Town of Ramapo
Building, Planning and Zoning Department
237 Route 59, Suffern NY 10901
Phone: (845) 357-5100 Fax: (845) 357-5140

COMMUNITY DESIGN REVIEW COMMITTEE
April 23, 2025

A Community Design Review Committee was held on April 23, 2025, with Ian Smith, Building Inspector; Hannah Ross, Secretary to Planning; Joel Bianchi, Engineering/Planning Consultant; Dennis Lynch, Engineering Consultant; Abigail Shvartsman, Planning Board Attorney; and Aneisha Samuels, Planning Consultant were present.

2023.037: 1507 Route 202 Site Development Permit
1507 Route 202, Pomona
Tax Lot: 33.05-2-15
Zoning: PO
Use: Professional Office
Project update

The following people were present: Rachel Barese, Daniel Richmond, Rhonda Smith

Project Description: The Ramapo Planning Board has received an application from Moshe Messner (applicant) and Jasco 202 LLC (owner), represented by Zarin & Steinmetz and Civil Tec Engineering, for Site Development Permit approval at 1507 US Route 202, Pomona. The project site is a 1.397-acre parcel located at 1507 Route 202. Currently, the site is occupied by a one-story commercial building. The applicant plans to demolish the existing structure and construct a new three-story building. The proposed building is expected to provide a total usable area of 27,645 square feet, including a parking lot with 105 spaces. Access to the site will be through an existing curb cut onto Route 202. The site will be connected to municipal water and sewer services. This parcel is located in the Town's PO Zoning District and requires a Site Development Permit. Area variances are required from the Zoning Board.

Applicant Provided Materials:

1. Project Narrative as prepared by Zarin & Steinmetz, LLP and dated April 4, 2025
2. Project Narrative as prepared by Civil Tec Engineering and Surveying, PC, dated April 4, 2025
3. Plan set entitled, "1507 Route 202", nine sheets in total as prepared by Civil Tec Engineering and Surveying, PC
   a. Site Plan, Sheet 1 of 9, dated April 4, 2025, as revision 4
   b. Grading, Drainage & Utilities Plan, Sheet 2 of 9, dated April 4, 2025, as revision 4
   c. Sewer Main Extension, Sheet 3 of 9, dated April 4, 2025
   d. Sewer Main Extension, Sheet 4 of 9, dated April 24, 2025
   e. Landscaping & Erosion & Sediment Control Plan, Sheet 5 of 9, dated April 4, 2025, as revision 4
   f. Fire Truck Maneuverability Plan, Sheet 6 of 9, dated April 4, 2025, as revision 4
   g. Details, Sheet 7 of 9, dated April 4, 2025, as revision 4
   h. Details, Sheet 9 of 9, dated April 4, 2025, as revision 4
   i. Details, Sheet 9 of 9, dated April 4, 2025, as revision 4
4. Hydrant Flow test dated June 19, 2024
5. Architectural Plans
6. Fire Flow Cals dated April 2025
7. Parking and Traffic Evaluation as prepared by Colliers Engineering dated April 4, 2025
8. Sewer Capacity Analysis as prepared by Civil Tec Engineering and Surveying and dated March 8, 2024 previously provided *
9. Stormwater Pollution Prevention Plan (SWPPP) as prepared by Civil Tec Engineering Surveying, PC, dated February 2024, Revised October 2024 previously provided *
10. Color Renderings *previously provided
11. Parking and Lighting Map *previously provided
12. Site Plan Application *previously provided
13. Short EAF dated November 17, 2023 *previously provided
14. Narrative re: Scenic Road District as prepared by Attorney Dan Richmond

Review Letters:

1. Department of Public Works letter dated 5/9/25 *received after meeting
2. MJ Engineering letter dated 4/22/25
3. Fire Inspector letter dated 4/14/25
4. Building Inspector letter dated 4/8/25
5. Rockland Co Sewer District No. 1 letter dated 4/9/25
6. Rockland Co Environmental Health letter dated 4/21/25

Application History / Status:

- **3/6/24:** The applicant was before the CDRC for a concept discussion. The CDRC commented that the traffic study and plans will be subject to DOT review and approval. Compliance with the Scenic Overlay District is required. The applicant was instructed to address CDRC comments, make a formal application, and return to the CDRC.
- **6/5/24:** The applicant was before the CRDC for a project update. The applicant provided a Scenic Overlay Narrative, a truck turning analysis, and loading zone. The CDRC had some technical comments on the site plan and requested that the applicant provide a SWPPP and soil testing. The applicant was instructed to address CRDC comments and return to the CDRC.
- **12/4/24:** The applicant was before the CDRC and was referred to be placed on the January 28, 2025, Planning Board Agenda for concept, SEQR classification, and to initiate a Coordinated Review. Additionally, the applicant was asked to provide architectural drawings, resubmit SWPPP with soil testing, Look into loading berth and provide building heights.

The following was discussed:

1. The applicant provided a project update. Re project scope and increase in parking. The applicant provided a narrative re the scenic route requirements. The building is greater than 30ft in height. State variances are required.
2. CDRC Comments:
    a. **DPW** has no comments.
    b. **Fire Inspector** notes five (5) comments on fire flow requirements, building heights, and fire access roads. They also note eight (8) comments on the architectural plans.
    c. **Building Inspector** notes the variances that are needed and that the applicant should provide striped crosswalk from external to internal sidewalk
    d. **RCSD No.1** notes nine (9) comments on sewer district requirements including fees.
    e. **RC Health notes** two (2) comments regarding the sanitary sewer expansion and compliance to the County Mosquito Code
    f. MJ notes SEQR, GML, and minor plan changes. The applicant needs permitting closure for wetlands prior to finalizing plans.

CDRC Recommendations / Observations

1. SEQR: The application is an Unlisted Action. A coordinated review is optional for Unlisted action. It is the CDRC's recommendation that a coordinated review occurs.
2. GML: A GML referral is required due to the project site being within 500-feet of a state highway (State Route 202 – Haverstraw Road) and county property (Mount Ivy County Park).
3. Waivers: None
4. Variances: The applicant is requesting the following area variances: Variances need should be confirmed by Zoning Staff.

A state variance may be required for two egresses and remoteness and Fire apparatus per sectionD104.1, D104.3 and D105

	Required	Proposed
Minimum Front Yard	20 ft	8.9 ft
Maximum building height	30 ft	34 ft
Maximum Development Coverage	75%	85%
Parking spaces	124	105
Loading Berth	yes	no

Next Steps:

1. **The CDRC is of the opinion that the applicant needs to address CDRC comments, and is ready for the Planning Board's review and is tentatively scheduled for May 27th , 2025 for updated concept review and to initiate SEQR. *Moved to special meeting of May 22, 2025**

Applicant To:

1. **Provide a revised narrative that discusses the impact of the proposed work on the 100-foot adjacent area and discuss the necessary permits considering updated DEC Regulations. *provided 5.13.2025**

CIVILTEC
Engineering + Surveying

April 4, 2025

Town of Ramapo
237 Route 59
Suffern, NY 10901

Re: 1507 Route 202
Pomona, NY 10970
Tax Lot 33.05-2-15

Subject: Narrative

Enclosed is a site plan for Tax Lot 33.05-2-15. The property is located at 1507 Route 202 in the Town of Ramapo. The lot contains an existing small commercial building. The applicant proposes a 3 story office building with a total of 24,722 SF (reduced from the prior submittal where the building was 27,645 SF). The property is in the PO zone and offices are a permitted use.

Based on a parking requirement of 1 space per 200 SF of floor area, 124 parking spaces are required. 105 parking spaces are provided. Additional spaces have been added since the prior plan to bring it more in compliance. The parking provided is 84.7% compliant. A loading zone is now provided for delivery vehicles. Some of the spaces are 18' deep. The applicant requests a waiver to permit the 18' deep parking spaces.

The building will be 34' tall and will have a 4' parapet. A variance is requested for the building height.

Public sewer and water will be used. Stormwater has been designed to meet the zero net increase in runoff requirement.

Variances will be required for the following:

1. Minimum Front Yard: 20 FT Required, 8.9 FT Provided to parking
2. Maximum Building Height 30 FT Required, 34 FT Provided
3. Maximum Development Coverage 75% Required, 85% Provided
4. Parking: 124 Spaces Required, 105 Spaces Provided
5. 376-77 no loading berth

Civil Tec Engineering & Surveying P.C.
139 Lafayette Avenue, 2nd Floor, Suffern, NY 10901 Tel 845.547.2241 Fax 845.547.2243
111 Main Street, Chester, NY 10918 Tel 845.610.3621
Civil-Tec.com

ZARIN & STEINMETZ LLP

Daniel M. Richmond
dmrichmond@zarin-steinmetz.com

May 13, 2025

Chairman Yisroel Eisenbach and the
Members of the Planning Board
Town of Ramapo
237 Route 59
Suffern, NY 10901

Re: 1507 Route 202;
Application for Site Development Plan Approval

Dear Chairman Eisenbach and Members of the Planning Board:

As you will recall, this firm, in coordination with Civil Tec Engineering and Surveying PC ("Civil Tec"), Hartman Design, Colliers Engineering and Design, and Ecological Analysis, LLC, represents the Applicant on its proposed redevelopment of an office building located in the Town's Professional Office (PO) District, where offices are a use permitted by right (the "Project").

By this letter, the Applicant respectfully supplements its analysis on the Project's conformance to the standards set forth in the Town's Scenic Road District Law. As set forth in the accompanying narrative from Larry Hartman of Hartman Design ("Hartman Narrative," copy attached hereto at Tab "A"), the Applicant's architect, the Applicant has worked closely with its consultants to ensure that the proposed development is thoughtfully designed to comply with the standards set forth in the Law. The overall site plan and building design were carefully considered to protect the visual quality of the Route 202 corridor and to integrate harmoniously with the surrounding neighborhood.

Initially, please note that the proposed building is in the location of the existing building, and, as such, that location is already disturbed. Moreover, consistent with Scenic Road District Law Section 215-4(A)(3), the proposed building is sited approximately 50 feet back from Route 202 so as to avoid or minimize obstructing scenic views along Route 202 to the extent practicable. In fact, as explained in the Hartman Narrative, the positioning of the building setback from the roadway significantly reduces its visual presence from Route 202. This increased setback, along with a front parking layout that mirrors that of nearby properties, ensures consistency with the existing development pattern and helps maintain the open and scenic character of the District.

The Applicant proposes landscaping between the parking area and the property line to create buffering and to screen the proposed building from vantage points along Route 202. *See* Town Code §§ 215-4(A)(4)(b) & (e). As explained in the Hartman Narrative, the Project includes a landscaped buffer of proposed trees and plantings between the parking area and the roadway to

further shield the building from view. This green barrier softens the site's appearance and reinforces the project's intention to minimize any visual disruption to the streetscape.

As further explained in the Hartman Narrative, architecturally, the building features a modest stucco façade complemented by accents of a secondary material that adds visual interest without drawing excessive attention. A simple and restrained design was intentionally chosen to avoid standing out and instead to support a continuous, even visual flow along Route 202.

Additionally, as also explained in the Hartman Narrative, the proposed building has fewer windows than a typical modern office building. This was a conscious decision to limit exterior reflections and reduce visual glare, further ensuring the building blends quietly into the landscape. The selected materials and neutral color palette contribute to a calm, integrated aesthetic that is consistent with the goals of the Scenic Road District.

As a result, as drivers pass the property, the structure will present a calm, consistent appearance that blends into its surroundings, contributing to the overall aesthetic unity of the corridor rather than interrupting it.

The Applicant is unaware of any historic or scenic resources that would be protected by enhanced rear or side setbacks are unwarranted. In fact, as set forth in the annexed correspondence from the State Office of Parks, Recreation and Historic Preservation ("SHPO"), the Project will not impact any properties, including archaeological and/or historic resources, listed or eligible to be listed on the State or National Registers of Historic Places. (See SHPO Letter, copy attached hereto at Tab "B"). As such, the Applicant respectfully submits that doubling the required setbacks for the Project would serve no rational planning purpose. *See* Town Code § 215-4(A)(4)(a).

There is no significant existing vegetation, plant specimens, landforms and/or water features, stonewalls or other scenic vistas along the front yard that require special management. *See* Town Code § 215-4(A)(4)(b). Moreover, there is no existing vegetation on the Site to be preserved and, moreover, although the Project is not in a Zoning District that is subject to the particular tree cutting limitations of the Scenic Road District Law, it is still worth noting that the only trees proposed to be cut down are toward the rear of the Site, where they do not impact the viewsheds on Route 202. *See* Town Code §§ 215-4(A)(4)(e) & (f).

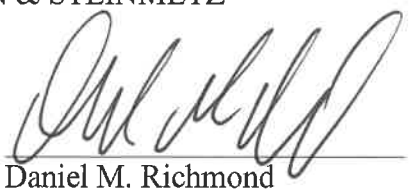
Finally the Project does not involve intrusion in open space areas, does not involve a cluster subdivision, and does not propose a telecommunication tower. *See* Town Code §§ 215-4(A)(4)(c), (d) & (g).

In summary, through its careful siting, landscape buffering, and understated architectural design, the proposed building respects the intent of the Scenic Road District Law and ensures a compatible and non-intrusive presence within the neighborhood.

As always, please let us know if your Board has any questions or requires any additional information.

Very truly yours,

ZARIN & STEINMETZ

By: 
Daniel M. Richmond

encs.
cc: Moshe Eisen
Moshe Messner
Messner Construction
Rachel Barese, P.E.
Civil Tec Engineering and Surveying PC
Larry Hartman
Moshe Hershkowitz
Shloimy Gelb
Hartman Design

A

Hartman Design
COMMERCIAL · RESIDENTIAL
412 N. Main Street, 301 Monroe, NY, 10950
845-781-4222 I Larry@lhartmandesign.com

Narrative of Conformance with the Scenic Road District Law for 1507 Route 202

The proposed development at 1507 Route 202 has been thoughtfully designed to comply with the standards set forth in the Town's Scenic Road District Law. The overall site plan and building design were carefully considered to protect the visual quality of the corridor and to integrate harmoniously with the surrounding neighborhood.

The building is positioned further back from the roadway, which significantly reduces its visual presence from Route 202. This increased setback, along with a front parking layout that mirrors that of nearby properties, ensures consistency with the existing development pattern and helps maintain the open and scenic character of the district.

Between the parking area and the roadway, a landscaped buffer of proposed trees and plantings is incorporated to further shield the building from view. This green barrier softens the site's appearance and reinforces the project's intention to minimize any visual disruption to the streetscape.

Architecturally, the building features a modest stucco façade complemented by accents of a secondary material that adds visual interest without drawing excessive attention. A simple and restrained design was intentionally chosen to avoid standing out and instead to support a continuous, even visual flow along the roadway. As drivers pass the property, the structure will present a calm, consistent appearance that blends into its surroundings, contributing to the overall aesthetic unity of the corridor rather than interrupting it.

Additionally, the building has fewer windows than a typical modern office building. This was a conscious decision to limit exterior reflections and reduce visual glare, further ensuring the building blends quietly into the landscape. The selected materials and neutral color palette contribute to a calm, integrated aesthetic that is consistent with the goals of the Scenic Road District.

In summary, through its careful sitting, landscape buffering, and understated architectural design, the proposed building respects the intent of the Scenic Road District Law and ensures a compatible and non-intrusive presence within the neighborhood.

Sincerely.

Lerry Hartman
Hartman Design.

B

New York State
Parks, Recreation and
Historic Preservation

KATHY HOCHUL
Governor

RANDY SIMONS
Commissioner Pro Tempore

May 02, 2024

RACHEL BARESE
President
Civil Tec Engineering & Surveying PC
139 Lafayette Avenue
2nd Fl.
Suffern, NY 10901

Re: DEC
1507 Rt 202
1507 Route 202, Pomona, NY 10970
24PR03558

Dear RACHEL BARESE:

Thank you for requesting the comments of the Office of Parks, Recreation and Historic Preservation (OPRHP). We have reviewed the project in accordance with the New York State Historic Preservation Act of 1980 (Section 14.09 of the New York Parks, Recreation and Historic Preservation Law). These comments are those of the OPRHP and relate only to Historic/Cultural resources. They do not include potential environmental impacts to New York State Parkland that may be involved in or near your project.

Based upon this review, it is the opinion of OPRHP that no properties, including archaeological and/or historic resources, listed in or eligible for the New York State and National Registers of Historic Places will be impacted by this project.

If further correspondence is required regarding this project, please be sure to refer to the OPRHP Project Review (PR) number noted above. If you have any questions, please contact Chelsea Towers at the following email address:

Chelsea.Towers@parks.ny.gov

Sincerely,

R. Daniel Mackay

Deputy Commissioner for Historic Preservation
Division for Historic Preservation

ZARIN & STEINMETZ LLP

Daniel M. Richmond
dmrichmond@zarin-steinmetz.com

April 4, 2025

Chairman Yisroel Eisenbach and the
Members of the Planning Board
Town of Ramapo
237 Route 59
Suffern, NY 10901

Re: 1507 Route 202;
Application for Site Development Plan Approval

Dear Chairman Eisenbach and Members of the Planning Board:

As you will recall, this firm, in coordination with Civil Tec Engineering and Surveying PC ("Civil Tec"), Hartman Design, Colliers Engineering and Design ("Colliers), and Ecological Analysis, LLC, represents the Applicant on its proposed redevelopment of an office building located in the Town's Professional Office (PO) District, where offices are a use permitted by right (the "Project").

The Applicant hereby respectfully submits a substantially revised Site Plan, prepared by Civil Tec, in response to your Board's comments at its January 28, 2025 Meeting (the "Revised Site Plan"). The Revised Site Plan reflects a major reduction in the Project's size (reduced from 27,645 square feet to 24,722 square feet), as well as a significant increase in the parking proposed for the Project (increased from 90 parking spaces to 105 parking spaces). These revisions equate to an approximately 10% reduction in the Project size, and an approximately 17% increase in the parking proposed for the Project. As a result of these revisions, the Project will be in approximately 85% compliance with the required parking ratio (as compared to approximately 64% compliance for the original proposal).

As explained in the Memorandum on Parking and Trip Generation, prepared by Colliers, dated April 4, 2025, based on Institute of Transportation Engineers ("ITE") average parking demand for similar uses, the proposed office building would only require 48 spaces, and an 85th percentile parking demand (design criteria) of 74 spaces, such that the proposed 105 spaces is more than adequate. Moreover, the Truck Turning Analysis Plan demonstrates that fire trucks will be able to maneuver throughout the Site.

The Project also meets the review standards set forth in the Town's Scenic Road District Law. Consistent with Town Code Section 215-4(A)(3), the proposed building has been sited approximately 50 feet back from Route 202 so as to avoid or minimize obstructing scenic views along Route 202 to the extent practicable. Please note that the proposed building is in the location of the existing building, and, as such, that location is already disturbed.

As always, please let us know if your Board has any questions or requires any additional information.

Very truly yours,

ZARIN & STEINMETZ

By: Daniel M. Richmond

encs.

cc: Moshe Eisen
Moshe Messner
Messner Construction
Rachel Barese, P.E.
Civil Tec Engineering and Surveying PC
Mordechai Tirnower
Moshe Hershkowitz
Shloimy Gelb
Hartman Design
Ronald P. Rieman,
Colliers Engineering & Design
James Bates
Ecological Analysis

Town of Ramapo

Department of Public Works
16 Pioneer Avenue
P.O. Box 446
Tallman, New York 10982
(845) 357-0591
Fax: (845) 357-0895

MICHAEL SPECHT
Supervisor

MICHAEL J. SADOWSKI
Superintendent of Public Works

May 9, 2025

To: Hannah Ross
From: Edward Moran, P.E.

Re: 1507 Route 202
Tax Lot No. 33.05-2-15

We are in receipt of and have reviewed the items listed below for the above referenced project.

Items received on November 21, 2023
- Site Plan prepared by Civil Tec, containing 1 sheet, last revised on November 14, 2023

Items received on February 16, 2024
- Site Plan prepared by Civil Tec, containing 6 sheets, last revised on February 8, 2024

Items received on May 21, 2024
- Site Plan prepared by Civil Tec, containing 6 sheets, last revised on May 15, 2024

Items received on November 19, 2024
- Site Plan prepared by Civil Tec, containing 7 sheets, last revised on October 21, 2024

Items received on April 8, 2025
- Site Plan prepared by Civil Tec, containing 9 sheets, last revised on April 8, 2025

Our sanitary sewer comments are as follows:

1) All previous comments have been addressed.

File: 1507 Route 202

April 22, 2025

To: Ian Smith, Building Inspector
Hannah Ross, Planning Department
Abigail Shvartsman, Town Attorney
Ed Moran, PE Town Dept of Public Works
Rachel Barese, PE, Civil Tec Engineering Surveying, PC
Daniel Richmond, Zarin & Steinmetz, LLP

From: Joel Bianchi, PE, Principal / Senior Vice President of Civil Engineering
Dennis Lynch, PE, Project Manager
Aneisha Samuels, Planning Consultant
MJ Engineering & Land Surveying PC

Re: 1507 Route 202 Site Development Permit
1507 Route 202
Tax Lot 33.05-2-15
Ramapo File: 2023.037
MJ File: 1074.01.312

MJ Engineering, Architecture, Landscape Architecture, and Land Surveying (MJ) has reviewed the submission for the above-referenced application within the Town of Ramapo. Documents received for our review included the following:

- Project Narrative as prepared by Zarin & Steinmetz, LLP and dated April 4, 2025
- Project Narrative as prepared by Civil Tec Engineering and Surveying, PC, dated April 4, 2025
- Plan set entitled, "1507 Route 202", nine sheets in total as prepared by Civil Tec Engineering and Surveying, PC
  - Site Plan, Sheet 1 of 9, dated April 4, 2025, as revision 4
  - Grading, Drainage & Utilities Plan, Sheet 2 of 9, dated April 4, 2025, as revision 4
  - Sewer Main Extension, Sheet 3 of 9, dated April 4, 2025
  - Sewer Main Extension, Sheet 4 of 9, dated April 24, 2025
  - Landscaping & Erosion & Sediment Control Plan, Sheet 5 of 9, dated April 4, 2025, as revision 4
  - Fire Truck Maneuverability Plan, Sheet 6 of 9, dated April 4, 2025, as revision 4
  - Details, Sheet 7 of 9, dated April 4, 2025, as revision 4
  - Details, Sheet 9 of 9, dated April 4, 2025, as revision 4
  - Details, Sheet 9 of 9, dated April 4, 2025, as revision 4

The project site is a 1.397-acre parcel located at 1507 Route 202. Currently, the site is occupied by a one-story commercial building. The applicant plans to demolish the existing structure and construct a new three-story building. The proposed building is expected to provide a total usable area of 27,645 square feet, including a parking lot with 105 spaces. Access to the site will be through an existing curb cut onto Route 202. The site will be connected to municipal water and sewer services. This parcel is located in the Town's PO Zoning District and requires a Site Development Permit.

Based upon our review of the above documents, we offer the following comments for consideration.

State Environmental Quality Review Act

1. Based upon our review of Part 617 of NYS Environmental Conservation Law, the project appears to be an "Unlisted" action. The Ramapo Planning Board would serve as the Lead Agency under SEQR. The need to undergo a coordinated review is optional for Unlisted actions.

2. Under a coordinated review, involved / interested agencies to be engaged may include, but are not necessarily limited to, the following:
   a. Ramapo Zoning Board of Appeals – review of area variances being requested.
   b. Veolia Water - approval of reserve capacity for potable water.
   c. Rockland County Sewer District No. 1 – approval of reserve sewer capacity, plan approval extension of public sewers.
   d. Rockland County Planning Dept – GML referral
   e. Rockland County Dept of Health – plan approval extension of public sewer, compliance with County Mosquito Code.
   f. NYS Dept of Transportation – utility / non-utility work permit for potential activity within the State Route 202 right-of-way.
   g. NYS Dept of Environmental Conservation –permit coverage under stormwater SPDES, identification of threatened and endangered species, Fresh Water Wetlands permit.
   h. NYS Office of Parks, Recreation, and Historic Preservation – identification of cultural, historic, or archeological resources.
   i. United States Army Corps of Engineers – Joint Permit associated with wetland or adjacent area impacts.

3. The applicant has submitted Part I of the Short Environmental Assessment Form (SEAF), and based on our review, we offer the following comments.
   a. Part I.3: The response indicates that the acreage of physical disturbance will be 1.25 acres. As such, a project-specific stormwater pollution prevention plan (SWPPP) has been prepared for review, and the project must seek coverage under General Permit GP-0-25-001.
   b. Part I.10: The response indicates the project will connect to an existing public/private water supply. It is recommended that the applicant provide documentation to the Town that the water purveyor is willing and capable of providing water to the project.
   c. Part I.11: The response indicated that the project will connect to an existing wastewater utility. It is recommended that the applicant provide documentation to the Town that the sewer authority is willing and capable of servicing the project.

4. Based upon the information submitted to date, Part II of the SEAF has been reviewed with potential impacts identified for the Town's review. The purpose of Part II is to generally identify areas where significant environmental impacts may occur. This allows the Town to request additional information from the applicant to document the extent of the impact. The following items were identified in Part II, and additional information may be needed to support the application to avoid, minimize, or mitigate potential moderate to large impacts.
   a. Impact on Land—The proposed action has the potential to increase erosion due to physical land disturbance and the removal of vegetation. To address soil erosion and sedimentation impacts, the applicant shall be required to prepare appropriate erosion and sediment control plans.
   b. Impact on Surface Water—The proposed action may cause soil erosion or otherwise create

a source of stormwater discharges that may lead to siltation or other degradation of receiving water bodies. Adherence to the above plans and the development of a project-specific drainage plan will substantially show that these impacts are potentially being mitigated.

General Municipal Law

5. The project site is located within 500-feet of a state highway (State Route 202 – Haverstraw Road) and county property (Mount Ivy County Park). Therefore, the application requires a 239 I, m, or n referral to the Rockland County Planning Board.

Zoning Compliance

6. The project site is located in the PO Zoning District and on Scenic Road. The proposal is for a Commercial Building. Based on a review of Section 376, Attachment 4 of the Town's Zoning, the proposal is defined as use group B. The Commercial Building requires Site Development Permit approval.

7. Based upon our review of the development proposal and the bulk lot requirements of the underlying zoning district, the following area variances appear necessary, which shall be confirmed by the Town's Chief Zoning Official:
   a. Minimum Front Yard: 20 ft Required, 8.9 ft Provided to parking
   b. Maximum Building Height: 30 ft Allowable; 34 feet Provided
   c. Maximum Development Coverage 75% Allowable, 85% Provided
   d. Loading Berth per 376-77 is required, none proposed
   e. Parking: 124 Spaces Required, 105 Spaces Provided.

8. A state variance may be required for two egresses and remoteness per section D104.1 and D104.3

9. The project site is located within the Town's Scenic Overlay District and is subject to the requirements of Chapter 215 of the Town Code. The applicant shall provide a narrative discussion of how the development proposal complies with Section 215-4(A)(3) and (A)(4) of the Town Code for review by the Planning Board.

Narrative

10. The narrative shall be revised to discuss the impact of the proposed work on the 100-foot adjacent area and discuss the necessary permits.

Site Plans

Site Plan

11. As noted in Comment 11 of our March 5, 2024 review, update Note 29 if and when the requested variances are granted.

12. As noted in Comment 12 of our March 5, 2024 review, if and when approved, provide the XBA number for the variances being requested.

13. As noted in Comment 15 of our March 5, 2024 review, the development proposed work within the NYSDEC wetland 100-foot adjacent area. The applicant shall provide the Town with a copy of the adjacent area permit once received, which shall be prior to receipt of final signed plans.

14. As noted in Comment 18 of our March 5, 2024 review, identify the location for the required ADA accessible route from the accessible aisle to the accessible entrance(s) of the building.

15. As noted in Comment 14 of our December 3, 2024 review, the plans indicate designated snow storage on the southern side of the site. However, alternative areas should be considered because the proposed retaining wall and fence will prevent snow from being stored in this location. If snow needs to be removed from the site, please include a note specifying this requirement, along with the maximum timeframe for its removal.

16. The plans note the total square footage of the buildings as 27,645 square feet; however, the parking calculations note 24,722 square feet. The plans and the parking calculations shall be revised to be consistent.

Grading, Drainage, & Utilities Plan

17. All sanitary sewer improvements shown, which appear to include an individual service lateral and sewer main extension, are subject to the review and approval by the Town of Ramapo DPW, Rockland County Department of Health, and/or Rockland County Sewer District No. 1. Any required revisions to the sanitary sewer system design shall be provided on subsequent plan submissions.

18. All water system improvements shown, which appear to include an individual service lateral, are subject to review and approval by Veolia Water. Any required revisions to the water system design shall be provided in subsequent plan submissions.

Sewer Main Extension

19. MJ takes no exception to the analysis completed. However, the technical analysis remains subject to the review and approval of the Town of Ramapo DPW, Rockland County Department of Health, and/or Rockland County Sewer District No. 1, who shall have final authority.

Sewer Main Extension

20. MJ takes no exception to the analysis completed. However, the technical analysis remains subject to the review and approval of the Town of Ramapo DPW, Rockland County Department of Health, and/or Rockland County Sewer District No. 1, who shall have final authority.

Landscaping & Erosion & Sediment Control Plan

21. As noted in Comment 19 of our December 3, 2024 review, the applicant should consider adding a landscape island in the striped area to the north of the loading zone. This addition will also help reduce the maximum development coverage variance being requested.

Fire Truck Maneuverability Plan

22. MJ takes no exception to the analysis completed. However, the technical analysis remains subject to the review and approval of the Town Fire Official, who shall have final authority.

Details (1 of 3)

23. No comment

Details (2 of 3)

24. As noted in Comment 22 of our December 3, 2024 review, provide filter and grow media specifications.

Details (3 of 3)

25. As noted in Comment 23 of our December 3, 2024 review, details for the ADS Storm Pipe System shall be provided.

Stormwater Pollution Prevention Plan

An updated SWPPP was not provided with the applicant's latest submission. Below are outstanding comments that need to be addressed as Part of subsequent submissions.

26. The SWPPP shall include the operation and maintenance required of the installed stormwater management facilities pursuant to Part III.B.2.f of GP 0-25-001. It shall also cover the post-construction O&M requirements associated with soil restoration pursuant to Section 5.1.6 of the NYSSMDM.

27. Remove extraneous storm events from HydroCAD model and provide updated report for relevant storm events only.

28. Provide a completed NOI and MS4 Acceptance Form for review as Part of subsequent plan submissions.

29. Section 5 of the SWPPP shall be updated to include the following information:
    a. There shall be a general discussion of stormwater management planning undertaken with emphasis on items outlined in Section 5.2 (Table 5.4) and Section 5.3 (Table 5.7) of the New York State Stormwater Management Design Manual (NYSSMDM). For Green Infrastructure practices, differentiate between those which are and are not being utilized to obtain the required WQv and RRv. If not being utilized, provide reasoning.

b. Provide a description of each stormwater practice proposed that provides water quality, RRv, and water quantity controls with the appropriate NYSDEC designation number noted pursuant to Part III.B.2.a of General Permit 0-20-001. The plans shall cover the dimensional and material requirements.
c. Identify the party that will be taking ownership of each stormwater practice proposed.

30. The SWPPP makes no mention of soil restoration. Pursuant to Section 5.1.6 of the NYSSMDM, soil restoration is a required practice applied across areas of a development site where soils have been disturbed and will be vegetated in order to recover the original properties and porosity of the soil. The required soil restoration is a function of the underlying soils where the disturbance is to occur pursuant to Table 5.3 found in Section 5.1.6 of the NYSSMDM.

Traffic Memorandum

31. MJ previously reviewed Parking and Trip Generation Evaluations by Colliers Engineering & Design dated February 28, 2024, and May 14, 2024.

32. The current site plan has been revised to reflect a 24,722 s.f. building, which is less than the 27,645 s.f. office building previously proposed.

33. The number of proposed parking spaces shown on the site plan has increased from 90 to 105.

34. The Town Code requires 124 parking spaces for the proposed 24,722 s.f. office building, necessitating a variance. (1 space per 200 s.f. of building)

35. The parking and trip generation data provided in the report are accurate, as they were in the previous submittals.

The applicant shall provide written responses to comments received from Town staff, consultants, and external agencies as Part of their next submission. Should there be any questions regarding the above comments, please do not hesitate to contact this office at (518) 371-0799.

Town of Ramapo
237 Route 59
Suffern, New York 10901
(845) 357-5100 Fax: (845) 357-5140

Ian Smith, Building Inspector
Building, Planning & Zoning

Adam Peltz
Fire Inspector

Date: April 22, 2025

REF: 1507 Route 202- Project 2023.037

I have reviewed the plans and have the following comments:

1. Commercial buildings exceeding 3 stories or 30' in height shall have not fewer than 2 means of fire apparatus access for each structure as per FCNYS Appendix D – D 104.1. I do not understand what increased construction methods mean and no variance has been submitted as proof as of yet. Construction type has no bearing on this section, building height determines compliance.
2. Where 2 fire apparatus access roads are required, they shall be placed a distance apart equal to not less than ½ of the length of the maximum overall diagonal dimension of the lot or area to be served, measured in a straight line between accesses as per FCNYS Appendix D- D 104.3. I do not understand what increased construction methods mean and no variance has been submitted as proof as of yet. Construction type has no bearing on this section, building height determines compliance
3. Dead-end fire apparatus access roads in excess of 150' in length shall be provided with an approved area for turning around fire apparatus as per FCNYS 503.2.5. Turnaround to comply with FCNYS Appendix D -Table D 103.4
4. Class III standpipe systems shall be installed throughout buildings where the floor level of highest finished floor exceeds 30' above lowest level of fire department vehicle access as per FCNYS 905.3.1

The following comments are for architectural plans:

1. Building shall be sprinklered with a NFPA 13 system and plans shall be submitted
2. FDC shall be mounted on the street front of the building as per FCNYS 912.2.1
3. All egress components shall comply with chapter 10 of FCNYS
4. Emergency and exit lights shall comply with section 1008 of the FCNYS
5. Knox box to be shown on plan as per FCNYS 506.1
6. Truss signs shall comply with Rockland County and New York State
7. All basement storage areas shall meet required separation of table 508.4 BCNYS
8. A plan showing the following shall be provided
    a. Fire/Carbon Monoxide detectors

b. Fire extinguishers/Pull stations
c. Exit/Emergency Lights
d. Occupancy load/ Egress paths

TOWN OF RAMAPO
BUILDING, PLANNING ZONING
237 ROUTE 59
SUFFERN, NY 10901

(845) 357-5100 FAX: (845) 357-5140

RECEIVED
APR 08 2025
TOWN OF RAMAPO
BUILDING-PLANNING-ZONING

CDRC Comments - Building Dept. **Date: 4/8/2025**

ADDRESS:1507 Rt 202		**Section-Block-Lot #**	**33.05-2-15**
ZONE: PO			
USE GROUP:B			
ENGINEER/ARCHITECT:	**Civil Tec**		
ON A MAP DATED:	**4/4/2025**		

To Whom It May Concern:Proposed office building

	REQUIRED	***PROPOSED Lot 1***	
Min front yard	20ft	8.9ft	
Max. building height	30ft	34ft	
Parking spaces	124	105	
Loading berth per 376-77	yes	no	
A state variance will be required for two egresses and remotness per section D104.1 and D104.3			
Providea striped crosswalk from external sidewalk to internal sidewalk			

Rockland County
HEALTH

CENTER FOR ENVIRONMENTAL HEALTH
Dr. Robert L. Yeager Health Center
50 Sanatorium Road, Building D
Pomona, New York 10970
Phone: (845) 364-2608 Fax: (845) 364-2025

Public Health
Prevent. Promote. Protect.

EDWIN J. DAY
County Executive

SAMUEL RULLI, PE
Director, Environmental Health

April 21, 2025

Mr. Yisroel Eisenbach, Chairman
Town of Ramapo Planning Board
237 Route 59
Suffern, NY 10901

Re: Municipal Referral
DOH-MR-25-0055
1507 Route 202
Site Development – Proposed 3-Story Office Building
Tax lot 33.05-2-15

Dear Mr. Eisenbach:

We have received an application and plans as prepared by Civil Tec Engineering & Surveying P.C., revised through April 4, 2025, for the above referenced project. Comments are as follows:

1. Application is to be made to the Rockland County Health Department for sanitary sewer extension approval.
2. Application is to be made to the RCDOH for review of the storm water management system for compliance with the County Mosquito Code.

If you have any questions regarding this matter, do not hesitate to call.

Very truly yours,

Brandon Durant, Ph.D.
Assistant Public Health Engineer
durantb@co.rockland.ny.us
(845) 364-2642

cc: Jake Palant, Rockland County Department of Planning
Civil Tec Engineering & Surveying P.C.
Nicholas King, RCSD #1
MBSP (via email)

Rockland County
Ed Day, Rockland County Executive

ROCKLAND COUNTY SEWER DISTRICT NO. 1
4 Route 340
Orangeburg, New York 10962
Phone: (845) 365-6111 Fax: (845) 365-6686
RCSD@co.rockland.ny.us

Michael Specht
Chairman

Michael R. Saber, P.E.
Executive Director

April 9, 2025

Ms. Hannah Ross
Planning Department
Town of Ramapo
237 Route 59
Suffern, NY 10901

Re: 1507 Route 202
1507 Route 202, Pomona
Tax Lot 89/33.05-2-15 (formerly 4./6/A1E2)

Dear Ms. Ross:

Our office has received and reviewed a site plan that was last revised on April 4, 2025, which Civil Tec Engineering & Surveying prepared for the above referenced project. We thank you for the opportunity to comment on this application. Our comments are as follows:

1. The sanitary sewer from this project would connect to the District's sewer system.
   a. Upon review of this application, the District has determined that an impact fee is required, in accordance with Sections 502A and 1317 of the Rockland County *Sewer Use Law* as last amended in 2010.
   b. Approval of this application and the variances for a proposed 27,645 square foot office building on a 60,867 square foot lot in the PO District will result in one (1) additional sewer unit. **Therefore, the applicant must submit a check in the amount of one thousand eight hundred fifty dollars ($1,850.00) payable to Rockland County Sewer District No. 1 within thirty (30) days of approval.**
   c. The 2023 Tax Roll classified the property as a converted residence. **If the use or occupancy of the property exceeds seven (7) units (e.g., with residential occupancy), the District will require further review and the owner will have to pay an additional impact fee.**
   d. Payment of the impact fee must be made to the District before the structure is connected to the sewerage system.
   e. We request that the Board notify the District upon approval of the project.
2. As this is a non-residential project, Rockland County Sewer District No. 1's "Commercial/ Non-residential Wastewater Questionnaire" and the County Planning Information Certification must be submitted at https://www.rocklandcountyny.gov/departments/sewer-

district-1/permits-forms and approved by this office before any sewage is discharged into the District's sewerage system. **The property owner must sign the wastewater questionnaire.**

3. Rockland County Sewer District No. 1 requires sanitary sewer construction to conform to District standards. This includes but is not limited to relative air, vacuum and deflection testing of mainline sewer and manhole construction. The District must receive and approve certification of test results from a licensed professional engineer before approving the sewers on this project.
4. In order to reduce infiltration into the system, the District requires that the precast and doghouse sanitary manhole construction be in accordance with the District's standards. The District's standard details require the joints to have butyl rubber seals with *mortar in and out, and then to be coated with "Infi-shield" EPDM rubber seal wrap or approved equal.*
5. We request that submission to Rockland County Sewer District No. 1 of an as-built drawing of the sewer extension be made a condition of granting a certificate of occupancy.
6. Please advise the engineer this project is in a drainage area that is tributary to the District's Mount Ivy Pump Station, which discharges into the Haverstraw Joint Regional sanitary sewer system.
7. Details for sanitary sewer construction as shown on the plans comply with the District's construction standards.
8. Details for the sanitary sewer connection are subject to approval by the Town of Ramapo.
9. Site Plan Note 27 acknowledges that any existing sewer connection proposed to be abandoned must be plugged between the edge of the right-of-way and the curb line with a permanent watertight plug or cap encased in concrete.

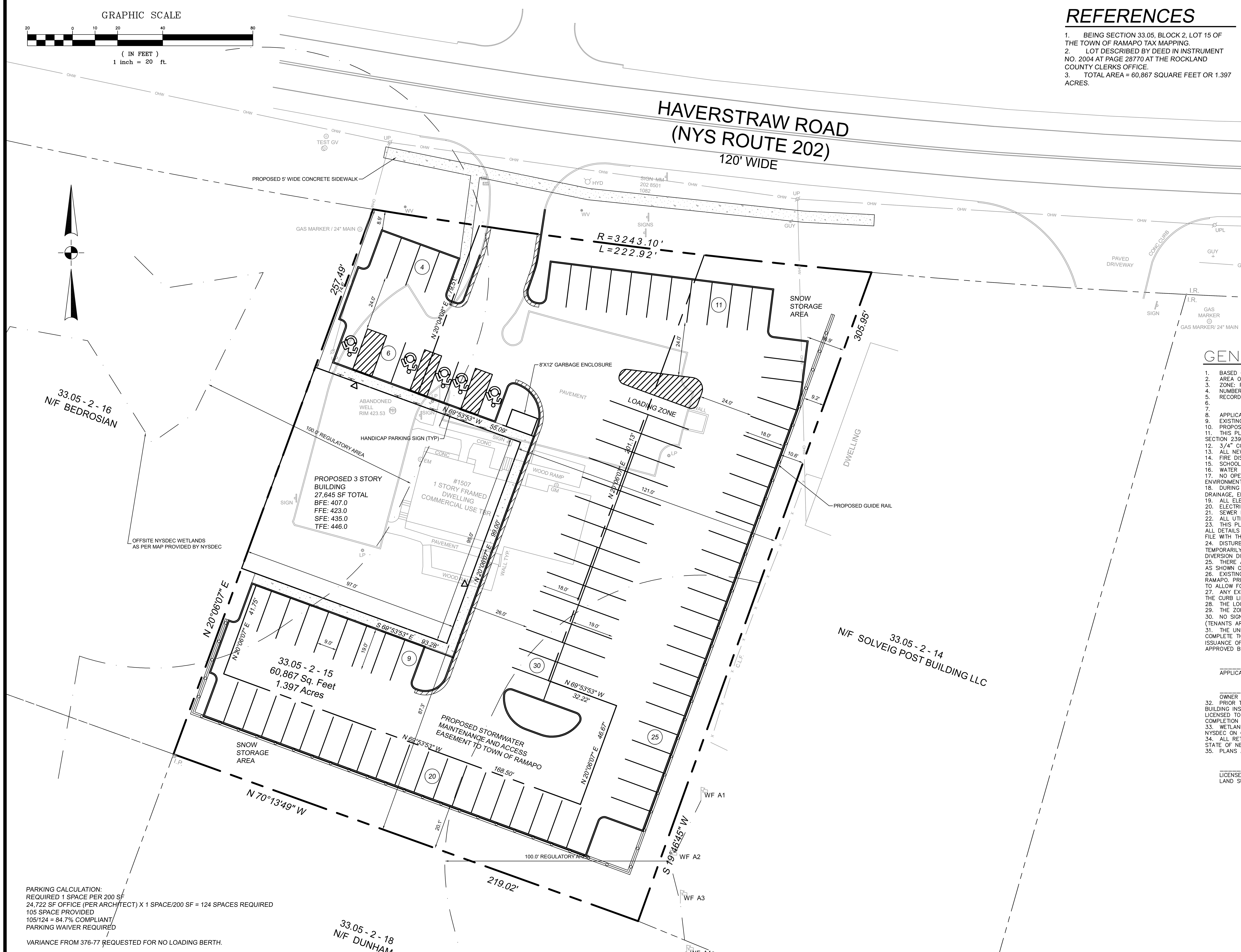
Please inform us of all developments in this project. If you have any questions, please contact this office at 845-365-6111.

Very truly yours,

Lorelei Greene Tinston
Engineer I

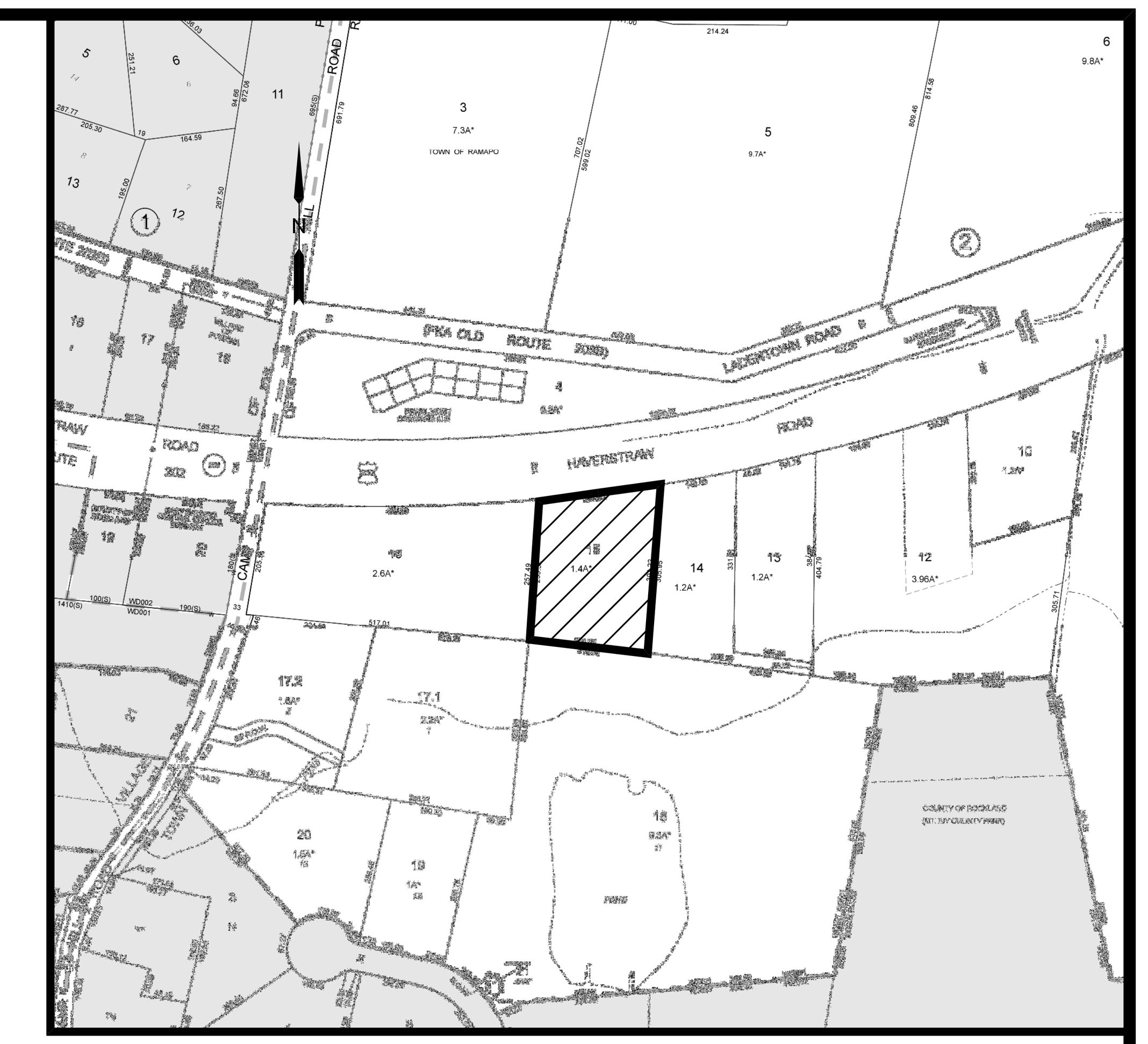
cc: M. Saber M. Dolphin M. Castro D. Gregory J. Roth
Michael Sadowski, P.E. – Town of Ramapo DPW
Patrick Brady, P.E. – Haverstraw Joint Regional Sewerage Board, 20 Ecology Road, West Haverstraw, NY 10993
Rachel Barese, P.E. – Civil Tec Engineering & Surveying PC, 139 Lafayette Avenue, 2nd Floor, Suffern, NY 10901-5614
Moshe Messner – Messner Construction - 43 Olympia Lane, Monsey, NY 10952
Jacob Safrin – 7 Holly Circle, Monsey, NY 10952

File: TOR 33.05-2-15 – 1507 Route 202
Impact Fees
Reader



REFERENCES

1. BEING SECTION 33.05, BLOCK 2, LOT 15 OF THE TOWN OF RAMAPO TAX MAPPING.
2. LOT DESCRIBED BY DEED IN INSTRUMENT NO. 2004 AT PAGE 28770 AT THE ROCKLAND COUNTY CLERKS OFFICE.
3. TOTAL AREA = 60,867 SQUARE FEET OR 1.397 ACRES.



VICINITY MAP
1" = 300'

GENERAL NOTES

1. BASED ON THE TOWN OF RAMAPO TAX MAP, THIS LOT IS 15 ON MAP 33.05 BLOCK 2.
2. AREA OF TRACT: 60,867 SQ FT OR 1.397 AC
3. ZONE: PO
4. NUMBER OF PROPOSED LOTS: 1
5. RECORD OWNER: MOSHE MESSNER
6. 43 OLYMPIA LANE
7. MONSEY, NY 10952
8. APPLICANT: SAME
9. EXISTING USE: COMMERCIAL
10. PROPOSED USE: OFFICE
11. THIS PLAT DOES NOT CONFLICT WITH THE OFFICIAL COUNTY MAP AND HAS BEEN APPROVED IN THE MANNER SPECIFIED BY SECTION 239N OF THE GENERAL MUNICIPAL LAW.
12. 3/4" CORNER IRON PIPES TO BE SET BEFORE C.O. IS ISSUED.
13. ALL NEW UTILITIES TO BE UNDERGROUND.
14. FIRE DISTRICT – MOLESTON
15. SCHOOL DISTRICT – EAST RAMAPO
16. WATER DISTRICT – RAMAPO CONSOLIDATED WATER DISTRICT. WATER SUPPLY BY VEOLIA WATER
17. NO OPEN BURNING DURING CONSTRUCTION WITHOUT EXPLICIT PERMISSION FROM THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION.
18. DURING THE COURSE OF CONSTRUCTION, THE BUILDER SHALL TAKE ALL PRECAUTIONS NECESSARY TO AVOID THE CREATION OF DRAINAGE, EROSION AND SILTING PROBLEMS (IN CONSULTATION WITH APPROPRIATE AGENCIES) TO THE TOWN ENGINEER'S SATISFACTION.
19. ALL ELEVATIONS SHOWN ARE BASED ON U.S.C. & G.S. DATUM.
20. ELECTRIC DISTRICT – ORANGE & ROCKLAND
21. SEWER DISTRICT – BENEFITED AREA NO. 5
22. ALL UTILITIES UNDERGROUND.
23. THIS PLAT IS SUBJECT TO COMPLIANCE WITH ALL LAWS, REGULATIONS AND SPECIFICATIONS OF THE TOWN OF RAMAPO AND WITH ALL DETAILS AND SPECIFICATIONS INDICATED ON THE APPROVED CONSTRUCTION PLANS AND SITE GRADING PLANS, AS A MINIMUM IN FILE WITH THE TOWN OF RAMAPO.
24. DISTURBED AREAS, EXCEPT ROADWAYS,WHICH WILL REMAIN UNFINISHED FOR MORE THAN FIFTEEN (15) DAYS, SHALL BE TEMPORARILY SEEDED WITH 1/2 LB RYE GRASS OR MULCHED WITH 100 LBS OF STRAW OR HAY PER 1,000 SQ FT AND TEMPORARY DIVERSION DITCHES WILL BE ESTABLISHED WHERE NECESSARY ACROSS ROADWAYS, RIGHT OF WAY, AND INDIVIDUAL LOTS.
25. THERE ARE NO COVENANTS, DEED RESTRICTIONS, EASEMENTS, OR OTHER RESERVATIONS OF LAND RELATIVE TO THIS SITE, EXCEPT AS SHOWN ON THIS MAP, SUBJECT TO THE FINDINGS OF A COMPLETE AND UP TO DATE TITLE REPORT.
26. EXISTING STRUCTURES TO BE DEMOLISHED AND ALL DEBRIS REMOVED FROM AND DISPOSED OF AS APPROVED BY THE TOWN OF RAMAPO. PRIOR TO DEMOLITION NECESSARY PERMITS SHALL BE OBTAINED. ALL NECESSARY UTILITY COMPANIES SHALL BE CONTACTED TO ALLOW FOR DISCONNECTION OF RESPECTIVE SERVICE.
27. ANY EXISTING CONNECTION PROPOSED TO BE ABANDONED MUST BE PLUGGED BETWEEN THE EDGE OF THE RIGHT OF WAY AND THE CURB LINE WITH A PERMANENT WATERTIGHT PLUG OR CAP ENCASED IN CONCRETE.
28. THE LOCATION OF ALL EXISTING UTILITIES MUST BE VERIFIED.
29. THE ZONING BOARD OF APPEALS, ON ___, AS CASE NUMBER ___ IN THE APPLICATION OF ___, GRANTED VARIANCES ___.
30. NO SIGN(S) OTHER THAN THOSE SHOWN ON THIS DRAWING ARE PERMITTED WITHOUT PRIOR APPROVAL OF THE PLANNING BOARD (TENANTS ARE TO BE ADVISED OF THIS CONDITION).
31. THE UNDERSIGNED, OWNER AND/OR APPLICANT, AS A CONDITION OF APPROVAL OF THIS SITE PLAN, HEREBY AGREES TO COMPLETE THE WITHIN SITE DEVELOPMENT PLAN AS DRAWN AND ALL IMPROVEMENTS SHOWN THEREON, AS A CONDITION OF THE ISSUANCE OF A BUILDING PERMIT. THE APPLICANT/OWNER IS AWARE THAT NO CHANGES IN THIS PLAN MAY BE MADE UNLESS APPROVED BY THE PLANNING BOARD.

______________________ APPLICANT ______________ DATE

______________________ OWNER ______________ DATE

32. PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY, AN AS-BUILT LANDSCAPING DRAWING SHALL BE SUBMITTED TO THE BUILDING INSPECTOR, PLANNING BOARD AND DEPARTMENT OF PUBLIC WORKS WHICH IS CERTIFIED BY A LANDSCAPE ARCHITECT LICENSED TO PRACTICE IN THE STATE OF NEW YORK. SAID CERTIFIED LANDSCAPING DRAWING SHALL INDICATE THE DEGREE OF COMPLETION OF SAID LANDSCAPING IMPROVEMENTS IN ACCORDANCE WITH THE APPROVED SITE PLAN.
33. WETLANDS WERE DELINEATED BY JAMES BATES AND CONFIRMED BY NYSDEC ON JULY 6, 2023. THE DELINEATION WAS SIGNED BY NYSDEC ON OCTOBER 10, 2023 AND IS VALID UNTIL OCTOBER 10, 2028.
34. ALL RETAINING WALLS GREATER THAN 48 INCHES MUST BE DESIGNED AND CERTIFIED BY A PROFESSIONAL ENGINEER IN THE STATE OF NEW YORK.
35. PLANS ARE BASED ON FIELD ENGINEERING DATA AND CERTIFIED HERETO BY:

______________________ LICENSED PROFESSIONAL ENGINEER OR LAND SURVEYOR ______________ DATE

PARKING CALCULATION:
REQUIRED 1 SPACE PER 200 SF
24,722 SF OFFICE (PER ARCHITECT) X 1 SPACE/200 SF = 124 SPACES REQUIRED
105 SPACE PROVIDED
105/124 = 84.7% COMPLIANT
PARKING WAIVER REQUIRED

VARIANCE FROM 376-77 REQUESTED FOR NO LOADING BERTH.

Bulk Requirements: PO District Professional Offices

Use Group B	Min Lot Area	Min Lot Width	Min Front Setback	Min Front Yard	Min Side Setback	Min Total Side Setback	Min Side Yard	Min Rear Setback	Min Rear Yard	Min Street Frontage	Max Height	Max Development Coverage	Max FAR
Required	20,000 SF	100 FT	30 FT	20 FT	0/10 FT	0 FT	0 FT	25 FT	10 FT	100 FT	30 FT	75%	0.4
Provided	60,867 SF	217 FT	74.6 FT	8.9 FT to parking*	0 FT	121 FT	0 FT	87.3 FT	20.1 FT	222 FT	34 FT*	85%*	0.4

*Variance Required

DATE	ISSUE	DESCRIPTION	REVISIONS
APRIL 4, 2025	REV 4	REV PER PB	
DECEMBER 30, 2024	REV 3	REV FOR PB	
OCTOBER 21, 2024	REV 2	REV PER CDRC	
MAY 15, 2024	REV 1	REV PER CDRC	

S.B.L. 33.05 - 2 - 15

SITE PLAN
FOR
1507 ROUTE 202

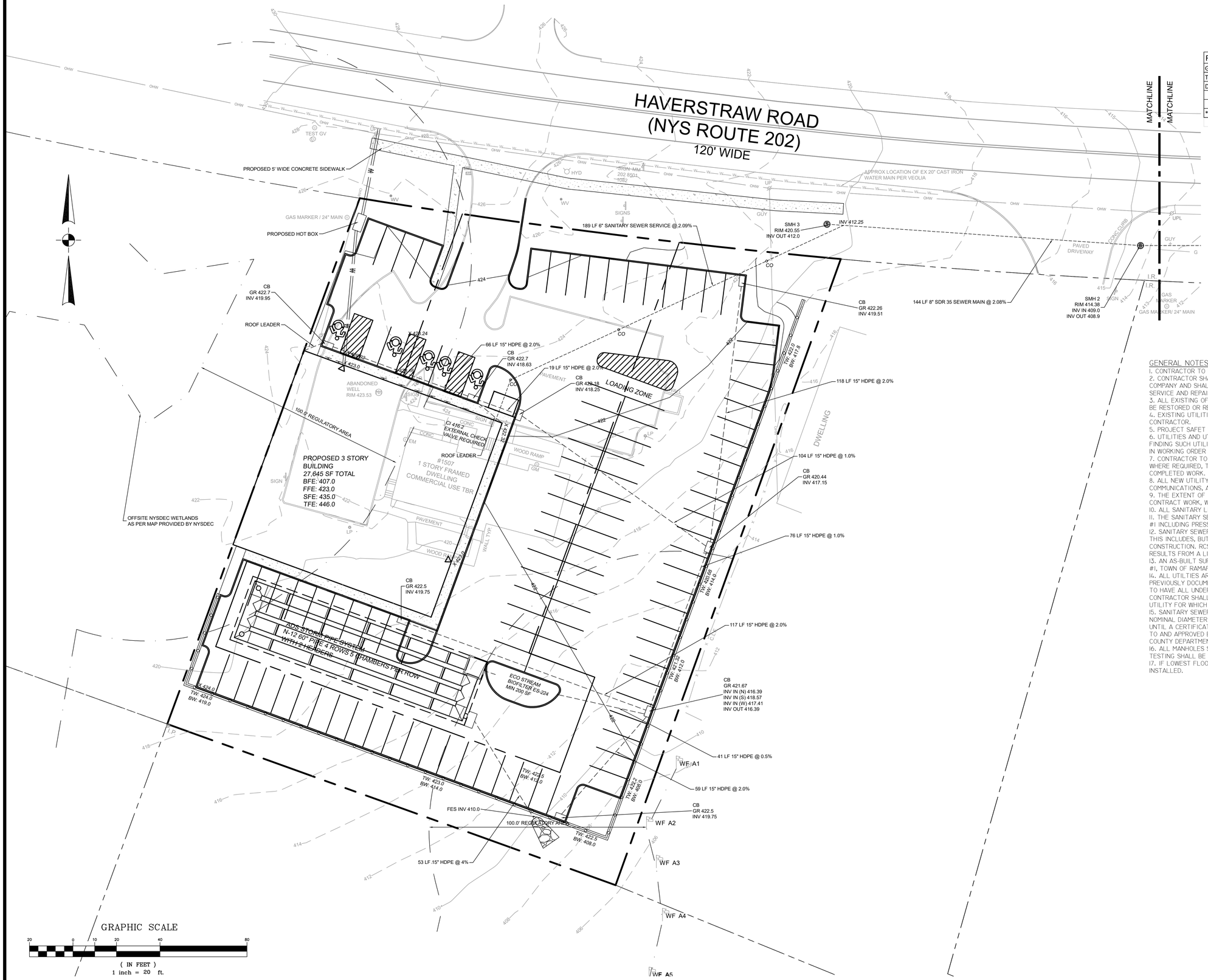
TOWN OF RAMAPO - ROCKLAND COUNTY - NEW YORK

CIVIL TEC Engineering & Surveying PC
139 Lafayette Avenue, 2nd Fl.
Suffern, NY 10901
P 845.547.2241 - F 845.547.2243
111 Main Street
Chester, NY 10918
845.610.3621
Civil Engineering & Land Surveying Services that Build Con...
www.Civil-Tec.com

Rachel B. Barese, P.E.
N.Y. Lic. No. 90143

STATE OF NEW YORK · RACHEL BETH BARESE · 090143 · LICENSED PROFESSIONAL ENGINEER

DATE:	2/8/24
DRAWN BY:	RB/LT
CHKD BY:	RB/LT
JOB No.	4227
SCALE:	1"=20'
DWG No.	1 OF 9



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

Fire Access Information	
Grade Plane Elevation	422.1
Top of 3RD Floor (Highest Pt)	454.0
Difference in Height	31.9
** Elevations to be confirmed by architect	

GENERAL NOTES:

1. CONTRACTOR TO VERIFY LOCATION, SIZE AND INVERTS OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION.
2. CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES AND HAVE ALL UTILITIES FIELD LOCATED BY RESPECTIVE UTILITY COMPANY AND SHALL ASSUME FULL RESPONSIBILITY AND BE SOLELY RESPONSIBLE FOR MAINTAINING CONTINOUS UTILITY SERVICE AND REPAIR ANY DAMAGES.
3. ALL EXISTING OFF-SITE PAVEMENT, FENCES, CURBS, WALKS AND OTHER FACILITIES DISTURBED BY CONSTRUCTION SHALL BE RESTORED OR REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST.
4. EXISTING UTILITIES THAT ARE TO BE REMOVED AND/OR REPLACED SHALL BE REMOVED AND LEGALLY DISPOSED OF BY THE CONTRACTOR.
5. PROJECT SAFET YAND MAINTENANCE ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
6. UTILITIES AND UTILITY STRUCTURES WHOSE LOCATIONS ARE UNKNOWN MAY BE AFFECTED BY THE PROPOSED WORK. UPON FINDING SUCH UTILITIES, THE CONTRACTOR'S RESPONSIBILITY SHALL BE TO NOTIFY THE OWNER AND MAINTAIN THE UTILITIES IN WORKING ORDER UNTIL THEIR DISPOSITION IS RESOLVED.
7. CONTRACTOR TO COORDINATE WITH ALL COMPANIES TO ASSURE ADEQUATE SUPPLY AND SCHEDULING OF NEW SERVICE, WHERE REQUIRED, TO FIT THE CONSTRUCTION SCHEDULING AND SEQUENCE TO ASSURE NO DAMAGE OR DISTURBANCE TO COMPLETED WORK.
8. ALL NEW UTILITY SERVICE CONNECTIONS, INCLUDING LINES AND EQUIPMENT FOR PROVIDING POWER AND/OR COMMUNICATIONS, ARE TO BE INSTALLED UNDERGROUND.
9. THE EXTENT OF THE CONSTRUCTION AND DISTURBANCE AREAS SHALL BE THE MINIMUM REQUIRED TO PERFORM THE CONTRACT WORK, WITH AS MINIMAL EFFECT ON ADJACENT AREAS AS POSSIBLE.
10. ALL SANITARY LINES TO BE SDR 35 PVC UNLESS OTHERWISE NOTED.
11. THE SANITARY SEWER SYSTEM SHALL BE TESTED TO MEET THE REQUIREMENTS OF THE ROCKLND COUNTY SEWER DISTRICT #1 INCLUDING PRESSURE TESTS OF PIPES AND VACUUM TESTS OF MANHOLES.
12. SANITARY SEWER CONSTRUCTION MUST CONFORM TO ALL ROCKLAND COUNTY SEWER DISTRICT NO. ONE'S STANDARDS. THIS INCLUDES, BUT IS NOT LIMITED TO, RELATIVE AIR, VACUUM AND DEFLECTION TESTING OF MAINLINE SEWER AND MANHOLE CONSTRUCTION. RCSD #1 AND ROCKLAND COUNTY HEALTH DEPARTMENT MUST RECEIVE AND APPROVE CERTIFICATION OF TEST RESULTS FROM A LICENSED PROFESSIONAL ENGINEER BEFORE APPROVING THE SEWERS ON THIS PROJECT.
13. AN AS-BUILT SURVEY OF THE SEWER MAIN EXTENSION MUST BE SUBMITTED TO THE ROCKLAND COUNTY SEWER DISTRICT #1, TOWN OF RAMAPO, AND ROCKLAND COUNTY HEALTH DEPARTMENT UPON COMPLETION OF THIS PROJECT.
14. ALL UTILITIES ARE SHOWN IN AN APPROXIMATE WAY FROM AVAILABLE INFORMATION COLLECTED IN THE FIELD AND PREVIOUSLY DOCUMENTED. THE CONTRACTOR SHALL CALL THE LOCAL UNDERGROUND FACILITIES PROTECTIVE ORGANIZATION TO HAVE ALL UNDERGROUND UTILITIES MARKED IN THE FIELD PRIOR TO ANY CLEARING OR ANY CONSTRUCTION. THE CONTRACTOR SHALL ALSO VERIFY THE LOCATION, SIZE AND INVERT OF ALL UTILITIES PRIOR TO ANY CONSTRUCTION. ANY UTILITY FOR WHICH NO EVIDENCE CAN BE SEEN ON THE SURFACE OF THE LANDS MAY NOT BE SHOWN ON THIS DRAWING.
15. SANITARY SEWER INFILTRATION AND EXFILTRATION RATE SHALL NOT EXCEED 25 GALLONS PER 24 HOURS PER MILE PER NOMINAL DIAMETER IN INCHES. CERTIFICATES OF OCCUPANCY MAY NOT BE REQUESTED, NOR ANY OCCUPANCY PERMITTED, UNTIL A CERTIFICATE OF COMPLIANCE, CERTIFIED BY A LICENSED NEW YORK STATE PROFESSIONAL ENGINEER IS SUBMITTED TO AND APPROVED BY THE TOWN OF RAMAPO. COPIES OF THIS CERTIFICATE SHOULD ALSO BE SENT TO THE ROCKLAND COUNTY DEPARTMENT OF HEALTH AND TO THE ROCKLAND COUNTY SEWER DISTRICT NO. 1.
16. ALL MANHOLES SHALL BE SUCCESSFULLY VACUUM TESTED PRIOR TO BEING ACCEPTED BY THE TOWN OF RAMAPO. VACUUM TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH THE TOWN OF RAMAPO'S GUIDELINES.
17. IF LOWEST FLOOR TO BE SEWERED IS BELOW THE UPSTREAM SEWER ELEVATION, AN INTERIOR CHECK VALVE SHALL BE INSTALLED.

DATE	ISSUE	DESCRIPTION
APRIL 4, 2025	REV 4	REV PER PB
DECEMBER 30, 2024	REV 3	REV FOR PB
OCTOBER 21, 2024	REV 2	REV PER CDRC
MAY 15, 2024	REV 1	REV PER CDRC

REVISIONS

S.B.L. 33.05 - 2 - 15

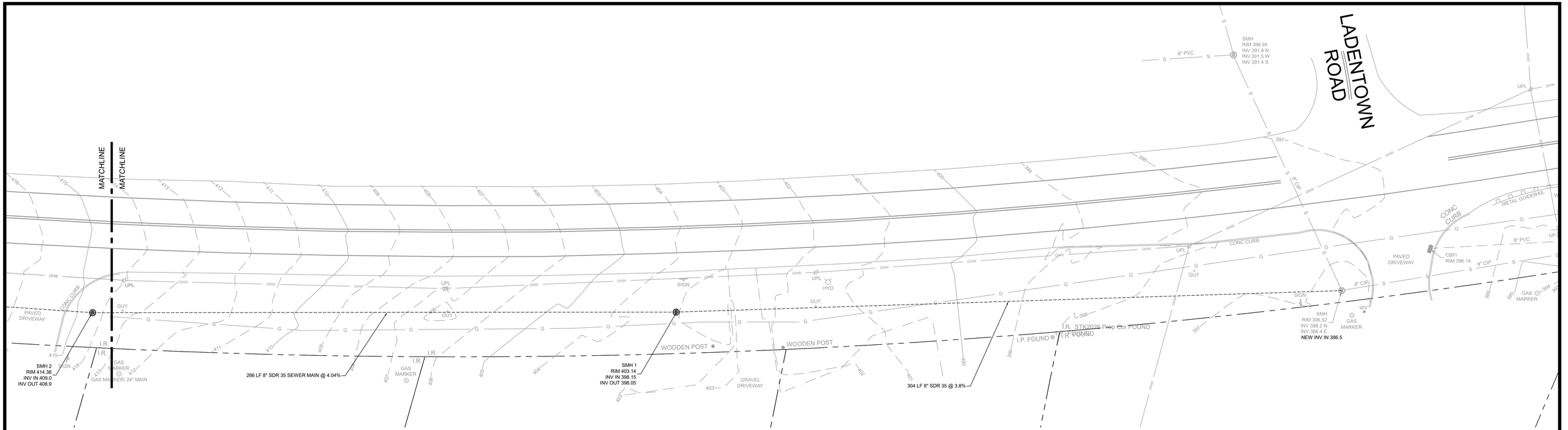
GRADING, DRAINAGE & UTILITIES PLAN
FOR
1507 ROUTE 202
TOWN OF RAMAPO - ROCKLAND COUNTY - NEW YORK

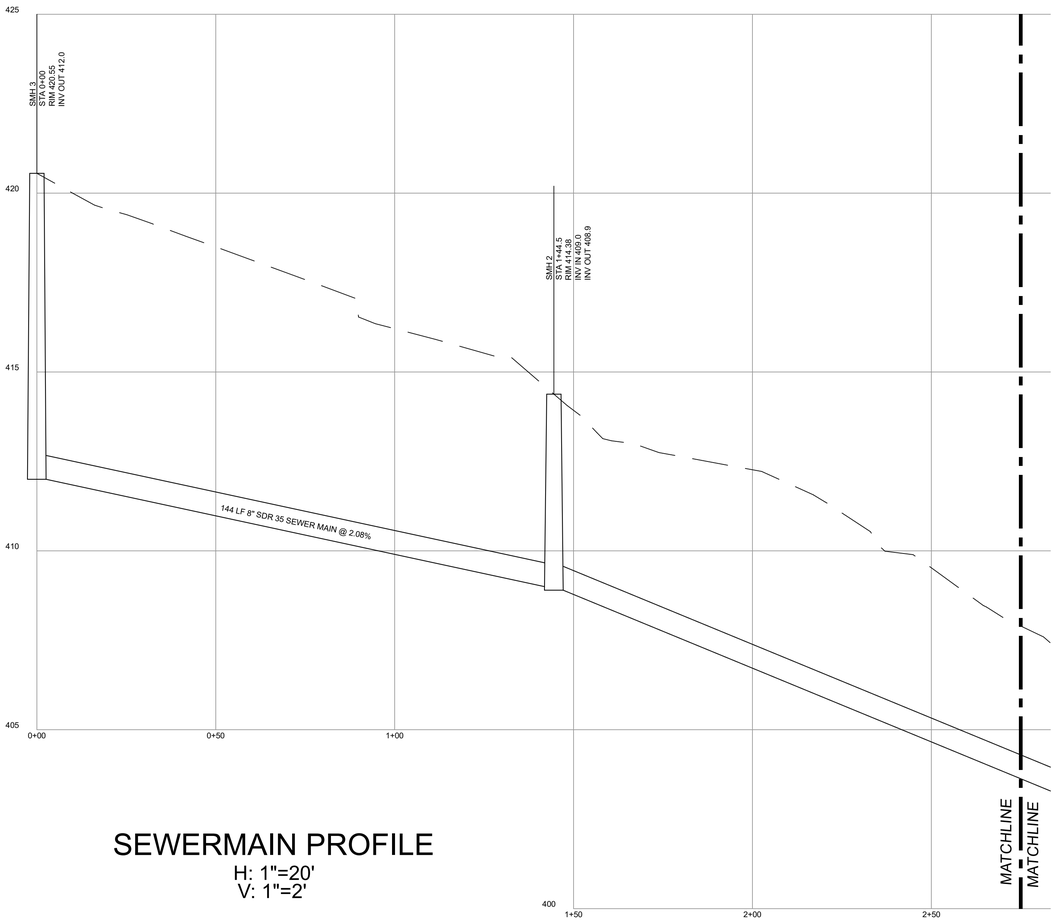
CIVIL TEC Engineering & Surveying PC
139 Lafayette Avenue, 2nd Fl.
Suffern, NY 10901
P 845.547.2241 - F 845.547.2243
111 Main Street
Chester, NY 10918
845.610.3621
Civil Engineering & Land Surveying Services that Build Confidence
www.Civil-Tec.com

DATE:	2/8/24
DRAWN BY:	RB/LT
CHKD BY:	RB/LT
JOB No.	4227
SCALE:	1"=20'
DWG No.	2 OF 9

STATE OF NEW YORK · RACHEL BETH BARESE · 090143 · LICENSED PROFESSIONAL ENGINEER

Rachel Barese
Rachel B. Barese, P.E.
N.Y. Lic. No. 90143





SEWERMAIN PROFILE

H: 1"=20'
V: 1"=2'

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

DATE	ISSUE	DESCRIPTION	REVISIONS

S.B.L. 33.05 - 2 - 15

SEWER MAIN EXTENSION
FOR
1507 ROUTE 202
TOWN OF RAMAPO - ROCKLAND COUNTY - NEW YORK

CIVIL TEC Engineering & Surveying PC

139 Lafayette Avenue, 2nd Fl.
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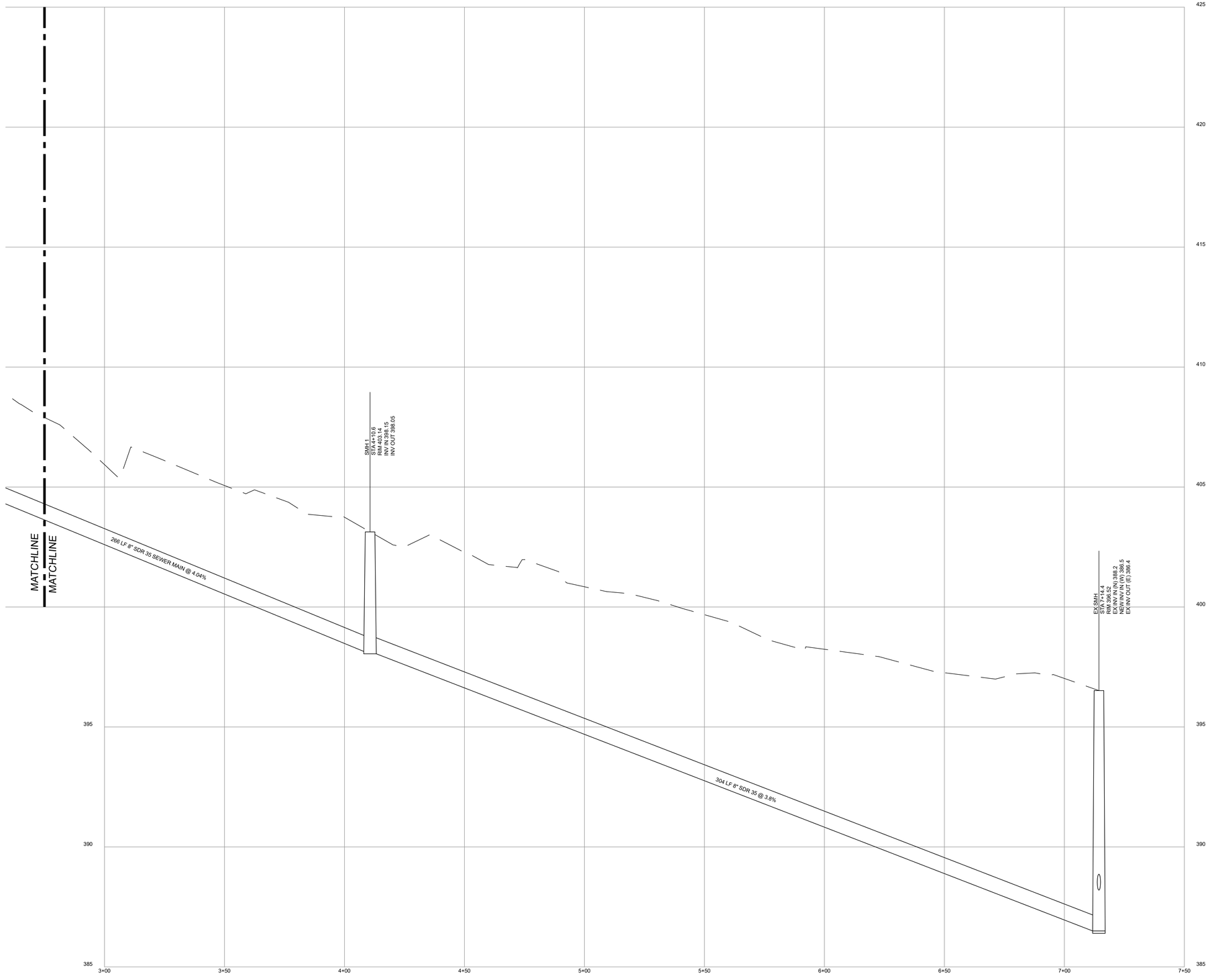
STATE OF NEW YORK · RACHEL BETH BARESE · LICENSED PROFESSIONAL ENGINEER · 090143

Rachel B. Barese, P.E.
N.Y. Lic. No. 90143

DATE:	4/4/25
DRAWN BY:	RB/LT
CHKD BY:	RB/LT
JOB No.	4227
SCALE:	1"=20'
DWG No.	3 OF 9



SEWERMAIN PROFILE

H: 1"=20'
V: 1"=2'

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

DATE	ISSUE	DESCRIPTION	REVISIONS

S.B.L. 33.05 - 2 - 15

SEWER MAIN EXTENSION
FOR
1507 ROUTE 202
TOWN OF RAMAPO - ROCKLAND COUNTY - NEW YORK

CIVIL TEC Engineering & Surveying PC

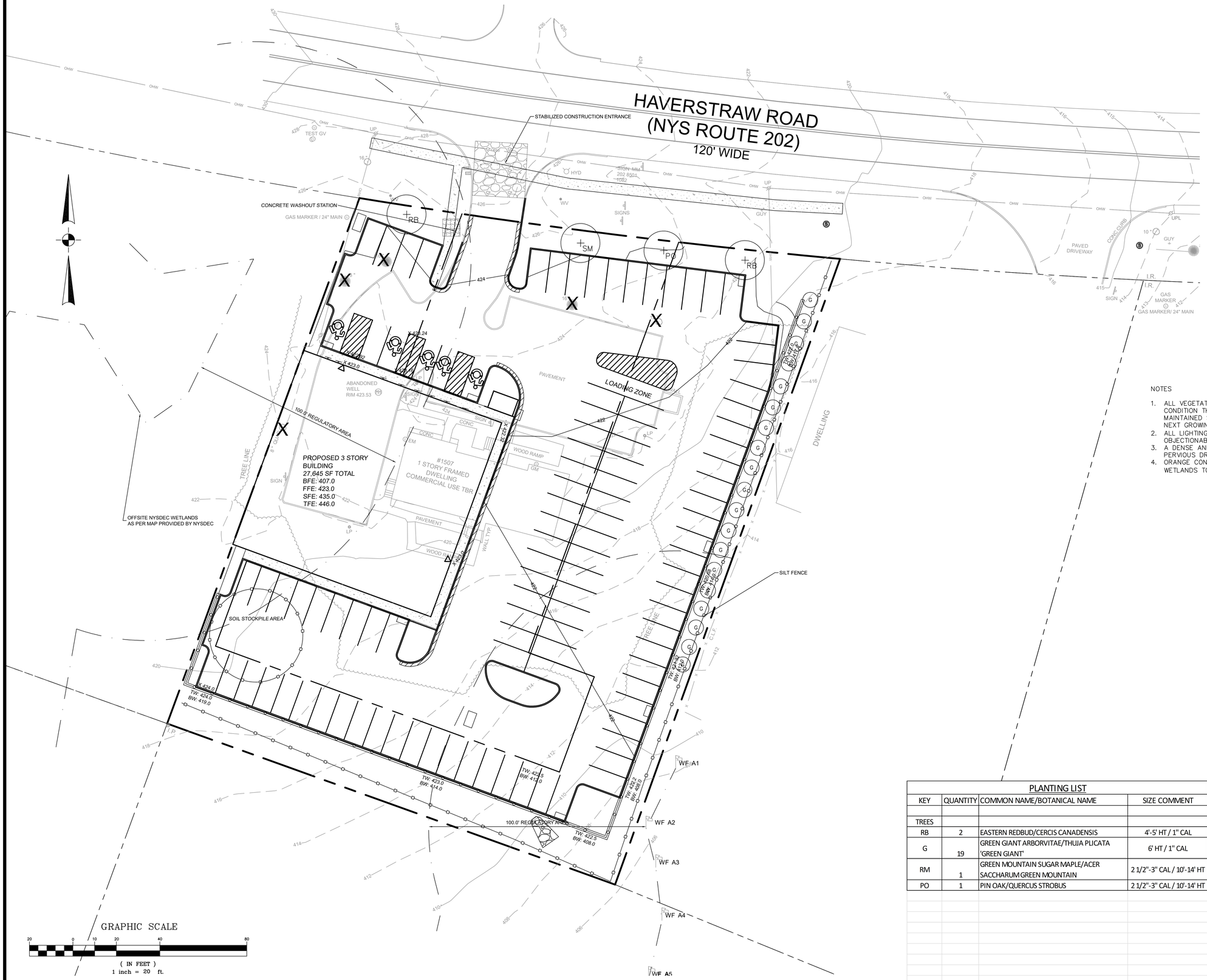
139 Lafayette Avenue, 2nd Fl.
Suffern, NY 10901
P 845.547.2241 - F 845.547.2243

111 Main Street
Chester, NY 10918
845.610.3621

Civil Engineering & Land Surveying Services that Build Communities
www.Civil-Tec.com

Rachel B. Barese, P.E.
N.Y. Lic. No. 90143

DATE:	4/4/25
DRAWN BY:	RB/LT
CHKD BY:	RB/LT
JOB No.	4227
SCALE:	1"=20'
DWG No.	4 OF 9



Standard Erosion Control Notes

An Erosion control system will be utilized by the developer to minimize the production of sediment from the site. Methods to be utilized will be those found most effective for the site and shall include one or more of the following, as applicable:

1) Temporary sedimentation entrapment areas shall be provided at key locations to intercept and clarify silt laden runoff from the site. These may be excavated or may be created utilizing earthen berms, rip-rap or crushed stone dams, hay bales, or other suitable materials. Diversion swales, berms, or other channelization shall be constructed to ensure that all silt laden waters are directed into the entrapment areas, which shall not be permitted to fill in, but shall be cleaned periodically during the course of construction. The collected silt shall be deposited in areas safe from further erosion.
2) All disturbed areas, except roadways, which will remain unfinished for more than 30 days shall be temporarily seeded with ½ lb. of rye grass or mulched with 100 lbs. of straw or hay per 1,000 square feet. Roadways shall be stabilized as rapidly as practicable by the installation of the base course.
3) Silt that leaves the site in spite of the required precautions shall be collected and removed as directed by appropriate municipal authorities.
4) At the completion of the project, all temporary siltation devices shall be removed.

Standard Landscape Notes

1) Mulch all plant beds and trees with a 4" depth of sugar cane or licorice root mulch.
2) Stake all trees with 2 cedar stakes, rubber hose around tree (6'0" above grade) and twisted #10 gauge galvanized wire.
3) Plant pits shall be 12" wider and 6" deeper than the root ball. Remove all existing soil and backfill with a mixture of one part peat-humus to 4 parts topsoil. Add 3 year Eeesey grow fertilizer packets (or equal) – 1 per inch of tree caliper or per 12" height of shrub.
4) Guarantee all plants and workmanship for two planting seasons.
5) All planting shall be placed under the direction of an appropriate licensed design professional. Notify 48 hours prior to planting.
6) Provide the Town of Ramapo building inspector with a copy of the State Certificate of Source for all plant material.
7) All plant material shall be nursery grown and shall conform to the American Association of Nursery Men's Standards.

NOTES

1. ALL VEGETATION SHOWN ON THIS PLAN SHALL BE MAINTAINED IN A HEALTHY AND VIGOROUS GROWING CONDITION THROUGHOUT THE DURATION OF THE PROPOSED USE OF THE SITE. ALL VEGETATION NOT SO MAINTAINED SHALL BE REPLACED WITH NEW COMPARABLE VEGETATION AT THE BEGINNING OF THE NEXT GROWING SEASON.
2. ALL LIGHTING SHOWN ON THIS PLAN SHALL BE DIRECTED AND/OR SHIELDED SO AS TO PRECLUDE OBJECTIONABLE GLARE FROM BEING OBSERVABLE FROM ADJOINING STREETS AND PROPERTIES.
3. A DENSE AND VIGOROUS VEGETATIVE COVER SHALL BE ESTABLISHED OVER THE CONTRIBUTING PERVIOUS DRAINAGE AREAS BEFORE RUNOFF CAN BE ACCEPTED INTO THE DRAINAGE FACILITY.
4. ORANGE CONSTRUCTION FENCING SHALL BE INSTALLED AT THE LIMITS OF DISTURBANCE NEAR THE WETLANDS TO PREVENT OVER CLEARING/ADDITIONAL DISTURBANCE.

PLANTING LIST

KEY	QUANTITY	COMMON NAME/BOTANICAL NAME	SIZE COMMENT
TREES			
RB	2	EASTERN REDBUD/CERCIS CANADENSIS	4'-5' HT / 1" CAL
G	19	GREEN GIANT ARBORVITAE/THUJA PLICATA 'GREEN GIANT'	6' HT / 1" CAL
RM	1	GREEN MOUNTAIN SUGAR MAPLE/ACER SACCHARUM GREEN MOUNTAIN	2 1/2"-3" CAL / 10'-14' HT
PO	1	PIN OAK/QUERCUS STROBUS	2 1/2"-3" CAL / 10'-14' HT

DATE	ISSUE	DESCRIPTION
APRIL 4, 2025	REV 4	REV PER PB
DECEMBER 30, 2024	REV 3	REV FOR PB
OCTOBER 21, 2024	REV 2	REV PER CDRC
MAY 15, 2024	REV 1	REV PER CDRC

REVISIONS

S.B.L. 33.05 - 2 - 15

LANDSCAPING & EROSION & SEDIMENT CONTROL FOR 1507 ROUTE 202

TOWN OF RAMAPO - ROCKLAND COUNTY - NEW YORK

CIVIL TEC Engineering & Surveying PC
139 Lafayette Avenue, 2nd Fl.
Suffern, NY 10901
P 845.547.2241 - F 845.547.2243
111 Main Street
Chester, NY 10918
845.610.3621
Civil Engineering & Land Surveying Services that Build Confidence
www.Civil-Tec.com

STATE OF NEW YORK · RACHEL BETH BARESE · 090143 · LICENSED PROFESSIONAL ENGINEER

Rachel B. Barese, P.E.
N.Y. Lic. No. 90143

DATE:	2/8/24
DRAWN BY:	RB/LT
CHKD BY:	RB/LT
JOB No.	4227
SCALE:	1"=20'
DWG No.	5 OF 9

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

HAVERSTRAW ROAD
(NYS ROUTE 202)
120' WIDE

PROPOSED 5' WIDE CONCRETE SIDEWALK

PROPOSED 3 STORY
BUILDING
27,645 SF TOTAL
BFE: 407.0
FFE: 423.0
SFE: 435.0
TFE: 446.0

#1507
1 STORY FRAMED
DWELLING
COMMERCIAL USE TBR

SNOW
STORAGE
AREA

SNOW
STORAGE
AREA

LOADING ZONE

6'x10' TRASH ENCLOSURE

ABANDONED
WELL
RIM 423.53

HANDICAP PARKING SIGN (TYP)

100.0' REGULATORY AREA

100.0' REGULATORY AREA

PROPOSED GUIDE RAIL

DWELLING

PAVED
DRIVEWAY

GAS MARKER / 24" MAIN

GAS MARKER/ 24" MAIN

OFFSITE NYSDEC WETLANDS
AS PER MAP PROVIDED BY NYSDEC

33.05 - 2 - 15
60,961 Sq. Feet
1.39 Acres

WF A1

WF A2

WF A3

WF A4

WF A5

DATE	ISSUE	DESCRIPTION	REVISIONS
APRIL 4, 2025	REV 2	REV PER PB	
DECEMBER 30, 2024	REV 1	REV FOR PB	

S.B.L. 33.05 - 2 - 15

FIRE TRUCK MANEUVERABILITY PLAN
FOR
1507 ROUTE 202
TOWN OF RAMAPO - ROCKLAND COUNTY - NEW YORK

CIVIL TEC Engineering & Surveying PC

139 Lafayette Avenue, 2nd Fl.
Suffern, NY 10901
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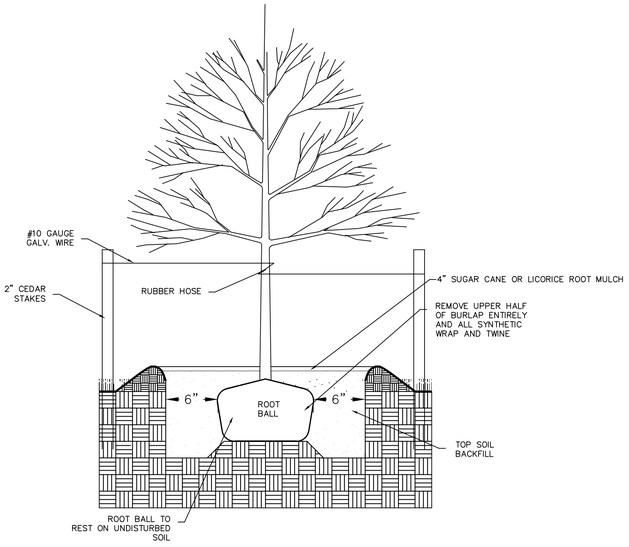
845.610.3621

Civil Engineering & Land Surveying Services that Build Communities
www.Civil-Tec.com

Rachel B. Barese, P.E.
N.Y. Lic. No. 90143

DATE:	10/21/24
DRAWN BY:	RB/LT
CHKD BY:	RB/LT
JOB No.	4227
SCALE:	1"=20'
DWG No.	6 OF 9

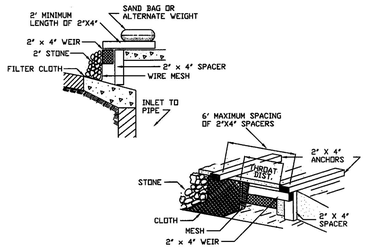


TREE PLANTING DETAIL

SCALE: N. T. S.

Standard Landscape Notes

1) Mulch all plant beds and trees with a 4" depth of sugar cane or licorice root mulch.
2) Stake all trees with 2 cedar stakes, rubber hose around tree (6'0" above grade) and twisted #10 gauge galvanized wire.
3) Plant pits shall be 12" wider and 6" deeper than the root ball. Remove all existing soil and backfill with a mixture of one part peat-humus to 4 parts topsoil. Add 3 year Eeesey grow fertilizer packets (or equal) – 1 per inch of tree caliper or per 12" height of shrub.
4) Guarantee all plants and workmanship for two planting seasons.
5) All planting shall be placed under the direction of an appropriate licensed design professional. Notify 48 hours prior to planting.
6) Provide the Town of Ramapo building inspector with a copy of the State Certificate of Source for all plant material.
7) All plant material shall be nursery grown and shall conform to the American Association of Nursery Men's Standards.

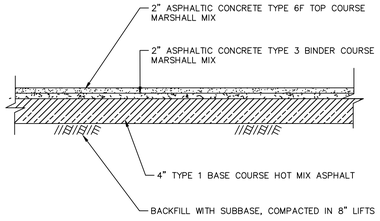


CONSTRUCTION SPECIFICATIONS

1. FILTER FABRIC SHALL HAVE AN AOS OF 40-85.
2. WOODEN FRAME SHALL BE CONSTRUCTED OF 2" x 4" CONSTRUCTION GRADE LUMBER.
3. WIRE MESH ACROSS THROAT SHALL BE A CONTINUOUS PIECE 30 INCH MINIMUM WIDTH WITH A LENGTH 4 FEET LONGER THAN THE THROAT. IT SHALL BE SHAPED AND SECURELY NAILED TO A 2" x 4" VEIR.
4. THE WEIR SHALL BE SECURELY NAILED TO 2" x 4" SPACERS 9 INCHES LONG SPACED NO MORE THAN 6 FEET APART.
5. THE ASSEMBLY SHALL BE PLACED AGAINST THE INLET AND SECURED BY 2" x 4" ANCHORS 2 FEET LONG EXTENDING ACROSS THE TOP OF THE INLET AND HELD IN PLACE BY SANDBAGS OR ALTERNATE WEIGHTS.

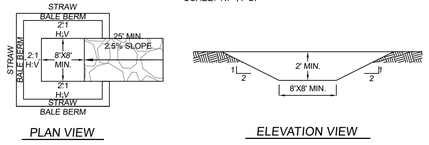
INLET PROTECTION DETAIL

SCALE: N. T. S.



TYPICAL PAVEMENT SECTION

SCALE: N. T. S.

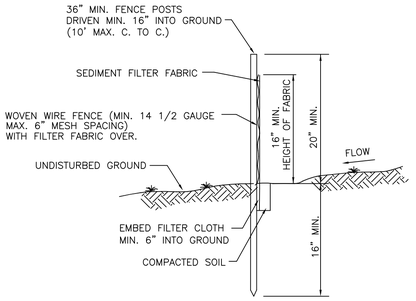


PLAN VIEW — ELEVATION VIEW

1. *Locate the facility a minimum of 100 feet from drainage swales, storm drain inlets, wetlands, streams and other surface waters. Prevent surface water from entering the structure except for the access road. Provide appropriate access with a gravel access road sloped down to the structure. Signs shall be placed to direct drivers to the facility after their load is discharged.*
2. *All washout facilities will be lined to prevent leaching of liquids into the ground. The liner shall be plastic sheeting with a minimum thickness of 10 mils with no holes or tears, and anchored beyond the top of the pit with an earthen berm, sand bags, stone, or other structural appurtenance except at the access point. If pre-fabricated washouts are used they must ensure the capture and containment of the concrete wash and be sized based on the expected frequency of concrete pours. They shall be sited as noted in the location criteria.*
3. *All concrete washout facilities shall be inspected daily. Damaged or leaking facilities shall be deactivated and repaired or replaced immediately. Excess rainwater that has accumulated over hardened concrete should be pumped to a stabilized area, such as a grass filter strip.*
4. *Accumulated hardened material shall be removed when 75% of the storage capacity of the structure is filled. Any excess wash water shall be pumped into a containment vessel and properly disposed of off site.*
5. *Dispose of the hardened material off-site in a construction/demolition landfill.*
6. *The plastic liner shall be replaced with each cleaning of the washout facility.*
7. *Inspect the project site frequently to ensure that no concrete discharges are taking place in non-designated areas.*
8. *Perimeter berm shall have a minimum height of 1'.*

CONCRETE WASHOUT STATION

N.T.S



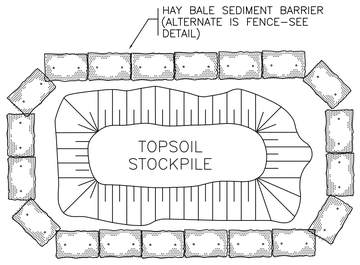
SECTION

SILT FENCE

N.T.S.

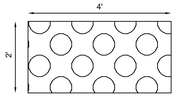
CONSTRUCTION NOTES FOR FABRICATED SILT FENCE

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN BULGES DEVELOP IN THE SILT FENCE.
5. POST TO BE STEEL EITHER "T" OR "U" TYPE OR 2" HARWOOD.
6. FILTER CLOTH TO BE MIRAFI 100X STABILINKA T140N OR APPROVED EQUAL.
7. PREFABRICATED UNIT – GEOFAB. ENVIROFENCE OR APPROVED EQUAL.



TOPSOIL STOCKPILE SEDIMENT BARRIER

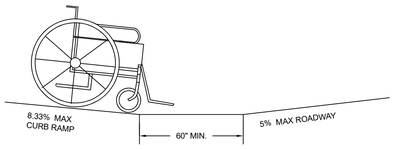
N.T.S.



ADA DETECTABLE WARNING PAD DETAIL

SCALE: N. T. S.

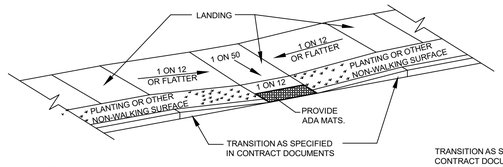
NOTES:
1. PAD TO BE ULTRATECH ULTRA–ADA PAD, SAFETY RED
2. HEIGHT TO BE 0.5 INCHES



NOTE:
TO AVOID WHEEL CHAIR FOOTREST STRIKING PAVEMENT, PROVIDE 24" LEVEL STRIP (1:50 MAX. IN DIRECTION OF PEDESTRIAN TRAVEL) IF ALGEBRAIC DIFFERENCE BETWEEN CURB RAMP SLOPE & ROADWAY CROSS SLOPE EXCEEDS 11%.

COUNTER SLOPE CONDITIONS

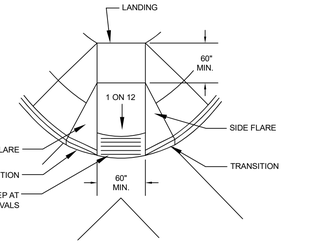
NOT TO SCALE



NOTE:
THESE PARALLEL AND PARALLEL/PERPENDICULAR CURB RAMPS MAY BE USED AT INTERSECTIONS AND MID BLOCK LOCATIONS.

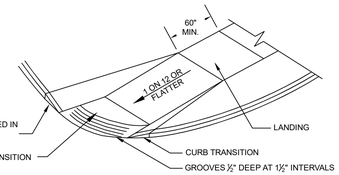
COMBINED PARALLEL/PERPENDICULAR CURB RAMP (TYPE 2A)

NOT TO SCALE



DIAGONAL SIDEWALK CURB RAMP (TYPE 4)

NOT TO SCALE

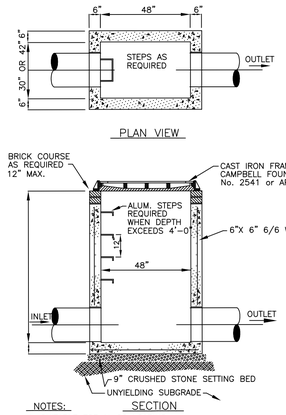


SIDEWALK RAMP (TYPE 3A)

NOT TO SCALE

NOTE:
THE DETECTABLE WARNING SURFACE OF THE HANDICAP ACCESS RAMPS IS TO BE APPROVED BY THE TOWN DEPARMENT OF PUBLIC WORKS SUPERINTENDENT.

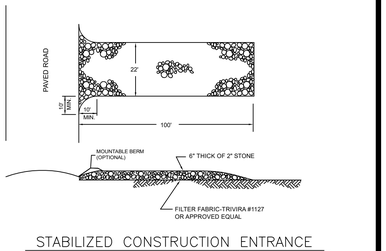
CURB RAMP DETAILS



PLAN VIEW — SECTION

NOTES:
1. SUITABLE FOR H–20 LOADING
2. MATERIALS & CONSTRUCTION TO CONFORM TO LOCAL BUILDING DEPARTMENT.
3. ALL CONCRETE TO BE 4000 P.S.I.
4. FLAT GRATE CATCH BASIN FRAME & GRATE, CAMPBELL FOUNDRY PATTERN No. 3413 OR EQUAL AS APPROVED BY LOCAL BUILDING DEPARTMENT.

PRECAST CONCRETE CATCH BASIN

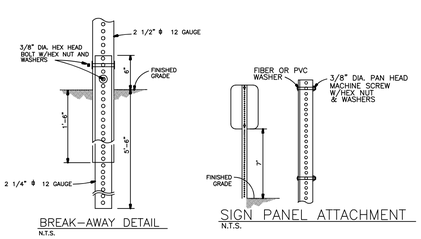


STABILIZED CONSTRUCTION ENTRANCE

N.T.S.

CONSTRUCTION SPECIFICATIONS

1. STONE SIZE – USE 2 INCHES STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH – NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS – NOT LESS THAN 6 INCHES.
4. WIDTH – 12 FEET MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY FOUR FEET IF SINGLE ENTRANCE TO SITE.
5. FILTER CLOTH – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

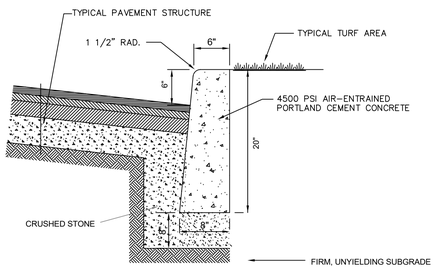


BREAK–AWAY DETAIL

N.T.S.

SIGN PANEL ATTACHMENT

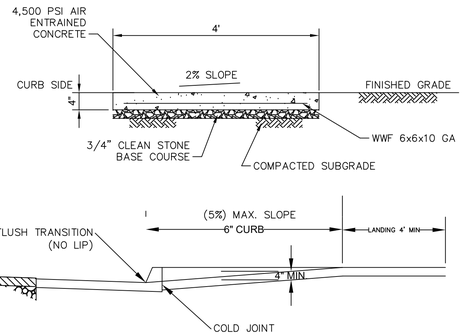
N.T.S.



NOTE:
1) PROVIDE EXPANSION JOINT AT 20'–0" MAX.

CONCRETE CURB DETAIL

N.T.S.



SECTION "A - A"

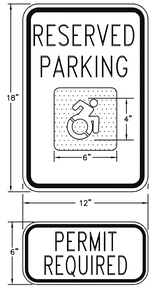
CONCRETE SIDEWALK

SCALE: N. T. S.

LETTERING, BORDER & SHADED AREAS–RED
LETTERING ON LOWER PORTION OF SIGN TO BE CENTERED HORIZONTALLY WITHIN RED BORDER
BACKGROUND–WHITE

HANDICAPPED LOADING ZONE

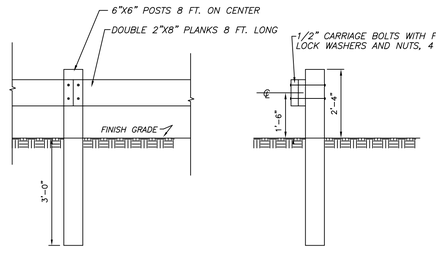
NOT TO SCALE



LETTERING AND BORDER – GREEN
WHITE SYMBOL ON BLUE BACKGROUND
BACKGROUND – WHITE

HANDICAPPED PARKING SIGN

NOT TO SCALE



WOOD POST & PLANK GUIDE RAIL

NTS

DATE	ISSUE	DESCRIPTION	REVISIONS
APRIL 4, 2025	REV 4	REV PER PB	
DECEMBER 30, 2024	REV 3	REV FOR PB	
OCTOBER 21, 2024	REV 2	REV PER CDRC	
MAY 15, 2024	REV 1	REV PER CDRC	

S.B.L. 33.05 - 2 - 15

DETAILS FOR 1507 ROUTE 202

TOWN OF RAMAPO - ROCKLAND COUNTY - NEW YORK

CIVIL TEC Engineering & Surveying PC

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Suffern, NY 10901
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111 Main Street
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Rachel B. Barese, P.E.
N.Y. Lic. No. 90143

STATE OF NEW YORK · RACHEL BETH BARESE · LICENSED PROFESSIONAL ENGINEER · 090143

DATE:	2/8/24
DRAWN BY:	RB/LT
CHKD BY:	RB/LT
JOB No.	4227
SCALE:	1"=20'
DWG No.	7 OF 9

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER:	JUSTIN PICCILLO 917-716-6420 JUSTIN.PICCILLO@ADSPIPE.COM
ADS SALES REP:	CHRISTOPHER FRITZL 845-837-9723 CHRISTOPHER .FRITZL@ADSPIPE.COM
PROJECT NO:	S420216

Advanced Drainage Systems, Inc.

APPROVED BY:

SIGNED:_____

DATE:_____

COMPANY:_____

PHONE / EMAIL:_____

1507 ROUTE 202

RAMAPO, NY

CONTRACTOR PROVIDED DELIVERY SCHEDULE & SITE INFORMATION:

SYSTEM DESIGNATION / SIZE									
SYSTEM DELIVERY DATE									

***ACTUAL DATE REQUIRED, ASAP IS NOT ACCEPTABLE AND A MINIMUM OF 4 WEEKS MUST BE PROVIDED UNLESS OTHERWISE DISCUSSED WITH A SALES REPRESENTATIVE.**

DELIVERY INFORMATION			
JOB SITE STREET ADDRESS		CITY	
CONTACT		CONTACT PHONE	
ALTERNATE CONTACT		ALTERNATE PHONE	

ADS ECOSTREAM SPECIFICATIONS

PRODUCTS

A. INTERNAL COMPONENTS: SHALL BE SUBSTANTIALLY CONSTRUCTED OF RECYCLED POLYETHYLENE OR OTHER THERMOPLASTIC MATERIAL APPROVED BY THE MANUFACTURER

B. FILTER MEDIA/VEGETATION: FILTER MEDIA SHALL BE BY ADS AND SHALL CONSIST OF A PROPRIETARY BLEND OF FILTER MEDIA. VEGETATION IS VARIABLE DEPENDENT ON REGION. ITEMS CHOSEN SHOULD ALIGN WITH CONTROLLING MUNICIPAL, COUNTY, OR STATE REQUIREMENTS.

C. PRECAST CONCRETE VAULT: DESIGNED FOR H-20 TRAFFIC LOADING AND APPLICABLE SOIL LOADS OR AS OTHERWISE DETERMINED BY A LICENSED PROFESSIONAL ENGINEER. THE MATERIALS AND STRUCTURAL DESIGN OF THE DEVICES SHALL BE PER ASTM C478, ASTM C857 AND ASTM C858.

PERFORMANCE

A. THE STORMWATER FILTER SYSTEM SHALL BE AN OFFLINE DESIGN CAPABLE OF TREATING 100% OF THE REQUIRED TREATMENT FLOW AT FULL SEDIMENT LOAD CONDITIONS.
B. THE STORMWATER FILTER SYSTEM SHALL HAVE NO MOVING PARTS.
C. THE STORMWATER TREATMENT UNIT SHALL BE DESIGNED TO REMOVE AT LEAST 80% OF SUSPENDED SOLIDS

ECOSTREAM MAINTENANCE

THE ECOSTREAM SYSTEM REQUIRES PERIODIC MAINTENANCE TO CONTINUE OPERATING AT ITS PEAK EFFICIENCY DESIGN. FOR BEST RESULTS, ECOSTREAM MAINTENANCE SHOULD BE PERFORMED BY A CERTIFIED MAINTENANCE CONTRACTOR. A QUICK CALL TO AN ADS ENGINEER OR CUSTOMER SERVICE REPRESENTATIVE WILL PROVIDE YOU WITH A LIST OF RELIABLE CONTRACTORS IN YOUR AREA.

WHEN ECOSTREAM IS INITIALLY INSTALLED, WE RECOMMEND THAT AN INSPECTION BE PERFORMED ON THE SYSTEM IN THE FIRST SIX (6) MONTHS. AFTER THAT, THE INSPECTION CYCLE TYPICALLY FALLS INTO A BIANNUAL PATTERN GIVEN NORMAL STORM OCCURRENCE AND ACTUAL SOLIDS LOADS.

ECOSTREAM EXHIBITS FLOWS BELOW DESIGN LEVELS, THE SYSTEM SHOULD BE INSPECTED AND MAINTAINED AS SOON AS PRACTICAL.

MAINTENANCE OF THE STORMWATER TREATMENT UNIT(S) SHALL BE PERFORMED PER MANUFACTURER'S MAINTENANCE INSTRUCTIONS. SUCH INSTRUCTIONS CAN BE OBTAINED BY CALLING ADVANCED DRAINAGE SYSTEMS AT (800) 821-6710 OR BY LOGGING ON TO WWW.ADS-PIPE.COM.

ECOSTREAM INSTALLATION NOTES

INSTALLATION OF THE STORMWATER TREATMENT UNIT(S) SHALL BE PERFORMED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. SUCH INSTRUCTIONS CAN BE OBTAINED BY CALLING ADVANCED DRAINAGE SYSTEMS AT (800) 821-6710 OR BY LOGGING ON TO WWW.ADS-PIPE.COM.

PROPOSED ECOSTREAM : ES-224 WQU 1

16	UNIT WIDTH
14	UNIT LENGTH
224	EFFECTIVE AREA
WQ_FLOW	TREATMENT RATE (CFS)
DRAIN_AREA	DRAINAGE AREA (ACRES)
7	BYPASS RATE (CFS)
6	FREEBOARD (FT)
24	NYLOPLAST BYPASS / OUTLET STRUCTURE
24	REQUIRED HEAD TO ACHIEVE BYPASS RATE (IN)

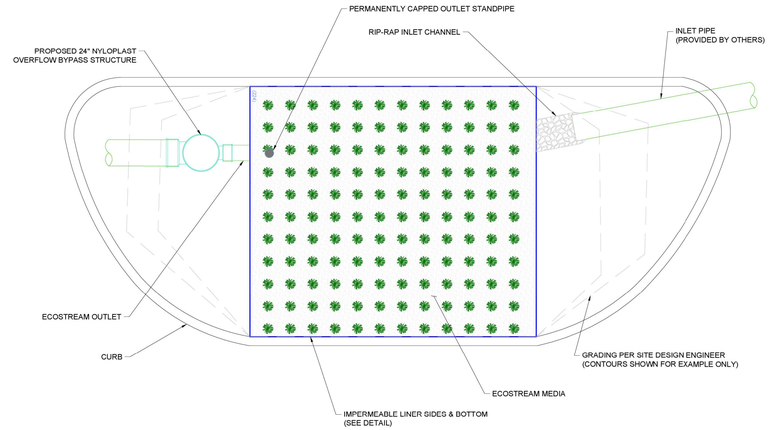
PROPOSED ELEVATIONS

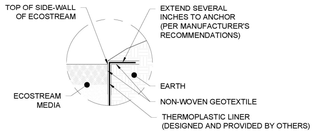
422.00	GRADE AT CURB INLET
416.00	ESTIMATED WATER SURFACE ELEVATION
414.00	BYPASS / WQ ELEVATION
413.58	BOTTOM OF POND / GROWTH MEDIA SURFACE
411.33	BOTTOM OF ECOSTREAM / MINIMUM OUTLET ELEVATION

NOTES:

- THE ECOSTREAM BIOFILTER™ IS A BIOFILTRATION STORMWATER TREATMENT TECHONOLOGY THAT RELIES ON PHYSICAL, CHEMICAL AND BIOLOGICAL MECHANISMS TO REMOVE TOTAL SUSPENDED SOLIDS.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND FINALIZE GRADING TO MEET SITE CONDITIONS.
- THE SITE DESIGN ENGINEER MUST REVIEW THE INLET CHANNEL AND FINALIZE THE DESIGN TO MEET SITE CONDITIONS.
- WATER SURFACE ELEVATION ESTIMATED BASED ON THE INLET CAPACITY OF THE NYLOPLAST GRATE AND THE PROVIDED BYPASS FLOW RATE PER THE SITE DESIGN ENGINEER. SITE DESIGN ENGINEER MUST REVIEW THE WATER SURFACE ELEVATION AND FINALIZE THE DESIGN TO MEET THE PROJECT DESIGN PARAMETERS.
- ADS DOES NOT DESIGN OR PROVIDE MEMBRANE LINER SYSTEMS. TO MINIMIZE THE LEAKAGE POTENTIAL OF LINER SYSTEMS, THE MEMBRANE LINER SYSTEM SHOULD BE DESIGNED BY A KNOWLEDGEABLE GEOTEXTILE PROFESSIONAL AND INSTALLED BY A QUALIFIED CONTRACTOR.
- ADS DOES NOT RECOMMEND PLACING THE LINED ECOSTREAM SYSTEM IN THE WATER TABLE. FOR ASSISTANCE PLEASE CONTACT ADS ENGINEERING SERVICES.

NOT FOR CONSTRUCTION - UNIT PROVIDE AS A CONCEPT ONLY





THERMOPLASTIC LINER DETAIL
NTS

1507 ROUTE 202			
RAMAPO, NY			
DATE:	09-18-24	DRAWN:	MSW
PROJECT #	S420216	CHECKED:	MSW

DATE	DRWN	CHKD	DESCRIPTION

EcoStream™ Biofilter
Stormwater Media Filters

4640 TRUEMAN BLVD
HILLIARD, OH 43026

NOT FOR CONSTRUCTION - UNIT PROVIDE AS A CONCEPT ONLY

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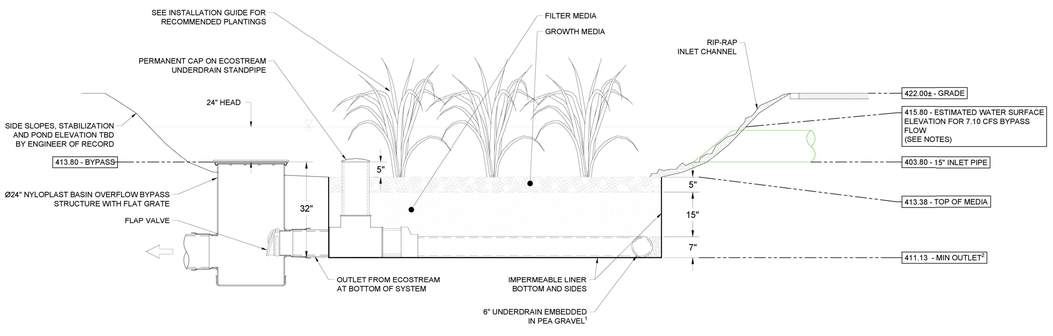
NOT FOR CONSTRUCTION - UNIT PROVIDE AS A CONCEPT ONLY



1. SEE INSTALLATION GUIDE FOR NUMBER AND CONFIGURATION OF UNDERDRAIN KITS REQUIRED
2. MINIMUM OUTLET ASSUMES 8.20 FT OF FREEBOARD ABOVE WATER SURFACE ELEVATION FOR REQUIRED HEAD ACTING UPON THE BYPASS TO PRODUCE THE PEAK BYPASS RATE. ENGINEER OF RECORD TO CONFIRM.

PROFILE VIEW
NTS

1507 ROUTE 202			
RAMAPO, NY			
DATE:	09-18-24	DRAWN:	MSW
PROJECT #	S420216	CHECKED:	MSW

DATE	DRWN	CHKD	DESCRIPTION

EcoStream™ Biofilter
Stormwater Media Filters

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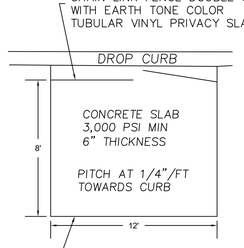
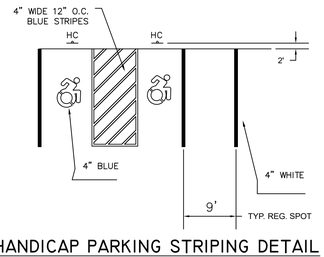
HILLIARD, OH 43026

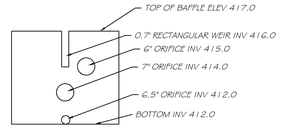


GARBAGE ENCLOSURE DETAIL
SCALE: N. T. S.

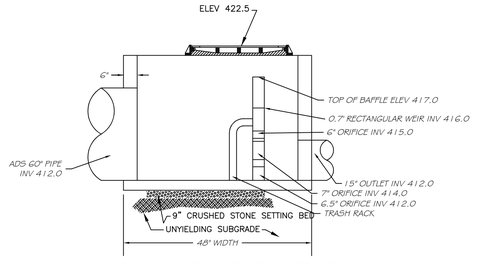


HANDICAP PARKING STRIPING DETAIL
SCALE: N. T. S.

NOTE:
ADA ACCESSIBLE SPACE AND AISLE MUST BE BLUE.
ADA ACCESSIBLE SPACE MUST HAVE A SPECIFIC LOGO MEETING 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN/ANSO REQUIREMENTS AS MODIFIED BY NEW YORK STATE.

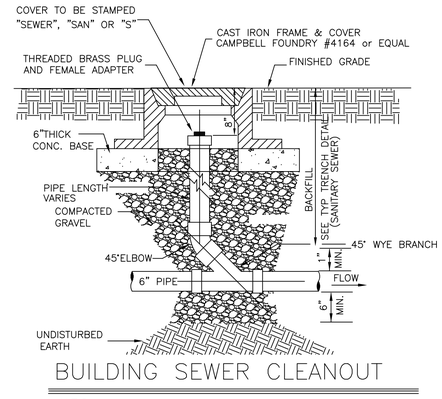


BAFFLE WALL



DRAINAGE OUTLET STRUCTURE N.T.S.

NOTES:
1. SUITABLE FOR H-20 LOADING
2. MATERIALS & CONSTRUCTION TO CONFORM TO LOCAL BUILDING DEPARTMENT.
3. ALL CONCRETE TO BE 4000 P.S.I.
4. FLAT GRATE CATCH BASIN FRAME & GRATE, CAMPBELL FOUNDRY PATTERN No. 3413 OR EQUAL AS APPROVED BY LOCAL BUILDING DEPARTMENT.
5. PRECAST STRUCTURE 72"x48" TO BE WOODARD'S PRECAST OR APPROVED EQUAL.
6. TRASH RACK TO BE LANE MODEL #139 OR SIMILAR.



BUILDING SEWER CLEANOUT
N.T.S.

DATE	ISSUE	DESCRIPTION	REVISIONS
APRIL 4, 2025	REV 4	REV PER PB	
DECEMBER 30, 2024	REV 3	REV FOR PB	
OCTOBER 21, 2024	REV 2	REV PER CDRC	
MAY 15, 2024	REV 1	REV PER CDRC	

S.B.L. 33.05 - 2 - 15

DETAILS
FOR
1507 ROUTE 202
TOWN OF RAMAPO - ROCKLAND COUNTY - NEW YORK

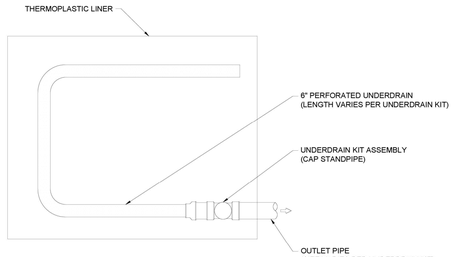
CIVIL TEC Engineering & Surveying PC
139 Lafayette Avenue, 2nd Fl.
Suffern, NY 10901
P 845.547.2241 - F 845.547.2243
111 Main Street
Chester, NY 10918
845.610.3621
Civil Engineering & Land Surveying Services that Build Co...
www.Civil-Tec.com

DATE:	2/8/24
DRAWN BY:	RB/LT
CHKD BY:	RB/LT
JOB No.	4227
SCALE:	1"=20'
DWG No.	8 OF 9

STATE OF NEW YORK · RACHEL BETH BARBSE · 090143 · LICENSED PROFESSIONAL ENGINEER

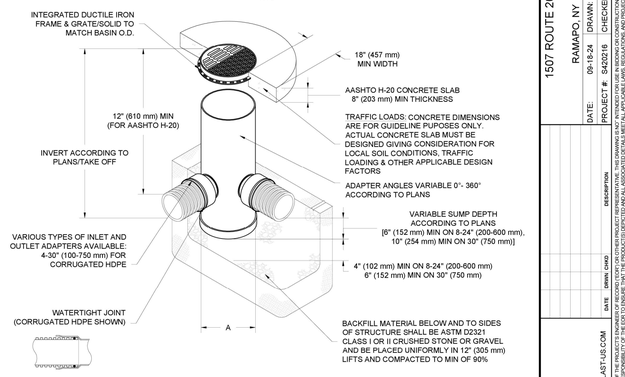
Rachel Barbse
Rachel B. Barese, P.E.
N.Y. Lic. No. 90143

UNDERDRAIN DETAIL
NTS



NOTES:
1. GENERIC UNDERDRAIN ASSEMBLY SHOWN. SEE ECOSTREAM INSTALLATION GUIDE FOR MODEL SPECIFIC ASSEMBLIES/LAYOUTS
2. OUTLET LOCATION IS VARIABLE PROVIDING THE SYSTEM WIDTH ALLOWS FOR THE DESIRED ORIENTATION OF THE UNDERDRAIN ASSEMBLY.

NYLOPLAST DRAIN BASIN
NTS



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

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

1507 ROUTE 202
RAMAPO, NY
DATE: 09-18-24 DRAWN: MSW
PROJECT #: 5420216 CHECKED: MSW

DATE	DRWN.	DESCRIPTION

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS/NYLOPLAST UNDER THE DIRECTION OF THE PROJECT'S ENGINEER OF RECORD TO ASSIST OTHER PROJECT REPRESENTATIVE. THE DRAWING IS NOT INTENDED FOR USE IN BIDDING OR CONSTRUCTION WITHOUT THE LOCAL REGULATIONS, AND PROJECT REQUIREMENTS PRIOR APPROVAL. ADS SHALL REVIEW THE DRAWING PRIOR TO VENDOR AND/OR CONTRACTOR CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE ENGINEER OF RECORD TO ENSURE THAT THE PRODUCTS DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS,

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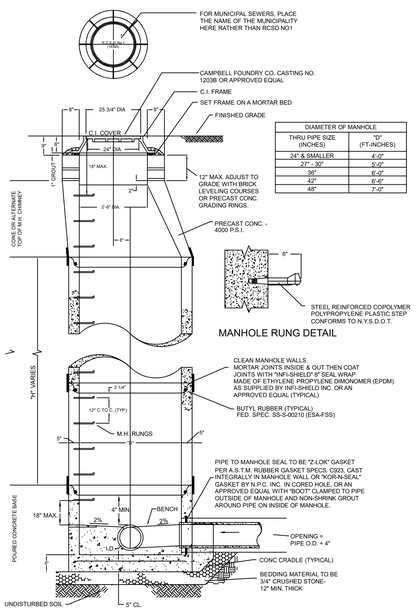
770-932-2443 | WWW.NYLOPLAST-US.COM
4640 TRUEMAN BLVD
HILLIARD, OH 43026
ADS

SHEET 4 OF 4

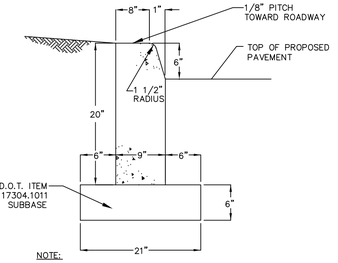


DIAMETER OF MANHOLE	
THRU PIPE SIZE (INCHES)	"D" (FT-INCHES)
24" & SMALLER	6'-0"
27" - 30"	8'-0"
36"	6'-0"
42"	6'-6"
48"	7'-0"

MANHOLE RUNG DETAIL

PRECAST STANDARD MANHOLE SECTION
N.T.S.

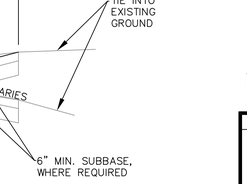
NOTE:
ALL JOINTS TO HAVE BUTYL RUBBER SEALS WITH MORTAR IN AND OUT, AND THEN TO BE COATED WITH "INFI-SHIELD" EPDM RUBBER SEAL WRAP OR APPROVED EQUAL.



NOTE:
THE END OF THE CURB NOT ABUTTING EXISTING CURB SHALL BE RAMPED DOWN TO ZERO HEIGHT REVEAL IN THE LAST 10 FEET AT LOCATIONS FACING TRAFFIC.

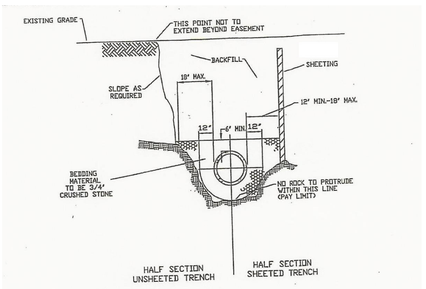
CONCRETE CURB WITHIN NYSDOT RIGHT-OF-WAY
SCALE: N. T. S.

TYPE BB (BARRIER)
PORTLAND CEMENT CONCRETE CURB NYSDOT
STANDARD SHEET 609-2

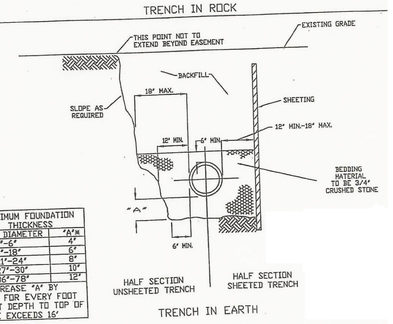


SECTION B-B

BUILDING CONNECTION TRENCH DETAIL
N.T.S.



TRENCH IN ROCK

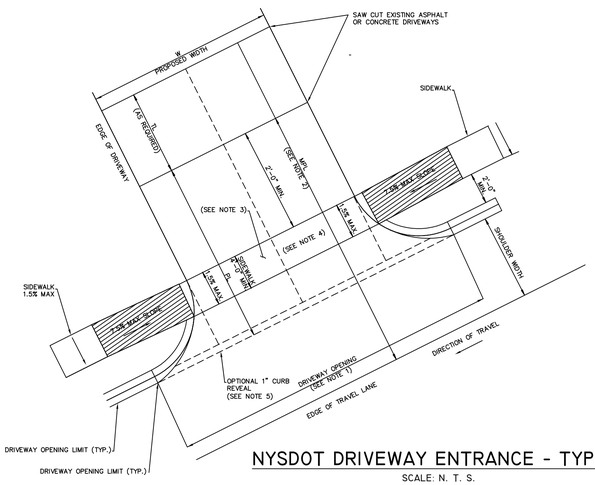


MINIMUM FOUNDATION THICKNESS	
PIPE DIAMETER	"A" M.
4"-6"	4"
8"-18"	6"
21"-24"	8"
27"-30"	10"
36"-78"	12"

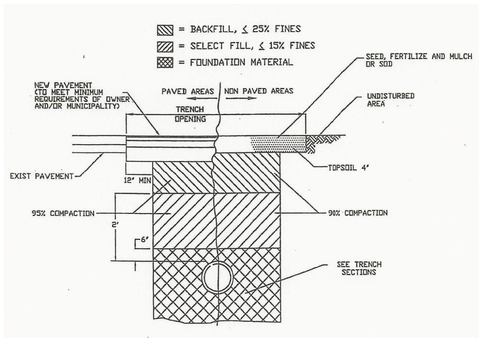
INCREASE "A" BY 1/2" FOR EVERY FOOT THAT DEPTH TO TOP OF PIPE EXCEEDS 15'

TRENCH IN EARTH

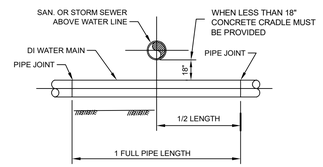
ROCKLAND COUNTY SEWER DISTRICT NO. 1 TRENCH SECTIONS
N.T.S.



NYSDOT DRIVEWAY ENTRANCE - TYPE 2
SCALE: N. T. S.



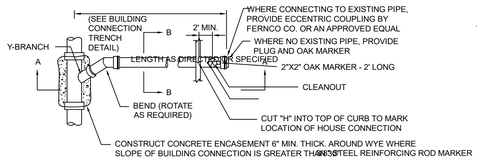
PIPE TRENCH BACKFILL DETAIL



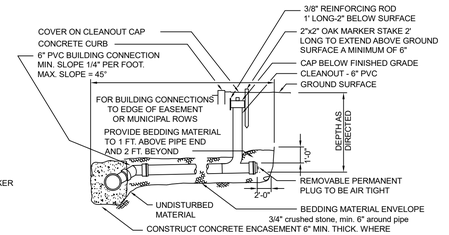
SECTION

NOTE:
WHEN WATER & SEWER LINES ARE PARALLEL, MIN. HOR. SEPARATION SHALL BE 10'-0" (MEASURED FROM EDGE TO EDGE

WATER & SEWER CROSSING
N.T.S.

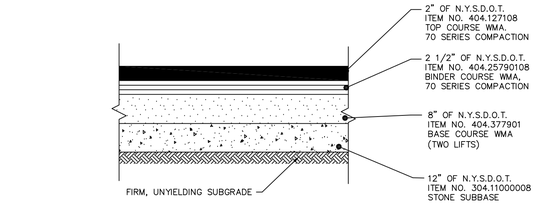


BUILDING CONNECTION PLAN



SECTION A-A
BUILDING CONNECTION ELEVATION

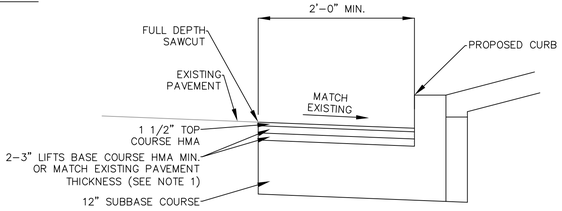
BUILDING CONNECTION DETAIL
N.T.S.



TYPICAL PAVEMENT SECTION WITHIN NYSDOT ROW
SCALE: N. T. S.

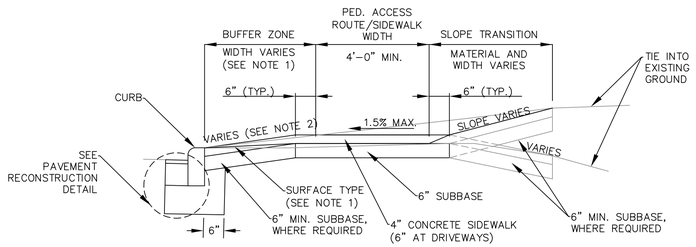
NOTES: 1. TACK COAT NYSDOT ITEM NO. 407.0103 SHALL BE PLACED PRIOR TO THE PLACEMENT OF EACH COURSE OF ASPHALT.

2. MINIMUM DEPTH OF NEW PAVEMENT CROSS-SECTION MUST MEET DEPTH OF EXISTING PAVEMENT.



NYSDOT PAVEMENT RECONSTRUCTION HOT MIX ASPHALT
SCALE: N. T. S.

NOTES: 1. WHERE EXISTING ROADWAYS ARE SAWCUT TO INSTALL CURBING AND/OR SIDEWALK, THE ROADWAY SHOULD BE SAWCUT AT LEAST 2'-0" FROM THE PROPOSED CURB LINE TO ALLOW FOR ADEQUATE COMPACTION OF ASPHALT. IF THE SAWCUT IS LESS THAN 2'-0" FROM THE PROPOSED CURB LINE, THE ROADWAY SHALL BE REBUILT USING CLASS A, C, OR D CONCRETE.



TYPICAL SIDEWALK CROSS SECTION CURBED WITH BUFFER ZONE
SCALE: N. T. S.

NOTES: 1. THE BUFFER ZONE IS A PHYSICAL DISTANCE SEPARATING THE PEDESTRIAN ACCESS ROUTE FROM THE VEHICLE TRAVELED WAY. THE BUFFER ZONE MAY BE PLANTED OR PAVED. WHERE THE BUFFER ZONE WIDTH, EXCLUSIVE OF CURB, IS LESS THAN 3'-0", THE SURFACE SHOULD BE PAVED OR CONSTRUCTED WITH HARDSCAPE MATERIALS.

2. THE MAXIMUM RECOMMENDED CROSS SLOPE OF A TURF BUFFER ZONE OR SLOPE TRANSITION BEHIND SIDEWALK IS 25%. BUFFER ZONES WITH A CROSS SLOPE GREATER THAN 25% SHOULD BE PAVED, PLANTED OR CONSTRUCTED WITH HARDSCAPE MATERIALS.

DATE	ISSUE	DESCRIPTION	REVISIONS
APRIL 4, 2025	REV 4	REV PER PB	
DECEMBER 30, 2024	REV 3	REV FOR PB	
OCTOBER 21, 2024	REV 2	REV PER CDRC	
MAY 15, 2024	REV 1	REV PER CDRC	

S.B.L. 33.05 - 2 - 15

DETAILS FOR 1507 ROUTE 202

TOWN OF RAMAPO - ROCKLAND COUNTY - NEW YORK

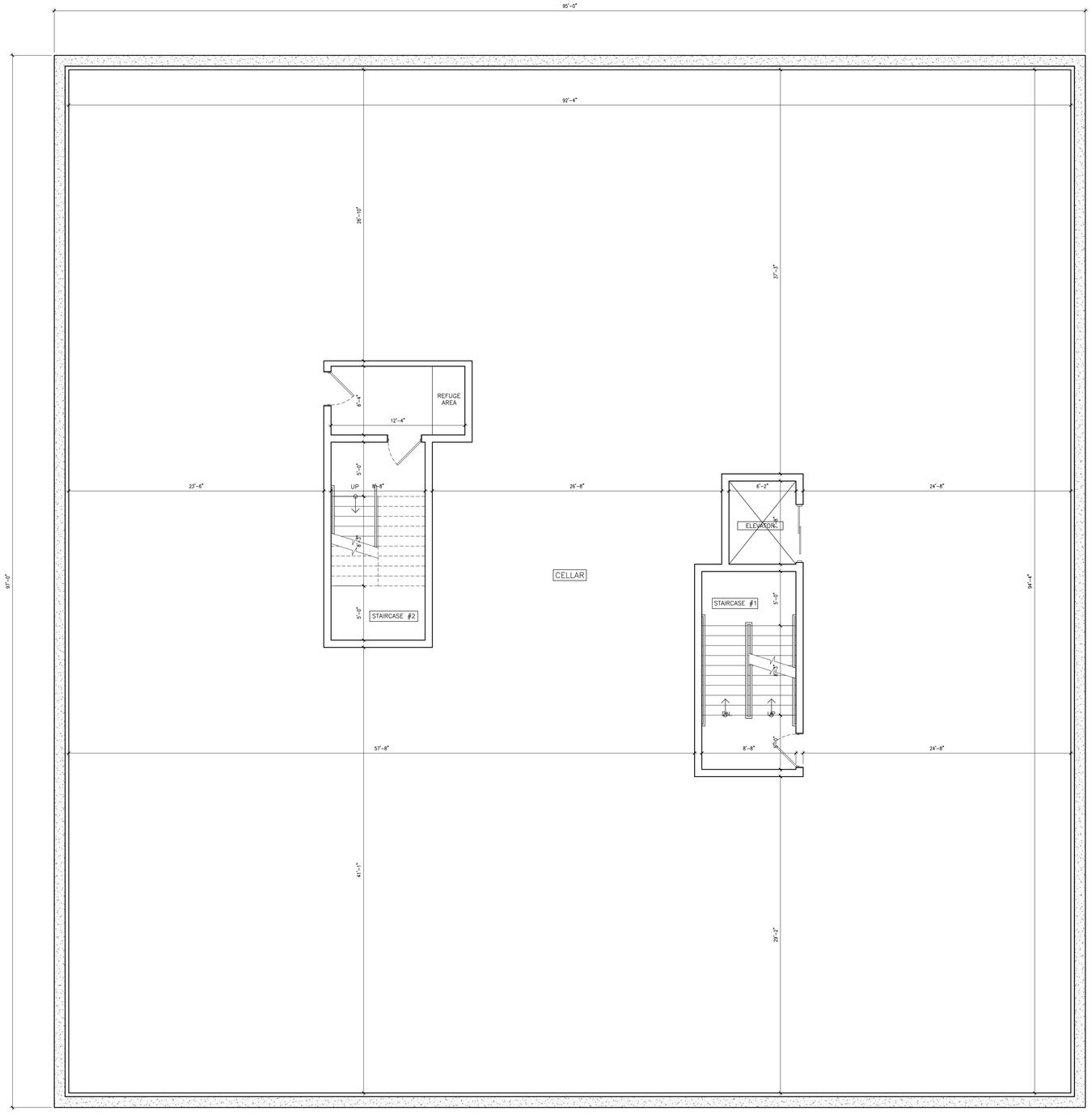
CIVIL TEC Engineering & Surveying PC
139 Lafayette Avenue, 2nd Fl.
Suffern, NY 10901
P 845.547.2241 - F 845.547.2243
111 Main Street
Chester, NY 10918
845.610.3621
Civil Engineering & Land Surveying Services that Build Confidence
www.Civil-Tec.com

Rachel B. Barese, P.E.
N.Y. Lic. No. 90143

STATE OF NEW YORK · RACHEL BETH BARESE · LICENSED PROFESSIONAL ENGINEER · 090143

DATE:	2/8/24
DRAWN BY:	RB/LT
CHKD BY:	RB/LT
JOB No.	4227
SCALE:	1"=20'
DWG No.	9 OF 9

PLANS ARE NOT FOR CONSTRUCTION



1 / A-101 BASEMENT FLOOR PLAN

SCALE: 3/16" =1'-0"

Hartman Design
COMMERCIAL • RESIDENTIAL
412 N. MAIN STREET. SUITE 301
MONROE NY 10950 845-781-4222
LARRY@HARTMANDESIGN.COM

REGISTERED ARCHITECT
MANUEL ANTONIO ANDRADE
027188
STATE OF NEW YORK
SEAL

OFFICE BUILDING FOR:

MESSNER CONSTRICTION

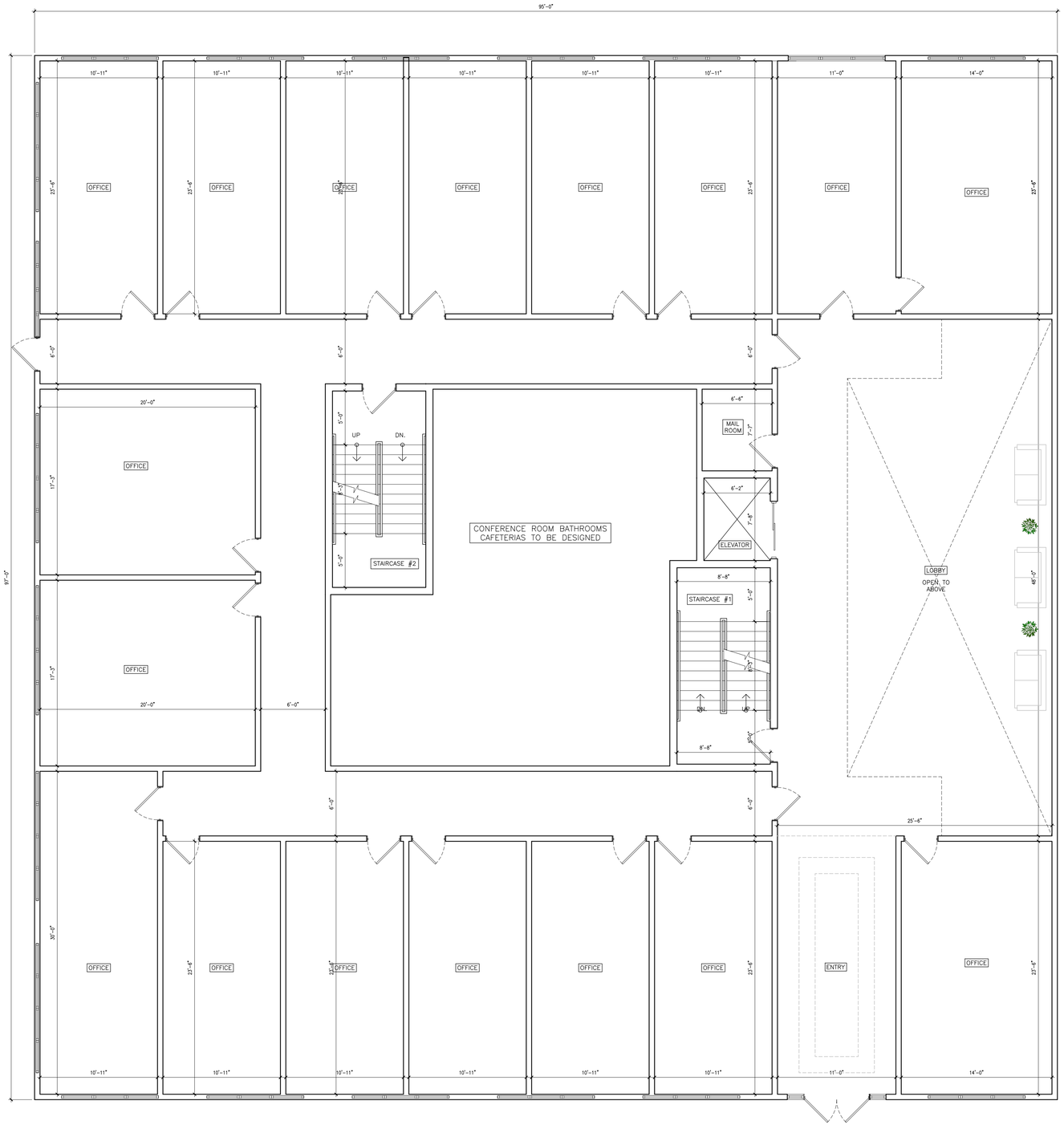
1507 ROUTE 202 TOWN OF RAMAPO
ROCKLAND COUNTY, NEW YORK

WRITTEN STATEMENT

TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE NEW YORK STATE UNIFORM FIRE PREVENTION AND BUILDING CODE AND THE NEW YORK STATE ENERGY CONSERVATION CONSTRUCTION CODE, AS CURRENTLY IN EFFECT.

Project No.	---101
Drawn By:	LH
Reviewed By:	PS
Date	5-31-2025

A-101



1 A-102 FIRST FLOOR PLAN

SCALE: 3/16" =1'-0"

PLANS ARE NOT FOR CONSTRUCTION

SQUARE FOOTAGE	
OFFICE AND ACCESSORY SPACE	17,060
PUBLIC AND COMMON SPACE AND EXTERIOR WALLS	10,585

SQUARE FOOTAGE	
BASEMENT	UNFINISHED
FIRST FLOOR	8,537
SECOND FLOOR	7,648
THIRD FLOOR	8,537
TOTAL FAR	24,722

ALL DIMENSIONS ARE FROM INSIDE OF EXTERIOR WALLS AND EXCLUDES THE STAIR WELLS AND ELEVATOR SHAFTS AND OPEN TO BELOW AREAS

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REGISTERED ARCHITECT
MANUEL ANTONIO ANDRADE
028788
STATE OF NEW YORK
SEAL

BUILDING FOR:

MESSNER CONSTRUCTION

OFFICE BUILDING

1507 ROUTE 202 TOWN OF RAMAPO

ROCKLAND COUNTY, NEW YORK

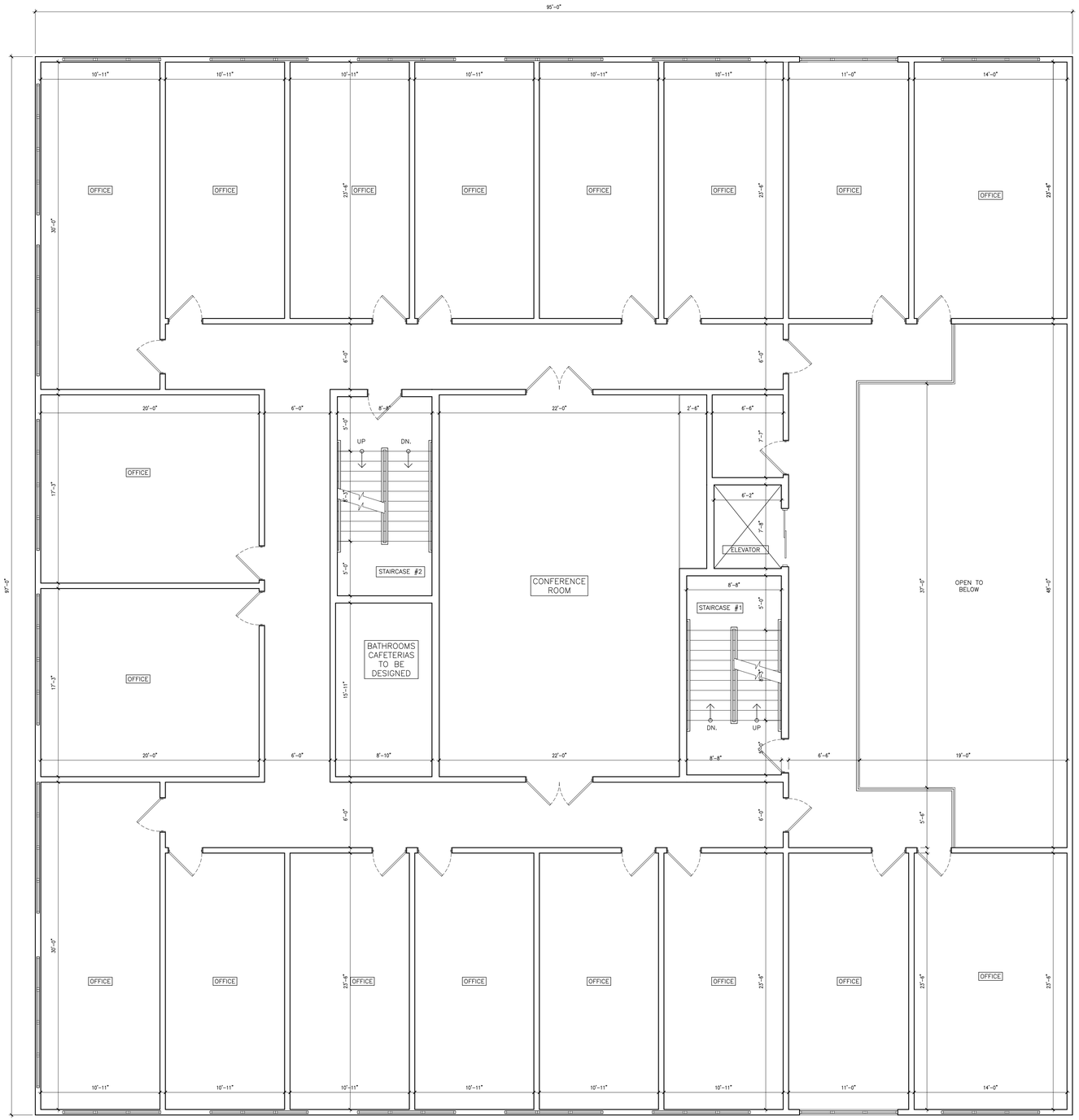
WRITTEN STATEMENT

TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE NEW YORK STATE UNIFORM FIRE PREVENTION AND BUILDING CODE AND THE NEW YORK STATE ENERGY CONSERVATION CONSTRUCTION CODE, AS CURRENTLY IN EFFECT.

Project No. ---101
Drawn By: LH
Reviewed By: MS
Date 3-31-2025

A-102

PLANS ARE NOT FOR CONSTRUCTION



1 A-103 SECOND FLOOR PLAN

SCALE: 1/4" =1'-0"

Hartman Design
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412 N. MAIN STREET. SUITE 301
MONROE NY 10950 845-781-4222
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REGISTERED ARCHITECT
MANUEL ANTONIO ANDRADE
028788
STATE OF NEW YORK
SEAL

OFFICE BUILDING FOR:

MESSNER CONSTRICTION

1507 ROUTE 202 TOWN OF RAMAPO
ROCKLAND COUNTY, NEW YORK

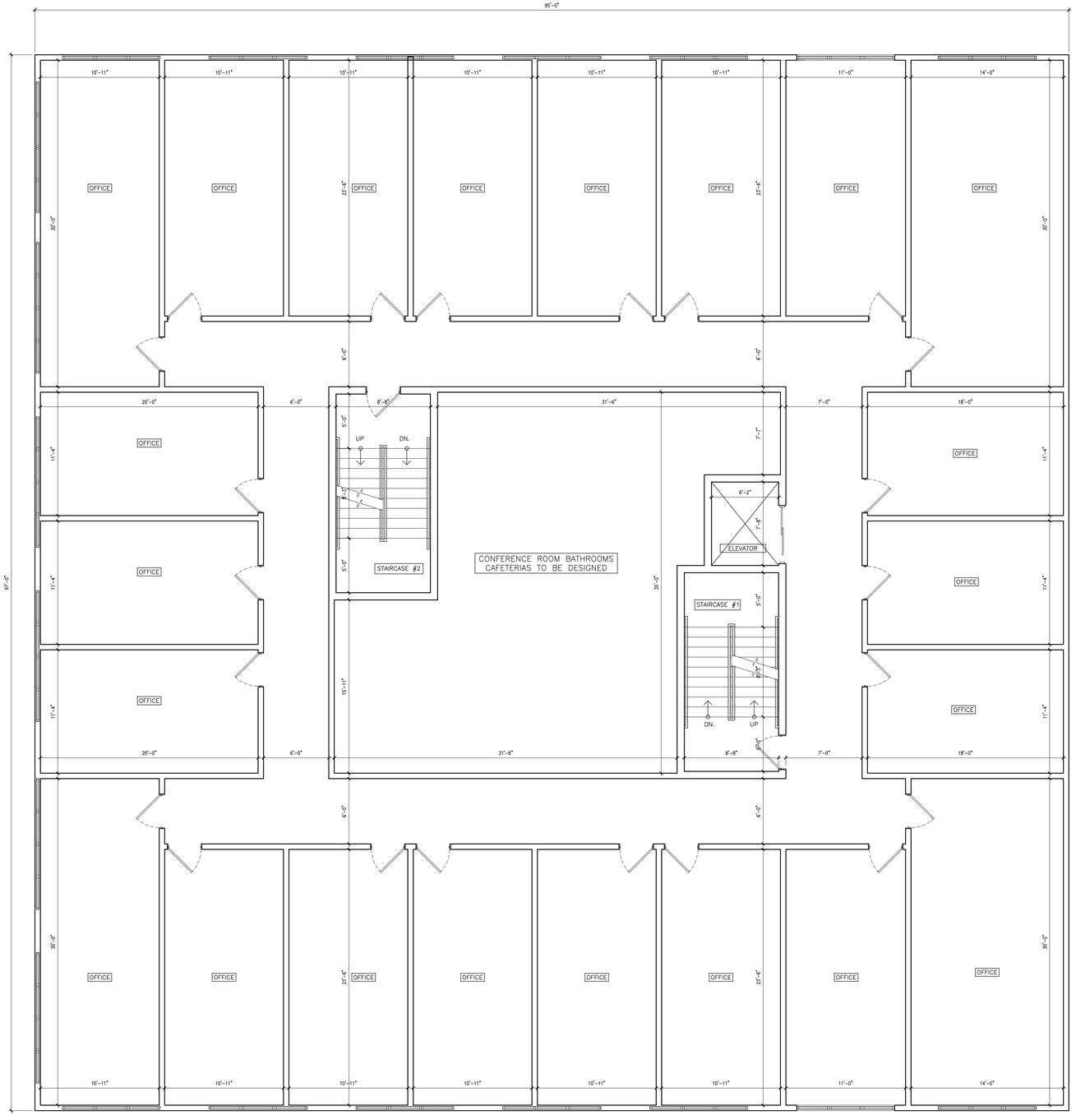
WRITTEN STATEMENT

TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE NEW YORK STATE UNIFORM FIRE PREVENTION AND BUILDING CODE AND THE NEW YORK STATE ENERGY CONSERVATION CONSTRUCTION CODE, AS CURRENTLY IN EFFECT.

Project No. ---101
Drawn By: LH
Reviewed By: PS
Date 5-31-2029

A-103

PLANS ARE NOT FOR CONSTRUCTION



1 / A-104 THIRD FLOOR PLAN

SCALE: 1/4" =1'-0"

Hartman Design
COMMERCIAL • RESIDENTIAL
412 N. MAIN STREET. SUITE 301
MONROE NY 10950 845-781-4222
LARRY@HARTMANDESIGN.COM

REGISTERED ARCHITECT
MANUEL ANTONIO ANDRADE
027188
STATE OF NEW YORK
SEAL

OFFICE BUILDING FOR:

MESSNER CONSTRICTION

1507 ROUTE 202 TOWN OF RAMAPO
ROCKLAND COUNTY, NEW YORK

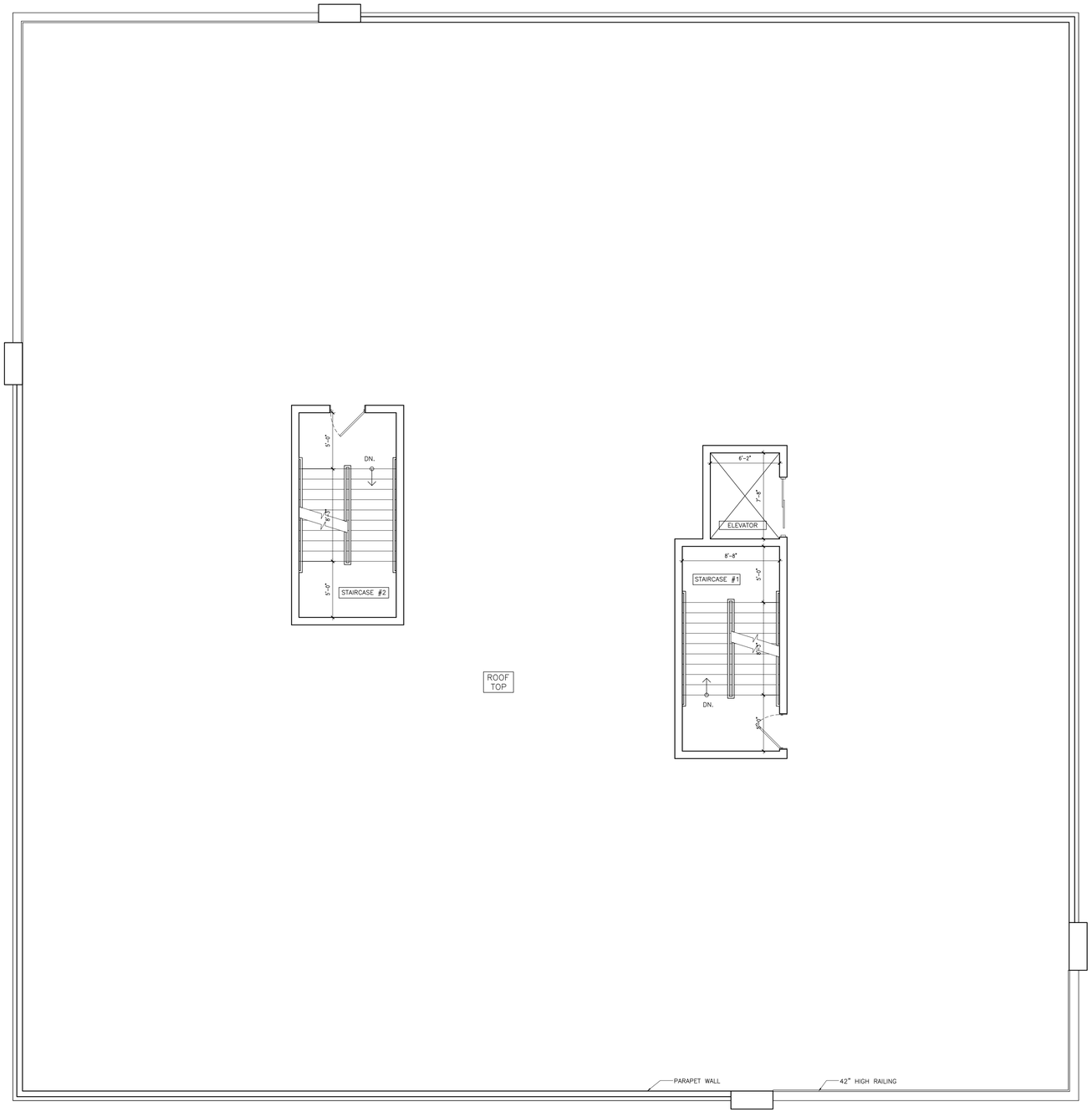
WRITTEN STATEMENT

TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE NEW YORK STATE UNIFORM FIRE PREVENTION AND BUILDING CODE AND THE NEW YORK STATE ENERGY CONSERVATION CONSTRUCTION CODE, AS CURRENTLY IN EFFECT.

Project No. ---101
Drawn By: LH
Reviewed By: PS
Date 5-31-2029

A-104

PLANS ARE NOT FOR CONSTRUCTION



1 / A-105 ROOF PLAN

SCALE: 3/16" =1'-0"

Hartman Design
COMMERCIAL • RESIDENTIAL
412 N. MAIN STREET. SUITE 301
MONROE NY 10950 845-781-4222
LARRY@HARTMANDESIGN.COM

REGISTERED ARCHITECT
MANUEL ANTONIO ANDRADE
STATE OF NEW YORK
SEAL

OFFICE BUILDING FOR:

MESSNER CONSTRICTION

1507 ROUTE 202 TOWN OF RAMAPO
ROCKLAND COUNTY, NEW YORK

WRITTEN STATEMENT

TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE NEW YORK STATE UNIFORM FIRE PREVENTION AND BUILDING CODE AND THE NEW YORK STATE ENERGY CONSERVATION CONSTRUCTION CODE, AS CURRENTLY IN EFFECT.

Project No. ---101
Drawn By: LH
Reviewed By: PS
Date 5-31-2025

A-105

Plan View
Scale - 1" = 25ft

Schedule										
Symbol	Label	QTY	Manufacturer	Catalog	Description	Number Lamps	Lamp Output	LLF	Input Power	Polar Plot
	S4	3	Cyclone Lighting	BECSxA-FGC-T4HS-P40-30K	Tribeca	1	5566	0.9	59.59553	Max: 3913cd
	S5	1	Cyclone Lighting	BECSxA-FGC-T5-P40-30K	Tribeca	1	7367	0.9	59.80362	Max: 3082cd
	S52	3	Cyclone Lighting	BECSxA-FGC-T5-P40-30K	Tribeca	1	7367	0.9	119.6072	Max: 3082cd
	W	5	Holophane	HLWPC2 P30 30K XX TFTM	Wallpack Full Cutoff LED, LED Performance Package P10, 3000 series CCT, Voltage, Forward Throw Medium	1	7507	0.9	71	Max: 5356cd

Statistics						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Trespass	+	0.1 fc	0.6 fc	0.0 fc	N/A	N/A
Parking	+	1.9 fc	4.1 fc	0.4 fc	10.3:1	4.8:1

VISUAL

1507 Route 22
Ramapo_NY

Designer
az
Date
04/17/2024
Scale
Not to Scale
Drawing No.

Summary

Hartman Design

COMMERCIAL • RESIDENTIAL

1507 ROUTE 202

1507 ROUTE 202

Hartman Design

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Short Environmental Assessment Form
Part 1 - Project Information

Instructions for Completing

Part 1 – Project Information. The applicant or project sponsor is responsible for the completion of Part 1. Responses become part of the application for approval or funding, are subject to public review, and may be subject to further verification. Complete Part 1 based on information currently available. If additional research or investigation would be needed to fully respond to any item, please answer as thoroughly as possible based on current information.

Complete all items in Part 1. You may also provide any additional information which you believe will be needed by or useful to the lead agency; attach additional pages as necessary to supplement any item.

Part 1 – Project and Sponsor Information

Name of Action or Project:
1507 Route 202

Project Location (describe, and attach a location map):
1507 Rt 202 Pomona, NY

Brief Description of Proposed Action:
Proposed Office building

Name of Applicant or Sponsor:	Telephone:
Moshe Messner	E-Mail: moshe@messnerconstruction.com

Address:
43 Olympia Lane

City/PO:	State:	Zip Code:
Monsey	NY	10952

	NO	YES
1. Does the proposed action only involve the legislative adoption of a plan, local law, ordinance, administrative rule, or regulation? If Yes, attach a narrative description of the intent of the proposed action and the environmental resources that may be affected in the municipality and proceed to Part 2. If no, continue to question 2.	☑	☐
2. Does the proposed action require a permit, approval or funding from any other government Agency? If Yes, list agency(s) name and permit or approval: site plan-PB, variances-ZBA, sewer-RCSD No 1 & Ramapo DPW, NYSDOT, mosquito-RCDOH	☐	☑

3. a. Total acreage of the site of the proposed action? 1.397 acres
   b. Total acreage to be physically disturbed? 1.25 acres
   c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? 1.397 acres

4. Check all land uses that occur on, are adjoining or near the proposed action:

5. ☐ Urban ☐ Rural (non-agriculture) ☐ Industrial ☑ Commercial ☐ Residential (suburban)
   ☐ Forest ☐ Agriculture ☐ Aquatic ☐ Other(Specify):
   ☐ Parkland

	NO	YES	N/A
5. Is the proposed action,			
a. A permitted use under the zoning regulations?	☐	☑	☐
b. Consistent with the adopted comprehensive plan?	☐	☑	☐

	NO	YES
6. Is the proposed action consistent with the predominant character of the existing built or natural landscape?	☐	☑

	NO	YES
7. Is the site of the proposed action located in, or does it adjoin, a state listed Critical Environmental Area?		
If Yes, identify: _____	☑	☐

	NO	YES
8. a. Will the proposed action result in a substantial increase in traffic above present levels?	☑	☐
b. Are public transportation services available at or near the site of the proposed action?	☑	☐
c. Are any pedestrian accommodations or bicycle routes available on or near the site of the proposed action?	☑	☐

	NO	YES
9. Does the proposed action meet or exceed the state energy code requirements?		
If the proposed action will exceed requirements, describe design features and technologies: _____ _____	☐	☑

	NO	YES
10. Will the proposed action connect to an existing public/private water supply?		
If No, describe method for providing potable water: _____ _____	☐	☑

	NO	YES
11. Will the proposed action connect to existing wastewater utilities?		
If No, describe method for providing wastewater treatment: _____ _____	☐	☑

	NO	YES
12. a. Does the project site contain, or is it substantially contiguous to, a building, archaeological site, or district which is listed on the National or State Register of Historic Places, or that has been determined by the Commissioner of the NYS Office of Parks, Recreation and Historic Preservation to be eligible for listing on the State Register of Historic Places?	☑	☐
b. Is the project site, or any portion of it, located in or adjacent to an area designated as sensitive for archaeological sites on the NY State Historic Preservation Office (SHPO) archaeological site inventory?	☑	☐

	NO	YES
13. a. Does any portion of the site of the proposed action, or lands adjoining the proposed action, contain wetlands or other waterbodies regulated by a federal, state or local agency?	☐	☑
b. Would the proposed action physically alter, or encroach into, any existing wetland or waterbody?	☑	☐
If Yes, identify the wetland or waterbody and extent of alterations in square feet or acres: _____ _____ _____		

14. Identify the typical habitat types that occur on, or are likely to be found on the project site. Check all that apply:

☐ Shoreline ☐ Forest ☐ Agricultural/grasslands ☐ Early mid-successional

☐ Wetland ☐ Urban ☑ Suburban

	NO	YES
15. Does the site of the proposed action contain any species of animal, or associated habitats, listed by the State or Federal government as threatened or endangered?	☑	☐
16. Is the project site located in the 100-year flood plan?	☑	☐
17. Will the proposed action create storm water discharge, either from point or non-point sources?	☐	☑
If Yes,		
a. Will storm water discharges flow to adjacent properties?	☐	☑
b. Will storm water discharges be directed to established conveyance systems (runoff and storm drains)?	☑	☐
If Yes, briefly describe: _____		
18. Does the proposed action include construction or other activities that would result in the impoundment of water or other liquids (e.g., retention pond, waste lagoon, dam)?	☑	☐
If Yes, explain the purpose and size of the impoundment: _____		
19. Has the site of the proposed action or an adjoining property been the location of an active or closed solid waste management facility?	☑	☐
If Yes, describe: _____		
20. Has the site of the proposed action or an adjoining property been the subject of remediation (ongoing or completed) for hazardous waste?	☐	☑
If Yes, describe: _____		

I CERTIFY THAT THE INFORMATION PROVIDED ABOVE IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE

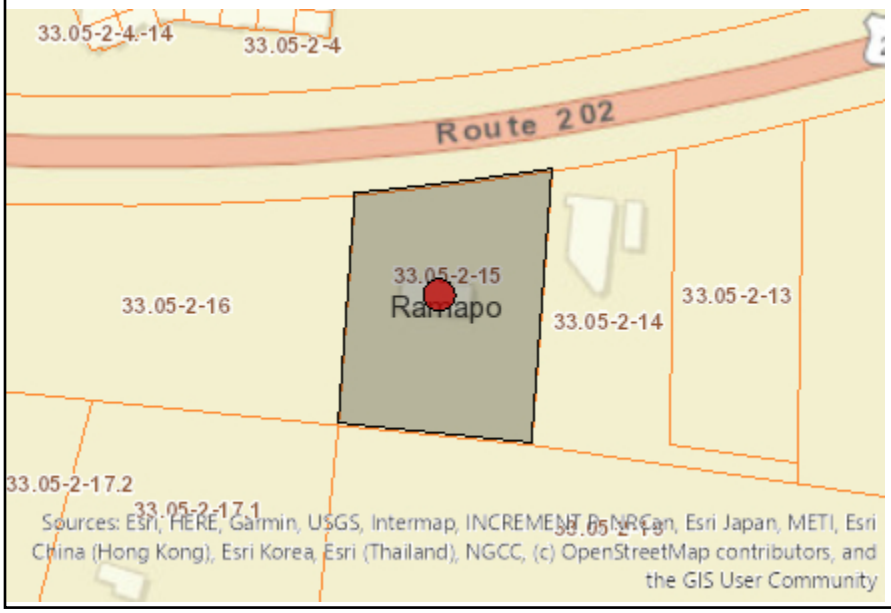
Applicant/sponsor/name: Civil Tec Engineering & Surveying PC Date: 11-17-23

Signature: Title: President

PRINT FORM

EAF Mapper Summary Report

Tuesday, November 14, 2023 4:34 PM



Disclaimer: The EAF Mapper is a screening tool intended to assist project sponsors and reviewing agencies in preparing an environmental assessment form (EAF). Not all questions asked in the EAF are answered by the EAF Mapper. Additional information on any EAF question can be obtained by consulting the EAF Workbooks. Although the EAF Mapper provides the most up-to-date digital data available to DEC, you may also need to contact local or other data sources in order to obtain data not provided by the Mapper. Digital data is not a substitute for agency determinations.

Part 1 / Question 7 [Critical Environmental Area]	No
Part 1 / Question 12a [National or State Register of Historic Places or State Eligible Sites]	No
Part 1 / Question 12b [Archeological Sites]	No
Part 1 / Question 13a [Wetlands or Other Regulated Waterbodies]	Yes - Digital mapping information on local and federal wetlands and waterbodies is known to be incomplete. Refer to EAF Workbook.
Part 1 / Question 15 [Threatened or Endangered Animal]	No
Part 1 / Question 16 [100 Year Flood Plain]	No
Part 1 / Question 20 [Remediation Site]	Yes

Hydrant Flow Test Results

TO:

Moshe Messner
Jasco 202 LLC
30 Palisades Ct
Pomona, NY 10970

RE:

Hydrant 32-61
1507 Route 202, Ramapo

Following are the results of the flow test:

Date Tested	06/19/2024
Flow Hydrant:	32-62
Control Hydrant	32-61
Gauge Pressure (PSI)	65
Static Pressure (PSI)	145
Residual Pressure (PSI)	135
Hydrant Discharge Observed (GPM) **	1220
Work Order #	2502837

If there are any questions, please email us.vna.nyflowtest.all.mailbox@veolia.com

***** Flow test results represent pressure and flow conditions in the water main at the specified location at the time of the flow test. Please note that these conditions do not necessarily represent the lowest pressure and flow conditions that may occur in the main due to normal changes in daily and seasonal water demand. Please note that Veolia Water New York makes no guarantees about the accuracy of the flow test information and shall not be held liable for operational problems with fire sprinkler systems designed using this information.***

CIVILTEC
Engineering + Surveying

Fire Flow Availability Calculations
1507 Route 202
Town of Ramapo, Rockland County, New York
33.05-2-15
Project Number 4227
April 2025

FIRE FLOW CALCULATIONS

Floor Area = 9,215 SF + 50%*(9,215SF * 2 stories) = 18,430 SF
Ci = 18F(Ai)^0.5
F = Construction Class. This will be Masonry Non-Combustible Construction F = 0.8
Ai = 18,430 SF
Ci = 18*0.8*(18,430 SF)^0.5
Ci = 1,955 gpm
Occupancy Factor (Oi)
C-2 Limited-Combustible = 0.85
Exposure (Xi) and Communication (Pi)
(X+P)i = 1.0 + ∑(Xi + Pi)
Xi = 0
Pi = 0
Needed Fire Flow (NFFi)
NFFi = (Ci)(Oi)(1.0 + (X+P)i)
NFFi = (1,955 gpm)*(0.85)*(1.0 + (0+0))
NFFi = 1,662 gpm

According to Veolia, the most recent flow test for the area shows a static pressure of 145 psi, residual pressure of 135 psi, and a flow of 1,220 gpm.

Qr = Qf x (Hr/Hf)^0.54
Where:
Qr=Rated Capacity at 20 psi
Qf=Total test flow
Hr=static pressure minus 20 psi
Hf=static pressure minus residual pressure

Qr = 1,220 gpm x ((145 psi – 20 psi)/(145 psi – 135 psi)) ^ 0.54
Qr = 4,772 gpm

1,662 gpm < 4,772 gpm

Therefore, there is sufficient flow available.

* Information provided by Veolia may not be the most recent data and should be field verified at the time of construction.

Civil Tec Engineering & Surveying P.C.
139 Lafayette Avenue, 2nd Floor, Suffern, NY 10901 Tel 845.547.2241 Fax 845.547.2243
111 Main Street, Chester, NY 10918 Tel 845.610.3621
Civil-Tec.com

400 Columbus Avenue, Suite 180E
Valhalla, New York 10595
Main: 877 627 3772

Colliers Engineering & Design

Memorandum

To:	Town of Ramapo - CDRC
CC:	Moshe Eisen, Messner Construction Rachel Barese, CivilTec Daniel M. Richmond, Zarin & Steinmetz
From:	Ronald P. Rieman, Project Manager
Date:	April 4, 2025
Subject:	1507 Route 202 Parking and Trip Generation Evaluation Town of Ramapo, Rockland County, NY
Project No.:	23015049A

The following information has been provided to identify future parking needs for the proposed redevelopment of the 1507 Route 202 property. The following sections provides a description of the proposed Project and tasks undertaken in completing the parking evaluation and includes a comparison of the Town parking rates with current industry standards. In addition, the anticipated trip generation is also provided.

1. Project Description

The property currently consist of an existing building consisting of approximately 2,300 s.f. of professional office space and is known as the 1507 Rt. 202 Professional Center. A new 3-story office building is proposed consisting of some 24,722 s.f. with 105 parking spaces provided.

2. Required Parking based on Town Code (as shown on the Site Plan)

As shown on the Site Plan, based on Town Code the proposed office building would require 124 parking spaces (1 space per 200 SF which would equate to a 5.0 spaces per 1,000 s.f.). **This would require a 15.3% variance.**

It should be noted that the Town parking requirements are relatively high when compared to current industry standards. See Section 3, below.

3. Current Industry Standards (ITE Parking Generation)

As noted above, the Town parking requirements are relatively high when compared to industry standards. Based on studies contained in the Institute of Transportation Engineers (ITE) latest Parking Generation Manual, 6th Edition, the following parking would be needed.

Based on the ITE average parking demand for similar uses, the proposed office building would require 48 spaces (at 1.95 spaces per 1,000 s.f.) **and would be satisfied by the 105 spaces** provided.

Based on the ITE 85th percentile parking demand, the proposed office building would require 74 spaces (at 2.98 spaces per 1,000 s.f.) **and would also be satisfied by the 105 spaces provided.**

A copy of the ITE Peak Parking Demand is contained is Attachment A.

In addition to the above, it should be noted, that the Site is currently serviced by the Transport of Rockland (TOR 95 Bus) which could further reduce the need for parking.

4. Anticipated Trip Generation (ITE Trip Generation)

The anticipated Trip Generation for the proposed 3-story office building (24,722 s.f.) is anticipated to generate a total of 50 trips (44 entering trips and 6 exiting trips) during the Weekday Peak AM Hour and a total of 52 trips (9 entering trips and 43 exiting trips) during the Weekday Peak PM Hour based on information contained in the latest Institute of Transportation Engineers (ITE) "Trip Generation Manual" , 11th Edition for ITE Land Use 710.

It should be noted that the anticipated trip generation, is below the 100 peak hour vehicles trip criteria by the NYSDOT where generally adverse impacts may occur.

A copy of the ITE Trip Generation is contained is Attachment B.

Colliers Engineering & Design

Parking Attachment A

ITE Peak Parking Demand

DATA STATISTICS

Land Use:
General Office Building (710) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday (Monday - Friday)

Setting/Location:
General Urban/Suburban

Number of Studies:
77

Avg. 1000 Sq. Ft. GFA:
131

Average Rate:
1.95

Range of Rates:
0.50 - 3.60

33rd / 85th Percentile:
1.68 / 2.98

95% Confidence Interval:
1.79 - 2.11

Standard Deviation:
0.70

Coefficient of Variation:
36%

Fitted Curve Equation:
Ln(P) = 0.99 Ln(X) + 0.66

R^2:
0.83

Calculated Parking Demand:
Weighted Average: 48
Fitted Curve: 46
85th Percentile: 74

Colliers Engineering & Design

Traffic Attachment B

ITE Trip Generation

DATA STATISTICS

Land Use:
General Office Building (710) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
221

Avg. 1000 Sq. Ft. GFA:
201

Average Rate:
1.52

Range of Rates:
0.32 - 4.93

Standard Deviation:
0.58

Fitted Curve Equation:
Ln(T) = 0.86 Ln(X) + 1.16

R^2:
0.78

Directional Distribution:
88% entering, 12% exiting

Calculated Trip Ends:
Average Rate: 38 (Total), 33 (Entry), 5 (Exit)
Fitted Curve: 50 (Total), 44 (Entry), 6 (Exit)

DATA STATISTICS

Land Use:
General Office Building (710) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
232

Avg. 1000 Sq. Ft. GFA:
199

Average Rate:
1.44

Range of Rates:
0.26 - 6.20

Standard Deviation:
0.60

Fitted Curve Equation:
Ln(T) = 0.83 Ln(X) + 1.29

R^2:
0.77

Directional Distribution:
17% entering, 83% exiting

Calculated Trip Ends:
Average Rate: 36 (Total), 6 (Entry), 30 (Exit)
Fitted Curve: 52 (Total), 9 (Entry), 43 (Exit)

400 Columbus Avenue, Suite 180E
Valhalla, New York 10595
Main: 877 627 3772

Colliers Engineering & Design

Memorandum

To:	Town of Ramapo - CDRC
CC:	Moshe Eisen, Messner Construction Rachel Barese, CivilTec Daniel M. Richmond, Zarin & Steinmetz
From:	Ronald P. Rieman, Project Manager
Date:	May 14, 2024
Subject:	1507 Route 202 Parking and Trip Generation Evaluation Town of Ramapo, Rockland County, NY
Project No.:	23015049A

The following information has been provided to identify future parking needs for the proposed redevelopment of the 1507 Route 202 property. The following sections provides a description of the proposed Project and tasks undertaken in completing the parking evaluation and includes a comparison of the Town parking rates with current industry standards. In addition, the anticipated trip generation is also provided.

1. Project Description

The property currently consist of an existing building consisting of approximately 2,300 s.f. of professional office space and is known as the 1507 Rt. 202 Professional Center. A new 3-story office building is proposed consisting of some 27,645 s.f. with 90 parking spaces provided.

2. Required Parking based on Town Code (as shown on the Site Plan)

As shown on the Site Plan, based on Town Code the proposed office building would require 139 parking spaces (1 space per 200 SF which would equate to a 5.0 spaces per 1,000 s.f.). **This would require a 35.25% variance.**

It should be noted that the Town parking requirements are relatively high when compared to current industry standards. See Section 3, below.

3. Current Industry Standards (ITE Parking Generation)

As noted above, the Town parking requirements are relatively high when compared to industry standards. Based on studies contained in the Institute of Transportation Engineers (ITE) latest Parking Generation Manual, 6th Edition, the following parking would be needed.

Based on the ITE average parking demand for similar uses, the proposed office building would require 54 spaces (at 1.95 spaces per 1,000 s.f.) **and would be satisfied by the 90 spaces** provided.

Based on the ITE 85th percentile parking demand, the proposed office building would require 82 spaces (at 2.98 spaces per 1,000 s.f.) **and would also be satisfied by the 90 spaces provided.**

A copy of the ITE Peak Parking Demand is contained is Attachment A.

In addition to the above, it should be noted, that the Site is currently serviced by the Transport of Rockland (TOR 95 Bus) which could further reduce the need for parking.

4. Anticipated Trip Generation (ITE Trip Generation)

The anticipated Trip Generation for the proposed 3-story office building (27,645 s.f.) is anticipated to generate a total of 55 trips (49 entering trips and 6 exiting trips) during the Weekday Peak AM Hour and a total of 57 trips (10 entering trips and 47 exiting trips) during the Weekday Peak PM Hour based on information contained in the latest Institute of Transportation Engineers (ITE) "Trip Generation Manual" , 11th Edition for ITE Land Use 710.

It should be noted that the anticipated trip generation, is below the 100 peak hour vehicles trip criteria by the NYSDOT where generally adverse impacts may occur.

A copy of the ITE Trip Generation is contained is Attachment B.

Colliers Engineering & Design

Parking Attachment A

ITE Peak Parking Demand

DATA STATISTICS

Land Use:
General Office Building (710) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday (Monday - Friday)

Setting/Location:
General Urban/Suburban

Number of Studies:
77

Avg. 1000 Sq. Ft. GFA:
131

Average Rate:
1.95

Range of Rates:
0.50 - 3.60

33rd / 85th Percentile:
1.68 / 2.98

95% Confidence Interval:
1.79 - 2.11

Standard Deviation:
0.70

Coefficient of Variation:
36%

Fitted Curve Equation:
Ln(P) = 0.99 Ln(X) + 0.66

R^2:
0.83

Calculated Parking Demand:
Weighted Average: 54
Fitted Curve: 52
85th Percentile: 82

Colliers Engineering & Design

Traffic Attachment B

ITE Trip Generation

DATA STATISTICS

Land Use:
General Office Building (710) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
221

Avg. 1000 Sq. Ft. GFA:
201

Average Rate:
1.52

Range of Rates:
0.32 - 4.93

Standard Deviation:
0.58

Fitted Curve Equation:
Ln(T) = 0.86 Ln(X) + 1.16

R^2:
0.78

Directional Distribution:
88% entering, 12% exiting

Calculated Trip Ends:
Average Rate: 42 (Total), 37 (Entry), 5 (Exit)
Fitted Curve: 55 (Total), 49 (Entry), 6 (Exit)

DATA STATISTICS

Land Use:
General Office Building (710) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
232

Avg. 1000 Sq. Ft. GFA:
199

Average Rate:
1.44

Range of Rates:
0.26 - 6.20

Standard Deviation:
0.60

Fitted Curve Equation:
Ln(T) = 0.83 Ln(X) + 1.29

R^2:
0.77

Directional Distribution:
17% entering, 83% exiting

Calculated Trip Ends:
Average Rate: 40 (Total), 7 (Entry), 33 (Exit)
Fitted Curve: 57 (Total), 10 (Entry), 47 (Exit)

Sewer Capacity Analysis
1507 Route 202
Town of Ramapo, Rockland County
S-B-L 33.05-2-15
March 8, 2024

The applicant is proposing a 3-story office building. The existing commercial building will be removed. Public sewer and water will be utilized.

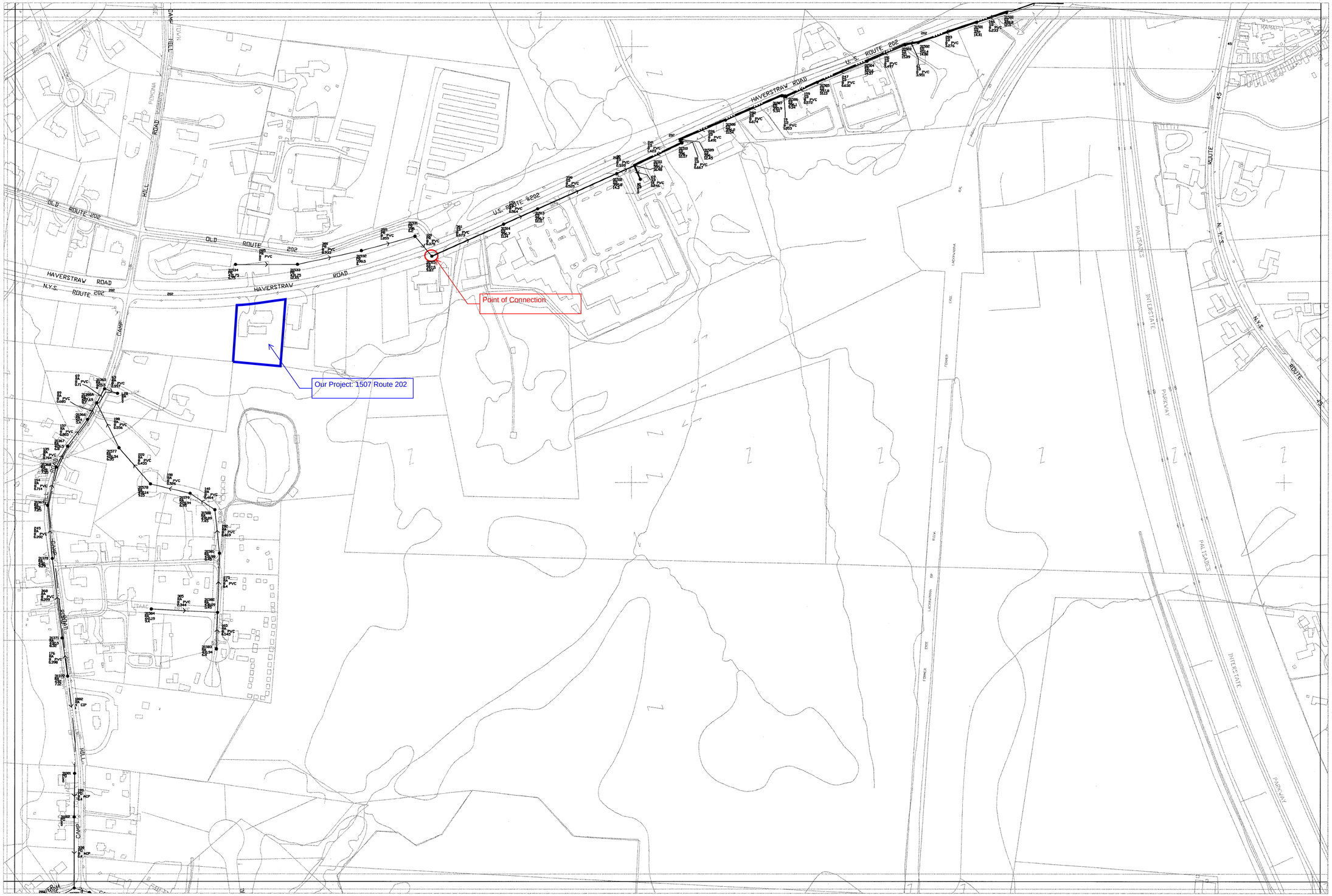
According to the RCSD #1 sewer maps (sheet 3301) the property will tie into MH 31515 which connects into the 8" PVC County Collector main in Route 202. The project will add a total Q = 27,645 SF x 0.1 gal/SF = 2,765 gpd to the system.

The existing commercial building contributes a total Q = 2,328 SF x 0.1 gal/SF = 233 gpd. Therefore, the proposed office building will be a net increase of 2,532 gpd to the system.

Civil Tec Engineering & Surveying P.C.
139 Lafayette Avenue, 2nd Floor, Suffern, NY 10901 Tel 845.547.2241 Fax 845.547.2243
111 Main Street, Chester, NY 10918 Tel 845.610.3621
Civil-Tec.com

SEE MAP 2503

SEE MAP 3202



SEE MAP 3303

NO	DATE	DESCRIPTION

DRAWN BY : R.S.T.
CHECKED BY :

SCALE
1" = 200'
200 100 0 200

NORTH

ROCKLAND COUNTY SEWER DISTRICT No. 1
ORANGEBURG, NEW YORK

COMPREHENSIVE SEWER PLANS
DATE: JUNE 2007

MAP: 3301

STORMWATER POLLUTION PREVENTION PLAN

FOR

1507 Route 202

February 2024

Revised October 2024

CIVILTEC
Engineering + Surveying

139 Lafayette Avenue, 2nd Floor

Suffern, New York 10901

(845) 547-2241

Rachel Barese, P.E.

NY License No. 090143

TABLE OF CONTENTS

1 Introduction and Site Description

The project is located at 1507 Route 202 in the Town of Ramapo (See Figure A-1 Location Map). It is known as Tax lot 33.05-2-15 based on the Town of Ramapo tax map. There is an existing office building and driveway which will be removed. A new 3 story 27,645 SF office building and parking lot is proposed. The area of disturbance exceeds an 1 acre so a NYSDEC compliant SWPPP is provided.

Applicant Information: Moshe Messner
43 Olympia Lane
Monsey, NY 10952

There are no wetlands, open waters, or flood zones on the property according to the NYSDEC Environmental Resource Mapper, ACOE Wetland Mapper, and the FEMA maps available online. That said, there are NYSDEC wetlands on the adjacent parcels, so the 100' regulatory area extends on to this parcel.

Construction of the proposed office building will cause some disturbance to the site and an increase in impervious area. To mitigate the development, underground detention is proposed. This will allow a zero net increase in runoff from the site.

2 Site Drainage and Drainage Basin Description

The site slopes towards the rear of the property, towards the offsite wetland. The proposed condition is divided into two subareas, the area being directed to treatment and the area being bypassed. The treated area will be collected by catch basins and directed to an underground detention system where it will have an outlet that will discharge towards the offsite wetland.

All drainage components are designed in accordance with the NYSDEC Phase II stormwater regulations for treatment of the runoff to improve water quality.

According to the National Resource Conservation Service (NRCS), soils on the project area are Paxton fine sandy loam (PnC) and Wethersfield gravelly silt loam (WeC). The soils are considered C soils. These soils are generally well drained.

Soil testing was conducted onsite on May 13, 2024. Three locations were analyzed. The first hole was approximately 70 feet south of the existing building. From 0—9.5' there was brown silty loam with stones 1"-12". Groundwater was encountered at a depth of 9.5'. There were no signs of bedrock. A perc test was attempted at a depth of 6', but the

water did not infiltrate 1" in under 2 hours so it failed. The second hole was approximately 50 feet east of the first hole. From 0'-3' was brown silty loam with stones 1"-6". Groundwater was encountered at 3'. There were no signs of bedrock. The third hole was in the front yard, near the existing eastern curb line. From 0'-1' was topsoil. From 1'-8' was brown silty loam with stones 1"-12". Groundwater was encountered at 8'. There were no signs of bedrock. A perc test was attempted at a depth of 5', but the water did not infiltrate 1" in under 2 hours so it failed.

3 General Study Methodology

In the existing condition, stormwater runoff flows to the southeast via sheetflow. Under the proposed condition, runoff will be as mentioned.

WQv calculations were performed in accordance with the NYSDEC Stormwater Management Design Manual (SMDM) and can be found in Appendix B. Routing calculations were made using the HydroCAD 10.20-5c computer modeling program. This program uses standard SCS methods of overall hydrograph calculations (TR-20 and TR-55), and allows, for example, direct entry of sub-watershed characteristics to calculate Times of Concentration (TCs). The model description and calculation methodology is presented in Appendix C.

As previously mentioned, soils on the site are classified as Hydrologic Soil Group C. Composite Curve Number (CN) values were calculated for the site and can be found in Appendix B. CN values were based on the existing condition being comprised of lawn, woods, and impervious area. The proposed condition has impervious area and lawn.

Table 1 – Summary of Drainage Basin Characteristics

Site Basin	Total Area (Acres)	Impervious Area (Acres)	CN
Existing			
Drainage Area	1.68	0.47	79
Proposed to Treatment			
Drainage Area	1.44	1.24	95
Proposed to Bypass			
Drainage Area	0.24	0	74

TR-55 Methods were used for calculating Times of Concentration (TC) in the existing condition and are presented in the model output. The TC paths are shown on the Existing Drainage Area Map and the Proposed Drainage Area Map.

Precipitation events have been utilized based on the Northeast Regional Climate Center Extreme Precipitation.

Storm Event	24 hour
1 Year	2.75 in
2 Year	3.36 in
5 Year	4.21 in
10 Year	5.00 in
25 Year	6.29 in
50 Year	7.49 in
100 Year	8.91 in

4 Model Results

The following table presents the overall model results; details are presented in Appendix C. A schematic of the model routing can be found in Appendix C, Hydrology Model Results.

Table 2 – Summary of Model Results

Basin	Peak Flow, CFS		
(Hydr. #)	1-YR	10-YR	100-YR
Existing			
Drainage Area	1.59	4.59	10.25
Proposed to Treatment			
Drainage Area	1.34	2.81	6.80
Proposed Bypass			
Drainage Area	0.16	0.56	1.36
Proposed Combined			
Drainage Area	1.46	3.26	8.00
Difference in Discharge	-0.13	-1.33	-2.25

For each storm event, there is a net decrease in peak flow.

5 Detention System Sizing

The underground detention systems were sized to safely pass the 100-year storm event. For the discharge, there is an outlet structure with a 15" outlet pipe. There is a 6.5" orifice, a 7" orifice, a 6" orifice, and a 0.7' rectangular weir to control the discharge rate.

6 Quality Controls

NYSDEC Phase II regulations call for treatment of the water quality volume (WQv), which is assumed to control 90% of the storms and is defined as

WQv=	P*Rv*A/12
P=	Runoff Coefficient
A=	Area in acres
Rv=	0.05+0.009(I),
	Where I= percent Impervious Cover

Calculations can be found in Appendix B.

The required water quality volume (WQv) is 0.18 acre-feet. Quality treatment and runoff reduction will be provided through the ADS EcoStream Biofilter ES-224.

7 Runoff Reduction

NYSDEC regulations call for treatment of the runoff reduction volume through green infrastructure techniques and stormwater management practices designed to replicate pre-development hydrology. The minimum runoff reduction volume permitted, based on the soil type, is 0.05 ac-ft. Runoff reduction is provided through the Biofilter. The runoff reduction volume will meet the required Water Quality Volume.

Soil restoration will be used onsite after construction to return the soils to their natural condition. Roadways were not reduced because of the amount of parking required. Tree plantings are not proposed for runoff reduction because the existing significant trees are not in close proximity to the impervious surfaces after the walls are installed. Stream daylighting was not provided because there are no onsite streams. Rain gardens were not proposed because the tributary areas were more than the 1,000 SF permitted by the manual. A green roof was not proposed because of the increased maintenance. Rain barrels were not proposed due to the limited volume they could treat compared to the size of the proposed building and the roof was already being directed to the stormwater planter. Standard infiltration practices were not used due to the poor soils.

8 Sediment and Erosion Controls

The implementation of erosion control measures remains the responsibility of the Contractor to be hired by the Applicant and shall be in accordance with the most recent NYSDEC and local regulations at the time of construction.

Because the disturbance is over one acre, a SPDES permit for stormwater discharges from construction activities (GP-0-20-001) will be required, along with the submission of a notice of intent (NOI) form to the NYSDEC. The primary components of this plan are the control of incidental releases during construction. Disturbance will be phased and will comply with NYSDEC regulations.

Should it be found that sediments have left the site; the contractor must take immediate measures to rectify the situation.

8.1 Temporary Erosion and Sediment Control Features

Table 2 presents a narrative of the construction sequence and erosion control plan. The significant components of this plan are as follows. At no time is any of the site to be left unprotected.

Inlet Protection – Once installed and building work begins, every catch basin in a paved area where construction traffic will travel is to have a protection of block and gravel or silt fence (in accordance with NYSDEC details).

Silt Fences – Silt fences are proposed downhill of any soil disturbance and around all soil stockpile areas.

Stabilized Construction Entrance – A stabilized construction entrance with filter fabric and stone shall be placed at the point of entry to the site, or multiple points, if necessary. Entrance shall be a minimum of 24 foot width for two-way traffic with a maximum grade of 12%.

Concrete Truck Washout – One 8’x8’ 2’ deep concrete washout station to be provided.

Soil Stockpile Areas – Soil stockpile areas shall be surrounded by silt fence.

Potential impacts from sediment and erosion during construction would be mitigated by implementation of a detailed Soil Erosion and Sediment Control Plan prepared in accordance with “Guidelines for Urban Erosion and Sediment Control in New York”, latest edition. The objectives of the plan would be to:

Control erosion at its source with temporary control devices.

Minimize the runoff from areas of disturbance.

Remove sediments from stormwater runoff before discharging to the drainage systems.

These objectives would be achieved by implementing the following general soil erosion and control measures during grading and earthwork operations:

Minimize land disturbance.

Minimize the extent of cleared soil at any particular time.

Retain existing vegetation wherever feasible.

Stabilize disturbed areas that would not require further earthwork operations within 48 hours after the land has been cleared.

Minimize the extent of disturbed slopes.

Trap sediment on-site prior to discharge.

Dispose excess soil by trucking offsite to an appropriate discharge point.

Soil erosion and sediment control during construction would be accomplished through a variety of measures, including silt fences and stabilized construction entrances. Additionally, the earthwork contractors would be required to follow the following control procedures:

Repair or replace damaged erosion control devices immediately or in no case more than 4 hours after observing such deficiencies.

Be prepared to implement interim drainage controls and erosion control measures as may be necessary during the course of the construction.

Make available on-site all equipment, materials, and labor necessary to effect emergency erosion control and drainage improvement within 4 hours of any impending emergency situation.

Make a final inspection, clean all cross culverts, and sweep roadways.

Have on call at all times a responsible representative who, when authorized, would mobilize the necessary personnel, materials, and equipment and otherwise provide the required action when notified of any impending emergency situation.

Supply a telephone number to the Town Engineer so that the contractor may be contacted during the evenings and on weekends, if necessary.

Maintain a site log and certification of the practices and inspections.

The control measures for this site have been designed to minimize the impact of construction. The majority of the site work will be complete as quickly as possible, so that the building can then be constructed with minimal disturbance.

In addition, the site shall follow the New York State Standards and Specifications for Erosion and Sediment Control (November 2016 Edition) requirements for Winter Stabilization. These standards shall apply from November 15-April 1. During that time, a minimum 25 foot buffer shall be maintained from all perimeter controls such as silt fence. Drainage structures must be kept open and free of snow and ice dams. Soil stabilization measures should be initiated within three days in areas where soil disturbance has temporarily or permanently ceased.

9 Implementation Schedule and Maintenance

9.1 During Construction

Table 2 presents the schedule and sequence of sedimentation and erosion control features during construction. This is a suggested schedule and is subject to the Contractor's actual schedule, means, and methods.

Inlet protection should be inspected after significant rainfalls and repaired as needed. Remove sediment from the pool area as necessary with care not to undercut or damage the filter fabric. If straw bales are used, they must be replaced every 4 months until the area is stabilized.

Silt fence should be installed downhill of construction. It should be inspected weekly or after significant rainfalls. If silt fence is damaged it shall be replaced in a timely manner. Sediment should not accumulate more than 50% of the height of the fence or it shall be removed and placed in a manner such that it will not erode from the site.

Stabilized construction entrances shall have stone added as needed.

The concrete truck washout shall have concrete removed when it reaches a depth of 18". Concrete shall be disposed of properly at such time.

Soil stockpile areas shall be seeded/stabilized to prevent erosion. Silt fence surrounding the stockpiles shall be replaced if it is damaged at any time.

Soil restoration shall be applied to areas across the site where soils have been disturbed to recover the original properties and porosity of the soil. Soil restoration shall include mechanical decompaction, compost amendment or both.

9.2 After Construction

Table 2 presents the schedule and sequence of sediment and erosion control features after construction. The Owner is committed to maintaining its site facilities. In the event the Owner fails to maintain the facilities, there is a maintenance easement filed with the Town of Ramapo to permit the Town to maintain the facilities.

Table 2 – Soil Erosion Sequence

Prior to Construction	
1.	Notify Town. Develop list of contacts. FALL 2025
2.	Install Stabilized Construction Entrance, soil stockpile areas, concrete washout station, and silt fences. FALL 2025
3.	Install diversion swales where necessary. FALL/WINTER 2025
During Construction	
4.	Maintain and supplement erosion control measures as necessary. At a minimum, inspect all measures weekly and after storm events or incidents. FALL 2025/WINTER/SPRING/SUMMER 2026
5.	Check filter fences weekly, and after rainfall events; clean and replace as necessary. FALL 2025/WINTER/SPRING/SUMMER 2026
6.	Check concrete washout station daily. Pump out excess rainwater. Remove hardened material when 75% storage capacity is filled. FALL 2025/WINTER/SPRING/SUMMER 2026
7.	Public streets to remain broom clean at the end of each day. FALL 2025/WINTER/SPRING/SUMMER 2026
8.	Implement soil restoration procedures as per Table 5.3 of the NYSSWDM. SUMMER 2026
After Construction	
8.	Remove erosion control measures and install landscaping as required by Town approvals. SUMMER/FALL 2026
9.	Monitor landscape restoration growth and dress up as necessary. SUMMER 2026-SUMMER 2027

10.	Owner to check detention system and controls monthly and after significant rainfall. Controls to be cleaned and kept free of unwanted vegetation and litter. SUMMER 2026+

10 Pollution Prevention

Both during and after construction, pollution prevention is an important part of stormwater management. Without working to prevent pollution, stormwater is easily polluted with everyday occurrences even unintentionally. Pollutants can include paints, varnishes, solvents, oil and automotive fluids, solid waste, yard waste, refuse, litter, pesticides, fertilizers, sewage, cleaning solvents, asphalt products, and animal wastes.

The guidelines to help chemical spill prevention include the following (information from http://dnr.louisiana.gov/crm/coastmgt/interagencyaff/nonpoint/pdf/urban1.pdf):

- Properly handle, apply, store and dispose of pesticides.
- Persons mixing and applying these chemicals should be qualified applicators and should wear suitable protective clothing, in accordance with the law.
- Pesticides and herbicides should be used in conjunction with integrated pest management.
- When applying herbicides and pesticides, follow all label directions and additional information provided with the product. Take care not to exceed recommended rates or application.
- Pesticide storage areas on construction sites should be protected from the elements. Storage practices include:
    - Keep in an area that is locked, cool, dry and lined with plastic sheeting
    - Maintain a list of products in storage
    - Tightly close lids
    - Check containers periodically for leaks or deterioration
- Disposal of excess pesticides and pesticide-related wastes as directed on the labels and should be through a licensed waste management firm or a treatment, storage and disposal facility.
- Properly store, handle, use and dispose of petroleum products following subguidelines such as:

  - Line the storage area with a double layer of plastic sheeting
  - Create an impervious berm around the perimeter
  - Clearly label all products
  - Keep tanks off the ground
  - Keep lids securely fastened
  - Oily wastes should be disposed of in proper receptacles or recycled. Waste oil for recycling should not be mixed with degreasers, solvents, antifreeze or brake fluid.

- Provide sanitary facilities for construction workers.
- Store, cover and isolate from drainage courses all construction materials to keep these materials from washing into the water.
- Spill control components should include measures for: immediately stopping the source of the spill, containing any liquid, and covering the spill with absorbent material such as sawdust or kitty litter (DO NOT USE STRAW). Properly dispose of the used absorbent and contaminated material.
- Have persons trained in spill handling on site or on call at all times. Post procedure information onsite. Keep materials for cleaning up spills onsite and readily available.
- Wash, clean or maintain equipment and machinery in confined areas specifically designed to control runoff.
- Thinners or solvents should not be discharged into sanitary or storm sewer systems when cleaning machinery.
- Use alternative methods for cleaning larger equipment parts, such as high-pressure, high temperature water washes or steam cleaning.
- Equipment-washing detergents can be used and wash water may be discharged into sanitary sewers if solids are removed from the solution first (if the local sewer authority permits such action).
- Small parts can be cleaned with degreasing solvents, which can be reused or recycled. Do not discharge any solvents into sewers.
- Washout from concrete trucks should be disposed of into a designated area that will later be backfilled; an area where the concrete wash can harden, can be

broken up, and then can be placed in a dumpster; or a location not subject to urban runoff and more than 50 feet away from a storm drain, open ditch or surface water.

- Provide adequate disposal facilities for solid waste, including asphalt, produced during construction.
- Educate construction workers about proper materials handling and spill response procedures. Distribute or post informational material regarding chemical control.
- In the event of a spill, call the NYS Spill Hotline at (800) 457-7362.

11 Certifications

11.1 Owner's Certification

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 false statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law.

Printed Name:_____ Title:_____

Signature:_____ Date:_____

11.2 SWPPP Inspector's Certification

I have agreed to perform compliance inspections for the 1507 Route 202 project (including Site Stabilization) in accordance with this Storm Water Pollution Prevention Plan (SWPPP) for the above referenced project.

I have agreed to notify, within one business day of completion of the inspection, the owner, the contractor and appropriate subcontractor(s) of any corrective measures that need to be taken and also obtain a schedule of completion for such measures.

I certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP for conducting the required inspections.

Printed Name: Rachel Barese, P.E. Title: President

Signature:_____ Date:_____

Company Name: Civil Tec Engineering & Surveying PC

Address: 139 Lafayette Avenue Suffern, NY 10901

Phone Number: 845-547-2241

Field Person in Charge: Rachel Barese, P.E.

Phone Number: 845-642-8342

11.3 Construction Contractor's Certification

I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the stormwater pollution prevention plan and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations.

I have agreed to perform construction-related professional services for the referenced project(s) that will likely impact the nature of storm water runoff from the named industrial facility.

Construction site: 1507 Route 202
Pomona, NY 10970

Printed Name:_____ Title:_____

Signature:_____ Date:_____

Company Name:_____

Address:_____

Phone Number:_____

Field Person in Charge:_____

Note that the authorized signatory must be signed by:

- For a corporation by a president, secretary, treasurer or vice president of the corporation.
- For a partnership or sole proprietorship by a general partner of the proprietor.

11.4 Preparer's Certification

I certify under penalty of law that this SWPPP has been 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 false statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law.

Printed Name: Rachel Barese, P.E. Title: President

Signature:_____ Date:_____

Company Name: Civil Tec Engineering & Surveying PC

Address: 139 Lafayette Avenue Suffern, NY 10901

Phone Number: 845-547-2241

APPENDIX A - FIGURES

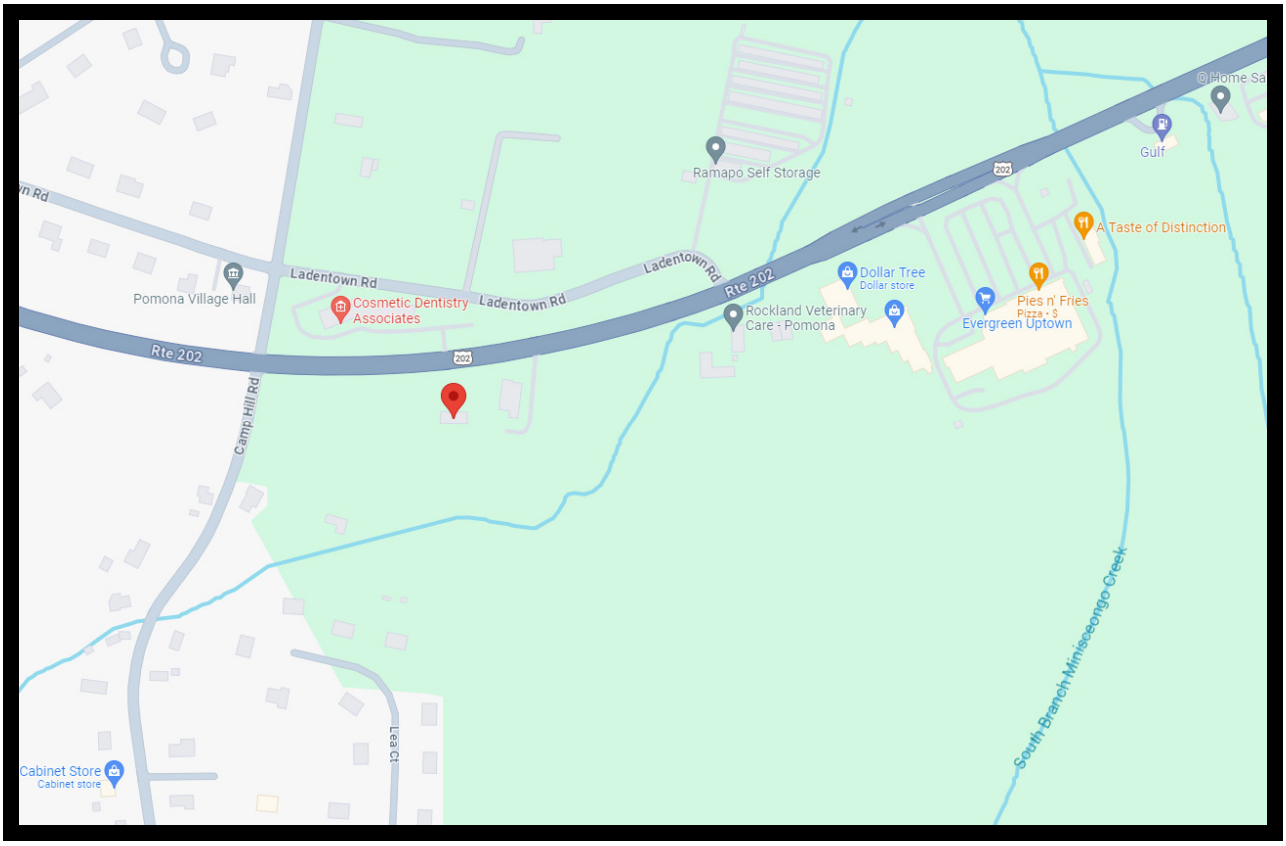


Figure 1 – Site Location Map

Map Scale: 1:944 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 10 20 40 60

Feet
0 45 90 180 270

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N 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: Rockland County, New York
Survey Area Data: Version 21, Sep 6, 2023

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

Date(s) aerial images were photographed: May 31, 2022—Oct 27, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PnB	Paxton fine sandy loam, 3 to 8 percent slopes	0.0	0.8%
PnC	Paxton fine sandy loam, 8 to 15 percent slopes	1.9	49.0%
WeB	Wethersfield gravelly silt loam, 3 to 8 percent slopes	0.4	11.0%
WeC	Wethersfield gravelly silt loam, 8 to 15 percent slopes	1.5	39.2%
Totals for Area of Interest		**3.8**	**100.0%**

Rockland County, New York

PnC—Paxton fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2w66y
Elevation: 0 to 1,320 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Paxton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting

Landform: Ground moraines, hills, drumlins
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 15 inches: fine sandy loam
Bw2 - 15 to 26 inches: fine sandy loam
Cd - 26 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C

Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Charlton
Percent of map unit: 7 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Woodbridge
Percent of map unit: 6 percent
Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Footslope, summit, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ridgebury
Percent of map unit: 2 percent
Landform: Drumlins, drainageways, depressions, ground moraines, hills
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Rockland County, New York
Survey Area Data: Version 21, Sep 6, 2023

Rockland County, New York

WeC—Wethersfield gravelly silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9v5m
Elevation: 20 to 690 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Wethersfield and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wethersfield

Setting

Landform: Till plains, hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy acid till derived mainly from reddish sandstone, shale, and conglomerate, with some basalt

Typical profile

H1 - 0 to 13 inches: gravelly silt loam
H2 - 13 to 22 inches: gravelly loam
H3 - 22 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 38 inches to densic material
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F145XY012CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Charlton
Percent of map unit: 5 percent
Hydric soil rating: No

Riverhead
Percent of map unit: 5 percent
Hydric soil rating: No

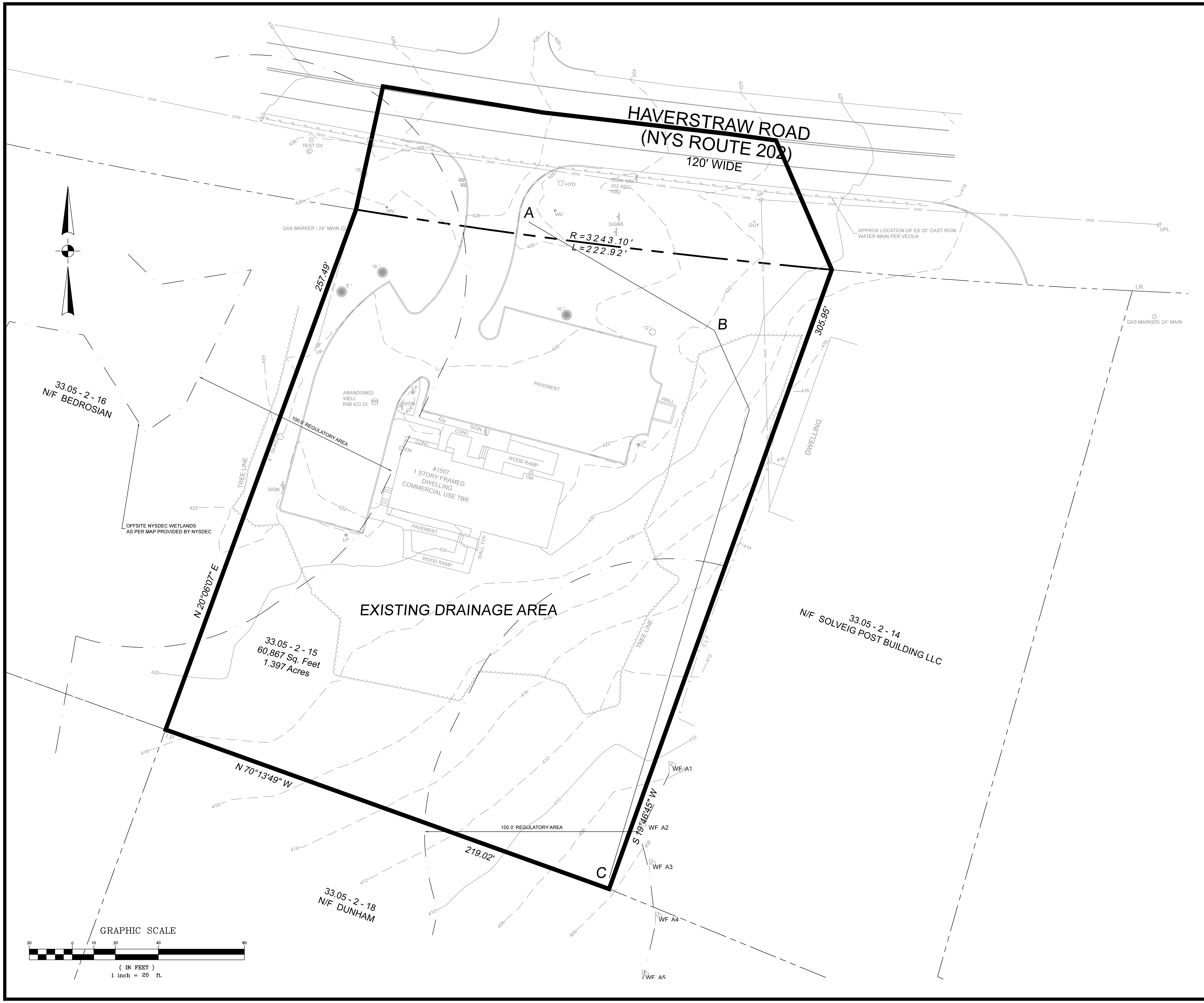
Cheshire
Percent of map unit: 5 percent
Hydric soil rating: No

Wallington
Percent of map unit: 3 percent
Hydric soil rating: No

Yalesville
Percent of map unit: 2 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Rockland County, New York
Survey Area Data: Version 21, Sep 6, 2023


HAVERSTRAW ROAD
(NYS ROUTE 202)
120' WIDE
A
B
C
R=3243.10'
L=222.92'
257.49'
305.95'
N 20°06'07" E
S 19°46'45" W
N 70°13'49" W
219.02'
33.05 - 2 - 16
N/F BEDROSIAN
33.05 - 2 - 14
N/F SOLVEIG POST BUILDING LLC
33.05 - 2 - 15
60,867 Sq. Feet
1.397 Acres
33.05 - 2 - 18
N/F DUNHAM
EXISTING DRAINAGE AREA
#1507
1 STORY FRAMED
DWELLING
COMMERCIAL USE TBR
PAVEMENT
WOOD RAMP
ABANDONED
WELL
RIM 423.53
100.0' REGULATORY AREA
OFFSITE NYSDEC WETLANDS
AS PER MAP PROVIDED BY NYSDEC
GAS MARKER / 24" MAIN
APPROX LOCATION OF EX 20" CAST IRON
WATER MAIN PER VEOLIA
TREE LINE
DWELLING
WF A1
WF A2
WF A3
WF A4
WF A5
GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.

DATE	ISSUE	DESCRIPTION	REVISIONS

S.B.L. 33.05 - 2 - 15

EXISTING DRAINAGE AREA MAP
FOR
1507 ROUTE 202
TOWN OF RAMAPO - ROCKLAND COUNTY - NEW YORK

CIVIL TEC Engineering & Surveying PC

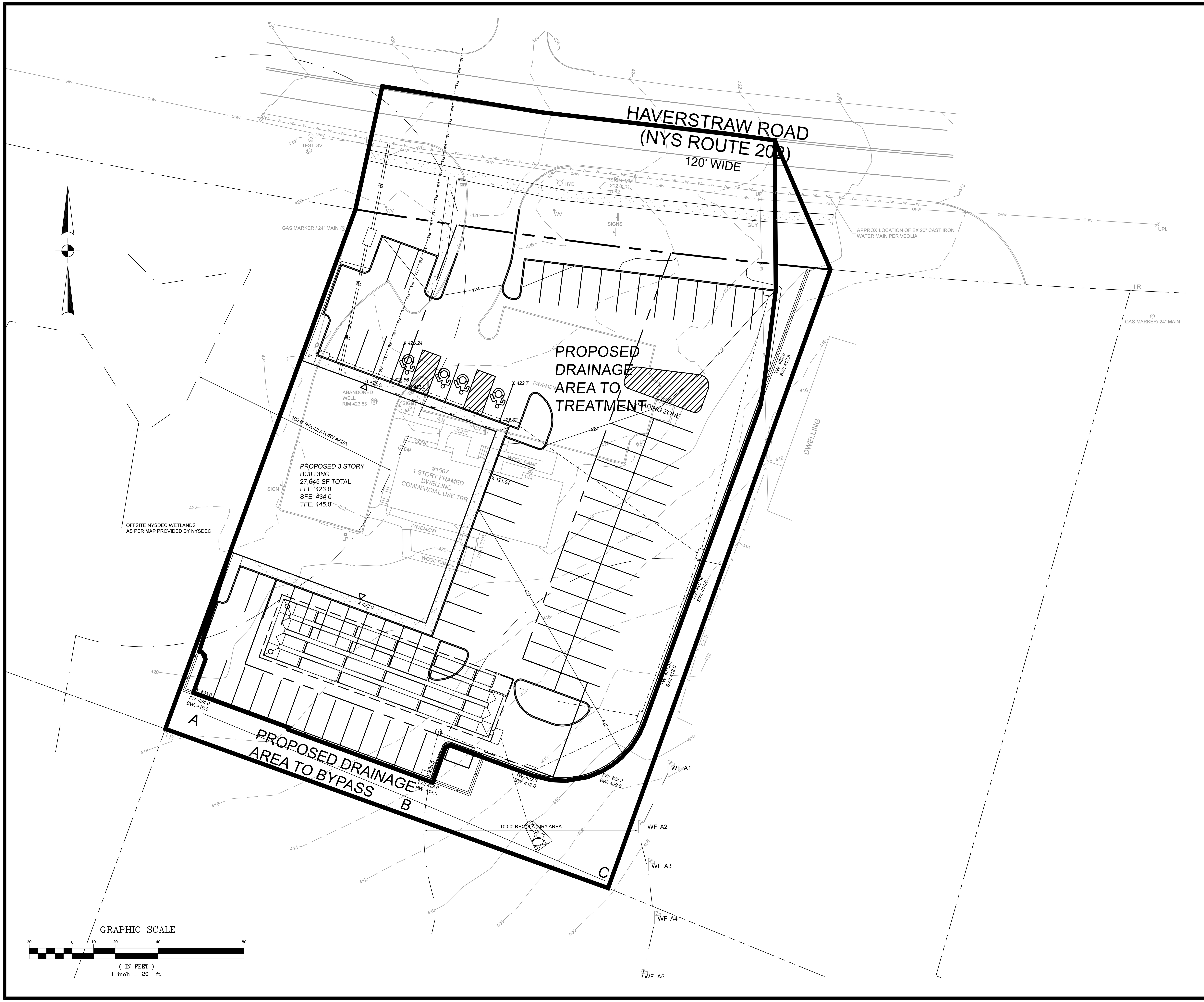
139 Lafayette Avenue, 2nd Fl.
Suffern, NY 10901
P 845.547.2241 - F 845.547.2243

111 Main Street
Chester, NY 10918
845.610.3621

Civil Engineering & Land Surveying Services that Build Communities
www.Civil-Tec.com

DATE:	10/21/24
DRAWN BY:	RB/LT
CHKD BY:	RB/LT
JOB No.	4227
SCALE:	1"=20'
DWG No.	1 OF 1

Rachel B. Barese, P.E.
N.Y. Lic. No. 90143



HAVERSTRAW ROAD
(NYS ROUTE 202)
120' WIDE
PROPOSED DRAINAGE AREA TO TREATMENT
PROPOSED DRAINAGE AREA TO BYPASS
PROPOSED 3 STORY BUILDING
27,645 SF TOTAL
FFE: 423.0
SFE: 434.0
TFE: 445.0
#1507
1 STORY FRAMED DWELLING
COMMERCIAL USE TBR
ABANDONED WELL
RIM 423.53
100.0' REGULATORY AREA
OFFSITE NYSDEC WETLANDS
AS PER MAP PROVIDED BY NYSDEC
GAS MARKER / 24" MAIN
APPROX LOCATION OF EX 20" CAST IRON WATER MAIN PER VEOLIA
LOADING ZONE
DWELLING
TEST GV
HYD
WV
SIGNS
GUY
UPL
I.R.
I.P.
A
B
C
WF A1
WF A2
WF A3
WF A4
WF A5
GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.

DATE	ISSUE	DESCRIPTION	REVISIONS

S.B.L. 33.05 - 2 - 15

PROPOSED DRAINAGE AREA MAP
FOR
1507 ROUTE 202
TOWN OF RAMAPO - ROCKLAND COUNTY - NEW YORK

CIVIL TEC Engineering & Surveying PC
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DATE:	10/21/24
DRAWN BY:	RB/LT
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JOB No.	4227
SCALE:	1"=20'
DWG No.	1 OF 1

Rachel B. Barese, P.E.
N.Y. Lic. No. 90143

APPENDIX B – CALCULATIONS

STORMWATER MANAGEMENT
PLANNING AND PRACTICE SELECTION WORKSHEET FOR
NEW PROJECTS IN NON-IMPAIRED WATERSHEDS*

**Use different methods for enhanced phosphorus treatment and re-development projects.*

PROJECT:	1507 Route 202		DATE:	2/14/2024	
Watershed Drainage Area	Soils:	C	Revised:	10/15/2024	
DA:	1.68 (acres)	HSG (S): B soils	90% RAIN: (P)		1.5 (inches)

PLANNING

1. **Plan to preserve, avoid and minimize (underline all concepts utilized):**
   - Preserve undisturbed, natural buffer, and critical environment areas
   - Employ open space, conservation, and clustering site design techniques
   - Avoid developing in environmentally sensitive areas: floodplain, steep slopes, habitat, ecosystems, bedrock, wetlands, shorelines, shallow groundwater, impervious soils, unstable soil
   - Minimize impervious surfaces: building footprints, parking, roads, sidewalks and driveways
   - Minimize clearing and grading

WATER QUALITY VOLUME *(before runoff reduction)*

2. **Calculate water quality volume (WQv): WQv = P*A*Rv/12**

   DA = 1.68 Impervious area* (AI) = 1.48 acres Rv = 0.843

   **If soil restoration is not practiced, include construction compacted areas as impervious*

   Original WQv = 0.177 ac-ft

3. **Minimum RRv requirements *(when 100% WQv reduction cannot be achieved)***

   (Calculate minimum required Runoff Reduction Volume (RRv) using):

   RRV = 90% rain (P) x 0.95 x S x total impervious area (AI from #2) / 12

   with S = 0.55 (A soils) 0.40 (B soils) 0.30 (C soils) 0.20 (D soils)

   OR weighted HSG average in DA

   Minimum required RRV = (P) 1.5 " x 0.95 x (S) 0.30 x (AI) 1.48 ac/12 =

   Minimum RRv required = 0.053 ac-ft

EcoStream™ BioFilter

The EcoStream BioFilter is a leader in the Biofiltration stormwater treatment market. This high flow, low impact system incorporates the processes of sedimentation, filtration, adsorption, and biological. The ADS EcoStream BioFilter is designed to capture and retain a variety of pollutants including sediment, nutrients, heavy metals, and hydrocarbons while helping to meet green infrastructure objectives.

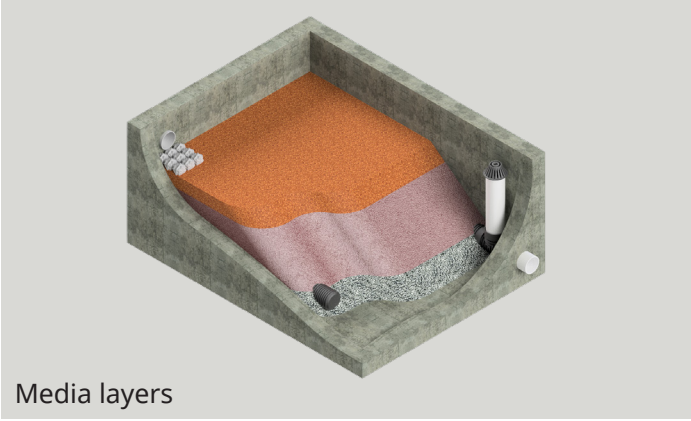
Boasting a small footprint and high flowrate, the EcoStream BioFilter offers high value and outstanding performance.

Features

- High filter media area and flowrate
- Low elevation change between the inlet and outlet of the system
- Superior removal mechanisms utilizing physical unit operations and biological processes
- Living plant component on the surface of the unit
- Internal bypass
- Optional external high flow bypass available in most configurations
- Available in multiple configurations to meet specific requirements
- Scalable systems allow for treatment rates starting at 66 GPM
- Surface loaded filter that can receive water via inlet pipe or curb inlet

Benefits

- Compact footprint without sacrificing flowrate
- Can utilize regional plant life in the plant growth section
- Simple, efficient, cost-effective design
- Maintainable system with access to remove accumulated pollutants before full media replacement is required
- Supports designs both with and without a plant growth section



Media layers

Underdrain & gravel

ADS™

EcoStream BioFilter Specification

Materials and Design

- Concrete Structures: Designed for H-20 traffic loading and applicable soil loads or as otherwise determined by a Licensed Professional Engineer. The materials and structural design of the devices shall be per ASTM C857 and ASTM C858.
- Internal components are constructed of proprietary media blends, recycled polyethylene and an underdrain.

Performance

- The EcoStream BioFilter is an inline unit capable of conveying 100% of the design peak flow and can bypass (internally or externally) excessive flow rates.
- Up to 66 GPM in a 4’ x 4’ (1.2 x 1.2 m) unit, with larger units available for higher treatment flowrates
- Greater than 85% removal of TSS and 84% removal of phosphorus

EcoStream Model	Treatment Rate cfs (L/s)*	Mass Capture Capacity lb (kg)
4 x 4	0.147 (4.2)	271 (123)
4 x 6	0.221 (6.3)	407 (185)
4 x 8	0.294 (8.3)	542 (246)
4 x 10	0.368 (10.4)	678 (308)
4 x 12	0.441 (12.5)	813 (369)
6 x 6	0.331 (9.4)	610 (277)
6 x 8	0.441 (12.5)	813 (369)
6 x 10	0.551 (15.6)	1016 (461)
6 x 12	0.662 (18.7)	1220 (553)
8 x 10	0.735 (20.8)	1355 (615)
8 x 12	0.882 (25.0)	1626 (738)
8 x 14	1.029 (29.1)	1897 (860)
8 x 16	1.176 (33.3)	2168 (983)

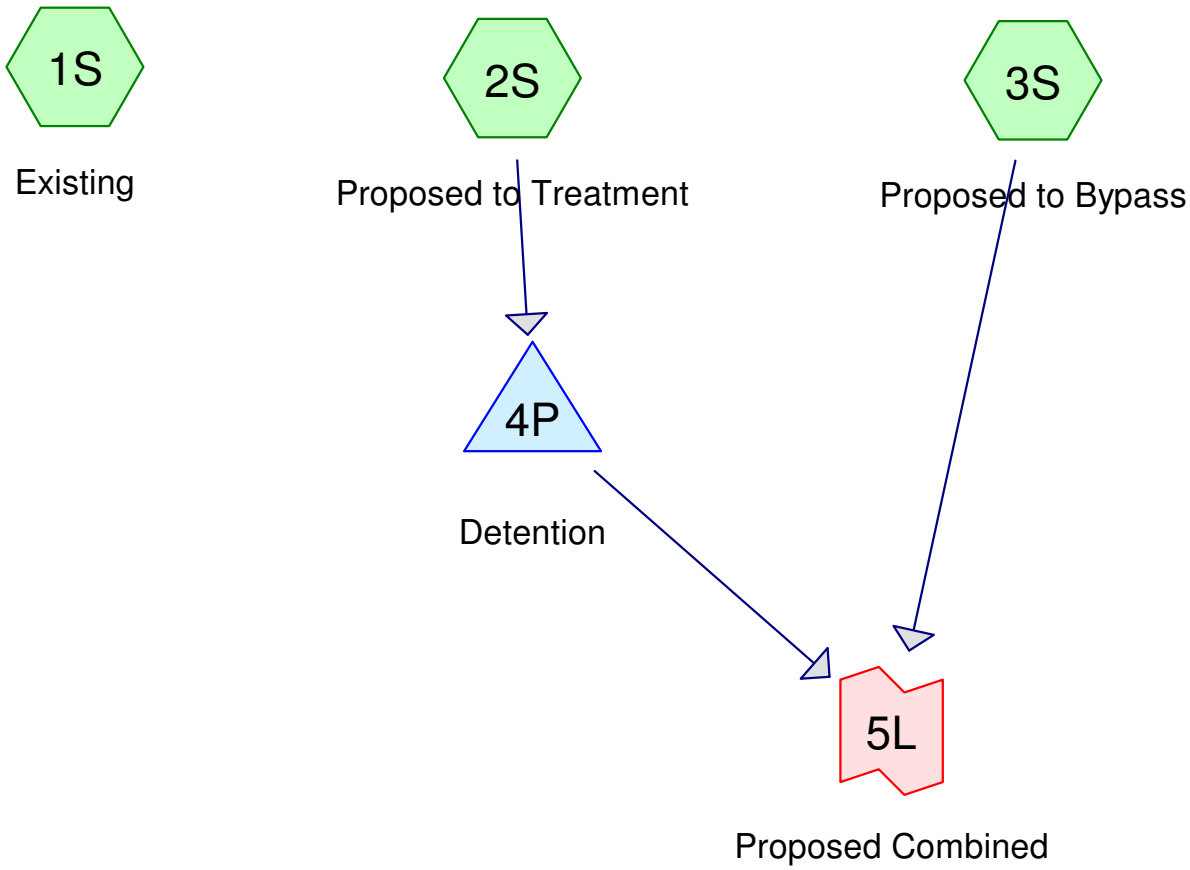
*Based on NJCAT/DEP filtration testing protocol

Installation

EcoStream should be activated after a site is stabilized to prevent uncontrolled stormwater runoff from the construction site from entering the system. Installation of the EcoStream BioFilter unit(s) shall be performed per manufacturer’s installation instructions. Such instructions can be obtained by calling Advanced Drainage Systems at (800) 821-6710 or by logging on to www.adspipe.com.

adspipe.com
800-821-6710

APPENDIX C – HYDROLOGY MODEL RESULTS



Subcat Reach Pond Link

Routing Diagram for 1507 Rt 202 9-5-24
Prepared by Civil Tec Engineering & Surveyin, Printed 10/21/2024

Project Notes

Defined 9 rainfall events from 1507 Rt 202 IDF

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-yr	Type III 24-hr		Default	24.00	1	2.75	2
2	2-yr	Type III 24-hr		Default	24.00	1	3.36	2
3	5-yr	Type III 24-hr		Default	24.00	1	4.21	2
4	10-yr	Type III 24-hr		Default	24.00	1	5.00	2
5	25-yr	Type III 24-hr		Default	24.00	1	6.29	2
6	50-yr	Type III 24-hr		Default	24.00	1	7.49	2
7	100-yr	Type III 24-hr		Default	24.00	1	8.91	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.130	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S)
1.710	98	Impervious (1S, 2S)
0.520	70	Woods, Good, HSG C (1S)
3.360	**86**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
1.650	HSG C	1S, 2S, 3S
0.000	HSG D	
1.710	Other	1S, 2S
3.360		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	1.130	0.000	0.000	1.130	>75% Grass cover, Good	1S, 2S, 3S
0.000	0.000	0.000	0.000	1.710	1.710	Impervious	1S, 2S
0.000	0.000	0.520	0.000	0.000	0.520	Woods, Good	1S
0.000	**0.000**	**1.650**	**0.000**	**1.710**	**3.360**	**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	4P	412.00	408.00	40.0	0.1000	0.013	0.0	15.0	0.0	

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Existing Runoff Area=1.680 ac 27.98% Impervious Runoff Depth=1.01"
Flow Length=367' Tc=11.4 min CN=79 Runoff=1.59 cfs 0.141 af

Subcatchment 2S: Proposed to Treatment Runoff Area=1.440 ac 86.11% Impervious Runoff Depth=2.21"
Tc=6.0 min CN=95 Runoff=3.48 cfs 0.265 af

Subcatchment 3S: Proposed to Bypass Runoff Area=0.240 ac 0.00% Impervious Runoff Depth=0.75"
Flow Length=200' Tc=10.7 min CN=74 Runoff=0.16 cfs 0.015 af

Pond 4P: Detention Peak Elev=413.72' Storage=0.047 af Inflow=3.48 cfs 0.265 af
Outflow=1.34 cfs 0.265 af

Link 5L: Proposed Combined Inflow=1.46 cfs 0.280 af
Primary=1.46 cfs 0.280 af

Total Runoff Area = 3.360 ac Runoff Volume = 0.421 af Average Runoff Depth = 1.50"
49.11% Pervious = 1.650 ac 50.89% Impervious = 1.710 ac

Summary for Subcatchment 1S: Existing

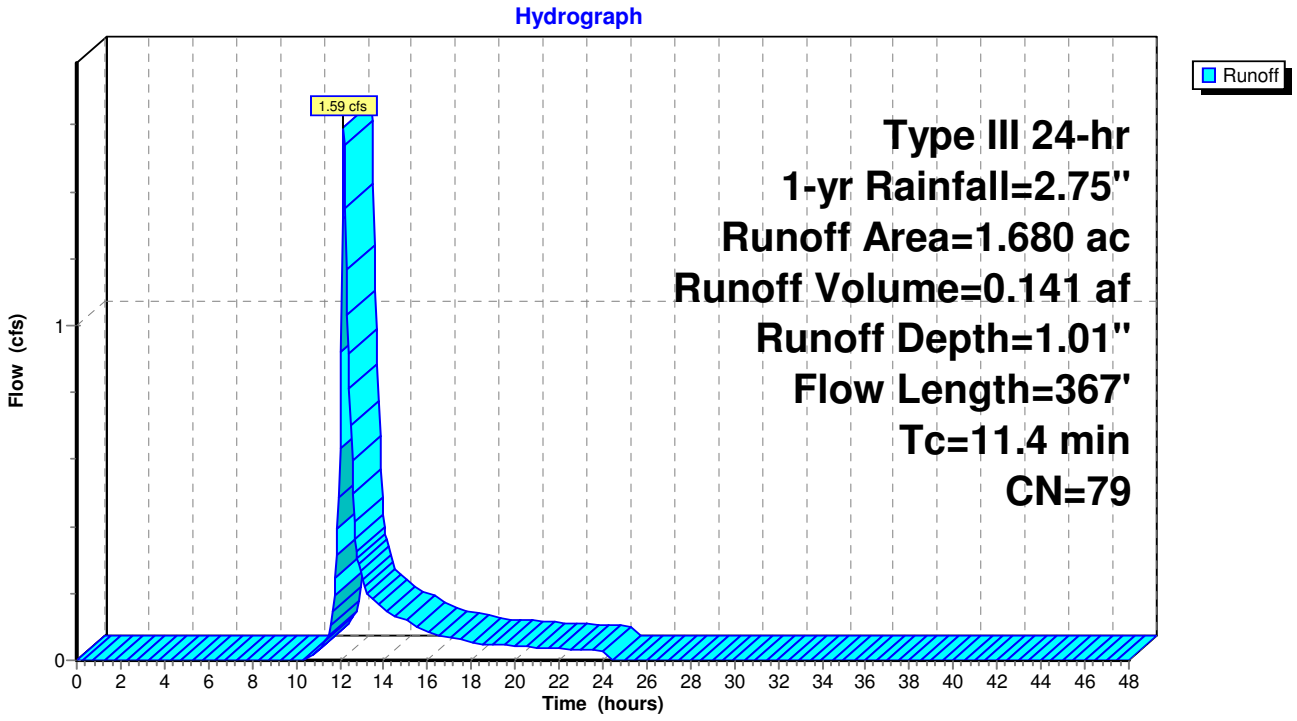
Runoff = 1.59 cfs @ 12.17 hrs, Volume= 0.141 af, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.75"

	Area (ac)	CN	Description
*	0.470	98	Impervious
	0.520	70	Woods, Good, HSG C
	0.690	74	>75% Grass cover, Good, HSG C
	1.680	79	Weighted Average
	1.210		72.02% Pervious Area
	0.470		27.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0400	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
1.1	267	0.0600	3.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
11.4	367	Total			

Subcatchment 1S: Existing



Hydrograph for Subcatchment 1S: Existing

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.01	0.00	0.00
1.00	0.03	0.00	0.00
1.50	0.04	0.00	0.00
2.00	0.06	0.00	0.00
2.50	0.07	0.00	0.00
3.00	0.08	0.00	0.00
3.50	0.10	0.00	0.00
4.00	0.12	0.00	0.00
4.50	0.14	0.00	0.00
5.00	0.16	0.00	0.00
5.50	0.18	0.00	0.00
6.00	0.20	0.00	0.00
6.50	0.22	0.00	0.00
7.00	0.25	0.00	0.00
7.50	0.28	0.00	0.00
8.00	0.31	0.00	0.00
8.50	0.35	0.00	0.00
9.00	0.40	0.00	0.00
9.50	0.46	0.00	0.00
10.00	0.52	0.00	0.00
10.50	0.60	0.00	0.01
11.00	0.69	0.01	0.03
11.50	0.82	0.03	0.08
12.00	1.37	0.20	**0.63**
12.50	1.93	0.48	**0.70**
13.00	2.06	0.56	0.25
13.50	2.15	0.62	0.19
14.00	2.23	0.66	0.15
14.50	2.29	0.70	0.13
15.00	2.35	0.74	0.12
15.50	2.40	0.77	0.10
16.00	2.44	0.80	0.09
16.50	2.47	0.82	0.08
17.00	2.50	0.84	0.07
17.50	2.53	0.86	0.06
18.00	2.55	0.87	0.05
18.50	2.57	0.89	0.05
19.00	2.59	0.90	0.05
19.50	2.61	0.91	0.04
20.00	2.63	0.93	0.04
20.50	2.65	0.94	0.04
21.00	2.67	0.95	0.04
21.50	2.68	0.96	0.04
22.00	2.70	0.97	0.04
22.50	2.71	0.98	0.03
23.00	2.73	0.99	0.03
23.50	2.74	1.00	0.03
24.00	**2.75**	**1.01**	0.03
24.50	2.75	1.01	0.00
25.00	2.75	1.01	0.00
25.50	2.75	1.01	0.00
26.00	2.75	1.01	0.00
26.50	2.75	1.01	0.00
27.00	2.75	1.01	0.00
27.50	2.75	1.01	0.00
28.00	2.75	1.01	0.00
28.50	2.75	1.01	0.00
29.00	2.75	1.01	0.00
29.50	2.75	1.01	0.00
30.00	2.75	1.01	0.00
30.50	2.75	1.01	0.00
31.00	2.75	1.01	0.00
31.50	2.75	1.01	0.00
32.00	2.75	1.01	0.00
32.50	2.75	1.01	0.00
33.00	2.75	1.01	0.00
33.50	2.75	1.01	0.00
34.00	2.75	1.01	0.00
34.50	2.75	1.01	0.00
35.00	2.75	1.01	0.00
35.50	2.75	1.01	0.00
36.00	2.75	1.01	0.00
36.50	2.75	1.01	0.00
37.00	2.75	1.01	0.00
37.50	2.75	1.01	0.00
38.00	2.75	1.01	0.00
38.50	2.75	1.01	0.00
39.00	2.75	1.01	0.00
39.50	2.75	1.01	0.00
40.00	2.75	1.01	0.00
40.50	2.75	1.01	0.00
41.00	2.75	1.01	0.00
41.50	2.75	1.01	0.00
42.00	2.75	1.01	0.00
42.50	2.75	1.01	0.00
43.00	2.75	1.01	0.00
43.50	2.75	1.01	0.00
44.00	2.75	1.01	0.00
44.50	2.75	1.01	0.00
45.00	2.75	1.01	0.00
45.50	2.75	1.01	0.00
46.00	2.75	1.01	0.00
46.50	2.75	1.01	0.00
47.00	2.75	1.01	0.00
47.50	2.75	1.01	0.00
48.00	2.75	1.01	0.00

Summary for Subcatchment 2S: Proposed to Treatment

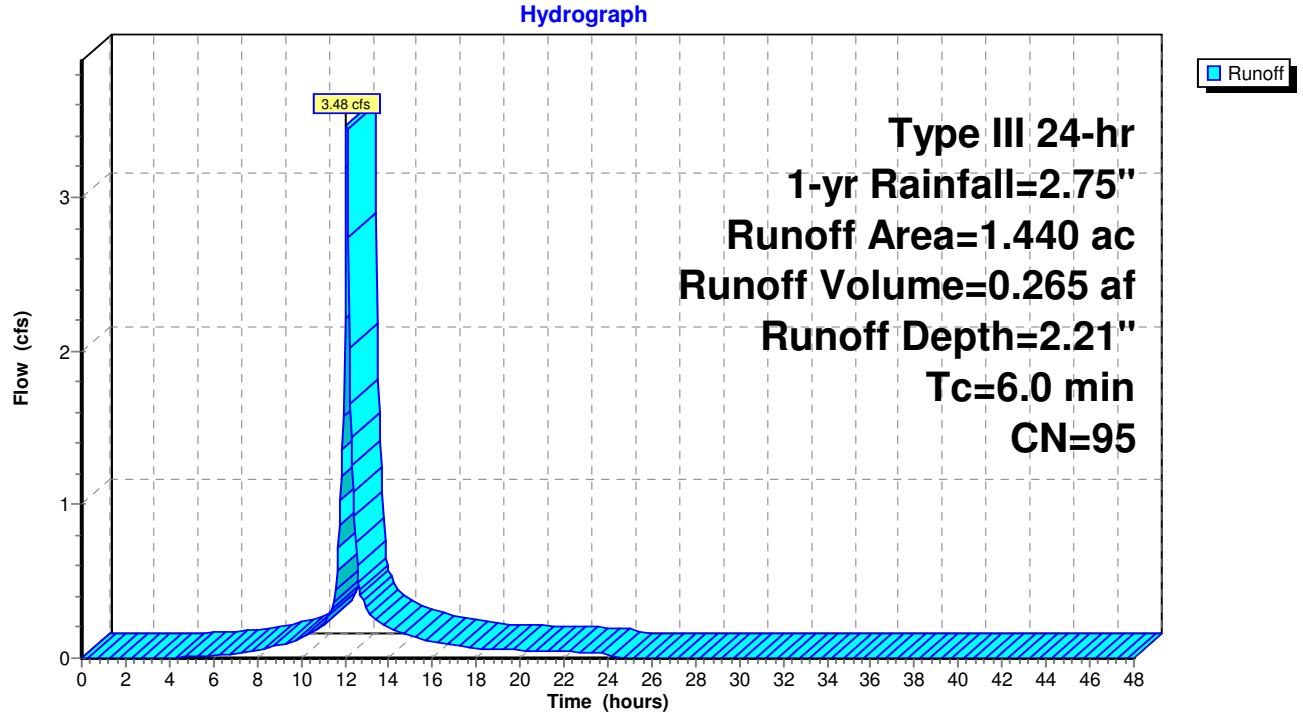
Runoff = 3.48 cfs @ 12.09 hrs, Volume= 0.265 af, Depth= 2.21"
Routed to Pond 4P : Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.75"

	Area (ac)	CN	Description
*	1.240	98	Impervious
	0.200	74	>75% Grass cover, Good, HSG C
	1.440	95	Weighted Average
	0.200		13.89% Pervious Area
	1.240		86.11% Impervious Area

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

Subcatchment 2S: Proposed to Treatment



Hydrograph for Subcatchment 2S: Proposed to Treatment

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.01	0.00	0.00
1.00	0.03	0.00	0.00
1.50	0.04	0.00	0.00
2.00	0.06	0.00	0.00
2.50	0.07	0.00	0.00
3.00	0.08	0.00	0.00
3.50	0.10	0.00	0.00
4.00	0.12	0.00	0.00
4.50	0.14	0.00	0.01
5.00	0.16	0.00	0.01
5.50	0.18	0.01	0.01
6.00	0.20	0.01	0.02
6.50	0.22	0.02	0.02
7.00	0.25	0.03	0.03
7.50	0.28	0.04	0.04
8.00	0.31	0.06	0.05
8.50	0.35	0.08	0.06
9.00	0.40	0.11	0.08
9.50	0.46	0.14	0.11
10.00	0.52	0.18	0.13
10.50	0.60	0.24	0.17
11.00	0.69	0.31	0.22
11.50	0.82	0.41	0.36
12.00	1.37	0.90	**2.21**
12.50	1.93	1.42	**0.76**
13.00	2.06	1.54	0.31
13.50	2.15	1.63	0.24
14.00	2.23	1.70	0.20
14.50	2.29	1.76	0.17
15.00	2.35	1.82	0.15
15.50	2.40	1.86	0.13
16.00	2.44	1.90	0.10
16.50	2.47	1.93	0.09
17.00	2.50	1.96	0.08
17.50	2.53	1.99	0.07
18.00	2.55	2.01	0.06
18.50	2.57	2.03	0.06
19.00	2.59	2.05	0.06
19.50	2.61	2.07	0.05
20.00	2.63	2.09	0.05
20.50	2.65	2.11	0.05
21.00	2.67	2.12	0.05
21.50	2.68	2.14	0.04
22.00	2.70	2.15	0.04
22.50	2.71	2.17	0.04
23.00	2.73	2.18	0.04
23.50	2.74	2.19	0.04
24.00	**2.75**	**2.21**	0.03
24.50	2.75	2.21	0.00
25.00	2.75	2.21	0.00
25.50	2.75	2.21	0.00
26.00	2.75	2.21	0.00
26.50	2.75	2.21	0.00
27.00	2.75	2.21	0.00
27.50	2.75	2.21	0.00
28.00	2.75	2.21	0.00
28.50	2.75	2.21	0.00
29.00	2.75	2.21	0.00
29.50	2.75	2.21	0.00
30.00	2.75	2.21	0.00
30.50	2.75	2.21	0.00
31.00	2.75	2.21	0.00
31.50	2.75	2.21	0.00
32.00	2.75	2.21	0.00
32.50	2.75	2.21	0.00
33.00	2.75	2.21	0.00
33.50	2.75	2.21	0.00
34.00	2.75	2.21	0.00
34.50	2.75	2.21	0.00
35.00	2.75	2.21	0.00
35.50	2.75	2.21	0.00
36.00	2.75	2.21	0.00
36.50	2.75	2.21	0.00
37.00	2.75	2.21	0.00
37.50	2.75	2.21	0.00
38.00	2.75	2.21	0.00
38.50	2.75	2.21	0.00
39.00	2.75	2.21	0.00
39.50	2.75	2.21	0.00
40.00	2.75	2.21	0.00
40.50	2.75	2.21	0.00
41.00	2.75	2.21	0.00
41.50	2.75	2.21	0.00
42.00	2.75	2.21	0.00
42.50	2.75	2.21	0.00
43.00	2.75	2.21	0.00
43.50	2.75	2.21	0.00
44.00	2.75	2.21	0.00
44.50	2.75	2.21	0.00
45.00	2.75	2.21	0.00
45.50	2.75	2.21	0.00
46.00	2.75	2.21	0.00
46.50	2.75	2.21	0.00
47.00	2.75	2.21	0.00
47.50	2.75	2.21	0.00
48.00	2.75	2.21	0.00

Summary for Subcatchment 3S: Proposed to Bypass

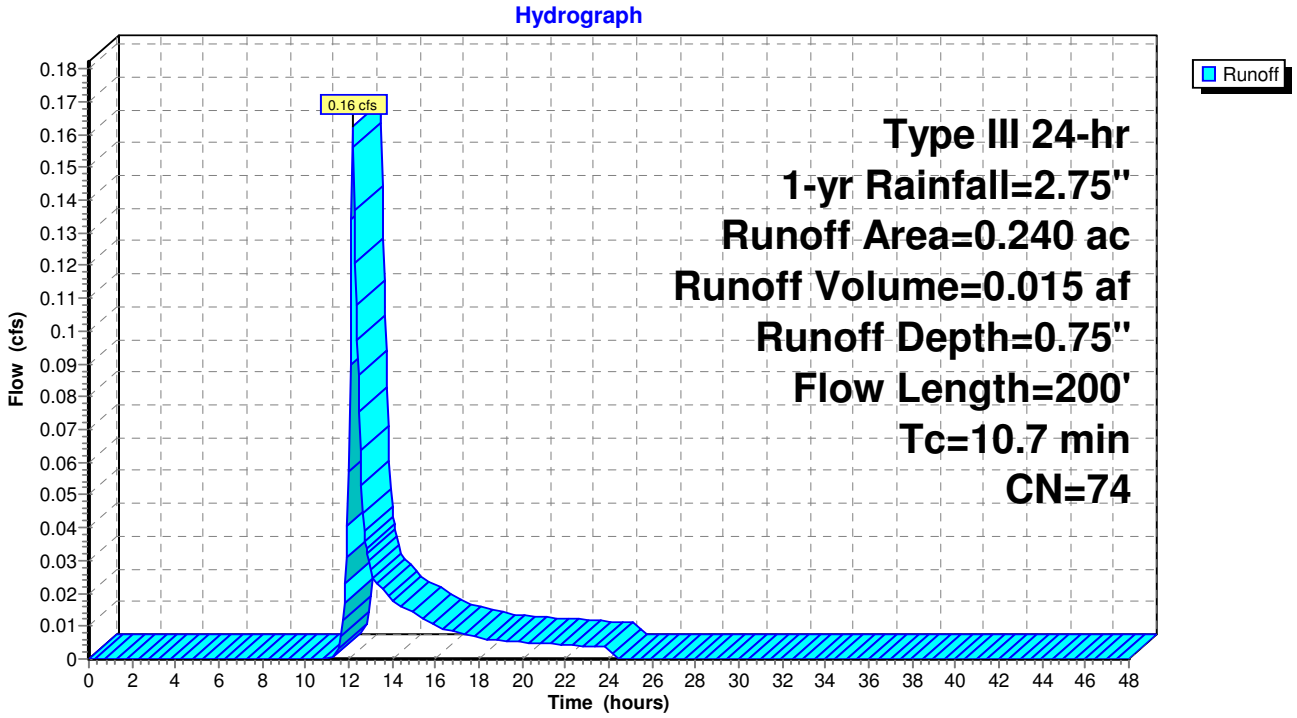
Runoff = 0.16 cfs @ 12.17 hrs, Volume= 0.015 af, Depth= 0.75"
Routed to Link 5L : Proposed Combined

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.75"

Area (ac)	CN	Description
0.240	74	>75% Grass cover, Good, HSG C
0.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0400	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
0.4	100	0.0700	4.26		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.7	200	Total			

Subcatchment 3S: Proposed to Bypass



Hydrograph for Subcatchment 3S: Proposed to Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.01	0.00	0.00
1.00	0.03	0.00	0.00
1.50	0.04	0.00	0.00
2.00	0.06	0.00	0.00
2.50	0.07	0.00	0.00
3.00	0.08	0.00	0.00
3.50	0.10	0.00	0.00
4.00	0.12	0.00	0.00
4.50	0.14	0.00	0.00
5.00	0.16	0.00	0.00
5.50	0.18	0.00	0.00
6.00	0.20	0.00	0.00
6.50	0.22	0.00	0.00
7.00	0.25	0.00	0.00
7.50	0.28	0.00	0.00
8.00	0.31	0.00	0.00
8.50	0.35	0.00	0.00
9.00	0.40	0.00	0.00
9.50	0.46	0.00	0.00
10.00	0.52	0.00	0.00
10.50	0.60	0.00	0.00
11.00	0.69	0.00	0.00
11.50	0.82	0.00	0.00
12.00	1.37	0.11	**0.06**
12.50	1.93	0.32	**0.08**
13.00	2.06	0.38	0.03
13.50	2.15	0.42	0.02
14.00	2.23	0.46	0.02
14.50	2.29	0.50	0.02
15.00	2.35	0.53	0.01
15.50	2.40	0.55	0.01
16.00	2.44	0.57	0.01
16.50	2.47	0.59	0.01
17.00	2.50	0.61	0.01
17.50	2.53	0.62	0.01
18.00	2.55	0.64	0.01
18.50	2.57	0.65	0.01
19.00	2.59	0.66	0.01
19.50	2.61	0.67	0.01
20.00	2.63	0.68	0.01
20.50	2.65	0.69	0.00
21.00	2.67	0.70	0.00
21.50	2.68	0.71	0.00
22.00	2.70	0.72	0.00
22.50	2.71	0.73	0.00
23.00	2.73	0.74	0.00
23.50	2.74	0.75	0.00
24.00	**2.75**	**0.75**	0.00
24.50	2.75	0.75	0.00
25.00	2.75	0.75	0.00
25.50	2.75	0.75	0.00
26.00	2.75	0.75	0.00
26.50	2.75	0.75	0.00
27.00	2.75	0.75	0.00
27.50	2.75	0.75	0.00
28.00	2.75	0.75	0.00
28.50	2.75	0.75	0.00
29.00	2.75	0.75	0.00
29.50	2.75	0.75	0.00
30.00	2.75	0.75	0.00
30.50	2.75	0.75	0.00
31.00	2.75	0.75	0.00
31.50	2.75	0.75	0.00
32.00	2.75	0.75	0.00
32.50	2.75	0.75	0.00
33.00	2.75	0.75	0.00
33.50	2.75	0.75	0.00
34.00	2.75	0.75	0.00
34.50	2.75	0.75	0.00
35.00	2.75	0.75	0.00
35.50	2.75	0.75	0.00
36.00	2.75	0.75	0.00
36.50	2.75	0.75	0.00
37.00	2.75	0.75	0.00
37.50	2.75	0.75	0.00
38.00	2.75	0.75	0.00
38.50	2.75	0.75	0.00
39.00	2.75	0.75	0.00
39.50	2.75	0.75	0.00
40.00	2.75	0.75	0.00
40.50	2.75	0.75	0.00
41.00	2.75	0.75	0.00
41.50	2.75	0.75	0.00
42.00	2.75	0.75	0.00
42.50	2.75	0.75	0.00
43.00	2.75	0.75	0.00
43.50	2.75	0.75	0.00
44.00	2.75	0.75	0.00
44.50	2.75	0.75	0.00
45.00	2.75	0.75	0.00
45.50	2.75	0.75	0.00
46.00	2.75	0.75	0.00
46.50	2.75	0.75	0.00
47.00	2.75	0.75	0.00
47.50	2.75	0.75	0.00
48.00	2.75	0.75	0.00

Summary for Pond 4P: Detention

Inflow Area = 1.440 ac, 86.11% Impervious, Inflow Depth = 2.21" for 1-yr event
Inflow = 3.48 cfs @ 12.09 hrs, Volume= 0.265 af
Outflow = 1.34 cfs @ 12.33 hrs, Volume= 0.265 af, Atten= 62%, Lag= 14.4 min
Primary = 1.34 cfs @ 12.33 hrs, Volume= 0.265 af
Routed to Link 5L : Proposed Combined

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 413.72' @ 12.33 hrs Surf.Area= 0.081 ac Storage= 0.047 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 9.0 min (794.7 - 785.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	411.50'	0.000 af	**31.09'W x 114.17'L x 6.58'H Field A** 0.536 af Overall - 0.240 af Embedded = 0.296 af x 0.0% Voids
#2A	412.00'	0.202 af	**ADS N-12 60"** x 20 Inside #1 Inside= 59.5"W x 59.5"H => 19.30 sf x 20.00'L = 386.0 cf Outside= 67.0"W x 67.0"H => 22.92 sf x 20.00'L = 458.4 cf 20 Chambers in 4 Rows 28.09' Header x 19.30 sf x 2 = 1,084.1 cf Inside
		0.202 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	412.00'	**15.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 412.00' / 408.00' S= 0.1000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	412.00'	**6.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	416.00'	**0.7' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 1	414.00'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	415.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.34 cfs @ 12.33 hrs HW=413.72' (Free Discharge)
└**1=Culvert** (Passes 1.34 cfs of 6.18 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.34 cfs @ 5.80 fps)
  ├**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  ├**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: Detention - Chamber Wizard Field A

Chamber Model = ADS N-12 60" (ADS N-12® Pipe)
Inside= 59.5"W x 59.5"H => 19.30 sf x 20.00'L = 386.0 cf
Outside= 67.0"W x 67.0"H => 22.92 sf x 20.00'L = 458.4 cf

67.0" Wide + 23.0" Spacing = 90.0" C-C Row Spacing

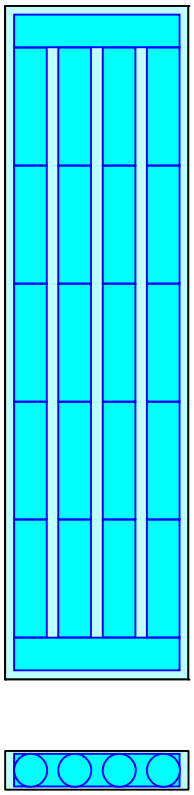
5 Chambers/Row x 20.00' Long +5.58' Header x 2 = 111.17' Row Length +18.0" End Stone x 2 = 114.17' Base Length
4 Rows x 67.0" Wide + 23.0" Spacing x 3 + 18.0" Side Stone x 2 = 31.09' Base Width
6.0" Stone Base + 67.0" Chamber Height + 6.0" Stone Cover = 6.58' Field Height

20 Chambers x 386.0 cf + 28.09' Header x 19.30 sf x 2 = 8,804.1 cf Chamber Storage
20 Chambers x 458.4 cf + 28.09' Header x 22.92 sf x 2 = 10,455.8 cf Displacement

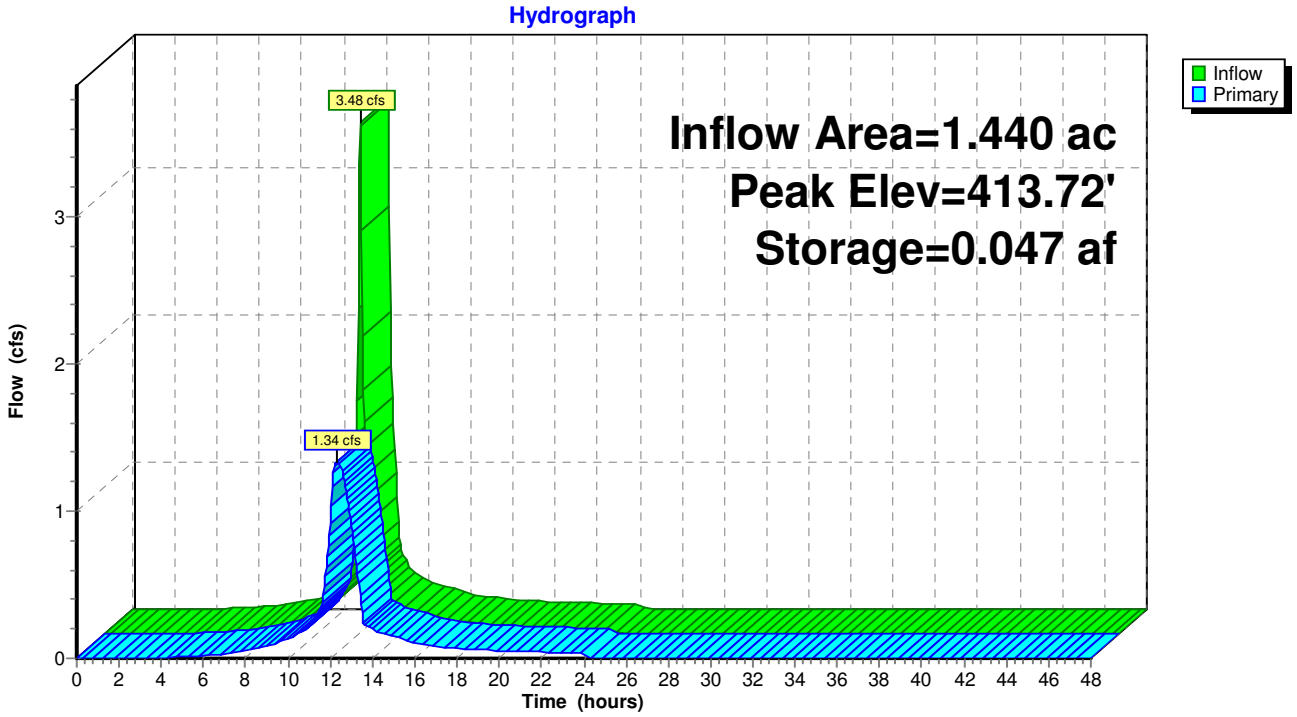
23,365.6 cf Field - 10,455.8 cf Chambers = 12,909.8 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 8,804.1 cf = 0.202 af
Overall Storage Efficiency = 37.7%
Overall System Size = 114.17' x 31.09' x 6.58'

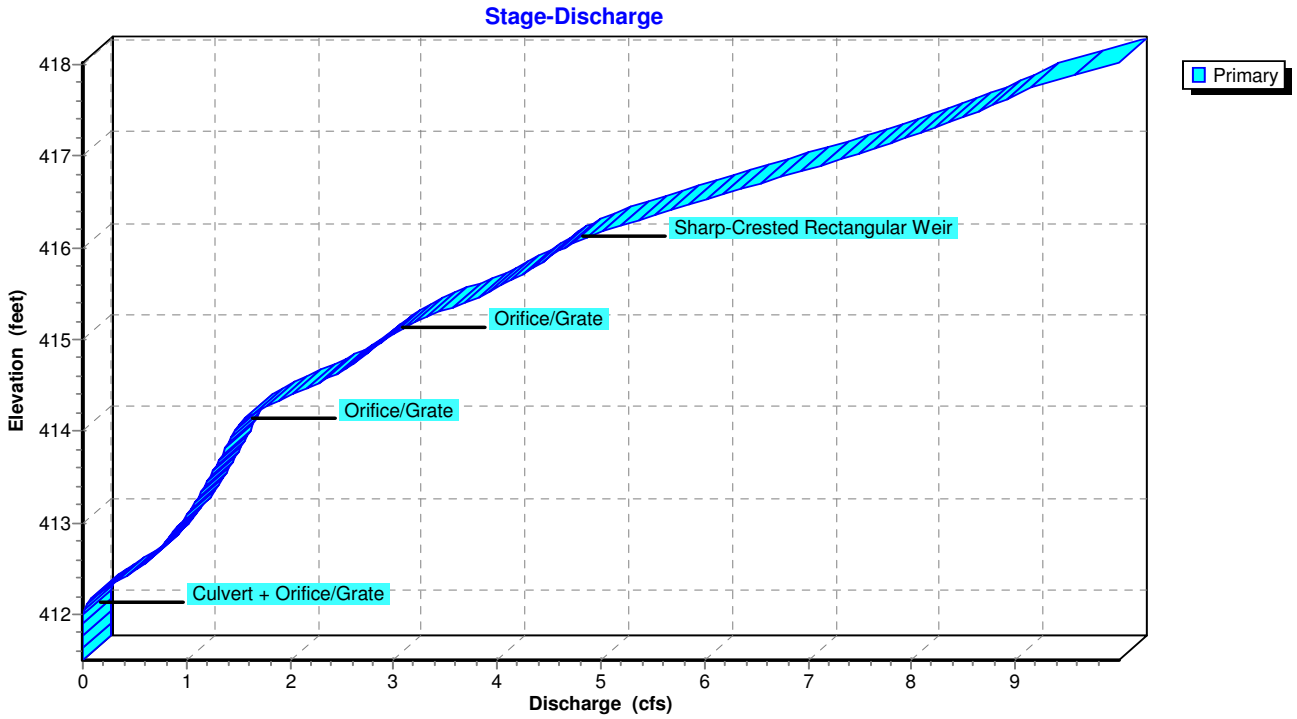
20 Chambers
865.4 cy Field
478.1 cy Stone



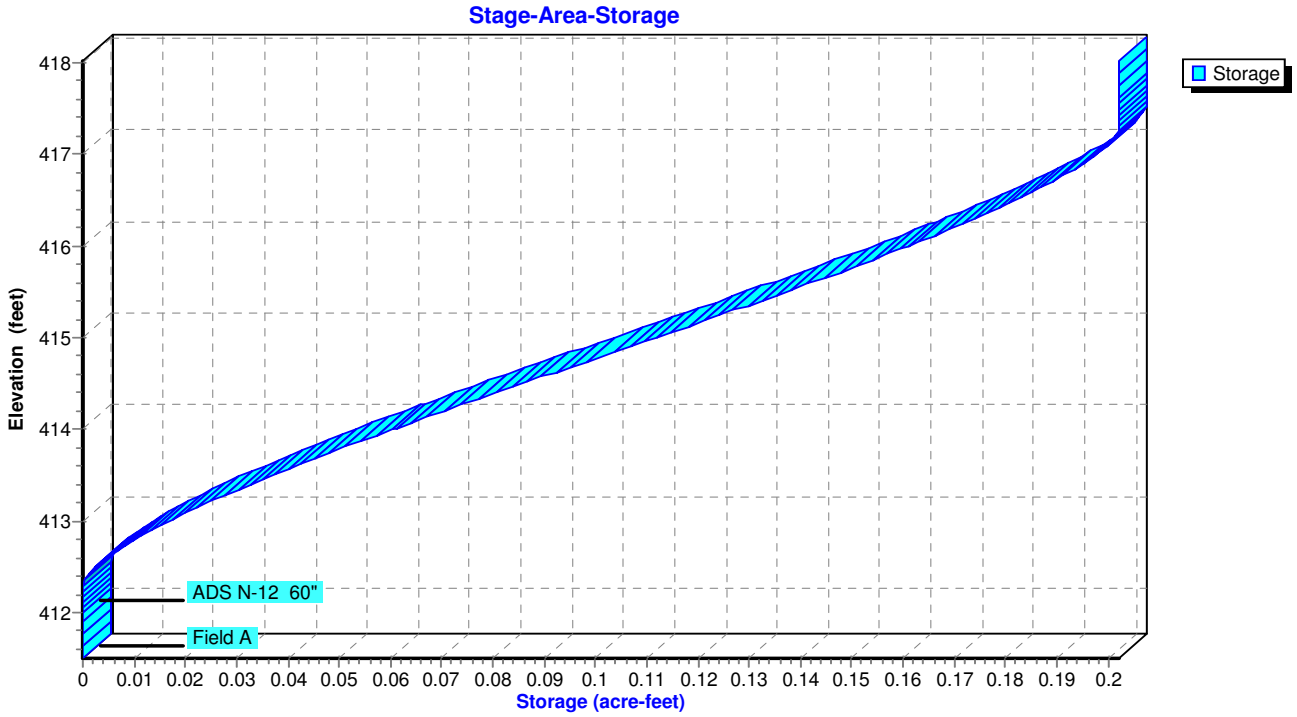
Pond 4P: Detention



Pond 4P: Detention



Pond 4P: Detention



Hydrograph for Pond 4P: Detention

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	411.50	0.00
1.00	0.00	0.000	411.50	0.00
2.00	0.00	0.000	411.50	0.00
3.00	0.00	0.000	411.50	0.00
4.00	0.00	0.000	412.02	0.00
5.00	0.01	0.000	412.05	0.01
6.00	0.02	0.000	412.07	0.02
7.00	0.03	0.000	412.10	0.03
8.00	0.05	0.000	412.12	0.05
9.00	0.08	0.000	412.17	0.08
10.00	0.13	0.000	412.21	0.13
11.00	0.22	0.000	412.28	0.22
12.00	**2.21**	**0.015**	**412.96**	**0.92**
13.00	**0.31**	**0.015**	**412.94**	**0.91**
14.00	0.20	0.000	412.26	0.20
15.00	0.15	0.000	412.23	0.15
16.00	0.10	0.000	412.19	0.10
17.00	0.08	0.000	412.17	0.08
18.00	0.06	0.000	412.14	0.06
19.00	0.06	0.000	412.13	0.06
20.00	0.05	0.000	412.13	0.05
21.00	0.05	0.000	412.12	0.05
22.00	0.04	0.000	412.12	0.04
23.00	0.04	0.000	412.11	0.04
24.00	0.03	0.000	412.10	0.03
25.00	0.00	0.000	412.00	0.00
26.00	0.00	0.000	412.00	0.00
27.00	0.00	0.000	412.00	0.00
28.00	0.00	0.000	412.00	0.00
29.00	0.00	0.000	412.00	0.00
30.00	0.00	0.000	412.00	0.00
31.00	0.00	0.000	412.00	0.00
32.00	0.00	0.000	412.00	0.00
33.00	0.00	0.000	412.00	0.00
34.00	0.00	0.000	412.00	0.00
35.00	0.00	0.000	412.00	0.00
36.00	0.00	0.000	412.00	0.00
37.00	0.00	0.000	412.00	0.00
38.00	0.00	0.000	412.00	0.00
39.00	0.00	0.000	412.00	0.00
40.00	0.00	0.000	412.00	0.00
41.00	0.00	0.000	412.00	0.00
42.00	0.00	0.000	412.00	0.00
43.00	0.00	0.000	412.00	0.00
44.00	0.00	0.000	412.00	0.00
45.00	0.00	0.000	412.00	0.00
46.00	0.00	0.000	412.00	0.00
47.00	0.00	0.000	412.00	0.00
48.00	0.00	0.000	412.00	0.00

Stage-Discharge for Pond 4P: Detention

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
411.50	0.00	414.10	1.53	416.70	6.54
411.55	0.00	414.15	1.59	416.75	6.69
411.60	0.00	414.20	1.66	416.80	6.84
411.65	0.00	414.25	1.75	416.85	6.99
411.70	0.00	414.30	1.84	416.90	7.13
411.75	0.00	414.35	1.94	416.95	7.28
411.80	0.00	414.40	2.04	417.00	7.42
411.85	0.00	414.45	2.14	417.05	7.56
411.90	0.00	414.50	2.24	417.10	7.69
411.95	0.00	414.55	2.33	417.15	7.82
412.00	0.00	414.60	2.41	417.20	7.96
412.05	0.01	414.65	2.48	417.25	8.08
412.10	0.03	414.70	2.55	417.30	8.21
412.15	0.07	414.75	2.62	417.35	8.33
412.20	0.12	414.80	2.68	417.40	8.44
412.25	0.18	414.85	2.74	417.45	8.56
412.30	0.24	414.90	2.80	417.50	8.66
412.35	0.32	414.95	2.86	417.55	8.77
412.40	0.39	415.00	2.92	417.60	8.87
412.45	0.47	415.05	2.98	417.65	8.96
412.50	0.54	415.10	3.05	417.70	9.05
412.55	0.59	415.15	3.14	417.75	9.13
412.60	0.64	415.20	3.24	417.80	9.29
412.65	0.68	415.25	3.34	417.85	9.45
412.70	0.73	415.30	3.45	417.90	9.61
412.75	0.77	415.35	3.57	417.95	9.78
412.80	0.81	415.40	3.68	418.00	9.94
412.85	0.84	415.45	3.79	418.05	**10.10**
412.90	0.88	415.50	3.88		
412.95	0.91	415.55	3.97		
413.00	0.95	415.60	4.06		
413.05	0.98	415.65	4.14		
413.10	1.01	415.70	4.22		
413.15	1.04	415.75	4.29		
413.20	1.07	415.80	4.37		
413.25	1.10	415.85	4.44		
413.30	1.13	415.90	4.51		
413.35	1.15	415.95	4.58		
413.40	1.18	416.00	4.64		
413.45	1.20	416.05	4.73		
413.50	1.23	416.10	4.84		
413.55	1.25	416.15	4.96		
413.60	1.28	416.20	5.09		
413.65	1.30	416.25	5.23		
413.70	1.33	416.30	5.36		
413.75	1.35	416.35	5.51		
413.80	1.37	416.40	5.65		
413.85	1.39	416.45	5.80		
413.90	1.42	416.50	5.94		
413.95	1.44	416.55	6.09		
414.00	1.46	416.60	6.24		
414.05	1.49	416.65	6.39		

Stage-Area-Storage for Pond 4P: Detention

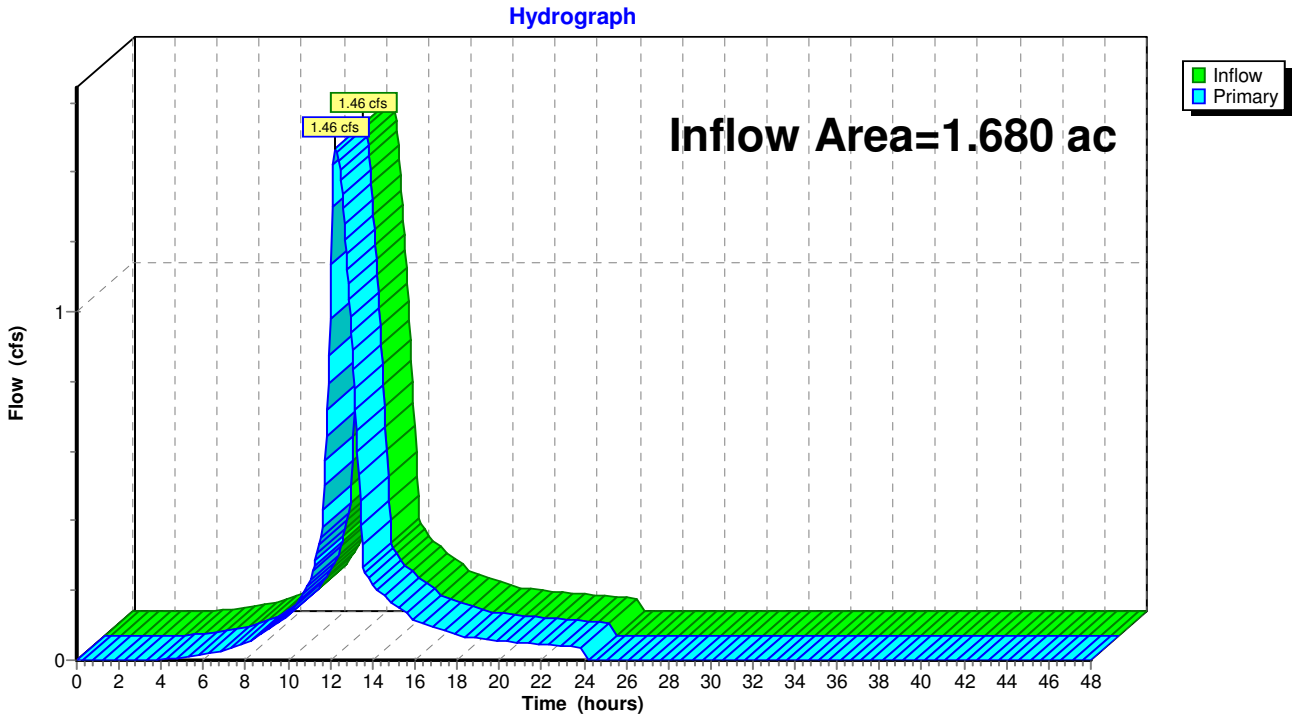
Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
411.50	0.000	414.10	0.066	416.70	0.189
411.55	0.000	414.15	0.068	416.75	0.191
411.60	0.000	414.20	0.071	416.80	0.192
411.65	0.000	414.25	0.073	416.85	0.194
411.70	0.000	414.30	0.076	416.90	0.195
411.75	0.000	414.35	0.078	416.95	0.197
411.80	0.000	414.40	0.081	417.00	0.198
411.85	0.000	414.45	0.083	417.05	0.199
411.90	0.000	414.50	0.086	417.10	0.200
411.95	0.000	414.55	0.089	417.15	0.201
412.00	0.000	414.60	0.091	417.20	0.202
412.05	0.000	414.65	0.094	417.25	0.202
412.10	0.000	414.70	0.096	417.30	**0.202**
412.15	0.000	414.75	0.099	417.35	0.202
412.20	0.000	414.80	0.101	417.40	0.202
412.25	0.000	414.85	0.104	417.45	0.202
412.30	0.000	414.90	0.107	417.50	0.202
412.35	0.000	414.95	0.109	417.55	0.202
412.40	0.001	415.00	0.112	417.60	0.202
412.45	0.002	415.05	0.114	417.65	0.202
412.50	0.002	415.10	0.117	417.70	0.202
412.55	0.004	415.15	0.120	417.75	0.202
412.60	0.005	415.20	0.122	417.80	0.202
412.65	0.006	415.25	0.125	417.85	0.202
412.70	0.007	415.30	0.127	417.90	0.202
412.75	0.009	415.35	0.130	417.95	0.202
412.80	0.010	415.40	0.132	418.00	0.202
412.85	0.012	415.45	0.135	418.05	0.202
412.90	0.013	415.50	0.137		
412.95	0.015	415.55	0.140		
413.00	0.017	415.60	0.142		
413.05	0.019	415.65	0.145		
413.10	0.021	415.70	0.147		
413.15	0.023	415.75	0.150		
413.20	0.025	415.80	0.152		
413.25	0.027	415.85	0.154		
413.30	0.029	415.90	0.157		
413.35	0.031	415.95	0.159		
413.40	0.033	416.00	0.161		
413.45	0.035	416.05	0.163		
413.50	0.037	416.10	0.166		
413.55	0.039	416.15	0.168		
413.60	0.042	416.20	0.170		
413.65	0.044	416.25	0.172		
413.70	0.046	416.30	0.174		
413.75	0.049	416.35	0.176		
413.80	0.051	416.40	0.178		
413.85	0.053	416.45	0.180		
413.90	0.056	416.50	0.182		
413.95	0.058	416.55	0.184		
414.00	0.061	416.60	0.186		
414.05	0.063	416.65	0.188		

Summary for Link 5L: Proposed Combined

Inflow Area = 1.680 ac, 73.81% Impervious, Inflow Depth = 2.00" for 1-yr event
Inflow = 1.46 cfs @ 12.24 hrs, Volume= 0.280 af
Primary = 1.46 cfs @ 12.24 hrs, Volume= 0.280 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 5L: Proposed Combined



Hydrograph for Link 5L: Proposed Combined

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.00	0.00	0.00	27.00	0.00	0.00	0.00
1.50	0.00	0.00	0.00	27.50	0.00	0.00	0.00
2.00	0.00	0.00	0.00	28.00	0.00	0.00	0.00
2.50	0.00	0.00	0.00	28.50	0.00	0.00	0.00
3.00	0.00	0.00	0.00	29.00	0.00	0.00	0.00
3.50	0.00	0.00	0.00	29.50	0.00	0.00	0.00
4.00	0.00	0.00	0.00	30.00	0.00	0.00	0.00
4.50	0.01	0.00	0.01	30.50	0.00	0.00	0.00
5.00	0.01	0.00	0.01	31.00	0.00	0.00	0.00
5.50	0.01	0.00	0.01	31.50	0.00	0.00	0.00
6.00	0.02	0.00	0.02	32.00	0.00	0.00	0.00
6.50	0.02	0.00	0.02	32.50	0.00	0.00	0.00
7.00	0.03	0.00	0.03	33.00	0.00	0.00	0.00
7.50	0.04	0.00	0.04	33.50	0.00	0.00	0.00
8.00	0.05	0.00	0.05	34.00	0.00	0.00	0.00
8.50	0.06	0.00	0.06	34.50	0.00	0.00	0.00
9.00	0.08	0.00	0.08	35.00	0.00	0.00	0.00
9.50	0.11	0.00	0.11	35.50	0.00	0.00	0.00
10.00	0.13	0.00	0.13	36.00	0.00	0.00	0.00
10.50	0.17	0.00	0.17	36.50	0.00	0.00	0.00
11.00	0.22	0.00	0.22	37.00	0.00	0.00	0.00
11.50	0.34	0.00	0.34	37.50	0.00	0.00	0.00
12.00	**0.98**	0.00	**0.98**	38.00	0.00	0.00	0.00
12.50	**1.37**	0.00	**1.37**	38.50	0.00	0.00	0.00
13.00	0.94	0.00	0.94	39.00	0.00	0.00	0.00
13.50	0.33	0.00	0.33	39.50	0.00	0.00	0.00
14.00	0.21	0.00	0.21	40.00	0.00	0.00	0.00
14.50	0.19	0.00	0.19	40.50	0.00	0.00	0.00
15.00	0.16	0.00	0.16	41.00	0.00	0.00	0.00
15.50	0.14	0.00	0.14	41.50	0.00	0.00	0.00
16.00	0.11	0.00	0.11	42.00	0.00	0.00	0.00
16.50	0.10	0.00	0.10	42.50	0.00	0.00	0.00
17.00	0.09	0.00	0.09	43.00	0.00	0.00	0.00
17.50	0.08	0.00	0.08	43.50	0.00	0.00	0.00
18.00	0.07	0.00	0.07	44.00	0.00	0.00	0.00
18.50	0.07	0.00	0.07	44.50	0.00	0.00	0.00
19.00	0.06	0.00	0.06	45.00	0.00	0.00	0.00
19.50	0.06	0.00	0.06	45.50	0.00	0.00	0.00
20.00	0.06	0.00	0.06	46.00	0.00	0.00	0.00
20.50	0.05	0.00	0.05	46.50	0.00	0.00	0.00
21.00	0.05	0.00	0.05	47.00	0.00	0.00	0.00
21.50	0.05	0.00	0.05	47.50	0.00	0.00	0.00
22.00	0.05	0.00	0.05	48.00	0.00	0.00	0.00
22.50	0.04	0.00	0.04				
23.00	0.04	0.00	0.04				
23.50	0.04	0.00	0.04				
24.00	0.04	0.00	0.04				
24.50	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Existing Runoff Area=1.680 ac 27.98% Impervious Runoff Depth=1.46"
Flow Length=367' Tc=11.4 min CN=79 Runoff=2.35 cfs 0.204 af

Subcatchment 2S: Proposed to Treatment Runoff Area=1.440 ac 86.11% Impervious Runoff Depth=2.80"
Tc=6.0 min CN=95 Runoff=4.36 cfs 0.336 af

Subcatchment 3S: Proposed to Bypass Runoff Area=0.240 ac 0.00% Impervious Runoff Depth=1.14"
Flow Length=200' Tc=10.7 min CN=74 Runoff=0.26 cfs 0.023 af

Pond 4P: Detention Peak Elev=414.12' Storage=0.067 af Inflow=4.36 cfs 0.336 af
Outflow=1.56 cfs 0.336 af

Link 5L: Proposed Combined Inflow=1.73 cfs 0.359 af
Primary=1.73 cfs 0.359 af

Total Runoff Area = 3.360 ac Runoff Volume = 0.563 af Average Runoff Depth = 2.01"
49.11% Pervious = 1.650 ac 50.89% Impervious = 1.710 ac

Summary for Subcatchment 1S: Existing

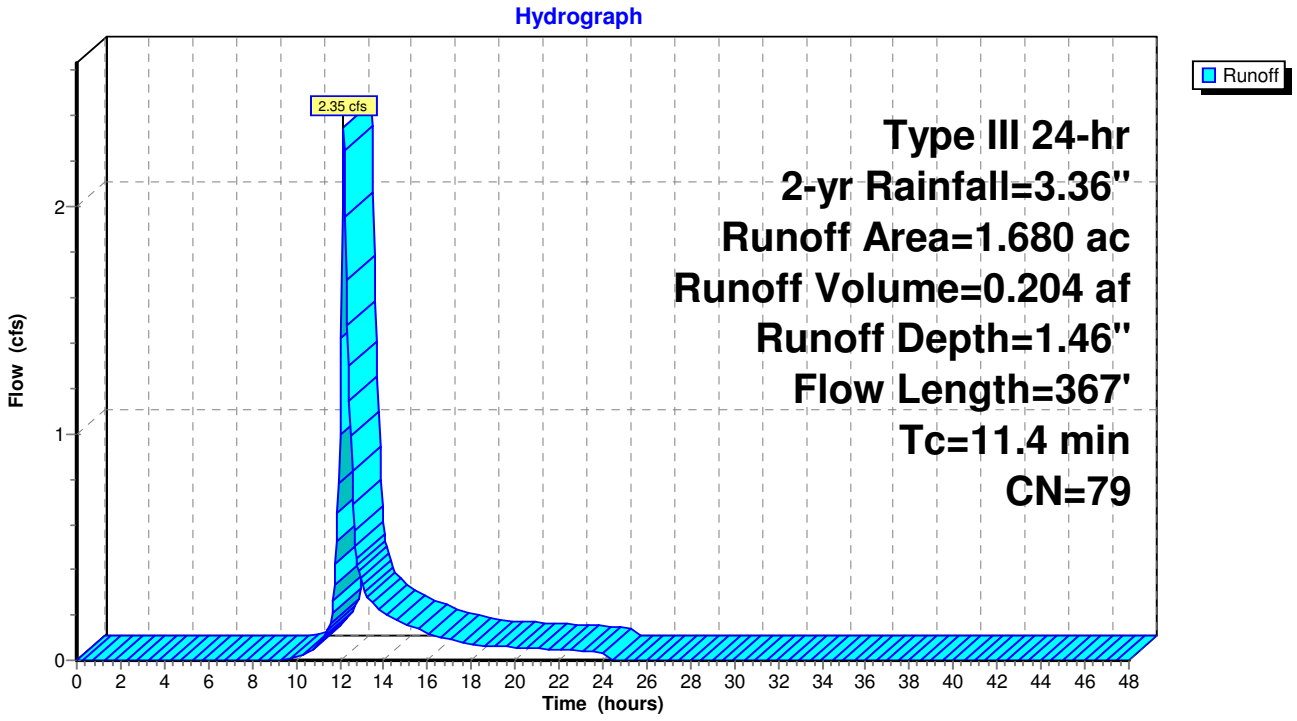
Runoff = 2.35 cfs @ 12.17 hrs, Volume= 0.204 af, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.36"

	Area (ac)	CN	Description
*	0.470	98	Impervious
	0.520	70	Woods, Good, HSG C
	0.690	74	>75% Grass cover, Good, HSG C
	1.680	79	Weighted Average
	1.210		72.02% Pervious Area
	0.470		27.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0400	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
1.1	267	0.0600	3.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
11.4	367	Total			

Subcatchment 1S: Existing



Hydrograph for Subcatchment 1S: Existing

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.03	0.00	0.00
1.50	0.05	0.00	0.00
2.00	0.07	0.00	0.00
2.50	0.08	0.00	0.00
3.00	0.10	0.00	0.00
3.50	0.12	0.00	0.00
4.00	0.14	0.00	0.00
4.50	0.17	0.00	0.00
5.00	0.19	0.00	0.00
5.50	0.22	0.00	0.00
6.00	0.24	0.00	0.00
6.50	0.27	0.00	0.00
7.00	0.30	0.00	0.00
7.50	0.34	0.00	0.00
8.00	0.38	0.00	0.00
8.50	0.43	0.00	0.00
9.00	0.49	0.00	0.00
9.50	0.56	0.00	0.00
10.00	0.64	0.00	0.01
10.50	0.73	0.01	0.04
11.00	0.84	0.03	0.07
11.50	1.00	0.07	0.15
12.00	1.68	0.35	**1.00**
12.50	2.36	0.74	**0.99**
13.00	2.52	0.85	0.34
13.50	2.63	0.93	0.25
14.00	2.72	0.99	0.21
14.50	2.80	1.05	0.18
15.00	2.87	1.09	0.16
15.50	2.93	1.14	0.14
16.00	2.98	1.17	0.12
16.50	3.02	1.20	0.10
17.00	3.06	1.23	0.09
17.50	3.09	1.25	0.08
18.00	3.12	1.28	0.07
18.50	3.14	1.30	0.07
19.00	3.17	1.31	0.06
19.50	3.19	1.33	0.06
20.00	3.22	1.35	0.06
20.50	3.24	1.36	0.05
21.00	3.26	1.38	0.05
21.50	3.28	1.39	0.05
22.00	3.30	1.41	0.05
22.50	3.31	1.42	0.04
23.00	3.33	1.43	0.04
23.50	3.35	1.45	0.04
24.00	**3.36**	**1.46**	0.04
24.50	3.36	1.46	0.00
25.00	3.36	1.46	0.00
25.50	3.36	1.46	0.00
26.00	3.36	1.46	0.00
26.50	3.36	1.46	0.00
27.00	3.36	1.46	0.00
27.50	3.36	1.46	0.00
28.00	3.36	1.46	0.00
28.50	3.36	1.46	0.00
29.00	3.36	1.46	0.00
29.50	3.36	1.46	0.00
30.00	3.36	1.46	0.00
30.50	3.36	1.46	0.00
31.00	3.36	1.46	0.00
31.50	3.36	1.46	0.00
32.00	3.36	1.46	0.00
32.50	3.36	1.46	0.00
33.00	3.36	1.46	0.00
33.50	3.36	1.46	0.00
34.00	3.36	1.46	0.00
34.50	3.36	1.46	0.00
35.00	3.36	1.46	0.00
35.50	3.36	1.46	0.00
36.00	3.36	1.46	0.00
36.50	3.36	1.46	0.00
37.00	3.36	1.46	0.00
37.50	3.36	1.46	0.00
38.00	3.36	1.46	0.00
38.50	3.36	1.46	0.00
39.00	3.36	1.46	0.00
39.50	3.36	1.46	0.00
40.00	3.36	1.46	0.00
40.50	3.36	1.46	0.00
41.00	3.36	1.46	0.00
41.50	3.36	1.46	0.00
42.00	3.36	1.46	0.00
42.50	3.36	1.46	0.00
43.00	3.36	1.46	0.00
43.50	3.36	1.46	0.00
44.00	3.36	1.46	0.00
44.50	3.36	1.46	0.00
45.00	3.36	1.46	0.00
45.50	3.36	1.46	0.00
46.00	3.36	1.46	0.00
46.50	3.36	1.46	0.00
47.00	3.36	1.46	0.00
47.50	3.36	1.46	0.00
48.00	3.36	1.46	0.00

Summary for Subcatchment 2S: Proposed to Treatment

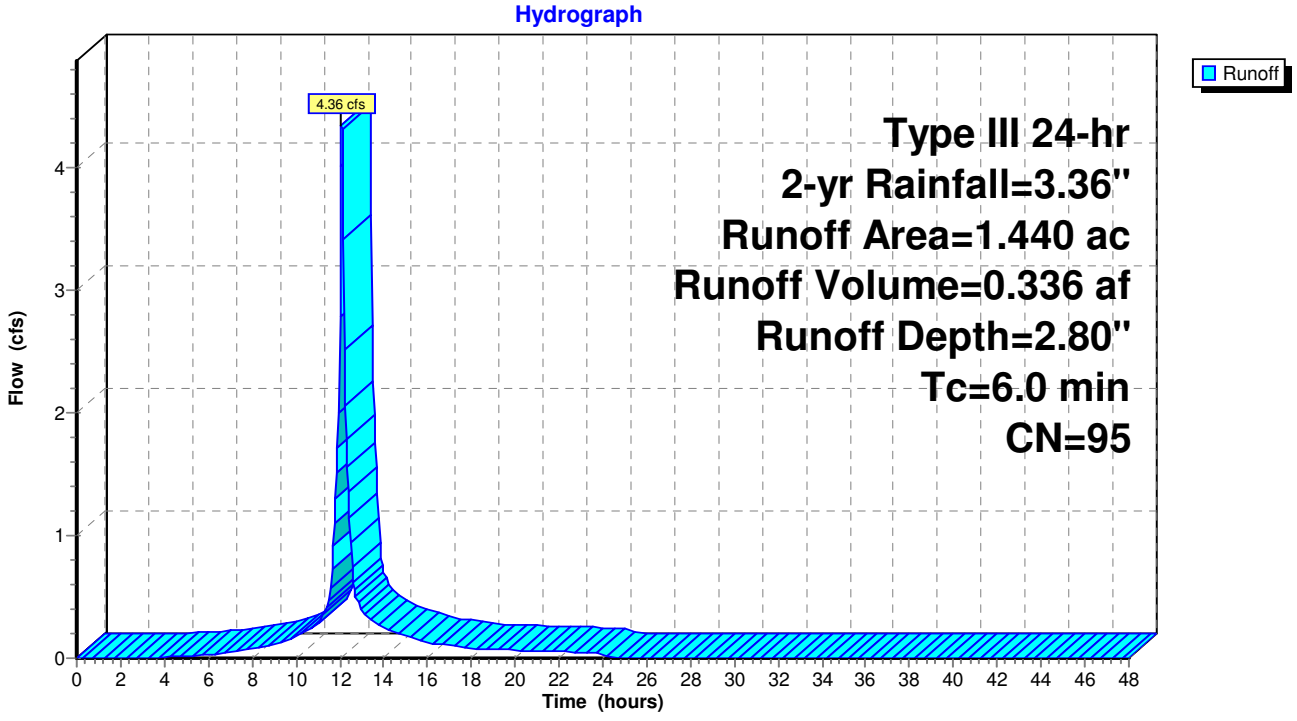
Runoff = 4.36 cfs @ 12.09 hrs, Volume= 0.336 af, Depth= 2.80"
Routed to Pond 4P : Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.36"

	Area (ac)	CN	Description
*	1.240	98	Impervious
	0.200	74	>75% Grass cover, Good, HSG C
	1.440	95	Weighted Average
	0.200		13.89% Pervious Area
	1.240		86.11% Impervious Area

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

Subcatchment 2S: Proposed to Treatment



Hydrograph for Subcatchment 2S: Proposed to Treatment

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.03	0.00	0.00
1.50	0.05	0.00	0.00
2.00	0.07	0.00	0.00
2.50	0.08	0.00	0.00
3.00	0.10	0.00	0.00
3.50	0.12	0.00	0.00
4.00	0.14	0.00	0.01
4.50	0.17	0.01	0.01
5.00	0.19	0.01	0.02
5.50	0.22	0.02	0.02
6.00	0.24	0.03	0.03
6.50	0.27	0.04	0.04
7.00	0.30	0.05	0.05
7.50	0.34	0.07	0.06
8.00	0.38	0.10	0.07
8.50	0.43	0.12	0.09
9.00	0.49	0.16	0.12
9.50	0.56	0.21	0.14
10.00	0.64	0.27	0.17
10.50	0.73	0.34	0.22
11.00	0.84	0.43	0.28
11.50	1.00	0.56	0.46
12.00	1.68	1.18	**2.79**
12.50	2.36	1.83	**0.94**
13.00	2.52	1.98	0.38
13.50	2.63	2.09	0.30
14.00	2.72	2.18	0.24
14.50	2.80	2.26	0.21
15.00	2.87	2.32	0.18
15.50	2.93	2.38	0.16
16.00	2.98	2.43	0.13
16.50	3.02	2.47	0.11
17.00	3.06	2.50	0.10
17.50	3.09	2.54	0.09
18.00	3.12	2.56	0.08
18.50	3.14	2.59	0.07
19.00	3.17	2.61	0.07
19.50	3.19	2.64	0.07
20.00	3.22	2.66	0.06
20.50	3.24	2.68	0.06
21.00	3.26	2.70	0.06
21.50	3.28	2.72	0.05
22.00	3.30	2.74	0.05
22.50	3.31	2.76	0.05
23.00	3.33	2.77	0.05
23.50	3.35	2.79	0.04
24.00	**3.36**	**2.80**	0.04
24.50	3.36	2.80	0.00
25.00	3.36	2.80	0.00
25.50	3.36	2.80	0.00
26.00	3.36	2.80	0.00
26.50	3.36	2.80	0.00
27.00	3.36	2.80	0.00
27.50	3.36	2.80	0.00
28.00	3.36	2.80	0.00
28.50	3.36	2.80	0.00
29.00	3.36	2.80	0.00
29.50	3.36	2.80	0.00
30.00	3.36	2.80	0.00
30.50	3.36	2.80	0.00
31.00	3.36	2.80	0.00
31.50	3.36	2.80	0.00
32.00	3.36	2.80	0.00
32.50	3.36	2.80	0.00
33.00	3.36	2.80	0.00
33.50	3.36	2.80	0.00
34.00	3.36	2.80	0.00
34.50	3.36	2.80	0.00
35.00	3.36	2.80	0.00
35.50	3.36	2.80	0.00
36.00	3.36	2.80	0.00
36.50	3.36	2.80	0.00
37.00	3.36	2.80	0.00
37.50	3.36	2.80	0.00
38.00	3.36	2.80	0.00
38.50	3.36	2.80	0.00
39.00	3.36	2.80	0.00
39.50	3.36	2.80	0.00
40.00	3.36	2.80	0.00
40.50	3.36	2.80	0.00
41.00	3.36	2.80	0.00
41.50	3.36	2.80	0.00
42.00	3.36	2.80	0.00
42.50	3.36	2.80	0.00
43.00	3.36	2.80	0.00
43.50	3.36	2.80	0.00
44.00	3.36	2.80	0.00
44.50	3.36	2.80	0.00
45.00	3.36	2.80	0.00
45.50	3.36	2.80	0.00
46.00	3.36	2.80	0.00
46.50	3.36	2.80	0.00
47.00	3.36	2.80	0.00
47.50	3.36	2.80	0.00
48.00	3.36	2.80	0.00

Summary for Subcatchment 3S: Proposed to Bypass

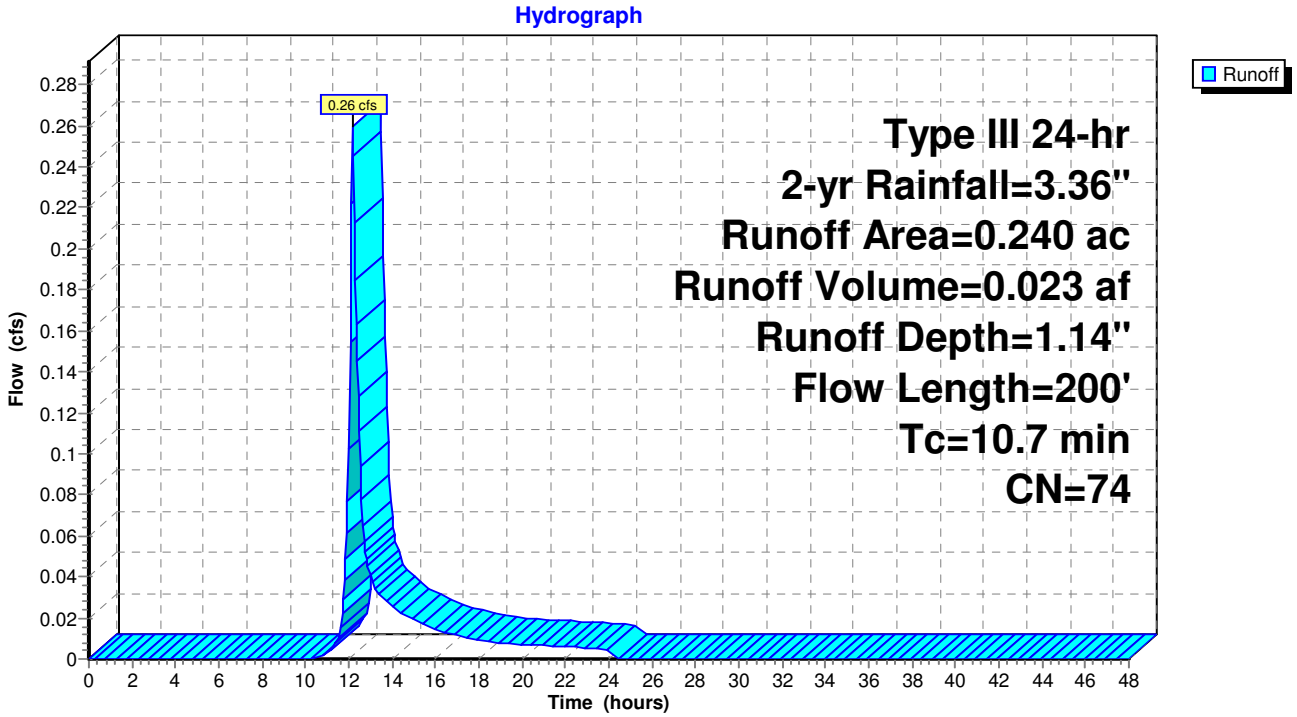
Runoff = 0.26 cfs @ 12.16 hrs, Volume= 0.023 af, Depth= 1.14"
Routed to Link 5L : Proposed Combined

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.36"

Area (ac)	CN	Description
0.240	74	>75% Grass cover, Good, HSG C
0.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0400	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
0.4	100	0.0700	4.26		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.7	200	Total			

Subcatchment 3S: Proposed to Bypass



Hydrograph for Subcatchment 3S: Proposed to Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.03	0.00	0.00
1.50	0.05	0.00	0.00
2.00	0.07	0.00	0.00
2.50	0.08	0.00	0.00
3.00	0.10	0.00	0.00
3.50	0.12	0.00	0.00
4.00	0.14	0.00	0.00
4.50	0.17	0.00	0.00
5.00	0.19	0.00	0.00
5.50	0.22	0.00	0.00
6.00	0.24	0.00	0.00
6.50	0.27	0.00	0.00
7.00	0.30	0.00	0.00
7.50	0.34	0.00	0.00
8.00	0.38	0.00	0.00
8.50	0.43	0.00	0.00
9.00	0.49	0.00	0.00
9.50	0.56	0.00	0.00
10.00	0.64	0.00	0.00
10.50	0.73	0.00	0.00
11.00	0.84	0.01	0.00
11.50	1.00	0.02	0.01
12.00	1.68	0.21	**0.10**
12.50	2.36	0.53	**0.11**
13.00	2.52	0.62	0.04
13.50	2.63	0.68	0.03
14.00	2.72	0.74	0.03
14.50	2.80	0.79	0.02
15.00	2.87	0.83	0.02
15.50	2.93	0.86	0.02
16.00	2.98	0.89	0.01
16.50	3.02	0.92	0.01
17.00	3.06	0.94	0.01
17.50	3.09	0.97	0.01
18.00	3.12	0.98	0.01
18.50	3.14	1.00	0.01
19.00	3.17	1.02	0.01
19.50	3.19	1.03	0.01
20.00	3.22	1.05	0.01
20.50	3.24	1.06	0.01
21.00	3.26	1.08	0.01
21.50	3.28	1.09	0.01
22.00	3.30	1.10	0.01
22.50	3.31	1.11	0.01
23.00	3.33	1.12	0.01
23.50	3.35	1.13	0.01
24.00	**3.36**	**1.14**	0.00
24.50	3.36	1.14	0.00
25.00	3.36	1.14	0.00
25.50	3.36	1.14	0.00
26.00	3.36	1.14	0.00
26.50	3.36	1.14	0.00
27.00	3.36	1.14	0.00
27.50	3.36	1.14	0.00
28.00	3.36	1.14	0.00
28.50	3.36	1.14	0.00
29.00	3.36	1.14	0.00
29.50	3.36	1.14	0.00
30.00	3.36	1.14	0.00
30.50	3.36	1.14	0.00
31.00	3.36	1.14	0.00
31.50	3.36	1.14	0.00
32.00	3.36	1.14	0.00
32.50	3.36	1.14	0.00
33.00	3.36	1.14	0.00
33.50	3.36	1.14	0.00
34.00	3.36	1.14	0.00
34.50	3.36	1.14	0.00
35.00	3.36	1.14	0.00
35.50	3.36	1.14	0.00
36.00	3.36	1.14	0.00
36.50	3.36	1.14	0.00
37.00	3.36	1.14	0.00
37.50	3.36	1.14	0.00
38.00	3.36	1.14	0.00
38.50	3.36	1.14	0.00
39.00	3.36	1.14	0.00
39.50	3.36	1.14	0.00
40.00	3.36	1.14	0.00
40.50	3.36	1.14	0.00
41.00	3.36	1.14	0.00
41.50	3.36	1.14	0.00
42.00	3.36	1.14	0.00
42.50	3.36	1.14	0.00
43.00	3.36	1.14	0.00
43.50	3.36	1.14	0.00
44.00	3.36	1.14	0.00
44.50	3.36	1.14	0.00
45.00	3.36	1.14	0.00
45.50	3.36	1.14	0.00
46.00	3.36	1.14	0.00
46.50	3.36	1.14	0.00
47.00	3.36	1.14	0.00
47.50	3.36	1.14	0.00
48.00	3.36	1.14	0.00

Summary for Pond 4P: Detention

Inflow Area = 1.440 ac, 86.11% Impervious, Inflow Depth = 2.80" for 2-yr event
Inflow = 4.36 cfs @ 12.09 hrs, Volume= 0.336 af
Outflow = 1.56 cfs @ 12.35 hrs, Volume= 0.336 af, Atten= 64%, Lag= 16.0 min
Primary = 1.56 cfs @ 12.35 hrs, Volume= 0.336 af
Routed to Link 5L : Proposed Combined

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 414.12' @ 12.35 hrs Surf.Area= 0.081 ac Storage= 0.067 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 11.5 min (791.0 - 779.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	411.50'	0.000 af	**31.09'W x 114.17'L x 6.58'H Field A** 0.536 af Overall - 0.240 af Embedded = 0.296 af x 0.0% Voids
#2A	412.00'	0.202 af	**ADS N-12 60"** x 20 Inside #1 Inside= 59.5"W x 59.5"H => 19.30 sf x 20.00'L = 386.0 cf Outside= 67.0"W x 67.0"H => 22.92 sf x 20.00'L = 458.4 cf 20 Chambers in 4 Rows 28.09' Header x 19.30 sf x 2 = 1,084.1 cf Inside
		0.202 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	412.00'	**15.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 412.00' / 408.00' S= 0.1000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	412.00'	**6.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	416.00'	**0.7' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 1	414.00'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	415.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.55 cfs @ 12.35 hrs HW=414.12' (Free Discharge)
└**1=Culvert** (Passes 1.55 cfs of 7.22 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.51 cfs @ 6.55 fps)
  ├**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  ├**4=Orifice/Grate** (Orifice Controls 0.05 cfs @ 1.17 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: Detention - Chamber Wizard Field A

Chamber Model = ADS N-12 60" (ADS N-12® Pipe)
Inside= 59.5"W x 59.5"H => 19.30 sf x 20.00'L = 386.0 cf
Outside= 67.0"W x 67.0"H => 22.92 sf x 20.00'L = 458.4 cf

67.0" Wide + 23.0" Spacing = 90.0" C-C Row Spacing

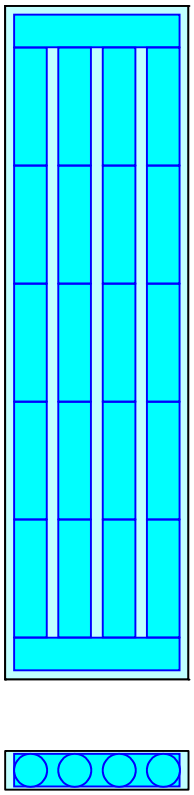
5 Chambers/Row x 20.00' Long +5.58' Header x 2 = 111.17' Row Length +18.0" End Stone x 2 = 114.17' Base Length
4 Rows x 67.0" Wide + 23.0" Spacing x 3 + 18.0" Side Stone x 2 = 31.09' Base Width
6.0" Stone Base + 67.0" Chamber Height + 6.0" Stone Cover = 6.58' Field Height

20 Chambers x 386.0 cf + 28.09' Header x 19.30 sf x 2 = 8,804.1 cf Chamber Storage
20 Chambers x 458.4 cf + 28.09' Header x 22.92 sf x 2 = 10,455.8 cf Displacement

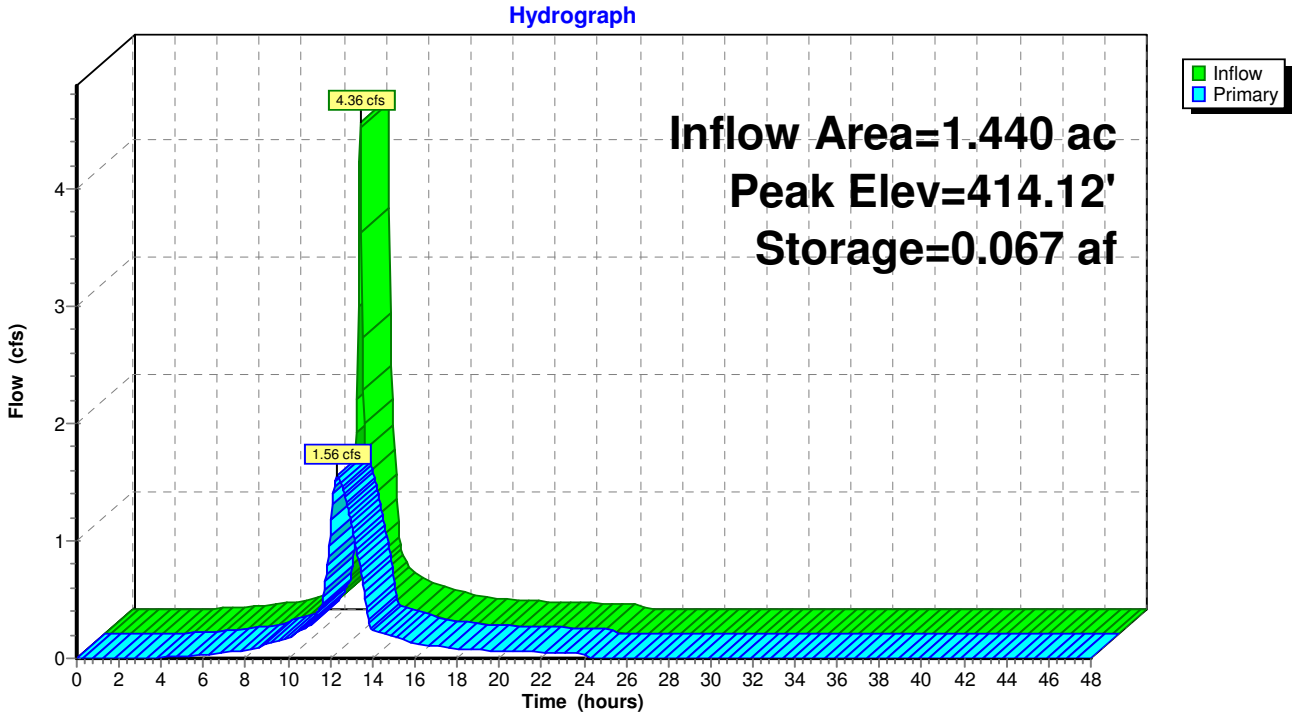
23,365.6 cf Field - 10,455.8 cf Chambers = 12,909.8 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 8,804.1 cf = 0.202 af
Overall Storage Efficiency = 37.7%
Overall System Size = 114.17' x 31.09' x 6.58'

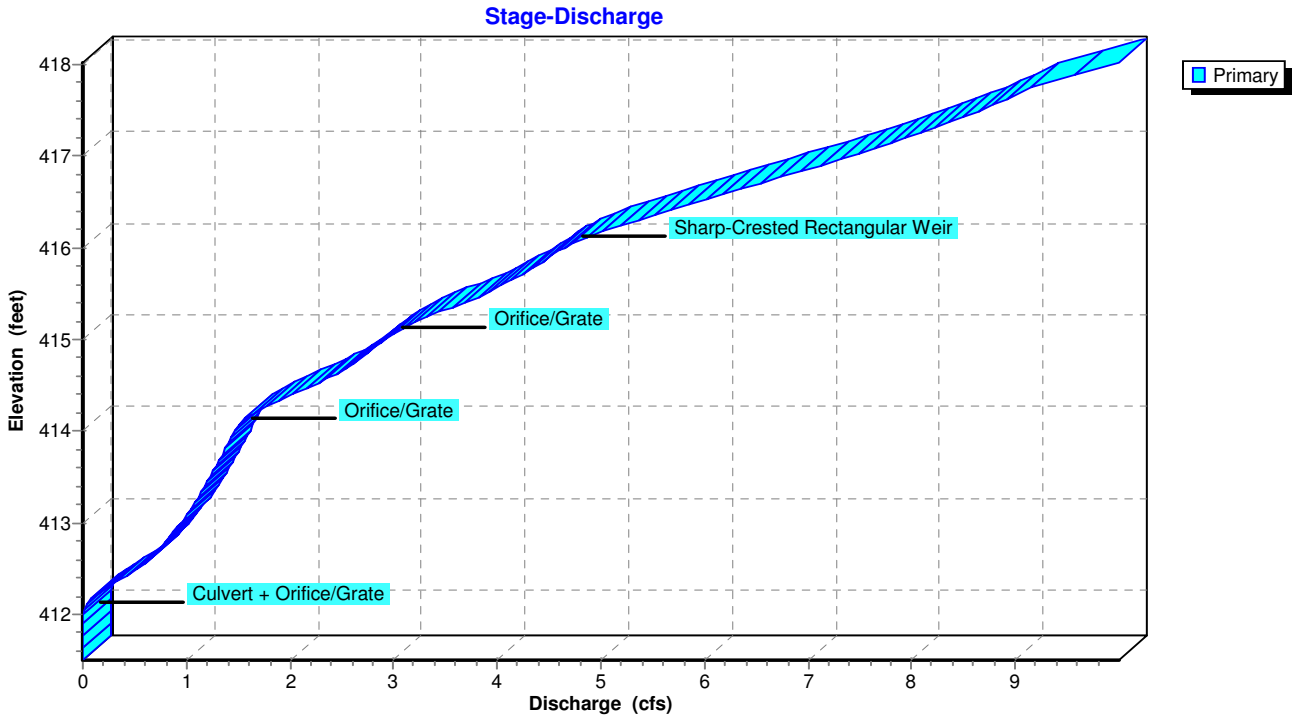
20 Chambers
865.4 cy Field
478.1 cy Stone



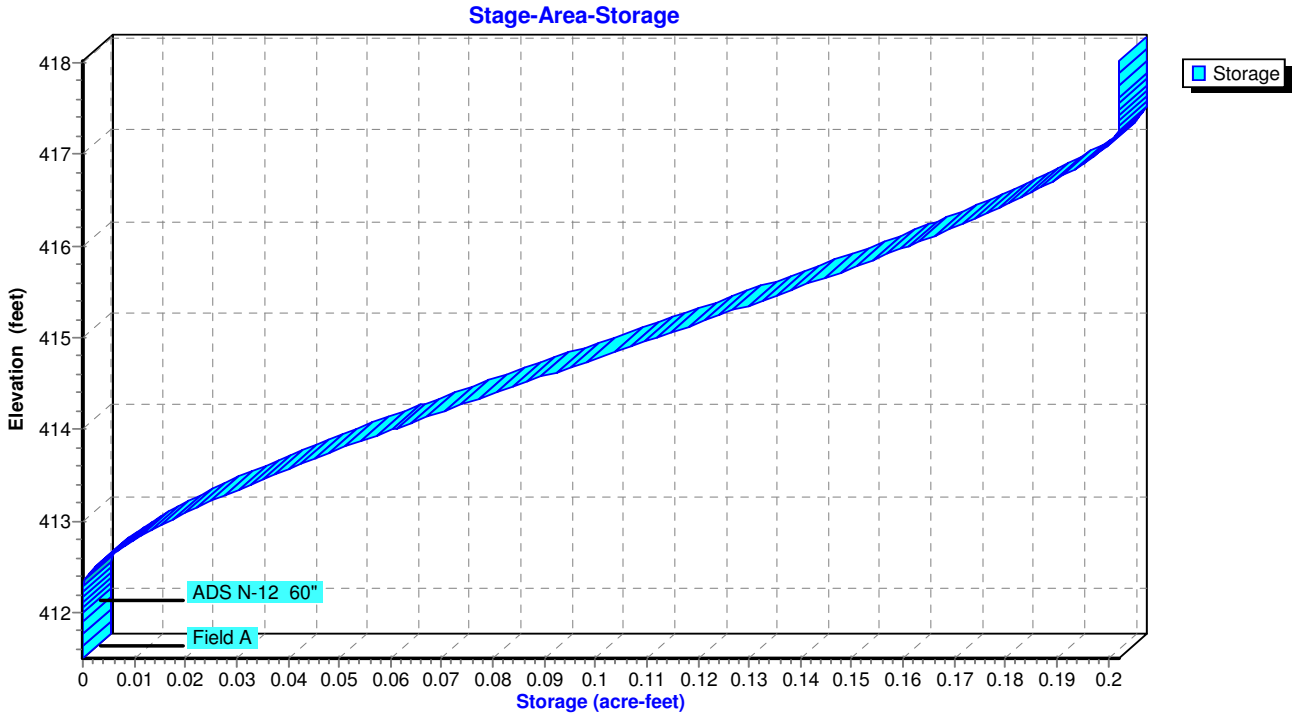
Pond 4P: Detention



Pond 4P: Detention



Pond 4P: Detention



Hydrograph for Pond 4P: Detention

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	411.50	0.00
1.00	0.00	0.000	411.50	0.00
2.00	0.00	0.000	411.50	0.00
3.00	0.00	0.000	411.50	0.00
4.00	0.01	0.000	412.05	0.01
5.00	0.02	0.000	412.07	0.02
6.00	0.03	0.000	412.09	0.03
7.00	0.05	0.000	412.12	0.05
8.00	0.07	0.000	412.15	0.07
9.00	0.12	0.000	412.20	0.12
10.00	0.17	0.000	412.25	0.17
11.00	0.28	0.000	412.33	0.28
12.00	**2.79**	**0.023**	**413.16**	**1.04**
13.00	**0.38**	**0.030**	**413.34**	**1.15**
14.00	0.24	0.000	412.30	0.24
15.00	0.18	0.000	412.25	0.18
16.00	0.13	0.000	412.21	0.13
17.00	0.10	0.000	412.18	0.10
18.00	0.08	0.000	412.16	0.08
19.00	0.07	0.000	412.15	0.07
20.00	0.06	0.000	412.14	0.06
21.00	0.06	0.000	412.13	0.06
22.00	0.05	0.000	412.13	0.05
23.00	0.05	0.000	412.12	0.05
24.00	0.04	0.000	412.11	0.04
25.00	0.00	0.000	412.00	0.00
26.00	0.00	0.000	412.00	0.00
27.00	0.00	0.000	412.00	0.00
28.00	0.00	0.000	412.00	0.00
29.00	0.00	0.000	412.00	0.00
30.00	0.00	0.000	412.00	0.00
31.00	0.00	0.000	412.00	0.00
32.00	0.00	0.000	412.00	0.00
33.00	0.00	0.000	412.00	0.00
34.00	0.00	0.000	412.00	0.00
35.00	0.00	0.000	412.00	0.00
36.00	0.00	0.000	412.00	0.00
37.00	0.00	0.000	412.00	0.00
38.00	0.00	0.000	412.00	0.00
39.00	0.00	0.000	412.00	0.00
40.00	0.00	0.000	412.00	0.00
41.00	0.00	0.000	412.00	0.00
42.00	0.00	0.000	412.00	0.00
43.00	0.00	0.000	412.00	0.00
44.00	0.00	0.000	412.00	0.00
45.00	0.00	0.000	412.00	0.00
46.00	0.00	0.000	412.00	0.00
47.00	0.00	0.000	412.00	0.00
48.00	0.00	0.000	412.00	0.00

Stage-Discharge for Pond 4P: Detention

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
411.50	0.00	414.10	1.53	416.70	6.54
411.55	0.00	414.15	1.59	416.75	6.69
411.60	0.00	414.20	1.66	416.80	6.84
411.65	0.00	414.25	1.75	416.85	6.99
411.70	0.00	414.30	1.84	416.90	7.13
411.75	0.00	414.35	1.94	416.95	7.28
411.80	0.00	414.40	2.04	417.00	7.42
411.85	0.00	414.45	2.14	417.05	7.56
411.90	0.00	414.50	2.24	417.10	7.69
411.95	0.00	414.55	2.33	417.15	7.82
412.00	0.00	414.60	2.41	417.20	7.96
412.05	0.01	414.65	2.48	417.25	8.08
412.10	0.03	414.70	2.55	417.30	8.21
412.15	0.07	414.75	2.62	417.35	8.33
412.20	0.12	414.80	2.68	417.40	8.44
412.25	0.18	414.85	2.74	417.45	8.56
412.30	0.24	414.90	2.80	417.50	8.66
412.35	0.32	414.95	2.86	417.55	8.77
412.40	0.39	415.00	2.92	417.60	8.87
412.45	0.47	415.05	2.98	417.65	8.96
412.50	0.54	415.10	3.05	417.70	9.05
412.55	0.59	415.15	3.14	417.75	9.13
412.60	0.64	415.20	3.24	417.80	9.29
412.65	0.68	415.25	3.34	417.85	9.45
412.70	0.73	415.30	3.45	417.90	9.61
412.75	0.77	415.35	3.57	417.95	9.78
412.80	0.81	415.40	3.68	418.00	9.94
412.85	0.84	415.45	3.79	418.05	**10.10**
412.90	0.88	415.50	3.88		
412.95	0.91	415.55	3.97		
413.00	0.95	415.60	4.06		
413.05	0.98	415.65	4.14		
413.10	1.01	415.70	4.22		
413.15	1.04	415.75	4.29		
413.20	1.07	415.80	4.37		
413.25	1.10	415.85	4.44		
413.30	1.13	415.90	4.51		
413.35	1.15	415.95	4.58		
413.40	1.18	416.00	4.64		
413.45	1.20	416.05	4.73		
413.50	1.23	416.10	4.84		
413.55	1.25	416.15	4.96		
413.60	1.28	416.20	5.09		
413.65	1.30	416.25	5.23		
413.70	1.33	416.30	5.36		
413.75	1.35	416.35	5.51		
413.80	1.37	416.40	5.65		
413.85	1.39	416.45	5.80		
413.90	1.42	416.50	5.94		
413.95	1.44	416.55	6.09		
414.00	1.46	416.60	6.24		
414.05	1.49	416.65	6.39		

Stage-Area-Storage for Pond 4P: Detention

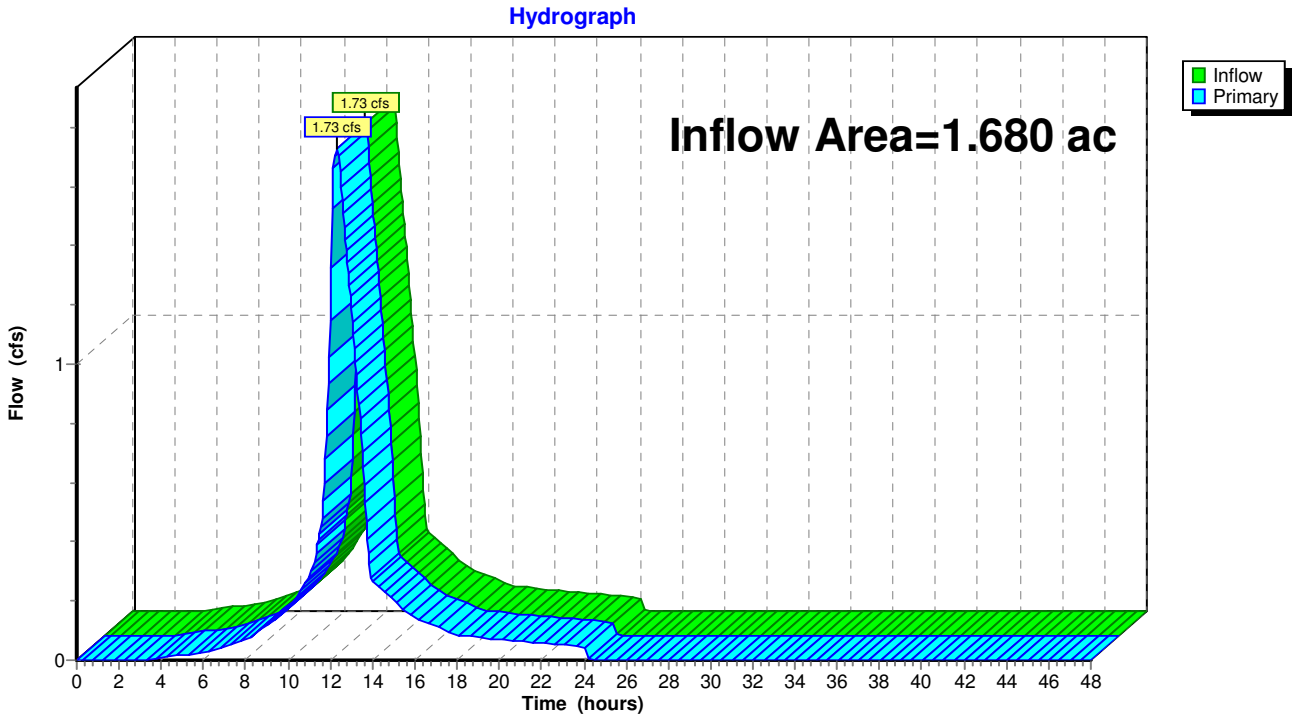
Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
411.50	0.000	414.10	0.066	416.70	0.189
411.55	0.000	414.15	0.068	416.75	0.191
411.60	0.000	414.20	0.071	416.80	0.192
411.65	0.000	414.25	0.073	416.85	0.194
411.70	0.000	414.30	0.076	416.90	0.195
411.75	0.000	414.35	0.078	416.95	0.197
411.80	0.000	414.40	0.081	417.00	0.198
411.85	0.000	414.45	0.083	417.05	0.199
411.90	0.000	414.50	0.086	417.10	0.200
411.95	0.000	414.55	0.089	417.15	0.201
412.00	0.000	414.60	0.091	417.20	0.202
412.05	0.000	414.65	0.094	417.25	0.202
412.10	0.000	414.70	0.096	417.30	**0.202**
412.15	0.000	414.75	0.099	417.35	0.202
412.20	0.000	414.80	0.101	417.40	0.202
412.25	0.000	414.85	0.104	417.45	0.202
412.30	0.000	414.90	0.107	417.50	0.202
412.35	0.000	414.95	0.109	417.55	0.202
412.40	0.001	415.00	0.112	417.60	0.202
412.45	0.002	415.05	0.114	417.65	0.202
412.50	0.002	415.10	0.117	417.70	0.202
412.55	0.004	415.15	0.120	417.75	0.202
412.60	0.005	415.20	0.122	417.80	0.202
412.65	0.006	415.25	0.125	417.85	0.202
412.70	0.007	415.30	0.127	417.90	0.202
412.75	0.009	415.35	0.130	417.95	0.202
412.80	0.010	415.40	0.132	418.00	0.202
412.85	0.012	415.45	0.135	418.05	0.202
412.90	0.013	415.50	0.137		
412.95	0.015	415.55	0.140		
413.00	0.017	415.60	0.142		
413.05	0.019	415.65	0.145		
413.10	0.021	415.70	0.147		
413.15	0.023	415.75	0.150		
413.20	0.025	415.80	0.152		
413.25	0.027	415.85	0.154		
413.30	0.029	415.90	0.157		
413.35	0.031	415.95	0.159		
413.40	0.033	416.00	0.161		
413.45	0.035	416.05	0.163		
413.50	0.037	416.10	0.166		
413.55	0.039	416.15	0.168		
413.60	0.042	416.20	0.170		
413.65	0.044	416.25	0.172		
413.70	0.046	416.30	0.174		
413.75	0.049	416.35	0.176		
413.80	0.051	416.40	0.178		
413.85	0.053	416.45	0.180		
413.90	0.056	416.50	0.182		
413.95	0.058	416.55	0.184		
414.00	0.061	416.60	0.186		
414.05	0.063	416.65	0.188		

Summary for Link 5L: Proposed Combined

Inflow Area = 1.680 ac, 73.81% Impervious, Inflow Depth = 2.56" for 2-yr event
Inflow = 1.73 cfs @ 12.29 hrs, Volume= 0.359 af
Primary = 1.73 cfs @ 12.29 hrs, Volume= 0.359 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 5L: Proposed Combined



Hydrograph for Link 5L: Proposed Combined

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.00	0.00	0.00	27.00	0.00	0.00	0.00
1.50	0.00	0.00	0.00	27.50	0.00	0.00	0.00
2.00	0.00	0.00	0.00	28.00	0.00	0.00	0.00
2.50	0.00	0.00	0.00	28.50	0.00	0.00	0.00
3.00	0.00	0.00	0.00	29.00	0.00	0.00	0.00
3.50	0.00	0.00	0.00	29.50	0.00	0.00	0.00
4.00	0.01	0.00	0.01	30.00	0.00	0.00	0.00
4.50	0.01	0.00	0.01	30.50	0.00	0.00	0.00
5.00	0.02	0.00	0.02	31.00	0.00	0.00	0.00
5.50	0.02	0.00	0.02	31.50	0.00	0.00	0.00
6.00	0.03	0.00	0.03	32.00	0.00	0.00	0.00
6.50	0.04	0.00	0.04	32.50	0.00	0.00	0.00
7.00	0.05	0.00	0.05	33.00	0.00	0.00	0.00
7.50	0.06	0.00	0.06	33.50	0.00	0.00	0.00
8.00	0.07	0.00	0.07	34.00	0.00	0.00	0.00
8.50	0.09	0.00	0.09	34.50	0.00	0.00	0.00
9.00	0.12	0.00	0.12	35.00	0.00	0.00	0.00
9.50	0.14	0.00	0.14	35.50	0.00	0.00	0.00
10.00	0.17	0.00	0.17	36.00	0.00	0.00	0.00
10.50	0.22	0.00	0.22	36.50	0.00	0.00	0.00
11.00	0.28	0.00	0.28	37.00	0.00	0.00	0.00
11.50	0.43	0.00	0.43	37.50	0.00	0.00	0.00
12.00	**1.15**	0.00	**1.15**	38.00	0.00	0.00	0.00
12.50	**1.60**	0.00	**1.60**	38.50	0.00	0.00	0.00
13.00	1.19	0.00	1.19	39.00	0.00	0.00	0.00
13.50	0.71	0.00	0.71	39.50	0.00	0.00	0.00
14.00	0.27	0.00	0.27	40.00	0.00	0.00	0.00
14.50	0.23	0.00	0.23	40.50	0.00	0.00	0.00
15.00	0.20	0.00	0.20	41.00	0.00	0.00	0.00
15.50	0.17	0.00	0.17	41.50	0.00	0.00	0.00
16.00	0.14	0.00	0.14	42.00	0.00	0.00	0.00
16.50	0.13	0.00	0.13	42.50	0.00	0.00	0.00
17.00	0.11	0.00	0.11	43.00	0.00	0.00	0.00
17.50	0.10	0.00	0.10	43.50	0.00	0.00	0.00
18.00	0.09	0.00	0.09	44.00	0.00	0.00	0.00
18.50	0.08	0.00	0.08	44.50	0.00	0.00	0.00
19.00	0.08	0.00	0.08	45.00	0.00	0.00	0.00
19.50	0.07	0.00	0.07	45.50	0.00	0.00	0.00
20.00	0.07	0.00	0.07	46.00	0.00	0.00	0.00
20.50	0.07	0.00	0.07	46.50	0.00	0.00	0.00
21.00	0.06	0.00	0.06	47.00	0.00	0.00	0.00
21.50	0.06	0.00	0.06	47.50	0.00	0.00	0.00
22.00	0.06	0.00	0.06	48.00	0.00	0.00	0.00
22.50	0.05	0.00	0.05				
23.00	0.05	0.00	0.05				
23.50	0.05	0.00	0.05				
24.00	0.05	0.00	0.05				
24.50	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Existing Runoff Area=1.680 ac 27.98% Impervious Runoff Depth=2.14"
Flow Length=367' Tc=11.4 min CN=79 Runoff=3.49 cfs 0.299 af

Subcatchment 2S: Proposed to Treatment Runoff Area=1.440 ac 86.11% Impervious Runoff Depth=3.64"
Tc=6.0 min CN=95 Runoff=5.57 cfs 0.437 af

Subcatchment 3S: Proposed to Bypass Runoff Area=0.240 ac 0.00% Impervious Runoff Depth=1.75"
Flow Length=200' Tc=10.7 min CN=74 Runoff=0.41 cfs 0.035 af

Pond 4P: Detention Peak Elev=414.53' Storage=0.087 af Inflow=5.57 cfs 0.437 af
Outflow=2.30 cfs 0.437 af

Link 5L: Proposed Combined Inflow=2.60 cfs 0.472 af
Primary=2.60 cfs 0.472 af

Total Runoff Area = 3.360 ac Runoff Volume = 0.771 af Average Runoff Depth = 2.75"
49.11% Pervious = 1.650 ac 50.89% Impervious = 1.710 ac

Summary for Subcatchment 1S: Existing

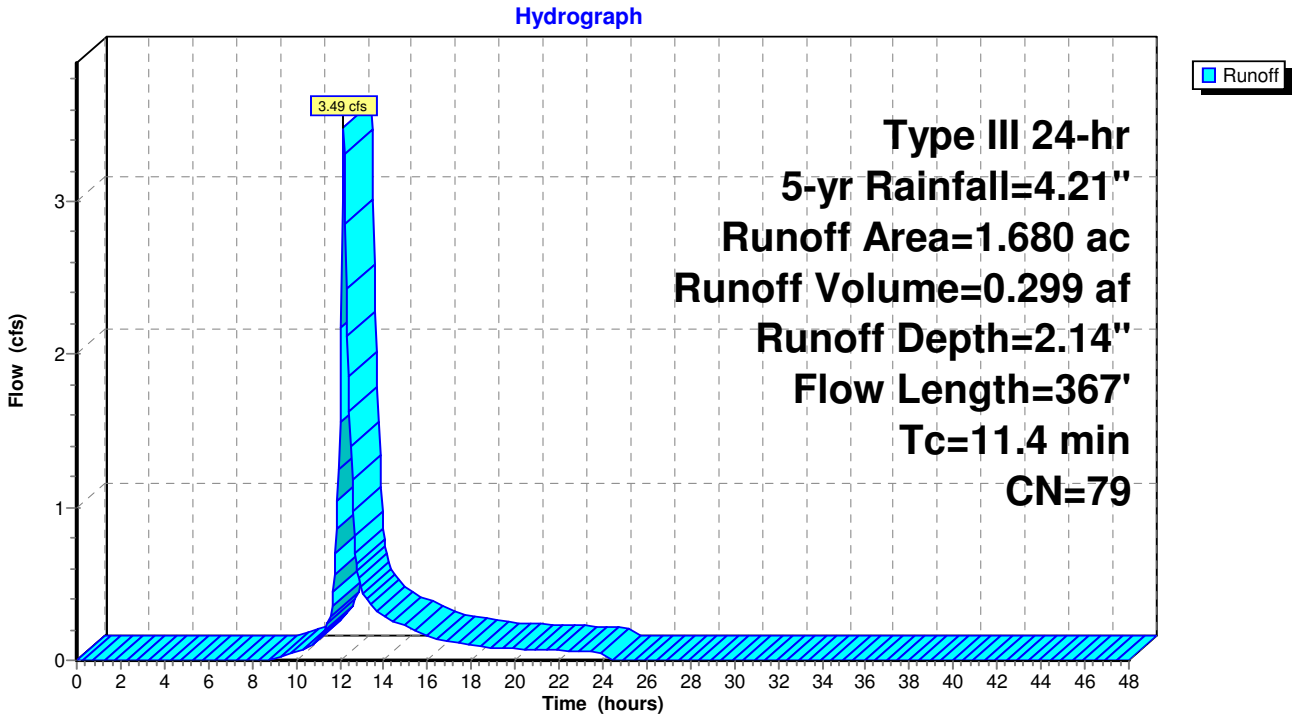
Runoff = 3.49 cfs @ 12.16 hrs, Volume= 0.299 af, Depth= 2.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-yr Rainfall=4.21"

	Area (ac)	CN	Description
*	0.470	98	Impervious
	0.520	70	Woods, Good, HSG C
	0.690	74	>75% Grass cover, Good, HSG C
	1.680	79	Weighted Average
	1.210		72.02% Pervious Area
	0.470		27.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0400	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
1.1	267	0.0600	3.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
11.4	367	Total			

Subcatchment 1S: Existing



Hydrograph for Subcatchment 1S: Existing

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.00	0.00
2.50	0.11	0.00	0.00
3.00	0.13	0.00	0.00
3.50	0.15	0.00	0.00
4.00	0.18	0.00	0.00
4.50	0.21	0.00	0.00
5.00	0.24	0.00	0.00
5.50	0.27	0.00	0.00
6.00	0.30	0.00	0.00
6.50	0.34	0.00	0.00
7.00	0.38	0.00	0.00
7.50	0.43	0.00	0.00
8.00	0.48	0.00	0.00
8.50	0.54	0.00	0.00
9.00	0.61	0.00	0.01
9.50	0.70	0.01	0.03
10.00	0.80	0.02	0.05
10.50	0.91	0.05	0.09
11.00	1.05	0.09	0.14
11.50	1.25	0.15	0.26
12.00	2.10	0.58	**1.56**
12.50	2.96	1.16	**1.40**
13.00	3.16	1.30	0.47
13.50	3.30	1.41	0.35
14.00	3.41	1.50	0.29
14.50	3.51	1.57	0.25
15.00	3.60	1.64	0.22
15.50	3.67	1.70	0.19
16.00	3.73	1.75	0.16
16.50	3.78	1.79	0.14
17.00	3.83	1.83	0.12
17.50	3.87	1.86	0.11
18.00	3.91	1.89	0.10
18.50	3.94	1.91	0.09
19.00	3.97	1.94	0.09
19.50	4.00	1.96	0.08
20.00	4.03	1.99	0.08
20.50	4.06	2.01	0.07
21.00	4.08	2.03	0.07
21.50	4.11	2.05	0.07
22.00	4.13	2.07	0.06
22.50	4.15	2.09	0.06
23.00	4.17	2.10	0.06
23.50	4.19	2.12	0.05
24.00	**4.21**	**2.14**	0.05
24.50	4.21	2.14	0.00
25.00	4.21	2.14	0.00
25.50	4.21	2.14	0.00
26.00	4.21	2.14	0.00
26.50	4.21	2.14	0.00
27.00	4.21	2.14	0.00
27.50	4.21	2.14	0.00
28.00	4.21	2.14	0.00
28.50	4.21	2.14	0.00
29.00	4.21	2.14	0.00
29.50	4.21	2.14	0.00
30.00	4.21	2.14	0.00
30.50	4.21	2.14	0.00
31.00	4.21	2.14	0.00
31.50	4.21	2.14	0.00
32.00	4.21	2.14	0.00
32.50	4.21	2.14	0.00
33.00	4.21	2.14	0.00
33.50	4.21	2.14	0.00
34.00	4.21	2.14	0.00
34.50	4.21	2.14	0.00
35.00	4.21	2.14	0.00
35.50	4.21	2.14	0.00
36.00	4.21	2.14	0.00
36.50	4.21	2.14	0.00
37.00	4.21	2.14	0.00
37.50	4.21	2.14	0.00
38.00	4.21	2.14	0.00
38.50	4.21	2.14	0.00
39.00	4.21	2.14	0.00
39.50	4.21	2.14	0.00
40.00	4.21	2.14	0.00
40.50	4.21	2.14	0.00
41.00	4.21	2.14	0.00
41.50	4.21	2.14	0.00
42.00	4.21	2.14	0.00
42.50	4.21	2.14	0.00
43.00	4.21	2.14	0.00
43.50	4.21	2.14	0.00
44.00	4.21	2.14	0.00
44.50	4.21	2.14	0.00
45.00	4.21	2.14	0.00
45.50	4.21	2.14	0.00
46.00	4.21	2.14	0.00
46.50	4.21	2.14	0.00
47.00	4.21	2.14	0.00
47.50	4.21	2.14	0.00
48.00	4.21	2.14	0.00

Summary for Subcatchment 2S: Proposed to Treatment

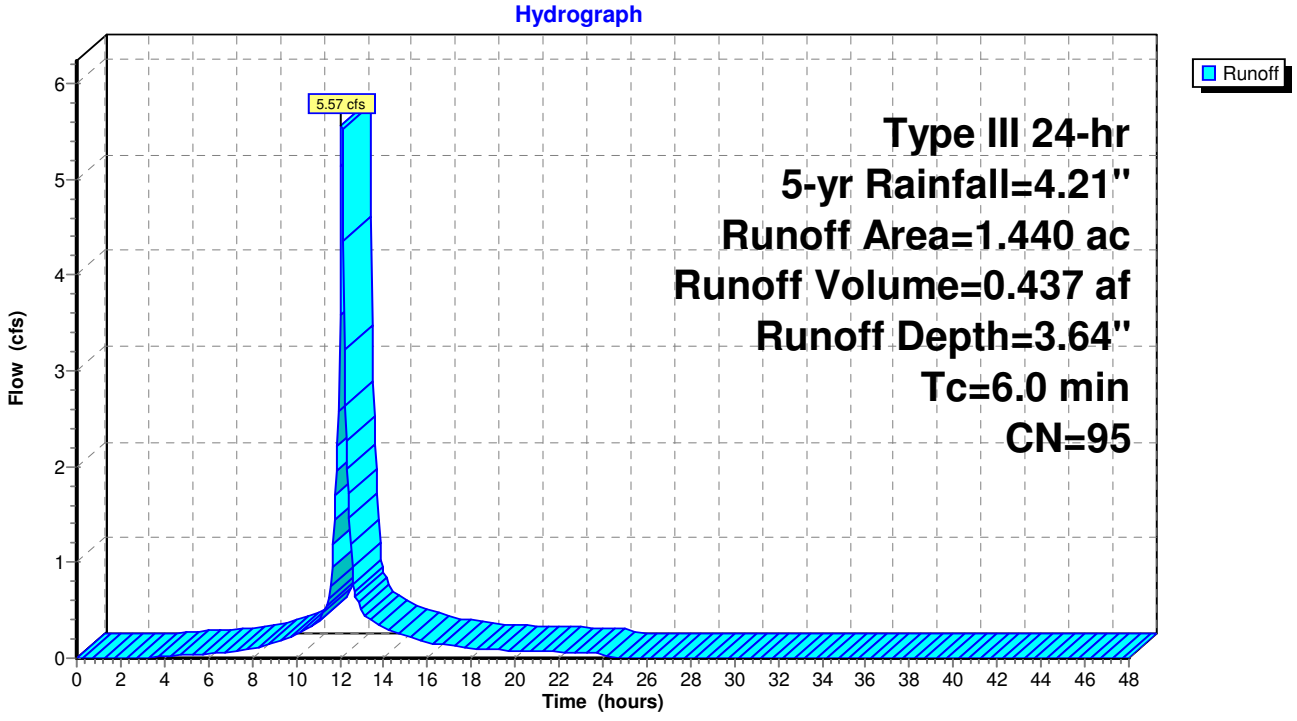
Runoff = 5.57 cfs @ 12.09 hrs, Volume= 0.437 af, Depth= 3.64"
Routed to Pond 4P : Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-yr Rainfall=4.21"

	Area (ac)	CN	Description
*	1.240	98	Impervious
	0.200	74	>75% Grass cover, Good, HSG C
	1.440	95	Weighted Average
	0.200		13.89% Pervious Area
	1.240		86.11% Impervious Area

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

Subcatchment 2S: Proposed to Treatment



Hydrograph for Subcatchment 2S: Proposed to Treatment

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.00	0.00
2.50	0.11	0.00	0.00
3.00	0.13	0.00	0.00
3.50	0.15	0.00	0.01
4.00	0.18	0.01	0.02
4.50	0.21	0.02	0.02
5.00	0.24	0.03	0.03
5.50	0.27	0.04	0.04
6.00	0.30	0.05	0.04
6.50	0.34	0.07	0.06
7.00	0.38	0.09	0.07
7.50	0.43	0.12	0.09
8.00	0.48	0.16	0.10
8.50	0.54	0.20	0.13
9.00	0.61	0.25	0.16
9.50	0.70	0.31	0.20
10.00	0.80	0.39	0.24
10.50	0.91	0.49	0.30
11.00	1.05	0.61	0.38
11.50	1.25	0.79	0.61
12.00	2.10	1.58	**3.59**
12.50	2.96	2.41	**1.20**
13.00	3.16	2.60	0.49
13.50	3.30	2.74	0.38
14.00	3.41	2.85	0.31
14.50	3.51	2.95	0.27
15.00	3.60	3.03	0.23
15.50	3.67	3.11	0.20
16.00	3.73	3.17	0.16
16.50	3.78	3.22	0.14
17.00	3.83	3.26	0.13
17.50	3.87	3.30	0.11
18.00	3.91	3.34	0.10
18.50	3.94	3.37	0.09
19.00	3.97	3.40	0.09
19.50	4.00	3.43	0.08
20.00	4.03	3.46	0.08
20.50	4.06	3.49	0.08
21.00	4.08	3.51	0.07
21.50	4.11	3.54	0.07
22.00	4.13	3.56	0.07
22.50	4.15	3.58	0.06
23.00	4.17	3.60	0.06
23.50	4.19	3.62	0.06
24.00	**4.21**	**3.64**	0.05
24.50	4.21	3.64	0.00
25.00	4.21	3.64	0.00
25.50	4.21	3.64	0.00
26.00	4.21	3.64	0.00
26.50	4.21	3.64	0.00
27.00	4.21	3.64	0.00
27.50	4.21	3.64	0.00
28.00	4.21	3.64	0.00
28.50	4.21	3.64	0.00
29.00	4.21	3.64	0.00
29.50	4.21	3.64	0.00
30.00	4.21	3.64	0.00
30.50	4.21	3.64	0.00
31.00	4.21	3.64	0.00
31.50	4.21	3.64	0.00
32.00	4.21	3.64	0.00
32.50	4.21	3.64	0.00
33.00	4.21	3.64	0.00
33.50	4.21	3.64	0.00
34.00	4.21	3.64	0.00
34.50	4.21	3.64	0.00
35.00	4.21	3.64	0.00
35.50	4.21	3.64	0.00
36.00	4.21	3.64	0.00
36.50	4.21	3.64	0.00
37.00	4.21	3.64	0.00
37.50	4.21	3.64	0.00
38.00	4.21	3.64	0.00
38.50	4.21	3.64	0.00
39.00	4.21	3.64	0.00
39.50	4.21	3.64	0.00
40.00	4.21	3.64	0.00
40.50	4.21	3.64	0.00
41.00	4.21	3.64	0.00
41.50	4.21	3.64	0.00
42.00	4.21	3.64	0.00
42.50	4.21	3.64	0.00
43.00	4.21	3.64	0.00
43.50	4.21	3.64	0.00
44.00	4.21	3.64	0.00
44.50	4.21	3.64	0.00
45.00	4.21	3.64	0.00
45.50	4.21	3.64	0.00
46.00	4.21	3.64	0.00
46.50	4.21	3.64	0.00
47.00	4.21	3.64	0.00
47.50	4.21	3.64	0.00
48.00	4.21	3.64	0.00

Summary for Subcatchment 3S: Proposed to Bypass

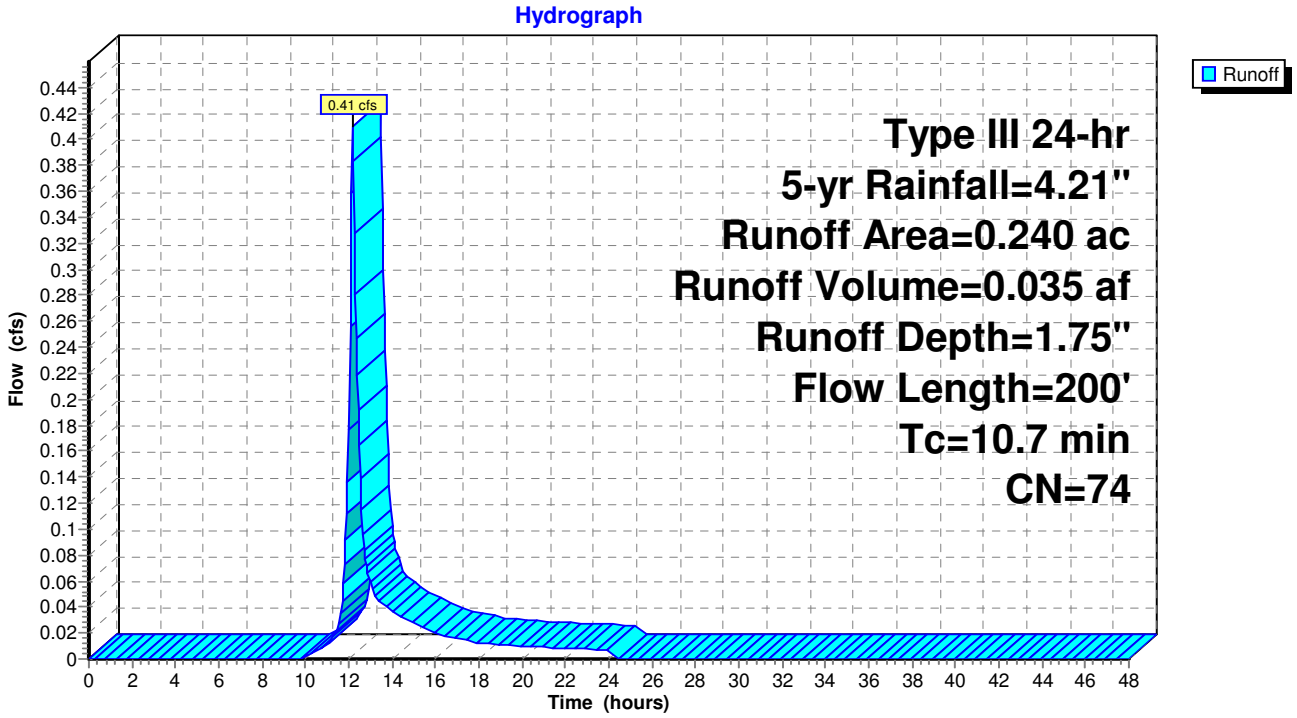
Runoff = 0.41 cfs @ 12.16 hrs, Volume= 0.035 af, Depth= 1.75"
Routed to Link 5L : Proposed Combined

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-yr Rainfall=4.21"

Area (ac)	CN	Description
0.240	74	>75% Grass cover, Good, HSG C
0.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0400	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
0.4	100	0.0700	4.26		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.7	200	Total			

Subcatchment 3S: Proposed to Bypass



Hydrograph for Subcatchment 3S: Proposed to Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.00	0.00
2.50	0.11	0.00	0.00
3.00	0.13	0.00	0.00
3.50	0.15	0.00	0.00
4.00	0.18	0.00	0.00
4.50	0.21	0.00	0.00
5.00	0.24	0.00	0.00
5.50	0.27	0.00	0.00
6.00	0.30	0.00	0.00
6.50	0.34	0.00	0.00
7.00	0.38	0.00	0.00
7.50	0.43	0.00	0.00
8.00	0.48	0.00	0.00
8.50	0.54	0.00	0.00
9.00	0.61	0.00	0.00
9.50	0.70	0.00	0.00
10.00	0.80	0.00	0.00
10.50	0.91	0.01	0.01
11.00	1.05	0.03	0.01
11.50	1.25	0.07	0.02
12.00	2.10	0.40	**0.18**
12.50	2.96	0.88	**0.17**
13.00	3.16	1.01	0.06
13.50	3.30	1.10	0.04
14.00	3.41	1.18	0.04
14.50	3.51	1.25	0.03
15.00	3.60	1.31	0.03
15.50	3.67	1.36	0.02
16.00	3.73	1.40	0.02
16.50	3.78	1.44	0.02
17.00	3.83	1.47	0.02
17.50	3.87	1.50	0.01
18.00	3.91	1.53	0.01
18.50	3.94	1.55	0.01
19.00	3.97	1.58	0.01
19.50	4.00	1.60	0.01
20.00	4.03	1.62	0.01
20.50	4.06	1.64	0.01
21.00	4.08	1.66	0.01
21.50	4.11	1.67	0.01
22.00	4.13	1.69	0.01
22.50	4.15	1.71	0.01
23.00	4.17	1.72	0.01
23.50	4.19	1.74	0.01
24.00	**4.21**	**1.75**	0.01
24.50	4.21	1.75	0.00
25.00	4.21	1.75	0.00
25.50	4.21	1.75	0.00
26.00	4.21	1.75	0.00
26.50	4.21	1.75	0.00
27.00	4.21	1.75	0.00
27.50	4.21	1.75	0.00
28.00	4.21	1.75	0.00
28.50	4.21	1.75	0.00
29.00	4.21	1.75	0.00
29.50	4.21	1.75	0.00
30.00	4.21	1.75	0.00
30.50	4.21	1.75	0.00
31.00	4.21	1.75	0.00
31.50	4.21	1.75	0.00
32.00	4.21	1.75	0.00
32.50	4.21	1.75	0.00
33.00	4.21	1.75	0.00
33.50	4.21	1.75	0.00
34.00	4.21	1.75	0.00
34.50	4.21	1.75	0.00
35.00	4.21	1.75	0.00
35.50	4.21	1.75	0.00
36.00	4.21	1.75	0.00
36.50	4.21	1.75	0.00
37.00	4.21	1.75	0.00
37.50	4.21	1.75	0.00
38.00	4.21	1.75	0.00
38.50	4.21	1.75	0.00
39.00	4.21	1.75	0.00
39.50	4.21	1.75	0.00
40.00	4.21	1.75	0.00
40.50	4.21	1.75	0.00
41.00	4.21	1.75	0.00
41.50	4.21	1.75	0.00
42.00	4.21	1.75	0.00
42.50	4.21	1.75	0.00
43.00	4.21	1.75	0.00
43.50	4.21	1.75	0.00
44.00	4.21	1.75	0.00
44.50	4.21	1.75	0.00
45.00	4.21	1.75	0.00
45.50	4.21	1.75	0.00
46.00	4.21	1.75	0.00
46.50	4.21	1.75	0.00
47.00	4.21	1.75	0.00
47.50	4.21	1.75	0.00
48.00	4.21	1.75	0.00

Summary for Pond 4P: Detention

Inflow Area = 1.440 ac, 86.11% Impervious, Inflow Depth = 3.64" for 5-yr event
Inflow = 5.57 cfs @ 12.09 hrs, Volume= 0.437 af
Outflow = 2.30 cfs @ 12.30 hrs, Volume= 0.437 af, Atten= 59%, Lag= 12.8 min
Primary = 2.30 cfs @ 12.30 hrs, Volume= 0.437 af
Routed to Link 5L : Proposed Combined

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 414.53' @ 12.30 hrs Surf.Area= 0.081 ac Storage= 0.087 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 12.8 min (785.7 - 772.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	411.50'	0.000 af	**31.09'W x 114.17'L x 6.58'H Field A** 0.536 af Overall - 0.240 af Embedded = 0.296 af x 0.0% Voids
#2A	412.00'	0.202 af	**ADS N-12 60"** x 20 Inside #1 Inside= 59.5"W x 59.5"H => 19.30 sf x 20.00'L = 386.0 cf Outside= 67.0"W x 67.0"H => 22.92 sf x 20.00'L = 458.4 cf 20 Chambers in 4 Rows 28.09' Header x 19.30 sf x 2 = 1,084.1 cf Inside
		0.202 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	412.00'	**15.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 412.00' / 408.00' S= 0.1000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	412.00'	**6.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	416.00'	**0.7' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 1	414.00'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	415.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.29 cfs @ 12.30 hrs HW=414.53' (Free Discharge)
└**1=Culvert** (Passes 2.29 cfs of 8.15 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.67 cfs @ 7.23 fps)
  ├**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  ├**4=Orifice/Grate** (Orifice Controls 0.63 cfs @ 2.47 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: Detention - Chamber Wizard Field A

Chamber Model = ADS N-12 60" (ADS N-12® Pipe)
Inside= 59.5"W x 59.5"H => 19.30 sf x 20.00'L = 386.0 cf
Outside= 67.0"W x 67.0"H => 22.92 sf x 20.00'L = 458.4 cf

67.0" Wide + 23.0" Spacing = 90.0" C-C Row Spacing

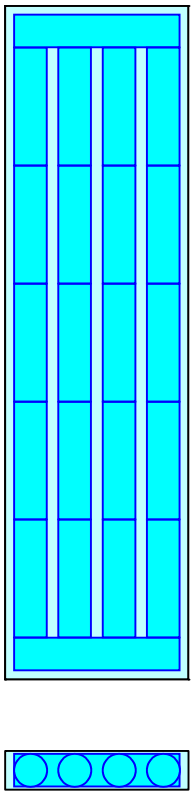
5 Chambers/Row x 20.00' Long +5.58' Header x 2 = 111.17' Row Length +18.0" End Stone x 2 = 114.17' Base Length
4 Rows x 67.0" Wide + 23.0" Spacing x 3 + 18.0" Side Stone x 2 = 31.09' Base Width
6.0" Stone Base + 67.0" Chamber Height + 6.0" Stone Cover = 6.58' Field Height

20 Chambers x 386.0 cf + 28.09' Header x 19.30 sf x 2 = 8,804.1 cf Chamber Storage
20 Chambers x 458.4 cf + 28.09' Header x 22.92 sf x 2 = 10,455.8 cf Displacement

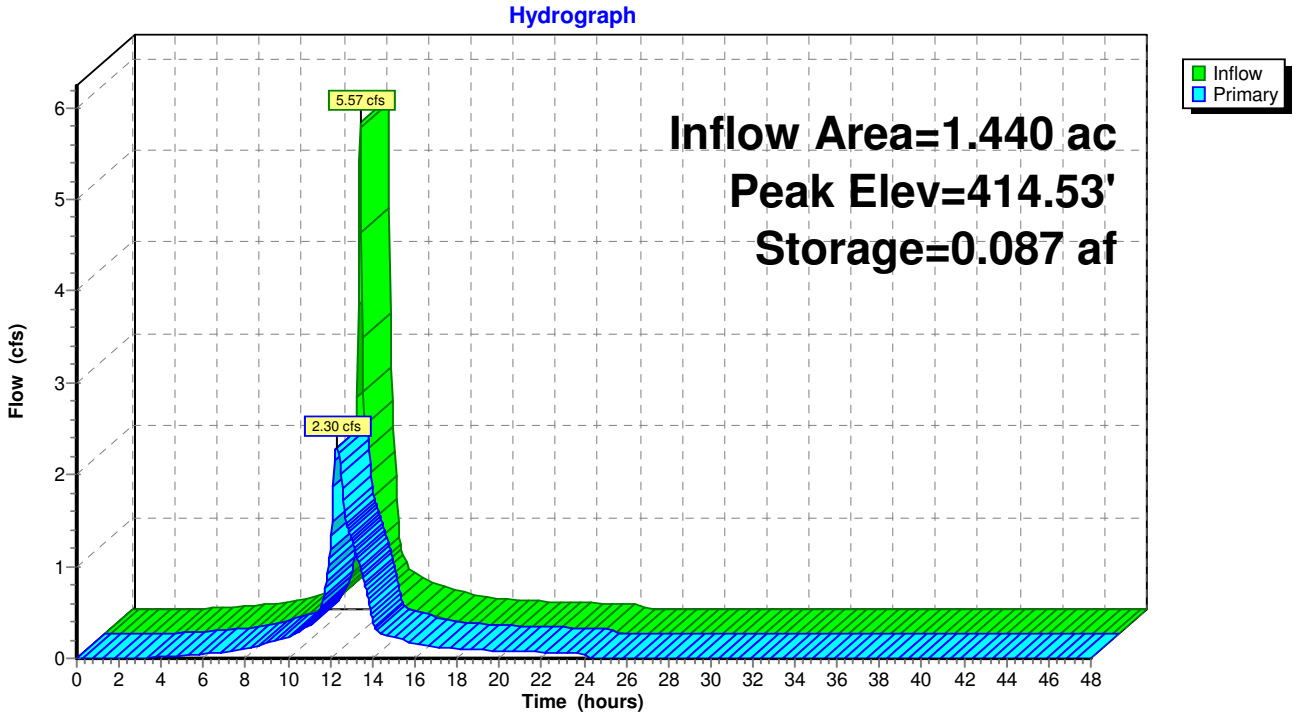
23,365.6 cf Field - 10,455.8 cf Chambers = 12,909.8 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 8,804.1 cf = 0.202 af
Overall Storage Efficiency = 37.7%
Overall System Size = 114.17' x 31.09' x 6.58'

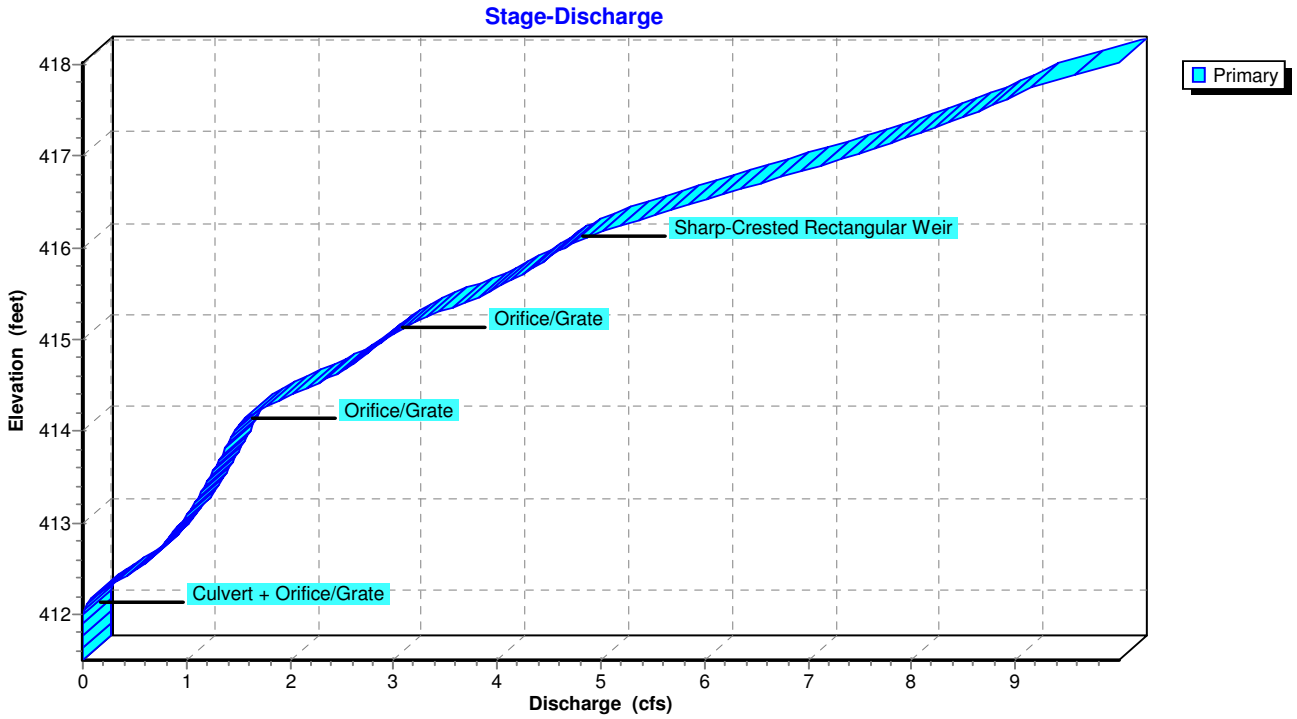
20 Chambers
865.4 cy Field
478.1 cy Stone



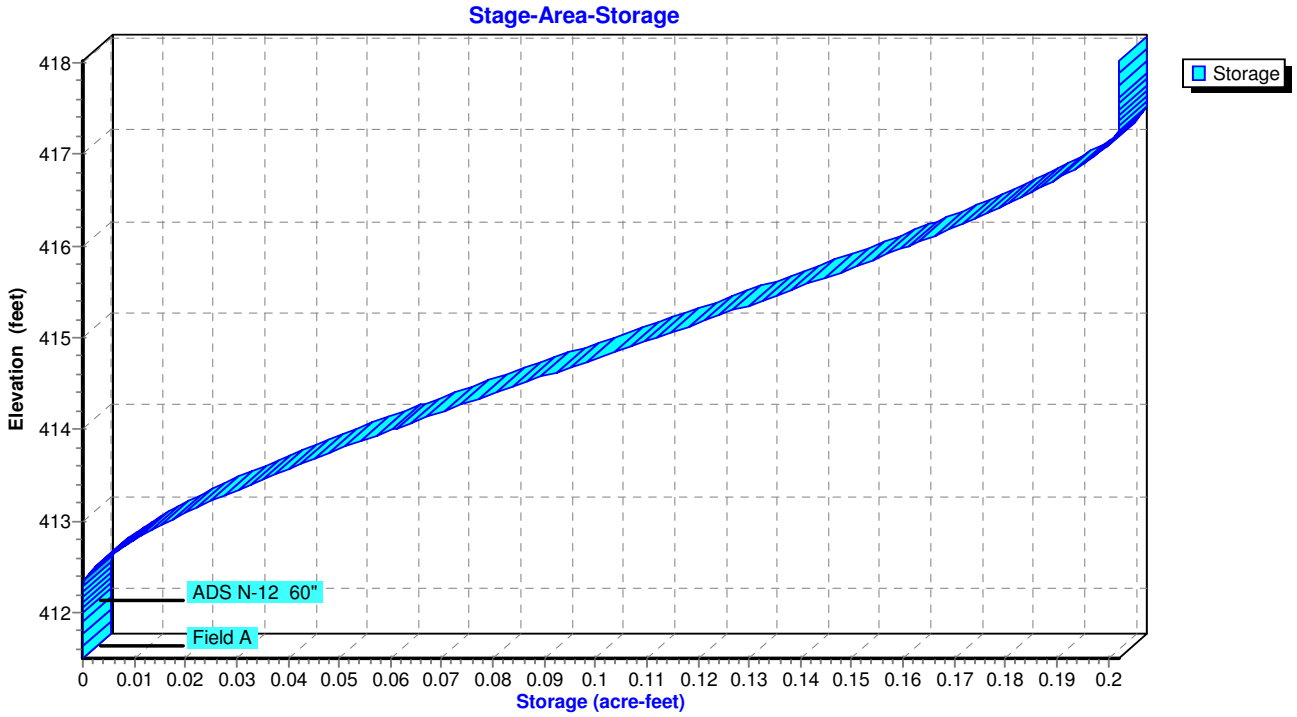
Pond 4P: Detention



Pond 4P: Detention



Pond 4P: Detention



Hydrograph for Pond 4P: Detention

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	411.50	0.00
1.00	0.00	0.000	411.50	0.00
2.00	0.00	0.000	411.50	0.00
3.00	0.00	0.000	412.04	0.00
4.00	0.02	0.000	412.07	0.02
5.00	0.03	0.000	412.10	0.03
6.00	0.04	0.000	412.12	0.04
7.00	0.07	0.000	412.15	0.07
8.00	0.10	0.000	412.18	0.10
9.00	0.16	0.000	412.24	0.16
10.00	0.24	0.000	412.29	0.24
11.00	0.38	0.001	412.38	0.36
12.00	**3.59**	**0.034**	**413.42**	**1.19**
13.00	**0.49**	**0.044**	**413.65**	**1.31**
14.00	0.31	0.001	412.43	0.43
15.00	0.23	0.000	412.29	0.23
16.00	0.16	0.000	412.24	0.16
17.00	0.13	0.000	412.21	0.13
18.00	0.10	0.000	412.18	0.10
19.00	0.09	0.000	412.17	0.09
20.00	0.08	0.000	412.16	0.08
21.00	0.07	0.000	412.15	0.07
22.00	0.07	0.000	412.14	0.07
23.00	0.06	0.000	412.14	0.06
24.00	0.05	0.000	412.13	0.05
25.00	0.00	0.000	412.00	0.00
26.00	0.00	0.000	412.00	0.00
27.00	0.00	0.000	412.00	0.00
28.00	0.00	0.000	412.00	0.00
29.00	0.00	0.000	412.00	0.00
30.00	0.00	0.000	412.00	0.00
31.00	0.00	0.000	412.00	0.00
32.00	0.00	0.000	412.00	0.00
33.00	0.00	0.000	412.00	0.00
34.00	0.00	0.000	412.00	0.00
35.00	0.00	0.000	412.00	0.00
36.00	0.00	0.000	412.00	0.00
37.00	0.00	0.000	412.00	0.00
38.00	0.00	0.000	412.00	0.00
39.00	0.00	0.000	412.00	0.00
40.00	0.00	0.000	412.00	0.00
41.00	0.00	0.000	412.00	0.00
42.00	0.00	0.000	412.00	0.00
43.00	0.00	0.000	412.00	0.00
44.00	0.00	0.000	412.00	0.00
45.00	0.00	0.000	412.00	0.00
46.00	0.00	0.000	412.00	0.00
47.00	0.00	0.000	412.00	0.00
48.00	0.00	0.000	412.00	0.00

Stage-Discharge for Pond 4P: Detention

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
411.50	0.00	414.10	1.53	416.70	6.54
411.55	0.00	414.15	1.59	416.75	6.69
411.60	0.00	414.20	1.66	416.80	6.84
411.65	0.00	414.25	1.75	416.85	6.99
411.70	0.00	414.30	1.84	416.90	7.13
411.75	0.00	414.35	1.94	416.95	7.28
411.80	0.00	414.40	2.04	417.00	7.42
411.85	0.00	414.45	2.14	417.05	7.56
411.90	0.00	414.50	2.24	417.10	7.69
411.95	0.00	414.55	2.33	417.15	7.82
412.00	0.00	414.60	2.41	417.20	7.96
412.05	0.01	414.65	2.48	417.25	8.08
412.10	0.03	414.70	2.55	417.30	8.21
412.15	0.07	414.75	2.62	417.35	8.33
412.20	0.12	414.80	2.68	417.40	8.44
412.25	0.18	414.85	2.74	417.45	8.56
412.30	0.24	414.90	2.80	417.50	8.66
412.35	0.32	414.95	2.86	417.55	8.77
412.40	0.39	415.00	2.92	417.60	8.87
412.45	0.47	415.05	2.98	417.65	8.96
412.50	0.54	415.10	3.05	417.70	9.05
412.55	0.59	415.15	3.14	417.75	9.13
412.60	0.64	415.20	3.24	417.80	9.29
412.65	0.68	415.25	3.34	417.85	9.45
412.70	0.73	415.30	3.45	417.90	9.61
412.75	0.77	415.35	3.57	417.95	9.78
412.80	0.81	415.40	3.68	418.00	9.94
412.85	0.84	415.45	3.79	418.05	**10.10**
412.90	0.88	415.50	3.88		
412.95	0.91	415.55	3.97		
413.00	0.95	415.60	4.06		
413.05	0.98	415.65	4.14		
413.10	1.01	415.70	4.22		
413.15	1.04	415.75	4.29		
413.20	1.07	415.80	4.37		
413.25	1.10	415.85	4.44		
413.30	1.13	415.90	4.51		
413.35	1.15	415.95	4.58		
413.40	1.18	416.00	4.64		
413.45	1.20	416.05	4.73		
413.50	1.23	416.10	4.84		
413.55	1.25	416.15	4.96		
413.60	1.28	416.20	5.09		
413.65	1.30	416.25	5.23		
413.70	1.33	416.30	5.36		
413.75	1.35	416.35	5.51		
413.80	1.37	416.40	5.65		
413.85	1.39	416.45	5.80		
413.90	1.42	416.50	5.94		
413.95	1.44	416.55	6.09		
414.00	1.46	416.60	6.24		
414.05	1.49	416.65	6.39		

Stage-Area-Storage for Pond 4P: Detention

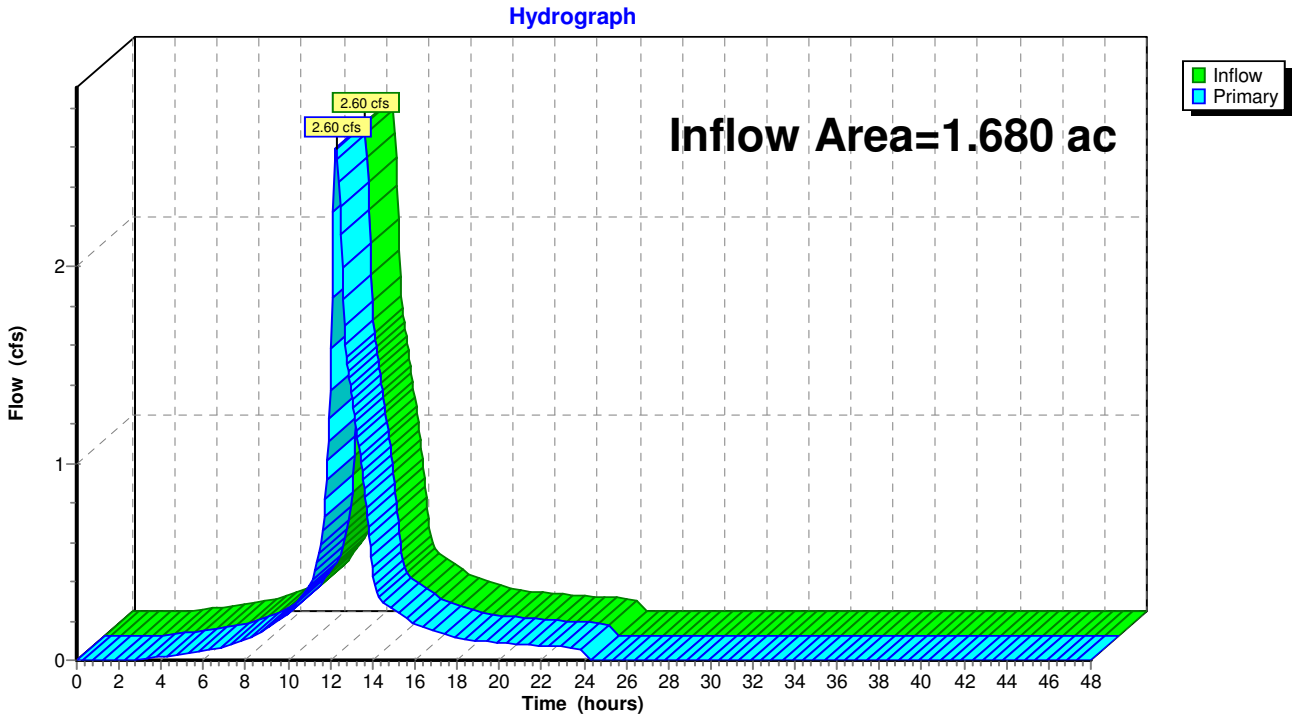
Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
411.50	0.000	414.10	0.066	416.70	0.189
411.55	0.000	414.15	0.068	416.75	0.191
411.60	0.000	414.20	0.071	416.80	0.192
411.65	0.000	414.25	0.073	416.85	0.194
411.70	0.000	414.30	0.076	416.90	0.195
411.75	0.000	414.35	0.078	416.95	0.197
411.80	0.000	414.40	0.081	417.00	0.198
411.85	0.000	414.45	0.083	417.05	0.199
411.90	0.000	414.50	0.086	417.10	0.200
411.95	0.000	414.55	0.089	417.15	0.201
412.00	0.000	414.60	0.091	417.20	0.202
412.05	0.000	414.65	0.094	417.25	0.202
412.10	0.000	414.70	0.096	417.30	**0.202**
412.15	0.000	414.75	0.099	417.35	0.202
412.20	0.000	414.80	0.101	417.40	0.202
412.25	0.000	414.85	0.104	417.45	0.202
412.30	0.000	414.90	0.107	417.50	0.202
412.35	0.000	414.95	0.109	417.55	0.202
412.40	0.001	415.00	0.112	417.60	0.202
412.45	0.002	415.05	0.114	417.65	0.202
412.50	0.002	415.10	0.117	417.70	0.202
412.55	0.004	415.15	0.120	417.75	0.202
412.60	0.005	415.20	0.122	417.80	0.202
412.65	0.006	415.25	0.125	417.85	0.202
412.70	0.007	415.30	0.127	417.90	0.202
412.75	0.009	415.35	0.130	417.95	0.202
412.80	0.010	415.40	0.132	418.00	0.202
412.85	0.012	415.45	0.135	418.05	0.202
412.90	0.013	415.50	0.137		
412.95	0.015	415.55	0.140		
413.00	0.017	415.60	0.142		
413.05	0.019	415.65	0.145		
413.10	0.021	415.70	0.147		
413.15	0.023	415.75	0.150		
413.20	0.025	415.80	0.152		
413.25	0.027	415.85	0.154		
413.30	0.029	415.90	0.157		
413.35	0.031	415.95	0.159		
413.40	0.033	416.00	0.161		
413.45	0.035	416.05	0.163		
413.50	0.037	416.10	0.166		
413.55	0.039	416.15	0.168		
413.60	0.042	416.20	0.170		
413.65	0.044	416.25	0.172		
413.70	0.046	416.30	0.174		
413.75	0.049	416.35	0.176		
413.80	0.051	416.40	0.178		
413.85	0.053	416.45	0.180		
413.90	0.056	416.50	0.182		
413.95	0.058	416.55	0.184		
414.00	0.061	416.60	0.186		
414.05	0.063	416.65	0.188		

Summary for Link 5L: Proposed Combined

Inflow Area = 1.680 ac, 73.81% Impervious, Inflow Depth = 3.37" for 5-yr event
Inflow = 2.60 cfs @ 12.26 hrs, Volume= 0.472 af
Primary = 2.60 cfs @ 12.26 hrs, Volume= 0.472 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 5L: Proposed Combined



Hydrograph for Link 5L: Proposed Combined

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.00	0.00	0.00	27.00	0.00	0.00	0.00
1.50	0.00	0.00	0.00	27.50	0.00	0.00	0.00
2.00	0.00	0.00	0.00	28.00	0.00	0.00	0.00
2.50	0.00	0.00	0.00	28.50	0.00	0.00	0.00
3.00	0.00	0.00	0.00	29.00	0.00	0.00	0.00
3.50	0.01	0.00	0.01	29.50	0.00	0.00	0.00
4.00	0.02	0.00	0.02	30.00	0.00	0.00	0.00
4.50	0.02	0.00	0.02	30.50	0.00	0.00	0.00
5.00	0.03	0.00	0.03	31.00	0.00	0.00	0.00
5.50	0.04	0.00	0.04	31.50	0.00	0.00	0.00
6.00	0.04	0.00	0.04	32.00	0.00	0.00	0.00
6.50	0.06	0.00	0.06	32.50	0.00	0.00	0.00
7.00	0.07	0.00	0.07	33.00	0.00	0.00	0.00
7.50	0.09	0.00	0.09	33.50	0.00	0.00	0.00
8.00	0.10	0.00	0.10	34.00	0.00	0.00	0.00
8.50	0.13	0.00	0.13	34.50	0.00	0.00	0.00
9.00	0.16	0.00	0.16	35.00	0.00	0.00	0.00
9.50	0.20	0.00	0.20	35.50	0.00	0.00	0.00
10.00	0.24	0.00	0.24	36.00	0.00	0.00	0.00
10.50	0.30	0.00	0.30	36.50	0.00	0.00	0.00
11.00	0.37	0.00	0.37	37.00	0.00	0.00	0.00
11.50	0.55	0.00	0.55	37.50	0.00	0.00	0.00
12.00	**1.37**	0.00	**1.37**	38.00	0.00	0.00	0.00
12.50	**2.16**	0.00	**2.16**	38.50	0.00	0.00	0.00
13.00	1.36	0.00	1.36	39.00	0.00	0.00	0.00
13.50	0.96	0.00	0.96	39.50	0.00	0.00	0.00
14.00	0.47	0.00	0.47	40.00	0.00	0.00	0.00
14.50	0.30	0.00	0.30	40.50	0.00	0.00	0.00
15.00	0.26	0.00	0.26	41.00	0.00	0.00	0.00
15.50	0.22	0.00	0.22	41.50	0.00	0.00	0.00
16.00	0.18	0.00	0.18	42.00	0.00	0.00	0.00
16.50	0.16	0.00	0.16	42.50	0.00	0.00	0.00
17.00	0.14	0.00	0.14	43.00	0.00	0.00	0.00
17.50	0.13	0.00	0.13	43.50	0.00	0.00	0.00
18.00	0.11	0.00	0.11	44.00	0.00	0.00	0.00
18.50	0.10	0.00	0.10	44.50	0.00	0.00	0.00
19.00	0.10	0.00	0.10	45.00	0.00	0.00	0.00
19.50	0.09	0.00	0.09	45.50	0.00	0.00	0.00
20.00	0.09	0.00	0.09	46.00	0.00	0.00	0.00
20.50	0.08	0.00	0.08	46.50	0.00	0.00	0.00
21.00	0.08	0.00	0.08	47.00	0.00	0.00	0.00
21.50	0.08	0.00	0.08	47.50	0.00	0.00	0.00
22.00	0.07	0.00	0.07	48.00	0.00	0.00	0.00
22.50	0.07	0.00	0.07				
23.00	0.07	0.00	0.07				
23.50	0.06	0.00	0.06				
24.00	0.06	0.00	0.06				
24.50	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Existing Runoff Area=1.680 ac 27.98% Impervious Runoff Depth=2.80"
Flow Length=367' Tc=11.4 min CN=79 Runoff=4.59 cfs 0.392 af

Subcatchment 2S: Proposed to Treatment Runoff Area=1.440 ac 86.11% Impervious Runoff Depth=4.42"
Tc=6.0 min CN=95 Runoff=6.69 cfs 0.530 af

Subcatchment 3S: Proposed to Bypass Runoff Area=0.240 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=200' Tc=10.7 min CN=74 Runoff=0.56 cfs 0.047 af

Pond 4P: Detention Peak Elev=414.91' Storage=0.107 af Inflow=6.69 cfs 0.530 af
Outflow=2.81 cfs 0.530 af

Link 5L: Proposed Combined Inflow=3.26 cfs 0.578 af
Primary=3.26 cfs 0.578 af

Total Runoff Area = 3.360 ac Runoff Volume = 0.970 af Average Runoff Depth = 3.46"
49.11% Pervious = 1.650 ac 50.89% Impervious = 1.710 ac

Summary for Subcatchment 1S: Existing

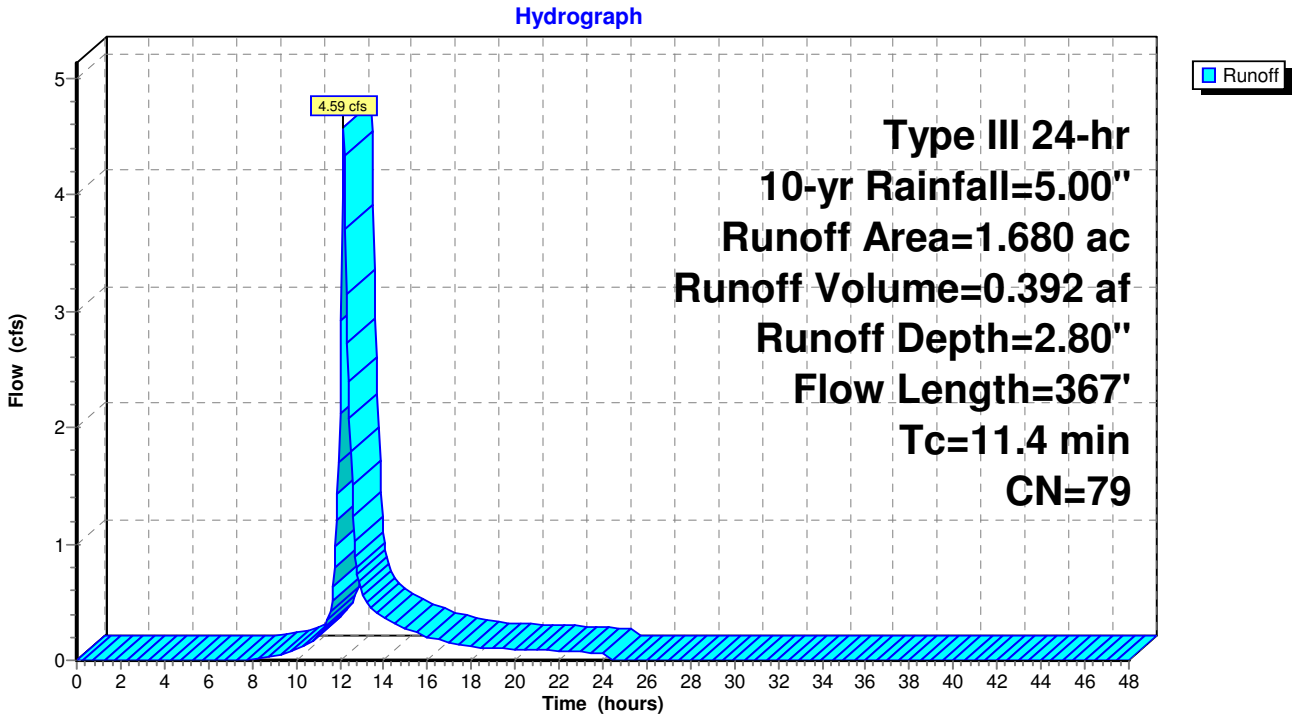
Runoff = 4.59 cfs @ 12.16 hrs, Volume= 0.392 af, Depth= 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.00"

	Area (ac)	CN	Description
*	0.470	98	Impervious
	0.520	70	Woods, Good, HSG C
	0.690	74	>75% Grass cover, Good, HSG C
	1.680	79	Weighted Average
	1.210		72.02% Pervious Area
	0.470		27.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0400	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
1.1	267	0.0600	3.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
11.4	367	Total			

Subcatchment 1S: Existing



Hydrograph for Subcatchment 1S: Existing

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.10	0.00	0.00
2.50	0.13	0.00	0.00
3.00	0.15	0.00	0.00
3.50	0.18	0.00	0.00
4.00	0.22	0.00	0.00
4.50	0.25	0.00	0.00
5.00	0.28	0.00	0.00
5.50	0.32	0.00	0.00
6.00	0.36	0.00	0.00
6.50	0.40	0.00	0.00
7.00	0.45	0.00	0.00
7.50	0.51	0.00	0.00
8.00	0.57	0.00	0.00
8.50	0.64	0.00	0.02
9.00	0.73	0.01	0.03
9.50	0.83	0.03	0.06
10.00	0.95	0.06	0.09
10.50	1.08	0.09	0.14
11.00	1.25	0.15	0.21
11.50	1.49	0.25	0.38
12.00	2.50	0.84	**2.12**
12.50	3.51	1.57	**1.79**
13.00	3.75	1.76	0.60
13.50	3.92	1.90	0.44
14.00	4.06	2.01	0.37
14.50	4.17	2.10	0.31
15.00	4.27	2.19	0.28
15.50	4.36	2.26	0.24
16.00	4.43	2.32	0.20
16.50	4.49	2.37	0.17
17.00	4.55	2.42	0.16
17.50	4.60	2.46	0.14
18.00	4.64	2.49	0.12
18.50	4.68	2.53	0.11
19.00	4.72	2.56	0.11
19.50	4.75	2.59	0.10
20.00	4.79	2.62	0.10
20.50	4.82	2.64	0.09
21.00	4.85	2.67	0.09
21.50	4.88	2.70	0.08
22.00	4.90	2.72	0.08
22.50	4.93	2.74	0.08
23.00	4.95	2.76	0.07
23.50	4.98	2.78	0.07
24.00	**5.00**	**2.80**	0.06
24.50	5.00	2.80	0.00
25.00	5.00	2.80	0.00
25.50	5.00	2.80	0.00
26.00	5.00	2.80	0.00
26.50	5.00	2.80	0.00
27.00	5.00	2.80	0.00
27.50	5.00	2.80	0.00
28.00	5.00	2.80	0.00
28.50	5.00	2.80	0.00
29.00	5.00	2.80	0.00
29.50	5.00	2.80	0.00
30.00	5.00	2.80	0.00
30.50	5.00	2.80	0.00
31.00	5.00	2.80	0.00
31.50	5.00	2.80	0.00
32.00	5.00	2.80	0.00
32.50	5.00	2.80	0.00
33.00	5.00	2.80	0.00
33.50	5.00	2.80	0.00
34.00	5.00	2.80	0.00
34.50	5.00	2.80	0.00
35.00	5.00	2.80	0.00
35.50	5.00	2.80	0.00
36.00	5.00	2.80	0.00
36.50	5.00	2.80	0.00
37.00	5.00	2.80	0.00
37.50	5.00	2.80	0.00
38.00	5.00	2.80	0.00
38.50	5.00	2.80	0.00
39.00	5.00	2.80	0.00
39.50	5.00	2.80	0.00
40.00	5.00	2.80	0.00
40.50	5.00	2.80	0.00
41.00	5.00	2.80	0.00
41.50	5.00	2.80	0.00
42.00	5.00	2.80	0.00
42.50	5.00	2.80	0.00
43.00	5.00	2.80	0.00
43.50	5.00	2.80	0.00
44.00	5.00	2.80	0.00
44.50	5.00	2.80	0.00
45.00	5.00	2.80	0.00
45.50	5.00	2.80	0.00
46.00	5.00	2.80	0.00
46.50	5.00	2.80	0.00
47.00	5.00	2.80	0.00
47.50	5.00	2.80	0.00
48.00	5.00	2.80	0.00

Summary for Subcatchment 2S: Proposed to Treatment

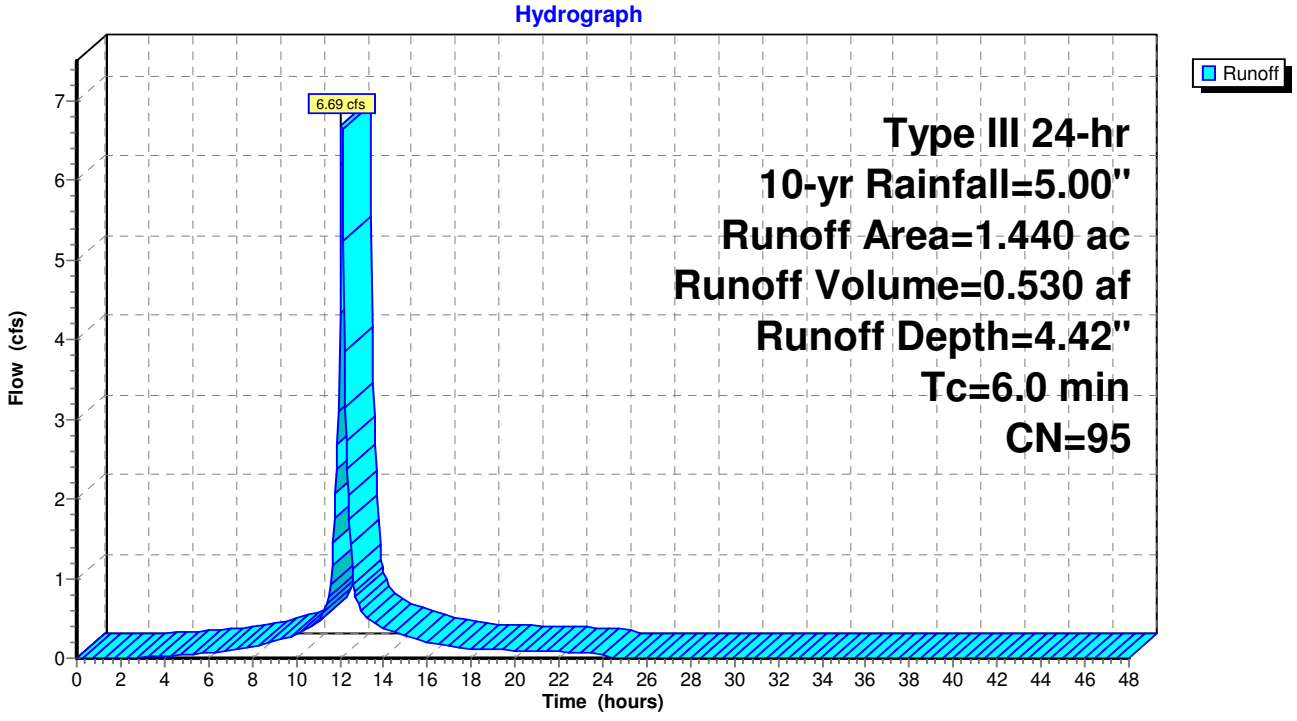
Runoff = 6.69 cfs @ 12.09 hrs, Volume= 0.530 af, Depth= 4.42"
Routed to Pond 4P : Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.00"

	Area (ac)	CN	Description
*	1.240	98	Impervious
	0.200	74	>75% Grass cover, Good, HSG C
	1.440	95	Weighted Average
	0.200		13.89% Pervious Area
	1.240		86.11% Impervious Area

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

Subcatchment 2S: Proposed to Treatment



Hydrograph for Subcatchment 2S: Proposed to Treatment

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.10	0.00	0.00
2.50	0.13	0.00	0.00
3.00	0.15	0.00	0.01
3.50	0.18	0.01	0.02
4.00	0.22	0.02	0.03
4.50	0.25	0.03	0.04
5.00	0.28	0.05	0.05
5.50	0.32	0.06	0.05
6.00	0.36	0.08	0.06
6.50	0.40	0.11	0.08
7.00	0.45	0.14	0.09
7.50	0.51	0.17	0.11
8.00	0.57	0.22	0.13
8.50	0.64	0.27	0.17
9.00	0.73	0.34	0.21
9.50	0.83	0.42	0.25
10.00	0.95	0.52	0.29
10.50	1.08	0.64	0.37
11.00	1.25	0.78	0.46
11.50	1.49	1.00	0.74
12.00	2.50	1.96	**4.32**
12.50	3.51	2.95	**1.43**
13.00	3.75	3.18	0.58
13.50	3.92	3.35	0.45
14.00	4.06	3.49	0.37
14.50	4.17	3.60	0.32
15.00	4.27	3.70	0.28
15.50	4.36	3.78	0.24
16.00	4.43	3.86	0.19
16.50	4.49	3.92	0.17
17.00	4.55	3.97	0.15
17.50	4.60	4.02	0.14
18.00	4.64	4.06	0.12
18.50	4.68	4.10	0.11
19.00	4.72	4.14	0.11
19.50	4.75	4.17	0.10
20.00	4.79	4.21	0.09
20.50	4.82	4.24	0.09
21.00	4.85	4.27	0.09
21.50	4.88	4.30	0.08
22.00	4.90	4.32	0.08
22.50	4.93	4.35	0.07
23.00	4.95	4.37	0.07
23.50	4.98	4.40	0.07
24.00	**5.00**	**4.42**	0.06
24.50	5.00	4.42	0.00
25.00	5.00	4.42	0.00
25.50	5.00	4.42	0.00
26.00	5.00	4.42	0.00
26.50	5.00	4.42	0.00
27.00	5.00	4.42	0.00
27.50	5.00	4.42	0.00
28.00	5.00	4.42	0.00
28.50	5.00	4.42	0.00
29.00	5.00	4.42	0.00
29.50	5.00	4.42	0.00
30.00	5.00	4.42	0.00
30.50	5.00	4.42	0.00
31.00	5.00	4.42	0.00
31.50	5.00	4.42	0.00
32.00	5.00	4.42	0.00
32.50	5.00	4.42	0.00
33.00	5.00	4.42	0.00
33.50	5.00	4.42	0.00
34.00	5.00	4.42	0.00
34.50	5.00	4.42	0.00
35.00	5.00	4.42	0.00
35.50	5.00	4.42	0.00
36.00	5.00	4.42	0.00
36.50	5.00	4.42	0.00
37.00	5.00	4.42	0.00
37.50	5.00	4.42	0.00
38.00	5.00	4.42	0.00
38.50	5.00	4.42	0.00
39.00	5.00	4.42	0.00
39.50	5.00	4.42	0.00
40.00	5.00	4.42	0.00
40.50	5.00	4.42	0.00
41.00	5.00	4.42	0.00
41.50	5.00	4.42	0.00
42.00	5.00	4.42	0.00
42.50	5.00	4.42	0.00
43.00	5.00	4.42	0.00
43.50	5.00	4.42	0.00
44.00	5.00	4.42	0.00
44.50	5.00	4.42	0.00
45.00	5.00	4.42	0.00
45.50	5.00	4.42	0.00
46.00	5.00	4.42	0.00
46.50	5.00	4.42	0.00
47.00	5.00	4.42	0.00
47.50	5.00	4.42	0.00
48.00	5.00	4.42	0.00

Summary for Subcatchment 3S: Proposed to Bypass

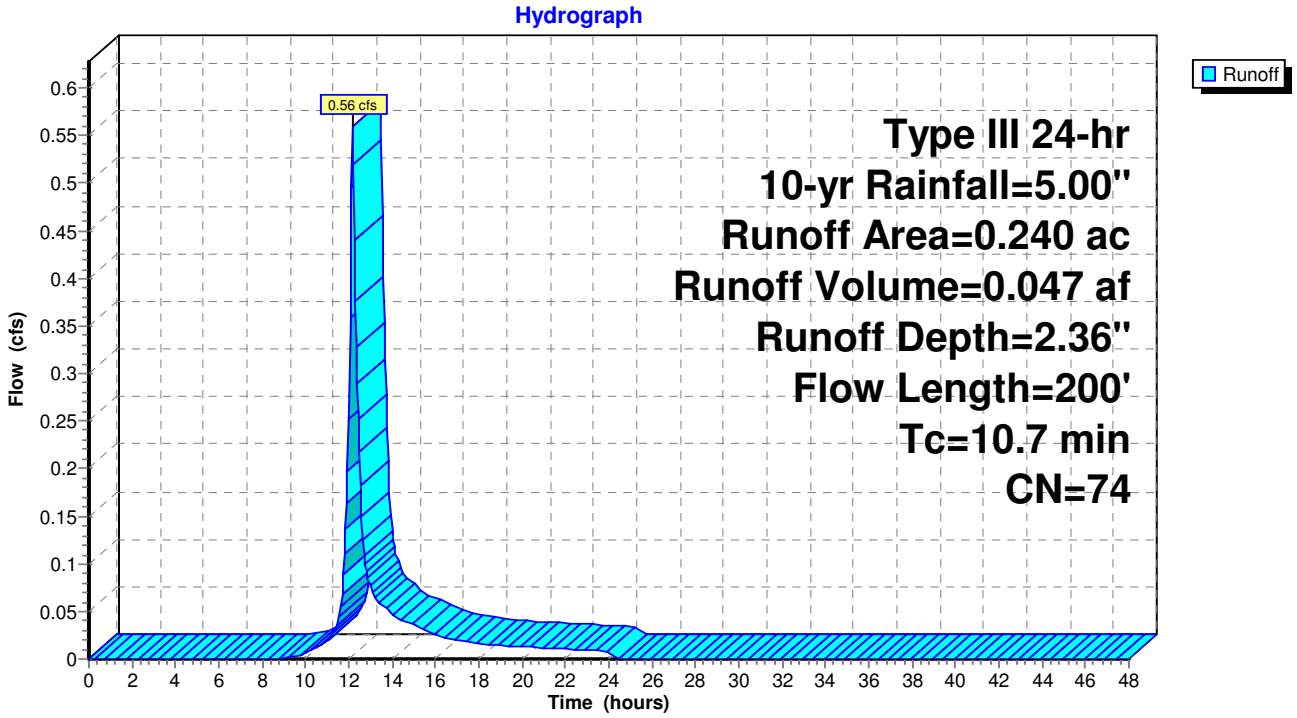
Runoff = 0.56 cfs @ 12.16 hrs, Volume= 0.047 af, Depth= 2.36"
Routed to Link 5L : Proposed Combined

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.00"

Area (ac)	CN	Description
0.240	74	>75% Grass cover, Good, HSG C
0.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0400	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
0.4	100	0.0700	4.26		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.7	200	Total			

Subcatchment 3S: Proposed to Bypass



Hydrograph for Subcatchment 3S: Proposed to Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.10	0.00	0.00
2.50	0.13	0.00	0.00
3.00	0.15	0.00	0.00
3.50	0.18	0.00	0.00
4.00	0.22	0.00	0.00
4.50	0.25	0.00	0.00
5.00	0.28	0.00	0.00
5.50	0.32	0.00	0.00
6.00	0.36	0.00	0.00
6.50	0.40	0.00	0.00
7.00	0.45	0.00	0.00
7.50	0.51	0.00	0.00
8.00	0.57	0.00	0.00
8.50	0.64	0.00	0.00
9.00	0.73	0.00	0.00
9.50	0.83	0.00	0.00
10.00	0.95	0.02	0.01
10.50	1.08	0.04	0.01
11.00	1.25	0.07	0.02
11.50	1.49	0.14	0.04
12.00	2.50	0.61	**0.25**
12.50	3.51	1.25	**0.22**
13.00	3.75	1.42	0.08
13.50	3.92	1.54	0.06
14.00	4.06	1.64	0.05
14.50	4.17	1.72	0.04
15.00	4.27	1.80	0.04
15.50	4.36	1.86	0.03
16.00	4.43	1.92	0.03
16.50	4.49	1.97	0.02
17.00	4.55	2.01	0.02
17.50	4.60	2.05	0.02
18.00	4.64	2.08	0.02
18.50	4.68	2.11	0.01
19.00	4.72	2.14	0.01
19.50	4.75	2.17	0.01
20.00	4.79	2.19	0.01
20.50	4.82	2.22	0.01
21.00	4.85	2.24	0.01
21.50	4.88	2.27	0.01
22.00	4.90	2.29	0.01
22.50	4.93	2.31	0.01
23.00	4.95	2.33	0.01
23.50	4.98	2.35	0.01
24.00	**5.00**	**2.36**	0.01
24.50	5.00	2.36	0.00
25.00	5.00	2.36	0.00
25.50	5.00	2.36	0.00
26.00	5.00	2.36	0.00
26.50	5.00	2.36	0.00
27.00	5.00	2.36	0.00
27.50	5.00	2.36	0.00
28.00	5.00	2.36	0.00
28.50	5.00	2.36	0.00
29.00	5.00	2.36	0.00
29.50	5.00	2.36	0.00
30.00	5.00	2.36	0.00
30.50	5.00	2.36	0.00
31.00	5.00	2.36	0.00
31.50	5.00	2.36	0.00
32.00	5.00	2.36	0.00
32.50	5.00	2.36	0.00
33.00	5.00	2.36	0.00
33.50	5.00	2.36	0.00
34.00	5.00	2.36	0.00
34.50	5.00	2.36	0.00
35.00	5.00	2.36	0.00
35.50	5.00	2.36	0.00
36.00	5.00	2.36	0.00
36.50	5.00	2.36	0.00
37.00	5.00	2.36	0.00
37.50	5.00	2.36	0.00
38.00	5.00	2.36	0.00
38.50	5.00	2.36	0.00
39.00	5.00	2.36	0.00
39.50	5.00	2.36	0.00
40.00	5.00	2.36	0.00
40.50	5.00	2.36	0.00
41.00	5.00	2.36	0.00
41.50	5.00	2.36	0.00
42.00	5.00	2.36	0.00
42.50	5.00	2.36	0.00
43.00	5.00	2.36	0.00
43.50	5.00	2.36	0.00
44.00	5.00	2.36	0.00
44.50	5.00	2.36	0.00
45.00	5.00	2.36	0.00
45.50	5.00	2.36	0.00
46.00	5.00	2.36	0.00
46.50	5.00	2.36	0.00
47.00	5.00	2.36	0.00
47.50	5.00	2.36	0.00
48.00	5.00	2.36	0.00

Summary for Pond 4P: Detention

Inflow Area = 1.440 ac, 86.11% Impervious, Inflow Depth = 4.42" for 10-yr event
Inflow = 6.69 cfs @ 12.09 hrs, Volume= 0.530 af
Outflow = 2.81 cfs @ 12.29 hrs, Volume= 0.530 af, Atten= 58%, Lag= 12.3 min
Primary = 2.81 cfs @ 12.29 hrs, Volume= 0.530 af
Routed to Link 5L : Proposed Combined

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 414.91' @ 12.29 hrs Surf.Area= 0.081 ac Storage= 0.107 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 13.6 min (781.8 - 768.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	411.50'	0.000 af	**31.09'W x 114.17'L x 6.58'H Field A** 0.536 af Overall - 0.240 af Embedded = 0.296 af x 0.0% Voids
#2A	412.00'	0.202 af	**ADS N-12 60"** x 20 Inside #1 Inside= 59.5"W x 59.5"H => 19.30 sf x 20.00'L = 386.0 cf Outside= 67.0"W x 67.0"H => 22.92 sf x 20.00'L = 458.4 cf 20 Chambers in 4 Rows 28.09' Header x 19.30 sf x 2 = 1,084.1 cf Inside
		0.202 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	412.00'	**15.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 412.00' / 408.00' S= 0.1000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	412.00'	**6.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	416.00'	**0.7' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 1	414.00'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	415.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.81 cfs @ 12.29 hrs HW=414.90' (Free Discharge)
└**1=Culvert** (Passes 2.81 cfs of 8.92 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.80 cfs @ 7.81 fps)
  ├**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  ├**4=Orifice/Grate** (Orifice Controls 1.01 cfs @ 3.77 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: Detention - Chamber Wizard Field A

Chamber Model = ADS N-12 60" (ADS N-12® Pipe)
Inside= 59.5"W x 59.5"H => 19.30 sf x 20.00'L = 386.0 cf
Outside= 67.0"W x 67.0"H => 22.92 sf x 20.00'L = 458.4 cf

67.0" Wide + 23.0" Spacing = 90.0" C-C Row Spacing

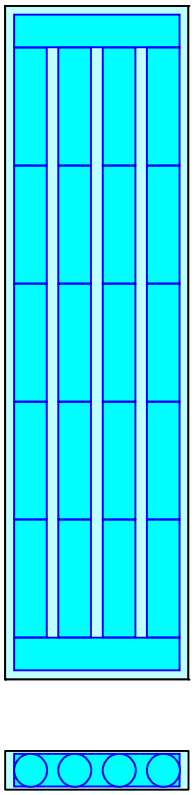
5 Chambers/Row x 20.00' Long +5.58' Header x 2 = 111.17' Row Length +18.0" End Stone x 2 = 114.17' Base Length
4 Rows x 67.0" Wide + 23.0" Spacing x 3 + 18.0" Side Stone x 2 = 31.09' Base Width
6.0" Stone Base + 67.0" Chamber Height + 6.0" Stone Cover = 6.58' Field Height

20 Chambers x 386.0 cf + 28.09' Header x 19.30 sf x 2 = 8,804.1 cf Chamber Storage
20 Chambers x 458.4 cf + 28.09' Header x 22.92 sf x 2 = 10,455.8 cf Displacement

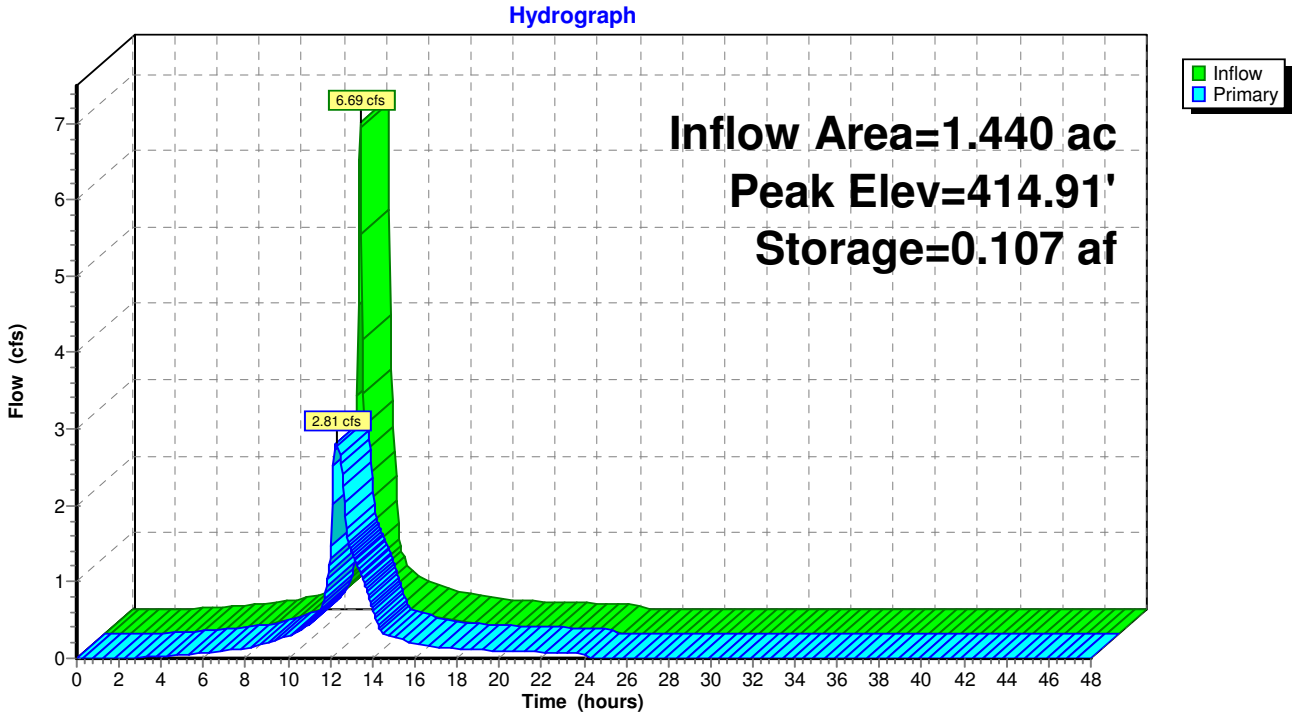
23,365.6 cf Field - 10,455.8 cf Chambers = 12,909.8 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 8,804.1 cf = 0.202 af
Overall Storage Efficiency = 37.7%
Overall System Size = 114.17' x 31.09' x 6.58'

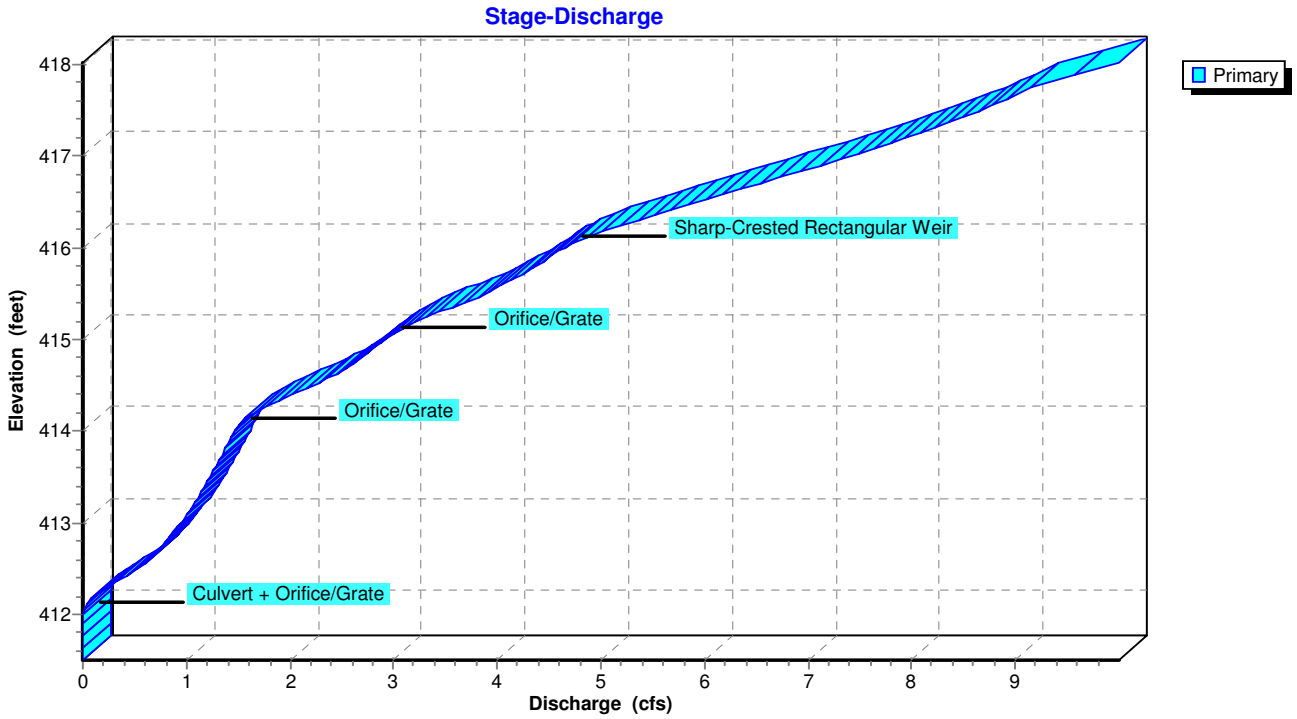
20 Chambers
865.4 cy Field
478.1 cy Stone



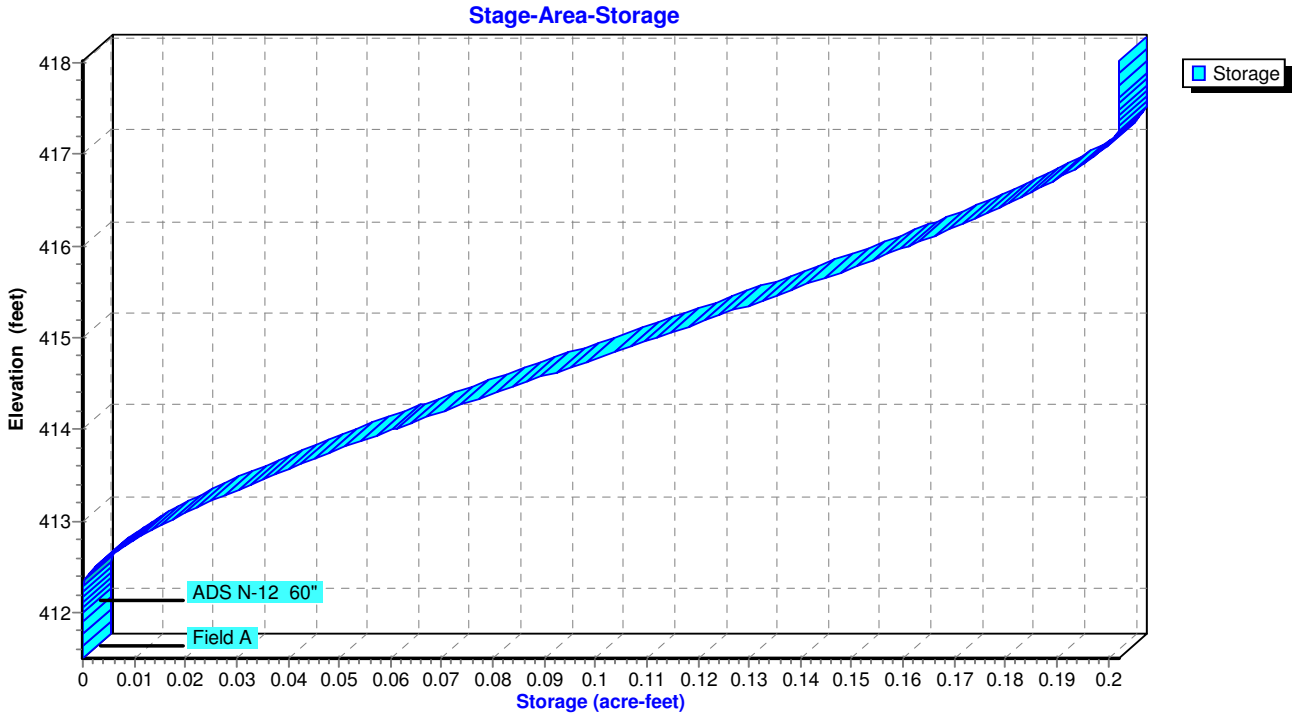
Pond 4P: Detention



Pond 4P: Detention



Pond 4P: Detention



Hydrograph for Pond 4P: Detention

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	411.50	0.00
1.00	0.00	0.000	411.50	0.00
2.00	0.00	0.000	411.50	0.00
3.00	0.01	0.000	412.06	0.01
4.00	0.03	0.000	412.09	0.03
5.00	0.05	0.000	412.12	0.05
6.00	0.06	0.000	412.14	0.06
7.00	0.09	0.000	412.18	0.09
8.00	0.13	0.000	412.21	0.13
9.00	0.21	0.000	412.27	0.21
10.00	0.29	0.000	412.33	0.29
11.00	0.46	0.001	412.43	0.44
12.00	**4.32**	**0.045**	**413.67**	**1.31**
13.00	**0.58**	**0.054**	**413.87**	**1.40**
14.00	0.37	0.005	412.62	0.65
15.00	0.28	0.000	412.32	0.28
16.00	0.19	0.000	412.26	0.19
17.00	0.15	0.000	412.23	0.15
18.00	0.12	0.000	412.20	0.12
19.00	0.11	0.000	412.19	0.10
20.00	0.09	0.000	412.18	0.09
21.00	0.09	0.000	412.17	0.09
22.00	0.08	0.000	412.16	0.08
23.00	0.07	0.000	412.15	0.07
24.00	0.06	0.000	412.14	0.06
25.00	0.00	0.000	412.00	0.00
26.00	0.00	0.000	412.00	0.00
27.00	0.00	0.000	412.00	0.00
28.00	0.00	0.000	412.00	0.00
29.00	0.00	0.000	412.00	0.00
30.00	0.00	0.000	412.00	0.00
31.00	0.00	0.000	412.00	0.00
32.00	0.00	0.000	412.00	0.00
33.00	0.00	0.000	412.00	0.00
34.00	0.00	0.000	412.00	0.00
35.00	0.00	0.000	412.00	0.00
36.00	0.00	0.000	412.00	0.00
37.00	0.00	0.000	412.00	0.00
38.00	0.00	0.000	412.00	0.00
39.00	0.00	0.000	412.00	0.00
40.00	0.00	0.000	412.00	0.00
41.00	0.00	0.000	412.00	0.00
42.00	0.00	0.000	412.00	0.00
43.00	0.00	0.000	412.00	0.00
44.00	0.00	0.000	412.00	0.00
45.00	0.00	0.000	412.00	0.00
46.00	0.00	0.000	412.00	0.00
47.00	0.00	0.000	412.00	0.00
48.00	0.00	0.000	412.00	0.00

Stage-Discharge for Pond 4P: Detention

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
411.50	0.00	414.10	1.53	416.70	6.54
411.55	0.00	414.15	1.59	416.75	6.69
411.60	0.00	414.20	1.66	416.80	6.84
411.65	0.00	414.25	1.75	416.85	6.99
411.70	0.00	414.30	1.84	416.90	7.13
411.75	0.00	414.35	1.94	416.95	7.28
411.80	0.00	414.40	2.04	417.00	7.42
411.85	0.00	414.45	2.14	417.05	7.56
411.90	0.00	414.50	2.24	417.10	7.69
411.95	0.00	414.55	2.33	417.15	7.82
412.00	0.00	414.60	2.41	417.20	7.96
412.05	0.01	414.65	2.48	417.25	8.08
412.10	0.03	414.70	2.55	417.30	8.21
412.15	0.07	414.75	2.62	417.35	8.33
412.20	0.12	414.80	2.68	417.40	8.44
412.25	0.18	414.85	2.74	417.45	8.56
412.30	0.24	414.90	2.80	417.50	8.66
412.35	0.32	414.95	2.86	417.55	8.77
412.40	0.39	415.00	2.92	417.60	8.87
412.45	0.47	415.05	2.98	417.65	8.96
412.50	0.54	415.10	3.05	417.70	9.05
412.55	0.59	415.15	3.14	417.75	9.13
412.60	0.64	415.20	3.24	417.80	9.29
412.65	0.68	415.25	3.34	417.85	9.45
412.70	0.73	415.30	3.45	417.90	9.61
412.75	0.77	415.35	3.57	417.95	9.78
412.80	0.81	415.40	3.68	418.00	9.94
412.85	0.84	415.45	3.79	418.05	**10.10**
412.90	0.88	415.50	3.88		
412.95	0.91	415.55	3.97		
413.00	0.95	415.60	4.06		
413.05	0.98	415.65	4.14		
413.10	1.01	415.70	4.22		
413.15	1.04	415.75	4.29		
413.20	1.07	415.80	4.37		
413.25	1.10	415.85	4.44		
413.30	1.13	415.90	4.51		
413.35	1.15	415.95	4.58		
413.40	1.18	416.00	4.64		
413.45	1.20	416.05	4.73		
413.50	1.23	416.10	4.84		
413.55	1.25	416.15	4.96		
413.60	1.28	416.20	5.09		
413.65	1.30	416.25	5.23		
413.70	1.33	416.30	5.36		
413.75	1.35	416.35	5.51		
413.80	1.37	416.40	5.65		
413.85	1.39	416.45	5.80		
413.90	1.42	416.50	5.94		
413.95	1.44	416.55	6.09		
414.00	1.46	416.60	6.24		
414.05	1.49	416.65	6.39		

Stage-Area-Storage for Pond 4P: Detention

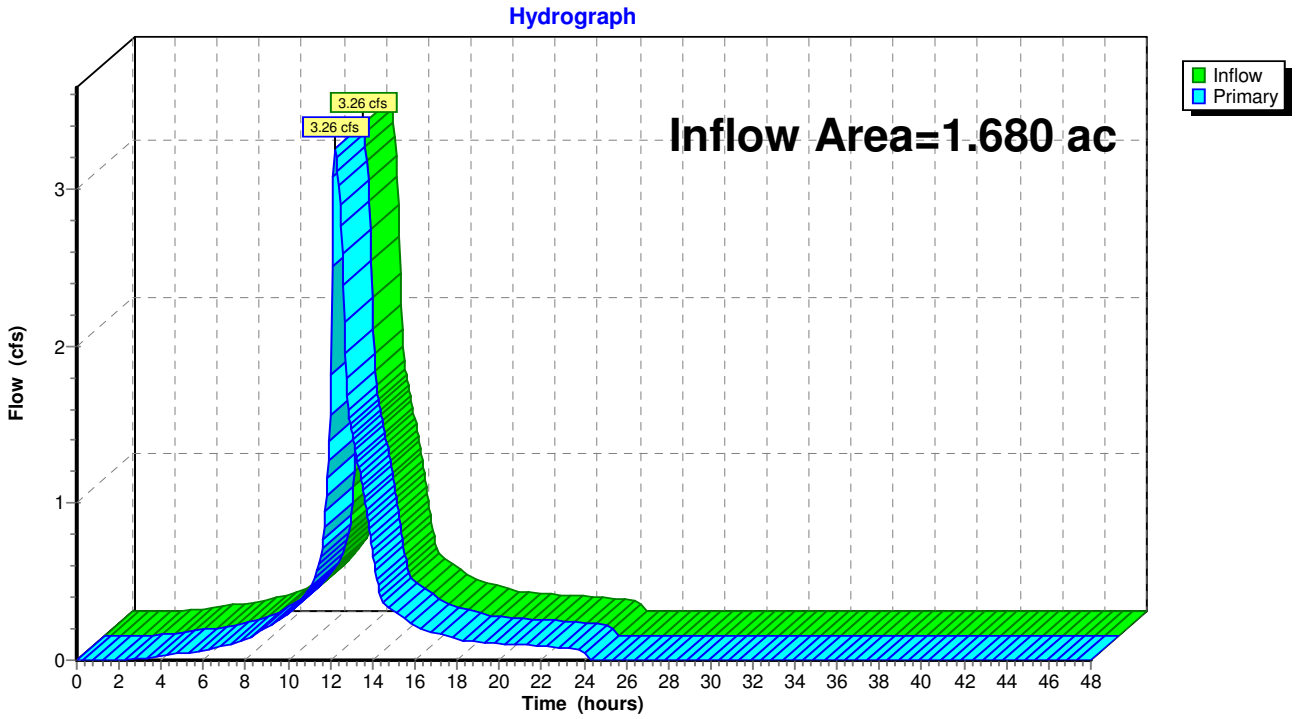
Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
411.50	0.000	414.10	0.066	416.70	0.189
411.55	0.000	414.15	0.068	416.75	0.191
411.60	0.000	414.20	0.071	416.80	0.192
411.65	0.000	414.25	0.073	416.85	0.194
411.70	0.000	414.30	0.076	416.90	0.195
411.75	0.000	414.35	0.078	416.95	0.197
411.80	0.000	414.40	0.081	417.00	0.198
411.85	0.000	414.45	0.083	417.05	0.199
411.90	0.000	414.50	0.086	417.10	0.200
411.95	0.000	414.55	0.089	417.15	0.201
412.00	0.000	414.60	0.091	417.20	0.202
412.05	0.000	414.65	0.094	417.25	0.202
412.10	0.000	414.70	0.096	417.30	**0.202**
412.15	0.000	414.75	0.099	417.35	0.202
412.20	0.000	414.80	0.101	417.40	0.202
412.25	0.000	414.85	0.104	417.45	0.202
412.30	0.000	414.90	0.107	417.50	0.202
412.35	0.000	414.95	0.109	417.55	0.202
412.40	0.001	415.00	0.112	417.60	0.202
412.45	0.002	415.05	0.114	417.65	0.202
412.50	0.002	415.10	0.117	417.70	0.202
412.55	0.004	415.15	0.120	417.75	0.202
412.60	0.005	415.20	0.122	417.80	0.202
412.65	0.006	415.25	0.125	417.85	0.202
412.70	0.007	415.30	0.127	417.90	0.202
412.75	0.009	415.35	0.130	417.95	0.202
412.80	0.010	415.40	0.132	418.00	0.202
412.85	0.012	415.45	0.135	418.05	0.202
412.90	0.013	415.50	0.137		
412.95	0.015	415.55	0.140		
413.00	0.017	415.60	0.142		
413.05	0.019	415.65	0.145		
413.10	0.021	415.70	0.147		
413.15	0.023	415.75	0.150		
413.20	0.025	415.80	0.152		
413.25	0.027	415.85	0.154		
413.30	0.029	415.90	0.157		
413.35	0.031	415.95	0.159		
413.40	0.033	416.00	0.161		
413.45	0.035	416.05	0.163		
413.50	0.037	416.10	0.166		
413.55	0.039	416.15	0.168		
413.60	0.042	416.20	0.170		
413.65	0.044	416.25	0.172		
413.70	0.046	416.30	0.174		
413.75	0.049	416.35	0.176		
413.80	0.051	416.40	0.178		
413.85	0.053	416.45	0.180		
413.90	0.056	416.50	0.182		
413.95	0.058	416.55	0.184		
414.00	0.061	416.60	0.186		
414.05	0.063	416.65	0.188		

Summary for Link 5L: Proposed Combined

Inflow Area = 1.680 ac, 73.81% Impervious, Inflow Depth = 4.13" for 10-yr event
Inflow = 3.26 cfs @ 12.22 hrs, Volume= 0.578 af
Primary = 3.26 cfs @ 12.22 hrs, Volume= 0.578 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 5L: Proposed Combined



Hydrograph for Link 5L: Proposed Combined

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.00	0.00	0.00	27.00	0.00	0.00	0.00
1.50	0.00	0.00	0.00	27.50	0.00	0.00	0.00
2.00	0.00	0.00	0.00	28.00	0.00	0.00	0.00
2.50	0.00	0.00	0.00	28.50	0.00	0.00	0.00
3.00	0.01	0.00	0.01	29.00	0.00	0.00	0.00
3.50	0.02	0.00	0.02	29.50	0.00	0.00	0.00
4.00	0.03	0.00	0.03	30.00	0.00	0.00	0.00
4.50	0.04	0.00	0.04	30.50	0.00	0.00	0.00
5.00	0.05	0.00	0.05	31.00	0.00	0.00	0.00
5.50	0.05	0.00	0.05	31.50	0.00	0.00	0.00
6.00	0.06	0.00	0.06	32.00	0.00	0.00	0.00
6.50	0.08	0.00	0.08	32.50	0.00	0.00	0.00
7.00	0.09	0.00	0.09	33.00	0.00	0.00	0.00
7.50	0.11	0.00	0.11	33.50	0.00	0.00	0.00
8.00	0.13	0.00	0.13	34.00	0.00	0.00	0.00
8.50	0.17	0.00	0.17	34.50	0.00	0.00	0.00
9.00	0.21	0.00	0.21	35.00	0.00	0.00	0.00
9.50	0.25	0.00	0.25	35.50	0.00	0.00	0.00
10.00	0.30	0.00	0.30	36.00	0.00	0.00	0.00
10.50	0.37	0.00	0.37	36.50	0.00	0.00	0.00
11.00	0.46	0.00	0.46	37.00	0.00	0.00	0.00
11.50	0.65	0.00	0.65	37.50	0.00	0.00	0.00
12.00	**1.57**	0.00	**1.57**	38.00	0.00	0.00	0.00
12.50	**2.77**	0.00	**2.77**	38.50	0.00	0.00	0.00
13.00	1.48	0.00	1.48	39.00	0.00	0.00	0.00
13.50	1.12	0.00	1.12	39.50	0.00	0.00	0.00
14.00	0.70	0.00	0.70	40.00	0.00	0.00	0.00
14.50	0.37	0.00	0.37	40.50	0.00	0.00	0.00
15.00	0.31	0.00	0.31	41.00	0.00	0.00	0.00
15.50	0.27	0.00	0.27	41.50	0.00	0.00	0.00
16.00	0.22	0.00	0.22	42.00	0.00	0.00	0.00
16.50	0.19	0.00	0.19	42.50	0.00	0.00	0.00
17.00	0.17	0.00	0.17	43.00	0.00	0.00	0.00
17.50	0.15	0.00	0.15	43.50	0.00	0.00	0.00
18.00	0.13	0.00	0.13	44.00	0.00	0.00	0.00
18.50	0.12	0.00	0.12	44.50	0.00	0.00	0.00
19.00	0.12	0.00	0.12	45.00	0.00	0.00	0.00
19.50	0.11	0.00	0.11	45.50	0.00	0.00	0.00
20.00	0.11	0.00	0.11	46.00	0.00	0.00	0.00
20.50	0.10	0.00	0.10	46.50	0.00	0.00	0.00
21.00	0.10	0.00	0.10	47.00	0.00	0.00	0.00
21.50	0.09	0.00	0.09	47.50	0.00	0.00	0.00
22.00	0.09	0.00	0.09	48.00	0.00	0.00	0.00
22.50	0.08	0.00	0.08				
23.00	0.08	0.00	0.08				
23.50	0.07	0.00	0.07				
24.00	0.07	0.00	0.07				
24.50	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Existing Runoff Area=1.680 ac 27.98% Impervious Runoff Depth=3.94"
Flow Length=367' Tc=11.4 min CN=79 Runoff=6.43 cfs 0.552 af

Subcatchment 2S: Proposed to Treatment Runoff Area=1.440 ac 86.11% Impervious Runoff Depth=5.70"
Tc=6.0 min CN=95 Runoff=8.51 cfs 0.684 af

Subcatchment 3S: Proposed to Bypass Runoff Area=0.240 ac 0.00% Impervious Runoff Depth=3.43"
Flow Length=200' Tc=10.7 min CN=74 Runoff=0.82 cfs 0.069 af

Pond 4P: Detention Peak Elev=415.51' Storage=0.138 af Inflow=8.51 cfs 0.684 af
Outflow=3.90 cfs 0.684 af

Link 5L: Proposed Combined Inflow=4.58 cfs 0.753 af
Primary=4.58 cfs 0.753 af

Total Runoff Area = 3.360 ac Runoff Volume = 1.304 af Average Runoff Depth = 4.66"
49.11% Pervious = 1.650 ac 50.89% Impervious = 1.710 ac

Summary for Subcatchment 1S: Existing

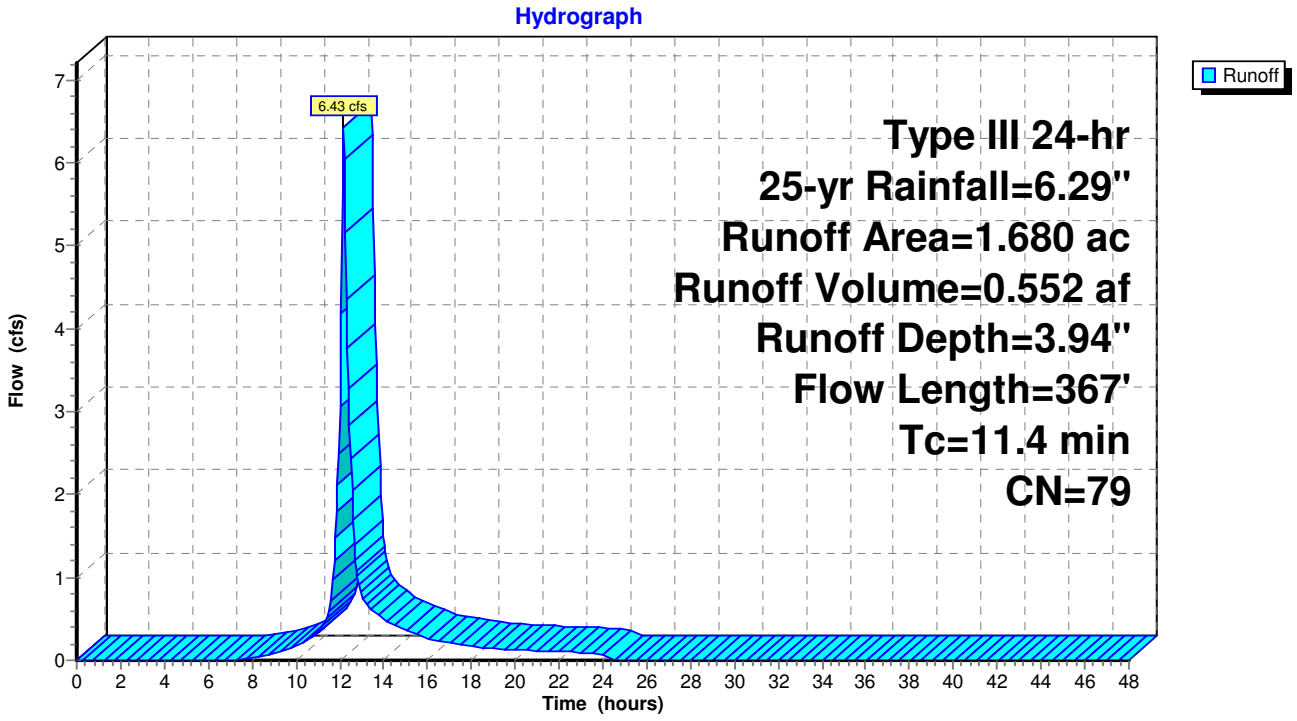
Runoff = 6.43 cfs @ 12.16 hrs, Volume= 0.552 af, Depth= 3.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.29"

	Area (ac)	CN	Description
*	0.470	98	Impervious
	0.520	70	Woods, Good, HSG C
	0.690	74	>75% Grass cover, Good, HSG C
	1.680	79	Weighted Average
	1.210		72.02% Pervious Area
	0.470		27.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0400	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
1.1	267	0.0600	3.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
11.4	367	Total			

Subcatchment 1S: Existing



Hydrograph for Subcatchment 1S: Existing

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.06	0.00	0.00
1.50	0.09	0.00	0.00
2.00	0.13	0.00	0.00
2.50	0.16	0.00	0.00
3.00	0.19	0.00	0.00
3.50	0.23	0.00	0.00
4.00	0.27	0.00	0.00
4.50	0.31	0.00	0.00
5.00	0.36	0.00	0.00
5.50	0.40	0.00	0.00
6.00	0.45	0.00	0.00
6.50	0.51	0.00	0.00
7.00	0.57	0.00	0.00
7.50	0.64	0.00	0.01
8.00	0.72	0.01	0.03
8.50	0.81	0.03	0.05
9.00	0.92	0.05	0.08
9.50	1.04	0.08	0.12
10.00	1.19	0.13	0.17
10.50	1.36	0.20	0.24
11.00	1.57	0.29	0.34
11.50	1.87	0.45	0.58
12.00	3.14	1.30	**3.07**
12.50	4.42	2.31	**2.44**
13.00	4.72	2.56	0.80
13.50	4.93	2.74	0.59
14.00	5.10	2.89	0.49
14.50	5.25	3.01	0.42
15.00	5.37	3.13	0.37
15.50	5.48	3.22	0.32
16.00	5.57	3.30	0.26
16.50	5.65	3.37	0.23
17.00	5.72	3.43	0.21
17.50	5.78	3.49	0.18
18.00	5.84	3.53	0.16
18.50	5.89	3.58	0.15
19.00	5.93	3.62	0.14
19.50	5.98	3.66	0.13
20.00	6.02	3.70	0.13
20.50	6.06	3.73	0.12
21.00	6.10	3.77	0.12
21.50	6.13	3.80	0.11
22.00	6.17	3.83	0.10
22.50	6.20	3.86	0.10
23.00	6.23	3.89	0.09
23.50	6.26	3.91	0.09
24.00	**6.29**	**3.94**	0.08
24.50	6.29	3.94	0.00
25.00	6.29	3.94	0.00
25.50	6.29	3.94	0.00
26.00	6.29	3.94	0.00
26.50	6.29	3.94	0.00
27.00	6.29	3.94	0.00
27.50	6.29	3.94	0.00
28.00	6.29	3.94	0.00
28.50	6.29	3.94	0.00
29.00	6.29	3.94	0.00
29.50	6.29	3.94	0.00
30.00	6.29	3.94	0.00
30.50	6.29	3.94	0.00
31.00	6.29	3.94	0.00
31.50	6.29	3.94	0.00
32.00	6.29	3.94	0.00
32.50	6.29	3.94	0.00
33.00	6.29	3.94	0.00
33.50	6.29	3.94	0.00
34.00	6.29	3.94	0.00
34.50	6.29	3.94	0.00
35.00	6.29	3.94	0.00
35.50	6.29	3.94	0.00
36.00	6.29	3.94	0.00
36.50	6.29	3.94	0.00
37.00	6.29	3.94	0.00
37.50	6.29	3.94	0.00
38.00	6.29	3.94	0.00
38.50	6.29	3.94	0.00
39.00	6.29	3.94	0.00
39.50	6.29	3.94	0.00
40.00	6.29	3.94	0.00
40.50	6.29	3.94	0.00
41.00	6.29	3.94	0.00
41.50	6.29	3.94	0.00
42.00	6.29	3.94	0.00
42.50	6.29	3.94	0.00
43.00	6.29	3.94	0.00
43.50	6.29	3.94	0.00
44.00	6.29	3.94	0.00
44.50	6.29	3.94	0.00
45.00	6.29	3.94	0.00
45.50	6.29	3.94	0.00
46.00	6.29	3.94	0.00
46.50	6.29	3.94	0.00
47.00	6.29	3.94	0.00
47.50	6.29	3.94	0.00
48.00	6.29	3.94	0.00

Summary for Subcatchment 2S: Proposed to Treatment

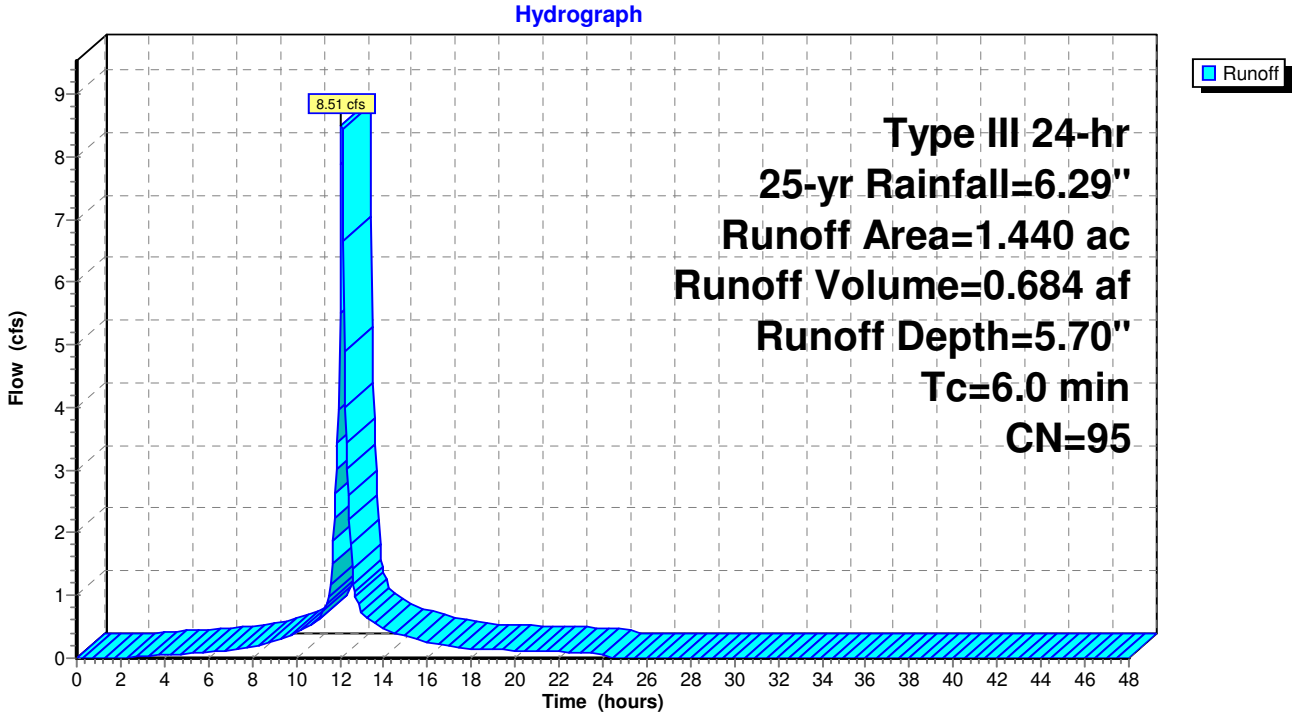
Runoff = 8.51 cfs @ 12.09 hrs, Volume= 0.684 af, Depth= 5.70"
Routed to Pond 4P : Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.29"

	Area (ac)	CN	Description
*	1.240	98	Impervious
	0.200	74	>75% Grass cover, Good, HSG C
	1.440	95	Weighted Average
	0.200		13.89% Pervious Area
	1.240		86.11% Impervious Area

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

Subcatchment 2S: Proposed to Treatment



Hydrograph for Subcatchment 2S: Proposed to Treatment

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.06	0.00	0.00
1.50	0.09	0.00	0.00
2.00	0.13	0.00	0.00
2.50	0.16	0.00	0.02
3.00	0.19	0.01	0.03
3.50	0.23	0.02	0.04
4.00	0.27	0.04	0.05
4.50	0.31	0.06	0.06
5.00	0.36	0.08	0.07
5.50	0.40	0.11	0.08
6.00	0.45	0.14	0.09
6.50	0.51	0.17	0.11
7.00	0.57	0.22	0.13
7.50	0.64	0.27	0.16
8.00	0.72	0.33	0.18
8.50	0.81	0.40	0.23
9.00	0.92	0.49	0.28
9.50	1.04	0.60	0.33
10.00	1.19	0.73	0.39
10.50	1.36	0.89	0.49
11.00	1.57	1.08	0.60
11.50	1.87	1.36	0.95
12.00	3.14	2.59	**5.51**
12.50	4.42	3.84	**1.81**
13.00	4.72	4.14	0.74
13.50	4.93	4.35	0.57
14.00	5.10	4.52	0.46
14.50	5.25	4.66	0.40
15.00	5.37	4.79	0.35
15.50	5.48	4.90	0.30
16.00	5.57	4.99	0.25
16.50	5.65	5.06	0.22
17.00	5.72	5.13	0.19
17.50	5.78	5.20	0.17
18.00	5.84	5.25	0.15
18.50	5.89	5.30	0.14
19.00	5.93	5.35	0.13
19.50	5.98	5.39	0.13
20.00	6.02	5.43	0.12
20.50	6.06	5.47	0.11
21.00	6.10	5.51	0.11
21.50	6.13	5.54	0.10
22.00	6.17	5.58	0.10
22.50	6.20	5.61	0.09
23.00	6.23	5.64	0.09
23.50	6.26	5.67	0.08
24.00	**6.29**	**5.70**	0.08
24.50	6.29	5.70	0.00
25.00	6.29	5.70	0.00
25.50	6.29	5.70	0.00
26.00	6.29	5.70	0.00
26.50	6.29	5.70	0.00
27.00	6.29	5.70	0.00
27.50	6.29	5.70	0.00
28.00	6.29	5.70	0.00
28.50	6.29	5.70	0.00
29.00	6.29	5.70	0.00
29.50	6.29	5.70	0.00
30.00	6.29	5.70	0.00
30.50	6.29	5.70	0.00
31.00	6.29	5.70	0.00
31.50	6.29	5.70	0.00
32.00	6.29	5.70	0.00
32.50	6.29	5.70	0.00
33.00	6.29	5.70	0.00
33.50	6.29	5.70	0.00
34.00	6.29	5.70	0.00
34.50	6.29	5.70	0.00
35.00	6.29	5.70	0.00
35.50	6.29	5.70	0.00
36.00	6.29	5.70	0.00
36.50	6.29	5.70	0.00
37.00	6.29	5.70	0.00
37.50	6.29	5.70	0.00
38.00	6.29	5.70	0.00
38.50	6.29	5.70	0.00
39.00	6.29	5.70	0.00
39.50	6.29	5.70	0.00
40.00	6.29	5.70	0.00
40.50	6.29	5.70	0.00
41.00	6.29	5.70	0.00
41.50	6.29	5.70	0.00
42.00	6.29	5.70	0.00
42.50	6.29	5.70	0.00
43.00	6.29	5.70	0.00
43.50	6.29	5.70	0.00
44.00	6.29	5.70	0.00
44.50	6.29	5.70	0.00
45.00	6.29	5.70	0.00
45.50	6.29	5.70	0.00
46.00	6.29	5.70	0.00
46.50	6.29	5.70	0.00
47.00	6.29	5.70	0.00
47.50	6.29	5.70	0.00
48.00	6.29	5.70	0.00

Summary for Subcatchment 3S: Proposed to Bypass

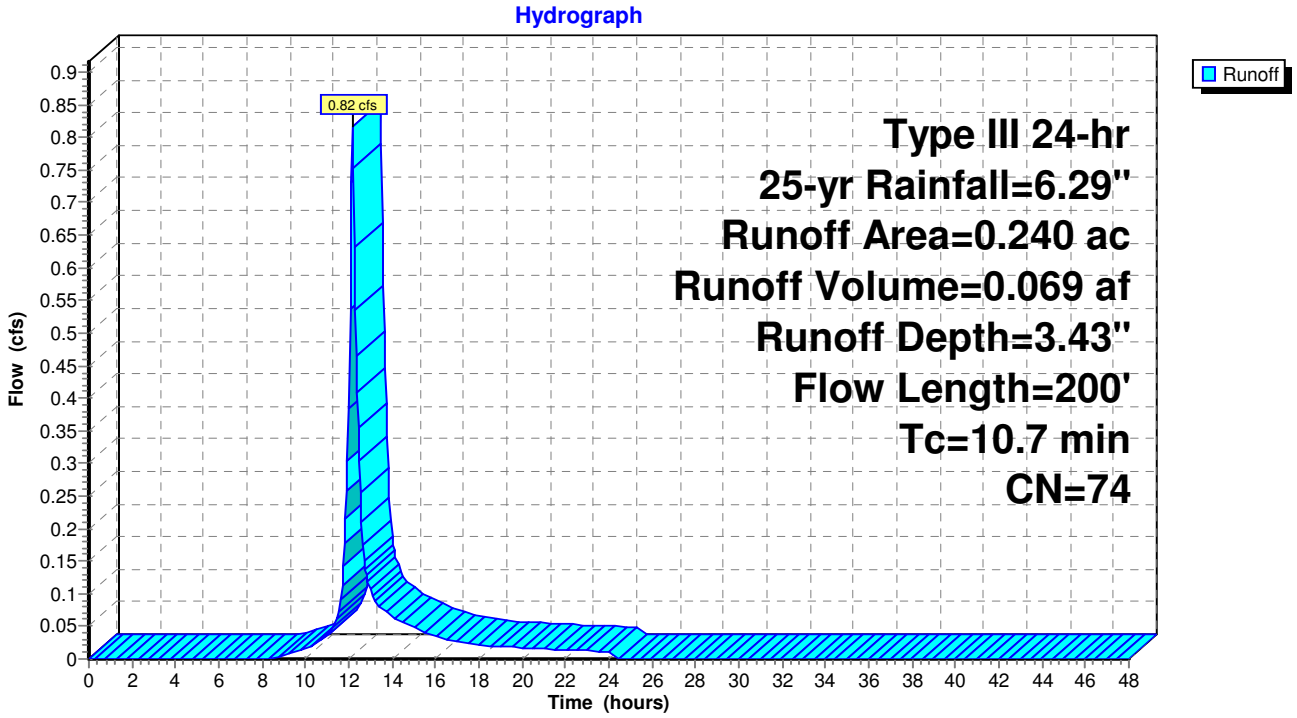
Runoff = 0.82 cfs @ 12.15 hrs, Volume= 0.069 af, Depth= 3.43"
Routed to Link 5L : Proposed Combined

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.29"

Area (ac)	CN	Description
0.240	74	>75% Grass cover, Good, HSG C
0.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0400	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
0.4	100	0.0700	4.26		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.7	200	Total			

Subcatchment 3S: Proposed to Bypass



Hydrograph for Subcatchment 3S: Proposed to Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.06	0.00	0.00
1.50	0.09	0.00	0.00
2.00	0.13	0.00	0.00
2.50	0.16	0.00	0.00
3.00	0.19	0.00	0.00
3.50	0.23	0.00	0.00
4.00	0.27	0.00	0.00
4.50	0.31	0.00	0.00
5.00	0.36	0.00	0.00
5.50	0.40	0.00	0.00
6.00	0.45	0.00	0.00
6.50	0.51	0.00	0.00
7.00	0.57	0.00	0.00
7.50	0.64	0.00	0.00
8.00	0.72	0.00	0.00
8.50	0.81	0.00	0.00
9.00	0.92	0.01	0.01
9.50	1.04	0.03	0.01
10.00	1.19	0.06	0.01
10.50	1.36	0.10	0.02
11.00	1.57	0.17	0.04
11.50	1.87	0.29	0.06
12.00	3.14	1.00	**0.38**
12.50	4.42	1.91	**0.30**
13.00	4.72	2.14	0.10
13.50	4.93	2.31	0.08
14.00	5.10	2.45	0.06
14.50	5.25	2.56	0.06
15.00	5.37	2.67	0.05
15.50	5.48	2.75	0.04
16.00	5.57	2.83	0.03
16.50	5.65	2.89	0.03
17.00	5.72	2.95	0.03
17.50	5.78	3.00	0.02
18.00	5.84	3.05	0.02
18.50	5.89	3.09	0.02
19.00	5.93	3.13	0.02
19.50	5.98	3.17	0.02
20.00	6.02	3.20	0.02
20.50	6.06	3.24	0.02
21.00	6.10	3.27	0.02
21.50	6.13	3.30	0.01
22.00	6.17	3.33	0.01
22.50	6.20	3.36	0.01
23.00	6.23	3.38	0.01
23.50	6.26	3.41	0.01
24.00	**6.29**	**3.43**	0.01
24.50	6.29	3.43	0.00
25.00	6.29	3.43	0.00
25.50	6.29	3.43	0.00
26.00	6.29	3.43	0.00
26.50	6.29	3.43	0.00
27.00	6.29	3.43	0.00
27.50	6.29	3.43	0.00
28.00	6.29	3.43	0.00
28.50	6.29	3.43	0.00
29.00	6.29	3.43	0.00
29.50	6.29	3.43	0.00
30.00	6.29	3.43	0.00
30.50	6.29	3.43	0.00
31.00	6.29	3.43	0.00
31.50	6.29	3.43	0.00
32.00	6.29	3.43	0.00
32.50	6.29	3.43	0.00
33.00	6.29	3.43	0.00
33.50	6.29	3.43	0.00
34.00	6.29	3.43	0.00
34.50	6.29	3.43	0.00
35.00	6.29	3.43	0.00
35.50	6.29	3.43	0.00
36.00	6.29	3.43	0.00
36.50	6.29	3.43	0.00
37.00	6.29	3.43	0.00
37.50	6.29	3.43	0.00
38.00	6.29	3.43	0.00
38.50	6.29	3.43	0.00
39.00	6.29	3.43	0.00
39.50	6.29	3.43	0.00
40.00	6.29	3.43	0.00
40.50	6.29	3.43	0.00
41.00	6.29	3.43	0.00
41.50	6.29	3.43	0.00
42.00	6.29	3.43	0.00
42.50	6.29	3.43	0.00
43.00	6.29	3.43	0.00
43.50	6.29	3.43	0.00
44.00	6.29	3.43	0.00
44.50	6.29	3.43	0.00
45.00	6.29	3.43	0.00
45.50	6.29	3.43	0.00
46.00	6.29	3.43	0.00
46.50	6.29	3.43	0.00
47.00	6.29	3.43	0.00
47.50	6.29	3.43	0.00
48.00	6.29	3.43	0.00

Summary for Pond 4P: Detention

Inflow Area = 1.440 ac, 86.11% Impervious, Inflow Depth = 5.70" for 25-yr event
Inflow = 8.51 cfs @ 12.09 hrs, Volume= 0.684 af
Outflow = 3.90 cfs @ 12.26 hrs, Volume= 0.684 af, Atten= 54%, Lag= 10.7 min
Primary = 3.90 cfs @ 12.26 hrs, Volume= 0.684 af
Routed to Link 5L : Proposed Combined

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 415.51' @ 12.26 hrs Surf.Area= 0.081 ac Storage= 0.138 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 14.5 min (777.0 - 762.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	411.50'	0.000 af	**31.09'W x 114.17'L x 6.58'H Field A** 0.536 af Overall - 0.240 af Embedded = 0.296 af x 0.0% Voids
#2A	412.00'	0.202 af	**ADS N-12 60"** x 20 Inside #1 Inside= 59.5"W x 59.5"H => 19.30 sf x 20.00'L = 386.0 cf Outside= 67.0"W x 67.0"H => 22.92 sf x 20.00'L = 458.4 cf 20 Chambers in 4 Rows 28.09' Header x 19.30 sf x 2 = 1,084.1 cf Inside
		0.202 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	412.00'	**15.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 412.00' / 408.00' S= 0.1000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	412.00'	**6.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	416.00'	**0.7' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 1	414.00'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	415.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.89 cfs @ 12.26 hrs HW=415.50' (Free Discharge)
└**1=Culvert** (Passes 3.89 cfs of 10.02 cfs potential flow)
├**2=Orifice/Grate** (Orifice Controls 1.99 cfs @ 8.66 fps)
├**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
├**4=Orifice/Grate** (Orifice Controls 1.42 cfs @ 5.30 fps)
└**5=Orifice/Grate** (Orifice Controls 0.47 cfs @ 2.42 fps)

Pond 4P: Detention - Chamber Wizard Field A

Chamber Model = ADS N-12 60" (ADS N-12® Pipe)
Inside= 59.5"W x 59.5"H => 19.30 sf x 20.00'L = 386.0 cf
Outside= 67.0"W x 67.0"H => 22.92 sf x 20.00'L = 458.4 cf

67.0" Wide + 23.0" Spacing = 90.0" C-C Row Spacing

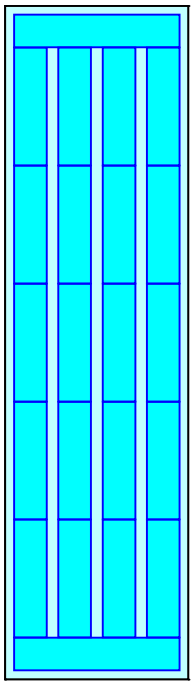
5 Chambers/Row x 20.00' Long +5.58' Header x 2 = 111.17' Row Length +18.0" End Stone x 2 = 114.17' Base Length
4 Rows x 67.0" Wide + 23.0" Spacing x 3 + 18.0" Side Stone x 2 = 31.09' Base Width
6.0" Stone Base + 67.0" Chamber Height + 6.0" Stone Cover = 6.58' Field Height

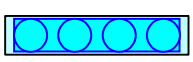
20 Chambers x 386.0 cf + 28.09' Header x 19.30 sf x 2 = 8,804.1 cf Chamber Storage
20 Chambers x 458.4 cf + 28.09' Header x 22.92 sf x 2 = 10,455.8 cf Displacement

23,365.6 cf Field - 10,455.8 cf Chambers = 12,909.8 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

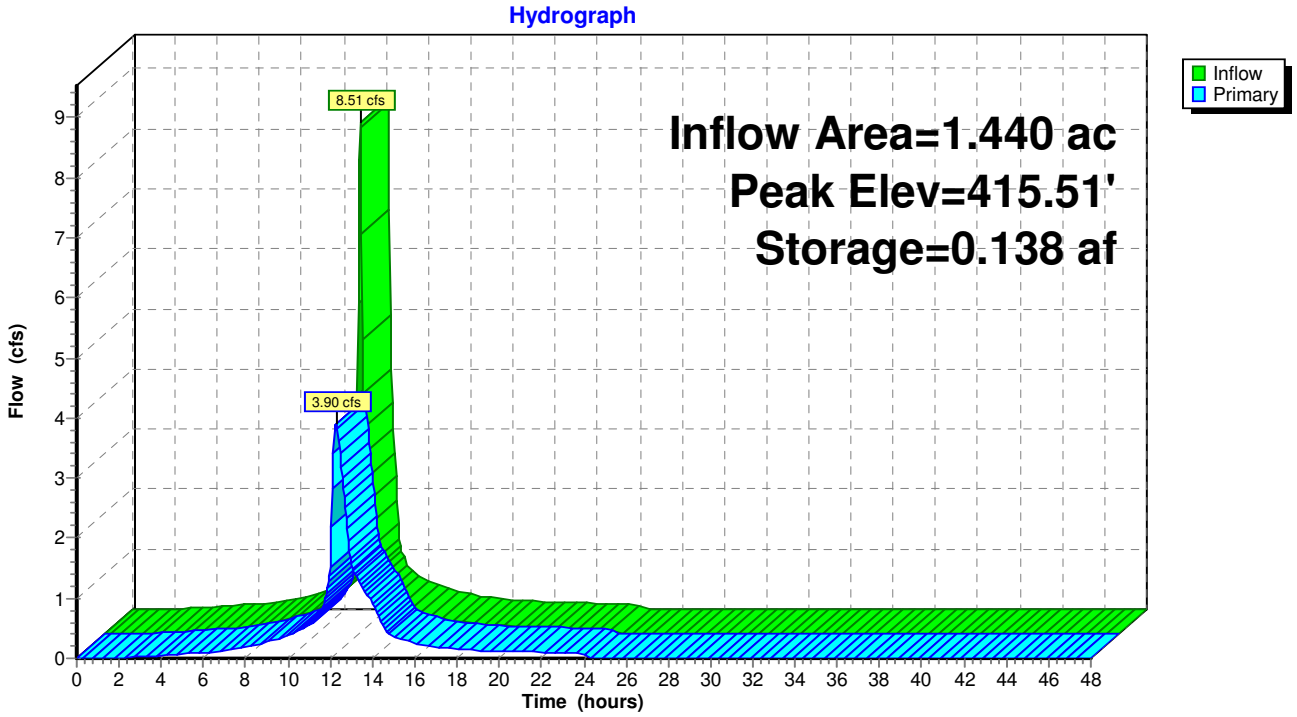
Chamber Storage = 8,804.1 cf = 0.202 af
Overall Storage Efficiency = 37.7%
Overall System Size = 114.17' x 31.09' x 6.58'

20 Chambers
865.4 cy Field
478.1 cy Stone

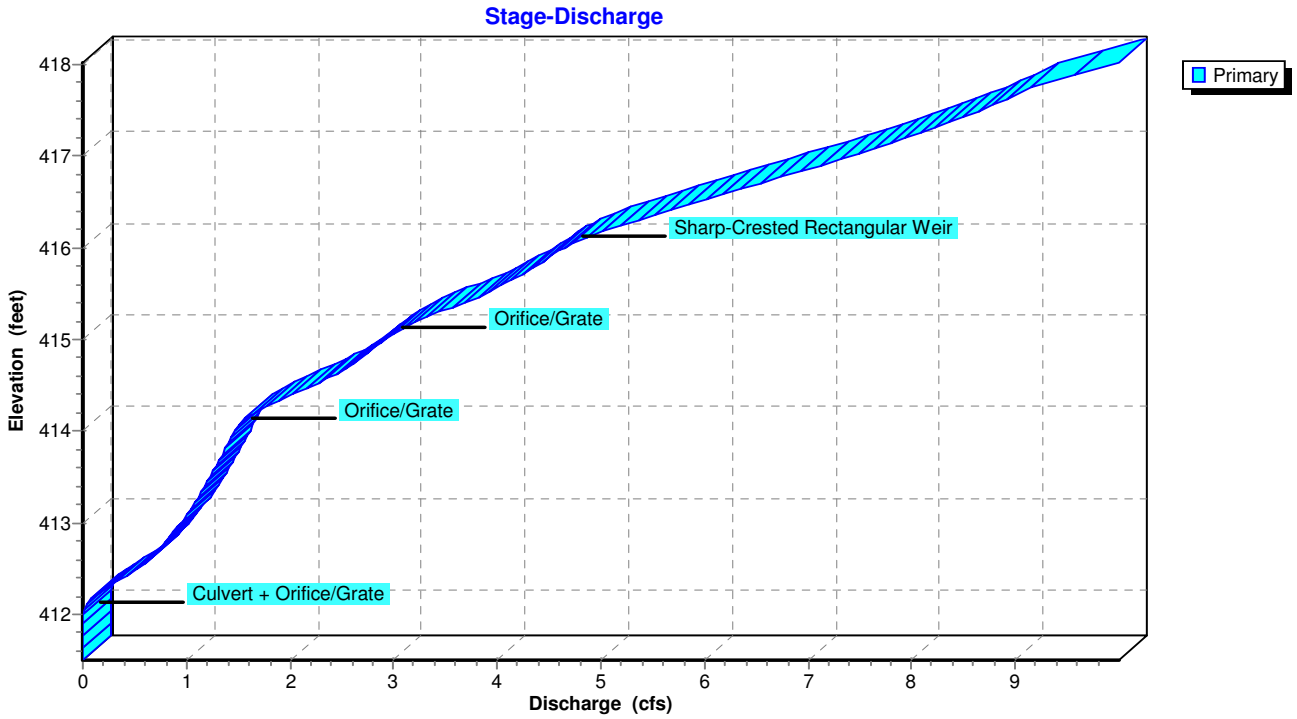




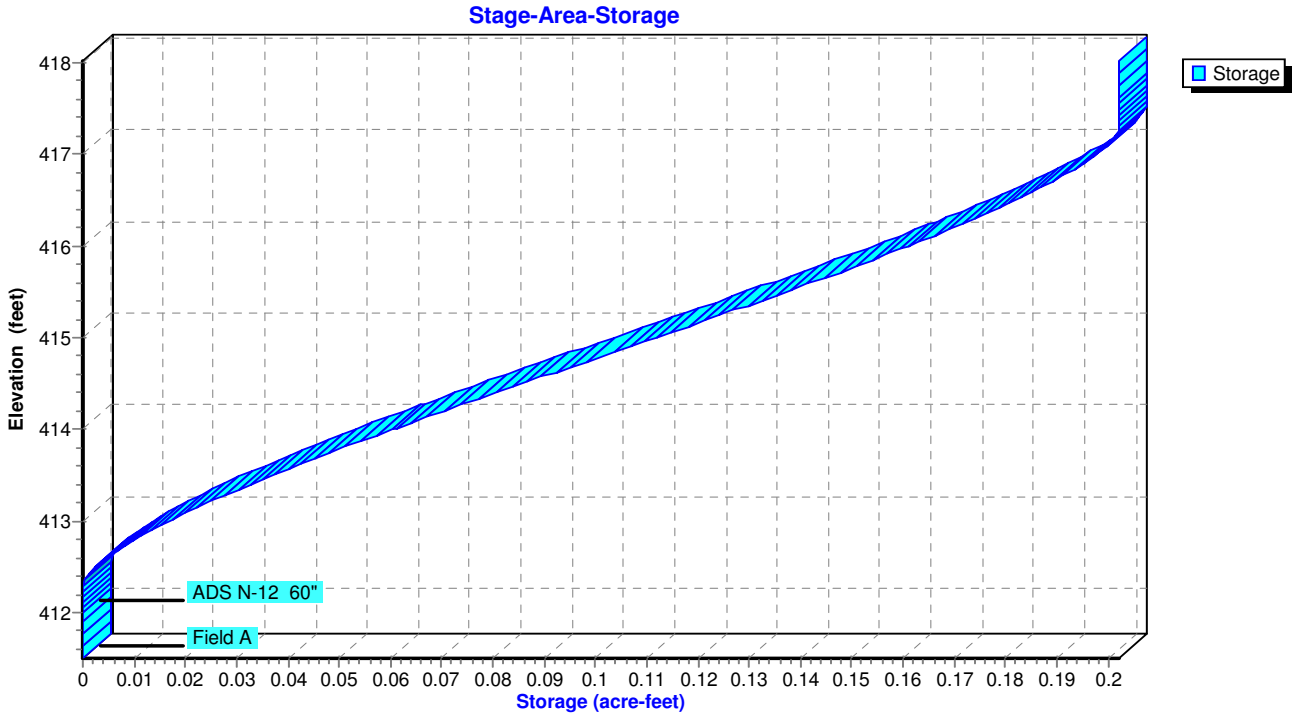
Pond 4P: Detention



Pond 4P: Detention



Pond 4P: Detention



Hydrograph for Pond 4P: Detention

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	411.50	0.00
1.00	0.00	0.000	411.50	0.00
2.00	0.00	0.000	412.04	0.00
3.00	0.03	0.000	412.09	0.03
4.00	0.05	0.000	412.12	0.05
5.00	0.07	0.000	412.15	0.07
6.00	0.09	0.000	412.17	0.09
7.00	0.13	0.000	412.21	0.13
8.00	0.18	0.000	412.25	0.18
9.00	0.28	0.000	412.32	0.28
10.00	0.39	0.001	412.39	0.38
11.00	0.60	0.003	412.52	0.56
12.00	**5.51**	**0.065**	**414.08**	**1.51**
13.00	**0.74**	**0.067**	**414.13**	**1.56**
14.00	0.46	0.014	412.91	0.89
15.00	0.35	0.001	412.38	0.36
16.00	0.25	0.000	412.30	0.25
17.00	0.19	0.000	412.26	0.19
18.00	0.15	0.000	412.23	0.15
19.00	0.13	0.000	412.21	0.13
20.00	0.12	0.000	412.20	0.12
21.00	0.11	0.000	412.19	0.11
22.00	0.10	0.000	412.18	0.10
23.00	0.09	0.000	412.17	0.09
24.00	0.08	0.000	412.16	0.08
25.00	0.00	0.000	412.00	0.00
26.00	0.00	0.000	412.00	0.00
27.00	0.00	0.000	412.00	0.00
28.00	0.00	0.000	412.00	0.00
29.00	0.00	0.000	412.00	0.00
30.00	0.00	0.000	412.00	0.00
31.00	0.00	0.000	412.00	0.00
32.00	0.00	0.000	412.00	0.00
33.00	0.00	0.000	412.00	0.00
34.00	0.00	0.000	412.00	0.00
35.00	0.00	0.000	412.00	0.00
36.00	0.00	0.000	412.00	0.00
37.00	0.00	0.000	412.00	0.00
38.00	0.00	0.000	412.00	0.00
39.00	0.00	0.000	412.00	0.00
40.00	0.00	0.000	412.00	0.00
41.00	0.00	0.000	412.00	0.00
42.00	0.00	0.000	412.00	0.00
43.00	0.00	0.000	412.00	0.00
44.00	0.00	0.000	412.00	0.00
45.00	0.00	0.000	412.00	0.00
46.00	0.00	0.000	412.00	0.00
47.00	0.00	0.000	412.00	0.00
48.00	0.00	0.000	412.00	0.00

Stage-Discharge for Pond 4P: Detention

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
411.50	0.00	414.10	1.53	416.70	6.54
411.55	0.00	414.15	1.59	416.75	6.69
411.60	0.00	414.20	1.66	416.80	6.84
411.65	0.00	414.25	1.75	416.85	6.99
411.70	0.00	414.30	1.84	416.90	7.13
411.75	0.00	414.35	1.94	416.95	7.28
411.80	0.00	414.40	2.04	417.00	7.42
411.85	0.00	414.45	2.14	417.05	7.56
411.90	0.00	414.50	2.24	417.10	7.69
411.95	0.00	414.55	2.33	417.15	7.82
412.00	0.00	414.60	2.41	417.20	7.96
412.05	0.01	414.65	2.48	417.25	8.08
412.10	0.03	414.70	2.55	417.30	8.21
412.15	0.07	414.75	2.62	417.35	8.33
412.20	0.12	414.80	2.68	417.40	8.44
412.25	0.18	414.85	2.74	417.45	8.56
412.30	0.24	414.90	2.80	417.50	8.66
412.35	0.32	414.95	2.86	417.55	8.77
412.40	0.39	415.00	2.92	417.60	8.87
412.45	0.47	415.05	2.98	417.65	8.96
412.50	0.54	415.10	3.05	417.70	9.05
412.55	0.59	415.15	3.14	417.75	9.13
412.60	0.64	415.20	3.24	417.80	9.29
412.65	0.68	415.25	3.34	417.85	9.45
412.70	0.73	415.30	3.45	417.90	9.61
412.75	0.77	415.35	3.57	417.95	9.78
412.80	0.81	415.40	3.68	418.00	9.94
412.85	0.84	415.45	3.79	418.05	**10.10**
412.90	0.88	415.50	3.88		
412.95	0.91	415.55	3.97		
413.00	0.95	415.60	4.06		
413.05	0.98	415.65	4.14		
413.10	1.01	415.70	4.22		
413.15	1.04	415.75	4.29		
413.20	1.07	415.80	4.37		
413.25	1.10	415.85	4.44		
413.30	1.13	415.90	4.51		
413.35	1.15	415.95	4.58		
413.40	1.18	416.00	4.64		
413.45	1.20	416.05	4.73		
413.50	1.23	416.10	4.84		
413.55	1.25	416.15	4.96		
413.60	1.28	416.20	5.09		
413.65	1.30	416.25	5.23		
413.70	1.33	416.30	5.36		
413.75	1.35	416.35	5.51		
413.80	1.37	416.40	5.65		
413.85	1.39	416.45	5.80		
413.90	1.42	416.50	5.94		
413.95	1.44	416.55	6.09		
414.00	1.46	416.60	6.24		
414.05	1.49	416.65	6.39		

Stage-Area-Storage for Pond 4P: Detention

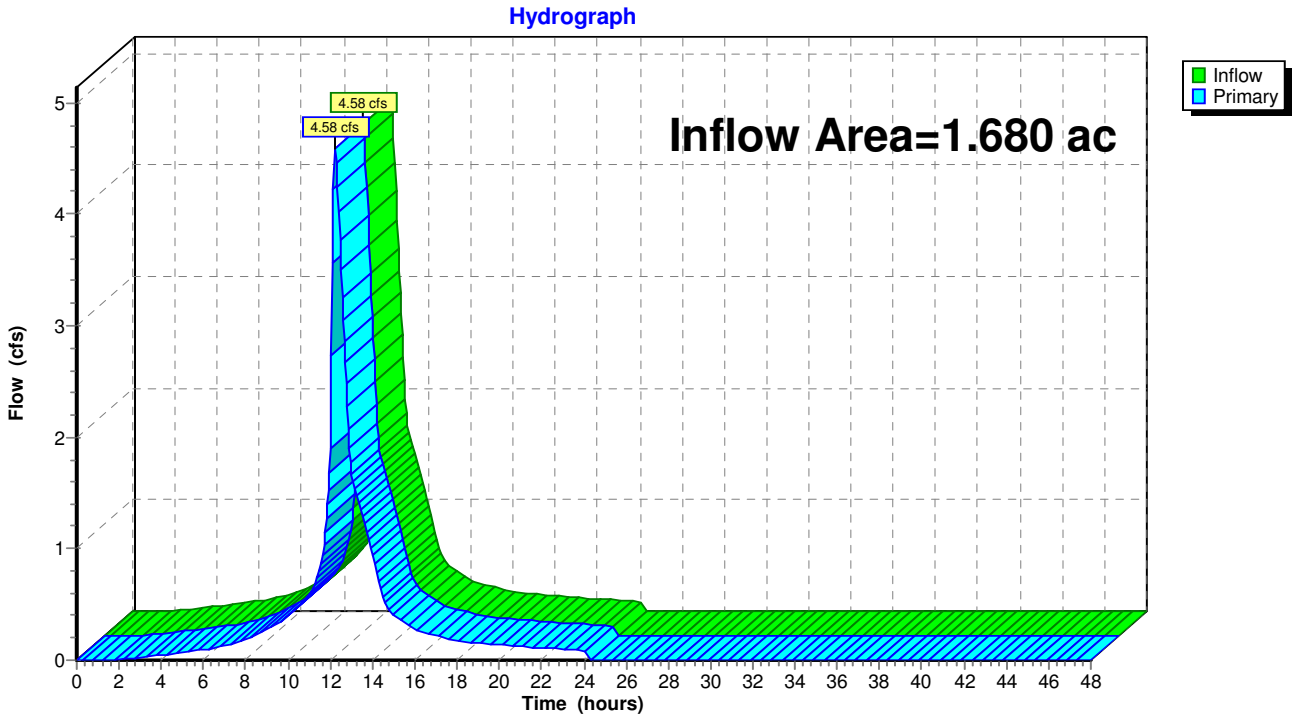
Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
411.50	0.000	414.10	0.066	416.70	0.189
411.55	0.000	414.15	0.068	416.75	0.191
411.60	0.000	414.20	0.071	416.80	0.192
411.65	0.000	414.25	0.073	416.85	0.194
411.70	0.000	414.30	0.076	416.90	0.195
411.75	0.000	414.35	0.078	416.95	0.197
411.80	0.000	414.40	0.081	417.00	0.198
411.85	0.000	414.45	0.083	417.05	0.199
411.90	0.000	414.50	0.086	417.10	0.200
411.95	0.000	414.55	0.089	417.15	0.201
412.00	0.000	414.60	0.091	417.20	0.202
412.05	0.000	414.65	0.094	417.25	0.202
412.10	0.000	414.70	0.096	417.30	**0.202**
412.15	0.000	414.75	0.099	417.35	0.202
412.20	0.000	414.80	0.101	417.40	0.202
412.25	0.000	414.85	0.104	417.45	0.202
412.30	0.000	414.90	0.107	417.50	0.202
412.35	0.000	414.95	0.109	417.55	0.202
412.40	0.001	415.00	0.112	417.60	0.202
412.45	0.002	415.05	0.114	417.65	0.202
412.50	0.002	415.10	0.117	417.70	0.202
412.55	0.004	415.15	0.120	417.75	0.202
412.60	0.005	415.20	0.122	417.80	0.202
412.65	0.006	415.25	0.125	417.85	0.202
412.70	0.007	415.30	0.127	417.90	0.202
412.75	0.009	415.35	0.130	417.95	0.202
412.80	0.010	415.40	0.132	418.00	0.202
412.85	0.012	415.45	0.135	418.05	0.202
412.90	0.013	415.50	0.137		
412.95	0.015	415.55	0.140		
413.00	0.017	415.60	0.142		
413.05	0.019	415.65	0.145		
413.10	0.021	415.70	0.147		
413.15	0.023	415.75	0.150		
413.20	0.025	415.80	0.152		
413.25	0.027	415.85	0.154		
413.30	0.029	415.90	0.157		
413.35	0.031	415.95	0.159		
413.40	0.033	416.00	0.161		
413.45	0.035	416.05	0.163		
413.50	0.037	416.10	0.166		
413.55	0.039	416.15	0.168		
413.60	0.042	416.20	0.170		
413.65	0.044	416.25	0.172		
413.70	0.046	416.30	0.174		
413.75	0.049	416.35	0.176		
413.80	0.051	416.40	0.178		
413.85	0.053	416.45	0.180		
413.90	0.056	416.50	0.182		
413.95	0.058	416.55	0.184		
414.00	0.061	416.60	0.186		
414.05	0.063	416.65	0.188		

Summary for Link 5L: Proposed Combined

Inflow Area = 1.680 ac, 73.81% Impervious, Inflow Depth = 5.38" for 25-yr event
Inflow = 4.58 cfs @ 12.22 hrs, Volume= 0.753 af
Primary = 4.58 cfs @ 12.22 hrs, Volume= 0.753 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 5L: Proposed Combined



Hydrograph for Link 5L: Proposed Combined

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.00	0.00	0.00	27.00	0.00	0.00	0.00
1.50	0.00	0.00	0.00	27.50	0.00	0.00	0.00
2.00	0.00	0.00	0.00	28.00	0.00	0.00	0.00
2.50	0.02	0.00	0.02	28.50	0.00	0.00	0.00
3.00	0.03	0.00	0.03	29.00	0.00	0.00	0.00
3.50	0.04	0.00	0.04	29.50	0.00	0.00	0.00
4.00	0.05	0.00	0.05	30.00	0.00	0.00	0.00
4.50	0.06	0.00	0.06	30.50	0.00	0.00	0.00
5.00	0.07	0.00	0.07	31.00	0.00	0.00	0.00
5.50	0.08	0.00	0.08	31.50	0.00	0.00	0.00
6.00	0.09	0.00	0.09	32.00	0.00	0.00	0.00
6.50	0.11	0.00	0.11	32.50	0.00	0.00	0.00
7.00	0.13	0.00	0.13	33.00	0.00	0.00	0.00
7.50	0.16	0.00	0.16	33.50	0.00	0.00	0.00
8.00	0.18	0.00	0.18	34.00	0.00	0.00	0.00
8.50	0.23	0.00	0.23	34.50	0.00	0.00	0.00
9.00	0.28	0.00	0.28	35.00	0.00	0.00	0.00
9.50	0.34	0.00	0.34	35.50	0.00	0.00	0.00
10.00	0.39	0.00	0.39	36.00	0.00	0.00	0.00
10.50	0.48	0.00	0.48	36.50	0.00	0.00	0.00
11.00	0.59	0.00	0.59	37.00	0.00	0.00	0.00
11.50	0.81	0.00	0.81	37.50	0.00	0.00	0.00
12.00	**1.90**	0.00	**1.90**	38.00	0.00	0.00	0.00
12.50	**3.49**	0.00	**3.49**	38.50	0.00	0.00	0.00
13.00	1.67	0.00	1.67	39.00	0.00	0.00	0.00
13.50	1.30	0.00	1.30	39.50	0.00	0.00	0.00
14.00	0.95	0.00	0.95	40.00	0.00	0.00	0.00
14.50	0.59	0.00	0.59	40.50	0.00	0.00	0.00
15.00	0.41	0.00	0.41	41.00	0.00	0.00	0.00
15.50	0.35	0.00	0.35	41.50	0.00	0.00	0.00
16.00	0.28	0.00	0.28	42.00	0.00	0.00	0.00
16.50	0.25	0.00	0.25	42.50	0.00	0.00	0.00
17.00	0.22	0.00	0.22	43.00	0.00	0.00	0.00
17.50	0.20	0.00	0.20	43.50	0.00	0.00	0.00
18.00	0.17	0.00	0.17	44.00	0.00	0.00	0.00
18.50	0.16	0.00	0.16	44.50	0.00	0.00	0.00
19.00	0.15	0.00	0.15	45.00	0.00	0.00	0.00
19.50	0.14	0.00	0.14	45.50	0.00	0.00	0.00
20.00	0.14	0.00	0.14	46.00	0.00	0.00	0.00
20.50	0.13	0.00	0.13	46.50	0.00	0.00	0.00
21.00	0.12	0.00	0.12	47.00	0.00	0.00	0.00
21.50	0.12	0.00	0.12	47.50	0.00	0.00	0.00
22.00	0.11	0.00	0.11	48.00	0.00	0.00	0.00
22.50	0.11	0.00	0.11				
23.00	0.10	0.00	0.10				
23.50	0.09	0.00	0.09				
24.00	0.09	0.00	0.09				
24.50	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Existing Runoff Area=1.680 ac 27.98% Impervious Runoff Depth=5.03"
Flow Length=367' Tc=11.4 min CN=79 Runoff=8.17 cfs 0.705 af

Subcatchment 2S: Proposed to Treatment Runoff Area=1.440 ac 86.11% Impervious Runoff Depth=6.89"
Tc=6.0 min CN=95 Runoff=10.20 cfs 0.827 af

Subcatchment 3S: Proposed to Bypass Runoff Area=0.240 ac 0.00% Impervious Runoff Depth=4.47"
Flow Length=200' Tc=10.7 min CN=74 Runoff=1.07 cfs 0.089 af

Pond 4P: Detention Peak Elev=416.09' Storage=0.165 af Inflow=10.20 cfs 0.827 af
Outflow=4.83 cfs 0.827 af

Link 5L: Proposed Combined Inflow=5.71 cfs 0.917 af
Primary=5.71 cfs 0.917 af

Total Runoff Area = 3.360 ac Runoff Volume = 1.622 af Average Runoff Depth = 5.79"
49.11% Pervious = 1.650 ac 50.89% Impervious = 1.710 ac

Summary for Subcatchment 1S: Existing

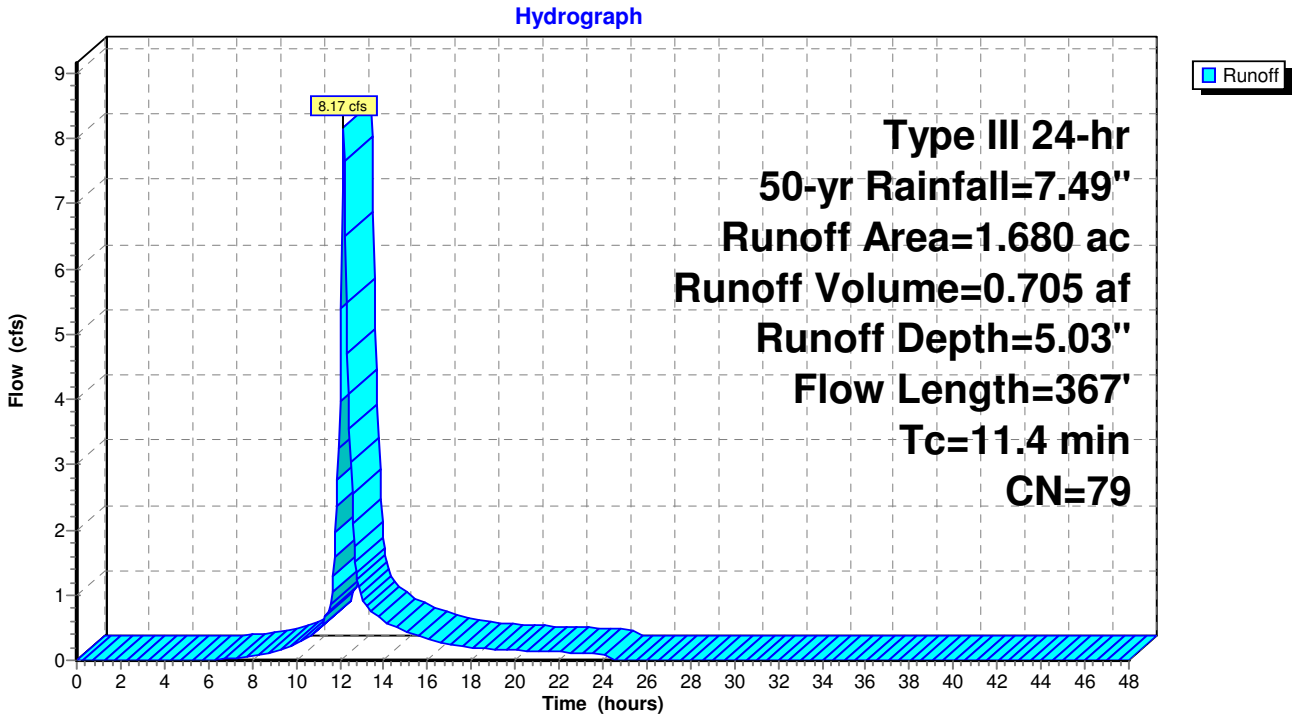
Runoff = 8.17 cfs @ 12.16 hrs, Volume= 0.705 af, Depth= 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.49"

	Area (ac)	CN	Description
*	0.470	98	Impervious
	0.520	70	Woods, Good, HSG C
	0.690	74	>75% Grass cover, Good, HSG C
	1.680	79	Weighted Average
	1.210		72.02% Pervious Area
	0.470		27.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0400	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
1.1	267	0.0600	3.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
11.4	367	Total			

Subcatchment 1S: Existing



Hydrograph for Subcatchment 1S: Existing

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.11	0.00	0.00
2.00	0.15	0.00	0.00
2.50	0.19	0.00	0.00
3.00	0.23	0.00	0.00
3.50	0.27	0.00	0.00
4.00	0.32	0.00	0.00
4.50	0.37	0.00	0.00
5.00	0.43	0.00	0.00
5.50	0.48	0.00	0.00
6.00	0.54	0.00	0.00
6.50	0.60	0.00	0.01
7.00	0.68	0.01	0.02
7.50	0.76	0.02	0.04
8.00	0.85	0.03	0.06
8.50	0.96	0.06	0.09
9.00	1.09	0.10	0.13
9.50	1.24	0.15	0.19
10.00	1.42	0.22	0.25
10.50	1.62	0.32	0.34
11.00	1.87	0.45	0.47
11.50	2.23	0.66	0.79
12.00	3.74	1.76	**3.98**
12.50	5.26	3.02	**3.04**
13.00	5.62	3.34	1.00
13.50	5.87	3.56	0.73
14.00	6.07	3.75	0.60
14.50	6.25	3.90	0.52
15.00	6.40	4.04	0.45
15.50	6.53	4.15	0.39
16.00	6.64	4.25	0.32
16.50	6.73	4.34	0.28
17.00	6.81	4.41	0.25
17.50	6.89	4.48	0.22
18.00	6.95	4.54	0.20
18.50	7.01	4.59	0.18
19.00	7.06	4.64	0.17
19.50	7.12	4.69	0.16
20.00	7.17	4.74	0.15
20.50	7.22	4.78	0.15
21.00	7.26	4.82	0.14
21.50	7.30	4.86	0.13
22.00	7.35	4.90	0.13
22.50	7.39	4.94	0.12
23.00	7.42	4.97	0.11
23.50	7.46	5.00	0.11
24.00	**7.49**	**5.03**	0.10
24.50	7.49	5.03	0.00
25.00	7.49	5.03	0.00
25.50	7.49	5.03	0.00
26.00	7.49	5.03	0.00
26.50	7.49	5.03	0.00
27.00	7.49	5.03	0.00
27.50	7.49	5.03	0.00
28.00	7.49	5.03	0.00
28.50	7.49	5.03	0.00
29.00	7.49	5.03	0.00
29.50	7.49	5.03	0.00
30.00	7.49	5.03	0.00
30.50	7.49	5.03	0.00
31.00	7.49	5.03	0.00
31.50	7.49	5.03	0.00
32.00	7.49	5.03	0.00
32.50	7.49	5.03	0.00
33.00	7.49	5.03	0.00
33.50	7.49	5.03	0.00
34.00	7.49	5.03	0.00
34.50	7.49	5.03	0.00
35.00	7.49	5.03	0.00
35.50	7.49	5.03	0.00
36.00	7.49	5.03	0.00
36.50	7.49	5.03	0.00
37.00	7.49	5.03	0.00
37.50	7.49	5.03	0.00
38.00	7.49	5.03	0.00
38.50	7.49	5.03	0.00
39.00	7.49	5.03	0.00
39.50	7.49	5.03	0.00
40.00	7.49	5.03	0.00
40.50	7.49	5.03	0.00
41.00	7.49	5.03	0.00
41.50	7.49	5.03	0.00
42.00	7.49	5.03	0.00
42.50	7.49	5.03	0.00
43.00	7.49	5.03	0.00
43.50	7.49	5.03	0.00
44.00	7.49	5.03	0.00
44.50	7.49	5.03	0.00
45.00	7.49	5.03	0.00
45.50	7.49	5.03	0.00
46.00	7.49	5.03	0.00
46.50	7.49	5.03	0.00
47.00	7.49	5.03	0.00
47.50	7.49	5.03	0.00
48.00	7.49	5.03	0.00

Summary for Subcatchment 2S: Proposed to Treatment

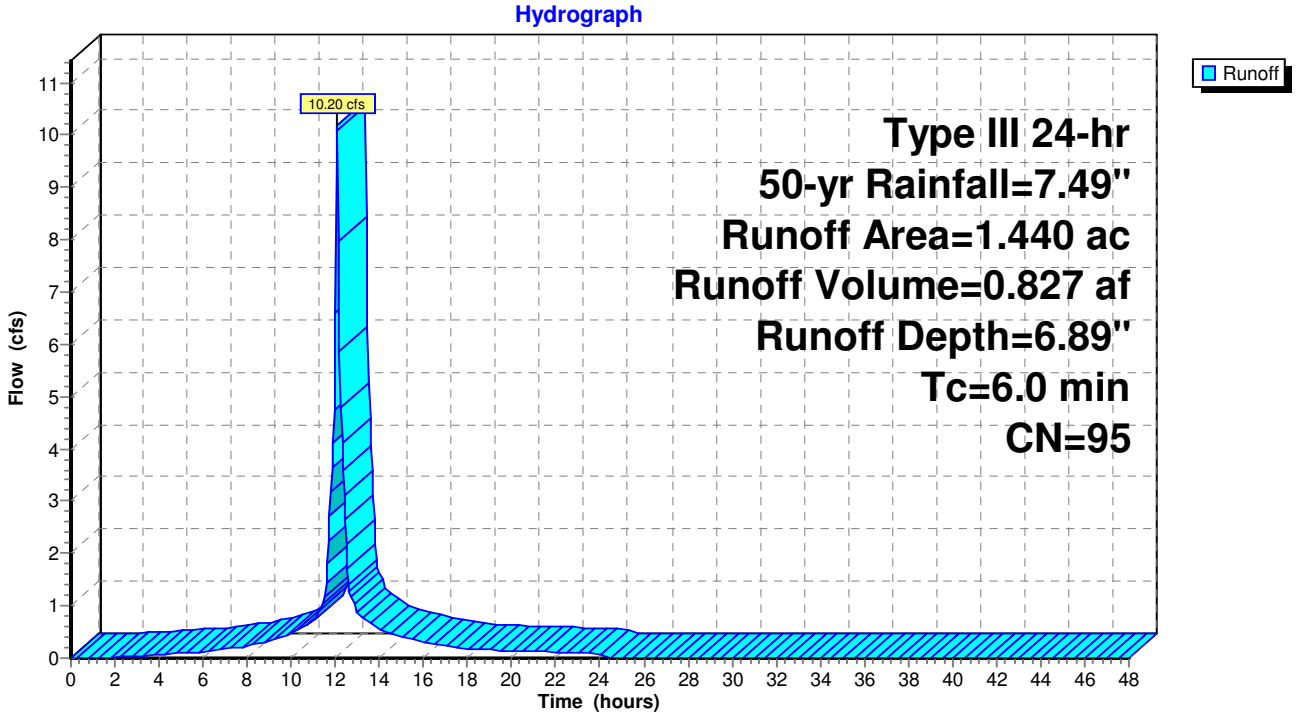
Runoff = 10.20 cfs @ 12.09 hrs, Volume= 0.827 af, Depth= 6.89"
Routed to Pond 4P : Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.49"

	Area (ac)	CN	Description
*	1.240	98	Impervious
	0.200	74	>75% Grass cover, Good, HSG C
	1.440	95	Weighted Average
	0.200		13.89% Pervious Area
	1.240		86.11% Impervious Area

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

Subcatchment 2S: Proposed to Treatment



Hydrograph for Subcatchment 2S: Proposed to Treatment

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.11	0.00	0.00
2.00	0.15	0.00	0.01
2.50	0.19	0.01	0.03
3.00	0.23	0.02	0.04
3.50	0.27	0.04	0.05
4.00	0.32	0.06	0.07
4.50	0.37	0.09	0.08
5.00	0.43	0.12	0.09
5.50	0.48	0.16	0.11
6.00	0.54	0.20	0.12
6.50	0.60	0.24	0.14
7.00	0.68	0.30	0.17
7.50	0.76	0.36	0.20
8.00	0.85	0.44	0.23
8.50	0.96	0.53	0.28
9.00	1.09	0.64	0.35
9.50	1.24	0.78	0.41
10.00	1.42	0.93	0.48
10.50	1.62	1.13	0.59
11.00	1.87	1.36	0.73
11.50	2.23	1.70	1.15
12.00	3.74	3.18	**6.61**
12.50	5.26	4.68	**2.16**
13.00	5.62	5.03	0.88
13.50	5.87	5.28	0.68
14.00	6.07	5.49	0.55
14.50	6.25	5.66	0.48
15.00	6.40	5.81	0.42
15.50	6.53	5.94	0.35
16.00	6.64	6.04	0.29
16.50	6.73	6.14	0.26
17.00	6.81	6.22	0.23
17.50	6.89	6.29	0.21
18.00	6.95	6.36	0.18
18.50	7.01	6.41	0.17
19.00	7.06	6.47	0.16
19.50	7.12	6.52	0.15
20.00	7.17	6.57	0.14
20.50	7.22	6.62	0.14
21.00	7.26	6.67	0.13
21.50	7.30	6.71	0.12
22.00	7.35	6.75	0.12
22.50	7.39	6.79	0.11
23.00	7.42	6.83	0.11
23.50	7.46	6.86	0.10
24.00	**7.49**	**6.89**	0.09
24.50	7.49	6.89	0.00
25.00	7.49	6.89	0.00
25.50	7.49	6.89	0.00
26.00	7.49	6.89	0.00
26.50	7.49	6.89	0.00
27.00	7.49	6.89	0.00
27.50	7.49	6.89	0.00
28.00	7.49	6.89	0.00
28.50	7.49	6.89	0.00
29.00	7.49	6.89	0.00
29.50	7.49	6.89	0.00
30.00	7.49	6.89	0.00
30.50	7.49	6.89	0.00
31.00	7.49	6.89	0.00
31.50	7.49	6.89	0.00
32.00	7.49	6.89	0.00
32.50	7.49	6.89	0.00
33.00	7.49	6.89	0.00
33.50	7.49	6.89	0.00
34.00	7.49	6.89	0.00
34.50	7.49	6.89	0.00
35.00	7.49	6.89	0.00
35.50	7.49	6.89	0.00
36.00	7.49	6.89	0.00
36.50	7.49	6.89	0.00
37.00	7.49	6.89	0.00
37.50	7.49	6.89	0.00
38.00	7.49	6.89	0.00
38.50	7.49	6.89	0.00
39.00	7.49	6.89	0.00
39.50	7.49	6.89	0.00
40.00	7.49	6.89	0.00
40.50	7.49	6.89	0.00
41.00	7.49	6.89	0.00
41.50	7.49	6.89	0.00
42.00	7.49	6.89	0.00
42.50	7.49	6.89	0.00
43.00	7.49	6.89	0.00
43.50	7.49	6.89	0.00
44.00	7.49	6.89	0.00
44.50	7.49	6.89	0.00
45.00	7.49	6.89	0.00
45.50	7.49	6.89	0.00
46.00	7.49	6.89	0.00
46.50	7.49	6.89	0.00
47.00	7.49	6.89	0.00
47.50	7.49	6.89	0.00
48.00	7.49	6.89	0.00

Summary for Subcatchment 3S: Proposed to Bypass

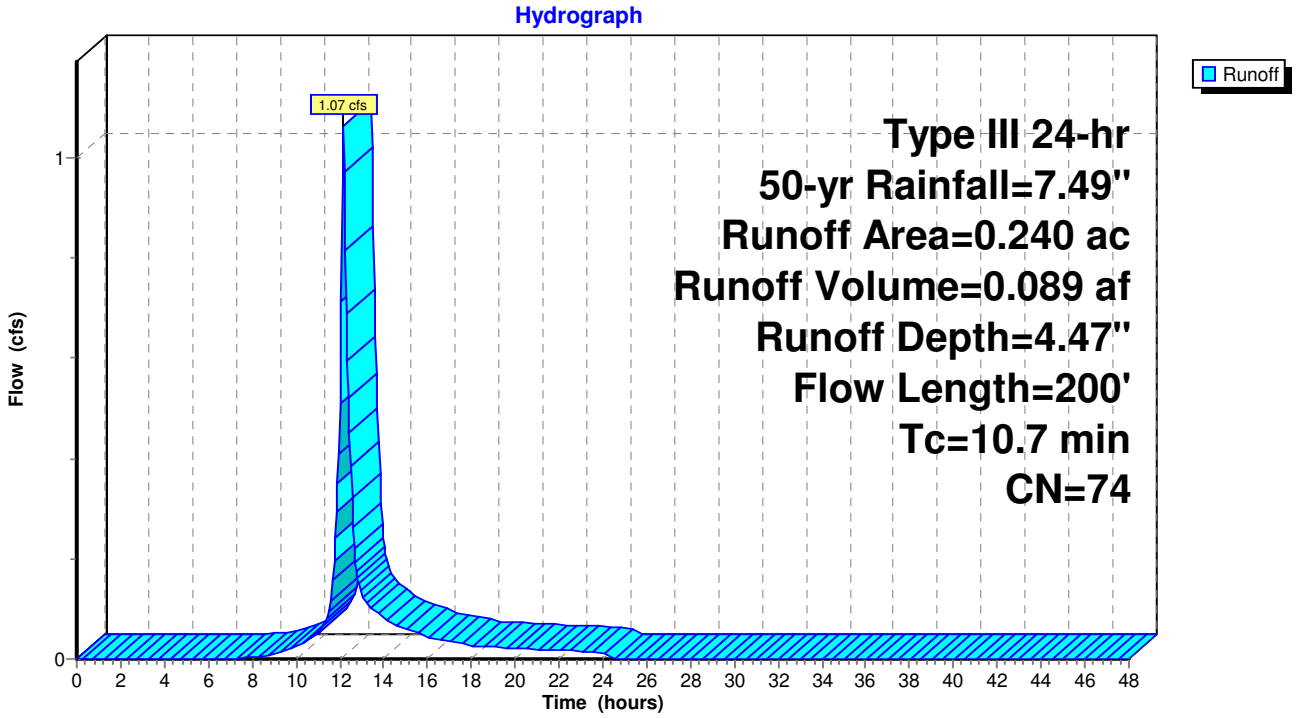
Runoff = 1.07 cfs @ 12.15 hrs, Volume= 0.089 af, Depth= 4.47"
Routed to Link 5L : Proposed Combined

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.49"

Area (ac)	CN	Description
0.240	74	>75% Grass cover, Good, HSG C
0.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0400	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
0.4	100	0.0700	4.26		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.7	200	Total			

Subcatchment 3S: Proposed to Bypass



Hydrograph for Subcatchment 3S: Proposed to Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.11	0.00	0.00
2.00	0.15	0.00	0.00
2.50	0.19	0.00	0.00
3.00	0.23	0.00	0.00
3.50	0.27	0.00	0.00
4.00	0.32	0.00	0.00
4.50	0.37	0.00	0.00
5.00	0.43	0.00	0.00
5.50	0.48	0.00	0.00
6.00	0.54	0.00	0.00
6.50	0.60	0.00	0.00
7.00	0.68	0.00	0.00
7.50	0.76	0.00	0.00
8.00	0.85	0.01	0.00
8.50	0.96	0.02	0.01
9.00	1.09	0.04	0.01
9.50	1.24	0.07	0.02
10.00	1.42	0.12	0.02
10.50	1.62	0.19	0.04
11.00	1.87	0.29	0.05
11.50	2.23	0.46	0.09
12.00	3.74	1.41	**0.51**
12.50	5.26	2.57	**0.39**
13.00	5.62	2.87	0.13
13.50	5.87	3.07	0.10
14.00	6.07	3.25	0.08
14.50	6.25	3.39	0.07
15.00	6.40	3.52	0.06
15.50	6.53	3.63	0.05
16.00	6.64	3.73	0.04
16.50	6.73	3.81	0.04
17.00	6.81	3.88	0.03
17.50	6.89	3.94	0.03
18.00	6.95	4.00	0.03
18.50	7.01	4.05	0.02
19.00	7.06	4.10	0.02
19.50	7.12	4.14	0.02
20.00	7.17	4.19	0.02
20.50	7.22	4.23	0.02
21.00	7.26	4.27	0.02
21.50	7.30	4.31	0.02
22.00	7.35	4.35	0.02
22.50	7.39	4.38	0.02
23.00	7.42	4.41	0.02
23.50	7.46	4.44	0.01
24.00	**7.49**	**4.47**	0.01
24.50	7.49	4.47	0.00
25.00	7.49	4.47	0.00
25.50	7.49	4.47	0.00
26.00	7.49	4.47	0.00
26.50	7.49	4.47	0.00
27.00	7.49	4.47	0.00
27.50	7.49	4.47	0.00
28.00	7.49	4.47	0.00
28.50	7.49	4.47	0.00
29.00	7.49	4.47	0.00
29.50	7.49	4.47	0.00
30.00	7.49	4.47	0.00
30.50	7.49	4.47	0.00
31.00	7.49	4.47	0.00
31.50	7.49	4.47	0.00
32.00	7.49	4.47	0.00
32.50	7.49	4.47	0.00
33.00	7.49	4.47	0.00
33.50	7.49	4.47	0.00
34.00	7.49	4.47	0.00
34.50	7.49	4.47	0.00
35.00	7.49	4.47	0.00
35.50	7.49	4.47	0.00
36.00	7.49	4.47	0.00
36.50	7.49	4.47	0.00
37.00	7.49	4.47	0.00
37.50	7.49	4.47	0.00
38.00	7.49	4.47	0.00
38.50	7.49	4.47	0.00
39.00	7.49	4.47	0.00
39.50	7.49	4.47	0.00
40.00	7.49	4.47	0.00
40.50	7.49	4.47	0.00
41.00	7.49	4.47	0.00
41.50	7.49	4.47	0.00
42.00	7.49	4.47	0.00
42.50	7.49	4.47	0.00
43.00	7.49	4.47	0.00
43.50	7.49	4.47	0.00
44.00	7.49	4.47	0.00
44.50	7.49	4.47	0.00
45.00	7.49	4.47	0.00
45.50	7.49	4.47	0.00
46.00	7.49	4.47	0.00
46.50	7.49	4.47	0.00
47.00	7.49	4.47	0.00
47.50	7.49	4.47	0.00
48.00	7.49	4.47	0.00

Summary for Pond 4P: Detention

Inflow Area = 1.440 ac, 86.11% Impervious, Inflow Depth = 6.89" for 50-yr event
Inflow = 10.20 cfs @ 12.09 hrs, Volume= 0.827 af
Outflow = 4.83 cfs @ 12.26 hrs, Volume= 0.827 af, Atten= 53%, Lag= 10.1 min
Primary = 4.83 cfs @ 12.26 hrs, Volume= 0.827 af
Routed to Link 5L : Proposed Combined

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 416.09' @ 12.26 hrs Surf.Area= 0.081 ac Storage= 0.165 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 15.1 min (773.6 - 758.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	411.50'	0.000 af	**31.09'W x 114.17'L x 6.58'H Field A** 0.536 af Overall - 0.240 af Embedded = 0.296 af x 0.0% Voids
#2A	412.00'	0.202 af	**ADS N-12 60"** x 20 Inside #1 Inside= 59.5"W x 59.5"H => 19.30 sf x 20.00'L = 386.0 cf Outside= 67.0"W x 67.0"H => 22.92 sf x 20.00'L = 458.4 cf 20 Chambers in 4 Rows 28.09' Header x 19.30 sf x 2 = 1,084.1 cf Inside
		0.202 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	412.00'	**15.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 412.00' / 408.00' S= 0.1000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	412.00'	**6.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	416.00'	**0.7' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 1	414.00'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	415.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.82 cfs @ 12.26 hrs HW=416.09' (Free Discharge)
└**1=Culvert** (Passes 4.82 cfs of 11.00 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 2.17 cfs @ 9.41 fps)
  ├**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.06 cfs @ 0.98 fps)
  ├**4=Orifice/Grate** (Orifice Controls 1.73 cfs @ 6.46 fps)
  └**5=Orifice/Grate** (Orifice Controls 0.87 cfs @ 4.41 fps)

Pond 4P: Detention - Chamber Wizard Field A

Chamber Model = ADS N-12 60" (ADS N-12® Pipe)
Inside= 59.5"W x 59.5"H => 19.30 sf x 20.00'L = 386.0 cf
Outside= 67.0"W x 67.0"H => 22.92 sf x 20.00'L = 458.4 cf

67.0" Wide + 23.0" Spacing = 90.0" C-C Row Spacing

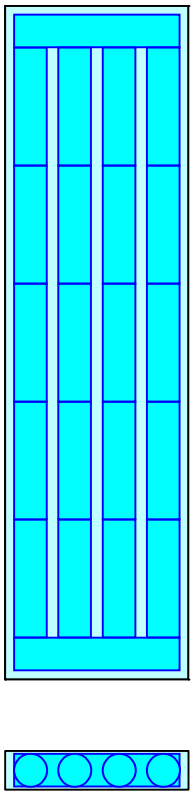
5 Chambers/Row x 20.00' Long +5.58' Header x 2 = 111.17' Row Length +18.0" End Stone x 2 = 114.17' Base Length
4 Rows x 67.0" Wide + 23.0" Spacing x 3 + 18.0" Side Stone x 2 = 31.09' Base Width
6.0" Stone Base + 67.0" Chamber Height + 6.0" Stone Cover = 6.58' Field Height

20 Chambers x 386.0 cf + 28.09' Header x 19.30 sf x 2 = 8,804.1 cf Chamber Storage
20 Chambers x 458.4 cf + 28.09' Header x 22.92 sf x 2 = 10,455.8 cf Displacement

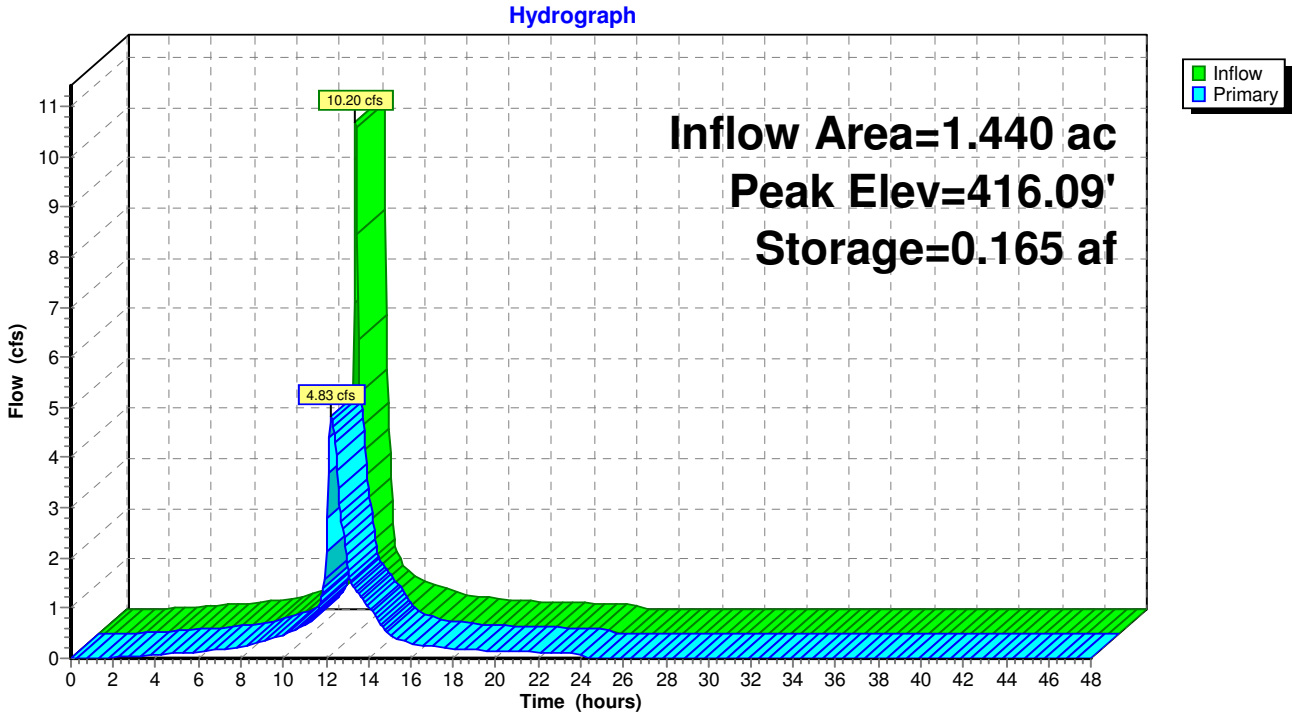
23,365.6 cf Field - 10,455.8 cf Chambers = 12,909.8 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 8,804.1 cf = 0.202 af
Overall Storage Efficiency = 37.7%
Overall System Size = 114.17' x 31.09' x 6.58'

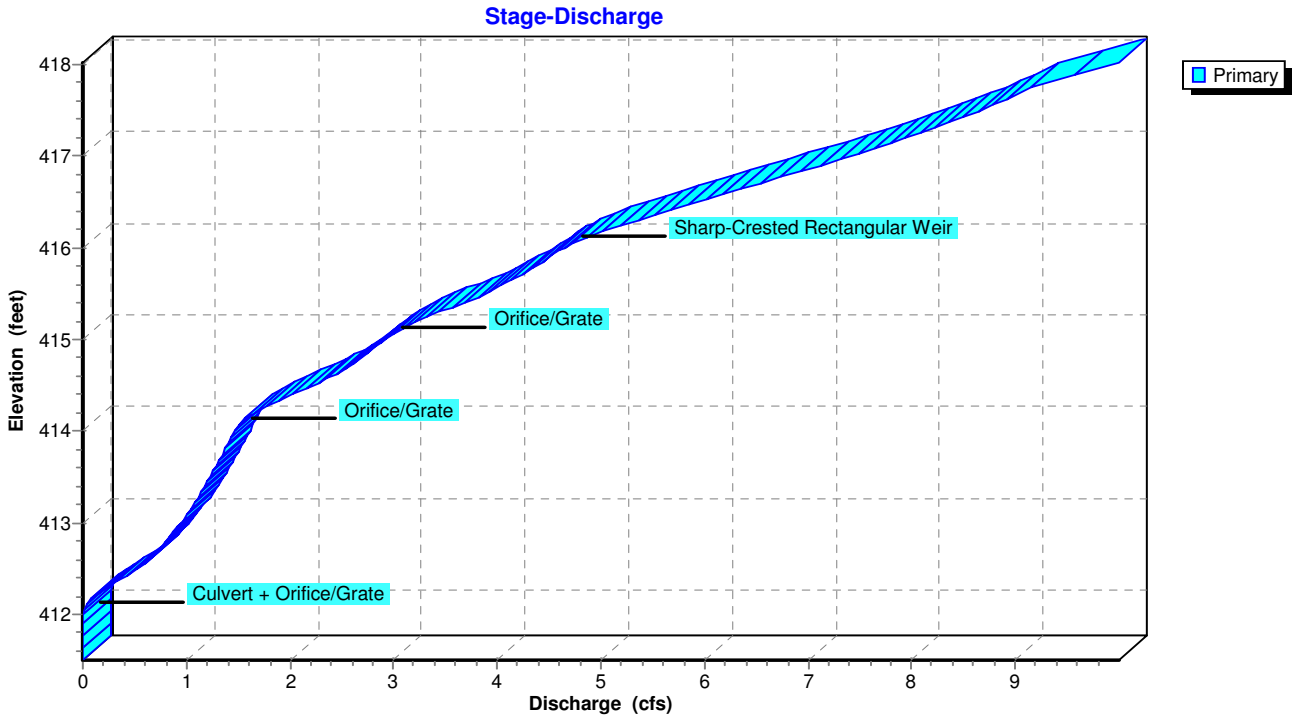
20 Chambers
865.4 cy Field
478.1 cy Stone



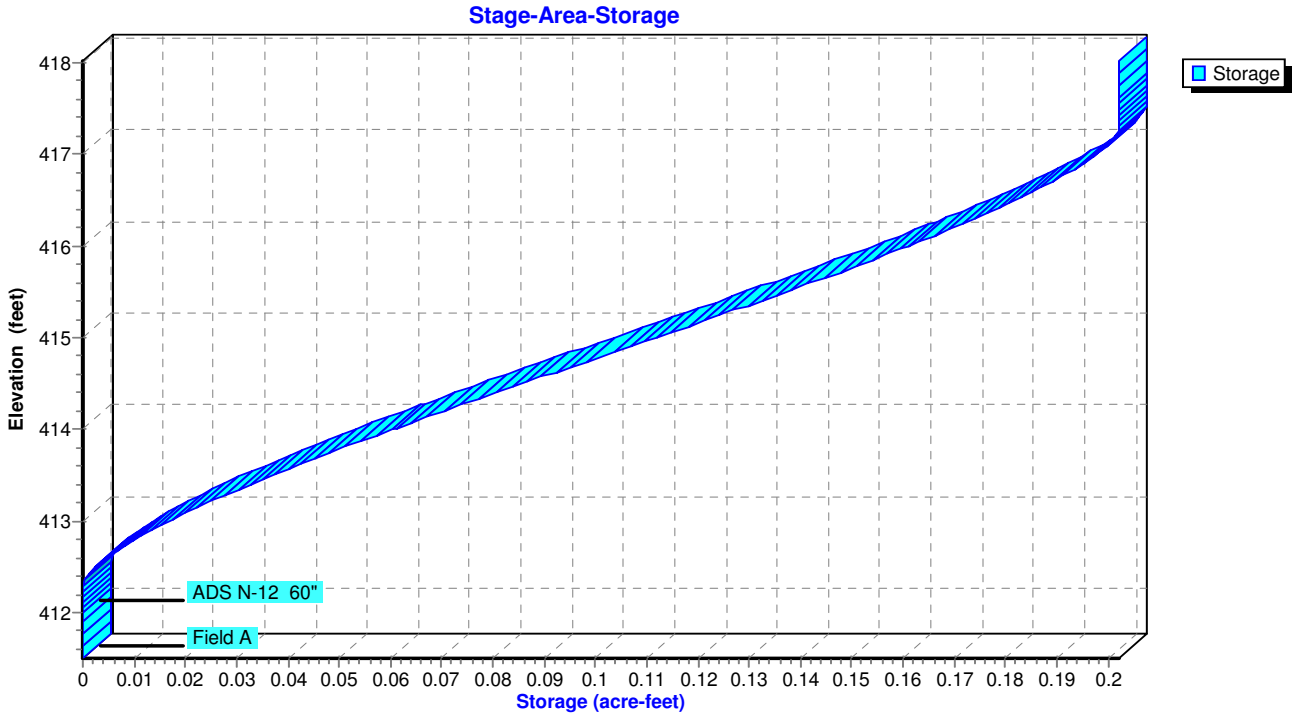
Pond 4P: Detention



Pond 4P: Detention



Pond 4P: Detention



Hydrograph for Pond 4P: Detention

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	411.50	0.00
1.00	0.00	0.000	411.50	0.00
2.00	0.01	0.000	412.06	0.01
3.00	0.04	0.000	412.11	0.04
4.00	0.07	0.000	412.15	0.07
5.00	0.09	0.000	412.18	0.09
6.00	0.12	0.000	412.20	0.12
7.00	0.17	0.000	412.24	0.17
8.00	0.23	0.000	412.29	0.23
9.00	0.35	0.000	412.36	0.34
10.00	0.48	0.001	412.44	0.46
11.00	0.73	0.005	412.62	0.66
12.00	**6.61**	**0.083**	**414.44**	**2.13**
13.00	**0.88**	**0.077**	**414.32**	**1.87**
14.00	0.55	0.022	413.15	1.04
15.00	0.42	0.002	412.45	0.47
16.00	0.29	0.000	412.34	0.30
17.00	0.23	0.000	412.29	0.23
18.00	0.18	0.000	412.25	0.18
19.00	0.16	0.000	412.23	0.16
20.00	0.14	0.000	412.22	0.14
21.00	0.13	0.000	412.21	0.13
22.00	0.12	0.000	412.20	0.12
23.00	0.11	0.000	412.19	0.11
24.00	0.09	0.000	412.18	0.09
25.00	0.00	0.000	412.00	0.00
26.00	0.00	0.000	412.00	0.00
27.00	0.00	0.000	412.00	0.00
28.00	0.00	0.000	412.00	0.00
29.00	0.00	0.000	412.00	0.00
30.00	0.00	0.000	412.00	0.00
31.00	0.00	0.000	412.00	0.00
32.00	0.00	0.000	412.00	0.00
33.00	0.00	0.000	412.00	0.00
34.00	0.00	0.000	412.00	0.00
35.00	0.00	0.000	412.00	0.00
36.00	0.00	0.000	412.00	0.00
37.00	0.00	0.000	412.00	0.00
38.00	0.00	0.000	412.00	0.00
39.00	0.00	0.000	412.00	0.00
40.00	0.00	0.000	412.00	0.00
41.00	0.00	0.000	412.00	0.00
42.00	0.00	0.000	412.00	0.00
43.00	0.00	0.000	412.00	0.00
44.00	0.00	0.000	412.00	0.00
45.00	0.00	0.000	412.00	0.00
46.00	0.00	0.000	412.00	0.00
47.00	0.00	0.000	412.00	0.00
48.00	0.00	0.000	412.00	0.00

Stage-Discharge for Pond 4P: Detention

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
411.50	0.00	414.10	1.53	416.70	6.54
411.55	0.00	414.15	1.59	416.75	6.69
411.60	0.00	414.20	1.66	416.80	6.84
411.65	0.00	414.25	1.75	416.85	6.99
411.70	0.00	414.30	1.84	416.90	7.13
411.75	0.00	414.35	1.94	416.95	7.28
411.80	0.00	414.40	2.04	417.00	7.42
411.85	0.00	414.45	2.14	417.05	7.56
411.90	0.00	414.50	2.24	417.10	7.69
411.95	0.00	414.55	2.33	417.15	7.82
412.00	0.00	414.60	2.41	417.20	7.96
412.05	0.01	414.65	2.48	417.25	8.08
412.10	0.03	414.70	2.55	417.30	8.21
412.15	0.07	414.75	2.62	417.35	8.33
412.20	0.12	414.80	2.68	417.40	8.44
412.25	0.18	414.85	2.74	417.45	8.56
412.30	0.24	414.90	2.80	417.50	8.66
412.35	0.32	414.95	2.86	417.55	8.77
412.40	0.39	415.00	2.92	417.60	8.87
412.45	0.47	415.05	2.98	417.65	8.96
412.50	0.54	415.10	3.05	417.70	9.05
412.55	0.59	415.15	3.14	417.75	9.13
412.60	0.64	415.20	3.24	417.80	9.29
412.65	0.68	415.25	3.34	417.85	9.45
412.70	0.73	415.30	3.45	417.90	9.61
412.75	0.77	415.35	3.57	417.95	9.78
412.80	0.81	415.40	3.68	418.00	9.94
412.85	0.84	415.45	3.79	418.05	**10.10**
412.90	0.88	415.50	3.88		
412.95	0.91	415.55	3.97		
413.00	0.95	415.60	4.06		
413.05	0.98	415.65	4.14		
413.10	1.01	415.70	4.22		
413.15	1.04	415.75	4.29		
413.20	1.07	415.80	4.37		
413.25	1.10	415.85	4.44		
413.30	1.13	415.90	4.51		
413.35	1.15	415.95	4.58		
413.40	1.18	416.00	4.64		
413.45	1.20	416.05	4.73		
413.50	1.23	416.10	4.84		
413.55	1.25	416.15	4.96		
413.60	1.28	416.20	5.09		
413.65	1.30	416.25	5.23		
413.70	1.33	416.30	5.36		
413.75	1.35	416.35	5.51		
413.80	1.37	416.40	5.65		
413.85	1.39	416.45	5.80		
413.90	1.42	416.50	5.94		
413.95	1.44	416.55	6.09		
414.00	1.46	416.60	6.24		
414.05	1.49	416.65	6.39		

Stage-Area-Storage for Pond 4P: Detention

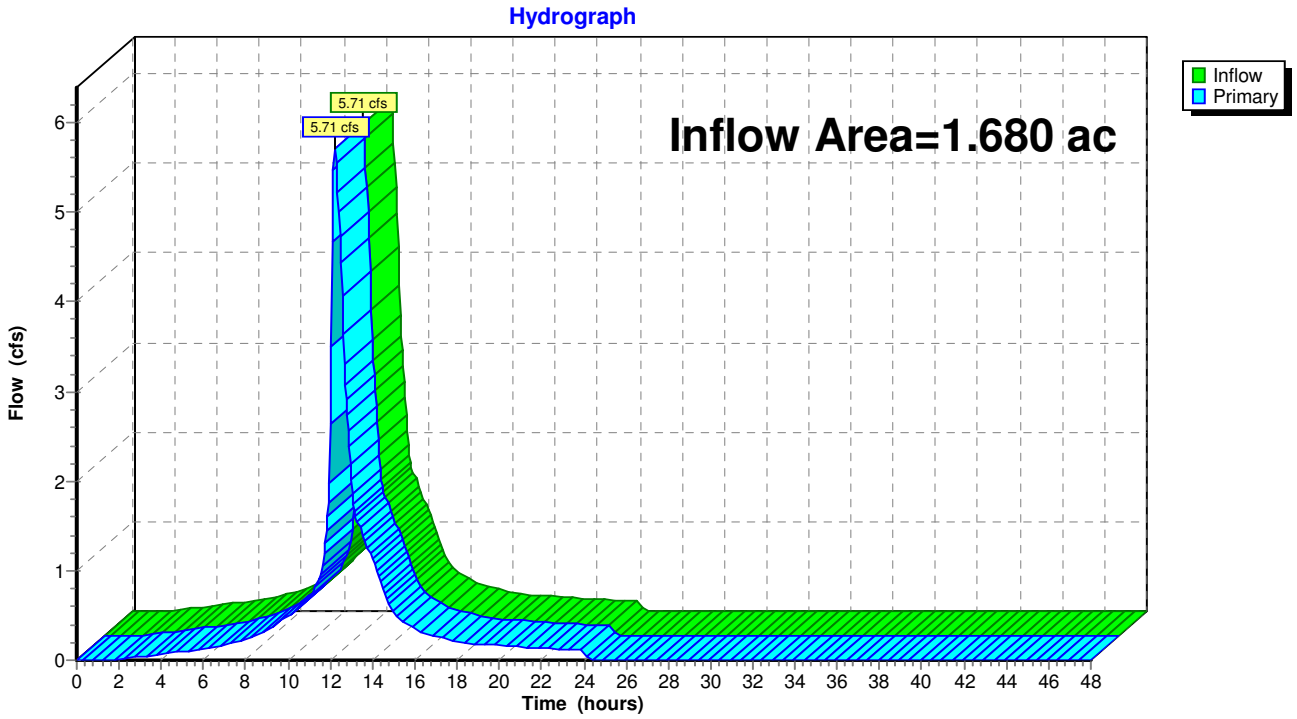
Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
411.50	0.000	414.10	0.066	416.70	0.189
411.55	0.000	414.15	0.068	416.75	0.191
411.60	0.000	414.20	0.071	416.80	0.192
411.65	0.000	414.25	0.073	416.85	0.194
411.70	0.000	414.30	0.076	416.90	0.195
411.75	0.000	414.35	0.078	416.95	0.197
411.80	0.000	414.40	0.081	417.00	0.198
411.85	0.000	414.45	0.083	417.05	0.199
411.90	0.000	414.50	0.086	417.10	0.200
411.95	0.000	414.55	0.089	417.15	0.201
412.00	0.000	414.60	0.091	417.20	0.202
412.05	0.000	414.65	0.094	417.25	0.202
412.10	0.000	414.70	0.096	417.30	**0.202**
412.15	0.000	414.75	0.099	417.35	0.202
412.20	0.000	414.80	0.101	417.40	0.202
412.25	0.000	414.85	0.104	417.45	0.202
412.30	0.000	414.90	0.107	417.50	0.202
412.35	0.000	414.95	0.109	417.55	0.202
412.40	0.001	415.00	0.112	417.60	0.202
412.45	0.002	415.05	0.114	417.65	0.202
412.50	0.002	415.10	0.117	417.70	0.202
412.55	0.004	415.15	0.120	417.75	0.202
412.60	0.005	415.20	0.122	417.80	0.202
412.65	0.006	415.25	0.125	417.85	0.202
412.70	0.007	415.30	0.127	417.90	0.202
412.75	0.009	415.35	0.130	417.95	0.202
412.80	0.010	415.40	0.132	418.00	0.202
412.85	0.012	415.45	0.135	418.05	0.202
412.90	0.013	415.50	0.137		
412.95	0.015	415.55	0.140		
413.00	0.017	415.60	0.142		
413.05	0.019	415.65	0.145		
413.10	0.021	415.70	0.147		
413.15	0.023	415.75	0.150		
413.20	0.025	415.80	0.152		
413.25	0.027	415.85	0.154		
413.30	0.029	415.90	0.157		
413.35	0.031	415.95	0.159		
413.40	0.033	416.00	0.161		
413.45	0.035	416.05	0.163		
413.50	0.037	416.10	0.166		
413.55	0.039	416.15	0.168		
413.60	0.042	416.20	0.170		
413.65	0.044	416.25	0.172		
413.70	0.046	416.30	0.174		
413.75	0.049	416.35	0.176		
413.80	0.051	416.40	0.178		
413.85	0.053	416.45	0.180		
413.90	0.056	416.50	0.182		
413.95	0.058	416.55	0.184		
414.00	0.061	416.60	0.186		
414.05	0.063	416.65	0.188		

Summary for Link 5L: Proposed Combined

Inflow Area = 1.680 ac, 73.81% Impervious, Inflow Depth = 6.55" for 50-yr event
Inflow = 5.71 cfs @ 12.22 hrs, Volume= 0.917 af
Primary = 5.71 cfs @ 12.22 hrs, Volume= 0.917 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 5L: Proposed Combined



Hydrograph for Link 5L: Proposed Combined

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.00	0.00	0.00	27.00	0.00	0.00	0.00
1.50	0.00	0.00	0.00	27.50	0.00	0.00	0.00
2.00	0.01	0.00	0.01	28.00	0.00	0.00	0.00
2.50	0.03	0.00	0.03	28.50	0.00	0.00	0.00
3.00	0.04	0.00	0.04	29.00	0.00	0.00	0.00
3.50	0.05	0.00	0.05	29.50	0.00	0.00	0.00
4.00	0.07	0.00	0.07	30.00	0.00	0.00	0.00
4.50	0.08	0.00	0.08	30.50	0.00	0.00	0.00
5.00	0.09	0.00	0.09	31.00	0.00	0.00	0.00
5.50	0.11	0.00	0.11	31.50	0.00	0.00	0.00
6.00	0.12	0.00	0.12	32.00	0.00	0.00	0.00
6.50	0.14	0.00	0.14	32.50	0.00	0.00	0.00
7.00	0.17	0.00	0.17	33.00	0.00	0.00	0.00
7.50	0.20	0.00	0.20	33.50	0.00	0.00	0.00
8.00	0.23	0.00	0.23	34.00	0.00	0.00	0.00
8.50	0.29	0.00	0.29	34.50	0.00	0.00	0.00
9.00	0.35	0.00	0.35	35.00	0.00	0.00	0.00
9.50	0.41	0.00	0.41	35.50	0.00	0.00	0.00
10.00	0.48	0.00	0.48	36.00	0.00	0.00	0.00
10.50	0.58	0.00	0.58	36.50	0.00	0.00	0.00
11.00	0.71	0.00	0.71	37.00	0.00	0.00	0.00
11.50	0.95	0.00	0.95	37.50	0.00	0.00	0.00
12.00	**2.64**	0.00	**2.64**	38.00	0.00	0.00	0.00
12.50	**4.44**	0.00	**4.44**	38.50	0.00	0.00	0.00
13.00	2.00	0.00	2.00	39.00	0.00	0.00	0.00
13.50	1.42	0.00	1.42	39.50	0.00	0.00	0.00
14.00	1.12	0.00	1.12	40.00	0.00	0.00	0.00
14.50	0.79	0.00	0.79	40.50	0.00	0.00	0.00
15.00	0.53	0.00	0.53	41.00	0.00	0.00	0.00
15.50	0.42	0.00	0.42	41.50	0.00	0.00	0.00
16.00	0.34	0.00	0.34	42.00	0.00	0.00	0.00
16.50	0.30	0.00	0.30	42.50	0.00	0.00	0.00
17.00	0.27	0.00	0.27	43.00	0.00	0.00	0.00
17.50	0.24	0.00	0.24	43.50	0.00	0.00	0.00
18.00	0.20	0.00	0.20	44.00	0.00	0.00	0.00
18.50	0.19	0.00	0.19	44.50	0.00	0.00	0.00
19.00	0.18	0.00	0.18	45.00	0.00	0.00	0.00
19.50	0.17	0.00	0.17	45.50	0.00	0.00	0.00
20.00	0.16	0.00	0.16	46.00	0.00	0.00	0.00
20.50	0.16	0.00	0.16	46.50	0.00	0.00	0.00
21.00	0.15	0.00	0.15	47.00	0.00	0.00	0.00
21.50	0.14	0.00	0.14	47.50	0.00	0.00	0.00
22.00	0.14	0.00	0.14	48.00	0.00	0.00	0.00
22.50	0.13	0.00	0.13				
23.00	0.12	0.00	0.12				
23.50	0.11	0.00	0.11				
24.00	0.11	0.00	0.11				
24.50	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Existing Runoff Area=1.680 ac 27.98% Impervious Runoff Depth=6.36"
Flow Length=367' Tc=11.4 min CN=79 Runoff=10.25 cfs 0.890 af

Subcatchment 2S: Proposed to Treatment Runoff Area=1.440 ac 86.11% Impervious Runoff Depth=8.31"
Tc=6.0 min CN=95 Runoff=12.18 cfs 0.997 af

Subcatchment 3S: Proposed to Bypass Runoff Area=0.240 ac 0.00% Impervious Runoff Depth=5.75"
Flow Length=200' Tc=10.7 min CN=74 Runoff=1.36 cfs 0.115 af

Pond 4P: Detention Peak Elev=416.79' Storage=0.192 af Inflow=12.18 cfs 0.997 af
Outflow=6.80 cfs 0.997 af

Link 5L: Proposed Combined Inflow=8.00 cfs 1.112 af
Primary=8.00 cfs 1.112 af

Total Runoff Area = 3.360 ac Runoff Volume = 2.002 af Average Runoff Depth = 7.15"
49.11% Pervious = 1.650 ac 50.89% Impervious = 1.710 ac

Summary for Subcatchment 1S: Existing

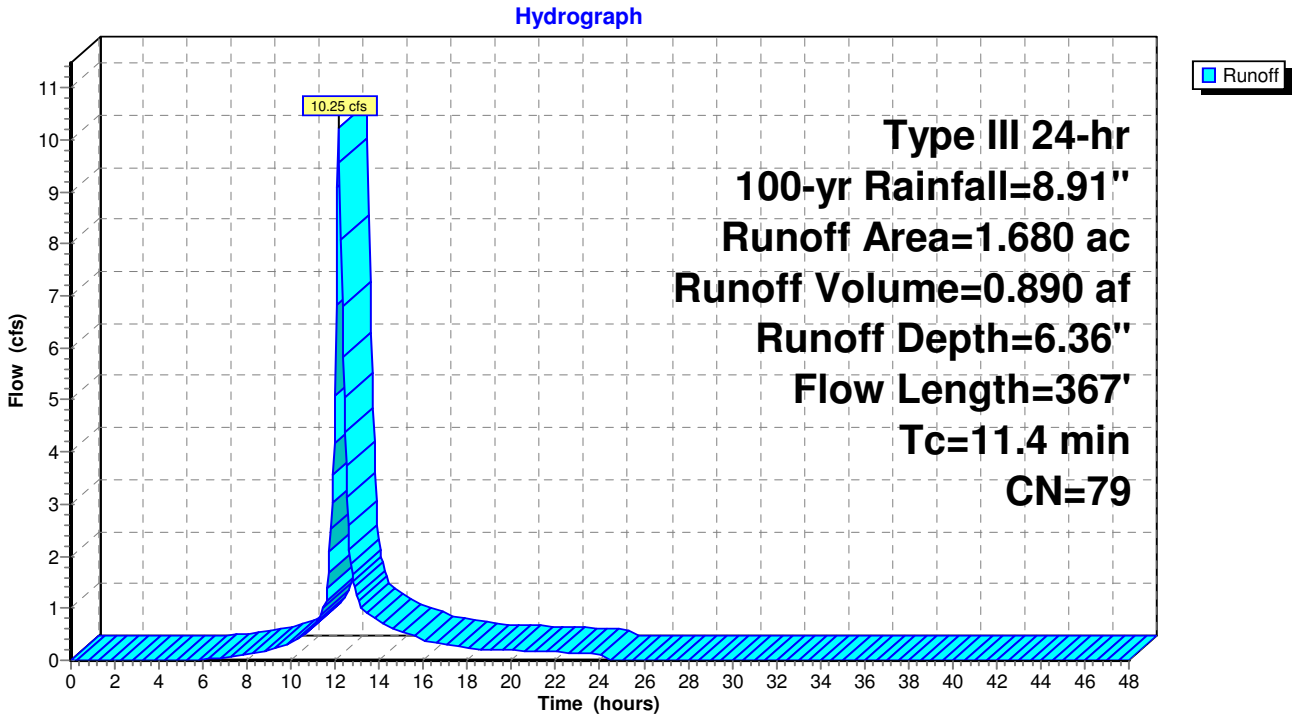
Runoff = 10.25 cfs @ 12.16 hrs, Volume= 0.890 af, Depth= 6.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.91"

	Area (ac)	CN	Description
*	0.470	98	Impervious
	0.520	70	Woods, Good, HSG C
	0.690	74	>75% Grass cover, Good, HSG C
	1.680	79	Weighted Average
	1.210		72.02% Pervious Area
	0.470		27.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0400	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
1.1	267	0.0600	3.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
11.4	367	Total			

Subcatchment 1S: Existing



Hydrograph for Subcatchment 1S: Existing

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.09	0.00	0.00
1.50	0.13	0.00	0.00
2.00	0.18	0.00	0.00
2.50	0.22	0.00	0.00
3.00	0.27	0.00	0.00
3.50	0.33	0.00	0.00
4.00	0.38	0.00	0.00
4.50	0.44	0.00	0.00
5.00	0.51	0.00	0.00
5.50	0.57	0.00	0.00
6.00	0.64	0.00	0.01
6.50	0.72	0.01	0.03
7.00	0.81	0.03	0.05
7.50	0.91	0.05	0.07
8.00	1.02	0.07	0.10
8.50	1.14	0.11	0.14
9.00	1.30	0.17	0.20
9.50	1.48	0.25	0.27
10.00	1.68	0.35	0.35
10.50	1.93	0.48	0.47
11.00	2.23	0.66	0.63
11.50	2.66	0.94	1.04
12.00	4.45	2.34	**5.07**
12.50	6.25	3.91	**3.75**
13.00	6.68	4.29	1.22
13.50	6.98	4.57	0.90
14.00	7.23	4.79	0.74
14.50	7.43	4.98	0.63
15.00	7.61	5.15	0.55
15.50	7.77	5.29	0.47
16.00	7.89	5.41	0.39
16.50	8.00	5.51	0.34
17.00	8.10	5.60	0.31
17.50	8.19	5.69	0.27
18.00	8.27	5.76	0.24
18.50	8.34	5.82	0.22
19.00	8.40	5.89	0.21
19.50	8.47	5.94	0.20
20.00	8.53	6.00	0.19
20.50	8.58	6.05	0.18
21.00	8.64	6.10	0.17
21.50	8.69	6.15	0.16
22.00	8.74	6.20	0.16
22.50	8.79	6.24	0.15
23.00	8.83	6.28	0.14
23.50	8.87	6.32	0.13
24.00	**8.91**	**6.36**	0.12
24.50	8.91	6.36	0.00
25.00	8.91	6.36	0.00
25.50	8.91	6.36	0.00
26.00	8.91	6.36	0.00
26.50	8.91	6.36	0.00
27.00	8.91	6.36	0.00
27.50	8.91	6.36	0.00
28.00	8.91	6.36	0.00
28.50	8.91	6.36	0.00
29.00	8.91	6.36	0.00
29.50	8.91	6.36	0.00
30.00	8.91	6.36	0.00
30.50	8.91	6.36	0.00
31.00	8.91	6.36	0.00
31.50	8.91	6.36	0.00
32.00	8.91	6.36	0.00
32.50	8.91	6.36	0.00
33.00	8.91	6.36	0.00
33.50	8.91	6.36	0.00
34.00	8.91	6.36	0.00
34.50	8.91	6.36	0.00
35.00	8.91	6.36	0.00
35.50	8.91	6.36	0.00
36.00	8.91	6.36	0.00
36.50	8.91	6.36	0.00
37.00	8.91	6.36	0.00
37.50	8.91	6.36	0.00
38.00	8.91	6.36	0.00
38.50	8.91	6.36	0.00
39.00	8.91	6.36	0.00
39.50	8.91	6.36	0.00
40.00	8.91	6.36	0.00
40.50	8.91	6.36	0.00
41.00	8.91	6.36	0.00
41.50	8.91	6.36	0.00
42.00	8.91	6.36	0.00
42.50	8.91	6.36	0.00
43.00	8.91	6.36	0.00
43.50	8.91	6.36	0.00
44.00	8.91	6.36	0.00
44.50	8.91	6.36	0.00
45.00	8.91	6.36	0.00
45.50	8.91	6.36	0.00
46.00	8.91	6.36	0.00
46.50	8.91	6.36	0.00
47.00	8.91	6.36	0.00
47.50	8.91	6.36	0.00
48.00	8.91	6.36	0.00

Summary for Subcatchment 2S: Proposed to Treatment

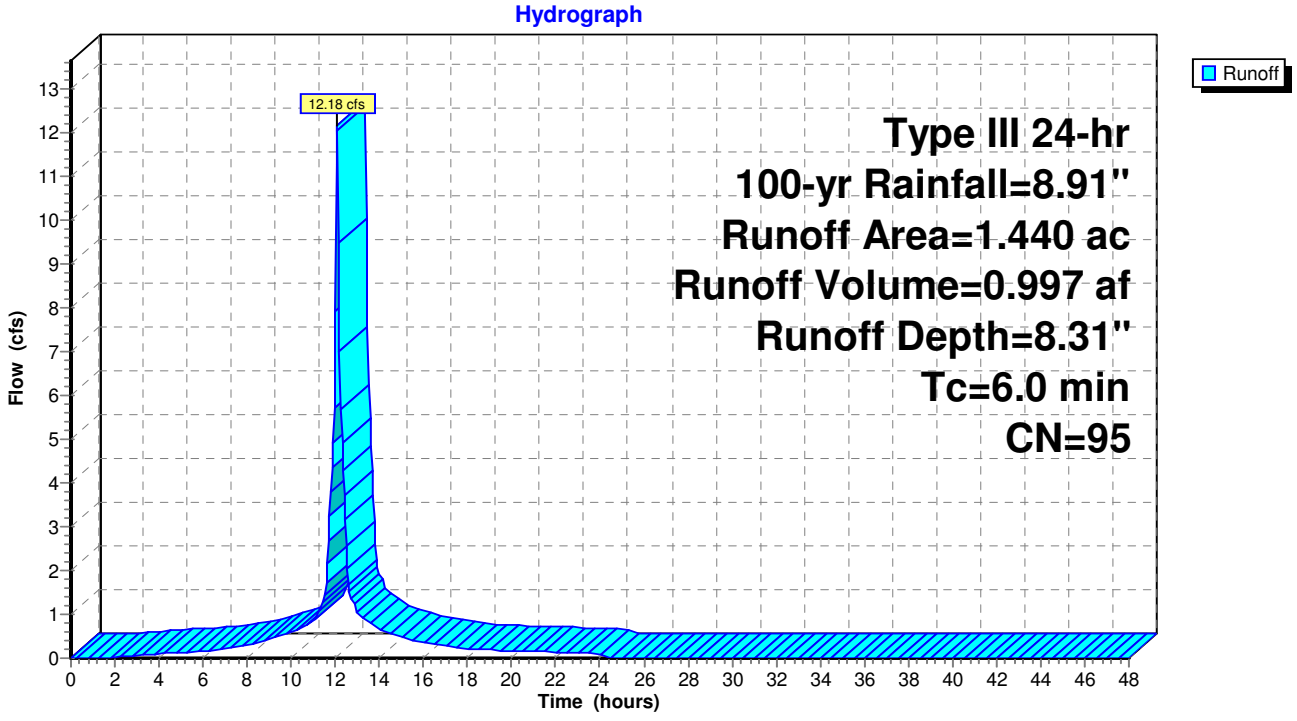
Runoff = 12.18 cfs @ 12.09 hrs, Volume= 0.997 af, Depth= 8.31"
Routed to Pond 4P : Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.91"

	Area (ac)	CN	Description
*	1.240	98	Impervious
	0.200	74	>75% Grass cover, Good, HSG C
	1.440	95	Weighted Average
	0.200		13.89% Pervious Area
	1.240		86.11% Impervious Area

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

Subcatchment 2S: Proposed to Treatment



Hydrograph for Subcatchment 2S: Proposed to Treatment

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.09	0.00	0.00
1.50	0.13	0.00	0.01
2.00	0.18	0.01	0.03
2.50	0.22	0.02	0.04
3.00	0.27	0.04	0.06
3.50	0.33	0.07	0.08
4.00	0.38	0.10	0.09
4.50	0.44	0.13	0.11
5.00	0.51	0.17	0.12
5.50	0.57	0.22	0.14
6.00	0.64	0.27	0.15
6.50	0.72	0.33	0.18
7.00	0.81	0.40	0.22
7.50	0.91	0.48	0.25
8.00	1.02	0.58	0.28
8.50	1.14	0.69	0.35
9.00	1.30	0.83	0.43
9.50	1.48	0.99	0.50
10.00	1.68	1.18	0.58
10.50	1.93	1.42	0.72
11.00	2.23	1.70	0.88
11.50	2.66	2.11	1.38
12.00	4.45	3.88	**7.91**
12.50	6.25	5.66	**2.58**
13.00	6.68	6.09	1.05
13.50	6.98	6.39	0.81
14.00	7.23	6.63	0.66
14.50	7.43	6.84	0.57
15.00	7.61	7.01	0.50
15.50	7.77	7.17	0.42
16.00	7.89	7.30	0.35
16.50	8.00	7.41	0.31
17.00	8.10	7.50	0.28
17.50	8.19	7.59	0.24
18.00	8.27	7.67	0.21
18.50	8.34	7.74	0.20
19.00	8.40	7.80	0.19
19.50	8.47	7.87	0.18
20.00	8.53	7.93	0.17
20.50	8.58	7.98	0.16
21.00	8.64	8.04	0.15
21.50	8.69	8.09	0.15
22.00	8.74	8.14	0.14
22.50	8.79	8.18	0.13
23.00	8.83	8.23	0.13
23.50	8.87	8.27	0.12
24.00	**8.91**	**8.31**	0.11
24.50	8.91	8.31	0.00
25.00	8.91	8.31	0.00
25.50	8.91	8.31	0.00
26.00	8.91	8.31	0.00
26.50	8.91	8.31	0.00
27.00	8.91	8.31	0.00
27.50	8.91	8.31	0.00
28.00	8.91	8.31	0.00
28.50	8.91	8.31	0.00
29.00	8.91	8.31	0.00
29.50	8.91	8.31	0.00
30.00	8.91	8.31	0.00
30.50	8.91	8.31	0.00
31.00	8.91	8.31	0.00
31.50	8.91	8.31	0.00
32.00	8.91	8.31	0.00
32.50	8.91	8.31	0.00
33.00	8.91	8.31	0.00
33.50	8.91	8.31	0.00
34.00	8.91	8.31	0.00
34.50	8.91	8.31	0.00
35.00	8.91	8.31	0.00
35.50	8.91	8.31	0.00
36.00	8.91	8.31	0.00
36.50	8.91	8.31	0.00
37.00	8.91	8.31	0.00
37.50	8.91	8.31	0.00
38.00	8.91	8.31	0.00
38.50	8.91	8.31	0.00
39.00	8.91	8.31	0.00
39.50	8.91	8.31	0.00
40.00	8.91	8.31	0.00
40.50	8.91	8.31	0.00
41.00	8.91	8.31	0.00
41.50	8.91	8.31	0.00
42.00	8.91	8.31	0.00
42.50	8.91	8.31	0.00
43.00	8.91	8.31	0.00
43.50	8.91	8.31	0.00
44.00	8.91	8.31	0.00
44.50	8.91	8.31	0.00
45.00	8.91	8.31	0.00
45.50	8.91	8.31	0.00
46.00	8.91	8.31	0.00
46.50	8.91	8.31	0.00
47.00	8.91	8.31	0.00
47.50	8.91	8.31	0.00
48.00	8.91	8.31	0.00

Summary for Subcatchment 3S: Proposed to Bypass

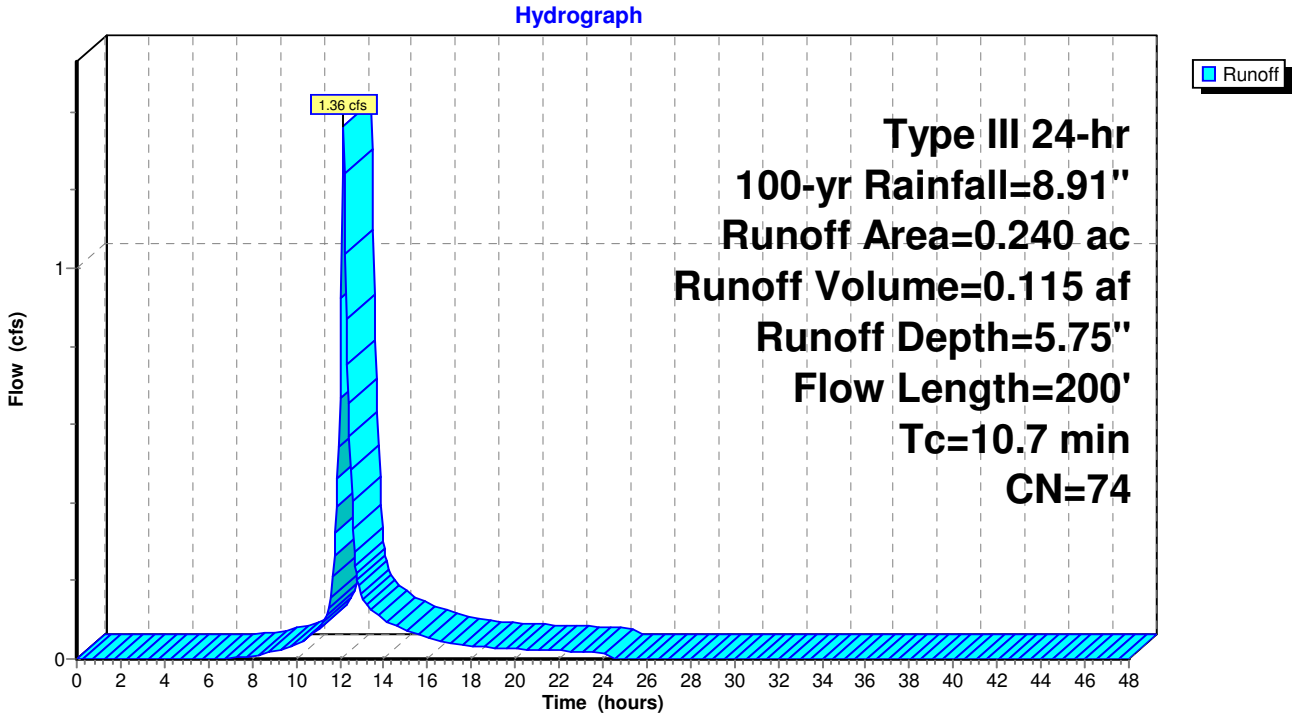
Runoff = 1.36 cfs @ 12.15 hrs, Volume= 0.115 af, Depth= 5.75"
Routed to Link 5L : Proposed Combined

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.91"

Area (ac)	CN	Description
0.240	74	>75% Grass cover, Good, HSG C
0.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0400	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
0.4	100	0.0700	4.26		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.7	200	Total			

Subcatchment 3S: Proposed to Bypass



Hydrograph for Subcatchment 3S: Proposed to Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.09	0.00	0.00
1.50	0.13	0.00	0.00
2.00	0.18	0.00	0.00
2.50	0.22	0.00	0.00
3.00	0.27	0.00	0.00
3.50	0.33	0.00	0.00
4.00	0.38	0.00	0.00
4.50	0.44	0.00	0.00
5.00	0.51	0.00	0.00
5.50	0.57	0.00	0.00
6.00	0.64	0.00	0.00
6.50	0.72	0.00	0.00
7.00	0.81	0.00	0.00
7.50	0.91	0.01	0.00
8.00	1.02	0.03	0.01
8.50	1.14	0.05	0.01
9.00	1.30	0.09	0.02
9.50	1.48	0.14	0.03
10.00	1.68	0.21	0.04
10.50	1.93	0.32	0.05
11.00	2.23	0.46	0.07
11.50	2.66	0.70	0.13
12.00	4.45	1.94	**0.67**
12.50	6.25	3.40	**0.48**
13.00	6.68	3.77	0.16
13.50	6.98	4.03	0.12
14.00	7.23	4.24	0.10
14.50	7.43	4.42	0.09
15.00	7.61	4.58	0.08
15.50	7.77	4.72	0.06
16.00	7.89	4.83	0.05
16.50	8.00	4.93	0.05
17.00	8.10	5.02	0.04
17.50	8.19	5.10	0.04
18.00	8.27	5.17	0.03
18.50	8.34	5.23	0.03
19.00	8.40	5.29	0.03
19.50	8.47	5.35	0.03
20.00	8.53	5.40	0.03
20.50	8.58	5.45	0.02
21.00	8.64	5.50	0.02
21.50	8.69	5.55	0.02
22.00	8.74	5.59	0.02
22.50	8.79	5.63	0.02
23.00	8.83	5.67	0.02
23.50	8.87	5.71	0.02
24.00	**8.91**	**5.75**	0.02
24.50	8.91	5.75	0.00
25.00	8.91	5.75	0.00
25.50	8.91	5.75	0.00
26.00	8.91	5.75	0.00
26.50	8.91	5.75	0.00
27.00	8.91	5.75	0.00
27.50	8.91	5.75	0.00
28.00	8.91	5.75	0.00
28.50	8.91	5.75	0.00
29.00	8.91	5.75	0.00
29.50	8.91	5.75	0.00
30.00	8.91	5.75	0.00
30.50	8.91	5.75	0.00
31.00	8.91	5.75	0.00
31.50	8.91	5.75	0.00
32.00	8.91	5.75	0.00
32.50	8.91	5.75	0.00
33.00	8.91	5.75	0.00
33.50	8.91	5.75	0.00
34.00	8.91	5.75	0.00
34.50	8.91	5.75	0.00
35.00	8.91	5.75	0.00
35.50	8.91	5.75	0.00
36.00	8.91	5.75	0.00
36.50	8.91	5.75	0.00
37.00	8.91	5.75	0.00
37.50	8.91	5.75	0.00
38.00	8.91	5.75	0.00
38.50	8.91	5.75	0.00
39.00	8.91	5.75	0.00
39.50	8.91	5.75	0.00
40.00	8.91	5.75	0.00
40.50	8.91	5.75	0.00
41.00	8.91	5.75	0.00
41.50	8.91	5.75	0.00
42.00	8.91	5.75	0.00
42.50	8.91	5.75	0.00
43.00	8.91	5.75	0.00
43.50	8.91	5.75	0.00
44.00	8.91	5.75	0.00
44.50	8.91	5.75	0.00
45.00	8.91	5.75	0.00
45.50	8.91	5.75	0.00
46.00	8.91	5.75	0.00
46.50	8.91	5.75	0.00
47.00	8.91	5.75	0.00
47.50	8.91	5.75	0.00
48.00	8.91	5.75	0.00

Summary for Pond 4P: Detention

Inflow Area = 1.440 ac, 86.11% Impervious, Inflow Depth = 8.31" for 100-yr event
Inflow = 12.18 cfs @ 12.09 hrs, Volume= 0.997 af
Outflow = 6.80 cfs @ 12.22 hrs, Volume= 0.997 af, Atten= 44%, Lag= 7.8 min
Primary = 6.80 cfs @ 12.22 hrs, Volume= 0.997 af
Routed to Link 5L : Proposed Combined

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 416.79' @ 12.22 hrs Surf.Area= 0.081 ac Storage= 0.192 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 15.3 min (770.1 - 754.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	411.50'	0.000 af	**31.09'W x 114.17'L x 6.58'H Field A** 0.536 af Overall - 0.240 af Embedded = 0.296 af x 0.0% Voids
#2A	412.00'	0.202 af	**ADS N-12 60"** x 20 Inside #1 Inside= 59.5"W x 59.5"H => 19.30 sf x 20.00'L = 386.0 cf Outside= 67.0"W x 67.0"H => 22.92 sf x 20.00'L = 458.4 cf 20 Chambers in 4 Rows 28.09' Header x 19.30 sf x 2 = 1,084.1 cf Inside
		0.202 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	412.00'	**15.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 412.00' / 408.00' S= 0.1000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	412.00'	**6.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	416.00'	**0.7' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 1	414.00'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	415.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.71 cfs @ 12.22 hrs HW=416.76' (Free Discharge)
└**1=Culvert** (Passes 6.71 cfs of 12.01 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 2.35 cfs @ 10.20 fps)
  ├**3=Sharp-Crested Rectangular Weir** (Weir Controls 1.18 cfs @ 2.85 fps)
  ├**4=Orifice/Grate** (Orifice Controls 2.02 cfs @ 7.56 fps)
  └**5=Orifice/Grate** (Orifice Controls 1.16 cfs @ 5.91 fps)

Pond 4P: Detention - Chamber Wizard Field A

Chamber Model = ADS N-12 60" (ADS N-12® Pipe)
Inside= 59.5"W x 59.5"H => 19.30 sf x 20.00'L = 386.0 cf
Outside= 67.0"W x 67.0"H => 22.92 sf x 20.00'L = 458.4 cf

67.0" Wide + 23.0" Spacing = 90.0" C-C Row Spacing

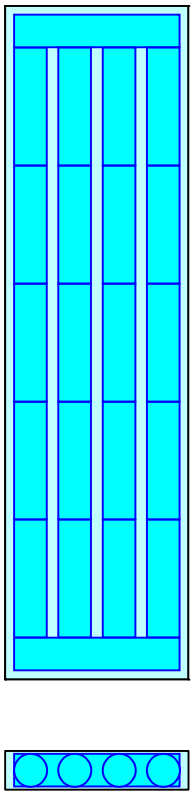
5 Chambers/Row x 20.00' Long +5.58' Header x 2 = 111.17' Row Length +18.0" End Stone x 2 = 114.17' Base Length
4 Rows x 67.0" Wide + 23.0" Spacing x 3 + 18.0" Side Stone x 2 = 31.09' Base Width
6.0" Stone Base + 67.0" Chamber Height + 6.0" Stone Cover = 6.58' Field Height

20 Chambers x 386.0 cf + 28.09' Header x 19.30 sf x 2 = 8,804.1 cf Chamber Storage
20 Chambers x 458.4 cf + 28.09' Header x 22.92 sf x 2 = 10,455.8 cf Displacement

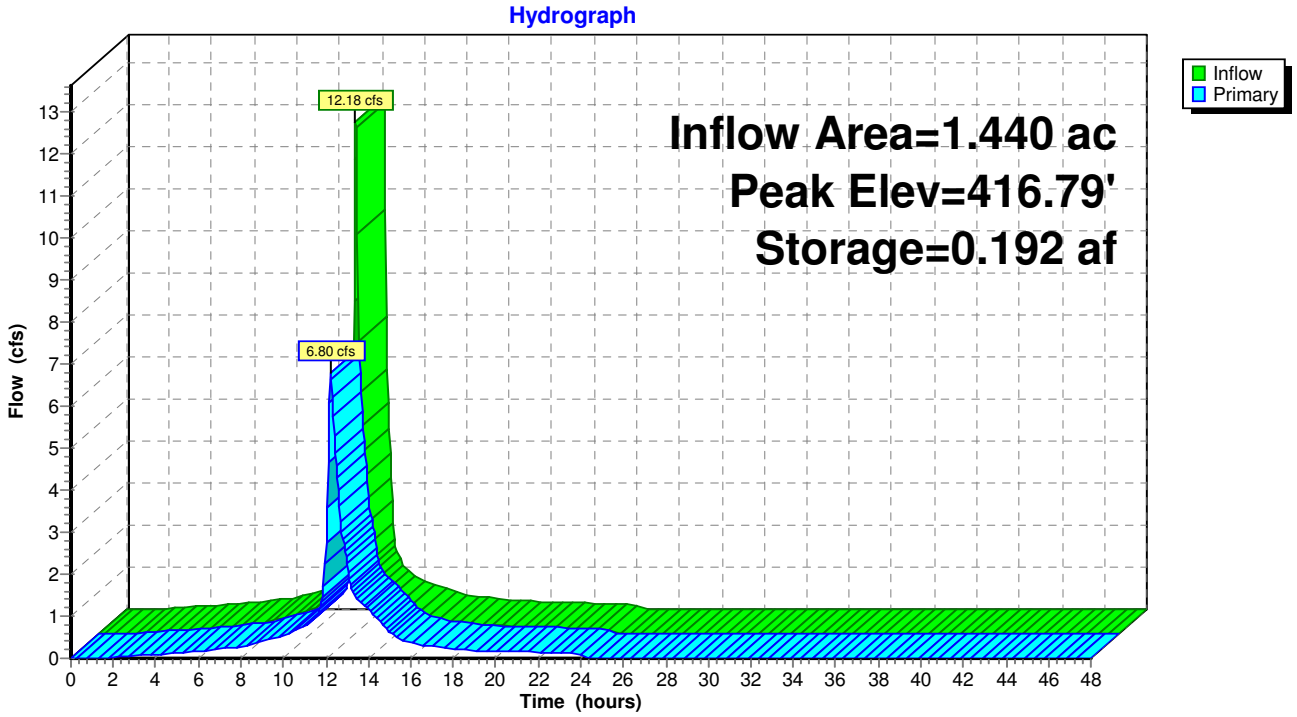
23,365.6 cf Field - 10,455.8 cf Chambers = 12,909.8 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 8,804.1 cf = 0.202 af
Overall Storage Efficiency = 37.7%
Overall System Size = 114.17' x 31.09' x 6.58'

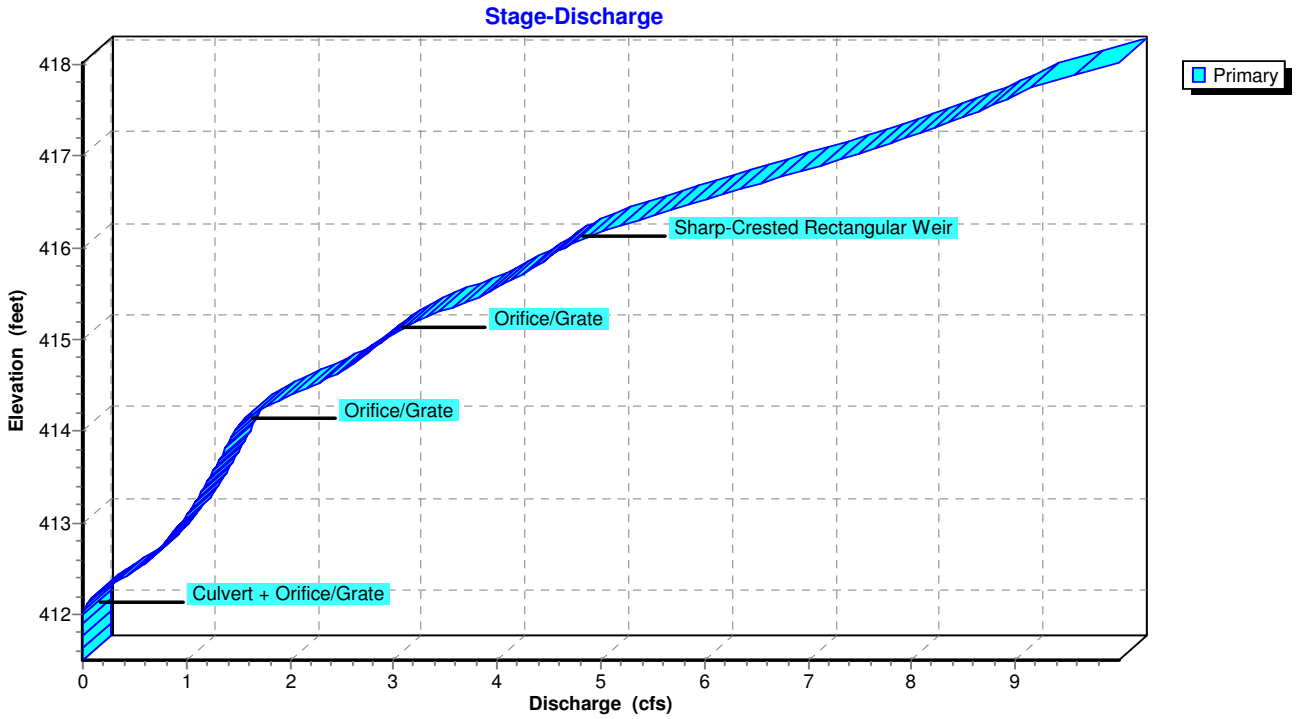
20 Chambers
865.4 cy Field
478.1 cy Stone



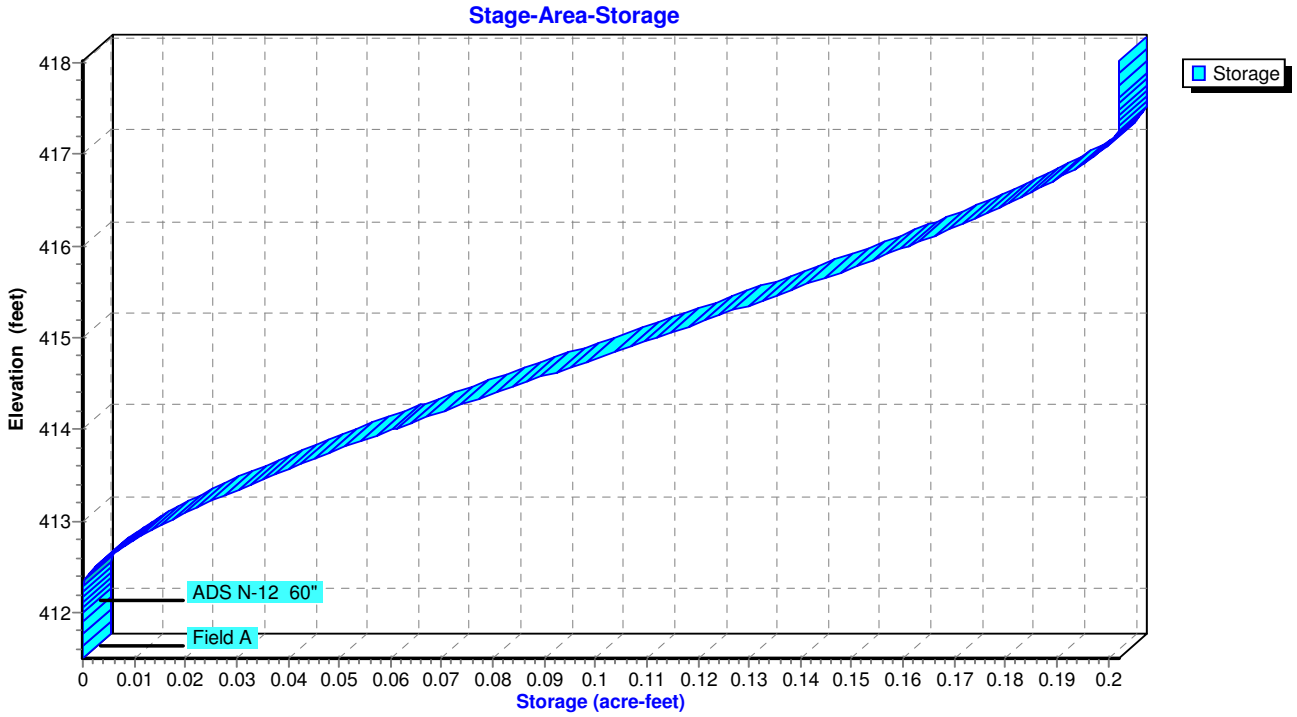
Pond 4P: Detention



Pond 4P: Detention



Pond 4P: Detention



Hydrograph for Pond 4P: Detention

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	411.50	0.00
1.00	0.00	0.000	411.50	0.00
2.00	0.03	0.000	412.09	0.03
3.00	0.06	0.000	412.14	0.06
4.00	0.09	0.000	412.18	0.09
5.00	0.12	0.000	412.20	0.12
6.00	0.15	0.000	412.23	0.15
7.00	0.22	0.000	412.28	0.22
8.00	0.28	0.000	412.33	0.28
9.00	0.43	0.001	412.41	0.41
10.00	0.58	0.003	412.51	0.55
11.00	0.88	0.009	412.75	0.77
12.00	**7.91**	**0.104**	**414.85**	**2.74**
13.00	**1.05**	**0.086**	**414.50**	**2.25**
14.00	0.66	0.032	413.37	1.17
15.00	0.50	0.005	412.60	0.64
16.00	0.35	0.001	412.38	0.36
17.00	0.28	0.000	412.32	0.28
18.00	0.21	0.000	412.28	0.21
19.00	0.19	0.000	412.26	0.19
20.00	0.17	0.000	412.24	0.17
21.00	0.15	0.000	412.23	0.15
22.00	0.14	0.000	412.22	0.14
23.00	0.13	0.000	412.21	0.13
24.00	0.11	0.000	412.19	0.11
25.00	0.00	0.000	412.00	0.00
26.00	0.00	0.000	412.00	0.00
27.00	0.00	0.000	412.00	0.00
28.00	0.00	0.000	412.00	0.00
29.00	0.00	0.000	412.00	0.00
30.00	0.00	0.000	412.00	0.00
31.00	0.00	0.000	412.00	0.00
32.00	0.00	0.000	412.00	0.00
33.00	0.00	0.000	412.00	0.00
34.00	0.00	0.000	412.00	0.00
35.00	0.00	0.000	412.00	0.00
36.00	0.00	0.000	412.00	0.00
37.00	0.00	0.000	412.00	0.00
38.00	0.00	0.000	412.00	0.00
39.00	0.00	0.000	412.00	0.00
40.00	0.00	0.000	412.00	0.00
41.00	0.00	0.000	412.00	0.00
42.00	0.00	0.000	412.00	0.00
43.00	0.00	0.000	412.00	0.00
44.00	0.00	0.000	412.00	0.00
45.00	0.00	0.000	412.00	0.00
46.00	0.00	0.000	412.00	0.00
47.00	0.00	0.000	412.00	0.00
48.00	0.00	0.000	412.00	0.00

Stage-Discharge for Pond 4P: Detention

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
411.50	0.00	414.10	1.53	416.70	6.54
411.55	0.00	414.15	1.59	416.75	6.69
411.60	0.00	414.20	1.66	416.80	6.84
411.65	0.00	414.25	1.75	416.85	6.99
411.70	0.00	414.30	1.84	416.90	7.13
411.75	0.00	414.35	1.94	416.95	7.28
411.80	0.00	414.40	2.04	417.00	7.42
411.85	0.00	414.45	2.14	417.05	7.56
411.90	0.00	414.50	2.24	417.10	7.69
411.95	0.00	414.55	2.33	417.15	7.82
412.00	0.00	414.60	2.41	417.20	7.96
412.05	0.01	414.65	2.48	417.25	8.08
412.10	0.03	414.70	2.55	417.30	8.21
412.15	0.07	414.75	2.62	417.35	8.33
412.20	0.12	414.80	2.68	417.40	8.44
412.25	0.18	414.85	2.74	417.45	8.56
412.30	0.24	414.90	2.80	417.50	8.66
412.35	0.32	414.95	2.86	417.55	8.77
412.40	0.39	415.00	2.92	417.60	8.87
412.45	0.47	415.05	2.98	417.65	8.96
412.50	0.54	415.10	3.05	417.70	9.05
412.55	0.59	415.15	3.14	417.75	9.13
412.60	0.64	415.20	3.24	417.80	9.29
412.65	0.68	415.25	3.34	417.85	9.45
412.70	0.73	415.30	3.45	417.90	9.61
412.75	0.77	415.35	3.57	417.95	9.78
412.80	0.81	415.40	3.68	418.00	9.94
412.85	0.84	415.45	3.79	418.05	**10.10**
412.90	0.88	415.50	3.88		
412.95	0.91	415.55	3.97		
413.00	0.95	415.60	4.06		
413.05	0.98	415.65	4.14		
413.10	1.01	415.70	4.22		
413.15	1.04	415.75	4.29		
413.20	1.07	415.80	4.37		
413.25	1.10	415.85	4.44		
413.30	1.13	415.90	4.51		
413.35	1.15	415.95	4.58		
413.40	1.18	416.00	4.64		
413.45	1.20	416.05	4.73		
413.50	1.23	416.10	4.84		
413.55	1.25	416.15	4.96		
413.60	1.28	416.20	5.09		
413.65	1.30	416.25	5.23		
413.70	1.33	416.30	5.36		
413.75	1.35	416.35	5.51		
413.80	1.37	416.40	5.65		
413.85	1.39	416.45	5.80		
413.90	1.42	416.50	5.94		
413.95	1.44	416.55	6.09		
414.00	1.46	416.60	6.24		
414.05	1.49	416.65	6.39		

Stage-Area-Storage for Pond 4P: Detention

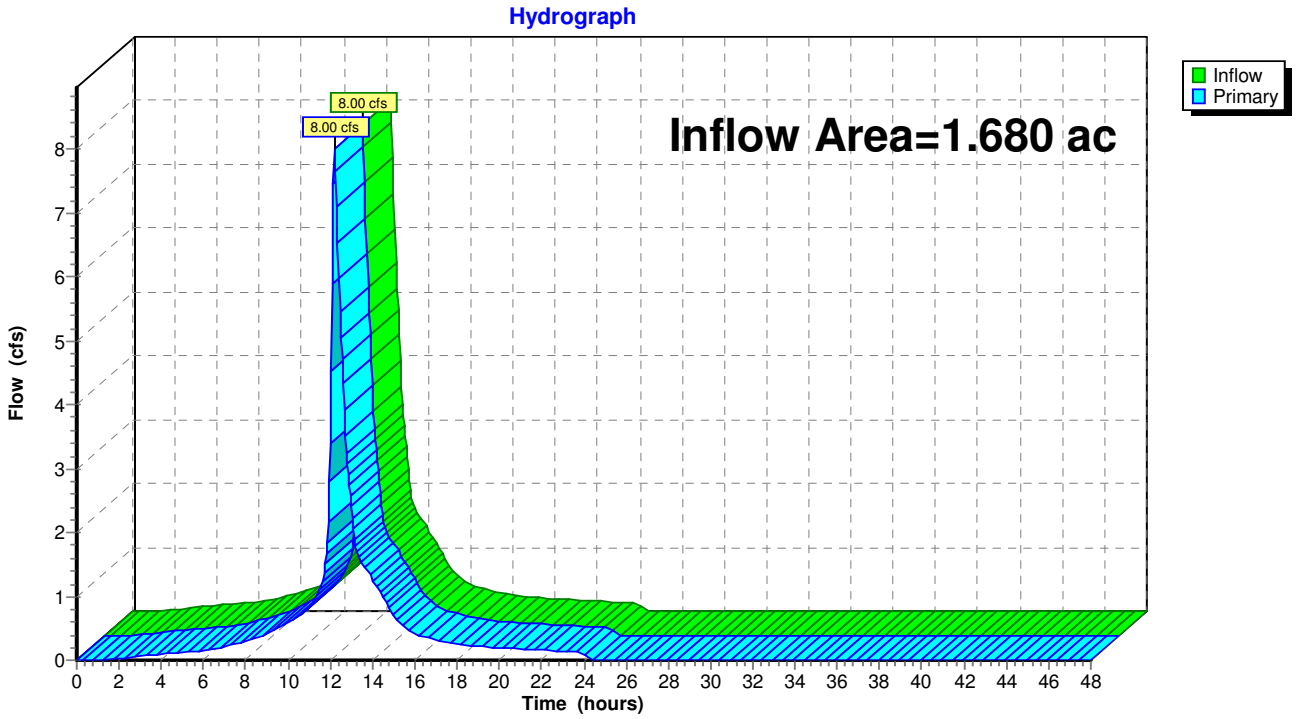
Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
411.50	0.000	414.10	0.066	416.70	0.189
411.55	0.000	414.15	0.068	416.75	0.191
411.60	0.000	414.20	0.071	416.80	0.192
411.65	0.000	414.25	0.073	416.85	0.194
411.70	0.000	414.30	0.076	416.90	0.195
411.75	0.000	414.35	0.078	416.95	0.197
411.80	0.000	414.40	0.081	417.00	0.198
411.85	0.000	414.45	0.083	417.05	0.199
411.90	0.000	414.50	0.086	417.10	0.200
411.95	0.000	414.55	0.089	417.15	0.201
412.00	0.000	414.60	0.091	417.20	0.202
412.05	0.000	414.65	0.094	417.25	0.202
412.10	0.000	414.70	0.096	417.30	**0.202**
412.15	0.000	414.75	0.099	417.35	0.202
412.20	0.000	414.80	0.101	417.40	0.202
412.25	0.000	414.85	0.104	417.45	0.202
412.30	0.000	414.90	0.107	417.50	0.202
412.35	0.000	414.95	0.109	417.55	0.202
412.40	0.001	415.00	0.112	417.60	0.202
412.45	0.002	415.05	0.114	417.65	0.202
412.50	0.002	415.10	0.117	417.70	0.202
412.55	0.004	415.15	0.120	417.75	0.202
412.60	0.005	415.20	0.122	417.80	0.202
412.65	0.006	415.25	0.125	417.85	0.202
412.70	0.007	415.30	0.127	417.90	0.202
412.75	0.009	415.35	0.130	417.95	0.202
412.80	0.010	415.40	0.132	418.00	0.202
412.85	0.012	415.45	0.135	418.05	0.202
412.90	0.013	415.50	0.137		
412.95	0.015	415.55	0.140		
413.00	0.017	415.60	0.142		
413.05	0.019	415.65	0.145		
413.10	0.021	415.70	0.147		
413.15	0.023	415.75	0.150		
413.20	0.025	415.80	0.152		
413.25	0.027	415.85	0.154		
413.30	0.029	415.90	0.157		
413.35	0.031	415.95	0.159		
413.40	0.033	416.00	0.161		
413.45	0.035	416.05	0.163		
413.50	0.037	416.10	0.166		
413.55	0.039	416.15	0.168		
413.60	0.042	416.20	0.170		
413.65	0.044	416.25	0.172		
413.70	0.046	416.30	0.174		
413.75	0.049	416.35	0.176		
413.80	0.051	416.40	0.178		
413.85	0.053	416.45	0.180		
413.90	0.056	416.50	0.182		
413.95	0.058	416.55	0.184		
414.00	0.061	416.60	0.186		
414.05	0.063	416.65	0.188		

Summary for Link 5L: Proposed Combined

Inflow Area = 1.680 ac, 73.81% Impervious, Inflow Depth = 7.94" for 100-yr event
Inflow = 8.00 cfs @ 12.21 hrs, Volume= 1.112 af
Primary = 8.00 cfs @ 12.21 hrs, Volume= 1.112 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 5L: Proposed Combined



Hydrograph for Link 5L: Proposed Combined

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.00	0.00	0.00	27.00	0.00	0.00	0.00
1.50	0.01	0.00	0.01	27.50	0.00	0.00	0.00
2.00	0.03	0.00	0.03	28.00	0.00	0.00	0.00
2.50	0.04	0.00	0.04	28.50	0.00	0.00	0.00
3.00	0.06	0.00	0.06	29.00	0.00	0.00	0.00
3.50	0.08	0.00	0.08	29.50	0.00	0.00	0.00
4.00	0.09	0.00	0.09	30.00	0.00	0.00	0.00
4.50	0.11	0.00	0.11	30.50	0.00	0.00	0.00
5.00	0.12	0.00	0.12	31.00	0.00	0.00	0.00
5.50	0.14	0.00	0.14	31.50	0.00	0.00	0.00
6.00	0.15	0.00	0.15	32.00	0.00	0.00	0.00
6.50	0.18	0.00	0.18	32.50	0.00	0.00	0.00
7.00	0.22	0.00	0.22	33.00	0.00	0.00	0.00
7.50	0.25	0.00	0.25	33.50	0.00	0.00	0.00
8.00	0.29	0.00	0.29	34.00	0.00	0.00	0.00
8.50	0.35	0.00	0.35	34.50	0.00	0.00	0.00
9.00	0.43	0.00	0.43	35.00	0.00	0.00	0.00
9.50	0.51	0.00	0.51	35.50	0.00	0.00	0.00
10.00	0.59	0.00	0.59	36.00	0.00	0.00	0.00
10.50	0.70	0.00	0.70	36.50	0.00	0.00	0.00
11.00	0.84	0.00	0.84	37.00	0.00	0.00	0.00
11.50	1.11	0.00	1.11	37.50	0.00	0.00	0.00
12.00	**3.41**	0.00	**3.41**	38.00	0.00	0.00	0.00
12.50	**5.06**	0.00	**5.06**	38.50	0.00	0.00	0.00
13.00	2.41	0.00	2.41	39.00	0.00	0.00	0.00
13.50	1.53	0.00	1.53	39.50	0.00	0.00	0.00
14.00	1.27	0.00	1.27	40.00	0.00	0.00	0.00
14.50	0.98	0.00	0.98	40.50	0.00	0.00	0.00
15.00	0.71	0.00	0.71	41.00	0.00	0.00	0.00
15.50	0.52	0.00	0.52	41.50	0.00	0.00	0.00
16.00	0.42	0.00	0.42	42.00	0.00	0.00	0.00
16.50	0.36	0.00	0.36	42.50	0.00	0.00	0.00
17.00	0.32	0.00	0.32	43.00	0.00	0.00	0.00
17.50	0.28	0.00	0.28	43.50	0.00	0.00	0.00
18.00	0.24	0.00	0.24	44.00	0.00	0.00	0.00
18.50	0.23	0.00	0.23	44.50	0.00	0.00	0.00
19.00	0.22	0.00	0.22	45.00	0.00	0.00	0.00
19.50	0.21	0.00	0.21	45.50	0.00	0.00	0.00
20.00	0.19	0.00	0.19	46.00	0.00	0.00	0.00
20.50	0.19	0.00	0.19	46.50	0.00	0.00	0.00
21.00	0.18	0.00	0.18	47.00	0.00	0.00	0.00
21.50	0.17	0.00	0.17	47.50	0.00	0.00	0.00
22.00	0.16	0.00	0.16	48.00	0.00	0.00	0.00
22.50	0.15	0.00	0.15				
23.00	0.14	0.00	0.14				
23.50	0.14	0.00	0.14				
24.00	0.13	0.00	0.13				
24.50	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				

APPENDIX D – INSPECTION FORMS

1507 ROUTE 202
STORMWATER OPERATION & MAINTENANCE CHECKLIST FOR UNDERGROUND DETENTION, INLETS & SOIL RESTORATION

INLETS:

- ☐ Check annually for damage to grates and inlet structure. Repair/replace as needed.
- ☐ Check bi-annually for debris and clean as required.
- ☐ Check annually for silt buildup in remove/clean as needed, when depth of silt is 6".

UNDERGROUND DETETENTION:

- ☐ Check annually for damage to access structures/outlet structures. Repair/replace as needed.
- ☐ Check bi-annually for debris and clean as required.
- ☐ Check annually for silt buildup and remove/clean as needed, when depth of silt is 6".

SOIL RESTORATION:

- ☐ Initial inspections for the first six months (once after each storm greater than ½").
- ☐ Continued reseeding to repair bare or eroding areas to assure grass stabilization over the first year.
- ☐ Water once every three days for first month, and then provide a half inch of water per week during first year. Irrigation may be adjusted according to rain events.
- ☐ Fertilization may be needed in the fall after the first growing season to increase plant vigor.
- ☐ Following the first year, plant appropriate ground cover with deep roots to maintain the soil structure, as needed.
- ☐ Following the first year, keep the site free of vehicular and traffic. Thatch the turf every few years, as needed.

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Civil-Tec.com

EcoStream™ Biofiltration System Operation & Maintenance Guidance

Description

The EcoStream Biofiltration System (EcoStream) is an engineered stormwater biofiltration treatment system designed to capture and retain a variety of pollutants including sediments, phosphorus, heavy metals, and hydrocarbons from stormwater runoff. EcoStream incorporates the processes of sedimentation, filtration, infiltration, adsorption, and biological uptake to provide both water quality and quantity benefits in a small footprint. EcoStream should be activated after a site is stabilized to prevent uncontrolled stormwater runoff from the construction site from entering the system.

Configuration

The EcoStream system comes in many standard sizes and is available in several different deployment configurations. Excess flow spills over an overflow pipe and is directly discharged along with treated flow. The EcoStream system can be configured as a planter box filter with an open top that is suitable for shrubs and grasses, or as an underground filter with a subsurface inlet pipe. The optional external high flow bypass may be incorporated with any of these configurations.

Operations

Stormwater runoff enters the EcoStream via a pipe inlet or curb inlet and flows downward under gravity flow through mulch/media/gravel layers. The top layer provides pretreatment by retaining the coarse sediments, trash, and debris. The fine sediments and dissolved pollutants are further treated through the media bed in depth. Treated water enters an underdrain pipe or infiltrates into the ground (installations with open bottoms). A flow control orifice is placed downstream of the underdrain to ensure the distribution of flow in the media bed.

Inspections and Maintenance Overview

The EcoStream system requires periodic inspection and maintenance for it to operate at the design efficiency. The inspection process helps in deciding when and what level of maintenance will be needed to bring the unit up to or near peak efficiency. As with ADS' other water quality products, the maintenance cycle of the EcoStream system will be driven mostly by the actual solids and trash/debris load brought into the system.

The frequency of maintenance depends on the site-specific pollutant loading conditions. ADS recommends a visual inspection of the system quarterly for the first year of service, and after every high intensity and high-volume storm event occurring (1 in/hr and greater than 3 inches rainfall within 24 hours) during the first six months. After the first year, systems should be inspected at least bi-annually and ideally before the spring or rainy season and after the summer season, or prior to fall or winter seasons. The inspections should look for signs of but not limited to erosion, displacement, sediment, and trash accumulations in the upper portion of media bed or planting area. It is recommended that some general "good housekeeping" maintenance be performed at the beginning of the rainy or spring season every year. Depending on the site conditions, full system maintenance including removal of all media and plant life may be necessary if ponding water remains on top of media bed for 24 hours after any storm event.

For most maintenance needs, the EcoStream planting component follows the practices used for handling standard bioretention systems (i.e., general landscaping, cover management, and replacement planting of surface plants).

It may be advisable to “water” or irrigate the EcoStream plant area in geographical regions experiencing droughts or prolong periods without rainfall during the first year of service. Watering the plant life will help to ensure the plants can take hold and be established for future growth and treatment capabilities.

Inspection and General Maintenance Equipment

The following is a list of equipment recommended for inspection and general maintenance.

- Personal Protection Equipment (pants, steel-toed shoes, safety glasses, gloves, safety vest, hard hat, etc.)
- Manhole Hook or Crowbar
- Traffic Cones and Signage
- Stadia Rod and Tape Measure
- Inspection Operation and Maintenance (O&M) Log or other recording method (included at end of guide)
- Flashlight, Trash removal “Net” device, shovel, rake, broom and trash receptacle
- Vac Truck (if more extensive maintenance is required)
- Light Duty Construction Equipment (if bioretention media replacement is required

General Inspection and Maintenance Procedures

Routine inspection will ensure that the system is performing at optimal conditions and that the risk of public flooding is low. EcoStream inspection involves a visual inspection of the plant surface area, structure inlet, and the media bed. This can all be done at the surface and requires no confined space entry into the EcoStream unit. An Inspection O&M log should be used, dates and weather conditions should be noted.

If the EcoStream is located in a traffic area (i.e. roadway or automobile travel way), and inspection is not possible without entering the vehicular area, safety measures should be employed --safety cones setup, etc. --prior to performing the inspection and maintenance.

For inspection of the treatment chamber of the EcoStream system, the manhole cover should be safely removed (i.e., using a manhole hook). A visual inspection of any inlet grates should be noted. If grates are missing or inlets are damaged, contact ADS for recommendation of repair. A visual inspection of the general appearance of the EcoStream should be performed, and notes should be taken detailing the condition of the surface plant life, invasive species intrusion, vandalism, erosion in the planting area and any signs of standing water or disturbed or “shifted” surface soil bed area. This general system condition should be noted in the inspection/maintenance log.

If the plant life and surface media show signs of distress, general landscaping O&M should be performed, i.e., raking, weeding (removal of invasive plants), and general planting replacement to maximize the cover area in the planting bed/media treatment chamber. If ponding of water is present in the media treatment cell and the last rain event was greater than 24 hours prior, further inspection should be performed to ensure the effluent pipe is not blocked.

A visual inspection (with a flashlight if needed) will inspect the appearance of the inlet (pipe or curb) and media bed. Remove all trash and debris from the inlet and the top of the media bed manually or by vacuum truck as required. If there is a visible sediment load or the media bed appears to have been greatly disturbed during preceding storm events, redistribute or replace the top mulch layer as needed. If sediment load is heavy, remove the mulch layer and inspect the biofiltration media and replace the top two-inch media if it appears clogged. Additionally, a further inspection should be undertaken within 24 hours after a major storm event to see if there is standing water in the system. Water stagnation in the treatment chamber indicates that media bed replacement may be recommended. ADS Field Engineering can assist with this analysis.

ADS should be contacted for material specifications and replacement parts. Media chamber replacement will involve utilizing small construction excavation equipment.

Disposal of material from the treatment chamber should be in accordance with the local municipality’s requirements. Typically, traditional municipal landfills can be used for disposal of solids and trash obtained from servicing the EcoStream. Call ADS at 800-821-6710 for further information.

Records of Operation and Maintenance

The owner shall maintain annual records of the operation and maintenance of the EcoStream unit to document the effective maintenance of this important component of a site’s stormwater management program. The attached Inspection & Maintenance Log is suggested and should be retained for a minimum period of two years.

EcoStream BioFilter Inspection and O&M Log Sheet

Project Name: _____

Location: _____

Date	Inspection or O&M	Observation/Actions	Operator comments and general description	Inspector

adspipe.com
800-821-6710

APPENDIX E – STORMWATER AGREEMENT

SEDIMENT AND EROSION CONTROL
AND STORMWATER MANAGEMENT

Attachment 1

Town of Ramapo

Schedule A
STORMWATER CONTROL FACILITY
MAINTENANCE AGREEMENT

Whereas, the Town of Ramapo ("Municipality") and 1507 Route 202 ("facility owner") want to enter into an agreement to provide for the long term maintenance and continuation of stormwater control measures approved by the Municipality for the below named project, and

Whereas, the Municipality and the facility owner desire that the stormwater control measures be built in accordance with the approved project plans and thereafter be maintained, cleaned, repaired, replaced and continued in perpetuity in order to ensure optimum performance of the components. Therefore, the Municipality and the facility owner agree as follows:

1. This agreement binds the facility owner, its successors and assigns, to the maintenance provisions depicted in the approved project plans which are attached as Schedule A[1] of this agreement.

2. The facility owner shall maintain, clean, repair, replace and continue the stormwater control measures depicted in Schedule A as necessary to ensure optimum performance of the measures to design specifications. The stormwater control measures shall include, but shall not be limited to, the following: drainage ditches, swales, drywells, infiltrators, drop inlets, pipes, culverts, soil absorption devices and retention ponds.

3. The facility owner shall be responsible for all expenses related to the maintenance of the stormwater control measures and shall establish a means for the collection and distribution of expenses among parties for any commonly owned facilities.

4. The facility owner shall provide for the periodic inspection of the stormwater control measures, not less than once in every five year period, or more frequently if otherwise specified within the Stormwater Pollution Prevention Plan, to determine the condition and integrity of the measures. Such inspection shall be performed by a Professional Engineer licensed by the State of New York. The inspecting engineer shall prepare and submit to the Municipality within 30 days of the inspection, a written report of the findings including recommendations for those actions necessary for the continuation of the stormwater control measures.

5. The facility owner shall not authorize, undertake or permit alteration, abandonment, modification or discontinuation of the stormwater control measures except in accordance with written approval of the Municipality.

[1] Editor's Note: Said schedule is on file in the Town offices.

6. The facility owner shall undertake necessary repairs and replacement of the stormwater control measures at the direction of the Municipality or in accordance with the recommendations of the inspecting engineer.

7. The facility owner shall provide to the Municipality within 30 days of the date of this agreement, a security for the maintenance and continuation of the stormwater control measures in the form of a Bond, letter of credit or escrow account in the amount of $5,000 for a period of 5 years.

8. This agreement shall be recorded in the Office of the County Clerk, County of Rockland together with the deed for the common property and shall be included in the offering plan and/or prospectus approved pursuant to _____.

9. If ever the Municipality determines that the facility owner has failed to construct or maintain the stormwater control measures in accordance with the project plan or has failed to undertake corrective action specified by the Municipality or by the inspecting engineer, the Municipality is authorized to undertake such steps as reasonably necessary for the preservation, continuation or maintenance of the stormwater control measures and to affix the expenses thereof as a lien against the property. Furthermore, the Municipality is hereby granted an easement on the property for the purposes of taking any action(s) to which the Municipality is entitled to under this agreement.

10. This agreement is effective as of the _____ day of _____.

Town of Ramapo

By: _____ **By: _____**

Supervisor **President/Owner**

APPENDIX F – SOIL TEST RESULTS

1507 Route 202
Town of Ramapo
Percolation/Deep Tests
May 13, 2024

Test performed by Devin Crichlow, signed off by Rachel Barese, P.E.

Hole 1 (Approximately 70 ft south of existing building)
Deep Test:
0'-9.5' Brown silty loam with stones 1" – 12"
Groundwater reached at 9.5'
No signs of bedrock

24" perc test at 6'
Run 1- fail

Civil Tec Engineering & Surveying P.C.
139 Lafayette Avenue, 2nd Floor, Suffern, NY 10901 Tel 845.547.2241 Fax 845.547.2243
111 Main Street, Chester, NY 10918 Tel 845.610.3621
Civil-Tec.com

Hole 2 (Approximately 50 ft east of hole 1)
Deep Test:
0'-3' Brown silty loam with stones 1" – 6"
Groundwater reached at 3'
No signs of bedrock


Hole 3 (Front yard; near existing eastern curb)
Deep Test:
0' – 1' Topsoil
1'-8' Brown silty loam with stones 1" – 12"
Groundwater reached at 8'
No signs of bedrock

24" perc test at 5'
Run 1- fail

Civil Tec Engineering & Surveying P.C.
139 Lafayette Avenue, 2nd Floor, Suffern, NY 10901 Tel 845.547.2241 Fax 845.547.2243
111 Main Street, Chester, NY 10918 Tel 845.610.3621
Civil-Tec.com

CIVILTEC
Engineering + Surveying

Civil Tec Engineering & Surveying P.C.
139 Lafayette Avenue, 2nd Floor, Suffern, NY 10901 Tel 845.547.2241 Fax 845.547.2243
111 Main Street, Chester, NY 10918 Tel 845.610.3621
Civil-Tec.com

APPENDIX G – NOTICE OF INTENT (TO BE PROVIDED)

APPENDIX H – MS4 ACCEPTANCE FORM (TO BE PROVIDED)

APPENDIX I – CORRESPONDENCE

U.S. Fish and Wildlife Service
National Wetlands Inventory

Wetlands

February 15, 2024

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Rockland County, New York

Local offices

Long Island Ecological Services Field Office

(631) 286-0485
(631) 286-4003

340 Smith Road
Shirley, NY 11967-2258

New York Ecological Services Field Office

(607) 753-9334
(607) 753-9699
fw5es_nyfo@fws.gov

3817 Luker Road
Cortland, NY 13045-9385

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat Perimyotis subflavus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

Reptiles

NAME	STATUS
Bog Turtle Glyptemys muhlenbergii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6962	Threatened

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

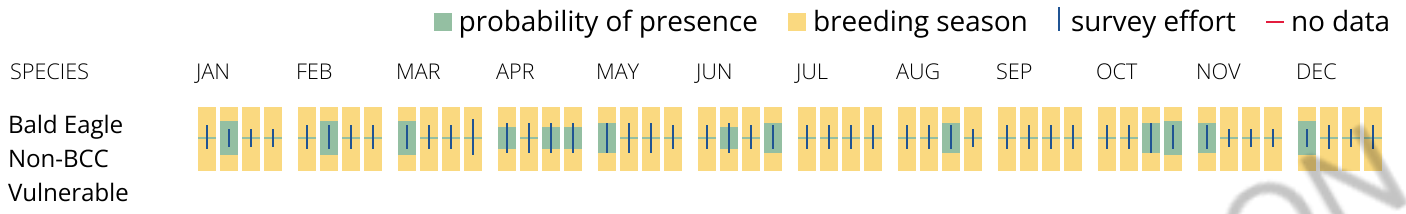
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON

Bald Eagle Haliaeetus leucocephalus — Breeds Sep 1 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1626

Black-billed Cuckoo Coccyzus erythropthalmus — Breeds May 15 to Oct 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9399

Black-capped Chickadee Poecile atricapillus practicus — Breeds Apr 10 to Jul 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Canada Warbler Cardellina canadensis — Breeds May 20 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Eastern Whip-poor-will Antrostomus vociferus — Breeds May 1 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Golden-winged Warbler Vermivora chrysoptera — Breeds May 1 to Jul 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8745

Rusty Blackbird Euphagus carolinus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Wood Thrush *Hylocichla mustelina* Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

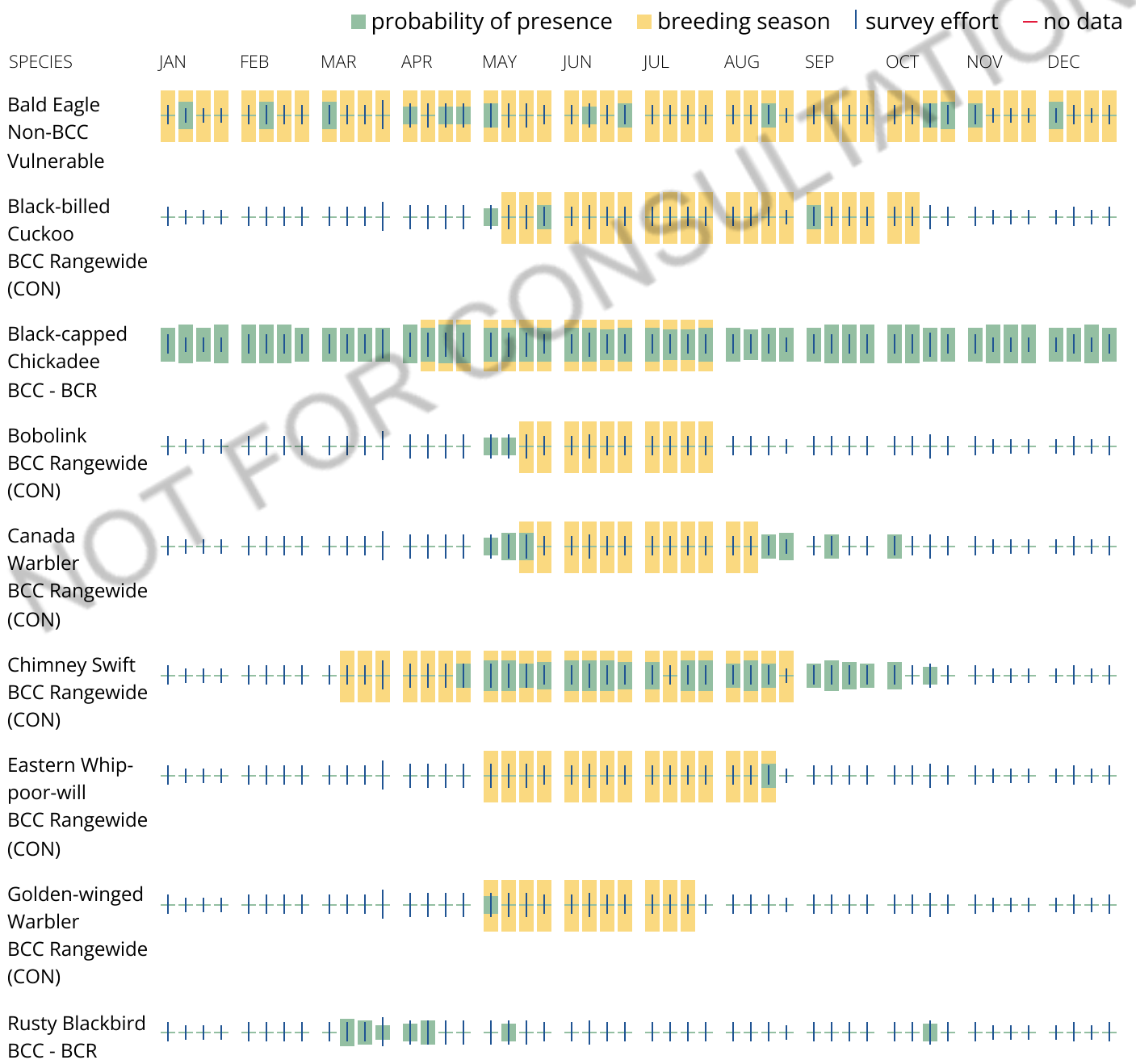
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)

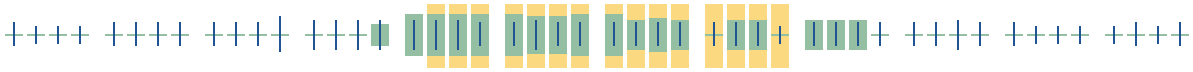
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Wood Thrush
BCC Rangewide
(CON)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird

on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key

component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

This location did not intersect any wetlands mapped by NWI.

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

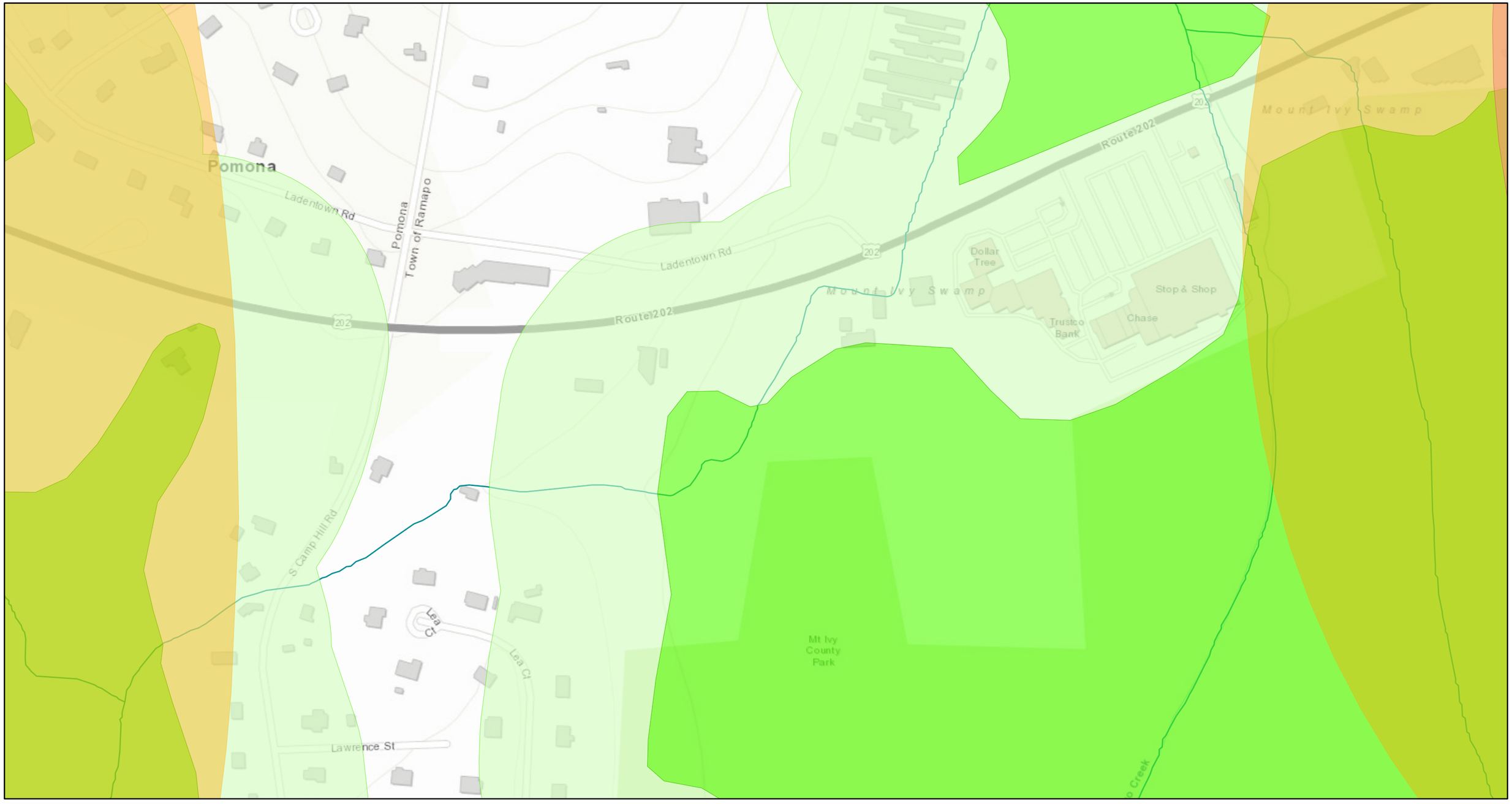
Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Environmental Resource Mapper



April 17, 2024

1:4,514

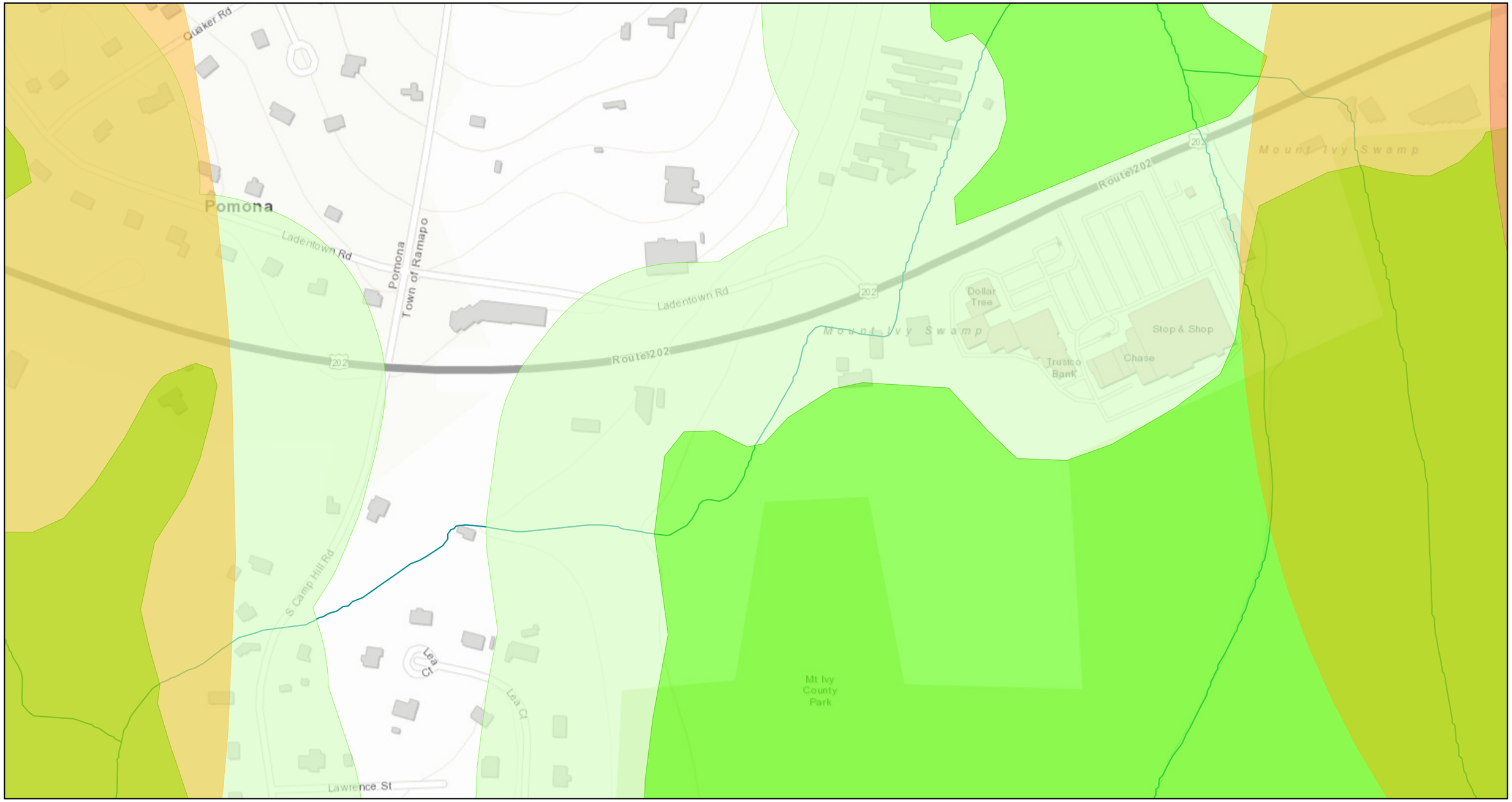
0 0.04 0.09 0.17 mi

0 0.05 0.1 0.2 km

Orange County, NY, State of New Jersey, Esri, HERE, Garmin, INCREMENT P, USGS, EPA, USDA

NYS Department of Environmental Conservation
Not a legal document

Environmental Resource Mapper



February 15, 2024

1:4,514

0 0.04 0.09 0.17 mi

0 0.05 0.1 0.2 km

Orange County, NY, State of New Jersey, Esri, HERE, Garmin, INCREMENT P, USGS, EPA, USDA

NYS Department of Environmental Conservation
Not a legal document

New York State
Parks, Recreation and
Historic Preservation

KATHY HOCHUL
Governor

RANDY SIMONS
Commissioner Pro Tempore

May 02, 2024

RACHEL BARESE
President
Civil Tec Engineering & Surveying PC
139 Lafayette Avenue
2nd Fl.
Suffern, NY 10901

Re: DEC
1507 Rt 202
1507 Route 202, Pomona, NY 10970
24PR03558

Dear RACHEL BARESE:

Thank you for requesting the comments of the Office of Parks, Recreation and Historic Preservation (OPRHP). We have reviewed the project in accordance with the New York State Historic Preservation Act of 1980 (Section 14.09 of the New York Parks, Recreation and Historic Preservation Law). These comments are those of the OPRHP and relate only to Historic/Cultural resources. They do not include potential environmental impacts to New York State Parkland that may be involved in or near your project.

Based upon this review, it is the opinion of OPRHP that no properties, including archaeological and/or historic resources, listed in or eligible for the New York State and National Registers of Historic Places will be impacted by this project.

If further correspondence is required regarding this project, please be sure to refer to the OPRHP Project Review (PR) number noted above. If you have any questions, please contact Chelsea Towers at the following email address:

Chelsea.Towers@parks.ny.gov

Sincerely,

R. Daniel Mackay

Deputy Commissioner for Historic Preservation
Division for Historic Preservation