



**FINAL DRAINAGE REPORT
FOR
JACKSON CREEK NORTH FILING NO. 2**

May 15, 2019

Prepared for:

Colorado Structures, Inc.
540 Elkton Drive, Suite 202
Colorado Springs, CO 80907

WestWorks Job #91805

**FINAL DRAINAGE REPORT for
JACKSON CREEK NORTH FILING NO. 2**

Engineer's Statement:

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the City/County for drainage reports and said report is in conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors, or omissions on my part in preparing this report.

Chad D. Kuzbek, Colorado PE #35751
For and on behalf of WestWorks Engineering

Date

Developer's Statement:

I, the developer have read and will comply with all of the requirements specified in this drainage report and plan.

Colorado Structures, Inc.
Business Name

By: _____

Title: _____

Address: 540 Elkton Drive, Suite 202

Colorado Springs, CO 80907

Town of Monument:

Filed in accordance with Section 17.45 of the Zoning Ordinance for the Town of Monument, and Section 16.12.060 of the Subdivision Code for the Town of Monument, revised February, 2007.

Director of Development Services

Date

FINAL DRAINAGE REPORT for JACKSON CREEK NORTH FILING NO. 2

PURPOSE

The purpose of this drainage report is to identify specific solutions to problems on site and off-site resulting from the development of this subdivision to be platted.

GENERAL LOCATION AND DESCRIPTION

Jackson Creek North Filing No. 2 (herein referred to as "Site") consists of 25.7 acres within portions of Sections 23, 24, 25 & 26, Township 11 South, Range 67 West of the Sixth P.M. in the Town of Monument, El Paso County, Colorado. This site is bounded by unplatted land to the north, unplatted & Remington Hills subdivision to the east, Leather Chaps Drive to the south, and Jackson Creek Assisted Living to the west. Proposed development of this site consists of 85 single-family residential lots with associated roadways, sidewalks, and landscaping. The site ultimately drains to Teachout Creek.

The site is currently undeveloped. Most of the ground is gently to moderately sloping and drains generally to the north and west. Existing soils on the site consist mostly of Pring coarse sandy loam (Map Symbol 71) with a small amount of Tomah-Crowfoot complex (Map Symbol 93). The average existing soil condition on the site reflects the characteristics of Hydrologic Soil Group 'B' as designated in the "Soil Survey of El Paso County Area," prepared by the USDA NRCS.

DRAINAGE BASINS AND SUB-BASINS

Existing Drainage Conditions:

The site is undeveloped and covered mostly with native grasses. Most of the ground is gently to moderately sloping and drains generally to the north and west. The site is impacted by off-site flows from existing and future subdivisions to the east and north.

Due to large tributary area to the east of the site (>90-acres) the existing conditions were analyzed using the SCS TR-20 hydrologic methodology for the 10YR-24HR (2.9" depth) and 100YR-24HR (4.4" depth) storm depths.

Design Point EX1 ($Q_{10} = 201$ CFS and $Q_{100} = 472$ CFS)

Design Point EX1 (DP-EX1) is 2 of 3 outfall structures from existing Pond C. These outfall structures discharge to existing triple 22"x34" elliptical RCP culverts under Jackson Creek Parkway. Draining to DP-EX1 are undeveloped flows from Basin EXC1 and developed flows from Basins T-13 and T-11.

Design Point EX2 ($Q_{10} = 10$ CFS and $Q_{100} = 27$ CFS)

DP-EX2 discharges into existing Pond C. Draining to DP-EX2 are undeveloped flows from Basin EXC2 and developed flows from Basin EXC4.

Design Point EX3 ($Q_{10} = 49$ CFS and $Q_{100} = 104$ CFS)

DP-EX3 discharges into existing Pond C. Draining to DP-EX3 are undeveloped flows from Basin EXC3 and developed flows from Basin T-9.

Design Point EX4 ($Q_{10} = 15$ CFS and $Q_{100} = 28$ CFS)

DP-EX4 is the existing developed Senior Living site that discharges into existing Pond C via an existing 42" RCP storm drain.

Design Point T9 ($Q_{10} = 46$ CFS and $Q_{100} = 91$ CFS)

DP-T9 is an existing culvert under Higby Road. Basin characteristics are taken from the "Drainage Master Plan for Jackson Creek, Teachout Creek, and No Name Creek, Final Report," prepared by Ayres Associates, dated October 2002 (herein referred to as DMP). Existing developed flows from Basin T-9 go through Pond C.

Design Point T11 ($Q_{10} = 174$ CFS and $Q_{100} = 357$ CFS)

DP-T11 is an existing culvert under Higby Road. Basin characteristics are taken from the DMP. Existing developed flows from Basin T-11 go through Pond C.

Design Point T13 ($Q_{10} = 16$ CFS and $Q_{100} = 62$ CFS)

DP-T13 represents existing culverts under Higby Road. Basin characteristics are taken from the DMP. Existing developed flows from Basin T-13 go through Pond C.

Developed Drainage Conditions:

The Site will be developed into 85 single-family residential lots with associated roadways, sidewalks, and landscaping.

The developed drainage conditions are broken into 2 separate hydrologic methodologies. The proposed inlets and storm drain for this subdivision is a smaller basin analysis using the Rational Method. The overall sizing of stormwater quality and detention (Pond C) and major storm drain trunk lines includes acreages over 90; therefore the SCS TR-20 method is used. Assumptions and calculations are included for both methodologies. For the Rational Method, the following basin naming characteristics were used:

The Rational Method developed site is divided into drainage basins as follows:

Design Point 1 ($Q_5 = 4$ CFS and $Q_{100} = 10$ CFS)

DP1 is a proposed 10' at-grade inlet collecting flows from Basin C1. This at-grade inlet will collect flows of $Q_5 = 3.6$ CFS and $Q_{100} = 6.7$ CFS. Flow-by will continue to DP2.

Design Point 2 ($Q_5 = 2$ CFS and $Q_{100} = 7$ CFS)

DP2 is a proposed 10' at-grade inlet collecting flows from Basin C2 and flow-by from DP1. This at-grade inlet will collect flows of $Q_5 = 2$ CFS and $Q_{100} = 5.5$ CFS. Flow-by will continue to DP3.

Design Point 3 ($Q_5 = 5$ CFS and $Q_{100} = 15$ CFS)

DP3 is a proposed 15' sump inlet collecting flows from Basin C3 and flow-by from DP2.

Design Point 4 ($Q_5 = 2$ CFS and $Q_{100} = 5$ CFS)

DP4 is a proposed 5' sump inlet collecting flows from Basin C4. Combined flows from DP1-4 are routed via storm drain design point SD4 to an existing 36" RCP storm drain stub installed with the Jackson Creek Senior Living site. Flows into this stub are carried to Pond C.

Design Point 5 ($Q_5 = 2$ CFS and $Q_{100} = 6$ CFS)

DP5 represents the sheet flow from rear lots in Basin C5 onto the adjacent property to the west. The Jackson Creek Senior Living project was designed anticipating these flows. Future development north of the Senior Living site will need to account for this sheet flow.

Design Point 6 ($Q_5 = 3$ CFS and $Q_{100} = 8$ CFS)

DP6 is a proposed 10' at-grade inlet collecting flows from Basin C6. This at-grade inlet will collect flows of $Q_5 = 3$ CFS and $Q_{100} = 6$ CFS. Flow-by will continue to DP10.

Design Point 7 ($Q_5 = 3$ CFS and $Q_{100} = 7$ CFS)

DP7 is a proposed 10' at-grade inlet collecting flows from Basin C7. This at-grade inlet will collect flows of $Q_5 = 3$ CFS and $Q_{100} = 5.6$ CFS. Flow-by will continue to DP10.

Design Point 8 ($Q_5 = 3$ CFS and $Q_{100} = 8$ CFS)

DP8 is a proposed 10' at-grade inlet collecting flows from Basin C8. This at-grade inlet will collect flows of $Q_5 = 3$ CFS and $Q_{100} = 5.9$ CFS. Flow-by will continue to DP10.

Design Point 9 ($Q_5 = 1$ CFS and $Q_{100} = 3$ CFS)

DP9 is a proposed 5' at-grade inlet collecting flows from Basin C9. This at-grade inlet will collect flows of $Q_5 = 1$ CFS and $Q_{100} = 2.1$ CFS. Flow-by will continue to DP10.

Design Point 10 ($Q_5 = 4$ CFS and $Q_{100} = 15$ CFS)

DP10 is a proposed 15' and 5' sump inlets collecting flows from Basin C10 and flow-by from DP6 through DP9. All collected flows are routed to Pond C.

The SCS TR-20 drainage basins are divided as follows:

Design Point T13A and T13B (Each at $Q_{10} = 8$ CFS and $Q_{100} = 31$ CFS)

DP-T13A and B are existing culverts under Higby Road. Basin T-13 was established with the DMP. It appears that future grading in Jackson Creek will cause Basin T-13 to drain into 2 different collection systems. For calculation purposes, Basin T-13 was divided in half and routed to the 2 separate collection systems.

Design Point C1 ($Q_{10} = 32$ CFS and $Q_{100} = 85$ CFS)

DP-C1 includes developed runoff from Basin T-13A and Basin OSC1. Flows at DP-C1 will be routed to Pond C via proposed storm drain SD10. SD10 is a proposed 36" RCP stub that will be used as a temporary culvert for existing flows east of the site. This culvert stub can be extended with future development to the east. Runoff in SD10 will be routed to SD12 and into Pond C.

Design Point C2 ($Q_{10} = 87$ CFS and $Q_{100} = 212$ CFS)

DP-C2 includes developed runoff from Basin T-13B and Basin OSC2. Flows at DP-C2 will be routed to Pond C via proposed storm drain SD11. SD11 is a proposed 48" RCP stub that will be used as a temporary culvert for existing flows east of the site. This culvert stub can be extended with future development to the east. Runoff in SD11 will be routed to SD12 and into Pond C.

On-site flows from the Rational Method Basins C6 through C10 are also included in the TR-20 model to size the storm drain trunk lines SD10, SD11, and SD12. The 54" RCP outfall of SD12 into Pond C shall be protected by a concrete energy dissipater.

Pond C

Pond C is designed as an extended detention basin stormwater quality and detention facility. Pond C provides stormwater quality capture volume (WQCV) and detention for all current and future development in Jackson Creek that is tributary to it as shown on the Drainage Maps in the appendix of this report (168.4 acres total). Also routed through Pond C are existing flows from DMP Basins T-9, T-11, and T-13. The outfall structure for Pond C is 3 CDOT Type C grated inlets each with 30" RCP outfall culverts. The inlet boxes will have the trash rack and orifice plate from the WQCV along with several holes notched out to allow the proper detention discharge. Total inflow into Pond C is $Q_{10} = 506$ CFS and $Q_{100} = 1,053$ CFS. Total outflow from Pond C is $Q_{10} = 88$ CFS and $Q_{100} = 146$ CFS. The outflow from Pond C is less than the existing flows at DP-EXT of $Q_{10} = 264$ CFS and $Q_{100} = 612$ CFS, therefore development of this subdivision will not adversely impact downstream properties.

DRAINAGE DESIGN CRITERIA

This drainage report was prepared in accordance to the criteria established in the City of Colorado Springs and El Paso County Drainage Criteria Manual, as well as the "Design Criteria and Construction Specifications Manual for Residential Development," for the Triview Metropolitan District. This report has taken into account the results and recommendations of the following previous drainage studies:

"Drainage Master Plan for Jackson Creek, Teachout Creek, and No Name Creek Final Report," prepared by Ayres Associates, dated October 2002. The Drainage Master Plan (DMP) by Ayres establishes the overall design flows in No Name Creek.

"Final Drainage Report for Jackson Creek Senior Living," prepared by WestWorks Engineering, dated May 4, 2016.

WestWorks Engineering uses the Rational Method for hydrologic calculations in areas under 90 acres. For the Rational Method, flows are calculated for the 5-year and 100-year recurrence intervals. The average runoff coefficients, 'C' values, are taken from Table 6-6 and the Intensity-Duration-Frequency curves are taken from Figure 6-5 of the City Drainage Criteria Manual. Time of concentration for overland flow and storm drain or gutter flow are calculated per Section 3.2 of the City Drainage Criteria Manual. Calculations for the Rational Method are shown in the Appendix of this report. Detention volume is calculated in accordance with the City Drainage Criteria Manual Guidelines.

WestWorks Engineering uses the SCS Unity Hydrograph Procedure (TR-20) for drainage basin study areas greater than 90 acres. This methodology is implemented in accordance with the City/County Drainage Criteria Guidelines. For the SCS Unit Hydrograph Procedure (TR-20), WestWorks Engineering uses the aid of HydroCAD version 7.00 for runoff calculations, routing quantities, and detention. Runoff quantities are analyzed for storms with recurrence intervals of 10 years and 100 years. The 24-hour storm distributions are based on a Type IIA distribution as shown in Figure 5-5b of the City/County Drainage Criteria Manual. Rainfall depths are based on the Isopluvial maps in City/County Drainage Criteria Manual Figures 5-4d and 5-4e. The 10-year 24-hour rainfall depth for this site is 2.9 inches. The 100-year 24-hour rainfall depth for this site is 4.4 inches. Runoff Curve Numbers are taken from Tables 5-6 and 5-7 (using AMC II) of the City/County Drainage Criteria Manual. Calculations for the SCS Unit Hydrograph Procedure (TR-20) are shown in the Appendix of this report.

DRAINAGE FACILITY DESIGN

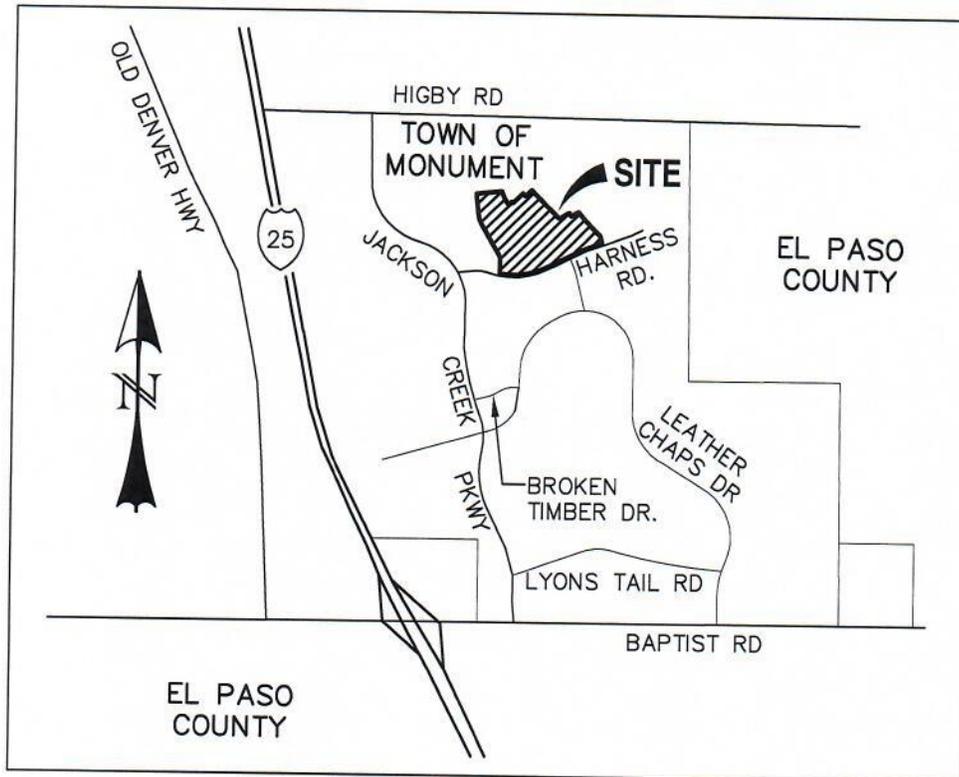
All roadways, curbs & gutters, inlets, storm drain, and swales within this development have adequate capacity to handle the 100-year peak runoff quantities.

All proposed inlets, storm drains, culverts, and open channels are sized using the procedures outlined in the City/County Drainage Criteria Manual Chapters 7, 8, 9, and 10 respectively. All of the proposed drainage systems, including the streets, are designed to safely route the 5-year and 100-year storm flows.

FLOODPLAIN STATEMENT

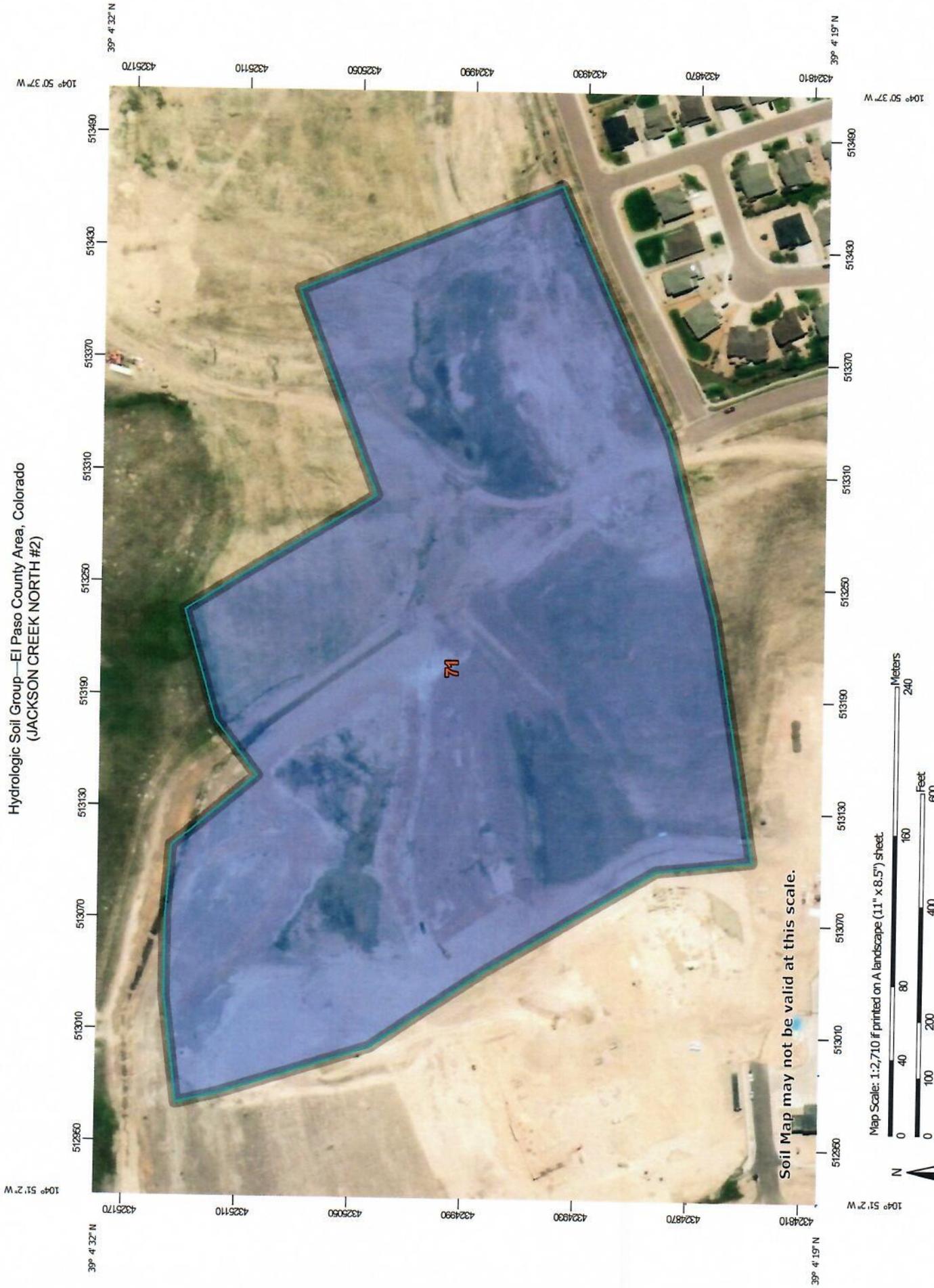
No portion of this Site is within a F.E.M.A. designated floodplain per Flood Insurance Rate Map Community Panel Nos. 08041C0278 G, effective December 7, 2018.

APPENDIX



VICINITY MAP
SCALE: N.T.S.

Hydrologic Soil Group—El Paso County Area, Colorado
(JACKSON CREEK NORTH #2)



Soil Map may not be valid at this scale.

Map Scale: 1:2,710 if printed on A landscape (11" x 8.5") sheet.

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
71	Pring coarse sandy loam, 3 to 8 percent slopes	B	23.4	100.0%
Totals for Area of Interest			23.4	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

National Flood Hazard Layer FIRMette



39°4'37.34"N



104°50'28.19"W

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) Zone A, V, A99
- With BFE or Depth Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Area of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone 2
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee. See Notes. Zone X
- Area with Flood Risk due to Levee Zone D

OTHER AREAS

- Area of Minimal Flood Hazard Zone X
- Effective LOMRs
- Area of Undetermined Flood Hazard Zone

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS

- Digital Data Available
- No Digital Data Available
- Unmapped



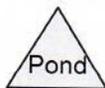
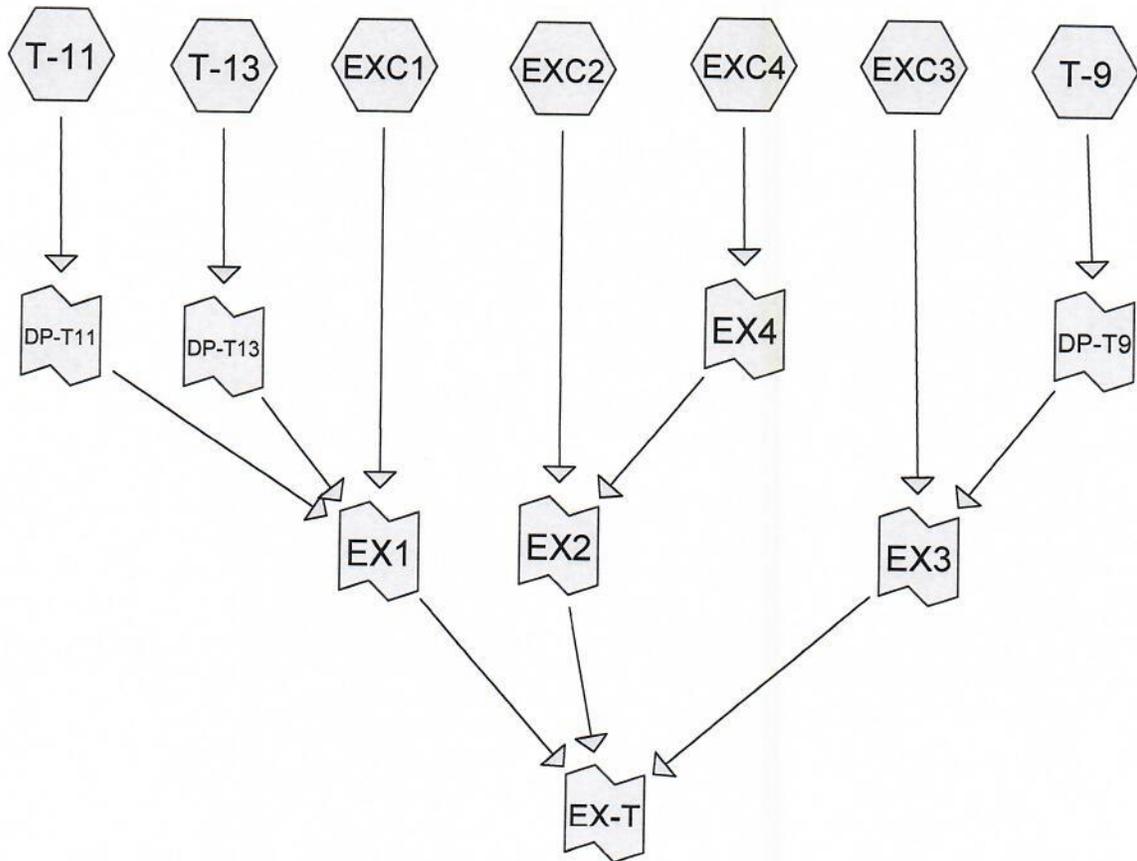
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/22/2019 at 2:07:35 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

**HYDROLOGIC CALCULATIONS
EXISTING CONDITIONS
[SCS TR-20]**



Drainage Diagram for 10YR-EXISTING
 Prepared by WestWorks Engineering 5/15/2019
 HydroCAD® 7.00 s/n 002053 © 1986-2003 Applied Microcomputer Systems

10YR-EXISTING

Prepared by WestWorks Engineering
 HydroCAD® 7.00 s/n 002053 © 1986-2003 Applied Microcomputer Systems

Type IIA 24-hr Rainfall=2.90"

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Subcatchment EXC1:

Runoff = 51.83 cfs @ 6.40 hrs, Volume= 6.690 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type IIA 24-hr Rainfall=2.90"

Area (ac)	CN	Description
131.000	69	Pasture/grassland/range, Fair, HSG B

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.0					Direct Entry,

Subcatchment EXC2:

Runoff = 9.70 cfs @ 6.20 hrs, Volume= 0.850 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type IIA 24-hr Rainfall=2.90"

Area (ac)	CN	Description
16.600	69	Pasture/grassland/range, Fair, HSG B

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0					Direct Entry,

Subcatchment EXC3:

Runoff = 12.82 cfs @ 6.30 hrs, Volume= 1.381 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type IIA 24-hr Rainfall=2.90"

Area (ac)	CN	Description
27.000	69	Pasture/grassland/range, Fair, HSG B

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.0					Direct Entry,

Subcatchment EXC4:

Runoff = 15.49 cfs @ 6.04 hrs, Volume= 0.894 af, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type IIA 24-hr Rainfall=2.90"

10YR-EXISTING

Type IIA 24-hr Rainfall=2.90"

Prepared by WestWorks Engineering

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Area (ac)	CN	Description
4.500	98	Paved parking & roofs
2.000	61	>75% Grass cover, Good, HSG B
6.500	87	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Subcatchment T-11:

Runoff = 174.21 cfs @ 6.05 hrs, Volume= 9.902 af, Depth= 1.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=2.90"

Area (ac)	CN	Description
106.600	79	FROM DMP

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4					Direct Entry, FROM DMP

Subcatchment T-13:

Runoff = 16.33 cfs @ 6.12 hrs, Volume= 1.302 af, Depth= 0.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=2.90"

Area (ac)	CN	Description
43.600	62	FROM DMP

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0					Direct Entry, FROM DMP

Subcatchment T-9:

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 46.21 cfs @ 5.99 hrs, Volume= 2.340 af, Depth= 1.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=2.90"

Area (ac)	CN	Description
23.900	80	FROM DMP

10YR-EXISTING

Type IIA 24-hr Rainfall=2.90"

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5/15/2019

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4					Direct Entry, FROM DMP

Link DP-T11:

Inflow Area = 106.600 ac, Inflow Depth = 1.11"
 Inflow = 174.21 cfs @ 6.05 hrs, Volume= 9.902 af
 Primary = 174.21 cfs @ 6.05 hrs, Volume= 9.902 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP-T13:

Inflow Area = 43.600 ac, Inflow Depth = 0.36"
 Inflow = 16.33 cfs @ 6.12 hrs, Volume= 1.302 af
 Primary = 16.33 cfs @ 6.12 hrs, Volume= 1.302 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP-T9:

Inflow Area = 23.900 ac, Inflow Depth = 1.18"
 Inflow = 46.21 cfs @ 5.99 hrs, Volume= 2.340 af
 Primary = 46.21 cfs @ 5.99 hrs, Volume= 2.340 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX-T:

Inflow Area = 355.200 ac, Inflow Depth = 0.79"
 Inflow = 264.01 cfs @ 6.05 hrs, Volume= 23.359 af
 Primary = 264.01 cfs @ 6.05 hrs, Volume= 23.359 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX1:

Inflow Area = 281.200 ac, Inflow Depth = 0.76"
 Inflow = 200.97 cfs @ 6.07 hrs, Volume= 17.893 af
 Primary = 200.97 cfs @ 6.07 hrs, Volume= 17.893 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

10YR-EXISTING

Type IIA 24-hr Rainfall=2.90"

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Link EX2:

Inflow Area = 23.100 ac, Inflow Depth = 0.91"
Inflow = 22.07 cfs @ 6.09 hrs, Volume= 1.744 af
Primary = 22.07 cfs @ 6.09 hrs, Volume= 1.744 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX3:

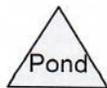
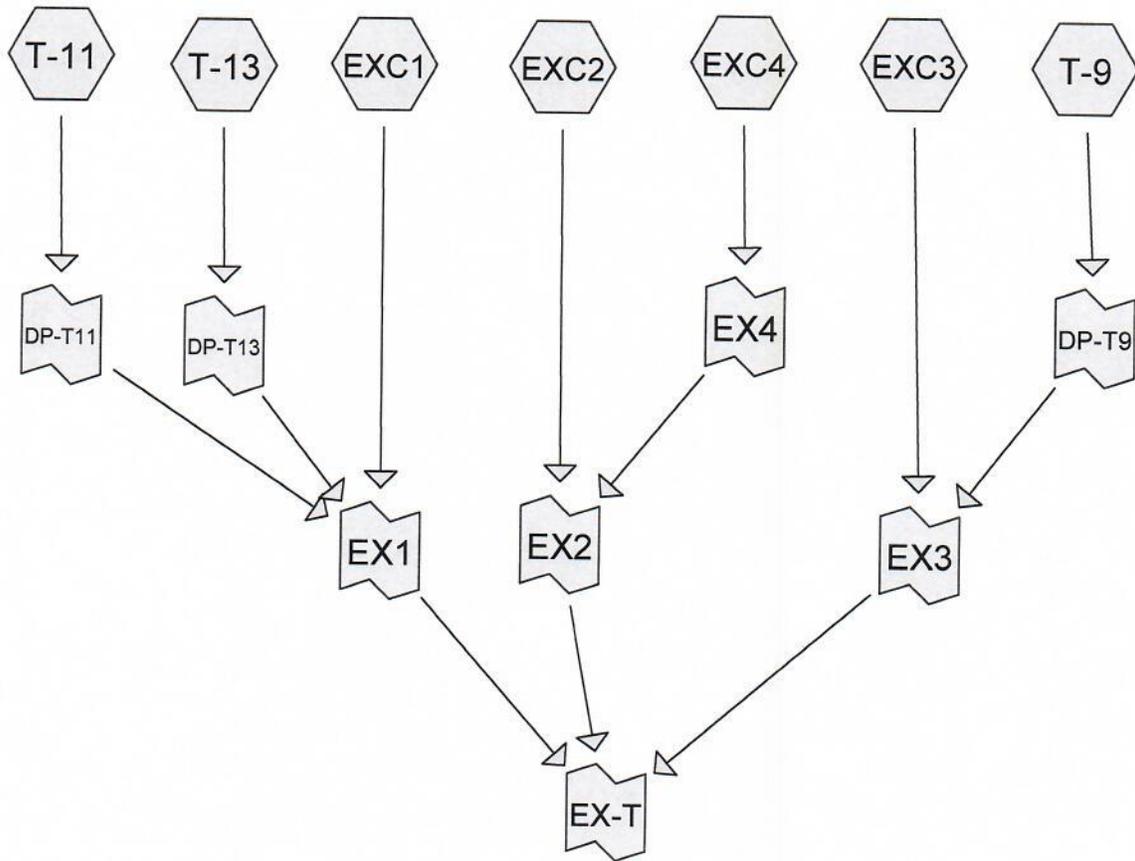
Inflow Area = 50.900 ac, Inflow Depth = 0.88"
Inflow = 48.88 cfs @ 6.00 hrs, Volume= 3.721 af
Primary = 48.88 cfs @ 6.00 hrs, Volume= 3.721 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX4:

Inflow Area = 6.500 ac, Inflow Depth = 1.65"
Inflow = 15.49 cfs @ 6.04 hrs, Volume= 0.894 af
Primary = 15.49 cfs @ 6.04 hrs, Volume= 0.894 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs



Drainage Diagram for 100YR-EXISTING
 Prepared by WestWorks Engineering 5/15/2019
 HydroCAD® 7.00 s/n 002053 © 1986-2003 Applied Microcomputer Systems

100YR-EXISTING

Type IIA 24-hr Rainfall=4.40"

Prepared by WestWorks Engineering

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Subcatchment EXC1:

Runoff = 152.90 cfs @ 6.36 hrs, Volume= 16.654 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=4.40"

Area (ac)	CN	Description
131.000	69	Pasture/grassland/range, Fair, HSG B

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.0					Direct Entry,

Subcatchment EXC2:

Runoff = 27.49 cfs @ 6.18 hrs, Volume= 2.116 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=4.40"

Area (ac)	CN	Description
16.600	69	Pasture/grassland/range, Fair, HSG B

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0					Direct Entry,

Subcatchment EXC3:

Runoff = 37.35 cfs @ 6.27 hrs, Volume= 3.437 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=4.40"

Area (ac)	CN	Description
27.000	69	Pasture/grassland/range, Fair, HSG B

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.0					Direct Entry,

Subcatchment EXC4:

Runoff = 27.68 cfs @ 6.04 hrs, Volume= 1.627 af, Depth= 3.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=4.40"

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Type IIA 24-hr Rainfall=4.40"

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Area (ac)	CN	Description
4.500	98	Paved parking & roofs
2.000	61	>75% Grass cover, Good, HSG B
6.500	87	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Subcatchment T-11:

Runoff = 357.69 cfs @ 6.04 hrs, Volume= 20.348 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=4.40"

Area (ac)	CN	Description
106.600	79	FROM DMP

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4					Direct Entry, FROM DMP

Subcatchment T-13:

Runoff = 61.78 cfs @ 6.09 hrs, Volume= 3.928 af, Depth= 1.08"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=4.40"

Area (ac)	CN	Description
43.600	62	FROM DMP

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0					Direct Entry, FROM DMP

Subcatchment T-9:

[49] Hint: Tc<2dt may require smaller dt

Runoff = 90.50 cfs @ 5.99 hrs, Volume= 4.732 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=4.40"

Area (ac)	CN	Description
23.900	80	FROM DMP

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Type IIA 24-hr Rainfall=4.40"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4					Direct Entry, FROM DMP

Link DP-T11:

Inflow Area = 106.600 ac, Inflow Depth = 2.29"
 Inflow = 357.69 cfs @ 6.04 hrs, Volume= 20.348 af
 Primary = 357.69 cfs @ 6.04 hrs, Volume= 20.348 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP-T13:

Inflow Area = 43.600 ac, Inflow Depth = 1.08"
 Inflow = 61.78 cfs @ 6.09 hrs, Volume= 3.928 af
 Primary = 61.78 cfs @ 6.09 hrs, Volume= 3.928 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP-T9:

Inflow Area = 23.900 ac, Inflow Depth = 2.38"
 Inflow = 90.50 cfs @ 5.99 hrs, Volume= 4.732 af
 Primary = 90.50 cfs @ 5.99 hrs, Volume= 4.732 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX-T:

Inflow Area = 355.200 ac, Inflow Depth = 1.79"
 Inflow = 611.52 cfs @ 6.05 hrs, Volume= 52.841 af
 Primary = 611.52 cfs @ 6.05 hrs, Volume= 52.841 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX1:

Inflow Area = 281.200 ac, Inflow Depth = 1.75"
 Inflow = 471.87 cfs @ 6.07 hrs, Volume= 40.930 af
 Primary = 471.87 cfs @ 6.07 hrs, Volume= 40.930 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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Type IIA 24-hr Rainfall=4.40"

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Link EX2:

Inflow Area = 23.100 ac, Inflow Depth = 1.94"
Inflow = 49.91 cfs @ 6.09 hrs, Volume= 3.743 af
Primary = 49.91 cfs @ 6.09 hrs, Volume= 3.743 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX3:

Inflow Area = 50.900 ac, Inflow Depth = 1.93"
Inflow = 103.59 cfs @ 6.00 hrs, Volume= 8.169 af
Primary = 103.59 cfs @ 6.00 hrs, Volume= 8.169 af, Atten= 0%, Lag= 0.0 min

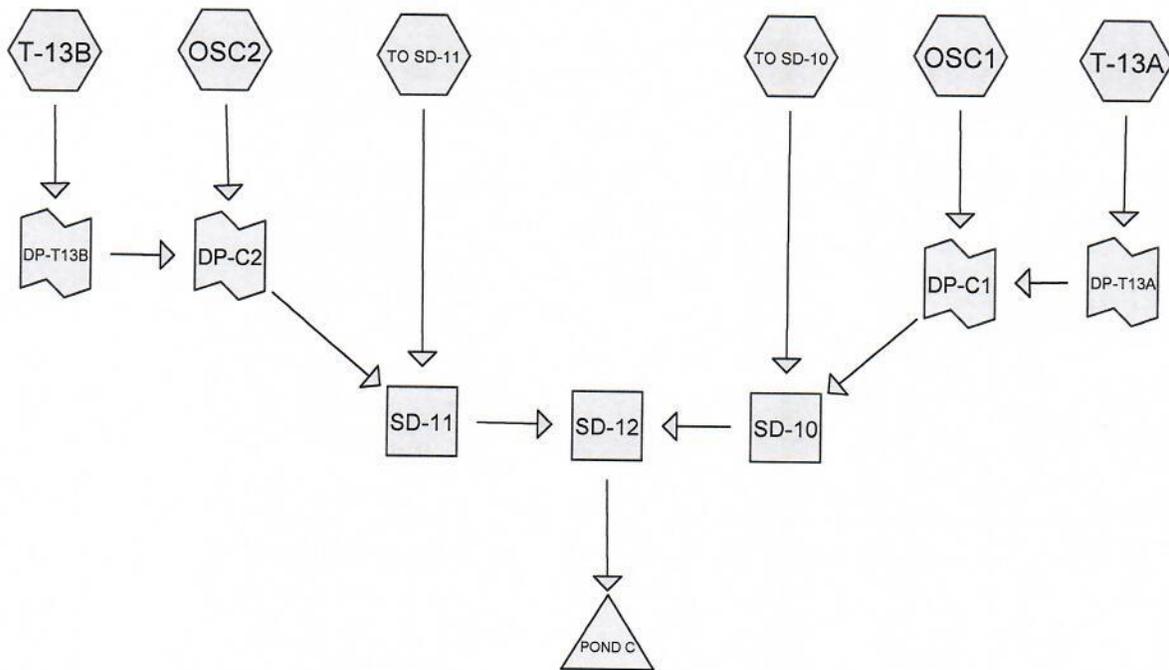
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX4:

Inflow Area = 6.500 ac, Inflow Depth = 3.00"
Inflow = 27.68 cfs @ 6.04 hrs, Volume= 1.627 af
Primary = 27.68 cfs @ 6.04 hrs, Volume= 1.627 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

**HYDROLOGIC CALCULATIONS
DEVELOPED ON & OFF-SITE CONDITIONS
[SCS TR-20]**



Drainage Diagram for 10YR-DEVELOPED-OFFSITE
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Type IIA 24-hr Rainfall=2.90"

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Subcatchment OSC1:

Runoff = 23.69 cfs @ 6.10 hrs, Volume= 1.426 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=2.90"

Area (ac)	CN	Description
20.000	75	1/4 acre lots, 38% imp, HSG B

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

Subcatchment OSC2:

Runoff = 79.36 cfs @ 6.10 hrs, Volume= 4.778 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=2.90"

Area (ac)	CN	Description
67.000	75	1/4 acre lots, 38% imp, HSG B

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

Subcatchment T-13A:

Runoff = 8.16 cfs @ 6.12 hrs, Volume= 0.610 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=2.90"

Area (ac)	CN	Description
21.800	62	FROM DMP

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0					Direct Entry, FROM DMP

Subcatchment T-13B:

Runoff = 8.16 cfs @ 6.12 hrs, Volume= 0.610 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=2.90"

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Type IIA 24-hr Rainfall=2.90"

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Area (ac)	CN	Description
21.800	62	FROM DMP

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0					Direct Entry, FROM DMP

Subcatchment TO SD-10:

Runoff = 4.23 cfs @ 6.11 hrs, Volume= 0.264 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=2.90"

Area (ac)	CN	Description
2.800	75	BASIN C8
0.900	75	BASIN C9
3.700	75	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0					Direct Entry,

Subcatchment TO SD-11:

Runoff = 9.75 cfs @ 6.16 hrs, Volume= 0.698 af, Depth= 0.85"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=2.90"

Area (ac)	CN	Description
2.900	75	BASIN C6
2.700	75	BASIN C7
4.200	75	BASIN C10
9.800	75	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.0					Direct Entry,

Reach SD-10:

[52] Hint: Inlet conditions not evaluated

Inflow Area = 45.500 ac, Inflow Depth = 0.61"
 Inflow = 35.97 cfs @ 6.10 hrs, Volume= 2.300 af
 Outflow = 35.60 cfs @ 6.11 hrs, Volume= 2.299 af, Atten= 1%, Lag= 0.5 min

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Type IIA 24-hr Rainfall=2.90"

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Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 13.4 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 5.0 fps, Avg. Travel Time= 0.8 min

Peak Depth= 1.21' @ 6.11 hrs
Capacity at bank full= 104.81 cfs
Inlet Invert= 6,964.00', Outlet Invert= 6,958.00'
36.0" Diameter Pipe n= 0.013 Length= 243.0' Slope= 0.0247 '/'

Reach SD-11:

[52] Hint: Inlet conditions not evaluated

Inflow Area = 98.600 ac, Inflow Depth = 0.74"
Inflow = 96.41 cfs @ 6.10 hrs, Volume= 6.085 af
Outflow = 93.90 cfs @ 6.13 hrs, Volume= 6.076 af, Atten= 3%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 17.0 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 6.3 fps, Avg. Travel Time= 2.8 min

Peak Depth= 1.83' @ 6.12 hrs
Capacity at bank full= 222.71 cfs
Inlet Invert= 6,983.00', Outlet Invert= 6,958.00'
48.0" Diameter Pipe n= 0.013 Length= 1,040.0' Slope= 0.0240 '/'

Reach SD-12:

[52] Hint: Inlet conditions not evaluated

[61] Hint: Submerged 22% of Reach SD-6 bottom

[61] Hint: Submerged 5% of Reach SD-7 bottom

Inflow Area = 144.100 ac, Inflow Depth = 0.70"
Inflow = 129.00 cfs @ 6.13 hrs, Volume= 8.374 af
Outflow = 126.96 cfs @ 6.15 hrs, Volume= 8.363 af, Atten= 2%, Lag= 1.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 21.0 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 7.7 fps, Avg. Travel Time= 2.1 min

Peak Depth= 1.84' @ 6.14 hrs
Capacity at bank full= 365.45 cfs
Inlet Invert= 6,957.50', Outlet Invert= 6,924.00'
54.0" Diameter Pipe n= 0.013 Length= 970.0' Slope= 0.0345 '/'

10YR-DEVELOPED-OFFSITE

Type IIA 24-hr Rainfall=2.90"

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Pond POND C:

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 144.100 ac, Inflow Depth = 0.70"
 Inflow = 126.96 cfs @ 6.15 hrs, Volume= 8.363 af
 Primary = 126.96 cfs @ 6.15 hrs, Volume= 8.363 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link DP-C1:

Inflow Area = 41.800 ac, Inflow Depth = 0.58"
 Inflow = 31.75 cfs @ 6.10 hrs, Volume= 2.036 af
 Primary = 31.75 cfs @ 6.10 hrs, Volume= 2.036 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link DP-C2:

Inflow Area = 88.800 ac, Inflow Depth = 0.73"
 Inflow = 87.38 cfs @ 6.10 hrs, Volume= 5.388 af
 Primary = 87.38 cfs @ 6.10 hrs, Volume= 5.388 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link DP-T13A:

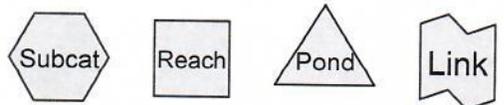
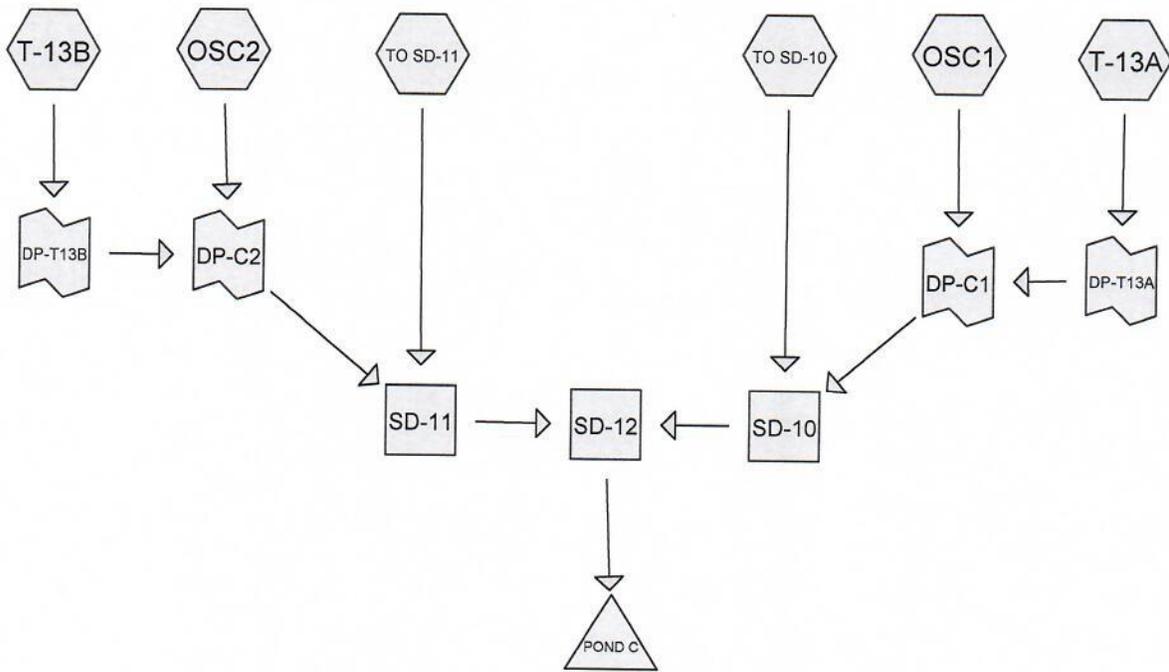
Inflow Area = 21.800 ac, Inflow Depth = 0.34"
 Inflow = 8.16 cfs @ 6.12 hrs, Volume= 0.610 af
 Primary = 8.16 cfs @ 6.12 hrs, Volume= 0.610 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link DP-T13B:

Inflow Area = 21.800 ac, Inflow Depth = 0.34"
 Inflow = 8.16 cfs @ 6.12 hrs, Volume= 0.610 af
 Primary = 8.16 cfs @ 6.12 hrs, Volume= 0.610 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Drainage Diagram for 100YR-DEVELOPED-OFFSITE
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Type IIA 24-hr Rainfall=4.40"

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Subcatchment OSC1:

Runoff = 53.95 cfs @ 6.08 hrs, Volume= 3.164 af, Depth= 1.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=4.40"

Area (ac)	CN	Description
20.000	75	1/4 acre lots, 38% imp, HSG B

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

Subcatchment OSC2:

Runoff = 180.73 cfs @ 6.08 hrs, Volume= 10.598 af, Depth= 1.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=4.40"

Area (ac)	CN	Description
67.000	75	1/4 acre lots, 38% imp, HSG B

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

Subcatchment T-13A:

Runoff = 30.89 cfs @ 6.09 hrs, Volume= 1.870 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=4.40"

Area (ac)	CN	Description
21.800	62	FROM DMP

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0					Direct Entry, FROM DMP

Subcatchment T-13B:

Runoff = 30.89 cfs @ 6.09 hrs, Volume= 1.870 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=4.40"

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Type IIA 24-hr Rainfall=4.40"

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Area (ac)	CN	Description
21.800	62	FROM DMP

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0					Direct Entry, FROM DMP

Subcatchment TO SD-10:

Runoff = 9.70 cfs @ 6.09 hrs, Volume= 0.585 af, Depth= 1.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=4.40"

Area (ac)	CN	Description
2.800	75	BASIN C8
0.900	75	BASIN C9
3.700	75	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0					Direct Entry,

Subcatchment TO SD-11:

Runoff = 22.86 cfs @ 6.14 hrs, Volume= 1.548 af, Depth= 1.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=4.40"

Area (ac)	CN	Description
2.900	75	BASIN C6
2.700	75	BASIN C7
4.200	75	BASIN C10
9.800	75	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.0					Direct Entry,

Reach SD-10:

[52] Hint: Inlet conditions not evaluated

Inflow Area = 45.500 ac, Inflow Depth = 1.48"
 Inflow = 94.47 cfs @ 6.09 hrs, Volume= 5.619 af
 Outflow = 93.86 cfs @ 6.09 hrs, Volume= 5.617 af, Atten= 1%, Lag= 0.4 min

100YR-DEVELOPED-OFFSITE

Type IIA 24-hr Rainfall=4.40"

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Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 16.8 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 6.2 fps, Avg. Travel Time= 0.6 min

Peak Depth= 2.23' @ 6.09 hrs
Capacity at bank full= 104.81 cfs
Inlet Invert= 6,964.00', Outlet Invert= 6,958.00'
36.0" Diameter Pipe n= 0.013 Length= 243.0' Slope= 0.0247 '/'

Reach SD-11:

[52] Hint: Inlet conditions not evaluated
[55] Hint: Peak inflow is 105% of Manning's capacity

Inflow Area = 98.600 ac, Inflow Depth = 1.71"
Inflow = 233.19 cfs @ 6.09 hrs, Volume= 14.016 af
Outflow = 227.54 cfs @ 6.11 hrs, Volume= 14.001 af, Atten= 2%, Lag= 1.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 20.2 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 7.7 fps, Avg. Travel Time= 2.2 min

Peak Depth= 3.42' @ 6.10 hrs
Capacity at bank full= 222.71 cfs
Inlet Invert= 6,983.00', Outlet Invert= 6,958.00'
48.0" Diameter Pipe n= 0.013 Length= 1,040.0' Slope= 0.0240 '/'

Reach SD-12:

[52] Hint: Inlet conditions not evaluated
[61] Hint: Submerged 46% of Reach SD-6 bottom
[61] Hint: Submerged 11% of Reach SD-7 bottom

Inflow Area = 144.100 ac, Inflow Depth = 1.63"
Inflow = 320.72 cfs @ 6.11 hrs, Volume= 19.619 af
Outflow = 317.30 cfs @ 6.13 hrs, Volume= 19.602 af, Atten= 1%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 25.9 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 9.6 fps, Avg. Travel Time= 1.7 min

Peak Depth= 3.26' @ 6.12 hrs
Capacity at bank full= 365.45 cfs
Inlet Invert= 6,957.50', Outlet Invert= 6,924.00'
54.0" Diameter Pipe n= 0.013 Length= 970.0' Slope= 0.0345 '/'

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Type IIA 24-hr Rainfall=4.40"

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Pond POND C:

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 144.100 ac, Inflow Depth = 1.63"
 Inflow = 317.30 cfs @ 6.13 hrs, Volume= 19.602 af
 Primary = 317.30 cfs @ 6.13 hrs, Volume= 19.602 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link DP-C1:

Inflow Area = 41.800 ac, Inflow Depth = 1.45"
 Inflow = 84.77 cfs @ 6.09 hrs, Volume= 5.034 af
 Primary = 84.77 cfs @ 6.09 hrs, Volume= 5.034 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link DP-C2:

Inflow Area = 88.800 ac, Inflow Depth = 1.68"
 Inflow = 211.53 cfs @ 6.09 hrs, Volume= 12.469 af
 Primary = 211.53 cfs @ 6.09 hrs, Volume= 12.469 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link DP-T13A:

Inflow Area = 21.800 ac, Inflow Depth = 1.03"
 Inflow = 30.89 cfs @ 6.09 hrs, Volume= 1.870 af
 Primary = 30.89 cfs @ 6.09 hrs, Volume= 1.870 af, Atten= 0%, Lag= 0.0 min

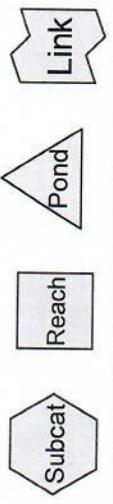
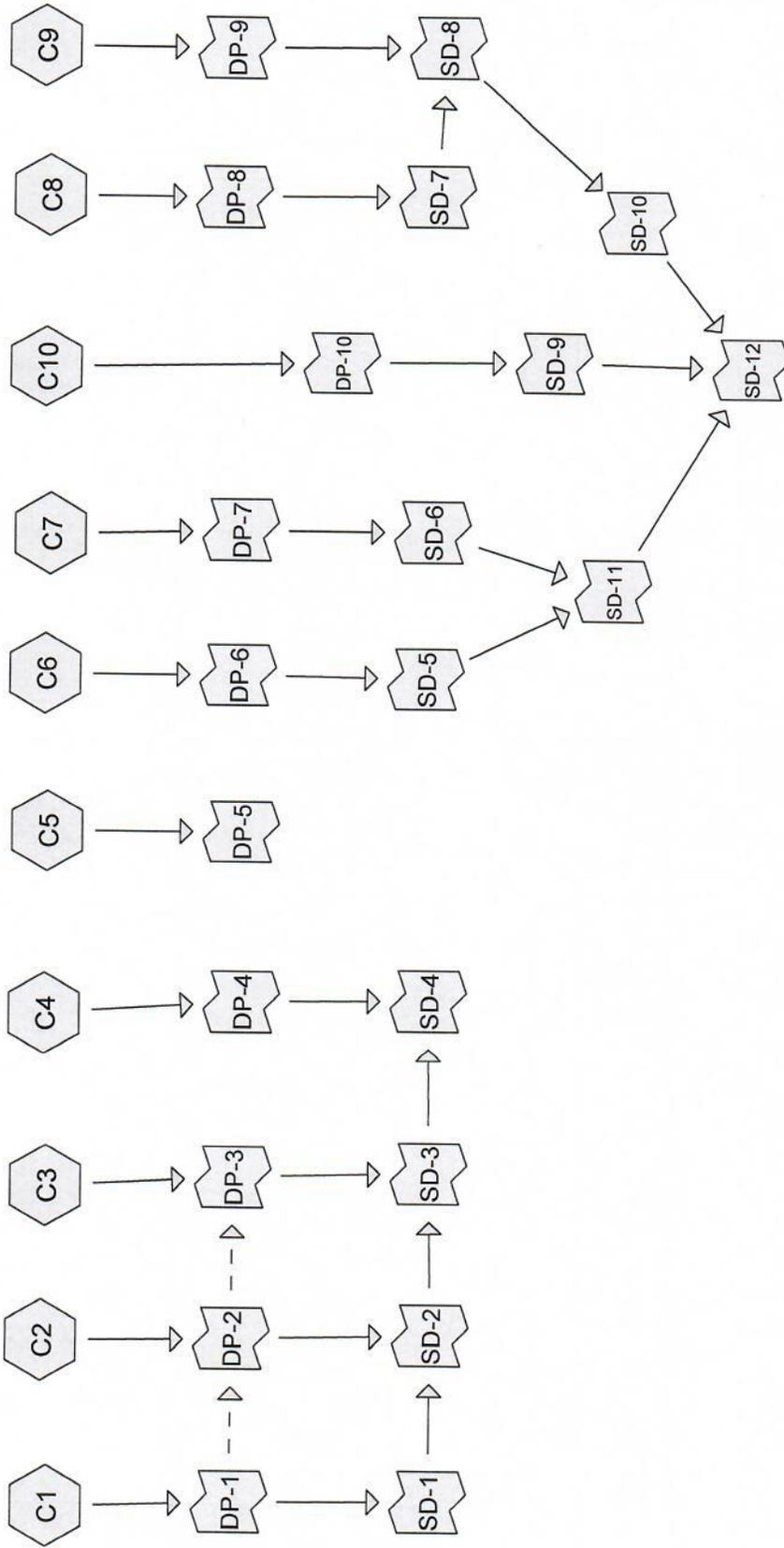
Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link DP-T13B:

Inflow Area = 21.800 ac, Inflow Depth = 1.03"
 Inflow = 30.89 cfs @ 6.09 hrs, Volume= 1.870 af
 Primary = 30.89 cfs @ 6.09 hrs, Volume= 1.870 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

**HYDROLOGIC CALCULATIONS
DEVELOPED ON-SITE CONDITIONS
[RATIONAL METHOD]**



Drainage Diagram for 5YR-DEVELOPED-ONSITE
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5YR-DEVELOPED-ONSITE*El Paso County 5-Year Duration=16 min, Inten=3.42 in/hr*

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Subcatchment C1:

Runoff = 3.68 cfs @ 0.27 hrs, Volume= 0.082 af, Depth= 0.27"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
El Paso County 5-Year Duration=16 min, Inten=3.42 in/hr

Area (ac)	C	Description
3.600	0.30	1/4 AC LOTS, 40% IMP.

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0					Direct Entry,

Subcatchment C4:

Runoff = 1.94 cfs @ 0.27 hrs, Volume= 0.043 af, Depth= 0.27"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
El Paso County 5-Year Duration=16 min, Inten=3.42 in/hr

Area (ac)	C	Description
1.900	0.30	1/4 AC LOTS, 40% IMP.

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0					Direct Entry,

Subcatchment C5:

Runoff = 2.39 cfs @ 0.27 hrs, Volume= 0.053 af, Depth= 0.23"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
El Paso County 5-Year Duration=16 min, Inten=3.42 in/hr

Area (ac)	C	Description
2.800	0.25	REAR YARDS & OS

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0					Direct Entry,

Subcatchment C6:

Runoff = 2.97 cfs @ 0.27 hrs, Volume= 0.066 af, Depth= 0.27"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
El Paso County 5-Year Duration=16 min, Inten=3.42 in/hr

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Area (ac)	C	Description
2.900	0.30	1/4 AC LOTS, 40% IMP.

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0					Direct Entry,

Subcatchment C8:

Runoff = 2.87 cfs @ 0.27 hrs, Volume= 0.064 af, Depth= 0.27"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
 El Paso County 5-Year Duration=16 min, Inten=3.42 in/hr

Area (ac)	C	Description
2.800	0.30	1/4 AC LOTS, 40% IMP.

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0					Direct Entry,

Link DP-1:

Inflow Area = 3.600 ac, Inflow Depth = 0.27" for 5-Year event
 Inflow = 3.68 cfs @ 0.27 hrs, Volume= 0.082 af
 Primary = 3.68 cfs @ 0.27 hrs, Volume= 0.082 af, Atten= 0%, Lag= 0.0 min
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Primary outflow = Inflow below 4.00 cfs, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link DP-2:

Inflow Area = 1.500 ac, Inflow Depth = 0.27" for 5-Year event
 Inflow = 1.55 cfs @ 0.17 hrs, Volume= 0.034 af
 Primary = 1.55 cfs @ 0.17 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Primary outflow = Inflow below 6.00 cfs, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link DP-3:

Inflow Area = 4.900 ac, Inflow Depth = 0.27" for 5-Year event
 Inflow = 5.07 cfs @ 0.20 hrs, Volume= 0.112 af
 Primary = 5.07 cfs @ 0.20 hrs, Volume= 0.112 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

5YR-DEVELOPED-ONSITE*El Paso County 5-Year Duration=16 min, Inten=3.42 in/hr*

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Link DP-4:

Inflow Area = 1.900 ac, Inflow Depth = 0.27" for 5-Year event
Inflow = 1.94 cfs @ 0.27 hrs, Volume= 0.043 af
Primary = 1.94 cfs @ 0.27 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link DP-5:

Inflow Area = 2.800 ac, Inflow Depth = 0.23" for 5-Year event
Inflow = 2.39 cfs @ 0.27 hrs, Volume= 0.053 af
Primary = 2.39 cfs @ 0.27 hrs, Volume= 0.053 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link DP-6:

Inflow Area = 2.900 ac, Inflow Depth = 0.27" for 5-Year event
Inflow = 2.97 cfs @ 0.27 hrs, Volume= 0.066 af
Primary = 2.97 cfs @ 0.27 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link DP-8:

Inflow Area = 2.800 ac, Inflow Depth = 0.27" for 5-Year event
Inflow = 2.87 cfs @ 0.27 hrs, Volume= 0.064 af
Primary = 2.87 cfs @ 0.27 hrs, Volume= 0.064 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link SD-1:

Inflow Area = 3.600 ac, Inflow Depth = 0.27" for 5-Year event
Inflow = 3.68 cfs @ 0.27 hrs, Volume= 0.082 af
Primary = 3.68 cfs @ 0.27 hrs, Volume= 0.082 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link SD-2:

Inflow Area = 5.100 ac, Inflow Depth = 0.27" for 5-Year event
Inflow = 5.22 cfs @ 0.27 hrs, Volume= 0.116 af
Primary = 5.22 cfs @ 0.27 hrs, Volume= 0.116 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

5YR-DEVELOPED-ONSITE*El Paso County 5-Year Duration=16 min, Inten=3.42 in/hr*

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Link SD-3:

Inflow Area = 10.000 ac, Inflow Depth = 0.27" for 5-Year event
Inflow = 10.26 cfs @ 0.26 hrs, Volume= 0.228 af
Primary = 10.26 cfs @ 0.26 hrs, Volume= 0.228 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link SD-4:

Inflow Area = 11.900 ac, Inflow Depth = 0.27" for 5-Year event
Inflow = 12.18 cfs @ 0.26 hrs, Volume= 0.271 af
Primary = 12.18 cfs @ 0.26 hrs, Volume= 0.271 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link SD-5:

Inflow Area = 2.900 ac, Inflow Depth = 0.27" for 5-Year event
Inflow = 2.97 cfs @ 0.27 hrs, Volume= 0.066 af
Primary = 2.97 cfs @ 0.27 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link SD-7:

Inflow Area = 2.800 ac, Inflow Depth = 0.27" for 5-Year event
Inflow = 2.87 cfs @ 0.27 hrs, Volume= 0.064 af
Primary = 2.87 cfs @ 0.27 hrs, Volume= 0.064 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link SD-8:

Inflow Area = 3.700 ac, Inflow Depth = 0.27" for 5-Year event
Inflow = 3.79 cfs @ 0.27 hrs, Volume= 0.084 af
Primary = 3.79 cfs @ 0.27 hrs, Volume= 0.084 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

5YR-DEVELOPED-ONSITE

El Paso County 5-Year Duration=10 min, Inten=4.13 in/hr

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Subcatchment C2:

Runoff = 1.84 cfs @ 0.17 hrs, Volume= 0.026 af, Depth= 0.21"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
El Paso County 5-Year Duration=10 min, Inten=4.13 in/hr

Area (ac)	C	Description
1.500	0.30	1/4 AC LOTS, 40% IMP.

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

5YR-DEVELOPED-ONSITE*El Paso County 5-Year Duration=12 min, Inten=3.86 in/hr*

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Subcatchment C3:

Runoff = 5.72 cfs @ 0.20 hrs, Volume= 0.095 af, Depth= 0.23"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
El Paso County 5-Year Duration=12 min, Inten=3.86 in/hr

Area (ac)	C	Description
4.900	0.30	1/4 AC LOTS, 40% IMP.

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Subcatchment C9:

Runoff = 1.05 cfs @ 0.20 hrs, Volume= 0.017 af, Depth= 0.23"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
El Paso County 5-Year Duration=12 min, Inten=3.86 in/hr

Area (ac)	C	Description
0.900	0.30	1/4 AC LOTS, 40% IMP.

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Link DP-9:

Inflow Area = 0.900 ac, Inflow Depth = 0.23" for 5-Year event

Inflow = 1.05 cfs @ 0.20 hrs, Volume= 0.017 af

Primary = 1.05 cfs @ 0.20 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

5YR-DEVELOPED-ONSITE*El Paso County 5-Year Duration=18 min, Inten=3.25 in/hr*

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Subcatchment C7:

Runoff = 2.65 cfs @ 0.30 hrs, Volume= 0.066 af, Depth= 0.29"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
El Paso County 5-Year Duration=18 min, Inten=3.25 in/hr

Area (ac)	C	Description
2.700	0.30	1/4 AC LOTS, 40% IMP.

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0					Direct Entry,

Link DP-7:

Inflow Area = 2.700 ac, Inflow Depth = 0.29" for 5-Year event
 Inflow = 2.65 cfs @ 0.30 hrs, Volume= 0.066 af
 Primary = 2.65 cfs @ 0.30 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link SD-6:

Inflow Area = 2.700 ac, Inflow Depth = 0.29" for 5-Year event
 Inflow = 2.65 cfs @ 0.30 hrs, Volume= 0.066 af
 Primary = 2.65 cfs @ 0.30 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

5YR-DEVELOPED-ONSITE*El Paso County 5-Year Duration=21 min, Inten=3.02 in/hr*

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Subcatchment C10:

Runoff = 3.84 cfs @ 0.35 hrs, Volume= 0.111 af, Depth= 0.32"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
El Paso County 5-Year Duration=21 min, Inten=3.02 in/hr

Area (ac)	C	Description
4.200	0.30	1/4 AC LOTS, 40% IMP.

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.0					Direct Entry,

Link DP-10:

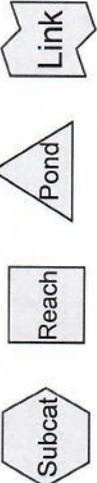
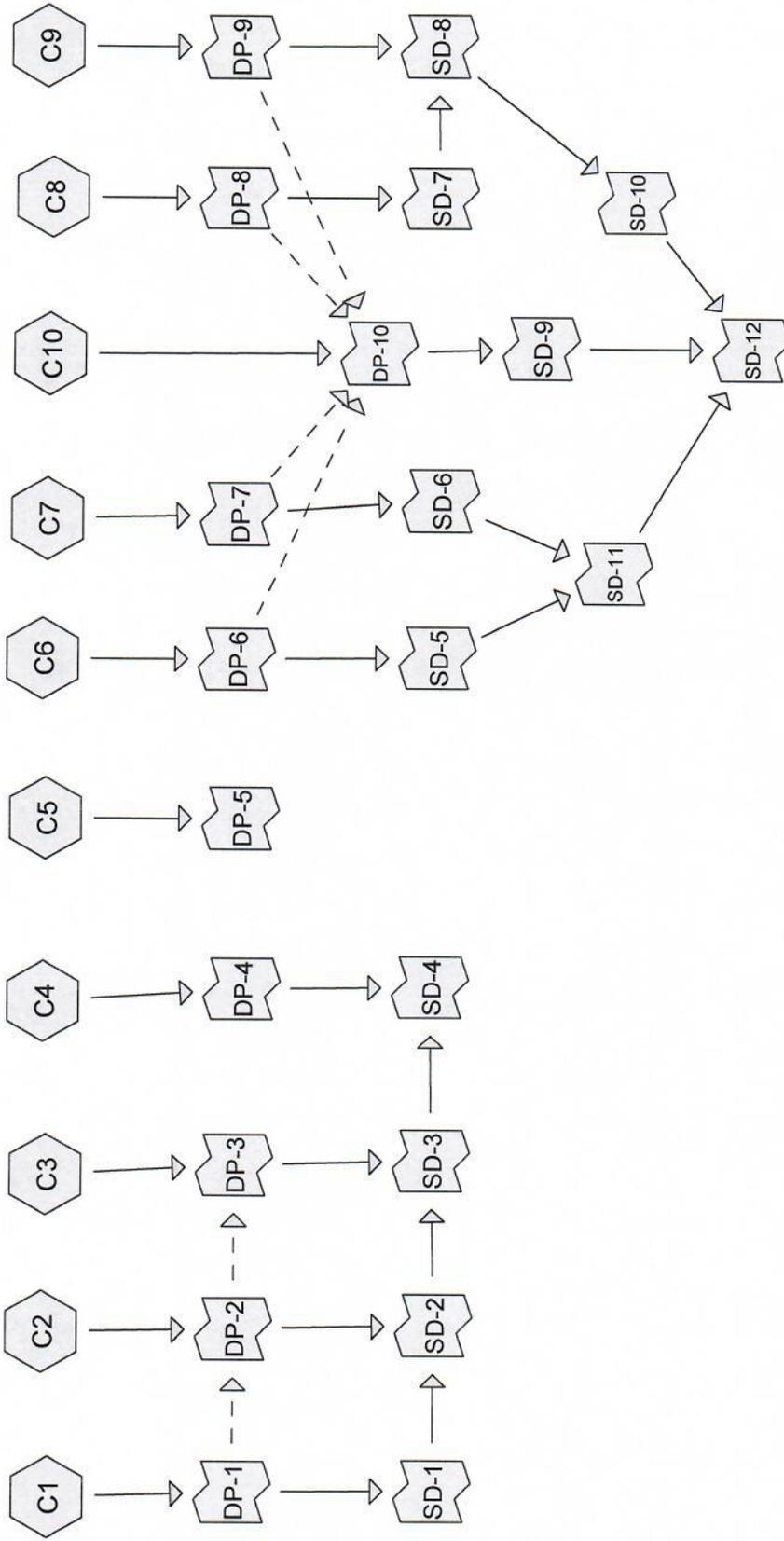
Inflow Area = 4.200 ac, Inflow Depth = 0.32" for 5-Year event
 Inflow = 3.84 cfs @ 0.35 hrs, Volume= 0.111 af
 Primary = 3.84 cfs @ 0.35 hrs, Volume= 0.111 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link SD-9:

Inflow Area = 4.200 ac, Inflow Depth = 0.32" for 5-Year event
 Inflow = 3.84 cfs @ 0.35 hrs, Volume= 0.111 af
 Primary = 3.84 cfs @ 0.35 hrs, Volume= 0.111 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs



Drainage Diagram for 100YR-DEVELOPED-ONSITE
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100YR-DEVELOPED-ONSITE*El Paso County 100-Year Duration=16 min, Inten=5.75 in/hr*

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Subcatchment C1:

Runoff = 10.32 cfs @ 0.27 hrs, Volume= 0.230 af, Depth= 0.77"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
El Paso County 100-Year Duration=16 min, Inten=5.75 in/hr

Area (ac)	C	Description
3.600	0.50	1/4 AC LOTS, 40% IMP.

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0					Direct Entry,

Subcatchment C4:

Runoff = 5.45 cfs @ 0.27 hrs, Volume= 0.121 af, Depth= 0.77"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
El Paso County 100-Year Duration=16 min, Inten=5.75 in/hr

Area (ac)	C	Description
1.900	0.50	1/4 AC LOTS, 40% IMP.

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0					Direct Entry,

Subcatchment C5:

Runoff = 6.42 cfs @ 0.27 hrs, Volume= 0.143 af, Depth= 0.61"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
El Paso County 100-Year Duration=16 min, Inten=5.75 in/hr

Area (ac)	C	Description
2.800	0.40	REAR YARDS & OS

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0					Direct Entry,

Subcatchment C6:

Runoff = 8.32 cfs @ 0.27 hrs, Volume= 0.185 af, Depth= 0.77"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
El Paso County 100-Year Duration=16 min, Inten=5.75 in/hr

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Area (ac)	C	Description
2.900	0.50	1/4 AC LOTS, 40% IMP.

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0					Direct Entry,

Subcatchment C8:

Runoff = 8.03 cfs @ 0.27 hrs, Volume= 0.179 af, Depth= 0.77"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
El Paso County 100-Year Duration=16 min, Inten=5.75 in/hr

Area (ac)	C	Description
2.800	0.50	1/4 AC LOTS, 40% IMP.

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0					Direct Entry,

Link DP-1:

Inflow Area = 3.600 ac, Inflow Depth = 0.77" for 100-Year event
 Inflow = 10.32 cfs @ 0.27 hrs, Volume= 0.230 af
 Primary = 7.50 cfs @ 0.20 hrs, Volume= 0.212 af, Atten= 27%, Lag= 0.0 min
 Secondary = 2.82 cfs @ 0.27 hrs, Volume= 0.018 af

Primary outflow = Inflow below 7.50 cfs, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link DP-2:

Inflow Area = 1.500 ac, Inflow Depth = 0.91" for 100-Year event
 Inflow = 7.13 cfs @ 0.27 hrs, Volume= 0.114 af
 Primary = 6.10 cfs @ 0.24 hrs, Volume= 0.112 af, Atten= 14%, Lag= 0.0 min
 Secondary = 1.03 cfs @ 0.27 hrs, Volume= 0.002 af

Primary outflow = Inflow below 6.10 cfs, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link DP-3:

Inflow Area = 4.900 ac, Inflow Depth = 0.77" for 100-Year event
 Inflow = 15.14 cfs @ 0.26 hrs, Volume= 0.315 af
 Primary = 15.14 cfs @ 0.26 hrs, Volume= 0.315 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link DP-4:

Inflow Area = 1.900 ac, Inflow Depth = 0.77" for 100-Year event
Inflow = 5.45 cfs @ 0.27 hrs, Volume= 0.121 af
Primary = 5.45 cfs @ 0.27 hrs, Volume= 0.121 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link DP-5:

Inflow Area = 2.800 ac, Inflow Depth = 0.61" for 100-Year event
Inflow = 6.42 cfs @ 0.27 hrs, Volume= 0.143 af
Primary = 6.42 cfs @ 0.27 hrs, Volume= 0.143 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link DP-6:

Inflow Area = 2.900 ac, Inflow Depth = 0.77" for 100-Year event
Inflow = 8.32 cfs @ 0.27 hrs, Volume= 0.185 af
Primary = 6.00 cfs @ 0.20 hrs, Volume= 0.170 af, Atten= 28%, Lag= 0.0 min
Secondary = 2.32 cfs @ 0.27 hrs, Volume= 0.015 af

Primary outflow = Inflow below 6.00 cfs, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link DP-8:

Inflow Area = 2.800 ac, Inflow Depth = 0.77" for 100-Year event
Inflow = 8.03 cfs @ 0.27 hrs, Volume= 0.179 af
Primary = 5.90 cfs @ 0.20 hrs, Volume= 0.166 af, Atten= 27%, Lag= 0.0 min
Secondary = 2.13 cfs @ 0.27 hrs, Volume= 0.013 af

Primary outflow = Inflow below 5.90 cfs, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link SD-1:

Inflow Area = 3.600 ac, Inflow Depth = 0.71" for 100-Year event
Inflow = 7.50 cfs @ 0.20 hrs, Volume= 0.212 af
Primary = 7.50 cfs @ 0.20 hrs, Volume= 0.212 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link SD-2:

Inflow Area = 5.100 ac, Inflow Depth = 0.76" for 100-Year event
Inflow = 13.60 cfs @ 0.24 hrs, Volume= 0.323 af
Primary = 13.60 cfs @ 0.24 hrs, Volume= 0.323 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link SD-3:

Inflow Area = 10.000 ac, Inflow Depth = 0.77" for 100-Year event
Inflow = 28.74 cfs @ 0.26 hrs, Volume= 0.639 af
Primary = 28.74 cfs @ 0.26 hrs, Volume= 0.639 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link SD-4:

Inflow Area = 11.900 ac, Inflow Depth = 0.77" for 100-Year event
Inflow = 34.14 cfs @ 0.26 hrs, Volume= 0.760 af
Primary = 34.14 cfs @ 0.26 hrs, Volume= 0.760 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link SD-5:

Inflow Area = 2.900 ac, Inflow Depth = 0.70" for 100-Year event
Inflow = 6.00 cfs @ 0.20 hrs, Volume= 0.170 af
Primary = 6.00 cfs @ 0.20 hrs, Volume= 0.170 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link SD-7:

Inflow Area = 2.800 ac, Inflow Depth = 0.71" for 100-Year event
Inflow = 5.90 cfs @ 0.20 hrs, Volume= 0.166 af
Primary = 5.90 cfs @ 0.20 hrs, Volume= 0.166 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link SD-8:

Inflow Area = 3.700 ac, Inflow Depth = 0.71" for 100-Year event
Inflow = 8.00 cfs @ 0.20 hrs, Volume= 0.219 af
Primary = 8.00 cfs @ 0.20 hrs, Volume= 0.219 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

100YR-DEVELOPED-ONSITE*El Paso County 100-Year Duration=10 min, Inten=6.93 in/hr*

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Subcatchment C2:

Runoff = 5.15 cfs @ 0.17 hrs, Volume= 0.072 af, Depth= 0.58"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
El Paso County 100-Year Duration=10 min, Inten=6.93 in/hr

Area (ac)	C	Description
1.500	0.50	1/4 AC LOTS, 40% IMP.

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

100YR-DEVELOPED-ONSITE*El Paso County 100-Year Duration=12 min, Inten=6.47 in/hr*

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Subcatchment C3:

Runoff = 15.98 cfs @ 0.20 hrs, Volume= 0.264 af, Depth= 0.65"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
El Paso County 100-Year Duration=12 min, Inten=6.47 in/hr

Area (ac)	C	Description
4.900	0.50	1/4 AC LOTS, 40% IMP.

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Subcatchment C9:

Runoff = 2.94 cfs @ 0.20 hrs, Volume= 0.049 af, Depth= 0.65"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
El Paso County 100-Year Duration=12 min, Inten=6.47 in/hr

Area (ac)	C	Description
0.900	0.50	1/4 AC LOTS, 40% IMP.

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Link DP-9:

Inflow Area = 0.900 ac, Inflow Depth = 0.65" for 100-Year event
 Inflow = 2.94 cfs @ 0.20 hrs, Volume= 0.049 af
 Primary = 2.10 cfs @ 0.15 hrs, Volume= 0.045 af, Atten= 28%, Lag= 0.0 min
 Secondary = 0.84 cfs @ 0.20 hrs, Volume= 0.004 af

Primary outflow = Inflow below 2.10 cfs, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Subcatchment C7:

Runoff = 7.42 cfs @ 0.30 hrs, Volume= 0.184 af, Depth= 0.82"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
 El Paso County 100-Year Duration=18 min, Inten=5.45 in/hr

Area (ac)	C	Description
2.700	0.50	1/4 AC LOTS, 40% IMP.

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0					Direct Entry,

Link DP-7:

Inflow Area = 2.700 ac, Inflow Depth = 0.82" for 100-Year event
 Inflow = 7.42 cfs @ 0.30 hrs, Volume= 0.184 af
 Primary = 5.60 cfs @ 0.23 hrs, Volume= 0.173 af, Atten= 25%, Lag= 0.0 min
 Secondary = 1.82 cfs @ 0.30 hrs, Volume= 0.011 af

Primary outflow = Inflow below 5.60 cfs, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link SD-6:

Inflow Area = 2.700 ac, Inflow Depth = 0.77" for 100-Year event
 Inflow = 5.60 cfs @ 0.23 hrs, Volume= 0.173 af
 Primary = 5.60 cfs @ 0.23 hrs, Volume= 0.173 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

100YR-DEVELOPED-ONSITE*El Paso County 100-Year Duration=21 min, Inten=5.06 in/hr*

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Subcatchment C10:

Runoff = 10.71 cfs @ 0.35 hrs, Volume= 0.310 af, Depth= 0.89"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
El Paso County 100-Year Duration=21 min, Inten=5.06 in/hr

Area (ac)	C	Description
4.200	0.50	1/4 AC LOTS, 40% IMP.

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.0					Direct Entry,

Link DP-10:

Inflow Area = 4.200 ac, Inflow Depth = 1.01" for 100-Year event
 Inflow = 14.91 cfs @ 0.35 hrs, Volume= 0.353 af
 Primary = 14.91 cfs @ 0.35 hrs, Volume= 0.353 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Link SD-9:

Inflow Area = 4.200 ac, Inflow Depth = 1.01" for 100-Year event
 Inflow = 14.91 cfs @ 0.35 hrs, Volume= 0.353 af
 Primary = 14.91 cfs @ 0.35 hrs, Volume= 0.353 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs

Time of Concentration Calculations

Sub-Basin	Time of Concentration, Tc [min.]			Sub-Basin	Time of Concentration, Tc [min.]			Sub-Basin	Time of Concentration, Tc [min.]		
	Flowline L [ft.]	H [ft.]	v [ft/s]		Flowline L [ft.]	H [ft.]	v [ft/s]		Flowline L [ft.]	H [ft.]	v [ft/s]
<u>EXC1</u>	overland	1000	70.0	<u>C1</u>	overland	155	4.0	<u>C6</u>	overland	180	6.0
	channel	4900	168.0		channel	460	14.0		channel	610	14.0
	Total Tc =		39		Total Tc =		6.11		16	Total Tc =	
<u>EXC2</u>	overland	300	8.0	<u>C2</u>	overland	60	1.5	<u>C7</u>	overland	140	2.0
	channel	1300	40.0		channel	410	20.0		channel	520	12.0
	Total Tc =		23		Total Tc =		7.73		10	Total Tc =	
<u>EXC3</u>	overland	1000	50.0	<u>C3</u>	overland	110	4.0	<u>C8</u>	overland	200	8.0
	channel	700	26.0		channel	360	14.0		channel	450	10.0
	Total Tc =		31		Total Tc =		6.90		12	Total Tc =	
<u>EXC4</u>	overland	140	2.0	<u>C4</u>	overland	140	4.0	<u>C9</u>	overland	60	1.0
	channel	28	0.5		channel	500	5.0		channel	450	10.0
	Total Tc =		17		Total Tc =		3.50		16	Total Tc =	
				<u>C5</u>	overland	130	2.0	<u>C10</u>	overland	210	4.0
					channel	1	1.0		channel	820	24.0
	Total Tc =				Total Tc =		35.00		16	Total Tc =	

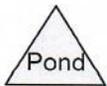
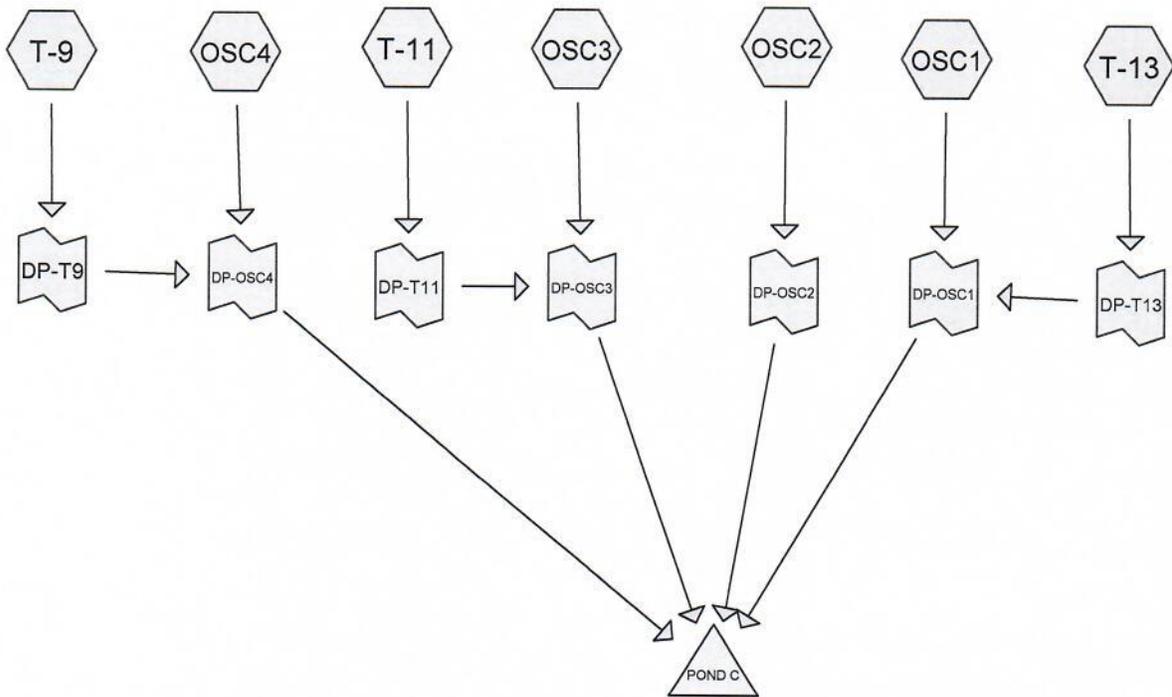
Project: JC NORTH FILING NO. 2

Job No.: 91805

Engineer: Chad Kuzbek, PE

Date: May 11, 2019

**HYDROLOGIC CALCULATIONS
FOR POND C
DEVELOPED ON & OFF-SITE CONDITIONS
[SCS TR-20]**



Drainage Diagram for 10YR-DEV-WQ
 Prepared by WestWorks Engineering 5/8/2019
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10YR-DEV-WQ

Type IIA 24-hr Rainfall=2.90"

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Subcatchment OSC1:

Runoff = 134.08 cfs @ 6.10 hrs, Volume= 8.073 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=2.90"

Area (ac)	CN	Description
113.200	75	1/4 acre lots, 38% imp, HSG B

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

Subcatchment OSC2:

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 35.04 cfs @ 5.95 hrs, Volume= 1.895 af, Depth= 2.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=2.90"

Area (ac)	CN	Description
11.300	92	Urban commercial, 85% imp, HSG B

Subcatchment OSC3:

Runoff = 54.49 cfs @ 6.05 hrs, Volume= 3.028 af, Depth= 1.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=2.90"

Area (ac)	CN	Description
25.000	85	PRD-10, 65% imp, HSG B

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Subcatchment OSC4:

Runoff = 97.12 cfs @ 6.03 hrs, Volume= 5.591 af, Depth= 2.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=2.90"

Area (ac)	CN	Description
33.400	92	PMD, Urban commercial, 85% imp, HSG B

10YR-DEV-WQ

Type IIA 24-hr Rainfall=2.90"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Subcatchment T-11:

Runoff = 174.21 cfs @ 6.05 hrs, Volume= 9.520 af, Depth= 1.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=2.90"

Area (ac)	CN	Description
106.600	79	FROM DMP

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4					Direct Entry, FROM DMP

Subcatchment T-13:

Runoff = 16.33 cfs @ 6.12 hrs, Volume= 1.219 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=2.90"

Area (ac)	CN	Description
43.600	62	FROM DMP

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0					Direct Entry, FROM DMP

Subcatchment T-9:

[49] Hint: Tc<2dt may require smaller dt

Runoff = 46.21 cfs @ 5.99 hrs, Volume= 2.254 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=2.90"

Area (ac)	CN	Description
23.900	80	FROM DMP

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4					Direct Entry, FROM DMP

10YR-DEV-WQ

Type IIA 24-hr Rainfall=2.90"

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Pond POND C:

Inflow Area = 357.000 ac, Inflow Depth = 1.06"
 Inflow = 505.53 cfs @ 6.05 hrs, Volume= 31.580 af
 Outflow = 88.31 cfs @ 6.38 hrs, Volume= 20.713 af, Atten= 83%, Lag= 20.1 min
 Primary = 88.31 cfs @ 6.38 hrs, Volume= 20.713 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 6,928.48' @ 6.38 hrs Surf.Area= 3.207 ac Storage= 15.700 af
 Plug-Flow detention time= 238.6 min calculated for 20.713 af (66% of inflow)
 Center-of-Mass det. time= 110.0 min (606.7 - 496.7)

#	Invert	Avail.Storage	Storage Description
1	6,922.00'	36.416 af	Custom Stage Data (Prismatic) Listed below
	Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)
	6,922.00	0.846	0.000
	6,924.00	2.350	3.196
	6,926.00	2.720	5.070
	6,928.00	3.110	8.266
	6,930.00	3.510	14.096
	6,932.00	3.920	20.716
	6,934.00	4.350	28.146
			36.416

#	Routing	Invert	Outlet Devices
1	Primary	6,921.80'	23.2" x 100.0' long OUTFALL CULVERT W/ RESTRICTOR PLATE X 3.00 RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 6,921.00' S= 0.0080 '/' n= 0.013 Cc= 0.900
2	Device 1	6,926.50'	1.50' x 1.00' Vert. HOLES IN SIDES OF INLET BOX X 6.00 C= 0.600
3	Device 1	6,928.00'	2.70' x 2.70' Horiz. CDOT TYPE 'C' INLET W/ MESH GRATE X 3.00 Limited to weir flow C= 0.600
4	Secondary	6,933.50'	30.0' long x 6.0' breadth EMERGENCY OVERFLOW WEIR Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=88.08 cfs @ 6.38 hrs HW=6,928.48' (Free Discharge)
 1=OUTFALL CULVERT W/ RESTRICTOR PLATE (Passes 88.08 cfs of 107.38 cfs potential flow)
 2=HOLES IN SIDES OF INLET BOX (Orifice Controls 52.52 cfs @ 5.8 fps)
 3=CDOT TYPE 'C' INLET W/ MESH GRATE (Weir Controls 35.56 cfs @ 2.3 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=6,922.00' (Free Discharge)
 4=EMERGENCY OVERFLOW WEIR (Controls 0.00 cfs)

Link DP-OSC1:

Inflow Area = 156.800 ac, Inflow Depth = 0.71"
 Inflow = 150.13 cfs @ 6.10 hrs, Volume= 9.292 af
 Primary = 150.13 cfs @ 6.10 hrs, Volume= 9.292 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Link DP-OSC2:

Inflow Area = 11.300 ac, Inflow Depth = 2.01"
 Inflow = 35.04 cfs @ 5.95 hrs, Volume= 1.895 af
 Primary = 35.04 cfs @ 5.95 hrs, Volume= 1.895 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Link DP-OSC3:

Inflow Area = 131.600 ac, Inflow Depth = 1.14"
 Inflow = 228.68 cfs @ 6.05 hrs, Volume= 12.548 af
 Primary = 228.68 cfs @ 6.05 hrs, Volume= 12.548 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Link DP-OSC4:

Inflow Area = 57.300 ac, Inflow Depth = 1.64"
 Inflow = 140.79 cfs @ 6.01 hrs, Volume= 7.845 af
 Primary = 140.79 cfs @ 6.01 hrs, Volume= 7.845 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Link DP-T11:

Inflow Area = 106.600 ac, Inflow Depth = 1.07"
 Inflow = 174.21 cfs @ 6.05 hrs, Volume= 9.520 af
 Primary = 174.21 cfs @ 6.05 hrs, Volume= 9.520 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Link DP-T13:

Inflow Area = 43.600 ac, Inflow Depth = 0.34"
 Inflow = 16.33 cfs @ 6.12 hrs, Volume= 1.219 af
 Primary = 16.33 cfs @ 6.12 hrs, Volume= 1.219 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

10YR-DEV-WQ

Type IIA 24-hr Rainfall=2.90"

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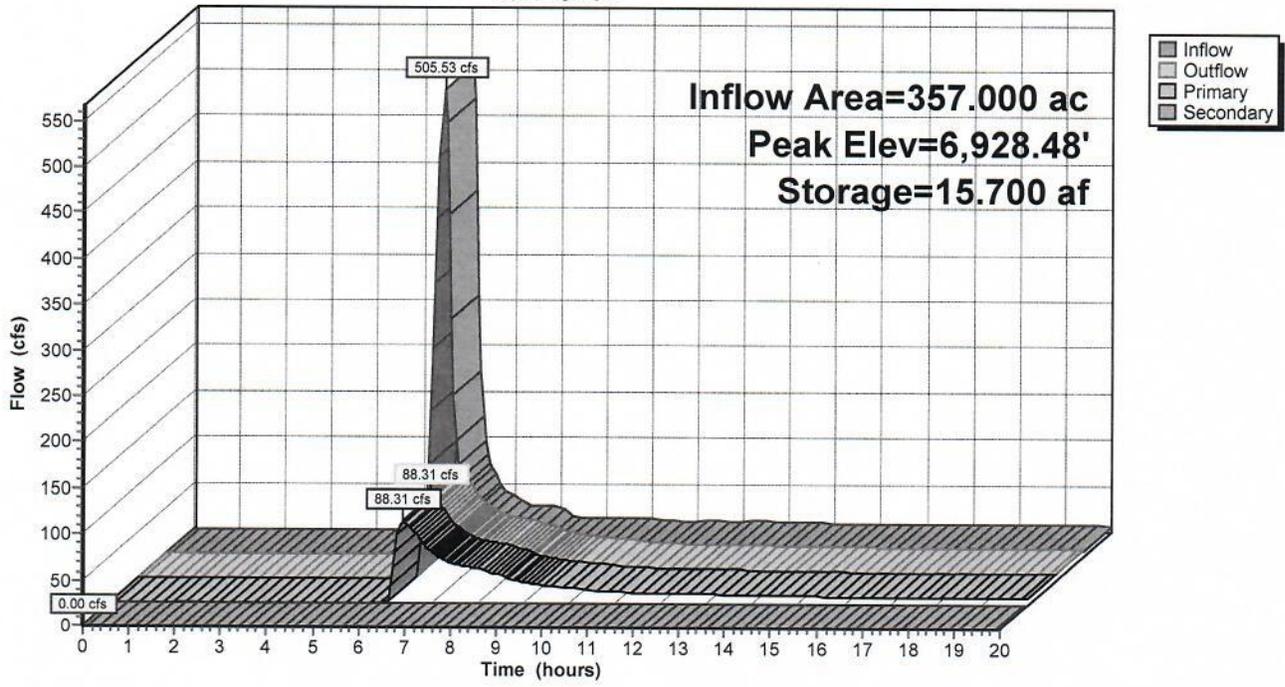
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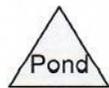
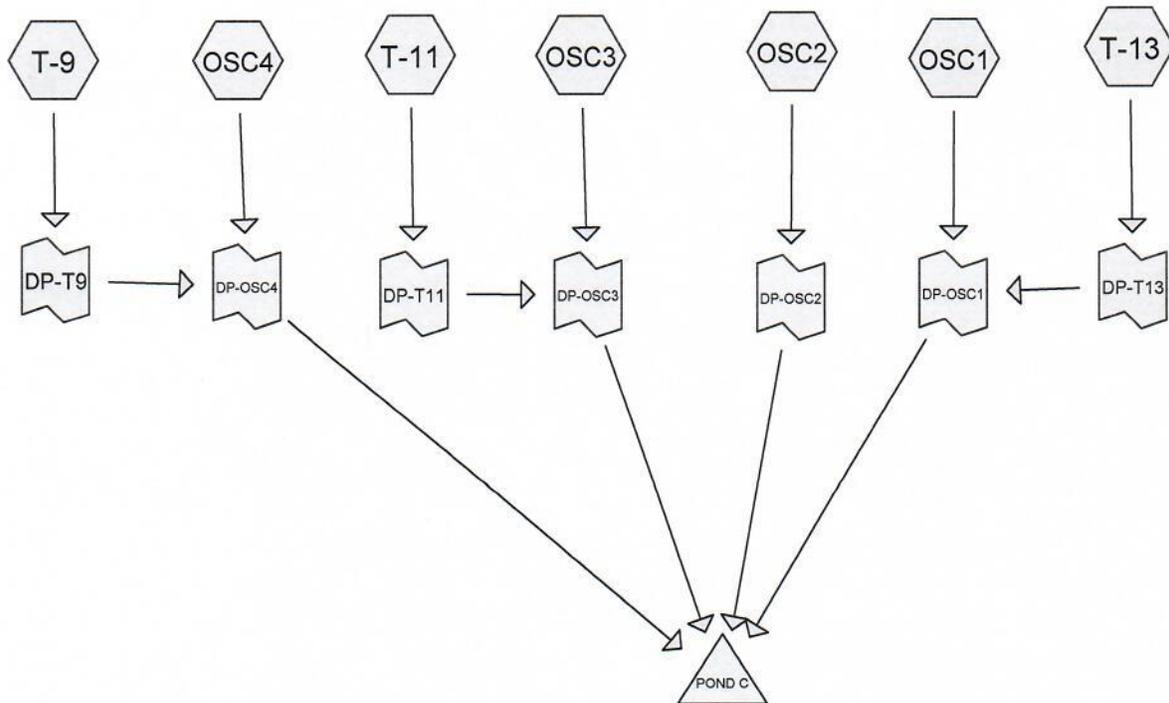
Inflow Area = 23.900 ac, Inflow Depth = 1.13"
Inflow = 46.21 cfs @ 5.99 hrs, Volume= 2.254 af
Primary = 46.21 cfs @ 5.99 hrs, Volume= 2.254 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Pond POND C:

Hydrograph





Drainage Diagram for 100YR-DEV-WQ
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100YR-DEV-WQ

Type IIA 24-hr Rainfall=4.40"

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Subcatchment OSC1:

Runoff = 304.82 cfs @ 6.08 hrs, Volume= 17.875 af, Depth= 1.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=4.40"

Area (ac)	CN	Description
113.000	75	1/4 acre lots, 38% imp, HSG B

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

Subcatchment OSC2:

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 56.47 cfs @ 5.95 hrs, Volume= 3.220 af, Depth= 3.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=4.40"

Area (ac)	CN	Description
11.300	92	Urban commercial, 85% imp, HSG B

Subcatchment OSC3:

Runoff = 100.64 cfs @ 6.04 hrs, Volume= 5.694 af, Depth= 2.73"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=4.40"

Area (ac)	CN	Description
25.000	85	PRD-10, 65% imp, HSG B

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Subcatchment OSC4:

Runoff = 160.52 cfs @ 6.03 hrs, Volume= 9.502 af, Depth= 3.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=4.40"

Area (ac)	CN	Description
33.400	92	PMD, Urban commercial, 85% imp, HSG B

100YR-DEV-WQ

Type IIA 24-hr Rainfall=4.40"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Subcatchment T-11:

Runoff = 357.69 cfs @ 6.04 hrs, Volume= 19.677 af, Depth= 2.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=4.40"

Area (ac)	CN	Description
106.600	79	FROM DMP

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4					Direct Entry, FROM DMP

Subcatchment T-13:

Runoff = 61.78 cfs @ 6.09 hrs, Volume= 3.741 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=4.40"

Area (ac)	CN	Description
43.600	62	FROM DMP

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0					Direct Entry, FROM DMP

Subcatchment T-9:

[49] Hint: Tc<2dt may require smaller dt

Runoff = 90.50 cfs @ 5.99 hrs, Volume= 4.582 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type IIA 24-hr Rainfall=4.40"

Area (ac)	CN	Description
23.900	80	FROM DMP

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4					Direct Entry, FROM DMP

Pond POND C:

Inflow Area = 356.800 ac, Inflow Depth = 2.16"
 Inflow = 1,053.00 cfs @ 6.04 hrs, Volume= 64.291 af
 Outflow = 146.22 cfs @ 6.44 hrs, Volume= 52.887 af, Atten= 86%, Lag= 23.9 min
 Primary = 146.22 cfs @ 6.44 hrs, Volume= 52.887 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 6,933.22' @ 6.44 hrs Surf.Area= 4.183 ac Storage= 33.201 af
 Plug-Flow detention time= 177.8 min calculated for 52.887 af (82% of inflow)
 Center-of-Mass det. time= 88.0 min (568.4 - 480.5)

#	Invert	Avail.Storage	Storage Description
1	6,922.00'	36.416 af	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
6,922.00	0.846	0.000	0.000
6,924.00	2.350	3.196	3.196
6,926.00	2.720	5.070	8.266
6,928.00	3.110	5.830	14.096
6,930.00	3.510	6.620	20.716
6,932.00	3.920	7.430	28.146
6,934.00	4.350	8.270	36.416

#	Routing	Invert	Outlet Devices
1	Primary	6,921.80'	23.2" x 100.0' long OUTFALL CULVERT W/ RESTRICTOR PLATE X 3.00 RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 6,921.00' S= 0.0080 '/' n= 0.013 Cc= 0.900
2	Device 1	6,926.50'	1.50' x 1.00' Vert. HOLES IN SIDES OF INLET BOX X 6.00 C= 0.600
3	Device 1	6,928.00'	2.70' x 2.70' Horiz. CDOT TYPE 'C' INLET W/ MESH GRATE X 3.00 Limited to weir flow C= 0.600
4	Secondary	6,933.50'	30.0' long x 6.0' breadth EMERGENCY OVERFLOW WEIR Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=146.21 cfs @ 6.44 hrs HW=6,933.22' (Free Discharge)
 ↖ 1=OUTFALL CULVERT W/ RESTRICTOR PLATE (Barrel Controls 146.21 cfs @ 16.6 fps)
 ↖ 2=HOLES IN SIDES OF INLET BOX (Passes < 108.06 cfs potential flow)
 ↖ 3=CDOT TYPE 'C' INLET W/ MESH GRATE (Passes < 240.61 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=6,922.00' (Free Discharge)
 ↖ 4=EMERGENCY OVERFLOW WEIR (Controls 0.00 cfs)

Link DP-OSC1:

Inflow Area = 156.600 ac, Inflow Depth = 1.66"
Inflow = 366.42 cfs @ 6.09 hrs, Volume= 21.616 af
Primary = 366.42 cfs @ 6.09 hrs, Volume= 21.616 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Link DP-OSC2:

Inflow Area = 11.300 ac, Inflow Depth = 3.42"
Inflow = 56.47 cfs @ 5.95 hrs, Volume= 3.220 af
Primary = 56.47 cfs @ 5.95 hrs, Volume= 3.220 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Link DP-OSC3:

Inflow Area = 131.600 ac, Inflow Depth = 2.31"
Inflow = 458.31 cfs @ 6.04 hrs, Volume= 25.371 af
Primary = 458.31 cfs @ 6.04 hrs, Volume= 25.371 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Link DP-OSC4:

Inflow Area = 57.300 ac, Inflow Depth = 2.95"
Inflow = 247.62 cfs @ 6.00 hrs, Volume= 14.084 af
Primary = 247.62 cfs @ 6.00 hrs, Volume= 14.084 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Link DP-T11:

Inflow Area = 106.600 ac, Inflow Depth = 2.22"
Inflow = 357.69 cfs @ 6.04 hrs, Volume= 19.677 af
Primary = 357.69 cfs @ 6.04 hrs, Volume= 19.677 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Link DP-T13:

Inflow Area = 43.600 ac, Inflow Depth = 1.03"
Inflow = 61.78 cfs @ 6.09 hrs, Volume= 3.741 af
Primary = 61.78 cfs @ 6.09 hrs, Volume= 3.741 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

100YR-DEV-WQ

Type IIA 24-hr Rainfall=4.40"

Prepared by WestWorks Engineering

Page 6

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5/8/2019

Link DP-T9:

Inflow Area = 23.900 ac, Inflow Depth = 2.30"

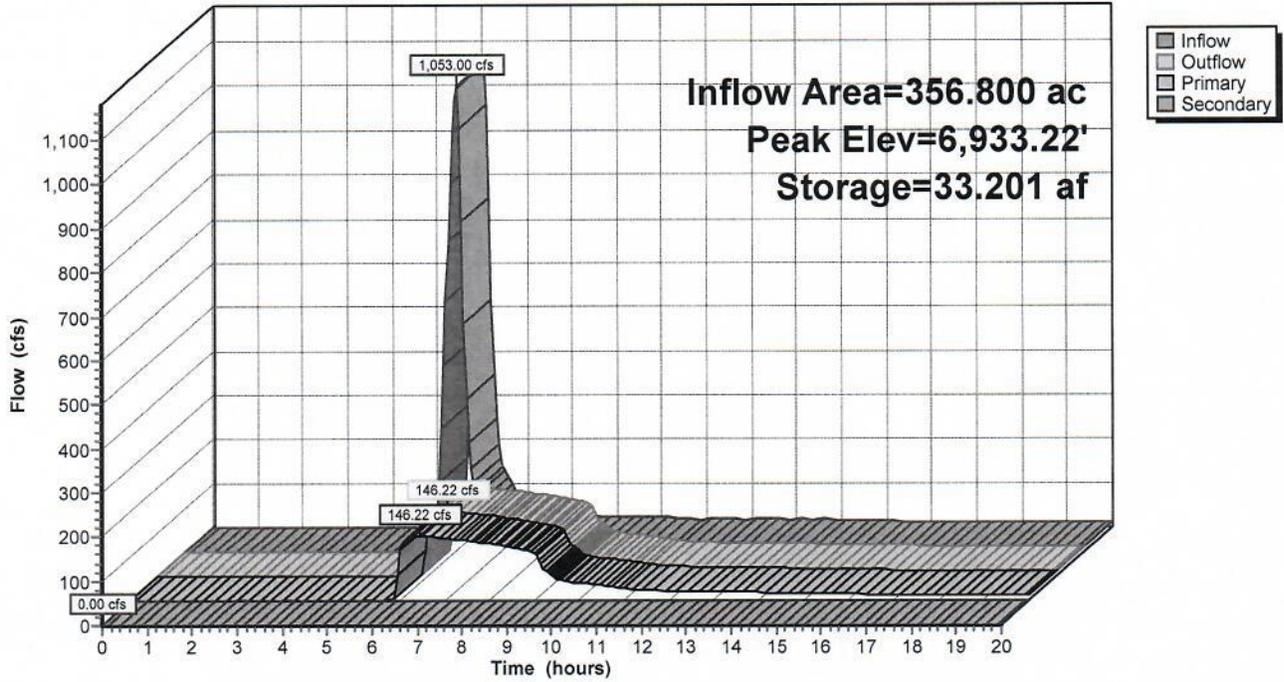
Inflow = 90.50 cfs @ 5.99 hrs, Volume= 4.582 af

Primary = 90.50 cfs @ 5.99 hrs, Volume= 4.582 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Pond POND C:

Hydrograph



HYDRAULIC CALCULATIONS

DETENTION VOLUME BY THE FULL SPECTRUM METHOD

Project: JACKSON CREEK NORTH
Basin ID: POND C

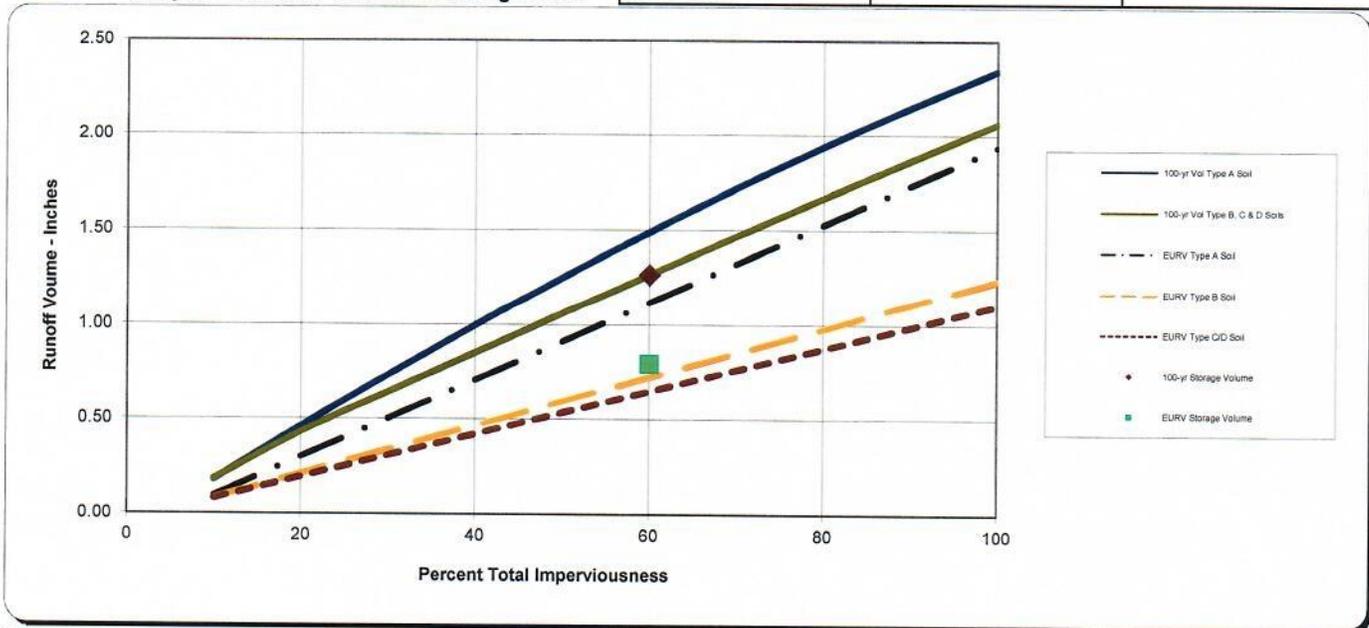
* User input data shown in blue.

Area of Watershed (acres)	168.40	
Subwatershed Imperviousness	60.0%	
Level of Minimizing Directly Connected Impervious Area (MDCIA)	0	0 ▼
Effective Imperviousness ¹	60.0%	
Hydrologic Soil Type	Percentage of Area	Area (acres)
Type A	0.0%	0.0
Type B	100.0%	168.4
Type C or D	0.0%	0.0

Recommended Horton's Equation Parameters for CUHP		
Infiltration (inches per hour)		Decay Coefficient-- α
Initial-- f_i	Final-- f_o	
4.5	0.6	0.0018
Detention Volumes ^{2,5}		
(watershed inches)	(acre-feet)	Maximum Allowable Release Rate, cfs ³
0.80	11.19	Design Outlet to Empty EURV in 72 Hours
1.27	17.76	143.14

Excess Urban Runoff Volume⁴

100-year Detention Volume Including WQCV⁵



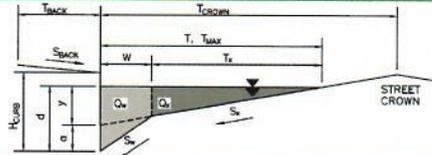
Notes:

- 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) 100-yr detention volume includes EURV. No need to add more volume for WQCV or EURV

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

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

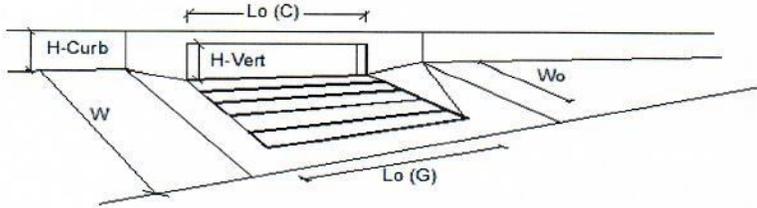
Project: JACKSON CREEK NORTH FILING NO. 2
 Inlet ID: DP-1



Gutter Geometry (Enter data in the blue cells)													
Maximum Allowable Width for Spread Behind Curb	$T_{BACK} = 9.0$ ft												
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	$S_{BACK} = 0.020$ ft/ft												
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	$n_{BACK} = 0.020$												
Height of Curb at Gutter Flow Line	$H_{CURB} = 6.00$ inches												
Distance from Curb Face to Street Crown	$T_{CROWN} = 16.0$ ft												
Gutter Width	$W = 2.00$ ft												
Street Transverse Slope	$S_x = 0.020$ ft/ft												
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	$S_w = 0.083$ ft/ft												
Street Longitudinal Slope - Enter 0 for sump condition	$S_o = 0.020$ ft/ft												
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	$n_{STREET} = 0.012$												
Max. Allowable Spread for Minor & Major Storm	<table border="1"> <thead> <tr> <th></th> <th>Minor Storm</th> <th>Major Storm</th> <th></th> </tr> </thead> <tbody> <tr> <td>$T_{MAX} =$</td> <td>11.0</td> <td>16.0</td> <td>ft</td> </tr> <tr> <td>$d_{MAX} =$</td> <td>4.0</td> <td>8.0</td> <td>inches</td> </tr> </tbody> </table>		Minor Storm	Major Storm		$T_{MAX} =$	11.0	16.0	ft	$d_{MAX} =$	4.0	8.0	inches
	Minor Storm	Major Storm											
$T_{MAX} =$	11.0	16.0	ft										
$d_{MAX} =$	4.0	8.0	inches										
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm													
Allow Flow Depth at Street Crown (leave blank for no)	<input type="checkbox"/> <input checked="" type="checkbox"/> check = yes												
MINOR STORM Allowable Capacity is based on Depth Criterion													
MAJOR STORM Allowable Capacity is based on Depth Criterion													
Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'													
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'													
	<table border="1"> <thead> <tr> <th></th> <th>Minor Storm</th> <th>Major Storm</th> <th></th> </tr> </thead> <tbody> <tr> <td>$Q_{ALLOW} =$</td> <td>6.4</td> <td>52.0</td> <td>cfs</td> </tr> </tbody> </table>		Minor Storm	Major Storm		$Q_{ALLOW} =$	6.4	52.0	cfs				
	Minor Storm	Major Storm											
$Q_{ALLOW} =$	6.4	52.0	cfs										

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017

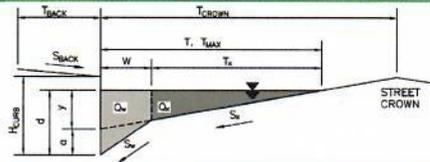


Design Information (input)	MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	10.00	10.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'			
Total Inlet Interception Capacity	3.6	6.7	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	0.1	3.3	cfs
Capture Percentage = Q_i/Q_0 =	98	67	%

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

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

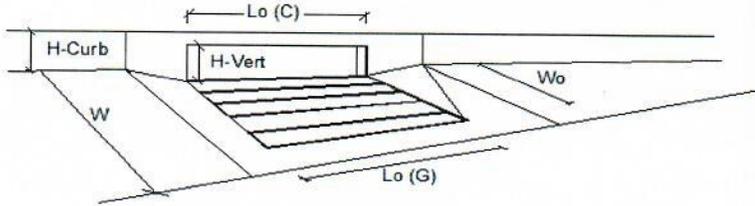
Project: JACKSON CREEK NORTH FILING NO. 2
 Inlet ID: DP-2



Gutter Geometry (Enter data in the blue cells)							
Maximum Allowable Width for Spread Behind Curb	$T_{BACK} = 9.0$ ft						
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	$S_{BACK} = 0.020$ ft/ft						
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	$n_{BACK} = 0.020$						
Height of Curb at Gutter Flow Line	$H_{CURB} = 6.00$ inches						
Distance from Curb Face to Street Crown	$T_{CROWN} = 16.0$ ft						
Gutter Width	$W = 2.00$ ft						
Street Transverse Slope	$S_x = 0.020$ ft/ft						
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	$S_w = 0.083$ ft/ft						
Street Longitudinal Slope - Enter 0 for sump condition	$S_c = 0.020$ ft/ft						
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	$n_{STREET} = 0.012$						
Max. Allowable Spread for Minor & Major Storm	<table border="1"> <tr> <th>Minor Storm</th> <th>Major Storm</th> </tr> <tr> <td>$T_{MAX} = 11.0$</td> <td>16.0</td> </tr> <tr> <td colspan="2">ft</td> </tr> </table>	Minor Storm	Major Storm	$T_{MAX} = 11.0$	16.0	ft	
Minor Storm	Major Storm						
$T_{MAX} = 11.0$	16.0						
ft							
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	<table border="1"> <tr> <th>Minor Storm</th> <th>Major Storm</th> </tr> <tr> <td>$d_{MAX} = 4.0$</td> <td>8.0</td> </tr> <tr> <td colspan="2">inches</td> </tr> </table>	Minor Storm	Major Storm	$d_{MAX} = 4.0$	8.0	inches	
Minor Storm	Major Storm						
$d_{MAX} = 4.0$	8.0						
inches							
Allow Flow Depth at Street Crown (leave blank for no)	<table border="1"> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td>check = yes</td> </tr> </table>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	check = yes			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	check = yes					
MINOR STORM Allowable Capacity is based on Depth Criterion							
MAJOR STORM Allowable Capacity is based on Depth Criterion							
Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'							
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'							
	<table border="1"> <tr> <th>Minor Storm</th> <th>Major Storm</th> </tr> <tr> <td>$Q_{ALLOW} = 6.4$</td> <td>52.0</td> </tr> <tr> <td colspan="2">cfs</td> </tr> </table>	Minor Storm	Major Storm	$Q_{ALLOW} = 6.4$	52.0	cfs	
Minor Storm	Major Storm						
$Q_{ALLOW} = 6.4$	52.0						
cfs							

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017

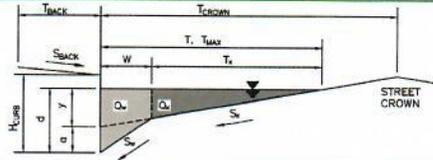


Design Information (Input)	MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	CDOT Type R Curb Opening		
Total Number of Units in the Inlet (Grate or Curb Opening)	3.0	3.0	inches
Length of a Single Unit Inlet (Grate or Curb Opening)	1	1	
Width of a Unit Grate (cannot be greater than W, Gutter Width)	10.00	10.00	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	N/A	N/A	ft
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	N/A	N/A	
Street Hydraulics: OK - Q < Allowable Street Capacity			
Total Inlet Interception Capacity	MINOR		MAJOR
	1.6	5.5	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	0.0	1.5	cfs
Capture Percentage = Q_i/Q_o =	100	79	%

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

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

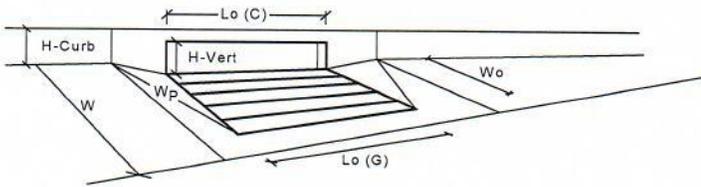
Project: JACKSON CREEK NORTH FILING NO. 2
 Inlet ID: DP-3



Gutter Geometry (Enter data in the blue cells)							
Maximum Allowable Width for Spread Behind Curb	$T_{BACK} = 9.0$ ft						
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	$S_{BACK} = 0.020$ ft/ft						
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	$n_{BACK} = 0.020$						
Height of Curb at Gutter Flow Line	$H_{CURB} = 6.00$ inches						
Distance from Curb Face to Street Crown	$T_{CROWN} = 16.0$ ft						
Gutter Width	$W = 2.00$ ft						
Street Transverse Slope	$S_x = 0.020$ ft/ft						
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	$S_w = 0.083$ ft/ft						
Street Longitudinal Slope - Enter 0 for sump condition	$S_L = 0.000$ ft/ft						
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	$n_{STREET} = 0.012$						
Max. Allowable Spread for Minor & Major Storm	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;"></td> <td style="width: 25%; text-align: center;">Minor Storm</td> <td style="width: 25%; text-align: center;">Major Storm</td> </tr> <tr> <td>$T_{MAX} =$</td> <td style="text-align: center;">11.0</td> <td style="text-align: center;">16.0</td> </tr> </table>		Minor Storm	Major Storm	$T_{MAX} =$	11.0	16.0
	Minor Storm	Major Storm					
$T_{MAX} =$	11.0	16.0					
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;"></td> <td style="width: 25%; text-align: center;">Minor Storm</td> <td style="width: 25%; text-align: center;">Major Storm</td> </tr> <tr> <td>$d_{MAX} =$</td> <td style="text-align: center;">4.0</td> <td style="text-align: center;">8.0</td> </tr> </table>		Minor Storm	Major Storm	$d_{MAX} =$	4.0	8.0
	Minor Storm	Major Storm					
$d_{MAX} =$	4.0	8.0					
Check boxes are not applicable in SUMP conditions							
MINOR STORM Allowable Capacity is based on Depth Criterion							
MAJOR STORM Allowable Capacity is based on Depth Criterion							
	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;"></td> <td style="width: 25%; text-align: center;">Minor Storm</td> <td style="width: 25%; text-align: center;">Major Storm</td> </tr> <tr> <td>$Q_{allow} =$</td> <td style="text-align: center;">SUMP</td> <td style="text-align: center;">SUMP</td> </tr> </table>		Minor Storm	Major Storm	$Q_{allow} =$	SUMP	SUMP
	Minor Storm	Major Storm					
$Q_{allow} =$	SUMP	SUMP					

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017

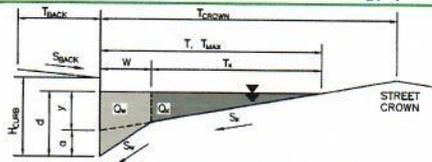


		MINOR	MAJOR	
Design Information (Input)				
Type of Inlet		CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		1	1	
Water Depth at Flowline (outside of local depression)		4.0	5.4	inches
Grate Information				
Length of a Unit Grate		N/A	N/A	feet
Width of a Unit Grate		N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		N/A	N/A	
Curb Opening Information				
Length of a Unit Curb Opening		15.00	15.00	feet
Height of Vertical Curb Opening in Inches		6.00	6.00	inches
Height of Curb Orifice Throat in Inches		6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		0.67	0.67	
Low Head Performance Reduction (Calculated)				
Depth for Grate Midwidth		N/A	N/A	ft
Depth for Curb Opening Weir Equation		0.17	0.28	ft
Combination Inlet Performance Reduction Factor for Long Inlets		0.38	0.50	
Curb Opening Performance Reduction Factor for Long Inlets		0.64	0.74	
Grated Inlet Performance Reduction Factor for Long Inlets		N/A	N/A	
Total Inlet Interception Capacity (assumes clogged condition)				
		2.8	7.1	cfs
WARNING: Inlet Capacity less than Q Peak for Minor and Major Storms		5.0	15.0	cfs

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

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

Project: JACKSON CREEK NORTH FILING NO. 2
 Inlet ID: DP-4



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb
 Side Slope Behind Curb (leave blank for no conveyance credit behind curb)
 Manning's Roughness Behind Curb (typically between 0.012 and 0.020)
 Height of Curb at Gutter Flow Line
 Distance from Curb Face to Street Crown
 Gutter Width
 Street Transverse Slope
 Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)
 Street Longitudinal Slope - Enter 0 for sump condition
 Manning's Roughness for Street Section (typically between 0.012 and 0.020)

$T_{BACK} = 9.0$ ft
 $S_{BACK} = 0.020$ ft/ft
 $n_{BACK} = 0.020$
 $H_{CURB} = 6.00$ inches
 $T_{CROWN} = 16.0$ ft
 $W = 2.00$ ft
 $S_X = 0.020$ ft/ft
 $S_W = 0.083$ ft/ft
 $S_L = 0.000$ ft/ft
 $n_{STREET} = 0.012$

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

	Minor Storm	Major Storm	
$T_{MAX} =$	11.0	16.0	ft
$d_{MAX} =$	4.0	8.0	inches

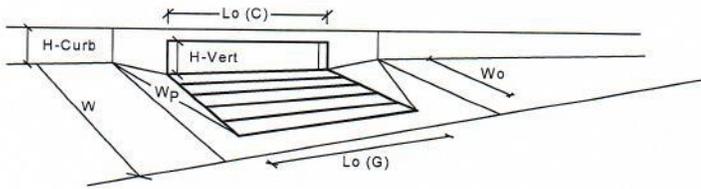
MINOR STORM Allowable Capacity is based on Depth Criterion
 MAJOR STORM Allowable Capacity is based on Depth Criterion

$Q_{allow} =$

Minor Storm	Major Storm	
SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017

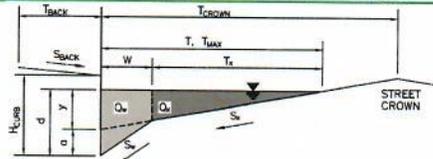


Design Information (input)	MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	1	1	
Water Depth at Flowline (outside of local depression)	4.0	6.0	inches
Grate Information	MINOR	MAJOR	<input checked="" type="checkbox"/> Override Depths
Length of a Unit Grate	N/A	N/A	feet
Width of a Unit Grate	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	N/A	N/A	
Curb Opening Information	MINOR	MAJOR	
Length of a Unit Curb Opening	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	0.67	0.67	
Low Head Performance Reduction (Calculated)	MINOR	MAJOR	
Depth for Grate Midwidth	N/A	N/A	ft
Depth for Curb Opening Weir Equation	0.17	0.33	ft
Combination Inlet Performance Reduction Factor for Long Inlets	0.51	0.77	
Curb Opening Performance Reduction Factor for Long Inlets	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	N/A	N/A	
Total Inlet Interception Capacity (assumes clogged condition)	MINOR	MAJOR	
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	1.9	5.4	cfs
$Q_{PEAK REQUIRED}$	1.9	5.0	cfs

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

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

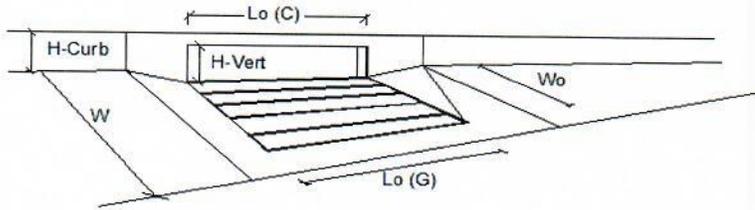
Project: JACKSON CREEK NORTH FILING NO. 2
 Inlet ID: DP-6



Gutter Geometry (Enter data in the blue cells)					
Maximum Allowable Width for Spread Behind Curb	$T_{BACK} = 9.0$ ft				
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	$S_{BACK} = 0.020$ ft/ft				
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	$n_{BACK} = 0.020$				
Height of Curb at Gutter Flow Line	$H_{CURB} = 6.00$ inches				
Distance from Curb Face to Street Crown	$T_{CROWN} = 16.0$ ft				
Gutter Width	$W = 2.00$ ft				
Street Transverse Slope	$S_x = 0.020$ ft/ft				
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	$S_w = 0.083$ ft/ft				
Street Longitudinal Slope - Enter 0 for sump condition	$S_o = 0.034$ ft/ft				
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	$n_{STREET} = 0.012$				
Max. Allowable Spread for Minor & Major Storm	<table border="1" style="display: inline-table; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Minor Storm</th> <th style="width: 50%;">Major Storm</th> </tr> </thead> <tbody> <tr> <td>$T_{MAX} = 11.0$</td> <td>16.0</td> </tr> </tbody> </table> ft	Minor Storm	Major Storm	$T_{MAX} = 11.0$	16.0
Minor Storm	Major Storm				
$T_{MAX} = 11.0$	16.0				
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	<table border="1" style="display: inline-table; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Minor Storm</th> <th style="width: 50%;">Major Storm</th> </tr> </thead> <tbody> <tr> <td>$d_{MAX} = 4.0$</td> <td>8.0</td> </tr> </tbody> </table> inches	Minor Storm	Major Storm	$d_{MAX} = 4.0$	8.0
Minor Storm	Major Storm				
$d_{MAX} = 4.0$	8.0				
Allow Flow Depth at Street Crown (leave blank for no)	<input type="checkbox"/> <input type="checkbox"/> check = yes				
MINOR STORM Allowable Capacity is based on Depth Criterion					
MAJOR STORM Allowable Capacity is based on Spread Criterion					
Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'					
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'					
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Minor Storm</th> <th style="width: 50%;">Major Storm</th> </tr> </thead> <tbody> <tr> <td>$Q_{allow} = 8.3$</td> <td>23.0</td> </tr> </tbody> </table> cfs	Minor Storm	Major Storm	$Q_{allow} = 8.3$	23.0
Minor Storm	Major Storm				
$Q_{allow} = 8.3$	23.0				

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)	MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	10.00	10.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity			
Total Inlet Interception Capacity	3.0	6.0	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	0.0	2.0	cfs
Capture Percentage = Q_i/Q_o =	100	75	%

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

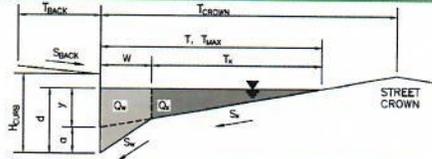
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

JACKSON CREEK NORTH FILING NO. 2

Inlet ID:

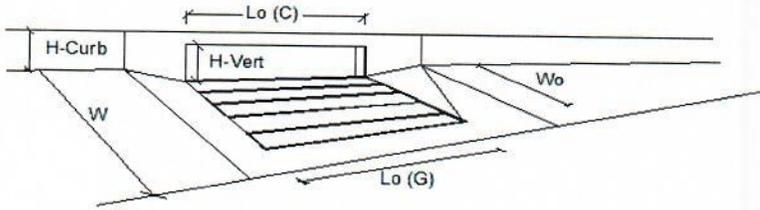
DP-7



Gutter Geometry (Enter data in the blue cells)													
Maximum Allowable Width for Spread Behind Curb	$T_{BACK} = 9.0$ ft												
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	$S_{BACK} = 0.020$ ft/ft												
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	$n_{BACK} = 0.020$												
Height of Curb at Gutter Flow Line	$H_{CURB} = 6.00$ inches												
Distance from Curb Face to Street Crown	$T_{CROWN} = 19.0$ ft												
Gutter Width	$W = 2.00$ ft												
Street Transverse Slope	$S_x = 0.020$ ft/ft												
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	$S_w = 0.083$ ft/ft												
Street Longitudinal Slope - Enter 0 for sump condition	$S_L = 0.040$ ft/ft												
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	$n_{STREET} = 0.012$												
Max. Allowable Spread for Minor & Major Storm	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th style="text-align: center;">Minor Storm</th> <th style="text-align: center;">Major Storm</th> <th></th> </tr> </thead> <tbody> <tr> <td>$T_{MAX} =$</td> <td style="text-align: center;">14.0</td> <td style="text-align: center;">19.0</td> <td style="text-align: right;">ft</td> </tr> <tr> <td>$d_{MAX} =$</td> <td style="text-align: center;">5.0</td> <td style="text-align: center;">8.0</td> <td style="text-align: right;">inches</td> </tr> </tbody> </table>		Minor Storm	Major Storm		$T_{MAX} =$	14.0	19.0	ft	$d_{MAX} =$	5.0	8.0	inches
	Minor Storm	Major Storm											
$T_{MAX} =$	14.0	19.0	ft										
$d_{MAX} =$	5.0	8.0	inches										
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm													
Allow Flow Depth at Street Crown (leave blank for no)	<input type="checkbox"/> <input type="checkbox"/> check = yes												
MINOR STORM Allowable Capacity is based on Spread Criterion													
MAJOR STORM Allowable Capacity is based on Spread Criterion													
Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'													
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'													
	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th style="text-align: center;">Minor Storm</th> <th style="text-align: center;">Major Storm</th> <th></th> </tr> </thead> <tbody> <tr> <td>$Q_{allow} =$</td> <td style="text-align: center;">18.0</td> <td style="text-align: center;">38.2</td> <td style="text-align: right;">cfs</td> </tr> </tbody> </table>		Minor Storm	Major Storm		$Q_{allow} =$	18.0	38.2	cfs				
	Minor Storm	Major Storm											
$Q_{allow} =$	18.0	38.2	cfs										

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



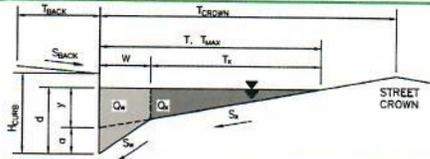
Design Information (Input)	MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening			
Local Depression (additional to continuous gutter depression 'a')	3.0	3.0	inches	
Total Number of Units in the Inlet (Grate or Curb Opening)	1	1		
Length of a Single Unit Inlet (Grate or Curb Opening)	10.00	10.00	ft	
Width of a Unit Grate (cannot be greater than W, Gutter Width)	N/A	N/A	ft	
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	N/A	N/A		
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	0.10	0.10		
Street Hydraulics: OK - Q < Allowable Street Capacity				
Total Inlet Interception Capacity	3.0	5.6	cfs	
Total Inlet Carry-Over Flow (flow bypassing inlet)	0.0	1.4	cfs	
Capture Percentage = Q_i/Q_o =	100	79	%	

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

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

Project:
Inlet ID:

JACKSON CREEK NORTH FILING NO. 2
DP-8



Gutter Geometry (Enter data in the blue cells)

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

$T_{BACK} = 9.0$ ft
 $S_{BACK} = 0.020$ ft/ft
 $n_{BACK} = 0.020$

Height of Curb at Gutter Flow Line
Distance from Curb Face to Street Crown

$H_{CURB} = 6.00$ inches
 $T_{CROWN} = 16.0$ ft

Gutter Width
Street Transverse Slope

$W = 2.00$ ft
 $S_x = 0.020$ ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

$S_w = 0.083$ ft/ft

Street Longitudinal Slope - Enter 0 for sump condition

$S_o = 0.010$ ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

$n_{STREET} = 0.012$

Max. Allowable Spread for Minor & Major Storm

	Minor Storm	Major Storm	
$T_{MAX} =$	11.0	16.0	ft
$d_{MAX} =$	4.0	8.0	inches

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

Allow Flow Depth at Street Crown (leave blank for no)

check = yes

MINOR STORM Allowable Capacity is based on Depth Criterion

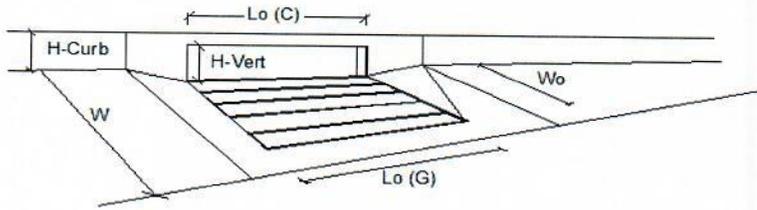
MAJOR STORM Allowable Capacity is based on Spread Criterion

	Minor Storm	Major Storm	
$Q_{allow} =$	4.5	12.5	cfs

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

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017

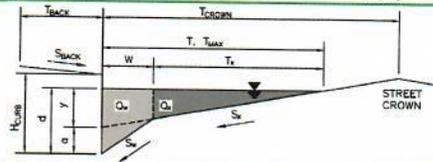


Design Information (Input)	MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	10.00	10.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'			
Total Inlet Interception Capacity	3.0	5.9	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	0.0	2.1	cfs
Capture Percentage = Q_i/Q_o =	100	73	%

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

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

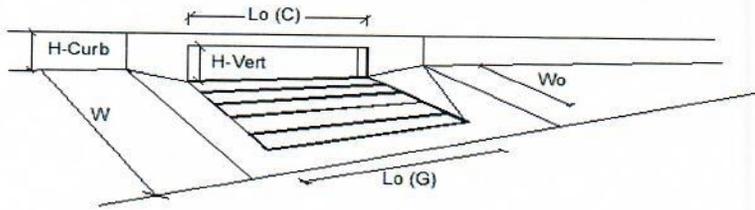
Project: JACKSON CREEK NORTH FILING NO. 2
 Inlet ID: DP-9



Gutter Geometry (Enter data in the blue cells)							
Maximum Allowable Width for Spread Behind Curb	$T_{BACK} = 9.0$ ft						
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	$S_{BACK} = 0.020$ ft/ft						
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	$n_{BACK} = 0.020$						
Height of Curb at Gutter Flow Line	$H_{CURB} = 6.00$ inches						
Distance from Curb Face to Street Crown	$T_{CROWN} = 16.0$ ft						
Gutter Width	$W = 2.00$ ft						
Street Transverse Slope	$S_x = 0.020$ ft/ft						
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	$S_w = 0.083$ ft/ft						
Street Longitudinal Slope - Enter 0 for sump condition	$S_o = 0.025$ ft/ft						
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	$n_{STREET} = 0.012$						
Max. Allowable Spread for Minor & Major Storm	<table border="1"> <tr> <th>Minor Storm</th> <th>Major Storm</th> <th>ft</th> </tr> <tr> <td>$T_{MAX} = 11.0$</td> <td>16.0</td> <td></td> </tr> </table>	Minor Storm	Major Storm	ft	$T_{MAX} = 11.0$	16.0	
Minor Storm	Major Storm	ft					
$T_{MAX} = 11.0$	16.0						
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	<table border="1"> <tr> <th>Minor Storm</th> <th>Major Storm</th> <th>inches</th> </tr> <tr> <td>$d_{MAX} = 4.0$</td> <td>8.0</td> <td></td> </tr> </table>	Minor Storm	Major Storm	inches	$d_{MAX} = 4.0$	8.0	
Minor Storm	Major Storm	inches					
$d_{MAX} = 4.0$	8.0						
Allow Flow Depth at Street Crown (leave blank for no)	<input type="checkbox"/> <input type="checkbox"/> check = yes						
MINOR STORM Allowable Capacity is based on Depth Criterion							
MAJOR STORM Allowable Capacity is based on Spread Criterion							
Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'							
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'							
	<table border="1"> <tr> <th>Minor Storm</th> <th>Major Storm</th> <th>cfs</th> </tr> <tr> <td>$Q_{allow} = 7.1$</td> <td>19.7</td> <td></td> </tr> </table>	Minor Storm	Major Storm	cfs	$Q_{allow} = 7.1$	19.7	
Minor Storm	Major Storm	cfs					
$Q_{allow} = 7.1$	19.7						

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017

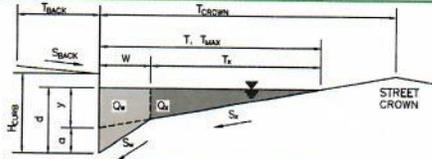


Design Information (Input)	MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'			
Total Inlet Interception Capacity	1.0	2.1	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	0.0	0.9	cfs
Capture Percentage = Q_i/Q_o =	99	69	%

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

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

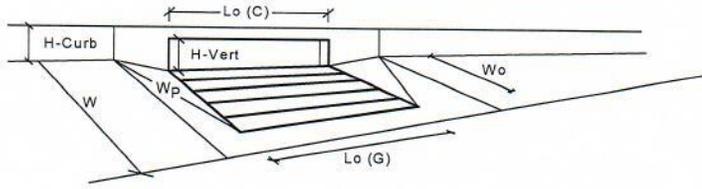
Project: JACKSON CREEK NORTH FILING NO. 2
 Inlet ID: DP-10



Gutter Geometry (Enter data in the blue cells)							
Maximum Allowable Width for Spread Behind Curb	$T_{BACK} = 9.0$ ft						
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	$S_{BACK} = 0.020$ ft/ft						
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	$n_{BACK} = 0.020$						
Height of Curb at Gutter Flow Line	$H_{CURB} = 6.00$ inches						
Distance from Curb Face to Street Crown	$T_{CROWN} = 19.0$ ft						
Gutter Width	$W = 2.00$ ft						
Street Transverse Slope	$S_x = 0.020$ ft/ft						
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	$S_w = 0.083$ ft/ft						
Street Longitudinal Slope - Enter 0 for sump condition	$S_L = 0.000$ ft/ft						
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	$n_{STREET} = 0.012$						
Max. Allowable Spread for Minor & Major Storm	<table border="1"> <tr> <th>Minor Storm</th> <th>Major Storm</th> <th>ft</th> </tr> <tr> <td>$T_{MAX} = 14.0$</td> <td>$T_{MAX} = 19.0$</td> <td></td> </tr> </table>	Minor Storm	Major Storm	ft	$T_{MAX} = 14.0$	$T_{MAX} = 19.0$	
Minor Storm	Major Storm	ft					
$T_{MAX} = 14.0$	$T_{MAX} = 19.0$						
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	<table border="1"> <tr> <th>Minor Storm</th> <th>Major Storm</th> <th>inches</th> </tr> <tr> <td>$d_{MAX} = 5.0$</td> <td>$d_{MAX} = 8.0$</td> <td></td> </tr> </table>	Minor Storm	Major Storm	inches	$d_{MAX} = 5.0$	$d_{MAX} = 8.0$	
Minor Storm	Major Storm	inches					
$d_{MAX} = 5.0$	$d_{MAX} = 8.0$						
Check boxes are not applicable in SUMP conditions							
MINOR STORM Allowable Capacity is based on Depth Criterion							
MAJOR STORM Allowable Capacity is based on Depth Criterion							
	<table border="1"> <tr> <th>Minor Storm</th> <th>Major Storm</th> <th>cfs</th> </tr> <tr> <td>$Q_{allow} = SUMP$</td> <td>$Q_{allow} = SUMP$</td> <td></td> </tr> </table>	Minor Storm	Major Storm	cfs	$Q_{allow} = SUMP$	$Q_{allow} = SUMP$	
Minor Storm	Major Storm	cfs					
$Q_{allow} = SUMP$	$Q_{allow} = SUMP$						

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)	MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	1	1	
Water Depth at Flowline (outside of local depression)	4.9	6.5	inches
Grate Information			
Length of a Unit Grate	N/A	N/A	feet
Width of a Unit Grate	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	N/A	N/A	
Curb Opening Information			
Length of a Unit Curb Opening	20.00	20.00	feet
Height of Vertical Curb Opening in Inches	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	0.67	0.67	
Low Head Performance Reduction (Calculated)			
Depth for Grate Midwidth	N/A	N/A	ft
Depth for Curb Opening Weir Equation	0.24	0.38	ft
Combination Inlet Performance Reduction Factor for Long Inlets	0.46	0.61	
Curb Opening Performance Reduction Factor for Long Inlets	0.71	0.82	
Grated Inlet Performance Reduction Factor for Long Inlets	N/A	N/A	
Total Inlet Interception Capacity (assumes clogged condition)			
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	6.9	15.5	cfs
Q PEAK REQUIRED =	4.0	15.0	cfs

DRAINAGE MAPS (3)



DRAINAGE LEGEND

BASIN IDENTIFIER	X
BASIN AREA [AC]	X.XX
SURFACE DESIGN POINT IDENTIFIER	#
SWALE DESIGN POINT IDENTIFIER	#
DRAINAGE BASIN BOUNDARY	---

DRAINAGE BASIN

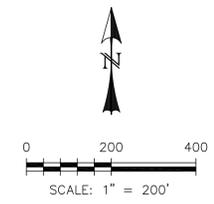
BASIN	Q ₁₀ [CFS]	Q ₁₀₀ [CFS]
EXC1	52	153
EXC2	10	27
EXC3	13	37
EXC4	15	28
T-9	46	91
T-11	174	358
T-13	16	62

DESIGN POINT

DESIGN POINT	Q ₁₀ [CFS]	Q ₁₀₀ [CFS]	DESCRIPTION
EX1	201	472	FLOW TO (E) CULVERT UNDER JACKSON CREEK PKWY
EX2	22	50	FLOW TO (E) CULVERT UNDER JACKSON CREEK PKWY
EX3	49	104	FLOW TO (E) CULVERT UNDER JACKSON CREEK PKWY
EX4	15	28	FLOW IN (E) 42" RCP STORM TO POND C
T9	46	91	FLOW OVER HIGBY ROAD
T11	174	357	FLOW TO (E) PIPE UNDER HIGBY ROAD
T13	16	62	FLOW TO (E) CULVERT UNDER HIGBY ROAD
EXT	264	612	TOTAL COMBINED FLOW IN TEACHOUT CREEK

LEGEND

EXISTING	(E)
PROPOSED	(P)
ADDRESS	(1234)
CURB AND GUTTER	C&G
EASEMENT	ESMT
RIGHT-OF-WAY	ROW
BOUNDARY	---
RIGHT-OF-WAY	---
LOT LINE	---
EASEMENT	---
TIME OF CONCENTRATION PATH	---
(E) CONTOUR, INDEX	---6940---
(E) CONTOUR	---
(P) CONTOUR, INDEX	---6940---
(P) CONTOUR	---
(E) STORM SEWER, INLET, MH	---
(P) STORM SEWER, INLET, MH	---



REV.	DESCRIPTION	DATE

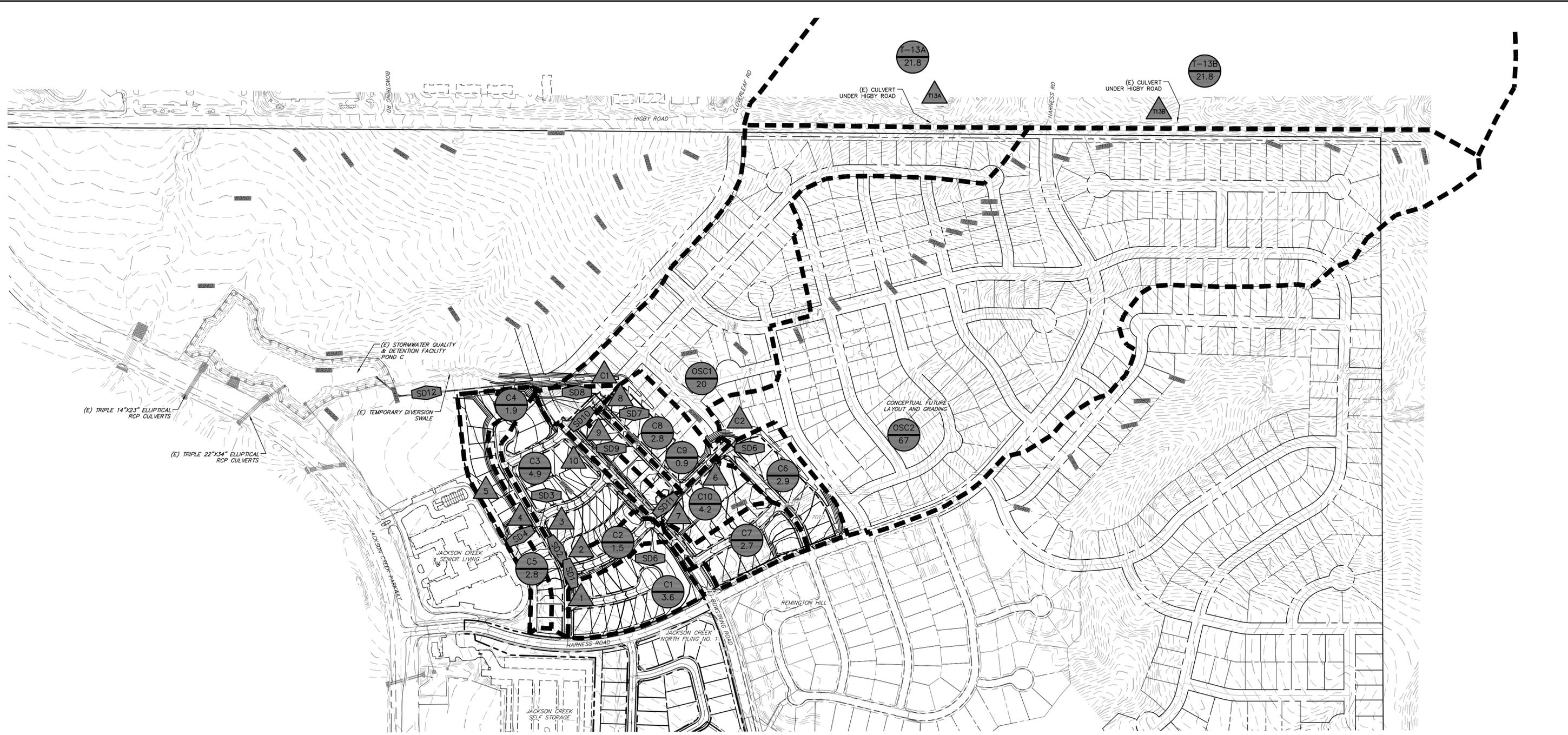


PREPARED FOR:
VISION DEVELOPMENT
540 ELKTON DRIVE
SUITE 202
COLORADO SPRINGS, CO 80907
(719) 385-0555



JACKSON CREEK NORTH
FILING NO. 2
DRAINAGE MAP
EXISTING CONDITIONS

DESIGNED BY: CDK	DRAWN BY: CDK
SCALE: 1"=200'	DATE: 05/08/19
JOB NUMBER: 91805	SHEET: 1 OF 3



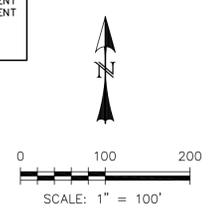
DRAINAGE LEGEND	
BASIN IDENTIFIER	
BASIN AREA [AC]	
SURFACE DESIGN POINT IDENTIFIER	
SWALE DESIGN POINT IDENTIFIER	
DRAINAGE BASIN BOUNDARY	

DRAINAGE BASIN (RATIONAL METHOD)		
BASIN	Q ₅ [CFS]	Q ₁₀₀ [CFS]
C1	4	10
C2	2	5
C3	2	16
C4	2	5
C5	2	6
C6	2	8
C7	3	7
C8	3	8
C9	1	3
C10	4	11

DESIGN POINT (RATIONAL METHOD)			
DESIGN POINT	Q ₅ [CFS]	Q ₁₀₀ [CFS]	DESCRIPTION
1	4	10	(P) 10" TYPE R AT-GRADE INLET
2	2	7	(P) 10" TYPE R AT-GRADE INLET
3	5	15	(P) 10" TYPE R SUMP INLET
4	2	5	(P) 5" TYPE R SUMP INLET
5	2	6	(P) SHEET FLOW TO WEST
6	3	8	(P) 10" TYPE R AT-GRADE INLET
7	3	7	(P) 10" TYPE R AT-GRADE INLET
8	3	7	(P) 10" TYPE R AT-GRADE INLET
9	1	3	(P) 5" TYPE R AT-GRADE INLET
10	4	15	(P) 15" & 5" TYPE R SUMP INLETS
SD1	4	8	(P) 18" RCP STORM DRAIN
SD2	5	14	(P) 24" RCP STORM DRAIN
SD3	10	29	(P) 30" RCP STORM DRAIN
SD4	12	34	(P) 36" RCP STORM DRAIN
SD5	3	6	(P) 18" RCP STORM DRAIN
SD6	3	6	(P) 18" RCP STORM DRAIN
SD7	3	6	(P) 18" RCP STORM DRAIN
SD8	4	8	(P) 18" RCP STORM DRAIN
SD9	4	15	(P) 24" RCP STORM DRAIN

DRAINAGE BASIN (SCS TR-20 METHOD)		
BASIN	Q ₁₀ [CFS]	Q ₁₀₀ [CFS]
T13A	8	31
T13B	8	31
C1	24	54
OSC1	79	181
TO SD11	10	23
TO SD10	4	10

DESIGN POINT (SCS TR-20 METHOD)			
DESIGN POINT	Q ₁₀ [CFS]	Q ₁₀₀ [CFS]	DESCRIPTION
T13A	8	31	RUNOFF FROM NORTH OF HIGBY ROAD
T13B	8	31	RUNOFF FROM NORTH OF HIGBY ROAD
C1	24	54	(P) 36" RCP STUB/CULVERT FOR FUTURE DEVELOPMENT
C2	87	212	(P) 48" RCP STUB/CULVERT FOR FUTURE DEVELOPMENT
SD10	36	94	(P) 36" RCP STORM DRAIN
SD11	96	233	(P) 48" RCP STORM DRAIN
SD12	129	321	(P) 54" RCP STORM DRAIN



LEGEND	
EXISTING	(E)
PROPOSED	(P)
ADDRESS	(1234)
CURB AND GUTTER	C&G
EASEMENT	ESMT
RIGHT-OF-WAY	ROW
BOUNDARY	
RIGHT-OF-WAY	
LOT LINE	
EASEMENT	
TIME OF CONCENTRATION PATH	
(E) CONTOUR, INDEX	
(E) CONTOUR	
(P) CONTOUR, INDEX	
(P) CONTOUR	
(E) STORM SEWER, INLET, MH	
(P) STORM SEWER, INLET, MH	

REV.	DESCRIPTION	DATE

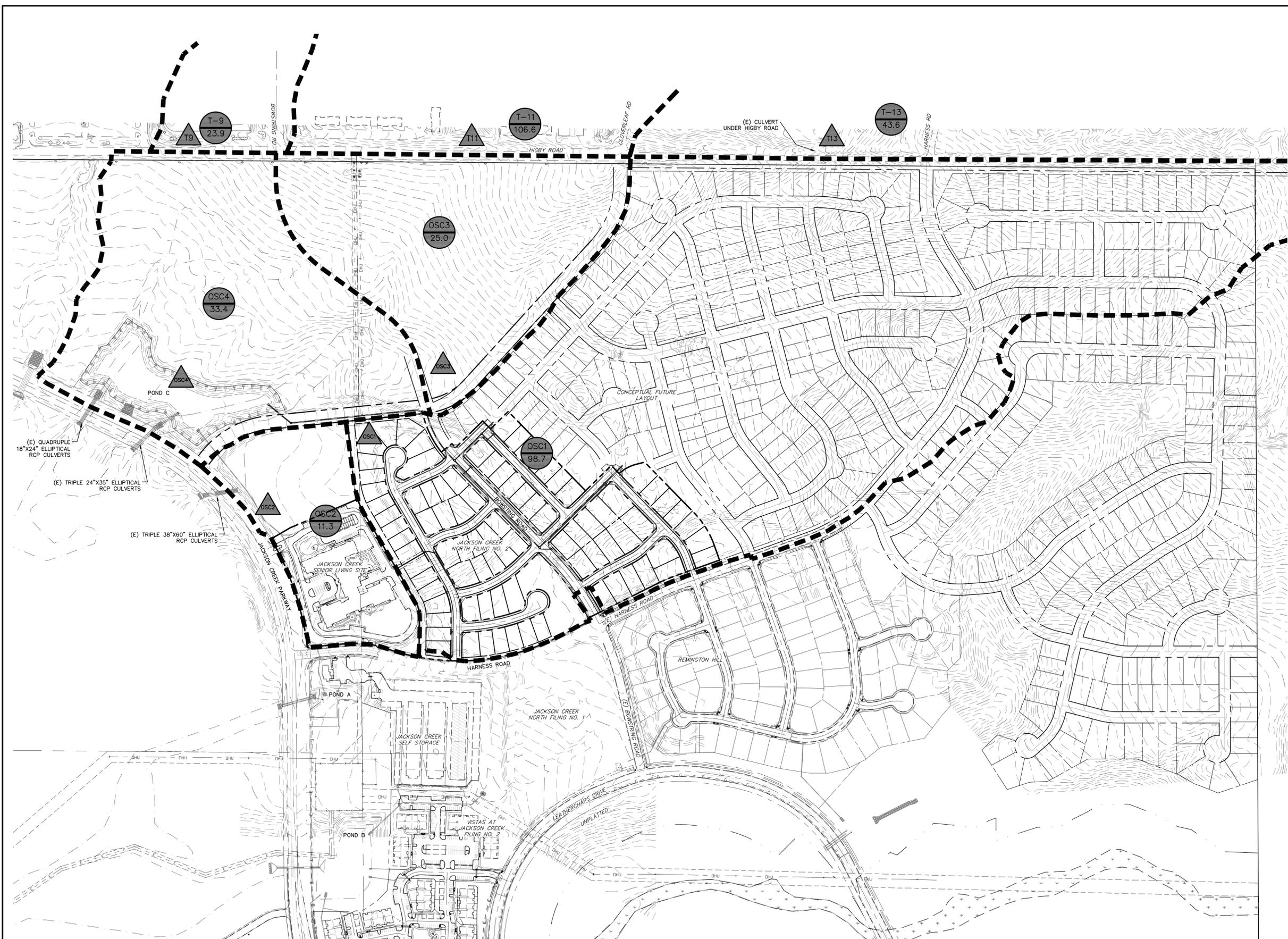


PREPARED FOR:
 VISION DEVELOPMENT
 540 ELKTON DRIVE
 SUITE 202
 COLORADO SPRINGS, CO 80907
 (719) 385-0555



JACKSON CREEK NORTH
 FILING NO. 2
 DRAINAGE MAP
 DEVELOPED CONDITIONS

DESIGNED BY: CDK	DRAWN BY: CDK
SCALE: 1"=100'	DATE: 10/10/18
JOB NUMBER: 91805	SHEET: 2 OF 3



DRAINAGE LEGEND

BASIN IDENTIFIER	X
BASIN AREA [AC]	X.XX
SURFACE DESIGN POINT IDENTIFIER	#
SWALE DESIGN POINT IDENTIFIER	#
DRAINAGE BASIN BOUNDARY	---

DRAINAGE BASIN

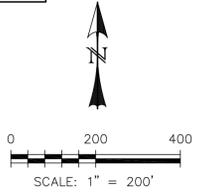
BASIN	Q ₁₀ [CFS]	Q ₁₀₀ [CFS]
OSC1	134	305
OSC2	35	56
OSC3	54	101
OSC4	97	161
T-9	46	91
T-11	174	358
T-13	16	62

DESIGN POINT

DESIGN POINT	Q ₁₀ [CFS]	Q ₁₀₀ [CFS]	DESCRIPTION
OSC1	150	366	TOTAL DEVELOPED PEAK RUNOFF FROM BASIN OSC1
OSC2	35	56	TOTAL DEVELOPED PEAK RUNOFF FROM BASIN OSC2
OSC3	229	458	TOTAL DEVELOPED PEAK RUNOFF FROM BASIN OSC3
OSC4	141	248	TOTAL DEVELOPED PEAK RUNOFF FROM BASIN OSC4
T9	46	91	PEAK RUNOFF FROM DMP BASIN T-9
T11	174	358	PEAK RUNOFF FROM DMP BASIN T-11
T13	16	62	PEAK RUNOFF FROM DMP BASIN T-13

POND C

DESCRIPTION	10 _{YR}	100 _{YR}	UNITS
INFLOW	506	1,053	[CFS]
OUTFLOW	88	146	[CFS]
WATER SURFACE ELEV.	6,928.5	6,935.2	[FT]
STORAGE VOLUME	15.7	5.9	[AC-FT]



LEGEND

EXISTING	(E)
PROPOSED	(P)
ADDRESS	(1234)
CURB AND GUTTER	C&G
EASEMENT	ESMT
RIGHT-OF-WAY	ROW
BOUNDARY	---
RIGHT-OF-WAY	---
LOT LINE	---
EASEMENT	---
TIME OF CONCENTRATION PATH	---
(E) CONTOUR, INDEX	---6940---
(E) CONTOUR	---
(P) CONTOUR, INDEX	---6940---
(P) CONTOUR	---
(E) STORM SEWER, INLET, MH	---
(P) STORM SEWER, INLET, MH	---

REV.	DESCRIPTION	DATE

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**JACKSON CREEK NORTH
FILING NO. 2**
STORMWATER QUALITY/POND SIZING
DEVELOPED CONDITIONS

DESIGNED BY: CDK	DRAWN BY: CDK
SCALE: 1"=200'	DATE: 05/08/19
JOB NUMBER: 91805	SHEET: 3 OF 3