STORMWATER DESIGN REPORT

Amenia Free Library

APPLICANT : **Amenia Free Library Association**
3309 Route 343
Amenia, NY 12501

LOCATION: **3309 Route 343**
Amenia, NY 12501
Dutchess County

PROJECT No.: **17-016**

DATE: **October 2, 2018**

PREPARED BY:

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CIVIL ▪ ENVIRONMENTAL ▪ STRUCTURAL

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1. INTRODUCTION

The Amenia Free Library property encompasses approximately 0.401 acres of land and includes 2 existing structures, a 240 SF storage shed and an 886 SF library. The proposed project includes a 1,904 SF addition along the west end of the existing library, a 67 SF Vestibule as well as a paved parking area along the western side of the site. Due to the development, there will be an increase in impervious ground cover that increases from 0.15 acres to 0.19 acres. The current project will not generate more than 1 acre of soil disturbance and therefore is not subject to the requirements of the New York State Department of Environmental Conservation (NYSDEC) State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity. The project does not require NYSDEC permit coverage and therefore, a Stormwater Pollution Prevention Plan (SWPPP) is not required. The Amenia Free Library will incorporate two separate stormwater infiltration practices on the site to reduce peak rate stormwater flows by capturing, storing and infiltrating stormwater runoff volumes. In the event of a particular storm event referred to as the 90th percentile rainfall event or water quality storm event, the infiltration practices will be able to store and infiltrate the entire storm event volume without any offsite discharge. The Water Quality event can be a frequent occurrence in which 1.30 inches of rainfall can occur over a 24-hour period of time. This particular type of event tends to produce higher pollutant levels within the surface runoff. The larger storm events that occur less frequently will also drain into the new management practices where some storage and infiltration of the runoff will take place prior to overflowing into the existing stormwater collection system located along State Route 343. Additionally, the infiltration practices will assist in groundwater recharge by increasing recharge rates and introducing more surface runoff back into the ground.

2. SITE SOILS

Based on a review of the USDA Natural Resources Conservation Service's Soil Survey of Dutchess County, New York, the project site soils consist entirely of Copake-Urban land complex, undulating. This project site is made up of Hydrologic Soil Group A soil. The HSG A soils have low runoff potential when thoroughly wet and high infiltration rate values. These consist of soils that transmit water freely through the soil.

3. STORMWATER MANAGEMENT

The main goal of the selected stormwater management practices is to minimize peak discharge rates and to capture and infiltrate all runoff volume produced from impervious surfaces during the 24-hour water quality storm event. To achieve this, two practices have been selected for use at the site.

The first practice is a rain garden which will be located near the southwest portion of the property and will collect stormwater runoff from the proposed asphalt parking area that is located immediately north and above the proposed rain garden. The rain garden has a volumetric capacity to store runoff as well as the ability to infiltrate the water that is being stored back into the ground. Any flow beyond the infiltration and storage capacity of the rain garden will overflow into a proposed drywell via a vertical riser collector and horizontal overflow pipe leading downward toward the east and into the top of the dry well. The storage capacity of the rain garden is as follows:

Volume within Rain Garden = 81 ft^3
= 605.9 gallons

The second infiltration practice is a drywell that is located at the southern end of the site and will collect runoff generated from the southern portions of the roofs for both the existing structure and proposed addition. The roof runoff will be diverted from the roofs to the dry well via roof gutters and downspouts. This practice also has volumetric capacity for stormwater storage as well as the ability to infiltrate water back into the ground for groundwater recharge. Any volume beyond the infiltration and storage capacity of the drywell will overflow out the top of the structure and discharge out of the roof leader discharge pipes. Discharges occurring as part of an overflow event will flow into the existing stormwater collection system located on Route 343. The storage capacity of the drywell is as follows:

Drywell with a 7.33 ft interior diameter or a 3.67 ft interior radius and 4 ft depth.

Volume within Drywell = ($3.67^2 ft^2$ x 3.14 x 4 ft) = 169.3 ft^3

Stone thickness around Drywell = 18” with a 40% void ratio
Drywell Outer Diameter = 8 ft
Drywell Outer Radius = 4 ft
Stone Outer Diameter = 11 ft
Stone Outer Radius = 5.5 ft

Void Volume around Drywell = [(5.5^{2}ft^2 x 3.14) - (4^2 ft^2 x 3.14)] x 0.4 x 4 ft = 71.9 ft^3

Total Storage = 169.3 ft^3 + 71.9 ft^3 = 241.2 ft^3
=1804.2 gallons

As identified in the introduction, the two above proposed stormwater management practices have the capability to collect, store and infiltrate stormwater runoff. As a combined system, the two management practices will store and infiltrate the entire stormwater runoff volume, from the impervious areas mentioned above, during the water quality storm event.