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Project:  
25 STILES TERRACE,  
NEWTON,  
MASSACHUSETTS.

Calculations by: GS  
Date: July 8, 2016  
REV: 9/19/2016

## STORMWATER MANAGEMENT PROGRAM

### Design Criteria:

Lot = 8,563 SF

Proposed Roof = 640 SF

Proposed Pavement = 880 SF

Design Percolation Rate = 2 min/in

### Runoff Coefficients:

Roof            0.95

Pavement       0.90

Q = CIA

Q = Quantity, CFS

C = Runoff Coefficient

I = Rainfall Intensity (7")

A = Area, S.F.

**Roof:**

$$Q = CIA$$

$$Q = (0.95) (0.583 F) (640 SF) = 354 CF$$

**Pavement:**

$$Q = CIA$$

$$Q = (0.9) (0.583 F) (880 SF) = 462 CF$$

$$\begin{aligned} \text{Total Runoff Entering System} &= (\text{Roof Runoff}) + (\text{Pavement Runoff}) \\ &= 354 CF + 462 CF \\ &= \mathbf{816 CF/D} \end{aligned}$$

$$\begin{aligned} \text{Quantity of Storage in Crushed Stone:} \\ (\text{Area} \times \text{Depth}) &= \\ (1/2)(15.1')(28.1')(2') &= \mathbf{424.3 CF} \end{aligned}$$

$$\begin{aligned} \text{Quantity of Storage in Pipe:} \\ (A_{\text{Pipe}}) \times (L_{\text{Pipe}}) &= \\ ((\pi)(6''/12)^2)(18.8' + 9.4') &= \mathbf{22 CF} \end{aligned}$$

$$\begin{aligned} \text{Total Storage Capacity} &= (V_{\text{Stone}} - V_{\text{Pipe}})(\text{Void Ratio}) \\ &= (424.3 CF - 22 CF) (0.4) = \mathbf{160.9 CF} \end{aligned}$$

**Percolation Credit:**

Designed system has only two sides with percolation.

$$\begin{aligned} \text{Available Area for Percolation (Sides of System above Poor Soils (0.5' Depth))} &= \\ D((L_1) + (L_2)) &= \\ (0.5')(18.8' + 9.4') &= 14.1 SF \end{aligned}$$

$$\text{Using } 2 \text{ min/in} = 2.5 \text{ ft/hr}$$

$$\text{Volume Percolated in One Hour} = 35.25 CF/HR = 846 CF/D$$

$$\text{By Rule of Thumb, Volume Percolated in 24 Hours} = 5 \times \text{System Capacity} = \mathbf{804.5 CF}$$

**Total Storage Capacity of System (1) Per Day:**

$$160.9 CF + 804.5 CF = \mathbf{965.4 CF/D}$$

Since Total Storage Provided (965.4 CF/D) > Total Storage Required (816 CF/D)  
Therefore System is Adequate

STORM WATER MANAGEMENT PROGRAM  
(VOLUME BASED)

25 STILES TERRACE  
NEWTON, MASSACHUSETTS.

September 29, 2016

PETER NOLAN & ASSOCIATES, LLC.