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

γ = NO. OF SETS; CUT LINE; B = NO. OF BARS PER SET; AVE. L'GTH = (α + N)/2

Dimensions

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

TYPE W (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.	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	3'-3	5'-5	1	2	4'-4	1'-1	0	2	1	1'-1	2'-7	2	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	3'-9	6'-11		3	5'-4	1'-7	7"		2	1'-1	3'-1	3	2'-5	3'-7	8	3'-4	6	2'-9			9	5'-11		70.4	92.7	0.577	0.690
3	4'-3	8'-5		3	6'-4	2'-1	1'-1		2	1'-7	3'-7	3	2'-11	4'-1	10	4'-0	6	3'-5			9	8'-5		91.9	116.2	0.832	0.979
4	5'-2	10'-4		4	7'-9	2'-7	7"		3	1'-7	4'-1	4	3'-5	4'-7	10	4'-9	8	4'-2			12	10'-4		122.3	153.5	1.169	1.347
5	5'-7	11'-9		4	8'-8	3'-1	1'-1		3	2'-1	4'-7	4	3'-11	5'-1	12	5'-6	8	4'-10			12	11'-9		149.7	182.8	1.536	1.739
6	6'-2	13'-4		5	9'-9	3'-7	7"		4	2'-1	5'-1	5	4'-5	5'-7	14	6'-2	10	5'-6			15	13'-4		198.1	255.4	1.934	2.166
7	6'-9	14'-11		5	10'10	4'-1	1'-1		4	2'-7	5'-7	6	4'-11	6'-1	16	6'-11	10	6'-3			16	14'11		236.8	279.9	2.414	2.674
8	5'-7	9'-5		3	7'-6	1'-11	11"		2	1'-5	3'-5	4	2'-9	3'-11	10	3'-10	6	3'-2			10	9'-5		92.6	120.0	0.832	0.996
9	6'-7	11'-3		3	8'-11	2'-4	1'-4		2	1'-10	3'-10	5	3'-2	4'-4	10	4'-5	6	3'-9			11	11'-3		108.5	139.5	1.123	1.318
10	7'-9	13'-1		4	10'-5	2'-8	8"		3	1'-8	4'-2	7	3'-6	4'-8	12	4'-11	8	4'-3			15	13'-1		150.0	189.2	1.417	1.645
11	7'-9	13'-11		4	10'-10	3'-1	1'-1		3	2'-1	4'-7	7	3'-11	5'-1	12	5'-6	8	4'-10			15	13'-11		164.7	205.0	1.709	1.952
12	8'-9	15'-7		5	12'-2	3'-5	5"		4	1'-11	4'-11	8	4'-3	5'-5	14	5'-11	10	5'-4			18	15'-7		210.0	256.9	2.040	2.311
13	8'-9	16'-3	1	5	12'-6	3'-5	9"	2	4	2'-3	5'-3	8	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)

LINE NUMBER	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
1	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
2	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
3	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
4	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
5	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
6	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
7	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
8	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
9	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
10	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
11	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
12	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
13	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

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.

Dimensions

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

WINGWALLS WITHOUT ATTACHED APRON

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

(Wingwall Y: K2 with 6" hook, T, 135°; P1)

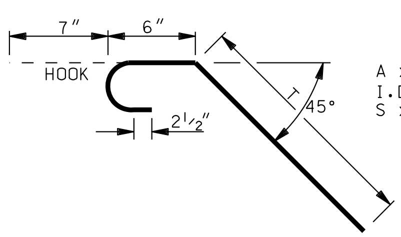
WALL TYPES

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

LINE NUMBER	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	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

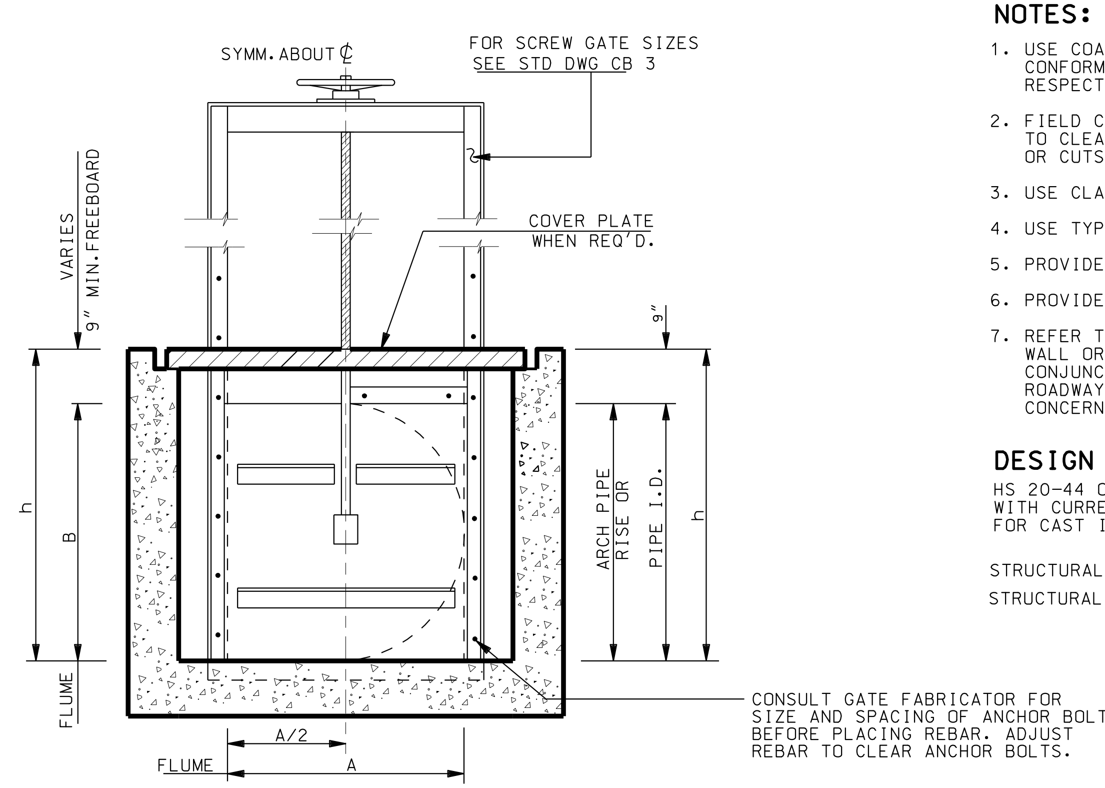
WALL T (G1: θ, 1'-2; H2: 10") and **BOTTOM SLAB** (M1)

LINE NUMBER	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
1	1'-11	3'-1	4	10	1'-8	4	17.3	0.049	2'-8	8	14.3	0.194
2	2'-5	3'-7				6	21.6	0.063	3'-2	8	16.9	0.265
3	2'-11	4'-1				6	23.7	0.076	3'-8	10	24.5	0.346
4	3'-5	4'-7				8	28.0	0.110	4'-6	12	36.1	0.505
5	3'-11	5'-1				8	30.1	0.127	5'-0	12	40.1	0.614
6	4'-5	5'-7				10	34.4	0.144	5'-6	14	51.4	0.735
7	4'-11	6'-1				10	36.5	0.176	6'-2	14	57.7	0.913
8	2'-9	3'-11				6	23.0	0.088	5'-0	12	40.1	0.614
9	3'-2	4'-4				6	24.8	0.102	6'-0	16	64.1	0.867
10	3'-5	4'-8				8	28.4	0.124	7'-2	16	76.6	1.215
11	3'-11	5'-1				8	30.1	0.139	7'-2	16	76.6	1.215
12	4'-3	5'-5				8	31.5	0.151	8'-2	18	98.2	1.561
13	4'-7	5'-9	4	10	1'-8	10	35.1	0.164	8'-2	18	98.2	1.561



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

180° STANDARD HOOK DETAIL



SCREW GATE INSTALLATION DIAGRAM

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.

NOTES:

1. USE COATED DEFORMED REINFORCING STEEL BARS CONFORMING TO AASHTO M 284 OR M 111 AND M 31 GRADE 60 RESPECTIVELY.
2. FIELD CUT AND BEND REINFORCING STEEL AS NECESSARY TO CLEAR PIPES AND MAINTAIN 2" COVER. REPAIR ANY DAMAGE OR CUTS TO THE EPOXY COATING ON REINFORCING BARS.
3. USE CLASS AA (AE) CONCRETE.
4. USE TYPE II CEMENT (LOW ALKALI).
5. PROVIDE 2" CONCRETE COVER TO REINFORCING STEEL.
6. PROVIDE ¾" CHAMFER ON ALL EXPOSED CONCRETE CORNERS.
7. REFER TO EACH FULL LINE IN TABLE FOR QUANTITIES FOR ONE WALL OR SLAB OF THE TYPE SPECIFIED. USE THIS DRAWING IN CONJUNCTION WITH THE ROADWAY PLAN AND PROFILE, AND ROADWAY SUMMARY SCHEDULE TO DETERMINE THE SPECIFICS CONCERNING EACH DIVERSION BOX.

DESIGN DATA

HS 20-44 OR ALTERNATE LOADING IN ACCORDANCE WITH CURRENT AASHTO INTERIM SPECIFICATIONS FOR CAST IN PLACE STRUCTURAL CONCRETE.

STRUCTURAL STEEL Fs = 24,000 psi
STRUCTURAL CONCRETE f'c = 1,400 psi
fy = 60,000 psi
n = 8

REVISIONS

NO.	DATE	APPR.	REMARKS

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

RECOMMENDED FOR APPROVAL — JAN.01,2008 DATE
CHAIRMAN STANDARDS COMMITTEE APPROVED — JAN.01,2008 DATE
DEPUTY DIRECTOR

STANDARD DIVERSION BOX W/INTERCHANGEABLE WALLS, QUANTITIES SCHEDULE
STANDARD DRAWING TITLE

STD DWG
DB 2B

DGN File: L:\Standard_Drawings\Imperial\2008Approved\Diversion Boxes (DB)\DB02B.dgn
18-DEC-2007