Summer Hill

Civil Engineers & Land Surveyors, P.C.

BY: MJO DATE: 12-5-25 SUBJECT: 33 Kenyon Road Waterford, Connecticut SHEET No.: 1 OF 2

CHECKED: LJM DATE: 12-5-25 Water Quality and Required Retention Volume Computations PROJECT No.: 23-20

1. Narrative

The project site land parcel is located in the Thames River subregional drainage basin (HUC 3000) and locally drains to the east to an immediately adjacent inland wetland approximately 20 acres in area. The outlet watercourse of the wetland crosses Vauxhall Street Extension to the east and joins Great Swamp Brook which flows southeasterly and enters the northern end of Brandegee Lake approximately 2,000 feet east of the project site.

A single family residence was formerly located in the southern portion of the project site. The residence has been removed and the only impervious land cover surface remaining on the site is a small area of the former driveway apron.

The planned redevelopment of the site includes the construction of 3,975 square foot synagogue building and associated parking areas, sidewalks, waste and recyclables receptacle enclosure, utility services, stormwater infiltration basin, exterior lighting, fencing, and the placement of fill and grading within an inland wetland 100-foot upland review area, and placement of fill in and a stormwater discharge to an inland wetland.

The impervious surface land coverage associated with the planned redevelopment project is 21,528 square feet or 19.2% of the land parcel area. The total area of disturbance associated with the projects construction activities is approximately 1.1 acres.

The grading of the site has been developed to direct the planned building roof water and surface water runoff from the planned driveway, parking areas, and sidewalks to a stormwater infiltration basin.

The bottom elevation of the stormwater infiltration basin has been set 24 inches above the average groundwater level observed in test pits excavated in the basin area and a 24-inch thickness of filter media has been specified below the basin bottom.

The stormwater infiltration basin and the site grading in combination provide the required measures to address the water quality volume and required retention volume guidance contained in the Connecticut Stormwater Quality Manual.

The stormwater infiltration basin has been designed to temporarily store 100% of the computed water quality volume and allow for its infiltration into the underlying natural soils.

Stormwater runoff generated from less frequent, greater rainfall depth events in excess of this temporary storage volume will flow over a two-foot width vegetated berm and four horizontal to one vertical slope on the downgradient side of the stormwater infiltration basin to the inland wetland to the east.

2. Water quality volume and required retention volume computed using the CT Stormwater Quality Manual equation

WQV = RRV = (1.3)(R)(A)/12, where:

WQV, Water quality volume (cubic feet)
RRV, Required retention volume (cubic feet)
P, Precipitation depth = 1.3 inches
R, Volumetric runoff coefficient = 0.05 + 0.009(I)
I, Post-development impervious area (percent)
A Post-development site drainage area (square feet)

I = 95.0%
R = 0.05 + 0.009(95) = 0.91
A = 21,528 $ft^2$

WQV = RRV = (1.3 in)(R)(A)/12 = (1.3 in)(0.91)(22,598 $ft^2$)/12 = 2,228 $ft^3$

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3. Stormwater infiltration basin storage volume

Stage-Storage

| Elevation ft | Area $ft^2$ | Average Area $ft^2$ | Incremental Volume $ft^3$ | Cumulative Volume $ft^3$ | Cumulative Volume Ac-ft |
|---|---|---|---|---|---|
| 138.50 | 1,904 | 1,904 | 0 | 0 | 0 |
| 139.00 | 2,171 | 2,038 | 1,019 | 1,019 | 0.0234 |
| 139.50 | 2,443 | 2,307 | 1,154 | 2,172 | 0.0499 |
| 140.00 | 2,722 | 2,583 | 1,291 | 2,445 | 0.0561 |

4. Test pit logs

Test pits excavated on 11-14-23 and logged by Michael J. Ott, P.E.

TP 1

0” – 10” Topsoil
10” – 22” Grey very fine sand and silt
22” – 36” Orange brown very fine sand, trace silt
Groundwater observed @ 32”

TP 2

0” – 12” Topsoil
12” – 25” Grey very fine sand and silt
25” – 36” Orange brown very fine sand, trace silt
Groundwater observed @ 24”

TP 3

0” – 12” Topsoil
12” – 30” Grey very fine sand and silt
30” – 37” Orange brown very fine sand, trace silt
Groundwater observed @ 30”

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