DRAINAGE CALCULATIONS

NOTES:

* RUNOFF FOR STORM SEWER BASED ON 5 YR DESIGN FREQUENCY

** RUNOFF FOR CULVERT BASED ON 100 YR DESIGN FREQUENCY

* RUNOFF COMPUTATIONS

RUNOFF I.D.	C-VALUE	AREA (ha)	Tc (min)	INTENSITY (cm/hr)	TOTAL Q* (m^3/s)
A 1	0.85	0.45	10.0	17.489	0.184
A 2	0.85	0.14	10.0	17.489	0.057
A 3	0.85	0.57	10.0	17.489	0.233
B 1	0.85	2.63	14.5	14.775	0.910
B 2	0.85	2.63	14.5	14.775	0.910
B 3	0.70	1.49	10.0	17.489	0.503
B 4	0.85	0.06	10.0	17.489	0.025
B 5	0.85	0.04	10.0	17.489	0.016
B 6	0.85	0.75	10.0	17.489	0.307
B 7	0.85	0.30	10.0	17.489	0.123
B 8	0.85	0.13	10.0	17.489	0.053
C 1	0.85	0.45	10.0	17.489	0.184
C 2	0.85	0.13	10.0	17.489	0.053

** HEC-2 OUTPUT FOR BOX CULVERT (ENGLISH UNITS)

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q**	CWSEL	CRIWS	EG	10xKS	VCH	AREA	.01K
1970	100	590.84	587	581	1200	583.5	0	584.82	18.43	9.22	130.18	279.56
1970	100	590.84	587	581	2150	587.87	0	588.43	2.47	6.02	357.29	1367.76
2005	35	0	0	582	1200	584.74	584.74	585.89	102.78	8.58	139.86	118.36
2005	35	0	0	582	2150	588.11	0	588.52	13.59	5.23	443.59	583.26
2130	125	0	0	583	1200	586.26	0	587.01	55.62	6.95	172.59	160.91
2130	125	0	0	583	2150	588.2	0	588.91	29.69	6.81	321.66	394.56
2330	200	0	0	585	1200	587.91	0	588.21	42.95	4.37	274.78	183.11
2330	200	0	0	585	2150	589.33	0	589.69	30.19	4.85	453.99	391.27
2494	164	0	0	586	1200	588.96	588.96	589.93	179.82	7.92	154.79	89.49
2494	164	0	0	586	2150	589.92	589.92	591.22	148.4	9.31	250.95	176.49
2570	76	0	0	587	1200	590.39	0	591.16	126.54	7.04	170.57	106.68
2570	76	0	0	587	2150	591.12	591.12	592.46	174.39	9.27	232.19	162.81
2600	30	0	0	588	1200	590.96	590.96	591.97	190.73	8.04	149.18	86.89
2600	30	0	0	588	2150	592.03	592.03	593.29	154.53	9.06	245.45	172.95
3200	600	0	0	591.3	1200	597.06	0	597.31	49.81	6.13	479.14	170.03
3200	600	0	0	591.3	2150	597.8	0	598.02	44.08	6.47	811.08	323.82
3380	180	596.6	595	594.5	1200	598.44	0	598.54	85.43	2.76	483.09	129.83
3380	180	596.6	595	594.5	2150	598.98	0	599.11	79.39	3.05	732.61	241.29
3400	20	596.6	595	594.5	1200	598.61	0	598.68	55.06	2.32	559.29	161.72
3400	20	596.6	595	594.5	2150	599.15	0	599.26	57	2.69	820.3	284.77
3500	100	0	0	594.9	1200	600.37	600.37	600.83	90.46	7.86	369.88	126.17
3500	100	0	0	594.9	2150	600.84	600.84	601.41	114.32	9.57	551.72	201.09
5000	1500	0	0	609.9	600	611.98	0	612.1	74.18	4.78	250.85	69.66
5000	1500	0	0	609.9	1000	612.55	0	612.67	52.45	4.81	413.29	138.08

SAG INLET COMPUTATIONS

INLET I.D.	INLET LENGTH (m)	LT. LONG. SLOPE (%)	LT. TRAN. SLOPE (%)	RT. LONG SLOPE (%)	RT. TRAN. SLOPE (%)	TOTAL Q (m^3/s)	INLET CAPACITY (m^3/s)	ALLOW DEPTH (m)	TOTAL HEAD (m)	PONDED WIDTH (m)
A 2	3.048	0.30	4.00	0.30	4.00	0.057	1.221	0.14	0.051	2.088
A 3	6.096	0.30	4.00	0.30	4.00	0.233	2.164	0.14	0.088	3.270

ON-GRADE INLET COMPUTATIONS

INLET I.D.	INLET LENGTH (m)	LONG. SLOPE (%)	TRANS. SLOPE (%)	FLOW Q (m^3/s)	CAPACITY (m^3/s)	TOTAL BYPASS (m^3/s)	TO INLET	REQ'D LENGTH (m)	PONDED WIDTH (m)	ALLOW. PONDING (m)	INLET I.D.
A 1	3.048	1.21	4.00	0.184	0.184	0		2.378	2.708	3.6	A 1
B 1	6.096	2.30	2.08	0.910	0.719	0.191	B 4	8.372	6.576	3.6	B 1
B 2	6.096	2.30	2.08	0.910	0.719	0.191	B 5	8.372	6.576	3.6	B 2
B 3	6.096	5.90	2.08	0.503	0.469	0.034	B 5	6.658	4.411	3.6	B 3
B 4	6.096	3.81	2.08	0.215	0.215	0		3.633	3.484	3.6	B 4
B 5	6.096	3.92	2.08	0.241	0.241	0		3.903	3.614	3.6	B 5
B 6	6.096	0.16	2.50	0.307	0.370	0		2.454	6.430	3.6	B 6
B 7	6.096	0.80	3.80	0.123	0.123	0		1.730	2.596	3.6	B 7
B 8	2.438	2.00	4.00	0.053	0.053	0		1.394	1.547	3.6	B 8
C 1	3.048	0.80	2.08	0.184	0.184	0		2.397	4.405	3.6	C 1
C 2	3.048	0.80	2.08	0.053	0.053	0		1.163	2.765	3.6	C 2

CUMULATIVE JUNCTION DISCHARGE

NODE I.D.	WEIGHTED C-VALUE	CUMULATIVE D.A. (hectares)	CUMULATIVE Tc (min)	INTENSITY (cm/hr)	TOTAL DISCHARGE
A 1	0.850	0.45	10.00	17.489	0.184
A 2	0.850	0.14	10.00	17.489	0.057
A 3	0.850	0.57	10.00	17.489	0.233
LA-2	0.850	1.16	10.51	17.128	0.465
LA-3	0.850	1.02	10.50	17.133	0.409
P.V.I.	0.850	0.45	10.00	17.489	0.184
B 1	0.850	2.63	14.50	14.775	0.910
B 2	0.850	2.63	14.50	14.775	0.910
B 3	0.700	1.49	10.00	17.489	0.503
B 4	0.850	0.06	10.00	17.489	0.025
B 5	0.850	0.04	10.00	17.489	0.016
B 6	0.850	0.75	10.00	17.489	0.307
B 7	0.850	0.30	10.00	17.489	0.123
B 8	0.850	0.13	10.00	17.489	0.053
LB-1	0.850	5.26	14.52	14.764	1.818
LB-2	0.850	2.63	14.50	14.775	0.910
LB-4	0.817	6.81	14.57	14.739	2.259
LB-3	0.850	5.32	14.57	14.741	1.836
LB-5	0.817	6.85	14.59	14.730	2.272
LB-6	0.821	7.60	14.64	14.705	2.526
LB-7	0.822	7.90	14.72	14.668	2.623
LB-8	0.822	8.03	14.85	14.604	2.656
P.V.I.	0.821	7.60	14.64	14.705	2.526
C 1	0.850	0.45	10.00	17.489	0.184
C 2	0.850	0.13	10.00	17.489	0.053
LC-2	0.850	0.58	10.25	17.309	0.235

STORM SEWER COMPUTATIONS

RUN I.D.	US NODE I.D.	DS NODE I.D.	US FLOWLINE	DS FLOWLINE	PIPE DIA (m)	RUN LENGTH (m)	PIPE SLOPE (%)	MANNING n	US HGL ELEV	DS HGL ELEV	HGL SLOPE (%)	UNIFORM DEPTH (m)	ACTUAL DEPTH (m)	UNIFORM VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	FLOW Q (m^3/s)	CAPACITY (m^3/s)	RUN I.D.
1	LA - 2	OUTFALL	177.42	177.32	0.750	3.05	3.41	0.012	178.31	178.31	0.15	0.23	0.75	3.99	1.05	0.47	2.23	1
2	A 2	LA - 2	178.43	177.54	0.525	9.45	9.46	0.012	178.50	178.31	0.02	0.07	0.53	3.23	0.26	0.06	1.43	2
3	LA - 3	LA - 2	177.48	177.42	0.750	1.52	3.41	0.012	178.32	178.31	0.12	0.22	0.75	3.85	0.93	0.41	2.23	3
4	A 3	LA - 3	178.21	177.55	0.600	6.10	10.92	0.012	178.35	178.32	0.12	0.13	0.60	5.04	0.83	0.23	2.20	4
5	P.V.I.	LA - 3	178.84	177.70	0.525	33.53	3.38	0.012	179.00	178.32	0.16	0.17	0.53	3.16	0.85	0.18	0.86	5
6	A 1	P.V.I.	178.97	178.84	0.525	29.20	0.45	0.012	179.35	179.00	0.46	0.29	0.29	1.51	1.51	0.18	0.31	6
1	LB - 8	OUTFALL	178.40	177.05	1.050	60.96	2.21	0.012	178.98	178.31	0.81	0.59	1.05	5.32	3.07	2.66	4.39	1
2	B 8	LB - 8	180.09	178.70	0.450	14.33	9.78	0.012	180.17	178.98	0.06	0.07	0.28	3.26	0.50	0.05	0.97	2
3	LB - 7	LB - 8	179.45	178.55	0.900	40.84	2.22	0.012	180.12	178.98	2.22	0.67	0.67	5.19	5.19	2.62	2.92	3
4	B 7	LB - 7	180.02	179.60	0.600	4.57	9.25	0.012	180.12	180.12	0.03	0.10	0.52	3.93	0.47	0.12	2.02	4
5	P.V.I.	LB - 7	179.72	179.45	0.900	12.50	2.16	0.012	180.37	180.12	2.06	0.65	0.67	5.11	5.00	2.53	2.88	5
6	LB - 6	P.V.I.	180.09	179.72	0.900	12.07	3.03	0.012	180.66	180.37	2.16	0.58	0.65	5.87	5.11	2.53	3.41	6
7	B 6	LB - 6	180.93	180.28	0.525	22.25	2.92	0.012	181.15	180.66	0.55	0.23	0.38	3.43	1.81	0.31	0.80	7
8	LB - 5	LB - 6	180.60	180.09	0.900	17.19	3.00	0.012	181.14	180.66	2.45	0.54	0.58	5.72	5.28	2.27	3.40	8
9	B 5	LB - 5	181.37	180.75	0.600	9.14	6.81	0.012	181.43	181.14	0.00	0.04	0.39	1.94	0.09	0.02	1.74	9
10	LB - 3	LB - 5	180.78	180.60	0.900	6.10	3.00	0.012	181.32	181.14	2.97	0.54	0.54	5.72	5.69	2.26	3.40	10
11	B 3	LB - 3	181.83	180.94	0.600	10.06	8.95	0.012	182.04	181.32	1.04	0.21	0.38	5.89	2.63	0.50	1.99	11
12	LB - 4	LB - 3	180.83	180.78	0.900	1.52	3.02	0.012	181.35	181.32	1.98	0.47	0.54	5.46	4.65	1.84	3.41	12
13	B 4	LB - 4	181.67	180.98	0.600	6.10	11.33	0.012	181.72	181.35	0.00	0.04	0.37	2.59	0.13	0.02	2.24	13
14	LB - 1	LB - 4	181.44	180.98	0.750	15.24	3.01	0.012	181.98	181.35	3.02	0.54	0.54	5.34	5.34	1.82	2.09	14
15	B 1	LB - 1	182.20	181.52	0.600	7.32	9.36	0.012	182.48	181.98	2.11	0.28	0.46	7.00	3.89	0.91	2.04	15
16	LB - 2	LB - 1	181.49	181.44	0.750	1.52	2.95	0.012	181.99	181.98	0.76	0.35	0.54	4.54	2.68	0.91	2.07	16
17	B 2	LB - 2	182.20	181.56	0.600	6.71	9.54	0.012	182.48	181.99	2.52	0.28	0.43	7.04	4.20	0.91	2.05	17
1	LC - 2	OUTFALL	180.42	180.21	0.450	20.73	1.01	0.012	180.72	180.50	1.02	0.29	0.29	2.15	2.15	0.24	0.31	1
2	C 2	LC - 2	180.73	180.42	0.450	11.89	2.62	0.012	180.83	180.72	0.05	0.10	0.29	2.04	0.49	0.05	0.50	2
3	C 1	LC - 2	180.73	180.42	0.450	30.48	1.02	0.012	180.98	180.72	0.62	0.25	0.29	2.04	1.68	0.18	0.31	3

M.E. ROMANOWSKI

7/7/97

2/2

DRAINAGE CALCULATIONS

KELLER SPRINGS ROAD

DALLAS COUNTY, TEXAS

TEXAS DEPARTMENT OF TRANSPORTATION

Halff Associates

ENGINEERS . ARCHITECTS . SCIENTISTS . PLANNERS . SURVEYORS

DESIGN	DRAWN	NOTES	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			SHEET NO.
	CADD		6	TEXAS	STP [illegible]			
DATE	FILE	SCALE	STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
JULY 1996	706DCALC	1:500 HORIZ	18	DALLAS	0918	45	222	C9