

January 6, 2017

Mr. Craig Perl  
City of Aurora  
15151 East Alameda Parkway  
Aurora, CO 80012

**RE: DRAINAGE LETTER FOR  
CONFLUENT CENTER 70 SUBDIVISION  
FILING 1, LOT 1, BLOCK 1  
CITY OF AURORA, COLORADO**

The purpose of this letter is to detail the changes proposed to the approved Civil Construction Plans for the Confluent Center 70 site (COA Plan #215152). In order to accommodate the proposed tenant, the following changes will be made to the approved site plan:

- A half-height (2.0'), 4-bay truck dock will be constructed on the southwest side of the building. A trench drain will be installed in the proposed truck dock.
- Parking stalls will be removed to the south of the building, to provide queuing area for the new truck docks.
- A dumpster enclosure will be added adjacent to the current trash enclosure to accommodate the tenant's proposed use.

The addition of the truck dock will result in the division of basin W4 into two basins – W4a and W4b. W4a will continue to drain to the storm inlet 6, while W4b will drain to the new truck dock trench drain. W4a and W4b will generate 0.86-cfs and 0.71-cfs of runoff, respectively, in the 100-year storm event. The imperviousness of basins W3 and W4 will increase slightly with the removal of parking landscape islands. The overall western portion of the site will increase in imperviousness from 82.2% to 82.5%. This will result in an increase in runoff from 24.22-cfs to 24.32-cfs in the 100-year storm event. These increases in imperviousness and runoff are negligible and do not affect the required detention volumes for the pond.

The addition of the dumpster enclosure will result in an adjustment of the boundary between basin E10 and E11. The imperviousness of basin E10 will increase with the addition of the paved dumpster enclosure. The overall eastern portion of the site will increase in imperviousness from 77.6% to 77.9%. This will result in an increase in runoff from 28.91-cfs to 28.94-cfs in the 100-year storm event. These increases in imperviousness and runoff are negligible and do not affect the required detention volumes for the pond.

A revised drainage plan and calculations detailing the proposed site changes are attached to this letter.

Based on the above information, it is the opinion of the engineer that the proposed changes will not result in a significant deviation from the approved drainage design for the Confluent Center 70 site (COA Plan #215152).

Sincerely,  
MANHARD CONSULTING

Daniel Madruga, P.E.  
Registered Professional Engineer  
State of Colorado No. 36834







**PROPOSED RUNOFF COEFFICIENTS AND IMPERVIOUSNESS**  
**Confluent Center 70**  
**1/6/2016**

Land Use	Runoff Coeff.			Impervious
	2-yr	5-yr	100-yr	
Paving	0.87	0.88	0.93	100%
Gravel	0.15	0.25	0.65	40%
Roofs	0.80	0.85	0.90	90%
Lawns	0.10	0.11	0.15	2%

Soil Type = B

Basin No	Total Area (AC)	Paved Area (AC)	Gravel (AC)	Roofed Area (AC)	Lawn Area (AC)	Composite Runoff Coefficient			Composite Imperviousness (%)
						2 Year	5 Year	100 Year	
W1	1.53	0.90	0.00	0.53	0.10	0.80	0.82	0.87	90.1%
W2	0.20	0.17	0.00	0.00	0.03	0.77	0.78	0.82	86.7%
W3	0.67	0.61	0.00	0.00	0.05	0.81	0.82	0.87	92.1%
W4a	0.11	0.10	0.00	0.00	0.01	0.83	0.84	0.89	94.9%
W4b	0.09	0.09	0.00	0.00	0.01	0.80	0.81	0.86	91.0%
W5	0.49	0.00	0.00	0.49	0.00	0.80	0.85	0.90	90.0%
W6	0.32	0.00	0.03	0.00	0.29	0.10	0.12	0.19	5.1%
SUBTOTAL	3.42	1.88	0.03	1.02	0.49	0.73	0.76	0.81	82.5%
E1	0.48	0.00	0.00	0.48	0.00	0.80	0.85	0.90	90.0%
E2	0.48	0.00	0.00	0.48	0.00	0.80	0.85	0.90	90.0%
E3	0.48	0.00	0.00	0.48	0.00	0.80	0.85	0.90	90.0%
E4	0.49	0.00	0.00	0.49	0.00	0.80	0.85	0.90	90.0%
E5	0.37	0.37	0.00	0.00	0.00	0.87	0.88	0.93	100.0%
E6	0.11	0.11	0.00	0.00	0.00	0.87	0.88	0.93	100.0%
E7	0.25	0.23	0.00	0.00	0.02	0.81	0.82	0.87	92.7%
E8	0.10	0.10	0.00	0.00	0.00	0.84	0.85	0.90	96.3%
E9	0.37	0.35	0.00	0.00	0.02	0.83	0.84	0.89	95.5%
E10	0.32	0.32	0.00	0.00	0.00	0.87	0.88	0.93	100.0%
E11	0.52	0.00	0.05	0.00	0.46	0.11	0.12	0.20	6.0%
E12	0.16	0.00	0.00	0.00	0.16	0.10	0.11	0.15	2.0%
E13	0.11	0.05	0.00	0.00	0.07	0.41	0.42	0.47	41.9%
SUBTOTAL	4.25	1.53	0.05	1.94	0.73	0.70	0.73	0.78	77.9%
U1	0.22	0.00	0.00	0.00	0.22	0.10	0.11	0.15	2.0%
U2	0.42	0.00	0.00	0.00	0.42	0.10	0.11	0.15	2.0%
U3	0.06	0.00	0.00	0.00	0.06	0.10	0.11	0.15	2.0%
U4	0.11	0.00	0.00	0.00	0.11	0.10	0.11	0.15	2.0%
U5	0.48	0.17	0.00	0.00	0.32	0.37	0.38	0.42	35.9%
SUBTOTAL	1.30	0.17	0.00	0.00	1.13	0.20	0.21	0.25	14.6%
TOTAL	8.96	3.58	0.08	2.96	2.35	0.64	0.66	0.71	70.5%

**Confluent Center 70**  
**PROPOSED TIME OF CONCENTRATION**

DATE: 1/6/2016  
CALCULATED BY: LMM

PROJECT: CONAUCO  
DESIGN STORM: PROPOSED

			INITIAL/OVERLAND TIME (ti)			TRAVEL TIME (tt)					tc CHECK (URBANIZED BASINS)			FINAL tc
TRIBUTARY BASINS	AREA Ac (2)	C5 (3)	LENGTH Ft (4)	SLOPE % (5)	ti Min. (6)	LENGTH Ft. (7)	SLOPE % (8)	Conveyance Coefficient	VEL fps (9)	tt Min. (10)	COMP. tc (11)	TOTAL LENGTH (12)	(L/180)+10 Min. (13)	Min. (14)
W1	1.53	0.82	50	1.50	3.13	200	1.50	20	2.45	1.36	4.49	250	11.39	5.00
W2	0.20	0.78	95	5.00	3.35	10	2.65	20	3.26	0.05	3.40	105	10.58	5.00
W3	0.67	0.82	110	6.00	2.95	85	1.00	20	2.00	0.71	3.66	195	11.08	5.00
W4a	0.11	0.84	60	1.50	3.17	2	1.00	20	2.00	0.02	3.19	62	10.34	5.00
W4b	0.09	0.81	60	1.80	3.34	20	2.50	20	3.16	0.11	3.44	80	10.44	5.00
W5	0.49	0.85	210	1.00	6.52	0	0.00	20	0.00	0.00	6.52	210	11.17	5.00
W6	0.32	0.12	90	10.00	7.81	180	1.00	20	2.00	1.50	9.31	270	11.50	5.00
E1	0.48	0.85	210	1.00	6.52	0	0.00	20	0.00	0.00	6.52	210	11.17	5.00
E2	0.48	0.85	210	1.00	6.52	0	0.00	20	0.00	0.00	6.52	210	11.17	5.00
E3	0.48	0.85	210	1.00	6.52	0	0.00	20	0.00	0.00	6.52	210	11.17	5.00
E4	0.49	0.85	210	1.00	6.52	0	0.00	20	0.00	0.00	6.52	210	11.17	5.00
E5	0.37	0.88	55	5.00	1.73	125	1.00	20	2.00	1.04	2.77	180	11.00	5.00
E6	0.11	0.88	40	4.50	1.52	50	3.00	20	3.46	0.24	1.77	90	10.50	5.00
E7	0.25	0.82	35	1.50	2.59	65	1.50	20	2.45	0.44	3.03	100	10.56	5.00
E8	0.10	0.85	65	1.50	3.16	15	1.50	20	2.45	0.10	3.26	80	10.44	5.00
E9	0.37	0.84	70	1.50	3.36	90	0.50	20	1.41	1.06	4.42	160	10.89	5.00
E10	0.32	0.88	70	1.50	2.90	55	0.50	20	1.41	0.65	3.55	125	10.69	5.00
E11	0.52	0.12	200	5.00	14.60	175	0.50	7	0.49	5.89	20.49	375	12.08	12.08
E12	0.16	0.11	15	3.00	4.80	240	0.50	20	1.41	2.83	7.63	255	11.42	5.00
E13	0.11	0.42	40	6.00	4.26	65	2.00	7	0.99	1.09	5.36	105	10.58	5.00
U1	0.22	0.11	40	25.00	3.90	0	0.00	7	0.00	0.00	3.90	40	10.22	5.00
U2	0.42	0.11	15	33.00	2.18	0	0.00	7	0.00	0.00	2.18	15	10.08	5.00
U3	0.06	0.11	15	33.00	2.18	0	0.00	7	0.00	0.00	2.18	15	10.08	5.00
U4	0.11	0.11	10	33.00	1.78	0	0.00	7	0.00	0.00	1.78	10	10.06	5.00
U5	0.48	0.38	25	10.00	3.05	800	1.00	20	2.00	6.67	9.71	825	14.58	5.00

**NOTES:**

$$T_i = [1.8 \times (1.1 - C_5) \times L^{0.5}] / (S_w^{0.33}) \quad *S \text{ IN } \%$$

$$V = (C_v) \times (S_w^{0.33})$$

$$T_i = L / (60 \times V)$$

$$T_c \text{ Check} = 10 + L/180 \text{ (Urbanized Basins Only)}$$

$$T_c \text{ Min} = 10 \text{ Minutes (Per XXX)}$$

Table RO-2—Conveyance Coefficient,  $C_v$

Type of Land Surface	Conveyance Coefficient, $C_v$
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

**Confluent Center 70**  
**15150 East 40th Avenue, Aurora CO**  
**PROPOSED 2-YEAR RUNOFF CALCULATIONS**

DATE: 1/6/2016  
 CALCULATED BY: LMM

PROJECT: CONAUCO

2 Year, 1 Hour Point Rainfall Depth = 0.95 in

Basin	DIRECT RUNOFF							TOTAL RUNOFF				CARRYOVER				
	Design Point	Area (acres)	C2	C x A	Tc (min)	Intensity (in/hr)	Qd = CIA (cfs)	C x A	Tc (min)	Intensity (in/hr)	Qd = CIA (cfs)	C x A	Tc (min)	Intensity (in/hr)	Qd = CIA (cfs)	To Design Point
W1	1	1.53	0.80	1.22	5.00	3.22	3.93									
W2	2	0.20	0.77	0.15	5.00	3.22	0.49									
W3	3	0.67	0.81	0.54	5.00	3.22	1.74									
W5	5	0.49	0.80	0.39	5.00	3.22	1.27									
W4a	4	0.11	0.83	0.09	5.00	3.22	0.29									
W4b		0.09	0.80	0.08	5.00	3.22	0.24									
										W4+W5	1.81					
W6	6	0.32	0.10	0.03	5.00	3.22	0.11									
<b>SUBTOTAL</b>							<b>8.07</b>									
E1	11	0.48	0.80	0.39	5.00	3.22	1.24									
E2	12	0.48	0.80	0.39	5.00	3.22	1.24									
E9	19	0.37	0.83	0.31	5.00	3.22	0.99									
E10	20	0.32	0.87	0.28	5.00	3.22	0.91									
										E1+E2+E9+E10	4.38					
E5	15	0.37	0.87	0.32	5.00	3.22	1.03									
E3	13	0.48	0.80	0.39	5.00	3.22	1.24									
E4	14	0.49	0.80	0.39	5.00	3.22	1.27									
E6	16	0.11	0.87	0.09	5.00	3.22	0.30									
E7	17	0.25	0.81	0.21	5.00	3.22	0.66									
E8	18	0.10	0.84	0.09	5.00	3.22	0.28									
E12	22	0.16	0.10	0.02	5.00	3.22	0.05									
E13	23	0.11	0.41	0.05	5.00	3.22	0.15									
										E3+E4+E6+E7+E8+E12+E13	3.95					
E11	21	0.52	0.11	0.05	12.08	2.38	0.13									
<b>SUBTOTAL</b>							<b>9.49</b>									
U1		0.22	0.10	0.02	5.00	3.22	0.07									
U2		0.42	0.10	0.04	5.00	3.22	0.14									
U3		0.06	0.10	0.01	5.00	3.22	0.02									
U4		0.11	0.10	0.01	5.00	3.22	0.04									
U5		0.48	0.37	0.18	5.00	3.22	0.57									
<b>SUBTOTAL</b>							<b>0.83</b>									
<b>TOTAL</b>							<b>18.40</b>									

NOTES:  
 $I = (28.5 \times P_1) / (10 + T_c)^{0.786}$

**Confluent Center 70**  
**15150 East 40th Avenue, Aurora CO**  
**PROPOSED 100-YEAR RUNOFF CALCULATIONS**

DATE: 1/6/2016  
 CALCULATED BY: LMM

PROJECT: CONAUCO

100 Year, 1 Hour Point Rainfall Depth = 2.6 in

Basin	DIRECT RUNOFF							TOTAL RUNOFF				CARRYOVER				
	Design Point	Area (acres)	C <sub>100</sub>	C x A	Tc (min)	Intensity (in/hr)	Qd = CIA (cfs)	C x A	Tc (min)	Intensity (in/hr)	Qd = CIA (cfs)	C x A	Tc (min)	Intensity (in/hr)	Qd = CIA (cfs)	To Design Point
W1	1	1.53	0.87	1.33	5.00	8.82	11.74									
W2	2	0.20	0.82	0.16	5.00	8.82	1.45									
W3	3	0.67	0.87	0.58	5.00	8.82	5.11									
W5	5	0.49	0.90	0.44	5.00	8.82	3.91									
W4a	4	0.11	0.89	0.10	5.00	8.82	0.86									
W4b		0.09	0.86	0.08	5.00	8.82	0.71									
W6	6	0.32	0.19	0.06	5.00	8.82	0.54			W4+W5	5.48					
<b>SUBTOTAL</b>							24.32									
E1	11	0.48	0.90	0.43	5.00	8.82	3.82									
E2	12	0.48	0.90	0.43	5.00	8.82	3.83									
E9	19	0.37	0.89	0.33	5.00	8.82	2.90									
E10	20	0.32	0.93	0.30	5.00	8.82	2.65									
										E1+E2+E9+E10	13.20					
E5	15	0.37	0.93	0.34	5.00	8.82	3.01									
E3	13	0.48	0.90	0.43	5.00	8.82	3.83									
E4	14	0.49	0.90	0.44	5.00	8.82	3.90									
E6	16	0.11	0.93	0.10	5.00	8.82	0.88									
E7	17	0.25	0.87	0.22	5.00	8.82	1.94									
E8	18	0.10	0.90	0.09	5.00	8.82	0.83									
E12	22	0.16	0.15	0.02	5.00	8.82	0.21									
E13	23	0.11	0.47	0.05	5.00	8.82	0.46									
										E3+E4+E6+E7+E8+E12+E13	12.05					
E11	21	0.52	0.20	0.10	12.08	6.51	0.68									
<b>SUBTOTAL</b>							28.94									
U1		0.22	0.15	0.03	5.00	8.82	0.30									
U2		0.42	0.15	0.06	5.00	8.82	0.56									
U3		0.06	0.15	0.01	5.00	8.82	0.08									
U4		0.11	0.15	0.02	5.00	8.82	0.15									
U5		0.48	0.42	0.20	5.00	8.82	1.79									
<b>SUBTOTAL</b>							2.87									
<b>TOTAL</b>							56.13									

NOTES:  
 $I = (28.5 \times P_1) / (10 + T_c)^{0.786}$

# DETENTION VOLUME BY THE FULL SPECTRUM METHOD

Project: **Confluent Center 70**  
 Basin ID: **SW Pond**

\* User input data  
 shown in blue.

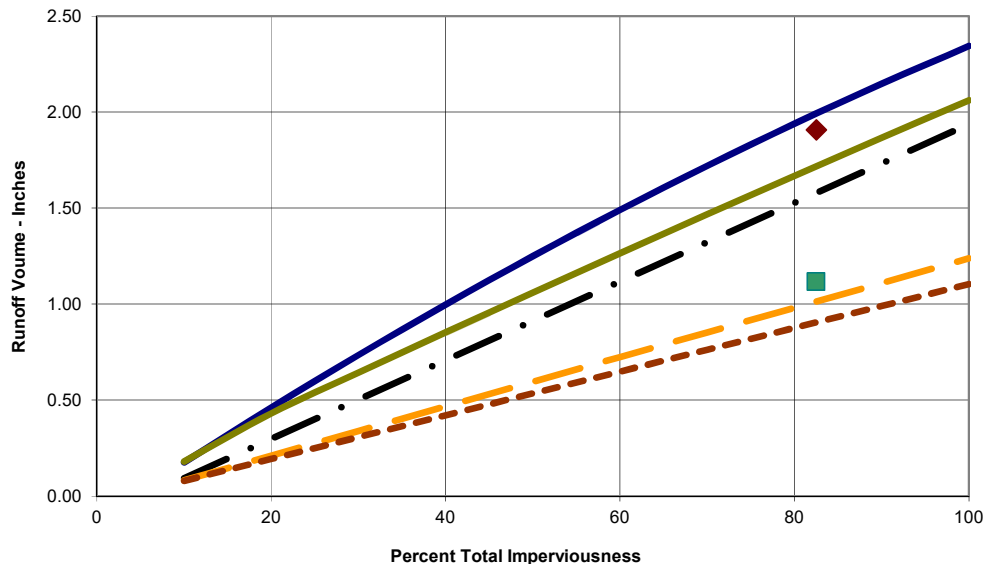
Area of Watershed (acres)	3.42	
Subwatershed Imperviousness	82.5%	
Level of Minimizing Directly Connected Impervious Area (MDCIA)	0	<input type="text" value="0"/> ▼
Effective Imperviousness <sup>1</sup>	82.5%	
Hydrologic Soil Type	Percentage of Area	Area (acres)
Type A		0.0
Type B	100.0%	3.4
Type C or D		0.0

Recommended Horton's Equation Parameters for CUHP		
Infiltration (inches per hour)		Decay Coefficient-- $\alpha$
Initial-- $f_i$	Final-- $f_o$	
4.5	0.6	0.0018

Detention Volumes <sup>2,5</sup>		Maximum Allowable Release Rate, cfs <sup>3</sup>
(watershed inches)	(acre-feet)	
1.12	0.32	Design Outlet to Empty EURV in 72 Hours
1.91	0.54	2.91

Excess Urban Runoff Volume<sup>4</sup>

100-year Detention Volume plus 1/2 WQCV<sup>5</sup>



## Notes:

- 1) Effective imperviousness is based on Figure ND-1 of the Urban Storm Drainage Criteria Manual (USDCM).
- 2) Results shown reflect runoff reduction from Level 1 or 2 MDCIA and are plotted at the watershed's total imperviousness value; the impact of MDCIA is reflected by the results being below the curves.
- 3) Maximum allowable release rates for 100-year event are based on Table SO-1. Outlet for the Excess Urban Runoff Volume (EURV) to be designed to empty out the EURV in 72 hours. Outlet design is similar to one for the WQCV outlet of an extended detention basin (i.e., perforated plate with a micro-pool) and extends to top of EURV water surface elevation.
- 4) EURV approximates the difference between developed and pre-developed runoff volume.
- 5) User has opted to add 1/2 the WQCV to the 100-year detention volume to satisfy local regulations. This is not required per the USDCM.



# DETENTION VOLUME BY THE FULL SPECTRUM METHOD

Project: **Confluent Center 70**  
 Basin ID: **SE Pond**

\* User input data  
 shown in blue.

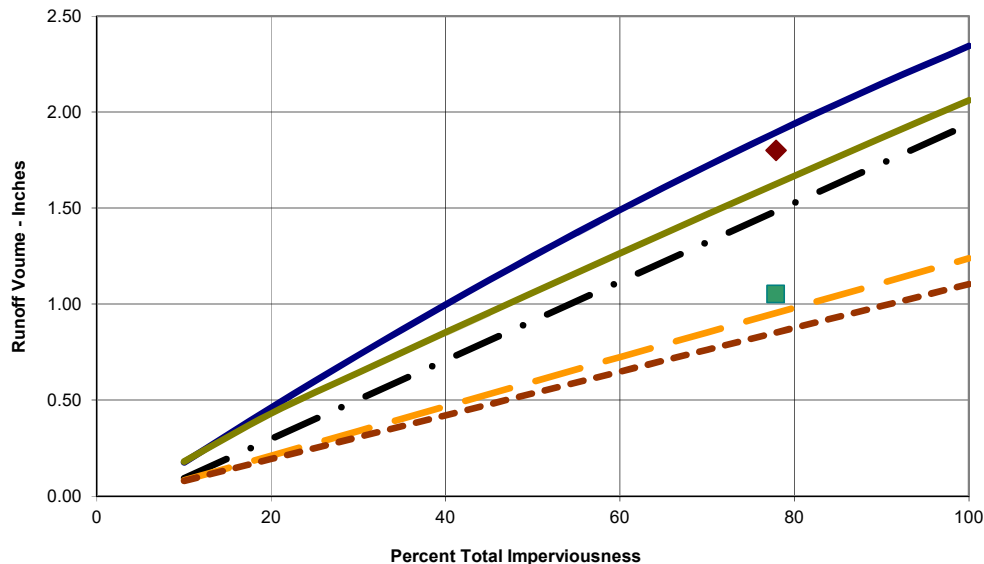
Area of Watershed (acres)	4.25	
Subwatershed Imperviousness	77.9%	
Level of Minimizing Directly Connected Impervious Area (MDCIA)	0	<input type="text" value="0"/>
Effective Imperviousness <sup>1</sup>	77.9%	
Hydrologic Soil Type	Percentage of Area	Area (acres)
Type A		0.0
Type B	100.0%	4.3
Type C or D		0.0

Recommended Horton's Equation Parameters for CUHP		
Infiltration (inches per hour)		Decay Coefficient-- $\alpha$
Initial-- $f_i$	Final-- $f_o$	
4.5	0.6	0.0018

Detention Volumes <sup>2,5</sup>		Maximum Allowable Release Rate, cfs <sup>3</sup>
(watershed inches)	(acre-feet)	
1.05	0.37	Design Outlet to Empty EURV in 72 Hours
1.80	0.64	3.61

Excess Urban Runoff Volume<sup>4</sup>

100-year Detention Volume plus 1/2 WQCV<sup>5</sup>

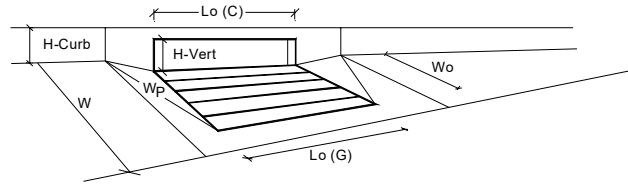


## Notes:

- 1) Effective imperviousness is based on Figure ND-1 of the Urban Storm Drainage Criteria Manual (USDCM).
- 2) Results shown reflect runoff reduction from Level 1 or 2 MDCIA and are plotted at the watershed's total imperviousness value; the impact of MDCIA is reflected by the results being below the curves.
- 3) Maximum allowable release rates for 100-year event are based on Table SO-1. Outlet for the Excess Urban Runoff Volume (EURV) to be designed to empty out the EURV in 72 hours. Outlet design is similar to one for the WQCV outlet of an extended detention basin (i.e., perforated plate with a micro-pool) and extends to top of EURV water surface elevation.
- 4) EURV approximates the difference between developed and pre-developed runoff volume.
- 5) User has opted to add 1/2 the WQCV to the 100-year detention volume to satisfy local regulations. This is not required per the USDCM.

# INLET IN A SUMP OR SAG LOCATION

Project = Confluent Center 70  
Inlet ID = PR Inlet 06 (Design Point 4)



## Design Information (Input)

Type of Inlet

Local Depression (additional to continuous gutter depression 'a' from 'Q-Allow')

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)

## Total Inlet Interception Capacity (assumes clogged condition)

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

	MINOR	MAJOR	
Inlet Type =	CDOT Type R Curb Opening		
a <sub>local</sub> =	3.00	3.00	inches
No =	1	1	
Ponding Depth =	4.0	6.0	inches
	MINOR	MAJOR	<input checked="" type="checkbox"/> Override Depths
L <sub>o</sub> (G) =	N/A	N/A	feet
W <sub>o</sub> =	N/A	N/A	feet
A <sub>ratio</sub> =	N/A	N/A	
C <sub>r</sub> (G) =	N/A	N/A	
C <sub>w</sub> (G) =	N/A	N/A	
C <sub>o</sub> (G) =	N/A	N/A	
	MINOR	MAJOR	
L <sub>o</sub> (C) =	5.00	5.00	feet
H <sub>vert</sub> =	6.00	6.00	inches
H <sub>throat</sub> =	6.00	6.00	inches
Theta =	63.40	63.40	degrees
W <sub>p</sub> =	2.00	2.00	feet
C <sub>r</sub> (C) =	0.20	0.20	
C <sub>w</sub> (C) =	3.60	3.60	
C <sub>o</sub> (C) =	0.67	0.67	
	MINOR	MAJOR	
Q <sub>a</sub> =	1.7	4.8	cfs
Q <sub>PEAK REQUIRED</sub> =	0.3	0.9	cfs

# Fast Track™

» Pre-sloped Trench Drain System



## Fast

Construction cover included to protect channels during rough-in. Longer channels for fewer joints and solid connections for better alignment.

## Versatile

Sloped and neutral channels made from lightweight, durable HDPE material. A variety of grating options for all types of traffic applications. Integral bottom outlet connection or attach end outlet.



# Typical Configurations

## »» Sloping

- FastTrack channels are available pre-sloped (0.75%) or neutral. Systems can be designed using all sloped, all neutral, or both types
- Neutral channels can be used where the ground itself slopes or where excavation depth must be minimized

### All Sloped - One Direction 54 ft



### Sloped & Neutral - One Direction 78 ft



### Neutral / No Slope



## »» Outlet Type

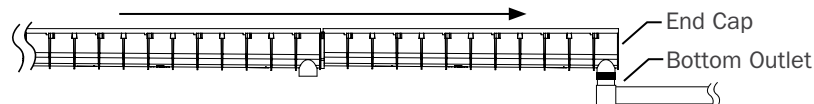
- FastTrack channels are designed with an integral bottom outlet or attach an end outlet for pipe connection
- Bottom and end outlet size is 4" no-hub - make connection to the pipe with standard no-hub couplings

### End Outlet:

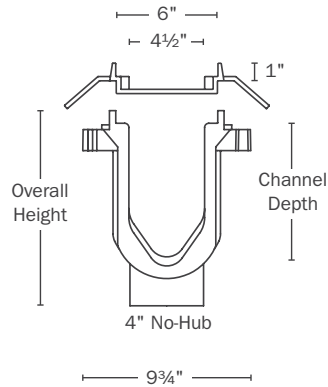


When using end outlets, be sure to allow sufficient slab depth above outlet and drain pipe to prevent cracking.

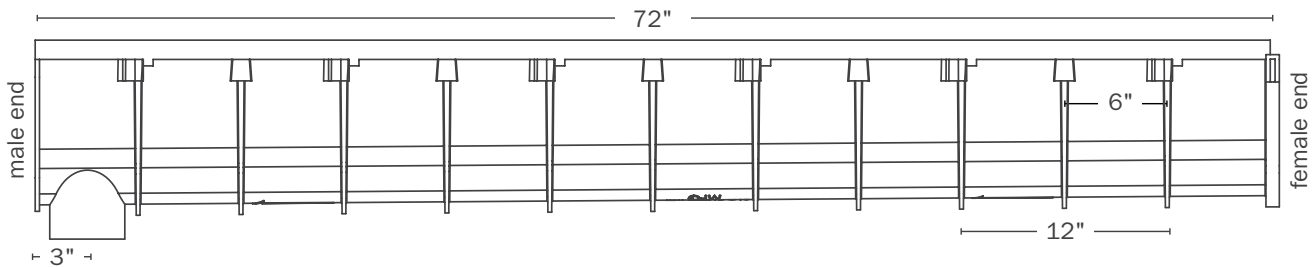
### Bottom Outlet:



# Channel Specs



- U.V. protected, black, high-density polyethylene material
- Channels available pre-sloped (0.75%) or neutral
- All channels include pre-installed grate anchors (6) and construction covers (2)



Channel	Channel Depth		Overall Height <sup>1</sup>	Slope Type	Weight <sup>2</sup> Lbs.	Est. Flow Rate <sup>3</sup>	
	Shallow End	Deep End				GPM	CFS
865-S1	3.63"	4.13"	7.25"	Sloped	15.4	91.23	0.20
865-S2	4.13"	4.63"	7.75"	Sloped	16.4	119.13	0.27
865-N3	4.63"	4.63"	7.75"	Neutral	16.9	—	—
865-S3	4.63"	5.13"	8.25"	Sloped	17.4	147.79	0.33
865-S4	5.13"	5.63"	8.75"	Sloped	18.4	176.97	0.39
865-N5	5.63"	5.63"	8.75"	Neutral	18.9	—	—
865-S5	5.63"	6.13"	9.25"	Sloped	19.4	206.55	0.46
865-S6	6.13"	6.63"	9.75"	Sloped	20.4	236.42	0.53
865-N7	6.63"	6.63"	9.75"	Neutral	20.9	—	—
865-S7	6.63"	7.13"	10.25"	Sloped	21.4	266.52	0.59
865-S8	7.13"	7.63"	10.75"	Sloped	21.4	296.81	0.66
865-N9	7.63"	7.63"	10.75"	Neutral	21.9	—	—
865-S9	7.63"	8.13"	11.25"	Sloped	22.4	327.23	0.73

**1** Add 1" to overall height when using iron frame

**2** Weight includes grate anchors and construction covers

**3** Estimated flow rate is for the single channel only (open ends, no grate), and is based on calculation using Manning's equation