DIVERSION BOX SIZES ARE BASED ON BOTH THE SCREW GATE FRAME SIZES AND THE DIAMETERS OF ROUND PIPE. THEY MAY BE USED WITH EITHER FLUMES, ARCH PIPES OR ROUND PIPES.

WINGWALLS WITH ATTACHED APRON

PIPE	LINE NUMBER	DIMENSIONS IN INCHES	FLUME SIZE A x B: SCREW GATE	FLUME SIZE A x B: HAND SLIDE GATE	DIMENSIONS: C	E	F	h	L1
I.D.	1	12		12x12	2'-6	6"	3"	1'-9	2'-0
I.D.	2	18	18x18	18x18	3'-2	6"	3"	2'-3	2'-6
I.D.	3	24	24x24	24x24	3'-10	6"	3"	2'-9	3'-0
I.D.	4	30	30x30		4'-7	8"	5"	3'-3	3'-10
I.D.	5	36	36x36		5'-4	8"	5"	3'-9	4'-4
I.D.	6	42	42x42		6'-0	8"	4"	4'-3	4'-10
I.D.	7	48	48x48		6'-9	9"	5"	4'-9	5'-6
S x R	8	36x22	36x24	36x24	3'-8	8"	5"	2'-7	4'-4
S x R	9	43x27	48x30		4'-3	8"	4"	3'-0	5'-4
S x R	10	50x31	60x36		4'-9	9"	5"	3'-4	6'-6
S x R	11	58x36	60x36		5'-4	9"	5"	3'-9	6'-6
S x R	12	65x40	72x42		5'-9	9"	5"	4'-1	7'-6
S x R	13	72x44	72x48		6'-3	9"	5"	4'-5	7'-6

TYPE W

γ = NO. OF SETS; B = NO. OF BARS PER SET; CUT LINE; W E1, D2

$$AVE.\ L'GTH = \frac{\alpha + N}{2}$$

G1 (θ, 1'-2); D1, F1, L1, S1; J1 (1'-1, 1'-1)

LINE NUMBER	E1: α	E1: W	E1: γ	E1: B	E1: AVE. L'GTH	D2: α	D2: W	D2: γ	D2: B	D2: AVE. L'GTH	D1: L'GTH	D1: NO.
1	3'-3	5'-5	1	2	4'-4	1'-1	0	2	1	1'-1	2'-7	2
2	3'-9	6'-11	↑	3	5'-4	1'-7	7"	↑	2	1'-1	3'-1	3
3	4'-3	8'-5		3	6'-4	2'-1	1'-1		2	1'-7	3'-7	3
4	5'-2	10'-4		4	7'-9	2'-7	7"		3	1'-7	4'-1	4
5	5'-7	11'-9		4	8'-8	3'-1	1'-1		3	2'-1	4'-7	4
6	6'-2	13'-4		5	9'-9	3'-7	7"		4	2'-1	5'-1	5
7	6'-9	14'-11		5	10'10	4'-1	1'-1		4	2'-7	5'-7	6
8	5'-7	9'-5		3	7'-6	1'-11	11"		2	1'-5	3'-5	4
9	6'-7	11'-3		3	8'-11	2'-4	1'-4		2	1'-10	3'-10	5
10	7'-9	13'-1		4	10'-5	2'-8	8"		3	1'-8	4'-2	7
11	7'-9	13'-11		4	10'-10	3'-1	1'-1		3	2'-1	4'-7	7
12	8'-9	15'-7	↓	5	12'-2	3'-5	5"	↓	4	1'-11	4'-11	8
13	8'-9	16'-3	1	5	12'-6	3'-5	9"	2	4	2'-3	5'-3	8

LINE NUMBER	G1: θ	G1: L'GTH	G1: NO.	F1: L'GTH	F1: NO.	L1: L'GTH	L1: NO.	J1: L'GTH	J1: NO.	S1: L'GTH	S1: NO.	REINFORCING STEEL LB.: WITHOUT CUT-OFF WALL	REINFORCING STEEL LB.: WITH CUT-OFF WALL	CONCRETE CUBIC YARDS: WITHOUT CUT-OFF WALL	CONCRETE CUBIC YARDS: WITH CUT-OFF WALL
1	1'-11	3'-1	6	2'-8	4	2'-0	4	2'-2	6	5'-5	2	42.5	58.4	0.362	0.462
2	2'-5	3'-7	8	3'-4	6	2'-9	↑	↑	9	5'-11	↑	70.4	92.7	0.577	0.690
3	2'-11	4'-1	10	4'-0	6	3'-5			9	8'-5		91.9	116.2	0.832	0.979
4	3'-5	4'-7	10	4'-9	8	4'-2			12	10'-4		122.3	153.5	1.169	1.347
5	3'-11	5'-1	12	5'-6	8	4'-10			12	11'-9		149.7	182.8	1.536	1.739
6	4'-5	5'-7	14	6'-2	10	5'-6			15	13'-4		198.1	255.4	1.934	2.166
7	4'-11	6'-1	16	6'-11	10	6'-3			16	14'11		236.8	279.9	2.414	2.674
8	2'-9	3'-11	10	3'-10	6	3'-2			10	9'-5		92.6	120.0	0.832	0.996
9	3'-2	4'-4	10	4'-5	6	3'-9			11	11'-3		108.5	139.5	1.123	1.318
10	3'-6	4'-8	12	4'-11	8	4'-3			15	13'-1		150.0	189.2	1.417	1.645
11	3'-11	5'-1	12	5'-6	8	4'-10			15	13'-11		164.7	205.0	1.709	1.952
12	4'-3	5'-5	14	5'-11	10	5'-4	↓	↓	18	15'-7	↓	210.0	256.9	2.040	2.311
13	4'-7	5'-9	14	6'-5	10	5'-9	4	2'-2	18	16'-3	2	224.0	271.8	2.321	2.603

TYPE V

G1 (θ, 1'-2); L2, D1, M1, F2, S1; J1 (1'-1, 1'-1)

G1: θ	G1: L'GTH	G1: NO.	L2: L'GTH	L2: NO.	D1: L'GTH	D1: NO.	M1: L'GTH	M1: NO.	F2: L'GTH	F2: NO.	J1: L'GTH	J1: NO.	S1: L'GTH	S1: NO.	REINFORCING STEEL LB.: WITHOUT CUT-OFF WALL	REINFORCING STEEL LB.: WITH CUT-OFF WALL	CONCRETE CUBIC YARDS: WITHOUT CUT-OFF WALL	CONCRETE CUBIC YARDS: WITH CUT-OFF WALL	LINE NUMBER
1'-11	3'-1	6	1'-5	4	2'-7	2	2'-8	3	2'-7	4	2'-2	4	2'-8	2	38.8	48.2	0.227	0.278	1
2'-5	3'-7	6	1'-11	↑	3'-1	3	3'-2	3	3'-1	6	↑	5	3'-2	↑	52.4	63.9	0.358	0.417	2
2'-11	4'-1	8	2'-5		3'-7	3	3'-8	4	3'-7	6		5	3'-8		71.9	84.0	0.518	0.586	3
3'-5	4'-7	8	2'-11		4'-1	4	4'-6	4	4'-1	8		6	4'-6		90.8	105.5	0.731	0.813	4
3'-11	5'-1	10	3'-5		4'-7	4	5'-0	5	4'-7	8		6	5'-0		115.6	131.0	0.953	1.044	5
4'-5	5'-7	10	3'-11		5'-1	5	5'-6	5	5'-1	10		7	5'-6		138.0	155.5	1.205	1.304	6
4'-11	6'-1	12	4'-5		5'-7	6	6'-2	6	5'-7	12		8	6'-2		179.8	199.6	1.503	1.613	7
2'-9	3'-11	6	2'-3		3'-5	4	5'-0	3	3'-5	6		6	5'-0		63.4	78.7	0.545	0.636	8
3'-2	4'-4	8	2'-8		3'-10	5	6'-0	4	3'-10	8		7	6'-0		92.6	110.8	0.744	0.854	9
3'-5	4'-8	8	3'-0		4'-2	7	7'-2	4	4'-2	8		9	7'-2		107.9	130.5	0.952	1.079	10
3'-11	5'-1	10	3'-5		4'-7	7	7'-2	5	4'-7	8		9	7'-2		132.0	154.6	1.128	1.255	11
4'-3	5'-5	10	3'-9	↓	4'-11	8	8'-2	5	4'-11	10	↓	10	8'-2	↓	152.9	178.3	1.367	1.511	12
4'-7	5'-9	10	4'-1	4	5'-3	8	8'-2	5	5'-3	10	2'-2	10	8'-2	2	161.3	186.7	1.534	1.678	13

DIVERSION BOX SIZES ARE BASED ON BOTH THE SCREW GATE FRAME SIZES AND THE DIAMETERS OF ROUND PIPE. THEY MAY BE USED WITH EITHER FLUMES, ARCH PIPES OR ROUND PIPES.

PIPE	LINE NUMBER	DIMENSIONS IN INCHES	FLUME SIZE A x B: SCREW GATE	FLUME SIZE A x B: HAND SLIDE GATE	DIMENSIONS: C	E	F	h	L1
I.D.	1	12		12x12	2'-6	6"	3"	1'-9	2'-0
I.D.	2	18	18x18	18x18	3'-2	6"	3"	2'-3	2'-6
I.D.	3	24	24x24	24x24	3'-10	6"	3"	2'-9	3'-0
I.D.	4	30	30x30		4'-7	8"	5"	3'-3	3'-10
I.D.	5	36	36x36		5'-4	8"	5"	3'-9	4'-4
I.D.	6	42	42x42		6'-0	8"	4"	4'-3	4'-10
I.D.	7	48	48x48		6'-9	9"	5"	4'-9	5'-6
S x R	8	36x22	36x24	36x24	3'-8	8"	5"	2'-7	4'-4
S x R	9	43x27	48x30		4'-3	8"	4"	3'-0	5'-4
S x R	10	50x31	60x36		4'-9	9"	5"	3'-4	6'-6
S x R	11	58x36	60x36		5'-4	9"	5"	3'-9	6'-6
S x R	12	65x40	72x42		5'-9	9"	5"	4'-1	7'-6
S x R	13	72x44	72x48		6'-3	9"	5"	4'-5	7'-6

WINGWALLS WITHOUT ATTACHED APRON

WINGWALL X: K1, P1. WINGWALL Y: P1; K2 (6", T, 135°)

LINE NUMBER	WINGWALL X: K1 L'GTH	K1 NO.	P1 L'GTH	P1 NO.	REINFORCING STEEL LB.	CONCRETE CUBIC YARDS	WINGWALL Y: K2 T	K2 L'GTH	K2 NO.	P1 L'GTH	P1 NO.	REINFORCING STEEL LB.	CONCRETE CUBIC YARDS
1	2'-7	3	1'-11	3	11.9	0.076	2'-9	3'-10	3	1'-11	3	15.8	0.103
2	3'-1	3	2'-5	3	14.5	0.118	3'-5	4'-6	3	2'-5	4	20.5	0.160
3	3'-7	4	2'-11	4	22.7	0.170	4'-1	5'-2	4	2'-11	4	29.3	0.229
4	4'-1	4	3'-5	4	26.2	0.231	4'-10	5'-11	4	3'-5	5	36.1	0.317
5	4'-7	5	3'-11	5	37.0	0.301	5'-7	6'-8	5	3'-11	6	50.5	0.418
6	5'-1	5	4'-5	5	41.3	0.380	6'-3	7'-4	5	4'-5	6	55.9	0.526
7	5'-7	6	4'-11	6	54.6	0.469	7'-0	8'-1	6	4'-11	7	73.6	0.654
8	3'-5	3	2'-9	3	16.2	0.152	3'-11	5'-0	3	2'-9	4	23.0	0.208
9	3'-10	4	3'-2	4	24.5	0.199	4'-6	5'-7	4	3'-2	5	33.9	0.274
10	4'-2	4	3'-6	4	26.7	0.242	5'-0	6'-1	4	3'-5	5	36.8	0.336
11	4'-7	5	3'-11	5	37.0	0.301	5'-7	6'-8	5	3'-11	6	50.5	0.418
12	4'-11	5	4'-3	5	39.8	0.353	6'-0	7'-1	5	4'-3	6	54.0	0.486
13	5'-3	5	4'-7	5	42.7	0.409	6'-6	7'-7	5	4'-7	7	60.5	0.567

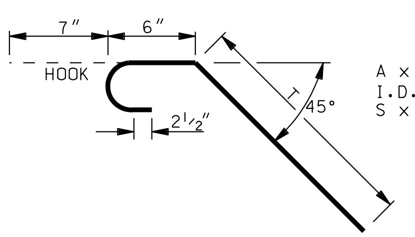
WALL TYPES

WALL R: G1 (θ, 1'-2), V1, H1 (10", I). WALL S: G1 (θ, 1'-2), V2, H1 (10", I).

LINE NUMBER	WALL R: G1 θ	G1 L'GTH	G1 NO.	H1 I	H1 L'GTH	H1 NO.	V1 L'GTH	V1 NO.	REINFORCING STEEL LB.	CONCRETE CUBIC YARDS	WALL S: G1 θ	G1 L'GTH	G1 NO.	H1 I	H1 L'GTH	H1 NO.	V2 L'GTH	V2 NO.	REINFORCING STEEL LB.	CONCRETE CUBIC YARDS
1	1'-11	3'-1	2	2'-8	4'-4	2	1'-11	2	18.0	0.081	1'-11	3'-1	4	2'-8	4'-4	2	1'-5	1	22.8	0.067
2	2'-5	3'-7	↑	3'-2	4'-10	3	2'-5	2	25.8	0.125	2'-5	3'-7	↑	3'-2	4'-10	3	1'-8	1	31.2	0.092
3	2'-11	4'-1		3'-8	5'-4	3	2'-11	3	31.1	0.179	2'-11	4'-1		3'-8	5'-4	3	1'-11	1	35.0	0.120
4	3'-5	4'-7		4'-6	6'-2	4	3'-5	4	44.4	0.262	3'-5	4'-7		4'-6	6'-2	4	2'-2	2	47.7	0.170
5	3'-11	5'-1		5'-0	6'-8	4	3'-11	4	48.9	0.337	3'-11	5'-1		5'-0	6'-8	4	2'-5	3	53.9	0.205
6	4'-5	5'-7		5'-6	7'-2	5	4'-5	5	63.8	0.422	4'-5	5'-7		5'-6	7'-2	5	2'-8	3	66.0	0.242
7	4'-11	6'-1		6'-2	7'-10	5	4'-11	5	70.0	0.530	4'-11	6'-1		6'-2	7'-10	5	2'-11	4	74.0	0.296
8	2'-9	3'-11		5'-0	6'-8	3	2'-9	4	36.4	0.232	2'-9	3'-11		5'-0	6'-8	3	1'-10	3	40.9	0.150
9	3'-2	4'-4		6'-0	7'-8	3	3'-2	5	43.6	0.326	3'-2	4'-4		6'-10	7'-6	3	2'-1	5	48.5	0.206
10	3'-6	4'-8		7'-2	8'-10	4	3'-6	6	60.6	0.434	3'-6	4'-8		7'-2	8'-10	4	2'-4	5	64.1	0.271
11	3'-11	5'-1		7'-2	8'-10	4	3'-11	6	63.2	0.488	3'-11	5'-1		7'-2	8'-10	4	2'-5	5	66.1	0.275
12	4'-3	5'-5	↓	8'-2	9'-10	4	4'-3	7	72.2	0.608	4'-3	5'-5	↓	8'-2	9'-10	4	2'-7	6	74.0	0.340
13	4'-7	5'-9	2	8'-2	9'-10	5	4'-7	7	84.7	0.657	4'-7	5'-9	4	8'-2	9'-10	5	2'-9	6	86.3	0.328

WALL T: G1 (θ, 1'-2), H2 (10"). BOTTOM SLAB: M1.

WALL T: G1 θ	G1 L'GTH	G1 NO.	H2 θ	H2 L'GTH	H2 NO.	REINFORCING STEEL LB.	CONCRETE CUBIC YARDS	BOTTOM SLAB: M1 L'GTH	M1 NO.	REINFORCING STEEL LB.	CONCRETE CUBIC YARDS	LINE NUMBER
1'-11	3'-1	4	10	1'-8	4	17.3	0.049	2'-8	8	14.3	0.194	1
2'-5	3'-7	↑	↑	↑	6	21.6	0.063	3'-2	8	16.9	0.265	2
2'-11	4'-1				6	23.7	0.076	3'-8	10	24.5	0.346	3
3'-5	4'-7				8	28.0	0.110	4'-6	12	36.1	0.505	4
3'-11	5'-1				8	30.1	0.127	5'-0	12	40.1	0.614	5
4'-5	5'-7				10	34.4	0.144	5'-6	14	51.4	0.735	6
4'-11	6'-1				10	36.5	0.176	6'-2	14	57.7	0.913	7
2'-9	3'-11				6	23.0	0.088	5'-0	12	40.1	0.614	8
3'-2	4'-4				6	24.8	0.102	6'-0	16	64.1	0.867	9
3'-5	4'-8				8	28.4	0.124	7'-2	16	76.6	1.215	10
3'-11	5'-1				8	30.1	0.139	7'-2	16	76.6	1.215	11
4'-3	5'-5	↓	↓	↓	8	31.5	0.151	8'-2	18	98.2	1.561	12
4'-7	5'-9	4	10	1'-8	10	35.1	0.164	8'-2	18	98.2	1.561	13

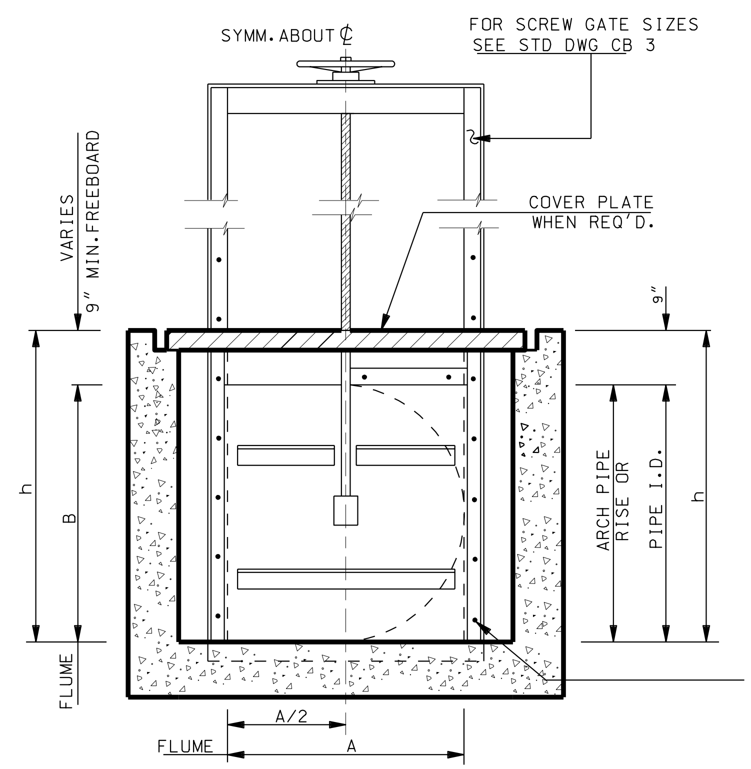


A x B - FLUME SIZE OR GATE SIZE
I.D. - INSIDE DIAMETER OF ROUND PIPE
S x R - SPAN x RISE OF ARCH PIPE

180° STANDARD HOOK DETAIL

NOTES:

1. FOR TRANSITION STRUCTURE FROM DIVERSION BOX TO TRAPEZOIDAL SHAPED CHANNEL WITH BOTTOM WIDTH OF 1'-0". SEE STD DWG CB 3
2. ALL DIMENSIONS ARE ROUNDED TO THE NEAREST WHOLE INCH. THOSE DIMENSIONS SHOWN FOR REBAR ARE OUT-TO-OUT OF BAR.
3. WHEN LAYING-OUT SET REBAR, USE "α" AND "W" DIMENSIONS NOT AVERAGE LENGTH OF REBAR.
4. USE STANDARD 180 DEGREE HOOK FOR K2 BAR AS NOTED.
5. USE #5 REBARS FOR K1, K2, G1 AND H1 MARK NUMBERS. ALL REMAINING MARK NUMBERS ARE #4 REBARS.
6. SAME SIZE BOX IS REQUIRED FOR BOTH METAL PIPE AND CONCRETE PIPE.



SCREW GATE INSTALLATION DIAGRAM

GENERAL NOTES:

1. USE COATED DEFORMED BILLET REINFORCING STEEL BARS CONFORMING TO ASSHTO M 284 OR M 111 AND M 31 GRADE 60 RESPECTIVELY.
2. USE TYPE II CEMENT (LOW ALKALI) AND STRUCTURAL CONCRETE UNLESS SPECIFIED OTHERWISE.
3. CHAMFER ALL EXPOSED CONCRETE CORNERS ¾" EXCEPT WHERE NOTED OTHERWISE.
4. USE CLASS AA(AE) CAST-IN-PLACE CONCRETE EXCEPT WHERE NOTED OTHERWISE, SPECIFIED OTHERWISE.
5. EACH LINE DESCRIBES THE QUANTITIES FOR ONE WALL OR SLAB OF THE TYPE SPECIFIED. USE THIS DRAWING IN CONJUNCTION WITH ROADWAY PLAN AND PROFILE, AND ROADWAY SUMMARY SCHEDULES TO DETERMINE THE SPECIFICS CONCERNING EACH DIVERSION BOX.

DESIGN DATA

HS-20 OR INTERSTATE ALTERNATE LOADING IN ACCORDANCE WITH CURRENT AASHTO AND INTERIM SPECIFICATIONS.
CAST-IN-PLACE STRUCTURAL CONCRETE: Fc = 1,400 psi n = 8
REINF. STEEL: Fs = 24,000 psi

NO.	DATE	APPR.	REVISIONS	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — CHAIRMAN STANDARDS COMMITTEE — JAN.01,2005 DATE
APPROVED — DEPUTY DIRECTOR — JAN.01,2005 DATE

STANDARD DIVERSION BOX W/INTERCHANGEABLE WALLS, QUANTITIES SCHEDULE

STANDARD DRAWING TITLE

STD DWG DB 2B

15-DEC-2004