Drainage Area	Area (Acres)	Runoff Coeff.	1.22	Time (conc.) (minutes)	Discharge (c.f.s.)	Comment
	"A"	"C"	"I"	T_C	"Q"	
PHASE 7D DRAINAGE AREAS						
STORM LINE 16						
16-A	0.83	0.5	9.80	10.0	4.07	Developed - Single Family - Phase 7D
16-B	0.31	0.5	9.80	10.0	1.52	Developed - Single Family - Phase 7D
16-C	2.30	0.5	9.80	10.0	11.27	Developed - Single Family - Phase 7D
16-D	1.70	0.5	9.80	10.0	8.33	Developed - Single Family - Phase 7D
16-E	0.74	0.5	9.80	10.0	3.63	Developed - Single Family - Phase 7B
					28.81	
STORM LINE 17						
17-A	0.57	0.5	9.80	10.0	2.79	Developed - Single Family - Phase 7D
17-B	0.86	0.5	9.80	10.0	4.21	Developed - Single Family - Phase 7D
					7.01	

RUNOFF CALCULATIONS PHASE 7D						
Drainage Area	Area (Acres)	Runoff Coeff.	Intensity (in./hr.)	Time (conc.) (minutes)	Discharge (c.f.s.)	Comment
	"A"	"C"	"I"	T_C	"Q"	
OFFSITE DRAINAGE AREAS						
STORM LINE B						
B-1	2.14	0.5	9.80	10.0	10.49	Developed - Single Family - Phase 8B
B-2	2.74	0.5	9.80	10.0	13.43	Developed - Single Family - Phase 8B
B-4	3.50	0.5	9.80	10.0	17.15	Developed - Single Family - Phase 8B
B-5	0.47	0.5	9.80	10.0	2.30	Developed - Single Family - Phase 8B
					43.37	
STORM LINE 16						
16-F	1.22	0.5	9.80	10.0	5.98	Developed - Single Family - Phase 7B
16-G	0.67	0.5	9.80	10.0	3.28	Developed - Single Family - Phase 7B
16-H	0.90	0.5	9.80	10.0	4.41	Developed - Single Family - Phase 7B
16-I	0.77	0.5	9.80	10.0	3.77	Developed - Single Family - Phase 7B
16-J	1.49	0.5	9.80	10.0	7.30	Developed - Single Family - Phase 7B
16-K	1.48	0.5	9.80	10.0	7.25	Developed - Single Family - Phase 7B
					32.00	
STORM LINE 18						
18-A	0.51	0.5	9.80	10.0	2.50	Developed - Single Family - Phase 7B
18-B	0.93	0.5	9.80	10.0	4.56	Developed - Single Family - Phase 7B
					7.06	
STORM LINE 19						
19-A	1.10	0.5	9.80	10.0	5.39	Developed - Single Family - Phase 7B
19-B	1.45	0.5	9.80	10.0	7.11	Developed - Single Family - Phase 7B

PIPE HYDRAULICS

RUNOFF COLLECTION POINT (Inlet or Manhole)		Distance Between Collection Points	INCREMENTAL DRAINAGE AREA				Time at Upstream Station	Design Storm Frequency (yrs.)	Intensity "I" (inches/hr)	Storm Water Runoff "Q"	Slope of Hydraulic Gradient "S"	No. of Pipes or Boxes	Selected Storm Sewer Size		Velocity in Sewer Between Collection Points "V"	Head loss Coeff. Kj	Velocity Head Loss at Upstream Station $V2^2/2g$	Velocity Head Loss at Downstream Station $KjV_1^2/2g$	Velocity Head Loss $(V_2^2/2g - KjV_1^2/2g)$	Velocity Head Loss $(V_2^2/4g - KjV_1^2/4g)$	Total Velocity Headloss	Friction Loss = Sf x L	Upstream Hydraulic Grade	Downstream Hydraulic Grade	Flow Time in Sewer Distance / V x 60	Time of Downstream Station	Remarks	Phase of Project
UPSTREAM STATION	DOWNSTREAM STATION		Area No.	Drainage Area	Runoff Coeff. "C"	Accumulated "CA"																					
STA	STA	ft		acres			min	yrs	in/hr	cfs	ft/ft		in of ft		fps		ft	ft	ft	ft	ft	ft	ft	ft	min	min		
1	2	3	4	5	6	7	8	9	10	11	12		13		14	15	16	17	18	19	20	21	22	23	24	25	26	27
														Dia.														
													HT.	W														

STM LINE 16

																								514.67			
2259.74	2220.12	39.62	16-K	1.48	0.5	0.74	10.00	100	9.80	7.25	0.0048	1		18	4.11	1.25	0.26	0.33	0.26		0.263	0.19	514.41	514.22	0.16	10.16	TC=533.10	PH 7B
2220.12	2216.12	4	PIPE SIZE		0.5	0.74	10.16	100	9.73	7.20	0.0010	1		24	2.30	0.60	0.08	0.05	(0.25)		(0.247)	0.00	514.47	514.46	0.03	10.19		PH 7B
2216.12	2037.65	178.47	16-J	1.49	0.5	1.49	10.19	100	9.72	14.43	0.0041	1		24	4.60	0.60	0.33	0.20	0.28		0.280	0.73	514.18	513.46	0.65	10.84	TC=533.10	PH 7B
2037.65	2033.65	4	PIPE SIZE		0.5	1.49	10.84	100	9.43	14.00	0.0020	1		27	3.53	0.60	0.19	0.12	(0.00)		(0.004)	0.01	513.46	513.45	0.02	10.85		PH 7B
2033.65	1848.58	185.07	16-I	0.77	0.5	1.87	10.85	100	9.42	17.61	0.0032	1		27	4.44	0.60	0.31	0.18	0.19		0.190	0.60	513.26	512.66	0.69	11.55	TC=530.05	PH 7B
1848.58	1844.58	4	PIPE SIZE		0.5	1.87	11.55	100	9.11	17.03	0.0017	1		30	3.48	0.60	0.19	0.11	0.00		0.004	0.01	512.66	512.65	0.02	11.57		PH 7B
1844.58	1779.97	64.61	STM LINE 19	2.55	0.5	3.15	11.57	100	9.10	28.61	0.0049	1		30	5.84	0.60	0.53	0.32	0.42		0.418	0.31	512.24	511.92	0.18	11.75		PH 7B
1779.97	1692.68	87.29	16-H	0.90	0.5	3.60	11.75	100	9.01	32.41	0.0062	1		30	6.62	0.60	0.68	0.41	0.36		0.362	0.54	511.56	511.01	0.22	11.97	TC=527.36	PH 7B
1692.68	1688.68	4	PIPE SIZE		0.5	3.60	11.97	100	8.92	32.05	0.0037	1		33	5.41	0.60	0.45	0.27	0.05		0.046	0.01	510.97	510.95	0.01	11.98		PH 7B
1688.68	1548.54	140.14	16-G	0.67	0.5	3.93	11.98	100	8.91	35.02	0.0044	1		33	5.91	0.60	0.54	0.33	0.27		0.270	0.61	510.68	510.07	0.40	12.38	TC=528.28	PH 7B
1548.54	1544.59	3.95	PIPE SIZE		0.5	3.93	12.38	100	8.73	34.32	0.0026	1		36	4.87	0.60	0.37	0.22	0.04		0.042	0.01	510.03	510.02	0.01	12.39		PH 7B
1544.59	1478.86	65.73	STM LINE 18	1.44	0.5	4.65	12.39	100	8.73	40.58	0.0037	1		36	5.76	0.60	0.51	0.31	0.29		0.294	0.24	509.72	509.48	0.19	12.58		PH 7B
1478.86	1391.33	87.53	16-F	1.22	0.5	5.26	12.58	100	8.64	45.46	0.0046	1		36	6.45	0.60	0.65	0.39	0.34		0.337	0.41	509.14	508.74	0.23	12.81	TC=525.95	PH 7B
1391.33	1286.12	105.21	16-E	0.74	0.5	5.63	12.81	100	8.54	48.09	0.0052	1		36	6.82	0.60	0.72	0.43	0.34		0.335	0.55	508.40	507.85	0.26	13.07	TC=525.96	PH 7D
1286.12	890.61	395.51	MH		0.5	5.63	13.07	100	8.43	47.44	0.0051	1		36	6.73	0.60	0.70	0.42	0.27		0.270	2.00	507.58	505.58	0.98	14.05	TC=525.82	PH 7D
890.61	884.35	6.26	16-D	1.70	0.5	6.48	14.05	100	7.99	51.76	0.0060	1		36	7.34	0.60	0.84	0.50	0.42		0.415	0.04	505.17	505.13	0.01	14.06	TC=522.51	PH 7C
884.35	541.5	342.85	16-C	2.30	0.5	7.63	14.06	100	7.98	60.89	0.0083	1		36	8.64	0.60	1.16	0.70	0.66		0.656	2.86	504.47	501.62	0.66	14.72	TC=522.51	PH 7C
541.5	535.37	6.13	16-B	0.31	0.5	7.79	14.72	100	7.68	59.82	0.0080	1		36	8.49	0.60	1.12	0.67	0.42		0.423	0.05	501.19	501.14	0.01	14.73	TC=520.5	PH 7C
535.37	460.88	74.49	16-A	0.83	0.5	8.20	14.73	100	7.68	62.97	0.0089	1		36	8.93	0.60	1.24	0.74	0.57		0.568	0.66	500.58	499.91	0.14	14.87	TC=520.11	PH 7C
460.88	189.36	271.52	STM LINE 17 & MH	1.43	0.5	8.92	14.87	100	7.62	67.91	0.0104	1		36	9.63	0.60	1.44	0.86	0.70		0.697	2.81	499.21	496.40	0.47	15.34		PH 7C
189.36	100	89.36	A-13	0.60	0.5	9.22	15.34	100	7.41	68.25	0.0105	1		36	9.68	0.60	1.46	0.87	0.59		0.591	0.94	495.81	494.87	0.15	15.50	TC=513.11	PH 7C
			Subtotal	18.43																BEGINNING HGL IS FROM STM LINE 15 STA: 8+15.63			494.87				

STM LINE 17

																								502.66			
833.83	308.41	525.42	17-B	0.86	0.5	0.43	10.00	100	9.80	4.21	0.0016	1		18	2.39	1.25	0.09	0.11	(0.03)		(0.027)	0.85	502.69	501.85	3.66	13.66	TC=525.32	PH 7B
308.41	100	208.41	17-A	0.57	0.5	0.72	13.66	100	8.16	5.83	0.0031	1		18	3.31	0.60	0.17	0.10	0.06		0.059	0.64	501.79	501.14	1.05	14.71	TC=521.85	PH 7B
			Subtotal	1.43																BEGINNING HGL IS FROM STM LINE 16 STA: 4+60.88			501.14				

STM 16-A

																								500.02			
20.51	0	20.51	16-A	0.83	0.5	0.42	10.00	100	9.80	4.07	0.0015	1		18	2.31	1.25	0.08	0.10	0.08		0.083	0.03	499.94	499.91	0.15	10.15	TC=520.11	PH7D
			Subtotal	0.83																BEGINNING HGL IS FROM STORM LINE 16 STA: 4+02.42			499.91				

STM 16-B

																								501.16			
16.74	0	16.74	16-B	0.31	0.5	0.16	10.00	100	9.80	1.52	0.0002	1		18	0.86	1.25	0.01	0.01	0.01		0.012	0.00	501.15	501.14	0.32	10.32	TC=520.5	PH7D
			Subtotal	0.31																EXISTING HGL IS FROM EXISTING STORM LINE B STA: 5+16.60			501.14				

STM 16-C

																								502.47			
19.46	0	19.46	16-C	2.30	0.5	1.15	10.00	100	9.80	11.27	0.0115	1		18	6.39	1.25	0.63	0.79	0.63		0.635	0.22	501.84	501.62	0.05	10.05	TC=522.51	PH7D
			Subtotal	2.30																EXISTING HGL IS FROM EXISTING STORM LINE B STA: 8+86.03			501.62				

STM 16-D

																								505.58			
16.81	0	16.81	16-D	1.70	0.5	0.85	10.00	100	9.80	8.33	0.0063	1		18	4.73	1.25	0.35	0.43	0.35		0.347	0.11	505.24	505.13	0.06	10.06	TC=522.51	PH7D
			Subtotal	1.70																EXISTING HGL IS FROM EXISTING STORM LINE B STA: 8+90.61			505.13				

STM 17-A

																								494.92			
8.32	0	8.32	17-A	0.57	0.5	0.29	10.00	100	9.80	2.79	0.0007	1		18	1.58	1.25	0.04	0.05	0.04		0.039	0.01	494.88	494.87	0.09	10.09	TC=513.11	PH7D
			Subtotal	0.57																EXISTING HGL IS FROM EXISTING STORM LINE 17 STA: 3+08.41			494.87				

ONSITE INLETS PHASE 7D

STORM LINE 16																			
16-A	19+68.74 CRESCENT COVE DRIVE	16-A	100	10	9.80	0.5	0.83	4.07			4.07	21.00	0.94	6" PARABOLIC	10		5.80	-	4.07
16-B	18+54.59 CRESCENT COVE DRIVE	16-B	100	10	9.80	0.5	0.31	1.52			1.52	18.00	0.60	6" PARABOLIC	10		5.80	-	1.52
16-C	14+80.46 CRESCENT COVE DRIVE	16-C	100	10	9.80	0.5	2.30	11.27			11.27	-	-	SAG	10		20.00	-	11.27
16-D	14+80.46 CRESCENT COVE DRIVE	16-D	100	10	9.80	0.5	1.70	8.33			8.33	-	-	SAG	5		10.00	-	8.33
16-E	13+29.63 ALLEY 6 NORTH	16-E	100	10	9.80	0.5	0.74	3.63			3.63	26.50	1.43	5" INVERT	10		6.25	-	3.63
STORM LINE 17																			
17-A	2+09.97 ALLEY 6 NORTH	17-A	100	10	9.80	0.5	0.57	2.79	1.4	17-A / 17-B	4.21	18.50	0.69	5" INVERT	5		2.80	1.41	2.80
17-B	7+27.61 ALLEY 6 NORTH	17-B	100	10	9.80	0.5	0.86	4.21			4.21	18.50	0.69	5" INVERT	5		2.80	1.41	2.80

NOTE: INLET 17-A OVERFLOW WILL BE CAPTURED AT INLET 14-A CONSTRUCTED WITH CARUTH LAKES PHASE 7C.

ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OR ACCURACY OF DESIGN.

BENCHMARKS

1. X-chiseled in CL of Alley East of Morningstar Drive within the third lot north of Midnight Pass.
Elevation = 513.26

2. PK Nail in CL of Caruth Lane & Alley intersection 150 feet +/- east of Morningstar Drive.
Elevation = 491.68

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

AS-BUILT DRAWING
TO THE BEST OF JBI PARTNERS, INC. KNOWLEDGE HEREBY STATES THIS PLAN IS AS-BUILT. THE INFORMATION PROVIDED IS BASED ON CONSTRUCTION STAKING AND PAD VERIFICATION AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

NAME _____ DATE 04-13-2015

STATE OF TEXAS · DANIEL DEWEY · 93961 · LICENSED PROFESSIONAL ENGINEER

The seal appearing on this document was authorized by DANIEL DEWEY, P.E. 93961. Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

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DRAINAGE CALCULATIONS

PROJECT NO. HOE132

Caruth Lakes Phase 7D

City of Rockwall, Texas

SHEET NO. 11