LINE	NO. of MANHOLE STEPS	R	COLUMN "E" DIMENSIONS H	K	T	REINFORCING STEEL A LENGTH	NO	B LENGTH	NO	C NO.=20 LENGTH	D NO.=3 LENGTH	QUANTITIES CONC. yd^3	REINF. STEEL lbs
1	4	6	* 6'-4	5'-2	6"	5'-11	17	4'-4	26	5'-11	3'-9	3.00	358
2	4	7	6'-10	5'-8		19			28	6'-5		3.18	389
3	5	7	7'-4	6'-2		19			28	6'-11		3.37	400
4	5	8	7'-10	6'-8		21			30	7'-5		3.55	432
5	6	8	8'-4	7'-2		21			30	7'-11		3.74	442
6	6	9	8'-10	7'-8		23			32	8'-5		3.92	474
7	7	9	9'-4	8'-2		23			32	8'-11		4.10	484
8	7	10	9'-10	8'-8		25			34	9'-5		4.29	516
9	8	10	10'-4	9'-2		25			34	9'-11		4.47	527
10	8	11	10'-10	9'-8		27			36	10'-5		4.65	558
11	9	11	11'-4	10'-2		27			36	10'-11		4.84	569
12	9	12	11'-10	10'-8		29			38	11'-5		5.02	601
13	10	12	12'-4	11'-2	6"	5'-11	29	4'-4	38	11'-11	3'-9	5.20	611
14	10	13	12'-11	11'-8	7"	6'-1	31	4'-6	40	12'-6	3'-10	6.36	657
15	11	13	13'-5	12'-2			31		40	13'-0		6.58	668
16	11	14	13'-11	12'-8			33		42	13'-6		6.80	700
17	12	14	14'-5	13'-2			33		42	14'-0		7.02	711
18	12	15	14'-11	13'-8			35		44	14'-6		7.23	743
19	13	15	15'-5	14'-2			35		44	15'-0		7.45	753
20	13	16	15'-11	14'-8			37		46	15'-6		7.67	786
21	14	16	16'-5	15'-2			37		46	16'-0		7.89	796
22	14	17	16'-11	15'-8			39		48	16'-6		8.11	829
23	15	17	17'-5	16'-2			39		48	17'-0		8.32	839
24	15	18	17'-11	16'-8			41		50	17'-6		8.54	872
25	16	18	18'-5	17'-2			41		50	18'-0		8.76	882
26	16	19	18'-11	17'-8			43		52	18'-6		8.98	915
27	17	19	19'-5	18'-2			43		52	19'-0		9.19	925
28	17	20	19'-11	18'-8			45		54	19'-6		9.41	958
29	18	20	20'-5	19'-2			45		54	20'-0		9.63	968
30	18	21	20'-11	19'-8			47		56	20'-6		9.85	1001
31	19	21	21'-5	20'-2			47		56	21'-0		10.07	1011
32	19	22	21'-11	20'-8			49		58	21'-6		10.28	1044
33	20	22	22'-5	21'-2	7"	6'-1	49	4'-6	58	22'-0	3'-10	10.50	1054
34	20	23	23'-0	21'-8	8"	6'-3	51	4'-8	60	22'-7	3'-11	12.44	1108
35	21	23	23'-6	22'-2			51		60	23'-1		12.69	1118
36	21	24	24'-0	22'-8			53		62	23'-7		12.94	1151
37	22	24	24'-6	23'-2			53		62	24'-1		13.19	1162
38	22	25	25'-0	23'-8			55		64	24'-7		13.45	1195
39	23	25	25'-6	24'-2			55		64	25'-1		13.70	1206
40	23	26	26'-0	24'-8			57		66	25'-7		13.95	1239
41	24	26	26'-6	25'-2			57		66	26'-1		14.21	1249
42	24	27	27'-0	25'-8			59		68	26'-7		14.46	1282
43	25	27	27'-6	26'-2			59		68	27'-1		14.71	1293
44	25	28	28'-0	26'-8			61		70	27'-7		14.97	1326
45	26	28	28'-6	27'-2			61		70	28'-1		15.22	1336
46	26	29	29'-0	27'-8			63		72	28'-7		15.47	1370
47	27	29	29'-6	28'-2			63		72	29'-1		15.73	1380
48	27	30	30'-0	28'-8			65		74	29'-7		15.98	1413
49	28	30	30'-6	29'-2	8"	6'-3	65	4'-8	74	30'-1	3'-11	16.23	1424
			W=5'-3, M=3'-7½									N=7, Q=7	

LINE	COLUMN "F" DIMENSIONS H	K	T	REINFORCING STEEL A LENGTH	NO	B LENGTH	NO	C NO.=20 LENGTH	D NO.=3 LENGTH	QUANTITIES CONC. yd^3	REINF. STEEL lbs
1	* 6'-10	5'-8	6"	6'-5	19	4'-4	29	6'-5	4'-3	3.39	405
2	7'-4	6'-2		6'-7	19		29	6'-11		3.59	416
3	7'-10	6'-8			21		31	7'-5		3.78	449
4	8'-4	7'-2			21		31	7'-11		3.97	459
5	8'-10	7'-8			23		33	8'-5		4.16	492
6	9'-4	8'-2			23		33	8'-11		4.36	502
7	9'-10	8'-8			25		35	9'-5		4.55	535
8	10'-4	9'-2			25		35	9'-11		4.74	546
9	10'-10	9'-8			27		37	10'-5		4.93	579
10	11'-4	10'-2			27		37	10'-11		5.13	589
11	11'-10	10'-8			29		39	11'-5		5.32	622
12	12'-4	11'-2	6"	6'-5	29	4'-4	39	11'-11	4'-3	5.51	632
13	12'-11	11'-8	7"	6'-7	31	4'-6	41	12'-6	4'-4	6.73	680
14	13'-5	12'-2			31		41	13'-0		6.96	690
15	13'-11	12'-8			33		43	13'-6		7.18	724
16	14'-5	13'-2			33		43	14'-0		7.41	734
17	14'-11	13'-8			35		45	14'-6		7.64	768
18	15'-5	14'-2			35		45	15'-0		7.87	778
19	15'-11	14'-8			37		47	15'-6		8.10	812
20	16'-5	15'-2			37		47	16'-0		8.33	822
21	16'-11	15'-8			39		49	16'-6		8.56	856
22	17'-5	16'-2			39		49	17'-0		8.78	866
23	17'-11	16'-8			41		51	17'-6		9.01	900
24	18'-5	17'-2			41		51	18'-0		9.24	910
25	18'-11	17'-8			43		53	18'-6		9.47	943
26	19'-5	18'-2			43		53	19'-0		9.69	954
27	19'-11	18'-8			45		55	19'-6		9.93	987
28	20'-5	19'-2			45		55	20'-0		10.16	998
29	20'-11	19'-8			47		57	20'-6		10.39	1031
30	21'-5	20'-2			47		57	21'-0		10.61	1042
31	21'-11	20'-8			49		59	21'-6		10.84	1075
32	22'-5	21'-2	7"	6'-7	49	4'-6	59	22'-0	4'-4	11.07	1086
33	23'-0	21'-8	8"	6'-9	51	4'-8	61	22'-7	4'-5	13.09	1141
34	23'-6	22'-2			51		61	23'-1		13.36	1151
35	24'-0	22'-8			53		63	23'-7		13.63	1186
36	24'-6	23'-2			53		63	24'-1		13.89	1196
37	25'-0	23'-8			55		65	24'-7		14.16	1230
38	25'-6	24'-2			55		65	25'-1		14.42	1241
39	26'-0	24'-8			57		67	25'-7		14.69	1275
40	26'-6	25'-2			57		67	26'-1		14.95	1285
41	27'-0	25'-8			59		69	26'-7		15.22	1320
42	27'-6	26'-2			59		69	27'-1		15.48	1330
43	28'-0	26'-8			61		71	27'-7		15.75	1364
44	28'-6	27'-2			61		71	28'-1		16.01	1375
45	29'-0	27'-8			63		73	28'-7		16.28	1409
46	29'-6	28'-2			63		73	29'-1		16.55	1419
47	30'-0	28'-8			65		75	29'-7		16.81	1454
48	30'-6	29'-2	8"	6'-9	65	4'-8	75	30'-1	4'-5	17.08	1478
49	W=5'-9, M=4'-1½									N=7, Q=8	

LINE	COLUMN "G" DIMENSIONS H	K	T	REINFORCING STEEL A LENGTH	NO	B LENGTH	NO	C NO.=22 LENGTH	D NO.=3 LENGTH	QUANTITIES CONC. yd^3	REINF. STEEL lbs
1	----	----	---	----	--	----	--	----	---	----	----
2	----	----	---	----	--	----	--	----	---	----	----
3	* 7'-4	6'-2	6"	6'-11	19	4'-4	31	6'-11	4'-9	3.80	451
4	7'-10	6'-8			21		33	7'-5		4.00	486
5	8'-4	7'-2			21		33	7'-11		4.20	497
6	8'-10	7'-8			23		35	8'-5		4.40	532
7	9'-4	8'-2			23		35	8'-11		4.61	544
8	9'-10	8'-8			25		37	9'-5		4.81	579
9	10'-4	9'-2			25		37	9'-11		5.01	590
10	10'-10	9'-8			27		39	10'-5		5.21	625
11	11'-4	10'-2			27		39	10'-11		5.42	636
12	11'-10	10'-8			29		41	11'-5		5.62	671
13	12'-5	11'-2	6"	6'-11	29	4'-4	41	11'-11	4'-9	5.82	683
14	12'-11	11'-8	7"	7'-1	31	4'-6	43	12'-6	4'-10	7.09	733
15	13'-5	12'-2			31		43	13'-0		7.33	744
16	13'-11	12'-8			33		45	13'-6		7.57	780
17	14'-5	13'-2			33		45	14'-0		7.81	792
18	14'-11	13'-8			35		47	14'-6		8.05	827
19	15'-5	14'-2			35		47	15'-0		8.29	838
20	15'-11	14'-8			37		49	15'-6		8.53	874
21	16'-5	15'-2			37		49	16'-0		8.77	886
22	16'-11	15'-8			39		51	16'-6		9.01	921
23	17'-5	16'-2			39		51	17'-0		9.24	933
24	17'-11	16'-8			41		53	17'-6		9.48	968
25	18'-5	17'-2			41		53	18'-0		9.72	980
26	18'-11	17'-8			43		55	18'-6		9.96	1015
27	19'-5	18'-2			43		55	19'-0		10.20	1027
28	19'-11	18'-8			45		57	19'-6		10.44	1063
29	20'-5	19'-2			45		57	20'-0		10.68	1074
30	20'-11	19'-8			47		59	20'-6		10.92	1110
31	21'-5	20'-2			47		59	21'-0		11.16	1121
32	21'-11	20'-8			49		61	21'-6		11.40	1157
33	22'-5	21'-2	7"	7'-1	49	4'-6	61	22'-0	4'-10	11.64	1168
34	23'-0	21'-8	8"	7'-3	51	4'-8	63	22'-7	4'-11	13.75	1226
35	23'-6	22'-2			51		63	23'-1		14.03	1237
36	24'-0	22'-8			53		65	23'-7		14.31	1274
37	24'-6	23'-2			53		65	24'-1		14.58	1285
38	25'-0	23'-8			55		67	24'-7		14.86	1321
39	25'-6	24'-2			55		67	25'-1		15.14	1333
40	26'-0	24'-8			57		69	25'-7		15.42	1369
41	26'-6	25'-2			57		69	26'-1		15.70	1381
42	27'-0	25'-8			59		71	26'-7		15.97	1417
43	27'-6	26'-2			59		71	27'-1		16.25	1429
44	28'-0	26'-8			61		73	27'-7		16.53	1465
45	28'-6	27'-2			61		73	28'-1		16.81	1476
46	29'-0	27'-8			63		75	28'-7		17.08	1513
47	29'-6	28'-2			63		75	29'-1		17.36	1524
48	30'-0	28'-8			65		77	29'-7		17.64	1561
49	30'-6	29'-2	8"	7'-3	65	4'-8	77	30'-1	4'-11	17.92	1572
	W=6'-3, M=4'-7½									N=8, Q=9	

LINE	COLUMN "H" DIMENSIONS H	K	T	REINFORCING STEEL A LENGTH	NO	B LENGTH	NO	C NO.=22 LENGTH	D NO.=3 LENGTH	QUANTITIES CONC. yd^3	REINF. STEEL lbs	LINE
1	----	----	---	----	--	----	--	----	---	----	----	1
2	----	----	---	----	--	----	--	----	---	----	----	2
3	----	----	---	----	--	----	--	----	---	----	----	3
4	* 8'-1	6'-11	6"	7'-5	21	4'-4	34	7'-8	5'-3	4.33	508	4
5	8'-7	7'-5			21		34	8'-2		4.54	520	5
6	9'-1	7'-11			23		36	8'-8		4.75	556	6
7	9'-7	8'-5			23		36	9'-2		4.96	567	7
8	10'-1	8'-11			25		38	9'-8		5.18	603	8
9	10'-7	9'-5			25		38	10'-2		5.39	615	9
10	11'-1	9'-11			27		40	10'-8		5.60	651	10
11	11'-7	10'-5			27		40	11'-2		5.81	662	11
12	12'-1	10'-11			29		42	11'-8		6.02	698	12
13	12'-7	11'-5	6"	7'-5	29	4'-4	42	12'-2	5'-3	6.23	710	13
14	13'-2	11'-11	7"	7'-7	31	4'-6	44	12'-9	5'-4	7.58	761	14
15	13'-8	12'-5			31		44	13'-3		7.83	772	15
16	14'-2	12'-11			33		46	13'-9		8.08	809	16
17	14'-8	13'-5			33		46	14'-3		8.33	821	17
18	15'-2	13'-11			35		48	14'-9		8.58	857	18
19	15'-8	14'-5			35		48	15'-3		8.83	869	19
20	16'-2	14'-11			37		50	15'-9		9.08	905	20
21	16'-8	15'-5			37		50	16'-3		9.33	917	21
22	17'-2	15'-11			39		52	16'-9		9.58	954	22
23	17'-8	16'-5			39		52	17'-3		9.83	965	23
24	18'-2	16'-11			41		54	17'-9		10.08	1002	24
25	18'-8	17'-5			41		54	18'-3		10.33	1013	25
26	19'-2	17'-11			43		56	18'-9		10.58	1050	26
27	19'-8	18'-5			43		56	19'-3		10.83	1061	27
28	20'-2	18'-11			45		58	19'-9		11.08	1098	28
29	20'-8	19'-5			45		58	20'-3		11.33	1109	29
30	21'-2	19'-11			47		60	20'-9		11.58	1146	30
31	21'-8	20'-5			47		60	21'-3		11.83	1158	31
32	22'-2	20'-11			49		62	21'-9		12.08	1194	32
33	22'-8	21'-5	7"	7'-7	49	4'-6	62	22'-3	5'-4	12.33	1206	33
34	23'-3	21'-11	8"	7'-9	51	4'-8	64	22'-10	5'-5	14.56	1264	34
35	23'-9	22'-5			51		64	23'-4		14.85	1276	35
36	24'-3	22'-11			53		66	23'-10		15.14	1313	36
37	24'-9	23'-5			53		66	24'-4		15.43	1325	37
38	25'-3	23'-11			55		68	24'-10		15.72	1362	38
39	25'-9	24'-5			55		68	25'-4		16.01	1374	39
40	26'-3	24'-11			57		70	25'-10		16.30	1411	40
41	26'-9	25'-5			57		70	26'-4		16.59	1423	41
42	27'-3	25'-11			59		72	26'-10		16.88	1460	42
43	27'-9	26'-5			59		72	27'-4		17.17	1471	43
44	28'-3	26'-11			61		74	27'-10		17.46	1509	44
45	28'-9	27'-5			61		74	28'-4		17.75	1520	45
46	29'-3	27'-11			63		76	28'-10		18.04	1558	46
47	29'-9	28'-5			63		76	29'-4		18.33	1569	47
48	30'-3	28'-11			65		78	29'-10		18.62	1607	48
49	30'-9	29'-5	8"	7'-9	65	4'-8	78	30'-4	5'-5	18.91	1618	49
	W=6'-9, M=5'-1½									N=8, Q=10		

NOTE: LINES MARKED WITH * REFER TO METAL PIPE ONLY.

TABLE 1 : CONCRETE DISPLACED BY PIPES

PIPE SIZES RCP	CMP	T= 6" yd^3	T= 7" yd^3	T= 8" yd^3
48"	60"	0.340	0.396	0.453
54"	66"	0.427	0.498	0.569
60"	72"	0.524	0.611	0.698
66"	78"	0.630	0.735	0.840

TABLE 2 : MAXIMUM PIPE SIZE TO BE USED

	RCP	CMP
COL. E	48"	60"
COL. F	54"	66"
COL. G	60"	72"
COL. H	66"	78"

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

PIPE SIZES	48"	54"	60"	66"	72"	78"
RCP (yd^3)	0.676	0.814	0.964	1.126	----	----
CMP (yd^3)	----	----	0.370	0.443	0.522	0.609

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 — JULY 03, 2002 DATE
CHAIRMAN STANDARDS COMMITTEE APPROVED — JULY 03, 2002 DATE
DEPUTY DIRECTOR

STANDARD CATCH BASIN AND CLEANOUT BOX SCHEDULE OF INSTALLATION 48" TO 66"RCP 60" TO 78"CMP

STANDARD DRAWING TITLE

STD DWG
CB 9D