STORMWATER DESIGN REPORT

Amenia Free Library – Amended Site Plan

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: March 4, 2020

PREPARED BY:

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CIVIL ▪ ENVIRONMENTAL ▪ STRUCTURAL

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TABLE OF CONTENTS

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 2,398 SF addition along the west end of the existing library, a paved parking area along the western side of the site and the removal of the existing shed. Due to the development, there will be an increase in impervious ground cover from the existing 0.15 acres to the proposed 0.21 acres. The current project will not disturb more than 1 acre and is therefore 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 majority of the storm event volume. 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 the majority of the 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 an existing sewage disposal system leaching galley, which will be converted into a stormwater infiltration practice. The galley 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 infiltration system 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 leaching galley will overflow out the top of the structure and discharge out of the roof leader discharge pipes and a yard drain. 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 leaching galley is as follows:

The Leaching Galley has a 7.25 ft interior length, 3.25 ft interior width, and 3.25 ft interior depth.

Volume within Leaching Galley = (7.25’ x 3.25’ x 3.25’) = 76.6 ft^3

Stone thickness around Infiltration System = 30” with a 40% void ratio
Drywell Outer Length = 7.83 ft
Drywell Outer Width = 3.75 ft
Stone Outer Length = 12.83 ft
Stone Outer Radius = 8.75 ft

Void Volume around Leaching Galley = [(12.83 x 8.75’ x 3.75’) - (7.83’ x 3.75’ x 3.75’)] x 0.4 x = 124.4 ft^3

Total Storage = 76.6 ft^3 + 124.4 ft^3 = 201 ft^3
= 1503.5 gallons

The combined volume of storage for the two practices is 282 ft^2. In addition to the storage volume the soil has a high hydraulic conductivity based on the USDA soil mapping and the percolation testing performed at the site which resulted in a range of percolation rates from 17 min/inch to 30 min/inch. The remaining volume of Water Quality Volume is estimated to be infiltrated into the ground where it will recharge the groundwater aquafer.