CONSTRUCTION BMPs
(and Maintenance)
for
POST-CONSTRUCTION BMPs

Hawaii State Department of Transportation
Highways Division, Oahu District

PROTECT OUR WATER
MĀLAMA I KA WAI

TRASH FREE HAWAI'I

Storm Water Management Program Elements

PUBLIC EDUCATION AND OUTREACH

ILLICIT DISCHARGE DETECTION AND ELIMINATION

CONSTRUCTION SITE RUNOFF CONTROL

POST-CONSTRUCTION STORM WATER MANAGEMENT IN NEW DEVELOPMENT AND REDEVELOPMENT

POLLUTION PREVENTION/GOOD HOUSEKEEPING DEBRIS CONTROL BMPS

POLLUTION PREVENTION/GOOD HOUSEKEEPING CHEMICAL APPLICATIONS BMPS

POLLUTION PREVENTION/GOOD HOUSEKEEPING EROSION CONTROL BMPS

POLLUTION PREVENTION/GOOD HOUSEKEEPING MAINTENANCE ACTIVITIES BMPS

INDUSTRIAL AND COMMERCIAL ACTIVITIES DISCHARGE MANAGEMENT

MUNICIPAL INDUSTRIAL FACILITIES

MONITORING

TOTAL MAXIMUM DAILY LOAD

REPORTING

Post-Construction (Permanent) BMPs & LID

Post-Construction Best Management Practice (PBMP):

A BMP that will remain in place following construction to minimize the discharge of pollutants from activities on-site.

Low Impact Development (LID):

PBMPs that attempt to mimic predevelopment site hydrology by using site design techniques that store, infiltrate, evaporate, and detain runoff.

Post-Construction (Permanent) BMP Requirement Triggers

Unified Criteria (Permanent BMP Manual)

- "All non-exempt projects (new development or redevelopment) that disturb an area of one (1) acre or more of land are required to be reviewed for storm water controls."
- Also, smaller projects that have the potential to pollute:
  - Retail Gasoline Outlets with at least 10,000 SF Area
  - Carwashes with at least 10,000 SF Area
  - Auto Repair Shops with at least 10,000 SF Area
  - Restaurants with at least 10,000 SF Area
  - Parking Lots with at least 10,000 SF Area

PERMANENT BMP REQUIREMENT TRIGGERS

Post-Construction (Permanent) BMP Requirement Triggers

Permanent BMPs are also being constructed and installed under other SWMP programs:

- Action Plan for Retrofitting Structural BMPs
- Total Maximum Daily Load Implementation and Monitoring Plans (Waste Load Allocations)
- Erosion Control BMPs Program
- Action Plan to Address Erosional Outfalls
- Trash Reduction Plan

Once complete, these PBMPs are tracked, inspected, and maintained under the Post-Construction Program.

Post-Construction (Permanent) BMP Construction Considerations

- Proper construction and installation techniques are critical for the optimal long-term function of PBMPs.
- Structural PBMP treatment device projects typically include a 9 to 12-month maintenance period.
- Vegetative PBMP projects typically include a plant establishment period followed by a maintenance period.

HDOT Highways, Oahu District

Typical Post-Construction BMPs

Erosion Repair

Erosion Repair

Erosion Repair

Erosion Repair

Grass Swale/Bioswale (LID)

Grass Swale:

Vegetated Drainage Channel or Depression for Surface Storm Water Flow

Bioswale:

Vegetated Drainage Channel or Depression on top of Engineered Soils and that provide Biofiltration, sometimes includes storage layer or underdrain.

Bioswale with Underdrain

Bioswale, H-3 Kaneohe

Bioswale, H-3 Kaneohe

Bioswale, H-3 Kaneohe

Bioswale, H-3 Kaneohe

Bioswale, H-3 Kaneohe

Example Bioswale Construction Specifications

COMPOSITION- BIORETENTION SOIL MIX (BSM)							
TEST PROPERTY	**TEST METHOD**	**TEST VALUE AND AMENDMENT**					
Debris	—	920.01.05(a)(2)					
Textural Analysis	T 88	Particle		% Passing by Weight			
		Size	mm	Minimum		Maximum	
		Sand	2.0 – 0.050	55		85	
		Silt	0.050 – 0.002	–		20	
		Clay	less than 0.002	1		8	
Soil pH	D 4972	pH of 5.7 to 7.1.					
Organic Matter	T 194	Minimum 1.5 % by weight.					
Nutrient Analysis and Soluble Salts	Mehlich-3	Concentration					
		Element	Minimum		Maximum		
			ppm	FIV	ppm	FIV	
		Calcium (Ca)	32	25	no limit	no limit	
		Magnesium (Mg)	15	25	no limit	no limit	
		Phosphorus (P)	18	25	92	100	
		Potassium (K)	22	25	no limit	no limit	
		Sulfur (SO4)	25	n/a	no limit	no limit	
	EC1:2 (V:V)	Soluble Salts	40	n/a	500	n/a	

Downspout Filter Box

Curb Inlet Screens
Automatic Retractable Screens (ARS)

Curb Inlet Screens
Automatic Retractable Screens (ARS)

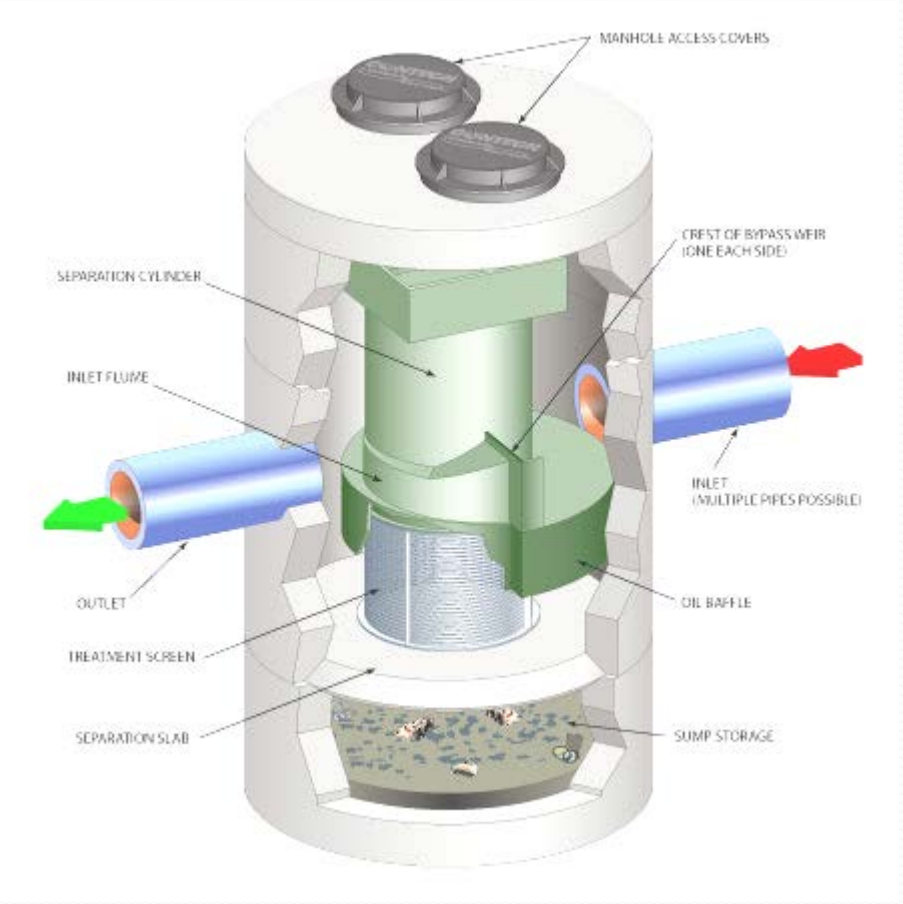
Curb Inlet Screens
Automatic Retractable Screens (ARS)

Grate Inlet Skimmer Box (GISB)
Grate Inlet Filter (CBF)

Grate Inlet Skimmer Box (GISB)

Hydrodynamic Separators

Continuous Deflection Separation (CDS) Unit



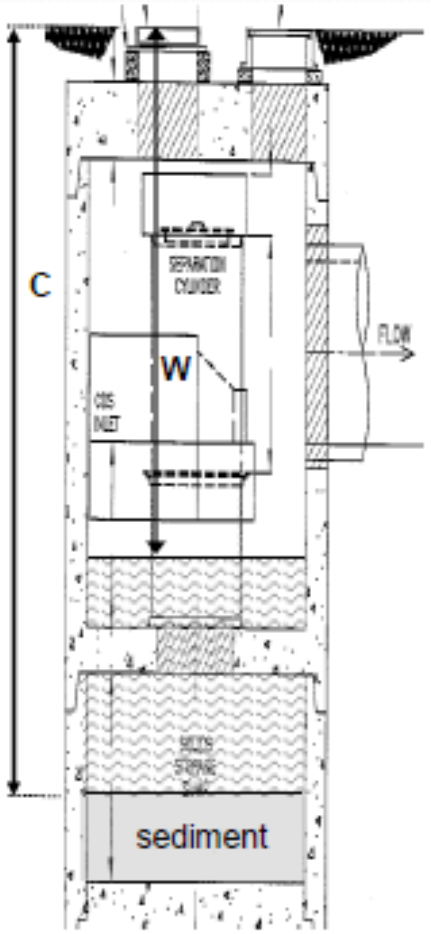
Continuous Deflection Separation (CDS) Maintenance

Continuous Deflection Separation (CDS) Maintenance

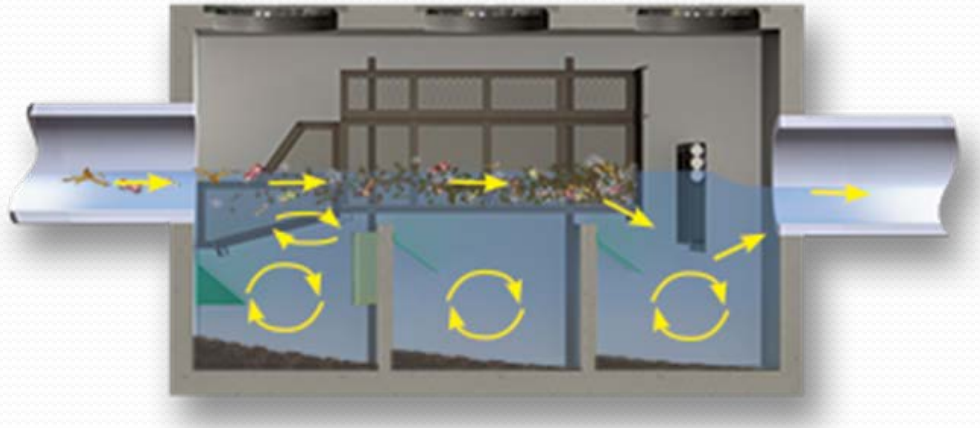
Unit Name	BMP ID	PID	Downstream Feature PID	Unit Model	Height (feet, in.)	
					Grade to floor	Cleaning Depth C_{cutoff}
Inlet 1	CDSU 1	800001	600369	PMS U20_20	11'	9', 4"
Inlet 2	CDSU 2	800002	501489	PSWC40_40	24', 6"	22', 7"
Inlet 3	CDSU 3	800003	505165	PMSUC30_30	15', 7"	14', 1"
Inlet 4A	CDSU 4A	800004	511841	PMIU20_15_5	9', 7"	8', 5"
Inlet 4B	CDSU 4B	800005	511840	PMIU20_15_5	9', 6"	8', 4"
Inlet 4C	CDSU 4C	800006	511837	PMIU20_15_5	9', 2"	8', 1"
Inlet 5	CDSU 5	800007	510536	PMSU40_30	15', 8"	13', 5"
Inlet 9B	CDSU 9B	800008	47446 (CCH)	PMSU30_30	21', 5"	20, 11"
Inlet 10	CDSU 10	800009	511825	PMSU40_30	17', 1"	15, 9"

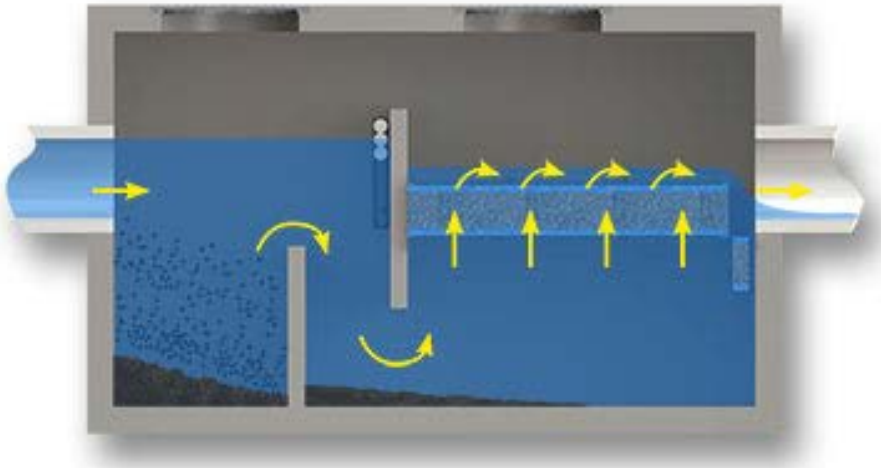
W = _____ in.
(depth to water level in CDS unit from grade)

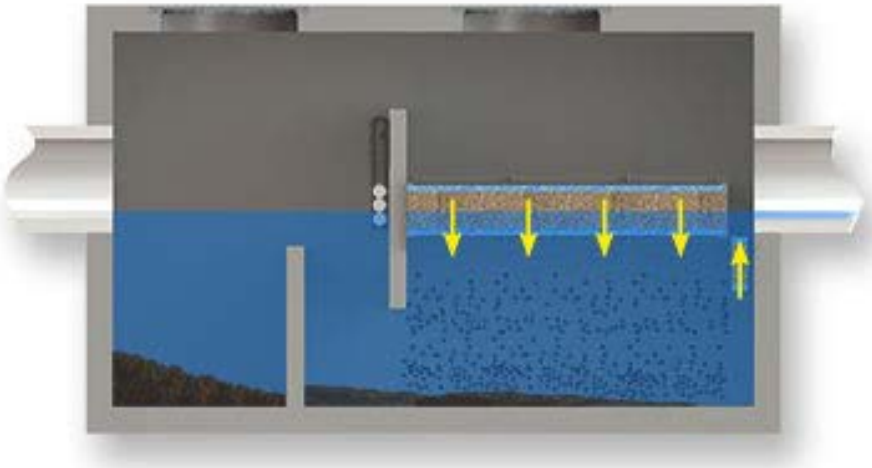
C = _____ in.
(depth from grade to bottom of collected solids/sediment)



Nutrient Separating Baffle Box (NSBB) and Water Polisher







Nutrient Separating Baffle Box (NSBB)

Nutrient Separating Baffle Box (NSBB)

Observations During Construction
NSBB Plus Water Polisher

Observations During Construction NSBB Plus Water Polisher

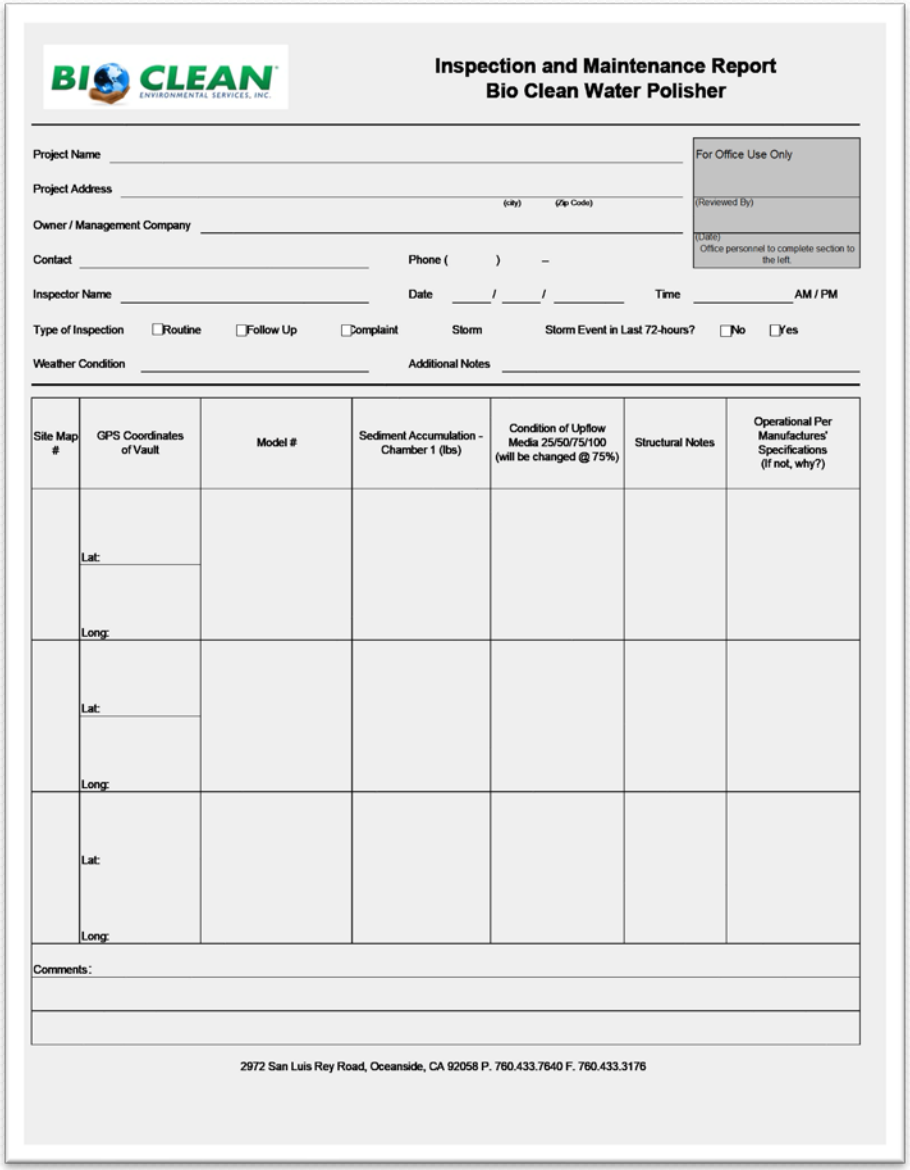
NSBB/Water Polisher Maintenance

NSBB/Water Polisher Maintenance

NSBB/Water Polisher Maintenance

Water Polisher Filter Maintenance

NSBB/Water Polisher Maintenance



BIO CLEAN ENVIRONMENTAL SERVICES, INC.

Inspection and Maintenance Report
Bio Clean Water Polisher

Project Name _____

Project Address _____ (city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/_____ Time _____ AM / PM

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Type of Inspection ☐Routine ☐Follow Up ☐Complaint Storm Storm Event in Last 72-hours? ☐No ☐Yes

Weather Condition _____ Additional Notes _____

Site Map #	GPS Coordinates of Vault	Model #	Sediment Accumulation - Chamber 1 (lbs)	Condition of Upflow Media 25/50/75/100 (will be changed @ 75%)	Structural Notes	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:					
	Lat: Long:					
	Lat: Long:					

Comments:

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Questions?

www.stormwaterhawaii.com

www.trashfreehawaii.com