

Wolcott Estate
Great Estate Planned Unit Development
#1672-1726 Canton Avenue
Canton, Massachusetts

August 31, 2018

**STORMWATER MANAGEMENT REPORT AND HYDROLOGIC-HYDRAULIC
ANALYSIS**

Project Summary

The project proponent, Wolcott Residential, LLC, proposes to redevelop multiple parcels containing approximately 47± acres of land along Canton Avenue in Milton, Massachusetts known as the Carberry Property. The proposed redevelopment consists of an active adult residential community containing 54 dwelling units including razing several structures, rehabilitation of three existing structures (Manor House, Devens House and Wolcott House), construction of thirty-one (31) new buildings consisting of one or two unit homes, preservation of open space, approximately 3,784 linear feet of roadway, associated driveways, gravel access and parking to the Department of Conservation and Recreation (DCR) property, stormwater management facilities, gravity sewer collection system with connection to the municipal wastewater collection system, utility service connections and associated infrastructure.

The subject property is located on the south side of Canton Avenue and consists of five (5) parcels identified as Parcel ID No. M-2-2, M-2-40, M-2-4, M-2-29A and M-2-29 as shown on the Town of Milton Assessors maps. The property is located within the Residence AA District. The property is bordered by developed residentially zoned properties to the north, west and southwest while abutting DCR property to the east and southeast. Refer the Figure-1 USGS Locus Map for the location of the parcel. The property consists of a total of 47.06± acres of which approximately 46.78± acres is upland. An intermittent stream located within a manmade channel lined with high stonewalls flows through the site in a northerly direction towards Carberry Lane. The intermittent stream and associated limits of inland bank and bordering vegetated wetlands were reviewed and confirmed through an Order of Resource Area Delineation (DEP File No. 046-0512) issued on December 20, 2016. The site is not located within a Zone A, or Land Subject to Flooding resource area as shown on the current FEMA Flood Map (25023C0111J, dated July 17, 2012). Refer to Figure-2 FEMA Flood Map.

Methodology

Drainage computations were performed using the Natural Resources Conservation Services (NRCS) TR-20 method and HydroCAD® Drainage Calculation Software. Sketches of the existing and proposed watershed areas, HydroCAD® Report, and copies of the calculation sheets are included as appendices to this report.

Existing Conditions

The site presently consists of several residential homes, barns and outbuildings. The remainder of the site is comprised of wooded areas and open fields surrounding the residential homes. The site's topography is gentle to moderate with slopes ranging from 0 to 35 percent draining towards Carberry Lane via the intermittent stream to the north and on-site natural depression areas to the west along Canton Avenue. The site has frontage along Canton Avenue with three access drives.

Soil types were obtained from NRCS mapping and were found to vary from hydrologic soil group (HSG) A to D soils. In order to confirm the soil class, groundwater depth and characteristics of these soils, test pits were performed on site in December 2015 and in March 2017. Based on soil textures encountered at the time of testing, the overall site was found to have sandy soils (HSG A) along Canton Avenue while transitioning into a denser gravel till (HSG C/D) in the upper or rear portions of the site. Refer to Figure-4 NRCS Soils Map and Appendix E – Soil Testing Results for supporting documentation.

Under existing conditions, the northwesterly portion of the stormwater runoff from the project site flows overland towards the on-site intermittent stream flowing in a northerly direction towards Carberry Lane (Design Point 1). The remaining stormwater runoff from the site flows overland towards the onsite depression areas along Canton Avenue (Design Points 2 and 3). In both the existing and proposed stormwater analysis, the watershed area analyzed was approximately 92.2 acres consisting of the subject parcel and a large tributary area from the southeast (Blue Hills Reservation).

Existing conditions were established with supporting field inspections of the watershed areas and historic documentation of site conditions. All indications support the assumption that the stormwater runoff flowing towards the front of the site along Canton Avenue is contained on site within the existing natural depression areas along the stone wall. No indication of standing water within the depression areas was observed, therefore an increased infiltration rate was utilized for the existing natural depressions in the drainage analysis.

Proposed Conditions/Stormwater Management

Under the post development condition, the proposed impervious surface runoff will be discharged into multiple infiltration systems, either subsurface chambers, bioretention basin, open infiltration basin or rain gardens with pretreatment. These drainage facilities will collect and treat the proposed impervious surfaces through first defense pretreatment units or a stone diaphragm prior to discharge to the infiltration facilities. As portions of the project are located within an area subject to protection under the Wetlands Protection Act, M.G.L. c. 131, Section 40 and are considered a redevelopment project, the stormwater management systems were designed to be in compliance with the DEP Stormwater Management Regulations (SMR) to the extent practicable.

Compliance with Stormwater Management Standards

Standard 1 – No New Untreated Discharges

No new stormwater conveyances will discharge untreated impervious runoff into, or cause erosion to downgradient areas.

Standard 2 – Peak Rate Attenuation

Peak rates of runoff were calculated using the TR-20 methodology developed by the NRCS computer-based program, HydroCAD (refer to Appendices A & B). The increase in runoff is attenuated by the proposed subsurface infiltration chamber systems, the infiltration basin, and the bioretention basin as well as existing natural depression areas onsite providing treatment, infiltration and storage volume controls. These measures will both detain and infiltrate runoff, mitigating increased rates of runoff for the 2, 10, 25 and 100-year storms events to the extent practicable.

All closed drainage structures were designed employing the rational method and the Hanover design regulations to accommodate peak flows generated by the 100-year storm event where applicable. The stormwater facilities were designed to accommodate peak flows generated by the 100-year storm event. Refer to Appendix C for closed drainage system design.

The following is a summary of pre- and post-construction rates of runoff:

	PEAK RATES OF RUNOFF					
	Design Point 1 (Stream Channel towards Carberry Lane)		Design Point 2 (Canton Avenue - North)		Design Point 3 (Canton Avenue - South)	
	EXISTING (cfs)	PROPOSED (cfs)	EXISTING (cfs)	PROPOSED (cfs)	EXISTING (cfs)	PROPOSED (cfs)
2YR	12.26	11.60	0.00	0.00	0.00	0.00
10YR	30.50	26.94	0.00	0.00	0.00	0.00
25YR	46.55	41.22	0.00	0.00	0.00	0.00
100YR	80.55	72.09	0.00	0.00	2.71	0.00

Standard 3 – Groundwater Recharge

Runoff will be infiltrated by subsurface infiltration chamber systems, infiltration basin, bioretention basin and the existing natural basins. Infiltration structures will be a minimum of two feet above seasonal high groundwater. The hydraulic conductivity was

based on soil conditions found on the site via soil testing and DEP SMR Table 2.3.3 1982 Rawls Rates - values developed from Rawls, Brakensiek and Saxton, 1982. The total required groundwater recharge volume for the entire site was calculated to be 8,930 cubic feet. The proposed subsurface infiltration facilities will provide 114,053 cubic feet of recharge below the minimum outlet elevation. Refer to Appendix C for recharge volume and drawdown calculations and Appendix E for soil testing results.

Standard 4 – Water Quality

A Long-Term Source Control/Pollution Prevention Plan has been incorporated into the Operation and Maintenance Plan. Refer to Appendix D for BMP Operation and Maintenance Plans. The water quality volume was calculated using the one-inch rule as portions of the site are within an area of rapid infiltration. The total required water quality treatment volume was calculated to be 29,178 cubic feet. Refer to Appendix C for water quality calculations for each treatment stream.

In accordance with the guidelines of the Stormwater Management Policy, the Total Suspended Solids (TSS) Removal was calculated to be 80% or greater for the new treatment trains which will handle the stormwater runoff from the proposed project area. The treatment trains consist of deep hooded catch basins, first defense pretreatment units to either subsurface infiltration chamber systems or infiltration basin or a pretreatment stone diaphragm to the bio retention basin to achieve the required removal rate of 80% total suspended soils. TSS removal calculations are included in Appendix C.

Standard 5 – Land Use with Higher Potential Pollutants Loads (LUHPPL)

The proposed project is not considered a LUHPPL. Not Applicable.

Standard 6 – Critical Areas

The proposed project does not discharge to any critical areas. Not Applicable.

Standard 7 – Redevelopment and Other Projects Subject to the Standards only to the maximum extent practicable

The project site is currently developed, and the proposed project consists of razing several existing structures, restoring three historic homes and constructing thirty-one (31) new residential buildings. Portions of the site could be considered redevelopment, but for the purpose of stormwater design, the project was considered new development and has been designed to be in compliance with the stormwater standards.

Standard 8 – Construction Period Pollutions Prevention and Erosion and Sedimentation Control

Silt socks will be placed at the limit of work as erosion control barriers prior to commencement of any construction activity. A Construction Operation and Maintenance

Plan and Construction Pollution Prevention Plan have been provided. Refer to the construction detail plan for erosion control details and the BMP Operation and Maintenance Plans in Appendix D.

Standard 9 – Operation and Maintenance Plan

The Long-Term Source Control/Pollution Prevention Plan and Operation and Maintenance Plan is also provided within Appendix D.

Standard 10 – Prohibition of Illicit Discharges

No illicit discharges are anticipated on site. Measures to prevent illicit discharges are included in the Long-Term Source Control/Pollution Prevention Plan.