PRELIMINARY DRAINAGE REPORT
SANTA FE PARK

JANUARY 2020

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Project# 19-012

PRELIMINARY DRAINAGE REPORT
SANTA FE PARK

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General Location and Description

The Santa Fe Park development is located approximately at the northeast corner of Baptist Road and Old Denver Road along the west side of Interstate 25 and east of Old Denver Road in southwest, Monument Colorado. The site consists of approximately 77 acres of proposed industrial/office buildings. The site is located within Section 26, Township 11 South, Range 67 West of the 6th P.M., El Paso County, Colorado (see Figure 1). The Santa Fe Park development is bound on the north by Teachout Creek and future commercial development (Conexus Business Park), on the east by Interstate 25 and an existing gas station, on the west by Old Denver Road and on the south by Baptist Road

The proposed 65 acre site will be developed into 26 industrial/office building lots with 2 proposed access roads (Baja Drive and La Campana Drive) off of Old Denver Road. An internal north-south street, named Terrazzo Drive, is planned in the middle of the side with lots fronting onto that street along the east and west sides. A proposed water quality/detention pond will be constructed in the southwest corner of the site.

The slope generally slopes from east to west toward Old Denver Road at grades of approximately 2.0 % to 5.0%. There is an existing drainageways to the north of the site called Teachout Creek. Well established native grasses exist throughout the site. The Santa Fe trails runs along the westerly boundary line of the site.

Purpose

The purpose of this drainage report is to define historic and developed runoff rates and patterns associated with the proposed development of the subject site. This report provides preliminary calculations and descriptions of historic and developed runoff rates, storm sewer pipe sizing and water quality capture volume and full spectrum detention requirements required to serve the site. Once more detailed site plans are developed and available, these drainage calculations will be further refined and submitted to the City of Monument.

SUMMARY OF DATA

The sources of information used in the development of this study are listed below:

1. City of Colorado Springs "Drainage Criteria Manual", May, 2014.

2. Soil Survey for El Paso County, Colorado, U.S. Department of Agriculture, Soil Conservation Service, June 1980.

3. "Flood Insurance Studies for Colorado Springs and El Paso County, Colorado", prepared by the Federal Emergency Management Agency (FEMA), 1985.

SOILS

According to the Soil Survey of El Paso County Area, Colorado, prepared by the U.S. Department of Agriculture Soil Conservation Service, the soils underlying this parcel consists of Pring (Soil Type 71) as shown on Figure 2. The Pring Soil type falls under hydrological group B soils. Runoff coefficients were selected based on the B type soils.

CLIMATE

This area of El Paso County can be described as the foothills, with total precipitation amounts typical of a semi-arid region. Winters are generally cold and dry, and summers relatively warm and dry. Precipitation ranges from 12 to 14 inches per year, with the majority of this moisture occurring in the spring and summer in the form of rainfall. Thunderstorms are common during the summer months.

FLOODPLAIN STATEMENT

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panels #08041C0278 G and #08041C286 G, a Zone "A" area with "No Base Flood Elevations Determined" exists along the northerly boundary line of this development. (See Figure 3). P

The proposed lots and all development will be kept out of these floodplain limits.

DRAINAGE CRITERIA

The El Paso County Drainage Criteria Manual, which further referenced the City of Colorado Springs Drainage Criteria Manual, was utilized in the preparation of this report. Peak runoff quantities were determined using the Rational Method for both the 5 year and 100 year storms. The Urban Drainage and Flood Control District criteria was used in sizing the water quality pond and full spectrum detention.

HISTORIC DRAINAGE ANALYSIS

The historic drainage basins and corresponding runoff rates are depicted on Exhibit 1. The historic drainage patterns are defined by 3 historic basins.

Basin A consists of 6.80 acres at the north end of the project consisting of an existing drainage way. Historic runoff rates of 1.6 cubic feet per second (cfs) are generated from this basin during the 5 year storm and 11.5 cfs during the 100 year storm. Flows from this basin enter the existing drainageway and flow westerly toward and under Old Denver Road.

Basin B comprises approximately 18.44 acres toward the northerly portion of the proposed site. Runoff rates of 3.2 cfs during the 5 year storm and 23.7 cfs during the 100 year storm sheet flow southwesterly toward Old Denver Road These flows enter the existing swale along the east side of Old Denver Road (Basin C). These flows then continue southerly within the existing swale along the east side of Old Denver Road.

Historic Basin C comprises the east portion of the Old Denver Road right-of-way including the Santa Fe trail tract owned by El Paso County. This 13.30 acre basin generates runoff rates of 1.6 cfs during the 5 year storm and 12.0 cfs during the 100 year storm. These flows continue southerly within an existing swale with the Santa Fe trail tract to the intersection of Old Denver Road and Baptist Road.

Approximately 8.81 acres in the middle of the proposed Santa Fe Park Development comprises Basin D. The flows rates of Q_5 = 1.6 cfs and Q_{100} = 11.9 cfs generated from this basin sheet flow off the site toward Old Denver Road. These flows also enter the El Paso County trail tract combining with flows from Basins B and C and then continue southerly within the existing swale.

Basin E comprises approximately 21.02 acres northeast of the Old Denver Road and Baptist Road intersection. Runoff rates of 3.4 cfs and 25.1 cfs are generated from this basin during the 5 and 100 year storms, respectively. These flows also enter the swale along the east side of Old Denver Road.

Total runoff rates of 5.5 cfs during the 5 year storm and 40.7 cfs during the 100 year storm reach Historic Design Point #1 from Basins B through E. These flows reach the northeast corner of the Baptist Road and Old Denver Road intersection and then are conveyed westerly across Old Denver Road and then southerly across Baptist Road in existing storm sewer facilities.

Basin F is located toward the southeasterly portion of the site. This 14.79 acre basin generates runoff rates of 2.3 cfs during the 5 year storm and 16.6 cfs during the 100 year storm. These flows are directed toward the existing roadway extending northerly from Baptist Road and then flow southerly.

Basin G is located along the north side of Baptist Road. This 10.73 acre basin generates runoff rates of 2.0 cfs during the 5 year storm and 15.0 cfs during the 100 year storm. These flows sheet flow toward Baptist Road entering the existing drainage swale along the north side of Baptist Road.

The historic flows from the overall 77 acres reach the northeast corner of the Baptist Road and Old Denver Road round about. The flows are conveyed westerly under Old Denver Road and then southerly across Baptist Road in existing storm sewer systems.

DEVELOPED DRAINAGE BASIN DESCRIPTIONS

Preliminary drainage patterns and flows affecting this site are described by 16 developed on-site basins and are depicted on Exhibit 2. These basins are preliminary in nature until such time more detailed information is known for the building and parking lot layouts. Nevertheless, general flow rates and patterns are depicted to determine approximate storm sewer sizes. More detailed calculations for the inlets, storm sewer pipes including Hydraulic Grade Line calculations, forebays and outfall structures will be provided with the Final Drainage Report and Final Construction Documents.

At this time, the exact development of the proposed lots are unknown, so the drainage basins general development areas outside of the proposed streets. For this initial drainage analysis, storm sewer pipe stubs are depicted at each of the basin to collect flows from the future lots. More detailed development plans and drainage calculations will be provided in the future once exact layouts are determined.

A water quality/detention pond will be constructed at the southwestern corner of the development. Flows from the pond will be released into the existing drainage way.

Basin 1 comprises the existing drainage way along the northerly boundary line of the site and consists of 6.34 acres. Flow rates of 1.4 cfs and 10.6 cfs are generated from this basin during the 5 year and 100 year storms, respectively. These flows, like the flows from historic Basin A will reach the existing swale and then flow westerly under Old Denver Road.

The 3.26 acre Basin 2, located northeast of the Terrazzo Drive cul-de-sac, generates additional runoff rates of 10.4 cfs during the 5 year storm and 19.4 cfs during the 100 year storm. The flows generated from this basin will be collected within future on-site inlets. A proposed 24" reinforced concrete pipe (RCP) will be stubbed into this areas from Terrazzo Drive as an outfall pipe for this development area.

Basin 3, located just northwest of the Terrazzo Drive cul-de-sac, comprises 1.79 acres and generates runoff rates of $Q_5 = 6.0$ cfs and $Q_{100} = 11.3$ cfs. These flows will also be collected within proposed inlets with the proposed development area. A proposed 24" RCP will be stubbed into the basin to convey developed flows southerly.

Combined runoff rates of 16.1 cfs during the 5 year storm and 30.2 cfs during the 100 year storm reach Design Point #1 from Basins 2 and 3. These flows will be piped southerly within a proposed 30" RCP storm sewer.

Developed Basin 4 comprises 5.26 acres along the east side of Terrazzo Drive. Runoff rates of 15.0 cfs during the 5 year storm and 30.0 cfs during the 100 year storm are generated from this basin. A proposed 30" RCP will be stubbed into this basin from Terrazzo Drive.

Basin 5 consists of Terrazzo Drive from Baja Drive to the Terrazzo Drive cul-de-sac. This 0.41 acres basin generates runoff rates of 1.0 cfs and 2.1 cfs during the 5 and 100 year storms, respectively. A proposed 10' on-grade Type R inlet will be installed at the south end of this basin to collect all of these flows.

Likewise, Basin 6 comprises 0.91 acres along the west side of Terrazzo Drive. Runoff rates of 2.2 cfs and 4.7 cfs during the 5 and 100 year storms, respectively, are generated from this basin. These flows continue southerly as street flows to the proposed 15' on-grade Type R inlet which collects all the flows generated from Basin 6.

Total flow rates of $Q_5 = 30.8$ cfs and $Q_{100} = 60.3$ cfs reach Design Point #2 from Basins 2 through 6. A proposed 36" RCP will convey these flows southerly as pipe flows.

The 3.52 acre Basin 7 is located along the west side of Terrazzo Drive and north of Baja Drive. Runoff rates of 11.5 cfs during the 5 year storm and 21.6 cfs during the 100 year storm generated from this basin flow southwesterly toward Baja Drive. A proposed 24" RCP will be stubbed into this basin for future collection of these flows.

Basin 8 consists of the north half of Baja Drive comprising 0.40 acres. Runoff rates of $Q_5 = 1.1$ cfs and $Q_{100} = 2.2$ cfs are generated from this basin. These flows are conveyed westerly within Baja Drive to a proposed 15' on-grade Type R inlet. This inlet will collect all these flows. A proposed 24" RCP will convey these flows along with the flows generated from Basin 7 southerly across Baja Drive.

Basin 9 is located at the southwest corner of the Terrazzo Drive and Baja Drive intersection. The 2.51 acre Basin 9 generates flow rates of $Q_5 = 9.2$ cfs and $Q_{100} = 17.2$ cfs. Runoff from this basin flows northwesterly where a proposed 24" RCP will be stubbed into this basin to collect flows generated from this basin.
Basin 10 consists 0.29 acres along the south half of Baja Drive generating runoff rates of 0.7 cfs during the 5 year storm and 1.5 cfs during the 100 year storm. A proposed 10' on-grade inlet will be installed at the west end of this basin to collect these flows.

Total runoff rates of 21.5 cfs during the 5 year storm and 40.6 cfs during the 100 year storm reach Design Point #3 from Basins 7 through 10. A proposed 30" RCP storm sewer pipe will convey these flows southerly.

Basin 11, consisting of 4.55 acres, is located just east of the Terrazzo Drive and Baja Drive intersection. This basin generates runoff rates of Q_5 = 14.5 cfs and Q_{100} = 28.2 cfs. These flows will be directed to the southwest corner of Basin 11 where a proposed 30" RCP will be stubbed from Terrazzo Drive to collect these flows.

The 0.60 acre Basin 12 comprises a portion of the east half of Terrazzo Drive. Runoff rates of 1.2 cfs during the 5 year storm and 2.6 cfs during the 100 year storm generated from this basin will flow southerly within the east side of Terrazzo Drive reaching a proposed 10' on-grade inlet. This 10' inlet will collect all of these flows.

The 5.11 acre Basin 13 is located east of Terrazzo Drive and generates runoff rates of 12.0 cfs and 24.0 cfs during the 5 and 100 year storms, respectively. A proposed 24" RCP will be stubbed into this basin from Terrazzo Drive to collect these flows.

Basin 14 comprises an area of 0.84 acres of the west half of Terrazzo Drive and the adjacent area of landscaping. The flows rates of Q_5 = 1.8 cfs and Q_{100} = 3.8 cfs generated from this basin flow southerly within Terrazzo Drive reaching a proposed Type R 15' on-grade inlet. The inlet will collect all of these flows.

Runoff from Basins 2 through 6 and Basins 11 to 14 reach Design Point #4 as pipe flows. A proposed 48" RCP storm sewer pipe will convey flow rates of Q_5 = 55.2 cfs and Q_{100} = 108.9 cfs southerly from Design Point #4.

Basin 15 comprises a portion of the the east half of Terrazzo Drive consisting of 0.43 acres and generating 1.0 cfs during the 5 year storm and 2.1 cfs during the 100 year storm. These flows will be collected by a proposed 10' on-grade inlet at the south end of this basin.

Approximately 0.82 acres along the west half of Terrazzzo Drive comprises Basin 16 which generates runoff rates of Q_5 = 1.9 cfs and Q_{100} = 3.9 cfs. These runoff rates flow southerly within the west side of Terrazzo Drive and approach a proposed 15' on-grade Type R inlet. This inlet will collect all the flows generated from Basin 16.

The 6.34 acre Basin 17 is located between I-25 and Terrazzo Drive. Runoff rates of 18.5 cfs during the 5 year storm and 36.8 cfs during the 100 year storm generated from this basin are directed to a proposed 30" RCP at the southeast corner of this basin. These flows will be collected within future on-site inlet and then conveyed within this 30" RCP to the proposed main storm sewer line within Terrazzo Drive.

Total flow rates of 68.9 cfs and 136.5 cfs during the 5 and 100 year storms, respectively, reach Design Point #5 as pipe flow. These flows will be piped southerly within a proposed 48" RCP.

Basin 18 is also located along the east side of Terrazzo Drive comprising 8.70 acres. It is anticipated runoff rates of Q_5 = 24.7 cfs and Q_{100} = 48.5 cfs will be generated from this basin. A proposed 36" RCP will be stubbed into the southeast corner of this basin as an outfall for the future development of this basin.

Basin 19 consists of a portion of the east half of Terrazzo Drive comprising 0.52 acres. A proposed 10' on-grade inlet will be constructed at the south end of this basin to collect the runoff rates of 1.3 cfs and 2.7 cfs generated from this basin.

Total runoff rates of 25.4 cfs during the 5 year storm and 50.2 cfs during the 10 year storm reach Design Point #6 from Basins 18 and 19. These flows will be piped westerly within a proposed 36" RCP.

The west side of Terrazzo Drive from La Campana Drive south to Baptist Road comprises Basin 20. Runoff rates of 3.0 cfs during the 5 year storm and 6.4 cfs during the 100 year storm generated from this basin flow southerly within the west side of Terrazzo Drive reaching an existing 10' inlet. This inlet collects runoff rates of 2.9 cfs and 4.8cfs during the 5 and 100 year storms, respectively. Bypass flows of 0.1 cfs during the 5 year storm and 1.6 cfs during the 100 year storm will enter Baptist Road as street flows.

Basin 21 is located between Terrazzo Drive and the Old Denver Road consisting of 4.89 acres. Runoff rates of Q_5 = 15.1 cfs and Q_{100} = 28.3 cfs generated from this basin flow to the west. Future inlets and pipes within this basin will collect the flows generated from this basin. A proposed 30" RCP will be stubbed into the southwest corner of this basin to provide an outfall for this basin. These flows will then be conveyed southerly within a proposed 36" RCP.

Runoff rates of 33.4 cfs and 62.7 cfs reaching Design Point #7 are piped southerly within a proposed 36" RCP.

Basin 22 consists of 8.33 acres just north of La Campana Drive. The runoff rates of 26.4 cfs and 49.6 cfs generated from this basin, during the 5 and 100 year storms, respectively, will be directed to the southwest corner of this basin. A proposed 36" RCP will be stubbed into this basin to collect these future flows.

Runoff rates of 55.0 cfs during the 5 year storm and 103.1 cfs during the 100 year storm reach Design Point #8.

Basin 23 comprises the north half of La Campana Drive generating runoff rates of 1.8 cfs during the 5 year storm and 3.8 cfs during the 100 year storm. These flows continue as street flows along the north side of La Campana Drive to a proposed 15' on-grade inlet which will collect all these flows.

The 0.67 acre Basin 24 comprises the south half of La Campana Drive. Runoff rates of 1.8 cfs during the 5 year storm and 3.7 cfs during the 100 year storm are directed to a proposed 15' on-grade inlet at the west end of this basin collecting all the flows generated from Basin 24.

A proposed 48" RCP will convey runoff rates of Q_5 = 57.4 cfs and Q_{100} = 106.2 cfs reaching Design Point #9.

Basin 25 consists of 1.42 acres at the south of La Campana Drive generating runoff rates of 5.1 cfs and 9.6 cfs during the 5 and 100 year storms, respectively. These flows will be collected within future on-site inlets and the collected flows will be conveyed southwesterly within a proposed 18" RCP.

Runoff rates of 61.5 cfs during the 5 year storm and 115.5 cfs during the 100 year storm reach Design Point #10. These flows will be piped into the proposed Detention/Water Quality Pond within a proposed 48" RCP.

Basin 26 is located at the southwest corner of The La Campana and Terrazzo Drive intersection. Runoff rates of 13.2 cfs and 24.8 cfs generated from this basin during the 5 and 100 year storms, respectively, reach a proposed 24" RCP storm into the southwest corner of this basin.

Flow rates of Q_5 = 95.5 cfs and Q_{100} = 188.0 cfs.reach Design Point #11. These flows will be piped into the proposed Detention/Water Quality Pond within a proposed 54" RCP.

The 2.17 acre Basin 27, located at the northwest corner of Terrazzo Drive and Baptist Road, generates additional flows of 7.7 cfs during the 5 year storm and 14.5 cfs during the 100 year storm. A 24" RCP will be stubbed into this basin to convey these flows to the proposed Extended Detention Basin (EDB).

Basin 28 consists of the proposed EDB itself generating runoff rates of Q_5 = 1.4 cfs and Q_{100} = 10.3 cfs.

Basin 29 consist of the existing open space east of Old Denver Road and west of the proposed Santa Fe Park Development. This 3.81 acre basin generates runoff rates of 1.7 cfs during the 5 year storm and 12.4 cfs during the 100 year storm. These flows are less than the flows currently reaching this area (Historic Basin C) because runoff from the tributary area to the east will be collected and routed to the pond instead of the roadside area along Old Denver Road.

WATER QUALITY

An Extended Detention Basin (EDB)/ Full Spectrum Pond will be installed at the south end of the project. The EDB/Detention Pond will be constructed to provide water quality capture volume (WQCV), Excessive Urban Runoff Volume (EURV) and Full Spectrum Detention (FSD) for a total of 9.586 acre feet of Full Spectrum Detention volume.

The Urban Drainage and Flood Control District's UD Detention Spreadsheet was used in determining Water Quality Capture Volume, EURV and Full Spectrum Detention requirements. The tributary area to this pond is approximately 71.0 acres. These calculations are presented in the Appendix of this report.

The emergency spillway for the pond will be designed to discharge into the existing drainage way south of the subject site. This is a preliminary design of the pond and once more detailed plans are available for the tributary area, the pond configuration may change.

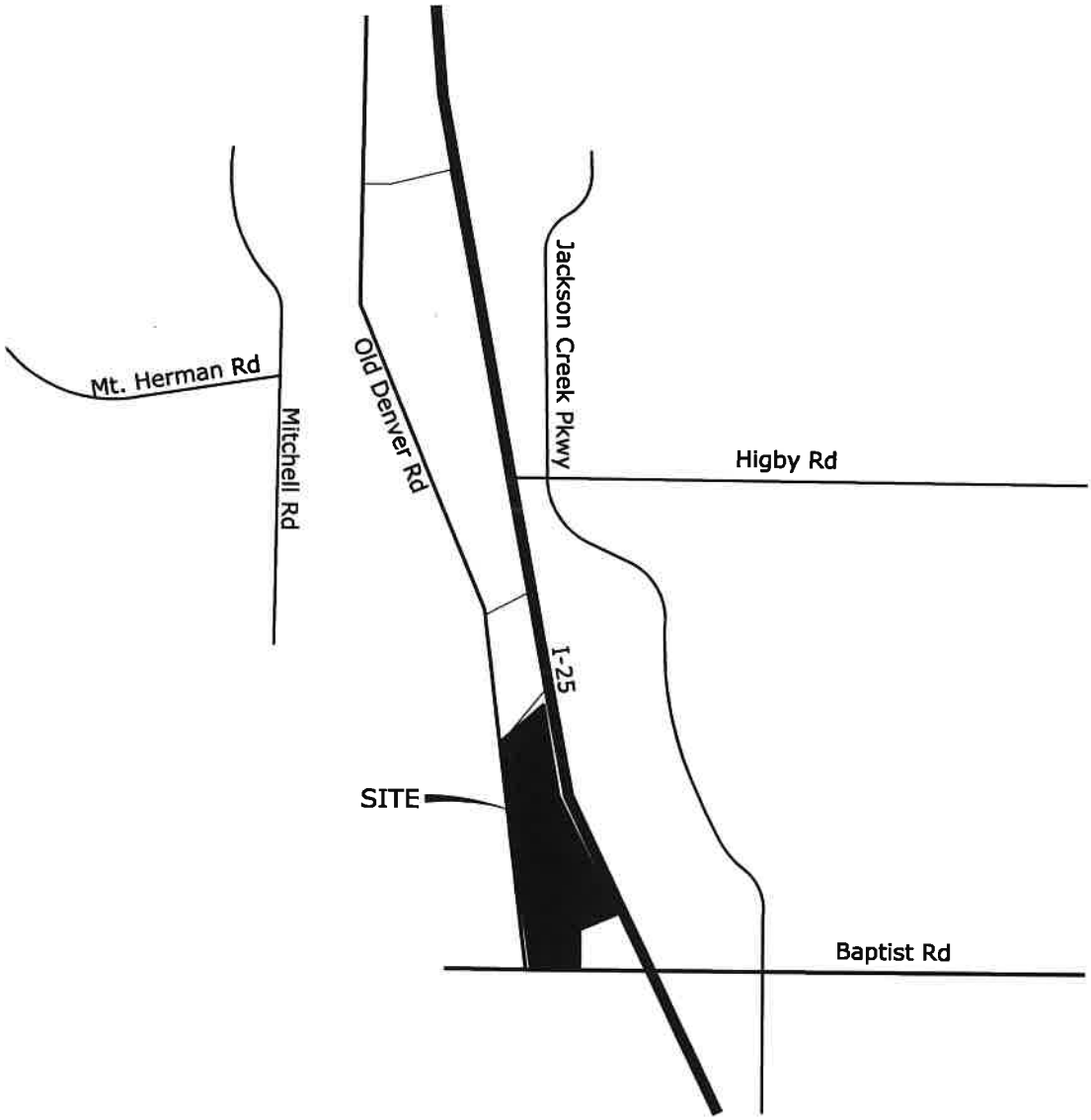
DRAINAGE FEES

Drainage fees will be paid per City of Monuments requirement based on impervious area. The exact fees to be paid will be determined at the time of final platting of the property.

SUMMARY

Runoff from the Santa Fe Park development will be collected on site and conveyed to the proposed EDB. If the drainage facilities are properly installed and maintained, the development of this site will not adversely affect the downstream and surrounding developments.

APPENDIX



VICINITY MAP

FIGURE 1

JOB NO. 19-012

FILE: 19012DEV8.DWG
DATE: 11/2/19

ROCKWELL CONSULTING, Inc.
ENGINEERING • SURVEYING
1955 N. UNION BLVD., SUITE 200
COLORADO SPRINGS, CO 80909
(719) 475-2575 • FAX (719) 475-9223

Soil Map—El Paso County Area, Colorado

Map Scale: 1:7,020 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 300 600 1200 1800

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

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 17, Sep 13, 2019

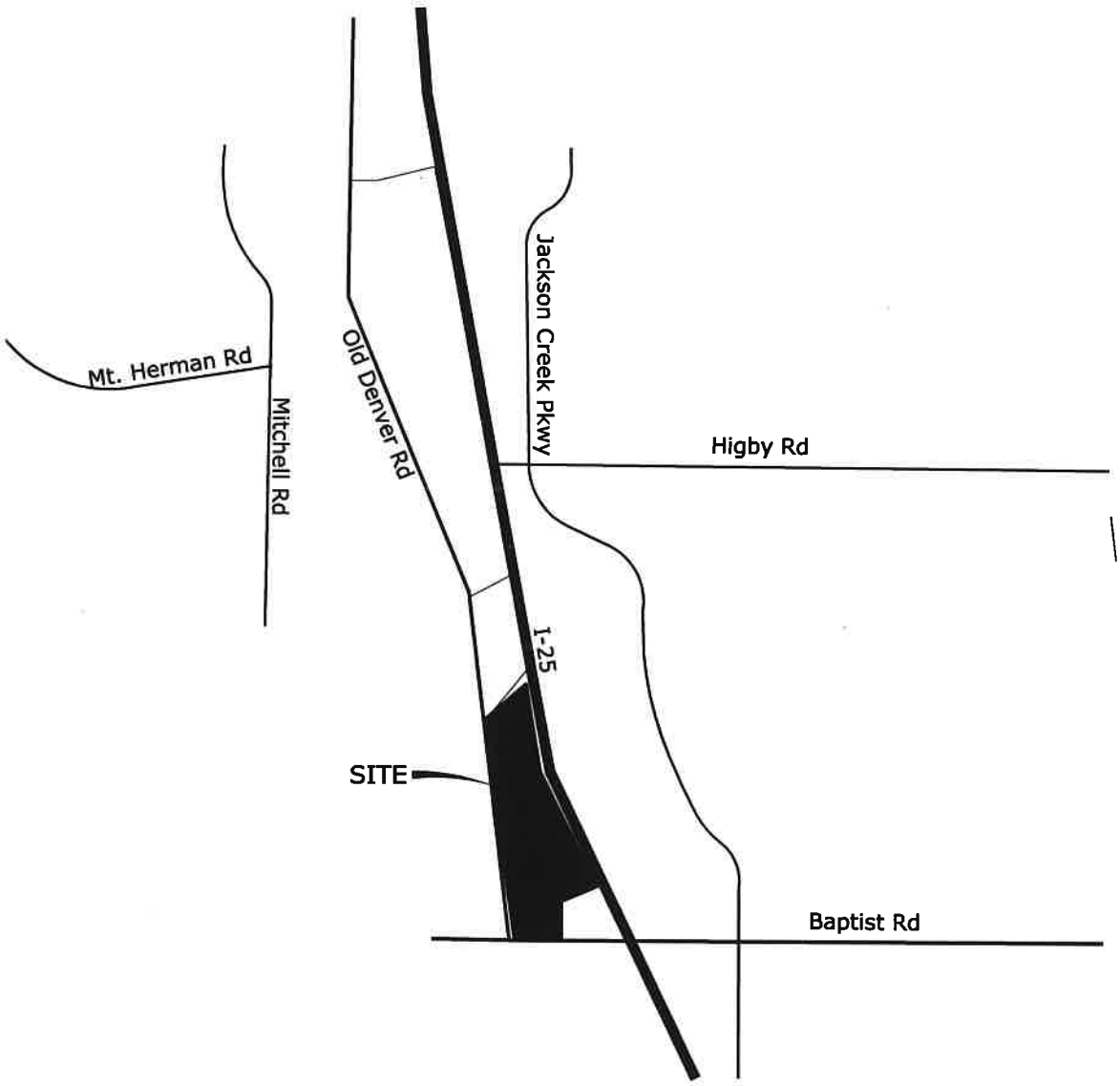
Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 4, 2010—Oct 16, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
71	Pring coarse sandy loam, 3 to 8 percent slopes	90.5	100.0%
Totals for Area of Interest		**90.5**	**100.0%**



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Map Scale: 1:14,400 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 200 400 800 1200

Feet: 0 500 1000 2000 3000

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

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Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Alamosa loam, 1 to 3 percent slopes	4.2	2.3%
71	Pring coarse sandy loam, 3 to 8 percent slopes	24.0	13.0%
92	Tomah-Crowfoot loamy sands, 3 to 8 percent slopes	156.3	84.7%
Totals for Area of Interest		**184.5**	**100.0%**

and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0° North American **Vertical Datum of 1988** (NAVD88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The horizontal datum was NAD83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the **North American Vertical Datum of 1988 (NAVD88)**. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at http://www.ngs.noaa.gov/

Base Map information shown on this FIRM was provided in digital format by El Paso County, Colorado Springs Utilities, City of Fountain, Bureau of Land Management, National Oceanic and Atmospheric Administration, United States Geological Survey, and Anderson Consulting Engineers, Inc. These data are current as of 2008.

This map reflects more detailed and up-to-date stream channel configurations and floodplain delineations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. The profile baselines depicted on this map represent the hydraulic modeling baselines that match the flood profiles and Floodway Data Tables if applicable, in the FIS report. As a result, the profile baselines may deviate significantly from the new base map channel representation and may appear outside of the floodplain.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

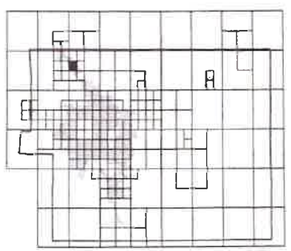
Contact FEMA Map Service Center (MSC) via the FEMA Map Information eXchange (FMIX) 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The MSC may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

El Paso County Vertical Datum Offset Table

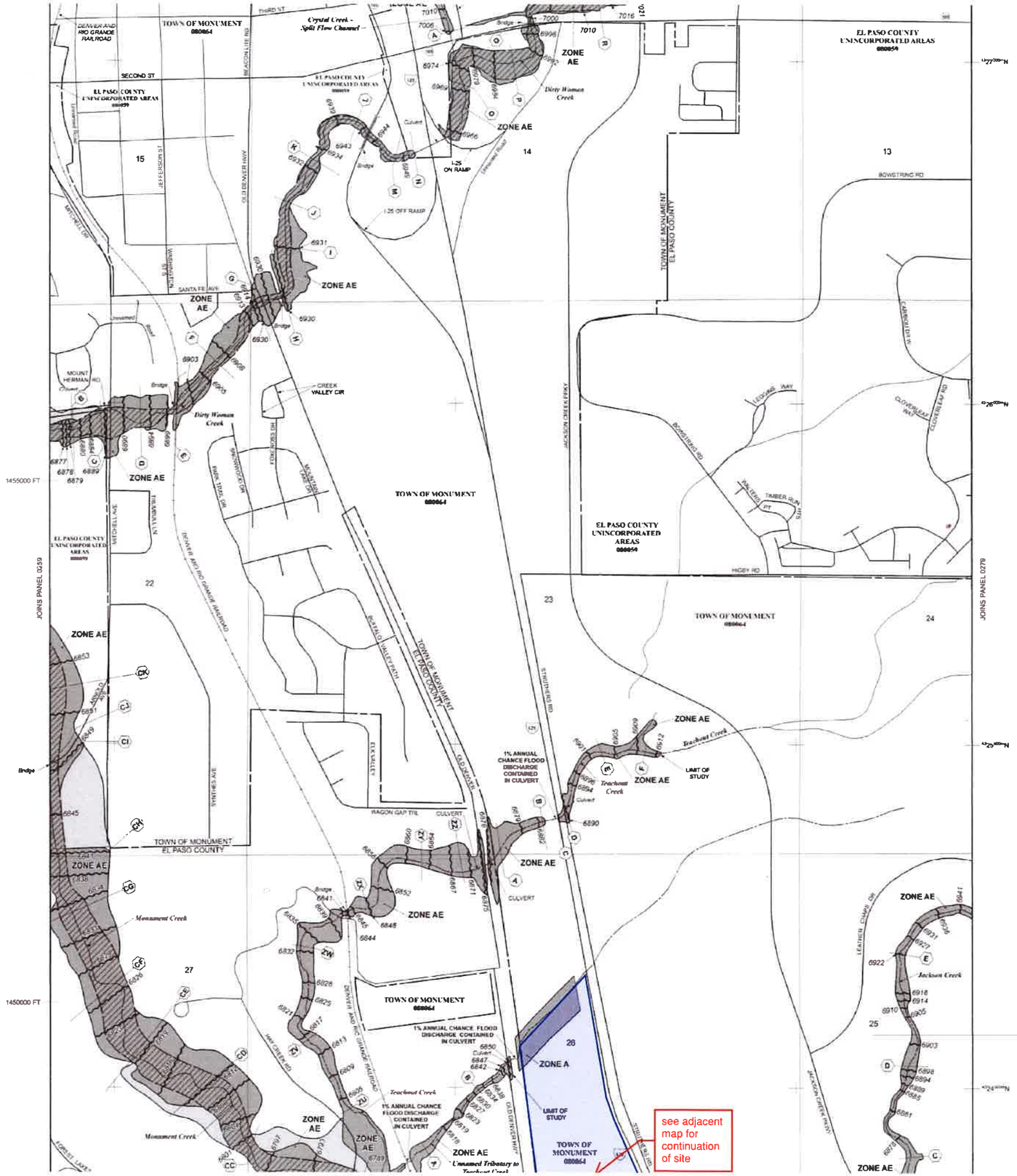
Flooding Source	Vertical Datum Offset (ft)
REFER TO SECTION 3.3 OF THE EL PASO COUNTY FLOOD INSURANCE STUDY FOR STREAM-SPECIFIC VERTICAL DATUM CONVERSION INFORMATION	

Panel Location Map



This Digital Flood Insurance Rate Map (DFIRM) was produced through a Cooperating Technical Partner (CTP) agreement between the State of Colorado Water Conservation Board (CWCB) and the Federal Emergency Management Agency (FEMA).

Additional Flood Hazard information and resources are



SPECIAL FLOOD HAZARD AREAS (Areas subject to inundation by the 1% annual chance flood event. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.)

- **ZONE A** — No Base Flood Elevations determined.
- **ZONE AE** — Base Flood Elevations determined.
- **ZONE AH** — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** — Special Flood Hazard Area Formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** — Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D Boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- (A)—(A) — Cross section line
- (23)—(23) — Transect line
- 97° 07' 30.00" / 32° 22' 30.00" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4759000mN — 1000-meter Universal Transverse Mercator grid ticks, zone 13
- 6000000 FT — 5000-foot grid ticks: Colorado State Plane coordinate system, central zone (FIPSZONE 0502), Lambert Conformal Conic Projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
MARCH 17, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
DECEMBER 7, 2018 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History Table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0278G

FIRM
FLOOD INSURANCE RATE MAP
EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 278 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EL PASO COUNTY	080059	0278	G
MONUMENT, TOWN OF	080064	0278	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
08041C0278G

and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The horizontal datum was NAD83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988 (NAVD88). These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at http://www.ngs.noaa.gov/.

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This map reflects more detailed and up-to-date **stream channel configurations** and **floodplain delineations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. The profile baselines depicted on this map represent the hydraulic modeling baselines that match the flood profiles and Floodway Data Tables if applicable in the FIS report. As a result, the profile baselines may deviate significantly from the new base map channel representation and may appear outside of the floodplain.

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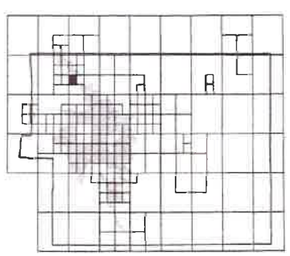
El Paso County Vertical Datum Offset Table

Flooding Source	Vertical Datum Offset (ft)

REFER TO SECTION 3.3 OF THE EL PASO COUNTY FLOOD INSURANCE STUDY FOR STREAM BY STREAM VERTICAL DATUM CONVERSION INFORMATION

Panel Location Map



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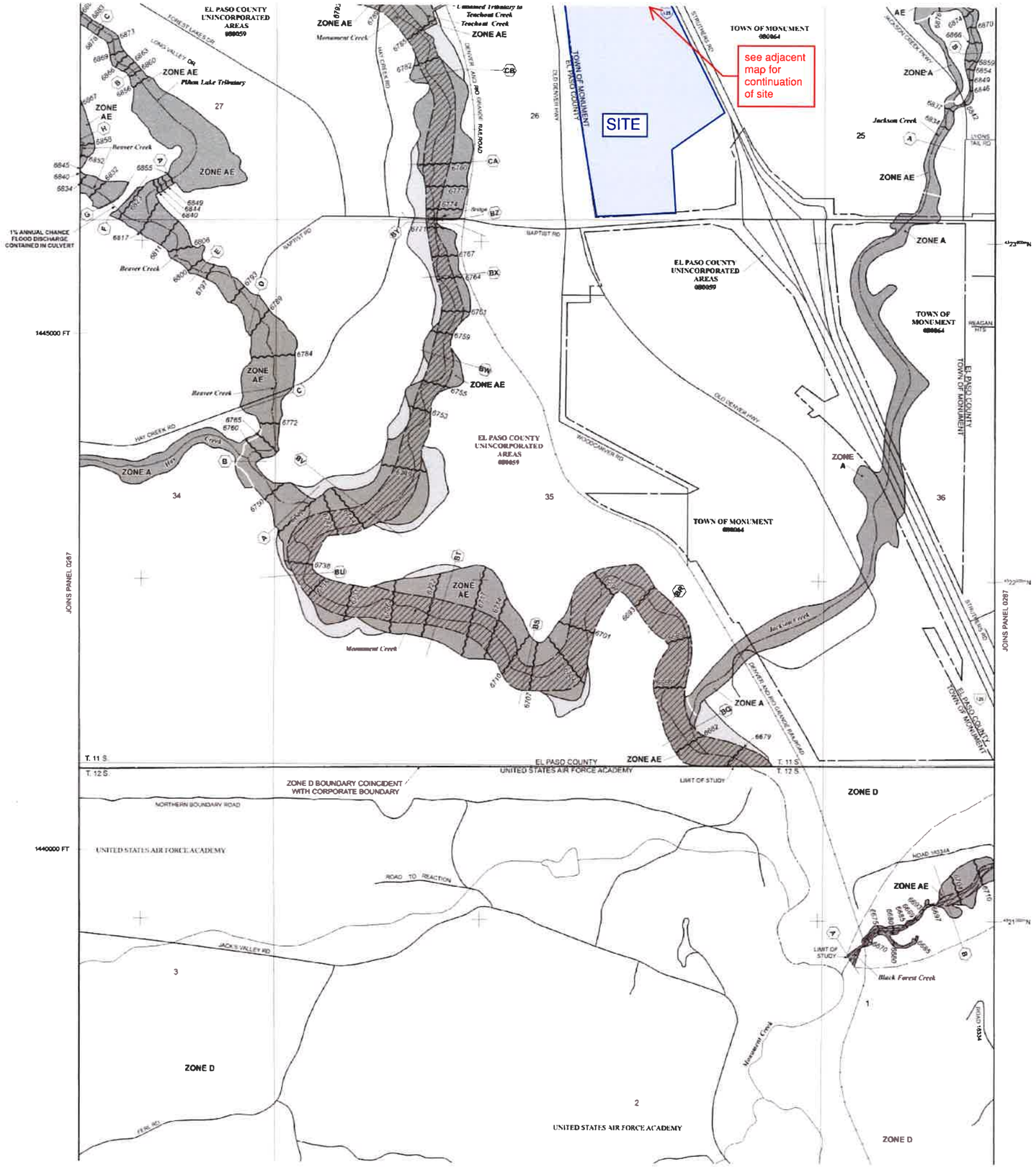

Special Flood Hazard Areas include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
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ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

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OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

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- Floodway boundary
- Zone D Boundary
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- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A — A — Cross section line
- 23 — 23 — Transect line
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- 4275000 mN — 1000-meter Universal Transverse Mercator grid ticks, zone 13
- 6000000 FT — 5000-foot grid ticks: Colorado State Plane coordinate system, central zone (FIPSZONE 0502), Lambert Conformal Conic Projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
MARCH 17, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
DECEMBER 7, 2018 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

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MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP

PANEL 0286G

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 286 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EL PASO COUNTY	080059	0286	G
MONUMENT, TOWN OF	080064	0286	G

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER 08041C0286G

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: A
AREA: 6.80 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
				0.00%
Undeveloped	6.80	0.08	0.35	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	6.80			100%

COMPOSITE: C5= 0.08 C100= 0.35

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	300	10.0%		14.92
Swale	540	2.5%	1.1	8.13
Tc Total:				23.05

Intensity, I (inches/hr)

I5	**I100**
2.9 in/hr	4.8 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
1.6 cfs	11.5 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: B
AREA: 18.44 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Undeveloped	18.44	0.08	0.35	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	18.44			100%

COMPOSITE: C5= 0.08 C100= 0.35

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	300	2.0%		25.38
Swale	770	2.7%	1.2	11.16
Tc Total:				36.53

Intensity, I (inches/hr)

I5	**I100**
2.2 in/hr	3.7 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
3.2 cfs	23.7 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: C
AREA: 13.30 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Undeveloped	13.3	0.08	0.35	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	13.30			100%

COMPOSITE: C5= 0.08 C100= 0.35

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	40	30.0%		3.79
Swale	2800	1.6%	0.9	52.70
Tc Total:				56.50

Intensity, I (inches/hr)

I5	**I100**
1.5 in/hr	2.6 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
1.6 cfs	12.0 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: D
AREA: 8.81 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Undeveloped	8.81	0.08	0.35	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	8.81			100%

COMPOSITE: C5= 0.08 C100= 0.35

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	300	3.0%		22.20
Swale	840	2.9%	1.2	11.74
Tc Total:				33.94

Intensity, I (inches/hr)

I5	**I100**
2.3 in/hr	3.9 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
1.6 cfs	11.9 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: E
AREA: 21.02 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Undeveloped	21.02	0.08	0.35	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	21.02			100%

COMPOSITE: C5= 0.08 C100= 0.35

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	300	5.0%		18.75
Swale	1350	2.2%	1.0	21.67
Tc Total:				40.42

Intensity, I (inches/hr)

I5	**I100**
2.0 in/hr	3.4 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
3.4 cfs	25.1 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: F
AREA: 14.79 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Undeveloped	14.79	0.08	0.35	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	14.79			100%

COMPOSITE: C5= 0.08 C100= 0.35

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	20	10.0%		3.85
Swale	2050	1.5%	0.9	39.85
Tc Total:				43.71

Intensity, I (inches/hr)

I5	**I100**
1.9 in/hr	3.2 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
2.3 cfs	16.6 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: G
AREA: 10.73 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Undeveloped	10.73	0.08	0.35	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	10.73			100%

COMPOSITE: C5= 0.08 C100= 0.35

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	300	4.0%		20.19
Swale	870	3.0%	1.2	11.96
Tc Total:				32.15

Intensity, I (inches/hr)

I5	**I100**
2.4 in/hr	4.0 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
2.0 cfs	15.0 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: Historic DP #1
AREA: 61.57 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Basin B	18.44	0.08	0.35	29.95%
Basin C	13.3	0.08	0.35	21.60%
Basin D	8.81	0.00	0.00	14.31%
Basin E	21.02	0.00	0.00	34.14%
	61.57			100%

COMPOSITE: C5= 0.04 C100= 0.18

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	300	2.0%		25.38
Street	770	2.7%	1.2	11.16

Tc Total: 36.53
(Use Tc minimum of 5 minutes)

Intensity, I (inches/hr)

I5	**I100**
2.2 in/hr	3.7 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
5.5 cfs	40.7 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: 1
AREA: 6.34 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	0.00	0.90	0.96	0.00%
Landscaping	6.34	0.08	0.35	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	6.34			100%

COMPOSITE: C5= 0.08 C100= 0.35

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	300	10.0%		14.92
Street	520	2.0%	1.0	8.75
Tc Total:				23.67

Intensity, I (inches/hr)

I5	**I100**
2.8 in/hr	4.8 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
1.4 cfs	10.6 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: 2
AREA: 3.26 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	2.77	0.90	0.96	84.97%
Landscaping	0.49	0.08	0.35	15.03%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	3.26			100%

COMPOSITE: C5= 0.78 C100= 0.87

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	40	3.0%		8.11
Street	450	3.0%	3.5	2.17

Tc Total: 10.27
(Use Tc minimum of 5 minutes)

Intensity, I (inches/hr)

I5	**I100**
4.1 in/hr	6.9 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
10.4 cfs	19.4 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: 3
AREA: 1.79 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	1.52	0.90	0.96	84.92%
Landscaping	0.27	0.08	0.35	15.08%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	1.79			100%

COMPOSITE: C5= 0.78 C100= 0.87

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	30	3.0%		7.02
Street	280	2.0%	2.8	1.65
Tc Total:				8.67

Intensity, I (inches/hr)

I5	**I100**
4.3 in/hr	7.3 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
6.0 cfs	11.3 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: 4
AREA: 5.26 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	3.62	0.90	0.96	68.82%
Landscaping	1.64	0.08	0.35	31.18%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	5.26			100%

COMPOSITE: C5= 0.64 C100= 0.77

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	80	30.0%		5.36
Street	550	2.5%	3.2	2.90
Tc Total:				8.26

Intensity, I (inches/hr)

I5	**I100**
4.4 in/hr	7.4 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
15.0 cfs	30.0 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: 5
AREA: 0.41 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	0.25	0.90	0.96	60.98%
Landscaping	0.16	0.08	0.35	39.02%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.41			100%

COMPOSITE: C5= 0.58 C100= 0.72

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	20	3.0%		5.73
Street	400	1.0%	2.0	3.33
				9.06

Tc Total:

Intensity, I (inches/hr)

I5	**I100**
4.3 in/hr	7.2 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
1.0 cfs	2.1 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: 6
AREA: 0.91 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	0.55	0.90	0.96	60.44%
Landscaping	0.36	0.08	0.35	39.56%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.91			100%

COMPOSITE: C5= 0.58 C100= 0.72

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	20	3.0%		5.73
Street	400	1.0%	2.0	3.33
Tc Total:				9.06

Intensity, I (inches/hr)

I5	**I100**
4.3 in/hr	7.2 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
2.2 cfs	4.7 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: 7
AREA: 3.52 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Building	2.99	0.90	0.96	84.94%
Landscaping	0.53	0.08	0.35	15.06%
	0.00	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	3.52			100%

COMPOSITE: C5= 0.78 C100= 0.87

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	30	3.0%		7.02
Street & Pipe	500	3.0%	3.5	2.41
Tc Total:				9.43

Intensity, I (inches/hr)

I5	**I100**
4.2 in/hr	7.1 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
11.5 cfs	21.6 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: 8
AREA: 0.40 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	0.24	0.90	0.96	60.00%
Landscaping	0.16	0.08	0.35	40.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.40			100%

COMPOSITE: C5= 0.57 C100= 0.72

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	20	3.0%		5.73
Street	330	3.3%	3.6	1.51
Tc Total:				7.25

Intensity, I (inches/hr)

I5	**I100**
4.6 in/hr	7.7 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
1.1 cfs	2.2 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: 9
AREA: 2.51 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	2.13	0.90	0.96	84.86%
Landscaping	0.38	0.08	0.35	15.14%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	2.51			100%

COMPOSITE: C5= 0.78 C100= 0.87

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	20	3.0%		5.73
Street	250	3.6%	3.8	1.10
Tc Total:				6.83

Intensity, I (inches/hr)

I5	**I100**
4.7 in/hr	7.9 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
9.2 cfs	17.2 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: 10
AREA: 0.29 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	0.17	0.90	0.96	58.62%
Landscaping	0.12	0.08	0.35	41.38%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.29			100%

COMPOSITE: C5= 0.56 C100= 0.71

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	40	3.0%		8.11
Street	250	3.6%	3.8	1.10
Tc Total:				9.20

Intensity, I (inches/hr)

I5	**I100**
4.3 in/hr	7.1 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
0.7 cfs	1.5 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: 11
AREA: 4.55 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	3.44	0.90	0.96	75.60%
Landscaping	1.11	0.08	0.35	24.40%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	4.55			100%

COMPOSITE: C5= 0.70 C100= 0.81

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	75	30.0%		5.19
Street	400	2.0%	2.8	2.36
Tc Total:				7.55

Intensity, I (inches/hr)

I5	**I100**
4.6 in/hr	7.6 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
14.5 cfs	28.2 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: 12
AREA: 0.60 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	0.36	0.90	0.96	60.00%
Landscaping	0.24	0.08	0.35	40.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.60			100%

COMPOSITE: C5= 0.57 C100= 0.72

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	30	3.0%		7.02
Street	800	0.8%	1.8	7.45
Tc Total:				14.47

Intensity, I (inches/hr)

I5	**I100**
3.6 in/hr	6.0 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
1.2 cfs	2.6 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: 13
AREA: 5.11 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	3.6	0.90	0.96	70.45%
Landscaping	1.51	0.08	0.35	29.55%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	5.11			100%

COMPOSITE: C5= 0.66 C100= 0.78

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	80	3.0%		11.46
Street	500	2.0%	2.8	2.95
				14.41

Tc Total:

Intensity, I (inches/hr)

I5	**I100**
3.6 in/hr	6.0 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
12.0 cfs	24.0 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: 14
AREA: 0.84 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	0.51	0.90	0.96	60.71%
Landscaping	0.33	0.08	0.35	39.29%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.84			100%

COMPOSITE: C5= 0.58 C100= 0.72

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	20	3.0%		5.73
Street	700	0.7%	1.7	6.97
Tc Total:				12.70

Intensity, I (inches/hr)

I5	**I100**
3.8 in/hr	6.3 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
1.8 cfs	3.8 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTA FE PARK

BASIN: 15
AREA: 0.43 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	0.26	0.90	0.96	60.47%
Landscaping	0.17	0.08	0.35	39.53%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.43			100%

COMPOSITE: C5= 0.58 C100= 0.72

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	20	3.0%		5.73
Street	600	1.0%	2.0	5.00
Tc Total:				10.73

Intensity, I (inches/hr)

I5	**I100**
4.0 in/hr	6.8 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
1.0 cfs	2.1 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: 16
AREA: 0.82 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	0.49	0.90	0.96	59.76%
Landscaping	0.33	0.08	0.35	40.24%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.82			100%

COMPOSITE: C5= 0.57 C100= 0.71

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	20	3.0%		5.73
Street	750	1.5%	2.4	5.10
Tc Total:				10.83

Intensity, I (inches/hr)

I5	**I100**
4.0 in/hr	6.7 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
1.9 cfs	3.9 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: 17
AREA: 6.34 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	4.51	0.90	0.96	71.14%
Landscaping	1.83	0.08	0.35	28.86%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	6.34			100%

COMPOSITE: C5= 0.66 C100= 0.78

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	80	30.0%		5.36
Street	500	2.0%	2.8	2.95
Tc Total:				8.31

Intensity, I (inches/hr)

I5	**I100**
4.4 in/hr	7.4 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
18.5 cfs	36.8 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: 18
AREA: 8.70 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	6.39	0.90	0.96	73.45%
Landscaping	2.31	0.08	0.35	26.55%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	8.70			100%

COMPOSITE: C5= 0.68 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	80	30.0%		5.36
Street	750	2.0%	2.8	4.42
Tc Total:				9.78

Intensity, I (inches/hr)

I5	**I100**
4.2 in/hr	7.0 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
24.7 cfs	48.5 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: 19
AREA: 0.52 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	0.35	0.90	0.96	67.31%
Landscaping	0.17	0.08	0.35	32.69%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.52			100%

COMPOSITE: C5= 0.63 C100= 0.76

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	30	3.0%		7.02
Street	500	1.5%	2.4	3.40
Tc Total:				10.42

Intensity, I (inches/hr)

I5	**I100**
4.1 in/hr	6.8 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
1.3 cfs	2.7 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: 20
AREA: 1.39 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	0.81	0.90	0.96	58.27%
Landscaping	0.58	0.08	0.35	41.73%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	1.39			100%

COMPOSITE: C5= 0.56 C100= 0.71

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	30	3.0%		7.02
Street	680	1.5%	2.4	4.63
Tc Total:				11.65

Intensity, I (inches/hr)

I5	**I100**
3.9 in/hr	6.5 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
3.0 cfs	6.4 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: 21
AREA: 4.89 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	4.16	0.90	0.96	85.07%
Landscaping	0.73	0.08	0.35	14.93%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	4.89			100%

COMPOSITE: C5= 0.78 C100= 0.87

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	30	3.0%		7.02
Street	600	1.5%	2.4	4.08
Tc Total:				11.10

Intensity, I (inches/hr)

I5	**I100**
4.0 in/hr	6.7 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
15.1 cfs	28.3 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: 22
AREA: 8.33 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	7.08	0.90	0.96	84.99%
Landscaping	1.25	0.08	0.35	15.01%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	8.33			100%

COMPOSITE: C5= 0.78 C100= 0.87

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	30	3.0%		7.02
Street	680	3.0%	3.5	3.27
Tc Total:				10.29

Intensity, I (inches/hr)

I5	**I100**
4.1 in/hr	6.9 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
26.4 cfs	49.6 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: 23
AREA: 0.66 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	0.40	0.90	0.96	60.61%
Landscaping	0.26	0.08	0.35	39.39%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.66			100%

COMPOSITE: C5= 0.58 C100= 0.72

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	40	30.0%		3.79
Street	600	3.2%	3.6	2.80
Tc Total:				6.59

Intensity, I (inches/hr)

I5	**I100**
4.8 in/hr	8.0 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
1.8 cfs	3.8 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: 24
AREA: 0.67 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	0.40	0.90	0.96	59.70%
Landscaping	0.27	0.08	0.35	40.30%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.67			100%

COMPOSITE: C5= 0.57 C100= 0.71

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	50	30.0%		4.24
Street	600	3.2%	3.6	2.80
Tc Total:				7.03

Intensity, I (inches/hr)

I5	**I100**
4.7 in/hr	7.8 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
1.8 cfs	3.7 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: ~~2~~ C5

AREA: 1.42 Acres

SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	1.21	0.90	0.96	85.21%
Landscaping	0.21	0.08	0.35	14.79%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	1.42			100%

COMPOSITE: C5= 0.78 C100= 0.87

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	20	3.0%		5.73
Street	300	3.0%	3.5	1.44
Tc Total:				7.17

Intensity, I (inches/hr)

I5	**I100**
4.6 in/hr	7.8 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
5.1 cfs	9.6 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: 25 26

AREA: 3.83 Acres

SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	3.26	0.90	0.96	85.12%
Landscaping	0.57	0.08	0.35	14.88%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	3.83			100%

COMPOSITE: C5= 0.78 C100= 0.87

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	20	3.0%		5.73
Street	500	3.0%	3.5	2.41
Tc Total:				8.14

Intensity, I (inches/hr)

I5	**I100**
4.4 in/hr	7.5 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
13.2 cfs	24.8 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: 26-i7
AREA: 2.17 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	1.84	0.90	0.96	84.79%
Landscaping	0.33	0.08	0.35	15.21%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	2.17			100%

COMPOSITE: C5= 0.78 C100= 0.87

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	20	3.0%		5.73
Street	350	3.0%	3.5	1.68
Tc Total:				7.42

Intensity, I (inches/hr)

I5	**I100**
4.6 in/hr	7.7 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
7.7 cfs	14.5 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: 28
AREA: 3.71 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	0	0.90	0.96	0.00%
Landscaping	3.71	0.08	0.35	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	3.71			100%

COMPOSITE: C5= 0.08 C100= 0.35

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	45	30.0%		4.02
Street	350	2.0%	2.1	2.75
Tc Total:				6.77

Intensity, I (inches/hr)

I5	**I100**
4.7 in/hr	7.9 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
1.4 cfs	10.3 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: 29
AREA: 13.81 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Streets/Buildings	0	0.90	0.96	0.00%
Landscaping	13.81	0.08	0.35	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	13.81			100%

COMPOSITE: C5= 0.08 C100= 0.35

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	40	30.0%		3.79
Street	2800	1.6%	0.9	52.70
Tc Total:				56.50

Intensity, I (inches/hr)

I5	**I100**
1.5 in/hr	2.6 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
1.7 cfs	12.4 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: DP #1
AREA: 5.05 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Basin 2	3.26	0.78	0.87	64.55%
Basin 3	1.79	0.78	0.87	35.45%
	0.00	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	5.05			100%

COMPOSITE: C5= 0.78 C100= 0.87

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	40	3.0%		8.11
Street	450	3.0%	3.5	2.17

Tc Total: 10.27

Intensity, I (inches/hr)

I5	**I100**
4.1 in/hr	6.9 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
16.1 cfs	30.2 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: DP #2
AREA: 11.63 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Design Point #1	5.05	0.78	0.87	43.42%
Basin 4	5.26	0.64	0.77	45.23%
Basin 5	0.41	0.58	0.72	3.53%
Basin 6	0.91	0.58	0.72	7.82%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	11.63			100%

COMPOSITE: C5= 0.69 C100= 0.81

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	40	3.0%		8.11
Street	450	3.0%	3.5	2.17
Pipe	600	1.0%	5.0	2.00
Tc Total:				12.27

Intensity, I (inches/hr)

I5	**I100**
3.8 in/hr	6.4 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
30.8 cfs	60.3 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: DP #3
AREA: 6.72 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Basin 7	3.52	0.78	0.87	52.38%
Basin 8	0.4	0.57	0.72	5.95%
Basin 9	2.51	0.78	0.87	37.35%
Basin 10	0.29	0.56	0.71	4.32%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	6.72			100%

COMPOSITE: C5= 0.76 C100= 0.85

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	30	3.0%		7.02
Street	500	3.0%	3.5	2.41

Tc Total: 9.43

Intensity, I (inches/hr)

I5	**I100**
4.2 in/hr	7.1 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
21.5 cfs	40.6 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: DP #4
AREA: 22.73 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
DP#2	11.63	0.69	0.81	51.17%
Basin 11	4.55	0.70	0.81	20.02%
Basin 12	0.60	0.57	0.72	2.64%
Bsain 13	5.11	0.66	0.78	22.48%
Basin 14	0.84	0.58	0.71	3.70%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	22.73			100%

COMPOSITE: C5= 0.68 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	80	3.0%		11.46
Street	500	2.0%	2.8	2.95
Pipe Flow				
Tc Total:				14.41

Intensity, I (inches/hr)

I5	**I100**
3.6 in/hr	6.0 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
55.2 cfs	108.9 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: DP #5
AREA: 30.32 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
DP#4	22.73	0.68	0.80	74.97%
Basin 15	0.43	0.58	0.72	1.42%
Basin 16	0.82	0.57	0.71	2.70%
Basin 17	6.34	0.66	0.78	20.91%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	30.32			100%

COMPOSITE: C5= 0.67 C100= 0.79

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	80	3.0%		11.46
Street	500	2.0%	2.8	2.95
Pipe Flow	600	1.0%	5.0	2.00
Tc Total:				16.41

Intensity, I (inches/hr)

I5	**I100**
3.4 in/hr	5.7 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
68.9 cfs	136.5 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: DP #6
AREA: 9.22 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Basin 18	8.70	0.68	0.80	94.36%
Basin 19	0.52	0.63	0.76	5.64%
	0.00	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	9.22			100%

COMPOSITE: C5= 0.68 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	30	3.0%		7.02
Street	500	1.5%	2.4	3.40
Pipe Flow	0	1.0%	5.0	0.00
Tc Total:				10.42

Intensity, I (inches/hr)

I5	**I100**
4.1 in/hr	6.8 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
25.4 cfs	50.2 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: DP #7
AREA: 11.61 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Design Point #3	6.72	0.76	0.85	57.88%
Basni 21	4.89	0.78	0.87	42.12%
	0.00	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	11.61			100%

COMPOSITE: C5= 0.77 C100= 0.86

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	30	3.0%		7.02
Street	500	1.5%	2.4	3.40
Pipe Flow	750	1.0%	5.0	2.50
Tc Total:				12.92

Intensity, I (inches/hr)

I5	**I100**
3.7 in/hr	6.3 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
33.4 cfs	62.7 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: DP #8
AREA: 19.94 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Design Point #7	11.61	0.77	0.86	58.22%
Basni 22	8.33	0.78	0.87	41.78%
	0.00	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	19.94			100%

COMPOSITE: C5= 0.77 C100= 0.86

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	30	3.0%		7.02
Street	500	1.5%	2.4	3.40
Pipe Flow	1250	1.0%	5.0	4.17
Tc Total:				14.59

Intensity, I (inches/hr)

I5	**I100**
3.6 in/hr	6.0 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
55.0 cfs	103.1 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: DP #9
AREA: 21.27 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
	0	0.00	0.00	0.00%
Design Point #8	19.94	0.77	0.86	93.75%
Basin 23	0.66	0.58	0.72	3.10%
Basin 24	0.67	0.57	0.71	3.15%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	21.27			100%

COMPOSITE: C5= 0.76 C100= 0.85

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	30	3.0%		7.02
Street	500	1.5%	2.4	3.40
Pipe Flow	1250	1.0%	5.0	4.17
Tc Total:				14.59

Intensity, I (inches/hr)

I5	**I100**
3.6 in/hr	6.0 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
57.4 cfs	108.2 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: DP #10
AREA: 22.69 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
	0	0.00	0.00	0.00%
Design Point #9	21.27	0.76	0.85	93.74%
Basin 25	1.42	0.78	0.87	6.26%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	22.69			100%

COMPOSITE: C5= 0.76 C100= 0.85

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	30	3.0%		7.02
Street	500	1.5%	2.4	3.40
Pipe Flow	1250	1.0%	5.0	4.17
Tc Total:				14.59

Intensity, I (inches/hr)

I5	**I100**
3.6 in/hr	6.0 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
61.5 cfs	115.5 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: SANTE FE PARK

BASIN: DP #11
AREA: 43.37 Acres
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Design Point #5	30.32	0.67	0.79	69.91%
Design Point #6	9.22	0.68	0.80	21.26%
Basin 26	3.83	0.78	0.87	8.83%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	43.37			100%

COMPOSITE: C5= 0.68 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	80	3.0%		11.46
Street	500	1.5%	2.4	3.40
Pipe Flow	1000	1.0%	5.0	3.33
Tc Total:				18.20

Intensity, I (inches/hr)

I5	**I100**
3.2 in/hr	5.4 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
95.5 cfs	188.0 cfs

STREET AND INLET HYDRAULICS

Version 4.05 Released March 2017
Urban Drainage and Flood Control District
Denver, Colorado

Purpose: **This workbook can be used to size a variety of inlets based on allowable spread and depth in a street or swale.**

Content: **The workbook consists of the following worksheets:**

Q-Peak The *Q-Peak* sheet calculates the peak discharge for the inlet tributary area based on the Rational Method for the minor and major storm events. Alternatively, the user can enter a known flow. Information from this sheet is then exported to the *Inlet Management* sheet.

Inlet Management The *Inlet Management* sheet imports information from the *Q-Peak* sheet and *Inlet [#]* sheets and can be used to connect inlets in series so that bypass flow from an upstream inlet is added to flow calculated for the next downstream inlet. This sheet can also be used to modify design information from the Q-peak sheet.

Inlet [#] *Inlet [#]* sheets are created each time the user exports information from the *Q-Peak* sheet to the *Inlet Management* sheet. The *Inlet [#]* sheets calculate allowable half-street capacity based on allowable depth and allowable spread for the minor and major storm events. This is also where the user selects an inlet type and calculates the capacity of that inlet.

Inlet Pictures The Inlet Pictures sheet contains a library of photographs of the various types of inlets contained in UD-Inlet and referenced in the USDCM.

Acknowledgements: ***Spreadsheet Development Team:***
Dr. James C.Y. Guo, P.E.
Professor, Department of Civil Engineering, University of Colorado at Denver
Ken A. MacKenzie, P.E., Chris Carandang
Urban Drainage and Flood Control District
Derek N. Rapp, P.E.
Peak Stormwater Engineering, LLC

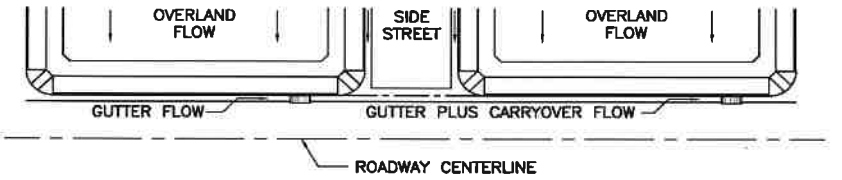
Comments? Direct all comments regarding this spreadsheet workbook to: UDFCD email
Revisions? Check for revised versions of this or any other workbook at: Downloads

Version 4.05 Released March 2017

Worksheet Protected

DESIGN PEAK FLOW FOR SWALE OR ONE-HALF OF STREET BY THE RATIONAL METHOD

Project: Santa Fe Park



Show Details

Design Flow: ONLY if already determined through other methods:

(local peak flow for 1/2 of street OR grass-lined channel):

	Minor Storm	Major Storm	
$*Q_{Known}$ =			cfs

<---- FILL IN THIS SECTION OR...

* If you enter flows in Row 14, select "Street Inlet" or "Area Inlet" button and then skip the rest of this sheet and click "Add New Inlet" at bottom of sheet.

Geographic Information: (Enter data in the blue cells):

FILL IN THE SECTIONS BELOW. <----

Subcatchment Area =		Acres
Percent Imperviousness =		%
NRCS Soil Type =		A, B, C, or D

Site Type:
- (•) Site is Urban
- ( ) Site is Rural

Flows Developed For:
- (•) Street Inlet
- ( ) Area Inlet in a Swale

	Slope (ft/ft)	Length (ft)
Overland Flow =		
Gutter Flow =		

Rainfall Information: Intensity I (inch/hr) = $C_1 * P_1 / (C_2 + T_c) ^ {C_3}$

	Minor Storm	Major Storm	
Design Storm Return Period, T_r =			years
Return Period One-Hour Precipitation, P_1 =			inches
C_1 =			
C_2 =			
C_3 =			
User-Defined Storm Runoff Coefficient (leave this blank to accept a calculated value), C =			
User-Defined 5-yr. Runoff Coefficient (leave this blank to accept a calculated value), C_5 =			
Bypass (Carry-Over) Flow from upstream Subcatchments, Q_b =			cfs
Total Design Peak Flow, Q =			cfs

Version 4.05 Released March 2017

INLET MANAGEMENT

Watershed Protection

INLET NAME	Inlet 5	Inlet 6	Inlet 12	Inlet 14	Inlet 15	Inlet 16
Site Type (Urban or Rural)	URBAN	URBAN	URBAN	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET	STREET	STREET	STREET
Hydraulic Condition	On Grade	On Grade	On Grade	On Grade	On Grade	On Grade
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{known} (cfs)	1.0	2.2	1.2	1.8	1.0	1.9
Major Q_{known} (cfs)	2.1	4.7	2.6	3.8	2.1	3.9

Bypass (Carry-Over) Flow from Upstream

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

Watershed Characteristics

Subcatchment Area (acres)						
Percent Impervious						
NRCS Soil Type						

Watershed Profile

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

Minor Storm Rainfall Input

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

Major Storm Rainfall Input

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

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	**1.0**	**2.2**	**1.2**	**1.8**	**1.0**	**1.9**
Major Total Design Peak Flow, Q (cfs)	**2.1**	**4.7**	**2.6**	**3.8**	**2.1**	**3.9**
Minor Flow Bypassed Downstream, Q_b (cfs)	0.0	0.0	0.0	0.0	0.0	0.0
Major Flow Bypassed Downstream, Q_b (cfs)	0.0	0.0	0.0	0.0	0.0	0.0

Minor Storm (Calculated) Analysis of Flow Time

C	N/A	N/A	N/A	N/A	N/A	N/A
C_s	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, Vi	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, Vt	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, Ti	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, Tt	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, T_c	N/A	N/A	N/A	N/A	N/A	N/A
Regional T_c	N/A	N/A	N/A	N/A	N/A	N/A
Recommended T_c	N/A	N/A	N/A	N/A	N/A	N/A
T_c selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, I	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, Q_p	N/A	N/A	N/A	N/A	N/A	N/A

Major Storm (Calculated) Analysis of Flow Time

C	N/A	N/A	N/A	N/A	N/A	N/A
C_s	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, Vi	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, Vt	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, Ti	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, Tt	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, T_c	N/A	N/A	N/A	N/A	N/A	N/A
Regional T_c	N/A	N/A	N/A	N/A	N/A	N/A
Recommended T_c	N/A	N/A	N/A	N/A	N/A	N/A
T_c selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, I	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, Q_p	N/A	N/A	N/A	N/A	N/A	N/A

Version 4.05 Released March 2017

INLET MANAGEMENT

Worksheet Protected

INLET NAME	Inlet 19
Site Type (Urban or Rural)	URBAN
Inlet Application (Street or Area)	STREET
Hydraulic Condition	On Grade
Inlet Type	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	1.3
Major Q_{Known} (cfs)	2.7

Bypass (Carry-Over) Flow from Upstream

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

Watershed Characteristics

Subcatchment Area (acres)	
Percent Impervious	
NRCS Soil Type	

Watershed Profile

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

Minor Storm Rainfall Input

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

Major Storm Rainfall Input

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

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	**1.3**
Major Total Design Peak Flow, Q (cfs)	**2.7**
Minor Flow Bypassed Downstream, Q_b (cfs)	0.0
Major Flow Bypassed Downstream, Q_b (cfs)	0.0

Minor Storm (Calculated) Analysis of Flow T

C	N/A
C_5	N/A
Overland Flow Velocity, Vi	N/A
Channel Flow Velocity, Vt	N/A
Overland Flow Time, Ti	N/A
Channel Travel Time, Tt	N/A
Calculated Time of Concentration, T_c	N/A
Regional T_c	N/A
Recommended T_c	N/A
T_c selected by User	N/A
Design Rainfall Intensity, I	N/A
Calculated Local Peak Flow, Q_p	N/A

Major Storm (Calculated) Analysis of Flow T

C	N/A
C_5	N/A
Overland Flow Velocity, Vi	N/A
Channel Flow Velocity, Vt	N/A
Overland Flow Time, Ti	N/A
Channel Travel Time, Tt	N/A
Calculated Time of Concentration, T_c	N/A
Regional T_c	N/A
Recommended T_c	N/A
T_c selected by User	N/A
Design Rainfall Intensity, I	N/A
Calculated Local Peak Flow, Q_p	N/A

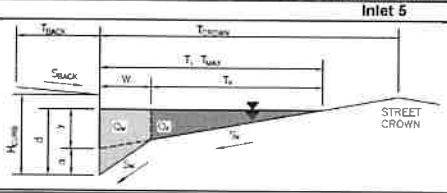
Version 4.05 Released March 2017

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

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

Project: Santa Fe Park

Inlet ID: Inlet 5



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	5.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	8.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0	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 =	0.010	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

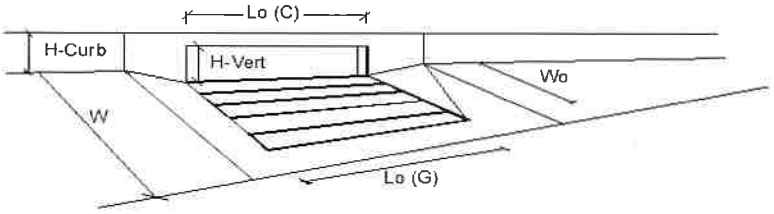
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	Q_{allow} =	6.8	6.8	cfs

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	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	1.0	1.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	10.00	10.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**1.0**	**2.1**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.0**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**100**	**%**

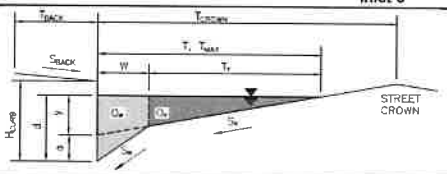
Version 4.05 Released March 2017

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

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

Project: Santa Fe Park

Inlet ID: Inlet 6



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	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} =	8.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0	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 =	0.010	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

MINOR STORM Allowable Capacity is based on Spread Criterion

MAJOR STORM Allowable Capacity is based on Spread Criterion

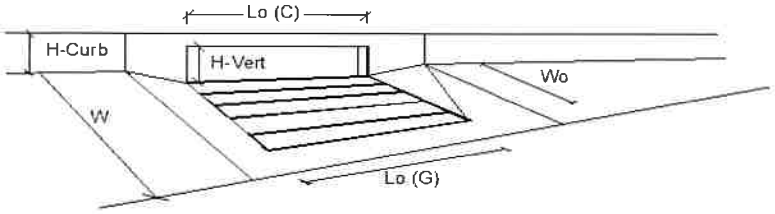
	Minor Storm	Major Storm	
Q_{allow} =	6.8	6.8	cfs

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)	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	1.0	1.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	15.00	15.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**2.2**	**4.7**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.0**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**100**	**%**

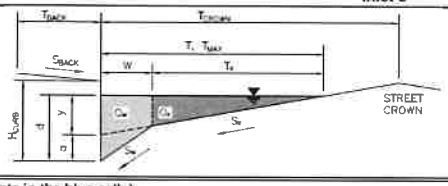
Version 4.05 Released March 2017

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

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

Project: Santa Fe Park

Inlet ID: Inlet 8



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	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} =	8.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0	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 =	0.040	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

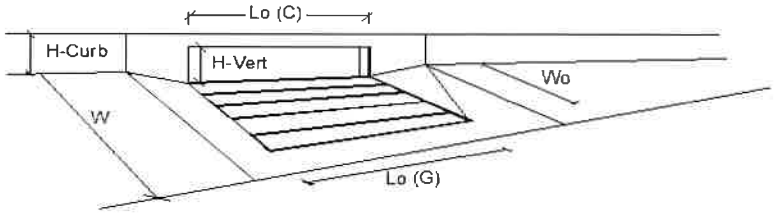
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	Q_{allow} =	13.5	13.5	**cfs**

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	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	1.0	1.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	15.00	15.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**1.1**	**2.2**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.0**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**100**	**%**

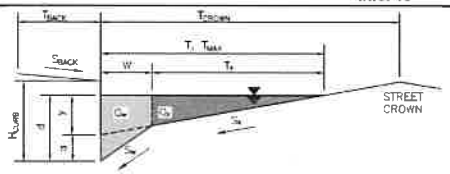
Version 4.05 Released March 2017

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

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

Project: Santa Fe Park

Inlet ID: Inlet 10



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	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} =	8.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0	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 =	0.040	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

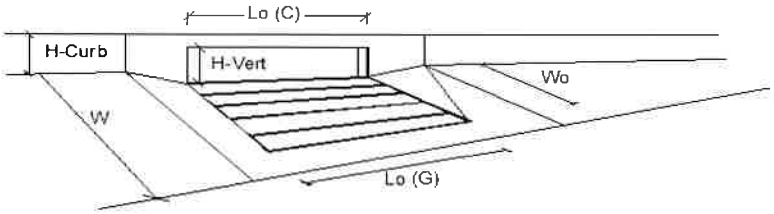
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	Q_{allow} =	13.5	13.5	cfs

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	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	1.0	1.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	10.00	10.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**0.7**	**1.5**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.0**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**100**	**%**

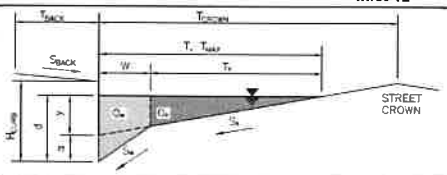
Version 4.05 Released March 2017

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

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

Project: Santa Fe Park

Inlet ID: Inlet 12



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	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} =	8.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0	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 =	0.010	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

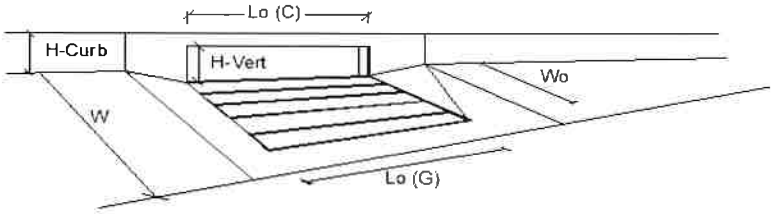
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	Q_{allow} =	6.8	6.8	cfs

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	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	1.0	1.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	10.00	10.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**1.2**	**2.6**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.0**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**100**	**%**

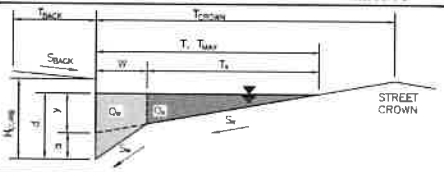
Version 4.05 Released March 2017

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

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

Project: Santa Fe Park

Inlet ID: Inlet 14



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	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} =	8.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0	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 =	0.010	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

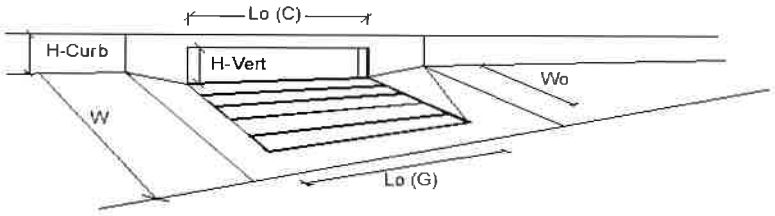
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	Q_{allow} =	6.8	6.8	cfs

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	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	1.0	1.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	15.00	15.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**1.8**	**3.8**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.0**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**100**	**%**

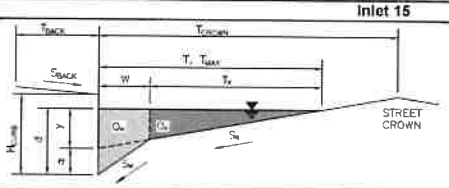
Version 4.05 Released March 2017

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

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

Project: Santa Fe Park

Inlet ID: Inlet 15



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	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} =	8.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0	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 =	0.010	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

MINOR STORM Allowable Capacity is based on Spread Criterion

MAJOR STORM Allowable Capacity is based on Spread Criterion

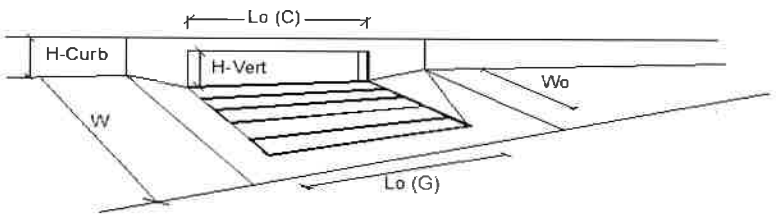
	Minor Storm	Major Storm	
Q_{allow} =	6.8	6.8	cfs

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	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	1.0	1.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	10.00	10.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**1.0**	**2.1**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.0**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**100**	**%**

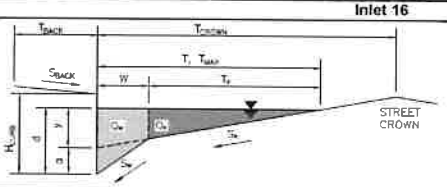
Version 4.05 Released March 2017

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

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

Project: Santa Fe Park

Inlet ID: Inlet 16



Gutter Geometry (Enter data in the blue cells)			
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	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} =	8.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0	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 =	0.010	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

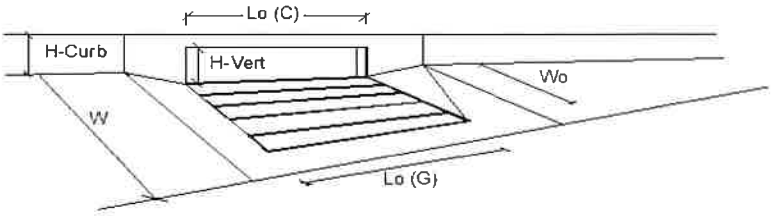
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	Q_{allow} =	6.8	6.8	cfs

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)	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	1.0	1.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	15.00	15.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**1.9**	**3.9**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.0**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**100**	**%**

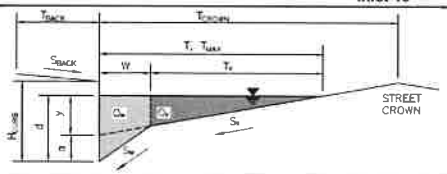
Version 4.05 Released March 2017

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

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

Project: Santa Fe Park

Inlet ID: Inlet 19



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	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} =	14.0	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} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

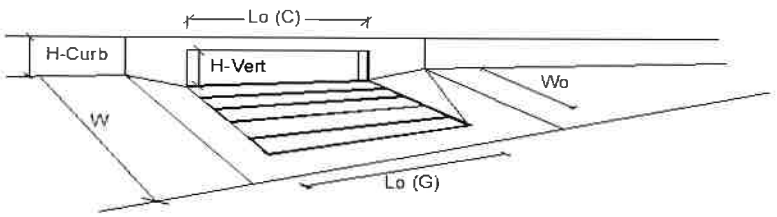
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	Q_{allow} =	9.6	9.6	cfs

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	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	1.0	1.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	10.00	10.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**1.3**	**2.7**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.0**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**99**	**%**

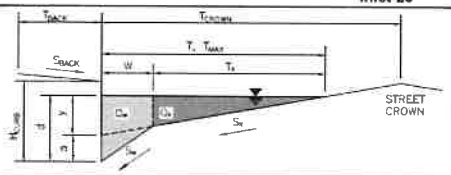
Version 4.05 Released March 2017

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

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

Project: Santa Fe Park

Inlet ID: Inlet 20



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	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} =	8.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	18.0	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 =	0.030	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

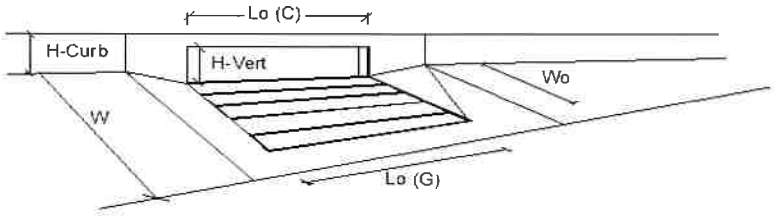
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	Q_{allow} =	11.7	11.7	cfs

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

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

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	1.0	1.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	10.00	10.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**2.9**	**4.8**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.1**	**1.6**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**98**	**76**	**%**

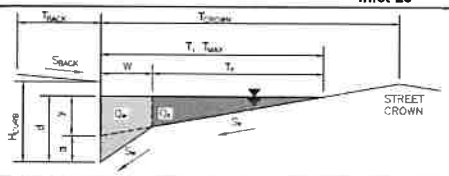
Version 4.05 Released March 2017

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

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

Project: Santa Fe Park

Inlet ID: Inlet 23



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	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} =	8.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0	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 =	0.030	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

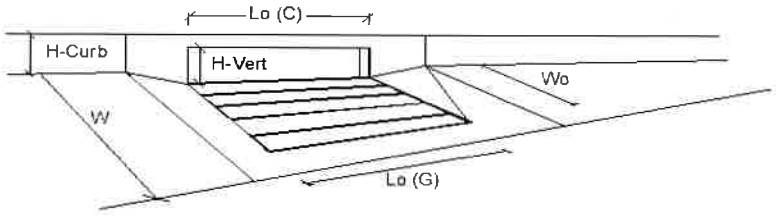
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	Q_{allow} =	11.7	11.7	cfs

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

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

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	1.0	1.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	15.00	15.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**1.8**	**3.8**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.0**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**100**	**%**

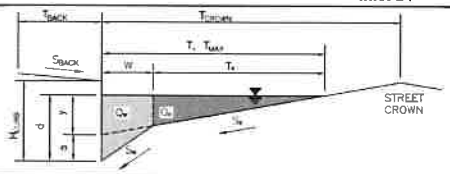
Version 4.05 Released March 2017

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

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

Project: Santa Fe Park

Inlet ID: Inlet 24



Gutter Geometry (Enter data in the blue cells)			
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	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} =	8.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0	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 =	0.030	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

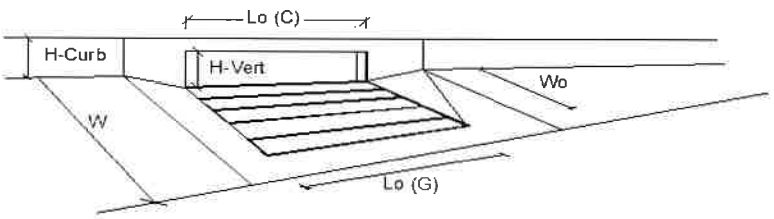
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	Q_{allow} =	11.7	11.7	cfs

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

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

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



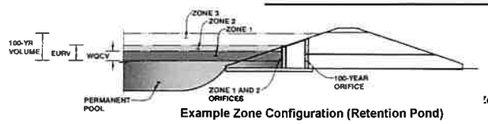
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	1.0	1.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	15.00	15.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**1.8**	**3.7**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.0**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**100**	**%**

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Santa Fe Park

Basin ID:



Example Zone Configuration (Retention Pond)

	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	2.03	1.943	Orifice Plate
Zone 2 (EURV)	4.13	4.362	Orifice Plate
Zone 3 (100-year)	5.57	3.281	Weir&Pipe (Restrict)
		9.586	Total

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)
Underdrain Orifice Diameter =	N/A	inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =	N/A	ft^2
Underdrain Orifice Centroid =	N/A	feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =	4.13	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	18.00	inches
Orifice Plate: Orifice Area per Row =	14.53	sq. inches (use rectangular openings)

Calculated Parameters for Plate

WQ Orifice Area per Row =	1.009E-01	ft^2
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft^2

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	1.50	3.00					
Orifice Area (sq. inches)	14.53	14.53	14.53					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected	
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	N/A	N/A	inches

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =	N/A	N/A	ft^2
Vertical Orifice Centroid =	N/A	N/A	feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	4.13	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	8.00	N/A	feet
Overflow Weir Slope =	0.00	N/A	H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =	8.00	N/A	feet
Overflow Grate Open Area % =	70%	N/A	%, grate open area/total area
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H_t =	4.13	N/A	feet
Over Flow Weir Slope Length =	8.00	N/A	feet
Grate Open Area / 100-yr Orifice Area =	5.02	N/A	should be ≥ 4
Overflow Grate Open Area w/o Debris =	44.80	N/A	ft^2
Overflow Grate Open Area w/ Debris =	22.40	N/A	ft^2

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	0.25	N/A	ft (distance below basin bottom at Stage = 0 ft)
Outlet Pipe Diameter =	48.00	N/A	inches
Restrictor Plate Height Above Pipe Invert =	32.10		inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Restrictor	Not Selected	
Outlet Orifice Area =	8.93	N/A	ft^2
Outlet Orifice Centroid =	1.50	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	1.92	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	5.80	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	60.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway

Spillway Design Flow Depth=	1.13	feet
Stage at Top of Freeboard =	7.93	feet
Basin Area at Top of Freeboard =	2.70	acres

Routed Hydrograph Results

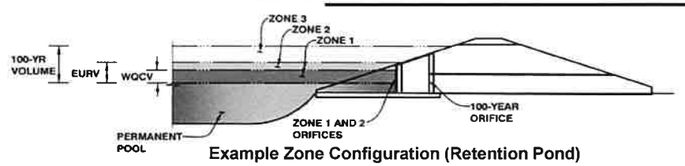
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	0.53	1.07	1.19	1.50	1.75	2.00	2.25	2.52	0.00
Calculated Runoff Volume (acre-ft) =	1.943	6.305	5.326	7.002	8.673	10.565	12.013	13.920	0.000
OPTIONAL Override Runoff Volume (acre-ft) =									
Inflow Hydrograph Volume (acre-ft) =	1.942	6.303	5.322	7.002	8.667	10.556	12.006	13.913	#N/A
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.01	0.02	0.22	0.71	0.98	1.32	0.00
Predevelopment Peak Q (cfs) =	0.0	0.0	0.9	1.6	15.4	50.5	69.8	93.6	0.0
Peak Inflow Q (cfs) =	33.7	107.2	90.9	118.7	146.1	176.9	200.3	230.8	#N/A
Peak Outflow Q (cfs) =	1.0	2.2	2.0	5.1	24.1	49.9	70.0	87.5	#N/A
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	3.2	1.6	1.0	1.0	0.9	#N/A
Structure Controlling Flow =	Plate	Plate	Plate	Overflow Grate 1	Overflow Grate 1	Overflow Grate 1	Overflow Grate 1	Outlet Plate 1	#N/A
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	0.1	0.5	1.1	1.5	1.9	#N/A
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	#N/A
Time to Drain 97% of Inflow Volume (hours) =	38	68	63	70	69	67	66	65	#N/A
Time to Drain 99% of Inflow Volume (hours) =	40	72	67	75	74	74	73	73	#N/A
Maximum Ponding Depth (ft) =	1.95	3.98	3.54	4.25	4.59	4.91	5.11	5.39	#N/A
Area at Maximum Ponding Depth (acres) =	1.91	2.18	2.13	2.21	2.25	2.28	2.31	2.34	#N/A
Maximum Volume Stored (acre-ft) =	1.803	5.993	5.046	6.563	7.342	8.044	8.526	9.152	#N/A

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: Santa Fe Park

Basin ID:



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	EDB	
Watershed Area =	71.00	acres
Watershed Length =	2,500	ft
Watershed Slope =	0.030	ft/ft
Watershed Imperviousness =	80.00%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	100.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Desired WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	
Water Quality Capture Volume (WQCV) =	1.943	acre-feet
Excess Urban Runoff Volume (EURV) =	6.305	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	5.326	acre-feet
5-yr Runoff Volume (P1 = 1.5 in.) =	7.002	acre-feet
10-yr Runoff Volume (P1 = 1.75 in.) =	8.673	acre-feet
25-yr Runoff Volume (P1 = 2 in.) =	10.565	acre-feet
50-yr Runoff Volume (P1 = 2.25 in.) =	12.013	acre-feet
100-yr Runoff Volume (P1 = 2.52 in.) =	13.920	acre-feet
500-yr Runoff Volume (P1 = 0 in.) =	0.000	acre-feet
Approximate 2-yr Detention Volume =	4.995	acre-feet
Approximate 5-yr Detention Volume =	6.582	acre-feet
Approximate 10-yr Detention Volume =	8.172	acre-feet
Approximate 25-yr Detention Volume =	8.758	acre-feet
Approximate 50-yr Detention Volume =	9.097	acre-feet
Approximate 100-yr Detention Volume =	9.586	acre-feet

Optional User Override 1-hr Precipitation

1.19	inches
1.50	inches
1.75	inches
2.00	inches
2.25	inches
2.52	inches
	inches

Stage-Storage Calculation

Zone 1 Volume (WQCV) =	1.943	acre-feet
Zone 2 Volume (EURV - Zone 1) =	4.362	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	3.281	acre-feet
Total Detention Basin Volume =	9.586	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V

Depth Increment = ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	**200**	0.005		
16	--	**1.00**	--	--	--	**40,000**	0.918	19,701	0.452
17	--	**2.00**	--	--	--	**85,317**	1.959	81,907	1.880
18	--	**3.00**	--	--	--	**90,073**	2.068	170,452	3.913
19	--	**4.00**	--	--	--	**94,929**	2.179	262,953	6.037
20	--	**5.00**	--	--	--	**99,885**	2.293	360,360	8.273
21	--	**6.00**	--	--	--	**104,942**	2.409	462,774	10.624
22	--	**7.00**	--	--	--	**110,100**	2.528	570,295	13.092
23	--	**7.50**	--	--	--	**115,359**	2.648	626,660	14.386
23.5	--	**8.00**	--	--	--	**118,025**	2.709	685,006	15.726

1" = 100'

0 25 50 100 200

Scale in Feet

USE:SPECIAL PURPOSE
ZONE: PCD
OWNER: TKG MONUMENT
DEVELOPMENT LLC
REC NO:(7126005016)

USE:SPECIAL PURPOSE
ZONE: PCD
OWNER: FRUC-TUOUS LLC
REC NO:(7126005021)

USE:SPECIAL PURPOSE
ZONE: PCD
OWNER: CBA MONUMENT LLC
REC NO:(7126005023)

USE: VACANT COMMERCIAL LOTS
ZONE: PCD
OWNER: TKG MONUMENT
DEVELOPMENT LLC
REC NO:(7126005013)

USE:SPECIAL PURPOSE
ZONE: PCD
OWNER: TKG MONUMENT
DEVELOPMENT LLC
REC NO:(7126005007)

USE: DUPLEXES /TRIPLEXES
ZONE: RR-5
OWNER: OTTAWAY KRISTIN
REC NO:(7126004010)

USE: AGRICULTURE
ZONE: A-35
OWNER: DELLACROCE LLC
REC NO:(7100000427)

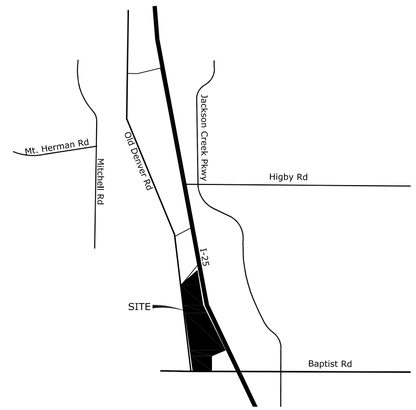
SANTA FE TRAIL

OLD DENVER ROAD

OLD DENVER RD

SHEET 1 MATCHLINE

SHEET 2 MATCHLINE



VICINITY MAP

LEGEND

- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR
- EXISTING BASINS
- A — HISTORIC BASINS
- HDP#1 — HISTORIC DESIGN POINT
- DIRECTION OF FLOW

HISTORIC DRAINAGE BASIN TABLE

BASIN	AREA (Ac.)	Q_5 (CFS)	Q_{100} (CFS)
A	6.80	1.6	11.5
B	18.44	3.2	23.7
C	13.30	1.6	12.0
D	8.81	1.6	11.9
E	21.02	3.4	25.1
F	14.79	2.3	16.6
G	10.73	2.0	15.0

HISTORIC DRAINAGE DESIGN POINTS

BASIN	AREA (Ac.)	Q_5 (CFS)	Q_{100} (CFS)
HDP#1	61.57	5.5	40.7

EXHIBIT 1–SHEET 1 OF 2

FILE: 19012BAS4.DWG 1/17/20

ROCKWELL CONSULTING, Inc.
ENGINEERING · SURVEYING
1955 N. UNION BLVD., SUITE 200
COLORADO SPRINGS, CO 80909
(719) 475-2575 · FAX (719) 475-9223

TITLE : SANTA FE PARK
HISTORIC DRAINAGE PLAN

SCALE :	1"=100'	DRAWN BY :	KDR	19-012
DATE :	1/17/20	CHECKED BY :	KDR	JOB NO.

1" = 100'

0 25 50 100 200

Scale in Feet

USE: VACANT LAND
ZONE: PID
OWNER: PHOENIX BELL ASSOCIATES L L P
REC NO:(7126000003)

POSE
JMENT
.LC
5007)

I-25

A
B
C
D
E
F
G

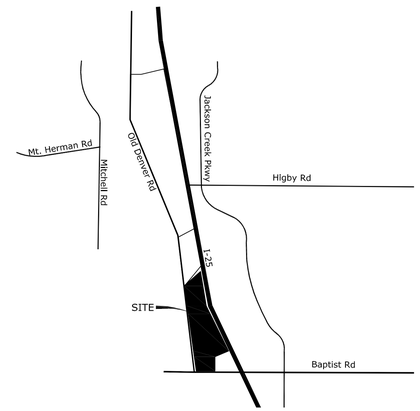
HDP#1

SHEET 1 MATCHLINE

SHEET 2 MATCHLINE

QLD DERVER ROAD

BAPTIST ROAD



VICINITY MAP

LEGEND

- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR
- EXISTING BASINS
- A — HISTORIC BASINS
- HDP#1 — HISTORIC DESIGN POINT
- DIRECTION OF FLOW

HISTORIC DRAINAGE BASIN TABLE

BASIN	AREA (Ac.)	Q_5 (CFS)	Q_{100} (CFS)
A	6.80	1.6	11.5
B	18.44	3.2	23.7
C	13.30	1.6	12.0
D	8.81	1.6	11.9
E	21.02	3.4	25.1
F	14.79	2.3	16.6
G	10.73	2.0	15.0

HISTORIC DRAINAGE DESIGN POINTS

BASIN	AREA (Ac.)	Q_5 (CFS)	Q_{100} (CFS)
HDP#1	61.57	5.5	40.7

EXHIBIT 1–SHEET 2 OF 2

FILE: 19012BAS4.DWG 1/17/20

ROCKWELL CONSULTING, Inc.
ENGINEERING - SURVEYING
1955 N. UNION BLVD., SUITE 200
COLORADO SPRINGS, CO 80909
(719) 475-2575 - FAX (719) 475-9223

TITLE : SANTA FE PARK
HISTORIC DRAINAGE PLAN

SCALE : 1"=100' | DRAWN BY : KDR

DATE : 1/17/20 | CHECKED BY : KDR

19-012
JOB NO.

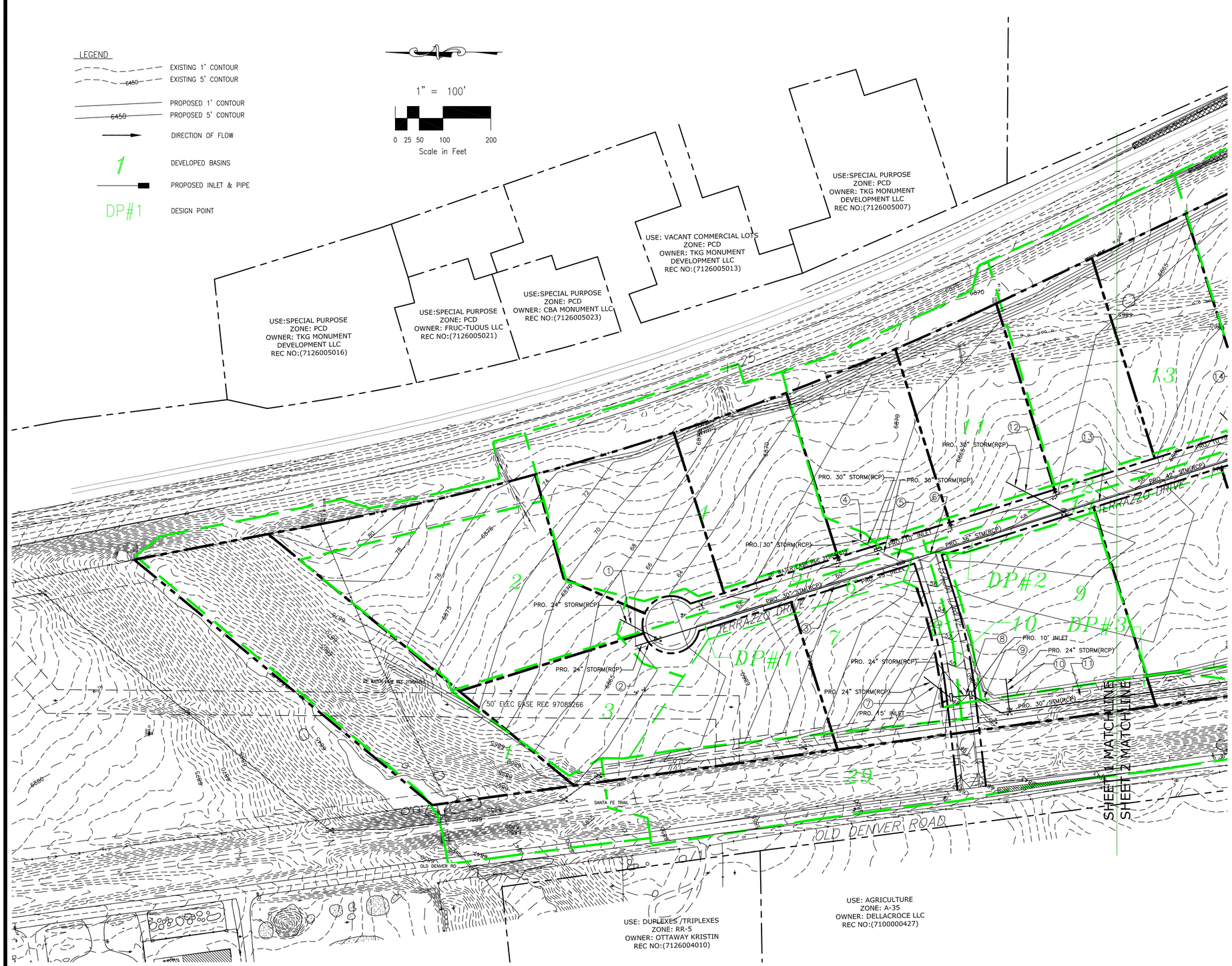
LEGEND

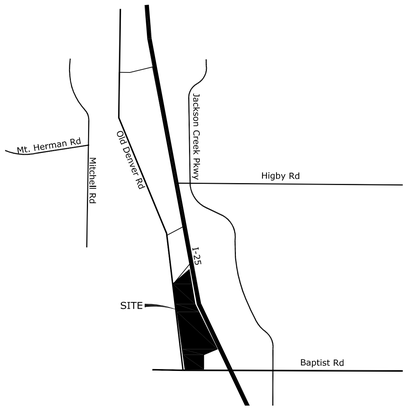
- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR (6450)
- PROPOSED 1' CONTOUR
- PROPOSED 5' CONTOUR (6450)
- DIRECTION OF FLOW
- 1 — DEVELOPED BASINS
- PROPOSED INLET & PIPE
- DP#1 — DESIGN POINT

1" = 100'

0 25 50 100 200

Scale in Feet





VICINITY MAP

DEVELOPED DRAINAGE BASIN TABLE

BASIN	AREA (Ac.)	Q_5 (CFS)	Q_{100} (CFS)
1	6.34	1.4	10.6
2	3.26	10.4	19.4
3	1.79	6.0	11.3
4	5.26	15.0	30.0
5	0.41	1.0	2.1
6	0.91	2.2	4.7
7	3.52	11.5	21.6
8	0.40	1.1	2.2
9	2.51	9.2	17.2
10	0.29	0.7	1.5
11	4.55	14.5	28.2
12	0.60	1.2	2.6
13	5.11	12.0	24.0
14	0.84	1.8	3.8
15	0.43	1.0	2.1
16	0.82	1.9	3.9
17	6.34	18.5	36.8
18	8.70	24.7	48.5
19	0.52	1.3	2.7
20	1.39	3.0	6.4
21	4.89	15.1	28.3
22	8.33	26.4	49.6
23	0.66	1.8	3.8
24	0.67	1.8	3.7
25	3.83	13.2	24.8
26	2.17	7.7	14.5
27	1.42	5.1	9.6
28	3.71	1.4	10.3
29	13.81	1.7	12.4

DEVELOPED DRAINAGE DESIGN POINTS

BASIN	AREA (Ac.)	Q_5 (CFS)	Q_{100} (CFS)
DP#1	5.05	16.1	30.2
DP#2	11.63	30.8	60.3
DP#3	6.72	21.5	40.6
DP#4	22.73	55.2	108.9
DP#5	30.32	68.9	136.5
DP#6	9.22	25.4	50.2
DP#7	11.61	33.4	62.7
DP#8	19.94	55.0	103.1
DP#9	21.27	57.4	108.2
DP#10	22.69	61.5	115.5
DP#11	43.37	95.5	188.0

PROPOSED PIPE SEGMENTS

PIPE NO.	Q_5 (CFS)	Q_{100} (CFS)	PIPE SIZE
1	10.4	19.4	24" RCP
2	6.0	11.3	24" RCP
3	16.1	30.2	30" RCP
4	15.0	30.0	30" RCP
5	16.0	32.1	30" RCP
6	30.8	60.3	36" RCP
7	11.5	21.6	24" RCP
8	12.6	23.8	24" RCP
9	13.3	25.3	24" RCP
10	9.2	17.2	24" RCP
11	21.5	40.6	30" RCP
12	14.5	28.2	30" RCP
13	45.3	88.5	42" RCP
14	12.0	24.0	24" RCP
15	13.2	26.6	24" RCP
16	55.2	108.9	48" RCP
17	18.5	36.8	30" RCP
18	19.5	38.9	30" RCP
19	68.9	136.5	48" RCP
20	68.9	136.5	48" RCP
21	24.7	48.5	36" RCP
22	25.4	50.2	36" RCP
23	25.4	50.2	36" RCP
24	15.1	28.3	30" RCP
25	33.4	62.7	36" RCP
26	26.4	49.6	36" RCP
27	55.0	103.1	48" RCP
28	1.8	3.8	18" RCP
29	3.6	7.5	18" RCP
30	57.4	108.2	48" RCP
31	5.1	9.6	18" RCP
32	61.5	115.5	48" RCP
33	13.2	24.8	24" RCP
34	85.5	168.9	54" RCP
35	95.5	188.0	54" RCP
36	7.7	14.5	24" RCP

EXHIBIT 2–SHEET 1 OF 2

FILE: 17016DEV.DWG 1/17/20

ROCKWELL CONSULTING, Inc.

ENGINEERING · SURVEYING
1955 N. UNION BLVD., SUITE 200
COLORADO SPRINGS, CO 80909
(719) 475-2575 · FAX (719) 475-9223

TITLE : SANTA FE PARK
DEVELOPED DRAINAGE PLAN

SCALE : 1"=100'
DRAWN BY : KDR
DATE : 1/17/20
CHECKED BY : KDR
19–012
JOB NO.

LEGEND

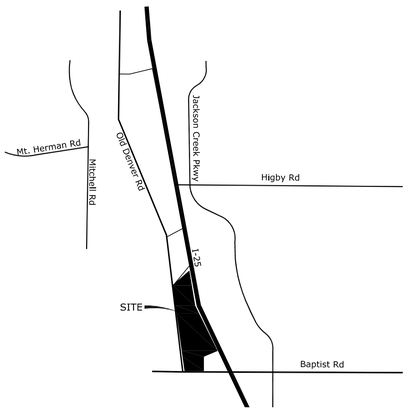
- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR (6450)
- PROPOSED 1' CONTOUR
- PROPOSED 5' CONTOUR (6450)
- DIRECTION OF FLOW
- 1 — DEVELOPED BASINS
- PROPOSED INLET & PIPE
- DP#1 — DESIGN POINT

1" = 100'

0 25 50 100 200

Scale in Feet

USE: VACANT LAND
ZONE: PID
OWNER: PHOENIX BELL ASSOCIATES L L P
REC NO:(7126000003)



VICINITY MAP

DEVELOPED DRAINAGE BASIN TABLE

BASIN	AREA (Ac.)	Q_5 (CFS)	D_{100} (CFS)
1	6.34	1.4	10.6
2	3.26	10.4	19.4
3	1.79	6.0	11.3
4	5.26	15.0	30.0
5	0.41	1.0	2.1
6	0.91	2.2	4.7
7	3.52	11.5	21.6
8	0.40	1.1	2.2
9	2.51	9.2	17.2
10	0.29	0.7	1.5
11	4.55	14.5	28.2
12	0.60	1.2	2.6
13	5.11	12.0	24.0
14	0.84	1.8	3.8
15	0.43	1.0	2.1
16	0.82	1.9	3.9
17	6.34	18.5	36.8
18	8.70	24.7	48.5
19	0.52	1.3	2.7
20	1.39	3.0	6.4
21	4.89	15.1	28.3
22	8.33	26.4	49.6
23	0.66	1.8	3.8
24	0.67	1.8	3.7
25	3.83	13.2	24.8
26	2.17	7.7	14.5
27	1.42	5.1	9.6
28	3.71	1.4	10.3
29	13.81	1.7	12.4

DEVELOPED DRAINAGE DESIGN POINTS

BASIN	AREA (Ac.)	Q_5 (CFS)	Q_{100} (CFS)
DP#1	5.05	16.1	30.2
DP#2	11.63	30.8	60.3
DP#3	6.72	21.5	40.6
DP#4	22.73	55.2	108.9
DP#5	30.32	68.9	136.5
DP#6	9.22	25.4	50.2
DP#7	11.61	33.4	62.7
DP#8	19.94	55.0	103.1
DP#9	21.27	57.4	108.2
DP#10	22.69	61.5	115.5
DP#11	43.37	95.5	188.0

PROPOSED PIPE SEGMENTS

PIPE NO.	Q_5 (CFS)	Q_{100} (CFS)	PIPE SIZE
1	10.4	19.4	24" RCP
2	6.0	11.3	24" RCP
3	16.1	30.2	30" RCP
4	15.0	30.0	30" RCP
5	16.0	32.1	30" RCP
6	30.9	60.3	36" RCP
7	11.5	21.6	24" RCP
8	12.6	23.8	24" RCP
9	13.3	25.3	24" RCP
10	9.2	17.2	24" RCP
11	21.5	40.6	30" RCP
12	14.5	28.2	30" RCP
13	45.3	88.5	42" RCP
14	12.0	24.0	24" RCP
15	13.2	26.6	24" RCP
16	55.2	108.9	48" RCP
17	18.5	36.8	30" RCP
18	19.5	38.9	30" RCP
19	68.9	136.5	48" RCP
20	68.9	136.5	48" RCP
21	24.7	48.5	36" RCP
22	25.4	50.2	36" RCP
23	25.4	50.2	36" RCP
24	15.1	28.3	30" RCP
25	33.4.	62.7	36" RCP
26	26.4	49.6	36" RCP
27	55.0	103.1	48" RCP
28	1.8	3.8	18" RCP
29	3.6	7.5	18" RCP
30	57.4	108.2	48" RCP
31	5.1	9.6	18" RCP
32	61.5	115.5	48" RCP
33	13.2	24.8	24" RCP
34	85.5	168.9	54" RCP
35	95.5	188.0	54" RCP
36	7.7	14.5	24" RCP

SHEET 1 MATCHLINE
SHEET 2 MATCHLINE

EXHIBIT 2–SHEET 2 OF 2

FILE: 17016DEV.DWG 1/17/20

ROCKWELL CONSULTING, Inc.
ENGINEERING - SURVEYING
1955 N. UNION BLVD., SUITE 200
COLORADO SPRINGS, CO 80909
(719) 475-2575 - FAX (719) 475-9223

SANTA FE PARK
TITLE : DEVELOPED DRAINAGE PLAN

SCALE : 1"=100' | DRAWN BY : KDR | 19-012
DATE : 1/17/20 | CHECKED BY : KDR | JOB NO.