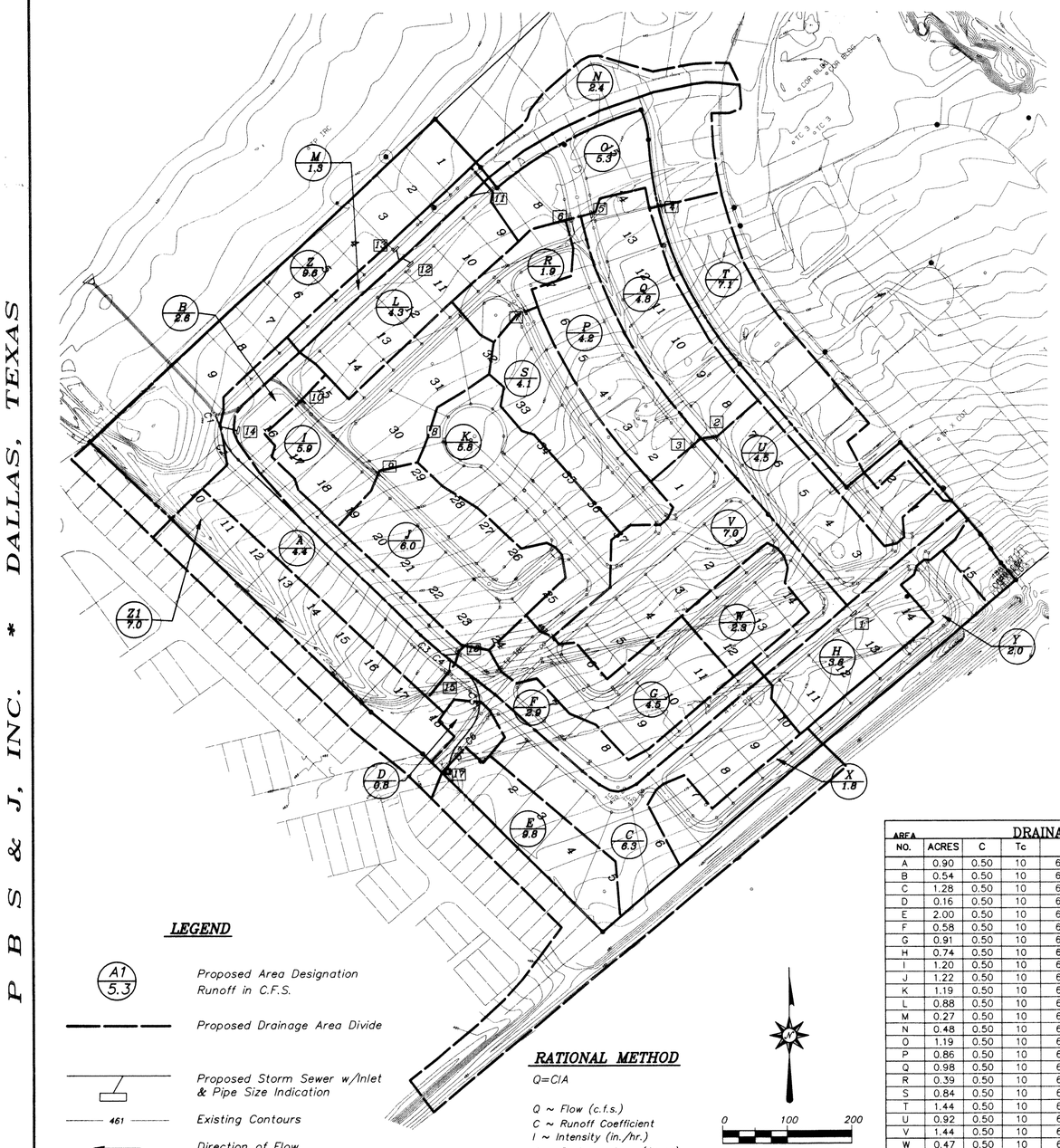


STORM SEWER CALCULATIONS

LINE	JUNCTION No.	JUNCTION TYPE	LOCATION STORM STATION	LOCATION LINE	LOCATION STREET NAME	Design Flow Qd	CONDUIT DIAMETER	CONDUIT TYPE	CONDUIT "N"	CONDUIT LENGTH	CONDUIT SLOPE	CONDUIT FALL	ELEVATIONS FLOW IN	ELEVATIONS FLOW OUT	ELEVATIONS TOP	CLEARANCE IN	CLEARANCE OUT	HYDROLOGY FLOW Capacity @ full Flow	Velocity @ full Flow	Velocity @ design Flow	Depth	Water Flow	Hydro. Grade @ lower section	Hydro. Grade @ upper section	Hydraulic Slope	Mean Vel. Head	Friction Head	Hydraulic Depth	REMARKS
						cfs.	in.			ft.	%	ft.	Elev.	Elev.	Elev.	ft.	ft.	cfs.	fps.	fps.	%	Elev.	Elev.	Elev.	%	ft.	ft.	ft.	
1	2	3	4	5	6	7	8	9	10	11	12	17	18	19	20	21	22	13	14	15	16	23	24	25	26	27	28	29	30
1	CB1	10' Curb in Sac	7 + 39.16	E	Baypoint Drive	5.60	18	RCP	0.013	279.79	4.90	13.70		466.67	470.97		2.59	23.24	13.2	10.9	33	467.17	466.29	468.47	5.01	1.85	14.02	2.50	
2	RCP Grade Reduction		4 + 59.37	E	Woodland Way	5.60	18	RCP	0.013	76.00	3.95	3.00	452.97	452.97	457.60	2.92	2.92	20.87	11.8	10.3	35	453.49	455.47	454.99	4.21	1.63	3.20	2.61	
3	CB2	10' Curb on Grade	0 + 17.32	E2	Woodland Way	4.50	18	RCP	0.013	17.32	2.19	0.38		450.35	455.13		3.07	15.56	8.8	7.7	36	450.90	452.67	454.07	2.29	0.93	0.40	1.06	
4	18"x18" RCP WYE-15		3 + 83.37	E	Woodland Way	11.50	18	RCP	0.013	14.23	1.20	0.17	449.97	449.97	454.98	3.30	3.30	11.52	6.5	6.5	99	451.46	452.27	453.21	1.13	0.66	0.16	1.77	
5	CB3	10' Curb on Grade	0 + 20.12	E1	Woodland Way	9.30	18	RCP	0.013	20.12	8.02	1.61		451.18	454.73		1.84	29.75	16.8	15.1	38	451.75	453.66	453.66	8.28	3.52	1.67	1.07	
6	21"x18" RCP Reducer-9 to WYE-15		3 + 69.14	E	Woodland Way	11.50	21	RCP	0.013	4.51	2.40	0.11	449.80	449.55	454.48	2.97	2.95	24.53	10.2	10.2	48	450.38	452.11	452.45	2.47	1.60	0.11	2.03	
7	21"x18" RCP WYE-14		3 + 64.63	E	Woodland Way	20.80	21	RCP	0.013	364.63	2.40	8.74	449.57	449.44	454.48	3.21	3.06	24.53	10.2	11.2	70	450.67	452.00	451.52	2.29	1.94	8.35	2.96	
8	CB4	4Grate Combined on Grade	6 + 36.52	D	Existing Alley	7.10	18	RCP	0.013	105.40	1.27	1.34		443.05	447.04		2.28	11.83	6.7	7.1	55	443.88	445.42	445.42	1.33	0.79	1.40	1.62	
9	CB5	10' Curb on Grade	0 + 05.44	D3	Woodland Way	4.80	21	RCP	0.013	5.44	0.78	0.04		441.48	445.15		1.69	13.83	5.7	5.4	40	442.18	444.04	444.04	0.82	0.45	0.04	1.11	
10	21"x18" RCP Reducer-8 to CB4		5 + 31.12	D	Woodland Way	7.10	21	RCP	0.013	4.51	0.56	0.03	441.71	441.46	445.15	1.73	1.71	11.90	4.9	5.2	55	442.43	444.02	444.00	0.58	0.43	0.03	1.15	
11	21"x21" RCP WYE-13		5 + 26.61	D	Woodland Way	11.90	21	RCP	0.013	32.09	0.56	0.18	441.44	441.44	445.15	1.73	1.73	11.90	4.9	5.0	99	443.18	443.99	444.46	0.53	0.38	0.17	0.67	
12	CB6	10' Curb on Grade	0 + 17.57	D2	Woodland Way	6.10	21	RCP	0.013	17.57	1.66	0.29		441.55	445.15		1.62	20.44	8.5	7.5	37	442.20	444.12	444.12	1.70	0.87	0.30	1.03	
13	21"x21" RCP WYE-12		4 + 94.52	D	Woodland Way	18.00	21	RCP	0.013	10.74	1.30	0.14	441.26	441.26	445.23	2.00	2.00	18.09	7.5	7.5	99	443.00	443.82	443.89	1.22	0.87	0.13	1.34	
14	30"x21" RCP Reducer-7 to WYE-12		4 + 83.78	D	Woodland Way	18.00	30	RCP	0.013	4.72	0.89	0.04	441.12	440.37	445.38	2.29	2.22	38.80	7.9	7.8	48	441.56	443.69	443.72	0.90	0.94	0.04	1.66	
15	30"x21" RCP WYE-11		4 + 79.06	D/E	Alley D-2	38.80	30	RCP	0.013	143.69	0.89	1.29	440.70	440.33	445.38	1.89	2.27	38.80	7.9	7.9	99	442.81	443.65	443.53	0.85	0.97	1.22	1.85	
16	CB7	3Grate Combined on Grade	0 + 63.06	D1	Alley D-2	4.10	18	RCP	0.013	63.06	7.69	4.85		444.12	448.62		2.79	29.13	16.5	11.9	25	444.49	447.58	447.58	8.20	2.20	5.17	1.04	
17	36"x30" RCP Reducer-6 to WYE-11		3 + 35.37	D	Alley D-2	38.80	36	RCP	0.013	4.69	0.41	0.02	439.04	438.54	446.34	5.60	4.47	42.96	6.1	6.9	74	440.76	442.43	442.35	0.54	0.74	0.03	4.00	
18	36"x18" RCP WYE-10		3 + 30.51	D	Alley D-2	42.90	36	RCP	0.013	330.51	0.41	1.37	439.27	438.52	446.26	5.28	4.41	42.96	6.1	6.1	99	441.50	442.41	442.51	0.41	0.57	1.37	3.75	
19	CB8	10' Curb in Sac	1 + 31.76	C2	Danielle Court	5.60	18	RCP	0.013	131.76	0.69	0.91		442.26	446.81		2.84	8.73	4.9	5.3	60	443.15	444.25	445.76	0.69	0.43	0.91	1.05	
20	CB9	3Grate Combined on Grade	2 + 20.52	C	Alley D-1	6.00	18	RCP	0.013	26.8	3.28	0.88		442.23	445.79		1.85	19.03	10.8	9.7	38	442.80	444.26	444.74	3.45	1.47	0.92	1.05	
21	18"x18" RCP WYE-9		1 + 93.72	C	Alley D-1	11.80	18	RCP	0.013	64.52	4.15	2.68	441.35	441.35	444.99	1.93	1.93	21.41	12.1	11.2	52	442.14	443.33	442.59	3.52	1.95	2.27	2.40	
22	39"x18" RCP Reducer-5 to WYE-9		1 + 29.20	C	Alley D-1	11.80	39	RCP	0.013	4.94	0.44	0.02	438.67	436.92	444.79	4.41	4.27	54.75	6.6	5.4	31	437.93	441.06	441.29	0.47	0.45	0.02	3.50	
23	39"x36" RCP WYE-8		1 + 24.26	C/D	Alley D-1	54.70	39	RCP	0.013	65.04	0.44	0.28	437.15	436.90	444.66	4.18	4.16	54.75	6.6	6.6	99	440.13	441.04	441.19	0.42	0.68	0.27	3.47	
24	CB10	3Grate Combined on Grade	0 + 06.62	C1	Alley D-1	5.90	18	RCP	0.013	6.62	24.81	1.64		439.13	443.53		2.69	52.33	29.6	19.8	23	439.47	442.45	442.45	25.43	6.08	1.68	1.08	
25	39"x18" RCP WYE-7		0 + 59.22	C	Alley D-1	60.60	39	RCP	0.013	59.22	0.54	0.32	437.49	436.61	443.17	3.97	2.95	60.69	7.3	7.3	99	439.84	440.77	441.17	0.51	0.83	0.30	2.00	
26	CB11	10' Curb on Grade	5 + 55.39	B	Lexington Drive	5.30	18	RCP	0.013	166.1	0.36	0.60		439.25	442.95		1.99	6.34	3.6	4.1	69	440.29	441.62	441.62	0.38	0.26	0.63	1.33	
27	CB12	10' Curb in Sac	0 + 15.68	B2	Lexington Drive	4.30	18	RCP	0.013	15.68	0.24	0.04		438.30	442.10		2.09	5.19	2.9	3.3	69	439.34	441.03	441.07	0.25	0.17	0.04	1.03	
28	27"x16" RCP Reducer-4 to CB11		3 + 89.29	B	Lexington Drive	5.30	27	RCP	0.013	4.63	0.18	0.01	438.65	437.90	442.18	1.83	1.77	13.30	3.3	3.2	44	438.88	441.00	441.05	0.19	0.16	0.01	1.13	
29	27"x18" RCP WYE-6		3 + 84.66	B	Lexington Drive	9.60	27	RCP	0.013	8	0.18	0.06	438.28	437.89	442.27	2.30	1.86	13.30	3.3	3.7	62	439.28	440.99	440.97	0.19	0.21	0.01	1.30	
30	CB13	10' Curb in Sac	0 + 17.32	B1	Lexington Drive	3.70	18	RCP	0.013	17.32	0.57	0.10		438.30	442.10		2.09	7.91	4.5	4.4	48	439.02	441.08	441.08	0.58	0.31	0.10	1.02	
31	27"x18" RCP WYE-5		3 + 78.66	B	Lexington Drive	13.30	27	RCP	0.013	298.31	0.18	0.49	438.20	437.83	442.02	2.11	1.67	13.30	3.3	3.3	99	440.06	440.98	441.55	0.17	0.17	0.47	0.47	
32	39"x27" RCP Reducer-3 to WYE-5		1 + 10.35	B	Lexington Drive	13.30	39	RCP	0.013	4.94	0.80	0.04	437.33	436.33	442.33	2.48	2.40	73.90	8.9	6.9	28	437.25	440.51	441.00	0.86	0.75	0.04	1.34	
33	39"x39" RCP WYE-4		1 + 05.41	B/C	Lexington Drive	73.90	39	RCP	0.013	105.41	0.80	0.84	436.29	436.29	442.25	2.35	2.35	73.90	8.9	8.9	99	439.52	440.47	440.96	0.76	1.23	0.80	1.29	
34	CB17	4' x 4' "Y" Inlet	10 + 15.04	A	Sherwood Drive	9.80	18	RCP	0.013	203.24	6.89	14.00		464.82	468.92		2.39	27.57	15.6	14.5	41	465.43	467.35	467.35	7.18	3.27	14.59	1.57	Throat EL =567.84
35	CB15	15' Curb on Grade	0 + 17.32	A3	Sherwood Drive	8.90	18	RCP	0.013	17.32	18.94	3.28		454.10	458.10		2.29	45.71	25.9	20.4	30	454.54	456.20	456.20	19.84	6.45	3.44	1.90	
36	18"x18" RCP WYE-3		8 + 11.80	A	Sherwood Drive	16.70	18	RCP	0.013	8.7	3.18	0.28	450.82	450.82	453.60	1.07	1.07	18.74	10.6	10.6	99	452.31	452.78	453.15	3.00	1.74	0.26	0.45	
37	CB16	10' Curb on Grade	0 + 21.75	A2	Sherwood Drive	2.90	18	RCP	0.013	21.75	16.40	3.57		453.87	457.87		2.29	42.54	24.1	13.8	18	454.13	456.02	456.02	16.71	2.98	3.63	1.85	
38	21"x18" RCP Reducer-2 to WYE-3		8 + 03.10	A	Sherwood Drive	16.70	21	RCP	0.013	6.51	2.54	0.11	450.54	450.29	453.62	1.37	1.35	25.24	10.5	11.7	63	451.40	452.50	452.55	2.66	2.13	0.12	1.07	
39	21"x21" RCP WYE-2		7 + 98.59	A	Sherwood Drive	21.60	21	RCP	0.013	432.83	2.54	10.98	450.30	450.18	453.62	1.61	1.46	25.24	10.5	11.8	71	451.42	452.38	451.92	2.55	2.17	11.05	1.70	
40	RCP Grade Reduction		3 + 65.76	A	Sherwood Drive	21.60	21	RCP	0.013	68.51	1.86	1.27	439.20	439.20	443.80	2.62	2.62	21.60	9.0	9.0	99	440.94	441.33	441.74	1.76	1.26	1.20	2.06	
41	CB14	10' Curb in Sac	0 + 15.68	A1	Sherwood Drive	5.90	18	RCP	0.013	28.44	2.36	0.67		438.72	442.43		2.00	16.12	9.1	8.5	42	439.34	440.81	441.36	2.40	1.12	0.68	1.07	
42	21"x18" RCP WYE-1		2 + 97.25	A	Sherwood Drive	27.50	21	RCP	0.013	19.82	3.01	0.60	438.05	437.92	441.93	2.17	2.03	27.50	10.3	10.3	99	439.66	440.13	440.19	2.33	1.66	0.46	1.74	
43	Storm Manhole		2 + 77.43	A/B	Sherwood Drive	101.40	42	RCP	0.013	277.43	1.02	2.83	437.33	434.83	443.00	3.69	4.30	101.61	10.6	10.6	99	438.30	439.67	438.80	0.96	1.73	2.67	4.20	FL 39"=435.45W
44	HEADWALL, Type-B		0 + 00.00	A		101.40	42	RCP						432.00	435.50		0.00			0.0			437.00	437.00		0.00			

DRAINAGE CALCULATIONS

AREA NO.	ACRES	C	Tc	I2	Q2	I1	Q1	INLET PICK-UP POINTS
A	0.90	0.50	10	6.20	2.8	9.80	4.4	WETLAND TO LAKE
B	0.54	0.50	10	6.20	1.7	9.80	2.6	14
C	1.28	0.50	10	6.20	4.0	9.80	6.3	15
D	0.16	0.50	10	6.20	0.5	9.80	0.8	15
E	2.00	0.50	10	6.20	6.2	9.80	9.8	17
F	0.58	0.50	10	6.20	1.8	9.80	2.9	16
G	0.91	0.50	10	6.20	2.8	9.80	4.5	16
H	0.74	0.50	10	6.20	2.3	9.80	3.6	1
I	1.20	0.50	10	6.20	3.7	9.80	5.9	10
J	1.22	0.50	10	6.20	3.8	9.80	6.0	9
K	1.19	0.50	10	6.20	3.7	9.80	5.8	8
L	0.88	0.50	10	6.20	2.7	9.80	4.3	12
M	0.27	0.50	10	6.20	0.8	9.80	1.3	13
N	0.48	0.50	10	6.20	1.5	9.80	2.4	13
O	1.19	0.50	10	6.20	3.7	9.00	5.3	11
P	0.86	0.50	10	6.20	2.7	9.80	4.2	6
Q	0.98	0.50	10	6.20	3.0	9.80	4.8	5
R	0.39	0.50	10	6.20	1.2	9.80	1.9	6
S	0.84	0.50	10	6.20	2.6	9.80	4.1	7
T	1.44	0.50	10	6.20	4.5	9.80	7.1	4
U	0.92	0.50	10	6.20	2.8	9.80	4.5	2
V	1.44	0.50	10	6.20	4.5	9.80	7.0	3
W	0.47	0.50	10	6.20	1.5	9.80	2.3	3
X	0.37	0.50	10	6.20	1.1	9.80	1.8	15
Y	0.42	0.50	10	6.20	1.3	9.80	2.0	1
Z	1.97	0.50	10	6.20	6.1	9.80	9.6	LAKE
Z1	1.43	0.50	10	6.20	4.4	9.80	7.0	EX. SWALE TO LAKE

LEGEND

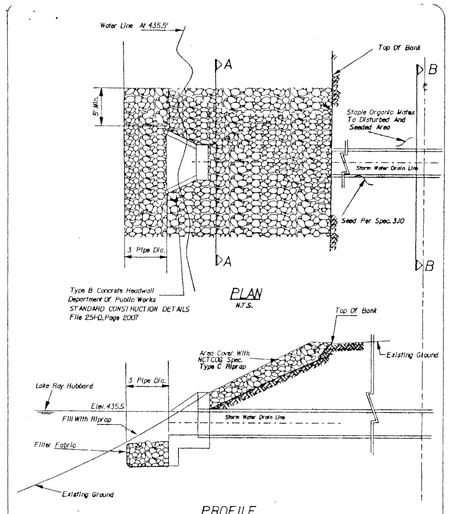
- (A1 / 5.3) Proposed Area Designation Runoff in C.F.S.
- Proposed Drainage Area Divide
- Proposed Storm Sewer w/Inlet & Pipe Size Indication
- 461 Existing Contours
- Direction of Flow
- 14 Inlet Number

RATIONAL METHOD

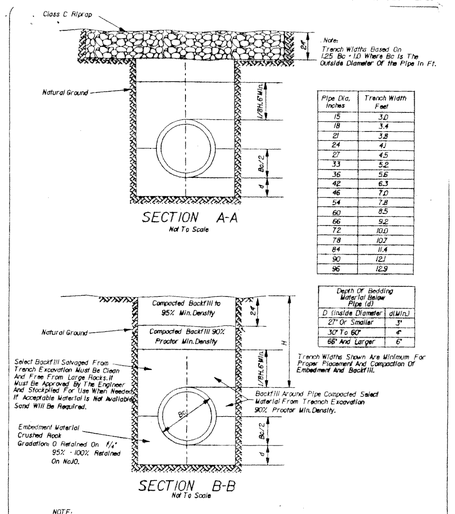
Q=CIA

Q ~ Flow (c.f.s.)
C ~ Runoff Coefficient
I ~ Intensity (in./hr.)
A ~ Drainage Area (Acres)

0 100 200
GRAPHIC SCALE IN FEET



dallas water utilities — LAKE RAY HUBBARD - TYPICAL STORM SEWER INSTALLATION



Note: Trench Width: Based On (2.5 Do + 1.0) Where Do Is The Outside Diameter Of The Pipe In Ft.

Pipe Dia. Inches	Trench Width Feet
15	3.0
18	3.4
21	3.8
24	4.1
27	4.5
33	5.2
36	5.6
42	6.3
48	7.0
54	7.8
60	8.5
66	9.2
72	10.0
78	10.7
84	11.4
90	12.1
96	12.9

Depth Of Bedding Material Below Pipe (d)	
D (Inside Diameter	d(Min)
21" Or Smaller	1'
30" To 60"	4"
66" And Larger	6"

Trench Widths Shown Are Minimum For Proper Placement And Compaction Of Embedment And Backfill.

dallas water utilities — LAKE RAY HUBBARD - TYPICAL STORM SEWER INSTALLATION

BENCHMARKS:

1. SQUARE CUT ON NORTHEAST CURB ± 150' NORTHWEST OF RAILROAD ON TURTLE COVE BOULEVARD
   ELEV. 469.36
2. SQUARE CUT ON CENTERLINE OF INLET WESTERLY FROM CLUBHOUSE ENTRANCE
   ELEV. 447.21

RECORD DRAWING
DATE: 7-28-00
THIS RECORD DRAWING HEREIN REFLECTS TO THE BEST OF THE DESIGN ENGINEER'S KNOWLEDGE THE APPROXIMATE LOCATION OF THE CONSTRUCTED WORK USING INFORMATION AS PROVIDED BY THE CONTRACTOR(S).

NO.	REVISION	BY	DATE

STATE OF TEXAS — BRIAN L. UMBERGER 82474 — REGISTERED PROFESSIONAL ENGINEER
1-4-00
THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY BRIAN L. UMBERGER, P.E. #82474

SCALE: AS SHOWN
DESIGNED PBSJ
DRAWN PBSJ
DATE
DWG FILE

PBSJ
5999 SUMMERSIDE DRIVE ~ SUITE 202
DALLAS, TEXAS 75252
PH. (972) 380~2605 FAX (972) 380~2609

DRAINAGE AREA MAP
TURTLE COVE ADDITION, PHASE 3

ROCKWALL
ROCKWALL COUNTY, TEXAS

JOB NO. 95115.02
SHEET 20 OF 28

P B S & J, INC. * DALLAS, TEXAS

TURTLE COVE ADDITION, PHASE 3, DRAINAGE AREA MAP

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Mon Jan 03 16:20:13 2000