

1. Agenda & Minutes

Documents:

[JANUARY 14 2025 DRB MINUTES.PDF](#)
[MARCH 11 2025 DRB AGENDA.PDF](#)

2. PL-25-3 439 & 441 Boston Post Road Site Plan

Documents:

[PL-25-3 OSWEGATCHIE FIRE STATION-PZ APPLICATION-STATEMENT OF USE.PDF](#)
[PL-25-3 OSWEGATCHIE FIRE STATION-CAM APPLICATION-MEMO.PDF](#)
[PL-25-3 OSWEGATCHIE FIRE STATION-PLAN SET.PDF](#)
[PL-25-3 STAFF REPORT.PDF](#)
[PL-25-3 OSWEGATCHIE FIRE STATION-STORMWATER REPORT.PDF](#)
[PL-25-3 STORMWATER REPORT_EXEC SUMMARY.PDF](#)

RECEIVED FOR RECORD
WATERFORD, CT

2025 JAN 16 P 3:42

ATTEST: *David L. Lamp*
TOWN CLERK

**DESIGN REVIEW BOARD
MEETING MINUTES**

Design Review Board
Remote Access

January 14, 2025
4:00 PM

Members Present: Chairman -John O'Neill, Robert Nye, Joy Merrill, Edward Pellegrini and Michael Elbaum,
Members Absent: None
Staff Present: Jonathan Mullen, AICP, Planning Director, Mark Wujtewicz, Planner

ITEM #1 CALL TO ORDER AND APPOINTMENT OF ALTERNATES
Chairman, John O'Neill called the meeting to order at 4:0 p.m.

ITEM #2 PLAN REVIEWS

#PL-24-16 Request of Wal Mart Real Estate Business Trust, owner & applicant for a Site Plan /Special Permit approval for an expansion at 155 Waterford Parkway North, C-R zone, in accordance with Sections 9.1.2, 22 & 23 of the Zoning Regulations and as shown on plans entitled "Proposed Site Plan Documents for Walmart Store #0233-1000 proposed Pick Up and Signage/Striping Improvements and Building Expansion"

Greg Dibona of Bohler Engineering representing the applicant presented the building expansion and parking lot modifications to the Board. The purpose of the addition is to accommodate a more efficient operation of the online ordering and purchasing option. He stated that it was determined there is not sufficient space within the building to provide for this service, therefore the 3,800 square foot addition is proposed.

He reviewed the modified site plan with the Board identifying changes to the parking layout to accommodate the online pickup operation and upgrade the existing striping and pavement.

M. Elbaum asked if there would be any accessible parking spaces added as a result of this project. G. Dibona stated that there are twenty-four existing accessible spaces located directly in front of each of the entrances to the building and that these spaces will remain as is. There will not be additional spaces added for the addition. The purpose of the parking stalls for the addition are for online pick up where the customers will remain in the vehicle while employees of Wal-Mart bring out the purchased merchandise to them

There being no other questions from the Board.

MOTION: Motion made by E. Pellegrini, seconded by J. Merrill to submit a positive recommendation to the Planning and Zoning Commission.

VOTE: 5-0

ITEM #3 APPROVAL OF THE October 22, 2024 MEETING MINUTES

MOTION: Motion made by J. Merrill, seconded by M. Elbaum, to approve the October 22, 2024 meeting minutes as written.

VOTE: 4-0-1 (E. Pellegrini abstaining)

R. Nye requested a motion that the Board add the 2025 meeting schedule to the Agenda.

MOTION: Motion made by R. Nye, seconded by E. Pellegrini to add the 2025 meeting schedule to the agenda for consideration.

VOTE: 5-0

MOTION: Motion made by R. Nye, seconded by M. Elbaum to accept the 2025 meeting schedule as presented.

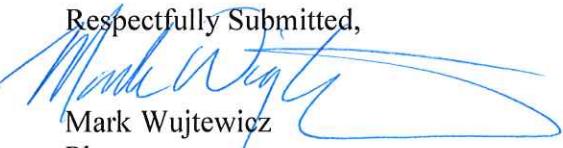
VOTE: 5-0

ITEM #4 ADJOURNMENT

MOTION: Motion made by E. Pellegrini, seconded by J. Merrill, to adjourn the meeting at 4:20 pm.

VOTE: 5-0

Respectfully Submitted,


Mark Wujtewicz
Planner

FIFTEEN ROPE FERRY ROAD
WATERFORD, CT 06385-2886



PHONE: 860-442-0553
www.waterfordct.org

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2025 MAR - 4 A. Q. 1

ATTEST: *D. J. K.*
TOWN CLERK

March 11, 2025
4:00 p.m.

AGENDA

Design Review Board Town Hall

Meeting Documents

https://ct-waterford.civicplus.com/AgendaCenter/Design-Review-Board-7/?#_03112025-2017

ITEM #1 CALL TO ORDER/APPOINTMENT OF ALTERNATES

ITEM #2 PLAN REVIEWS

#PL-25-3 – Request of the Town of Waterford, owner and applicant, for a site plan review and approval for a new Oswegatchie Fire Station on property located at 439 and 441 Boston Post Road, NBPO zone in accordance with sections 7a.2.3, 22 and 25.4 of the Zoning Regulations and as shown on plans titled “Oswegatchie Fire Station, 441 Boston Post Road, Waterford, Connecticut, Site Plan/Design Review/Coastal Site Plan Application” dated revised 2/7/2025.

ACTION REQUIRED BY: 4/16/25

ITEM #3 APPROVAL OF THE January 14, 2025 MEETING MINUTES

ITEM #4 ADJOURNMENT



Town of Waterford

Department of Planning and Development

www.waterfordct.org

PZC Form 1

Office Use Only

Date Submitted: _____

Processed By: _____

App. No.: _____

Total Fee: \$ _____

Electronic Submission

Waived: Yes No

Planning and Zoning Application

1. Type of Application(s), Use and Property Information (check all that apply)

<input type="checkbox"/> Informal Staff Review	<input type="checkbox"/> Site Plan/Design Review	<input type="checkbox"/> Municipal Project (CGS§8-24)
<input type="checkbox"/> Special Permit/Design Review ¹	<input type="checkbox"/> Subdivision /Resubdivision	<input type="checkbox"/> Lot line Adjustment
<input type="checkbox"/> Zoning Map Change	<input type="checkbox"/> Regulation Amendment(s)	<input type="checkbox"/> New District
<input type="checkbox"/> Multifamily Development	<input type="checkbox"/> Coastal Area Management ²	<input type="checkbox"/> Earth Excavation
<input type="checkbox"/> Flood Hazard Area	<input type="checkbox"/> Other: _____	<input type="checkbox"/> Other: _____

Specify all uses and corresponding section for which this application applies³:

Use: _____ Section: _____

Use: _____ Section: _____

Use: _____ Section: _____

Name of proposed development/subdivision: _____ If subdivision how many lots?: _____

If applicable, are roadways proposed to be private, public or both:

Private Public Both⁴

Parcel 1

Map/Block/Lot: _____ / _____ / _____ / _____ / _____

Parcel 2

Map/Block/Lot: _____ / _____ / _____ / _____ / _____

Street No. & Name: _____

Street No. & Name: _____

Size SF/AC: _____ / _____

Size SF/AC: _____ / _____

Zoning District(s): _____

Zoning District(s): _____

¹ Include a completed list of property owners with Parcel ID, name, address and mailing address. It is the applicant's responsibility to distribute all notices certified return receipt. Evidence of mailing shall be submitted prior to the start of the hearing. Failure to do so will delay the opening of the hearing.

² Coastal Site Plan reviews under Coastal Area Management §25.4 must submit a completed PZC Form 2 in addition to this PZC Form 1.

³ The use listed must correspond to the exact use term noted within the zoning district as a permitted use allowed through site plan or special permit.

⁴ A plan must accompany the application clearly delineating the limits of public and private roads.

2. Applicant Information

Name: _____

Title: _____

Company: _____

Address: _____

City/State: _____

Zip Code: _____

Telephone: _____ Fax: _____ Email: _____

Applicant's Authority to File Application⁵

- Legal Owner of Record
- Power of Attorney
- Contract to Purchase
- Other _____

3. Agent Information; if applicable

Name: _____

Title: _____

Company: _____

Address: _____

City/State: _____

Zip Code: _____

Specify Nature of Agent

- Attorney
- Civil Engineer
- Land Surveyor
- Design Professional: _____
- Other: _____

Bar/License/Reg. No.: _____

Telephone: _____ Fax: _____ Email: _____

4. Property Owner(s) and Parcel(s) Information

Is owner co-applicant? Yes No

Note: If landowner is an LLC, Corporation, Trust or other legal entity, attach the names, addresses and title of each member or officer, including agent(s). If same as applicant list 'Same'.

Name: _____

Title: _____

Company: _____

Address: _____

City/State: _____

Zip Code: _____

Telephone: _____

Fax: _____

Email: _____

Name: _____

Title: _____

Company: _____

Address: _____

City/State: _____

Zip Code: _____

Telephone: _____

Fax: _____

Email: _____

⁵ Applicant must submit evidence attesting to the authority to file application (i.e. deed, option for purchase, etc.)

5. Statement of Use

Attached a typed statement of use in conformance with the Zoning Regulations as described in Section 22.4.2. In addition include all hours and days of operation, size of buildings and number of stories, utilities servicing the parcel, variances received, number of employee and structures to be demolished.

6. Statement of Design Compatibility (Site Plans and Special Permits only)

Attach a statement describing how the building and site design is compatible with the neighborhood, character of Waterford and Zoning Regulations.

7. Consistency with Adopted Plan of Preservation, Conservation and Development (all applications)

Attach a statement attesting to how the proposed use, zone change, amendment or design is consistent with the most recent adopted Plan of Preservation, Conservation and Development (the Plan). Note relevant Plan section numbers and pages.

8. Natural and Cultural Resources

Yes	No	% of Property
<input type="checkbox"/>	<input type="checkbox"/>	a. Are inland wetlands present on site? Total SF/AC _____ / _____
<input type="checkbox"/>	<input type="checkbox"/>	b. Are tidal wetlands present on site? Total SF/AC _____ / _____
<input type="checkbox"/>	<input type="checkbox"/>	c. Are there known or suspected vernal pools on the property?
<input type="checkbox"/>	<input type="checkbox"/>	d. CT DEEP NDDB: Are endangered, threatened or species of special concern suspected to be located on the property? <i>Applicant must attach an 8 1/2 x 11 map of the most current CT DEEP Natural Diversity Database with site clearly identified regardless of response provided. If you answered yes to item d., attach a letter from CT DEEP stating the name of the specie(s) that are suspected to be on the property. See Section 22 of the Zoning Regulations for additional information.</i>
<input type="checkbox"/>	<input type="checkbox"/>	e. Are floodplains or flood hazard areas on the property? Identify: _____
<input type="checkbox"/>	<input type="checkbox"/>	f. Is the property located within a local, state or national historic district? If yes identify district name: _____
<input type="checkbox"/>	<input type="checkbox"/>	g. Does the site possess any structures or sites listed on the local, state or national register of historic landmarks? If yes, identify: _____

9. Additional Information

Yes No

a. Is any part of the site within 500' of the Town line? Which town: _____

b. Will any egress or ingress for the property use streets within an adjoining municipality?

c. Is any work proposed in wetlands or watercourses? Explain in Statement of Use

d. Is any work proposed within 100 feet of a wetlands or watercourse? Explain in Statement of Use

e. Is any work proposed within a floodplain or flood hazard area? Explain in Statement of Use

f. Is public water available or proposed to the site? Identify: _____

g. Are public sanitary sewers available or proposed to the site? Identify: _____

h. Is there a utility, drainage or other easement(s) on the site? Specify: _____

i. Is open space proposed on the property?

How much open space is proposed (SF/AC)? _____ / _____ Percent of property(s) _____

Use and purpose of open space: _____

10. Previous Land Use Permits Associated with the Property(s)

Have previous permits been issued for the Property: Yes No (List singularly; attach additional pages if necessary)

Date Issued

Issuing Agency _____

Approved Use/Activity _____

11. Change of Zone, Regulation Amendment or New Zoning District, if applicable

Yes No

a. Is this application for a new zoning district and/or regulation not presently established within the Zoning Regulations? If a new zoning district, distinguish type of zone proposed:

Fixed Zone

Floating Zone

Overlay Zone

Identify proposed zone name: _____

For new regulations, list proposed section number(s) and titles(s):

i. _____

ii. _____

iii. _____

b. Is this application an amendment to an existing regulation? Attach proposed amendments, clearly noting any deletions, modifications or additions. List sections proposed to be modified:

i. _____

ii. _____

iii. _____

c. Is this application for a change to a district already established within the regulations? Identify:

Supporting materials:

For new zoning districts or a change in zone provide a legal description of the land involved in the zone district change including the following:

- Location map at 1"=1000'
- Accurate description and acreage of tract(s) to be changed with existing buildings and uses
- Show existing features including but not limited to contours at two-foot intervals, wetlands and watercourses, flood plains, all improvements and structures,
- All lots or parts of lots contained in an area within 500 feet in all directions of the zone change tract
- All lots shown in this area and within the zone change tract shall contain the name and address of owners as recorded in the Assessor's records and shall show the nature of use
- North point, and distance along road from nearest road intersection.
- Scale of map(s)

12. Bulk Zoning Requirements Table

Complete the following table, which must also be included on applicable drawings:

Zoning District(s): _____		
Item	Required	Proposed
Minimum Lot Size		
Frontage		
Front Yard		
Side Yard		
Rear Yard		
Building Line		
Building Coverage		
Parking ⁶		
Landscaping		
Impermeable Coverage		

Note:

See Planting Plan sheet LP101 for required landscape buffer.

Parking count calculated using guidelines in Section 7A.8 and Section 20.3.c in the Town of Waterford Zoning Section. Please see the Zoning Chart on the Site Plan sheet CS101.

⁶ Attach method used to determine the number of parking spaces required.

13. Planning, Design and Engineering Team

Provide a list of all professionals responsible for the project. Additional pages attached, if necessary: Yes No

Discipline: _____

Telephone: _____

Name: _____

Fax: _____

Company: _____

Email: _____

License(s)/

License(s)/

Accreditations: _____

Accreditation No(s): _____

Discipline: _____

Telephone: _____

Name: _____

Fax: _____

Company: _____

Email: _____

Licenses and/or

License/

Accreditations: _____

Accreditation No(s): _____

Discipline: _____

Telephone: _____

Name: _____

Fax: _____

Company: _____

Email: _____

Licenses and/or

License/

Accreditations: _____

Accreditation No(s): _____

Discipline: _____

Telephone: _____

Name: _____

Fax: _____

Company: _____

Email: _____

Licenses and/or

License/

Accreditations: _____

Accreditation No(s): _____

Discipline: _____

Telephone: _____

Name: _____

Fax: _____

Company: _____

Email: _____

Licenses and/or

License/

Accreditations: _____

Accreditation No(s): _____

14. Supporting Documentation

Itemize, including additional attachments, all information provided in support of the application. Titles, dates and sheet/map numbers shall correspond exactly with the corresponding information provided.

Additional pages attached, if necessary: Yes No

15. For Informal Staff Review Use Only

Sec. 7-159b – Pre-application review of use of property. Notwithstanding any other provision of the general statutes, prior to the submission of an application for use of property under chapters 124, 126, 440 and 541 or any other provision of the general statutes authorizing an authority, commission, department or agency of a municipality to issue a permit or approval for use of such property, such authority, commission, department or agency or authorized agent thereof may separately, jointly, or in any combination, conduct a pre-application review of a proposed project with the applicant at the applicant's request. Such pre-application review and any results or information obtained from it may not be appealed under any provision of the general statutes, and shall not be binding on the applicant or any authority, commission, department, agency or other official having jurisdiction to review the proposed project.

I have read and understand the above provision of the Connecticut General Statutes and understand and agree that whatever discussion, comments and/or recommendations are made through this review are non-binding upon the parties.

Further, I acknowledge and agree that this pre-application review meeting is being conducted prior to and in anticipation of a formal application to the Waterford Planning and Zoning Commission or Conservation Commission to obtain feedback and response to the proposal or design, as it exists on this date, in the interest of preparing an application consistent with the Subdivision, Zoning or Wetlands regulations of the Town of Waterford as the case may be.

Signature

Printed Name

Date

Applicant

Agent

Land Owner

Land Owner

16. Technical Assistance Review Fee

In accordance with the Waterford Code of Ordinance Chapter 16.08, the Commission may require third party technical assistance review for the evaluation of applications associated with but not limited to site plans, special permits, zone change and regulation amendments and may collect payment for costs associated with the review. This includes but is not limited to civil engineering, architecture, legal assistance, traffic engineering and environmental protection.

17. Acknowledgements; All applications

Application Content

The undersigned hereby acknowledges that this application and statements submitted herewith are true to the best of my knowledge and approval of the application is contingent upon compliance with all requirements of said regulations.

Right of Entry and Inspection

The undersigned hereby authorizes the Waterford Planning and Zoning Commission or its agents, to enter the subject property for the purposes of inspection and enforcement for the said Zoning Regulations until receipt of final Certificate of Occupancy and Certificate of Zoning Compliance.

Electronic Data Accuracy and Transmission

If applicable, the undersigned hereby acknowledges that all electronic data submitted as part of this application is an accurate and true representation of all paper transmissions provided as part of this application and may be transmitted publically when requested and all applicable fees are paid in full by the requesting party.

Signature

Printed Name

Date

Applicant

Agent

Land Owner

Land Owner

Site Permit Narrative
Osweagatchie Fire Station
441 Boston Post Road
Waterford, CT 06385
Langan Project No.: 140286501
02/07/2025

STATEMENT OF USE

This narrative has been prepared in support of the site plan/design review board/coastal site plan permit applications for the proposed fire station and associated site work at the Osweagatchie Fire Station at 441 Boston Post Road in Waterford, CT. The project includes a new fire station and the demolition of the existing fire station once the new station is online. Associated site work includes new concrete sidewalks, bituminous concrete paved parking and drive aisles, stormwater quality and utility improvements, and new landscaping and lighting. The proposed fire station will provide improved life safety services for the residents of Waterford.

The site is located within the Neighborhood Professional Business Office district, and the existing use of a municipal building (fire station) will be maintained. The project will adhere to all bulk zoning requirements, including parking, as outlined in the Zoning Chart on the Site Plan sheet CS101 in the attached set of plans. The proposed project is expected to operate very similarly and generate similar traffic volumes and traffic patterns as the current fire station. The site is currently served by public electric, water, and sanitary sewer services which will be maintained, and a new propane storage tank added in the rear of the proposed structure. The existing fire station to be demolished is approximately 12,000 square feet and the proposed station is approximately 10,160 square feet.

The building has been designed in a way to act as a transition between residential and non-residential type uses. Given that there is a mix in the site's surroundings, the structure has a shingled gable roof and fiber cement siding to blend with existing residences while providing the necessary site amenities a municipal building of the town needs to function. Ample space and buffer have been provided on all sides to make sure the firehouse seamlessly blends into the neighborhood and that it does not impact the character of any existing structures along Boston Post Road.

The project applied for and received approval in accordance with CGS Section 8-24 at the January 14, 2025 Planning and Zoning Commission meeting. The Commission found that the proposed project is consistent with the stated goal in the 2012 Plan of Conservation and Development, Community Facilities chapter to "provide adequate services and facilities to meet community needs" (pg. 66), Section A "Monitor and Adapt to Changing Community Facility Needs" (pg. 67), the Development Future Land Plan "community facilities and institutional uses will be encouraged and configured to enhance the overall community" (pg. 80), and consistency with the location of the proposed fire

Site Permit Narrative
Oswegatchie Fire Station
441 Boston Post Road
Waterford, CT 06385
Langan Project No.: 140286501
02/07/2025

station in that the parcel is identified in the Future Land Use Plan as an Institutional/ Community Facility (pg. 81).

Portions of the proposed building and associated site work fall within the 100-foot upland review area for two delineated wetland areas. A separate inland wetland and watercourses permit has been filed with the Conservation Commission and that application received approval at the Commission's meeting on January 23, 2025.



Town of Waterford

Building, Conservation, Planning and Zoning

www.waterfordct.org

Office Use Only

Date Submitted: _____

Processed By: _____

App. No.: _____

Rev: 07/24/14

PZC Form 2:

Application for Coastal Area Management Site Plan Permit

Property Address: _____

1. General

- a. This form must be submitted in conjunction with *PZC Form 1: Planning and Zoning Application* or, in the case of minor activities and if permitted by the Zoning Enforcement Officer, *Zoning Compliance Permit*.
- b. This form does not supersede or take the place of any state or federal permits. The applicant shall consult with the necessary agencies to review the possibility of additional permits, including general or individual permits that may be required for specific activities.

2. Authority

Consistent with Connecticut General Statutes ,Chapter 444, Secs. 22a-90 to 22a-113j, Waterford's Planning and Zoning Commission, acting in the capacity of the Town's Zoning Commission, regulates certain activities upon properties which lie completely or partially within the coastal area as defined by CGS §22a-94(b). Specifically, the Commission's is authorized, cited in part, by the following:

Sec. 22a-105. Coastal site plan reviews. (a) Coastal municipalities shall undertake coastal site plan reviews in accordance with the requirements of this chapter.

(b) The following site plans, plans and applications for activities or projects to be located fully or partially within the coastal boundary and landward of the mean high water mark shall be defined as "coastal site plans" and shall be subject to the requirements of this chapter: (1) Site plans submitted to a zoning commission in accordance with section 22a-109; (2) plans submitted to a planning commission for subdivision or resubdivision in accordance with section 8-25 or with any special act; (3) applications for a special exception or special permit submitted to a planning commission, zoning commission or zoning board of appeals in accordance with section 8-2 or with any special act; (4) applications for a variance submitted to a zoning board of appeals in accordance with subdivision (3) of section 8-6 or with any special act, and (5) a referral of a proposed municipal project to a planning commission in accordance with section 8-24 or with any special act.

3. Coastal Resources and Policies

a. By placing a check mark in the appropriate box(es), identify the coastal resources and their policies for each that is located on and adjacent to the property or that may be influenced by the activities associated with the application.

Note: A resources may be located on site, adjacent and be off-site but influenced by the activities. Refer to CGS §22a-92(a) for General Coastal Resource Policy, CGS§221-92(b)(2) and CGS §22a-93(7) for definitions of each corresponding policy's coastal resource.

Coastal Resource	On-site	Adjacent	Off-site but within Influence
General Coastal Resources			
Beaches and Dunes			
Bluffs & Escarpments			
Coastal Hazard Area			
Coastal Waters, Estuarine Embayments, Nearshore Waters, Offshore Waters			
Development Shorefront			
Freshwater Wetlands and Watercourses			
Intertidal Flats			
Islands			
Rocky Shorefront			
Shellfish Concentration Area			
Shorelands			
Coastal Hazard Area ID Type (i.e. VE, A, etc.)		NA	NA
Base Flood Elevation		NA	NA
Tidal Wetlands			

b. Consistency with Coastal Resources and Policies.

Attached a typed and briefly statement of how the resources checked are consistent or inconsistent with coastal resource policies.

c. Identification of Potential Adverse Impacts on Coastal Resources

Please complete this section for all projects. Identify the adverse impact categories below that apply to the proposed project or activity. The applicable column must be checked if the proposed activity has the potential to generate any adverse impacts as defined in CGS Section 22a-93(15). If an adverse impact may result from the proposed project or activity, please use Part VIII to describe what project design features may be used to eliminate, minimize, or mitigate the potential for adverse impacts.

<u>Potential Adverse Impacts on Coastal Resources</u>	<u>Applicable</u>	<u>Not Applicable</u>	<u>Mitigation Proposed</u>
i. Degrading tidal wetlands, beaches and dunes, rocky shorefronts, and bluffs and escarpments through significant alteration of their natural characteristics or functions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ii. Increasing the hazard of coastal flooding through significant alteration of shoreline configurations or bathymetry, particularly within high velocity flood zones - CGS Section 22a-93(15)(E)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iii. Degrading existing circulation patterns of coastal water through the significant alteration of patterns of tidal exchange or flushing rates, freshwater input, or existing basin characteristics and channel contours	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iv. Degrading natural or existing drainage patterns through the significant alteration of groundwater flow and recharge and volume of runoff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
v. Degrading natural erosion patterns through the significant alteration of littoral transport of sediments in terms of deposition or source reduction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
vi. Degrading visual quality through significant alteration of the natural features of vistas and view points	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
vii. Degrading water quality through the significant introduction into either coastal waters or groundwater supplies of suspended solids, nutrients, toxics, heavy metals or pathogens, or through the significant alteration of temperature, pH, dissolved oxygen or salinity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
viii. Degrading or destroying essential wildlife, finfish, or shellfish habitat through significant alteration of the composition, migration patterns, distribution, breeding or other population characteristics of the natural species or significant alterations of the natural components of the habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Coastal Use and Activities Policies and Standards

a. Identify all coastal policies and standards in or referenced by CGS Section 22a-92 applicable to the proposed project or activity:

<input type="checkbox"/> General Development	<input type="checkbox"/> Sewer and Water Lines
<input type="checkbox"/> Water-Dependent Uses	<input type="checkbox"/> Energy Facilities
<input type="checkbox"/> Ports and Harbors	<input type="checkbox"/> Fuel, Chemicals and Hazardous Materials
<input type="checkbox"/> Coastal Structures and Filling	<input type="checkbox"/> Transportation
<input type="checkbox"/> Dredging and Navigation	<input type="checkbox"/> Solid Waste
<input type="checkbox"/> Boating	<input type="checkbox"/> Dams, Dikes and Reservoirs
<input type="checkbox"/> Fisheries	<input type="checkbox"/> Cultural Resources
<input type="checkbox"/> Coastal Recreation and Access	<input type="checkbox"/> Open Space and Agricultural Lands

b. Consistency With Applicable Coastal Use Policies And Standards

Attach an explanation of how the proposed activity or use is consistent with all of the applicable coastal use and activity policies and standards identified in Part V. For projects proposed at waterfront sites (including those with tidal wetlands frontage), particular emphasis should be placed on the evaluation of the project's consistency with the water-dependent use policies and standards contained in CGS Sections 22a-92(a)(3) and 22a-92(b)(1)(A) -- also see adverse impacts assessment in Part VII.B below:

5. Mitigation of Adverse Impacts and Overall Consistency *(all applications)*

Attach a summary addressing each of the following:

- a. Describe the methods proposed to mitigate any adverse impacts.
- b. Explain why adverse impacts are not being mitigated, if applicable.
- c. Summarize why the project as proposed is consistent with the Connecticut Coastal Management Act

6. Potential Adverse Impacts on Water-dependent Uses (for project or activity is proposed at a waterfront site)

- a. Identification of existing and/or proposed Water-dependent Uses: Attach a description of the features or characteristics of the proposed activity or project that qualify as water-dependent uses as defined in CGS Section 22a-93(16). If general public access to coastal waters is provided, please identify the legal mechanisms used to ensure public access in perpetuity, and describe any provisions for parking or other access to the site and proposed amenities associated with the access (e.g., boardwalk, benches, trash receptacles, interpretative signage, etc.)*:
- b. Identify the adverse impact categories below that apply to the proposed project or activity. The applicable column must be checked if the proposed activity has the potential to generate any adverse impacts as defined in CGS Section 22a-93(17). If an adverse impact may result from the proposed project or activity, use Part VIII to describe what project design features may be used to eliminate, minimize, or mitigate the potential for adverse impacts.

<i>Potential Adverse Impacts on Future Water-dependent Development Opportunities and Activities</i>	<i>Applicable</i>	<i>Not Applicable</i>	<i>Mitigation Proposed</i>
i. Locating a non-water-dependent use at a site physically suited for or planned for location of a water-dependent use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ii. Replacing an existing water-dependent use with a non-water dependent use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iii. Siting a non-water-dependent use which would substantially reduce or inhibit existing public access to marine or tidal waters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Acknowledgements; All applications

Application Content

The undersigned hereby acknowledges that this application and statements submitted herewith are true to the best of my knowledge and approval of the application is contingent upon compliance with all requirements of said regulations.

Signature

Printed Name

Date

555 Long Wharf Drive New Haven, CT 06511 T: 203.562.5771 F: 203.789.6142

To: Mark Wujtewicz | Waterford Planning & Development

From: Brian Phillips, P.E.
Chris Cardany, P.E.

Date: 07 February 2025

Re: Coastal Site Plan Application
Oswegatchie Fire Station
441 & 439 Boston Post Rd.
Waterford, Connecticut
Langan Project No.: 140286501

Project Description

This Coastal Site Plan Application memorandum has been prepared in support of the proposed Oswegatchie Fire Station project at 441 Boston Post Road. The project includes the phased demolition of the existing fire station building and the construction of a new fire station along with associated site improvements including parking, utilities, landscaping, and lighting.

Coastal and Other Resources

Portions of the property lie within the Connecticut Coastal Boundary line, however only about half of the proposed development will fall within this boundary. Following review of the State Coastal Resources Maps (Niantic), the coastal resources on site include only shorelands. The only other identified natural features of the development site are shorelands and inland freshwater wetlands both on the parcel and offsite to the north. No significant historical or cultural resources have been identified within the limit of development. The property also contains no floodplain.

Coastal Resource and Activities Policies (CT Coastal Management Manual)

- General Resources (1, 2, 3, 4) – To preserve and enhance coastal resources in accordance with the applicable policies established by the state.
- Shorelands (42) – To regulate shoreland use and development in a manner which minimizes adverse impacts upon adjacent coastal systems and resources.
- Freshwater Wetlands & Watercourses (27, 28) – To protect the citizens of the state by making provisions for the protection, preservation, maintenance and use of the inland wetlands and watercourses by minimizing their disturbance and pollution, etc.
- General Development (49, 50, 51) – To insure that the development, preservation or use of the land and water resources of the coastal area proceeds in a manner consistent with the capability of the land and water resources to support development, preservation or

MEMO

Coastal Site Plan Application
441 & 439 Boston Post Rd.
Waterford, Connecticut
Langan Project No.: 140286501
07 February 2025- Page 2 of 3

use without significantly disrupting either the natural environment or sound economic growth.

Consistency with Coastal Resource and Activities Policies

In accordance with the policies noted above, the proposed development includes erosion controls throughout construction, stormwater quality and quantity improvements, and a limited development area so as not to encroach on any inland freshwater wetlands and watercourses.

The proposed development will be designed in accordance with the CT Stormwater Quality Manual and CT Guidelines for Soil Erosion and Sediment Control. Controls to be implemented throughout construction include anti-track pad construction entrances, silt fences backed by hay bales, and temporary sediment traps. These controls will help minimize the passage of sediment and pollutants from the limit of development.

Stormwater quality and quantity improvements include catch basins with deep sumps, a rain garden to promote infiltration, riprap scour pads and level spreaders at stormwater outfalls, and vegetated swales with check dams. These proposed improvements are designed to attenuate stormwater peak flows for all storm events up to and including the 100-year storm event. Additionally, per the 2024 CT Stormwater Quality Manual requirements, peak stormwater runoff from each individual onsite watershed where site development is proposed will be reduced by 50% for the 2-year storm event. These measures will be implemented to reduce stormwater peak flows, promote infiltration of stormwater and groundwater recharge, improve water quality, and minimize the passage of pollutants to the onsite wetlands, offsite drainage networks and the adjacent coastal resources noted in this memorandum.

The extent of site development is proposed within the 100-foot upland review area of both inland freshwater wetland areas, however no further encroachments are proposed beyond the existing site disturbances. The project has submitted a wetlands application to the Waterford Conservation Commission and was approved at their January 23, 2025 meeting.

Evaluation of Potential Benefits and Adverse Impacts of the Project

The potential adverse impacts of the project to the applicable coastal resources include erosion during construction and stormwater runoff following construction. Additionally, the project proposes to maintain the undeveloped wooded and wetland area to the north of the site. Other benefits include the implementation of stormwater infrastructure to reduce stormwater runoff, promote infiltration, and improve water quality.

In order to mitigate the potential adverse impacts, the project proposes the previously mentioned sediment and erosion control measures to minimize the passage of sediment and other pollutants from the site during construction. The permanent stormwater infrastructure is designed to reduce stormwater peak flows from the development for all storms up to and including the 100-year storm event and promote onsite infiltration and groundwater recharge.

MEMO

Coastal Site Plan Application
441 & 439 Boston Post Rd.
Waterford, Connecticut
Langan Project No.: 140286501
07 February 2025- Page 3 of 3

Evaluation of Impacts or Effects the Project Will Have on Future Water-Dependent Uses

The site is not on a waterfront location and therefore has very little or no potential for water-dependent uses or water-dependent development. As such, there are no impacts proposed by the development and no mitigation measures required.

If there are any questions or comments, please feel free to contact our office.

Sincerely,
Langan CT, Inc.



Brian Phillips, P.E.
Senior Project Manager



Christopher Cardany, P.E., LEED AP
Principal/Vice President

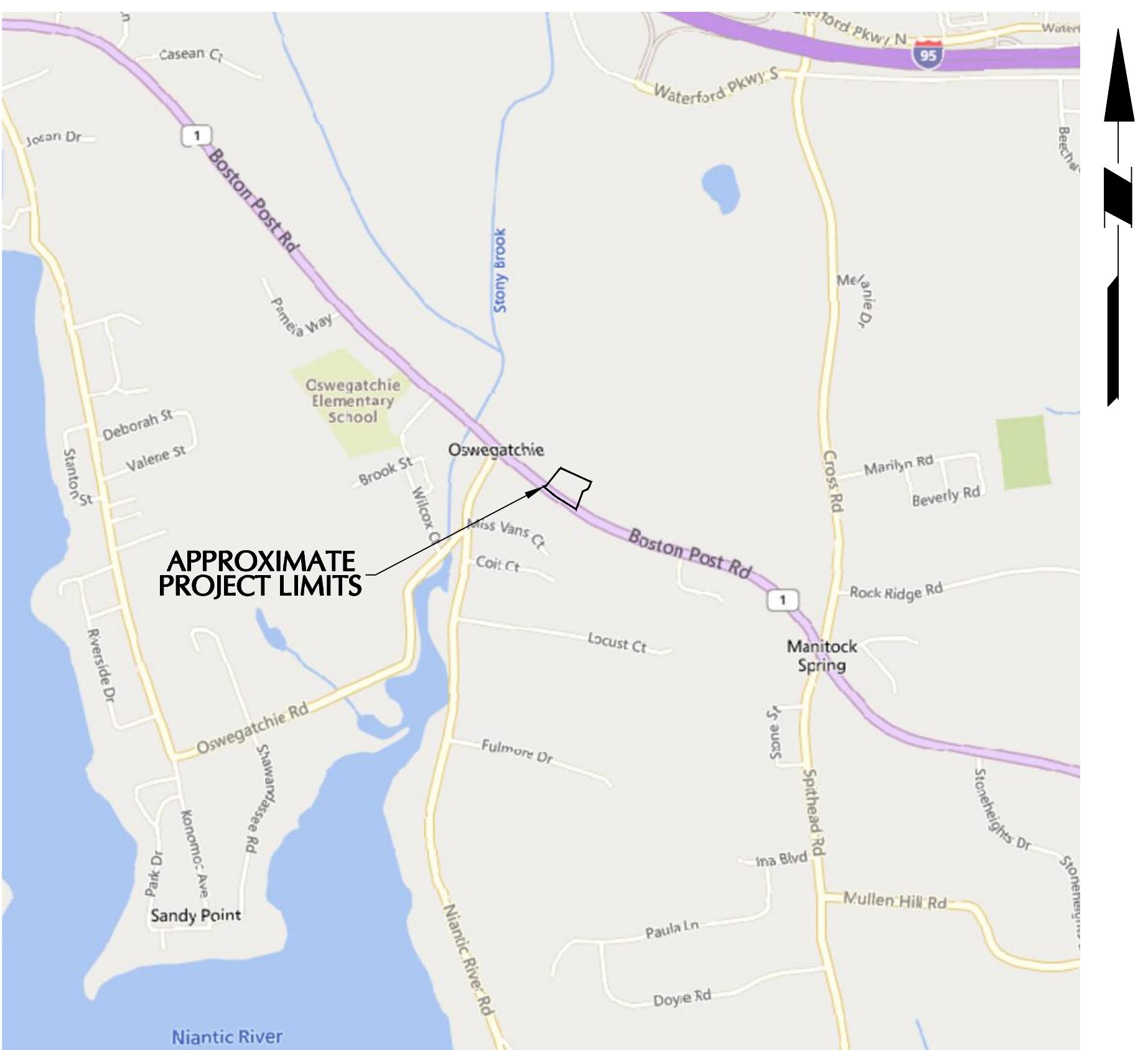
\\\langan.com\data\nhv\data5\140286501\project data_discipline\site civil\permit apps\coastal site plan application\2025-02-07 oswegatchie fire station-cam narrative.docx

OSWEGATCHIE FIRE STATION

441 BOSTON POST ROAD

WATERFORD, CONNECTICUT

SITE PLAN/DESIGN REVIEW/COASTAL SITE PLAN APPLICATION



LOCATION MAP

SCALE: 1" = 1,000'

OWNER & APPLICANT
OSWEGATCHIE FIRE COMPANY #4, INC.
441 BOSTON POST ROAD
WATERFORD, CT 06385

**SURVEYOR, CIVIL ENGINEER &
LANDSCAPE ARCHITECT**
LANGAN ENGINEERING &
ENVIRONMENTAL SERVICES, INC
555 LONG WHARF DRIVE
NEW HAVEN, CT 06511
(203) 562-5771

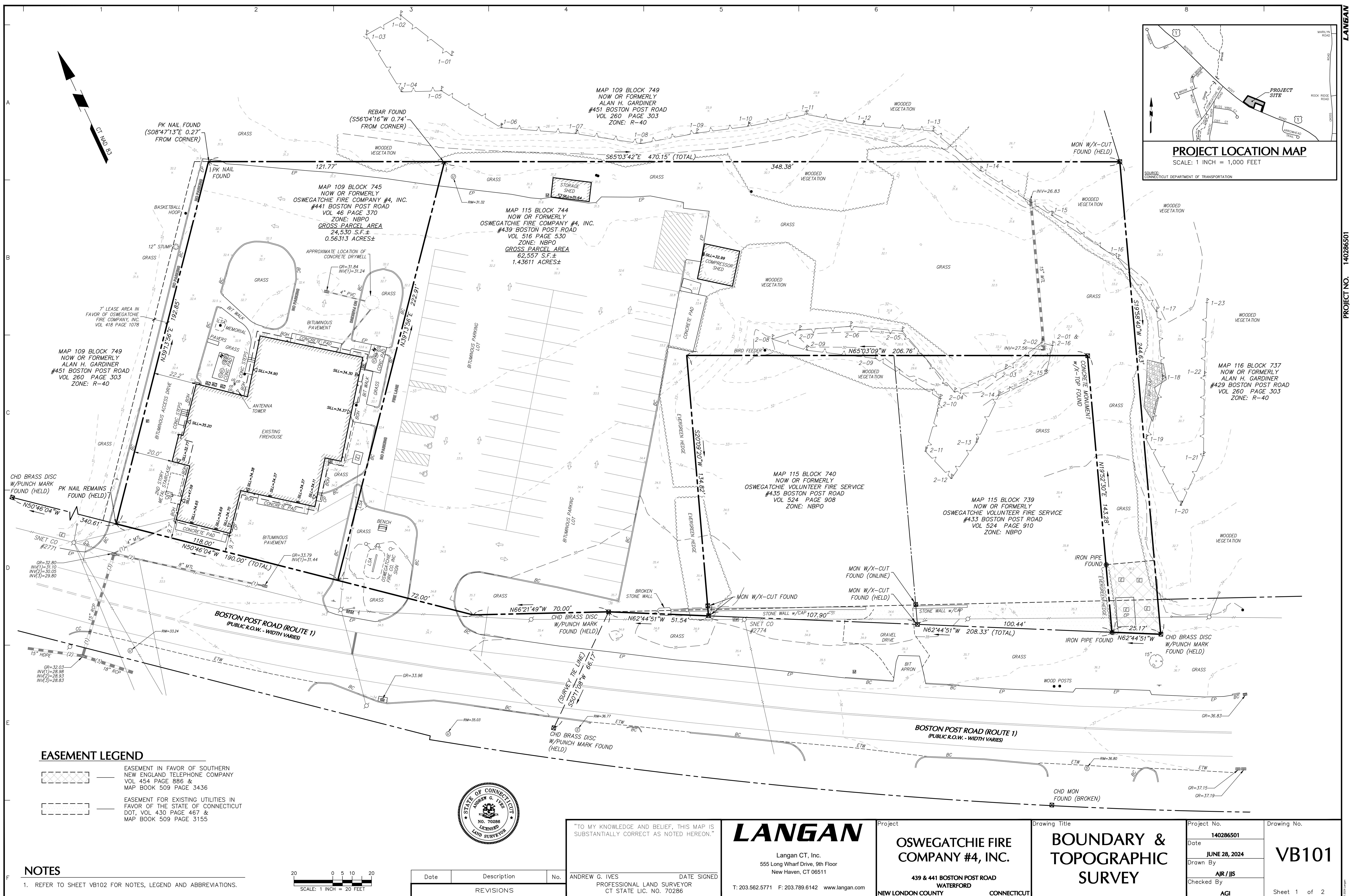
ARCHITECT
SILVER AND PETRUCELLI & ASSOCIATES
3190 WHITNEY AVENUE, BUILDING 2
HAMDEN, CT 06518
(203) 230-9007

DRAWING LIST			
NUMBER	TITLE	DATE	REVISED
-	COVER SHEET	2/7/2025	-
VB101	BOUNDARY AND TOPOGRAPHIC SURVEY	6/28/2024	-
VB102	BOUNDARY AND TOPOGRAPHIC SURVEY	6/28/2024	-
CS101	SITE PLAN	2/7/2025	-
CS501	SITE DETAILS I	2/7/2025	-
CS502	SITE DETAILS II	2/7/2025	-
CG101	GRADING, DRAINAGE & UTILITY PLAN	2/7/2025	-
CG501	GRADING & DRAINAGE DETAILS I	2/7/2025	-
CU101	UTILITY PLAN	2/7/2025	-
CU501	UTILITY DETAILS I	2/7/2025	-
CU501	UTILITY DETAILS II	2/7/2025	-
CE101	EROSION CONTROL/CONSTRUCTION PHASING PLAN I	2/7/2025	-
CE102	EROSION CONTROL/CONSTRUCTION PHASING PLAN II	2/7/2025	-
CE501	SOIL EROSION & SEDIMENT CONTROL DETAILS	2/7/2025	-
LP101	PLANTING PLAN	2/7/2025	-
LP501	PLANTING DETAILS	2/7/2025	-
LL101	LIGHTING PLAN	2/7/2025	-
LL501	LIGHTING DETAILS	2/7/2025	-
A100	FLOOR PLANS	1/24/2025	-
A302	EXTERIOR ELEVATIONS	1/24/2025	-
A303	EXTERIOR ELEVATIONS	1/24/2025	-
A304	3D VIEW	1/24/2025	-
A305	3D VIEW	1/24/2025	-

RELEASE DATES

DATE	ISSUED FOR
1/7/2025	INLAND WETLAND/WATERCOURSE PERMIT APP
1/21/2025	TOWN CONSERVATION COMMENTS
2/1/2025	SITE PLAN/DRB/COASTAL SITE PLAN APP

LANGAN



NOTES

1. REFER TO SHEET VB102 FOR NOTES, LEGEND AND ABBREVIATIONS

SCALE: 1 INCH = 20 FEET

Date	Description
REVISIONS	

"TO MY KNOWLEDGE AND BELIEF, THIS MAP IS
SUBSTANTIALLY CORRECT AS NOTED HEREON.

LANGAN

Langan CT, Inc.
555 Long Wharf Drive, 9th Floor
New Haven, CT 06511

Project

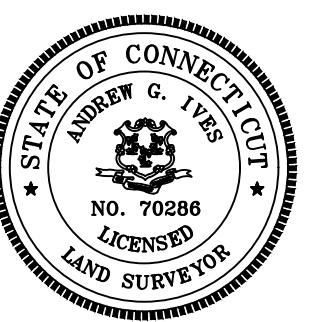
OSWEGATCHIE FIRE COMPANY #4, INC.

Drawing Title

BOUNDARY & TOPOGRAPHIC SURVEY

Project No.	Drawing No.
140286501	
Date	
JUNE 28, 2024	
Drawn By	
AJR / JJS	
Checked By	
ACI	
	Sheet 1 of 2

1	2	3	4	5	6	7	8
A	<p>NOTES</p> <p>1. THIS SURVEY HAS BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300b-1 THROUGH 20-300b-20 AND THE "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996.</p> <p>a. THIS SURVEY IS A PROPERTY SURVEY CONFORMING TO A HORIZONTAL ACCURACY OF A-2 AND A TOPOGRAPHIC SURVEY CONFORMING TO A T-2 ACCURACY. THE BOUNDARY DETERMINATION IS A RESURVEY. THE PURPOSE OF THIS SURVEY IS TO PROVIDE A BOUNDARY OPINION AND DEPICT SITE FEATURES FOR FUTURE SITE DEVELOPMENT.</p> <p>2. THIS SURVEY IS BASED UPON EXISTING PHYSICAL CONDITIONS FOUND AT THE SUBJECT SITE, DEED INFORMATION AND THE FOLLOWING REFERENCES:</p> <p>B. MAP TITLED "CONNECTICUT STATE HIGHWAY DEPARTMENT RIGHT OF WAY MAP TOWN OF WATERFORD BOSTON POST ROAD FROM THE HICKS HILL ROAD WESTERLY ABOUT 5,800 FEET ROUTE U.S.1", SCALE: 1"=40', DATED: AUG. 29, 1930, LAST REVISED: APRIL 13, 1994, NUMBER 878 SHEET NO. 2 OF 3</p> <p>B. MAP TITLED "SITE DEVELOPMENT PLAN, ZONING LOCATION SURVEY SHOWING NEW ADDITION 441 BOSTON POST ROAD (US ROUTE 1) WATERFORD, CONNECTICUT, PROPERTY OF OSWEGATCHIE FIRE COMPANY #4, INC., ZONE: NB-PO", SCALE: 1"= 20', DATED: FEBRUARY 1, 2008, BY: JAMES BERNARDO LAND SURVEYING, LLC</p> <p>C. MAP TITLED "TOWN OF WATERFORD MAP SHOWING LAND RELEASED TO OSWEGATCHIE FIRE COMPANY #4, INC. - BY THE STATE OF CONNECTICUT - BOSTON POST ROAD U.S. RTE. 1", SCALE: 1 INCH = 40 FEET, DATED: 19 OCTOBER 1991, LAST REVISED: 17 MARCH 1992, AS PREPARED BY: CONNECTICUT DEPARTMENT OF TRANSPORTATION</p> <p>D. MAP TITLED "PLAN SHOWING PROPERTY BELONGING TO OSWEGATCHIE FIRE COMPANY, INC. BOSTON POST ROAD WATERFORD, CONNECTICUT", SCALE: 1"=20', DATED: NOVEMBER 1979, MAP BOOK 509 PAGE 1240</p> <p>E. MAP TITLED "TOWN OF WATERFORD MAP SHOWING LAND RELEASED TO OSWEGATCHIE FIRE COMPANY #4, INC. BY THE STATE OF CONNECTICUT BOSTON POST ROAD U.S. RTE. 1", SCALE: 1"=40', DATED: OCTOBER 1991, LAST REVISED: 3/17/92, TOWN NO. 152, PROJECT NO. 152-MISC, SERIAL NO. 66, SHEET 1 OF 1, MAP BOOK 509 PAGE 3155</p> <p>F. MAP TITLED "DETAILED SITE PLAN, PROPERTY OF OSWEGATCHIE FIRE CO. INC. BOSTON POST ROAD WATERFORD, CONNECTICUT, ZONE: N.B.P.O.", SCALE: 1"=20', DATED: JULY 19, 1993, LAST REVISED: MAY 2, 1994, BY: WILLIAM F. KENT, P.L.S., MAP BOOK 509 PAGE 3166</p> <p>G. MAP TITLED "EASEMENT PLAN SHOWING EASEMENT TO BE GRANTED TO THE SOUTHERN NEW ENGLAND TELEPHONE COMPANY ON THE PROPERTY OF OSWEGATCHIE FIRE CO. #4, INC. BOSTON POST ROAD - U.S. ROUTE #1 WATERFORD, CONNECTICUT", SCALE: 1"=10', DATED: OCTOBER 20, 1995, BY: ANGUS McDONALD/GARY SHARPE & ASSOCIATES, INC., MAP BOOK 509 PAGE 3436</p> <p>H. MAP TITLED "BOUNDARY SURVEY MAP PROPERTY OF OSWEGATCHIE FIRE COMPANY #4, INC. #433-441 BOSTON POST ROAD (U.S. ROUTE #1) WATERFORD, CONNECTICUT", SCALE: 1"=20', DATED: SEPTEMBER 24, 2000, LAST REVISED: 10/8/00, BY: JAMES BERNARDO, LLS, MAP BOOK 509 PAGE 4256</p>						
B	<p>3. THE MERIDIAN OF THIS SURVEY IS REFERENCED TO CONNECTICUT STATE PLANE COORDINATE SYSTEM NAD 83 (EPOCH 2011). POSITION WAS DETERMINED BY GLOBAL NAVIGATION SATELLITE SYSTEMS (GNSS) AS PROVIDED BY HXGN SMARTNET CONTINUOUSLY OPERATED REFERENCE STATIONS (CORS).</p> <p>4. ELEVATIONS SHOWN ARE REFERENCED TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) (GEOD 18) AS DETERMINED BY GNSS.</p> <p>5. PLANIMETRIC AND TOPOGRAPHIC INFORMATION SHOWN HEREON HAS BEEN OBTAINED FROM GROUND SURVEYS BY LANGAN CT, INC. FIELD WORK COMPLETED DURING THE MONTH OF JUNE 2024.</p> <p>6. AS PER THE NATIONAL FLOOD INSURANCE PROGRAM FIRM MAP ENTITLED "NEW LONDON COUNTY, CONNECTICUT PANEL 481 OF 554 MAP NUMBER 09011C0481J, EFFECTIVE DATE AUGUST 5, 2013" THE PROJECT AREA IS IN ZONE X (UNSHADED).</p> <p>7. UNLESS SPECIFICALLY NOTED HEREON, STORM AND SANITARY SEWER INFORMATION (INCLUDING PIPE INVERT, PIPE MATERIAL, AND PIPE SIZE) WAS OBSERVED AND MEASURED AT FIELD LOCATED STRUCTURES (MANHOLES/CATCH BASINS, ETC.). CONDITIONS CAN VARY FROM THOSE ENCOUNTERED AT THE TIMES WHEN AND LOCATIONS WHERE DATA IS OBTAINED. DESPITE MEETING THE REQUIRED STANDARD OF CARE, THE SURVEYOR CANNOT, AND DOES NOT WARRANT THAT PIPE MATERIAL AND/OR PIPE SIZE THROUGHOUT THE PIPE RUN ARE THE SAME AS THOSE OBSERVED AT EACH STRUCTURE, OR THAT THE PIPE RUN IS STRAIGHT BETWEEN THE LOCATED STRUCTURES.</p> <p>8. ADDITIONAL UTILITY (WATER, GAS, ELECTRIC ETC.) DATA MAY BE SHOWN FROM FIELD LOCATED SURFACE MARKINGS (BY OTHERS, EXISTING STRUCTURES, AND/OR FROM EXISTING DRAWINGS).</p> <p>9. UNLESS SPECIFICALLY NOTED HEREON, THE SURVEYOR HAS NOT EXCAVATED TO PHYSICALLY LOCATE THE UNDERGROUND UTILITIES. THE SURVEYOR MAKES NO GUARANTEES THAT THE SHOWN UNDERGROUND UTILITIES ARE EITHER IN SERVICE, ABANDONED OR SUITABLE FOR USE, NOR ARE IN THE EXACT LOCATION OR CONFIGURATION INDICATED HEREON.</p> <p>10. ALL BUILDINGS AND STRUCTURES WERE LOCATED AND MEASURED AT GROUND LEVEL. THE SURVEYOR MAKES NO DETERMINATIONS OR GUARANTEES AS TO THE ABSENCE, EXISTENCE OR LOCATION OF UNDERGROUND STRUCTURES, FOUNDATIONS, FOOTINGS, PROJECTIONS, WALLS, TANKS, SEPTIC SYSTEMS, ETC. NO TEST PITS, EXCAVATIONS OR GROUND PENETRATING RADAR WERE PERFORMED AS PART OF THIS SURVEY.</p> <p>11. PRIOR TO ANY DESIGN OR CONSTRUCTION, THE PROPER UTILITY AGENCIES MUST BE CONTACTED FOR VERIFICATION OF UTILITY TYPE AND FOR FIELD LOCATIONS.</p> <p>12. WETLANDS DELINEATED BY ALL-POINTS TECHNOLOGY CORPORATION THE WEEK OF JUNE 2024. ALL FLAGS WERE FIELD LOCATED ON JUNE 20, 2024.</p> <p>13. THIS SURVEY IS NOT VALID WITHOUT THE EMBOSSED OR INKED SEAL OF THE PROFESSIONAL.</p>						
C	<p>14. THE SURVEYOR HAS NOT EXCAVATED TO PHYSICALLY LOCATE THE UNDERGROUND UTILITIES. THE SURVEYOR MAKES NO GUARANTEES THAT THE SHOWN UNDERGROUND UTILITIES ARE EITHER IN SERVICE, ABANDONED OR SUITABLE FOR USE, NOR ARE IN THE EXACT LOCATION OR CONFIGURATION INDICATED HEREON.</p> <p>15. ALL BUILDINGS AND STRUCTURES WERE LOCATED AND MEASURED AT GROUND LEVEL. THE SURVEYOR MAKES NO DETERMINATIONS OR GUARANTEES AS TO THE ABSENCE, EXISTENCE OR LOCATION OF UNDERGROUND STRUCTURES, FOUNDATIONS, FOOTINGS, PROJECTIONS, WALLS, TANKS, SEPTIC SYSTEMS, ETC. NO TEST PITS, EXCAVATIONS OR GROUND PENETRATING RADAR WERE PERFORMED AS PART OF THIS SURVEY.</p> <p>16. PRIOR TO ANY DESIGN OR CONSTRUCTION, THE PROPER UTILITY AGENCIES MUST BE CONTACTED FOR VERIFICATION OF UTILITY TYPE AND FOR FIELD LOCATIONS.</p> <p>17. WETLANDS DELINEATED BY ALL-POINTS TECHNOLOGY CORPORATION THE WEEK OF JUNE 2024. ALL FLAGS WERE FIELD LOCATED ON JUNE 20, 2024.</p> <p>18. THIS SURVEY IS NOT VALID WITHOUT THE EMBOSSED OR INKED SEAL OF THE PROFESSIONAL.</p>						
D	<p>19. THE SURVEYOR HAS NOT EXCAVATED TO PHYSICALLY LOCATE THE UNDERGROUND UTILITIES. THE SURVEYOR MAKES NO GUARANTEES THAT THE SHOWN UNDERGROUND UTILITIES ARE EITHER IN SERVICE, ABANDONED OR SUITABLE FOR USE, NOR ARE IN THE EXACT LOCATION OR CONFIGURATION INDICATED HEREON.</p> <p>20. ALL BUILDINGS AND STRUCTURES WERE LOCATED AND MEASURED AT GROUND LEVEL. THE SURVEYOR MAKES NO DETERMINATIONS OR GUARANTEES AS TO THE ABSENCE, EXISTENCE OR LOCATION OF UNDERGROUND STRUCTURES, FOUNDATIONS, FOOTINGS, PROJECTIONS, WALLS, TANKS, SEPTIC SYSTEMS, ETC. NO TEST PITS, EXCAVATIONS OR GROUND PENETRATING RADAR WERE PERFORMED AS PART OF THIS SURVEY.</p> <p>21. PRIOR TO ANY DESIGN OR CONSTRUCTION, THE PROPER UTILITY AGENCIES MUST BE CONTACTED FOR VERIFICATION OF UTILITY TYPE AND FOR FIELD LOCATIONS.</p> <p>22. WETLANDS DELINEATED BY ALL-POINTS TECHNOLOGY CORPORATION THE WEEK OF JUNE 2024. ALL FLAGS WERE FIELD LOCATED ON JUNE 20, 2024.</p> <p>23. THIS SURVEY IS NOT VALID WITHOUT THE EMBOSSED OR INKED SEAL OF THE PROFESSIONAL.</p>						
E	<p>24. THE SURVEYOR HAS NOT EXCAVATED TO PHYSICALLY LOCATE THE UNDERGROUND UTILITIES. THE SURVEYOR MAKES NO GUARANTEES THAT THE SHOWN UNDERGROUND UTILITIES ARE EITHER IN SERVICE, ABANDONED OR SUITABLE FOR USE, NOR ARE IN THE EXACT LOCATION OR CONFIGURATION INDICATED HEREON.</p> <p>25. ALL BUILDINGS AND STRUCTURES WERE LOCATED AND MEASURED AT GROUND LEVEL. THE SURVEYOR MAKES NO DETERMINATIONS OR GUARANTEES AS TO THE ABSENCE, EXISTENCE OR LOCATION OF UNDERGROUND STRUCTURES, FOUNDATIONS, FOOTINGS, PROJECTIONS, WALLS, TANKS, SEPTIC SYSTEMS, ETC. NO TEST PITS, EXCAVATIONS OR GROUND PENETRATING RADAR WERE PERFORMED AS PART OF THIS SURVEY.</p> <p>26. PRIOR TO ANY DESIGN OR CONSTRUCTION, THE PROPER UTILITY AGENCIES MUST BE CONTACTED FOR VERIFICATION OF UTILITY TYPE AND FOR FIELD LOCATIONS.</p> <p>27. WETLANDS DELINEATED BY ALL-POINTS TECHNOLOGY CORPORATION THE WEEK OF JUNE 2024. ALL FLAGS WERE FIELD LOCATED ON JUNE 20, 2024.</p> <p>28. THIS SURVEY IS NOT VALID WITHOUT THE EMBOSSED OR INKED SEAL OF THE PROFESSIONAL.</p>						
F	<p>29. THE SURVEYOR HAS NOT EXCAVATED TO PHYSICALLY LOCATE THE UNDERGROUND UTILITIES. THE SURVEYOR MAKES NO GUARANTEES THAT THE SHOWN UNDERGROUND UTILITIES ARE EITHER IN SERVICE, ABANDONED OR SUITABLE FOR USE, NOR ARE IN THE EXACT LOCATION OR CONFIGURATION INDICATED HEREON.</p> <p>30. ALL BUILDINGS AND STRUCTURES WERE LOCATED AND MEASURED AT GROUND LEVEL. THE SURVEYOR MAKES NO DETERMINATIONS OR GUARANTEES AS TO THE ABSENCE, EXISTENCE OR LOCATION OF UNDERGROUND STRUCTURES, FOUNDATIONS, FOOTINGS, PROJECTIONS, WALLS, TANKS, SEPTIC SYSTEMS, ETC. NO TEST PITS, EXCAVATIONS OR GROUND PENETRATING RADAR WERE PERFORMED AS PART OF THIS SURVEY.</p> <p>31. PRIOR TO ANY DESIGN OR CONSTRUCTION, THE PROPER UTILITY AGENCIES MUST BE CONTACTED FOR VERIFICATION OF UTILITY TYPE AND FOR FIELD LOCATIONS.</p> <p>32. WETLANDS DELINEATED BY ALL-POINTS TECHNOLOGY CORPORATION THE WEEK OF JUNE 2024. ALL FLAGS WERE FIELD LOCATED ON JUNE 20, 2024.</p> <p>33. THIS SURVEY IS NOT VALID WITHOUT THE EMBOSSED OR INKED SEAL OF THE PROFESSIONAL.</p>						



"TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON."

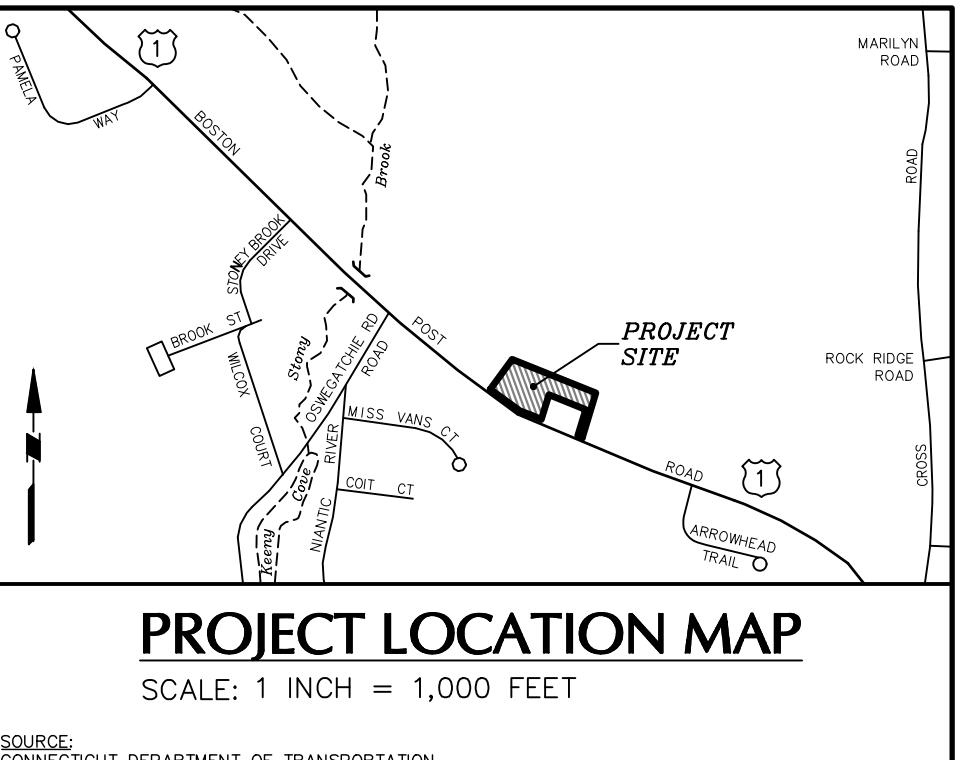
Date	Description	No.
REVISIONS		

LANGAN
Langan CT, Inc.
555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project
OSWEGATCHIE FIRE COMPANY #4, INC.
439 & 441 BOSTON POST ROAD
WATERFORD
NEW LONDON COUNTY CONNECTICUT

Drawing Title
BOUNDARY & TOPOGRAPHIC SURVEY

Project No. **140286501**
Drawing No. **VB102**

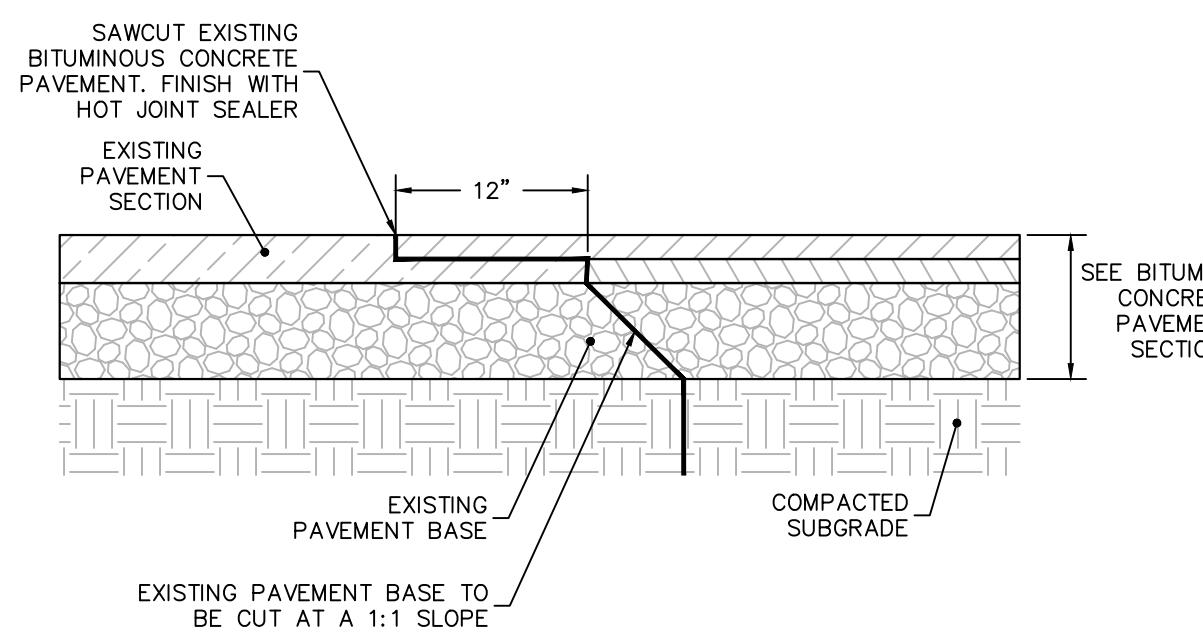


SOURCE: CONNECTICUT DEPARTMENT OF TRANSPORTATION

LEGEND (NOT SHOWN TO SCALE)

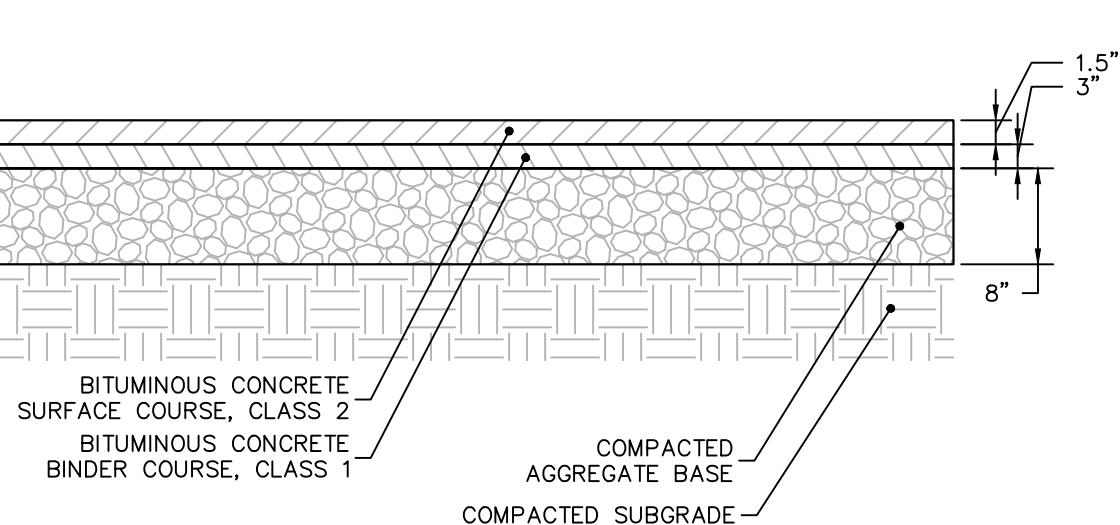
■	AIR CONDITIONING UNIT	BITUMINOUS
●	BOLLARD	CONCRETE
●	BORING HOLE	CONCRETE PAD
●	COLUMN	LANDSCAPED AREA
△	DOOR	BOTTOM OF WALL
△	DOUBLE DOOR	BUILDING OVERHANG
△	FLAG POLE	EDGE OF PAVEMENT
△	HANDICAP SYMBOL	EDGE OF GRAVEL
△	MAILBOX	EDGE OF WALK
△	MONITORING WELL	DETECTABLE WARNING
△	PARKING METER	BITUMINOUS CURB
△	ROOF VENT	CONCRETE CURB
△	SIGN	GRANITE CURB
△	SHRUB	SLOPED GRANITE CURB
△	ROOF FAN	SINGLE WHITE STRIPE
△	TEST PIT	BROKEN WHITE STRIPE
△	TREE	SINGLE YELLOW STRIPE
△	WETLAND FLAG	DOUBLE YELLOW STRIPE
△	GROUND LIGHT	METAL GUARD RAIL
△	CABLE BOX/HAND HOLE	WOOD GUARD RAIL
△	CATCH BASIN	STOCKADE FENCE
△	CLEANOUT	CHAINLINK FENCE
△	ELECTRIC BOX	IRON FENCE
△	ELECTRIC METER	TREE LINE
△	FILLER VALVE	OVERHEAD WIRE
△	FLARED END SECTION	WETLAND LINE
△	FUEL PUMP	EASEMENT LINE
△	GAS METER	PROPERTY LINE
△	GAS VALVE	RIGHT-OF-WAY LINE
△	GUY POLE	CONTOUR LINE
△	GUY WIRE	SANITARY FORCE MAIN
△	HAND HOLE	CABLE TV MARK OUT LINE
△	LIGHT POLE	DRAINAGE MARK OUT LINE
△	MANHOLE (TYPE AS LABELED)	ELECTRIC MARK OUT LINE
△	POST INDICATOR VALVE	COMMUNICATION MARK OUT LINE
△	POWER POLE	GAS MARK OUT LINE
△	ROOF DRAIN	SANITARY SEWER MARK OUT LINE
△	SATELLITE DISH	WATER MARK OUT LINE
△	SPRINKLER HEAD	STEAM MARK OUT LINE
△	STANDPIPE	UNKNOWN MARK OUT LINE
△	TELEPHONE BOOTH	REFERENCE UTILITY LINE (TYPE AS NOTED) - PLOTTED FROM EXISTING MAPPING
△	TELEPHONE BOX	
△	TRAFFIC BOX	
△	TRAFFIC SIGNAL	
△	TRAFFIC SIGNAL ARM	
△	TRAFFIC SIGNAL POLE	
△	UNDERGROUND VAULT	
△	VALVE UNKNOWN	
△	WATER METER	
△	WATER VALVE	
△	SPOT ELEVATION	

X.262.3



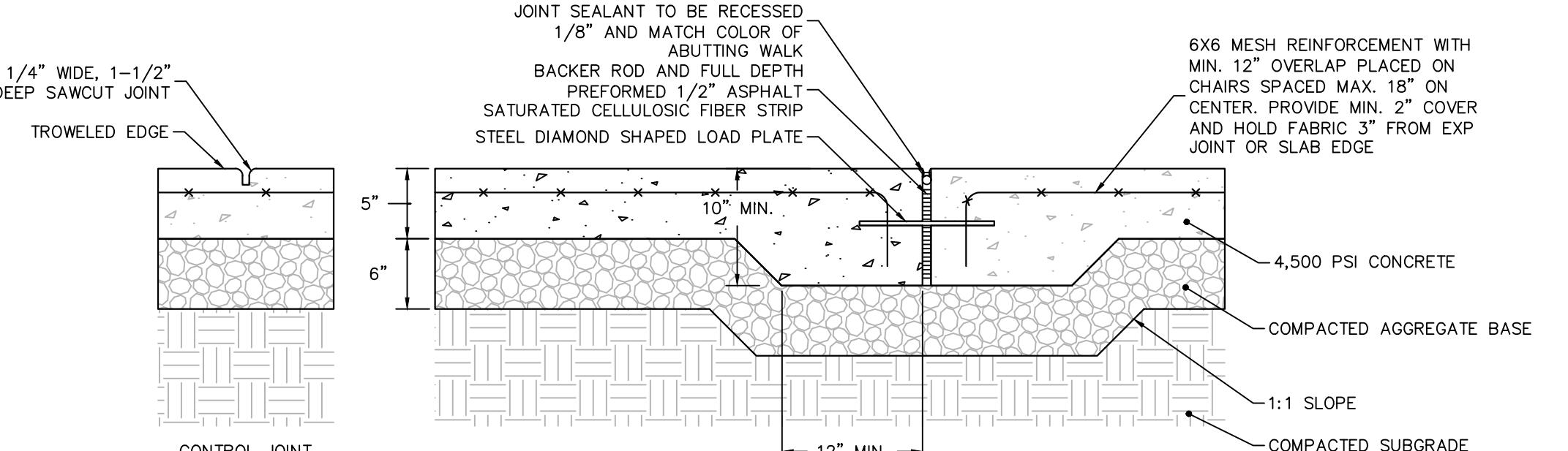
NOTES:
1. CONTRACTOR TO INSTALL TACK COAT ON ALL BUTT EDGES OF EXISTING PAVEMENT

1 SAW CUT PAVEMENT SECTION N.T.S



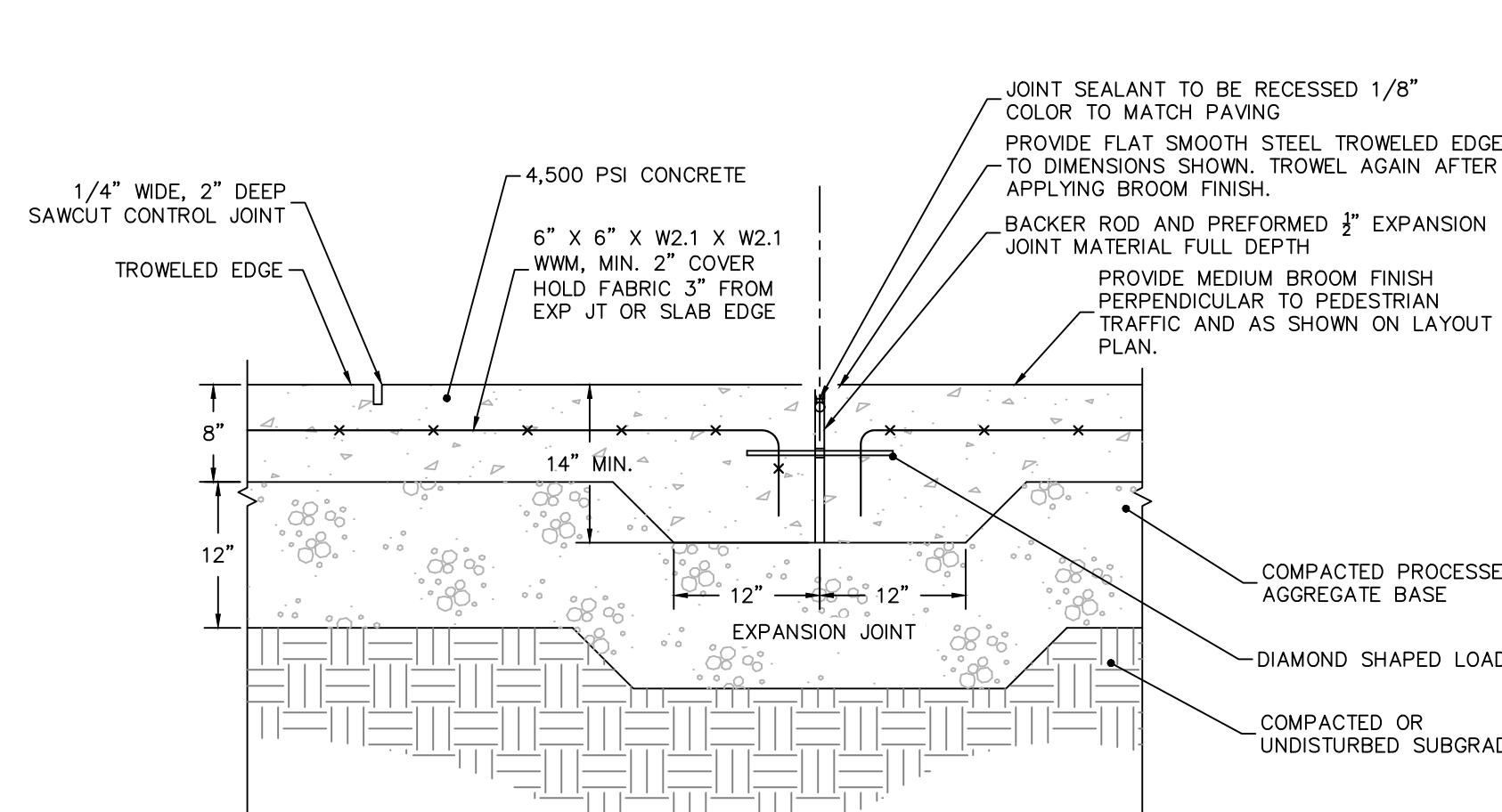
NOTES:
1. PROVIDE BITUMINOUS CONCRETE PAVEMENT AS INDICATED ON THE SITE PLAN.
2. BITUMINOUS CONCRETE SHALL CONFORM TO CT D.O.T. SPECIFICATIONS, FORM 818 SECTION 4.06, LATEST REVISION.
3. PROCESSED AGGREGATE SHALL CONFORM TO CT D.O.T. SPECIFICATIONS, FORM 818 SECTION 3.04, LATEST REVISION.

2 BITUMINOUS CONCRETE PAVEMENT SECTION - HEAVY DUTY N.T.S



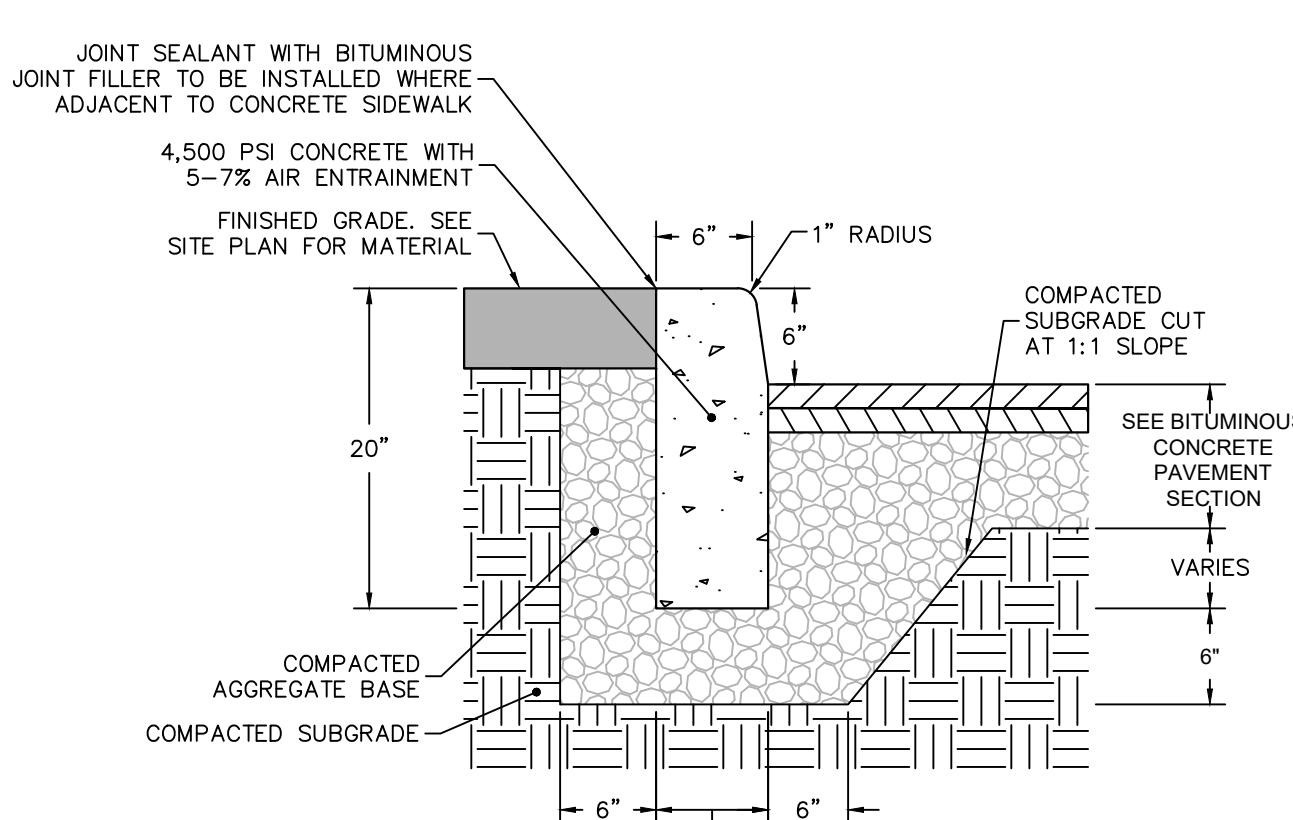
NOTES:
1. ALL CONTROL JOINTS TO BE SAWCUT, REFER TO ENLARGEMENT.
2. SIDEWALKS TO COMPLY WITH CITY STANDARDS WHERE APPLICABLE.
3. EXPANSION AND CONTROL JOINTS SHALL BE INSTALLED PER LAYOUT AND DIMENSIONING PLANS. IF NOT SPECIFIED DETAILED MAXIMUM SPACING OF JOINTS SHALL BE AS FOLLOWS:
EXPANSION = 20 FT.
CONTROL = 5 FT.
4. CONTROL JOINTS SHALL BE SPACED EQUAL TO THE WIDTH. CARE SHALL BE TAKEN TO ENSURE UNIFORM GRADE, FREE OF SAGS AND SHORT GRADE CHANGES.
5. SURFACE TEXTURE SHALL BE A LIGHT BROOMING, TRANSVERSE TO THE LENGTH OF THE WALK.
6. CONTRACTOR TO PROVIDE 10'X10' MOCKUP SHOWING EXPANSION JOINTS, SAWCUT JOINTS, AND BROOM FINISH PRIOR TO INSTALLATION.

3 ON-SITE CONCRETE SIDEWALK N.T.S



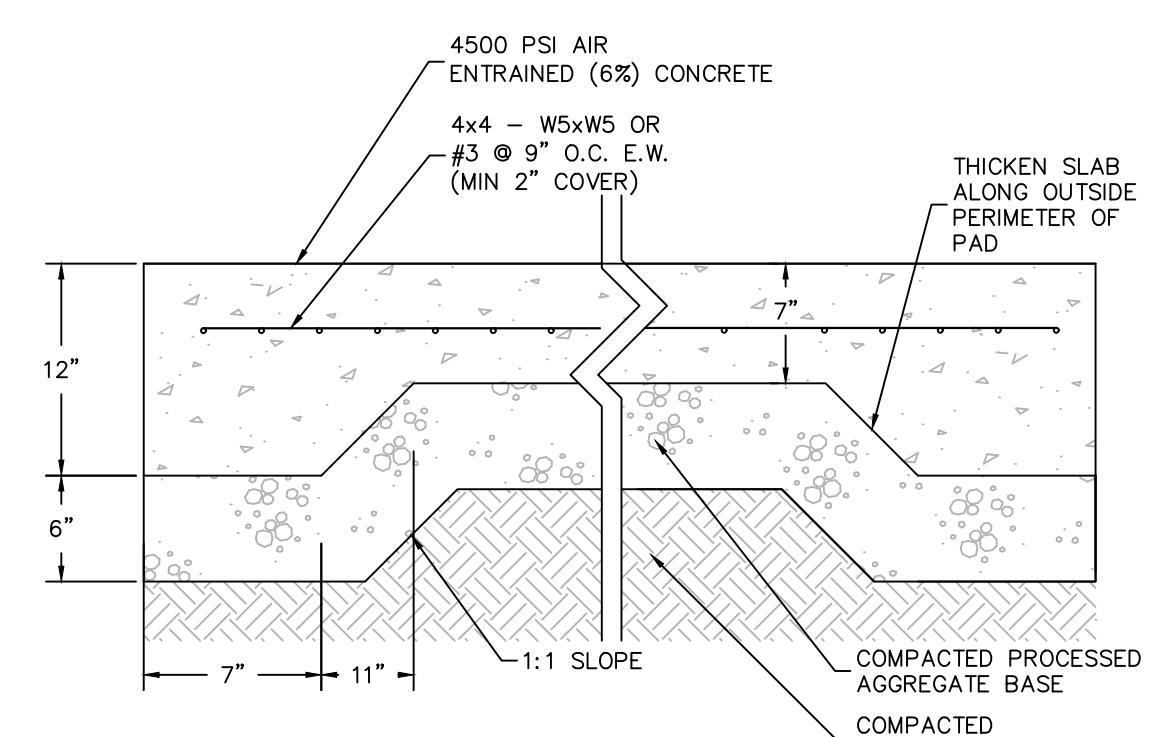
NOTE:
1. PROVIDE EXPANSION JOINT WITH SEALANT WHERE CONCRETE PAVEMENT ABUTS CURBS, WALLS, AND BUILDING FACES. INSTALL EXPANSION JOINTS @ ±20° O.C. OR AS SHOWN ON DRAWING

4 HEAVY DUTY CONCRETE PAVEMENT N.T.S

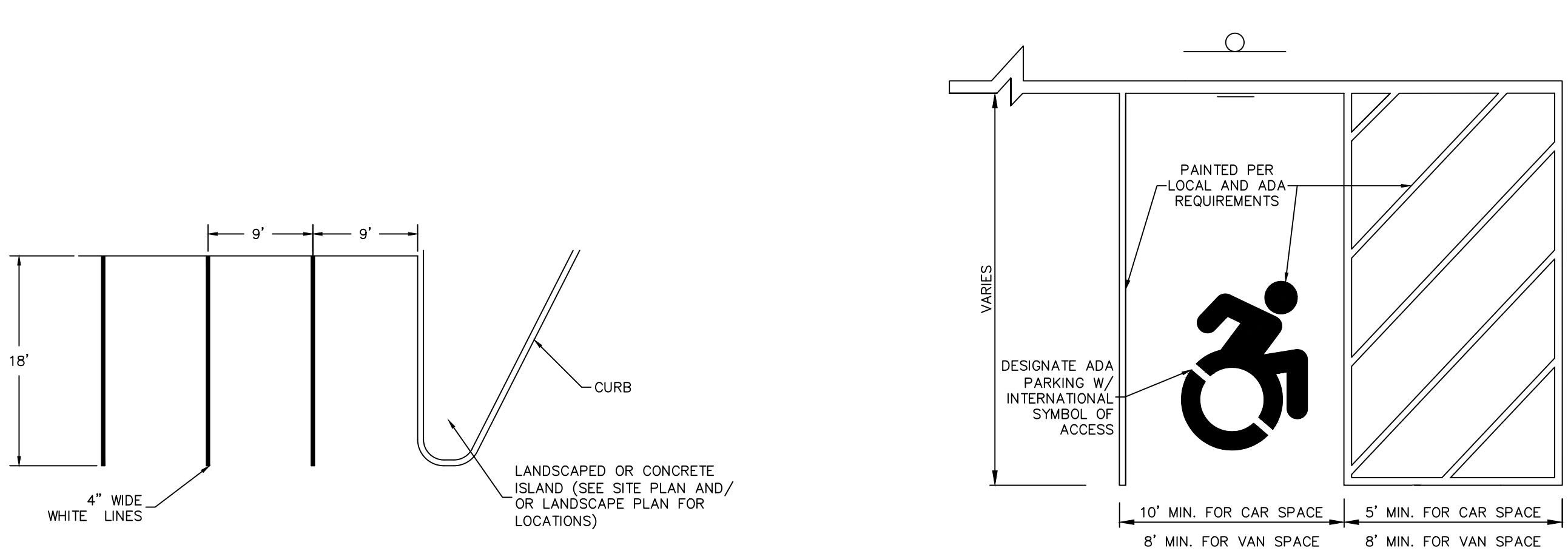


NOTES:
1. CURB TO BE PRECAST CONCRETE.
2. STRAIGHT SEGMENTS SHOULD NOT BE INSTALLED ALONG CURVES UNLESS RADIUS IS GREATER THAN 50'.
3. INDIVIDUAL SEGMENTS TO BE GREATEST LENGTH POSSIBLE IN ORDER TO MINIMIZE NUMBER OF JOINTS. CORNERS TO BE SINGLE PIECE.
4. JOINT SEALANT TO BE INSTALLED AT ALL JOINTS BETWEEN CURB SEGMENTS.
5. PROVIDE AGGREGATE BASE CONFORM TO CT D.O.T. SPECIFICATIONS, FORM 817 SECTION 3.04, LATEST REVISION.
6. CONTRACTOR TO PROVIDE PRODUCT DATA FOR REVIEW PRIOR TO INSTALLATION.

5 PRECAST CONCRETE CURB N.T.S

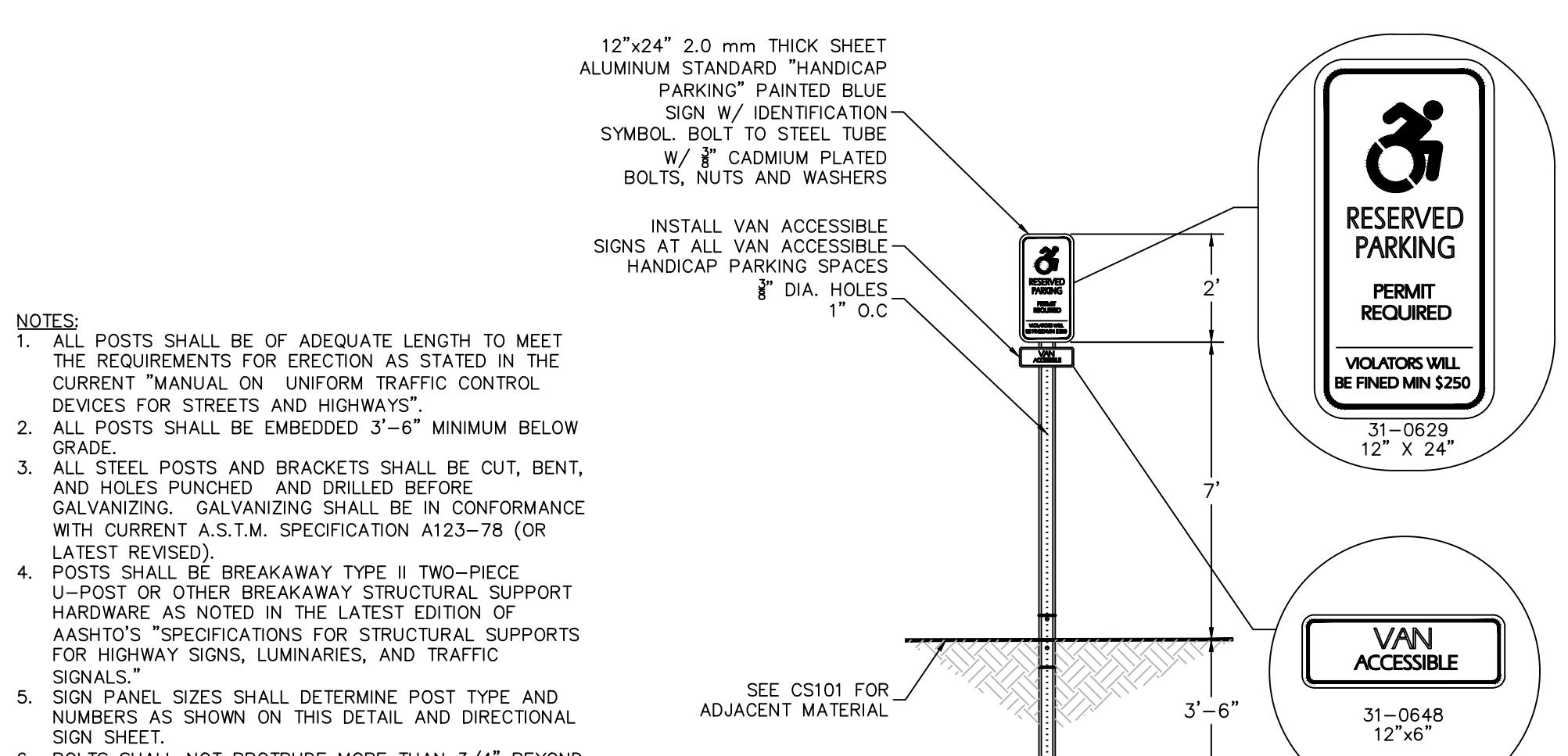


6 CONCRETE PAD N.T.S



NOTES:
1. ALL PAVEMENT MARKINGS TO BE EPOXY RESIN.
2. CONFIRM ALL PARKING SPACE DIMENSIONS ON PLANS.

7 PARKING STALL STRIPING N.T.S



8 ADA PARKING STALL STRIPING N.T.S

9 ADA PARKING SIGN N.T.S

Date	Description	No.
Revisions		



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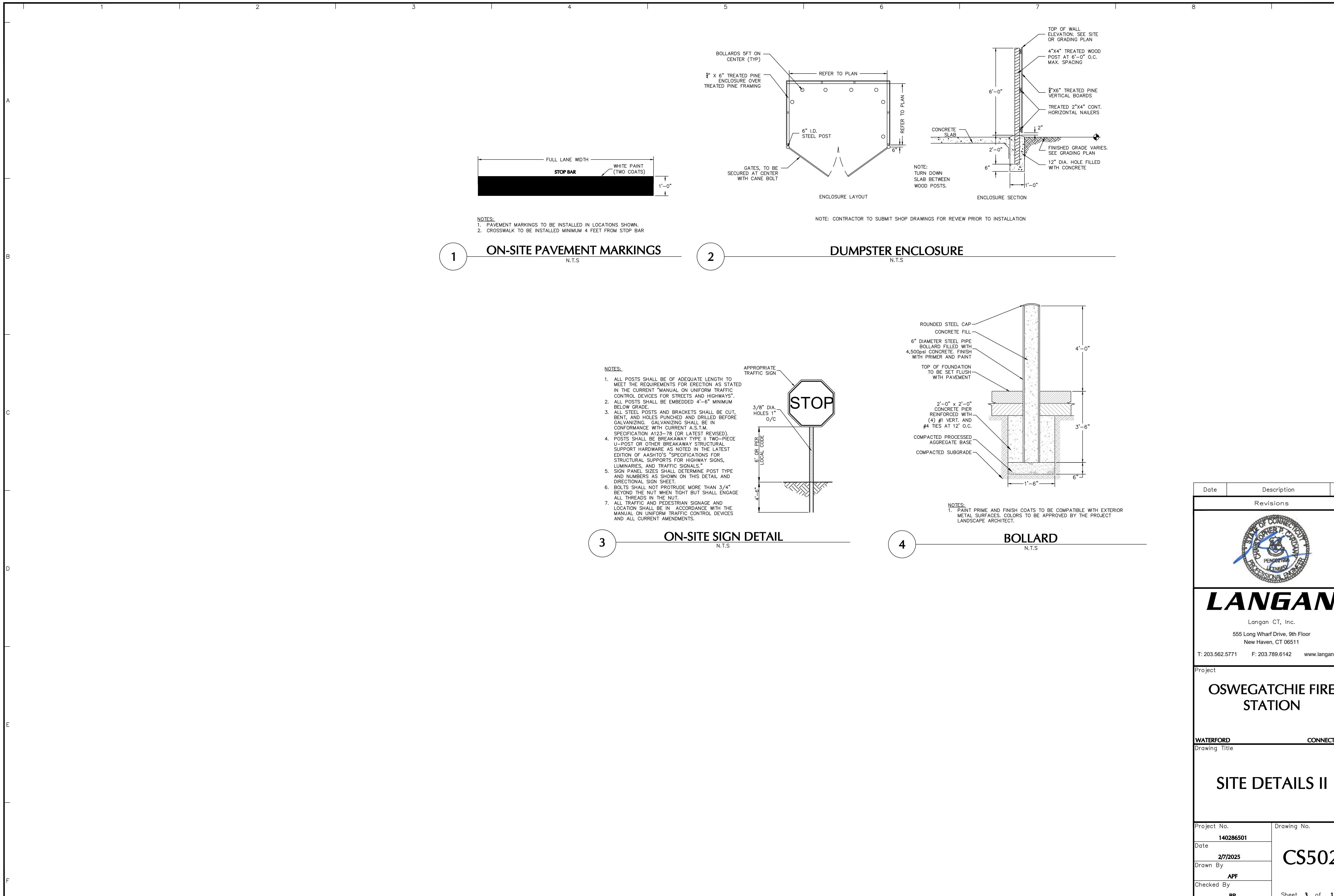
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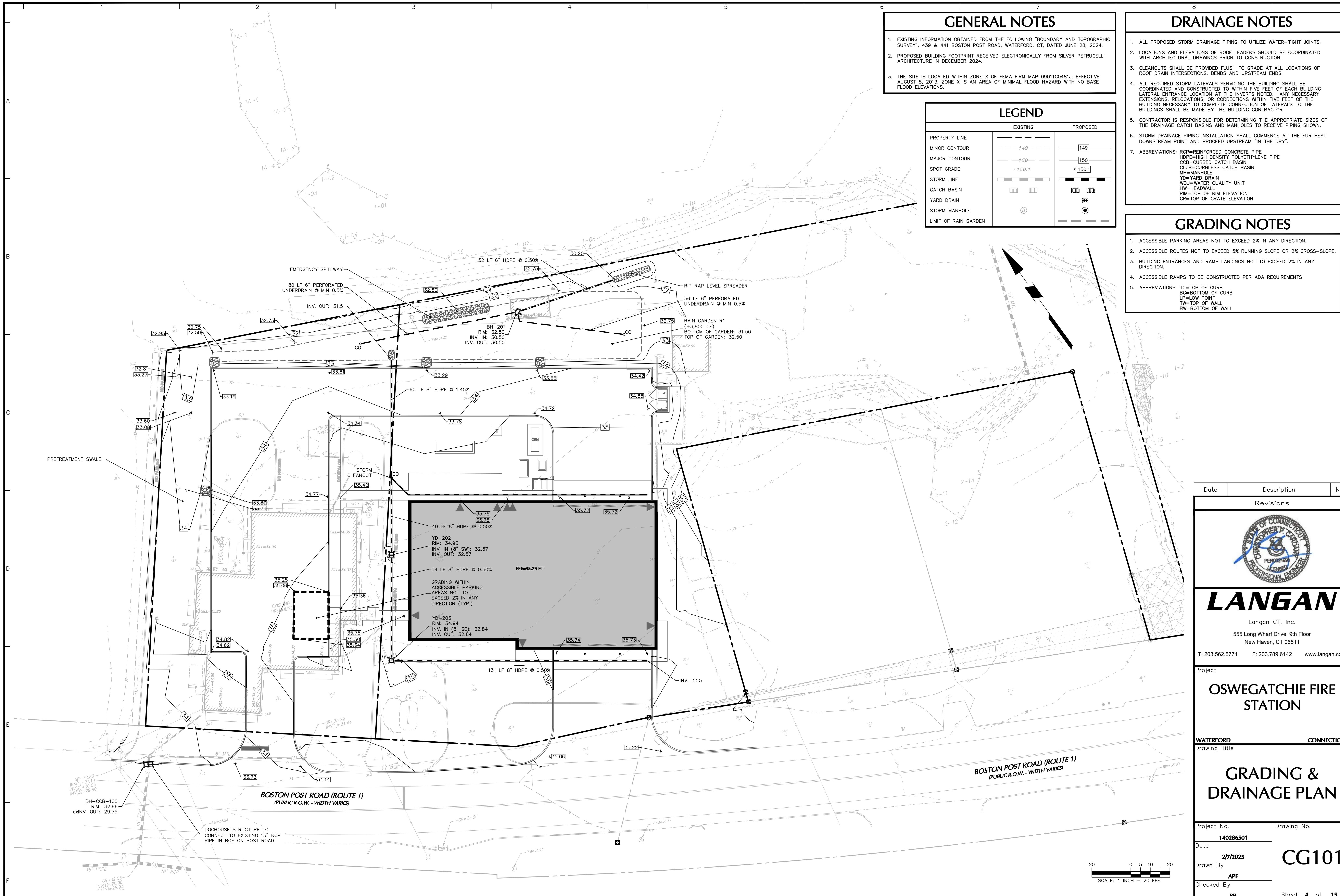
OSWEGATCHIE FIRE STATION

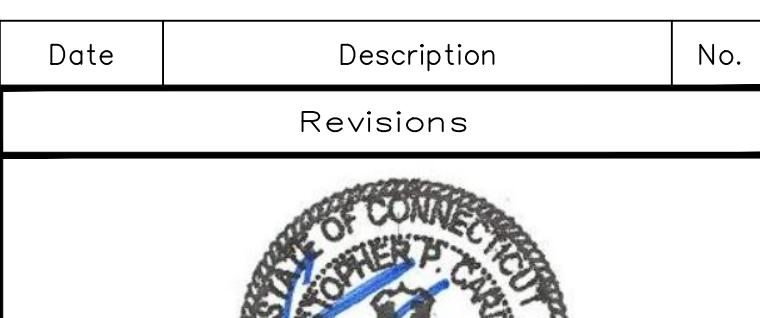
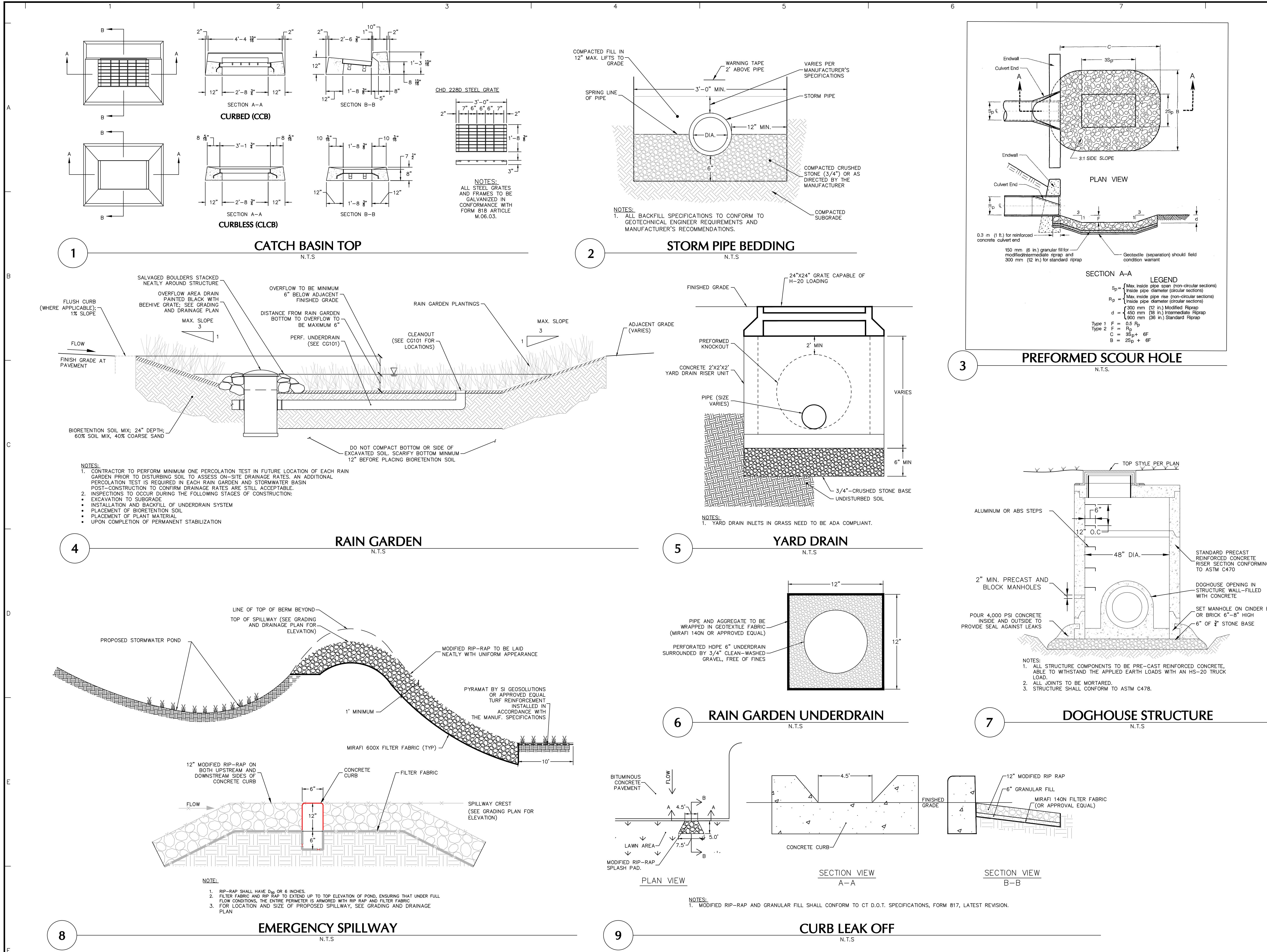
WATERFORD CONNECTICUT

SITE DETAILS I

Project No.	Drawing No.
140286501	
Date	
2/7/2025	
Drawn By	
APF	
Checked By	
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Project

OSWEGATCHIE FIRE STATION

WATERFORD

CONNECTICUT

GRADING AND DRAINAGE DETAILS

Project No.	Drawing No.
140286501	
Date	
2/7/2025	
Drawn By	APF
Checked By	BP
Sheet 5 of 15	

GENERAL NOTES

1. EXISTING INFORMATION OBTAINED FROM THE FOLLOWING "BOUNDARY AND TOPOGRAPHIC SURVEY", 439 & 441 BOSTON POST ROAD, WATERFORD, CT, DATED JUNE 28, 2024.
2. PROPOSED BUILDING FOOTPRINT RECEIVED ELECTRONICALLY FROM SILVER PETRUCELLI ARCHITECTURE IN DECEMBER 2024.
3. THE SITE IS LOCATED WITHIN ZONE X OF FEMA FIRM MAP 09011C0481J, EFFECTIVE AUGUST 5, 2013. ZONE X IS AN AREA OF MINIMAL FLOOD HAZARD WITH NO BASE FLOOD ELEVATIONS.

TOWN OF WATERFORD UTILITY NOTES

1. A REPRESENTATIVE FROM THE UTILITY COMMISSION SHALL BE PRESENT FOR THE CONNECTION TO THE SEWER SYSTEM. PLEASE GIVE AT LEAST 48 HOURS NOTICE BEFORE CONNECTION.
2. A REPRESENTATIVE FROM THE UTILITY COMMISSION SHALL BE PRESENT FOR THE DISCONNECTION OF THE EXISTING FIRE STATION. PLEASE GIVE AT LEAST 48 HOURS NOTICE BEFORE DISCONNECTION.
3. ALL DESIGN AND CONSTRUCTION OF WATER AND SEWER UTILITIES MUST CONFORM TO THE TOWN OF WATERFORD'S STANDARDS AND SPECIFICATIONS.
4. CONTACT THE CITY OF NEW LONDON FOR INFORMATION REGARDING WATER CONNECTION.

UTILITY NOTES

GENERAL:

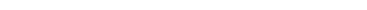
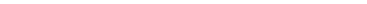
1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS IN A MANNER WHICH WILL NOT NEGATIVELY AFFECT ANY EXISTING USERS OF THESE UTILITIES.
16. THE CONTRACTOR SHALL MAINTAIN ALL FLOWS AND UTILITY CONNECTIONS TO EXISTING BUILDINGS WITHOUT INTERRUPTION UNLESS/UNTIL AUTHORIZED TO DISCONNECT BY THE OWNERS, THE CIVIL ENGINEER, UTILITY PROVIDERS AND GOVERNING AUTHORITIES.
17. ALL REQUIRED UTILITIES SERVING THE BUILDINGS SHALL BE COORDINATED AND CONSTRUCTED TO WITHIN FIVE FEET OF BUILDING UTILITY ENTRANCE LOCATION AT THE INVERTS NOTED. ALL REQUIRED CONNECTION FEES SHALL BE PAID BY THE BUILDING CONTRACTOR. ANY NECESSARY EXTENSIONS, RELOCATIONS, OR CORRECTIONS WITHIN FIVE FEET OF THE BUILDING NECESSARY TO COMPLETE CONNECTION OF UTILITIES TO THE BUILDINGS SHALL BE MADE BY THE BUILDING CONTRACTOR.
18. ALL ON-SITE UTILITIES SHALL BE UNDERGROUND. WHFRE APPLICABLE.

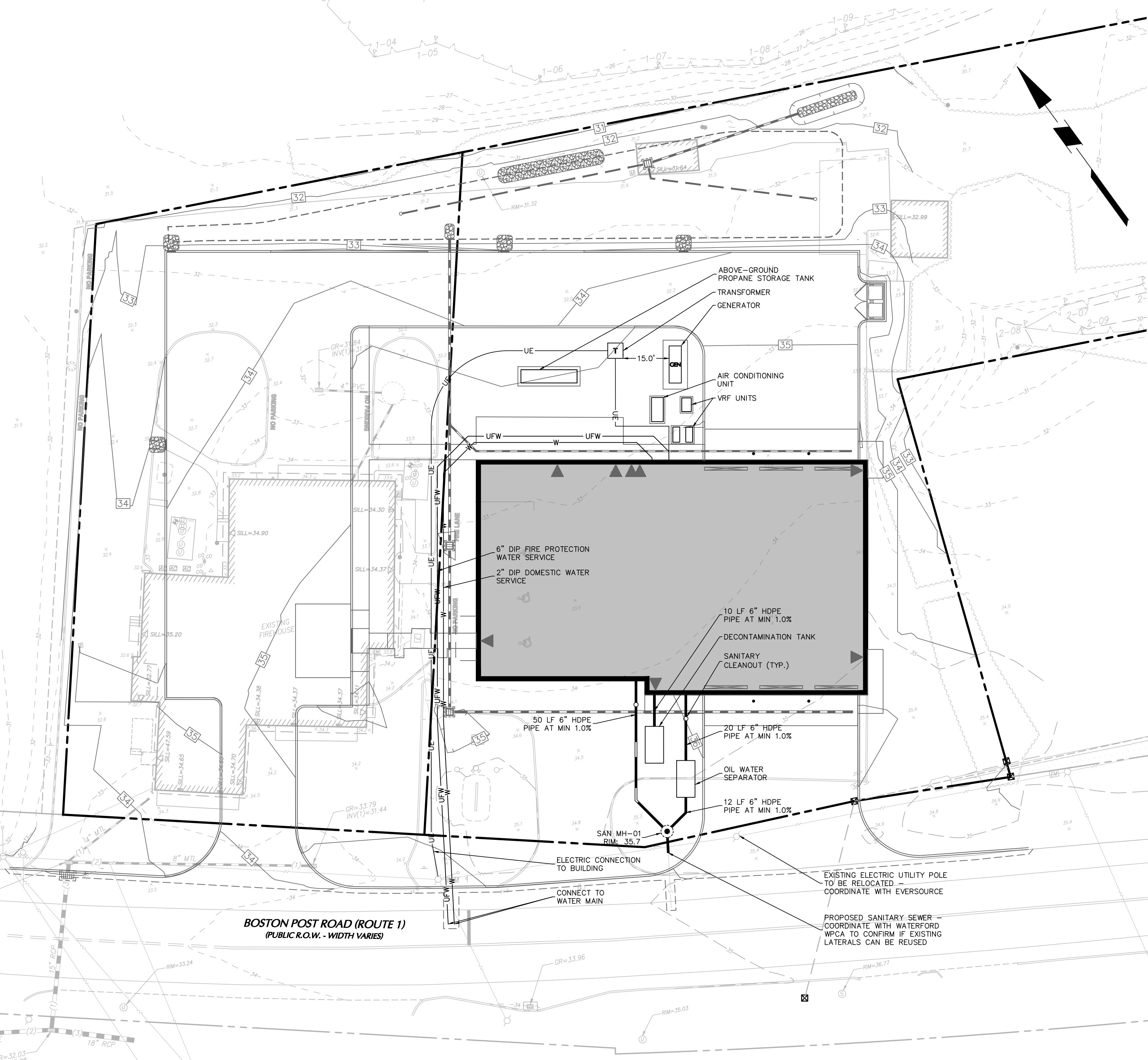
2. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LOCATIONS (WATER, SEWER, GAS, ELECTRIC, TELEPHONE AND CABLE), INVERTS AND CONDITIONS PRIOR TO CONSTRUCTION. ANY CONDITIONS FOUND TO SUBSTANTIALLY DIFFER FROM THOSE SHOWN ON THE DRAWINGS AND REQUIRING MODIFICATIONS TO THE SITE DESIGN SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE CONSTRUCTION. SUBSTANTIALLY DIFFERENT UTILITY CONDITIONS THAT ARE ENCOUNTERED BY THE CONTRACTOR, THAT REQUIRE MODIFICATION OF SITE DESIGN AND THAT ARE NOT BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO.
3. THE CONTRACTOR SHALL ARRANGE FOR AND COORDINATE WITH THE RESPECTIVE UTILITY PROVIDERS FOR SERVICE INSTALLATIONS AND CONNECTIONS. THE CONTRACTOR SHALL COORDINATE WORK TO BE PERFORMED BY THE VARIOUS UTILITY PROVIDERS AND SHALL PAY ALL FEES FOR CONNECTIONS, DISCONNECTIONS, RELOCATIONS, INSPECTIONS, AND DEMOLITION UNLESS OTHERWISE STATED IN THE PROJECT SPECIFICATIONS MANUAL AND/OR GENERAL CONDITIONS OF THE CONTRACT.
4. ALL UNDERGROUND UTILITIES MUST BE CLEARLY & PERMANENTLY MARKED WITH UNDERGROUND MARKING TAPE AND AS REQUIRED BY THE APPROPRIATE UTILITY COMPANY.
5. BUILDING UTILITY PENETRATIONS AND LOCATIONS ARE SHOWN FOR THE CONTRACTOR'S
18. ALL ON-SITE UTILITIES SHALL BE UNDERGROUND, WHERE APPLICABLE.
19. CONTRACTOR IS REQUIRED TO DIGITALLY PHOTOGRAPH 75% OF THE UTILITIES INSTALLED.

ELECTRIC, TELEPHONE, & GAS:

1. THE LOCATIONS OF EXISTING GAS MAINS ARE APPROXIMATE. THE CONTRACTOR MUST CONSULT THE LOCAL UTILITY COMPANIES FOR ADDITIONAL INFORMATION. ALL PROPOSED GAS WORK AND OTHER ASSOCIATED APPURTENANCES WILL BE IN CONFORMANCE WITH APPLICABLE LOCAL, COUNTY, STATE AND FEDERAL GUIDELINES AND REQUIREMENTS.
2. THE LOCATION OF EXISTING ELECTRIC LINES ARE APPROXIMATE. THE CONTRACTOR MUST CONSULT THE LOCAL UTILITY COMPANIES FOR ADDITIONAL INFORMATION. ALL PROPOSED ELECTRICAL WORK, TRANSFORMER PADS, AND ASSOCIATED APPURTENANCES WILL BE IN CONFORMANCE WITH APPLICABLE LOCAL, COUNTY, STATE AND FEDERAL GUIDELINES AND REQUIREMENTS.
3. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 30 INCHES OF COVER FOR ALL UNDERGROUND GAS UTILITIES OR AS REQUIRED BY THE UTILITY COMPANY, WHICHEVER IS MORE RESTRICTIVE.
4. ALL DETAILS OF ELECTRIC, GAS, & TELEPHONE UTILITY SERVICE SHALL BE APPROVED BY THE APPLICABLE UTILITY COMPANY AND INSTALLED TO THEIR REQUIREMENTS.

LEGEND

	EXISTING	PROPOSED
PROPERTY LINE		
BUILDING LINE		
SANITARY LINE		
SANITARY CLEANOUT		
ELECTRIC UTILITY LINE		
DOMESTIC WATER SERVICE LINE		
FIRE PROTECTION WATER LINE		



Date	Description	No.
Revisions		
		
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<p>Project</p> <h2>OSWEGATCHIE FIRE STATION</h2> <p>WATERFORD CONNECTICUT</p> <p>Drawing Title</p> <h2>UTILITY PLAN</h2>		
<p>Project No. 140286501</p> <p>Date 2/7/2025</p> <p>Drawn By APP</p> <p>Checked By RD</p>		<p>Drawing No.</p> <p>CU101</p>
<p>Sheet 6 of 15</p>		

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OSWEGATCHIE FIRE STATION

TERFORD CONNECTICUT
in Title

UTILITY PLAN

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RAIN GARDEN NOTES

1. DURING CLEARING AND GRADING OF THE SITE, MEASURES MUST BE TAKEN TO ELIMINATE SOIL COMPACTION AT THE LOCATION OF PROPOSED RAIN GARDEN.
2. THE LOCATION OF THE PROPOSED RAIN GARDEN MUST BE CORDONED OFF DURING CONSTRUCTION TO PREVENT COMPACTION OF THE SUBSOIL BY CONSTRUCTION EQUIPMENT OR MATERIAL STOCKPILES AND PREVENT SILT ACCUMULATION.
3. THE USE OF THE PROPOSED RAIN GARDEN LOCATION FOR A TEMPORARY SEDIMENT TRAP DURING CONSTRUCTION IS DISCOURAGED. HOWEVER, WHEN UNAVOIDABLE, EXCAVATION FOR THE TEMPORARY SEDIMENT TRAP MUST BE A MINIMUM OF TWO FEET ABOVE THE FINAL DESIGN ELEVATION OF THE BOTTOM OF THE PROPOSED RAIN GARDEN.
4. EXCAVATION AND CONSTRUCTION OF THE RAIN GARDEN MUST BE PERFORMED USING EQUIPMENT PLACED OUTSIDE OF THE LIMITS OF THE BASIN.
5. THE EXCAVATION TO THE FINAL DESIGN ELEVATION OF THE RAIN GARDEN MAY ONLY OCCUR AFTER ALL CONSTRUCTION WITHIN ITS DRAINAGE AREA IS COMPLETED AND THE DRAINAGE AREA IS STABILIZED. IF CONSTRUCTION OF A STORMWATER BASIN OR RAIN GARDEN CANNOT BE DELAYED, BERMS MUST BE PLACED AROUND THE PERIMETER OF THE BASIN THROUGHOUT ALL PHASES OF CONSTRUCTION TO DIVERT FLOWS AWAY FROM THE BASIN. THE BERMS MAY NOT BE REMOVED UNTIL ALL CONSTRUCTION WITHIN THE DRAINAGE AREA IS COMPLETED AND THE DRAINAGE AREA IS STABILIZED.
6. THE CONTRIBUTING DRAINAGE AREA MUST BE COMPLETELY STABILIZED PRIOR TO RAIN GARDEN USE.
7. PRIOR TO PLACING THE BASIN SOIL MIX AND PLANTINGS, CONTRACTOR TO REMOVE ALL ACCUMULATED SILT AND SEDIMENT AND PERFORM TWO PERCOLATION TESTS IN THE PRESENCE OF THE ENGINEER TO ENSURE INFILTRATION CAPABILITIES.
8. THE RAIN GARDEN IS TO BE INSPECTED AFTER EVERY MAJOR STORM EVENT FOR THE FIRST 6 MONTHS POST CONSTRUCTION TO ENSURE PROPER INFILTRATION IS REALIZED. INSPECTION LOG TO CAPTURE THE DURATION OF STANDING WATER IN THE BASIN POST STORM AND AMOUNT OF ANY SEDIMENT BUILDUP TO DETERMINE IF BASIN IS CLOGGED. IF BASIN IS CLOGGED, CONTRACTOR TO REMOVE CLOGGED BASIN MATERIALS AND REPLACE WITH NEW. ADDITIONALLY, CONTRACTOR TO REMOVE ANY ACCUMULATED SEDIMENT PRIOR TO PLACING TOPSOIL AND PLANTINGS.
9. POST 6 MONTHS OF OPERATION, THE RAIN GARDEN MAINTENANCE TO CONTINUE IN ACCORDANCE WITH MOST CURRENT CONNECTICUT STORMWATER QUALITY MANUAL AND EROSION CONTROL GUIDELINES.
10. CONTRACTOR TO PERFORM FIELD PERMEABILITY TESTS BOTH PRE- AND POST-CONSTRUCTION TO CONFIRM PERCOLATION RATES WITHIN THE RAIN GARDEN REMAIN THE SAME AS DESIGNED.

GENERAL NOTES

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LEGEND

	PROPOSED
PROPERTY LINE	— - - - -
LIMIT OF DISTURBANCE	— LOD — LOD —
SILT FENCE	● ● ● ● ● ● ● ● ● ● ● ●
EXISTING INLET PROTECTION	□
PROPOSED INLET PROTECTION	○
PROPOSED BUILDING	— - - - -
HAYBALES	□□□□□□□□□□□□
TEMPORARY PARKING AREA	—
CONSTRUCTION ENTRANCE	□□□□□□□□□□□□
PROPOSED CURB	— - - - -

SOIL EROSION-SEDIMENT CONTROL NOTES

PROPOSED DEVELOPMENT

1. CONSTRUCTION WILL INCLUDE EARTHWORK, CURBING, PAVING, UTILITY INSTALLATION, LANDSCAPING AND BUILDING CONSTRUCTION. ALL DEMOLITION DEBRIS AND SOIL REMOVAL RELATED TO CONSTRUCTION SHALL BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH APPLICABLE STATE AND LOCAL LAWS GOVERNING SUCH ACTIVITIES.
2. THE DETAILED EROSION AND SEDIMENT CONTROL MEASURES ARE SHOWN WITHIN THIS PLANSET. THE PROPOSED MEASURES HAVE BEEN DESIGNED TO PREVENT THE MIGRATION OF SOIL SEDIMENT FROM THE SITE.

PROJECT SCHEDULE

PHASE 1 (APPROXIMATELY SPRING 2025 – SPRING 2026):

1. SCHEDULE A PRE-CONSTRUCTION MEETING WITH TOWN STAFF
2. FLAG THE CLEARING LIMIT LINES
3. REQUEST STAFF INSPECTION (IF REQUIRED)
4. INSTALL EROSION CONTROLS FOR PHASE 1 IN THE FOLLOWING ORDER:
 - 4.1. INSTALLATION OF SILT FENCE AND STAKED HAYBALES
 - 4.2. INSTALLATION OF INLET PROTECTION
 - 4.3. INSTALLATION OF TREE PROTECTION
 - 4.4. INSTALLATION OF CONSTRUCTION FENCE AND GATES
 - 4.5. INSTALLATION OF STABILIZED CONSTRUCTION PAD
5. REQUEST STAFF INSPECTION (IF REQUIRED)
6. COMPLETION OF SITE CLEARING WITHIN THE LIMITS OF PHASE 1
7. COMPLETION OF ROUGH GRADING WITHIN THE LIMITS OF PHASE 1
8. PREPARATION OF FOUNDATION AND BUILDING PAD
9. INSTALLATION OF SITE UTILITIES
10. COMPLETION OF FINAL GRADING AND PAVEMENT INSTALLATION WITHIN LIMITS OF PHASE 1
11. SUBSTANTIAL COMPLETION OF BUILDING FOR PHASE 1

12. ALL EROSION AND SEDIMENT CONTROL DEVICES MUST BE INSPECTED ON A DAILY BASIS AND CLEANED IMMEDIATELY AFTER EACH STORM.
13. ALL EXPOSED SURFACES WILL BE TREATED WITH TOPSOIL PER THE LANDSCAPE PLANS PRIOR TO FINAL STABILIZATION.
14. PERMANENT VEGETATION IS TO BE SEEDED OR SODDED ON ALL EXPOSED AREAS WITHIN TEN (10) DAYS AFTER FINAL GRADING. MULCH AS NECESSARY FOR SEED PROTECTION AND ESTABLISHMENT. LIME AND FERTILIZE PRIOR TO PERMANENT SEEDING.
15. SOIL EROSION AND SEDIMENT CONTROL SHALL INCLUDE, BUT NOT BE LIMITED TO, OMISSIONS, ERRORS, OR FIELD OPERATIONS IMMEDIATELY AND IN ACCORDANCE WITH THE ABOVE MEASURES. THE CONTRACTOR SHALL BE RESPONSIBLE TO CORRECT ANY OMISSIONS, ERRORS, OR FIELD OPERATIONS IMMEDIATELY AND IN ACCORDANCE WITH THE GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL.
16. ANY CONVEYANCE OF THIS PROJECT PRIOR TO ITS COMPLETION WILL TRANSFER FULL RESPONSIBILITY FOR COMPLIANCE WITH THE CERTIFIED PLAN TO ANY SUBSEQUENT OWNERS.
17. PERMANENT
 - A. MATERIALS SPECIFICATION: LAWN AREAS.
 - a. SOIL
ANY SOIL HAVING A pH OF 4 OR LESS CONTAINING IRON SULFIDES SHALL BE COVERED WITH A MINIMUM OF TWELVE INCHES OF SOIL HAVING A pH OF FIVE OR MORE PRIOR TO SEED BED PREPARATION.
 - b. LIME
THREE TONS PER ACRE GROUND LIMESTONE INCORPORATED FOUR INCHES INTO SOIL.
 - c. FERTILIZER

500 L.S. PER ACRES 10-20-10 INCORPORATED FOUR INCHES INTO SOIL.

d. SEED
DATES 4/15-6/15 AND 9/15-10/15. 30 LBS OF KENTUCKY 31 TALL FESCUE, 30 LBS OF SPREADING FESCUE, 30 LBS OF KENTUCKY BLUEGRASS PER ACRE.

e. SHADE AREAS
15 LBS OF SPREADING FESCUE, 15 LBS OF CHEWINGS RED FESCUE, 30 LBS KENTUCKY BLUEGRASS, AND 10 LBS OF PERENNIAL RYE GRASS PER ACRE. MULCH SHOULD BE APPLIED AFTER SEEDING FOR ADDED PROTECTION.

B. MULCHING SHALL BE DONE AT THE RATE OF SEVENTY TO NINETY POUNDS (70-90 LBS) PER 1,000 SQUARE FEET WITH UNROTTED SALT HAY.

C. LIQUID MULCH BINDERS MUST BE USED TO ANCHOR SALT HAY, HAY OR STRAY MULCHES.

a. APPLICATIONS SHOULD BE HEAVIER AT EDGES WHERE WIND CATCHES THE MULCH IN VALLEYS AND AT CREATED BANKS. REMAINDER OF AREA SHOULD BE UNIFORM IN APPEARANCE.

b. USE ONE OF THE FOLLOWING: SYNTHETIC OR ORGANIC BINDERS, BINDERS SUCH AS CURASOL DCA-70, PETRO SET, TERRA TACH, HYDRO MULCH AND AEROSPRAY MAY BE USED AT RATES RECOMMENDED BY

SHALL NOT BE USED.

NOTE: ALL NAMES GIVEN ABOVE ARE REGISTERED TRADE NAMES. THIS DOES NOT CONSTITUTE A RECOMMENDATION OF THESE TO THE EXCLUSION OF OTHER PRODUCTS.

- D. FILL MATERIAL SHALL BE FREE FROM DEBRIS, PERISHABLE OR COMBUSTIBLE MATERIAL AND FROZEN OR WET EARTH OR STONES LARGER THAN THREE INCHES IN MAXIMUM DIMENSION.
- E. CONSTRUCTION AREAS SHALL BE PERIODICALLY SPRAYED WITH WATER UNTIL THE SURFACE IS WET TO CONTROL THE GENERATION OF DUST.
- F. ALL REVISIONS AFTER APPROVAL HAS BEEN GRANTED SHALL BE FORWARDED TO THE APPROPRIATE DISTRICT FOR REVIEW.
- G. THE LOCAL GOVERNING AUTHORITY SHALL RECEIVE WRITTEN NOTIFICATION SEVENTY TWO HOURS BEFORE THE START OF ANY CONSTRUCTION.
- H. SEEDED PREPARATION:
 - c. TOPSOIL SHOULD BE A MINIMUM OF SIX INCHES DEEP (COMPACTED) BEFORE SEEDING.
 - d. HAVE TOPSOIL TESTED FOR pH, ADD LIME AS NECESSARY TO ACHIEVE pH OF 6.5. APPLY FERTILIZER AT A RATE OF 300 POUNDS PER ACRE OR SEVEN POUNDS PER 4,000 SQUARE FEET USING 10-20-10 OR EQUIVALENT. IN ADDITION, 300 POUNDS 38-0-0 PER ACRE OF SLOW RELEASE NITROGEN MAY BE USED IN LIEU OF TOP DRESSING.
 - e. WORK LIME AND FERTILIZER INTO SOIL AS NEARLY AS PRACTICAL TO A DEPTH OF FOUR INCHES WITH A DISC, SPRINGTOOTH HARROW OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OR DISCING OPERATION SHOULD BE ON THE GENERAL CONTOUR. CONTINUE ALL CLAY OR SILTY SOIL AND COARSE SANDS SHOULD BE ROLLED TO FIRM THE SEED BED WHEREVER FEASIBLE.
 - f. REMOVE FROM THE SURFACE ALL STONES ONE INCH OR LARGER IN ANY DIMENSION. REMOVE ALL OTHER DEBRIS, SUCH AS WIRE, CABLE, TREE ROOTS, PIECES OF CONCRETE, CLODS, LUMPS, OR OTHER UNSUITABLE MATERIAL.
 - g. INSPECT SEED BED JUST BEFORE SEEDING. IF TRAFFIC HAS LEFT SOIL COMPACT, THE AREA MUST BE RETILLED AND FIRMED AS ABOVE.

CONTINGENCY SOIL EROSION AND SEDIMENT CONTROL NARRATIVE

1. THE GENERAL CONTRACTOR WILL DESIGNATE PERSONNEL FOR 24 HOUR EMERGENCY RESPONSE IN THE EVENT OF SEVERE WEATHER AND INCREASED POTENTIAL FOR SEVERE EROSION. CONTRACTOR TO PROVIDE NAME AND PHONE NUMBER OF INDIVIDUAL TO THE PLANNING AND ZONING COMMISSION PRIOR TO THE START OF CONSTRUCTION.
2. THE GENERAL CONTRACTOR IS REQUIRED TO MAINTAIN ON SITE OR HAVE THE ABILITY TO RETRIEVE WITHIN 12 HOURS THE FOLLOWING MATERIALS IN THE EVENT THAT THERE ARE DEFICIENCIES IN THE SESC MEASURES:
 - A. 25% OF THE INSTALLED LENGTH OF SILT FENCE
 - B. EQUIVALENT TONNAGE OF STONE FOR STABILIZATION OF 1 STABILIZATION ENTRANCE. STONE COULD BE USED FOR SLOPE REPAIRS, ENERGY DISSIPATER ENHANCEMENTS, ETC.
 - C. HEAVY EQUIPMENT CAPABLE OF TRENCHING/EXCAVATING LARGE AREAS TO DIVERT AND CONTROL RUNOFF IN A CONTROLLED MANNER.
 - D. HAVE DESIGNATED A HYDRO-SEED CONTRACTOR CAPABLE OF RESPONDING TO THE SITE WITHIN 12 HOURS

Revisions	Description	No.
1	Initial version	1.0

A circular seal for the State of Connecticut. The outer ring contains the text "STATE OF CONNECTICUT" at the top and "PROFESSIONAL ENGINEER" at the bottom. The center features a crest with a bridge and a river, surrounded by the words "CROWNED BY INDEPENDENCE". Below the crest is the text "CHRISTOPHER P. CARDILLO" and "PEN0021993" at the bottom. The entire seal is blue and white.

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OSWEGATCHIE FIRE STATION

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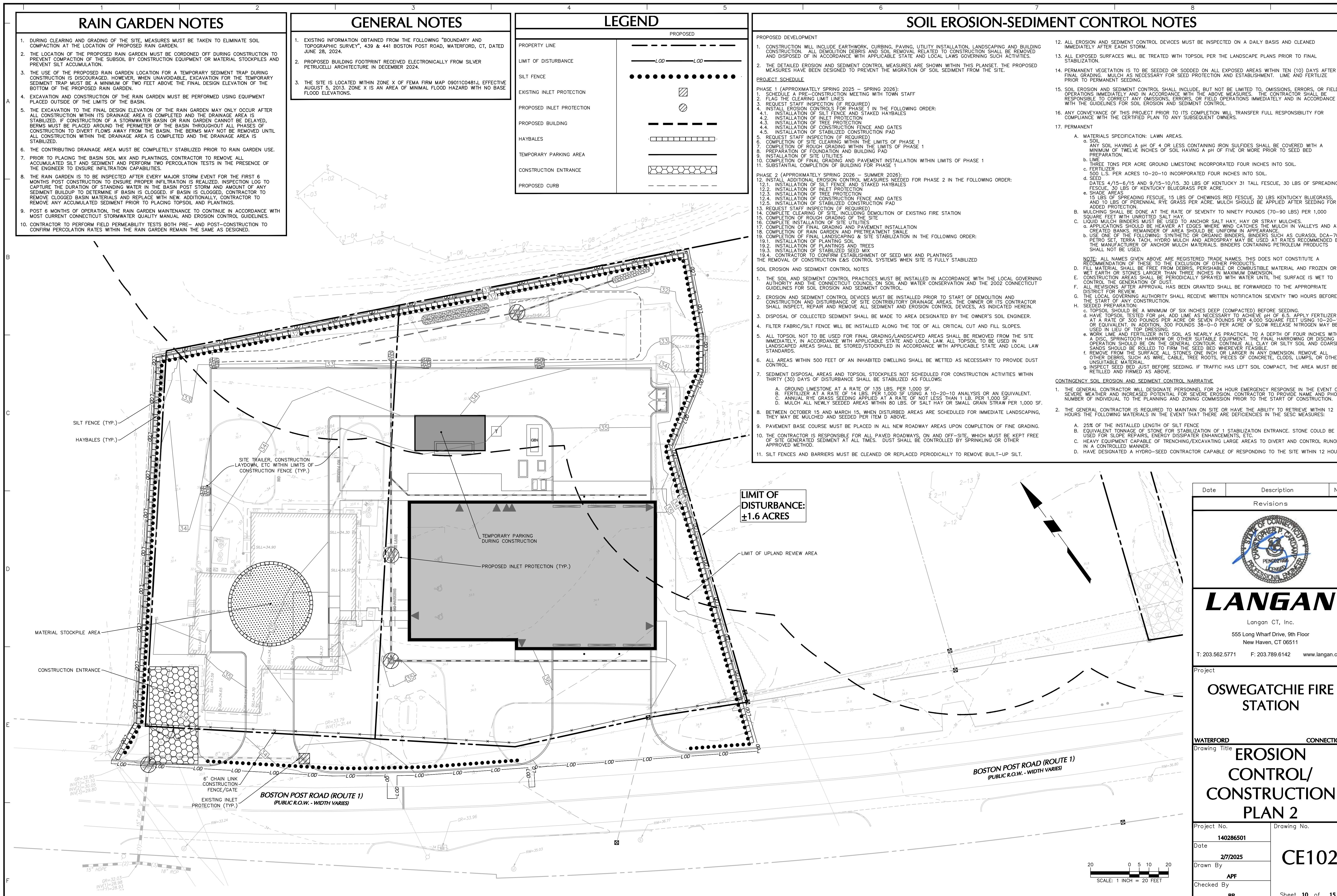
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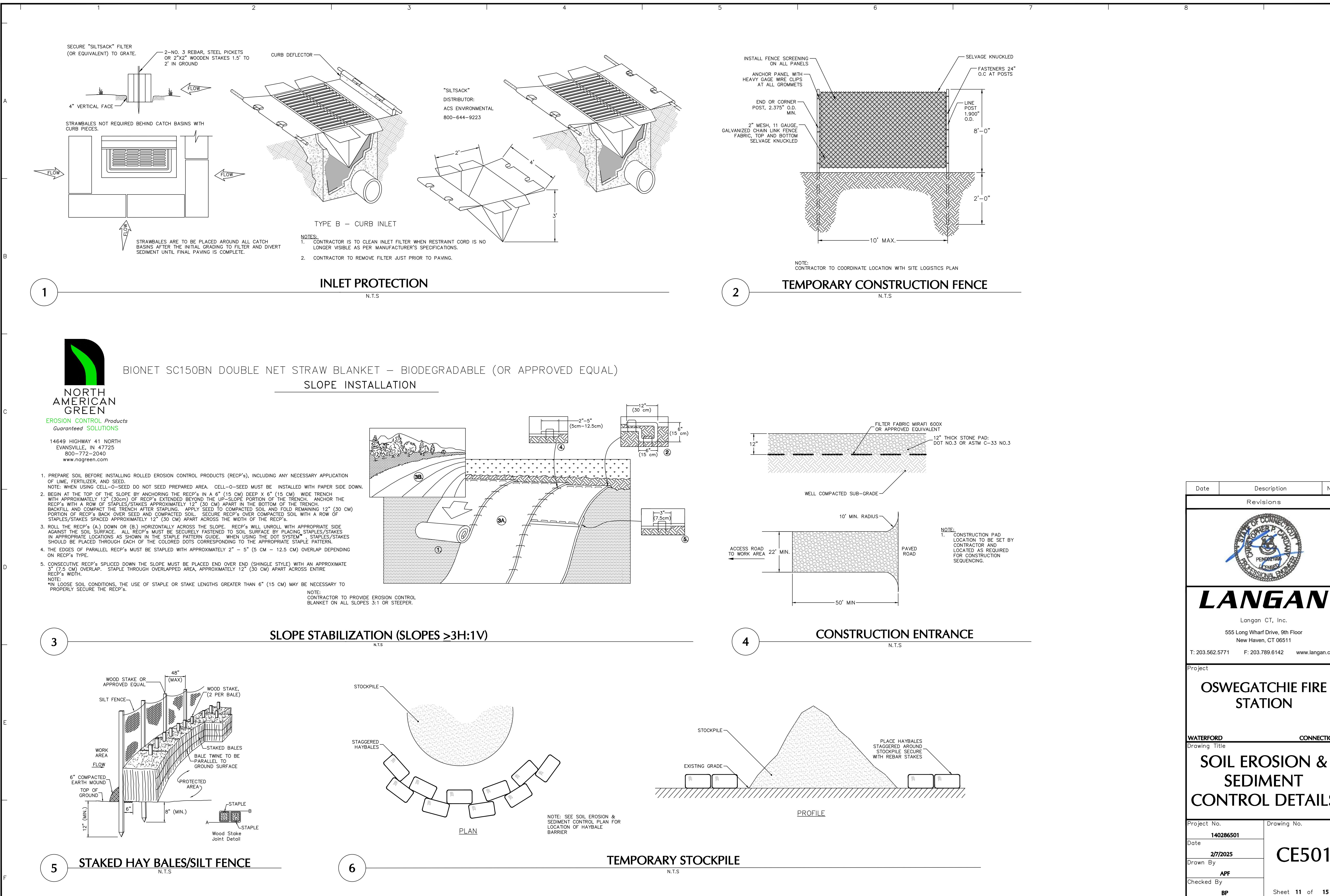
EROSION CONTROL/ CONSTRUCTION PHASING PLAN 1

Project No.	Drawing No.
140286501	
2/7/2025	
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	Sheet 9 of 15

you1 Document Code: 140286501-0502-CE101-010

5/2025 Time: 12:15 User: afay Style Table: Langan.stb Layout: Layout1 Document Code: 140286501-0502-CE101-01





PLANT SCHEDULE

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	ROOT	REMARKS
SHADE TREE(S)						
AROG	1	ACER RUBRUM 'OCTOBER GLORY'	OCTOBER GLORY RED MAPLE	2 1/2-3" CAL.	B+B	-
EVERGREEN TREE(S)						
JV	13	JUNIPERUS VIRGINIANA	EASTERN RED CEDAR	6-7'	B+B	-
PGL	14	PICEA GLAUCA	WHITE SPRUCE	6-7'	B+B	-
EVERGREEN SHRUB(S)						
IGC	4	ILEX GLABRA COMPACTA	DWARF INKBERRY HOLLY	18-24"	CONTAINER	-
DECIDUOUS SHRUB(S)						
AAB	20	ARONIA ARBUTIFOLIA 'BRILLIANTISSIMA'	RED CHOKEBERRY	18-24"	CONTAINER	-
CA	27	CLETHRA ALNIFOLIA	SUMMERSWEET CLETHRA	18-24"	CONTAINER	-
ORNAMENTAL GRASS(ES)						
PVI	16	PANICUM VIRGATUM	SWITCH GRASS	2 GAL.	CONTAINER	-
SSCO	34	SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	2 GAL.	CONTAINER	-

NOTE: IF ANY DISCREPANCIES OCCUR BETWEEN AMOUNTS SHOWN IN THE PLAN AND THE PLANT LIST, THE PLAN SHALL DICTATE.

A

B

C

D

E

F

TANGAN

Project No. 140286501

PLANT SCHEDULE

KEY	QTY.	BOTANICAL NAME	COMMON NAME
SHADE TREE(S)			
AROG	1	ACER RUBRUM 'OCTOBER GLORY'	OCTOBER GLORY RED MAPLE
EVERGREEN TREE(S)			
JV	13	JUNIPERUS VIRGINIANA	EASTERN RED CEDAR
PGL	14	PICEA GLAUCA	WHITE SPRUCE
EVERGREEN SHRUB(S)			
IGC	4	ILEX GLABRA COMPACTA	DWARF INKBERRY HOLLY
DECIDUOUS SHRUB(S)			
AAB	20	ARONIA ARBUTIFOLIA 'BRILLIANTISSIMA'	RED CHokeBERRY
CA	27	CLETHRA ALNIFOLIA	SUMMERSWEET CLETHRA
ORNAMENTAL GRASS(ES)			
PVI	16	PANICUM VIRGATUM	SWITCH GRASS
SSCO	34	SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM

NOTE: IF ANY DISCREPANCIES OCCUR BETWEEN AMOUNTS SHOWN IN THE PLAN AND THE PLANT LIST, THE PLAN SH...

BOSTON POST ROAD (ROUTE 1) (PUBLIC R.O.W. - WIDTH VARIES)

BOSTON POST ROAD (ROUTE 1) (PUBLIC R.O.W. - WIDTH VARIES)

SCALE: 1 INCH = 20 FEET

Date	Description	N
Revisions		
 The seal is circular with a double-lined outer border. The top half of the inner circle contains the text "STATE OF CONNECTICUT" and the bottom half contains "ARCHITECT". The bottom half also features the motto "ENSE PETIT PLACIDAM SVB LIBERTATE QUIETEM". In the center is a crest depicting a shield with a building, flanked by two figures, all within a decorative frame. The bottom of the crest features a banner with the text "ARCHITECT".		

JANGAN

Langan CT, Inc.
555 Long Wharf Drive, 9th Floor

WATERFORD **CONNECTICUT**
Drawing Title

PLANTING PLAN

Project No.	Drawing No.
140286501	
Date	
2/7/2025	
Drawn By	LP101
Checked By	

GENERAL LANDSCAPE PLANTING NOTES

1. NAMES OF PLANTS AS DESCRIBED ON THIS PLAN CONFORM TO THOSE GIVEN IN "STANDARDIZED PLANT NAMES", 1942 EDITION, PREPARED BY THE AMERICAN JOINT COMMITTEE ON HORTICULTURAL NOMENCLATURE. PLANT VARIETIES NOT INCLUDED THEREIN NAMES GENERALLY ACCEPTED IN NURSERY TRADE.

2. STANDARDS FOR TYPE, SPREAD, HEIGHT, ROOT BALL AND QUALITY OF NEW PLANT MATERIAL SHALL BE IN ACCORDANCE WITH GUIDELINES SET FORTH IN THE "AMERICAN STANDARDS FOR NURSERY STOCK". PLANTS AND PLANT MATERIALS PLANTED BY THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION NURSERY MATERIAL SHALL HAVE NORMAL HABIT OF GROWTH AND BE HEALTHY, VIGOROUS AND FREE FROM DISEASES AND INSECT INFESTATION.

3. NEW PLANT MATERIAL SHALL BE NURSERY GROWN UNLESS SPECIFIED OTHERWISE. ALL PLANTS SHALL BE PLANTED AND SHALL BE PLANTED IN THE SAME SOIL GRADE AS PLANTED. PLANT MATERIAL GRADE REFERS DIVISION OF PLANT MATERIALS. THE SAME SPECIES AS SPECIFIED AS THE SAME SPECIES SHOULD BE SIMILAR IN SHAPE, COLOR, AND HABIT. THE LANDSCAPE ARCHITECT HAS THE RIGHT TO REJECT PLANT MATERIAL WHICH DOES NOT MEET THE PLANTED SPECIES AND HABIT OF THAT SPECIES. ALL TREES SHALL HAVE A STRAIGHT TRUNK AND FULL HEAD AND MEET ALL REQUIREMENTS SPECIFIED. ANY TREE THAT LOSES THE MALE LEADER SHALL BE REPLACED.

4. THE BACKFILL MIXTURE AND SOIL MIXES TO BE INSTALLED FOR THE SPECIFICATIONS.

5. THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE SITE AND SUBGRADE DRAINAGE OR PERCOLATION CHARACTERISTICS, WHETHER THE DIVISIONS OF PLANT MATERIALS ARE EXISTING OR IMPORTED AND PLACED. CONTRACTOR SHALL BECOME FAMILIAR WITH THE SITE AND SUBGRADE DRAINAGE OR PERCOLATION CHARACTERISTICS, WHETHER THE DIVISIONS OF PLANT MATERIALS ARE EXISTING OR IMPORTED AND PLACED. CONTRACTOR SHALL BECOME FAMILIAR WITH THE SITE AND SUBGRADE DRAINAGE OR PERCOLATION CHARACTERISTICS, WHETHER THE DIVISIONS OF PLANT MATERIALS ARE EXISTING OR IMPORTED AND PLACED. CONTRACTOR SHALL BECOME FAMILIAR WITH THE SITE AND SUBGRADE DRAINAGE OR PERCOLATION CHARACTERISTICS, WHETHER THE DIVISIONS OF PLANT MATERIALS ARE EXISTING OR IMPORTED AND PLACED. CONTRACTOR SHALL BECOME FAMILIAR WITH THE SITE AND SUBGRADE DRAINAGE OR PERCOLATION CHARACTERISTICS, WHETHER THE DIVISIONS OF PLANT MATERIALS ARE EXISTING OR IMPORTED AND PLACED. CONTRACTOR SHALL BECOME FAMILIAR WITH THE SITE AND SUBGRADE DRAINAGE OR PERCOLATION CHARACTERISTICS, WHETHER THE DIVISIONS OF PLANT MATERIALS ARE EXISTING OR IMPORTED AND PLACED.

6. NO PLANT SHALL BE PUT INTO THE GROUND BEFORE FINISH GRADING HAS BEEN COMPLETED AND APPROVED BY THE PROJECT LANDSCAPE ARCHITECT OR PROJECT ENGINEER.

7. ALL PLANT INSTALLATION SHALL BE COMPLETED EITHER BETWEEN APRIL 15 - JUNE 15 OR SEPT 1 - OCTOBER 15, UNLESS OTHERWISE DIRECTED BY THE PROJECT LANDSCAPE ARCHITECT. SEE LAWN SEEDING DATES IN SEEDING NOTES.

8. ALL FENCE AND GUIDE RAIL INSTALLATIONS SHALL BE COMPLETED PRIOR TO COMMENCEMENT OF ANY LANDSCAPE PLANTING, LAWN AND GRASSES, OR IRRIGATION WORK.

9. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL NOTIFY THE PROJECT LANDSCAPE ARCHITECT DURING THE COURSE OF CONSTRUCTION, NOTIFY THE PROJECT ENGINEER AND OWNER IMMEDIATELY FOR ANY DAMAGE.

10. LOCATIONS OF EXISTING BURIED UTILITY LINES SHOWN ON THE PLANS ARE BASED UPON BEST AVAILABLE INFORMATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM THE EXACT LOCATION OF ALL UTILITY LINES (CONTRACTOR 1) TO VERIFY THE LOCATIONS OF UTILITY LINES AND ADJACENT TO THE WORK AREA 2) TO PROTECT ALL UTILITY LINES DURING THE CONSTRUCTION PERIOD 3) TO REPAIR ANY AND ALL DAMAGE TO UTILITIES, STRUCTURES, SITE APPURTENANCES, ETC. WHICH OCCURS AS A RESULT OF THE CONSTRUCTION.

11. THE CONTRACTOR SHALL NOT MAKE SUBSTITUTIONS. IF THE SPECIFIED LANDSCAPE MATERIAL IS NOT OBTAINABLE, THE CONTRACTOR SHALL SUBMIT PROOF OF NON-AVAILABILITY TO THE LANDSCAPE ARCHITECT AND OWNER, TOGETHER WITH A WRITTEN PROPOSAL FOR USE OF AN EQUIVALENT MATERIAL.

12. LANDSCAPE CONTRACTOR TO STAKE OUT PLANTING LOCATIONS, FOR REVIEW AND APPROVAL BY THE LANDSCAPE ARCHITECT. THE CONTRACTOR SHALL NOT PLANT ANY PLANT MATERIAL UNTIL THE OWNER AND/OR OWNER SHALL DIRECT THE CONTRACTOR IN THE FINAL PLACEMENT OF ALL PLANT MATERIAL AND LOCATION OF PLANTING BEDS TO ENSURE COMPLIANCE WITH DESIGN INTENT UNLESS OTHERWISE INSTRUCTED.

13. ALL MATERIALS ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT BEFORE, DURING, AND AFTER INSTALLATION. THE LANDSCAPE ARCHITECT MAY REVIEW PLANT MATERIALS AT THE SITE FOR COMPLIANCE WITH REQUIREMENTS FOR GENUS, SPECIES, VARIETY, SIZE, AND QUALITY. THE LANDSCAPE ARCHITECT MAY REQUIRE PLANT MATERIALS TO BE STORED IN A MANNER THAT PREVENTS DAMAGE TO ROOTS AND ROOT SYSTEM, INSECTS, INJURIES, AND LATENT DEFECTS, AND TO REJECT UNSATISFACTORY DEFECTIVE MATERIAL AT ANY TIME DURING PROGRESS OF WORK. THE CONTRACTOR SHALL REMOVE REJECT MATERIAL IMMEDIATELY FROM PROJECT SITE AS DIRECTED BY THE LANDSCAPE ARCHITECT OR OWNER.

14. ALL PLANT MATERIAL SHALL BE HEALTHY, VIGOROUS, AND FREE OF PESTS AND DISEASE. ANY PLANT MATERIAL WHICH IS DISEASED, DISEASED, MISSING, 25% OR MORE DEAD, WHICH DO NOT DEVELOP FROM PLANT MATERIAL WHICH IS UNPLANTED, UNPLANTED, OR WHICH DO NOT MEET THE DESIGN INTENT SHAPE DUE TO DEAD BRANCHES, OR REJECTED FOR ANY OTHER REASON (PRIOR TO SUBSTANTIAL COMPLETION) SHALL BE PROMPTLY REMOVED FROM THE SITE AND REPLACED WITH MATERIAL OF THE SAME SPECIES, QUALITY, AND DESIGN INTENT AS THE ORIGINAL PLANT MATERIALS.

15. CONTRACTOR SHALL BE RESPONSIBLE FOR DELIVERY SCHEDULE AND PROTECTION BETWEEN DELIVERY AND PLANTING PER SPECIFICATIONS TO MAINTAIN HEALTHY PLANT CONDITIONS.

16. DELIVERY, STORAGE, AND HANDLING
A. PACKAGED MATERIALS: PACKAGED MATERIALS SHALL BE DELIVERED IN CONTAINERS SHOWING WEIGHT, ANALYSIS, NAME, AND MANUFACTURER. MATERIALS SHALL BE PROTECTED FROM DETERIORATION DURING DELIVERY AND STORED AT SITE.

B. TREES AND SHRUBS: THE CONTRACTOR SHALL PROVIDE TREES AND SHRUBS DUE TO THE GROWING SEASON FOR WHICH THEY WILL BE PLANTED. DO NOT PRUNE PRIOR TO DELIVERY UNLESS OTHERWISE DIRECTED BY THE LANDSCAPE ARCHITECT. DO NOT BEND OR BEND-TIE TREES OR SHRUBS IN SUCH A MANNER AS TO DAMAGE THE PLANT MATERIAL. DO NOT DAMAGE THE PLANT MATERIAL DURING PROTECTIVE COVERING DURING TRANSIT. DO NOT DROPPED BALLED AND BURLAPPED STOCK DURING DELIVERY OR HANDLING.

C. ALL PLANTS SHALL BE BALLED AND BURLAPPED OR CONTAINER GROWN AS SPECIFIED. NO CONTAINER GROWN STOCK SHALL BE USED. NO PLANT MATERIALS SHALL BE STORED IN CONTAINERS. PLANT MATERIAL MADE OF SYNTHETICS OR PLASTICS SHALL BE REMOVED FROM THE TOP OF THE BALL AT THE TIME OF PLANTING. DO NOT PLANT WITH A WIRE BASKET OR BURLAP. THE PLANT MATERIAL CONTAINER GROWN STOCK, THE CONTAINER SHALL BE REMOVED AND THE ROOT BALL SHALL BE CUT THROUGH THE SURFACE IN PLANTING LOCATIONS.

D. PLANT CONTRACTOR HAVE THE PLANT SHRUBS DELIVERED TO SITE AFTER PREPARATIONS FOR PLANTING HAVE BEEN COMPLETED AND PLANT IMMEDIATELY. PLANTING IS DELAYED MORE THAN 6 HOURS AFTER DELIVERY, THE CONTRACTOR SHALL SET TREES AND SHRUBS IN SHADE, PROTECT FROM WEATHER, AND COVER THE PLANT MATERIALS MOST BY COVERING WITH MULCH, BURLAP, OR OTHER ACCEPTABLE MEANS OF RETAINING MOISTURE.

17. ALL LANDSCAPED AREAS TO BE CLEARED OF ROCKS, STUMPS, TRASH AND OTHER UNSIGHTLY DEBRIS. ALL FINISHED AREAS SHOULD BE HAND RAKED SMOOTH ELIMINATING ANY CLUMPS AND UNEVEN SURFACES PRIOR TO PLANTING OR MULCHING.

18. ALL PLANT MATERIAL SHALL BE INSTALLED AS PER DETAILS, NOTES AND CONTRACT SPECIFICATIONS. THE LANDSCAPE ARCHITECT MAY REVIEW PLANT MATERIALS AND CONTRACT SPECIFICATIONS.

19. CONTRACTOR SHALL MAINTAIN PLANT MATERIALS AS PLANTED UNTIL PERMANENTLY MAINTAINED. NEW PLANT MATERIAL SHALL BE GUARANTEED TO BE ALIVE AND IN VIGOROUS GROWING CONDITION FOR A PERIOD OF ONE YEAR FOLLOWING ACCEPTANCE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PLANT MATERIALS WHICH ARE NOT MAINTAINED AS SPECIFIED. REPAIRING, REPAIRING, MULCHING, FERTILIZING, ETC. ALL OF THE PLANT MATERIALS AND LAWNS FOR THE DURATION OF THE GUARANTEED PERIOD. PLANT MATERIAL FOUND TO BE UNHEALTHY, DYING OR DEAD DURING THIS PERIOD, SHALL BE REMOVED AND REPLACED IN KIND BY THE CONTRACTOR AT NO EXPENSE TO THE OWNER.

20. THE CONTRACTOR SHALL KEEP AREA CLEAN DURING DELIVERY AND INSTALLATION OF PLANT MATERIALS. DUST AND DIRT FROM PLANT MATERIALS OR UNPACKED MATERIALS. REPAIR DAMAGE TO ADJACENT AREAS CAUSED BY LANDSCAPE INSTALLATION OPERATIONS.

21. ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24- HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL THEN BE WATERED WEEKLY OR AS REQUIRED BY SITE AND WEATHER CONDITIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR WATERING PLANT MATERIALS FROM A WATER SOURCE WITH OWNER PRIOR TO BID AND INCLUDE ALTERNATE MEANS OF WATERING IF NECESSARY.

22. ON-SITE WATER SHALL BE FURNISHED BY THE CONTRACTOR. HOSE AND OTHER WATERING EQUIPMENT SHALL BE FURNISHED BY THE CONTRACTOR.

23. AFTER PLANT IS PLACED IN TREE PIT LOCATION, ALL TWINE HOLDING ROOT BALL TOGETHER SHOULD BE COMPLETELY REMOVED AND THE BURLAP SHOULD BE PULLED DOWN SO 1/3 OF THE ROOT BALL IS EXPOSED. DO NOT PULL DOWN THE BURLAP AFTER INSTALLATION.

24. ALL TREES MUST BE GUARDED OR STAKED IF REQUIRED BY ORDINANCE, IF LOCATED ON A SLOPE: 3:1 OR GREATER, OR IF THE SITE IS LOCATED IN A HIGH WIND ZONE.

25. ALL EXPOSED GROUND SURFACES THAT ARE NOT PAVED WITHIN THE CONTRACT LIMIT LINE, AND THAT ARE NOT COVERED BY LANDSCAPE PLANTING OR SEEDING AS SPECIFIED, SHALL BE COVERED BY A NATURAL MULCH. THE NATURAL MULCH SHALL BE A FIBROUS SHREDDED WOOD MULCH. THE NATURAL MULCH SHOULD NOT BE PILED UP AROUND THE TRUNK OF ANY PLANT MATERIAL. MULCH OR TOPSOIL SHOULD NOT EXCEED THE BASE OF THE TRUNK ABOVE THE ROOT COLLAR.

26. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL QUANTITIES SHOWN ON THESE PLANS BEFORE PRICING THE WORK, FOR ANY DISCREPANCY BETWEEN THE PLANT SCHEDULE AND PLANTING PLAN THE GRAPHIC QUANTITY SHALL SHOW GOVERN.

27. LANDSCAPE PUNCH LIST SITE VISITS TO BE PERFORMED BY THE PROJECT LANDSCAPE ARCHITECT, IF UNDERSIGNED CONTRACT FOR SUCH WORK, WILL NOT BE SCHEDULED UNTIL CONFIRMATION IS RECEIVED THAT ALL PLANT MATERIALS HAVE BEEN INSTALLED AND PLANTED. THE CONTRACTOR SHALL FURNISH A PUNCH LIST REPORT HAVE BEEN CORRECTED, THE PUNCH LIST SITE VISIT WILL THEN BE PERFORMED WITHIN 10 BUSINESS DAYS.

28. CONTRACTOR SHALL ASSESS THAT NEED FOR ANIMAL PROTECTION ON SITE. IF DEEMED NECESSARY, TREES SHALL BE PROTECTED AS NECESSARY.

29. ALL SLOPES 3:1 OR GREATER AND ALL SIDE SLOPES OF BASINS SHALL REQUIRE AN EROSION CONTROL BLANKET. ERONE: 50149 FOR NORTH AMERICAN GREEN, OR APPROVED EQUAL.

30. SOD SPECIFICATIONS

1. SOD TO BE 100% TURF TYPE TALL FESQUE BLACK BEAUTY AS GROWN BY SODCO (OR APPROVED EQUAL), AREA TO BE FURNISHED BY A REPUTABLE GROWER WITH A MINIMUM 5 YEARS EXPERIENCE.

2. PRIOR TO SODDING ALL AREAS ARE TO BE TOPSOILED, FIN GRADED, RAKED, WATERED LIGHTLY, AND FERTILIZED WITH A STARTER FERTILIZER.

3. ALL STONES GREATER THAN 2" DIAMETER SHALL BE REMOVED.

4. SOD TO BE INSTALLED PERPENDICULAR TO ALL SLOPED AREAS. SOD STRIPS TO BE LAYED OUT SO JOINTS ARE NOT CLOSER THAN ONE FOOT (1'-0") FROM EACH OTHER.

5. SOD IS TO BE WATERED AT A RATE OF AT LEAST ONE AND A HALF INCHES (1 1/2") PER WEEK UNTIL ROOT MASS MENDS WITH SOIL. AFTER THIS HAS OCCURRED NORMAL WATERING OF AT LEAST ONE INCH (1") PER WEEK IS TO COMMENCE.

6. ALL SOD AREAS ARE TO BE ROLLED IF ANY HEAVING OR DEPRESSIONS OCCUR.

PLANTING SOIL SPECIFICATIONS

1. PLANTING SOIL ALTERNATELY REFERRED TO AS TOPSOIL, SHOULD BE FRIABLE, FERTILE, WELL DRAINED, FREE OF DEBRIS, TOXINS, TRASH AND STONES OVER 1/2" dia. IT SHOULD HAVE A HIGH ORGANIC CONTENT SUITABLE TO SUSTAIN HEALTHY PLANT GROWTH AND SHOULD LOOK AESTHETICALLY PLEASING HAVING NO NOXIOUS ODORS.

2. PLANTING SOIL
REUSE SURFACE SOIL STOCKPILED ON SITE, VERIFYING COMPLIANCE WITH PLANTING SOIL AND TOPSOIL CRITERIA IN THIS SPECIFICATION THROUGH TESTING. CLEAN SURFACE SOIL OF ALL STONES, PLANTS, SOIL, AND GRAVEL OVER 1" IN DIAMETER AND DELETERIOUS MATERIALS. IF ON-SITE SOILS ARE TO BE USED, THE CONTRACTOR SHALL TEST SOILS AND FURNISH SAMPLES UPON REQUEST. PLANT MATERIAL SHALL HAVE NORMAL HABIT OF GROWTH AND BE HEALTHY, VIGOROUS AND FREE FROM DISEASES AND INSECT INFESTATION.

3. NEW PLANT MATERIAL SHALL BE NURSERY GROWN UNLESS SPECIFIED OTHERWISE. ALL PLANTS SHALL BE PLANTED AND SHALL BE PLANTED IN THE SAME SOIL GRADE AS PLANTED. PLANT MATERIAL GRADE REFERS DIVISION OF PLANT MATERIALS. THE SAME SPECIES AS SPECIFIED AS THE SAME SPECIES SHOULD BE SIMILAR IN SHAPE, COLOR, AND HABIT. THE LANDSCAPE ARCHITECT HAS THE RIGHT TO REJECT PLANT MATERIAL WHICH DOES NOT MEET THE PLANTED SPECIES AND HABIT OF THAT SPECIES. ALL TREES SHALL HAVE A STRAIGHT TRUNK AND FULL HEAD AND MEET ALL REQUIREMENTS SPECIFIED. ANY TREE THAT LOSES THE MALE LEADER SHALL BE REPLACED.

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15. CONTRACTOR SHALL BE RESPONSIBLE FOR DELIVERY SCHEDULE AND PROTECTION BETWEEN DELIVERY AND PLANTING PER SPECIFICATIONS TO MAINTAIN HEALTHY PLANT CONDITIONS.

16. DELIVERY, STORAGE, AND HANDLING
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B. TREES AND SHRUBS: THE CONTRACTOR SHALL PROVIDE TREES AND SHRUBS DUE TO THE GROWING SEASON FOR WHICH THEY WILL BE PLANTED. DO NOT PRUNE PRIOR TO DELIVERY UNLESS OTHERWISE DIRECTED BY THE LANDSCAPE ARCHITECT. DO NOT BEND OR BEND-TIE TREES OR SHRUBS IN SUCH A MANNER AS TO DAMAGE THE PLANT MATERIAL. DO NOT DAMAGE THE PLANT MATERIAL DURING PROTECTIVE COVERING DURING TRANSIT. DO NOT DROPPED BALLED AND BURLAPPED STOCK DURING DELIVERY OR HANDLING.

C. ALL PLANTS SHALL BE BALLED AND BURLAPPED OR CONTAINER GROWN AS SPECIFIED. NO CONTAINER GROWN STOCK SHALL BE USED. NO PLANT MATERIALS SHALL BE STORED IN CONTAINERS. PLANT MATERIAL MADE OF SYNTHETICS OR PLASTICS SHALL BE REMOVED FROM THE TOP OF THE BALL AT THE TIME OF PLANTING. DO NOT PLANT WITH A WIRE BASKET OR BURLAP. THE PLANT MATERIAL CONTAINER GROWN STOCK, THE CONTAINER SHALL BE REMOVED AND THE ROOT BALL SHALL BE CUT THROUGH THE SURFACE IN PLANTING LOCATIONS.

D. PLANT CONTRACTOR HAVE THE PLANT SHRUBS DELIVERED TO SITE AFTER PREPARATIONS FOR PLANTING HAVE BEEN COMPLETED AND PLANT IMMEDIATELY. PLANTING IS DELAYED MORE THAN 6 HOURS AFTER DELIVERY, THE CONTRACTOR SHALL SET TREES AND SHRUBS IN SHADE, PROTECT FROM WEATHER, AND COVER THE PLANT MATERIALS MOST BY COVERING WITH MULCH, BURLAP, OR OTHER ACCEPTABLE MEANS OF RETAINING MOISTURE.

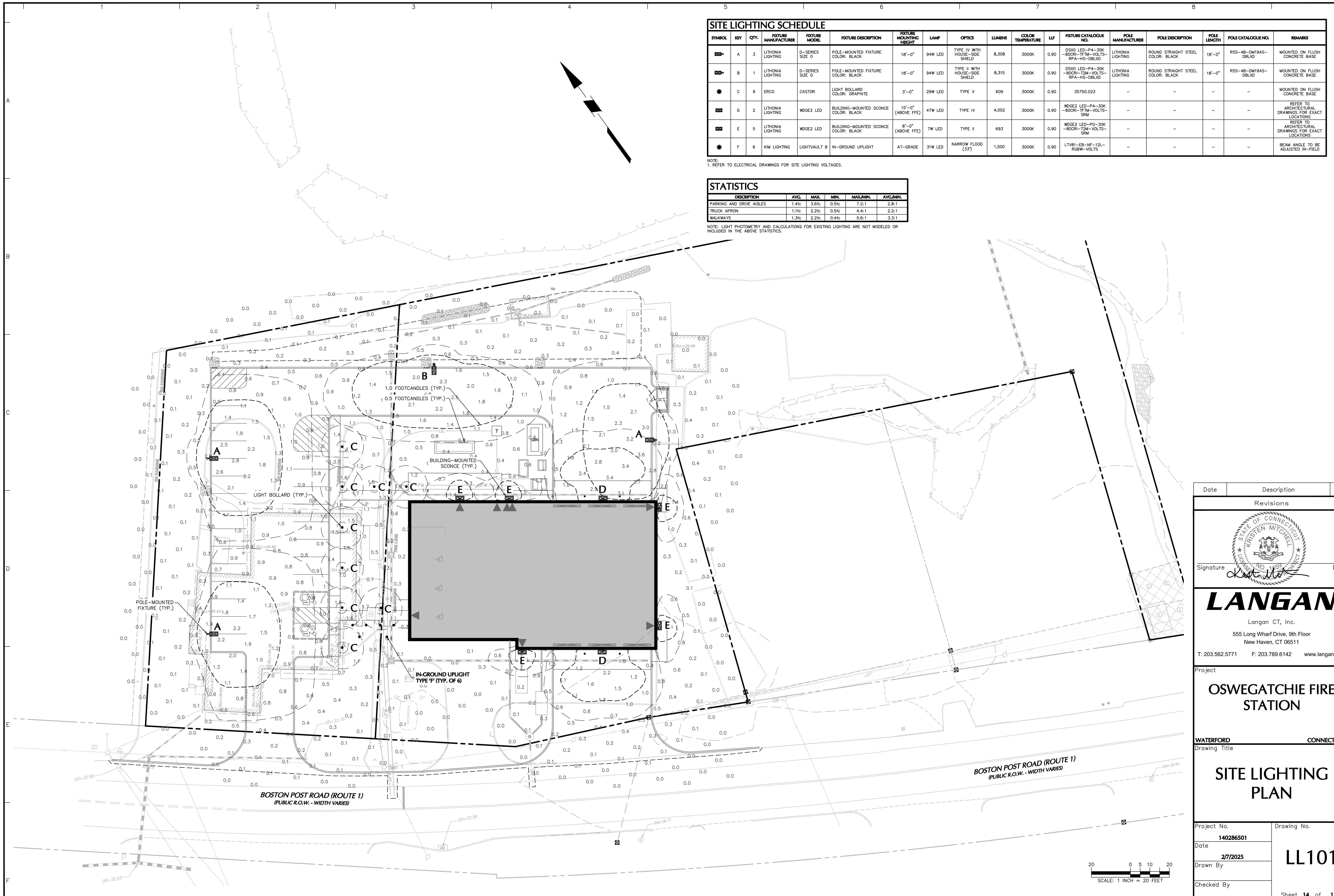
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21. ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24- HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL THEN BE WATERED WEEKLY OR AS REQUIRED BY SITE AND WEATHER CONDITIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR WATER

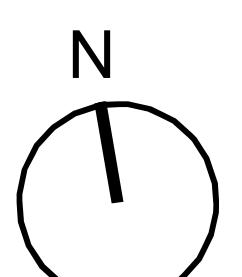
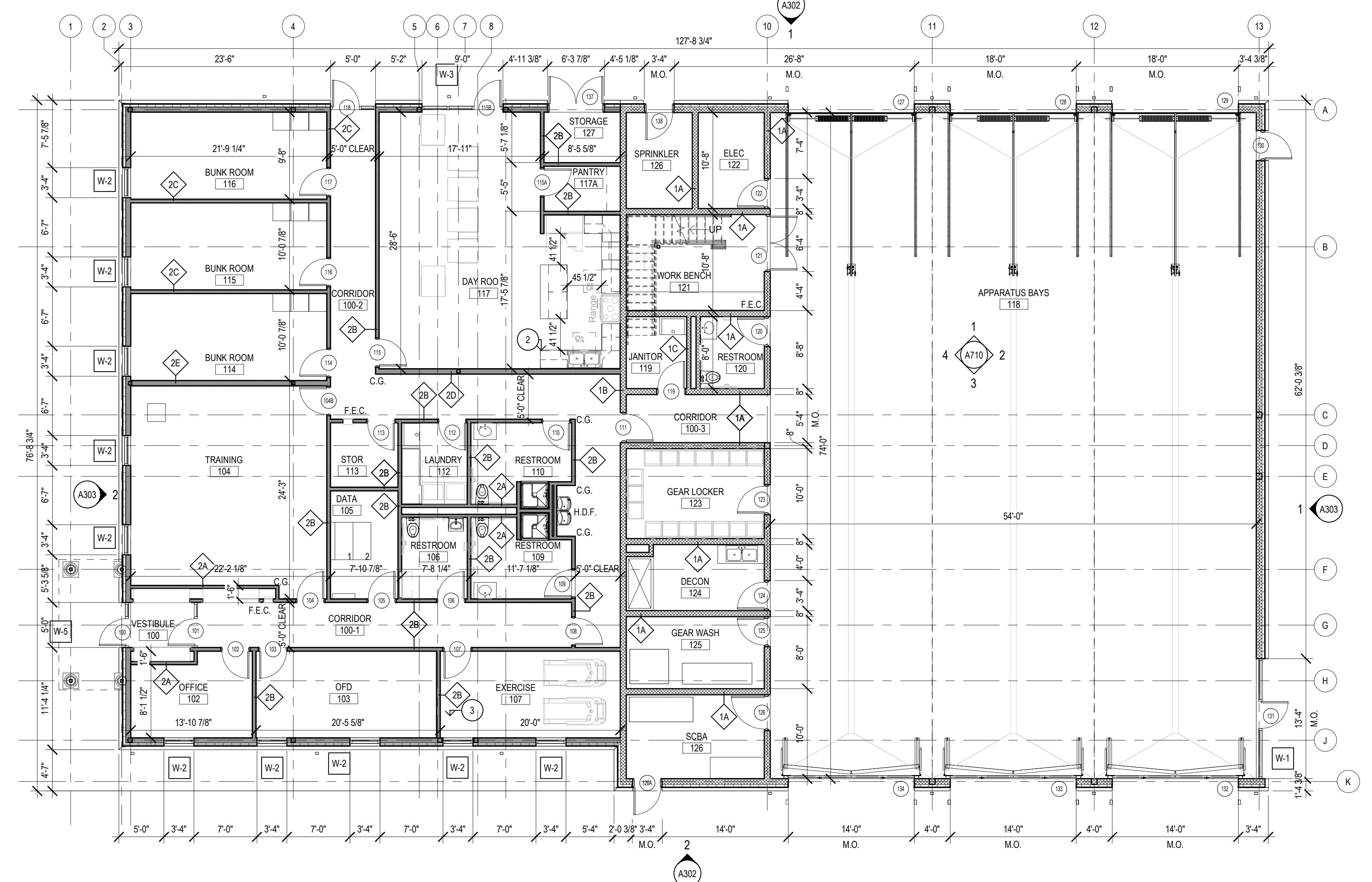
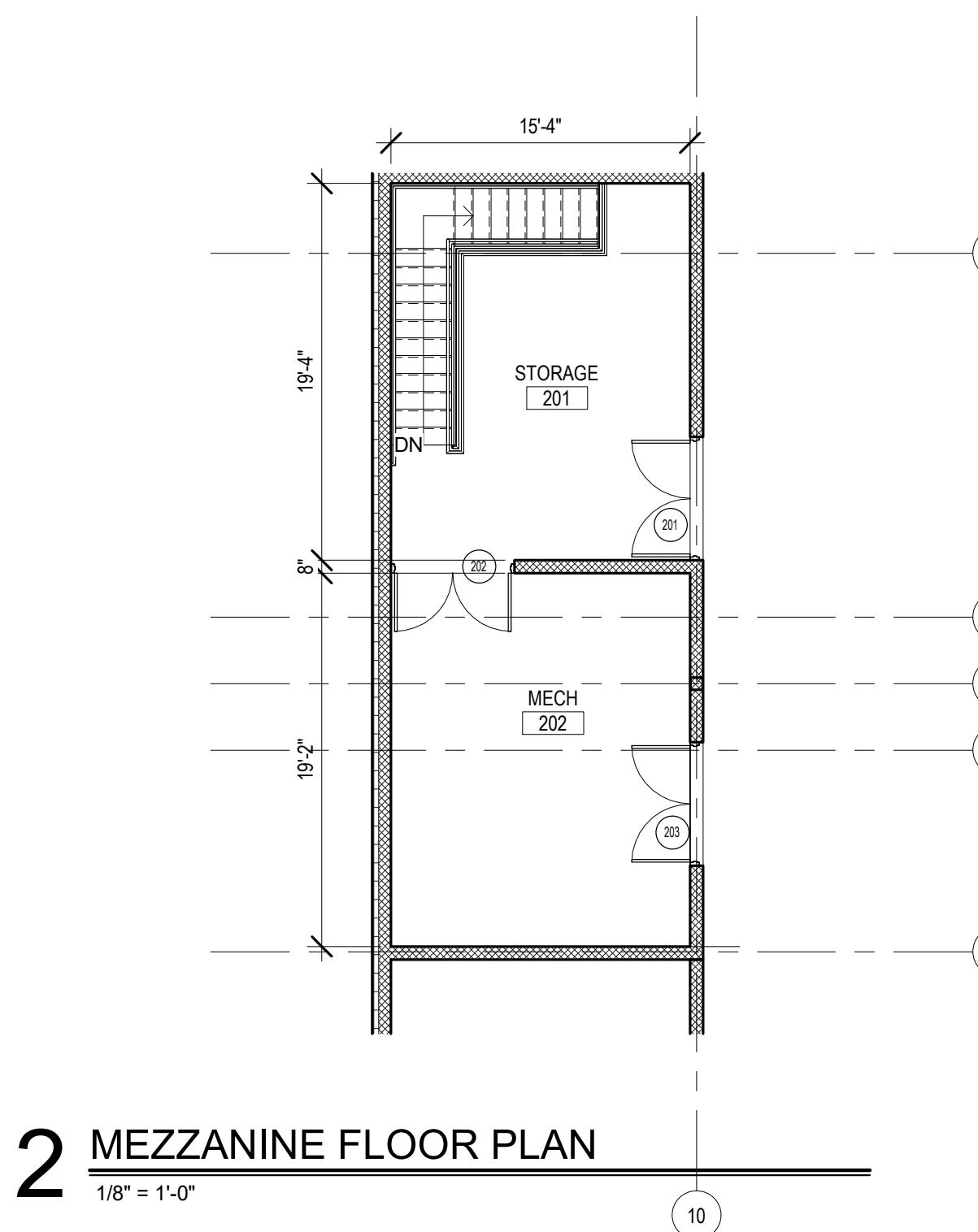


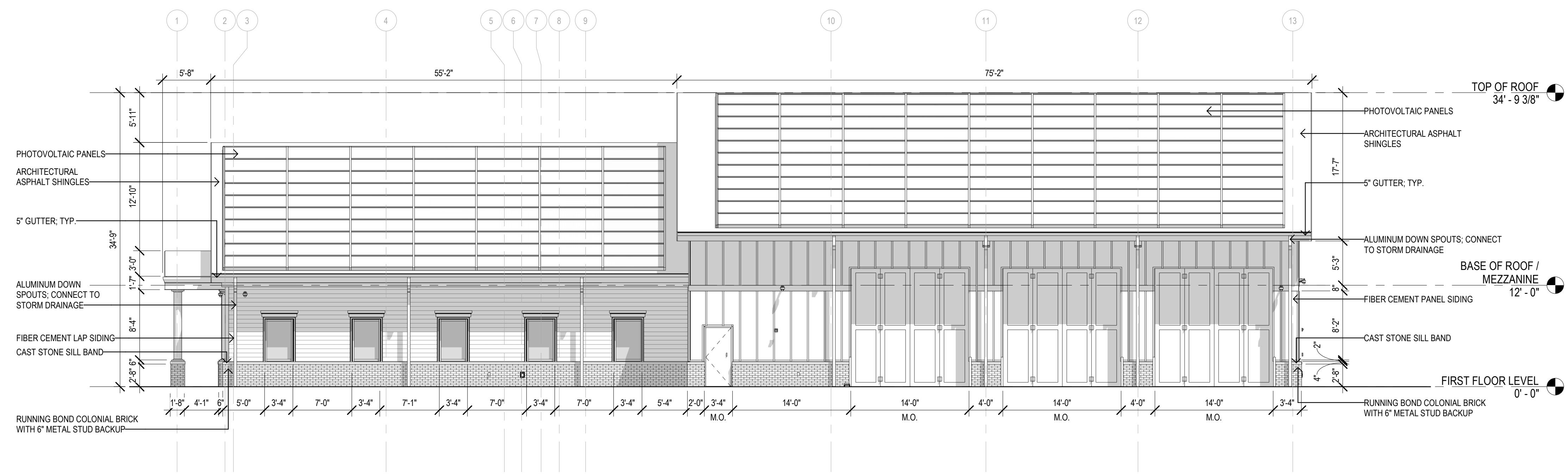
SYMBOL LEGEND

	- NEW METAL STUD PARTITIONS
	- NEW MASONRY WALL
	- NEW CMU WALL
	- DOOR NUMBER
	- WINDOW TYPE
	Room name
	- ROOM NAME - ROOM NUMBER
	- PARTITION TYPE
	- CONSTRUCTION NOTE
	- EXTERIOR ELEVATION NUMBER
	- SHEET NUMBER
	- INTERIOR ELEVATION NUMBER
	- SHEET NUMBER
	- BUILDING SECTION NUMBER
	- SHEET NUMBER
	- WALL SECTION NUMBER
	- SHEET NUMBER
	C.G.
	F.E.C.
	FD
	H.D.F.

GENERAL NOTES

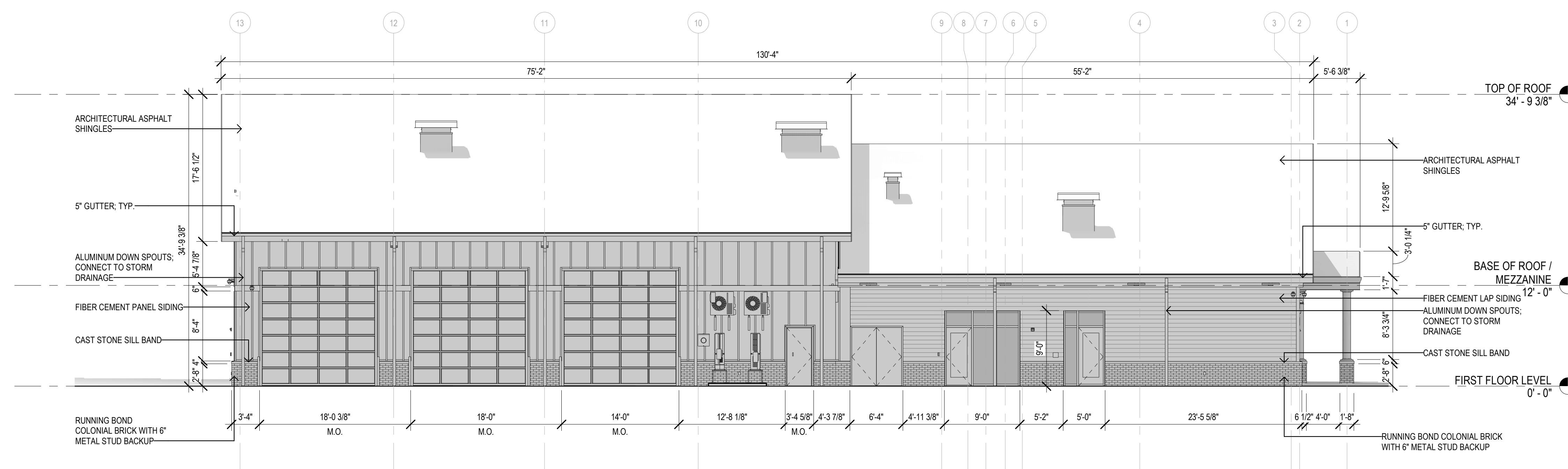
1. READ ALL GENERAL NOTES ON DRAWING A001.
2. CONTRACTORS SHALL FIELD VERIFY ALL CONDITIONS AND DIMENSIONS.
3. ALL DIMENSIONS ARE TO OUTSIDE FACE OF BRICK, CONCRETE MASONRY UNITS AND METAL FRAMING UNLESS OTHERWISE NOTED.
4. ALL NEW WALL AND PARTITION ASSEMBLIES SHALL EXCLUDE THICKNESS OF DECK UNLESS OTHERWISE NOTED.
5. PROVIDE CMU WITH PRE-MANUFACTURED BULLNOSE AT ALL EXPOSED CORNERS WHERE THE WORD "ALIGN" IS INDICATED IT SHALL MEAN TO ALIGN BOTH SIDES OF WALL.
6. 100% DESIGN DEVELOPMENT





2 SOUTH ELEVATION

1/8" = 1'-0"



1 NORTH ELEVATION

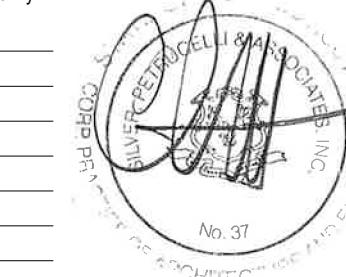
1/8" = 1'-0"

Project Title:
NEW CONSTRUCTION
OSWEGATCHIE FIRE STATION
441 BOSTON POST RD
WATERFORD, CT 06385



SILVER PETRUCELLI + ASSOCIATES
3190 WHITNEY AVENUE HAMDEN CT 06518
311 STATE STREET NEW LONDON CT 06320
203 230 9007 silverpetrucci.com

Revision: _____ Description: _____ Date: _____ Revised By: _____



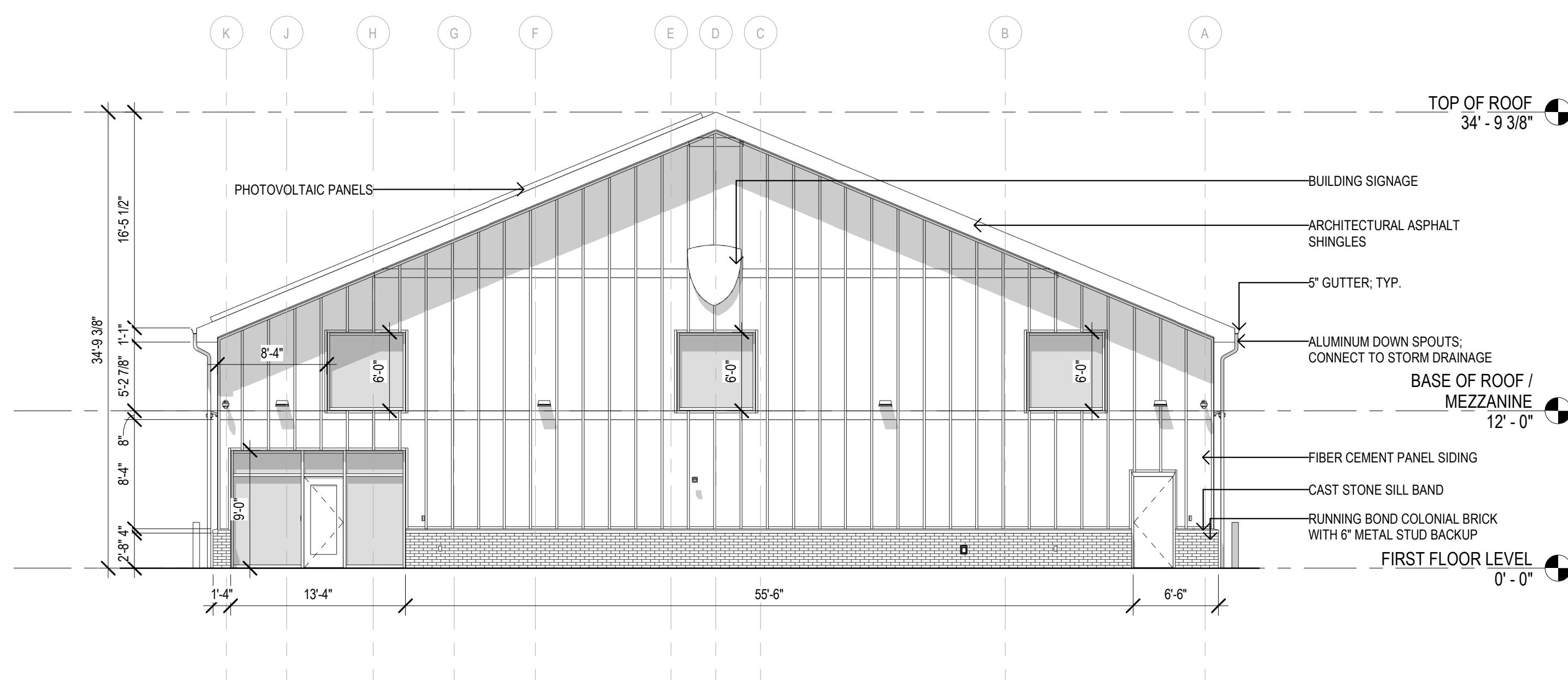
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Project Phase: 100% DESIGN DEVELOPMENT
State Project Number: _____

Date: 01/24/25
Scale: 1/8" = 1'-0"
Drawn By: _____
EAC _____
Project Number: 23352

A302



2 WEST ELEVATION



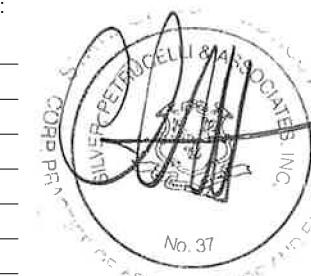
1 EAST ELEVATION

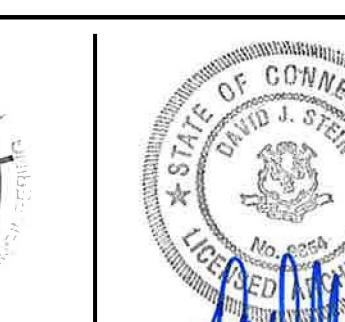
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OSWEGATCHIE FIRE STATION
441 BOSTON POST RD
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Drawing Title: EXTERIOR ELEVATIONS
Project Phase: 100% DESIGN DEVELOPMENT
State Project Number: _____

Date: 01/24/25
Scale: 1/8" = 1'-0"
Drawn By: EAC
Project Number: 23352

A303



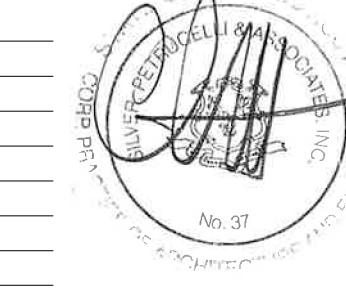
Project Title:

NEW CONSTRUCTION OSWEGATCHIE FIRE STATION

441 BOSTON POST RD WATERFORD, CT 06385



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3190 WHITNEY AVENUE HAMDEN CT 06511
311 STATE STREET NEW LONDON CT 06320
203 230 9007 silverpetrucelli.com



Drawing Title: **3D VIEW**

Project Phase: **100% DESIGN**

State Project Number: **1234567890**



Project Phase:

100% DESIGN DEVELOPMENT

Date: 01/24/25
Scale:
Drawn By:
EC
Project Number:
00-050

A304

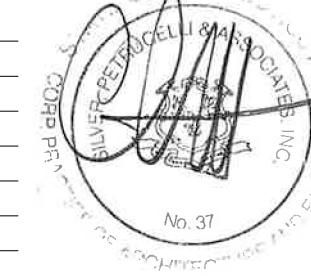


Project Title:

NEW CONSTRUCTION OSWEGATCHIE FIRE STATION 441 BOSTON POST RD WATERFORD, CT 06385



SILVER PETRUCELLI + ASSOCIATES
3190 WHITNEY AVENUE HAMDEN CT 06514
311 STATE STREET NEW LONDON CT 06320
203 230 9007 silverpetrucelli.com



Drawing Title:
3D VIEW

Project Phase:
100% DESIGN

State Project Number:

Project Phase:
100% DESIGN DEVELOPMENT

Date: 01/24/25
Scale:

Drawn By: EC
Project Number:

A305

**DEPARTMENT OF PLANNING AND DEVELOPMENT****MEMORANDUM**

TO: Planning and Zoning Commission

FROM: Mark Wujtewicz, Planner

DATE: March 11, 2025

TITLE: Staff Report: Oswegatchie Fire Station
439 & 441 Boston Post Road
Site Plan
Application PL-25-3

EXECUTIVE SUMMARY

The project as proposed is to construct an approximate 10,160 square foot footprint fire station building located at 439 & 441 Boston Post Road. The parcels are located within the Neighborhood Business and Professional Office (NBPO) Zone District with a combined area of approximately 2 acres. The parcels are also located within the Connecticut Coastal Area Management (CAM) boundary. The existing firehouse is approximately 12,000 square feet and located on the 439 Boston Post Road parcel while the associated parking lot is located on the 441 Boston Post Road parcel. In addition to the construction of the new fire station building, other site improvements include new concrete sidewalks and paved parking areas, stormwater quality elements and utilities. The proposed building will be served by the existing municipal water and sewer system.

The existing firehouse facility will remain in operation while the new building is being constructed. The plan identifies temporary procedures and phasing of work that will be implemented during the construction and demolition that will separate the activities in order to maintain the ongoing operation of services conducted on the site. Once the new building is constructed and associated site improvements are completed, the existing facility building will be demolished and any remaining site improvements in the area of the demolished building will be completed.

Prior Planning and Zoning Commission approvals granted for this project site include two Connecticut General Statute (CGS) 8-24 approvals. PL-24-3 was approved by the Commission on January 23, 2024 for the purchase of the two parcels. On January 14, 2025, CGS 8-24 application PL-25-1 was approved by the Commission for the improvements to the property, which is the subject of this site plan application.

The application has been reviewed and approved by the Waterford Conservation Commission through the issuance of Inland Wetland Permit #C-25-02. A copy of the Conservation Commission Action has been submitted into the record.

BACKGROUND

Pertinent Regulations

CGS 8-3(g)

Section 7A – Neighborhood Business and Professional Office (NBPO)

Section 7A.2.3 – Municipal office and facilities

Section 22 – Site Plans

Section 22b – Design Review of Site and Building Requirements

Section 25.4 – Coastal Area Management

This application was received by the Commission on February 11, 2025.

Action on this application must be no later than April 16, 2025.

DISCUSSION

In order for the Commission to approve a site plan it must find that the plan is consistent with the Town of Waterford Zoning Regulations. The Commission must act on the plan initially submitted for review and can find that the site plan is either compliant with the Zoning Regulations or it may approve the plan with modifications that are required to be implemented prior to filing on the land records.

A portion of the project is located within the Connecticut Coastal Area Management (CAM) boundary, therefore an application for a Coastal Area Management Site Plan Permit was submitted into the record. Coastal resources identified were shorelands and inland freshwater wetlands. The plan was found to be consistent with Coastal Resource policies and any potential temporary adverse impacts during construction of the project is mitigated through the implementation of appropriate erosion and sedimentation control measures in accordance with the CT Guidelines for Soil Erosion and Sediment Control. The proposed stormwater management design includes onsite infiltration promoting groundwater recharge and reducing peak flows.

Activity associated with the construction of the proposed facility will impact approximately 20,000 square feet of area within the upland review area of two wetlands identified on the plan as Wetland #1 and Wetland #2. As a result, an application for Inland Wetland Permit #C-25-02 was submitted to the Waterford Conservation Commission. Inland Wetland Permit #C-25-02 was approved with conditions by the Conservation Commission to conduct authorized regulated activities associated with the construction of the new fire station, associated paved area and stormwater treatment. In accordance with CGS §8-3(g) a report of the Conservation Commission action was submitted into the record.

The applicant submitted a Stormwater Management Report into the record. The report noted that the existing conditions on the site include approximately 52,200 square feet of impervious

cover, while the proposed improvements will provide for a net reduction in impervious area by approximately 20,700 square feet. The report indicates that the design of the Stormwater Management System is in conformance with the 2024 CTDEEP Stormwater Quality Manual, the 2000 CTDOT Drainage Manual and that the system as proposed will effectively manage the quality and quantity of stormwater runoff.

RECOMMENDED ACTION

Based on the information provided, staff recommends the Planning and Zoning Commission find that:

Findings:

1. The application is for a use subject to a Site Plan approval, pursuant to Section 7A.2.3 of the Waterford Zoning Regulations.
2. The application meets the criteria for a modified site plan approval, pursuant to Section 22 of the Waterford Zoning Regulations, subject to modifications listed.
3. The Waterford Conservation Commission issued Inland Wetland Permit# C-25-02 for regulated inland wetland activities.
4. The Waterford Conservation Commission issued a report of its action on application #C-25-02 in accordance with CGS §8.3(g).
5. The project as approved with conditions is consistent with all applicable coastal policies and includes all reasonable measures to mitigate adverse impacts.
6. This application has been reviewed by the Town of Waterford Design Review Board in accordance with Section 22b of the Waterford Zoning Regulations and which Board submits a positive report to the Planning and Zoning Commission.

and that the Commission approve the proposal with the following modifications and conditions:

1. As a result of the site improvements extending onto both parcels, the two parcels known as 439 and 441 Boston Post Road shall be merged into one parcel. This shall be completed prior to filing the plans on the land records.
2. Construction phasing and the implementation of measures to separate the continuing operation of services from the construction activities shall be strictly adhered to as identified on the plan.
3. All conditions of approval for Inland Wetland Permit #C-25-02 shall be incorporated into this decision as if fully set forth herein.

Proposed Motion

To approve with modifications and conditions, the Site Plan for the new Oswegatchie Fire House Facility application #PL-25-3 located at 439 & 441 Boston Post Road, with modifications and conditions 1 and 3 and to adopt the findings 1 thru 6 of the staff report.

7 January 2025

Jonathan Mullen
Planning Director
Town of Waterford
15 Rope Ferry Road
Waterford, CT 06385

**RE: Stormwater Management Report
Oswegatchie Fire Station
441 Boston Post Road
Waterford, Connecticut
Langan Project No.: 140286501**

Dear Mr. Mullen,

This report provides an analysis of the proposed peak runoff discharges and the engineering design for the proposed stormwater conveyance system at 441 Boston Post Road.

PROJECT DESCRIPTION

Existing Conditions

The project site is located at 441 Boston Post Road in Waterford CT; see Figure 1. The overall approximately 2.0-acre parcel is currently occupied by the existing Oswegatchie Fire Station, including impervious and grass areas. The parcel is located within the Niantic River sub regional drainage basin. The parcel area does not contain any known locations of State and Federal Listed Species and Critical Habitats per the CT Natural Diversity Data Base Areas map of Waterford, CT dated June 2024. The project site is located on the western part of the parcel within the limits of the existing fire station site. To the west the project site is bordered by a garden shop. To the south, the project site is bordered by Boston Post Road. To the east the project site is bordered by residential properties on Boston Post Road. To the north the site is bordered by lightly wooded wetland areas. The existing project site is mostly impervious areas with the majority of stormwater running overland towards the wetlands in the north.

Based upon a topographic survey prepared by Langan, dated June 28, 2024, the site grades slope downward from the southern corner of the property towards the northern property line, with elevations ranging from approximately 35 feet to about 30 feet.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Study of the town of Waterford, Connecticut map number 09011C0481J with an effective date of August 5, 2013, the proposed development is located within Zone X (Unshaded). Zone X (Unshaded) is considered a Low-Risk Area and described by FEMA as areas outside the 0.2-percent-annual-chance chance flood. No base flood elevations or base flood depths are shown within these zones.

According to the USDA Natural Resources Conservation Service Web Soil Survey, the site's soil type varies throughout. The site is mostly classified as Hinckley Loamy Sand with an A hydrologic rating and slopes between 3 and 15 percent. Additionally, the eastern corner of the site is classified as Walpole Sandy Loam with a D hydrologic rating and slopes between 0 and 3 percent.

There are wetland areas to the east and north of the site. While some of the site work is proposed within the 100-foot upland review area, no direct wetland impacts are proposed.

Proposed Project

The proposed project consists of the demolition of the existing fire station and the construction of a new fire station building with new landscaped areas, driveways, and parking areas. Additional improvements include new stormwater and utility infrastructure. A summary of the change in impervious is shown below.

Project Site Impervious Cover [SF]

Existing Conditions	Proposed Conditions	Net Decrease
±52,200	±31,500	±20,700

The proposed stormwater system has been designed to maintain existing site hydrology to the maximum extent practicable. The majority of runoff from the new development will be conveyed to various stormwater management systems before discharging to either the existing stormwater network in Boston Post Road or overland towards the existing offsite wetlands. Water quality improvements include yard drains with sumps, a pretreatment swale and a rain garden. These water quality improvements have been designed to retain 100% of the proposed project's water quality volume onsite. This achieves the average annual pollutant load reduction requirements as per the recommendations of the 2024 CT Stormwater Quality Manual.

Details of the size and location of the stormwater network can be found on the Grading &

Drainage Plans, detail sheets and supporting calculations in the appendices of this report.

PEAK RUNOFF ANALYSIS (See Appendices A & B)

The stormwater management system is designed to control the rate of runoff from the site's watersheds to be equal or less than existing conditions up to, and including, a 100-year design storm event.

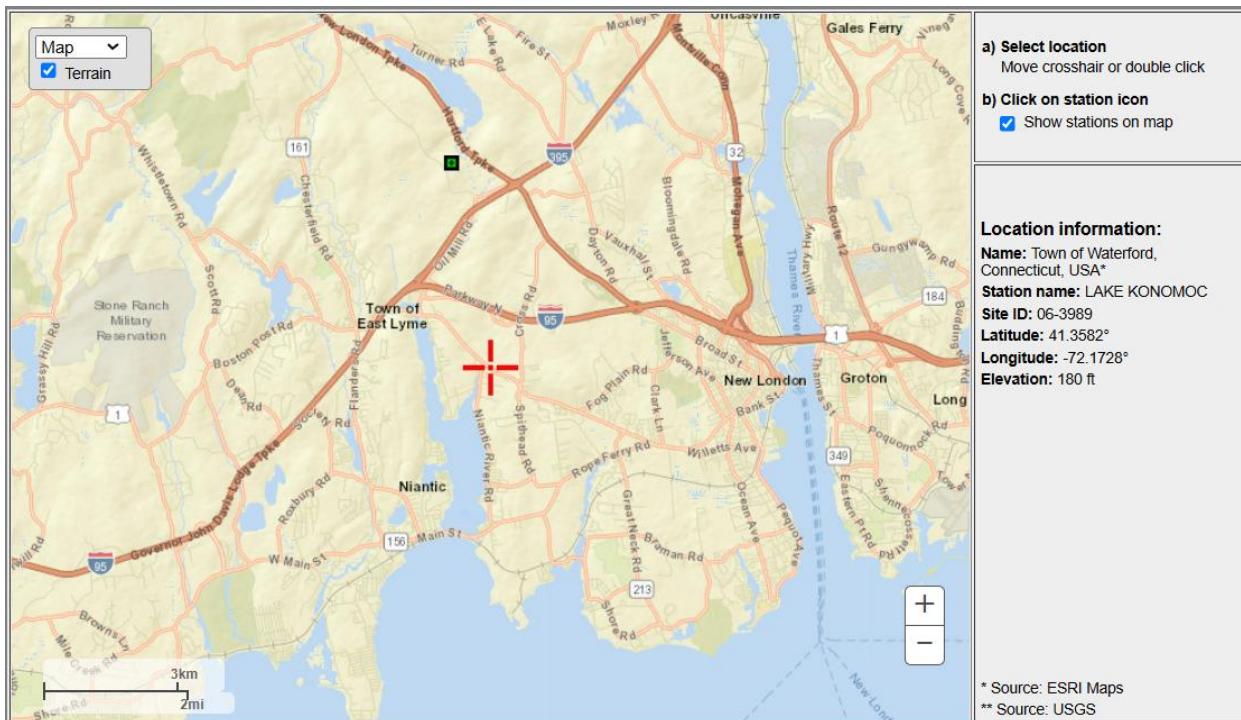
The peak runoff discharges for the existing and proposed conditions were analyzed using Soil Conservation Service (SCS) methodology which outlines procedures for calculating peak rates of runoff resulting from precipitation events as well as procedures for developing runoff hydrographs. The entire site was included in the analysis; see Figures EXWS and PRWS. Values for area, curve number (CN), and a time of concentration were calculated for the existing and proposed conditions.

The curve number is a land sensitive coefficient that dictates the relationship between total rainfall depth and direct storm runoff. The soils within the watershed are divided into hydrologic soil groups (A, B, C, and D). The SCS classification system evaluates the runoff potential of a soil according to its infiltration and transmission rates. "A" soils have the lowest runoff potential, while "D" soils have the greatest runoff potential.

The time of concentration (T_c) is defined as the time for runoff to travel from the hydraulically most distant point in the watershed to a point of interest. Values of time of concentration were determined for existing and proposed conditions based on land cover and slope of the flow path using methods outlined in TR-55.

For this study, a 24-hour SCS Type III standard rainfall distribution was used to determine the peak flow rate and volume to all points of discharge from the site. Precipitation data used for the various storm events is based on the "NOAA Atlas 14 Point Precipitation Frequency Estimates: CT" for Lake Konomoc Station. Lake Konomoc Station was chosen for rainfall data because it is the station located within the closest proximity of the project location as shown in Graphic 1. A summary of all rainfall data utilized in the analysis for this site is provided below and a complete compilation of data provided by NOAA for this location is included in Appendix C.

Graphic 1. NOAA Rainfall Data Location Map



NOAA Precipitation Depth per Average Recurrence Interval [in]

Duration	2-Year	10-Year	25-Year	100-Year
24-hour	3.45	5.13	6.17	7.79

Existing Condition (See Appendix A)

The project area's existing drainage conditions were analyzed as Watersheds A, B, and C (See Drawing EXWS).

Existing Watershed A is approximately 0.26 acres and comprises grassy areas, driveway aprons onto the site and the southwestern portion of the existing building. Stormwater runoff from this watershed either flows into the existing storm drainage network or overland and offsite towards Boston Post Road.

Existing Watershed B is approximately 0.08 acres and consists of grass and brush areas at the east of the site. Stormwater runoff from this watershed flows overland to the wetlands #2 to the east of the site.

Existing Watershed C is about 1.27 acres and consists of the existing building and parking areas along with grassy and brush areas. Stormwater runoff from this watershed flows overland to the wetlands #1 offsite to the north.

Proposed Condition (See Appendix B)

In the proposed condition, site hydrology attempts to mimic existing conditions and all watershed outlets remain the same.

Proposed Watershed A is about 0.37 acres and consists of grassy areas and the proposed driveway aprons. Stormwater will continue to flow overland to Boston Post Road. The proposed site within this watershed has been designed to significantly reduce impervious area as compared with the existing condition.

Proposed Watershed B is about 0.09 acres and includes grass and brush areas to the east of the site. This watershed will remain generally unchanged, and stormwater collected within this watershed will flow overland to the wetlands #2 offsite to the east.

Proposed Watershed C is divided into two sub-watersheds: Sub-watershed C1 and Sub-watershed C2. Sub-watershed C1 is about 1.04 acres and consists of the proposed building and parking areas along with grassy areas; stormwater within this watershed will flow either through a pretreatment swale conveyance feature or directly into a rain garden before flowing to the wetlands #2 offsite to the north. Sub-watershed C2 is about 0.12 acres and consists of grassy and brush areas; stormwater within this watershed will continue to flow overland to the wetlands #2 offsite to the north.

Details of the sizes and locations of the stormwater collection systems can be found on drawings CG101. A conservative design infiltration rate for the rain garden is 1 inch per hour. The design infiltration rate will be confirmed with on-site testing prior to construction. Please refer to Appendix F for boring log data within the vicinity of the proposed rain garden. This testing was performed by Barton & Loguidice as a part of a Limited Phase II Environmental Site Assessment report, dated 08/27/2024. According to the boring log data, groundwater was encountered between 6' and 13' below existing grade, and existing site soils within the rain gardens consist of a mainly sandy material.

Site Discharge Peak Flow Comparison for WS-A (CF)

Storm	Current	Proposed	Delta	% Reduction
2-Year	0.37	0.09	-0.28	75.68%
10-Year	0.77	0.44	-0.33	42.86%
25-Year	1.04	0.71	-0.33	31.73%
100-Year	1.46	1.20	-0.26	17.81%

Site Discharge Peak Flow Comparison for WS-B (CF)

Storm	Current	Proposed	Delta	% Reduction
2-Year	0.02	0.01	-0.01	50.00%
10-Year	0.09	0.09	0.00	0.00%
25-Year	0.15	0.19	0.00	0.00%
100-Year	0.26	0.26	0.00	0.00%

Site Discharge Peak Flow Comparison for WS-C (CF)

Storm	Current	Proposed	Delta	% Reduction
2-Year	3.77	0.32	-3.45	91.51%
10-Year	5.91	2.04	-3.87	65.48%
25-Year	7.22	3.73	-3.49	48.34%
100-Year	9.24	5.62	-3.62	39.18%

Site Discharge Peak Flow Comparison for Total Site (CF)

Storm	Current	Proposed	Delta	% Reduction
2-Year	4.15	0.38	-3.77	90.84%
10-Year	6.76	2.39	-4.37	64.65%
25-Year	8.39	4.44	-3.95	47.08%
100-Year	10.95	6.93	-4.02	36.71%

As can be seen from the tables above, runoff from each watershed and the total site will be attenuated for the storms up to and including the 100-year storm. Additionally, per the 2024 CT Stormwater Quality Manual requirements, runoff from each watershed that includes proposed site development will be attenuated by 50% for the 2-year storm event.

STORMWATER CONVEYANCE SYSTEM (See Appendix D)

The stormwater conveyance system was sized using the Rational Method for the 10-year storm event as per the CTDEEP Stormwater Quality Manual. Values for area, runoff coefficient, C, and

a time of concentration were calculated for each drainage area. The average runoff coefficient was calculated based upon the following cover types:

<u>Cover</u>	<u>C</u>
Grass/Pervious	0.3
Roof/Pavement/Impervious	0.9

Rainfall intensities were taken from the "NOAA Atlas 14 Point Precipitation Frequency Estimates: CT" for Lake Konomoc. Stormwater pipes were then sized based upon the Manning's Equation for full flow pipe capacity and solving for the hydraulic grade line. The computer program Hydraflow Storm Sewers 2011 by Intellisolve was used in the analysis.

Each proposed storm sewer system has been analyzed sing a starting HGL elevation equal to the outlet pipe's crown elevation. This mimics a tailwater elevation equal to the outlet pipe's diameter or a scenario where a proposed pipe is entering an existing pipe flow at full capacity.

STORMWATER QUALITY (See Appendix E)

The proposed stormwater management system has been designed to incorporate stormwater quality measures including a significant decrease in site imperviousness, yard drains with sumps, a pretreatment swale conveyance feature, and a rain garden. These measures will be implemented to increase water quality and minimize the passage of pollutants to the existing stormwater systems as compared to current conditions.

Under current conditions, the entirety of the site impervious cover ($\pm 52,200$ SF) is considered directly connected impervious area (DCIA). This project proposes to decrease DCIA by over 90%, which will decrease surface runoff and increase infiltration of rainfall into the soil.

Per Table 4.1 of the CT Stormwater Quality Manual, the site is considered a redevelopment with existing DCIA of 40% or more. As such, the Required Retention Volume (RRV) is 50% of the site's Water Quality Volume (WQV). Through coordination with the town of Waterford Environmental Planner, this project occurs within the Stony Brook watershed area. Stormwater discharge from the site contributes to an intermittent watercourse and wetland system located north of the parcel. The receiving portion of Stony Brook south of Route 1 has been designated as an impaired waterbody by CTDEEP. Because of this information, the stormwater system has

been designed to retain 100% of the site WQV and exceed the RRV requirements for our redevelopment site.

Table 4.3 of the CT Stormwater Quality Manual shows the minimum average annual pollutant load reductions for Total Suspended Solids (TSS), Total Phosphorus (TP) and Total Nitrogen (TN). Per the manual, “a proposed stormwater management system meets or exceeds these average pollutant load reductions when the RRV is retained on-site using suitable stormwater retention practices. Achieving these minimum required load reductions for sediment and nutrients is assumed to provide adequate reductions of other stormwater pollutants including floatable materials.” Through the use of the proposed rain garden, the stormwater system designed exceeds our RRV and will retain 100% of the WQV, thereby also exceeding the required average annual pollutant load reductions.

CONCLUSION

The proposed stormwater management system has been designed in general accordance with the 2024 CTDEEP Stormwater Quality Manual and the 2000 CTDOT Drainage Manual. It has been designed to maintain existing site hydrology to the maximum extent practicable with attenuated peak flows and multiple water quality improvements.

This Langan report shows that the proposed stormwater management system, as designed, will effectively manage quality and quantity of stormwater runoff for the proposed development. Please refer to the Drawings for additional drainage information.

Sincerely,
Langan CT, Inc.


Brian Phillips, P.E.
Senior Project Manager

LIST OF FIGURES

Fig. 1	Location Map
Fig. 2	FEMA Flood Map
Fig. 3	NRCS Soil Map

LIST OF DRAWINGS

EXWS	Existing Watershed Map
PRWS	Proposed Watershed Map
DACB	Drainage Area Catchment Basin Map

REFERENCE DRAWINGS

CG101	Grading & Drainage Plan
CG501	Grading & Drainage Details

LIST OF APPENDICES

Appendix A	Existing Stormwater Discharge Calculations
Appendix B	Proposed Stormwater Discharge Calculations
Appendix C	NOAA Rainfall Data
Appendix D	Stormwater Collection System Calculations
Appendix E	Supporting Calculations
Appendix F	Boring Logs (by others)
Appendix G	Stormwater Management System Operation and Maintenance Plan

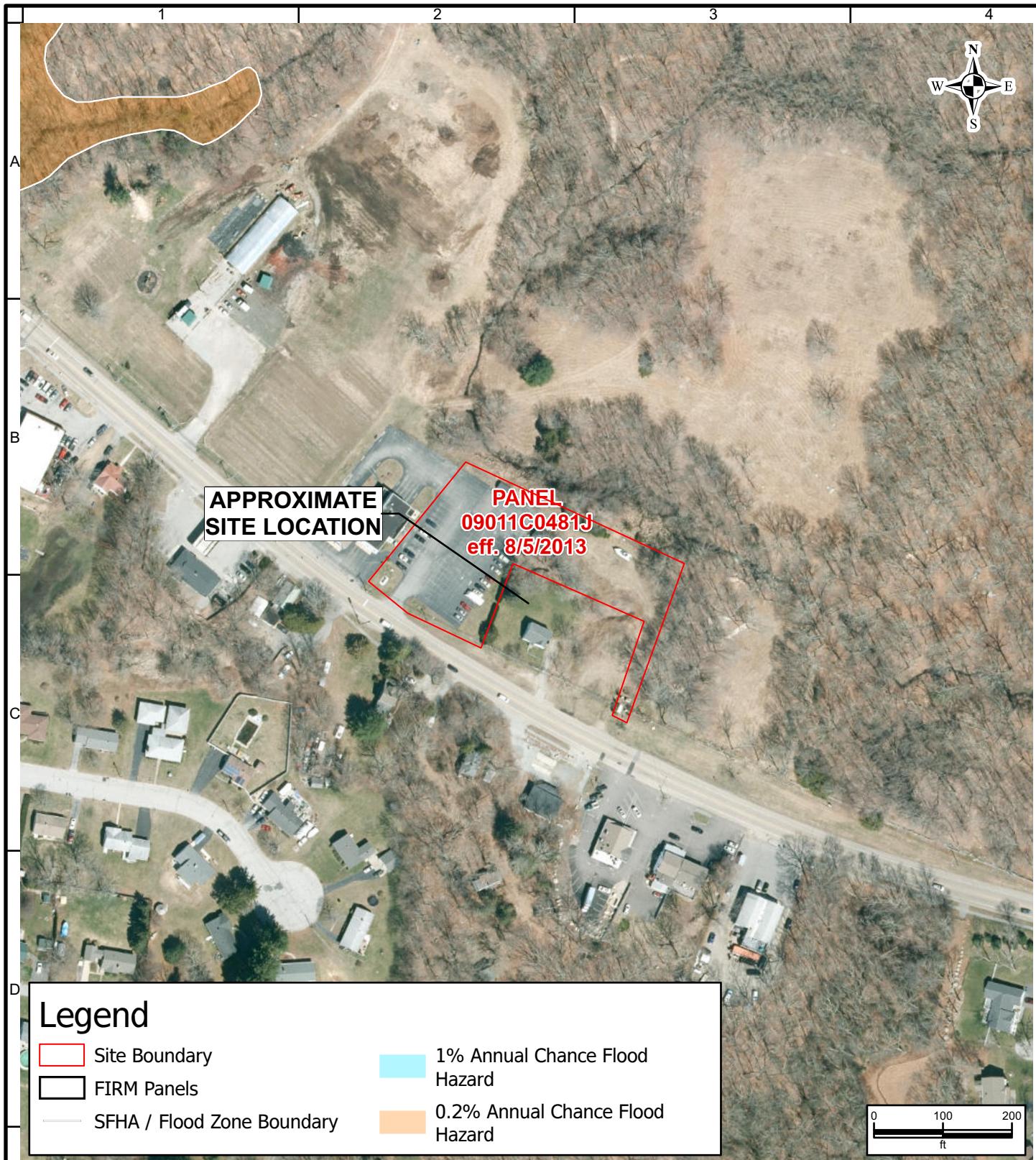


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LANGAN 300 Kimball Drive 4th Floor Parsippany NJ 07054-2172 T: 973-560-4900 F: 973-560-4901 www.langan.com	<p>Project Oswegatchie Fire Station</p> <p>WATERFORD CONNECTICUT SOUTHEASTERN</p>	<p>Drawing Title SITE LOCATION</p> <p>CT</p>	<p>Project No. 140286501</p> <p>Date 1/3/2025</p> <p>Scale 1:200</p> <p>Drawn By Site Analyzer</p> <p>Submission Date 1/3/2025</p>	<p>Figure 1</p> <p>Sheet 1 of 2</p>
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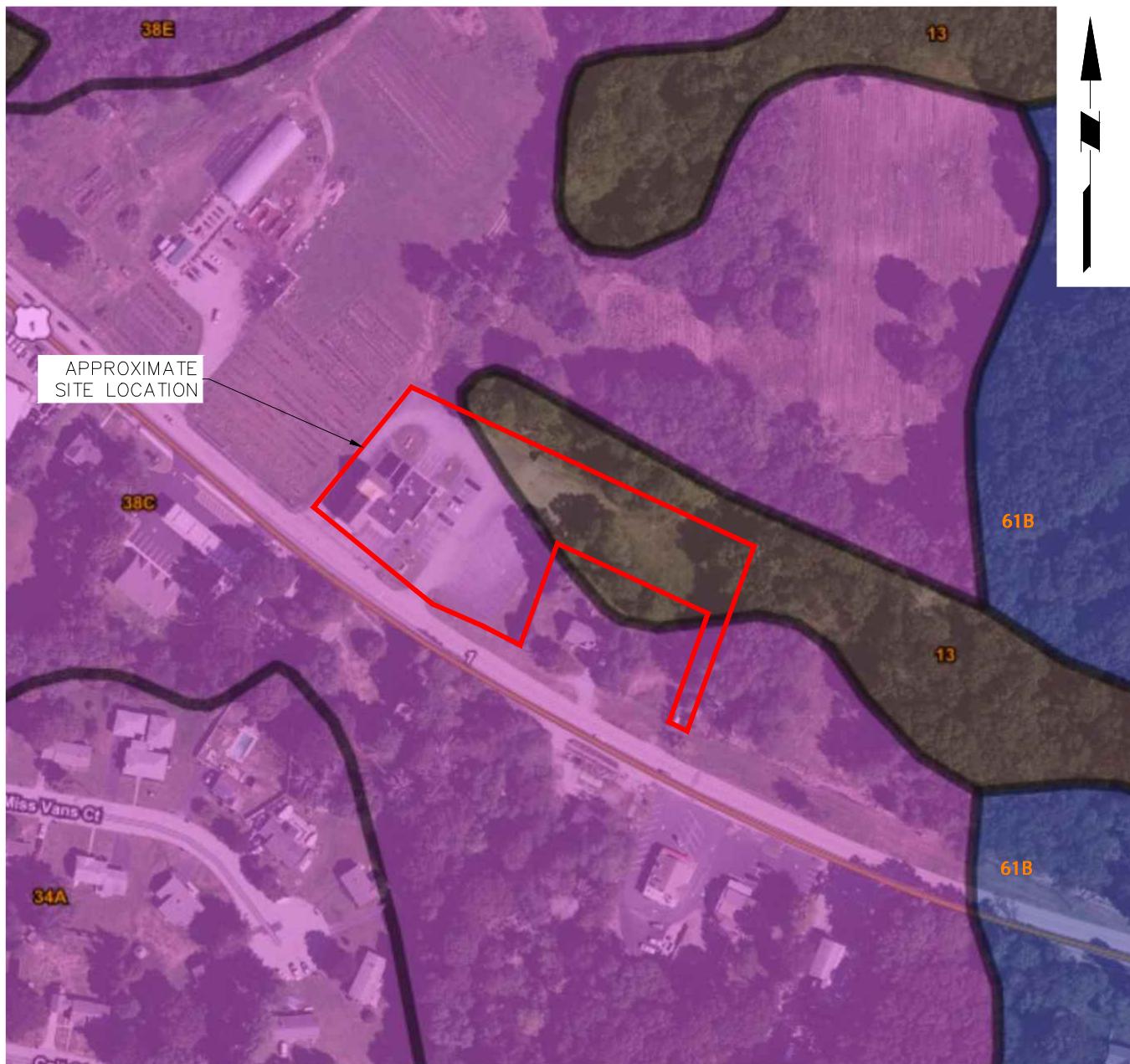
Spatial Reference: NAD 1983 StatePlane Connecticut FIPS 0600 Feet



LANGAN 300 Kimball Drive 4th Floor Parsippany NJ 07054-2172 T: 973-560-4900 F: 973-560-4901 www.langan.com	Project Oswegatchie Fire Station WATERFORD CONNECTICUT SOUTHEASTERN	Drawing Title EFFECTIVE FEMA FIRM CT	Project No. 140286501 Date 1/3/2025 Scale 1:200 Drawn By Site Analyzer Submission Date 1/3/2025	Figure 2 Sheet 2 of 2
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Spatial Reference: NAD 1983 StatePlane Connecticut FIPS 0600 Feet

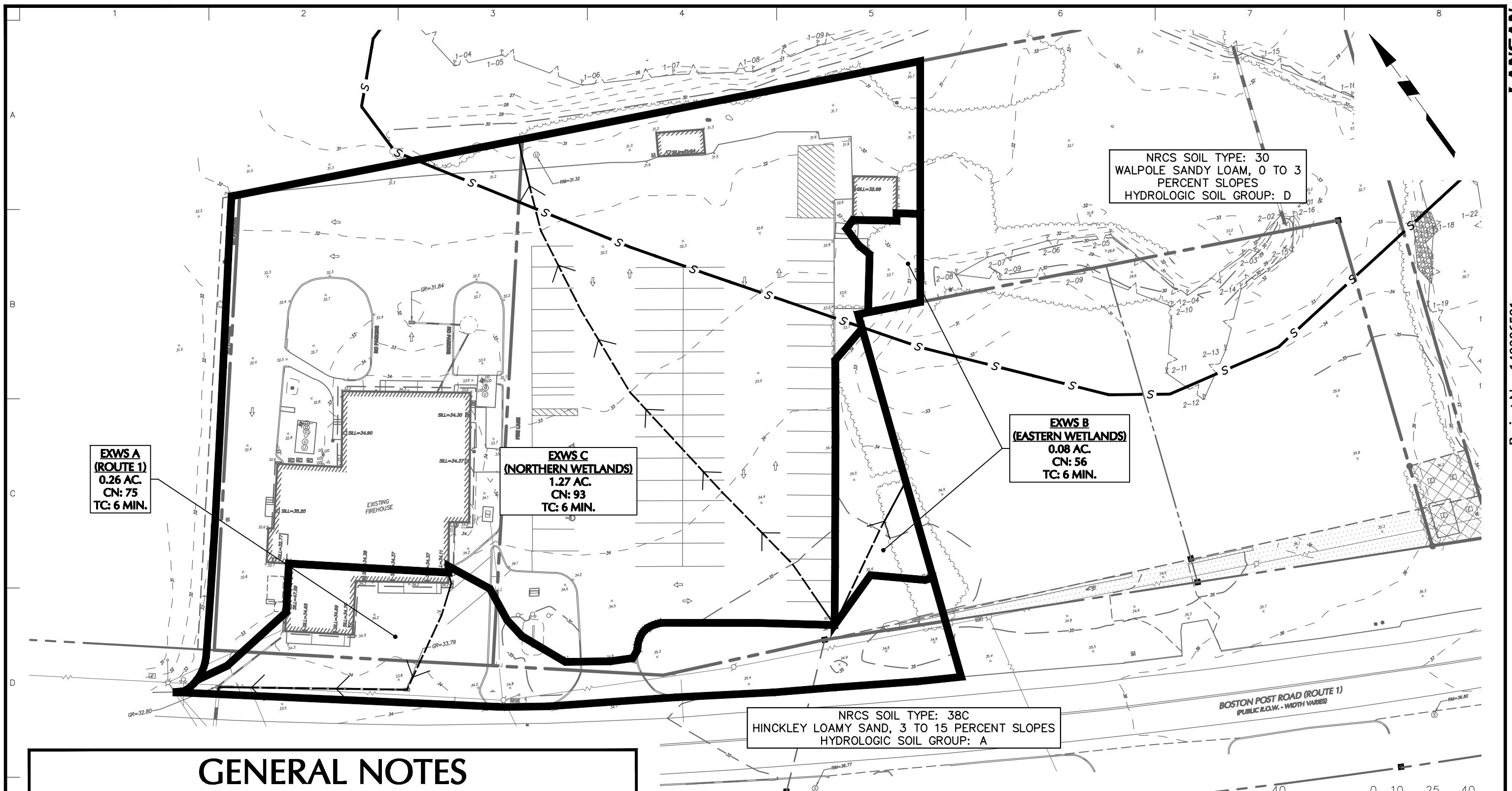


SOIL TYPE LEGEND

SYMBOL	NAME	GROUP
13	WALPOLE SANDY LOAM, 0 TO 3 PERCENT SLOPES	B/D
38C	HINCKLEY LOAMY SAND, 3 TO 15 PERCENT SLOPES	A

REFERENCE: WEB SOIL SURVEY BY THE UNITED STATES DEPARTMENT OF
AGRICULTURAL AND NATURAL RESOURCES CONSERVATION SERVICE.

LANGAN Langan CT, Inc. 555 Long Wharf Drive, 9th Floor New Haven, CT 06511 T: 203.562.5771 F: 203.789.6142 www.langan.com	Project OSWEGATCHIE FIRE STATION WATERFORD CONNECTICUT	Drawing Title NRCS SOILS MAP	Project No. 140286501 Date 1/7/2025 Drawn By APF Checked By BP	Drawing No. 3 Sheet 3 of 1
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GENERAL NOTES

1. EXISTING INFORMATION OBTAINED FROM THE FOLLOWING "BOUNDARY AND TOPOGRAPHIC SURVEY", 439 & 441 BOSTON POST ROAD, WATERFORD, CT, DATED JUNE 28, 2024.
2. PROPOSED BUILDING FOOTPRINT RECEIVED ELECTRONICALLY FROM SILVER PETRUCELLI ARCHITECTURE IN DECEMBER 2024.
3. THE SITE IS LOCATED WITHIN ZONE X OF FEMA FIRM MAP 09011C0481J, EFFECTIVE AUGUST 5, 2013. ZONE X IS AN AREA OF MINIMAL FLOOD HAZARD WITH NO BASE FLOOD ELEVATIONS.

LANGAN

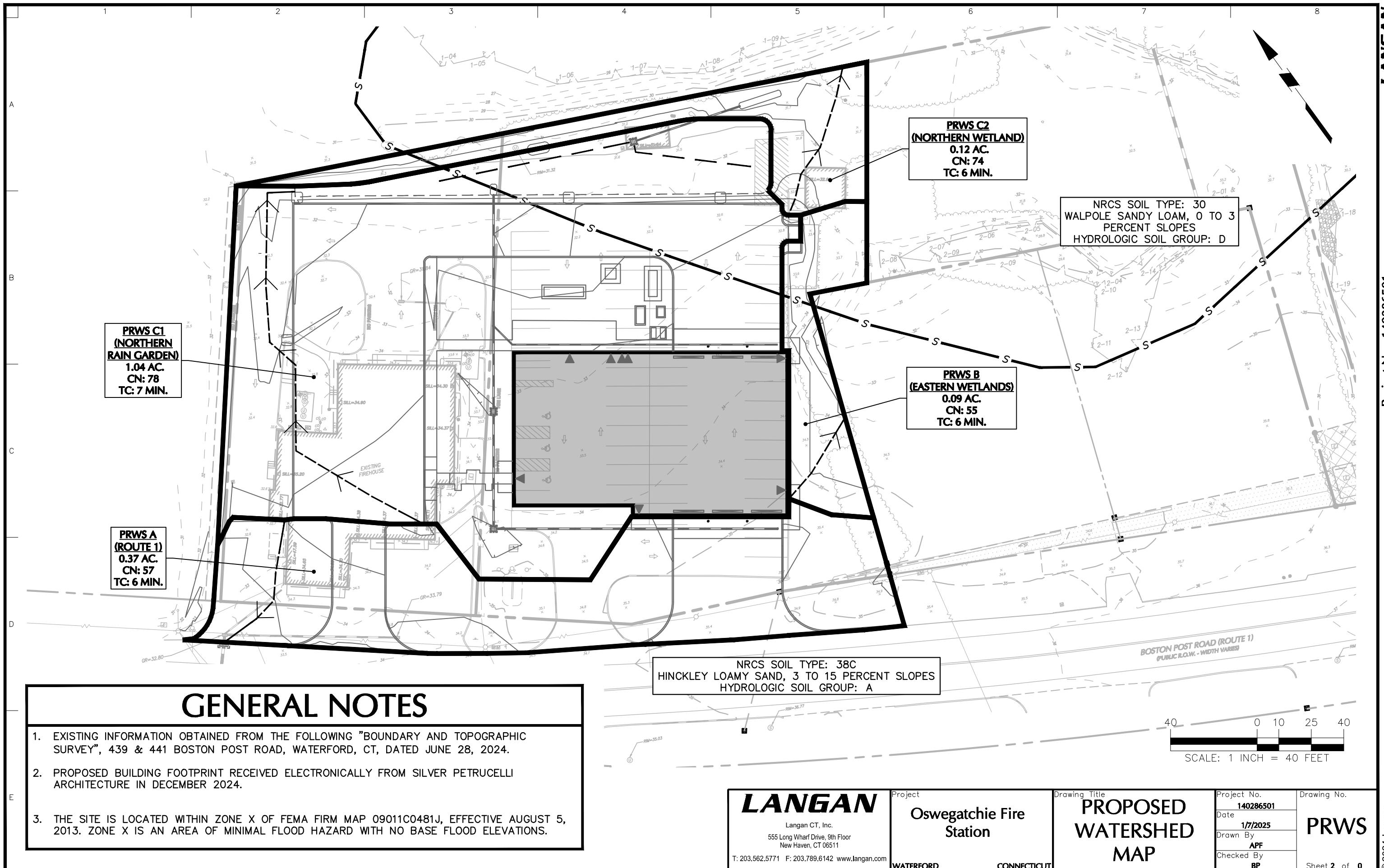
Langan CT, Inc.
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New Haven, CT 06511
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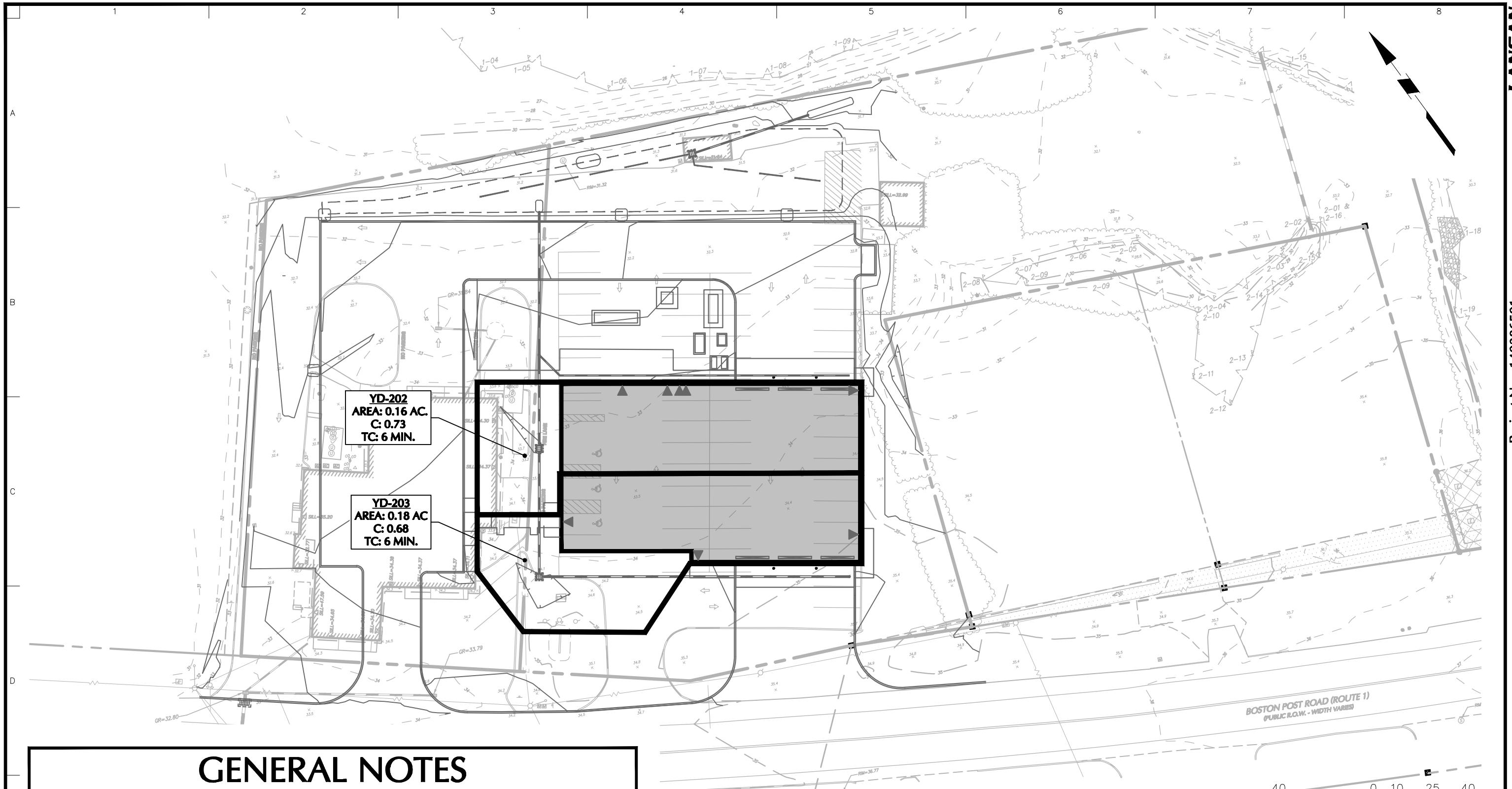
Project
**Oswegatchie Fire
Station**
WATERFORD CONNECTICUT

Drawing Title
**EXISTING
WATERSHED
MAP**

Project No.
140286501
Date
1/7/2025
Drawn By
APF
Checked By
BP

Drawing No.
EXWS
Sheet 1 of 3
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GENERAL NOTES

1. EXISTING INFORMATION OBTAINED FROM THE FOLLOWING "BOUNDARY AND TOPOGRAPHIC SURVEY", 439 & 441 BOSTON POST ROAD, WATERFORD, CT, DATED JUNE 28, 2024.
2. PROPOSED BUILDING FOOTPRINT RECEIVED ELECTRONICALLY FROM SILVER PETRUCELLI ARCHITECTURE IN DECEMBER 2024.
3. THE SITE IS LOCATED WITHIN ZONE X OF FEMA FIRM MAP 09011C0481J, EFFECTIVE AUGUST 5, 2013. ZONE X IS AN AREA OF MINIMAL FLOOD HAZARD WITH NO BASE FLOOD ELEVATIONS.

LANGAN

Langan CT, Inc.
555 Long Wharf Drive, 9th Floor
New Haven, CT 06511

T: 203.562.5771 F: 203.789.6142 www.langan.com

Project
Oswegatchie Fire
Station
WATERFORD CONNECTICUT

Drawing Title
**DRAINAGE AREA
CATCHMENT
BASIN MAP**

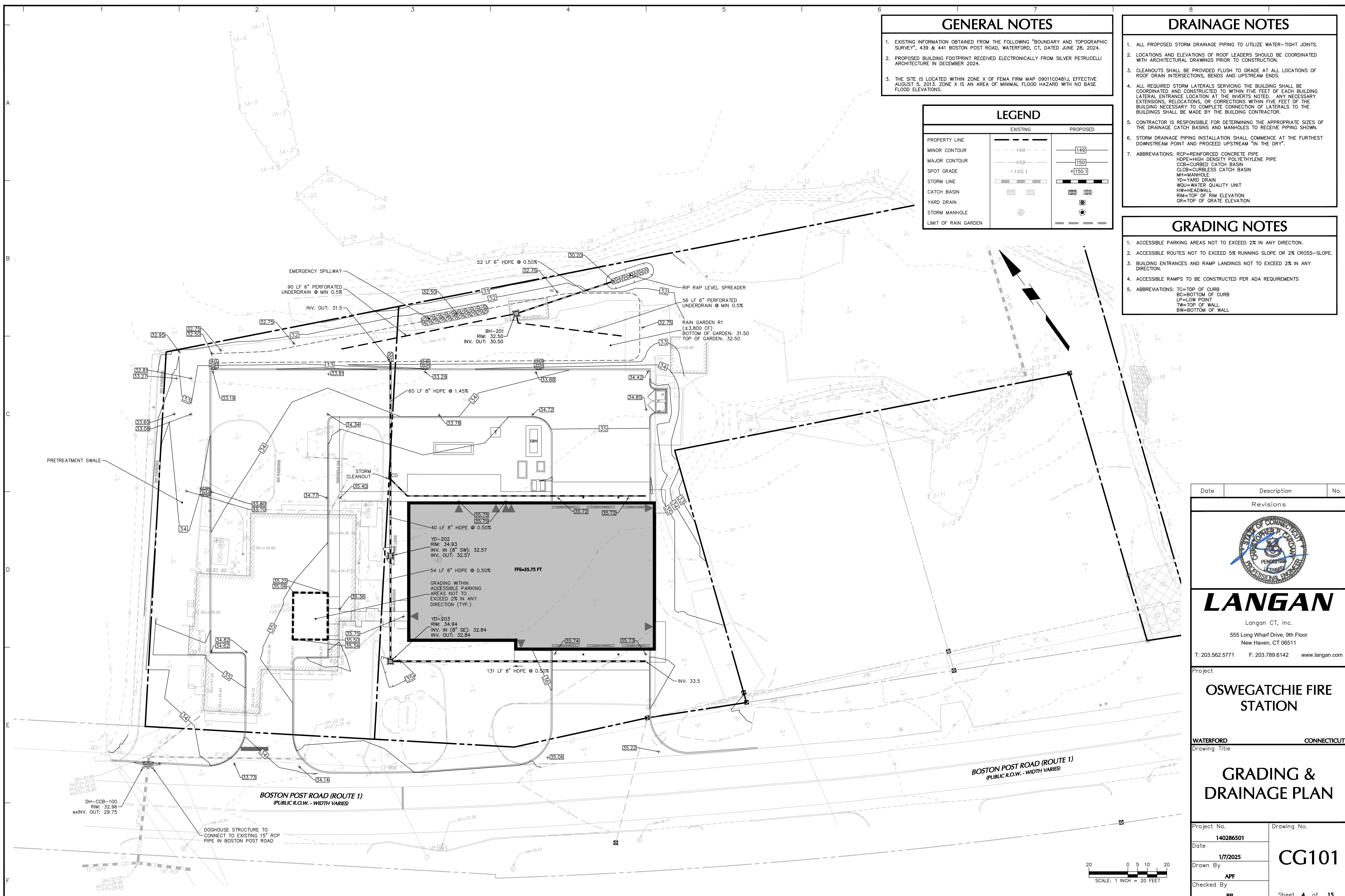
Project No.
140286501

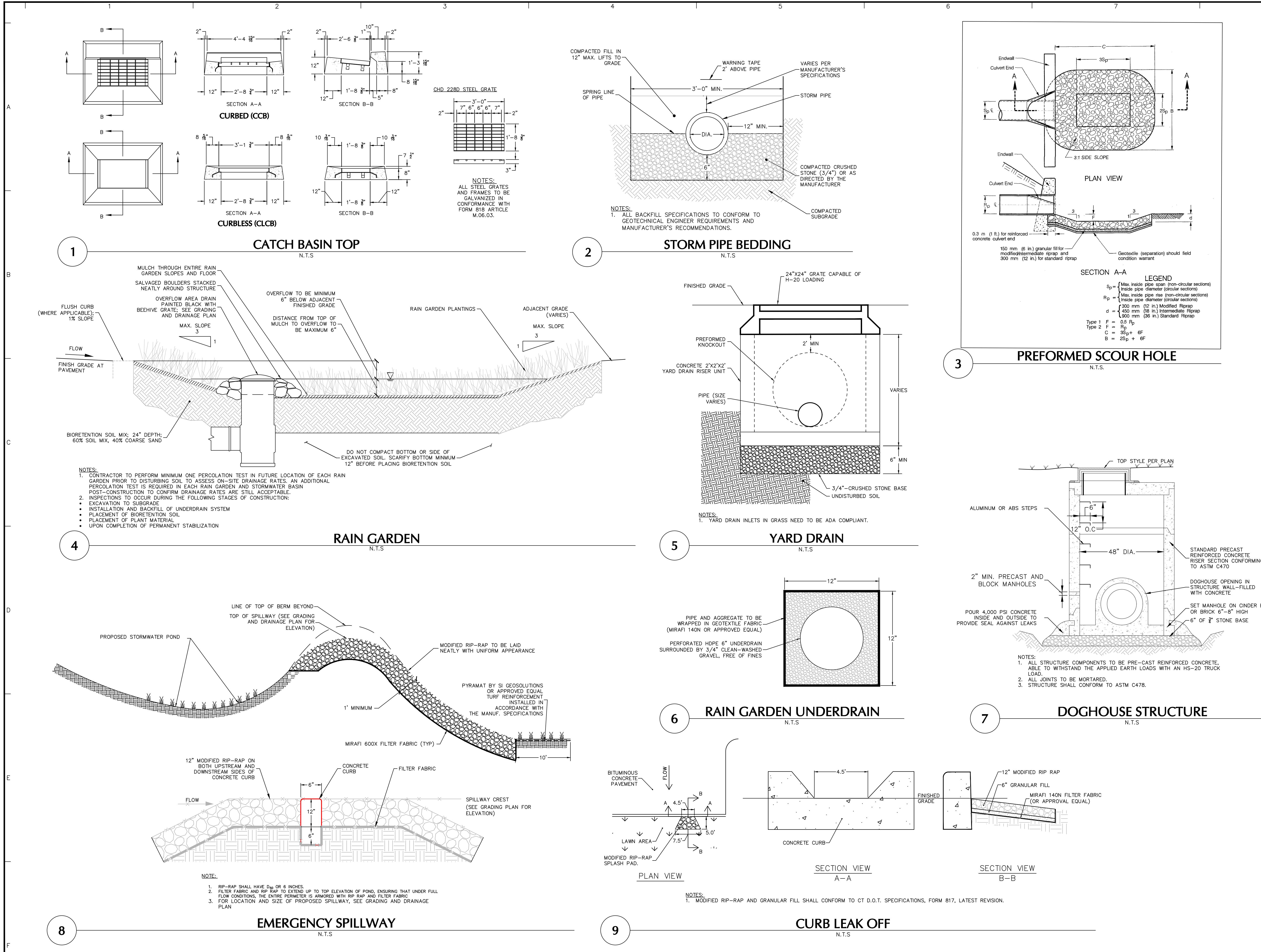
Date
1/7/2024

Drawn By
APF

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BP

Sheet 3 of 3





Date	Description	No.
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Project

OSWEGATCHIE FIRE STATION

WATERFORD CONNECTICUT

GRADING AND DRAINAGE DETAILS

Project No. 140286501

Drawing No.

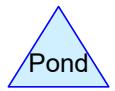
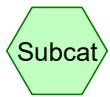
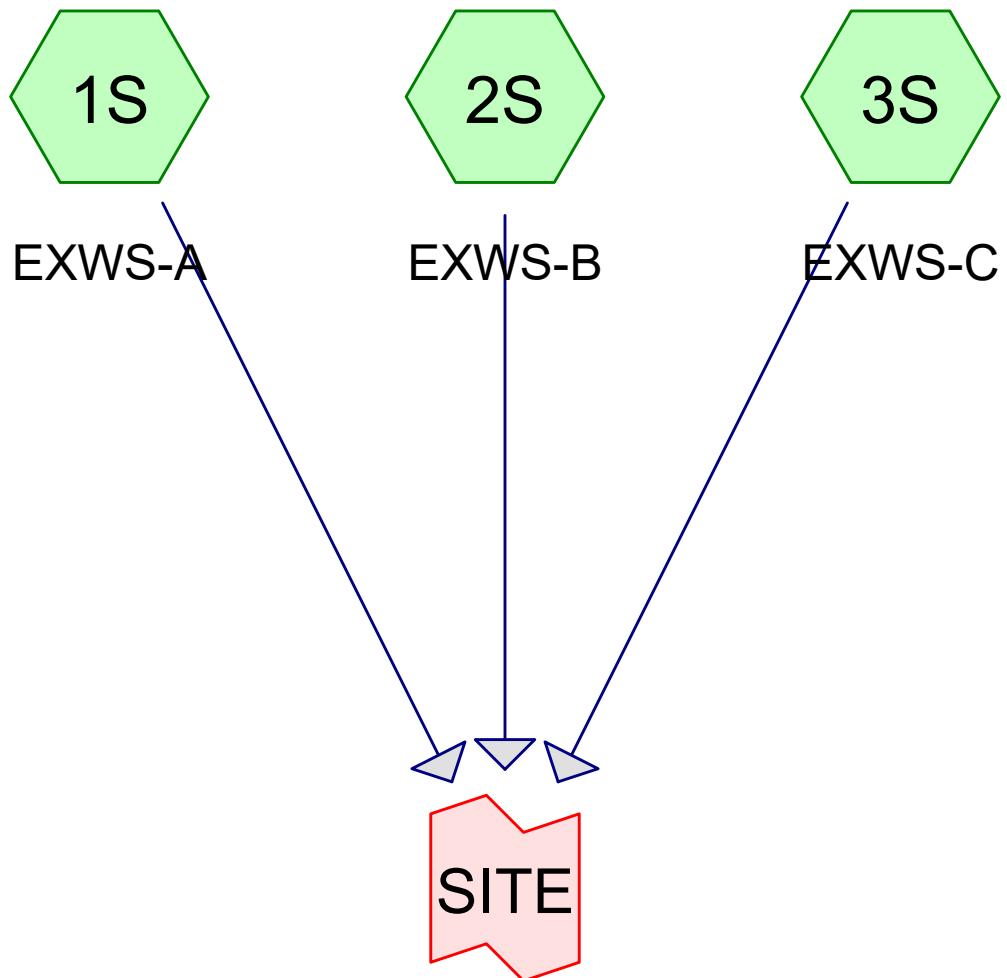
1/7/2025

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Checked By BP

Sheet 5 of 15

APPENDIX A
Existing Stormwater Discharge Calculations



Routing Diagram for EX Hydro
Prepared by Langan Engineering, Printed 11/12/2024
HydroCAD® 10.20-3f s/n 08223 © 2023 HydroCAD Software Solutions LLC

EX Hydro

Prepared by Langan Engineering

HydroCAD® 10.20-3f s/n 08223 © 2023 HydroCAD Software Solutions LLC

Printed 11/12/2024

Page 2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
13,021	49	50-75% Grass cover, Fair, HSG A (1S, 2S, 3S)
4,022	84	50-75% Grass cover, Fair, HSG D (2S, 3S)
1,432	77	Brush, Fair, HSG D (2S, 3S)
52,049	98	Paved parking, HSG A (1S, 3S)
36	98	Paved parking, HSG D (2S)
70,560	88	TOTAL AREA

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: EXWS-A

Runoff Area=11,475 sf 52.74% Impervious Runoff Depth=1.27"
Flow Length=137' Tc=6.0 min CN=75 Runoff=0.37 cfs 1,211 cf

Subcatchment 2S: EXWS-B

Runoff Area=3,749 sf 0.96% Impervious Runoff Depth=0.36"
Flow Length=68' Slope=0.0250 '/' Tc=6.4 min CN=56 Runoff=0.02 cfs 113 cf

Subcatchment 3S: EXWS-C

Runoff Area=55,336 sf 83.12% Impervious Runoff Depth=2.69"
Flow Length=248' Slope=0.0200 '/' Tc=6.0 min CN=93 Runoff=3.77 cfs 12,389 cf

Link SITE: Total Site

Inflow=4.15 cfs 13,713 cf
Primary=4.15 cfs 13,713 cf

Total Runoff Area = 70,560 sf Runoff Volume = 13,713 cf Average Runoff Depth = 2.33"
26.18% Pervious = 18,475 sf 73.82% Impervious = 52,085 sf

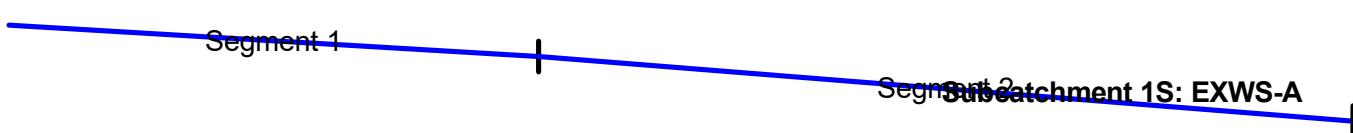
Summary for Subcatchment 1S: EXWS-A

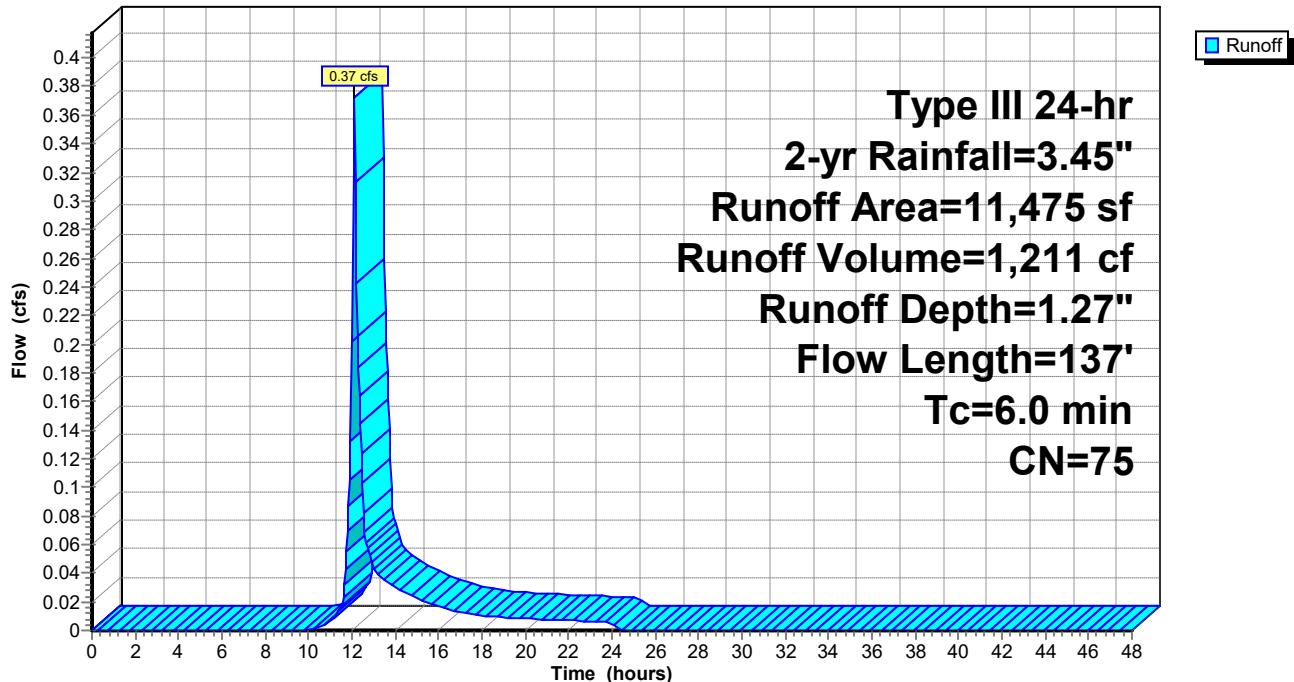
Runoff = 0.37 cfs @ 12.10 hrs, Volume= 1,211 cf, Depth= 1.27"
 Routed to Link SITE : Total Site

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=3.45"

Area (sf)	CN	Description
5,423	49	50-75% Grass cover, Fair, HSG A
6,052	98	Paved parking, HSG A
11,475	75	Weighted Average
5,423		47.26% Pervious Area
6,052		52.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	54	0.0075	0.85		Sheet Flow, Segment 1 Smooth surfaces n= 0.011 P2= 3.43"
0.3	83	0.0100	4.50	1.57	Pipe Channel, Segment 2 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010
1.4	137				Total, Increased to minimum Tc = 6.0 min



Subcatchment 1S: EXWS-A**Hydrograph**

Summary for Subcatchment 2S: EXWS-B

Runoff = 0.02 cfs @ 12.15 hrs, Volume= 113 cf, Depth= 0.36"
 Routed to Link SITE : Total Site

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=3.45"

Area (sf)	CN	Description
2,844	49	50-75% Grass cover, Fair, HSG A
770	77	Brush, Fair, HSG D
99	84	50-75% Grass cover, Fair, HSG D
36	98	Paved parking, HSG D

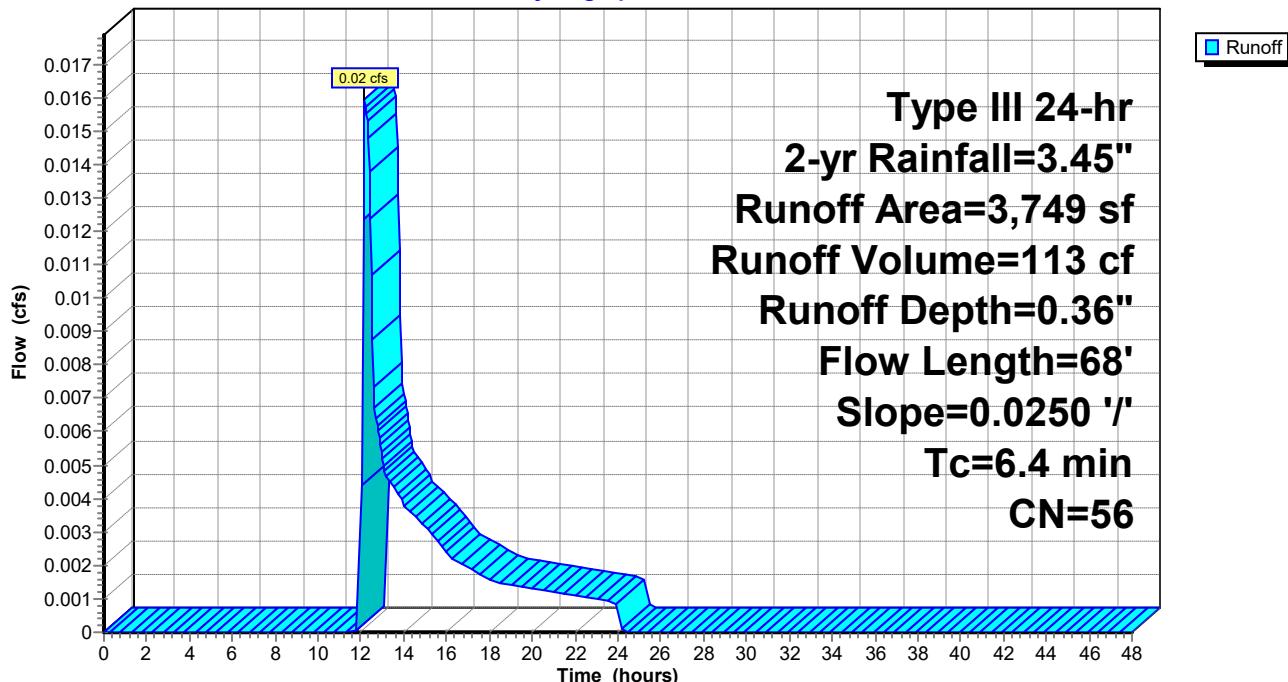
3,749	56	Weighted Average
3,713		99.04% Pervious Area
36		0.96% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.4	68	0.0250	0.18	Sheet Flow, Segment 1	
				Grass: Short n= 0.150 P2= 3.43"	



Subcatchment 2S: EXWS-B

Hydrograph



Summary for Subcatchment 3S: EXWS-C

Runoff = 3.77 cfs @ 12.09 hrs, Volume= 12,389 cf, Depth= 2.69"
 Routed to Link SITE : Total Site

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=3.45"

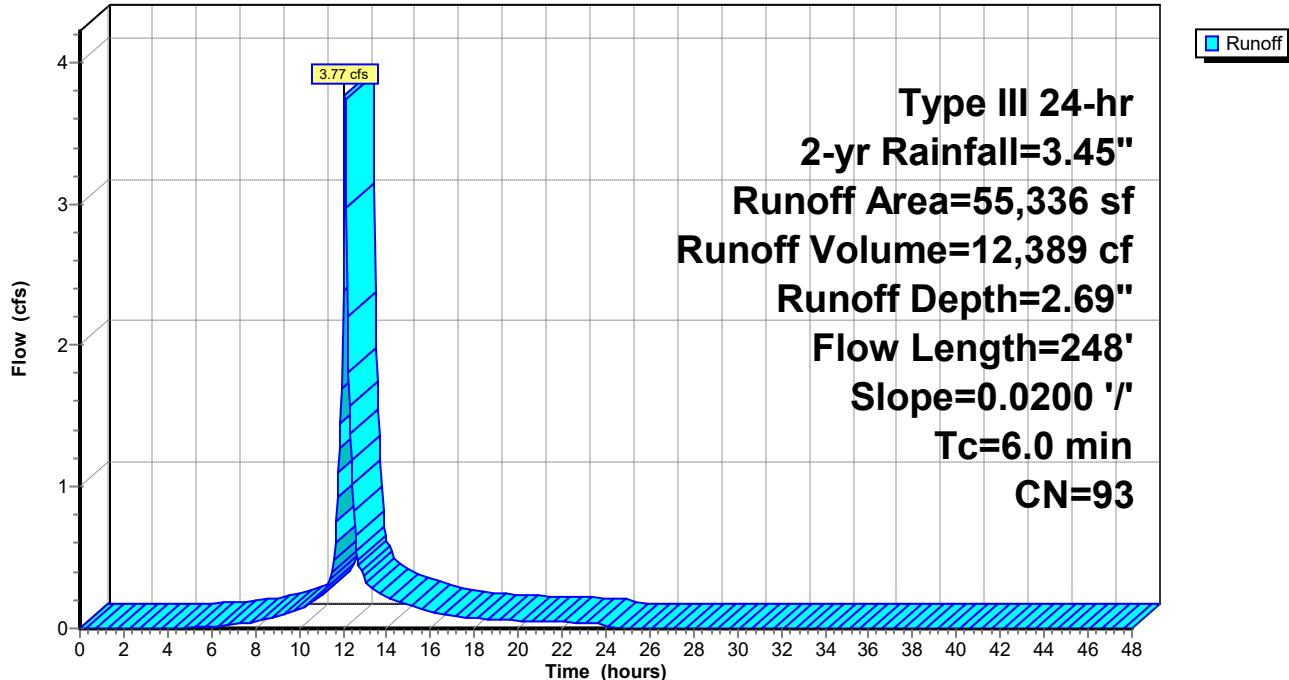
Area (sf)	CN	Description
4,754	49	50-75% Grass cover, Fair, HSG A
3,923	84	50-75% Grass cover, Fair, HSG D
662	77	Brush, Fair, HSG D
45,997	98	Paved parking, HSG A
55,336	93	Weighted Average
9,339		16.88% Pervious Area
45,997		83.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	150	0.0200	1.54		Sheet Flow, Segment 1 Smooth surfaces n= 0.011 P2= 3.43"
0.5	86	0.0200	2.87		Shallow Concentrated Flow, Segment 2 Paved Kv= 20.3 fps
0.1	12	0.0200	2.12		Shallow Concentrated Flow, Segment 3 Grassed Waterway Kv= 15.0 fps
2.2	248	Total, Increased to minimum Tc = 6.0 min			

Segment 1

Subcatchment 3S: EXWS-C

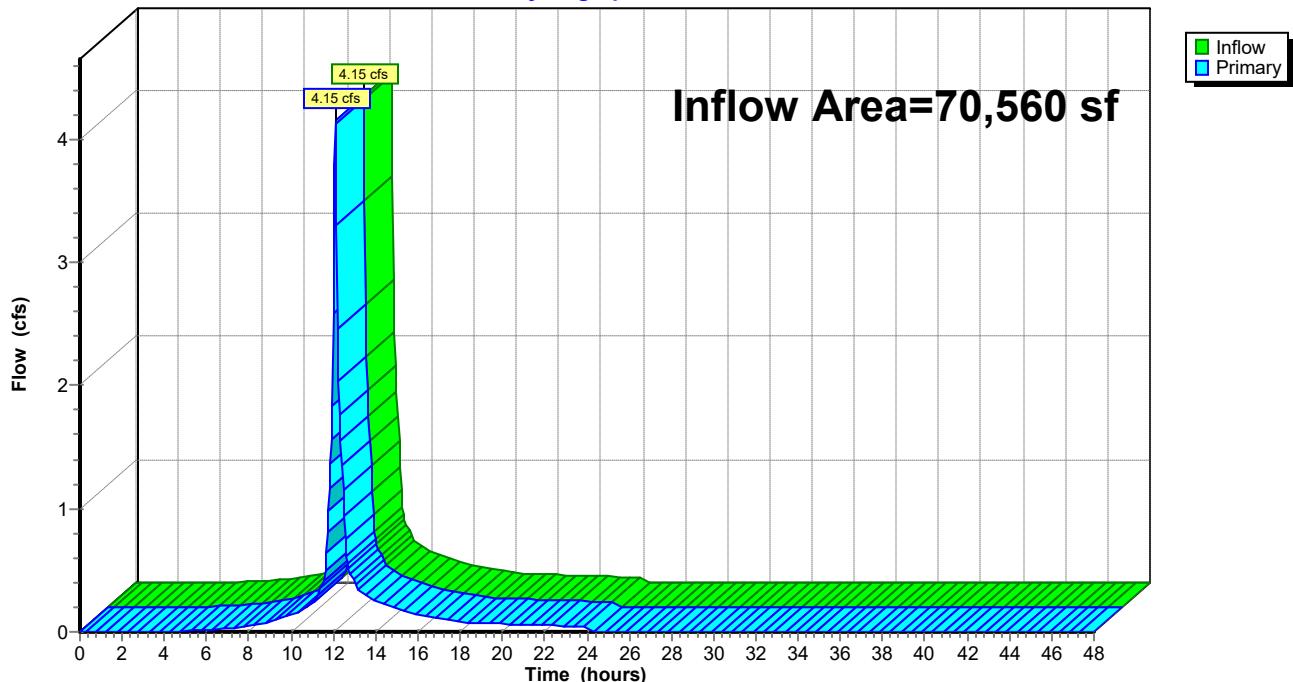
Segment 2 Segment 3

Subcatchment 3S: EXWS-C**Hydrograph**

Summary for Link SITE: Total Site

Inflow Area = 70,560 sf, 73.82% Impervious, Inflow Depth = 2.33" for 2-yr event
Inflow = 4.15 cfs @ 12.09 hrs, Volume= 13,713 cf
Primary = 4.15 cfs @ 12.09 hrs, Volume= 13,713 cf, Atten= 0%, Lag= 0.0 min

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

Link SITE: Total Site**Hydrograph**

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: EXWS-A

Runoff Area=11,475 sf 52.74% Impervious Runoff Depth=2.56"
Flow Length=137' Tc=6.0 min CN=75 Runoff=0.77 cfs 2,443 cf

Subcatchment 2S: EXWS-B

Runoff Area=3,749 sf 0.96% Impervious Runoff Depth=1.11"
Flow Length=68' Slope=0.0250 '/' Tc=6.4 min CN=56 Runoff=0.09 cfs 347 cf

Subcatchment 3S: EXWS-C

Runoff Area=55,336 sf 83.12% Impervious Runoff Depth=4.33"
Flow Length=248' Slope=0.0200 '/' Tc=6.0 min CN=93 Runoff=5.91 cfs 19,947 cf

Link SITE: Total Site

Inflow=6.76 cfs 22,737 cf
Primary=6.76 cfs 22,737 cf

Total Runoff Area = 70,560 sf Runoff Volume = 22,737 cf Average Runoff Depth = 3.87"
26.18% Pervious = 18,475 sf 73.82% Impervious = 52,085 sf

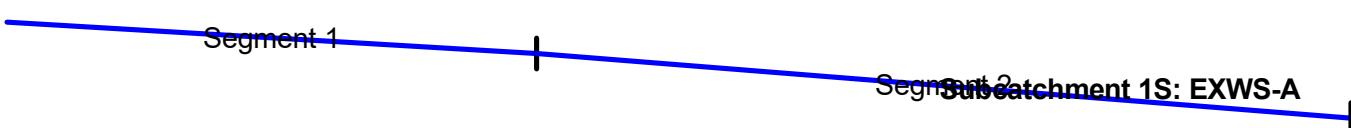
Summary for Subcatchment 1S: EXWS-A

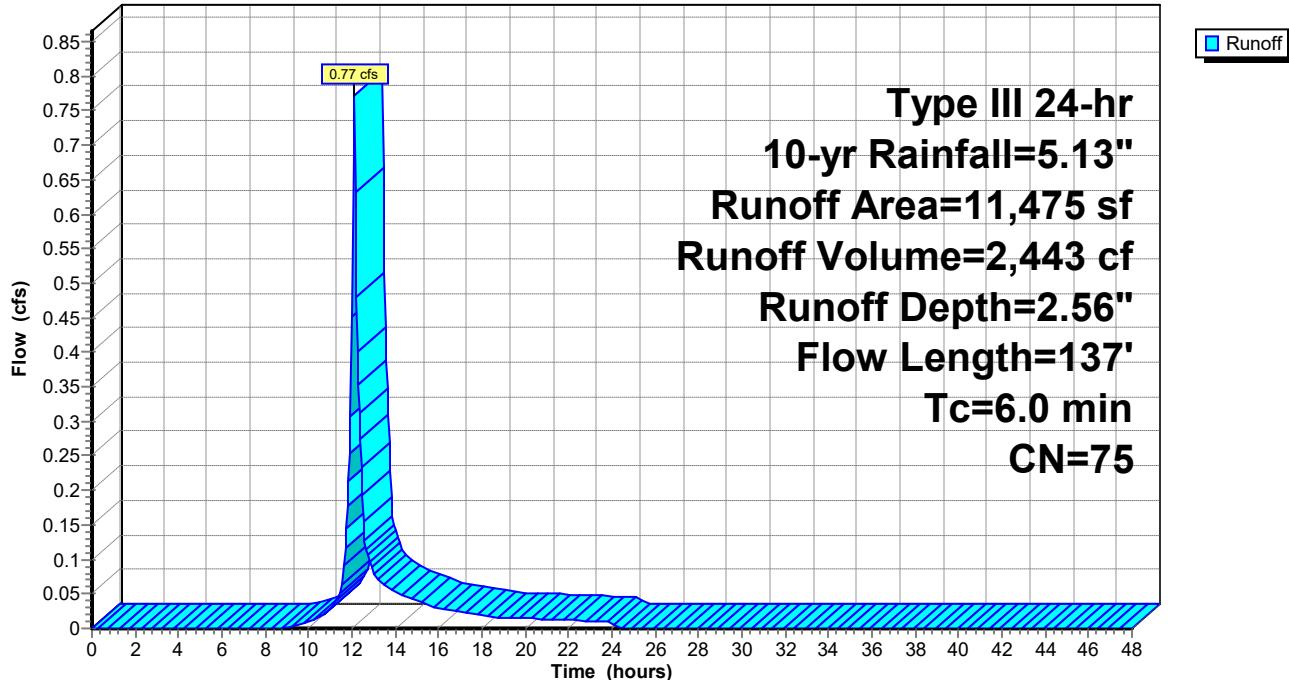
Runoff = 0.77 cfs @ 12.09 hrs, Volume= 2,443 cf, Depth= 2.56"
Routed to Link SITE : Total Site

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=5.13"

Area (sf)	CN	Description
5,423	49	50-75% Grass cover, Fair, HSG A
6,052	98	Paved parking, HSG A
11,475	75	Weighted Average
5,423		47.26% Pervious Area
6,052		52.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	54	0.0075	0.85		Sheet Flow, Segment 1 Smooth surfaces n= 0.011 P2= 3.43"
0.3	83	0.0100	4.50	1.57	Pipe Channel, Segment 2 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010
1.4	137				Total, Increased to minimum Tc = 6.0 min



Subcatchment 1S: EXWS-A**Hydrograph**

Summary for Subcatchment 2S: EXWS-B

Runoff = 0.09 cfs @ 12.11 hrs, Volume= 347 cf, Depth= 1.11"
 Routed to Link SITE : Total Site

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=5.13"

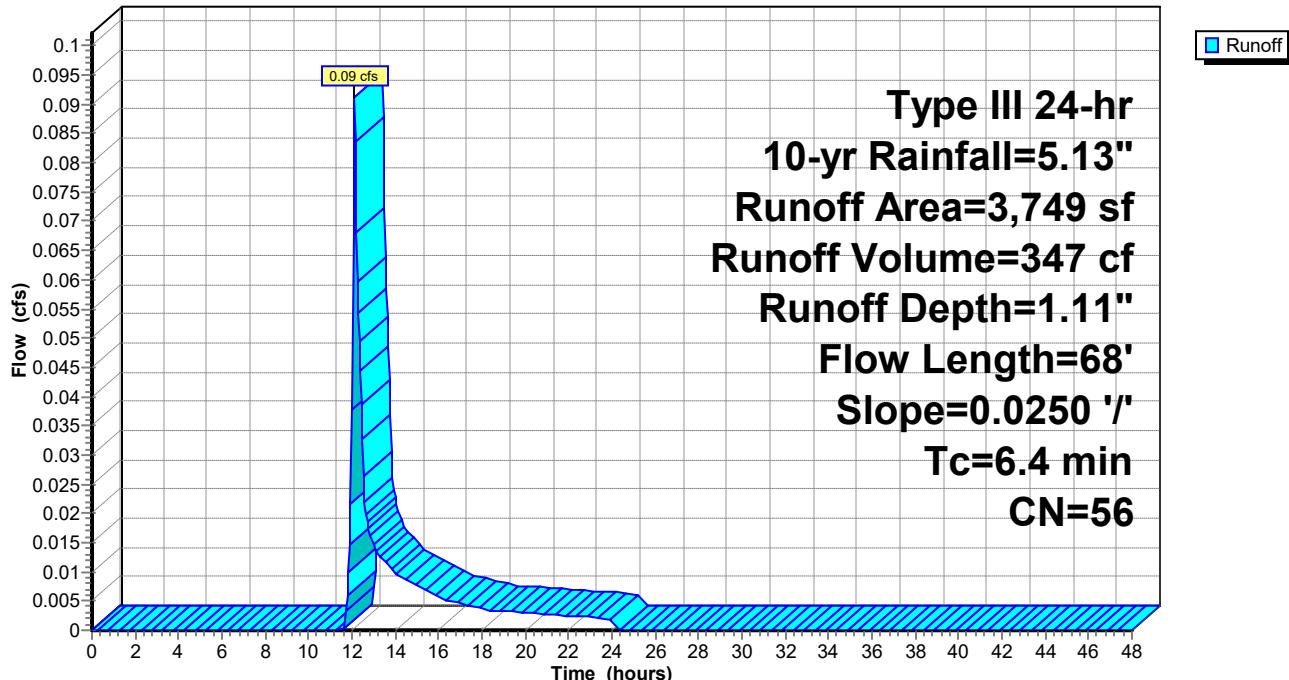
Area (sf)	CN	Description
2,844	49	50-75% Grass cover, Fair, HSG A
770	77	Brush, Fair, HSG D
99	84	50-75% Grass cover, Fair, HSG D
36	98	Paved parking, HSG D
3,749	56	Weighted Average
3,713		99.04% Pervious Area
36		0.96% Impervious Area

Tc	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	68	0.0250	0.18		Sheet Flow, Segment 1 Grass: Short n= 0.150 P2= 3.43"



Subcatchment 2S: EXWS-B

Hydrograph



Summary for Subcatchment 3S: EXWS-C

Runoff = 5.91 cfs @ 12.09 hrs, Volume= 19,947 cf, Depth= 4.33"
 Routed to Link SITE : Total Site

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=5.13"

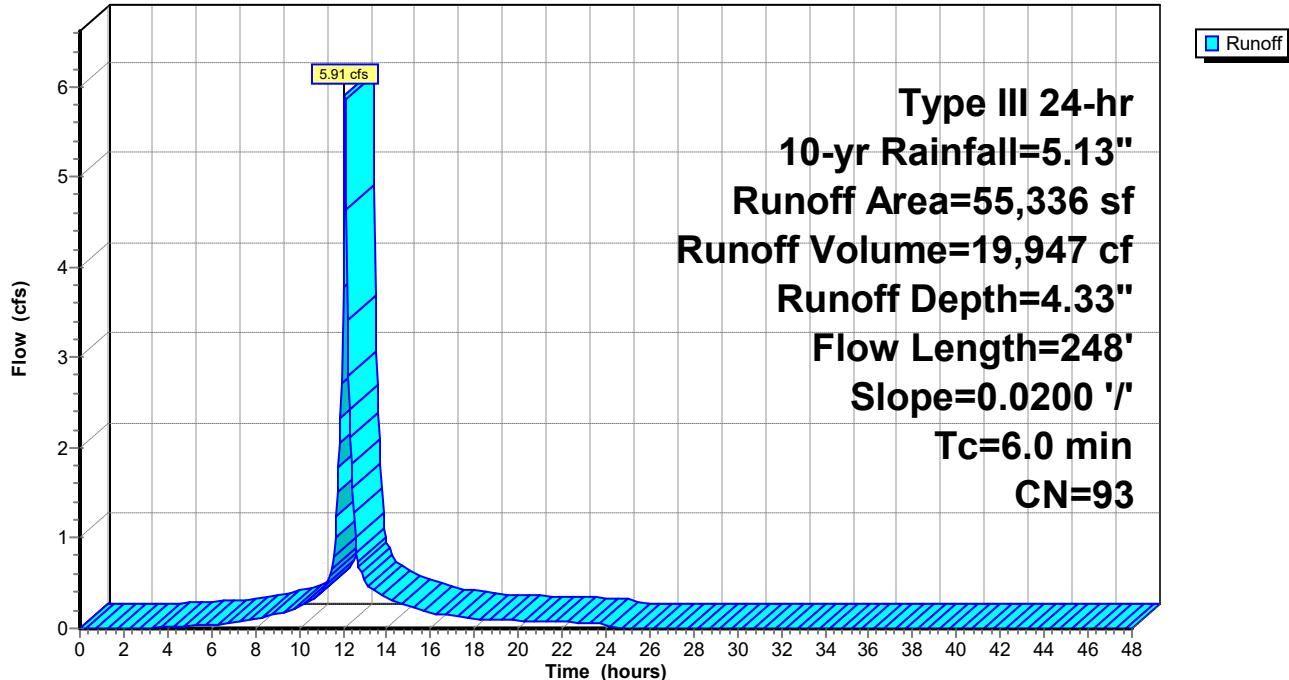
Area (sf)	CN	Description
4,754	49	50-75% Grass cover, Fair, HSG A
3,923	84	50-75% Grass cover, Fair, HSG D
662	77	Brush, Fair, HSG D
45,997	98	Paved parking, HSG A
55,336	93	Weighted Average
9,339		16.88% Pervious Area
45,997		83.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	150	0.0200	1.54		Sheet Flow, Segment 1 Smooth surfaces n= 0.011 P2= 3.43"
0.5	86	0.0200	2.87		Shallow Concentrated Flow, Segment 2 Paved Kv= 20.3 fps
0.1	12	0.0200	2.12		Shallow Concentrated Flow, Segment 3 Grassed Waterway Kv= 15.0 fps
2.2	248	Total, Increased to minimum Tc = 6.0 min			

Segment 1

Subcatchment 3S: EXWS-C

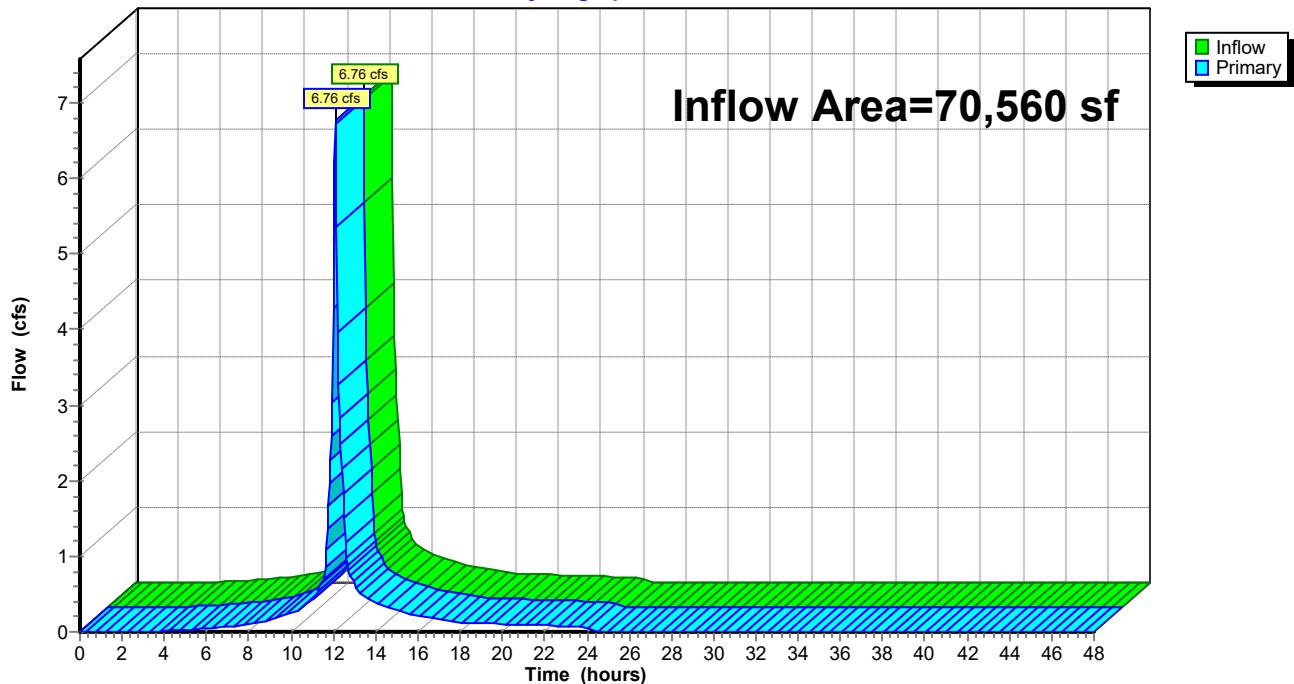
Segment 2 Segment 3

Subcatchment 3S: EXWS-C**Hydrograph**

Summary for Link SITE: Total Site

Inflow Area = 70,560 sf, 73.82% Impervious, Inflow Depth = 3.87" for 10-yr event
Inflow = 6.76 cfs @ 12.09 hrs, Volume= 22,737 cf
Primary = 6.76 cfs @ 12.09 hrs, Volume= 22,737 cf, Atten= 0%, Lag= 0.0 min

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

Link SITE: Total Site**Hydrograph**

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: EXWS-A

Runoff Area=11,475 sf 52.74% Impervious Runoff Depth=3.43"
Flow Length=137' Tc=6.0 min CN=75 Runoff=1.04 cfs 3,277 cf

Subcatchment 2S: EXWS-B

Runoff Area=3,749 sf 0.96% Impervious Runoff Depth=1.70"
Flow Length=68' Slope=0.0250 '/' Tc=6.4 min CN=56 Runoff=0.15 cfs 530 cf

Subcatchment 3S: EXWS-C

Runoff Area=55,336 sf 83.12% Impervious Runoff Depth=5.35"
Flow Length=248' Slope=0.0200 '/' Tc=6.0 min CN=93 Runoff=7.22 cfs 24,673 cf

Link SITE: Total Site

Inflow=8.40 cfs 28,480 cf
Primary=8.40 cfs 28,480 cf

Total Runoff Area = 70,560 sf Runoff Volume = 28,480 cf Average Runoff Depth = 4.84"
26.18% Pervious = 18,475 sf 73.82% Impervious = 52,085 sf

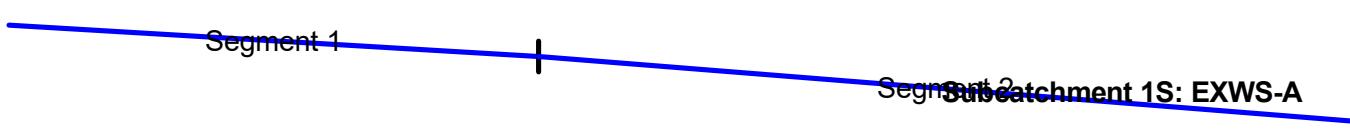
Summary for Subcatchment 1S: EXWS-A

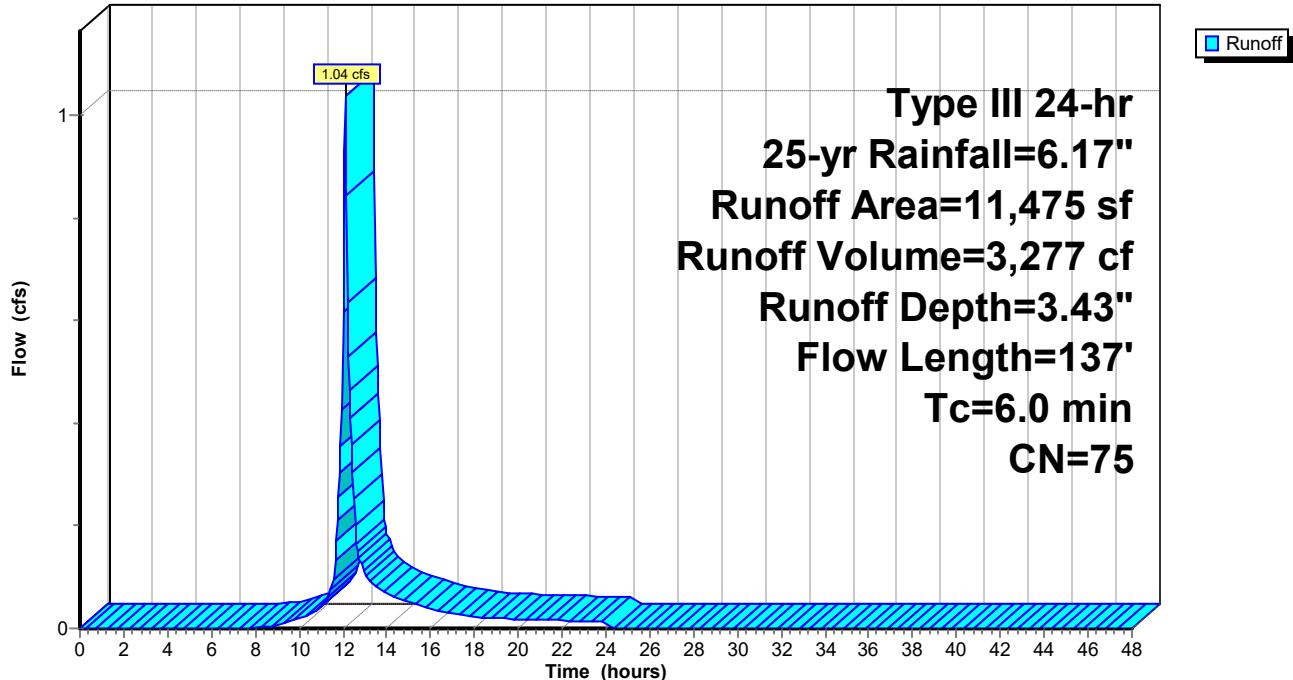
Runoff = 1.04 cfs @ 12.09 hrs, Volume= 3,277 cf, Depth= 3.43"
Routed to Link SITE : Total Site

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=6.17"

Area (sf)	CN	Description
5,423	49	50-75% Grass cover, Fair, HSG A
6,052	98	Paved parking, HSG A
11,475	75	Weighted Average
5,423		47.26% Pervious Area
6,052		52.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	54	0.0075	0.85		Sheet Flow, Segment 1 Smooth surfaces n= 0.011 P2= 3.43"
0.3	83	0.0100	4.50	1.57	Pipe Channel, Segment 2 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010
1.4	137				Total, Increased to minimum Tc = 6.0 min



Subcatchment 1S: EXWS-A**Hydrograph**

Summary for Subcatchment 2S: EXWS-B

Runoff = 0.15 cfs @ 12.11 hrs, Volume= 530 cf, Depth= 1.70"
 Routed to Link SITE : Total Site

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=6.17"

Area (sf)	CN	Description
2,844	49	50-75% Grass cover, Fair, HSG A
770	77	Brush, Fair, HSG D
99	84	50-75% Grass cover, Fair, HSG D
36	98	Paved parking, HSG D

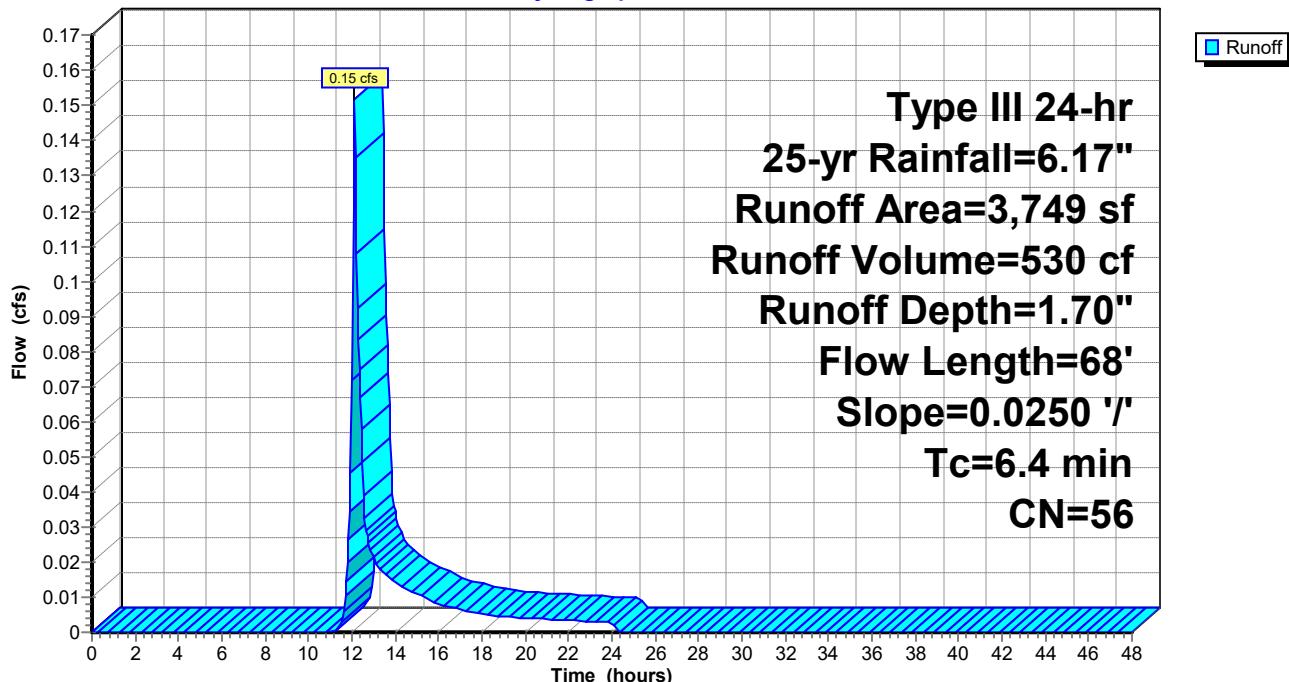
3,749	56	Weighted Average
3,713		99.04% Pervious Area
36		0.96% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.4	68	0.0250	0.18	Sheet Flow, Segment 1	
				Grass: Short n= 0.150 P2= 3.43"	



Subcatchment 2S: EXWS-B

Hydrograph



Summary for Subcatchment 3S: EXWS-C

Runoff = 7.22 cfs @ 12.09 hrs, Volume= 24,673 cf, Depth= 5.35"
 Routed to Link SITE : Total Site

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=6.17"

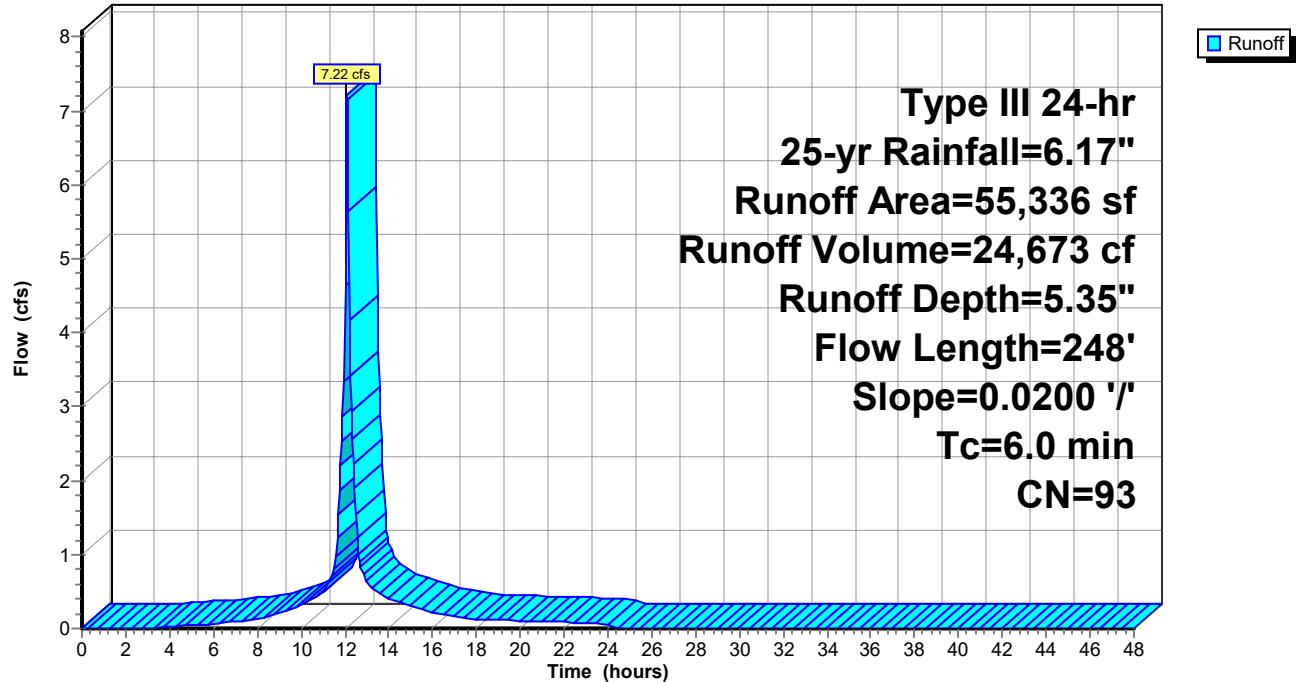
Area (sf)	CN	Description
4,754	49	50-75% Grass cover, Fair, HSG A
3,923	84	50-75% Grass cover, Fair, HSG D
662	77	Brush, Fair, HSG D
45,997	98	Paved parking, HSG A
55,336	93	Weighted Average
9,339		16.88% Pervious Area
45,997		83.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	150	0.0200	1.54		Sheet Flow, Segment 1 Smooth surfaces n= 0.011 P2= 3.43"
0.5	86	0.0200	2.87		Shallow Concentrated Flow, Segment 2 Paved Kv= 20.3 fps
0.1	12	0.0200	2.12		Shallow Concentrated Flow, Segment 3 Grassed Waterway Kv= 15.0 fps
2.2	248	Total, Increased to minimum Tc = 6.0 min			

Segment 1

Subcatchment 3S: EXWS-C

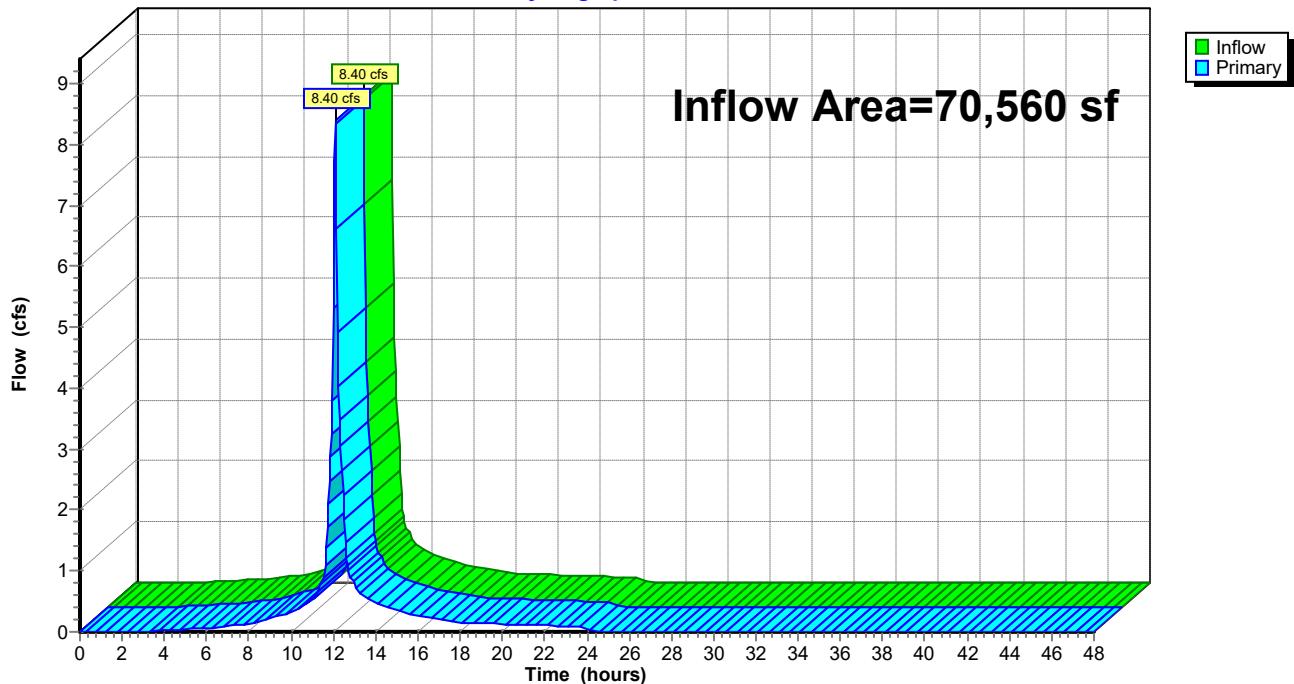
Segment 2 Segment 3

Subcatchment 3S: EXWS-C**Hydrograph**

Summary for Link SITE: Total Site

Inflow Area = 70,560 sf, 73.82% Impervious, Inflow Depth = 4.84" for 25-yr event
Inflow = 8.40 cfs @ 12.09 hrs, Volume= 28,480 cf
Primary = 8.40 cfs @ 12.09 hrs, Volume= 28,480 cf, Atten= 0%, Lag= 0.0 min

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

Link SITE: Total Site**Hydrograph**

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: EXWS-A

Runoff Area=11,475 sf 52.74% Impervious Runoff Depth=4.85"
Flow Length=137' Tc=6.0 min CN=75 Runoff=1.46 cfs 4,640 cf

Subcatchment 2S: EXWS-B

Runoff Area=3,749 sf 0.96% Impervious Runoff Depth=2.75"
Flow Length=68' Slope=0.0250 '/' Tc=6.4 min CN=56 Runoff=0.26 cfs 858 cf

Subcatchment 3S: EXWS-C

Runoff Area=55,336 sf 83.12% Impervious Runoff Depth=6.95"
Flow Length=248' Slope=0.0200 '/' Tc=6.0 min CN=93 Runoff=9.24 cfs 32,069 cf

Link SITE: Total Site

Inflow=10.96 cfs 37,567 cf
Primary=10.96 cfs 37,567 cf

Total Runoff Area = 70,560 sf Runoff Volume = 37,567 cf Average Runoff Depth = 6.39"
26.18% Pervious = 18,475 sf 73.82% Impervious = 52,085 sf

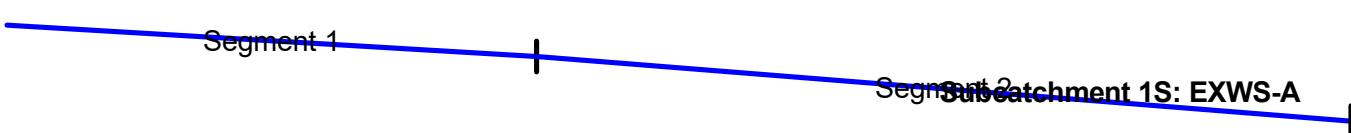
Summary for Subcatchment 1S: EXWS-A

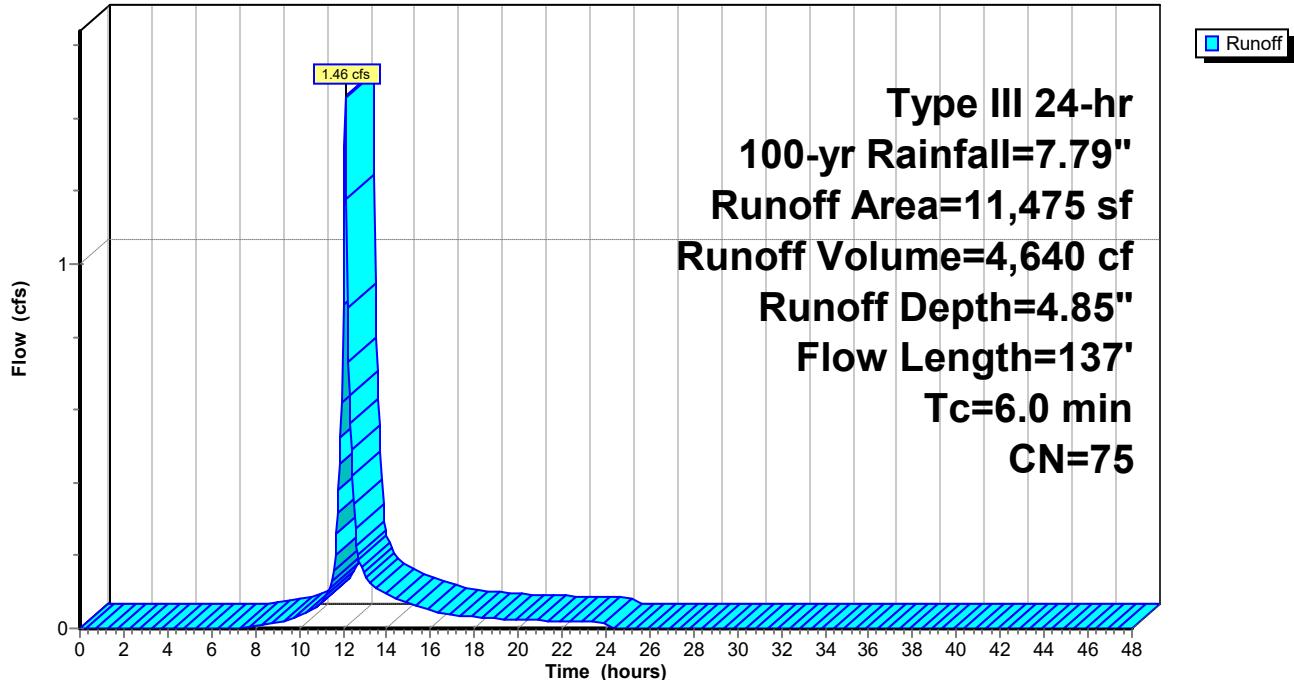
Runoff = 1.46 cfs @ 12.09 hrs, Volume= 4,640 cf, Depth= 4.85"
 Routed to Link SITE : Total Site

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=7.79"

Area (sf)	CN	Description
5,423	49	50-75% Grass cover, Fair, HSG A
6,052	98	Paved parking, HSG A
11,475	75	Weighted Average
5,423		47.26% Pervious Area
6,052		52.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	54	0.0075	0.85		Sheet Flow, Segment 1 Smooth surfaces n= 0.011 P2= 3.43"
0.3	83	0.0100	4.50	1.57	Pipe Channel, Segment 2 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010
1.4	137				Total, Increased to minimum Tc = 6.0 min



Subcatchment 1S: EXWS-A**Hydrograph**

Summary for Subcatchment 2S: EXWS-B

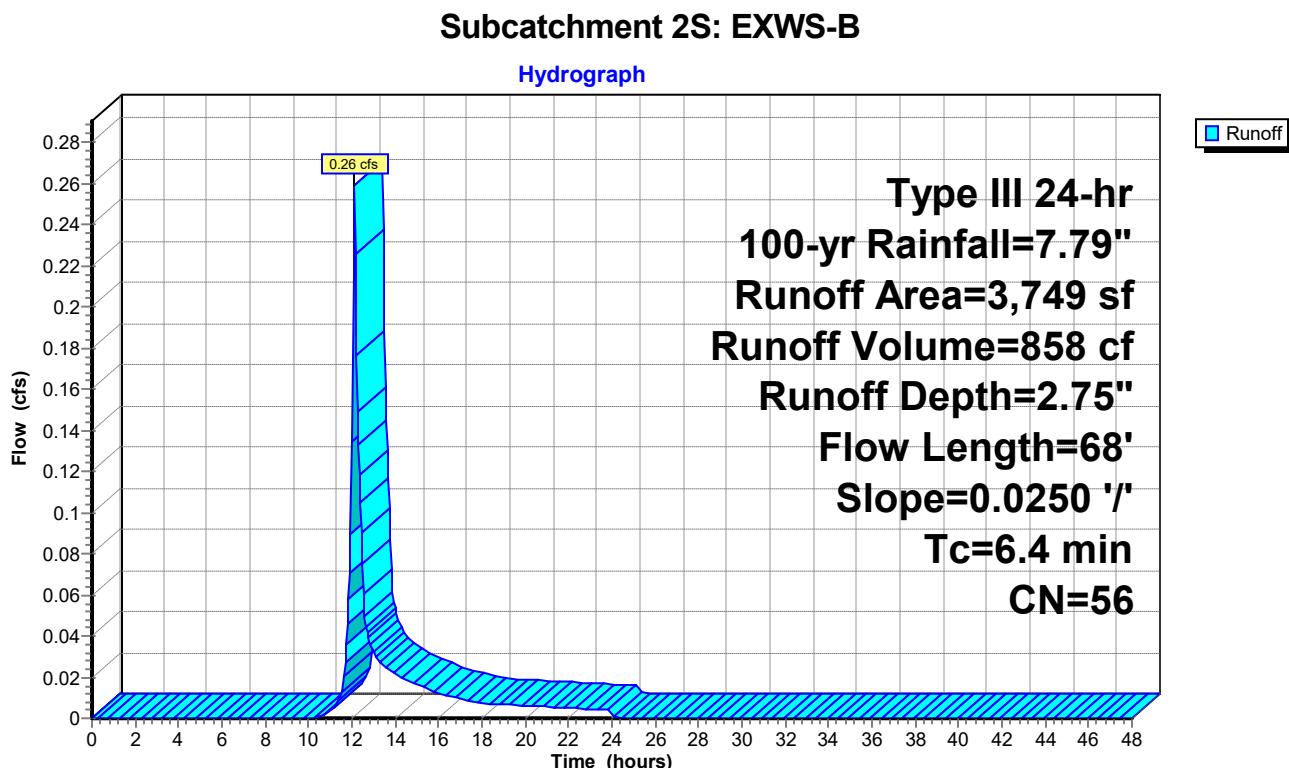
Runoff = 0.26 cfs @ 12.10 hrs, Volume= 858 cf, Depth= 2.75"
 Routed to Link SITE : Total Site

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=7.79"

Area (sf)	CN	Description
2,844	49	50-75% Grass cover, Fair, HSG A
770	77	Brush, Fair, HSG D
99	84	50-75% Grass cover, Fair, HSG D
36	98	Paved parking, HSG D

3,749	56	Weighted Average
3,713		99.04% Pervious Area
36		0.96% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.4	68	0.0250	0.18	Sheet Flow, Segment 1	
				Grass: Short n= 0.150 P2= 3.43"	



Summary for Subcatchment 3S: EXWS-C

Runoff = 9.24 cfs @ 12.09 hrs, Volume= 32,069 cf, Depth= 6.95"
 Routed to Link SITE : Total Site

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=7.79"

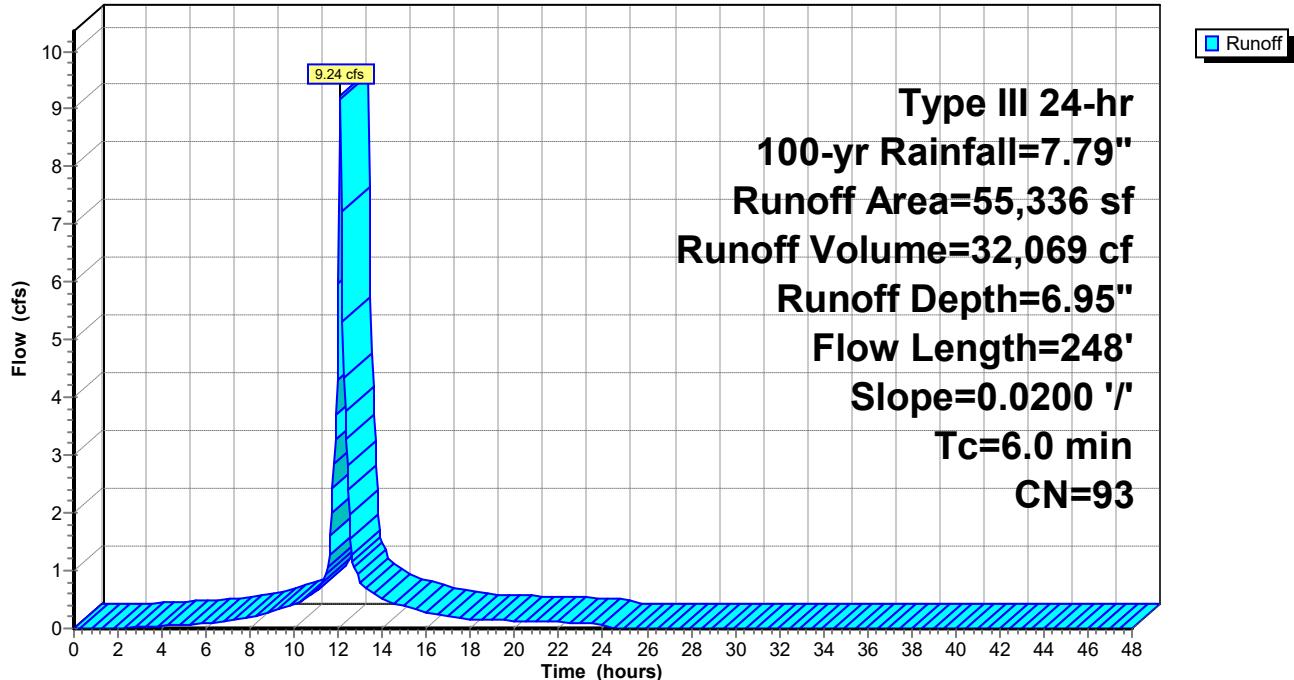
Area (sf)	CN	Description
4,754	49	50-75% Grass cover, Fair, HSG A
3,923	84	50-75% Grass cover, Fair, HSG D
662	77	Brush, Fair, HSG D
45,997	98	Paved parking, HSG A
55,336	93	Weighted Average
9,339		16.88% Pervious Area
45,997		83.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	150	0.0200	1.54		Sheet Flow, Segment 1 Smooth surfaces n= 0.011 P2= 3.43"
0.5	86	0.0200	2.87		Shallow Concentrated Flow, Segment 2 Paved Kv= 20.3 fps
0.1	12	0.0200	2.12		Shallow Concentrated Flow, Segment 3 Grassed Waterway Kv= 15.0 fps
2.2	248	Total, Increased to minimum Tc = 6.0 min			

Segment 1

Subcatchment 3S: EXWS-C

Segment 2 Segment 3

Subcatchment 3S: EXWS-C**Hydrograph**

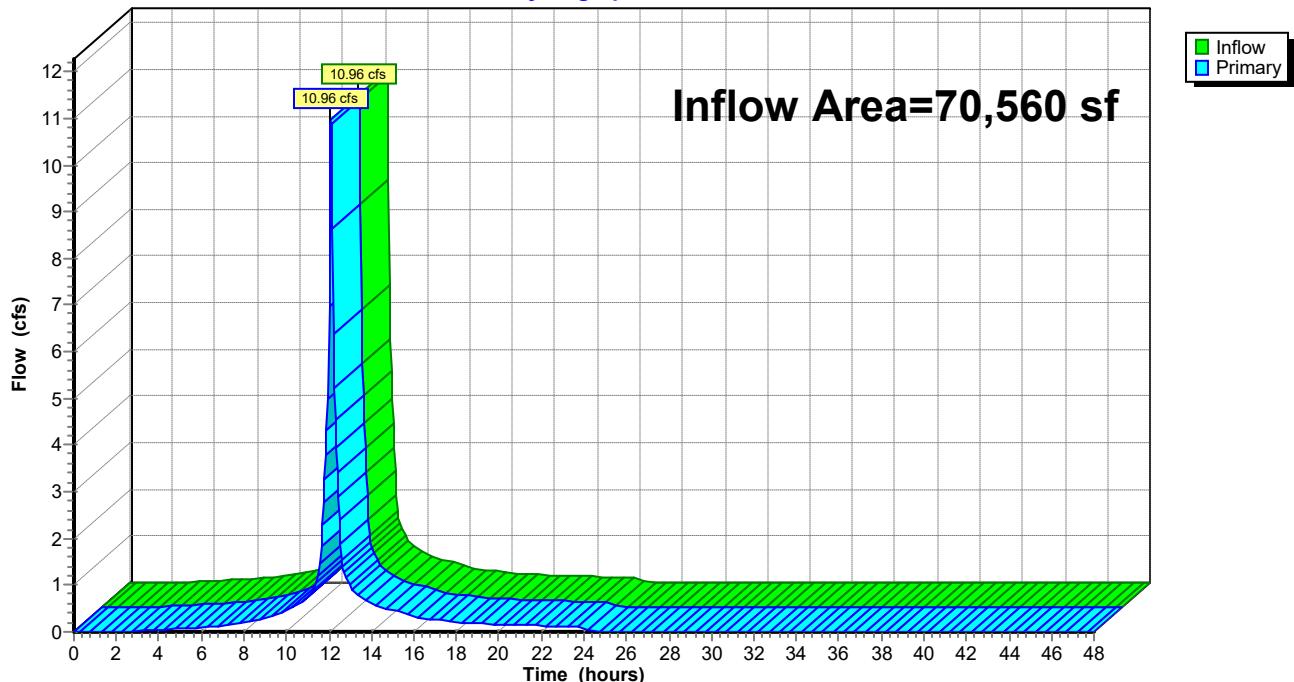
Summary for Link SITE: Total Site

Inflow Area = 70,560 sf, 73.82% Impervious, Inflow Depth = 6.39" for 100-yr event

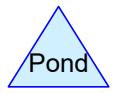
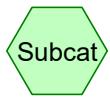
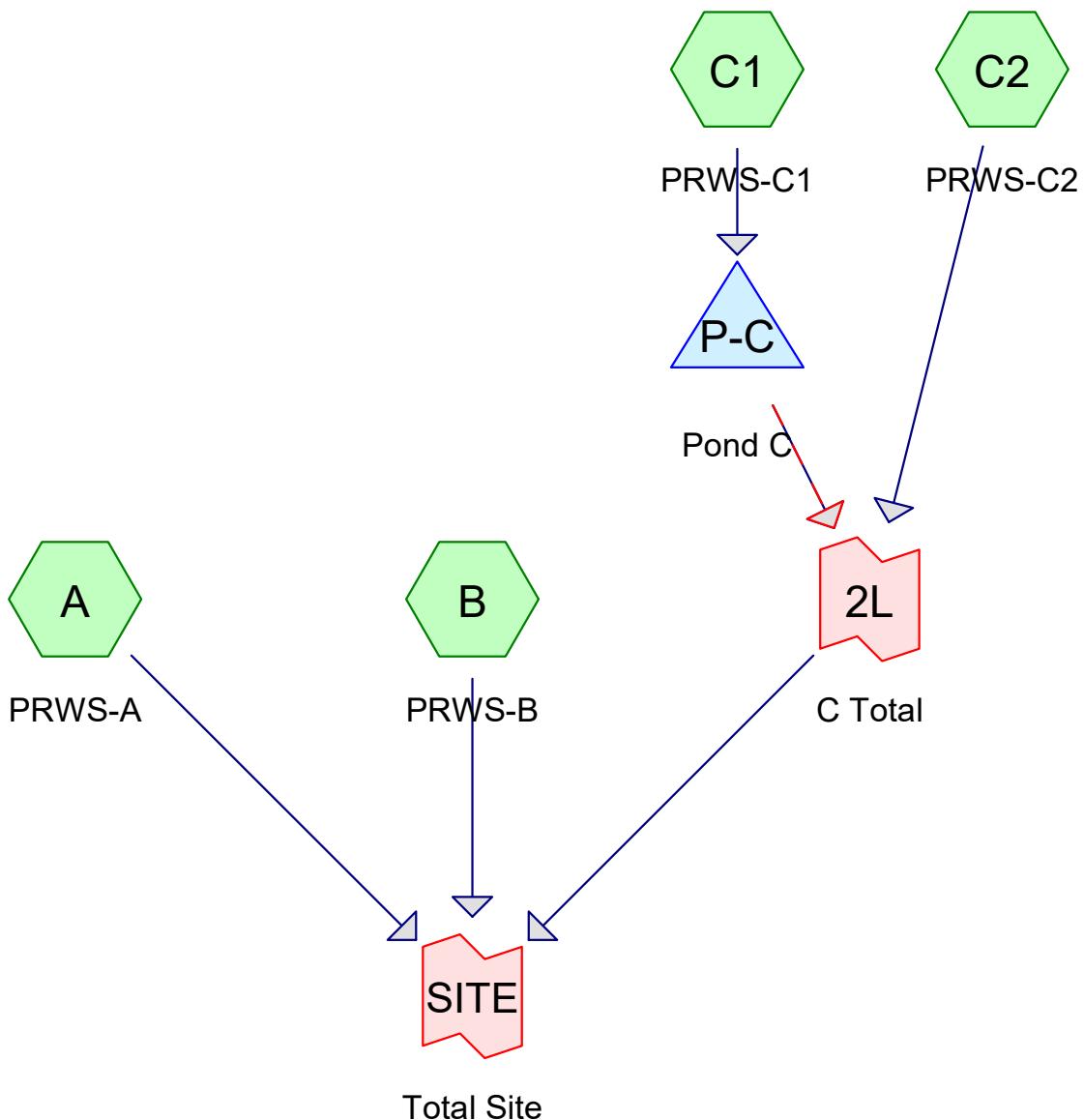
Inflow = 10.96 cfs @ 12.09 hrs, Volume= 37,567 cf

Primary = 10.96 cfs @ 12.09 hrs, Volume= 37,567 cf, Atten= 0%, Lag= 0.0 min

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

Link SITE: Total Site**Hydrograph**

APPENDIX B
Proposed Stormwater Discharge Calculations



Routing Diagram for PR Hydro
Prepared by Langan Engineering, Printed 1/3/2025
HydroCAD® 10.20-6a s/n 08223 © 2024 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.652	39	>75% Grass cover, Good, HSG A (A, B, C1, C2)
0.206	80	>75% Grass cover, Good, HSG D (B, C1, C2)
0.018	77	Brush, Fair, HSG D (B)
0.013	73	Brush, Good, HSG D (C2)
0.114	98	Paved parking, HSG A (A, B)
0.617	98	Paved parking, HSG D (C1)
1.620	72	TOTAL AREA

Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 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 A: PRWS-A

Runoff Area=16,220 sf 29.90% Impervious Runoff Depth=0.40"

Flow Length=68' Slope=0.0440 '/' Tc=6.0 min CN=57 Runoff=0.09 cfs 0.012 af

Subcatchment B: PRWS-B

Runoff Area=3,874 sf 3.02% Impervious Runoff Depth=0.33"

Flow Length=45' Slope=0.0389 '/' Tc=6.0 min CN=55 Runoff=0.01 cfs 0.002 af

Subcatchment C1: PRWS-C1

Runoff Area=45,321 sf 59.33% Impervious Runoff Depth=1.46"

Flow Length=205' Tc=6.8 min CN=78 Runoff=1.70 cfs 0.127 af

Subcatchment C2: PRWS-C2

Runoff Area=5,156 sf 0.00% Impervious Runoff Depth=1.21"

Flow Length=74' Slope=0.0610 '/' Tc=6.0 min CN=74 Runoff=0.16 cfs 0.012 af

Pond P-C: Pond C

Peak Elev=32.09' Storage=2,079 cf Inflow=1.70 cfs 0.127 af

Discarded=0.09 cfs 0.102 af Primary=0.29 cfs 0.025 af Secondary=0.00 cfs 0.000 af Outflow=0.38 cfs 0.127 af

Link 2L: C Total

Inflow=0.32 cfs 0.037 af

Primary=0.32 cfs 0.037 af

Link SITE: Total Site

Inflow=0.38 cfs 0.052 af

Primary=0.38 cfs 0.052 af

Total Runoff Area = 1.620 ac Runoff Volume = 0.153 af Average Runoff Depth = 1.13"
54.86% Pervious = 0.889 ac 45.14% Impervious = 0.731 ac

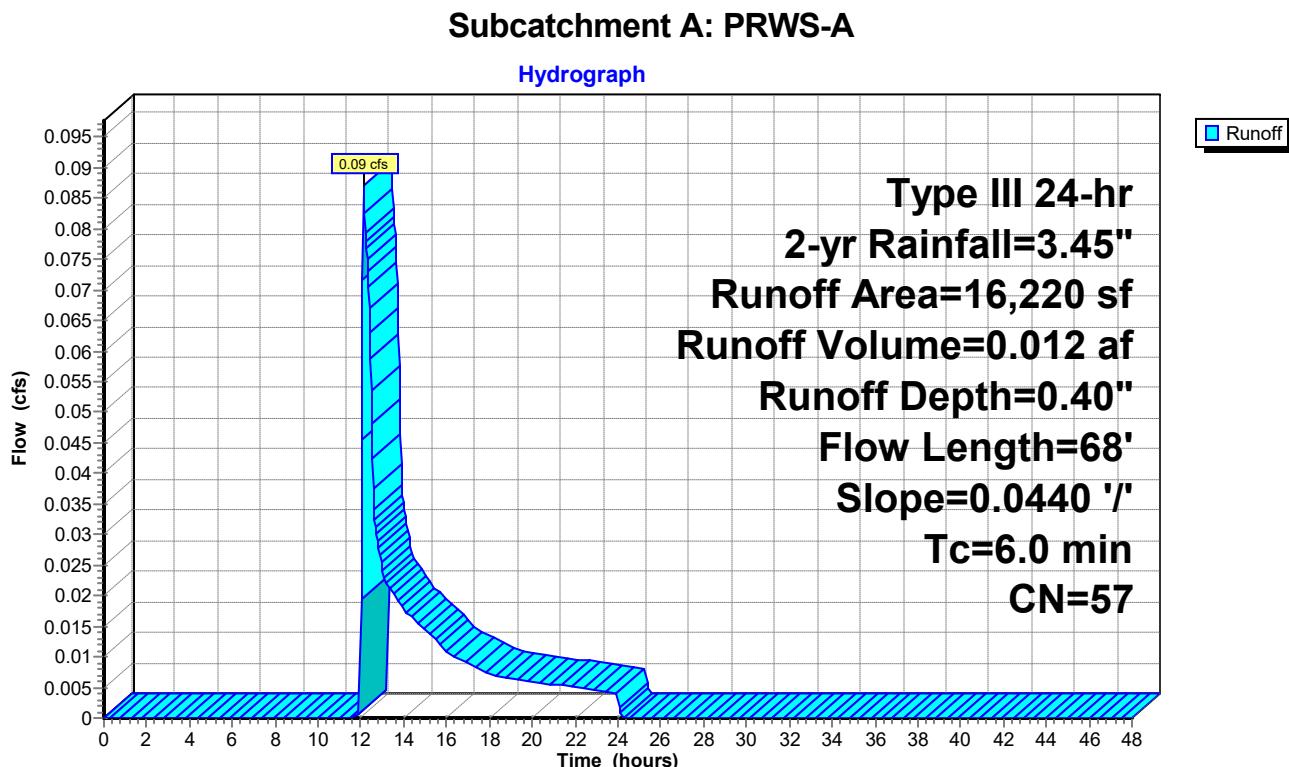
Summary for Subcatchment A: PRWS-A

Runoff = 0.09 cfs @ 12.14 hrs, Volume= 0.012 af, Depth= 0.40"
 Routed to Link SITE : Total Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
 Type III 24-hr 2-yr Rainfall=3.45"

Area (sf)	CN	Description
11,370	39	>75% Grass cover, Good, HSG A
4,850	98	Paved parking, HSG A
16,220	57	Weighted Average
11,370		70.10% Pervious Area
4,850		29.90% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
5.1	68	0.0440	0.22		Sheet Flow, Segment 1 Grass: Short n= 0.150 P2= 3.43"
5.1	68				Total, Increased to minimum Tc = 6.0 min



Summary for Subcatchment B: PRWS-B

Runoff = 0.01 cfs @ 12.28 hrs, Volume= 0.002 af, Depth= 0.33"
Routed to Link SITE : Total Site

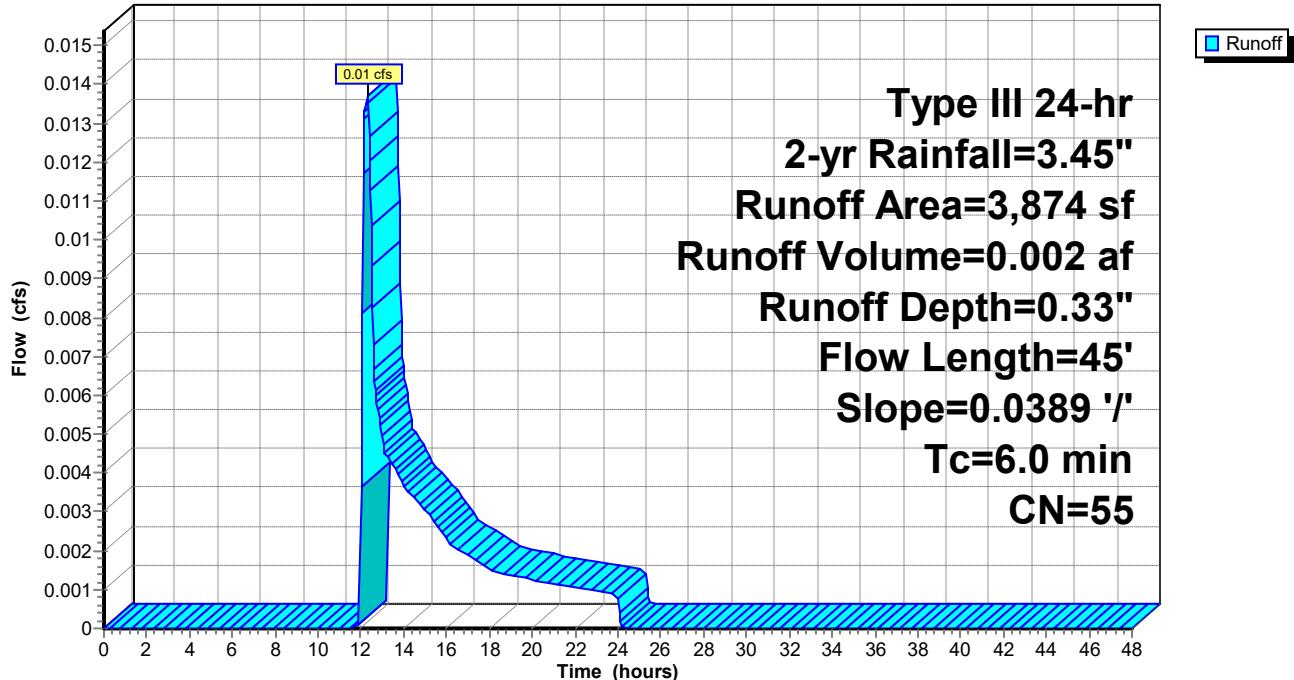
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-yr Rainfall=3.45"

Area (sf)	CN	Description
2,337	39	>75% Grass cover, Good, HSG A
648	80	>75% Grass cover, Good, HSG D
772	77	Brush, Fair, HSG D
117	98	Paved parking, HSG A
3,874	55	Weighted Average
3,757		96.98% Pervious Area
117		3.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	45	0.0389	0.20		Sheet Flow, Segment 1 Grass: Short n= 0.150 P2= 3.43"
3.8	45	Total, Increased to minimum Tc = 6.0 min			

Segment 1

Subcatchment B: PRWS-B

Subcatchment B: PRWS-B**Hydrograph**

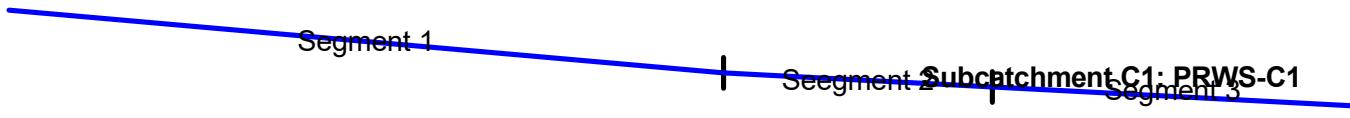
Summary for Subcatchment C1: PRWS-C1

Runoff = 1.70 cfs @ 12.10 hrs, Volume= 0.127 af, Depth= 1.46"
 Routed to Pond P-C : Pond C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
 Type III 24-hr 2-yr Rainfall=3.45"

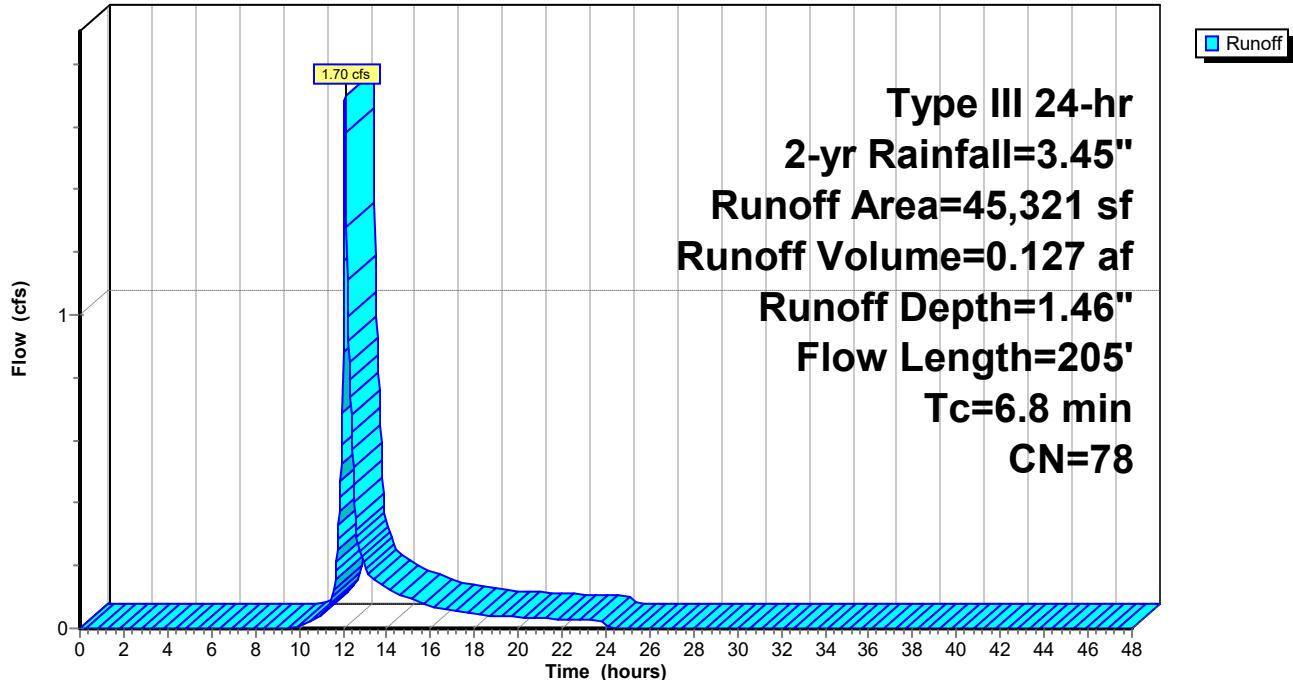
Area (sf)	CN	Description
4,355	80	>75% Grass cover, Good, HSG D
14,079	39	>75% Grass cover, Good, HSG A
26,887	98	Paved parking, HSG D
45,321	78	Weighted Average
18,434		40.67% Pervious Area
26,887		59.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	109	0.0250	1.58		Sheet Flow, Segment 1 Smooth surfaces n= 0.011 P2= 3.43"
5.2	41	0.0150	0.13		Sheet Flow, Segment 2 Grass: Short n= 0.150 P2= 3.43"
0.5	55	0.0150	1.84		Shallow Concentrated Flow, Segment 3 Grassed Waterway Kv= 15.0 fps
6.8	205	Total			



Subcatchment C1: PRWS-C1

Hydrograph



Summary for Subcatchment C2: PRWS-C2

Runoff = 0.16 cfs @ 12.10 hrs, Volume= 0.012 af, Depth= 1.21"
Routed to Link 2L : C Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-yr Rainfall=3.45"

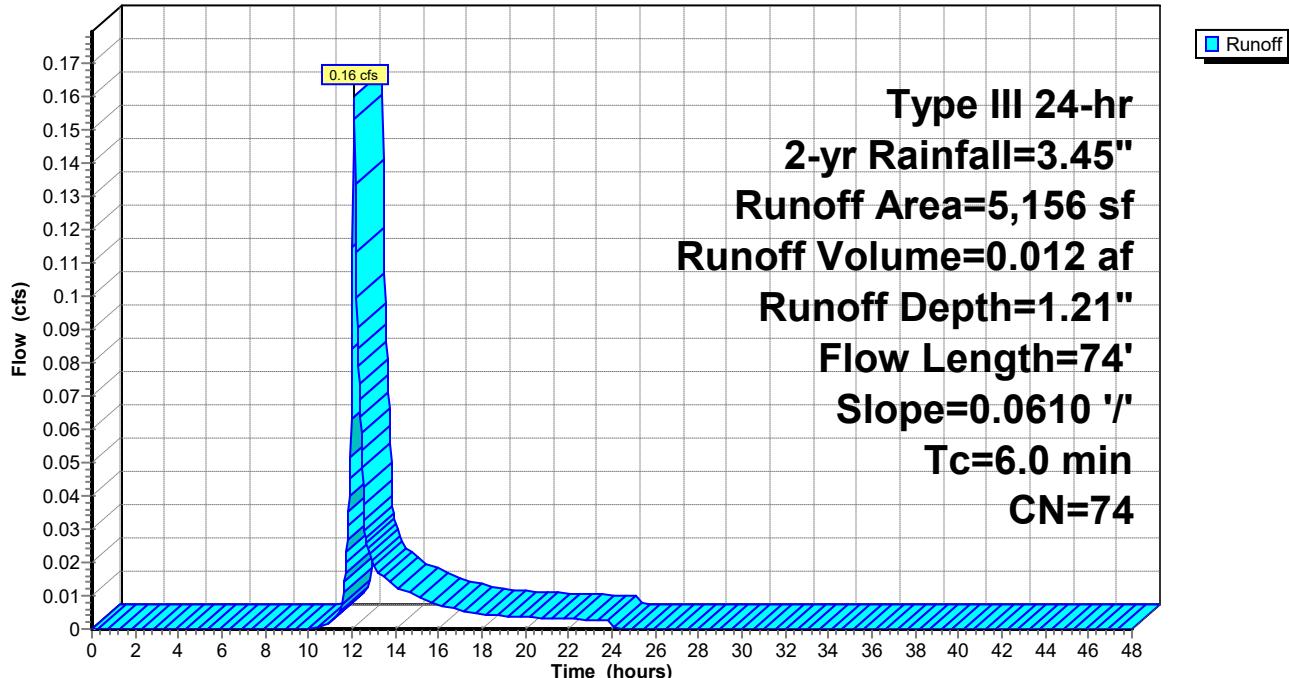
Area (sf)	CN	Description
557	73	Brush, Good, HSG D
3,991	80	>75% Grass cover, Good, HSG D
608	39	>75% Grass cover, Good, HSG A
5,156	74	Weighted Average
5,156		100.00% Pervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
4.8	74	0.0610	0.26		Sheet Flow, Segment 1 Grass: Short n= 0.150 P2= 3.43"
4.8	74				Total, Increased to minimum Tc = 6.0 min



Subcatchment C2: PRWS-C2

Hydrograph



Summary for Pond P-C: Pond C

Inflow Area = 1.040 ac, 59.33% Impervious, Inflow Depth = 1.46" for 2-yr event
 Inflow = 1.70 cfs @ 12.10 hrs, Volume= 0.127 af
 Outflow = 0.38 cfs @ 12.56 hrs, Volume= 0.127 af, Atten= 78%, Lag= 27.2 min
 Discarded = 0.09 cfs @ 12.56 hrs, Volume= 0.102 af
 Primary = 0.29 cfs @ 12.56 hrs, Volume= 0.025 af
 Routed to Link 2L : C Total
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link 2L : C Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
 Peak Elev= 32.09' @ 12.56 hrs Surf.Area= 3,914 sf Storage= 2,079 cf

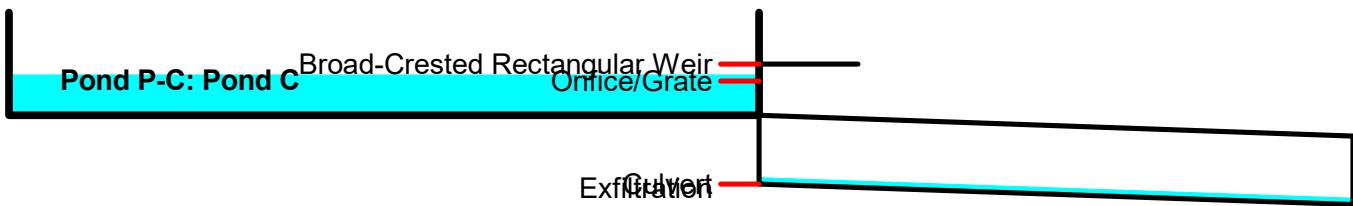
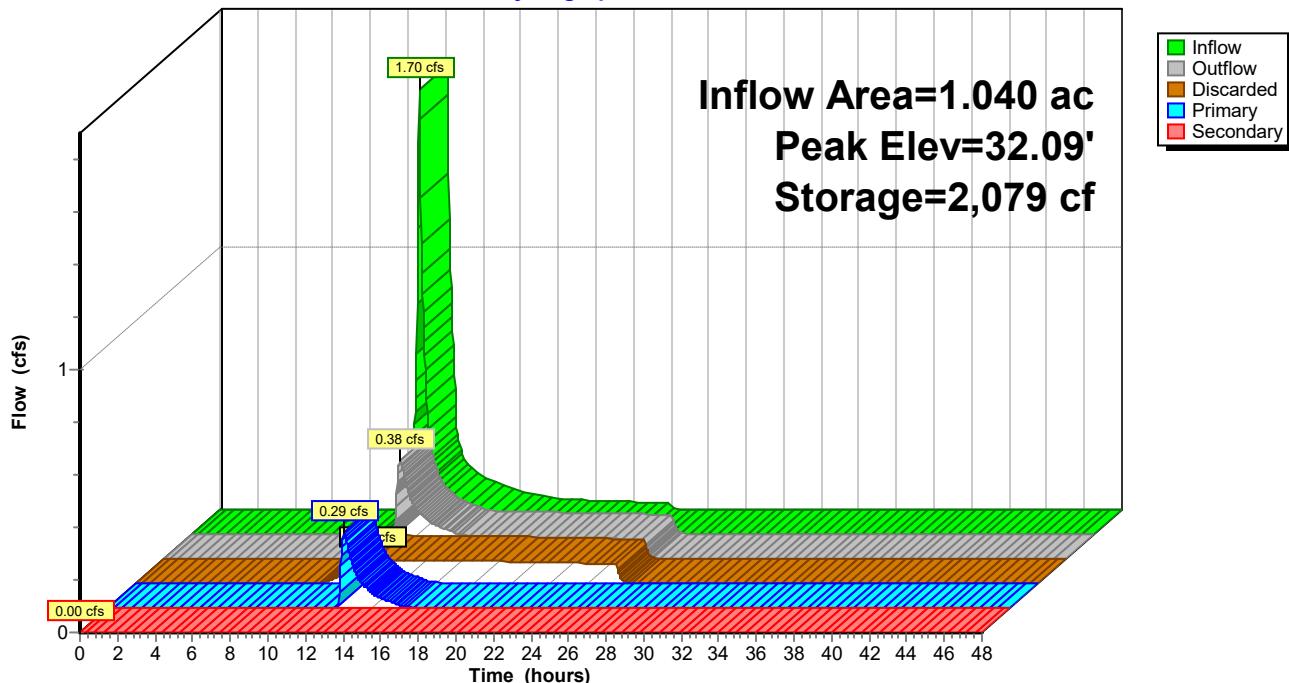
Plug-Flow detention time= 185.8 min calculated for 0.126 af (100% of inflow)
 Center-of-Mass det. time= 185.7 min (1,031.6 - 845.9)

Volume	Invert	Avail.Storage	Storage Description	
#1	31.50'	6,050 cf	Custom Stage Data (Conic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
31.50	3,128	0	0	3,128
32.50	4,507	3,797	3,797	4,524
33.00	4,507	2,254	6,050	4,643
Device	Routing	Invert	Outlet Devices	
#1	Discarded	31.50'	1.000 in/hr Exfiltration over Wetted area	
#2	Primary	30.50'	12.0" Round Culvert L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 30.50' / 30.20' S= 0.0100 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf	
#3	Device 2	32.00'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads	
#4	Secondary	32.25'	10.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88	

Discarded OutFlow Max=0.09 cfs @ 12.56 hrs HW=32.09' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.28 cfs @ 12.56 hrs HW=32.09' (Free Discharge)
 ↑ 2=Culvert (Passes 0.28 cfs of 3.12 cfs potential flow)
 ↑ 3=Orifice/Grate (Weir Controls 0.28 cfs @ 0.99 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=31.50' (Free Discharge)
 ↑ 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

**Pond P-C: Pond C****Hydrograph**

Stage-Discharge for Pond P-C: Pond C

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
31.50	0.00	0.00	0.00	0.00
31.55	0.07	0.07	0.00	0.00
31.60	0.08	0.08	0.00	0.00
31.65	0.08	0.08	0.00	0.00
31.70	0.08	0.08	0.00	0.00
31.75	0.08	0.08	0.00	0.00
31.80	0.08	0.08	0.00	0.00
31.85	0.08	0.08	0.00	0.00
31.90	0.08	0.08	0.00	0.00
31.95	0.09	0.09	0.00	0.00
32.00	0.09	0.09	0.00	0.00
32.05	0.20	0.09	0.11	0.00
32.10	0.42	0.09	0.32	0.00
32.15	0.69	0.09	0.60	0.00
32.20	1.01	0.09	0.92	0.00
32.25	1.38	0.10	1.28	0.00
32.30	2.05	0.10	1.69	0.26
32.35	2.97	0.10	2.13	0.74
32.40	3.85	0.10	2.39	1.36
32.45	4.73	0.10	2.54	2.09
32.50	5.75	0.10	2.67	2.97
32.55	6.89	0.11	2.80	3.98
32.60	8.13	0.11	2.93	5.09
32.65	9.48	0.11	3.05	6.32
32.70	10.97	0.11	3.16	7.70
32.75	12.57	0.11	3.28	9.19
32.80	14.30	0.11	3.38	10.81
32.85	16.14	0.11	3.49	12.55
32.90	17.82	0.11	3.59	14.12
32.95	19.55	0.11	3.69	15.75
33.00	21.33	0.11	3.78	17.44

Stage-Area-Storage for Pond P-C: Pond C

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
31.50	3,128	3,128	0
31.55	3,191	3,192	158
31.60	3,255	3,256	319
31.65	3,319	3,321	483
31.70	3,384	3,387	651
31.75	3,449	3,453	822
31.80	3,515	3,520	996
31.85	3,582	3,588	1,173
31.90	3,649	3,656	1,354
31.95	3,717	3,725	1,538
32.00	3,786	3,794	1,726
32.05	3,855	3,864	1,917
32.10	3,925	3,935	2,111
32.15	3,996	4,007	2,309
32.20	4,067	4,079	2,511
32.25	4,139	4,151	2,716
32.30	4,211	4,225	2,925
32.35	4,284	4,299	3,137
32.40	4,358	4,373	3,353
32.45	4,432	4,448	3,573
32.50	4,507	4,524	3,797
32.55	4,507	4,536	4,022
32.60	4,507	4,548	4,247
32.65	4,507	4,560	4,473
32.70	4,507	4,572	4,698
32.75	4,507	4,584	4,923
32.80	4,507	4,596	5,149
32.85	4,507	4,607	5,374
32.90	4,507	4,619	5,599
32.95	4,507	4,631	5,825
33.00	4,507	4,643	6,050

Summary for Link 2L: C Total

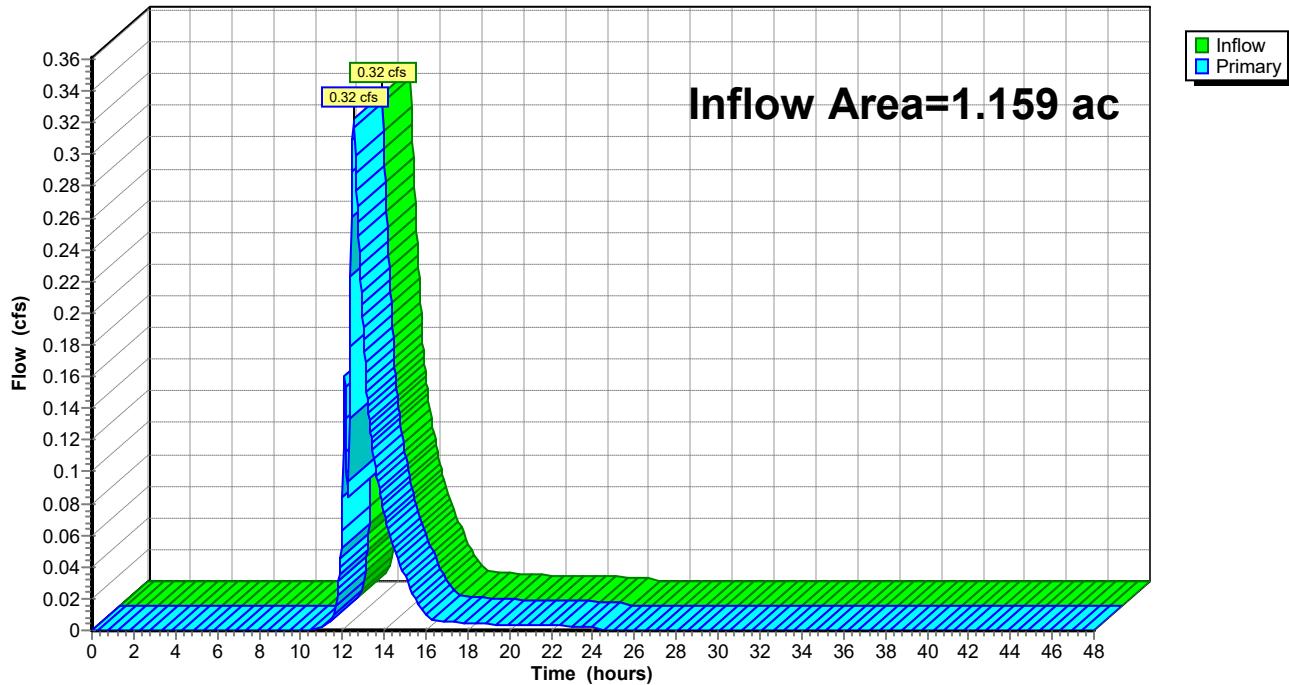
Inflow Area = 1.159 ac, 53.27% Impervious, Inflow Depth = 0.38" for 2-yr event

Inflow = 0.32 cfs @ 12.53 hrs, Volume= 0.037 af

Primary = 0.32 cfs @ 12.53 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min

Routed to Link SITE : Total Site

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link 2L: C Total**Hydrograph**

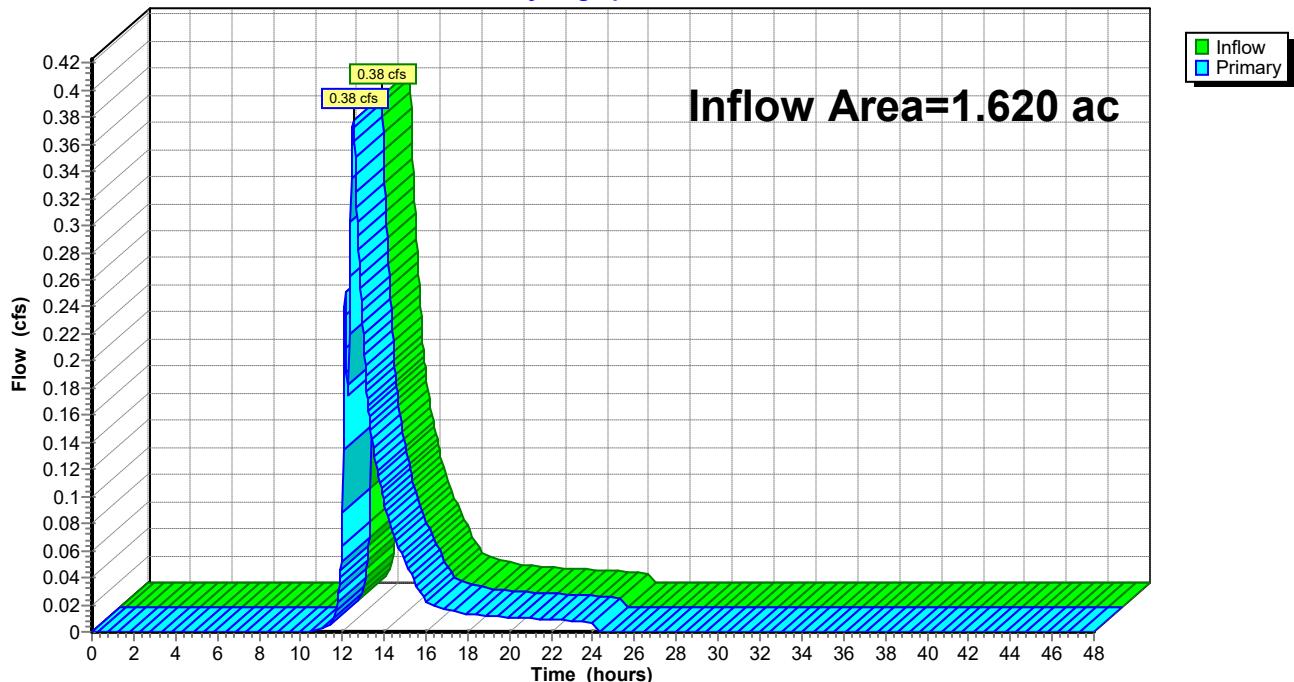
Summary for Link SITE: Total Site

Inflow Area = 1.620 ac, 45.14% Impervious, Inflow Depth = 0.38" for 2-yr event

Inflow = 0.38 cfs @ 12.51 hrs, Volume= 0.052 af

Primary = 0.38 cfs @ 12.51 hrs, Volume= 0.052 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link SITE: Total Site**Hydrograph**

Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 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 A: PRWS-A

Runoff Area=16,220 sf 29.90% Impervious Runoff Depth=1.17"

Flow Length=68' Slope=0.0440 '/' Tc=6.0 min CN=57 Runoff=0.44 cfs 0.036 af

Subcatchment B: PRWS-B

Runoff Area=3,874 sf 3.02% Impervious Runoff Depth=1.05"

Flow Length=45' Slope=0.0389 '/' Tc=6.0 min CN=55 Runoff=0.09 cfs 0.008 af

Subcatchment C1: PRWS-C1

Runoff Area=45,321 sf 59.33% Impervious Runoff Depth=2.82"

Flow Length=205' Tc=6.8 min CN=78 Runoff=3.33 cfs 0.245 af

Subcatchment C2: PRWS-C2

Runoff Area=5,156 sf 0.00% Impervious Runoff Depth=2.47"

Flow Length=74' Slope=0.0610 '/' Tc=6.0 min CN=74 Runoff=0.34 cfs 0.024 af

Pond P-C: Pond C

Peak Elev=32.29' Storage=2,897 cf Inflow=3.33 cfs 0.245 af

Discarded=0.10 cfs 0.127 af Primary=1.63 cfs 0.115 af Secondary=0.21 cfs 0.003 af Outflow=1.94 cfs 0.245 af

Link 2L: C Total

Inflow=2.04 cfs 0.142 af

Primary=2.04 cfs 0.142 af

Link SITE: Total Site

Inflow=2.39 cfs 0.186 af

Primary=2.39 cfs 0.186 af

Total Runoff Area = 1.620 ac Runoff Volume = 0.313 af Average Runoff Depth = 2.32"
54.86% Pervious = 0.889 ac 45.14% Impervious = 0.731 ac

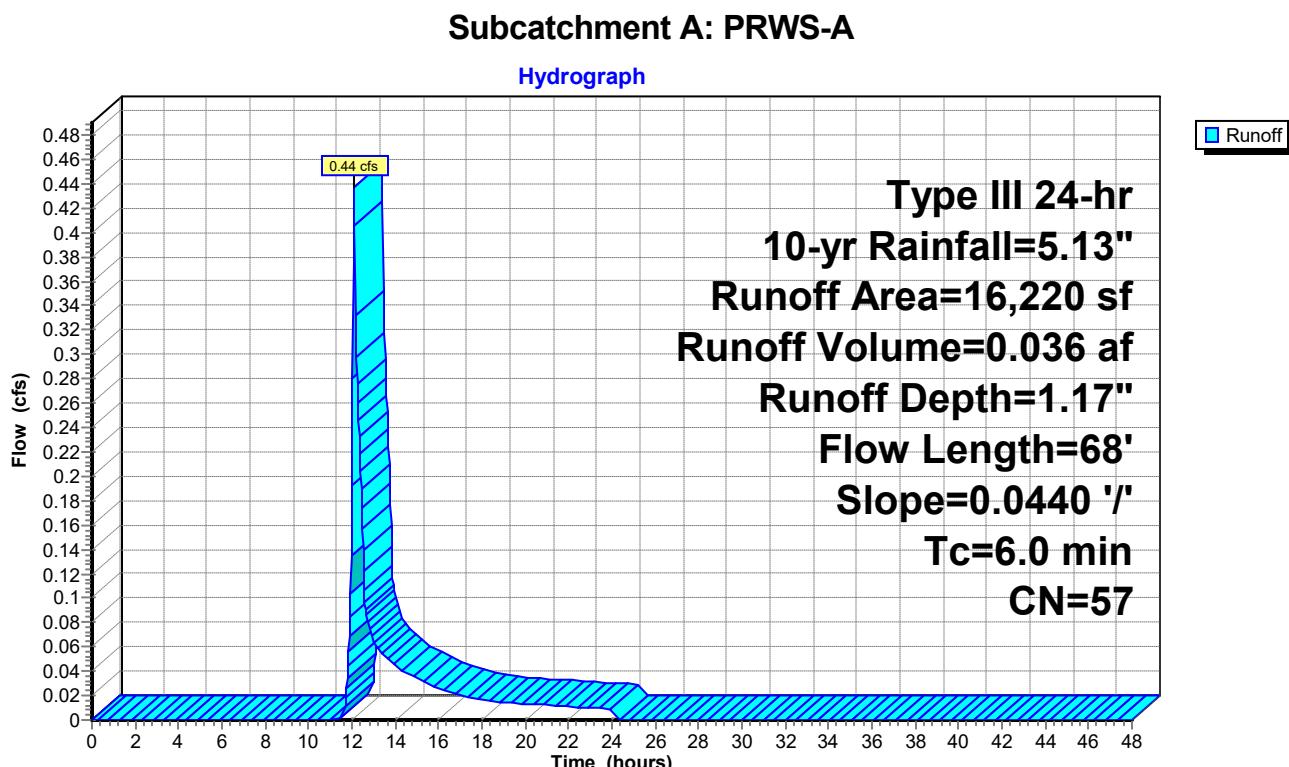
Summary for Subcatchment A: PRWS-A

Runoff = 0.44 cfs @ 12.10 hrs, Volume= 0.036 af, Depth= 1.17"
 Routed to Link SITE : Total Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
 Type III 24-hr 10-yr Rainfall=5.13"

Area (sf)	CN	Description
11,370	39	>75% Grass cover, Good, HSG A
4,850	98	Paved parking, HSG A
16,220	57	Weighted Average
11,370		70.10% Pervious Area
4,850		29.90% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
5.1	68	0.0440	0.22		Sheet Flow, Segment 1 Grass: Short n= 0.150 P2= 3.43"
5.1	68				Total, Increased to minimum Tc = 6.0 min



Summary for Subcatchment B: PRWS-B

Runoff = 0.09 cfs @ 12.11 hrs, Volume= 0.008 af, Depth= 1.05"
Routed to Link SITE : Total Site

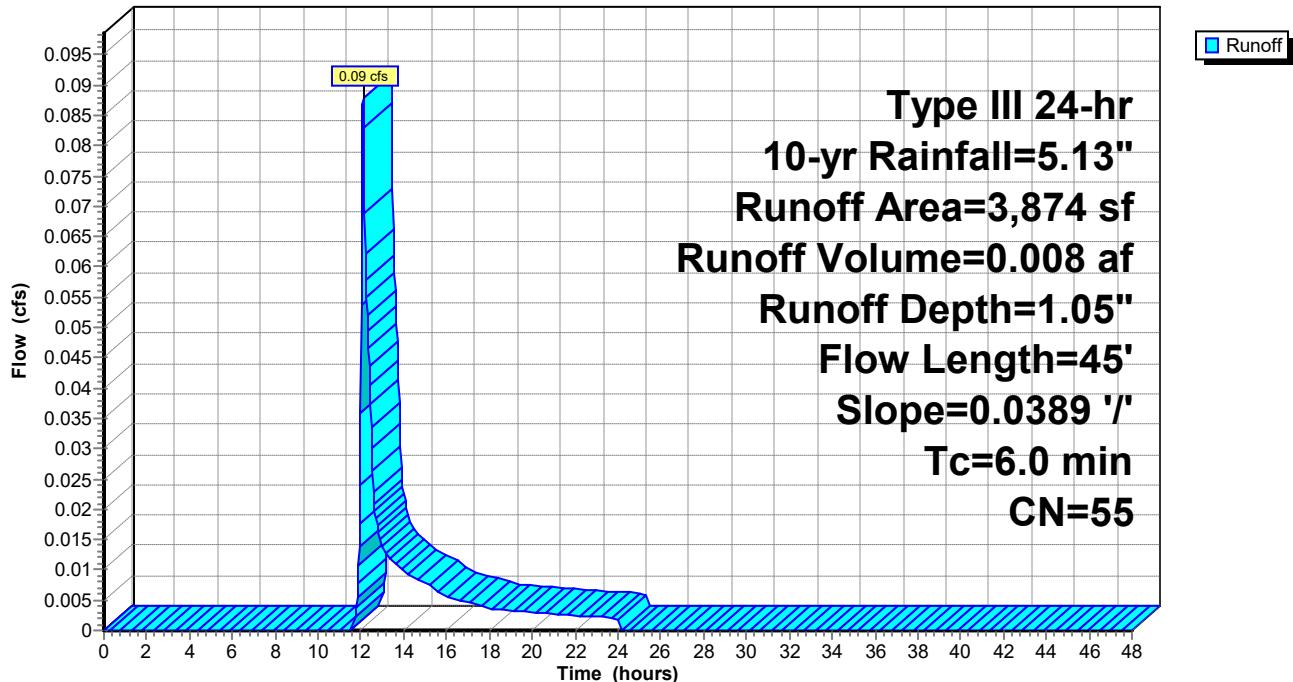
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-yr Rainfall=5.13"

Area (sf)	CN	Description
2,337	39	>75% Grass cover, Good, HSG A
648	80	>75% Grass cover, Good, HSG D
772	77	Brush, Fair, HSG D
117	98	Paved parking, HSG A
3,874	55	Weighted Average
3,757		96.98% Pervious Area
117		3.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	45	0.0389	0.20		Sheet Flow, Segment 1 Grass: Short n= 0.150 P2= 3.43"
3.8	45	Total, Increased to minimum Tc = 6.0 min			

Segment 1

Subcatchment B: PRWS-B

Subcatchment B: PRWS-B**Hydrograph**

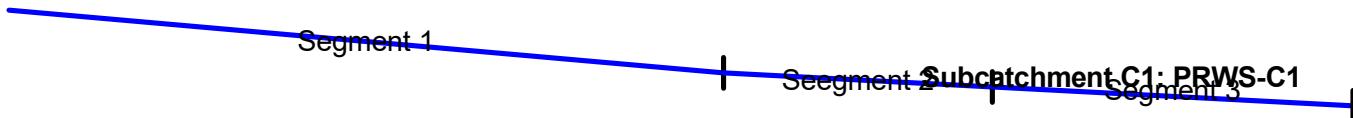
Summary for Subcatchment C1: PRWS-C1

Runoff = 3.33 cfs @ 12.10 hrs, Volume= 0.245 af, Depth= 2.82"
 Routed to Pond P-C : Pond C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
 Type III 24-hr 10-yr Rainfall=5.13"

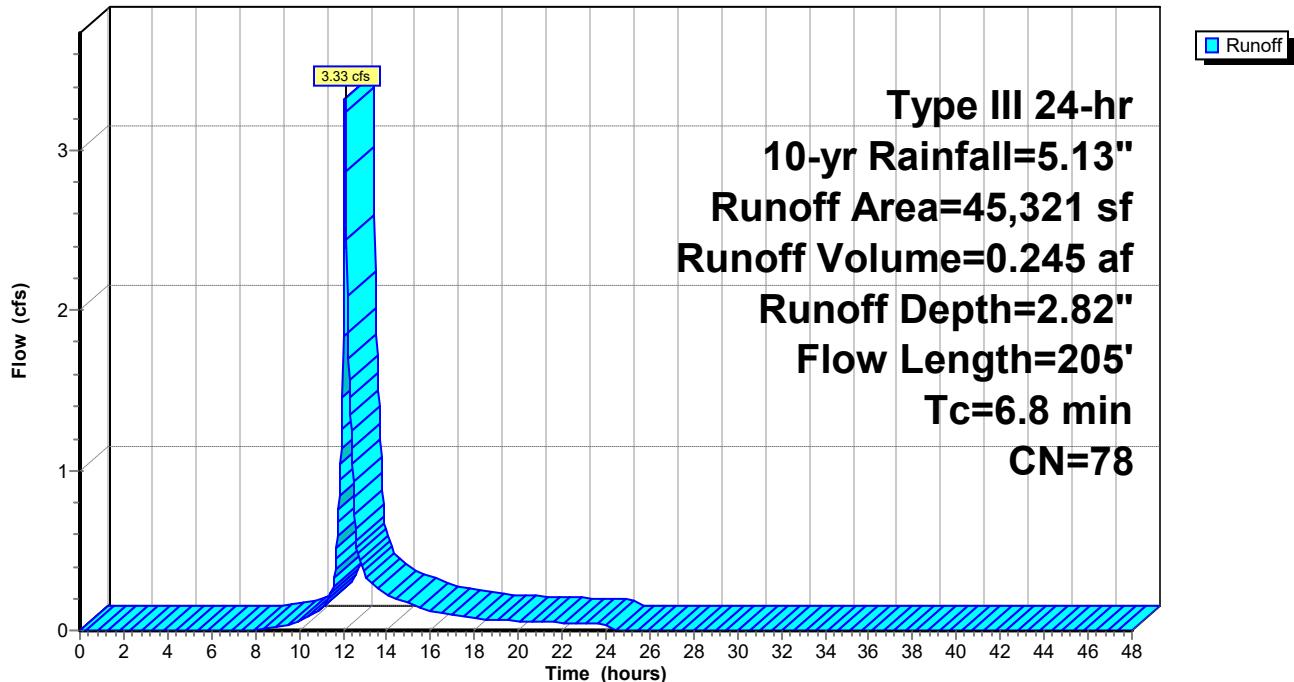
Area (sf)	CN	Description
4,355	80	>75% Grass cover, Good, HSG D
14,079	39	>75% Grass cover, Good, HSG A
26,887	98	Paved parking, HSG D
45,321	78	Weighted Average
18,434		40.67% Pervious Area
26,887		59.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	109	0.0250	1.58		Sheet Flow, Segment 1 Smooth surfaces n= 0.011 P2= 3.43"
5.2	41	0.0150	0.13		Sheet Flow, Segment 2 Grass: Short n= 0.150 P2= 3.43"
0.5	55	0.0150	1.84		Shallow Concentrated Flow, Segment 3 Grassed Waterway Kv= 15.0 fps
6.8	205	Total			



Subcatchment C1: PRWS-C1

Hydrograph



Summary for Subcatchment C2: PRWS-C2

Runoff = 0.34 cfs @ 12.09 hrs, Volume= 0.024 af, Depth= 2.47"
 Routed to Link 2L : C Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
 Type III 24-hr 10-yr Rainfall=5.13"

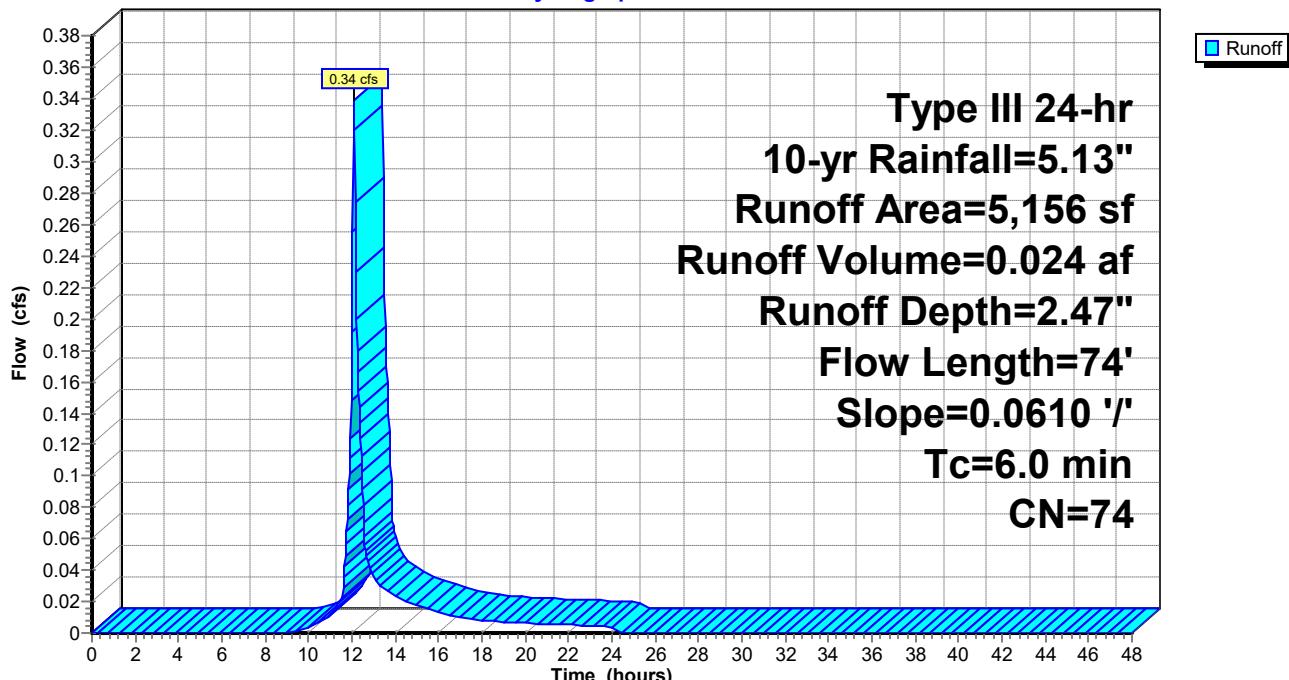
Area (sf)	CN	Description
557	73	Brush, Good, HSG D
3,991	80	>75% Grass cover, Good, HSG D
608	39	>75% Grass cover, Good, HSG A
5,156	74	Weighted Average
5,156		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	74	0.0610	0.26		Sheet Flow, Segment 1 Grass: Short n= 0.150 P2= 3.43"
4.8	74				Total, Increased to minimum Tc = 6.0 min



Subcatchment C2: PRWS-C2

Hydrograph



Summary for Pond P-C: Pond C

Inflow Area = 1.040 ac, 59.33% Impervious, Inflow Depth = 2.82" for 10-yr event
 Inflow = 3.33 cfs @ 12.10 hrs, Volume= 0.245 af
 Outflow = 1.94 cfs @ 12.23 hrs, Volume= 0.245 af, Atten= 42%, Lag= 8.0 min
 Discarded = 0.10 cfs @ 12.23 hrs, Volume= 0.127 af
 Primary = 1.63 cfs @ 12.23 hrs, Volume= 0.115 af
 Routed to Link 2L : C Total
 Secondary = 0.21 cfs @ 12.23 hrs, Volume= 0.003 af
 Routed to Link 2L : C Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
 Peak Elev= 32.29' @ 12.23 hrs Surf.Area= 4,201 sf Storage= 2,897 cf

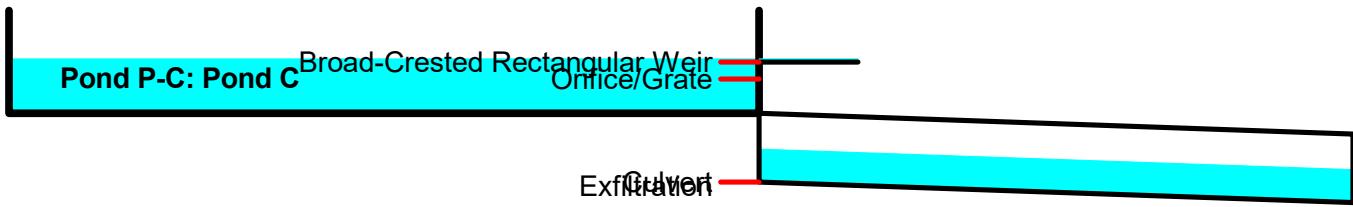
Plug-Flow detention time= 131.0 min calculated for 0.245 af (100% of inflow)
 Center-of-Mass det. time= 130.9 min (957.6 - 826.7)

Volume	Invert	Avail.Storage	Storage Description	
#1	31.50'	6,050 cf	Custom Stage Data (Conic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
31.50	3,128	0	0	3,128
32.50	4,507	3,797	3,797	4,524
33.00	4,507	2,254	6,050	4,643
Device	Routing	Invert	Outlet Devices	
#1	Discarded	31.50'	1.000 in/hr Exfiltration over Wetted area	
#2	Primary	30.50'	12.0" Round Culvert L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 30.50' / 30.20' S= 0.0100 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf	
#3	Device 2	32.00'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads	
#4	Secondary	32.25'	10.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88	

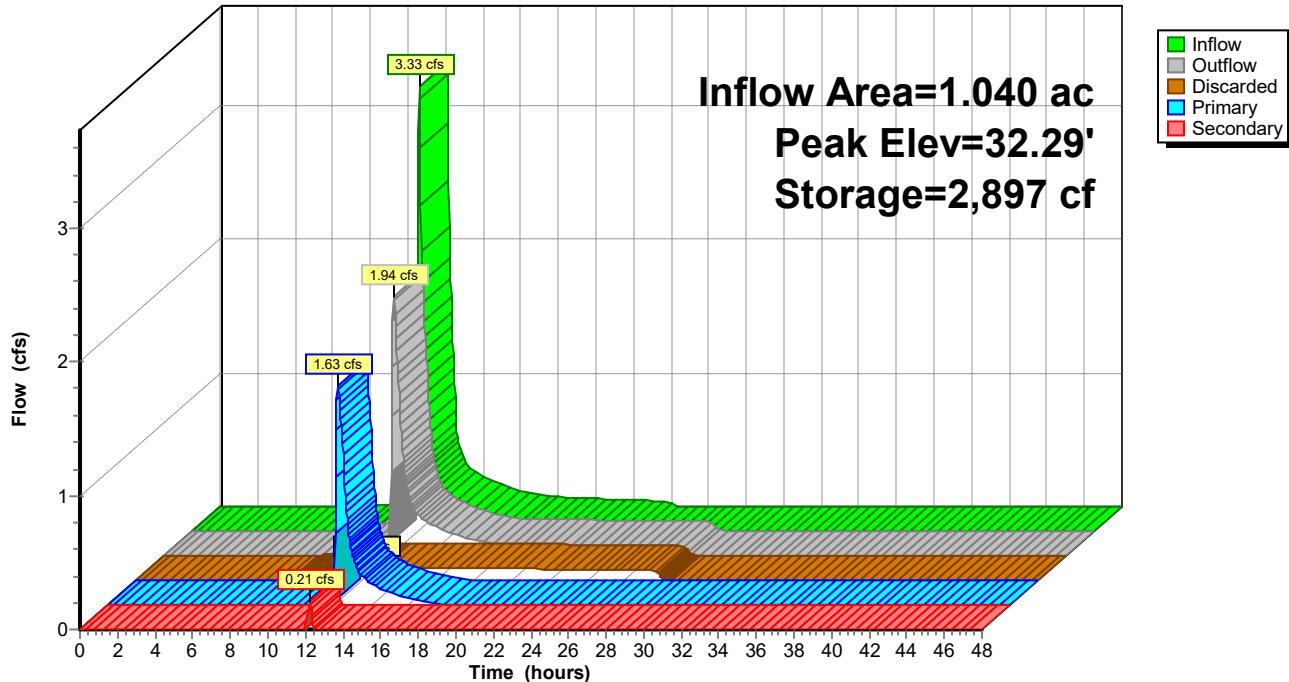
Discarded OutFlow Max=0.10 cfs @ 12.23 hrs HW=32.29' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=1.63 cfs @ 12.23 hrs HW=32.29' (Free Discharge)
 ↑ 2=Culvert (Passes 1.63 cfs of 3.39 cfs potential flow)
 ↑ 3=Orifice/Grate (Weir Controls 1.63 cfs @ 1.77 fps)

Secondary OutFlow Max=0.21 cfs @ 12.23 hrs HW=32.29' (Free Discharge)
 ↑ 4=Broad-Crested Rectangular Weir (Weir Controls 0.21 cfs @ 0.48 fps)

**Pond P-C: Pond C**

Hydrograph



Stage-Discharge for Pond P-C: Pond C

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
31.50	0.00	0.00	0.00	0.00
31.55	0.07	0.07	0.00	0.00
31.60	0.08	0.08	0.00	0.00
31.65	0.08	0.08	0.00	0.00
31.70	0.08	0.08	0.00	0.00
31.75	0.08	0.08	0.00	0.00
31.80	0.08	0.08	0.00	0.00
31.85	0.08	0.08	0.00	0.00
31.90	0.08	0.08	0.00	0.00
31.95	0.09	0.09	0.00	0.00
32.00	0.09	0.09	0.00	0.00
32.05	0.20	0.09	0.11	0.00
32.10	0.42	0.09	0.32	0.00
32.15	0.69	0.09	0.60	0.00
32.20	1.01	0.09	0.92	0.00
32.25	1.38	0.10	1.28	0.00
32.30	2.05	0.10	1.69	0.26
32.35	2.97	0.10	2.13	0.74
32.40	3.85	0.10	2.39	1.36
32.45	4.73	0.10	2.54	2.09
32.50	5.75	0.10	2.67	2.97
32.55	6.89	0.11	2.80	3.98
32.60	8.13	0.11	2.93	5.09
32.65	9.48	0.11	3.05	6.32
32.70	10.97	0.11	3.16	7.70
32.75	12.57	0.11	3.28	9.19
32.80	14.30	0.11	3.38	10.81
32.85	16.14	0.11	3.49	12.55
32.90	17.82	0.11	3.59	14.12
32.95	19.55	0.11	3.69	15.75
33.00	21.33	0.11	3.78	17.44

Stage-Area-Storage for Pond P-C: Pond C

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
31.50	3,128	3,128	0
31.55	3,191	3,192	158
31.60	3,255	3,256	319
31.65	3,319	3,321	483
31.70	3,384	3,387	651
31.75	3,449	3,453	822
31.80	3,515	3,520	996
31.85	3,582	3,588	1,173
31.90	3,649	3,656	1,354
31.95	3,717	3,725	1,538
32.00	3,786	3,794	1,726
32.05	3,855	3,864	1,917
32.10	3,925	3,935	2,111
32.15	3,996	4,007	2,309
32.20	4,067	4,079	2,511
32.25	4,139	4,151	2,716
32.30	4,211	4,225	2,925
32.35	4,284	4,299	3,137
32.40	4,358	4,373	3,353
32.45	4,432	4,448	3,573
32.50	4,507	4,524	3,797
32.55	4,507	4,536	4,022
32.60	4,507	4,548	4,247
32.65	4,507	4,560	4,473
32.70	4,507	4,572	4,698
32.75	4,507	4,584	4,923
32.80	4,507	4,596	5,149
32.85	4,507	4,607	5,374
32.90	4,507	4,619	5,599
32.95	4,507	4,631	5,825
33.00	4,507	4,643	6,050

Summary for Link 2L: C Total

Inflow Area = 1.159 ac, 53.27% Impervious, Inflow Depth = 1.47" for 10-yr event

Inflow = 2.04 cfs @ 12.22 hrs, Volume= 0.142 af

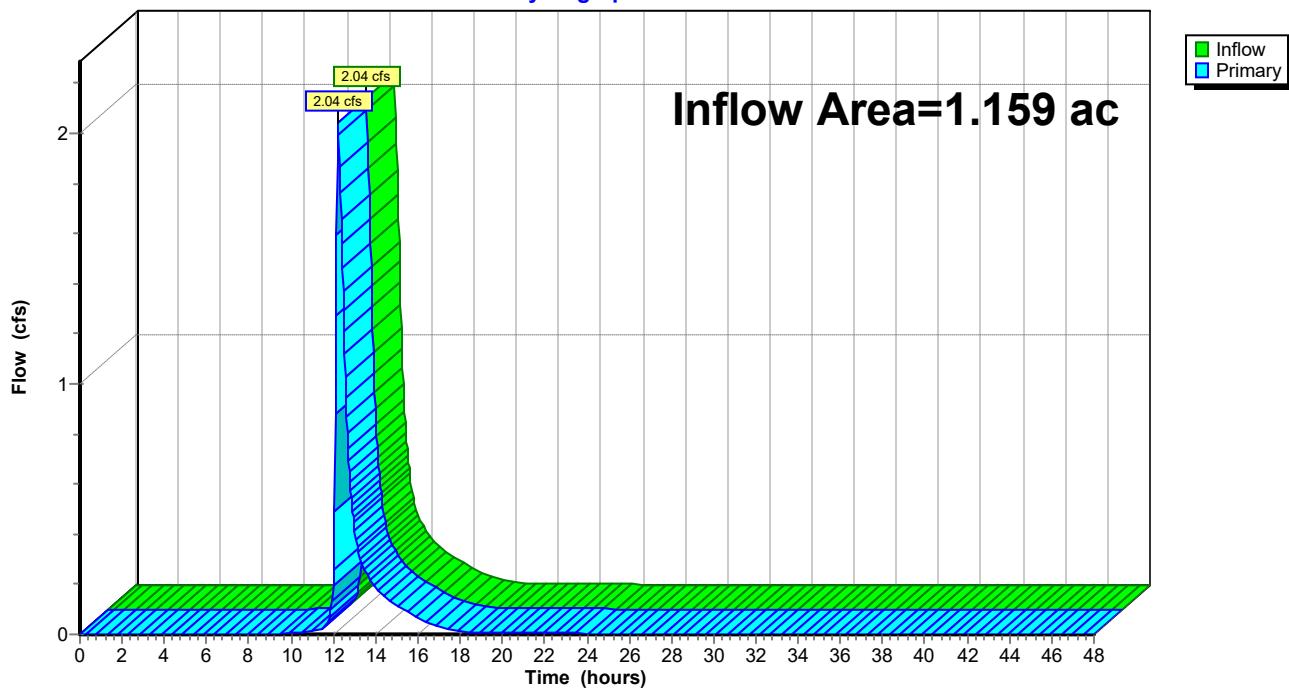
Primary = 2.04 cfs @ 12.22 hrs, Volume= 0.142 af, Atten= 0%, Lag= 0.0 min

Routed to Link SITE : Total Site

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link 2L: C Total

Hydrograph



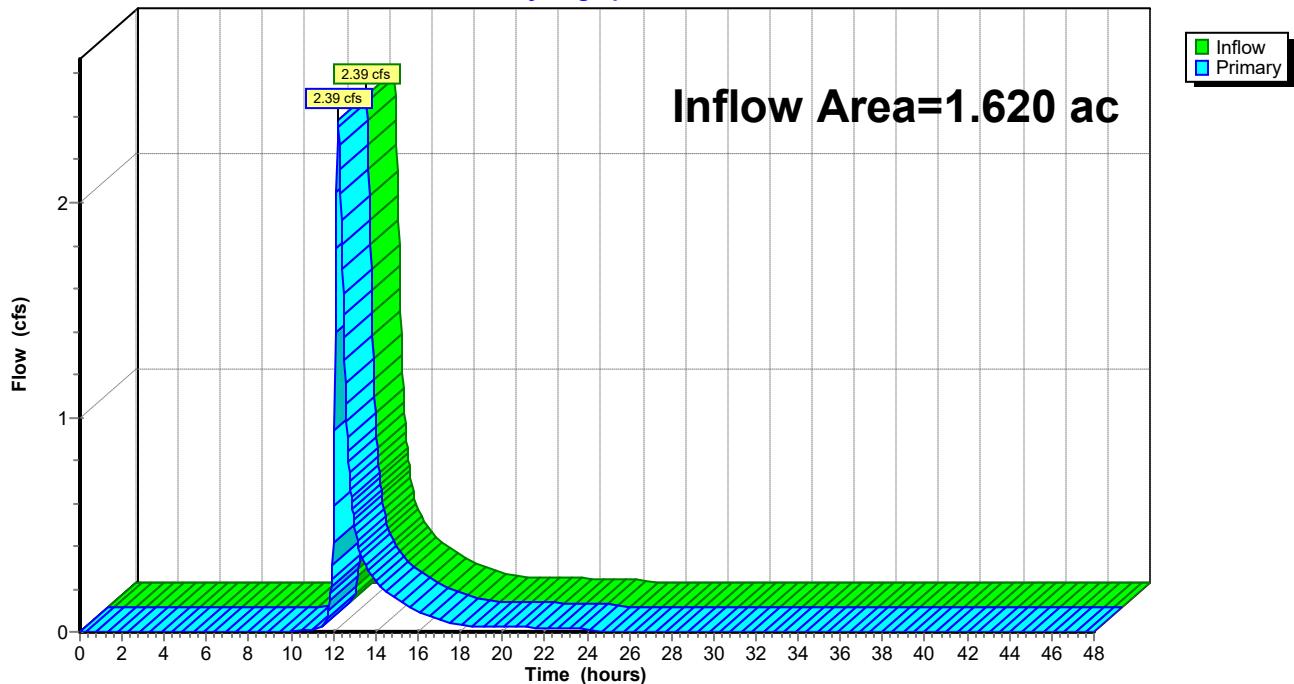
Summary for Link SITE: Total Site

Inflow Area = 1.620 ac, 45.14% Impervious, Inflow Depth = 1.38" for 10-yr event

Inflow = 2.39 cfs @ 12.22 hrs, Volume= 0.186 af

Primary = 2.39 cfs @ 12.22 hrs, Volume= 0.186 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link SITE: Total Site**Hydrograph**

Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 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 A: PRWS-A

Runoff Area=16,220 sf 29.90% Impervious Runoff Depth=1.78"

Flow Length=68' Slope=0.0440 '/' Tc=6.0 min CN=57 Runoff=0.71 cfs 0.055 af

Subcatchment B: PRWS-B

Runoff Area=3,874 sf 3.02% Impervious Runoff Depth=1.62"

Flow Length=45' Slope=0.0389 '/' Tc=6.0 min CN=55 Runoff=0.15 cfs 0.012 af

Subcatchment C1: PRWS-C1

Runoff Area=45,321 sf 59.33% Impervious Runoff Depth=3.73"

Flow Length=205' Tc=6.8 min CN=78 Runoff=4.40 cfs 0.323 af

Subcatchment C2: PRWS-C2

Runoff Area=5,156 sf 0.00% Impervious Runoff Depth=3.33"

Flow Length=74' Slope=0.0610 '/' Tc=6.0 min CN=74 Runoff=0.46 cfs 0.033 af

Pond P-C: Pond C

Peak Elev=32.38' Storage=3,249 cf Inflow=4.40 cfs 0.323 af

Discarded=0.10 cfs 0.139 af Primary=2.32 cfs 0.166 af Secondary=1.05 cfs 0.018 af Outflow=3.47 cfs 0.323 af

Link 2L: C Total

Inflow=3.73 cfs 0.217 af

Primary=3.73 cfs 0.217 af

Link SITE: Total Site

Inflow=4.44 cfs 0.284 af

Primary=4.44 cfs 0.284 af

Total Runoff Area = 1.620 ac Runoff Volume = 0.423 af Average Runoff Depth = 3.14"
54.86% Pervious = 0.889 ac 45.14% Impervious = 0.731 ac

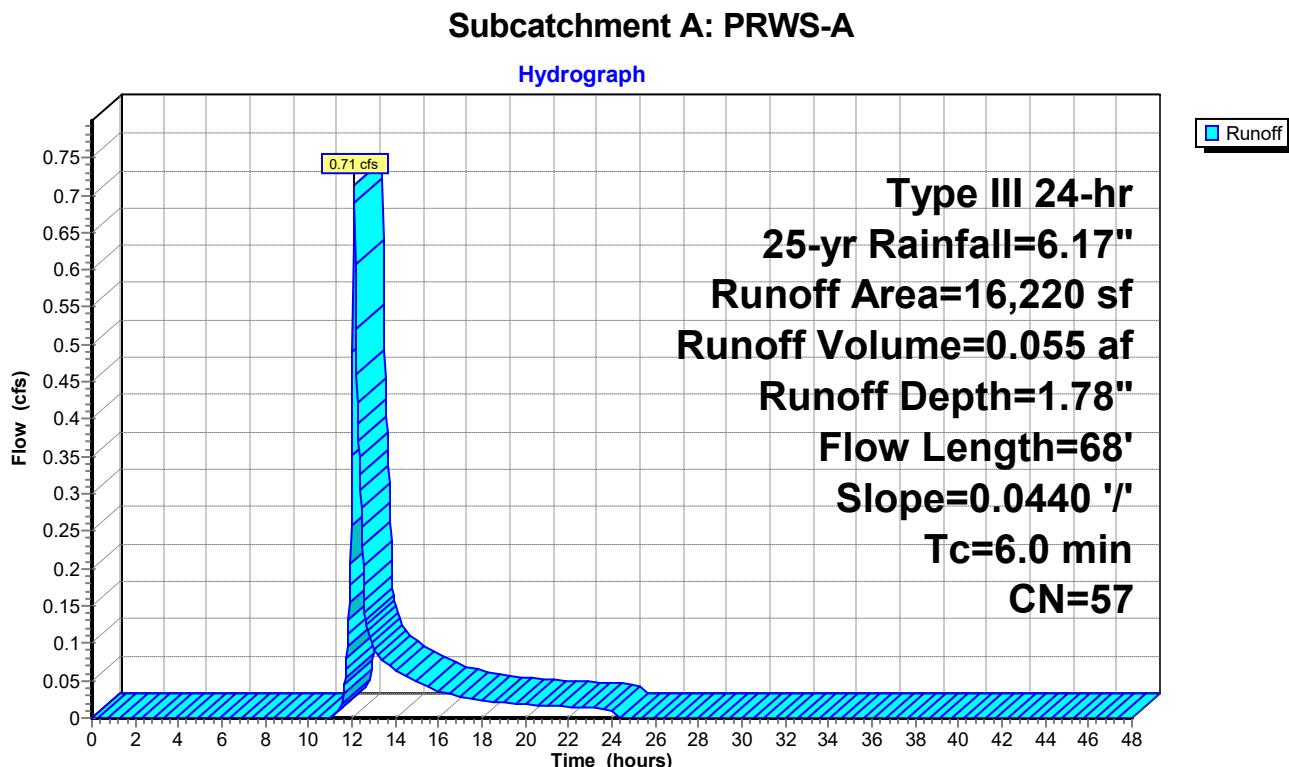
Summary for Subcatchment A: PRWS-A

Runoff = 0.71 cfs @ 12.10 hrs, Volume= 0.055 af, Depth= 1.78"
 Routed to Link SITE : Total Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
 Type III 24-hr 25-yr Rainfall=6.17"

Area (sf)	CN	Description
11,370	39	>75% Grass cover, Good, HSG A
4,850	98	Paved parking, HSG A
16,220	57	Weighted Average
11,370		70.10% Pervious Area
4,850		29.90% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
5.1	68	0.0440	0.22		Sheet Flow, Segment 1 Grass: Short n= 0.150 P2= 3.43"
5.1	68				Total, Increased to minimum Tc = 6.0 min



Summary for Subcatchment B: PRWS-B

Runoff = 0.15 cfs @ 12.10 hrs, Volume= 0.012 af, Depth= 1.62"
Routed to Link SITE : Total Site

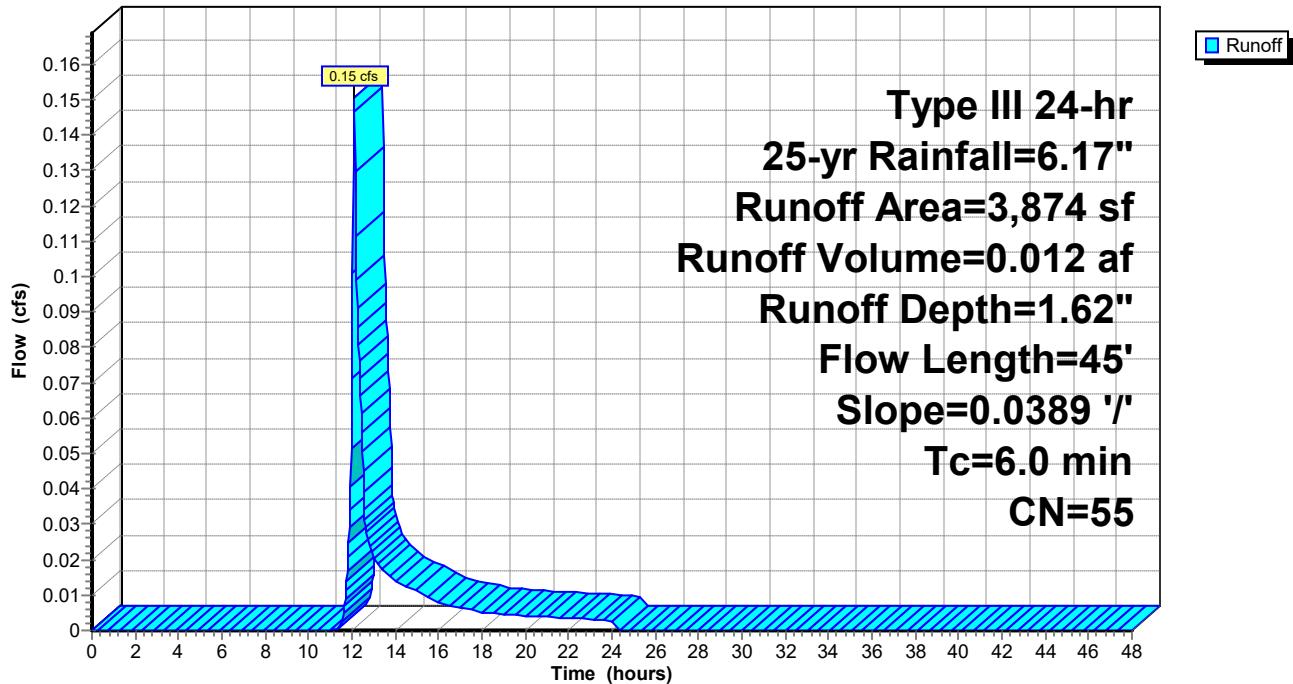
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-yr Rainfall=6.17"

Area (sf)	CN	Description
2,337	39	>75% Grass cover, Good, HSG A
648	80	>75% Grass cover, Good, HSG D
772	77	Brush, Fair, HSG D
117	98	Paved parking, HSG A
3,874	55	Weighted Average
3,757		96.98% Pervious Area
117		3.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	45	0.0389	0.20		Sheet Flow, Segment 1 Grass: Short n= 0.150 P2= 3.43"
3.8	45	Total, Increased to minimum Tc = 6.0 min			

Segment 1

Subcatchment B: PRWS-B

Subcatchment B: PRWS-B**Hydrograph**

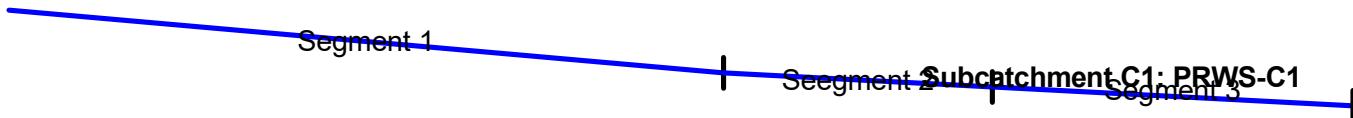
Summary for Subcatchment C1: PRWS-C1

Runoff = 4.40 cfs @ 12.10 hrs, Volume= 0.323 af, Depth= 3.73"
 Routed to Pond P-C : Pond C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
 Type III 24-hr 25-yr Rainfall=6.17"

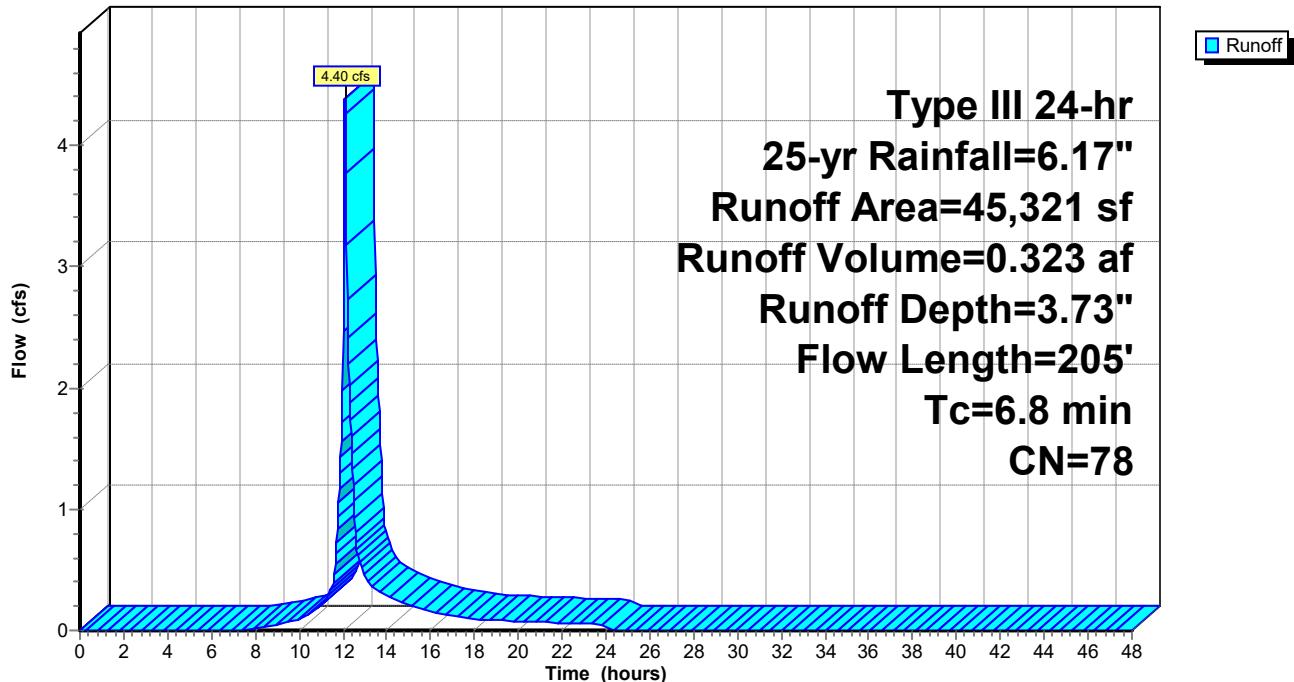
Area (sf)	CN	Description
4,355	80	>75% Grass cover, Good, HSG D
14,079	39	>75% Grass cover, Good, HSG A
26,887	98	Paved parking, HSG D
45,321	78	Weighted Average
18,434		40.67% Pervious Area
26,887		59.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	109	0.0250	1.58		Sheet Flow, Segment 1 Smooth surfaces n= 0.011 P2= 3.43"
5.2	41	0.0150	0.13		Sheet Flow, Segment 2 Grass: Short n= 0.150 P2= 3.43"
0.5	55	0.0150	1.84		Shallow Concentrated Flow, Segment 3 Grassed Waterway Kv= 15.0 fps
6.8	205	Total			



Subcatchment C1: PRWS-C1

Hydrograph



Summary for Subcatchment C2: PRWS-C2

Runoff = 0.46 cfs @ 12.09 hrs, Volume= 0.033 af, Depth= 3.33"
Routed to Link 2L : C Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-yr Rainfall=6.17"

Area (sf)	CN	Description
557	73	Brush, Good, HSG D
3,991	80	>75% Grass cover, Good, HSG D
608	39	>75% Grass cover, Good, HSG A
5,156	74	Weighted Average
5,156		100.00% Pervious Area

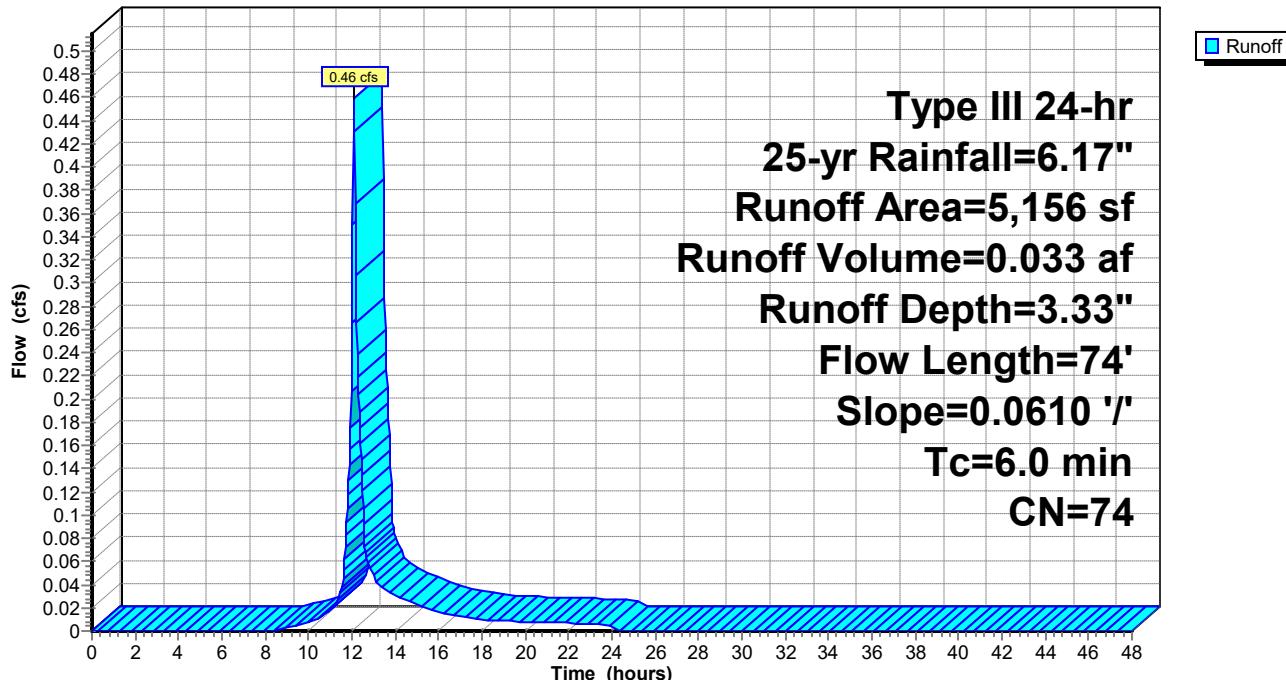
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
4.8	74	0.0610	0.26		Sheet Flow, Segment 1
					Grass: Short n= 0.150 P2= 3.43"

4.8 74 Total, Increased to minimum Tc = 6.0 min



Subcatchment C2: PRWS-C2

Hydrograph



Summary for Pond P-C: Pond C

Inflow Area = 1.040 ac, 59.33% Impervious, Inflow Depth = 3.73" for 25-yr event
 Inflow = 4.40 cfs @ 12.10 hrs, Volume= 0.323 af
 Outflow = 3.47 cfs @ 12.17 hrs, Volume= 0.323 af, Atten= 21%, Lag= 4.1 min
 Discarded = 0.10 cfs @ 12.17 hrs, Volume= 0.139 af
 Primary = 2.32 cfs @ 12.17 hrs, Volume= 0.166 af
 Routed to Link 2L : C Total
 Secondary = 1.05 cfs @ 12.17 hrs, Volume= 0.018 af
 Routed to Link 2L : C Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
 Peak Elev= 32.38' @ 12.17 hrs Surf.Area= 4,322 sf Storage= 3,249 cf

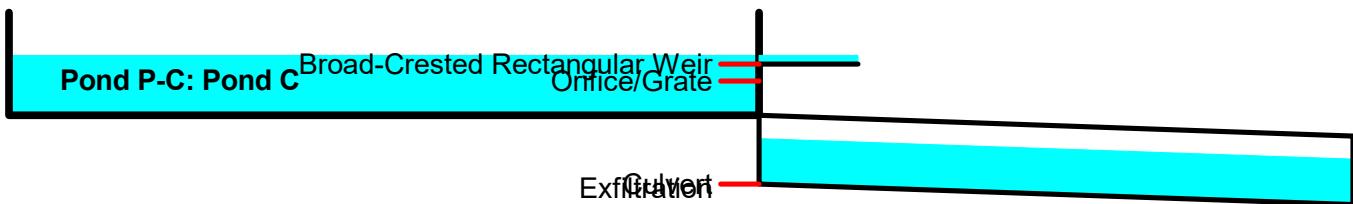
Plug-Flow detention time= 112.2 min calculated for 0.323 af (100% of inflow)
 Center-of-Mass det. time= 112.3 min (931.1 - 818.7)

Volume	Invert	Avail.Storage	Storage Description	
#1	31.50'	6,050 cf	Custom Stage Data (Conic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
31.50	3,128	0	0	3,128
32.50	4,507	3,797	3,797	4,524
33.00	4,507	2,254	6,050	4,643
Device	Routing	Invert	Outlet Devices	
#1	Discarded	31.50'	1.000 in/hr Exfiltration over Wetted area	
#2	Primary	30.50'	12.0" Round Culvert L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 30.50' / 30.20' S= 0.0100 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf	
#3	Device 2	32.00'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads	
#4	Secondary	32.25'	10.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.66 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88	

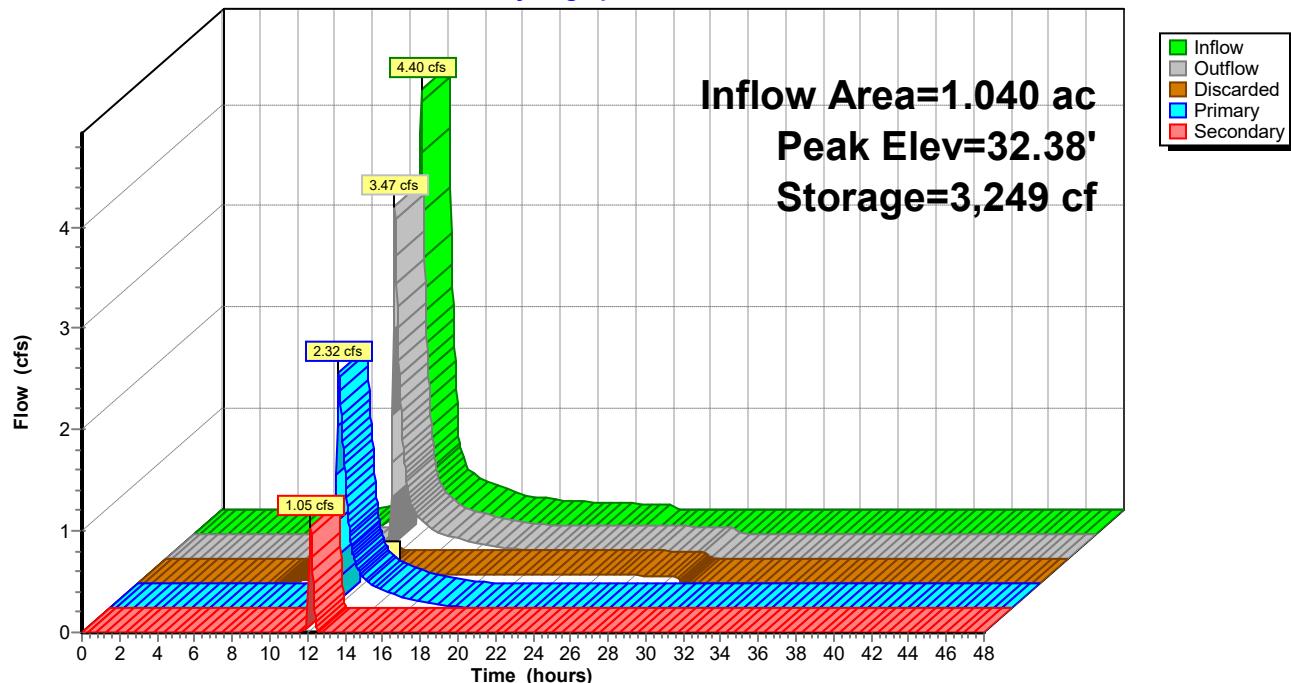
Discarded OutFlow Max=0.10 cfs @ 12.17 hrs HW=32.37' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=2.31 cfs @ 12.17 hrs HW=32.37' (Free Discharge)
 ↑ 2=Culvert (Passes 2.31 cfs of 3.50 cfs potential flow)
 ↑ 3=Orifice/Grate (Orifice Controls 2.31 cfs @ 2.95 fps)

Secondary OutFlow Max=1.03 cfs @ 12.17 hrs HW=32.37' (Free Discharge)
 ↑ 4=Broad-Crested Rectangular Weir (Weir Controls 1.03 cfs @ 0.83 fps)

**Pond P-C: Pond C**

Hydrograph



Stage-Discharge for Pond P-C: Pond C

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
31.50	0.00	0.00	0.00	0.00
31.55	0.07	0.07	0.00	0.00
31.60	0.08	0.08	0.00	0.00
31.65	0.08	0.08	0.00	0.00
31.70	0.08	0.08	0.00	0.00
31.75	0.08	0.08	0.00	0.00
31.80	0.08	0.08	0.00	0.00
31.85	0.08	0.08	0.00	0.00
31.90	0.08	0.08	0.00	0.00
31.95	0.09	0.09	0.00	0.00
32.00	0.09	0.09	0.00	0.00
32.05	0.20	0.09	0.11	0.00
32.10	0.42	0.09	0.32	0.00
32.15	0.69	0.09	0.60	0.00
32.20	1.01	0.09	0.92	0.00
32.25	1.38	0.10	1.28	0.00
32.30	2.05	0.10	1.69	0.26
32.35	2.97	0.10	2.13	0.74
32.40	3.85	0.10	2.39	1.36
32.45	4.73	0.10	2.54	2.09
32.50	5.75	0.10	2.67	2.97
32.55	6.89	0.11	2.80	3.98
32.60	8.13	0.11	2.93	5.09
32.65	9.48	0.11	3.05	6.32
32.70	10.97	0.11	3.16	7.70
32.75	12.57	0.11	3.28	9.19
32.80	14.30	0.11	3.38	10.81
32.85	16.14	0.11	3.49	12.55
32.90	17.82	0.11	3.59	14.12
32.95	19.55	0.11	3.69	15.75
33.00	21.33	0.11	3.78	17.44

Stage-Area-Storage for Pond P-C: Pond C

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
31.50	3,128	3,128	0
31.55	3,191	3,192	158
31.60	3,255	3,256	319
31.65	3,319	3,321	483
31.70	3,384	3,387	651
31.75	3,449	3,453	822
31.80	3,515	3,520	996
31.85	3,582	3,588	1,173
31.90	3,649	3,656	1,354
31.95	3,717	3,725	1,538
32.00	3,786	3,794	1,726
32.05	3,855	3,864	1,917
32.10	3,925	3,935	2,111
32.15	3,996	4,007	2,309
32.20	4,067	4,079	2,511
32.25	4,139	4,151	2,716
32.30	4,211	4,225	2,925
32.35	4,284	4,299	3,137
32.40	4,358	4,373	3,353
32.45	4,432	4,448	3,573
32.50	4,507	4,524	3,797
32.55	4,507	4,536	4,022
32.60	4,507	4,548	4,247
32.65	4,507	4,560	4,473
32.70	4,507	4,572	4,698
32.75	4,507	4,584	4,923
32.80	4,507	4,596	5,149
32.85	4,507	4,607	5,374
32.90	4,507	4,619	5,599
32.95	4,507	4,631	5,825
33.00	4,507	4,643	6,050

Summary for Link 2L: C Total

Inflow Area = 1.159 ac, 53.27% Impervious, Inflow Depth = 2.25" for 25-yr event

Inflow = 3.73 cfs @ 12.16 hrs, Volume= 0.217 af

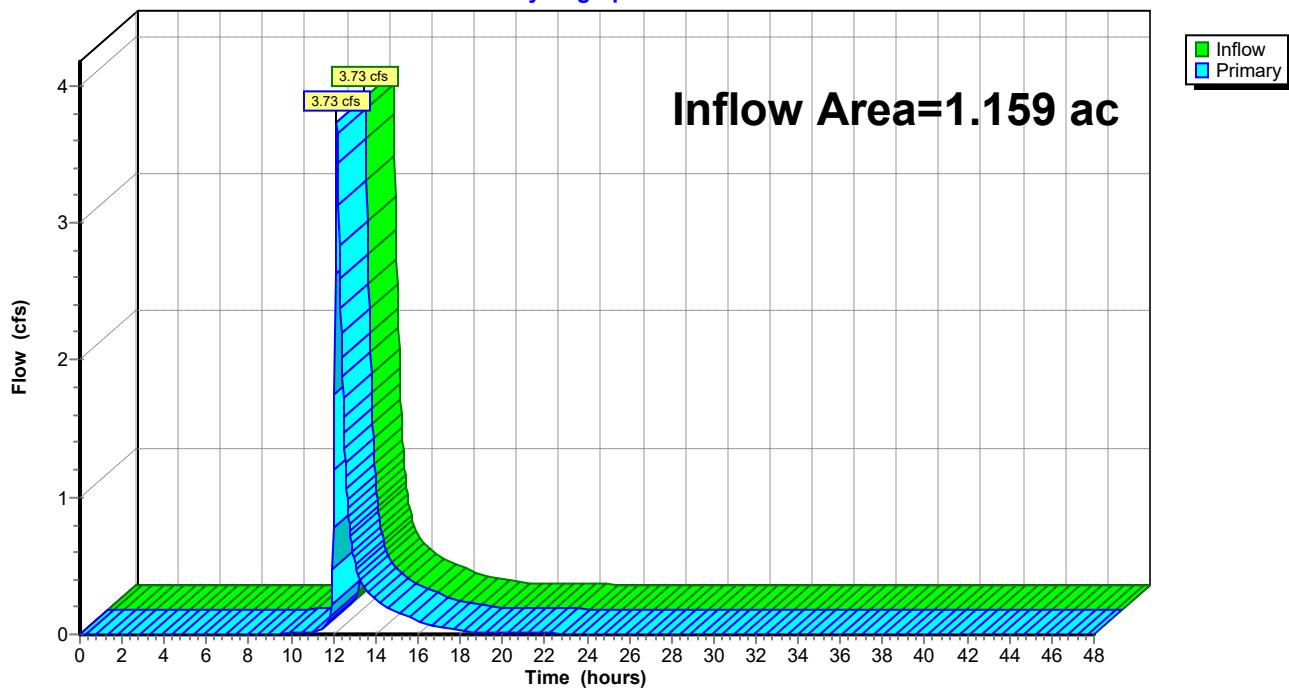
Primary = 3.73 cfs @ 12.16 hrs, Volume= 0.217 af, Atten= 0%, Lag= 0.0 min

Routed to Link SITE : Total Site

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link 2L: C Total

Hydrograph



Summary for Link SITE: Total Site

Inflow Area = 1.620 ac, 45.14% Impervious, Inflow Depth = 2.10" for 25-yr event

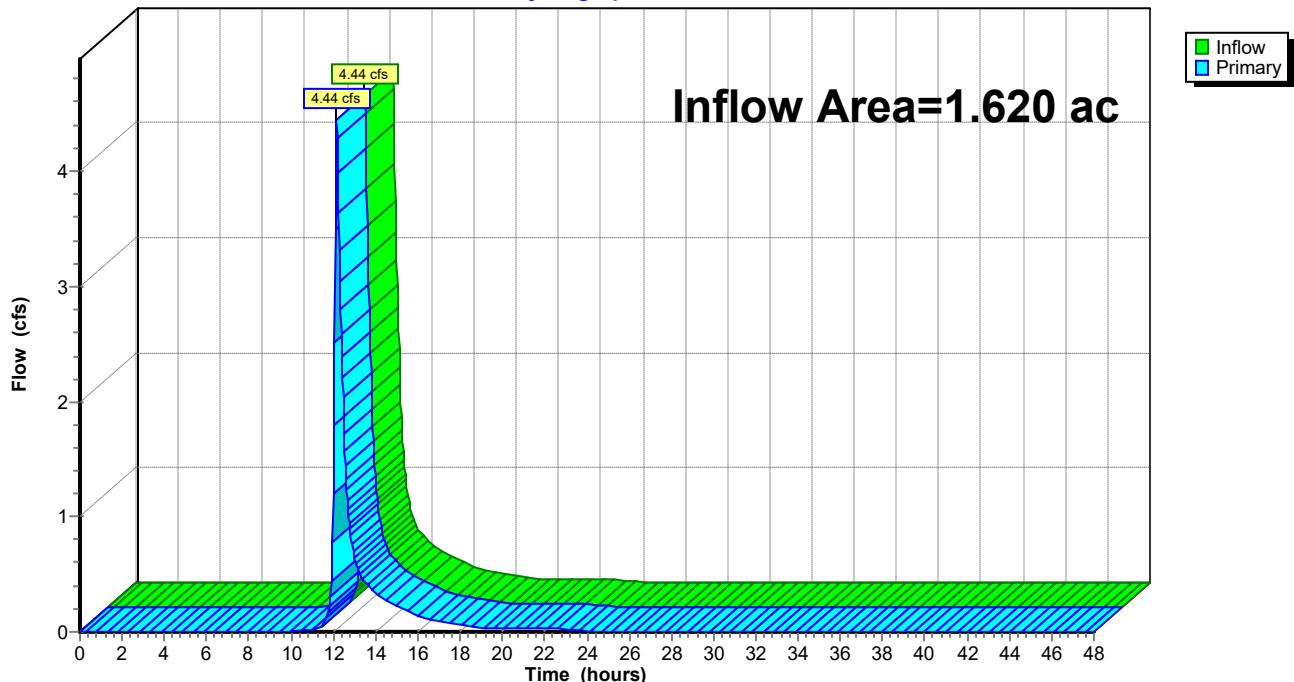
Inflow = 4.44 cfs @ 12.15 hrs, Volume= 0.284 af

Primary = 4.44 cfs @ 12.15 hrs, Volume= 0.284 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link SITE: Total Site

Hydrograph



Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 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 A: PRWS-A

Runoff Area=16,220 sf 29.90% Impervious Runoff Depth=2.85"

Flow Length=68' Slope=0.0440 '/' Tc=6.0 min CN=57 Runoff=1.20 cfs 0.089 af

Subcatchment B: PRWS-B

Runoff Area=3,874 sf 3.02% Impervious Runoff Depth=2.64"

Flow Length=45' Slope=0.0389 '/' Tc=6.0 min CN=55 Runoff=0.26 cfs 0.020 af

Subcatchment C1: PRWS-C1

Runoff Area=45,321 sf 59.33% Impervious Runoff Depth=5.20"

Flow Length=205' Tc=6.8 min CN=78 Runoff=6.08 cfs 0.451 af

Subcatchment C2: PRWS-C2

Runoff Area=5,156 sf 0.00% Impervious Runoff Depth=4.74"

Flow Length=74' Slope=0.0610 '/' Tc=6.0 min CN=74 Runoff=0.65 cfs 0.047 af

Pond P-C: Pond C

Peak Elev=32.47' Storage=3,678 cf Inflow=6.08 cfs 0.451 af

Discarded=0.10 cfs 0.153 af Primary=2.60 cfs 0.246 af Secondary=2.49 cfs 0.052 af Outflow=5.20 cfs 0.451 af

Link 2L: C Total

Inflow=5.62 cfs 0.345 af

Primary=5.62 cfs 0.345 af

Link SITE: Total Site

Inflow=6.93 cfs 0.453 af

Primary=6.93 cfs 0.453 af

Total Runoff Area = 1.620 ac Runoff Volume = 0.605 af Average Runoff Depth = 4.48"
54.86% Pervious = 0.889 ac 45.14% Impervious = 0.731 ac

Summary for Subcatchment A: PRWS-A

Runoff = 1.20 cfs @ 12.09 hrs, Volume= 0.089 af, Depth= 2.85"
 Routed to Link SITE : Total Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
 Type III 24-hr 100-yr Rainfall=7.79"

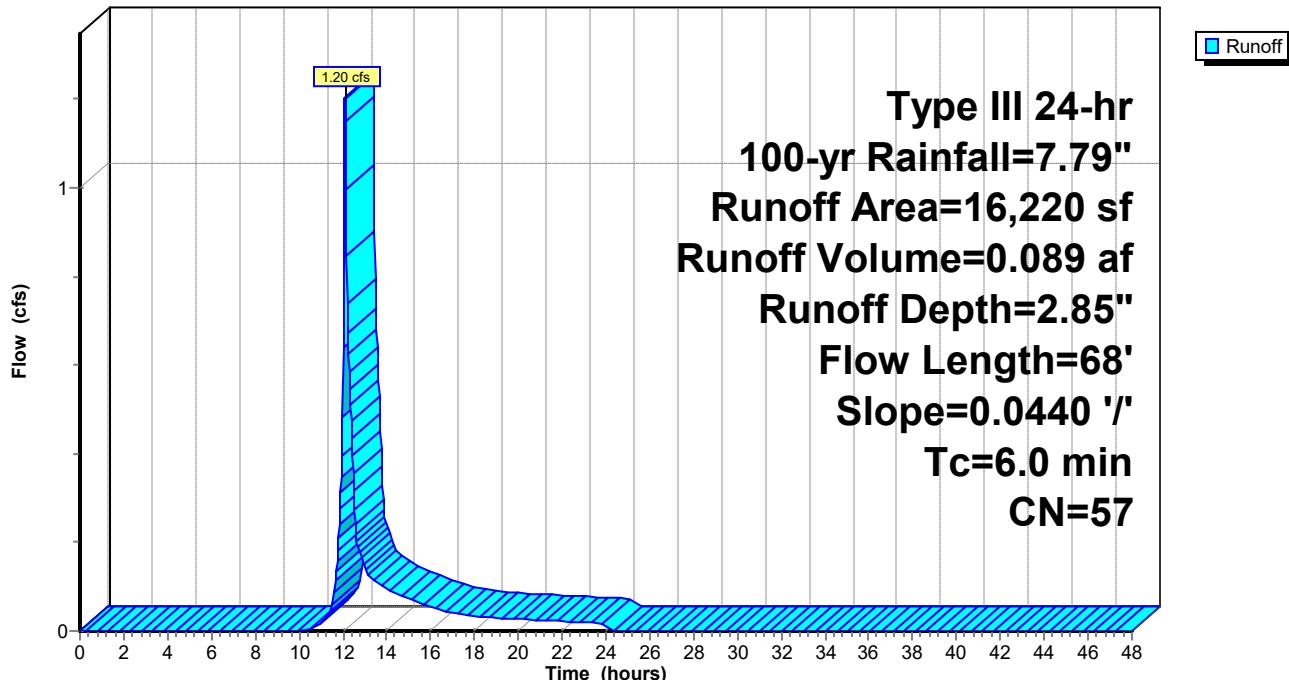
Area (sf)	CN	Description
11,370	39	>75% Grass cover, Good, HSG A
4,850	98	Paved parking, HSG A
16,220	57	Weighted Average
11,370		70.10% Pervious Area
4,850		29.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	68	0.0440	0.22		Sheet Flow, Segment 1 Grass: Short n= 0.150 P2= 3.43"
5.1	68				Total, Increased to minimum Tc = 6.0 min



Subcatchment A: PRWS-A

Hydrograph



Summary for Subcatchment B: PRWS-B

Runoff = 0.26 cfs @ 12.10 hrs, Volume= 0.020 af, Depth= 2.64"
Routed to Link SITE : Total Site

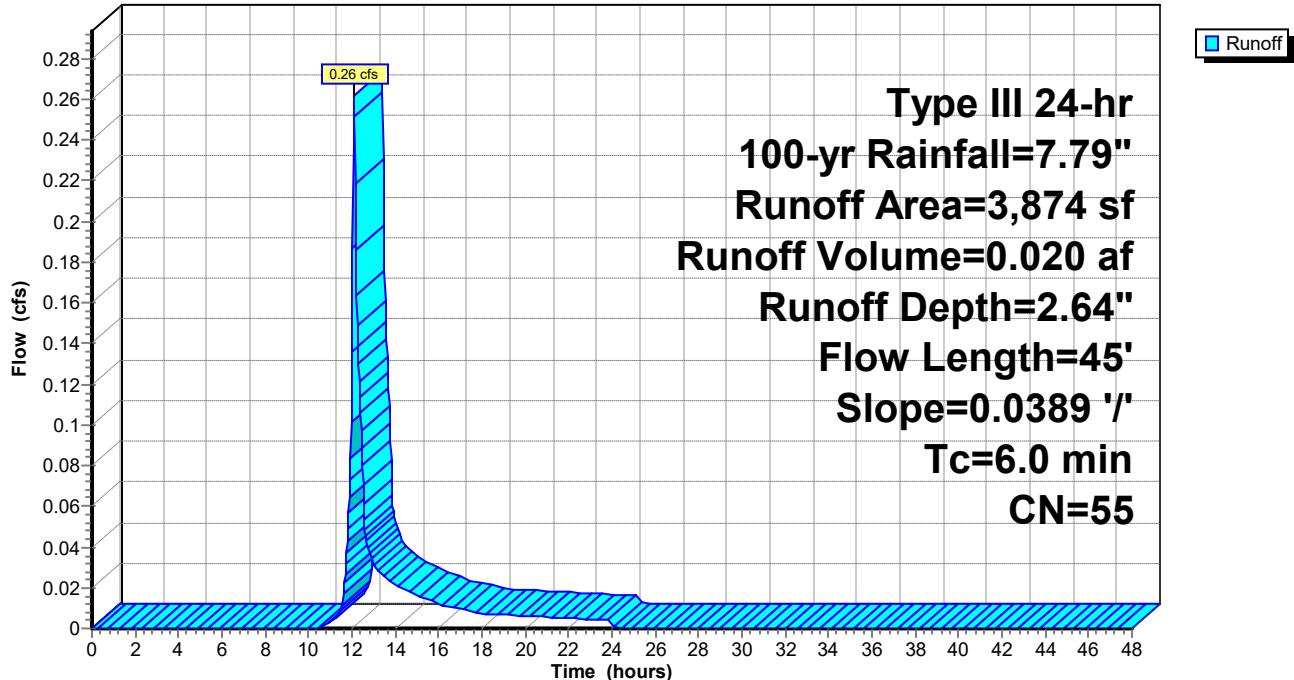
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 100-yr Rainfall=7.79"

Area (sf)	CN	Description
2,337	39	>75% Grass cover, Good, HSG A
648	80	>75% Grass cover, Good, HSG D
772	77	Brush, Fair, HSG D
117	98	Paved parking, HSG A
3,874	55	Weighted Average
3,757		96.98% Pervious Area
117		3.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	45	0.0389	0.20		Sheet Flow, Segment 1 Grass: Short n= 0.150 P2= 3.43"
3.8	45	Total, Increased to minimum Tc = 6.0 min			

Segment 1

Subcatchment B: PRWS-B

Subcatchment B: PRWS-B**Hydrograph**

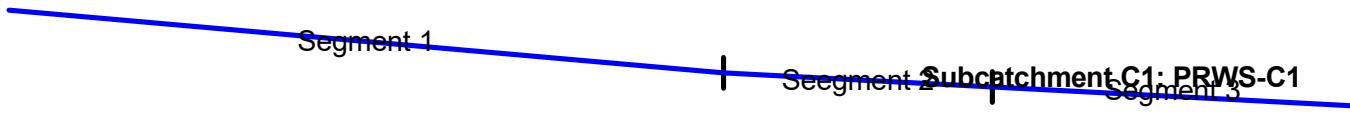
Summary for Subcatchment C1: PRWS-C1

Runoff = 6.08 cfs @ 12.10 hrs, Volume= 0.451 af, Depth= 5.20"
 Routed to Pond P-C : Pond C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
 Type III 24-hr 100-yr Rainfall=7.79"

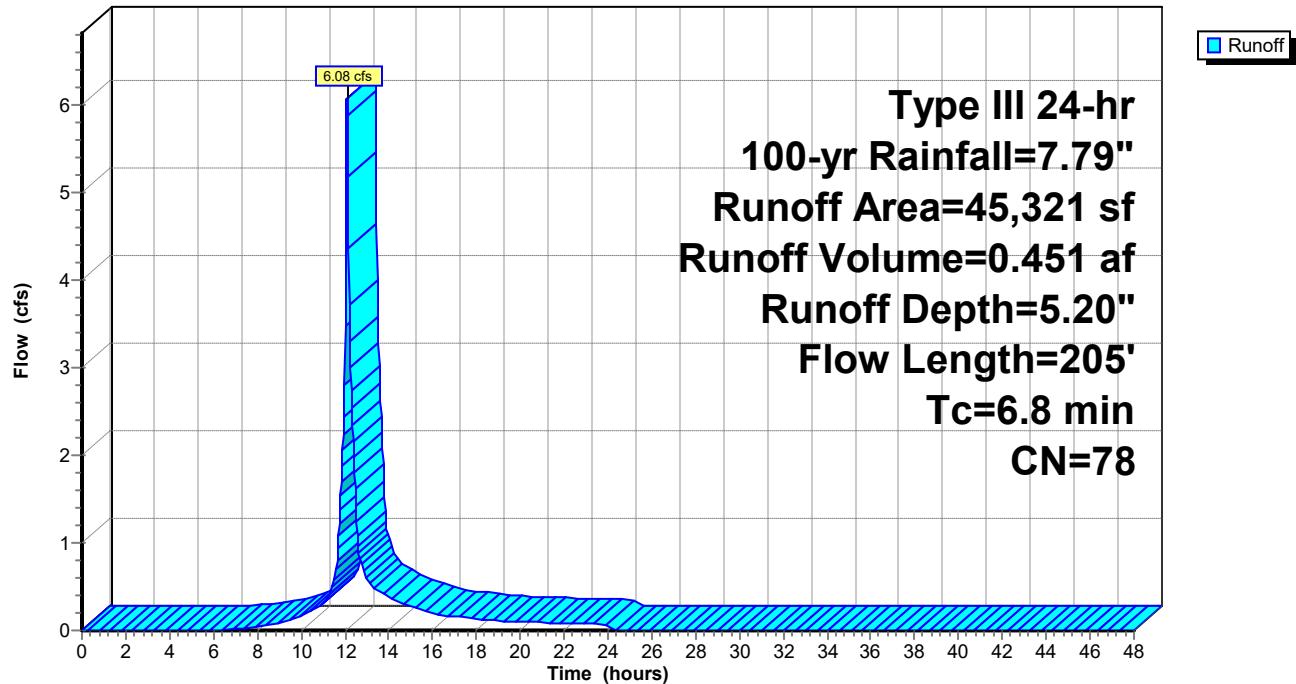
Area (sf)	CN	Description
4,355	80	>75% Grass cover, Good, HSG D
14,079	39	>75% Grass cover, Good, HSG A
26,887	98	Paved parking, HSG D
45,321	78	Weighted Average
18,434		40.67% Pervious Area
26,887		59.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	109	0.0250	1.58		Sheet Flow, Segment 1 Smooth surfaces n= 0.011 P2= 3.43"
5.2	41	0.0150	0.13		Sheet Flow, Segment 2 Grass: Short n= 0.150 P2= 3.43"
0.5	55	0.0150	1.84		Shallow Concentrated Flow, Segment 3 Grassed Waterway Kv= 15.0 fps
6.8	205	Total			



Subcatchment C1: PRWS-C1

Hydrograph



Summary for Subcatchment C2: PRWS-C2

Runoff = 0.65 cfs @ 12.09 hrs, Volume= 0.047 af, Depth= 4.74"
 Routed to Link 2L : C Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
 Type III 24-hr 100-yr Rainfall=7.79"

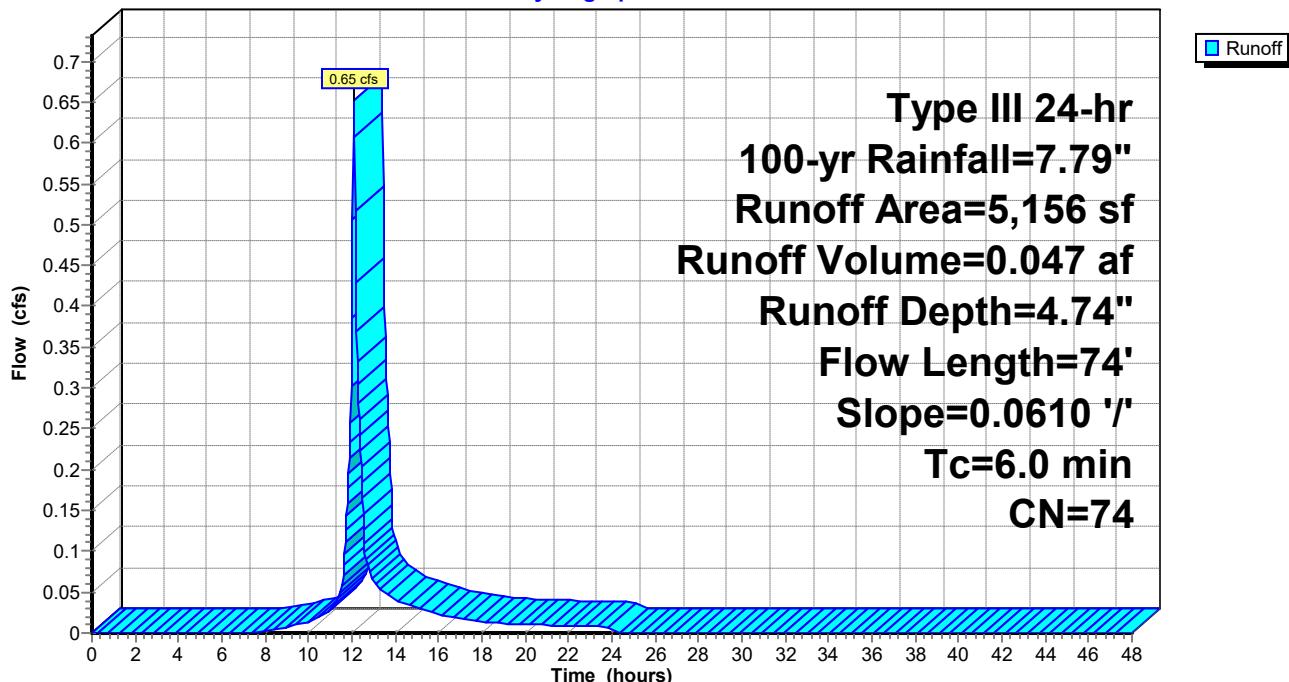
Area (sf)	CN	Description
557	73	Brush, Good, HSG D
3,991	80	>75% Grass cover, Good, HSG D
608	39	>75% Grass cover, Good, HSG A
5,156	74	Weighted Average
5,156		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	74	0.0610	0.26		Sheet Flow, Segment 1 Grass: Short n= 0.150 P2= 3.43"
4.8	74				Total, Increased to minimum Tc = 6.0 min



Subcatchment C2: PRWS-C2

Hydrograph



Summary for Pond P-C: Pond C

Inflow Area = 1.040 ac, 59.33% Impervious, Inflow Depth = 5.20" for 100-yr event
 Inflow = 6.08 cfs @ 12.10 hrs, Volume= 0.451 af
 Outflow = 5.20 cfs @ 12.15 hrs, Volume= 0.451 af, Atten= 15%, Lag= 3.2 min
 Discarded = 0.10 cfs @ 12.15 hrs, Volume= 0.153 af
 Primary = 2.60 cfs @ 12.15 hrs, Volume= 0.246 af
 Routed to Link 2L : C Total
 Secondary = 2.49 cfs @ 12.15 hrs, Volume= 0.052 af
 Routed to Link 2L : C Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
 Peak Elev= 32.47' @ 12.15 hrs Surf.Area= 4,467 sf Storage= 3,678 cf

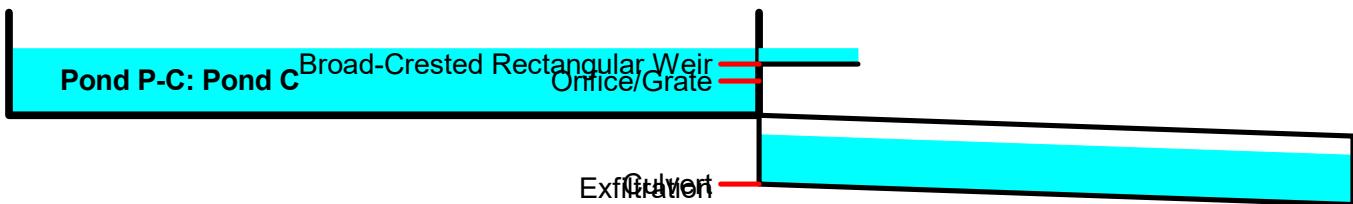
Plug-Flow detention time= 92.1 min calculated for 0.450 af (100% of inflow)
 Center-of-Mass det. time= 92.3 min (901.5 - 809.3)

Volume	Invert	Avail.Storage	Storage Description	
#1	31.50'	6,050 cf	Custom Stage Data (Conic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
31.50	3,128	0	0	3,128
32.50	4,507	3,797	3,797	4,524
33.00	4,507	2,254	6,050	4,643
Device	Routing	Invert	Outlet Devices	
#1	Discarded	31.50'	1.000 in/hr Exfiltration over Wetted area	
#2	Primary	30.50'	12.0" Round Culvert L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 30.50' / 30.20' S= 0.0100 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf	
#3	Device 2	32.00'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads	
#4	Secondary	32.25'	10.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88	

Discarded OutFlow Max=0.10 cfs @ 12.15 hrs HW=32.47' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.10 cfs)

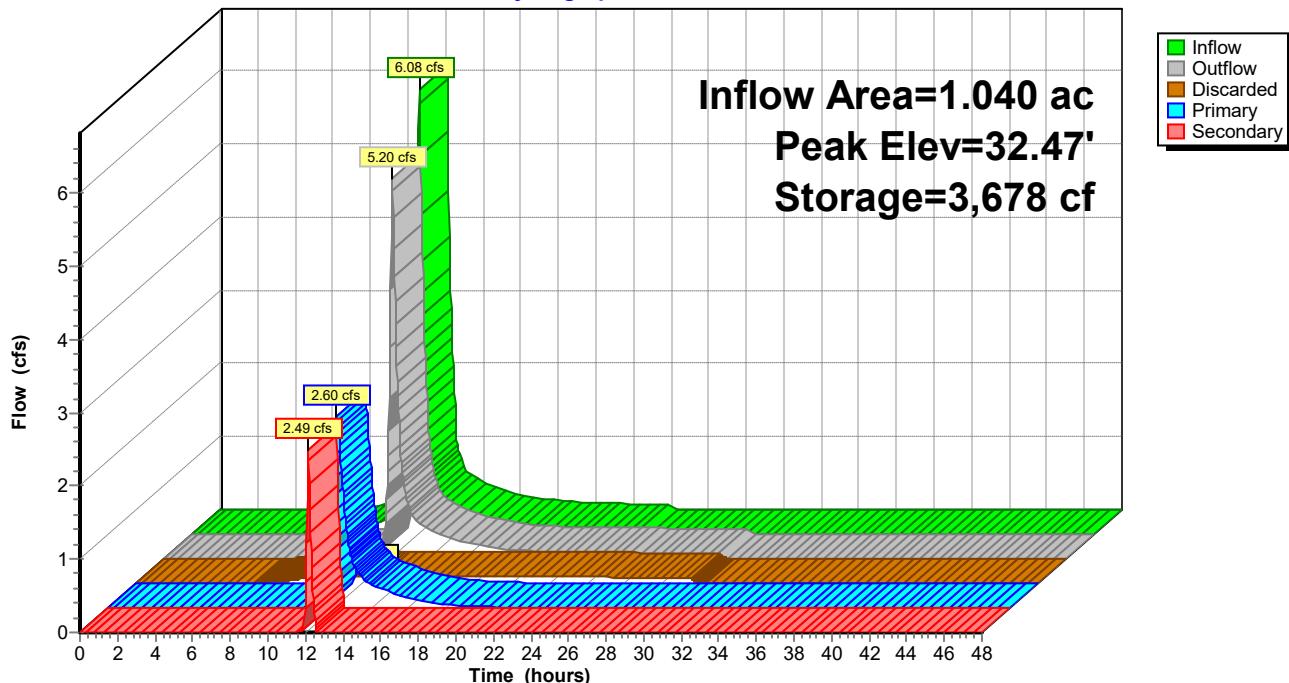
Primary OutFlow Max=2.60 cfs @ 12.15 hrs HW=32.47' (Free Discharge)
 ↑ 2=Culvert (Passes 2.60 cfs of 3.62 cfs potential flow)
 ↑ 3=Orifice/Grate (Orifice Controls 2.60 cfs @ 3.31 fps)

Secondary OutFlow Max=2.49 cfs @ 12.15 hrs HW=32.47' (Free Discharge)
 ↑ 4=Broad-Crested Rectangular Weir (Weir Controls 2.49 cfs @ 1.11 fps)



Pond P-C: Pond C

Hydrograph



Stage-Discharge for Pond P-C: Pond C

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
31.50	0.00	0.00	0.00	0.00
31.55	0.07	0.07	0.00	0.00
31.60	0.08	0.08	0.00	0.00
31.65	0.08	0.08	0.00	0.00
31.70	0.08	0.08	0.00	0.00
31.75	0.08	0.08	0.00	0.00
31.80	0.08	0.08	0.00	0.00
31.85	0.08	0.08	0.00	0.00
31.90	0.08	0.08	0.00	0.00
31.95	0.09	0.09	0.00	0.00
32.00	0.09	0.09	0.00	0.00
32.05	0.20	0.09	0.11	0.00
32.10	0.42	0.09	0.32	0.00
32.15	0.69	0.09	0.60	0.00
32.20	1.01	0.09	0.92	0.00
32.25	1.38	0.10	1.28	0.00
32.30	2.05	0.10	1.69	0.26
32.35	2.97	0.10	2.13	0.74
32.40	3.85	0.10	2.39	1.36
32.45	4.73	0.10	2.54	2.09
32.50	5.75	0.10	2.67	2.97
32.55	6.89	0.11	2.80	3.98
32.60	8.13	0.11	2.93	5.09
32.65	9.48	0.11	3.05	6.32
32.70	10.97	0.11	3.16	7.70
32.75	12.57	0.11	3.28	9.19
32.80	14.30	0.11	3.38	10.81
32.85	16.14	0.11	3.49	12.55
32.90	17.82	0.11	3.59	14.12
32.95	19.55	0.11	3.69	15.75
33.00	21.33	0.11	3.78	17.44

Stage-Area-Storage for Pond P-C: Pond C

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
31.50	3,128	3,128	0
31.55	3,191	3,192	158
31.60	3,255	3,256	319
31.65	3,319	3,321	483
31.70	3,384	3,387	651
31.75	3,449	3,453	822
31.80	3,515	3,520	996
31.85	3,582	3,588	1,173
31.90	3,649	3,656	1,354
31.95	3,717	3,725	1,538
32.00	3,786	3,794	1,726
32.05	3,855	3,864	1,917
32.10	3,925	3,935	2,111
32.15	3,996	4,007	2,309
32.20	4,067	4,079	2,511
32.25	4,139	4,151	2,716
32.30	4,211	4,225	2,925
32.35	4,284	4,299	3,137
32.40	4,358	4,373	3,353
32.45	4,432	4,448	3,573
32.50	4,507	4,524	3,797
32.55	4,507	4,536	4,022
32.60	4,507	4,548	4,247
32.65	4,507	4,560	4,473
32.70	4,507	4,572	4,698
32.75	4,507	4,584	4,923
32.80	4,507	4,596	5,149
32.85	4,507	4,607	5,374
32.90	4,507	4,619	5,599
32.95	4,507	4,631	5,825
33.00	4,507	4,643	6,050

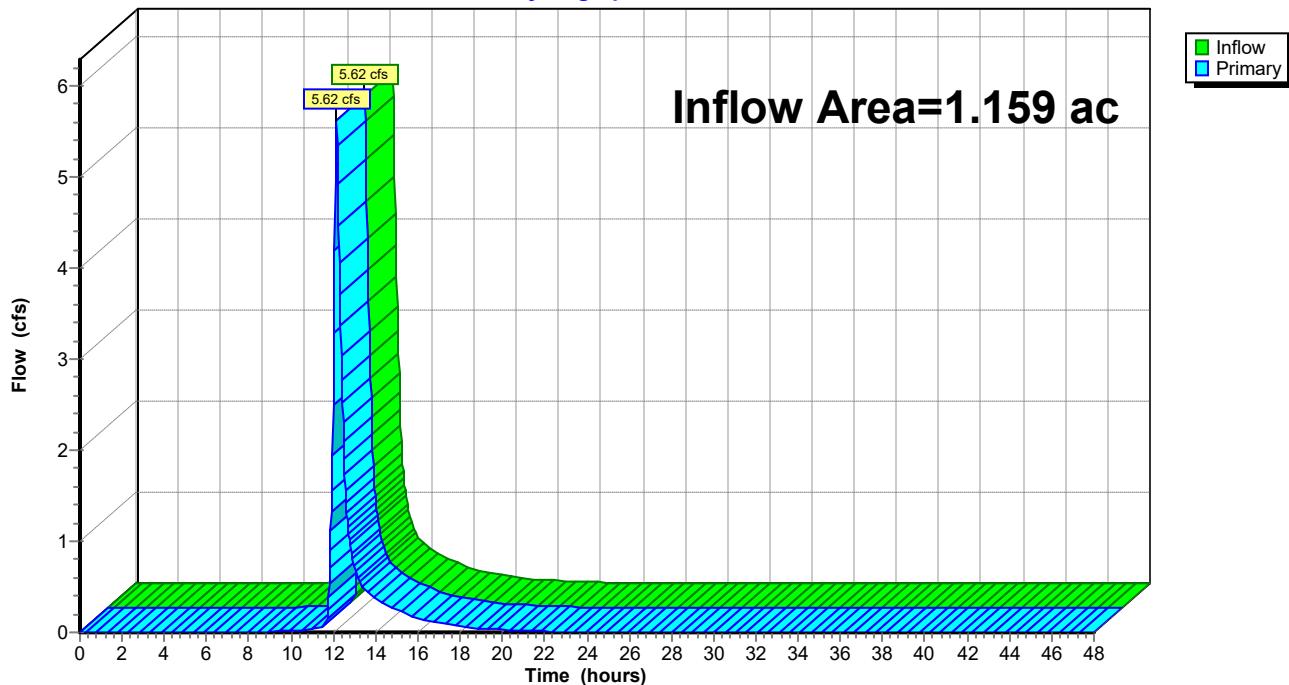
Summary for Link 2L: C Total

Inflow Area = 1.159 ac, 53.27% Impervious, Inflow Depth = 3.57" for 100-yr event
Inflow = 5.62 cfs @ 12.14 hrs, Volume= 0.345 af
Primary = 5.62 cfs @ 12.14 hrs, Volume= 0.345 af, Atten= 0%, Lag= 0.0 min
Routed to Link SITE : Total Site

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link 2L: C Total

Hydrograph



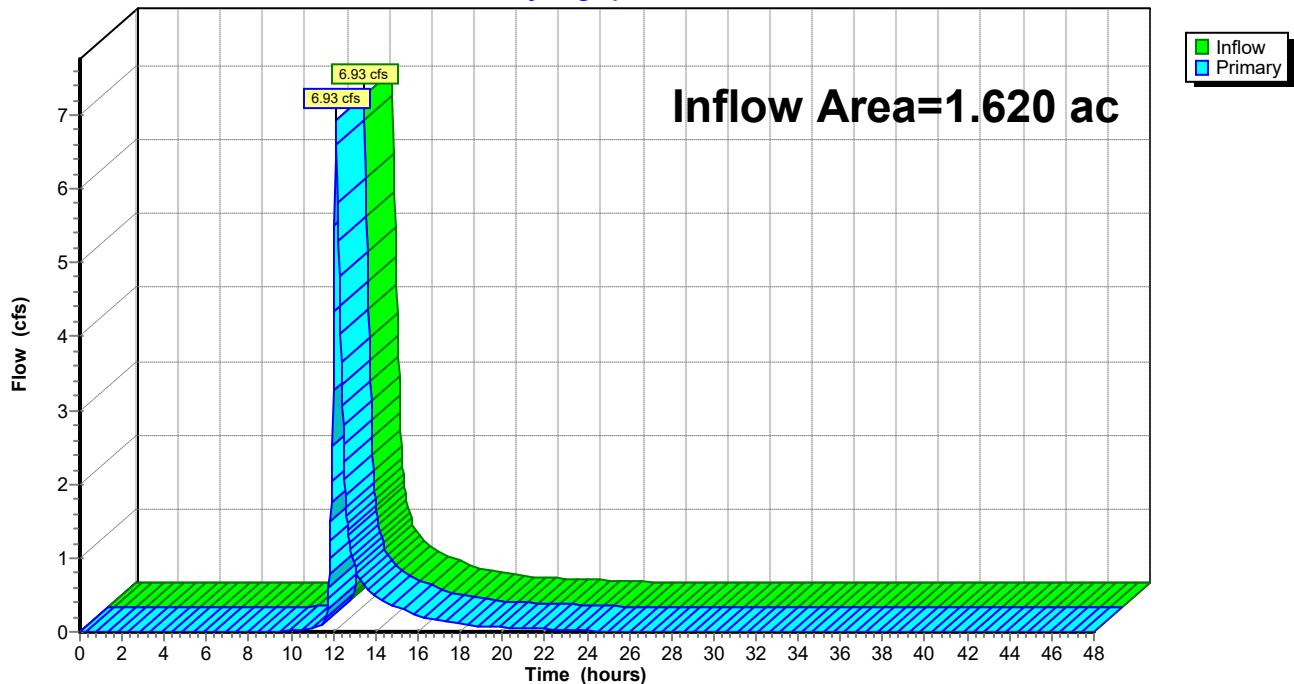
Summary for Link SITE: Total Site

Inflow Area = 1.620 ac, 45.14% Impervious, Inflow Depth = 3.35" for 100-yr event
Inflow = 6.93 cfs @ 12.13 hrs, Volume= 0.453 af
Primary = 6.93 cfs @ 12.13 hrs, Volume= 0.453 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link SITE: Total Site

Hydrograph



APPENDIX C
NOAA Rainfall Data

NOAA Atlas 14, Volume 10, Version 3 LAKE

KONOMOC

Station ID: 06-3989



Location name: Waterford, Connecticut, USA*

Latitude: 41.4°, Longitude: -72.1833°

Elevation:

Elevation (station metadata): 180 ft**

* source: ESRI Maps

** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aerials](#)

PF tabular

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.337 (0.263-0.419)	0.403 (0.315-0.501)	0.511 (0.397-0.637)	0.601 (0.464-0.752)	0.724 (0.542-0.943)	0.816 (0.599-1.08)	0.914 (0.652-1.25)	1.03 (0.692-1.43)	1.19 (0.771-1.71)	1.32 (0.838-1.93)
10-min	0.478 (0.373-0.593)	0.571 (0.446-0.710)	0.724 (0.563-0.903)	0.851 (0.658-1.07)	1.03 (0.768-1.34)	1.16 (0.848-1.53)	1.30 (0.924-1.78)	1.45 (0.979-2.02)	1.68 (1.09-2.41)	1.88 (1.19-2.74)
15-min	0.562 (0.439-0.698)	0.672 (0.524-0.835)	0.852 (0.662-1.06)	1.00 (0.774-1.25)	1.21 (0.904-1.57)	1.36 (0.999-1.81)	1.52 (1.09-2.09)	1.71 (1.15-2.38)	1.98 (1.28-2.84)	2.21 (1.40-3.22)
30-min	0.795 (0.620-0.986)	0.950 (0.741-1.18)	1.20 (0.936-1.50)	1.42 (1.09-1.77)	1.70 (1.28-2.22)	1.92 (1.41-2.55)	2.15 (1.53-2.95)	2.41 (1.63-3.36)	2.79 (1.81-4.00)	3.11 (1.97-4.53)
60-min	1.03 (0.802-1.27)	1.23 (0.957-1.52)	1.56 (1.21-1.94)	1.83 (1.41-2.29)	2.20 (1.65-2.87)	2.48 (1.82-3.29)	2.78 (1.98-3.81)	3.12 (2.10-4.34)	3.60 (2.34-5.17)	4.01 (2.54-5.85)
2-hr	1.35 (1.06-1.67)	1.61 (1.27-1.99)	2.04 (1.60-2.53)	2.40 (1.87-2.98)	2.89 (2.18-3.73)	3.25 (2.41-4.29)	3.64 (2.62-4.96)	4.10 (2.77-5.65)	4.76 (3.10-6.77)	5.32 (3.38-7.69)
3-hr	1.57 (1.24-1.93)	1.87 (1.48-2.30)	2.37 (1.86-2.92)	2.78 (2.17-3.44)	3.34 (2.53-4.30)	3.76 (2.80-4.94)	4.21 (3.04-5.72)	4.74 (3.22-6.50)	5.52 (3.60-7.80)	6.18 (3.94-8.87)
6-hr	2.00 (1.59-2.44)	2.38 (1.89-2.90)	2.99 (2.38-3.66)	3.51 (2.76-4.31)	4.21 (3.22-5.38)	4.74 (3.54-6.16)	5.30 (3.85-7.12)	5.96 (4.07-8.09)	6.93 (4.54-9.68)	7.75 (4.96-11.0)
12-hr	2.47 (1.99-2.99)	2.93 (2.35-3.56)	3.69 (2.95-4.48)	4.31 (3.43-5.27)	5.18 (3.98-6.56)	5.82 (4.38-7.50)	6.51 (4.75-8.65)	7.30 (5.01-9.82)	8.46 (5.58-11.7)	9.44 (6.06-13.3)
24-hr	2.89 (2.35-3.48)	3.45 (2.80-4.16)	4.37 (3.52-5.28)	5.13 (4.11-6.22)	6.17 (4.78-7.76)	6.95 (5.27-8.90)	7.79 (5.72-10.3)	8.76 (6.04-11.7)	10.2 (6.74-13.9)	11.4 (7.35-15.8)
2-day	3.24 (2.65-3.87)	3.91 (3.19-4.67)	5.00 (4.07-5.99)	5.90 (4.77-7.11)	7.15 (5.59-8.94)	8.08 (6.18-10.3)	9.08 (6.74-11.9)	10.3 (7.12-13.6)	12.1 (8.02-16.4)	13.6 (8.82-18.7)
3-day	3.51 (2.89-4.18)	4.24 (3.48-5.05)	5.42 (4.43-6.47)	6.40 (5.20-7.67)	7.75 (6.08-9.64)	8.75 (6.72-11.1)	9.83 (7.33-12.9)	11.1 (7.74-14.6)	13.1 (8.72-17.6)	14.8 (9.59-20.2)
4-day	3.77 (3.11-4.48)	4.53 (3.73-5.38)	5.77 (4.73-6.87)	6.80 (5.54-8.12)	8.21 (6.47-10.2)	9.26 (7.14-11.7)	10.4 (7.77-13.5)	11.8 (8.20-15.4)	13.8 (9.22-18.5)	15.6 (10.1-21.2)
7-day	4.50 (3.73-5.31)	5.32 (4.41-6.29)	6.67 (5.51-7.90)	7.79 (6.39-9.26)	9.34 (7.39-11.5)	10.5 (8.11-13.1)	11.7 (8.77-15.1)	13.2 (9.22-17.1)	15.3 (10.3-20.4)	17.2 (11.2-23.1)
10-day	5.21 (4.34-6.13)	6.07 (5.06-7.15)	7.48 (6.21-8.83)	8.66 (7.13-10.3)	10.3 (8.15-12.6)	11.5 (8.90-14.2)	12.8 (9.56-16.3)	14.2 (10.0-18.3)	16.4 (11.0-21.6)	18.2 (11.9-24.3)
20-day	7.40 (6.23-8.65)	8.33 (7.00-9.73)	9.83 (8.23-11.5)	11.1 (9.21-13.0)	12.8 (10.2-15.4)	14.1 (11.0-17.2)	15.5 (11.6-19.3)	16.9 (11.9-21.5)	18.8 (12.7-24.5)	20.3 (13.3-26.9)
30-day	9.24 (7.81-10.7)	10.2 (8.61-11.9)	11.8 (9.89-13.7)	13.1 (10.9-15.3)	14.8 (11.9-17.8)	16.2 (12.7-19.6)	17.6 (13.1-21.7)	18.9 (13.5-24.0)	20.7 (14.0-26.8)	22.0 (14.4-28.8)
45-day	11.5 (9.78-13.3)	12.5 (10.6-14.5)	14.2 (12.0-16.4)	15.5 (13.0-18.1)	17.4 (14.0-20.7)	18.9 (14.8-22.7)	20.3 (15.2-24.8)	21.6 (15.4-27.1)	23.1 (15.8-29.7)	24.2 (15.9-31.5)
60-day	13.4 (11.4-15.5)	14.4 (12.3-16.7)	16.2 (13.7-18.7)	17.6 (14.8-20.5)	19.6 (15.8-23.1)	21.2 (16.6-25.3)	22.6 (16.9-27.4)	23.9 (17.1-29.8)	25.3 (17.3-32.4)	26.2 (17.4-34.1)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

[Back to Top](#)

PF graphical



NOAA Atlas 14, Volume 10, Version 3
Location name: Waterford, Connecticut, USA*
Latitude: 41.4°, Longitude: -72.1833°

Elevation: 254 ft**

* source: ESRI Maps

** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aerials](#)

PF tabular

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	4.04 (3.16-5.03)	4.84 (3.78-6.01)	6.13 (4.76-7.64)	7.21 (5.57-9.02)	8.69 (6.50-11.3)	9.79 (7.19-13.0)	11.0 (7.82-15.0)	12.3 (8.30-17.1)	14.3 (9.25-20.5)	15.9 (10.1-23.2)
10-min	2.87 (2.24-3.56)	3.43 (2.68-4.26)	4.34 (3.38-5.42)	5.11 (3.95-6.40)	6.16 (4.61-8.01)	6.94 (5.09-9.20)	7.77 (5.54-10.7)	8.72 (5.87-12.1)	10.1 (6.55-14.5)	11.2 (7.12-16.4)
15-min	2.25 (1.76-2.79)	2.69 (2.10-3.34)	3.41 (2.65-4.25)	4.00 (3.10-5.01)	4.83 (3.62-6.28)	5.44 (4.00-7.22)	6.10 (4.35-8.36)	6.84 (4.61-9.52)	7.92 (5.14-11.4)	8.82 (5.58-12.9)
30-min	1.59 (1.24-1.97)	1.90 (1.48-2.36)	2.41 (1.87-3.00)	2.83 (2.19-3.54)	3.41 (2.55-4.44)	3.85 (2.82-5.10)	4.30 (3.07-5.90)	4.83 (3.25-6.72)	5.59 (3.62-8.01)	6.21 (3.93-9.07)
60-min	1.03 (0.802-1.27)	1.23 (0.957-1.52)	1.56 (1.21-1.94)	1.83 (1.41-2.29)	2.20 (1.65-2.87)	2.48 (1.82-3.29)	2.78 (1.98-3.81)	3.12 (2.10-4.34)	3.60 (2.34-5.17)	4.01 (2.54-5.85)
2-hr	0.675 (0.532-0.833)	0.807 (0.634-0.995)	1.02 (0.800-1.26)	1.20 (0.934-1.49)	1.44 (1.09-1.87)	1.63 (1.20-2.14)	1.82 (1.31-2.48)	2.05 (1.39-2.82)	2.38 (1.55-3.38)	2.66 (1.69-3.84)
3-hr	0.523 (0.413-0.642)	0.623 (0.492-0.766)	0.788 (0.620-0.971)	0.925 (0.723-1.14)	1.11 (0.843-1.43)	1.25 (0.930-1.64)	1.40 (1.01-1.90)	1.58 (1.07-2.16)	1.84 (1.20-2.60)	2.06 (1.31-2.95)
6-hr	0.333 (0.265-0.406)	0.396 (0.315-0.484)	0.499 (0.396-0.612)	0.585 (0.461-0.719)	0.703 (0.536-0.898)	0.791 (0.591-1.03)	0.885 (0.642-1.19)	0.994 (0.679-1.35)	1.16 (0.759-1.62)	1.29 (0.827-1.84)
12-hr	0.205 (0.164-0.248)	0.243 (0.195-0.295)	0.306 (0.244-0.372)	0.358 (0.284-0.437)	0.429 (0.330-0.544)	0.483 (0.363-0.622)	0.540 (0.394-0.718)	0.605 (0.415-0.814)	0.702 (0.462-0.971)	0.783 (0.502-1.10)
24-hr	0.120 (0.097-0.145)	0.143 (0.116-0.173)	0.182 (0.146-0.219)	0.213 (0.171-0.259)	0.257 (0.199-0.323)	0.289 (0.219-0.370)	0.324 (0.238-0.428)	0.364 (0.251-0.486)	0.424 (0.280-0.580)	0.474 (0.306-0.659)
2-day	0.067 (0.055-0.080)	0.081 (0.066-0.097)	0.104 (0.084-0.124)	0.123 (0.099-0.148)	0.148 (0.116-0.186)	0.168 (0.128-0.214)	0.189 (0.140-0.248)	0.214 (0.148-0.282)	0.251 (0.167-0.340)	0.283 (0.183-0.389)
3-day	0.048 (0.040-0.058)	0.058 (0.048-0.070)	0.075 (0.061-0.089)	0.088 (0.072-0.106)	0.107 (0.084-0.133)	0.121 (0.093-0.153)	0.136 (0.101-0.178)	0.154 (0.107-0.202)	0.181 (0.121-0.244)	0.205 (0.133-0.280)
4-day	0.039 (0.032-0.046)	0.047 (0.038-0.056)	0.060 (0.049-0.071)	0.070 (0.057-0.084)	0.085 (0.067-0.106)	0.096 (0.074-0.121)	0.108 (0.080-0.141)	0.122 (0.085-0.160)	0.143 (0.096-0.192)	0.162 (0.105-0.220)
7-day	0.026 (0.022-0.031)	0.031 (0.026-0.037)	0.039 (0.032-0.047)	0.046 (0.038-0.055)	0.055 (0.043-0.068)	0.062 (0.048-0.077)	0.069 (0.052-0.089)	0.078 (0.054-0.101)	0.091 (0.061-0.121)	0.102 (0.066-0.137)
10-day	0.021 (0.018-0.025)	0.025 (0.021-0.029)	0.031 (0.025-0.036)	0.036 (0.029-0.042)	0.042 (0.033-0.052)	0.047 (0.037-0.059)	0.053 (0.039-0.067)	0.059 (0.041-0.076)	0.068 (0.045-0.090)	0.075 (0.049-0.101)
20-day	0.015 (0.012-0.018)	0.017 (0.014-0.020)	0.020 (0.017-0.023)	0.023 (0.019-0.027)	0.026 (0.021-0.032)	0.029 (0.022-0.035)	0.032 (0.024-0.040)	0.035 (0.024-0.044)	0.039 (0.026-0.051)	0.042 (0.027-0.055)
30-day	0.012 (0.010-0.014)	0.014 (0.011-0.016)	0.016 (0.013-0.019)	0.018 (0.015-0.021)	0.020 (0.016-0.024)	0.022 (0.017-0.027)	0.024 (0.018-0.030)	0.026 (0.018-0.033)	0.028 (0.019-0.037)	0.030 (0.020-0.040)
45-day	0.010 (0.009-0.012)	0.011 (0.009-0.013)	0.013 (0.011-0.015)	0.014 (0.012-0.016)	0.016 (0.012-0.019)	0.017 (0.013-0.020)	0.018 (0.014-0.022)	0.019 (0.014-0.025)	0.021 (0.014-0.027)	0.022 (0.014-0.029)
60-day	0.009 (0.007-0.010)	0.010 (0.008-0.011)	0.011 (0.009-0.013)	0.012 (0.010-0.014)	0.013 (0.010-0.016)	0.014 (0.011-0.017)	0.015 (0.011-0.019)	0.016 (0.011-0.020)	0.017 (0.012-0.022)	0.018 (0.012-0.023)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

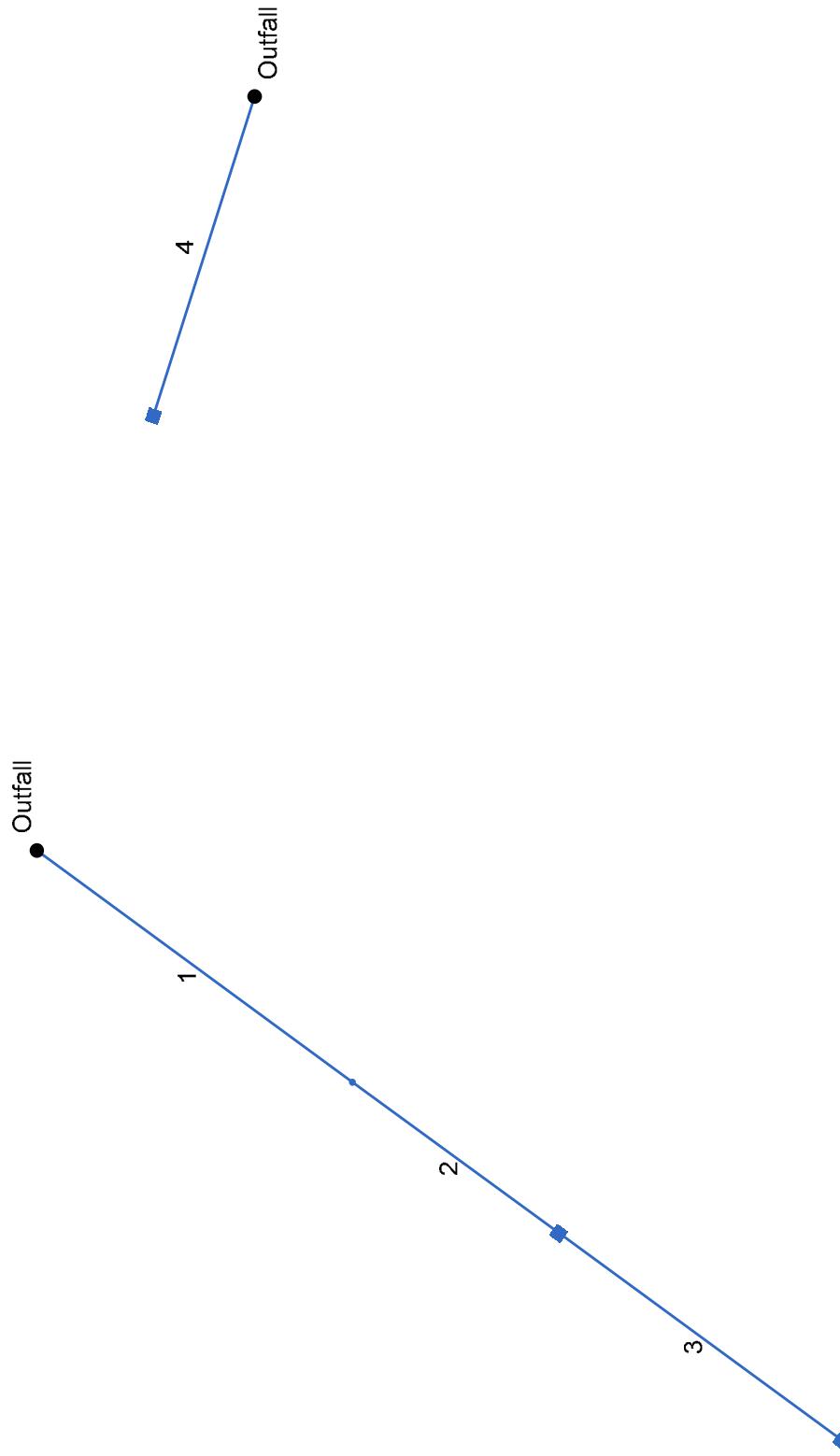
Please refer to NOAA Atlas 14 document for more information.

[Back to Top](#)

PF graphical

APPENDIX D
Stormwater Collection System Calculations

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: 2025-01-03 Stormsewers.stm

Number of lines: 4

Date: 1/5/2025

Storm Sewers v2024.00

Storm Sewer Tabulation

Station	Len	Drgn Area	Rnoff coeff		Area x C		Tc	Rain (I)	Total flow	Cap full	Vel	Pipe	Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID			
Line	To Line	Imcr	Total	Incr	Total	Inlet	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size	Slope (%)	Dn	Up	Dn	Up	Dn	Up (ft)			
1	End	60.389	0.00	0.34	0.00	0.00	0.24	0.0	6.5	6.5	1.56	4.83	8	1.46	31.50	32.38	32.08	32.96	32.64	35.52	CO-RG	
2	1	39.504	0.16	0.34	0.73	0.12	0.24	6.0	6.4	6.6	1.57	0.91	4.51	8	0.48	32.38	32.57	33.05	33.62	35.52	34.93	YD202-CO
3	2	54.194	0.18	0.18	0.68	0.12	0.12	6.0	6.0	6.8	0.83	0.92	2.37	8	0.50	32.57	32.84	33.78	33.99	34.93	34.94	YD203-YD202
4	End	51.616	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.32	0.93	6.68	8	0.50	30.24	30.50	30.88	32.42	30.81	32.50	BH201-OUTFALL
																					Number of lines: 4	
																					Run Date: 1/5/2025	
																					Project File: 2025-01-03 Stormsewers.stm	
																					NOTES: Intensity = 29.47 / (Inlet time + 3.10) ^ 0.67; Return period = Yrs. 10 ; c = cir e = ellip b = box	

APPENDIX E
Supporting Calculations

$$WQV = \frac{(P)(R)(A)}{12}$$

where:

WQV = water quality volume (cubic feet)

P = 1.3 inches (90th percentile rainfall event)

R = volumetric runoff coefficient = 0.05+0.009(*I*)

I = post- development impervious area (percent) after application of non-structural LID site planning and design strategies and before application of structural stormwater BMPs

A = post-development total drainage area of site or design point (square feet)

Project	140286501 - Oswegatchie Fire Station	Date	12/27/2024
Location	Waterford, CT	By	APF

PRWS-C

Area (SF) 45,321

Impervious (SF) 26,887

I 0.59

R 0.5839

WQV (CF) **2,867**

Project Oswegatchie Fire Station By APF Date 1/7/2024
 Location Waterford, CT Checked BP Date 1/7/2024
 Circle one: Present Developed Job No. 140281101

1. Rational 'C' Runoff Coefficient & Area Calculations

Catchment Area	Total Area		Impervious (C=.9)		Pervious (C=0.3)		Percent Impervious	C
	SF	AC	SF	AC	SF	AC		
YD-202	6,880	0.16	4,967	0.11	1,913	0.04	72%	0.73
YD-203	7,666	0.18	4,869	0.11	2,797	0.06	64%	0.68

APPENDIX F
Boring Logs (by others)

BORING LOGS

Barton & Loguidice, LLC

41 Sequin Drive

Glastonbury, CT 06033

Tel. (860) 633-8770 Fax (860) 633-5971

Project #: 3261,053,091 Sheet #: 1 of 1

Project: Osweagatchie Fire House

Phase 1E

Boring #: B-1

Location: Waterford CT

B&L Personnel: PJM, CED	Drilling Rig: AMS 9520	Date Started: 6/20/24	Surface Elevation:
Drilling Contractor: Ground 1420	Auger/Core Diameter:	Date Completed:	Groundwater Depth at 0 Hours:
On-Site Drillers: Mark Lacoste	Hammer Wt. & Fall:	Sampling Method:	Groundwater Depth at _____ Hours:

Depth	Sample #	# of Blow Counts	Penetration/ Recovery	Sample Description	Sample Number
0			5/34"	0-17" SAND, fine, trace med sand trace coarse sand trace gravel, trace organics, brown no staining no odor	
				17"-34" SAND fine, trace silt, trace clay, trace med sand trace coarse sand, trace gravel, light brown no staining	
5			5/43"	init PID=0.0 Hspace PID=0.0 no odor	D-S 08488 sampled
				0-43" SAND medium fine sand trace coarse sand trace gravel, trace cobble light brown, no staining no odor	
10			5/5'	init PID=0.0 Hspace PID=0.0	
				D-S' SAND, fine, trace silt, trace med sand trace coarse sand trace gravel, trace cobble, light brown, w/ some orange and black mottling no staining no odor saturated @ ~13' BGS	
15				init PID=0.0 Hspace PID=0.0	
				end of boring	
20					
25					
30					

REMARKS-

located near generator UST

Proportions Used

		<u>Cohesionless Density</u>	<u>Cohesive Consistency</u>
Trace	0 to 10%	0 - 10 Loose	0 - 4 Soft
Little	10 to 20%	10 - 30 Med. Dense	4 - 8 Mod. Stiff
Some	20 to 35%	30 - 50 Dense	8 - 15 Stiff
And	35 to 50%	50+ Very Dense	15 - 30 Very Stiff

NOTES:Water Readings Represent Direct Observations at the Times Noted Above.
Samples will be Retained for 90 Days Unless Otherwise Requested.

Barton & Loguidice, LLC
 41 Sequin Drive
 Glastonbury, CT 06033
 Tel. (860) 633-8770 Fax (860) 633-5971

Project #: 3261,053,001 Sheet #: 10F1
 Project: Oswegatchie Fire House Boring #: B-2
 Location: Waterford CT

B&L Personnel: PJM CED	Drilling Rig: AMS 9520	Date Started: 6/29/24	Surface Elevation:
Drilling Contractor: Ground H2O	Auger/Core Diameter:	Date Completed:	Groundwater Depth at 0 Hours:
On-Site Drillers: ML	Hammer Wt. & Fall:	Sampling Method:	Groundwater Depth at _____ Hours:

Depth	Sample #	# of Blow Counts	Penetration/ Recovery	Sample Description	Sample Number
0			5/43'	0-43" SAND, fine, trace medium, trace coarse, trace gravel/ trace cobble, light brown no staining no odor	Sample 9-5, @0934
5			5/5'	init PID=0.0 Hspce PID=0.0 0-5' SAND fine some medium, trace coarse sand, + trace gravel, trace cobble light brown no staining no odor	
10			5/5'	init PID=0.0 Hspce PID=0.0 0-5' SAND fine, trace med sand, trace silt, trace coarse sand trace gravel, trace cobble, light brown, little orange mottling no staining no odor water @ ~ 13' BGS	
15				init PID=0.0 Hspce PID=0.0 end of boring	
20					
25					
30					

REMARKS: Moved over ~ 3' from
 initial boring due to defiller
 hitting steel & bailing down gradient
 of generator VS

Proportions Used	Cohesionless Density	Cohesive Consistency
Trace	0 to 10%	0 - 10 Loose
Little	10 to 20%	10 - 30 Med. Dense
Some	20 to 35%	30 - 50 Dense
And	35 to 50%	50+ Very Dense

NOTES:

Water Readings Represent Direct Observations at the Times Noted Above.
 Samples will be Retained for 90 Days Unless Otherwise Requested.

Barton & Loguidice, LLC

41 Sequin Drive

Glastonbury, CT 06033

Tel. (860) 633-8770 Fax (860) 633-5971

Project #: 3261,053,001 Sheet #: 1 of 1
 Project: Osweagatchie Fire House
 Phase II Boring #: B-3
 Location: Waterford CT

B&L Personnel: PSM CED	Drilling Rig: AMS Q520	Date Started: 6/20/24	Surface Elevation:
Drilling Contractor: Ground H2O	Auger/Core Diameter:	Date Completed:	Groundwater Depth at 0 Hours:
On-Site Drillers: Munk Laramie	Hammer Wt. & Fall:	Sampling Method:	Groundwater Depth at _____ Hours:

Depth	Sample #	# of Blow Counts	Penetration/ Recovery	Sample Description	Sample Number
0			5'/32"	0-6" SAND fine trace med sand trace coarse sand trace organics dark brown 6"-2'6" GRAVEL, little fine sand trace med sand trace coarse sand trace gravel light brown no staining no odor init PID=0.0 Hspace PID=0.0	sample 0-5' collected @ 1007
5			5'/54"	0-32" SAND, medium, trace fine sand, trace coarse sand, trace gravel, trace cobble, light brown some orange mottling 32"-54" SAND, fine, trace medium sand trace coarse sand, trace gravel light brown no staining no odor init PID=0.0 Hspace PID=0.0	
10			5'/42"	0-8" SAND, fine trace med sand trace coarse sand light brown 8"-42" SAND, medium, some coarse sand, trace fine, trace gravel trace cobble light brown no staining no odor init PID=0.0 Hspace PID=0.0	
15				init PID=0.0 Hspace PID=0.0 water @ ~13' BGS end of boring	
20					
25					
30					

REMARKS- Northern corner of site off edge of driveway

Proportions Used	Cohesionless Density	Cohesive Consistency
Trace	0 to 10%	0 - 10 Loose
Little	10 to 20%	10 - 30 Med. Dense
Some	20 to 35%	30 - 50 Dense
And	35 to 50%	50+ Very Dense
		0 - 4 Soft
		4 - 8 Mod. Stiff
		8 - 15 Stiff
		15 - 30 Very Stiff

NOTES:

Water Readings Represent Direct Observations at the Times Noted Above.
 Samples will be Retained for 90 Days Unless Otherwise Requested.

Barton & Loguidice, LLC

41 Sequin Drive

Glastonbury, CT 06033

Tel. (860) 633-8770 Fax (860) 633-5971

Project #: Oneagashie Firehouse Sheet #: Lot 1

Project: 3261.053-001 I PLII

Boring #: B-4

Location: Watertown CT

B&L Personnel: <u>PJM/ced</u>	Drilling Rig: <u>AMS 9520</u>	Date Started: <u>6/20/24</u>	Surface Elevation:
Drilling Contractor: <u>Ground H₂O</u>	Auger/Core Diameter:	Date Completed:	Groundwater Depth at 0 Hours:
On-Site Drillers: <u>Mark Larasie</u>	Hammer Wt. & Fall:	Sampling Method:	Groundwater Depth at _____ Hours:

Depth	Sample #	# of Blow Counts	Penetration/ Recovery	Sample Description	Sample Number
0			<u>5 1/2"</u>	1-11" Sand, fine to medium sand, trace coarse sand, trace organics, trace gravel, dark brown	Sample @ 1113
5			<u>2' 1/8"</u>	11-32 Sand fine - medium, trace coarse, trace gravel, trace cobble, dark brown, little white Initial PID: 0.0 Headspace: 0.0	
			<u>3' 1/2"</u>	3' 1/2" Sand, coarse, trace medium, trace fine, trace gravel, light brown with orange + black mottling - concrete, ~2-3" medium - coarse sand, trace gravel, light	moist at ~9 ft
10				Initial PID: 0.0 Headspace: 0.0	
			<u>5' 1/4"</u>	- sand fine - medium, trace coarse sand, trace gravel, trace cobble, light brown with red orange mottle, saturated, no odor, no obvious stain	
15				Initial PID: 0.0 Headspace: 0.0 end of boring	
20					
25					
30					

REMARKS-	Proportions Used	Cohesionless Density	Cohesive Consistency
located @ UST grave along eastern edge of site concrete @ ~7-8' BGS (possible dead man)	Trace	0 to 10% 0 - 10 Loose	0 - 4 Soft
	Little	10 to 20% 10 - 30 Med. Dense	4 - 8 Mod. Stiff
	Some	20 to 35% 30 - 50 Dense	8 - 15 Stiff
	and	35 to 50% 50+ Very Dense	15 - 30 Very Stiff

NOTES:

Water Readings Represent Direct Observations at the Times Noted Above.

Samples will be Retained for 90 Days Unless Otherwise Requested.

Barton & Loguidice, LLC

41 Sequin Drive

Glastonbury, CT 06033

Tel. (860) 633-8770 Fax (860) 633-5971

Project #: 3261,053,021 Sheet #: 1 of 1

Project: Omega Tech Fire Hawk Phase II

Boring #: B-5 / B-7

Location: Waterford CT

B&L Personnel: <u>PJM / LED</u>	Drilling Rig: <u>AMS 9520</u>	Date Started: <u>6/30/24</u>	Surface Elevation:
Drilling Contractor: <u>Ground Tech</u>	Auger/Core Diameter:	Date Completed:	Groundwater Depth at 0 Hours:
On-Site Drillers: <u>Marques Parabie</u>	Hammer Wt. & Fall:	Sampling Method:	Groundwater Depth at _____ Hours:

Depth	Sample #	# of Blow Counts	Penetration/ Recovery	Sample Description	Sample Number
0			5/38"	0-9" top soil, fine sand, trace medium coarse, trace gravel, trace organic, dark brown, no staining, no odor	B-5 Sample @ 11:47
				7-38" fine sand, trace clay, trace silt, trace medium sand, trace coarse sand, trace gravel, dark brown, no stain, no odor	B-7 Sample @ 11:49
5				Initial PID: 0:0 Headspace: 0.0	
			5/46"	0-9" Sand fine, trace coarse + medium sand, light brown, orange + red mottling Water ~ 7ft BGS	
10				Initial PID: 0.0 Headspace: 0.0	
			5/51"	0-40" medium sand, trace fine + coarse sand, trace gravel, trace silt, trace clay, light brown	
				40-49" fine sand, trace medium + coarse sand, trace cobbles initial PID: 0:0 Headspace: 0.0 Saturated	
15					
20					
25					
30					

REMARKS:

boring near concrete structures on
eastern boundary

Proportions Used		Cohesionless Density		Cohesive Consistency
Trace	0 to 10%	0 - 10	Loose	0 - 4 Soft
Little	10 to 20%	10 - 30	Med. Dense	4 - 8 Mod. Stiff
Some	20 to 35%	30 - 50	Dense	8 - 15 Stiff
And	35 to 50%	50+	Very Dense	15 - 30 Very Stiff

NOTES:

Water Readings Represent Direct Observations at the Times Noted Above.

Samples will be Retained for 90 Days Unless Otherwise Requested.

Barton & Loguidice, LLC
 41 Sequin Drive
 Glastonbury, CT 06033
 Tel. (860) 633-8770 Fax (860) 633-5971

Project #: 3261.053 Sheet #: 10f1
 Project: Osmegeflic Firehouse Pt II Boring #: B-6
 Location: Waterford, CT

B&L Personnel: PJM /CED	Drilling Rig:	Date Started: 6/20/24	Surface Elevation:
Drilling Contractor: Ground H2O	Auger/Core Diameter:	Date Completed:	Groundwater Depth at 0 Hours:
On-Site Drillers: Larbie	Hammer Wt. & Fall:	Sampling Method:	Groundwater Depth at _____ Hours:

Depth	Sample #	# of Blow Counts	Penetration/ Recovery	Sample Description	Sample Number
0			5'/34"	0-3" brown topsoil, fine sand, trace medium/coarse sand, trace organics, 3"-4" gravel + cobbles, 8"-34" fine sand, trace silt, trace medium/coarse sand, trace gravel, no odor, no staining, moist ~4' 8" Initial 0.0 Headpace: 0.0	Sample @ 12:18
5			5'/31"	0-12 fine sand, trace medium/coarse, trace gravel, trace cobbles, dark brown/grey, saturated 12"-31" saturated, black, clay/organics, peat odor	
10			5'/42"	5"-silt+clay, trace cobbles, trace fine sand, saturated	
15				Initial: 0.0 Headpace: 0.0 End of boring	
20					
25					
30					

REMARKS-

East of shed corner, temp well

Proportions Used	Cohesionless Density		Cohesive Consistency
Trace	0 to 10%	0 - 10 Loose	0 - 4 Soft
Little	10 to 20%	10 - 30 Med. Dense	4 - 8 Mod. Stiff
Some	20 to 35%	30 - 50 Dense	8 - 15 Stiff
And	35 to 50%	50+ Very Dense	15 - 30 Very Stiff

NOTES:

Water Readings Represent Direct Observations at the Times Noted Above.
 Samples will be Retained for 90 Days Unless Otherwise Requested.

Barton & Loguidice, LLC
 41 Sequin Drive
 Glastonbury, CT 06033
 Tel. (860) 633-8770 Fax (860) 633-5971

Project #: 3261,053,001 Sheet #: 1 of 1
 Project: Oswegatchie Fire House
 Phase II
 Location: Waterford CT
 Boring #: B-8

B&L Personnel: <u>PJM/CED</u>	Drilling Rig: <u>ASM 9520</u>	Date Started: <u>6/20/24</u>	Surface Elevation:
Drilling Contractor: <u>Ground H2O</u>	Auger/Core Diameter:	Date Completed:	Groundwater Depth at 0 Hours:
On-Site Drillers: <u>Marcus Lacable</u>	Hammer Wt. & Fall:	Sampling Method:	Groundwater Depth at _____ Hours:

Depth	Sample #	# of Blow Counts	Penetration/ Recovery	Sample Description	Sample Number
0			51/31'	0-7" SAND fine trace med sand trace coarse sand trace organics, dark brown	
				7"-31" SAND fine trace med sand trace coarse sand trace gravel trace cobble brown no staining no odor	
5			15/17'	init PID=0.0 Hspace PID=0.0 sample 0-S ¹ collected @ 1254	
				0-17" SAND fine trace med sand trace coarse sand trace gravel, dark grey, saturated no staining no odor init PID=0.0 Hspace PID=0.0	
10				refusal @ ~6.5' BGS end of boring	
15					
20					
25					
30					

REMARKS- Located on eastern side of
detached garage near dump

Proportions Used	Cohesionless Density	Cohesive Consistency
Trace	0 to 10%	0 - 10 Loose
Little	10 to 20%	10 - 30 Med. Dense
Some	20 to 35%	30 - 50 Dense
And	35 to 50%	50+ Very Dense

NOTES:

Water Readings Represent Direct Observations at the Times Noted Above.
 Samples will be Retained for 90 Days Unless Otherwise Requested.

Barton & Loguidice, LLC

 41 Sequin Drive
 Glastonbury, CT 06033
 Tel. (860) 633-8770 Fax (860) 633-5971

 Project #: 3261.053

 Sheet #: Loft

 Project: Oneonta Fire House

 Location: Waterford LF Bl II Boring #: B-9

B&L Personnel:	<u>PJM / CED</u>	Drilling Rig:	Date Started:	Surface Elevation:
Drilling Contractor:	<u>Ground H2O</u>	Auger/Core Diameter:	Date Completed:	Groundwater Depth at 0 Hours:
On-Site Drillers:	<u>Larrie</u>	Hammer Wt. & Fall:	Sampling Method:	Groundwater Depth at _____ Hours:

Depth	Sample #	# of Blow Counts	Penetration/ Recovery	Sample Description	Sample Number
0			<u>5'/25"</u>	0-6" dark brown topsoil, fine sand, trace medium/coarse, trace organic	<u>Sample taken at 13:22</u>
				6"-21" fine sand, trace medium/coarse sand, trace gravel, light brown, dry	
				4'-5" concrete per driller Initial PID: 0.0 Headspace: 0.0	
5			<u>15'/14"</u>	21"-25" 0-14" fine sand, trace medium/coarse, trace cobbles, light brown, no stain, no odor	
				Initial PID: 0.0 Headspace: 0.0	
10				refusal at ~6.5' End of boring	
15					
20					
25					
30					

REMARKS-

 West of shed + south of concrete
 dumpster pad

Proportions Used	Cohesionless Density		Cohesive Consistency
Trace	0 to 10%	0 - 10	Loose
Little	10 to 20%	10 - 30	Med. Dense
Some	20 to 35%	30 - 50	Dense
And	35 to 50%	50+	Very Dense

NOTES:

 Water Readings Represent Direct Observations at the Times Noted Above.
 Samples will be Retained for 90 Days Unless Otherwise Requested.

TEMPORARY MONITORING WELL FIELD DATA SHEETS

Monitoring Well Field Data Sheet

B-1

Client/Project Name:	Location: <u>Osweigatchie Firehouse</u>	Project:
Sample #:	Well #: <u>mw-DW</u>	
Water Level Data		
Date: <u>7/15/24</u>	Water Column Height:	Diam. (in)
Weather: <u>Sunny 80°</u>	Correction Factor: <u>x</u>	0.3
Well Diameter: <u>in.</u>	Volume to Purge: <u>gal</u>	0.5
		2.0
		4.4
	Measured Depth	
Depth to Bottom	<u>19.55</u>	Measuring Device: Tape / Elec. Tape / Other
Depth to Water	<u>13.77</u>	Measuring Point: PVC / Top of Steel / Other
Water Column Height:	Comments:	

Well Condition

General Condition: Good / Fair / Requires Repair
Protective Casing: Steel / PVC Other
Casing Condition: Good / Rusty / Bent / Requires Repair
Concrete Collar: Good / Cracked / None / Requires Maintenance
Comments: 10:10
Ponding Near Well: Yes / No
Holes Observed Near Well: Yes / No
Water Between PVC and Casing: Yes / No
Lockable Cap: Yes / No
Lock Present: Yes / No

Purge Data

Start Time: _____ Purge Device: Bailer / Peristaltic Pump / Bladder Pump / Waterra _____
Finish Time: _____ Bailer Type: Stainless Steel / Teflon / PVC / _____
Pump Rate: _____ mL/pm (if appl.) Bailer Size: 2" / 1.05" / N/A _____
Elapsed Time: _____ min Equipment Decon: Office / Dedicated / Designated / Field _____
Volume Purged: _____ gal Well Recharge: Good / Moderate / Low Dry @ _____ gal
Comments: _____

Sample Data

Date: _____ Time: _____ Additional Comments: _____
Sampler: _____ Weather: _____
Sampling Device: Bailer / Pump / Other _____
Filtering Required: Yes / No Field Filtered: Yes / No
Filter Type: Pneumatic / Syringe / Other / N/A _____
Filter Field Decontaminated: Yes / No

Field Parameters

Sample Appearance / Description / Odor:

Monitoring Well Field Data Sheet

Client/Project Name:	Location: <u>Oswegeatchie Binkhouse</u>	Project:	
Sample #:		Well #: <u>MW-Tree</u>	
Water Level Data			
Date: <u>7/15/24</u>	Water Column Height:	Diam. (in)	Corr. Factor
Weather: <u>Sunny 80°</u>		1.5	0.3
Well Diameter: <u>in.</u>	Correction Factor: <u>x</u>	2	0.5
	Volume to Purge: <u>gal</u>	4	2.0
		6	4.4
Measured Depth			
Depth to Bottom	<u>16.38</u>	Measuring Device: Tape / Elec. Tape / Other	
Depth to Water	<u>10.37</u>	Measuring Point: PVC / Top of Steel / Other	
Water Column Height:		Comments:	

B-4

91

B⁻ >

Well Condition

General Condition: Good / Fair / Requires Repair
Protective Casing: Steel / PVC / Other
Casing Condition: Good / Rusty / Bent / Requires Repair
Concrete Collar: Good / Cracked / None / Requires Maintenance
Comments: 10:00
Ponding Near Well: Yes / No
Holes Observed Near Well: Yes / No
Water Between PVC and Casing: Yes / No
Lockable Cap: Yes / No
Lock Present: Yes / No

10:00

Purge Data

Start Time: _____ Purge Device: Bailey / Peristaltic Pump / Bladder Pump / Waterra _____
Finish Time: _____ Bailey Type: Stainless Steel / Teflon / PVC / _____
Pump Rate: _____ mL/pm (if appl.) Bailey Size: 2" / 1.05" / N/A _____
Elapsed Time: _____ min Equipment Decon: Office / Dedicated / Designated / Field
Volume Purged: _____ gal Well Recharge: Good / Moderate / Low Dry @ _____ gal
Comments: _____

Sample Data

Date: _____ Time: _____ Additional Comments: _____
Sampler: _____ Weather: _____
Sampling Device: Bailer / Pump / Other _____
Filtering Required: Yes / No Field Filtered: Yes / No 
Filter Type: Pneumatic / Syringe / Other / N/A _____
Filter Field Decontaminated: Yes / No 

Field Parameters

Sample Appearance / Description / Odor:

Monitoring Well Field Data Sheet

Client/Project Name:	Location: <i>Osuggitchie Firehouse</i>	Project:	
Sample #:	Well #: <i>mw-sneel</i>		
Water Level Data			
Date: <i>7/15/24</i>	Water Column Height:	Diam. (in)	Corr. Factor
Weather: <i>Sunny SDS</i>		1.5	0.3
Well Diameter: <i>8 in.</i>	Correction Factor: <i>x</i>	2	0.5
	Volume to Purge: <i>4 gal</i>	4	2.0
		6	4.4
Measured Depth			
Depth to Bottom	<i>13.07</i>	Measuring Device: Tape / Elec. Tape / Other	
Depth to Water	<i>6.11</i>	Measuring Point: PVC / Top of Steel / Other	
Water Column Height:		Comments:	

B-6

Well Condition

General Condition: Good / Fair / Requires Repair
Protective Casing: Steel / PVC / Other
Casing Condition: Good / Rusty / Bent / Requires Repair
Concrete Collar: Good / Cracked / None / Requires Maintenance
Comments:
10:15

Ponding Near Well: Yes / No
Holes Observed Near Well: Yes / No
Water Between PVC and Casing: Yes / No
Lockable Cap: Yes / No
Lock Present: Yes / No

Purge Data

Start Time: _____ Purge Device: Bailer / Peristaltic Pump / Bladder Pump / Waterra _____
Finish Time: _____ Bailer Type: Stainless Steel / Teflon / PVC / _____
Pump Rate: _____ mL/pm (if appl.) Bailer Size: 2" / 1.05" / N/A
Elapsed Time: _____ min Equipment Decon: Office / Dedicated / Designated / Field
Volume Purged: _____ gal Well Recharge: Good / Moderate / Low Dry @ _____ gal
Comments: _____

Sample Data

Date: _____ Time: _____ Additional Comments: _____
Sampler: _____ Weather: _____
Sampling Device: Bailer / Pump / Other _____
Filtering Required: Yes / No _____ Field Filtered: Yes / No _____
Filter Type: Pneumatic / Syringe / Other / N/A _____
Filter Field Decontaminated: Yes / No _____

Field Parameters

Sample Appearance / Description / Odor:

APPENDIX G

Stormwater Management System Operation and Maintenance Plan

Operations and Maintenance Plan

*Oswegatchie Fire Station
Waterford, CT*

Scope:

The purpose of the Operations and Maintenance Plan is to ensure that the existing and proposed stormwater components installed at 441 Boston Post Road in Waterford, CT are maintained in operational condition throughout the life of the project. The service procedures associated with this plan shall be performed as required by the parties legally responsible for their maintenance.

Recommended Frequency of Service:

As further defined below, all stormwater components should be checked on a periodic basis and kept in full working order. Ultimately, the required frequency of inspection and service will depend on runoff quantities, pollutant loading, and clogging due to debris. At a minimum, we recommend that all stormwater components be inspected and serviced twice per year, once before winter begins and once during spring cleanup.

Qualified Inspector:

The inspections must be completed by an individual experienced in the construction and maintenance of stormwater drainage systems. If required by the town, the inspections must be completed by a professional engineer.

Service Procedures:

1. Catch Basins & Drainage Inlets:

- a. Catch basins and drainage inlets shall be completely cleaned of accumulated debris and sediments at the completion of construction.
- b. For the first year, catch basins and drainage inlets shall be inspected on a quarterly basis.
- c. Any accumulated debris within the catch basins/inlets shall be removed and any repairs as required.
- d. From the second year onward, visual inspections shall occur twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.
- e. Accumulated debris within the catch basins/inlets shall be removed and repairs made as required.
- f. Accumulated sediments shall be removed at which time they are within 12 inches of the invert of the outlet pipe.
- g. Any additional maintenance required per the manufacturer's specifications shall also be completed.

2. Storm Drainage Piping and Cleanouts:

- a. All storm drainage piping shall be completely flushed of debris and accumulated sediment at the completion of construction.
- b. Cleanouts shall be inspected and repaired on an annual basis.
- c. Unless system performance indicates degradation of piping, comprehensive video inspection of storm drainage piping shall occur once every ten years.
- d. Any additional maintenance required per the manufacturer's specifications shall also be completed.

3. Rain Gardens:

- a. Rain gardens shall be inspected annually. Inspect after every major storm (1 inch or more of precipitation) during the first three months of operation.
- b. Remove trash and organic debris in the Spring and Fall.
- c. Remove sediment from the rain garden when the sediment accumulation exceeds 1 inch or more when drawdown exceeds 48 hours after the end of a storm event.
- d. Periodically remove grass clippings to prevent clogging of the surface of the rain garden.

4. Drainage Swales:

- a. All drainage swales shall be completely cleaned of accumulated debris and sediments at the completion of construction.
- b. Spring through fall, mow grass to between 4 to 6 inches, remove grass clippings.
- c. Accumulated debris shall be removed and repairs made as required.
- d. Reseed any bare areas as needed.
- e. Inspect level spreaders twice per year and remove sediment as necessary.

Disposal of Debris and Sediment:

All debris and sediment removed from the stormwater structures and rain gardens shall be disposed of legally. There shall be no dumping of silt or debris into or in proximity to any inland or tidal wetlands.

Maintenance Records:

The Owners(s) must maintain all records (logs, invoices, reports, data, etc.) and have them readily available for inspection at all times.

Operations and Maintenance Log (Page 1 of 2)

Oswegatchie Fire Station
Waterford, CT

Type of Inspection: Spring Fall Other

Inspector's Name: _____ Date of Inspection: _____

Affiliation: _____ Phone #: _____

Catch Basins & Drainage Inlets:

- Has accumulated debris been removed from grates? Yes No N/A
- Do any basins require additional repair? (identify below): Yes No N/A
- Have sumps been cleaned of sediment? Yes No N/A

Notes:

Storm Drainage Piping and Cleanouts:

- Has accumulated debris been removed? Yes No N/A
- Do any cleanouts require additional repair? (identify below): Yes No N/A
- Is there any evidence of stormwater piping failure? Yes No N/A
- Has a comprehensive video inspection been completed? Yes No N/A

Notes:

Operations and Maintenance Log (Page 2 of 2)

*Oswegatchie Fire Station
Waterford, CT*

Rain Gardens:

- Has accumulated debris or sediment been removed? Yes No N/A
- Are any repairs required? (identify below): Yes No N/A
- Has accumulated grass clippings been removed? Yes No N/A

Notes:

Drainage Swales:

- Has accumulated debris been removed? Yes No N/A
- Do any swales require repair? (identify below): Yes No N/A
- Do swales need to be mowed? (spring through fall only) Yes No N/A
- Are there any bare areas? Yes No N/A

Notes:

Signature of Inspector:

Date:

7 January 2025

Jonathan Mullen
Planning Director
Town of Waterford
15 Rope Ferry Road
Waterford, CT 06385

**RE: Stormwater Management Report
Oswegatchie Fire Station
441 Boston Post Road
Waterford, Connecticut
Langan Project No.: 140286501**

Dear Mr. Mullen,

This report provides an analysis of the proposed peak runoff discharges and the engineering design for the proposed stormwater conveyance system at 441 Boston Post Road.

PROJECT DESCRIPTION

Existing Conditions

The project site is located at 441 Boston Post Road in Waterford CT; see Figure 1. The overall approximately 2.0-acre parcel is currently occupied by the existing Oswegatchie Fire Station, including impervious and grass areas. The parcel is located within the Niantic River sub regional drainage basin. The parcel area does not contain any known locations of State and Federal Listed Species and Critical Habitats per the CT Natural Diversity Data Base Areas map of Waterford, CT dated June 2024. The project site is located on the western part of the parcel within the limits of the existing fire station site. To the west the project site is bordered by a garden shop. To the south, the project site is bordered by Boston Post Road. To the east the project site is bordered by residential properties on Boston Post Road. To the north the site is bordered by lightly wooded wetland areas. The existing project site is mostly impervious areas with the majority of stormwater running overland towards the wetlands in the north.

Based upon a topographic survey prepared by Langan, dated June 28, 2024, the site grades slope downward from the southern corner of the property towards the northern property line, with elevations ranging from approximately 35 feet to about 30 feet.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Study of the town of Waterford, Connecticut map number 09011C0481J with an effective date of August 5, 2013, the proposed development is located within Zone X (Unshaded). Zone X (Unshaded) is considered a Low-Risk Area and described by FEMA as areas outside the 0.2-percent-annual-chance chance flood. No base flood elevations or base flood depths are shown within these zones.

According to the USDA Natural Resources Conservation Service Web Soil Survey, the site's soil type varies throughout. The site is mostly classified as Hinckley Loamy Sand with an A hydrologic rating and slopes between 3 and 15 percent. Additionally, the eastern corner of the site is classified as Walpole Sandy Loam with a D hydrologic rating and slopes between 0 and 3 percent.

There are wetland areas to the east and north of the site. While some of the site work is proposed within the 100-foot upland review area, no direct wetland impacts are proposed.

Proposed Project

The proposed project consists of the demolition of the existing fire station and the construction of a new fire station building with new landscaped areas, driveways, and parking areas. Additional improvements include new stormwater and utility infrastructure. A summary of the change in impervious is shown below.

Project Site Impervious Cover [SF]

Existing Conditions	Proposed Conditions	Net Decrease
±52,200	±31,500	±20,700

The proposed stormwater system has been designed to maintain existing site hydrology to the maximum extent practicable. The majority of runoff from the new development will be conveyed to various stormwater management systems before discharging to either the existing stormwater network in Boston Post Road or overland towards the existing offsite wetlands. Water quality improvements include yard drains with sumps, a pretreatment swale and a rain garden. These water quality improvements have been designed to retain 100% of the proposed project's water quality volume onsite. This achieves the average annual pollutant load reduction requirements as per the recommendations of the 2024 CT Stormwater Quality Manual.

Details of the size and location of the stormwater network can be found on the Grading &

Drainage Plans, detail sheets and supporting calculations in the appendices of this report.

PEAK RUNOFF ANALYSIS (See Appendices A & B)

The stormwater management system is designed to control the rate of runoff from the site's watersheds to be equal or less than existing conditions up to, and including, a 100-year design storm event.

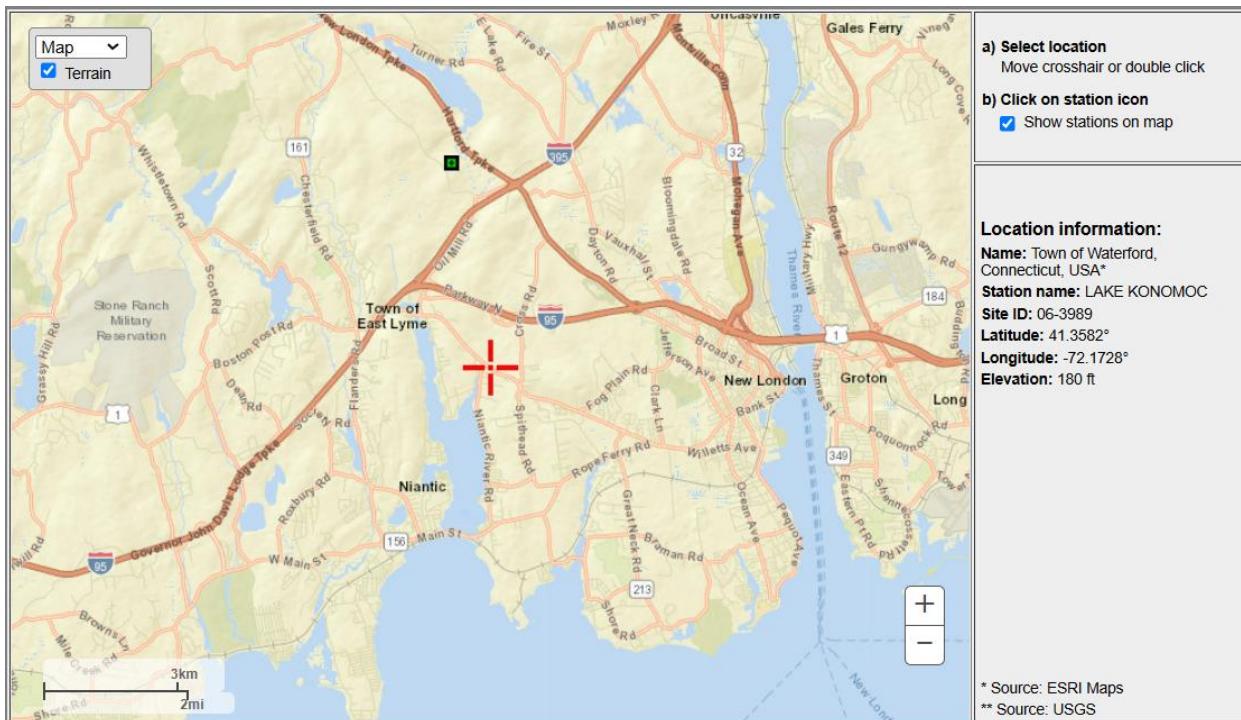
The peak runoff discharges for the existing and proposed conditions were analyzed using Soil Conservation Service (SCS) methodology which outlines procedures for calculating peak rates of runoff resulting from precipitation events as well as procedures for developing runoff hydrographs. The entire site was included in the analysis; see Figures EXWS and PRWS. Values for area, curve number (CN), and a time of concentration were calculated for the existing and proposed conditions.

The curve number is a land sensitive coefficient that dictates the relationship between total rainfall depth and direct storm runoff. The soils within the watershed are divided into hydrologic soil groups (A, B, C, and D). The SCS classification system evaluates the runoff potential of a soil according to its infiltration and transmission rates. "A" soils have the lowest runoff potential, while "D" soils have the greatest runoff potential.

The time of concentration (T_c) is defined as the time for runoff to travel from the hydraulically most distant point in the watershed to a point of interest. Values of time of concentration were determined for existing and proposed conditions based on land cover and slope of the flow path using methods outlined in TR-55.

For this study, a 24-hour SCS Type III standard rainfall distribution was used to determine the peak flow rate and volume to all points of discharge from the site. Precipitation data used for the various storm events is based on the "NOAA Atlas 14 Point Precipitation Frequency Estimates: CT" for Lake Konomoc Station. Lake Konomoc Station was chosen for rainfall data because it is the station located within the closest proximity of the project location as shown in Graphic 1. A summary of all rainfall data utilized in the analysis for this site is provided below and a complete compilation of data provided by NOAA for this location is included in Appendix C.

Graphic 1. NOAA Rainfall Data Location Map



NOAA Precipitation Depth per Average Recurrence Interval [in]

Duration	2-Year	10-Year	25-Year	100-Year
24-hour	3.45	5.13	6.17	7.79

Existing Condition (See Appendix A)

The project area's existing drainage conditions were analyzed as Watersheds A, B, and C (See Drawing EXWS).

Existing Watershed A is approximately 0.26 acres and comprises grassy areas, driveway aprons onto the site and the southwestern portion of the existing building. Stormwater runoff from this watershed either flows into the existing storm drainage network or overland and offsite towards Boston Post Road.

Existing Watershed B is approximately 0.08 acres and consists of grass and brush areas at the east of the site. Stormwater runoff from this watershed flows overland to the wetlands #2 to the east of the site.

Existing Watershed C is about 1.27 acres and consists of the existing building and parking areas along with grassy and brush areas. Stormwater runoff from this watershed flows overland to the wetlands #1 offsite to the north.

Proposed Condition (See Appendix B)

In the proposed condition, site hydrology attempts to mimic existing conditions and all watershed outlets remain the same.

Proposed Watershed A is about 0.37 acres and consists of grassy areas and the proposed driveway aprons. Stormwater will continue to flow overland to Boston Post Road. The proposed site within this watershed has been designed to significantly reduce impervious area as compared with the existing condition.

Proposed Watershed B is about 0.09 acres and includes grass and brush areas to the east of the site. This watershed will remain generally unchanged, and stormwater collected within this watershed will flow overland to the wetlands #2 offsite to the east.

Proposed Watershed C is divided into two sub-watersheds: Sub-watershed C1 and Sub-watershed C2. Sub-watershed C1 is about 1.04 acres and consists of the proposed building and parking areas along with grassy areas; stormwater within this watershed will flow either through a pretreatment swale conveyance feature or directly into a rain garden before flowing to the wetlands #2 offsite to the north. Sub-watershed C2 is about 0.12 acres and consists of grassy and brush areas; stormwater within this watershed will continue to flow overland to the wetlands #2 offsite to the north.

Details of the sizes and locations of the stormwater collection systems can be found on drawings CG101. A conservative design infiltration rate for the rain garden is 1 inch per hour. The design infiltration rate will be confirmed with on-site testing prior to construction. Please refer to Appendix F for boring log data within the vicinity of the proposed rain garden. This testing was performed by Barton & Loguidice as a part of a Limited Phase II Environmental Site Assessment report, dated 08/27/2024. According to the boring log data, groundwater was encountered between 6' and 13' below existing grade, and existing site soils within the rain gardens consist of a mainly sandy material.

Site Discharge Peak Flow Comparison for WS-A (CF)

Storm	Current	Proposed	Delta	% Reduction
2-Year	0.37	0.09	-0.28	75.68%
10-Year	0.77	0.44	-0.33	42.86%
25-Year	1.04	0.71	-0.33	31.73%
100-Year	1.46	1.20	-0.26	17.81%

Site Discharge Peak Flow Comparison for WS-B (CF)

Storm	Current	Proposed	Delta	% Reduction
2-Year	0.02	0.01	-0.01	50.00%
10-Year	0.09	0.09	0.00	0.00%
25-Year	0.15	0.19	0.00	0.00%
100-Year	0.26	0.26	0.00	0.00%

Site Discharge Peak Flow Comparison for WS-C (CF)

Storm	Current	Proposed	Delta	% Reduction
2-Year	3.77	0.32	-3.45	91.51%
10-Year	5.91	2.04	-3.87	65.48%
25-Year	7.22	3.73	-3.49	48.34%
100-Year	9.24	5.62	-3.62	39.18%

Site Discharge Peak Flow Comparison for Total Site (CF)

Storm	Current	Proposed	Delta	% Reduction
2-Year	4.15	0.38	-3.77	90.84%
10-Year	6.76	2.39	-4.37	64.65%
25-Year	8.39	4.44	-3.95	47.08%
100-Year	10.95	6.93	-4.02	36.71%

As can be seen from the tables above, runoff from each watershed and the total site will be attenuated for the storms up to and including the 100-year storm. Additionally, per the 2024 CT Stormwater Quality Manual requirements, runoff from each watershed that includes proposed site development will be attenuated by 50% for the 2-year storm event.

STORMWATER CONVEYANCE SYSTEM (See Appendix D)

The stormwater conveyance system was sized using the Rational Method for the 10-year storm event as per the CTDEEP Stormwater Quality Manual. Values for area, runoff coefficient, C, and

a time of concentration were calculated for each drainage area. The average runoff coefficient was calculated based upon the following cover types:

<u>Cover</u>	<u>C</u>
Grass/Pervious	0.3
Roof/Pavement/Impervious	0.9

Rainfall intensities were taken from the "NOAA Atlas 14 Point Precipitation Frequency Estimates: CT" for Lake Konomoc. Stormwater pipes were then sized based upon the Manning's Equation for full flow pipe capacity and solving for the hydraulic grade line. The computer program Hydraflow Storm Sewers 2011 by Intellisolve was used in the analysis.

Each proposed storm sewer system has been analyzed sing a starting HGL elevation equal to the outlet pipe's crown elevation. This mimics a tailwater elevation equal to the outlet pipe's diameter or a scenario where a proposed pipe is entering an existing pipe flow at full capacity.

STORMWATER QUALITY (See Appendix E)

The proposed stormwater management system has been designed to incorporate stormwater quality measures including a significant decrease in site imperviousness, yard drains with sumps, a pretreatment swale conveyance feature, and a rain garden. These measures will be implemented to increase water quality and minimize the passage of pollutants to the existing stormwater systems as compared to current conditions.

Under current conditions, the entirety of the site impervious cover ($\pm 52,200$ SF) is considered directly connected impervious area (DCIA). This project proposes to decrease DCIA by over 90%, which will decrease surface runoff and increase infiltration of rainfall into the soil.

Per Table 4.1 of the CT Stormwater Quality Manual, the site is considered a redevelopment with existing DCIA of 40% or more. As such, the Required Retention Volume (RRV) is 50% of the site's Water Quality Volume (WQV). Through coordination with the town of Waterford Environmental Planner, this project occurs within the Stony Brook watershed area. Stormwater discharge from the site contributes to an intermittent watercourse and wetland system located north of the parcel. The receiving portion of Stony Brook south of Route 1 has been designated as an impaired waterbody by CTDEEP. Because of this information, the stormwater system has

been designed to retain 100% of the site WQV and exceed the RRV requirements for our redevelopment site.

Table 4.3 of the CT Stormwater Quality Manual shows the minimum average annual pollutant load reductions for Total Suspended Solids (TSS), Total Phosphorus (TP) and Total Nitrogen (TN). Per the manual, “a proposed stormwater management system meets or exceeds these average pollutant load reductions when the RRV is retained on-site using suitable stormwater retention practices. Achieving these minimum required load reductions for sediment and nutrients is assumed to provide adequate reductions of other stormwater pollutants including floatable materials.” Through the use of the proposed rain garden, the stormwater system designed exceeds our RRV and will retain 100% of the WQV, thereby also exceeding the required average annual pollutant load reductions.

CONCLUSION

The proposed stormwater management system has been designed in general accordance with the 2024 CTDEEP Stormwater Quality Manual and the 2000 CTDOT Drainage Manual. It has been designed to maintain existing site hydrology to the maximum extent practicable with attenuated peak flows and multiple water quality improvements.

This Langan report shows that the proposed stormwater management system, as designed, will effectively manage quality and quantity of stormwater runoff for the proposed development. Please refer to the Drawings for additional drainage information.

Sincerely,
Langan CT, Inc.


Brian Phillips, P.E.
Senior Project Manager