

7/8/97

DIAMOND POINTE  
RETENTION REPORT

AREA OF SITE : 40.29 AC

A PERMANENT DETENTION BASIN WILL BE CONSTRUCTED ON THE SITE, USING A 25 YEAR STORM / 20 MIN. DURATION

THE TOTAL FLOW FROM THE UNDEVELOPED SITE IS 88.91 CFS, OF WHICH 65.74 CFS FLOWS INTO THE CREEK TO THE NORTH OF THE SITE.

THE TOTAL FLOW FROM THE DEVELOPED SITE IS 125.52 CFS. OF WHICH 66.60 CFS FLOWS TO THE DETENTION BASIN. THE PEAK DISCHARGE FROM THE BASIN, USING THE ST. CHARLES COUNTY HIGHWAY DEPARTMENT DETENTION BASIN PROGRAM, IS 26.99 CFS

THE TOTAL FLOW OFF SITE FROM THE DEVELOPED SITE IS 85.91 CFS WHICH IS LESS THAN THE UNDEVELOPED FLOW OF 88.91 CFS.

THE TOP OF THE OVERFLOW STRUCTURE IS 491.88 USING THE 25-YR PEAK ELEVATION.

DIAMOND, POINTE  
CALCULATIONS

UNDEVELOPED SITE

$$P.I. = 1.87, \quad P.I. \text{ FACTOR} = 1.18$$

$$Q_{25} = (40.29)(1.87)(1.18) \\ = 88.91 \text{ CFS}$$

DEVELOPED SITE

$$P.I. = 2.64 \quad P.I. \text{ FACTOR} = 1.18$$

$$Q_{25} = (40.29)(2.64)(1.18) \\ = 125.52 \text{ CFS}$$

FLOW TO BASIN

$$Q_{25} = (21.38)(2.64)(1.18) \\ = 66.60 \text{ CFS}$$

DIFFERENTIAL Q

$$Q_{25} = 125.52 - 66.60 \\ = 58.92 \text{ CFS}$$

BY-PASS DETENTION

58.92 CFS

FLOW FROM BASIN

26.99 CFS

85.91 CFS < 88.91 CFS ok

DIAMOND POINTE

1 JUL 1997

SUBMITTAL DATE: 1 JULY 1997

ELEVATION	AREA	VOLUME	CUM. VOLUME
487.00	0	5380	5380
488.00	107.1	15086	30446
490.00	143.5	32483	62929
492.00	18178	40351	103490
494.00	22393		

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 \*  
 \* RECTANGULAR ORIFICE \*  
 \* 12 in W X 36 in H ELEV 487 \*  
 \* \*  
 \* Outlet Pipe - 34.1 ft - 36 in pipe \*  
 \* UFL= 483.8 LFL= 483.45 n= .013 \*  
 \* **15 YR STORM** \*  
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DIAMOND POINTE

1 JULY 1997

SUBMITTAL DATE: 1 JULY 1997

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	698.40	698.40	0.00	698.40	487.13
2	1396.80	2095.20	7.29	2087.91	487.39
3	2095.20	4183.11	37.71	4145.40	487.77
4	2793.60	6939.00	103.50	6833.50	488.12
5	3492.00	10325.50	193.90	10141.60	488.38
6	3492.00	13633.60	352.36	13380.74	488.64
7	3492.00	16872.74	527.14	16545.60	488.89
8	3492.00	20037.60	805.62	19631.98	489.14
9	3492.00	23123.98	1107.38	22636.60	489.38
10	3492.00	26128.60	1571.65	25556.95	489.61
11	3492.00	29049.95	2157.74	28391.22	489.84
12	3492.00	31881.22	2845.05	31136.18	490.04
13	3492.00	34630.18	3624.38	33535.80	490.19
14	3492.00	37027.80	4485.56	35892.25	490.33
15	3492.00	39374.25	5438.51	38180.74	490.48
16	3492.00	41672.74	6483.68	40434.06	490.61
17	3492.00	43926.06	7621.43	42644.63	490.75
18	3492.00	46136.63	8852.02	44814.62	490.88
19	3492.00	48306.62	10175.68	46945.94	491.02
20	3492.00	50437.94	11602.62	49040.32	491.14
21	2793.60	51833.92	13130.00	50400.93	491.23
22	2095.20	52496.13	14755.51	51040.62	491.27 ←
23	1396.80	52437.42	16478.38 ←	50971.44	491.26
24	698.40	51669.84	18298.85	50204.99	491.22
25	0.00	50204.99	18298.85	48732.70	491.13

PEAK OUTFLOW= 24.43 CFS AT 23 MINUTES

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 \* RECTANGULAR ORIFICE  
 \* 12 in W X 36 in H ELEV= 487  
 \*  
 \* Outlet Pipe - 34.1 ft - 36 in pipe  
 \* UFL= 483.6 LFL= 483.45  
 \*  
 \* **25 YR STORM**  
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DIAMOND POINTE                      1 JULY 1997                      INITIAL DATE: 1 JULY 1997

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	824.16	824.16	0.00	824.16	487.15
2	1648.32	2472.48	9.35	2463.13	487.46
3	2472.48	4944.61	48.32	4887.29	487.91
4	3296.64	8133.75	135.05	8048.88	488.21
5	4120.80	12154.86	293.39	11961.29	488.53
6	4120.80	16033.09	293.81	15788.28	488.83
7	4120.80	19909.08	586.33	19522.75	489.13
8	4120.80	23643.55	484.40	23159.16	489.42
9	4120.80	27277.56	586.76	26693.21	489.70
10	4120.80	30814.01	692.31	30121.71	489.97
11	4120.80	34247.51	900.12	33442.39	490.18
12	4120.80	37563.19	1143.60	36419.59	490.37
13	4120.80	40540.39	1204.22	39336.17	490.55
14	4120.80	43463.77	1269.78	42196.19	490.72
15	4120.80	46326.75	1313.89	45003.10	490.90
16	4120.80	49123.50	1364.00	47759.91	491.07
17	4120.80	51860.71	1411.48	50469.23	491.23
18	4120.80	54540.03	1456.63	53133.40	491.40
19	4120.80	57204.20	1499.71	55754.49	491.56
20	4120.80	59853.23	1540.92	58334.37	491.72
21	3296.64	61481.01	1580.43	60950.58	491.82
22	2472.48	62523.56	1606.18	60916.88	491.88 ←
23	1648.32	62545.20	1619.02	60946.19	491.88
24	824.16	61770.35	1619.45 ←	60150.90	491.83
25	0.00	60150.90	1607.67	58543.23	491.73

PEAK OUTFLOW= 20.29 CFS AT 4 HOURS



PROJECT NAME : DIAMOND POINTE - RANGE II & III

PROJECT NUMBER : 96-257R3

ENGINEER/DESIGNER : J.R.S.

DATE COMPLETED : 16 SEPT 1997

CLIENT/DEVELOPER : \_\_\_\_\_

SHEET 1 OF 2 DATE REVISED : \_\_\_\_\_

File

HYDRAULIC COMPUTATIONS

LINE		PIPE CHARACTERISTICS					STRUCT. TIPS		DEPTH	ELEV. HYD. GR'D.		HYD. GRADE	FRICT. HEAD LOSS	VEL	V <sup>2</sup> /2g	VEL HEAD LOSS	TURN LOSS	INLETS		FLOW REQUIREMENTS			PIPE CAP.		
UPPER	LOWER	LENGTH	SIZE	FL GRADE	FL UPPER	FL LOWER	UPPER	LOWER	HYD. GRADE	UPPER	LOWER							STREET GRADE	CAPACITY	ORNG. AREA	P1	2		TOTAL 2	
CI	CI		15"								<FULL														
38	37	34.00	RCP	0.01	512.29	511.99	517.64	517.64	4.10	513.25	513.24	0.0003	0.01	0.9	0.01	0.01	~	1.5%	2.11	0.40	2.64	1.06	1.06	6.47	
CI	CI		15"								<FULL														
37	26	49.50	RCP	0.01	511.79	511.33	517.64	517.21	4.40	512.63	512.58	0.0009	0.05	1.6	0.04	0.05	0.47 75°	1.5%	2.11	0.35	2.64	0.92	1.98	6.47	
CI	MH		15"								<FULL														
36	35A	75.00	RCP	0.016	511.13	509.99	517.21	516.15	4.63	511.50	511.24	0.0034	0.26	3.1	0.15	0.17	0.55 120°	1.5%	2.11	0.69	2.64	1.82	3.80	8.18	
MH	AI		15"								<FULL														
35A	35	108.00	RCP	0.01	509.79	508.13	516.15	514.00	4.91	510.06	509.69	0.0034	0.37	3.1	0.15	0	0.30 75°	~	~	~	~	~	~	3.80	6.47
AI	CI		15"								<FULL														
35	34	80.00	RCP	0.01	507.93	507.17	514.00	513.29	4.31	509.23	508.53	0.0088	0.70	4.9	0.37	0.37	0.24 90°	2-5	5.50	0.86	2.64	2.27	6.07	6.47	
CI	CI		15"								<FULL														
34	33	49.50	RCP	0.01	506.97	506.51	513.29	512.86	4.76	508.29	508.01	0.0057	0.28	4.5	0.32	0.05	0.24 90°	1.5%	2.11	0.52	2.64	1.37	7.92	10.51	
CI	CI		15"								<FULL														
33	32	34.00	RCP	0.01	506.31	506.01	512.86	512.86	4.85	507.93	507.51	0.0045	0.22	4.8	0.36	0.08	0.17 45°	1.5%	2.11	0.22	2.64	0.58	8.50	10.51	
CI	CI		15"								<FULL														
32	31	107.87	RCP	0.01	505.81	504.77	512.86	510.72	5.35	507.26	506.45	0.0075	0.81	5.1	0.40	0.08	0.26 70°	1.5%	2.11	0.22	2.64	0.58	9.08	10.51	
CI	CI		15"								<FULL														
31	30	34.00	RCP	0.01	504.57	504.27	510.72	510.72	4.27	506.08	505.80	0.0084	0.28	5.4	0.45	0.10	0.27 70°	1.5%	2.11	0.20	2.64	0.53	9.61	10.51	
CI	MH		15"								<FULL														
30	29A	35.00	RCP	0.025	504.07	503.29	510.72	510.32	4.92	505.20	504.99	0.0162	0.41	6.4	0.64	0.34	0.26 35°	1.5%	2.11	0.65	2.64	1.72	11.33	16.62	
MH	AI		15"								<FULL														
29A	29	255.00	RCP	0.023	503.09	497.32	510.32	506.31	5.53	501.83	498.87	0.0162	2.96	6.4	0.64	0	0.12 30°	~	~	~	~	~	~	11.33	15.94
AI	AI		27"								<FULL														
29	28	228.76	RCP	0.02	497.12	492.62	506.31	499.77	7.44	497.67	495.07	0.0114	2.60	8.3	1.07	0.66	0.12 30°	2-5	5.50	0.85	2.64	2.24	33.04	43.98	
AI	AI		27"								<FULL														
28	27	84.87	RCP	0.015	492.42	491.21	499.77	498.23	4.70	494.61	493.46	0.0136	1.15	9.1	1.29	0.40	0.12 30°	1-5	5.50	0.34	2.64	2.11	36.05	39.92	
AI	AI		30"								<FULL														
27	26	226.92	RCP	0.01	491.01	488.78	498.23	496.77	4.77	492.82	491.85	0.0043	0.97	6.2	0.60	0	0.24 45°	2-5	5.50	0.48	2.64	1.27	43.52	66.66	
AI	FE		30"								<FULL														
26	25	65.33	RCP	0.01	488.58	487.95	496.77	~	4.92	491.56	491.27	0.0045	0.29	6.3	0.62	0.02	0.11 15°	1-5	2.75	0.27	2.64	0.98	44.50	66.66	
↑ 15' R.H.H. IN PLACE																									
CI	AI		12"								<FULL														
39	26	124.04	RCP	0.098	500.56	488.78	504.60	496.29	3.04	492.75	491.85	0.0073	0.90	3.9	0.24	0.24	~	Low	4.00	1.15	2.64	3.04	3.04	11.66	
CI	AI		12"								<FULL														
45	44	102.72	RCP	0.04	509.85	504.93	515.22	509.53	5.27	505.94	505.93	0.0009	0.01	1.4	0.30	0.30	~	3.2%	1.50	0.40	2.64	1.06	1.06	7.13	
AI	CI		12"								<FULL														
44	42	100.48	RCP	0.01	504.93	503.77	509.50	509.36	3.57	505.52	504.97	0.0075	0.75	3.9	0.24	0.18	0.20 80°	2-5	5.50	0.79	2.64	2.03	2.09	3.57	
CI	CI		15"								<FULL														
43	42	34.00	RCP	0.01	503.57	503.27	509.76	509.76	4.99	504.65	504.52	0.0033	0.13	3.3	0.17	0	0.11 10°	Low	4.00	0.34	2.64	0.90	3.99	6.47	
CI	MH		15"								<FULL														
42	41	105.00	RCP	0.067	503.07	496.30	509.76	506.73	5.24	498.09	497.55	0.0051	0.54	3.8	0.22	0.10	~	Low	4.00	0.24	2.64	0.63	4.62	16.75	
MH	AI		15"								<FULL														
41	40	164.04	RCP	0.017	496.10	493.38	506.73	500.17	9.18	496.53	495.69	0.0051	0.84	3.8	0.22	0	0.09 20°	~	~	~	~	~	~	4.62	8.44
AI	AI		15"								<FULL														
40	27	120.00	RCP	0.017	493.18	491.21	500.17	498.28	4.48	495.06	493.46	0.0133	1.60	6.1	0.58	0.59	0.13 15°	2-5	5.50	1.09	2.64	2.95	9.47	8.44	



