

# Parker Adventist Hospital MOB III



November 15, 2018

Town of Parker  
Engineering Development Review  
20120 East Main Street  
Parker, CO 80138

Denver

Abu Dhabi

RE: Parker Adventist Hospital – MOB III

Civil  
Structural  
Integrated Services

To whom it may concern,

This letter serves as a Drainage Conformance Letter for the MOB III addition at the Parker Adventist Hospital. This letter references the Final Drainage and Erosion Control Report for the Parker Adventist Hospital, prepared by S. A. Miro, Inc., dated May 1, 2002. The latest update to the report was for the Parking Lot a, prepared by S. A. Miro, Inc., dated March, 2018.

The purpose of this letter is to demonstrate the existing and proposed storm sewer facilities serving the improvements for the Parker Adventist Hospital can convey the runoff generated by the proposed MOB III. All tributary drainage from the MOB is routed through existing and proposed storm sewer facilities to the south detention/water quality pond.

## I. PROJECT DESCRIPTION

Improvements that impact the storm sewer facilities are as follows:

- The construction of Medical Office Building III, located northeast of the Sierra MOB, with a footprint of 23,288 sq. ft.
- Proposed parking lot, with an added impervious area of 151,740 sq. ft. (188,840 sq. ft. total parking lot area)
- The addition of approximately 1,185 LF of proposed storm sewer pipe and 12 proposed inlets.

The sub-basins that have been modified for these additions are the following, DA5, DA6, DA13, and F1, with the addition of sub-basins E1-E15.

The Parker Adventist Hospital campus was master planned with the anticipation of the entire campus to be fully developed. While the proposed development is increasing imperviousness, it is still within the planned overall imperviousness. The existing storm infrastructure was sized with future development in mind and can convey increased flows to the South pond. The proposed design is accounting for future development to be conveyed through the system as well. See the appendix for further information regarding storm sewer conveyance.

## II. DRAINAGE FACILITY DESIGN

### Detention/Water Quality

All proposed storm runoff will be conveyed via storm pipe and discharged to the South pond. The South pond has been master planned to detain and treat the eastern half of the Parker Adventist Hospital site in a future, fully-developed condition.

## Parker Adventist Hospital MOB III

### Storm Sewer Layout

The proposed storm sewer system will tie into the existing infrastructure at three different locations. The roof drain will connect into an existing storm line which previously led to an inlet but is being removed. Storm line B will tie into an existing area inlet located at the north end of existing parking lot C. Storm line A will tie into the 24" PVC line that currently takes on flows from basin F1, but as designed with the intention of taking on future development flows. The proposed storm sewer was analyzed using the StormCAD V8i program to ensure that the added storm infrastructure does not overwhelm the existing system. The hydraulic grade lines are under the required 1-foot below finish grade at the manholes. The system was checked against flows in the 100-yr condition, but Parker minimum pipe size standards (18" RCP) drove a majority of the pipe sizes. Therefore, the existing and proposed storm sewer is expected to function adequately to convey the anticipated runoff flows.

### III. CONCLUSIONS

#### Compliance with Standards

This Drainage Conformance Letter complies with the Town of Parker Storm Drainage and Environmental Criteria Manual, and the Urban Storm Drainage Criteria Manual. The drainage system is designed to efficiently intercept runoff in curb and gutter and storm sewer and convey the flows to the South detention/water quality pond. The site provides a drainage system which does not exceed the allowable capacities of the existing storm sewer/drainage facilities.

Please call us if you have any questions.

Sincerely,



Jason D. Carr, P.E.  
Associate Principle

### IV. APPENDICIES

- a. HYDROLOGIC CALCULATIONS
- b. HYDRAULIC CALCULATIONS
- c. MAPS

**APPENDIX**

**Appendix A  
Hydrologic Calculations**



### Historic Composite C Calculations

**Project Information**  
 Project Name: MOB III  
 Miro Project No: 18057  
 Revised Date: 8/7/2018  
 Calculated By: MHV

**Jurisdiction Impervious Value**  
 Pond Area 100% Impervious  
 Landscape Area 0% Impervious  
 Paved Area 100% Impervious  
 Roof Area 90% Impervious

**Coefficient Equations**  
 $K_{CD(2)} = 0$        $K_{CD(10)} = -0.18i + 0.21$   
 $K_{CD(5)} = -0.10i + 0.11$        $K_{CD(100)} = -0.39i + 0.46$   
 $C_{CD} = K_{CD} + (0.858i^3 - 0.786i^2 + 0.774i + 0.04)$

\*NOTE:  $K_{CD}$  &  $C_{CD}$  Equations from UDFCD Criteria Manual

Basin Designation	A <sub>pond</sub> (ft <sup>2</sup> )	A <sub>landscape</sub> (ft <sup>2</sup> )	A <sub>paved</sub> (ft <sup>2</sup> )	A <sub>roof</sub> (ft <sup>2</sup> )	A <sub>total</sub> (acres)	Impervious-ness	K <sub>CD</sub> 02-yr	K <sub>CD</sub> 05-yr	K <sub>CD</sub> 10-yr	K <sub>CD</sub> 100-yr	C <sub>CD</sub> 02 yr	C <sub>CD</sub> 05 yr	C <sub>CD</sub> 10 yr	C <sub>CD</sub> 100 yr
*A1					4.61	67%	0	0.04	0.09	0.20	0.46	0.51	0.55	0.66
*A2					0.71	52%	0	0.06	0.12	0.26	0.35	0.41	0.47	0.61
*A3					0.32	2%	0	0.11	0.21	0.45	0.06	0.16	0.26	0.51
A4		7131	515		0.18	7%	0	0.10	0.20	0.43	0.09	0.19	0.29	0.52
A5		5045	15105		0.46	75%	0	0.04	0.08	0.17	0.54	0.57	0.62	0.71
B1#					1.20	80%	0	0.03	0.07	0.15	0.60	0.63	0.66	0.74
B1A#					0.14	80%	0	0.03	0.07	0.15	0.60	0.63	0.66	0.74
B2#					0.82	85%	0	0.03	0.06	0.13	0.66	0.68	0.71	0.79
B2A#					0.73	79%	0	0.03	0.07	0.15	0.58	0.61	0.65	0.74
B2B#					1.15	85%	0	0.03	0.06	0.13	0.66	0.68	0.71	0.79
B3***					0.73	67%	0	0.04	0.09	0.20	0.46	0.51	0.55	0.66
B3-1***					0.03	0%	0	0.11	0.21	0.46	0.04	0.15	0.25	0.50
B3-2***					0.14	60%	0	0.05	0.10	0.23	0.41	0.46	0.51	0.63
B4***					1.24	100%	0	0.01	0.03	0.07	0.89	0.90	0.92	0.96
B5***					0.55	72%	0	0.04	0.08	0.18	0.51	0.55	0.59	0.69
B5A***					0.10	89%	0	0.02	0.05	0.11	0.71	0.73	0.76	0.82
B5B***					0.20	80%	0	0.03	0.07	0.15	0.60	0.63	0.66	0.74
B5C***					0.08	88%	0	0.02	0.05	0.12	0.70	0.72	0.75	0.81
B6A(EX)**					0.67	78%	0	0.03	0.07	0.16	0.57	0.60	0.64	0.73
B6B(EX)					0.53	87%	0	0.02	0.05	0.12	0.68	0.71	0.74	0.80
B6C**					0.03	82%	0	0.03	0.06	0.14	0.62	0.65	0.68	0.76
B6D**					0.02	28%	0	0.08	0.16	0.35	0.21	0.30	0.37	0.56
B7 (EX)*					2.20	37%	0	0.07	0.14	0.32	0.26	0.34	0.41	0.58
B7A		21,047	69,660		2.08	77%	0	0.03	0.07	0.16	0.56	0.59	0.63	0.72
B7B	26319	12,883			0.90	67%	0	0.04	0.09	0.20	0.47	0.51	0.55	0.66
B8***					0.18	11%	0	0.10	0.19	0.42	0.12	0.22	0.31	0.53
C1A#					0.05	41%	0	0.07	0.14	0.30	0.28	0.35	0.42	0.58
C1B#					0.18	47%	0	0.06	0.13	0.28	0.32	0.38	0.44	0.60
C1C#					0.31	86%	0	0.02	0.06	0.12	0.67	0.69	0.73	0.79
C1D#					0.93	89%	0	0.02	0.05	0.11	0.71	0.73	0.76	0.82
C2#					0.36	92%	0	0.02	0.04	0.10	0.75	0.77	0.80	0.86
C3***					0.41	88%	0	0.02	0.05	0.12	0.70	0.72	0.75	0.81
C5#					0.22	50%	0	0.06	0.12	0.27	0.34	0.40	0.46	0.60
C7 (EX)**					1.75	45%	0	0.07	0.13	0.28	0.31	0.37	0.44	0.59
C7		26,034	50,346		1.75	66%	0	0.04	0.09	0.20	0.45	0.50	0.55	0.66
C8**					0.48	80%	0	0.03	0.07	0.15	0.60	0.63	0.66	0.74
C9		4,162	6,898		0.25	62%	0	0.05	0.10	0.22	0.43	0.47	0.52	0.64
D1#					0.26	90%	0	0.02	0.05	0.11	0.73	0.75	0.77	0.83
D2#					0.49	90%	0	0.02	0.05	0.11	0.73	0.75	0.77	0.83
D3#					0.53	90%	0	0.02	0.05	0.11	0.73	0.75	0.77	0.83
D4**					0.67	90%	0	0.02	0.05	0.11	0.73	0.75	0.77	0.83
D5***					0.40	90%	0	0.02	0.05	0.11	0.73	0.75	0.77	0.83
D6#					0.25	90%	0	0.02	0.05	0.11	0.73	0.75	0.77	0.83
D7**					0.67	90%	0	0.02	0.05	0.11	0.73	0.75	0.77	0.83
DA1#					0.66	71%	0	0.04	0.08	0.18	0.50	0.54	0.58	0.68
DA2#					0.47	95%	0	0.02	0.04	0.09	0.80	0.82	0.84	0.89
DA5#					0.97	93%	0	0.02	0.04	0.10	0.77	0.79	0.81	0.87
DA6#					0.61	50%	0	0.06	0.12	0.27	0.34	0.40	0.46	0.60
DA7#					0.19	96%	0	0.01	0.04	0.09	0.82	0.83	0.85	0.90
DA8#					0.48	88%	0	0.02	0.05	0.12	0.70	0.72	0.75	0.81
DA9#					0.08	74%	0	0.04	0.08	0.17	0.53	0.57	0.61	0.70
DA10#					1.17	99%	0	0.01	0.03	0.07	0.87	0.88	0.90	0.94
DA11#					0.03	4%	0	0.11	0.20	0.44	0.07	0.18	0.27	0.51
DA12#					0.43	76%	0	0.03	0.07	0.16	0.55	0.58	0.62	0.71
DA13*					1.50	69%	0	0.04	0.09	0.19	0.48	0.52	0.57	0.67
DA15#					0.05	20%	0	0.09	0.17	0.38	0.17	0.26	0.34	0.55
DA16#					0.08	57%	0	0.05	0.11	0.24	0.38	0.44	0.49	0.62
OS-1*					6.40	2%	0	0.11	0.21	0.45	0.06	0.16	0.26	0.51
OS-2*					12.80	2%	0	0.11	0.21	0.45	0.06	0.16	0.26	0.51
OS-3*					164.50	2%	0	0.11	0.21	0.45	0.06	0.16	0.26	0.51
OS-4*					3.11	2%	0	0.11	0.21	0.45	0.06	0.16	0.26	0.51
OS-5*					0.54	100%	0	0.01	0.03	0.07	0.89	0.90	0.92	0.96
F1*					5.37	63%	0	0.05	0.10	0.21	0.43	0.48	0.53	0.64
R1#					0.48	90%	0	0.02	0.05	0.11	0.73	0.75	0.77	0.83
F3*					0.36	69%	0	0.04	0.09	0.19	0.48	0.52	0.57	0.67
F4*					0.69	73%	0	0.04	0.08	0.18	0.52	0.56	0.60	0.70
F5#					2.24	100%	0	0.01	0.03	0.07	0.89	0.90	0.92	0.96
F6*					0.23	71%	0	0.04	0.08	0.18	0.50	0.54	0.58	0.68
					0.00									
South Pond Trib					28.89	44%	0	0.07	0.13	0.29	0.30	0.37	0.43	0.59
SW Pond Trib					25.40	61%	0	0.05	0.10	0.22	0.41	0.46	0.51	0.64
<b>Total Onsite</b>					<b>54.29</b>	<b>52%</b>	<b>0</b>	<b>0.06</b>	<b>0.12</b>	<b>0.26</b>	<b>0.35</b>	<b>0.41</b>	<b>0.46</b>	<b>0.61</b>

# From Addendum to Final Drainage Plan dated 7/22/2008

\* Approved Master Planned Impervious Values used

\*\* From Update dated 1/6/2010

\*\*\* From Update dated 6/13/2014

Master Basin B	6.72	80%
	9.37	74%
	12.80	2%
Master Basin A	8.36	82%
	5.62	75%
	5.76	81%
	6.40	2%



### Composite C Calculations

**Project Information**

**Project Name:** Parker MOB III  
**Miro Project No:** 18057  
**Revised Date:** 10/15/2018  
**Calculated By:** DAT

**Jurisdiction Impervious Value**

**Pond Area** 100%  
**Landscape Area** 2%  
**Paved Area** 100%  
**Roof Area** 90%

**Coefficient Equations**

$C_{CD(2)} = 0.83I^{1.122}$        $C_{CD(10)} = 0.74i + 0.132$   
 $C_{CD(5)} = 0.82i + 0.035$        $C_{CD(100)} = 0.4i + 0.484$

\*NOTE:  $C_{CD}$  Equations from UDFCD Criteria Manual updated March 2017

Basin Designation	A <sub>pond</sub> (ft <sup>2</sup> )	A <sub>landscape</sub> (ft <sup>2</sup> )	A <sub>paved</sub> (ft <sup>2</sup> )	A <sub>roof</sub> (ft <sup>2</sup> )	A <sub>total</sub> (acres)	Impervious-ness	C <sub>CD</sub> 02 yr	C <sub>CD</sub> 05 yr	C <sub>CD</sub> 10 yr	C <sub>CD</sub> 100 yr
E1				23,473	0.54	90%	0.72	0.77	0.80	0.84
E2		23,244			0.53	2%	0.01	0.05	0.15	0.49
E3		2,562	6,608		0.21	73%	0.57	0.63	0.67	0.77
E4		4,010	10,513		0.33	73%	0.57	0.63	0.67	0.78
E5		4,799	11,708		0.38	72%	0.56	0.62	0.66	0.77
E6		11,551			0.27	2%	0.01	0.05	0.15	0.49
E7		12,542	18,703		0.72	61%	0.46	0.53	0.58	0.73
E8		1,360	3,183		0.10	71%	0.55	0.61	0.65	0.77
E9		1,971	25,406		0.63	93%	0.75	0.80	0.82	0.86
E10		2,585	19,070		0.50	88%	0.71	0.76	0.79	0.84
E11		917	26,635		0.63	97%	0.78	0.83	0.85	0.87
E12			16,075		0.37	100%	0.81	0.86	0.87	0.88
E13		1,748	10,475		0.28	86%	0.68	0.74	0.77	0.83
E14		735	20,646		0.49	97%	0.78	0.83	0.85	0.87
E15		9,837	5,494		0.35	37%	0.27	0.34	0.41	0.63
					0.00					
F1		82,679			1.90	2%	0.01	0.05	0.15	0.49
TOTAL		160,540	174,516	23,473	8.23	55%	0.42	0.49	0.54	0.71
					0.00					
DA1		8,337	20,412		0.66	72%	0.56	0.62	0.66	0.77
DA2		1,024	19,450		0.47	95%	0.77	0.81	0.84	0.86
DA7		331	7,945		0.19	96%	0.78	0.82	0.84	0.87
DA8		2,509	18,400		0.48	88%	0.71	0.76	0.78	0.84
DA9		906	2,579		0.08	75%	0.58	0.65	0.68	0.78
DA10		509	50,456		1.17	99%	0.80	0.85	0.86	0.88
DA11		1,254	52		0.03	6%	0.03	0.08	0.18	0.51
DA15		1,742	436		0.05	22%	0.15	0.21	0.29	0.57
DA16		1,498	1,986		0.08	58%	0.44	0.51	0.56	0.72
F3		4,861	10,820		0.36	70%	0.54	0.61	0.65	0.76
F4		8,115	21,941		0.69	74%	0.57	0.64	0.68	0.78



### TIME OF CONCENTRATION

**Project Information**  
 Project Name: Parker MOB III  
 S.A. Project No: 18057  
 Revised Date: 10/15/2018  
 Calculated By: DAT

**Conveyance Coefficient Value**  
 Grassed Waterway 15  
 Heavy Meadow 2.5  
 Nearly Bare Ground 10  
 Paved Areas and Shallow Paved Swales 20  
 Short Pasture and Lawns 7  
 Tillage / Field 5

**Time of Concentration Equations**  
 $t_t = 0.395(1.1 - C_5)L^{1/2} / S^{1/3}$        $t_t = (L/v)/60$   
 $t_c \text{ check: } t_c = (26-17i) + (L/(60(14i+19)S^{1/2}))$

\*NOTE: Cv Values, T<sub>i</sub>, T<sub>t</sub>, & T<sub>c</sub> Equations from UDFCD Criteria Manual updated March 2017

SUB-BASIN DATA			INITIAL/OVERLAND TIME (t <sub>i</sub> )			TRAVEL TIME (t <sub>t</sub> )						t <sub>i</sub> + t <sub>t</sub>		t <sub>c</sub> CHECK (urbanized basins)		FINAL t <sub>c</sub> USED
Basin Designation	Area (acres)	C <sub>CD</sub> 05 yr	length (ft)	slope %	t <sub>i</sub> (min)	length (ft)	slope %	Type of Land Surface	Conveyance Coefficient Cv	velocity (ft/sec)	t <sub>t</sub> (min)	t <sub>c</sub> (min)	Total Length (ft)	t <sub>c</sub> (min)	t <sub>c</sub> (min)	
E1	0.54	0.77	225	1.00%	8.99	0	1.00%	Paved areas and shallow paved swales	20	2.00	0	8.99	225	12.44	8.99	
E2	0.53	0.05	86	15.00%	7.23	275	2.50%	Paved areas and shallow paved swales	20	3.16	1.45	8.68	361	29.76	8.68	
E3	0.21	0.63	55	4.00%	4.02	91	4.30%	Paved areas and shallow paved swales	20	4.15	0.37	4.39	146	14.27	5.00	
E4	0.33	0.63	84	1.20%	7.38	148	2.60%	Paved areas and shallow paved swales	20	3.22	0.76	8.15	232	14.85	8.15	
E5	0.38	0.62	110	2.00%	7.30	120	2.90%	Paved areas and shallow paved swales	20	3.41	0.59	7.89	230	15.03	7.89	
E6	0.27	0.05	66	18.00%	5.96	0	1.00%	Paved areas and shallow paved swales	20	2.00	0	5.96	66	26.85	5.96	
E7	0.72	0.53	271	4.00%	10.79	0	1.00%	Paved areas and shallow paved swales	20	2.00	0	10.79	271	18.27	10.79	
E8	0.10	0.61	110	2.00%	7.41	0	10.0%	Paved areas and shallow paved swales	20	6.32	0	7.41	110	14.29	7.41	
E9	0.63	0.80	200	2.90%	5.51	63	1.0%	Paved areas and shallow paved swales	20	2.00	0.53	6.03	263	12.19	6.03	
E10	0.50	0.76	236	3.6%	6.27	0	1.0%	Paved areas and shallow paved swales	20	2.00	0	6.27	236	12.83	6.27	
E11	0.63	0.83	206	3.80%	4.58	83	1.8%	Paved areas and shallow paved swales	20	2.68	0.52	5.10	289	11.15	5.10	
E12	0.37	0.86	138	4.00%	3.32	85	1.6%	Paved areas and shallow paved swales	20	2.53	0.56	3.88	223	10.28	5.00	
E13	0.28	0.74	85	3.50%	4.01	45	3.0%	Paved areas and shallow paved swales	20	3.46	0.22	4.22	130	11.98	5.00	
E14	0.49	0.83	150	2.80%	4.34	115	1.5%	Paved areas and shallow paved swales	20	2.45	0.78	5.13	265	11.17	5.13	
E15	0.35	0.34	0	1.00%	0.00	300	2.40%	Paved areas and shallow paved swales	20	3.10	1.61	1.61	300	21.96	5.00	
F1	1.90	0.05	192	4.60%	16.02	0	1.0%	Paved areas and shallow paved swales	20	2.00	0	16.02	192	29.11	16.02	
TOTAL	8.23	0.49			0			Paved areas and shallow paved swales	20		0	0.00	0	#DIV/0!	#DIV/0!	
								Paved areas and shallow paved swales								



### TIME OF CONCENTRATION

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\*NOTE: Cv Values, T<sub>i</sub>, T<sub>c</sub>, & T<sub>c</sub> Equations from UDFCD Criteria Manual updated March 2017

SUB-BASIN DATA			INITIAL/OVERLAND TIME (t <sub>i</sub> )			TRAVEL TIME (t <sub>t</sub> )						t <sub>i</sub> + t <sub>t</sub>		t <sub>c</sub> CHECK (urbanized basins)		FINAL t <sub>c</sub> USED
Basin Designation	Area (acres)	C <sub>CD</sub> 05 yr	length (ft)	slope %	t <sub>i</sub> (min)	length (ft)	slope %	Type of Land Surface	Conveyance Coefficient Cv	velocity (ft/sec)	t <sub>t</sub> (min)	t <sub>c</sub> (min)	Total Length (ft)	t <sub>c</sub> (min)	t <sub>c</sub> (min)	
DA1	0.66	0.62	202	4.00%	7.85	0	1.0%	Paved areas and shallow paved swales	20	2.00	0	7.85	202	15.60	7.85	
DA2	0.47	0.81	200	3.70%	4.78	18	2.0%	Paved areas and shallow paved swales	20	2.83	0.11	4.89	218	10.98	5.00	
DA7	0.19	0.82	12	2.00%	1.40	250	2.00%	Paved areas and shallow paved swales	20	2.83	1.47	2.87	262	11.04	5.00	
DA8	0.48	0.76	12	3.10%	1.49	225	3.10%	Paved areas and shallow paved swales	20	3.52	1.06	2.55	237	12.05	5.00	
DA9	0.08	0.65	12	2.90%	2.02	240	2.90%	Paved areas and shallow paved swales	20	3.41	1.17	3.20	252	14.60	5.00	
DA10	1.17	0.85	20	3.80%	1.33	130	3.80%	Paved areas and shallow paved swales	20	3.90	0.56	1.89	150	9.73	5.00	
DA11	0.03	0.08	52	2.00%	10.67	0	2.60%	Paved areas and shallow paved swales	20	3.22	0	10.67	52	25.54	10.67	
DA15	0.05	0.21	93	2.00%	12.46	0	1.00%	Paved areas and shallow paved swales	20	2.00	0	12.46	93	23.61	12.46	
DA16	0.08	0.51	63	2.00%	6.82	0	1.00%	Paved areas and shallow paved swales	20	2.00	0	6.82	63	16.78	6.82	
F3	0.36	0.61	10	2.00%	2.27	300	3.7%	Paved areas and shallow paved swales	20	3.85	1.30	3.57	310	15.60	5.00	
F4	0.03	0.64	14	2.00%	2.52	300	2.7%	Paved areas and shallow paved swales	20	3.29	1.52	4.04	314	15.15	5.00	



## Runoff Calculations (Rational Method)

### Project Information

**Project Name:** Parker MOB III  
**S.A. Project No:** 18057  
**Revised Date:** 10/15/2018  
**Calculated By:** DAT

### Intensity Equation

$$I = 28.5 (P_1)/(10+T_c)^{0.786}$$

\*NOTE: P & Intensity Equation from UDFCD Criteria Manual

Basin Designation	Area (ac.)	'c'	cA	t <sub>c</sub> (min)	P <sub>1</sub>	intensity (in/hr)	Q (cfs)	
E1	0.54	0.72	0.39	8.99	0.99	2.79	1.08	02 YR
		0.77	0.42		1.39	3.92	1.63	05 YR
		0.80	0.43		1.64	4.62	1.99	10 YR
		0.84	0.45		2.60	7.33	3.33	100 YR
E2	0.53	0.01	0.01	8.68	0.99	2.83	0.02	02 YR
		0.05	0.03		1.39	3.97	0.11	05 YR
		0.15	0.08		1.64	4.68	0.37	10 YR
		0.49	0.26		2.60	7.42	1.95	100 YR
E3	0.21	0.57	0.12	5.00	0.99	3.36	0.40	02 YR
		0.63	0.13		1.39	4.71	0.63	05 YR
		0.67	0.14		1.64	5.56	0.78	10 YR
		0.77	0.16		2.60	8.82	1.44	100 YR
E4	0.33	0.57	0.19	8.15	0.99	2.89	0.55	02 YR
		0.63	0.21		1.39	4.06	0.86	05 YR
		0.67	0.22		1.64	4.79	1.07	10 YR
		0.78	0.26		2.60	7.59	1.96	100 YR
E5	0.38	0.56	0.21	7.89	0.99	2.92	0.62	02 YR
		0.62	0.24		1.39	4.10	0.97	05 YR
		0.66	0.25		1.64	4.84	1.21	10 YR
		0.77	0.29		2.60	7.68	2.24	100 YR
E6	0.27	0.01	0.00	5.96	0.99	3.20	0.01	02 YR
		0.05	0.01		1.39	4.49	0.06	05 YR
		0.15	0.04		1.64	5.30	0.21	10 YR
		0.49	0.13		2.60	8.40	1.10	100 YR
E7	0.72	0.46	0.33	10.79	0.99	2.60	0.86	02 YR
		0.53	0.38		1.39	3.65	1.39	05 YR
		0.58	0.42		1.64	4.30	1.79	10 YR
		0.73	0.52		2.60	6.82	3.56	100 YR
E8	0.10	0.55	0.06	7.41	0.99	2.99	0.17	02 YR
		0.61	0.06		1.39	4.19	0.27	05 YR
		0.65	0.07		1.64	4.95	0.34	10 YR
		0.77	0.08		2.60	7.84	0.63	100 YR
E9	0.63	0.75	0.47	6.03	0.99	3.19	1.50	02 YR
		0.80	0.50		1.39	4.47	2.24	05 YR
		0.82	0.52		1.64	5.28	2.72	10 YR
		0.86	0.54		2.60	8.37	4.50	100 YR
E10	0.50	0.71	0.35	6.27	0.99	3.15	1.11	02 YR
		0.76	0.38		1.39	4.42	1.67	05 YR
		0.79	0.39		1.64	5.22	2.04	10 YR
		0.84	0.42		2.60	8.27	3.44	100 YR
E11	0.63	0.78	0.49	5.10	0.99	3.34	1.65	02 YR
		0.83	0.52		1.39	4.69	2.46	05 YR
		0.85	0.54		1.64	5.53	2.97	10 YR
		0.87	0.55		2.60	8.77	4.83	100 YR



## Runoff Calculations (Rational Method)

### Project Information

**Project Name:** Parker MOB III  
**S.A. Project No:** 18057  
**Revised Date:** 10/15/2018  
**Calculated By:** DAT

### Intensity Equation

$$I = 28.5 (P_1)/(10+T_c)^{0.786}$$

\*NOTE: P & Intensity Equation from UDFCD Criteria Manual

Basin Designation	Area (ac.)	'c'	cA	t <sub>c</sub> (min)	P <sub>1</sub>	intensity (in/hr)	Q (cfs)	
E12	0.37	0.81	0.30	5.00	0.99	3.36	1.01	02 YR
		0.86	0.32		1.39	4.71	1.49	05 YR
		0.87	0.32		1.64	5.56	1.79	10 YR
		0.88	0.33		2.60	8.82	2.88	100 YR
E13	0.28	0.68	0.19	5.00	0.99	3.36	0.65	02 YR
		0.74	0.21		1.39	4.71	0.98	05 YR
		0.77	0.22		1.64	5.56	1.20	10 YR
		0.83	0.23		2.60	8.82	2.05	100 YR
E14	0.49	0.78	0.38	5.13	0.99	3.34	1.28	02 YR
		0.83	0.41		1.39	4.68	1.90	05 YR
		0.85	0.42		1.64	5.53	2.30	10 YR
		0.87	0.43		2.60	8.76	3.74	100 YR
E15	0.35	0.27	0.09	5.00	0.99	3.36	0.32	02 YR
		0.34	0.12		1.39	4.71	0.56	05 YR
		0.41	0.14		1.64	5.56	0.80	10 YR
		0.63	0.22		2.60	8.82	1.96	100 YR
F1	1.90	0.01	0.02	16.02	0.99	2.18	0.04	02 YR
		0.05	0.10		1.39	3.06	0.30	05 YR
		0.15	0.28		1.64	3.61	1.01	10 YR
		0.49	0.93		2.60	5.72	5.34	100 YR
DA1	0.66	0.56	0.37	7.85	0.99	2.93	1.08	02 YR
		0.62	0.41		1.39	4.11	1.69	05 YR
		0.66	0.44		1.64	4.85	2.12	10 YR
		0.77	0.51		2.60	7.69	3.91	100 YR
DA2	0.47	0.77	0.36	5.00	0.99	3.36	1.21	02 YR
		0.81	0.38		1.39	4.71	1.81	05 YR
		0.84	0.39		1.64	5.56	2.19	10 YR
		0.86	0.41		2.60	8.82	3.58	100 YR
DA7	0.19	0.78	0.15	5.00	0.99	3.36	0.49	02 YR
		0.82	0.16		1.39	4.71	0.74	05 YR
		0.84	0.16		1.64	5.56	0.89	10 YR
		0.87	0.16		2.60	8.82	1.45	100 YR



## Runoff Calculations (Rational Method)

### Project Information

**Project Name:** Parker MOB III  
**S.A. Project No:** 18057  
**Revised Date:** 10/15/2018  
**Calculated By:** DAT

### Intensity Equation

$$I = 28.5 (P_1)/(10+T_c)^{0.786}$$

\*NOTE: P & Intensity Equation from UDFCD Criteria Manual

Basin Designation	Area (ac.)	'c'	cA	t <sub>c</sub> (min)	P <sub>1</sub>	intensity (in/hr)	Q (cfs)	
DA8	0.48	0.71	0.34	5.00	0.99	3.36	1.14	02 YR
		0.76	0.36		1.39	4.71	1.72	05 YR
		0.78	0.38		1.64	5.56	2.10	10 YR
		0.84	0.40		2.60	8.82	3.54	100 YR
DA9	0.08	0.58	0.05	5.00	0.99	3.36	0.16	02 YR
		0.65	0.05		1.39	4.71	0.24	05 YR
		0.68	0.05		1.64	5.56	0.30	10 YR
		0.78	0.06		2.60	8.82	0.55	100 YR
DA10	1.17	0.80	0.94	5.00	0.99	3.36	3.15	02 YR
		0.85	0.99		1.39	4.71	4.67	05 YR
		0.86	1.01		1.64	5.56	5.63	10 YR
		0.88	1.03		2.60	8.82	9.08	100 YR
DA11	0.03	0.03	0.00	10.67	0.99	2.61	0.00	02 YR
		0.08	0.00		1.39	3.66	0.01	05 YR
		0.18	0.01		1.64	4.32	0.02	10 YR
		0.51	0.02		2.60	6.85	0.10	100 YR
DA15	0.05	0.15	0.01	12.46	0.99	2.45	0.02	02 YR
		0.21	0.01		1.39	3.43	0.04	05 YR
		0.29	0.01		1.64	4.05	0.06	10 YR
		0.57	0.03		2.60	6.42	0.18	100 YR
DA16	0.08	0.44	0.04	6.82	0.99	3.07	0.11	02 YR
		0.51	0.04		1.39	4.31	0.18	05 YR
		0.56	0.04		1.64	5.08	0.23	10 YR
		0.72	0.06		2.60	8.06	0.46	100 YR
F3	0.36	0.54	0.19	5.00	0.99	3.36	0.65	02 YR
		0.61	0.22		1.39	4.71	1.03	05 YR
		0.65	0.23		1.64	5.56	1.30	10 YR
		0.76	0.27		2.60	8.82	2.42	100 YR
F4	0.69	0.57	0.40	5.00	0.99	3.36	1.33	02 YR
		0.64	0.44		1.39	4.71	2.08	05 YR
		0.68	0.47		1.64	5.56	2.60	10 YR
		0.78	0.54		2.60	8.82	4.74	100 YR



**Storm Sewer Routing**

**Project Information**  
 Project Name: Parker MOB III  
 Miro Project No: 18057  
 Revised Date: 10/15/2018  
 Calculated by: 18057

05 Yr Event

Design Point	Basin(s)	Direct Runoff							Total Runoff					Travel Time (Pipe)							Remarks	
		Area (ac.)	C5	tc (min)	cA (ac.)	P1 (in)	I (in/hr)	Q5 (cfs)	tc (min)	Σ (cA) (ac.)	P1 (in)	I (in/hr)	Q5 (cfs)	Design Flow (cfs)	Slope (ft/ft)	Size (in)	Length (ft)	Manning's n	Depth (in)	Velocity (ft/sec)		tt (min)
	E1	0.54	0.77	8.99	0.42	1.39	3.92	1.63						1.63								
	E2	0.53	0.05	8.68	0.03	1.39	3.97	0.11						0.11								
	DA11	0.03	0.08	10.67	0.00	1.39	3.66	0.01						0.01								
	DA15	0.05	0.21	12.46	0.01	1.39	3.43	0.04						0.04								
	DA16	0.08	0.51	6.82	0.04	1.39	4.31	0.18						0.18								
1	E+E2+DA11+D A15+DA16							1.71	12.46	0.50	1.39	3.43	1.71	1.71	0.022	24.00	36	0.013	5.3652	7.01	0.09	
	E6	0.27	0.05	5.96	0.01	1.39	4.49	0.06						0.06								
	E7	0.72	0.53	10.79	0.38	1.39	3.65	1.39						1.39								
2	E6+E7							1.44	10.79	0.40	1.39	3.65	1.44	1.44	0.010	18.00	100	0.013	8.1204	5.68	0.29	
	E8	0.10	0.61	7.41	0.06	1.39	4.19	0.27						0.27								
3	DP2+E8							1.66	11.08	0.46	1.39	3.61	1.66	1.66	0.010	18.00	228	0.013	8.6244	5.84	0.65	
	E4	0.33	0.63	8.15	0.21	1.39	4.06	0.86						0.86								
4	DP3+E4							2.36	11.74	0.67	1.39	3.52	2.36	2.36	0.010	18.00	41	0.013	10.2048	6.25	0.11	
	E5	0.38	0.62	7.89	0.24	1.39	4.10	0.97						0.97								
5	DP4+E5							3.18	11.85	0.91	1.39	3.51	3.18	3.18	0.020	18.00	50	0.013	9.642	8.65	0.10	
	DA1	0.66	0.62	7.85	0.41	1.39	4.11	1.69						1.69								
6	DP5+DA1							4.60	11.94	1.32	1.39	3.50	4.60	4.60	0.031	18.00	63	0.013	10.3356	11.05	0.09	
	E5	0.38	0.62	7.89	0.24	1.39	4.10	0.97						0.97								
7	DP6+E5							5.41	12.04	1.55	1.39	3.48	5.41	5.41	0.070	18.00	41	0.013	8.8308	15.60	0.04	
8	DP1+DP7							7.04	12.46	2.05	1.39	3.43	7.04	7.04	0.038	24.00	103	0.013	10.8564	13.34	0.13	
	E12	0.37	0.86	5.00	0.32	1.39	4.71	1.49						1.49								
	E13	0.28	0.74	5.00	0.21	1.39	4.71	0.98						0.98								
	F1	1.90	0.05	16.02	0.10	1.39	3.06	0.30						0.30								
9	E12+E13=F1							1.90	16.02	0.62	1.39	3.06	1.90	1.90	0.010	18.00	13	0.013	12.1584	6.60	0.03	
	E14	0.49	0.83	5.13	0.41	1.39	4.68	1.90						1.90								
10	DP9+E14							3.14	16.05	1.03	1.39	3.06	3.14	3.14	0.020	18.00	26	0.013	11.3832	9.17	0.05	
11	DP9+DP10							3.13	16.10	1.03	1.39	3.05	3.13	3.13	0.028	18.00	176	0.013	10.1892	10.45	0.28	
	E11	0.63	0.83	5.10	0.52	1.39	4.69	2.46						2.46								
12	DP11+E11							4.69	16.38	1.55	1.39	3.03	4.69	4.69	0.024	18.00	37	0.013	12.7152	10.33	0.06	
	E9	0.63	0.80	6.03	0.50	1.39	4.47	2.24						2.24								
	E10	0.50	0.76	6.27	0.38	1.39	4.42	1.67						1.67								
14	DP12+E9+E10							7.34	16.44	2.43	1.39	3.02	7.34	7.34	0.010	24.00	190	0.013	16.914	8.07	0.39	
	DA1	0.66	0.62	7.85	0.41	1.39	4.11	1.69						1.69								
	DA2	0.47	0.81	5.00	0.38	1.39	4.71	1.81						1.81								
	DA7	0.19	0.82	5.00	0.16	1.39	4.71	0.74						0.74								
	DA8	0.48	0.76	5.00	0.36	1.39	4.71	1.72						1.72								
	DA9	0.08	0.65	5.00	0.05	1.39	4.71	0.24						0.24								
	DA10	1.17	0.85	5.00	0.99	1.39	4.71	4.67						4.67								
	F4	0.69	0.64	5.00	0.44	1.39	4.71	2.08						2.08								
	F3	0.36	0.61	5.00	0.22	1.39	4.71	1.03						1.03								
15	BASIN B							22.37	16.83	7.49	1.39	2.99	22.37	22.37	0.036	36.00	70	0.013	16.3584	17.16	0.07	



**Storm Sewer Routing**

**Project Information**  
 Project Name: Parker MOB III  
 Miro Project No: 18057  
 Revised Date: 10/15/2018  
 Calculated by: 18057

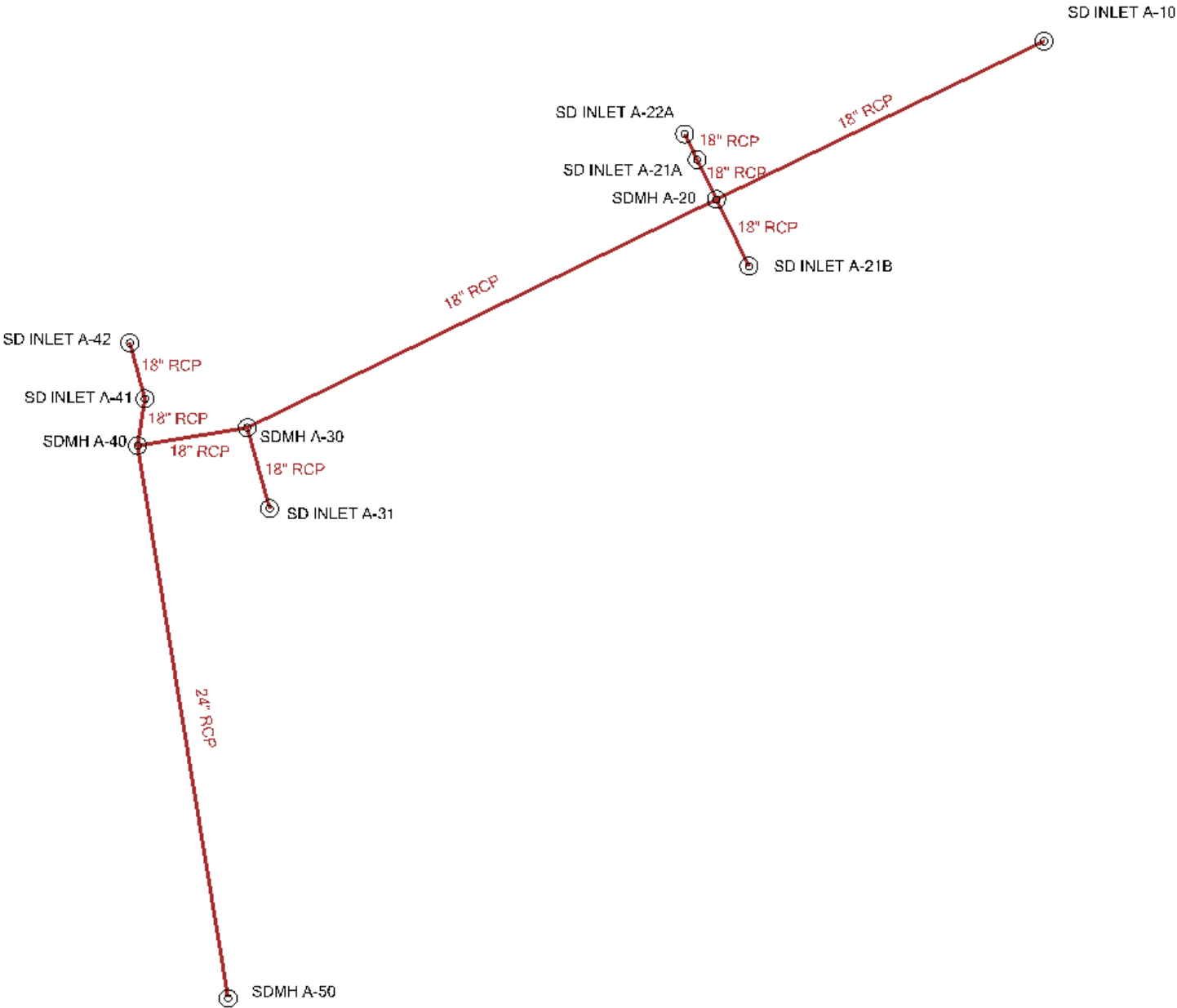
100 Yr Event

Design Point	Basin(s)	Direct Runoff							Total Runoff					Travel Time (Pipe)							Remarks	
		Area (ac.)	C100	tc (min)	cA (ac.)	P1 (in)	I (in/hr)	Q100 (cfs)	tc (min)	Σ (cA) (ac.)	P1 (in)	I (in/hr)	Q100 (cfs)	Design Flow (cfs)	Slope (ft/ft)	Size (in)	Length (ft)	Manning's n	Depth (in)	Velocity (ft/sec)		tt (min)
	E1	0.54	0.84	8.99	0.45	2.60	7.33	3.33						3.33								
	E2	0.53	0.49	8.68	0.26	2.60	7.42	1.95						1.95								
	DA11	0.03	0.51	10.67	0.02	2.60	6.85	0.10						0.10								
	DA15	0.05	0.57	12.46	0.03	2.60	6.42	0.18						0.18								
	DA16	0.08	0.72	6.82	0.06	2.60	8.06	0.46						0.46								
1	E+E2+DA11+D A15+DA16							5.25	12.46	0.82	2.60	6.42	5.25	5.25	0.022	24.00	36	0.013	5.3652	7.01	0.09	
	E6	0.27	0.49	5.96	0.13	2.60	8.40	1.10						1.10								
	E7	0.72	0.73	10.79	0.52	2.60	6.82	3.56						3.56								
2	E6+E7							4.45	10.79	0.65	2.60	6.82	4.45	4.45	0.010	18.00	100	0.013	8.1204	5.68	0.29	
	E8	0.10	0.77	7.41	0.08	2.60	7.84	0.63						0.63								
3	DP2+E8							4.94	11.08	0.73	2.60	6.75	4.94	4.94	0.010	18.00	228	0.013	8.6244	5.84	0.65	
	E4	0.33	0.78	8.15	0.26	2.60	7.59	1.96						1.96								
4	DP3+E4							6.52	11.74	0.99	2.60	6.59	6.52	6.52	0.010	18.00	41	0.013	10.2048	6.25	0.11	
	E5	0.38	0.77	7.89	0.29	2.60	7.68	2.24						2.24								
5	DP4+E5							8.41	11.85	1.28	2.60	6.56	8.41	8.41	0.020	18.00	50	0.013	9.642	8.65	0.10	
	DA1	0.66	0.77	7.85	0.51	2.60	7.69	3.91						3.91								
6	DP5+DA1							11.71	11.94	1.79	2.60	6.54	11.71	11.71	0.031	18.00	63	0.013	10.3356	11.05	0.09	
	E5	0.38	0.77	7.89	0.29	2.60	7.68	2.24						2.24								
7	DP6+E5							13.57	12.04	2.08	2.60	6.52	13.57	13.57	0.070	18.00	41	0.013	8.8308	15.60	0.04	
8	DP1+DP7							18.63	12.46	2.90	2.60	6.42	18.63	18.63	0.038	24.00	103	0.013	10.8564	13.34	0.13	
	E12	0.37	0.88	5.00	0.33	2.60	8.82	2.88						2.88								
	E13	0.28	0.83	5.00	0.23	2.60	8.82	2.05						2.05								
	F1	1.90	0.49	16.02	0.93	2.60	5.72	5.34						5.34								
9	E12+E13=F1							8.54	16.02	1.49	2.60	5.72	8.54	8.54	0.010	18.00	13	0.013	12.1584	6.60	0.03	
	E14	0.49	0.87	5.13	0.43	2.60	8.76	3.74						3.74								
10	DP9+E14							10.97	16.05	1.92	2.60	5.71	10.97	10.97	0.020	18.00	26	0.013	11.3832	9.17	0.05	
11	DP9+DP10							10.95	16.10	1.92	2.60	5.71	10.95	10.95	0.028	18.00	176	0.013	10.1892	10.45	0.28	
	E11	0.63	0.87	5.10	0.55	2.60	8.77	4.83						4.83								
12	DP11+E11							13.98	16.38	2.47	2.60	5.66	13.98	13.98	0.024	18.00	37	0.013	12.7152	10.33	0.06	
	E9	0.63	0.86	6.03	0.54	2.60	8.37	4.50						4.50								
	E10	0.50	0.84	6.27	0.42	2.60	8.27	3.44						3.44								
14	DP12+E9+E10							19.34	16.44	3.42	2.60	5.65	19.34	19.34	0.010	24.00	190	0.013	16.914	8.07	0.39	
	DA1	0.66	0.77	7.85	0.51	2.60	7.69	3.91						3.91								
	DA2	0.47	0.86	5.00	0.41	2.60	8.82	3.58						3.58								
	DA7	0.19	0.87	5.00	0.16	2.60	8.82	1.45						1.45								
	DA8	0.48	0.84	5.00	0.40	2.60	8.82	3.54						3.54								
	DA9	0.08	0.78	5.00	0.06	2.60	8.82	0.55						0.55								
	DA10	1.17	0.88	5.00	1.03	2.60	8.82	9.08						9.08								
	F4	0.69	0.78	5.00	0.54	2.60	8.82	4.74						4.74								
	F3	0.36	0.76	5.00	0.27	2.60	8.82	2.42						2.42								
15	BASIN B							54.22	16.83	9.71	2.60	5.58	54.22	54.22	0.036	36.00	70	0.013	16.3584	17.16	0.07	

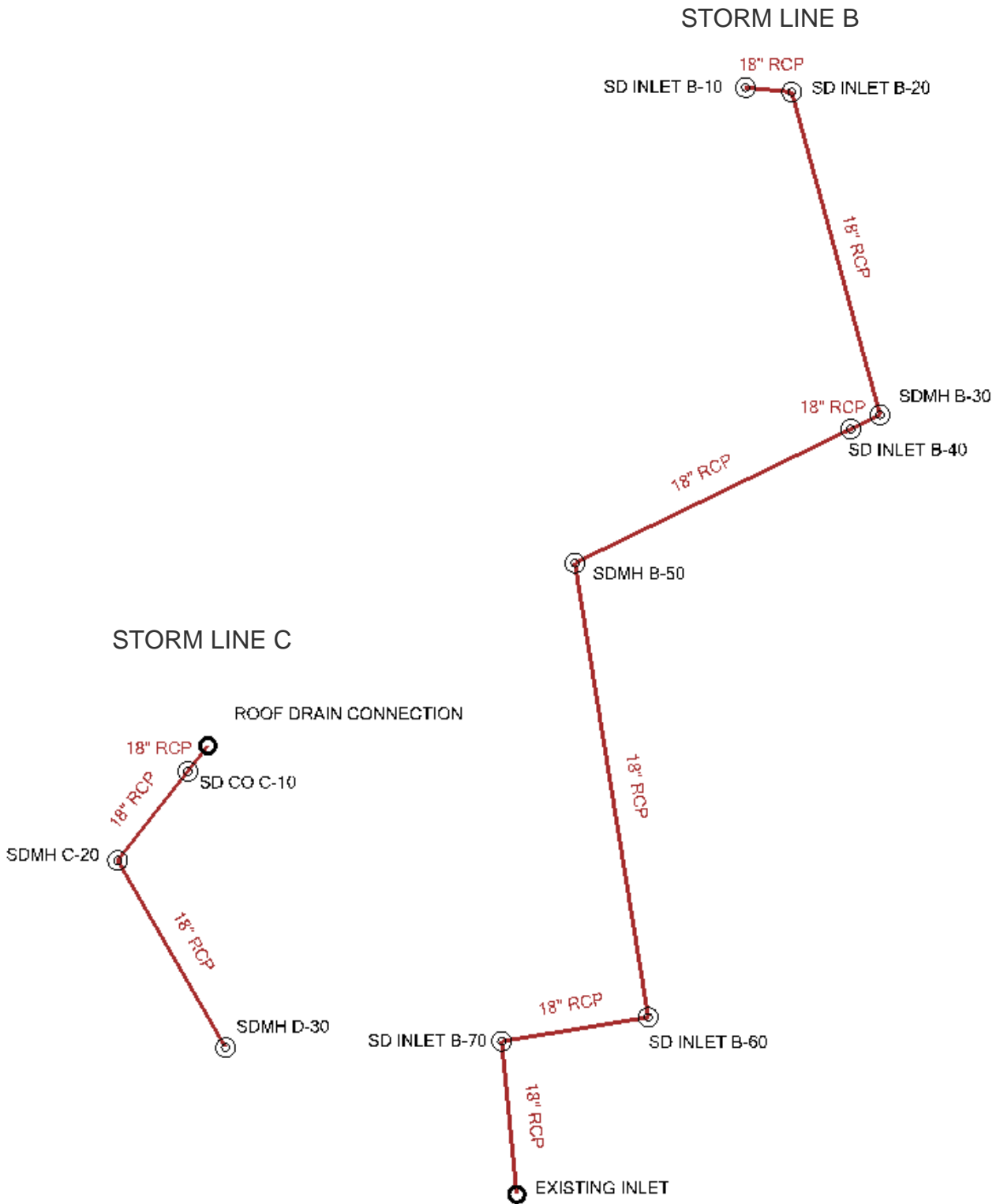
**Appendix B**  
**Hydraulic Calculations**

**Scenario: Base**

STORM LINE A



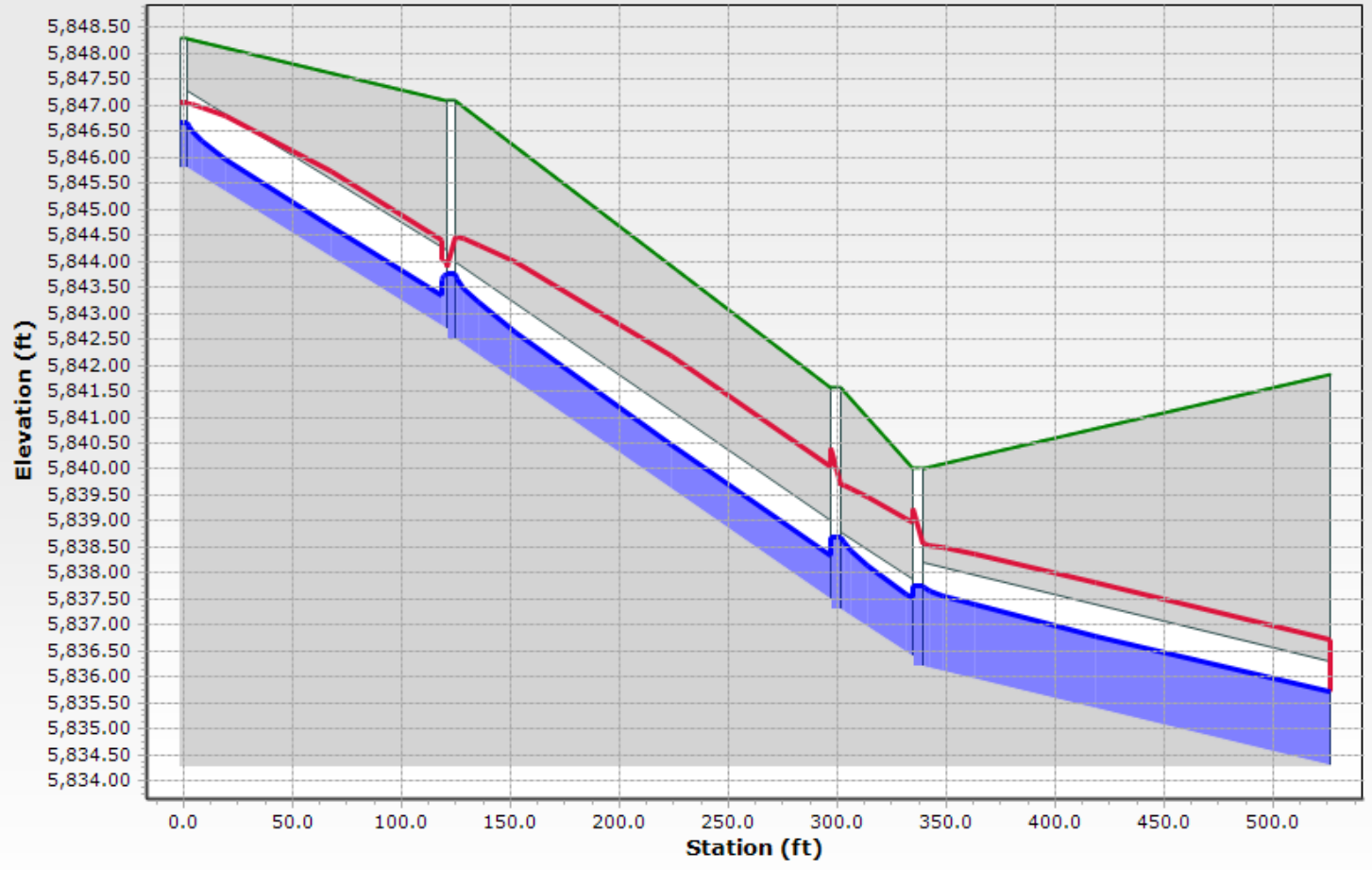
# Scenario: Base



# Profile Report

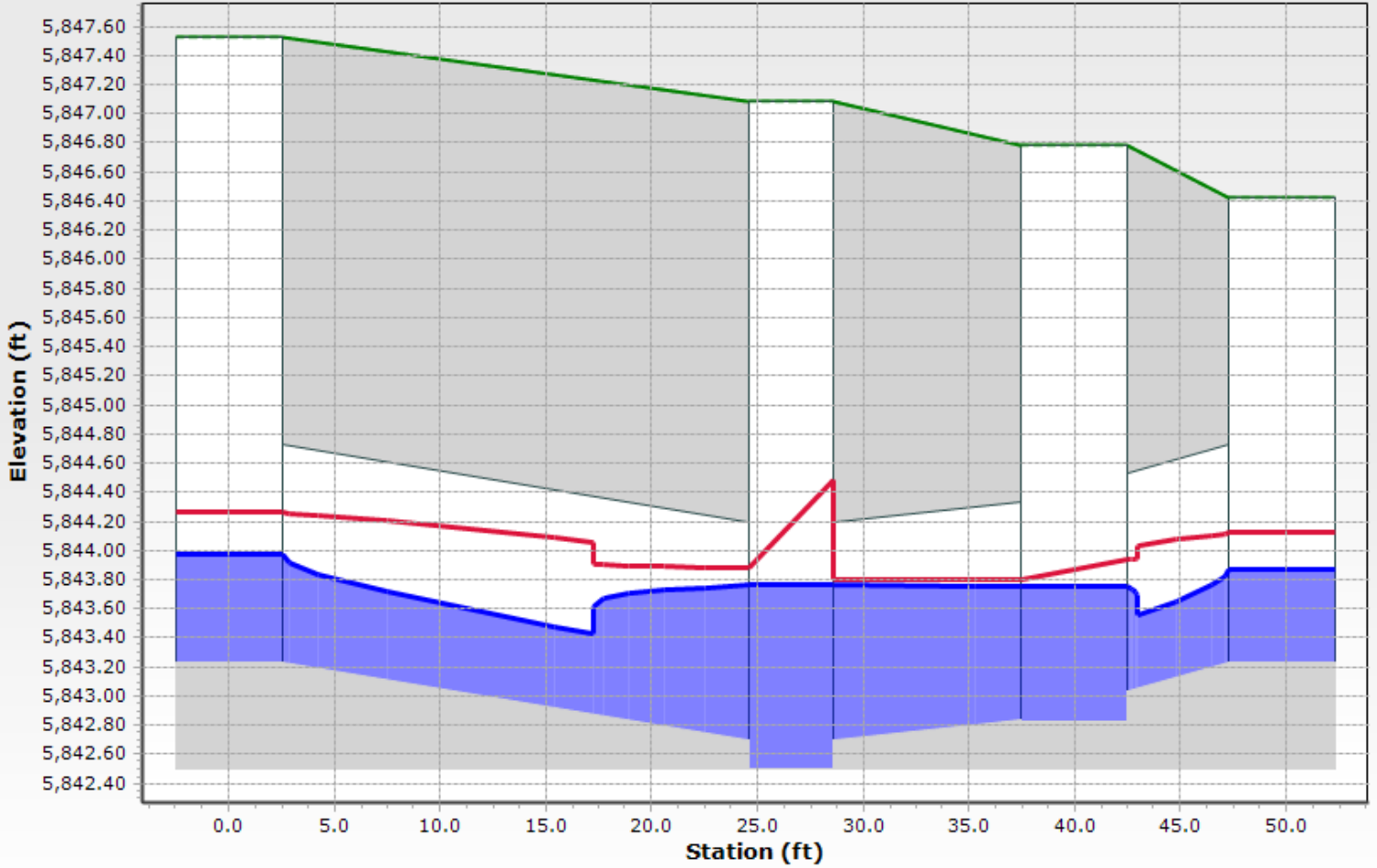
## Profile: STORM LINE A

### STORM LINE A - Base



**Profile Report**  
**Profile: STORM LINE A-20**

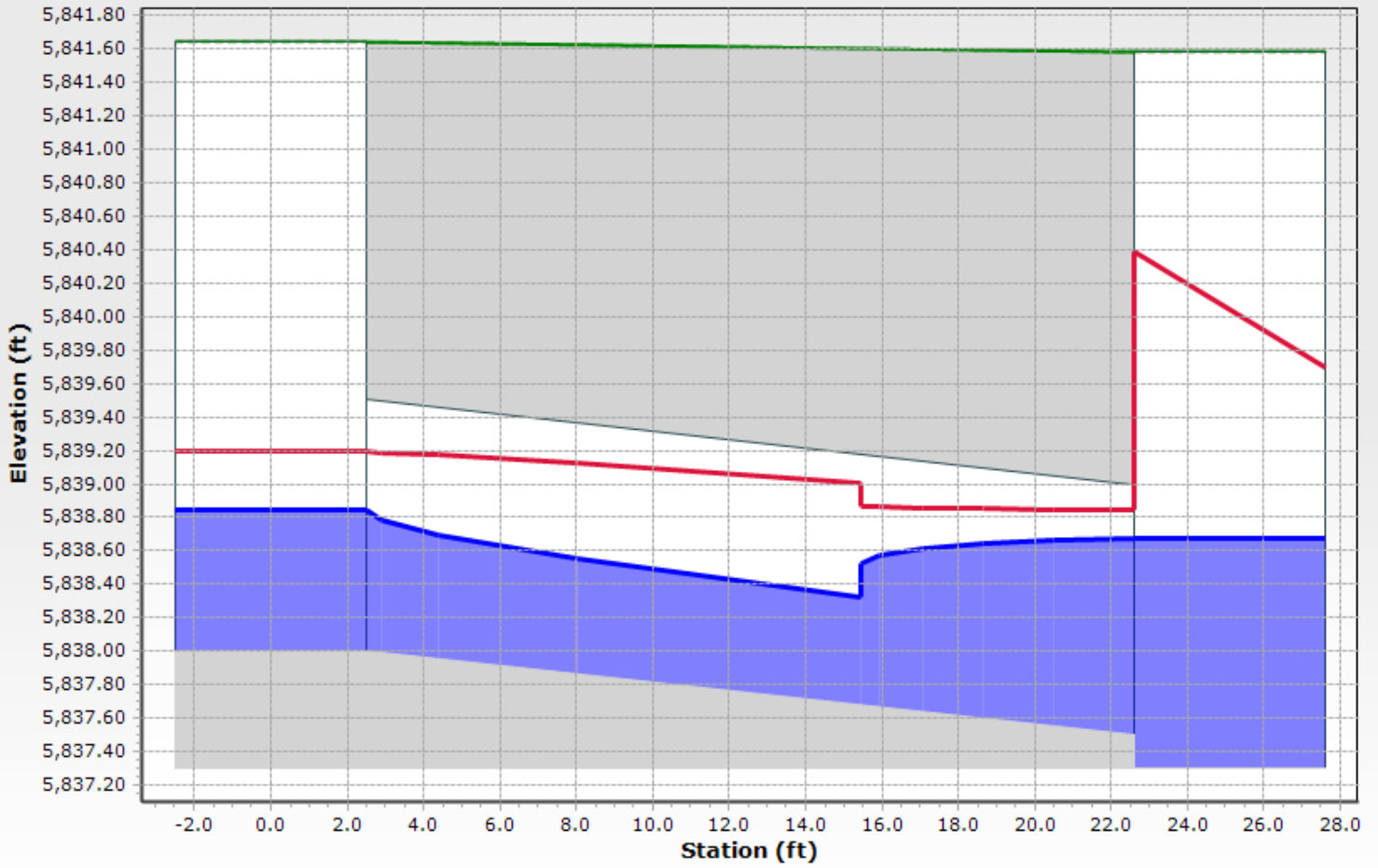
**STORM LINE A-20 - Base**



# Profile Report

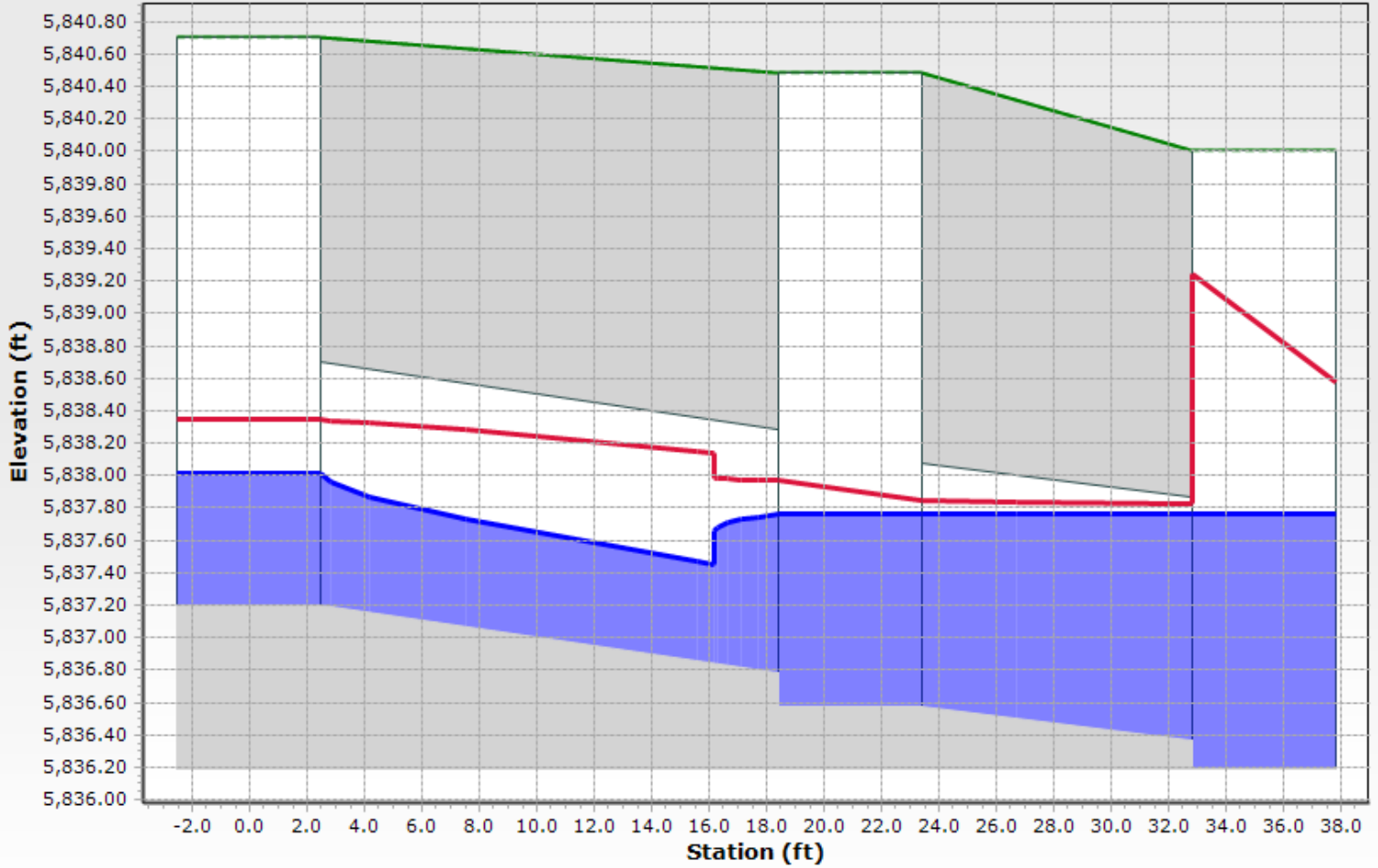
## Profile: STORM LINE A-30

### STORM LINE A-30 - Base



**Profile Report**  
**Profile: STORM LINE A-40**

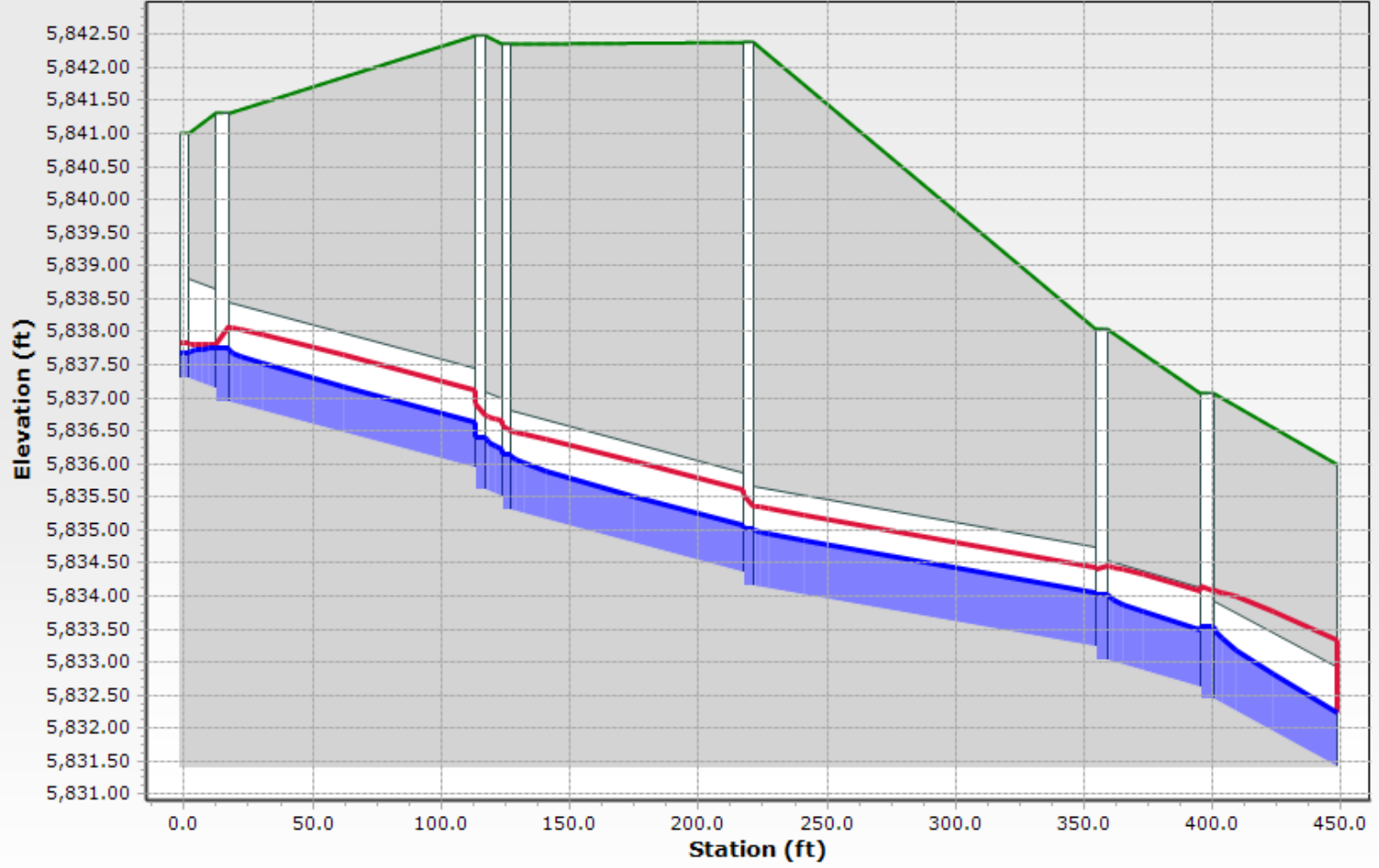
**STORM LINE A-40 - Base**



# Profile Report

## Profile: STORM LINE B

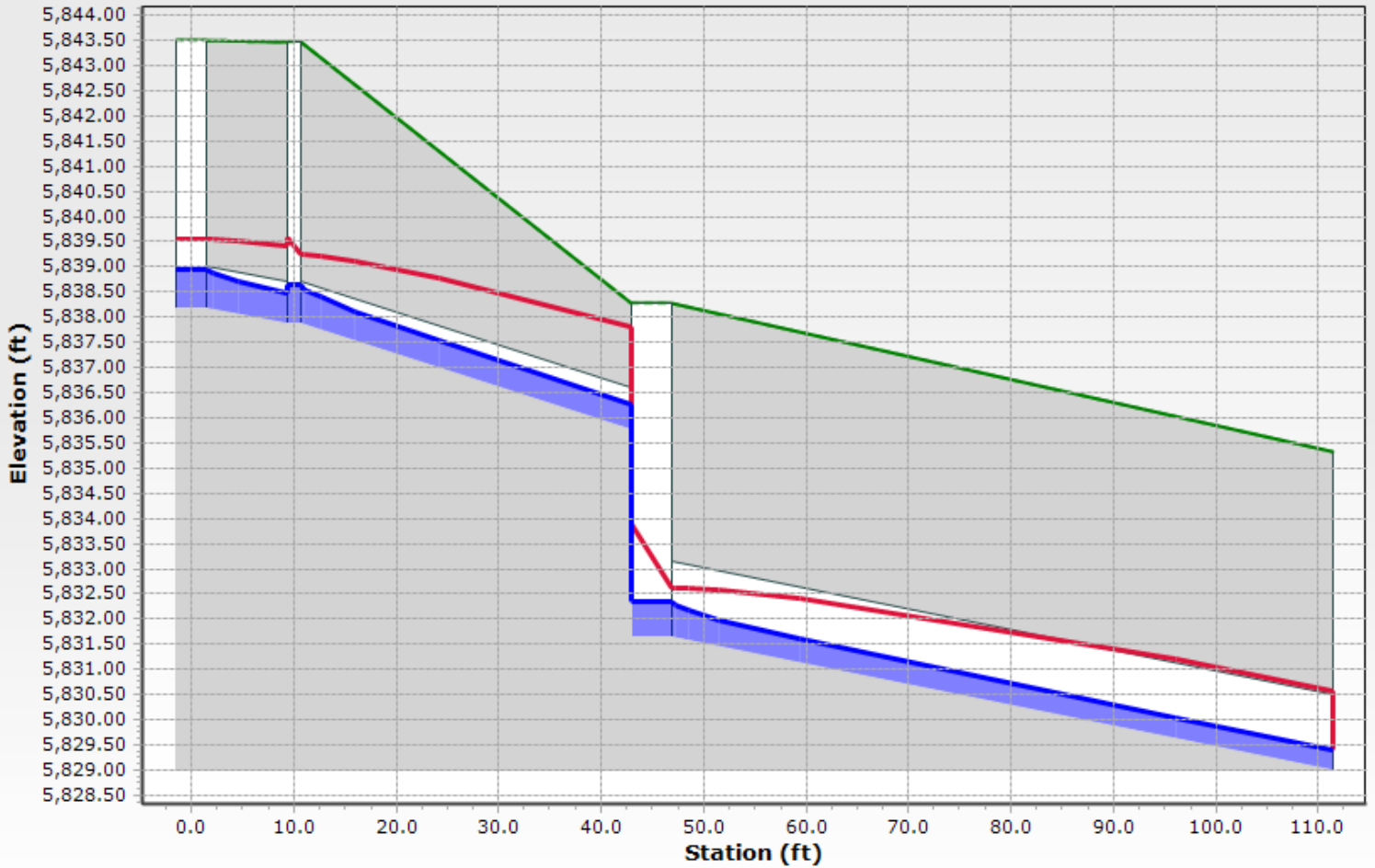
### STORM LINE B - Base



# Profile Report

## Profile: STORM LINE C

### STORM LINE C - Base



**Scenario: Base**  
**Current Time Step: 0.000Hr**  
**FlexTable: Conduit Table**

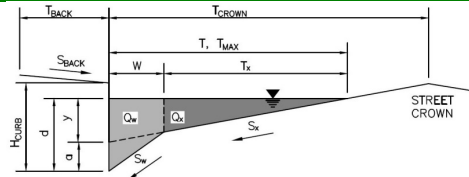
Start Node	Invert (Start) (ft)	Stop Node	Invert (Stop) (ft)	Length (User Defined) (ft)	Slope (Calculated) (ft/ft)	Diameter (in)	Manning's n	Flow (cfs)	Velocity (ft/s)	Hydraulic Grade Line (Out) (ft)	Capacity (Full Flow) (cfs)
SD INLET B-70	5,832.43	EXISTING INLET	5,831.42	50.5	0.020	18.0	0.013	8.34	8.65	5,832.25	14.85
ROOF DRAIN CONNECTION	5,838.17	SD CO C-10	5,837.87	10.0	0.030	10.0	0.010	3.33	9.71	5,838.48	4.93
SD INLET A-10	5,845.80	SDMH A-20	5,842.70	122.9	0.025	18.0	0.013	5.22	8.34	5,843.76	16.67
SD INLET A-21B	5,843.23	SDMH A-20	5,842.70	26.6	0.020	18.0	0.013	3.74	7.00	5,843.76	14.85
SDMH A-20	5,842.50	SDMH A-30	5,837.50	176.3	0.028	18.0	0.013	10.78	10.50	5,838.35	17.69
SD INLET A-21A	5,842.83	SDMH A-20	5,842.70	13.4	0.010	18.0	0.013	2.05	4.61	5,843.76	10.50
SD INLET A-22A	5,843.23	SD INLET A-21A	5,843.03	9.8	0.020	18.0	0.013	2.88	6.51	5,843.75	14.85
SD CO C-10	5,837.87	SDMH C-20	5,835.78	34.9	0.060	10.0	0.013	3.33	10.36	5,836.27	5.36
SD INLET B-20	5,836.95	SDMH B-30	5,835.94	100.6	0.010	18.0	0.013	4.40	5.68	5,836.62	10.50
SDMH B-30	5,835.60	SD INLET B-40	5,835.50	10.0	0.010	18.0	0.013	4.40	5.68	5,836.21	10.50
SD INLET B-40	5,835.30	SDMH B-50	5,834.36	94.3	0.010	18.0	0.013	4.88	5.84	5,835.08	10.50
SDMH B-50	5,834.16	SD INLET B-60	5,833.24	137.4	0.007	18.0	0.013	4.88	5.02	5,834.05	8.60
SDMH A-40	5,836.19	SDMH A-50	5,834.30	189.2	0.010	24.0	0.013	19.11	8.07	5,835.71	22.62
SD INLET A-31	5,838.00	SDMH A-30	5,837.50	25.1	0.020	18.0	0.013	4.83	7.51	5,838.68	14.85
SDMH A-30	5,837.30	SDMH A-40	5,836.40	37.5	0.024	18.0	0.013	13.79	10.32	5,837.52	16.26
SD INLET B-10	5,837.30	SD INLET B-20	5,837.15	14.7	0.010	18.0	0.013	1.07	3.82	5,837.75	10.50
SD INLET A-42	5,837.20	SD INLET A-41	5,836.78	20.9	0.020	18.0	0.013	4.49	7.36	5,837.76	14.85
SD INLET A-41	5,836.58	SDMH A-40	5,836.37	14.4	0.015	18.0	0.013	3.43	6.10	5,837.77	12.68
SDMH C-20	5,831.66	SDMH C-30	5,829.00	66.5	0.040	18.0	0.013	3.33	8.68	5,829.40	21.00
SD INLET B-60	5,833.04	SD INLET B-70	5,832.63	40.9	0.010	18.0	0.013	6.46	6.25	5,833.48	10.50

**UD Inlet Calculations**

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Parker MOB III**  
 Inlet ID: **Inlet A-21A**



**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb  
 Side Slope Behind Curb (leave blank for no conveyance credit behind curb)  
 Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

$T_{BACK}$	5.0	ft
$S_{BACK}$	0.020	ft/ft
$n_{BACK}$	0.013	

Height of Curb at Gutter Flow Line  
 Distance from Curb Face to Street Crown  
 Gutter Width  
 Street Transverse Slope  
 Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)  
 Street Longitudinal Slope - Enter 0 for sump condition  
 Manning's Roughness for Street Section (typically between 0.012 and 0.020)

$H_{CURB}$	6.00	inches
$T_{CROWN}$	12.0	ft
$W$	1.00	ft
$S_x$	0.020	ft/ft
$S_w$	0.083	ft/ft
$S_o$	0.030	ft/ft
$n_{STREET}$	0.013	

Max. Allowable Spread for Minor & Major Storm  
 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm  
 Allow Flow Depth at Street Crown (leave blank for no)

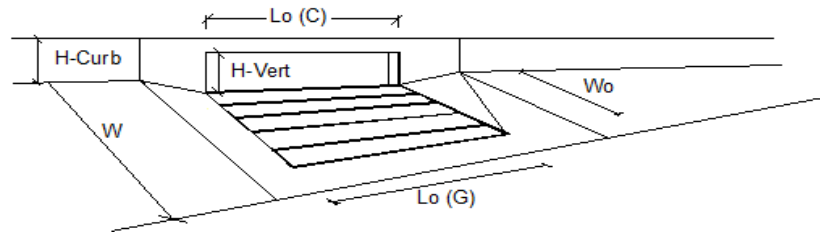
	Minor Storm	Major Storm	
$T_{MAX}$	6.0	12.0	ft
$Q_{MAX}$	6.0	9.0	inches
	<input type="checkbox"/>	<input type="checkbox"/>	check = yes

**MINOR STORM Allowable Capacity is based on Spread Criterion**  
**MAJOR STORM Allowable Capacity is based on Spread Criterion**

	Minor Storm	Major Storm	
$Q_{allow}$	1.6	8.7	cfs

**Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'**  
**Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'**

**INLET ON A CONTINUOUS GRADE**



**Design Information (Input)**

Type of Inlet: **CDOT Type R Curb Opening**  
 Local Depression (additional to continuous gutter depression 'a')  
 Total Number of Units in the Inlet (Grate or Curb Opening)  
 Length of a Single Unit Inlet (Grate or Curb Opening)  
 Width of a Unit Grate (cannot be greater than W, Gutter Width)  
 Clogging Factor for a Single Unit Grate (typical min. value = 0.5)  
 Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)

	MINOR	MAJOR	
Type	CDOT Type R Curb Opening		
$a_{LOCAL}$	3.0	3.0	inches
No	1	1	
$L_o$	5.00	5.00	ft
$W_o$	N/A	N/A	ft
$C_r-G$	N/A	N/A	
$C_r-C$	0.10	0.10	

**Street Hydraulics: OK - Q < Allowable Street Capacity'**

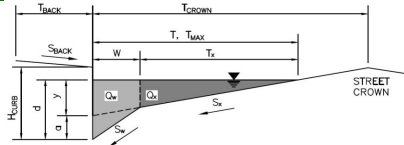
Total Inlet Interception Capacity  
 Total Inlet Carry-Over Flow (flow bypassing inlet)  
 Capture Percentage =  $Q_a/Q_o$  =

	MINOR	MAJOR	
$Q$	1.2	2.3	cfs
$Q_b$	0.1	1.8	cfs
$C\%$	95	57	%

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Parker MOB III**  
 Inlet ID: **Inlet A-22A**



**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb  
 Side Slope Behind Curb (leave blank for no conveyance credit behind curb)  
 Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

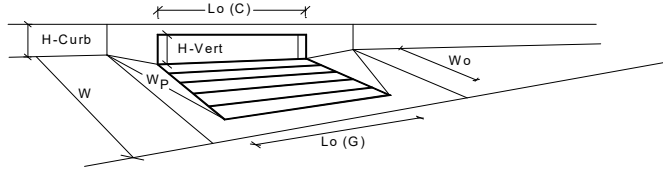
Height of Curb at Gutter Flow Line  
 Distance from Curb Face to Street Crown  
 Gutter Width  
 Street Transverse Slope  
 Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)  
 Street Longitudinal Slope - Enter 0 for sump condition  
 Manning's Roughness for Street Section (typically between 0.012 and 0.020)

Max. Allowable Spread for Minor & Major Storm  
 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm  
 Check boxes are not applicable in SUMP conditions

**MINOR STORM Allowable Capacity is based on Depth Criterion**  
**MAJOR STORM Allowable Capacity is based on Depth Criterion**

$T_{BACK}$	10.0	ft
$S_{BACK}$	0.020	ft/ft
$n_{BACK}$	0.013	
$H_{CURB}$	9.00	inches
$T_{CROWN}$	12.0	ft
$W$	2.00	ft
$S_x$	0.040	ft/ft
$S_w$	0.083	ft/ft
$S_o$	0.000	ft/ft
$n_{STREET}$	0.013	
$T_{MAX}$	12.0	ft
$d_{MAX}$	6.0	inches
	<input type="checkbox"/>	
	<input type="checkbox"/>	
$Q_{allow}$	SUMP	SUMP cfs

**INLET IN A SUMP OR SAG LOCATION**



**Design Information (Input)** CDOT Type R Curb Opening

Type of Inlet  
 Local Depression (additional to continuous gutter depression 'a' from above)  
 Number of Unit Inlets (Grate or Curb Opening)  
 Water Depth at Flowline (outside of local depression)

**Grate Information**  
 Length of a Unit Grate  
 Width of a Unit Grate  
 Area Opening Ratio for a Grate (typical values 0.15-0.90)  
 Clogging Factor for a Single Grate (typical value 0.50 - 0.70)  
 Grate Weir Coefficient (typical value 2.15 - 3.60)  
 Grate Orifice Coefficient (typical value 0.60 - 0.80)

**Curb Opening Information**  
 Length of a Unit Curb Opening  
 Height of Vertical Curb Opening in Inches  
 Height of Curb Orifice Throat in Inches  
 Angle of Throat (see USDCM Figure ST-5)  
 Side Width for Depression Pan (typically the gutter width of 2 feet)  
 Clogging Factor for a Single Curb Opening (typical value 0.10)  
 Curb Opening Weir Coefficient (typical value 2.3-3.7)  
 Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)

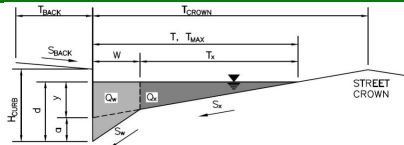
**Low Head Performance Reduction (Calculated)**  
 Depth for Grate Midwidth  
 Depth for Curb Opening Weir Equation  
 Combination Inlet Performance Reduction Factor for Long Inlets  
 Curb Opening Performance Reduction Factor for Long Inlets  
 Grated Inlet Performance Reduction Factor for Long Inlets

**Total Inlet Interception Capacity (assumes clogged condition)**  
**Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)**

	MINOR	MAJOR	
Type	CDOT Type R Curb Opening		
$a_{local}$	0.00	0.00	inches
$N_o$	1	1	
Ponding Depth	6.0	6.8	inches
	<input type="checkbox"/>	<input type="checkbox"/>	Override Depths
$L_o (G)$	N/A	N/A	feet
$W_o$	N/A	N/A	feet
$A_{ratio}$	N/A	N/A	
$C_r (G)$	N/A	N/A	
$C_w (G)$	N/A	N/A	
$C_o (G)$	N/A	N/A	
$L_o (C)$	5.00	5.00	feet
$H_{vert}$	6.00	6.00	inches
$H_{throat}$	6.00	6.00	inches
$\theta$	63.40	63.40	degrees
$W_p$	2.00	2.00	feet
$C_r (C)$	0.10	0.10	
$C_w (C)$	3.60	3.60	
$C_o (C)$	0.67	0.67	
$d_{Grate}$	N/A	N/A	ft
$d_{Curb}$	0.33	0.40	ft
$RF_{Combination}$	0.77	0.87	
$RF_{Curb}$	1.00	1.00	
$RF_{Grate}$	N/A	N/A	
$Q_a$	5.4	6.6	cfs
$Q_{PEAK REQUIRED}$	1.5	2.9	cfs

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**  
 (Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Parker MOB III**  
 Inlet ID: **Inlet A-21B**



**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb  
 Side Slope Behind Curb (leave blank for no conveyance credit behind curb)  
 Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

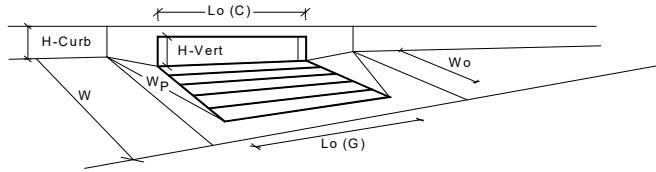
Height of Curb at Gutter Flow Line  
 Distance from Curb Face to Street Crown  
 Gutter Width  
 Street Transverse Slope  
 Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)  
 Street Longitudinal Slope - Enter 0 for sump condition  
 Manning's Roughness for Street Section (typically between 0.012 and 0.020)

Max. Allowable Spread for Minor & Major Storm  
 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm  
 Check boxes are not applicable in SUMP conditions

**MINOR STORM Allowable Capacity is based on Depth Criterion**  
**MAJOR STORM Allowable Capacity is based on Depth Criterion**

$T_{BACK}$	10.0	ft
$S_{BACK}$	0.020	ft/ft
$n_{BACK}$	0.013	
$H_{CURB}$	6.00	inches
$T_{CROWN}$	12.0	ft
$W$	1.00	ft
$S_x$	0.018	ft/ft
$S_w$	0.083	ft/ft
$S_o$	0.000	ft/ft
$n_{STREET}$	0.013	
$T_{MAX}$	12.0	ft
$d_{MAX}$	6.0	inches
	<input type="checkbox"/>	
$Q_{allow}$	SUMP	cfs

**INLET IN A SUMP OR SAG LOCATION**



**Design Information (Input)** CDOT Type R Curb Opening

Type of Inlet  
 Local Depression (additional to continuous gutter depression 'a' from above)  
 Number of Unit Inlets (Grate or Curb Opening)  
 Water Depth at Flowline (outside of local depression)

**Grate Information**  
 Length of a Unit Grate  
 Width of a Unit Grate  
 Area Opening Ratio for a Grate (typical values 0.15-0.90)  
 Clogging Factor for a Single Grate (typical value 0.50 - 0.70)  
 Grate Weir Coefficient (typical value 2.15 - 3.60)  
 Grate Orifice Coefficient (typical value 0.60 - 0.80)

**Curb Opening Information**  
 Length of a Unit Curb Opening  
 Height of Vertical Curb Opening in Inches  
 Height of Curb Orifice Throat in Inches  
 Angle of Throat (see USDCM Figure ST-5)  
 Side Width for Depression Pan (typically the gutter width of 2 feet)  
 Clogging Factor for a Single Curb Opening (typical value 0.10)  
 Curb Opening Weir Coefficient (typical value 2.3-3.7)  
 Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)

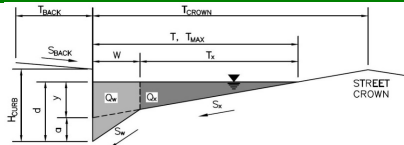
**Low Head Performance Reduction (Calculated)**  
 Depth for Grate Midwidth  
 Depth for Curb Opening Weir Equation  
 Combination Inlet Performance Reduction Factor for Long Inlets  
 Curb Opening Performance Reduction Factor for Long Inlets  
 Grated Inlet Performance Reduction Factor for Long Inlets

**Total Inlet Interception Capacity (assumes clogged condition)**  
**Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)**

	MINOR	MAJOR	
Type	CDOT Type R Curb Opening		
$a_{local}$	3.00	3.00	inches
$N_o$	1	1	
Ponding Depth	6.0	9.0	inches
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Override Depths
$L_o (G)$	N/A	N/A	feet
$W_o$	N/A	N/A	feet
$A_{ratio}$	N/A	N/A	
$C_r (G)$	N/A	N/A	
$C_w (G)$	N/A	N/A	
$C_o (G)$	N/A	N/A	
	MINOR	MAJOR	
$L_o (C)$	5.00	5.00	feet
$H_{vert}$	6.00	6.00	inches
$H_{throat}$	6.00	6.00	inches
$\theta$	63.40	63.40	degrees
$W_p$	1.00	1.00	feet
$C_r (C)$	0.10	0.10	
$C_w (C)$	3.60	3.60	
$C_o (C)$	0.67	0.67	
	MINOR	MAJOR	
$d_{Grate}$	N/A	N/A	ft
$d_{Curb}$	0.42	0.67	ft
$RF_{Combination}$	0.77	1.00	
$RF_{Curb}$	1.00	1.00	
$RF_{Grate}$	N/A	N/A	
	MINOR	MAJOR	
$Q_a$	5.9	10.5	cfs
$Q_{PEAK REQUIRED}$	1.9	3.7	cfs

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**  
 (Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Parker MOB III**  
 Inlet ID: **Inlet A-31**



**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb:  $T_{BACK} = 15.0$  ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb):  $S_{BACK} = 0.020$  ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020):  $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line:  $H_{CURB} = 6.00$  inches

Distance from Curb Face to Street Crown:  $T_{CROWN} = 24.0$  ft

Gutter Width:  $W = 1.00$  ft

Street Transverse Slope:  $S_x = 0.040$  ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft):  $S_w = 0.083$  ft/ft

Street Longitudinal Slope - Enter 0 for sump condition:  $S_o = 0.000$  ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020):  $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm:  $T_{MAX} = 12.0$  (Minor Storm) /  $24.0$  (Major Storm) ft

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm:  $d_{MAX} = 6.0$  (Minor Storm) /  $9.0$  (Major Storm) inches

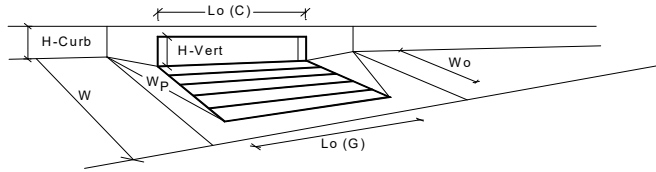
Check boxes are not applicable in SUMP conditions:

**MINOR STORM Allowable Capacity is based on Depth Criterion**

**MAJOR STORM Allowable Capacity is based on Depth Criterion**

Allowable Capacity:  $Q_{allow} = \text{SUMP}$  (Minor Storm) /  $\text{SUMP}$  (Major Storm) cfs

**INLET IN A SUMP OR SAG LOCATION**



**Design Information (Input)** | **CDOT Type R Curb Opening**

Type of Inlet: **CDOT Type R Curb Opening**

Local Depression (additional to continuous gutter depression 'a' from above):  $a_{local} = 3.00$  inches

Number of Unit Inlets (Grate or Curb Opening):  $N_o = 1$

Water Depth at Flowline (outside of local depression): **Ponding Depth** =  $6.0$  (Minor) /  $9.0$  (Major) inches

**Grate Information**

Length of a Unit Grate:  $L_o (G) = N/A$  feet

Width of a Unit Grate:  $W_o = N/A$  feet

Area Opening Ratio for a Grate (typical values 0.15-0.90):  $A_{ratio} = N/A$

Clogging Factor for a Single Grate (typical value 0.50 - 0.70):  $C_r (G) = N/A$

Grate Weir Coefficient (typical value 2.15 - 3.60):  $C_w (G) = N/A$

Grate Orifice Coefficient (typical value 0.60 - 0.80):  $C_o (G) = N/A$

**Curb Opening Information**

Length of a Unit Curb Opening:  $L_o (C) = 5.00$  feet

Height of Vertical Curb Opening in Inches:  $H_{vert} = 6.00$  inches

Height of Curb Orifice Throat in Inches:  $H_{throat} = 6.00$  inches

Angle of Throat (see USDCM Figure ST-5):  $\theta = 63.40$  degrees

Side Width for Depression Pan (typically the gutter width of 2 feet):  $W_o = 1.00$  feet

Clogging Factor for a Single Curb Opening (typical value 0.10):  $C_r (C) = 0.10$

Curb Opening Weir Coefficient (typical value 2.3-3.7):  $C_w (C) = 3.60$

Curb Opening Orifice Coefficient (typical value 0.60 - 0.70):  $C_o (C) = 0.67$

**Low Head Performance Reduction (Calculated)**

Depth for Grate Midwidth:  $d_{Grate} = N/A$  ft

Depth for Curb Opening Weir Equation:  $d_{Curb} = 0.42$  ft

Combination Inlet Performance Reduction Factor for Long Inlets:  $RF_{Combination} = 0.77$

Curb Opening Performance Reduction Factor for Long Inlets:  $RF_{Curb} = 1.00$

Grated Inlet Performance Reduction Factor for Long Inlets:  $RF_{Grate} = N/A$

**Total Inlet Interception Capacity (assumes clogged condition)**

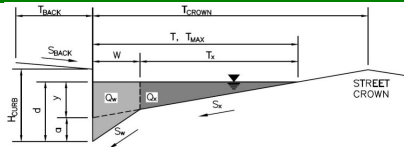
**Inlet Capacity IS GOOD for Minor and Major Storms (>Q PEAK)**

Allowable Capacity:  $Q_a = 5.9$  (Minor) /  $10.5$  (Major) cfs

Peak Required:  $Q_{PEAK REQUIRED} = 2.5$  (Minor) /  $4.8$  (Major) cfs

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**  
 (Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Parker MOB III**  
 Inlet ID: **Inlet A-42**



**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb:  $T_{BACK} = 20.0$  ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb):  $S_{BACK} = 0.020$  ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020):  $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line:  $H_{CURB} = 6.00$  inches

Distance from Curb Face to Street Crown:  $T_{CROWN} = 24.0$  ft

Gutter Width:  $W = 1.00$  ft

Street Transverse Slope:  $S_x = 0.030$  ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft):  $S_w = 0.083$  ft/ft

Street Longitudinal Slope - Enter 0 for sump condition:  $S_o = 0.000$  ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020):  $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm:  $T_{MAX} = 24.0$  ft (Minor Storm),  $24.0$  ft (Major Storm)

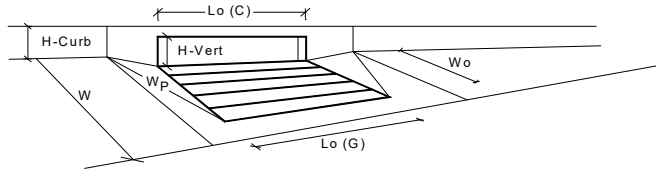
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm:  $d_{MAX} = 6.0$  inches (Minor Storm),  $9.0$  inches (Major Storm)

Check boxes are not applicable in SUMP conditions:

MINOR STORM Allowable Capacity is based on Depth Criterion  
 MAJOR STORM Allowable Capacity is based on Depth Criterion

$Q_{allow} =$  **SUMP** (Minor Storm), **SUMP** (Major Storm) cfs

**INLET IN A SUMP OR SAG LOCATION**



**Design Information (Input)** | **CDOT Type R Curb Opening**

Type of Inlet: **CDOT Type R Curb Opening**

Local Depression (additional to continuous gutter depression 'a' from above):  $a_{local} = 3.00$  inches

Number of Unit Inlets (Grate or Curb Opening):  $N_o = 1$

Water Depth at Flowline (outside of local depression): **Ponding Depth** =  $6.0$  inches (Minor),  $9.0$  inches (Major)

**Grate Information**

Length of a Unit Grate:  $L_o (G) = N/A$  feet

Width of a Unit Grate:  $W_o = N/A$  feet

Area Opening Ratio for a Grate (typical values 0.15-0.90):  $A_{ratio} = N/A$

Clogging Factor for a Single Grate (typical value 0.50 - 0.70):  $C_r (G) = N/A$

Grate Weir Coefficient (typical value 2.15 - 3.60):  $C_w (G) = N/A$

Grate Orifice Coefficient (typical value 0.60 - 0.80):  $C_o (G) = N/A$

**Curb Opening Information**

Length of a Unit Curb Opening:  $L_o (C) = 5.00$  feet

Height of Vertical Curb Opening in Inches:  $H_{vert} = 6.00$  inches

Height of Curb Orifice Throat in Inches:  $H_{throat} = 6.00$  inches

Angle of Throat (see USDCM Figure ST-5):  $\theta = 63.40$  degrees

Side Width for Depression Pan (typically the gutter width of 2 feet):  $W_o = 1.00$  feet

Clogging Factor for a Single Curb Opening (typical value 0.10):  $C_r (C) = 0.10$

Curb Opening Weir Coefficient (typical value 2.3-3.7):  $C_w (C) = 3.60$

Curb Opening Orifice Coefficient (typical value 0.60 - 0.70):  $C_o (C) = 0.67$

**Low Head Performance Reduction (Calculated)**

Depth for Grate Midwidth:  $d_{Grate} = N/A$  ft

Depth for Curb Opening Weir Equation:  $d_{Curb} = 0.42$  ft

Combination Inlet Performance Reduction Factor for Long Inlets:  $RF_{Combination} = 0.77$

Curb Opening Performance Reduction Factor for Long Inlets:  $RF_{Curb} = 1.00$

Grated Inlet Performance Reduction Factor for Long Inlets:  $RF_{Grate} = N/A$

**Total Inlet Interception Capacity (assumes clogged condition)**

**Inlet Capacity IS GOOD for Minor and Major Storms (>Q PEAK)**

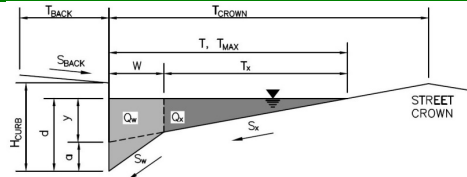
$Q_a = 5.9$  cfs (Minor),  $10.5$  cfs (Major)

$Q_{PEAK REQUIRED} = 2.2$  cfs (Minor),  $4.5$  cfs (Major)

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: Parker MOB III  
 Inlet ID: Inlet A-41



**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb  $T_{BACK} = 5.0$  ft  
 Side Slope Behind Curb (leave blank for no conveyance credit behind curb)  $S_{BACK} = 0.020$  ft/ft  
 Manning's Roughness Behind Curb (typically between 0.012 and 0.020)  $n_{BACK} = 0.013$

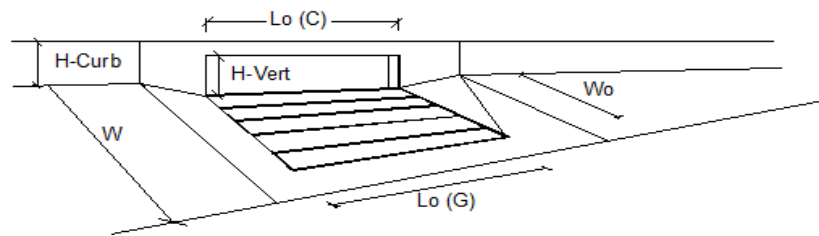
Height of Curb at Gutter Flow Line  $H_{CURB} = 6.00$  inches  
 Distance from Curb Face to Street Crown  $T_{CROWN} = 12.0$  ft  
 Gutter Width  $W = 1.00$  ft  
 Street Transverse Slope  $S_x = 0.030$  ft/ft  
 Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)  $S_w = 0.083$  ft/ft  
 Street Longitudinal Slope - Enter 0 for sump condition  $S_o = 0.027$  ft/ft  
 Manning's Roughness for Street Section (typically between 0.012 and 0.020)  $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm  $T_{MAX} = 12.0$  ft (Minor Storm) /  $12.0$  ft (Major Storm)  
 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm  $Q_{MAX} = 5.0$  inches (Minor Storm) /  $6.0$  inches (Major Storm)  
 Allow Flow Depth at Street Crown (leave blank for no)  check = yes

**MINOR STORM Allowable Capacity is based on Spread Criterion**  
**MAJOR STORM Allowable Capacity is based on Spread Criterion**  
 Minor storm max. allowable capacity **GOOD** - greater than the design flow given on sheet 'Inlet Management'  
 Major storm max. allowable capacity **GOOD** - greater than the design flow given on sheet 'Inlet Management'

$Q_{allow} = 15.9$  cfs (Minor Storm) /  $15.9$  cfs (Major Storm)

**INLET ON A CONTINUOUS GRADE**



**Design Information (Input)** CDOT Type R Curb Opening

Type of Inlet: CDOT Type R Curb Opening

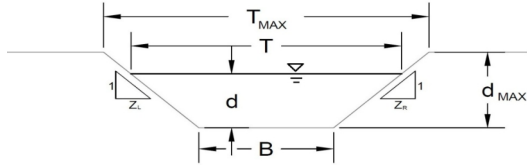
	MINOR	MAJOR	
Type =	CDOT Type R Curb Opening		
$a_{LOCAL} =$	3.0	3.0	inches
No =	1	1	
$L_o =$	5.00	5.00	ft
$W_o =$	N/A	N/A	ft
$C_{r-G} =$	N/A	N/A	
$C_{r-C} =$	0.10	0.10	

**Street Hydraulics: OK - Q < Allowable Street Capacity'**

	MINOR	MAJOR	
Total Inlet Interception Capacity $Q =$	1.8	2.8	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet) $Q_b =$	0.5	2.5	cfs
Capture Percentage = $Q/Q_o =$	78	53	%

## AREA INLET IN A SWALE

Parker MOB III  
Inlet A-10



This worksheet uses the NRCS vegetative retardance method to determine Manning's n.  
For more information see Section 7.2.3 of the USDCM.

**Analysis of Trapezoidal Grass-Lined Channel Using SCS Method**

NRCS Vegetal Retardance (A, B, C, D, or E) A, B, C, D or E: **C**  
 Manning's n (Leave cell D16 blank to manually enter an n value) n = see details below  
 Channel Invert Slope S<sub>0</sub> = 0.0200 ft/ft  
 Bottom Width B = 5.00 ft  
 Left Side Slope Z1 = 4.00 ft/ft  
 Right Side Slope Z2 = 4.00 ft/ft  
 Check one of the following soil types:

Soil Type:	Max. Velocity (V <sub>MAX</sub> )	Max Froude No. (F <sub>MAX</sub> )
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:  
 Non-Cohesive  
 Cohesive  
 Paved

	Minor Storm	Major Storm	
T <sub>MAX</sub> =	10.00	15.00	feet
d <sub>MAX</sub> =	0.50	1.00	feet

Max. Allowable Top Width of Channel for Minor & Major Storm  
 Max. Allowable Water Depth in Channel for Minor & Major Storm

**Allowable Channel Capacity Based On Channel Geometry**

**MINOR STORM** Allowable Capacity is based on Depth Criterion Minor Storm: **0.9** cfs  
**MAJOR STORM** Allowable Capacity is based on Depth Criterion Major Storm: **25.5** cfs

	Minor Storm	Major Storm	
Q <sub>allow</sub> =	0.9	25.5	cfs
d <sub>allow</sub> =	0.50	1.00	ft

**Water Depth in Channel Based On Design Peak Flow**

Design Peak Flow Q<sub>o</sub> = **0.3** cfs  
 Water Depth d = **0.27** feet

	Minor Storm	Major Storm	
Q <sub>o</sub> =	0.3	5.3	cfs
d =	0.27	0.70	feet

**Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'**  
**Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'**

**Inlet Design Information (Input)**

Type of Inlet: CDOT Type C Inlet Type = CDOT Type C

Angle of Inclined Grate (must be <= 30 degrees) θ = **0.00** degrees  
 Width of Grate W = **3.00** feet  
 Length of Grate L = **3.00** feet  
 Open Area Ratio A<sub>RATIO</sub> = **0.70**  
 Height of Inclined Grate H<sub>B</sub> = **0.00** feet  
 Clogging Factor C<sub>f</sub> = **0.50**  
 Grate Discharge Coefficient C<sub>d</sub> = **0.96**  
 Orifice Coefficient C<sub>o</sub> = **0.64**  
 Weir Coefficient C<sub>w</sub> = **2.05**

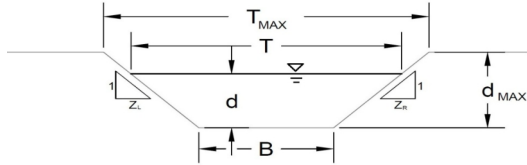
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression) d = **0.27** MINOR **0.70** MAJOR

**Total Inlet Interception Capacity (assumes clogged condition)**

	MINOR	MAJOR	
Q <sub>a</sub> =	2.6	10.7	cfs
Bypassed Flow, Q <sub>b</sub> =	0.0	0.0	cfs
Capture Percentage = Q <sub>a</sub> /Q <sub>o</sub> = C%	100	100	%

**AREA INLET IN A SWALE**

Parker MOB III  
Inlet B-10



This worksheet uses the NRCS vegetative retardance method to determine Manning's n.  
For more information see Section 7.2.3 of the USDCM.

**Analysis of Trapezoidal Grass-Lined Channel Using SCS Method**

NRCS Vegetal Retardance (A, B, C, D, or E)  
Manning's n (Leave cell D16 blank to manually enter an n value)  
Channel Invert Slope  
Bottom Width  
Left Side Slope  
Right Side Slope  
Check one of the following soil types:

Soil Type:	Max. Velocity (V <sub>MAX</sub> )	Max Froude No. (F <sub>MAX</sub> )
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

A, B, C, D or E: **C**  
n = see details below  
S<sub>0</sub> = 0.0060 ft/ft  
B = 3.00 ft  
Z1 = 4.00 ft/ft  
Z2 = 4.00 ft/ft

Choose One:

Non-Cohesive  
 Cohesive  
 Paved

Max. Allowable Top Width of Channel for Minor & Major Storm  
Max. Allowable Water Depth in Channel for Minor & Major Storm

	Minor Storm	Major Storm	
T <sub>MAX</sub> =	5.00	15.00	feet
d <sub>MAX</sub> =	1.00	2.00	feet

**Allowable Channel Capacity Based On Channel Geometry**

MINOR STORM Allowable Capacity is based on Top Width Criterion  
MAJOR STORM Allowable Capacity is based on Top Width Criterion

	Minor Storm	Major Storm	
Q <sub>allow</sub> =	0.1	19.2	cfs
d <sub>allow</sub> =	0.25	1.50	ft

**Water Depth in Channel Based On Design Peak Flow**

Design Peak Flow  
Water Depth

Q <sub>o</sub> =	0.1	1.1	cfs
d =	0.20	0.89	feet

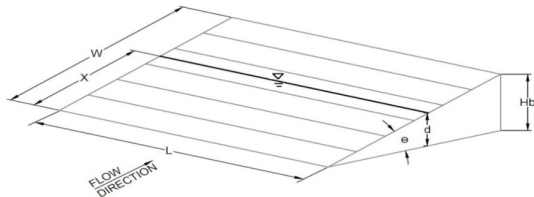
Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'  
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

**Inlet Design Information (Input)**

Type of Inlet: **CDOT Type C (Depressed)**

Inlet Type = **CDOT Type C (Depressed)**

Angle of Inclined Grate (must be <= 30 degrees)  
Width of Grate  
Length of Grate  
Open Area Ratio  
Height of Inclined Grate  
Clogging Factor  
Grate Discharge Coefficient  
Orifice Coefficient  
Weir Coefficient



θ = 0.00 degrees  
W = 3.00 feet  
L = 3.00 feet  
A<sub>RATIO</sub> = 0.70  
H<sub>B</sub> = 0.00 feet  
C<sub>f</sub> = 0.50  
C<sub>g</sub> = 0.84  
C<sub>o</sub> = 0.56  
C<sub>w</sub> = 1.81

Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)

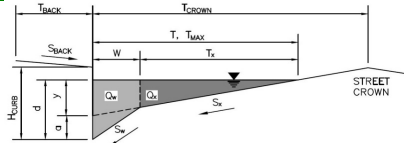
**Total Inlet Interception Capacity (assumes clogged condition)**

	MINOR	MAJOR	
d =	1.20	1.89	
Q <sub>a</sub> =	15.6	19.5	cfs
Bypassed Flow, Q <sub>b</sub> =	0.0	0.0	cfs
Capture Percentage = Q <sub>a</sub> /Q <sub>o</sub> = C%	100	100	%

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Parker MOB III**  
 Inlet ID: **Inlet B-20**



**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb  
 Side Slope Behind Curb (leave blank for no conveyance credit behind curb)  
 Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

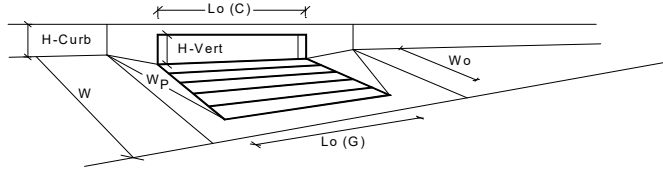
Height of Curb at Gutter Flow Line  
 Distance from Curb Face to Street Crown  
 Gutter Width  
 Street Transverse Slope  
 Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)  
 Street Longitudinal Slope - Enter 0 for sump condition  
 Manning's Roughness for Street Section (typically between 0.012 and 0.020)

Max. Allowable Spread for Minor & Major Storm  
 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm  
 Check boxes are not applicable in SUMP conditions

**MINOR STORM Allowable Capacity is based on Depth Criterion**  
**MAJOR STORM Allowable Capacity is based on Depth Criterion**

$T_{BACK}$	10.0	ft	
$S_{BACK}$	0.010	ft/ft	
$n_{BACK}$	0.013		
$H_{CURB}$	6.00	inches	
$T_{CROWN}$	18.0	ft	
$W$	1.00	ft	
$S_x$	0.033	ft/ft	
$S_w$	0.083	ft/ft	
$S_o$	0.000	ft/ft	
$n_{STREET}$	0.013		
$T_{MAX}$	12.0	18.0	ft
$d_{MAX}$	6.0	9.0	inches
	<input type="checkbox"/>	<input type="checkbox"/>	
$Q_{allow}$	SUMP	SUMP	cfs

**INLET IN A SUMP OR SAG LOCATION**



**Design Information (Input)** CDOT Type R Curb Opening

Type of Inlet  
 Local Depression (additional to continuous gutter depression 'a' from above)  
 Number of Unit Inlets (Grate or Curb Opening)  
 Water Depth at Flowline (outside of local depression)

**Grate Information**

Length of a Unit Grate  
 Width of a Unit Grate  
 Area Opening Ratio for a Grate (typical values 0.15-0.90)  
 Clogging Factor for a Single Grate (typical value 0.50 - 0.70)  
 Grate Weir Coefficient (typical value 2.15 - 3.60)  
 Grate Orifice Coefficient (typical value 0.60 - 0.80)

**Curb Opening Information**

Length of a Unit Curb Opening  
 Height of Vertical Curb Opening in Inches  
 Height of Curb Orifice Throat in Inches  
 Angle of Throat (see USDCM Figure ST-5)  
 Side Width for Depression Pan (typically the gutter width of 2 feet)  
 Clogging Factor for a Single Curb Opening (typical value 0.10)  
 Curb Opening Weir Coefficient (typical value 2.3-3.7)  
 Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)

**Low Head Performance Reduction (Calculated)**

Depth for Grate Midwidth  
 Depth for Curb Opening Weir Equation  
 Combination Inlet Performance Reduction Factor for Long Inlets  
 Curb Opening Performance Reduction Factor for Long Inlets  
 Grated Inlet Performance Reduction Factor for Long Inlets

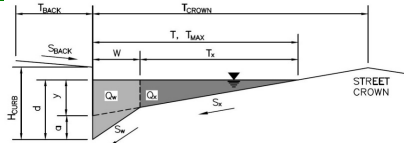
**Total Inlet Interception Capacity (assumes clogged condition)**  
**Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)**

	MINOR	MAJOR	
Type	CDOT Type R Curb Opening		
$a_{local}$	3.00	3.00	inches
No	1	1	
Ponding Depth	5.4	7.7	inches
	<input type="checkbox"/>	<input type="checkbox"/>	Override Depths
$L_o (G)$	N/A	N/A	feet
$W_o$	N/A	N/A	feet
$A_{ratio}$	N/A	N/A	
$C_r (G)$	N/A	N/A	
$C_w (G)$	N/A	N/A	
$C_o (G)$	N/A	N/A	
	MINOR	MAJOR	
$L_o (C)$	5.00	5.00	feet
$H_{vert}$	6.00	6.00	inches
$H_{throat}$	6.00	6.00	inches
Theta	63.40	63.40	degrees
$W_p$	1.00	1.00	feet
$C_r (C)$	0.10	0.10	
$C_w (C)$	3.60	3.60	
$C_o (C)$	0.67	0.67	
	MINOR	MAJOR	
$d_{Grate}$	N/A	N/A	ft
$d_{Curb}$	0.36	0.56	ft
$RF_{Combination}$	0.69	0.99	
$RF_{Curb}$	1.00	1.00	
$RF_{Grate}$	N/A	N/A	
	MINOR	MAJOR	
$Q_a$	4.8	8.9	cfs
$Q_{PEAK REQUIRED}$	1.4	3.6	cfs

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Parker MOB III**  
 Inlet ID: **Inlet B-60**



**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb:  $T_{BACK} = 15.0$  ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb):  $S_{BACK} = 0.020$  ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020):  $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line:  $H_{CURB} = 6.00$  inches

Distance from Curb Face to Street Crown:  $T_{CROWN} = 50.0$  ft

Gutter Width:  $W = 1.00$  ft

Street Transverse Slope:  $S_x = 0.034$  ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft):  $S_w = 0.083$  ft/ft

Street Longitudinal Slope - Enter 0 for sump condition:  $S_o = 0.000$  ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020):  $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm:  $T_{MAX} = 12.0$  (Minor Storm) /  $24.0$  (Major Storm) ft

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm:  $d_{MAX} = 6.0$  (Minor Storm) /  $9.0$  (Major Storm) inches

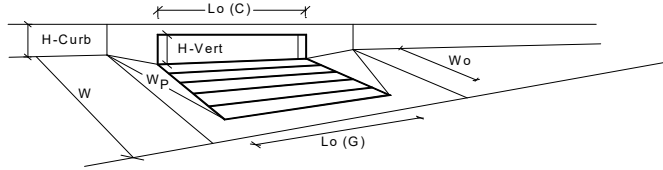
Check boxes are not applicable in SUMP conditions:

**MINOR STORM Allowable Capacity is based on Depth Criterion**

**MAJOR STORM Allowable Capacity is based on Depth Criterion**

$Q_{allow} =$  **SUMP** (Minor Storm) / **SUMP** (Major Storm) cfs

**INLET IN A SUMP OR SAG LOCATION**



**Design Information (Input)** | **CDOT Type R Curb Opening**

Type of Inlet: **CDOT Type R Curb Opening**

Local Depression (additional to continuous gutter depression 'a' from above):  $a_{local} = 3.00$  inches

Number of Unit Inlets (Grate or Curb Opening):  $N_o = 1$

Water Depth at Flowline (outside of local depression): **Ponding Depth** =  $5.5$  (MINOR) /  $9.0$  (MAJOR) inches

**Grate Information**

Length of a Unit Grate:  $L_o (G) = N/A$  feet

Width of a Unit Grate:  $W_o = N/A$  feet

Area Opening Ratio for a Grate (typical values 0.15-0.90):  $A_{ratio} = N/A$

Clogging Factor for a Single Grate (typical value 0.50 - 0.70):  $C_r (G) = N/A$

Grate Weir Coefficient (typical value 2.15 - 3.60):  $C_w (G) = N/A$

Grate Orifice Coefficient (typical value 0.60 - 0.80):  $C_o (G) = N/A$

**Curb Opening Information**

Length of a Unit Curb Opening:  $L_o (C) = 5.00$  feet

Height of Vertical Curb Opening in Inches:  $H_{vert} = 6.00$  inches

Height of Curb Orifice Throat in Inches:  $H_{throat} = 6.00$  inches

Angle of Throat (see USDCM Figure ST-5):  $\theta = 63.40$  degrees

Side Width for Depression Pan (typically the gutter width of 2 feet):  $W_o = 1.00$  feet

Clogging Factor for a Single Curb Opening (typical value 0.10):  $C_r (C) = 0.10$

Curb Opening Weir Coefficient (typical value 2.3-3.7):  $C_w (C) = 3.60$

Curb Opening Orifice Coefficient (typical value 0.60 - 0.70):  $C_o (C) = 0.67$

**Low Head Performance Reduction (Calculated)**

Depth for Grate Midwidth:  $d_{Grate} = N/A$  ft

Depth for Curb Opening Weir Equation:  $d_{Curb} = 0.37$  ft

Combination Inlet Performance Reduction Factor for Long Inlets:  $RF_{Combination} = 0.70$

Curb Opening Performance Reduction Factor for Long Inlets:  $RF_{Curb} = 1.00$

Grated Inlet Performance Reduction Factor for Long Inlets:  $RF_{Grate} = N/A$

**Total Inlet Interception Capacity (assumes clogged condition)**

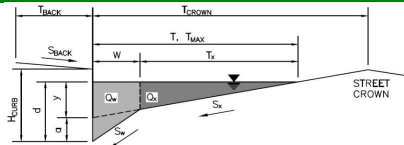
**Inlet Capacity IS GOOD for Minor and Major Storms (>Q PEAK)**

$Q_a = 5.0$  (MINOR) /  $10.5$  (MAJOR) cfs

$Q_{PEAK REQUIRED} = 0.9$  (MINOR) /  $2.0$  (MAJOR) cfs

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**  
 (Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Parker MOB III**  
 Inlet ID: **Inlet B-70**



**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb  
 Side Slope Behind Curb (leave blank for no conveyance credit behind curb)  
 Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

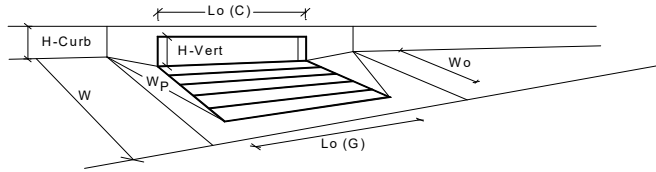
Height of Curb at Gutter Flow Line  
 Distance from Curb Face to Street Crown  
 Gutter Width  
 Street Transverse Slope  
 Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)  
 Street Longitudinal Slope - Enter 0 for sump condition  
 Manning's Roughness for Street Section (typically between 0.012 and 0.020)

Max. Allowable Spread for Minor & Major Storm  
 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm  
 Check boxes are not applicable in SUMP conditions

**MINOR STORM Allowable Capacity is based on Depth Criterion**  
**MAJOR STORM Allowable Capacity is based on Depth Criterion**

$T_{BACK}$	15.0	ft
$S_{BACK}$	0.020	ft/ft
$n_{BACK}$	0.013	
$H_{CURB}$	6.00	inches
$T_{CROWN}$	50.0	ft
$W$	1.00	ft
$S_s$	0.045	ft/ft
$S_w$	0.083	ft/ft
$S_o$	0.000	ft/ft
$n_{STREET}$	0.013	
$T_{MAX}$	12.0	ft
$d_{MAX}$	6.0	inches
	<input type="checkbox"/>	
	<input type="checkbox"/>	
$Q_{allow}$	SUMP	SUMP
		cfs

**INLET IN A SUMP OR SAG LOCATION**



**Design Information (Input)** CDOT Type R Curb Opening

Type of Inlet  
 Local Depression (additional to continuous gutter depression 'a' from above)  
 Number of Unit Inlets (Grate or Curb Opening)  
 Water Depth at Flowline (outside of local depression)

**Grate Information**

Length of a Unit Grate  
 Width of a Unit Grate  
 Area Opening Ratio for a Grate (typical values 0.15-0.90)  
 Clogging Factor for a Single Grate (typical value 0.50 - 0.70)  
 Grate Weir Coefficient (typical value 2.15 - 3.60)  
 Grate Orifice Coefficient (typical value 0.60 - 0.80)

**Curb Opening Information**

Length of a Unit Curb Opening  
 Height of Vertical Curb Opening in Inches  
 Height of Curb Orifice Throat in Inches  
 Angle of Throat (see USDCM Figure ST-5)  
 Side Width for Depression Pan (typically the gutter width of 2 feet)  
 Clogging Factor for a Single Curb Opening (typical value 0.10)  
 Curb Opening Weir Coefficient (typical value 2.3-3.7)  
 Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)

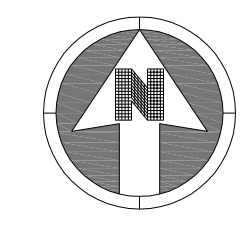
**Low Head Performance Reduction (Calculated)**

Depth for Grate Midwidth  
 Depth for Curb Opening Weir Equation  
 Combination Inlet Performance Reduction Factor for Long Inlets  
 Curb Opening Performance Reduction Factor for Long Inlets  
 Grated Inlet Performance Reduction Factor for Long Inlets

**Total Inlet Interception Capacity (assumes clogged condition)**  
**Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)**

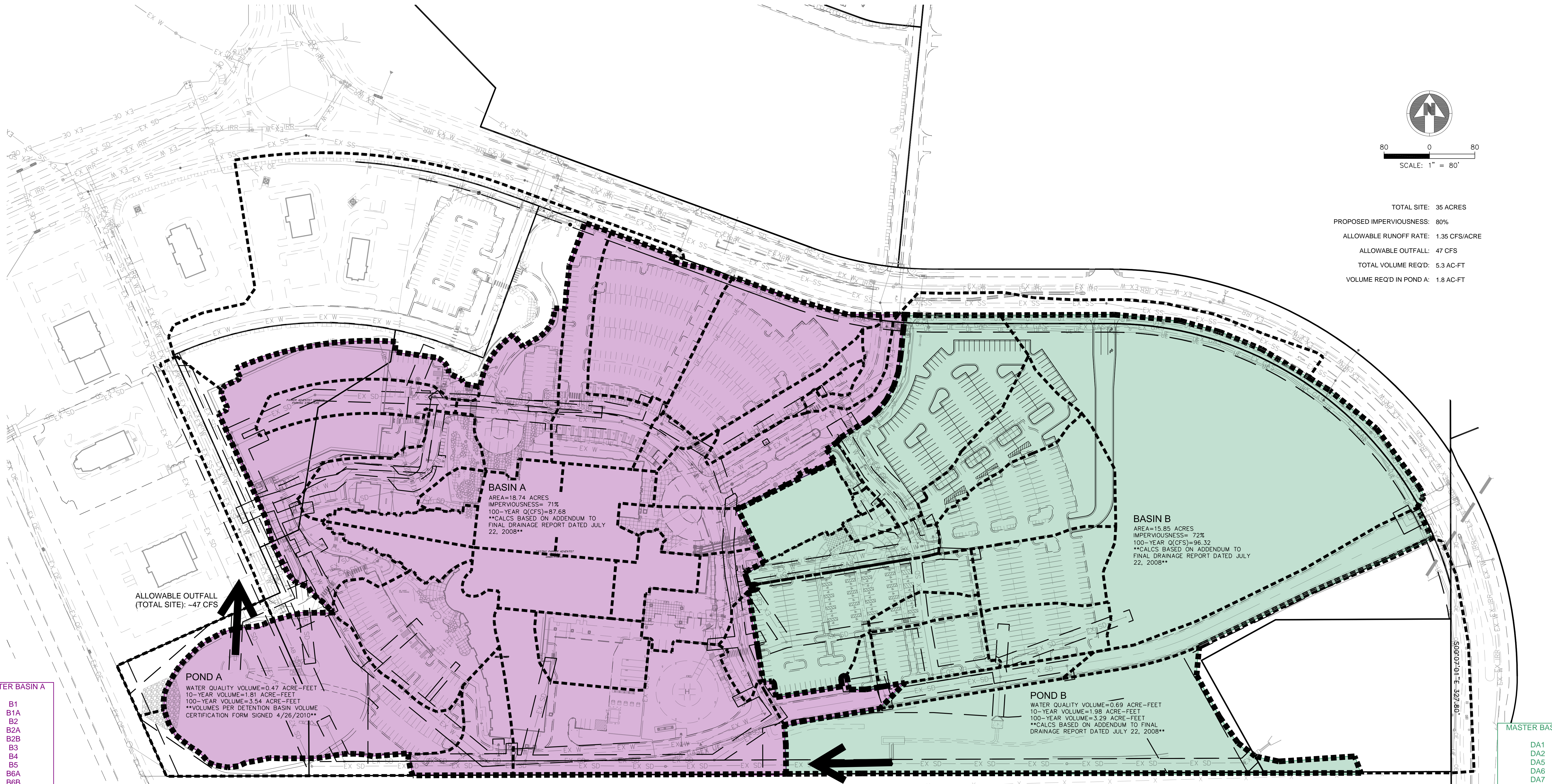
	MINOR	MAJOR	
Type	CDOT Type R Curb Opening		
$a_{local}$	3.00	3.00	inches
$N_o$	1	1	
Ponding Depth	6.0	9.0	inches
	<input type="checkbox"/>	<input type="checkbox"/>	Override Depths
$L_o(G)$	N/A	N/A	feet
$W_o$	N/A	N/A	feet
$A_{ratio}$	N/A	N/A	
$C_r(G)$	N/A	N/A	
$C_w(G)$	N/A	N/A	
$C_o(G)$	N/A	N/A	
	MINOR	MAJOR	
$L_o(C)$	5.00	5.00	feet
$H_{vert}$	6.00	6.00	inches
$H_{throat}$	6.00	6.00	inches
Theta	63.40	63.40	degrees
$W_p$	1.00	1.00	feet
$C_r(C)$	0.10	0.10	
$C_w(C)$	3.60	3.60	
$C_o(C)$	0.67	0.67	
	MINOR	MAJOR	
$d_{Grate}$	N/A	N/A	ft
$d_{Curb}$	0.42	0.67	ft
$RF_{Combination}$	0.77	1.00	
$RF_{Curb}$	1.00	1.00	
$RF_{Grate}$	N/A	N/A	
	MINOR	MAJOR	
$Q_a$	5.9	10.5	cfs
$Q_{PEAK REQUIRED}$	0.6	1.4	cfs

**MAPS**



80 0 80  
SCALE: 1" = 80'

TOTAL SITE: 35 ACRES  
PROPOSED IMPERVIOUSNESS: 80%  
ALLOWABLE RUNOFF RATE: 1.35 CFS/ACRE  
ALLOWABLE OUTFALL: 47 CFS  
TOTAL VOLUME REQ'D: 5.3 AC-FT  
VOLUME REQ'D IN POND A: 1.8 AC-FT



**BASIN A**  
AREA=18.74 ACRES  
IMPERVIOUSNESS= 71%  
100-YEAR Q(CFS)=87.68  
\*\*CALCS BASED ON ADDENDUM TO  
FINAL DRAINAGE REPORT DATED JULY  
22, 2008\*\*

**BASIN B**  
AREA=15.85 ACRES  
IMPERVIOUSNESS= 72%  
100-YEAR Q(CFS)=96.32  
\*\*CALCS BASED ON ADDENDUM TO  
FINAL DRAINAGE REPORT DATED JULY  
22, 2008\*\*

ALLOWABLE OUTFALL  
(TOTAL SITE): ~47 CFS

**POND A**  
WATER QUALITY VOLUME=0.47 ACRE- FEET  
10-YEAR VOLUME=1.81 ACRE- FEET  
100-YEAR VOLUME=3.54 ACRE- FEET  
\*\*VOLUMES PER DETENTION BASIN VOLUME  
CERTIFICATION FORM SIGNED 4/26/2010\*\*

**POND B**  
WATER QUALITY VOLUME=0.69 ACRE- FEET  
10-YEAR VOLUME=1.98 ACRE- FEET  
100-YEAR VOLUME=3.29 ACRE- FEET  
\*\*CALCS BASED ON ADDENDUM TO FINAL  
DRAINAGE REPORT DATED JULY 22, 2008\*\*

POND B OUTFALL

MASTER BASIN A

- B1
- B1A
- B2
- B2A
- B2B
- B3
- B4
- B5
- B6A
- B6B
- B6C
- B6D
- B8
- C1A
- C1B
- C1D
- C2
- C3
- C5
- C7
- C8
- C9
- D1
- D2
- D3
- D4
- D5
- D6
- D7

MASTER BASIN B

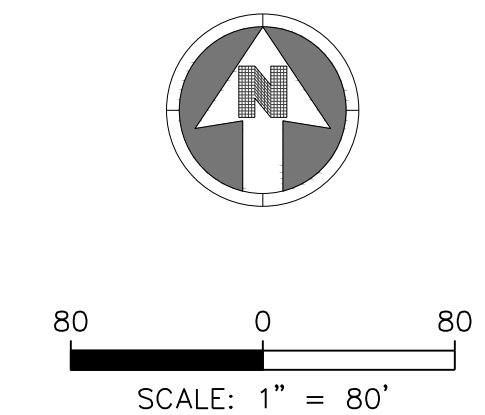
- DA1
- DA2
- DA5
- DA6
- DA7
- DA8
- DA9
- DA10
- DA11
- DA12
- DA13
- DA15
- DA16
- F1
- F3
- F4
- F5
- F6
- R1



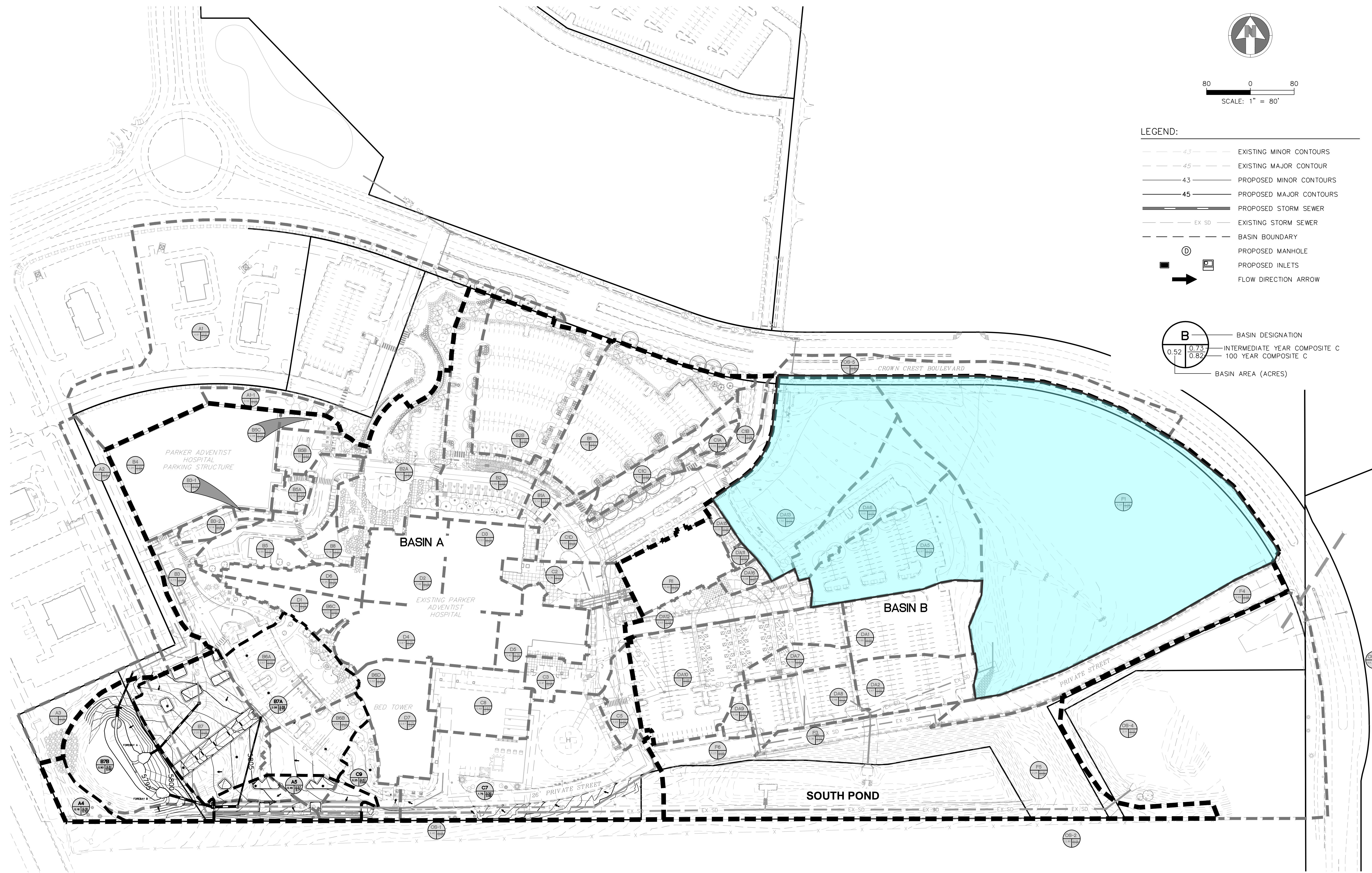
**S.A. MIRO INC.**  
CONSULTING ENGINEERS  
4582 South Ulster Street Pkwy.  
Suite 750 Denver, CO 80237  
ph. 303-741-3737  
fax 303-694-3134



Know what's **below.**  
Call before you dig.



- LEGEND:**
- 43--- EXISTING MINOR CONTOURS
  - 45--- EXISTING MAJOR CONTOUR
  - 43— PROPOSED MINOR CONTOURS
  - 45— PROPOSED MAJOR CONTOURS
  - — — EX SD — EXISTING STORM SEWER
  - — — BASIN BOUNDARY
  - ⊕ PROPOSED MANHOLE
  - PROPOSED INLETS
  - FLOW DIRECTION ARROW
- 
- B** — BASIN DESIGNATION
- |      |      |                               |
|------|------|-------------------------------|
| 0.52 | 0.73 | INTERMEDIATE YEAR COMPOSITE C |
|      | 0.82 | 100 YEAR COMPOSITE C          |
- BASIN AREA (ACRES)



DATE	DESCRIPTION

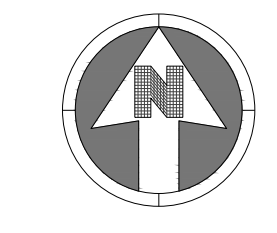
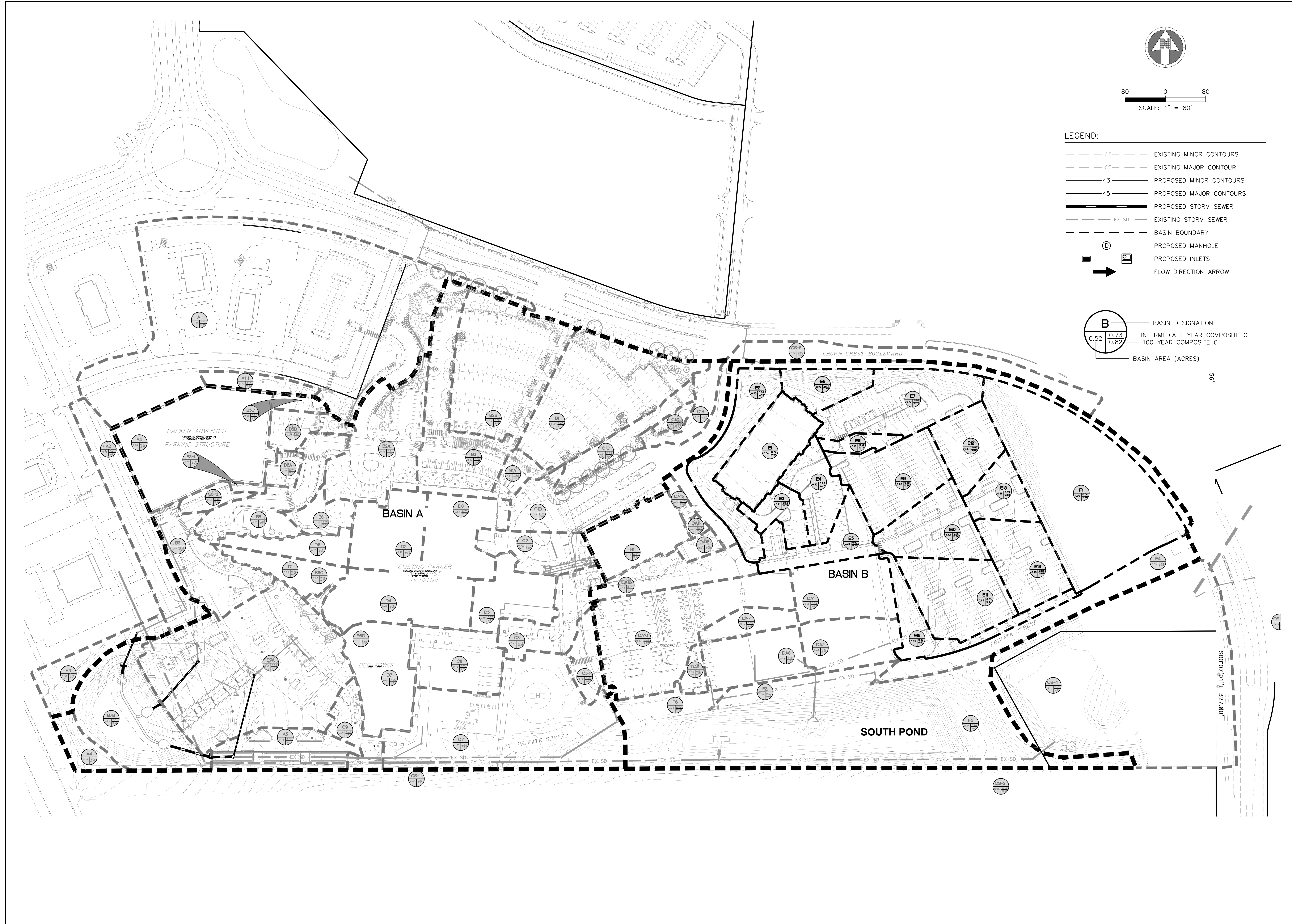
REV.	DESCRIPTION
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6	
7	
8	

**NOT FOR CONSTRUCTION**

CLIENT NAME:	PARKER ADVENTIST HOSPITAL
PROJECT NAME:	PARKER MOB III 9403 CROWN CREST BLVD.
DRAWING TITLE:	HISTORIC DRAINAGE MAP
DESIGNED BY:	DAT
DRAWN BY:	DAT
CHECKED BY:	MHV
DATE:	07/30/2018
MIRO JOB NUMBER:	18057
CLIENT JOB NUMBER:	

DRAWING NUMBER:  
**FIG. 3**

FILE PATH: J:\Jobs\15029 PKR Parking Lot Addition\04 Civil Design\Drainage\FIG.2 Overall Drainage Map.dwg - 24X36 - 8/8/2018



80 0 80  
SCALE: 1" = 80'

- LEGEND:**
- 43--- EXISTING MINOR CONTOURS
  - 45--- EXISTING MAJOR CONTOUR
  - 43— PROPOSED MINOR CONTOURS
  - 45— PROPOSED MAJOR CONTOURS
  - — — EX SD — EXISTING STORM SEWER
  - — — BASIN BOUNDARY
  - ⊕ PROPOSED MANHOLE
  - ⊕ PROPOSED INLETS
  - FLOW DIRECTION ARROW

B	0.52	BASIN DESIGNATION
	0.73	INTERMEDIATE YEAR COMPOSITE C
	0.82	100 YEAR COMPOSITE C
— BASIN AREA (ACRES)		



DATE	DESCRIPTION

REV. 1	
REV. 2	
REV. 3	
REV. 4	
REV. 5	
REV. 6	
REV. 7	
REV. 8	

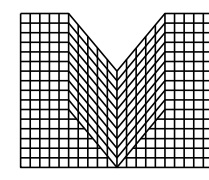
CLIENT NAME: **PARKER ADVENTIST HOSPITAL**  
PROJECT NAME: **PARKER MOB III**  
DRAWING TITLE: **9403 CROWN CREST BLVD. OVERALL DRAINAGE MAP**

FILE PATH: J:\Jobs\18057 Parker MOB III\04 Civil Design\Drainage\Fig.2 Overall Drainage Map.dwg FIG. 2 - 8/6/2018

**NOT FOR CONSTRUCTION**

DESIGNED BY:	DAT
DRAWN BY:	DAT
CHECKED BY:	MHV
DATE:	07/30/2018
MIRO JOB NUMBER	18057
CLIENT JOB NUMBER	

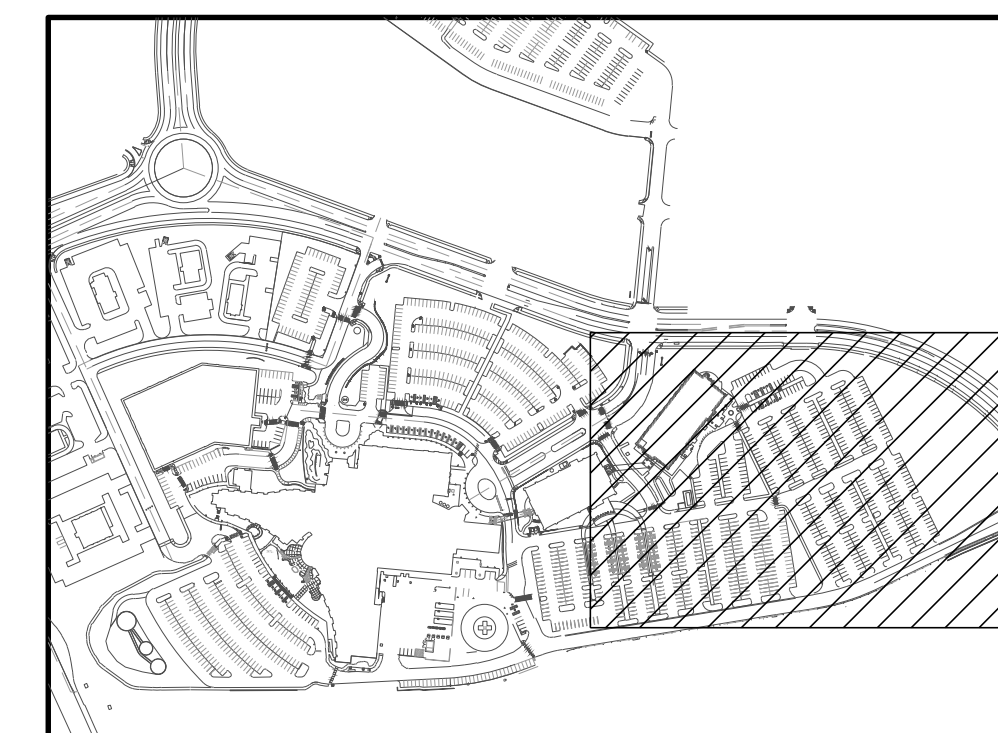
DRAWING NUMBER:  
**FIG. 2**



**S.A. MIRO INC.**  
CONSULTING ENGINEERS  
4582 South Ulster Street Plwy.  
Suite 750 Denver, CO 80237  
ph. 303-741-3737  
fax 303-694-3134

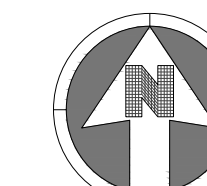


Know what's below.  
Call before you dig.



**KEY MAP**

NOT TO SCALE



40 0 40

SCALE: 1" = 40'

**NOTES:**

- SEE SHEET C-001 FOR CIVIL NOTES AND LEGEND.

**LEGEND:**

- - - - - 43 - - - - - EXISTING MINOR CONTOURS
- - - - - 45 - - - - - EXISTING MAJOR CONTOUR
- - - - - 43 - - - - - PROPOSED MINOR CONTOURS
- - - - - 45 - - - - - PROPOSED MAJOR CONTOURS
- - - - - PROPOSED STORM SEWER
- - - - - EX SD - - - - - EXISTING STORM SEWER
- - - - - BASIN BOUNDARY
- ⊙ PROPOSED MANHOLE
- PROPOSED INLETS
- FLOW DIRECTION ARROW
- △ XX DESIGN POINT DESIGNATION
- ⊙ B BASIN DESIGNATION
- ⊙ 0.52 0.73 0.82 INTERMEDIATE YEAR COMPOSITE C  
100 YEAR COMPOSITE C
- ⊙ BASIN AREA (ACRES)

**RUNOFF SUMMARY**

DESIGN POINT	TRIBUTARY BASINS	TRIBUTARY AREA (ac.)	DIRECT RUNOFF		TOTAL RUNOFF	
			Q-5 (cfs)	Q-100 (cfs)	Q-5 (cfs)	Q-100 PEAK(cfs)
1	E1, E2, DA11, DA15, DA16	1.07	-	-	1.71	5.25
2	E6, E7	0.99	1.39	3.56	1.44	4.45
3	E6, E7, E8	1.09	0.27	0.63	1.66	4.94
4	E6-E8, E4	1.42	0.86	1.96	2.36	6.52
5	E6-E8, E3, E4	1.63	0.63	1.44	2.82	7.57
6	E6-E8, E3, E4, DA1	2.01	1.69	3.91	4.24	10.87
7	E3-E8, DA1	2.67	0.97	2.24	5.05	12.73
8	E1-E8, DA1, DA11, DA15, DA16	3.74	-	-	6.68	17.80
9	F1, E12, E13	2.55	0.98	2.05	1.90	8.54
10	E14	0.49	1.90	3.74	1.90	3.74
11	F1, E12-E14	3.04	-	-	3.13	10.95
12	F1, E11-E14	3.67	2.46	4.83	4.69	13.98
13	E9, E10	1.13	2.24	3.44	3.91	7.94
14	F1, E9-E14	4.80	-	-	7.34	19.34
15	DP8, DP14	8.54	-	-	22.06	53.50

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TOWN OF PARKER, DIRECTOR OF ENGINEERING

DATE

REV.	DESCRIPTION
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CLIENT NAME: **PARKER ADVENTIST HOSPITAL**  
PROJECT NAME: **PARKER MOB III**  
DRAWING TITLE: **9403 CROWN CREST BLVD. DRAINAGE MAP**

FILE PATH: J:\Jobs\18057 Parker MOB III\04 Civil Design\Drainage\Drainage Plan Fig-01.dwg Fig-1.0 - 10/17/2018

**NOT FOR CONSTRUCTION**

DESIGNED BY: DAT  
DRAWN BY: DAT  
CHECKED BY: MHV  
DATE: 10/15/2018  
MIRO JOB NUMBER: 18057  
CLIENT JOB NUMBER:

DRAWING NUMBER:  
**FIG. 1**

