

SEDIMENT BASIN #1 (SB1) COMPUTATIONS

1992 3.14

TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET
(with or without an emergency spillway)

Project: Walmart Leesburg
Location: NORTHWEST CORNER OF SITE NEAR HAWLING FARM BOULEVARD
Basin #: SB1
Total area draining to basin: 0.80 acres

Basin Volume Design

Wet Storage:

- Minimum required volume = 67 cu. yds. ± Total Drainage Area (acres).
67 cu. yds. ± 0.80 acres = 657 cu. yds.
- Available basin volume = 752 cu. yds. at elevation 350.30. (From storage - elevation curve)
- Excavate 752 cu. yds. to obtain required volume.
* Elevation corresponding to required volume = invert of the dewatering orifice.
- Available volume before cleanout required.
33 cu. yds. ± 11.23 acres = 371 cu. yds.
- Elevation corresponding to cleanout level = 348.30. (From Storage - Elevation Curve)
- Distance from invert of the dewatering orifice to cleanout level = 1.0 ft. (Min. = 1.0 ft.)

Dry Storage:

- Minimum required volume = 67 cu. yds. ± Total Drainage Area (acres).
67 cu. yds. ± 11.23 acres = 752 cu. yds.

SOURCE: VA DSWC III - 112

SEDIMENT BASIN #2 (SB2) COMPUTATIONS

1992 3.14

TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET
(with or without an emergency spillway)

Project: Walmart Leesburg
Location: SOUTHWEST CORNER OF SITE NEAR HAWLING FARM BOULEVARD
Basin #: SB2
Total area draining to basin: 7.80 acres

Basin Volume Design

Wet Storage:

- Minimum required volume = 67 cu. yds. ± Total Drainage Area (acres).
67 cu. yds. ± 7.80 acres = 323 cu. yds.
- Available basin volume = 523 cu. yds. at elevation 347.5. (From storage - elevation curve)
- Excavate 523 cu. yds. to obtain required volume.
* Elevation corresponding to required volume = invert of the dewatering orifice.
- Available volume before cleanout required.
33 cu. yds. ± 7.80 acres = 371 cu. yds.
- Elevation corresponding to cleanout level = 347.50. (From Storage - Elevation Curve)
- Distance from invert of the dewatering orifice to cleanout level = 1.0 ft. (Min. = 1.0 ft.)

Dry Storage:

- Minimum required volume = 67 cu. yds. ± Total Drainage Area (acres).
67 cu. yds. ± 7.80 acres = 523 cu. yds.

SOURCE: VA DSWC III - 112

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- Total available basin volume at crest of riser* = 1535 cu. yds. at elevation 351.50. (From Storage - Elevation Curve)
* Minimum = 134 cu. yds./acre of total drainage area.
- Diameter of dewatering orifice = 6 inches.
- Diameter of flexible tubing = 3 inches (diameter of dewatering orifice plus 2 inches).

Principal Spillway Design

- Crest of Riser = 351.50
Top of Dam = 355.00
Design High Water = 352.00
Upstream Toe of Dam = 348.00

Basin Shape:

- Length of Flow Effective Width $L_e = 0.25$
If > 2, baffles are not required
If < 2, baffles are required YES

Runoff:

- $Q_2 = 31.85$ cfs (From Chapter 5) $Q = CIA$
 $Q = (0.60)(5.7)(30.80) = 31.85$ CFS
- $Q_{25} = 48.85$ cfs (From Chapter 5) $Q = CIA$
 $Q = (0.60)(8.27)(75.80) = 48.85$ CFS

Emergency Spillway Design

- With emergency spillway, required spillway capacity $Q_3 = Q_2 + Q_4 = 76.8$ cfs (over and beyond)
- Without emergency spillway, required spillway capacity $Q_3 = Q_2 = 48.85$ cfs (over and beyond)

SOURCE: VA DSWC III - 113

1992 3.14

- With emergency spillway:
Assumed available head (h) = 1.0 ft. (Using Q_2)
b = Crest of Emergency Spillway Elevation - Crest of Riser Elevation
- Without emergency spillway:
Assumed available head (h) = 1.0 ft. (Using Q_2)
h = Design High Water Elevation - Crest of Riser Elevation

Final Design Elevation:

- Riser diameter (D_r) = 48 inches. Actual head (h) = 1.2 ft. (From Plate 3.14-B)
- Barrel length (l) = 30.00 ft.
Head (H) on barrel through embankment = 4.12 ft. (From Plate 3.14-7)
- Barrel diameter = 24 inches.
(From Plate 3.14-B (concrete pipe) or Plate 3.14-A (corrugated pipe)).
- Trash rack and anti-vortex device
Diameter = 72 inches.
Height = 21 inches.
(From Table 3.14-D)

Emergency Spillway Design

- Required spillway capacity $Q_3 = Q_{25} - Q_4 = 76.8$ cfs.
- Bottom width (b) = 10.0 ft.; the slope of the exit channel (s) = 1:1.0; and the minimum length of the exit channel (L) = 10.0 ft. (From Table 3.14-C)

SOURCE: VA DSWC III - 114

1992 3.14

- Anti-Slope Collar Design
Depth of water at principal spillway crest (Y) = 3.0 ft.
Slope of upstream face of embankment (Z) = 2:1.
Slope of principal spillway barrel (S_b) = 2:1.
Length of barrel in saturated zone (L_s) = 24 ft.
Number of collars required = 2 dimensions = 2.8 x 2.8 ft. (from Plate 3.14-12)

Final Design Elevation:

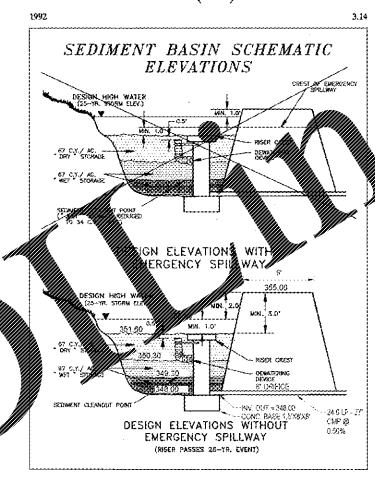
- Top of Dam = 355.00
Design High Water = 352.00
Emergency Spillway Crest = 350.00
Principal Spillway Crest = 351.50
Dewatering Orifice Invert = 350.50
Cleanout Elevation = 348.30
Elevation of Upstream Toe of Dam or Excavated Bottom of "Wet Storage Area" (if excavation was performed) = 348.00

DEWATERING ORIFICE CALCULATIONS

NOTE: THE SEDIMENT BASIN VOLUME IS DESIGNED TO HANDLE A LARGER DRAINAGE AREA THAN THE ACTUAL DRAINAGE AREA DURING PHASE II. THE RISER STRUCTURE AND OUTFALL PIPE ARE DESIGNED TO HANDLE THE ACTUAL DRAINAGE AREA. AS SUCH, THE PROPOSED DESIGN IS APPROPRIATE.

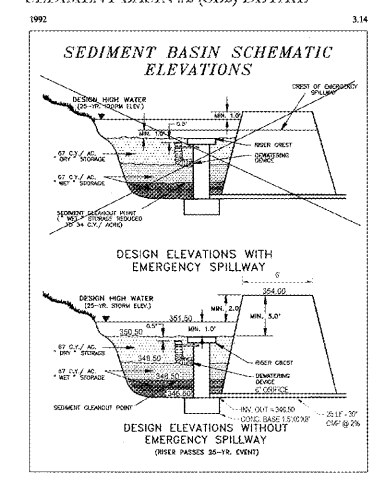
SOURCE: VA DSWC III - 114

SEDIMENT BASIN #1 (SB1) DETAIL



Source: VA DSWC Plate 3.14-2 III - 83

SEDIMENT BASIN #2 (SB2) DETAIL



Source: VA DSWC Plate 3.14-2 III - 83

DEVELOPER/OWNER:
WALMART REAL ESTATE BUSINESS TRUST
MAIL STOP 5570
2001 SE 10TH STREET
BENTONVILLE, AR
72716-5570
479-204-3514

SITE OPERATOR/GENERAL CONTRACTOR:
SUPERINTENDENT:

IMPORTANT: GC MUST SIGN ALL PLAN SHEETS AND ANY NEW PLAN SHEETS ISSUED BY THE GC.

EROSION AND SEDIMENT CONTROL COMPUTATIONS

REVISIONS	BY
REVISION PER COUNTY AND TOWN COMMENTS	
REVISION PER COUNTY AND TOWN COMMENTS	
REVISION PER COUNTY AND TOWN COMMENTS	

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WALMART SUPERCENTER #1904-005 - SPAM #1
CATOCTIN ELECTION DISTRICT
LEESBURG, LOUDOUN COUNTY, VA
WAL-MART STORES, INC.
BENTONVILLE, AR

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