

### FILTER FLOW CALCULATIONS

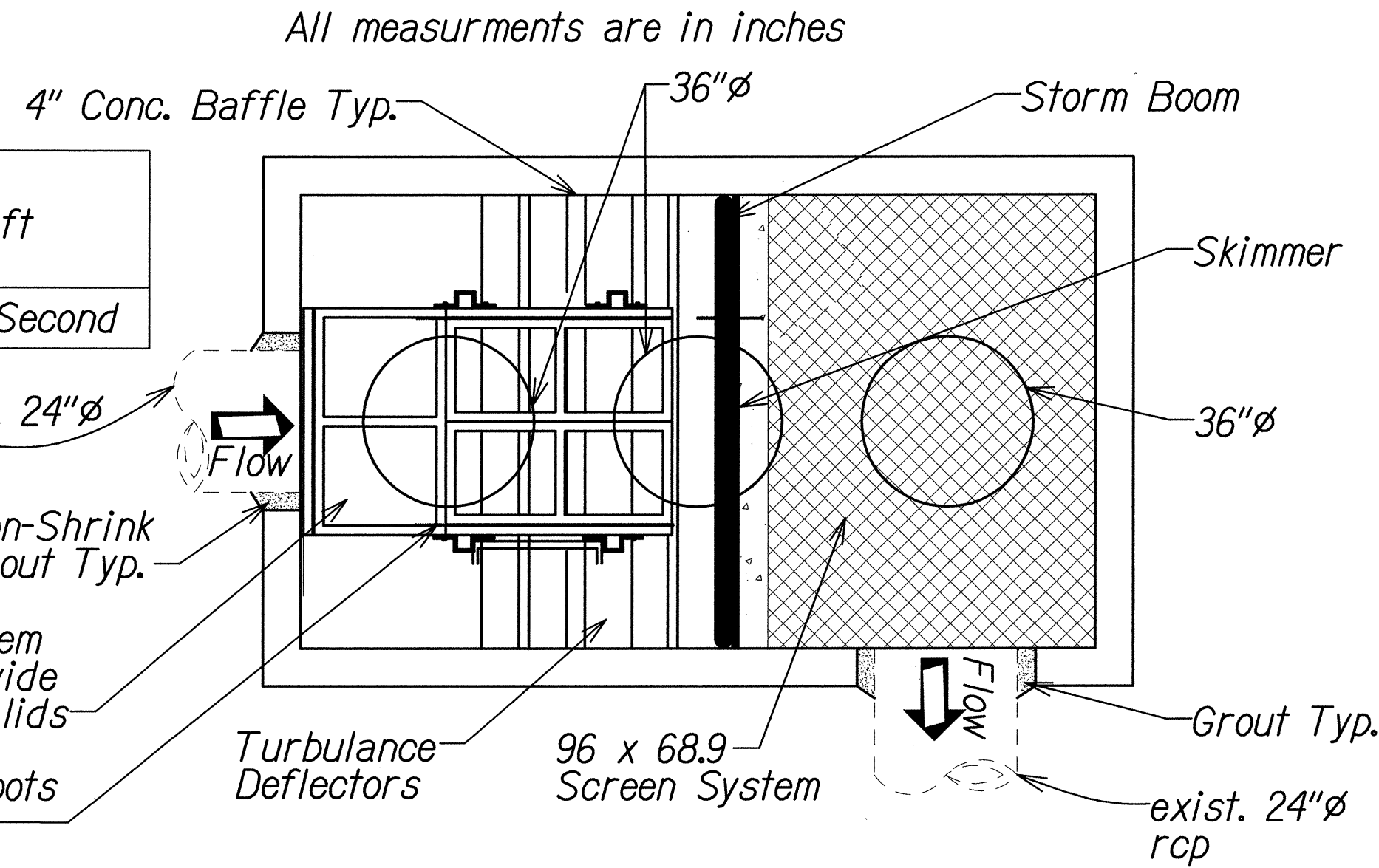
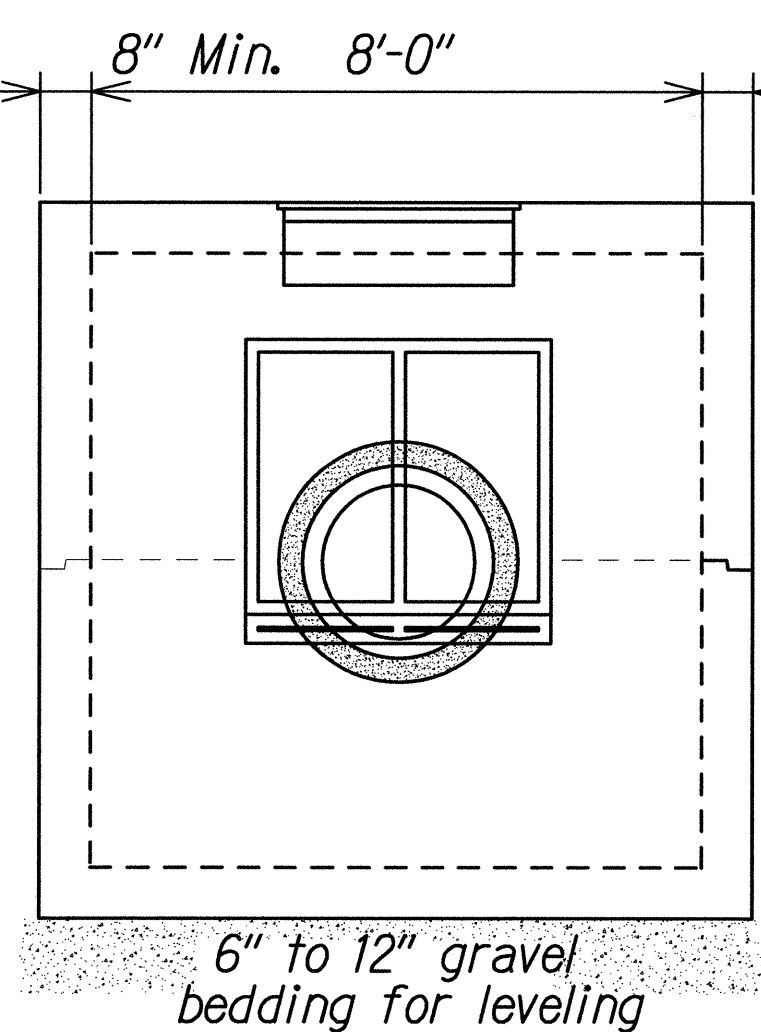
UP FLOW Media Surface Area (flat)	46 sq ft
Hydraulic Conductivity (BioMediaGREEN)	.0138 Feet/Second
Available Head	21"
MAX Media Filter Flow Rate (no clogging)	5.07 CFS
Safety Factor	2
Media Filter Flow Rate (accounts for clogging)	2.54 CFS
PEAK DESIGN FLOW	TBD

BIOMEDIA GREEN TESTED REMOVAL EFFICIENCIES	
Total Suspended Solids "Si-Co-Sil 106"	85%
Dissolved Phosphorus	69%
Fecal Coliform	68%
Dissolved Copper	79%
Dissolved Lead	98%
Dissolved Zinc	78%
Dissolved Mercury	71%
TPH	99%

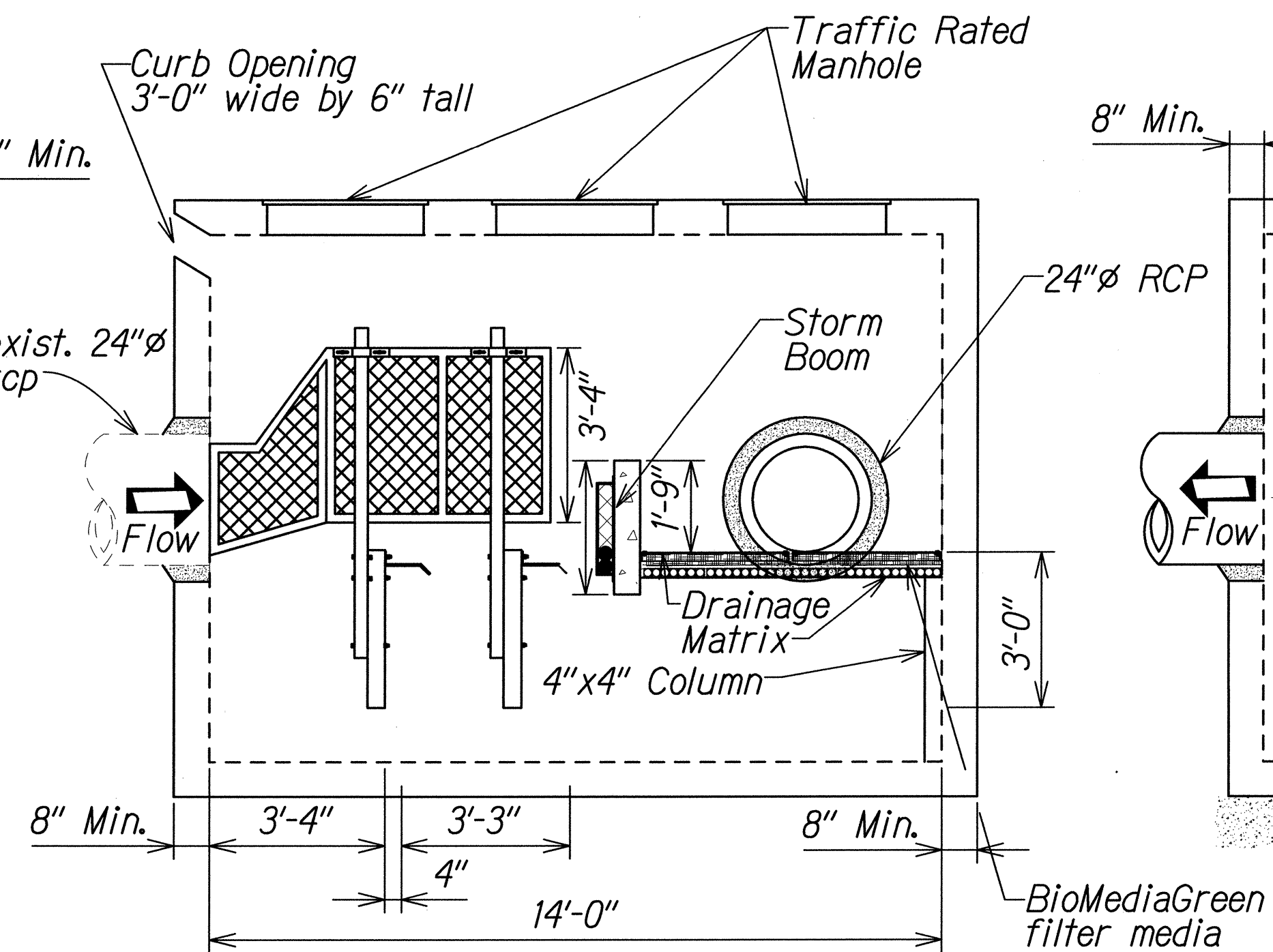
#### NOTES:

- Complies with ASTM C 858
- The shop drawings provide information on the storm filter, filter media and accessory equipment including principle dimensions, filter placement, location of fittings and unit foundation.
- This is a passive treatment system. Up flow vertical media filter.
- Media cartridges easily replaceable and can incorporate a variety of filter media.
- See manufacturer's representative regarding recommendations for specified equipment.
- Manhole Frames and Covers shall be cast iron conforming to ASTM A48/A48M, Class No. 30, see standard Specs. These manhole covers are equipped with recesses lift handle and a locking latch. The manhole covers shall meet HL-93 loading requirements. Ladders shall be constructed of aluminum and steel reinforced copolymer conforming to ASTM D 4101. Ladder shall meet all ASTM C 497M. Steps shall conform with ASTM C 478.

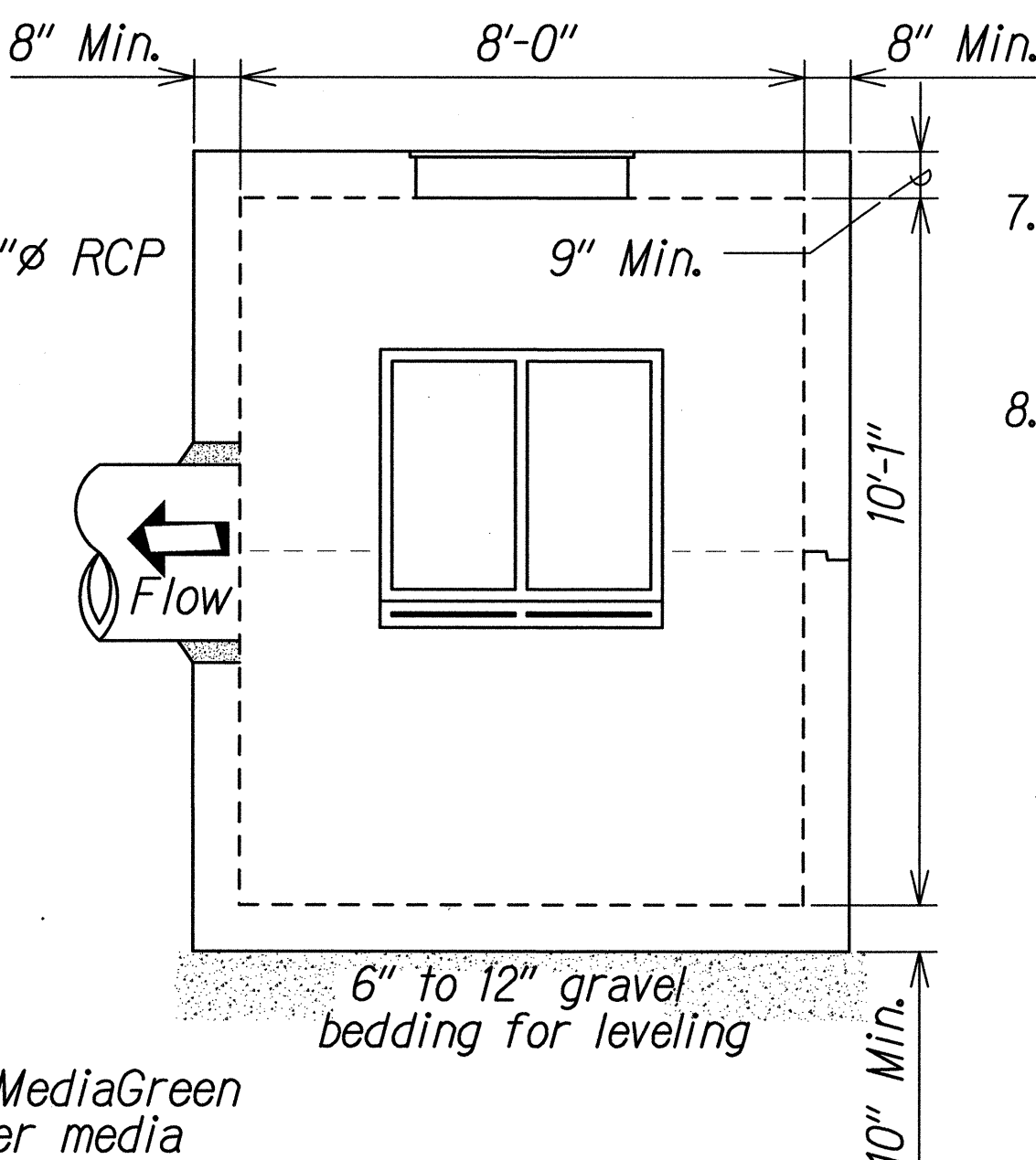
#### LEFT END VIEW



#### FRONT VIEW



#### RIGHT END VIEW

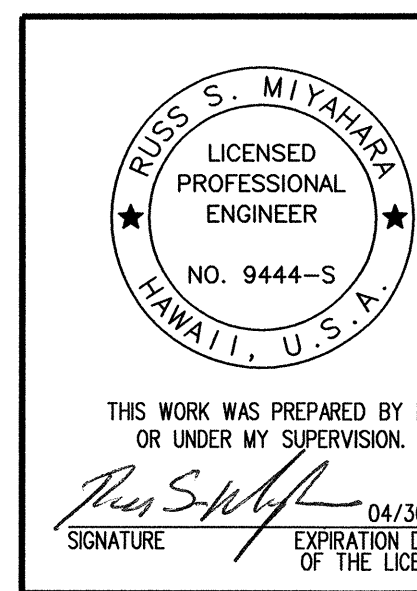


## BIOCLEAN ENVIRONMENTAL NSBB-WATER POLISHER-UP FLOW MEDIA FILTER DESIGN DETAILS

NTS

#### NOTES:

- Concrete 28 day compressive strength  $f_c=5,000$  psi
- Reinforcing: ASTM A-615, grade 60, deformed bars.
- Loads:
  - A: Dead load: Concrete weight=160 pcf
  - B: Live load: HL-93 as indicated by AASHTO LRFD specifications.
  - C: Soil properties:
    - Soil dry weight=120 pcf
    - At-Rest pressure=50 pcf
    - Passive pressure=300 pcf
    - Coefficient of friction=0.4
    - Allowable bearing pressure=3,000 psf
- Joint sealant: Butyl rubber SS-S-00210.
- Unless otherwise noted, all walls shall be 8 inch thick minimum. Top slab shall be 9 inch thick minimum. Bottom slab shall be 10 inch thick minimum.
- Concrete cover reinforcement:
  - A: Top slab: 2 1/2 inch for reinforcement at exterior face; 2 inch for reinforcement at interior face.
  - B: Bottom slab 3 inch for reinforcement at exterior face; 2 inch for reinforcement at interior face.
  - C: Wall: 2 inch for reinforcement at exterior face and interior face.
- Filter material and structural backfill material A shall conform with the requirements of 2005 HDOT Standards Specifications Subsections 206.03.
- The BMP drawings and calculations shall be prepared, designed, stamped, and signed under the supervision of a civil and structural engineer licensed in the State of Hawaii as required in Section 627.



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**MISCELLANEOUS DETAIL**  
**KANEOHE BAY DRIVE BMP RETROFIT**  
**MISCELLANEOUS PERMANENT BEST**  
**MANAGEMENT PRACTICES ON OAHU**  
PROJECT NO. HWY-0-02-11R  
Scale: NTS Date: April, 2014