Primary=1.75 cfs 38,587 cf Secondary=11.70 cfs 10,038 cf Outflow=13.45 cfs 48,625 cf

Link DP-1: DP-1 Inflow=13.45 cfs 48,625 cf
Primary=13.45 cfs 48,625 cf

Link DP-2: DP-2 Inflow=0.22 cfs 974 cf
Primary=0.22 cfs 974 cf

Total Runoff Area = 246,139 sf Runoff Volume = 49,599 cf Average Runoff Depth = 2.42"
9.97% Pervious = 24,528 sf 90.03% Impervious = 221,611 sf

Summary for Subcatchment 1: Sub-catchment 1

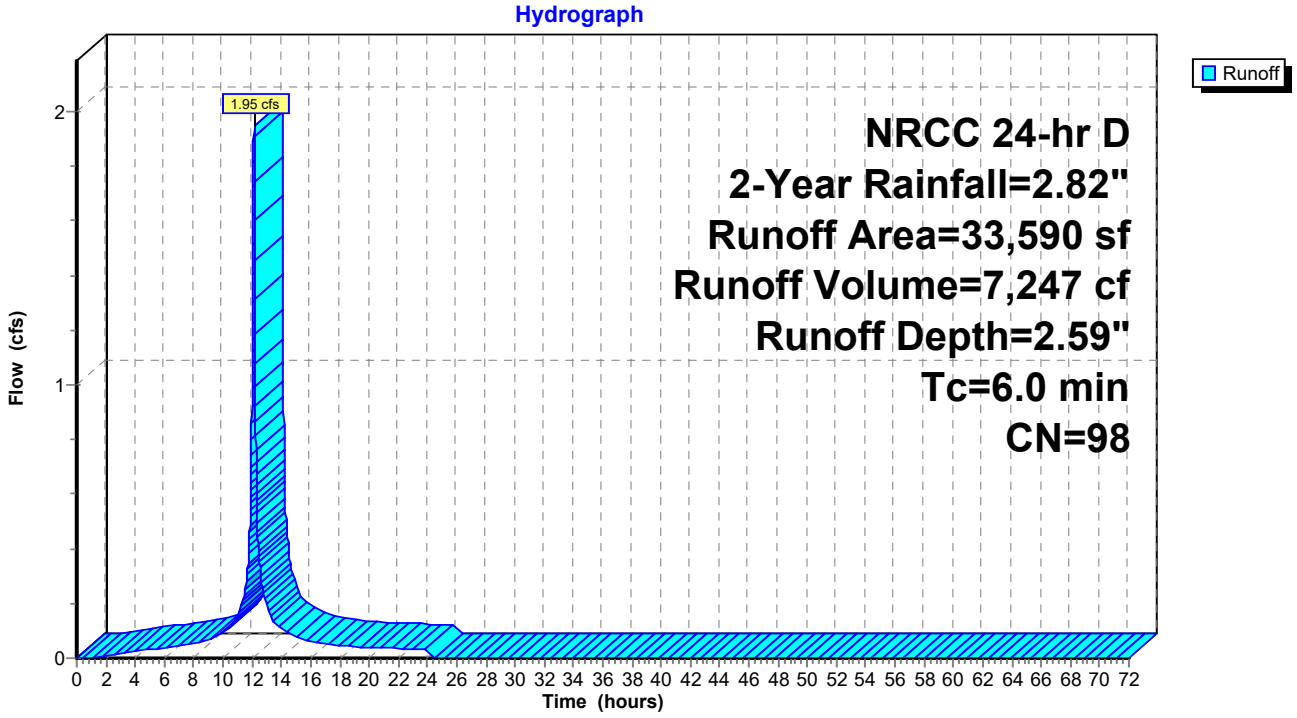
Runoff = 1.95 cfs @ 12.13 hrs, Volume= 7,247 cf, Depth= 2.59"
Routed to Pond 1P : EX OWS

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

Area (sf)	CN	Description
15,206	98	Roofs, HSG B
18,384	98	Unconnected pavement, HSG B
33,590	98	Weighted Average
33,590		100.00% Impervious Area
18,384		54.73% Unconnected

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

Subcatchment 1: Sub-catchment 1



Summary for Subcatchment 2: Sub-catchment 2

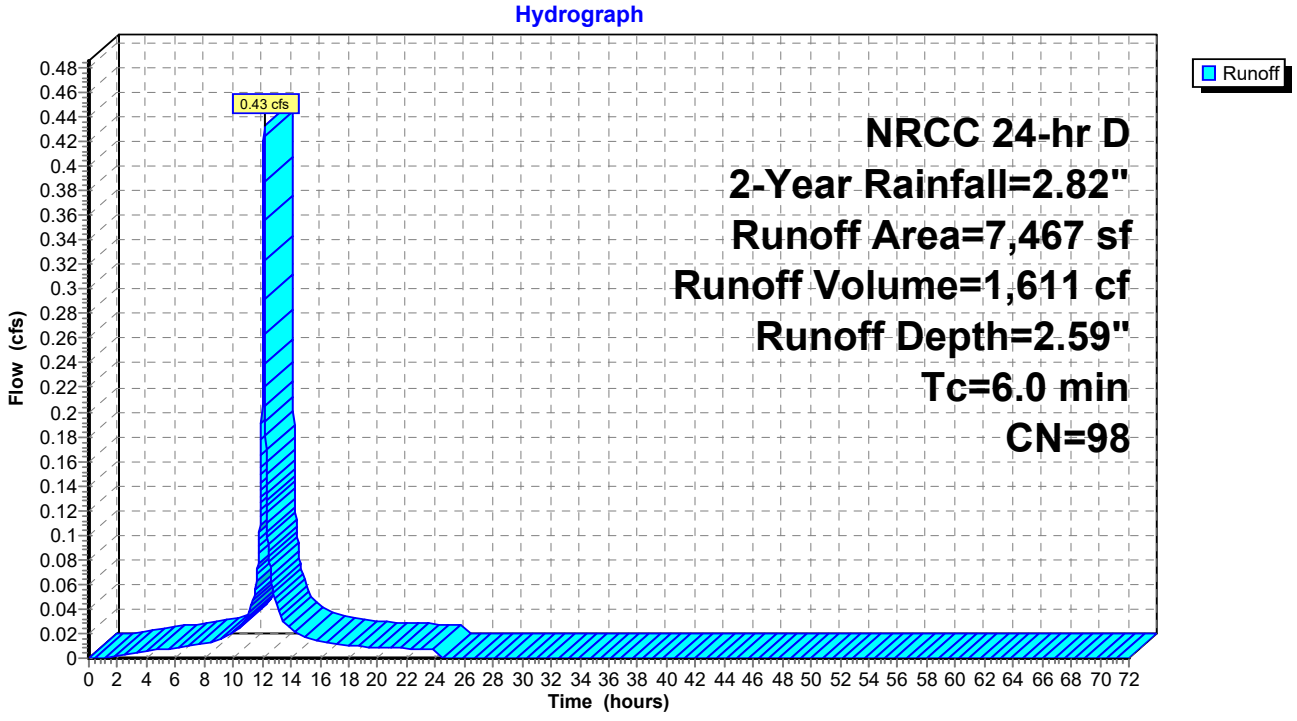
Runoff = 0.43 cfs @ 12.13 hrs, Volume= 1,611 cf, Depth= 2.59"
Routed to Pond 1P : EX OWS

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

Area (sf)	CN	Description
2,936	98	Roofs, HSG B
4,531	98	Unconnected pavement, HSG B
7,467	98	Weighted Average
7,467		100.00% Impervious Area
4,531		60.68% Unconnected

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

Subcatchment 2: Sub-catchment 2



Summary for Subcatchment 3: Sub-catchment 3

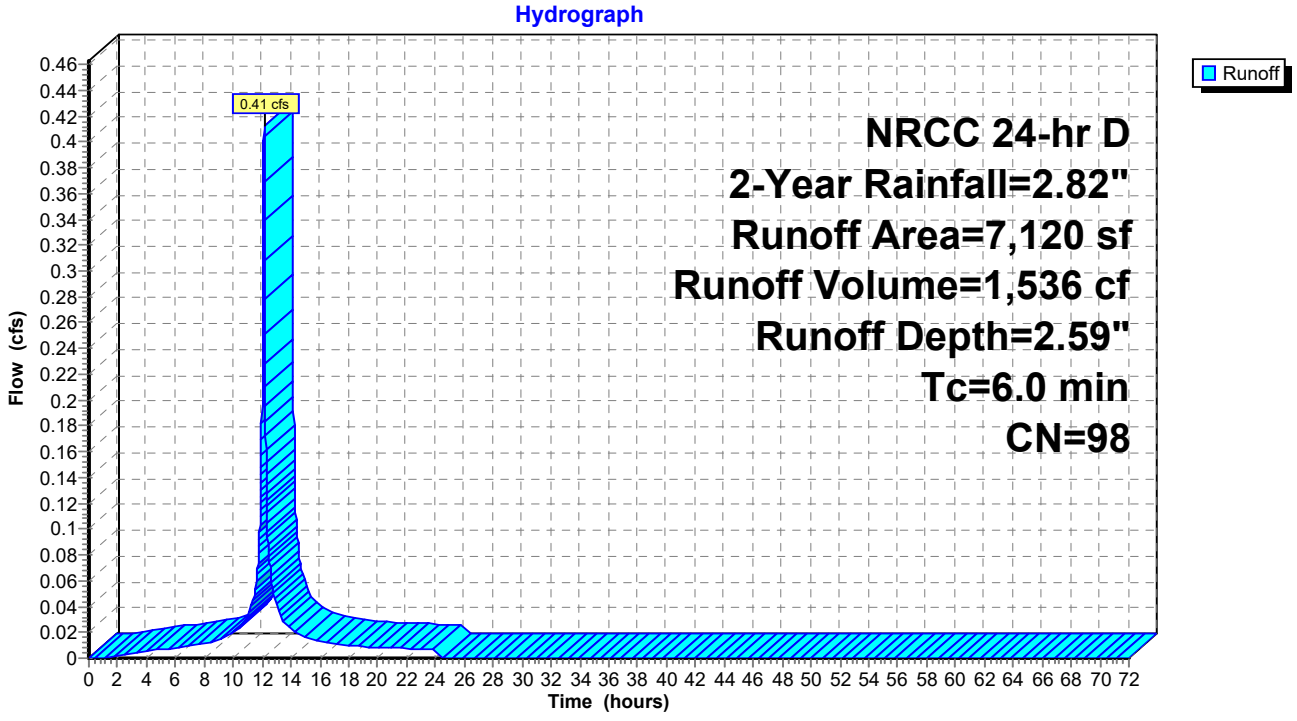
Runoff = 0.41 cfs @ 12.13 hrs, Volume= 1,536 cf, Depth= 2.59"
Routed to Pond 1P : EX OWS

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

Area (sf)	CN	Description
2,543	98	Roofs, HSG B
4,577	98	Unconnected pavement, HSG B
7,120	98	Weighted Average
7,120		100.00% Impervious Area
4,577		64.28% Unconnected

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

Subcatchment 3: Sub-catchment 3



Summary for Subcatchment 4: Sub-catchment 4

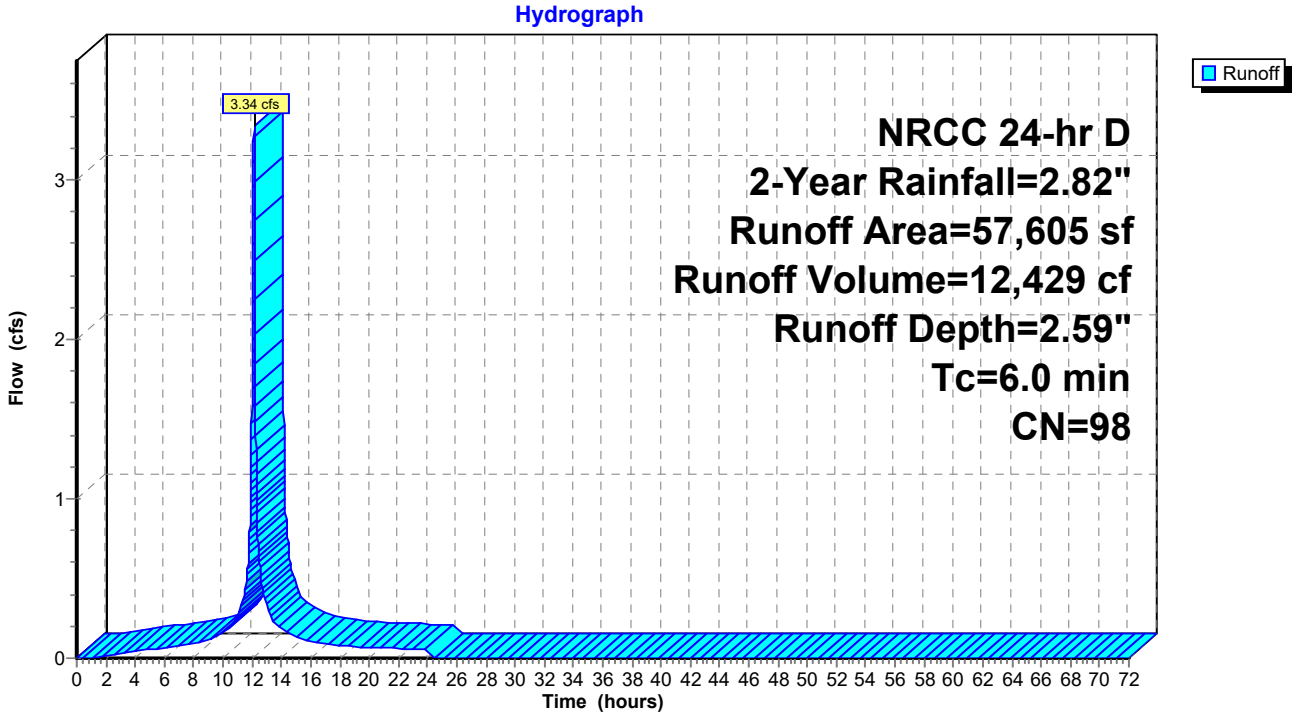
Runoff = 3.34 cfs @ 12.13 hrs, Volume= 12,429 cf, Depth= 2.59"
Routed to Pond 1P : EX OWS

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

Area (sf)	CN	Description
5,329	98	Roofs, HSG B
52,276	98	Unconnected pavement, HSG B
57,605	98	Weighted Average
57,605		100.00% Impervious Area
52,276		90.75% Unconnected

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

Subcatchment 4: Sub-catchment 4



Summary for Subcatchment 5: Sub-catchment 5

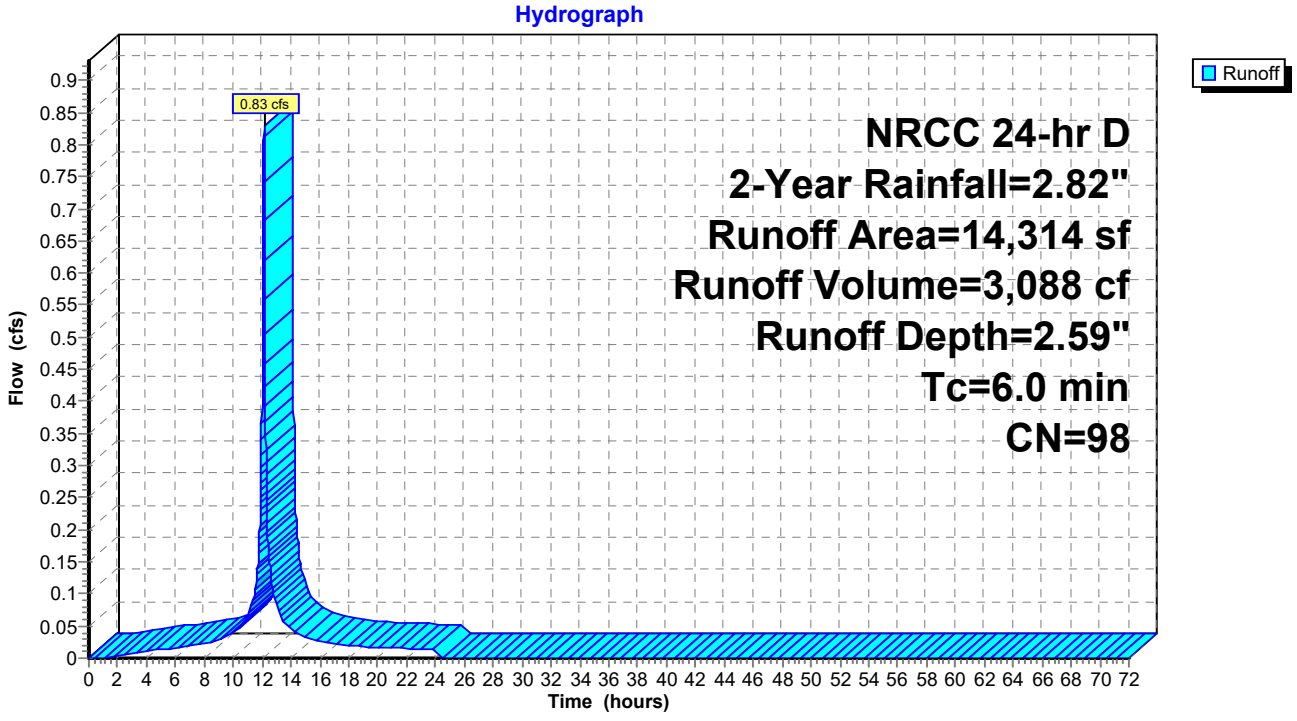
Runoff = 0.83 cfs @ 12.13 hrs, Volume= 3,088 cf, Depth= 2.59"
Routed to Pond 1P : EX OWS

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

Area (sf)	CN	Description
5,500	98	Roofs, HSG B
8,814	98	Unconnected pavement, HSG B
14,314	98	Weighted Average
14,314		100.00% Impervious Area
8,814		61.58% Unconnected

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

Subcatchment 5: Sub-catchment 5



Summary for Subcatchment 6: Sub-Catchment 6

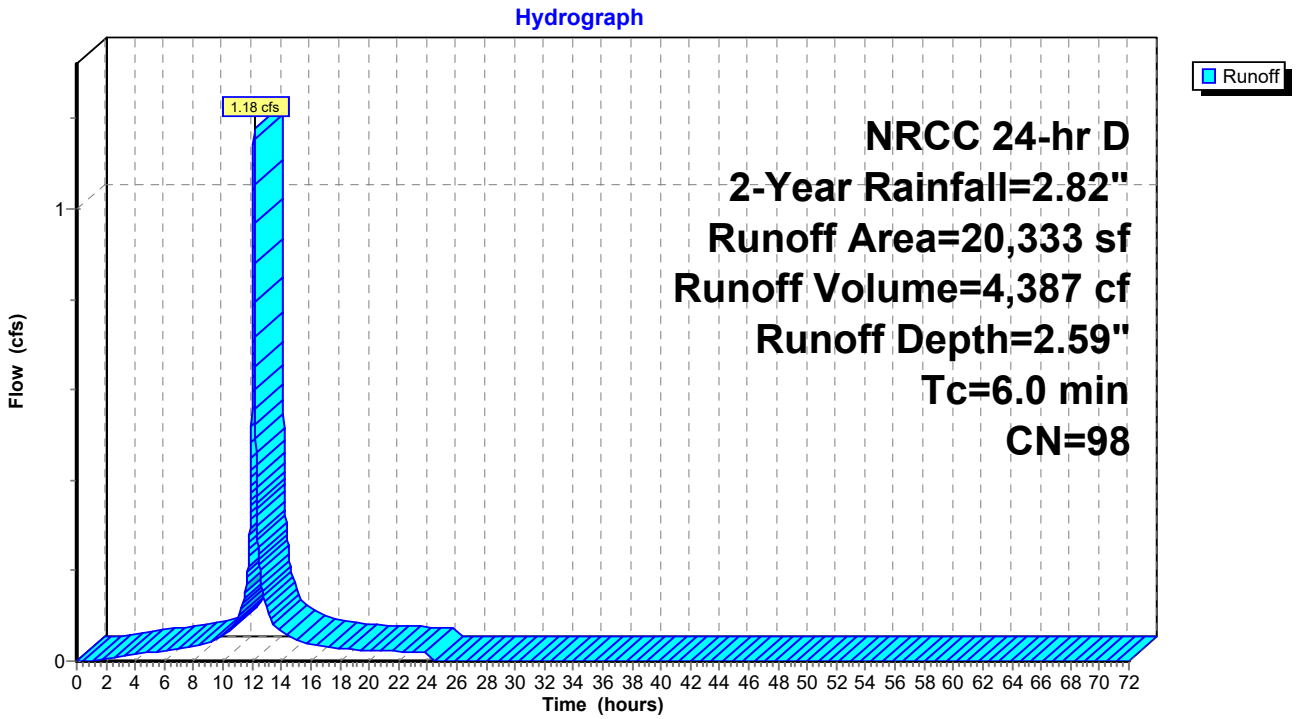
Runoff = 1.18 cfs @ 12.13 hrs, Volume= 4,387 cf, Depth= 2.59"
Routed to Pond 1P : EX OWS

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

Area (sf)	CN	Description
20,333	98	Unconnected pavement, HSG B
20,333		100.00% Impervious Area
20,333		100.00% Unconnected

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

Subcatchment 6: Sub-Catchment 6



Summary for Subcatchment 7: Sub-catchment 7

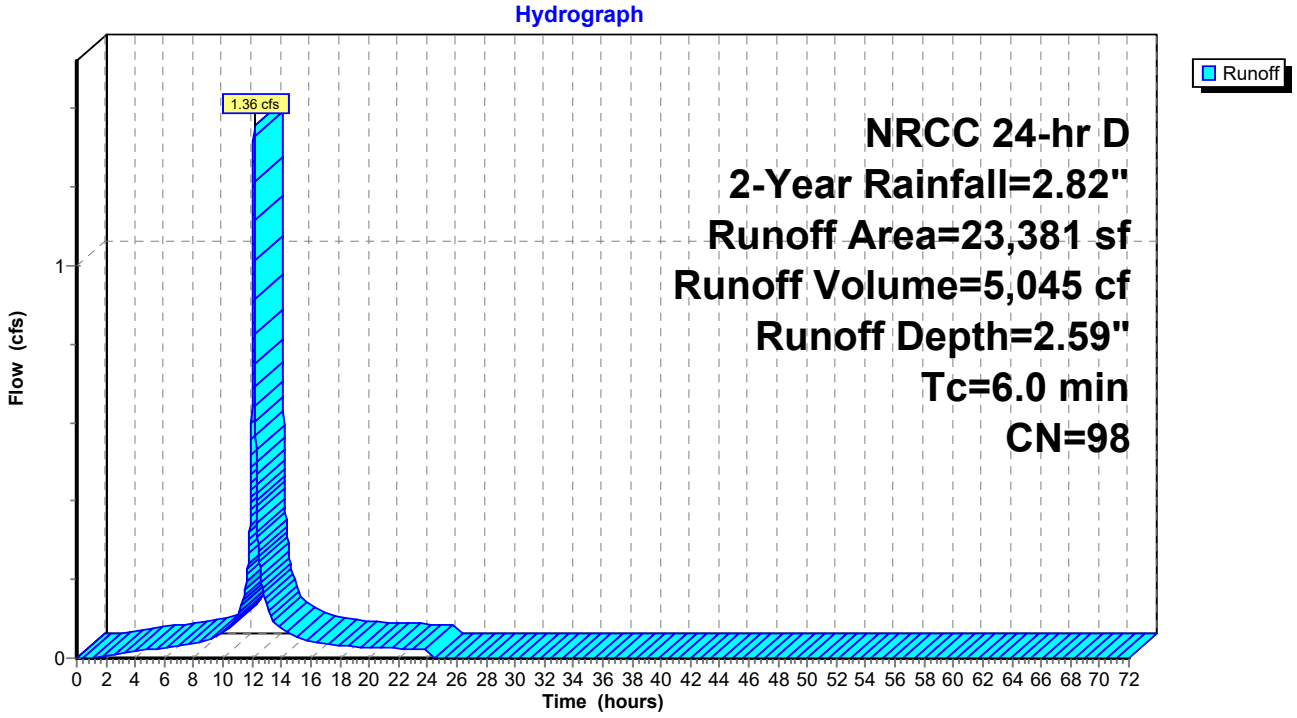
Runoff = 1.36 cfs @ 12.13 hrs, Volume= 5,045 cf, Depth= 2.59"
Routed to Pond 1P : EX OWS

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

Area (sf)	CN	Description
3,396	98	Roofs, HSG B
19,985	98	Unconnected pavement, HSG B
23,381	98	Weighted Average
23,381		100.00% Impervious Area
19,985		85.48% Unconnected

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

Subcatchment 7: Sub-catchment 7



Summary for Subcatchment 8: Sub-catchment 8

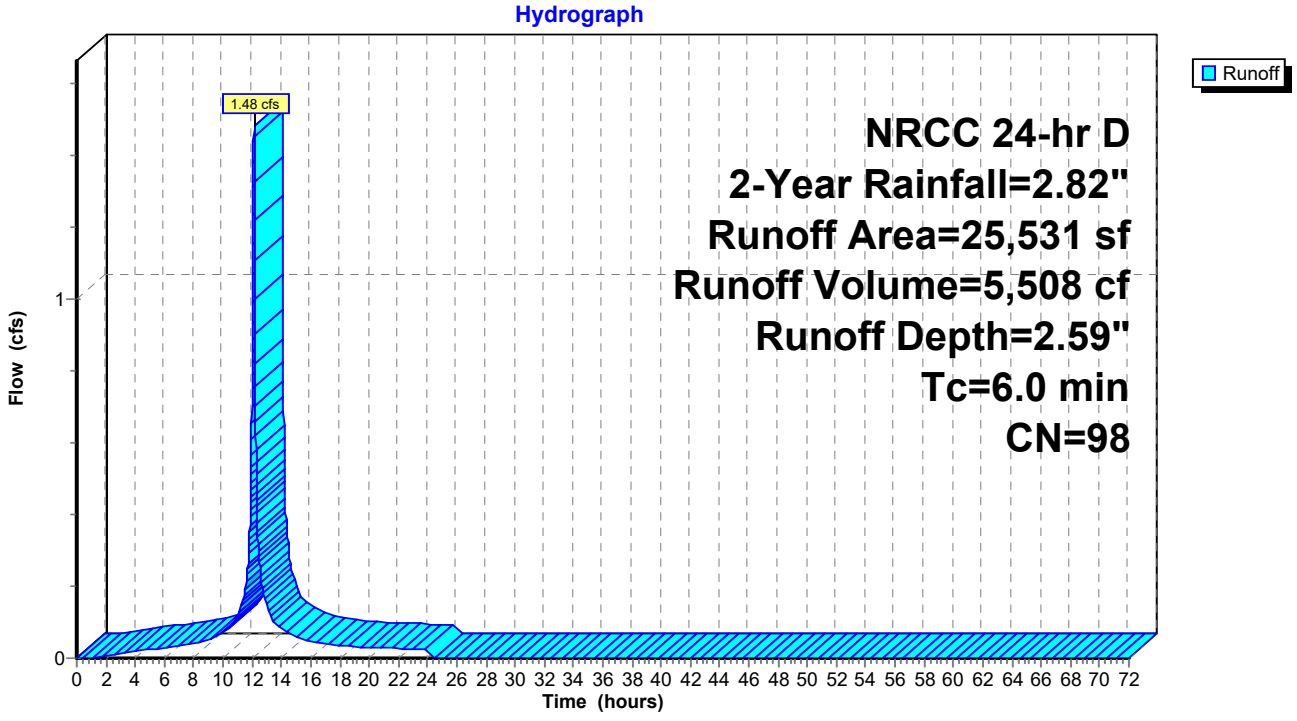
Runoff = 1.48 cfs @ 12.13 hrs, Volume= 5,508 cf, Depth= 2.59"
Routed to Pond 1P : EX OWS

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

Area (sf)	CN	Description
2,117	98	Roofs, HSG B
23,414	98	Unconnected pavement, HSG B
25,531	98	Weighted Average
25,531		100.00% Impervious Area
23,414		91.71% Unconnected

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

Subcatchment 8: Sub-catchment 8



Summary for Subcatchment 9: Sub-catchment 9

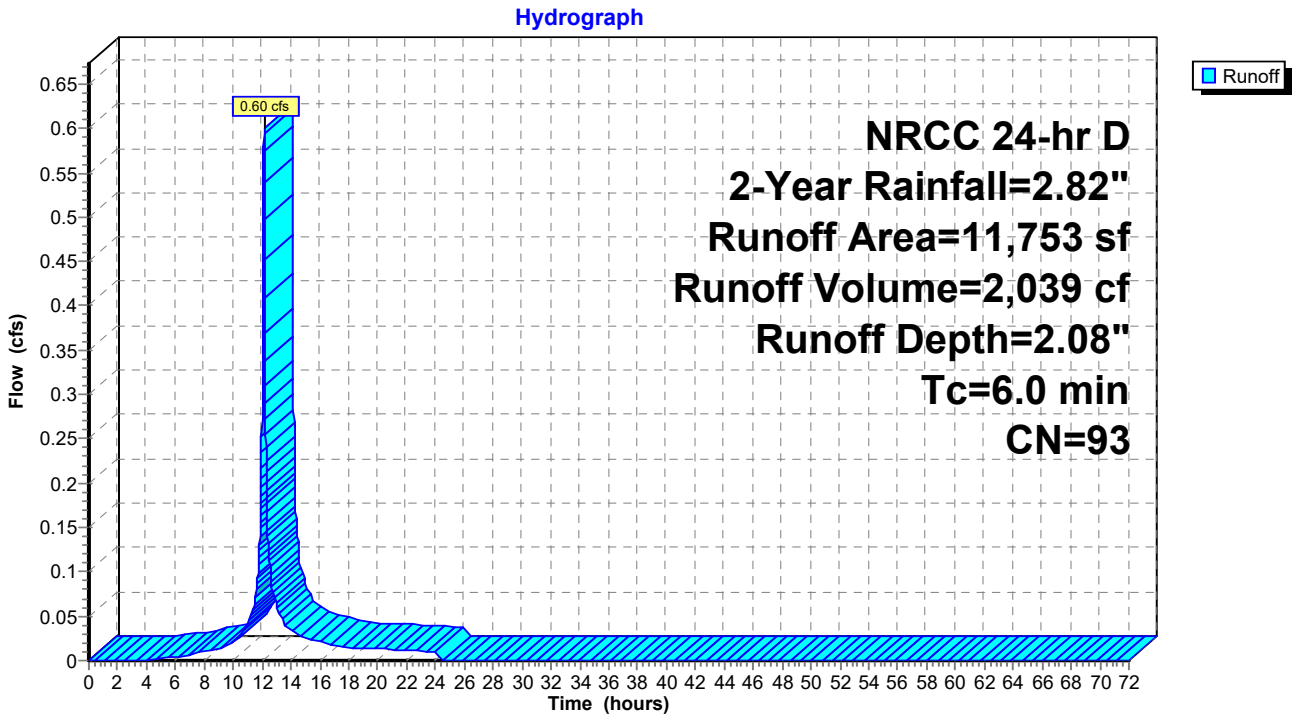
Runoff = 0.60 cfs @ 12.13 hrs, Volume= 2,039 cf, Depth= 2.08"
Routed to Pond 1P : EX OWS

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

Area (sf)	CN	Description
3,069	79	<50% Grass cover, Poor, HSG B
8,684	98	Unconnected pavement, HSG B
11,753	93	Weighted Average
3,069		26.11% Pervious Area
8,684		73.89% Impervious Area
8,684		100.00% Unconnected

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

Subcatchment 9: Sub-catchment 9



Summary for Subcatchment 10: Sub-catchment 10

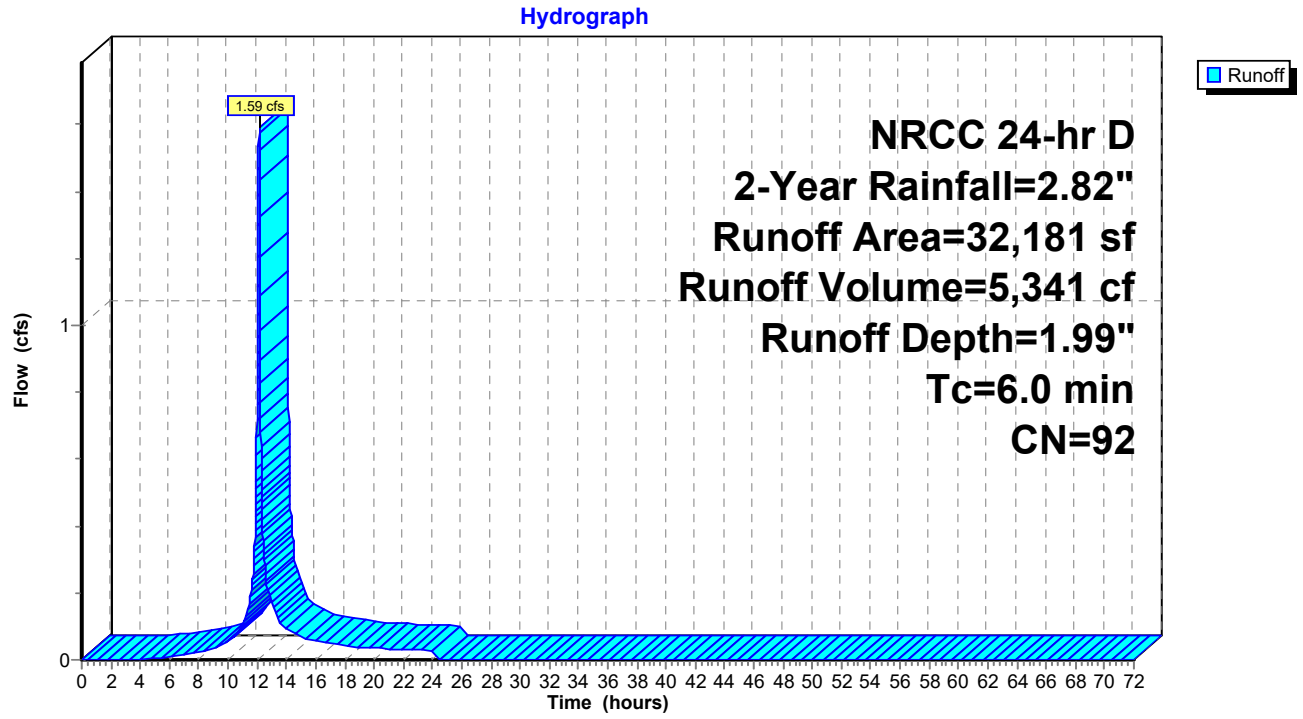
Runoff = 1.59 cfs @ 12.13 hrs, Volume= 5,341 cf, Depth= 1.99"
Routed to Pond 1P : EX OWS

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

Area (sf)	CN	Description
10,491	79	<50% Grass cover, Poor, HSG B
6,760	98	Roofs, HSG B
14,930	98	Unconnected pavement, HSG B
32,181	92	Weighted Average
10,491		32.60% Pervious Area
21,690		67.40% Impervious Area
14,930		68.83% Unconnected

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

Subcatchment 10: Sub-catchment 10



Summary for Subcatchment 11: Sub-catchment 11

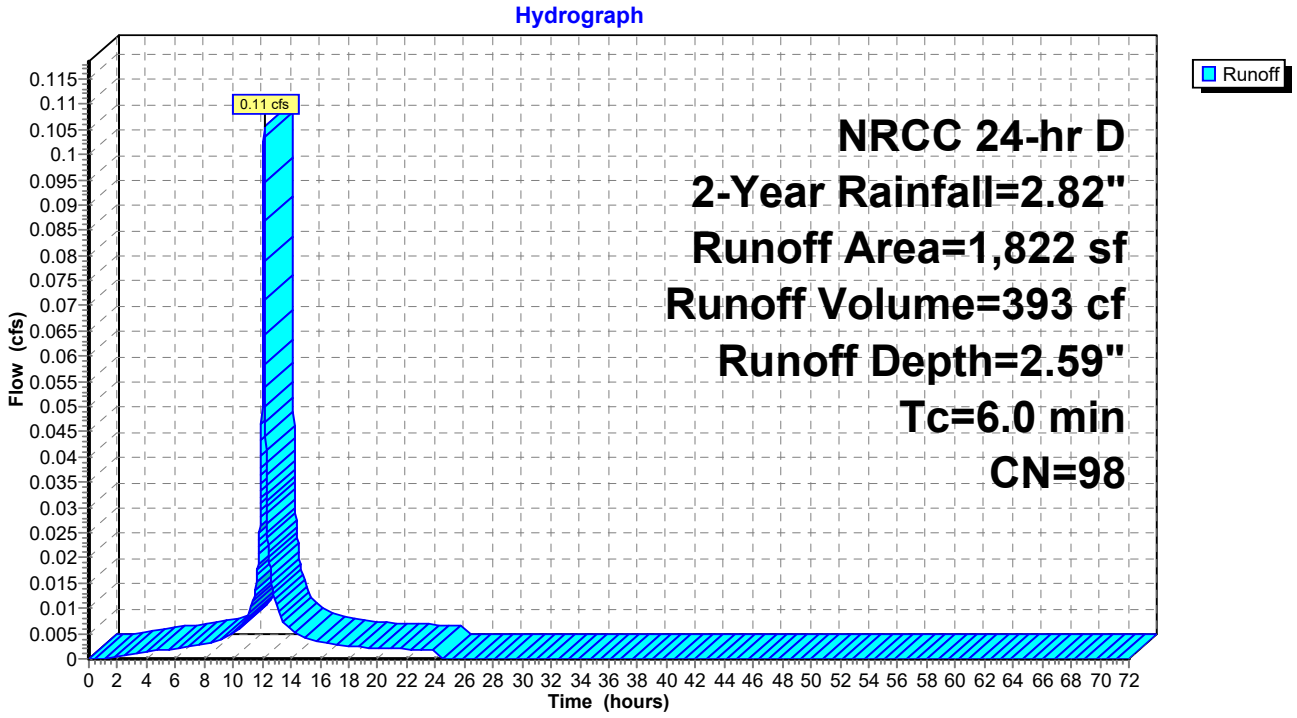
Runoff = 0.11 cfs @ 12.13 hrs, Volume= 393 cf, Depth= 2.59"
Routed to Pond 1P : EX OWS

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

Area (sf)	CN	Description
1,822	98	Roofs, HSG B
1,822		100.00% Impervious Area

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

Subcatchment 11: Sub-catchment 11



Summary for Subcatchment 12: Sub-catchment 12

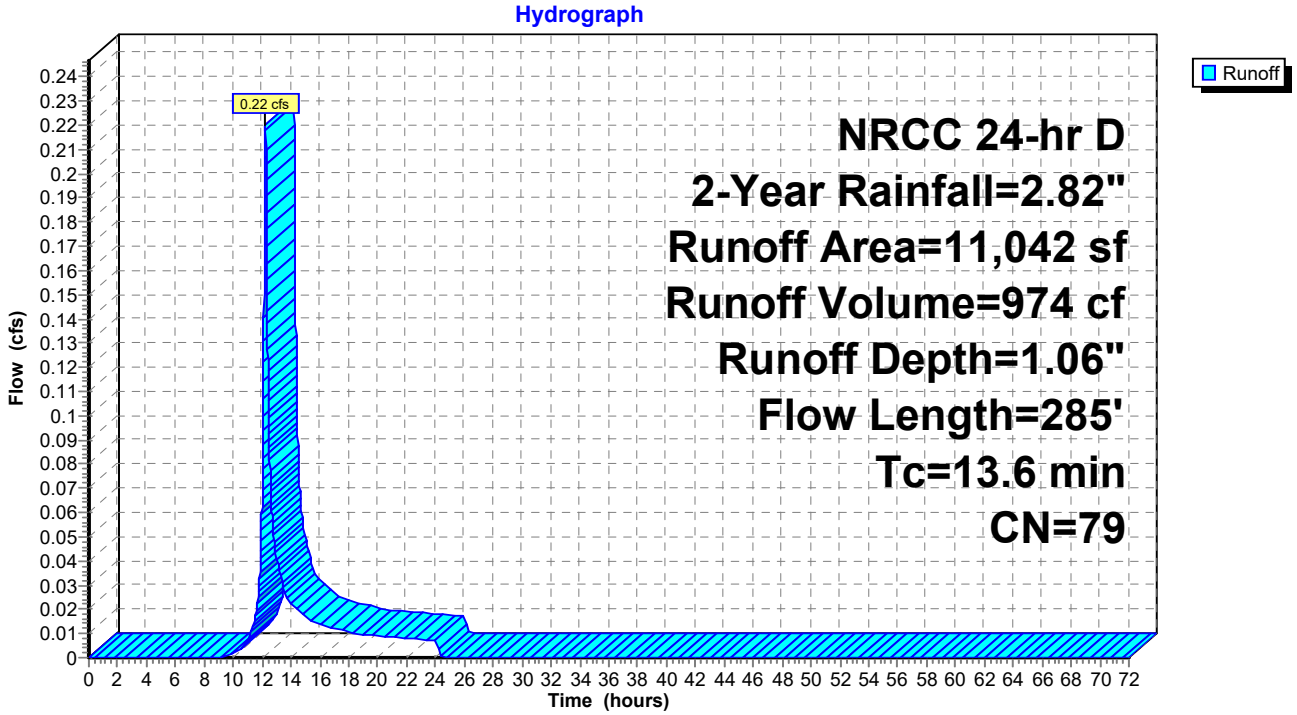
Runoff = 0.22 cfs @ 12.22 hrs, Volume= 974 cf, Depth= 1.06"
Routed to Link DP-2 : DP-2

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

Area (sf)	CN	Description
74	98	Unconnected pavement, HSG B
10,968	79	<50% Grass cover, Poor, HSG B
11,042	79	Weighted Average
10,968		99.33% Pervious Area
74		0.67% Impervious Area
74		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.0120	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
1.6	185	0.0150	1.97		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.6	285	Total			

Subcatchment 12: Sub-catchment 12



Summary for Pond 1P: EX OWS

[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=5)

Inflow Area = 235,097 sf, 94.23% Impervious, Inflow Depth = 2.48" for 2-Year event
Inflow = 13.29 cfs @ 12.13 hrs, Volume= 48,625 cf
Outflow = 13.45 cfs @ 12.12 hrs, Volume= 48,625 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.75 cfs @ 12.12 hrs, Volume= 38,587 cf
Routed to Link DP-1 : DP-1
Secondary = 11.70 cfs @ 12.12 hrs, Volume= 10,038 cf
Routed to Link DP-1 : DP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 230.82' @ 12.12 hrs Surf.Area= 2,775 sf Storage= 3,676 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 13.1 min (784.9 - 771.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	227.14'	0 cf	**53.75'W x 51.62'L x 4.00'H Field A** 11,098 cf Overall - 4,587 cf Embedded = 6,511 cf x 0.0% Voids
#2A	227.14'	3,676 cf	**ADS N-12 36"** x 20 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf Row Length Adjustment= +1.62' x 7.10 sf x 10 rows 50.75' Header x 7.10 sf x 2 = 720.6 cf Inside
		3,676 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	227.14'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	227.14'	**16.0" Round Culvert** L= 36.0' Ke= 0.500 Inlet / Outlet Invert= 227.14' / 227.10' S= 0.0011 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.40 sf
#3	Device 2	230.14'	**9.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.75 cfs @ 12.12 hrs HW=230.82' TW=0.00' (Dynamic Tailwater)
└**1=Orifice/Grate** (Orifice Controls 1.75 cfs @ 8.92 fps)

Secondary OutFlow Max=11.63 cfs @ 12.12 hrs HW=230.80' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Inlet Controls 11.63 cfs @ 8.33 fps)
└**3=Broad-Crested Rectangular Weir** (Passes 11.63 cfs of 15.18 cfs potential flow)

Pond 1P: EX OWS - Chamber Wizard Field A

Chamber Model = ADS N-12 36" (ADS N-12® Pipe)
Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf
Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf
Row Length Adjustment= +1.62' x 7.10 sf x 10 rows

42.0" Wide + 21.0" Spacing = 63.0" C-C Row Spacing

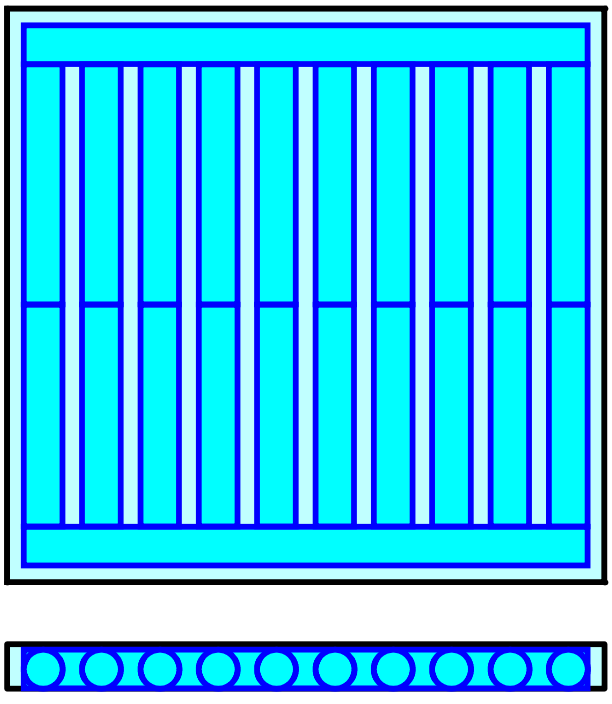
2 Chambers/Row x 20.00' Long +1.62' Row Adjustment +3.50' Header x 2 = 48.62' Row Length +18.0" End Stone x 2 = 51.62' Base Length
10 Rows x 42.0" Wide + 21.0" Spacing x 9 + 18.0" Side Stone x 2 = 53.75' Base Width
42.0" Chamber Height + 6.0" Stone Cover = 4.00' Field Height

20 Chambers x 142.0 cf +1.62' Row Adjustment x 7.10 sf x 10 Rows + 50.75' Header x 7.10 sf x 2 = 3,675.7 cf Chamber Storage
20 Chambers x 177.1 cf +1.62' Row Adjustment x 8.86 sf x 10 Rows + 50.75' Header x 8.86 sf x 2 = 4,585.4 cf Displacement

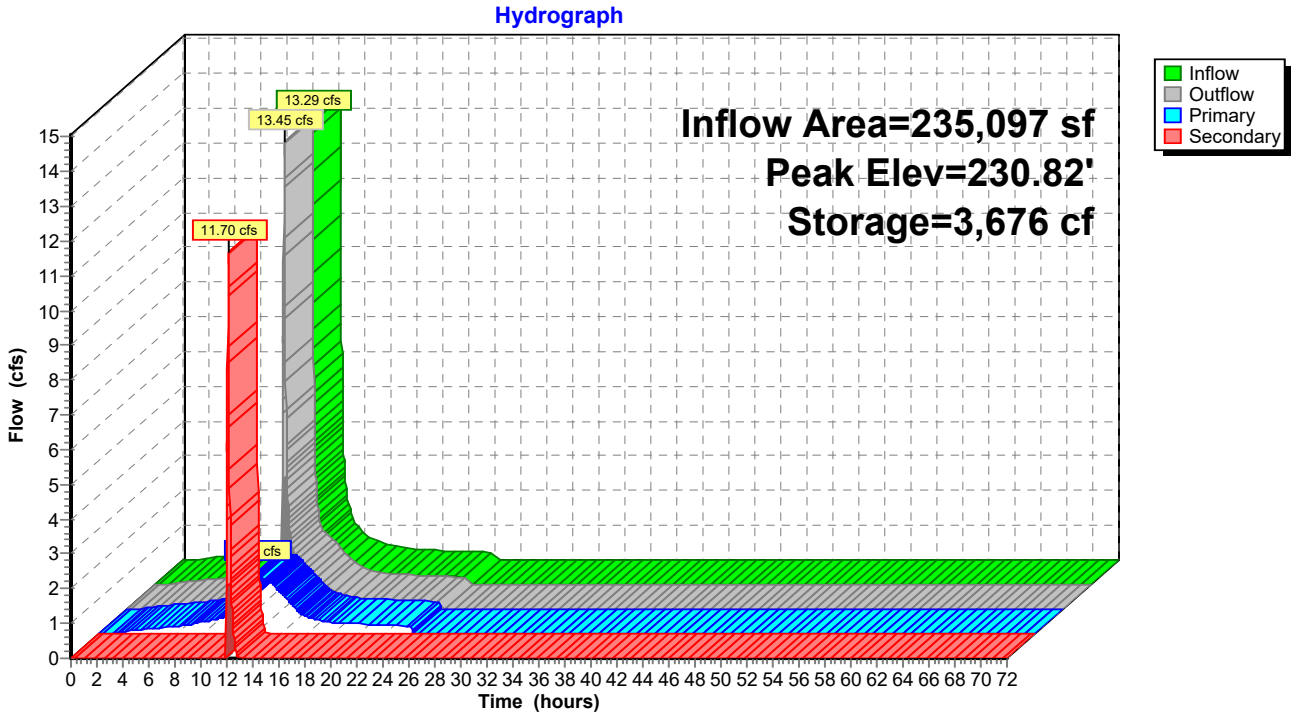
11,098.3 cf Field - 4,585.4 cf Chambers = 6,512.9 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 3,675.7 cf = 0.084 af
Overall Storage Efficiency = 33.1%
Overall System Size = 51.62' x 53.75' x 4.00'

20 Chambers
411.0 cy Field
241.2 cy Stone



Pond 1P: EX OWS

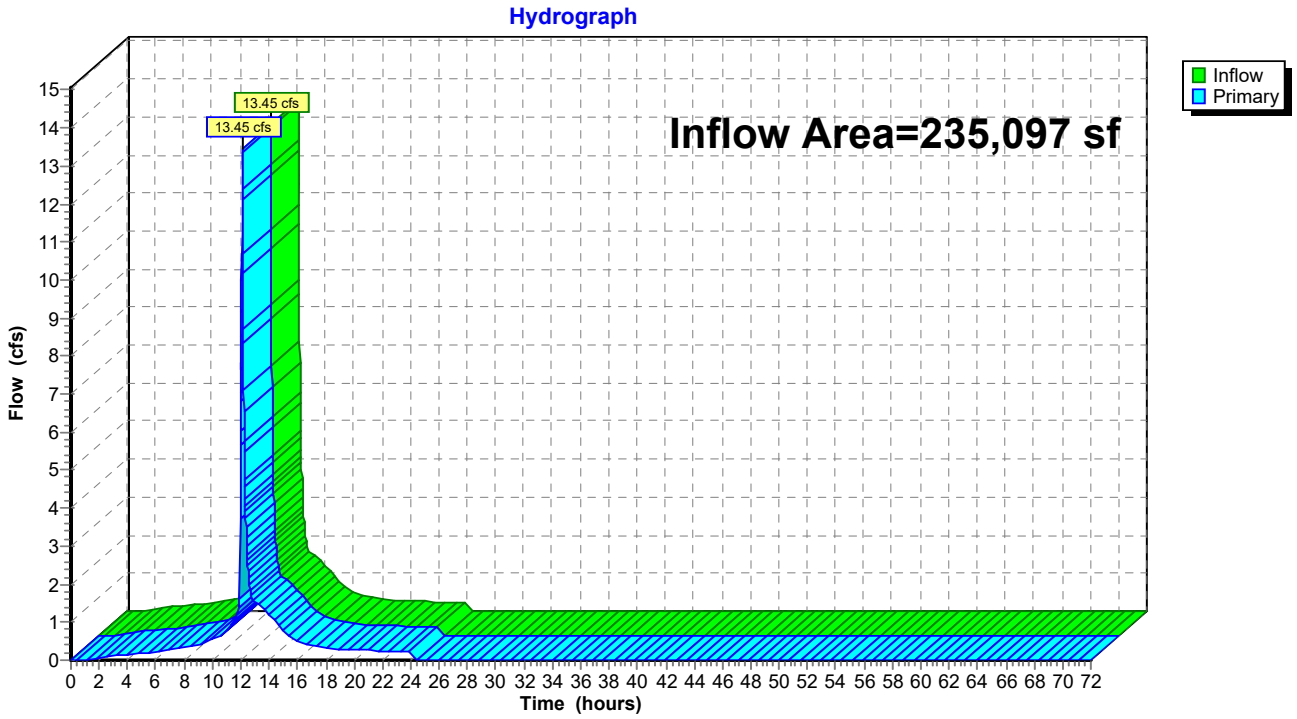


Summary for Link DP-1: DP-1

Inflow Area = 235,097 sf, 94.23% Impervious, Inflow Depth = 2.48" for 2-Year event
Inflow = 13.45 cfs @ 12.12 hrs, Volume= 48,625 cf
Primary = 13.45 cfs @ 12.12 hrs, Volume= 48,625 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: DP-1

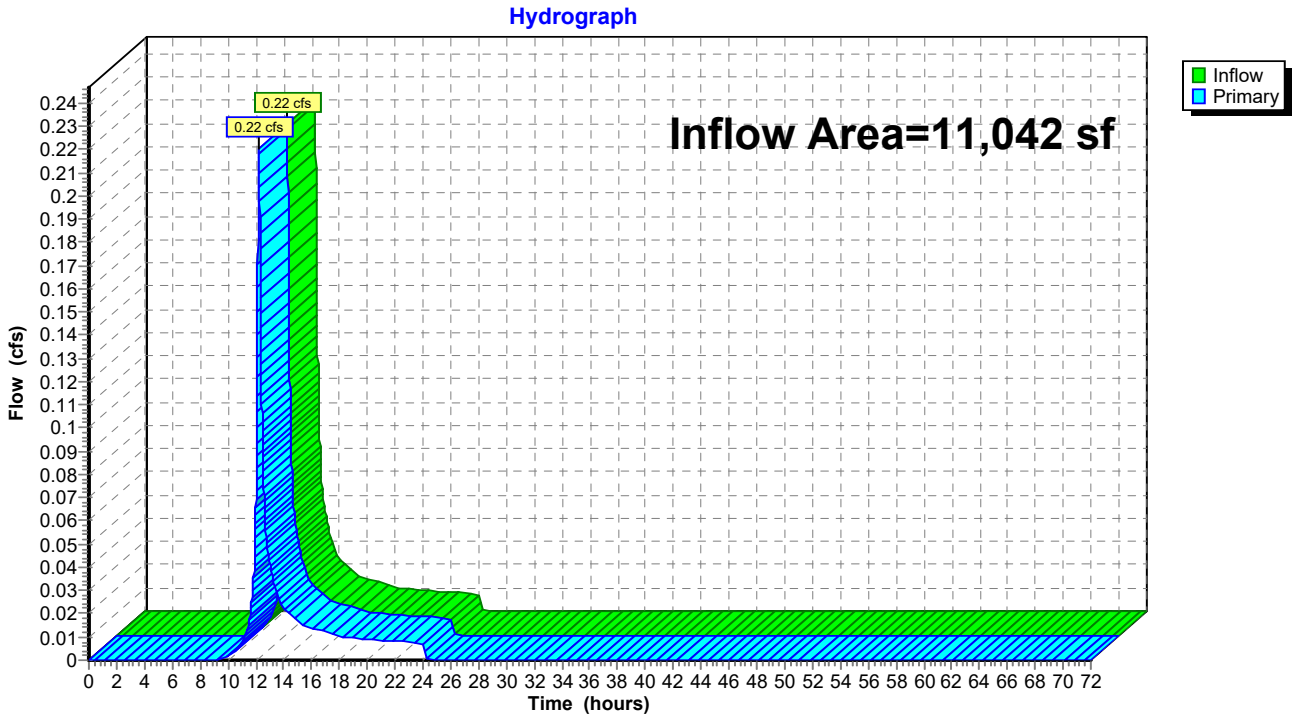


Summary for Link DP-2: DP-2

Inflow Area = 11,042 sf, 0.67% Impervious, Inflow Depth = 1.06" for 2-Year event
Inflow = 0.22 cfs @ 12.22 hrs, Volume= 974 cf
Primary = 0.22 cfs @ 12.22 hrs, Volume= 974 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: DP-2



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

Subcatchment1: Sub-catchment1 Runoff Area=33,590 sf 100.00% Impervious Runoff Depth=3.92"
Tc=6.0 min CN=98 Runoff=2.90 cfs 10,986 cf

Subcatchment2: Sub-catchment2 Runoff Area=7,467 sf 100.00% Impervious Runoff Depth=3.92"
Tc=6.0 min CN=98 Runoff=0.64 cfs 2,442 cf

Subcatchment3: Sub-catchment3 Runoff Area=7,120 sf 100.00% Impervious Runoff Depth=3.92"
Tc=6.0 min CN=98 Runoff=0.61 cfs 2,329 cf

Subcatchment4: Sub-catchment4 Runoff Area=57,605 sf 100.00% Impervious Runoff Depth=3.92"
Tc=6.0 min CN=98 Runoff=4.97 cfs 18,840 cf

Subcatchment5: Sub-catchment5 Runoff Area=14,314 sf 100.00% Impervious Runoff Depth=3.92"
Tc=6.0 min CN=98 Runoff=1.24 cfs 4,682 cf

Subcatchment6: Sub-Catchment6 Runoff Area=20,333 sf 100.00% Impervious Runoff Depth=3.92"
Tc=6.0 min CN=98 Runoff=1.76 cfs 6,650 cf

Subcatchment7: Sub-catchment7 Runoff Area=23,381 sf 100.00% Impervious Runoff Depth=3.92"
Tc=6.0 min CN=98 Runoff=2.02 cfs 7,647 cf

Subcatchment8: Sub-catchment8 Runoff Area=25,531 sf 100.00% Impervious Runoff Depth=3.92"
Tc=6.0 min CN=98 Runoff=2.20 cfs 8,350 cf

Subcatchment9: Sub-catchment9 Runoff Area=11,753 sf 73.89% Impervious Runoff Depth=3.38"
Tc=6.0 min CN=93 Runoff=0.95 cfs 3,306 cf

Subcatchment10: Sub-catchment10 Runoff Area=32,181 sf 67.40% Impervious Runoff Depth=3.27"
Tc=6.0 min CN=92 Runoff=2.54 cfs 8,775 cf

Subcatchment11: Sub-catchment11 Runoff Area=1,822 sf 100.00% Impervious Runoff Depth=3.92"
Tc=6.0 min CN=98 Runoff=0.16 cfs 596 cf

Subcatchment12: Sub-catchment12 Runoff Area=11,042 sf 0.67% Impervious Runoff Depth=2.09"
Flow Length=285' Tc=13.6 min CN=79 Runoff=0.45 cfs 1,927 cf

Pond 1P: EX OWS Peak Elev=234.50' Storage=3,676 cf Inflow=19.99 cfs 74,604 cf
Primary=2.52 cfs 53,461 cf Secondary=17.40 cfs 21,144 cf Outflow=19.92 cfs 74,605 cf

Link DP-1: DP-1 Inflow=19.92 cfs 74,605 cf
Primary=19.92 cfs 74,605 cf

Link DP-2: DP-2 Inflow=0.45 cfs 1,927 cf
Primary=0.45 cfs 1,927 cf

Total Runoff Area = 246,139 sf Runoff Volume = 76,531 cf Average Runoff Depth = 3.73"
9.97% Pervious = 24,528 sf 90.03% Impervious = 221,611 sf

Summary for Subcatchment 1: Sub-catchment 1

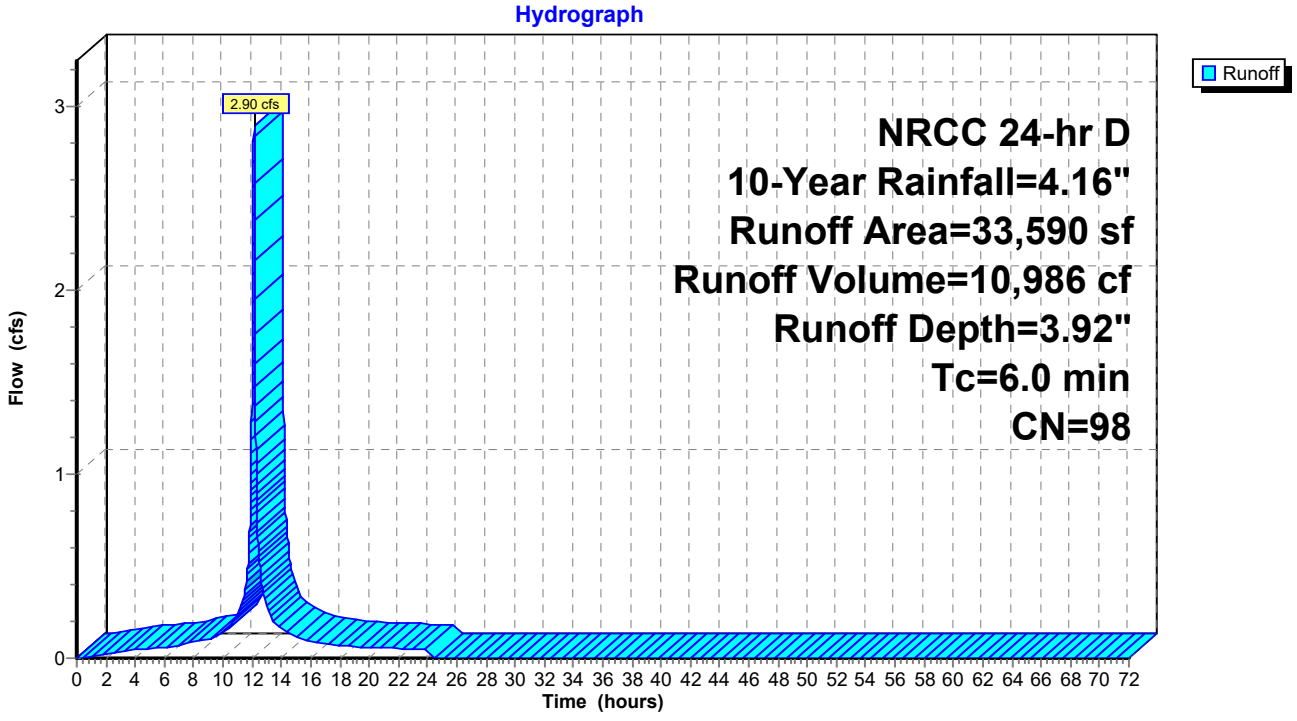
Runoff = 2.90 cfs @ 12.13 hrs, Volume= 10,986 cf, Depth= 3.92"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
15,206	98	Roofs, HSG B
18,384	98	Unconnected pavement, HSG B
33,590	98	Weighted Average
33,590		100.00% Impervious Area
18,384		54.73% Unconnected

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

Subcatchment 1: Sub-catchment 1



Summary for Subcatchment 2: Sub-catchment 2

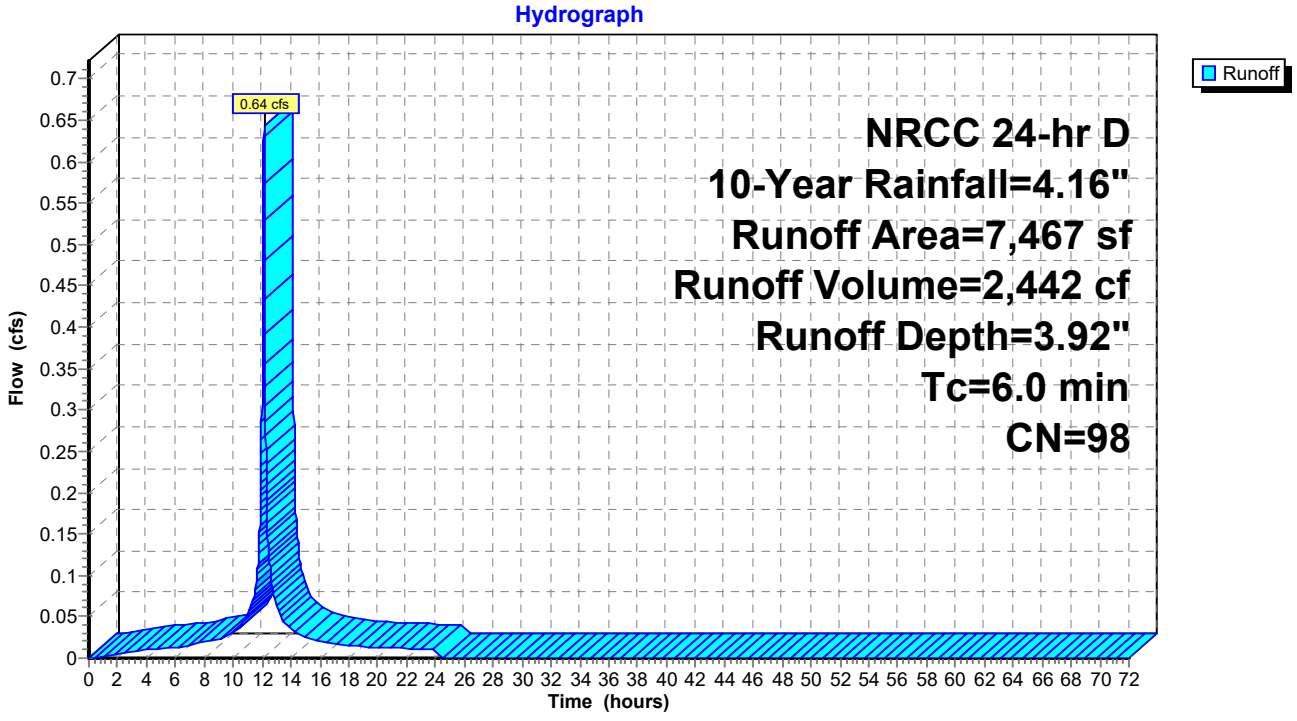
Runoff = 0.64 cfs @ 12.13 hrs, Volume= 2,442 cf, Depth= 3.92"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
2,936	98	Roofs, HSG B
4,531	98	Unconnected pavement, HSG B
7,467	98	Weighted Average
7,467		100.00% Impervious Area
4,531		60.68% Unconnected

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

Subcatchment 2: Sub-catchment 2



Summary for Subcatchment 3: Sub-catchment 3

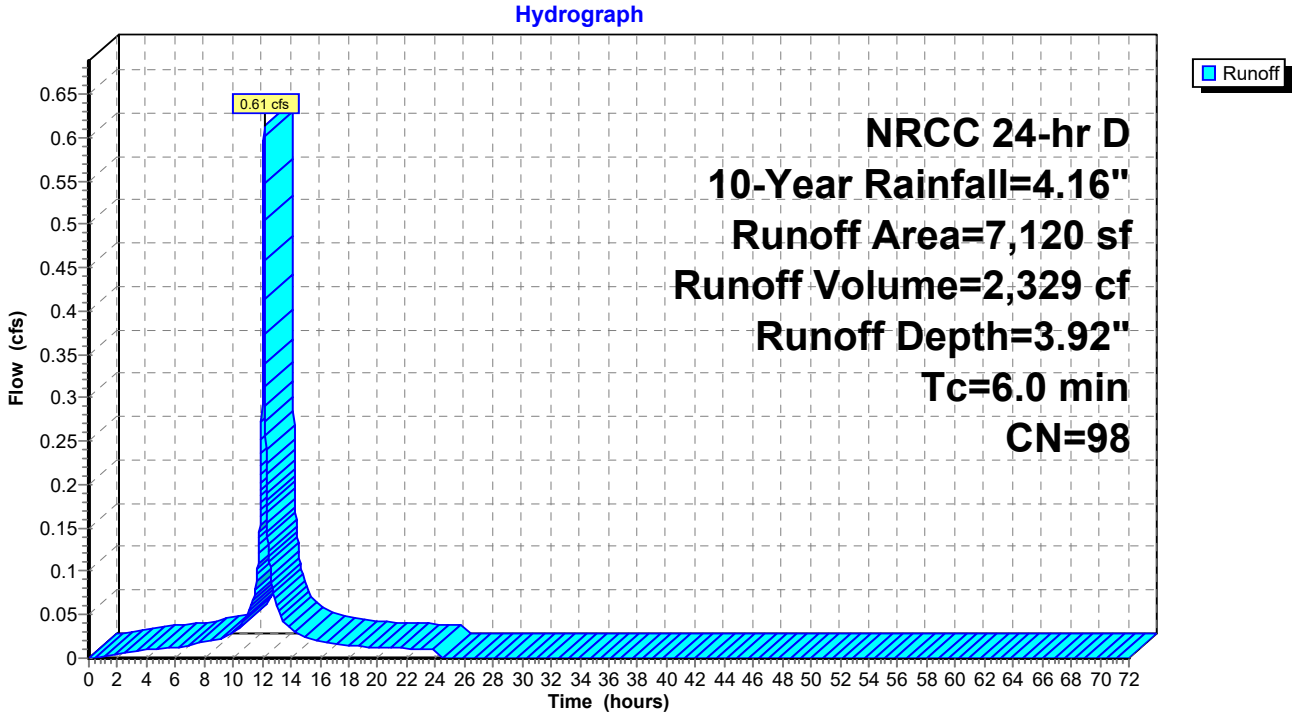
Runoff = 0.61 cfs @ 12.13 hrs, Volume= 2,329 cf, Depth= 3.92"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
2,543	98	Roofs, HSG B
4,577	98	Unconnected pavement, HSG B
7,120	98	Weighted Average
7,120		100.00% Impervious Area
4,577		64.28% Unconnected

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

Subcatchment 3: Sub-catchment 3



Summary for Subcatchment 4: Sub-catchment 4

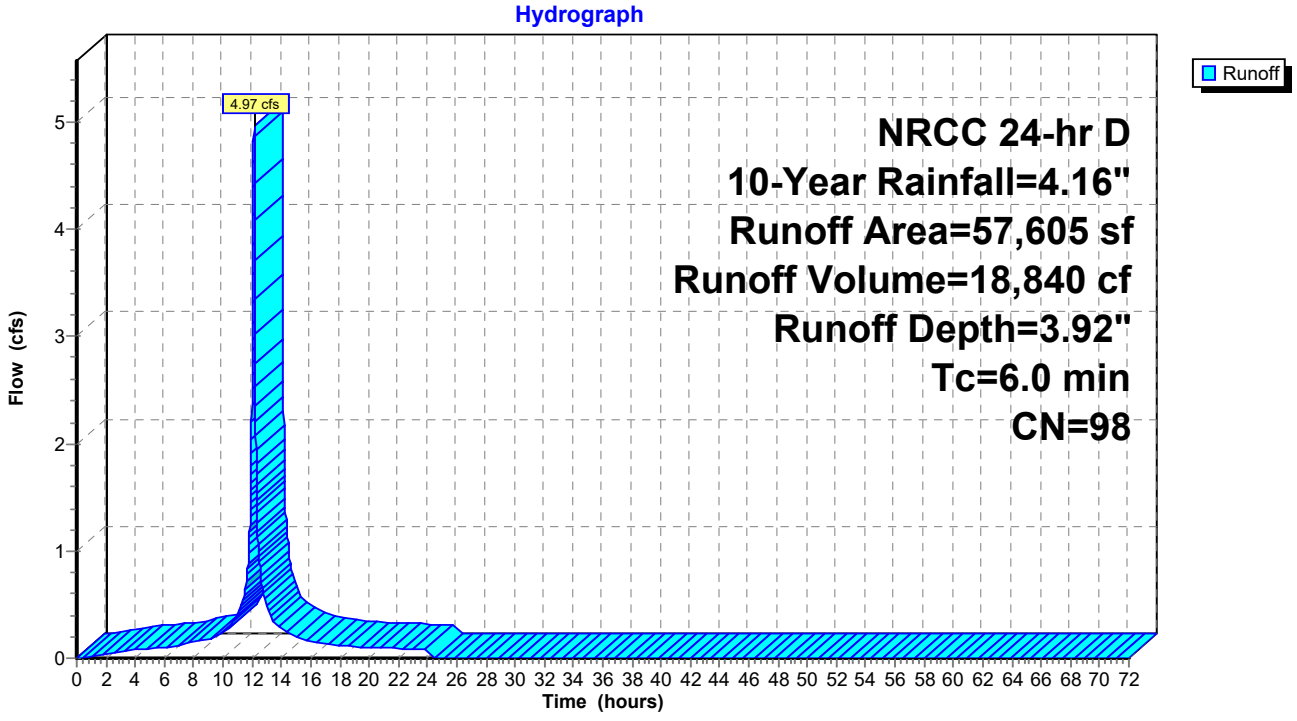
Runoff = 4.97 cfs @ 12.13 hrs, Volume= 18,840 cf, Depth= 3.92"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
5,329	98	Roofs, HSG B
52,276	98	Unconnected pavement, HSG B
57,605	98	Weighted Average
57,605		100.00% Impervious Area
52,276		90.75% Unconnected

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

Subcatchment 4: Sub-catchment 4



Summary for Subcatchment 5: Sub-catchment 5

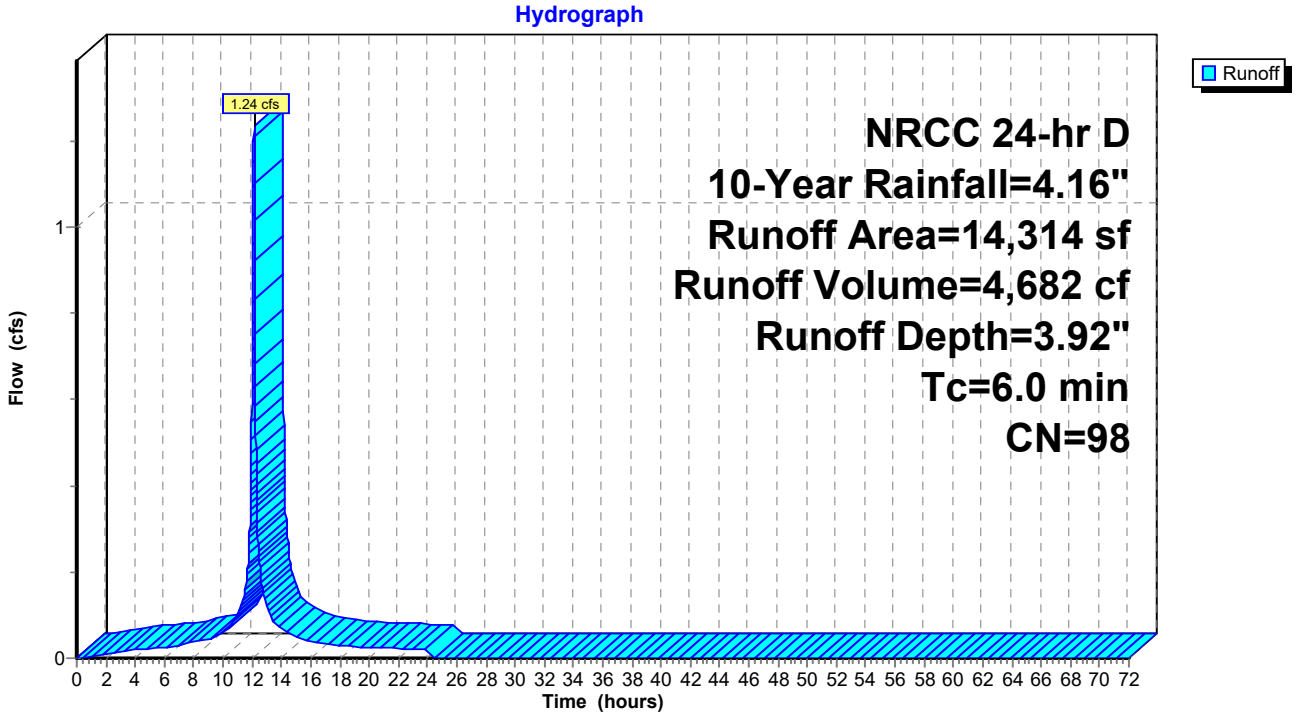
Runoff = 1.24 cfs @ 12.13 hrs, Volume= 4,682 cf, Depth= 3.92"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
5,500	98	Roofs, HSG B
8,814	98	Unconnected pavement, HSG B
14,314	98	Weighted Average
14,314		100.00% Impervious Area
8,814		61.58% Unconnected

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

Subcatchment 5: Sub-catchment 5



Summary for Subcatchment 6: Sub-Catchment 6

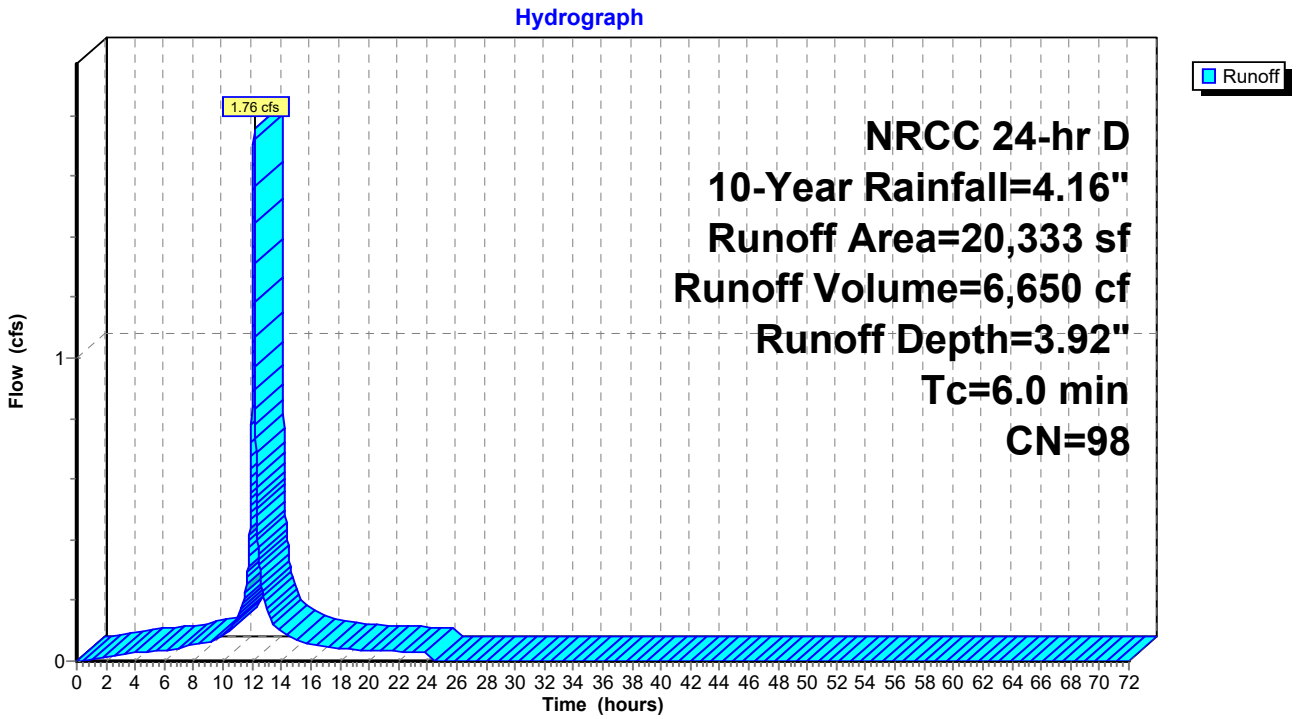
Runoff = 1.76 cfs @ 12.13 hrs, Volume= 6,650 cf, Depth= 3.92"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
20,333	98	Unconnected pavement, HSG B
20,333		100.00% Impervious Area
20,333		100.00% Unconnected

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

Subcatchment 6: Sub-Catchment 6



Summary for Subcatchment 7: Sub-catchment 7

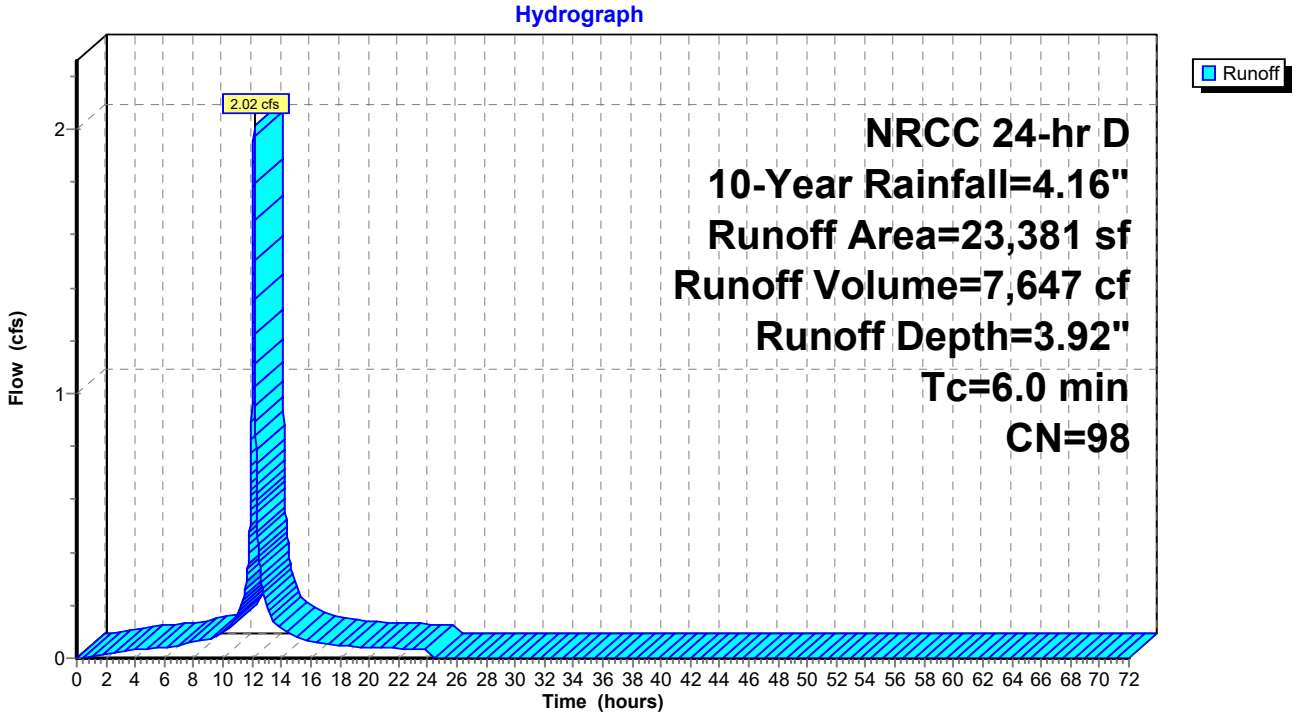
Runoff = 2.02 cfs @ 12.13 hrs, Volume= 7,647 cf, Depth= 3.92"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
3,396	98	Roofs, HSG B
19,985	98	Unconnected pavement, HSG B
23,381	98	Weighted Average
23,381		100.00% Impervious Area
19,985		85.48% Unconnected

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

Subcatchment 7: Sub-catchment 7



Summary for Subcatchment 8: Sub-catchment 8

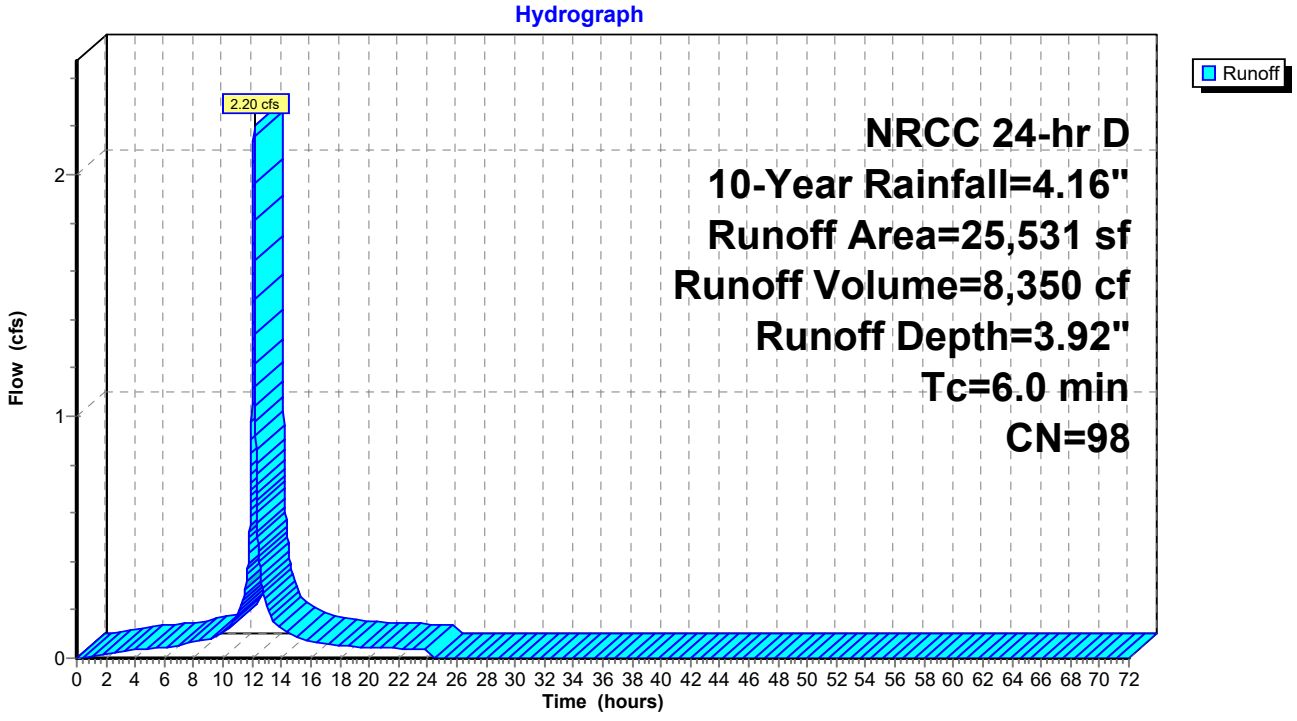
Runoff = 2.20 cfs @ 12.13 hrs, Volume= 8,350 cf, Depth= 3.92"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
2,117	98	Roofs, HSG B
23,414	98	Unconnected pavement, HSG B
25,531	98	Weighted Average
25,531		100.00% Impervious Area
23,414		91.71% Unconnected

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

Subcatchment 8: Sub-catchment 8



Summary for Subcatchment 9: Sub-catchment 9

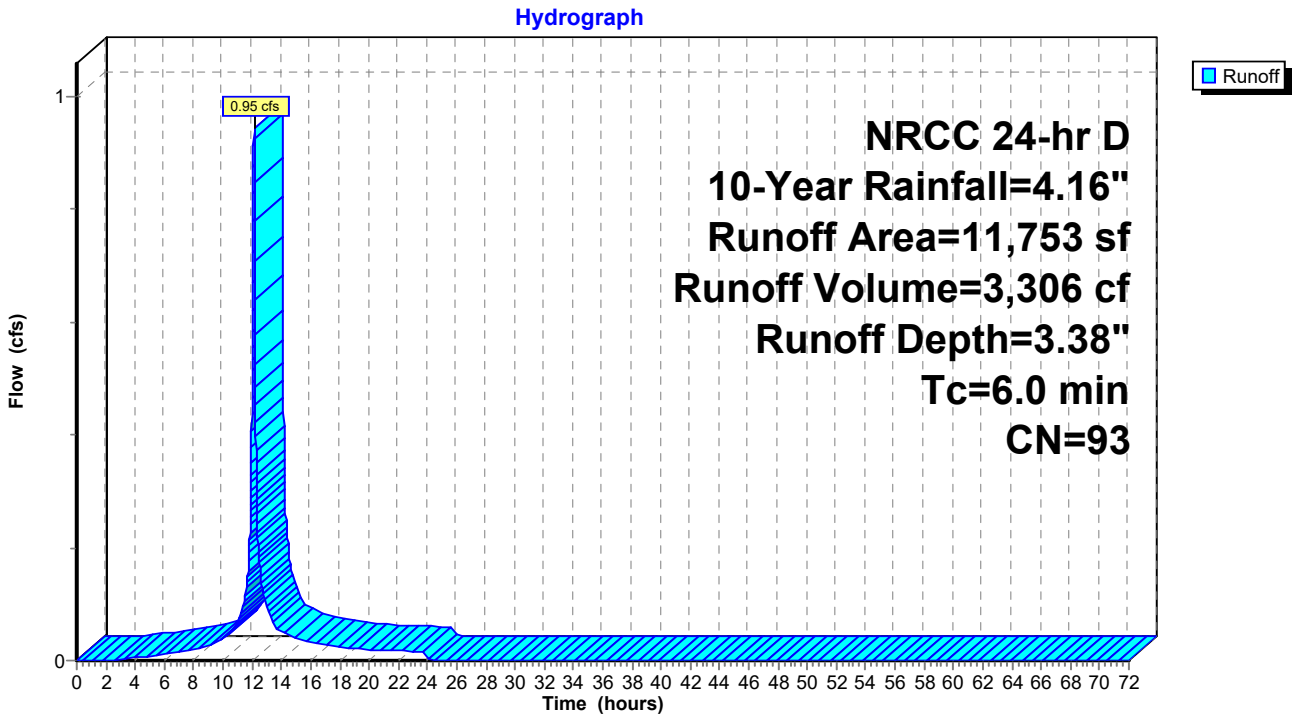
Runoff = 0.95 cfs @ 12.13 hrs, Volume= 3,306 cf, Depth= 3.38"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
3,069	79	<50% Grass cover, Poor, HSG B
8,684	98	Unconnected pavement, HSG B
11,753	93	Weighted Average
3,069		26.11% Pervious Area
8,684		73.89% Impervious Area
8,684		100.00% Unconnected

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

Subcatchment 9: Sub-catchment 9



Summary for Subcatchment 10: Sub-catchment 10

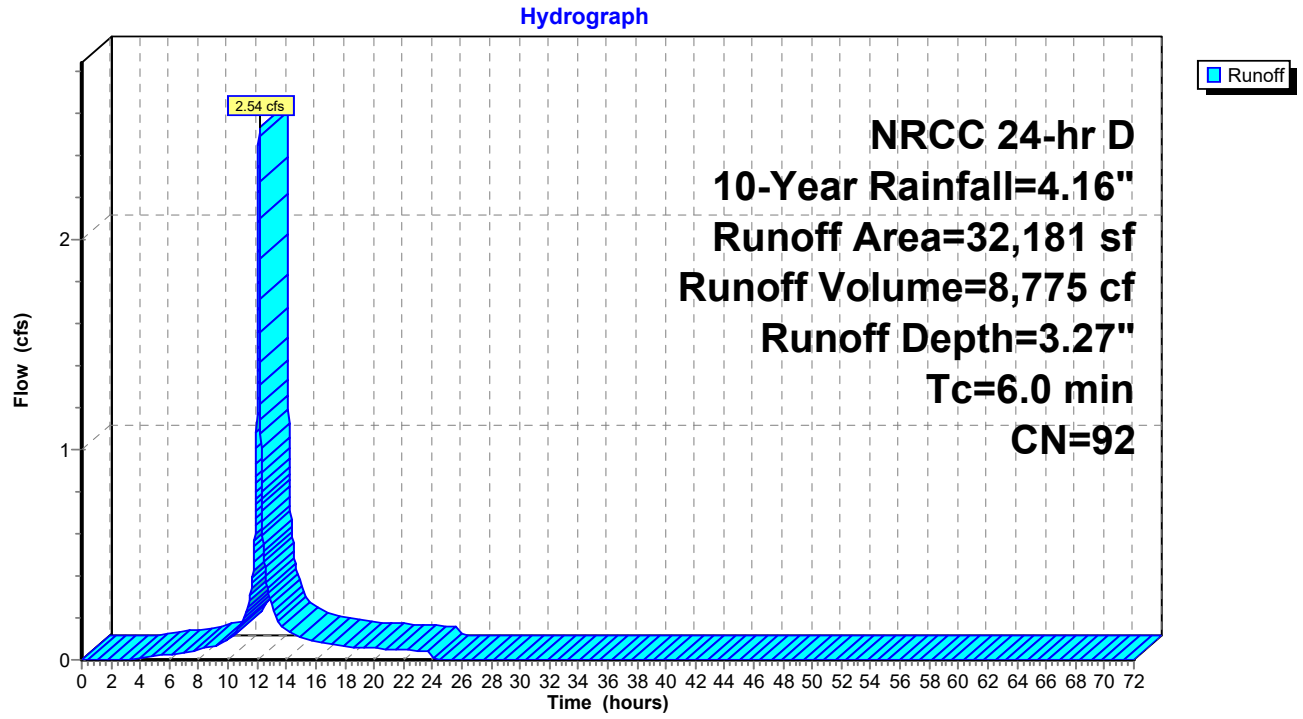
Runoff = 2.54 cfs @ 12.13 hrs, Volume= 8,775 cf, Depth= 3.27"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
10,491	79	<50% Grass cover, Poor, HSG B
6,760	98	Roofs, HSG B
14,930	98	Unconnected pavement, HSG B
32,181	92	Weighted Average
10,491		32.60% Pervious Area
21,690		67.40% Impervious Area
14,930		68.83% Unconnected

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

Subcatchment 10: Sub-catchment 10



Summary for Subcatchment 11: Sub-catchment 11

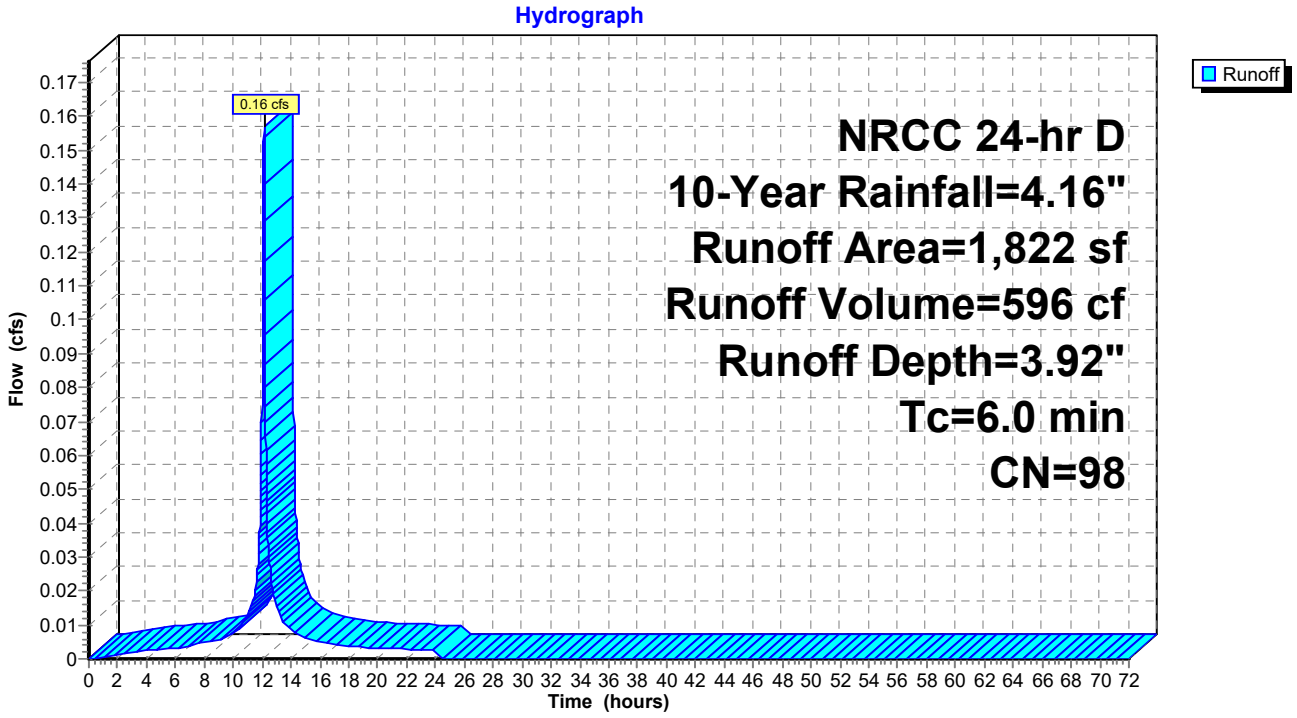
Runoff = 0.16 cfs @ 12.13 hrs, Volume= 596 cf, Depth= 3.92"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
1,822	98	Roofs, HSG B
1,822		100.00% Impervious Area

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

Subcatchment 11: Sub-catchment 11



Summary for Subcatchment 12: Sub-catchment 12

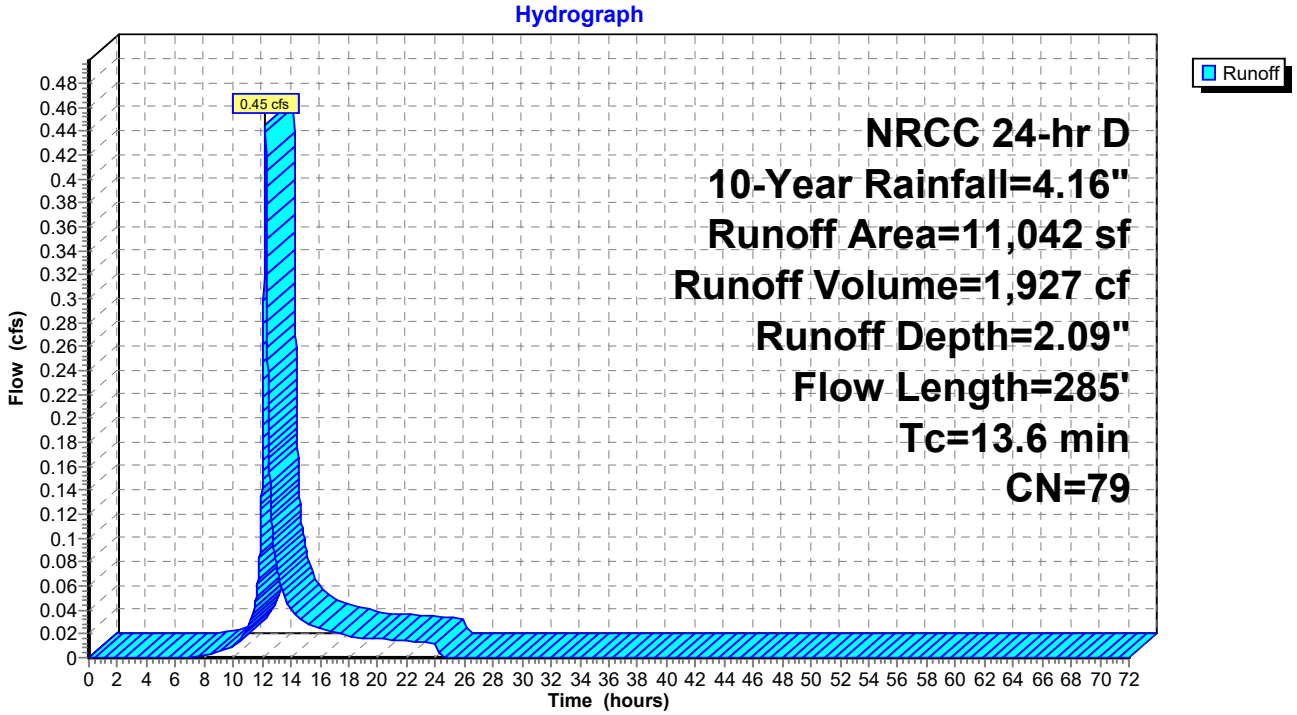
Runoff = 0.45 cfs @ 12.22 hrs, Volume= 1,927 cf, Depth= 2.09"
Routed to Link DP-2 : DP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
74	98	Unconnected pavement, HSG B
10,968	79	<50% Grass cover, Poor, HSG B
11,042	79	Weighted Average
10,968		99.33% Pervious Area
74		0.67% Impervious Area
74		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.0120	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
1.6	185	0.0150	1.97		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.6	285	Total			

Subcatchment 12: Sub-catchment 12



Summary for Pond 1P: EX OWS

[93] Warning: Storage range exceeded by 3.36'

Inflow Area = 235,097 sf, 94.23% Impervious, Inflow Depth = 3.81" for 10-Year event
Inflow = 19.99 cfs @ 12.13 hrs, Volume= 74,604 cf
Outflow = 19.92 cfs @ 12.13 hrs, Volume= 74,605 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.52 cfs @ 12.13 hrs, Volume= 53,461 cf
Routed to Link DP-1 : DP-1
Secondary = 17.40 cfs @ 12.13 hrs, Volume= 21,144 cf
Routed to Link DP-1 : DP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 234.50' @ 12.13 hrs Surf.Area= 2,775 sf Storage= 3,676 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 13.7 min (775.2 - 761.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	227.14'	0 cf	**53.75'W x 51.62'L x 4.00'H Field A** 11,098 cf Overall - 4,587 cf Embedded = 6,511 cf x 0.0% Voids
#2A	227.14'	3,676 cf	**ADS N-12 36"** x 20 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf Row Length Adjustment= +1.62' x 7.10 sf x 10 rows 50.75' Header x 7.10 sf x 2 = 720.6 cf Inside
		3,676 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	227.14'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	227.14'	**16.0" Round Culvert** L= 36.0' Ke= 0.500 Inlet / Outlet Invert= 227.14' / 227.10' S= 0.0011 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.40 sf
#3	Device 2	230.14'	**9.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=2.52 cfs @ 12.13 hrs HW=234.49' TW=0.00' (Dynamic Tailwater)
└**1=Orifice/Grate** (Orifice Controls 2.52 cfs @ 12.83 fps)

Secondary OutFlow Max=17.39 cfs @ 12.13 hrs HW=234.49' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Inlet Controls 17.39 cfs @ 12.45 fps)
└**3=Broad-Crested Rectangular Weir** (Passes 17.39 cfs of 271.53 cfs potential flow)

Pond 1P: EX OWS - Chamber Wizard Field A

Chamber Model = ADS N-12 36" (ADS N-12® Pipe)
Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf
Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf
Row Length Adjustment= +1.62' x 7.10 sf x 10 rows

42.0" Wide + 21.0" Spacing = 63.0" C-C Row Spacing

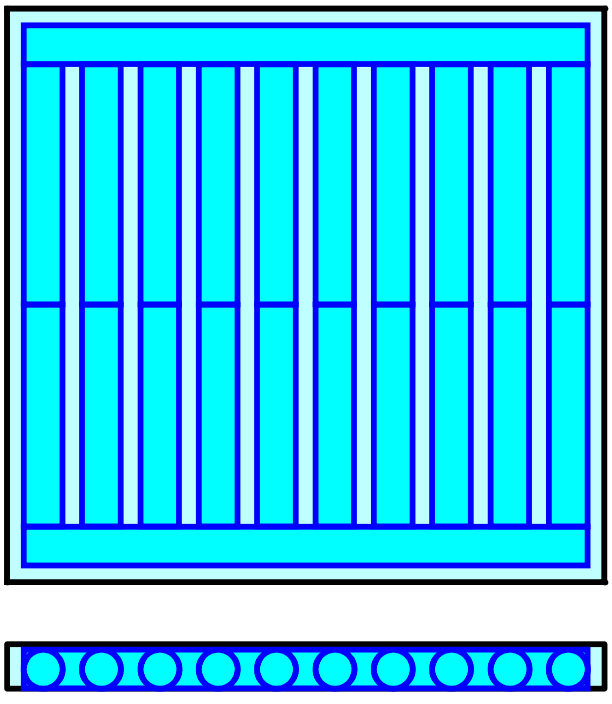
2 Chambers/Row x 20.00' Long +1.62' Row Adjustment +3.50' Header x 2 = 48.62' Row Length +18.0" End Stone x 2 = 51.62' Base Length
10 Rows x 42.0" Wide + 21.0" Spacing x 9 + 18.0" Side Stone x 2 = 53.75' Base Width
42.0" Chamber Height + 6.0" Stone Cover = 4.00' Field Height

20 Chambers x 142.0 cf +1.62' Row Adjustment x 7.10 sf x 10 Rows + 50.75' Header x 7.10 sf x 2 = 3,675.7 cf Chamber Storage
20 Chambers x 177.1 cf +1.62' Row Adjustment x 8.86 sf x 10 Rows + 50.75' Header x 8.86 sf x 2 = 4,585.4 cf Displacement

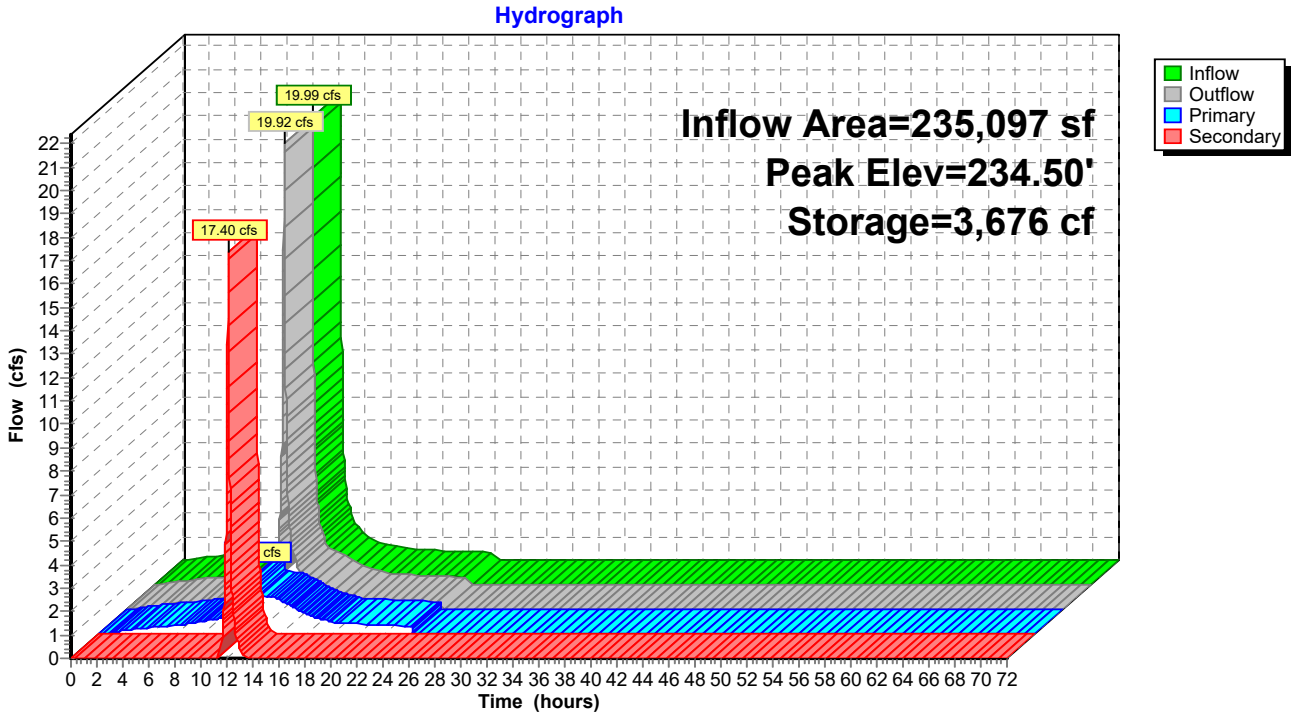
11,098.3 cf Field - 4,585.4 cf Chambers = 6,512.9 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 3,675.7 cf = 0.084 af
Overall Storage Efficiency = 33.1%
Overall System Size = 51.62' x 53.75' x 4.00'

20 Chambers
411.0 cy Field
241.2 cy Stone



Pond 1P: EX OWS

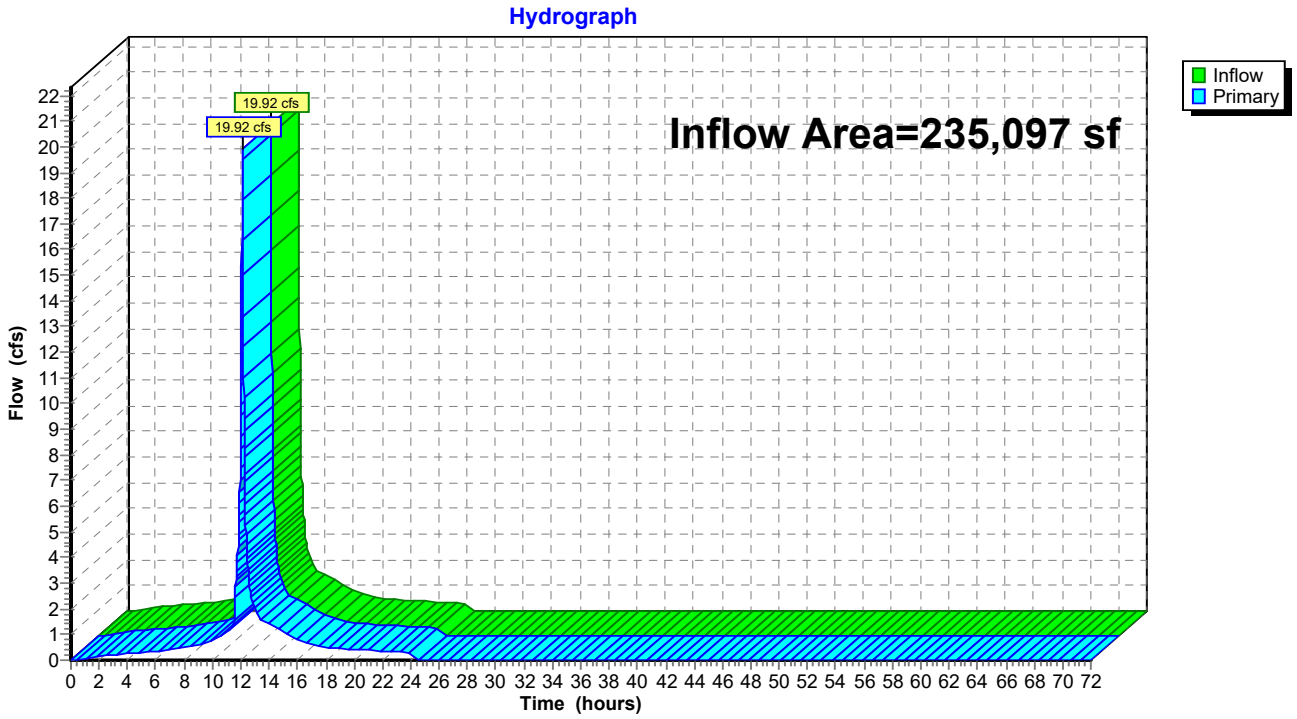


Summary for Link DP-1: DP-1

Inflow Area = 235,097 sf, 94.23% Impervious, Inflow Depth = 3.81" for 10-Year event
Inflow = 19.92 cfs @ 12.13 hrs, Volume= 74,605 cf
Primary = 19.92 cfs @ 12.13 hrs, Volume= 74,605 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: DP-1

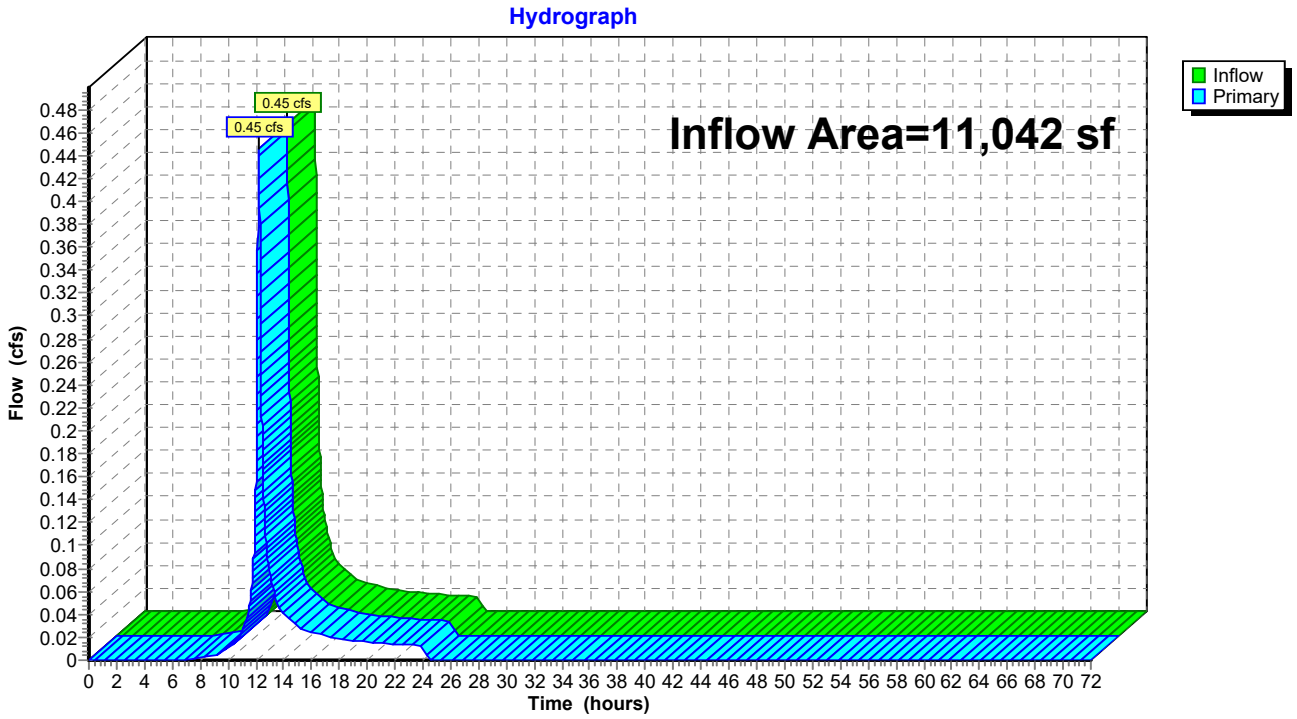


Summary for Link DP-2: DP-2

Inflow Area = 11,042 sf, 0.67% Impervious, Inflow Depth = 2.09" for 10-Year event
Inflow = 0.45 cfs @ 12.22 hrs, Volume= 1,927 cf
Primary = 0.45 cfs @ 12.22 hrs, Volume= 1,927 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: DP-2



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

Subcatchment1: Sub-catchment1 Runoff Area=33,590 sf 100.00% Impervious Runoff Depth=5.91"
Tc=6.0 min CN=98 Runoff=4.30 cfs 16,548 cf

Subcatchment2: Sub-catchment2 Runoff Area=7,467 sf 100.00% Impervious Runoff Depth=5.91"
Tc=6.0 min CN=98 Runoff=0.96 cfs 3,679 cf

Subcatchment3: Sub-catchment3 Runoff Area=7,120 sf 100.00% Impervious Runoff Depth=5.91"
Tc=6.0 min CN=98 Runoff=0.91 cfs 3,508 cf

Subcatchment4: Sub-catchment4 Runoff Area=57,605 sf 100.00% Impervious Runoff Depth=5.91"
Tc=6.0 min CN=98 Runoff=7.38 cfs 28,379 cf

Subcatchment5: Sub-catchment5 Runoff Area=14,314 sf 100.00% Impervious Runoff Depth=5.91"
Tc=6.0 min CN=98 Runoff=1.83 cfs 7,052 cf

Subcatchment6: Sub-Catchment6 Runoff Area=20,333 sf 100.00% Impervious Runoff Depth=5.91"
Tc=6.0 min CN=98 Runoff=2.61 cfs 10,017 cf

Subcatchment7: Sub-catchment7 Runoff Area=23,381 sf 100.00% Impervious Runoff Depth=5.91"
Tc=6.0 min CN=98 Runoff=3.00 cfs 11,518 cf

Subcatchment8: Sub-catchment8 Runoff Area=25,531 sf 100.00% Impervious Runoff Depth=5.91"
Tc=6.0 min CN=98 Runoff=3.27 cfs 12,578 cf

Subcatchment9: Sub-catchment9 Runoff Area=11,753 sf 73.89% Impervious Runoff Depth=5.33"
Tc=6.0 min CN=93 Runoff=1.45 cfs 5,221 cf

Subcatchment10: Sub-catchment10 Runoff Area=32,181 sf 67.40% Impervious Runoff Depth=5.22"
Tc=6.0 min CN=92 Runoff=3.93 cfs 13,991 cf

Subcatchment11: Sub-catchment11 Runoff Area=1,822 sf 100.00% Impervious Runoff Depth=5.91"
Tc=6.0 min CN=98 Runoff=0.23 cfs 898 cf

Subcatchment12: Sub-catchment12 Runoff Area=11,042 sf 0.67% Impervious Runoff Depth=3.81"
Flow Length=285' Tc=13.6 min CN=79 Runoff=0.81 cfs 3,509 cf

Pond 1P: EX OWS Peak Elev=243.00' Storage=3,676 cf Inflow=29.88 cfs 113,386 cf
Primary=3.74 cfs 73,058 cf Secondary=26.20 cfs 40,329 cf Outflow=29.94 cfs 113,387 cf

Link DP-1: DP-1 Inflow=29.94 cfs 113,387 cf
Primary=29.94 cfs 113,387 cf

Link DP-2: DP-2 Inflow=0.81 cfs 3,509 cf
Primary=0.81 cfs 3,509 cf

Total Runoff Area = 246,139 sf Runoff Volume = 116,896 cf Average Runoff Depth = 5.70"
9.97% Pervious = 24,528 sf 90.03% Impervious = 221,611 sf

Summary for Subcatchment 1: Sub-catchment 1

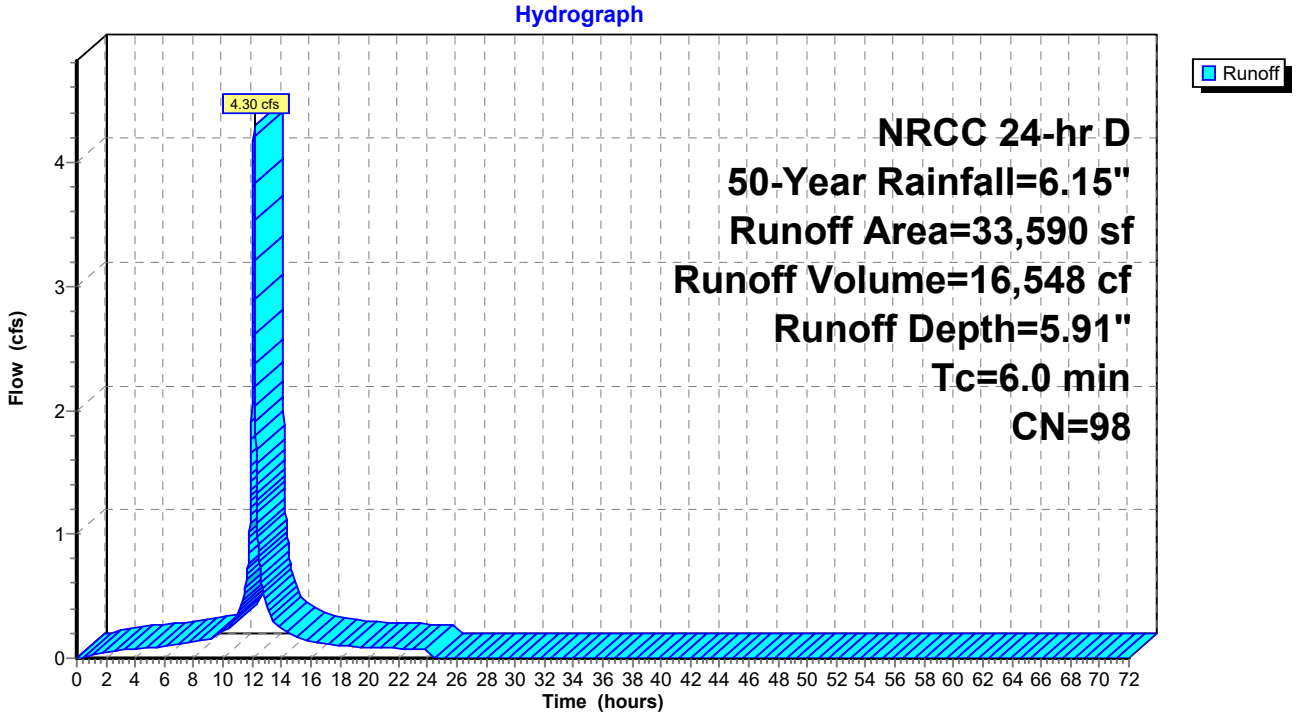
Runoff = 4.30 cfs @ 12.13 hrs, Volume= 16,548 cf, Depth= 5.91"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
15,206	98	Roofs, HSG B
18,384	98	Unconnected pavement, HSG B
33,590	98	Weighted Average
33,590		100.00% Impervious Area
18,384		54.73% Unconnected

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

Subcatchment 1: Sub-catchment 1



Summary for Subcatchment 2: Sub-catchment 2

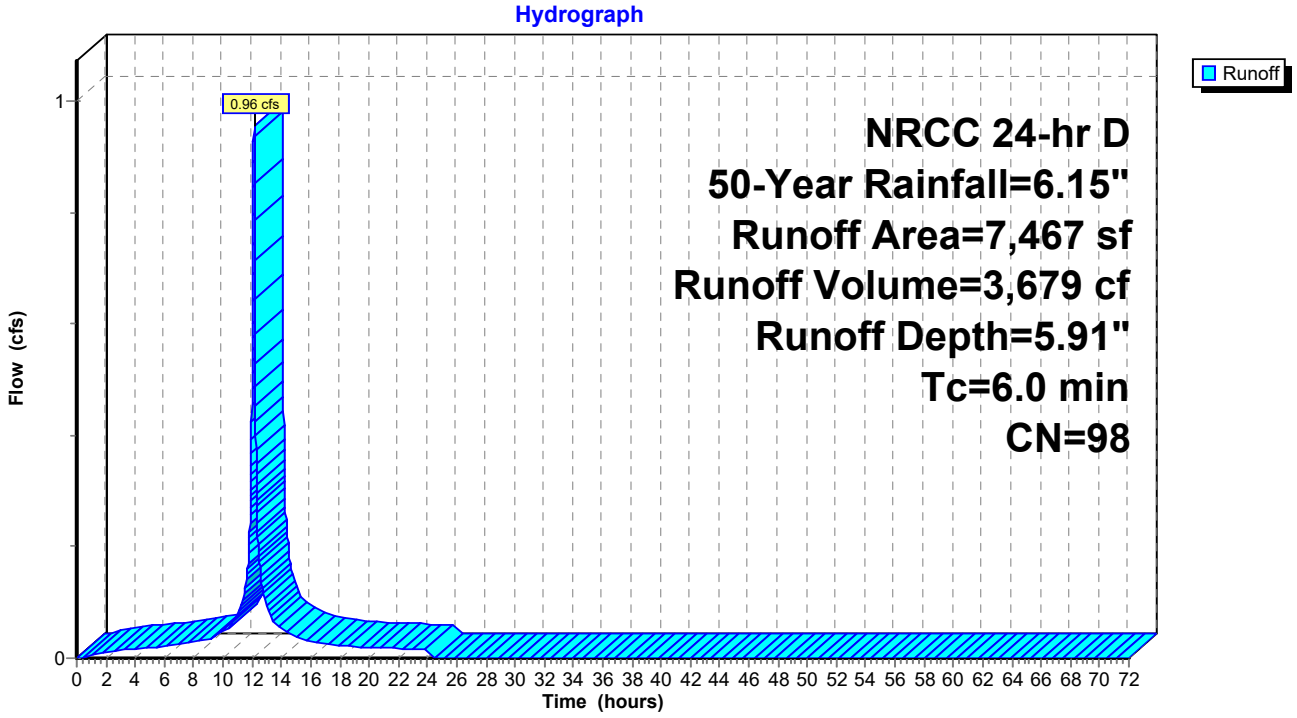
Runoff = 0.96 cfs @ 12.13 hrs, Volume= 3,679 cf, Depth= 5.91"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
2,936	98	Roofs, HSG B
4,531	98	Unconnected pavement, HSG B
7,467	98	Weighted Average
7,467		100.00% Impervious Area
4,531		60.68% Unconnected

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

Subcatchment 2: Sub-catchment 2



Summary for Subcatchment 3: Sub-catchment 3

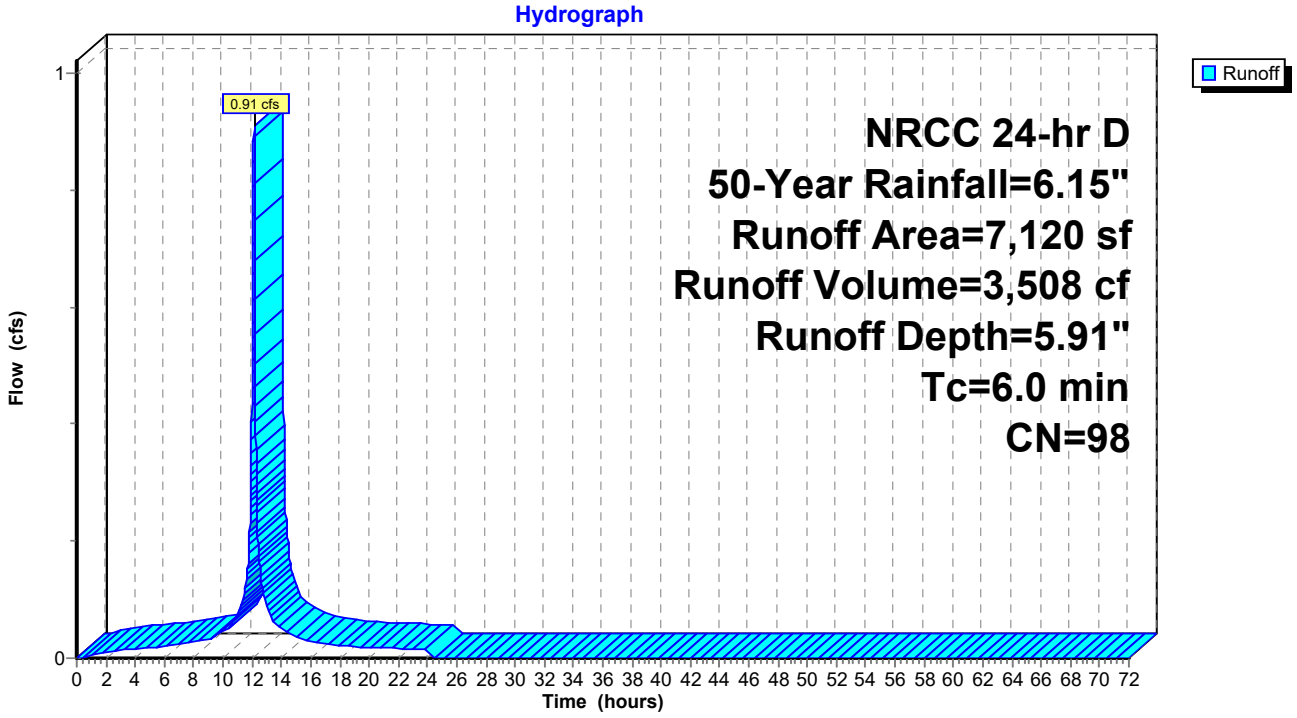
Runoff = 0.91 cfs @ 12.13 hrs, Volume= 3,508 cf, Depth= 5.91"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
2,543	98	Roofs, HSG B
4,577	98	Unconnected pavement, HSG B
7,120	98	Weighted Average
7,120		100.00% Impervious Area
4,577		64.28% Unconnected

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

Subcatchment 3: Sub-catchment 3



Summary for Subcatchment 4: Sub-catchment 4

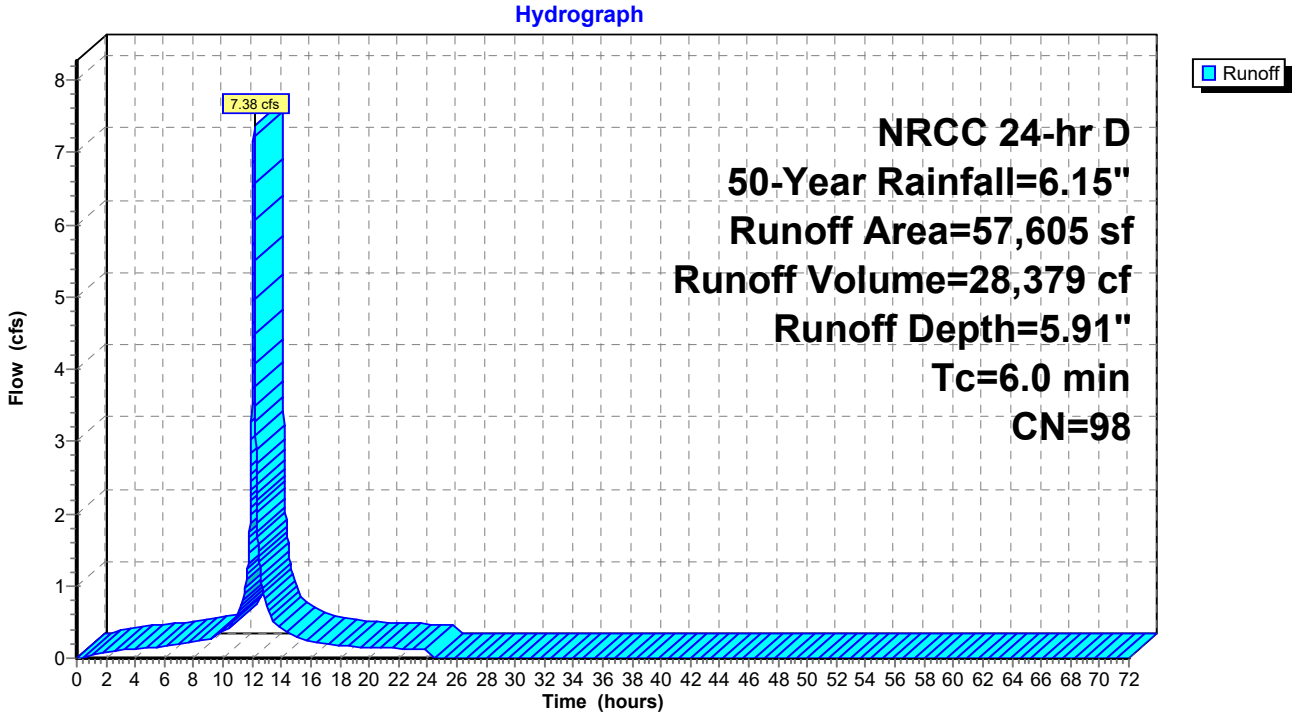
Runoff = 7.38 cfs @ 12.13 hrs, Volume= 28,379 cf, Depth= 5.91"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
5,329	98	Roofs, HSG B
52,276	98	Unconnected pavement, HSG B
57,605	98	Weighted Average
57,605		100.00% Impervious Area
52,276		90.75% Unconnected

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

Subcatchment 4: Sub-catchment 4



Summary for Subcatchment 5: Sub-catchment 5

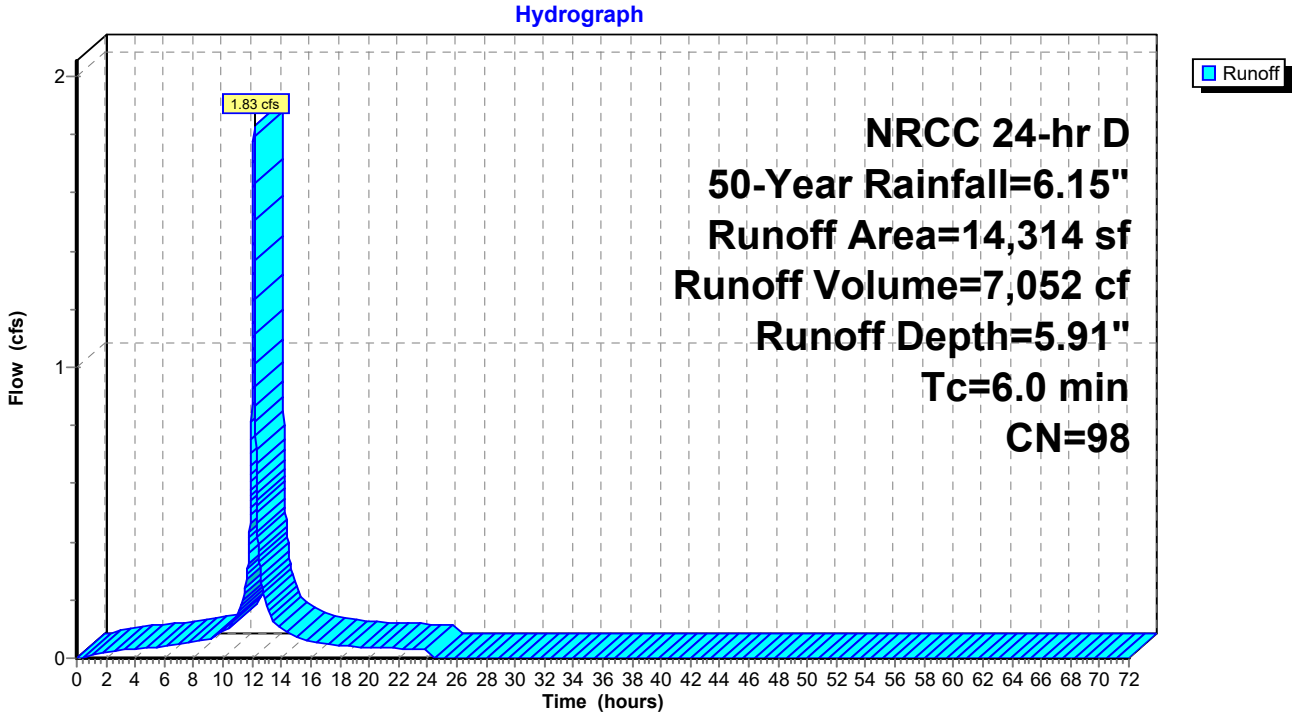
Runoff = 1.83 cfs @ 12.13 hrs, Volume= 7,052 cf, Depth= 5.91"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
5,500	98	Roofs, HSG B
8,814	98	Unconnected pavement, HSG B
14,314	98	Weighted Average
14,314		100.00% Impervious Area
8,814		61.58% Unconnected

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

Subcatchment 5: Sub-catchment 5



Summary for Subcatchment 6: Sub-Catchment 6

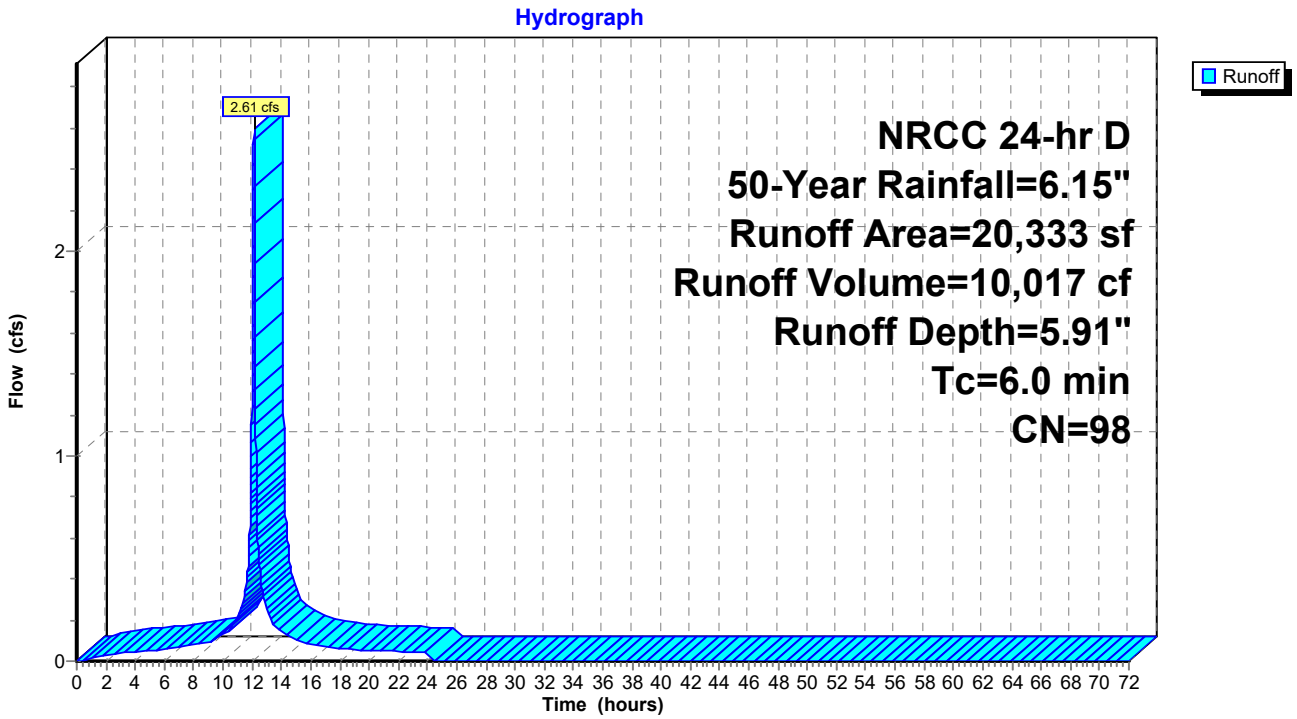
Runoff = 2.61 cfs @ 12.13 hrs, Volume= 10,017 cf, Depth= 5.91"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
20,333	98	Unconnected pavement, HSG B
20,333		100.00% Impervious Area
20,333		100.00% Unconnected

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

Subcatchment 6: Sub-Catchment 6



Summary for Subcatchment 7: Sub-catchment 7

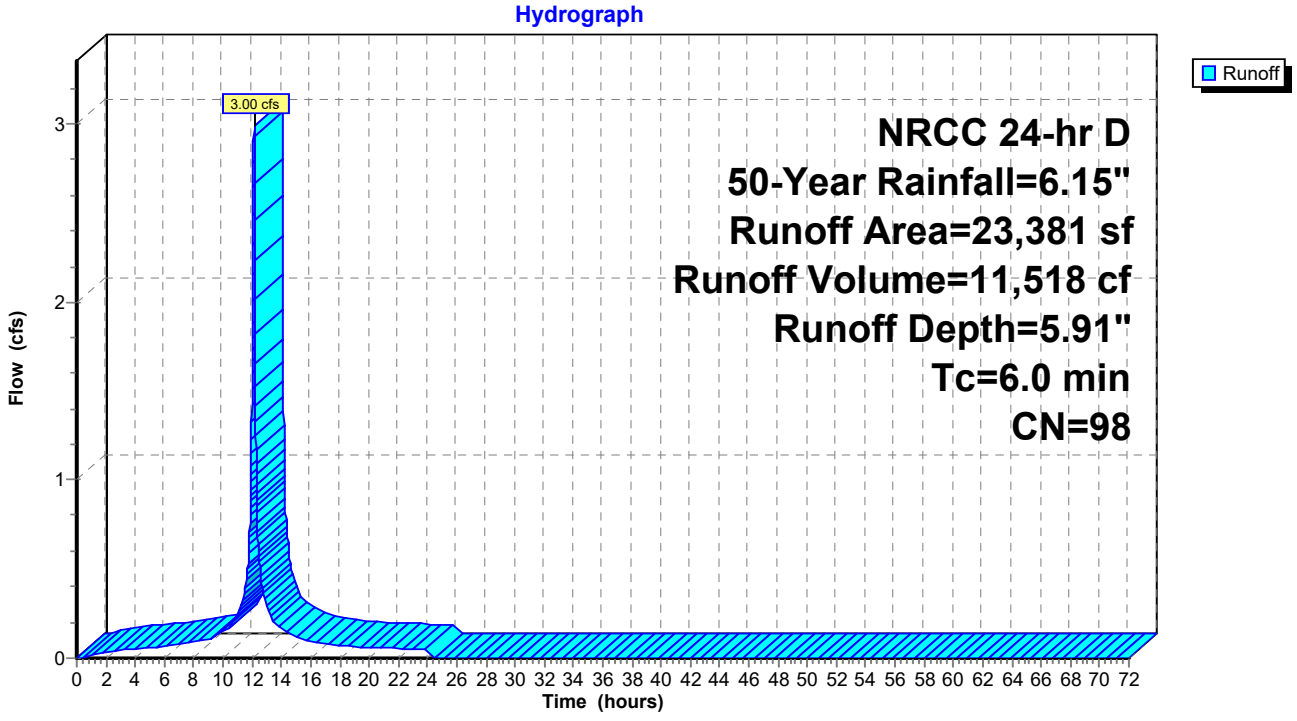
Runoff = 3.00 cfs @ 12.13 hrs, Volume= 11,518 cf, Depth= 5.91"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
3,396	98	Roofs, HSG B
19,985	98	Unconnected pavement, HSG B
23,381	98	Weighted Average
23,381		100.00% Impervious Area
19,985		85.48% Unconnected

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

Subcatchment 7: Sub-catchment 7



Summary for Subcatchment 8: Sub-catchment 8

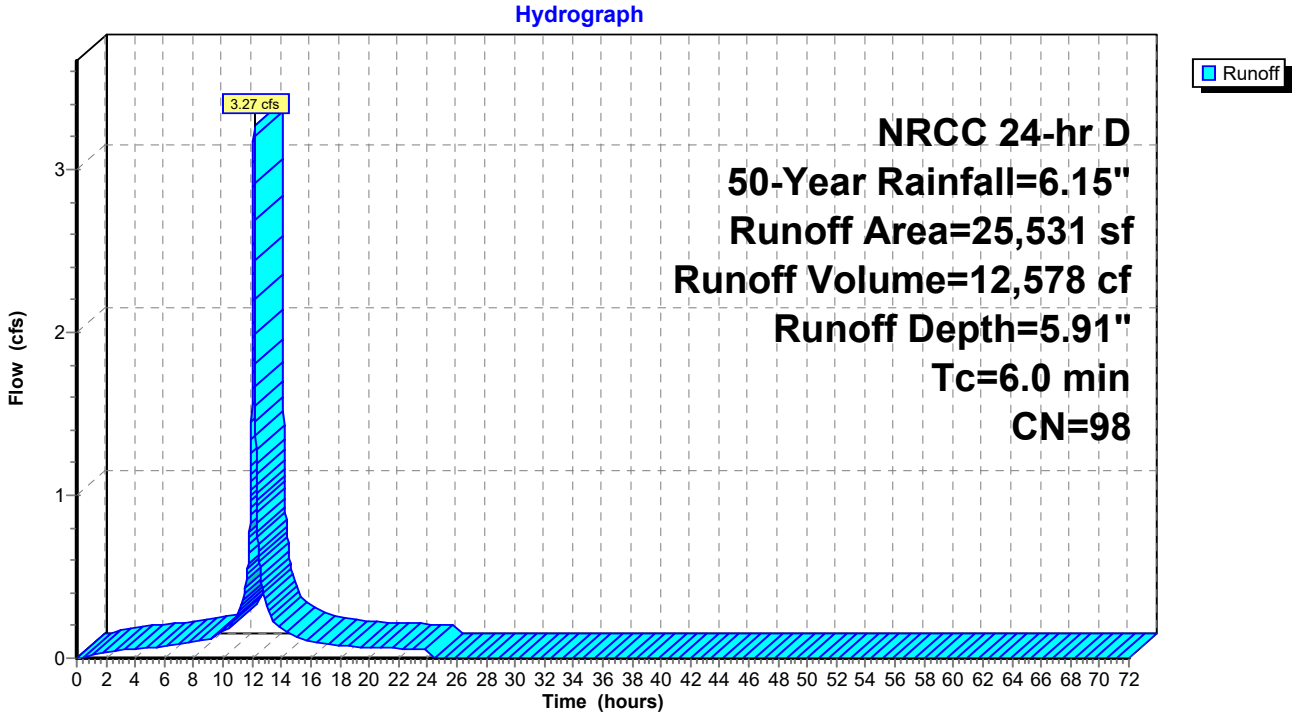
Runoff = 3.27 cfs @ 12.13 hrs, Volume= 12,578 cf, Depth= 5.91"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
2,117	98	Roofs, HSG B
23,414	98	Unconnected pavement, HSG B
25,531	98	Weighted Average
25,531		100.00% Impervious Area
23,414		91.71% Unconnected

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

Subcatchment 8: Sub-catchment 8



Summary for Subcatchment 9: Sub-catchment 9

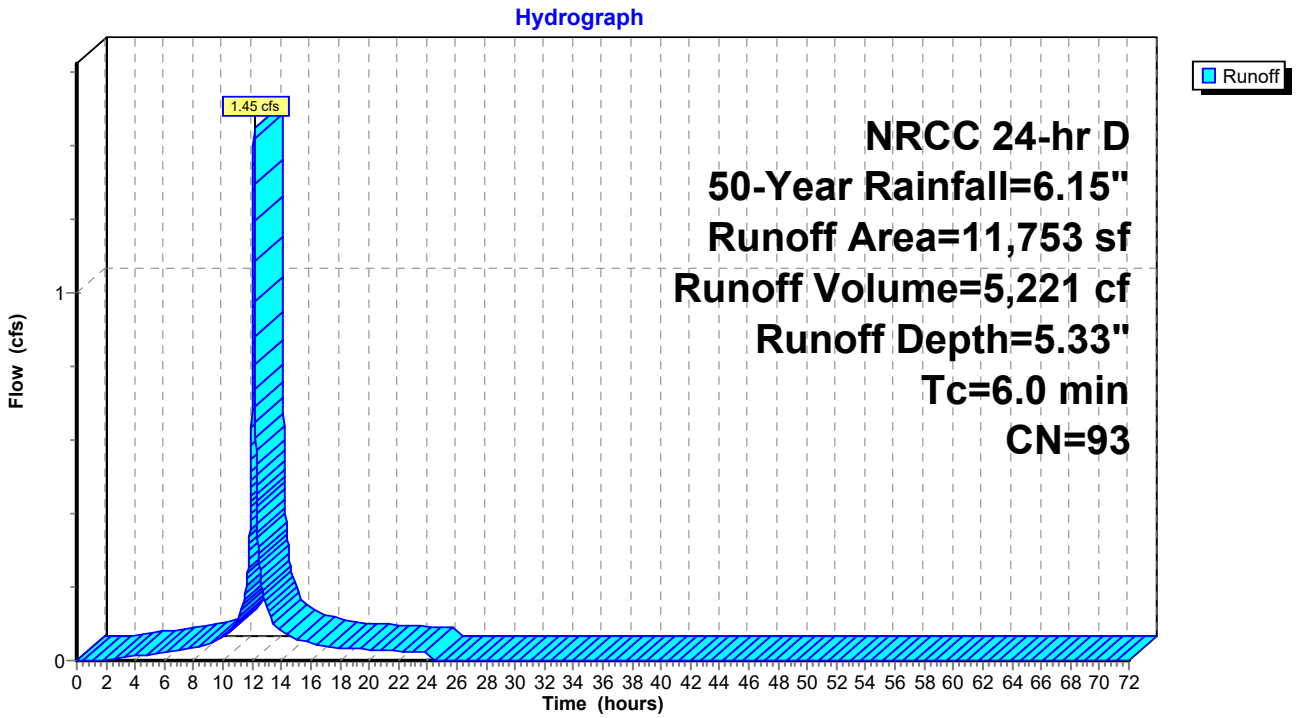
Runoff = 1.45 cfs @ 12.13 hrs, Volume= 5,221 cf, Depth= 5.33"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
3,069	79	<50% Grass cover, Poor, HSG B
8,684	98	Unconnected pavement, HSG B
11,753	93	Weighted Average
3,069		26.11% Pervious Area
8,684		73.89% Impervious Area
8,684		100.00% Unconnected

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

Subcatchment 9: Sub-catchment 9



Summary for Subcatchment 10: Sub-catchment 10

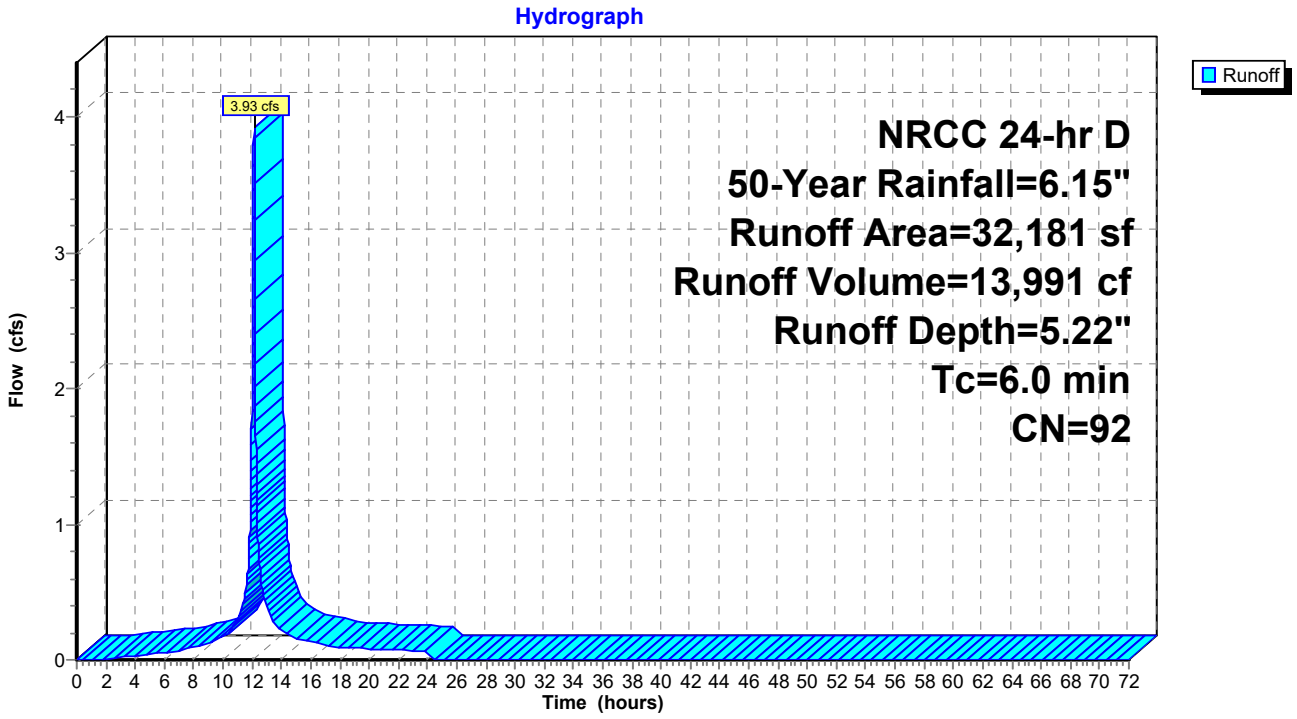
Runoff = 3.93 cfs @ 12.13 hrs, Volume= 13,991 cf, Depth= 5.22"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
10,491	79	<50% Grass cover, Poor, HSG B
6,760	98	Roofs, HSG B
14,930	98	Unconnected pavement, HSG B
32,181	92	Weighted Average
10,491		32.60% Pervious Area
21,690		67.40% Impervious Area
14,930		68.83% Unconnected

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

Subcatchment 10: Sub-catchment 10



Summary for Subcatchment 11: Sub-catchment 11

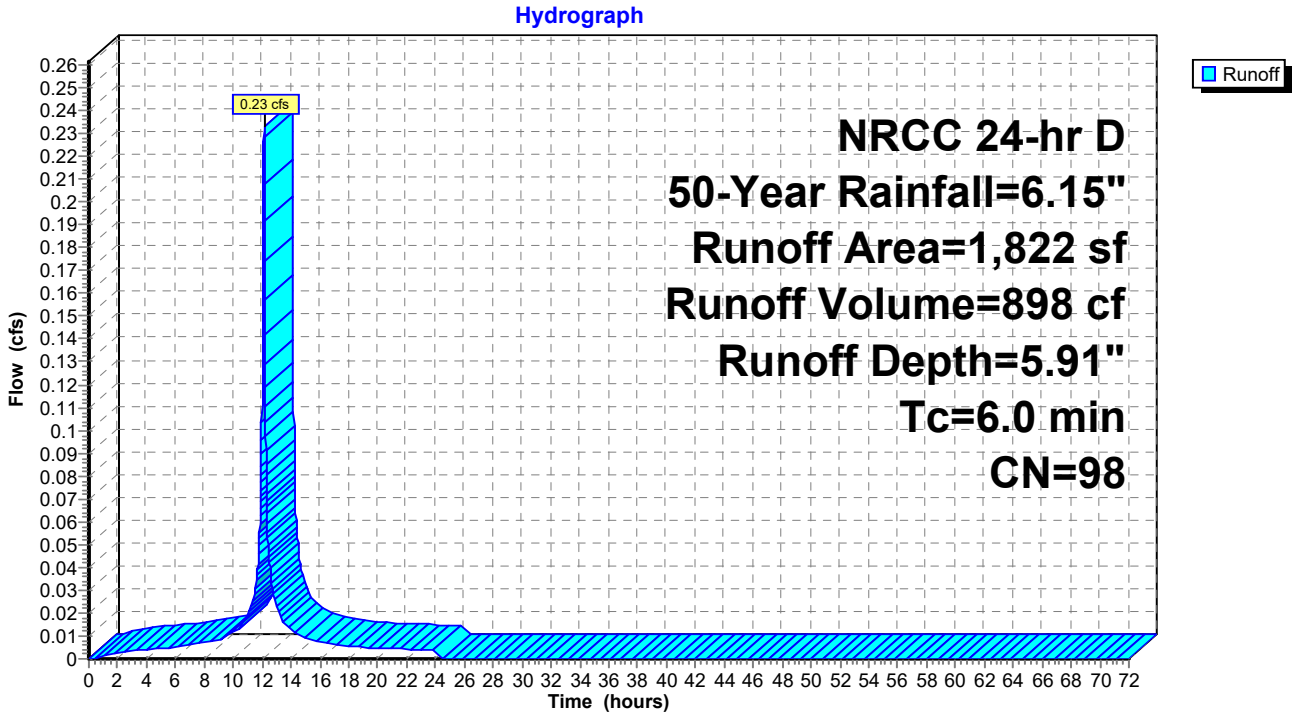
Runoff = 0.23 cfs @ 12.13 hrs, Volume= 898 cf, Depth= 5.91"
Routed to Pond 1P : EX OWS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
1,822	98	Roofs, HSG B
1,822		100.00% Impervious Area

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

Subcatchment 11: Sub-catchment 11



Summary for Subcatchment 12: Sub-catchment 12

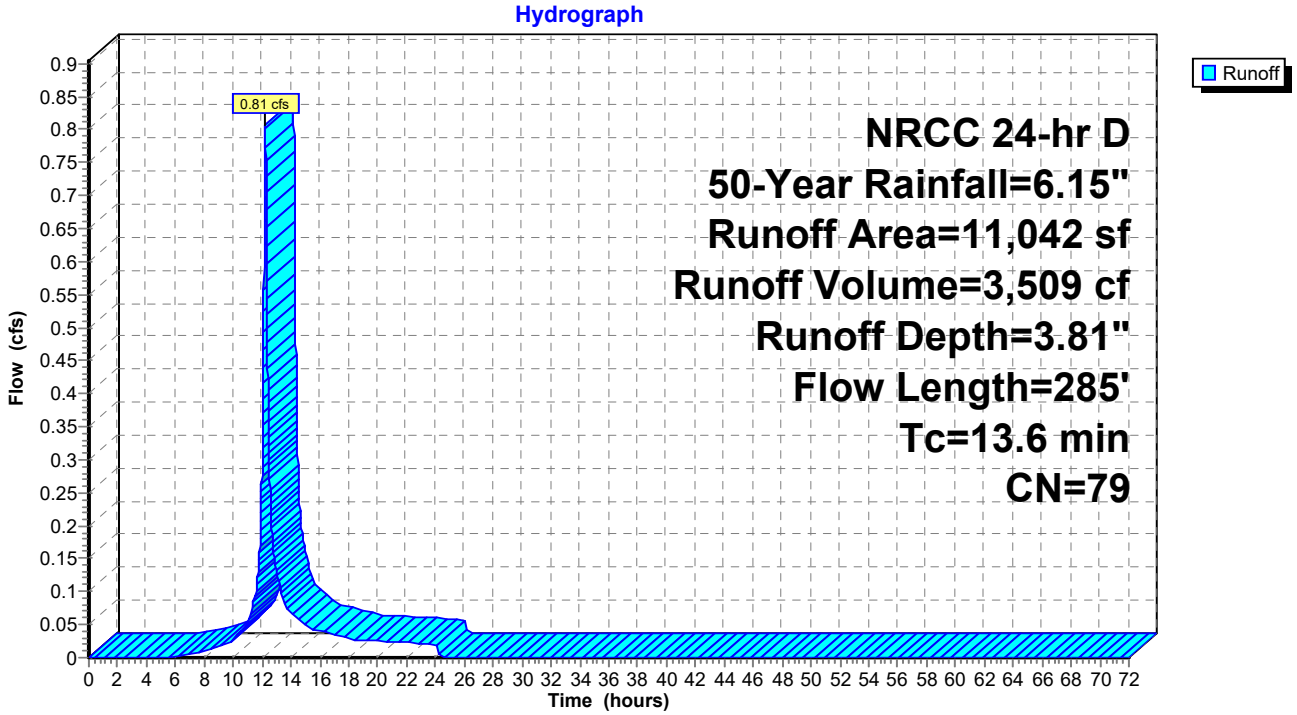
Runoff = 0.81 cfs @ 12.21 hrs, Volume= 3,509 cf, Depth= 3.81"
Routed to Link DP-2 : DP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
74	98	Unconnected pavement, HSG B
10,968	79	<50% Grass cover, Poor, HSG B
11,042	79	Weighted Average
10,968		99.33% Pervious Area
74		0.67% Impervious Area
74		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.0120	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
1.6	185	0.0150	1.97		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.6	285	Total			

Subcatchment 12: Sub-catchment 12



Summary for Pond 1P: EX OWS

[93] Warning: Storage range exceeded by 11.86'
[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 235,097 sf, 94.23% Impervious, Inflow Depth = 5.79" for 50-Year event
Inflow = 29.88 cfs @ 12.13 hrs, Volume= 113,386 cf
Outflow = 29.94 cfs @ 12.13 hrs, Volume= 113,387 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.74 cfs @ 12.13 hrs, Volume= 73,058 cf
Routed to Link DP-1 : DP-1
Secondary = 26.20 cfs @ 12.13 hrs, Volume= 40,329 cf
Routed to Link DP-1 : DP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 243.00' @ 12.13 hrs Surf.Area= 2,775 sf Storage= 3,676 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 14.6 min (767.6 - 753.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	227.14'	0 cf	**53.75'W x 51.62'L x 4.00'H Field A** 11,098 cf Overall - 4,587 cf Embedded = 6,511 cf x 0.0% Voids
#2A	227.14'	3,676 cf	**ADS N-12 36"** x 20 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf Row Length Adjustment= +1.62' x 7.10 sf x 10 rows 50.75' Header x 7.10 sf x 2 = 720.6 cf Inside
		3,676 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	227.14'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	227.14'	**16.0" Round Culvert** L= 36.0' Ke= 0.500 Inlet / Outlet Invert= 227.14' / 227.10' S= 0.0011 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.40 sf
#3	Device 2	230.14'	**9.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=3.73 cfs @ 12.13 hrs HW=242.96' TW=0.00' (Dynamic Tailwater)
└**1=Orifice/Grate** (Orifice Controls 3.73 cfs @ 19.00 fps)

Secondary OutFlow Max=26.17 cfs @ 12.13 hrs HW=242.96' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Inlet Controls 26.17 cfs @ 18.74 fps)
└**3=Broad-Crested Rectangular Weir** (Passes 26.17 cfs of 1,371.93 cfs potential flow)

Pond 1P: EX OWS - Chamber Wizard Field A

Chamber Model = ADS N-12 36" (ADS N-12® Pipe)
Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf
Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf
Row Length Adjustment= +1.62' x 7.10 sf x 10 rows

42.0" Wide + 21.0" Spacing = 63.0" C-C Row Spacing

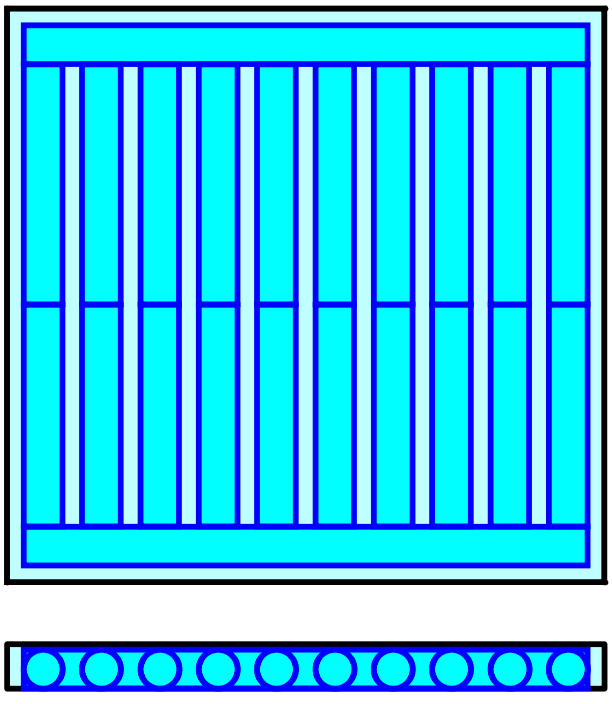
2 Chambers/Row x 20.00' Long +1.62' Row Adjustment +3.50' Header x 2 = 48.62' Row Length +18.0" End Stone x 2 = 51.62' Base Length
10 Rows x 42.0" Wide + 21.0" Spacing x 9 + 18.0" Side Stone x 2 = 53.75' Base Width
42.0" Chamber Height + 6.0" Stone Cover = 4.00' Field Height

20 Chambers x 142.0 cf +1.62' Row Adjustment x 7.10 sf x 10 Rows + 50.75' Header x 7.10 sf x 2 = 3,675.7 cf Chamber Storage
20 Chambers x 177.1 cf +1.62' Row Adjustment x 8.86 sf x 10 Rows + 50.75' Header x 8.86 sf x 2 = 4,585.4 cf Displacement

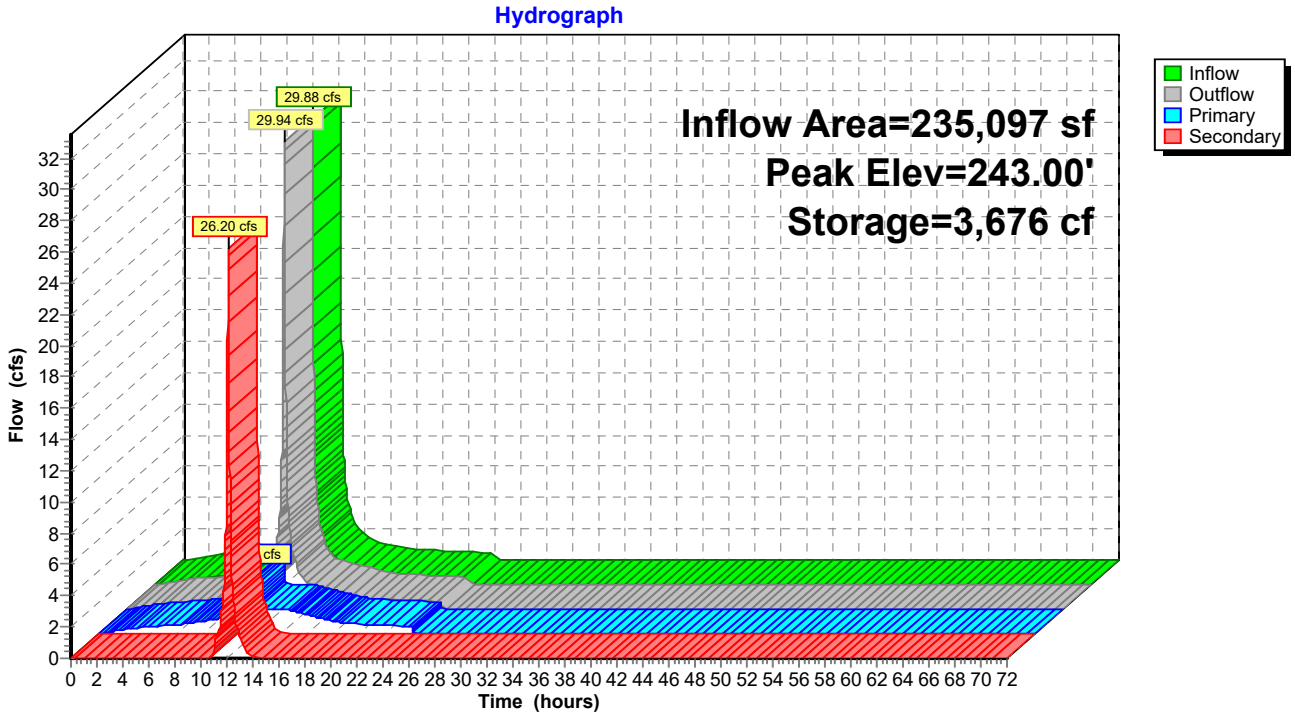
11,098.3 cf Field - 4,585.4 cf Chambers = 6,512.9 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 3,675.7 cf = 0.084 af
Overall Storage Efficiency = 33.1%
Overall System Size = 51.62' x 53.75' x 4.00'

20 Chambers
411.0 cy Field
241.2 cy Stone



Pond 1P: EX OWS

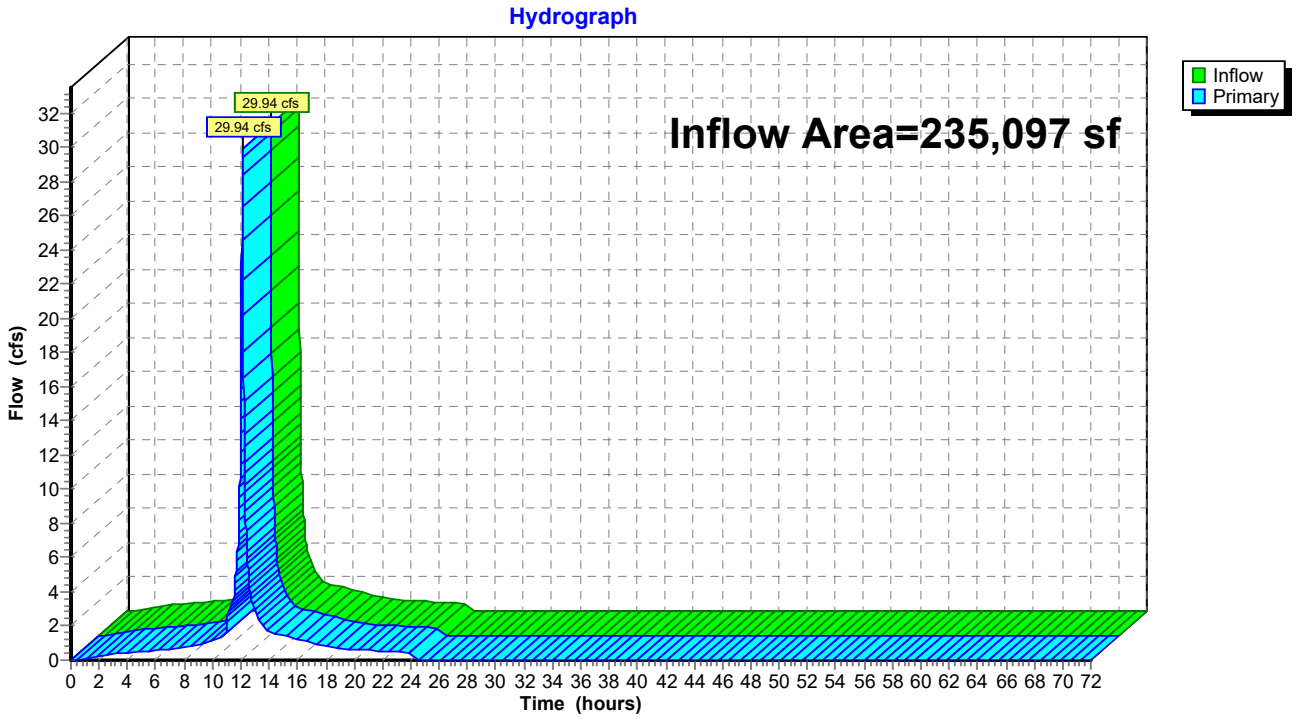


Summary for Link DP-1: DP-1

Inflow Area = 235,097 sf, 94.23% Impervious, Inflow Depth = 5.79" for 50-Year event
Inflow = 29.94 cfs @ 12.13 hrs, Volume= 113,387 cf
Primary = 29.94 cfs @ 12.13 hrs, Volume= 113,387 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: DP-1

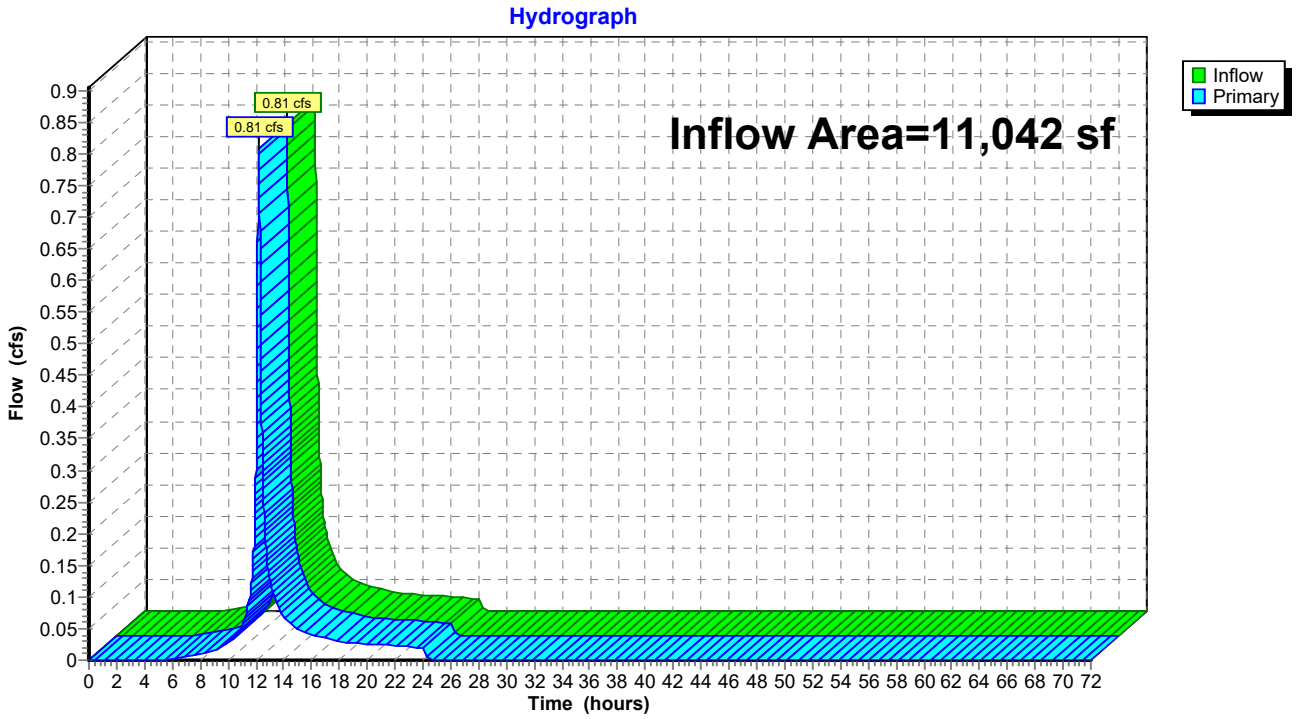


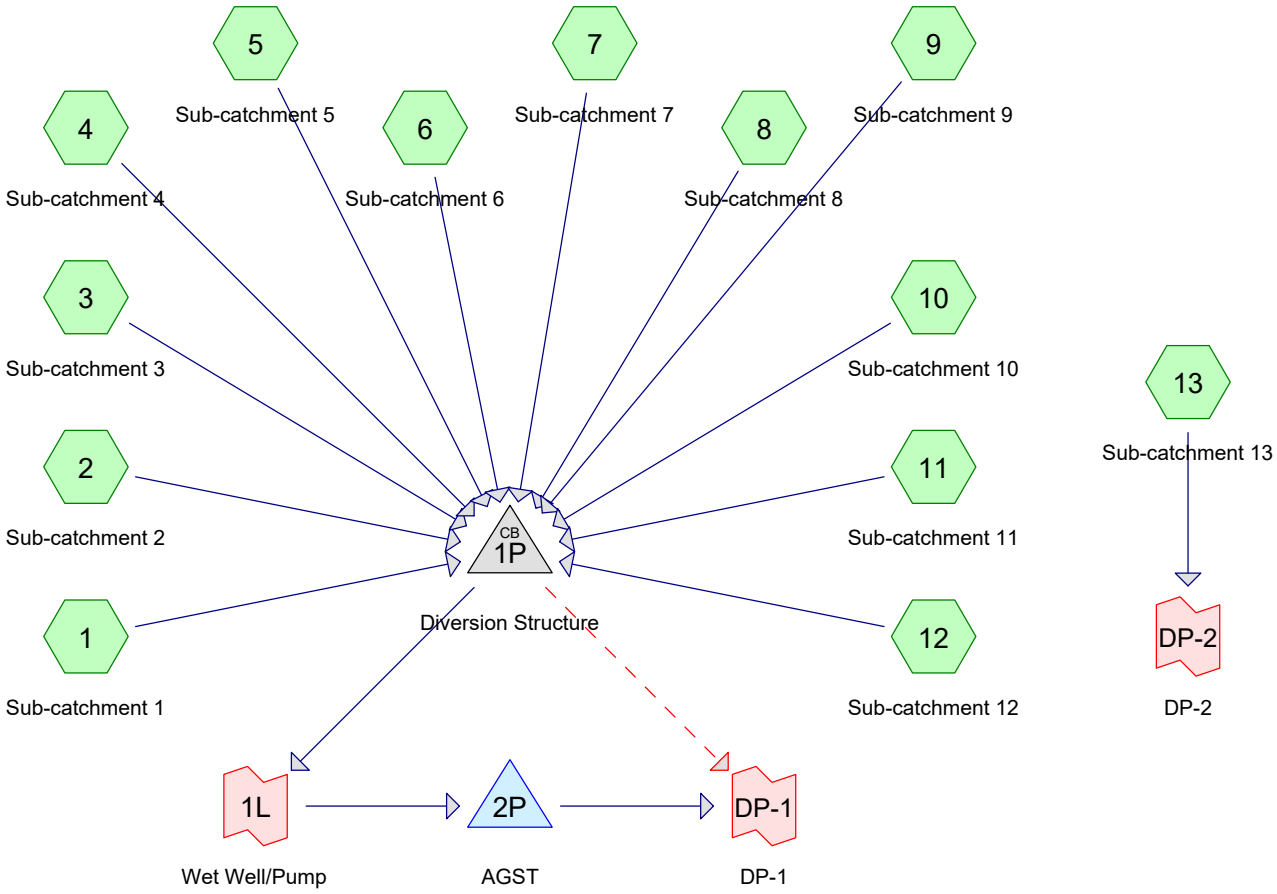
Summary for Link DP-2: DP-2

Inflow Area = 11,042 sf, 0.67% Impervious, Inflow Depth = 3.81" for 50-Year event
Inflow = 0.81 cfs @ 12.21 hrs, Volume= 3,509 cf
Primary = 0.81 cfs @ 12.21 hrs, Volume= 3,509 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: DP-2





Subcat Reach Pond Link

Routing Diagram for Sandquist Proposed Conditions
Prepared by Woodard & Curran, Inc, Printed 10/20/2025
HydroCAD® 10.20-5c s/n 01204 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	WQV	NRCC 24-hr	D	Default	24.00	1	1.27	2
2	2-Year	NRCC 24-hr	D	Default	24.00	1	2.82	2
3	10-Year	NRCC 24-hr	D	Default	24.00	1	4.16	2
4	50-Year	NRCC 24-hr	D	Default	24.00	1	6.15	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
17,393	79	<50% Grass cover, Poor, HSG B (4, 10, 12)
4,231	61	>75% Grass cover, Good, HSG B (13)
43,788	98	Roofs, HSG B (1, 2, 3, 4, 5, 7, 8, 10)
180,727	98	Unconnected pavement, HSG B (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12)
246,139	**96**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
246,139	HSG B	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
0	HSG C	
0	HSG D	
0	Other	
246,139		**TOTAL AREA**

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	1	0.00	0.00	257.0	0.0020	0.012	0.0	18.0	0.0	
2	1	0.00	0.00	85.0	0.0020	0.012	0.0	30.0	0.0	
3	1	0.00	0.00	35.0	0.0020	0.012	0.0	30.0	0.0	
4	1	0.00	0.00	97.0	0.0020	0.012	0.0	30.0	0.0	
5	1	0.00	0.00	64.0	0.0020	0.012	0.0	30.0	0.0	
6	1	0.00	0.00	103.0	0.0200	0.012	0.0	30.0	0.0	
7	1	0.00	0.00	52.0	0.0200	0.012	0.0	30.0	0.0	
8	1	0.00	0.00	9.0	0.0200	0.012	0.0	30.0	0.0	
9	2	0.00	0.00	80.0	0.0010	0.012	0.0	10.0	0.0	
10	2	0.00	0.00	76.0	0.0120	0.012	0.0	10.0	0.0	
11	2	0.00	0.00	47.0	0.0020	0.012	0.0	18.0	0.0	
12	2	0.00	0.00	257.0	0.0020	0.012	0.0	18.0	0.0	
13	2	0.00	0.00	85.0	0.0020	0.012	0.0	30.0	0.0	
14	2	0.00	0.00	35.0	0.0020	0.012	0.0	30.0	0.0	
15	2	0.00	0.00	97.0	0.0020	0.012	0.0	30.0	0.0	
16	2	0.00	0.00	64.0	0.0020	0.012	0.0	30.0	0.0	
17	2	0.00	0.00	103.0	0.0200	0.012	0.0	30.0	0.0	
18	2	0.00	0.00	52.0	0.0200	0.012	0.0	30.0	0.0	
19	2	0.00	0.00	9.0	0.0200	0.012	0.0	30.0	0.0	
20	3	0.00	0.00	10.0	0.0012	0.012	0.0	10.0	0.0	
21	3	0.00	0.00	76.0	0.0120	0.012	0.0	10.0	0.0	
22	3	0.00	0.00	47.0	0.0020	0.012	0.0	18.0	0.0	
23	3	0.00	0.00	257.0	0.0020	0.012	0.0	18.0	0.0	
24	3	0.00	0.00	85.0	0.0020	0.012	0.0	30.0	0.0	
25	3	0.00	0.00	35.0	0.0020	0.012	0.0	30.0	0.0	
26	3	0.00	0.00	97.0	0.0020	0.012	0.0	30.0	0.0	
27	3	0.00	0.00	64.0	0.0020	0.012	0.0	30.0	0.0	
28	3	0.00	0.00	103.0	0.0200	0.012	0.0	30.0	0.0	
29	3	0.00	0.00	52.0	0.0200	0.012	0.0	30.0	0.0	
30	3	0.00	0.00	9.0	0.0200	0.012	0.0	30.0	0.0	
31	4	0.00	0.00	10.0	0.0020	0.012	0.0	18.0	0.0	
32	4	0.00	0.00	85.0	0.0020	0.012	0.0	30.0	0.0	
33	4	0.00	0.00	35.0	0.0020	0.012	0.0	30.0	0.0	
34	4	0.00	0.00	97.0	0.0020	0.012	0.0	30.0	0.0	
35	4	0.00	0.00	64.0	0.0020	0.012	0.0	30.0	0.0	
36	4	0.00	0.00	103.0	0.0200	0.012	0.0	30.0	0.0	
37	4	0.00	0.00	52.0	0.0200	0.012	0.0	30.0	0.0	
38	4	0.00	0.00	9.0	0.0200	0.012	0.0	30.0	0.0	
39	5	0.00	0.00	85.0	0.0020	0.012	0.0	12.0	0.0	
40	5	0.00	0.00	35.0	0.0020	0.012	0.0	30.0	0.0	
41	5	0.00	0.00	97.0	0.0020	0.012	0.0	30.0	0.0	

Pipe Listing (all nodes) (continued)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
42	5	0.00	0.00	64.0	0.0020	0.012	0.0	30.0	0.0	
43	5	0.00	0.00	103.0	0.0200	0.012	0.0	30.0	0.0	
44	5	0.00	0.00	52.0	0.0200	0.012	0.0	30.0	0.0	
45	5	0.00	0.00	9.0	0.0200	0.012	0.0	30.0	0.0	
46	6	0.00	0.00	10.0	0.0050	0.012	0.0	10.0	0.0	
47	6	0.00	0.00	97.0	0.0020	0.012	0.0	30.0	0.0	
48	6	0.00	0.00	64.0	0.0020	0.012	0.0	30.0	0.0	
49	6	0.00	0.00	103.0	0.0200	0.012	0.0	30.0	0.0	
50	6	0.00	0.00	52.0	0.0200	0.012	0.0	30.0	0.0	
51	6	0.00	0.00	9.0	0.0200	0.012	0.0	30.0	0.0	
52	7	0.00	0.00	10.0	0.0050	0.012	0.0	18.0	0.0	
53	7	0.00	0.00	64.0	0.0020	0.012	0.0	30.0	0.0	
54	7	0.00	0.00	103.0	0.0200	0.012	0.0	30.0	0.0	
55	7	0.00	0.00	52.0	0.0200	0.012	0.0	30.0	0.0	
56	7	0.00	0.00	9.0	0.0200	0.012	0.0	30.0	0.0	
57	8	0.00	0.00	10.0	0.0050	0.012	0.0	18.0	0.0	
58	8	0.00	0.00	103.0	0.0200	0.012	0.0	30.0	0.0	
59	8	0.00	0.00	52.0	0.0200	0.012	0.0	30.0	0.0	
60	8	0.00	0.00	9.0	0.0200	0.012	0.0	30.0	0.0	
61	9	0.00	0.00	45.0	0.0050	0.012	0.0	12.0	0.0	
62	9	0.00	0.00	9.0	0.0200	0.012	0.0	30.0	0.0	
63	10	0.00	0.00	114.0	0.0050	0.012	0.0	12.0	0.0	
64	10	0.00	0.00	52.0	0.0200	0.012	0.0	30.0	0.0	
65	10	0.00	0.00	9.0	0.0200	0.012	0.0	30.0	0.0	
66	11	0.00	0.00	59.0	0.0020	0.012	0.0	12.0	0.0	
67	11	0.00	0.00	39.0	0.0050	0.012	0.0	15.0	0.0	
68	11	0.00	0.00	47.0	0.0020	0.012	0.0	18.0	0.0	
69	11	0.00	0.00	257.0	0.0020	0.012	0.0	18.0	0.0	
70	11	0.00	0.00	85.0	0.0020	0.012	0.0	30.0	0.0	
71	11	0.00	0.00	35.0	0.0020	0.012	0.0	30.0	0.0	
72	11	0.00	0.00	97.0	0.0020	0.012	0.0	30.0	0.0	
73	11	0.00	0.00	64.0	0.0020	0.012	0.0	30.0	0.0	
74	11	0.00	0.00	103.0	0.0200	0.012	0.0	30.0	0.0	
75	11	0.00	0.00	52.0	0.0200	0.012	0.0	30.0	0.0	
76	11	0.00	0.00	9.0	0.0200	0.012	0.0	30.0	0.0	
77	12	0.00	0.00	26.0	0.0050	0.012	0.0	12.0	0.0	
78	1P	226.32	226.28	7.7	0.0052	0.012	0.0	24.0	0.0	
79	1P	226.38	226.24	27.0	0.0052	0.012	0.0	30.0	0.0	

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Sub-catchment1 Runoff Area=33,590 sf 100.00% Impervious Runoff Depth=1.05"
Flow Length=851' Tc=6.0 min CN=98 Runoff=0.84 cfs 2,951 cf

Subcatchment2: Sub-catchment2 Runoff Area=7,467 sf 100.00% Impervious Runoff Depth=1.05"
Flow Length=946' Tc=6.0 min CN=98 Runoff=0.19 cfs 656 cf

Subcatchment3: Sub-catchment3 Runoff Area=7,120 sf 100.00% Impervious Runoff Depth=1.05"
Flow Length=897' Tc=6.0 min CN=98 Runoff=0.18 cfs 625 cf

Subcatchment4: Sub-catchment4 Runoff Area=57,605 sf 97.94% Impervious Runoff Depth=1.05"
Flow Length=632' Tc=6.0 min CN=98 Runoff=1.44 cfs 5,060 cf

Subcatchment5: Sub-catchment5 Runoff Area=14,314 sf 100.00% Impervious Runoff Depth=1.05"
Flow Length=500' Tc=6.0 min CN=98 Runoff=0.36 cfs 1,257 cf

Subcatchment6: Sub-catchment6 Runoff Area=20,333 sf 100.00% Impervious Runoff Depth=1.05"
Flow Length=490' Tc=6.0 min CN=98 Runoff=0.51 cfs 1,786 cf

Subcatchment7: Sub-catchment7 Runoff Area=23,381 sf 100.00% Impervious Runoff Depth=1.05"
Flow Length=393' Tc=6.0 min CN=98 Runoff=0.58 cfs 2,054 cf

Subcatchment8: Sub-catchment8 Runoff Area=25,531 sf 100.00% Impervious Runoff Depth=1.05"
Flow Length=359' Tc=6.0 min CN=98 Runoff=0.64 cfs 2,243 cf

Subcatchment9: Sub-catchment9 Runoff Area=7,621 sf 100.00% Impervious Runoff Depth=1.05"
Flow Length=216' Tc=6.0 min CN=98 Runoff=0.19 cfs 669 cf

Subcatchment10: Sub-catchment10 Runoff Area=29,279 sf 73.39% Impervious Runoff Depth=0.67"
Flow Length=350' Tc=6.0 min CN=93 Runoff=0.50 cfs 1,633 cf

Subcatchment11: Sub-catchment11 Runoff Area=1,822 sf 100.00% Impervious Runoff Depth=1.05"
Flow Length=900' Tc=6.0 min CN=98 Runoff=0.05 cfs 160 cf

Subcatchment12: Sub-catchment12 Runoff Area=13,845 sf 39.23% Impervious Runoff Depth=0.35"
Flow Length=170' Tc=6.0 min CN=86 Runoff=0.12 cfs 400 cf

Subcatchment13: Sub-catchment13 Runoff Area=4,231 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=227' Slope=0.0100 '/' Tc=24.9 min CN=61 Runoff=0.00 cfs 0 cf

Pond 1P: Diversion Structure Peak Elev=227.58' Inflow=5.57 cfs 19,496 cf
Primary=5.57 cfs 19,496 cf Secondary=0.00 cfs 0 cf Outflow=5.57 cfs 19,496 cf

Pond 2P: AGST Peak Elev=236.89' Storage=8,851 cf Inflow=5.57 cfs 19,496 cf
Outflow=0.22 cfs 19,497 cf

Link 1L: Wet Well/Pump Inflow=5.57 cfs 19,496 cf
Primary=5.57 cfs 19,496 cf

Link DP-1: DP-1 Inflow=0.22 cfs 19,497 cf
Primary=0.22 cfs 19,497 cf

Link DP-2: DP-2 Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 246,139 sf Runoff Volume = 19,496 cf Average Runoff Depth = 0.95"
8.79% Pervious = 21,624 sf 91.21% Impervious = 224,515 sf

Summary for Subcatchment 1: Sub-catchment 1

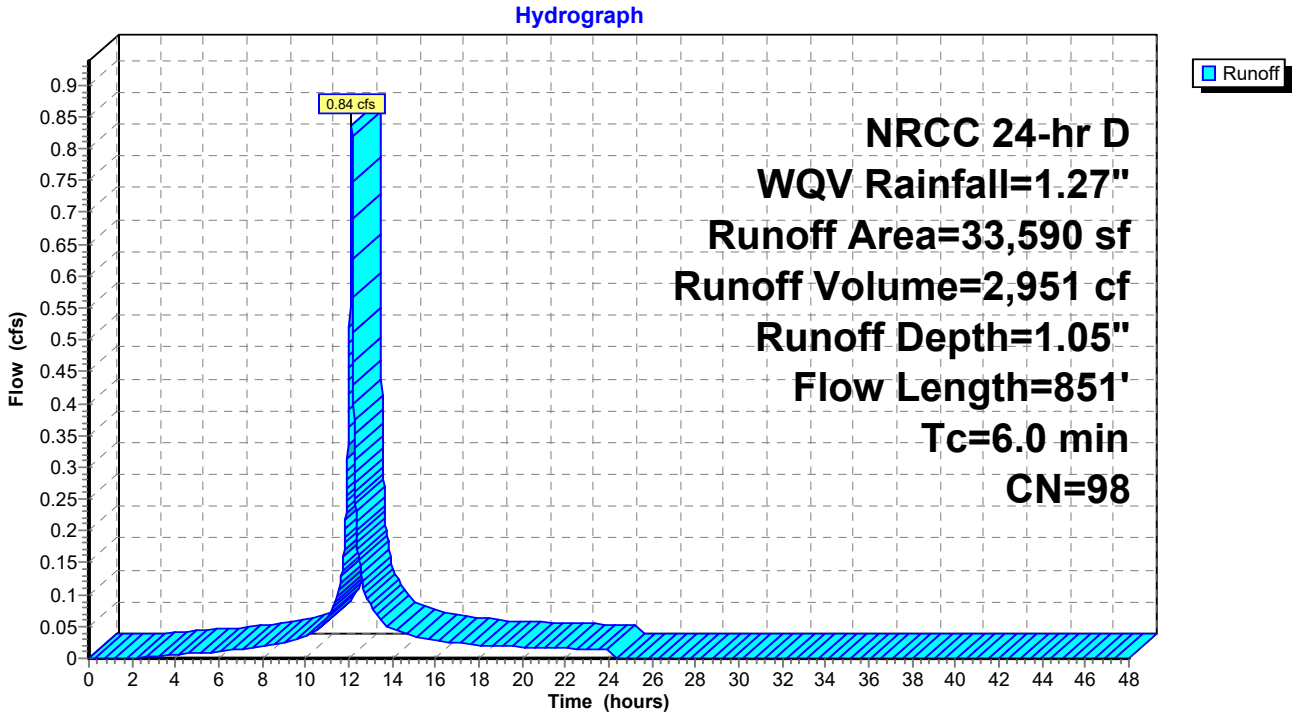
Runoff = 0.84 cfs @ 12.13 hrs, Volume= 2,951 cf, Depth= 1.05"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
15,206	98	Roofs, HSG B
18,384	98	Unconnected pavement, HSG B
33,590	98	Weighted Average
33,590		100.00% Impervious Area
18,384		54.73% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0160	1.26		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.7	49	0.0030	1.11		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	257	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	85	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
4.8	851	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1: Sub-catchment 1



Summary for Subcatchment 2: Sub-catchment 2

Runoff = 0.19 cfs @ 12.13 hrs, Volume= 656 cf, Depth= 1.05"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

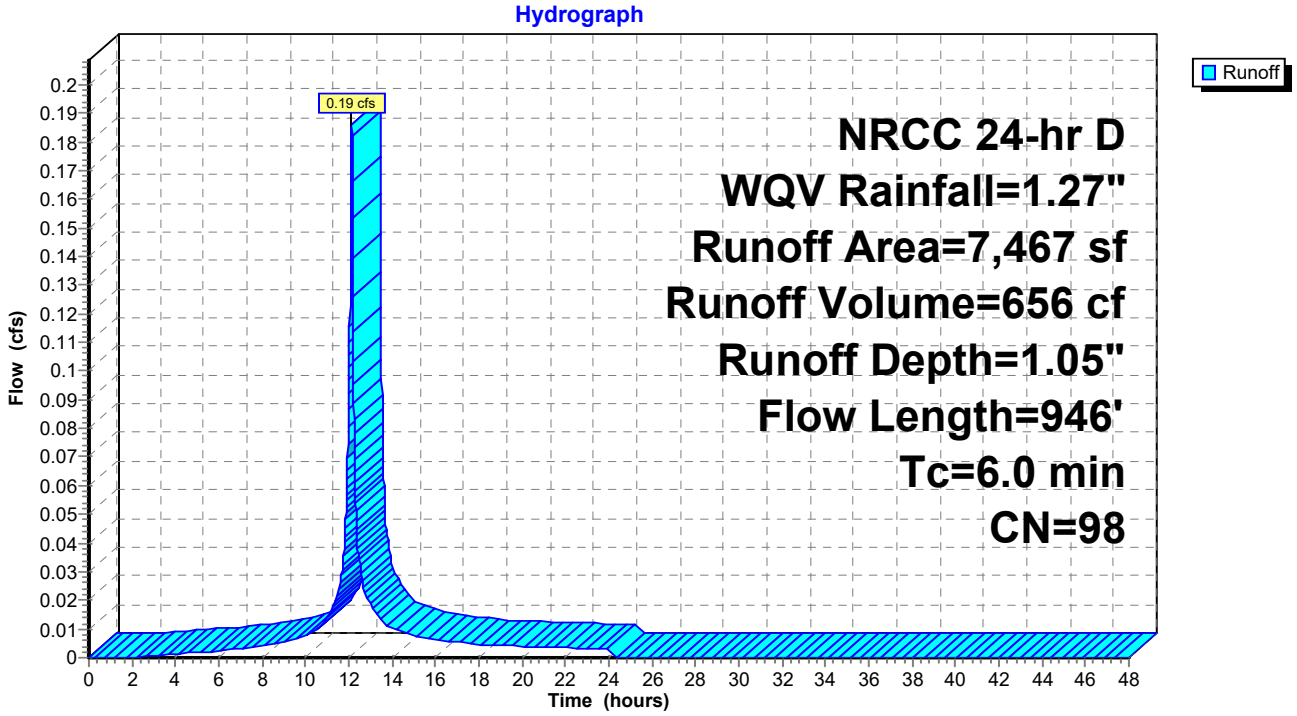
Area (sf)	CN	Description
2,936	98	Roofs, HSG B
4,531	98	Unconnected pavement, HSG B
7,467	98	Weighted Average
7,467		100.00% Impervious Area
4,531		60.68% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	41	0.0140	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
1.0	80	0.0010	1.38	0.75	**Pipe Channel, RCP_Round 10"** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Concrete pipe, finished
0.3	76	0.0120	4.77	2.60	**Pipe Channel, RCP_Round 10"** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Concrete pipe, finished
0.3	47	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.5	257	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	85	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63'

n= 0.012 Concrete pipe, finished

5.1 946 Total, Increased to minimum Tc = 6.0 min

Subcatchment 2: Sub-catchment 2



Summary for Subcatchment 3: Sub-catchment 3

Runoff = 0.18 cfs @ 12.13 hrs, Volume= 625 cf, Depth= 1.05"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

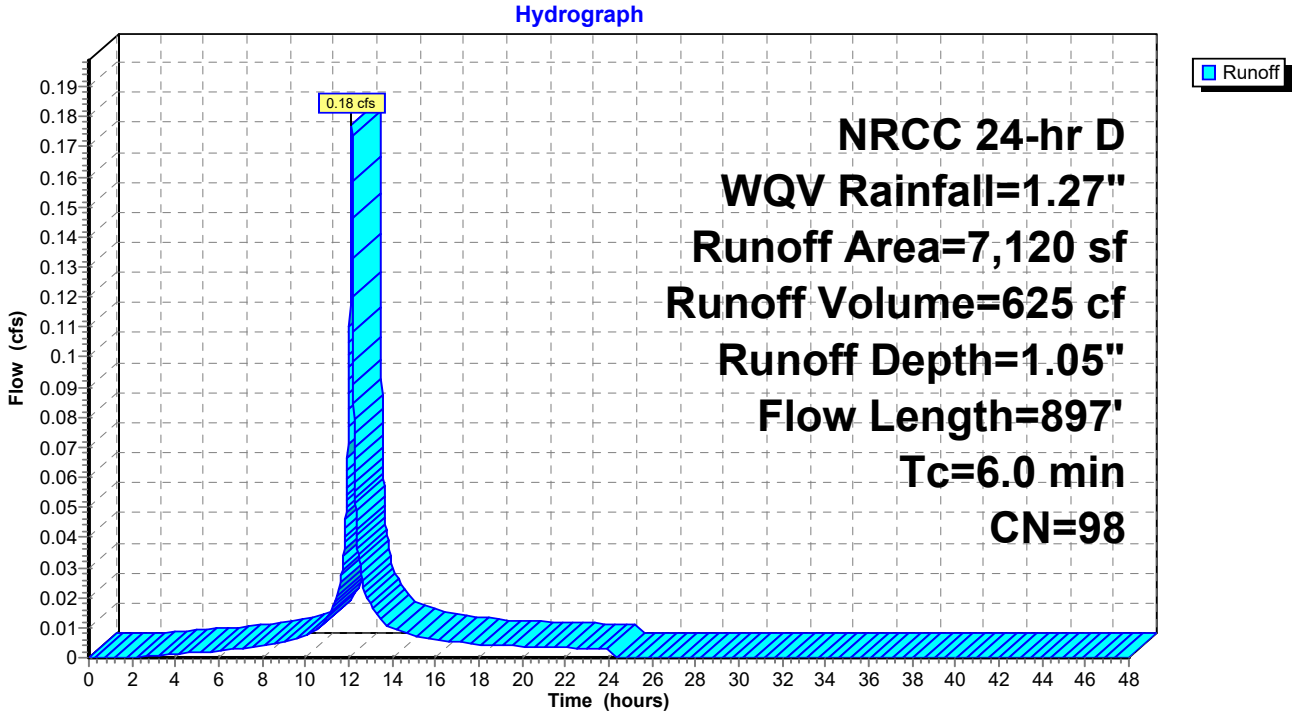
Area (sf)	CN	Description
2,543	98	Roofs, HSG B
4,577	98	Unconnected pavement, HSG B
7,120	98	Weighted Average
7,120		100.00% Impervious Area
4,577		64.28% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	62	0.0030	0.59		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.1	10	0.0012	1.51	0.82	**Pipe Channel, RCP_Round 10"** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Concrete pipe, finished
0.3	76	0.0120	4.77	2.60	**Pipe Channel, RCP_Round 10"** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Concrete pipe, finished
0.3	47	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.5	257	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	85	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63'

n= 0.012 Concrete pipe, finished

5.3 897 Total, Increased to minimum Tc = 6.0 min

Subcatchment 3: Sub-catchment 3



Summary for Subcatchment 4: Sub-catchment 4

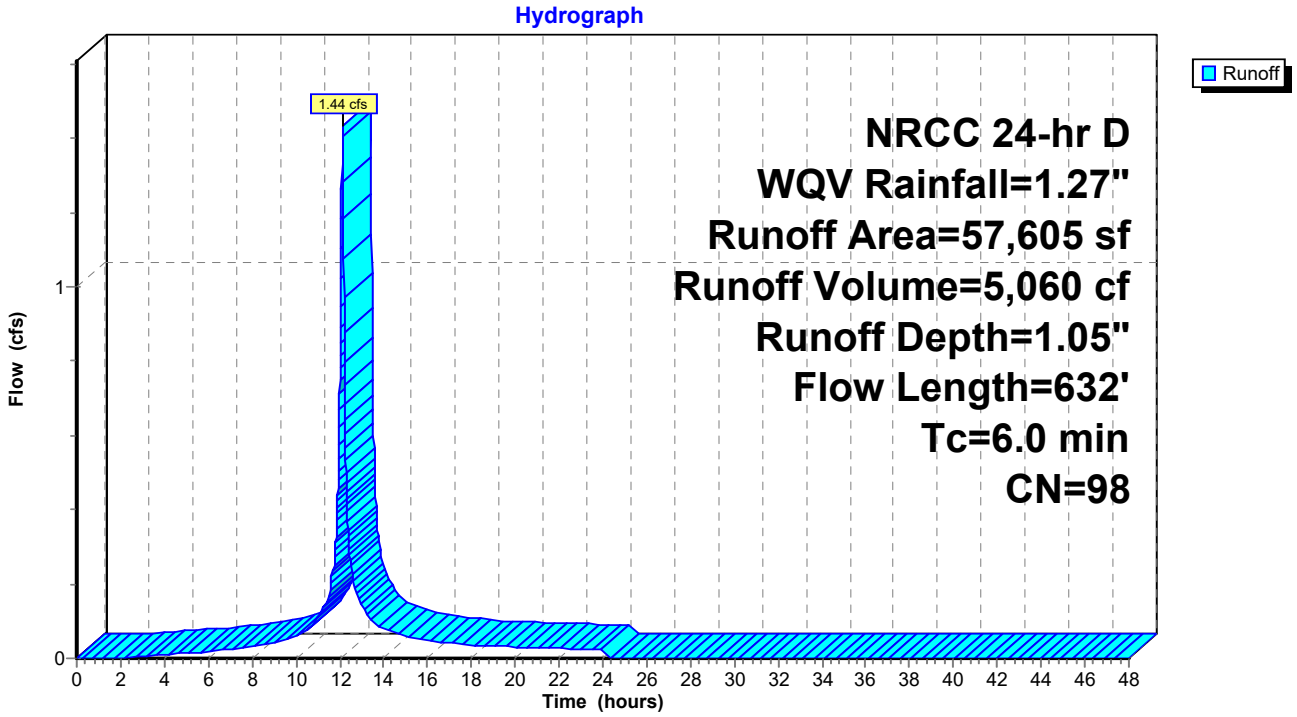
Runoff = 1.44 cfs @ 12.13 hrs, Volume= 5,060 cf, Depth= 1.05"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
5,329	98	Roofs, HSG B
51,087	98	Unconnected pavement, HSG B
1,189	79	<50% Grass cover, Poor, HSG B
57,605	98	Weighted Average
1,189		2.06% Pervious Area
56,416		97.94% Impervious Area
51,087		90.55% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0120	1.12		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.4	77	0.0230	3.08		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	10	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	85	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
3.3	632	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 4: Sub-catchment 4



Summary for Subcatchment 5: Sub-catchment 5

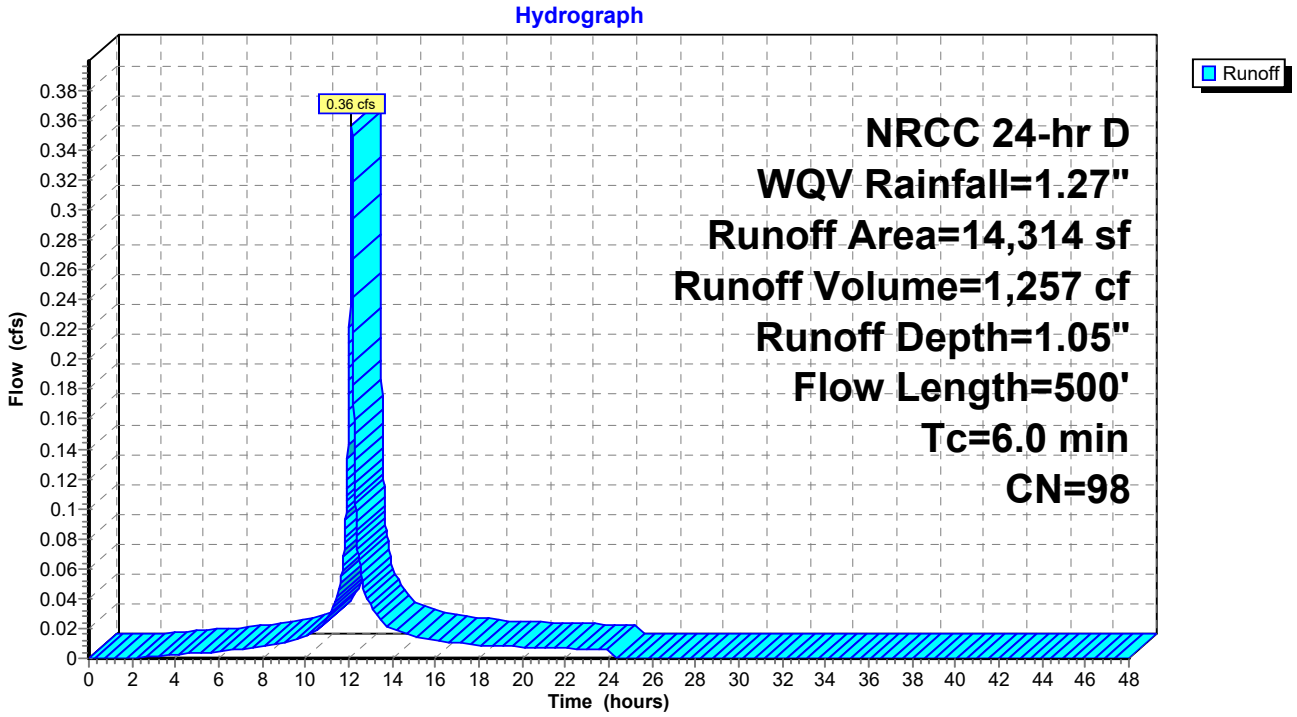
Runoff = 0.36 cfs @ 12.13 hrs, Volume= 1,257 cf, Depth= 1.05"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
5,500	98	Roofs, HSG B
8,814	98	Unconnected pavement, HSG B
14,314	98	Weighted Average
14,314		100.00% Impervious Area
8,814		61.58% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	55	0.0550	1.83		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.6	85	0.0020	2.20	1.73	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
2.1	500	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 5: Sub-catchment 5



Summary for Subcatchment 6: Sub-catchment 6

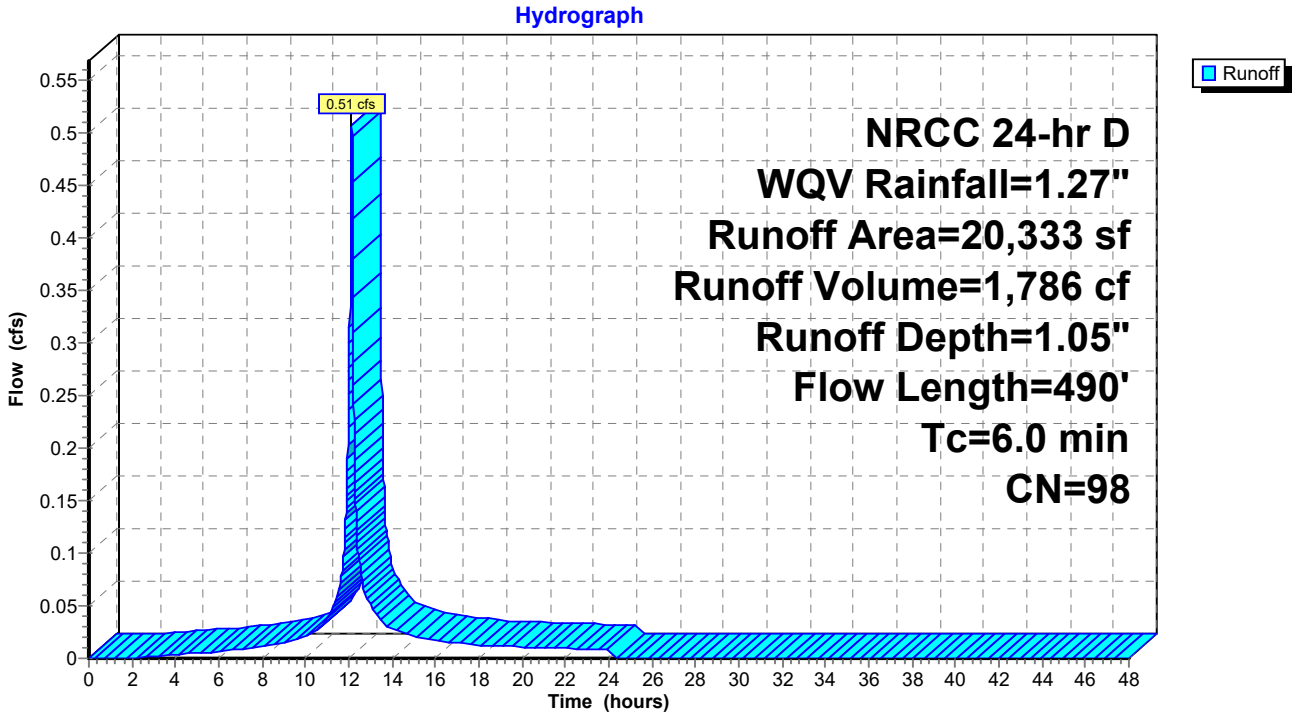
Runoff = 0.51 cfs @ 12.13 hrs, Volume= 1,786 cf, Depth= 1.05"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
20,333	98	Unconnected pavement, HSG B
20,333		100.00% Impervious Area
20,333		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.5	55	0.0090	1.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	10	0.0050	3.08	1.68	**Pipe Channel, RCP_Round 10"** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
3.1	490	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 6: Sub-catchment 6



Summary for Subcatchment 7: Sub-catchment 7

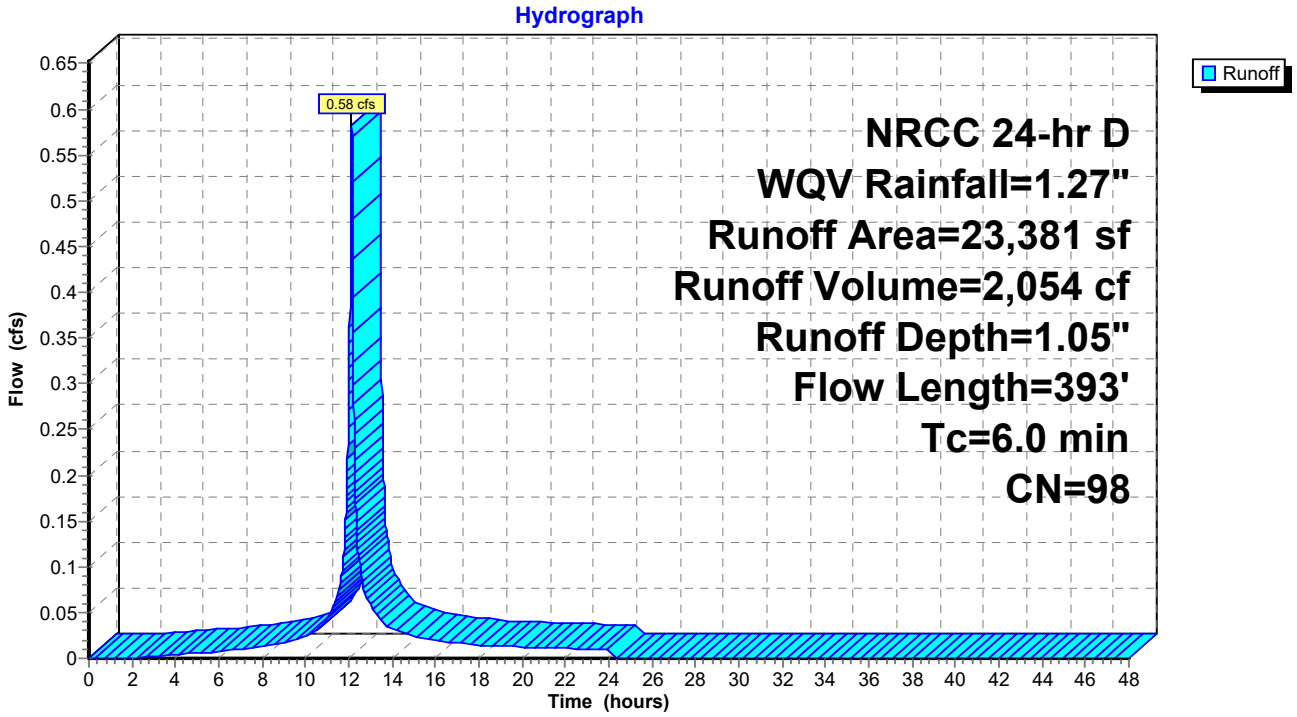
Runoff = 0.58 cfs @ 12.13 hrs, Volume= 2,054 cf, Depth= 1.05"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
19,985	98	Unconnected pavement, HSG B
3,396	98	Roofs, HSG B
23,381	98	Weighted Average
23,381		100.00% Impervious Area
19,985		85.48% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.5	55	0.0090	1.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.0	10	0.0050	4.55	8.05	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
2.6	393	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 7: Sub-catchment 7



Summary for Subcatchment 8: Sub-catchment 8

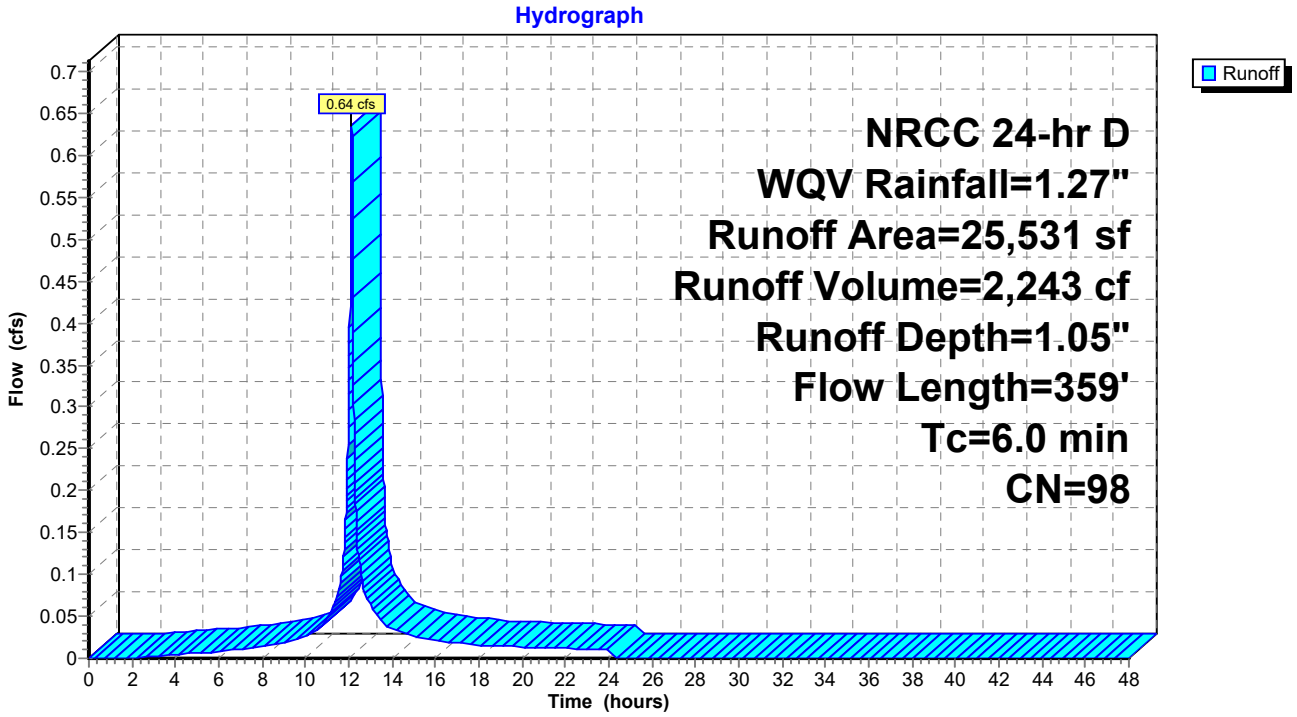
Runoff = 0.64 cfs @ 12.13 hrs, Volume= 2,243 cf, Depth= 1.05"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
23,413	98	Unconnected pavement, HSG B
2,118	98	Roofs, HSG B
25,531	98	Weighted Average
25,531		100.00% Impervious Area
23,413		91.70% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0070	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.6	85	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.0	10	0.0050	4.55	8.05	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
2.6	359	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 8: Sub-catchment 8



Summary for Subcatchment 9: Sub-catchment 9

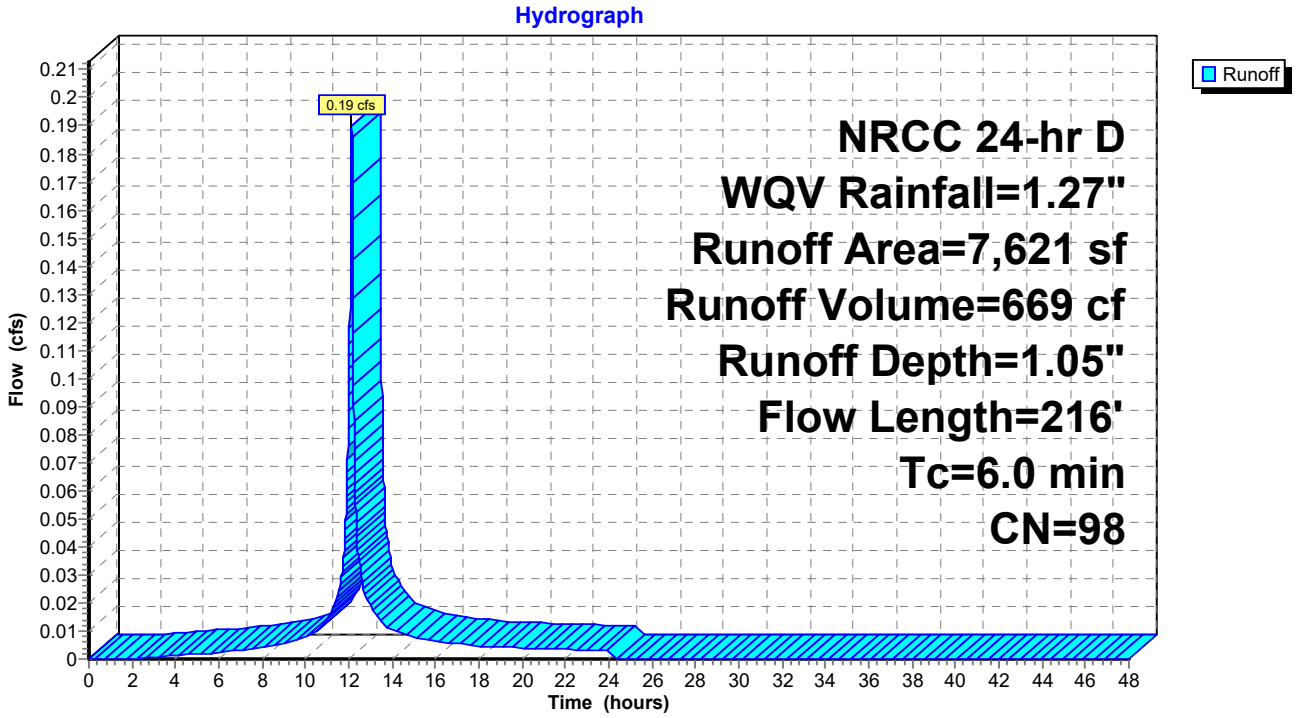
Runoff = 0.19 cfs @ 12.13 hrs, Volume= 669 cf, Depth= 1.05"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
7,621	98	Unconnected pavement, HSG B
7,621		100.00% Impervious Area
7,621		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	100	0.0090	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.7	62	0.0060	1.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	45	0.0050	3.47	2.73	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
2.6	216	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 9: Sub-catchment 9



Summary for Subcatchment 10: Sub-catchment 10

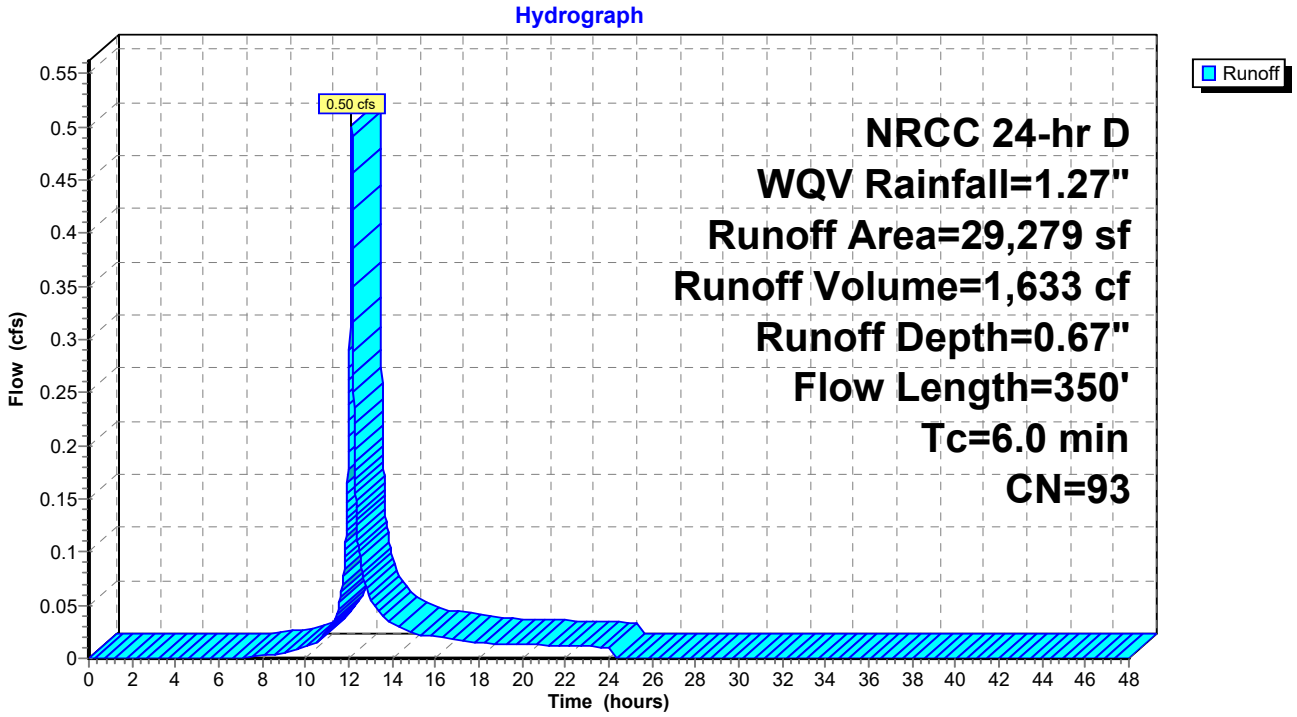
Runoff = 0.50 cfs @ 12.13 hrs, Volume= 1,633 cf, Depth= 0.67"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
14,729	98	Unconnected pavement, HSG B
6,760	98	Roofs, HSG B
7,790	79	<50% Grass cover, Poor, HSG B
29,279	93	Weighted Average
7,790		26.61% Pervious Area
21,489		73.39% Impervious Area
14,729		68.54% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.6	75	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	114	0.0050	3.47	2.73	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
2.8	350	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 10: Sub-catchment 10



Summary for Subcatchment 11: Sub-catchment 11

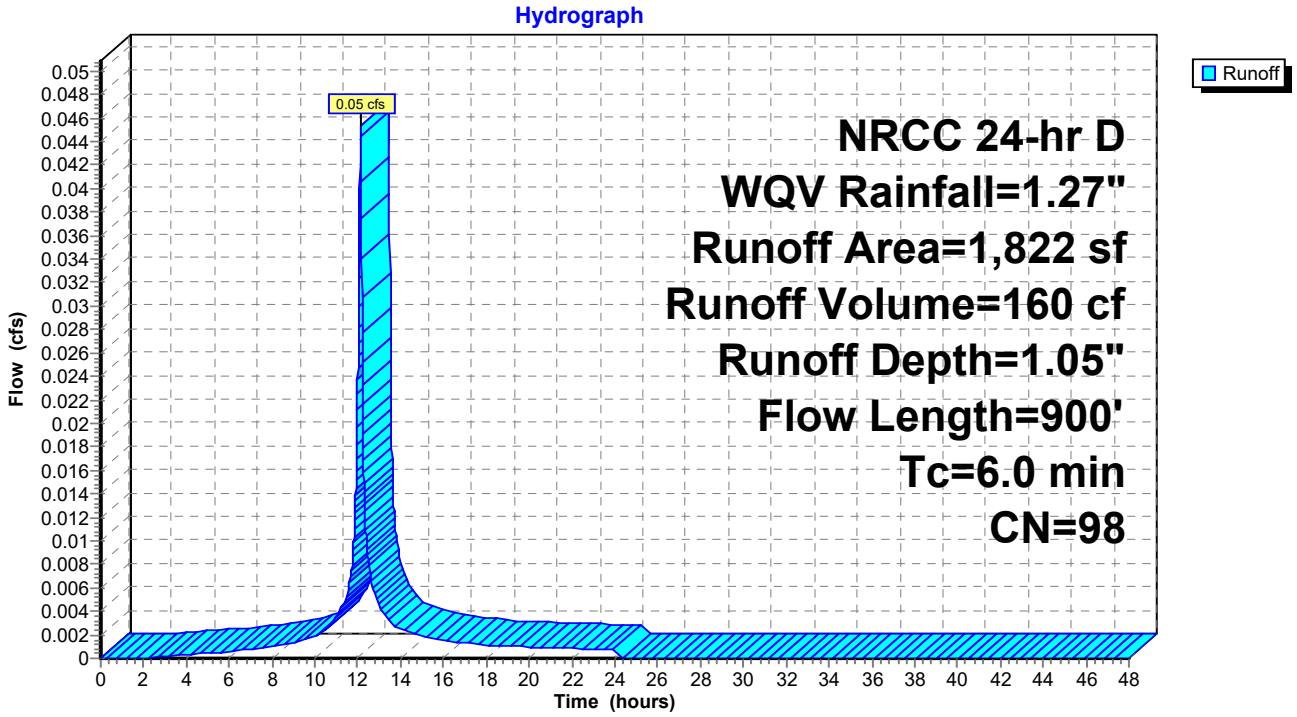
Runoff = 0.05 cfs @ 12.13 hrs, Volume= 160 cf, Depth= 1.05"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
1,822	98	Unconnected pavement, HSG B
1,822		100.00% Impervious Area
1,822		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	53	0.0690	1.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.4	59	0.0020	2.20	1.73	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.2	39	0.0050	4.03	4.95	**Pipe Channel, RCP_Round 15"** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.3	47	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.5	257	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	85	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
4.1	900	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 11: Sub-catchment 11



Summary for Subcatchment 12: Sub-catchment 12

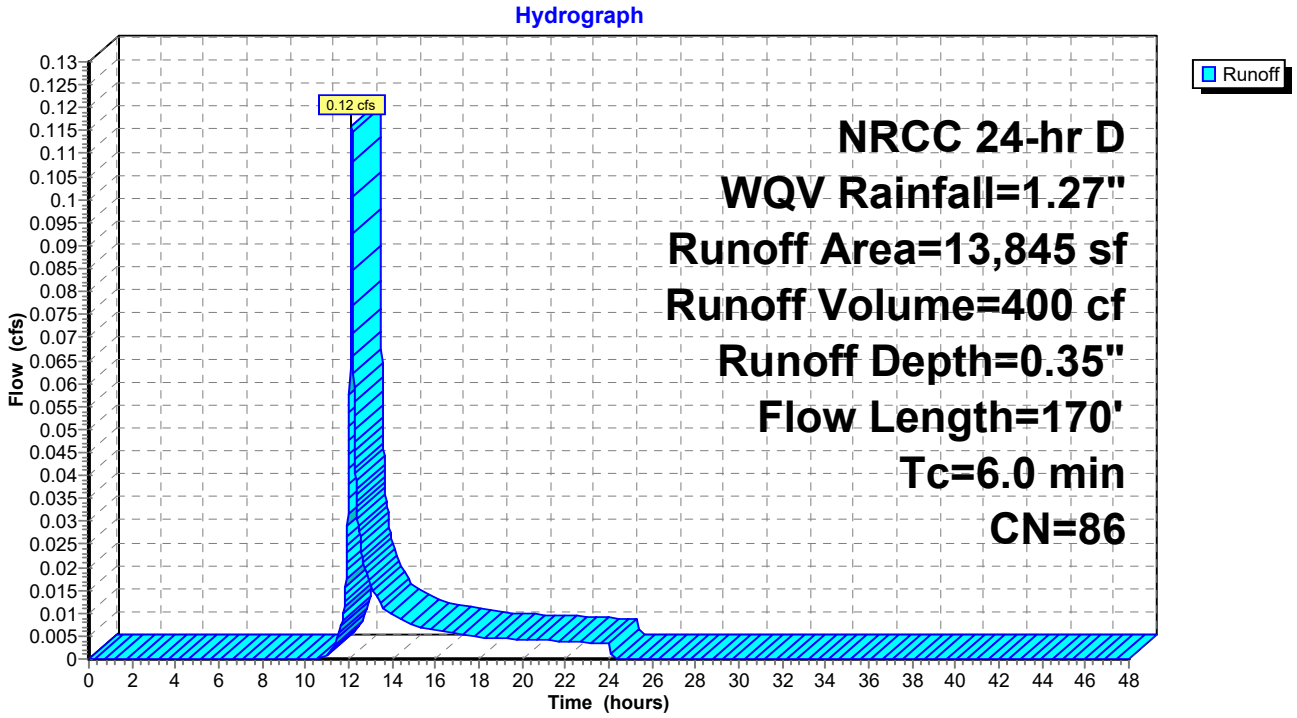
Runoff = 0.12 cfs @ 12.14 hrs, Volume= 400 cf, Depth= 0.35"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
5,431	98	Unconnected pavement, HSG B
8,414	79	<50% Grass cover, Poor, HSG B
13,845	86	Weighted Average
8,414		60.77% Pervious Area
5,431		39.23% Impervious Area
5,431		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.2	44	0.0230	3.08		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	26	0.0050	3.47	2.73	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
1.9	170	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 12: Sub-catchment 12



Summary for Subcatchment 13: Sub-catchment 13

[45] Hint: Runoff=Zero

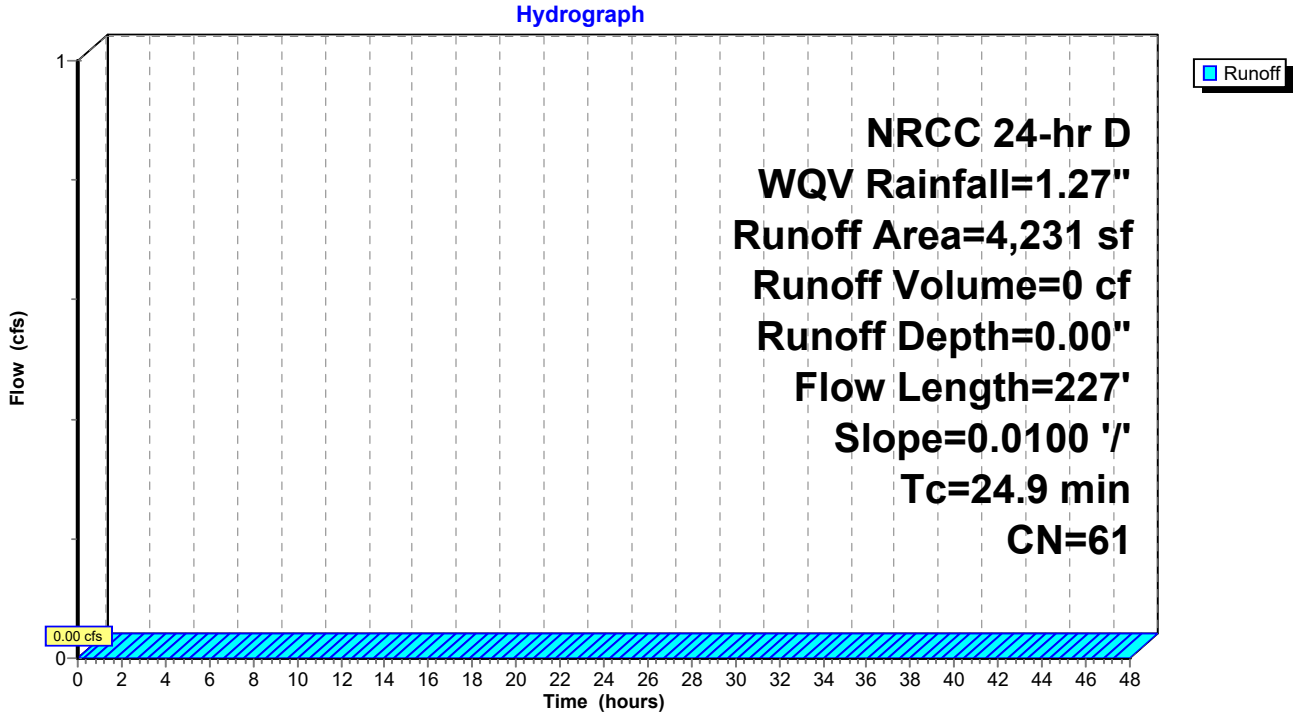
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Link DP-2 : DP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D WQV Rainfall=1.27"

Area (sf)	CN	Description
4,231	61	>75% Grass cover, Good, HSG B
4,231		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.9	227	0.0100	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"

Subcatchment 13: Sub-catchment 13



Summary for Pond 1P: Diversion Structure

[57] Hint: Peaked at 227.58' (Flood elevation advised)

Inflow Area = 241,908 sf, 92.81% Impervious, Inflow Depth = 0.97" for WQV event
Inflow = 5.57 cfs @ 12.13 hrs, Volume= 19,496 cf
Outflow = 5.57 cfs @ 12.13 hrs, Volume= 19,496 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.57 cfs @ 12.13 hrs, Volume= 19,496 cf
Routed to Link 1L : Wet Well/Pump
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link DP-1 : DP-1

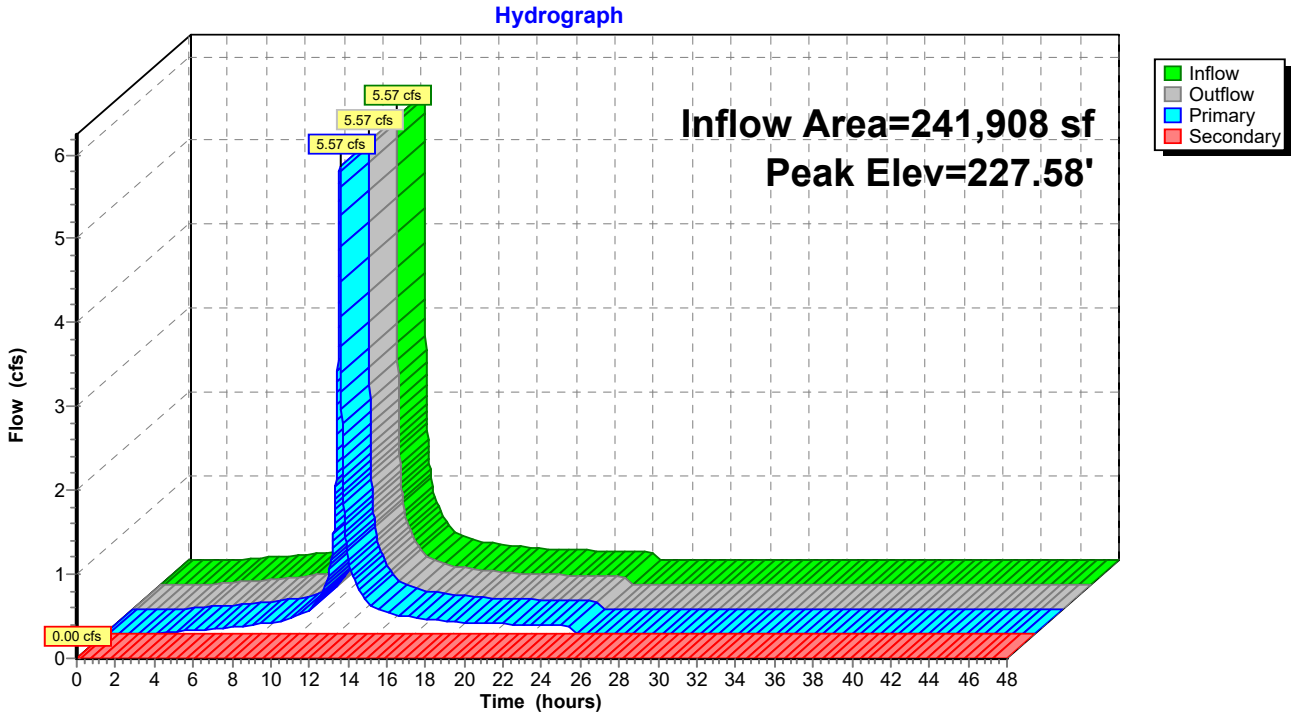
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 227.58' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	226.32'	**24.0" Round Culvert** L= 7.7' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 226.32' / 226.28' S= 0.0052 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Secondary	226.38'	**30.0" Round Culvert** L= 27.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 226.38' / 226.24' S= 0.0052 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#3	Device 2	228.99'	**6.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#4	Device 1	225.00'	**Special & User-Defined** Elev. (feet) 225.00 226.00 240.00 Disch. (cfs) 0.000 5.790 5.790

Primary OutFlow Max=5.57 cfs @ 12.13 hrs HW=227.58' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 5.57 cfs @ 3.80 fps)
↑**4=Special & User-Defined** (Passes 5.57 cfs of 5.79 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=225.00' TW=0.00' (Dynamic Tailwater)
↑**2=Culvert** (Controls 0.00 cfs)
↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Diversion Structure



Summary for Pond 2P: AGST

Inflow Area = 241,908 sf, 92.81% Impervious, Inflow Depth = 0.97" for WQV event
Inflow = 5.57 cfs @ 12.13 hrs, Volume= 19,496 cf
Outflow = 0.22 cfs @ 11.19 hrs, Volume= 19,497 cf, Atten= 96%, Lag= 0.0 min
Primary = 0.22 cfs @ 11.19 hrs, Volume= 19,497 cf
Routed to Link DP-1 : DP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 236.89' @ 15.07 hrs Surf.Area= 908 sf Storage= 8,851 cf

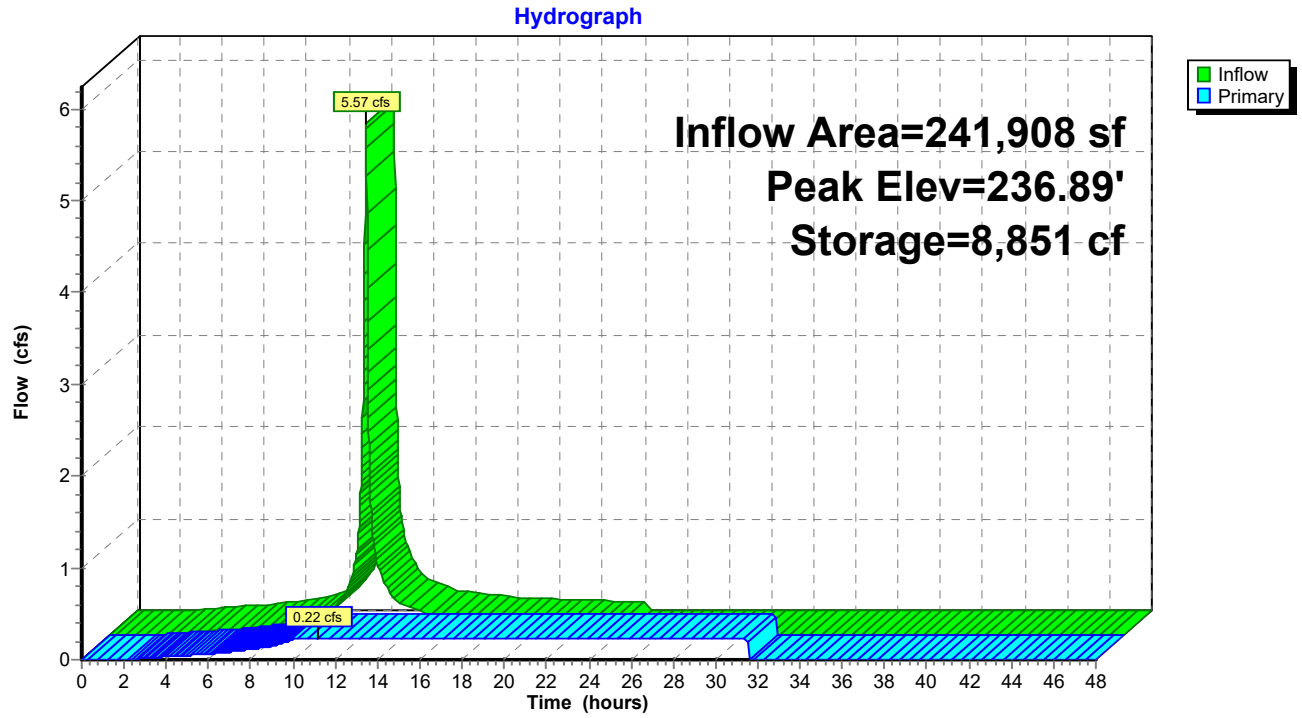
Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 361.9 min (1,159.6 - 797.7)

Volume	Invert	Avail.Storage	Storage Description
#1	227.14'	38,133 cf	**34.00'D x 42.00'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	227.14'	**0.223 cfs Constant Flow/Skimmer**
#2	Primary	265.14'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.22 cfs @ 11.19 hrs HW=227.56' TW=0.00' (Dynamic Tailwater)
└─**1=Constant Flow/Skimmer** (Constant Controls 0.22 cfs)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 2P: AGST

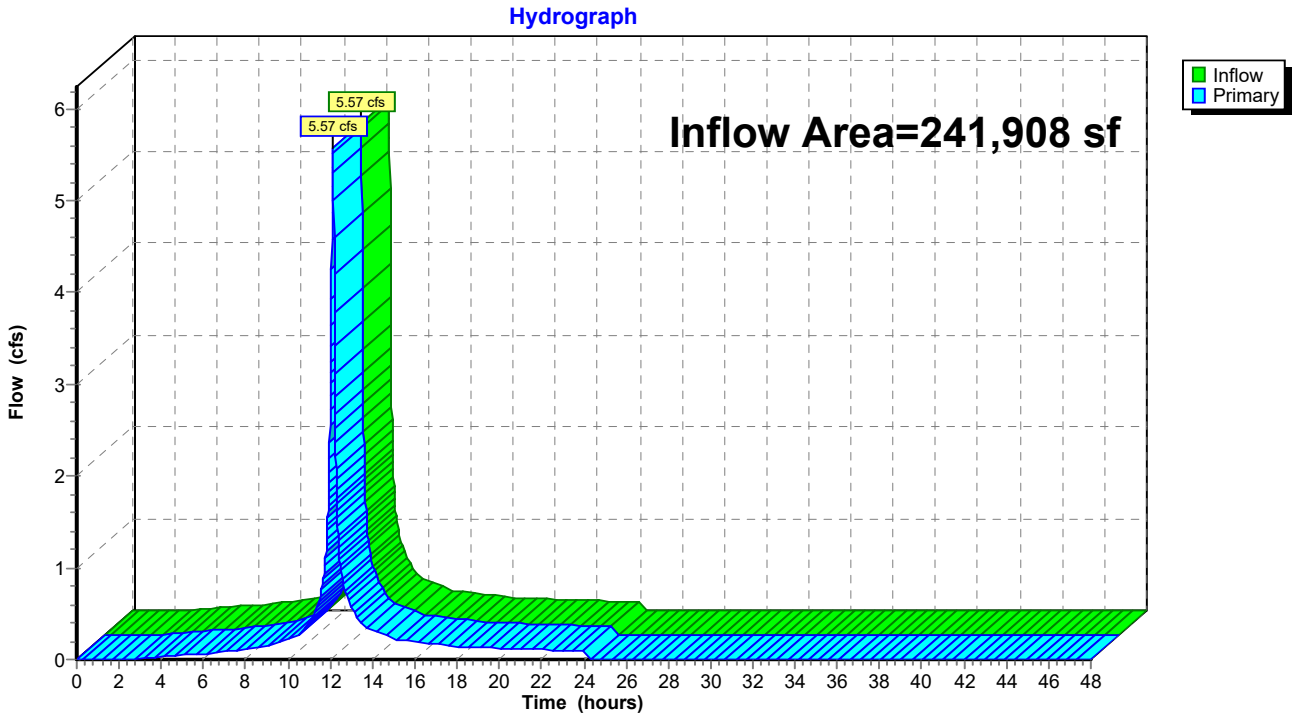


Summary for Link 1L: Wet Well/Pump

Inflow Area = 241,908 sf, 92.81% Impervious, Inflow Depth = 0.97" for WQV event
Inflow = 5.57 cfs @ 12.13 hrs, Volume= 19,496 cf
Primary = 5.57 cfs @ 12.13 hrs, Volume= 19,496 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 2P : AGST

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 1L: Wet Well/Pump

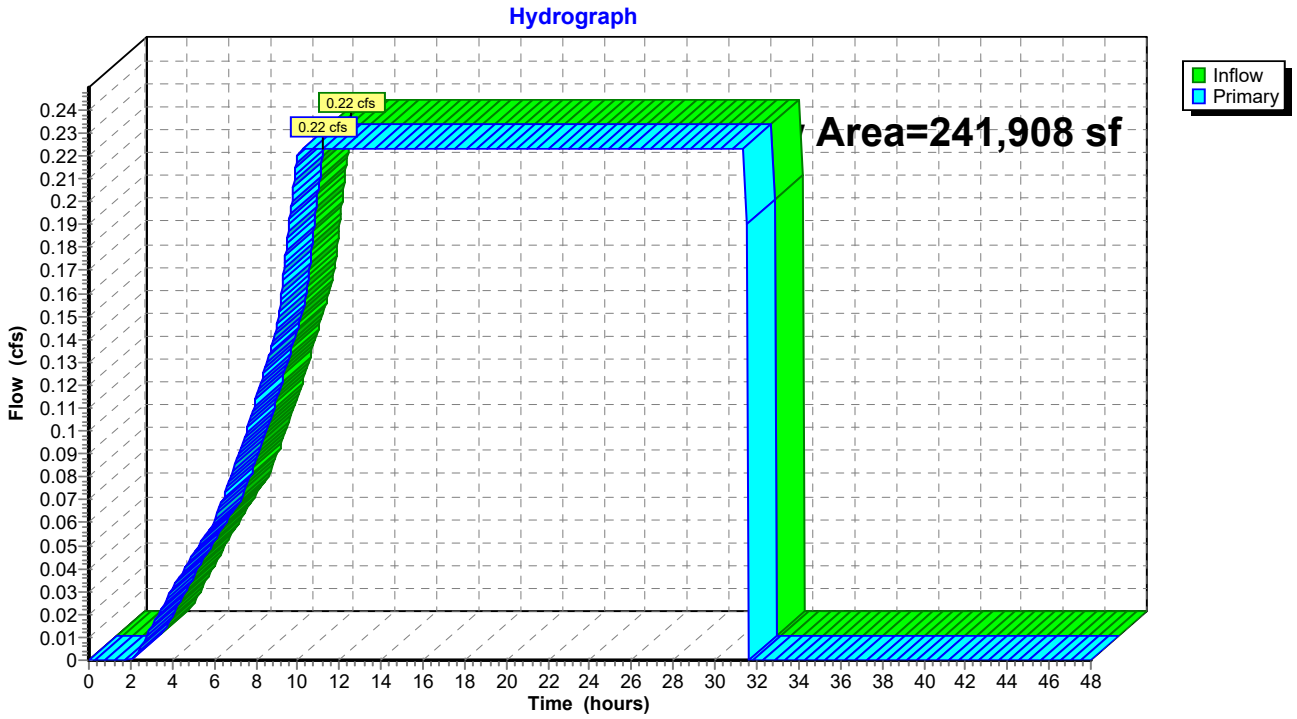


Summary for Link DP-1: DP-1

Inflow Area = 241,908 sf, 92.81% Impervious, Inflow Depth = 0.97" for WQV event
Inflow = 0.22 cfs @ 11.19 hrs, Volume= 19,497 cf
Primary = 0.22 cfs @ 11.19 hrs, Volume= 19,497 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link DP-1: DP-1

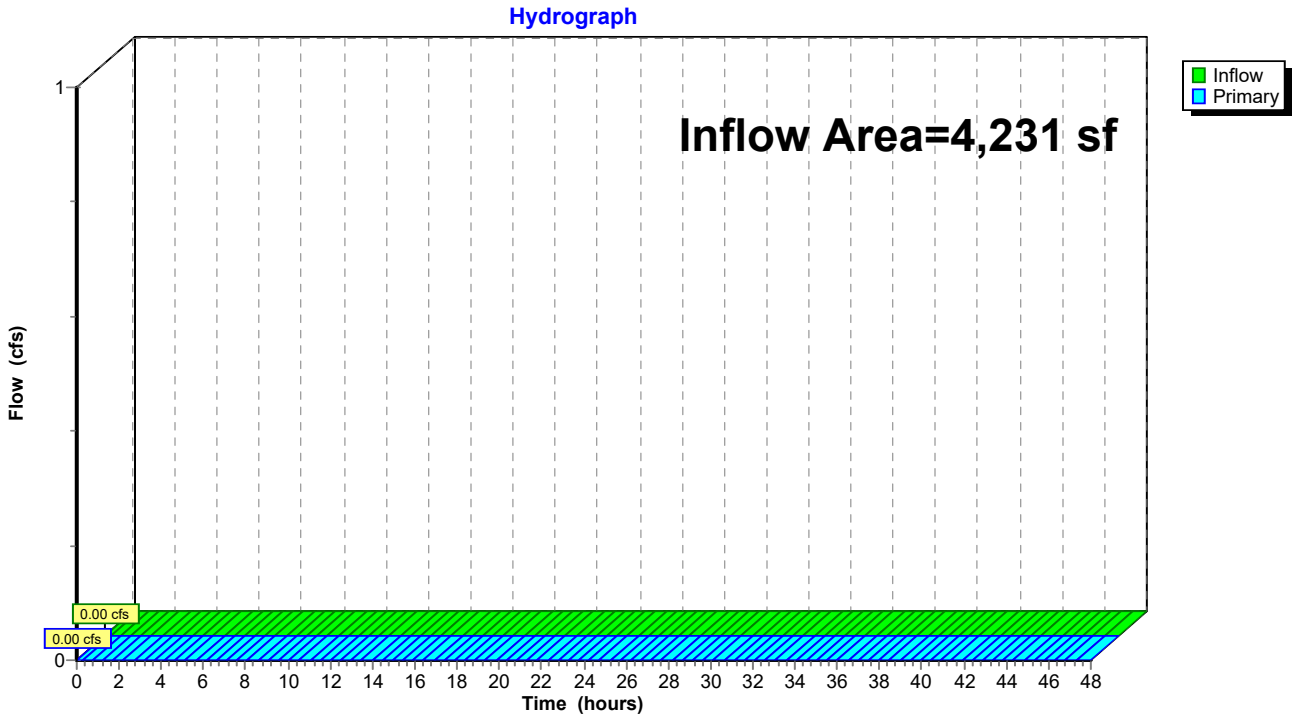


Summary for Link DP-2: DP-2

Inflow Area = 4,231 sf, 0.00% Impervious, Inflow Depth = 0.00" for WQV event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link DP-2: DP-2



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Sub-catchment1 Runoff Area=33,590 sf 100.00% Impervious Runoff Depth=2.59"
Flow Length=851' Tc=6.0 min CN=98 Runoff=1.95 cfs 7,247 cf

Subcatchment2: Sub-catchment2 Runoff Area=7,467 sf 100.00% Impervious Runoff Depth=2.59"
Flow Length=946' Tc=6.0 min CN=98 Runoff=0.43 cfs 1,611 cf

Subcatchment3: Sub-catchment3 Runoff Area=7,120 sf 100.00% Impervious Runoff Depth=2.59"
Flow Length=897' Tc=6.0 min CN=98 Runoff=0.41 cfs 1,536 cf

Subcatchment4: Sub-catchment4 Runoff Area=57,605 sf 97.94% Impervious Runoff Depth=2.59"
Flow Length=632' Tc=6.0 min CN=98 Runoff=3.34 cfs 12,429 cf

Subcatchment5: Sub-catchment5 Runoff Area=14,314 sf 100.00% Impervious Runoff Depth=2.59"
Flow Length=500' Tc=6.0 min CN=98 Runoff=0.83 cfs 3,088 cf

Subcatchment6: Sub-catchment6 Runoff Area=20,333 sf 100.00% Impervious Runoff Depth=2.59"
Flow Length=490' Tc=6.0 min CN=98 Runoff=1.18 cfs 4,387 cf

Subcatchment7: Sub-catchment7 Runoff Area=23,381 sf 100.00% Impervious Runoff Depth=2.59"
Flow Length=393' Tc=6.0 min CN=98 Runoff=1.36 cfs 5,045 cf

Subcatchment8: Sub-catchment8 Runoff Area=25,531 sf 100.00% Impervious Runoff Depth=2.59"
Flow Length=359' Tc=6.0 min CN=98 Runoff=1.48 cfs 5,508 cf

Subcatchment9: Sub-catchment9 Runoff Area=7,621 sf 100.00% Impervious Runoff Depth=2.59"
Flow Length=216' Tc=6.0 min CN=98 Runoff=0.44 cfs 1,644 cf

Subcatchment10: Sub-catchment10 Runoff Area=29,279 sf 73.39% Impervious Runoff Depth=2.08"
Flow Length=350' Tc=6.0 min CN=93 Runoff=1.50 cfs 5,081 cf

Subcatchment11: Sub-catchment11 Runoff Area=1,822 sf 100.00% Impervious Runoff Depth=2.59"
Flow Length=900' Tc=6.0 min CN=98 Runoff=0.11 cfs 393 cf

Subcatchment12: Sub-catchment12 Runoff Area=13,845 sf 39.23% Impervious Runoff Depth=1.51"
Flow Length=170' Tc=6.0 min CN=86 Runoff=0.54 cfs 1,741 cf

Subcatchment13: Sub-catchment13 Runoff Area=4,231 sf 0.00% Impervious Runoff Depth=0.30"
Flow Length=227' Slope=0.0100 '/' Tc=24.9 min CN=61 Runoff=0.01 cfs 106 cf

Pond 1P: Diversion Structure Peak Elev=229.60' Inflow=13.57 cfs 49,711 cf
Primary=5.79 cfs 45,927 cf Secondary=7.78 cfs 3,783 cf Outflow=13.57 cfs 49,711 cf

Pond 2P: AGST Peak Elev=259.25' Storage=29,150 cf Inflow=5.79 cfs 45,927 cf
Outflow=0.22 cfs 35,976 cf

Link 1L: Wet Well/Pump Inflow=5.79 cfs 45,927 cf
Primary=5.79 cfs 45,927 cf

Link DP-1: DP-1 Inflow=8.00 cfs 39,759 cf
Primary=8.00 cfs 39,759 cf

Link DP-2: DP-2 Inflow=0.01 cfs 106 cf
Primary=0.01 cfs 106 cf

Total Runoff Area = 246,139 sf Runoff Volume = 49,816 cf Average Runoff Depth = 2.43"
8.79% Pervious = 21,624 sf 91.21% Impervious = 224,515 sf

Summary for Subcatchment 1: Sub-catchment 1

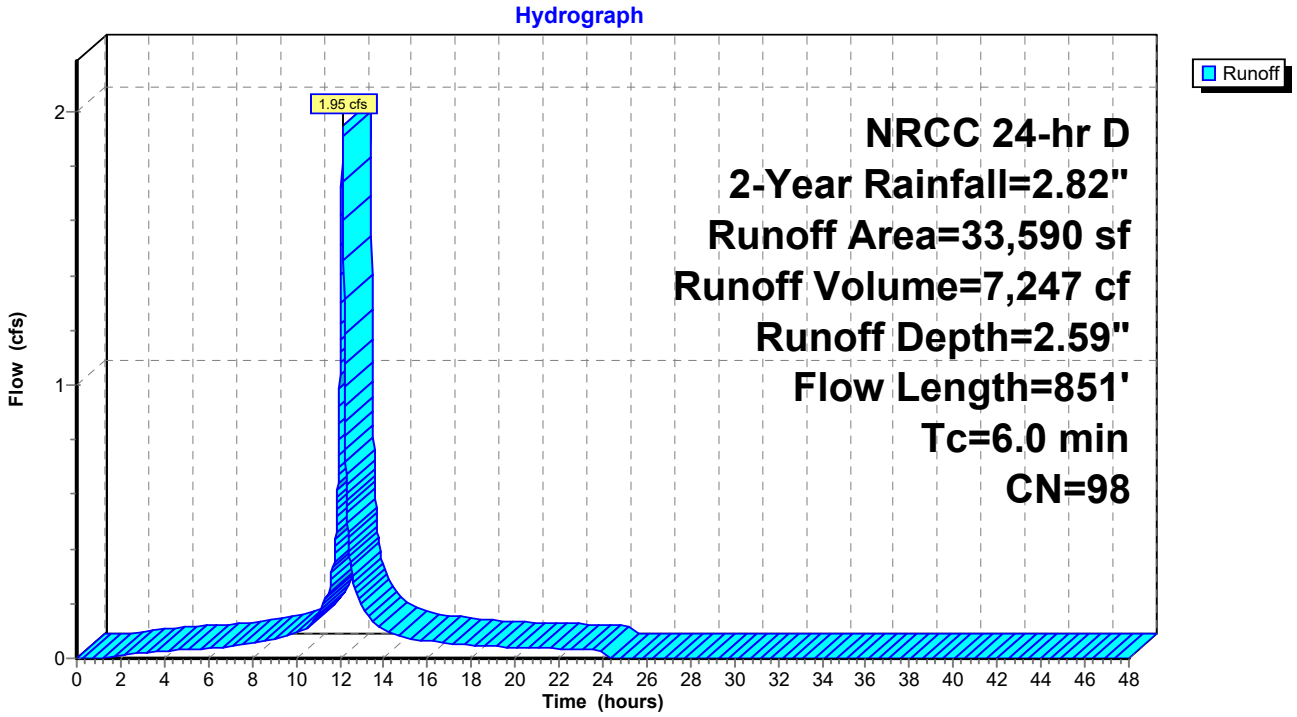
Runoff = 1.95 cfs @ 12.13 hrs, Volume= 7,247 cf, Depth= 2.59"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=2.82"

Area (sf)	CN	Description
15,206	98	Roofs, HSG B
18,384	98	Unconnected pavement, HSG B
33,590	98	Weighted Average
33,590		100.00% Impervious Area
18,384		54.73% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0160	1.26		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.7	49	0.0030	1.11		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	257	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	85	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
4.8	851	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1: Sub-catchment 1



Summary for Subcatchment 2: Sub-catchment 2

Runoff = 0.43 cfs @ 12.13 hrs, Volume= 1,611 cf, Depth= 2.59"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=2.82"

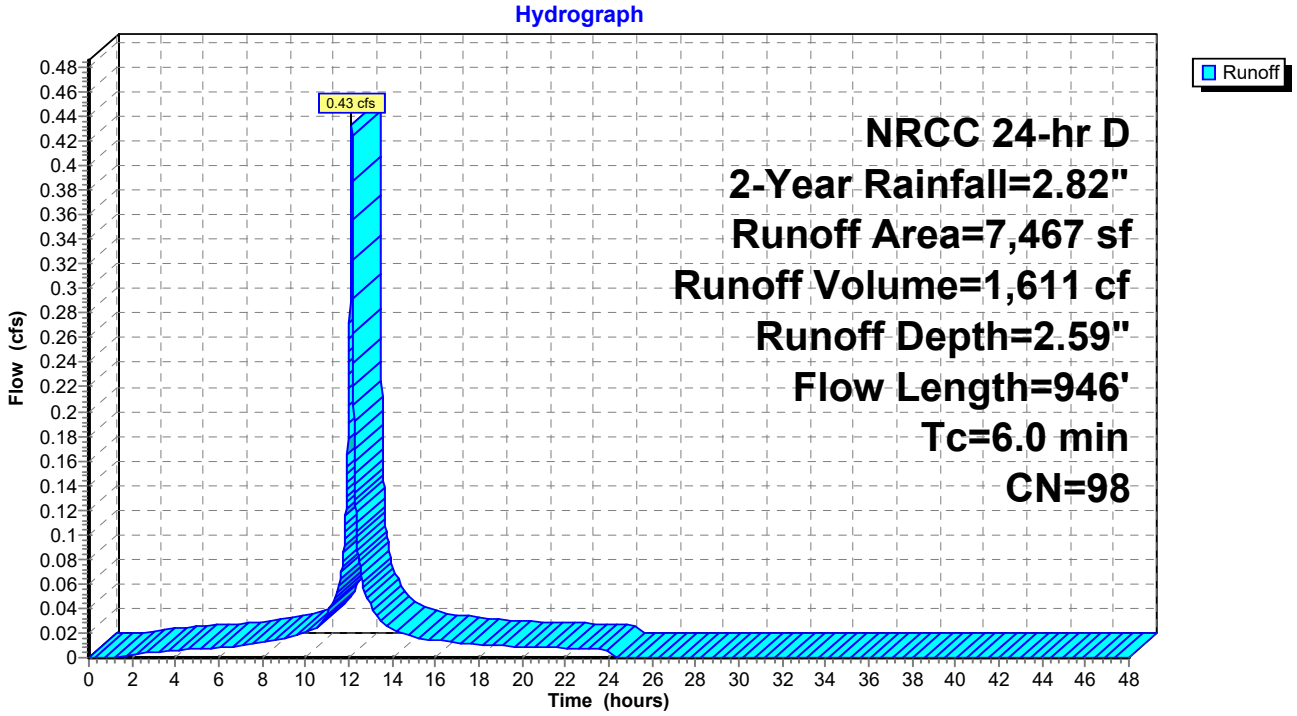
Area (sf)	CN	Description
2,936	98	Roofs, HSG B
4,531	98	Unconnected pavement, HSG B
7,467	98	Weighted Average
7,467		100.00% Impervious Area
4,531		60.68% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	41	0.0140	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
1.0	80	0.0010	1.38	0.75	**Pipe Channel, RCP_Round 10"** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Concrete pipe, finished
0.3	76	0.0120	4.77	2.60	**Pipe Channel, RCP_Round 10"** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Concrete pipe, finished
0.3	47	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.5	257	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	85	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63'

n= 0.012 Concrete pipe, finished

5.1 946 Total, Increased to minimum Tc = 6.0 min

Subcatchment 2: Sub-catchment 2



Summary for Subcatchment 3: Sub-catchment 3

Runoff = 0.41 cfs @ 12.13 hrs, Volume= 1,536 cf, Depth= 2.59"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=2.82"

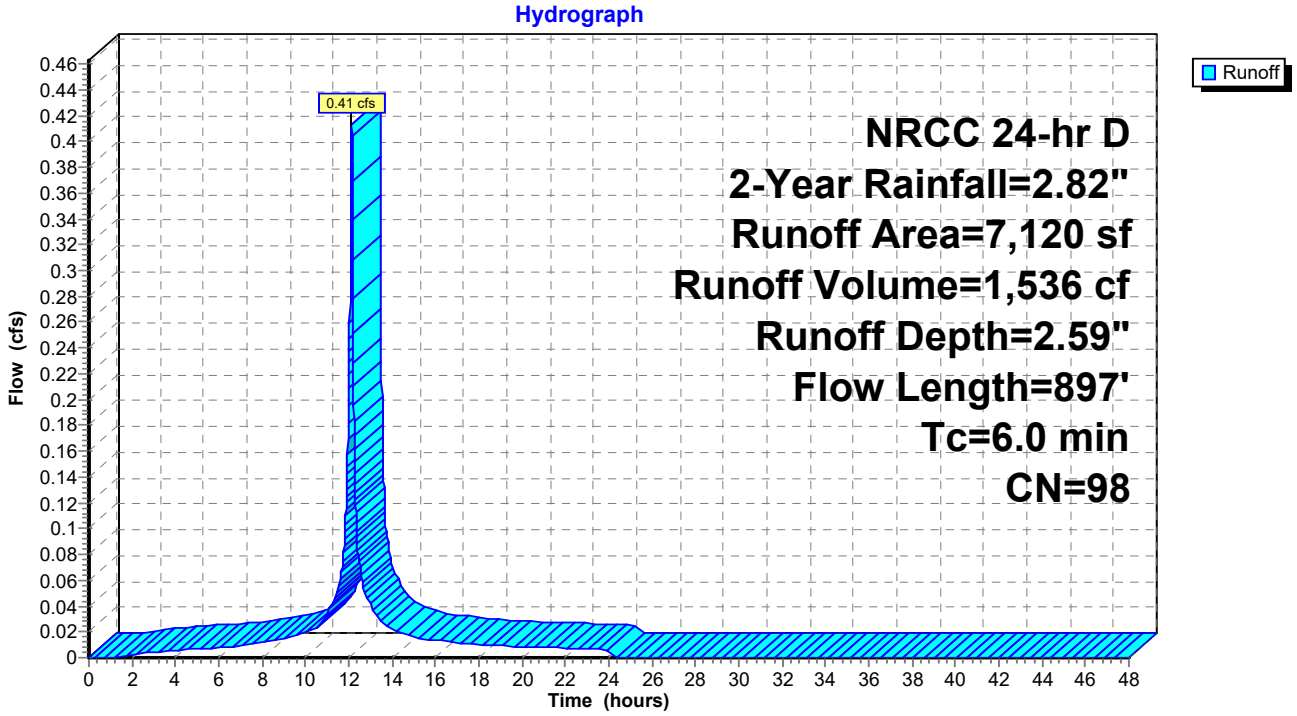
Area (sf)	CN	Description
2,543	98	Roofs, HSG B
4,577	98	Unconnected pavement, HSG B
7,120	98	Weighted Average
7,120		100.00% Impervious Area
4,577		64.28% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	62	0.0030	0.59		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.1	10	0.0012	1.51	0.82	**Pipe Channel, RCP_Round 10"** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Concrete pipe, finished
0.3	76	0.0120	4.77	2.60	**Pipe Channel, RCP_Round 10"** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Concrete pipe, finished
0.3	47	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.5	257	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	85	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63'

n= 0.012 Concrete pipe, finished

5.3 897 Total, Increased to minimum Tc = 6.0 min

Subcatchment 3: Sub-catchment 3



Summary for Subcatchment 4: Sub-catchment 4

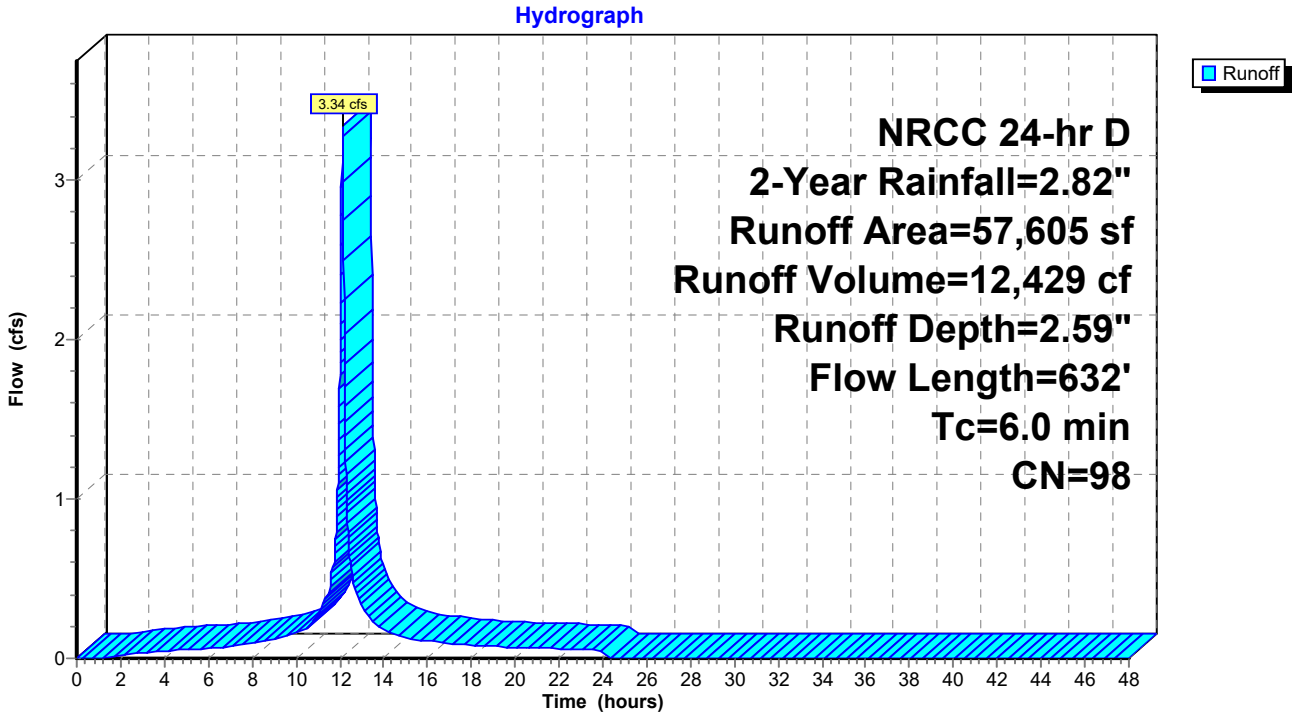
Runoff = 3.34 cfs @ 12.13 hrs, Volume= 12,429 cf, Depth= 2.59"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=2.82"

Area (sf)	CN	Description
5,329	98	Roofs, HSG B
51,087	98	Unconnected pavement, HSG B
1,189	79	<50% Grass cover, Poor, HSG B
57,605	98	Weighted Average
1,189		2.06% Pervious Area
56,416		97.94% Impervious Area
51,087		90.55% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0120	1.12		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.4	77	0.0230	3.08		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	10	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	85	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
3.3	632	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 4: Sub-catchment 4



Summary for Subcatchment 5: Sub-catchment 5

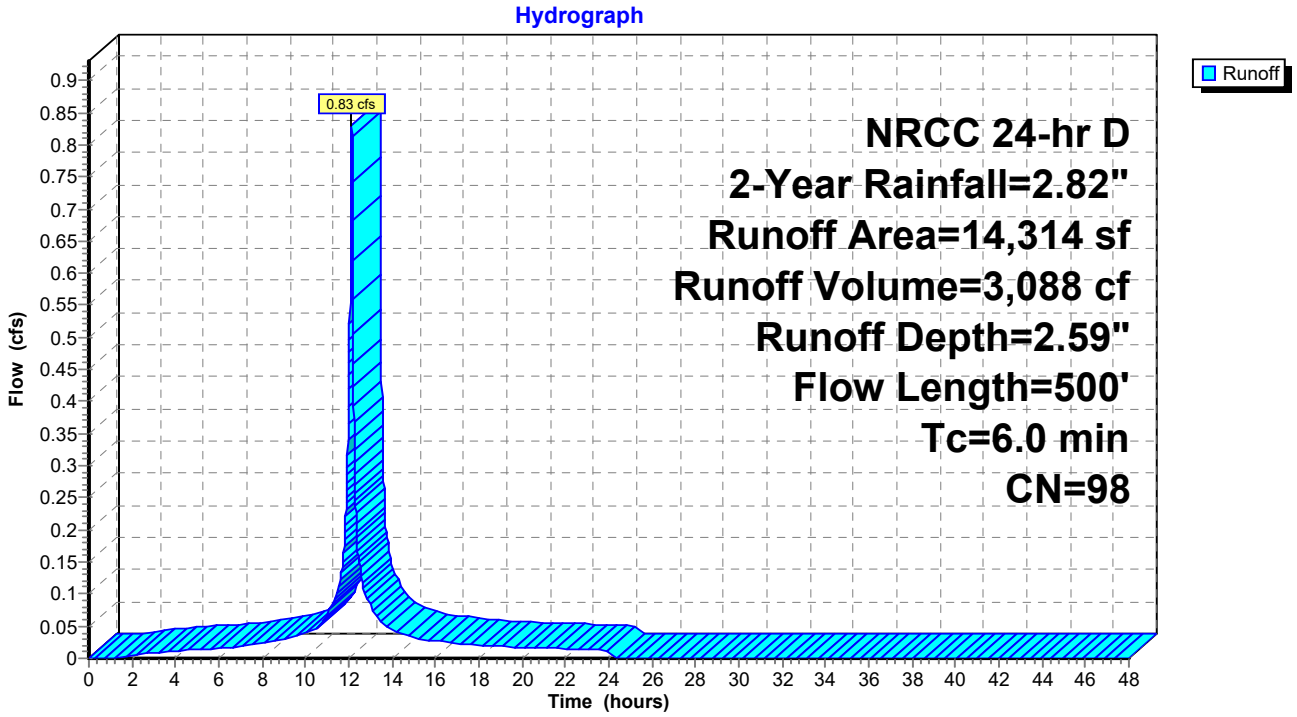
Runoff = 0.83 cfs @ 12.13 hrs, Volume= 3,088 cf, Depth= 2.59"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=2.82"

Area (sf)	CN	Description
5,500	98	Roofs, HSG B
8,814	98	Unconnected pavement, HSG B
14,314	98	Weighted Average
14,314		100.00% Impervious Area
8,814		61.58% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	55	0.0550	1.83		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.6	85	0.0020	2.20	1.73	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
2.1	500	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 5: Sub-catchment 5



Summary for Subcatchment 6: Sub-catchment 6

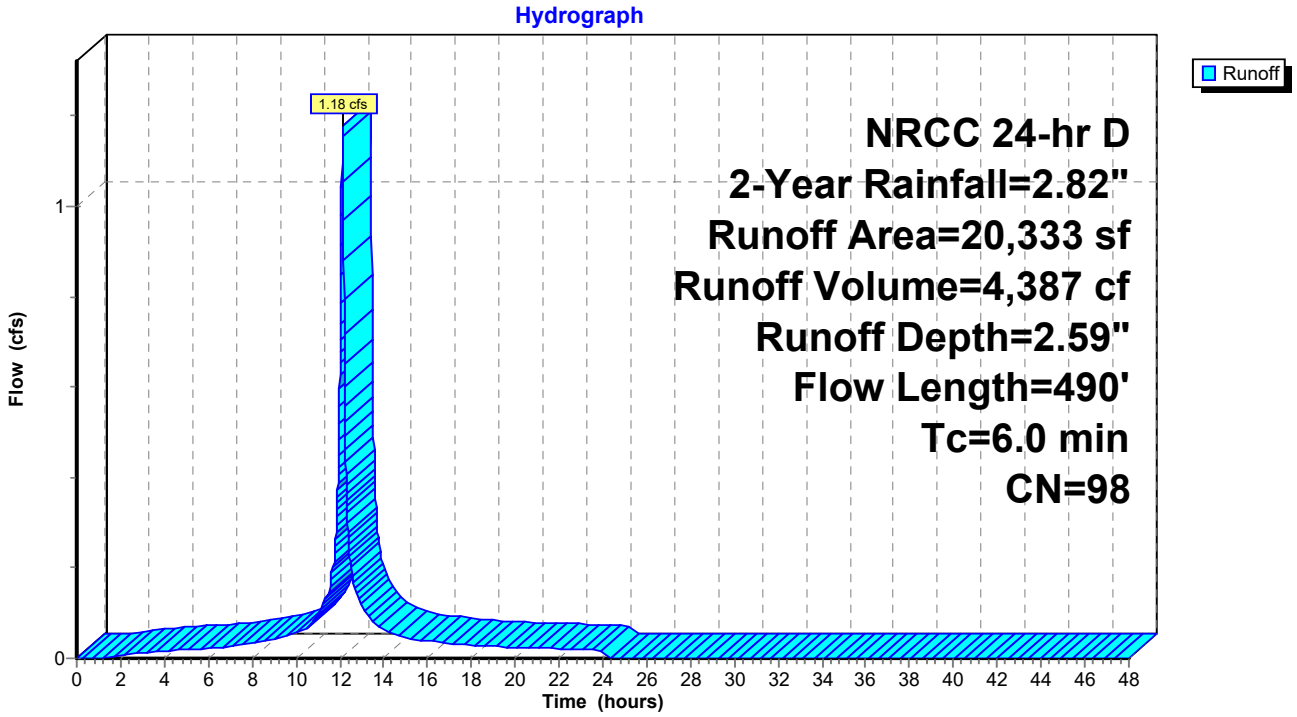
Runoff = 1.18 cfs @ 12.13 hrs, Volume= 4,387 cf, Depth= 2.59"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=2.82"

Area (sf)	CN	Description
20,333	98	Unconnected pavement, HSG B
20,333		100.00% Impervious Area
20,333		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.5	55	0.0090	1.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	10	0.0050	3.08	1.68	**Pipe Channel, RCP_Round 10"** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
3.1	490	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 6: Sub-catchment 6



Summary for Subcatchment 7: Sub-catchment 7

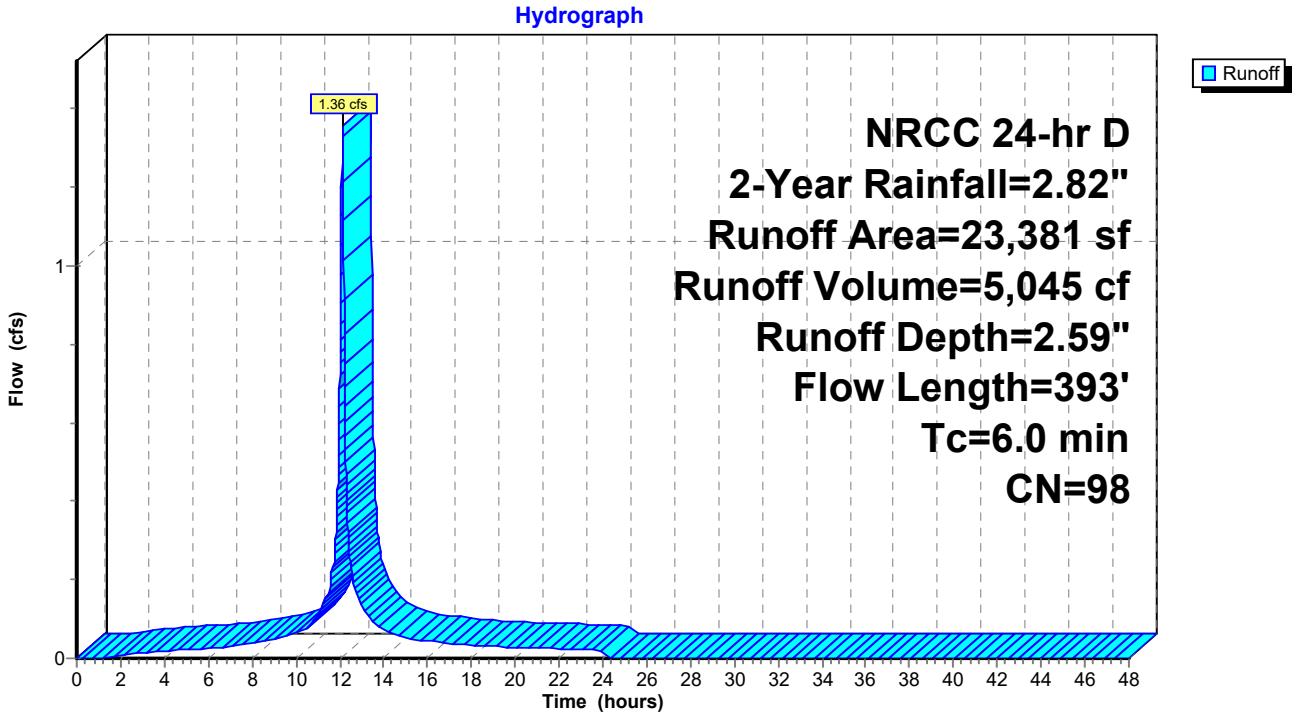
Runoff = 1.36 cfs @ 12.13 hrs, Volume= 5,045 cf, Depth= 2.59"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=2.82"

Area (sf)	CN	Description
19,985	98	Unconnected pavement, HSG B
3,396	98	Roofs, HSG B
23,381	98	Weighted Average
23,381		100.00% Impervious Area
19,985		85.48% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.5	55	0.0090	1.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.0	10	0.0050	4.55	8.05	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
2.6	393	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 7: Sub-catchment 7



Summary for Subcatchment 8: Sub-catchment 8

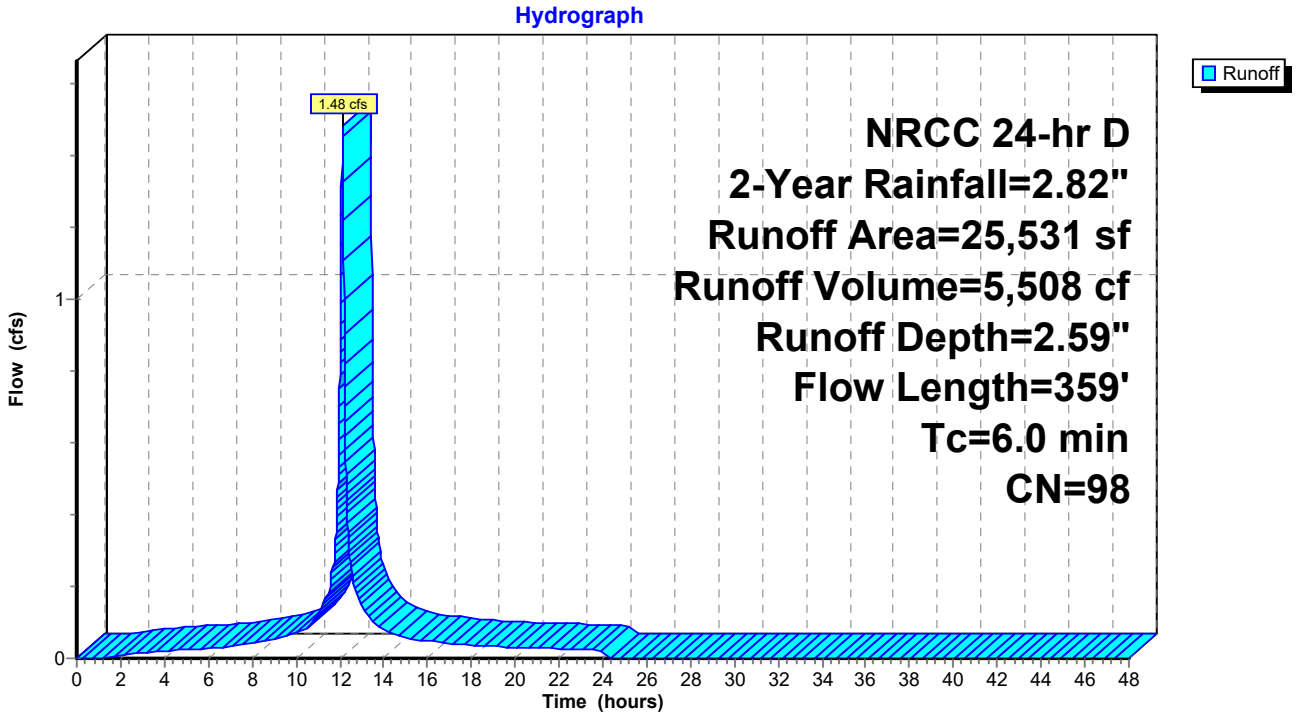
Runoff = 1.48 cfs @ 12.13 hrs, Volume= 5,508 cf, Depth= 2.59"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=2.82"

Area (sf)	CN	Description
23,413	98	Unconnected pavement, HSG B
2,118	98	Roofs, HSG B
25,531	98	Weighted Average
25,531		100.00% Impervious Area
23,413		91.70% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0070	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.6	85	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.0	10	0.0050	4.55	8.05	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
2.6	359	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 8: Sub-catchment 8



Summary for Subcatchment 9: Sub-catchment 9

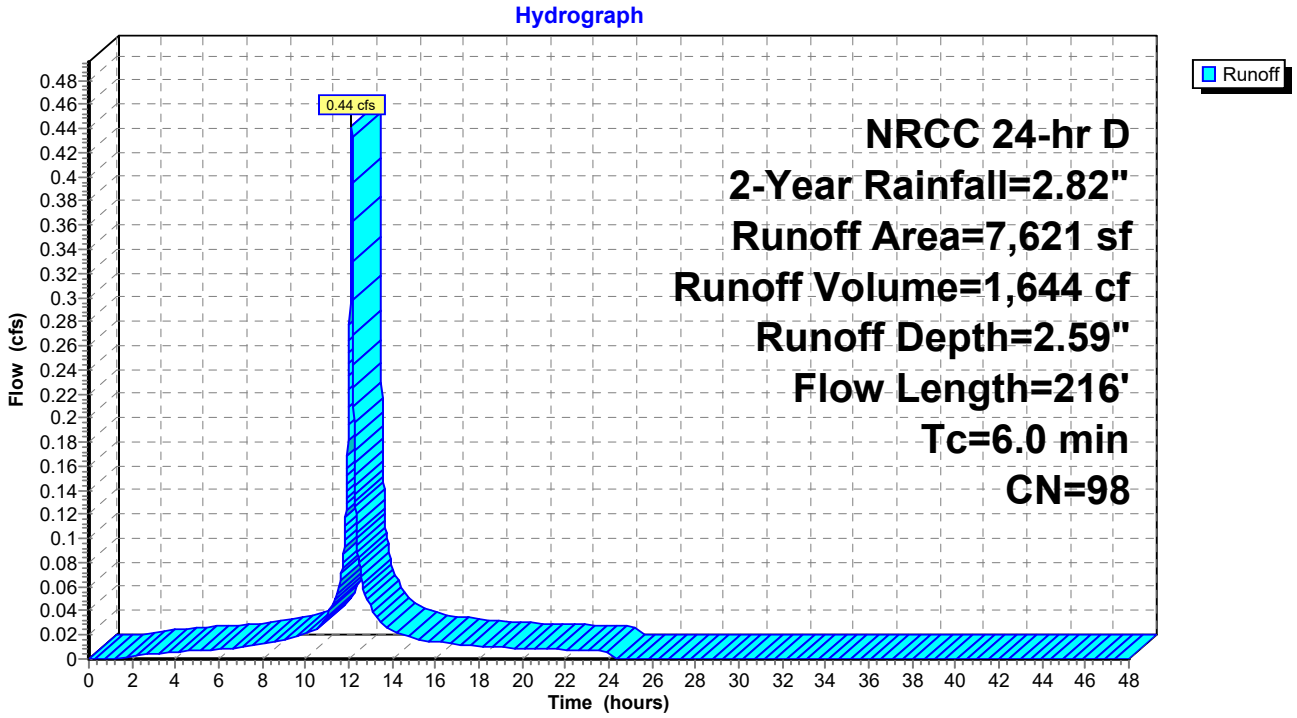
Runoff = 0.44 cfs @ 12.13 hrs, Volume= 1,644 cf, Depth= 2.59"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=2.82"

Area (sf)	CN	Description
7,621	98	Unconnected pavement, HSG B
7,621		100.00% Impervious Area
7,621		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	100	0.0090	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.7	62	0.0060	1.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	45	0.0050	3.47	2.73	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
2.6	216	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 9: Sub-catchment 9



Summary for Subcatchment 10: Sub-catchment 10

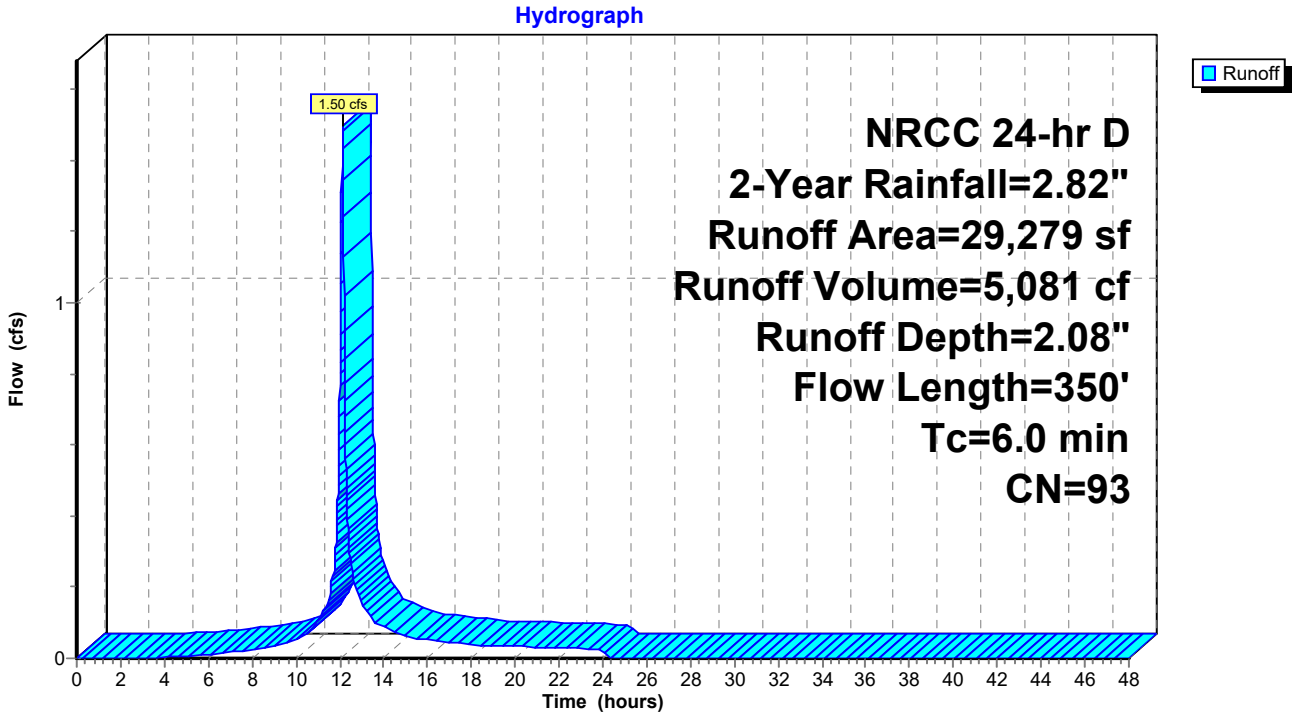
Runoff = 1.50 cfs @ 12.13 hrs, Volume= 5,081 cf, Depth= 2.08"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=2.82"

Area (sf)	CN	Description
14,729	98	Unconnected pavement, HSG B
6,760	98	Roofs, HSG B
7,790	79	<50% Grass cover, Poor, HSG B
29,279	93	Weighted Average
7,790		26.61% Pervious Area
21,489		73.39% Impervious Area
14,729		68.54% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.6	75	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	114	0.0050	3.47	2.73	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
2.8	350	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 10: Sub-catchment 10



Summary for Subcatchment 11: Sub-catchment 11

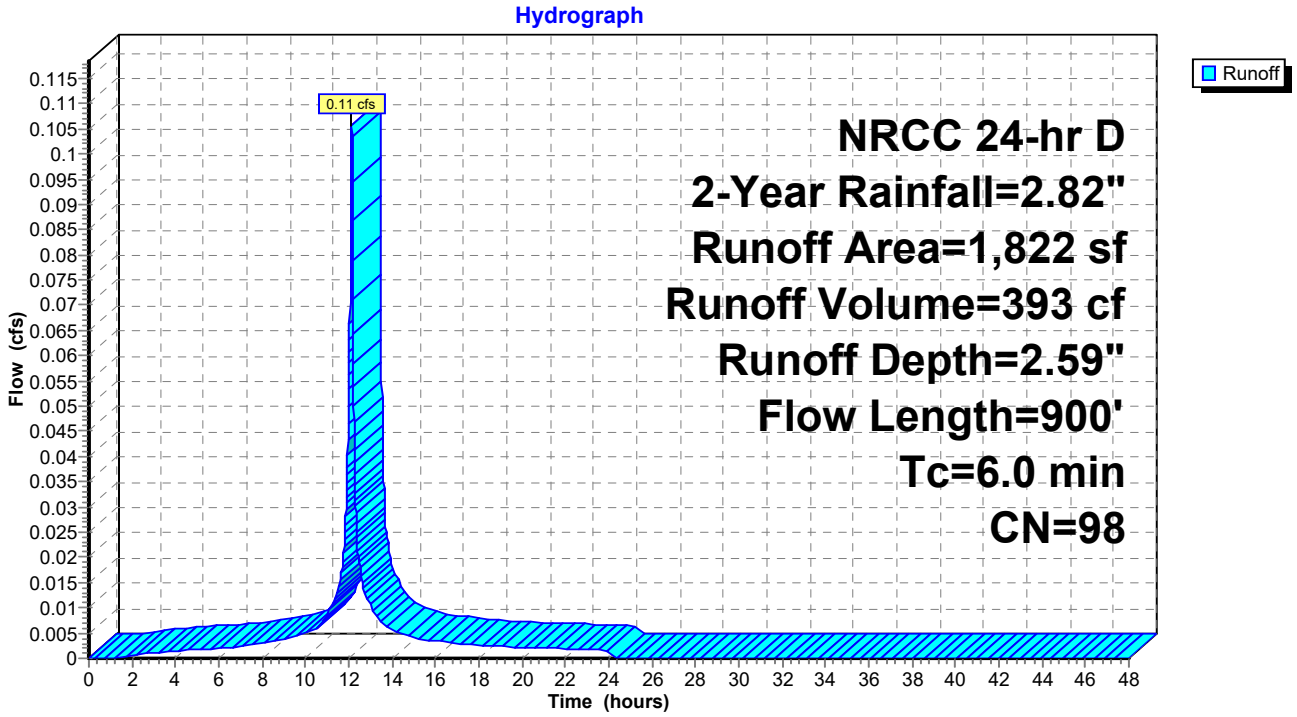
Runoff = 0.11 cfs @ 12.13 hrs, Volume= 393 cf, Depth= 2.59"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=2.82"

Area (sf)	CN	Description
1,822	98	Unconnected pavement, HSG B
1,822		100.00% Impervious Area
1,822		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	53	0.0690	1.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.4	59	0.0020	2.20	1.73	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.2	39	0.0050	4.03	4.95	**Pipe Channel, RCP_Round 15"** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.3	47	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.5	257	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	85	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
4.1	900	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 11: Sub-catchment 11



Summary for Subcatchment 12: Sub-catchment 12

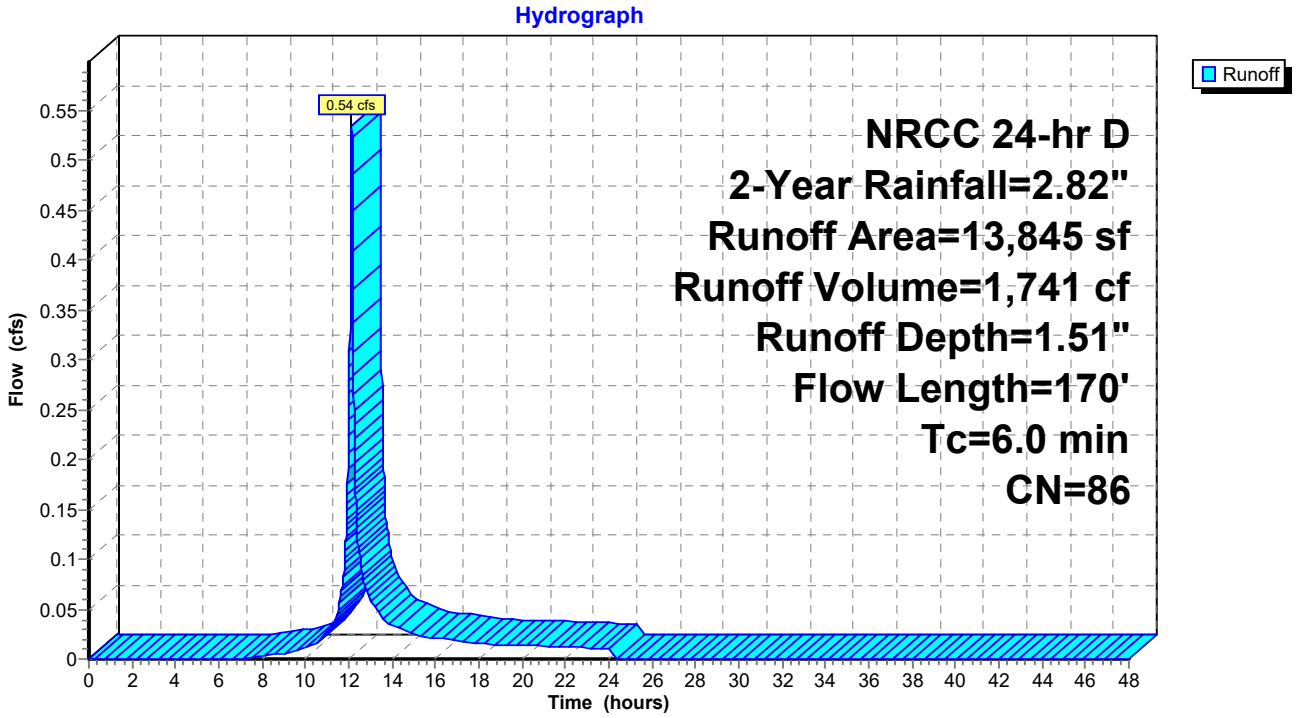
Runoff = 0.54 cfs @ 12.13 hrs, Volume= 1,741 cf, Depth= 1.51"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=2.82"

Area (sf)	CN	Description
5,431	98	Unconnected pavement, HSG B
8,414	79	<50% Grass cover, Poor, HSG B
13,845	86	Weighted Average
8,414		60.77% Pervious Area
5,431		39.23% Impervious Area
5,431		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.2	44	0.0230	3.08		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	26	0.0050	3.47	2.73	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
1.9	170	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 12: Sub-catchment 12



Summary for Subcatchment 13: Sub-catchment 13

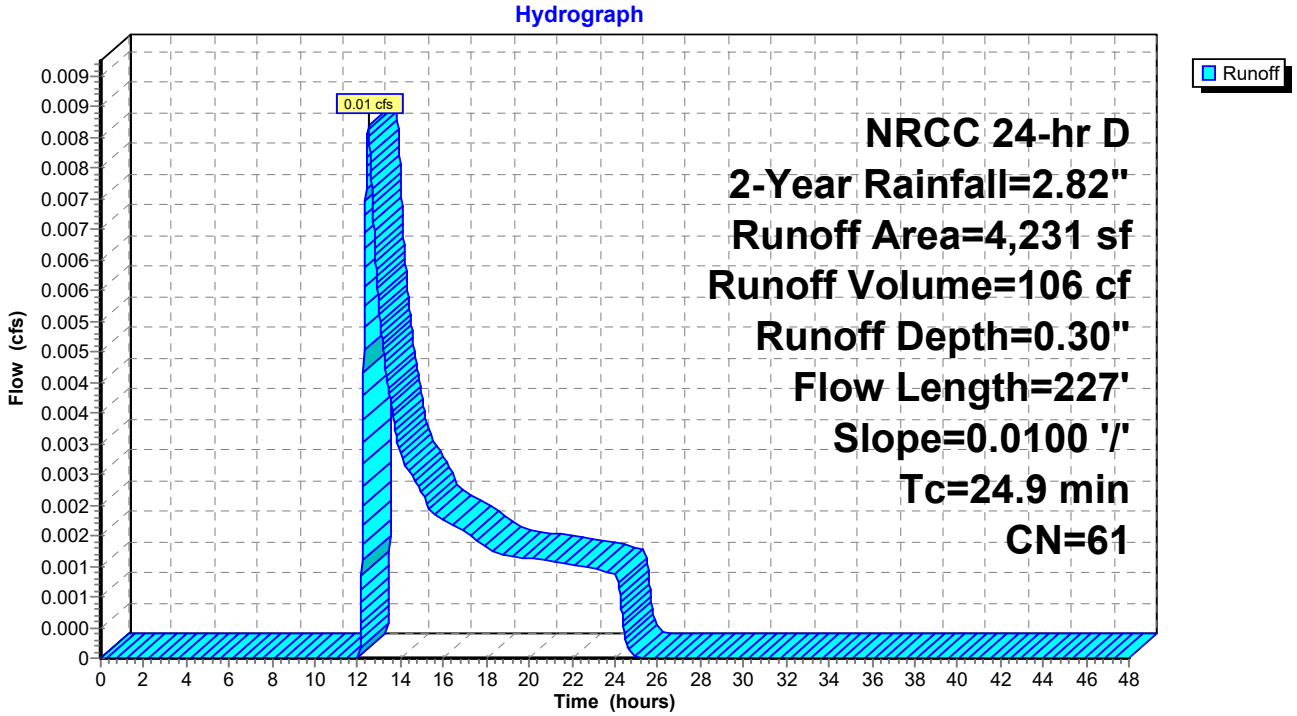
Runoff = 0.01 cfs @ 12.48 hrs, Volume= 106 cf, Depth= 0.30"
Routed to Link DP-2 : DP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=2.82"

Area (sf)	CN	Description
4,231	61	>75% Grass cover, Good, HSG B
4,231		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.9	227	0.0100	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"

Subcatchment 13: Sub-catchment 13



Summary for Pond 1P: Diversion Structure

[57] Hint: Peaked at 229.60' (Flood elevation advised)

Inflow Area = 241,908 sf, 92.81% Impervious, Inflow Depth = 2.47" for 2-Year event
Inflow = 13.57 cfs @ 12.13 hrs, Volume= 49,711 cf
Outflow = 13.57 cfs @ 12.13 hrs, Volume= 49,711 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.79 cfs @ 11.97 hrs, Volume= 45,927 cf
Routed to Link 1L : Wet Well/Pump
Secondary = 7.78 cfs @ 12.13 hrs, Volume= 3,783 cf
Routed to Link DP-1 : DP-1

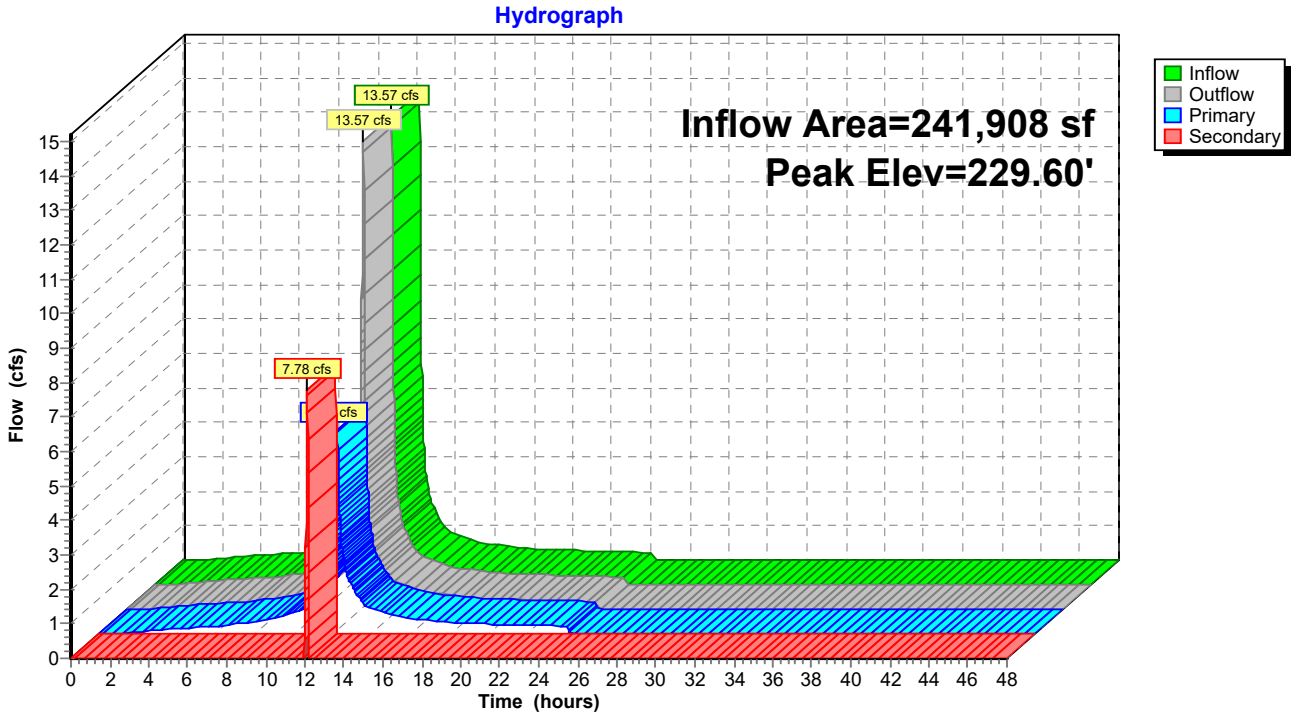
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 229.60' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	226.32'	**24.0" Round Culvert** L= 7.7' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 226.32' / 226.28' S= 0.0052 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Secondary	226.38'	**30.0" Round Culvert** L= 27.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 226.38' / 226.24' S= 0.0052 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#3	Device 2	228.99'	**6.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#4	Device 1	225.00'	**Special & User-Defined** Elev. (feet) 225.00 226.00 240.00 Disch. (cfs) 0.000 5.790 5.790

Primary OutFlow Max=5.79 cfs @ 11.97 hrs HW=229.03' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Passes 5.79 cfs of 17.39 cfs potential flow)
↑**4=Special & User-Defined** (Custom Controls 5.79 cfs)

Secondary OutFlow Max=7.77 cfs @ 12.13 hrs HW=229.59' TW=0.00' (Dynamic Tailwater)
↑**2=Culvert** (Passes 7.77 cfs of 29.17 cfs potential flow)
↑**3=Broad-Crested Rectangular Weir** (Weir Controls 7.77 cfs @ 2.14 fps)

Pond 1P: Diversion Structure



Summary for Pond 2P: AGST

Inflow Area = 241,908 sf, 92.81% Impervious, Inflow Depth = 2.28" for 2-Year event
Inflow = 5.79 cfs @ 11.97 hrs, Volume= 45,927 cf
Outflow = 0.22 cfs @ 7.87 hrs, Volume= 35,976 cf, Atten= 96%, Lag= 0.0 min
Primary = 0.22 cfs @ 7.87 hrs, Volume= 35,976 cf
Routed to Link DP-1 : DP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 259.25' @ 23.69 hrs Surf.Area= 908 sf Storage= 29,150 cf

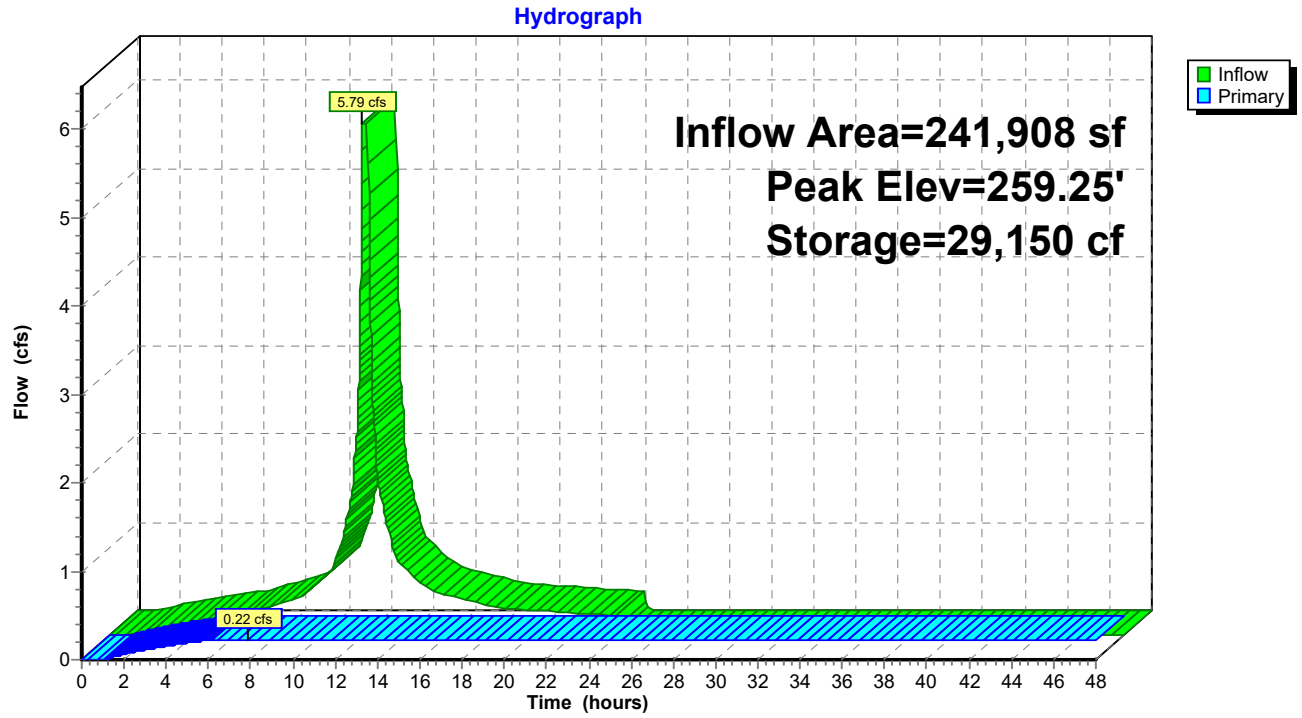
Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 759.1 min (1,534.5 - 775.4)

Volume	Invert	Avail.Storage	Storage Description
#1	227.14'	38,133 cf	**34.00'D x 42.00'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	227.14'	**0.223 cfs Constant Flow/Skimmer**
#2	Primary	265.14'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.22 cfs @ 7.87 hrs HW=227.56' TW=0.00' (Dynamic Tailwater)
└─**1=Constant Flow/Skimmer** (Constant Controls 0.22 cfs)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 2P: AGST

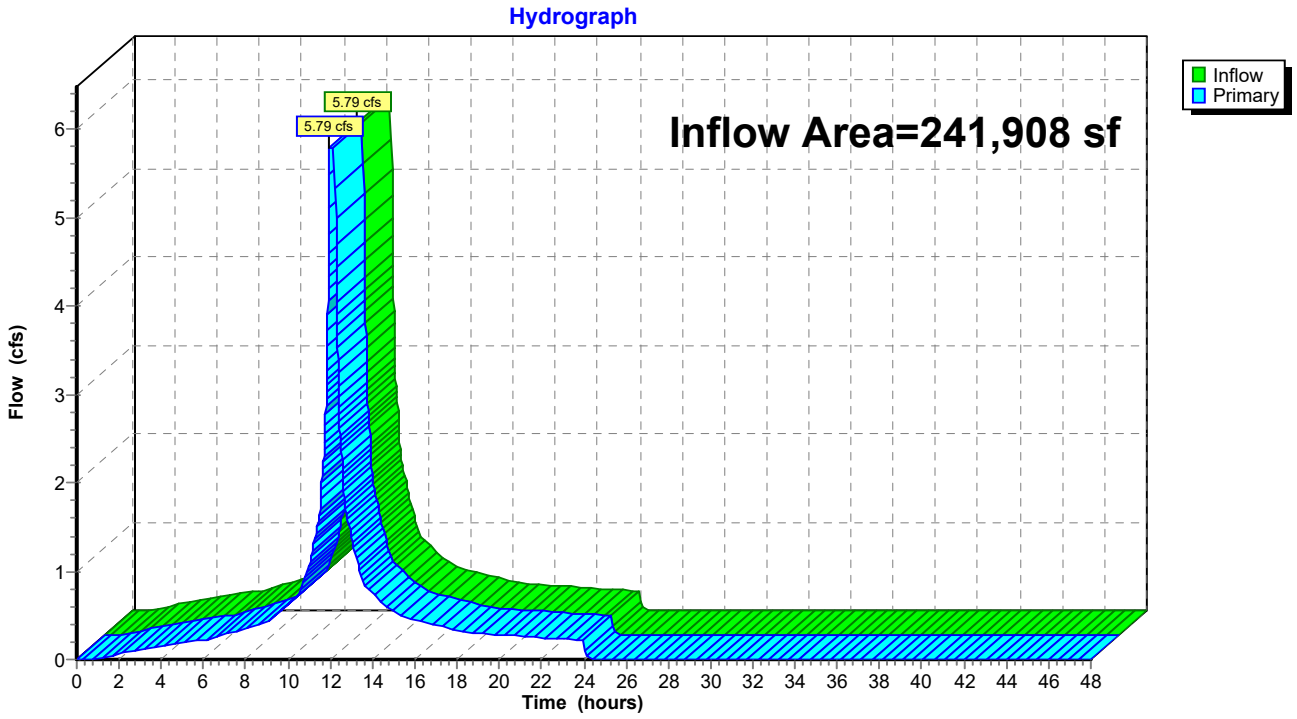


Summary for Link 1L: Wet Well/Pump

Inflow Area = 241,908 sf, 92.81% Impervious, Inflow Depth = 2.28" for 2-Year event
Inflow = 5.79 cfs @ 11.97 hrs, Volume= 45,927 cf
Primary = 5.79 cfs @ 11.97 hrs, Volume= 45,927 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 2P : AGST

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 1L: Wet Well/Pump

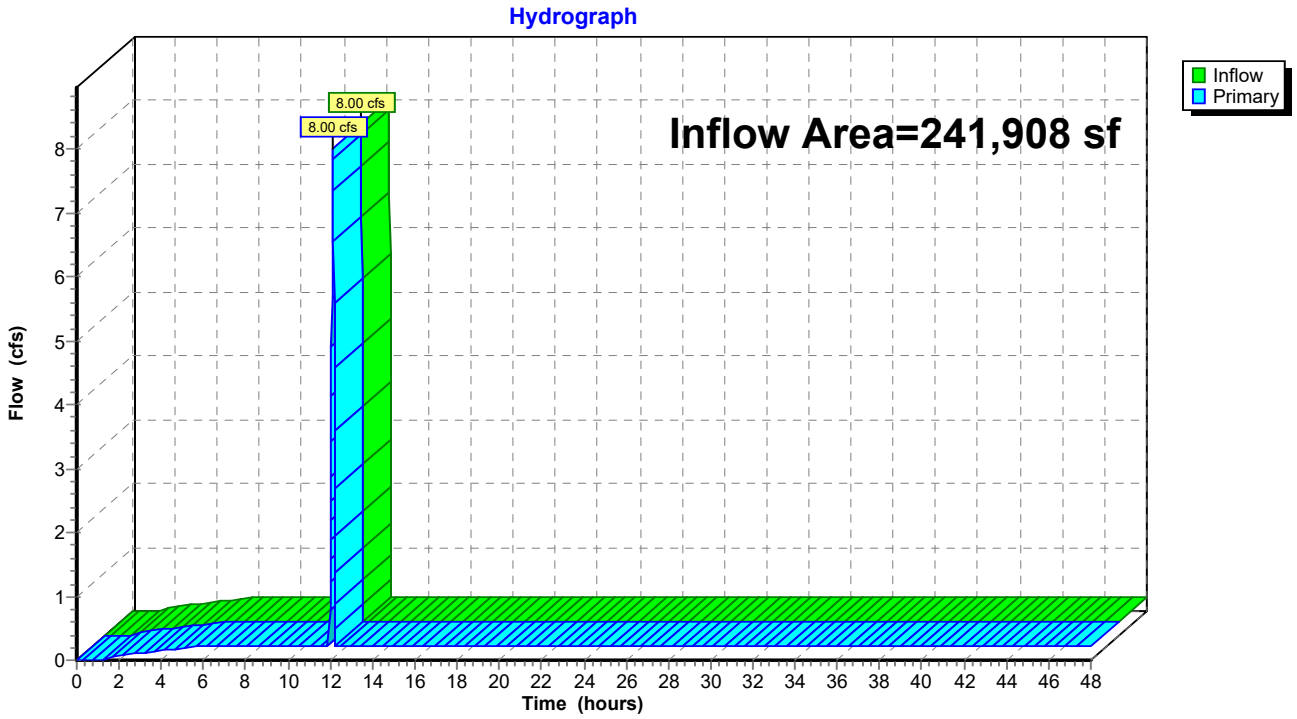


Summary for Link DP-1: DP-1

Inflow Area = 241,908 sf, 92.81% Impervious, Inflow Depth > 1.97" for 2-Year event
Inflow = 8.00 cfs @ 12.13 hrs, Volume= 39,759 cf
Primary = 8.00 cfs @ 12.13 hrs, Volume= 39,759 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link DP-1: DP-1

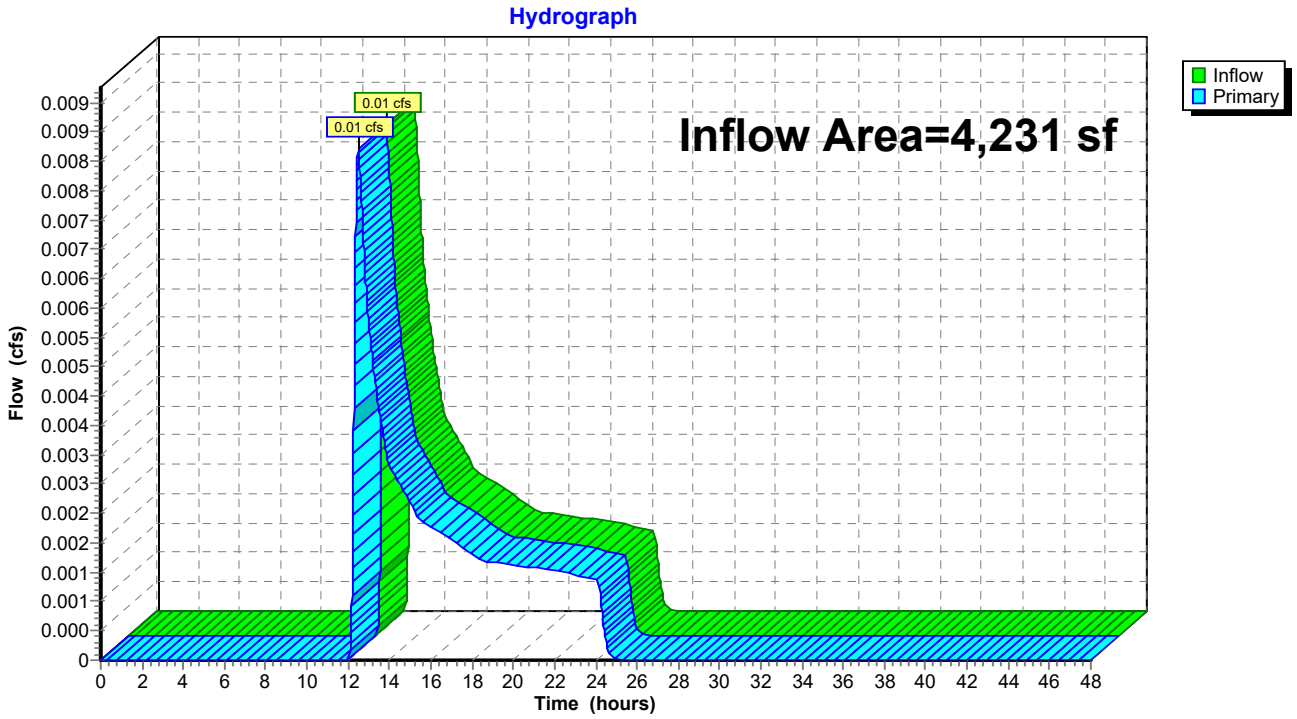


Summary for Link DP-2: DP-2

Inflow Area = 4,231 sf, 0.00% Impervious, Inflow Depth = 0.30" for 2-Year event
Inflow = 0.01 cfs @ 12.48 hrs, Volume= 106 cf
Primary = 0.01 cfs @ 12.48 hrs, Volume= 106 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link DP-2: DP-2



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Sub-catchment1 Runoff Area=33,590 sf 100.00% Impervious Runoff Depth=3.92"
Flow Length=851' Tc=6.0 min CN=98 Runoff=2.90 cfs 10,986 cf

Subcatchment2: Sub-catchment2 Runoff Area=7,467 sf 100.00% Impervious Runoff Depth=3.92"
Flow Length=946' Tc=6.0 min CN=98 Runoff=0.64 cfs 2,442 cf

Subcatchment3: Sub-catchment3 Runoff Area=7,120 sf 100.00% Impervious Runoff Depth=3.92"
Flow Length=897' Tc=6.0 min CN=98 Runoff=0.61 cfs 2,329 cf

Subcatchment4: Sub-catchment4 Runoff Area=57,605 sf 97.94% Impervious Runoff Depth=3.92"
Flow Length=632' Tc=6.0 min CN=98 Runoff=4.97 cfs 18,840 cf

Subcatchment5: Sub-catchment5 Runoff Area=14,314 sf 100.00% Impervious Runoff Depth=3.92"
Flow Length=500' Tc=6.0 min CN=98 Runoff=1.24 cfs 4,682 cf

Subcatchment6: Sub-catchment6 Runoff Area=20,333 sf 100.00% Impervious Runoff Depth=3.92"
Flow Length=490' Tc=6.0 min CN=98 Runoff=1.76 cfs 6,650 cf

Subcatchment7: Sub-catchment7 Runoff Area=23,381 sf 100.00% Impervious Runoff Depth=3.92"
Flow Length=393' Tc=6.0 min CN=98 Runoff=2.02 cfs 7,647 cf

Subcatchment8: Sub-catchment8 Runoff Area=25,531 sf 100.00% Impervious Runoff Depth=3.92"
Flow Length=359' Tc=6.0 min CN=98 Runoff=2.20 cfs 8,350 cf

Subcatchment9: Sub-catchment9 Runoff Area=7,621 sf 100.00% Impervious Runoff Depth=3.92"
Flow Length=216' Tc=6.0 min CN=98 Runoff=0.66 cfs 2,493 cf

Subcatchment10: Sub-catchment10 Runoff Area=29,279 sf 73.39% Impervious Runoff Depth=3.38"
Flow Length=350' Tc=6.0 min CN=93 Runoff=2.36 cfs 8,237 cf

Subcatchment11: Sub-catchment11 Runoff Area=1,822 sf 100.00% Impervious Runoff Depth=3.92"
Flow Length=900' Tc=6.0 min CN=98 Runoff=0.16 cfs 596 cf

Subcatchment12: Sub-catchment12 Runoff Area=13,845 sf 39.23% Impervious Runoff Depth=2.69"
Flow Length=170' Tc=6.0 min CN=86 Runoff=0.94 cfs 3,106 cf

Subcatchment13: Sub-catchment13 Runoff Area=4,231 sf 0.00% Impervious Runoff Depth=0.90"
Flow Length=227' Slope=0.0100 '/' Tc=24.9 min CN=61 Runoff=0.05 cfs 316 cf

Pond 1P: Diversion Structure Peak Elev=229.88' Inflow=20.46 cfs 76,357 cf
Primary=5.79 cfs 66,953 cf Secondary=14.67 cfs 9,404 cf Outflow=20.46 cfs 76,357 cf

Pond 2P: AGST Peak Elev=265.74' Storage=35,047 cf Inflow=5.79 cfs 66,953 cf
Outflow=1.52 cfs 51,519 cf

Link 1L: Wet Well/Pump Inflow=5.79 cfs 66,953 cf
Primary=5.79 cfs 66,953 cf

Link DP-1: DP-1 Inflow=14.89 cfs 60,923 cf
Primary=14.89 cfs 60,923 cf

Link DP-2: DP-2 Inflow=0.05 cfs 316 cf
Primary=0.05 cfs 316 cf

Total Runoff Area = 246,139 sf Runoff Volume = 76,672 cf Average Runoff Depth = 3.74"
8.79% Pervious = 21,624 sf 91.21% Impervious = 224,515 sf

Summary for Subcatchment 1: Sub-catchment 1

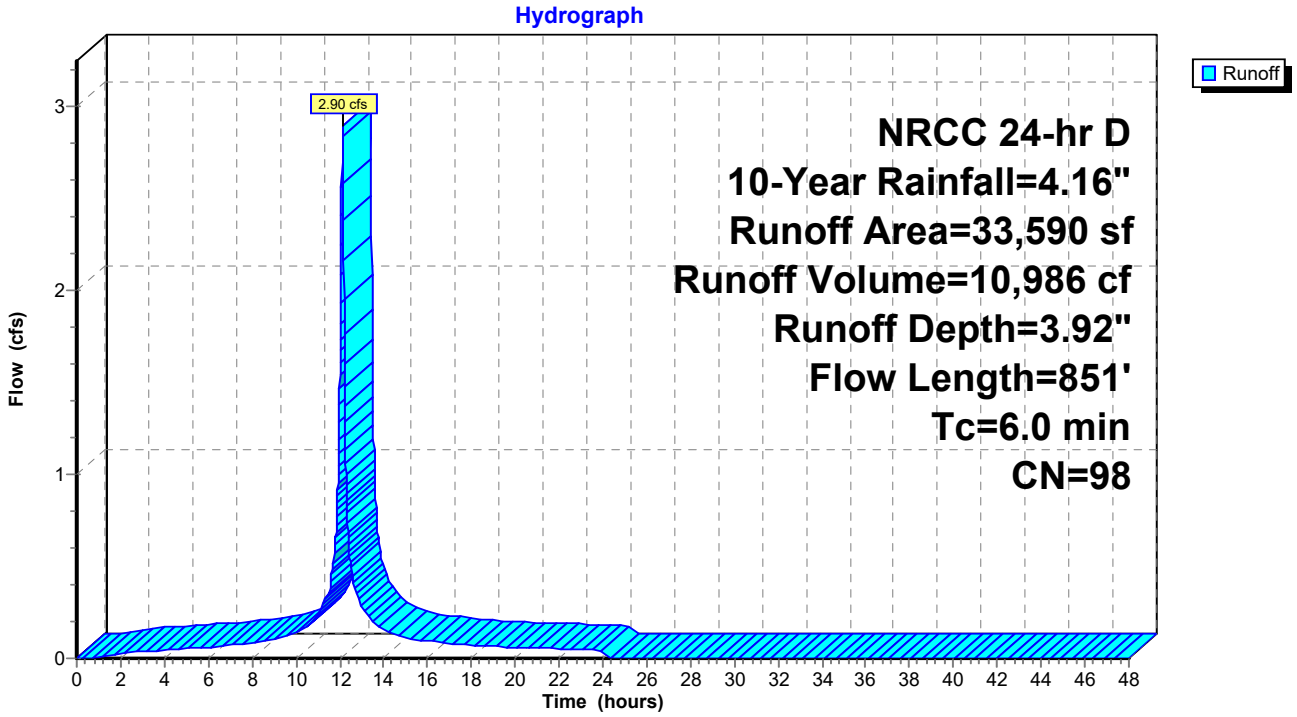
Runoff = 2.90 cfs @ 12.13 hrs, Volume= 10,986 cf, Depth= 3.92"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
15,206	98	Roofs, HSG B
18,384	98	Unconnected pavement, HSG B
33,590	98	Weighted Average
33,590		100.00% Impervious Area
18,384		54.73% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0160	1.26		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.7	49	0.0030	1.11		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	257	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	85	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
4.8	851	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1: Sub-catchment 1



Summary for Subcatchment 2: Sub-catchment 2

Runoff = 0.64 cfs @ 12.13 hrs, Volume= 2,442 cf, Depth= 3.92"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

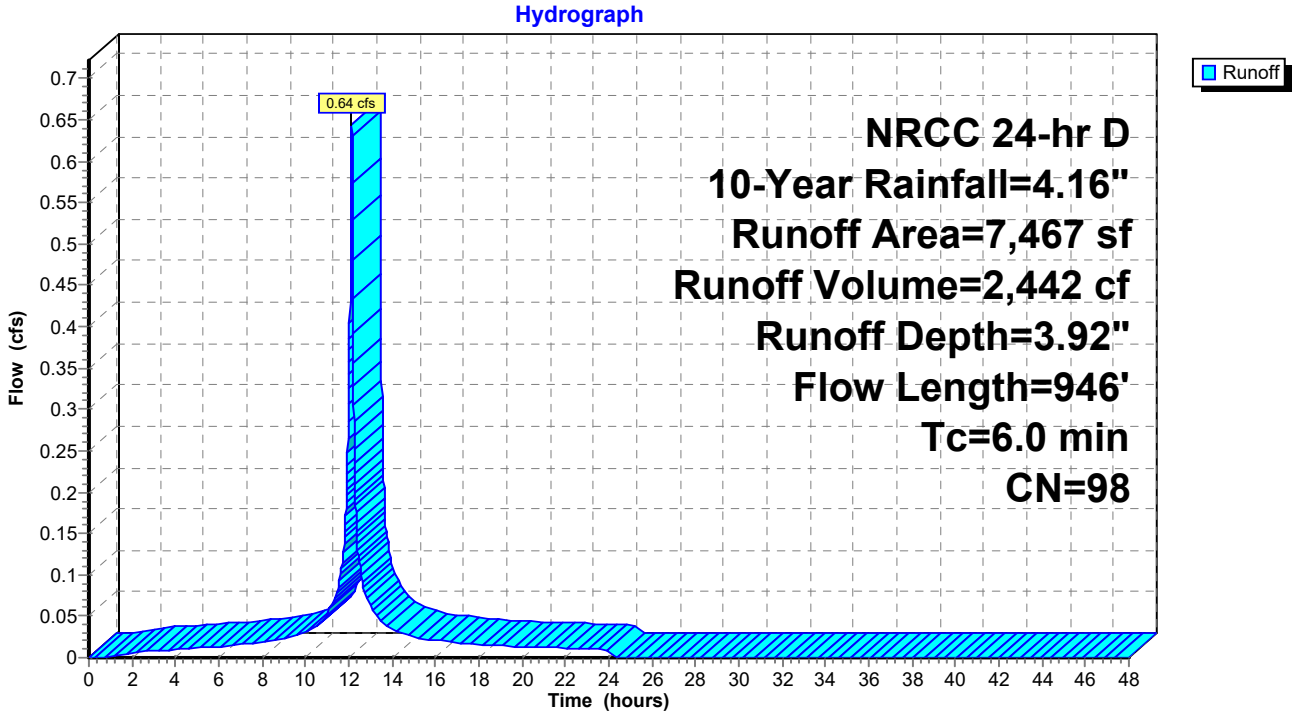
Area (sf)	CN	Description
2,936	98	Roofs, HSG B
4,531	98	Unconnected pavement, HSG B
7,467	98	Weighted Average
7,467		100.00% Impervious Area
4,531		60.68% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	41	0.0140	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
1.0	80	0.0010	1.38	0.75	**Pipe Channel, RCP_Round 10"** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Concrete pipe, finished
0.3	76	0.0120	4.77	2.60	**Pipe Channel, RCP_Round 10"** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Concrete pipe, finished
0.3	47	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.5	257	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	85	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63'

n= 0.012 Concrete pipe, finished

5.1 946 Total, Increased to minimum Tc = 6.0 min

Subcatchment 2: Sub-catchment 2



Summary for Subcatchment 3: Sub-catchment 3

Runoff = 0.61 cfs @ 12.13 hrs, Volume= 2,329 cf, Depth= 3.92"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

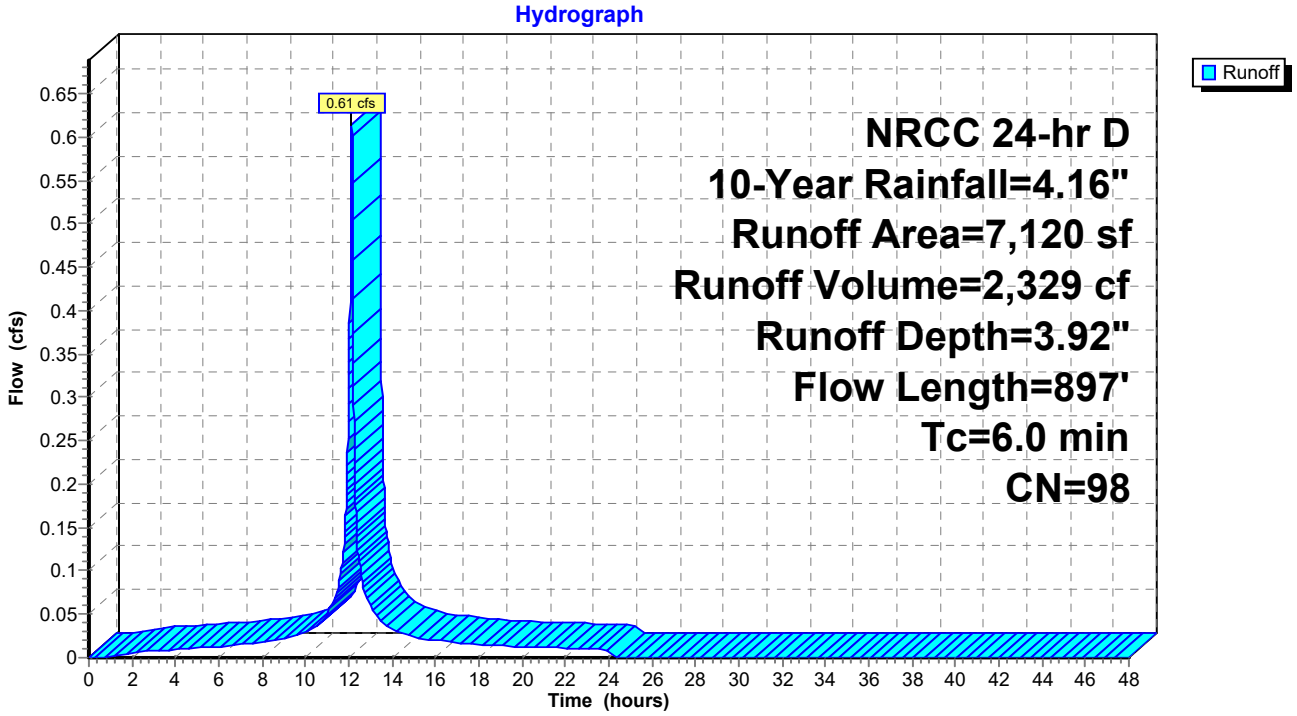
Area (sf)	CN	Description
2,543	98	Roofs, HSG B
4,577	98	Unconnected pavement, HSG B
7,120	98	Weighted Average
7,120		100.00% Impervious Area
4,577		64.28% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	62	0.0030	0.59		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.1	10	0.0012	1.51	0.82	**Pipe Channel, RCP_Round 10"** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Concrete pipe, finished
0.3	76	0.0120	4.77	2.60	**Pipe Channel, RCP_Round 10"** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Concrete pipe, finished
0.3	47	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.5	257	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	85	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63'

n= 0.012 Concrete pipe, finished

5.3 897 Total, Increased to minimum Tc = 6.0 min

Subcatchment 3: Sub-catchment 3



Summary for Subcatchment 4: Sub-catchment 4

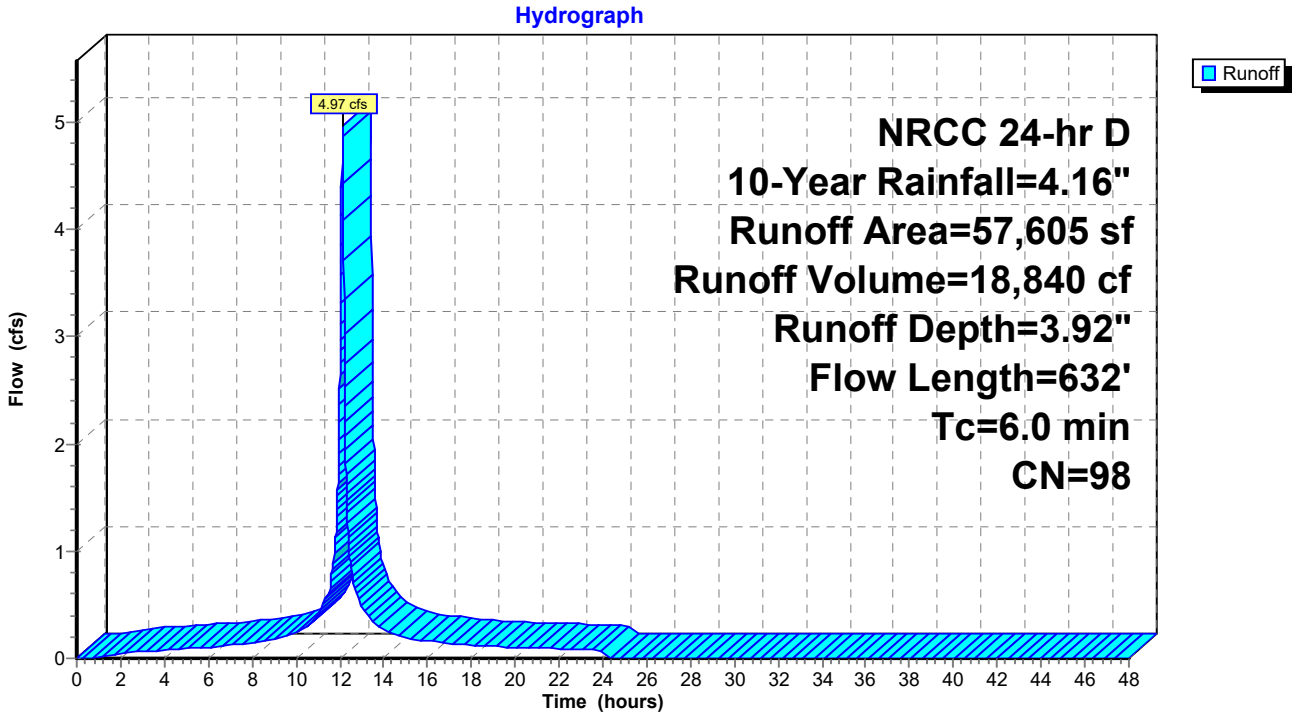
Runoff = 4.97 cfs @ 12.13 hrs, Volume= 18,840 cf, Depth= 3.92"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
5,329	98	Roofs, HSG B
51,087	98	Unconnected pavement, HSG B
1,189	79	<50% Grass cover, Poor, HSG B
57,605	98	Weighted Average
1,189		2.06% Pervious Area
56,416		97.94% Impervious Area
51,087		90.55% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0120	1.12		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.4	77	0.0230	3.08		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	10	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	85	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
3.3	632	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 4: Sub-catchment 4



Summary for Subcatchment 5: Sub-catchment 5

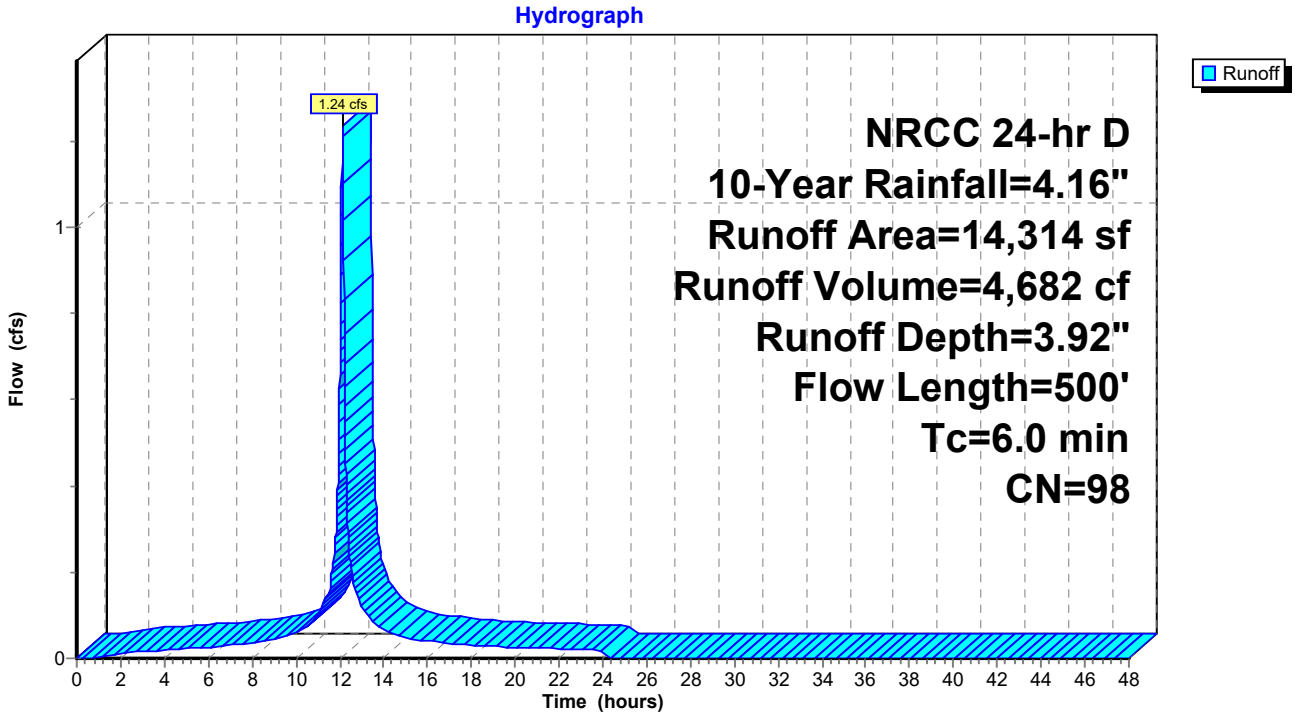
Runoff = 1.24 cfs @ 12.13 hrs, Volume= 4,682 cf, Depth= 3.92"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
5,500	98	Roofs, HSG B
8,814	98	Unconnected pavement, HSG B
14,314	98	Weighted Average
14,314		100.00% Impervious Area
8,814		61.58% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	55	0.0550	1.83		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.6	85	0.0020	2.20	1.73	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
2.1	500	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 5: Sub-catchment 5



Summary for Subcatchment 6: Sub-catchment 6

[47] Hint: Peak is 105% of capacity of segment #3

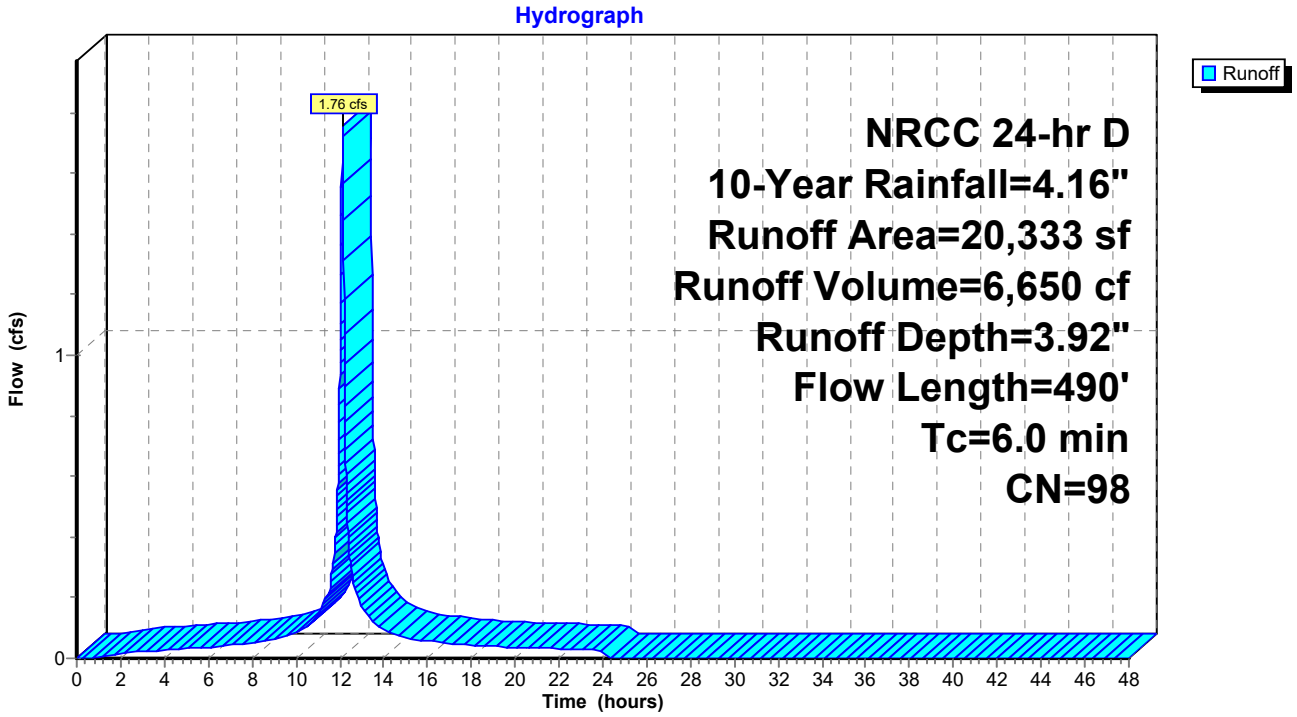
Runoff = 1.76 cfs @ 12.13 hrs, Volume= 6,650 cf, Depth= 3.92"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
20,333	98	Unconnected pavement, HSG B
20,333		100.00% Impervious Area
20,333		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.5	55	0.0090	1.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	10	0.0050	3.08	1.68	**Pipe Channel, RCP_Round 10"** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
3.1	490	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 6: Sub-catchment 6



Summary for Subcatchment 7: Sub-catchment 7

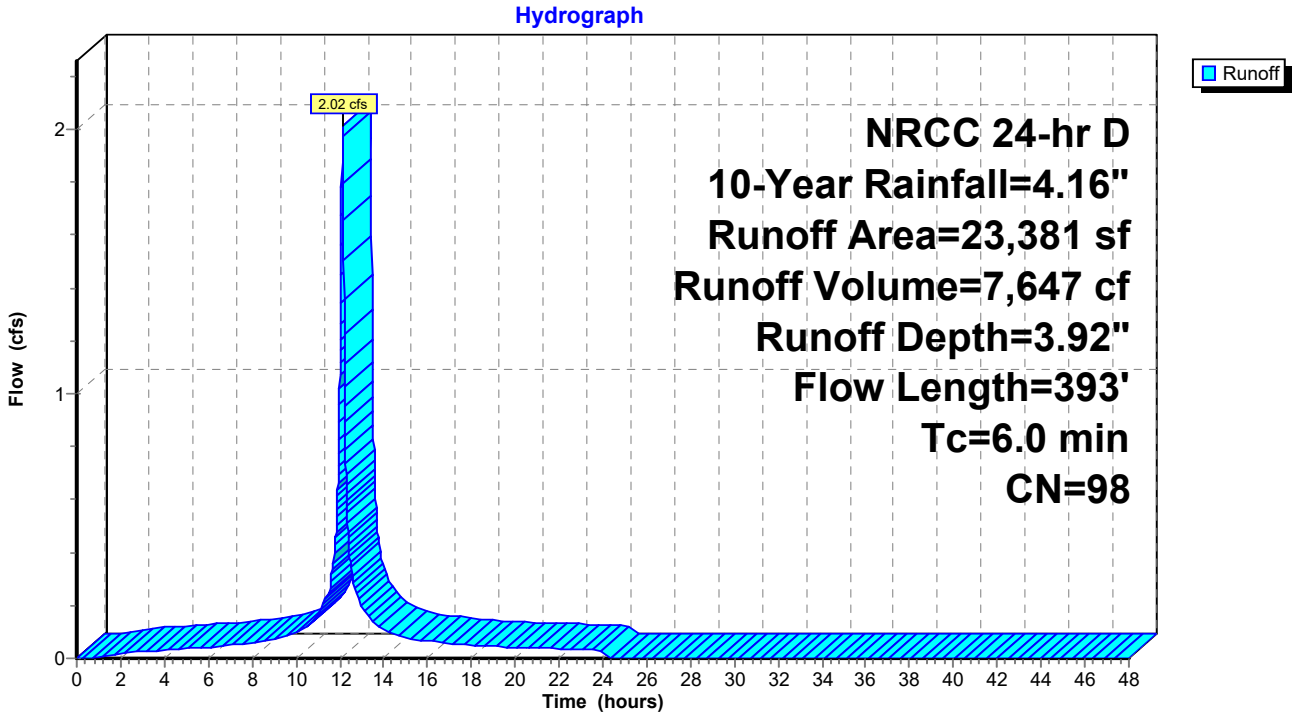
Runoff = 2.02 cfs @ 12.13 hrs, Volume= 7,647 cf, Depth= 3.92"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
19,985	98	Unconnected pavement, HSG B
3,396	98	Roofs, HSG B
23,381	98	Weighted Average
23,381		100.00% Impervious Area
19,985		85.48% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.5	55	0.0090	1.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.0	10	0.0050	4.55	8.05	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
2.6	393	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 7: Sub-catchment 7



Summary for Subcatchment 8: Sub-catchment 8

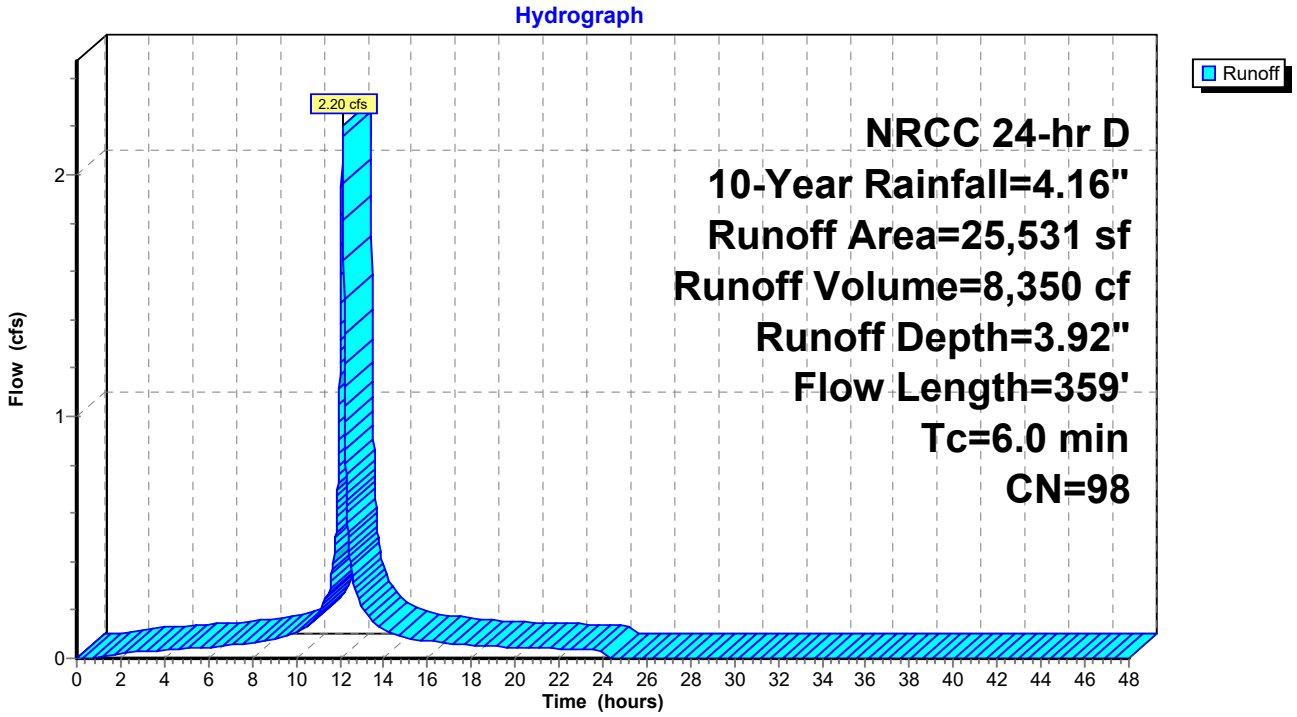
Runoff = 2.20 cfs @ 12.13 hrs, Volume= 8,350 cf, Depth= 3.92"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
23,413	98	Unconnected pavement, HSG B
2,118	98	Roofs, HSG B
25,531	98	Weighted Average
25,531		100.00% Impervious Area
23,413		91.70% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0070	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.6	85	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.0	10	0.0050	4.55	8.05	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
2.6	359	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 8: Sub-catchment 8



Summary for Subcatchment 9: Sub-catchment 9

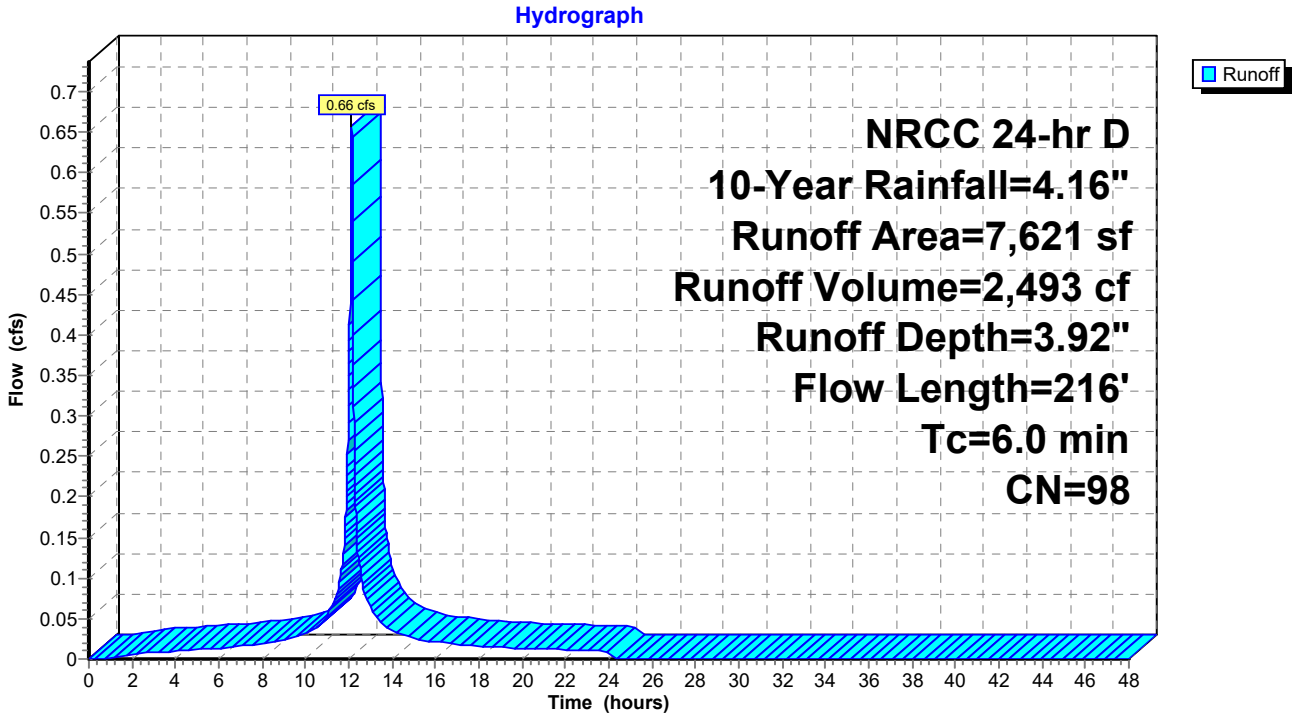
Runoff = 0.66 cfs @ 12.13 hrs, Volume= 2,493 cf, Depth= 3.92"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
7,621	98	Unconnected pavement, HSG B
7,621		100.00% Impervious Area
7,621		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	100	0.0090	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.7	62	0.0060	1.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	45	0.0050	3.47	2.73	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
2.6	216	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 9: Sub-catchment 9



Summary for Subcatchment 10: Sub-catchment 10

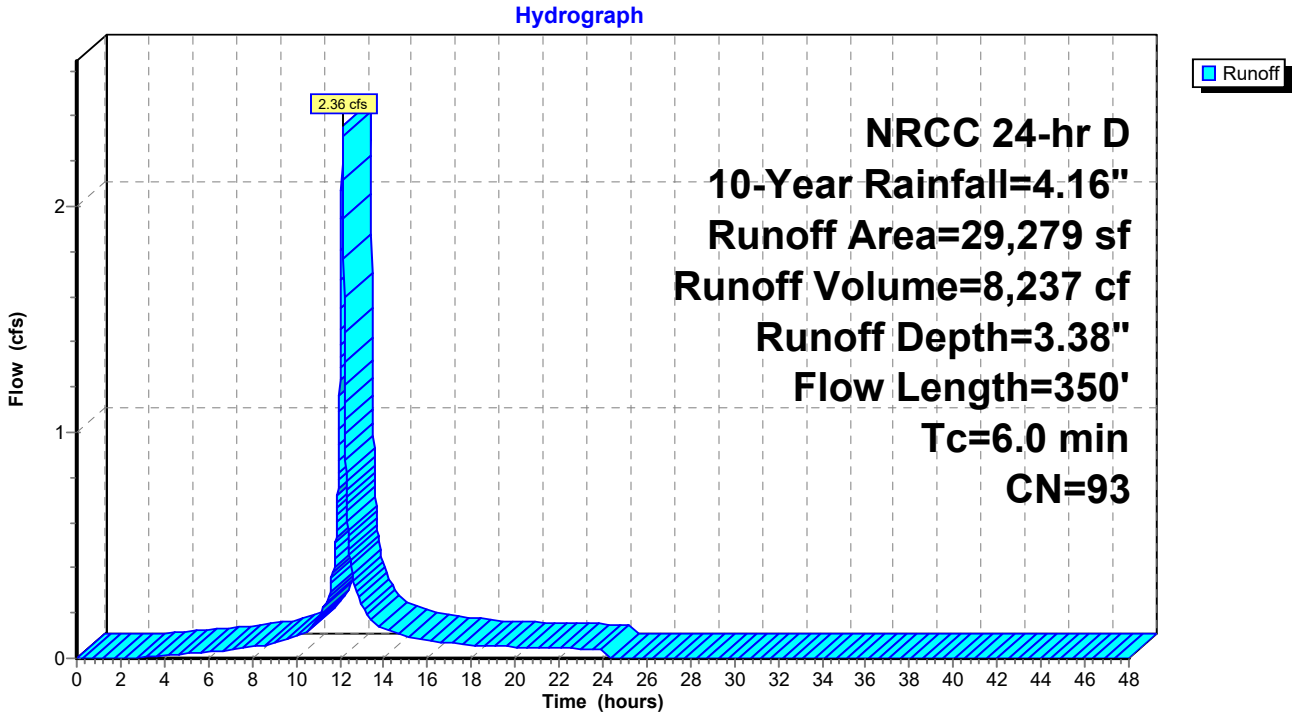
Runoff = 2.36 cfs @ 12.13 hrs, Volume= 8,237 cf, Depth= 3.38"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
14,729	98	Unconnected pavement, HSG B
6,760	98	Roofs, HSG B
7,790	79	<50% Grass cover, Poor, HSG B
29,279	93	Weighted Average
7,790		26.61% Pervious Area
21,489		73.39% Impervious Area
14,729		68.54% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.6	75	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	114	0.0050	3.47	2.73	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
2.8	350	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 10: Sub-catchment 10



Summary for Subcatchment 11: Sub-catchment 11

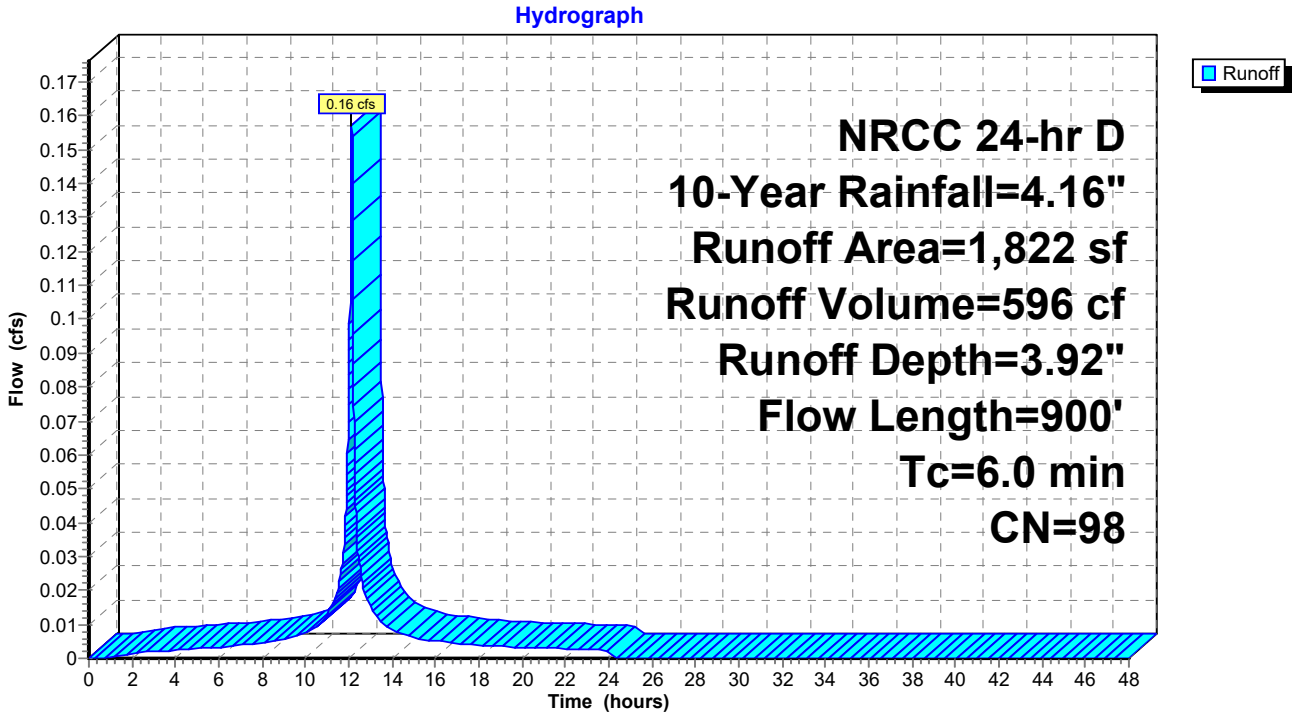
Runoff = 0.16 cfs @ 12.13 hrs, Volume= 596 cf, Depth= 3.92"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
1,822	98	Unconnected pavement, HSG B
1,822		100.00% Impervious Area
1,822		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	53	0.0690	1.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.4	59	0.0020	2.20	1.73	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.2	39	0.0050	4.03	4.95	**Pipe Channel, RCP_Round 15"** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.3	47	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.5	257	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	85	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
4.1	900	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 11: Sub-catchment 11



Summary for Subcatchment 12: Sub-catchment 12

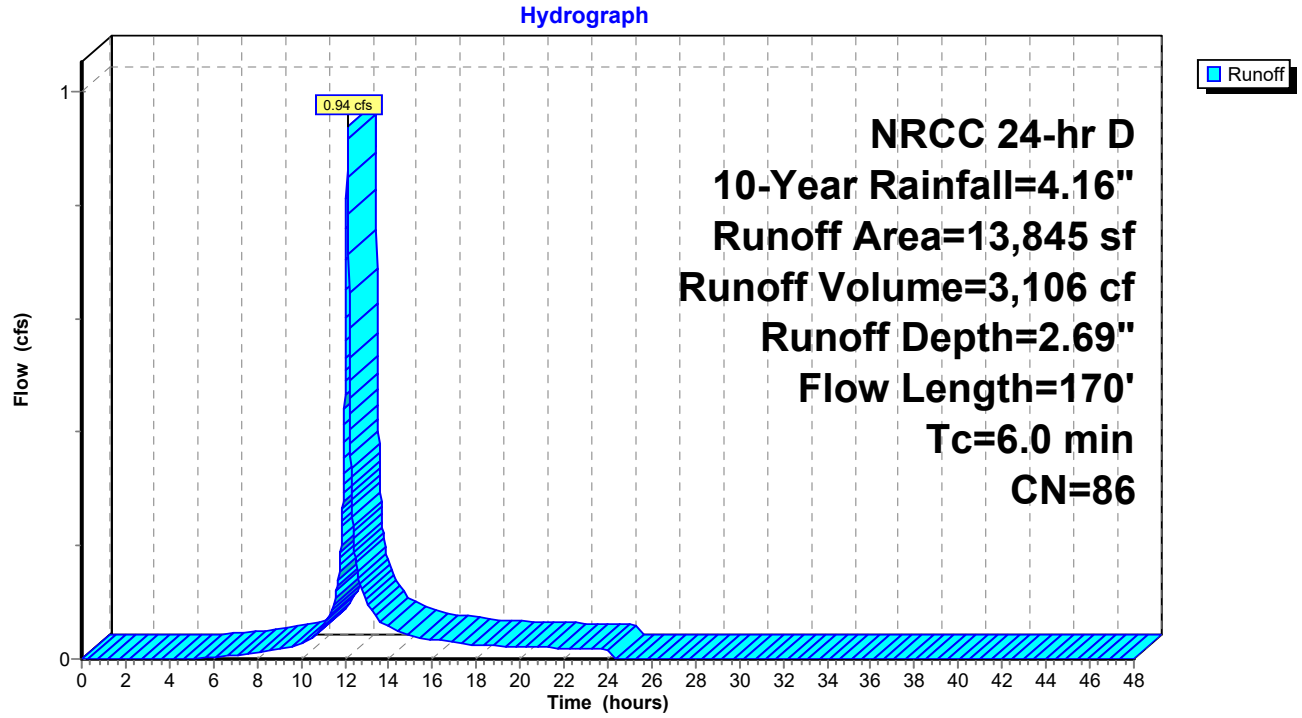
Runoff = 0.94 cfs @ 12.13 hrs, Volume= 3,106 cf, Depth= 2.69"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
5,431	98	Unconnected pavement, HSG B
8,414	79	<50% Grass cover, Poor, HSG B
13,845	86	Weighted Average
8,414		60.77% Pervious Area
5,431		39.23% Impervious Area
5,431		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.2	44	0.0230	3.08		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	26	0.0050	3.47	2.73	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
1.9	170	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 12: Sub-catchment 12



Summary for Subcatchment 13: Sub-catchment 13

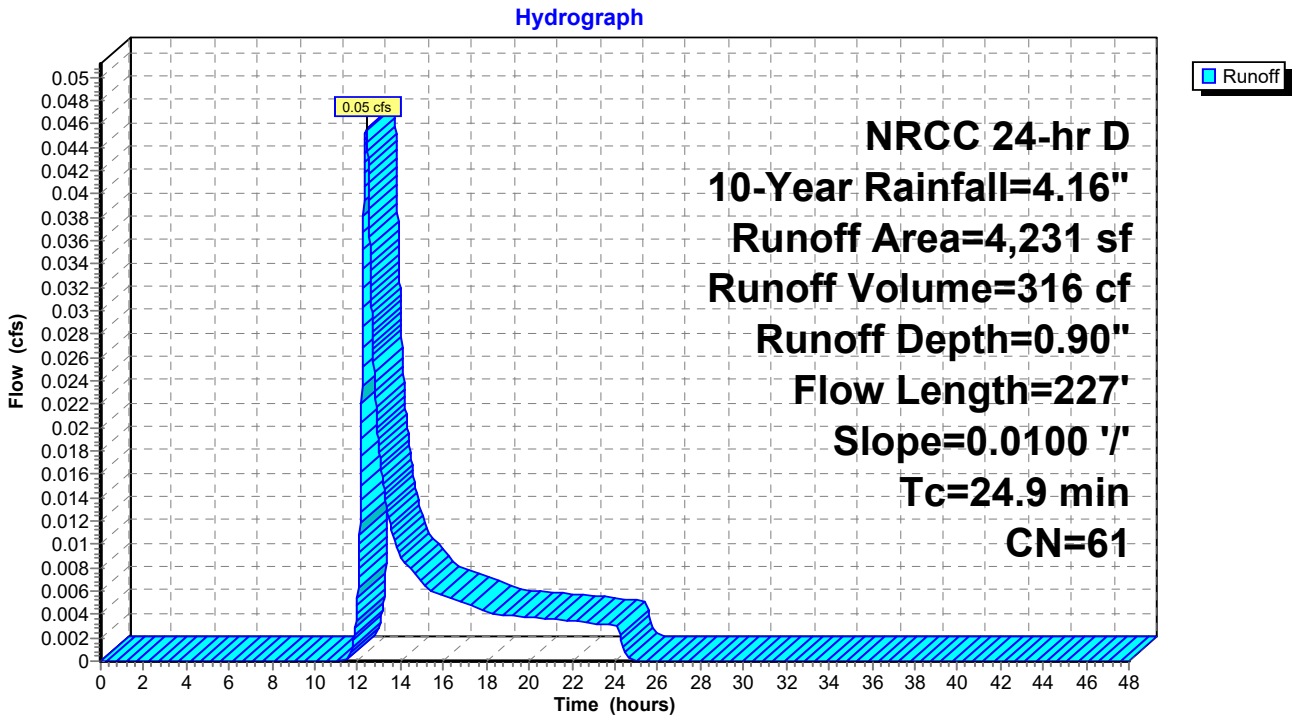
Runoff = 0.05 cfs @ 12.39 hrs, Volume= 316 cf, Depth= 0.90"
Routed to Link DP-2 : DP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.16"

Area (sf)	CN	Description
4,231	61	>75% Grass cover, Good, HSG B
4,231		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.9	227	0.0100	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"

Subcatchment 13: Sub-catchment 13



Summary for Pond 1P: Diversion Structure

[57] Hint: Peaked at 229.88' (Flood elevation advised)

Inflow Area = 241,908 sf, 92.81% Impervious, Inflow Depth = 3.79" for 10-Year event
Inflow = 20.46 cfs @ 12.13 hrs, Volume= 76,357 cf
Outflow = 20.46 cfs @ 12.13 hrs, Volume= 76,357 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.79 cfs @ 11.88 hrs, Volume= 66,953 cf
Routed to Link 1L : Wet Well/Pump
Secondary = 14.67 cfs @ 12.13 hrs, Volume= 9,404 cf
Routed to Link DP-1 : DP-1

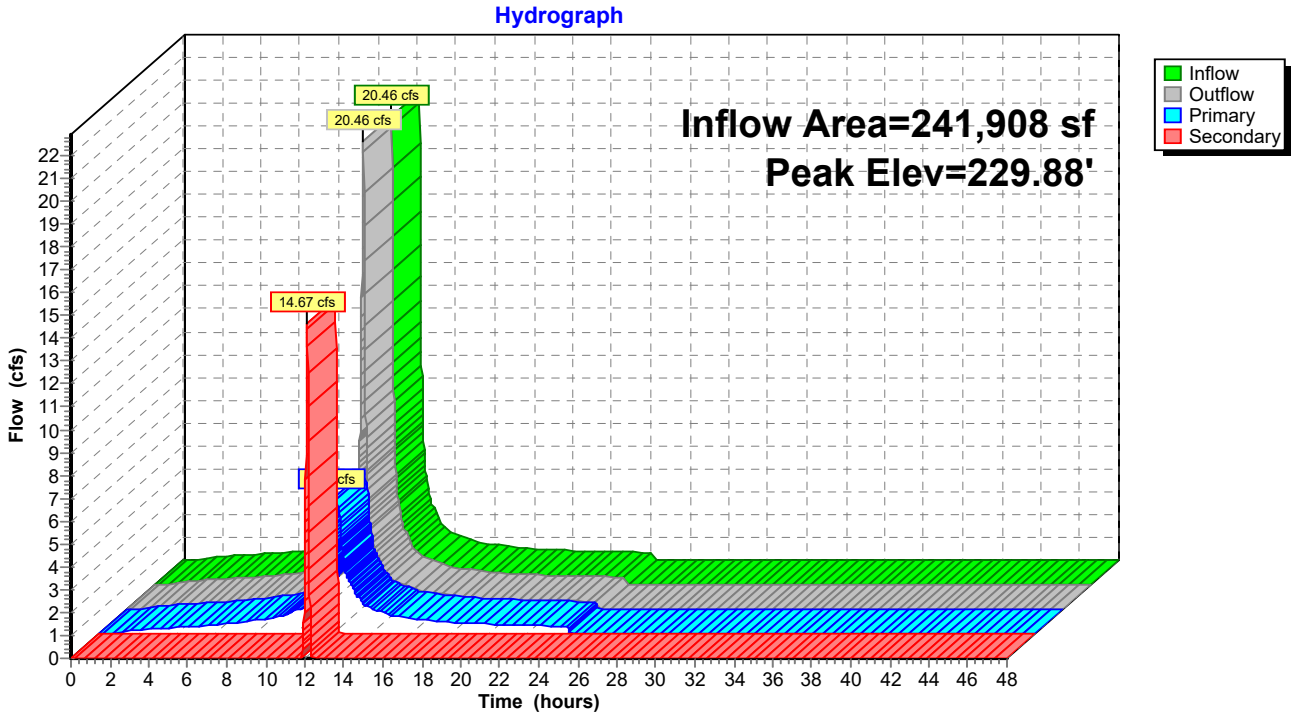
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 229.88' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	226.32'	**24.0" Round Culvert** L= 7.7' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 226.32' / 226.28' S= 0.0052 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Secondary	226.38'	**30.0" Round Culvert** L= 27.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 226.38' / 226.24' S= 0.0052 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#3	Device 2	228.99'	**6.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#4	Device 1	225.00'	**Special & User-Defined** Elev. (feet) 225.00 226.00 240.00 Disch. (cfs) 0.000 5.790 5.790

Primary OutFlow Max=5.79 cfs @ 11.88 hrs HW=229.03' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Passes 5.79 cfs of 17.41 cfs potential flow)
↑**4=Special & User-Defined** (Custom Controls 5.79 cfs)

Secondary OutFlow Max=14.65 cfs @ 12.13 hrs HW=229.88' TW=0.00' (Dynamic Tailwater)
↑**2=Culvert** (Passes 14.65 cfs of 32.13 cfs potential flow)
↑**3=Broad-Crested Rectangular Weir** (Weir Controls 14.65 cfs @ 2.74 fps)

Pond 1P: Diversion Structure



Summary for Pond 2P: AGST

Inflow Area = 241,908 sf, 92.81% Impervious, Inflow Depth = 3.32" for 10-Year event
Inflow = 5.79 cfs @ 11.88 hrs, Volume= 66,953 cf
Outflow = 1.52 cfs @ 13.38 hrs, Volume= 51,519 cf, Atten= 74%, Lag= 90.1 min
Primary = 1.52 cfs @ 13.38 hrs, Volume= 51,519 cf
Routed to Link DP-1 : DP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 265.74' @ 13.38 hrs Surf.Area= 908 sf Storage= 35,047 cf

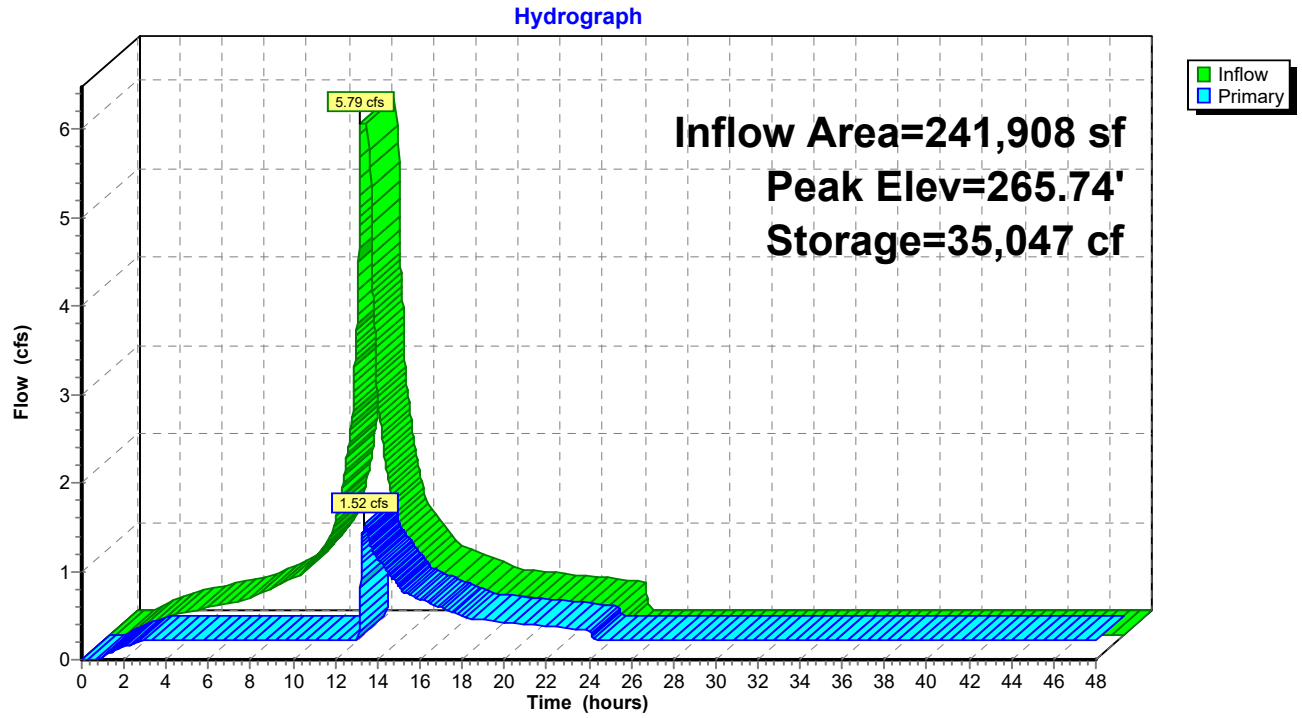
Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 585.5 min (1,352.2 - 766.7)

Volume	Invert	Avail.Storage	Storage Description
#1	227.14'	38,133 cf	**34.00'D x 42.00'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	227.14'	**0.223 cfs Constant Flow/Skimmer**
#2	Primary	265.14'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.52 cfs @ 13.38 hrs HW=265.74' TW=0.00' (Dynamic Tailwater)
└─**1=Constant Flow/Skimmer** (Constant Controls 0.22 cfs)
└─**2=Orifice/Grate** (Orifice Controls 1.30 cfs @ 2.64 fps)

Pond 2P: AGST

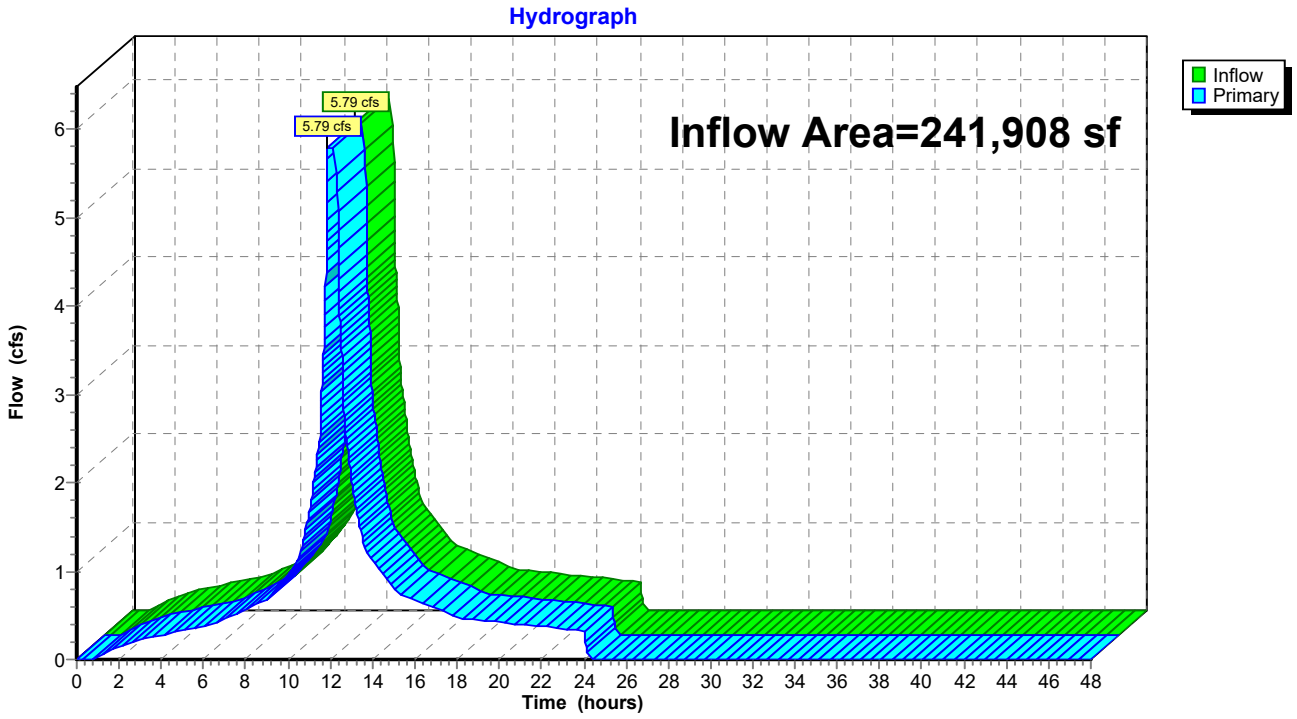


Summary for Link 1L: Wet Well/Pump

Inflow Area = 241,908 sf, 92.81% Impervious, Inflow Depth = 3.32" for 10-Year event
Inflow = 5.79 cfs @ 11.88 hrs, Volume= 66,953 cf
Primary = 5.79 cfs @ 11.88 hrs, Volume= 66,953 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 2P : AGST

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 1L: Wet Well/Pump

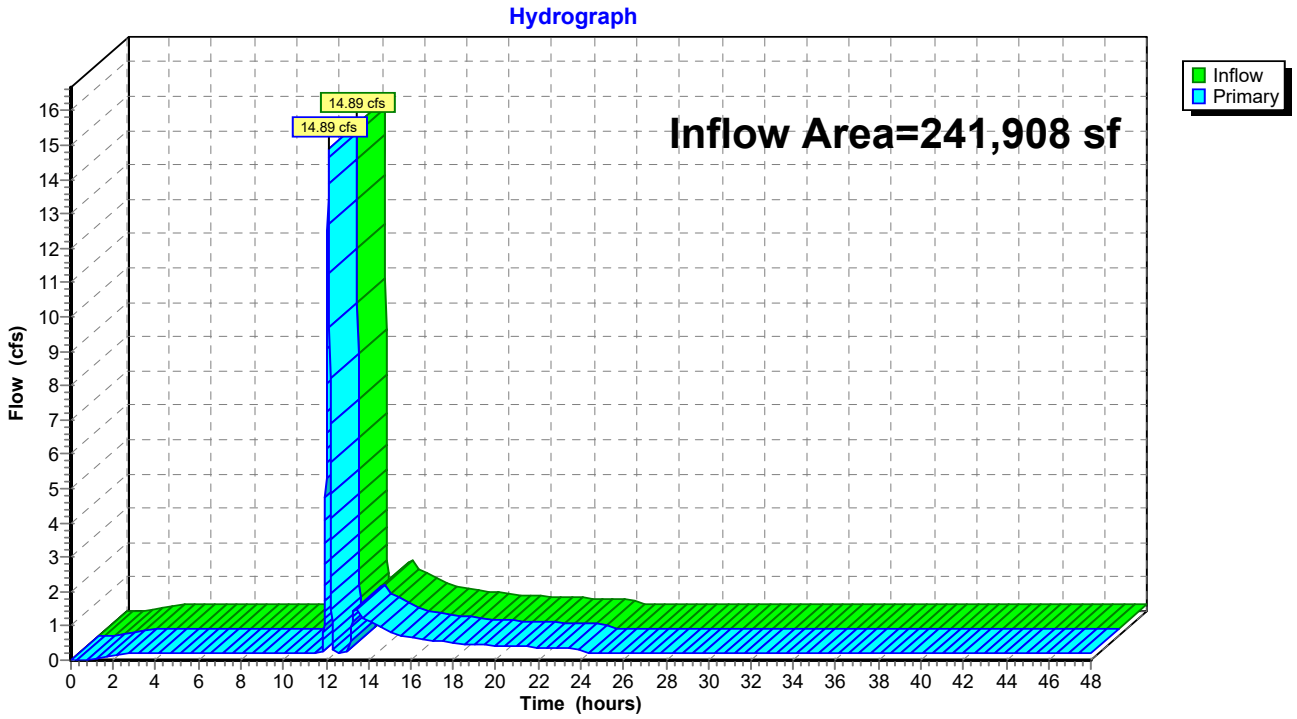


Summary for Link DP-1: DP-1

Inflow Area = 241,908 sf, 92.81% Impervious, Inflow Depth > 3.02" for 10-Year event
Inflow = 14.89 cfs @ 12.13 hrs, Volume= 60,923 cf
Primary = 14.89 cfs @ 12.13 hrs, Volume= 60,923 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link DP-1: DP-1

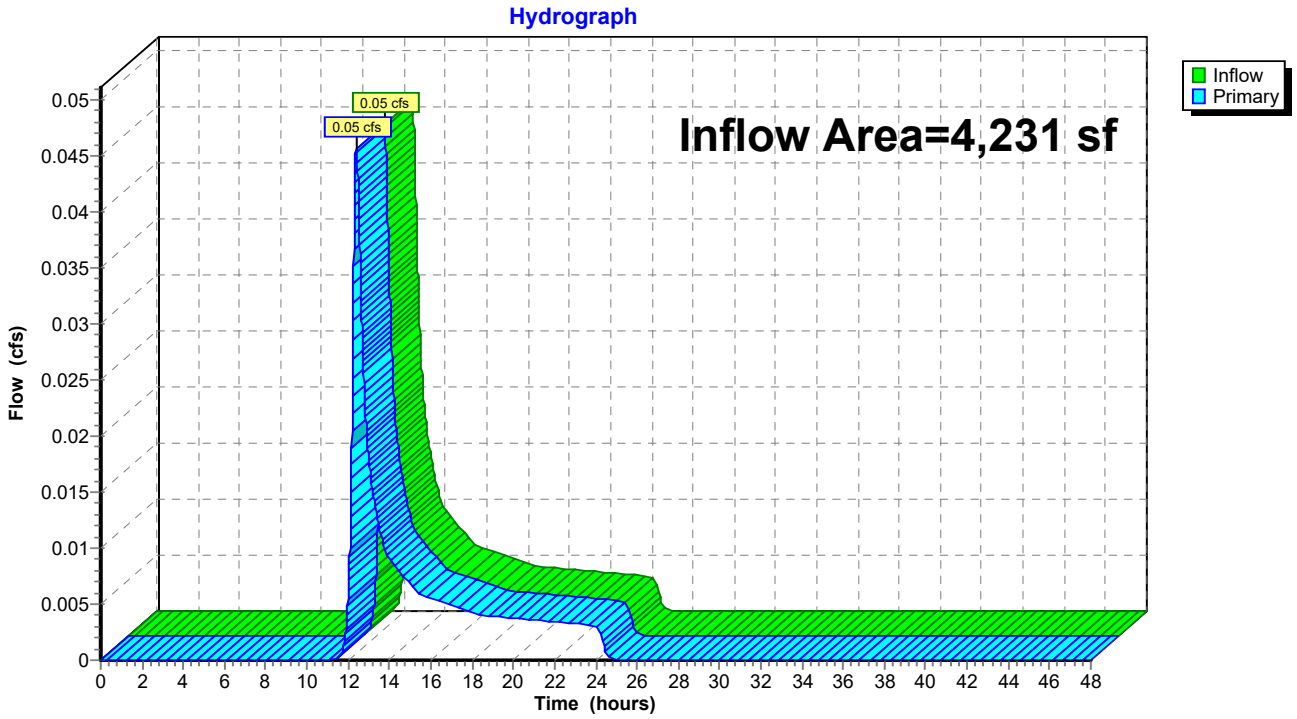


Summary for Link DP-2: DP-2

Inflow Area = 4,231 sf, 0.00% Impervious, Inflow Depth = 0.90" for 10-Year event
Inflow = 0.05 cfs @ 12.39 hrs, Volume= 316 cf
Primary = 0.05 cfs @ 12.39 hrs, Volume= 316 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link DP-2: DP-2



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Sub-catchment1 Runoff Area=33,590 sf 100.00% Impervious Runoff Depth=5.91"
Flow Length=851' Tc=6.0 min CN=98 Runoff=4.30 cfs 16,548 cf

Subcatchment2: Sub-catchment2 Runoff Area=7,467 sf 100.00% Impervious Runoff Depth=5.91"
Flow Length=946' Tc=6.0 min CN=98 Runoff=0.96 cfs 3,679 cf

Subcatchment3: Sub-catchment3 Runoff Area=7,120 sf 100.00% Impervious Runoff Depth=5.91"
Flow Length=897' Tc=6.0 min CN=98 Runoff=0.91 cfs 3,508 cf

Subcatchment4: Sub-catchment4 Runoff Area=57,605 sf 97.94% Impervious Runoff Depth=5.91"
Flow Length=632' Tc=6.0 min CN=98 Runoff=7.38 cfs 28,379 cf

Subcatchment5: Sub-catchment5 Runoff Area=14,314 sf 100.00% Impervious Runoff Depth=5.91"
Flow Length=500' Tc=6.0 min CN=98 Runoff=1.83 cfs 7,052 cf

Subcatchment6: Sub-catchment6 Runoff Area=20,333 sf 100.00% Impervious Runoff Depth=5.91"
Flow Length=490' Tc=6.0 min CN=98 Runoff=2.61 cfs 10,017 cf

Subcatchment7: Sub-catchment7 Runoff Area=23,381 sf 100.00% Impervious Runoff Depth=5.91"
Flow Length=393' Tc=6.0 min CN=98 Runoff=3.00 cfs 11,518 cf

Subcatchment8: Sub-catchment8 Runoff Area=25,531 sf 100.00% Impervious Runoff Depth=5.91"
Flow Length=359' Tc=6.0 min CN=98 Runoff=3.27 cfs 12,578 cf

Subcatchment9: Sub-catchment9 Runoff Area=7,621 sf 100.00% Impervious Runoff Depth=5.91"
Flow Length=216' Tc=6.0 min CN=98 Runoff=0.98 cfs 3,754 cf

Subcatchment10: Sub-catchment10 Runoff Area=29,279 sf 73.39% Impervious Runoff Depth=5.33"
Flow Length=350' Tc=6.0 min CN=93 Runoff=3.62 cfs 13,006 cf

Subcatchment11: Sub-catchment11 Runoff Area=1,822 sf 100.00% Impervious Runoff Depth=5.91"
Flow Length=900' Tc=6.0 min CN=98 Runoff=0.23 cfs 898 cf

Subcatchment12: Sub-catchment12 Runoff Area=13,845 sf 39.23% Impervious Runoff Depth=4.55"
Flow Length=170' Tc=6.0 min CN=86 Runoff=1.55 cfs 5,252 cf

Subcatchment13: Sub-catchment13 Runoff Area=4,231 sf 0.00% Impervious Runoff Depth=2.11"
Flow Length=227' Slope=0.0100 '/' Tc=24.9 min CN=61 Runoff=0.12 cfs 743 cf

Pond 1P: Diversion Structure Peak Elev=230.21' Inflow=30.64 cfs 116,188 cf
Primary=5.79 cfs 96,333 cf Secondary=24.85 cfs 19,854 cf Outflow=30.64 cfs 116,188 cf

Pond 2P: AGST Peak Elev=267.61' Storage=36,742 cf Inflow=5.79 cfs 96,333 cf
Outflow=5.53 cfs 80,849 cf

Link 1L: Wet Well/Pump Inflow=5.79 cfs 96,333 cf
Primary=5.79 cfs 96,333 cf

Link DP-1: DP-1 Inflow=28.79 cfs 100,704 cf
Primary=28.79 cfs 100,704 cf

Link DP-2: DP-2 Inflow=0.12 cfs 743 cf
Primary=0.12 cfs 743 cf

Total Runoff Area = 246,139 sf Runoff Volume = 116,930 cf Average Runoff Depth = 5.70"
8.79% Pervious = 21,624 sf 91.21% Impervious = 224,515 sf

Summary for Subcatchment 1: Sub-catchment 1

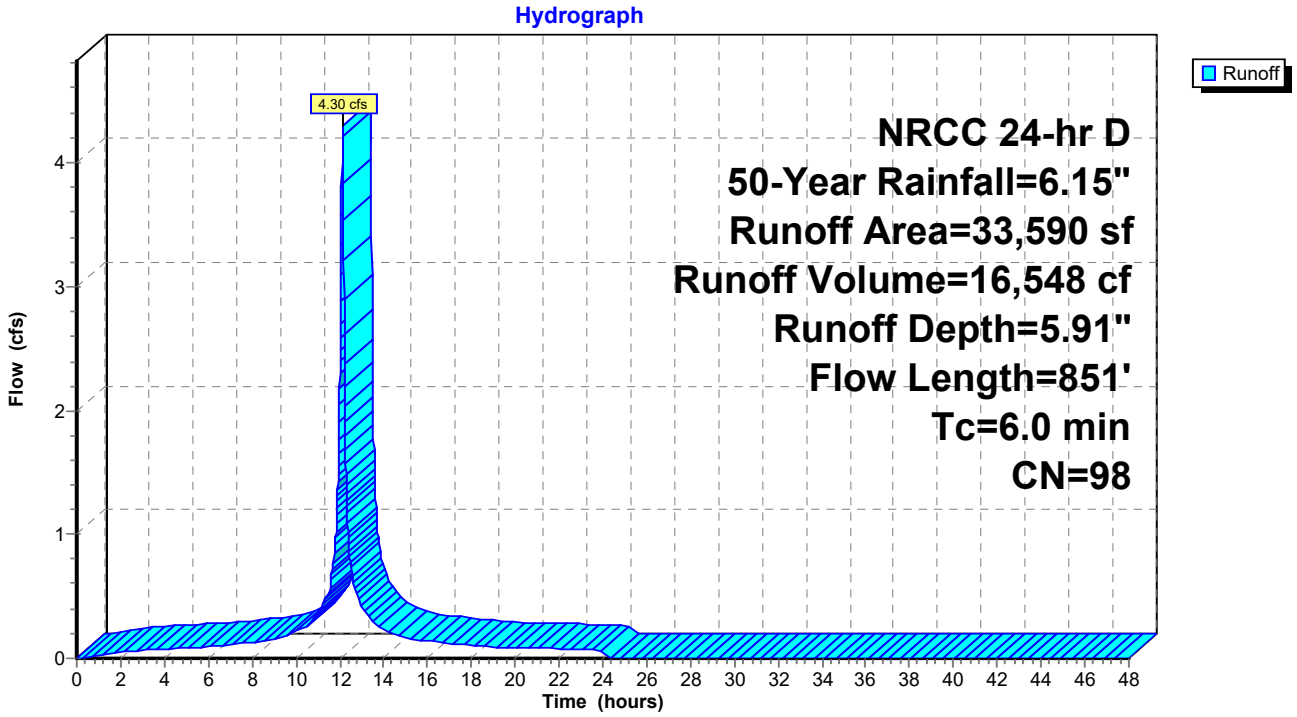
Runoff = 4.30 cfs @ 12.13 hrs, Volume= 16,548 cf, Depth= 5.91"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
15,206	98	Roofs, HSG B
18,384	98	Unconnected pavement, HSG B
33,590	98	Weighted Average
33,590		100.00% Impervious Area
18,384		54.73% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0160	1.26		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.7	49	0.0030	1.11		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	257	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	85	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
4.8	851	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1: Sub-catchment 1



Summary for Subcatchment 2: Sub-catchment 2

[47] Hint: Peak is 127% of capacity of segment #2

Runoff = 0.96 cfs @ 12.13 hrs, Volume= 3,679 cf, Depth= 5.91"
Routed to Pond 1P : Diversion Structure

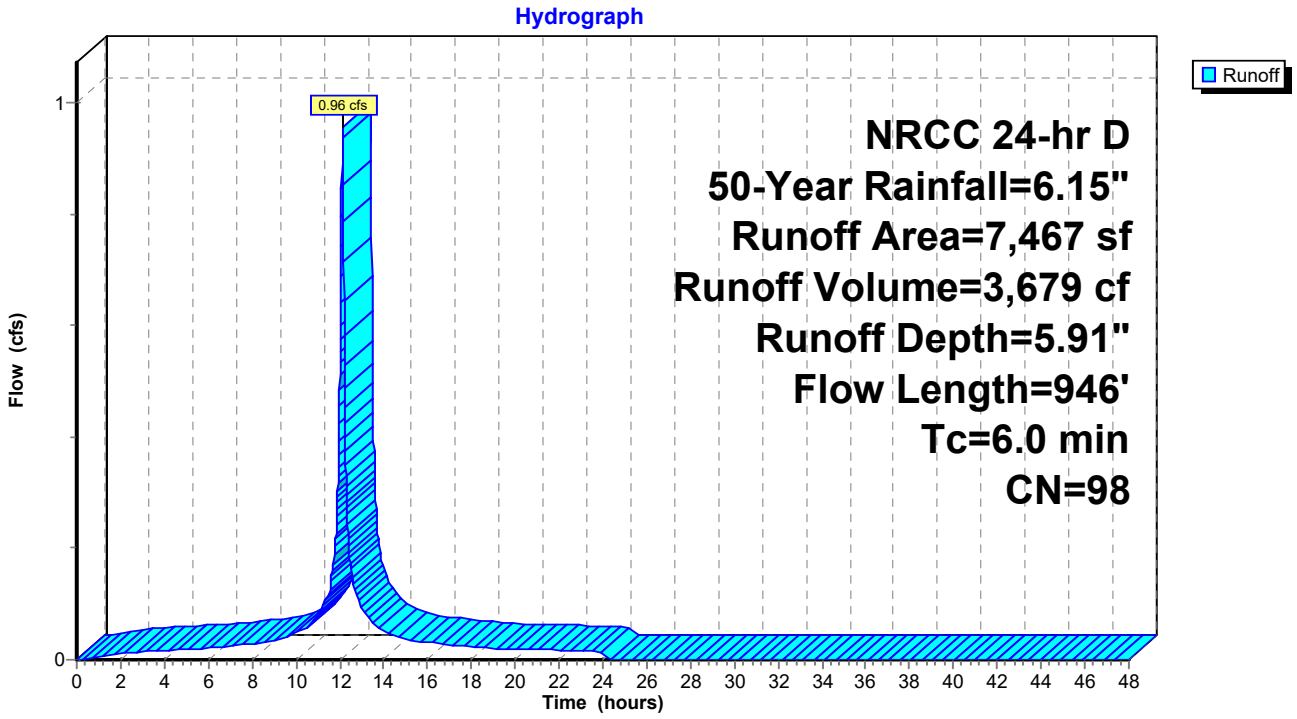
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
2,936	98	Roofs, HSG B
4,531	98	Unconnected pavement, HSG B
7,467	98	Weighted Average
7,467		100.00% Impervious Area
4,531		60.68% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	41	0.0140	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
1.0	80	0.0010	1.38	0.75	**Pipe Channel, RCP_Round 10"** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Concrete pipe, finished
0.3	76	0.0120	4.77	2.60	**Pipe Channel, RCP_Round 10"** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Concrete pipe, finished
0.3	47	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.5	257	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	85	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished

0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
5.1	946	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2: Sub-catchment 2



Summary for Subcatchment 3: Sub-catchment 3

[47] Hint: Peak is 111% of capacity of segment #2

Runoff = 0.91 cfs @ 12.13 hrs, Volume= 3,508 cf, Depth= 5.91"
Routed to Pond 1P : Diversion Structure

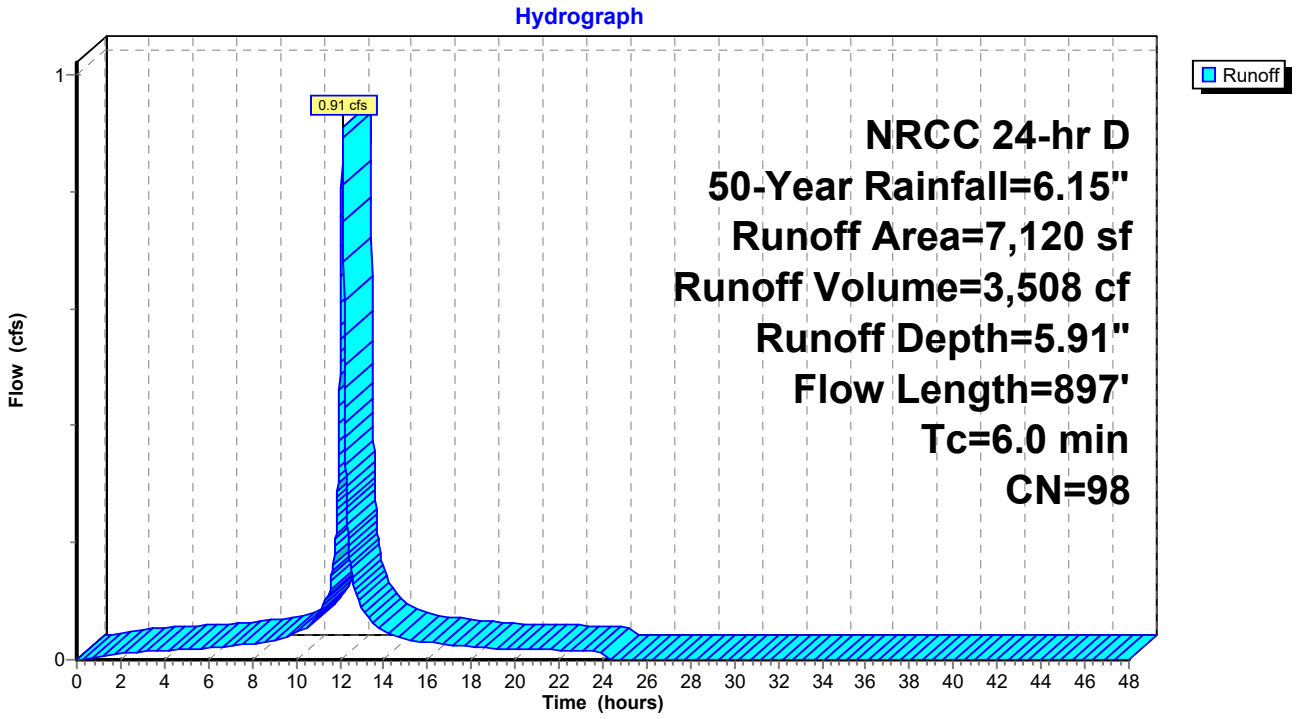
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
2,543	98	Roofs, HSG B
4,577	98	Unconnected pavement, HSG B
7,120	98	Weighted Average
7,120		100.00% Impervious Area
4,577		64.28% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	62	0.0030	0.59		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.1	10	0.0012	1.51	0.82	**Pipe Channel, RCP_Round 10"** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Concrete pipe, finished
0.3	76	0.0120	4.77	2.60	**Pipe Channel, RCP_Round 10"** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Concrete pipe, finished
0.3	47	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.5	257	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	85	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished

0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
5.3	897	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 3: Sub-catchment 3



Summary for Subcatchment 4: Sub-catchment 4

[47] Hint: Peak is 145% of capacity of segment #3

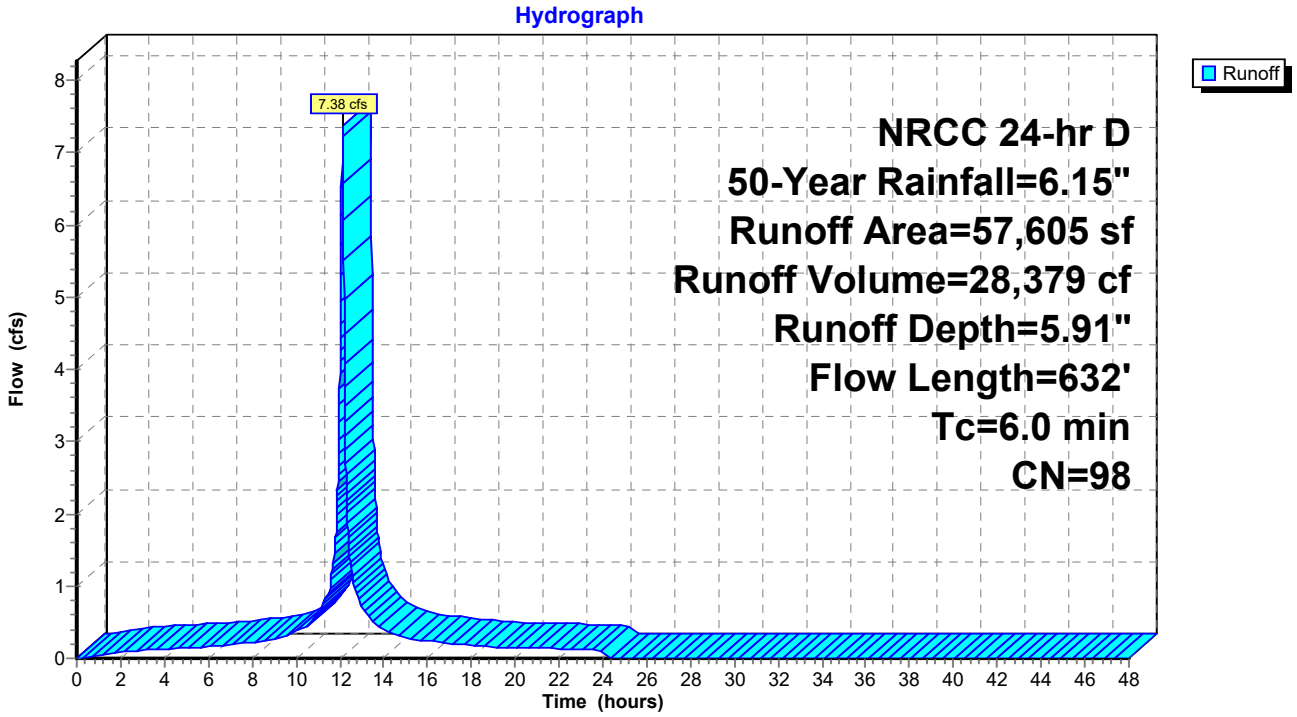
Runoff = 7.38 cfs @ 12.13 hrs, Volume= 28,379 cf, Depth= 5.91"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
5,329	98	Roofs, HSG B
51,087	98	Unconnected pavement, HSG B
1,189	79	<50% Grass cover, Poor, HSG B
57,605	98	Weighted Average
1,189		2.06% Pervious Area
56,416		97.94% Impervious Area
51,087		90.55% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0120	1.12		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.4	77	0.0230	3.08		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	10	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	85	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
3.3	632	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 4: Sub-catchment 4



Summary for Subcatchment 5: Sub-catchment 5

[47] Hint: Peak is 106% of capacity of segment #2

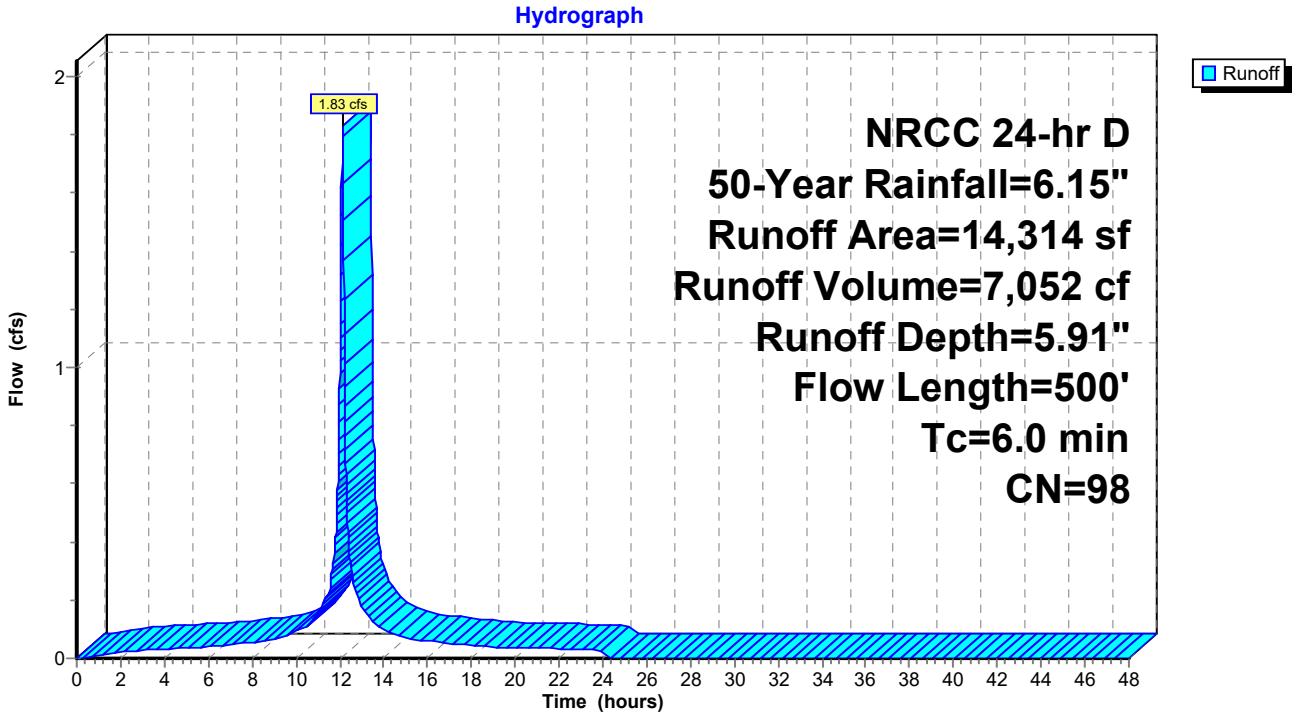
Runoff = 1.83 cfs @ 12.13 hrs, Volume= 7,052 cf, Depth= 5.91"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
5,500	98	Roofs, HSG B
8,814	98	Unconnected pavement, HSG B
14,314	98	Weighted Average
14,314		100.00% Impervious Area
8,814		61.58% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	55	0.0550	1.83		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.6	85	0.0020	2.20	1.73	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
2.1	500	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 5: Sub-catchment 5



Summary for Subcatchment 6: Sub-catchment 6

[47] Hint: Peak is 155% of capacity of segment #3

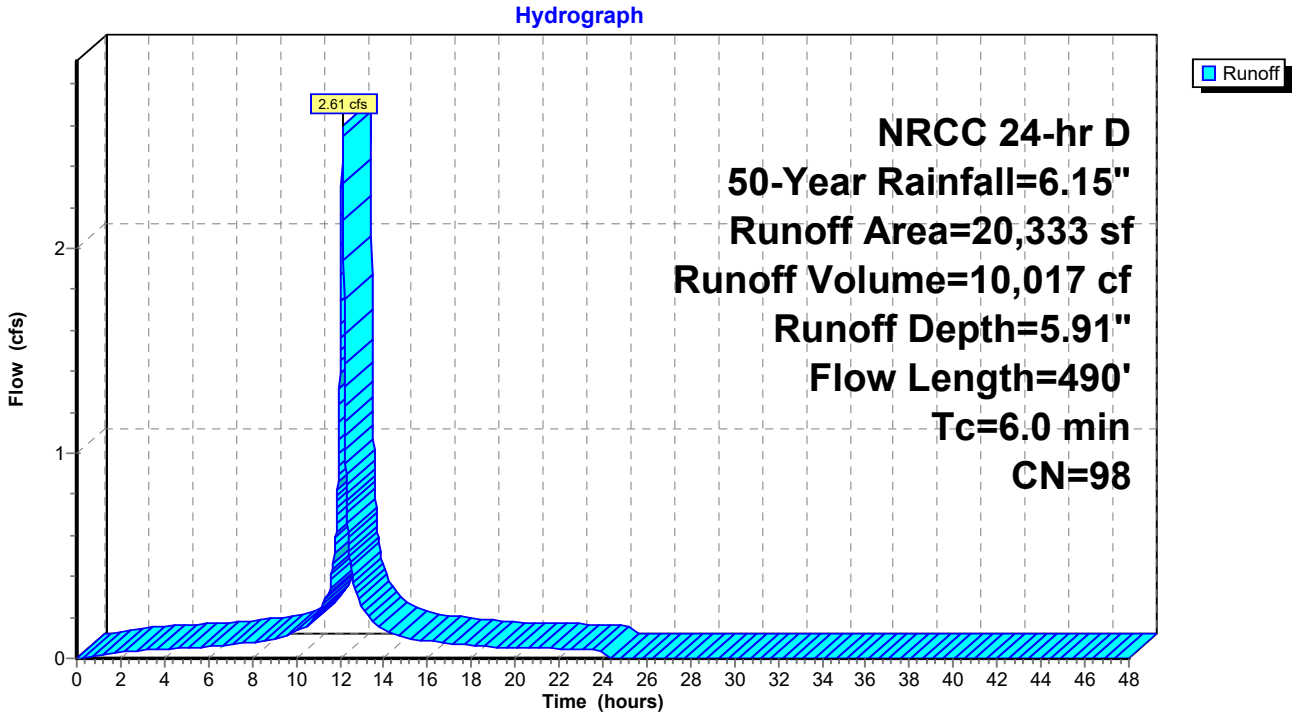
Runoff = 2.61 cfs @ 12.13 hrs, Volume= 10,017 cf, Depth= 5.91"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
20,333	98	Unconnected pavement, HSG B
20,333		100.00% Impervious Area
20,333		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.5	55	0.0090	1.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	10	0.0050	3.08	1.68	**Pipe Channel, RCP_Round 10"** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
3.1	490	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 6: Sub-catchment 6



Summary for Subcatchment 7: Sub-catchment 7

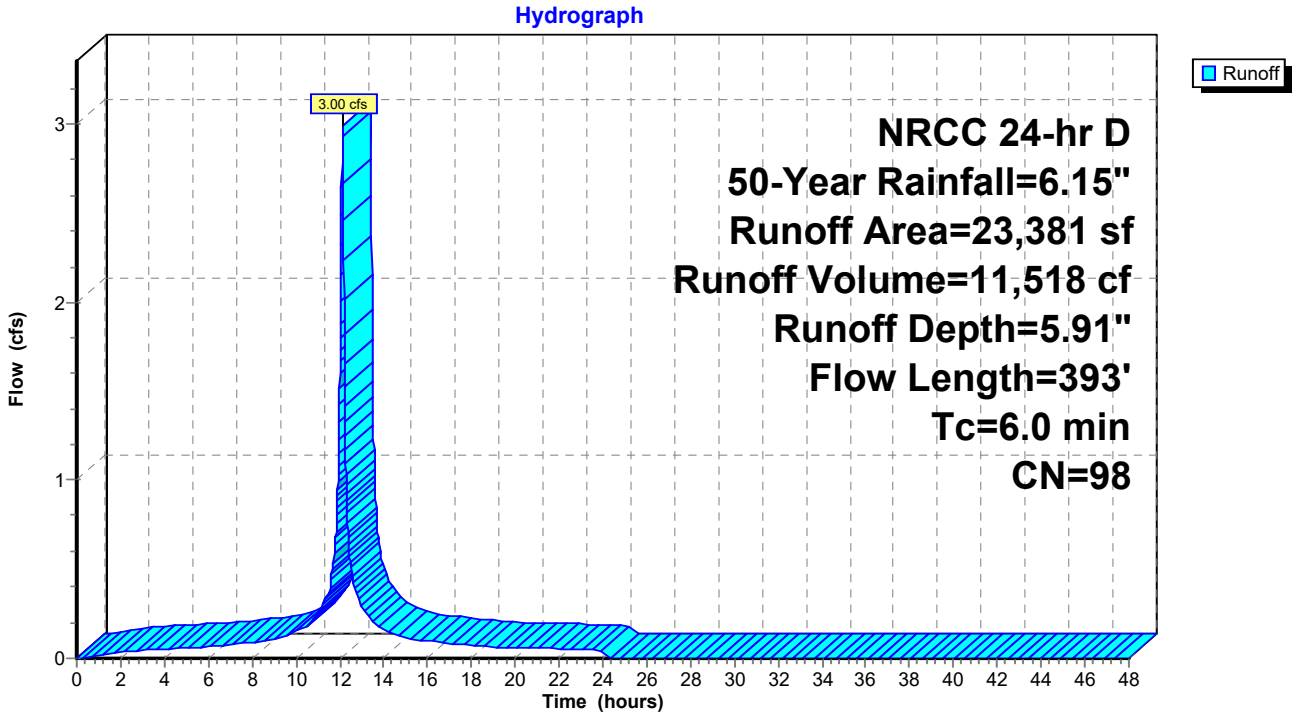
Runoff = 3.00 cfs @ 12.13 hrs, Volume= 11,518 cf, Depth= 5.91"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
19,985	98	Unconnected pavement, HSG B
3,396	98	Roofs, HSG B
23,381	98	Weighted Average
23,381		100.00% Impervious Area
19,985		85.48% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.5	55	0.0090	1.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.0	10	0.0050	4.55	8.05	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
2.6	393	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 7: Sub-catchment 7



Summary for Subcatchment 8: Sub-catchment 8

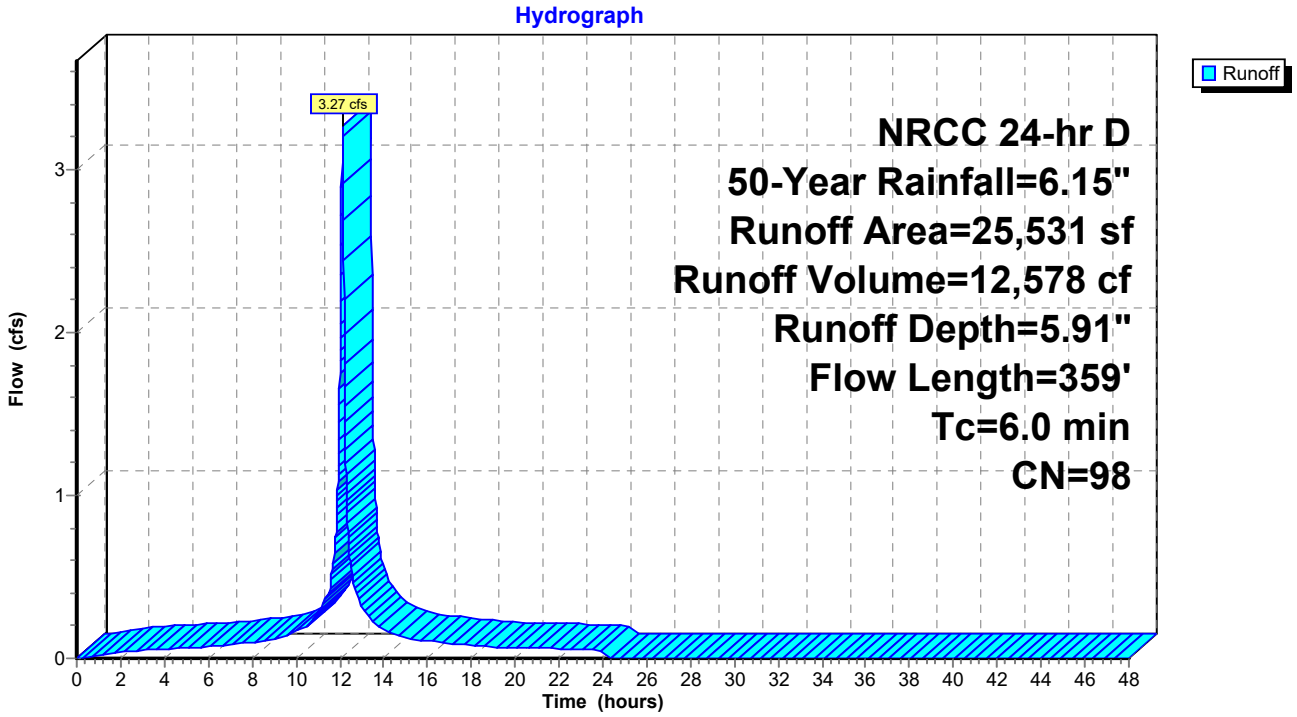
Runoff = 3.27 cfs @ 12.13 hrs, Volume= 12,578 cf, Depth= 5.91"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
23,413	98	Unconnected pavement, HSG B
2,118	98	Roofs, HSG B
25,531	98	Weighted Average
25,531		100.00% Impervious Area
23,413		91.70% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0070	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.6	85	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.0	10	0.0050	4.55	8.05	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
2.6	359	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 8: Sub-catchment 8



Summary for Subcatchment 9: Sub-catchment 9

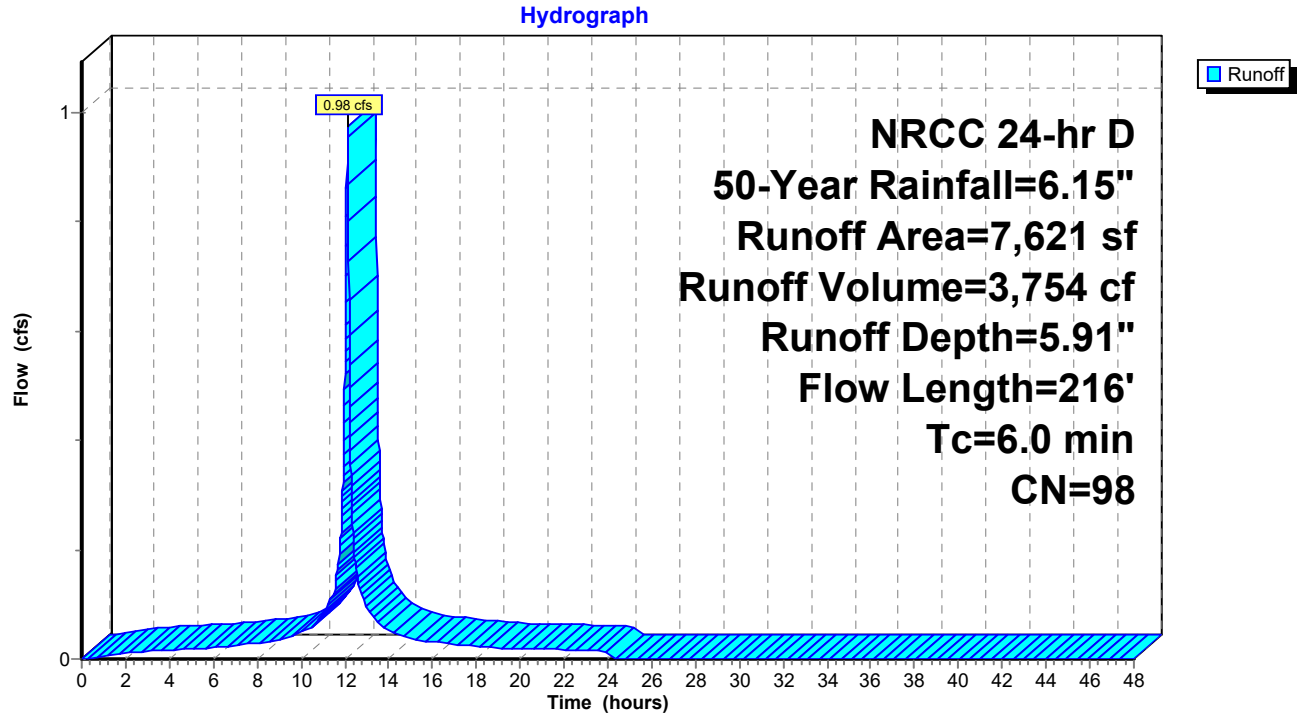
Runoff = 0.98 cfs @ 12.13 hrs, Volume= 3,754 cf, Depth= 5.91"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
7,621	98	Unconnected pavement, HSG B
7,621		100.00% Impervious Area
7,621		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	100	0.0090	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.7	62	0.0060	1.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	45	0.0050	3.47	2.73	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
2.6	216	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 9: Sub-catchment 9



Summary for Subcatchment 10: Sub-catchment 10

[47] Hint: Peak is 133% of capacity of segment #3

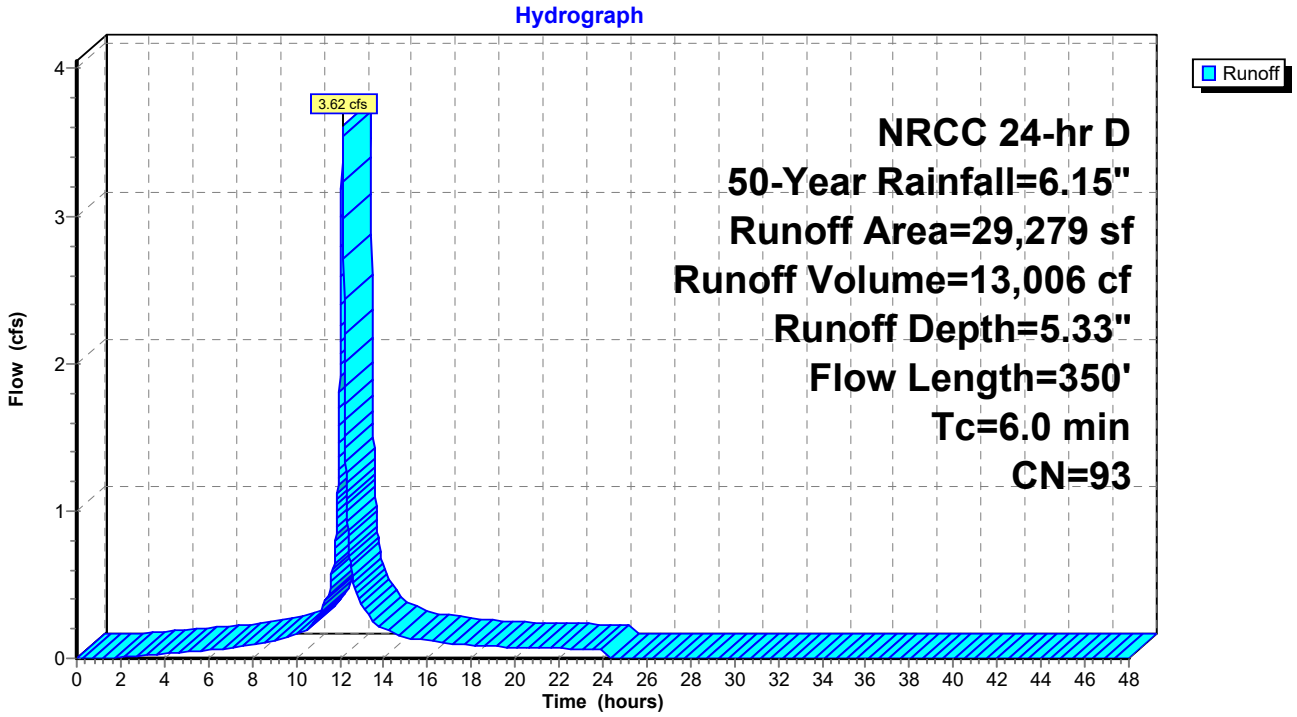
Runoff = 3.62 cfs @ 12.13 hrs, Volume= 13,006 cf, Depth= 5.33"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
14,729	98	Unconnected pavement, HSG B
6,760	98	Roofs, HSG B
7,790	79	<50% Grass cover, Poor, HSG B
29,279	93	Weighted Average
7,790		26.61% Pervious Area
21,489		73.39% Impervious Area
14,729		68.54% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.6	75	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	114	0.0050	3.47	2.73	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
2.8	350	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 10: Sub-catchment 10



Summary for Subcatchment 11: Sub-catchment 11

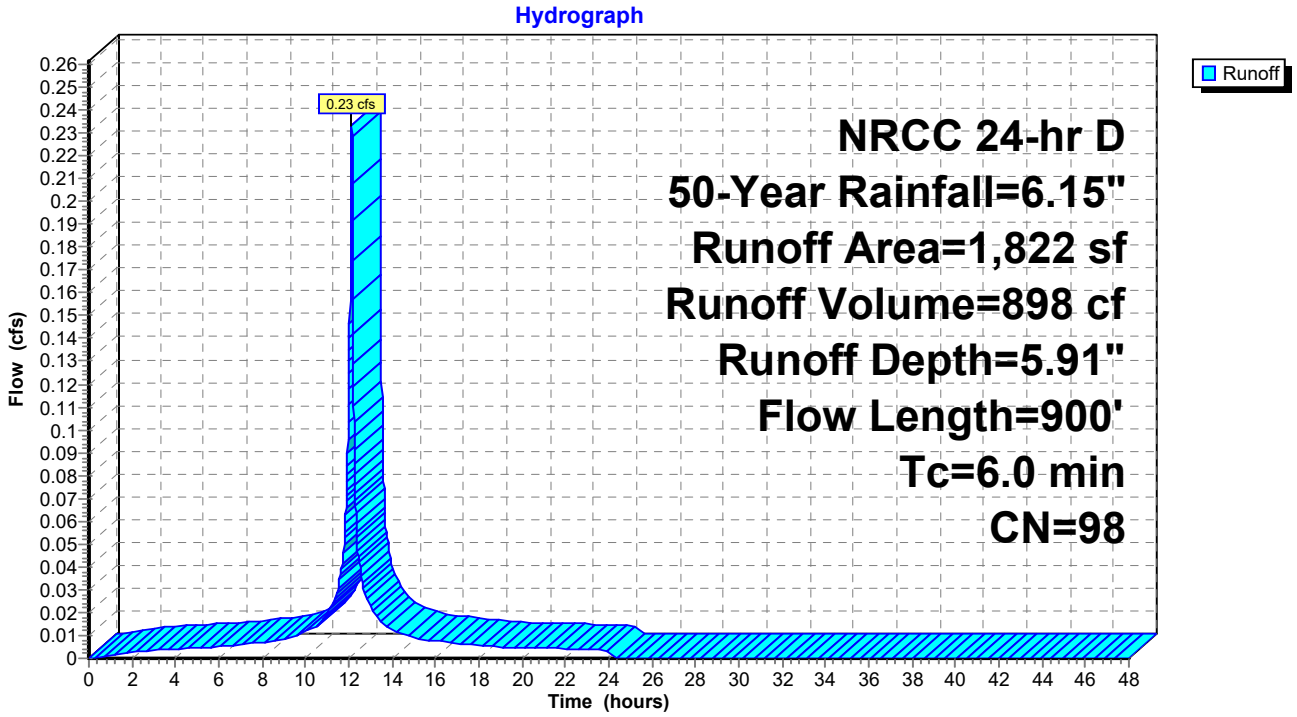
Runoff = 0.23 cfs @ 12.13 hrs, Volume= 898 cf, Depth= 5.91"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
1,822	98	Unconnected pavement, HSG B
1,822		100.00% Impervious Area
1,822		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	53	0.0690	1.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.4	59	0.0020	2.20	1.73	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.2	39	0.0050	4.03	4.95	**Pipe Channel, RCP_Round 15"** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.3	47	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.5	257	0.0020	2.88	5.09	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.3	85	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	35	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.4	97	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.3	64	0.0020	4.05	19.87	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	103	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.1	52	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
0.0	9	0.0200	12.80	62.84	**Pipe Channel, RCP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012 Concrete pipe, finished
4.1	900	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 11: Sub-catchment 11



Summary for Subcatchment 12: Sub-catchment 12

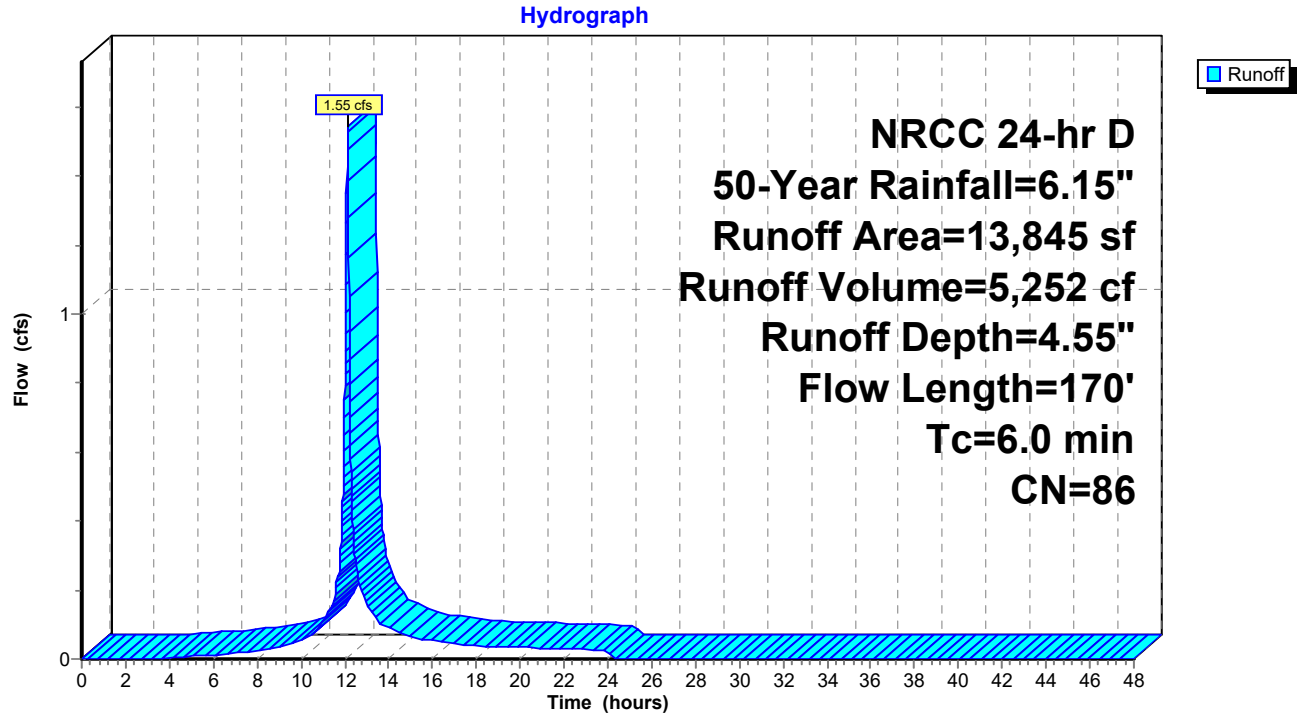
Runoff = 1.55 cfs @ 12.13 hrs, Volume= 5,252 cf, Depth= 4.55"
Routed to Pond 1P : Diversion Structure

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
5,431	98	Unconnected pavement, HSG B
8,414	79	<50% Grass cover, Poor, HSG B
13,845	86	Weighted Average
8,414		60.77% Pervious Area
5,431		39.23% Impervious Area
5,431		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.2	44	0.0230	3.08		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	26	0.0050	3.47	2.73	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
1.9	170	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 12: Sub-catchment 12



Summary for Subcatchment 13: Sub-catchment 13

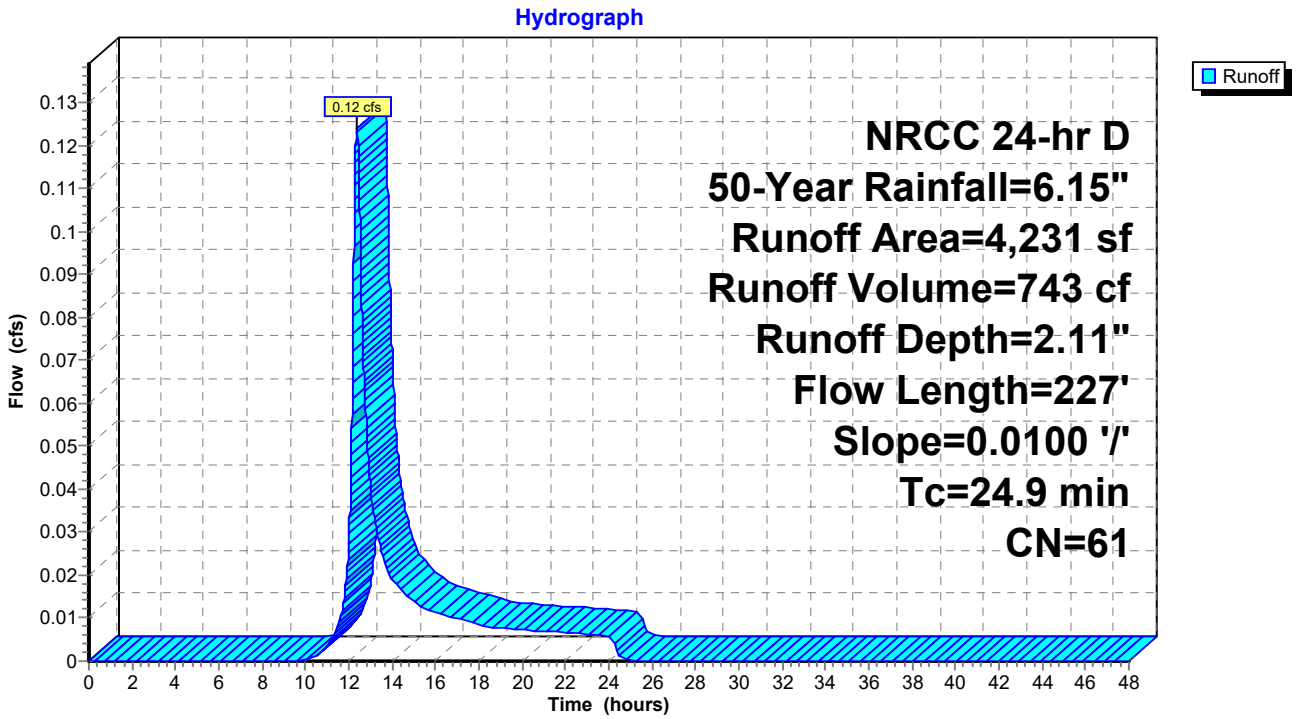
Runoff = 0.12 cfs @ 12.37 hrs, Volume= 743 cf, Depth= 2.11"
Routed to Link DP-2 : DP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 50-Year Rainfall=6.15"

Area (sf)	CN	Description
4,231	61	>75% Grass cover, Good, HSG B
4,231		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.9	227	0.0100	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"

Subcatchment 13: Sub-catchment 13



Summary for Pond 1P: Diversion Structure

[57] Hint: Peaked at 230.21' (Flood elevation advised)

Inflow Area = 241,908 sf, 92.81% Impervious, Inflow Depth = 5.76" for 50-Year event
Inflow = 30.64 cfs @ 12.13 hrs, Volume= 116,188 cf
Outflow = 30.64 cfs @ 12.13 hrs, Volume= 116,188 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.79 cfs @ 11.76 hrs, Volume= 96,333 cf
Routed to Link 1L : Wet Well/Pump
Secondary = 24.85 cfs @ 12.13 hrs, Volume= 19,854 cf
Routed to Link DP-1 : DP-1

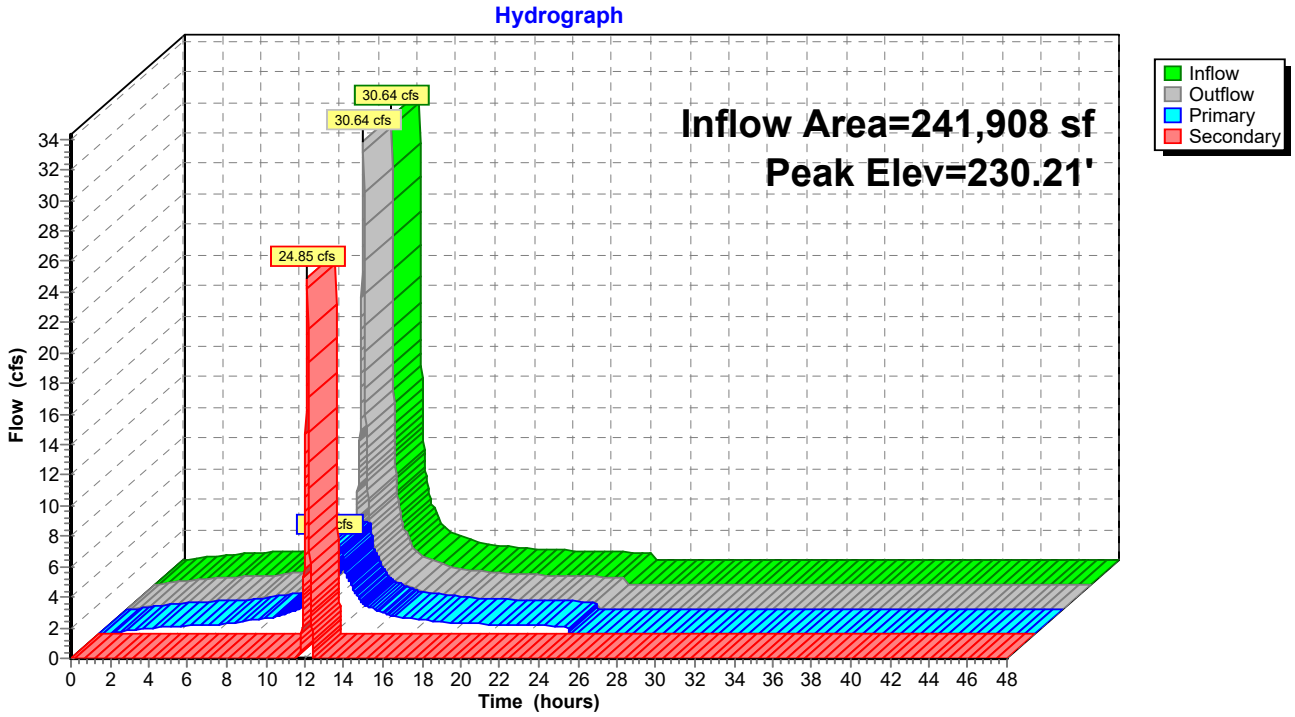
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 230.21' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	226.32'	**24.0" Round Culvert** L= 7.7' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 226.32' / 226.28' S= 0.0052 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Secondary	226.38'	**30.0" Round Culvert** L= 27.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 226.38' / 226.24' S= 0.0052 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#3	Device 2	228.99'	**6.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#4	Device 1	225.00'	**Special & User-Defined** Elev. (feet) 225.00 226.00 240.00 Disch. (cfs) 0.000 5.790 5.790

Primary OutFlow Max=5.79 cfs @ 11.76 hrs HW=229.02' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Passes 5.79 cfs of 17.30 cfs potential flow)
↑**4=Special & User-Defined** (Custom Controls 5.79 cfs)

Secondary OutFlow Max=24.81 cfs @ 12.13 hrs HW=230.20' TW=0.00' (Dynamic Tailwater)
↑**2=Culvert** (Passes 24.81 cfs of 36.43 cfs potential flow)
↑**3=Broad-Crested Rectangular Weir** (Weir Controls 24.81 cfs @ 3.40 fps)

Pond 1P: Diversion Structure



Summary for Pond 2P: AGST

Inflow Area = 241,908 sf, 92.81% Impervious, Inflow Depth = 4.78" for 50-Year event
Inflow = 5.79 cfs @ 11.76 hrs, Volume= 96,333 cf
Outflow = 5.53 cfs @ 12.48 hrs, Volume= 80,849 cf, Atten= 5%, Lag= 43.0 min
Primary = 5.53 cfs @ 12.48 hrs, Volume= 80,849 cf
Routed to Link DP-1 : DP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 267.61' @ 12.48 hrs Surf.Area= 908 sf Storage= 36,742 cf

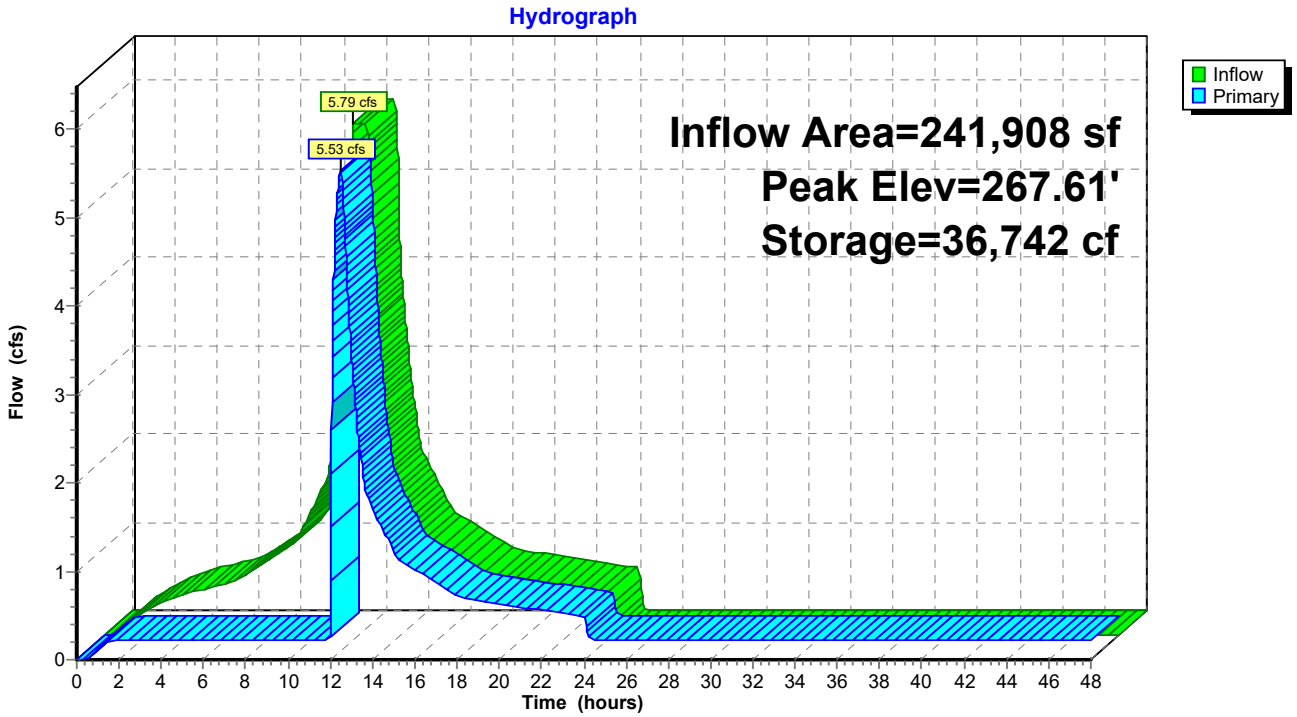
Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 411.4 min (1,170.3 - 759.0)

Volume	Invert	Avail.Storage	Storage Description
#1	227.14'	38,133 cf	**34.00'D x 42.00'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	227.14'	**0.223 cfs Constant Flow/Skimmer**
#2	Primary	265.14'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.53 cfs @ 12.48 hrs HW=267.61' TW=0.00' (Dynamic Tailwater)
└─**1=Constant Flow/Skimmer** (Constant Controls 0.22 cfs)
└─**2=Orifice/Grate** (Orifice Controls 5.31 cfs @ 6.76 fps)

Pond 2P: AGST

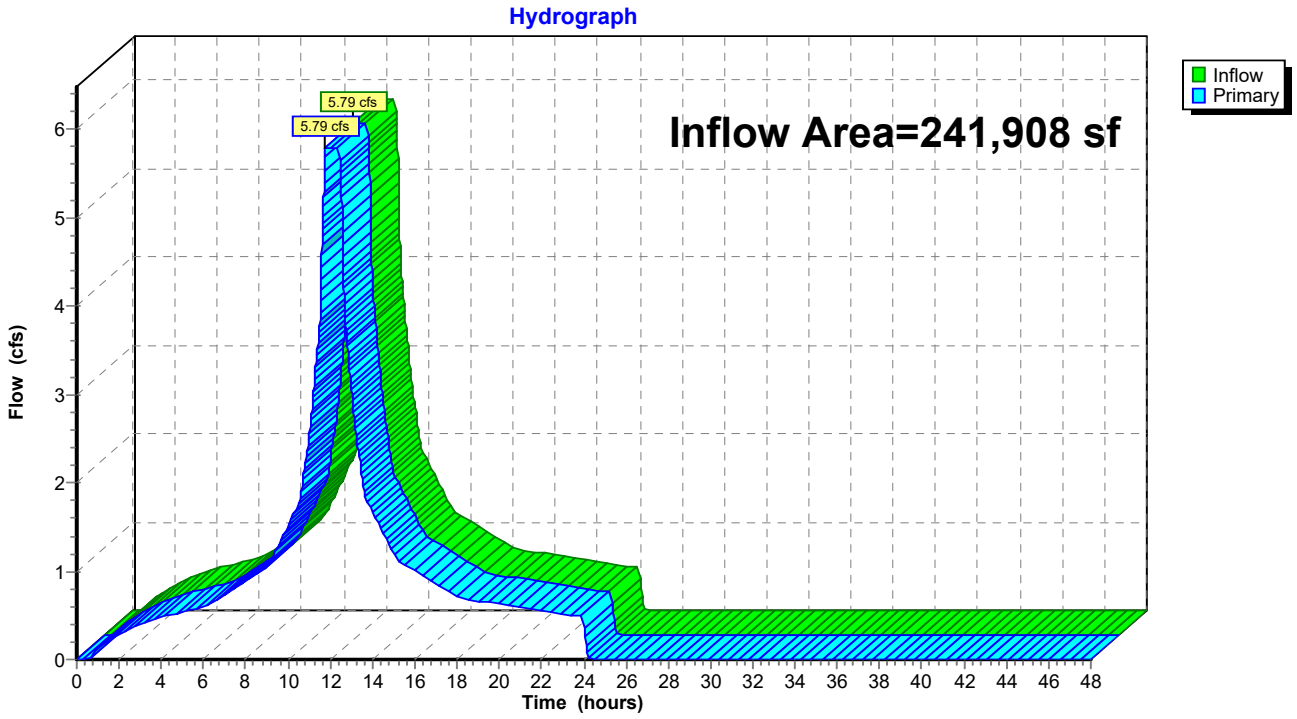


Summary for Link 1L: Wet Well/Pump

Inflow Area = 241,908 sf, 92.81% Impervious, Inflow Depth = 4.78" for 50-Year event
Inflow = 5.79 cfs @ 11.76 hrs, Volume= 96,333 cf
Primary = 5.79 cfs @ 11.76 hrs, Volume= 96,333 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 2P : AGST

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 1L: Wet Well/Pump

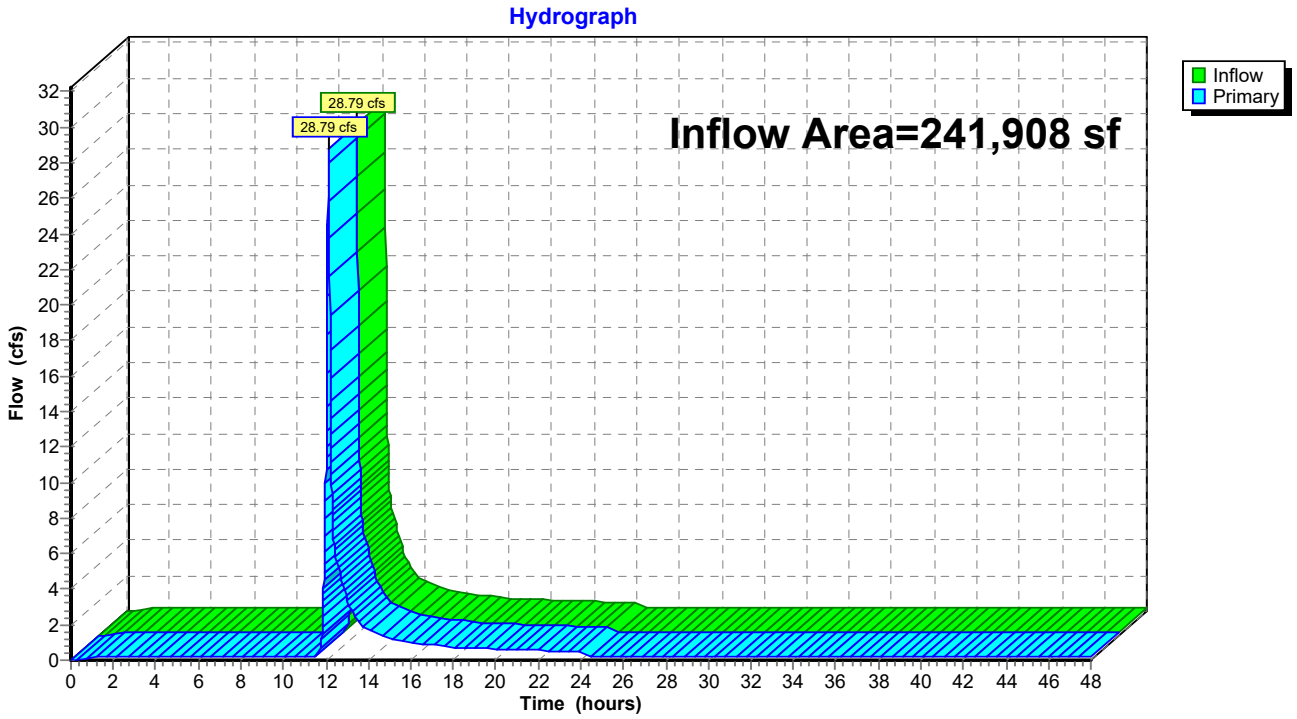


Summary for Link DP-1: DP-1

Inflow Area = 241,908 sf, 92.81% Impervious, Inflow Depth > 5.00" for 50-Year event
Inflow = 28.79 cfs @ 12.13 hrs, Volume= 100,704 cf
Primary = 28.79 cfs @ 12.13 hrs, Volume= 100,704 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link DP-1: DP-1

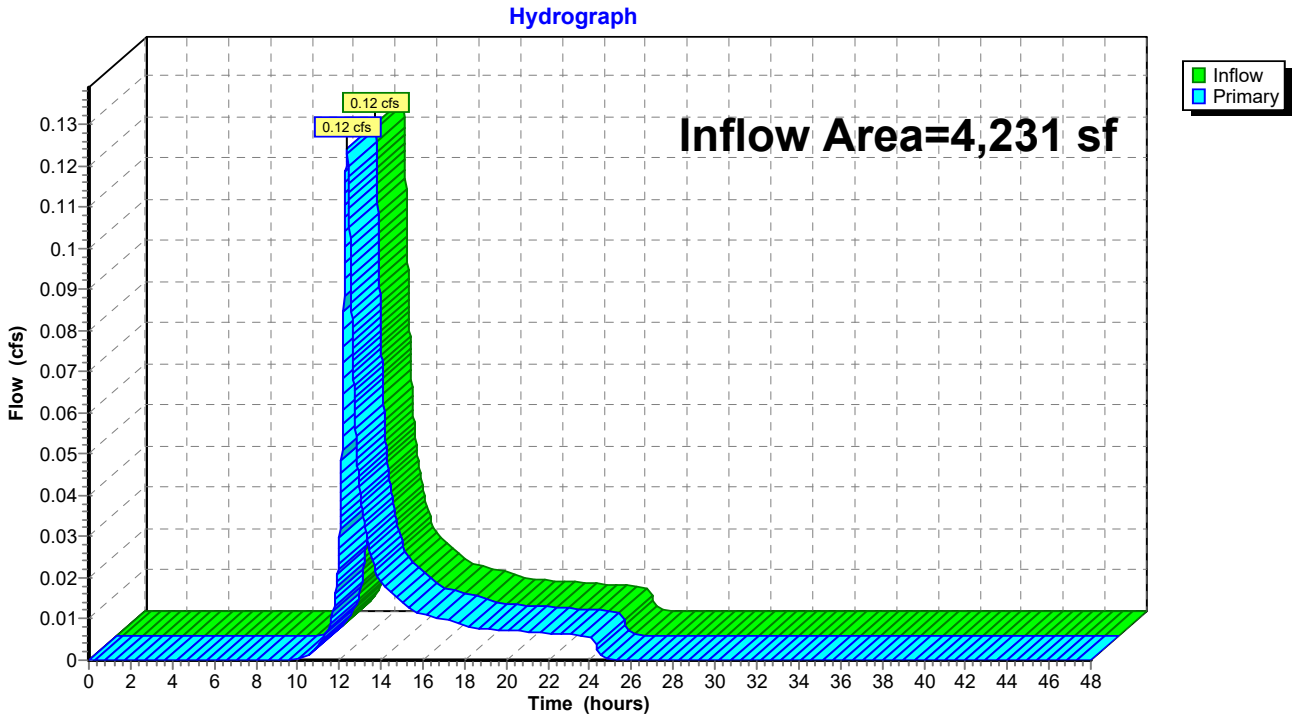


Summary for Link DP-2: DP-2

Inflow Area = 4,231 sf, 0.00% Impervious, Inflow Depth = 2.11" for 50-Year event
Inflow = 0.12 cfs @ 12.37 hrs, Volume= 743 cf
Primary = 0.12 cfs @ 12.37 hrs, Volume= 743 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link DP-2: DP-2



APPENDIX K: SITE SPECIFIC SOIL SURVEY WAIVER REQUEST

40 Shattuck Road | Suite 110
Andover, Massachusetts 01810
www.woodardcurran.com

T 800.426.4262
T 978.557.8150
F 978.557.7948

Via Electronic Submission

11/7/2025

DES Water Division
Attn: Alteration of Terrain Program
29 Hazen Drive
P.O. Box 95
Concord, New Hampshire 03302-0095

Re: Proposed Stormwater Improvements - 25 Sandquist St., Concord, NH
Formal Waiver Request – Site Specific Soil Survey

To Whom it May Concern:

On behalf of the Applicant, Radius Recycling, Woodard & Curran is respectfully seeking a waiver for the site-specific soil survey located in Concord, New Hampshire.

Requestor (Consultant):

Yuya Ishizuka, PE
Woodard & Curran
800 Westchester Ave.
Rye Brook, NY 10573
Phone: 914-246-2932
yishizuka@woodardcurran.com

Applicant:

Radius Recycling
Environmental Manager: Gary Raddatz
25 Sandquist St.
Concord, NH 03301
Phone: 617-233-2664
graddatz@rdus.com

Specific Section for which Waiver is sought:

Env-Wq 1503.08 (r) Additional Information Required for AOT Permit Applications
"A report to accompany hydrologic soil group plans, prepared in accordance with the Society of Soil Scientists of Northern New England (SSSNNE) Special Publication No. 3, Version 7.0, Site-Specific Soil Mapping Standards for New Hampshire and Vermont, July 2021, available as noted in Appendix B."

Explanation of why a waiver is being requested:

The purpose of this project is to provide improvements to the existing stormwater system, and as a result, will increase the amount of impervious area for the overall site. The increase is associated with upgrades to the stormwater management system. Due to the fact that the site is located within a high-load area, and that the increase in impervious area is less than 3,000 SF, ground water recharge is not required, therefore, we are requesting a waiver from Env-Wq 1803.08 (r) in order to improve water quality and volume irrespective of a site-specific soil survey.

Explanation of Proposed Alternative:

The Requestor proposes that the drainage analysis has been prepared using delineations from the NRCS Web Soil Survey website, as an alternative to a site-specific soil map.

Explanation of why this meets the criteria in 1509.04:

The proposed stormwater system requires additional pavement to accommodate storage and treatment infrastructure, which would alleviate pollutant load to meet the Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity benchmarks. Due to the fact that the facility is used for activities related to scrap metal recycling, it is our belief that granting the request will not result in an adverse impact on the environment, public health, public safety, or abutting properties that is more significant than the impact that would result from complying with the rule as written.

Strict compliance with the rule in the circumstances presented will trigger the need for investigation of site-specific soil which we believe would be unnecessary provided the existing high load area does not require ground water recharge.

This waiver would not waive or modify a statutory requirement and does not waiver from any of the criteria for obtaining a permit specified in Env-Wq 1503.19.

Signatures:

I certify that (1) The information provided is true, complete, and not misleading to the knowledge and belief of the signer; and (2) The signer understands that any waiver granted based on false, incomplete, or misleading information shall be subject to revocation.

November 6, 2025

Yuya Ishizuka, PE
Woodard & Curran

Date

Oct. 31, 2025

Gary Raddatz
Environmental Manager
Radius Recycling

Date

APPENDIX L: BMP INSPECTION AND MAINTENANCE MANUALS

OPERATIONS AND MAINTENANCE PLAN

This Operation and Maintenance Plan outlines measures that are essential to minimize potential adverse impacts on stormwater quality runoff from the following:

25 Sandquist St. Concord, NH Proposed Stormwater Improvements
Concord, New Hampshire

herein referred to as "the Project area".

RESPONSIBLE PARTY

The party responsible for implementing this Plan is as follows:

Radius Recycling
25 Sandquist Street
Concord, New Hampshire

GOOD HOUSEKEEPING

The project area will be maintained as clean and orderly. Routine inspections of the project area for debris and sediment accumulations shall be performed. Debris and sediment shall be disposed of in accordance with local and State requirements.

STORMWATER SYSTEM MAINTENANCE

Stormwater management systems at the project area are provided by diversion manholes, storm drainage piping, aboveground storage tank, oil-water separator, active stormwater treatment system, and pump station. These measures are illustrated on the project plans. Routine inspections and maintenance of the stormwater management system shall be performed in accordance with Table 1 of this report for the project area. These measures are recommended to prevent deficiencies with the system that may result in a poor quality of stormwater runoff.

INSPECTIONS & MAINTENANCE MEASURES

The stormwater management systems at the project area include diversion manholes, storm drainage piping, aboveground storage tank, oil-water separator, active stormwater treatment system, and pump station. These measures are illustrated on project drawings.

Attachment A provides the Inspection Form that is recommended for use during routine inspections of the stormwater management system. The form includes a table that outlines specific inspection and maintenance measures, in addition to the following information:

- Name of inspector

- Name of the project area and its location
- Date and time of inspection
- Weather conditions during inspection
- Outline of items inspected
- Condition of the stormwater management measures, including corrective measures taken to maintain the system

Completed Inspections Forms should be kept at the responsible party's office to enable both City staff and regulatory agencies to ensure that operation of the system complies with permit requirements.

Table 1 – Operations & Maintenance Measures – Aboveground Storage Tank

Aboveground Storage Tank	
Objective: Maintain the storage capacity of the aboveground storage tank system.	
Frequency	***Measure***
INSPECTION:	
Ongoing/As Needed	• Inspect the storage tank immediately after every major storm event. • Inspect contributing drainage areas for any sediment and debris. • Inspect the storage tank for any sediment, debris and other obstructions. • Inspect storage tank for structural damage. Repair as necessary.
MAINTENANCE:	
Ongoing/As Needed	• Remove trash, debris, sediment, and grass clippings from the storage tank during monthly inspections. • Storage tank should be inspected and cleaned in accordance with the Manufacturer's specifications. • Remove sediment and debris from contributing drainage areas. • Dispose of sediment in accordance with all applicable regulations. • Repair damage (if any) to infiltration basin/storm chamber system. • All repaired areas/infrastructure shall be restored according to original design specifications.
NOTIFICATION:	
As Needed	• Notify Owner of any system repairs needed and/or operational problems.

Table 2 – Operations & Maintenance Measures – Oil-Water Separator

Highland Tank Oil-Water Separator	
Objective: Maintain the treatment capacity of the oil-water separator.	
Frequency	***Measure***
INSPECTION:	
Ongoing/As Needed	• Inspect the inside of the oil-water separator for sand, trash, sludge, and oil build-up. • Inspect effluent for oils and other contaminants • Inspect the oil/water interface level by using a gauge stick and water finding paste • Inspect separator after a heavy rainfall event to check for signs of malfunction due to an excessive flow rate
MAINTENANCE:	
Ongoing/As Needed	• Remove oil and refill separator with clean water when oil/water interace level surpasses the high-oil level or 20% of separator's working volume. • Remove accumulated oils and solids if combined oil and solids layers are equal to or greater than 20%. • Oil-water separator should be inspected and cleaned in accordance with the Manufacturer's specifications. • Remove sediment and debris from contributing drainage areas. • Dispose of sediment in accordance with all applicable regulations. • Repair damage (if any) to oil-water separator. • All repaired areas/infrastructure shall be restored according to original design specifications.
NOTIFICATION:	
As Needed	• Notify Owner of any system repairs needed and/or operational problems.

ATTACHMENT A – INSPECTION FORM & CORRECTIVE ACTION LOG

STORMWATER MANAGEMENT SYSTEM INSPECTION FORM

25 Sandquist St. Concord, NH Proposed Stormwater Improvements
Concord, New Hampshire

Name of Inspector: _____

Date/Time: _____

Weather: _____

Date of Last Inspection: _____

Items Inspected (Refer to Table 1. Provide additional sheets if necessary.):

Comments & Corrective Actions Taken (Provide additional sheets if necessary.):

Certification statement:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Print name: _____

Signature: _____

Date: _____

Corrective Action Log

Date of Discovery	Action (Response, Repair or Replacement)	Date of Action	Maintenance	Person(s) Completing Corrective Action

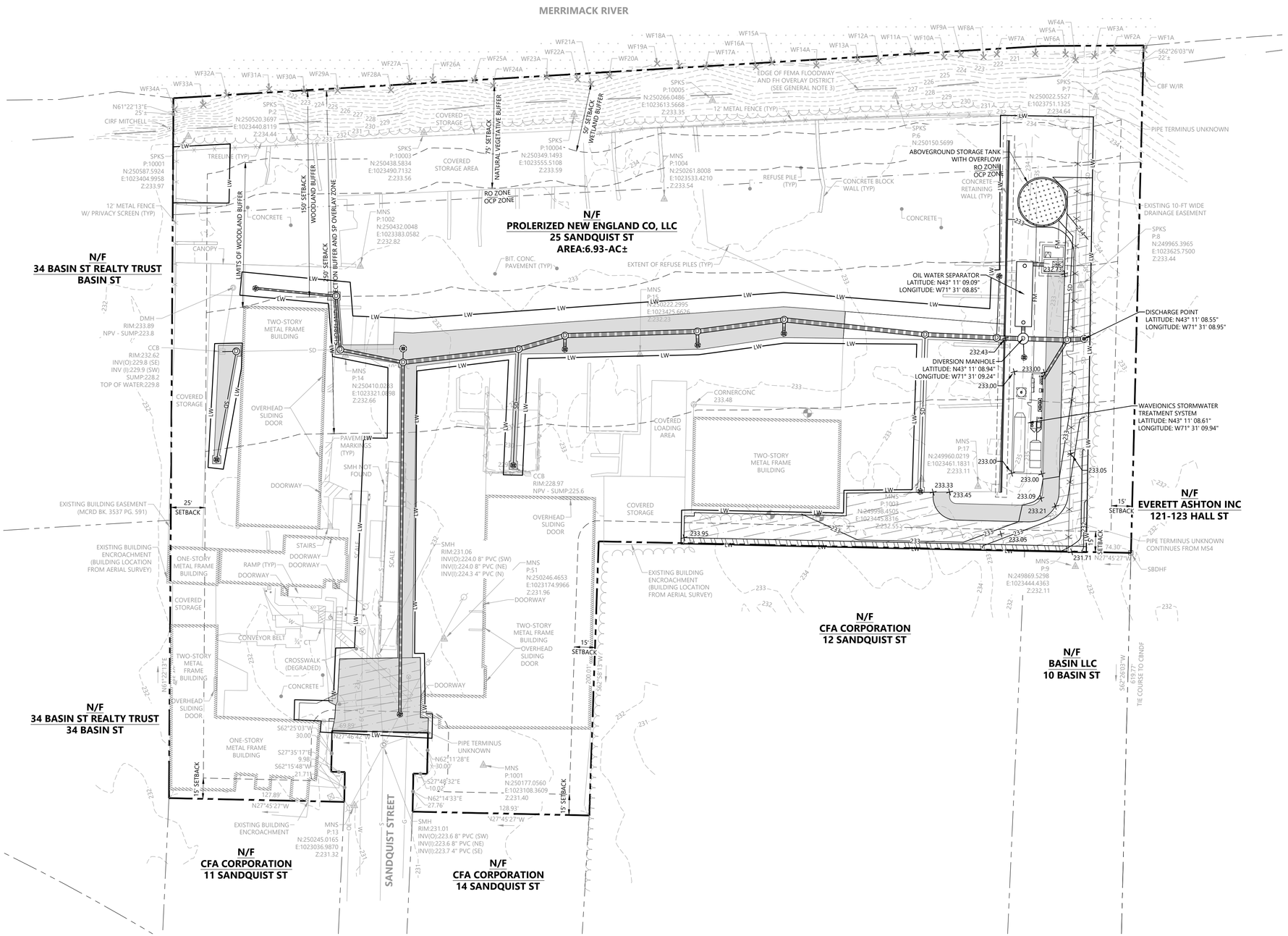
Date of Discovery	Action (Response, Repair or Replacement)	Date of Action	Maintenance	Person(s) Completing Corrective Action

APPENDIX M: SOURCE CONTROL PLAN

22x34

SHEET GENERAL NOTES

1. THIS PLAN IS TO SHOW THE SOURCE CONTROL AND MAINTENANCE LOCATIONS FOR THE PROPOSED STORMWATER MANAGEMENT SYSTEM.
2. PLEASE REFER TO THE APPENDIX L OF THIS REPORT FOR INSTRUCTIONS ON SITE INSPECTION AND MAINTENANCE OF BMPS. THE OWNER SHALL BE RESPONSIBLE TO OBTAIN SERVICES TO INSPECTION AND MAINTAIN THE PROPOSED STORMWATER PRACTICES.
3. NO REGULATED SUBSTANCES ARE EXPECTED TO BE PRESENT ON THIS SITE.
4. GROUNDWATER PROTECTION AREAS ARE NOT PRESENT WITHIN 1,000 FEET OF THE SITE PERIMETER.
5. OWNER CONTACT INFORMATION - RADIUS RECYCLING (SANDQUIST)
   CONTACT - GARY RADDATZ (ENVIRONMENTAL MANAGER)
   ADDRESS - 24 SANDQUIST STREET, CONCORD, NH 03301
   EMAIL - GRADDATZ@RDUS.COM
   PHONE NUMBER - 617-233-2664



Woodard & Curran
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Andover, Massachusetts 01810
800.426.4262 | www.woodardcurran.com

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DRAFT 60% DESIGN NOT FOR CONSTRUCTION

CLIENT INFO:

RADIUS RECYCLING
CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

REV	MM/DD/YY	DESCRIPTION

JOB NO:	0224539.48
DATE:	AUGUST 2024
SCALE:	1" = 40'
DESIGNED BY:	YI
DRAWN BY:	KC
CHECKED BY:	YI/RT
FILENAME:	0224539.48-FIG 5-SOURCE*.dwg

DRAWING TITLE:

CIVIL
SOURCE CONTROL PLAN

DRAWING NO:

FIGURE 3

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APPENDIX N: DRAWING SET

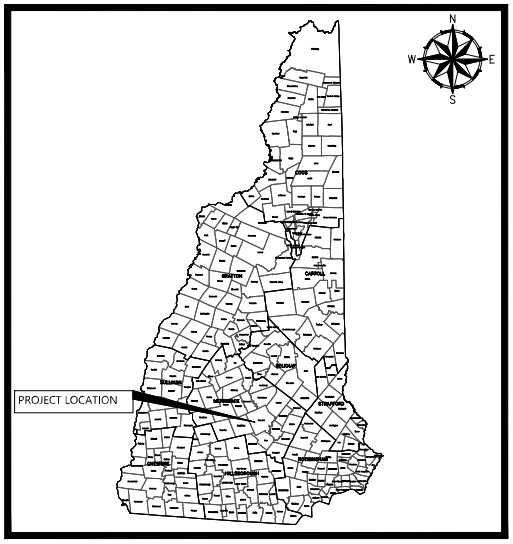
RADIUS RECYCLING

CONCORD, NH

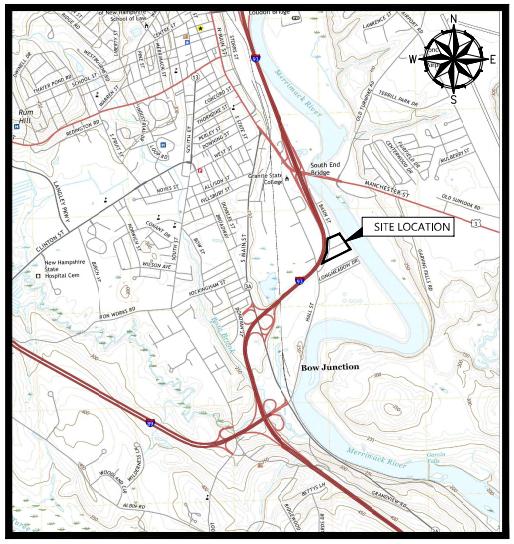
SANDQUIST FACILITY STORMWATER IMPROVEMENTS

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NOVEMBER 2025



PROJECT LOCATION MAP



SITE LOCATION MAP

SOURCE: USGS TOPO QUADRANGLE

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PE SEAL:

STATE OF NEW HAMPSHIRE
ROSS TSANTOULIS
No. 14122
LICENSED PROFESSIONAL ENGINEER

Ross Tsantoulis

Digitally signed by Ross Tsantoulis
DN: CN=Ross Tsantoulis, O=Woodard&Curran, OU=Andover, C=US
Date: 2025.11.24 15:40:49-05'00'

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CLIENT INFO:

RADIUS RECYCLING
CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

REV	MM/DD/YY	DESCRIPTION

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DATE:	NOVEMBER 2025
SCALE:	NO SCALE
DESIGNED BY:	YT
DRAWN BY:	KC
CHECKED BY:	RT
FILENAME:	0224539.48-G-000.dwg

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GENERAL COVER SHEET

DRAWING NO:
G-000

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SHEET INDEX	
SHEET NO.	SHEET TITLE
GENERAL	
G-000	COVER SHEET
G-001	SHEET INDEX
CIVIL	
C-001	ABBREVIATIONS AND LEGEND
C-002	GENERAL NOTES
C-100	EXISTING CONDITIONS PLAN
CD-100	SITE PREPARATION AND EROSION CONTROL PLAN
CD-101	STORMWATER TREATMENT AND STORAGE AREA SITE PREPARATION AND EROSION CONTROL PLAN
CI-100	OVERALL LAYOUT AND MATERIALS PLAN
CI-101	STORMWATER TREATMENT AND STORAGE AREA LAYOUT AND MATERIALS PLAN
CG-100	OVERALL GRADING AND DRAINAGE PLAN
CG-101	STORMWATER TREATMENT AND STORAGE AREA GRADING AND DRAINAGE PLAN
CG-102	GRADING AND DRAINAGE PLAN AND PROFILE 1
CG-103	GRADING AND DRAINAGE PLAN AND PROFILE 2
CG-104	DRAINAGE TABLES
CU-100	OVERALL UTILITY PLAN
CU-101	STORMWATER TREATMENT AND STORAGE AREA UTILITY PLAN
C-900	DETAILS 1
C-901	DETAILS 2
C-902	DETAILS 3
C-903	DETAILS 4
STRUCTURAL	
S-001	ABBREVIATIONS, NOTES AND DESIGN LOADS
S-002	CONCRETE NOTES
S-101	PUMP STATION FOUNDATION PLAN
S-102	PUMP STATION SECTIONS
S-201	PAD PLAN & SECTION
S-930	CONCRETE TANK DETAILS
S-932	CONCRETE FLOOR SLAB & WALL FOOTING DETAILS
MECHANICAL	
M-001	MECHANICAL LEGEND
M-101	PUMP STATION PLAN
M-102	PUMP STATION SECTIONS
M-901	PUMP STATION DETAILS
M-902	PUMP STATION DETAILS
M-903	PUMP STATION DETAILS
ELECTRICAL	
E-001	LEGEND
E-002	RISER AND SCHEDULES
E-100	SITE PLAN
E-101	POWER PLAN
E-200	DETAILS
INSTRUMENTATION	
I-101	NOTES & LEGEND
I-102	SCADA PANEL BILL OF MATERIAL
I-103	SCADA PANEL EQUIPMENT LAYOUT
I-104	SCADA PANEL TERMINAL BLOCK LAYOUT
I-105	SCADA PANEL POWER DISTRIBUTION
I-106	SCADA PANEL COMMUNICATIONS
I-107	SCADA PANEL PLC BASE I/O: DIGITAL INPUTS AND OUTPUTS
I-108	SCADA PANEL PLC BASE I/O: ANALOG INPUTS
I-109	SCADA PANEL EXPANSION I/O: DIGITAL INPUTS

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PE SEAL:

STATE OF NEW HAMPSHIRE
ROSS TSANTOULIS No. 14122 LICENSED PROFESSIONAL ENGINEER

Ross Tsantoulis

Digitally signed by Ross Tsantoulis
DN: cn=Ross Tsantoulis, ou=Andover Users, ou=Employees, dc=woodardcurran, dc=net
Date: 2025.11.24 15:51:04-05'00'

DRAFT 60% DESIGN
NOT FOR CONSTRUCTION

CLIENT INFO:

RADIUS RECYCLING
CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

REV	MM/DD/YY	DESCRIPTION

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DATE:	NOVEMBER 2025
SCALE:	NO SCALE
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CHECKED BY:	RT
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DRAWING TITLE:
GENERAL
SHEET INDEX

DRAWING NO:
G-001

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ABBREVIATIONS*

&	AND	GRND	GROUND	SGC	SLOPED GRANITE CURB
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS	G.S.	GAS SERVICE/GALVANIZED STEEL	S.H.G.W.T.	SEASONAL HIGH GROUND WATER TABLE
		G.T.	GRAVITY THICKENER	SHT	SHEET
A.B.	ANCHOR BOLTS			SLG	SLUDGE
A.C.	ASBESTOS CEMENT	G.T. INF.	GRATIY THICKENER INFLUENT	SMH	SEWER MANHOLE
ACC	ACCESS	G.T. OV.	GRAVITY THICKENER OVERFLOW	SP	SEPTAGE
ACFM	ACTUAL CUBIC FEET PER MINUTE			S.P.D.	SUMP PUMP DISCHARGE
ADA	AMERICANS WITH DISABILITIES ACT	H	HYDRANT/FLEXIBLE HOSE	SPEC	SPECIAL
ADJ	ADJUST	H.A.T.	HIGHEST ANNUAL TIDE	SPECS	SPECIFICATIONS
ADS	ADVANCED DRAINAGE SYSTEMS	H.B.	HOSE BIB	S.P.F.	SEPTAGE FILTRATE
A.G.	ABOVE GROUND	HDPE	HIGH DENSITY POLYETHYLENE	SPKS	SPIKE SET
A.F.F.	ABOVE FINISHED FLOOR	HDS	HYDRODYNAMIC SEPARATOR	S.P.S.	SLUDGE PUMPING STATION
AGGR.	AGGREGATE	HH	HANDHOLE	SQ	SQUARE
ALT	ALTERNATE	H.M.A.	HOT MIX ASPHALT	SS	SANITARY SEWER
ALUM	ALUMINUM	HORIZ	HORIZONTAL	S.S./SST	STAINLESS STEEL
AN	ANAEROBIC	H.P.	HIGH POINT	S.SL.	SECONDARY SLUDGE
APPROX. ±	APPROXIMATELY	H.P.	HIGH PRESSURE	STA	STATION
A.R.	AIR RELEASE	HT	HEIGHT	STD	STANDARD
A.R.MH.	AIR RELEASE MANHOLE	H.W.L.	HIGH WATER LEVEL	STDBY	STANDBY
A.S.	ACTIVATED SLUDGE	HWY	HIGHWAY	SQ. FT.	SQUARE FEET
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS	H.V.	HORIZONTAL TO VERTICAL	SU	SUPERNATANT
		HYD	HYDRANT	SWL	SINGLE WHITE LINE
A.T.	AERATION TANK	HYP	SODIUM HYPOCHLORITE	S.WW.	SCREENED WASTEWATER
A.T.E.	AERATION TANK EFFLUENT			SYL	SINGLE YELLOW LINE
AX	ANOXIC	I.A.	INSTRUMENT AIR		
		I.D.	INSIDE DIAMETER	T	TANK
B-#	BORING NUMBER	I.M.R.	INTERNAL MIXED LIQUOR RECYCLE	T.B.M.	TEMPORARY BENCH MARK
B.C.	BOTTOM OF CURB	IN	INCHES	T.C.	TOP OF CURB
BCB	BITUMINOUS CONCRETE BERM	I.N.C.L.	INCLUDED WITH PURCHASED EQUIPMENT	T.D.H.	TOTAL DYNAMIC HEAD
BCC	BITUMINOUS CONCRETE CURB	INF	INFLUENT	T.E.D.	THICKENER EFFLUENT DRAIN
B.F.	BLIND FLANGE	INT	INTERIOR	T.O.C.	TOP OF CONCRETE
BIS	SODIUM BISULFITE	INV	INVERT	T.O.F.	TOP OF FOOTING
BIT	BITUMINOUS	I.P.	IRON PIPE	T.O.P.	TOP OF PLATE
BLDG	BUILDING	IPF	IRON PIPE FOUND	T.O.W., T.W.	TOP OF WALL
B.M.	BENCH MARK			TP-#	TEST PIT
B.O.A.	BOTTOM OF FOOTING	K.D.	KILN DRIED	T.S.	TOP OF STEPS
B.O.S.	BOTTOM OF SILL			T.SL.	THICKENED SLUDGE
BOT	BOTTOM	L	LENGTH	T.W.A.S.	THICKENED WASTE ACTIVATED SLUDGE
B.O.T.	BOTTOM OF TANK	LA	LANDSCAPE	TYP	TYPICAL
B.S.	BOTTOM OF STEPS/BLENDED SLUDGE	LB	POUND		
B.W.	BOTTOM OF WALL	L.C.P.	LOCAL CONTROL PANEL	U.C.	UNDERGROUND CABLE
B/W	BETWEEN	L.F.	LINEAR FEET	U.N.O.	UNLESS NOTED OTHERWISE
		LG	LONG	U.P.	UTILITY POLE
℄	CENTERLINE	L.P.	LOW POINT	U.W.	UTILITY WATER
CA	CARBON	L.P.	LOW PRESSURE		
CB	CATCH BASIN	LW, L.O.W.	LIMIT OF WORK	V	VENTED AIR/VINYL
CBF W/R	CONCRETE BOUND FOUND W/ IRON ROD	L.W.L.	LOW WATER LEVEL	V.B.	VAPOR BARRIER
CC	CONCRETE CURB			V.C.	VITRIFIED CLAY
C.D.F.	CONTROL DENSITY FILL	M.A.	MIXED AIR	VGC	VERTICAL GRANITE CURB
C.H.	CHLORINE SOLUTION	MAX	MAXIMUM	VERT	VERTICAL
C.I.	CAST IRON	M.C.	MOISTURE CONTENT	V.T.A.	VENT TO ATMOSPHERE
C.I.P.H.	CURED-IN-PLACE PIPE LINING	M.C.C.	MOTOR CONTROL CENTER		
CIRF	CAPPED IRON ROD FOUND	MECH	MECHANICAL	W/	WITH
C.I.T.S.	CLEAN, INSPECT, TEST AND SEAL	MFG	MANUFACTURER	W	WEST/WATER/WATERMAIN
C.L.	CLEARING LIMITS	MG/L	MILLIGRAMS PER LITER	W.A.S.	WASTE ACTIVATED SLUDGE
C.L.D.I.	CEMENTED LINED DUCTILE IRON	MH	MANHOLE	WD	WOOD
C.L.F.	CHAIN LINK FENCE	M.H.H.W.	MEAN HIGHER HIGH WATER	WF-#	WETLAND FLAG NUMBER
CLR	CLEAR	M.H.W.	MEAN HIGH WATER	W.G.	WATER GATE VALVE
CL2	CHLORINATION	MIL	MILLIMETER	W.S.	WATER SERVICE/WATER STOP/WATER
C.M.P.	CORRUGATED METAL PIPE	MIN	MINIMUM		
C.M.U.	CONCRETE MASONRY UNIT	M.J.	MECHANICAL JOINT	W.V.	WATER VALVE
CO	CLEANOUT	ML	MIXED LIQUOR	W.W.F.	WELDED WIRE FABRIC
COAG	COAGULANT	MLLW	MEAN LOWER LOW WATER	W.W.M.	WELDED WIRE MESH
COL	COLUMN	M.L.S.S.	MIXED LIQUOR SUSPENDED SOLIDS		
CON	CONTINSATE	MLW	MEAN LOW WATER		
CONC	CONCRETE	MNS	MAG-NAIL SET		
CONST	CONSTRUCTION	MON	MONUMENT		
CONT	CONTINUOUS	M.P.H.	MILES PER HOUR		
CORR	CORRUGATED	M.S.L.	MEAN SEA LEVEL		
C.P.	CONTROL PANEL	MTL	METAL		
C.P.P.	CORRUGATE PLASTIC PIPE				
C.PVC.	CHLORINATED POLYVINYL CHLORIDE	N/A	NOT APPLICABLE		
C.R.W.	CONCRETE REINFORCED WALL	NAD	NORTH AMERICAN DATUM		
C.S.	CARBON STEEL/CURB STOP/COMBINED SEWER	NAVD	NORTH AMERICAN VERTICAL DATUM		
		N/F	NOW OR FORMERLY		
C.S.O.	COMBINED SEWER OVERFLOW	N.I.C.	NOT IN CONTRACT		
CU	COPPER	NO.	NUMBER		
CW	WATER-POTABLE	NP	NO PIPES VISIBLE		
		N.R.	NO REFUSAL		
D	DRAIN	N.S.	NEAR SIDE		
D.B.C.	DIRECT BURIAL CABLE	N.T.S.	NOT TO SCALE		
DCB	DOUBLE GRATE CATCH BASIN				
DEMO	DEMOLISH	O.A.	ODOROUS AIR		
DEW	DEWATERED SLUDGE	O.C.	ON CENTER		
D.H.	DRILL HOLE	O.C.E.W.	ON CENTER EACH WAY		
DHF	DRILL HOLE FOUND	O.D.	OUTSIDE DIAMETER		
D.I.	DUCTILE IRON	O.E.	OVERHEAD ELECTRIC		
DIA, Ø	DIAMETER	OF	OUTFALL		
DIAG	DIAGONAL	OH	OVERHEAD		
D.I./G.A.	DUCTILE IRON-GROOVED END	OPER	OPERATOR		
DIR.	DIRECTION	OWS	OIL WATER SEPARATOR		
DISCH	DISCHARGE				
DN	DOWN	P.A.	PROCESS AIR		
DMH	DRAINAGE MANHOLE	PCC	PRECAST CONCRETE CURB		
DR	DRAIN/DRAWN	P.C.C.P.	PRESTRESSED CONCRETE CYLINDER PIPE		
DTL	DETAIL	P.D.	PROCESS DRAIN		
DWL	DOUBLE WHITE LINE	PE	POLYETHYLENE/PLAIN END/PRIMARY		
DYL	DOUBLE YELLOW LINE		EFFLUENT		
		PEN	PENETRATION		
E	UNDERGROUND ELECTRICAL	PER	PERMANGANATE		
EA	EACH	P.G.	PROPANE GAS		
ECC	ECCENTRIC	P.I.	PRIMARY INFLUENT		
EF	EACH FACE	P.L.C.	PROGRAMMABLE LOGIC CONTROLLER		
EL, ELEV	ELEVATION	P.L.S.	PROFESSIONAL LAND SURVEYOR		
ELEC	ELECTRICAL	POLY	POLYMER SOLUTION		
ELEC. COND.	ELECTRICAL CONDUIT	PROP	PROPOSED		
EMBED	EMBEDMENT	PR.W.	PROCESS WATER		
E.O.P.	EDGE OF PAVEMENT/EDGE OF PIPE	P.S., P.SL.	PRIMARY SLUDGE		
E.P.	EXPLOSION PROOF	PSF	POUNDS PER SQUARE FOOT		
EQUIP	EQUIPMENT	PSI	POUNDS PER SQUARE INCH		
ETC	ET CETERA	PSIA	POUNDS PER SQUARE INCH ABSOLUTE		
EW	EACH WAY	PSIG	POUNDS PER SQUARE INCH GAUGE		
EXIST, EX, EXG	EXISTING	PSL	PRIMARY SLUDGE		
EXP	EXPANSION	PT.	PRESSURE TREATED/POINT		
EXT	EXTERIOR	PTD	PAINTED		
		PVC	POLYVINYL CHLORIDE		
FB	FIBERGLASS	PW	PLANT WATER		
F.C.	FIRE CODE/FLUSHING CONNECTION	P.W.R.	PROCESS WASTE RETURN		
F.C.MH.	FORCE MAIN CLEANOUT MANHOLE				
F.D.	FLOOR DRAIN	R=/RIM	RIM ELEVATION		
FDN	FOUNDATION	R & D	REMOVE AND DISPOSE		
F.E.	FIRE EXTINGUISHER/FINAL EFFLUENT	R	RADIUS		
F.E.S.	FLARED END SECTION	R.A.S.	RETURN ACTIVATED SLUDGE		
F.F., FIN. FLR.	FINISH FLOOR	RCEP	REINFORCED CONCRETE ELLIPTICAL PIPE		
F.F.E.	FINISH FLOOR ELEVATION	RCP	REINFORCED CONCRETE PIPE		
F.H.	FIRE HYDRANT	R.D.	ROOF DRAIN		
FIN	FINISHED	RED	REDUCER		
FIN. GR.	FINISH GRADE	REINF	REINFORCED		
FL, FLR	FLOOR	RET.	RETAINING WALL		
FLG	FLANGE	REQ'D	REQUIRED		
FLX	FLEXIBLE	RESIL	RESILIENT		
FM	FORCE MAIN	R.O.	ROUGH OPENING		
F.R.P.	FIBERGLASS REINFORCED PLASTIC	R.O.W., R/W	RIGHT-OF-WAY		
FT	FOOT/ FEET	R.S.	RECIRCULATED SLUDGE		
FTG	FITTING	RT, RTE	ROUTE		
		R.WW.	RAW WASTEWATER		
G	GAS MAIN				
GA	GAUGE	S	SEWER/SLOPE (FT./FT.)		
GAL	GALLON	S.B.	SPLITTER BOX		
GALV	GALVANIZED	SBDHF	STONE BOUND, DRILL HOLE FOUND		
G.C.	GRIT CHAMBER	SCFM	STANDARD CUBIC FEET PER MINUTE		
G.C.E.	GRIT CHAMBER EFFLUENT	SCH	SCHEDULE		
G.G.	GAS GATE VALVE	SD	STORM DRAIN		
GPD	GALLONS PER DAY	S.D.	SLUDGE DRAWOFF		
GPH	GALLONS PER HOUR	S.D.R.	STANDARD DIMENSION RATIO		
GPM	GALLONS PER MINUTE	S.E.	SECONDARY EFFLUENT		
GRAN	GRANITE	SECT	SECTION		

LINETYPE LEGEND

EXISTING		PROPOSED
122	CONTOUR (1' OR 2' INTERVAL)	122
120	CONTOUR (10' INTERVAL)	120
S	SANITARY SEWER (<18" IN DIA.)	S
S	SANITARY SEWER (≥18" IN DIA.)	
FM	FORCE MAIN	FM
SD	STORM DRAIN (<18" IN DIA.)	SD
SD	STORM DRAIN (≥18" IN DIA.)	
UD	UNDERDRAIN	UD
FD	FOUNDATION DRAIN	FD
RD	ROOF DRAIN	RD
W	WATER MAIN	W
E	UNDERGROUND ELECTRIC	E
T	UNDERGROUND TELEPHONE	T
TV	UNDERGROUND TELEVISION	TV
COMM	UNDERGROUND COMMUNICATIONS	COMM
G	GAS LINE	G
OE	OVERHEAD ELECTRIC	OE
CS	COMBINE SEWER	CS
AS	ABANDONED SEWER	AS
AW	ABANDONED WATER MAIN	AW
CIPP	CIPP LINING (<18"× IN DIA.)	CIPP
	CIPP LINING (≥18" IN. DIA.)	
	PROPERTY LINE	
	EASEMENT	
	SETBACK	
	FEMA FLOODWAY	
	ZONE LINE	
	EDGE OF VEGETATION	
	CHAIN LINK FENCE	
	WOOD FENCE	
	CENTERLINE	
	RETAINING WALL	
	STONE WALL	
	WALL FOOTING / STRUCTURE SLAB	
	CURB	
	EDGE OF PAVEMENT	
	EDGE OF GRAVEL	
	GUARDRAIL	
	RAILROAD TRACKS	
	DRAINAGE DITCH / SWALE	
	EROSION CONTROL SEDIMENT BARRIER	
	LIMIT OF WORK	LW
	ABANDON IN PLACE	
	UTILITY REMOVE AND DISPOSE	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
	50 FT. WETLAND BUFFER	
	100 FT. WETLAND BUFFER	
WF-X	WETLAND FLAG W/ FLAG NO.	
	WETLAND HATCHING	
	REMOVE AND DISPOSE PAVEMENT	
	HEAVY DUTY BITUMINOUS PAVEMENT	
	STANDARD DUTY BITUMINOUS PAVEMENT	
	STONE DUST TRAIL	
	CONCRETE	
	RIPRAP	
	GRAVEL	
	CRUSHED STONE	
	LAWN	
S	HOUSE SERVICE / LATERAL	S
INV.=XXXXX INV.=XXXXX	CUL.VERT	INV.=XXXXX INV.=XXXXX
	BERM	
	AREA TO BE REGRADED	
	DEMOLISH SUBSURFACE UTILITY STRUCTURES	
	EROSION CONTROL BLANKET	

SYMBOLS LEGEND

EXISTING		PROPOSED
	DEMOLISH MANHOLE	M
	DEMOLISH CATCH BASIN	
XXXX.XX	SPOT ELEVATION	XXXX.XX
SCB	STONE CHECK DAM	SCB
S / CO	SANITARY SEWER MANHOLE	S / CO
	CLEANOUT	
D	DRAINAGE MANHOLE & DIVERSION STRUCTURE	D
	CATCH BASIN	
	DOUBLE GRATE CATCH BASIN	
	CURB INLET CATCH BASIN	
	INLET PROTECTION	
RD	ROOF DRAIN	RD
	ACCESS COVER HATCH	
T	TELEPHONE MANHOLE	T
	TELEPHONE STAND BOX	
	TRANSFORMER	
E	ELECTRICAL MANHOLE	E
	UTILITY POLE	
	UTILITY POLE WITH GUY	
	LIGHT POST/LIGHT POLE	
	GAS METER BOX	
	GAS VENT	
	GAS GATE VALVE	
	CURB STOP	
	REDUCER	
	COUPLING	
	THRUST BLOCK	
	HYDRANT	
W	WATER WELL	W
W	WATER METER BOX	W
	WATER GATE VALVE	
MP	PROPERTY MONUMENT	MS
IPF	IRON PIN	IPS
	SURVEY STATION	
	TEMPORARY BENCH MARK	
	MAILBOX	
	BOLLARD	
	STREET AND MISCELLANEOUS SIGNS	
	ACCESSIBLE PARKING	
FP	FLAGPOLE	FP
	DECIDUOUS TREE/SHRUB	
	CONIFEROUS TREE/SHRUB	
	TREE PROTECTION	
	TREE REMOVAL	
TP-X	TEST PIT AND NUMBER	TP-X
B-X	BORING AND NUMBER	B-X
MW-X	MONITORING WELL AND NUMBER	MW-P
	ABOVEGROUND STORAGE TANK	
	GROUND ROD	

NOTE: THIS IS A GENERAL LIST OF SYMBOLS AND ABBREVIATIONS. NOT ALL ITEMS SHOWN HERE APPEAR ON THE CONTRACT DOCUMENT

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PE SEAL:

STATE OF NEW HAMPSHIRE ROSS TSANTOULIS No. 14122 LICENSED PROFESSIONAL ENGINEER

Ross Tsantoulis

Digitally signed by Ross Tsantoulis
DN: cn=Ross Tsantoulis, o=Woodard & Curran, ou=Engineering, email=rtsantoulis@woodardcurran.com, c=US
Date: 2025.12.11 15:52:11 -05'00'

DRAFT 60% DESIGN NOT FOR CONSTRUCTION

CLIENT INFO:

RADIUS RECYCLING
CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

REV	MM/DD/YY	DESCRIPTION

JOB NO:	0224539.48
DATE:	NOVEMBER 2025
SCALE:	NO SCALE
DESIGNED BY:	YT
DRAWN BY:	KC
CHECKED BY:	RT
FILENAME:	0224539.48-C-001.dwg

DRAWING TITLE:

CIVIL
ABBREVIATIONS AND LEGEND

DRAWING NO:

C-001

W:\woodardcurran.net\Shared\Projects\0224539.48 Sanitizer Concord Sandquist Preliminary Design\Drawings\Civil\0224539.48-C-001.dwg, Nov 26, 2025 - 11:13am, rtsantoulis

GENERAL NOTES

1. EXISTING CONDITIONS SHOWN HEREON HAVE BEEN PROVIDED FROM AN AERIAL SURVEY PERFORMED BY CIVIL DESIGN CONSULTANTS, INC., IN AUGUST 2022 AND A FIELD SURVEY PERFORMED BY SEC & ASSOCIATES INC., TITLED "EXISTING CONDITIONS PLAN FOR 25 SANDQUIST STREET, CONCORD, NH", DATED OCTOBER 2022 AND REVISED NOVEMBER 8, 2022.

2. EASEMENTS, RIGHTS AND RESTRICTIONS SHOWN OR IDENTIFIED ARE THOSE WHICH WERE FOUND DURING RESEARCH COMPLETED AT THE MERRIMACK COUNTY REGISTRY OF DEEDS. OTHER RIGHTS, RESTRICTIONS AND EASEMENTS MAY EXIST WHICH A TITLE EXAMINATION OF THE SUBJECT PARCEL WOULD DETERMINE.
   2.1. BOUNDARY REFERENCES: MERRIMACK COUNTY REGISTRY OF DEEDS (M.C.R.D.) SUBJECT DEED: BK. 3537 PG. 0591.
   PLANS:
   M.C.R.D. #6510 (12-1980)
   M.C.R.D. #10923 (03-1989)
   M.C.R.D. #14267 (03-1998)
   M.C.R.D. #201600003983 (09-2016)

3. PROPERTY IS PARTIALLY LOCATED WITHIN A DESIGNATED REGULATORY FLOODWAY, ZONE "AE" AS SHOWN WITH A PUBLISHED BASE FLOOD ELEVATION OF 230. REMAINDER OF PROPERTY IS LOCATED WITHIN A 0.2 PERCENT ANNUAL CHANCE FLOOD HAZARD ZONE "X" PER FLOOD INSURANCE RATE MAP NUMBER 33013C0543E DATED APRIL 19, 2010.

4. MAN-MADE AND NATURAL JURISDICTIONAL WETLAND BOUNDARIES WERE DELINEATED BY MARC JACOBS, CERTIFIED WETLAND SCIENTIST NUMBER 090, INC SEPTEMBER 2022, ACCORDING TO THE STANDARDS OF THE U.S. ARMY CORPS OF ENGINEERS - 1987 WETLANDS DELINEATION MANUAL; THE 2012 REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTH CENTRAL AND NORTHEAST REGION; AND THE CODE OF ADMINISTRATIVE RULES, NH DEPARTMENT OF ENVIRONMENTAL SERVICES - WETLANDS BUREAU - ENV-WT 100-500. PREDOMINANT HYDRIC SOILS WERE IDENTIFIED UTILIZING THE FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4, JUNE 2020 AND THE FIELD INDICATORS OF THE HYDRIC SOILS IN THE UNITED STATES, VERSION 8, 2016. THE STATUS OF VEGETATION AS HYDROPHYTIC WAS DETERMINED ACCORDING TO THE U.S. ARMY CORPS OF ENGINEERS - NORTH CENTRAL AND NORTHEAST 2020 REGIONAL WETLAND PLANT LIST. COPIES OF SITE PLANS DEPICTING THE WETLAND DELINEATION WHICH HAVE BEEN REVIEWED BY THE WETLAND SCIENTIST ARE INDIVIDUALLY STAMPED, SIGNED, AND DATED. THIS NOTE HAS BEEN CUSTOMIZED FOR THIS PROJECT.

5. ELEVATIONS REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

6. ELEVATIONS REFERENCED TO NH STATE PLAN, NAD-83 AS DETERMINED BY G.P.Z. OBSERVATIONS.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING ALL CONTROL POINTS AND BENCH MARKS NECESSARY FOR THE WORK.

8. EXISTING UTILITIES SHOWN ON THESE PLANS WERE COMPILED FROM A FIELD SURVEY PREPARED BY SEC & ASSOCIATES INC. AND RECORD DRAINAGE AND SEWER PLANS PROVIDED BY THE CONCORD DEPARTMENT OF PUBLIC WORKS. THESE PLANS DO NOT NECESSARILY DEPICT THE EXACT LOCATIONS OF ALL UTILITIES, WHICH MAY EXIST AT THIS TIME WITHIN THE SURVEY LIMITS. THERE MAY BE EXISTING LINES OTHER THAN THOSE INDICATED. THE LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES SHALL BE CONSIDERED APPROXIMATE AND MUST BE VERIFIED BY THE CONTRACTOR PRIOR TO ANY UTILITY CONNECTIONS OR CROSSINGS OF PROPOSED OR EXISTING UTILITIES. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO THE ENGINEER IN WRITING. THE CONTRACTOR SHALL CONTACT THE RESPECTIVE UTILITY COMPANIES RELATIVE TO THE LOCATIONS AND ELEVATIONS OF THESE LINES. NO SEPARATE OR ADDITIONAL COMPENSATION WILL BE ALLOWED TO THE CONTRACTOR DUE TO ANY VARIANCE BETWEEN THE DATA SHOWN ON THE PLANS AND ACTUAL FIELD CONDITIONS ENCOUNTERED. THE CONTRACTOR IS RESPONSIBLE FOR HIS/HER OWN DETERMINATION AS TO THE TYPE AND LOCATION OF THE EXISTING UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE AND TO FACILITATE THE PROPOSED CONNECTION(S).

9. THESE DOCUMENTS HAVE BEEN PREPARED TO SATISFY ASCE 38.02 MINIMUM UTILITY QUALITY LEVEL C ONLY. ASCE 38.02 MINIMUM QUALITY LEVEL C IS LIMITED TO THE COLLECTION AND REVIEW OF RECORD UTILITY DOCUMENTS AND A SITE FEATURES SURVEY TO MEASURE THE LOCATION AND ELEVATION OF THE EXISTING SEWER AND DRAIN SYSTEM. NO SUBSURFACE EXPLORATION IN THE FORM OF GPR, TEST PITS, BORING OR ANY OTHER GEOPHYSICAL METHODS WERE PERFORMED AS PART OF THIS SURVEY. ALL INFORMATION SHOWN IS OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE GROUND UTILITY FEATURES AND USING PROFESSIONAL JUDGEMENT IN RELATING THIS INFORMATION WITH AVAILABLE RECORD DOCUMENTATION.

10. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELOCATIONS THAT CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE SITE DRAWINGS, INCLUDING BUT NOT LIMITED TO ALL UTILITIES, STORM INFRASTRUCTURE, SIGNS, UTILITY POLES, FENCES, ETC. AS REQUIRED. ALL WORK SHALL BE IN ACCORDANCE WITH THE GOVERNING AUTHORITY'S SPECIFICATIONS AND SHALL BE APPROVED BY SUCH. ALL COSTS SHALL BE INCURRED BY THE CONTRACTOR.

11. THE CONTRACTOR SHALL CALL "DIG SAFE NEW HAMPSHIRE" AT 1-888-344-7233 AT LEAST 72 HOURS PRIOR TO EXCAVATION IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL SAFETY CODES.

12. PRIOR TO CONSTRUCTION, THE ENGINEER AND CONTRACTOR WILL REVIEW THE PERMITTED LIMITS OF WORK.

13. LAND OUTSIDE THE PROPOSED LIMIT OF WORK SHALL NOT BE DISTURBED BY THE CONTRACTOR.

14. THE CONTRACTOR SHALL TAKE ADEQUATE PRECAUTIONS TO PROTECT ALL WALKS, STREETS, PAVEMENTS, CURBING, TREES, PLANTINGS, LAWN, FENCING TO REMAIN ON OR OFF THE PREMISES, AND SHALL REPAIR AND REPLACE AT HIS/HER OWN EXPENSE, AS DIRECTED BY THE ENGINEER, ANY ITEMS DAMAGED AS A RESULT OF THE CONTRACTOR'S WORK.

15. RESTORE ALL AREAS DISTURBED BY CONTRACTOR'S OPERATIONS TO ORIGINAL FINISH. (GRAVEL, PAVEMENT, RIPRAP, GRASS, ETC.) UNLESS OTHERWISE NOTED ON PLANS. RESTORATION OF ALL AREAS DAMAGED BY CONTRACTOR SHALL BE INCIDENTAL TO THE PROJECT.

16. ALL SURFACES TO REMAIN THAT ARE DISTURBED BY THIS WORK SHALL BE RESTORED TO THEIR ORIGINAL CONDITION, AS DETAILED, OR AS SPECIFIED BY THE ENGINEER.

17. ALL CURB DAMAGED DURING CONSTRUCTION SHALL BE REPLACED IN KIND AND SHALL CONFORM TO STATE DEPARTMENT OF PUBLIC WORKS STANDARD SPECIFICATIONS. COST IS INCIDENTAL TO CONTRACT.

18. IF ANY EXISTING STRUCTURES TO REMAIN ARE DAMAGED DURING CONSTRUCTION IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY.

19. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL SAFETY CODES, REGULATIONS, LEGAL REQUIREMENTS, PERMIT CONDITIONS, ETC. PERMIT CONDITIONS RELATE TO THOSE OUTLINED IN THE STATE SPECIFICATIONS.

20. THE CONTRACTOR SHALL PROVIDE ADEQUATE BRACING AND SHORING OF ALL EXCAVATIONS IN ACCORDANCE WITH THE REQUIREMENTS OF ALL GOVERNING CODES AND REGULATIONS.

21. SAWCUTS IN EXISTING PAVEMENT SHALL BE SMOOTH AND STRAIGHT.

22. WORK WITHIN PUBLIC RIGHT-OF-WAY SHALL COMPLY WITH APPLICABLE MUNICIPAL AND STATE REQUIREMENTS.

23. IF IMPORTED FILL MATERIAL IS REQUIRED, IT SHALL BE CERTIFIED IN WRITING BY A STATE LICENSED PROFESSIONAL ENGINEER AS NON-CONTAMINATED, CLEAN FILL SUITABLE FOR THE INTENDED USE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TESTING OF ENVIRONMENTAL PARAMETERS AS OUTLINED IN THE PROJECT SPECIFICATIONS.

24. ALL STORMWATER MANAGEMENT AND SOIL EROSION AND SEDIMENT CONTROL FEATURES INCLUDED IN THE PROJECT STORMWATER POLLUTION PREVENTION PLAN (SWPPP) ARE THE RESPONSIBILITY OF THE CONTRACTOR. THIS INCLUDES, BUT IS NOT LIMITED TO, SEDIMENT BARRIER, STABILIZED CONSTRUCTION ENTRANCE, WATER QUALITY STRUCTURE, STORM INLET PROTECTION, SUBSURFACE DRAINAGE PIPES AND LAND GRADING.

25. THE STORMWATER POLLUTION PREVENTION PLAN SHALL BE MONITORED BY A QUALIFIED PROFESSIONAL. A STATE TRAINED INDIVIDUAL POSSESSING A CERTIFICATION SHALL BE PRESENT AT ALL TIMES DURING CONSTRUCTION OF ALL ITEMS PERTINENT TO THE SWPPP.

26. PROPERLY PROTECT AND DO NOT DISTURB PROPERTY IRONS, MONITORING WELLS, AND MONUMENTS. IF DISTURBED, THE PROPERTY MONUMENT WILL BE RESET AT THE CONTRACTOR'S EXPENSE BY A REGISTERED LAND SURVEYOR APPROVED BY THE ENGINEER.

27. ALL MATERIAL SHALL BE FURNISHED BY CONTRACTOR UNLESS OTHERWISE NOTED.

28. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL DIMENSIONS PRIOR TO START OF CONSTRUCTION.

29. CLEAN AND/OR FLUSH ALL MANHOLES AND SITE PIPING AFTER THE WORK HAS BEEN COMPLETED. NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK.

DEMOLITION NOTES

1. PRIOR TO THE START OF DEMOLITION, THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND/OR APPROVALS FROM THE CITY OF CONCORD, AND ALL OTHER AUTHORITIES HAVING JURISDICTION.

2. CONSTRUCTION/DEMOLITION DEBRIS NOT APPROVED FOR REUSE ON-SITE, SHALL BE REMOVED AND DISPOSED OFF SITE IN ACCORDANCE WITH THE REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION. WASTE MANIFEST FORMS DOCUMENTING PROPER OFF-SITE DISPOSAL SHALL BE PROVIDED TO THE SITE/CIVIL ENGINEER AND THE CITY OF CONCORD.

3. PRIOR TO THE START OF DEMOLITION, THE CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING UTILITIES TO BE DEMOLISHED OR TO REMAIN PROTECTED DURING CONSTRUCTION. IF ANY DISCREPANCIES ARE FOUND, THE CONTRACTOR SHALL NOTIFY THE OWNER IN WRITING OF THE CONFLICT.

4. THE CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES TO REMAIN. ANY TEMPORARY SHUT DOWNS REQUIRED TO FACILITATE THE PROPOSED CONSTRUCTION, WHICH MAY AFFECT USES ON ADJACENT PROPERTIES SHALL BE COORDINATED BY THE CONTRACTOR AND THE CITY OF CONCORD.

5. CONTRACTOR SHALL REPAIR OR REPLACE ANY STRUCTURES OR UTILITIES DAMAGED DURING CONSTRUCTION. THE CONTRACTOR SHALL PROCEED WITH CAUTION WITHIN THE PROPOSED WORK AREA TO PREVENT ANY INTERRUPTION TO EXISTING UTILITY SERVICE.

6. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE A MAINTENANCE AND PROTECTION OF TRAFFIC (MPT) PLAN IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REQUIREMENTS.

7. CONTRACTOR SHALL COVER CONSTRUCTION DUMPSTERS AND ROLL-OFF CONTAINERS, AND STORE ALL CONSTRUCTION CHEMICALS INSIDE THE CONSTRUCTION TRAILER OR UNDER A COVERED AREA DURING PERIODS WHEN CONSTRUCTION CEASES.

UTILITIES NOTES

1. REFER TO ELECTRICAL DRAWINGS FOR ELECTRICAL WIRING DIAGRAMS, SCHEDULES, CONDUIT MATERIAL, POWER CONNECTIONS AND ENERGIZATION AND ALL OTHER APPURTENANCES RELATED TO ELECTRICAL WORK FOR THIS PROJECT.

2. ALL PROPOSED ELECTRICAL AND LIGHTING WORK SHOWN ON THESE CIVIL DRAWINGS SHALL BE COORDINATED WITH THE ELECTRICAL PLANS AND SPECIFICATIONS SHOWN ON THE ELECTRICAL DRAWINGS. IN THE EVENT THERE IS A DISCREPANCY BETWEEN THE CIVIL AND ELECTRICAL DRAWINGS, THE ENGINEER SHALL BE NOTIFIED IN WRITING.

CONSTRUCTION NOTES

CONSTRUCTION SHALL BE PHASED SUCH THAT ALL DISTURBED AREAS SHALL FIRST BE PROTECTED WITH EROSION AND SEDIMENT CONTROLS AS INDICATED ON THE PLANS. THE CONSTRUCTION PHASING DESCRIBED BELOW IS FOR GENERAL PURPOSES ONLY, AND WILL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR HIS/HER MEANS AND METHODS OF CONSTRUCTION. GENERAL CONSTRUCTION SEQUENCING IS AS FOLLOWS:

1. INSTALLATION OF EROSION AND SEDIMENT CONTROL PRACTICES AS INDICATED ON THE PLANS.
2. DEMOLITION AND REMOVAL OF EXISTING PAVEMENT, CURB, TREES, UTILITIES, ETC.
3. STRIP AND STOCKPILE TOPSOIL AT DESIGNATED ON-SITE STORAGE AREA.
4. BEGIN ROUGH GRADING AND EARTHWORK ACTIVITIES (EMBANKMENT AND EXCAVATION OPERATIONS).
5. INSTALL NEW STORM SEWER SYSTEM AND REMOVE OLD SYSTEM (BEGINNING AT FURTHEST DOWNSTREAM STRUCTURE).
6. PLACE INLET PROTECTION ON PROPOSED CATCH BASINS AS SHOWN ON THE DRAWINGS.
7. INSTALL UTILITIES (SANITARY SEWER, WATER, ELECTRIC, ETC.).
8. INSTALL BITUMINOUS CONCRETE PAVEMENT SUBBASE AND BITUMINOUS CONCRETE BINDER COURSES AS SPECIFIED ON PLANS.
9. FINISH GRADING, REDISTRIBUTE STOCKPILED TOPSOIL AND ESTABLISH VEGETATION ON ALL DISTURBED AND NEW PERVIOUS AREAS.
10. CLEAN BITUMINOUS CONCRETE PAVEMENT AND STORM SEWER OF ALL DEBRIS AND SEDIMENT.
11. COMPLETE SITE AND BUILDING CONSTRUCTION.
12. INSTALLATION OF BITUMINOUS PAVEMENT CONCRETE TOP COURSE (THIS WEARING COURSE SHALL BE INSTALLED NEAR COMPLETION OF PROJECT).
13. ACHIEVE PERMANENT AND FINAL STABILIZATION OF AREAS DISTURBED DURING CONSTRUCTION.
14. REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL PRACTICES FROM THE SITE.

SEDIMENTATION & EROSION CONTROL NOTES

1. SOIL AND EROSION CONTROLS SHALL BE PLACED PRIOR TO ANY CONSTRUCTION ACTIVITIES. CONTRACTOR TO NOTIFY THE ENGINEER AND THE OWNER AT LEAST 48 HOURS PRIOR TO ANY CONSTRUCTION ACTIVITIES.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING ALL EROSION CONTROL MEASURES NECESSARY TO PREVENT OFF-SITE TRACKING OF EARTH, SEDIMENT AND DEBRIS.
3. SEDIMENTATION AND EROSION CONTROL MEASURES TO BE ADJUSTED AS NEEDED WITHIN ACTIVE LIMIT OF DISTURBANCE.
4. PERMANENT SEEDING SHALL OCCUR BETWEEN MARCH 1 AND JUNE 15, OR BETWEEN AUGUST 15 AND OCTOBER 15. INSTALL EROSION CONTROL BLANKETS OR SIMILAR EROSION CONTROL MEASURES OUTSIDE THE PERMANENT SEEDING TIME FRAME.
5. ALL SITE SOILS TO BE STOCKPILED FOR MORE THAN 14 DAYS SHALL BE SURROUNDED BY EROSION CONTROL BARRIERS AND TEMPORARILY SEEDED AND MULCHED.
6. EROSION CONTROL MEASURES SHALL BE INSPECTED AT A MINIMUM FREQUENCY OF ONCE EVERY WEEK, AND DURING AND AFTER EVERY RAIN EVENT GREATER THAN 0.25". ANY NECESSARY REPLACEMENT OR REPAIR SHALL BE PERFORMED PROMPTLY BY THE CONTRACTOR.
7. DUST SHALL BE CONTROLLED AS NECESSARY THROUGH THE USE OF WATER. THE USE OF CALCIUM CHLORIDE FOR DUST CONTROL IS NOT ALLOWED, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
8. CONTRACTOR SHALL COORDINATE LOCATION OF CONSTRUCTION ENTRANCE WITH OWNER.
9. CONTRACTOR SHALL COORDINATE OF CONCRETE WASHOUT WITH OWNER. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY MANAGING CONCRETE WASHOUT WASTEWATER IN ACCORDANCE WITH LOCAL REGULATIONS.
10. INVASIVE OR NOXIOUS SPECIES MAY NOT BE USED. PER THE WETLAND BUREAU, REED CANARY GRASS IS A LOCAL PROBLEMATIC SPECIES.
11. AN AREA SHALL BE CONSIDERED "STABLE" IF ONE OF THE FOLLOWING HAS OCCURRED: INSTALLATION OF BASE COURSE GRAVELS IN AREAS TO BE PAVED; A MINIMUM OF 85% VEGETATION GROWTH IS ESTABLISHED, INSTALLATION OF STONE OR RIPRAP AT A MINIMUM OF 3-INCHES, OR PROPER INSTALLATION OF EROSION CONTROL BLANKETS.
12. DURING CONSTRUCTION, THE MAXIMUM AREA OF DISTURBANCE SHALL NOT EXCEED TWO (2) ACRES AT ANY ONE TIME. THE AREA SHALL NOT BE LEFT UNSTABILIZED IN ORDER TO MAINTAIN THE SMALLEST PRACTICAL AREA OF DISTURBANCE.
13. WITHIN 72 HOURS OF FINAL GRADING, CUT AND FILL AREAS, PARKING LOTS, AND ROADWAYS SHALL BE PERMANENTLY STABILIZED.
14. ALL DISTURBED AREAS SHALL NOT BE EXPOSED AND STABILIZED WITHIN 45 DAYS.

WINTER SEDIMENTATION & EROSION CONTROL NOTES

THE CONTRACTOR SHALL FOLLOW WINTER CONSTRUCTION EROSION CONTROL METHODS AFTER OCTOBER 15TH AS FOLLOWS:

1. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
2. INCOMPLETE ROAD OR PARKING SURFACES WHERE WORK HAS STOPPED FOR THE WINTER SEASON SHALL BE PROTECTED WITH A MINIMUM OF 3-INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.

LAYOUT AND MATERIALS NOTES

1. ALL DIMENSIONS AND RADII ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.

GRADING AND DRAINAGE NOTES

1. CASTINGS FOR EXISTING STRUCTURES TO REMAIN AND PROPOSED STRUCTURES SHALL BE SET TO THE PROPOSED ELEVATIONS SHOWN ON THE DRAWINGS.
2. THE FILLING OF SOIL OVER THE ROOTS OF TREES TO BE PRESERVED IS PROHIBITED.
3. UNSUITABLE FILL AND BACKFILL MATERIALS ARE MATERIALS CONTAINING EXCESSIVE AMOUNT OF WATER, PLASTIC, CLAY, VEGETATION, ORGANIC MATTER, DEBRIS, PAVEMENT, STONES OR BOULDERS OVER X INCHES IN GREATEST DIMENSION, FROZEN MATERIAL, AND MATERIAL WHICH, IN THE OPINION OF THE ENGINEER, WILL NOT PROVIDE A SUITABLE FOUNDATION OR SUBGRADE.
4. SUITABLE SOIL SHALL BE PLACED IN LAYERS TO THE REQUIRED ELEVATIONS AS SHOWN ON THE DRAWINGS. FILL, BACKFILL AND COMPACT TO PRODUCE MINIMUM SUBSEQUENT SETTLEMENT OF THE MATERIAL AND PROVIDE ADEQUATE SUPPORT FOR THE SURFACE TREATMENT OR STRUCTURE TO BE PLACED ON THE MATERIAL. PLACE MATERIAL IN APPROXIMATELY HORIZONTAL LAYERS OF BEGINNING AT LOWEST AREA TO BE FILLED. DO NOT IMPAIR DRAINAGE. DO NOT USE ON-SITE TOPSOIL AS FILL MATERIAL.
5. CONTRACTOR SHALL PLACE BACKFILL AND FILL MATERIALS IN LAYERS NOT MORE THAN X INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HEAVY COMPACTION EQUIPMENT, AND NOT MORE THAN X INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HAND-OPERATED TAMPERS. DO NOT PLACE BACKFILL OR FILL MATERIAL ON SURFACES THAT ARE MUDDY, FROZEN, OR CONTAIN FROST OR ICE.
6. FOR GROUND SURFACE PREPARATION, CONTRACTOR SHALL REMOVE VEGETATION, DEBRIS, UNSUITABLE SOIL MATERIALS, OBSTRUCTIONS, AND DELETERIOUS MATERIALS FROM GROUND SURFACE PRIOR TO PLACEMENT OF FILL. REMOVE MATERIAL TO THE FULL EXTENT OF ROOT PENETRATION. PROOF-ROLL EXISTING GROUND SURFACE PRIOR TO PLACEMENT OF FILL TO PROVIDE A DENSE, STABLE BASE FOR THE FIRST LIFTS OF THE STRUCTURAL FILL.
7. CONTRACTOR SHALL COMPACT ALL MATERIAL TO THE FOLLOWING MINIMUM MODIFIED PROCTOR DENSITIES:

FILL AND BACKFILL LOCATION	DENSITY
UNDER ROADWAY AND PARKING AREA	95%
LAWN AREAS	95%

8. PRIOR TO THE START OF CONSTRUCTION, CONTRACTOR SHALL DIG TEST PITS TO VERIFY THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES. CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF ALL EXISTING UTILITIES AT PROPOSED UTILITY CROSSINGS, AND ADVISE THE ENGINEER IN WRITING OF ANY DISCREPANCIES.
9. ALL PROPOSED UTILITIES AND THEIR CONNECTIONS, DISCONNECTION AND RELOCATION OF EXISTING UTILITIES SHALL BE COMPLETED IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY COMPANY HAVING JURISDICTION. ANY COORDINATION WITH THE MUNICIPALITY AND/OR UTILITY COMPANY, PERMITS OR APPROVALS REQUIRED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

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Date: 2025.11.04 13:04:19 -05'00'

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CLIENT INFO:

RADIUS RECYCLING
CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

REV	M/M/DD/YY	DESCRIPTION

JOB NO:	0224539.48
DATE:	NOVEMBER 2025
SCALE:	NO SCALE
DESIGNED BY:	YT
DRAWN BY:	KC
CHECKED BY:	RT
FILENAME:	0224539.48-C-002.dwg

DRAWING TITLE:

CIVIL GENERAL NOTES

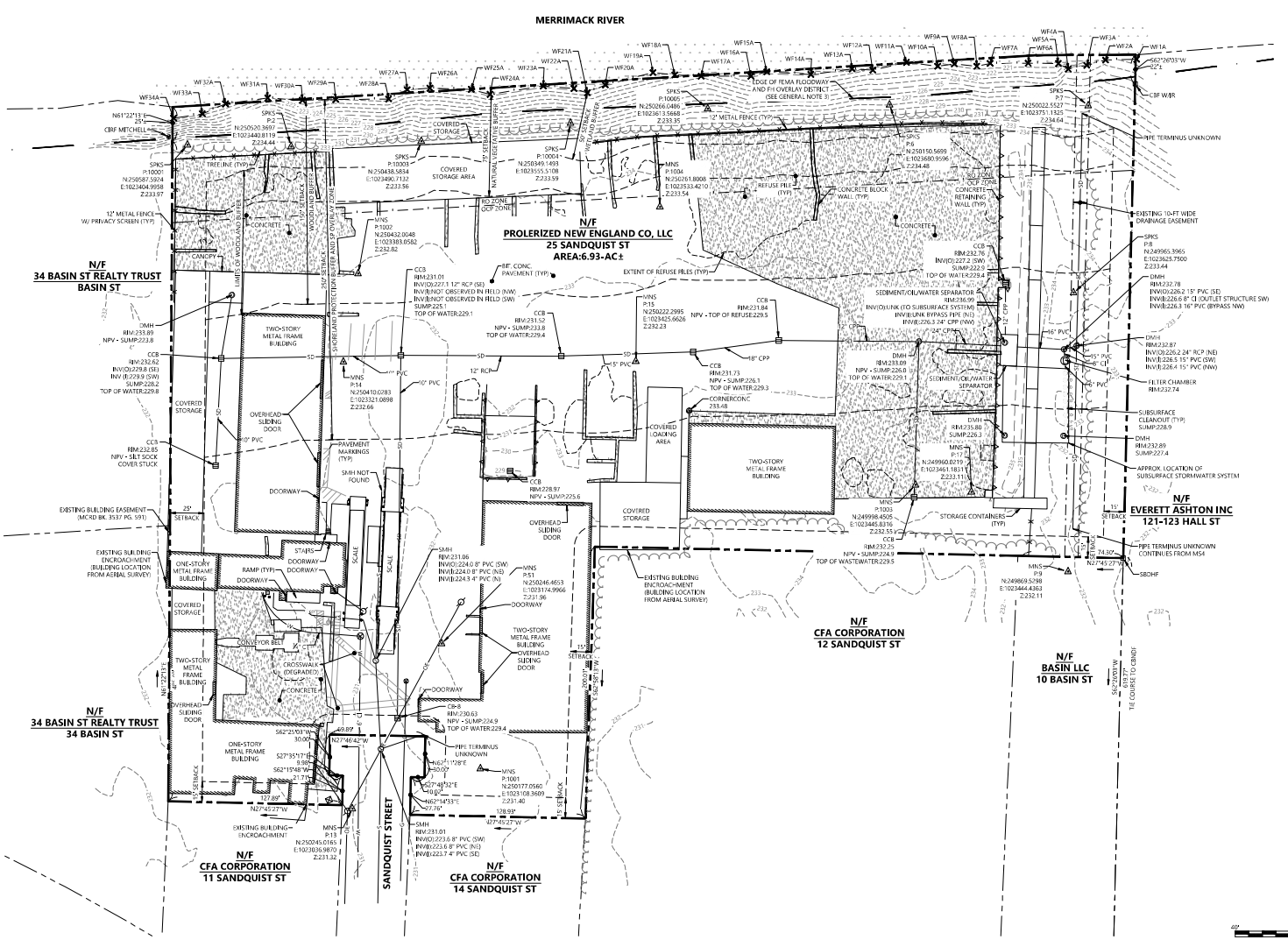
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C-002

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SHEET GENERAL NOTES

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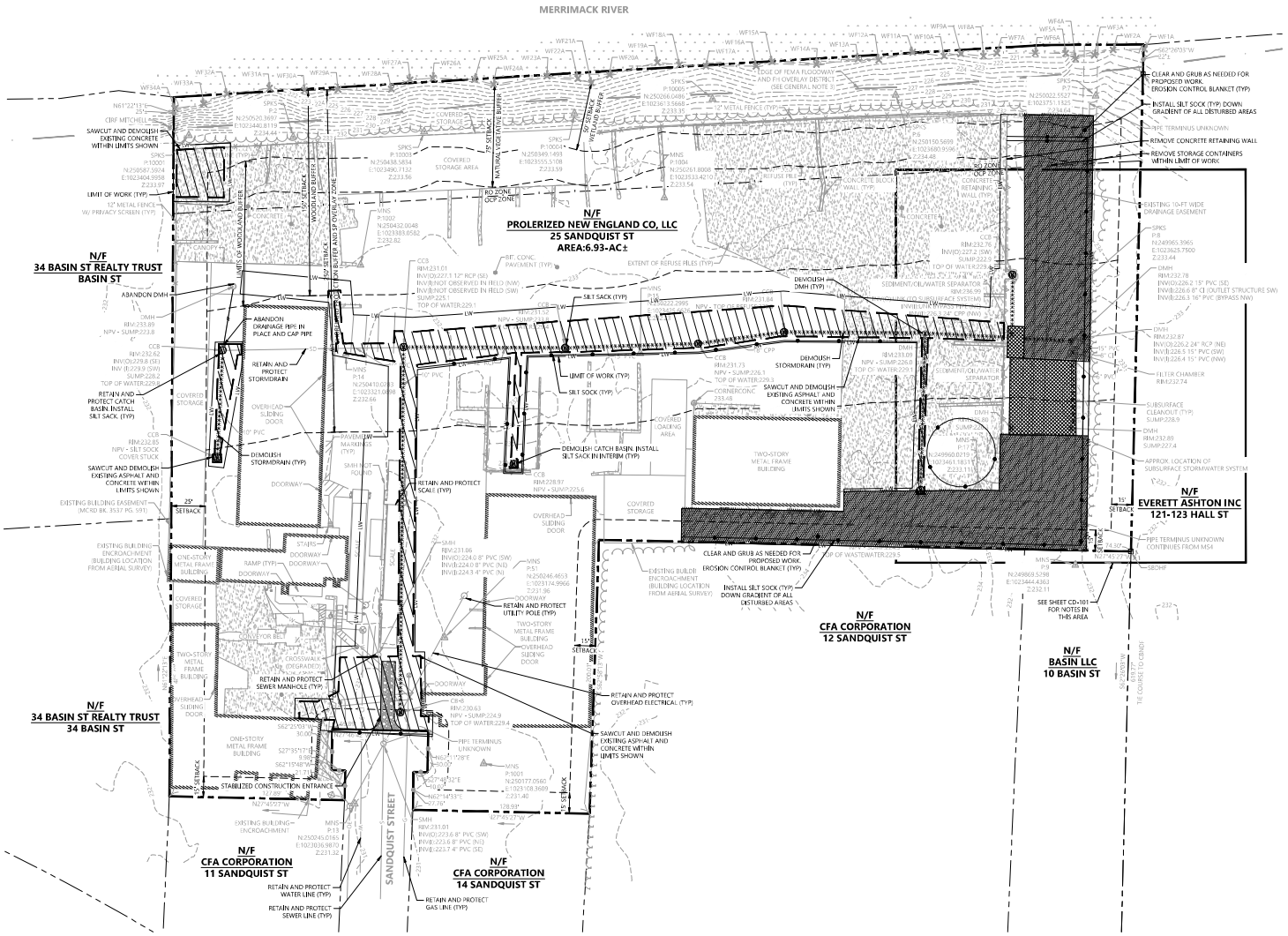
ROSS TSANTOULIS No. 14122 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

Ross Tsantoulis

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DN: CN=Ross Tsantoulis, O=Woodard Curran, OU=Employees, OU=Andover/Lynn, OU=Professional Engineer, OU=not valid without signature, OU=Water & Wastewater, OU=Water & Wastewater, OU=Water & Wastewater

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Date: 2025.11.21 15:54:04-05'00'

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CLIENT INFO:

RADIUS RECYCLING
CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

REV	MM/DD/YY	DESCRIPTION

JOB NO:	0224539.48
DATE:	NOVEMBER 2025
SCALE:	1" = 40'
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DRAWN BY:	KC
CHECKED BY:	RT
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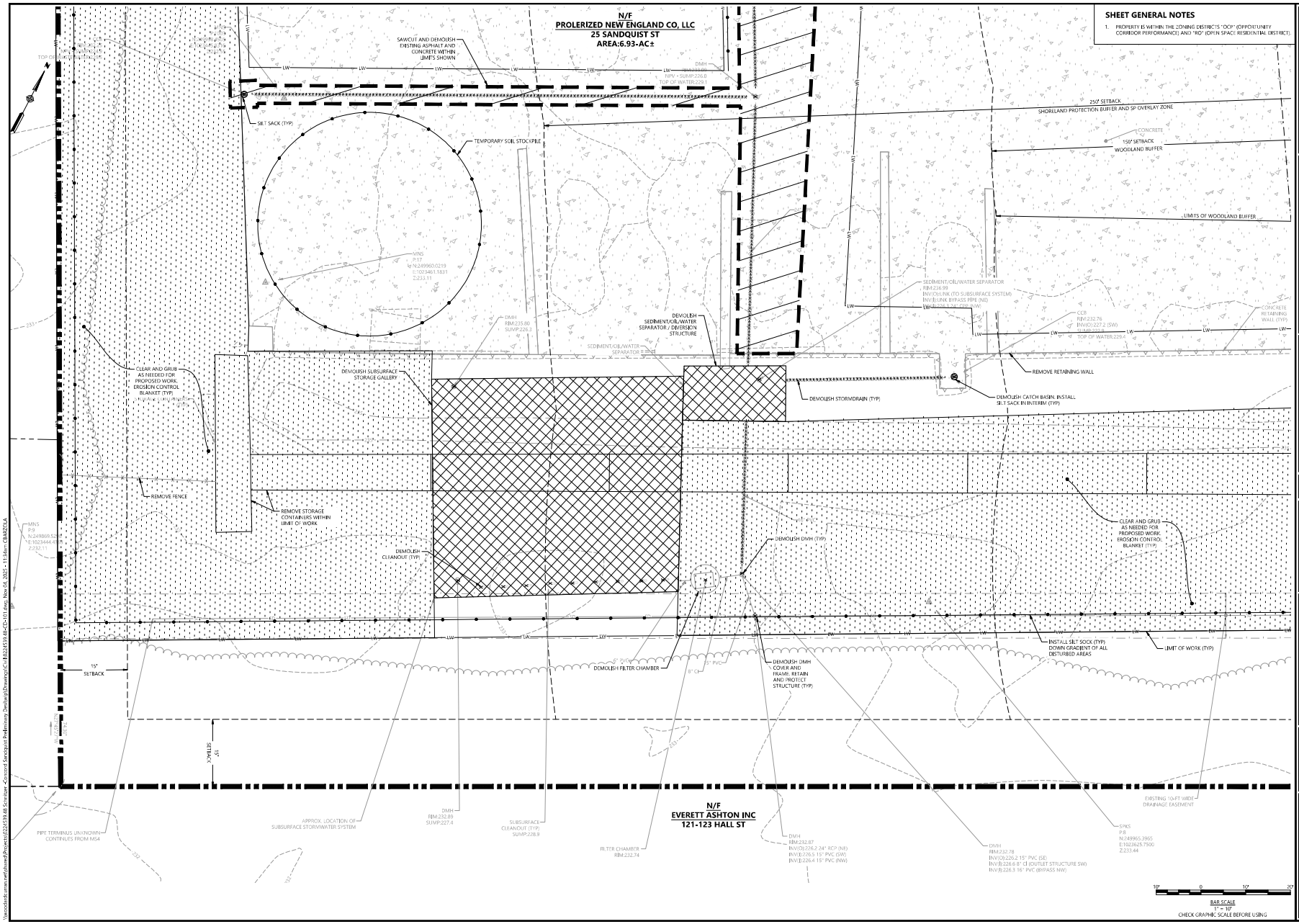
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SITE PREPARATION AND EROSION CONTROL PLAN

DRAWING NO:

CD-100

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REV	MM/DD/YY	DESCRIPTION

JOB NO:	0224539.48
DATE:	NOVEMBER 2025
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DESIGNED BY:	YI
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CHECKED BY:	RT
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CIVIL
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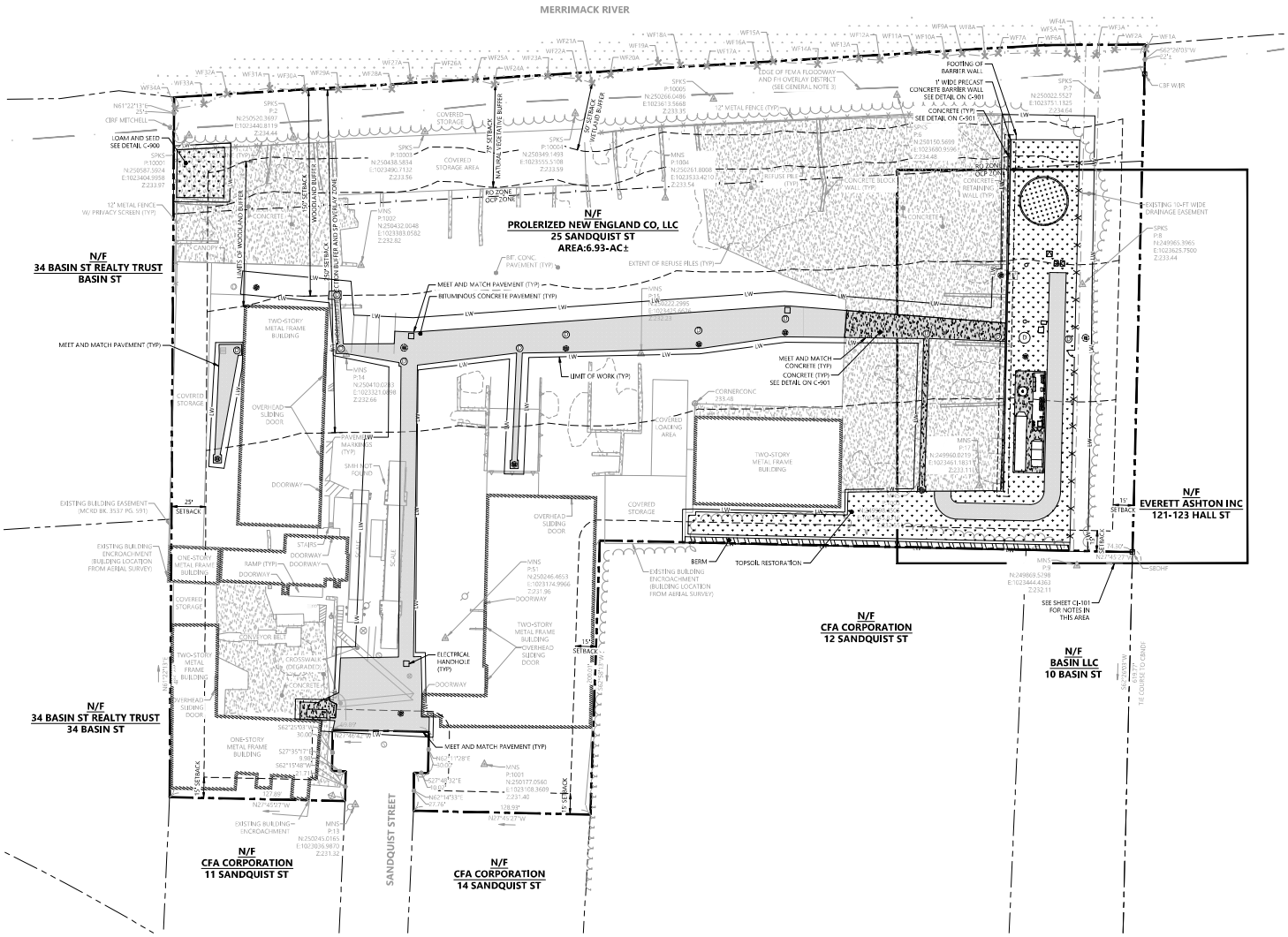
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SHEET GENERAL NOTES

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SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

REV	MM/DD/YY	DESCRIPTION

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DATE:	NOVEMBER 2025
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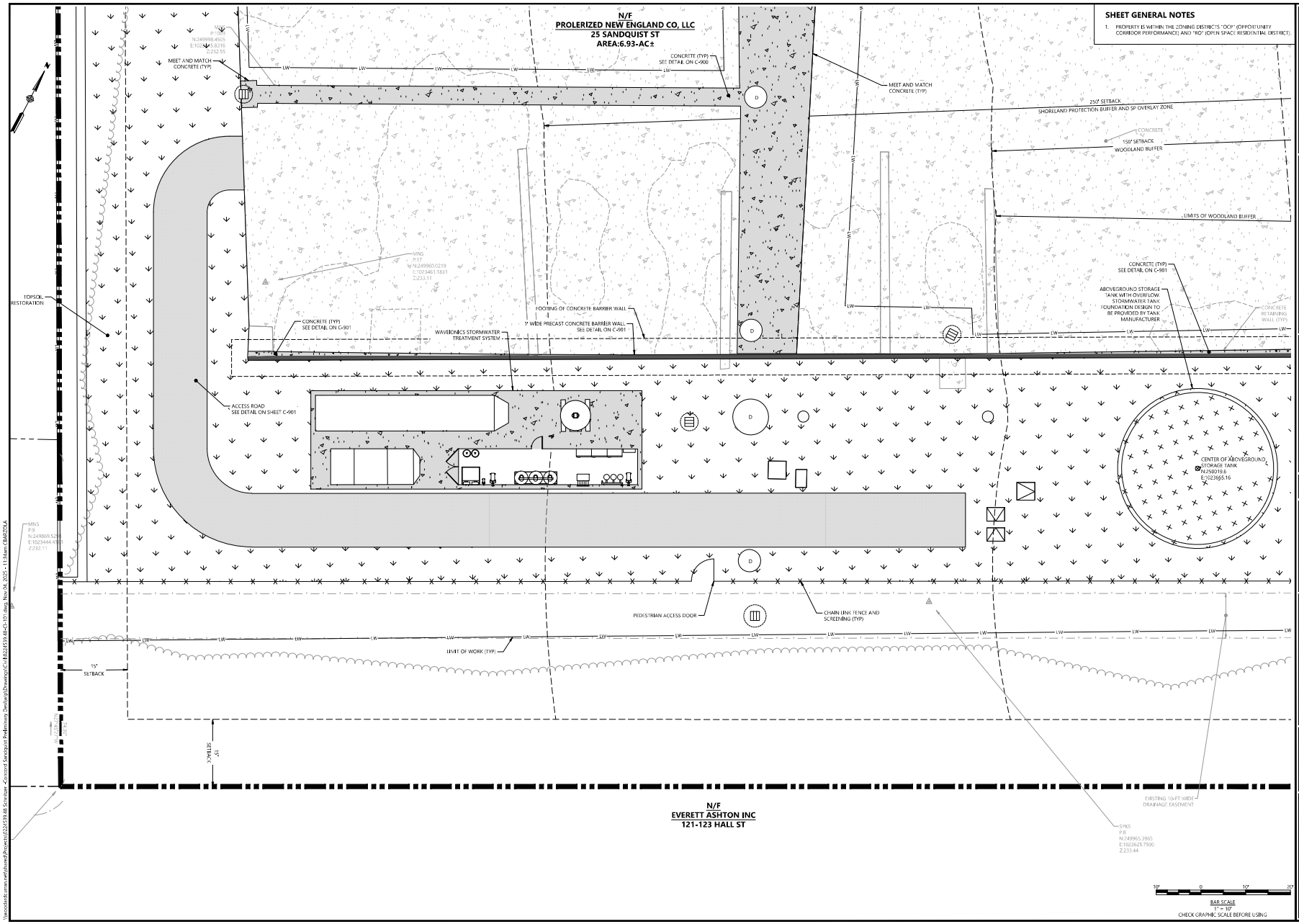
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OVERALL LAYOUT AND MATERIALS PLAN

DRAWING NO:

CI-100

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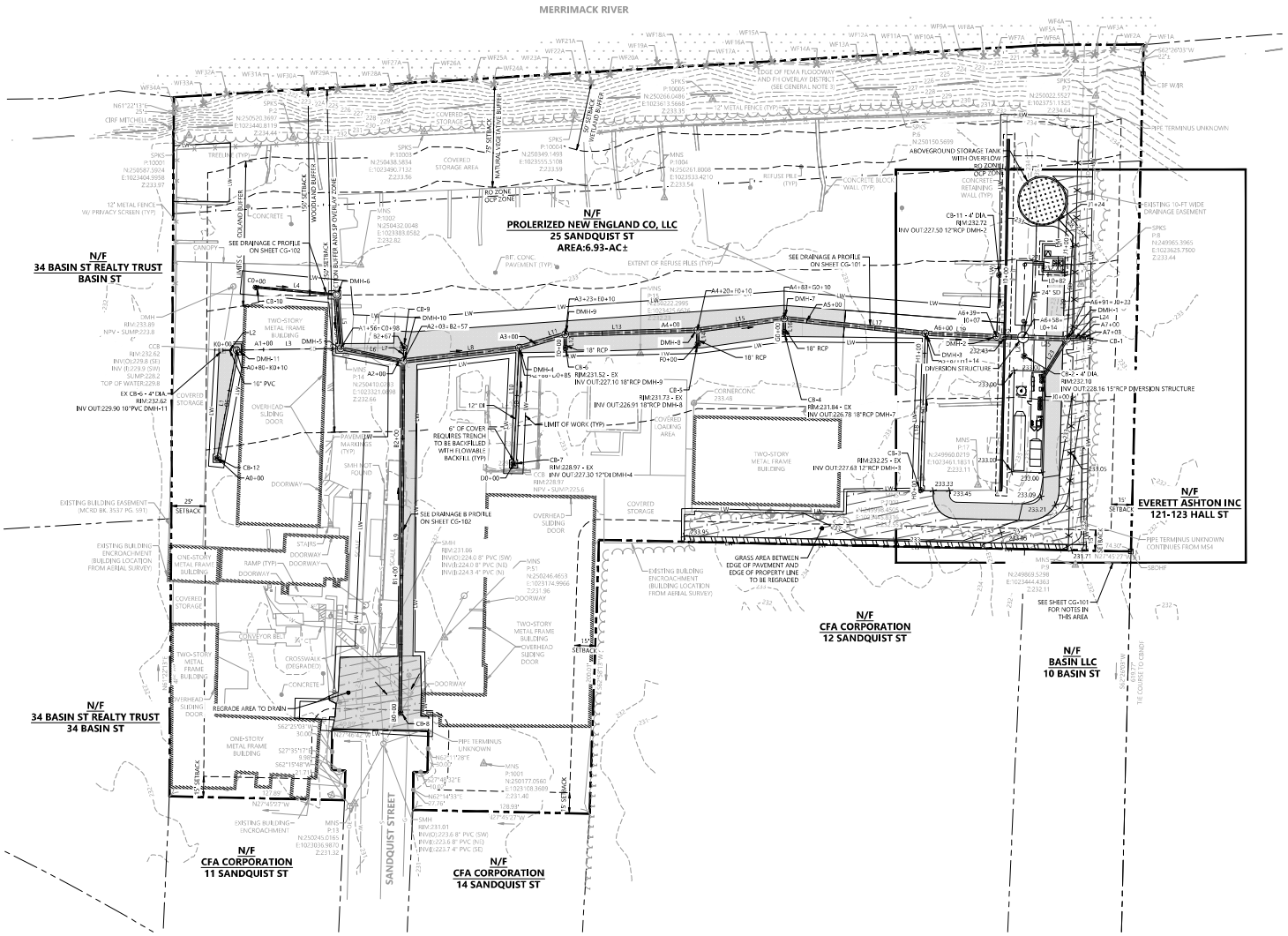
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SHEET GENERAL NOTES

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DATE:	NOVEMBER 2025
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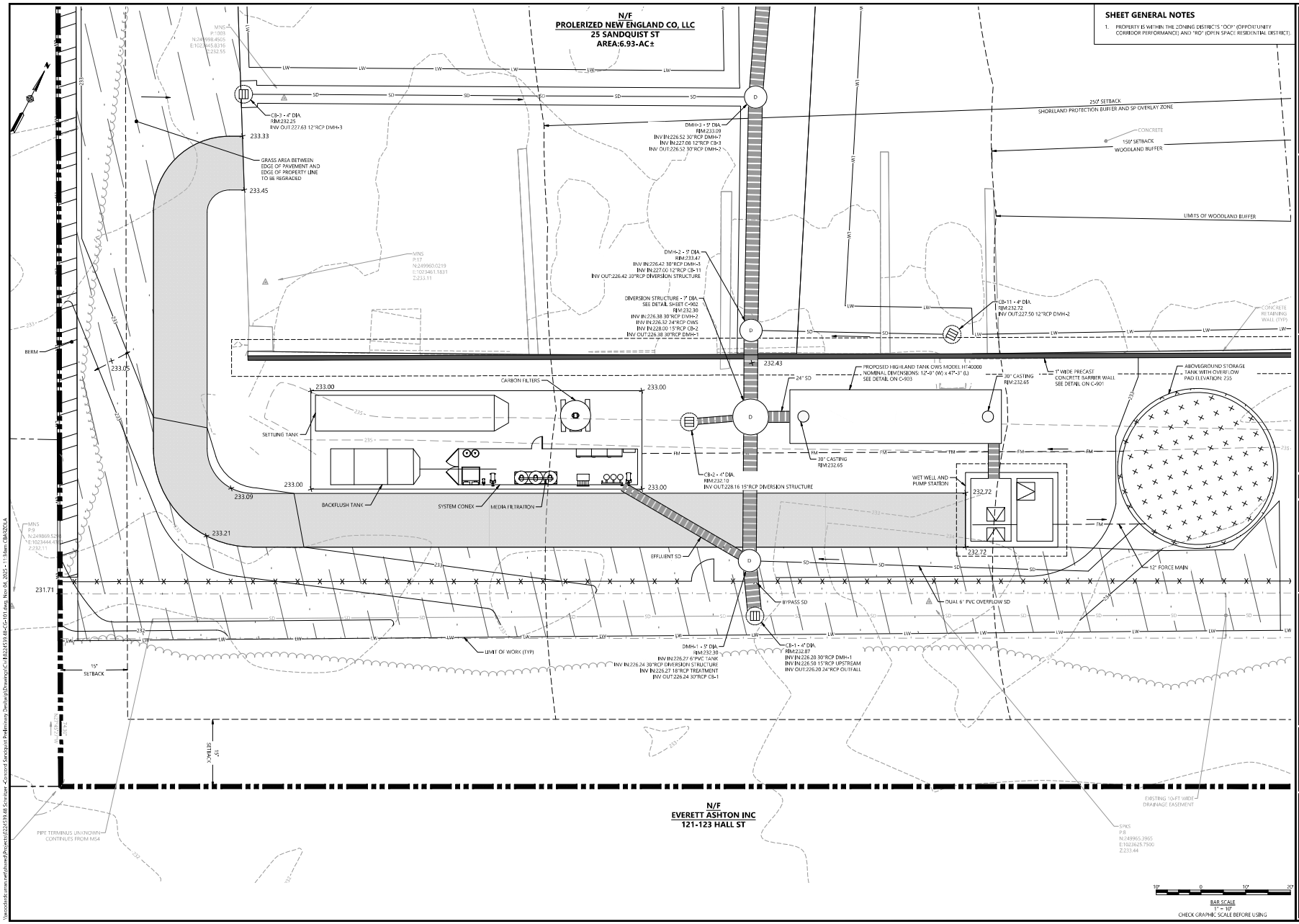
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CIVIL
OVERALL GRADING AND DRAINAGE PLAN

DRAWING NO:

CG-100

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LICENSED PROFESSIONAL ENGINEER

Ross Tsantoulis

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SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

REV	MM/DD/YY	DESCRIPTION

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DATE:	NOVEMBER 2025
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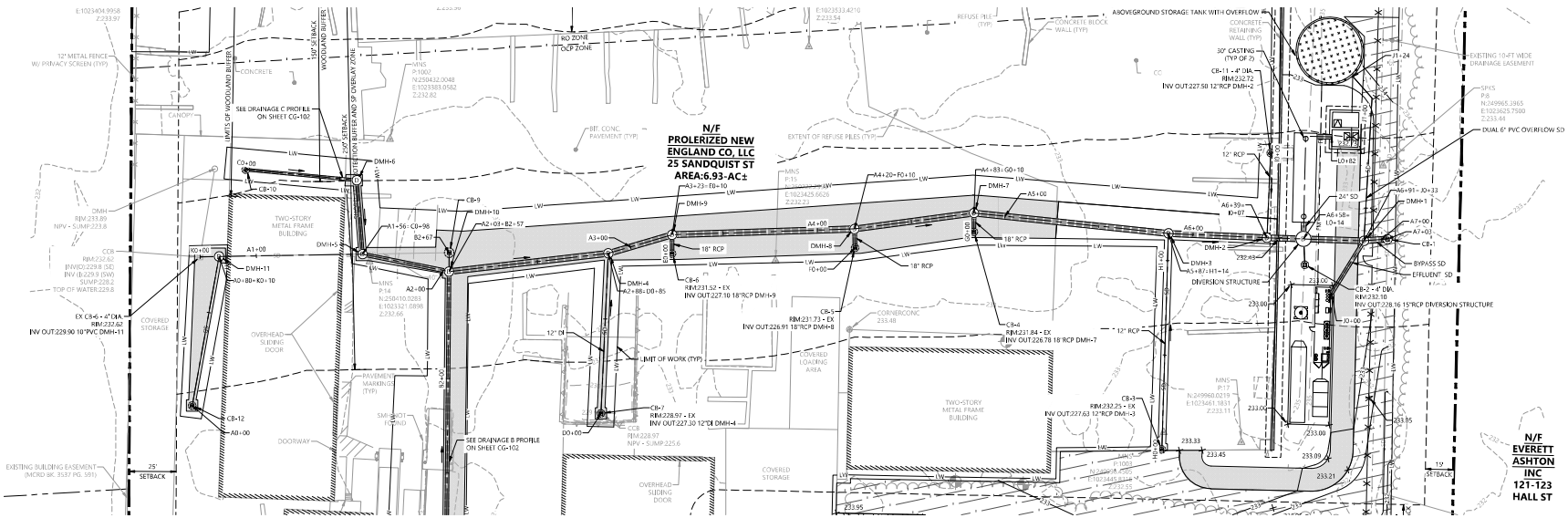
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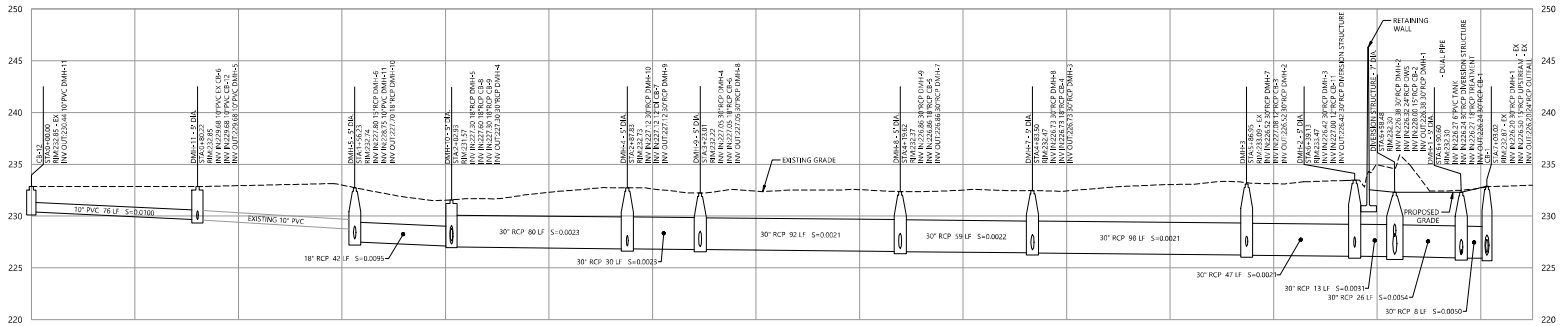
SHEET GENERAL NOTES

1. PROPERTY IS WITHIN THE ZONING DISTRICTS "OCP" (OPPORTUNITY CORRIDOR PERFORMANCE) AND "RO" (OPEN SPACE RESIDENTIAL DISTRICT).



DRAINAGE A PLAN

SCALE: 1" = 30'



DRAINAGE A-PROFILE STA. 0+00 TO STA. 7+25

HORIZONTAL SCALE: 1" = 30'
VERTICAL SCALE: 1" = 6'

VERTICAL BAR SCALE
1" = 6'
CHECK GRAPHIC SCALE BEFORE USING

BAR SCALE
1" = 30'
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Ross Tsantoulis

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CLIENT INFO:

RADIUS RECYCLING
CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

REV	MM/DD/YY	DESCRIPTION

JOB NO:	0224539.48
DATE:	NOVEMBER 2025
SCALE:	AS NOTED
DESIGNED BY:	YI
DRAWN BY:	KC
CHECKED BY:	RT
FILENAME:	0224539.48-CG-102.dwg

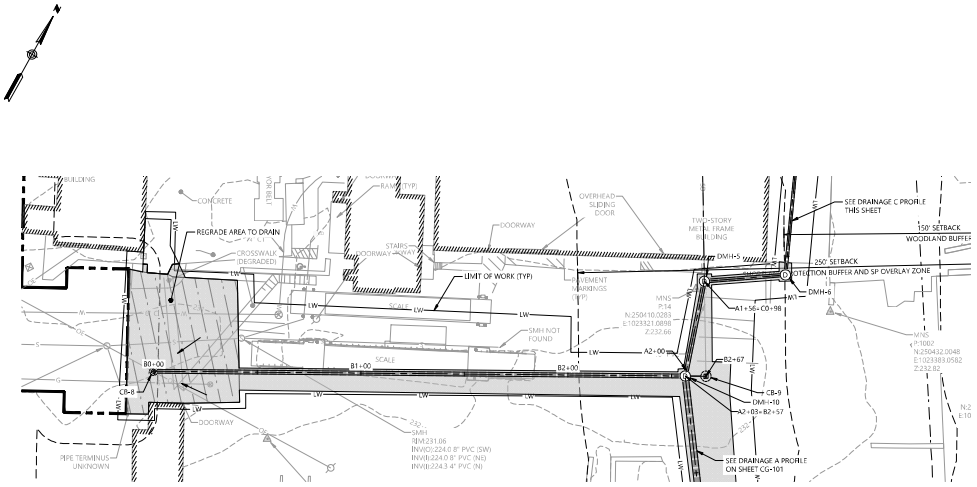
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CIVIL
GRADING AND DRAINAGE PLAN AND PROFILE 1

DRAWING NO:
CG-102

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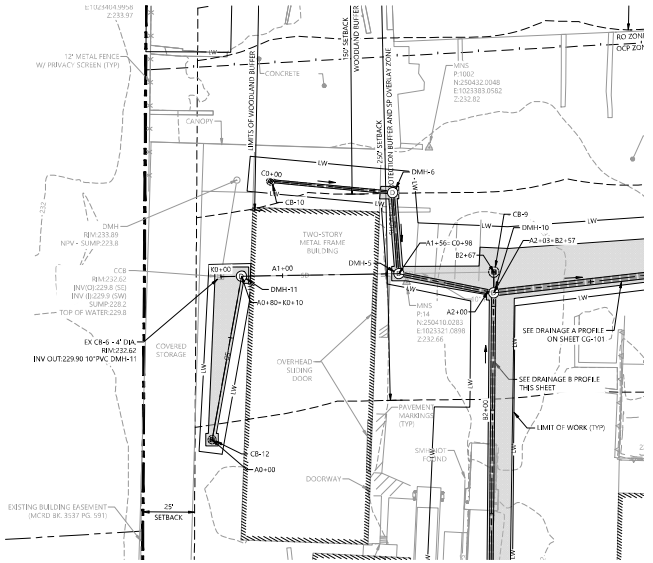
SHEET GENERAL NOTES

1. PROPERTY IS WITHIN THE ZONING DISTRICTS "OCP" (OPPORTUNITY CORRIDOR PERFORMANCE) AND "RO" (OPEN SPACE RESIDENTIAL DISTRICT).



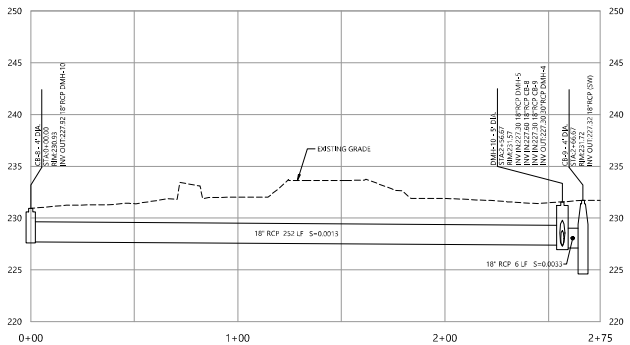
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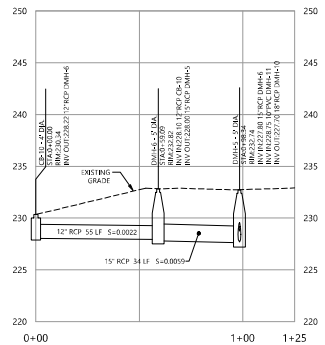
DRAINAGE C PLAN

SCALE: 1" = 30'



DRAINAGE B-PROFILE STA. 0+00 TO STA. 2+75

HORIZONTAL SCALE: 1" = 30'
VERTICAL SCALE: 1" = 6'



DRAINAGE C-PROFILE STA. 0+00 TO STA. 1+25

HORIZONTAL SCALE: 1" = 30'
VERTICAL SCALE: 1" = 6'

VERTICAL BAR SCALE
1" = 6'
CHECK GRAPHIC SCALE BEFORE USING

BAR SCALE
1" = 30'
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PE SEAL:

STATE OF NEW HAMPSHIRE — ROSS TSANTOULIS No. 14122 LICENSED PROFESSIONAL ENGINEER

Ross Tsantoulis

DRAFT 60% DESIGN NOT FOR CONSTRUCTION

CLIENT INFO:

RADIUS RECYCLING
CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

REV	MM/DD/YY	DESCRIPTION

JOB NO:	0224539.48
DATE:	NOVEMBER 2025
SCALE:	AS NOTED
DESIGNED BY:	YT
DRAWN BY:	KC
CHECKED BY:	RT
FILENAME:	0224539.48-CG-103.dwg

DRAWING TITLE:

CIVIL
GRADING AND DRAINAGE PLAN AND PROFILE 2

DRAWING NO:

CG-103

W:\woodardcurran\Sheet\Projects\0224539.48 Sandquist - Concord Sanquist Preliminary Design\Drawings\Civil\0224539.48-CG-103.dwg, Nov 04, 2025 - 11:35am, rtsantoulis

STRUCTURE TABLE

NAME	DIA.	RIM	INV IN/SIZE/FROM	INV OUT/SIZE/TO	STA./OFFSET	NORTHING	EASTING
CB-1	4'	232.87	226.30/30"RCP/DMH-1 226.50/15"RCP/UPSTREAM	226.20/24"RCP/OUTFALL	A7+93/0.0'	249944.5538	1023592.6942
CB-2	4'	232.10		228.16/15"RCP/DIVERSION STRUCTURE	L0+00/0.0'	249976.2278	1023559.6069
CB-3	4'	232.25		227.63/12"RCP/DMH-3	H0+00/0.0'	249995.0353	1023437.3854
CB-4	4'	231.84		226.78/18"RCP/DMH-7	G0+00/0.0'	250137.9226	1023489.8873
CB-5	4'	231.73		226.91/18"RCP/DMH-8	F0+00/0.0'	250188.8362	1023452.0239
CB-6	4'	231.52		227.10/18"RCP/DMH-9	E0+00/0.0'	250272.1123	1023402.3452
CB-7	4'	228.97		227.30/12"DI/DMH-4	D0+00/0.0'	250264.0462	1023310.1462
CB-8	4'	230.93		227.92/18"RCP/DMH-10	B0+00/0.0'	250248.3743	1023111.2073
CB-9	4'	231.72		227.32/18"RCP/DMH-10	B2+67/0.0'	250375.5571	1023345.5959
CB-10	4'	230.34		228.22/12"RCP/DMH-6	C0+00/0.0'	250491.0807	1023331.8282
CB-11	4'	232.72		227.50/12"RCP/DMH-2	I0+00/0.0'	250020.7315	1023602.6226
CB-12	4'	232.85		230.44/10"PVC/DMH-11	A0+00/0.0'	250455.3235	1023208.8003
DIVERSION STRUCTURE	7'	232.30	226.38/30"RCP/DMH-2 226.32/24"RCP/OWS 228.00/15"RCP/CB-2	226.38/30"RCP/DMH-1	A6+58/0.1' L=L0+21/0.0'	249983.5331	1023571.2438
DMH-1	5'	232.30	226.27/6"PVC/TANK 226.24/30"RCP/DIVERSION STRUCTURE 226.27/18"RCP/TREATMENT	226.24/30"RCP/CB-1	A6+91/0.0' R=J0+33/0.0'	249954.9452	1023585.8838
DMH-2	5'	233.47	226.42/30"RCP/DMH-3 227.00/12"RCP/CB-11	226.42/30"RCP/DIVERSION STRUCTURE	A6+39/0.0' -I0+07/0.0'	250000.7313	1023562.3710
DMH-3	5'	233.09	226.52/30"RCP/DMH-7 227.08/12"RCP/CB-3	226.52/30"RCP/DMH-2	A5+87/0.0'+H1+14/0.0'	250047.4478	1023539.1461
DMH-4	5'	232.73	227.12/30"RCP/DMH-10 227.12/12"DI/CB-7	227.12/30"RCP/DMH-9	A2+88/0.0' -D0+85/0.0'	250301.6791	1023386.1250
DMH-5	5'	232.74	227.80/15"RCP/DMH-6 228.75/10"PVC/DMH-11	227.70/18"RCP/DMH-10	A1+56/0.0' -C0+98/0.0'	250415.3059	1023322.6937
DMH-6	5'	232.82	228.10/12"RCP/CB-10	228.00/15"RCP/DMH-5	C0+59/0.0'	250436.9231	1023355.4602
DMH-7	5'	232.47	226.73/30"RCP/DMH-8 226.73/18"RCP/CB-4	226.73/30"RCP/DMH-3	A4+83/0.0' -G0+10/0.0'	250142.6679	1023498.6897
DMH-8	5'	232.37	226.86/30"RCP/DMH-9 226.86/18"RCP/CB-5	226.86/30"RCP/DMH-7	A4+20/0.0'+F0+10/0.0'	250193.9594	1023460.6119
DMH-9	5'	232.22	227.05/30"RCP/DMH-4 227.05/18"RCP/CB-6	227.05/30"RCP/DMH-8	A3+23/0.0' +E0+10/0.0'	250276.9221	1023411.1125
DMH-10	5'	231.57	227.30/18"RCP/DMH-5 227.80/18"RCP/CB-8 227.30/18"RCP/CB-9	227.30/30"RCP/DMH-4	A2+88/0.0' -B2+57/0.0'	250370.7870	1023336.8057
DMH-11	5'	232.85	229.68/10"PVC/EX CB-6 229.68/10"PVC/CB-12	229.68/10"PVC/DMH-5	A0+80/0.0' +K0+10/0.0'	250481.1621	1023284.7499
EX CB-6	4'	232.62		229.90/10"PVC/DMH-11	K0+00/0.0'	250489.7618	1023279.7796

ALIGNMENT HORIZONTAL DATA

NAME	LENGTH	ALIGNMENT NAME	LINE/CHORD DIRECTION	PIPE START NORTHING	PIPE START EASTING	PIPE END EASTING	PIPE END NORTHING	PIPE START STATION	PIPE END STATION
L1	80	A	N71° 12' 40.77"E	250455.3235	1023208.8003	1023284.7499	250481.1621	A0+00	A0+80
L2	10	K	S30° 01' 34.00"E	250489.7618	1023279.7796	1023284.7499	250481.1621	K0+00	K0+10
L3	76	A	S29° 56' 59.45"E	250481.1621	1023284.7499	1023322.6919	250415.3115	A0+80	A1+56
L4	59	C	S23° 34' 27.67"E	250491.0807	1023331.8282	1023355.4602	250436.9231	C0+00	C0+59
L5	39	C	S56° 35' 08.51"W	250436.9231	1023355.4602	1023322.6937	250415.3059	C0+59	C0+98
L6	47	A	S17° 35' 16.56"E	250415.3115	1023322.6919	1023336.8055	250370.7873	A1+56	A2+03
L7	10	B	N61° 33' 59.53"E	250370.7952	1023336.8012	1023345.5959	250375.5571	B2+57	B2+67
L8	85	A	S35° 30' 49.73"E	250370.7873	1023336.8055	1023386.1250	250301.6791	A2+03	A2+88
L9	257	B	N61° 30' 47.06"E	250248.3743	1023111.2073	1023336.8012	250370.7952	B0+00	B2+57
L10	85	D	N63° 39' 01.41"E	250264.0462	1023310.1462	1023386.1250	250301.6791	D0+00	D0+85
L11	35	A	S45° 15' 55.80"E	250301.6791	1023386.1250	1023411.1125	250276.9221	A2+88	A3+23
L12	10	E	N61° 13' 01.47"E	250272.1123	1023402.3452	1023411.1125	250276.9221	E0+00	E0+10
L13	97	A	S30° 49' 20.02"E	250276.9221	1023411.1125	1023460.6119	250193.9594	A3+23	A4+20
L14	10	F	N59° 10' 53.89"E	250188.8362	1023452.0239	1023460.6119	250193.9594	F0+00	F0+10
L15	64	A	S36° 35' 22.21"E	250193.9594	1023460.6119	1023498.6897	250142.6679	A4+20	A4+83
L16	10	G	N61° 40' 16.12"E	250137.9226	1023489.8873	1023498.6897	250142.6679	G0+00	G0+10
L17	103	A	S23° 01' 09.49"E	250142.6679	1023498.6897	1023539.1461	250047.4478	A4+83	A5+87
L18	114	H	N62° 46' 56.23"E	249995.0353	1023437.3854	1023539.1461	250047.4478	H0+00	H1+14
L19	52	A	S26° 26' 02.49"E	250047.4478	1023539.1461	1023562.3710	250000.7313	A5+87	A6+39
L20	45	I	S63° 34' 41.00"W	250020.7315	1023602.6226	1023562.3710	250000.7313	I0+00	I0+45
L22	13	A	S27° 04' 04.41"E	250000.7313	1023562.3710	1023568.2389	249989.2484	A6+39	A6+52
L23	33	J	S87° 20' 47.14"E	249956.5131	1023553.2679	1023585.8497	249955.0031	J0+00	J0+33
L24	12	A	S33° 12' 30.81"E	249955.0053	1023585.8527	1023592.6942	249944.5538	A6+91	A7+03
L25	39	A	S27° 13' 12.45"E	249989.2484	1023568.2389	1023585.8527	249955.0053	A6+52	A6+91
L26	14	L	N57° 52' 50.24"E	249976.2278	1023559.6069	1023571.2438	249983.5331	L0+00	L0+14
L27	14	L	S27° 33' 57.28"E	250008.8410	1023619.3794	1023625.8190	249996.5053	L0+68	L0+82
L28	15	J	N19° 12' 27.47"E	249987.9217	1023654.1313	1023659.1422	250002.3049	J1+08	J1+24
L29	76	J	N64° 11' 40.39"E	249955.0031	1023585.8497	1023654.1313	249987.9217	J0+33	J1+08

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Date: 2025.11.04 16:58:54-05'00'

DRAFT 60% DESIGN NOT FOR CONSTRUCTION

CLIENT INFO:

RADIUS RECYCLING
CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

REV	MM/DD/YY	DESCRIPTION

JOB NO:	0224539.48
DATE:	NOVEMBER 2025
SCALE:	NO SCALE
DESIGNED BY:	YT
DRAWN BY:	KC
CHECKED BY:	RT
FILENAME:	0224539.48-CG-104.dwg

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CIVIL
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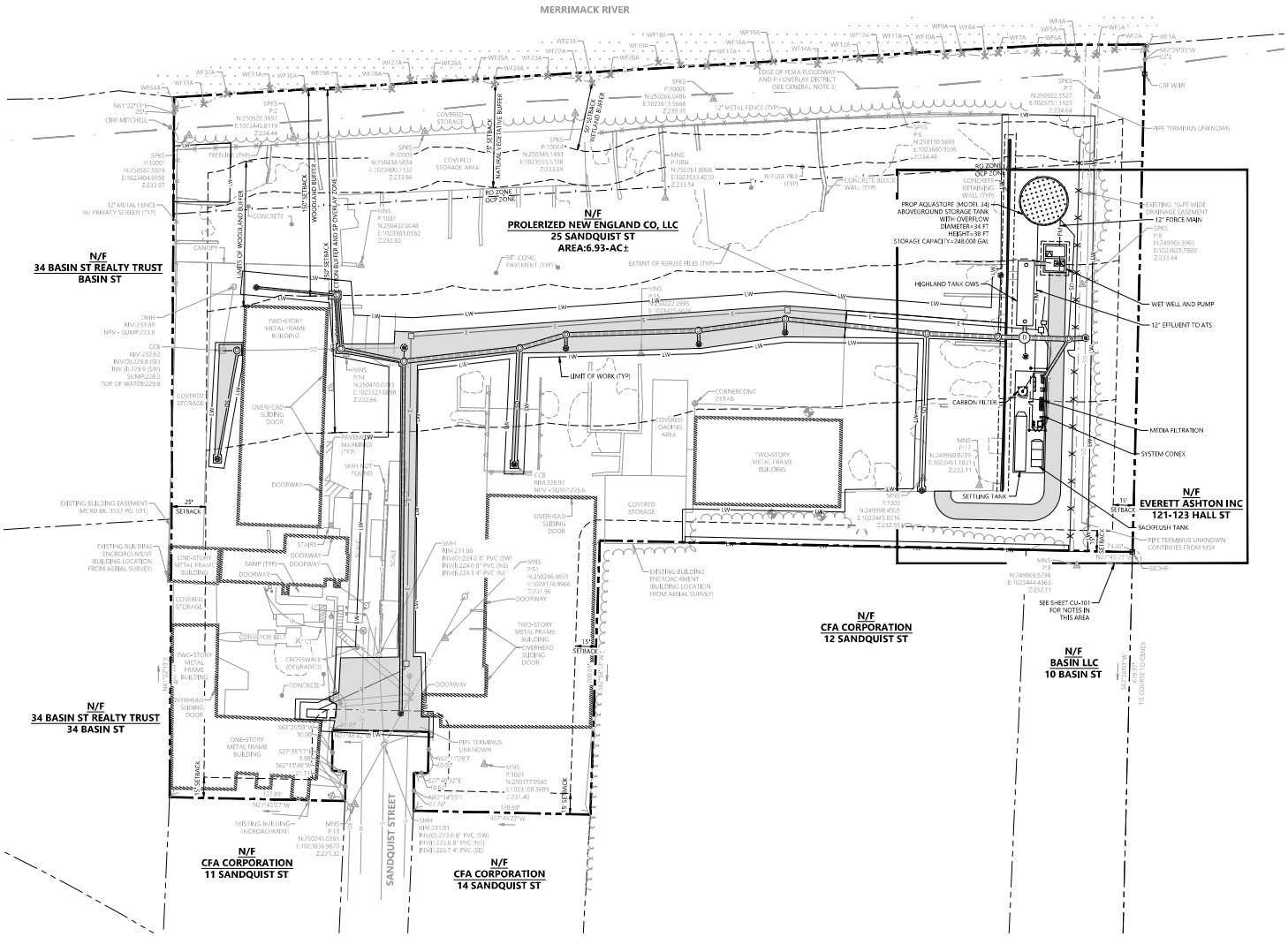
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CG-104

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SHEET GENERAL NOTES

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PE SEAL:

STATE OF NEW HAMPSHIRE — ROSS TSAMTOULIS No. 14122 — LICENSED PROFESSIONAL ENGINEER

Ross Tsamtoulis

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DN: CN=Ross Tsamtoulis, O=, OU=, E=rtsamtoulis@woodardcurran.com, C=US
Date: 2025.11.04 15:58:14-05'00'

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CLIENT INFO:

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SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

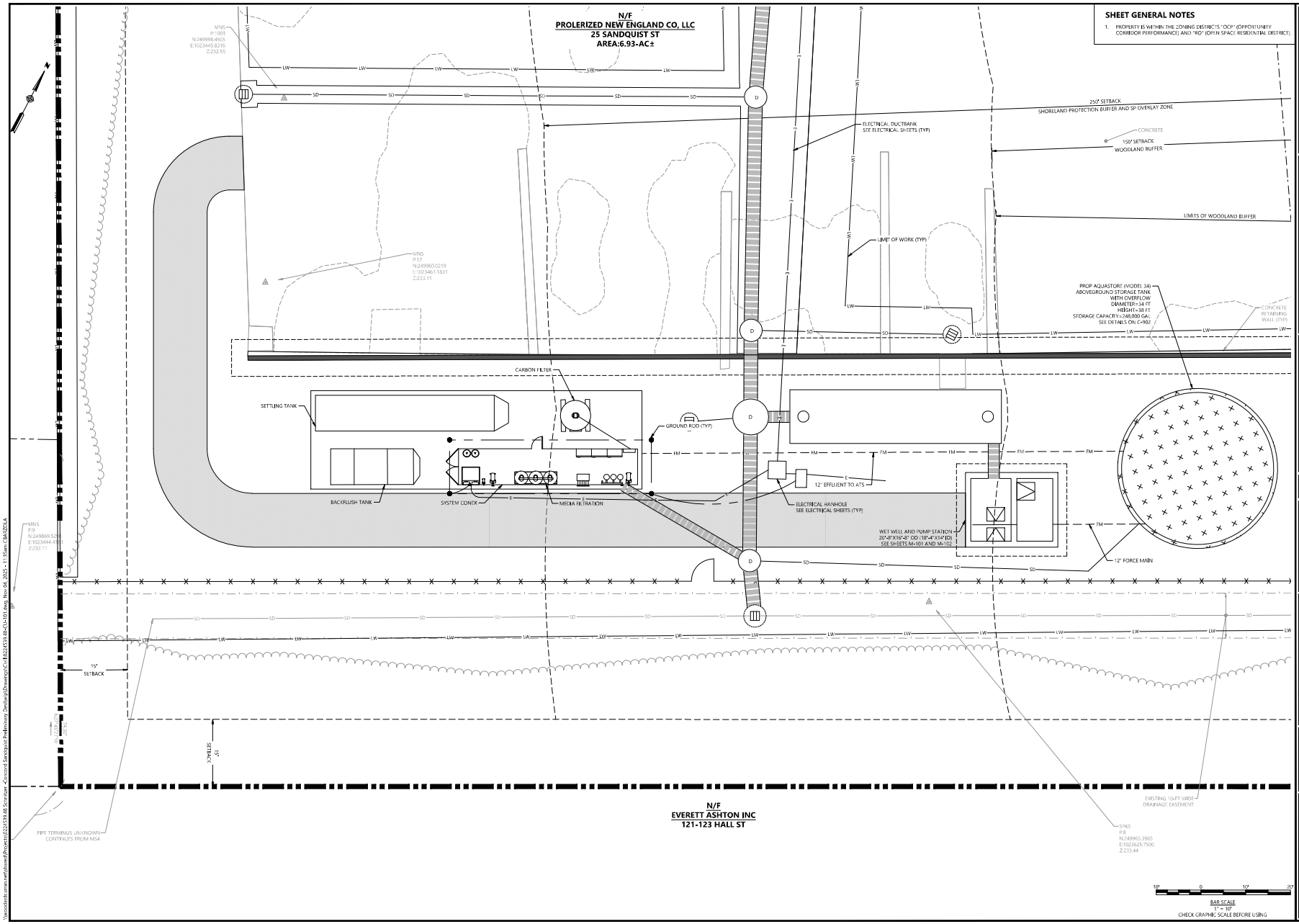
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FILENAME:	0224539.48-CU-100.dwg

DRAWING TITLE:
CIVIL
OVERALL UTILITY PLAN

DRAWING NO:
CU-100

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PE SEAL:

STATE OF NEW HAMPSHIRE
ROSS TSANTOULIS
No. 14122
LICENSED PROFESSIONAL ENGINEER

Ross Tsantoulis

Digitally signed by Ross Tsantoulis
DN: CN=Ross Tsantoulis, OU=Andover,Users, OU=WCUsers, DC=woodardcurran, DC=net
Date: 2025-11-24 19:59:58-05'00'

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CLIENT INFO:

RADIUS RECYCLING
CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

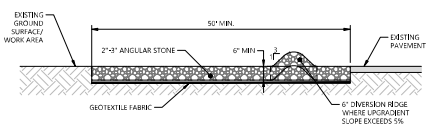
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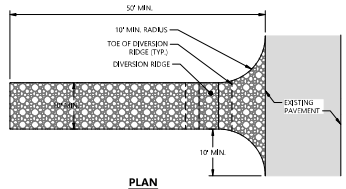
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CIVIL
STORMWATER TREATMENT AND STORAGE AREA UTILITY PLAN

DRAWING NO:
CU-101

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SECTION



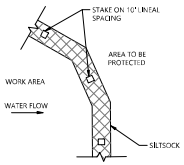
PLAN

NOTES:

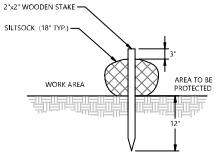
1. GRADE TOWARDS SEDIMENT BARRIER WHEN NECESSARY TO MANAGE FLOW.
2. INCREASE MINIMUM LENGTH TO 100' WHERE TRACKED SEDIMENTS CONTAIN LESS THAN 80% SAND OR AS NECESSARY FOR HEAVY CONSTRUCTION.

STABILIZED CONSTRUCTION ENTRANCE/EXIT

SCALE: NTS



PLAN VIEW



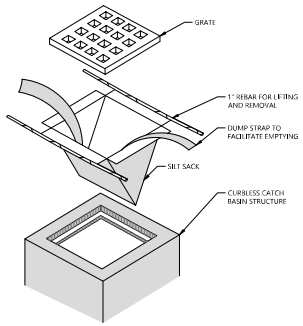
SECTION

NOTE:

1. WHEN STAKING IS NOT POSSIBLE, HEAVY CONCRETE BLOCKS SHALL BE USED BEHIND THE SEDIMENT CONTROL TO HELP STABILIZE DURING RAINFALL/RUNOFF EVENTS.

SILT SOCK

SCALE: NTS

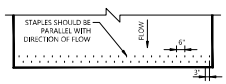


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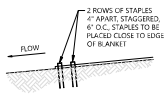
1. INSTALL SILTSACK PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
2. EMPTY OR REMOVE SEDIMENT FROM SILTSACK WHEN RESTRAINT CORD IS NO LONGER VISIBLE. CLEAN, RINSE, AND REPLACE AS NEEDED.
3. SILT SACKS TO BE INSTALLED WHEN THE POTENTIAL FOR SEDIMENT TO ENTER EXISTING & PROPOSED BASINS EXISTS.

SILTSACK - CURBLESS INLET

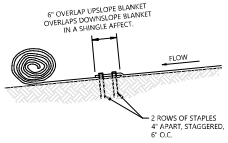
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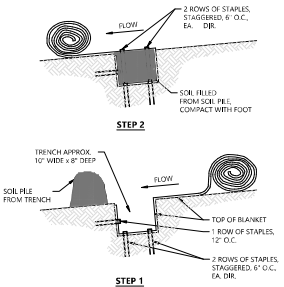
DETAIL A - PLAN VIEW CHANNEL TERMINATION
NOT TO SCALE



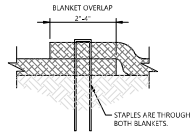
DETAIL B - SECTION VIEW CHANNEL TERMINATION
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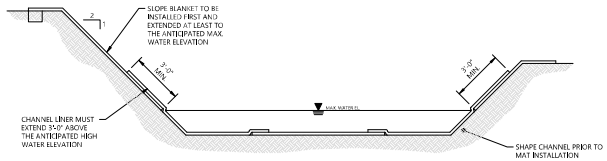
DETAIL C - CHANNEL BLANKET END OF ROLL OVERLAP
NOT TO SCALE



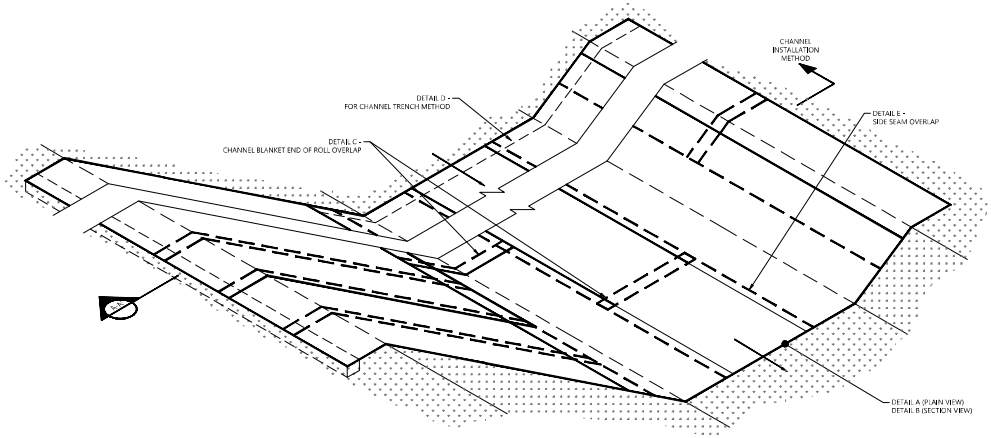
DETAIL D - CHANNEL TRENCHING METHOD
NOT TO SCALE



DETAIL E - SIDE SEAM OVERLAP
NOT TO SCALE



CHANNEL INSTALLATION METHOD (SECTION A-A')
NOT TO SCALE



CHANNEL DETAIL
NOT TO SCALE

NOTES:

1. SEE MANUFACTURER'S RECOMMENDATION FOR PROPER SLOPE INSTALLATION.
2. STAPLE PATTERNS ARE DEPENDENT ON SITE CONDITIONS. INSTALL PER MANUFACTURERS RECOMMENDATION.
3. E-STAPLES MAY BE USED IN PLACE OF WIRE STAPLES.

EROSION CONTROL BLANKET

SCALE: NTS

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Ross Tsantoulis

DRAFT 60% DESIGN NOT FOR CONSTRUCTION

CLIENT INFO:

RADIUS RECYCLING
CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

REV	MM/DD/YY	DESCRIPTION

JOB NO:	0224539.48
DATE:	NOVEMBER 2025
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DESIGNED BY:	YT
DRAWN BY:	KC
CHECKED BY:	RT
FILENAME:	0224539.48-C-900-903.dwg

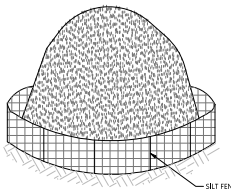
DRAWING TITLE:

CIVIL DETAILS 1

DRAWING NO:

C-900

\\woodardcurran.net\shared\Projects\0224539.48 Sanitas - Concord Sandquist Preliminary Design\Drawings\C-900-903.dwg, Nov 04, 2025 - 11:18am, CBARZOW

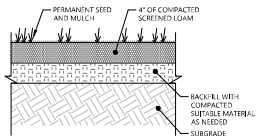


NOTES:

1. STOCKPILES SHALL BE SURROUNDED BY SILT FENCE.
2. STOCKPILES SHALL HAVE A MAXIMUM 2:1 (H:V) SIDE SLOPE.
3. REPAIR OR REPLACE DAMAGED SILT FENCE DUE TO CONSTRUCTION ACTIVITIES OR STOCKPILE MITIGATION.
4. STOCKPILE SHALL BE LOCATED IN AREAS AS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER.

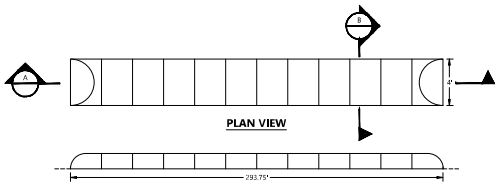
TEMPORARY SOIL STOCKPILE

SCALE: NTS



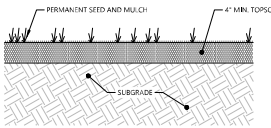
LOAM AND SEED

SCALE: NTS



BERM

SCALE: NTS



NOTES:

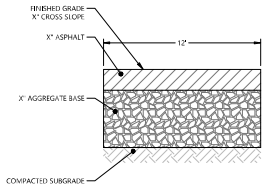
1. AVOID COMPACTION, UNLESS OTHERWISE NOTED ON PLANS.
2. TOPSOIL SHALL BE FERTILE, FRIABLE SOIL, TYPICAL OF PRODUCT SOILS IN THE SURROUNDING AREA AND SHALL CONTAIN BETWEEN 5% AND 20% ORGANIC MATTER.
3. TOPSOIL SHALL HAVE A MAXIMUM STONE SIZE OF 1" AND SHALL CONFORM TO THE FOLLOWING GRADATION:

SIEVE	% PASSING
	TOC
NO. 4	85-100
NO. 40	60-85
NO. 100	38-60
NO. 200	28-40

4. TOPSOIL SHALL NOT BE DISTRIBUTED OVER PARTLY OR FULLY FROZEN, MUDDY, SNOWY, ICY OR EXCESSIVELY WET SURFACES.
5. SOD AND SEED MIXTURE(S) SHALL BE APPROPRIATE FOR GROWING SEASON, CLIMATE AND SOIL CONDITIONS, AND SURFACE USAGE. REFER TO STATE GUIDELINES.
6. SEED SHALL BE APPLIED AT RATES RECOMMENDED BY STATE GUIDELINES.
7. APPLY MULCH OVER SEEDED AREAS IN ACCORDANCE WITH STATE GUIDELINES.
8. SODDING SHALL BE INSTALLED IN ACCORDANCE WITH SUPPLIER'S GUIDELINES, AT A MINIMUM, LAY SOD IN STAGGERED ROWS OVER DAMPENED AND LOOSENED/SCARIFIED TOPSOIL. PLACE STRIPS PERPENDICULAR TO THE DIRECTION OF FLOW. ON SLOPES, ANCHOR SOD TO HOLD IN PLACE UNTIL SECURED BY PLANT GROWTH.
9. INSTALL AND/OR REPAIR EROSION AND SEDIMENT CONTROL MEASURES BEFORE LAYING TOPSOIL. MAINTAIN EROSION CONTROL MEASURES DURING TOPSOILING.
10. MAXIMUM SLOPE TOPSOIL CAN BE USED IS 2:1.

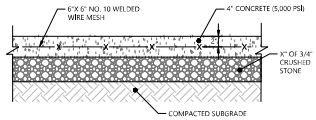
TOPSOIL RESTORATION

SCALE: NTS



ASPHALT ACCESS ROAD

SCALE: NTS

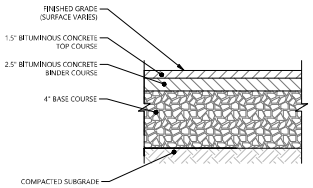


NOTES:

1. PROVIDE 1/2-INCH PREMOLDED BITUMINOUS EXPANSION JOINTS AT 20 FT. INTERVALS.
2. PROVIDE CONTROL JOINTS AT 5-FEET INTERVALS.
3. PROVIDE LIGHT BROOM FINISH WITH 3-INCH EDGE.

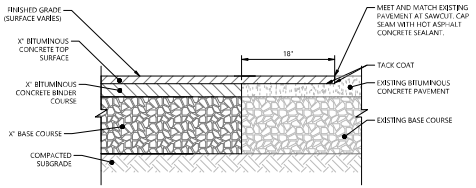
CONCRETE REPAIR

SCALE: NTS



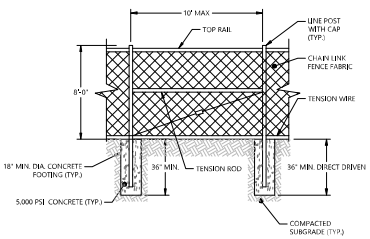
BITUMINOUS CONCRETE PAVEMENT SECTION

SCALE: NTS



BITUMINOUS CONCRETE PAVEMENT BUTT JOINT

SCALE: NTS

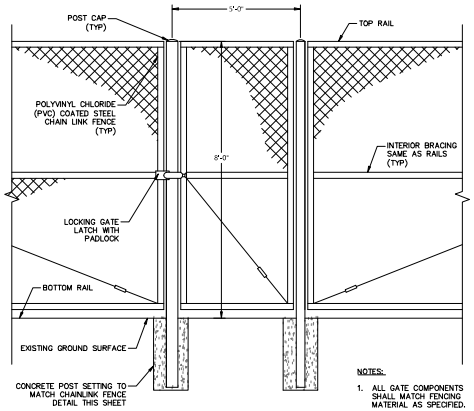


NOTES:

1. ALL FENCING AND HARDWARE TO BE UST MATERIAL.
2. INSTALL ALL FENCING AND HARDWARE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

CHAIN LINK FENCE

SCALE: NTS

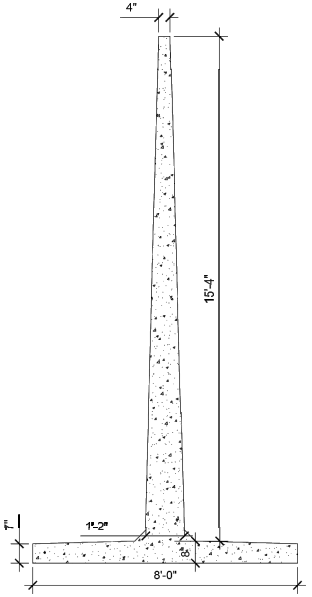


NOTES:

1. ALL GATE COMPONENTS SHALL MATCH FENCING MATERIAL AS SPECIFIED.

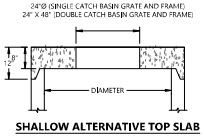
PEDESTRIAN GATE

SCALE: NTS

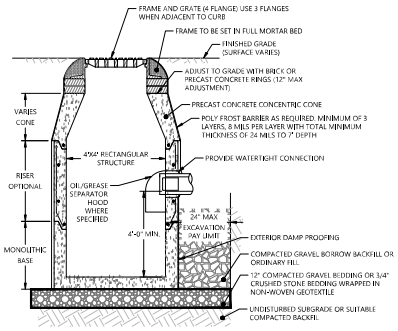


PRECAST CONCRETE BARRIER WALL

SCALE: NTS



SHALLOW ALTERNATIVE TOP SLAB



NOTES:

1. PRECAST CONCRETE STRUCTURES AND CASTINGS SHALL BE SUITABLE FOR HS-20 LOADINGS.
2. PRECAST CONCRETE STRUCTURES SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C-478.
3. ALTERNATE TOP SLAB MAY BE USED AS DICTATED BY DESIGN AND/OR FIELD CONDITIONS.
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE BUTYL RUBBER.
5. PROVIDE MINIMUM 24" DIAMETER OPENING.
6. PROVIDE ANTIFLOATATION SLAB EXTENSION AS REQUIRED TO SATISFY ANTIFLOATATION REQUIREMENTS.

PRECAST CONCRETE CATCH BASIN

SCALE: NTS

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PE SEAL:

STATE OF NEW HAMPSHIRE — ROSS TSANTOULIS No. 14122 — LICENSED PROFESSIONAL ENGINEER

Ross Tsantoulis

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DN: CN=Ross Tsantoulis, O=Woodard & Curran, OU=Andover, C=US
Reason: I am the author of this document
Date: 2025.11.26 15:59:35-05'00'

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CLIENT INFO:

RADIUS RECYCLING
CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

REV	MM/DD/YY	DESCRIPTION

JOB NO:	0224539.48
DATE:	NOVEMBER 2025
SCALE:	AS NOTED
DESIGNED BY:	YT
DRAWN BY:	KC
CHECKED BY:	RT
FILENAME:	0224539.48-C-900-903.dwg

DRAWING TITLE:

CIVIL DETAILS 2

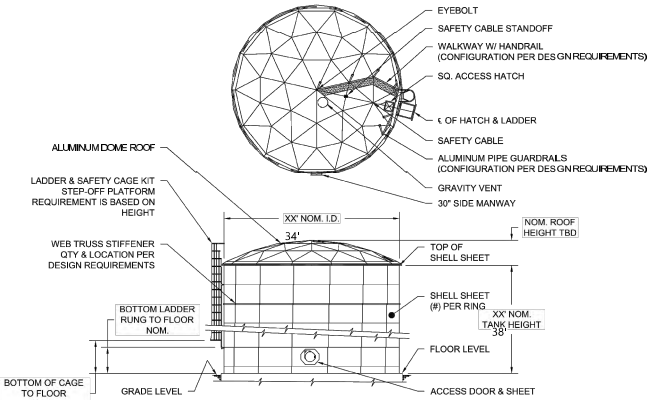
DRAWING NO:

C-901

\\woodcurranmarlinwa\Projects\0224539.48 Scrimber - Concord Sandquist Preliminary Design\Drawings\C-900-903.dwg, Nov 26, 2025 - 11:19am, CBARTON

PRELIMINARY COPY
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REVISIONS		
REV	DESCRIPTION	DATE
A	INITIAL RELEASE	10/17/2019
B	ADDED PLAN VIEW	1/3/2020
C	REMOVED NOTES	8/28/2020
D	UPDATED TITLE BLOCK	11/10/2020



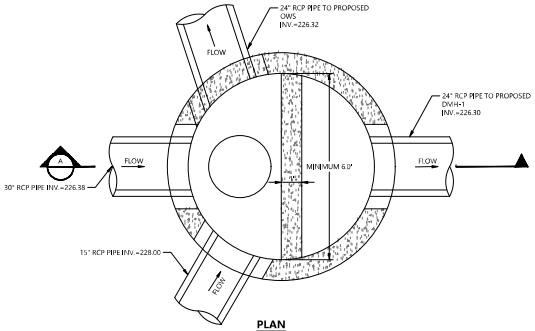
BY: MK
DATE: 10/17/2019
REVISION: D

DESCRIPTION: CONSTRUCTION DETAIL WATER TANK W/ CONCRETE FOUNDATION SHOP DRAWINGS
DWG #: 281352-TYP
SHT # : 1

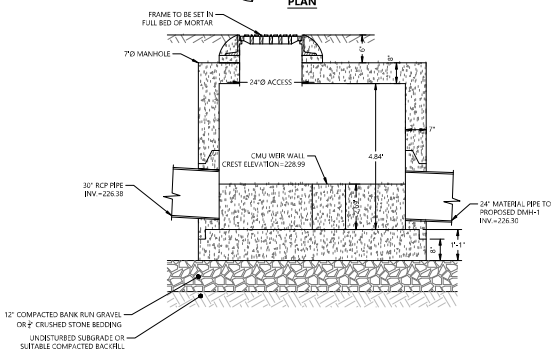
STATEWIDE AQUASTORE, Inc. Premium Water and Wastewater Storage Tanks

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ABOVE GROUND STORAGE TANK
SCALE: NTS



PLAN



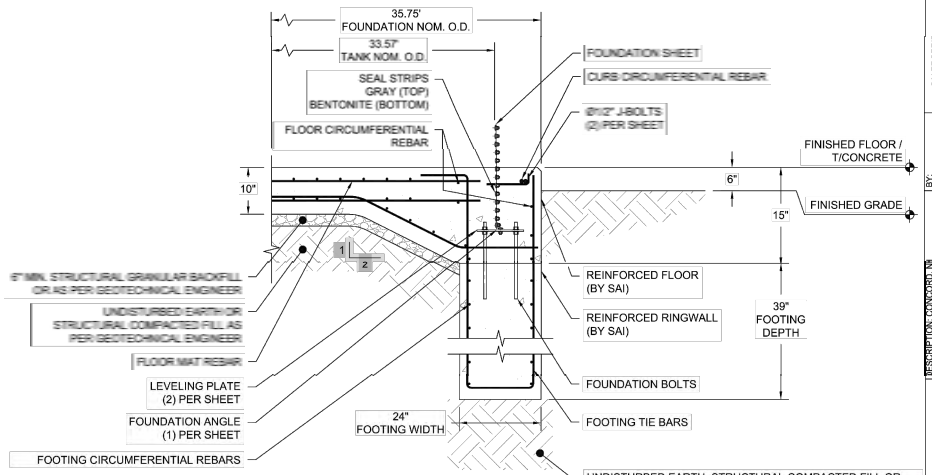
SECTION

MANHOLE DIVERSION STRUCTURE GENERAL NOTES:

1. MANUFACTURED TO MEET OR EXCEED: ASTM C-478 & AASHTO M 199 SPECS.
2. CONCRETE = 4,000 PSI. MINIMUM CEMENT PER ASTM C-478 (6.1).
3. REINFORCED STEEL CONFORMS TO LATEST ASTM A 185 SPECIFICATIONS. 0.24 SQ. IN/LINEAR FT. AND 0.24 SQ. IN (BOTH WAYS) BASE BOTTOM.
4. STEEL REINFORCEMENT TO MEET OR EXCEED AASHTO HS-20 LOADING.
5. MANHOLE STEPS MEET LATEST OSHA REGULATION 29 CFR1910.27, SECTION 16 OF ASTM SPECIFICATION C478 AND SECTION 10 OF ASTM SPECIFICATION C-497.
6. ONE POUR MONOLITHIC BASE

DIVERSION MANHOLE
SCALE: NTS

REVISIONS		
REV	DESCRIPTION	DATE
1	PRELIMINARY	7/18/2024



PRELIMINARY COPY
NOT FOR CONSTRUCTION

NOTES:
1. DRAWING IS NOT TO SCALE.

ABOVE GROUND STORAGE TANK
SCALE: NTS

BY: MK
DATE: 7/18/2024
REVISION: 1

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DESCRIPTION: CONCORD, NH
MODEL 34 38 - PROJECT#5466
SECTION THROUGH FOOTING
DWG#: 5466-3438-FND
SHT#: 1

STATEWIDE AQUASTORE, Inc. Premium Water and Wastewater Storage Tanks

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PE SEAL:
ROSS TSANTOULIS No. 14122 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

Ross Tsantoulis

DRAFT 60% DESIGN NOT FOR CONSTRUCTION

CLIENT INFO:
RADIUS RECYCLING
CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

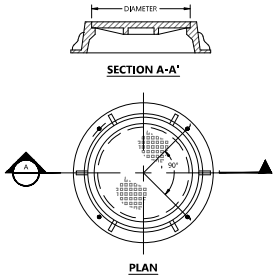
REV	M/M/DD/YY	DESCRIPTION

JOB NO:	0224539.48
DATE:	NOVEMBER 2025
SCALE:	AS NOTED
DESIGNED BY:	YT
DRAWN BY:	KC
CHECKED BY:	RT
FILENAME:	0224539.48-C-900-903.dwg

DRAWING TITLE:
CIVIL DETAILS 3

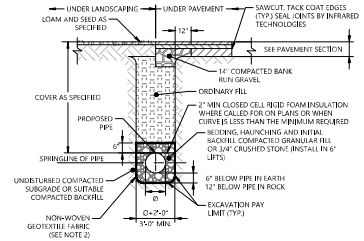
DRAWING NO:
C-902

\\woodcurran.com\shares\Projects\224539.48 Scrubber -Concord Sanquoit Preliminary Design\Drawings\C-902\224539.48-C-900-903.dwg, Nov 04, 2025 - 11:18am, CBARTON



MANHOLE FRAME AND COVER

SCALE: NTS

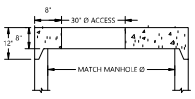


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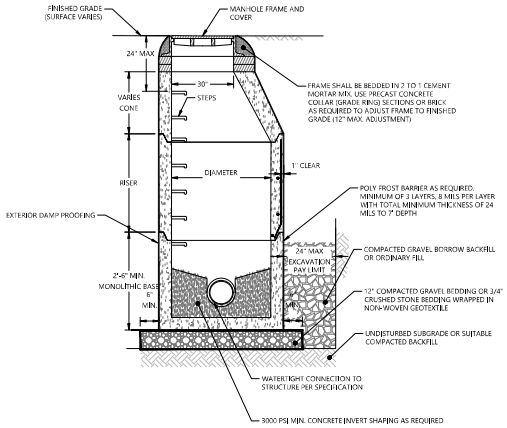
1. BEDDING, HAUNCHING AND BACKFILL SHALL BE COMPACTED IN ACCORDANCE WITH THE SPECIFICATIONS.
2. NON-WOVEN GEOTEXTILE SHALL BE INSTALLED AS SHOWN. WHEN FINE SANDS, SILT, CLAY OR ORGANIC MATERIALS ARE ENCOUNTERED AT THE TRENCH BOTTOM.

TRENCH

SCALE: NTS



SHALLOW ALTERNATE TOP SLAB



NOTES:

1. PRECAST CONCRETE STRUCTURES AND CASTINGS SHALL BE SUITABLE FOR HS-20 LOADINGS.
2. PRECAST CONCRETE STRUCTURES SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C-478.
3. ALTERNATE TOP SLAB MAY BE USED AS DICTATED BY DESIGN AND/OR FIELD CONDITIONS.
4. MANHOLE FRAME AND GRATE(S) SHALL MEET MUNICIPAL AND STATE SPECIFICATIONS WHEN APPLICABLE.
5. REFER TO PROJECT SPECIFICATIONS FOR MORE DRAINAGE MANHOLE INFORMATION.
6. JOINT SEALANT BETWEEN SECTIONS SHALL BE BUTYL RUBBER.
7. PROVIDE ANTIFLOTATION SLAB EXTENSION AS REQUIRED TO SATISFY ANTIFLOTATION REQUIREMENTS.

PRECAST CONCRETE DRAINAGE MANHOLE

SCALE: NTS

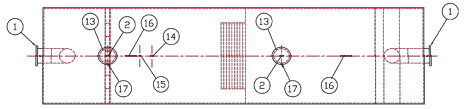
GENERAL SPECIFICATIONS

NO. REQ'D: (1)
CAPACITY: 40000 GALLONS
TYPE: HTC, HIGHGUARD, SINGLE WALL
MATERIAL: MILD CARBON STEEL
FLOW RATE: 4000 GPM
GAUGE: BASED ON 60" MAX BURIAL
SHELL– 3/8"
HEADS– 5/16"

SURFACE PREP:
SSPC NO.6 BLAST ALL EXTERIOR SURFACES
SSPC NO.10 BLAST ALL INTERIOR SURFACES

COATING:	MATERIAL	THICKNESS
EXTERIOR–	HIGHGUARD	(75 MILS)
INTERIOR–	CHEMLINE 4200 PW	(15 MILS)

CONSTRUCTION :
LAP FIT & WELD ALL EXTERIOR SEAMS
OPERATING PRESSURE : ATMOSPHERIC



PROVIDED EQUIPMENT

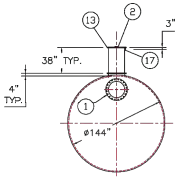
1. 150# R.F.S.O. FLANGE W/ 2" FNPT FOR VENT
2. 4"ø FNPT FOR GAUGE WITH PLUG
3. VELOCITY HEAD DIFFUSION BAFFLE
4. WEAR PLATE
5. SEDIMENT CHAMBER
6. UNDERFLOW BAFFLE
7. SLUDGE BAFFLE
8. STRIKER PLATES
9. PARALLEL CORRUGATED PLATE COALESCER. CORELLA PVC PLATES (3" PLATE SPACING)
10. OIL-/WATER SEPARATOR CHAMBER
11. 6" THICK PETROSCREEN COALESCER MATERIAL INSTALLED W/ PULL END SHIPPED LOOSE
12. STEEL OUTLET DOWNCOMER
13. 24"ø MANWAY WITH BOLT-ON EXTENSION SHIPPED LOOSE
14. 4"ø FNPT FOR OIL PUMP-OUT WITH INTERNAL PVC PIPE INSTALLED & RISER PIPE SHIPPED LOOSE
15. 2"ø FNPT FOR LEVEL SENSOR WITH RISER PIPE SHIPPED LOOSE
16. LIFTING LUG
17. 2"ø FNPT FOR VENT

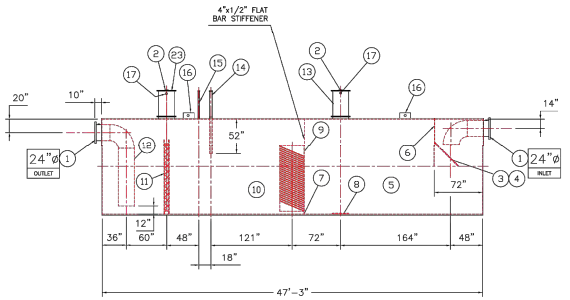
ANCILLARY PROVIDED EQUIPMENT

(4) 24" FIBREFLEX MANWAY GASKETS
(4) SETS OF NUTS/BOLTS/WASHERS FOR 24" MANWAY

NOTES

1. POLYURETHANE HIGHGUARD TANK IS NOT APPROVED FOR THE STORAGE OF HEATED PRODUCTS
2. ADD VENT PIPING BY INSTALLER
3. 15000 VOLT SPARK TEST PROVIDED AT FACTORY





NOTE :
ALL RIGHTS RESERVED. THIS DRAWING OR ANY PART THEREOF MUST NOT BE REPRODUCED IN ANY FORM WITHOUT THE WRITTEN PERMISSION OF HIGHLAND TANK.
HIGHLAND TANK SHALL BE RESPONSIBLE ONLY FOR ITEMS INDICATED ON THIS FABRICATION DRAWING UNLESS OTHERWISE NOTED. CUSTOMER IS RESPONSIBLE FOR VERIFYING CORRECTNESS OF SIZE / LOCATION OF FITTINGS , ACCESSORIES & COATINGS SHOWN ON THIS DRAWING

REVISIONS

Highland Tank

U.S. Patent #4,722,800 Canadian Patent # 1,296,263

40000 GALLON OIL WATER SEPARATOR
HTC, HIGHGUARD, SINGLE WALL

CUSTOMER:

PROJECT:

QUOTE NO:

CHK'D BY:

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE ± (OR – 1"

SCALE:	DATE:	DWG. BY:	DWG. NO.:
1/8"=1'-0"			40000HGSWHTCHDS

HIGHLAND TANK OIL WATER SEPERATOR

SCALE: NTS

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Andover, Massachusetts 01810
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PE SEAL:

STATE OF NEW HAMPSHIRE
ROSS TSANTOULIS No. 14122 LICENSED PROFESSIONAL ENGINEER

Ross Tsantoulis

Digitally signed by Ross Tsantoulis
DN: CN=Ross Tsantoulis, O=Woodard&Curran, OU=MCDivers, E=rtsantoulis@woodardcurran.com, C=US
Date: 2025.11.04 10:00:49-05'00'

DRAFT 60% DESIGN NOT FOR CONSTRUCTION

CLIENT INFO:

RADIUS RECYCLING
CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

REV	MM/DD/YY	DESCRIPTION

JOB NO:	0224539.48
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SCALE:	AS NOTED
DESIGNED BY:	YT
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FILENAME:	0224539.48-C-900-903.dwg

DRAWING TITLE:

CIVIL DETAILS 4

DRAWING NO:

C-903

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22x34

STRUCTURAL ABBREVIATIONS

&	AND
L	ANGLE
©	CHANNEL
#	NUMBER
ACI	AMERICAN CONCRETE INSTITUTE
ADD	ADDITIONAL
AFF	ABOVE FINISHED FLOOR
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ALT	ALTERNATE/ALTERNATING
ARCH	ARCHITECTURAL
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERING
ASTM	ASTM INTERNATIONAL
BLDG	BUILDING
BM	BEAM
BOC	BOTTOM OF CONCRETE
BOF	BOTTOM OF FOOTING
BOP	BOTTOM OF PIPE
BOT	BOTTOM
C/C	CENTER TO CENTER
C&C	COMPONENT & CLADDING
CL	CENTERLINE
CF	COLUMN FOOTING
CIRC	CIRCULAR/CIRCUMFERENCE
CJ	CONSTRUCTION JOINT
CLR	CLEAR
COL	COLUMN
CONC	CONCRETE
CONT	CONTINUOUS/CONTINUE
COR	CORNER
D	DEEP
DBS/DI	DOWEL BAR SPLICES AND DOWEL INSERTS
DEG	DEGREE
DET	DETAIL
DI	DUCTILE IRON
DIA	DIAMETER
DIA	DIAGONAL
DIR	DIRECTION
DN	DOWN
DWG(S)	DRAWING(S)
E-W	EAST-WEST
EA	EACH
EF	EACH FACE
EL	ELEVATION
ELEC	ELECTRICAL
EMBED	EMBEDDED
EQ	EQUAL(LY)
EQUIP	EQUIPMENT
EW	EACH WAY
EXG	EXISTING
EXP	EXPANSION OR EXPOSED
EXT	EXTERIOR
FF	FINISHED FLOOR
FFE	FINISHED FLOOR ELEVATION
FL	FLOOR, FEET
FND	FOUNDATION
FRP	FIBERGLASS REINFORCED POLYESTER
FT	FOOT, FEET
FTG	FOOTING
GA	GAGE
GALV	HOT-DIP GALVANIZED
GC	GENERAL CONTRACTOR
HOR	HORIZONTAL
HP	HIGH POINT
ID	INTERIOR DIAMETER
IJ	ISOLATION JOINT
IN	INCH(ES)
INT	INTERIOR
INV	INVERT
JT	JOINT
L	LONG
LB(S)	POUNDS
LG	LONG
LLV	LONG LEG VERTICAL
LP	LOW POINT
MATL	MATERIAL
MAX	MAXIMUM
MCJ	MASONRY CONTROL JOINT
MECH	MECHANICAL
MFR	MANUFACTURER
MID	MIDDLE
MIN	MINIMUM
MISC	MISCELLANEOUS
N-S	NORTH-SOUTH
NO	NUMBER
NTS	NOT-TO-SCALE
OC	ON-CENTER
OCEF	ON-CENTER EACH FACE
OCEW	ON-CENTER EACH WAY
OD	OUTSIDE DIAMETER
OE	OPEN END
OPNG	OPENING
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
P	CONCRETE PEDESTAL
PAF	POWDER ACTUATED FASTENER
PE	PLAIN END
PED	PEDESTAL
PEN	PENETRATION
PL	PLATE
PLF	POUNDS PER LINEAR FOOT
PROJ	PROJECTION
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TREATED
PTD	PAINTED
R	RISERS
RAD	RADIUS
REF	REFERENCE
REINF	REINFORCE, REINFORCING
REQD	REQUIRED
RO	ROUGH OPENING
RW	RETAINING WALL
SCH	SCHEDULE
SHT	SHEET
SJ	SAWED JOINT
SLR	SEALER
SPA	SPACE, SPACING
SPEC	SPECIFICATION, SPECIFIED
SQ	SQUARE
SS	STAINLESS STEEL
STD	STANDARD
STL	STEEL
STRU	STRUCTURAL
T	TREADS
T&B	TOP AND BOTTOM
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING
TOG	TOP OF GRATING
TOM	TOP OF MASONRY
TOS	TOP OF STEEL
TOW	TOP OF WALL
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
W	WIDTH, WIDE
W/	WITH
WCJ	WALL CONSTRUCTION JOINT
WP	WORK POINT

STRUCTURAL GENERAL NOTES

A. GENERAL STRUCTURAL NOTES:

1. DESIGN IS IN ACCORDANCE WITH THE 2021 INTERNATIONAL BUILDING CODE.
2. THESE NOTES SHALL APPLY TO ALL WORK, EXCEPT AS NOTED OTHERWISE.
3. STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE DRAWINGS AND SPECIFICATIONS OF ALL DISCIPLINES WHICH SHALL BE REFERRED TO FOR SIZES AND LOCATIONS OF ALL OPENINGS, PENETRATIONS, DRAINS, PADS, CONDUIT, EQUIPMENT, AND PIPE SUPPORTS, ETC.
4. GEOTECHNICAL CONDITIONS AND DESIGN PARAMETERS ARE BASED ON OBSERVATIONS AND RECOMMENDATIONS FOUND IN GEOTECHNICAL ENGINEERING REPORT BY S.W. COLE, DATED JUNE 25, 2024.

B. SITE CONDITIONS, EXCAVATION, SHORING, AND DEWATERING:

1. GENERAL FINDINGS
   a. SITE FILLS PRESENT UNKNOWN RISK OF ADVERSE FOUNDATION PERFORMANCE. REMOVE AND REPLACE BELOW TANK FOUNDATION.
   b. GROUND WATER ENCOUNTERED 10-12 FEET BELOW GRADE CORRESPONDING WITH MERRIMACK RIVER ELEVATION. FLUCTUATIONS IN GROUND WATER UNKNOWN.
   c. EARTHWORK AND FOUNDATION CONSTRUCTION ACTIVITIES SHOULD OCCUR DURING DRIER, NON-FREEZING WEATHER OF SPRING, SUMMER, AND FALL. RUBBER-TIRED CONSTRUCTION EQUIPMENT SHOULD NOT OPERATE DIRECTLY ON THE NATIVE SOILS. WHEN WET, EXCAVATION OF BEARING SURFACES SHOULD BE COMPLETED WITH A SMOOTH-EDGED BUCKET TO LESSEN SUBGRADE DISTURBANCE.

C. SUBGRADE PREPARATION, BACKFILL, AND COMPACTION:

1. SOIL UNDER TANK FOUNDATION AND MAT SLAB SHALL BE EXCAVATED TO FROST DEPTH AND BACKFILLED WITH NON-FROST SUSCEPTIBLE STRUCTURAL FILL OR BE INSULATED TO PROTECT FROM ADVERSE FROST ACTION AS RECOMMENDED HEREIN.
2. EXISTING FILLS WHERE ENCOUNTERED TO DEPTHS OF 6-6.5 FT WITHIN THE FOOTPRINT OF THE PROPOSED CONSTRUCTION AREA. EXISTING FILLS, RELIC STRUCTURES, FOUNDATIONS, UTILITIES AND DEBRIS SHALL BE COMPLETELY REMOVED FROM BENEATH THE PROPOSED STRUCTURES AND SLAB AREAS. EXTENT OF REMOVAL TO BE 1 FT PAST EDGE OF FOUNDATION ON ALL SIDES. THE OVER-EXCAVATED AREAS SHALL BE BACKFILLED WITH COMPACTED STRUCTURAL FILL. ALTERNATIVELY THE EXISTING FILLS MAY BE IMPROVED WITH STONE ONE AGGREGATE PIERS.

D. FOUNDATION AND SLAB DESIGN CRITERIA:

1. ALLOWABLE SOIL BEARING CAPACITY = 3,000 PSF
2. MODULUS OF SUBGRADE REACTION = 75 PCI
3. BASE FRICTION FACTOR = 0.5
4. TOTAL UNIT WEIGHT OF BACKFILL = 125 PCF
5. INTERNAL FRICTION ANGLE = 30 DEGREES
6. AT-REST LATERAL EARTH PRESSURE COEFFICIENT = 0.5

E. EMBEDDED CONDUITS AND PIPES:

1. REFER TO SHEET S-002

F. GENERAL REINFORCED CONCRETE REQUIREMENTS:

1. REFER TO SHEET S-002

G. SEQUENCE OF WORK:

1. REFER TO SHEET S-002 FOR FORM REMOVAL, THERMAL PROTECTION PERIOD AND CURING PERIOD REQUIREMENTS.
2. CONCRETE FOR TANK WALLS SHALL NOT BE PLACED UNTIL CONCRETE BASE SLABS HAVE ACHIEVED 75 PERCENT OF THE SPECIFIED 28-DAY CONCRETE COMPRESSIVE STRENGTH AND NO SOONER THAN 7-DAYS AFTER THE FINAL TANK SLAB PLACEMENT.
3. CONCRETE TANK WALLS SHALL OBTAIN 100 PERCENT OF THE SPECIFIED 28-DAY CONCRETE COMPRESSIVE STRENGTH BEFORE COMMENCEMENT OF FILLING THE STRUCTURE WITH WATER TO COMPLETE TIGHTNESS TESTING. CONTRACTOR'S CONSTRUCTION SCHEDULE MUST INCLUDE TIME TO PERFORM TIGHTNESS TESTING AND TIME TO PERFORM ALL TANK LEAK REPAIRS.
4. TANK WALLS SHALL NOT BE BACKFILLED UNTIL CONCRETE TANKS ARE TIGHTNESS TESTED AND ALL LEAKS IDENTIFIED DURING THE TIGHTNESS TEST ARE REPAIRED TO THE SATISFACTION OF THE ENGINEER, OWNER, AND OWNER'S REPRESENTATIVE AT CONTRACTOR'S OWN EXPENSE.

H. EXISTING CONDITIONS:

1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AS THEY RELATE TO NEW CONSTRUCTION. REPORT TO THE ENGINEER OF RECORD ALL OBSERVATIONS AND ANY DISCREPANCIES BEFORE PROCEEDING WITH WORK.
2. WHERE DETAILS FOR SPECIFIC CONDITIONS ARE NOT SHOWN ON THESE PLANS, USE DETAILS FOR THE MOST NEARLY SIMILAR CONDITIONS SHOWN ON THE STRUCTURAL DRAWINGS AS DETERMINED BY THE STRUCTURAL ENGINEER. REPORT ANY COORDINATION ISSUES IMMEDIATELY TO THE ENGINEER.
3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE FOR A SAFE AND EFFICIENT METHOD OF SHORING AND/OR BRACING THE STRUCTURE DURING ALL CONSTRUCTION PHASES. SUBMIT AN OUTLINE OF PROPOSED PROCEDURES BEFORE CONSTRUCTION COMMENCES.
4. STRUCTURAL MEMBERS SHALL NOT BE MODIFIED IN THE FIELD WITHOUT WRITTEN APPROVAL FROM THE STRUCTURAL ENGINEER. IN THE EVENT OF A CONSTRUCTION OR FABRICATION ERROR, THE CONTRACTOR SHALL PREPARE A SKETCH WITH A PROPOSED REPAIR, AND SUBMIT IT TO THE ENGINEER FOR APPROVAL PRIOR TO PERFORMING ANY CORRECTIVE WORK.
5. VERIFY ALL FIELD DIMENSIONS, LOCATIONS, AND GEOMETRY OF EXISTING STRUCTURES PRIOR TO CONSTRUCTION. ALL EXISTING DIMENSIONS ARE APPROXIMATE. NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCY BETWEEN THE FIELD CONDITIONS AND THE CONTRACT DRAWINGS.
6. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO PROTECT THE EXISTING BUILDING ELEMENTS TO REMAIN DURING DEMOLITION. DO NOT CUT OR ALTER ANY OF THE EXISTING STRUCTURAL OR ARCHITECTURAL ELEMENTS TO REMAIN WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER. PROVIDE PROTECTION FOR EXISTING WALLS, COLUMNS, BRACES, AND OTHER BUILDING ELEMENTS TO REMAIN FROM FALLING DEBRIS. ANY DAMAGE TO EXISTING ELEMENTS TO REMAIN SHALL BE REPAIRED BY THE CONTRACTOR AT THEIR OWN EXPENSE.

I. DESIGN LOADS AND BUILDING CODES:

1. DESIGN LOADS ARE PER THE 2021 INTERNATIONAL BUILDING CODE AS AMENDED BY THE NEW HAMPSHIRE STATE BUILDING CODE.
2. RISK CATEGORY OF BUILDING: II
   TERRAIN CATEGORY: C
   WIND-BORNE DEBRIS REGION: NO
3. SOIL LOADS PER ASCE 7-16:
   REFER TO FOUNDATION AND SLAB DESIGN CRITERIA, THIS SHEET.
4. ROOF LIVE LOADS PER ASCE 7-16:
   20 PSF NON-REDUCIBLE
5. SNOW LOADS PER ASCE 7-16:

GROUND SNOW LOAD P_g=	60 PSF
EXPOSURE FACTOR C_e=	1.0
THERMAL FACTOR C_t=	1.0
IMPORTANCE FACTOR I_s=	1.0

6. WIND LOADS PER ASCE 7-16:

DESIGN WIND SPEED (V)=	112 MPH
EXPOSURE CATEGORY	C
HURRICANE PRONE REGION=	NO
EXPOSURE COEFFICIENT K_z=	1.0
TOPOGRAPHIC FACTOR K_{zt}=	1.0
DIRECTIONALITY FACTOR K_d=	0.85
VELOCITY PRESSURE q_z=	17.03 PSF

7. FLOOD LOADS PER ASCE 7-16:
   FEMA ZONE X
   DESIGN FLOOD STILLWATER EL = <1.0 FT
   NOT IN MAPPED TSUNAMI ZONE
8. SEISMIC LOAD PER ASCE 7-16:

SHORT SPECTRAL RESP ACC (S_s)=	0.417
1-SEC SPECTRAL RESP ACC (S_1)=	0.085
SITE CLASS	E
SEISMIC IMPORTANCE FACTOR (I_e)=	1.0
SPECTRAL RESP COEF (S_{ds})=	0.537
SPECTRAL RESP COEF (S_{d1})=	0.238
SEISMIC DESIGN CATEGORY (SDC)=	D

   ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE (BY ACI 350.3)
   RESPONSE MODIFICATION FACTOR R= 3.25 (BURIED)
9. FLOOR LIVE LOADS PER ASCE 7-16:
   SLABS ON GRADE, STAIRS, PLATFORMS AND WALKWAYS = 100 PSF UNO
   REFER TO INDIVIDUAL AREA STRUCTURAL DRAWING NOTES. NON-REDUCIBLE, UNO.

NOTE: THIS IS A GENERAL LIST OF SYMBOLS AND ABBREVIATIONS. NOT ALL ITEMS SHOWN HERE APPEAR ON THE CONTRACT DOCUMENTS.

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PE SEAL:



Scott Michael Hawk

Digitally signed by Scott Michael Hawk
DN: C=US, E=shawk@woodardcurran.com, O=Woodard & Curran, CN=Scott Michael Hawk
Date: 2025.11.05 07:03:06-05'00'

60% DESIGN NOT FOR CONSTRUCTION

CLIENT INFO:

RADIUS RECYCLING
CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

REV	MM/DD/YYY	DESCRIPTION

JOB NO:	02245394.48
DATE:	NOVEMBER 2025
SCALE:	NO SCALE
DESIGNED BY:	JBH
DRAWN BY:	TPK
CHECKED BY:	SJT
FILENAME:	

DRAWING TITLE:

STRUCTURAL ABBREVIATIONS, NOTES, AND DESIGN LOADS

DRAWING NO:

S-001

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GENERAL CONCRETE NOTES

A. GENERAL REQUIREMENTS

1. DESIGN AND CONSTRUCTION SHALL CONFORM TO AMERICAN CONCRETE INSTITUTE (ACI) "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE AND COMMENTARY" (ACI 318-19), AND "SPECIFICATIONS FOR STRUCTURAL CONCRETE" (ACI 301), LATEST EDITION.

2. GROUT SHALL BE A NON-SHRINK, NON-CORROSIVE, NON-STAINING, NATURAL AGGREGATE (NONMETALLIC) GROUT AND SHALL BE A PREMIXED, PACKAGED TYPE, INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS. GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI AT 7 DAYS.

3. REBAR SHALL BE INSTALLED WITHIN THE TOLERANCES SET FORTH IN ACI 117 STANDARD SPECIFICATION FOR TOLERANCES FOR CONCRETE CONSTRUCTION.

4. PROVIDE 3/4-INCH, 45 DEGREE CHAMFER ON ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE.

5. UNLESS A GREATER COVER IS INDICATED, COVER FOR REINFORCEMENT SHALL NOT BE LESS THAN THE FOLLOWING (IN INCHES):

   a. CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3

   b. CONCRETE EXPOSED TO EARTH OR WEATHER
      NO 6 THROUGH NO.18 BARS: 2
      NO 5 BAR, W31 OR D31 WIRE, AND SMALLER: 2

   c. CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND: SLABS, WALLS, JOISTS
      NO 14 AND NO 18 BARS: 2
      NO 11 BAR AND SMALLER: 2

6. REFERENCE APPROVED CONTRACT DRAWINGS FOR FOUNDATION LOCATIONS AND ORIENTATIONS ON THE SITE.

7. ALL CAST-IN-PLACE ANCHOR BOLTS AND EMBEDDED STRUCTURAL ANCHORAGES AND SUPPORTS SHALL BE SUPPLIED BY THE STEEL CONTRACTOR AND INSTALLED BY THE CONCRETE CONTRACTOR, UNLESS OTHERWISE SPECIFIED.

8. PERMANENTLY EXPOSED EMBEDDED PLATES AND ANGLES SHALL BE HOT-DIPPED, GALVANIZED PER ASTM A153 AFTER FABRICATION, UNO. NO LOADS OR WELDS SHALL BE PLACED ON EMBEDDED PLATES OR ANGLES FOR A MINIMUM OF 7 DAYS AFTER CASTING.

9. COORDINATE OPENINGS AND EMBEDS IN CONCRETE WITH ALL OTHER TRADES.

10. NOTIFY ENGINEER OF ANY DISCREPANCIES DISCOVERED WITH OTHER TRADES.

11. ALL PLAN DIMENSIONS ARE INDICATED ON A HORIZONTAL PLANE.

12. TESTS SHALL BE PERFORMED FOR ALL CONCRETE WORK WITH A COMPRESSIVE STRENGTH GREATER THAN 2000 PSI.

13. ALL CONCRETE SHALL BE FIELD TESTED BY AN INDEPENDENT TESTING LABORATORY AS PER ASTM SPECIFICATIONS (PAID FOR BY CONTRACTOR). ONE SET OF 5 STANDARD 4" DIAMETER x 8" TALL CURED CYLINDERS SHALL BE PREPARED, PER ASTM C31, FOR EACH 100 CUBIC YARDS OF CONCRETE PLACED EACH DAY. CYLINDERS SHALL BE TRANSPORTED TO THE TESTING LAB WITHIN 48 HOURS OF FORMING, BUT NOT SOONER THAN 8 HOURS AFTER FINAL SET. CYLINDERS SHALL BE CURED IN A TEMPERATURE CONTROLLED COOLER, SUPPLIED BY THE TESTING SERVICE. CYLINDERS SHALL BE TESTED FOR COMPRESSIVE STRENGTH IN ACCORDANCE WITH ASTM C39. ONE CYLINDER SHALL BE TESTED AT 7 DAYS, THREE AT 28 DAYS, AND ONE HELD IN RESERVE. TESTS FOR AIR CONTENT, PER ASTM C173 OR ASTM C231, AND TESTS FOR SLUMP, PER ASTM C143, SHALL BE COMPLETED FOR THE FIRST TRUCK LOAD OF CONCRETE DELIVERED DURING EACH DAY OF CONCRETE PLACEMENT. ADDITIONAL TESTS FOR AIR CONTENT SHALL BE TAKEN FOR EACH 100 CUBIC YARDS OF CONCRETE PLACED AND WHENEVER ANY SLUMP ADJUSTMENTS ARE MADE.

B. CONCRETE ANCHORS

1. ANCHOR BOLTS SHALL BE SET AND PLUMBED WITH TEMPLATES. ALL EMBEDDED ITEMS SHALL BE ACCURATELY SECURED IN PLACE. FOR ANCHOR BOLT DETAILS.

2. ADHESIVE ANCHOR BOLTS SHALL NOT BE INSTALLED PRIOR TO A MINIMUM OF 21 DAYS AFTER CONCRETE IS POURED.

C. REINFORCED CONCRETE TANKS, PUMP STATIONS, TIGHTNESS TESTING, AND CONCRETE REPAIRS:

1. TANKS AND CONTAINMENT AREAS: COMPRESSIVE STRENGTH OF CONCRETE AT 28-DAYS = 4,500 PSI.

2. REINFORCEMENT: ASTM A615, GRADE 60.

3. CONCRETE DESIGN IS PER AMERICAN CONCRETE INSTITUTE "350-20 CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES."

4. WATERSTOPS SHALL BE CONTINUOUS THROUGHOUT, AND INTERSECTIONS SHALL BE FACTORY FABRICATED. WATERSTOPS AT VERTICAL JOINTS SHALL EXTEND TO WITHIN 6-INCHES OF THE TOP OF THE STRUCTURE, UNLESS NOTED OTHERWISE.

5. ALL PROPOSED CONCRETE TANKS, PUMP STATIONS, ETC, SHALL BE TIGHTNESS TESTED, AND REPAIRED AT CONTRACTOR'S OWN EXPENSE.

6. TIGHTNESS TESTING SHALL BE IN ACCORDANCE WITH ACI 350.1-10 "SPECIFICATION FOR TIGHTNESS TESTING OF ENVIRONMENTAL ENGINEERING CONCRETE CONTAINMENT STRUCTURES" CHAPTER 2, PART 1 QUALITATIVE CRITERIA AND PART 2 QUANTITATIVE CRITERIA. WOODARD&CURRAN WILL PROVIDE FIELD TESTING FORMS FOR EACH TANK TO BE COMPLETED BY CONTRACTOR AND SUBMITTED TO ENGINEER FOR RECORD OF TESTING PROGRAM AND COMPLETION OF TANK REPAIRS. PART 2 ACCEPTANCE CRITERIA = 0.01253% OF VOLUME PER DAY.

7. CONTRACTOR IS RESPONSIBLE FOR ALL CONCRETE TANK LEAK REPAIRS AT NO ADDITIONAL COST TO THE OWNER.

D. CONCRETE CURE AL SEAL COMPOUND:

1. PROVIDE THE FOLLOWING FOR HORIZONTAL AND VERTICAL EXPOSED TO VIEW CONCRETE SURFACES OF ALL EXTERIOR CONCRETE: CLEAR SILANE COATING EQUAL TO "CERTI-VEX GUARD CLEAR" BY VEXCON CHEMICALS, A ONE-STEP CURE AND PENETRATING WATER REPELLANT SEALER MEETING ASTM C1315, TYPE 1, CLASS B, NCHRP-244. APPLY (2) COATS IN STRICT ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.

E. NATIONAL SPECIFICATIONS INCORPORATED THROUGH REFERENCE

DESIGN, MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE FOLLOWING CODES AND STANDARDS CONTAINED THEREIN, UNLESS OTHERWISE NOTED ON THE DRAWINGS:

ACI 117 SPECIFICATION FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS AND COMMENTARY.

ACI 304 GUIDE FOR MEASURING, MIXING, TRANSPORTING AND PLACING CONCRETE

ACI 305R GUIDE TO HOT WEATHER CONCRETING

ACI 306R GUIDE TO COLD WEATHER CONCRETING

ACI 347R GUIDE TO FORMWORK FOR CONCRETE

ACI 211.1 STANDARD PRACTICE FOR SELECTING PROPORTIONS FOR NORMAL, HEAVYWEIGHT, AND MASS CONCRETE

ACI 302.1R GUIDE TO CONCRETE FLOOR AND SLAB CONSTRUCTION

ACI 308.1 SPECIFICATION FOR CURING CONCRETE

ACI SP-4 FORMWORK FOR CONCRETE

ACI SP-66 DETAILING MANUAL

AWS D1.4 STRUCTURAL WELDING CODE-REINFORCING STEEL

CRSI MSP MANUAL OF STANDARD PRACTICE

CRSI 10-PLACE CRSI RECOMMENDED PRACTICE FOR "PLACING REINFORCING BARS"

F. CONCRETE MIX

1. MATERIALS FOR CONCRETE AND PROPORTIONING SHALL CONFORM TO THE REQUIREMENTS OF ACI 211.1, ACI 301, AND ACI 318.

2. PORTLAND CEMENT SHALL CONFORM TO ASTM C150, TYPE I. (ASSUMED, PENDING GEOTECHNICAL REPORT)

3. CONCRETE COMPRESSIVE STRENGTH @ 28 DAYS

   a. REINFORCED CONCRETE FOUNDATIONS, PADS, AND WALLS: 4500 PSI

   b. LEAN CONCRETE (MUD MAT, STRUCTURAL FILL, DUCT BANKS): 500 PSI

4. EXTERIOR CONCRETE AND CONCRETE EXPOSED TO FREEZE-THAW CYCLES SHALL BE AIR-ENTRAINED. REFER TO SPECIFICATIONS FOR AIR CONTENT.

5. REFERENCE ASTM C33 FOR GRADATION. PROPORTIONS OF AGGREGATE TO CEMENT FOR ANY CONCRETE MIX SHALL BE SUCH AS TO PRODUCE A MIXTURE WHICH, CONSISTENT WITH THE METHOD OF PLACING, WILL WORK READILY INTO CORNERS AND ANGLES OF THE FORMS AND AROUND REINFORCEMENT WITHOUT PERMITTING THE MATERIALS TO SEGREGATE OR EXCESS WATER TO COLLECT ON THE SURFACE.

6. ADMIXTURES TO BE USED IN CONCRETE SHALL BE SUBJECT TO PRIOR APPROVAL BY THE ENGINEER.

G. REINFORCEMENT

1. REINFORCEMENT SHALL BE ASTM 615 GRADE 60 DEFORMED BAR. WELDED WIRE FABRIC AND SPIRAL REINFORCEMENT SHALL CONFORM TO ASTM A1064.

2. CONTINUOUS REINFORCING #11 AND SMALLER SHALL BE LAPPED AT SPLICES. LAP LENGTH OF SPLICES SHALL NOT BE LESS THAN CLASS B SPLICE. MINIMUM SPLICE LENGTHS SHALL BE AS SPECIFIED ON SHEET S-932.

3. DO NOT SPLICE MORE THAN 50% OF BARS AT ONE LOCATION.

4. REBAR SHALL BE INSTALLED WITHIN THE TOLERANCES SET FORTH IN ACI 117 STANDARD SPECIFICATION FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS. EXCEPT THAT FOR FOOTINGS, SLABS, MATS, AND WALLS SHOWN ON THESE DRAWINGS THE FOLLOWING TOLERANCES AND PROVISIONS MAY BE USED WHERE PENETRATIONS FROM NON-STRUCTURAL ITEMS SUCH AS ELECTRICAL DUCTS, PIPES OR OTHER ITEMS EMBEDDED INTO THE CONCRETE OCCUR:

   a. IN A LAYER OF REGULARLY SPACED BARS, AN INDIVIDUAL REBAR MAY BE RELOCATED WITHIN THE SAME PLANE AS THE LAYER, UP TO 3 INCHES FROM THE LOCATION SPECIFIED ON THE DRAWINGS.

   b. WHERE A REBAR IS INTERRUPTED BY A NON-STRUCTURAL EMBEDDED ITEM, THE REBAR SHALL BE CUT 2 INCHES CLEAR FROM THE ITEM. FOR EACH REBAR THAT IS INTERRUPTED BY A NON-STRUCTURAL EMBEDDED ITEM, AN ADDITIONAL REBAR SHALL BE ADDED ADJACENT TO THE NON-STRUCTURAL ITEM AND IN THE SAME LAYER AS THE INTERRUPTED REBAR, AND SHALL EXTEND BEYOND THE ITEM A DISTANCE EQUAL TO THE CLASS A SPLICE SHOWN IN ON SHEET S-932. WHERE THIS LENGTH CANNOT BE ACHIEVED DUE TO EDGE OF CONCRETE, TERMINATE REBAR WITH A STANDARD HOOK. WHERE THE ADDED REBAR RESULTS IN ON CENTER SPACING LESS THAN 3 INCHES WITHIN THE LAYER, THE CONTRACTOR SHALL NOTIFY THE ENGINEER FOR REVIEW AND REVISION PRIOR TO FINAL INSTALLATION OF REBAR.

5. ALL REINFORCING STEEL THAT IS TO BE WELDED, WHERE INDICATED ON THE CONTRACT DRAWINGS, SHALL BE DEFORMED BARS CONFORMING TO ASTM A706 AND WELDED IN ACCORDANCE WITH AWS D1.4.

6. FIELD BENDING OF REINFORCING STEEL SHALL NOT BE DONE WITHOUT PRIOR AUTHORIZATION OF THE STRUCTURAL ENGINEER. ALL REINFORCEMENT SHALL BE BENT COLD, UNLESS OTHERWISE PERMITTED BY THE ENGINEER. REINFORCEMENT PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE FIELD BENT, UNLESS PERMITTED BY THE ENGINEER IN ACCORDANCE WITH ACI 318.

7. REINFORCING STEEL SHALL NOT BE BENT OR DISPLACED FOR THE CONVENIENCE OF OTHER TRADES UNLESS APPROVED BY THE STRUCTURAL ENGINEER.

8. THE PROPER TYPE AND QUANTITIES OF ACCESSORIES SHALL BE FURNISHED TO HOLD THE REINFORCING STEEL IN PLACE WHILE THE CONCRETE IS BEING PLACED. REINFORCEMENT SHALL BE TIED OFF AT A MINIMUM OF 50% OF THE INTERSECTIONS.

9. PRIOR TO SHIPPING OF REINFORCING STEEL TO THE FIELD, SHOP DRAWINGS SHALL BE SUPPLIED TO THE ENGINEER FOR REVIEW.

10. FOR MINIMUM REINFORCING REQUIREMENTS AT CONCRETE OPENINGS AND RE-ENTRANT CORNERS, SEE TYPICAL CONCRETE DETAIL DRAWINGS.

11. ADHESIVE FOR REBAR DOWELS SHALL BE HILTI-HIT RE 500 V3 ADHESIVE.

H. CONCRETE SPECIALTIES AND ACCESSORIES

1. ISOLATION JOINT MATERIAL SHALL BE 1/2" ASPHALT IMPREGNATED FIBERBOARD, OR AN OPEN CELL FOAM MATERIAL APPROVED FOR CONCRETE EXPANSION JOINT.

I. FORMWORK:

1. FORMWORK SHALL BE IN ACCORDANCE WITH ACI 301 AND ACI 347R.

2. ACI SPECIAL PUBLICATION 4 SHALL BE USED AS A GUIDE.

3. WHERE WOOD FORMS ARE USED, THEY SHALL BE PLY FORM OR GRADED EXTERIOR TYPE PLYWOOD, GRADE BB OR BETTER.

4. FORMS OR SHORES SHALL NOT BE REMOVED WITHOUT THE APPROVAL OF THE CONSTRUCTION MANAGER. ALL REMOVAL SHALL BE ACCOMPLISHED IN A MANNER TO PREVENT DAMAGE TO THE CONCRETE. FORMS SHALL GENERALLY NOT BE REMOVED PRIOR TO THE MINIMUM NUMBER OF DAYS INDICATED BELOW:

   SLABS AND BEAM BOTTOMS: 14 DAYS
   WALLS AND FOOTINGS: 3 DAYS
   COLUMNS: 3 DAYS

5. STRUCTURES SHALL NOT BE LOADED UNTIL CONCRETE HAS CURED TO A MINIMUM COMPRESSIVE STRENGTH OF 75 PERCENT OF THE DESIGN COMPRESSIVE STRENGTH AT 28 DAYS.

J. EMBEDDED CONDUITS AND PIPES

1. ALL ELECTRICAL AND INSTRUMENTATION CONDUIT EMBEDDED IN CONCRETE SHALL BE INSTALLED, ARRANGED, AND SPACED AS FOLLOWS:

2. OUTSIDE DIAMETER OF CONDUIT SHALL NOT EXCEED 1/3 OF CONCRETE THICKNESS.

3. CONDUITS SHALL NOT BE PLACED CLOSER THAN 3 OUTSIDE DIAMETERS ON CENTER.

4. CONDUITS SHALL NOT BE EMBEDDED IN CONCRETE SLABS LESS THAN 4 INCHES THICK.

5. ONLY 2 CONDUITS MAY CROSS AT ANY POINT AND THE SUM OF THE OUTSIDE DIAMETER OF THE CROSSING CONDUITS SHALL NOT EXCEED 1/3 OF THE CONCRETE THICKNESS.

6. PROVIDE A MINIMUM 1-1/2 INCH CONCRETE COVER OVER CONDUITS.

7. CONDUITS SHALL NOT BE LOCATED BETWEEN BOTTOM OF REINFORCING STEEL AND BOTTOM OF SLAB.

8. ALUMINUM CONDUIT SHALL NOT BE EMBEDDED IN CONCRETE AND NO CONDUIT IS PERMITTED IN BEAMS, COLUMNS OR GIRDERS.

K. CONSTRUCTION

1. PLACING OF CONCRETE SHALL BE IN ACCORDANCE WITH ACI 301 AND ACI 304.

2. PUMPING OR PNEUMATIC CONVEYING EQUIPMENT SHALL BE OF SUITABLE KIND WITH ADEQUATE PUMPING CAPACITY. PNEUMATIC PLACEMENT SHALL BE CONTROLLED SO THAT SEGREGATION IS NOT APPARENT IN THE DISCHARGED CONCRETE. THE LOSS OF SLUMP IN PUMPING OR PNEUMATIC CONVEYING EQUIPMENT SHALL NOT EXCEED 2". CONCRETE SHALL NOT BE CONVEYED THROUGH PIPE MADE OF ALUMINUM OR ALUMINUM ALLOY. SLUMP SPECIFIED IN CONCRETE MIX NOTES SHALL BE AT CONVEYING DISCHARGE.

3. REFER TO MECHANICAL PIPING, ELECTRICAL & VENDOR DRAWINGS FOR NON-STRUCTURAL EMBEDDED ITEMS.

4. ALL CONCRETE PLACED IN COLD WEATHER SHALL CONFORM TO REQUIREMENTS OF ACI 306R.

5. ALL CONCRETE PLACED IN HOT WEATHER SHALL CONFORM TO REQUIREMENTS OF ACI 305R.

6. CONCRETE CURING IS REQUIRED FOR ALL EXPOSED SURFACES. CONCRETE SURFACES SHALL BE KEPT AT MOIST CONDITION FOR AT LEAST 7 DAYS. ALTERNATIVELY, MEMBRANE TYPE OF CURING COMPOUND MAY BE USED. MASS CONCRETE SHALL BE CURED IN ACCORDANCE WITH ACI 301.

7. APPLY BONDING AGENT AT ALL CONSTRUCTION JOINT SURFACES. BONDING AGENT SHALL BE EPOXY RESIN AS MANUFACTURED BY SIKADUR OR ARMATEC.

L. CONCRETE FINISH

1. FLOOR FINISH

   a. EXTERIOR FOUNDATIONS, SLABS, SIDEWALKS, FLOORS AND RAMPS SUBJECT TO VEHICULAR TRAFFIC, SHALL RECEIVE A BROOM FINISH. FLOOR SURFACE TOLERANCE SHALL COMPLY WITH ACI 117 REQUIREMENTS FOR A MODERATELY FLAT FLOOR SURFACE CLASSIFICATION.

2. FORMED SURFACES

   a. AFTER THE REMOVAL OF FORMS, SURFACES OF CONCRETE SHALL BE FINISHED IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 301, UNO. NO SURFACE MOCK-UPS ARE REQUIRED UNO.

   b. SURFACE DEFECTS AND TIE HOLES SHALL BE REPAIRED IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 301.

   c. UNLESS STAINLESS STEEL, NONCORROSIVE, OR COATED TIES ARE USED, TIE HOLES IN SURFACES NOT TO BE EXPOSED IN THE FINISHED WORK SHALL BE CLEANED, THOROUGHLY DAMPENED, AND FILLED SOLID WITH PATCHING MORTAR.

M. CONCRETE MIX DESIGN SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS:

MINIMUM 28 DAY COMPRESSIVE STRENGTH = 4,500 PSI
MAXIMUM WATER/CEMENTITIOUS MATERIALS = 0.42
MAXIMUM AGGREGATE SIZE = 3/4
AIR ENTRAINMENT= 6% +/- 1.5% (UNO)
SLUMP, AT POINT OF DELIVERY = 3 - 5 INCHES, 8" MAXIMUM W/ HIGH-RANGE WATER REDUCER

N. CONCRETE MATERIALS SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS:

CEMENT = ASTM C150, TYPE 2
FLY ASH (OPTIONAL) = ASTM C618, CLASS F, 3 PERCENT MAXIMUM LOSS OF IGNITION
BLAST FURNACE SLAG (OPTIONAL) = ASTM C989, SLAG ACTIVITY
CLASS (GRADE 100 OR 120)
AGGREGATE = ASTM C33
WATER = ASTM C1602
AIR-ENTRAINING ADMIXTURES = ASTM C260 AND SHALL BE FREE OF CHLORIDES
MID-RANGE WATER REDUCING AGENT = ASTM C494, TYPE A
SUPERPLASTICIERS = ASTM C494, TYPE F OR G
WATER REDUCING-RETARDING AGENTS = ASTM C494, TYPE D.

SUBMITTALS:

1. CONCRETE MIX DESIGNS WITH ADMIXTURE PRODUCT DATA
2. CURE AND SEAL PRODUCT DATA
3. REBAR SHOP DRAWINGS
4. CONCRETE TESTING RESULTS

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Date: 2025.11.25 07:03:03-05'00'

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CLIENT INFO:

RADIUS RECYCLING
CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

REV.	MM/DD/YYYY	DESCRIPTION

JOB NO:	02245349.48
DATE:	NOVEMBER 2025
SCALE:	NO SCALE
DESIGNED BY:	JBH
DRAWN BY:	TPK
CHECKED BY:	SJT
FILENAME:	

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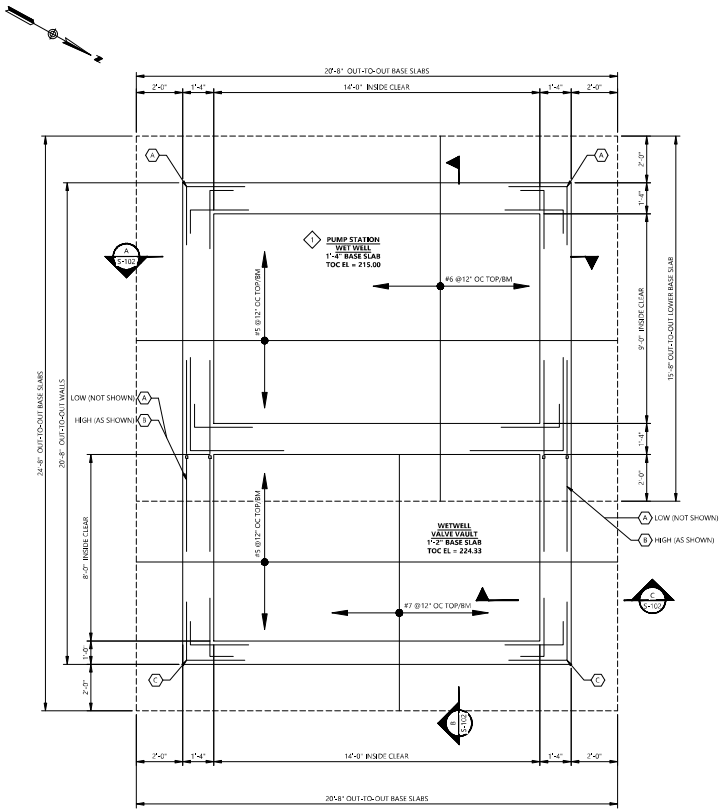
STRUCTURAL CONCRETE NOTES

DRAWING NO:

S-002

11/4/2025 12:48:11 PM

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FOUNDATION PLAN

SCALE: 3/8" = 1' - 0"

STRUCTURAL GENERAL NOTES:

1. CONTRACTOR MAY PROVIDE A PRECAST STRUCTURE PER SPECIFICATIONS AS AN ALTERNATE TO THE CAST-IN-PLACE CONSTRUCTION.

SHEET KEYNOTES:

1. CONCRETE FILL USED TO SLOPE THE FLOOR OF THE WET WELL WILL BE SHOWN ON THE FINAL DESIGN DRAWINGS.

CONCRETE TANK NOTES:

1. REFER TO SHEET S-001 AND GEOTECHNICAL REPORT FOR SITE SUBGRADE PREPARATION, GROUNDWATER, DEWATERING, AND EXCAVATION REQUIREMENTS.
2. "(XXX.XX)" INDICATES ELEVATION OF CONCRETE FILL. REFER TO SHEET S-002 FOR CONCRETE FILL REQUIREMENTS.
3. CONCRETE CONTAINMENT TANK SHALL BE TIGHTNESS TESTED IN ACCORDANCE WITH ACI 350.1, AND NOTES ON SHEET S-002, UNLESS NOTED OTHERWISE ON THIS DRAWING. ALL EXTERIOR AND INTERIOR TANK WALLS SHALL OBTAIN SPECIFIED 28-DAY COMPRESSIVE STRENGTH PRIOR TO FILLING STRUCTURE WITH WATER TO COMMENCE TIGHTNESS TESTING.
4. REFER TO SHEET S-930 FOR CONCRETE TANK STANDARD DETAILS. DETAILS SHOWN ON SHEET S-930 APPLY TO ALL WORK, UNLESS SPECIFICALLY NOTED OTHERWISE.
5. ALL TANK SUBGRADE CONDITIONS SHALL BE SITE INSPECTED AND APPROVED BY GEOTECHNICAL ENGINEER, PRIOR TO PLACING REBAR.
6. REFER TO SHEETS S-002 FOR CONCRETE TESTING REQUIREMENTS AND TESTING FREQUENCY.
7. REFER TO CIVIL & MECHANICAL DRAWINGS FOR PIPE PENETRATION SIZES, LOCATIONS, ELEVATIONS AND QUANTITIES.
8. CONCRETE CURING: MAINTAIN CONCRETE IN CONTINUOUSLY MOIST CONDITION FOR A MINIMUM OF 7 DAYS. CURING SHALL COMMENCE AS SOON AS POSSIBLE AFTER FINAL FINISHING WHEN IT WILL NOT MAR OR ERODE THE CONCRETE SURFACE. BASE SLABS SHALL BE WET CURED OR A DISSIPATING CURING COMPOUND SHALL BE APPLIED IMMEDIATELY AFTER FINISHING. WALLS SHALL BE CURED BY LEAVING FORMWORK IN-PLACE FOR 7 DAYS OR IF FORMS ARE REMOVED PRIOR TO 7 DAYS, WALL SURFACES SHALL BE IMMEDIATELY CURED WITH A CURING COMPOUND. NOT APPLYING CURING COMPOUND IN A TIMELY MANNER MAY INITIATE CRACKING. WAITING TO APPLY CURING COMPOUND TO THE DAY AFTER CONCRETE PLACEMENT OR STRIPPING OF FORMWORK IS NOT RECOMMENDED.
9. TANK CONCRETE TOPPING WILL DEVELOP TEMPERATURE AND SHRINKAGE CRACKS WHICH ARE ACCEPTABLE AND NOT DETRIMENTAL TO THE PERFORMANCE OF THE TOPPING.

WALL CORNER BAR SCHEDULE:

MARK	DESCRIPTION	COMMENTS
A	(1) #7 x 4'-0" x 4'-0" @ 6" OC (2) #7 x 1'-2" x 4'-0" @ 6" OC	CORNER BARS
B	(1) #7 x 4'-0" x 4'-0" @ 6" OC (1) #7 x 1'-2" x 4'-0" @ 6" OC (2) #7 x 4'-0" x 4'-0" DIS/OB @ 6" OC	UPPER T-WALL INTERSECTION
C	(1) #6 x 2'-0" x 2'-6" @ 12" OC (2) #6 x 1'-0" x 2'-6" @ 12" OC	CORNER BARS

CORNER BAR SCHEDULE NOTES:

1. TRIM BARS 2" CLR AT WALL OPENINGS/PENETRATIONS AND PROVIDE ADDITIONAL REINFORCEMENT PER STANDARD DETAIL.
2. ALL REINFORCEMENT SHALL APPLY TO FULL HEIGHT OF ALL WALLS, UNO.

4" 3" 2" 1" 0 3" 6"

BAR SCALE
3/8" = 1'-0"
CHECK GRAPHIC SCALE BEFORE USING

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SCOTT M. HAWK
No. 12545
LICENSED PROFESSIONAL ENGINEER

Scott Michael Hawk

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Date: 2025.11.07 09:44:09 -05'00'

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CONCORD, NH

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STORMWATER IMPROVEMENTS

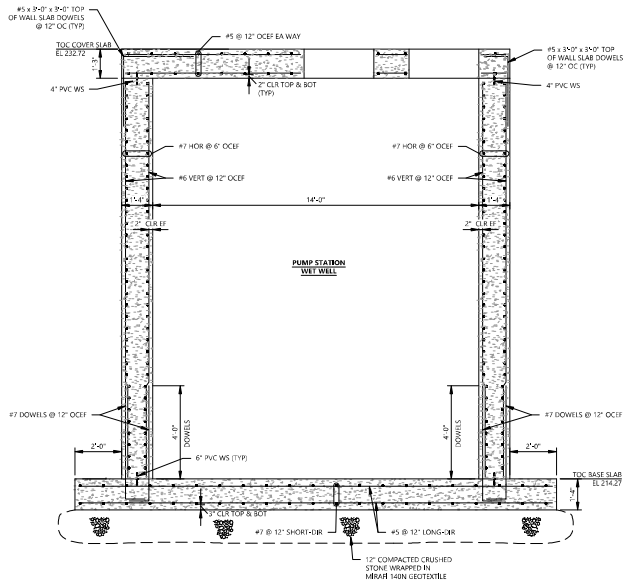
REV	MM/DD/YY	DESCRIPTION

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DATE:	NOVEMBER 2025
SCALE:	AS NOTED
DESIGNED BY:	SMH
DRAWN BY:	DMB
CHECKED BY:	SJT
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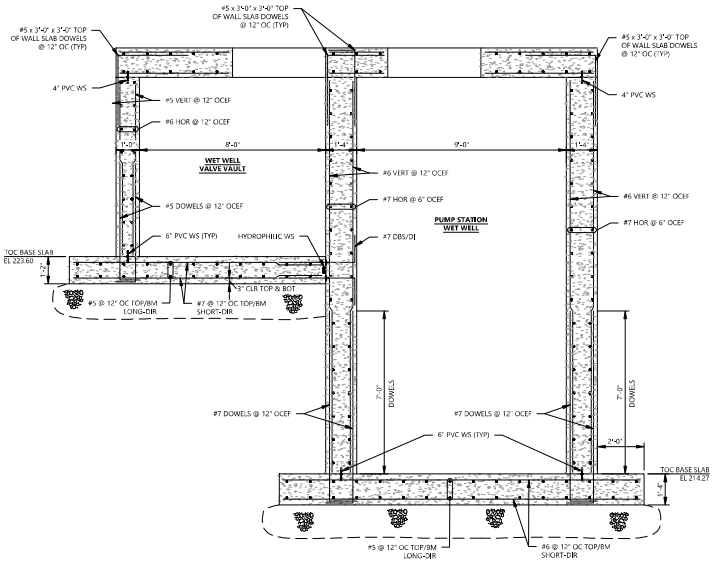
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STRUCTURAL
PUMP STATION
FOUNDATION PLAN

DRAWING NO:
S-101

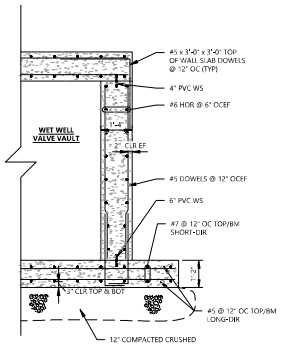
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SECTION A S-101
SCALE: 3/8" = 1'-0"



SECTION B S-101
SCALE: 3/8" = 1'-0"



PARTIAL SECTION C S-101
SCALE: 3/8" = 1'-0"

4" 3" 2" 1" 0 3" 6"
BAR SCALE
3/8" = 1'-0"
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Scott Michael Hawk
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DESIGNED BY:	SMH
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DRAWING TITLE:
STRUCTURAL PUMP STATION SECTIONS

DRAWING NO:
S-102

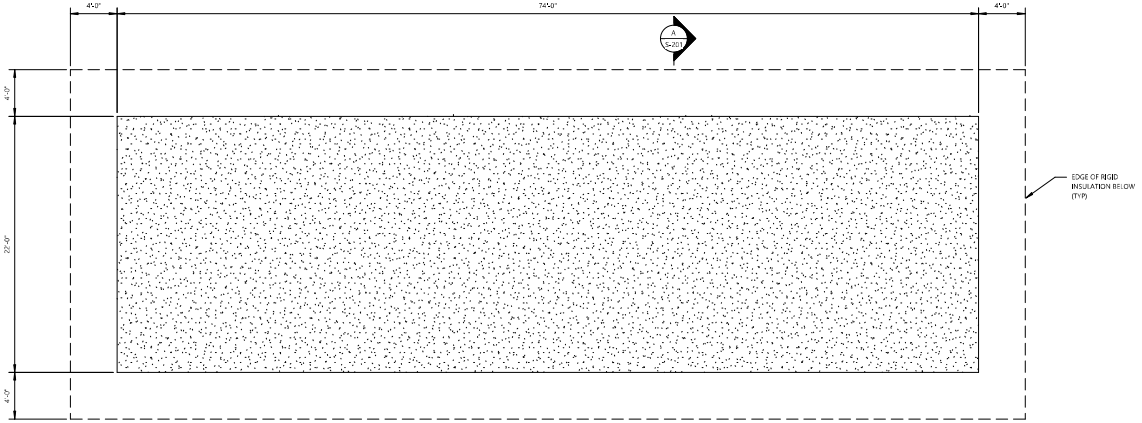
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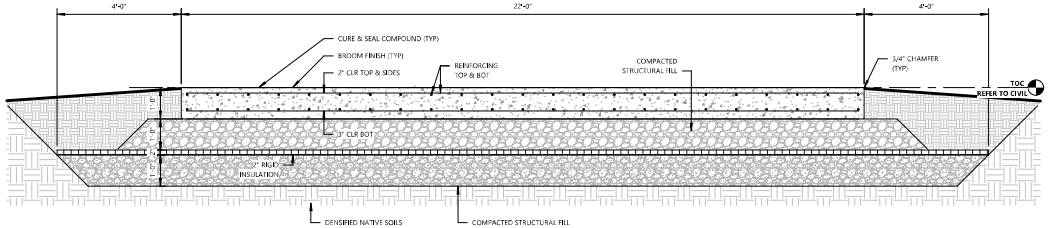
STRUCTURAL GENERAL NOTES:

1. NOT ALL MECHANICAL SYSTEMS, PIPING, UTILITIES, AND PENETRATIONS ARE SHOWN. REFER TO ALL OTHER DISCIPLINES FOR ADDITIONAL DETAILS.
2. REFER TO CIVIL PLANS FOR ELEVATIONS.
3. DESIGN LOADS:

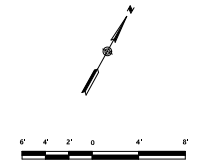
SYSTEM CONNEX	12,000 LB
SETTLING TANK	180,000 LB
BACKWASH TANK	85,000 LB
MEDIA FILTRATION SYSTEM	26,000 LB
CARBON VESSEL	18,000 LB



1 PAD PLAN
SCALE: 3/16" = 1'-0"



SECTION A
SCALE: 1/2" = 1'-0"
S-201



BAR SCALE
3/16" = 1'-0"
CHECK GRAPHIC SCALE BEFORE USING



BAR SCALE
1/2" = 1'-0"
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JOB NO:	0224539.48
DATE:	NOVEMBER 2025
SCALE:	AS NOTED
DESIGNED BY:	JBH
DRAWN BY:	TPK
CHECKED BY:	SJT
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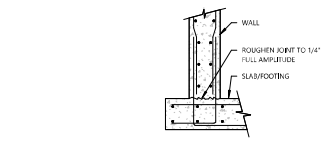
STRUCTURAL PAD PLAN & SECTION

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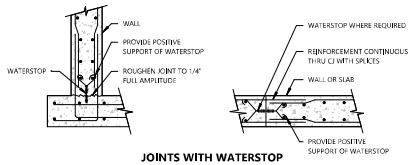
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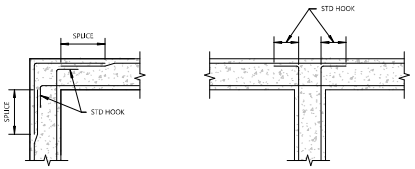
JOINTS WITHOUT WATERSTOP



JOINTS WITH WATERSTOP

S300 CONSTRUCTION JOINT (CJ)

SCALE: NTS



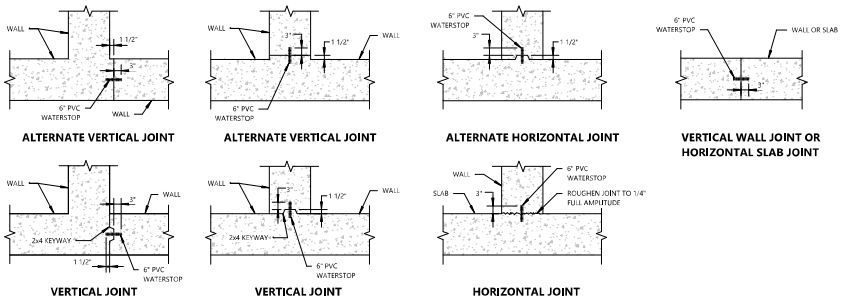
CORNER INTERSECTION

NOTES:

1. PROVIDE CLASS B SPLICE LENGTHS, UNO.
2. VERTICAL REINFORCING NOT SHOWN.
3. FOR SIZE AND SPACING OF REINFORCING, SEE SECTIONS

S301 WALL REINFORCEMENT

SCALE: NTS



S302 WATERSTOP POSITION

SCALE: NTS

CONCRETE PROTECTION FOR REINFORCEMENT (A)

MEMBER		EXPOSED TO: AIR	WEATHER & AIR OVER LIQUID	EARTH & LIQUID	SALT WATER
FOOTING		—	—	2" (B)	4"
WALL, COLUMN, BEAM		1 1/2"	2"	2" (B)	3" (B)
RLG SLAB	TOP	1 1/2" (C)	2"	2"	3"
	BOTTOM	1" (D)	2"	2" (B)	3" (B)
TANK BASE SLAB	TOP	N/A	N/A	3"	N/A
	BOTTOM	N/A	N/A	3"	N/A

NOTES:

A. APPLICABLE TO ALL CAST-IN-PLACE CONCRETE UNO

B. INCREASE 1 INCH WHEN CAST AGAINST EARTH

C. 3/4 INCH WHEN MEMBRANE OR WEARING SURFACE IS USED

D. 1-1/2 INCH WHERE REQUIRED TO CLEAR WATERSTOP

MINIMUM REINFORCING BAR SPLICE LENGTHS (IN)
fy=60,000 psi f'c:4,500 psi

BAR SIZE	TOP BARS	OTHER BARS
4	20	16
5	23	17
6	27	21
7	40	31
8	45	35
9	51	39
10	58	44
11	64	49

NOTES:

A. TABLE IS BASED ON NORMAL WEIGHT CONCRETE, UNCOATED BARS, CLEAR SPACING NOT LESS THAN FOUR BAR DIAMETERS, AND CLEAR COVER NOT LESS THAN TWO BAR DIAMETERS.

B. WHERE CLEAR SPACING BETWEEN BARS IS LESS THAN FOUR BAR DIAMETERS, OR CLEAR COVER IS LESS THAN TWO BAR DIAMETERS, INCREASE SPLICE LENGTHS SHOWN BY 67%.

C. TOP BARS = HORIZONTAL SLAB BARS WITH MORE THAN 12" OF CONCRETE CAST BELOW THE BARS. NOT APPLICABLE TO HORIZONTAL WALL REINFORCING.

D. FOR CONCRETE COMPRESSIVE STRENGTHS, f'_c, OTHER THAN 4,500 PSI, MULTIPLY THE VALUES BY THE SQUARE ROOT OF 4,500 DIVIDE BY THE SQUARE ROOT OF f'_c

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Date: 2025.11.05 07:04:36-05'00'

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CLIENT INFO:

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CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

REV.	MM/DD/YYY	DESCRIPTION

JOB NO:	0224539.48
DATE:	NOVEMBER 2025
SCALE:	NO SCALE
DESIGNED BY:	JBH
DRAWN BY:	TPK
CHECKED BY:	SJT
FILENAME:	

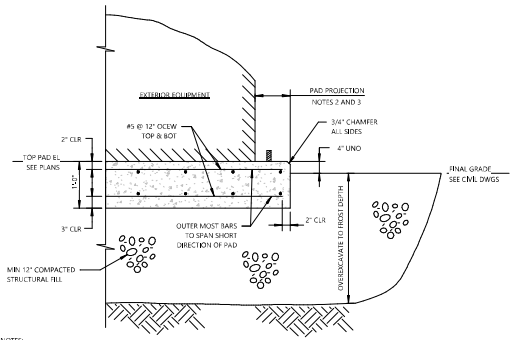
DRAWING TITLE:

STRUCTURAL CONCRETE TANK DETAILS

DRAWING NO:

S-930

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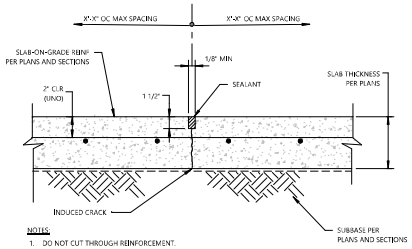


NOTES:

1. SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR EQUIPMENT AND EQUIPMENT PAD LOCATIONS, QUANTITIES, AND LAYOUT.
2. EQUIPMENT PAD PROJECTIONS PAST FACE OF MECHANICAL EQUIPMENT:
   FOR ANCHOR RODS GREATER THAN 5/8" DIA: MINIMUM 9-INCH PROJECTION
   FOR ANCHOR RODS 5/8" DIA OR LESS: MINIMUM 6-INCH PROJECTION
3. TOP OF PAD SHALL BE LEVEL WITHIN 1/8-INCH.
4. PROVIDE SACK-RUBBED FINISH TO ALL EXPOSED SIDES OF EQUIPMENT PAD AND A BROOM FINISH TO THE TOP SURFACE.
5. PROVIDE NON-FROST SUSCEPTIBLE COMPACTED STRUCTURAL FILL UNDER PAD FOOTPRINT TO FROST DEPTH TO PREVENT FROST HEAVE. IF OVEREXCAVATION IS NOT FEASIBLE, PROVIDE 3-INCH RIGID INSULATION UNDER ENTIRE PAD AND EXTENDING A MINIMUM OF 2-1 BEYOND ALL SIDES OF THE EQUIPMENT PAD. PLACE CONCRETE DIRECTLY ON TOP OF RIGID INSULATION AND PROVIDE A MINIMUM OF 6-INCHES OF SOIL ABOVE INSULATION LAYER WHERE INSULATION EXTENDS BEYOND CONCRETE PAD.
6. ANCHOR RODS SHALL BE 316 AISI STAINLESS STEEL, UNLESS NOTED OTHERWISE.
7. PRIOR TO EQUIPMENT INSTALLATION, APPLY CURE AND SEAL COMPOUND TO EQUIPMENT PAD SURFACES.

320 EXTERIOR EQUIP PAD

SCALE: NTS

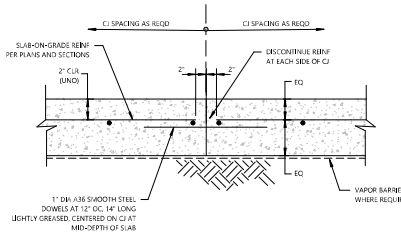


NOTES:

1. DO NOT CUT THROUGH REINFORCEMENT.
2. JOINT SHALL BE SAWN WITHIN 4 TO 12 HOURS AFTER PLACEMENT.

S321 SLAB SAWED JOINT (SJ)

SCALE: NTS

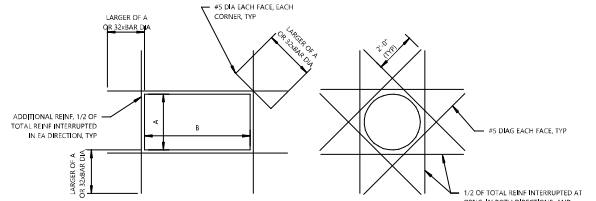


NOTES:

1. CONSTRUCTION JOINTS ARE REQUIRED WHEN FLOOR SLABS ARE NOT CONSTRUCTED IN A SINGLE MONOLITHIC CONCRETE PLACEMENT
2. SLAB CONSTRUCTION JOINTS MAY OR MAY NOT BE SHOWN ON PLANS
3. CONTRACTOR IS RESPONSIBLE FOR DETERMINING QUANTITY AND LOCATIONS OF CONSTRUCTION JOINTS TO LIMIT DAILY SLAB PLACEMENTS BASED ON PRIOR EXPERIENCE, ANTICIPATED CREW SIZE, CONCRETE DELIVERY LIMITATIONS, AND ENVIRONMENTAL FACTORS

S322 SLAB CONSTRUCTION JOINT (CJ)

SCALE: NTS

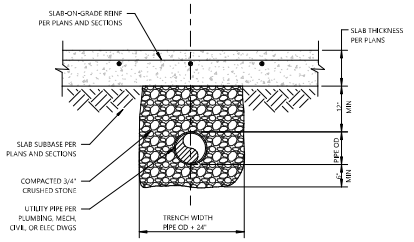


NOTES:

1. THESE DETAILS APPLY EXCEPT WHERE SHOWN OTHERWISE
2. ADDITIONAL BARS NOT REQUIRED WHERE THE EDGE OF OPENING IS WITHIN 6 INCHES OF A BEAM OR WALL AND PARALLEL THERETO
3. PROVIDE HOOKED BARS WHERE EXTENSIONS SHOWN ARE NOT POSSIBLE
4. FOR OPENING AT OR NEAR BASE OF WALL, ADDITIONAL DOWELS ARE REQUIRED AS INDICATED

S323 REINF AT OPENINGS

SCALE: NTS



S324 UNDERSLAB UTILITY TRENCH

SCALE: NTS

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PE SEAL:



Scott Michael Hawk

60% DESIGN NOT FOR CONSTRUCTION

CLIENT INFO:

RADIUS RECYCLING
CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

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DRAWING TITLE:

STRUCTURAL CONCRETE FLOOR SLAB & WALL FOOTING DETAILS

DRAWING NO:

S-932

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GENERAL NOTES

1. THIS SHEET REPRESENTS A GENERAL LIST OF SYMBOLS AND ABBREVIATIONS. NOT ALL ITEMS SHOWN WILL APPEAR ON THE CONTRACT DRAWINGS. ADDITIONAL ABBREVIATIONS, NOTES, OR LEGENDS MAY APPEAR TO INDICATE SPECIFIC CONDITIONS.

2. EQUIPMENT, PIPING, APPURTENANCES, ETC. SHOWN IN A "LIGHTER" LINE TYPE INDICATE THE ASSOCIATED ITEM IS "EXISTING". EQUIPMENT, PIPING, APPURTENANCES, ETC. SHOWN IN A "DARKER" LINE TYPE INDICATES THE ASSOCIATED ITEM IS "NEW". ITEMS SHOWN IN A "LIGHT" LINE TYPE WITH A "NOT IN CONTRACT" (N.I.C.) DESIGNATOR HAVE BEEN PROVIDED FOR INFORMATIONAL PURPOSES ONLY AND ARE NOT IN THE CONTRACT SCOPE. THE CONTRACTOR SHALL NOTE THAT ALL EXISTING INFORMATION ON THE DRAWINGS IS SHOWN WITH A LIGHTER LINE WEIGHT WITH THE EXCEPTION OF SCANNED IMAGES UTILIZED FROM PREVIOUS CONSTRUCTION PROJECTS. SCANNED IMAGES ARE NOT TO SCALE.

3. ALL EQUIPMENT, DIMENSIONS, PIPING, SYSTEM LAYOUTS, APPURTENANCES, ETC., HAVE BEEN LAID OUT AND SELECTED BY THE ENGINEER TO ALLOW FOR EASE OF MAINTENANCE. IF THE CONTRACTOR PROPOSES AN ARRANGEMENT WHICH DIFFERS FROM THAT WHICH HAS BEEN SPECIFIED OR INDICATED ON THE CONTRACT DRAWINGS, THE CONTRACTOR SHALL PREPARE AND SUBMIT DETAILED ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING, PROCESS AND INSTRUMENTATION, ELECTRICAL, HVAC, AND CONTROL DRAWINGS, EQUIPMENT LISTS, ETC. FOR REVIEW BY THE ENGINEER AS APPLICABLE. A SUBMITTAL SHALL SPECIFICALLY OUTLINE ALL NECESSARY CHANGES AND CONTAIN ALL FEATURES OF THE ALTERNATE EQUIPMENT AND/OR PROCESS SYSTEM WHICH IS BEING PROPOSED. THE INFORMATION SHALL INCLUDE BUT IS NOT LIMITED TO: PLAN/SECTION DRAWINGS, SCHEMATICS, AND ALL THE NECESSARY APPURTENANCES REQUIRED SUCH AS SUPPLIES, ELECTRICAL WIRING, CONTROLS, ETC. ANY SUCH CHANGES (IF APPROVED BY THE ENGINEER) SHALL BE AT NO ADDITIONAL COST TO THE OWNER. THE CONTRACTOR SHALL ASSUME ALL COST AND LIABILITY FOR SATISFACTORILY ACCOMPLISHING ALL NECESSARY CHANGES AS REQUIRED FOR EQUIPMENT AND/OR ARRANGEMENTS WHICH DIFFER FROM THE CONTRACT DOCUMENTS. NO CHANGE IN CONTRACT TIME SHALL BE GRANTED FOR EQUIPMENT AND/OR ARRANGEMENTS WHICH DIFFER FROM THE CONTRACT DOCUMENTS. REFER TO THE CONTRACT SPECIFICATIONS FOR ADDITIONAL DETAILS.

4. DIELECTRIC COUPLINGS, FLANGES, UNIONS, ETC., SHALL BE PROVIDED AT ALL CONNECTIONS OF DISSIMILAR METALLIC PIPING.

5. THE FOLLOWING MECHANICAL DRAWINGS MAY NOT SHOW ALL VALVES, GAUGES, SWITCHES, OPERATORS, DRAINS, VENTS, COUPLINGS, ETC., FOR COMPLETE AND OPERATIONAL SYSTEMS. SOME SMALL DIAMETER PIPING RUNS (2" AND SMALLER) MAY NOT BE SHOWN IN THEIR ENTIRETY FOR CLARITY ON THE DRAWINGS. SMALL DIAMETER PIPING IS GENERALLY SHOWN SCHEMATICALLY AND DIAGRAMMATICALLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD ROUTING ALL PIPING TO AVOID INTERFERENCES WITH OTHER DISCIPLINES OF CONSTRUCTION. ALL PIPE ROUTING SHALL BE AS APPROVED BY THE ENGINEER. PROVIDE, INSTALL, AND TEST ALL PIPING SYSTEMS AS SPECIFIED AND AS SHOWN ON THE PROCESS AND INSTRUMENTATION AND MECHANICAL DRAWINGS. ALL PIPING AND APPURTENANCES SHALL BE PROVIDED FOR COMPLETE AND OPERATIONAL SYSTEMS.

6. SIZES OF EQUIPMENT FOUNDATIONS AND CONCRETE PADS WHICH HAVE BEEN INDICATED ON THE DRAWINGS ARE APPROXIMATE. EXACT DIMENSIONS FOR ALL FOUNDATIONS AND CONCRETE PADS SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD FOR THE SPECIFIC EQUIPMENT PROVIDED. UNLESS OTHERWISE SPECIFIED OR INDICATED ON THE DRAWINGS ALL FLOOR MOUNTED EQUIPMENT SHALL BE PLACED ON CONCRETE PADS WHICH CONFORM TO THE DETAILS AND REQUIREMENTS SHOWN ON THE DRAWINGS.

7. NOT ALL AND ONLY CERTAIN TYPES OF PIPING SUPPORTS HAVE BEEN SHOWN ON THE DRAWINGS. PIPE SUPPORTS WHICH HAVE BEEN INDICATED ON THE DRAWINGS ARE SHOWN TO CONVEY THE INTENT OF THE PROCESS MECHANICAL DESIGN FOR A PARTICULAR SYSTEM. THE SUPPORTS WHICH HAVE BEEN SHOWN ARE NOT INTENDED TO REPRESENT A COMPLETE SYSTEM. ALL PIPING SUPPORTS, INCLUDING THOSE WHICH HAVE BEEN SHOWN FOR CONCEPTUAL PURPOSES, SHALL BE DESIGNED, FURNISHED, AND INSTALLED BY THE CONTRACTOR AS SPECIFIED AND AS APPROVED BY THE ENGINEER. ALL PIPING WHICH IS ADJACENT TO VALVES, COUPLINGS, INSTRUMENTS, EQUIPMENT, AND APPURTENANCES SHALL BE PROPERLY SUPPORTED AND/OR ANCHORED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE PIPING MANUFACTURER. ALL PIPING SHALL BE INDEPENDENTLY SUPPORTED. THE SUPPORT OF PIPING FROM OTHER ASSOCIATED PIPING SHALL NOT BE ACCEPTABLE UNDER ANY CIRCUMSTANCES.

8. ALL VALVE AND GATE ACTUATORS SHALL BE PROVIDED WITH A SQUARE OPERATING NUT FOR OPERATION WITH A POWERNUT ALL AND ONLY CERTAIN TYPES OF VALVE AND GATE OPERATORS (EG. HAND WHEELS, CHAIN WHEELS, HAND CRANKS, LEVERS, ETC.) HAVE BEEN SHOWN FOR CLARITY. ALL VALVE AND GATE OPERATORS SHALL BE LOCATED TO ALLOW CONVENIENT AND UNOBSTRUCTED ACCESS FOR OPENING/CLOSING AS REQUIRED. THE FINAL INSTALLED ORIENTATION OF ALL OPERATORS SHALL BE AS APPROVED BY THE ENGINEER. UNDER NO CIRCUMSTANCES SHALL VALVES BE INSTALLED WITH OPERATORS OR STEMS ORIENTED IN THE VERTICAL DOWNWARD POSITION.

9. FIELD LOCATE AND PROVIDE TAGS ON ALL PROCESS VALVES. THE PROCESS VALVE IDENTIFICATION NUMBERS AND TAGS SHALL BE AS INDICATED ON THE PROCESS AND INSTRUMENTATION DRAWINGS. REFER TO THE CONTRACT SPECIFICATIONS FOR ADDITIONAL DETAILS. SUBMIT SAMPLE TAG NUMBERING FOR REVIEW PRIOR TO ORDERING.

10. PORTIONS OF NON-PROCESS MECHANICAL ITEMS (STRUCTURAL, HVAC, AND PLUMBING) MAY BE SHOWN ON THE MECHANICAL DRAWINGS FOR CLARITY AND COORDINATION BETWEEN DISCIPLINES DURING CONSTRUCTION. REFER TO THE APPROPRIATE DRAWINGS AND/OR SPECIFICATIONS FOR ADDITIONAL DETAILS AND REQUIREMENTS.

11. ALL PROCESS PIPING SYSTEMS SHALL BE PROVIDED WITH VENTS AT HIGH POINTS AND DRAINS AT LOW POINTS. PROVIDE ADDITIONAL VENT AND DRAIN CONNECTIONS AS INDICATED ON THE DRAWINGS. FIELD ROUTE DRAIN PIPING TO END TERMINATION AS DIRECTED BY ENGINEER OR AS INDICATED ON THE DRAWINGS.

12. ALL PIPING SHALL BE INSTALLED SUCH THAT ANY PIPE, LAYER OF PIPING, OR EQUIPMENT CAN BE REMOVED WITHOUT DISTURBING REMAINING/ADJACENT PIPING AND ASSOCIATED PIPE SUPPORTS.

13. UNLESS OTHERWISE SPECIFIED OR INDICATED ON THE DRAWINGS ALL FLOOR, CONCRETE WALL/TANK, PENB, AND CMU WALL PENETRATIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DETAILS SHOWN ON THE DRAWINGS. IF APPROVED BY THE ENGINEER, THE CONTRACTOR MAY SUBSTITUTE ALTERNATE PENETRATION METHODS PROVIDED THAT THEY MEET THE INTENDED DESIGN REQUIREMENTS AND FUNCTIONALITY.

14. THE NUMBER OF UNIONS AND COUPLINGS SHOWN IS APPROXIMATE. PROVIDE ALL UNIONS OR DISMANTLING COUPLINGS WHETHER THEY HAVE BEEN SHOWN ON THE DRAWINGS OR NOT. UNIONS AND DISMANTLING COUPLINGS SHALL BE PROVIDED ON ALL PIPING WITH WELDED, THREADED, OR SOLVENT CEMENTED JOINTS AT ALL EQUIPMENT CONNECTIONS, AT A MINIMUM OF EVERY 50 LINEAR FEET, AND IN BRANCH LINES TO ALLOW CONVENIENT REMOVAL OF PIPING, EQUIPMENT, AND APPURTENANCES.

15. UNLESS OTHERWISE SPECIFIED OR INDICATED ON THE DRAWINGS, ALL PENETRATIONS THROUGH EXISTING STRUCTURAL WALLS, FOUNDATIONS, AND SLABS SHALL BE CORE DRILLED AND SEALED WITH MECHANICAL SEALS. ALL OPENINGS SHALL BE COMPATIBLE WITH REQUIRED PIPING AND STANDARD SEAL SIZES.

16. AFTER INSTALLATION IS COMPLETE ALL PIPING SYSTEMS SHALL BE PRESSURE TESTED. ALL LEAKS OR OTHER ASSOCIATED DEFECTS SHALL BE CORRECTED AND THE PIPING SHALL BE RETESTED AT NO ADDITIONAL COST TO THE OWNER. REFER TO SPECIFICATION DIVISION 40 "PROCESS INTEGRATION" FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

17. UNLESS OTHERWISE SPECIFIED OR INDICATED ON THE DRAWINGS, PROVIDE REINFORCED CONCRETE PADS UNDER ALL EQUIPMENT, CONTROL PANELS, PIPE SUPPORTS, EQUIPMENT SUPPORTS, ETC., PROVIDE A MINIMUM THICKNESS OF 6 INCHES. PROVIDE INCREASED PAD THICKNESS AS INDICATED ON THE DRAWINGS.

18. THE CONTRACTOR SHALL NOT SCALE DISTANCES OFF THE DRAWINGS. WRITTEN DIMENSIONS SHALL PREVAIL OVER SCALED DIMENSIONS. REPORT ANY AND ALL DIMENSIONAL DISCREPANCIES TO THE ENGINEER.

19. UNLESS OTHERWISE SPECIFIED OR INDICATED ON THE DRAWINGS: ALL VERTICALLY ORIENTED REDUCTION FITTINGS SHALL BE CONCENTRIC TYPE AND ALL HORIZONTALLY ORIENTED REDUCTION FITTINGS SHALL BE ECCENTRIC TYPE. ALL REDUCERS SHALL BE OF THE SAME MATERIAL AS THE CONNECTING PIPING UNLESS OTHERWISE INDICATED. ECCENTRIC REDUCERS IN HORIZONTAL PIPING SHALL BE INSTALLED WITH FLAT SIDE UP.

20. UNLESS OTHERWISE SPECIFIED OR INDICATED ON THE DRAWINGS, ALL "METALLIC" PIPING SHALL BE CONNECTED THROUGH STANDARD ANSI FLANGED CONNECTIONS OR WELDED CONNECTIONS. PLASTIC PIPING CONNECTIONS SHALL BE SOLVENT CEMENT WELDED. PROVIDE FLANGED ATTACHMENTS AS REQUIRED AND AS INDICATED ON THE DRAWINGS FOR CONNECTION TO EQUIPMENT AND APPURTENANCES. UNLESS OTHERWISE SPECIFIED OR INDICATED ON THE DRAWINGS, THE USE OF ALTERNATIVE JOINTING METHODS, INCLUDING BUT NOT LIMITED TO: COUPLINGS, FLANGED ADAPTORS, AND/OR GROOVED "VICTAULIC TYPE" CONNECTIONS SHALL NOT BE ACCEPTABLE WITHOUT PRIOR WRITTEN APPROVAL OF THE ENGINEER.

21. WHERE NEW PIPING IS TO BE CONNECTED TO EXISTING PIPING, PROVIDE ALL ADAPTORS, FITTINGS, AND ADDITIONAL PIPING FOR A COMPLETE AND OPERATIONAL SYSTEM. THE USE OF UNI-FLANGES SHALL NOT BE ACCEPTABLE UNLESS OTHERWISE SPECIFIED OR INDICATED ON THE DRAWINGS.

22. ALL VALVES, PIPING, AND PIPING SPECIALTIES INCLUDING BUT NOT LIMITED TO PLAIN END PIPE, STRAINERS, ETC., SHALL BE INDEPENDENTLY SUPPORTED FROM STRUCTURAL MEMBERS AS APPROVED BY THE ENGINEER. THE SUPPORT OF PIPING AND APPURTENANCES FROM OTHER ASSOCIATED PIPING SHALL NOT BE ACCEPTABLE.

23. SOME REDUCTION FITTINGS, EXPANSION FITTINGS, COUPLINGS, ETC. HAVE BEEN OMITTED FROM THE MECHANICAL DRAWINGS FOR CLARITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL PIPING, FITTINGS, COUPLINGS, APPURTENANCES, ETC. FOR COMPLETE OPERATIONAL PIPING SYSTEMS. UNLESS OTHERWISE SPECIFIED OR INDICATED ON THE DRAWINGS, ALL FITTINGS SHALL BE OF THE SAME TYPE, MATERIAL, STYLE, PRESSURE RATING AND DUTY AS THE CONNECTING PIPING.

VALVE SYMBOLS

- STOP COCK
- BUTTERFLY VALVE
- GATE/KNIFE GATE VALVE (ONE LINE)
- GATE VALVE (TWO LINE)
- KNIFE GATE VALVE (TWO LINE)
- PLUG VALVE (ONE LINE)
- PLUG VALVE (TWO LINE)
- GLOBE VALVE
- BALL VALVE
- PINCH VALVE
- OVERPRESSURE RELIEF VALVE
- AIR RELEASE VALVE
- DIAPHRAGM VALVE
- UNION
- SOLENOID VALVE
- THREE WAY VALVE
- CHECK VALVE (ONE LINE)
- CHECK VALVE (TWO LINE)
- MUD VALVE
- SLIDE GATE/STOP PLATE/WEIR GATE
- PRESSURE REGULATING VALVE
- TELESCOPING VALVE
- MOTOR OPERATED VALVE
- BALL VALVE (NORMALLY CLOSED)
- NEEDLE VALVE
- BACK PRESSURE VALVE

FLUID DESIGNATIONS

- AE - AERATION TANK EFFLUENT
- AS - ALUMINUM SULFATE
- BS - SODIUM BISULFITE
- BYP - BYPASS LINE
- CCS - CHEMICAL CLEANING SOLUTION
- CN - CENTRATE
- CA - COMPRESSED AIR
- CW - CITY WATER
- DRN - DRAIN
- DS - DEWATERED SLUDGE (CAKE)
- EFF - FINAL EFFLUENT
- FCL - FERRIC CHLORIDE
- FES - FINAL EFFLUENT SAMPLE
- GRT - GRIT SLURRY
- HWE - HEADWORKS EFFLUENT
- HYP - SODIUM HYPOCHLORITE
- IR - INTERNAL RECYCLE
- IS - INFLUENT SAMPLE
- LPA - LOW PRESSURE AIR
- MLSS - MIXED LIQUOR SUSPENDED SOLIDS
- MRC - MEMBRANE RECYCLE
- NPW - PLANT WATER (TREATED EFFLUENT)
- OD - ODOROUS AIR "FOUL"
- OV - OVERFLOW
- P - PROTECTED WATER
- PE - PRIMARY EFFLUENT
- PL - POLYMER SOLUTION
- POLY - BLENDED POLYMER
- PRM - MEMBRANE PERMEATE
- PSC - PRIMARY SCUM
- PSL - PRIMARY SLUDGE
- RCW - RECYCLED WATER
- RAS - RETURN ACTIVATED SLUDGE
- RWW - RAW WASTE WATER
- SA - SULFURIC ACID
- SC - SCUM
- SCR - SCREENINGS
- SD - STORM DRAIN
- SE - SECONDARY EFFLUENT
- SEP - SEPTAGE
- SH - SODIUM HYDROXIDE (CAUSTIC)
- SN - SUPERNATANT
- SPD - SUMP PUMP DISCHARGE
- SS - SANITARY SEWER
- SSC - SECONDARY SCUM
- SSL - SECONDARY SLUDGE
- SW - SEAL WATER
- TE - TERTIARY EFFLUENT
- TWAS - THICKENED WASTE ACTIVATED SLUDGE
- TW - POTABLE TOWN WATER (COLD)
- UD - UNDERDRAIN
- UVE - UV SYSTEM EFFLUENT
- V - VENT
- WAS - WASTE ACTIVATED SLUDGE

EQUIPMENT DESIGNATIONS

- AC - AIR COMPRESSOR
- AG - AGITATOR
- B - BLOWER
- CBA - COARSE BUBBLE AERATION SYSTEM
- CC - CROSS COLLECTOR
- CF - CENTRIFUGE
- CV - CONVEYOR
- CY - GRIT CYCLONE
- D - DECANTER
- DC - DAVIT CRANE
- F - FAN
- FA - FLOATING AERATOR
- FBA - FINE BUBBLE AERATION SYSTEM
- FM - FLOATING MIXER
- G - GRINDER
- GC - GRIT CLASSIFIER
- H - HEATER
- HT - HEAT TRACE
- ICM - INDUCTION CHEMICAL MIXER
- M - MOTOR
- MC - MACERATOR
- MG - MOTOR-OPERATED GATE
- MV - MOTOR-OPERATED VALVE
- MX - MIXER (VERTICAL SHAFT)
- O - ODOR CONTROL SYSTEM
- P - PUMP
- PC - PRIMARY CLARIFIER
- PDC - POWER DISTRIBUTION CENTER
- PL - POLYMER FEED SYSTEM
- RT - RECEIMER TANK (COMPRESSED AIR)
- S - SCREEN
- SC - SECONDARY CLARIFIER
- SCL - SCUM COLLECTOR
- SG - SLIDE GATE
- SLG - SLUICE GATE
- SM - SUBMERSIBLE MIXER
- SMP - SAMPLER
- SMU - SUBMERSIBLE MEMBRANE UNIT
- SP - STOP PLATE
- SRS - SEPTAGE RECEIVING STATION
- T - TANK
- TF - TERTIARY FILTER
- UV - ULTRAVIOLET DISINFECTION SYSTEM
- WG - WEIR GATE
- WP - WASH PRESS

GENERAL ABBREVIATIONS

- ACFM - ACTUAL CUBIC FEET PER MINUTE
- AFF - ABOVE FINISHED FLOOR
- ALGNMT - ALIGNMENT
- BF - BLIND FLANGE
- ECC - ECCENTRIC
- EL - ELEVATION
- FF - FINISHED FLOOR
- FLG - FLANGE
- FL - FLOOR
- FS - FLOW SWITCH
- GPD - GALLONS PER DAY
- GPH - GALLONS PER HOUR
- GPM - GALLONS PER MINUTE
- HB - HOSE BIB
- HWL - HIGH WATER LEVEL
- ICFM - INLET CUBIC FEET PER MINUTE
- INCL - INCLUDED WITH PURCHASED EQUIPMENT
- INV - INVERT
- LWL - LOW WATER LEVEL
- Ma - MILLIAMP
- MGD - MILLION GALLONS PER DAY
- MG/L - MILLIGRAMS PER LITER
- MHW - MEAN HIGH WATER
- MJ - MECHANICAL JOINT
- MLW - MEAN LOW WATER
- MSL - MEAN SEA LEVEL
- NTS - NOT TO SCALE
- O.L. - OVERLOAD
- OC - ON CENTER
- PE - PLAIN END
- PLC - PROGRAMMABLE LOGIC CONTROLLER
- PPD - POUND PER DAY
- PSIA - POUNDS PER SQUARE INCH ABSOLUTE
- PSIG - GAUGE POUNDS PER SQUAREINCH
- RED - REDUCER
- SCFM - CUBIC FEET PER MINUTE (STANDARD CONDITIONS)
- SCH - SCHEDULE
- SP - SET POINT (TYPICAL)
- STDBY - STANDBY
- TDH - TOTAL DYNAMIC HEAD
- TYP - TYPICAL
- UNO - UNLESS NOTED OTHERWISE
- VCP - VENDOR SUPPLIED CONTROL PANEL
- WS - WATER SURFACE

PIPE MATERIALS

- CI/X - CAST IRON PIPE
- CU/1 - COPPER PIPE & TUBING
- DI/1 - DUCTILE IRON PIPE (FLANGED)
- DI/2 - DUCTILE IRON PIPE (MECHANICAL JOINT)
- DI/3 - DUCTILE IRON (PUSH-ON JOINT)
- DI/4 - DUCTILE IRON (RIGID GROOVED END)
- PVC/1 - PVC PIPE (SOCKET WELDED - SCH. 80)
- PVC/2 - PVC TUBING
- PVC/3 - PVC DOUBLE CONTAINMENT PIPE
- PVC/4 - PVC PIPE (CPVC)
- PVC/5 - PVC PIPE (BURIED SDR 35)
- PVC/6 - PVC PIPE (BURIED SDR 18)
- PVC/7 - PVC PIPE (SOCKET WELDED - SCH. 40)
- SS/1 - STAINLESS STEEL PIPE (SCH. 10S)
- SS/2 - STAINLESS STEEL PIPE (SCH. 40)
- SS/3 - STAINLESS STEEL TUBING
- SS/4 - STAINLESS STEEL HOSE
- CS/1 - CARBON STEEL PIPE
- CS/2 - TEFLON LINED STEEL PIPE (FLANGED)
- PE/1 - POLYETHYLENE PIPING (SOCKET WELDED)
- PE/2 - POLYETHYLENE TUBING (HIGH DENSITY)
- PE/3 - POLYETHYLENE TUBING (LOW DENSITY)
- PE/4 - POLYETHYLENE PIPING (BURIED) - DR-11
- PE/5 - POLYETHYLENE PIPING (BURIED STORM DRAIN)



PROCESS PIPE INSULATION TYPE LISTING

- I/1 - FIBROUS GLASS PIPE INSULATION
- I/2 - ELASTOMERIC FOAM PIPE INSULATION
- I/3 - MINERAL WOOL PIPE INSULATION
- I/4 - POLYISOCYANURATE PIPE INSULATION

INSULATION JACKET TYPE LISTING

- J/1 - PVC INSULATION JACKET
- J/2 - ALUMINUM INSULATION JACKET
- J/3 - STAINLESS STEEL JACKET
- J/4 - SHEET MEMBRANE JACKET

NOTES:

1. REFER TO SPECIFICATION 40 42 13 "PROCESS PIPE INSULATION" FOR ADDITIONAL DETAILS AND REQUIREMENTS.

VALVE, STRAINER & COUPLING TYPE LISTING

SPECIALTY VALVES (TYPE V0#)

- V00 - BACK PRESSURE VALVE
- V01 - METALLIC PRESSURE REGULATING VALVE
- V02 - PVC PRESSURE REGULATING VALVE
- V03 - BACK FLOW PREVENTER (RPZ)
- V04 - METALLIC PRESSURE RELIEF VALVE
- V05 - PVC PRESSURE RELIEF VALVE
- V06 - WASTEWATER AIR RELEASE VALVE
- V07 - WASTEWATER AIR & VACUUM VALVE
- V08 - WASTEWATER COMBINATION AIR VALVE
- V09 - TELESCOPING VALVE

PLUG VALVES (TYPE V4#)

- V40 - METALLIC PLUG VALVE (FLANGED)
- V41 - BURIED PLUG VALVE (MECHANICAL JOINT)
- V42 - MUD VALVE (PLUG TYPE DRAIN VALVE)
- V43 - NOT USED
- V44 - NOT USED
- V45 - NOT USED
- V46 - NOT USED
- V47 - NOT USED
- V48 - NOT USED
- V49 - NOT USED

PINCH & DIAPHRAGM VALVES (TYPE V8#)

- V80 - PVC DIAPHRAGM VALVE
- V81 - METALLIC PINCH VALVE (CLOSED BODY)
- V82 - NOT USED
- V83 - NOT USED
- V84 - NOT USED
- V85 - NOT USED
- V86 - NOT USED
- V87 - NOT USED
- V88 - NOT USED
- V89 - NOT USED

GATE VALVES (TYPE V1#)

- V10 - KNIFE GATE VALVE (RESILIENT SEATED)
- V11 - KNIFE GATE VALVE (METAL SEATED)
- V12 - GATE VALVE (RESILIENT SEATED)
- V13 - GATE VALVE (METAL SEATED)
- V14 - BURIED GATE VALVE (RESILIENT SEATED)
- V15 - BURIED GATE VALVE (DOUBLE METAL DISK)
- V16 - PVC GATE VALVE
- V17 - BURIED INSERTION GATE VALVE (RESILIENT SEATED)
- V18 - NOT USED
- V19 - NOT USED

GLOBE & NEEDLE VALVES (TYPE V5#)

- V50 - METALLIC GLOBE VALVE
- V51 - PVC GLOBE VALVE
- V52 - METALLIC NEEDLE VALVE
- V53 - NOT USED
- V54 - NOT USED
- V55 - NOT USED
- V56 - NOT USED
- V57 - NOT USED
- V58 - NOT USED
- V59 - NOT USED

STRAINERS (TYPE S0#)

- S01 - PVC Y-STRAINER (CLEAR)
- S02 - METALLIC Y-STRAINER
- S03 - PVC SIMPLEX BASKET STRAINER
- S04 - METALLIC SIMPLEX BASKET STRAINER
- S05 - PVC DUPLEX BASKET STRAINER
- S06 - METALLIC DUPLEX BASKET STRAINER
- S07 - WATER FILTER
- S08 - NOT USED
- S09 - NOT USED
- S10 - NOT USED

BALL VALVES (TYPE V2#)

- V20 - PVC BALL VALVE (TRUE UNION SOCKET)
- V21 - PVC BALL VALVE (FLANGED)
- V22 - PVC BALL VALVE (THREADED)
- V23 - METALLIC BALL VALVE (FLANGED)
- V24 - METALLIC BALL VALVE (THREADED)
- V25 - STAINLESS STEEL BALL VALVE (FLANGED)
- V26 - STAINLESS STEEL BALL VALVE (THREADED)
- V27 - NOT USED
- V28 - NOT USED
- V29 - NOT USED

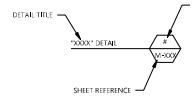
CHECK VALVES (TYPE V6#)

- V60 - PVC BALL CHECK VALVE
- V61 - PVC SWING CHECK VALVE
- V62 - METALLIC SWING CHECK VALVE
- V63 - METALLIC FLAP CHECK VALVE
- V64 - DOUBLE DISK SWING CHECK VALVE
- V65 - SLANTING DISK SWING CHECK VALVE
- V66 - WAFER STYLE SILENT CHECK VALVE
- V67 - GLOBE STYLE SILENT CHECK VALVE
- V68 - METALLIC BALL CHECK VALVE
- V69 - DUCK BILL CHECK VALVE

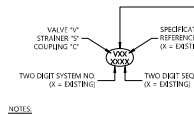
COUPLINGS (TYPE C##)

- C01 - SLEEVE TYPE COUPLINGS
- C02 - FLEXIBLE SLEEVE TYPE COUPLINGS
- C03 - FLEXIBLE SPLIT RING GROOVED END COUPLINGS
- C04 - FLEXIBLE SPLIT RING SHOULDERED END COUPLINGS
- C05 - RIGID SPLIT RING GROOVED END COUPLINGS
- C06 - RIGID SPLIT RING SHOULDERED END COUPLINGS
- C07 - SLEEVE TYPE FLANGED ADAPTORS
- C08 - STAINLESS STEEL SLEEVE TYPE FLANGED ADAPTORS
- C09 - SHORT BODY FLANGED ADAPTORS
- C10 - SPLIT TYPE FLANGED ADAPTORS
- C11 - LIQUID SERVICE EXPANSION JOINTS (FILLED ARCH)
- C12 - AIR SERVICE EXPANSION JOINTS (BELLOWS STYLE)
- C13 - QUICK CONNECT COUPLINGS
- C14 - RESTRAINED MECHANICAL JOINT COUPLINGS
- C15 - DUCTILE IRON EXPANSION JOINT
- C16 - EXPANSION JOINT

MECHANICAL DETAIL REFERENCE



VALVE, STRAINER & COUPLING TAG SYMBOL KEY



VALVE TYPE

- 1 GATE
- 2 BALL
- 3 BUTTERFLY
- 4 PLUG
- 5 GLOBE/NEEDLE
- 6 CHECK
- 7 ANGLE
- 8 PINCH OR DIAPHRAGM
- 9 3-WAY OR 4-WAY
- 0 SPECIAL (SEE SPECIFICATIONS)

NOTES:

1. REFER TO SPECIFICATION 40 05 23 "PROCESS VALVES AND STRAINERS FOR ADDITIONAL DETAILS AND REQUIREMENTS.
2. REFER TO SPECIFICATION 40 05 14 "PROCESS PIPE COUPLINGS & CONNECTORS FOR ADDITIONAL DETAILS AND REQUIREMENTS.

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Jason D. Jancatis

Digitally signed by Jason D. Jancatis
DN: CN=Jason D. Jancatis, E=jjancatis@woodardcurran.com, O=Woodard & Curran, Inc., OU=Jason D. Jancatis
Reason: I am approving this document
Location:
Contact Info: jjancatis@woodardcurran.com
Date: 2025.11.05 08:08:59-05'00'

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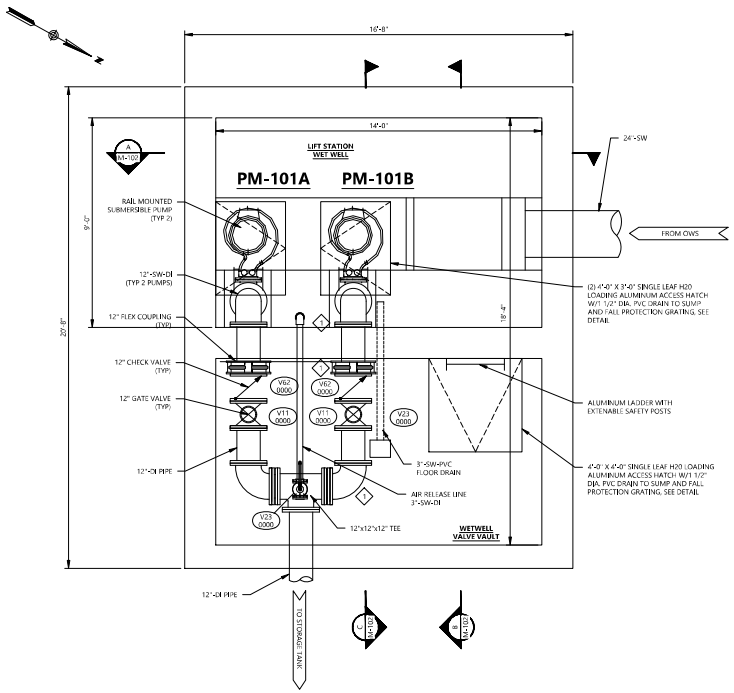
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MECHANICAL LEGEND

DRAWING NO:
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PUMP STATION PLAN

SCALE: 3/8" = 1'-0"

SHEET GENERAL NOTES:

1. PRESSURE GAUGES NOT SHOWN FOR CLARITY.
2. FLOW TRANSMITTER SHALL BE LOCATED AS SHOWN ON ELECTRICAL DRAWINGS.

SHEET KEYNOTES:

1 CONTRACTOR TO HEAT TRACE AND INSULATE ALL PIPING WITHIN THE VALVE VAULT FOR FREEZE PROTECTION.

4" 3" 2" 1" 0 3" 6"

BAR SCALE
3/8" = 1'-0"
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STATE OF NEW HAMPSHIRE
JASON D. JANCAITIS
No. 11047
LICENSED PROFESSIONAL ENGINEER

Jason D. Jancaitis

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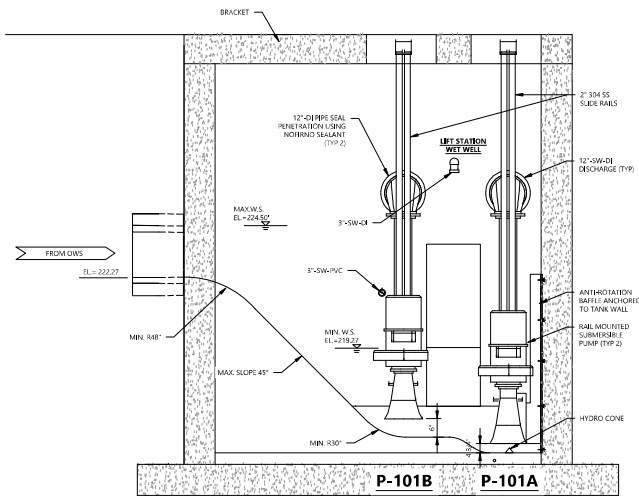
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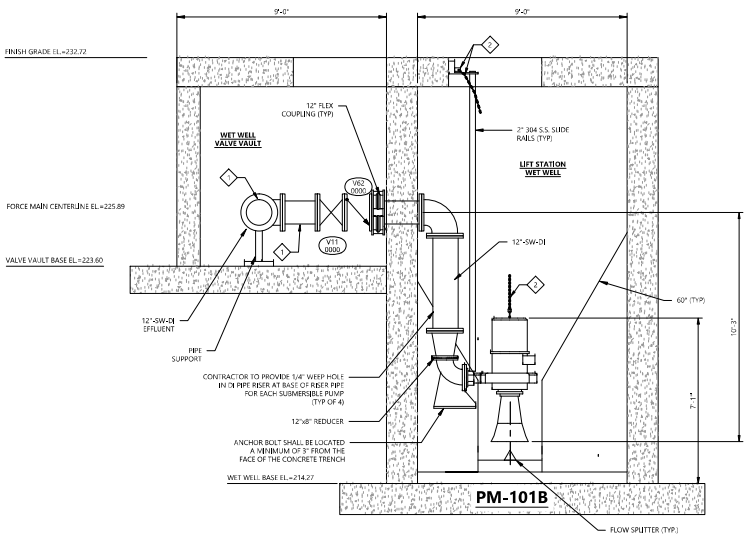
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PUMP STATION
PLAN

DRAWING NO:
M-101

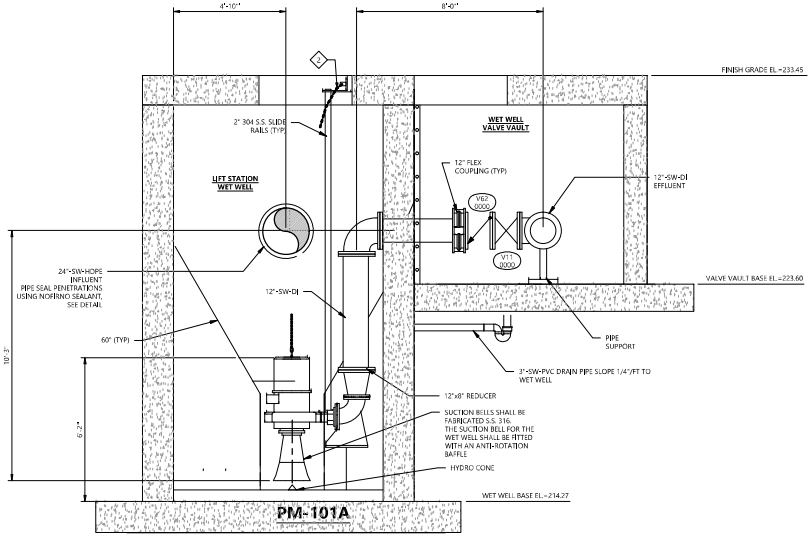
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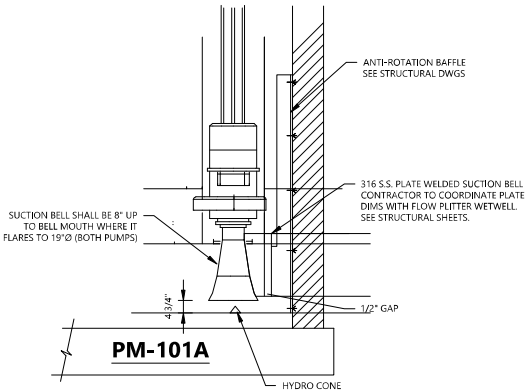
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SCALE: 3/8" = 1'-0"



SECTION (B, M-101)
SCALE: 3/8" = 1'-0"



SECTION (C, M-101)
SCALE: 3/8" = 1'-0"



1 **ANTI-ROTATION BAFFLE DETAIL**
SCALE: NTS

SHEET GENERAL NOTES:

1. PRESSURE GAUGES NOT SHOWN FOR CLARITY.
2. FLOW TRANSMITTER SHALL BE LOCATED AS SHOWN ON ELECTRICAL DRAWINGS.
3. PROVIDE A MINIMUM 6" CLEAR BETWEEN PIPE PENETRATIONS AND STRUCTURE JOINTS.

SHEET KEYNOTES:

1 CONTRACTOR TO HEAT TRACE AND INSULATE ALL PIPING WITHIN THE VALVE VAULT FOR FREEZE PROTECTION.
2 INSTALL CHAIN BRACKET TO WALL OF WETWELL. BRACKET TO BE MARINE GRADE STAINLESS STEEL SECURE CHAIN TO BRACKET WITH MARINE GRADE STAINLESS STEEL SHACKLE. CHAIN SHALL BE MARINE GRADE STAINLESS STEEL RATED FOR 5000 LB LIFT (MIN).

PUMP STATION CONTROL ELEVATIONS

FINISH GRADE	232.72
RIM ELEVATION	232.72
WET WELL INTERIOR DIMENSIONS	14'x9'
VALVE VAULT INTERIOR DIMENSIONS	14'x9'
FORCE MAIN CENTERLINE ELEVATION	225.89
VALVE VAULT BASE ELEVATION	223.60
INLET STORM DRAIN	222.27
HIGH HIGH LEVEL ALARM	227.30
HIGH LEVEL ALARM	226.30
LAG PUMP ON	225.30
LEAD PUMP ON	224.30
BOTH PUMPS OFF	220.30
LOW LEVEL ALARM	219.30
LOW LOW LEVEL ALARM	218.30
WW BASE ELEVATION	214.27

BAR SCALE
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Jason D. Jancaitis, PE

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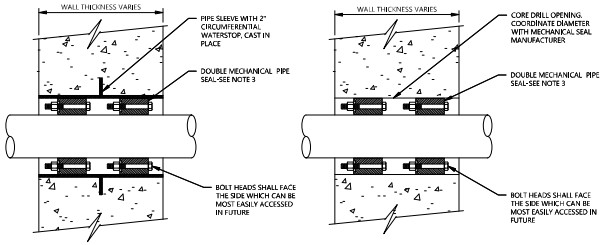
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DRAWING TITLE:
MECHANICAL PUMP STATION SECTIONS

DRAWING NO:
M-102

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NEW CONCRETE WALLS | **EXISTING CONCRETE WALLS**

NOTES:

1. REFER TO MECHANICAL, HVAC AND PLUMBING DRAWINGS FOR PIPE PENETRATION LOCATIONS, TYPES, SIZES AND MATERIALS.
2. MECHANICAL SEAL AND WALL SLEEVE SIZE SHALL BE SIZED AS RECOMMENDED BY MANUFACTURER FOR EACH APPLICATION.
3. SINGLE MECHANICAL SEAL MAY BE USED FOR PENETRATIONS WHERE BOTH SIDES OF WALL ARE DRY.
4. MECHANICAL SEAL SHALL BE FIRE-RATED TO MATCH FIRE-RATING OF WALLS. SEE DRAWINGS FOR LOCATIONS OF FIRE-RATED WALLS.
5. FOR INSULATED PIPING, INSTALL INSULATION CONTINUOUS THROUGH PENETRATIONS AND PROVIDE 304 S.S. PROTECTION SHIELDS WITH 360° COVERAGE BETWEEN SEALS AND INSULATION.
6. REFER TO SPECIFICATION SECTION 40 05 17 "PROCESS PIPE SLEEVES AND SEALS" FOR ADDITIONAL DETAILS AND REQUIREMENTS.

1 CONCRETE WALL DETAIL

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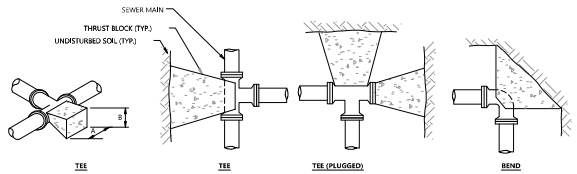


TABLE 1: 4" THRU 10" FITTINGS				
SOIL TYPE	TEES		BENDS	
	A	B	A	B
SOFT CLAY	48"	24"	48"	24"
SAND	24"	24"	24"	24"
GRAVEL	24"	18"	24"	18"

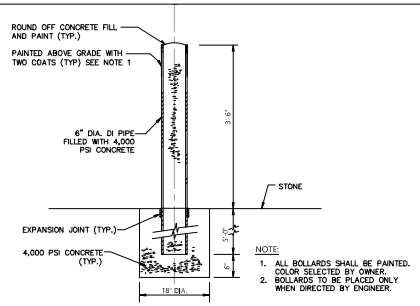
TABLE 2: 12" THRU 16" FITTINGS				
SOIL TYPE	TEES		BENDS	
	A	B	A	B
SOFT CLAY	60"	36"	72"	36"
SAND	36"	30"	48"	30"
GRAVEL	30"	24"	40"	24"

NOTES:

1. CONCRETE FOR ALL THRUST BLOCKS TO BE MINIMUM 3,000 PSI, 28 DAY STRENGTH, TYPE I CEMENT, 3/4" STONE.
2. WHERE POSSIBLE, CONSTRUCT THRUST BLOCKS AGAINST UNDISTURBED SOIL. WHERE NOT POSSIBLE, PLACE FILL BETWEEN THE THRUST BLOCK AND THE UNDISTURBED SOIL COMPACTED TO 90% STANDARD PROCTOR DENSITY.
3. WRAP FITTINGS WITH POLYETHYLENE PRIOR TO CONSTRUCTING THRUST BLOCKS. NO JOINTS SHALL BE COVERED WITH CONCRETE.
4. THRUST BLOCK DIMENSIONS ARE BASED ON A MAXIMUM WATER MAIN PRESSURE OF 150 PSI.

4 TYPICAL THRUST BLOCK DETAIL

SCALE: NTS

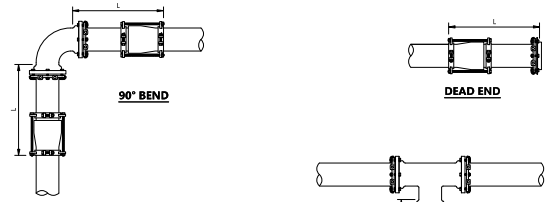


NOTE:

1. ALL BOLLARDS SHALL BE PAINTED. COLOR SELECTED BY OWNER.
2. BOLLARDS TO BE PLACED ONLY WHEN DIRECTED BY ENGINEER.

5 TYPICAL BOLLARD DETAIL

SCALE: NTS



NOTE :

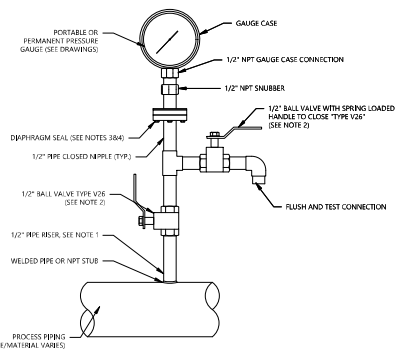
1. RESTRAINED JOINTS SHALL BE MECHANICAL JOINT OR PUSH-ON RESTRAINED JOINT AS SPECIFIED IN SECTION
   33 31 11 (GRAVITY SEWERAGE)
   33 31 23.01 (LOW PRESSURE SEWERAGE)
   33 31 23.02 (FORCE MAIN SEWERAGE)

ASSUMED PARAMETERS:	
LAYING CONDITION	TYPE 5
SOIL DESIGNATION	SLT 1
DEPTH COVER	5 FT
DESIGN PRESSURE	150 PSI
SAFETY FACTOR	1.5

DIAMETER	REQUIRED LEGTH RESTRAINED JOINT PIPE ON BOTH SIDES OF FITTING				REQUIRED LEGTH OF RESTRAINED JOINT PIPE
	HORIZONTAL BEND				
	11.25°	22.5°	45°	TEE/90°	DEAD END
6"	2'	3'	7'	16'	35'
8"	2'	4'	9'	20'	51'
10"	3'	5'	10'	24'	61'
12"	3'	6'	12'	28'	72'
16"	4'	8'	15'	36'	93'

2 THRUST RESTRAINT DETAIL

SCALE: NTS

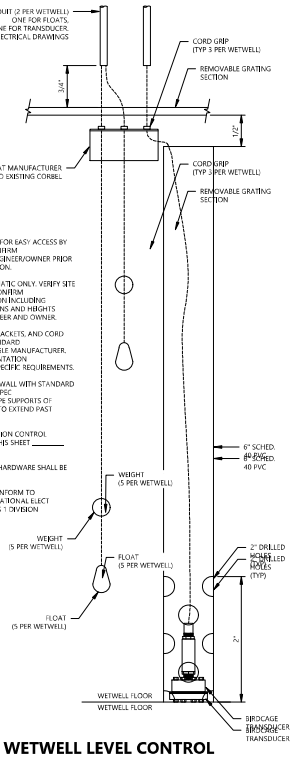


NOTES:

1. PROVIDE 1/2"-PVC/1 RISER PIPES FOR ALL PVC PROCESS PIPES UNLESS NOTED OTHERWISE.
2. PROVIDE DIAPHRAGM VALVES (TYPE V80) OR BALL VALVES (TYPE V20) FOR CHEMICAL SERVICE APPLICATIONS.
3. PROVIDE PTFE DIAPHRAGM FOR CHEMICAL SERVICE APPLICATIONS.
4. PROVIDE GLYCERIN FILLED DIAPHRAGM SEAL FOR PRESSURE APPLICATIONS. PROVIDE SILICONE FILLED DIAPHRAGM SEAL FOR VACUUM APPLICATIONS.
5. REFER TO INSTRUMENT DATA SHEETS INCLUDED IN SPECIFICATION SECTION 40 70 00 "INSTRUMENTATION FOR PROCESS SYSTEMS" FOR ADDITIONAL DETAILS AND REQUIREMENTS.

6 PRESSURE GAUGE DETAIL

SCALE: NTS



NOTE:

1. INSTALL EQUIPMENT FOR EASY ACCESS BY OWNER'S STAFF. CONFIRM LOCATIONS WITH ENGINEER/OWNER PRIOR TO FINAL INSTALLATION.
2. DETAIL IS DIAGRAMMATIC ONLY. VERIFY SITE CONDITIONS AND CONFIRM FINAL CONFIGURATION INCLUDING MOUNTING LOCATIONS AND HEIGHTS IN FIELD WITH ENGINEER AND OWNER.
3. FLOATS, WEIGHTS, BRACKETS, AND CORD GRIPS SHALL BE STANDARD PRODUCTS OF A SINGLE MANUFACTURER. REFER TO INSTRUMENTATION SPEC 40 70 00 FOR SPECIFIC REQUIREMENTS.
4. SECURE PVC PIPE TO WALL WITH STANDARD PIPE SUPPORTS PER SPEC 33 32 00. PROVIDE PIPE SUPPORTS OF SUFFICIENT LENGTH TO EXTEND PAST EXISTING CORBEL.
5. REFER TO PUMP STATION CONTROL ELEVATIONS TABLE THIS SHEET FIELD AS REQUIRED.
6. ALL SUPPORTS AND HARDWARE SHALL BE 316 STAINLESS STEEL.
7. ALL WORK SHALL CONFORM TO REQUIREMENTS OF NATIONAL ELECT FOR CLASS 1 DIVISION HAZARDOUS AREAS.

7 WETWELL LEVEL CONTROL EQUIPMENT INSTALLATION DETAIL

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Jason D. Jancaitis

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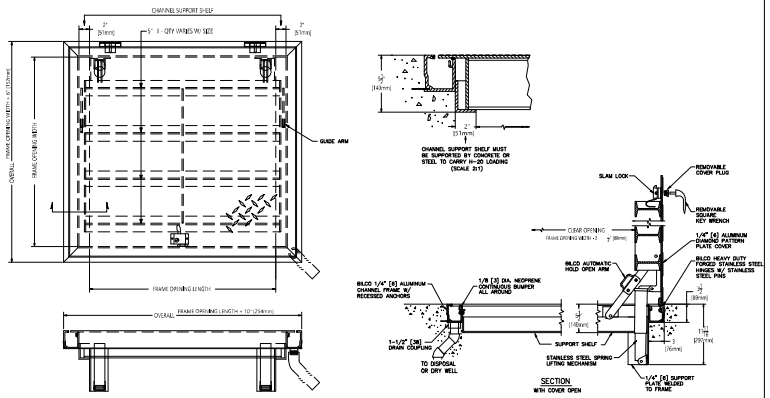
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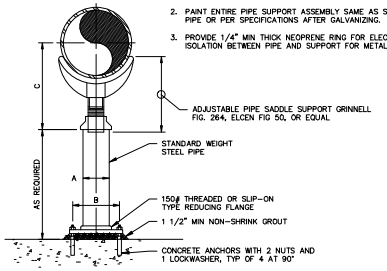
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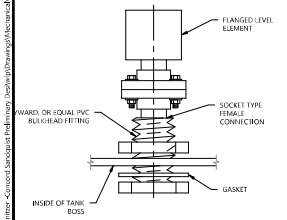
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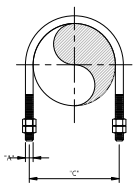
NOTES:
1. HOT-DIP GALVANIZE ALL PARTS AFTER FABRICATION.
2. PAINT ENTIRE PIPE SUPPORT ASSEMBLY SAME AS SUPPORTED PIPE OR PER SPECIFICATIONS AFTER GALVANIZING.
3. PROVIDE 1/4" MIN THICK NEOPRENE RING FOR ELECTRICAL ISOLATION BETWEEN PIPE AND SUPPORT FOR METALLIC PIPE.

DIMENSIONS IN INCHES				
PIPE SIZE	A	B	C MIN	C MAX
2 1/2	2 7/8	9	8	13
3	2 7/8	9	8 1/4	13 1/4
3 1/2	2 7/8	9	8 1/2	13 1/2
4	3 1/2	9	9 1/4	14
5	3 1/2	9	10	14 3/4
6	3 1/2	9	10 1/2	15 1/4
8	3 1/2	9	11 3/4	16 1/2
10	3 1/2	9	13 1/2	18 1/4
12	3 1/2	9	15	19 3/4
14	4 1/2	11	16 1/4	20 3/4
16	4 1/2	11	17 3/4	22 1/4

4 **ADJUSTABLE PIPE SUPPORT**
SCALE: NTS



2 **FLANGED LEVEL ELEMENT**
SCALE: NTS



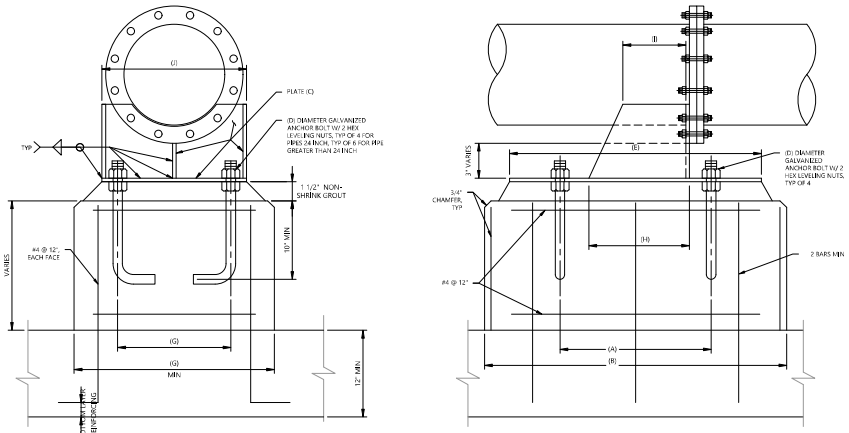
NOTE: WHEN U-BOLT IS IDENTIFIED AS A GUIDE ON THE PIPING DRAWING, PROVIDE 1/16" CLEARANCE ALL AROUND.

PIPE SIZE (IN)	A (IN)	C (IN)	MAX LOAD (LBS)
1	1/4	1 5/8	485
1 1/2	3/8	2 3/8	1220
2	3/8	2 13/16	1220
2 1/2	1/2	3 7/16	2260
3	1/2	4 1/16	2260
4	1/2	5 1/16	2260
5	1/2	6 1/8	2260
6	5/8	7 3/8	3620
8	5/8	9 3/8	3620
10	3/4	11 5/8	5420
12	7/8	13 3/4	7540
14	7/8	15	7540
16	7/8	17	7540
18	1	19 1/8	9920
20	1	21 1/8	9920
24	1	25 1/8	9920

3 **U-BOLT**
SCALE: NTS

PIPE SUPPORT SCHEDULE										
DIMENSIONS IN INCHES										
PIPE SIZE (NOM) (A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	
8	12	24	1/2	3/4	20	9	16	8	5	12
16	16	24	1/2	3/4	20	21	25	12	4	21
18	19	30	1/2	3/4	26	23	26	15	5	22
30	24	40	3/4	1 1/4	36	36	40	20	6	36

NOTES:
1. HOT-DIP GALVANIZE STEEL COMPONENTS AFTER FABRICATION.
2. WHEN ATTACHING TO EXISTING CONCRETE, PROVIDE EQUIVALENT SIZE ADHESIVE ANCHORS.
3. VERIFY PIPE OD PRIOR TO FABRICATION.



5 **EXPOSED PIPE THRUST RESTRAINED**
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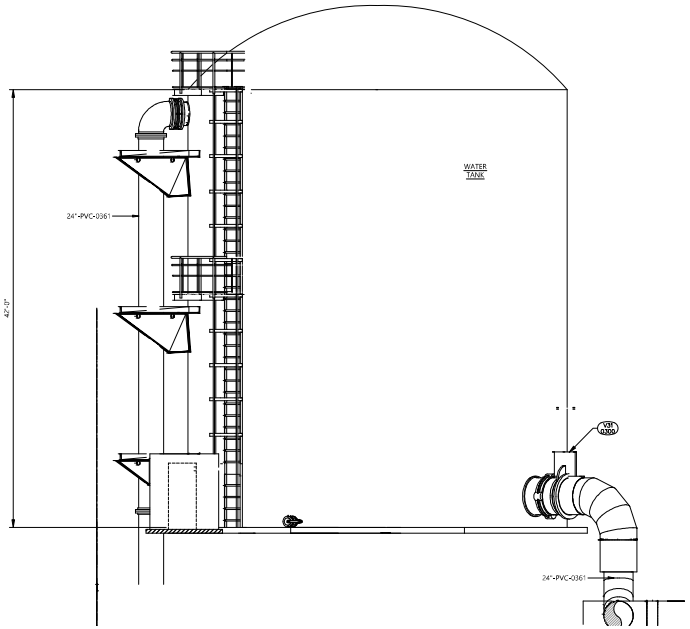
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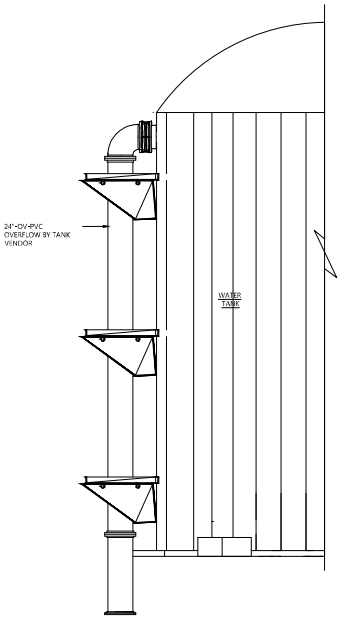
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DRAWING NO:
M-902

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1 **TANK PIPING LAYOUT DETAIL**
SCALE: NTS



2 **OVERFLOW PIPING SUPPORT DETAIL**
SCALE: NTS

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JASON D. JANCAITIS
No.11047
LICENSED PROFESSIONAL ENGINEER

Jason D. Jancaitis

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CLIENT INFO:

RADIUS RECYCLING
CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

REV	MM/DD/YY	DESCRIPTION

JOB NO:	0224539.48
DATE:	NOVEMBER 2025
SCALE:	AS NOTED
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FILENAME:	0224539.48 M-9XX.dwg

DRAWING TITLE:
MECHANICAL
PUMP STATION
DETAILS

DRAWING NO:
M-903

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GENERAL

- HOME RUN. ARROWS INDICATE NUMBER OF CIRCUITS, CROSS LINES INDICATE NUMBER OF WIRES. (OTHER THAN TWO (2) PLUS BOND, WIRE SIZE NOT SHOWN INDICATES #12AWG MIN. — INDICATES CIRCUIT NUMBER — PANEL DESIGNATION
- WIRING IN RACEWAY
- WIRING IN RACEWAY CONCEALED UNDERGROUND OR UNDERSLAB, MINIMUM 3/4"C
- 3/C #nr W/GND — Equip.No=P — CONDUIT AND CABLE ID TAG
- CONDUIT TURNING UP
- CONDUIT TURNING DOWN
- CONDUIT STUB
- EY CONDUIT SEAL
- FLEXIBLE NON-METALLIC CONDUIT
- PANELBOARD
- CP — CONTROL PANEL
- ATC — AUTOMATIC TEMPERATURE CONTROL PANEL
- ISBP — INTRINSIC SAFETY BARRIER PANEL
- POWER COMPANY METER
- HS — H/O/A - HAND/OFF/AUTO; H/O/R - HAND/OFF/REMOTE; L/O/R - LOCAL/OFF/REMOTE — LOCAL SELECTOR SWITCH
- PUSHBUTTON STATION, WITH "EM" EMERGENCY
- J — JUNCTION BOX
- MD — MOTORIZED DAMPER
- T — THERMOSTAT
- R — RELAY
- B T — DOOR BELL/BUZZER AND TRANSFORMER -MTD CL UP 7'-0" AFF
- EQUIP# / Description — EQUIPMENT TAG
- KEYED NOTE TAG
- REVISION TRIANGLE
- BRACKET
- SECTION # / X-XXX / SHEET # — SECTION CALL OUT
- (TYP.) 1 / X-0X — DETAIL CALL OUT

LIGHTING

- 2x4 LIGHT FIXTURE — A — ASSOCIATED CONTROL DEVICE; FIXTURE TYPE (SEE LIGHT FIXTURE SCHEDULE)
- 1x4 LIGHT FIXTURE
- 2x2 LIGHT FIXTURE
- FIXTURE WITH INTEGRAL EMERGENCY BATTERY PACK
- FIXTURE WIRED TO UNSWITCHED EMERGENCY CIRCUIT
- DOWN LIGHT
- WALL MOUNTED FIXTURES
- A — POLE MOUNTED SITE LIGHTING FIXTURE; FIXTURE TYPE (SEE LIGHT FIXTURE SCHEDULE)
- FLOOD LIGHT
- EXIT SIGN, CEILING MOUNTED. ARROW INDICATES EGRESS DIRECTION. SHADING INDICATES SIGN FACE. NUMERAL INDICATES BATTERY UNIT CONNECTED
- EMT SIGN, WALL MOUNTED 7'-6" AFF OR 0'-6" ABOVE DOOR. SHADING INDICATES SIGN FACE. NUMERAL INDICATES BATTERY UNIT CONNECTED TO
- BATT — DUAL HEAD EMERGENCY LIGHT BATTERY PACK WITH NUMBER OF HEADS AS INDICATED - WALL MOUNTED MTD 7'-6" AFF. NUMERAL INDICATES BATTERY ID NUMBER
- TANDEM EMERGENCY LIGHT BATTERY PACK & EXIT SIGN - WALL MOUNTED MTD 7'-6" AFF OR 0'-6" ABOVE DOOR. NUMERAL INDICATES BATTERY ID NUMBER
- REMOTE EMERGENCY LIGHTING HEAD - WALL MOUNTED MTD 7'-6" AFF. NUMERAL INDICATES BATTERY UNIT CONNECTED TO
- S — SINGLE POLE TOGGLE SWITCH - MTD CL UP 4'-0" AFF
- S_2 — DOUBLE POLE TOGGLE SWITCH - MTD CL UP 4'-0" AFF
- S_3 — 3-WAY TOGGLE SWITCH - MTD CL UP 4'-0" AFF
- S_4 — 4-WAY TOGGLE SWITCH - MTD CL UP 4'-0" AFF
- S_M — WALL MOUNTED OCCUPANCY SENSOR - MTD CL UP 4'-0" AFF
- S_P — TOGGLE SWITCH WITH PILOT LIGHT - MTD CL UP 4'-0" AFF
- S_D — DIMMER SWITCH - MTD CL UP 4'-0" AFF
- S_{LV} — LOW VOLTAGE SWITCH - MTD CL UP 4'-0" AFF
- a — OCCUPANCY SENSOR; a. INDICATES CONTROLLED FIXTURE
- PC — PHOTOCELL
- LC — LIGHTING CONTACTOR
- MS — MOTION SENSOR

COMMUNICATIONS

- TEL — TELEPHONE BACKBOARD
- WX — PROVISIONS FOR TELEPHONE OUTLET, TWO-GANG WALL BOX WITH ONE 1"C STUB TO ABOVE ACCESSIBLE CEILING - MTD CL UP SAME AS ASSOCIATED RECEPTACLE. W-INDICATES WALL MOUNTED AT 60" AFF. P-INDICATES PAYPHONE MOUNTED AT 4'-0" AFF. X-INDICATES NUMBER OF JACKS, SINGLE BOX
- PROVISIONS FOR DATA OUTLET, TWO-GANG WALL BOX WITH ONE 1"C STUB TO ABOVE ACCESSIBLE CEILING - MTD CL UP SAME AS ASSOCIATED RECEPTACLE. SUBSCRIPTS AS NOTED ABOVE
- 2D2T — PROVISIONS FOR TELEPHONE & DATA OUTLET, TWO-GANG WALL BOX WITH ONE 1"C STUB TO ABOVE ACCESSIBLE CEILING - MTD CL UP SAME AS ASSOCIATED RECEPTACLE. SUBSCRIPTS AS NOTED ABOVE
- PROVISIONS FOR SCADA SYSTEM OUTLET, TWO-GANG WALL BOX WITH ONE 1"C STUB TO ABOVE ACCESSIBLE CEILING - MTD CL UP SAME AS ASSOCIATED RECEPTACLE
- CEILING MOUNTED TELEPHONE SYSTEM OUTLET
- CEILING MOUNTED DATA SYSTEM OUTLET
- CEILING MOUNTED TELEPHONE & DATA OUTLET
- FLUSH FLOOR MOUNTED TELEPHONE SYSTEM OUTLET
- FLUSH FLOOR MOUNTED DATA SYSTEM OUTLET
- FLUSH FLOOR MOUNTED TELEPHONE & DATA OUTLET
- TV — TELEVISION COAXIAL OUTLET, MOUNTED UP SAME AS ASSOCIATED RECEPTACLE

SECURITY

- SEC — SECURITY PANEL
- DS — DOOR INTRUSION SWITCH
- DE — ELECTRIC DOOR STRIKE
- CR — CARD READER
- KP — KEY PAD
- MOTION DETECTOR
- CAM — SECURITY CAMERA PTZ = PAN/TILT/ZOOM

INTERCOM & PAGING SYSTEM

- S — CEILING MOUNTED SPEAKER
- PA — PAGING SYSTEM CONTROL PANEL
- HS — PAGING SYSTEM HANDSET

ONE-LINE DIAGRAM SYMBOLS

- 52 / GCB1 — CB 800A E.O. — 52 — HV VOLTAGE DRAWOUT TYPE POWER CIRCUIT BREAKER ELECTRICALLY OPERATED (E.O.)
- MV VOLTAGE DRAWOUT TYPE POWER CIRCUIT BREAKER WITH MANUAL CONTROL SWITCH
- AT / AF — EO — LOW VOLTAGE CIRCUIT BREAKER. AF - AMP FRAME; AT - AMP TRIP; EO - ELECTRICALLY OPERATED
- ST — ST - SHUNT TRIP; GF - GROUND FAULT; EO - ELECTRICALLY OPERATED
- DISCONNECT, ISOLATION OR SAFETY SWITCH
- FUSED DISCONNECT SWITCH
- 1 — MAGNETIC MOTOR STARTER. NUMERAL INDICATES NEMA SIZE. FVNR UNLESS OTHERWISE NOTED. FVR - FULL VOLTAGE REVERSING. RVAT - REDUCING VOLTAGE AUTO TRANSFORMER. 2S - TWO SPEED. YD - WYE DELTA REDUCED VOLTAGE STARTER
- CAPACITOR
- VFD / 11 — VFD - VARIABLE FREQUENCY DRIVE. SS - SOLID STATE STARTER. DC - DC VARIABLE DRIVE. NUMBER INDICATES AMP RATING
- OA — POWER TRANSFORMER. OA - LIQUID TYPE SELF COOLED. AA - DRY TYPE SELF COOLED. FA - FAN COOLED. CONNECTION
- 2 — 480/120 — POTENTIAL TRANSFORMER. RATIO. NUMBER REQUIRED
- Z — 600/5 — CURRENT TRANSFORMER. RATIO. PHASE
- S — MOTOR. NUMERAL INDICATES HORSEPOWER
- X — GENERAL LOAD. NUMERAL INDICATES LOAD IN KVA
- GENERATOR
- N / E / L — ATS — ATS - AUTOMATIC TRANSFER SWITCH. MTS - MANUAL TRANSFER SWITCH
- A — METER. A - AMMETER; V - VOLTMETER; W - WATTMETER; KWH - KILOWATT HOUR; KVAR - KILOVAR METER; VAR - VAR METER; HZ - FREQUENCY METER; PF - POWER FACTOR METER
- 3 — LINE OR LOAD REACTOR. NUMERAL INDICATES % IMPEDANCE
- DPM — DIGITAL POWER MONITOR
- AS — METER TRANSFER SWITCH. AS - AMMETER SWITCH; VS - VOLTMETER SWITCH
- SPD — SPD - SURGE PROTECTION DEVICE; END/N - ETHERNET TO DEVICENET LINKING DEVICE; DPS - DEVICENET POWER SUPPLY
- MEDIUM VOLTAGE CABLE TERMINATION
- DRAWOUT DEVICE
- LA — LIGHTNING ARRESTER
- KEY INTERLOCK

CONTROL DIAGRAM SYMBOLS

NOTE: ALL CONTROL SYMBOLS ARE DRAWN ASSUMING DE-ENERGIZED CIRCUITS, EMPTY TANKS, UNPRESSURIZED LINES, ETC.

OPEN ON INCREASE / CLOSE ON INCREASE

- PRESSURE SWITCH
- LEVEL SWITCH
- FLOW SWITCH
- TEMPERATURE SWITCH

NORMALLY CLOSED / NORMALLY OPEN

- PUSH BUTTON
- INSTANTANEOUS CONTACT
- TIMED CLOSE CONTACT
- TIMED OPEN CONTACT
- LIMIT SWITCH
- H / O / A — XOO / OOX — SELECTOR SWITCH; QUANTITY OF ARROWS INDICATES NUMBER OF POSITIONS. XOO INDICATES UPPER CONTACT CLOSED IN LEFT POSITION AND OPEN IN CENTER AND RIGHT POSITIONS
- INTERNAL WIRING
- FIELD WIRING
- RELAY COIL

ABBREVIATIONS

A,AMP	AMPERES	MCC	MOTOR CONTROL CENTER
AC	ALTERNATING CURRENT	MCB	MAIN CIRCUIT BREAKER
AFF	ABOVE FINISHED FLOOR	MFG	MANUFACTURER
AFG	ABOVE FINISHED GRADE	MH	MANHOLE
AHJ	AUTHORITY HAVING JURISDICTION	MLO	MAIN LUGS ONLY
AIC	AMPERE INTERRUPT CAPACITY	MTD	MOUNTED
AWG	AMERICAN WIRE GAUGE	MTR	MOTOR
		MV	MEDIUM VOLTAGE
BFG	BELOW FINISHED GRADE		
		NC	NORMALLY CLOSED
CATV	CABLE TELEVISION	NEC	NATIONAL ELECTRIC CODE
CB	CIRCUIT BREAKER	NEUT	NEUTRAL
CCTV	CLOSED CIRCUIT TELEVISION	NO	NORMALLY OPEN
CL	CENTER LINE		
CKT	CIRCUIT	OL	OVERLOAD ELEMENT
CP	CONTROL PANEL		
CPT	CONTROL POWER TRANSFORMER	PF	POWER FACTOR
CT	CURRENT TRANSFORMER	PH	PHASE
CU	COPPER	PRI	PRIMARY
		PT	POTENTIAL TRANSFORMER
E.C.	ELECTRICAL CONTRACTOR	PVC	POLYVINYL CHLORIDE
EMT	ELECTRIC METALLIC TUBING		
FAA	FIRE ALARM ANNUNCIATOR	RGS	RIGID STEEL CONDUIT
FACP	FIRE ALARM CONTROL PANEL	RTD	RESISTANCE TEMPERATURE DETECTOR
FBO	FURNISHED BY OTHERS		
FWE	FURNISHED WITH EQUIPMENT		
		SEC	SECONDARY
G.C.	GENERAL CONTRACTOR	SS	STAINLESS STEEL
GEN	GENERATOR	SV	SOLENOID VALVE
GFCI	GROUND FAULT CIRCUIT INTERRUPTER	TEMP	TEMPERATURE
G,GND	GROUND	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
HP	HORSEPOWER	TYP	TYPICAL
HZ	FREQUENCY IN CYCLES/SECOND		
		UE	UNDERGROUND ELECTRIC
IG	ISOLATED GROUND	UG	UNDERGROUND
IMT	INTERMEDIATE METALLIC CONDUIT	UPS	UNINTERRUPTED POWER SUPPLY
I/S	INTRINSICALLY SAFE		
		V	VOLTS
JBOX	JUNCTION BOX	VA	VOLT-AMPERES
		VAR	VOLT-AMPERE REACTIVE
K	KILO		
KCMIL	1000 CIRCULAR MILS	W	WATT
KVA	KILOVOLT AMPERE	WM	WATT METER
KVAR	KILOVOLT AMPERE REACTIVE	WP	WEATHER PROOF
KW	KILOWATT		
KWH	KILOWATT HOUR	XFMR	TRANSFORMER
		XP	EXPLOSION PROOF

POWER

- NON-FUSED SAFETY SWITCH
- FUSED SAFETY SWITCH
- NON-FUSED DISCONNECT/MAGNETIC MOTOR STARTER
- M — MANUAL MOTOR SWITCH (MOTOR RATED SWITCH), TOGGLE OPERATED, SINGLE PHASE, 1 OR 2 POLE AS REQUIRED.
- CB 100A — ENCLOSED CIRCUIT BREAKER W/AMPERE RATING
- ELECTRIC MOTOR, NUMBER INDICATES HORSEPOWER RATING, "F" INDICATES FRACTIONAL LESS THAN 1/2HP OR 100W
- T — TRANSFORMER
- POWER POLE
- DUPLEX RECEPTACLE, NEMA 5-20R - MTD CL UP 24" OR AS NOTED."WP" WEATHER PROOF, "G" PROTECTED BY GFCI RECEPTACLE OR BREAKER UPSTREAM, "H" MOUNTED 4'-6" BELOW CEILING, "TV" MOUNT 7'-6" UP
- DOUBLE DUPLEX RECEPTACLE, NEMA 5-20R - MTD CL UP 24" OR AS NOTED
- SINGLE RECEPTACLE, NEMA 5-20R - MTD CL UP 24" OR AS NOTED
- GFCI DUPLEX RECEPTACLE, NEMA 5-20R - MOUNTED CL UP 48" OR 6" ABOVE COUNTER
- DOUBLE DUPLEX GFCI RECEPTACLE, NEMA 5-20R - MOUNTED CL UP 48" OR 6" ABOVE COUNTER
- FLUSH FLOOR OUTLET, DUPLEX RECEPTACLE, NEMA 5-20R
- MULTI SERVICE FLUSH FLOOR BOX WITH DUPLEX RECEPTACLE AND PROVISIONS FOR DATA
- POWER RECEPTACLE, NEMA CONFIGURATION AS NOTED OR AS REQUIRED FOR EQUIPMENT SERVED
- FLUSH CEILING MTD DEVICE BOXES, ONE W/ DUPLEX RCPT FOR PROJECTOR POWER AND ONE FOR DATA TO SERVE CH- PROJECTOR. RUN ONE 1 1/2"C TO JBOX LOCATED AT FRONT OF ROOM FOR PROJECTOR CABLE PATHWAY. VERIFY FINAL LOCATION W/ OWNER PRIOR TO ROUGH IN.
- MULTI-OUTLET POWER STRIP, MOUNT 0'-6" ABOVE COUNTERTOP, RECEPTACLE SPACING AS NOTED.

FIRE ALARM DIAGRAM SYMBOLS

- FACP — FIRE ALARM CONTROL PANEL
- FAA — FIRE ALARM ANNUNCIATOR
- FCPS — FIELD CHARGER POWER SUPPLY
- M — FIRE ALARM MASTER BOX
- K — KNOX BOX
- F — FIRE ALARM MANUAL PULL STATION - WALL MTD CL UP 4'-0"
- H L — FIRE ALARM AUDIBLE/VISIBLE NOTIFICATION APPLIANCE CANDELA (CD) POWER PER NFPA 72 OR AS NOTED - WALL MTD BOTTOM UP 80" A/F. "H" HORN, "V" VOICE
- L — FIRE ALARM VISUAL NOTIFICATION APPLIANCE CANDELA (CD) POWER PER NFPA 72 OR AS NOTED - WALL MTD BOTTOM UP 80" AFF
- CEILING MOUNTED SMOKE DETECTOR
- CEILING MOUNTED HEAT DETECTOR
- DUCT SMOKE DETECTOR S=SUPPLY, R=RETURN
- PS — SPRINKLER SYSTEM FLOW SWITCH
- TS — SPRINKLER SYSTEM TAMPER SWITCH
- PS — SPRINKLER SYSTEM PRESSURE SWITCH
- DH — FIRE ALARM SYSTEM MAGNETIC DOOR HOLDER
- Z — MONITOR MODULE
- C — CONTROL MODULE
- R — RELAY MODULE

INSTRUMENTATION

- LS / XX — FIELD MOUNTED INSTRUMENT. INSTRUMENT IDENTIFICATION TYPE. INSTRUMENT LOOP NO.
- PS / XX — VENDOR SUPPLIED INSTRUMENT

INSTRUMENT IDENTIFIER:

AE	ANALYSIS ELEMENT
AIT	ANALYSIS INDICATING TRANSMITTER
AT	ANALYSIS TRANSMITTER
DPS	DIFFERENTIAL PRESSURE SWITCH
FCV	FLOW CONTROL VALVE
FE	FLOW ELEMENT
FIT	FLOW INDICATING TRANSMITTER
FT	FLOW TRANSMITTER
FS	FLOW SWITCH
LE	LEVEL ELEMENT
LIT	LEVEL INDICATING TRANSMITTER
LT	LEVEL TRANSMITTER
LS	LEVEL SWITCH
LSH	LEVEL SWITCH HIGH
LSL	LEVEL SWITCH LOW
MOV	MOTOR OPERATED VALVE
PE	PRESSURE ELEMENT
PIT	PRESSURE INDICATING TRANSMITTER
PT	PRESSURE TRANSMITTER
PS	PRESSURE SWITCH
SV	SOLENOID VALVE
TE	TEMPERATURE ELEMENT
TIT	TEMPERATURE INDICATING TRANSMITTER
TT	TEMPERATURE TRANSMITTER
ZS	PROXIMITY SWITCH

MISCELLANEOUS TERMINALS

- ARROW, SMALL
- ARROW, LARGE
- ARROW, TRIANGULAR
- CONTINUE, SMALL
- CONTINUE, LARGE
- DOT, SMALL
- DOT, MEDIUM
- DOT, LARGE
- POLARITY SQUARE
- SCREW TERMINAL
- TERMINAL POINT, SMALL
- TERMINAL POINT, LARGE
- TERMINAL POINT, SQUARE
- SHIELD
- SHIELD W/TERMINAL POINT

GROUNDING

- BARE COPPER GROUND CABLE (SIZE 4/0 UNLESS OTHERWISE NOTED)
- 3/4"Ø X 10'-0" LONG GROUND ROD. (10'-0" MINIMUM LENGTH)
- EQUIPMENT BOLTED CONNECTION OR APPROVED EQUAL.
- CADWELD EXOTHERMIC CONNECTION
- GROUND

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JOB NO:	0224539.48
DATE:	NOVEMBER 2025
SCALE:	AS NOTED
DESIGNED BY:	TR
DRAWN BY:	SAA
CHECKED BY:	AJF
FILENAME:	E-001.dwg

DRAWING TITLE:
ELECTRICAL LEGEND

DRAWING NO:
E-001

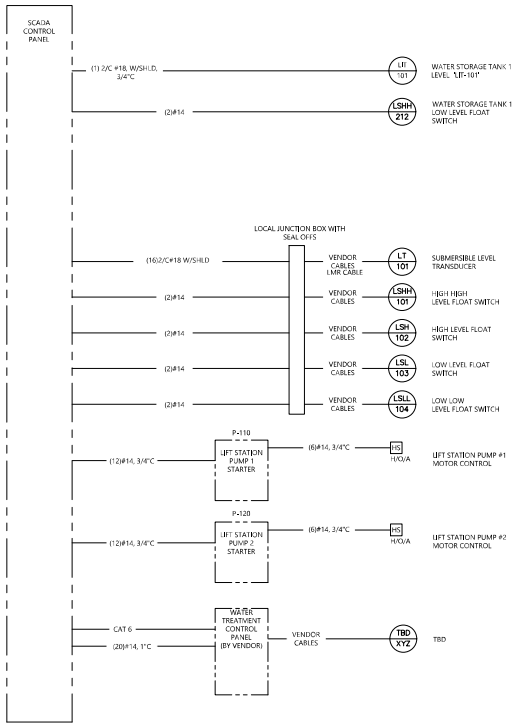
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KVA LOADS												
DIRECTORY	BRKR	POLE	CKT #	KVA	A	B	C	KVA	CKT #	POLE	BRKR	DIRECTORY
EXTERIOR LTG/RCPTS	20	1	1	0.36	0.36			0.00	2			
SCADA CP	20	1	3	0.36		0.36		0.00	4	3	30	SPD
SPARE	20	1	5				0.00	0.00	6			
SPARE	20	1	7		0.00				14		20	SPARE
SPARE	20	1	9			0.00			16		20	SPARE
SPARE	20	1	11				0.00		18		20	SPARE
SPARE	20	1	13		0.00				14		20	SPARE
SPARE	20	1	15			0.00			16		20	SPARE
SPARE	20	1	17				0.00		18		20	SPARE
SPARE	20	1	19		0.00				20		20	SPARE
SPARE	20	1	21			0.00			22		20	SPARE
SPARE	20	1	23				0.00		24		20	SPARE
			SUBTOTAL		0.36	0.36	0.00	SUBTOTAL				

VOLTAGE:	120/208	PANEL NAME:	L1
MAIN BREAKER:	60	LOCATION:	EQUIPMENT STAND
BUSES:	100	MOUNTING:	SURFACE
PH & WIRES:	3PH 4W	AIC RATING:	10 kAIC

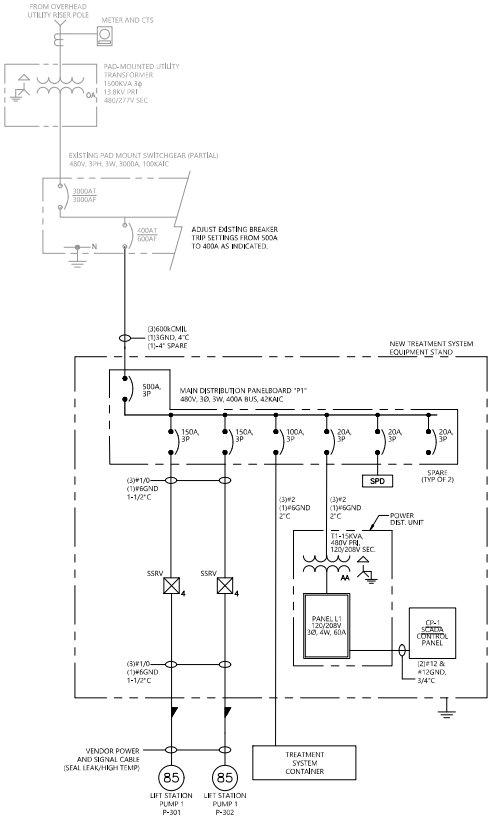
TOTAL KVA: 0.72
TOTAL AMPS: 1

NOTES: NEMA 4X



ELECTRICAL RISER DIAGRAM

SCALE: N.T.S.



ELECTRICAL ONE-LINE DIAGRAM

SCALE: N.T.S.

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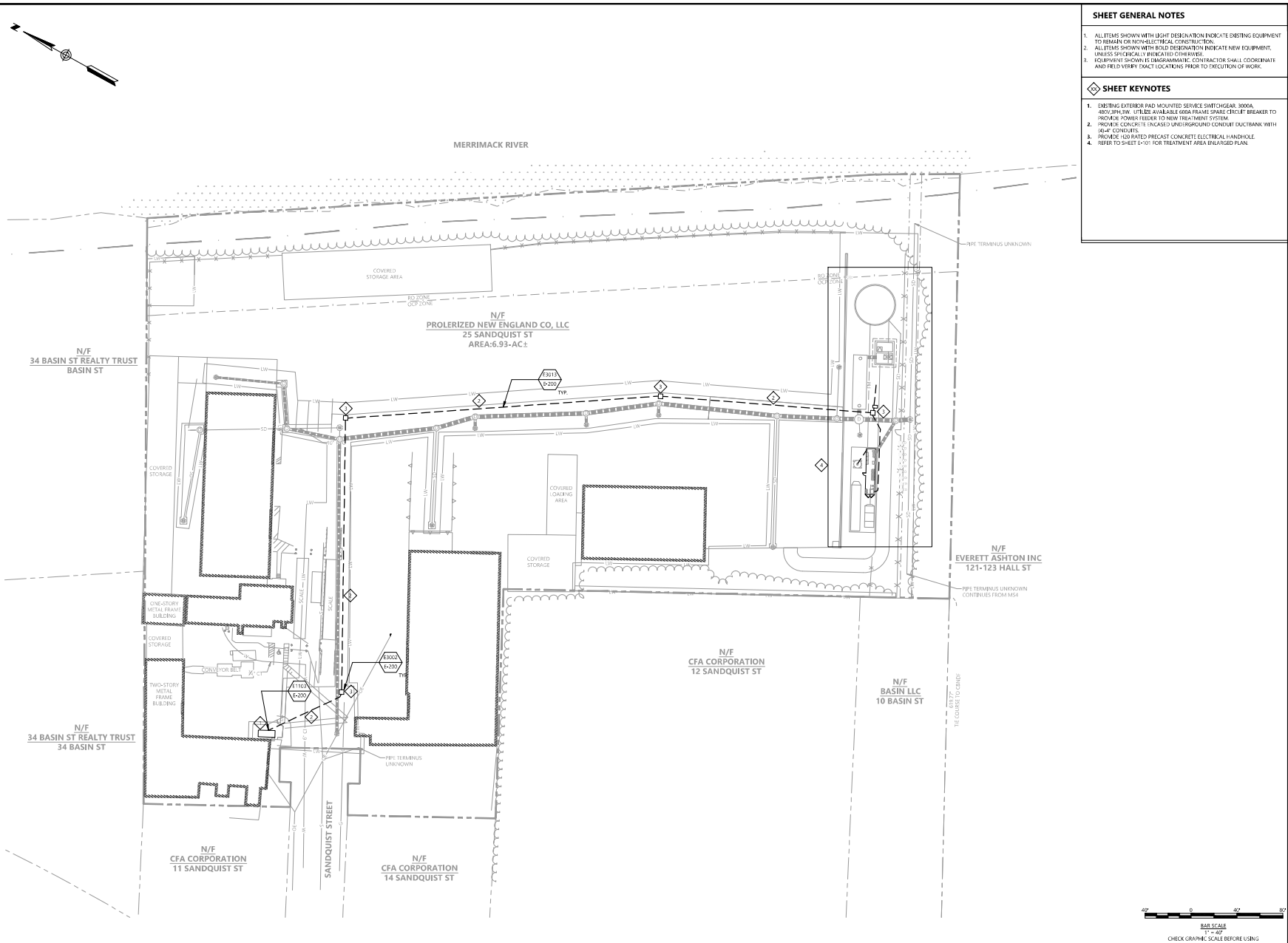
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ELECTRICAL RISER AND SCHEDULES

DRAWING NO:
E-002

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SHEET GENERAL NOTES

1. ALL ITEMS SHOWN WITH LIGHT DESIGNATION INDICATE EXISTING EQUIPMENT TO REMAIN OR NON-ELECTRICAL CONSTRUCTION.
2. ALL ITEMS SHOWN WITH BOLD DESIGNATION INDICATE NEW EQUIPMENT, UNLESS SPECIFICALLY INDICATED OTHERWISE.
3. EQUIPMENT SHOWN IS DIAGRAMMATIC. CONTRACTOR SHALL COORDINATE AND FIELD VERIFY EXACT LOCATIONS PRIOR TO EXECUTION OF WORK.

SHEET KEYNOTES

1. EXISTING EXTERIOR PAD MOUNTED SERVICE SWITCHGEAR, 3000A, 480V,3PH,3W. UTILIZE AVAILABLE 600A FRAME SPARE CIRCUIT BREAKER TO PROVIDE POWER FEEDER TO NEW TREATMENT SYSTEM.
2. PROVIDE CONCRETE ENCASED UNDERGROUND CONDUIT DUCTBANK WITH (4)-4" CONDUITS.
3. PROVIDE 1-ID RATED PRECAST CONCRETE ELECTRICAL HANDHOLE.
4. REFER TO SHEET E-101 FOR TREATMENT AREA ENLARGED PLAN.

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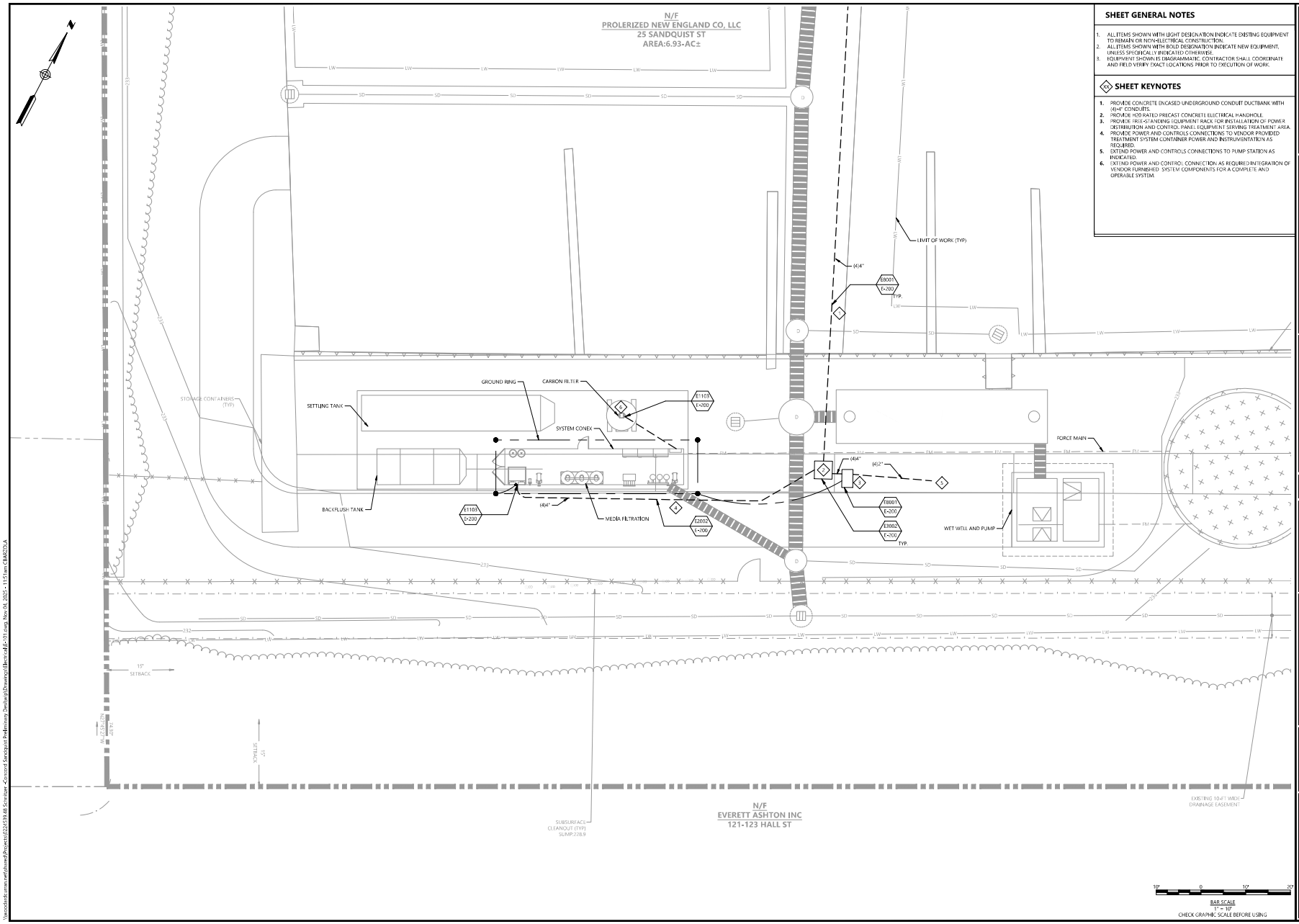
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DRAWING TITLE:
ELECTRICAL SITE PLAN

DRAWING NO:
E-100

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SHEET GENERAL NOTES

1. ALL ITEMS SHOWN WITH LIGHT DESIGNATION INDICATE EXISTING EQUIPMENT TO REMAIN OR NON-ELECTRICAL CONSTRUCTION.
2. ALL ITEMS SHOWN WITH BOLD DESIGNATION INDICATE NEW EQUIPMENT, UNLESS SPECIFICALLY INDICATED OTHERWISE.
3. EQUIPMENT SHOWN IS DIAGRAMMATIC. CONTRACTOR SHALL COORDINATE AND FIELD VERIFY EXACT LOCATIONS PRIOR TO EXECUTION OF WORK.

SHEET KEYNOTES

1. PROVIDE CONCRETE ENCASED UNDERGROUND CONDUIT DUCTBANK WITH (4)-4" CONDUITS.
2. PROVIDE H20 RATED PRECAST CONCRETE ELECTRICAL HANDHOLE.
3. PROVIDE FREE-STANDING EQUIPMENT RACK FOR INSTALLATION OF POWER DISTRIBUTION AND CONTROL PANEL EQUIPMENT SERVING TREATMENT AREA.
4. PROVIDE POWER AND CONTROLS CONNECTIONS TO VENDOR PROVIDED TREATMENT SYSTEM CONTAINER POWER AND INSTRUMENTATION AS REQUIRED.
5. EXTEND POWER AND CONTROLS CONNECTIONS TO PUMP STATION AS INDICATED.
6. EXTEND POWER AND CONTROL CONNECTION AS REQUIRED INTEGRATION OF VENDOR FURNISHED SYSTEM COMPONENTS FOR A COMPLETE AND OPERABLE SYSTEM.

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Andover, Massachusetts 01810
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CLIENT INFO:

RADIUS RECYCLING
CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

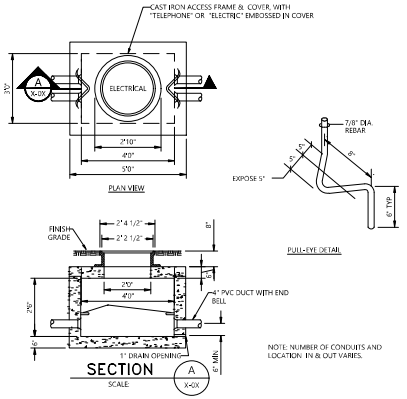
REV	MM/DD/YY	DESCRIPTION

JOB NO:	0224539.48
DATE:	NOVEMBER 2025
SCALE:	AS NOTED
DESIGNED BY:	TR
DRAWN BY:	SAA
CHECKED BY:	AJF
FILENAME:	E-101.dwg

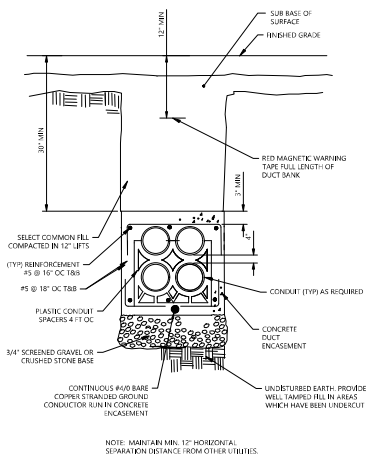
DRAWING TITLE:
ELECTRICAL POWER PLAN

DRAWING NO:
E-101

\\woodardcurran.net\shared\Projects\0224539.48 Sanitizer - Concord Sandquist Preliminary Design\Drawings\Electrical\E-101.dwg, Nov 04, 2025 - 11:51am, DMADSA



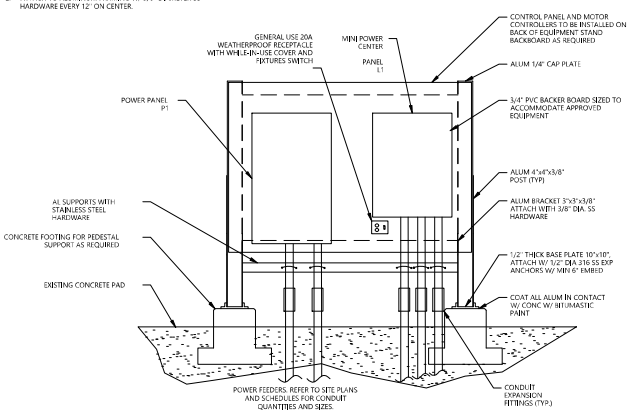
E3002 36X48 ELECTRICAL PULL BOX
SCALE: NTS



E3013 TYP. CONCRETE ENCASED UNDERGROUND DUCT BANK
SCALE: NTS

GENERAL NOTES:

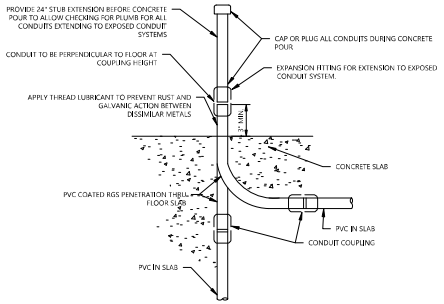
1. BACKBOARD TO BE MADE OF 3/4" PVC
2. ATTACH TO ALUMINUM FRAMING W/ 3/8" DIAMETER SS HARDWARE EVERY 12" ON CENTER.



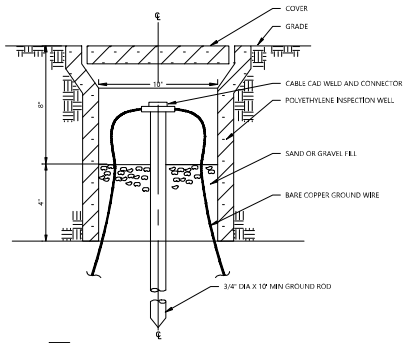
E8001 ELECTRICAL EQUIPMENT STAND
SCALE: NTS

NOTES:

1. APPLICABLE IN ALL AREAS UNLESS NOTED OTHERWISE



E1103 CONDUIT STUB-UP
SCALE: NTS



E2002 GROUNDING WELL
SCALE: NTS

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SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

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DATE:	NOVEMBER 2025
SCALE:	AS NOTED
DESIGNED BY:	TR
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CHECKED BY:	AJF
FILENAME:	E-200.dwg

DRAWING TITLE:
ELECTRICAL DETAILS

DRAWING NO:
E-200

\\woodardcurran.net\shared\Projects\0224539.48 Schnitzer-Concord Sandquist Preliminary Design\Drawings\Electrical\E-200.dwg, Nov 04, 2025 - 11:31am, DAVID.OLA

ELECTRICAL SYMBOLS

#	REVISION REFERENCE
(#)	ITEM REFERENCE
#	NOTE REFERENCE
<#>	KEY NOTE REFERENCE
######	TERMINAL NUMBER
	BREAK
	PANEL WIRING
	FIELD WIRING
	SHIELDED CABLE
	WIRES CROSSING
	WIRES CONNECTING
	LIMIT SWITCH NORMALLY CLOSED
	LIMIT SWITCH HELD CLOSED
	LIMIT SWITCH NORMALLY OPEN
	LIMIT SWITCH HELD OPEN
	FLOAT SWITCH NORMALLY OPEN
	PRESSURE SWITCH NORMALLY OPEN
	TEMPERATURE SWITCH NORMALLY OPEN
	TIME SWITCH (DROP OUT) NORMALLY OPEN
	TIME SWITCH (PULL IN) NORMALLY OPEN
	FLOW SWITCH NORMALLY OPEN
	PUSH BUTTON NORMALLY CLOSED
	PUSH BUTTON NORMALLY OPEN
	EMERGENCY STOP PUSH BUTTON
OFF ON OX	SELECTOR SWITCH 2 POSITION
H O A XOO OOX	SELECTOR SWITCH 3 POSITION
H O A XOOO OXOO OOOX	SELECTOR SWITCH 4 POSITION
	CONTACT NORMALLY CLOSED
	CONTACT NORMALLY OPEN
	SWITCH
	PILOT LIGHT (W/ LENS COLOR)
	SOLENOID
	COIL
	HORN
	CIRCUIT BREAKER
	FUSE
	EARTH GROUND
	CHASSIS GROUND
	THERMOCOUPLE
	RTD SENSOR
	CURRENT TRANSFORMER
	TRANSFORMER
M	MOTOR
	3 PHASE HEATER (DELTA)
	3 PHASE HEATER (WYE)
	3-POLE DISCONNECT
	3-POLE CIRCUIT BREAKER
L1 T1 L2 T2 L3 T3	MOTOR PROTECTOR
L1 T1 L2 T2 L3 T3	3-POLE CONTACTOR
	THERMAL OVERLOAD

PANEL NOTES

1. INCLUDE A DRAWING POCKET INSIDE THE PANEL LARGE ENOUGH TO STORE A COMPLETE SET OF SYSTEM DIAGRAMS, AND DRAWINGS.
2. ANALOG CABLES: 2-CONDUCTOR WITH SHIELD, BELDEN #8760 OR EQUAL.
3. LEAVE FREE SPACE ABOVE PLC FOR VENTILATION.
4. IDENTIFY ALL WIRES AS SPECIFIED BY THE NATIONAL ELECTRICAL CODE HANDBOOK AND THE FOLLOWING:

POWER DISTRIBUTION WIRES.....BLACK
NEUTRAL WIRES.....WHITE
AC CONTROL CIRCUIT WIRES.....RED
DC CONTROL CIRCUIT WIRES.....BLUE
DC COMMON WIRES.....WHITE W/BLUE STRIPE
GROUND WIRES.....GREEN W/YELLOW STRIPE
WIRES THAT MAY REMAIN.....ORANGE
ENERGIZED WHEN THE MAIN DISCONNECT IS IN THE OFF POSITION

5. SIZE ALL WIRE IN ACCORDANCE WITH NEC CODES. SINGLE CONDUCTORS: STRANDED COPPER WITH THWN INSULATION, RATED FOR 600 VAC, AND UL LISTED AS MTW, UNLESS NOTED OTHERWISE. MINIMUM CONDUCTOR SIZE#14AWG. #16 AWG MAY BE USED ONLY FOR THE INDIVIDUAL WIRES CONNECTING DIRECTLY TO AN I/O TERMINAL ON THE PLC SWING ARM. THE HOT AND NEUTRAL CONDUCTOR SUPPLYING EACH SWING ARM SHALL REMAIN #14 AWG. GROUND CONDUCTOR SIZE AS INDICATED ON THE DRAWINGS. WHERE NOT INDICATED, THEY SHALL BE #14 AWG OR LARGER.
6. BOND PLC CHASSIS, PANEL DOORS, SIDE PANELS, BACK PANELS AND GROUND BUS TOGETHER WITH WIRES SIZED AS SHOWN ON THE DRAWING.
7. TAG ALL WIRES AT EVERY TERMINATION POINT. SHORT WIRE LENGTHS, (LESS THAN 8") WHERE THE ENTIRE CONDUCTOR IS VISIBLE MAY BE TAGGED AT JUST ONE END. WIRE LABELS FOR WIRES SMALLER THAN NO. 4, SHALL BE VINYL, SELF ADHESIVE, WRAPAROUND, WITH MACHINE PRINTED NUMBERS AND LETTERS. WIRE SIZES NO. 4 AND LARGER AND MULTI CONDUCTOR CABLES SHALL BE MARKED WITH ONE-PIECE, NYLON LOCKING MACHINE PRINTED MARKER TIES EQUAL TO PANDUIT PLM SERIES. WIRE TAG NUMBER SHALL BE AS INDICATED ON THE DRAWINGS
8. DO NOT ROUTE ANY COMMUNICATION CABLES IN WIREWAYS WITH 120 VAC WIRING. ROUTE ALL THESE CABLES AWAY FROM 120 VAC WIRING. WHERE 120 VAC CONDUCTORS MUST BE CROSSED, DO SO AT RIGHT ANGLES AND PROVIDE AT LEAST 1" SEPARATION.
9. CONNECT NO MORE THAN TWO WIRES TO ANY ONE TERMINAL. PROVIDE TERMINAL BLOCKS WITH A SAFETY COVER OR BE FINGER SAFE TO PROTECT PERSONNEL FROM SHOCK. MOUNT ALL TERMINAL BLOCKS ON DIN RAILS. SUPPLY ALL HARDWARE NEEDED TO PROVIDE A COMPLETE TERMINAL STRIP ASSEMBLY, INCLUDING BUT NOT LIMITED TO: MISCELLANEOUS SEPARATORS, TOP JUMPER BARS, SIDE JUMPER BARS, MACHINE PRINTED TERMINAL BLOCK TAGS, FASTENERS, BRACKETS FOR RAISING 35MM RAIL, ETC.
10. RAISE AND CENTER ALL TERMINAL STRIPS SET BETWEEN WIRE WAYS TO FACILITATE WIRING, UNLESS OTHERWISE NOTED. PROVIDE A MINIMUM OF 1-1/2 INCH BETWEEN TERMINALS AND WIRE WAY ON BOTH SIDES OF TERMINAL STRIP. INSTALL END BARRIERS FOR EACH STYLE OF TERMINAL. INSTALL END STOPS ON EACH SECTION OF TERMINALS OR RELAYS. USE MACHINE PRINTED TAGS TO MARK TERMINAL STRIPS. WHEREVER POSSIBLE, MAKE ALL TERMINAL BLOCK CONNECTIONS FOR THE PANEL WIRING ON THE TOP OR RIGHT SIDE OF THE TERMINAL STRIP AND LEAVE THE BOTTOM OR LEFT SIDE FREE FOR FIELD TERMINATIONS, UNLESS NOTED OTHERWISE.
11. PROVIDE ENGRAVED PLASTIC NAMEPLATES. EITHER PAINT FILLED ENGRAVINGS OR 2 COLOR LAMINATIONS ARE ACCEPTABLE.
12. ALL OPERATOR CONTROL DEVICES (BUTTONS, SWITCHES, METERS, DISPLAYS, ETC.) SHALL HAVE NAMEPLATES.
13. PROVIDE A SET OF AS-BUILT DRAWINGS WITH THE PANEL. THESE SHALL BE COMPLETE, ALLOWING ENGINEER TO PRODUCE A SET OF "RECORD" DRAWINGS SHOWING ALL WIRE NUMBERS WITHIN THE PANEL AND THE DEVICE TERMINAL NUMBERS TO WHICH THEY CONNECT. REQUIRED INFORMATION SHALL INCLUDE BUT NOT BE LIMITED TO:
    A. ALL WIRE TAG NUMBERS.
    B. TERMINAL CONNECTION POINTS FOR POWER AND NEUTRAL FEEDS.
    C. ANY DEVIATIONS FROM THE EQUIPMENT LOCATIONS SHOWN ON THE DRAWINGS. PRIOR APPROVAL SHOULD BE OBTAINED BEFORE MAKING SUCH CHANGES.
14. SAVE ALL MATERIAL DATA SHEETS AND LITERATURE. WHERE PRODUCT DATA IS PROVIDED ON THE PACKAGE, MAKE A CLEAR COPY OF THE DATA AND INCLUDE WITH OTHER DATA SHEETS. INCLUDE ALL THIS MATERIAL WITH THE PANEL DURING DELIVERY.
15. EQUIPMENT LOCATIONS SHALL BE AS SHOWN ON THE DRAWINGS. THE PANEL BUILDER SHALL NOTIFY ENGINEER OF ANY PHYSICAL CONFLICTS OR OTHER PROBLEMS THAT COULD CAUSE PROBLEMS WITH THE INSTALLATION OR OPERATION OF THE PANEL BEFORE ASSEMBLING THE PANEL. RESOLUTION OF SUCH CONFLICTS SHALL BE APPROVED BY ENGINEER PRIOR TO PANEL ASSEMBLY.
16. PROVIDE ALL EQUIPMENT AS SHOWN ON THE BILL OF MATERIALS INCLUDED IN THIS DRAWING PACKAGE. SUBMIT ANY DEVIATION FROM THE BILL OF MATERIALS FOR APPROVAL IN WRITING PRIOR TO FABRICATION.

MISCELLANEOUS SYMBOLS



FIELD NOTES

1. TAKE CARE WHEN CONDUIT ENTRY PENETRATIONS ARE MADE INTO ENCLOSURE TO PREVENT SCATTERING OF DRILL CHIPS & KNOCK-OUT SLUGS. DE-BUR PENETRATIONS AND REMOVE DEBRIS. SEAL ALL CONDUIT ENTRIES INTO ENCLOSURE FROM LIQUIDS & CONTAMINANTS. AVOID CONDUIT ENTRIES OVER CRITICAL COMPONENTS, SUCH AS PLCs AND DRIVES.
2. ANALOG CABLES: 2 CONDUCTOR WITH SHIELD, BELDEN #8760 OR EQUAL.
3. IDENTIFY ALL WIRES AS SPECIFIED BY THE NATIONAL ELECTRICAL CODE HANDBOOK AND THE FOLLOWING:

460 VAC	120/208 VAC
(L1).....BROWN (L2).....ORANGE (L3).....YELLOW (NEUT)....GREY	(L1).....BLACK (L2).....RED (L3).....BLUE (NEUT)....WHITE
24 VDC	INTRINSICALLY SAFE
(ALL).....BLUE	(ALL).....LIGHT BLUE

4. SIZE ALL WIRES IN ACCORDANCE WITH NEC CODES. SINGLE CONDUCTORS SHALL BE STRANDED COPPER WITH THWN INSULATION, RATED FOR 600 VAC, AND UL LISTED AS MTW, UNLESS NOTED OTHERWISE. MINIMUM CONDUCTOR SIZE SHALL BE #14 AWG. GROUND CONDUCTOR SIZE SHALL BE AS INDICATED ON THE DRAWINGS. WHERE NOT INDICATED, IT SHALL BE #14 AWG OR LARGER.
5. LOCATE CONDUIT ENTRIES INTO ENCLOSURE TO ASSURE ADEQUATE WIRE BENDING SPACE. ROUTE WIRING SO THAT DOOR MOUNTED EQUIPMENT WILL NOT INTERFERE WITH IT WHEN THE DOOR IS CLOSED.
6. LOCATE INTRINSICALLY SAFE WIRING CONDUIT ENTRIES INTO ENCLOSURE AS CLOSE AS POSSIBLE TO THE WIREWAY PROVIDED FOR INTRINSICALLY SAFE FIELD WIRING SO THAT ALL INTRINSIC WIRING IS ISOLATED AT LEASED 2"I FROM ALL OTHER FIELD AND PANEL WIRING AND SECURED. ROUTE INTRINSICALLY SAFE FIELD WIRING THROUGH THE WIREWAY PROVIDED EXCLUSIVELY FOR INTRINSICALLY SAFE WIRING. ALL WIRING SHALL BE IN COMPLIANCE WITH THE NATIONAL ELECTRICAL CODE ARTICLE 504. OTHER APPLICABLE ARTICLES INCLUDE 501 & 515.
7. ENGINEER HAS IDENTIFIED AS MANY OF THE PLC INPUTS AND OUTPUTS AS POSSIBLE THAT WILL BE NEEDED TO MAKE THE CONTROL PROGRAM OPERATE AS REQUIRED. ADDITIONAL I/O MAY BE IDENTIFIED WHEN THE CONTROL PROGRAM IS WRITTEN AND RUGGINE WIRING. THESE SHALL BE CONSIDERED PART OF THESE SHOP DRAWINGS. THE INSTALLING CONTRACTOR SHALL INSTALL 10% SPARE CONDUCTORS TERMINATED ON TERMINAL BLOCKS ON BOTH ENDS TO MEET ADDITIONAL I/O REQUIREMENTS.
8. TAG ALL WIRES AT EVERY TERMINATION POINT. SHORT WIRE LENGTHS, (LESS THAN 8") WHERE THE ENTIRE CONDUCTOR IS VISIBLE MAY BE TAGGED AT JUST ONE END. WIRE LABELS FOR WIRES SMALLER THAN NO. 4, SHALL BE VINYL, SELF ADHESIVE, WRAPAROUND, WITH MACHINE PRINTED NUMBERS AND LETTERS. WIRE SIZES NO. 4 AND LARGER AND MULTI CONDUCTOR CABLES SHALL BE MARKED WITH ONE-PIECE, NYLON LOCKING MACHINE PRINTED MARKER TIES EQUAL TO PANDUIT PLM SERIES. WIRE TAG NUMBER SHALL BE AS INDICATED ON THE DRAWINGS.
9. DO NOT ROUTE ANY COMMUNICATION CABLES IN WIREWAYS WITH 120 VAC WIRING. ROUTE ALL THESE CABLES AWAY FROM 120 VAC WIRING. WHERE 120 VAC CONDUCTORS MUST BE CROSSED, DO SO AT RIGHT ANGLES AND PROVIDE AT LEAST 1" SEPARATION.
10. DO NOT CONNECT MORE THAN TWO WIRES TO ANY ONE TERMINAL.

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Contact info: 800-426-4262
Date: 2025.11.05 08:54:35-05'00'

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CLIENT INFO:
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CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

REV	MM/DD/YY	DESCRIPTION

JOB NO:	0224539.48
DATE:	NOVEMBER 2025
SCALE:	AS NOTED
DESIGNED BY:	VC
DRAWN BY:	VC
CHECKED BY:	RPM
FILENAME:	0224539.48 - I001 - I00* dwg

DRAWING TITLE:
INSTRUMENTATION
NOTES & LEGEND

DRAWING NO:
I-101

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22x34

BILL OF MATERIAL

ITEM	QTY.	MANUFACTURER	PART NUMBER	DESCRIPTION	DESIGNATION
				****ENCLOSURE & RELATED EQUIPMENT****	
1	1	HOFFMAN	CSD3930125S	ENCLOSURE, STAINLESS STEEL, 36.00.00" x 30.00" x 12.00"	ENCLOSURE
2	1	HOFFMAN	CP3630	BACK PANEL, 34.25" x 28.25"	SUB PANEL
3	1	HOFFMAN	CSBP3630	CONCEPT SWING OUT PANEL	
4	1	HOFFMAN	ALFSWD	DOOR SWITCH	INTRUSION SWITCH
5	1	HOFFMAN	CMFKSS	MOUNTING BRACKET KIT	
6	1	SIEGO	11101-0-00	THERMOSTAT, NO	INCLUDED WITH ITEM 10
7	1	HOFFMAN	ADLTEMP	DUAL THERMOSTAT	
8	1	PFANNENBERG	18040315407	400 WATT, 115VAC HEATER WITH THERMOSTAT	
9	1	HOFFMAN	CWHPTO	PADLOCKABLE HANDLE	
10					
11					
12					
13					
14					
15					
				****PLC & RELATED EQUIPMENT****	
16	1	ALLEN BRADLEY	1769-L24ER-QBFC1B	COMPACTLOGIX PLC PROCESSOR	PLC
17	1	ALLEN BRADLEY	1769-IQ16	16 POINT 24VDC SINKING/SOURCING INPUT MODULE	PLC, SLOT 1
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
				****OPERATOR INTERFACE EQUIPMENT****	
36	1	AUTOMATION DIRECT	CM5-T10W	OPERATOR INTERFACE, COLOR TOUCHSCREEN, 10 INCH	
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
				****TERMINAL BLOCKS & RELATED EQUIPMENT****	
50	45	ALLEN BRADLEY	1492-JD3	TERMINAL BLCCK 2 TIER	TB1
51	10	ALLEN BRADLEY	1492-EBJD3	TERMINAL BLCCK END BARRIER, 2 TIER	TB1
52	4	ALLEN BRADLEY	1492-EAJ35	TERMINAL BLCCK END ANCHOR	PLC, T31
53	3	ALLEN BRADLEY	1492-CJJ5-10	2-TIER TERMINAL BLOCK JUMPER, 10 POLE	TB1
54	7	ALLEN BRADLEY	1492-JG3	TERMINAL BLCCK, GROUNDING	TB1
55	1	ALLEN BRADLEY	199-D-11	DIN RAIL, STANDARD, 1 METER	MISC. COMPONENT MOUNTING
56	1	ALLEN BRADLEY	1492-DR6	DIN RAIL, RAISED, 1 METER	TB1
57	5	ALLEN BRADLEY	1492-II4	FUSED TERMINAL BLOCK, NEON INDICATOR	FU1-FU5
58	3	ALLEN BRADLEY	1492-W37	FUSED TERMINAL BLOCK END BARRIER	FU5, FJ5A, FU15
59	2	ALLEN BRADLEY	1492-W49	FUSE BLOCK SIDE JUMPERS 10 POLE	FU1-FU5, FU6-FU15
60	2	ALLEN BRADLEY	1492-SJS	FUSE BLOCK SIDE JUMPER INSULATING SLEEVE	FU1-FU5, FU6-FU15
61	1	ALLEN BRADLEY	1492-M5X12	GROUNDING TERMINAL BLOCK BLANK MARKING TAGS, 144 CT.	TB1
62	1	ALLEN BRADLEY	1492-M5X8	TERMINAL BLCCK BLANK MARKING TAGS, 2 TIER, 144 CT.	TB1
63	1	ALLEN BRADLEY	1492-MS8X12	FUSE BLOCK ELANK MARKING TAGS, 100 CT.	FU1-FU15
64	11	ALLEN BRADLEY	1492-II5	FUSED TERMINAL BLOCK, LED INDICATOR	FU5A, FU6-FU15
65	4	ALLEN BRADLEY	1492-J4	TERMINAL BLCCK 1 TIER	TB1 (120VAC POWER)
66	2	ALLEN BRADLEY	1492-JG4	TERMINAL BLCCK GROUNCING	TB1 (120VAC POWER)
67	2	ALLEN BRADLEY	1492-EBJ3	TERMINAL BLCCK END BARRIER, 1 TIER	TB1 (120VAC POWER)
68	1	ALLEN BRADLEY	1492-M6X12	TERMINAL BLCCK BLANK MARKING TAGS, 1 TIER, 120 CT.	TB1 (120VAC POWER)
69	2	ALLEN BRADLEY	1492-CJJ6-2	1-TIER TERMINAL BLOCK JUMPER, 2 POLE	TB1 (120VAC POWER)
70	1	ALLEN BRADLEY	700-H..T1L1	RELAY, SPDT, 120VAC COIL	PFR1
71	1	ALLEN BRADLEY	1492-MC6X10	RELAY BLANK MARKING TAGS	PFR1
72	6	ALLEN BRADLEY	700-HN121	RELAY SOCKET	CR0 - CR5
73	7	ALLEN BRADLEY	700-HC36Z24-4	RELAY, SPDT, 24VDC COIL	CR0 - CR5, PLUS SPARE
74	10	BJSSMANN	AGC-1	FUSE, 3A, 250V, FAST ACTING	
75	10	BJSSMANN	AGC-1	FUSE, 1A, 250V, FAST ACTING	FU2, FJ7, FU8, FU10 - FU15, PLUS SPARES
76	3	BJSSMANN	AGC-2	FUSE, 2A, 250V, FAST ACTING	FU6, FJ9, PLUS SPARE
77	2	BJSSMANN	MDL-5	FUSE, 5A, 250V, TIME DELAY	FU1, P..US SPARE
78	2	BJSSMANN	MDL-7	FUSE, 7A, 250V, TIME DELAY	FU5, P..US SPARE
79	2	BJSSMANN	AGC-15	FUSE, 15A, 32V, FAST ACTING	FU5A, PLUS SPARE
80	2	BJSSMANN	MDL-3-1/2-R	FUSE, 2-1/2A, 250V, TIME DELAY	FU3, P..US SPARE
81	2	BJSSMANN	AGC-1	FUSE, 5A, 250V, FAST ACTING	FU4, P..US SPARE
82	1	ALLEN BRADLEY	1489-M1C200	CIRCUIT BREAKER, 20 AMP, 1-POLE	CB1
83	2	PHOENIX CONTACT	2905318	VAL-VETRAB VAL-SEC-T2-1S-175-FM, 120VAC SURGE PROTECTOR	SUP1, PLUS SPARE
84	4	PHOENIX CONTACT	2906738	TERMITRAB ANALOG LOOP SURGE PROTECTOR	SUP2, SUP3, SUP4, PLUS 1 SPARE
85	1	PHOENIX CONTACT	0808710	ANALOG LOOP SURGE PROTECTOR MARKING STRIP	SUP2, SUP3, SUP4
86					
87					
88					
89					
				****WIREDUCT****	
93	6FT	PANDUIT	F1X4LG6	WIRING DUCT,1"W x 4"H	
94	6FT	PANDUIT	C1LG6	WIRING DUCT COVER, 1"W	
95	12FT	PANDUIT	F1.5X6LG6	WIRING DUCT 1.5"W X 4"H	
96	12FT	PANDUIT	C1.5LG6	WIRING DUCT COVER, 1.5"W	
97					
98					

ITEM	QTY.	MANUFACTURER	PART NUMBER	DESCRIPTION	DESIGNATION
				****WIREDUCT (CONT.)****	
99					
100					
101					
102					
103					
104					
				****HIGH VOLTAGE RELATED EQUIPMENT****	
108					
109					
110					
111					
112					
113					
114					
115					
116					
117					
118					
119					
120					
121					
122					
123					
124					
125					
126					
127					
128					
129					
				****POWER SUPPLIES****	
138	1	ALLEN BRADLEY	1606-XLE240EN	24VDC, 10 AMP POWER SUPPLY	PWS1
139	1	ALLEN BRADLEY	1606-XLS240-UPS	DC UPS MODULE	UPSM
140	1	POWERSONIC	PS-12110F2	SEALED RECHARGEABLE LEAD-ACID BATTERY, 12V, 18.0AH	
141	2	AMP	4-520448-2	FASTON .250 SERIES CRIMP-ON INSULATED RECEPTACLE TYPE LU	FOR BATTERY CONNECTIONS
142					
143					
144					
145					
				****COMMUNICATIONS****	
146					
147					
148					
149					
150					
151	1	ALLEN BRADLEY	1783-LMS5	LIGHTLY MANAGED SWITCH, 5 PORT	
152	1	BLACK BOX	EVNSL641-0003	CAT6E ETHERNET STANDARD PATCH CORD LENGTH 3 FT.	SEE COMMUNICATIONS
153	1	BLACK BOX	EVNSL641-0006	CAT6E ETHERNET STANDARD PATCH CORD LENGTH 6 FT.	SEE COMMUNICATIONS
154					
155					
156					
157					
158					
159					
160					
161					
162					
				****MISCELLANEOUS PANEL EQUIPMENT****	
164	1	PANDUIT	LGB2-0.414-6	GROUND BAR	
165					
166	1	PANEL FABRICATOR		NAMEPLATE, PHENOLIC, ENGRAVED	SEE SCHEDULE ON EQUIPMENT LAYOUT
167					
168	1	ALLEN BRADLEY	1492-REC15G	GFCI RECEPTACLE, 15 AMP, DIN RAIL MOUNT	PROGRAMMING RECEPTACLE
169					
170					
171					
172					
173					
174					
175	1	ENEDCO	GS3743	WARNING LABEL "ARC FLASH AND SHOCK HAZARD"	
176	1	ENEDCO	SQS110	WARNING LABEL "DEVICE POWERED FROM SEVERAL SOURCES"	
177					
178					
179					
				****MISCELLANEOUS FIELD EQUIPMENT****	
185					
186					
187					
188					
189					
190					
191					
192					
193					
194					
195					
196					
197					
198					
199					

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SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

REV	MM/DD/YY	DESCRIPTION

JOB NO:	0224539.48
DATE:	NOVEMBER 2025
SCALE:	AS NOTED
DESIGNED BY:	VC
DRAWN BY:	VC
CHECKED BY:	RPM
FILENAME:	0224539.48 - I001 - I00* dwg

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SCADA PANEL BILL OF MATERIAL

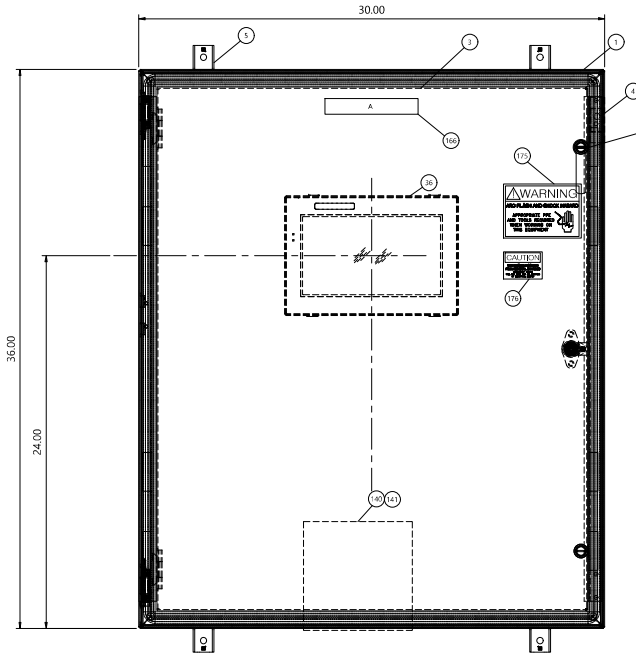
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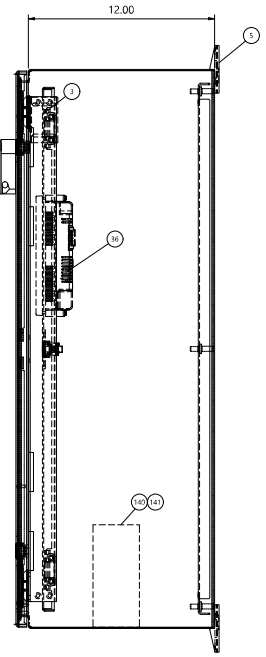
NAMEPLATE SCHEDULE			
ITEM	DIMENSION	DESCRIPTION	FABRICATION COMMENTS
A	5" x 1"	SCADA PANEL	NAMEPLATE TO BE BLACK WITH WHITE LETTERS WITH ADHESIVE BACK. TEXT SIZE TO BE .375
B	2.5" x .5"	FOR PROGRAMMING ONLY	NAMEPLATE TO BE RED WITH WHITE LETTERS WITH ADHESIVE BACK. TEXT SIZE TO BE .12

SHEET GENERAL NOTES

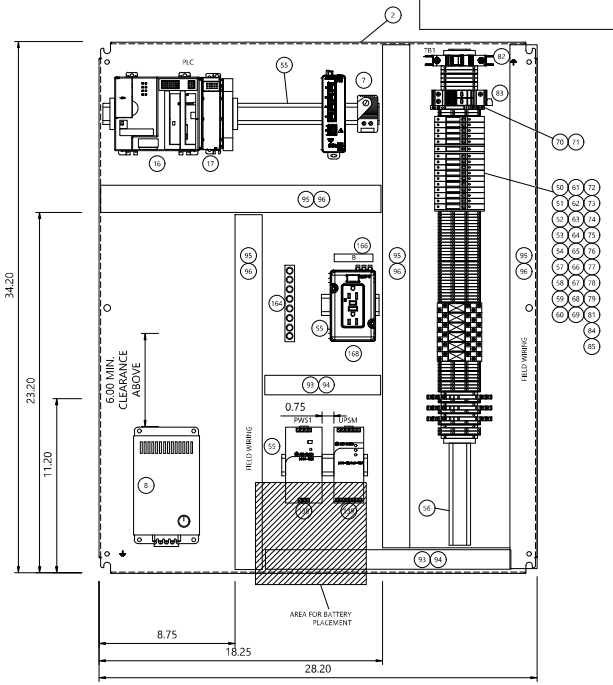
1. CONTRACTOR SHALL USE CAUTION WHEN LANDING CONDUITS IN THE BOTTOM OF ENCLOSURES TO AVOID INTERFERING WITH BATTERY PLACEMENT. (ITEM 140).
2. PANEL FABRICATOR SHALL MAKE NECESSARY MODIFICATIONS TO SWING OUT PANEL (ITEM 3) TO ACCOMMODATE INTRUSION SWITCH (ITEM 4).
3. CONTRACTOR SHALL INSTALL ENCLOSURE SO THAT THE BOTTOM OF THE PANEL IS APPROXIMATELY 36" FROM GROUND LEVEL, AND POSITIONING THE OPERATOR INTERFACE TERMINAL (ITEM 36) AT APPROXIMATELY 60" AT EYE LEVEL.



ENCLOSURE FRONT VIEW



ENCLOSURE RIGHT SIDE VIEW



SUB PANEL

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Date: 2025.11.20 08:56:39-05'00'

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STORMWATER IMPROVEMENTS

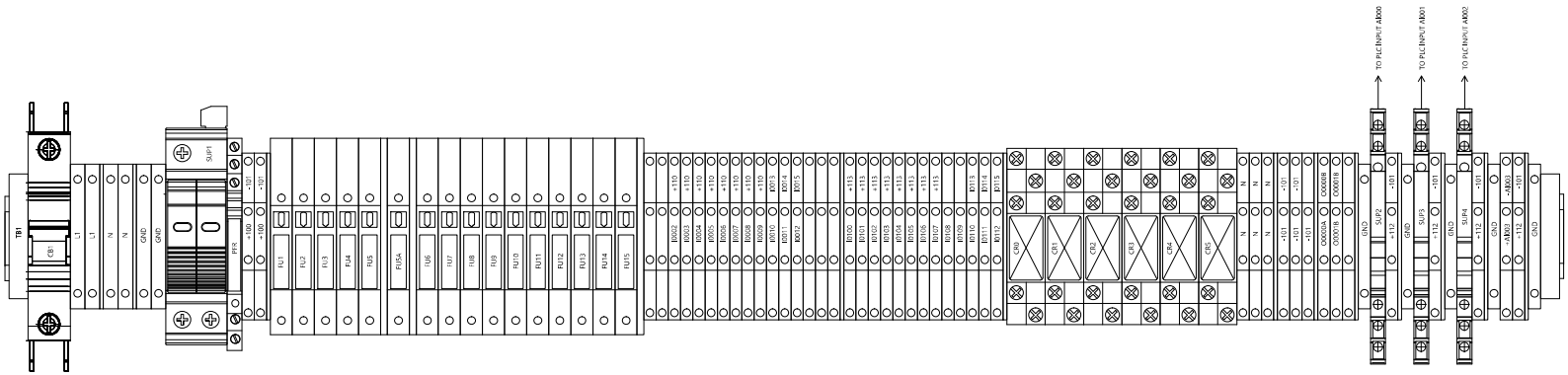
REV	MM/DD/YY	DESCRIPTION

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INSTRUMENTATION
SCADA PANEL EQUIPMENT LAYOUT

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I-103

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(1) 20 AMP CIRCUIT BREAKER
(1) 120VAC SURGE ARRESTOR
(6) 6-TIER END BARRIERS
(4) 4-TIER END BARRIERS
(2) 1-TIER END BARRIERS
(7) GROUNDING TERMINALS
(15) FUSE BLOCKS
(3) FUSE BLOCK END BARRIERS
(1) 120VAC RELAY
(6) 24VDC RELAYS
(3) MINI-LOC SURGE SUPPRESSORS
(2) END BARRIERS

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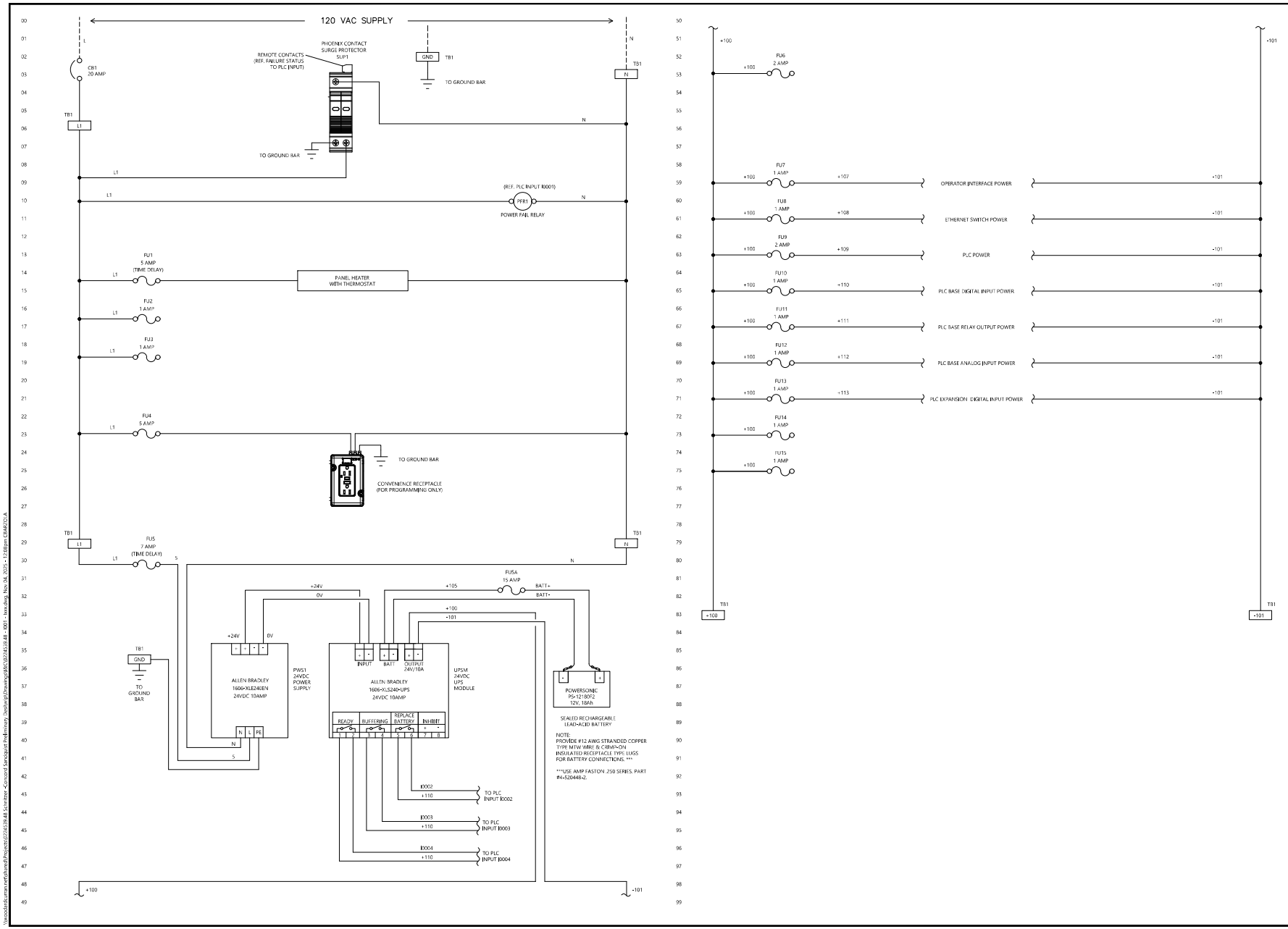
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DRAWING TITLE:
INSTRUMENTATION
SCADA PANEL TERMINAL BLOCK LAYOUT

DRAWING NO:
I-104

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DATE:	NOVEMBER 2025
SCALE:	AS NOTED
DESIGNED BY:	VC
DRAWN BY:	VC
CHECKED BY:	RPM
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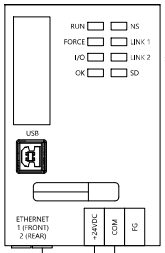
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INSTRUMENTATION
SCADA PANEL POWER
DISTRIBUTION

DRAWING NO:
I-105

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PLC
PROCESSOR/POWER SUPPLY

ALLEN BRADLEY COMPACTLOGIX
1769-L24ER-QBFC1B

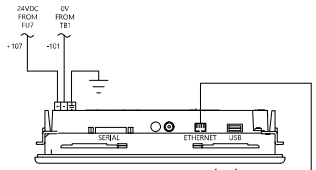


IP ADDRESS: 192.168.100.XX
SUBNET MASK: 255.255.255.0

-101 0VDC FROM TB1

+109 24VDC FROM FU9

BLACK BOX
EVNSL51-0003
CAT5E ETHERNET
STANDARD PATCH CORD
LENGTH: 3 FT.



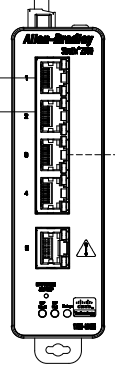
OPERATOR INTERFACE (OIT)
AUTOMATION DIRECT C-more OIT PORT DETAIL
CMS-T10W

BLACK BOX
EVNSL641-0006
CAT6 ETHERNET
PATCH CABLE
LENGTH: 6 FT.

ETHERNET SWITCH
ALLEN BRADLEY
1783-LMS5

24VDC FROM FU8 +108

0VDC FROM TB1 -101



TO VENDOR EQUIPMENT

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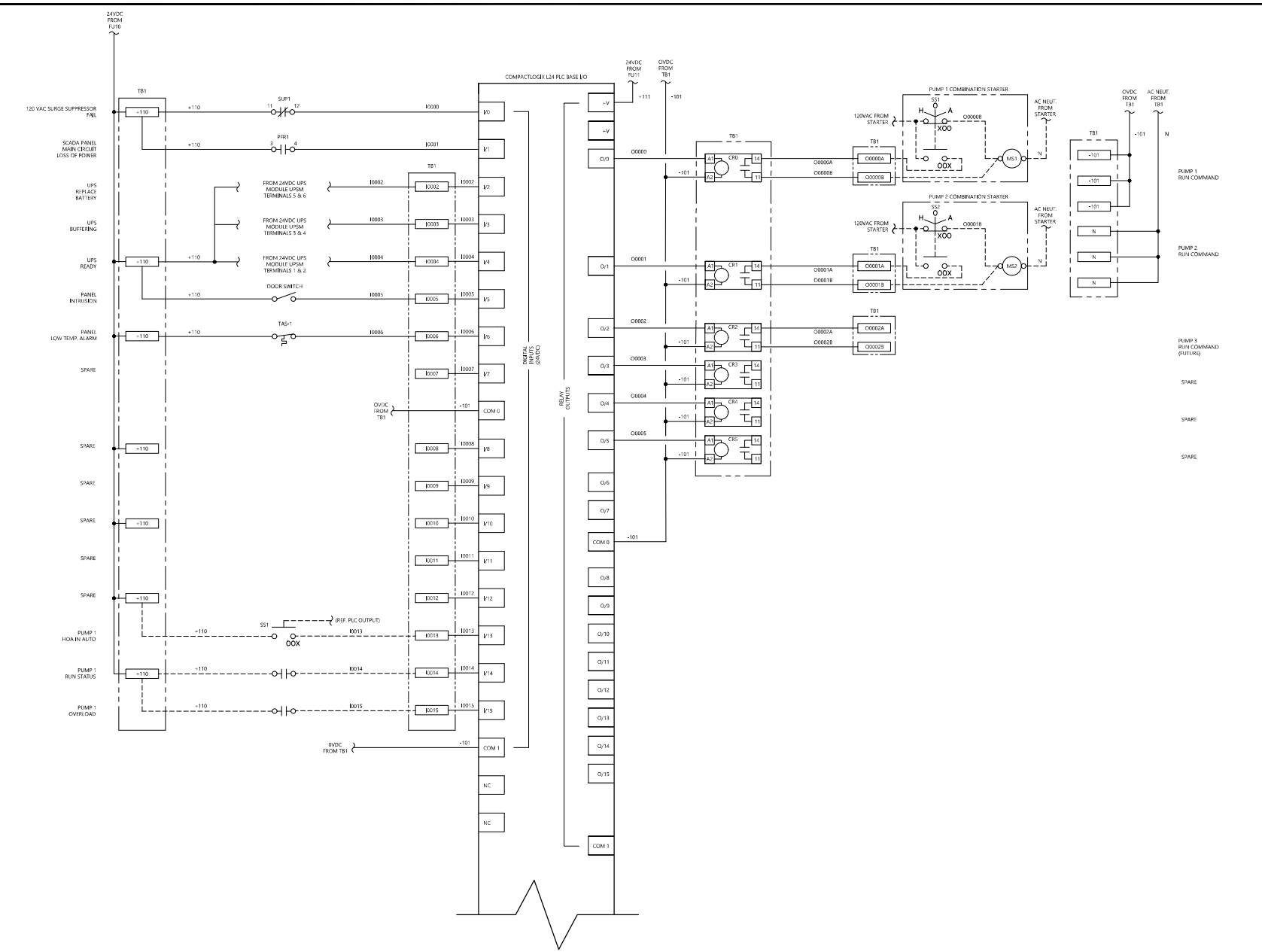
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INSTRUMENTATION
SCADA PANEL
COMMUNICATIONS

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I-106

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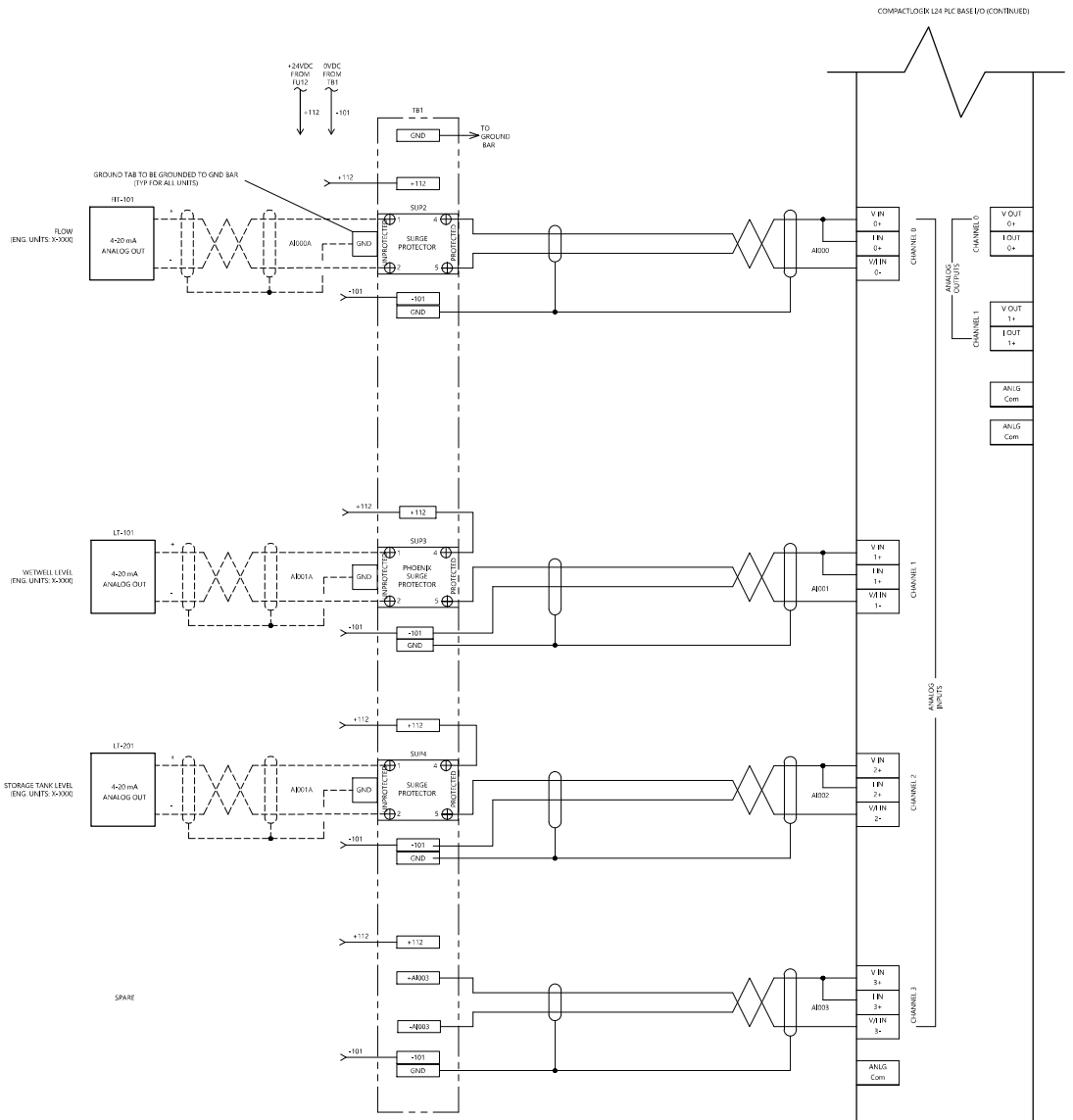
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INSTRUMENTATION
SCADA PANEL PLC BASE I/O:
DIGITAL INPUTS AND OUTPUTS

DRAWING NO:

I-107

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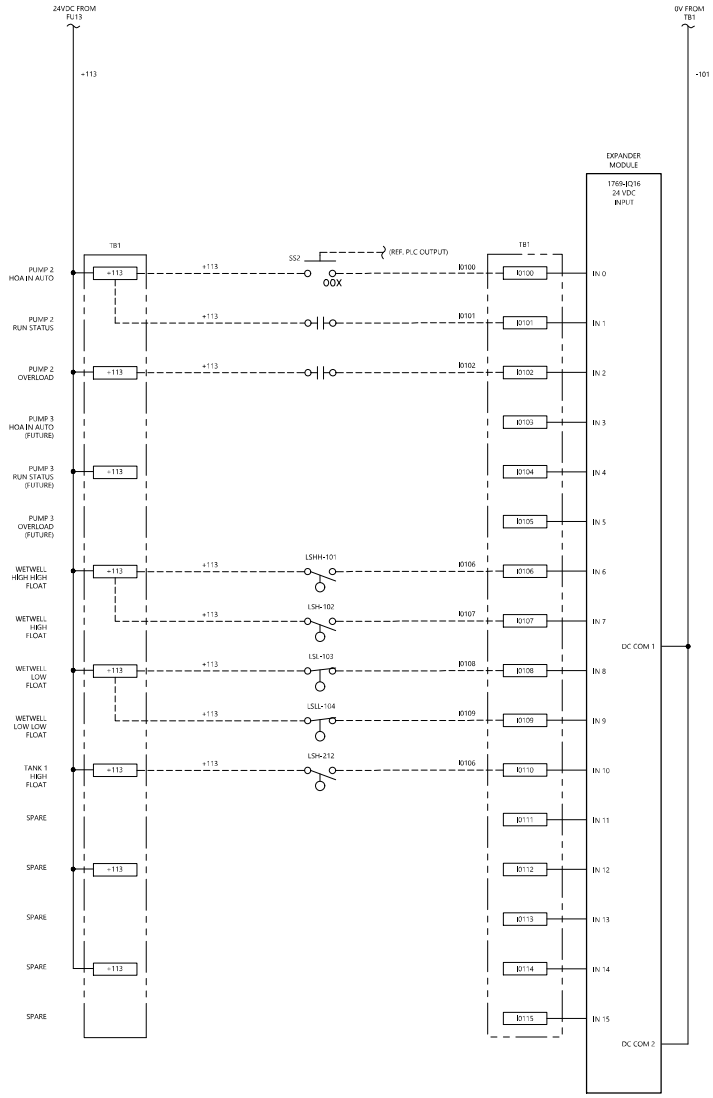
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SCADA PANEL PLC BASE I/O: ANALOG INPUTS

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I-108

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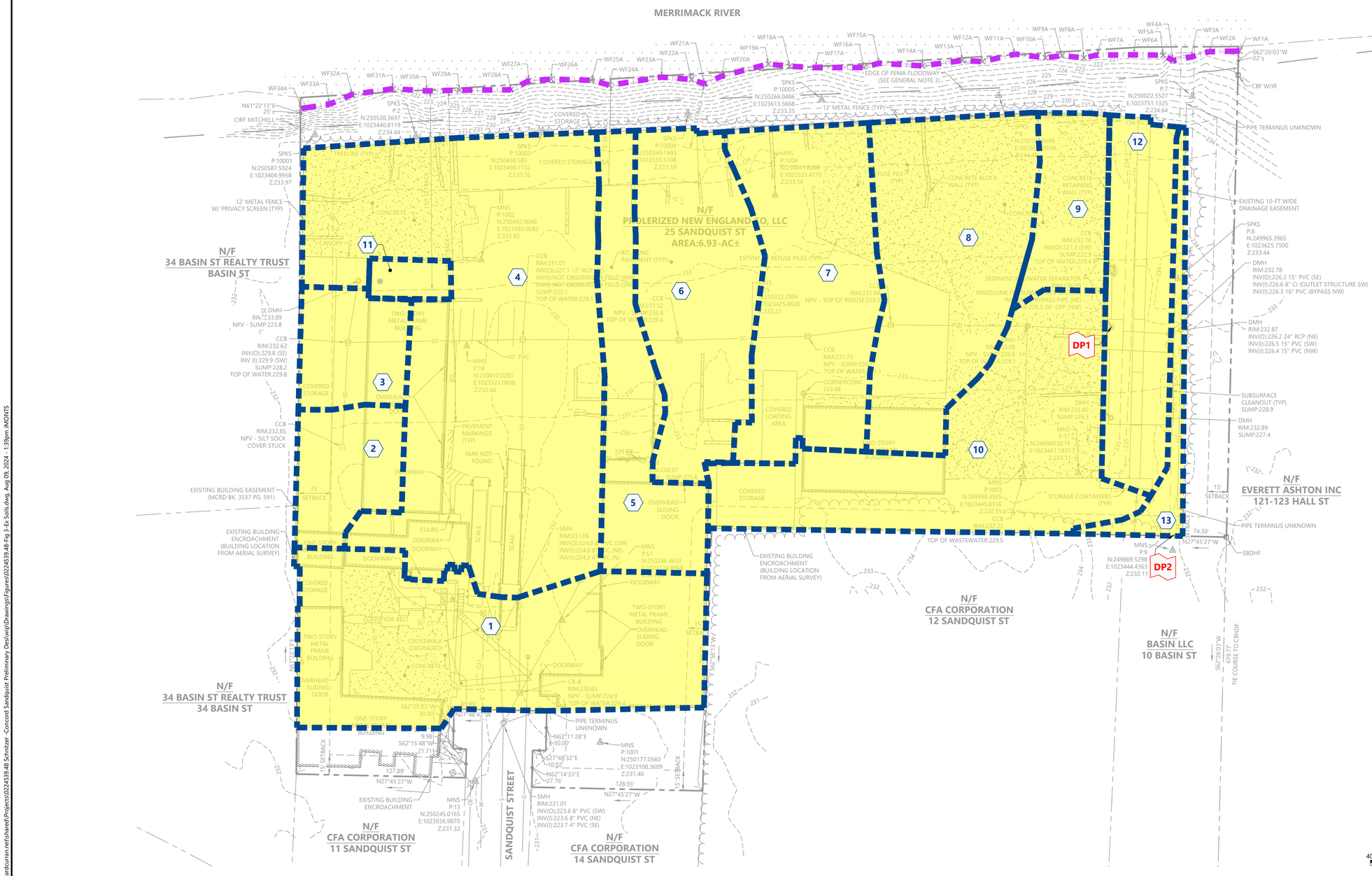
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SCADA PANEL EXPANSION I/O: DIGITAL INPUTS

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APPENDIX O: EXISTING CONDITIONS COLOR CODED SOILS PLANS

22x34



LEGEND

- DRAINAGE AREAS
- WETLAND BOUNDARY
- X — SUBCATCHMENT AREAS
- DP — DESIGN POINT
- HSG GROUP B

40' 0 40' 80'

BAR SCALE
1" = 40'
CHECK GRAPHIC SCALE BEFORE USING

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DATE:	JULY 2024
SCALE:	1" = 40'
DESIGNED BY:	YI
DRAWN BY:	JM
CHECKED BY:	YI/RT
FILENAME:	0224539.48-FIG 3-EX SOIl*.dwg

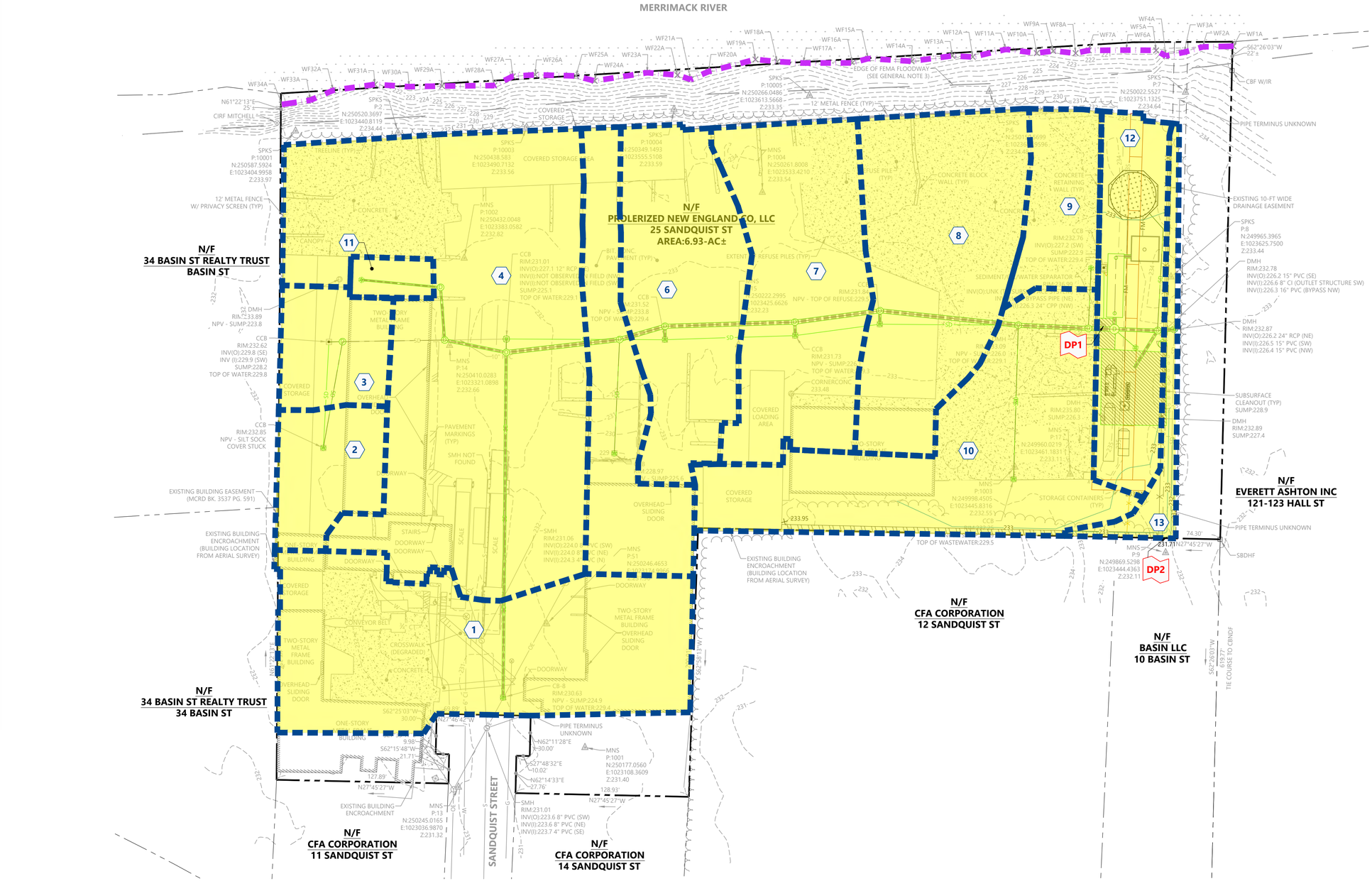
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CIVIL
EXISTING CONDITIONS COLOR CODED SOILS MAP

DRAWING NO:
FIGURE 1

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APPENDIX P: PROPOSED CONDITIONS COLOR CODED SOILS PLANS

22x34



LEGEND

- DRAINAGE AREAS
- WETLAND BOUNDARY
- SUBCATCHMENT AREAS
- DESIGN POINT
- HSG GROUP B

BAR SCALE
1" = 40'
CHECK GRAPHIC SCALE BEFORE USING

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DRAWING TITLE:

CIVIL
PROPOSED CONDITIONS
COLOR CODED SOILS MAP

DRAWING NO:

FIGURE 2

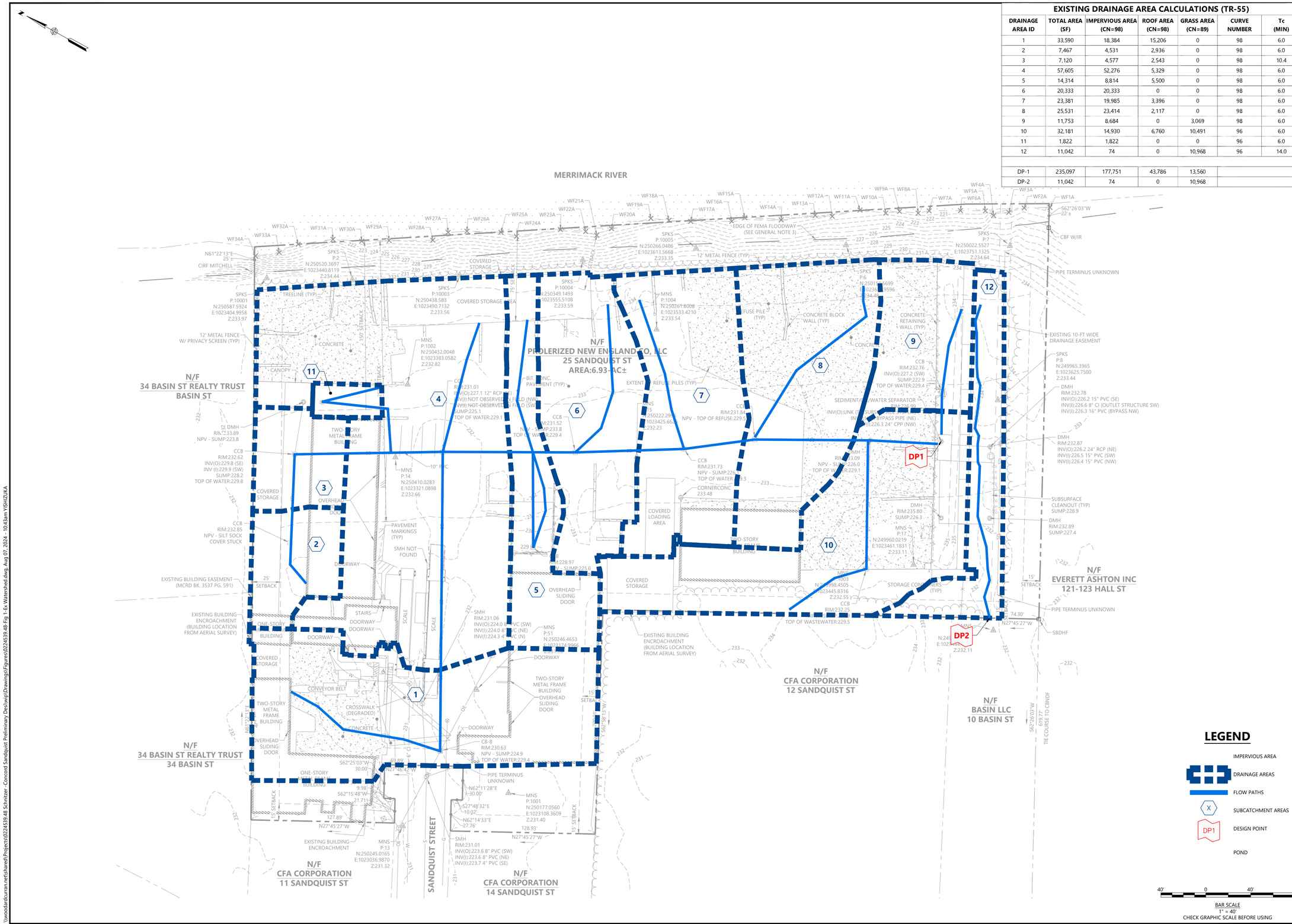
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APPENDIX Q: EXISTING CONDITIONS DRAINAGE AREA MAP

22x34

EXISTING DRAINAGE AREA CALCULATIONS (TR-55)

DRAINAGE AREA ID	TOTAL AREA (SF)	IMPERVIOUS AREA (CN=98)	ROOF AREA (CN=98)	GRASS AREA (CN=89)	CURVE NUMBER	Tc (MIN)
1	33,590	18,384	15,206	0	98	6.0
2	7,467	4,531	2,936	0	98	6.0
3	7,120	4,577	2,543	0	98	10.4
4	57,605	52,276	5,329	0	98	6.0
5	14,314	8,814	5,500	0	98	6.0
6	20,333	20,333	0	0	98	6.0
7	23,381	19,985	3,396	0	98	6.0
8	25,531	23,414	2,117	0	98	6.0
9	11,753	8,684	0	3,069	98	6.0
10	32,181	14,930	6,760	10,491	96	6.0
11	1,822	1,822	0	0	96	6.0
12	11,042	74	0	10,968	96	14.0
DP-1	235,097	177,751	43,786	13,560		
DP-2	11,042	74	0	10,968		



LEGEND

- IMPERVIOUS AREA
- DRAINAGE AREAS
- FLOW PATHS
- X — SUBCATCHMENT AREAS
- DP1 — DESIGN POINT
- POND

40' 0 40' 80'

BAR SCALE
1" = 40'
CHECK GRAPHIC SCALE BEFORE USING

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RADIUS RECYCLING
CONCORD, NH

SANDQUIST FACILITY
STORMWATER IMPROVEMENTS

REV	MM/DD/YY	DESCRIPTION

JOB NO:	0224539.48
DATE:	AUGUST 2024
SCALE:	1" = 40'
DESIGNED BY:	YI
DRAWN BY:	HAO/OP
CHECKED BY:	YI/RT
FILENAME:	0224539.48-FIG 1-EX WAT*.dwg

DRAWING TITLE:

CIVIL
EXISTING CONDITIONS WATERSHED DELINEATION

DRAWING NO:

EX-1

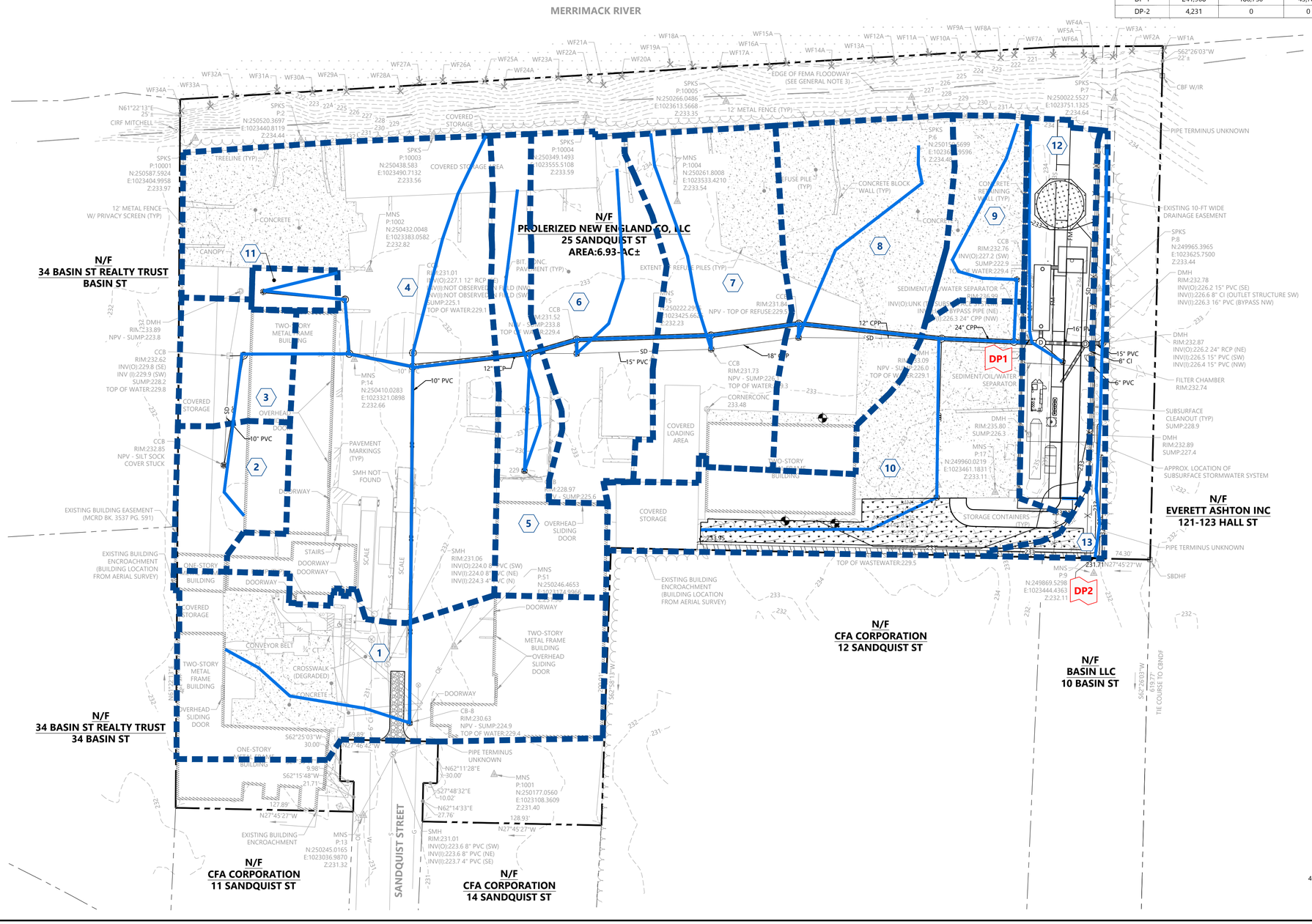
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APPENDIX R: PROPOSED CONDITIONS DRAINAGE AREA MAP

22x34

PROPOSED DRAINAGE AREA CALCULATIONS (TR-55)

DRAINAGE AREA ID	TOTAL AREA (SF)	IMPERVIOUS AREA (CN=98)	ROOF AREA (CN=98)	GRASS AREA (CN=89)	CURVE NUMBER	Tc (MIN)
1	33,590	18,384	15,206	0	98	6.0
2	7,467	4,531	2,936	0	98	6.0
3	7,120	4,577	2,543	0	98	10.4
4	57,605	51,575	5,329	701	98	6.0
5	14,314	8,814	5,500	0	98	6.0
6	20,333	20,333	0	0	98	6.0
7	23,381	19,985	3,396	0	98	6.0
8	25,531	23,413	2,117	0	98	6.0
9	7,621	7,621	0	0	98	6.0
10	29,279	14,729	6,760	7,790	96	6.0
11	1,822	1,822	0	0	98	6.0
12	13,845	4,945	0	8,900	91	6.0
13	4,231	0	0	4,231	91	6.0
DP-1	241,908	180,730	43,786	17,391		
DP-2	4,231	0	0	4,231		



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DRAWING NO:

PR-1

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