TECHNICAL REPORT IN SUPPORT OF SITE PLAN APPROVAL

14, 16 & 18 NORTH END BOULEVARD

SALISBURY, MASSACHUSETTS

FEBRUARY 1, 2023

PARTIALLY REVISED JULY 24, 2023

SUBMITTED TO:

TOWN OF SALISBURY
PLANNING BOARD
CONSERVATION COMMISSION
5 BEACH STREET
SALISBURY, MA 01952

APPLICANT:

18 NE BLVD LLC
271 SALEM STREET, UNIT E
WOBURN, MA 01801

July 24, 2023

Stormwater Management Calculations

STANDARD 2: Runoff Peak Discharge Rates

Rational Method - ASCE, 1992 and Rossmiller, 1980

The Rational Method is used for determining peak discharges from areas less than or equal to 20 acres. The Rational Formula is expressed as:

$Q = CiA$

Q = Peak rate runoff in cubic feet per second (ft^3/sec)
C = Runoff coefficient, an empirical coefficient representing a relationship between rainfall and runoff.
i = Average intensity of rainfall in inches per hour for the time of concentration (Tc) for a selected frequency of occurrence or return period.
A = The watershed area in acres
Tc =The rainfall intensity averaging time in minutes, usually referred to as the time of concentration, equal to the time required for water to flow from the hydraulically most distant point in the watershed to the point of design.

Rainfall Intensity Coefficient (i):

Storm	Intensity (inches/hour) (i)
2-yr	3.15
10-yr	4.83
100-yr	8.94

Essex County - Salisbury - MA
Source: Natural Resources Conservation Service

Runoff Coefficient (C):

Curve Numbers	
Pavement/Compacted Gravel	0.95
Porous Pavement	0.7
Vegetated Areas	0.1
Roof	0.95

July 24, 2023

Existing Conditions:

Watershed Area (A) = 12, 100 SF = 0.28 AC (All pavement/compacted gravel)
Runoff Coefficient (C) = 0.95

2-yr storm: Q = 0.95 x 3.15 (inch/hour) x 0.28 (AC)
Q = 0.83 ft^3/sec

10-yr storm: Q = 0.95 x 4.83 (inch/hour) x 0.28 (AC)
Q = 1.28 ft^3/sec

100-yr storm: Q = 0.95 x 8.94 (inch/hour) x 0.28 (AC)
Q = 2.37 ft^3/sec

Proposed Conditions:

Watershed Area (A) = 12, 100 SF = 0.28 AC

Runoff Coefficient (C) = Weighted Curve number = sum of each curve number value multiplied by its fraction of the total area:

- Roof= (6,153SF /12,100SF)x0.95 = 0.483
- Peastone Surface (excluding area under buildings) = (3956SF/12,100SF)x0.70 = 0.228
- Vegetated Areas = (1,991SF /12,100 SF)x0.1 = 0.016

C= 0.483 + 0.228 + 0.016 => **C= 0.73**

2-yr storm: Q = 0.73 x 3.15 (inch/hour) x 0.28 (AC)
Q = 0.64 ft^3/sec

10-yr storm: Q = 0.73 x 4.83 (inch/hour) x 0.28 (AC)
Q = 0.97 ft^3/sec

100-yr storm: Q = 0.73 x 8.94 (inch/hour) x 0.28 (AC)
Q = 1.80 ft^3/sec

Flow Rates Comparison:

Event	Flow Rate (ft3/sec)	
	Existing	Proposed
2-yr	0.83	0.64
10-yr	1.28	0.98
100-yr	2.37	1.83

As a result of the calculations, as shown on the table hereon, the peak run off observed in the post-development condition will reduce, compared to the rates under the existing conditions for all the storm events.

STANDARD 4: Water Quality Volume

Stormwater treatment is provided by using a pervious driveway with peastone surface for the driveway. Approximately 80% of TSS removal will be achieved. See TSS Removal Calculation attached.

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: 14, 16 & 18 North End Boulevard, Salisbury, MA

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Porous Pavement	0.80	1.00	0.80	0.20
	0.00	0.20	0.00	0.20
	0.00	0.20	0.00	0.20
	0.00	0.20	0.00	0.20
	0.00	0.20	0.00	0.20

Total TSS Removal = 80%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: 4155
Prepared By: The Morin-Cameron Group, Inc.
Date: 7/4/2023

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1