Response to Engineering Comments

To: Woodbridge Town Plan & Zoning Commission

From: Paul Rodrigues, P.E. / Solli Engineering
Jason Montagno, P.E. / Solli Engineering

Subject: Proposed Residential Development
804 Fountain Street, Woodbridge, CT
Project #: 25111001

Date: 08/18/2025

We have reviewed comments dated 5/30/25 by Trinkaus Engineering, LLC for the Proposed Residential Development that will be located at 804 Fountain Street in Woodbridge, Connecticut. Below are the comments with our responses in **bold** when applicable.

Reference Materials

Engineering Report prepared by Solli Engineering, dated August 18, 2025

Civil Plan Set prepared by Solli Engineering, dated August 18, 2025

Site Plans
Sheet SP-1:

1. The turning movement plan for the fire truck and garbage truck is not complete. It does not show the complete movements required to enter and then exit the site.

   A Truck Turning Movement Plan has been provided. See Sheet TT-1 for more information regarding fire truck and garbage truck movements.

Sheet SP-2:

2. No elevations for the top and bottom of the rock cut have been provided on the plan.

   Top and bottom of wall/rock cut elevations have been provided. Please refer to the Grading & Drainage Plan (Sheet 2.21) for more information.

3. No volumes for earth removal and earth fill have been provided.

   Earthwork volumes have been provided. Please refer to the Grading & Drainage Plan (Sheet 2.21) and Engineering Report for more information.

4. Drainage for the underbuilding parking area is shown to be directed to the proposed on-site drainage system. This is not allowed by the CT DEEP. CT DEEP requires that drainage from an underbuilding or underground parking area to be directed to the sanitary sewer system after being treated by a hydrodynamic separator.

   Drainage for the underbuilding parking area will be routed to an oil water separator before discharging to the existing sanitary line located in Fountain Street (Route 243). Please refer to

the Utility Plan (Sheet 2.51) for more information.

5. Many proposed contour lines are not labeled on the plan, making it difficult to follow.

   Proposed contour lines have been labeled accordingly. Please refer to the Grading & Drainage Plan (Sheet 2.21) for more information.

6. No curbing is shown for the driveway and parking islands. Will curbing be installed?

   Bituminous concrete curb is proposed for the driveway and parking islands. Refer to the Site Plan (Sheet 2.11) for more information.

7. The proposed slope in the north corner of the site has slopes steeper than 2:1. How will these slopes be stabilized?

   The proposed slope in the north corner of the site has been graded 2:1. The slope will be stabilized with erosion control blankets. Refer to the Soil Erosion & Sediment Control Plans (Sheets 2.31-2.41) for more information.

8. Has permission been obtained from the State of Connecticut DOT to perform the substantial earthwork proposed within the Right of Way of Fountain Road?

   An Encroachment Permit Application shall be submitted to the CT DOT for review and approval. Based on prior experience, it is common for DOT to approve such earthwork where sightlines will be substantially improved.

9. A modular block retaining wall is shown along the southeast side of the access driveway. The wall varies in height from 1′ to over 15′. The wall is approximately five (5) below the southeast end of the gallery system so there will be a conflict of the geogrid for the modular block retaining wall and the gallery system.

   The Grading & Drainage Plan (Sheet 2.21) has been revised to provide adequate separation between the underground stormwater system and proposed retaining walls.

10. The proposed underground detention system consist of 1,216 lf of 4′ x 4′ concrete galleries with the bottom of the crushed stone to be set an elevation of 277.0′. The system crosses the existing contours substantially as stated below:
    a. Southeast corner, bottom of stone is at existing grade, thus entire system is in fill material.
    b. Southwest corner, bottom of stone is 15′ below existing grade.
    c. Northwest corner, bottom of stone is 14′ below existing grade.
    d. Northeast corner, bottom of stone is 11′ below existing grade.

    Please refer to the Grading & Drainage Plan (Sheet 2.21) for the revised underground stormwater systems. The system in the parking lot shall consist of a total of 120 – 5′ Retain-It units. This will be a double-stacked system with bottom of stone set at elevation 281.5′, and top of system at elevation 294.5′.

    The system located in the site driveway entrance shall consist of six (6) 5′ Retain-It units, which bottom of stone set at elevation 268.33, and top of system at elevation 275.0.

11. No deep test holes which are at least three (3) feet below the bottom of the stone layer have been done as required by the CT DEEP 2024 Storm Water Quality Manual. The design of the underground detention system is not in compliance with the 2024 DEEP Manual.

Test pits were conducted within the vicinity of the proposed underground stormwater management systems. For the system in the parking lot, Test Pit 15 was excavated to approximately elevation 278.5 without encountering refusal. The bottom of stone for the underground stormwater system is proposed at elevation 281.5. For the system in the site driveway entrance, Test Pit 20 was excavated to approximately elevation 264 without encountering refusal. The bottom of stone is proposed at elevation 268.33.

At least three (3) feet of separation has been provided, therefore the design complies with the requirements of the 2024 Connecticut Stormwater Quality Manual.

12. No double ring infiltration tests were done for the underground detention systems as required by the 2024 DEEP Manual. The design is not in compliance with the 2024 DEEP Manual.

    Per the 2024 Connecticut Stormwater Quality Manual, an infiltration rate of 0.52 inches/hour was used in accordance with Table 10-2 and based on NRCS Hydrologic Soil Group B.

13. It has not been demonstrated that the requirements of the 2024 DEEP Manual to reduce pollutant loads for Total Suspended Solids (TSS), Total Phosphorus (TP), and Total Nitrogen (TN) have been met by the design.

    Per the 2024 Connecticut Stormwater Quality Manual, "if the full retention goal (i.e., Required Retention Volume is met, then it is assumed pollutant reduction is also achieved and individual pollutant calculations are not necessary." The required Water Quality Volume is retained within the underground infiltration systems. Hydrodynamic separators and catch basins with four-foot sumps are proposed to provide additional treatment.

14. There is negligible treatment of the runoff which will be generated by the driveway and the southern end of the parking lot. This runoff will be directly discharged to the level spreader near the Fountain Road and will drain to the off-site wetland along the Merritt Parkway.

    Stormwater runoff generated by the driveway will be collected by two (2) catch basins located adjacent to the property line and routed to a hydrodynamic separator to provide treatment prior to discharging to a riprap apron upgradient of the existing wetlands.

15. There is a series of invert elevations shown for drainage structure, S-7. It is unclear which invert elevations go to which drainage pipes. This condition also exists for many other drainage structures which makes a complete evaluation of the drainage system impossible to complete.

    Please refer to the revised Grading & Drainage Plan (Sheet 2.21) for additional information regarding invert elevations.

16. Using the length and distance of drainage pipes provided on the plan, many of the drainage inverts are not correct.

    Please refer to the Grading & Drainage Plan (Sheet 2.21) for pipe lengths and inverts.

17. A hydrodynamic separator is proposed to treat runoff. It appears to be in an online configuration which significantly reduces the ability of the hydrodynamic separator to reduce non-point source pollutant loads.

    See response to #18.

18. The only stormwater treatment devices are standard catch basins with a 24" sump and an online

hydrodynamic separator. These systems will only remove the following percentages of non-point source pollutant loads:

a. Catch Basins with 24″ deep sumps:
    i. Total Suspended Solids =5%
    ii. Total Petroleum Hydrocarbons = 0%
    iii. Metals = 0%
    iv. Phosphorus = 6%
    v. Nitrogen = 0%
b. Online Hydrodynamic Separators:
    vi. Total Suspended Solids =29%
    vii. Total Petroleum Hydrocarbons = 42%
    viii. Metals = 26%
    ix. Phosphorus = 0%
    x. Nitrogen = 0%

Table 4-2 of the 2024 Connecticut Stormwater Quality Manual (CSQM) indicates that new developments are required to retain 100% of the site's water quality volume (WQV) which is also referred to as 100% of the Required Retention Volume (RRV). If this is accomplished, then no additional treatment volume is required. The next page (Page 41) of the 2024 CSQM states that "Table 8-1. Stormwater Management Suitability in Chapter 8 identifies stormwater BMPs and their suitability for meeting the stormwater retention performance criterion. In general, Infiltration BMPs and Stormwater Reuse BMPs are considered suitable retention practices. Infiltration BMPs are preferred for meeting the stormwater retention performance criteria because they also recharge groundwater…"

Proceeding to Pages 47 and 48 of the 2024 CSQM, the following statements are made under the section entitled "Demonstrating Compliance with Standard 1":

- **Stormwater management systems should be designed to achieve the average annual pollutant load reductions from directly connected impervious area for sediment (Total Suspended Solids) and nutrients (Total Phosphorus and Total Nitrogen) shown in Table 4. 3.**
- **Achieving these minimum required load reductions for sediment and nutrients is assumed to provide adequate reductions of other stormwater pollutants including floatable materials. However, it is important to note that if the full retention goal (i.e., Required Retention Volume) is met then it is assumed pollutant reduction is also achieved and individual pollutant calculations are not necessary.**
- **A proposed stormwater management system meets or exceeds these average annual pollutant load reductions when the Required Retention Volume is retained on-site using suitable stormwater retention practices (refer to Figure 8- 1).**

Table 8-1 of the CSQM, indicates that an Underground Infiltration System, which is the mechanism proposed as part of this site design, is suitable for providing the stormwater management functions of retention in the form of volume reduction and infiltration/recharge, stormwater treatment and peak runoff attenuation, with a requirement for pretreatment before runoff enters the infiltration system. The same Table 8-1 indicates that deep sump hooded catch basins and proprietary pretreatment devices, individually, are suitable means for runoff pretreatment. Both of these pretreatment BMPs are proposed as part of our stormwater quality measures on the site, even though only one is sufficient to meet the pretreatment requirements outlined in Table 8-1.

It is our professional opinion that the proposed stormwater design, which is compliant with the 2024 CSQM, will result in a reduction in pollutant loads to the off-site wetland systems, underlying groundwater and downgradient surface waterbodies. Notated charts and additional information from

the 2024 CSQM are attached for reference; however, the entirety of this information can be found in Chapters 4 and 8 of the "Connecticut Stormwater Quality Manual", prepared by the Connecticut Department of Energy & Environmental Protection, last revised March 26, 2024.

19. The 2024 CT DEEP Storm Water Quality Manual requires the following percent reductions of certain non-point source pollutants for new developments:
    a. Total Suspended Solids = 90%
    b. Total Phosphorous = 60%
    c. Total Nitrogen = 40%

    See response to #18.

20. Based upon the removal efficiencies stated in comment #18 above, the design will not achieve the CT DEEP requirements in comment #19.

    See response to #18.

21. The table on this sheet stating that there will be no impervious areas directly connected for post-development conditions is wrong. This site plan is all directly connected impervious area which are not being adequately treated. This plan as proposed is in violation of the Town of Woodbridge MS4 permit.

    Stormwater runoff from impervious areas shall be treated by catch basins with four-foot sumps, hydrodynamic separators, and underground infiltration systems.

22. There are no provisions for snow storage on the site. If snow is to be stockpiled on the site, it must be in a location where it will drain to the stormwater management system.

    Snow storage locations have been provided on the Site Plan (Sheet 2.11) and will drain to the stormwater conveyance system.

Sheet SP-3

23. No contours are labelled for the proposed sediment basin, so the claimed storage volume cannot be confirmed.

    Contour labels have been provided on the Soil Erosion & Sediment Control Plans (Sheets 2.31-2.33).

24. No volume calculations have been provided for the sediment basin.

    Required volume calculations have been provided for the sediment trap. Please refer to Sheets 2.31 and 2.32 for more information.

25. A diversion swale is shown to direct runoff to the sediment basin, but no grading has been provided for the diversion swale.

    A temporary diversion swale is proposed to direct runoff to Sediment Trap #1. Please refer to Sheet 2.31 more information.

26. As the diversion swale crosses the driveway, how will it be maintained while there are vehicles entering and exiting the site?

A diversion swale is not proposed crossing the driveway. Refer to the Soil Erosion & Sediment Control Plans (Sheets 2.31-2.33) for more information.

27. Only a singular perimeter erosion control measure has been provided consisting of a silt fence backed by a hay bale. This is simply inadequate for this site and will fail in the field.

    In conjunction with the perimeter erosion control measures shown on Sheet 2.31, another row of silt fence with haybale backing is proposed adjacent to the haul drive to the site to provide additional protection against stormwater runoff.

28. Erosion control measures are shown perpendicular to the existing and proposed contours which will cause concentrated flow to occur along the face of the silt fence. This design is not in compliance with the CT DEEP 2024 Guidelines for Soil Erosion and Sediment Control.

    Per Table 5.38 Geotextile Silt Fence Slope/Length Limitations of the CT DEEP 2024 Guidelines for Soil Erosion and Sediment Control Manual, wing walls can be spaced at a minimum of 50' along 2:1-3:1 slopes. Geotextile silt fences aid in decreasing the velocity of sheet flows and low volume concentrated flows. The design is in compliance with the Connecticut Guidelines for Soil Erosion & Sediment Control Manual.

29. There are no provisions for handling the runoff to be generated from the upland area are the rock cut during the excavation phase.

    Phasing sequences have been provided to control runoff during the rock cut/excavation phase. Please refer to Sheets 2.31-2.33 for more information.

Sheet SP-4

30. The construction narrative is generic and not specific to this site.

    Please refer to Sheets 2.31-2.33 for construction sequences.

31. No phasing plan has been provided for the project.

    Phasing plans have been provided. Please refer to Sheets 2.31-2.33 for more information.

32. No provisions have been provided for how the rock will be removed. Will a crusher be located on site? How many cubic yards of rock and/or earth are to be removed from the site? How many trucks trips will be necessary to remove rock and earth material from the site?

    The quantity of export has been provided on the Grading & Drainage Plan, and a narrative has been provided in the Engineering Report discussing truck trips necessary to remove material.

33. The details for the silt fence with hay bale backing is not a redundant barrier. If the silt fence is overtopped by runoff so will the hay bale which will result in the discharge of turbid water toward the wetland system along the Merritt Parkway.

    A wall is proposed along the 100' upland review area, and a swale will redirect sediment laden runoff to the proposed sediment trap. Silt fence with hay bale backing is proposed down gradient of the wall to help prevent erosion.

34. A detail of stone check dams is shown on the plans; however, no check dams are shown on the erosion control plan.

Stone check dams are not proposed on the plans.

Sheet SP-5

35. The detail of the ADS Duraslot Level Spreader is not a level spreader and will result in concentrated flow and not overland flow being discharged from this system.

    The level spreader has been replaced with a modified riprap apron. Flows directed to the riprap apron are approximately 2.42 ft/sec. Refer to the Appendix D of the Engineering Report for more information. According to Table 5.19 of the Connecticut Guidelines for Soil Erosion & Sediment Control Manual, modified riprap has a maximum permissible velocity of 8 ft/sec.

36. The detail for the Reinforced Retaining wall does not provide any dimensional information as to the height, width and depth of the blocks. It appears to be only valid up to a wall height of 10', while according to the site plan, the wall height will be up to 15'.

    A detail for the gravity retaining wall along the site driveway has been provided on Sheet 3.02. Wall details must be prepared and signed by a licensed professional engineer in the State of Connecticut with full structural calculations and details.

Sheet SP-6

37. The detail of the Rock Face Stabilization conflicts with the grading show on the site plans.

    Per the Preliminary Geotechnical Engineering Report submitted as a separate attachment, a rock face inclination of 1H:4V or shallow is recommended to limit potential rockfall from the proposed rock cut face. A rock catchment area of at least 10 feet wide from the toe of the rock slope is proposed on the Grading & Drainage Plan (Sheet 2.21). The bottom of the ditch shall be sloped toward the toe of the rock slope at 4H:1V, which will reduce the quantity and velocity of potential falling rocks that reach the end of the catchment area.

Site Engineering Design Report

38. Page 1: It is stated that the design of the stormwater system was designed in accord with the 2004 CT DEEP Storm Water Quality Manual. This manual has been replaced by the 2024 version which must be applied

    The Civil Plans have been designed in accordance with the 2024 Connecticut Stormwater Quality Manual.

39. Page 1: It also refers to the 2002 Erosion Guidelines which have been replaced by the 2024 version which must be applied.

    The Civil Plans have been designed in accordance with the 2024 Connecticut Guidelines for Soil Erosion & Sediment Control.

40. Page 2: NOAA 14 rainfall amounts from Milford were used in hydrologic analysis. Rainfall rates for Woodbridge must be used, not those from Milford.

    NOAA 14 rainfall data for Woodbridge has been used in the hydrologic analysis. Refer to Appendix B of the Engineering Report for more information.

41. Page 4: It is stated that the discharge from the stormwater detention system will connect to an existing pipe in Fountain Road. However, the site plans show the discharge to a level spreader on

the site and not Fountain Road. What is correct?

The underground stormwater system will discharge to an outlet control structure before ultimately flowing to a riprap apron outside of the upland review area, thereby maintaining/reducing flows to the wetlands. Refer to the Grading & Drainage Plan (Sheet 2.21) for more information.

42. Page 4: Table 4 shows time of concentrations (Tc) for PDA-2 and PDA-3 which are less than 6 minutes. The minimum Tc for TR-55 Urban Hydrology is 6 minutes.

A minimum time of concentration value of at least 6 minutes has been used for the stormwater analyses.

43. Page 5: It is stated that an isolator row is being provided in the gallery system. No isolator row is shown on the site plans, so it does not exist.

Please refer to the Grading & Drainage Plan (Sheet 2.21) and the Engineering Report for the underground stormwater system. Isolator rows are not proposed.

44. Page 5: It is stated that the observation infiltration was 6" per hour, but the DEEP default rate of 0.52'/hour was used. No infiltration test results were found in this report or on the site plan.

Per the 2024 Connecticut Stormwater Quality Manual, an infiltration rate of 0.52 inches/hour was used in accordance with Table 10-2 and based on NRCS Hydrologic Soil Group B.

45. Page 5: It is stated that the impervious percentage is 43.5% over the area of 4.119 acres. This equates to 1.79 acres, which is greater than the value of 1.62 acres cited on page 1. What value is correct?

The impervious coverage percentage (28.5%) has been provided on the Site Plan (Sheet 2.11), and is below the maximum impervious coverage allowed per the Zoning Regulations.

46. Page 5: It is stated that a storage volume of 26,271 cubic feet is provided in the gallery system which exceeds the Water Quality Volume (WQV). No calculations have been provided to support the claim of 26,271 cubic feet being provided. Additionally, the lack of information, this requirement cannot be confirmed.

The required Water Quality Volume is 9,013 cubic feet and supporting calculations have been included in Appendix C of the Engineering Report. The underground infiltration systems provide storage volumes totaling approximately 10,628 cubic feet below the lowest outflows of the system, which exceeds the required Water Quality Volume.

47. Due to the lack of deep test holes and appropriate infiltration testing, it cannot be confirmed that any infiltration will occur with the proposed gallery system. If not infiltration occurs, then there will be a substantial increase in post-development runoff volume for all storm events. It is well documented in professional literature that increased runoff volumes will cause adverse physical impacts to the stream channel morphology. These impacts include erosion of the channel banks, widening of the channel section due to erosion and the deposition of eroded sediments downstream of the erosion.

Test pits were conducted within the vicinity of the proposed underground infiltration system, in which Test Pit 15 was excavated to approximately Elevation 278.5 without encountering refusal. The bottom of stone for the underground stormwater system is proposed at Elevation 281.5, providing at least three (3) feet of separation. Per the 2024 Connecticut Stormwater

Quality Manual, an infiltration rate of 0.52 inches/hour was used in accordance with Table 10-2 and based on NRCS Hydrologic Soil Group B.

48. No pollutant loading analysis has been provided for the stormwater system which will show numerically the pollutant loads to be generated by the site on an annual basis and how the stormwater management system will reduce the pollutant loads to achieve the required reductions under the CT DEEP 2024 Storm Water Quality Manual.

    See response to #18.

Thank you for providing the above comments. If you have any further comments or questions, please provide them at your earliest convenience.

Respectfully,

Solli Engineering, LLC

Jason Montagno, P.E.
Assistant Project Manager

Stormwater Retention

Retain on-site the applicable post-development stormwater runoff volume **for the site**, referred to as the "Required Retention Volume," using structural stormwater BMPs. The Required Retention Volume is equal to 100% or 50% of the site's Water Quality Volume (WQV) depending on the type of project or activity (new development, redevelopment, or retrofit) and the existing Directly Connected Impervious Area (DCIA) of the site, consistent with the post-construction stormwater management provisions of the CT DEEP stormwater general permits. Refer to Table 4-2 for determining the appropriate Required Retention Volume for a given land development project or activity.

Table 4-2. Required Retention Volume Determination

Type of Project or Activity	Required Retention Volume (RRV)[1]	Additional Treatment Volume Required[1]	
		If Volume Retained Meets or Exceeds RRV	If Volume Retained Does Not Meet RRV
➢ New development[2] ➢ Redevelopment[3] or retrofit of sites that are currently developed with existing DCIA[4] of less than 40% ➢ Any new stormwater discharges located within 500 feet of tidal wetlands, which are not fresh-tidal wetlands, to avoid dilution of the high marsh salinity and encouragement of the invasion of brackish or upland wetland species	100% of site's WQV	None	(100% of site's WQV) – (Volume Retained)
➢ Redevelopment or retrofit of sites that are currently developed with existing DCIA[4] of 40% or more	50% of site's WQV	None	(100% of site's WQV) – (Volume Retained)

[1] Provide stormwater retention or additional treatment without retention to the Maximum Extent Achievable as defined in the CT DEEP stormwater general permits and described in this section.

[2] "New Development" means any construction or disturbance of a parcel of land that is currently in a natural vegetated state and does not contain alteration by man-made activities.

[3] "Redevelopment" means any construction activity (including, but not limited to, clearing and grubbing, grading, excavation, and dewatering) within existing drainage infrastructure or at an existing site to modify, expand, or add onto existing buildings, structures, grounds, or infrastructure.

[4] For the purpose of determining the Required Retention Volume, existing DCIA should be calculated based on the existing (pre-development) conditions of the overall project site.

- "Retention" means to hold post-development runoff on-site using structural stormwater BMPs or non-structural LID site planning and design strategies. In addition, it means there shall be no subsequent point source discharge to the drainage system or surface waters, including bypass of the stormwater BMP through inlet or outlet controls, **of any portion of** the Required Retention Volume. Retention practices reduce post-development runoff volumes and therefore are also called "runoff reduction" practices.
- Table 8-1. Stormwater Management Suitability in Chapter 8 identifies stormwater BMPs and their suitability for meeting the stormwater retention performance criterion. In general, Infiltration BMPs and Stormwater Reuse BMPs are considered suitable retention practices. Infiltration BMPs are preferred for meeting the stormwater retention performance criteria because they also recharge groundwater. Filtering BMPs (bioretention systems, tree filters, and surface sand filters) can provide retention of stormwater when designed specifically for infiltration. Dry water quality swales and green roofs are also suitable for providing stormwater retention.
- Retention practices should be sized to meet or exceed the applicable Required Retention Volume and should be designed, installed, and maintained consistent with the guidelines contained in this Manual to preserve pre-development hydrology and to achieve minimum average annual pollutant load reductions for sediment, floatables, and nutrients.
- In cases where the Required Retention Volume cannot be fully[44] retained on-site, retain stormwater runoff on-site to the "Maximum Extent Achievable" (see text box for demonstrating this) and provide additional stormwater treatment without retention as summarized in Table 4-2. Required Retention Volume Determination and described in the following section.

The Standard 1 stormwater retention requirements can be met at each individual discharge point along the boundary of the development site or internal to the site (i.e., design point) such as abutting properties, roadways, wetlands and watercourses, and receiving storm drainage systems.[45] I Or the Standard 1 retention requirement may also be demonstrated sitewide or for multiple design points.

[44] Fully means for the site. This can be address through multiple LID strategies, and structural BMPs in series or separately at several discharge points. The element that is important here is the RRV for the entire site.

[45] Per the CTDOT MS4 Permit, linear projects have alternative standards and may take an alternative approach to address constraints that are different than those that affect traditional parcel development projects. These alternative linear project standards can be found in the CTDOT drainage manual, the CTDOT MS4 General Permit, the General Construction Permit and in the supporting materials that CTDOT has developed.

Compliance with the 2024 CT Stormwater Quality Manual

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Demonstrating Compliance with Standard 1

Stormwater management systems should be designed to achieve the average annual pollutant load reductions from directly connected impervious area for sediment (Total Suspended Solids) and nutrients (Total Phosphorus and Total Nitrogen) shown in Table 4. 3.

Achieving these minimum required load reductions for sediment and nutrients is assumed to provide adequate reductions of other stormwater pollutants including floatable materials. However, it is important to note that if the full retention goal (i.e., Required Retention Volume) is met, then it is assumed pollutant reduction is also achieved and individual pollutant calculations are not necessary.

Table 4. 3 Minimum Average Annual Pollutant Load Reductions When Evaluating BMP Selection and Sizing (Only needed when additional stormwater treatment is needed[1])

Water Quality Parameter	New Development	Redevelopment/Retrofits
Total Suspended Solids (TSS)	90%	80%
Total Phosphorus (TP)	60%	50%
Total Nitrogen (TN)	40%	30%

[1] Pollutant load reduction percentages are calculated based on average annual loading and not based on any individual storm event. Load reductions based on post-construction stormwater management standards contained in the EPA Massachusetts MS4 General Permit.

- A proposed stormwater management system meets or exceeds these average annual pollutant load reductions when the Required Retention Volume is retained on-site using suitable stormwater retention practices (refer to Figure 8- 1).[48]

- If the stormwater runoff volume retained on-site does not meet the Required Retention Volume (100% or 50% of the site's WQV), and therefore additional stormwater treatment is required, the project proponent should document that the proposed stormwater management system meets or exceeds the minimum required average annual pollutant load reductions through the use of EPA Region 1 stormwater BMP performance curves (see the following section).

Compliance with the 2024 CT Stormwater Quality Manual

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Table 8- 1 Stormwater Management Suitability

BMP Category	BMP Type	Retention		Treatment	Pretreatment	Peak Runoff Attenuation (5)	Requires Pretreatment?
		Volume Reduction	Infiltration/ Recharge				
Pretreatment BMPs	Sediment Forebay				♦		No
	Pretreatment Vegetated Filter Strip				♦		No
	Pretreatment Swale				♦		No
	Deep Sump Hooded Catch Basin				♦		No
	Oil Grit Separator				♦		No
	Proprietary Pretreatment Device				(1)		No
Infiltration BMPs	Infiltration Trench	♦	♦	♦		♦	**Yes**
	Underground Infiltration System	♦	♦	♦		♦	**Yes**
	Infiltration Basin	♦	♦	♦		♦	**Yes**
	Dry Well	(2)	(2)	(2)			No
	Infiltrating Catch Basin	(3)	(3)	(3)			**Yes**
	Permeable Pavement	♦	♦	♦		♦	No
Filtering BMPs	Bioretention	(4)	(4)	♦		♦	**Yes**
	Sand Filter	(4)	(4)	♦		♦	**Yes**
	Tree Filter	(4)	(4)	♦			**Yes**
Stormwater Pond BMPs	Wet Pond			♦		♦	**Yes**
	Micropool Extended Detention Pond			♦		♦	**Yes**
	Wet Extended Detention Pond					♦	**Yes**
	Multiple Pond System			♦		♦	**Yes**
Stormwater Wetland BMPs	Subsurface Gravel Wetland			♦			**Yes**
	Shallow Wetland			♦			**Yes**
	Extended Detention Shallow Wetland			♦		♦	**Yes**
	Pond/Wetland System			♦		♦	**Yes**

Legend				
	♦	♦	♦	Suitable for providing stormwater management function
	(See notes)	(See notes)	(See notes)	Suitable for providing stormwater management function under certain conditions or with design restrictions as noted
				Generally not suitable for providing stormwater management function

Note (1): When used for pretreatment. See Proprietary BMPs for use as stand-alone treatment.

Compliance with the 2024 CT Stormwater Quality Manual

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