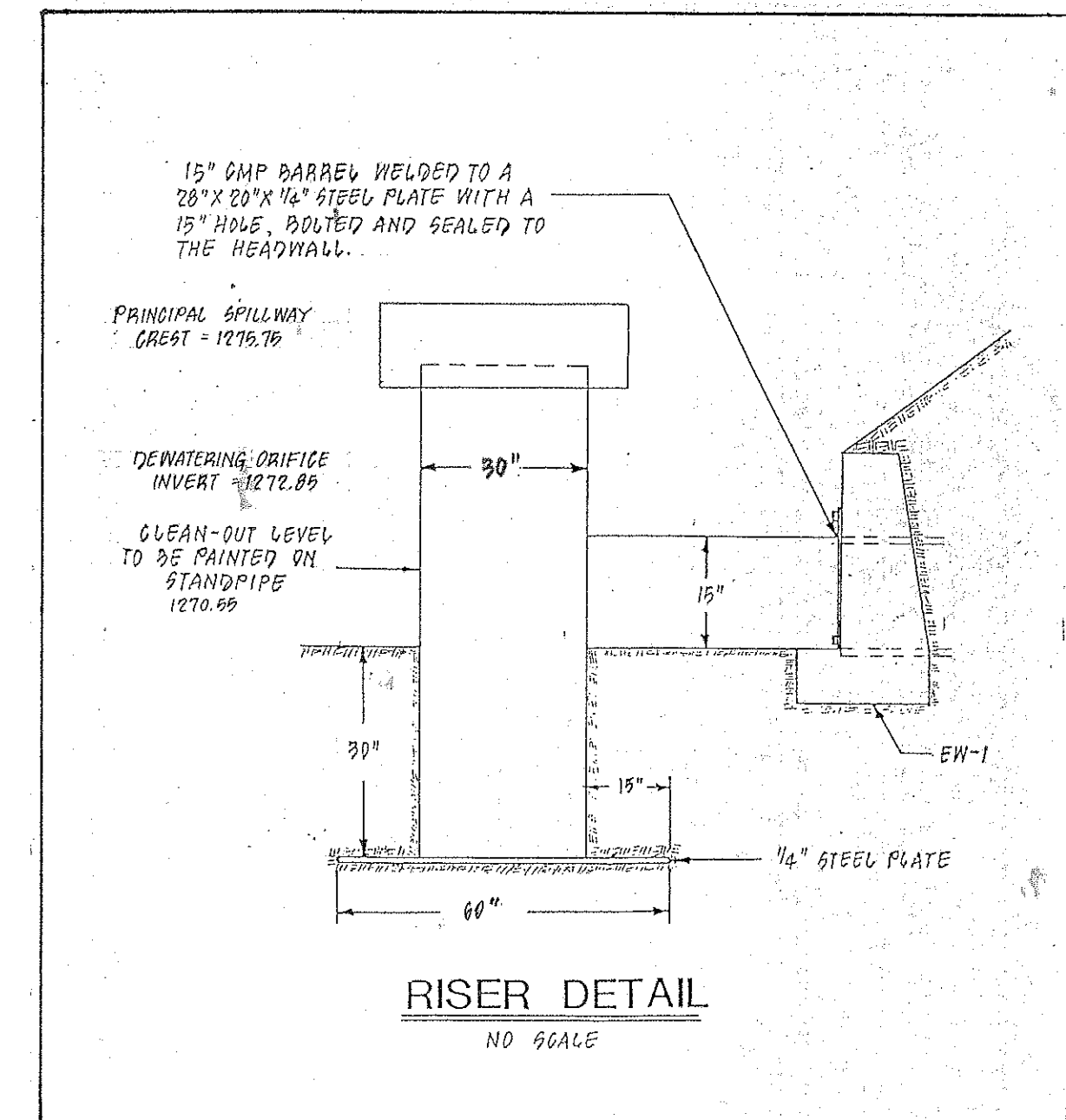
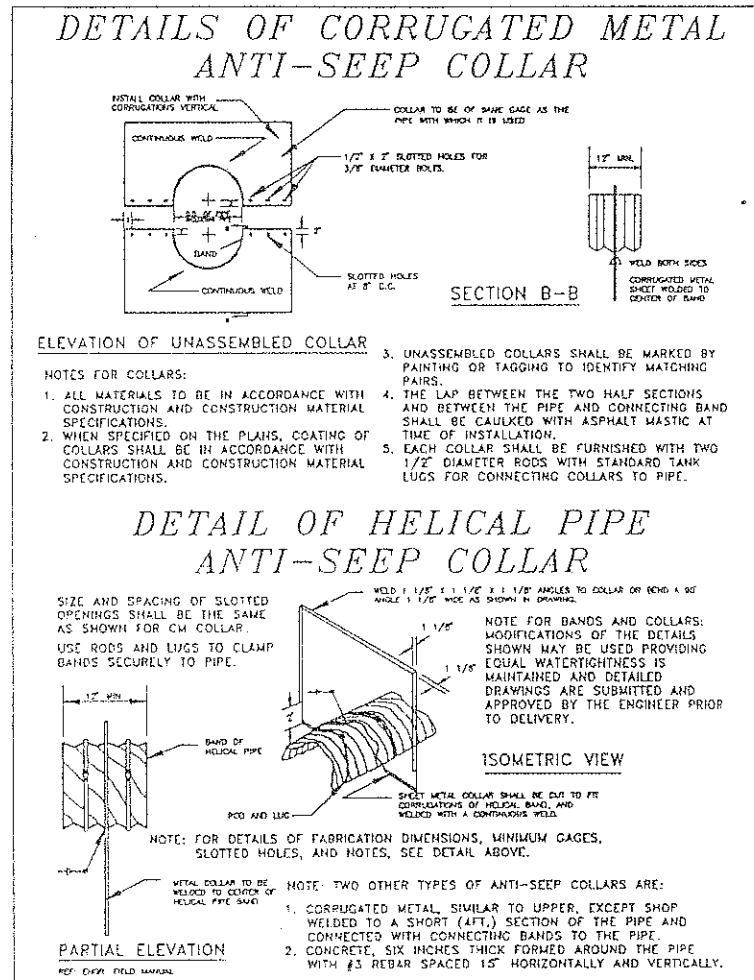
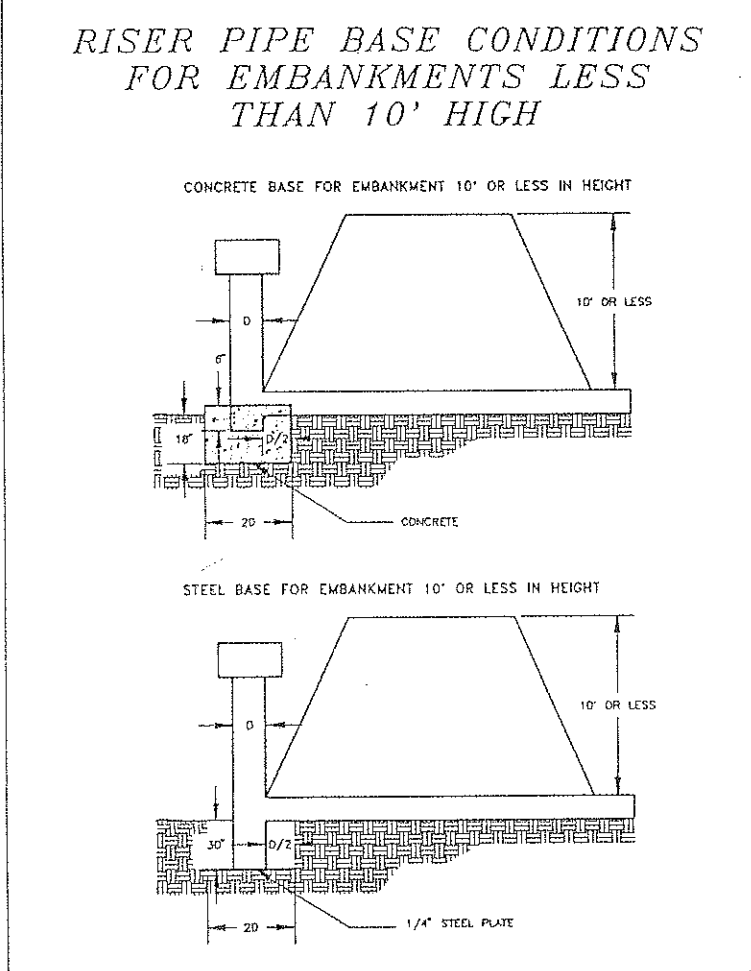
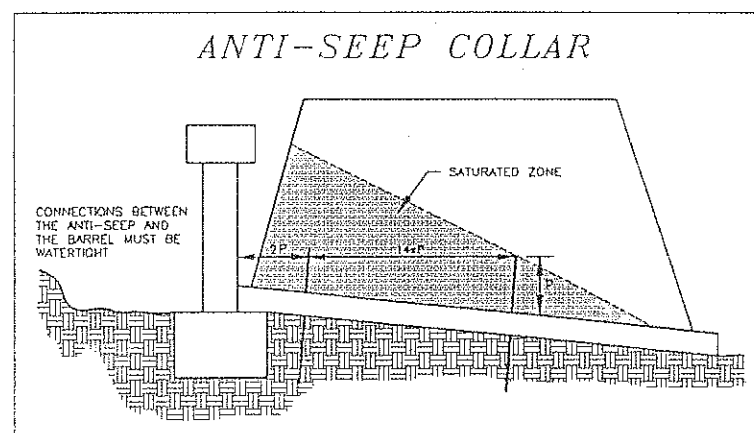
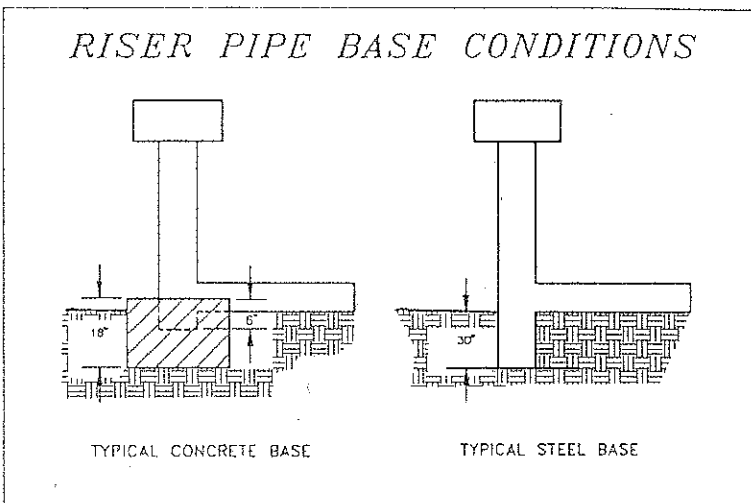


Riser Diam., in.	Cylinder Diameter, inches	Thickness, gage	Height, inches	Minimum Size Support Bar	Minimum Top Thickness	Stiffener
12	18	16	6	#6 Rebar or 1/4" x 1/4" x 3/16" angle	16 ga.	-
15	21	16	7	"	"	"
18	27	16	8	"	"	"
21	30	16	11	"	16 ga.(C), 14 ga.(F)	"
24	36	16	13	"	"	"
27	42	16	15	"	"	"
36	54	14	17	#8 Rebar	14 ga.(C), 12 ga.(F)	"
42	60	16	19	"	"	"
48	72	16	21	1/2" pipe or 1/4" x 1/4" x 3/16" angle	14 ga.(C), 10 ga.(F)	"
54	78	16	23	"	"	"
60	90	14	29	1/2" pipe or 1/4" x 1/4" x 3/16" angle	12 ga.(C), 8 ga.(F)	"
66	96	14	33	1/2" pipe or 2 x 2 x 3/16" angle	12 ga.(C), 8 ga.(F)	2 x 2 x 3/16" angle
72	102	14	36	"	"	2 1/2 x 2 1/2 x 3/16" angle
78	114	14	39	2 1/2" pipe or 2 x 2 x 3/16" angle	"	"
84	120	12	42	2 1/2" pipe or 2 1/2 x 2 1/2 x 3/16" angle	"	2 1/2 x 2 1/2 x 3/16" angle

Note: The criterion for using 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 limited for use with concrete pipe risers.
 Note: Corrugation for 12" to 30" pipe measures 2 1/2" x 1/4" for 42" to 48" the corrugation measures 3" x 1/4" or 3" x 1/2".
 Note: C = corrugated, F = flat.



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/COMPACTION 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 PERSHABLE 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 THE 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

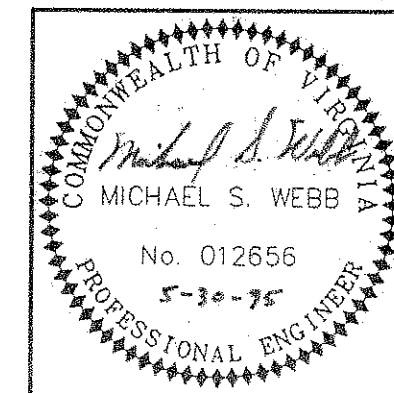
THE BASIN EMBANKMENT SHOULD BE CHECKED REGULARLY TO ENSURE THAT IT IS STRUCTURALLY SOUND AND HAS NOT BEEN DAMAGED BY EROSION OR CONSTRUCTION EQUIPMENT.

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.

SEDIMENT BASIN DATA			
	BASIN 1	BASIN 2	BASIN 3
BARREL			
Barrel Diameter	15"		
Barrel Length	75'		
Barrel Outlet Invert	1260.00		
Barrel Inlet Invert	1265.30		
Barrel Slope	7.07%		
Riprap Class at Outlet	I		
RISER			
Riser Diameter	30"		
Riser Top Elevation	1275.75		
Barrel Inlet Invert	1266.00		
Dewatering Device Diameter	8"		
Dewatering Device Invert	1272.85		
Dewatering Device Tubing Dia.	10"		
Anti-Vortex Diameter (D)	48"		
Anti-Vortex Height (H)	16"		
ANTI-SEEP COLLARS			
Number	-		
Size	-		
Spacing	-		
BAFFLES			
Length	70'		
EMERGENCY SPILLWAY			
Bottom Elevation	-		
Bottom Width	-		
Exit Channel Slope	-		
Exit Channel Length	-		
EMBANKMENT			
Basin Bottom Elevation	1265.30		
Embarkment Top Elevation	1278.75		
Inferior Slope	3:1		
Exterior Slope	2:1		
Top Width	10.0'		
CUT-OFF TRENCH			
Depth	2.0'		
Width	2.0'		
Slopes	2:1		

REVISION	DATE	DESCRIPTION
DESIGNED	WAG	SEDIMENT BASIN DETAILS FOR
DRAWN	PAG	"HANGING ROCK ESTATES"
CHECKED	MSW	PREPARED FOR
		J. ROBERT CARLTON
		CATAWBA MAGISTERIAL DISTRICT
		ROANOKE COUNTY, VIRGINIA



LUMSDEN ASSOCIATES, P.C.
 ENGINEERS-SURVEYORS-PLANNERS
 ROANOKE, VIRGINIA

SCALE: AS SHOWN
 DATE: 23 JUNE 1995
 COMM: #94-353
 SHEET 15 of 18