



ENGINEERING A BETTER TOMORROW

ENGINEERING | SITE WORK | LAND SURVEYING

October 3, 2017

Mr. Craig Dixon
Chairman
New Bedford Conservation Commission
New Bedford City Hall
133 Williams Street
New Bedford, MA 02740

**RE: Response Letter
Notice of Intent – Parallel Products (SE49-0771)
100 Duchaine Blvd. – New Bedford, Massachusetts**

Dear Mr. Nixon,

We have enclosed a response letter, revised HydroCAD calculations, revised Site Plan sheets and accompanying documentation in response to the comment letter prepared by Nitsch Engineering dated September 1, 2017 in regards to their review of the Site Plans and attached documents.

We trust the attachments noted above and included herewith will provide the necessary documentation to address their comments. If you should have any questions, please feel free to contact us.

Very Truly Yours,

FARLAND CORPORATION, INC.

Christian A. Farland

Christian A. Farland, P.E., LEED AP
Principal Engineer and President

Nitsch Engineering Comments

Comment #1:

The improvements on the parking lot to the east of the existing building include a new 100-foot-long access driveway. The plans do not show any proposed grades on this driveway, implying that the driveway is flat. The plans should show proposed grades and indicate how stormwater generated by the driveway will be handled.

Proposed grades have been added to this access drive, and the stormwater will be directed back into the existing parking lot.

Comment #2:

The proposed discharge to the existing detention basin should include a flared end and rip-rap pad.

A flared end section and rip-rap pad have been added to the proposed discharge areas into the existing detention pond.

Comment #3:

The applicant should perform a test hole in the vicinity of the proposed underground infiltration facility to determine seasonal high groundwater elevation and insure that there is two feet of separation between the bottom of the system and seasonal high groundwater. The detail shows seasonal high groundwater elevation as 96.7, which is incorrect.

Test hole #2 is located in the close vicinity of the proposed infiltration system, and the soil logs have been added to the detail sheet highlighting encountered soil conditions.

Comment #4:

The infiltration basin shows the 100-year storm elevation above the elevation of the berm for this facility. The Stormwater Management Guidelines require one foot of freeboard between the 100year storm elevation and the top of the basin's berm.

The elevation for the 100-year storm in the detention basin is 79' which provides one foot of freeboard from the top of berm which is proposed at 80'.

Comment #5:

The hydrologic calculations provided include only flows from the subcatchments and do not include flows for the existing and proposed stormwater basin or the underground infiltration facility. The complete calculations for all storms need to be provided. It

appears that the flows shown in the summary table are inconsistent with the flows shown for the subcatchments.

The discharge flows for all features have been corrected in the hydrologic calculations, and all storms are included in the response.

Comment #6:

The routing diagram for the hydrologic calculations show the underground infiltration system discharging to the stormwater basin. It is unclear how this connection occurs. The plans – and perhaps the existing conditions plans – should show this connection.

The plans and routing diagram have been revised to accurately depict the connections and discharge design.

Comment #7:

Pipe sizing calculations should be provided.

Pipe sizing calculations have been completed and are attached.

Comment #8:

We recommend that additional information be provided describing the outlet control structure from the underground infiltration system.

The outlet control structure has been replaced with a drain pipe manifold, and a detail of such connection has been added.

Comment #9:

The plans seem to imply that there is a stone diaphragm proposed along the paved pad. The pad also contains a water quality treatment device. It is unclear whether all the stormwater runoff over the pad is intended to flow towards the water quality structure. If so, there should be curb shown on the plans that directs water to the structure.

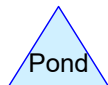
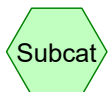
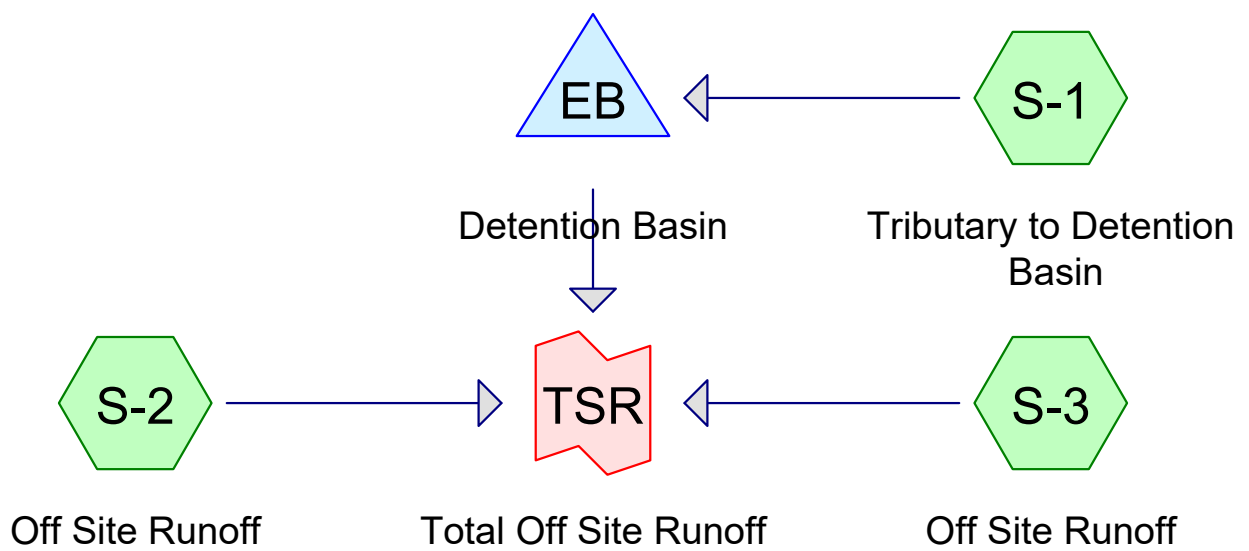
There is a proposed Cape Cod Berm at the edge of the pad to direct stormwater runoff back towards the structure, and it has been shown on the Grading & Utilities plan.

Comment #10:

A water quality treatment device detail should be added to the plans.

This has been added to the detail sheet.

If you have any questions or require any further information please contact this office at (508) 717-3479.



Drainage Diagram for 15500.2PRE

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Summary for Subcatchment S-1: Tributary to Detention Basin

Runoff = 2.31 cfs @ 12.09 hrs, Volume= 0.169 af, Depth= 1.29"

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

Area (sf)	CN	Description
7,700	39	>75% Grass cover, Good, HSG A
* 5,800	98	Roadway
6,700	98	Water Surface
47,950	76	Gravel roads, HSG A
68,150	76	Weighted Average
55,650		Pervious Area
12,500		Impervious Area

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

Summary for Subcatchment S-2: Off Site Runoff

Runoff = 0.00 cfs @ 21.02 hrs, Volume= 0.002 af, Depth= 0.02"

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

Area (sf)	CN	Description
42,500	30	Woods, Good, HSG A
6,100	39	>75% Grass cover, Good, HSG A
* 3,800	98	Roadway/Concrete
6,850	76	Gravel roads, HSG A
59,250	41	Weighted Average
55,450		Pervious Area
3,800		Impervious Area

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

Summary for Subcatchment S-3: Off Site Runoff

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

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

15500.2PRE

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

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Area (sf)	CN	Description
3,008	32	Woods/grass comb., Good, HSG A
3,008		Pervious Area

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

Summary for Pond EB: Detention Basin

Inflow Area = 1.565 ac, 18.34% Impervious, Inflow Depth = 1.29" for 2-yr event
 Inflow = 2.31 cfs @ 12.09 hrs, Volume= 0.169 af
 Outflow = 0.25 cfs @ 13.05 hrs, Volume= 0.169 af, Atten= 89%, Lag= 57.4 min
 Discarded = 0.03 cfs @ 13.05 hrs, Volume= 0.044 af
 Primary = 0.22 cfs @ 13.05 hrs, Volume= 0.125 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 77.66' @ 13.05 hrs Surf.Area= 4,882 sf Storage= 3,072 cf

Plug-Flow detention time= 177.0 min calculated for 0.169 af (100% of inflow)
 Center-of-Mass det. time= 177.0 min (1,029.1 - 852.1)

Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	10,186 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.00	4,465	0	0
78.00	5,100	4,783	4,783
79.00	5,706	5,403	10,186

Device	Routing	Invert	Outlet Devices
#1	Discarded	77.00'	0.270 in/hr Exfiltration over Surface area
#2	Primary	77.00'	4.0" x 20.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 76.90' S= 0.0050 '/' Cc= 0.900 n= 0.013
#3	Primary	78.20'	16.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Discarded OutFlow Max=0.03 cfs @ 13.05 hrs HW=77.66' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.22 cfs @ 13.05 hrs HW=77.66' TW=0.00' (Dynamic Tailwater)

↑ **2=Culvert** (Barrel Controls 0.22 cfs @ 2.54 fps)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link TSR: Total Off Site Runoff

Inflow Area = 2.994 ac, 12.50% Impervious, Inflow Depth = 0.51" for 2-yr event
Inflow = 0.22 cfs @ 13.05 hrs, Volume= 0.127 af
Primary = 0.22 cfs @ 13.05 hrs, Volume= 0.127 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Subcatchment S-1: Tributary to Detention Basin

Runoff = 4.34 cfs @ 12.09 hrs, Volume= 0.309 af, Depth= 2.37"

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

Area (sf)	CN	Description
7,700	39	>75% Grass cover, Good, HSG A
* 5,800	98	Roadway
6,700	98	Water Surface
47,950	76	Gravel roads, HSG A
68,150	76	Weighted Average
55,650		Pervious Area
12,500		Impervious Area

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

Summary for Subcatchment S-2: Off Site Runoff

Runoff = 0.08 cfs @ 12.44 hrs, Volume= 0.026 af, Depth= 0.23"

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

Area (sf)	CN	Description
42,500	30	Woods, Good, HSG A
6,100	39	>75% Grass cover, Good, HSG A
* 3,800	98	Roadway/Concrete
6,850	76	Gravel roads, HSG A
59,250	41	Weighted Average
55,450		Pervious Area
3,800		Impervious Area

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

Summary for Subcatchment S-3: Off Site Runoff

Runoff = 0.00 cfs @ 22.22 hrs, Volume= 0.000 af, Depth= 0.01"

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

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

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Area (sf)	CN	Description
3,008	32	Woods/grass comb., Good, HSG A
3,008		Pervious Area

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

Summary for Pond EB: Detention Basin

Inflow Area = 1.565 ac, 18.34% Impervious, Inflow Depth = 2.37" for 10-yr event
 Inflow = 4.34 cfs @ 12.09 hrs, Volume= 0.309 af
 Outflow = 0.65 cfs @ 12.63 hrs, Volume= 0.308 af, Atten= 85%, Lag= 32.5 min
 Discarded = 0.03 cfs @ 12.63 hrs, Volume= 0.051 af
 Primary = 0.62 cfs @ 12.63 hrs, Volume= 0.257 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 78.24' @ 12.63 hrs Surf.Area= 5,244 sf Storage= 6,012 cf

Plug-Flow detention time= 205.8 min calculated for 0.308 af (100% of inflow)
 Center-of-Mass det. time= 203.4 min (1,037.7 - 834.2)

Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	10,186 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.00	4,465	0	0
78.00	5,100	4,783	4,783
79.00	5,706	5,403	10,186

Device	Routing	Invert	Outlet Devices
#1	Discarded	77.00'	0.270 in/hr Exfiltration over Surface area
#2	Primary	77.00'	4.0" x 20.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 76.90' S= 0.0050 '/' Cc= 0.900 n= 0.013
#3	Primary	78.20'	16.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Discarded OutFlow Max=0.03 cfs @ 12.63 hrs HW=78.24' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.62 cfs @ 12.63 hrs HW=78.24' TW=0.00' (Dynamic Tailwater)

↑ **2=Culvert** (Barrel Controls 0.34 cfs @ 3.92 fps)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 0.28 cfs @ 0.46 fps)

Summary for Link TSR: Total Off Site Runoff

Inflow Area = 2.994 ac, 12.50% Impervious, Inflow Depth > 1.13" for 10-yr event
Inflow = 0.67 cfs @ 12.63 hrs, Volume= 0.282 af
Primary = 0.67 cfs @ 12.63 hrs, Volume= 0.282 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Subcatchment S-1: Tributary to Detention Basin

Runoff = 7.80 cfs @ 12.09 hrs, Volume= 0.555 af, Depth= 4.26"

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

Area (sf)	CN	Description
7,700	39	>75% Grass cover, Good, HSG A
* 5,800	98	Roadway
6,700	98	Water Surface
47,950	76	Gravel roads, HSG A
68,150	76	Weighted Average
55,650		Pervious Area
12,500		Impervious Area

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

Summary for Subcatchment S-2: Off Site Runoff

Runoff = 0.86 cfs @ 12.13 hrs, Volume= 0.104 af, Depth= 0.92"

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

Area (sf)	CN	Description
42,500	30	Woods, Good, HSG A
6,100	39	>75% Grass cover, Good, HSG A
* 3,800	98	Roadway/Concrete
6,850	76	Gravel roads, HSG A
59,250	41	Weighted Average
55,450		Pervious Area
3,800		Impervious Area

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

Summary for Subcatchment S-3: Off Site Runoff

Runoff = 0.01 cfs @ 12.45 hrs, Volume= 0.002 af, Depth= 0.32"

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

15500.2PRE

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

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Area (sf)	CN	Description
3,008	32	Woods/grass comb., Good, HSG A
3,008		Pervious Area

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

Summary for Pond EB: Detention Basin

Inflow Area = 1.565 ac, 18.34% Impervious, Inflow Depth = 4.26" for 100-yr event
 Inflow = 7.80 cfs @ 12.09 hrs, Volume= 0.555 af
 Outflow = 5.41 cfs @ 12.17 hrs, Volume= 0.550 af, Atten= 31%, Lag= 5.0 min
 Discarded = 0.03 cfs @ 12.17 hrs, Volume= 0.056 af
 Primary = 5.38 cfs @ 12.17 hrs, Volume= 0.495 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 78.46' @ 12.17 hrs Surf.Area= 5,376 sf Storage= 7,172 cf

Plug-Flow detention time= 148.1 min calculated for 0.550 af (99% of inflow)
 Center-of-Mass det. time= 143.0 min (960.5 - 817.4)

Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	10,186 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.00	4,465	0	0
78.00	5,100	4,783	4,783
79.00	5,706	5,403	10,186

Device	Routing	Invert	Outlet Devices
#1	Discarded	77.00'	0.270 in/hr Exfiltration over Surface area
#2	Primary	77.00'	4.0" x 20.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 76.90' S= 0.0050 '/' Cc= 0.900 n= 0.013
#3	Primary	78.20'	16.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Discarded OutFlow Max=0.03 cfs @ 12.17 hrs HW=78.46' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=5.37 cfs @ 12.17 hrs HW=78.46' TW=0.00' (Dynamic Tailwater)

↑ **2=Culvert** (Barrel Controls 0.38 cfs @ 4.32 fps)

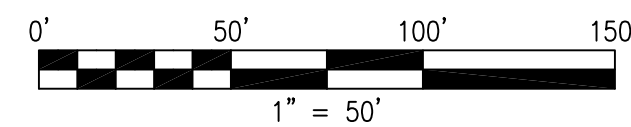
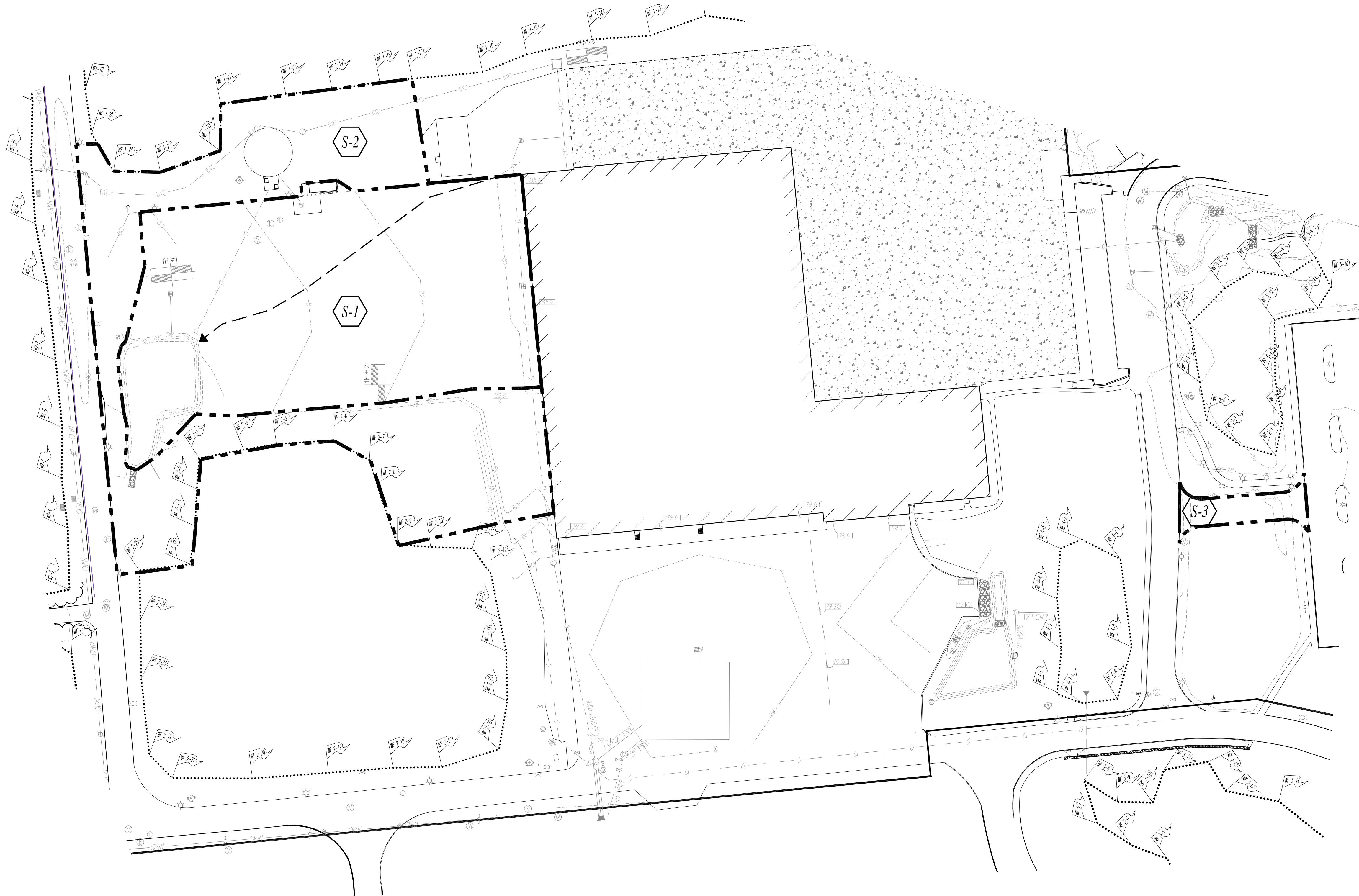
↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 5.00 cfs @ 1.22 fps)

Summary for Link TSR: Total Off Site Runoff

Inflow Area = 2.994 ac, 12.50% Impervious, Inflow Depth > 2.41" for 100-yr event
Inflow = 6.17 cfs @ 12.17 hrs, Volume= 0.600 af
Primary = 6.17 cfs @ 12.17 hrs, Volume= 0.600 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

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SITE PLAN

— 100 DUCHAINE BOULEVARD —
ASSESSORS MAP 134 LOT 5
NEW BEDFORD, MASSACHUSETTS

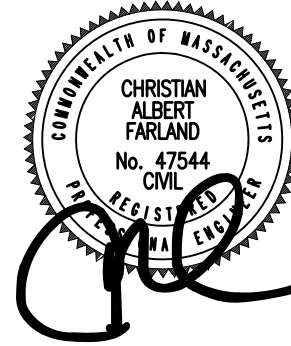
PREPARED
FOR:
PARALLEL PRODUCTS OF NEW ENGLAND
401 INDUSTRY ROAD
LOUISVILLE, KY 40208

AUGUST 10, 2017
SCALE: 1"=50'
JOB NO. 15-500.2
LATEST REVISION:
SEPTEMBER 29, 2017

PRE-SUBCATCHMENT
SHEET 5a OF 10

REVISIONS

1	9/29/17	CONSERVATION COMMENTS



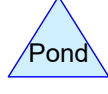
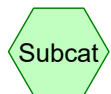
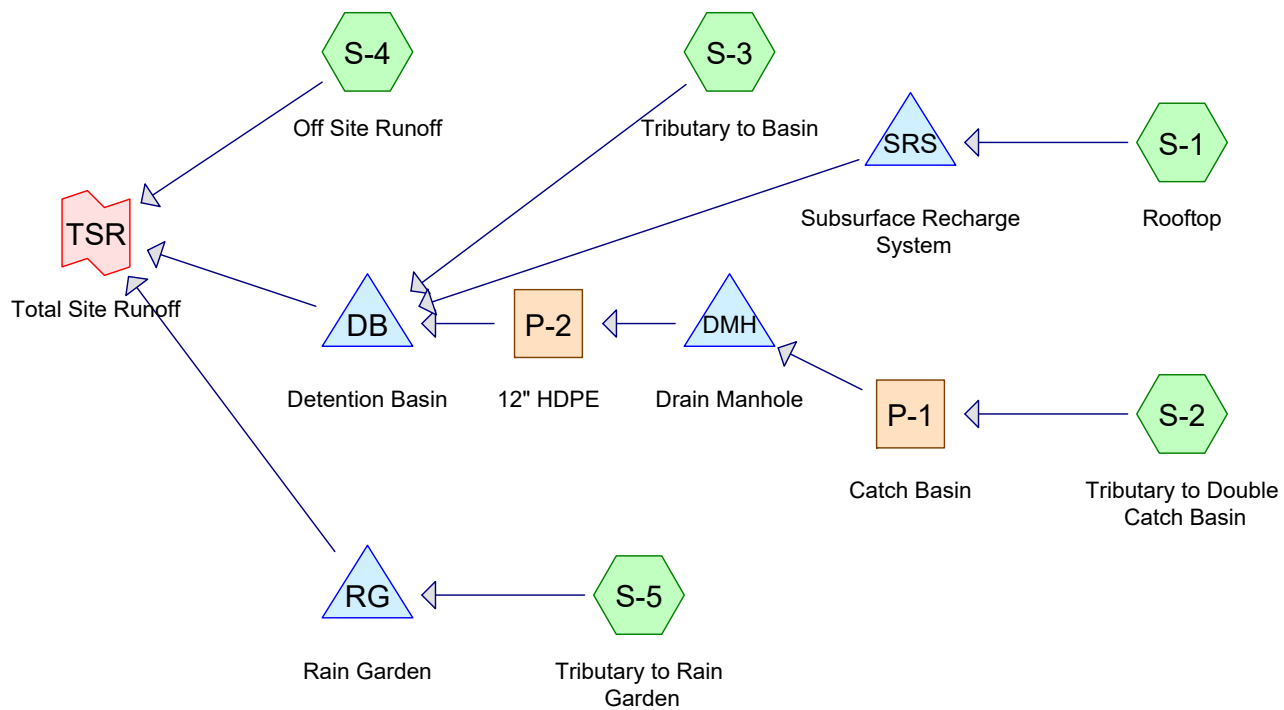
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• MARLBOROUGH
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DRAWN BY: MJW

DESIGNED BY: JKM

CHECKED BY: CAF



Drainage Diagram for 15500.2POST

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15500.2POST

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

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Summary for Subcatchment S-1: Rooftop

Runoff = 1.14 cfs @ 12.08 hrs, Volume= 0.091 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

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

	Area (sf)	CN	Description
*	15,000	98	Roof
	15,000		Impervious Area

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

Summary for Subcatchment S-2: Tributary to Double Catch Basin

Runoff = 1.80 cfs @ 12.08 hrs, Volume= 0.143 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

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

	Area (sf)	CN	Description
*	23,660	98	Roadway
	23,660		Impervious Area

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

Summary for Subcatchment S-3: Tributary to Basin

Runoff = 2.06 cfs @ 12.09 hrs, Volume= 0.147 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

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

	Area (sf)	CN	Description
*	16,450	98	Basin
*	26,600	76	Gravel roads, HSG A
	2,050	39	>75% Grass cover, Good, HSG A
	45,100	82	Weighted Average
	28,650		Pervious Area
	16,450		Impervious Area

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

15500.2POST

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

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Summary for Subcatchment S-4: Off Site Runoff

Runoff = 0.03 cfs @ 12.46 hrs, Volume= 0.012 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

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

	Area (sf)	CN	Description
*	3,500	98	Pavement
	10,900	76	Gravel roads, HSG A
	8,800	39	>75% Grass cover, Good, HSG A
	20,440	30	Woods, Good, HSG A
	43,640	49	Weighted Average
	40,140		Pervious Area
	3,500		Impervious Area

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

Summary for Subcatchment S-5: Tributary to Rain Garden

Runoff = 0.23 cfs @ 12.08 hrs, Volume= 0.018 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

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

	Area (sf)	CN	Description
	3,008	98	Paved parking & roofs
	3,008		Impervious Area

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

Summary for Reach P-1: Catch Basin

Inflow Area = 0.543 ac, 100.00% Impervious, Inflow Depth = 3.17" for 2-yr event

Inflow = 1.80 cfs @ 12.08 hrs, Volume= 0.143 af

Outflow = 1.79 cfs @ 12.09 hrs, Volume= 0.143 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3

Max. Velocity= 3.48 fps, Min. Travel Time= 0.4 min

Avg. Velocity= 1.19 fps, Avg. Travel Time= 1.1 min

Peak Storage= 41 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.62'

Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.52 cfs

15500.2POST

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

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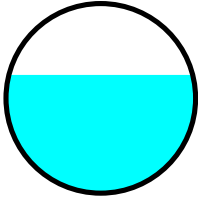
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12.0" Diameter Pipe, n= 0.013

Length= 80.0' Slope= 0.0050 '/'

Inlet Invert= 79.00', Outlet Invert= 78.60'



Summary for Reach P-2: 12" HDPE

Inflow Area = 0.543 ac, 100.00% Impervious, Inflow Depth = 3.17" for 2-yr event
Inflow = 1.79 cfs @ 12.09 hrs, Volume= 0.143 af
Outflow = 1.78 cfs @ 12.10 hrs, Volume= 0.143 af, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3

Max. Velocity= 3.48 fps, Min. Travel Time= 0.7 min

Avg. Velocity= 1.18 fps, Avg. Travel Time= 2.0 min

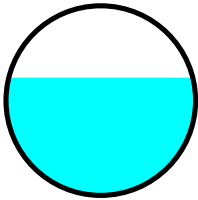
Peak Storage= 72 cf @ 12.10 hrs, Average Depth at Peak Storage= 0.62'

Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.52 cfs

12.0" Diameter Pipe, n= 0.013

Length= 140.0' Slope= 0.0050 '/'

Inlet Invert= 78.50', Outlet Invert= 77.80'



Summary for Pond DB: Detention Basin

Inflow Area = 1.923 ac, 65.80% Impervious, Inflow Depth = 1.81" for 2-yr event
Inflow = 3.84 cfs @ 12.09 hrs, Volume= 0.290 af
Outflow = 0.07 cfs @ 18.17 hrs, Volume= 0.141 af, Atten= 98%, Lag= 364.7 min
Discarded = 0.07 cfs @ 18.17 hrs, Volume= 0.141 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3

Peak Elev= 77.74' @ 18.17 hrs Surf.Area= 11,966 sf Storage= 8,458 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 306.4 min (1,102.1 - 795.8)

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

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Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	39,678 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.00	10,760	0	0
78.00	12,380	11,570	11,570
79.00	14,040	13,210	24,780
80.00	15,756	14,898	39,678

Device	Routing	Invert	Outlet Devices
#1	Discarded	77.00'	0.270 in/hr Exfiltration over Surface area
#2	Primary	79.00'	15.0' long x 5.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00			
2.50 3.00 3.50 4.00 4.50 5.00 5.50			
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65			
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88			

Discarded OutFlow Max=0.07 cfs @ 18.17 hrs HW=77.74' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.07 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=77.00' TW=0.00' (Dynamic Tailwater)↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond DMH: Drain Manhole**

Inflow Area = 0.543 ac, 100.00% Impervious, Inflow Depth = 3.17" for 2-yr event
 Inflow = 1.79 cfs @ 12.09 hrs, Volume= 0.143 af
 Primary = 1.79 cfs @ 12.09 hrs, Volume= 0.143 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3

Summary for Pond RG: Rain Garden

Inflow Area = 0.069 ac, 100.00% Impervious, Inflow Depth = 3.17" for 2-yr event
 Inflow = 0.23 cfs @ 12.08 hrs, Volume= 0.018 af
 Outflow = 0.01 cfs @ 14.74 hrs, Volume= 0.018 af, Atten= 96%, Lag= 159.5 min
 Discarded = 0.01 cfs @ 14.74 hrs, Volume= 0.018 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3

Peak Elev= 77.78' @ 14.74 hrs Surf.Area= 1,566 sf Storage= 398 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 334.7 min (1,089.9 - 755.1)

Volume	Invert	Avail.Storage	Storage Description
#1	77.50'	770 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.50	1,301	0	0
78.00	1,779	770	770

Device	Routing	Invert	Outlet Devices
#1	Discarded	77.50'	0.270 in/hr Exfiltration over Surface area
#2	Primary	78.00'	7.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.01 cfs @ 14.74 hrs HW=77.78' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.01 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=77.50' TW=0.00' (Dynamic Tailwater)↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond SRS: Subsurface Recharge System**

Inflow Area = 0.344 ac, 100.00% Impervious, Inflow Depth = 3.17" for 2-yr event
 Inflow = 1.14 cfs @ 12.08 hrs, Volume= 0.091 af
 Outflow = 0.02 cfs @ 8.27 hrs, Volume= 0.034 af, Atten= 99%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 8.27 hrs, Volume= 0.034 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3

Peak Elev= 79.62' @ 19.84 hrs Surf.Area= 2,519 sf Storage= 2,856 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 258.0 min (1,013.2 - 755.1)

Volume	Invert	Avail.Storage	Storage Description
#1	78.00'	2,423 cf	22.00'W x 114.50'L x 4.00'H Prismatic 10,076 cf Overall - 4,019 cf Embedded = 6,057 cf x 40.0% Voids
#2	78.50'	4,019 cf	52.6"W x 34.0"H x 7.50'L Cultec R-V8 x 60 Inside #1
		6,442 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	78.00'	0.270 in/hr Exfiltration over Surface area
#2	Primary	80.50'	6.0" x 22.0' long Culvert RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 80.50' S= -0.1136 '/' Cc= 0.900 n= 0.013

Discarded OutFlow Max=0.02 cfs @ 8.27 hrs HW=78.04' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=78.00' TW=77.00' (Dynamic Tailwater)↑**2=Culvert** (Controls 0.00 cfs)

Summary for Link TSR: Total Site Runoff

Inflow Area = 2.994 ac, 47.25% Impervious, Inflow Depth = 0.05" for 2-yr event
Inflow = 0.03 cfs @ 12.46 hrs, Volume= 0.012 af
Primary = 0.03 cfs @ 12.46 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

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

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Summary for Subcatchment S-1: Rooftop

Runoff = 1.62 cfs @ 12.08 hrs, Volume= 0.131 af, Depth= 4.56"

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

	Area (sf)	CN	Description
*	15,000	98	Roof
	15,000		Impervious Area

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

Summary for Subcatchment S-2: Tributary to Double Catch Basin

Runoff = 2.55 cfs @ 12.08 hrs, Volume= 0.207 af, Depth= 4.56"

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

	Area (sf)	CN	Description
*	23,660	98	Roadway
	23,660		Impervious Area

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

Summary for Subcatchment S-3: Tributary to Basin

Runoff = 3.52 cfs @ 12.09 hrs, Volume= 0.250 af, Depth= 2.90"

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

	Area (sf)	CN	Description
*	16,450	98	Basin
*	26,600	76	Gravel roads, HSG A
	2,050	39	>75% Grass cover, Good, HSG A
	45,100	82	Weighted Average
	28,650		Pervious Area
	16,450		Impervious Area

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

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

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Summary for Subcatchment S-4: Off Site Runoff

Runoff = 0.34 cfs @ 12.13 hrs, Volume= 0.047 af, Depth= 0.56"

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

	Area (sf)	CN	Description
*	3,500	98	Pavement
	10,900	76	Gravel roads, HSG A
	8,800	39	>75% Grass cover, Good, HSG A
	20,440	30	Woods, Good, HSG A
	43,640	49	Weighted Average
	40,140		Pervious Area
	3,500		Impervious Area

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

Summary for Subcatchment S-5: Tributary to Rain Garden

Runoff = 0.32 cfs @ 12.08 hrs, Volume= 0.026 af, Depth= 4.56"

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

	Area (sf)	CN	Description
	3,008	98	Paved parking & roofs
	3,008		Impervious Area

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

Summary for Reach P-1: Catch Basin

Inflow Area = 0.543 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-yr event
 Inflow = 2.55 cfs @ 12.08 hrs, Volume= 0.207 af
 Outflow = 2.54 cfs @ 12.09 hrs, Volume= 0.207 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3
 Max. Velocity= 3.66 fps, Min. Travel Time= 0.4 min
 Avg. Velocity= 1.33 fps, Avg. Travel Time= 1.0 min

Peak Storage= 56 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.83'
 Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.52 cfs

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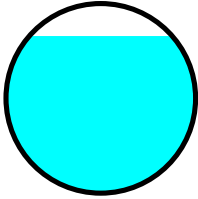
Type III 24-hr 10-yr Rainfall=4.80"

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12.0" Diameter Pipe, $n = 0.013$
Length= 80.0' Slope= 0.0050 '/
Inlet Invert= 79.00', Outlet Invert= 78.60'

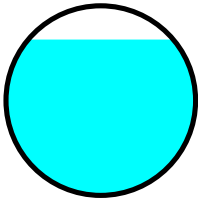
**Summary for Reach P-2: 12" HDPE**

Inflow Area = 0.543 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-yr event
Inflow = 2.54 cfs @ 12.09 hrs, Volume= 0.207 af
Outflow = 2.52 cfs @ 12.10 hrs, Volume= 0.207 af, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, $dt = 0.01$ hrs / 3
Max. Velocity= 3.66 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 1.8 min

Peak Storage= 97 cf @ 12.10 hrs, Average Depth at Peak Storage= 0.82'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.52 cfs

12.0" Diameter Pipe, $n = 0.013$
Length= 140.0' Slope= 0.0050 '/
Inlet Invert= 78.50', Outlet Invert= 77.80'

**Summary for Pond DB: Detention Basin**

Inflow Area = 1.923 ac, 65.80% Impervious, Inflow Depth = 2.85" for 10-yr event
Inflow = 6.02 cfs @ 12.09 hrs, Volume= 0.457 af
Outflow = 0.08 cfs @ 21.57 hrs, Volume= 0.156 af, Atten= 99%, Lag= 568.6 min
Discarded = 0.08 cfs @ 21.57 hrs, Volume= 0.156 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, $dt = 0.01$ hrs / 3
Peak Elev= 78.26' @ 21.57 hrs Surf.Area= 12,813 sf Storage= 14,860 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 285.5 min (1,073.1 - 787.5)

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

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Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	39,678 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.00	10,760	0	0
78.00	12,380	11,570	11,570
79.00	14,040	13,210	24,780
80.00	15,756	14,898	39,678

Device	Routing	Invert	Outlet Devices
#1	Discarded	77.00'	0.270 in/hr Exfiltration over Surface area
#2	Primary	79.00'	15.0' long x 5.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00			
2.50 3.00 3.50 4.00 4.50 5.00 5.50			
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65			
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88			

Discarded OutFlow Max=0.08 cfs @ 21.57 hrs HW=78.26' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.08 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=77.00' TW=0.00' (Dynamic Tailwater)↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond DMH: Drain Manhole**

Inflow Area = 0.543 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-yr event
 Inflow = 2.54 cfs @ 12.09 hrs, Volume= 0.207 af
 Primary = 2.54 cfs @ 12.09 hrs, Volume= 0.207 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3

Summary for Pond RG: Rain Garden

Inflow Area = 0.069 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-yr event
 Inflow = 0.32 cfs @ 12.08 hrs, Volume= 0.026 af
 Outflow = 0.01 cfs @ 15.56 hrs, Volume= 0.020 af, Atten= 97%, Lag= 208.9 min
 Discarded = 0.01 cfs @ 15.56 hrs, Volume= 0.020 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3

Peak Elev= 77.93' @ 15.56 hrs Surf.Area= 1,711 sf Storage= 646 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 319.4 min (1,068.1 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1	77.50'	770 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.50	1,301	0	0
78.00	1,779	770	770

Device	Routing	Invert	Outlet Devices
#1	Discarded	77.50'	0.270 in/hr Exfiltration over Surface area
#2	Primary	78.00'	7.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.01 cfs @ 15.56 hrs HW=77.93' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.01 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=77.50' TW=0.00' (Dynamic Tailwater)↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond SRS: Subsurface Recharge System**

Inflow Area = 0.344 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-yr event
 Inflow = 1.62 cfs @ 12.08 hrs, Volume= 0.131 af
 Outflow = 0.02 cfs @ 6.65 hrs, Volume= 0.036 af, Atten= 99%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 6.65 hrs, Volume= 0.036 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3

Peak Elev= 80.46' @ 23.24 hrs Surf.Area= 2,519 sf Storage= 4,481 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 224.2 min (972.9 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1	78.00'	2,423 cf	22.00'W x 114.50'L x 4.00'H Prismatic 10,076 cf Overall - 4,019 cf Embedded = 6,057 cf x 40.0% Voids
#2	78.50'	4,019 cf	52.6"W x 34.0"H x 7.50'L Cultec R-V8 x 60 Inside #1
		6,442 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	78.00'	0.270 in/hr Exfiltration over Surface area
#2	Primary	80.50'	6.0" x 22.0' long Culvert RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 80.50' S= -0.1136 '/' Cc= 0.900 n= 0.013

Discarded OutFlow Max=0.02 cfs @ 6.65 hrs HW=78.04' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=78.00' TW=77.00' (Dynamic Tailwater)↑**2=Culvert** (Controls 0.00 cfs)

Summary for Link TSR: Total Site Runoff

Inflow Area = 2.994 ac, 47.25% Impervious, Inflow Depth = 0.19" for 10-yr event
Inflow = 0.34 cfs @ 12.13 hrs, Volume= 0.047 af
Primary = 0.34 cfs @ 12.13 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

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

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Summary for Subcatchment S-1: Rooftop

Runoff = 2.36 cfs @ 12.08 hrs, Volume= 0.194 af, Depth= 6.76"

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

	Area (sf)	CN	Description
*	15,000	98	Roof
	15,000		Impervious Area

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

Summary for Subcatchment S-2: Tributary to Double Catch Basin

Runoff = 3.73 cfs @ 12.08 hrs, Volume= 0.306 af, Depth= 6.76"

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

	Area (sf)	CN	Description
*	23,660	98	Roadway
	23,660		Impervious Area

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

Summary for Subcatchment S-3: Tributary to Basin

Runoff = 5.87 cfs @ 12.09 hrs, Volume= 0.424 af, Depth= 4.92"

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

	Area (sf)	CN	Description
*	16,450	98	Basin
*	26,600	76	Gravel roads, HSG A
	2,050	39	>75% Grass cover, Good, HSG A
	45,100	82	Weighted Average
	28,650		Pervious Area
	16,450		Impervious Area

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

15500.2POST

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

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Summary for Subcatchment S-4: Off Site Runoff

Runoff = 1.58 cfs @ 12.10 hrs, Volume= 0.132 af, Depth= 1.58"

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

	Area (sf)	CN	Description
*	3,500	98	Pavement
	10,900	76	Gravel roads, HSG A
	8,800	39	>75% Grass cover, Good, HSG A
	20,440	30	Woods, Good, HSG A
	43,640	49	Weighted Average
	40,140		Pervious Area
	3,500		Impervious Area

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

Summary for Subcatchment S-5: Tributary to Rain Garden

Runoff = 0.47 cfs @ 12.08 hrs, Volume= 0.039 af, Depth= 6.76"

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

	Area (sf)	CN	Description
	3,008	98	Paved parking & roofs
	3,008		Impervious Area

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

Summary for Reach P-1: Catch Basin

Inflow Area = 0.543 ac, 100.00% Impervious, Inflow Depth = 6.76" for 100-yr event

Inflow = 3.73 cfs @ 12.08 hrs, Volume= 0.306 af

Outflow = 2.64 cfs @ 12.02 hrs, Volume= 0.306 af, Atten= 29%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3

Max. Velocity= 3.65 fps, Min. Travel Time= 0.4 min

Avg. Velocity= 1.49 fps, Avg. Travel Time= 0.9 min

Peak Storage= 63 cf @ 12.03 hrs, Average Depth at Peak Storage= 1.00'

Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.52 cfs

15500.2POST

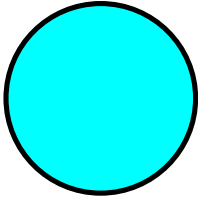
Type III 24-hr 100-yr Rainfall=7.00"

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12.0" Diameter Pipe, n= 0.013
Length= 80.0' Slope= 0.0050 '/'
Inlet Invert= 79.00', Outlet Invert= 78.60'

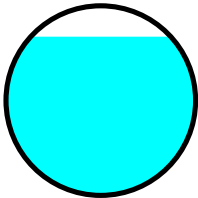
**Summary for Reach P-2: 12" HDPE**

Inflow Area = 0.543 ac, 100.00% Impervious, Inflow Depth = 6.76" for 100-yr event
Inflow = 2.64 cfs @ 12.02 hrs, Volume= 0.306 af
Outflow = 2.55 cfs @ 12.32 hrs, Volume= 0.306 af, Atten= 3%, Lag= 17.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 3.66 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 1.6 min

Peak Storage= 98 cf @ 12.32 hrs, Average Depth at Peak Storage= 0.84'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.52 cfs

12.0" Diameter Pipe, n= 0.013
Length= 140.0' Slope= 0.0050 '/'
Inlet Invert= 78.50', Outlet Invert= 77.80'

**Summary for Pond DB: Detention Basin**

Inflow Area = 1.923 ac, 65.80% Impervious, Inflow Depth = 4.92" for 100-yr event
Inflow = 8.39 cfs @ 12.09 hrs, Volume= 0.789 af
Outflow = 0.35 cfs @ 16.03 hrs, Volume= 0.260 af, Atten= 96%, Lag= 236.7 min
Discarded = 0.09 cfs @ 16.03 hrs, Volume= 0.178 af
Primary = 0.26 cfs @ 16.03 hrs, Volume= 0.082 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 79.04' @ 16.03 hrs Surf.Area= 14,105 sf Storage= 25,312 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 270.4 min (1,058.9 - 788.5)

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

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Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	39,678 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.00	10,760	0	0
78.00	12,380	11,570	11,570
79.00	14,040	13,210	24,780
80.00	15,756	14,898	39,678

Device	Routing	Invert	Outlet Devices
#1	Discarded	77.00'	0.270 in/hr Exfiltration over Surface area
#2	Primary	79.00'	15.0' long x 5.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00			
2.50 3.00 3.50 4.00 4.50 5.00 5.50			
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65			
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88			

Discarded OutFlow Max=0.09 cfs @ 16.03 hrs HW=79.04' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.09 cfs)**Primary OutFlow** Max=0.26 cfs @ 16.03 hrs HW=79.04' TW=0.00' (Dynamic Tailwater)↑**2=Broad-Crested Rectangular Weir** (Weir Controls 0.26 cfs @ 0.45 fps)**Summary for Pond DMH: Drain Manhole**

Inflow Area = 0.543 ac, 100.00% Impervious, Inflow Depth = 6.76" for 100-yr event
 Inflow = 2.64 cfs @ 12.02 hrs, Volume= 0.306 af
 Primary = 2.64 cfs @ 12.02 hrs, Volume= 0.306 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3

Summary for Pond RG: Rain Garden

Inflow Area = 0.069 ac, 100.00% Impervious, Inflow Depth = 6.76" for 100-yr event
 Inflow = 0.47 cfs @ 12.08 hrs, Volume= 0.039 af
 Outflow = 0.20 cfs @ 12.31 hrs, Volume= 0.029 af, Atten= 58%, Lag= 13.6 min
 Discarded = 0.01 cfs @ 12.30 hrs, Volume= 0.022 af
 Primary = 0.19 cfs @ 12.31 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3

Peak Elev= 78.05' @ 12.31 hrs Surf.Area= 1,779 sf Storage= 770 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 233.2 min (976.2 - 743.0)

Volume	Invert	Avail.Storage	Storage Description
#1	77.50'	770 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.50	1,301	0	0
78.00	1,779	770	770

Device	Routing	Invert	Outlet Devices
#1	Discarded	77.50'	0.270 in/hr Exfiltration over Surface area
#2	Primary	78.00'	7.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.01 cfs @ 12.30 hrs HW=78.05' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.01 cfs)**Primary OutFlow** Max=0.18 cfs @ 12.31 hrs HW=78.05' TW=0.00' (Dynamic Tailwater)↑**2=Broad-Crested Rectangular Weir** (Weir Controls 0.18 cfs @ 0.52 fps)**Summary for Pond SRS: Subsurface Recharge System**

Inflow Area = 0.344 ac, 100.00% Impervious, Inflow Depth = 6.76" for 100-yr event
 Inflow = 2.36 cfs @ 12.08 hrs, Volume= 0.194 af
 Outflow = 0.29 cfs @ 12.63 hrs, Volume= 0.096 af, Atten= 88%, Lag= 32.7 min
 Discarded = 0.02 cfs @ 4.37 hrs, Volume= 0.037 af
 Primary = 0.28 cfs @ 12.63 hrs, Volume= 0.058 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 3

Peak Elev= 80.78' @ 12.63 hrs Surf.Area= 2,519 sf Storage= 5,038 cf

Plug-Flow detention time= 314.4 min calculated for 0.096 af (49% of inflow)

Center-of-Mass det. time= 179.9 min (922.9 - 743.0)

Volume	Invert	Avail.Storage	Storage Description
#1	78.00'	2,423 cf	22.00'W x 114.50'L x 4.00'H Prismatic 10,076 cf Overall - 4,019 cf Embedded = 6,057 cf x 40.0% Voids
#2	78.50'	4,019 cf	52.6"W x 34.0"H x 7.50'L Cultec R-V8 x 60 Inside #1
		6,442 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	78.00'	0.270 in/hr Exfiltration over Surface area
#2	Primary	80.50'	6.0" x 22.0' long Culvert RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 80.50' S= -0.1136 '/' Cc= 0.900 n= 0.013

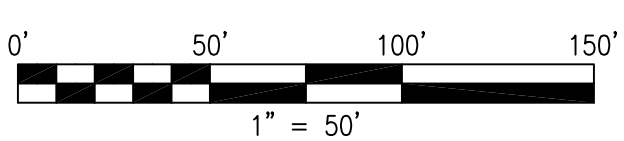
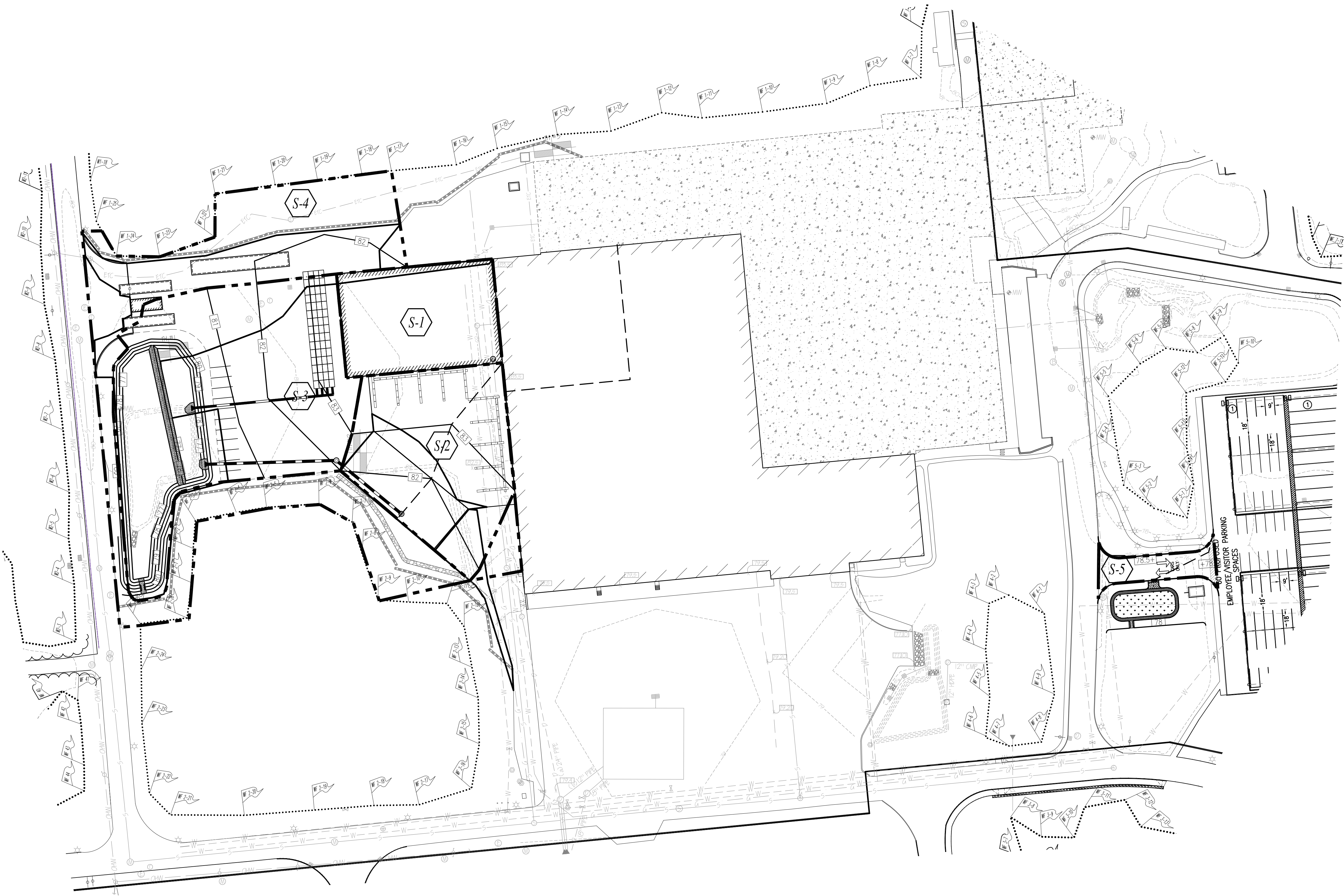
Discarded OutFlow Max=0.02 cfs @ 4.37 hrs HW=78.04' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)**Primary OutFlow** Max=0.28 cfs @ 12.63 hrs HW=80.78' TW=78.54' (Dynamic Tailwater)↑**2=Culvert** (Inlet Controls 0.28 cfs @ 2.46 fps)

Summary for Link TSR: Total Site Runoff

Inflow Area = 2.994 ac, 47.25% Impervious, Inflow Depth = 0.89" for 100-yr event
Inflow = 1.58 cfs @ 12.10 hrs, Volume= 0.221 af
Primary = 1.58 cfs @ 12.10 hrs, Volume= 0.221 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

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REVISIONS

1	9/29/17	CONSERVATION COMMENTS

VERIFICATION OF MASSACHUSETTS
CHRISTIAN ALBERT FARLAND
No. 47544
ONE
SEP 11 2015

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

DRAWN BY: MJW
DESIGNED BY: JKM
CHECKED BY: CAF

SITE PLAN

— 100 DUCHAINE BOULEVARD —
ASSESSORS MAP 134 LOT 5
NEW BEDFORD, MASSACHUSETTS

PREPARED FOR:
PARALLEL PRODUCTS OF NEW ENGLAND
401 INDUSTRY ROAD
LOUISVILLE, KY 40208

AUGUST 10, 2017

SCALE: 1"=50'

JOB NO. 15-500.2

LATEST REVISION:
SEPTEMBER 29, 2017

POST-SUBCATCHMENT

SHEET 5b OF 10



ENGINEERING A BETTER TOMORROW

ENGINEERING | SITE WORK | LAND SURVEYING

PIPE CAPACITY CALCULATIONS

10 YEAR STORM EVENT

Pipe Description				Drairage Area (Acres)			Comp. C-Value	CA	Time of Concentration (min)			I (in./hr)	Qc=CI/A (cfs)
Length #	DA #	From	To	Total	Imperv. C=0.90	Pervious C=0.30			Inlet	Drain	Total		
DRAINAGE PIPES													
1		WQI-1	DMH	0.543	0.543	0.000	0.90	0.489	10	0.32	10.32	4.3	2.10
2		DMH	FES	0.543	0.543	0.000	0.90	0.489	10	0.52	10.52	4.3	2.10

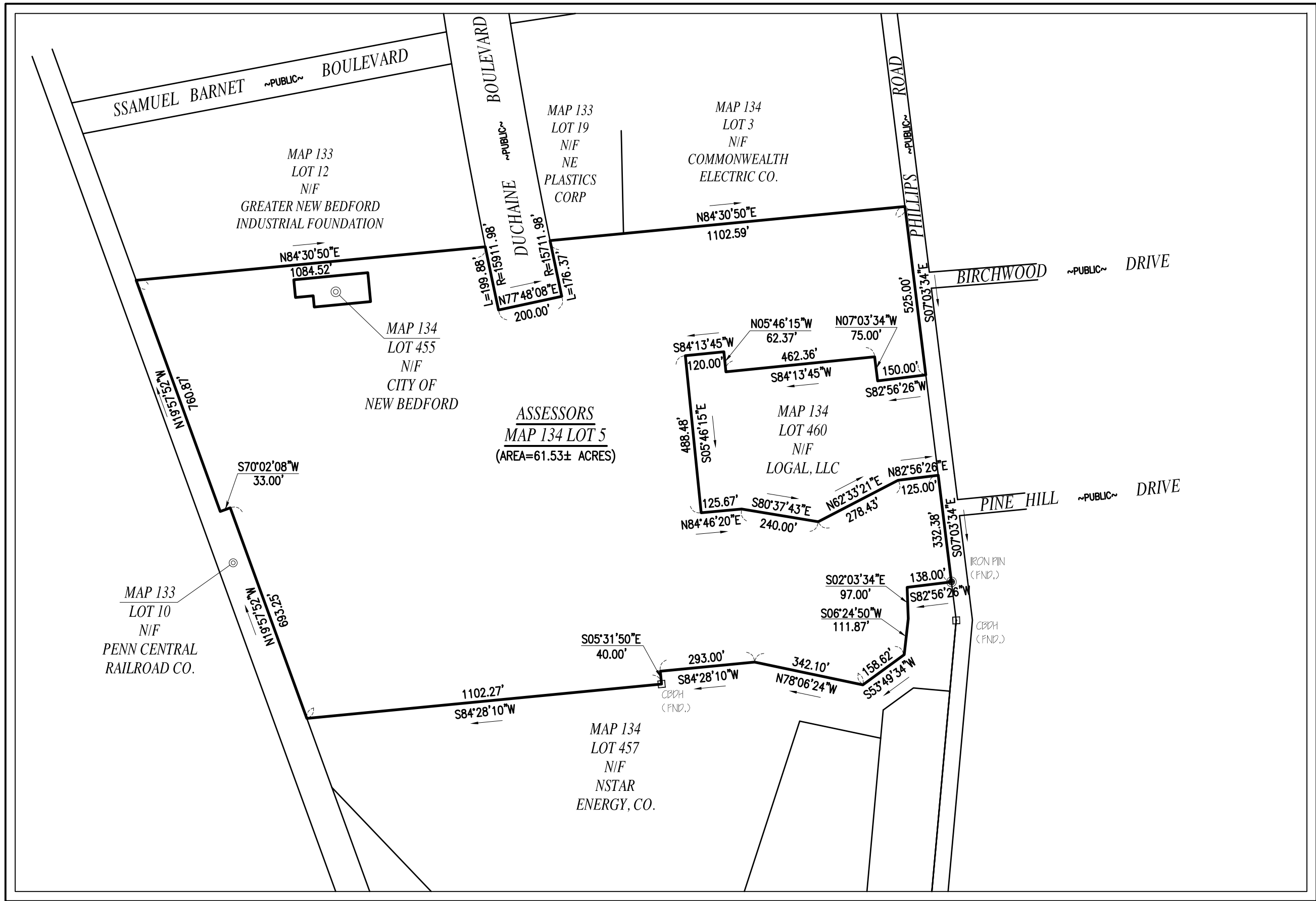
Length #	Pipe Diameter (in)	Pipe Material (n-value)	Slope (ft./ft.)	Length (ft)	Full Flow			Current Flow				Pipe capacity
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Flow Depth in pipe (in)	Flow capacity check
DRAINAGE PIPES												
1	12	0.013	0.0060	77	3.51	2.76	3.95	2.10	0.76	0.6	7.7	OK!
2	12	0.013	0.0060	124	3.51	2.76	3.95	2.10	0.76	0.6	7.7	OK!

S I T E P L A N

100 DUCHAINE BOULEVARD

ASSESSORS MAP #134 LOT #5

NEW BEDFORD, MASSACHUSETTS



— OVERALL SITE MAP —

SCALE: 1"=300'



— AREA MAP —

SCALE: 1"=1,000'±

— ZONING DATA —			
DISTRICT: INDUSTRIAL C			
DESCRIPTION	REQUIRED	EXISTING	PROVIDED
LOT AREA	0 S.F.	651± AC	651± AC
LOT FRONTAGE	0 FT	57617 FT	57617 FT
FRONT SETBACK	25 FT	843.6± FT	843.6± FT
SIDE SETBACK	25 FT	192.3± FT	192.3± FT
REAR SETBACK	25 FT	828.9± FT	828.9± FT
BUILDING HEIGHT (MAXIMUM)	100 FT	100 FT	100 FT
BUILDING COVERAGE (MAXIMUM)	50 %	3A± %	3B± %
LOT COVERAGE (MAXIMUM)	80 %	150 %	150 %
— PARKING & LOADING REQUIREMENTS —			
PRINCIPAL USE: RECYCLING FACILITY			
(FOR PARKING REGULATION PURPOSES: BUSINESS ENGAGED IN WAREHOUSING & DISTRIBUTION)			
REQUIREMENT	REQUIRED	PROVIDED	
1 SPACE PER 1,500 S.F. OF G.F.A. UP TO 15,000 S.F. THEREAFTER, ONE ADDITIONAL SPACE FOR EACH 5,000 S.F. OR PORTION THEREOF IN EXCESS OF 15,000 S.F., PLUS ONE SPACE FOR EACH VEHICLE UTILIZED IN THE BUSINESS.	55 TOTAL PARKING SPACES	142 TOTAL PARKING SPACES	
WHEN 26-50 TOTAL PARKING SPACES ARE PROVIDED, 2 MUST BE ACCESSIBLE SPACES. ONE IN EVERY EIGHT ACCESSIBLE SPACES, BUT NOT LESS THAN ONE, SHALL BE VAN ACCESSIBLE	2 TOTAL SPACES (1 VAN)	2 SPACES (1 VAN)	
TWO (2) LOADING SPACES FOR EACH BUILDING CONTAINING 10,000 S.F. OF GROSS FLOOR AREA. THEREAFTER, ONE (1) ADDITIONAL LOADING SPACE SHALL BE REQUIRED FOR EACH FIFTEEN (15) FEET OF DOCK, PLATFORM, OR OPENING IN THE BUILDING WHERE THE LOADING OR UNLOADING OF COMMODITIES IS INTENDED TO OCCUR.	17 LOADING SPACES	20 LOADING SPACES	

— INDEX —			
SHEET	DESCRIPTION	SHEET	DESCRIPTION
1	COVER	5	UTILITIES & GRADING
2	NOTES & LEGEND	6	LIGHTING
3	EXISTING CONDITIONS	7-8	DETAILS
4	LAYOUT	9-10	ARCHITECTURALS

WAIVERS REQUESTED

CODE OF ORDINANCES — CH. 9 COMPREHENSIVE ZONING

1. SECTION 5350 — DEVELOPMENT IMPACT STATEMENT

SITE PLAN REVIEW CHECKLIST

2. SECTION 36. LANDSCAPE PLAN

3. SECTION 8. TRAFFIC IMPACT & ACCESS STUDY

RECORD OWNER:

ASSESSORS MAP 134 LOT 5

SM REAL ESTATE, LLC

401 INDUSTRY ROAD

LOUISVILLE, KY 40208

LC CERT# 23339

LC PLAN# 36318C

REVISIONS

1	9/29/17	CONSERVATION COMMENTS

SEAL

CHRISTIAN ALBERT FARLAND
No. 47544
CIVIL ENGINEER
MASSACHUSETTS

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OFFICES IN:
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•WARWICK, RI

DRAWN BY: MJW

DESIGNED BY: JKM

CHECKED BY: CAF

SITE PLAN

— 100 DUCHAINE BOULEVARD —
ASSESSORS MAP 134 LOT 5
NEW BEDFORD, MASSACHUSETTS

PARALLEL PRODUCTS OF NEW ENGLAND
401 INDUSTRY ROAD
LOUISVILLE, KY 40208

PREPARED FOR:

AUGUST 10, 2017

SCALE: AS NOTED

JOB NO. 15-500.2

LATEST REVISION:
SEPTEMBER 29, 2017

COVER

SHEET 1 OF 10

GENERAL CONSTRUCTION NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AND STRUCTURES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF VARIOUS UTILITY COMPANIES AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THIS INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE LOCATION OF ALL UNDERGROUND UTILITIES AND STRUCTURES SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR MUST CONTACT THE APPROPRIATE UTILITY COMPANY, ANY GOVERNING PERMITTING AUTHORITY, AND "DIG SAFE" AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION WORK TO REQUEST EXACT FIELD LOCATION OF UTILITIES INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION TAKEN BEFORE PROCEEDING WITH THE WORK. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLAN.
2. TOPOGRAPHIC AND PROPERTY LINE SURVEY PERFORMED BY FARLAND CORP. IN SEPTEMBER OF 2015.
3. VERTICAL ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 AND HORIZONTAL LOCATIONS REFER TO THE NORTH AMERICAN DATUM (NAD) OF 1983.
4. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL STANDARDS AND REGULATIONS.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING ALL CONTROL POINTS AND BENCH MARKS NECESSARY FOR THE WORK.
6. ALL BENCHMARKS SHOWN ON THIS PLAN ARE TO BE CHECKED FOR CONSISTENCY BY THE CONTRACTOR. ANY DISCREPANCIES MUST BE RESOLVED BY THIS OFFICE PRIOR TO CONSTRUCTION.
7. WHERE PROPOSED PAVEMENT AND WALKS ARE TO MEET EXISTING, THE CONTRACTOR SHALL SAWCUT A NEAT LINE AND MATCH GRADE. SEAL ALL JOINTS WITH HOT BITUMINOUS ASPHALT JOINT SEALER.
8. CURBING TO BE AS INDICATED ON THE PLANS.
9. ALL EXISTING TREES, SHRUBS AND GROUND COVER WHERE NATURAL GRADE IS TO BE RETAINED SHALL BE KEPT IN THEIR EXISTING STATE UNLESS REMOVAL IS REQUIRED FOR CONSTRUCTION PURPOSES.
10. ALL AREAS DISTURBED BY CONSTRUCTION AND NOT TO BE PAVED OR OTHERWISE TREATED AS NOTED ON PLAN SHALL BE TREATED WITH 4" OF LOAM, SEEDDED AND HAY MULCHED FOR EROSION CONTROL.
11. SITE IMPROVEMENTS SHALL CONFORM TO A.D.A. SPECIFICATIONS.
12. ALL HANDICAP PARKING, RAMPS AND ACCESS SHALL CONFORM TO AAB & MAAB REQUIREMENTS.
13. ALL PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO MUTCD REQUIREMENTS.
14. LIGHTING SHALL BE DIRECTED ON SITE AND AWAY FROM TRAFFIC INTERFERENCE.
15. TEST PITS AND/OR BORINGS WERE TAKEN FOR THE PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY. THEY DO NOT NECESSARILY SHOW THE NATURE OF ALL MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
16. THE CONTRACTOR SHALL PROTECT AND/OR CAP OFF ALL EXISTING ON-SITE UTILITY SERVICES ACCORDING TO THE LOCAL AUTHORITY'S SPECIFICATIONS. SERVICES SHALL BE CAPPED OFF WHERE SAME ENTER THE PERIMETER OF THE PROPERTY LINE.
17. ANY WORK AND MATERIAL WITHIN THE CITY RIGHT-OF-WAY SHALL CONFORM TO THE CITY OF NEW BEDFORD REQUIREMENTS.
18. CONTRACTOR SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH ALL CONSTRUCTION DOCUMENTS, SPECIFICATIONS AND SITE CONDITIONS PRIOR TO BIDDING AND PRIOR TO CONSTRUCTION.
19. ANY DISCREPANCIES BETWEEN DRAWINGS, SPECIFICATIONS AND SITE CONDITIONS SHALL BE REPORTED IMMEDIATELY TO THE OWNER'S REPRESENTATIVE FOR CLARIFICATION AND RESOLUTION PRIOR TO BIDDING OR CONSTRUCTION.
20. ANY MINOR MODIFICATIONS (AS DETERMINED BY THE CITY ENGINEER) TO THE INFORMATION SHOWN ON THE APPROVED SITE PLANS SHALL BE SUBMITTED TO THE CITY ENGINEER AS A MINOR PLAN REVISION FOR APPROVAL PRIOR TO THE WORK BEING PERFORMED.
21. THESE PLANS ARE PERMITTING PLANS AND SHALL NOT TO BE USED FOR CONSTRUCTION. A FINAL SET OF STAMPED PLANS FOR CONSTRUCTION WILL BE ISSUED AFTER RECEIVING FINAL APPROVAL FROM THE LOCAL AND/OR STATE DEPARTMENTS.

CONSTRUCTION SEQUENCING NOTES

1. ALL BMP EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO DEMOLITION OR ANY SITE WORK.
2. EROSION CONTROL BMP'S SHALL CONFORM TO US EPA, NPDES, MA DEP AND MASSACHUSETTS EROSION AND SEDIMENTATION CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS.
3. CONSTRUCT TEMPORARY AND PERMANENT EROSION CONTROL FACILITIES. EROSION CONTROL FACILITIES SHALL BE INSTALLED PRIOR TO ANY EARTH MOVING.
4. ALL EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO CONSTRUCTION. EROSION CONTROL SHALL CONFORM TO THE CITY OF NEW BEDFORD CONSERVATION COMMISSION REQUIREMENTS AS STATED IN THE ORDER OF CONDITIONS.
5. TREE PROTECTION FENCE SHALL BE INSTALLED AND APPROVED BY THE OWNER REPRESENTATIVE PRIOR TO ANY EARTH MOVING.
6. ALL PERMANENT DITCHES AND SWALES ARE TO BE STABILIZED WITH VEGETATION OR RIP RAP PRIOR TO DIRECTING RUNOFF TO THEM.
7. CLEAR CUT, DEMOLISH AND DISPOSE OF EXISTING SITE ELEMENTS NOT TO REMAIN.
8. STORMWATER SHALL NOT BE DIRECTED TOWARDS THE INFILTRATION BASINS UNTIL THE ENTIRE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.
9. GRADE AND GRAVEL ALL PAVED AREAS. ALL PROPOSED PAVED AREAS SHALL BE STABILIZED IMMEDIATELY AFTER GRADING.
10. BEGIN ALL PERMANENT AND TEMPORARY SEEDING AND MULCHING. ALL CUT AND FILL SLOPES SHALL BE SEEDDED AND MULCHED IMMEDIATELY AFTER THEIR CONSTRUCTION.
11. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, SILT FENCES AND MULCH AND SEED AS REQUIRED.
12. FINISH PAVING ALL HARD SURFACE AREAS.
13. INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES.
14. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
15. REMOVE TEMPORARY EROSION CONTROL MEASURES.
16. THE CONSTRUCTION SEQUENCE SHALL BE CONFINED TO THE LIMIT OF WORK AS SHOWN ON THE DRAWINGS.
17. UPON COMPLETION OF CONSTRUCTION THE OWNER SHALL AGREE TO MAINTAIN AND CLEAN ALL DRAINAGE STRUCTURES AS REQUIRED.
18. MAINTENANCE SPECIFICATIONS SHALL BE PROVIDED FOR ALL PROPOSED EROSION AND SEDIMENTATION CONTROLS.

UTILITY AND GRADING NOTES

1. THE CONTRACTOR SHALL OBTAIN A STREET DISTURBANCE AND OBSTRUCTION PERMIT PRIOR TO ANY CONSTRUCTION WITHIN THE RIGHT-OF-WAY.
2. ALL WATER AND SEWER MATERIAL AND CONSTRUCTION SHALL CONFORM TO THE CITY OF NEW BEDFORD REQUIREMENTS.
3. ALL WATER AND SEWER CONSTRUCTION SHALL BE INSPECTED BY THE CITY OF NEW BEDFORD BEFORE BEING BACKFILLED.
4. THE CITY SHALL BE NOTIFIED AT LEAST 24 HOURS PRIOR TO THE REQUIRED INSPECTIONS.
5. ALL ON-SITE STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE PIPE (HDPE) OR RCP, UNLESS NOTED OTHERWISE.
6. HDPE PIPE SHALL CONFORM WITH AASHTO DESIGNATIONS M294 AND M252. SHALL BE MANUFACTURED WITH HIGH DENSITY POLYETHYLENE PLASTIC AND SHALL BE ADS N-12 PIPE AS MANUFACTURED BY ADVANCE DRAINAGE SYSTEM, INC. OR HANCOR HI Q PIPE AS MANUFACTURED BY HANCOR, INC. OR APPROVED EQUAL UNLESS OTHERWISE NOTED OR DETAILED.
7. A MINIMUM OF 18" VERTICAL CLEARANCE SHALL BE MAINTAINED WHERE WATER SERVICES CROSS STORM DRAIN LINES.
8. ALL SERVICE CONNECTIONS SHALL BE INSTALLED TO A POINT OF 10 FEET FROM THE BUILDING WALL UNLESS OTHERWISE NOTED OR DETAILED.
9. BEFORE THE DEVELOPMENT SITE IS GRADED, THE AREA OF THE DRAINAGE BASINS SHOULD BE FENCED OFF TO PREVENT HEAVY EQUIPMENT FROM COMPACTING THE UNDERLYING SOIL.
10. WHERE PROPOSED GRADES MEET EXISTING GRADES, CONTRACTOR SHALL BLEND GRADES TO PROVIDE A SMOOTH TRANSITION BETWEEN EXISTING AND NEW WORK. PONDING AT TRANSITION AREAS WILL NOT BE ALLOWED.
11. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AWAY FROM ALL BUILDING FOUNDATIONS AND STRUCTURES.
12. MAXIMUM SLOPE IN DISTURBED AREAS SHALL NOT EXCEED 3:1, UNLESS OTHERWISE NOTED.
13. CONTRACTOR SHALL VERIFY EXISTING GRADES AND NOTIFY OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES.
14. CONTRACTOR SHALL ADJUST UTILITY ELEMENT MEANT TO BE FLUSH WITH GRADE THAT IS AFFECTED BY SITE WORK OR GRADE CHANGES, WHETHER SPECIFICALLY NOTED ON PLANS OR NOT.
15. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE OWNER'S REPRESENTATIVE FOR RESOLUTION OF THE CONFLICT.
16. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF ALL GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.
17. ELECTRICAL DUCT BANK LOCATION IS SHOWN FOR COORDINATION PURPOSES, REFER TO ELECTRICAL PLANS FOR SECTIONS AND DETAILS OF THE UTILITY DUCT BANK.
18. THE LOCATION, SIZE, DEPTH AND SPECIFICATIONS FOR CONSTRUCTION OF PRIVATE UTILITY SERVICES SHALL BE INSTALLED ACCORDING TO THE REQUIREMENTS PROVIDED BY AND APPROVED BY THE RESPECTIVE UTILITY COMPANY (GAS, TELEPHONE AND ELECTRICAL). FINAL DESIGN AND LOCATIONS AT THE BUILDING WILL BE PROVIDED BY THE ARCHITECT. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF THE UTILITY CONNECTIONS WITH THE RESPECTIVE COMPANIES PRIOR TO ANY UTILITY CONSTRUCTION.

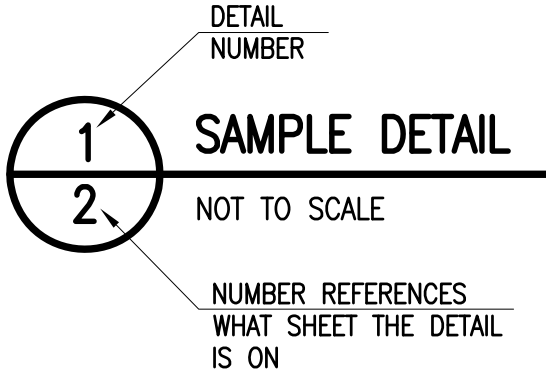
LAYOUT AND MATERIAL NOTES

1. CONTRACTOR SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH ALL CONSTRUCTION DOCUMENTS, SPECIFICATIONS AND SITE CONDITIONS PRIOR TO BIDDING AND PRIOR TO CONSTRUCTION.
2. ANY DISCREPANCIES BETWEEN DRAWINGS, SPECIFICATIONS AND SITE CONDITIONS SHALL BE REPORTED IMMEDIATELY TO THE OWNER'S REPRESENTATIVE FOR CLARIFICATION AND RESOLUTION PRIOR TO BIDDING OR CONSTRUCTION.
3. SEE ARCHITECTURAL DRAWINGS FOR EXACT BUILDING DIMENSIONS AND ALL DETAILS CONTIGUOUS TO THE BUILDING INCLUDING SIDEWALKS, RAMPS, UTILITY ENTRANCE LOCATIONS, WALL PACKS, CONCRETE DOOR PADS, ROOF DRAINS, ETC.
4. ACCESSIBLE CURB RAMPS SHALL BE PER THE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD AND THE AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES, WHICHER IS MORE STRINGENT.
5. THE FOLLOWING LAYOUT CRITERIA SHALL CONTROL UNLESS OTHERWISE NOTED ON THE PLAN:
ALL DIMENSIONS ARE TO OUTSIDE FACE OF BUILDING.
ALL DIMENSIONS ARE TO FACE OF CURB AT GUTTER LINE.
ALL DIMENSIONS ARE TO CENTER OF PAVEMENT MARKINGS.
ALL TIES TO PROPERTY LINES ARE PERPENDICULAR TO THE PROPERTY LINE UNLESS OTHERWISE NOTED.

SOIL EROSION AND SEDIMENT CONTROL NOTES

1. THE CONSERVATION COMMISSION SHALL BE NOTIFIED, AT LEAST 72 HOURS PRIOR TO ANY LAND DISTURBANCE.
2. A COPY OF THE SOIL EROSION AND SEDIMENT CONTROL PLAN MUST BE MAINTAINED ON THE PROJECT SITE DURING CONSTRUCTION.
3. SOIL EROSION AND SEDIMENT CONTROL PRACTICES IN THE PLAN SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
4. ALL APPLICABLE SOIL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE IN PLACE PRIOR TO ANY DEMOLITION GRADING OPERATIONS AND/OR INSTALLATION OF PROPOSED STRUCTURES OR UTILITIES.
5. ALL APPLICABLE SOIL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE LEFT IN PLACE UNTIL CONSTRUCTION IS COMPLETED AND/OR THE AREA IS STABILIZED.
6. ALL SOIL EROSION AND SEDIMENT CONTROL STRUCTURES SHALL BE INSPECTED AND MAINTAINED ON A REGULAR BASIS AND AFTER EVERY STORM EVENT.
7. THE MAINTENANCE OF SOIL EROSION AND SEDIMENT CONTROL MEASURES AND FACILITIES DURING AND IMMEDIATELY AFTER CONSTRUCTION RESTS WITH THE GENERAL CONTRACTOR. UPON ACCEPTANCE OF THE PROJECT, THE OWNER SHALL BECOME RESPONSIBLE FOR MAINTENANCE OF ANY REMAINING MEASURES AND FACILITIES.
8. OFF SITE SEDIMENT DISTURBANCE MAY REQUIRE ADDITIONAL CONTROL MEASURES TO BE DETERMINED BY THE ENGINEER.
9. THE CONSERVATION COMMISSION AND/OR ENGINEER MAY REQUIRE ADDITIONAL SOIL EROSION MEASURES TO BE INSTALLED, AS DIRECTED BY THE DISTRICT INSPECTOR.
10. ADJOINING PROPERTIES SHALL BE PROTECTED FROM EXCAVATION AND FILLING OPERATIONS AT ALL TIMES.
11. THE CONTRACTOR SHALL UTILIZE ALL METHODS NECESSARY TO PREVENT BLOWING AND MOVEMENT OF DUST FROM THE EXPOSED SOIL SURFACES.
12. PAVED ROADWAYS MUST BE KEPT CLEAN AT ALL TIMES.
13. A CRUSHED STONE TIRE CLEANING PAD WILL BE INSTALLED WHEREVER A CONSTRUCTION ENTRANCE EXISTS. SEE LOCATION DETAIL ON PLAN.
14. ALL CATCH BASIN INLETS SHALL BE PROTECTED DURING CONSTRUCTION AS DETAILED ON THE PLAN, IF APPLICABLE.
15. ALL STORM DRAINAGE OUTLETS SHALL BE PROTECTED AS REQUIRED HEREON BEFORE DISCHARGE POINTS BECOME OPERATIONAL.
16. THE SITE SHALL AT ALL TIMES BE GRADED AND MAINTAINED SUCH THAT ALL STORMWATER RUNOFF IS DIVERTED TO SOIL EROSION AND SEDIMENT CONTROL FACILITIES.
17. LAND AREAS EXPOSED AT ANY ONE TIME AND THE LENGTH OF EXPOSURE SHALL BE KEPT TO A PRACTICAL MINIMUM. THEY SHALL BE LEFT IN A NEAT AND FINISHED APPEARANCE AND PROTECTED FROM EROSION.
18. ANY DISTURBED AREA THAT WILL BE LEFT EXPOSED FOR MORE THAN SIXTY (60) DAYS AND NOT SUBJECT TO CONSTRUCTION TRAFFIC SHALL IMMEDIATELY RECEIVE A TEMPORARY SEEDING AND FERTILIZATION. IF THE SEASON PROHIBITS TEMPORARY SEEDING, THE DISTRIBUTED AREAS SHALL BE MULCHED.
19. ALL CRITICAL AREAS SUBJECT TO EROSION SHALL RECEIVE A TEMPORARY SEEDING AND BE MULCHED IN ACCORDANCE WITH THE SPECIFICATIONS IMMEDIATELY FOLLOWING ROUGH GRADING.
20. IMMEDIATELY AFTER COMPLETION OF STRIPPING AND STOCKPILING OF TOPSOIL, SEED THE STOCKPILE WITH ANNUAL RYE GRASS. STABILIZE TOPSOIL STOCKPILES WITH STRAW MULCH FOR PROTECTION IF THE SEASON DOES NOT PERMIT THE APPLICATION AND ESTABLISHMENT OF TEMPORARY SEEDING.
21. SOIL STOCKPILES ARE NOT TO BE LOCATED WITHIN FIFTY (50) FEET OF WETLANDS, THE FLOODPLAIN, SLOPE, ROADWAY OR DRAINAGE FACILITIES. THE BASE OF ALL STOCKPILES SHALL BE PROTECTED BY A HAY BALE BARRIER OR SEDIMENT FENCE. LOCATIONS ARE DELINEATED ON THE PLAN.
22. MAXIMUM SIDE SLOPES OF ALL EXPOSED SURFACES SHALL NOT BE CONSTRUCTED STEEPER THAN 3:1 UNLESS OTHERWISE APPROVED BY THE DISTRICT.
23. ALL AREAS NOT STABILIZED BY CONSTRUCTION, SODDING OR LANDSCAPING SHALL BE SEEDDED AND STABILIZED IN ACCORDANCE WITH THE SEEDING AND MULCHING SPECIFICATIONS.
24. MULCHING IS REQUIRED ON ALL SEEDDED AREAS TO INSURE AGAINST EROSION BEFORE GRASS IS ESTABLISHED TO PROMOTE EARLIER VEGETATIVE COVER.
25. ALL DEWATERING OPERATIONS MUST DISCHARGE DIRECTLY INTO A SEDIMENT FILTRATION DEVICE. THE SEDIMENT FILTER MUST BE CAPABLE OF FILTERING THE SEDIMENT AND BE PLACED SO AS NOT TO CAUSE EROSION OF THE DOWNSTREAM AREA.

EXISTING		PROPOSED
-----K-----	CONTOUR LINE	-----101-----
HOI	SPOT GRADE	EOP
EOP	EDGE OF PAVEMENT	+101.1
VGC	VERTICAL GRANITE CURB	VGC
SGC	SLOPED GRANITE CURB	SGC
VCC	VERTICAL CONCRETE CURB	VCC
BCC	BITUMINOUS CONCRETE CURB	BCC
CCB	CAPE COD BERM	CCB
-----X-----	STONE WALL	-----X-----
-----X-----	CHAIN LINK FENCE	-----X-----
-----X-----	IRON FENCE	-----X-----
-----O-----	POST & RAIL FENCE	-----O-----
-----X-----	STOCKADE FENCE	-----X-----
-----X-----	GUARD RAIL	-----X-----
-----X-----	HAY BALES	-----X-----
-----W-----	WATER LINE	-----W-----
-----X-----	FIRE HYDRANT	-----X-----
-----X-----	POST INDICATOR VALVE	-----X-----
-----X-----	WATER GATE	-----X-----
-----X-----	WATER METER PIT	-----X-----
-----X-----	IRRIGATION HAND HOLE	-----X-----
-----X-----	WELL	-----X-----
-----X-----	SEWER LINE	-----X-----
-----X-----	SEWER MANHOLE	-----X-----
-----X-----	GAS LINE	-----X-----
-----X-----	GAS METER	-----X-----
-----X-----	GAS GATE	-----X-----
-----X-----	DRAIN LINE	-----X-----
-----X-----	DRAIN MANHOLE	-----X-----
-----X-----	CATCH BASIN	-----X-----
-----X-----	OVERHEAD WIRES	-----X-----
-----X-----	ELECTRIC, TELEPHONE & CABLE	-----X-----
-----X-----	UTILITY POLE	-----X-----
-----X-----	GUY WIRE	-----X-----



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●MARLBOROUGH
●WARWICK, RI

DRAWN BY: MJW
DESIGNED BY: JKM
CHECKED BY: CAF

SITE PLAN

100 DUCHAINE BOULEVARD
ASSESSORS MAP 134 LOT 5
NEW BEDFORD, MASSACHUSETTS

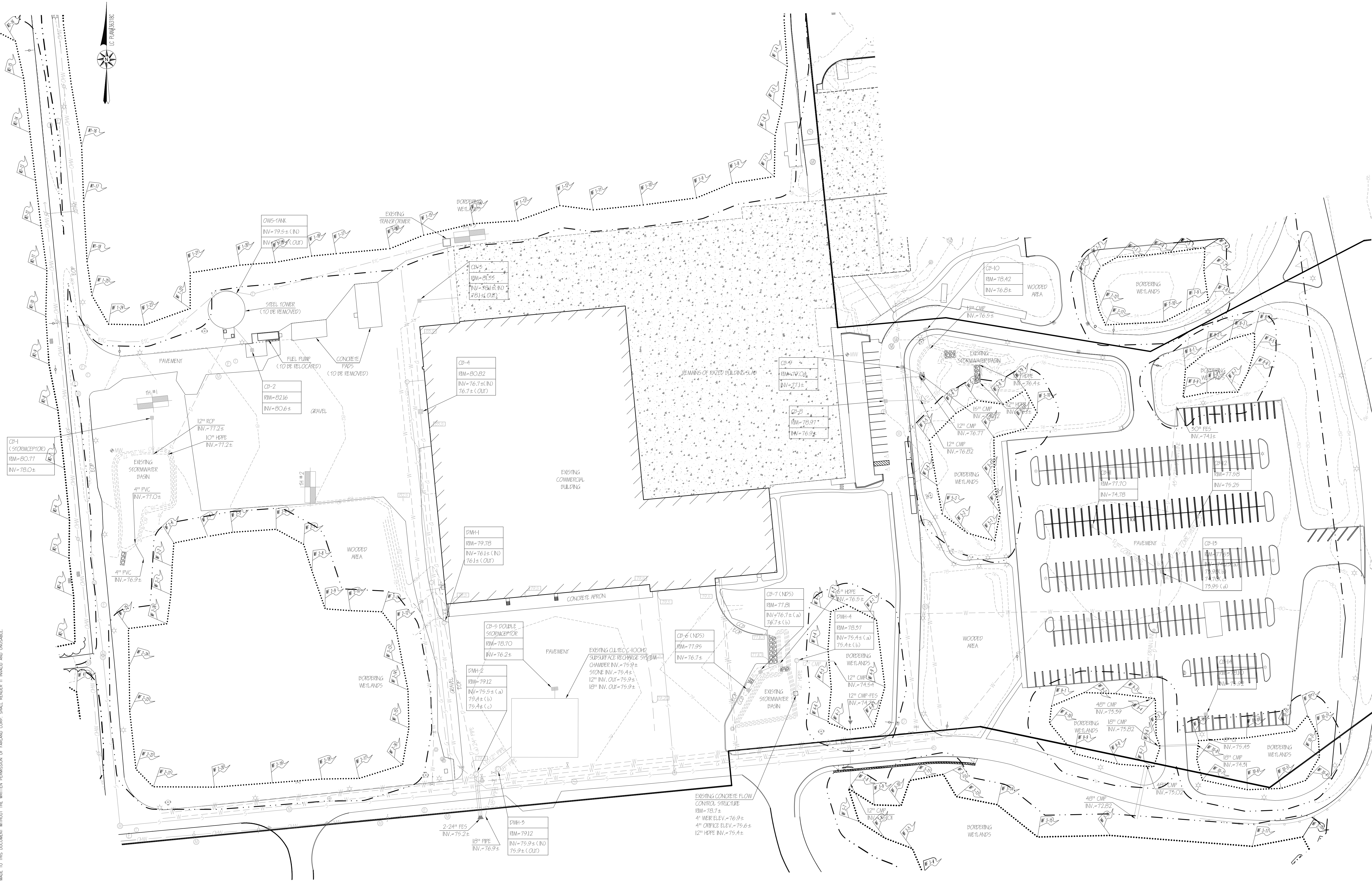
PREPARED FOR:
PARALLEL PRODUCTS OF NEW ENGLAND
401 INDUSTRY ROAD
LOUISVILLE, KY 40208

AUGUST 10, 2017
SCALE: AS NOTED
JOB NO. 15-500.2
LATEST REVISION:
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NOTES & LEGEND

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VERIFICATION OF MATERIALS

CHRISTIAN ALBERT FARLAND

No. 47544

Civil Engineer

MASSACHUSETTS

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SITE PLAN

100 DUCHAINE BOULEVARD
ASSESSORS MAP 134 LOT 5
NEW BEDFORD, MASSACHUSETTS

PREPARED FOR:
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LOUISVILLE, KY 40208

AUGUST 10, 2017

SCALE: 1"=50'

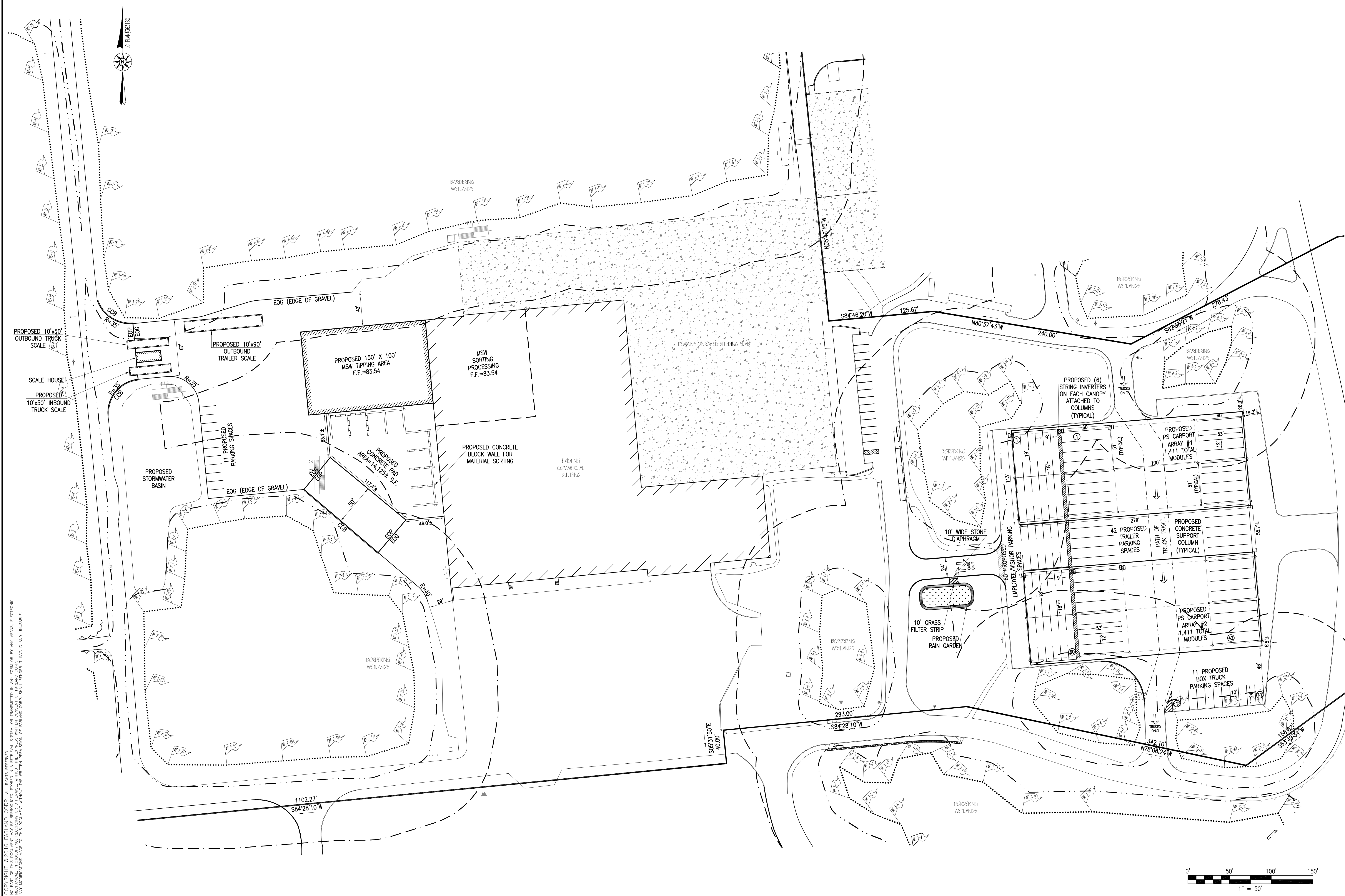
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EXISTING CONDITIONS

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CHRISTIAN ALBERT FARLAND
No. 47544
CIVIL ENGINEER
REG. STATE OF MASSACHUSETTS

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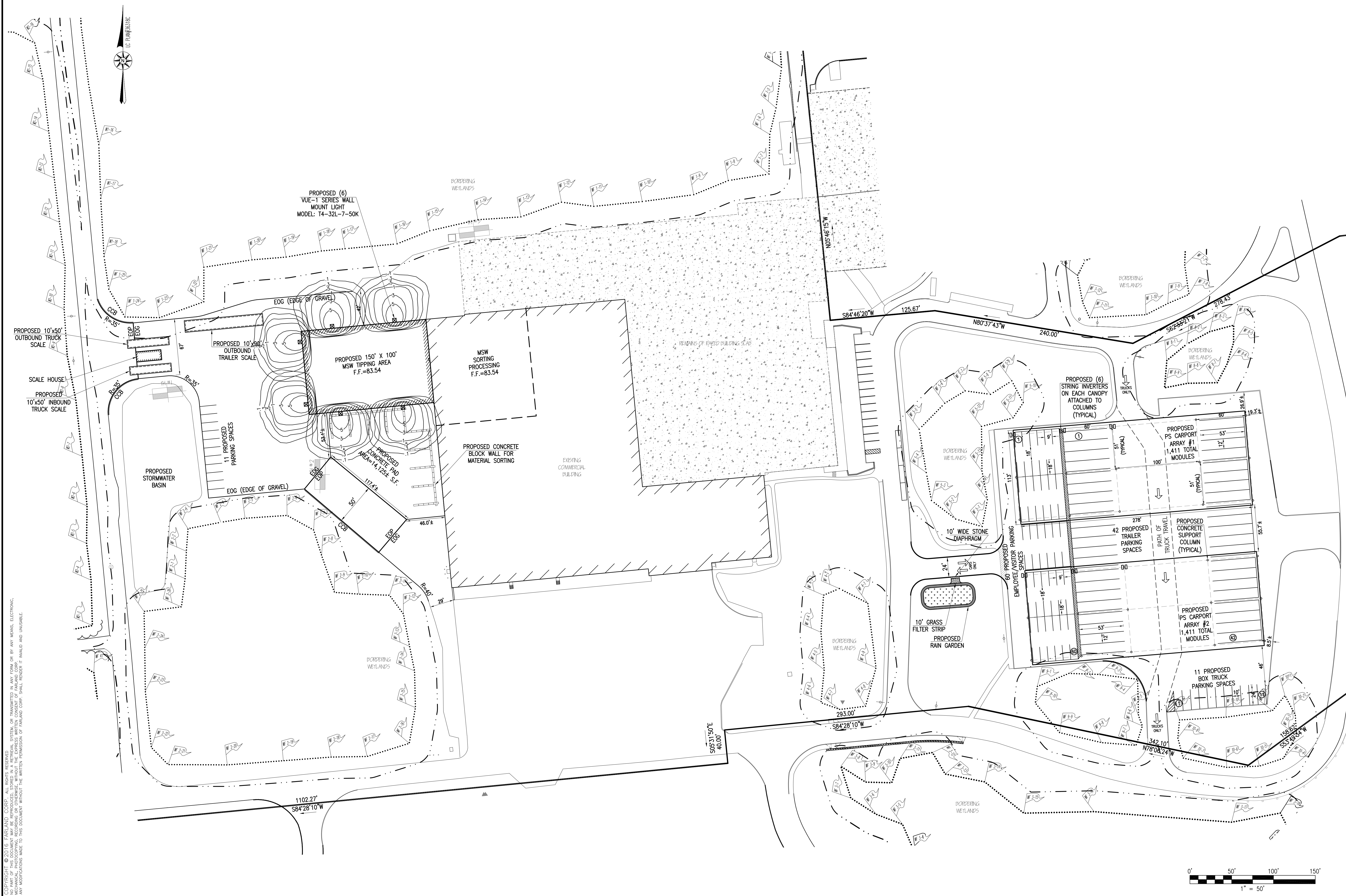
SITE PLAN

100 DUCHAINE BOULEVARD
ASSESSORS MAP 134 LOT 5
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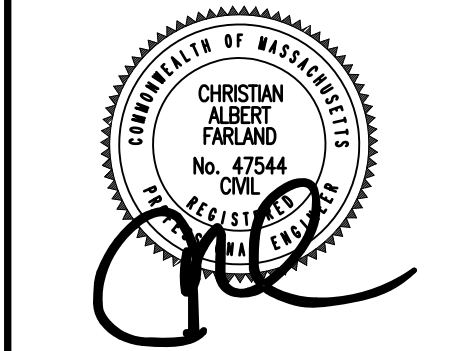
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LAYOUT
SHEET 4 OF 10

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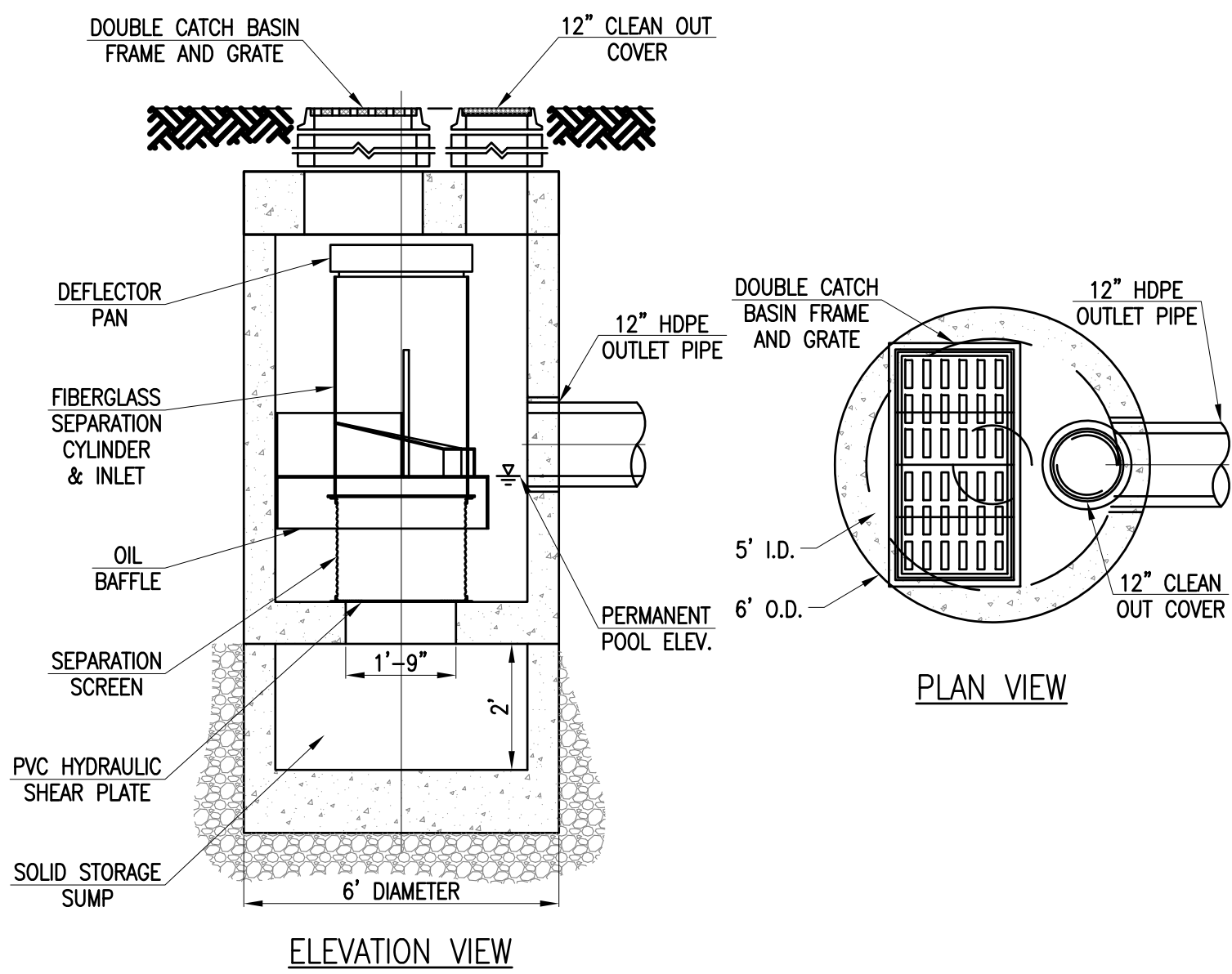
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SITE PLAN
— 100 DUCHAINE BOULEVARD —
ASSESSORS MAP 134 LOT 5
NEW BEDFORD, MASSACHUSETTS
PREPARED FOR:
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AUGUST 10, 2017
SCALE: 1"=50'
JOB NO. 15-500.2
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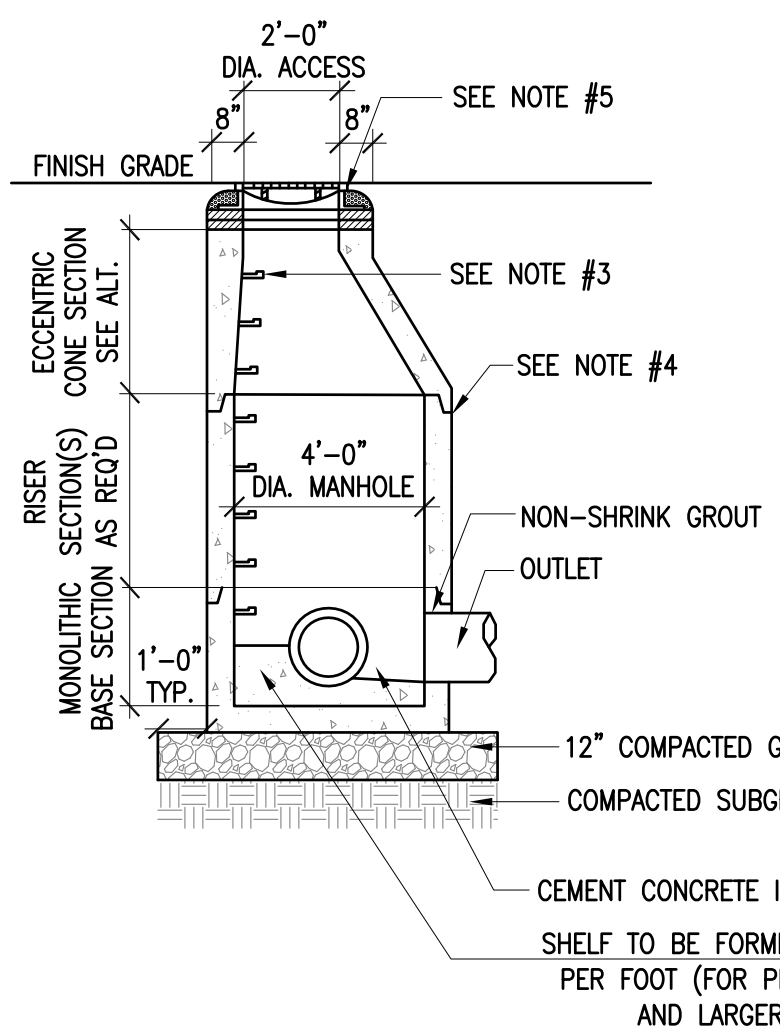
LIGHTING
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WATER QUALITY INLET STRUCTURE

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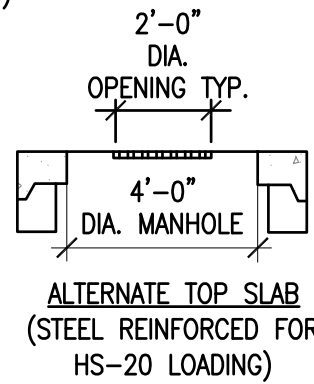


DRAIN MANHOLE

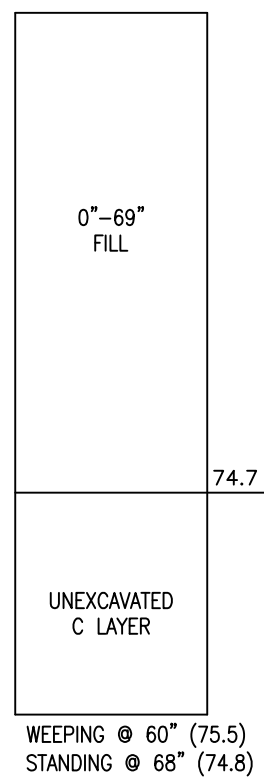
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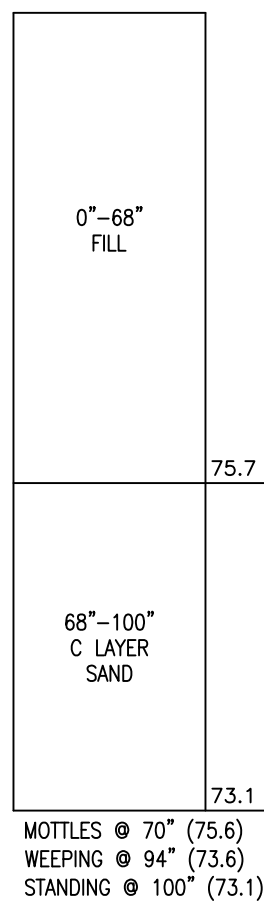
1. ALL SECTIONS SHALL BE DESIGNED FOR HS-20 LOADING.
2. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 1" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
3. COPOLYMER MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
5. DRAIN MANHOLE FRAME SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR. (2 BRICK COURSES MIN. 5 BRICK COURSES MAX.)



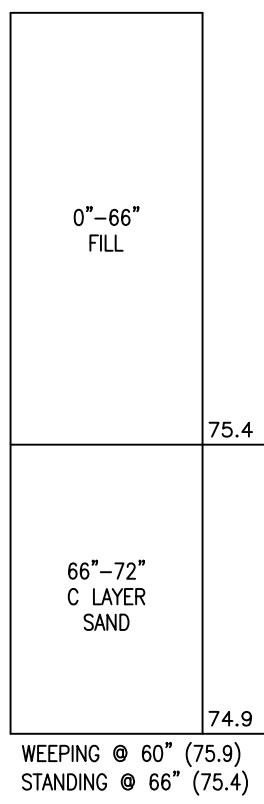
T.H. #1
EL. 80.5±



T.H. #2
EL. 81.4±

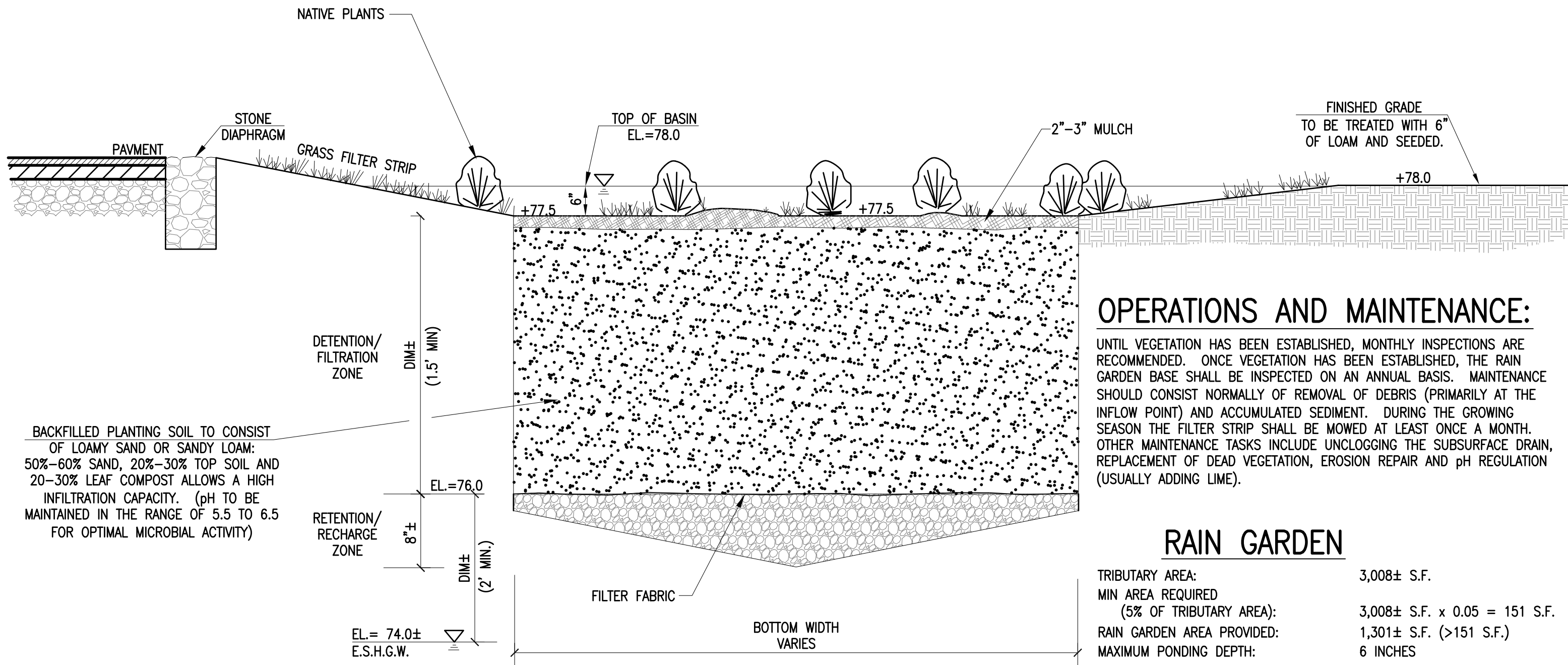


T.H. #3
EL. 80.9±



SOIL PROFILES

NOT TO SCALE



OPERATIONS AND MAINTENANCE:

UNTIL VEGETATION HAS BEEN ESTABLISHED, MONTHLY INSPECTIONS ARE RECOMMENDED. ONCE VEGETATION HAS BEEN ESTABLISHED, THE RAIN GARDEN BASE SHALL BE INSPECTED ON AN ANNUAL BASIS. MAINTENANCE SHOULD CONSIST NORMALLY OF REMOVAL OF DEBRIS (PRIMARYLY AT THE INFLOW POINT) AND ACCUMULATED SEDIMENT. DURING THE GROWING SEASON THE FILTER STRIP SHALL BE MOWED AT LEAST ONCE A MONTH. OTHER MAINTENANCE TASKS INCLUDE UNCLOGGING THE SUBSURFACE DRAIN, REPLACEMENT OF DEAD VEGETATION, EROSION REPAIR AND pH REGULATION (USUALLY ADDING LIME).

RAIN GARDEN

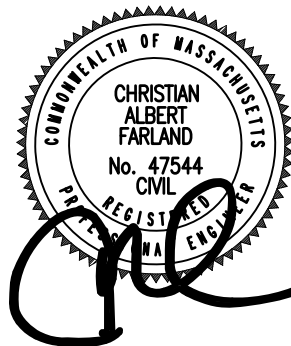
TRIBUTARY AREA:	3,008± S.F.
MIN AREA REQUIRED (5% OF TRIBUTARY AREA):	3,008± S.F. x 0.05 = 151 S.F.
RAIN GARDEN AREA PROVIDED:	1,301± S.F. (>151 S.F.)
MAXIMUM PONDING DEPTH:	6 INCHES

RAIN GARDEN (PROFILE)

NOT TO SCALE

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SITE PLAN

100 DUCHAINE BOULEVARD
ASSESSORS MAP 134 LOT 5
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AUGUST 10, 2017

SCALE: N.T.S.

JOB NO. 15-500.2

LATEST REVISION:
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DETAILS

SHEET 8 OF 10