

Preliminary Drainage Report

For

Sunset Pointe A Planned Unit Development

Presented To:

City of Fruita

Prepared For:

Sunshine of Delta, Inc.
P.O. Box 516
Fruita, CO 81521

Prepared By:

Rolland Consulting Engineers LLC
405 Ridges Blvd.
Grand Junction, CO 81507

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Preliminary Drainage Report – Sunset Pointe

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CERTIFICATION

"I hereby certify that this Preliminary Drainage Report for the design of Sunset Pointe was prepared by me in accordance with the provisions of the Stormwater Management Manual for the owners thereof. I understand that the City of Fruita does not and will not assume liability for drainage facilities designed by others."



Eric S. Slivon
Registered Professional Engineer,
State of Colorado, Number 36169

I. Introduction

A. Background

This report was prepared by Rolland Consulting Engineers LLC for Sunshine of Delta, Inc. This report will establish the general drainage design and guidelines for the entire development.

B. Project Location and Description

The Sunset Pointe subdivision is located in the south half of Section 19, Township 1 North, Range 2 West of the Ute Meridian in Mesa County, Colorado. The site encompasses three tax parcels west of State Highway 340 and south of the Colorado River. Tax parcel numbers are 2697-193-00-037, 2697-194-00-036 and 2697-194-00-038, having areas of 96.43 acres, 27.31 acres and 8.53 acres respectively. The Site is bounded by individual residential lots in King's View Subdivision to the east and south, BLM land to the south and west and land owned by the City of Fruita to the north and northeast. A Location Map has been included as Figure A.

The proposed Sunset Point will have 122 residential lots with large amounts of open space. Each lot will border an open space tract. A loop road, Golondrina Way, will access King's View Road from the intersection with the Access to Snooks Bottom and at a second location on the far west end of the site. Three cul-de-sacs and a second loop road, Lucia Circle, will access from Golondrina Way. Three additional cul-de-sacs will access from Lucia Circle. Fowler drive is currently a dead-end road in the existing King's View Subdivision that ends at the east boundary in the southern portion of the site. Fowler Drive will be extended about 500 feet to the southwest to a cul-de-sac. Fowler Drive and Catrina Ct. (from Lucia Circle) will be connected by a paved Private Road to create a secondary access to the subdivision. The proposal also includes re-aligning a portion of King's View Road at the intersection with the Snooks Bottom access and the main entrance to the Subdivision at Golondrina Way. The project will be built out over several phases.

C. Property Description

The site has an area of approximately 132.27 acres. The eastern extent of the property nearly reaches the intersection of King's View Road and Fowler Drive. Continuing west on King's View Road the subject property is on both sides of the road for about 1630 feet. King's View Road leaves the subject property before the intersection with the access to Snooks Bottom Open Space, then turns to the left where the subject property borders the south side of the road. The majority of the property, about 93% is located on the south side of King's View Road. Elevations on the property range from 4675 near the southwest corner to 4485 near the northeast corner. Two major drainages cross the property diagonally from the southwest to the north east. Most of the grade change occurs near the south property line, adjacent to the BLM land and near the north east corner where the adjacent to the Colorado River flood channel. The BLM has a trail head and signage for hikers coming from the subject property about 1000 feet east of the property's southwest corner. A network of hiking trails traverses the property between King's View Road, King's View Subdivision and the BLM trail access. An overhead electric transmission line crosses the property in an east-west direction. Vegetation is generally sparse in the lower areas of the site with small native grasses and shrubs. Drainages are restricted in small

canyons near the southern portion of the property. Here some small trees and rock outcrops can be found.

D. Previous Investigations

Vista Engineering Corp. prepared a Preliminary Drainage Study over this same area in 2006. The study was done for the same client for a subdivision with essentially the same layout. This Drainage Report has similar conclusions and can be considered as an update/replacement to the original study.

VI. Drainage System Description

A. Existing Drainage Conditions

The site lies between Devil's Canyon (6115 ac.) and Kodels Canyon (1103 Ac.), which originate in the Black Ridge Canyon Wilderness Area to the west of the Colorado National Monument. Drainage Basin maps found on the Mesa County and City of Grand Junction GIS, identify distinct drainage basins, within about one mile of the Colorado River, between Devil's Canyon and Kodels Canyon in the area of the Site. These basins are identified numerically from west to east as "32", "33" and "34". Basin "32" (127 Ac.) just crosses the north west corner of the property, where the main channels for Basins "33" (128 Ac.) and "34" (104 Ac.) pass through the site. Main channel flowlines average between 2 and 3% slope.

Historic Basin H-A has an area 5.58 ac. and is that portion of the site that lies within Basin "32". Runoff from Basin H-A collects on the north side of King's View Road, without a way to drain. If stormwater levels increase enough the potential exists to "spill over" to the west and discharge through an existing 15" CMP culvert passing under King's View Road.

Historic Basin H-B has an area of 55.34 ac and is the portion of the site that lies within Basin "33". Basin H-B discharges under King's View Road through a 30" CMP culvert just west of the Snooks Bottom access and shortly passes under the access through another 30" CMP culvert.

Historic Basin H-C, H-D and H-E are all included in Basin "34" and have areas of 13.65 ac., 42.79 ac. And 5.23 ac. respectively. Runoff from Basin H-E passes under King's View Road through a 36" CMP culvert approximately midway between the Snooks Bottom access and Fowler Drive. Runoff from Basins H-C and H-D is directed to a 12" culvert that passes under King's View Road closer to Snooks Bottom and combines with Basin H-B runoff before passing under the Snooks Bottom access road. One likely scenario is that at one time the drainage from Basin H-C was directed to the 36" culvert in Basin H-A (or did not drain at all) and the runoff from Basin H-D was directed to the 36" culvert in Basin H-E.

Historic Basin H-F is the portion of the subject property north of King's View Road and is a part of Basin "34". The area sits on a "bench" 200 to 250 feet wide before dropping 40 to 60 feet down to the Colorado River floodplain. The property line of the Site in this area is part-way down the slope. Stormwater from Basin H-E passes through Basin H-F.

Soil data was obtained from the USDA Natural Resources Conservation Service website. The majority (>90%) of the site soils are identified as Moffat-Sheppard-Pennell complex and classified as Hydrologic Soil Group A. This soil type has a high infiltration rate and is well to excessively drained. The soils in small portion of the site on the north side of King's View Road are identified as Blackston very gravelly sandy clay loam and classified as Hydrologic Soil Group C. This soil type has a slow infiltration rate. Portions of the southern extent of the site and a majority of the off-site basins to the south have soils identified as Zyme-Rock outcrop Gladel complex and classified as Hydrologic Soil Group D. This soil type has a very slow infiltration rate and very slow water transmission rate. The Moffat-Sheppard-Pennell complex soil is also found in significant amounts in the off-site basins.

B. Offsite Tributary Area

Off-site flows enter the site from the south and west. Off-site Basin O-B has an area of 61.31 acres and enters Basin D-B at a point source in a well-defined natural channel. Soil types in Off-site Basin O-B are primarily Zyme-Rock outcrop Gladel complex with some areas of Moffat-Sheppard-Pennell complex. Off-site Basin D has been divided into 4 sub-basins depending on discharge locations. Basin O-D1, O-D2 and O-D3, having areas of 8.87 ac., 17.54 ac., and 1.49 ac. respectively discharge into the site at point sources in existing channel. Off-site Basin O-D4, having an area of 13.75 ac., consists of the west 40% of the existing King's View Subdivision. Stormwater from Basin O-D4 mostly enters the site from point discharge from a 24" storm drain that originates in Fowler Drive. Stormwater also enters the site as sheet flow from the rear yards that border the site. Off-site flows enter the Site from Off-Site Basin O-E, which has an area of 6.15 ac. This basin makes up another 20% of the existing King's View Subdivision that discharges stormwater at the end of Laura Ct. and as sheet flows along boundaries from the rear yards.

C. Proposed Drainage System Description

The site is divided into 6 major developed basins based on discharge point. Four of the six major basins are further subdivided into sub-basins. Developed Basins are identified from west to east as Basins A, B, C, D, E, and F and approximate the boundaries of the Historic Basins.

Developed Basin D-A has an area of 6.62 ac. and drains to the same area as Historic Basin H-A. Basin D-A is further divided into two sub-basins, one being the front half of lots, draining to Golondrina Way and the other being the back half of the lots and the open space tract, draining directly to the low area adjacent to King's View Road. The existing low area will be improved to a retention basin, "Detention Basin A", that holds a volume at least equal to the Water Quality Capture Volume (WQCV) as dictated in the Stormwater Management Manual (SWMM), Detention Basin A could have additional volume to act as a full retention basin or provide an overflow to the west.

Developed Basin D-B has an area of 42.86 acres and receives off-site runoff from Basin O-B (61.31 acres). Basin D-B has been further divided into 15 sub-basins in order to analyze critical points. The boundary of Basin D-B closely resembles the boundary of Historic Basin H-B. The historic discharge culvert for Basin H-B will be replaced with the re-alignment of King's View Road. Runoff in Basin D-B will either be directed to roadways or to open space tracts from the

rear of developed lots. Natural primary drainage ways will for the most part be maintained in open tracts. Culverts will be located where existing drainage paths cross Lucia Circle and at two locations on Golondrina Way. Pairs of curb inlets will be located at low points in Lucia Circle and Golondrina Way. Detention Basin B will be located in the low portion of the basin at the new culvert under King's View Road. This basin should be able to be developed with little grading effort due to the existing topography and the elevation of King's View Road.

Developed Basin D-C has an area of 14.96 ac. Basin D-C has been further divided into 7 sub-basins in order to analyze critical points. This basin will drain to King's View Road in the area when the existing 12" CMP carried stormwater from Historic Basin H-C and H-D. A new 18" Culvert will be installed with the re-alignment of King's View Road. Stormwater will be directed to the to a Detention Pond C at the southeast corner of King's View Road and Golondrina Way. Inlets will be located in Isabella Ct. to collect runoff from a majority of the paved area and front half of the lots.

Developed Basin D-D has an area of 26.64 acres and receives off-site runoff from Basin O-D (41.65 acres). Basin D-D has been further divided into 7 sub-basins in order to analyze critical points. Off-site Basin O-D has been divided into 4 sub-basins depending on where runoff enters Basin D-D. Runoff in Basin D-D will either be directed to roadways or to open space tracts from the rear of developed lots. Natural primary drainage ways will for the most part be maintained in open tracts. Culverts will be located where existing drainage paths cross Catrina Court and the private drive between Catrina Court and Fowler Drive. Another culvert will be located where the extension of Fowler Drive starts in order to pick drainage that originates in the proposed subdivision. Detention Basin D will be located in the low portion of the basin just west of the existing 36" culvert. A new 36" Culvert will be installed at this location, discharging to the same drainage way that the existing 36" culvert discharges. Detention Basin D will be located in this area.

Developed Basin D-E has an area of 5.23 ac. No Development is planned in Basin D-F. This basin is the same as Historic Basin H-F. Stormwater from Off-site Basin O-E enters the site at the end of Laura Ct. in the existing King's View Subdivision. A detention basin is proposed in the low area of Basin D-E to account for lack of detention in Basin D-F. Basin D-E discharges through the existing 36" culvert under King's View Road to Basin D-F.

Developed Basin D-F has an area of 9.63 ac. and is located on the north side of King's View Road. Basin D-F will have 6 new residential lots and a portion of the emergency access/sanitary sewer maintenance roads that will connect from King's View Road to the sewer lift station on Highway 340. Two of the new lots will be located at the end of Squire Ct. in the existing King's View Subdivision. Runoff from Basin D-F will discharge to the adjacent Colorado River Floodplain at several point discharges and all along the 1200 ft. long boundary as sheet flow. Detention is not practical for Basin D-F. Since Stormwater from Off-site Basin O-E and Basin D-E pass through Basin D-F and the potential exists in Basin D-F, it is being proposed that a Detention Basin D-E be constructed to hold at least the Water Quality Capture Volume for the entire area of Basins D-E, D-F and Off-site O-E.

Final Detention Basin design will be performed during the final design of each phase. It is likely that Detention Basins B, C, D and E will be constructed in early phases and Detention Basin A would be constructed with that adjacent later phase. Since the subdivision is so close to the Colorado River, we request that the detention requirement be waived. Detention Basins will be designed for at least the Water Quality component of the SWMM, if not addition storage toward the 10 and 100-year storm events.

D. Drainage Facility Maintenance

The Sunset Pointe Home Owner’s Association (HOA) will own and maintain the detention facilities. A portion of Detention Basin B, and likely the release structure will be located on the narrow strip of land located on the south side of King’s View Road and north of the proposed site. This area will still be maintained by the Sunset Pointe HOA. The City of Fruita will own and maintain the storm drain and curb inlets within the City right-of-way. The Sunset Pointe HOA will own and maintain the natural drainage ways passing through the open space tracts of the subdivision. Regular maintenance in the fall and after major storm events will be necessary to remove accumulated silt, trash and other debris from the detention basins and trash rack or fine screens of the release structures. A full inspection of the facility should be performed and documented on a yearly basis.

E. Runoff Summary

<u>Historic Basin</u>	<u>Area (Ac)</u>	<u>10yr Runoff (cfs)</u>	<u>100yr Runoff (cfs)</u>
H-A	5.58	0.0	0.0
H-B	55.34	0.0	0.0
H-C	13.65	0.0	0.0
H-D	42.79	0.0	0.0
H-E	5.23	0.3	1.4
H-F	9.63	0.4	2.5

<u>Off-Site Basin</u>	<u>Area (Ac)</u>	<u>10yr Runoff (cfs)</u>	<u>100yr Runoff (cfs)</u>
O-B	61.31	1.4	19.5
O-D1	8.87	1.2	7.0
O-D2	17.54	0.3	7.6
O-D3	1.49	0.1	1.0
O-D4	13.75	3.6	8.2
O-E	6.15	3.2	5.1

Routed Historic Flows (added with off-site)

<u>Basin</u>	<u>Area (Ac)</u>	<u>10yr Runoff (cfs)</u>	<u>100yr Runoff (cfs)</u>
H-B + O-B	116.65	1.4	19.5
H-D + O-D	84.44	5.0	15.5
H-E + O-E	11.38	3.3	6.0

Routed Developed Flows (added with off-site)

<u>Basin</u>	<u>Area (Ac)</u>	<u>10yr Runoff (cfs)</u>	<u>100yr Runoff (cfs)</u>
D-A	6.62	1.1	2.3
D-B + O-B	104.17	7.8	28.3

D-C	14.96	3.2	7.1
D-D + O-D	83.17	6.4	26.8
D-E + O-E	11.38	3.3	6.0
D-F	9.83	0.7	3.3

Basins with Hydrologic Soil Group “A” and a composite CN value of 60 or less can show not to produce runoff for the 100-year storm event. Basis for runoff calculations, including composite percent impervious, SCS Curve number, time of concentration and intensity are included in the Appendix of the Report. Actual runoff calculations and flow routing were done by using the SCS Method and *Hydraflow Hydrographs* Software version 5.1. Analysis showed that a 24-hr storm distribution produced more runoff than the 3-hr distribution suggested by the SWMM.

III. Drainage Analysis and Design Criteria

A. Regulations

The preliminary stormwater analysis and design was prepared in accordance with the Stormwater Management Manual for Mesa County. Final hydrologic and hydraulic design and analysis will be done in accordance with the latest version of Stormwater Management Manual for Mesa County. The site is located within the Mesa County Urbanized area as shown on Figure 401 of the Stormwater Management Manual.

B. Development Criteria

This Preliminary Drainage Report and design for Sunset Pointe governs how runoff from the site will be transported to the Colorado River. At a minimum stormwater will be detained to meet stormwater water quality measure as dictated by the SWMM. The Fee in lieu of detention option may be utilized (or partially utilized) for larger storm events. Final design will determine the actual volume available beyond the water quality capture volume.

C. Hydrologic Criteria

Historic and developed runoff rates have been calculated for the 10 and 100-year storm events, listed above in Section 2 of the Report, using the SCS method as outlined in the Stormwater Management Manual for Mesa County. Point rainfall values for the Grand Valley Area (Table “601”) were used for runoff calculations.

D. Hydraulic Criteria

The Final Drainage Report will analyze inlets, streets, storm drains, culverts and the release structures in accordance with the Stormwater Management Manual for Mesa County.

IV. Conclusions

A. Compliance with Manual

Hydrologic and Hydraulic analysis and calculations for this project is in accordance with the assumptions and constraints of the Stormwater Management Manual for Mesa County as

referenced in Section III.A of this report. The detention basins will incorporate water quality measures as required by the SWMM.

B. Areas in Flood Hazard Zone

The site is located adjacent to the 100-year flood plain of the Colorado River.

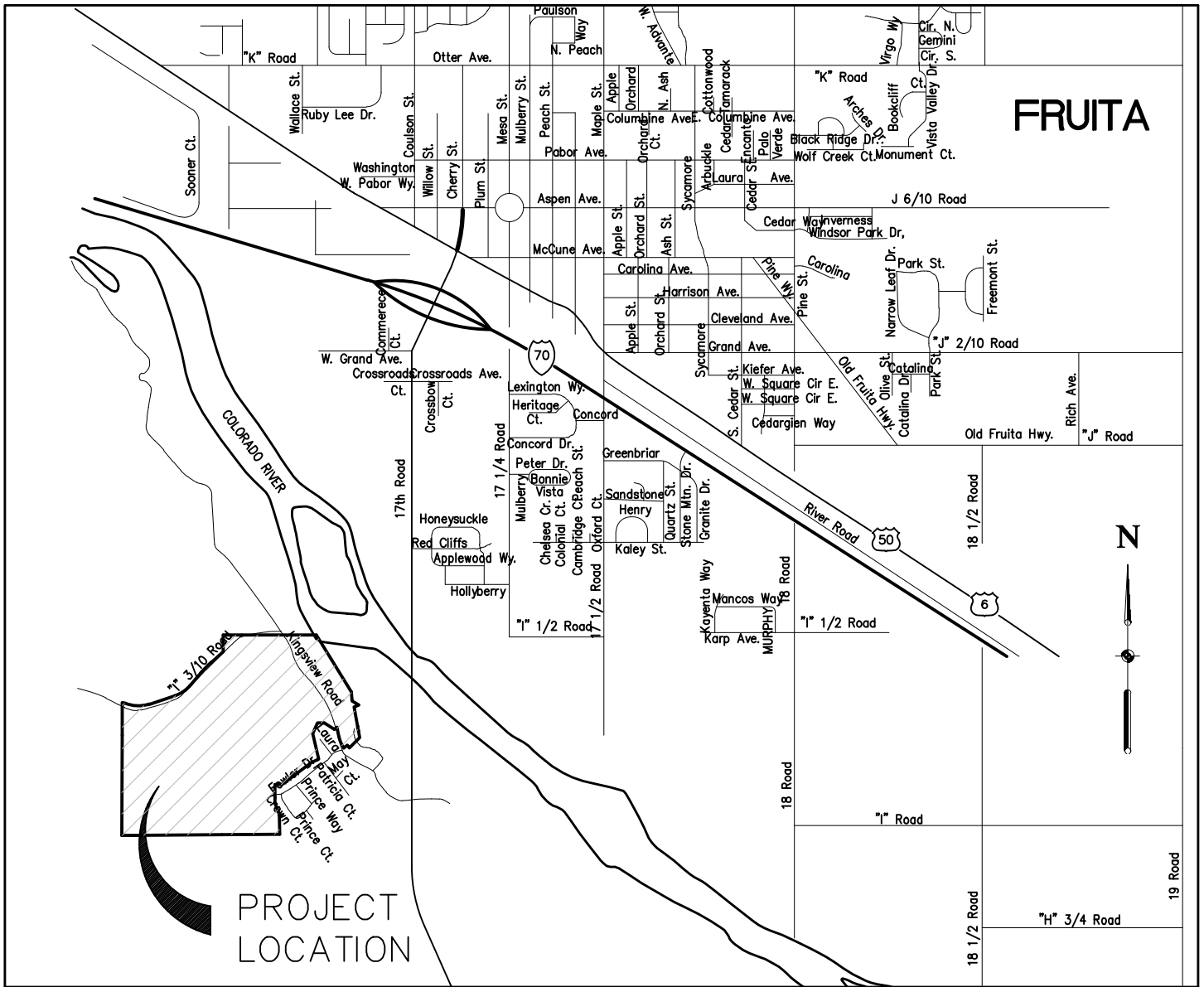
C. Variance from Manual

A variance is needed from Section 1407.3 of the SWMM. Section 1407.3 states “The total of all un-detained area shall not exceed 5% or 5,000 square feet, whichever is less.” In the case of Basin F, which will release un-detained. Basin F is long and narrow, with several point discharges and sheet flow release all along it’s boundary with the Colorado River. Basin E, which release to Basin F, has the opportunity to compensate for the lack of detention or Water Quality in Basin F.

IV. References

1. ***Geotechnical Investigation – Kings View Pointe Subdivision SW1/4 SE1/4, S3/4 of Lot 13, and NW1/4 SE1/4, Section 19, T1N, R2W Mesa County, Colorado***, April 11, 2006, Huddleston-Berry Engineering & Testing, LLC, Project# 2030-06.
2. ***Geotechnical Investigation – Sunset Pointe Subdivision Filings 1, 2 and Future Filing, Fruita, Colorado***, June 13, 2007, Huddleston-Berry Engineering & Testing, LLC, Project# 179-07.
3. Soils Data – USDA Natural Resources Conservation Service Website <http://websoilsurvey.nrcs.usda.gov>, Soil Survey Data Mesa County, Colorado, Version 3, Sep 25, 2007.

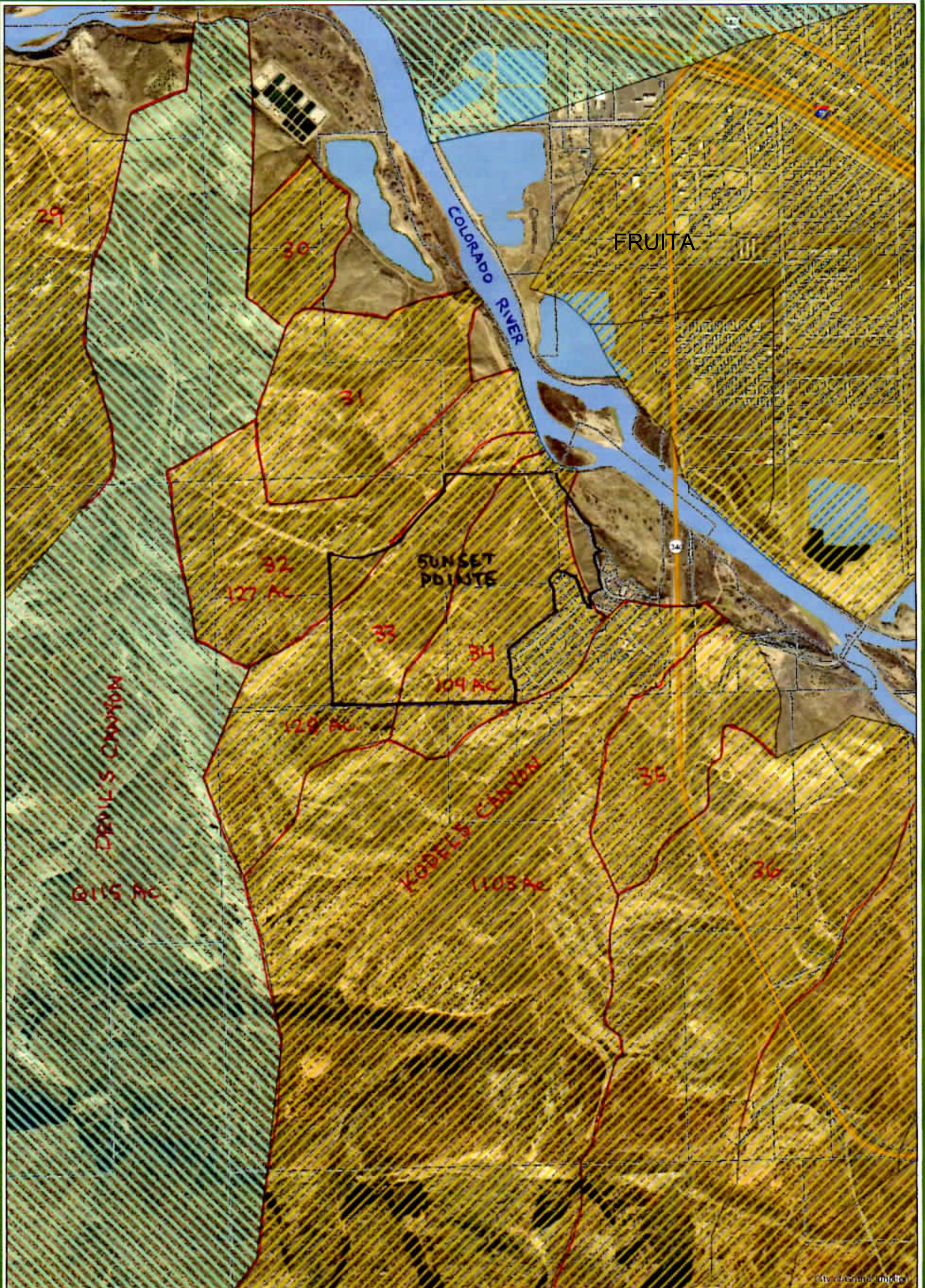
TABLES AND FIGURES



LOCATION MAP

FIGURE A

Major Drainage Basin Map



Date: 3/21/2018



STORMWATER MANAGEMENT MANUAL

RECOMMENDED IMPERVIOUSNESS VALUES

Land Use or Surface Characteristic	Percentage Imperviousness
Business	
Commercial Areas	95
Neighborhood Areas	85
Residential	
Single Family	(see figures)
Multi-unit (detached)	60
Multi-unit (attached)	75
Half-acre lot or larger	(see figures)
Apartments	80
Industrial	
Light industrial	80
Heavy industrial	90
Parks, cemeteries	5
Playgrounds	10
Schools	50
Railroad yards	15
Undeveloped Areas	
Historic flow analysis	2
Greenbelts, agriculture	2
Off-site flow analysis (when land use not defined)	45
Streets	
Paved (concrete/asphalt)	100
Gravel	40
Drives and walks	90
Roofs	90
Lawns (all soils)	0

NOTE: The imperviousness values are representative of land uses shown and are for future development projections only. Impervious values for existing land uses may vary.

Revision	Date
ORIGINAL ISSUE	3/27/06

Table 601 - Point Rainfall Values for the Grand Valley Area

Storm Duration	Precipitation Depth (inches)					
	2-year Recurrence	5-year Recurrence	10-year Recurrence	25-year Recurrence	50-year Recurrence	100-year Recurrence
5-min	0.10	0.14	0.18	0.25	0.31	0.39
10-min	0.15	0.22	0.28	0.38	0.48	0.60
15-min	0.19	0.28	0.36	0.48	0.61	0.76
30-min	0.27	0.39	0.50	0.67	0.85	1.06
1-hr	0.34	0.49	0.63	0.85	1.07	1.34
2-hr	0.42	0.58	0.72	0.94	1.15	1.40
3-hr	0.47	0.63	0.77	0.99	1.19	1.44
6-hr	0.55	0.73	0.87	1.10	1.31	1.56
12-hr	0.55	0.83	0.98	1.22	1.44	1.69
24-hr	0.70	0.93	1.12	1.42	1.69	2.01

For the area outside of the Grand Valley, the NOAA Atlas 2 Rainfall Depth-Duration-Frequency Maps are reproduced for the Mesa County area in **Figures 602 through 613**. Maps are presented for the 6- and 24-hour durations for the 2-, 5-, 10-, 25-, 50-, and 100-year recurrence intervals. Depending on the location of the project, point rainfall values are read from these figures, converted to other storm durations, and used to generate intensity-duration-frequency curves and design storms, following procedures described below.

For the areas within the Leach Creek/Horizon Drive watershed, point precipitation values are provided in **Table 602** for various frequencies and durations.

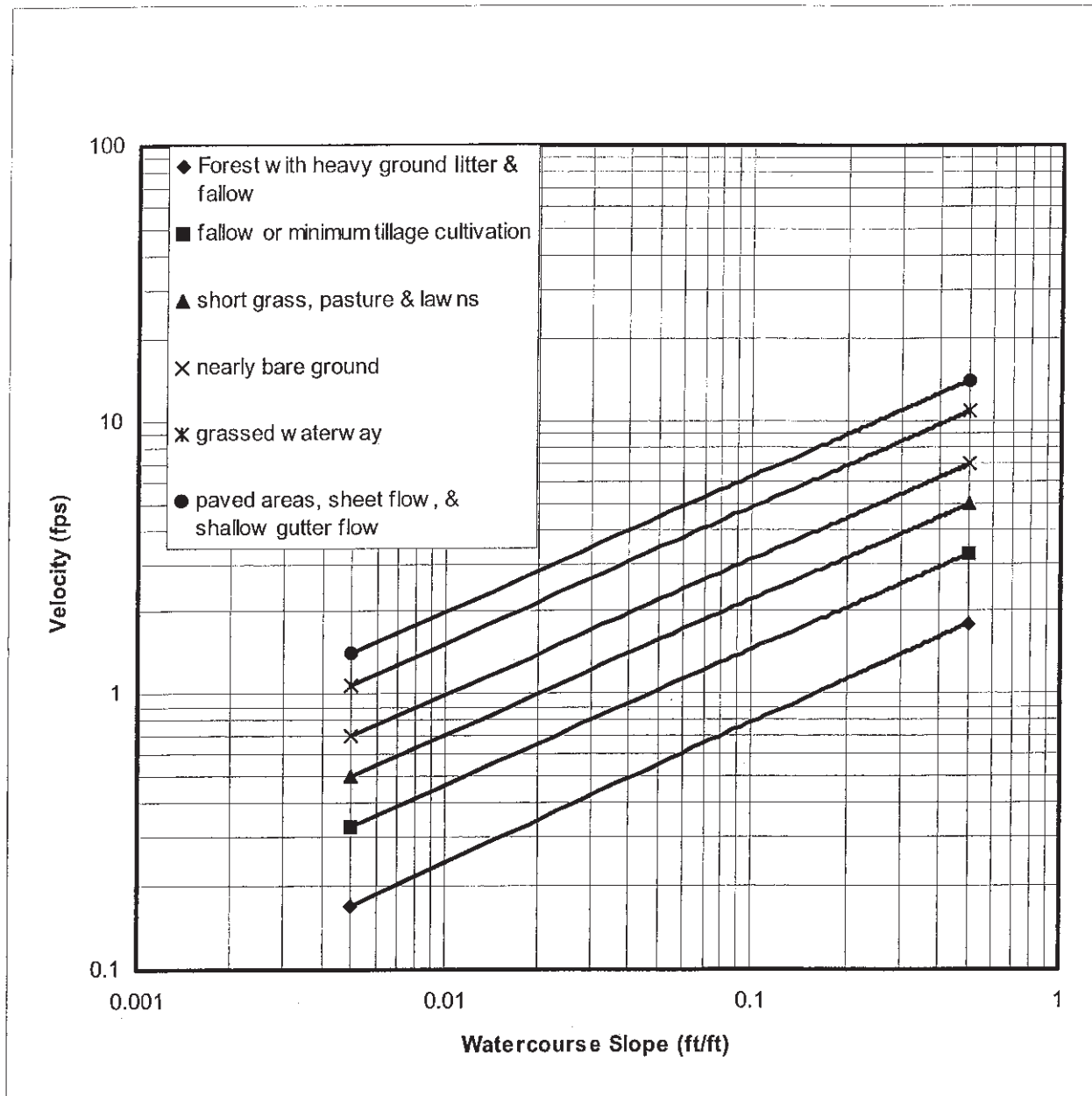
Table 602 - Point Rainfall Values for the Leach Creek/Horizon Drive Watershed

Storm Duration	Precipitation Depth (inches)					
	2-year Recurrence	5-year Recurrence	10-year Recurrence	25-year Recurrence	50-year Recurrence	100-year Recurrence
5-min	0.10	0.14	0.18	0.25	0.31	0.39
10-min	0.15	0.22	0.28	0.38	0.48	0.60
15-min	0.19	0.28	0.36	0.48	0.61	0.76
30-min	0.27	0.39	0.50	0.67	0.85	1.06
1-hr	0.29	0.41	0.52	0.85	0.86	1.07
2-hr	0.42	0.58	0.72	0.94	1.15	1.40
3-hr	0.46	0.63	0.78	0.99	1.24	1.52
6-hr	0.55	0.72	0.86	1.10	1.28	1.52
12-hr	0.67	0.85	0.99	1.22	1.39	1.61
24-hr	0.79	1.01	1.19	1.42	1.71	1.99

NOTE: The **italicized** values are the actual FEMA-approved data. The remaining data was obtained from **Table 601**.

STORMWATER MANAGEMENT MANUAL

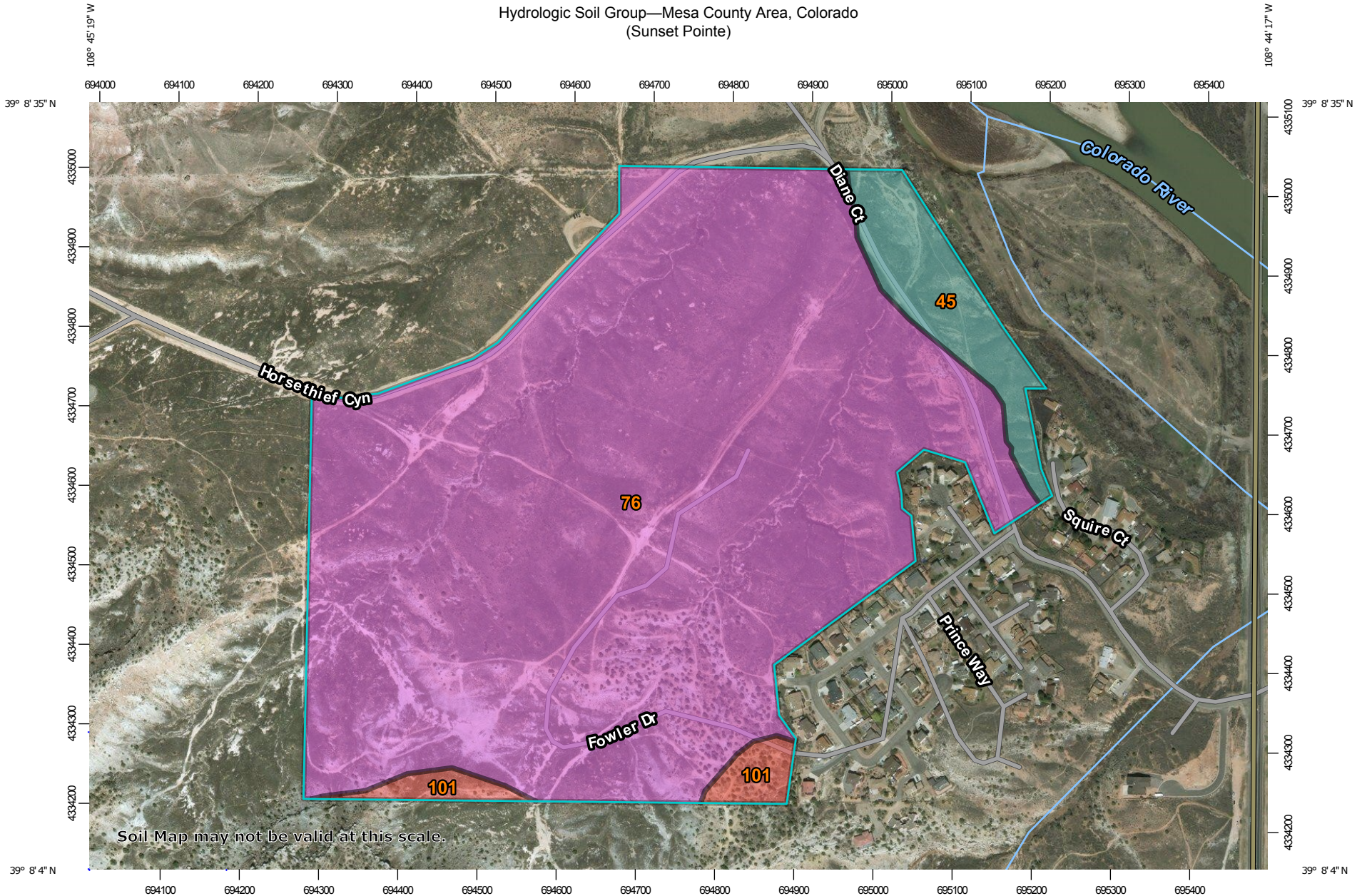
TRAVEL VELOCITY FOR RATIONAL METHOD



Revision	Date
ORIGINAL ISSUE	3/27/06

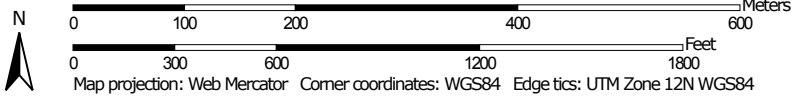
APPENDIX

Hydrologic Soil Group—Mesa County Area, Colorado
(Sunset Pointe)



Soil Map may not be valid at this scale.

Map Scale: 1:6,800 if printed on A landscape (11" x 8.5") sheet.



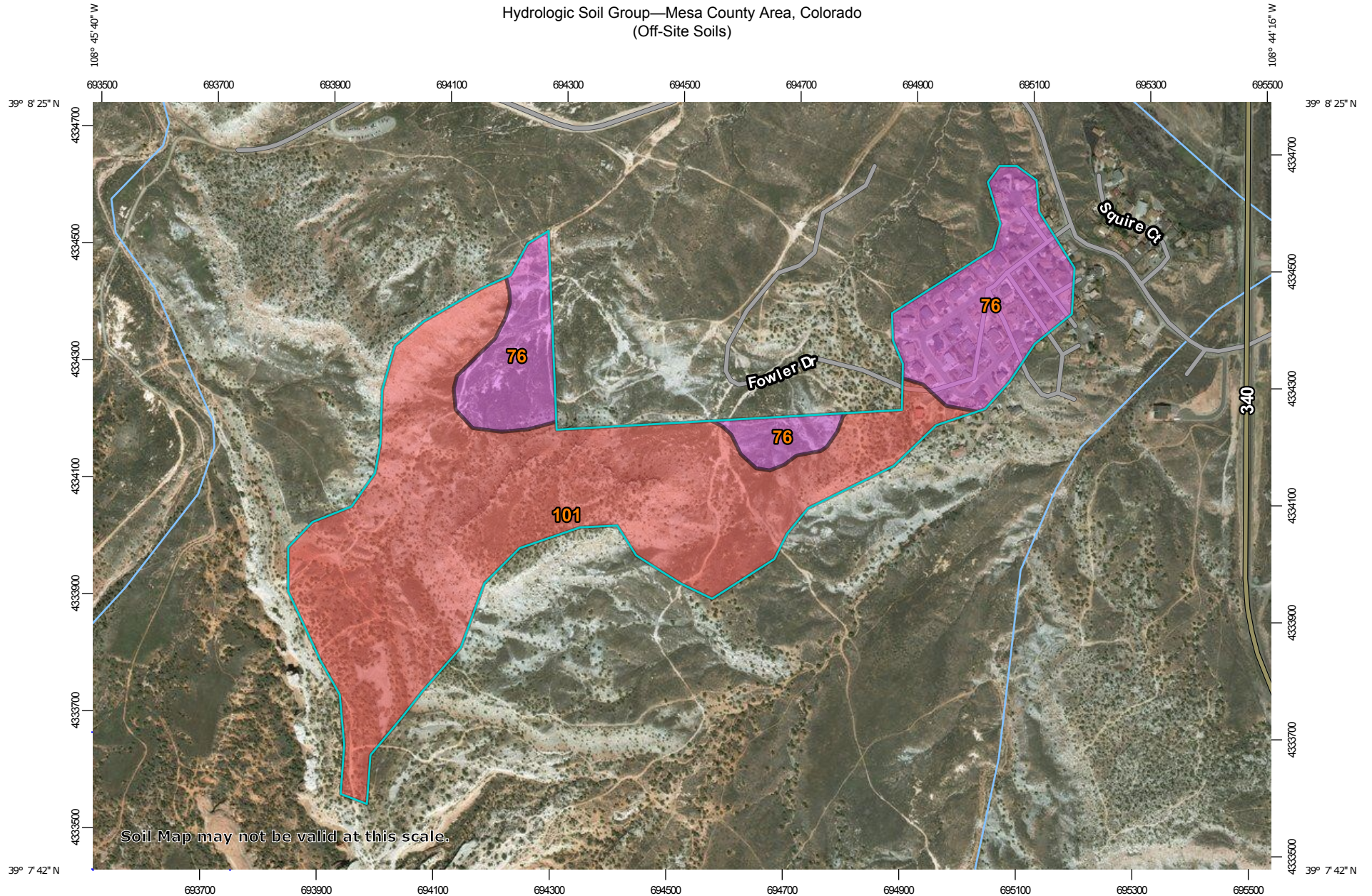
Sunset Pointe - Site Soils

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
45	Blackston very gravelly sandy clay loam, 3 to 25 percent slopes — DRAFT	C	8.0	6.1%
76	Moffat-Sheppard-Pennell complex, 3 to 25 percent slopes — DRAFT	A	118.9	91.4%
101	Zyme-Rock outcrop-Gladel complex, 3 to 25 percent slopes — DRAFT	D	3.2	2.5%
Totals for Area of Interest			130.1	100.0%

SUNSET POINT - SITE SOILS

Hydrologic Soil Group—Mesa County Area, Colorado
(Off-Site Soils)



Map Scale: 1:9,250 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84



Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
76	Moffat-Sheppard-Pennell complex, 3 to 25 percent slopes — DRAFT	A	29.1	28.2%
101	Zyme-Rock outcrop-Gladel complex, 3 to 25 percent slopes — DRAFT	D	74.2	71.8%
Totals for Area of Interest			103.3	100.0%

Description

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

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

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

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

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


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

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

OFF-SITE SOILS


MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons





 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines


 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points






 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

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: Mesa County Area, Colorado
 Survey Area Data: Version 8, Oct 12, 2017

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

Date(s) aerial images were photographed: Dec 31, 2009—Mar 2, 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.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Historic H-A

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.01
Flow Length, L	100 ft.
Land Slope, S	6.0%
T_o (Eq. "702")	10.8 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native Flow
Flow Length, L	535 ft.
Land Slope, S	6.4%
Flow Velocity, (Figure "701" or other)	2.2 ft./s
T_s	4.1 min.

Channel Flow

Reach	
Surface Description	
Flow Length, L	ft.
Land Slope, S	
Flow Velocity	ft./s
T_t	min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	15 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Historic H-B

Overland Flow

Reach	A-B
Surface Description	Bare Ground
Flow Resistance Coefficient (C_s in Table "702")	0.01
Flow Length, L	100 ft.
Land Slope, S	5.0%
T_o (Eq. "702")	11.5 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native Flow
Flow Length, L	835 ft.
Land Slope, S	2.5%
Flow Velocity, (Figure "701" or other)	1.1 ft./s
T_s	12.7 min.

Channel Flow

Reach	C-D
Surface Description	Dirt Channel
Flow Length, L	2550 ft.
Land Slope, S	2.0%
Flow Velocity	1.8 ft./s
T_t	23.6 min.

Time of Concentration

$T_{c=} (T_o+T_s+T_t)$	48 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Historic H-C

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0
Flow Length, L	100 ft.
Land Slope, S	4.0%
T_o (Eq. "702")	12.5 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	1146 ft.
Land Slope, S	3.5%
Flow Velocity, (Figure "701" or other)	1.7 ft./s
T_s	11.2 min.

Channel Flow

Reach	C-D
Surface Description	Dirt Channel
Flow Length, L	600 ft.
Land Slope, S	2.8%
Flow Velocity	3.2 ft./s
T_t	3.1 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	27 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Historic H-D

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.15
Flow Length, L	100 ft.
Land Slope, S	7.5%
T_o (Eq. "702")	8.7 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	470 ft.
Land Slope, S	6%
Flow Velocity, (Figure "701" or other)	2.0 ft./s
T_s	3.9 min.

Channel Flow

Reach	C-D	D-E
Surface Description	Dirt Channel	Dirt Channel
Flow Length, L	2745 ft.	630 ft.
Land Slope, S	2.5%	1.1%
Flow Velocity	1.6 ft./s	1.1 ft./s
T_t	28.6 min.	9.5 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	51 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Historic H-E

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.15
Flow Length, L	100 ft.
Land Slope, S	2.0%
T_o (Eq. "702")	13.6 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	323 ft.
Land Slope, S	9.3%
Flow Velocity, (Figure "701" or other)	3.1 ft./s
T_s	1.7 min.

Channel Flow

Reach	C-D
Surface Description	Dirt Channel
Flow Length, L	336 ft.
Land Slope, S	5.4%
Flow Velocity	3.1 ft./s
T_t	1.8 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	17 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Historic H-F

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.15
Flow Length, L	100 ft.
Land Slope, S	4.0%
T_o (Eq. "702")	10.8 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	338 ft.
Land Slope, S	8.9%
Flow Velocity, (Figure "701" or other)	2.7 ft./s
T_s	2.1 min.

Channel Flow

Reach	C-D
Surface Description	Dirt Channel
Flow Length, L	336 ft.
Land Slope, S	6.3%
Flow Velocity	2.5 ft./s
T_t	2.2 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	15 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Off-Site O-B

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.14
Flow Length, L	100 ft.
Land Slope, S	8.0%
T_o (Eq. "702")	8.6 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	1160 ft.
Land Slope, S	9.75%
Flow Velocity, (Figure "701" or other)	2.1 ft./s
T_s	9.2 min.

Channel Flow

Reach	C-D
Surface Description	Dirt Channel
Flow Length, L	2287 ft.
Land Slope, S	6.1%
Flow Velocity	3.3 ft./s
T_t	11.6 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	29 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
 Job Number: B7428
 Date: 3/28/2018

Basin: Off-Site O-D1

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.16
Flow Length, L	130 ft.
Land Slope, S	7.7%
T_o (Eq. "702")	9.8 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	575 ft.
Land Slope, S	25%
Flow Velocity, (Figure "701" or other)	3.6 ft./s
T_s	2.7 min.

Channel Flow

Reach	C-D
Surface Description	Dirt Channel
Flow Length, L	430 ft.
Land Slope, S	6.5%
Flow Velocity	3.4 ft./s
T_t	2.1 min.

Travel Through H-C

D-E
Dirt Channel
3466 ft.
2.3%
2.0 ft./s
29 min.

Time of Concentration

$T_{c=} (T_o+T_s+T_t)$	15 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Off-Site O-D2

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.16
Flow Length, L	113 ft.
Land Slope, S	13.3%
T_o (Eq. "702")	7.6 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	114 ft.
Land Slope, S	60%
Flow Velocity, (Figure "701" or other)	5.3 ft./s
T_s	0.4 min.

Channel Flow

Reach	C-D
Surface Description	Dirt Channel
Flow Length, L	1542 ft.
Land Slope, S	7.9%
Flow Velocity	4.0 ft./s
T_t	6.4 min.

Travel Through H-C

D-E
Dirt Channel
3285 ft.
2.1%
1.9 ft./s
29 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	14 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
 Job Number: B7428
 Date: 3/28/2018

Basin: Off-Site O-D3

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.16
Flow Length, L	112 ft.
Land Slope, S	10.7%
T_o (Eq. "702")	8.1 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	248 ft.
Land Slope, S	11.3%
Flow Velocity, (Figure "701" or other)	2.3 ft./s
T_s	1.8 min.

Channel Flow

Reach	
Surface Description	
Flow Length, L	ft.
Land Slope, S	
Flow Velocity	ft./s
T_t	min.

Travel Through H-C
D-E
Dirt Channel
3240 ft.
3.20%
2.4 ft./s
23 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	10 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
 Job Number: B7428
 Date: 3/28/2018

Basin: Off-Site O-D4

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.01
Flow Length, L	150 ft.
Land Slope, S	13.3%
T_o (Eq. "702")	10.1 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Gravel
Flow Length, L	343 ft.
Land Slope, S	5.5%
Flow Velocity, (Figure "701" or other)	1.6 ft./s
T_s	3.6 min.

Channel Flow

Reach	C-D	D-E	Travel Through I D-E
Surface Description	Dirt Channel	Storm Drain	Dirt Channel
Flow Length, L	654 ft.	150 ft.	2238 ft.
Land Slope, S	3.5%	4.4%	2.0%
Flow Velocity	2.0 ft./s	5 ft./s	1.8 ft./s
T_t	5.5 min.	0.5 min.	21 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	20 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
 Job Number: B7428
 Date: 3/28/2018

Basin: Off-Site O-E

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.01
Flow Length, L	50 ft.
Land Slope, S	1.0%
T_o (Eq. "702")	13.9 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Gravel
Flow Length, L	76 ft.
Land Slope, S	1%
Flow Velocity, (Figure "701" or other)	1.1 ft./s
T_s	1.2 min.

Channel Flow

Reach	C-D
Surface Description	Roadside Channel
Flow Length, L	640 ft.
Land Slope, S	2.0%
Flow Velocity	1.7 ft./s
T_t	6.3 min.

Travel Through H-E

D-E
Dirt Channel
1096 ft.
4.4%
2.8 ft./s
7 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	21 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-A1

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	30 ft.
Land Slope, S	2%
T_o (Eq. "702")	8.6 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	22 ft.
Land Slope, S	6.0%
Flow Velocity, (Figure "701" or other)	2.0 ft./s
T_s	0.2 min.

Channel Flow

Reach	C-D
Surface Description	Curb and Gutter
Flow Length, L	585 ft.
Land Slope, S	4.0%
Flow Velocity	3.8 ft./s
T_t	2.6 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	11 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-A2

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.01
Flow Length, L	100 ft.
Land Slope, S	6.0%
T_o (Eq. "702")	10.8 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native Flow
Flow Length, L	535 ft.
Land Slope, S	6.4%
Flow Velocity, (Figure "701" or other)	2.2 ft./s
T_s	4.1 min.

Channel Flow

Reach	
Surface Description	
Flow Length, L	ft.
Land Slope, S	
Flow Velocity	ft./s
T_t	min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	15 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-B1

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	100 ft.
Land Slope, S	10%
T_o (Eq. "702")	9.2 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	467 ft.
Land Slope, S	5.1%
Flow Velocity, (Figure "701" or other)	1.9 ft./s
T_s	4.1 min.

Channel Flow

Reach	C-D
Surface Description	Drainage Channel
Flow Length, L	245 ft.
Land Slope, S	2.9%
Flow Velocity	1.8 ft./s
T_t	2.3 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	16 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-B2

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.2
Flow Length, L	100 ft.
Land Slope, S	28%
T_o (Eq. "702")	5.6 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	351 ft.
Land Slope, S	6.6%
Flow Velocity, (Figure "701" or other)	2.1 ft./s
T_s	2.8 min.

Channel Flow

Reach	C-D
Surface Description	Curb and Gutter
Flow Length, L	670 ft.
Land Slope, S	1.2%
Flow Velocity	2.1 ft./s
T_t	5.3 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	14 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-B3

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	100 ft.
Land Slope, S	10%
T_o (Eq. "702")	9.2 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	90 ft.
Land Slope, S	8.9%
Flow Velocity, (Figure "701" or other)	2.7 ft./s
T_s	0.6 min.

Channel Flow

Reach	C-D
Surface Description	Curb and Gutter
Flow Length, L	890 ft.
Land Slope, S	1.2%
Flow Velocity	2.1 ft./s
T_t	7.1 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	17 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-B4

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	100 ft.
Land Slope, S	24%
T_o (Eq. "702")	6.9 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	832 ft.
Land Slope, S	8.9%
Flow Velocity, (Figure "701" or other)	1.4 ft./s
T_s	9.9 min.

Channel Flow

Reach	
Surface Description	
Flow Length, L	
Land Slope, S	
Flow Velocity	
T_t	

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	17 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
 Job Number: B7428
 Date: 3/28/2018

Basin: Developed D-B5

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	100 ft.
Land Slope, S	9.5%
T_o (Eq. "702")	9.3 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	105 ft.
Land Slope, S	8.1%
Flow Velocity, (Figure "701" or other)	2.4 ft./s
T_s	0.7 min.

Channel Flow

Reach	C-D	D-E	E-F
Surface Description	Curb and Gutter	Curb and Gutter	Curb and Gutter
Flow Length, L	210 ft.	105 ft.	305 ft.
Land Slope, S	1.4%	4.5%	0.7%
Flow Velocity	2.3 ft./s	4.0 ft./s	1.5 ft./s
T_t	1.5 min.	0.4 min.	3.4 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	15 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-B6

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	100 ft.
Land Slope, S	6.0%
T_o (Eq. "702")	10.9 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	318 ft.
Land Slope, S	6.0%
Flow Velocity, (Figure "701" or other)	1.9 ft./s
T_s	2.8 min.

Channel Flow

Reach	C-D
Surface Description	Drainage Channel
Flow Length, L	108 ft.
Land Slope, S	2.8%
Flow Velocity	1.7 ft./s
T_t	1.1 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	15 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-B7

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	100 ft.
Land Slope, S	6.0%
T_o (Eq. "702")	10.9 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	100 ft.
Land Slope, S	10.5%
Flow Velocity, (Figure "701" or other)	4.4 ft./s
T_s	0.4 min.

Channel Flow

Reach	C-D
Surface Description	Drainage Channel
Flow Length, L	396 ft.
Land Slope, S	2.1%
Flow Velocity	1.4 ft./s
T_t	4.7 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	16 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-B8

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	100 ft.
Land Slope, S	3%
T_o (Eq. "702")	13.7 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	33 ft.
Land Slope, S	3.0%
Flow Velocity, (Figure "701" or other)	1.6 ft./s
T_s	0.3 min.

Channel Flow

Reach	C-D
Surface Description	Curb and Gutter
Flow Length, L	1195 ft.
Land Slope, S	3.1%
Flow Velocity	3.3 ft./s
T_t	6.0 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	20 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-B9

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	100 ft.
Land Slope, S	4.4%
T_o (Eq. "702")	12.1 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	278 ft.
Land Slope, S	5.0%
Flow Velocity, (Figure "701" or other)	1.9 ft./s
T_s	2.4 min.

Channel Flow

Reach	C-D
Surface Description	Drainage Channel
Flow Length, L	386 ft.
Land Slope, S	5.2%
Flow Velocity	2.2 ft./s
T_t	2.9 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	17 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-B10

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	50 ft.
Land Slope, S	2.0%
T_o (Eq. "702")	11.1 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	60 ft.
Land Slope, S	7.5%
Flow Velocity, (Figure "701" or other)	2.3 ft./s
T_s	0.4 min.

Channel Flow

Reach	B-C	C-D
Surface Description	Curb and Gutter	Curb and Gutter
Flow Length, L	595 ft.	190 ft.
Land Slope, S	3.0%	1.2%
Flow Velocity	3.3 ft./s	2.1 ft./s
T_t	3.0 min.	1.5 min.

Time of Concentration

$T_{c=} (T_o+T_s+T_t)$	16 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-B11

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	25 ft.
Land Slope, S	2.0%
T_o (Eq. "702")	7.9 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	15 ft.
Land Slope, S	2.0%
Flow Velocity, (Figure "701" or other)	1.4 ft./s
T_s	0.2 min.

Channel Flow

Reach	C-D
Surface Description	Drainage Channel
Flow Length, L	535 ft.
Land Slope, S	2.4%
Flow Velocity	1.6 ft./s
T_t	5.6 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	14 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-B12

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	80 ft.
Land Slope, S	10%
T_o (Eq. "702")	8.2 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	160 ft.
Land Slope, S	2.5%
Flow Velocity, (Figure "701" or other)	1.4 ft./s
T_s	1.9 min.

Channel Flow

Reach	
Surface Description	
Flow Length, L	
Land Slope, S	
Flow Velocity	
T_t	

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	10 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-B13

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	100 ft.
Land Slope, S	8%
T_o (Eq. "702")	9.9 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	140 ft.
Land Slope, S	2.3%
Flow Velocity, (Figure "701" or other)	1.4 ft./s
T_s	1.7 min.

Channel Flow

Reach	
Surface Description	
Flow Length, L	
Land Slope, S	
Flow Velocity	
T_t	

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	12 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-B14

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	110 ft.
Land Slope, S	9.5%
T_o (Eq. "702")	9.8 min.

Shallow Concentrated Flow

Reach
Surface Description
Flow Length, L
Land Slope, S
Flow Velocity, (Figure "701" or other)
 T_s

Channel Flow

Reach	B-C	C-D
Surface Description	Drainage Channel	Drainage Channel
Flow Length, L	1360 ft.	300 ft.
Land Slope, S	2.1%	4.3%
Flow Velocity	1.4 ft./s	2.1 ft./s
T_t	16.2 min.	2.4 min.

Time of Concentration

$T_{c=} (T_o+T_s+T_t)$ **28 min.**

references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-B14

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	25 ft.
Land Slope, S	2.0%
T_o (Eq. "702")	7.9 min.

Shallow Concentrated Flow

Reach	
Surface Description	
Flow Length, L	
Land Slope, S	
Flow Velocity, (Figure "701" or other)	
T_s	

Channel Flow

Reach	B-C
Surface Description	Curb and Gutter
Flow Length, L	1250 ft.
Land Slope, S	2.8%
Flow Velocity	3.2 ft./s
T_t	6.5 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	14 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-C1

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	100 ft.
Land Slope, S	3.4%
T_o (Eq. "702")	13.2 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	86 ft.
Land Slope, S	6.0%
Flow Velocity, (Figure "701" or other)	2.0 ft./s
T_s	0.7 min.

Channel Flow

Reach	C-D
Surface Description	Curb and Gutter
Flow Length, L	1093 ft.
Land Slope, S	2.5%
Flow Velocity	3.1 ft./s
T_t	5.9 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	20 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-C2

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	100 ft.
Land Slope, S	4.5%
T_o (Eq. "702")	12.0 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	300 ft.
Land Slope, S	3.8%
Flow Velocity, (Figure "701" or other)	1.7 ft./s
T_s	2.9 min.

Channel Flow

Reach	C-D
Surface Description	Curb and Gutter
Flow Length, L	572 ft.
Land Slope, S	1.5%
Flow Velocity	2.3 ft./s
T_t	4.1 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	19 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-C3

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	100 ft.
Land Slope, S	3.0%
T_o (Eq. "702")	13.7 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	104 ft.
Land Slope, S	5.5%
Flow Velocity, (Figure "701" or other)	2.0 ft./s
T_s	0.9 min.

Channel Flow

Reach	C-D
Surface Description	Curb and Gutter
Flow Length, L	200 ft.
Land Slope, S	1.2%
Flow Velocity	2.1 ft./s
T_t	1.6 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	16 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-C4

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	100 ft.
Land Slope, S	3.5%
T_o (Eq. "702")	13.0 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	176 ft.
Land Slope, S	4.5%
Flow Velocity, (Figure "701" or other)	1.8 ft./s
T_s	1.6 min.

Channel Flow

Reach	
Surface Description	
Flow Length, L	
Land Slope, S	
Flow Velocity	
T_t	

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	15 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-C5

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	25 ft.
Land Slope, S	2.0%
T_o (Eq. "702")	7.9 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	10 ft.
Land Slope, S	2.0%
Flow Velocity, (Figure "701" or other)	1.2 ft./s
T_s	0.1 min.

Channel Flow

Reach	C-D
Surface Description	Curb and Gutter
Flow Length, L	195 ft.
Land Slope, S	1.1%
Flow Velocity	2.0 ft./s
T_t	1.6 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	10 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-C6

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	20 ft.
Land Slope, S	2.0%
T_o (Eq. "702")	7.0 min.

Shallow Concentrated Flow

Reach	
Surface Description	
Flow Length, L	
Land Slope, S	
Flow Velocity, (Figure "701" or other)	
T_s	

Channel Flow

Reach	B-C
Surface Description	Curb and Gutter
Flow Length, L	360 ft.
Land Slope, S	4.5%
Flow Velocity	4.1 ft./s
T_t	1.5 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	8 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-C7

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.0
Flow Length, L	150 ft.
Land Slope, S	8.0%
T_o (Eq. "702")	12.1 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	300 ft.
Land Slope, S	3.3%
Flow Velocity, (Figure "701" or other)	1.9 ft./s
T_s	2.6 min.

Channel Flow

Reach	
Surface Description	
Flow Length, L	
Land Slope, S	
Flow Velocity	
T_t	

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	15 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-D1

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.15 HSG D
Flow Length, L	100 ft.
Land Slope, S	7.5%
T_o (Eq. "702")	8.7 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	470 ft.
Land Slope, S	5.9%
Flow Velocity, (Figure "701" or other)	2.0 ft./s
T_s	3.9 min.

Channel Flow

Reach	C-D
Surface Description	Drainage Channel
Flow Length, L	130 ft.
Land Slope, S	4.9%
Flow Velocity	2.2 ft./s
T_t	1.0 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	14 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-D2

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.00
Flow Length, L	100 ft.
Land Slope, S	17.0%
T_o (Eq. "702")	7.7 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	174 ft.
Land Slope, S	3.6%
Flow Velocity, (Figure "701" or other)	1.7 ft./s
T_s	1.7 min.

Channel Flow

Reach	C-D
Surface Description	Curb and Gutter
Flow Length, L	190 ft.
Land Slope, S	1.0%
Flow Velocity	1.9 ft./s
T_t	1.7 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	11 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-D3

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_5 in Table "702")	0.00
Flow Length, L	100 ft.
Land Slope, S	8.5%
T_o (Eq. "702")	9.7 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	128 ft.
Land Slope, S	8.5%
Flow Velocity, (Figure "701" or other)	2.6 ft./s
T_s	0.8 min.

Channel Flow

Reach	C-D
Surface Description	Drainage Channel
Flow Length, L	290 ft.
Land Slope, S	1.5%
Flow Velocity	1.2 ft./s
T_t	4.0 min.

Time of Concentration

$T_c = (T_o + T_s + T_t)$	15 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-D4

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.00
Flow Length, L	140 ft.
Land Slope, S	10.0%
T_o (Eq. "702")	10.9 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	208 ft.
Land Slope, S	7.5%
Flow Velocity, (Figure "701" or other)	2.7 ft./s
T_s	1.3 min.

Channel Flow

Reach	C-D
Surface Description	Curb and Gutter
Flow Length, L	365 ft.
Land Slope, S	2.9%
Flow Velocity	3.0 ft./s
T_t	2.0 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	14 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-D5

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.00
Flow Length, L	25 ft.
Land Slope, S	2.0%
T_o (Eq. "702")	7.9 min.

Shallow Concentrated Flow

Reach	
Surface Description	
Flow Length, L	
Land Slope, S	
Flow Velocity, (Figure "701" or other)	
T_s	

Channel Flow

Reach	B-C
Surface Description	Curb and Gutter
Flow Length, L	468 ft.
Land Slope, S	2.9%
Flow Velocity	3.0 ft./s
T_t	2.6 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	10 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-D6

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.00
Flow Length, L	100 ft.
Land Slope, S	7.2%
T_o (Eq. "702")	10.3 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	372 ft.
Land Slope, S	5.1%
Flow Velocity, (Figure "701" or other)	1.9 ft./s
T_s	3.3 min.

Channel Flow

Reach	C-D
Surface Description	Drainage Channel
Flow Length, L	1570 ft.
Land Slope, S	2.7%
Flow Velocity	1.7 ft./s
T_t	15.4 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	29 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-D7

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.00
Flow Length, L	100 ft.
Land Slope, S	10.0%
T_o (Eq. "702")	9.2 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	372 ft.
Land Slope, S	5.1%
Flow Velocity, (Figure "701" or other)	1.9 ft./s
T_s	3.3 min.

Channel Flow

Reach	C-D
Surface Description	Drainage Channel
Flow Length, L	280 ft.
Land Slope, S	4.8%
Flow Velocity	2.2 ft./s
T_t	2.1 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	15 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-D8

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.00
Flow Length, L	100 ft.
Land Slope, S	3.2%
T_o (Eq. "702")	13.4 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	280 ft.
Land Slope, S	7.4%
Flow Velocity, (Figure "701" or other)	2.3 ft./s
T_s	2.0 min.

Channel Flow

Reach	C-D
Surface Description	Drainage Channel
Flow Length, L	425 ft.
Land Slope, S	1.4%
Flow Velocity	2.3 ft./s
T_t	3.1 min.

Time of Concentration

$T_{c=} (T_o+T_s+T_t)$	19 min.
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references to Tables and Figure are found in the Mesa County SWWM

TIME OF CONCENTRATION CALCULATION WORKSHEET

Job Name: Sunset Pointe
Job Number: B7428
Date: 3/28/2018

Basin: Developed D-F

Overland Flow

Reach	A-B
Surface Description	Native
Flow Resistance Coefficient (C_s in Table "702")	0.15
Flow Length, L	100 ft.
Land Slope, S	3.2%
T_o (Eq. "702")	11.6 min.

Shallow Concentrated Flow

Reach	B-C
Surface Description	Shallow Dirt/Native
Flow Length, L	280 ft.
Land Slope, S	7.4%
Flow Velocity, (Figure "701" or other)	2.3 ft./s
T_s	2.0 min.

Channel Flow

Reach	C-D
Surface Description	Drainage Channel
Flow Length, L	425 ft.
Land Slope, S	1.4%
Flow Velocity	2.3 ft./s
T_t	3.1 min.

Time of Concentration

$T_{c=}$ ($T_o+T_s+T_t$)	17 min.
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references to Tables and Figure are found in the Mesa County SWWM

Sunset Pointe

COMPOSITE CN FROM PERCENT IMPERVIOUS

BASIN	Buildings		Asphalt/Concrete Roads		Driveways patios, Walks		Gravel Paths/ Compacted Dirt & Gravel Roads		Landscape Gravel Shrub Bed		Lawn, Native Seed, Ex. Native Grass and Shrubs<20%		Ex. Hillside >20% With Rock Outcrops		COMPOSITE %Imp	CN 98*Imp+X(1-Imp) X=(See Below)
	AREA (AC)	Area (AC) %Imp	Area (AC) %Imp	Area (AC) %Imp	Area (AC) %Imp	Area (AC) %Imp	Area (AC) %Imp	Area (AC) %Imp	Area (AC) %Imp	Area (AC) %Imp	Area (AC) %Imp					
Historic																
H-A	5.58	0.00 90	0.13 100	0.00 90	0.14 40	0.00 20	5.31 0	0.00 20	3.3	41						
H-B	55.34	0.00 90	0.34 100	0.00 90	0.70 40	0.00 20	51.71 0	2.59 20	2.1	41						
H-C	13.65	0.00 90	0.14 100	0.00 90	0.15 40	0.00 20	13.36 0	0.00 20	1.5	40						
H-D	42.79	0.00 90	0.03 100	0.00 90	0.23 40	0.00 20	39.94 0	2.59 20	1.5	41						
H-E	5.23	0.00 90	0.24 100	0.00 90	0.08 40	0.00 20	3.04 0	1.87 20	12.4	74						
H-F	9.63	0.00 90	0.41 100	0.00 90	0.40 40	0.00 20	6.24 0	2.63 20	11.4	72						
Off-Site																
O-B	61.31	0.00 90	0.00 100	0.00 90	0.27 40	0.00 20	30.95 0	30.09 20	10.0	77						
O-D1	8.87	0.00 90	0.00 100	0.00 90	0.10 40	0.00 20	4.01 0	4.76 20	11.2	82						
O-D2	17.54	0.00 90	0.00 100	0.00 90	0.25 40	0.00 20	11.00 0	6.29 20	7.7	76						
O-D3	1.49	0.00 90	0.00 100	0.00 90	0.00 40	0.00 20	1.49 0	0.00 20	0.0	80						
O-D4	13.75	2.00 90	1.59 100	1.09 90	0.80 40	4.36 20	5.25 0	0.66 20	41.4	67						
O-D Total	41.65	2.00 90	1.59 100	1.09 90	1.15 40	4.36 20	21.75 0	11.71 20	19.3	74						
O-E	6.15	1.08 90	0.98 100	0.84 90	0.62 40	1.10 20	2.23 0	0.38 20	52.9	70						
Developed																
D-A1	2.29	0.27 90	0.73 100	0.28 90	0.00 40	0.58 20	0.43 0	0.00 20	58.6	74						
D-A2	4.33	0.23 90	0.11 100	0.07 90	0.06 40	0.48 20	3.38 0	0.00 20	11.5	46						
D-A Total	6.62	0.50 90	0.84 100	0.35 90	0.06 40	1.06 20	3.81 0	0.00 20	27.8	55						
D-B1	3.03	0.17 90	0.00 100	0.08 90	0.00 40	0.33 20	2.19 0	0.26 20	11.3	46						
D-B2	7.37	0.87 90	0.74 100	0.43 90	0.00 40	1.74 20	1.96 0	1.63 20	35.1	66						
D-B3	1.86	0.23 90	0.46 100	0.27 90	0.00 40	0.56 20	0.23 0	0.11 20	56.1	72						
D-B4	4.60	0.33 90	0.00 100	0.17 90	0.00 40	0.66 20	2.82 0	0.62 20	15.3	48						
D-B5	3.28	0.52 90	0.46 100	0.32 90	0.00 40	1.07 20	0.91 0	0.00 20	43.6	65						

Sunset Pointe

COMPOSITE CN FROM PERCENT IMPERVIOUS

BASIN		Buildings		Asphalt/Concrete Roads		Driveways patios, Walks		Gravel Paths/ Compacted Dirt & Gravel Roads		Landscape Gravel Shrub Bed		Lawn, Native Seed, Ex. Native Grass and Shrubs<20%		Ex. Hillside >20% With Rock Outcrops		COMPOSITE CN	
AREA (AC)	%Imp	Area (AC)	%Imp	Area (AC)	%Imp	Area (AC)	%Imp	Area (AC)	%Imp	Area (AC)	%Imp	Area (AC)	%Imp	Area (AC)	%Imp	%Imp	98*Imp+X(1-Imp) X=(See Below)
D-B6	4.08	0.50	90	0.00	100	0.25	90	0.00	40	0.99	20	2.34	0	0.00	20	21.4	52
D-B7	2.29	0.10	90	0.00	100	0.05	90	0.00	40	0.20	20	1.94	0	0.00	20	7.6	44
D-B8	4.89	0.87	90	1.15	100	0.51	90	0.00	40	1.78	20	0.58	0	0.00	20	56.2	72
D-B9	4.49	0.42	90	0.00	100	0.21	90	0.00	40	0.91	20	2.95	0	0.00	20	16.7	49
D-B10	1.22	0.25	90	0.34	100	0.12	90	0.00	40	0.50	20	0.01	0	0.00	20	63.4	76
D-B11	0.64	0.04	90	0.30	100	0.12	90	0.00	40	0.15	20	0.03	0	0.00	20	74.1	83
D-B12	0.76	0.08	90	0.00	100	0.04	90	0.00	40	0.16	20	0.48	0	0.00	20	18.4	50
D-B13	2.92	0.58	90	0.00	100	0.29	90	0.00	40	1.16	20	0.89	0	0.00	20	34.8	60
D-B14	10.60	0.04	90	0.45	100	0.02	90	0.06	40	0.08	20	9.95	0	0.00	20	5.1	42
D-B15	1.43	0.21	90	0.53	100	0.27	90	0.00	40	0.42	20	0.00	0	0.00	20	73.1	82
D-B Total	42.86	5.17	90	3.98	100	3.13	90	0.00	40	10.63	20	17.33	0	2.62	20	32.9	58
Developed (Cont.)																	
D-C1	2.76	0.35	90	0.46	100	0.18	90	0.00	40	0.70	20	1.07	0	0.00	20	39.0	62
D-C2	4.71	0.79	90	0.50	100	0.39	90	0.01	40	1.57	20	1.45	0	0.00	20	39.9	63
D-C3	1.93	0.33	90	0.29	100	0.17	90	0.00	40	0.66	20	0.48	0	0.00	20	45.2	66
D-C4	1.45	0.25	90	0.00	100	0.12	90	0.00	40	0.50	20	0.58	0	0.00	20	29.9	57
D-C5	0.37	0.04	90	0.20	100	0.02	90	0.01	40	0.08	20	0.02	0	0.00	20	74.1	83
D-C6	0.31	0.04	90	0.16	100	0.02	90	0.00	40	0.09	20	0.00	0	0.00	20	74.8	83
D-C7	3.43	0.25	90	0.30	100	0.12	90	0.03	40	0.50	20	2.23	0	0.00	20	21.7	52
D-C Total	14.96	2.05	90	1.91	100	1.02	90	0.05	40	4.10	20	5.83	0	0.00	20	36.9	61
D-D1	1.46	0.04	90	0.00	100	0.02	90	0.04	40	0.08	20	1.05	0	0.23	20	9.0	63
D-D2	2.20	0.25	90	0.41	100	0.12	90	0.00	40	0.50	20	0.66	0	0.26	20	40.7	63
D-D3	3.06	0.21	90	0.00	100	0.10	90	0.01	40	0.42	20	1.73	0	0.59	20	15.8	48

Sunset Pointe

COMPOSITE CN FROM PERCENT IMPERVIOUS

BASIN	Buildings		Asphalt/Concrete Roads		Driveways patios, Walks		Gravel Paths/ Compacted Dirt & Gravel Roads		Landscape Gravel Shrub Bed		Lawn, Native Seed, Ex. Native Grass and Shrubs<20%		Ex. Hillside >20% With Rock Outcrops		COMPOSITE %Imp	CN 98*Imp+X(1-Imp) X=(See Below)
	AREA (AC)	Area (AC) %Imp	Area (AC) %Imp	Area (AC) %Imp	Area (AC) %Imp	Area (AC) %Imp	Area (AC) %Imp	Area (AC) %Imp	Area (AC) %Imp	Area (AC) %Imp						
D-D4	3.61	0.24 90	0.24 100	0.12 90	0.00 40	0.48 20	2.47 0	0.06 20	18.6	50						
D-D5	0.50	0.02 90	0.25 100	0.02 90	0.00 40	0.21 20	0.00 0	0.00 20	65.6	78						
D-D6	14.88	0.48 90	0.00 100	0.24 90	0.28 40	0.96 20	11.60 0	1.32 20	8.2	44						
D-D7	5.61	0.02 90	0.00 100	0.01 90	0.00 40	0.06 20	4.65 0	0.87 20	3.8	41						
D-D8	10.20	0.41 90	0.05 100	0.21 90	0.24 40	0.83 20	8.21 0	0.25 20	9.0	44						
D-D Total	41.52	1.67 90	0.95 100	0.84 90	0.57 40	3.54 20	30.37 0	3.58 20	11.7	46						
Developed (Cont.)																
D-E	5.23	0.00 90	0.24 100	0.00 90	0.08 40	0.00 20	3.04 0	1.87 20	12.4	74						
D-F	9.83	0.50 90	0.43 100	0.25 90	0.05 40	1.00 20	5.03 0	2.57 20	18.7	74						

CN = 98*%Imp + X*(1-%Imp)

eq 708

HSG A, X=39 HSG B, X=61 HSG C, X=74 HSG D, X=80

Basin	%HSG A	%HSG B	%HSG C	%HSG D	Composite X
H-A	100%	0%	0%	0%	39
H-B	97%	0%	3%	0%	40
H-C	99%	0%	0%	1%	39
H-D	98%	0%	2%	0%	40
H-E	8%	0%	92%	0%	71
H-F	15%	0%	85%	0%	69
O-B	14%	0%	0%	86%	74
O-D1	0%	0%	0%	100%	80
O-D2	14%	0%	0%	86%	74
O-D3	0%	0%	0%	100%	80
O-D4	87%	0%	0%	13%	44
O-E	100%	0%	0%	0%	39

- Notes:
- 1) %imp values obtained from Table 701 (Mesa County SWMM) and based on Table 9-2 (USDA-NRCS National Engineering handbook).
 - 2) Basin D-D1 has 1/2 The area HSG A and 1/2 the area HSG D. X=59.5.
 - 3) The area >20% Slope in Basin D-B2 are HSG D. X=48.

Assumptions:

- 1) Propose Lots will have an average Roof area of 3600 s.f., 1800 s.f. of hardscape (Driveways, sidewalks and patios), 7200 s.f. of gravel landscape/shrub beds and the remainder undisturbed ground, native seed areas or lawn.

CONNECTED IMPERVIOUS AREA ANALYSIS

Area of Only Roads,
Buildings and Driveways

Only Basins that
drain to Curb and Gutter

	Area Ac.	Tc 5min+Curb Time	COMPOSITE		CN
			%Imp	Tc 5min+Curb Time	
Developed					
O-D4	4.68	11	93.4		94
O-E	2.90	11	93.4		94
Developed					
D-A1	1.28	8	95.7		95
D-A2					
D-A Total					
Developed					
D-B1					
D-B2	2.04	10	93.6		95
D-B3	0.96	12	94.8		95
D-B4					
D-B5	1.30	13	93.5		94
D-B6					
D-B7					
D-B8	2.53	11	94.5		95
D-B9					
D-B10	0.71	9	94.8		95
D-B11	0.46	8	96.5		96
D-B12					
D-B13					
D-B14					
D-B15	1.01	11	95.2		95
D-B Total					
Developed (Cont.)					
D-C1	0.99	11	94.6		95
D-C2	1.68	9	93.0		94
D-C3	0.79	8	93.7		94
D-C4					
D-C5	0.26	8	97.7		97
D-C6	0.22	8	97.3		96
D-C7					
D-C Total					
Developed					
D-D1					
D-D2	0.78	8	95.3		95
D-D3					
D-D4	0.60	8	94.0		94
D-D5	0.29	8	98.6		97

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Return period (yrs)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description	
1	SCS Runoff	0.0	5	0	0.00	100	---	-----	-----	H-A	
3	SCS Runoff	2.3	5	720	0.15	100	---	-----	-----	D-A1	
4	SCS Runoff	0.0	5	0	0.00	100	---	-----	-----	D-A2	
5	Combine	2.3	5	720	0.15	100	3 + 4	-----	-----	D-A12	
Proj. file: B7428_AX.GPW				IDF file: GJIDFNEW.IDF				Run date: 03-29-2018			

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Return period (yrs)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	0.0	5	0	0.00	10	---	-----	-----	H-A
3	SCS Runoff	1.1	5	720	0.07	10	---	-----	-----	D-A1
4	SCS Runoff	0.0	5	0	0.00	10	---	-----	-----	D-A2
5	Combine	1.1	5	720	0.07	10	3 + 4	-----	-----	D-A12

Proj. file: B7428A10.GPW	IDF file: GJIDFNEW.IDF	Run date: 03-30-2018
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Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Return period (yrs)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	0.0	5	0	0.00	100	---	-----	-----	H-B
2	SCS Runoff	19.5	5	735	2.39	100	---	-----	-----	O-B
3	Combine	19.5	5	735	2.39	100	1 + 2	-----	-----	H-B + O-B
6	SCS Runoff	0.0	5	0	0.00	100	---	-----	-----	Basin D-B1
7	SCS Runoff	3.6	5	720	0.22	100	---	-----	-----	Basin D-B2
8	SCS Runoff	1.8	5	720	0.11	100	---	-----	-----	Basin D-B3
9	SCS Runoff	0.0	5	0	0.00	100	---	-----	-----	Basin D-B4
10	SCS Runoff	2.3	5	720	0.14	100	---	-----	-----	Basin D-B5
11	SCS Runoff	0.0	5	1440	0.00	100	---	-----	-----	Basin D-B6
12	SCS Runoff	0.0	5	0	0.00	100	---	-----	-----	Basin D-B7
13	SCS Runoff	4.6	5	720	0.29	100	---	-----	-----	Basin D-B8
14	SCS Runoff	0.0	5	0	0.00	100	---	-----	-----	Basin D-B9
15	SCS Runoff	1.3	5	720	0.08	100	---	-----	-----	Basin D-B10
16	SCS Runoff	0.9	5	720	0.06	100	---	-----	-----	Basin D-B11
17	SCS Runoff	0.0	5	1440	0.00	100	---	-----	-----	Basin D-B12
18	SCS Runoff	0.0	5	775	0.01	100	---	-----	-----	Basin D-B13
19	SCS Runoff	0.0	5	0	0.00	100	---	-----	-----	Basin D-B14
20	SCS Runoff	1.8	5	720	0.12	100	---	-----	-----	Basin D-B15
22	Combine	19.5	5	735	2.39	100	2 + 6	-----	-----	OB+DB1
23	Combine	5.3	5	720	0.34	100	7 + 8	-----	-----	DB2+3
24	Combine	21.5	5	730	2.73	100	22 + 23	-----	-----	OB+BD1to3
25	Combine	21.5	5	730	2.73	100	9 + 24	-----	-----	OB+DB1to4
26	Combine	22.6	5	730	2.87	100	10 + 25	-----	-----	OB+DB1to5
27	Combine	22.6	5	730	2.87	100	11 + 26	-----	-----	OB+DB1to6
28	Combine	22.6	5	730	2.87	100	12 + 27	-----	-----	OB+DB1to7
29	Combine	4.6	5	720	0.29	100	13 + 14	-----	-----	DB8+9
30	Combine	5.9	5	720	0.38	100	15 + 29	-----	-----	DB8to10
31	Combine	6.8	5	720	0.43	100	16 + 30	-----	-----	DB8to11
32	Combine	6.8	5	720	0.43	100	17 + 31	-----	-----	DB8to12
33	Combine	26.8	5	725	3.30	100	28 + 32	-----	-----	OB+DB(1to12)
34	Combine	0.0	5	775	0.01	100	18 + 19	-----	-----	DB13+14

Proj. file: B7428_BX.GPW

IDF file: GJIDFNEW.IDF

Run date: 03-30-2018

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Return period (yrs)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description	
35	Combine	26.8	5	725	3.32	100	33 + 34	-----	-----	OB+DB(1to14)	
36	Combine	28.3	5	725	3.44	100	20 + 35	-----	-----	OB+DB(1to15)	
Proj. file: B7428_BX.GPW				IDF file: GJIDFNEW.IDF				Run date: 03-30-2018			

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Return period (yrs)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	0.0	5	0	0.00	10	---	-----	-----	H-B
2	SCS Runoff	1.4	5	745	0.41	10	---	-----	-----	O-B
3	Combine	1.4	5	745	0.41	10	1 + 2	-----	-----	H-B + O-B
6	SCS Runoff	0.0	5	0	0.00	10	---	-----	-----	Basin D-B1
7	SCS Runoff	1.7	5	720	0.11	10	---	-----	-----	Basin D-B2
8	SCS Runoff	0.8	5	720	0.05	10	---	-----	-----	Basin D-B3
9	SCS Runoff	0.0	5	0	0.00	10	---	-----	-----	Basin D-B4
10	SCS Runoff	1.0	5	720	0.06	10	---	-----	-----	Basin D-B5
11	SCS Runoff	0.0	5	0	0.00	10	---	-----	-----	Basin D-B6
12	SCS Runoff	0.0	5	0	0.00	10	---	-----	-----	Basin D-B7
13	SCS Runoff	2.1	5	720	0.13	10	---	-----	-----	Basin D-B8
14	SCS Runoff	0.0	5	0	0.00	10	---	-----	-----	Basin D-B9
15	SCS Runoff	0.6	5	720	0.04	10	---	-----	-----	Basin D-B10
16	SCS Runoff	0.4	5	720	0.03	10	---	-----	-----	Basin D-B11
17	SCS Runoff	0.0	5	0	0.00	10	---	-----	-----	Basin D-B12
18	SCS Runoff	0.0	5	0	0.00	10	---	-----	-----	Basin D-B13
19	SCS Runoff	0.0	5	0	0.00	10	---	-----	-----	Basin D-B14
20	SCS Runoff	0.8	5	720	0.05	10	---	-----	-----	Basin D-B15
22	Combine	1.4	5	745	0.41	10	2 + 6	-----	-----	OB+DB1
23	Combine	2.5	5	720	0.16	10	7 + 8	-----	-----	DB2+3
24	Combine	2.8	5	720	0.57	10	22 + 23	-----	-----	OB+BD1to3
25	Combine	2.8	5	720	0.57	10	9 + 24	-----	-----	OB+DB1to4
26	Combine	3.8	5	720	0.63	10	10 + 25	-----	-----	OB+DB1to5
27	Combine	3.8	5	720	0.63	10	11 + 26	-----	-----	OB+DB1to6
28	Combine	3.8	5	720	0.63	10	12 + 27	-----	-----	OB+DB1to7
29	Combine	2.1	5	720	0.13	10	13 + 14	-----	-----	DB8+9
30	Combine	2.7	5	720	0.17	10	15 + 29	-----	-----	DB8to10
31	Combine	3.1	5	720	0.20	10	16 + 30	-----	-----	DB8to11
32	Combine	3.1	5	720	0.20	10	17 + 31	-----	-----	DB8to12
33	Combine	7.0	5	720	0.82	10	28 + 32	-----	-----	OB+DB1to12
34	Combine	0.0	5	0	0.00	10	18 + 19	-----	-----	DB13to14

Proj. file: B7428B10.GPW

IDF file: GJIDFNEW.IDF

Run date: 03-30-2018

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Return period (yrs)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
35	Combine	7.0	5	720	0.82	10	33 + 34	-----	-----	OB+DB1to14
36	Combine	7.8	5	720	0.88	10	20 + 35	-----	-----	OB+DB1to15

Proj. file: B7428B10.GPW	IDF file: GJIDFNEW.IDF	Run date: 03-30-2018
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Hydrograph Summary Report

BASIN C - 100 YR STM

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Return period (yrs)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	0.0	5	0	0.00	100	---	-----	-----	H-C
3	SCS Runoff	1.8	5	720	0.12	100	---	-----	-----	D-C1
4	SCS Runoff	2.9	5	720	0.18	100	---	-----	-----	D-C2
5	SCS Runoff	1.4	5	720	0.09	100	---	-----	-----	D-C3
6	SCS Runoff	0.0	5	0	0.00	100	---	-----	-----	D-C4
7	SCS Runoff	0.5	5	720	0.03	100	---	-----	-----	D-C5
8	SCS Runoff	0.4	5	720	0.03	100	---	-----	-----	D-C6
9	SCS Runoff	0.0	5	0	0.00	100	---	-----	-----	D-C7
11	Combine	4.7	5	720	0.30	100	3 + 4	-----	-----	D-C1+2
12	Combine	6.1	5	720	0.39	100	11 + 5	-----	-----	D-C1to3
13	Combine	6.1	5	720	0.39	100	12 + 6	-----	-----	D-C1to4
14	Combine	6.6	5	720	0.42	100	13 + 7	-----	-----	D-C1to5
15	Combine	6.6	5	720	0.42	100	14 + 9	-----	-----	D-C1to5+7
16	Combine	7.1	5	720	0.45	100	15 + 8	-----	-----	D-C1to7

Proj. file: B7428_CX.GPW	IDF file: GJIDFNEW.IDF	Run date: 03-20-2018
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Hydrograph Summary Report

BASIN C - 10 YR STM

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Return period (yrs)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	0.0	5	0	0.00	10	---	-----	-----	H-C
3	SCS Runoff	0.8	5	720	0.05	10	---	-----	-----	D-C1
4	SCS Runoff	1.3	5	720	0.08	10	---	-----	-----	D-C2
5	SCS Runoff	0.6	5	720	0.04	10	---	-----	-----	D-C3
6	SCS Runoff	0.0	5	0	0.00	10	---	-----	-----	D-C4
7	SCS Runoff	0.3	5	720	0.02	10	---	-----	-----	D-C5
8	SCS Runoff	0.2	5	720	0.01	10	---	-----	-----	D-C6
9	SCS Runoff	0.0	5	0	0.00	10	---	-----	-----	D-C7
11	Combine	2.1	5	720	0.13	10	3 + 4	-----	-----	D-C1+2
12	Combine	2.7	5	720	0.17	10	11 + 5	-----	-----	D-C1to3
13	Combine	2.7	5	720	0.17	10	12 + 6	-----	-----	D-C1to4
14	Combine	3.0	5	720	0.18	10	13 + 7	-----	-----	D-C1to5
15	Combine	3.0	5	720	0.18	10	14 + 9	-----	-----	D-C1to5+7
16	Combine	3.2	5	720	0.20	10	15 + 8	-----	-----	D-C1to7

Proj. file: B7428C10.GPW

IDF file: GJIDFNEW.IDF

Run date: 03-20-2018

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Return period (yrs)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	0.0	5	0	0.00	100	---	-----	-----	H-D
2	SCS Runoff	7.0	5	720	0.45	100	---	-----	-----	O-D1
3	SCS Runoff	7.6	5	720	0.57	100	---	-----	-----	O-D2
4	SCS Runoff	1.0	5	720	0.07	100	---	-----	-----	O-D3
5	SCS Runoff	8.2	5	720	0.51	100	---	-----	-----	O-D4
6	Combine	14.6	5	720	1.03	100	2 + 3	-----	-----	O-D12
7	Combine	15.5	5	720	1.09	100	6 + 4	-----	-----	O-D123
8	Combine	23.7	5	720	1.61	100	7 + 5	-----	-----	O-D1234
9	Combine	15.5	5	720	1.09	100	1 + 7	-----	-----	HD + OD1to4
11	SCS Runoff	0.0	5	730	0.01	100	---	-----	-----	D-D1
12	SCS Runoff	1.4	5	720	0.09	100	---	-----	-----	D-D2
13	SCS Runoff	0.0	5	0	0.00	100	---	-----	-----	D-D3
14	SCS Runoff	1.0	5	720	0.07	100	---	-----	-----	O-D4
15	SCS Runoff	0.6	5	720	0.04	100	---	-----	-----	O-D5
16	SCS Runoff	0.0	5	0	0.00	100	---	-----	-----	D-D6
17	SCS Runoff	0.0	5	0	0.00	100	---	-----	-----	D-D7
18	SCS Runoff	0.0	5	0	0.00	100	---	-----	-----	D-D8
20	Combine	7.0	5	720	0.47	100	2 + 11	-----	-----	OD1 + DD1
21	Combine	8.4	5	720	0.56	100	20 + 12	-----	-----	OD1 + DD1+2
22	Combine	7.6	5	720	0.57	100	3 + 13	-----	-----	OD2 + DD3
23	Combine	16.0	5	720	1.13	100	21 + 22	-----	-----	OD12 + DD1to3
24	Combine	16.0	5	720	1.13	100	23 + 16	-----	-----	OD12+DD1to3+6
25	Combine	2.0	5	720	0.13	100	4 + 14	-----	-----	OD3 + DD4
26	Combine	2.6	5	720	0.17	100	15 + 25	-----	-----	OD3 + DD45
27	Combine	10.8	5	720	0.68	100	26 + 5	-----	-----	OD34 + DD45
28	Combine	10.8	5	720	0.68	100	17 + 27	-----	-----	OD34+DD45+7
29	Combine	26.8	5	720	1.81	100	24 + 28	-----	-----	OD1to4+DD1to7
30	Combine	26.8	5	720	1.81	100	18 + 29	-----	-----	OD1to4+DD1to8

Proj. file: B7428_DX.GPW

IDF file: GJIDFNEW.IDF

Run date: 03-30-2018

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Return period (yrs)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	0.0	5	0	0.00	10	---	-----	-----	H-D
2	SCS Runoff	1.2	5	725	0.11	10	---	-----	-----	O-D1
3	SCS Runoff	0.3	5	730	0.09	10	---	-----	-----	O-D2
4	SCS Runoff	0.1	5	725	0.01	10	---	-----	-----	O-D3
5	SCS Runoff	3.6	5	720	0.22	10	---	-----	-----	O-D4
6	Combine	1.6	5	725	0.20	10	2 + 3	-----	-----	OD12
7	Combine	1.7	5	725	0.22	10	6 + 4	-----	-----	OD1to3
8	Combine	5.0	5	720	0.44	10	7 + 5	-----	-----	OD1to4
9	Combine	5.0	5	720	0.44	10	1 + 8	-----	-----	HD+OD1to4
11	SCS Runoff	0.0	5	0	0.00	10	---	-----	-----	D-D1
12	SCS Runoff	0.7	5	720	0.04	10	---	-----	-----	D-D2
13	SCS Runoff	0.0	5	0	0.00	10	---	-----	-----	D-D3
14	SCS Runoff	0.5	5	720	0.03	10	---	-----	-----	O-D4
15	SCS Runoff	0.3	5	720	0.02	10	---	-----	-----	O-D5
16	SCS Runoff	0.0	5	0	0.00	10	---	-----	-----	D-D6
17	SCS Runoff	0.0	5	0	0.00	10	---	-----	-----	D-D7
18	SCS Runoff	0.0	5	0	0.00	10	---	-----	-----	D-D8
20	Combine	1.2	5	725	0.11	10	2 + 11	-----	-----	OD1 + DD1
21	Combine	1.8	5	720	0.15	10	20 + 12	-----	-----	OD1 + DD12
22	Combine	0.3	5	730	0.09	10	3 + 13	-----	-----	OD2 + DD3
23	Combine	2.1	5	725	0.24	10	21 + 22	-----	-----	OD12 + DD1to3
24	Combine	2.1	5	725	0.24	10	23 + 16	-----	-----	OD12+DD1to3+6
25	Combine	0.6	5	720	0.04	10	4 + 14	-----	-----	OD3 + DD4
26	Combine	0.9	5	720	0.06	10	15 + 25	-----	-----	OD3 + DD45
27	Combine	4.4	5	720	0.28	10	26 + 5	-----	-----	OD34 + DD45
28	Combine	4.4	5	720	0.28	10	17 + 27	-----	-----	OD34+DD45+7
29	Combine	6.4	5	720	0.52	10	24 + 28	-----	-----	OD1to4+DD1to7
30	Combine	6.4	5	720	0.52	10	18 + 29	-----	-----	OD1to4+DD1to8

Proj. file: B7428D10.GPW

IDF file: GJIDFNEW.IDF

Run date: 03-30-2018

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Return period (yrs)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	1.4	5	730	0.15	100	---	-----	-----	Basin H-E
2	SCS Runoff	2.5	5	725	0.22	100	---	-----	-----	Basin H-F
3	SCS Runoff	5.1	5	720	0.32	100	---	-----	-----	Basin O-E
5	Combine	6.0	5	720	0.47	100	1 + 3	-----	-----	H-E + O-E
7	SCS Runoff	3.3	5	725	0.27	100	---	-----	-----	Basin D-F

Proj. file: B7428_EX.GPW	IDF file: GJIDFNEW.IDF	Run date: 03-30-2018
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Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Return period (yrs)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	0.3	5	730	0.06	10	---	-----	-----	Basin H-E
2	SCS Runoff	0.4	5	725	0.07	10	---	-----	-----	Basin H-F
3	SCS Runoff	3.2	5	720	0.20	10	---	-----	-----	Basin O-E
5	Combine	3.3	5	720	0.26	10	1 + 3	-----	-----	H-E + O-E
7	SCS Runoff	0.7	5	725	0.10	10	---	-----	-----	Basin D-F

Proj. file: B7428E10.GPW	IDF file: GJIDFNEW.IDF	Run date: 03-30-2018
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Design Procedure Form: Water Quality Capture Volume - Sedimentation Facility

Designer: Eric Slivon
Company: Rolland Consulting Engineers LLC
Date: 5-Jan-17
Project: **Sunset Pointe**
Location: Fruita

Detention/Water Quality Basin A

1	Basin Storage Volume		
	A) Tributary Area's Imperviousness Ratio ($i = I_a / 100$)	$I_a =$	27.8 %
		$i =$	0.278
	B) Contributing Watershed Area (Area)	Area =	6.62 acres
	C) Water Quality Capture Volume (WQCV)	WQCV =	0.094 watershed inches
	WQCV = $0.65 * (1.0 * (0.91 * I_3 - 1.19 * I_2 + 0.78 * I_1))$		
	D) Design Volume: $Vol = (WQCV / 12) * Area * 1.2$	Vol =	0.062 acre-feet
	Volume in Cubic Feet (40 hr drain time)	Vol =	2707 Cubic Feet
2	Outlet Works		
	A) Outlet Type	X	Orifice Plate
	B) Depth at Outlet Above Lowest Perforation (H)	H =	1.50 feet
	C) Recommended Maximum Outlet Area per Row, (A_o)	$A_o =$	0.2218 square inches Use 1/2 minimum.
	D) Perforation Dimensions:		
	i) Circular Perforation Diameter or	D =	0.50000 inches
	E) Number of Columns (nc , See Table 6a-1 For Maximum)	$nc =$	1 number
	F) Actual Design Outlet Area per Row (A_o)	$A_o =$	0.1963 square inches
	G) Number of Rows (nr)	$nr =$	3.0 number
	H) Total Outlet Area (A_{ot})	$A_{ot} =$	0.5890 square inches

Formulas are based on Urban Storm Drainage Criterial Maual, Volume 3 - Best management Practices, September 1999, Latest Revision: November 2007 and adjusted per City of Grand Junction / Mesa County SWMM Section 1604.2

Design Procedure Form: Water Quality Capture Volume - Sedimentation Facility

Designer: Eric Slivon
Company: Rolland Consulting Engineers LLC
Date: 5-Jan-17
Project: Sunset Pointe
Location: Fruita

Detention/Water Quality Basin B

Contributing Basins: O-B(Off-Site) + D-B(Developed)

Basin	Area	Ia(%)
O-B	61.31	10.0
D-B	42.86	32.9
Composite	104.17	19.4

1 Basin Storage Volume

	Ia =	19.4 %
A) Tributary Area's Imperviousness Ratio ($i = Ia / 100$)	i =	0.194
B) Contributing Watershed Area (Area)	Area =	104.17 acres
C) Water Quality Capture Volume (WQCV) WQCV = $0.65 * (1.0 * (0.91 * I3 - 1.19 * I2 + 0.78 * I1))$	WQCV =	0.074 watershed inches
D) Design Volume: Vol = $(WQCV / 12) * Area * 1.2$	Vol =	0.766 acre-feet
Volume in Cubic Feet (40 hr drain time)	Vol =	33381 Cubic Feet

2 Outlet Works

A) Outlet Type	X	Orifice Plate
B) Depth at Outlet Above Lowest Perforation (H)	H =	2.50 feet
C) Recommended Maximum Outlet Area per Row, (Ao)	Ao =	1.7749 square inches
D) Perforation Dimensions: i) Circular Perforation Diameter or	D =	1.31250 inches
E) Number of Columns (nc, See Table 6a-1 For Maximum)	nc =	1 number
F) Actual Design Outlet Area per Row (Ao)	Ao =	1.3530 square inches
G) Number of Rows (nr)	nr =	6.0 number
H) Total Outlet Area (Aot)	Aot =	8.1178 square inches

Formulas are based on Urban Storm Drainage Criteria Manual, Volume 3 - Best management Practices, September 1999, Latest Revision: November 2007 and adjusted per City of Grand Junction / Mesa County SWMM Section 1604.2

Design Procedure Form: Water Quality Capture Volume - Sedimentation Facility

Designer: Eric Slivon
Company: Rolland Consulting Engineers LLC
Date: 5-Jan-17
Project: **Sunset Pointe**
Location: Fruita

Detention/Water Quality Basin C

1	Basin Storage Volume		
	A) Tributary Area's Imperviousness Ratio ($i = I_a / 100$)	$I_a =$	36.9 %
		$i =$	0.369
	B) Contributing Watershed Area (Area)	Area =	14.96 acres
	C) Water Quality Capture Volume (WQCV)	WQCV =	0.111 watershed inches
	WQCV = $0.65 * (1.0 * (0.91 * I_3 - 1.19 * I_2 + 0.78 * I_1))$		
	D) Design Volume: Vol = $(WQCV / 12) * Area * 1.2$	Vol =	0.167 acre-feet
	Volume in Cubic Feet (40 hr drain time)	Vol =	7265 Cubic Feet
2	Outlet Works		
	A) Outlet Type	X	Orifice Plate
	B) Depth at Outlet Above Lowest Perforation (H)	H =	2.50 feet
	C) Recommended Maximum Outlet Area per Row, (A_o)	$A_o =$	0.3863 square inches
	D) Perforation Dimensions:		
	i) Circular Perforation Diameter or	D =	0.62500 inches
	E) Number of Columns (n_c , See Table 6a-1 For Maximum)	$n_c =$	1 number
	F) Actual Design Outlet Area per Row (A_o)	$A_o =$	0.3068 square inches
	G) Number of Rows (n_r)	$n_r =$	4.0 number
	H) Total Outlet Area (A_{ot})	$A_{ot} =$	1.2272 square inches

Formulas are based on Urban Storm Drainage Criteria Manual, Volume 3 - Best management Practices, September 1999, Latest Revision: November 2007 and adjusted per City of Grand Junction / Mesa County SWMM Section 1604.2

Design Procedure Form: Water Quality Capture Volume - Sedimentation Facility

Designer: Eric Slivon
Company: Rolland Consulting Engineers LLC
Date: 5-Jan-17
Project: Sunset Pointe
Location: Fruita

Detention/Water Quality Basin D

Contributing Basins: O-D(Off-Site) + D-D(Developed)

Basin	Area	la(%)
O-D	41.65	15.0
D-D	41.52	11.7
Composite	83.17	13.4

- 1 Basin Storage Volume
- | | | |
|--|--------|------------------------|
| | la = | 13.4 % |
| A) Tributary Area's Imperviousness Ratio ($i = la / 100$) | i = | 0.134 |
| B) Contributing Watershed Area (Area) | Area = | 83.17 acres |
| C) Water Quality Capture Volume (WQCV)
WQCV = $0.65 * (1.0 * (0.91 * I3 - 1.19 * I2 + 0.78 * I))$ | WQCV = | 0.055 watershed inches |
| D) Design Volume: Vol = $(WQCV / 12) * Area * 1.2$ | Vol = | 0.461 acre-feet |
| Volume in Cubic Feet (40 hr drain time) | Vol = | 20097 Cubic Feet |
- 2 Outlet Works
- | | | |
|---|-------|--|
| A) Outlet Type | X | Orifice Plate |
| B) Depth at Outlet Above Lowest Perforation (H) | H = | 4.8 feet |
| C) Recommended Maximum Outlet Area per Row, (Ao) | Ao = | 0.5621 square inches
Use 3/4 minimum. |
| D) Perforation Dimensions:
i) Circular Perforation Diameter or | D = | 0.75000 inches |
| E) Number of Columns (nc, See Table 6a-1 For Maximum) | nc = | 1 number |
| F) Actual Design Outlet Area per Row (Ao) | Ao = | 0.4418 square inches |
| G) Number of Rows (nr) | nr = | 6.5 number |
| H) Total Outlet Area (Aot) | Aot = | 2.8716 square inches |

Formulas are based on Urban Storm Drainage Criterial Mauul, Volume 3 - Best management Practices, September 1999, Latest Revision: November 2007 and adjusted per City of Grand Junction / Mesa County SWMM Section 1604.2

Design Procedure Form: Water Quality Capture Volume - Sedimentation Facility

Designer: Eric Slivon
Company: Rolland Consulting Engineers LLC
Date: 5-Jan-17
Project: **Sunset Pointe**
Location: Fruita

Detention/Water Quality Basin E and F

Contributing Basins: O-D(Off-Site) + D-D(Developed)

Basin	Area	Ia(%)
O-E	6.15	52.9
D-E	5.23	12.4
D-F	9.83	18.7
Composite	21.21	27.1

1 Basin Storage Volume

	Ia =	27.1 %
A) Tributary Area's Imperviousness Ratio ($i = Ia / 100$)	i =	0.271
B) Contributing Watershed Area (Area)	Area =	21.21 acres
C) Water Quality Capture Volume (WQCV) WQCV = $0.65 * (1.0 * (0.91 * I3 - 1.19 * I2 + 0.78 * I1))$	WQCV =	0.092 watershed inches
D) Design Volume: Vol = $(WQCV / 12) * Area * 1.2$	Vol =	0.196 acre-feet
Volume in Cubic Feet (40 hr drain time)	Vol =	8533 Cubic Feet

2 Outlet Works

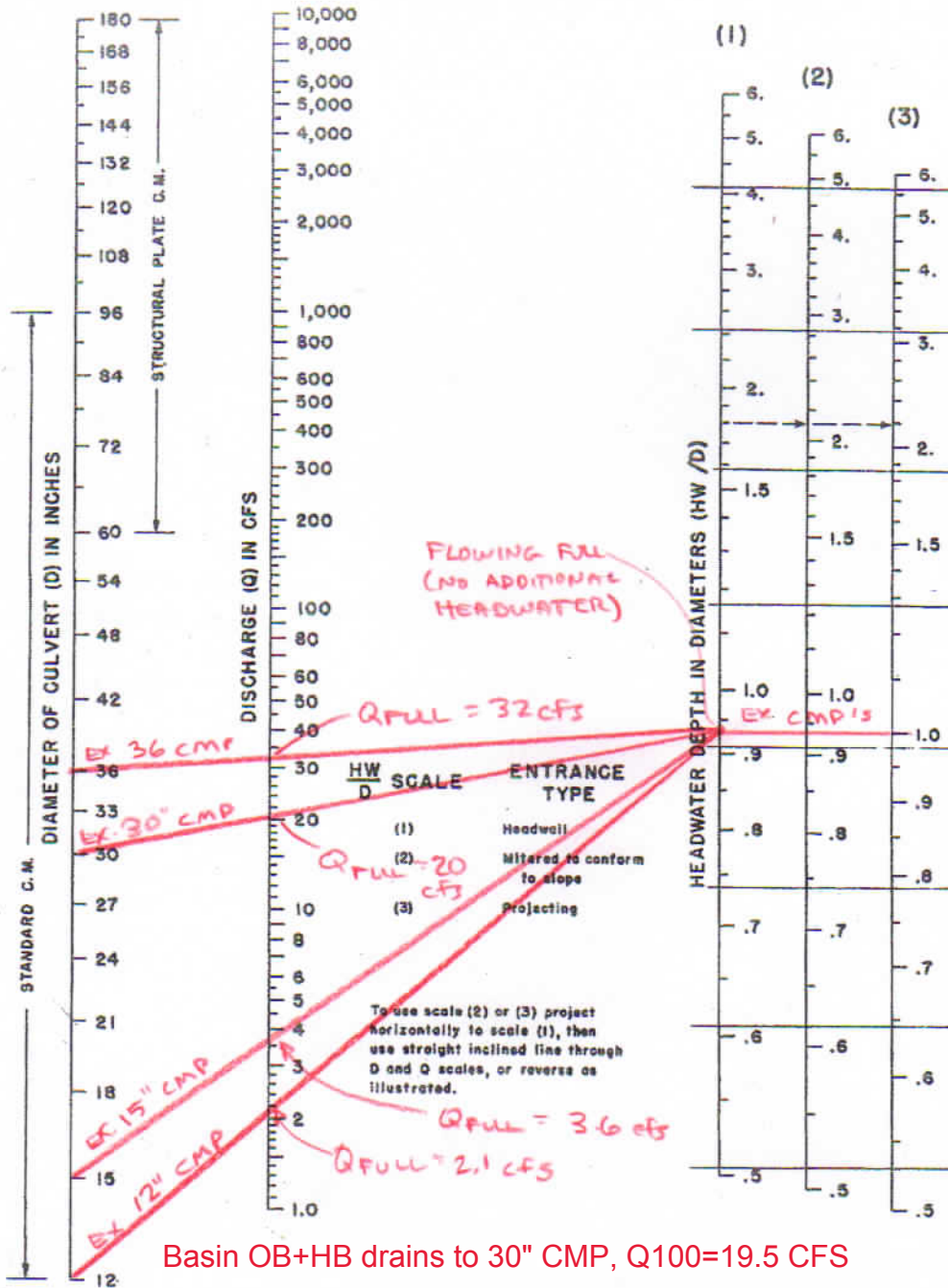
A) Outlet Type	X	Orifice Plate
B) Depth at Outlet Above Lowest Perforation (H)	H =	4 feet
C) Recommended Maximum Outlet Area per Row, (Ao)	Ao =	0.2873 square inches Use 3/4 minimum.
D) Perforation Dimensions: i) Circular Perforation Diameter or	D =	0.75000 inches
E) Number of Columns (nc, See Table 6a-1 For Maximum)	nc =	1 number
F) Actual Design Outlet Area per Row (Ao)	Ao =	0.4418 square inches
G) Number of Rows (nr)	nr =	6.5 number
H) Total Outlet Area (Aot)	Aot =	2.8716 square inches

Formulas are based on Urban Storm Drainage Criteria Manual, Volume 3 - Best management Practices, September 1999, Latest Revision: November 2007 and adjusted per City of Grand Junction / Mesa County SWMM Section 1604.2

STORMWATER MANAGEMENT MANUAL

HEADWATER DEPTH FOR CORRUGATED METAL PIPE CULVERTS WITH INLET CONTROL

Existing Culverts at King's View Road



Basin OB+HB drains to 30" CMP, Q100=19.5 CFS

Basin OD+HC+HD drains to 12" CMP (excess drains to 30" CMP in BASIN HB), Q100=8.4 CFS

BASIN OE+HE DRAINS TO 36" CMP, Q100=6.0 CFS

Revision	Date
ORIGINAL ISSUE	3/27/06

WFC ENGINEERING INC.

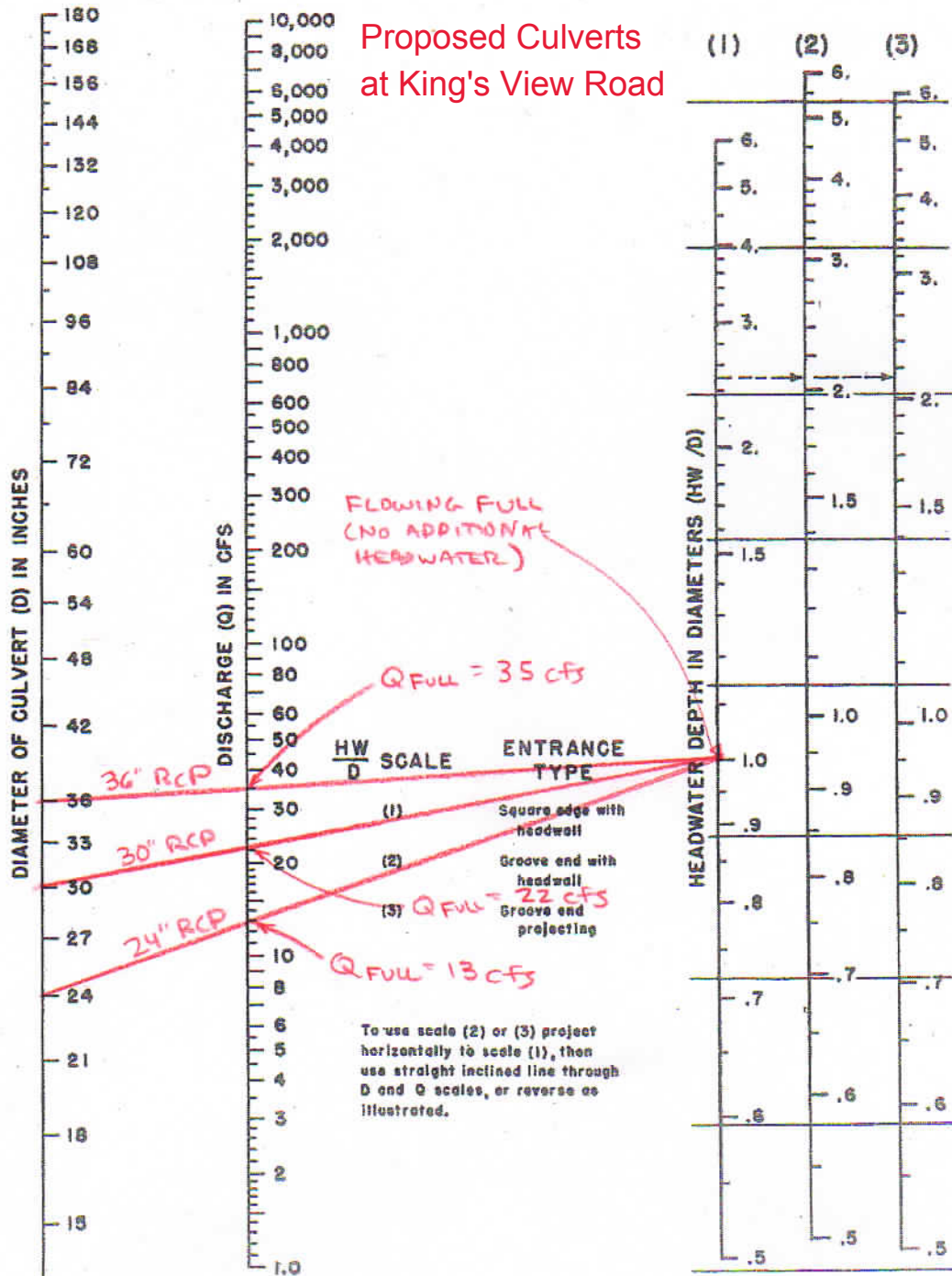
REFERENCE:

HDS-5. FHWA

FIGURE 1220

STORMWATER MANAGEMENT MANUAL

HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL

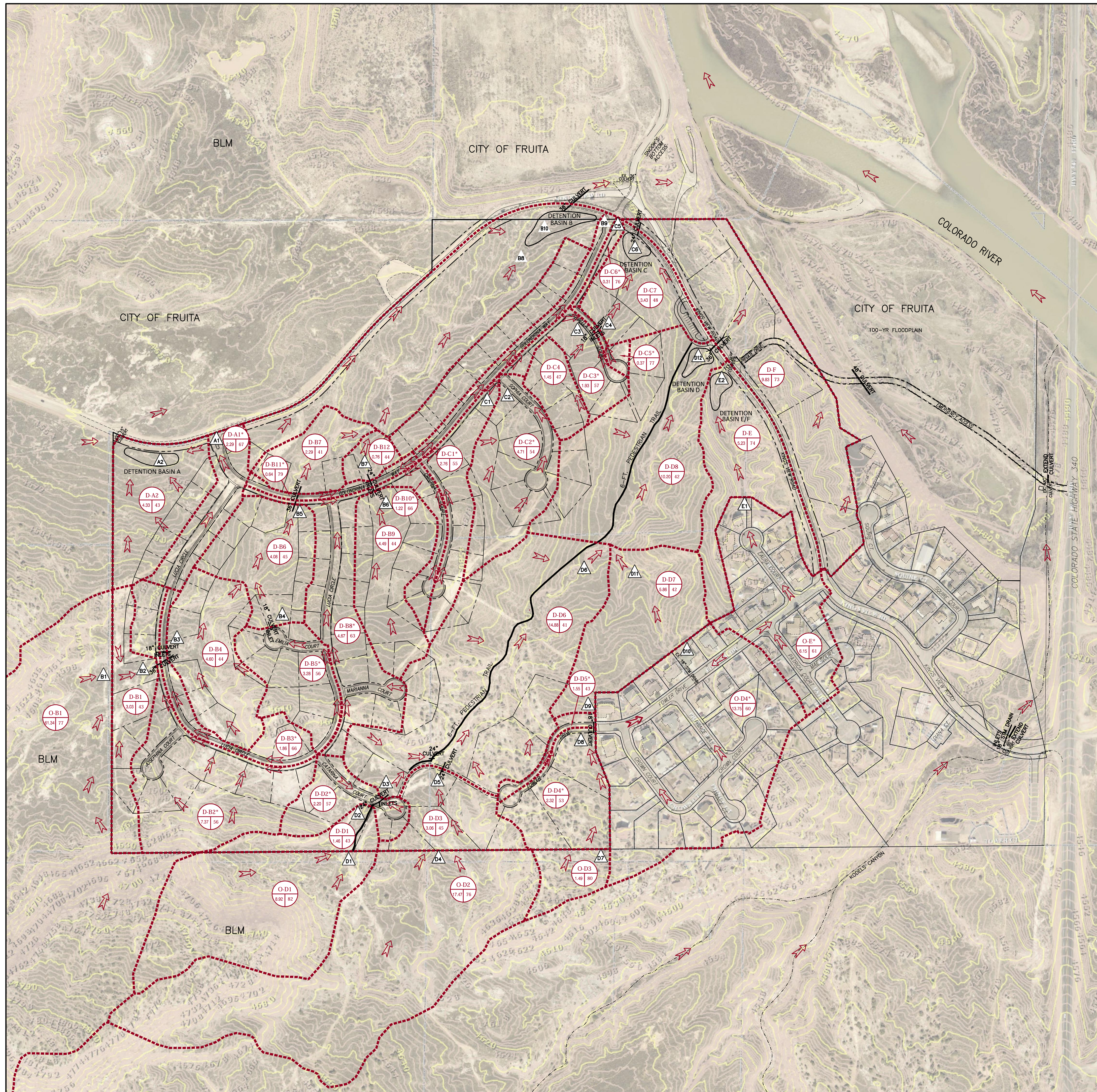


BASIN OB+DB drains to proposed 36" RCP, Q₁₀₀=28.3 CFS

BASIN DC drains to proposed 24" RCP, Q₁₀₀=7.1 CFS

BASIN HD+DD drains to proposed 36" RCP, Q₁₀₀=26.8 CFS

Revision	Date
ORIGINAL ISSUE	3/27/06

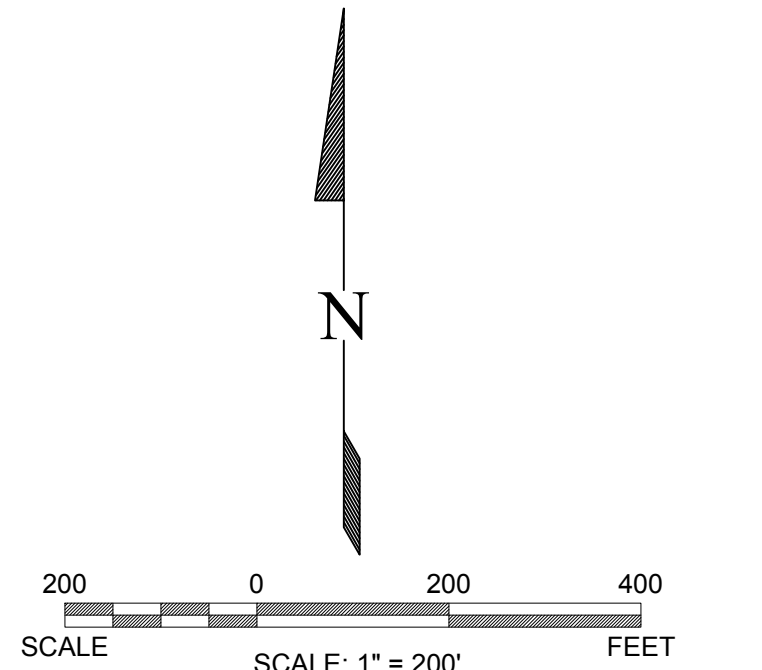


NOTES:

- NO BUILDING, STRUCTURE, OR FILL WILL BE PLACED IN THE STORMWATER DETENTION AREA AND NO CHANGES OR ALTERATIONS AFFECTING THE HYDRAULIC CHARACTERISTICS OF THE STORMWATER DETENTION BASIN WILL BE MADE WITHOUT THE APPROVAL OF THE CITY.
- MAINTENANCE AND OPERATION OF THE STORMWATER DETENTION BASIN IS THE RESPONSIBILITY OF THE PROPERTY OWNER/LESSEE. IF OWNER/LESSEE FAILS IN THIS RESPONSIBILITY, THE CITY HAS THE RIGHT TO ENTER THE PROPERTY, MAINTAIN THE STORMWATER DETENTION BASIN AND BE REIMBURSED FOR COSTS INCURRED.
- STORMWATER DETENTION BASIN VOLUMES, ALL DRAINAGE APPURTENANCES, AND BASIN BOUNDARIES SHALL BE VERIFIED. AS-BUILT DRAWINGS SHALL BE PREPARED BY A PROFESSIONAL ENGINEER PRIOR TO ISSUANCE OF CERTIFICATE OF OCCUPANCY FOR ANY STRUCTURE WITHIN THE DEVELOPMENT (THAT REQUIRES A CERTIFICATE OF OCCUPANCY FROM THE COUNTY).
- PERMISSION TO REPRODUCE THESE PLANS IS HEREBY GIVEN TO MESA COUNTY AND THE CITY OF GRAND JUNCTION FOR PURPOSES ASSOCIATED WITH PLAN REVIEW, APPROVAL, PERMITTING, INSPECTION AND CONSTRUCTION WORK.

LEGEND:

- DRAINAGE BASIN BOUNDARY
- PROPOSED DRAINAGE PATH
- (D-D8) BASIN DESIGNATION
10.00 42 AREA IN ACRES
SCS CURVE NUMBER
- △ DESIGN POINT



DETENTION BASINS

BASIN	CONTRIBUTING BASINS/AREA (AC.)	WATER QUALITY CAPTURE VOLUME IMPERVIOUS C.F.
A	D-A	6.62 21.0 2707
B	O-B + D-B	104.17 14.9 33,381
C	D-C	14.96 24.5 7265
D	O-D + D-D	68.29 12.9 20,097
E/F	O-E + O-E + O-F	21.21 20.3 7021

DESIGN POINTS

NOTES:

- DETENTION BASINS WILL PROVIDE FOR AT LEAST THE WATER QUALITY CAPTURE VOLUME (WQCV) AS DIRECTED BY THE MESA COUNTY STORMWATER MANAGEMENT MANUAL (SWMM). THE AVAILABILITY OF ADDITIONAL DETENTION VOLUME WILL BE DETERMINED AT FINAL DESIGN.
- DETENTION WILL NOT BE PROVIDED FOR IN BASIN D-F. THE DETENTION BASIN IN BASIN D-E WILL BE INCREASED IN SIZE TO ACCOUNT FOR BASIN D-F.

DESIGN POINT	10-YR FLOW RATE (CFS)	100-YR FLOW RATE (CFS)	NOTES
A1	1.1	2.3	BASIN D-A1 (CURB AND GUTTER)
A2	1.1	2.3	TOTAL TO DETENTION POND A
B1	1.4	19.5	OFF-SITE BASIN O-B
B2	1.4	19.5	BASIN O-B + D-B1 (36" CULVERT)
B3	2.5	5.3	BASIN D-(B2+B3) (18" CULVERT)
B4	1.0	2.3	D-B5 (18" CULVERT)
B5	3.8	22.6	BASIN O-B + D-(B1 TO B6) (36" CULVERT)
B6	0.0	0.0	BASIN D-B9 (24" CULVERT-INLET)
B7	3.1	6.8	BASIN D-(B8 TO B11) (24" CULVERT-OUTLET)
B8	7.0	26.8	BASIN O-B + D-(B1 TO B14) (SOUTH OF DET. POND)
B9	0.8	1.8	BASIN D-B15 (CURB AND GUTTER)
B10	7.8	28.3	TOTAL TO DETENTION POND B
C1	0.8	1.8	BASIN D-C1 (CURB AND GUTTER)
C2	1.3	2.9	BASIN D-C2 (CURB AND GUTTER)
C3	2.7	6.1	BASIN D-(C1 TO C4) (18" CULVERT)
C4	3.0	6.6	BASIN D-(C1 TO C5) (18" CULVERT)
C5	0.2	0.4	BASIN D-C6 (CURB AND GUTTER)
C6	3.2	7.1	TOTAL TO DETENTION POND C
D1	1.2	7.0	OFF-SITE BASIN O-D1
D2	1.2	7.0	BASIN O-D1 + D-D1 (24" CULVERT)
D3	1.8	8.4	BASIN O-D1 + D-(D1+D2) (24" CULVERT)
D4	0.3	7.6	OFF-SITE BASIN O-D2
D5	0.3	7.6	BASIN O-D2 + D-D3 (24" CULVERT)
D6	2.1	16.0	BASIN O-D12 + O-D1236
D7	0.1	1.0	OFF-SITE BASIN O-D3
D8	0.6	2.0	BASIN O-D3 + O-D4 (18" CULVERT)
D9	0.9	2.6	BASIN O-D3 + O-D45
D10	3.6	8.2	OFF-SITE BASIN O-D4
D11	4.4	10.8	BASIN O-D34 + O-D457
D12	6.4	26.8	TOTAL TO DETENTION POND D
E1	3.2	5.1	OFF-SITE BASIN O-E
E2	3.3	6.0	BASIN O-E + O-E (DETENTION POND E)

DRAINAGE DATA

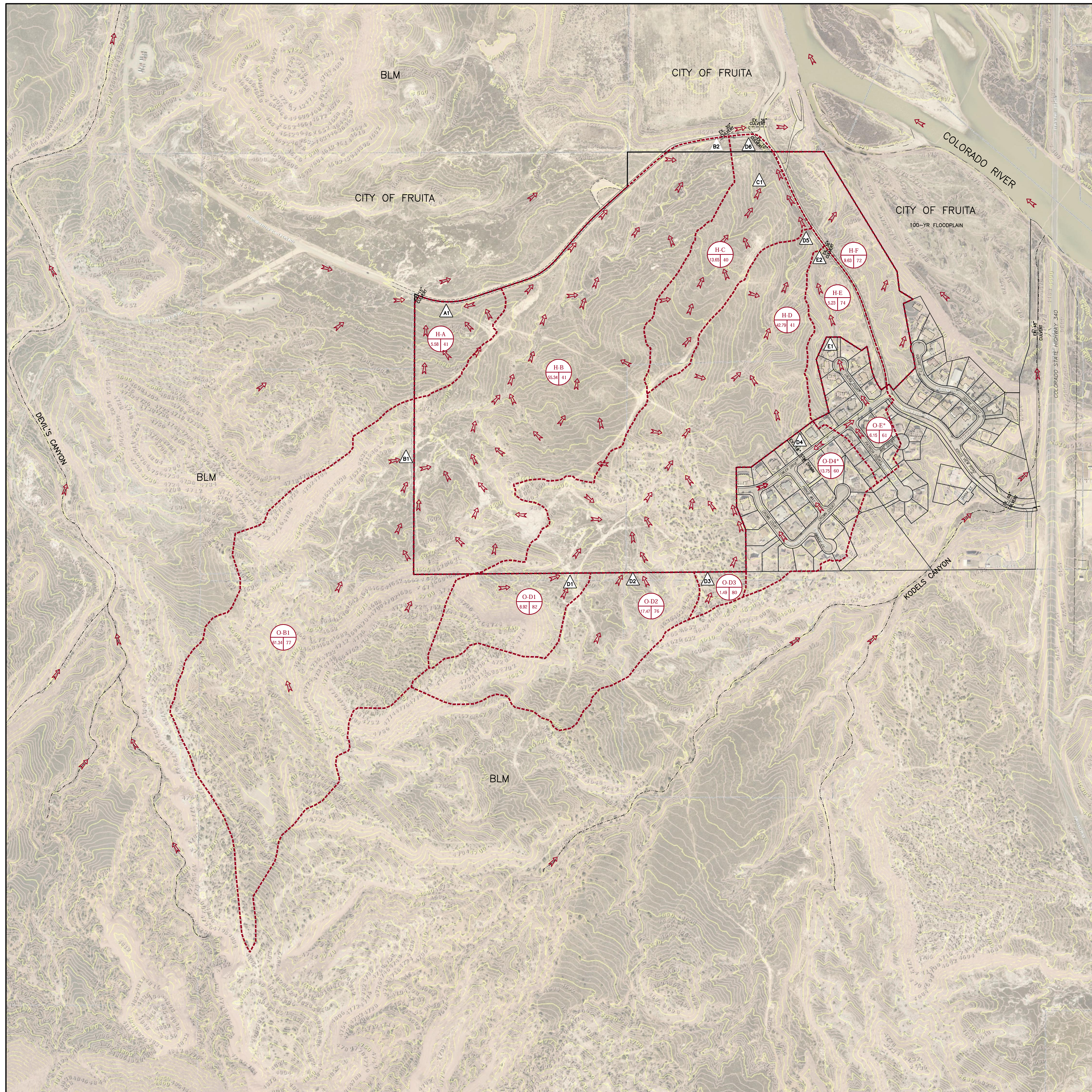
BASIN	AREA (AC.)	HSG TYPE	RUNOFF FLOW RATE Q (10-YR.) Q (100-YR.)
OFF-SITE:			
O-B	61.31	14%A,86%D	1.4 19.5
O-D1	8.87	D	1.2 7.0
O-D2	17.54	14%A,86%D	0.3 7.6
O-D3	1.49	D	0.1 1.0
O-D4*	13.75	87%A,13%C	3.6 8.2
O-E*	6.15	A	3.2 5.1
DEVELOPED:			
D-A1*	2.29	A	1.1 2.3
D-A2	4.33	A	0.0 0.0
D-B1	3.03	A	0.0 0.0
D-B2*	7.37	22%A,78%D	0.8 3.6
D-B3*	1.86	A	0.0 0.0
D-B4	4.60	A	1.0 2.3
D-B5*	3.28	A	0.0 0.0
D-B6	4.08	A	0.0 0.0
D-B7	2.29	A	0.0 0.0
D-B8*	4.89	A	2.1 4.6
D-B9	4.49	A	0.0 0.0
D-B10*	1.22	A	0.6 1.3
D-B11*	0.64	A	0.1 0.4
D-B12	0.76	A	0.0 0.0
D-B13	2.92	A	0.0 0.0
D-B14	10.60	A	0.0 0.0
D-B15	1.43	A	0.8 1.8
D-C1*	2.76	A	0.8 1.8
D-C2*	4.71	A	1.3 2.9
D-C3*	1.93	A	0.6 1.4
D-C4	1.45	A	0.0 0.0
D-C5*	0.37	A	0.3 0.5
D-C6*	0.31	A	0.2 0.4
D-C7	3.43	50%A,50%D	0.0 0.0
D-D1	1.46	A	0.0 0.0
D-D2*	2.20	A	0.7 1.4
D-D3	3.06	A	0.0 0.0
D-D4*	3.61	A	0.5 1.0
D-D5*	0.50	A	0.3 0.6
D-D6	14.88	A	0.0 0.0
D-D7	5.61	A	0.0 0.0
D-D8	10.20	A	0.0 0.0
D-E	5.23	8%A,92%C	0.3 1.4
D-F	9.83	15%A,85%C	0.5 2.9

- NOTES:**
- PEAK FLOWS FOR BASINS DRAINING TO ROADWAYS WERE CALCULATED BY ANALYZING "CONNECTED IMPERVIOUS AREAS". THE BASIN AREA AND CURVE NUMBER USED IN THE CALCULATION CONSIDERED ONLY THE ROADWAYS, BUILDING AND DRIVEWAYS AND PATIOS/WALKWAYS.

**SUNSET POINTE
PRELIMINARY PLAN**

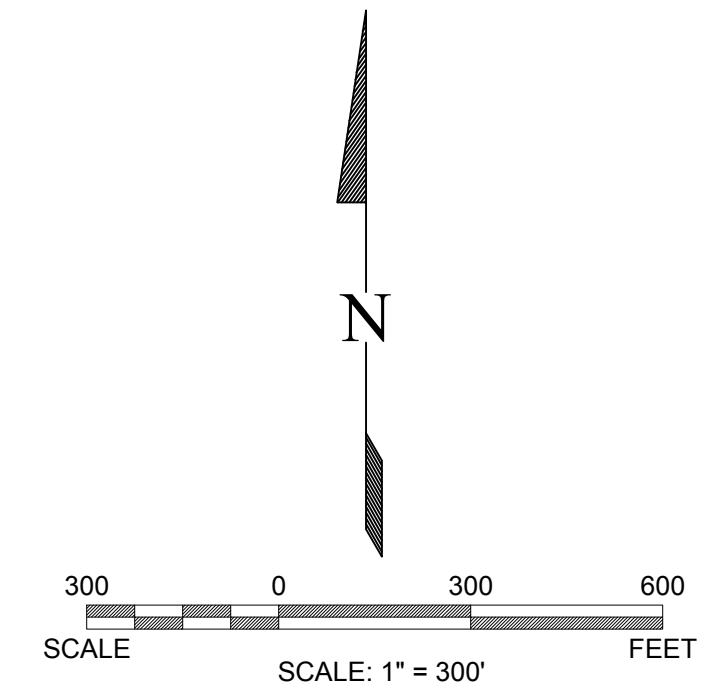
DEVELOPED DRAINAGE PLAN

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LEGEND:

- DRAINAGE BASIN BOUNDARY
- PROPOSED DRAINAGE PATH
- H-B
55.34 41 BASIN DESIGNATION
AREA IN ACRES
SCS CURVE NUMBER
- A1 DESIGN POINT



NOTES:

1. NO BUILDING, STRUCTURE, OR FILL WILL BE PLACED IN THE STORMWATER DETENTION AREA AND NO CHANGES OR ALTERATIONS AFFECTING THE HYDRAULIC CHARACTERISTICS OF THE STORMWATER DETENTION BASIN WILL BE MADE WITHOUT THE APPROVAL OF THE CITY.
2. PERMISSION TO REPRODUCE THESE PLANS IS HEREBY GIVEN TO MESA COUNTY AND THE CITY OF GRAND JUNCTION FOR PURPOSES ASSOCIATED WITH PLAN REVIEW, APPROVAL, PERMITTING, INSPECTION AND CONSTRUCTION WORK.

DRAINAGE DATA

BASIN	AREA (AC.)	HSG TYPE	RUNOFF FLOW RATE	
			Q (10-YR.) CFS	Q (100-YR.) CFS
HISTORIC:				
H-A	5.58	A	0.0	0.0
H-B	55.34	97%A,3%C	0.0	0.0
H-C	13.65	98%A,1%C	0.0	0.0
H-D	42.79	98%A,2%C	0.0	0.0
H-E	5.23	8%A,92%C	0.3	1.4
H-F	9.63	15%A,85%C	0.4	2.5
OFF-SITE:				
O-B	61.31	14%A,86%D	1.4	19.5
O-D1	8.87	D	1.2	7.0
O-D2	17.54	14%A,86%D	0.3	7.6
O-D3	1.49	D	0.1	1.0
O-D4*	13.75	87%A,13%C	3.6	8.2
O-E*	6.15	A	3.2	5.1

DESIGN POINTS

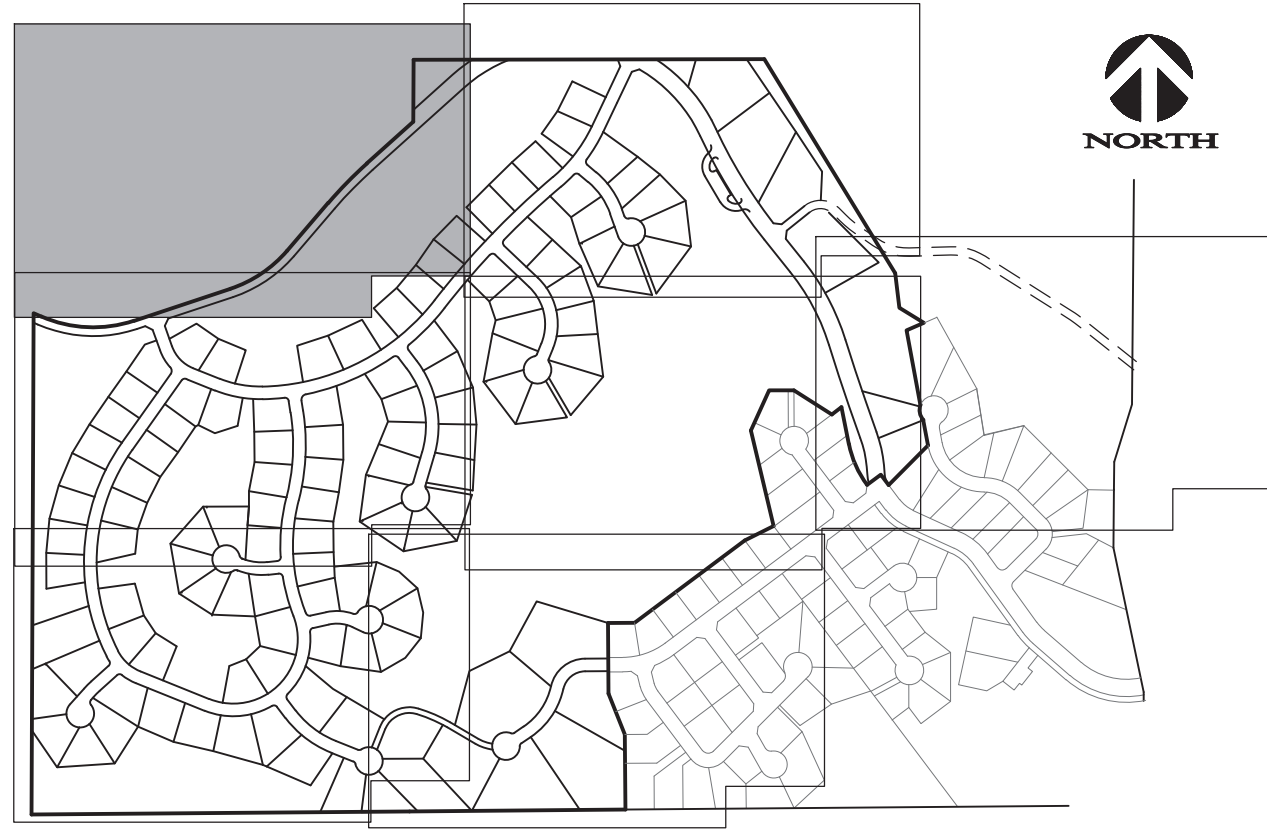
DESIGN POINT	10-YR FLOW RATE (CFS)	100-YR FLOW RATE (CFS)	NOTES
A1	0.0	0.0	BASIN H-A
B1	1.4	19.5	OFF-SITE BASIN O-B
B2	1.4	19.5	BASIN O-B + H-B
C1	0.0	0.0	BASIN H-C
D1	1.2	7.0	OFF-SITE BASIN O-D1
D2	0.3	7.6	OFF-SITE BASIN O-D2
D3	0.1	1.0	OFF-SITE BASIN O-D3
D4	3.6	8.2	OFF-SITE BASIN O-D4
D5	3.6	8.2	OFF-SITE BASIN O-D + BASIN H-D
D6	3.6	8.4	OFF-SITE BASIN O-D + BASIN H-D + H-C (TOTAL TO 12" CULVERT, EXCESS OVERFLOWS TO BASIN H-B)
E1	3.2	5.1	OFF-SITE BASIN O-E
E2	3.3	6.0	OFF-SITE BASIN O-E + H-E

NOTES:
 * PEAK FLOWS FOR BASINS DRAINING TO ROADWAYS WERE CALCULATED BY ANALYZING "CONNECTED IMPERVIOUS AREAS". THE BASIN AREA AND CURVE NUMBER USED IN THE CALCULATION CONSIDERED ONLY THE ROADWAYS, BUILDING AND DRIVEWAYS AND PATIOS/WALKWAYS.



**SUNSET POINTE
 PRELIMINARY PLAN
 HISTORIC DRAINAGE PLAN**

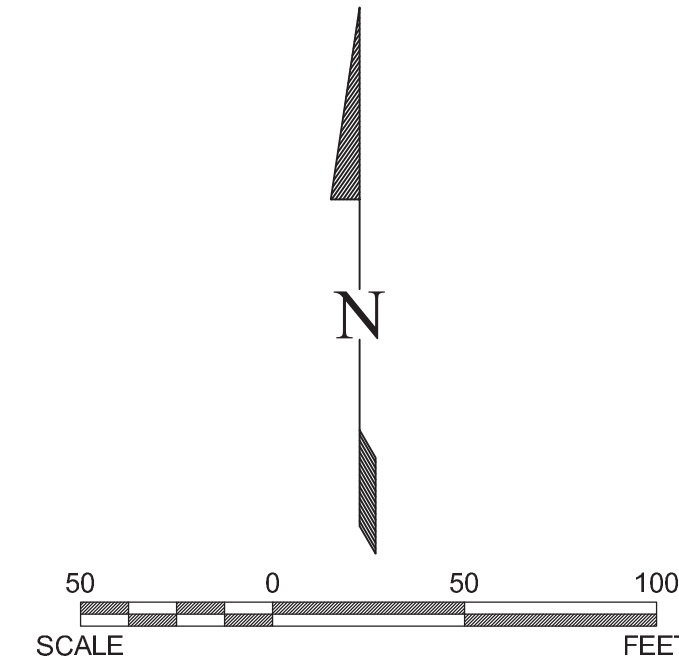
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2815 H ROAD
GRAND JUNCTION, CO 81506

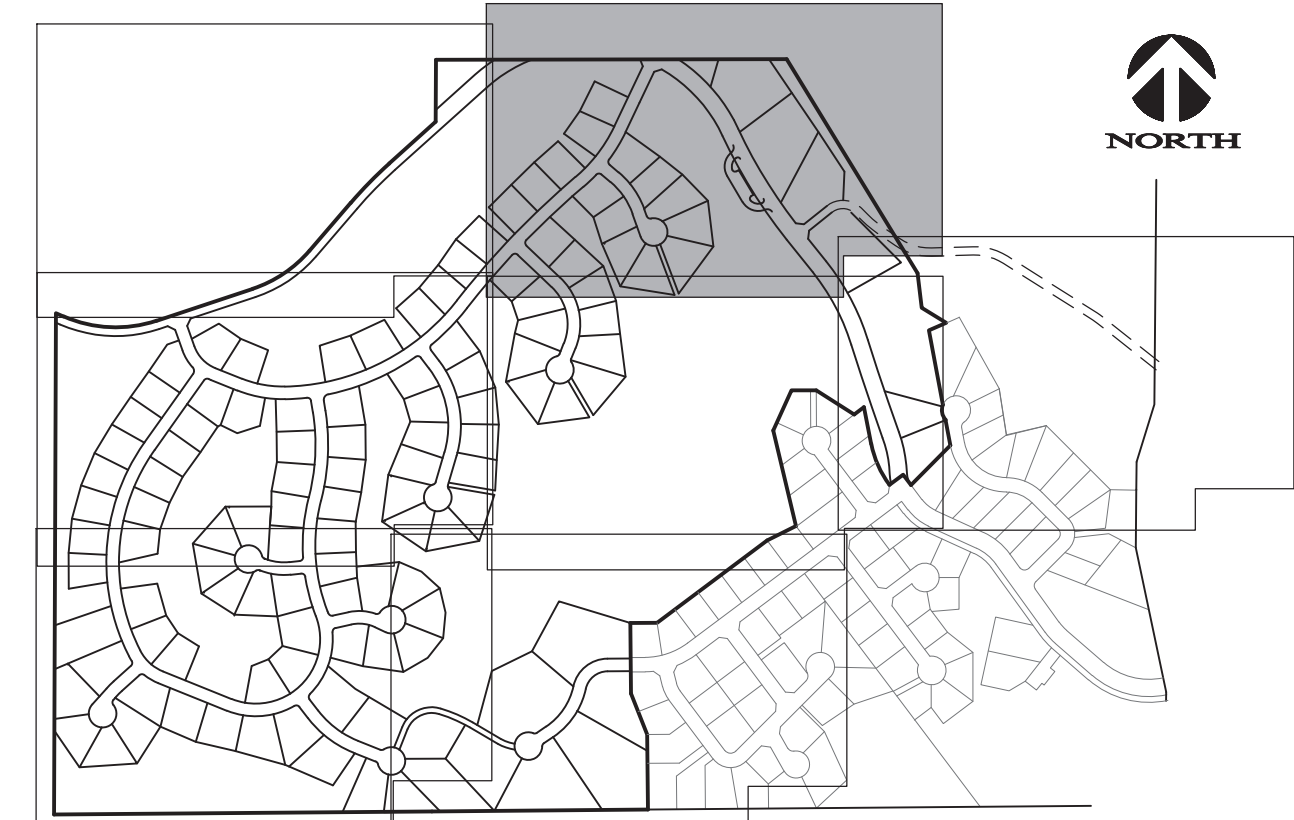
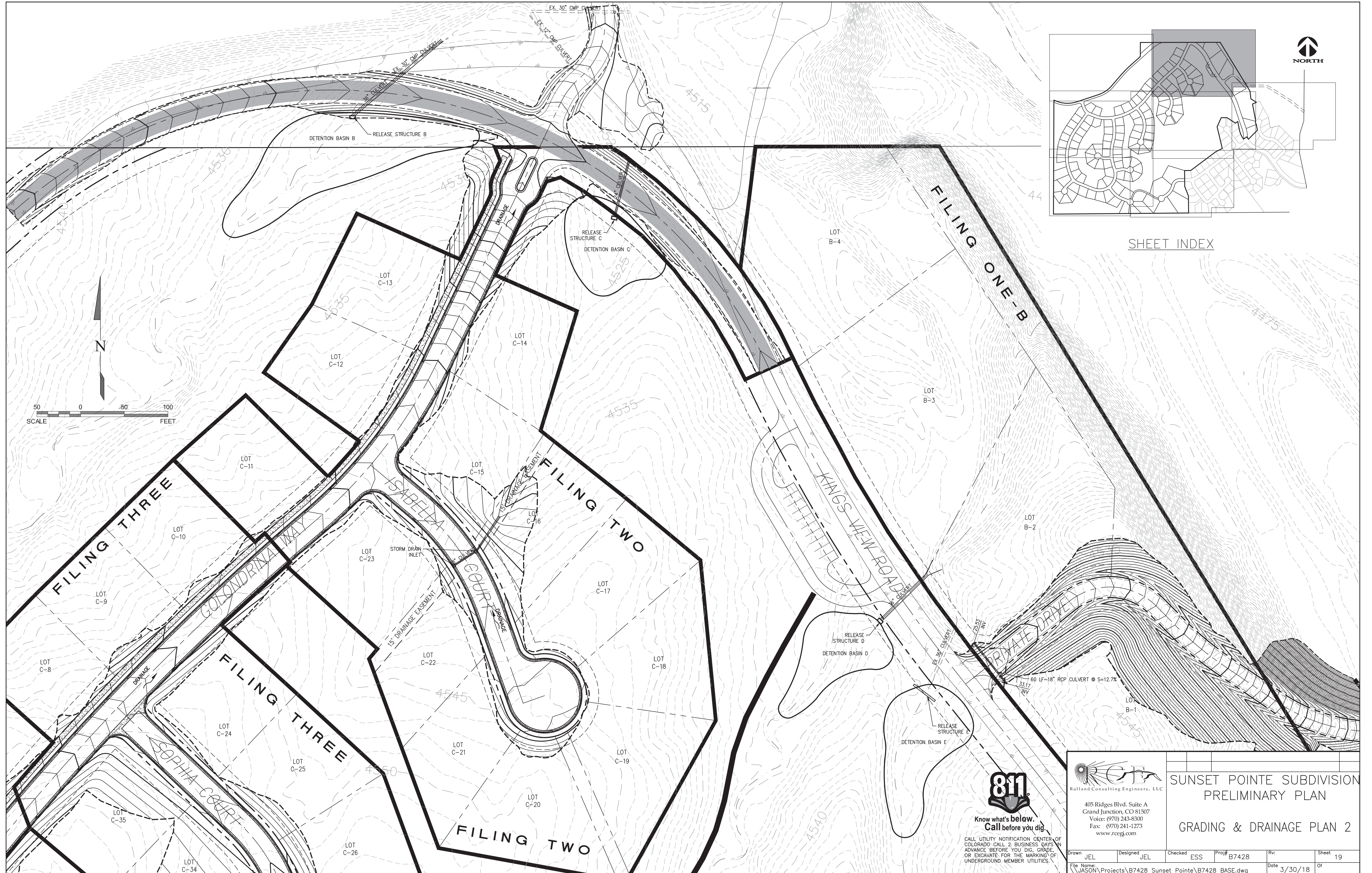
BLM ACCESS
EX. 15" CMP CULVERT

4555
4550
4545
FILING FOUR
LOT C-6
LOT C-7
LOT C-8
FILING THREE


Rotland Consulting Engineers, LLC
405 Ridges Blvd, Suite A
Grand Junction, CO 81507
Voice: (970) 243-8300
Fax: (970) 241-1273
www.rcegi.com

SUNSET POINTE SUBDIVISION
PRELIMINARY PLAN
GRADING & DRAINAGE PLAN 1

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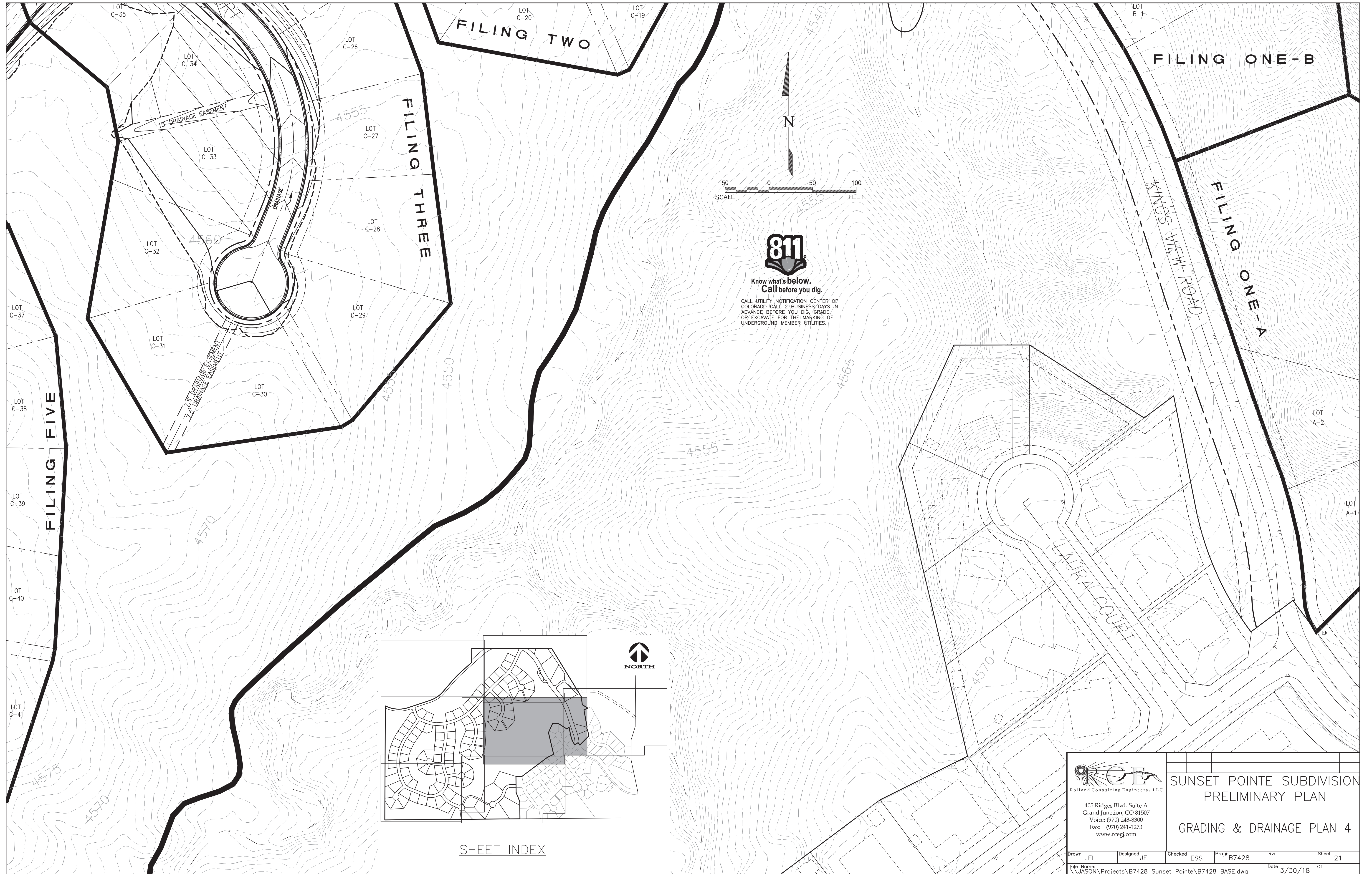


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SUNSET POINTE SUBDIVISION
PRELIMINARY PLAN
GRADING & DRAINAGE PLAN 2

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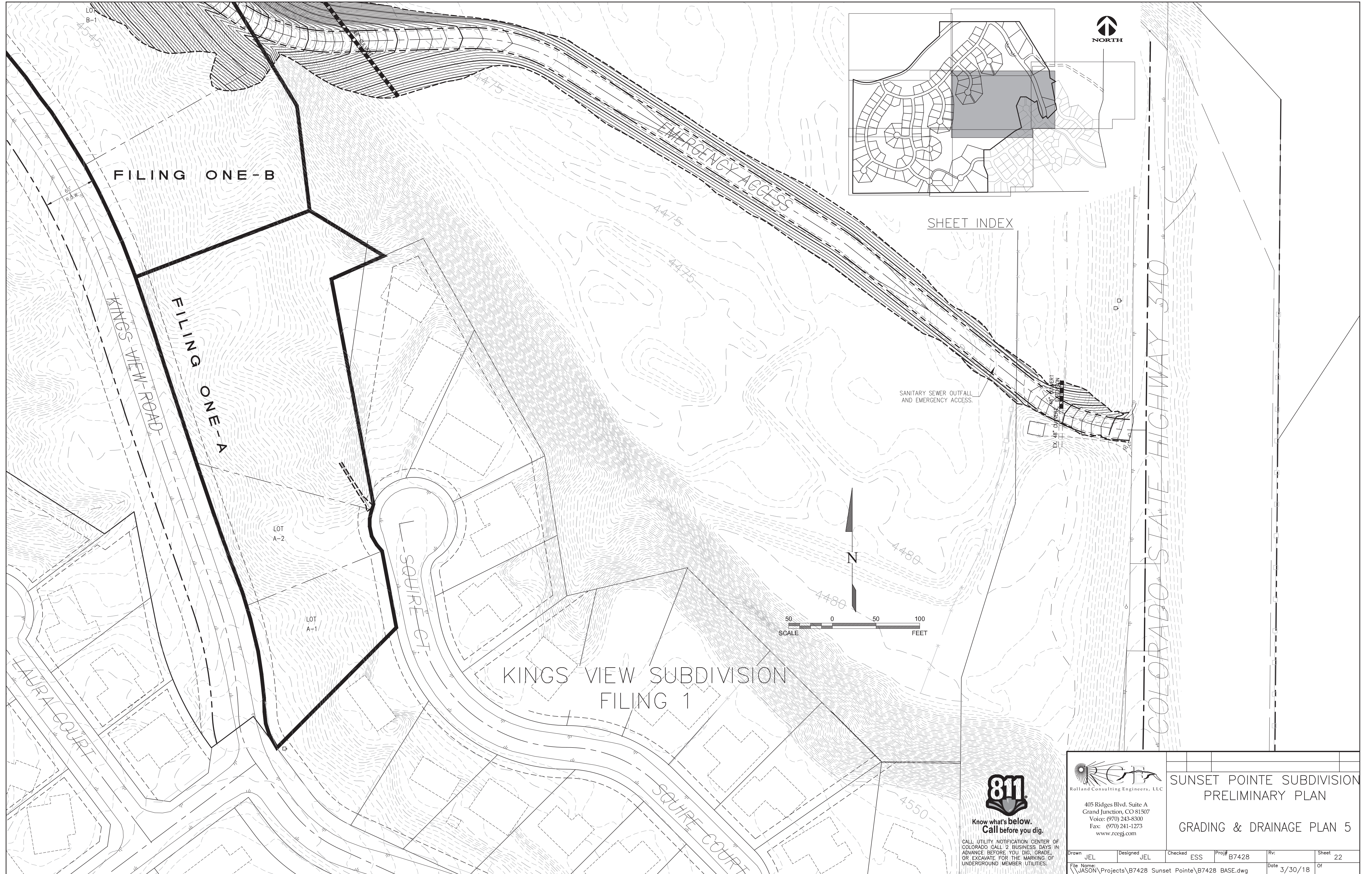


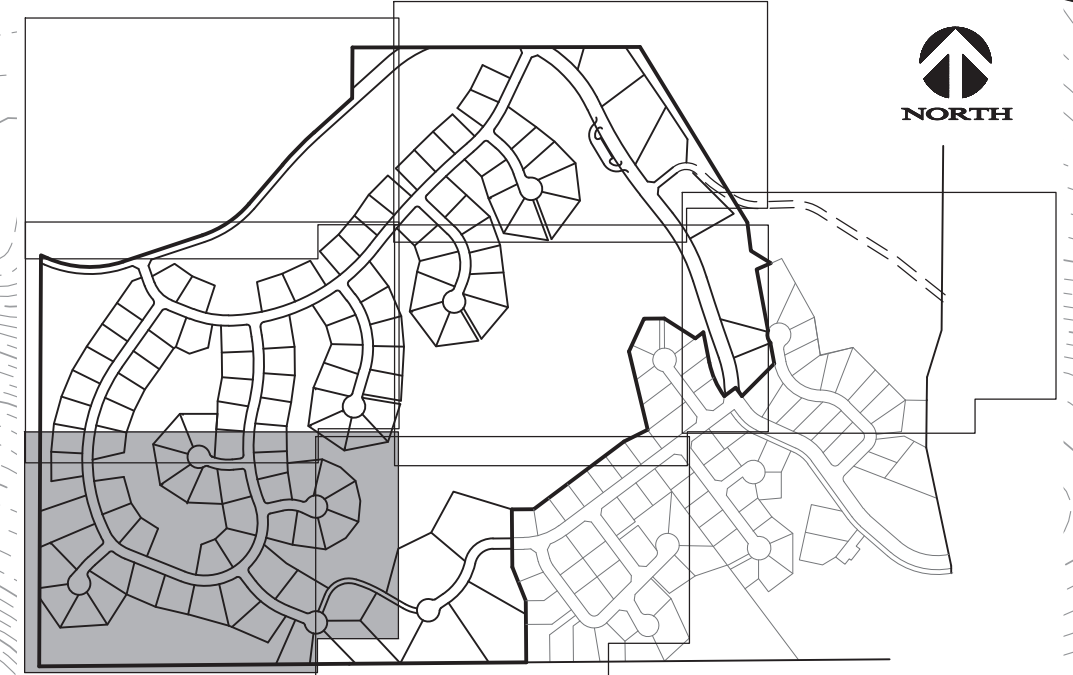
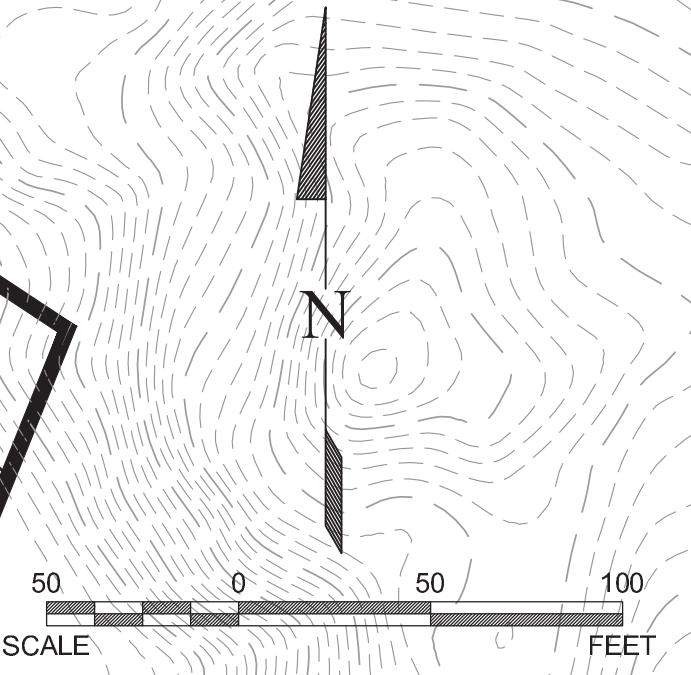

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SUNSET POINTE SUBDIVISION
 PRELIMINARY PLAN
 GRADING & DRAINAGE PLAN 4

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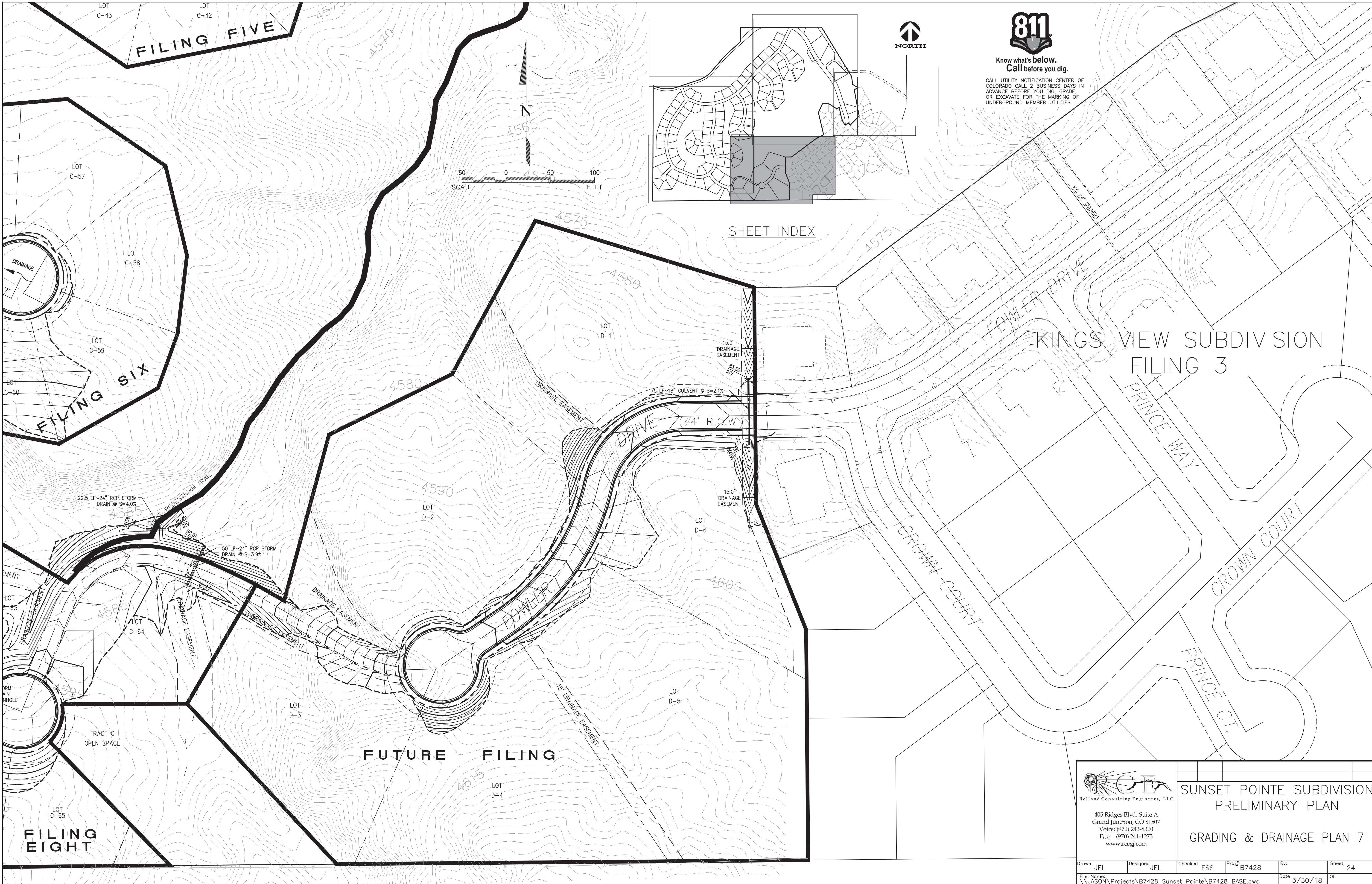


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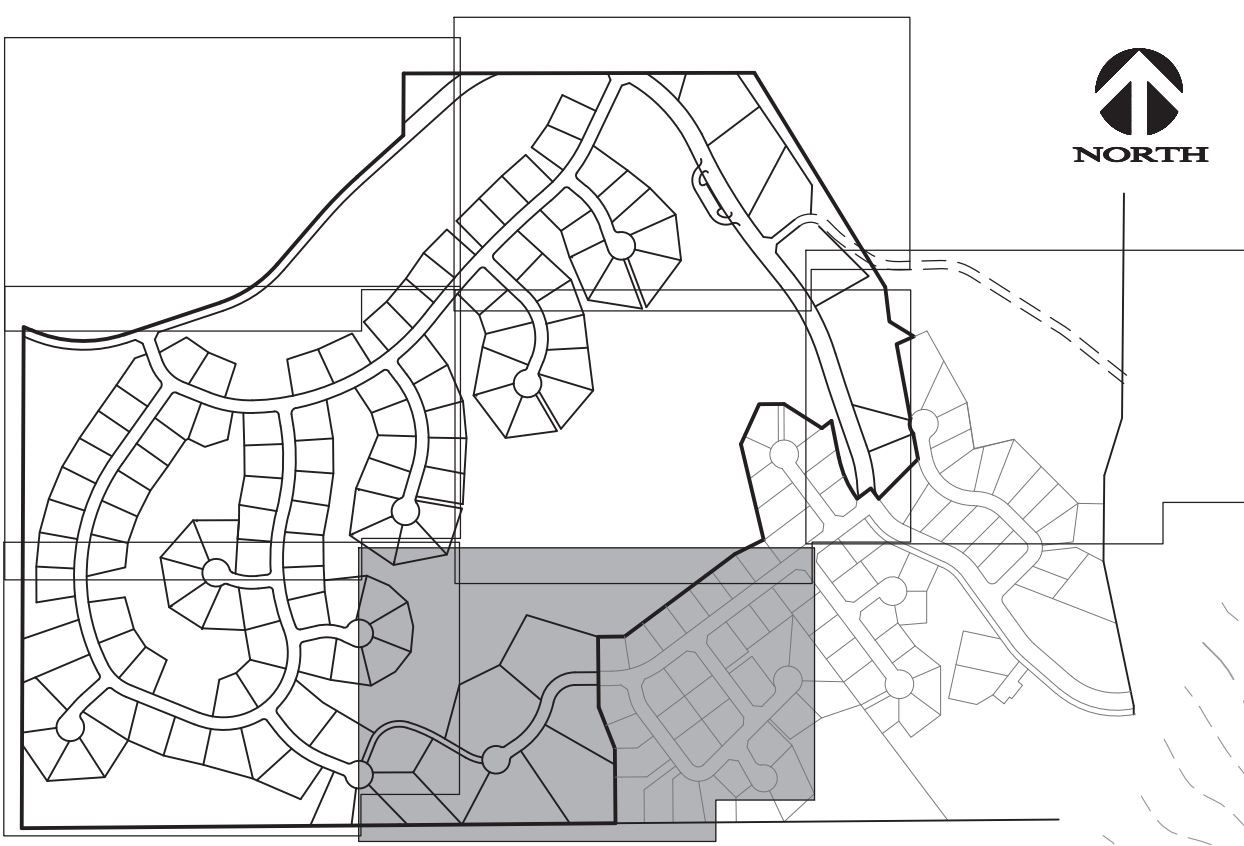
SUNSET POINTE SUBDIVISION
PRELIMINARY PLAN

GRADING & DRAINAGE PLAN 6

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FILING 3

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SUNSET POINTE SUBDIVISION
PRELIMINARY PLAN
GRADING & DRAINAGE PLAN 7

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