TREE BOX FILTER LOCATION E

	Description	Rim	Inlet Apron at Gutter	Invert In Elev.	Invert Out Elev.	Top of Storage Elev.	Bottom of Storage Elev.	Ground Surface (Range in Elevation	Overflow Weir Elevation
E-0	4' x 6' Tree Box Filter Pearl Street Extension (Driveway) Sta. 30+35; 18.5' Left.	8.53	7.70		5.09 (4" E-2)				
E-1	4'-0" dia. Overflow Catch Basin Sta. 30+18; 18.50' Left	7.40			4.44 (E-2)				
E-2	4'-0" dia. Junction Manhole Sta. 30+30; 31.0' Left	8.90		5.00 (4" E-0) 4.31 (12" E-1)	4.21 (E-3)				
E-4	4' dia. Manhole Sta. 30+67; 8.00' Left	9.7		3.68 (E-8) 4.44 (E-5)	3.69 (12")(E-6A)				
E-5	4' dia. Manhole Sta. 31+44, 8.00' Left	11.45		8.27 (12")(E-7) 8.14 (12")(E-5A)	8.04 (E-4)				
E-5A	4' dia. Manhole Sta. 31+37, 18.00' Left	10.88			8.21 (12")(E-5)				
E-6	Existing Manhole Sta. 30+11; 6.00' Left	7.80		3.56 (12" E-9) 3.09 (12" E-6A) 12" Existing Invert TBD (G-3)	3.00 (City System)				
E-6A	4'-0" Diameter Manhole Sta. 0+30.16; 8.5' Left	7.95		4.44 (E-6B) 3.36 (12")(E-4)	3.24 (12")(E-6)				
E-6B	4'-0" Diameter Catch Basin Sta. 30+30; 16.0' Right	7.85			4.64 (12" E-6A)				
E-7	Field Inlet Sta. 31+61; 5.00' Right	8.34			8.34 (12")(E-5)				
E-8	4'-0" x 6'-0" Outlet Control Manhole Sta. 30+54.50; 29.75' Left	10.00 10.06		3.94 (E-3) 3.98 (UD)(E-3)	3.78 (12")(E-4)				5.94
E-9	4'-0" dia. Catch Basin Sta. 30+17; 16.01' Right	7.66			3.66 (12")(E-6)				
Underground Storage Sta. 30+34 to 30+52; 28.23' to 32.75' Left						5.94	3.94		

New Storm Drain	Pipe Diameter (in.)	Length (ft)	Slope (ft/ft)	Grade Difference (ft)	Notes
E-0 to E-2	4	11.5	0.0078	0.09	
E-1 to E-2	12	13	0.0100	0.13	
E-2 to E-3	12	2	0.0100	0.02	
E-8 to E-4	12	19	0.0050	0.10	
E-5 to E-4	12	72	0.0500	3.60	
E-6A to E-6	12	15	0.0100	0.15	
E-6B to E-6A	12	20	0.0100	0.20	
E-4 to E-6A	12	33	0.0100	0.33	
E-7 to E-5	12	11	0.0060	0.07	
E-5A to E-5	12	14	0.0050	0.07	
E-9 to E-6	12	19.5	0.0050	0.10	

NOTES:

1. E-5 to E-4 is to be installed parallel to the new proposed sewer along the Pearl Street Extension Driveway.
2. Underdrains from underground storage to connect to downstream side of E-8.
3. Construct prior to lightweight concrete fill installation.
4. Install PVC Backwater Valve in E-2 on discharge from Filterra® underdrains.
5. Storm drain line crosses sewer with invert of 4.47 (sewer is at Elevation 6.00).
6. 6B to 6A Storm drain line crosses water with invert of 4.57 (grade is 7.80 less 5.5 = 3.30+/- top of main).

TREE BOX FILTER LOCATION F

	Description	Rim	Inlet Apron at Gutter	Invert In Elev.	Invert Out Elev.	Top of Storage Elev.	Bottom of Storage Elev.	Ground Surface (Range in Elevation)	Overflow Weir Elevation
F-0	4' x 6' Tree Box Filter Sta. 12+80.2; 16.2' Left	9.14	8.30		5.64 (4" F-2)				
F-1	4'-0" dia. Overflow Catch Basin Sta. 12+95; 11.16' Left	8.11			4.4 (12" F-2)				
F-2	4'-0" dia. Junction Manhole Sta. 12+85; 33' Left	11.84		5.44 (4" F-0) 4.30 (12" F-1)	4.20 (12" Storage)				
F-3	5' x 4' Outlet Control Manhole Sta. 12+53; 34' Left	11.83 11.90		3.56 (4" UD)	3.44 (12" F-4)				6.18
F-4	New 5' Manhole on Existing 18" Storm Drain Sta. 12+61; 9.5' Left	8.88		3.32 (12" F-4) (18"H4)	3.22 (18" E-6)				
Underground Storage Sta. 12+55.50 to 12+73.50; 31.00' to 37.00' Left				4.1 (12" F-2)		6.10	4.10	11.84 to 12.00+/-	

New Storm Drain	Pipe Diameter (in.)	Length (ft)	Slope (ft/ft)	Grade Difference (ft)
F-0 to F-2	4	10	0.0201	0.20
F-1 to F-2	12	20	0.0050	0.10
F-2 to Underground Storage	12	15	0.0067	0.10
F-3 to F-4	12	23	0.0050	0.12

NOTES:

1. Set Tree Box Filter to clear existing 18" storm drain (test pit required).
2. Use eccentric catch basin for F-1 to clear 18" storm drain. Test pit the 18" storm drain near F-1 (if necessary, move curb and F-1 northerly to clear 18" storm drain).
3. Underdrain from below storage unit is to connect to downstream side of outlet control manhole F-3.
4. Construct prior to lightweight concrete fill installation.
5. Install PVC Backwater Valves in F-2 to F-3 on discharge from underdrains.
6. Footing of ramp to be installed to clear F-2. Use eccentric cone for F-2 to aid in clearance.
7. The size of control manhole F-3 has been reduced to 5' x 4' to clear footings.
8. Centerline grade at bottom of excavation for concrete Sta. 12+50 = Elev. 7.92; Sta. 12+75 = Elev. 7.93.
9. Underdrain from Filterra® is converted to F-2.

TREE BOX FILTER LOCATION G

	Description	Rim	Inlet Apron at Gutter	Invert In Elev.	Invert Out Elev.	Top of Storage Elev.	Bottom of Storage Elev.	Ground Surface (Range in Elevation)	Overflow Weir Elevation
G-0	4' x 6' Tree Box Filter Sta. 12+68; 21.5' Right	9.10	8.26		5.6 (4" G-1)				
G-1	4'-0" dia. Overflow Catch Basin Sta. 12+77; 16.01' Right	8.20		5.53 (4" UD G-0)	4.64 (12" Storage)				
G-2	6' x 6' Outlet Control Manhole Station 12+90.5; 22.00' Right	8.59 8.65		4.11 (4" UD Storage) 4.61 (12" Storage) 4.92 (12" G-4)	4.02 (12" G-3)				6.61
G-3	Existing Catch Basin Sta. 13+06+; 16.50' Right	7.72		3.95 (12" G-2))	3.90 (12" E-6)				
G-4 to G-3	Type D Catch Basin Sta. 12+85; 32' Right	9.00			5.00 (12" G-2)				
Underground Storage Sta. 12+75 to 12+87; 21.50' to 24.50' Right				4.61		6.61	4.61	8.9	

New Storm Drain	Pipe Diameter (in.)	Length (ft)	Slope (ft/ft)	Grade Difference (ft)
G-0 to G-1	4	6	0.0120	0.07
Catch Basin G-1 to Storage	12	3	0.0100	0.03
G-2 to G-3	12	14	0.0050	0.07
G-4 to G-2	12	7	0.0110	0.08

NOTES:

1. Underdrain from below storage unit and tree box filter is to connect to downstream side of G-2 and G-1 respectively.
2. Construct prior to lightweight concrete fill installation (top of storage tanks are below underside of lightweight concrete).
3. Install PVC Backwater Valves in G-2 on discharge from underdrains below stage and G-1 for underdrain from Filterra®.
4. 4" Tree box filter under drain unit is to connect to G-1.
5. Centerline grade at bottom of excavation for concrete Sta. 12.75 = Elev. 7.54+/-; Sta. 13+00 = Elev. 7.34+/-.

TREE BOX FILTER LOCATION J

	Description	Rim	Inlet Apron at Gutter	Invert In Elev.	Invert Out Elev.	Top of Storage Elev.	Bottom of Storage Elev.	Ground Surface (Range in Elevation)	Overflow Weir Elevation
J-0	4' x 6' Tree Box Filter Sta. 9+00; 21.5' Right	11.44	10.60		7.94 (4" J-2)				
J-1	4'-0" dia. Overflow Catch Basin Sta. 9+10; 18.16' Right	10.82			6.40 (12" J-2)				
J-2	4'-0" dia. Junction Manhole Sta. 9+15; 22.5' Right	11.49		7.44 (4" J-0) 6.36 (12" J-1)	6.26 (12" Storage)				
J-4	6' x 6' Outlet Control Manhole Sta. 9+47.50; 21' Right	11.56 11.60		5.70 (6" UD) 6.20 (12" Storage) 5.62 (12" from J4A)	5.29 (12" J-5)				8.20
J-4A to J-4	2'-0" x 2'-0" Square Type D or Nyloplast Inlet	9.50			5.8 (12" J-4)				
J-5	Exist 4'-0" Manhole Over 18" Storm Drain Sta. 9+57; 10.50' Left	11.21		5.00(12" J-4) (18" K-4)	4.24 (18" 1-4)				
Underground Storage Sta. 9+20 to 9+44; 22' to 25' Right					6.20	8.20	6.20	11.50 to 11.70	

New Storm Drain	Pipe Diameter (in.)	Length (ft)	Slope (ft/ft)	Grade Difference (ft)	
J-0 to J-2	4	10	0.0497	0.50	
J-1 to J-2	12	2	0.0200	0.04	
J-2 to Storage	12	3	0.0200	0.06	
J-4 to J-5	12	29	0.0100	0.29	Test Pit on Water Main may require slope alignment.
J-4A to J-4	12	9	0.0200	0.18	

NOTES:

1. From J-4 to J-5 requires test pit over existing water main.
2. Connect underdrains below storage unit to downstream side of J-4.
3. Underground storage will project through the bottom of lightweight fill. Special provisions required.
4. Install PVC Backwater Valves in J-2 and J-4 on discharge from underdrains.
5. Connect underdrain from Filterra® to J-2.
6. Test pit existing water line. Adjust slope of storm drain between J-4 to J-5 if required to clear water main.
7. Construct prior to lightweight concrete fill installation (top of storage units are below underside of concrete).
8. The grade at bottom of excavation for lightweight concrete Sta. 9+00 = Elev. 7.81; Sta. 9+50 = Elev. 8.65.

TREE BOX FILTER LOCATION H

	Description	Rim	Inlet Apron at Gutter	Invert In Elev.	Invert Out Elev.	Top of Storage Elev.	Bottom of Storage Elev.	Ground Surface (Range in Elevation)	Overflow Weir Elevation
H-0	4' x 6' Tree Box Filter Sta. 11+00; 21.5' Right	11.37	10.53		7.87 (4")(H-2)				
H-1	4'-0" dia. Overflow Catch Basin Sta. 11+14; 18.16' Right	10.70			6.38 (12")(H-2)				
H-2	4'-0" dia. Manhole Sta. 11+14; 24.17' Right	11.43		6.34 (12")(H-1) 7.65 (4")(H-0)	6.24 (Storage)				
H-3	4' x 6' Outlet Control Manhole Sta. 11+31.50; 21' Right	11.46 to 11.52		6.24 (12")(Storage) 5.70 (4" UD)	5.60 (12")(H-4)				8.20
H-4	New Manhole on Existing Storm Drain 11+31.50; 10' Right	11.13		5.18 (12")(H-3) 5.74 (18")(H-5)	4.20 (18")(F-4)				
H-5	4'-0" dia. Catch Basin and Overflow Manhole Sta 11+35; 33' left	11.84		6.10 (18" A-13) 2x 7.00 (roof) drains	6.00 (18")(H-4)				
H-6	2' sq. Concrete Type 'D' Inlet Catch Basin 11+35; 38' Right								
Storage Sta. 11+17 to 11+29; 21' to 24' Right		11.50 11.42				8.20	6.20	10.70 to 11.40	

New Storm Drain	Pipe Diameter (in.)	Length (ft)	Slope (ft/ft)	Grade Difference (ft)
H-0 to H-2	4	9	0.0240	0.22
H2 to H-3	12	2	0.0200	0.04
H-1 to H-2	12	2	0.0200	0.04
H-3 to H-4	12	26	0.0160	0.42
H-5 to H-4	18	18	0.0140	0.25
A-13 to H-5	18	26	0.0145	0.38

NOTES:

1. Underdrains from storage underground system and tree box filter to enter downstream side of H-3 and H-2 respectively.
2. Test pit to locate water main between H-3 to H-4 Manhole.
3. Construct prior to lightweight fill installation (top of storage units are below bottom of concrete).
4. Install PVC Backwater Valves in H-2 and H-3 on the discharges from underdrains.
5. Centerline grade at bottom of excavation for concrete Sta. 11+00 = Elev. 8.81+/-; Sta. 11+25 = Elev. 8.35+/-

TREE BOX FILTER LOCATION I

	Description	Rim	Inlet Apron at Gutter	Invert In Elev.	Invert Out Elev.	Top of Storage Elev.	Bottom of Storage Elev.	Ground Surface (Range in Elevation)	Overflow Weir Elevation
I-0	4' x 6' Tree Box Filter Sta. 10+75; 15.50' Left	11.58	10.76		8.08 (4" I-2)				
I-1	4'-0" dia. Overflow Catch Basin Sta. 10+82; 12.16' Left	10.74	--		6.6 (12" I-2)				
I-2	4'-0" dia. Junction Manhole Sta. 10+82; 22.00' Left	11.62	--	7.82 (4" L-0) 6.46 (12" L-1)	6.36 (12" Storage)				
I-3	4' x 6' Outlet Control Manhole Sta. 10+57.50; 22' Left	11.86 11.92	--	5.50 (6" UD Storage) 6.00 (12" Storage)	5.40 (12" I-4)				8.00
I-4	4'-dia. Manhole Sta. 10.79; 10.00' Left	11.22	--	4.44 (12" I-3) Existing (18")	4.39 (18" H-4)				
Underground Storage Sta. 10+61 to 10+78; 19.75' to 24.25' Left			--	6.34		8.00	6.00	11.84 to 11.99	

New Storm Drain	Pipe Diameter (in.)	Length (ft)	Slope (ft/ft)	Grade Difference (ft)
I-0 to I-2	6	5	0.0517	0.26
I-1 to I-2	12	7	0.0200	0.14
I-2 to Storage	12	2	0.0100	0.02
I-3 to I-4	12	6	0.1500	0.90
I-4 to H-4 (I-5)	12	19	0.0100	0.19

NOTES:

1. Underdrains from underground storage and tree box filter to connect to downstream side of I-3 and I-2 respectively.
2. Construct prior to lightweight concrete fill installation (top of storage units are below underside of concrete).
3. Install PVC Backwater Valves in I-2 and E-3 on discharge from underdrains.
4. Manhole I-4 is existing. Core new opening for 12" pipe from I-3.
5. The grade at bottom of excavation for lightweight concrete Sta. 10+50 = Elev. 9.68; Sta. 10.75 = Elev. 9.52.

NOTES: USE ECCENTRIC CATCH BASIN INSTALLED TO MAXIMIZE THE SEPARATION BETWEEN THE CATCH BASIN AND THE EXISTING WATER MAIN IN THE NOTES ON DRAWING C-3.11 FOR BASINS G-1, G-3, I-1 AND J-1.

THE PROPOSED STORM DRAIN SYSTEM SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF PORTLAND TECHNICAL STANDARDS USING ONE OF THE FOLLOWING PIPE MATERIALS:

- **REINFORCED CONCRETE PIPE (RCP) WITH A MINIMUM STRENGTH OF CLASS III**
- **PVC RING TYPE SEWER PIPE (SDR 35 OR EQUIVALENT, MINIMUM PS-46 RATING**
- **P.V.C. RING TYPE SEWER PIPE MEETING ASTM F 789 OR EQUAL TO SDR 35**
- **DUCTILE IRON PIPE (DIP)**
- **ADS N-12 HP TRIPLE-WALL PIPE MEETING A MINIMUM PS-46**
- **ADS SANITITE HP MEETING A MINIMUM PS-46**

ALL JOINTS SHALL BE WATERTIGHT (SILT TIGHT JOINTS ARE NOT PERMITTED). CONTRACTORS SHALL REFER TO THE TECHNICAL SPECIFICATIONS FOR THE PROJECT FOR ADDITIONAL INFORMATION INCLUDING ANY SPECIAL PIPE CLASSES.

ANY PIPELINE WITH LESS THAN 2 FEET OF COVER SHALL BE DUCTILE IRON PIPE

REV	DATE	DESCRIPTION
1	11.14.14	FINAL LEVEL III SUBMISSION TO CITY OF PORTLAND

REVISIONS

STATE OF MAINE · WILLIAM R. MOORE · 13547 · LICENSED PROFESSIONAL ENGINEER · 11/14/14

P.E. WILLIAM R. MOORE
LIC. # 13547

PROJECT
midtown
PORTLAND, MAINE

SHEET TITLE
PROPOSED STORM DRAIN SCHEDULES FOR TREE BOX FILTER SYSTEMS SHEET 1 OF 3

CLIENT
THE FEDERATED COMPANIES

FST 100 YEARS
FAY, SPOFFORD & THORNDIKE
ENGINEERS · PLANNERS · SCIENTISTS
778 MAIN ST, SUITE 8, SOUTH PORTLAND, ME 04106

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DESIGNED:	WGH/BEK	SCALE:	N.T.S.
CHECKED:	WGH/SRB	JOB NO.	SP-M037B
FILE NAME:	3062-GRADE SCHED		
SHEET	C-3.11		