



United States  
Department of  
Agriculture

Soil  
Conservation  
Service

P.O. Box 2890  
Washington, D.C.  
20013

July 3, 1984

DESIGN NOTE 18, Amendment 1  
210-VI

SUBJECT: ENG - "UNATTACHED ES DRAWINGS"

Purpose. To distribute the revised Baffle Top Riser Engineering Standard Drawing, ES-232.

Effective Date. Effective when received.

Explanation. Recent test data indicate that the entrance head loss coefficients,  $K_e$ , may be larger than those presently shown on the Baffle Top Riser Standard Drawing, ES-232. The following changes have been made on the revised ES-232:

Under Criteria:

2.  $K_e = 0.60$  changed to  $K_e = 0.70$   
 $K_e = 0.65$  changed to  $K_e = 0.75$
4.  $K_e = 0.65$  changed to  $K_e = 0.75$

Filing Instructions. Replace ES-232 of Design Note No. 18 with the enclosed Revised ES-232 dated 6-84.

Distribution. The distribution is shown on the reverse side. Additional copies may be obtained from Central Supply by ordering item No. DN-18 - Amendment 1.

GERALD D. SEINWILL  
Associate Deputy Chief  
for Technology

Enclosure

DIST: See Reverse

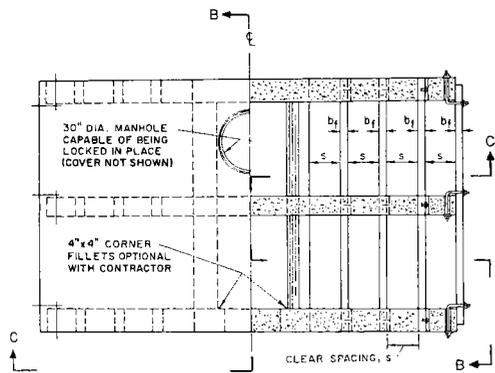


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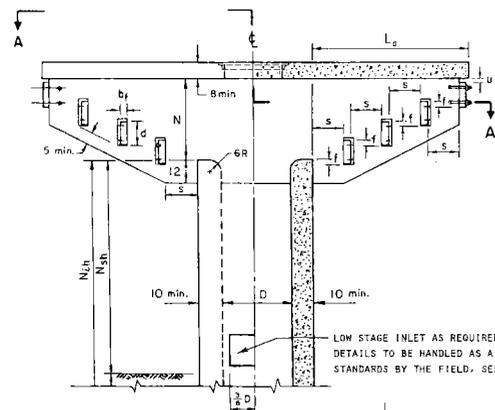
WO-AS-  
10-79

DISTRIBUTION AND CHECK LIST

STATE		TSC'S	
AL-01	10	MTSC-63	15
AK-02	4	WTSC-64	15
AZ-04	10	NETSC-61	15
AR-05	15	STSC-62	20
CA-06	30	Total TSC Staff	65
CO-08	15	DC-75	
CN-09	5	Total SCS	
DE-10	5	OTHER	
FL-12	8	ENG. AT	
GA-13	15	COTTON ANNEX	10
HA-15	5		
ID-16	8	ENG.	
IL-17	15	Room 6128	25
IN-18	10		
IA-19	15	Central Supply	334
KS-20	20		
KY-21	10		
LA-22	10		
ME-23	8		
MD-24	8		
MA-25	8		
MI-26	8		
MN-27	10		
MS-28	15		
MO-29	10		
MT-30	15		
NE-31	10		
NV-32	5		
NH-33	5		
NJ-34	8		
NM-35	15		
NY-36	10		
NC-37	10		
ND-38	8		
OH-39	15		
OK-40	20		
OR-41	8		
PA-42	15		
PR-72	4		
RI-44	4		
SC-45	10		
SD-46	8		
TN-47	10		
TX-48	40		
UT-49	8		
VT-50	5		
VA-51	10	Grand Total SCS	1000
WA-53	15	REMARKS	
WV-54	15		
WI-55	8		
WY-56	8		
Total States	566		



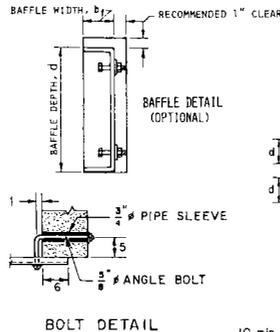
SECTION A-A  
FOOTING AND SPIGOT WALL FITTING NOT SHOWN



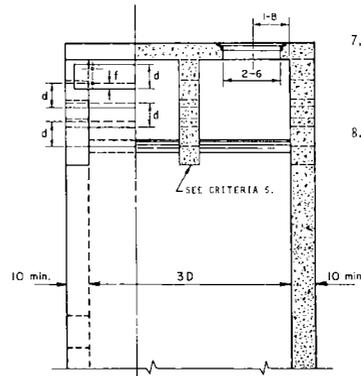
FLAT BOTTOM

ROUND BOTTOM

SECTION C-C



BOLT DETAIL



FLAT BOTTOM

ROUND BOTTOM

SECTION B-B

SCOPE

1. THE BAFFLE TOP RISER IS A STANDARD FOR ONE AND TWO-STAGE RISERS.
2. HEIGHT RANGES OF RISER:  
 $N_{sh} \leq 20$  FT.  
 $N_{cs} \leq 35$  FT.  
 $N_{ch} \leq 40$  FT.

CRITERIA

1. PIPE DIAMETERS AND ASSOCIATED DISCHARGES:

D	$Q_{MAX.} = \frac{20}{4} D^2$
24	94
30	147
36	212
42	289
48	377

NOTE:

MAXIMUM ALLOWABLE NOMINAL VELOCITY IN PIPE = 30 FPS

2. HYDRAULICS:

THE WEIR DISCHARGE COEFFICIENT, C:  
 $C = 3.1$  (CLEAR WATER FLOW)  
 $C = 2.0$  (TRASH LADEN FLOW)

FOR  $D \times 30$  RISERS WITH ROUND BOTTOMS, THE ENTRANCE HEAD LOSS COEFFICIENT,  $K_e$ :

$K_e = 0.70$  (CLEAR WATER FLOW)  
 $K_e = 0.75$  (TRASH LADEN FLOW)

DURING PIPE FLOW, THE HEAD LOSS BETWEEN POOL WATER SURFACE AND THE PROJECTED HYDRAULIC GRADE LINE AT THE PIPE ENTRANCE =  $K_e$  TIMES THE VELOCITY HEAD IN THE PIPE.

3. BAFFLES:

REQUIRED NET AREA FOR NATIONAL STANDARD DETAILED DRAWINGS - TO BE COMPUTED FROM  $Q_{MAX}$  AS LISTED IN CRITERIA (1) AND AN ALLOWABLE AVERAGE VELOCITY OF 2.5 FPS. THE CLEAR HORIZONTAL DISTANCE BETWEEN BAFFLES, S:

$$\frac{D}{3} \leq s \leq \frac{D}{2}$$

THE VERTICAL OVERLAP BETWEEN BAFFLES, f:  
 $f \geq 3"$

THE CLEARANCE BETWEEN THE COVER SLAB AND THE TOP-MOST BAFFLE, U:  
 $2" \leq U \leq 3"$

ALL BOLTS, NUTS, AND PIPE SLEEVES TO BE GALVANIZED OR OTHERWISE PROTECTED BY CORROSION RESISTANT COATING EXCEPT WHEN MADE OF ALUMINUM.

4. COVER SLAB:

COVER SLAB LIVE LOAD = 100 PSF PLUS WEIGHT OF EQUIPMENT ON THE SLAB.

$$L_o = B(s + b_f), \text{ ROUNDED UP TO NEXT INCH}$$

B = NUMBER OF BAFFLES ON ONE SIDE OF INLET

THE DISTANCE BETWEEN THE WEIR CREST AND THE UNDERSIDE OF THE COVER SLAB, N, IS EQUAL TO OR GREATER THAN THE HEAD OVER THE CREST AT WHICH THE CONDUIT PRIMES AND FULL CONDUIT FLOW BEGINS FOR "WITH TRASH" CONDITIONS, I.E.,  $K_e = 0.75$  AND  $C = 2.0$

5. ANTI-VORTEX WALLS:

OMIT CENTER ANTI-VORTEX WALL WHEN  $D \leq 36"$ .

6. FLOTATION:

WHEN RISER IS IN RESERVOIR - THE RATIO OF THE WEIGHT OF RISER TO THE WEIGHT OF THE VOLUME OF WATER DISPLACED BY THE RISER SHALL NOT BE LESS THAN 1.5. WHEN RISER IS IN EMBANKMENT - SAME AS ABOVE, BUT ADD TO THE WEIGHT OF THE RISER, THE BUOYANT WEIGHT OF THE SUBMERGED FILL OVER THE FOOTING PROJECTIONS.

7. DRY DAMS:

WHEN SEDIMENT IS NOT A PROBLEM - SET CREST OF SINGLE STAGE RISER, OR CREST OF LOW STAGE INLET OF TWO-STAGE RISER, AT REQUIRED ELEVATION. WHERE SEDIMENT IS A PROBLEM - USE A SERIES OF SLOTTED OPENINGS UP THE LONGITUDINAL SIDES (SEE ES-15). TRASHRACKS ARE NOT REQUIRED FOR THESE OPENINGS.

8. MATERIALS:

CONCRETE : CLASS 4000,  $f_c = 1600$  PSI.  
 REINFORCING STEEL : GRADE 40  
 BAFFLE : AMERICAN STANDARD CHANNELS, MISCELLANEOUS CHANNELS, STRUCTURAL STEEL TUBING OR REINFORCED CONCRETE BEAMS.

NOTES:

1. RISER ANALYSES: STANDARDS TO BE DEVELOPED FOR RISERS LOCATED IN THE EMBANKMENT (AT BERM) AND FOR RISERS LOCATED IN THE RESERVOIR AREA.
2. ROUND BOTTOM: MAY BE OBTAINED BY USE OF REMOVABLE SEMI-CIRCULAR FORMS ACCEPTABLE TO THE ENGINEER.
3. DRAINAGE OF POOL: PROVIDING FOR MEANS OF DRAINING POOL TO BE HANDLED AS A MODIFICATION OF THESE STANDARDS BY THE FIELD.

OPENING IN UPSTREAM ENDWALL NEAR BASE OF RISER TO BE HANDLED AS A MODIFICATION OF THESE STANDARDS BY THE FIELD, SEE TR-37.

Revised 6-84

DROP INLET SPILLWAYS  
STANDARD FOR  
BAFFLE TOP RISER

U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

Designed	Drawn	Traced	Checked	Date	File	Approved by	Special	Drawing No.
NES	H.J.G.	H.J.G.	J.A.B.	3-81	3-81			ES-232

STANDARD DWG. NO.	
DATE	SHEET OF

