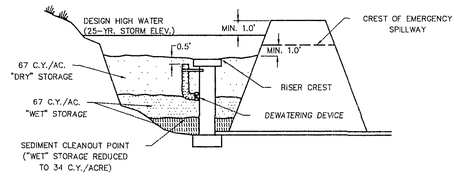
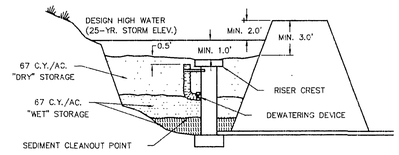
SEDIMENT BASIN SCHEMATIC ELEVATIONS

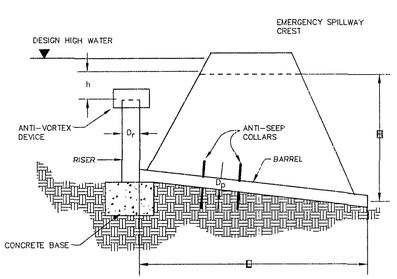


DESIGN ELEVATIONS WITH EMERGENCY SPILLWAY



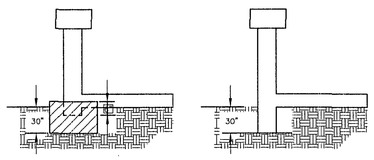
DESIGN ELEVATIONS WITHOUT EMERGENCY SPILLWAY
(RISER PASSES 25-YR. EVENT)

PRINCIPAL SPILLWAY DESIGN



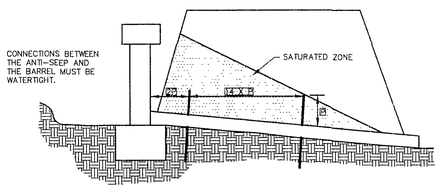
H = HEAD ON PIPE THROUGH EMBANKMENT
h = HEAD OVER RISER CREST
L = LENGTH OF PIPE THROUGH EMBANKMENT
D_p = DIAMETER OF PIPE THROUGH EMBANKMENT
D_r = DIAMETER OF RISER

RISER PIPE BASE CONDITIONS



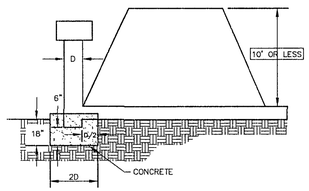
TYPICAL CONCRETE BASE TYPICAL STEEL BASE

ANTI-SEEP COLLAR

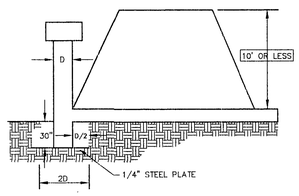


RISER PIPE BASE CONDITIONS FOR EMBANKMENTS LESS THAN 10' HIGH

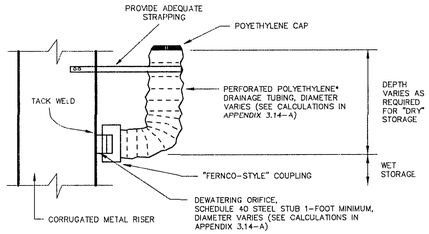
CONCRETE BASE FOR EMBANKMENT 10' OR LESS IN HEIGHT



STEEL BASE FOR EMBANKMENT 10' OR LESS IN HEIGHT



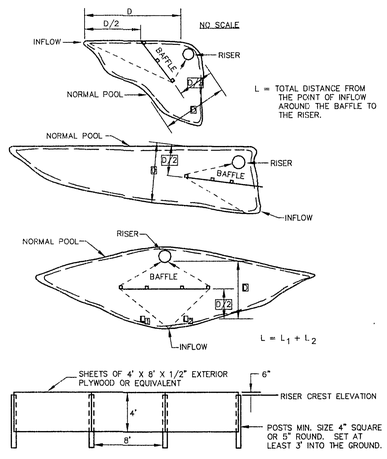
RECOMMENDED DEWATERING SYSTEM FOR SEDIMENT BASINS



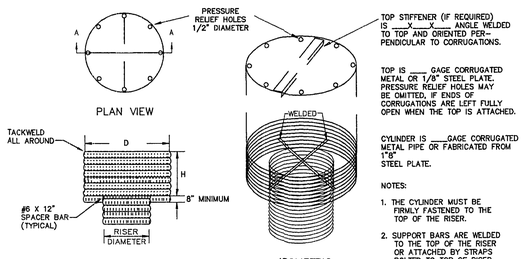
NOTE: WITH CONCRETE RISER, USE PVC SCHEDULE 40 STUB FOR DEWATERING ORIFICE

*DRAINAGE TUBING SHALL COMPLY WITH ASTM F667 AND AASHTO M294

EXAMPLE PLAN VIEWS OF BAFFLE LOCATIONS IN SEDIMENT BASINS



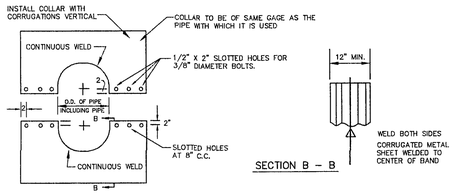
ANTI-VORTEX DEVICE DESIGN



Riser Diam., in.	Cylinder: Diameter, Inches	Cylinder: Thickness, gage	Height, Inches	Minimum Size Support Bar	Minimum Top: Thickness	Minimum Top: Stiffener
12	18	16	6	#6 Rebar or 1 1/2 x 1 1/2 x 3/16 angle	16 ga. (F&C)	–
15	21	16	7	" "	" "	–
18	27	16	8	" "	" "	–
21	30	16	11	" "	16 ga.(C), 14 ga. (F)	–
24	36	16	13	" "	" "	–
27	42	16	15	" "	" "	–
36	54	14	17	#8 Rebar	14 ga.(C), 12 ga. (F)	–
42	60	16	19	" "	" "	–
48	72	16	21	1 1/4" pipe or 1 1/4 x 1 1/4 x 1/4 angle	14 ga.(C), 10 ga. (F)	–
54	78	16	25	" "	" "	–
60	90	14	29	1 1/2" pipe or 1 1/2 x 1 1/2 x 1/4 angle	12 ga.(C), 8 ga. (F)	–
66	96	14	33	2" pipe or 2 x 2 x 3/16 angle	12 ga.(C), 8 ga. (F) w/ stiffener	2 x 2 x 1/4 angle
72	102	14	36	" "	" "	2 1/2 x 2 1/2 x 1/4 angle
78	114	14	39	2 1/2" pipe or 2 x 2 x 1/4 angle	" "	" "
84	120	12	42	2 1/2" pipe or 2 1/2 x 2 1/2 x 1/4 angle	" "	2 1/2 x 2 1/2 x 1/4 angle

Note: The criterion for sizing the cylinder is that the area between the inside of the cylinder and the outside of the riser is equal to or greater than the area inside the riser. Therefore, the above table is is invalid for use with concrete pipe risers.
Note : Corruption for 12"-36" pipe measures 2 2/3" x 1/2"; for 42"-84" the corrugation measures 5" x 1" or 8" x 1".
Note C = corrugated; F = flat.

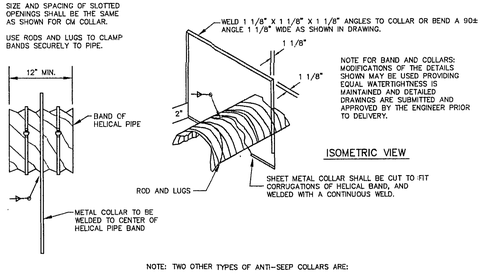
DETAILS OF CORRUGATED METAL ANTI-SEEP COLLAR



ELEVATION OF UNASSEMBLED COLLAR

NOTES:
1. ALL MATERIALS TO BE IN ACCORDANCE WITH CONSTRUCTION AND CONSTRUCTION MATERIAL SPECIFICATIONS.
2. WHEN SPECIFIED ON THE PLANS, COATING OF COLLARS SHALL BE IN ACCORDANCE WITH CONSTRUCTION AND CONSTRUCTION MATERIAL SPECIFICATIONS.
3. UNASSEMBLED COLLARS SHALL BE MARKED BY PAINTING OR TAGGING TO IDENTIFY MATCHING PAIRS.
4. THE LAP BETWEEN THE TWO HALF SECTIONS AND BETWEEN THE PIPE AND CONNECTING BAND SHALL BE CAULKED WITH ASPHALT MASTIC AT TIME OF INSTALLATION.
5. EACH COLLAR SHALL BE FURNISHED WITH TWO 1/2" DIAMETER RODS WITH STANDARD TANK LUGS FOR CONNECTING COLLARS TO PIPE.

DETAIL OF HELICAL PIPE ANTI-SEEP COLLAR



REF: ENGR. FIELD MANUAL

NOTE: TWO OTHER TYPES OF ANTI-SEEP COLLARS ARE:
1. CORRUGATED METAL, SIMILAR TO UPPER, EXCEPT SHOP WELDED TO A SHORT (4 FT.) SECTION OF THE PIPE AND CONNECTED WITH CONNECTING BANDS TO THE PIPE.
2. CONCRETE, SIX INCHES THICK FORMED AROUND THE PIPE WITH #3 REBAR SPACED 15" HORIZONTALLY AND VERTICALLY.

CONSTRUCTION SPECIFICATIONS

SITE PREPARATION

AREAS UNDER THE EMBANKMENT OR ANY STRUCTURAL WORKS RELATED TO THE BASIN SHALL BE CLEARED, GRUBBED, AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS OR OTHER OBJECTIONABLE MATERIAL. IN ORDER TO FACILITATE CLEANOUT AND RESTORATION, THE AREA OF MOST FREQUENT INUNDATION (MEASURED FROM THE TOP OF THE PRINCIPAL SPILLWAY) WILL BE CLEARED OF ALL BRUSH AND TREES.

CUTOFF TRENCH

FOR EARTH-FILL EMBANKMENTS, A CUTOFF TRENCH SHALL BE EXCAVATED ALONG THE CENTERLINE OF THE DAM. THE TRENCH MUST EXTEND AT LEAST 1 FOOT INTO A STABLE, IMPERVIOUS LAYER OF SOIL AND HAVE A MINIMUM DEPTH OF 2 FEET. THE CUTOFF TRENCH SHALL EXTEND UP BOTH ABUTMENTS TO THE RISER CREST ELEVATION. THE MINIMUM BOTTOM WIDTH SHALL BE 4 FEET, BUT ALSO MUST BE WIDE ENOUGH TO PERMIT OPERATION OF COMPACTION EQUIPMENT. THE SIDE SLOPES SHALL BE NO STEEPER THAN 1:1.

COMPACTION REQUIREMENTS SHALL BE THE SAME AS THOSE FOR THE EMBANKMENT. THE TRENCH SHALL BE DRAINED DURING THE BACKFILLING/COMPACTING OPERATIONS.

EMBANKMENT

THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED BORROW AREAS. IT SHALL BE CLEAN MINERAL SOIL, FREE OF ROOTS, WOODY VEGETATION, STUMPS, SOD, OVERSIZED STONES, ROCKS, OR OTHER PERISHABLE OR OBJECTIONABLE MATERIAL. THE MATERIAL SELECTED MUST HAVE ENOUGH STRENGTH FOR THE DAM TO REMAIN STABLE AND BE TIGHT ENOUGH, WHEN PROPERLY COMPACTED, TO PREVENT EXCESSIVE PERCOLATION OF WATER THROUGH THE DAM. FILL CONTAINING PARTICLES RANGING FROM SMALL GRAVEL OR COARSE SAND TO FINE SAND AND CLAY IN DESIRED PROPORTION IS APPROPRIATE. ANY EMBANKMENT MATERIAL SHOULD CONTAIN APPROXIMATELY 20% CLAY PARTICLES BY WEIGHT. USING THE UNIFIED SOIL CLASSIFICATION SYSTEM, SC (CLAYEY SAND), GC (CLAYEY GRAVEL) AND CL ("LOW LIQUID LIMIT" CLAY) ARE AMONG THE PREFERRED TYPES OF EMBANKMENT SOILS. AREA ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED PRIOR TO PLACEMENT OF FILL. THE MATERIAL SHOULD CONTAIN THE PROPER AMOUNT OF MOISTURE TO ENSURE THAT 95% COMPACTION WILL BE ACHIEVED. FILL MATERIAL WILL BE PLACED IN 6-INCH CONTINUOUS LAYERS OVER THE ENTIRE LENGTH OF FILL. COMPACTION SHALL BE OBTAINED BY ROUTING THE HAULING EQUIPMENT OVER THE FILL SO THAT THE ENTIRE SURFACE OF THE FILL IS TRANSVERSED BY AT LEAST ONE WHEEL OR TREAD TRACK OF THE EQUIPMENT, OR BY USING A COMPACTOR. SPECIAL CARE SHALL BE TAKEN IN COMPACTING AROUND THE ANTI-SEEP COLLARS (COMPACT BY HAND, IF NECESSARY) TO AVOID DAMAGE AND ACHIEVE DESIRED COMPACTION. THE EMBANKMENT SHALL BE CONSTRUCTED TO AN ELEVATION 10% HIGHER THAN THE DESIGN HEIGHT TO ALLOW FOR SETTLEMENT IF COMPACTION IS OBTAINED WITH HAULING EQUIPMENT. IF COMPACTORS ARE USED FOR COMPACTION, THE OVERBUILD MAY BE REDUCED TO NOT LESS THAN 5%.

PRINCIPAL SPILLWAY

THE RISER OF THE PRINCIPAL SPILLWAY SHALL BE SECURELY ATTACHED TO THE BARREL BY A WATERTIGHT CONNECTION. THE BARREL AND RISER SHALL BE PLACED ON A FIRMLY COMPACTED SOIL FOUNDATION. THE BASE OF THE RISER SHALL BE FIRMLY ANCHORED ACCORDING TO DESIGN CRITERIA TO PREVENT ITS FLOATING. PERVIOUS MATERIALS SUCH AS SAND, GRAVEL, OR CRUSHED STONE SHALL NOT BE USED AS BACKFILL AROUND THE BARREL OR ANTI-SEEP COLLARS. SPECIAL CARE SHALL BE TAKEN IN COMPACTING AROUND THE ANTI-SEEP COLLARS (COMPACT BY HAND, IF NECESSARY). FILL MATERIAL SHALL BE PLACED AROUND THE PIPE IN 4-INCH LAYERS AND COMPACTED UNTIL 95% COMPACTION IS ACHIEVED. A MINIMUM OF TWO FEET OF FILL SHALL BE HAND-COMPACTED OVER THE BARREL BEFORE CROSSING IT WITH CONSTRUCTION EQUIPMENT.

EMERGENCY SPILLWAY

VEGETATION EMERGENCY SPILLWAYS SHALL NOT BE CONSTRUCTED OVER FILL MATERIAL. DESIGN ELEVATIONS, WIDTH, ENTRANCE AND EXIT CHANNEL SLOPES ARE CRITICAL TO THE SUCCESSFUL OPERATION OF THE SPILLWAY AND SHOULD BE ADHERED TO CLOSELY DURING CONSTRUCTION.

VEGETATION STABILIZATION

THE EMBANKMENT AND EMERGENCY SPILLWAY OF THE SEDIMENT BASIN SHALL BE STABILIZED WITH TEMPORARY OR PERMANENT VEGETATION IMMEDIATELY AFTER INSTALLATION OF THE BASIN SEE TEMPORARY SEEDING, STD. & SPEC. 3.31 OR PERMANENT SEEDING, STD. & SPEC. 3.32).

EROSION AND SEDIMENT CONTROL

THE CONSTRUCTION OF THE SEDIMENT BASIN SHALL BE CARRIED OUT IN A MANNER SUCH THAT IT DOES NOT RESULT IN SEDIMENT PROBLEMS DOWNSTREAM.

SAFETY

ALL STATE AND LOCAL REQUIREMENTS SHALL BE MET CONCERNING FENCING AND SIGNS WARNING THE PUBLIC OF THE HAZARDS OF SOFT, SATURATED SEDIMENT AND FLOOD WATERS (REFER TO STD. & SPEC. 3.01, SAFETY FENCE).

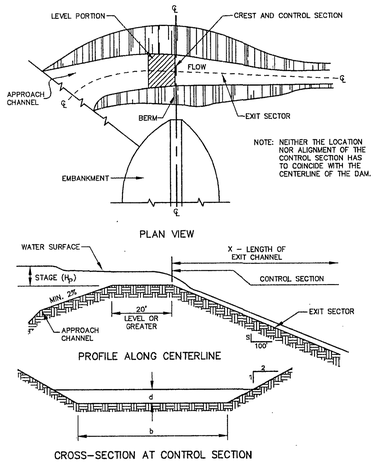
MAINTENANCE

THE BASIN EMBANKMENT SHOULD BE CHECKED REGULARLY TO ENSURE THAT IT IS STRUCTURALLY SOUND AND HAS NOT BEEN DAMAGED BY EROSION OR CONSTRUCTION EQUIPMENT.

THE EMERGENCY SPILLWAY SHOULD BE CHECKED REGULARLY TO ENSURE THAT ITS LINING IS WELL ESTABLISHED AND EROSION-RESISTANT.

THE BASIN SHOULD BE CHECKED AFTER EACH RUNOFF-PRODUCING RAINFALL *FOR SEDIMENT CLEANOUT. WHEN THE SEDIMENT REACHES THE CLEAN-OUT* LEVEL, IT SHALL BE REMOVED AND PROPERLY DISPOSED OF.

EXCAVATED EARTH SPILLWAY



SEDIMENT BASIN DATA

	BASIN 1	BASIN 2	BASIN 3
BARREL			
Barrel Diameter	24" CONC.		
Barrel Length	32'		
Barrel Outlet Invert	1115.27		
Barrel Inlet Invert	1115.66		
Barrel Slope	1.20%		
Riprap Class at Outlet			
RISER			
Riser Diameter	48"		
Riser Top Elevation	1121.00		
Barrel Inlet Invert	1115.66		
Dewatering Device Diameter	4"		
Dewatering Device Invert	1119.50		
Dewatering Device Tubing Dia.	6"		
Anti-Vortex Diameter (D)	72"		
Anti-Vortex Height (H)	21"		
ANTI-SEEP COLLARS			
Number	1		
Size	6' X6'		
Spacing			
BAFFLES			
Length			
EMERGENCY SPILLWAY			
Bottom Elevation			
Bottom Width			
Exit Channel Slope			
Exit Channel Length			
EMBANKMENT			
Basin Bottom Elevation	1116.00		
Embankment Top Elevation	1124.00		
Interior Slope	3:1		
Exterior Slope	N/A		
Top Width	N/A		
CUT-OFF TRENCH			
Depth			
Width			
Slopes			

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COMMONWEALTH OF VIRGINIA
7-16-01
B. LEE HENDERSON, JR.
No. 17591
PROFESSIONAL ENGINEER

SEDIMENT BASIN DETAILS

DEVELOPMENT PLAN FOR
"OAKLEAF MANOR"
SECTION No. 1
PREPARED FOR
JOE BLACKSTOCK
CITY OF ROANOKE, VIRGINIA

NO	DATE	REVISIONS DESCRIPTION
1		
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DATE: 13 JULY 2001
SCALE: AS SHOWN
COMMISSION NO: 00-106
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