

DRAINAGE CALCULATIONS, HYDRAULICS & HYDROLOGY REPORT

**179 Gallivan Lane
Montville, CT**

**July 2025
Revised 9/15/25**

DRAINAGE HYDRAULICS AND HYDROLOGY REPORT

179 Gallivan Lane Montville, CT

EXISTING CONDITIONS

The site is approximately 10.16 acres in area and is shown on the Existing Survey Plan (Sheet 1 of the site plans). The site has access onto Gallivan Lane. There are approximately 4.0 acres of wetlands on the site.

PROPOSED DEVELOPMENT

This project is a modification of the previous approved site plan. The modification includes temporary sedimentation basins, in accordance with the 2024 CT Guidelines for Soil Erosion & Sedimentation Control, which will ultimately become a permanent water quality basin in accordance with the Connecticut the 2024 Stormwater Quality Manual (Manual). The propose development is located within an existing paved outdoor storage area. We propose to remove a 40 foot wide strip of pavement and replace it with a stormwater treatment system consisting of a forebay and a water quality basin.

EXISTING AND PROPOSED HYDRAULICS

The stormwater management system has been designed to provide for zero increase in peak stormwater discharge from the site. The project has been designed to actually result in a decrease in the peak stormwater rates leaving the project site. The project will result in a decrease in impervious area on the site. The project proposes to eliminate 8,800 SF of pavement, and construct a forebay and water quality basin in this area.

The Proposed Drainage Area contains the proposed development consists of 1.7 aces of the site. The stormwater runoff from proposed development will be treated by the proposed forebay and water quality basin. Based on the test holes, the forebay has been

modelled to assume that the basin will be a dry basin at the onset of the storm event. And the water quality basin has been modelled to assume that the basin will contain water up to elevation 140 at the onset of the storm event.

EROSION & SEDIMENTATION CONTROL

The 2024 CT Guidelines for Soil Erosion & Sedimentation Control applies to the construction phase of the project. A detailed erosion and sediment control plan has been provided in the site development plans. The proposed stormwater water quality basin has been designed to function as sedimentation trap during stabilization. In addition, a temporary sedimentation trap is proposed along the frontage of the site, to collect the runoff from the front section of the site, which would miss the stormwater basin. This additional sediment trap has been included in the calculations.

The first calculation required by the Guidelines is for the sediment storage volume (SSV). The sediment storage volume is the calculation for one year of predicted sediment load. The required SSV calculation for the temporary sediment trap is shown below.

Drainage Area

$$SSV = A(134CY/Acre)$$

$$A = 1.7 \text{ ACRE}$$

$$SSV = 227.8 \text{ CY} = \underline{\underline{6,152 \text{ CF}}}$$

The second calculation required by the Guidelines is for wet storage volume (WSV). The wet storage volume is the volume in the basin that is located below the bottom of the riprap for the level spreader outlet of the basin. The volume of the wet storage is required to be half of the required SSV. The required wet storage volume is shown below along with the dry storage volumes (DSV).

Sedimentation Trap (forebay & water quality basin)

3,076 CF of Wet Storage Volume Required

5,200 CF Provided

3,076 CF of Dry Storage Volume Required
6,152 CF of Sediment Storage Volume Required

4,800 CF Provided
10,000 CF Total Provided

CONNECTICUT STORMWATER QUALITY MANUAL

The Connecticut 2024 Stormwater Quality Manual (Manual) applies to the post construction phase, for the operation of the facility. The temporary sediment trap has been designed to function as a water quality basin after the site is stabilized. The basin meets the criteria of the Connecticut Stormwater Quality Manual for a Water Quality Basin.

Drainage Area 1

$$WQV = (1.3'')(R)(A)/12$$

$$A = 1.7 \text{ Acre}$$

$$R = 0.05 + 0.009(I)$$

$$I = 1.0 \text{ Acres} / 1.7 \text{ Acres} = 0.64 \quad (59\%)$$

$$R = 0.58$$

$$WQV = 0.11 \text{ Ac-Ft} = 4,792 \text{ CF (Required)}$$

1,300 CF (Provided in Water Quality Basin between elevation 140 and 140.5)

3,900 CF (Provided in Forebay between elevation 138 and 140.5)

Total WQV = 5,200 CF

Once development of the site is completed, there will be a decrease in volume and runoff from the site. The temporary sedimentation basin provides ample wet and dry storage volume to meet and exceed the requirements of the 2024 CT Guidelines for Soil & Sedimentation Control, as well as the 2024 CT Guidelines for Soil & Sedimentation Control. Likewise, the Water Quality Basin meets and exceeds the post construction requirements of the Connecticut 2024 Stormwater Quality Manual.

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PROJECT NAME: _____

PROJECT NO: _____ SHEET NO. _____ OF _____

BY: _____ DATE _____

SCALE: _____

RIP PAD SPLASH PAD

$$AREA = 1.7 \text{ ACRES}$$

$$C = 0.8$$

$$T_c = 5 \text{ MIN} \quad I_{25} = 8.72$$

$$Q_{25} = (1.7)(0.8)(8.72) = 4.9 \text{ CFS}$$

$$L = \frac{1.7Q}{D^{3/2}} + 80 = \frac{1.7(4.9)}{(1.25)^{3/2}} + 8(1.25) = 16 \text{ FEET}$$

$$W = 3(1.25) + 0.4(16) = 10 \text{ FEET}$$

$$d_{50} = \left(\frac{0.02}{0.5D} \right) \left(\frac{Q}{D} \right)^{4/3} = 0.2 \text{ FT} = 2.4 \text{ INCHES}$$

USE MODIFIED RIPRA