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STORMWATER MANAGEMENT PLAN

The Eighteen-Eight Group, LLC

193 Black Meadow Road

Chester, New York

S-B-L: 6-1-102

July 6, 2016

ENGINEER'S REPORT

GENERAL SUMMARY

The subject project consists of the construction of a light industrial building on lot #3 as shown on a map entitled "Minor Subdivision of Lands of The Eighteen-Eight Group, LLC", (the applicant), filed in the O.C.C.O as Map No. 23-00. Construction will include accessory driveways, parking areas and loading areas, as well as a drilled well and private septic system. The lot is approximately 23.3 acres, part of which is federal wetlands which will remain untouched. The land is relatively flat, having a general slope of approximately 1% toward a ditch running through the rear yard, tributary to Black Meadow Creek.

The proposed building and operations do not use any process water, and only domestic service and wastewater will be present. No nitrates, phosphates, suspended solids or BOD will run off from the subject lots. Soil test pit investigation indicates that there is no groundwater within 8 feet of the ground surface.

The proposed stormwater management plan calls for retention of the first ½" of surface water runoff from impervious surfaces. Furthermore, the plan calls for zero increase in stormwater runoff in the post-construction condition. This will be accomplished by installation of eight DW-6.5(A+B) drywells as manufactured by Woodard's Concrete Products, Bullville, New York. Roof runoff from the building will be piped directly into the drywells. Other surface water runoff from driveways, parking areas and loading areas will run partly into the drywells, and partly overland through lawn area at least 150' wide before entering a drainage ditch in the rear of the property. In this manner, any silts, salts, vehicle drippings, etc. will be filtered and/or detained. In addition, silt fencing, lawn seeding and erosion control measures will be provided in accordance with the Erosion and Sediment Control Notes on Sheet 3 of 3 of the plans.

STORMWATER RUNOFF CALCULATIONS

For the purposes of this calculation, the Rational Method was used. The design storm is 15 years. The area under consideration is only the part of the lot to the north of the federal wetlands, which is the only area being developed. This area shows on sheet 2 of 3 of the plans.

The Pre-Construction and Post- Construction calculations are as follows:

Pre-Construction Runoff

Drainage Area(A) = 4 acres

Existing condition = average grass; coefficient of runoff $c = 0.3$

$s = 2'$ drop in $700' = 0.3\%$

$t_c = 17$ minutes

$I(\text{rainfall intensity}) = 4.7 \text{ in/hr.}$

$Q = cIA = 0.3 \times 4.7 \times 4 = 5.64 \text{ cfs.}$

Post-Construction Runoff

Building Area: $60' \times 160' = 9,600 \text{ sq.ft.}$

Paved Area: 17,150 sq.ft.

Total Impervious Area: $26,750 \text{ sq.ft.} = 0.61 \text{ ac.}$

Average grass area: $3.39 \text{ acres @ } c = 0.3$

Impervious area: $0.61 \text{ ac @ } c = 0.9$

$c(\text{weighted average}) = 0.39$

Calculate t_c : Overland flow into PVC pipe: $50'$ average grass, $t_{c \text{ overland}} = 14$ minutes

$6''$ PVC pipe flow @ $s = 1\%$, $L = 140'$, $V_f = 2.87 \text{ ft/sec}$, $t_{c \text{ pipe}} = 49$ seconds (say 1 minute)

Open channel flow: $530'$ @ $\Delta \text{elev} = 2'$, $t_{c \text{ open channel}} = 7$ minutes

$\sum t_c = 14 + 1 + 7 = 22$ minutes

$I = 4.1 \text{ in/hr}$

$Q = cIA = 0.39 \times 4.1 \times 4 = 6.4 \text{ cfs}$

$\Delta Q = 6.4 - 5.64 = 0.76 \text{ cfs}$

STORAGE VOLUME REQUIRED

$$\Delta Q = 0.76 \text{ cfs}$$

For 15-year storm and $t_c = 22$ minutes, storage volume required =
 $0.76 \times 60 \times 22 = 1003 \text{ cu.ft.} = 7,502 \text{ gals.}$

V_{storage} one DW-6.5(A+B) = 1,000 gals.

V_{storage} eight DW-6.5(A+B) as provided = 8,000 gals.

Rate of discharge 6" PVC $Q_f @ s = 1\% = 0.56 \text{ cfs}$, \leq original 5.64cfs discharge

CONCLUSIONS

Surface water runoff increase after construction is 0.76 cfs. This volume is easily stored in the eight DW-6.5(A+B) units as provided. Furthermore, the rate of discharge in the post-construction condition is actually decreased from 5.64cfs to 0.56 cfs.

The excess storage volume in the drywells will allow percolation into the soil of stormwater runoff. With the excellent percolation rates in this soil, it is likely that overflow through the 6" PVC pipes will rarely, if ever, occur.


Stephen Deutsch, P.E.

