

Data entry date MM/DD/YYYY | **ENVIRONMENT 21 SKETCH PLAN, HYDROLOGY ANALYSIS, AND HYDRAULIC ANALYSIS**

Site/Project	SITE
Municipality	MUNICIPALITY
Engineer	ENGINEER
Owner	OWNER
Contractor	CONTRACTOR
ENV 21 Affiliate	PRECASTER

Trunk sewer travel time	
Longest travel distance, ft	70
Average pipe flow velocity, fps	3.0
Travel time, minutes	0.4
IDF duration at last inlet, minutes	5.0
IDF duration at first inlet, minutes	5.0

Drainage Area Hydrology / Design Storm IDF Values	
Specified return interval	25 years
Specified duration	5.0 minutes
Average intensity	6.0 in/hr
Rainfall depth	0.50 inches

UNISTORM Inspection and Pumpout Interval	
Annual unit pavement pollutant washoff	1000 #/ac/yr
Annual unit roof pollutant washoff	100 #/ac/yr
Pavement pollutant washoff	460 #/yr
Roof pollutant washoff	0 #/yr
Site pollutant washoff load	460 #/yr
Washoff trapped at curbs and inlets	92 #/yr
Washoff trapped in UNISTORM	294 #/yr
Design sediment storage capacity	3093 #
Maximum pumpout interval	10.5 yrs+/-
Recommended inspection interval	1.0 yrs+/-
Design sediment storage capacity	29.5 ft ³
Design sediment storage depth	1.5 ft
Estimated per cent washoff trapped	79.8 %
UNISTORM sump depth	4.5 ft

UNISTORM Dimensioning	
Structure #	WQU (S.)
Model #	5R
Diameter, ft	5
Inlet stage	Outlet stage
Rim 117.30	Rim 117.30
Invert 113.20	Invert 113.10
Invert 113.20	
Invert 113.20	
Floor	108.70

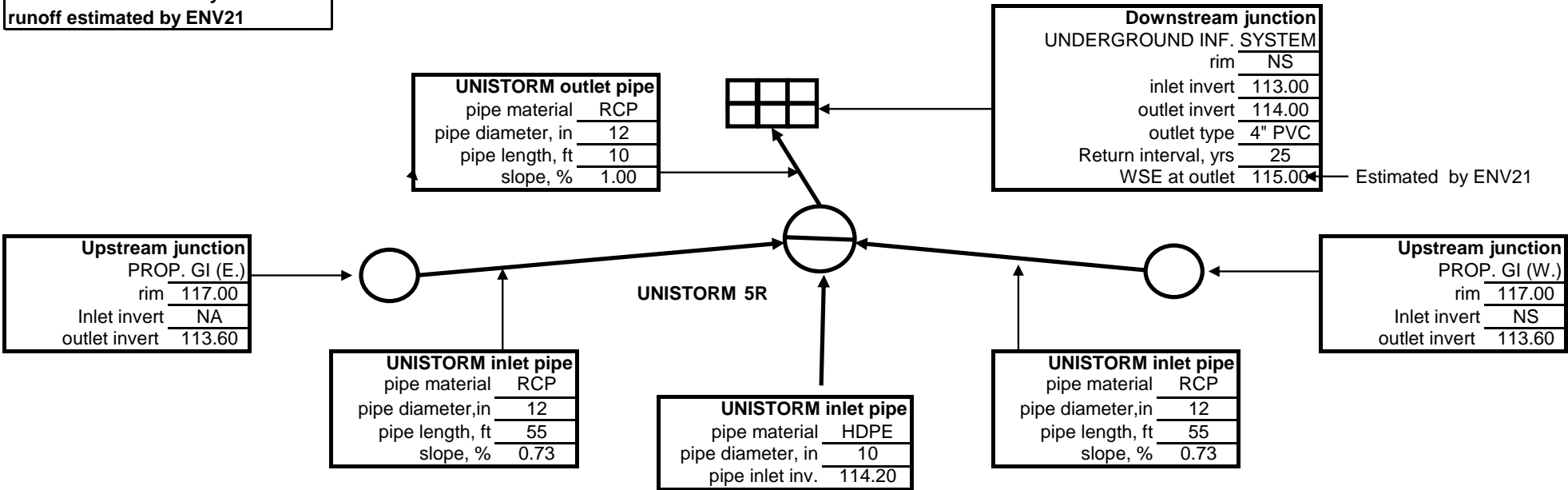
Site Drainage Hydrology for Specified IDF Duration			
Rainfall rate	2.76 cfs	Area, acres	0.46 C
Ponding/bypassing at inlets	0.28 cfs	% paved	100 0.90
Flow entering inlets	2.48 cfs	% roof	0 0.90
Inflow from offsite	0 cfs	% pervious	0 0.30
Total flow entering inlets	2.48 cfs	CA	0.41
C= fraction of rainfall depth entering inlets during specified duration			

Water Quality Volume (WQV)			
Drainage area	0.46 acres	Rainfall	3.82 inches
Impervious area	0.46 acres	Runoff	3.63 inches
Impervious area	100 %	WQV	0.14 ac-ft
Water Quality Rv	0.95	WQV	6060 cf

Water Quality Flow Rate (WQF)			
Average intensity	3.45 in/hr	C	0.90
Event duration	NS minutes	Impervious area	0.5 acres
Annual frequency	NS events/yr	WQFR	1.43 cfs



NOTE: Rainfall intensity and runoff estimated by ENV21

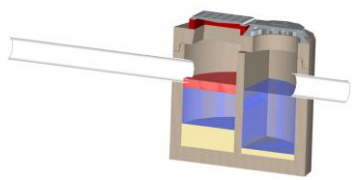


NS = NOT SPECIFIED

SKETCH PLAN



Environment 21, LLC
 8713 Read Road - P.O. Box 55
 East Pembroke, New York 14056
 ph# 585-762-8314
 fax# 585-762-8315
 email: envngr@env21.com



Technical Report

Project: SITE
 Municipality: MUNICIPALITY
 Engineer: ENGINEER
 Owner: OWNER
 Contractor: CONTRACTOR
 Environment 21 Affiliate: PRECASTER

Date: MM/DD/YYYY
 STS# WQU (S.)

ENV 21 Product UNISTORM
 UNISTORM™ Model 5R

Diameter 5 ft
 Surface area 19.6 sf

Drainage Area

Drainage area 0.46 acres
 Paved area 100 %
 Roof area 0 %
 Vegetated area 0 %

Water Quality Volume

Rainfall 3.82 in.
 Water Quality Rv 0.95
 Runoff depth 3.63 inches
 Drainage area 0.5 acres
 Water quality volume 0.14 ac-ft

Design Storm Rainfall IDF Values

Specified return interval 25 years
 Specified duration 5 minutes
 Average intensity 6.00 in/hr
 Rainfall depth 0.5 inches

Water Quality Flow Rate

Runoff coefficient 0.90
 Average Intensity 3.45 in/hr
 Impervious area 0.46 acres
 Water Quality Flow Rate 1.43 cfs

Site Drainage Hydrology for Specified IDF Duration

Rainfall rate 2.8 cfs
 Ponding/bypassing at inlets 0.3 cfs
 Flow entering inlets 2.48 cfs
 Inflow from offsite 0 cfs
 Total flow entering inlets 2.48 cfs
 UNISTORM inlet velocity 1.2 fps



Sediment Pumpout Interval

Hydraulic model: Inline treatment without bypassing

Estimated Composition for Pollutant Washoff Entering UNISTORM

Annual unit pavement pollutant washoff	1000	#/ac/yr
Annual unit roof pollutant washoff	100	#/ac/yr
TSS as silt + bouyant organics	30	wt%
TSS as fine sand	40	wt%
TSS as medium sand	30	wt%
Pavement pollutant washoff	460	#/yr
Roof pollutant washoff	0	#/yr
Site pollutant washoff load	460	#/yr

Storage Capacity for Washoff of Oil-Floatables

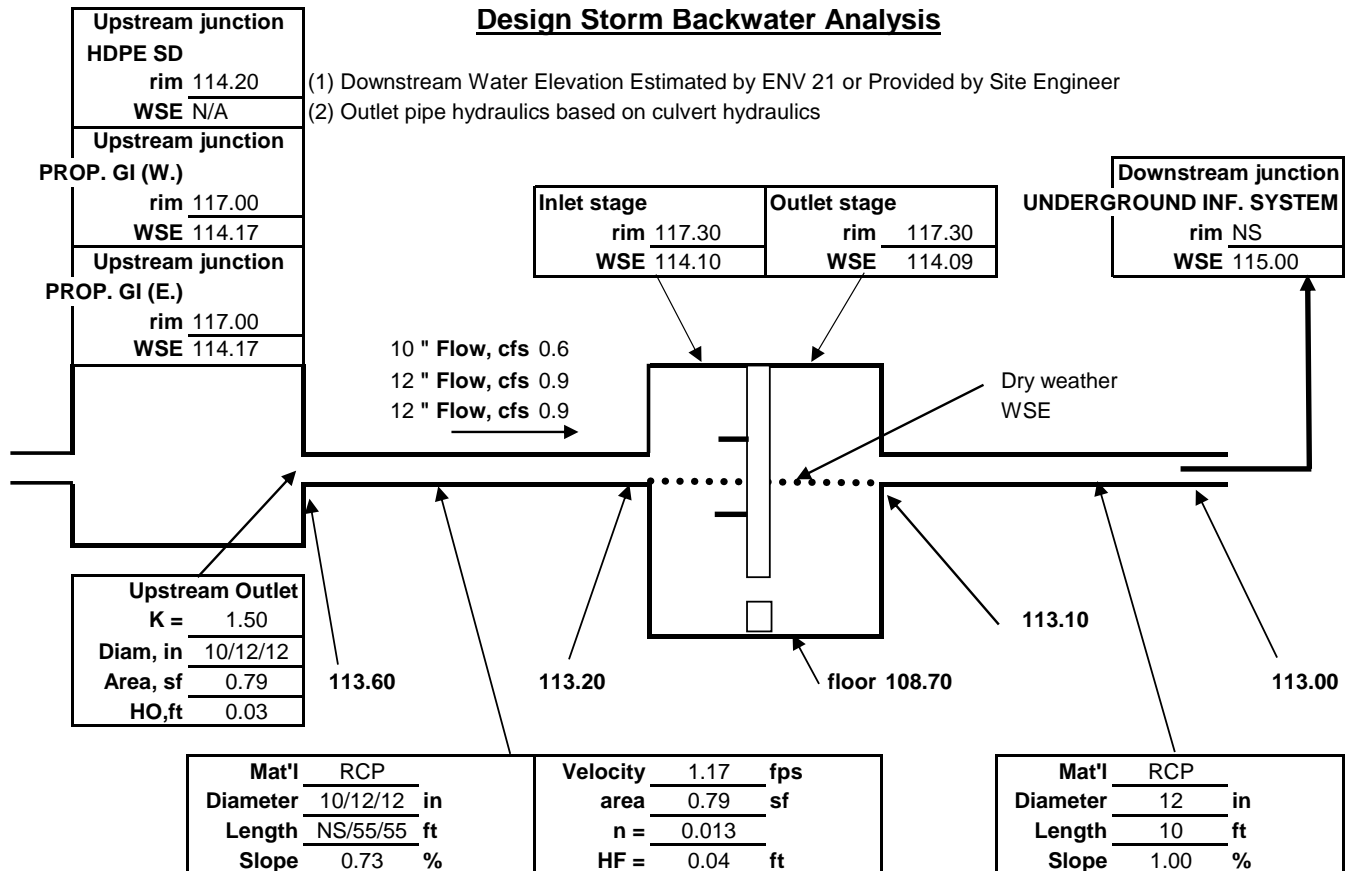
Water surface area	9.8	sf
Floatables depth	1.6	ft
Floatables stored	115.0	gal

Estimated UNISTORM Pumpout Interval

Washoff trapped at curbs and inlets	92	#/yr
Washoff trapped in UNISTORM	294	#/yr
Estimated per cent washoff trapped	79.8	%

UNISTORM sump depth	4.5	ft
Design sediment storage capacity	3093	#
Design sediment storage capacity	29.5	cf
Design sediment storage depth	1.5	ft
Maximum pumpout interval	10.5	yrs+/-
Recommended inspection interval	1.0	yrs+/-

Design Storm Backwater Analysis



Environment 21, LLC

8713 Read Road, P.O. Box 55
 East Pembroke, NY 14056-0055
 Fax: (585) 762-8315
 Web: www.env21.com

Phone: (800) 809-2801

Site/Project: SITE

Location: MUNICIPALITY

Owner: OWNER

Engineer: ENGINEER

Contractor: CONTRACTOR

ENV 21 Affiliate: PRECASTER

Data Entry Date: MM/DD/YYYY

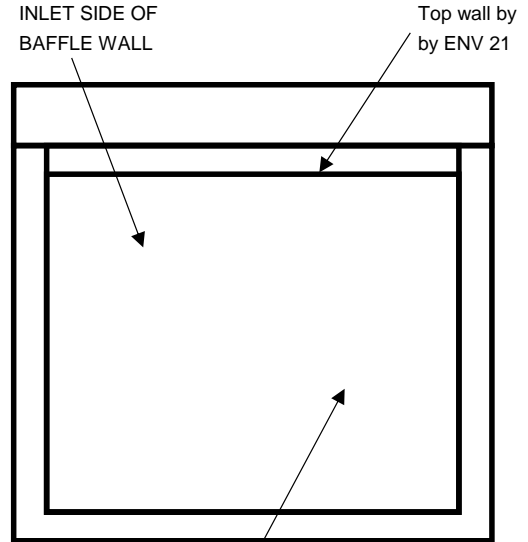
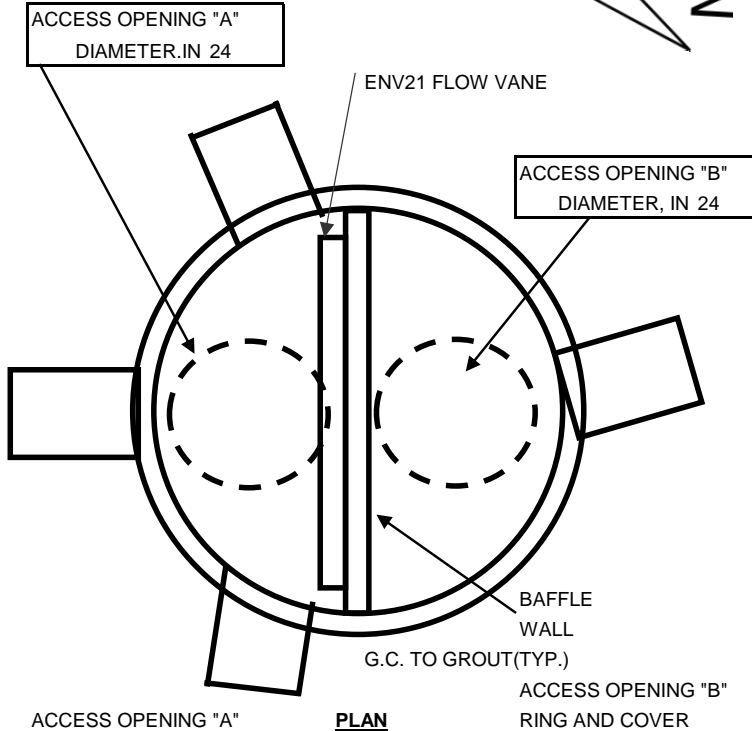


environment21
 Global Stormwater Solutions

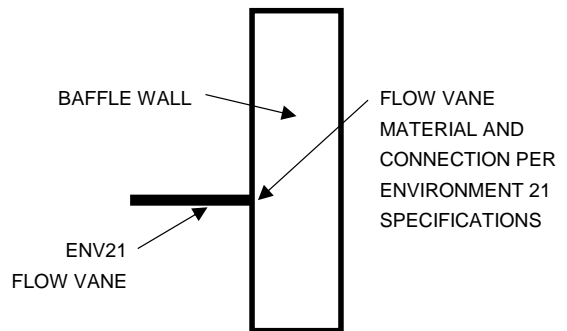
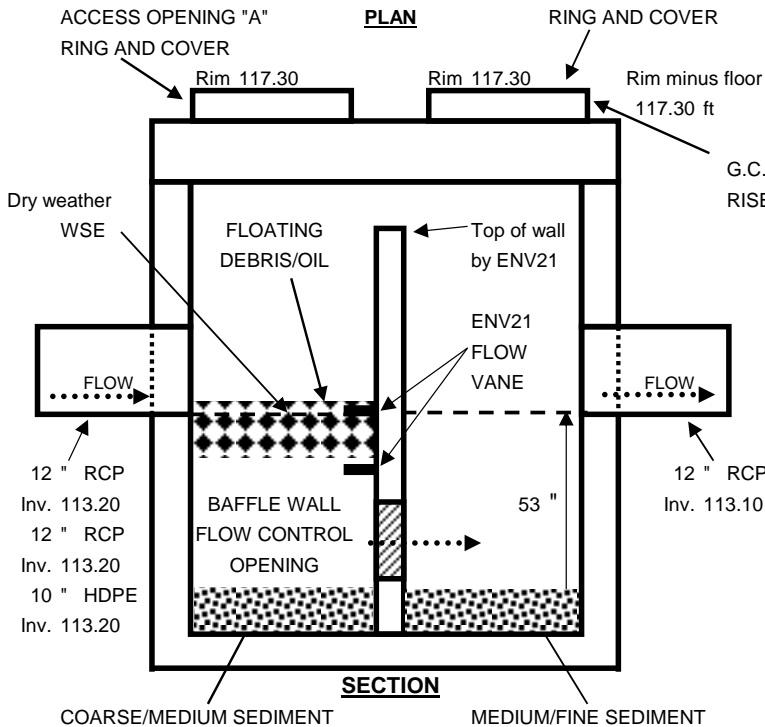
Product Name: UNISTORM

STRUCTURE NO. WQU (S.)	UNISTORM MODEL	5R
	MANHOLE DIAM., FT.	5

DESIGN STORM HYDROLOGY			
Return Interval, yrs	25	Area, acres	0.46
IDF Duration, minutes	5.0	% paved	100
Rainfall rate, cfs	2.76	%roof	0
Flow to Unistorm, cfs	2.48	%vegetation	0



Size, shape, and location of flow control openings determined by Environment 21, LLC



FLOW VANE MOUNTING SCHEMATIC

Environment 21, LLC
 8713 Read Road, P.O. Box 55
 East Pembroke, NY 14056-0055
 Fax: (585) 815-4701
 Web: www.env21.com

Phone: (800) 809-2801

Site/Project: SITE
 Location: MUNICIPALITY
 Owner: OWNER
 Engineer: ENGINEER
 Contractor: CONTRACTOR
 ENV 21 Affiliate: PRECASTER
 Data Entry Date: MM/DD/YYYY



Product Name: UNISTORM

CALCULATED REMOVAL EFFICIENCIES BASED ON ANNUAL RAINFALL DATA

UNISTORM CHAMBER DIMENSIONING

Structure # WQU (S.)
 Model # 5R
 Diameter, ft 5

 Rim el. 117.30
 Inlet invert 113.20
 Outlet invert 113.10
 floor el. 108.70

Area treated by UNISTORM

Area, acres	0.5	C
% paved	100	0.90
% roof	0	3.82
% vegetation	0	0.30
CA	0.41	

WQFR = 1.43 cfs

30 Min. Rainfall Depth (in.)	Rainfall intensity (in/hr)	Water flow rate (cfs)	Percentage of Annual Volume (%)	Percentage of Total Events (%)	Calculated removal efficiency at given flow rate of the 50 micron particle	Calculated critical settling velocity (ft/sec)	SOR (gpm/ft ²)
0.25	0.50	0.21	17.2	72.8	90.11 %	0.01	5
0.50	1.00	0.41	15.8	11.4	63.71 %	0.02	9
0.75	1.50	0.62	13.6	5.9	52.02 %	0.03	14
1.00	2.00	0.83	11.4	3.5	45.05 %	0.04	19
1.25	2.50	1.04	8.8	2.1	40.30 %	0.04	24
1.50	3.00	1.24	7.2	1.4	36.79 %	0.05	28
1.75	3.50	1.45	5.9	1.0	34.06 %	0.06	33
2.00	4.00	1.66	3.9	0.6	31.86 %	0.07	38
2.25	4.50	1.86	4.1	0.5	30.04 %	0.08	43
2.50	5.00	2.07	2.8	0.3	28.49 %	0.09	47
2.75	5.50	2.28	1.5	0.2	27.17 %	0.10	52
3.00	6.00	2.48	6.7	0.2	26.01 %	0.11	57
3.25	6.50	2.69	0.5	0.0	24.99 %	0.11	62
3.50	7.00	2.90	0.7	0.1	24.08 %	0.12	66
3.75	7.50	3.11	0.6	0.0	23.27 %	0.13	71
4.00	8.00	3.31	0.3	0.0	22.53 %	0.14	76
4.25	8.50	3.52	0.7	0.0	21.85 %	0.15	80
4.50	9.00	3.73	0.4	0.0	21.24 %	0.16	85
4.75	9.50	3.93	0.2	0.0	20.67 %	0.17	90
5.00	10.00	4.14	0.8	0.0	20.15 %	0.18	95
5.25	10.50	4.35	0.2	0.0	19.66 %	0.18	99
5.50	11.00	4.55	0.0	0.0	19.21 %	0.19	104
5.75	11.50	4.76	0.7	0.0	18.79 %	0.20	109
6.00	12.00	4.97	0.0	0.0	18.39 %	0.21	114
6.25	12.50	5.18	0.5	0.0	18.02 %	0.22	118
6.50	13.00	5.38	0.0	0.0	17.67 %	0.23	123
6.75	13.50	5.59	0.0	0.0	17.34 %	0.24	128
7.00	14.00	5.80	0.0	0.0	17.03 %	0.25	133
7.25	14.50	6.00	0.3	0.0	16.73 %	0.25	137
7.50	15.00	6.21	0.0	0.0	16.45 %	0.26	142
7.75	15.50	6.42	0.0	0.0	16.18 %	0.27	147
8.00	16.00	6.62	0.0	0.0	15.93 %	0.28	152
8.25	16.50	6.83	0.0	0.0	15.69 %	0.29	156
8.35	16.70	6.91	0.0	0.0	15.59 %	0.29	158

Based on a particle size of 50 microns, and
 the percentage of total storm events, the average
 annual estimated removal efficiency = →

80%

Notes:

1. Based on DETPOND Detention Pond Treatment Model by Robert Pitt.
2. Critical settling velocity calculation based on the application of Stokes Law using the water flow rate, a partial specific gravity of 2.65 and a chamber surface area of 19.63 square feet.
3. Rainfall Depth, Percentage of Total Events, and Percentage of Annual Volume data was obtained at [INSERT RAINSTATION LOCATION HERE].