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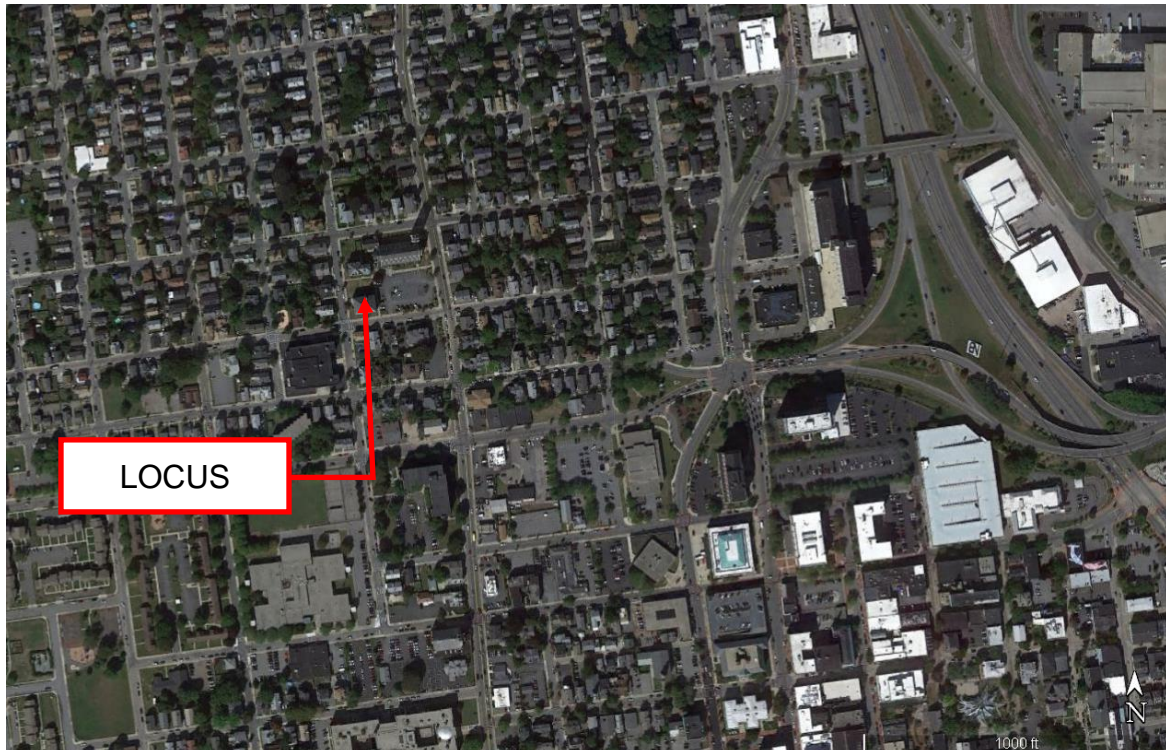
Servicing the Northeast

STORMWATER REPORT

Last Revised: April 28, 2021

#563 County Street – Lot 1

ASSESSORS MAP 58, LOT 259
NEW BEDFORD, MASSACHUSETTS



PREPARED FOR:

Charing Cross Realty Trust
2 Centennial Drive
Peabody, MA 01960

STORMWATER MANAGEMENT REPORT AND HYDROLOGIC ANALYSIS

SECTION 1: Project Summary

The subject property, a proposed portion of existing parcel identified as Map 58, Lot 259, contains approximately 0.42+/- acres. The existing parcel is the site of an existing church building, rectory building, and parsonage building, along with associated parking areas. The subject property will encompass only the existing parsonage building and existing parking spaces to the immediate east of the parsonage building, with remaining church and rectory buildings, and parking to be located on a separate lot. The subject property, at the southwest corner of Map 58, Lot 259, has pedestrian access from both Summer Street and North Street. The site encompasses an existing driveway opening on North Street and nine existing parking spaces. The remaining existing parking areas associated with the church will remain on a separate lot, and an access easement will be provided to allow the existing drive aisle to be utilized by the church. The subject property is bounded on the west and south by residential uses. At the opposite quadrant of the intersection of North Street and Summer Street, the Holy Family Holy Name school also abuts the property. The existing church uses abut the property to the north and east. Having been mostly developed, the topography is relatively flat throughout the project site with minimal slopes to allow for the proper movement of stormwater.

The Applicant seeks to convert the existing 3-story parsonage building to a 15-unit multi-family apartment building. This conversion will require a Special Permit to allow for the conversion of an existing non-conforming use. Due to the limited space available on-site, a Special Permit will also be required to allow for a reduction of the required number of parking spaces. Twenty-two parking spaces have been proposed on the north and east sides of the building. Parking will be accessed via the existing driveway opening on North Street. On street parking is available on North Street and Summer Street, and a SRTA bus stop is located on the corner of North Street and County Street. A bike rack has been proposed on-site. Pedestrian access from North Street and Summer Street will remain. Additionally, a handicap accessible lift is proposed on the north side of the building, where an additional building entrance is proposed. In order to attenuate runoff from the additional impervious area, stormwater from the proposed parking area is proposed to be collected in a deep sump hooded catch basin, and discharged to an underground infiltration basin consisting of twenty-four Cultec Recharger280HD chambers designed to capture and recharge storms up to the 100-year 24-hour storm.

SECTION 2: Methodology

Drainage computations were performed using the Natural Resources Conservation Services (NRCS) TR-20 method and HydroCAD® Drainage Calculation Software to determine the change in the existing and post-development runoff rates from each

drainage area for the 2-, 10-, 25-, and 100-year 24 hour storm events. The limits of the work proposed to construct the project do not fall within an area subject to protection by the Wetlands Protection Act, therefore, strict compliance with DEP Stormwater Management Standards is not required. The drainage facilities are designed to comply with section 5454 of the Zoning By-Law, which requires stormwater design to conform to City of New Bedford Subdivision Regulations. Sketches of the existing and proposed watershed areas, HydroCAD® Report, and copies of the calculation sheets are included as appendices to this report.

SECTION 3: Existing Conditions

The soils underlying the site are identified in the Natural Resources Conservation Service (NRCS) Soil Survey of Bristol County. The site soils are classified as 602 (Urban Land), which indicates that the soil consists of a significant amount of excavated and filled land.

A soil test hole was performed by Farland Corp in January 2021 to confirm the soil survey and determine the soil suitability for stormwater infiltration.

The test hole indicated site subsurface conditions generally include sandy loam fill underlain by a loamy sand natural C horizon to a depth of approximately 12 feet. Weepign groundwater was encountered at a depth of 64 inches.

SECTION 4: Stormwater Management Overview

The stormwater analyses for this site was limited to that area of the site where the groundcover is proposed to be altered. Because the proposed subcatchment area which includes the entire proposed parking lot is proposed to be captured and infiltrated on-site, and evaluation of existing runoff has not been performed.

Proposed Conditions:

Under proposed conditions, runoff from the area on the north side of the existing building will be captured by a proposed catch basin, and directed to a subsurface infiltration basin. The subcatchment area included all proposed groundcover alterations and proposed impervious areas. The infiltration basin has been designed to capture and infiltrate stormwater runoff for all storms up to the 100-year 24-hour storm event. Where no feasible overflow discharge location exists, storms in excess of the 100-year 24-hour storm will surcharge the catch basin grate and follow overland flow patterns. Remaining areas on the site will follow existing drainage patterns.

In accordance with the Subdivision Regulations, the rate mitigation facilities have been engineered so that the aggregate peak discharge rates during a 2-year, 10-year, 25-year, or 100-year frequency storm event are no greater following development than the estimated rate prior to development.

Subdivision Regulations – New Bedford, Massachusetts

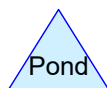
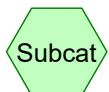
Article VI(B)(14):

Drainage provisions shall be made such that the peak run-off after development is not more than the peak run-off prior to development. Said condition shall be attained either through the containment of drainage on-site and/or the provisions for linkage to public storm drains. Further, provisions for collecting and discharging surface drainage shall be made, such that the drainage flowing onto surrounding properties after development is no more than the drainage flowing onto surrounding properties prior to development. All run-off calculations shall be based on the 100 year storm projections. Drainage calculations provided demonstrate that runoff from a significant portion of the site, which had previously discharged overland to abutting properties, is now proposed to be captured and recharged to groundwater on-site. Remaining areas of the site unaffected by the proposed site work will follow existing drainage patterns. This project meets this requirement.



Flow toward Infiltration
Basin

Infiltration Chambers



POST

Type III 24-hr 2-YEAR Rainfall=3.40"

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Flow toward Infiltration Runoff Area=6,927 sf 91.94% Impervious Runoff Depth=2.84"
Tc=6.0 min CN=95 Runoff=0.49 cfs 0.038 af

Pond 1P: Infiltration Chambers Peak Elev=109.77' Storage=0.013 af Inflow=0.49 cfs 0.038 af
Outflow=0.06 cfs 0.038 af

Total Runoff Area = 0.159 ac Runoff Volume = 0.038 af Average Runoff Depth = 2.84"
8.06% Pervious = 0.013 ac 91.94% Impervious = 0.146 ac

POST

Type III 24-hr 2-YEAR Rainfall=3.40"

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Summary for Subcatchment 1S: Flow toward Infiltration Basin

Runoff = 0.49 cfs @ 12.09 hrs, Volume= 0.038 af, Depth= 2.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.40"

Area (sf)	CN	Description
5,460	98	Paved parking, HSG B
* 876	98	Concrete, HSG B
* 33	98	Roof, HSG B
558	61	>75% Grass cover, Good, HSG B
6,927	95	Weighted Average
558		8.06% Pervious Area
6,369		91.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 Minimum

Summary for Pond 1P: Infiltration Chambers

Inflow Area = 0.159 ac, 91.94% Impervious, Inflow Depth = 2.84" for 2-YEAR event
 Inflow = 0.49 cfs @ 12.09 hrs, Volume= 0.038 af
 Outflow = 0.06 cfs @ 11.60 hrs, Volume= 0.038 af, Atten= 88%, Lag= 0.0 min
 Discarded = 0.06 cfs @ 11.60 hrs, Volume= 0.038 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 109.77' @ 12.73 hrs Surf.Area= 0.022 ac Storage= 0.013 af

Plug-Flow detention time= 67.4 min calculated for 0.038 af (100% of inflow)
 Center-of-Mass det. time= 67.3 min (846.4 - 779.1)

Volume	Invert	Avail.Storage	Storage Description
#1	108.80'	0.018 af	29.57"W x 32.00"L x 3.21'H Prismatic 0.070 af Overall - 0.024 af Embedded = 0.045 af x 40.0% Voids
#2	109.30'	0.024 af	Cultec R-280HD x 24 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 6 rows
		0.042 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	108.80'	2.570 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.06 cfs @ 11.60 hrs HW=108.83' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.06 cfs)

POST

Type III 24-hr 10-YEAR Rainfall=4.80"

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Flow toward Infiltration Runoff Area=6,927 sf 91.94% Impervious Runoff Depth=4.22"
Tc=6.0 min CN=95 Runoff=0.71 cfs 0.056 af

Pond 1P: Infiltration Chambers Peak Elev=110.29' Storage=0.021 af Inflow=0.71 cfs 0.056 af
Outflow=0.06 cfs 0.056 af

Total Runoff Area = 0.159 ac Runoff Volume = 0.056 af Average Runoff Depth = 4.22"
8.06% Pervious = 0.013 ac 91.94% Impervious = 0.146 ac

POST

Type III 24-hr 10-YEAR Rainfall=4.80"

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Summary for Subcatchment 1S: Flow toward Infiltration Basin

Runoff = 0.71 cfs @ 12.09 hrs, Volume= 0.056 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=4.80"

Area (sf)	CN	Description
5,460	98	Paved parking, HSG B
* 876	98	Concrete, HSG B
* 33	98	Roof, HSG B
558	61	>75% Grass cover, Good, HSG B
6,927	95	Weighted Average
558		8.06% Pervious Area
6,369		91.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 Minimum

Summary for Pond 1P: Infiltration Chambers

Inflow Area = 0.159 ac, 91.94% Impervious, Inflow Depth = 4.22" for 10-YEAR event
 Inflow = 0.71 cfs @ 12.09 hrs, Volume= 0.056 af
 Outflow = 0.06 cfs @ 11.25 hrs, Volume= 0.056 af, Atten= 92%, Lag= 0.0 min
 Discarded = 0.06 cfs @ 11.25 hrs, Volume= 0.056 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 110.29' @ 13.10 hrs Surf.Area= 0.022 ac Storage= 0.021 af

Plug-Flow detention time= 126.2 min calculated for 0.056 af (100% of inflow)
 Center-of-Mass det. time= 126.2 min (895.5 - 769.3)

Volume	Invert	Avail.Storage	Storage Description
#1	108.80'	0.018 af	29.57"W x 32.00"L x 3.21'H Prismaoid 0.070 af Overall - 0.024 af Embedded = 0.045 af x 40.0% Voids
#2	109.30'	0.024 af	Cultec R-280HD x 24 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 6 rows
		0.042 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	108.80'	2.570 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.06 cfs @ 11.25 hrs HW=108.83' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.06 cfs)

POST

Type III 24-hr 25-YEAR Rainfall=5.60"

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Flow toward Infiltration Runoff Area=6,927 sf 91.94% Impervious Runoff Depth=5.01"
Tc=6.0 min CN=95 Runoff=0.83 cfs 0.066 af

Pond 1P: Infiltration Chambers Peak Elev=110.64' Storage=0.027 af Inflow=0.83 cfs 0.066 af
Outflow=0.06 cfs 0.066 af

Total Runoff Area = 0.159 ac Runoff Volume = 0.066 af Average Runoff Depth = 5.01"
8.06% Pervious = 0.013 ac 91.94% Impervious = 0.146 ac

POST

Type III 24-hr 25-YEAR Rainfall=5.60"

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Summary for Subcatchment 1S: Flow toward Infiltration Basin

Runoff = 0.83 cfs @ 12.09 hrs, Volume= 0.066 af, Depth= 5.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=5.60"

Area (sf)	CN	Description
5,460	98	Paved parking, HSG B
* 876	98	Concrete, HSG B
* 33	98	Roof, HSG B
558	61	>75% Grass cover, Good, HSG B
6,927	95	Weighted Average
558		8.06% Pervious Area
6,369		91.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 Minimum

Summary for Pond 1P: Infiltration Chambers

Inflow Area = 0.159 ac, 91.94% Impervious, Inflow Depth = 5.01" for 25-YEAR event
 Inflow = 0.83 cfs @ 12.09 hrs, Volume= 0.066 af
 Outflow = 0.06 cfs @ 11.00 hrs, Volume= 0.066 af, Atten= 93%, Lag= 0.0 min
 Discarded = 0.06 cfs @ 11.00 hrs, Volume= 0.066 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 110.64' @ 13.49 hrs Surf.Area= 0.022 ac Storage= 0.027 af

Plug-Flow detention time= 165.5 min calculated for 0.066 af (100% of inflow)
 Center-of-Mass det. time= 165.2 min (930.5 - 765.3)

Volume	Invert	Avail.Storage	Storage Description
#1	108.80'	0.018 af	29.57'W x 32.00'L x 3.21'H Prismaoid 0.070 af Overall - 0.024 af Embedded = 0.045 af x 40.0% Voids
#2	109.30'	0.024 af	Cultec R-280HD x 24 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 6 rows
		0.042 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	108.80'	2.570 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.06 cfs @ 11.00 hrs HW=108.83' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.06 cfs)

POST

Type III 24-hr 100-YEAR Rainfall=7.00"

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Flow toward Infiltration Runoff Area=6,927 sf 91.94% Impervious Runoff Depth=6.41"
Tc=6.0 min CN=95 Runoff=1.05 cfs 0.085 af

Pond 1P: Infiltration Chambers Peak Elev=111.49' Storage=0.038 af Inflow=1.05 cfs 0.085 af
Outflow=0.06 cfs 0.085 af

Total Runoff Area = 0.159 ac Runoff Volume = 0.085 af Average Runoff Depth = 6.41"
8.06% Pervious = 0.013 ac 91.94% Impervious = 0.146 ac

POST

Type III 24-hr 100-YEAR Rainfall=7.00"

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Summary for Subcatchment 1S: Flow toward Infiltration Basin

Runoff = 1.05 cfs @ 12.09 hrs, Volume= 0.085 af, Depth= 6.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR Rainfall=7.00"

Area (sf)	CN	Description
5,460	98	Paved parking, HSG B
* 876	98	Concrete, HSG B
* 33	98	Roof, HSG B
558	61	>75% Grass cover, Good, HSG B
6,927	95	Weighted Average
558		8.06% Pervious Area
6,369		91.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 Minimum

Summary for Pond 1P: Infiltration Chambers

Inflow Area = 0.159 ac, 91.94% Impervious, Inflow Depth = 6.41" for 100-YEAR event
 Inflow = 1.05 cfs @ 12.09 hrs, Volume= 0.085 af
 Outflow = 0.06 cfs @ 10.40 hrs, Volume= 0.085 af, Atten= 95%, Lag= 0.0 min
 Discarded = 0.06 cfs @ 10.40 hrs, Volume= 0.085 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 111.49' @ 14.03 hrs Surf.Area= 0.022 ac Storage= 0.038 af

Plug-Flow detention time= 243.1 min calculated for 0.085 af (100% of inflow)
 Center-of-Mass det. time= 242.9 min (1,002.9 - 760.0)

Volume	Invert	Avail.Storage	Storage Description
#1	108.80'	0.018 af	29.57"W x 32.00"L x 3.21'H Prismaoid 0.070 af Overall - 0.024 af Embedded = 0.045 af x 40.0% Voids
#2	109.30'	0.024 af	Cultec R-280HD x 24 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 6 rows
		0.042 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	108.80'	2.570 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.06 cfs @ 10.40 hrs HW=108.83' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.06 cfs)