PROJECT NARRATIVE
&
DRAINAGE ANALYSIS

Proposed Site Plan
2104-2110 Acushnet Ave. & 859 Belleville Ave. – New Bedford

Project Summary

The project consists of two properties; 2104-2110 Acushnet Ave. which currently has a vacant Commercial Building and is located in a Mixed Use Business zoning district and 859 Belleville Ave. which is a vacant single family dwelling located in a Residence B zoning district. Total area of the two parcels is 68,505 sf (1.57 acres). The Commercial use has bituminous concrete parking area surrounding the building along with associated underground utilities including water, sewer, drainage, gas and electric. The vacant house site contains a dwelling along with bituminous concrete driveway and two accessory sheds. Topography for the project site slopes from west at elevation 25 to east at elevation 17.

The Applicant operates a private, non-profit corporation that assists with independent living for adults and children with disabilities. They propose to rehabilitate the vacant commercial building for use as their main office which employs approximately 112 people. The existing parking area will be re-paved and new parking space layout provided to improve vehicle circulation throughout the site. Handicap access will also be added to the building. The Belleville site will see the existing structures razed in order to provide additional employee parking for the office use. An infiltration system will be installed in this area to recharge stormwater associated with the new parking lot. Lighting will be provided throughout the site along with new greenspace via landscaped beds containing a variety of trees and shrubs.

Drainage 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.

Soil testing was performed by Chris Gilbert S.E. of Farland Corporation, Inc. under the direction of Christian A. Farland, P.E. on October 22, 2018 to determine the soil suitability for on-site stormwater management purposes.

Stormwater Management Overview

Existing Conditions (Commercial lot):
Currently, the project area consists of mostly all impervious area. Catch basins throughout the parking area and building roof leaders collect stormwater and direct it via a piping network to the City drainage system in Harwich Street.

Existing Conditions (Residential lot):
This project area consists of a combination of pervious grass surface and impervious driveway and rooftop surface. Stormwater for this area is uncontrolled and flows overland to Belleville Ave.

Proposed Conditions:
Under proposed conditions, the entire stormwater management of the site will be improved by adding a water quality unit to the piping network prior to discharge to the City drainage system in Harwich Street. Also, a water quality unit and stormwater infiltration system will be installed for the new parking lot which will treat and control runoff for this area.

Stormwater Management Narrative

The stormwater system was designed for the post-development conditions to handle all storms' peak discharges and runoff volume to include the 2, 10, and 100-year storm events. The site drainage system was designed in consideration of the structural standards and techniques of the Best Management Practices (BMP) and Low Impact Development (LID) outlined in the "Stormwater Management Handbook".

The results of site drainage calculations are presented in the following Tables. The results are based upon evaluation of Pre-development conditions and the design of proposed surface and subsurface drainage systems for the Post-development condition. These results show the Post-Development offsite volume and runoff rates are reduced to less than the Pre-development conditions, thus meeting the BMP guidelines for this site development.

Table 1 - Comparison of Pre- versus Post-Development Offsite Runoff Rate, cfs			
Frequency Storm	2-Year	10-Year	100-Year
Pre-Development	4.70	6.89	10.35
Post-Development	4.42	6.50	9.78

| Table 2 - Comparison of Pre- versus Post-Development Offsite Runoff Volume, af			
Frequency Storm	2-Year	10-Year	100-Year
Pre-Development	0.358	0.535	0.817
Post-Development	0.333	0.500	0.766

Groundwater recharge is a factor in the design of the subsurface drainage system. Table-3 below presents the minimum recharge required and the proposed recharge of stormwater based upon the BMP methods of the "Stormwater Management Handbook". The proposed recharge quantities exceed the required minimum recharges as noted in Table 3 below.

Table 3 - Drainage Recharge Calculation (Required Recharge = 0.1" Total Site Runoff from Impervious Areas for Class-C Soils)	
Required Recharge	Proposed Recharge
3,949 sf x 0.35"/12 =115 CF	1,001 CF

S-1
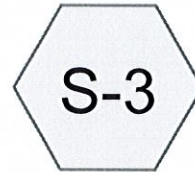
Site Runoff Harwich Street

S-3

Site Runoff Belleville Ave

Subcat Reach Pond Link
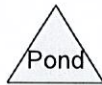
Routing Diagram for 18763PRE
Prepared by Farland Corp.
HydroCAD® 10.00-24 s/n 02085 © 2018 HydroCAD Software Solutions LLC

Summary for Subcatchment S-1: Site Runoff Harwich Street

Runoff   =   4.34 cfs @ 12.08 hrs, Volume=   0.332 af, Depth= 2.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

Area (sf)	CN	Description
42,677	98	Paved parking, HSG B
3,514	61	>75% Grass cover, Good, HSG B
12,770	98	Roofs, HSG B
58,961	96	Weighted Average
3,514		5.96% Pervious Area
55,447		94.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	212	0.0190	2.80		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
0.7	50	0.0190	1.21		**Sheet Flow, First 50'** Smooth surfaces n= 0.011 P2= 3.40"
0.9	152	0.0042	2.92	1.02	**Pipe Channel, CB-SE BLD** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010 PVC, smooth interior
0.8	111	0.0042	2.41	0.47	**Pipe Channel, CB-NE BLD** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.2	167	0.0042	2.41	0.47	**Pipe Channel, CB-N BLD TO STREET** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.1					**Direct Entry, Min**
6.0	692	Total			

Summary for Subcatchment S-3: Site Runoff Belleville Ave

Runoff   =   0.36 cfs @ 12.09 hrs, Volume=   0.026 af, Depth= 1.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

Area (sf)	CN	Description
3,121	98	Paved parking, HSG B
5,168	61	>75% Grass cover, Good, HSG B
1,227	98	Roofs, HSG B
9,516	78	Weighted Average
5,168		54.31% Pervious Area
4,348		45.69% Impervious Area

Summary for Subcatchment S-1: Site Runoff Harwich Street

Runoff = 6.24 cfs @ 12.08 hrs, Volume= 0.489 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

Area (sf)	CN	Description
42,677	98	Paved parking, HSG B
3,514	61	>75% Grass cover, Good, HSG B
12,770	98	Roofs, HSG B
58,961	96	Weighted Average
3,514		5.96% Pervious Area
55,447		94.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	212	0.0190	2.80		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
0.7	50	0.0190	1.21		**Sheet Flow, First 50'** Smooth surfaces n= 0.011 P2= 3.40"
0.9	152	0.0042	2.92	1.02	**Pipe Channel, CB-SE BLD** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010 PVC, smooth interior
0.8	111	0.0042	2.41	0.47	**Pipe Channel, CB-NE BLD** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.2	167	0.0042	2.41	0.47	**Pipe Channel, CB-N BLD TO STREET** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.1					**Direct Entry, Min**
6.0	692	Total			

Summary for Subcatchment S-3: Site Runoff Belleville Ave

Runoff = 0.65 cfs @ 12.09 hrs, Volume= 0.046 af, Depth= 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

Area (sf)	CN	Description
3,121	98	Paved parking, HSG B
5,168	61	>75% Grass cover, Good, HSG B
1,227	98	Roofs, HSG B
9,516	78	Weighted Average
5,168		54.31% Pervious Area
4,348		45.69% Impervious Area

Summary for Subcatchment S-1: Site Runoff Harwich Street

Runoff   =   9.21 cfs @ 12.08 hrs, Volume=   0.736 af, Depth= 6.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

Area (sf)	CN	Description
42,677	98	Paved parking, HSG B
3,514	61	>75% Grass cover, Good, HSG B
12,770	98	Roofs, HSG B
58,961	96	Weighted Average
3,514		5.96% Pervious Area
55,447		94.04% Impervious Area

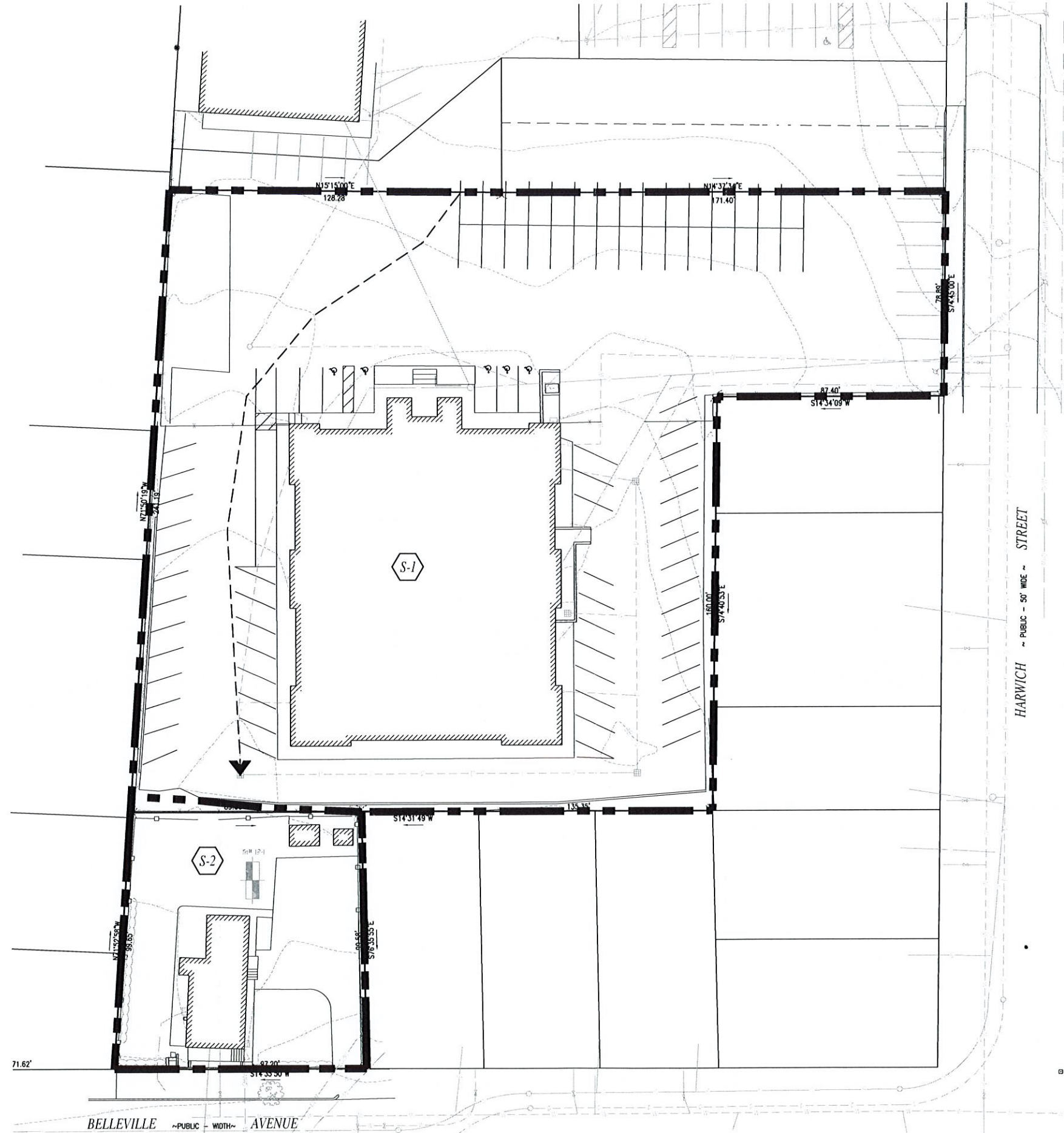| Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	212	0.0190	2.80		**Shallow Concentrated Flow, Pavement**
					Paved Kv= 20.3 fps
0.7	50	0.0190	1.21		**Sheet Flow, First 50'**
					Smooth surfaces n= 0.011 P2= 3.40"
0.9	152	0.0042	2.92	1.02	**Pipe Channel, CB-SE BLD**
					8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17'
					n= 0.010 PVC, smooth interior
0.8	111	0.0042	2.41	0.47	**Pipe Channel, CB-NE BLD**
					6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13'
					n= 0.010 PVC, smooth interior
1.2	167	0.0042	2.41	0.47	**Pipe Channel, CB-N BLD TO STREET**
					6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13'
					n= 0.010 PVC, smooth interior
1.1					**Direct Entry, Min**
6.0	692	Total			

Summary for Subcatchment S-3: Site Runoff Belleville Ave

Runoff   =   1.14 cfs @ 12.09 hrs, Volume=   0.081 af, Depth= 4.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

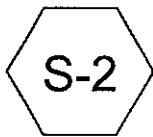| Area (sf)	CN	Description
3,121	98	Paved parking, HSG B
5,168	61	>75% Grass cover, Good, HSG B
1,227	98	Roofs, HSG B
9,516	78	Weighted Average
5,168		54.31% Pervious Area
4,348		45.69% Impervious Area

SITE PLAN
2104-2110 ACUSHNET AVENUE & 859 BELLEVILLE AVENUE
ASSESSORS MAP 119 LOTS 46 & 258
NEW BEDFORD, MASSACHUSETTS

PREPARED FOR: JMBA+ ARCHITECTS
47 N. 2ND STREET, 4TH FLOOR
NEW BEDFORD, MA 02740

N3°15'00"E
128.28

N0°37'34"E
171.40

S14°45'00"E
218.86'

87.40'
S14°34'09"W

S14°40'53"E
160.00'

S14°34'09"W

S14°31'49"W
135.11'

N27°50'19"W

S-1

HARWICH ~ PUBLIC - 50' WIDE ~ STREET

S-2

BLDG 12-1

N71°45'26"W

S76°33'35"E

71.62'

92.20'
S14°33'50"W

BELLEVILLE ~ PUBLIC - WIDTH ~ AVENUE

REVISIONS

DRAWN BY: ND
DESIGNED BY: CAF
CHECKED BY: BJM/CAF

MAY 10, 2019
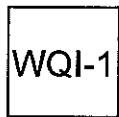SCALE: 1"=20'
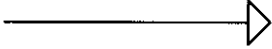JOB NO. 18-763
LATEST REVISION:

PRE-DEVELOPMENT

C4.0A

S-1

Site Runoff Harwich
Street

S-2

Tributary to WQI-1
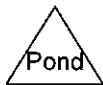
WQI-1

Water Quality Inlet

SRS

Subsurface Recharge
System

S-3

Site Runoff Belleville
Ave

Subcat   Reach   Pond   Link

Summary for Subcatchment S-1: Site Runoff Harwich Street

Runoff   =   4.20 cfs @ 12.08 hrs, Volume=   0.317 af, Depth= 2.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

Area (sf)	CN	Description
41,235	98	Paved parking, HSG B
4,333	61	>75% Grass cover, Good, HSG B
12,770	98	Roofs, HSG B
58,338	95	Weighted Average
4,333		7.43% Pervious Area
54,005		92.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	212	0.0190	2.80		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
0.7	50	0.0190	1.21		**Sheet Flow, First 50'** Smooth surfaces n= 0.011 P2= 3.40"
0.9	152	0.0042	2.92	1.02	**Pipe Channel, CB-SE BLD** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010 PVC, smooth interior
0.8	111	0.0042	2.41	0.47	**Pipe Channel, CB-NE BLD** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.2	167	0.0042	2.41	0.47	**Pipe Channel, CB-N BLD TO STREET** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.1					**Direct Entry, Min**
6.0	692	Total			

Summary for Subcatchment S-2: Tributary to WQI-1

Runoff   =   0.30 cfs @ 12.08 hrs, Volume=   0.023 af, Depth= 3.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

Area (sf)	CN	Description
3,949	98	Paved parking, HSG B
62	61	>75% Grass cover, Good, HSG B
4,011	97	Weighted Average
62		1.55% Pervious Area
3,949		98.45% Impervious Area

Summary for Pond SRS: Subsurface Recharge System

Inflow Area =   0.092 ac, 98.45% Impervious, Inflow Depth =   3.06"   for 2-yr event
Inflow   =   0.30 cfs @   12.09 hrs, Volume=   0.023 af
Outflow   =   0.01 cfs @   11.02 hrs, Volume=   0.023 af, Atten= 95%, Lag= 0.0 min
Discarded =   0.01 cfs @   11.02 hrs, Volume=   0.023 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 13.77' @ 14.58 hrs   Surf.Area= 575 sf   Storage= 487 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 305.4 min (1,070.2 - 764.9)

Volume	Invert	Avail.Storage	Storage Description
#1	12.50'	633 cf	**16.68'W x 34.50'L x 5.00'H Prismatoid** 2,877 cf Overall - 1,295 cf Embedded = 1,583 cf x 40.0% Voids
#2	13.00'	1,295 cf	**Cultec R-902HD** x 20 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap
		1,928 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	12.50'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 11.02 hrs HW=12.55'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment S-3: Site Runoff Belleville Ave

Runoff   =   0.40 cfs @ 12.09 hrs, Volume=   0.029 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

Area (sf)	CN	Description
2,598	98	Paved parking, HSG B
3,529	61	>75% Grass cover, Good, HSG B
6,127	77	Weighted Average
3,529		57.60% Pervious Area
2,598		42.40% Impervious Area

| Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Reach WQI-1: Water Quality Inlet

Inflow Area =   0.092 ac, 98.45% Impervious, Inflow Depth = 4.45"   for 10-yr event
Inflow   =   0.43 cfs @ 12.08 hrs, Volume=   0.034 af
Outflow   =   0.43 cfs @ 12.09 hrs, Volume=   0.034 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 3.55 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 0.5 min

Peak Storage= 4 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.39 cfs

12.0" Round Pipe
n= 0.013
Length= 33.0' Slope= 0.0152 '/'
Inlet Invert= 13.50', Outlet Invert= 13.00'
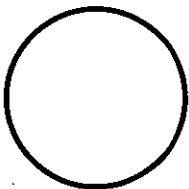
Summary for Subcatchment S-1: Site Runoff Harwich Street

Runoff   =   9.06 cfs @ 12.08 hrs, Volume=   0.715 af, Depth= 6.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

Area (sf)	CN	Description
41,235	98	Paved parking, HSG B
4,333	61	>75% Grass cover, Good, HSG B
12,770	98	Roofs, HSG B
58,338	95	Weighted Average
4,333		7.43% Pervious Area
54,005		92.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	212	0.0190	2.80		**Shallow Concentrated Flow, Pavement**
					Paved Kv= 20.3 fps
0.7	50	0.0190	1.21		**Sheet Flow, First 50'**
					Smooth surfaces n= 0.011 P2= 3.40"
0.9	152	0.0042	2.92	1.02	**Pipe Channel, CB-SE BLD**
					8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17'
					n= 0.010 PVC, smooth interior
0.8	111	0.0042	2.41	0.47	**Pipe Channel, CB-NE BLD**
					6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13'
					n= 0.010 PVC, smooth interior
1.2	167	0.0042	2.41	0.47	**Pipe Channel, CB-N BLD TO STREET**
					6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13'
					n= 0.010 PVC, smooth interior
1.1					**Direct Entry, Min**
6.0	692	Total			

Summary for Subcatchment S-2: Tributary to WQI-1

Runoff   =   0.63 cfs @ 12.08 hrs, Volume=   0.051 af, Depth= 6.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

Area (sf)	CN	Description
3,949	98	Paved parking, HSG B
62	61	>75% Grass cover, Good, HSG B
4,011	97	Weighted Average
62		1.55% Pervious Area
3,949		98.45% Impervious Area

Summary for Pond SRS: Subsurface Recharge System

Inflow Area =	0.092 ac, 98.45% Impervious, Inflow Depth = 6.64" for 100-yr event			
Inflow =	0.63 cfs @ 12.08 hrs, Volume=	0.051 af		
Outflow =	0.01 cfs @ 8.74 hrs, Volume=	0.029 af, Atten= 98%, Lag= 0.0 min		
Discarded =	0.01 cfs @ 8.74 hrs, Volume=	0.029 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3
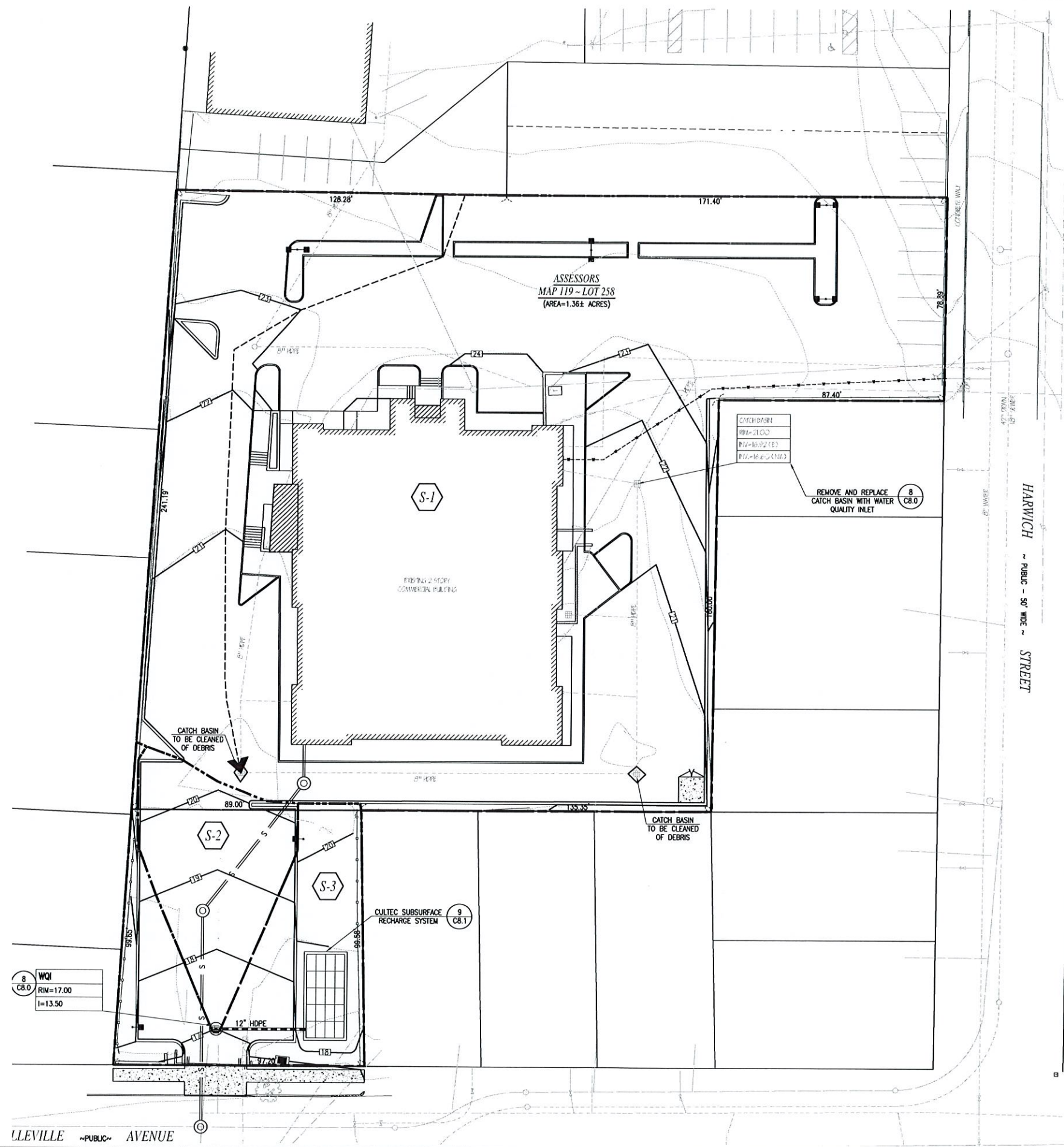Peak Elev= 15.79' @ 17.11 hrs   Surf.Area= 575 sf   Storage= 1,397 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 283.1 min (1,032.8 - 749.7)

Volume	Invert	Avail.Storage	Storage Description
#1	12.50'	633 cf	**16.68'W x 34.50'L x 5.00'H Prismatoid** 2,877 cf Overall - 1,295 cf Embedded = 1,583 cf x 40.0% Voids
#2	13.00'	1,295 cf	**Cultec R-902HD x 20 Inside #1** Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap
		1,928 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	12.50'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 8.74 hrs HW=12.55' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

SITE PLAN
2104-2110 ACUSHNET AVENUE & 859 BELLEVILLE AVENUE
ASSESSORS MAP 119 LOTS 46 & 258
NEW BEDFORD, MASSACHUSETTS

REVISIONS

FARLAND CORP.
www.FarlandCorp.com
401 COUNTY STREET
NEW BEDFORD, MA 02740
P.508.717.3479
OFFICES IN:
● TAUNTON
● MARLBOROUGH
● WARWICK, RI

DRAWN BY: ND
DESIGNED BY: CAF
CHECKED BY: BJM/CAF

PREPARED FOR:
JMBA+ ARCHITECTS
47 N. 2ND STREET, 4TH FLOOR
NEW BEDFORD, MA 02740

MAY 10, 2019
SCALE: 1"=20'
JOB NO. 18-763
LATEST REVISION:

POST-DEVELOPMENT

C4.0A

ASSESSORS
MAP 119 ~ LOT 258
(AREA=1.36± ACRES)

S-1

EXISTING 2 STORY
COMMERCIAL BUILDING

HARWICH ~ PUBLIC ~ 50' WIDE ~ STREET

REMOVE AND REPLACE
CATCH BASIN WITH WATER
QUALITY INLET
8 / C8.0

CATCH BASIN
TO BE CLEANED
OF DEBRIS

CATCH BASIN
TO BE CLEANED
OF DEBRIS

S-2

S-3

CULTEC SUBSURFACE
RECHARGE SYSTEM
9 / C8.1

8 / C8.0
WQI
RIM=17.00
I=13.50

12" HDPE

BELLEVILLE ~PUBLIC~ AVENUE

128.28'   171.40'

87.40'

89.00'

135.35'

241.19'

99.35'

99.56'

0' 20' 40' 60'
1" = 20'

RECHARGE CALCULATIONS

REQUIRED:

Recharge Volume Required ("B" Soils) inches/12)]

= [Impervious Area x (Recharge Depth

= [3,949 sf x (0.35"/12)]

= 115 cf (Required Volume)

PROVIDED:

Subsurface Recharge System Infiltration Volume for Bi-Annual Storm:
As depicted on the Hydrocad simulation for the Bi-Annual Storm (3.4" of rainfall/ 24-hour storm event), the discarded (infiltrated) rate is 0.01 cfs @11.02 hrs,
Volume = 0.023 Acre-feet.

Converting the volume from acre-feet to cubic feet:

$$(0.023 acre \bullet feet) \times \left(\frac{43560 feet^2}{acre} \right) \longrightarrow 1,001 feet^3$$

The recharged volume provided for the Bi-Annual Storm Event (3.40" of rainfall/ 24 hour storm)=1,001 cf

1,001 cf (Provided) >>> 115 cf (Required)

WATER QUALITY VOLUME CALCULATIONS

REQUIRED VOLUME (V_{req}):

$$V_{req} = 0.5 \; inches \times \frac{1 \; foot}{12 \; inches} \times Total \; Impervious \; Area \; (A_{imp})$$

$$V_{req} = 0.5 \; inches \times \frac{1 \; foot}{12 \; inches} \times 3{,}949 ft^2 = 165 ft^3$$

PROVIDED VOLUME (V_{pro}):

Water Quality Volume Provided = Subsurface Recharge System Infiltration for Bi-Annual Storm + Dead Storage Volume in Subsurface Recharge System

Subsurface Recharge System Infiltration Volume for Bi-Annual Storm:
As depicted on the Hydrocad simulation for the Bi-Annual Storm (3.4" of rainfall/ 24-hour storm event), the discarded (infiltrated) rate is 0.01 cfs @11.02 hrs,
Volume = 0.023 Acre-feet.

Converting the volume from acre-feet to cubic feet:

$$(0.023 acre \bullet feet) \times \left(\frac{43560 feet^2}{acre} \right) \longrightarrow 1{,}001 feet^3$$

The recharged volume provided for the Bi-Annual Storm Event (3.40" of rainfall/ 24 hour storm)=1,001 cf

Dead Storage Volume Subsurface Recharge System

Storage Volume from elevation 13.00 (System Bottom) to
17.00 (Top of Chambers) = 1,295 cf

Total Water Quality Volume Provided = 1,001 cf + 1,295 cf = 2,296 cf

2,296 cf (Provided) >>> 165 cf (Required)