ARCHITECTURE	CIVIL ENGINEERING
PLANNING	BRANDING
INTERIORS	BUILDING MEASUREMENT

December 9, 2022

Town of Castle Rock 100 N. Wilcox Street Castle Rock, CO 80104 Attn: Kevin Buffington

Re: Drainage Conformance Letter Meadows Filing No. 19, Lot 2 North Parcel D2A, Senior Housing – SDP22-0032

Dear Mr. Buffington:

This letter has been prepared in lieu of a formal drainage report as the Meadows Filing No. 19, Lot 2 North Parcel D2A, Senior Housing (site) is part of the Master Drainage study Phase III Drainage Report for The Meadows Filing No. 19 Lot 2 North (CD21-0042), prepared by Terracina Design, LLC, dated February 2022. The site project is located north of Timber Mill Pkwy and south of East Plum Creek. The site is in a portion of Section 28, Township 7 South, Range 67 West of the 6th Principal Meridian, Castle Rock, Colorado. The object of this letter is to demonstrate that the proposed development within Lot 2 North parcel D2A complies with Master Drainage study CD21-0042. We acknowledge that the Town of Castle Rock's review of this letter is only for general conformance with submittal requirements, current design criteria, and standard engineering principles and practices.

Description of Property

The proposed development includes construction of a new 200-unit affordable senior housing multifamily with associated parking lots and landscaping on an undeveloped 5.5 +/- acre site. The proposed site plan will result in a weighted imperviousness of 68%.

The site has been classified by the Natural Resources Conservation Service (NRCS) as 37.6% Bresser sandy loam (hydrologic group B), 29.2% Newlin gravelly sandy loam (hydrologic group B), 7.6% Sampson loam (hydrologic group B), and 25.6% Sandy wet alluvial land (hydrologic group D). Vegetation is light, with most of the site consisting of sparse grass cover. The NRCS web soil survey has been included in the appendix of this letter.

According to the Flood Insurance Rate Map Number 08035C0167G, dated March 16, 2016, the project site is located within zone X which is of minimal flood hazard. The FIRM Map has been included in the appendix of this letter for reference.

Master Study

According to the Master Drainage study CD21-0042, Pond A was designed for 33.4 acres which includes the 5.467 acres of the site. Pond A was designed as a Full-spectrum detention facility that includes an additional 0.5 times the 100-year detention volume as water quality capture volume. As Pond A will provide water quality and detention to the site, no on-site water quality/detention facility is required. The improvements are anticipating having no impacts on downstream conditions. The site is part of CD21-0042 Basins A6 and A7. These basins were analyzed for the design of Pond A to be 90% imperviousness and with a total runoff of 51.23 cfs and 45.76 cfs respectively.

Stormwater Quality Design Process

The four steps process of section 14.1.1 of the Town of Castle Rock Storm Drainage Design and Technical Criteria Manual (SDDTC), was considered for the design of the site.

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Roof drains are disconnected and daylighting into the area around the building that includes different types of surfaces to allow infiltration before the runoff reaches the proposed storm network. In addition, as mentioned above, water capture volume and detention are being provided for the site within Pond A designed by Terracina Design, Phase III Drainage Report for The Meadows Filing No. 19 Lot 2 North (CD21-0042), dated February 2022. Also, during construction, various best management practices will be put in place to prevent sedimentation and any potential contamination within adjacent roadways, properties, and existing storm systems and natural channels.

Maintenance

The owner, successors, and heirs are responsible for all on-site private drainage facilities. Inlets should be checked routinely and cleared of debris, as necessary.

Hydrologic Criteria

In accordance with the Town of Castle Rock Storm Drainage Design and Technical Criteria Manual (SDDTC), the minor storm for the proposed development type is evaluated as the 5-year storm, and the major storm is evaluated as the 100-year storm. For this letter, the site was divided in several sub-basins which encompasses the site plus part of the proposed joint access on the east site of the site for a total of approximately 5.61 (+/-) acres with a proposed weighted imperviousness of 70%.

The design storms were found using the SDDTC Table 6-1 and have been evaluated with 1-hour point rainfall depths of 1.43 inches for the 5-year storm and 2.60 inches for the 100-year storm. These 1-hour point rainfall depths were used to determine rainfall intensity for hydrologic calculations.

The peak discharge for the storm sewer analysis was calculated using the following Rational Method formula:

Q = C i A

Where:

Q = peak discharge (cfs) C = runoff coefficient from UDFCD manual i = rainfall intensity (inches/hour) A = drainage area (acres)

Runoff coefficients, or "C" values, have been calculated for the site in accordance with Mile Hight Flood District, UDFCD manual. Refer to Appendix A for the weighted "C" values used in the calculations. Using the Rational Method, the total peak rate of runoff was found to be 30.3 cfs for the major storm. As mentioned above, the master drainage study accounted for basin A6 and A7 to create 51.23 cfs and 45.76 cfs runoff, respectively. The master study also designed the storm sewer to be able to carry these mentioned flows. The proposed site is creating 30.3 cfs which is considerably less than what the master study anticipated. Therefore, the site is complying with the master drainage study, and the existing storm sewer can receive the runoff from the site to safely be conveyed to Pond A.

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Summary

The calculations included in this letter and the following appendices analyze the storm runoff from the proposed improvements in Meadows Filing No. 19, Lot 2 North Parcel D2A, Senior Housing to demonstrate that the imperviousness and runoff for the developed parcel complies with the Master Drainage study CD21-0042.

Basin ID	Area (acres)	Imperviousness (%)	Q ₅ (cfs)	Q100 (cfs)
A06	9.73	90	25.54	51.23
A07	7.59	90	22.81	45.76
Site	5.61	70	12.9	30.3

Should you have any questions or comments, please feel free to contact me at (303) 561-3333.

Sincerely,

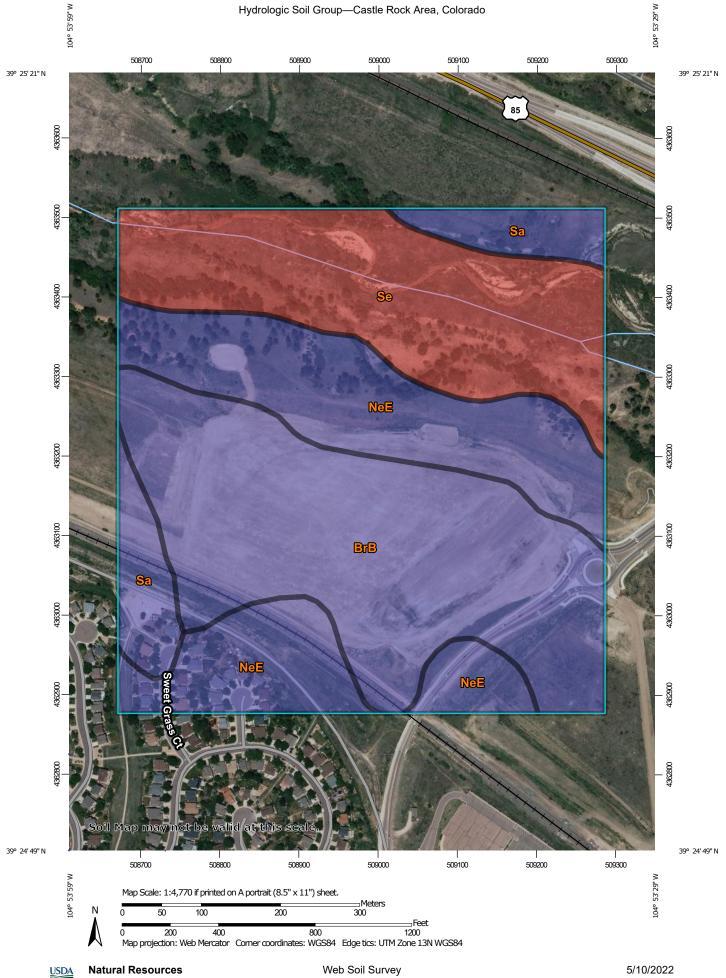
Ware Malcomb,

Ted Swan, PE Director of Civil Engineering

CC: Ileana Contreras <u>icontreras@waremalcomb.com</u> 303.689.1518

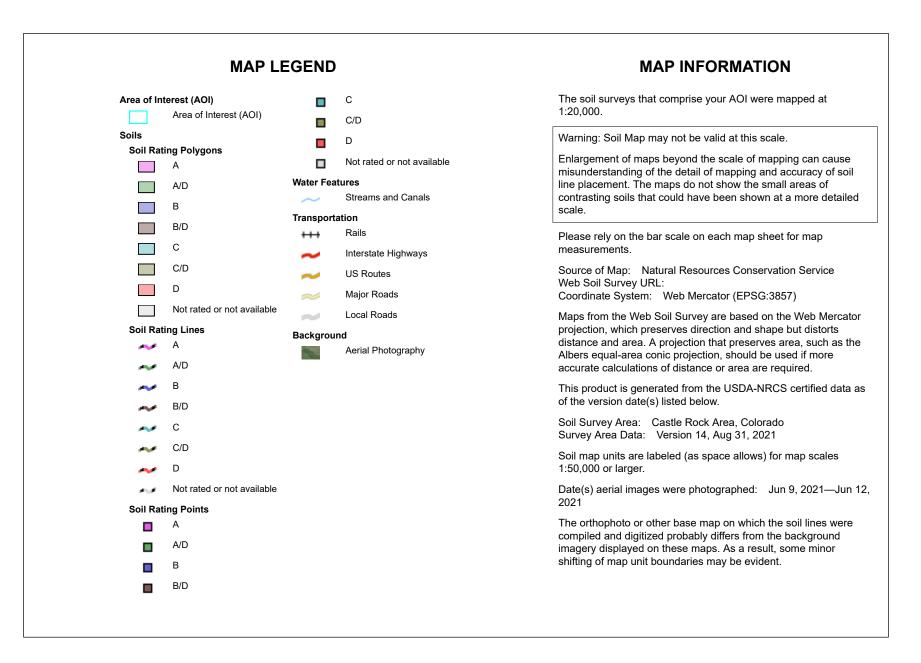
APPENDIX A:

SOIL CLASSIFICATION FEMA MAP



National Cooperative Soil Survey

Conservation Service



Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI		
BrB	Bresser sandy loam, cool, 1 to 3 percent slopes	В	36.4	37.6%		
NeE	Newlin gravelly sandy loam, 8 to 30 percent slopes	В	28.3	29.2%		
Sa	Sampson loam	В	7.4	7.6%		
Se	Sandy wet alluvial land	D	24.8	25.6%		
Totals for Area of Inter	est	96.9	100.0%			

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

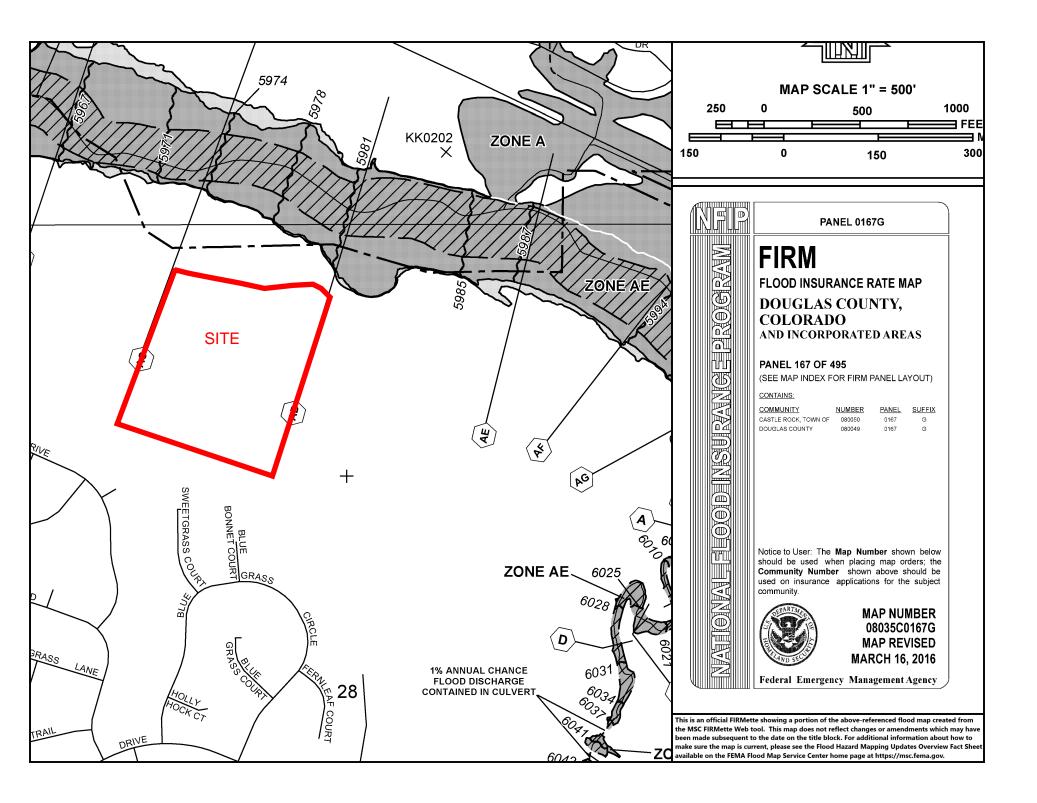
Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition Component Percent Cutoff: None Specified Tie-break Rule: Higher





APPENDIX B:

HYDROLOGY CALCULATIONS HYDRAULIC CALCULATIONS

PROJECT: The Meadows Lot 2N D2A JOB NO.: DCS22-4026 CALC. BY: ICA DATE: 8/30/2022 = FORMULA CELLS = USER INPUT CELLS

Project Location	
User Input	•

	P ₁ : 1-hour Rair	nfall Depths (inches)
	Minor Storm	Major Storm
Τ _d	5-Year	100-Year 🗸
Minutes	1.43	2.60
5	4.85	8.82
10	3.87	7.03
20	2.81	5.11
30	2.24	4.08
40	1.88	3.42
50	1.63	2.97
60	1.45	2.63
120	0.89	1.62

IDF Rainfall Data

Equation 5-1 $I=(28.5*P_1)/(10+T_d)^{-0.786}$

I = rainfall intensity (inches per hour)

 P_1 = 1-hour point rainfall depth (inches)

T_d = storm duration (minutes)

Reference:

1) Urban Drainage and Flood Control District - Urban Storm Drainage Criteria Manual Volume 1, 2017

2) NOAA Atlas 14, Volume 8, Version 2

http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=co

PROJECT: The Meadows Lot 2N D2A JOB NO.: DCS22-4026 CALC. BY: ICA

DATE: 10/13/2022

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Impervious Percentages - from Urban Drainage Table 6-3

Roof	90%		Land Use 5	0%				
Paved	100%		Land Use 6	0%				
Drive and Walks	90%		Land Use 7	0%				
Lawns	2%		Land Use 8					
SOIL TYPE:	В	 (use equation from 	om Table 6-4)					

= FORMULA CELLS
= USER INPUT CELLS

PROPOSED COMPOSITE IMPERVIOUSNESS

		Weigh	nted Imp	ervious	and C V	/alues	Areas (ac)							
Basin	Area (ac)	Imp.	C ₂	C₅	C ₁₀	C ₁₀₀	Roof	Paved	Drive and Walks	Lawns	Land Use 5	Land Use 6	Land Use 7	Land Use 8
A0	0.841	60%	0.46	0.49	0.54	0.71	0.05	0.41	0.04	0.33				
A1	0.317	78%	0.62	0.65	0.68	0.79	0.08	0.15	0.02	0.06	 			
A2	0.282	83%	0.68	0.71	0.73	0.82	0.13	0.12	0.002	0.03				
A3	0.841	86%	0.71	0.73	0.76	0.83	0.18	0.53	0.04	0.09				
OS1	0.136	100%	0.84	0.86	0.87	0.90	0.00	0.14	0.00	0.00				
B1	0.106	47%	0.35	0.38	0.44	0.65	0.05	0.00	0.00	0.05	 			
B2	0.442	53%	0.40	0.43	0.48	0.67	0.20	0.00	0.05	0.19	¦ 			
В3	0.086	46%	0.33	0.37	0.43	0.64	0.04	0.00	0.00	0.04	ļ ļ ļ			
B4	0.830	89%	0.73	0.76	0.78	0.84	0.18	0.53	0.05	0.07	i 		 	
B5	0.460	42%	0.31	0.34	0.40	0.62	0.19	0.00	0.02	0.25	 			
B6	1.270	66%	0.52	0.55	0.59	0.74	0.18	0.60	0.08	0.41	 			
Total	5.611	70%	0.56	0.59	0.63	0.76	1.28	2.48	0.31	1.54	 			
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STANDARD FORM SF-2

TIME OF CONCENTRATION SUMMARY

	SUB-E	BASIN		INITIA	L/OVERL	AND		TRAVEL TIME t _c CHECK								FINAL	REMARKS
	DA				TIME (t _i)			(t _t) (URBANIZED BASINS)						t _c			
Basin	i	C ₅	AREA	LENGTH	SLOPE	ť	LENGTH		SLOPE	VEL.	t	COMP.	Lt	St	tc (Equation	n 6-5)	
			Ac	Ft	%	Min	Ft	Cv	%	FPS	Min	t _c	Ft	%	Min	Min	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	
A0	0.60	0.49	0.84	91	3.8	6.73	174	20	1.1	2.09	1.38	8.1	174	1.09	17.4	8.12	
A1	0.78	0.65	0.32	103	6.8	4.35	72	20	2.5	3.18	0.38	4.7	72	2.52	13.2	5.00	
A2	0.83	0.71	0.28	94	2.0	5.47	86	20	1.1	2.1	0.7	6.2	86	1.12	12.5	6.15	
A3	0.86	0.73	0.84	73	5.4	3.23	542	20	2.1	2.9	3.2	6.4	542	2.05	14.3	6.39	
OS1	1.00	0.86	0.14	43	5.9	1.58	304	20	3.8	3.9	1.3	2.9	304	3.75	10.1	5.00	
B1	0.47	0.38	0.11	56	2.0	7.70	68	15	2.0	2.1	0.5	8.2	68	2.01	18.5	8.24	
B2	0.53	0.43	0.44	95	2.0	9.39	41	15	2.9	2.6	0.3	9.7	41	2.93	17.3	9.65	
B3	0.46	0.37	0.09	40	2.0	6.69	14	15	3.1	2.6	0.1	6.8	14	3.06	18.4	6.78	
B4	0.89	0.76	0.83	72	3.2	3.57	375	20	2.0	2.8	2.2	5.8	375	2.03	12.9	5.76	
B5	0.42	0.34	0.46	32	2.0	6.22	33	15	2.0	2.1	0.3	6.5	33	2.00	19.1	6.48	
B6	0.66	0.55	1.27	160	3.3	8.51	90	20	1.4	2.4	0.6	9.1	90	1.40	15.5	9.15	

Equation 6-3 Equation 6-5

t_i=((0.395(1.1-C₅)SQRT(L))/(S_o^0.33)) t_c=(26-17i)+(L_t/(60(14i+9)SQRT(S_o)))

NRCS Conveyance Factor K Table - Cv Value											
Heavy Meadow	2.5										
Tillage/Field	5										
Short Pasture and Lawns	7										
Nearly Bare Ground	10										
Grassed Waterway	15										
Paved Areas and Shallow Paved Swales	20										

Calculated By: <u>ICA</u> Date: <u>10/13/2022</u> Checked By: <u>DFA</u> 5-Year 1-hour rainfall=

STANDARD FORM SF-3

Project: The Meadows Lot 2N D2A

Job No.: <u>DCS22-4026</u>

Design Storm: <u>5-Year</u>

STORM DRAINAGE SYSTEM DESIGN (RATIONAL METHOD PROCEDURE)

			D	IRECT	RUNO	FF			Т	OTAL	RUNOF	F	STR	EET		PIPE					
BASIN	DESIGN POINT	AREA DESIGN	AREA (AC)	RUNOFF COEFF	t _c (MIN)	C * A (AC)	I (IN/HR)	Q (CFS)	t _c (MIN)	S (C * A) (CA)	I (IN/HR)	Q (CFS)	SLOPE (%)	STREET FLOW	DESIGN FLOW (CFS)	SLOPE (%)	PIPE DIAM. (IN.)	LENGTH (FT)	VELOCITY (FPS)	t _t (MIN)	REMARKS
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
A0	0		0.84	0.49	8.1	0.42	4.18	1.7													
A1	1		0.32	0.65	5.0	0.21	4.85	1.0													
	2								8.1	0.6	4.18	2.6									
A2	3		0.28	0.71	6.2	0.20	4.58	0.9													
	4								8.1	0.8	4.18	3.4									
OS1	5		0.14	0.86	5.0	0.12	4.85	0.6													
A3	6		0.84	0.73	6.4	0.62	4.53	2.8	6.4	0.7	4.53	3.3									
	7								8.1	1.6	4.18	6.5									
	8								8.1	1.6	4.18	6.5									
B1	9		0.11	0.38	8.2	0.04	4.16	0.2													
B2	10		0.44	0.43	9.7	0.19	3.92	0.7													
B3	11		0.09	0.37	6.8	0.03	4.44	0.1	9.7	0.2	3.92	0.9									
	12								9.7	0.3	3.92	1.0									
B4	13		0.83	0.76	5.8	0.63	4.66	2.9													
	14								9.7	0.9	3.92	3.5									
B5	15		0.46	0.34	6.5	0.16	4.50	0.7													
	16								9.7	1.0	3.92	4.1									
B6	17		1.27	0.55	9.1	0.69	4.00	2.8	9.7	1.7	3.92	6.8									
	18								9.7	3.3	3.92	12.9									

Calculated By: <u>ICA</u> Date: <u>10/13/2022</u> Checked By: <u>DFA</u> 100-Year 1-hour rainfall= 2.60

STANDARD FORM SF-3

Project: The Meadows Lot 2N D2A

Job No.: DCS22-4026

Design Storm: 100-Year

STORM DRAINAGE SYSTEM DESIGN (RATIONAL METHOD PROCEDURE)

			D	IRECT	RUNO	FF			Т	OTAL	RUNOF	F	STR	EET		PIPE					
BASIN	DESIGN POINT	AREA DESIGN	AREA (AC)	RUNOFF COEFF	t _c (MIN)	C * A (AC)	I (IN/HR)	Q (CFS)	t _c (MIN)	S (C * A) (CA)	I (IN/HR)	Q (CFS)	(%) SLOPE	STREET FLOW	DESIGN FLOW (CFS)	SLOPE (%)	PIPE DIAM. (IN.)	LENGTH (FT)	VELOCITY (FPS)	t _t (MIN)	REMARKS
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
A0	0		0.84	0.71	8.1	0.60	7.60	4.5													
A1	1		0.32	0.79	5.0	0.25	8.82	2.2													
	2								8.1	0.8	7.60	6.4									
A2	3		0.28	0.82	6.2	0.23	8.32	1.9													
	4								8.1	1.1	7.60	8.2									
OS1	5		0.14	0.90	5.0	0.12	8.82	1.1													
A3	6		0.84	0.83	6.4	0.70	8.23	5.8	6.4	0.8	8.23	6.8									
	7								8.1	1.9	7.60	14.4									
	8								8.1	1.9	7.60	14.4									
B1	9		0.11	0.65	8.2	0.07	7.56	0.5													
B2	10		0.44	0.67	9.7	0.30	7.13	2.1													
B3	11		0.09	0.64	6.8	0.06	8.07	0.4	9.7	0.4	7.13	2.5									
	12								9.7	0.4	7.13	3.0									
B4	13		0.83	0.84	5.8	0.70	8.48	5.9													
	14								9.7	1.1	7.13	8.0									
B5	15		0.46	0.62	6.5	0.29	8.19	2.4													
	16								9.7	1.4	7.13	10.1									
B6	17		1.27	0.74	9.1	0.93	7.28	6.8	9.7	2.3	7.13	16.7									
	18								9.7	4.2	7.13	30.3									

PROJECT: The Meadows Lot 2N D2A JOB NO.: DCS22-4026 CALC. BY: ICA DATE: 10/13/2022

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RUNOFF SUMMARY								
	BASIN LABEL DESIGN		LOCAL	_ (CFS)	ACCUMUL	ATIVE (CFS)		
DAGIN LADEL	POINT	AREA	Q5	Q100	Q5	Q100		
A0	0	0.84	1.74	4.53				
A1	1	0.32	1.00	2.21				
	2				2.6	6.4		
A2	3	0.28	0.91	1.92				
	4				3.4	8.2		
OS1	5	0.14	0.57	1.07				
A3	6	0.84	2.79	5.76	3.3	6.8		
	7				6.5	14.4		
	8				6.5	14.4		
B1	9	0.11	0.17	0.52				
B2	10	0.44	0.74	2.13				
B3	11	0.09	0.14	0.44	0.9	2.5		
	12				1.0	3.0		
B4	13	0.83	2.93	5.94				
	14				3.5	8.0		
B5	15	0.46	0.70	2.35				
	16				4.1	10.1		
B6	17	1.27	2.78	6.81	6.8	16.7		
	18				12.9	30.3		

MHFD-Inlet, Version 5.01 (April 2021)

INLET MANAGEMENT

Worksheet Protected

INLET NAME	SD-INLET-A6.1 - DP1	<u>SD-INLET-A5.1 - DP3</u>	<u>SD-INLET-A3.1 - DP6</u>
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET
Hydraulic Condition	In Sump	In Sump	In Sump
Inlet Type	Denver No. 16 Combination	Denver No. 16 Combination	Denver No. 16 Combination

USER-DEFINED INPUT

User-Defined Design Flows			
Minor Q _{Known} (cfs)	1.0	0.9	3.3
Major Q _{Known} (cfs)	2.2	1.9	6.8

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, Q _b (cfs)	0.0	0.0	0.0
Major Bypass Flow Received, Q _b (cfs)	0.0	0.0	0.0

Watershed Characteristics

Subcatchment Area (acres)		
Percent Impervious		
NRCS Soil Type		

Watershed Profile

Overland Slope (ft/ft)		
Overland Length (ft)		
Channel Slope (ft/ft)		
Channel Length (ft)		

Minor Storm Rainfall Input

Design Storm Return Period, T _r (years)		
One-Hour Precipitation, P ₁ (inches)		

Major Storm Rainfall Input

One-Hour Precipitation, P ₁ (inches)	

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	1.0	0.9	3.3
Major Total Design Peak Flow, Q (cfs)	2.2	1.9	6.8
Minor Flow Bypassed Downstream, Q _b (cfs)	N/A	N/A	N/A
Major Flow Bypassed Downstream, Q _b (cfs)	N/A	N/A	N/A

MHFD-Inlet, Version 5.01 (April 2021)

INLET MANAGEMENT

Worksheet Protected

INLET NAME	SD-INLET-B5.1 - DP13	<u>SD-INLET-B2.1 - DP17</u>	SD-INLET-A8 - DP0
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET
Hydraulic Condition	In Sump	In Sump	In Sump
Inlet Type	Denver No. 16 Combination	Denver No. 16 Combination	Denver No. 16 Combination

USER-DEFINED INPUT

User-Defined Design Flows			
Minor Q _{Known} (cfs)	2.9	2.8	1.7
Major Q _{Known} (cfs)	5.9	6.8	4.5

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, Q _b (cfs)	0.0	0.0	0.0
Major Bypass Flow Received, Q _b (cfs)	0.0	0.0	0.0

Watershed Characteristics

Subcatchment Area (acres)		
Percent Impervious		
NRCS Soil Type		

Watershed Profile

Overland Slope (ft/ft)		
Overland Length (ft)		
Channel Slope (ft/ft)		
Channel Length (ft)		

Minor Storm Rainfall Input

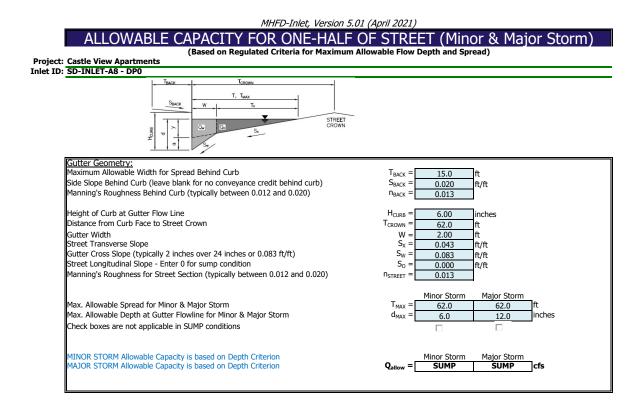
Design Storm Return Period, T _r (years)		
One-Hour Precipitation, P_1 (inches)		

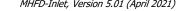
Major Storm Rainfall Input

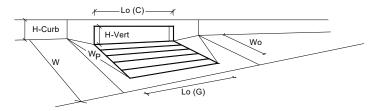
i		· · · · · · · · · · · · · · · · · · ·	
	Design Storm Return Period, T _r (years)		
	One-Hour Precipitation, P_1 (inches)		

CALCULATED OUTPUT

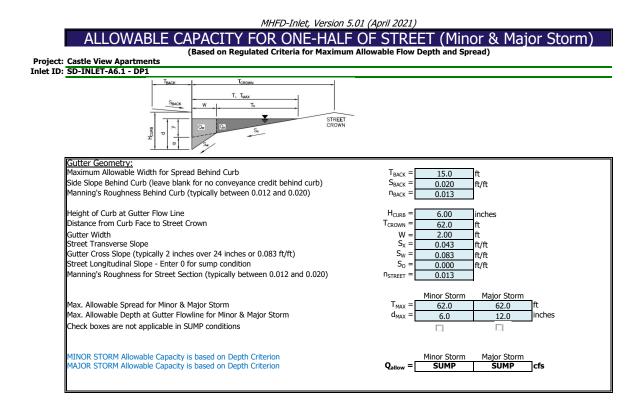
Minor Total Design Peak Flow, Q (cfs)	2.9	2.8	1.7
Major Total Design Peak Flow, Q (cfs)	5.9	6.8	4.5
Inor Flow Bypassed Downstream, Q _b (cfs)	N/A	N/A	N/A
Major Flow Bypassed Downstream, Q _b (cfs)	N/A	N/A	N/A



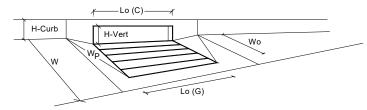




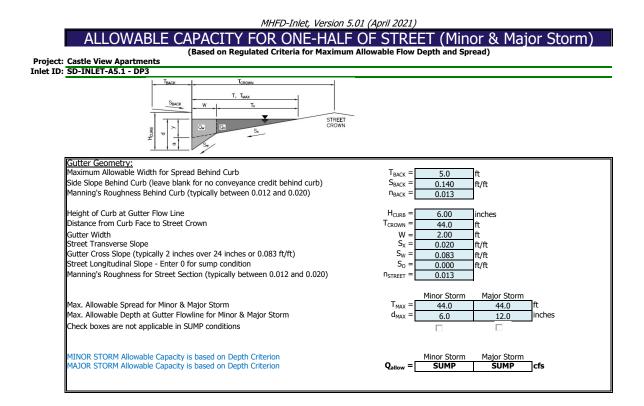
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	Denver No. 1	6 Combination	
Local Depression (additional to continuous gutter depression 'a' from above)	a _{local} =	2.00	2.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information	· • · · · · · · · · · · · · · · · · · ·	MINOR	MAJOR	Override Depths
Length of a Unit Grate	$L_{0}(G) =$	3.00	3.00	Iteet
Width of a Unit Grate	W ₀ =	1.73	1.73	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A _{ratio} =	0.31	0.31	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	$C_{f}(G) =$	0.50	0.50	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C _w (G) =	3.60	3.60	
Grate Orifice Coefficient (typical value 2.13 - 3.00) Grate Orifice Coefficient (typical value 0.60 - 0.80)	C _o (G) =	0.60	0.60	
	$C_0(0) =$			
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	$L_{o}(C) =$	3.00	3.00	feet
Height of Vertical Curb Opening in Inches	H _{vert} =	6.50	6.50	inches
Height of Curb Orifice Throat in Inches	H _{throat} =	5.25	5.25	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	0.00	0.00	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	$W_p =$	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	$C_{f}(C) =$	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	$C_w(C) =$	3.70	3.70	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	$C_0(C) =$	0.66	0.66	
Grate Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	1.00	1.00	
Clogging Factor for Multiple Units	Clog =	0.50	0.50	
Grate Capacity as a Weir (based on Modified HEC22 Method)	clog –	MINOR	MAJOR	
Interception without Clogging	Q _{wi} =	6.0	17.6	cfs
Interception with Clogging	Q _{wa} =	3.0	8.8	cfs
Grate Capacity as a Orifice (based on Modified HEC22 Method)	Rwa	MINOR	MAJOR	615
Interception without Clogging	Q _{oi} =	5.6	7.8	cfs
Interception with Clogging		2.8	3.9	cfs
	Q _{oa} =			cis
Grate Capacity as Mixed Flow	o F	MINOR	MAJOR	- -
Interception without Clogging	Q _{mi} =	5.2	10.6	cfs
Interception with Clogging	Q _{ma} =	2.6	5.3	cfs
Resulting Grate Capacity (assumes clogged condition)	Q _{Grate} =	2.6	3.9	cfs
Curb Opening Flow Analysis (Calculated)	-	MINOR	MAJOR	_
Clogging Coefficient for Multiple Units	Coef =	1.00	1.00	
Clogging Factor for Multiple Units	Clog =	0.17	0.17	
Curb Opening as a Weir (based on Modified HEC22 Method)		MINOR	MAJOR	
Interception without Clogging	Q _{wi} =	2.0	8.5	cfs
Interception with Clogging	Q _{wa} =	1.7	7.0	cfs
Curb Opening as an Orifice (based on Modified HEC22 Method)		MINOR	MAJOR	_
Interception without Clogging	Q _{oi} =	5.7	7.5	cfs
Interception with Clogging	Q _{oa} =	4.7	6.3	cfs
Curb Opening Capacity as Mixed Flow	200	MINOR	MAJOR	_
Interception without Clogging	Q _{mi} =	2.9	6.9	cfs
Interception with Clogging	$Q_{ma} =$	2.9	5.7	cfs
Resulting Curb Opening Capacity (assumes clogged condition)	Q _{curb} =	1.7	5.7	cfs
Resulting Curb Opening Capacity (assumes clogged condition) Resultant Street Conditions	COID	MINOR	MAJOR	
	. г			6
	L =	3.00	3.00	feet
Total Inlet Length		0.0	24.4	
Total Inlet Length Resultant Street Flow Spread (based on street geometry from above)	T =	9.8	21.4	ft
Total Inlet Length		9.8 0.0	21.4 0.0	ft inches
Total Inlet Length Resultant Street Flow Spread (based on street geometry from above) Resultant Flow Depth at Street Crown	T =	0.0	0.0	
Total Inlet Length Resultant Street Flow Spread (based on street geometry from above) Resultant Flow Depth at Street Crown Low Head Performance Reduction (Calculated)	T = d _{CROWN} =	0.0 MINOR	0.0 MAJOR	inches
Total Inlet Length Resultant Street Flow Spread (based on street geometry from above) Resultant Flow Depth at Street Crown Low Head Performance Reduction (Calculated) Depth for Grate Midwidth	$T = \begin{bmatrix} \\ d_{CROWN} \end{bmatrix}$	0.0 MINOR 0.523	0.0 MAJOR 1.023	inches ft
Total Inlet Length Resultant Street Flow Spread (based on street geometry from above) Resultant Flow Depth at Street Crown Low Head Performance Reduction (Calculated)	T = d _{CROWN} =	0.0 MINOR	0.0 MAJOR	inches
Total Inlet Length Resultant Street Flow Spread (based on street geometry from above) Resultant Flow Depth at Street Crown Low Head Performance Reduction (Calculated) Depth for Grate Midwidth Depth for Curb Opening Weir Equation	$T = \begin{bmatrix} \\ d_{CROWN} \end{bmatrix}$	0.0 MINOR 0.523	0.0 MAJOR 1.023	inches ft
Total Inlet Length Resultant Street Flow Spread (based on street geometry from above) Resultant Flow Depth at Street Crown Low Head Performance Reduction (Calculated) Depth for Grate Midwidth	$T = d_{CROWN} = d_{Grate} = d_{Curb} = d_{Curb} = d_{Curb}$	0.0 MINOR 0.523 0.33	0.0 MAJOR 1.023 0.83	inches ft
Total Inlet Length Resultant Street Flow Spread (based on street geometry from above) Resultant Flow Depth at Street Crown Low Head Performance Reduction (Calculated) Depth for Grate Midwidth Depth for Curb Opening Weir Equation Combination Inlet Performance Reduction Factor for Long Inlets	$T = \\ d_{CROWN} = \\ d_{Grate} = \\ d_{Curb} = \\ RF_{Combination} = \\ RF_{Curb} = \\ RF$	0.0 MINOR 0.523 0.33 0.94	0.0 MAJOR 1.023 0.83 1.00	inches ft
Total Inlet Length Resultant Street Flow Spread (based on street geometry from above) Resultant Flow Depth at Street Crown 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	$T = \begin{bmatrix} \\ d_{CROWN} \end{bmatrix}$ $\begin{bmatrix} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	0.0 MINOR 0.523 0.33 0.94 1.00	0.0 MAJOR 1.023 0.83 1.00 1.00	inches ft
Total Inlet Length Resultant Street Flow Spread (based on street geometry from above) Resultant Flow Depth at Street Crown 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	$T = \\ d_{CROWN} = \\ d_{Grate} = \\ d_{Curb} = \\ RF_{Combination} = \\ RF_{Curb} = \\ RF$	0.0 MINOR 0.523 0.33 0.94 1.00 0.94	0.0 MAJOR 1.023 0.83 1.00 1.00 1.00	inches ft
Total Inlet Length Resultant Street Flow Spread (based on street geometry from above) Resultant Flow Depth at Street Crown 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	$T = \\ d_{CROWN} = \\ d_{Grate} = \\ d_{Curb} = \\ RF_{Combination} = \\ RF_{Curb} = \\ RF$	0.0 MINOR 0.523 0.33 0.94 1.00	0.0 MAJOR 1.023 0.83 1.00 1.00	inches ft

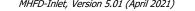


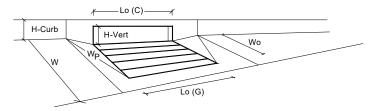




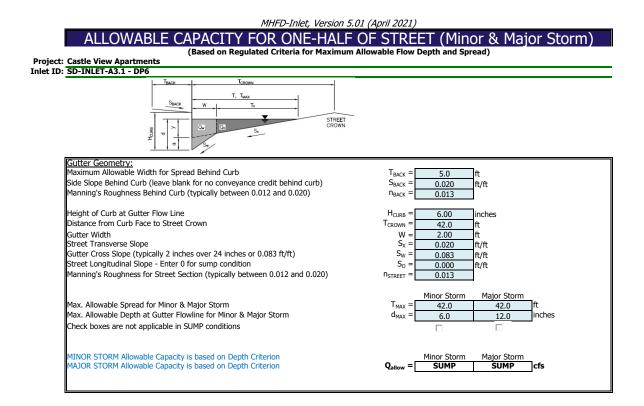
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =		6 Combination	
Local Depression (additional to continuous gutter depression 'a' from above)	a _{local} =	2.00	2.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	inches
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information	Ponding Depth =	MINOR	MAJOR	Override Depths
Length of a Unit Grate	$L_{0}(G) =$	3.00	3.00	feet
Width of a Unit Grate	W _o =	1.73	1.73	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		0.31	0.31	icel
Clogging Factor for a Single Grate (typical values 0.15-0.90)	$A_{ratio} = C_f(G) =$	0.50	0.50	
Grate Weir Coefficient (typical value 2.15 - 3.60)		3.60		
	$C_w(G) =$	0.60	3.60 0.60	-
Grate Orifice Coefficient (typical value 0.60 - 0.80)	$C_{o}(G) =$			
Curb Opening Information Length of a Unit Curb Opening	$L_{0}(C) =$	MINOR	MAJOR	6
5 5 6 6 6 5		3.00	3.00	feet inches
Height of Vertical Curb Opening in Inches	H _{vert} =		6.50	
Height of Curb Orifice Throat in Inches	H _{throat} =	5.25	5.25	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	0.00	0.00	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	$W_p =$	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	$C_{f}(C) =$	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	$C_w(C) =$	3.70	3.70	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	L ₀ (L) =	0.66	0.66	
Grate Flow Analysis (Calculated)		MINOR	MAJOR	-
Clogging Coefficient for Multiple Units	Coef =	1.00	1.00	4
Clogging Factor for Multiple Units	Clog =	0.50	0.50	
Grate Capacity as a Weir (based on Modified HEC22 Method)	o 5	MINOR	MAJOR	7.
Interception without Clogging	Q _{wi} =	6.0	17.6	cfs
Interception with Clogging	Q _{wa} =	3.0	8.8	cfs
Grate Capacity as a Orifice (based on Modified HEC22 Method)		MINOR	MAJOR	-
Interception without Clogging	Q _{oi} =	5.6	7.8	cfs
Interception with Clogging	Q _{oa} =	2.8	3.9	cfs
Grate Capacity as Mixed Flow	- F	MINOR	MAJOR	-
Interception without Clogging	Q _{mi} =	5.2	10.6	cfs
Interception with Clogging	Q _{ma} =	2.6	5.3	cfs
Resulting Grate Capacity (assumes clogged condition)	Q _{Grate} =	2.6	3.9	cfs
Curb Opening Flow Analysis (Calculated)		MINOR	MAJOR	-
Clogging Coefficient for Multiple Units	Coef =	1.00	1.00	
Clogging Factor for Multiple Units	Clog =	0.17	0.17	
Curb Opening as a Weir (based on Modified HEC22 Method)	o 5	MINOR	MAJOR	
Interception without Clogging	Q _{wi} =	2.0	8.5	cfs
Interception with Clogging	Q _{wa} =	1.7	7.0	cfs
Curb Opening as an Orifice (based on Modified HEC22 Method)	o 5	MINOR	MAJOR	
Interception without Clogging	$Q_{oi} =$	5.7	7.5	cfs
Interception with Clogging	Q _{oa} =	4.7	6.3	cfs
Curb Opening Capacity as Mixed Flow		MINOR	MAJOR	7.
Interception without Clogging	Q _{mi} =	2.9	6.9	cfs
Interception with Clogging	Q _{ma} =	2.4	5.7	cfs
Resulting Curb Opening Capacity (assumes clogged condition)	Q _{Curb} =	1.7	5.7	cfs
Resultant Street Conditions	-	MINOR	MAJOR	_
Total Inlet Length	L =	3.00	3.00	feet
Resultant Street Flow Spread (based on street geometry from above)	T =	9.8	21.4	ft
Resultant Flow Depth at Street Crown	d _{CROWN} =	0.0	0.0	inches
Low Head Performance Reduction (Calculated)	-	MINOR	MAJOR	٦.
Depth for Grate Midwidth	d _{Grate} =	0.523	1.023	ft
Depth for Curb Opening Weir Equation	d _{Curb} =	0.33	0.83	ft
Combination Inlet Performance Reduction Factor for Long Inlets	RF _{Combination} =	0.94	1.00	4
Curb Opening Performance Reduction Factor for Long Inlets	RF _{Curb} =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF _{Grate} =	0.94	1.00	
	~ -	MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition) Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_a =$	3.9	8.7	cfs
	Q PEAK REQUIRED =	1.0	2.2	cfs

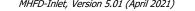


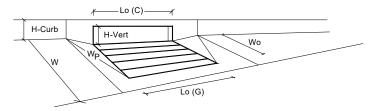




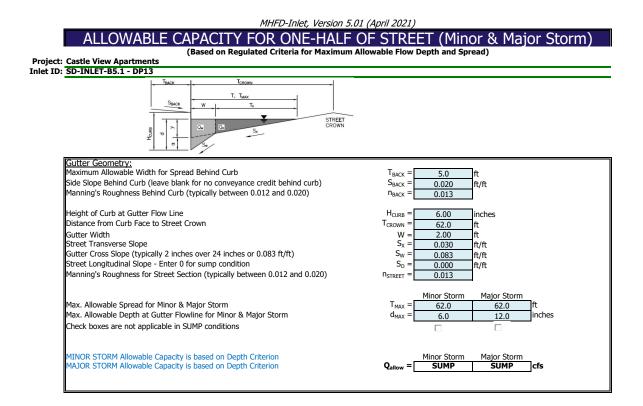
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =		6 Combination	
Local Depression (additional to continuous gutter depression 'a' from above)	a _{local} =	2.00	2.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	inches
Water Depth at Flowline (outside of local depression)		6.0	12.0	inches
Grate Information	Ponding Depth =	MINOR	MAJOR	
	$L_{0}(G) =$	3.00	MAJOR 3.00	Override Depths
Length of a Unit Grate				
Width of a Unit Grate	W _o =	1.73	1.73	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	$A_{ratio} =$	0.31	0.31	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	$C_{f}(G) =$	0.50	0.50	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	3.60	3.60	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	$C_{o}(G) =$	0.60	0.60	
Curb Opening Information		MINOR	MAJOR	-
Length of a Unit Curb Opening	$L_{o}(C) =$	3.00	3.00	feet
Height of Vertical Curb Opening in Inches	H _{vert} =	6.50	6.50	inches
Height of Curb Orifice Throat in Inches	H _{throat} =	5.25	5.25	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	0.00	0.00	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	$W_p =$	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	$C_{f}(C) =$	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	$C_w(C) =$	3.70	3.70	7
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	$C_0(C) =$	0.66	0.66	1
Grate Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	1.00	1.00	7
Clogging Factor for Multiple Units	Clog =	0.50	0.50	
Grate Capacity as a Weir (based on Modified HEC22 Method)	ciog –	MINOR	MAJOR	
Interception without Clogging	Q _{wi} =	6.0	17.6	cfs
Interception with Clogging	Q _{wa} =	3.0	8.8	cfs
Grate Capacity as a Orifice (based on Modified HEC22 Method)	Cwa	MINOR	MAJOR	
Interception without Clogging	Q _{oi} =	5.6	7.8	cfs
Interception with Clogging	$Q_{oa} =$	2.8	3.9	cfs
Grate Capacity as Mixed Flow	~ 0a	MINOR	MAJOR	615
Interception without Clogging	Q _{mi} =	5.2	10.6	cfs
Interception with Clogging	Q _{mi} = Q _{ma} =	2.6	5.3	cfs
	Q _{ma} =	2.0	3.9	cfs
Resulting Grate Capacity (assumes clogged condition) Curb Opening Flow Analysis (Calculated)	•Grate —	MINOR	MAJOR	CIS
	T			7
Clogging Coefficient for Multiple Units	Coef =	1.00	1.00	-
Clogging Factor for Multiple Units	Clog =	0.17	0.17	
Curb Opening as a Weir (based on Modified HEC22 Method)	o 5	MINOR	MAJOR	- ,
Interception without Clogging	Q _{wi} =	2.0	8.5	cfs
Interception with Clogging	Q _{wa} =	1.7	7.0	cfs
Curb Opening as an Orifice (based on Modified HEC22 Method)		MINOR	MAJOR	-
Interception without Clogging	Q _{oi} =	5.7	7.5	cfs
Interception with Clogging	Q _{oa} =	4.7	6.3	cfs
Curb Opening Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q _{mi} =	2.9	6.9	cfs
Interception with Clogging	Q _{ma} =	2.4	5.7	cfs
Resulting Curb Opening Capacity (assumes clogged condition)	Q _{Curb} =	1.7	5.7	cfs
Resultant Street Conditions		MINOR	MAJOR	
Total Inlet Length	L =	3.00	3.00	feet
Resultant Street Flow Spread (based on street geometry from above)	T =	18.7	43.7	ft
Resultant Flow Depth at Street Crown	d _{CROWN} =	0.0	0.0	inches
	L			-
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d _{Grate} =	0.523	1.023	ft
Depth for Curb Opening Weir Equation	d _{Curb} =	0.33	0.83	ft
Combination Inlet Performance Reduction Factor for Long Inlets	RF _{Combination} =	0.94	1.00	1
Curb Opening Performance Reduction Factor for Long Inlets	RF _{Curb} =	1.00	1.00	1
Grated Inlet Performance Reduction Factor for Long Inlets	RF _{Grate} =	0.94	1.00	1
	Grate -	0.01	2.00	_
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q _a =	3.9	8.7	cfs
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	Q PEAK REQUIRED =	0.9	1.9	cfs
The capacity 15 6000 for minor and Major Storms(>Q FEAK)	D at ALQUINED			1.1

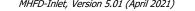


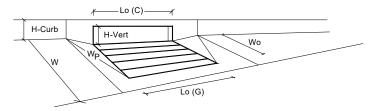




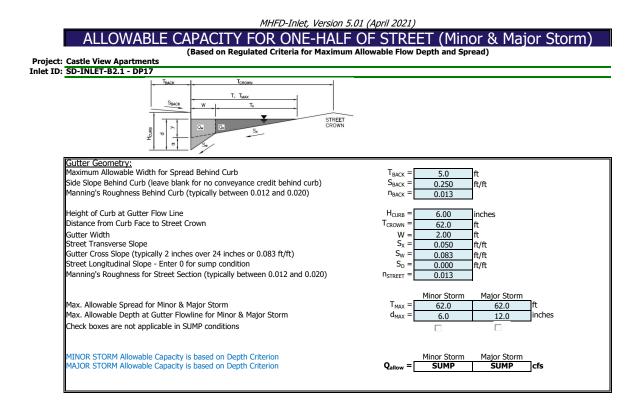
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =		6 Combination	
Local Depression (additional to continuous gutter depression 'a' from above)	a _{local} =	2.00	2.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	11.6	inches
Grate Information	· · · · · · · · · · · · · · · · · · ·	MINOR	MAJOR	Override Depths
Length of a Unit Grate	$L_{0}(G) =$	3.00	3.00	lfeet
Width of a Unit Grate	W _o =	1.73	1.73	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A _{ratio} =	0.31	0.31	1000
Clogging Factor for a Single Grate (typical values of 5 of 0.70)	$C_f(G) =$	0.50	0.50	
Grate Weir Coefficient (typical value 2.15 - 3.60)	$C_{w}(G) =$	3.60	3.60	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	$C_0(G) =$	0.60	0.60	-
Curb Opening Information	$c_0(0) =$	MINOR	MAJOR	
Length of a Unit Curb Opening	$L_{0}(C) =$	3.00	MAJOR 3.00	feet
Height of Vertical Curb Opening in Inches	$H_{vert} =$	6.50	6.50	inches
Height of Curb Orifice Throat in Inches	H _{throat} =	5.25		inches
5			5.25	
Angle of Throat (see USDCM Figure ST-5)	Theta =	0.00	0.00	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	$W_p =$	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	$C_{f}(C) =$	0.10	0.10	_
Curb Opening Weir Coefficient (typical value 2.3-3.7)	$C_{w}(C) =$	3.70	3.70	4
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	$C_0(C) =$	0.66	0.66	
Grate Flow Analysis (Calculated)		MINOR	MAJOR	_
Clogging Coefficient for Multiple Units	Coef =	1.00	1.00	_
Clogging Factor for Multiple Units	Clog =	0.50	0.50	
Grate Capacity as a Weir (based on Modified HEC22 Method)		MINOR	MAJOR	
Interception without Clogging	Q _{wi} =	6.0	16.7	cfs
Interception with Clogging	Q _{wa} =	3.0	8.3	cfs
Grate Capacity as a Orifice (based on Modified HEC22 Method)	-	MINOR	MAJOR	
Interception without Clogging	Q _{oi} =	5.6	7.7	cfs
Interception with Clogging	Q _{oa} =	2.8	3.9	cfs
Grate Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q _{mi} =	5.2	10.2	cfs
Interception with Clogging	Q _{ma} =	2.6	5.1	cfs
Resulting Grate Capacity (assumes clogged condition)	Q _{Grate} =	2.6	3.9	cfs
Curb Opening Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	1.00	1.00	7
Clogging Factor for Multiple Units	Clog =	0.17	0.17	
Curb Opening as a Weir (based on Modified HEC22 Method)	clog –	MINOR	MAJOR	
Interception without Clogging	Q _{wi} =	2.0	7.9	cfs
Interception with Clogging	Q _{wa} =	1.7	6.6	cfs
Curb Opening as an Orifice (based on Modified HEC22 Method)	~wa	MINOR	MAJOR	
Interception without Clogging	Q _{oi} =	5.7	7.4	cfs
Interception with Clogging	Q _{oa} =	4.7	6.2	cfs
Curb Opening Capacity as Mixed Flow	-2 _{0a} –	MINOR	MAJOR	
Interception without Clogging	Q _{mi} =	2.9	MAJOR 6.6	cfs
Interception with Clogging		2.9	5.5	cfs
	Q _{ma} = Q _{curb} =	2.4 1.7	5.5 5.5	cis
Resulting Curb Opening Capacity (assumes clogged condition)	Curb -			0.3
Resultant Street Conditions	. –	MINOR	MAJOR	-
Total Inlet Length	L =	3.00	3.00	feet
Resultant Street Flow Spread (based on street geometry from above)	T =	18.7	42.0	ft
Resultant Flow Depth at Street Crown	d _{CROWN} =	0.0	0.0	inches
Low Head Performance Reduction (Calculated)	-	MINOR	MAJOR	-
Depth for Grate Midwidth	d _{Grate} =	0.523	0.989	ft
Depth for Curb Opening Weir Equation	d _{Curb} =	0.33	0.80	ft
Combination Inlet Performance Reduction Factor for Long Inlets	RF _{Combination} =	0.94	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	RF _{Curb} =	1.00	1.00	_
Grated Inlet Performance Reduction Factor for Long Inlets	RF _{Grate} =	0.94	1.00	
				-
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q _a =	3.9	8.4	cfs
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	Q PEAK REQUIRED =	3.3	6.8	cfs

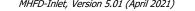


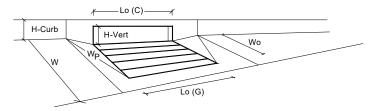




Type of Inite (Lerverke. In Combination 2) (Lerverke in C	Design Information (Input)		MINOR	MAJOR	
$ \begin{split} \begin{split} & L_{cold} Depression (additional to continuous gutter depression) a from above) & a_{cord}^{cord} = \frac{2.00}{1.0} & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & $		Type =			
Wate: Depth at Flowline (uotisde of local depression) Ponding Depth at Flowline (uotisde of local depression) Ponding Depth at Flowline (uotisde of local depression) Ponding Depth at Flow (Received Control of Control Co			2.00	2.00	inches
Wate: Depth at Flowline (uotisde of local depression) Ponding Depth at Flowline (uotisde of local depression) Ponding Depth at Flowline (uotisde of local depression) Ponding Depth at Flow (Received Control of Control Co	Number of Unit Inlets (Grate or Curb Opening)		1	1	
Grate Information Length of a Unit Grate MINOR MAUOR Ownerburght Nach Opening Ratio for a Single Cort Opening Height of Varial Curb Opening Inches $V_{eff} = \frac{1}{3.00}$ 3.00 Teet Nach Opening Ratio for a Single Cort Opening Height of Varial Curb Opening Inches $V_{eff} = \frac{1}{3.00}$ 3.00 Teet Angel of That Curb Opening Inches $V_{eff} = \frac{1}{3.00}$ $S_{eff} = \frac{1}{3.00}$ $S_{eff} = \frac{1}{3.00}$ $S_{eff} = \frac{1}{3.00}$ Angel of Thom Curb Opening Inches $H_{erce} = \frac{1}{3.00}$ $S_{eff} = \frac{1}{3.00}$ $S_{eff} = \frac{1}{3.00}$ $S_{eff} = \frac{1}{3.00}$ Angel of Thom Curb Opening Inches $H_{erce} = \frac{1}{3.00}$ $S_{eff} = \frac{1}{3.00}$ $S_$		Ponding Depth =	6.0	12.0	inches
Length of a Unit Grate $L_{c}(G) = 3.00 3.00$ reet with of a Unit Grate $W_{c} = 1.73 1.73 1.73$ reet $V_{c} = 0.31 0.31$ reet $V_{c} = 0.50 0.80$ rest $V_{c} = 0.50 0.00$ rest $V_{c} = 0.00 0.00$		· • · · · · · · · · · · · · · · · · · ·			
Width of a Unit Grate Wash 1.73 1.73 Text Area Opening Rattor for a Single Grate (typical value 0.50 - 0.70) C. (6) 0.53 0.50 Grate Werk Coefficient (typical value 0.50 - 0.80) C. (6) 0.50 0.50 Grate Ordifee Coefficient (typical value 0.60 - 0.80) C. (6) 0.50 0.50 Land Decring Information MINOR MAIOR MINOR MAIOR Height of Vertical Curb Opening Information Land Curb Opening (typical value 0.10) C. (6) 0.50 0.50 0.50 Side Width for Depression Pan (typical value 0.10) C. (7) 0.00 0.00 0.00 doggees Side Width for Depression Pan (typical value 0.60 - 0.70) C. (1) 0.10 0.10 0.10 0.00 Curb Opening Orifice Coefficient (typical value 0.60 - 0.70) C. (1) 0.00 <td< td=""><td></td><td>$L_{0}(G) =$</td><td></td><td></td><td></td></td<>		$L_{0}(G) =$			
Area Opening Rato for a Grate (typical values 0.15-0.90) Grate Weir Coefficient (typical value 0.60 - 0.70) Grate Weir Coefficient (typical value 0.60 - 0.80) Grate Office Coefficient (typical value 0.60 - 0.80) Grate Diffice Creditiont (bypical value 0.60 - 0.80) Grate Office Creditiont (bypical value 0.60 - 0.70) Grate Diversion Part Opening		W ₀ =	1.73	1.73	feet
Clogping Pactor for a Single Grate (typical value 0.50 - 0.70) Grate Verifice Coefficient (typical value 0.60 - 0.80) Craft Opening Information Length of a Unit Curb Opening Information Length of a Unit Curb Opening Information Height of Vertical Curb Opening (typical value 0.10) Curb Opening Opening (typical value 0.10) Curb Opening Office Coefficient (typical value 0.23.37) Curb Opening Office Coefficient (typical value 0.20, 0.70) Crafte Coefficient (typical value 0.23.37) Crafte Coefficient (typical value 0.24.37.7) Crafte Coefficient (typical value 0.24.3					
Grate View Coefficient (typical value 2.63 - 3.60) C ₁ (G) = $\overline{3.60}$ $\overline{3.60}$ Grate Orfice Coefficient (typical value 0.60 - 0.80) C ₁ (G) = $\overline{3.60}$ $\overline{3.60}$ Curb Doening Information L ₁ (C) = $\overline{3.60}$ $\overline{3.50}$ $\overline{5.50}$ Leight of Unit Curb Opening in Inches H _{wert} = $\overline{5.25}$ $\overline{5.22}$ inches Angle of Throat (see USOM Figure ST-5) Theta = $\overline{0.00}$ $\overline{0.00}$ $\overline{2.92}$ Side Width for Depression Pan (typical value 2.3-3.7) C ₁ (C) = $\overline{3.70}$ $\overline{2.70}$ Curb Opening Write Coefficient (typical value 2.3-3.7) C ₁ (C) = $\overline{3.60}$ $\overline{3.70}$ Curb Opening Write Coefficient (typical value 2.3-3.7) C ₁ (C) = $\overline{3.60}$ $\overline{3.70}$ Curb Opening Write Coefficient (typical value 2.3-7) C ₁ (C) = $\overline{3.60}$ $\overline{3.70}$ Curb Opening Write Coefficient (typical value 2.3-7) C ₁ (C) = $\overline{3.60}$ $\overline{3.70}$ Curb Opening Mrite Coefficient (typical value 2.3-7) C ₁ (C) = $\overline{3.70}$ $\overline{3.70}$ Curb Opening Coefficient (typical value 2.3-7) C ₁ (C) = $\overline{3.70}$ $\overline{3.70}$ $\overline{3.70}$ Card Edge Angle Coefficie			0.50	0.50	
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Height of Cub Orlifes Threat in Inches Angle of Throads (see USOC Higher ST-5) Side With for Depression Pan (typically the guitter 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 Weir Coefficient (typical value 2.3:3.7) Curb Opening Weir Coefficient (typical value 0.60 - 0.70) Crafte Flow Analysis (Calculated) Clogging Gactfrident for Multiple Units Clogging Gactfrident for Multiple					
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Cloging Factor for a Single Curb Opening (typical value 0.10) Curb Opening Weri Ceefficient (typical value 0.60 - 0.70) Curb Opening Orifice Coefficient (typical value 0.60 - 0.70) Curb Opening Orifice Coefficient (typical value 0.60 - 0.70) Curb Opening Orifice Coefficient (typical value 0.60 - 0.70) Curb Opening Grate Capacity as A Weir Caedio and Modified HEC22 Method) Interception without Clogging Grate Capacity as A Weir Caedio and Modified HEC22 Method) Interception without Clogging Grate Capacity as A Orifice (Dased on Modified HEC22 Method) Interception without Clogging Grate Capacity as A Orifice (Dased on Modified HEC22 Method) Interception without Clogging Grate Capacity as A Orifice (Dased on Modified HEC22 Method) Interception without Clogging Grate Capacity as A Orifice (Dased on Modified HEC22 Method) Interception without Clogging Grate Capacity as A Orifice (Dased on Modified HEC22 Method) Interception with Clogging Grate Capacity as A Orifice (Dased on Modified HEC22 Method) Interception with Clogging Grate Capacity as A Orifice (Dased on Modified HEC22 Method) Interception with Clogging Grate Capacity (assumes clogged condition) Cogning Caefficient for Multiple Units Clogging Caefficient for Multiple Units Clogging Caefficient for Multiple Units Curb Opening as an Orifice (Dased on Modified HEC22 Method) Interception without Clogging Interception without Clogging Interception without Clogging Curb Opening Capacity (assumes clogged condition) Qua = 5.7 7.5 cfs Resultant Street Flow Spraed (based on Modified HEC22 Method) Interception without Clogging Curb Opening Capacity (assumes clogged condition) Qua = 5.7 7.5 cfs Resultant Street Flow Spraed (based on Street geometry from above) Resultant Street Flow Spraed (based on street geometry from above) Resultant Street Cown Curb Opening Reformance Reduction Factor for Long Inlets Grate Inlet Performance Reduction Factor for Long Inlets Grate Inlet Interception Weix Equation Curb Opening Performance Reduct					
Curb Opening Wer Coefficient (typical value 2.3-3.7) Curb Opening Orifice Coefficient (typical value 0.60 - 0.70) Case (Line Coefficient (Line Coeffici					leet
Curb Opening Orffice Coefficient (typical value 0.60 - 0.70) C_0 (c) = 0.66 0.66 Grate Flow Analysis (Calculated) Cooging Coefficient for Multiple Units Coefficient for Multiple Units Coefficient for Multiple Units Caralle Capacity as a Weir (New of Coefficient for Multiple Units Coefficient for Multiple Units Coefficient for Multiple Units Coefficient for Multiple Units Interception without Clogging Q _{eff} = 6.0 17.6 cfs Interception without Clogging Q _{eff} = 5.6 7.8 cfs Interception without Clogging Q _{eff} = 5.6 7.8 cfs Interception without Clogging Q _{eff} = 5.2 10.6 cfs Interception with Clogging Q _{eff} = 5.2 10.6 cfs Resulting Grate Capacity (assumes clogged condition) Qeame 2.6 3.9 cfs Curb Opening as a Veir (Nesded on Modified HEC22 Method) MINOR MAJOR MINOR MAJOR Interception with Clogging Q _{eff} = 1.00 1.00 0.6 5.7 7.5 cfs Curb Opening as a Veir (Nesded on Modified HEC22 Method) MINOR MINOR MAJOR					-
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Clog in Factor for Multiple Units Grate Capacity as a Weir (based on Modified HEC22 Method) Interception with Ologging Clog = 0.50 0.50 MINOR MAJOR MAOR MAOR MINOR MAJOR Comparison of the Cased on Modified HEC22 Method) Interception with Ologging Grate Capacity as a Orifice (based on Modified HEC22 Method) Interception with Ologging Grate Capacity as a Orifice (based on Modified HEC22 Method) Interception with Ologging Grate Capacity as Mixed Flow Interception with Ologging Carete Capacity (assumes clogged condition) Cogging Coefficient for Multiple Units Clogging Coefficient for Multiple Units Club Dopening Capacity (assumes clogged condition) Resultant Street Conditions Curb Opening Capacity (assumes clogged condition) Curb Opening Capacity (assumes clogged condition) Curb Opening Performance Reduction Factor for Long Inlets Crote Minor Curb Opening Performance Reduction Factor for Long Inlets Crote Interception Capacity (assumes clogged condition) Curb Opening Performance Reduction Factor for Long Inlets Crote Interception Capacity (assumes clogged condition) Curb Opening Performance Reduction Factor for Long Inlets Crote Interce		Co-f			7
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Curb Opening Performance Reduction Factor for Long Inlets RF _{Curb} = 1.00 1.00 Grated Inlet Performance Reduction Factor for Long Inlets RF _{Grate} = 0.94 1.00 Total Inlet Interception Capacity (assumes clogged condition) MINOR MAJOR					ft
Curb Opening Performance Reduction Factor for Long Inlets RF _{Curb} = 1.00 1.00 Grated Inlet Performance Reduction Factor for Long Inlets RF _{Grate} = 0.94 1.00 Total Inlet Interception Capacity (assumes clogged condition) Qa = 3.9 8.7					_
Total Inlet Interception Capacity (assumes clogged condition) $MINOR$ MAJOR Qa = 3.9 8.7 cfs		RF _{Curb} =			_
Total Inlet Interception Capacity (assumes clogged condition) $Q_a = 3.9$ 8.7 cfs	Grated Inlet Performance Reduction Factor for Long Inlets	$RF_{Grate} =$	0.94	1.00	
Total Inlet Interception Capacity (assumes clogged condition) Qa = 3.9 8.7 cfs					
		-			-
	Total Inlet Interception Capacity (assumes clogged condition)			-	
	Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	Q PEAK REQUIRED =	2.9	5.9	cfs







Type of Inlet [Leaver Ro. 16 Combination T Type = Denver Ro. 16 Combination Inches Summer of Unit Inlets (Grate or Curb Opening) (Water Depth at Florentiation of from above) Number of Unit Inlets (Grate or Curb Opening) (Water Depth at Florentiation) (Combined Leaver Schermen Schermer S	Design Information (Input)	7	MINOR	MAJOR	
Lickia Depression (additional to continuous gutter depression 'a' from above) Mater Depth at Flowline (dustise of local depression) Carle User Coefficient (typical value 0.0 - 0.00) Carle Oscillation (typical value 0		Type =			
Water Depth at Flowline (usistie of local depression) Ponding Depth F 0.0 12.0 Inches Length of a Unit Grate No.0	Local Depression (additional to continuous gutter depression 'a' from above)		2.00	2.00	inches
Water Depth at Flowline (usistie of local depression) Ponding Depth F 0.0 12.0 Inches Length of a Unit Grate No.0	Number of Unit Inlets (Grate or Curb Opening)	No =	2	2	
Grate Information MINOR MUROR Devine Depths width of a Link Grate V, G = 1.73 1.73 Test Width of a Link Grate V, G = 1.73 1.73 Test Cloggin plactor for a Single Corb Opening (hypical values 0.15 - 0.70) C, G = 0.50 0.50 Grate Information L, C = 0.60 3.00 1.60 Grate Information L, C = 0.60 3.00 1.60 Grate Information L, C = 0.60 3.00 1.60 Height of Vinctica Uno Denning In Inches H _{Hear} 5.20 0.00 0.00 degrees Mige of Throat (use USDCH Figure ST-5) Theta = 0.00 0.00 degrees 0.00 degrees Side Width for Depression Fan (typical value 0.10) C, C (= 0.00 0.00 degrees 1.60 1.50 1.50 1.50 Grate Environ Analysis (Calculational Value 0.00) C, C (= 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.	Water Depth at Flowline (outside of local depression)	Ponding Depth =		12.0	inches
width of a lunk Grate $W_{a} = 1.73$ 1.73 75 75 1.75	Grate Information	5	MINOR	MAJOR	Override Depths
Area Opening Ratio for a Grate (typical value 0.15-0.20) Cogging Factor for a Single Care (typical value 0.5-0.70) Grate Weri Coefficient (typical value 0.5-0.70) C, (G) = 0.50 0.50 Grate Weri Coefficient (typical value 0.5-0.80) C, (G) = 0.50 0.50 MINOR MAJOR Height of Uth Cuth Opening In Inches Height of Uth Citro Throat Inches Height of Uth Citro Throa	Length of a Unit Grate	$L_{o}(G) =$	3.00	3.00	feet
Clogging part for a Single Grate (typical value 0.50 - 0.70) Grate Orifice Coefficient (typical value 0.50 - 0.80) C $_{\rm C}$ (G) = $\frac{0.50}{0.50}$ $\frac{0.50}{0.50}$ C $_{\rm C}$ (G) = $\frac{0.50}{0.0}$ $\frac{0.50}{0.0}$ C $_{\rm C}$ (G) = $\frac{0.50}{0.0}$	Width of a Unit Grate	W _o =	1.73	1.73	feet
Clogging Factor for a Single Grate (typical value 0.50 - 0.70) Grate Orifice Coefficient (typical value 0.50 - 0.80) Cr (G) = $\frac{0.50}{0.50}$ $\frac{0.50}{0.50}$ Cr (C) = $\frac{0.50}{0.50}$ $\frac{0.50}{0.50}$ Height of Vertice (typical value 0.60 - 0.80) Cr (C) = $\frac{0.50}{0.50}$ $\frac{0.50}{0.50}$ $\frac{0.50}{0.50}$ Feet Height of Vertice (typical value 0.50) $\frac{0.50}{0.50}$ $\frac{0.50}{0.50}$ $\frac{0.50}{0.50}$ Cr (C) = $\frac{0.50}{0.50}$ $\frac{0.50}{0.50}$ Cr (C) = $\frac{0.50}{0.50}$ $\frac{0.50}{0.50}$ Cr (C) = $$	Area Opening Ratio for a Grate (typical values 0.15-0.90)	A _{ratio} =	0.31	0.31	
Grete Ordine Coefficient (typical value 0.60 - 0.80) Length of a Unit Curb Opening In Inches Height of Vertical Curb Opening (typical value 0.10) Curb Opening Ordine Coefficient (typical value 0.20) Curb Opening Ordine (Dased on Modified HEC22 Method) Interception without Clogging Quant = 11.2 15.7 ctfs Grate Canacity vas Nikeel Flow Interception without Clogging Quant = 11.2 15.7 ctfs Grate Canacity vas Nikeel Flow Interception without Clogging Quant = 11.2 15.7 ctfs Grate Canacity vas Nikeel Flow Interception without Clogging Quant = 11.2 15.7 ctfs Grate Canacity vas Nikeel Flow Interception without Clogging Quant = 11.2 15.7 ctfs Grate Canacity vas Nikeel Flow Interception without Clogging Quant = 11.2 15.7 ctfs Grate Canacity vas Nikeel Flow Interception without Clogging Quant = 11.2 15.7 ctfs Grate Canacity vas Nikeel Flow Interception without Clogging Quan	Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		0.50	0.50	
Curb Deping MiNOR MAIOR Height of Unit Curb Opening in Inches Harr 6.50 5.50 inches Height of Unit Orifice Throat in Inches Harr 6.50 5.25 5.25 inches Angle of Throat (see USDCM Figure ST-5) Threa 0.00 0.00 degrees Sie Width for Depression Pan (Nypical value 0.40-0.00) C, (C) 0.00 0.00 degrees Curb Opening Write Coefficient (typical value 0.40-0.70) C, (C) 0.370 3.70 C Curb Opening Write Coefficient (typical value 0.40-0.70) C, (C) 0.38 0.38 0.38 0.38 Cogging Scefficient for Multiple Units Code = 1.50 1.50 0.56 0.56 Carle Coancality as a Weit (Dased on Modified HEC22 Method) MiNOR MINOR MINOR MINOR MINOR Interception without Cogging Q _u = 7.2 9.57 dfs dfs Interception without Cogging Q _u = 1.12 1.57 dfs Interception without Cogging Q _u = 7.2 9.58 dfs Interception without Cogging Q _u = 7.2	Grate Weir Coefficient (typical value 2.15 - 3.60)	$C_w(G) =$	3.60	3.60	
Curb Deping MiNOR MAIOR Height of Unit Curb Opening in Inches Harr 6.50 5.50 inches Height of Unit Orifice Throat in Inches Harr 6.50 5.25 5.25 inches Angle of Throat (see USDCM Figure ST-5) Threa 0.00 0.00 degrees Sie Width for Depression Pan (Nypical value 0.40-0.00) C, (C) 0.00 0.00 degrees Curb Opening Write Coefficient (typical value 0.40-0.70) C, (C) 0.370 3.70 C Curb Opening Write Coefficient (typical value 0.40-0.70) C, (C) 0.38 0.38 0.38 0.38 Cogging Scefficient for Multiple Units Code = 1.50 1.50 0.56 0.56 Carle Coancality as a Weit (Dased on Modified HEC22 Method) MiNOR MINOR MINOR MINOR MINOR Interception without Cogging Q _u = 7.2 9.57 dfs dfs Interception without Cogging Q _u = 1.12 1.57 dfs Interception without Cogging Q _u = 7.2 9.58 dfs Interception without Cogging Q _u = 7.2	Grate Orifice Coefficient (typical value 0.60 - 0.80)	$C_{0}(G) =$	0.60	0.60	
Length of a Unit Curb Opening in Inches Height of Vertical Curb Opening (here ST-5) Side With for Depression Pan (typical) the gutter width of 2 feet) Opening Weir Coefficient (typical value 0.10) Curb Opening Orien Valuipie Units Coeff = 1.50 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5			MINOR	MAJOR	
Height of Vertical Curb Opening in Inches Height of Vertical Curb Opening (in Inches) Angle of Throat (see USDOR Figure ST-5) Site Wath for Depression Pan (hypical value 0.10) Carbo Opening Vertication (typical value 2.3-2.7) Carbo Opening Orffice Coefficient (typical value 0.60 - 0.70) Carbo Opening Opening Ope		$L_{0}(C) =$	3.00	3.00	feet
Height of Curb Orifice Throat in Inches Height of Curb Orifice Throat in Inches Angle of Throat (see USDCA Figure ST-5) Side Width for Depression Pan (typical) the gutter width of 2 feet) Origing Factor for a Single Curb Opening (typical value 0.10) Curb Opening Orifice Coefficient (typical value 0.20 - 0.70) Curb Opening Value (Dased on Modified HEC22 Method) Interception with Clogging Carte Capacity as a Orifice (Dased on Modified HEC22 Method) Interception with Clogging Carte Capacity as a Orifice (Dased on Modified HEC22 Method) Interception with Clogging Carte Capacity as Orifice (Dased on Modified HEC22 Method) Interception with Clogging Carte Capacity as Mixed Flow Interception with Clogging Carte Capacity (assumes clogged condition) Curb Opening Charter Capacity (assumes clogged condition) Curb Opening Charter (Capacity (assumes clogged condition) Curb Opening Charter (Dased on Modified HEC22 Method) Interception with Clogging Curb Opening Capacity (assumes clogged condition) Curb Opening Capacity (assumes clogged c		H _{vert} =	6.50	6.50	inches
Side Width for Depression Pan (typically the gutter width of 2 feet) Caping Factor for a Single Curve Opening (Weir Coefficient (typical value 0.10) Curb Opening Orifice Coefficient (typical value 0.33 .7) Curb Opening Orifice Coefficient (typical value 0.36 - 0.70) Crate Flow Analysis (Calculated) Carate Capacity as a Weir (Lassed on Modified HEC22 Method) Interception with Clogging Carate Capacity as a Orifice (beside on Modified HEC22 Method) Interception with Clogging Carate Capacity as a Christice (based on Modified HEC22 Method) Interception with Clogging Carate Capacity as a Christice (based on Modified HEC22 Method) Interception with Clogging Carate Capacity as a Christice (based on Modified HEC22 Method) Interception with Clogging Carate Capacity as Mixed Flow Interception with Clogging Carate Capacity (assumes clogged condition) Carate Capacity (assumes clogged condition) Curb Denning Combined (Carate Capacity (assumes clogged condition) Curb Denning as a Weir (based on Modified HEC22 Method) Interception with Clogging Curb Denning as a Modified HEC22 Method) Interception with Clogging Curb Denning as a Modified HEC22 Method) Interception with Clogging Curb Denning as a Weir (based on Modified HEC22 Method) Interception with Clogging Curb Denning Capacity (assumes clogged condition) Curb Denning Capacity (assumes clogged condition) C	Height of Curb Orifice Throat in Inches		5.25	5.25	inches
Side Width for Depression Pan (typically the gutter width of 2 feet) Caping Factor for a Single Curve Opening (Weir Coefficient (typical value 0.10) Curb Opening Orifice Coefficient (typical value 0.33 .7) Curb Opening Orifice Coefficient (typical value 0.36 - 0.70) Crate Flow Analysis (Calculated) Carate Capacity as a Weir (Lassed on Modified HEC22 Method) Interception with Clogging Carate Capacity as a Orifice (beside on Modified HEC22 Method) Interception with Clogging Carate Capacity as a Christice (based on Modified HEC22 Method) Interception with Clogging Carate Capacity as a Christice (based on Modified HEC22 Method) Interception with Clogging Carate Capacity as a Christice (based on Modified HEC22 Method) Interception with Clogging Carate Capacity as Mixed Flow Interception with Clogging Carate Capacity (assumes clogged condition) Carate Capacity (assumes clogged condition) Curb Denning Combined (Carate Capacity (assumes clogged condition) Curb Denning as a Weir (based on Modified HEC22 Method) Interception with Clogging Curb Denning as a Modified HEC22 Method) Interception with Clogging Curb Denning as a Modified HEC22 Method) Interception with Clogging Curb Denning as a Weir (based on Modified HEC22 Method) Interception with Clogging Curb Denning Capacity (assumes clogged condition) Curb Denning Capacity (assumes clogged condition) C	Angle of Throat (see USDCM Figure ST-5)	Theta =	0.00	0.00	dearees
Clogging pactor for a Single Curb Opening (typical value 0.10) Curb Opening Write Coefficient (typical value 0.50 - 0.70) Curb Opening Write Coefficient (typical value 0.50 - 0.70) Curb Opening Write Coefficient (typical value 0.50 - 0.70) Curb Opening Orifice Coefficient (typical value 0.50 - 0.70) Curb Opening Caedity (assumes coeged condition) Curb Opening as an Orifice (based on Modified HEC22 Method) Interception without Coegging Curb Opening Caedity as Mixed Flow Interception without Coegging Curb Opening Caedity as Mixed Flow Interception without Coegging Curb Opening Caedity as Mixed Flow Interception with Clogging Curb					
Curb Opening Weir Coefficient (typical value 2.3 : 3.7) Curb Opening Orifice Coefficient (typical value 0.60 - 0.70) Crate How Analysis (Calculated) Clogging Coefficient for Multiple Units Clogging Coefficient for Multiple Units Crate Capacity as a Weir (based on Modified HEC22 Method) Interception without Clogging Grate Capacity as a Write (based on Modified HEC22 Method) Interception without Clogging Grate Capacity as a Write (based on Modified HEC22 Method) Interception without Clogging Grate Capacity as a Write (based on Modified HEC22 Method) Interception without Clogging Grate Capacity as Mixed Flow Interception without Clogging Grate Capacity (assumes clogged condition) Curb Opening as a Write (Capacity (assumes clogged condition) Curb Opening as an Orifice (based on Modified HEC22 Method) Interception without Clogging Curb Opening as an Orifice (based on Modified HEC22 Method) Interception without Clogging Curb Opening (Capacity (assumes clogged condition) Curb Opening Capacity (assumes			0.10	0.10	
Curb Depring Orifice Coefficient (Cypical value 0.60 \cdot 0.70) Carle Elow Analysis (Calculated) Cogging Cefficient for Multiple Units Carle Capacity as Weir (Dased on Modified HEC22 Method) Interception with Clogging Grate Capacity as a Weir (Dased on Modified HEC22 Method) Interception with Clogging Grate Capacity as Mixed Elow Interception with Clogging Grate Capacity (assumes clogged condition) Quants 4.1 9.8 cfs 1.00 1.00 Clogging Cefficient for Multiple Units Clogging Cefficient for Multiple Units Clogging Cefficient for Multiple Units Curb Openning as an Orifice (based on Modified HEC22 Method) Interception without Clogging Curb Openning as an Orifice (based on Modified HEC22 Method) Interception without Clogging Curb Openning as an Orifice (based on Modified HEC22 Method) Interception without Clogging Curb Openning Capacity as Mixed Flow Litterception without Clogging Curb Openning Capacity as Mixed Flow Elow Head Performance Reduction Factor for Long Inlets Code 1.00 1.00 Feet Resultant Street Cown Low Head Performance Reduction Factor for Long Inlets Resultant Flow Depth of Grate Reduction Factor for Long Inlets Grate Inlet Performance Reduction Factor for Long Inlets Carb Opening Performance Reduction Factor for Lo	Curb Opening Weir Coefficient (typical value 2.3-3.7)				1
Grate Flow Analysis (Calculated) MINOR MANOR Clogging Coefficient for Multiple Units $Coefficient for Multiple Units Coefficient for Multiple Units Coefficient for Multiple Units Clogging Catcr for Multiple Units Coefficient for Multiple Units Coefficient for Multiple Units Coefficient for Multiple Units Clogging Catcr Clogging Q_{otild} = \frac{1}{6.6} 25.7 cfs Grate Clogging Clogging Q_{otild} = \frac{1}{7.0} 9.8 6.6 Grate Clogging Clogging Q_{otild} = \frac{1}{7.0} 9.8 6.5 Grate Clogging Clogging Q_{otild} = \frac{1}{7.0} 9.8 6.5 Grate Clogging Clogging Q_{otild} = \frac{1}{7.0} 9.8 6.5 Grate Clogging Clogging Q_{otild} = \frac{1}{7.8} 18.1 cfs Interception without Clogging Q_{otild} = \frac{1}{7.8} 18.1 cfs Clogging Coefficient for Multiple Units Clogging Clogging Q_{otild} = \frac{1}{2.8} 15.5 cfs Curb Opening as a Weir (Closed on Modified HEC22 Method) MiNOR MAOR MiNOR MiNOR MiNOR Curb Opening Clogging Q_{otij} = \frac{1}{2.8} 1.5.0 cfs $					1
Clogging Coefficient for Multiple Units Clogging Factor for Multiple Units Clogging Factor for Multiple Units Clogging Cate Capacity as a Weir (based on Modified HEC22 Method) Interception without Clogging Grate Capacity as a Vier (based on Modified HEC22 Method) Interception without Clogging Clogging Cate Capacity as a Vier (based on Modified HEC22 Method) Interception with Clogging Grate Capacity as Mixed Flow Interception with Clogging Clogging Coefficient for Multiple Units Clogging Coefficient for Multiple Units Curb Opening Capacity (assumes clogged condition) Curb Opening as an Orifice (based on Modified HEC22 Method) Interception with Clogging Curb Opening as an Orifice (based on Modified HEC22 Method) Interception with Clogging Curb Opening as an Orifice (based on Modified HEC22 Method) Interception with Clogging Curb Opening as an Orifice (based on Modified HEC22 Method) Interception with Clogging Curb Opening Capacity as Mixed Flow Interception with Clogging Curb Opening Capacity as Mixed Flow Interception with Clogging Curb Opening Capacity as Mixed Flow Curb Opening Capacity as Mixed Flow Curb Opening Capacity as Mixed Flow Curb Opening Capacity (assumes clogged condition) Resultant Street Convin Curb Opening Capacity (assumes clogged condition) Resultant Street Flow Spread (based on street geometry from above) Resultant Street Flow Spread (based on street geometry from above) Resultant Street Flow Spread (based on street geometry from above) Resultant Street Flow Spread (based on street geometry from above) Resultant Street Flow Opening Capacity (assumes clogged condition) Curb Opening Capacity (ass			MINOR	MAJOR	
Cloging Factor for Multiple Units Crate Capacity as a Weir (Dased on Modified HEC22 Method) Interception with Clogging Crate Capacity as a Orifice (based on Modified HEC22 Method) Interception with Clogging Crate Capacity as Mixed Flow Interception with Clogging Crate Capacity (assumes cloged condition) Resulting Crate Capacity (assumes cloged condition) Crate Terret Conditions Crate Capacity (assumes cloged condition) Crate Capacity (assu		Coef =			7
Grate Capacity as a Weir (based on Modified HEC22 Method) MINOR MAJOR Interception with OLGoging $Q_{vir} = \begin{bmatrix} 6.6 & 25.7 & ds \\ 4.1 & 16.1 & ds \end{bmatrix}$ ds \\ 4.1 & 16.1 & ds \end{bmatrix} Interception with OLGoging $Q_{vir} = \begin{bmatrix} 6.6 & 25.7 & ds \\ 4.1 & 16.1 & ds \end{bmatrix}$ ds \\ 4.1 & 16.1 & ds \end{bmatrix} Interception with OLGoging $Q_{vir} = \begin{bmatrix} 7.8 & 18.1 & ds \\ 11.2 & 15.7 & ds \end{bmatrix}$ ds \\ ds					-
Interception without Clogging Interception with Clogging Grate Capacity as a Orifice (based on Modified HEC22 Method) Interception with Clogging Grate Capacity as a Orifice (based on Modified HEC22 Method) Interception with Clogging Grate Capacity as Mixed Flow Interception with Clogging Grate Capacity as Mixed Flow Interception with Clogging Grate Capacity (assumes clogged condition) Clogging Coefficient for Multiple Units Clogging Coefficient for Multiple Units Clogging Factor for Multiple Units Clogging Gate Capacity (assumes clogged condition) Curb Opening as a Weir (Desed on Modified HEC22 Method) Interception with Clogging Curb Opening as an Orifice (based on Modified HEC22 Method) Interception with Clogging Curb Opening as an Orifice (based on Modified HEC22 Method) Interception without Clogging Curb Opening Capacity (assumes clogged condition) Curb Opening Capacity (assumes clogged conditi	Grate Capacity as a Weir (based on Modified HEC22 Method)	clog –			
Interception with Clogging Grate Capacity as a Orifice (based on Modified HEC22 Method) Interception with Clogging Grate Capacity as Mixed Flow Interception with Clogging Grate Capacity (assumes clogged condition) Carter Capacity (assumes clogged condition) Clogging Coefficient for Multiple Units Clogging Carbon Modified HEC22 Method) Interception with Clogging Quant = 3.0 Tifice (based on Modified HEC22 Method) Interception with Clogging Quant = 5.0 Ti 3.7 cfs Curb Opening Capacity as Mixed Flow Interception with Clogging Quant = 5.0 Ti 3.7 cfs Resultant Street Conditions Total Intel Length Resultant Street Conditions Curb Opening Capacity (assumes clogged condition) Curb Opening Capac		O _{ut} =			cfs
Grate Capacity as a Orifice (based on Modified HEC22 Method) MINOR MINOR MINOR Interception with Ologging Q_{al} 11.2 15.7 cfs Grate Capacity as Mixed Flow MINOR MAJOR MINOR MAJOR Interception with Ologging Q_{an} 7.8 18.1 cfs Interception with Ologging Q_{ans} 4.8 11.3 cfs Clogging Coefficient for Multiple Units Code = 1.00 1.00 1.00 Clogging Factor for Multiple Units Code = 1.00 1.00 1.00 Curb Denning as a Weir (based on Modified HEC22 Method) MINOR MAJOR MINOR MAJOR Interception with Clogging Q_{an} 3.0 16.9 cfs Curb Denning as an Orifice (based on Modified HEC22 Method) MINOR MAJOR MINOR MAJOR Interception with Clogging Q_{an} 11.4 15.0 cfs cfs Curb Opening as an Orifice (based on Modified HEC22 Method) MINOR MAJOR minor cfs Interception with Clogging Q_{an} 11.4 15.0 cfs cfs				-	
Interception without Clogging $Q_{cin} = 11.2 15.7 \text{ cfs}$ Interception with Clogging $Q_{cin} = 7.8 18.1 \text{ cfs}$ Interception without Clogging $Q_{cin} = 7.8 18.1 \text{ cfs}$ Interception without Clogging $Q_{cin} = 4.8 11.3 \text{ cfs}$ Resulting Grate Capacity (assumes clogged condition) Quarts = 4.1 9.8 cfs Quarts = 0.00 1.00 Quarts = 1.00 1.00 Quarts = 1.00 1.00 Quarts = 1.00 1.00 Quarts = 1.00 1.00 Quarts = 1.14 15.0 cfs Quarts = 5.0 13.7 cfs Resultant Street Conditions Resultant Street Conditions Conto Quarts Quarts = 5.0 13.7 cfs Resultant Street Conditions Conto Quarts = 2.8 12.6 cfs Resultant Street Conditions Conto Quarts = 0.0 0.0 0.0 inches Low Head Performance Reduction (Calculated) Depth for Curb Opening Quarts = 5.0 13.7 cfs Resultant Street Conditions Curb Opening Capacity (assumes clogged condition) Curb Opening Capacity (assumes clogged condition) Curb Opening Quarts = 5.0 13.7 cfs Resultant Street Conditions Curb Opening Capacity (assumes clogged condition) Curb Opening Capacity (assumes clogged condition) Curb Opening Capacity (assumes clogged condition) Quarts = 0.0 0.0 0.0 inches Parts = 0.0 0.0 0.0 inches Parts = 0.0 1.00 1.00 Results RF _{Contest} = 0.71 1.00 RADOR Forents = 0.71 1.00 RADOR For		Ewa			
Interception with Clogging $Q_{as} = \frac{7.0}{7.0}$ 9.8 cfs Grate Capacity as Mixed Flow MAIOR Interception without Clogging $Q_{ms} = \frac{7.8}{4.8}$ 11.3 cfs Resulting Grate Capacity (assumes cloged condition) Qeares = 4.1 9.8 cfs Curb Opening Coefficient for Multiple Units Cloudeted) MINOR MAIOR Clogging Factor for Multiple Units Cloudeted) Coefficient for Multiple Units Clogging Factor for Multiple Units Clogging Factor for Multiple Units Clogging Factor for Multiple Units Clogging (Q_{ms} = 3.0 16.9 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.		0-: =[cfs
Grate Capacity as Mixed Flow MINOR MAJOR Interception without Clogging $Q_{mi} =$ 7.8 18.1 cfs Resulting Grate Capacity (assumes clooged condition) $Q_{max} =$ 4.3 9.8 cfs Curb Opening How Analysis (Calculated) MINOR MAJOR MINOR Clogging Coefficient for Multiple Units Coef = 1.00 1.00 Clogging Coefficient for Multiple Units Coef = 1.00 1.00 0.08 0.08 Curb Opening as a Weir (based on Modified HEC22 Method) MINOR MAJOR MINOR MAJOR Interception with Clogging Q _{wi} = 3.0 16.9 cfs Curb Opening as an Orifice (based on Modified HEC22 Method) MINOR MAJOR MINOR Interception with Clogging Q _{wi} = 3.0 16.9 cfs Curb Opening Capacity as Mixed Flow MINOR MAJOR MINOR MAJOR Interception with Clogging Q _{wi} = 5.0 13.7 cfs Interception with Clogging Q _{wi} = 5.0 13.7 cfs Resultant Street Conditions MINOR MAJOR ffe				-	
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Total Inlet Interception Capacity (assumes clogged condition) Q _a = 6.2 20.1 cfs					
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK) Q PEAK REQUIRED = 2.8 6.8 cfs	Total Inlet Interception Capacity (assumes clogged condition)			-	
	Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	Q PEAK REQUIRED =	2.8	6.8	cfs

APPENDIX C:

MS4 COMPLIANCE SUMMARY



The purpose of this worksheet is to document conformance with the Town of Castle Rock's MS4 permit with regard to permanent water quality on land disturbance projects.

Project Name Castle View Apartments, Lot 2 North, The Me	eadows PD Filing	No. 19
Project Owner Castle View Owner LLC		
Project Location Town of Castle Rock		
ToCR Project Number SDP22-0032		
Total Site Area 5.467	_acres	
Total Size of Common Plan of Development		acres
Check all that apply:		
Project within Plum Creek Basin		
Project within Plum Creek Basin Project within Cherry Creek Basin		

- 1. The water quality control measure(s) for applicable development sites shall meet one of the following base design standards as per the SDDTCM Section 14.4. Please select all design standards that were applied to meet conformance with the MS4 on this site.
 - □ WQCV standard
 - Pollutant removal standard
 - **Runoff reduction standard**
 - Applicable site draining to regional WQVC control measure (accepts drainage prior to discharging to WOTS)
 - □ Applicable site draining to regional WQVC control facility (with receiving pervious area control measure upstream of WOTS)
 - □ Constrained redevelopment sites standard
 - Imperviousness of existing site ____/ (Imp. Ac/Site Ac) =___%
 - Variance required TCV No. ______
 - □ Existing control measure with WQCV per previous criteria standards
 - Reference Construction Permit No. ______
 - □ Cherry Creek Basin only, choose one: □ Tier 1 □ Tier 2 □ Tier 3
 - □ No control measures provided (See Permanent WQ Worksheet for applicability)

Summary of Water Quality Conformance to MS4 Permit

2. Was an exclusion to water quality applied as per SDDTCM Sectioi. If yes, please select all that apply, provide total exclude	
applicable: TCV No	a impervious area(s) and submit variance, as
Pavement management site	
Excluded impervious area:	acres
Excluded roadway redevelopment	
Excluded impervious area:	acres
Excluded existing roadway areas	
Excluded impervious area:	acres
\Box Above ground and below ground utilities	
Large lot single family home	
Non-residential and non-commercial infiltration	ation
Excluded impervious area:	acres
\Box Land disturbance for land to remain undeve	loped
Excluded impervious area:	acres
Stream Stabilization Sites	
Excluded impervious area:	acres
□ Trails	
Excluded impervious area:	acres
Oil and Gas Exploration	
3. For Development and Redevelopment sites, following any exclusion site excluded up to 20% of the site and not to exceed one acre?	

If yes, complete the following:

Excluded area: ______ acres Total Site area: ______ acres, _____% site excluded

4. For Constrained sites, was any portion of the site excluded up to 50% of the site and not to exceed 50% of the impervious area? Yes No

If yes, complete the following:

Excluded area:	 acres

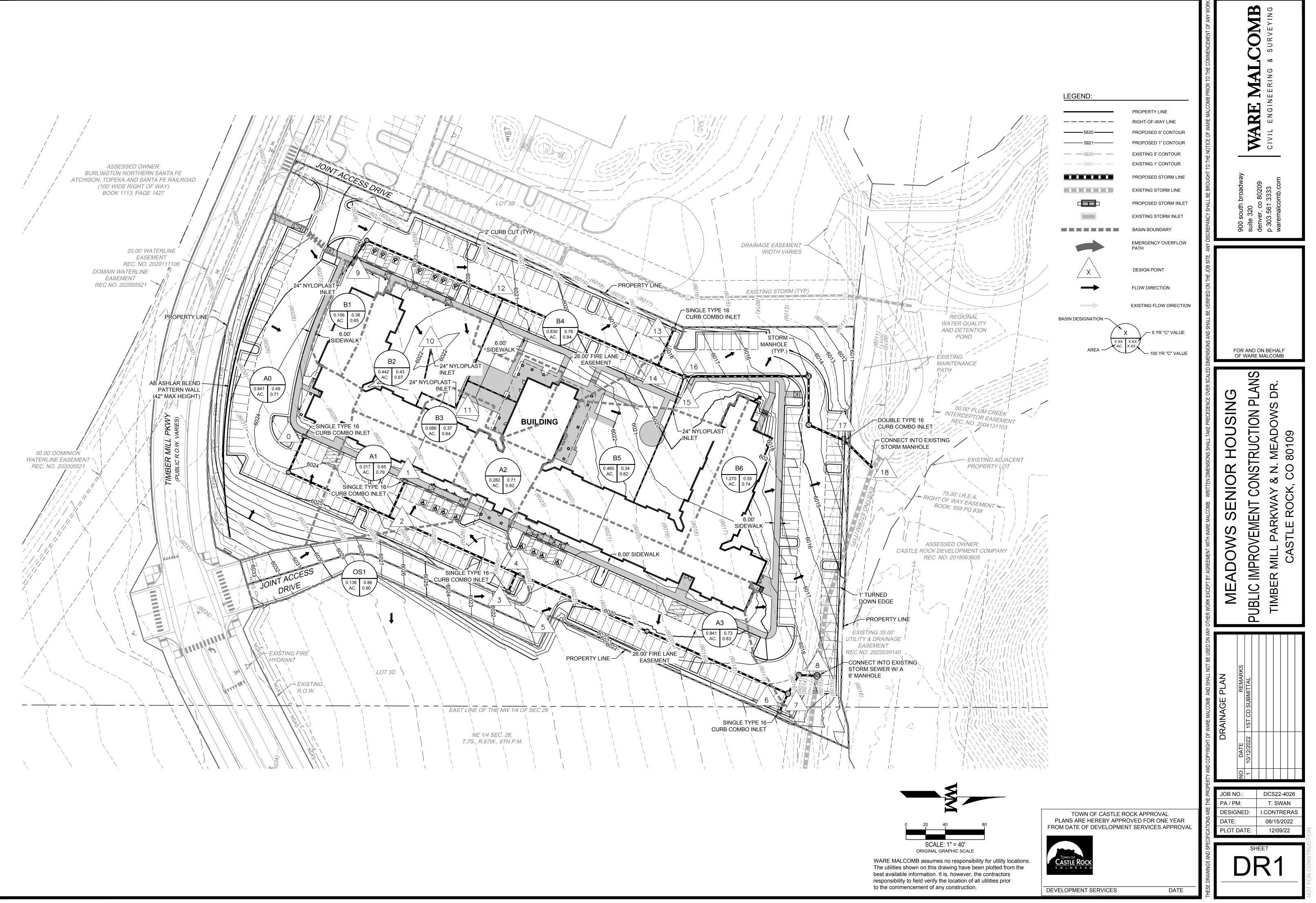
Excluded impervious area: ______ acres

Total Site area: ______ acres, _____ % site excluded

Total Impervious area: ______ acres, _____ % impervious excluded

APPENDIX D:

DRAINAGE MAP



CAUTION: IF THIS SHEET IS NOT 24"x36" IT IS A REDUCED PRINT

APPENDIX D:

EXCERPTS OF PHASE III DRAINGAE REPORT FOR THE MEADOWS FILING NO. 19 LOT 2 NORTH PROJECT NO. CD21-0042



PHASE III DRAINAGE REPORT FOR The Meadows Filing No. 19 Lot 2 North Castle Rock, CO Project No. CD21-0042

PREPARED FOR:

Castle Rock Development Co. 3033 e. 1st Ave. #310 Denver, Colorado 80206 303-394-5500 Contact: R.C Hanisch

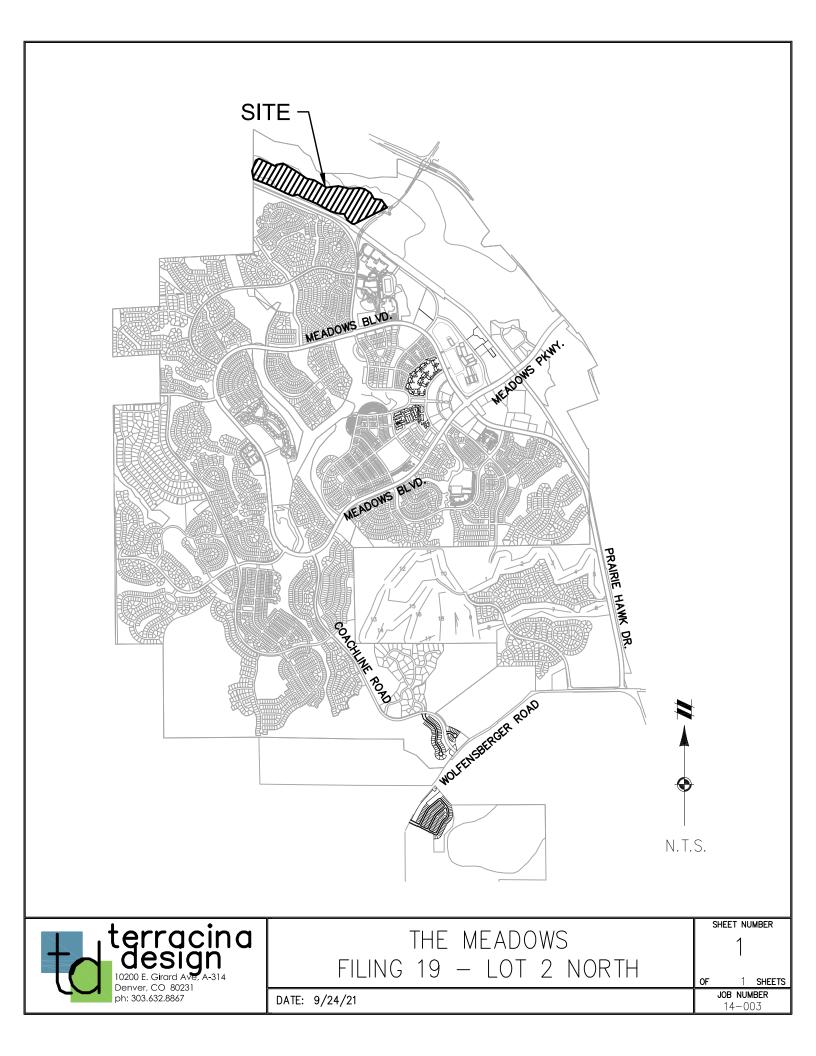
PREPARED BY:

Terracina Design, LLC 10200 E. Girard Avenue Building A, Suite 314 Denver, CO 80231 Phone: 303-632-8867 Contact: Martin Metsker, PE Project Number: 14-003

FEBRUARY 2022

terracina design

Landscape Architecture, Planning & Engineering 10200 E. Girard Avenue, A-314. Denver, CO 80231 PH: 303.632.8867





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Percent Impervious Calculations

					Streets		
		Total	Historic	Roof	Paved	Gravel	
			2%	90%	100%	40%	
Basin Id	Design	Total Basin					Weighted %
Dasinitu	Point	Area	Area	Area	Area	Area	Impervious
A01	A01	2.22	0.00	2.22			90.0%
A02	A02	6.71	0.00	6.71			90.0%
A03	A03	0.48	0.08		0.40		83.2%
A04	A04	0.69	0.13		0.56		82.1%
A05	A05	2.65	0.00	2.65			90.0%
A06	A06	9.73	0.00	9.73			90.0%
A07	A07	7.59	0.00	7.59			90.0%
A08	A08	2.08	2.08				2.0%
A09	A09	0.49	0.12		0.37		76.4%
A10	A10	0.73	0.13		0.60		82.0%
B1	B1	7.75	0.00	7.75			90.0%
C1	C1	0.58	0.21		0.37		63.9%
C2	C2	0.82	0.19		0.64		77.9%
C3	C3	1.91	0.00	1.91			90.0%
C4	C4	2.00	0.00	2.00			90.0%
C5	C5	4.76	0.00	4.76			90.0%
C6	C6	0.95	0.00	0.28		0.68	54.5%
C7	C7	0.74	0.74				2.0%
C8	C8	1.35	0.34		1.00		75.0%
C9	C9	1.36	0.62		0.74		55.1%
CO1	CO1	4.56	2.49			2.07	19.3%
CO2	CO2	3.79	2.22			1.56	17.7%
D1	D1	4.80	0.66		0.37	3.77	39.4%
C10	C10	0.14	0.05		0.09		64.6%
C11	C11	0.09	0.03		0.06		65.5%



Project Name: Meadows Filing 19 Lot 2 North Prepared By: MJG

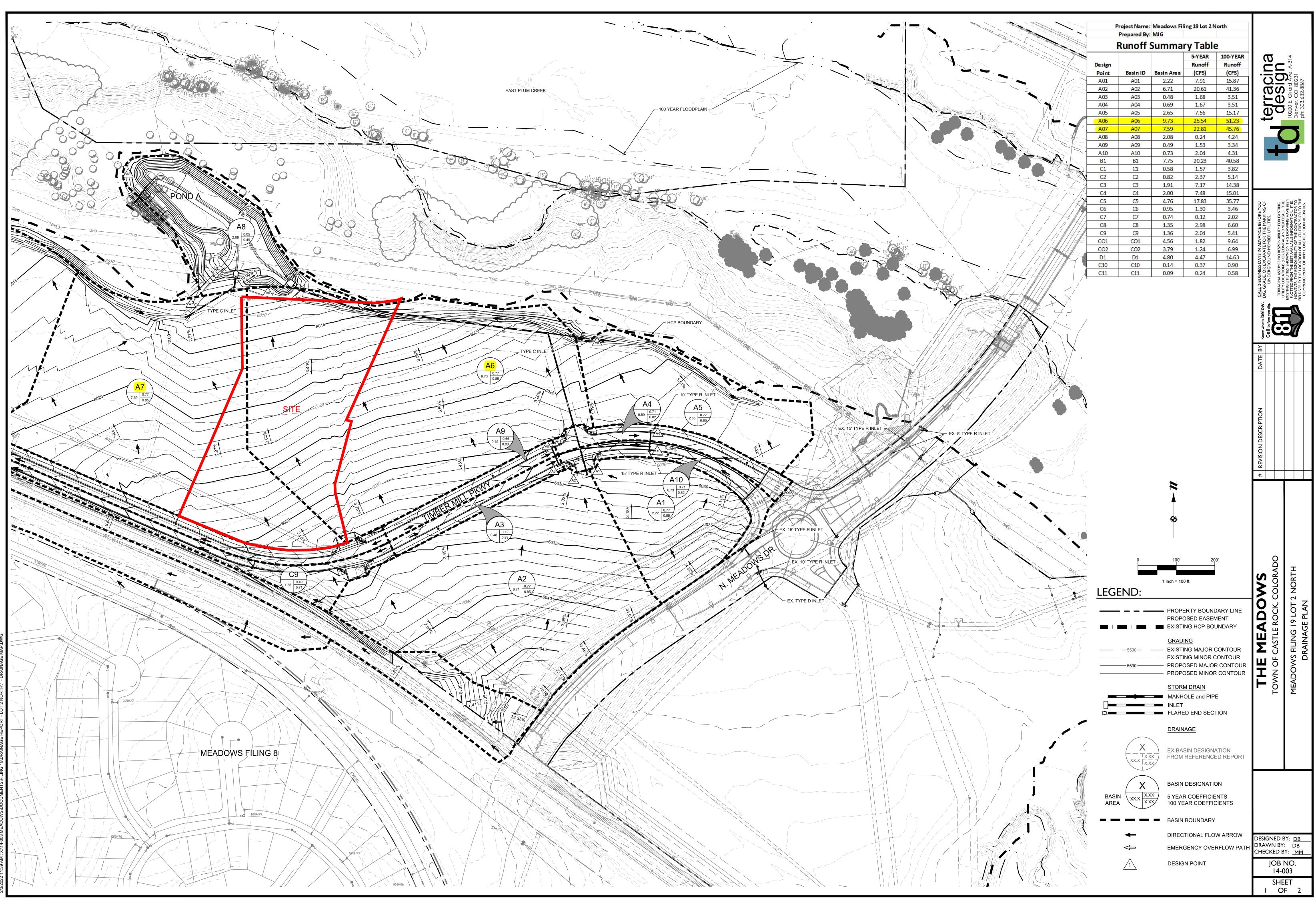
Peak Runoff Rational Method (5-Year Event)

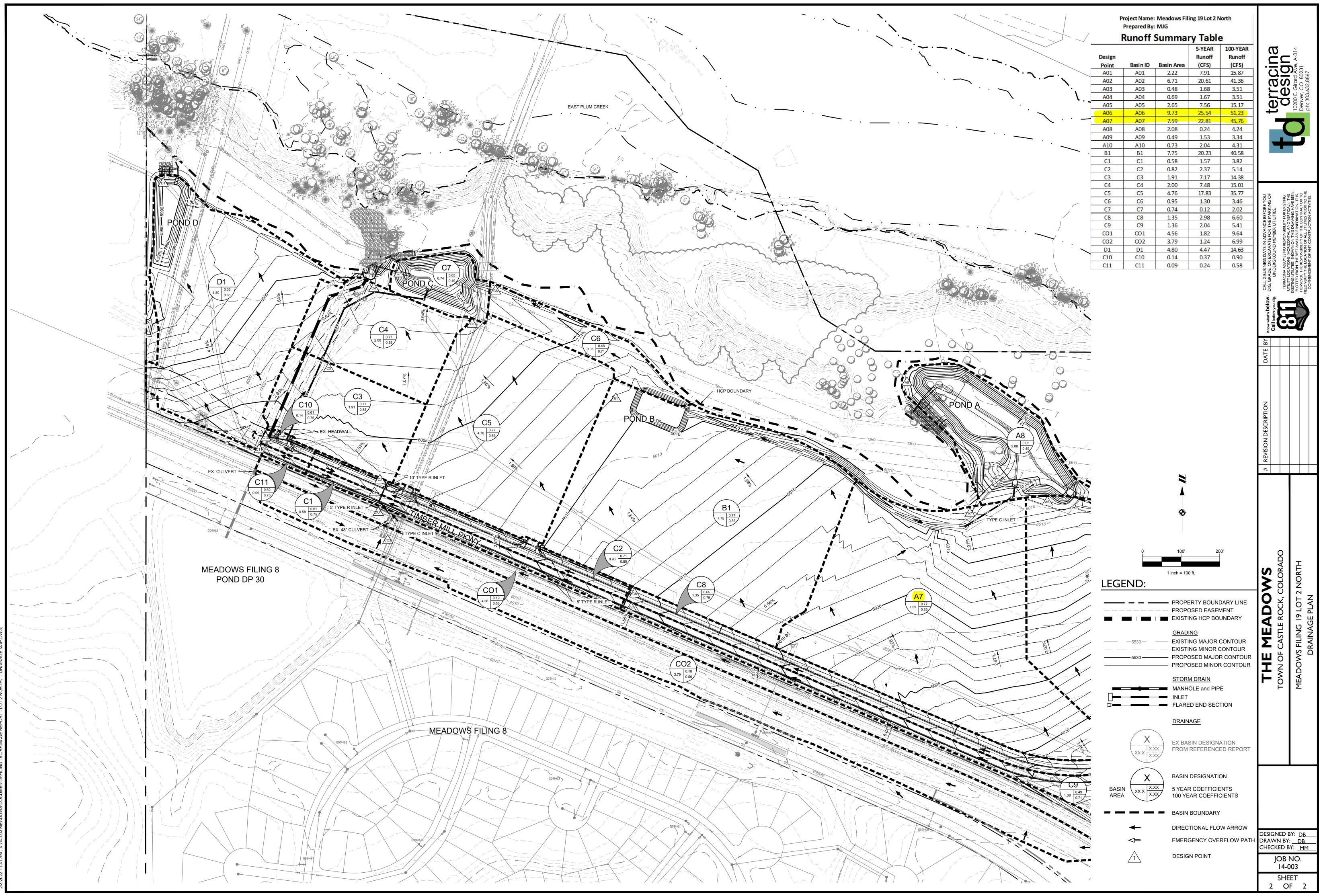
Rainfall Depth-Duration-Frequency (1-hr) =						1.43	
Design		Basin	Runoff Coeff	T_c		I	Q
Point	Basin ID	Area (Ac)	(5-Year)	(min)	СХА	(in/hr)	(cfs)
A01	A01	2.22	0.77	6.0	1.71	4.62	7.91
A02	A02	6.71	0.77	9.3	5.18	3.98	20.61
A03	A03	0.48	0.72	5.0	0.35	4.85	1.68
A04	A04	0.69	0.71	13.3	0.49	3.43	1.67
A05	A05	2.65	0.77	11.2	2.05	3.69	7.56
A06	A06	9.73	0.77	13.6	7.52	3.39	25.54
A07	A07	7.59	0.77	9.9	5.87	3.89	22.81
A08	A08	2.08	0.05	29.3	0.11	2.28	0.24
A09	A09	0.49	0.66	5.7	0.33	4.69	1.53
A10	A10	0.73	0.71	9.6	0.52	3.93	2.04
B1	B1	7.75	0.77	13.8	5.99	3.38	20.23
C1	C1	0.58	0.56	5.0	0.32	4.85	1.57
C2	C2	0.82	0.67	7.7	0.56	4.27	2.37
C3	C3	1.91	0.77	5.0	1.48	4.85	7.17
C4	C4	2.00	0.77	5.0	1.54	4.85	7.48
C5	C5	4.76	0.77	5.0	3.68	4.85	17.83
C6	C6	0.95	0.48	19.8	0.46	2.83	1.30
C7	C7	0.74	0.05	17.1	0.04	3.04	0.12
C8	C8	1.35	0.65	13.5	0.87	3.41	2.98
C9	C9	1.36	0.49	16.6	0.66	3.09	2.04
CO1	CO1	4.56	0.19	34.4	0.88	2.07	1.82
CO2	CO2	3.79	0.18	42.0	0.68	1.82	1.24
D1	D1	4.80	0.36	23.3	1.72	2.59	4.47
C10	C10	0.14	0.56	5.0	0.08	4.85	0.37
C11	C11	0.09	0.57	5.0	0.05	4.85	0.24



Peak Runoff Rational Method (100-Year Event)

Rainfall Depth-Duration-Frequency (1-hr) =						2.60	
Design		Basin	Runoff Coeff	T_c		I	Q
Point	Basin ID	Area (Ac)	(100-Year)	(min)	СХА	(in/hr)	(cfs)
A01	A01	2.22	0.85	6.0	1.89	8.39	15.87
A02	A02	6.7054	0.85300	9.3100	5.72	7.23	41.36
A03	A03	0.48	0.83	5.0	0.40	8.82	3.51
A04	A04	0.69	0.82	13.3	0.56	6.23	3.51
A05	A05	2.65	0.85	11.2	2.26	6.71	15.17
A06	A06	9.73	0.85	13.6	8.30	6.17	51.23
A07	A07	7.59	0.85	9.9	6.48	7.07	45.76
A08	A08	2.08	0.49	29.3	1.02	4.14	4.24
A09	A09	0.49	0.80	5.7	0.39	8.52	3.34
A10	A10	0.73	0.82	9.6	0.60	7.15	4.31
B1	B1	7.75	0.85	13.8	6.61	6.14	40.58
C1	C1	0.58	0.75	5.0	0.43	8.82	3.82
C2	C2	0.82	0.80	7.7	0.66	7.76	5.14
C3	C3	1.91	0.85	5.0	1.63	8.82	14.38
C4	C4	2.00	0.85	5.0	1.70	8.82	15.01
C5	C5	4.76	0.85	5.0	4.06	8.82	35.77
C6	C6	0.95	0.71	19.8	0.67	5.14	3.46
C7	C7	0.74	0.49	17.1	0.37	5.53	2.02
C8	C8	1.35	0.79	13.5	1.07	6.19	6.60
C9	C9	1.36	0.71	16.6	0.96	5.62	5.41
CO1	CO1	4.56	0.56	34.4	2.57	3.76	9.64
CO2	CO2	3.79	0.56	42.0	2.11	3.32	6.99
D1	D1	4.80	0.65	23.3	3.10	4.72	14.63
C10	C10	0.14	0.75	5.0	0.10	8.82	0.90
C11	C11	0.09	0.75	5.0	0.07	8.82	0.58





1:41 AM ; X:\14-003 MEADOWS\DOCUMENTS\FILING 19\DRAINAGE REPORT - LOT 2 NORTH\1 - DRAINAGE MAP.