LINE	NO. of MANHOLE STEPS	R	COLUMN "A" DIMENSIONS H	K	T	REINFORCING STEEL A LENGTH	A NO	B LENGTH	B NO	C NO.=16 LENGTH	D NO.=3 LENGTH	QUANTITIES CONC. yd^3	REINF. STEEL lbs
1	--	4	3'-10	2'-8	6"	3'-8	13	4'-4	16	3'-5	1'-6	1.41	184
2	2	4	4'-4	3'-2			13		16	3'-11		1.55	192
3	2	5	4'-10	3'-8			15		18	4'-5		1.69	217
4	3	5	5'-4	4'-2			15		18	4'-11		1.83	225
5	3	6	5'-10	4'-8			17		20	5'-5		1.98	250
6	4	6	6'-4	5'-2			17		20	5'-11		2.12	259
7	4	7	6'-10	5'-8			19		22	6'-5		2.26	284
8	5	7	7'-4	6'-2			19		22	6'-11		2.40	292
9	5	8	7'-10	6'-8			21		24	7'-5		2.54	317
10	6	8	8'-4	7'-2			21		24	7'-11		2.69	326
11	6	9	8'-10	7'-8			23		26	8'-5		2.83	351
12	7	9	9'-4	8'-2			23		26	8'-11		2.97	359
13	7	10	9'-10	8'-8			25		28	9'-5		3.11	384
14	8	10	10'-4	9'-2			25		28	9'-11		3.25	392
15	8	11	10'-10	9'-8			27		30	10'-5		3.40	417
16	9	11	11'-4	10'-2			27		30	10'-11		3.54	426
17	9	12	11'-10	10'-8			29		32	11'-5		3.68	451
18	10	12	12'-4	11'-2	6"	3'-8	29	4'-4	32	11'-11	1'-6	3.82	459
19	10	13	12'-11	11'-8	7"	3'-10	31	4'-6	34	12'-6	1'-7	4.72	497
20	11	13	13'-5	12'-2			31		34	13'-0		4.89	505
21	11	14	13'-11	12'-8			33		36	13'-6		5.06	531
22	12	14	14'-5	13'-2			33		36	14'-0		5.23	539
23	12	15	14'-11	13'-8			35		38	14'-6		5.40	565
24	13	15	15'-5	14'-2			35		38	15'-0		5.57	574
25	13	16	15'-11	14'-8			37		40	15'-6		5.74	599
26	14	16	16'-5	15'-2			37		40	16'-0		5.91	608
27	14	17	16'-11	15'-8			39		42	16'-6		6.08	633
28	15	17	17'-5	16'-2			39		42	17'-0		6.25	642
29	15	18	17'-11	16'-8			41		44	17'-6		6.42	667
30	16	18	18'-5	17'-2			41		44	18'-0		6.59	676
31	16	19	18'-11	17'-8			43		46	18'-6		6.76	702
32	17	19	19'-5	18'-2			43		46	19'-0		6.92	710
33	17	20	19'-11	18'-8			45		48	19'-6		7.09	736
34	18	20	20'-5	19'-2			45		48	20'-0		7.26	744
35	18	21	20'-11	19'-8			47		50	20'-6		7.43	770
36	19	21	21'-5	20'-2			47		50	21'-0		7.60	778
37	19	22	21'-11	20'-8			49		52	21'-6		7.77	804
38	20	22	22'-5	21'-2	7"	3'-10	49	4'-6	52	22'-0	1'-7	7.94	812
39	20	23	23'-0	21'-8	8"	4'-0	51	4'-8	54	22'-7	1'-8	9.47	858
40	21	23	23'-6	22'-2			51		54	23'-1		9.67	866
41	21	24	24'-0	22'-8			53		56	23'-7		9.87	892
42	22	24	24'-6	23'-2			53		56	24'-1		10.07	901
43	22	25	25'-0	23'-8			55		58	24'-7		10.26	927
44	23	25	25'-6	24'-2			55		58	25'-1		10.46	936
45	23	26	26'-0	24'-8			57		60	25'-7		10.66	962
46	24	26	26'-6	25'-2			57		60	26'-1		10.86	970
47	24	27	27'-0	25'-8			59		62	26'-7		11.05	997
48	25	27	27'-6	26'-2			59		62	27'-1		11.25	1005
49	25	28	28'-0	26'-8			61		64	27'-7		11.45	1031
50	26	28	28'-6	27'-2			61		64	28'-1		11.65	1040
51	26	29	29'-0	27'-8			63		66	28'-7		11.84	1066
52	27	29	29'-6	28'-2			63		66	29'-1		12.04	1075
53	27	30	30'-0	28'-8			65		68	29'-7		12.24	1101
54	28	30	30'-6	29'-2	8"	4'-0	65	4'-8	68	30'-1	1'-8	12.44	1109
			W=3'-0, M=1'-4½									N=5, Q=3	

LINE	COLUMN "B" DIMENSIONS H	K	T	REINFORCING STEEL A LENGTH	A NO	B LENGTH	B NO	C NO.=16 LENGTH	D NO.=3 LENGTH	QUANTITIES CONC. yd^3	REINF. STEEL lbs
1	----	----	---	----	--	----	--	----	---	----	----
2	4'-5	3'-3	6"	4'-2	13	4'-4	17	4'-0	2'-0	1.73	206
3	4'-11	3'-9			15		19	4'-6		1.88	232
4	5'-5	4'-3			15		19	5'-0		2.03	241
5	5'-11	4'-9			17		21	5'-6		2.19	266
6	6'-5	5'-3			17		21	6'-0		2.34	275
7	6'-11	5'-9			19		23	6'-6		2.49	303
8	7'-5	6'-3			19		23	7'-0		2.64	310
9	7'-11	6'-9			21		25	7'-6		2.79	336
10	8'-5	7'-3			21		25	8'-0		2.94	344
11	8'-11	7'-9			23		27	8'-6		3.09	370
12	9'-5	8'-3			23		27	9'-0		3.24	378
13	9'-11	8'-9			25		29	9'-6		3.39	405
14	10'-5	9'-3			25		29	10'-0		3.54	413
15	10'-11	9'-9			27		31	10'-6		3.70	439
16	11'-5	10'-3			27		31	11'-0		3.85	447
17	11'-11	10'-9			29		33	11'-6		4.00	473
18	12'-6	11'-3	6"	4'-2	29	4'-4	33	12'-0	2'-0	4.15	481
19	13'-0	11'-9	7"	4'-4	31	4'-6	35	12'-7	2'-1	5.12	521
20	13'-6	12'-3			31		35	13'-1		5.30	529
21	14'-0	12'-9			33		37	13'-7		5.48	556
22	14'-6	13'-3			33		37	14'-1		5.66	564
23	15'-0	13'-9			35		39	14'-7		5.84	591
24	15'-6	14'-3			35		39	15'-1		6.02	599
25	16'-0	14'-9			37		41	15'-7		6.20	626
26	16'-6	15'-3			37		41	16'-1		6.38	634
27	17'-0	15'-9			39		43	16'-7		6.56	661
28	17'-6	16'-3			39		43	17'-1		6.74	669
29	18'-0	16'-9			41		45	17'-7		6.92	696
30	18'-6	17'-3			41		45	18'-1		7.10	704
31	19'-0	17'-9			43		47	18'-7		7.28	731
32	19'-6	18'-3			43		47	19'-1		7.46	740
33	20'-0	18'-9			45		49	19'-7		7.64	766
34	20'-6	19'-3			45		49	20'-1		7.82	775
35	21'-0	19'-9			47		51	20'-7		8.10	801
36	21'-6	20'-3			47		51	21'-1		8.18	810
37	22'-0	20'-9			49		53	21'-7		8.36	837
38	22'-6	21'-3	7"	4'-4	49	4'-6	53	22'-1	2'-1	8.54	345
39	23'-1	21'-9	8"	4'-6	51	4'-8	55	22'-8	2'-2	10.17	892
40	23'-7	22'-3			51		55	23'-2		10.38	900
41	24'-1	22'-9			53		57	23'-8		10.59	928
42	24'-7	23'-3			53		57	24'-2		10.80	936
43	25'-1	23'-9			55		59	24'-8		11.01	963
44	25'-7	24'-3			55		59	25'-2		11.22	972
45	26'-1	24'-9			57		61	25'-8		11.43	1000
46	26'-7	25'-3			57		61	26'-2		11.64	1008
47	27'-1	25'-9			59		63	26'-8		11.85	1035
48	27'-7	26'-3			59		63	27'-2		12.06	1043
49	28'-1	26'-9			61		65	27'-8		12.27	1071
50	28'-7	27'-3			61		65	28'-2		12.48	1079
51	29'-1	27'-9			63		67	28'-8		12.69	1107
52	29'-7	28'-3			63		67	29'-2		12.90	1115
53	30'-1	28'-9			65		69	29'-8		13.11	1142
54	30'-7	29'-3	8"	4'-6	65	4'-8	69	30'-2	2'-2	13.32	1151
	W=3'-6, M=1'-10½									N=5, Q=4	

LINE	COLUMN "C" DIMENSIONS H	K	T	REINFORCING STEEL A LENGTH	A NO	B LENGTH	B NO	C NO.=18 LENGTH	D NO.=3 LENGTH	QUANTITIES CONC. yd^3	REINF. STEEL lbs
1	----	----	---	----	--	----	--	----	---	----	----
2	----	----	---	----	--	----	--	----	---	----	----
3	5'-0	3'-10	6"	4'-8	15	4'-4	21	4'-7	2'-6	2.08	262
4	5'-6	4'-4			15		21	5'-1		2.24	271
5	6'-0	4'-10			17		23	5'-7		2.40	299
6	6'-6	5'-4			17		23	6'-1		2.57	309
7	7'-0	5'-10			19		25	6'-7		2.73	337
8	7'-6	6'-4			19		25	7'-1		2.89	346
9	8'-0	6'-10			21		27	7'-7		3.05	374
10	8'-6	7'-4			21		27	8'-1		3.21	383
11	9'-0	7'-10			23		29	8'-7		3.37	412
12	9'-6	8'-4			23		29	9'-1		3.53	421
13	10'-0	8'-10			25		31	9'-7		3.69	449
14	10'-6	9'-4			25		31	10'-1		3.85	459
15	11'-0	9'-10			27		33	10'-7		4.01	487
16	11'-6	10'-4			27		33	11'-1		4.18	496
17	12'-0	10'-10			29		35	11'-7		4.34	524
18	12'-6	11'-4	6"	4'-8	29	4'-4	35	12'-1	2'-6	4.50	534
19	13'-1	11'-10	7"	4'-10	31	4'-6	37	12'-8	2'-7	5.52	576
20	13'-7	12'-4			31		37	13'-2		5.71	585
21	14'-1	12'-10			33		39	13'-8		5.90	613
22	14'-7	13'-4			33		39	14'-2		6.09	622
23	15'-1	13'-10			35		41	14'-8		6.28	651
24	15'-7	14'-4			35		41	15'-2		6.47	662
25	16'-1	14'-10			37		43	15'-8		6.66	691
26	16'-7	15'-4			37		43	16'-2		6.85	700
27	17'-1	15'-10			39		45	16'-8		7.04	729
28	17'-7	16'-4			39		45	17'-2		7.24	738
29	18'-1	16'-10			41		47	17'-8		7.43	767
30	18'-7	17'-4			41		47	18'-2		7.62	776
31	19'-1	17'-10			43		49	18'-8		7.81	805
32	19'-7	18'-4			43		49	19'-2		8.00	815
33	20'-1	18'-10			45		51	19'-8		8.19	844
34	20'-7	19'-4			45		51	20'-2		8.38	853
35	21'-1	19'-10			47		53	20'-8		8.57	882
36	21'-7	20'-4			47		53	21'-2		8.76	891
37	22'-1	20'-10			49		55	21'-8		8.95	920
38	22'-7	21'-4	7"	4'-10	49	4'-6	55	22'-2	2'-7	9.15	929
39	23'-2	21'-10	8"	5'-0	51	4'-8	57	22'-9	2'-8	10.86	979
40	23'-8	22'-4			51		57	23'-3		11.09	988
41	24'-2	22'-10			53		59	23'-9		11.31	1018
42	24'-8	23'-4			53		59	24'-3		11.53	1027
43	25'-2	23'-10			55		61	24'-9		11.75	1057
44	25'-8	24'-4			55		61	25'-3		11.97	1066
45	26'-2	24'-10			57		63	25'-9		12.20	1096
46	26'-8	25'-4			57		63	26'-3		12.42	1105
47	27'-2	25'-10			59		65	26'-9		12.64	1135
48	27'-8	26'-4			59		65	27'-3		12.86	1144
49	28'-2	26'-10			61		67	27'-9		13.08	1174
50	28'-8	27'-4			61		67	28'-3		13.31	1183
51	29'-2	27'-10			63		69	28'-9		13.53	1212
52	29'-8	28'-4			63		69	29'-3		13.75	1222
53	30'-2	28'-10			65		71	29'-9		13.97	1251
54	30'-8	29'-4	8"	5'-0	65	4'-8	71	30'-3	2'-8	14.19	1261
	W=4'-0, M=2'-4½									N=6, Q=5	

LINE	COLUMN "D" DIMENSIONS H	K	T	REINFORCING STEEL A LENGTH	A NO	B LENGTH	B NO	C NO.=18 LENGTH	D NO.=3 LENGTH	QUANTITIES CONC. yd^3	REINF. STEEL lbs	LINE
1	----	----	---	----	--	----	--	----	---	----	----	1
2	----	----	---	----	--	----	--	----	---	----	----	2
3	----	----	---	----	--	----	--	----	---	----	----	3
4	5'-7	4'-5	6"	5'-2	15	4'-4	22	5'-2	3'-0	2.45	287	4
5	6'-1	4'-11			17		24	5'-8		2.62	316	5
6	6'-7	5'-5			17		24	6'-2		2.79	325	6
7	7'-1	5'-11			19		26	6'-8		2.96	354	7
8	7'-7	6'-5			19		26	7'-2		3.13	364	8
9	8'-1	6'-11			21		28	7'-8		3.30	393	9
10	8'-7	7'-5			21		28	8'-2		3.47	402	10
11	9'-1	7'-11			23		30	8'-8		3.64	432	11
12	9'-7	8'-5			23		30	9'-2		3.81	441	12
13	10'-1	8'-11			25		32	9'-8		3.98	470	13
14	10'-7	9'-5			25		32	10'-2		4.15	480	14
15	11'-1	9'-11			27		34	10'-8		4.32	509	15
16	11'-7	10'-5			27		34	11'-2		4.49	518	16
17	12'-1	10'-11			29		36	11'-8		4.66	547	17
18	12'-7	11'-5	6"	5'-2	29	4'-4	36	12'-2	3'-0	4.83	557	18
19	13'-2	11'-11	7"	5'-4	31	4'-6	38	12'-9	3'-1	5.92	600	19
20	13'-8	12'-5			31		38	13'-3		6.12	609	20
21	14'-2	12'-11			33		40	13'-9		6.32	639	21
22	14'-8	13'-5			33		40	14'-3		6.52	648	22
23	15'-2	13'-11			35		42	14'-9		6.72	678	23
24	15'-8	14'-5			35		42	15'-3		6.93	688	24
25	16'-2	14'-11			37		44	15'-9		7.13	718	25
26	16'-8	15'-5			37		44	16'-3		7.33	727	26
27	17'-2	15'-11			39		46	16'-9		7.53	757	27
28	17'-8	16'-5			39		46	17'-3		7.74	766	28
29	18'-2	16'-11			41		48	17'-9		7.94	796	29
30	18'-8	17'-5			41		48	18'-3		8.14	806	30
31	19'-2	17'-11			43		50	18'-9		8.34	836	31
32	19'-8	18'-5			43		50	19'-3		8.53	845	32
33	20'-2	18'-11			45		52	19'-9		8.75	875	33
34	20'-8	19'-5			45		52	20'-3		8.95	884	34
35	21'-2	19'-11			47		54	20'-9		9.15	914	35
36	21'-8	20'-5			47		54	21'-3		9.35	923	36
37	22'-2	20'-11			49		56	21'-9		9.55	953	37
38	22'-8	21'-5	7"	5'-4	49	4'-6	56	22'-3	3'-1	9.76	962	38
39	23'-3	21'-11	8"	5'-6	51	4'-8	58	22'-10	3'-2	11.57	1013	39
40	23'-8	22'-5			51		58	23'-4		11.80	1023	40
41	24'-3	22'-11			53		60	23'-10		12.04	1053	41
42	24'-9	23'-5			53		60	24'-4		12.27	1063	42
43	25'-3	23'-11			55		62	24'-10		12.51	1093	43
44	25'-9	24'-5			55		62	25'-4		12.74	1103	44
45	26'-3	24'-11			57		64	25'-10		12.98	1133	45
46	26'-9	25'-5			57		64	26'-4		13.21	1143	46
47	27'-3	25'-11			59		66	26'-10		13.45	1173	47
48	27'-9	26'-5			59		66	27'-4		13.68	1183	48
49	28'-3	26'-11			61		68	27'-10		13.92	1213	49
50	28'-9	27'-5			61		68	28'-4		14.15	1223	50
51	29'-3	27'-11			63		70	28'-10		14.39	1253	51
52	29'-9	28'-5			63		70	29'-4		14.62	1263	52
53	30'-3	28'-11			65		72	29'-10		14.86	1293	53
54	30'-9	29'-5	8"	5'-6	65	4'-8	72	30'-4	3'-2	15.09	1303	54
	W=4'-6, M=2'-10½									N=6, Q=6		

TABLE 1 : CONCRETE DISPLACED BY PIPES

PIPE SIZES RCP	CMP	T= 6" yd^3	T= 7" yd^3	T= 8" yd^3
	12"	0.015	0.017	0.019
	18"	0.033	0.038	0.044
18"	24"	0.058	0.068	0.078
24"	30"	0.091	0.106	0.121
30"	36"	0.131	0.153	0.174
36"	42"	0.178	0.208	0.237
42"	48"	0.233	0.271	0.310

TABLE 2 : MAXIMUM PIPE SIZE TO BE USED

	RCP	CMP
COL. A	18"	12", 18", 24"
COL. B	30"	30", 36"
COL. C	36"	42"
COL. D	42"	48"

TABLE 3 : CONCRETE NEEDED FOR FORMED INVERT. (SEE SHEET 2)

PIPE SIZES	12"	18"	24"	30"	36"	42"	48"
RCP (yd^3)	-----	0.191	0.222	0.286	0.378	0.483	-----
CMP (yd^3)	0.081	0.106	0.120	0.124	0.169	0.220	0.277

STRUCTURAL STEEL :

RECTANGULAR GRATE & FRAME = 340 lbs
BICYCLE-SAFE GRATE & FRAME = 365 lbs
SOLID COVER & FRAME = 474 lbs

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 CATCH BASIN AND CLEANOUT BOX
SCHEDULE OF INSTALLATION
18" TO 42" RCP
12" TO 48" CMP
STANDARD DRAWING TITLE

STD DWG
CB 9C

DGN File:L:\Standard Drawings\Imperial\2008Approved\Catch Basins and Cleanouts (CB)\CB09c.dgn
18-DEC-2007