PRELIMINARY DRAINAGE REPORT
FOR
VILLAGES AT STERLING RANCH

CCES
Responses

Prepared for:
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Job No. 1183.26

PCD Project No.
PUDSP-226

CLASSIC CONSULTING℠

FINAL DRAINAGE REPORT FOR VILLAGES AT STERLING RANCH

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

____ __________________
Catherine M. Tessin P.E. #45004 Date

OWNER'S/DEVELOPER'S STATEMENT:
I, the owner/developer, have read and will comply with all of the requirements specified in this drainage report and plan.

Business Name: CLASSIC SRJ LAND, LLC

By: ________________________________

Title: ________________________________

Address: 2138 Flying Horse Club Drive

Colorado Springs, CO 80921

EL PASO COUNTY:
Filed in accordance with the requirements of the Drainage Criteria Manual, Volumes 1 and 2, El Paso County Engineering Criteria Manual and Land Development Code as amended.

________________________________ __________________
For County Engineer, / ECM Administrator Date

Conditions:

TABLE OF CONTENTS:

APPENDICES

PURPOSE

The purpose of this Preliminary Drainage Report is to address on-site and off-site drainage quantities and patterns, compare to approved MDDP and identify general drainage improvements and facilities required to minimize impacts to the adjacent properties.

GENERAL DESCRIPTION

The subject site is Villages at Sterling Ranch**.** This PUD consists of development area southeast of the intersection of Briargate Parkway and Sterling Ranch Road. The total PUD area is **39.058 acres** and includes the proposed Right-of-way extension of Briargate Pkwy. It is located in portions of section 34, township 12 south, range 65 west of the sixth principal meridian. The site is bounded on the north, east and south by future Sterling Ranch East property (zoned for future urban development) and to the west by the proposed Sterling Ranch Road. The site is in the upper portion of Sand Creek East Fork Drainage Basin. Urban single family residential development including four different product types and a total of **227 lots** is proposed within this PUD.

The average soil condition reflects Hydrologic Group “A” (Blakeland loamy sand and Columbine gravelly sandy loam) as determined by the “Web Soil Survey of El Paso County Area,” prepared by the Natural Resources Conservation Service (see map in Appendix).

EXISTING DRAINAGE CONDITIONS

EX1 (Q_5= 7.5 cfs and Q_{100} = 55.2 cfs) Basin EX1 is 32.39 acres of vacant land within proposed site. This area drains to the south. This basin was also represented in the referenced Preliminary Drainage Report for Sterling Ranch East Filing No. 5 existing conditions, within *Basin EX-9 and EX-10A*. See this report for overall modeling, routing, and historic release discussion.

EX2 (Q_5= 1.1 cfs and Q_{100} = 8.3 cfs) Basin EX2 is 5.25 acres of vacant land within proposed site. This area drains to the west. This basin was also represented in the referenced Final Drainage Report for Sterling Ranch East Filing No. 5 existing conditions, within *Basin EX-9 and EX-10A*. See this report for overall modeling, routing, and historic release discussion. Currently, the basin drains to the west toward inlets installed in future Briargate ROW and an existing public storm system that will ultimately outfall to the Full Spectrum Detention Facility in Sterling Ranch East Filing No 1.

EX3 (Q$_5$= 0.4 cfs and Q$_{100}$ = 3.3 cfs) Basin EX3 is 1.56 acres of vacant land within proposed site. This area drains to the west. This basin was also represented in the referenced Final Drainage Report for Sterling Ranch East Filing No. 5 existing conditions, within *Basin EX-9 and EX-10A*. See this report for overall modeling, routing, and historic release discussion. Currently, the basin drains to the west toward existing Sterling Ranch Road ROW and an existing public storm system that will ultimately outfall to the Full Spectrum Detention Facility in Sterling Ranch East Filing No 1.

Existing conditions calculations are provided in this report Appendix for Basins EX1, EX2, and EX3. The following Existing Refences section includes the references to the overall Approved MDDP and adjacent Final Drainage Reports that will be used for stormwater compliance related to release rates, routing, and stormwater quality and detention requirements for proposed Villages at Sterling Ranch East. The Final Drainage Report for Sterling Ranch East Filing No. 5 includes a full existing conditions overall calculation modeling for the subject site and surrounding properties. This report will rely upon this for existing "historic" conditions modeling. See Appendix for maps and calculation references.

EXISTING REFERENCES

Final Drainage Report for Sterling Ranch East Filing No. 5

The subject site has been included in the Final Drainage Report for Sterling Ranch East Filing No. 5, currently in review. This site was identified in *Basins P4-B (32.2 acres), OS-3 (0.25 acres), and OS-1 (2.6 acres)*. Basin P4-B was described as residential land use at 67.6% impervious, with total flows of Q$_5$= 48 cfs and Q$_{100}$ = 106 cfs. Total flows will be directed to a proposed 48" RCP public storm pipe stub in Oak Park Drive (Pipe Run 1) that will intercept the total developed flow condition. Pipe Run 1 and the total developed flow will be tributary to the proposed Pond FSD

14-B, with calculations and final design to be provided in this Final Drainage Report. References included in Appendix.

<u>Final Drainage Report for Sterling Ranch East Filing No. 1</u>

Portions of the subject site has been included in the approved Final Drainage Report for Sterling Ranch East Filing No. 1. This site was identified in the following

Basins P1-A5 (1.86 acres) Q_5*= 4.7 cfs and* Q_{100} *= 10.3 cfs*

P1-A6 (3.55 acres) Q_5*= 8.0 cfs and* Q_{100} *= 17.3 cfs*

P1-A7 (3.11 acres) Q_5*= 7.0 cfs and* Q_{100} *= 15.7 cfs*

P2-B2 (1.87 acres) Q_5*= 5.2 cfs and* Q_{100} *= 10.7 cfs*

Total flows will be directed to the existing public storm systems in future Briargate Parkway and Sterling Ranch Road right of way, as described in this approved report. See reference section included in Appendix.

PROPOSED DRAINAGE CONDITIONS

As referenced in the previously approved reports, this site is proposed residential development that matches previously approved “C” values, runoff routing, and developed runoff conditions. Since this site was fully studied in the previously approved Sterling Ranch East Filing No. 5 Preliminary Drainage Report, it has been included in this submittal as reference for the Proposed Drainage Conditions, Detention and Stormwater Quality Facility discussion, and conformance to current El Paso County criteria for overall treatment and release rates of developed stormwater.

<u>Design Point 1 (</u>Q_5= 6.6 cfs and Q_{100} = 13.4 cfs) includes Basin A. Basin A is single family residential land use. Total flows are directed to a proposed 10’ public sump inlet in Shorwood Drive. Stormwater is ultimately routed to the south into Sterling Ranch East Filing No. 5, where a proposed Full Spectrum Detention Facility will detain and provide Stormwater Quality for the full tributary area.

Design Point 2 (Q_5= 0.7 cfs and Q_{100} = 1.2 cfs) includes Basin B. Basin B is single family residential land use. Total flows are directed to a proposed 5' public sump inlet in Shorewood Drive. Stormwater is ultimately routed to the south into Sterling Ranch East Filing No. 5, where a proposed Full Spectrum Detention Facility will detain and provide Stormwater Quality for the full tributary area.

Design Point 3A (Q_5= 8.7 cfs and Q_{100} = 19.5 cfs) includes Basin E. Basins E is single family residential land use. Total flows are directed to an at-grade 10's public inlet in Shorewood Drive. Flow by will be routed to Design Point 3. Stormwater is ultimately routed to the south into Sterling Ranch East Filing No. 5, where a proposed Full Spectrum Detention Facility will detain and provide Stormwater Quality for the full tributary area.

Basin D?

Yes, includes Basin D Added

Design Point 3&4 (Q_5= 4.9 cfs and Q_{100} = 15.3 cfs Design Point 3) (Q_5= 0.6 cfs and Q_{100} = 1.1 cfs Design Point 4) includes Basin C and Basin E. Basins C and E are single family residential land use. Total flows are directed to (2) 10's public sump inlets in Shorewood Drive. Stormwater is ultimately routed to the south into Sterling Ranch East Filing No. 5, where a proposed Full Spectrum Detention Facility will detain and provide Stormwater Quality for the full tributary area.

Design Point 5 (Q_5= 10.9 cfs and Q_{100} = 23.0 cfs) includes Basin I, Basin J, and Basin K. Basins I, J, and K are single family residential land use. Total flows are directed to (2) 10's public sump inlets in St. Louis Street. Stormwater is ultimately routed to the south into Sterling Ranch East Filing No. 5, where a proposed Full Spectrum Detention Facility will detain and provide Stormwater Quality for the full tributary area.

Would Basin S be more likely to flow straight through the cross pan to DP 6A instead of turning and going to DP6?

Yes, Basin S will travel across crosspan to DP 6A. Revised

Design Point 6 (Q_5= 3.1 cfs and Q_{100} = 7.7 cfs) includes Basin L and S. Ba family residential land use that includes open space with amenities. Total a 10' public sump inlet in St. Louis Street. Stormwater is ultimately rou Sterling Ranch East Filing No. 5, where a proposed Full Spectrum Detention Facility will detain and provide Stormwater Quality for the full tributary area.

Design Point 6A (Q_5= 5.7 cfs and Q_{100} = 11.4 cfs) includes Basin F. Basin F is single family residential land use. Total flows are directed to a 10's public sump inlet in Oak Park Drive. Stormwater is ultimately routed to the south into Sterling Ranch East Filing No. 5, where a proposed Full Spectrum Detention Facility will detain and provide Stormwater Quality for the full tributary area.

Design Point 7 (Q_5= 4.7 cfs and Q_{100} = 9.5 cfs) includes Basin O. Basin O is single family residential land use. Total flows are directed to (2) 5's public sump inlets in Fort Wayne Heights. Stormwater is ultimately routed to the south into Sterling Ranch East Filing No. 5, where a proposed Full Spectrum Detention Facility will detain and provide Stormwater Quality for the full tributary area.

Design Point 8 (Q_5= 3.9 cfs and Q_{100} = 7.4 cfs) includes Basin P. Basin P is single family residential land use. Total flows are directed to a 5' public sump inlet in Oak Park Drive. Stormwater is ultimately routed to the south into Sterling Ranch East Filing No. 5, where a proposed Full Spectrum Detention Facility will detain and provide Stormwater Quality for the full tributary area.

Design Point 9 (Q_5= 1.4 cfs and Q_{100} = 2.5 cfs) includes Basin Q. Basin Q is single family residential land use. Total flows are directed to a 5' public sump inlet in Oak Park Drive. Stormwater is ultimately routed to the south into Sterling Ranch East Filing No. 5, where a proposed Full Spectrum Detention Facility will detain and provide Stormwater Quality for the full tributary area.

Design Point 10 (Q_5= 5.2 cfs and Q_{100} = 10.5 cfs) includes Basin N. Basin N is single family residential land use. Total flows are directed to (2) 5' public sumps inlet in Branson Heights. Stormwater is ultimately routed to the south into Sterling Ranch East Filing No. 5, where a proposed Full Spectrum Detention Facility will detain and provide Stormwater Quality for the full tributary area.

Design Point 11 (Q_5= 5.1 cfs and Q_{100} = 10.4 cfs) includes Basin M. Basin M is single family residential land use. Total flows are directed to (2) 5’ public sumps inlet in Branson Heights. Stormwater is ultimately routed to the south into Sterling Ranch East Filing No. 5, where a proposed Full Spectrum Detention Facility will detain and provide Stormwater Quality for the full tributary area.

Design Point 12 (Q_5= 1.1 cfs and Q_{100} = 2.0 cfs) includes Basin R. Basin R is single family residential land use. Total flows are directed to a 5’ public sump inlet in Oak Park Drive. Stormwater is ultimately routed to the south into Sterling Ranch East Filing No. 5, where a proposed Full Spectrum Detention Facility will detain and provide Stormwater Quality for the full tributary area.

Basin T (Q_5= 0.9 cfs and Q_{100} = 1.6 cfs) is mainly composed of street flows from Oak Park Drive. Developed runoff will be routed to the east and then south into St. Louis Street. Stormwater is ultimately routed to the south into Sterling Ranch East Filing No. 5, where a proposed Full Spectrum Detention Facility will detain and provide Stormwater Quality for the full tributary area.

Basin U (Q_5= 0.8 cfs and Q_{100} = 1.4 cfs) is mainly composed of street flows from Oak Park Drive. Total flows are directed to the west into existing Sterling Ranch Road.

Basin V (Q_5= 0.5 cfs and Q_{100} = 3.9 cfs mainly composed of street flows from Oak Park Drive and open space along the perimeter of the subdivision. Developed runoff is directed into existing Sterling Ranch Road to the west.

Basin G (Q_5= 1.4 cfs and Q_{100} = 3.1cfs mainly composed of ROW landscaping along Future Briargate Parkway. Developed runoff is directed into the existing inlets in future Briargate Parkway.

Basin U and V have been accounted for in downstream approved Final Drainage Report for Sterling Ranch East Filing No. 1, where a proposed Full Spectrum Detention Facility will detain and provide Stormwater Quality for the full tributary area.

Basin X (Q_5= 12.4 cfs and Q_{100} = 23.2 cfs mainly composed of street flows from future Briargate Parkway. Developed runoff is directed into the low point east of Sterling Ranch Road. Developed runoff intercepted at this location has been reviewed and approved in all prior reference reports. The developed runoff is collected and conveyed to the south in Sterling Ranch Road, and ultimately directed to a proposed Full Spectrum Detention Facility in Sterling Ranch East Filing No. 1. (See Basins *P1-A6, P1-A7, P1-A5 Basins* in Final Drainage Report for Sterling Ranch East Fling No. 1.)

Basin W (Q_5= 1.2 cfs and Q_{100} = 2.2 cfs mainly composed rear yard flows from the residential lots along the east property line. Developed runoff is directed across the pervious backyard area and will be directed to future development to the east.

Pipe Run 21 (Q_5= 51.3 cfs and Q_{100} = 106.9 cfs represents the total developed stormwater that will be routed into the stormwater stub from Sterling Ranch East Filing No. 5 to the south in St. Louis Street. (See reference to Final Drainage Report for Sterling Ranch East Filing No. 5, *Pipe Run 1*).

DRAINAGE COMPLIANCE

Final Drainage Report for Sterling Ranch East Filing No. 5	***This report:***
32.2 acres Basin P4-B @ 67.6% impervious	33.13 acres proposed: 65.4%
Total flows of Q_5*= 48 cfs and* Q_{100} *= 106 cfs.*	Proposed: Q_5= 48.4 cfs and Q_{100} = 103.2 cfs

Total flows tributary to Sterling Ranch East Filing No. 5 will be collected and conveyed as described in this report and routed to the proposed Full Spectrum Detention Facility FSD-14B. As demonstrated above, the majority of the subject site is conveyed, collected, and routed to the Full Spectrum Detention Pond FSD-14B in accordance with this and all prior approved reports.

Total flows, areas, routing, and calculations are all within compliance of prior reports and minor differences in calculations are related to negligible differences in final design details and will not adversely impact downstream developments.

The majority of this site drains directly south to Sterling Ranch East Filing No. 5. Proposed drainage will be collected in a Full Spectrum Detention Pond FSD-14B as described in this report, prior to be discharged. This is an accordance with all prior approved reports for Sterling Ranch.

in

The remaining minor basins that are not tributary to Sterling Ranch East Filing No. 5 will be directed toward existing Sterling Ranch Road, ultimately being routed into Sterling Ranch East Filing No. 1. Per the Filing 1 approved report, proposed drainage will be collected in a Full Spectrum Detention Pond 14A prior to release to Sand Creek. All Sand Creek Channel Improvements required for Sterling Ranch have been approved in the prior report “Final Design Report for Sand Creek Restoration”, JR Engineering, LLC, dated October 21, 2021.

DRAINAGE CRITERIA

Hydrologic calculations were performed using the City of Colorado Springs/El Paso County Drainage Criteria Manual, as revised in November 1991 and October 1994 with County adopted Chapter 6 and Section 3.2.1 of Chapter 13 of the City of Colorado Springs/El Paso County Drainage Criteria Manual as revised in May 2014. Individual on-site developed basin design used for detention/SWQ basin sizing, inlet sizing and storm system routing was calculated using the Rational Method. Runoff Coefficients are based on the imperviousness of the particular land use and the hydrologic soil type in accordance with Table 6-6. The average rainfall intensity, by recurrence interval found in the Intensity-Duration-Frequency (IDF) curves in Figure 6-5. (See Appendix)

The City of Colorado Springs/El Paso County DCM requires the Four Step Process for receiving water protection that focuses on reducing runoff volumes, treating the water quality capture volume (WQCV), stabilizing drainage ways, and implementing long-term source controls. The Four Step Process pertains to management of smaller, frequently occurring storm events, as opposed to larger storms for which drainage and flood control infrastructure are sized. Implementation of these four steps helps to achieve storm water permit requirements.

This site adheres to this **Four Step Process** as follows:

1. **Employ Runoff Reduction Practices:** (**NOTE: Runoff reduction was calculated and proved in Sterling Ranch East Filing No. 5 as it relates to the proposed Full Spectrum Detention FSD-14B. As such, the following applies for the subject site for step 1:**
    a. *All proposed lot impervious area (roof tops, patios, etc.) will sheet flow across landscaped portions of front and rear yards and through open space areas to slow runoff and increase time of concentration prior to being conveyed to the proposed public streets or detention facilities. This will minimize directly connected impervious areas within the project site.*

    Reference the Water Quality Treatment Plan Map from Approved Sterling Ranch East Filing No. 5 (including the subject site) in the Appendix for the following calculations:

Area treated in proposed permanent Pond FSD-14B *(Area includes 37.3 ac. from anticipated Villages site)*	*74.65 ac.*
Area treated in proposed permanent Pond FSD-11B	*7.61 ac.*
Area treated in temporary sediment basin *(Basin AA – Rear yards)*	*2.10 ac.*
Area of runoff reduction water quality treatment *(Basins Y1 - Buffer, Y2 - Buffer and Z – Rear yards* *Reference Runoff Reduction Calculations in Appendix for these areas)*	*3.48 ac.*
Filing No. 5 anticipated total platted area	***47.17 ac.***

2. **Stabilize Drainageways:** After developed flows utilize the runoff reduction practices through the front and rear yards, developed flows will travel via curb and gutter within the public streets and eventually public storm systems. These collected flows are then routed directly to the proposed extended detention basins (full-spectrum facilities). Where developed flows are not able to be routed to public street, sheet flows will travel across landscaped rear yards and then through undeveloped property prior to being released off-site.

3. **Provide Water Quality Capture Volume (WQCV):** Runoff from this development will be treated through capture and slow release of the WQCV and excess urban runoff volume (EURV) in the proposed Full-Spectrum permanent Extended Detention Basins designed per current El Paso County drainage criteria. For the 4.5 ac. that is not able to be captured and routed to one of the permanent EDB's, Runoff Reduction practices are required and provided in the rear setbacks of the lots or within the open space tract within these specific basins. Reference Runoff Reduction Calculations in Appendix for these areas that show a 100% WQCV Reduction and meets El Paso County standards as provided in the Approved PDR for Sterling Ranch East Filing No. 5.

4. **Consider need for Industrial and Commercial BMPs**: No industrial or commercial uses are proposed within this development. However, a site-specific storm water quality and erosion control plan and narrative along with the grading and erosion control plan will be submitted with the future Final Plat submittal. Details such as site-specific sediment and erosion control construction BMP's as well as temporary and permanent BMP's will be detailed in this plan and narrative to protect receiving waters. BMP's will be constructed and maintained as the development has been graded and erosion control methods employed.

FLOODPLAIN STATEMENT

No portion of this site is located within a floodplain as determined by the Flood Insurance Rate Maps (F.I.R.M.) Map Numbers 08041C 0533G and 08041C 0535G with effective dates of December 7, 2018 and the previously mentioned LOMR 08-08-0541P with an effective date of July 23, 2009. (See Appendix).

DRAINAGE AND BRIDGE FEES

This site lies entirely within the Sand Creek Drainage Basin boundaries.

Fees are calculated using the following impervious acreage method approved by El Paso County. The final fee estimate will be included in the Final Drainage Report(s), however, the following represent fee estimates based on the Sterling Ranch East Preliminary Plan/PUD submittal with a total area of 39.06 acres with the following different land uses proposed:

10.99 Acres	ROW
3.45 Acres	Tracts for Access
8.40 Acres	Open Space Tracts
16.22 Acres	Less than 6000 SF lot size
39.06 Acres	**Total**

The percent imperviousness for this subdivision is calculated as follows:

<u>Fees for Road Right-of-Way</u>

(Per El Paso County Percent Impervious Chart: 85**%**)

10.99 Ac. x 85% = **9.34 Impervious Ac.**

<u>Fees for Open Space Tracts</u>

(Per El Paso County Percent Impervious Chart: 7**%**)

8.40 Ac. x 7% = **0.59 Impervious Ac.**

<u>Fees for less than 6000 SF lots w/ Tracts for Access</u>

(Per El Paso County Percent Impervious Chart: 65**%)**

19.67 Ac. x 65% = **12.79 Impervious Ac.**

Total Impervious Acreage: **22.72 Imp. Ac.**

The following calculations are based on the 2024 Sand Creek drainage/bridge fees:

ESTIMATED FEE TOTALS:

Bridge Fees

$ 9,743 x 22.72 Impervious Ac. = **$ 221,360.96**

Drainage Fees

$ 23,821 x 22.72 Impervious Ac. = **$ 541,213.12**

SUMMARY

The proposed Villages at Sterling Ranch is within the Sand Creek Drainage Basin. Recommendations are made within this report concerning necessary improvements that will be required as a result of development of this property. The points of storm water release from the proposed site are required to be at or below the calculated historic flow quantities. The development of the proposed site does not significantly impact any downstream facility or property to an extent greater than that which currently exists in the pre-development conditions. All drainage facilities within this report were sized according to the Drainage Criteria Manuals and the full-spectrum storm water quality requirements.

PREPARED BY:

Classic Consulting Engineers & Surveyors, LLC

Catherine M. Tessin, P.E.
Project Manager

REFERENCES

1. City of Colorado Springs/County of El Paso Drainage Criteria Manual as revised in November 1991 and October 1994 with County adopted Chapter 6 and Section 3.2.1 of Chapter 13 of the City of Colorado Springs/El Paso County Drainage Criteria Manual as revised in May 2014.

2. "Urban Storm Drainage Criteria Manual Volume 1, 2 & 3" Urban Drainage and Flood Control District, dated January 2016.

3. "Sand Creek Drainage Basin Planning Study," Kiowa Engineering Corporation, dated March 1996.

4. "2018 Sterling Ranch MDDP", M&S Civil Consultants, Inc., June 2018

5. "Final Drainage Report for Retreat at TimberRidge Filing No. 1", Classic Consulting, approved November, 2020.

6. "Final Drainage Report for Retreat at TimberRidge Filing No. 2", Classic Consulting, dated March, 2022

7. "Final Design Report for Sand Creek Restoration", JR Engineering, LLC, dated October 21, 2021

8. "Drainage Letter for Sterling Ranch Road and Briargate Pkwy. Interim Plan", prepared by JR Engineering, LLC, dated December 2021

9. "Sterling Ranch MDDP Amendment No. 2 & Preliminary Drainage Report for Sterling Ranch East Preliminary Plan No. 1", prepared by Classic Consulting, approved January 2023.

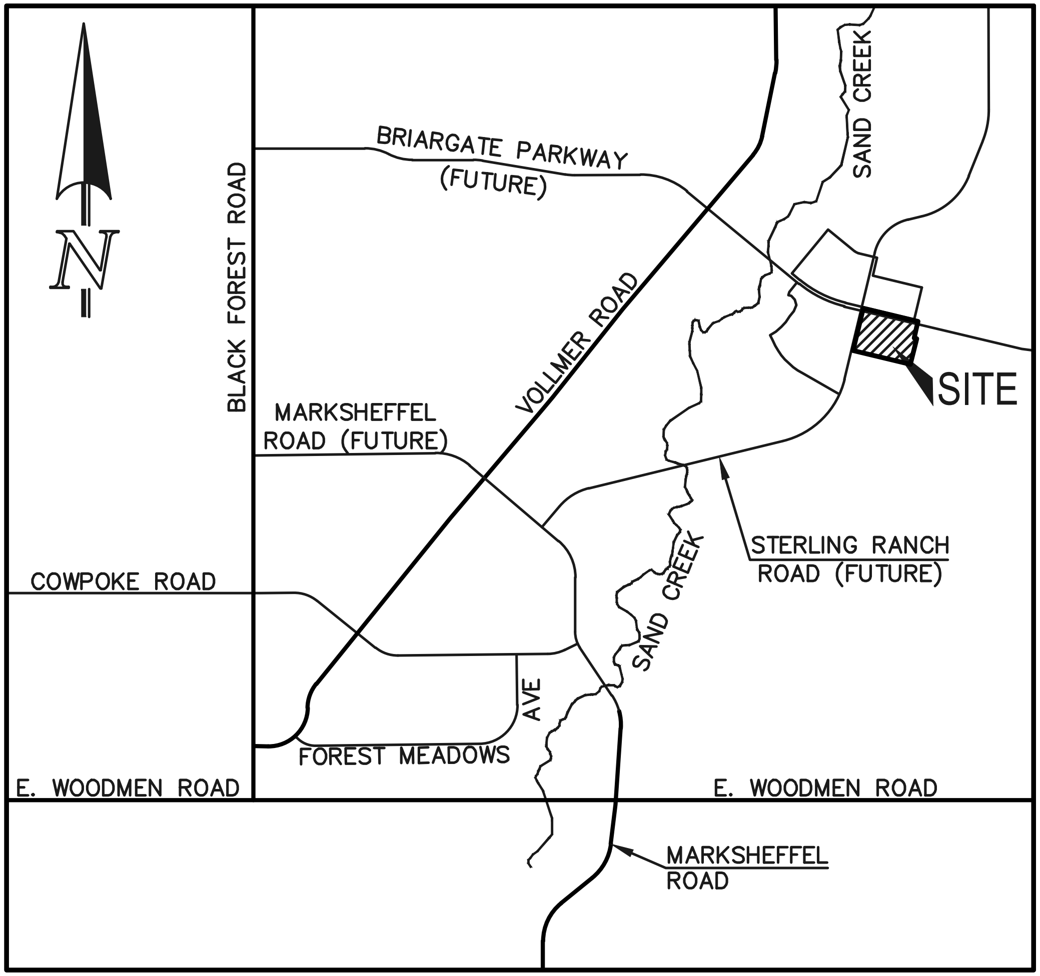
10. "Final Drainage Report for Sterling Ranch East Filing No. 2", prepared by Classic Consulting, approved 2024.

11. "Preliminary Drainage Report for Sterling Ranch East Filing No. 5 Preliminary Plan", prepared by Classic Consulting, approved January 2024.

12. "Final Drainage Report for Sterling Ranch East Filing No. 1", prepared by Classic Consulting, approved July 2024.

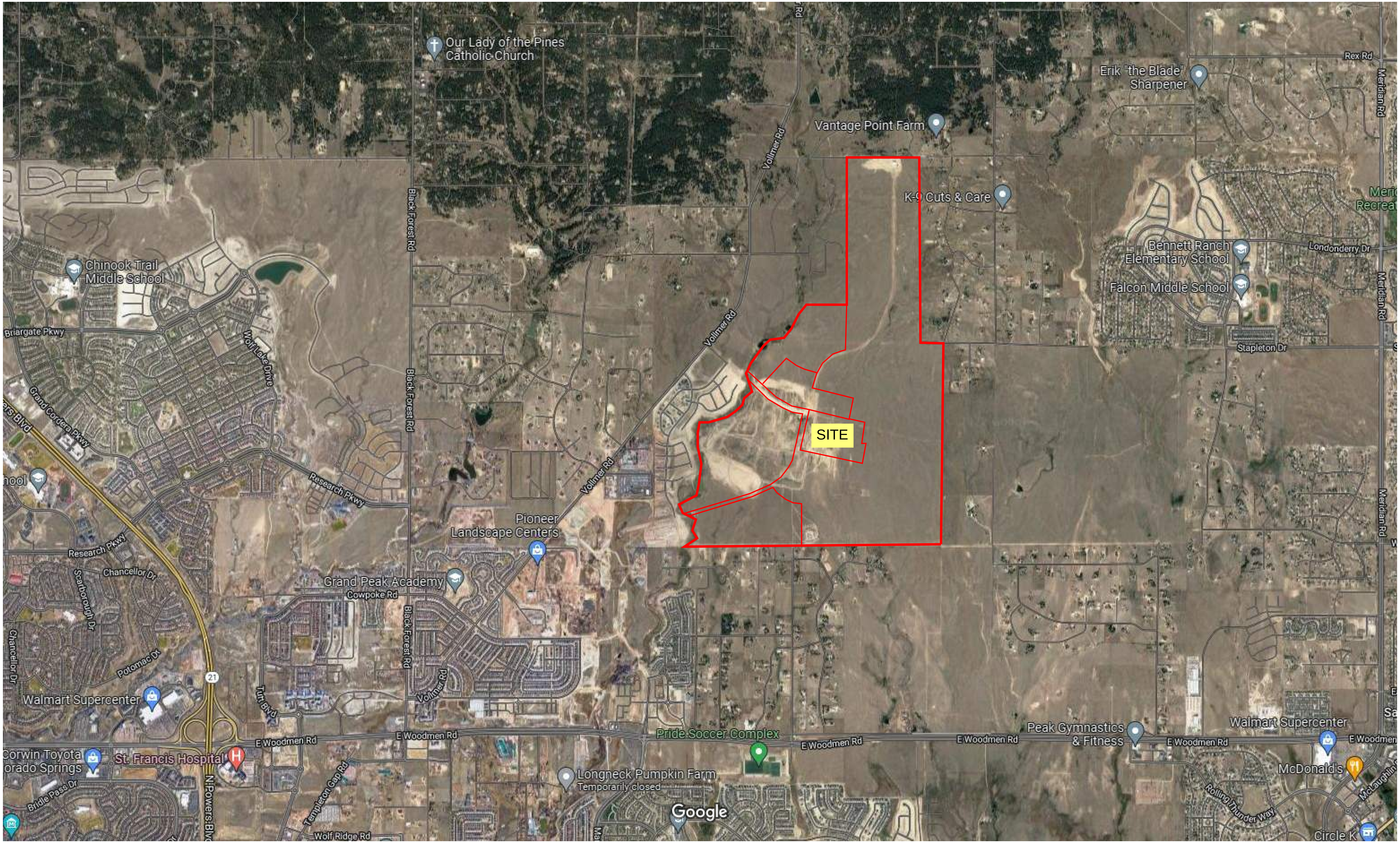
APPENDIX

VICINITY MAP



VICINITY MAP

NOT TO SCALE



Imagery ©2022 Landsat / Copernicus, Maxar Technologies, USDA/FPAC/GEO, Map data ©2022

VICINITY MAP

SOILS MAP (S.C.S SURVEY)

Soil Map—El Paso County Area, Colorado

Map Scale: 1:7,100 if printed on A landscape (11" x 8.5") sheet.

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

- ▭ Soil Map Unit Polygons
- ~ Soil Map Unit Lines
- ■ Soil Map Unit Points

Special Point Features

- ☉ Blowout
- ⊠ Borrow Pit
- ✱ Clay Spot
- ◇ Closed Depression
- ✕ Gravel Pit
- ∴ Gravelly Spot
- ⊗ Landfill
- Λ Lava Flow
- ⊥ Marsh or swamp
- ⚒ Mine or Quarry
- ◎ Miscellaneous Water
- ○ Perennial Water
- ∨ Rock Outcrop
- + Saline Spot
- ⁙ Sandy Spot
- ⊖ Severely Eroded Spot
- ◈ Sinkhole
- » Slide or Slip
- ∅ Sodic Spot
- ≡ Spoil Area
- ◊ Stony Spot
- ∞ Very Stony Spot
- ψ Wet Spot
- △ Other
- - - Special Line Features

Water Features

- ~ Streams and Canals

Transportation

- ┼┼┼ Rails
- ~ Interstate Highways
- ~ US Routes
- ~ Major Roads
- ~ Local Roads

Background

- ▨ Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 19, Aug 31, 2021

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

Date(s) aerial images were photographed: Sep 11, 2018—Oct 20, 2018

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	43.6	18.4%
19	Columbine gravelly sandy loam, 0 to 3 percent slopes	192.4	81.5%
71	Pring coarse sandy loam, 3 to 8 percent slopes	0.2	0.1%
Totals for Area of Interest		**236.2**	**100.0%**

El Paso County Area, Colorado

8—Blakeland loamy sand, 1 to 9 percent slopes

Map Unit Setting

National map unit symbol: 369v
Elevation: 4,600 to 5,800 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Blakeland and similar soils: 98 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blakeland

Setting

Landform: Hills, flats
Landform position (three-dimensional): Side slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock and/or eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 11 inches: loamy sand
AC - 11 to 27 inches: loamy sand
C - 27 to 60 inches: sand

Properties and qualities

Slope: 1 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R049XB210CO - Sandy Foothill
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 1 percent
Hydric soil rating: No

Pleasant

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 19, Aug 31, 2021

El Paso County Area, Colorado

19—Columbine gravelly sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 367p
Elevation: 6,500 to 7,300 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Columbine and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Columbine

Setting

Landform: Flood plains, fan terraces, fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 14 inches: gravelly sandy loam
C - 14 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R049XY214CO - Gravelly Foothill
Hydric soil rating: No

Minor Components

Fluvaquentic haplaquolls

Percent of map unit: 1 percent

Landform: Swales
Hydric soil rating: Yes

Other soils

Percent of map unit: 1 percent
Hydric soil rating: No

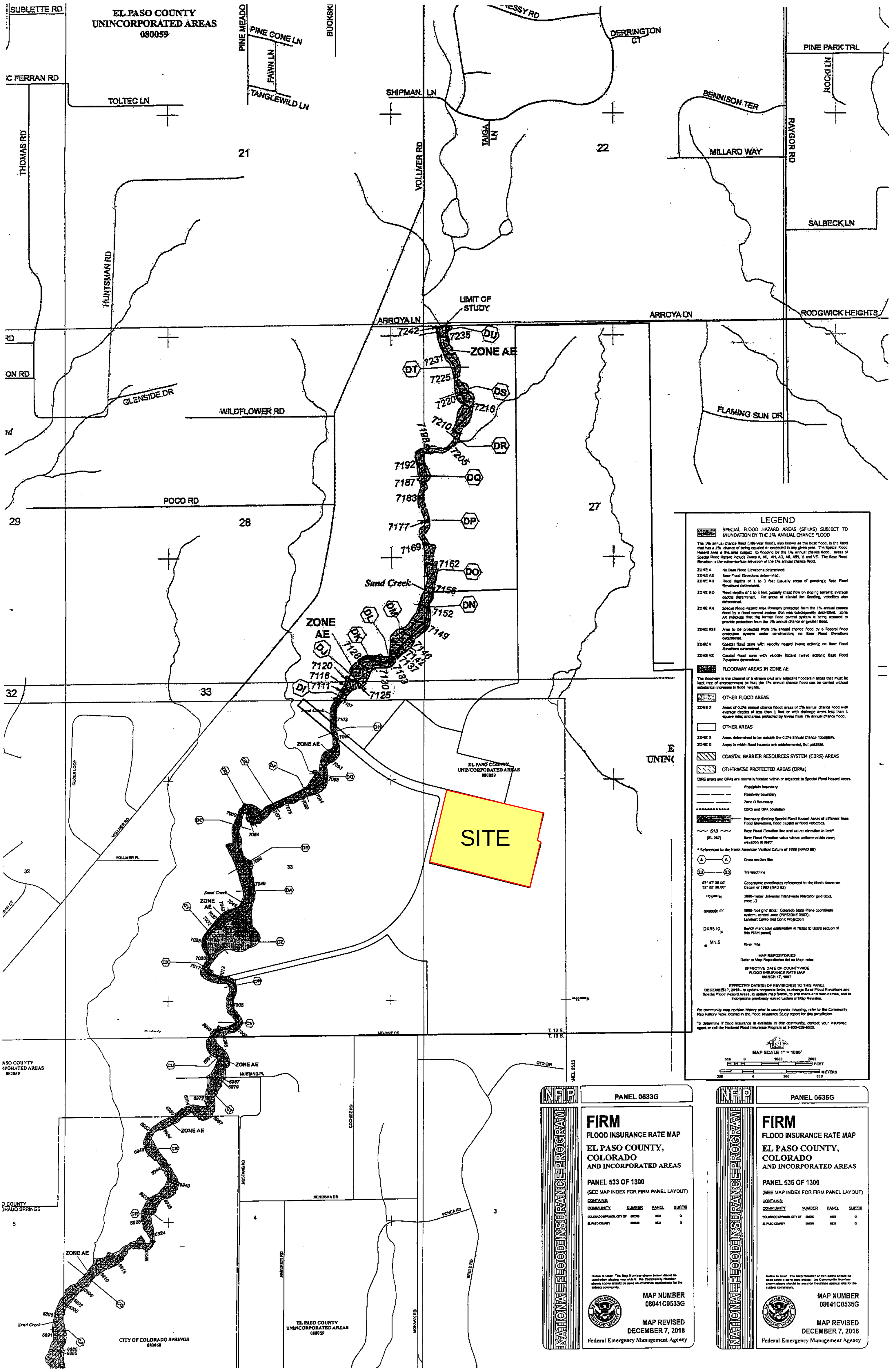
Pleasant

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 19, Aug 31, 2021

F.E.M.A. MAP / LOMR (08-08-0541P)



LEGEND

▨ SPECIAL FLOOD HAZARD AREAS (SFHAS) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

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

▨ FLOODWAY AREAS IN ZONE AE

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

▨ OTHER FLOOD AREAS

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

☐ OTHER AREAS

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

▨ COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

▨ OTHERWISE PROTECTED AREAS (OPAs)

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

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

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

(A)——(A)	Cross section line
(23)——(23)	Transect line
97° 07' 30.00" 32° 22' 30.00"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4275000mN	1000-meter Universal Transverse Mercator grid ticks, zone 13
6000000 FT	5000-foot grid ticks: Colorado State Plane coordinate system, central zone (FIPSZONE 0502), Lambert Conformal Conic Projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

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

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

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

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

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

300 0 300 600 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0533G

FIRM
FLOOD INSURANCE RATE MAP

EL PASO COUNTY,
COLORADO
AND INCORPORATED AREAS

PANEL 533 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLORADO SPRINGS, CITY OF	[illegible]	[illegible]	G
EL PASO COUNTY	[illegible]	[illegible]	G

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

MAP NUMBER
08041C0533G

MAP REVISED
DECEMBER 7, 2018

Federal Emergency Management Agency

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0535G

FIRM
FLOOD INSURANCE RATE MAP

EL PASO COUNTY,
COLORADO
AND INCORPORATED AREAS

PANEL 535 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLORADO SPRINGS, CITY OF	[illegible]	[illegible]	G
EL PASO COUNTY	[illegible]	[illegible]	G

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

MAP NUMBER
08041C0535G

MAP REVISED
DECEMBER 7, 2018

Federal Emergency Management Agency

PRELIMINARY HYDROLOGIC/HYDRAULIC DRAINAGE CALCULATIONS

Provide hydrologic calculations for 3 existing drainage basins

Now included on map calculation sheet and Appendix

JOB NAME: *STERLING RANCH EAST VILLAGES*
JOB NUMBER: *1183.26*
DATE: *12/17/24*
CALCULATED BY: *CMT*

Unresolved:
Indicate if this is existing or proposed conditions

BASIN RUNOFF COEFFICIENT SUMMARY

Now existing and proposed condition calculations labeled and provided

BASIN	TOTAL AREA (AC)	C VALUE DCM TABLE 6-6						C VALUE DCM TABLE 6-6						VALUE			WEIGHTED CA			WEIGHTED IMP.
		e	PERCENT IMP.	AREA (AC)	C(2)	C(5)	C(100)	LAND USE	PERCENT IMP.	AREA (AC)	C(2)	[illegible]	[illegible]	[illegible]	[illegible]	C(100)	CA(2)	CA(5)	CA(100)	PERCENT
A	3.04	RES 1/16	70.0%	3.04	0.51	0.54	0.65	LANDSCAPE	7.0%	0.00	0.02	[illegible]	[illegible]	[illegible]	[illegible]	0.65	1.55	1.64	1.98	70.0%
B	0.17	PAVEMENT	100.0%	0.15	0.89	0.90	0.96	LANDSCAPE	7.0%	0.02	0.02	[illegible]	[illegible]	[illegible]	[illegible]	0.90	0.14	0.14	0.15	90.7%
C	1.50	RES 1/16	70.0%	1.50	0.51	0.54	0.65	LANDSCAPE	7.0%	0.00	0.02	[illegible]	[illegible]	[illegible]	[illegible]	0.65	0.77	0.81	0.98	70.0%
D	0.15	PAVEMENT	100.0%	0.13	0.89	0.90	0.96	LANDSCAPE	7.0%	0.02	0.02	[illegible]	[illegible]	[illegible]	[illegible]	0.87	0.11	0.12	0.13	86.1%
E	5.44	RES 1/16	70.0%	4.22	0.51	0.54	0.65	LANDSCAPE	7.0%	1.22	0.02	0.08	0.35	0.40	0.44	0.58	2.18	2.38	3.17	55.9%
F	0.68	RES 1/16	70.0%	0.68	0.51	0.54	0.65	LANDSCAPE	7.0%	0.00	0.02	0.08	0.35	0.51	0.54	0.65	0.35	0.37	0.44	70.0%
G	0.87	RES 1/16	70.0%	0.74	0.51	0.54	0.65	LANDSCAPE	7.0%	0.13	0.02	0.08	0.35	0.44	0.47	0.61	0.38	0.41	0.53	60.6%
I	1.05	RES 1/16	70.0%	1.05	0.51	0.54	0.65	LANDSCAPE	7.0%	0.00	0.02	0.08	0.35	0.51	0.54	0.65	0.54	0.57	0.68	70.0%
J	2.11	RES 1/16	70.0%	1.32	0.51	0.54	0.65	LANDSCAPE	7.0%	0.79	0.02	0.08	0.35	0.33	0.37	0.54	0.69	0.78	1.13	46.4%
K	3.86	RES 1/16	70.0%	3.86	0.51	0.54	0.65	LANDSCAPE	7.0%	0.00	0.02	0.08	0.35	0.51	0.54	0.65	1.97	2.08	2.51	70.0%
L	2.06	RES 1/16	70.0%	1.02	0.51	0.54	0.65	LANDSCAPE	7.0%	1.04	0.02	0.08	0.35	0.26	0.31	0.50	0.54	0.63	1.03	38.2%
M	2.98	RES 1/16	70.0%	2.98	0.51	0.54	0.65	LANDSCAPE	7.0%	0.00	0.02	0.08	0.35	0.51	0.54	0.65	1.52	1.61	1.94	70.0%
N	3.01	RES 1/16	70.0%	3.01	0.51	0.54	0.65	LANDSCAPE	7.0%	0.00	0.02	0.08	0.35	0.51	0.54	0.65	1.54	1.63	1.96	70.0%
O	2.73	RES 1/16	70.0%	2.73	0.51	0.54	0.65	LANDSCAPE	7.0%	0.00	0.02	0.08	0.35	0.51	0.54	0.65	1.39	1.47	1.77	70.0%
P	1.39	PAVEMENT	100.0%	1.11	0.89	0.90	0.96	LANDSCAPE	7.0%	0.28	0.02	0.08	0.35	0.72	0.74	0.84	1.00	1.02	1.16	81.4%
Q	0.36	PAVEMENT	100.0%	0.36	0.89	0.90	0.96	LANDSCAPE	7.0%	0.00	0.02	0.08	0.35	0.89	0.90	0.96	0.32	0.32	0.35	100.0%
R	0.28	PAVEMENT	100.0%	0.28	0.89	0.90	0.96	LANDSCAPE	7.0%	0.00	0.02	0.08	0.35	0.89	0.90	0.96	0.25	0.25	0.27	100.0%
S	0.65	RES 1/16	70.0%	0.65	0.51	0.54	0.65	LANDSCAPE	7.0%	0.00	0.02	0.08	0.35	0.51	0.54	0.65	0.33	0.35	0.42	70.0%
T	0.21	PAVEMENT	100.0%	0.21	0.89	0.90	0.96	LANDSCAPE	7.0%	0.00	0.02	0.08	0.35	0.89	0.90	0.96	0.19	0.19	0.20	100.0%
U	0.21	PAVEMENT	100.0%	0.18	0.89	0.90	0.96	LANDSCAPE	7.0%	0.03	0.02	0.08	0.35	0.76	0.78	0.87	0.16	0.16	0.18	86.1%
V	1.77	RES 1/16	70.0%	0.00	0.51	0.54	0.65	LANDSCAPE	7.0%	1.77	0.02	0.08	0.35	0.02	0.08	0.35	0.04	0.14	0.62	7.0%
W	0.59	RES 1/16	70.0%	0.59	0.51	0.54	0.65	LANDSCAPE	7.0%	0.00	0.02	0.08	0.35	0.51	0.54	0.65	0.30	0.32	0.38	70.0%
X	4.39	PAVEMENT	100.0%	3.73	0.89	0.90	0.96	LANDSCAPE	7.0%	0.66	0.02	0.08	0.35	0.76	0.78	0.87	3.33	3.41	3.81	86.1%
BASIN TOTAL	**39.50**																			
EX1	32.39	PAVEMENT	100.0%	0.00	0.89	0.90	0.96	UNDEVELOPED	2.0%	32.39	0.02	0.08	0.35	0.02	0.08	0.35	0.65	2.59	11.34	2.0%
EX2	5.25	PAVEMENT	100.0%	0.00	0.89	0.90	0.96	UNDEVELOPED	2.0%	5.25	0.02	0.08	0.35	0.02	0.08	0.35	0.11	0.42	1.84	2.0%
EX3	1.56	PAVEMENT	100.0%	0.00	0.89	0.90	0.96	UNDEVELOPED	2.0%	1.56	0.02	0.08	0.35	0.02	0.08	0.35	0.03	0.12	0.55	2.0%

JOB NAME:	***STERLING RANCH EAST VILLAGES***
JOB NUMBER:	***1183.26***
DATE:	***03/28/03***
CALC'D BY:	***CMT***

Return Period	1-Hour Depth
2	1.19
5	1.50
10	1.75
25	2.00
50	2.25
100	2.52

$$t_i = \frac{0.395(1.1 - C_5)\sqrt{L}}{S^{0.33}}$$

$$V = C_v S_w^{0.5}$$

Tc=L/V

Now added

Table 6-7. Conveyance Coefficient, C_v

Type of Land Surface	C_v
Heavy meadow	2.5
Tillage/field	5
Riprap (not buried)*	6.5
Short pasture and lawns	7
Nearly bare ground	10
Grassed waterway	15
Paved areas and shallow paved swales	20

$$t_c = \frac{L}{180} + 10$$

*For buried riprap, select C_v value based on type of vegetative cover.

Proposed

BASIN RUNOFF SUMMARY

	WEIGHTED			OVERLAND				STREET / CHANNEL FLOW				Tc	INTENSITY			TOTAL FLOWS		
BASIN	CA(2)	CA(5)	CA(100)	C(5)	Length (ft)	Height (ft)	Tc (min)	Length (ft)	Slope (%)	Velocity (fps)	Tc (min)	TOTAL (min)	I(2) (in/hr)	I(5) (in/hr)	I(100) (in/hr)	Q(2) (cfs)	Q(5) (cfs)	Q(100) (cfs)
A	1.55	1.64	1.98	0.08	40	1	8.6	300	1.5%	2.4	2.0	10.6	3.22	4.03	6.77	5.0	**6.6**	**13.4**
B	0.14	0.14	0.15	0.08	10	0.2	4.6	300	1.5%	2.4	2.0	6.7	3.78	4.74	7.95	0.5	**0.7**	**1.2**
C	0.77	0.81	0.98	0.08	40	1	8.6	300	1.5%	2.4	2.0	10.6	3.22	4.03	6.77	2.5	**3.3**	**6.6**
D	0.11	0.12	0.13	0.08	10	0.5	3.4	100	1.0%	2.0	0.8	5.0	4.12	5.17	8.68	0.5	**0.6**	**1.1**
E	2.18	2.38	3.17	0.08	40	1	8.6	750	1.5%	2.4	5.1	13.7	2.92	3.66	6.14	6.4	**8.7**	**19.5**
F	0.35	0.37	0.44	0.08	100	2	14.7	75	1.5%	2.4	0.5	15.2	2.80	3.50	5.88	1.0	**1.3**	**2.6**
G	0.38	0.41	0.53	0.08	40	2	6.8	1400	2.0%	2.8	8.2	15.1	2.80	3.51	5.89	1.1	**1.4**	**3.1**
I	0.54	0.57	0.68	0.08	100	2	14.7	225	1.5%	2.4	1.5	16.2	2.72	3.41	5.72	1.5	**1.9**	**3.9**
J	0.69	0.78	1.13	0.08	100	2	14.7	450	1.5%	2.4	3.1	17.7	2.61	3.27	5.49	1.8	**2.5**	**6.2**
K	1.97	2.08	2.51	0.08	100	2	14.7	630	1.5%	2.4	4.3	18.9	2.54	3.17	5.32	5.0	**6.6**	**13.4**
L	0.54	0.63	1.03	0.08	100	2	14.7	610	1.5%	2.4	4.2	18.8	2.54	3.18	5.34	1.4	**2.0**	**5.5**
M	1.52	1.61	1.94	0.08	100	2	14.7	600	1.5%	2.4	4.1	18.7	2.55	3.19	5.35	3.9	**5.1**	**10.4**
N	1.54	1.63	1.96	0.08	100	2	14.7	600	1.5%	2.4	4.1	18.7	2.55	3.19	5.35	3.9	**5.2**	**10.5**
O	1.39	1.47	1.77	0.08	100	2	14.7	600	1.5%	2.4	4.1	18.7	2.55	3.19	5.35	3.5	**4.7**	**9.5**
P	1.00	1.02	1.16	0.08	40	1	8.6	600	1.5%	2.4	4.1	12.7	3.01	3.77	6.33	3.0	**3.9**	**7.4**
Q	0.32	0.32	0.35	0.08	15	0.3	5.7	400	1.5%	2.4	2.7	8.4	3.50	4.39	7.37	1.1	**1.4**	**2.5**

JOB NAME: ***STERLING RANCH EAST VILLAGES***
JOB NUMBER: ***1183.26***
DATE: ***03/28/03***
CALC'D BY: ***CMT***

Return Period	1-Hour Depth
2	1.19
5	1.50
10	1.75
25	2.00
50	2.25
100	2.52

$$t_i = \frac{0.395(1.1 - C_5)\sqrt{L}}{S^{0.33}}$$

$$V = C_v S_w^{0.5}$$

Tc=L/V

Table 6-7. Conveyance Coefficient, C_v

Type of Land Surface	C_v
Heavy meadow	2.5
Tillage/field	5
Riprap (not buried)*	6.5
Short pasture and lawns	7
Nearly bare ground	10
Grassed waterway	15
Paved areas and shallow paved swales	20

$$t_c = \frac{L}{180} + 10$$

* For buried riprap, select C_v value based on type of vegetative cover.

BASIN RUNOFF SUMMARY

BASIN	WEIGHTED CA(2)	CA(5)	CA(100)	OVERLAND C(5)	Length (ft)	Height (ft)	Tc (min)	STREET / CHANNEL FLOW Length (ft)	Slope (%)	Velocity (fps)	Tc (min)	Tc TOTAL (min)	INTENSITY I(2) (in/hr)	I(5) (in/hr)	I(100) (in/hr)	TOTAL FLOWS Q(2) (cfs)	Q(5) (cfs)	Q(100) (cfs)
R	0.25	0.25	0.27	0.08	15	0.3	5.7	400	1.5%	2.4	2.7	8.4	3.50	4.39	7.37	0.9	**1.1**	**2.0**
S	0.33	0.35	0.42	0.08	40	1	8.6	300	1.5%	2.4	2.0	10.6	3.22	4.03	6.77	1.1	**1.4**	**2.9**
T	0.19	0.19	0.20	0.08	15	0.3	5.7	150	1.5%	2.4	1.0	6.7	3.77	4.73	7.94	0.7	**0.9**	**1.6**
U	0.16	0.16	0.18	0.08	15	0.3	5.7	150	1.5%	2.4	1.0	6.7	3.77	4.73	7.94	0.6	**0.8**	**1.4**
V	0.04	0.14	0.62	0.08	40	1	8.6	580	1.5%	2.4	3.9	12.6	3.02	3.79	6.36	0.1	**0.5**	**3.9**
W	0.30	0.32	0.38	0.08	100	2	14.7	160	2.0%	2.8	0.9	15.6	2.77	3.46	5.81	0.8	**1.1**	**2.2**
X	3.33	3.41	3.81	0.08	25	1	5.8	1200	1.5%	2.4	8.2	14.0	2.90	3.63	6.09	9.7	**12.4**	**23.2**
EX1	0.65	2.59	11.34	0.08	300	10	21.4	300	4.2%	4.1	1.2	22.7	2.32	2.90	4.87	1.5	**7.5**	**55.2**
EX2	0.11	0.42	1.84	0.08	300	10	21.4	700	1.5%	2.4	4.8	26.2	2.15	2.68	4.51	0.2	**1.1**	**8.3**
EX3	0.03	0.12	0.55	0.08	55	2	8.9	930	2.0%	2.8	5.5	14.4	2.86	3.58	6.01	0.1	**0.4**	**3.3**

JOB NAME: ***STERLING RANCH EAST VILLAGES***
JOB NUMBER: ***1183.26***
DATE: ***12/17/24***
CALCULATED BY: ***CMT***

*ALL STORM SEWER TO BE PRIVATE UNLESS OTHERWISE NOTED

SURFACE ROUTING SUMMARY

Design Point(s)	Contributing Basins / Design Point	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		Facility/ Inlet Size*
					I(5)	I(100)	Q(5)	Q(100)	
1	BASIN A	1.64	1.98	10.6	4.03	6.77	6.6	13.4	10' INLET
2	BASIN B	0.14	0.15	6.7	4.74	7.95	0.7	1.2	5' INLET
3A	BASIN E	2.38	3.17	13.7	3.66	6.14	8.7	19.5	10' AT-GRADE INLET
3	BASIN C + DP3A FLOWBY	1.33	2.50	13.7	3.66	6.14	4.9	15.3	10' INLET
4	BASIN D	0.12	0.13	5.0	5.17	8.68	0.6	1.1	10' INLET
5	BASIN I, J, K	3.43	4.33	18.9	3.17	5.32	10.9	23.0	(2) 10' INLETS
6	BASIN L & S	0.99	1.45	18.8	3.18	5.34	3.1	7.7	10' INLET
6A	BASIN F	1.80	2.14	18.7	3.19	5.35	5.7	11.4	10' INLET
7	BASIN O	1.47	1.77	18.7	3.19	5.35	4.7	9.5	(2) 5' INLETS
8	BASIN P	1.02	1.16	12.7	3.77	6.33	3.9	7.4	5' INLET
9	BASIN Q	0.32	0.35	8.4	4.39	7.37	1.4	2.5	5' INLET
10	BASIN N	1.63	1.96	18.7	3.19	5.35	5.2	10.5	(2) 5' INLETS
11	BASIN M	1.61	1.94	18.7	3.19	5.35	5.1	10.4	(2) 5' INLETS
12	BASIN R	0.25	0.27	8.4	4.39	7.37	1.1	2.0	5' INLET

Added

Unresolved:
Add note at bottom of table that Basins T thru X do not have design points.

JOB NAME: *STERLING RANCH EAST VILLAGES*
JOB NUMBER: *1183.26*
DATE: *12/17/24*
CALCULATED BY: *CMT*

* PIPES ARE LISTED AT MAXIMUM SIZE REQUIRED TO ACCOMMODATE Q100 FLOWS AT MINIMUM SLOPE.
REFER TO INDIVIDUAL PIPE SHEETS FOR HYDRAULIC INFORMATION.
PIPES ARE TO BE PRIVATE UNLESS OTHERWISE NOTED.
PRIVATE STORM MATERIALS TO BE RCP OR DOUBLE WALL POLYPROPYLENE (DWPP) TO BE SELECTED BY CONTRACTOR

PIPE ROUTING SUMMARY

Pipe Run	Contributing Basin / Design Point / Pipe Run	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		
					I(5)	I(100)	Q(5)	Q(100)	Pipe Size*
1	DP1	1.64	1.98	10.6	4.03	6.77	6.6	13.4	24" RCP
2	DP2	0.14	0.15	6.7	4.74	7.95	0.7	1.2	18" RCP
3	PIPE 1 + 2	1.78	2.13	10.6	4.03	6.77	7.2	14.4	24" RCP
4A	DP3A INTERCEPTED	1.86	1.65	13.7	3.66	6.14	6.8	10.1	18" RCP
4	DP3	1.33	2.50	13.71	3.66	6.14	4.9	15.3	30" RCP
5	DP4	0.12	0.13	5.00	5.17	8.68	0.6	1.1	18" RCP
6	PIPE 3 + 4 + 5	3.23	4.76	13.7	3.66	6.14	11.8	29.2	36" RCP
7	DP5	3.43	4.33	18.94	3.17	5.32	10.9	23.0	30" RCP
8	DP6	0.49	0.72	18.8	3.18	5.34	1.6	3.9	18" RCP
9	PIPE 6 + 7 + 8	7.15	9.81	18.9	3.17	5.32	22.7	52.2	36" RCP @ 0.8%
10	DP7	1.47	1.77	18.73	3.19	5.35	4.7	9.5	24" RCP @ 0.5%
11	DP8	1.02	1.16	12.69	3.77	6.33	3.9	7.4	18" RCP @ 0.5%
12	DP9	0.32	0.35	8.40	4.39	7.37	1.4	2.5	18" RCP @ 0.5%

JOB NAME: *STERLING RANCH EAST VILLAGES*
JOB NUMBER: *1183.26*
DATE: *12/17/24*
CALCULATED BY: *CMT*

* PIPES ARE LISTED AT MAXIMUM SIZE REQUIRED TO ACCOMMODATE Q100 FLOWS AT MINIMUM SLOPE.
REFER TO INDIVIDUAL PIPE SHEETS FOR HYDRAULIC INFORMATION.
PIPES ARE TO BE PRIVATE UNLESS OTHERWISE NOTED.
PRIVATE STORM MATERIALS TO BE RCP OR DOUBLE WALL POLYPROPYLENE (DWPP) TO BE SELECTED BY CONTRACTOR

PIPE ROUTING SUMMARY

Pipe Run	Contributing Basin / Design Point / Pipe Run	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		
					I(5)	I(100)	Q(5)	Q(100)	Pipe Size*
13	PIPE 10+ 11 + 12	2.82	3.28	18.7	3.19	5.35	9.0	17.6	30" RCP @ 0.5%
14	DP10	1.63	1.96	18.73	3.19	5.35	5.2	10.5	24" RCP @ 0.5%
15	PIPE 13 + 14	4.45	5.24	18.7	3.19	5.35	14.2	28.0	30" RCP @ 0.5%
16	DP11	1.61	1.94	18.73	3.19	5.35	5.1	10.4	24" RCP @ 0.5%
17	PIPE 15 + 16	6.06	7.18	18.7	3.19	5.35	19.3	38.4	36" RCP @ 0.5%
18	DP6A	1.80	2.14	18.73	3.19	5.35	5.7	11.4	18" RCP @ 0.5%
19	DP12	0.25	0.27	8.40	4.39	7.37	1.1	2.0	18" RCP @ 0.5%
20	PIPE 17 + 18 + 19	8.11	9.59	18.7	3.19	5.35	25.8	51.3	36" RCP @ 0.5%
21	PIPE 9 + 20	15.26	19.39	18.9	3.17	5.32	48.4	103.2	48" RCP

JOB NAME: ***STERLING RANCH EAST VILLAGES***
JOB NUMBER: ***1183.26***
DATE: ***12/17/2024 14:57***
CALCULATED BY: ***CMT***

FULL SITE TRIBUTARY AREAS WEIGHTED IMPERVIOUS

TRIBUTARY BASIN	TOTAL AREA (AC)	IMP %	WORK
A	3.04	**70.0%**	2.13
B	0.17	**90.7%**	0.15
C	1.50	**70.0%**	1.05
D	0.15	**86.1%**	0.13
E	5.44	**55.9%**	3.04
F	0.68	**70.0%**	0.48
G	0.87	**60.6%**	0.53
I	1.05	**70.0%**	0.74
J	2.11	**46.4%**	0.98
K	3.86	**70.0%**	2.70
L	2.06	**38.2%**	0.79
M	2.98	**70.0%**	2.09
N	3.01	**70.0%**	2.11
O	2.73	**70.0%**	1.91
P	1.39	**81.4%**	1.13
Q	0.36	**100.0%**	0.36
R	0.28	**100.0%**	0.28
S	0.65	**70.0%**	0.46
T	0.21	**100.0%**	0.21
U	0.21	**86.1%**	0.18
V	1.77	**7.0%**	0.12
W	0.59	**70.0%**	0.41
X	4.39	**86.1%**	3.78
TOTAL	**39.50**	**65.2%**	25.74 total

JOB NAME: ***STERLING RANCH EAST VILLAGES***
JOB NUMBER: ***1183.26***
DATE: ***12/17/2024 14:57***
CALCULATED BY: ***CMT***

SRE5 FSD TRIBUTARY AREAS WEIGHTED IMPERVIOUS

TRIBUTARY BASIN	TOTAL AREA (AC)	**IMP %**		WORK
A	3.04	**70.0%**		2.13
B	0.17	**90.7%**		0.15
C	1.50	**70.0%**		1.05
D	0.15	**86.1%**		0.13
E	5.44	**55.9%**		3.04
F	0.68	**70.0%**		0.48
G	0.87	**60.6%**		0.53
I	1.05	**70.0%**		0.74
J	2.11	**46.4%**		0.98
K	3.86	**70.0%**		2.70
L	2.06	**38.2%**		0.79
M	2.98	**70.0%**		2.09
N	3.01	**70.0%**		2.11
O	2.73	**70.0%**		1.91
P	1.39	**81.4%**		1.13
Q	0.36	**100.0%**		0.36
R	0.28	**100.0%**		0.28
S	0.65	**70.0%**		0.46
T	0.21	**100.0%**		0.21
U				-
V				-
W	0.59	**70.0%**		0.41
X				-
TOTAL	**33.13**	**65.4%**		21.66 total

Inlet sizing will be reviewed with Final Drainage Report.

Understand but calcs. are still included

MHFD-Inlet, Version 5.02 (August 2022)

INLET MANAGEMENT

Worksheet Protected

INLET NAME	DP1	DP2	DP3
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET
Hydraulic Condition	In Sump	In Sump	In Sump
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	6.6	0.7	4.9
Major Q_{Known} (cfs)	13.4	1.2	15.3

Bypass (Carry-Over) Flow from Upstream

Inlets must be organized from upstream (left) to downstream (right) in order for bypass flows to be linked.

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

Watershed Characteristics

Subcatchment Area (acres)			
Percent Impervious			
NRCS Soil Type			

Watershed Profile

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

Minor Storm Rainfall Input

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

Major Storm Rainfall Input

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

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	**6.6**	**0.7**	**4.9**
Major Total Design Peak Flow, Q (cfs)	**13.4**	**1.2**	**15.3**
Minor Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	N/A

INLET MANAGEMENT

INLET NAME	DP5	DP6	DP7
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET
Hydraulic Condition	In Sump	In Sump	In Sump
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	5.5	3.1	2.4
Major Q_{Known} (cfs)	11.5	7.7	4.7

Bypass (Carry-Over) Flow from Upstream

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

Watershed Characteristics

Subcatchment Area (acres)			
Percent Impervious			
NRCS Soil Type			

Watershed Profile

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

Minor Storm Rainfall Input

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

Major Storm Rainfall Input

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

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	**5.5**	**3.1**	**2.4**
Major Total Design Peak Flow, Q (cfs)	**11.5**	**7.7**	**4.7**
Minor Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	N/A

MHFD-Inlet, Version 5.02 (August 2022)

INLET MANAGEMENT

Worksheet Protected

INLET NAME	DP8	DP9	DP10
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET
Hydraulic Condition	In Sump	In Sump	In Sump
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	3.9	1.4	2.6
Major Q_{Known} (cfs)	7.4	2.5	5.2

Bypass (Carry-Over) Flow from Upstream

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

Watershed Characteristics

Subcatchment Area (acres)			
Percent Impervious			
NRCS Soil Type			

Watershed Profile

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

Minor Storm Rainfall Input

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

Major Storm Rainfall Input

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

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	**3.9**	**1.4**	**2.6**
Major Total Design Peak Flow, Q (cfs)	**7.4**	**2.5**	**5.2**
Minor Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	N/A

INLET MANAGEMENT

Worksheet Protected

INLET NAME	DP11	DP12	DP3A
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET
Hydraulic Condition	In Sump	In Sump	On Grade
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	2.6	1.1	8.7
Major Q_{Known} (cfs)	5.2	2.0	19.5

Bypass (Carry-Over) Flow from Upstream

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

Watershed Characteristics

Subcatchment Area (acres)			
Percent Impervious			
NRCS Soil Type			

Watershed Profile

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

Minor Storm Rainfall Input

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

Major Storm Rainfall Input

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

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	**2.6**	**1.1**	**8.7**
Major Total Design Peak Flow, Q (cfs)	**5.2**	**2.0**	**19.5**
Minor Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	1.9
Major Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	9.3

MHFD-Inlet, Version 5.02 (August 2022)

INLET MANAGEMENT

Worksheet Protected

INLET NAME	DP4	DP6A
Site Type (Urban or Rural)	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET
Hydraulic Condition	In Sump	In Sump
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	0.6	5.7
Major Q_{Known} (cfs)	1.1	11.4

Bypass (Carry-Over) Flow from Upstream

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

Watershed Characteristics

Subcatchment Area (acres)		
Percent Impervious		
NRCS Soil Type		

Watershed Profile

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

Minor Storm Rainfall Input

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

Major Storm Rainfall Input

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

CALCULATED OUTPUT

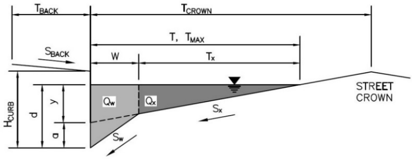
Minor Total Design Peak Flow, Q (cfs)	**0.6**	**5.7**
Major Total Design Peak Flow, Q (cfs)	**1.1**	**11.4**
Minor Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A

MHFD-Inlet, Version 5.02 (August 2022)

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

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

Project: **VILLAGES AT STERLING RANCH EAST**
Inlet ID: **DP1**



Gutter Geometry:

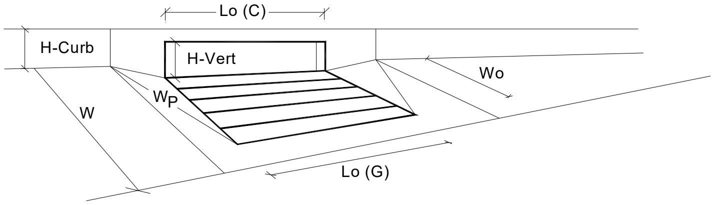
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	15.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.020	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	7.8	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



		MINOR	MAJOR	
Design Information (Input) CDOT Type R Curb Opening				
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	7.8	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	10.00	10.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.48	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**8.3**	**15.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	6.6	13.4	cfs

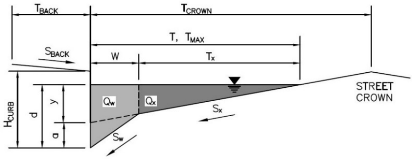
MHFD-Inlet, Version 5.02 (August 2022)

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

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

Project: VILLAGES AT STERLING RANCH EAST

Inlet ID: DP2



Gutter Geometry:

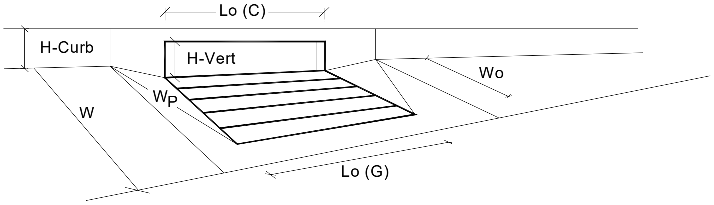
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	15.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.020	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	7.8	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)

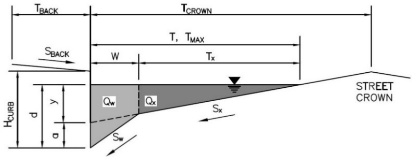


Design Information (Input)		MINOR	MAJOR	
Type of Inlet — CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	5.6	5.6	inches
Grate Information		MINOR	MAJOR	☐ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.30	0.30	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**4.6**	**4.6**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.7	1.2	cfs

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

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

Project: VILLAGES AT STERLING RANCH EAST
Inlet ID: DP3



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	15.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.020	

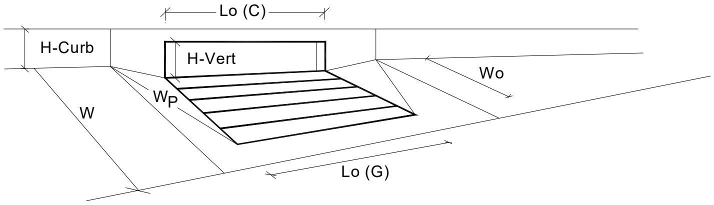
		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	7.8	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

MINOR STORM Allowable Capacity is not applicable to Sump Condition
MAJOR STORM Allowable Capacity is not applicable to Sump Condition

		Minor Storm	Major Storm	
	Q_{allow} =	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)

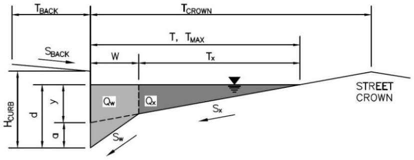


Design Information (Input)	CDOT Type R Curb Opening	MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	7.8	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	10.00	10.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.48	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**8.3**	**15.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	4.9	15.3	cfs

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

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

Project: VILLAGES AT STERLING RANCH EAST
Inlet ID: DP5



Gutter Geometry:

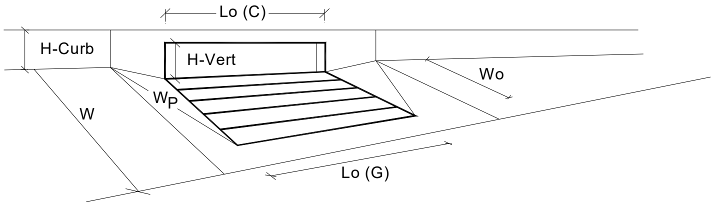
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.020	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	7.8	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



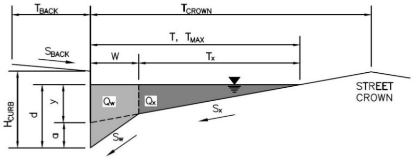
Design Information (Input) CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	7.8	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	30.00	30.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.48	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.79	0.88	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**16.1**	**31.4**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	5.5	11.5	cfs

MHFD-Inlet, Version 5.02 (August 2022)

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

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

Project: **VILLAGES AT STERLING RANCH EAST**
Inlet ID: **DP6**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.063	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.020	

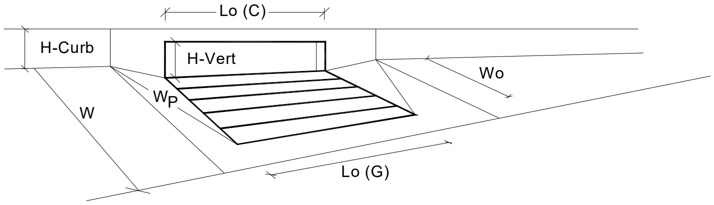
		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	7.8	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

MINOR STORM Allowable Capacity is not applicable to Sump Condition
MAJOR STORM Allowable Capacity is not applicable to Sump Condition

	Minor Storm	Major Storm	
Q_{allow} =	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



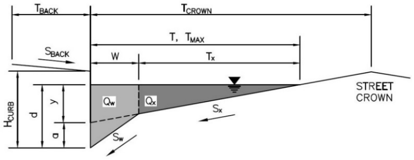
Design Information (Input)	CDOT Type R Curb Opening ▾	MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	7.8	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	10.00	10.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.37	0.52	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**9.8**	**17.4**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	3.1	7.7	cfs

MHFD-Inlet, Version 5.02 (August 2022)

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

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

Project: VILLAGES AT STERLING RANCH EAST
Inlet ID: DP7



Gutter Geometry:

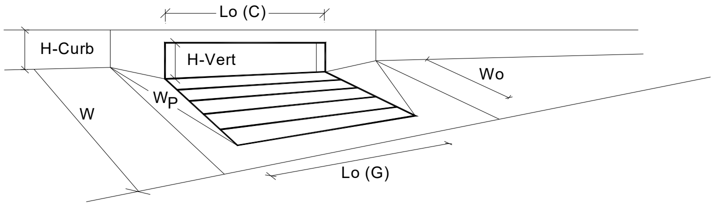
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	13.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.020	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	13.0	13.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)

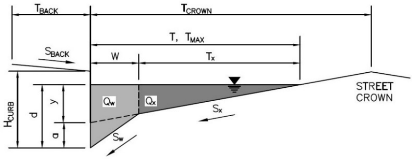


Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	1	1	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	6.0	6.0	inches
Grate Information			MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate		L_o (G) =	N/A	N/A	feet
Width of a Unit Grate		W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)		A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C_o (G) =	N/A	N/A	
Curb Opening Information			MINOR	MAJOR	
Length of a Unit Curb Opening		L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)			MINOR	MAJOR	
Depth for Grate Midwidth		d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d_{Curb} =	0.33	0.33	ft
Grated Inlet Performance Reduction Factor for Long Inlets		RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets		RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets		$RF_{Combination}$ =	N/A	N/A	
			MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)		**Q_a =**	**5.4**	**5.4**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)		$Q_{PEAK\ REQUIRED}$ =	2.4	4.7	cfs

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

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

Project: **VILLAGES AT STERLING RANCH EAST**
Inlet ID: **DP8**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	20.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.020	

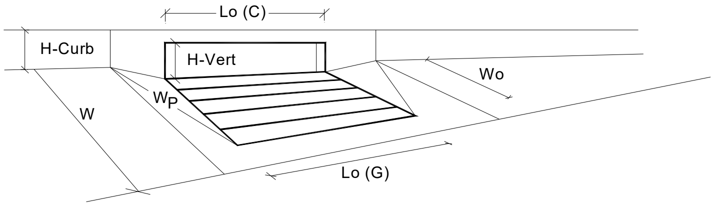
		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	20.0	20.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	7.8	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

MINOR STORM Allowable Capacity is not applicable to Sump Condition
MAJOR STORM Allowable Capacity is not applicable to Sump Condition

	Minor Storm	Major Storm	
Q_{allow} =	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)

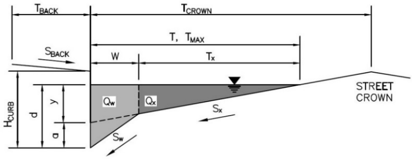


Design Information (Input)		MINOR	MAJOR	
Type of Inlet — CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	7.8	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.48	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**5.4**	**9.0**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	3.9	7.4	cfs

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

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

Project: **VILLAGES AT STERLING RANCH EAST**
Inlet ID: **DP9**



Gutter Geometry:

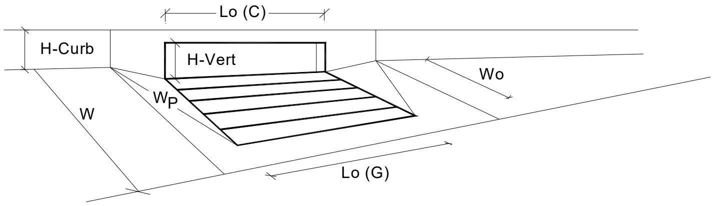
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0		ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020		
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00		inches
Distance from Curb Face to Street Crown	T_{CROWN} =	20.0		ft
Gutter Width	W =	2.00		ft
Street Transverse Slope	S_X =	0.020		ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083		ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000		ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.020		
		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	20.0	20.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.2	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

MINOR STORM Allowable Capacity is not applicable to Sump Condition
MAJOR STORM Allowable Capacity is not applicable to Sump Condition

	Minor Storm	Major Storm	
Q_{allow} =	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)

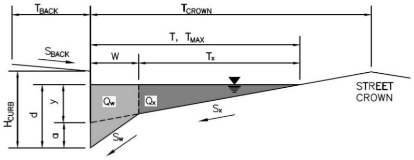


Design Information (Input) CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	6.3	inches
Grate Information		MINOR	MAJOR	☐ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.36	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**5.4**	**6.0**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	1.4	2.5	cfs

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

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

Project: VILLAGES AT STERLING RANCH EAST
Inlet ID: DP10



Gutter Geometry:

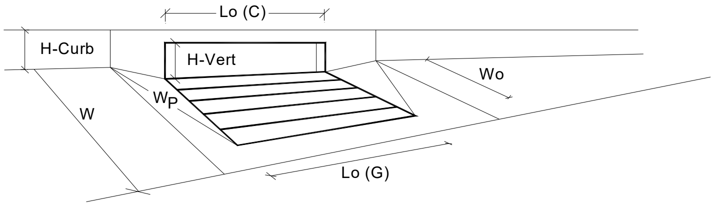
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	13.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.020	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	13.0	13.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



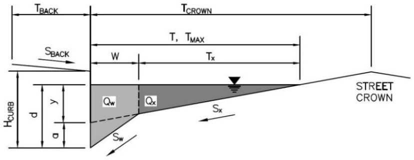
Design Information (Input)		MINOR	MAJOR	
Type of Inlet — CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	6.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.33	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**5.4**	**5.4**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	2.6	5.2	cfs

MHFD-Inlet, Version 5.02 (August 2022)

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

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

Project: **VILLAGES AT STERLING RANCH EAST**
Inlet ID: **DP11**



Gutter Geometry:

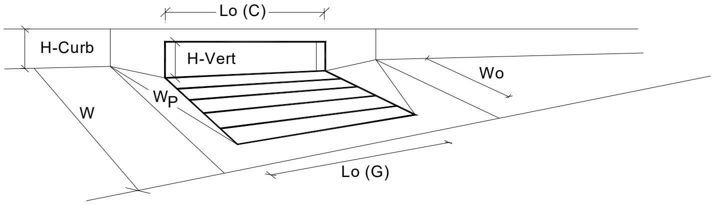
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	13.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.020	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	13.0	13.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



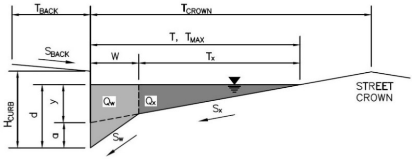
Design Information (Input) CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	6.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.33	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**5.4**	**5.4**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	2.6	5.2	cfs

MHFD-Inlet, Version 5.02 (August 2022)

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

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

Project: **VILLAGES AT STERLING RANCH EAST**
Inlet ID: **DP12**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	20.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.020	

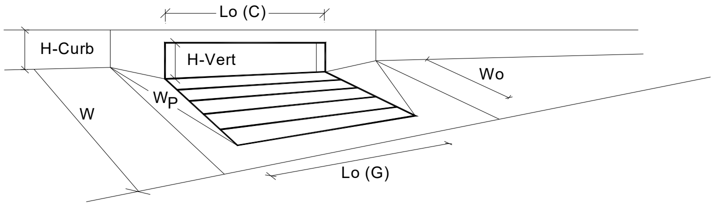
		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	20.0	20.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.2	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

MINOR STORM Allowable Capacity is not applicable to Sump Condition
MAJOR STORM Allowable Capacity is not applicable to Sump Condition

	Minor Storm	Major Storm	
Q_{allow} =	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



		MINOR	MAJOR	
Design Information (Input)		MINOR	MAJOR	
Type of Inlet — CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	8.2	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.52	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**5.4**	**9.6**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	1.1	2.0	cfs

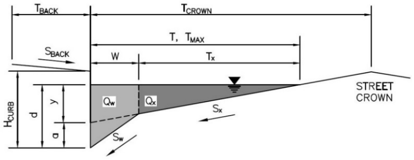
MHFD-Inlet, Version 5.02 (August 2022)

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

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

Project: VILLAGES AT STERLING RANCH EAST

Inlet ID: DP3A



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	15.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.010	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.020	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	7.8	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☐	

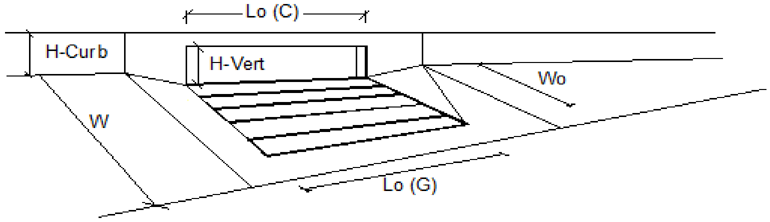
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	**Q_{allow} =**	**8.7**	**8.7**	**cfs**

WARNING: MINOR STORM max. allowable capacity is less than the design peak flow of 8.70 cfs on sheet 'Inlet Management'

WARNING: MAJOR STORM max. allowable capacity is less than the design peak flow of 19.50 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.02 (August 2022)



Design Information (Input)	CDOT Type R Curb Opening	MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	10.00	10.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f (G) =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f (C) =	0.10	0.10	

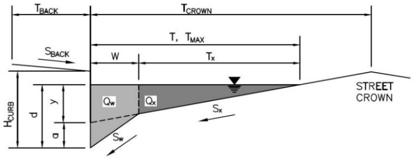
Street Hydraulics: WARNING: Q > ALLOWABLE Q FOR MINOR & MAJOR STORM		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**6.8**	**10.2**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**1.9**	**9.3**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**78**	**52**	**%**

MHFD-Inlet, Version 5.02 (August 2022)

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

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

Project: **VILLAGES AT STERLING RANCH EAST**
Inlet ID: **DP4**



Gutter Geometry:

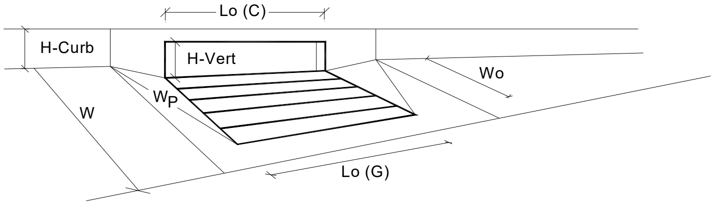
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	15.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.020	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	7.8	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



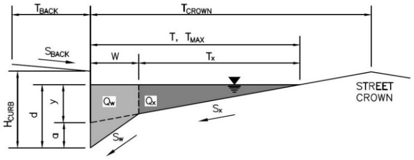
Design Information (Input)	CDOT Type R Curb Opening	MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	7.8	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	10.00	10.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.48	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**8.3**	**15.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{\text{PEAK REQUIRED}}$ =	0.6	1.1	cfs

MHFD-Inlet, Version 5.02 (August 2022)

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

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

Project: **VILLAGES AT STERLING RANCH EAST**
Inlet ID: **DP6A**



Gutter Geometry:

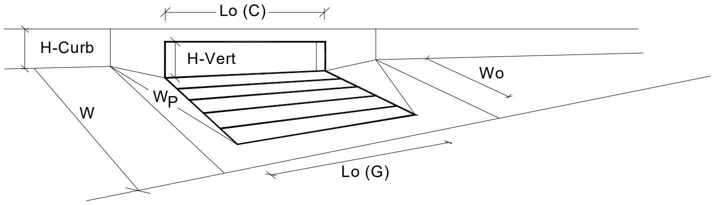
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	9.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	20.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.020	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	20.0	20.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.2	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition MAJOR STORM Allowable Capacity is not applicable to Sump Condition	$\mathbf{Q_{allow}}$ =	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



CDOT Type R Curb Opening

Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	8.2	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	10.00	10.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.52	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**8.3**	**17.1**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	5.7	11.4	cfs

REFERENCE APPROVED FINAL DRAINAGE REPORT FOR

STERLING RANCH EAST FILING NO. 1

INNOVATIVE DESIGN. CLASSIC RESULTS.

FINAL DRAINAGE REPORT
FOR
STERLING RANCH EAST FILING NO. 1

November 2022

Prepared for:
CLASSIC SRJ LAND, LLC
2138 Flying Horse Club Dr.
COLORADO SPRINGS CO 80921
(719) 592-9333

Prepared by:
CLASSIC CONSULTING ENGINEERS & SURVEYORS
619 N. CASCADE AVENUE, SUITE 200
COLORADO SPRINGS CO 80903
(719) 785-0790

Job no. 2183.30
PCD File # SF2235

CLASSIC CONSULTING

FINAL DRAINAGE REPORT FOR STERLING RANCH EAST FILING NO. 1

ENGINEER'S STATEMENT:

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

KYLE RAYE CAMPBELL
29794

Kyle R Campbell, Colorado P.E. #29794

02/28/24
Date

DEVELOPER'S STATEMENT:

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

Business Name: Classic SRJ Land, LLC
By:
Title: VICE PRESIDENT
Address: 2138 Flying Horse Club Dr.
Colorado Springs, CO 80921

EL PASO COUNTY ONLY:

Filed in accordance with the requirements of the Drainage Criteria Manual, Volumes 1 and 2, El Paso County Engineering Criteria Manual and Land Development Code as amended.

Gilbert LaForce, P.E.
Digitally signed by Gilbert LaForce, P.E.
Reason: On Behalf of the County Engineer
Date: 2024.07.02 15:58:09-06'00'

07/02/2024

For County Engineer / ECM Administrator
Date
Conditions:

JOB NAME: *Sterling Ranch East Filing No. 1*
JOB NUMBER: *1183.30*
DATE: *08/04/22*
CALCULATED BY: *MAL*

FINAL DRAINAGE REPORT ~ BASIN RUNOFF COEFFICIENT SUMMARY (DEVELOPED CONDITIONS)

		IMPERVIOUS AREA / STREETS			LOTS/LANDSCAPE/UNDEV. AREAS (NOT PAVEMENT)				WEIGHTED		WEIGHTED CA	
BASIN	TOTAL AREA (AC)	AREA (AC)	C(5)	C(100)	AREA (AC)	LAND USE	C(5)	C(100)	C(5)	C(100)	**CA(5)**	**CA(100)**
TT	1.63	0.08	0.90	0.96	1.55	OPEN	0.08	0.35	0.12	0.38	**0.20**	**0.62**
CH-1	27.11	0.00	0.90	0.96	27.11	OPEN	0.08	0.35	0.08	0.35	**2.17**	**9.49**
CH-2	10.62	0.00	0.90	0.96	10.62	OPEN	0.08	0.35	0.08	0.35	**0.85**	**3.72**
P1-A1	4.45	3.12	0.90	0.96	1.33	OPEN	0.08	0.35	0.65	0.78	**2.91**	**3.46**
P1-A2	6.59	4.20	0.90	0.96	2.01	OPEN	0.08	0.35	0.62	0.75	**4.11**	**4.96**
					0.38	S/F	0.45	0.59				
P1-A3	1.83	1.37	0.90	0.96	0.46	OPEN	0.08	0.35	0.69	0.81	**1.27**	**1.48**
P1-A4	1.64	1.22	0.90	0.96	0.42	OPEN	0.08	0.35	0.69	0.80	**1.13**	**1.32**
P1-A5	1.86	1.01	0.90	0.96	0.85	OPEN	0.08	0.35	0.53	0.68	**0.98**	**1.27**
					0.00	S/F	0.45	0.59				
P1-A6	3.55	1.97	0.90	0.96	1.58	OPEN	0.08	0.35	0.54	0.69	**1.90**	**2.44**
P1-A7	3.11	1.06	0.90	0.96	1.11	OPEN	0.08	0.35	0.47	0.63	**1.47**	**1.96**
					0.94	S/F	0.45	0.59				
P2-B1	1.82	1.19	0.90	0.96	0.63	OPEN	0.08	0.35	0.62	0.75	**1.12**	**1.36**
P2-B2	1.87	1.17	0.90	0.96	0.70	OPEN	0.08	0.35	0.59	0.73	**1.11**	**1.37**
P2-B3	1.55	0.98	0.90	0.96	0.57	OPEN	0.08	0.35	0.60	0.74	**0.93**	**1.14**
P2-B4	1.64	1.00	0.90	0.96	0.64	OPEN	0.08	0.35	0.58	0.72	**0.95**	**1.18**
P2-B5	0.97	0.66	0.90	0.96	0.31	OPEN	0.08	0.35	0.64	0.77	**0.62**	**0.74**
P2-B6	1.07	0.67	0.90	0.96	0.40	OPEN	0.08	0.35	0.59	0.73	**0.64**	**0.78**
P2-B7	1.62	0.80	0.90	0.96	0.82	OPEN	0.08	0.35	0.48	0.65	**0.79**	**1.06**
P2-B8	1.21	0.80	0.90	0.96	0.41	OPEN	0.08	0.35	0.62	0.75	**0.75**	**0.91**
P2-B9	2.08	1.60	0.90	0.96	0.48	OPEN	0.08	0.35	0.71	0.82	**1.48**	**1.70**
P2-B10	2.31	1.64	0.90	0.96	0.67	OPEN	0.08	0.35	0.66	0.78	**1.53**	**1.81**
P2-C2	1.73	1.26	0.90	0.96	0.47	OPEN	0.08	0.35	0.68	0.79	**1.17**	**1.37**
P2-S1	36.59	0.00	0.90	0.96	36.59	SCHOOL	0.42	0.61	0.42	0.61	**15.37**	**22.32**
P2-S1 (UNDEV)	36.59	0.00	0.90	0.96	36.59	OPEN	0.08	0.35	0.08	0.35	**2.93**	**12.81**

JOB NAME: **Sterling Ranch East Filing No. 1**
JOB NUMBER: **1183.30**
DATE: **8/4/2022**
CALC'D BY: **MAL**

FINAL DRAINAGE REPORT ~ BASIN RUNOFF SUMMARY (DEVELOPED CONDITIONS)

	WEIGHTED		OVERLAND				STREET / CHANNEL FLOW				Tc	INTENSITY		TOTAL FLOWS	
BASIN	CA(5)	CA(100)	C(5)	Length (ft)	Height (ft)	Tc (min)	Length (ft)	Slope (%)	Velocity (fps)	Tc (min)	TOTAL (min)	I(5) (in/hr)	I(100) (in/hr)	Q(5) (cfs)	Q(100) (cfs)
RR	0.48	2.10	0.08	100	25	6.4	360	1.0%	3.5	1.7	8.1	4.45	7.47	**2.1**	**15.7**
SS	0.27	0.43	0.45	60	7	4.0	150	2.0%	4.9	0.5	5.0	5.17	8.68	**1.4**	**3.7**
TT	0.20	0.62	0.08	40	1	8.6	400	2.0%	4.9	1.3	10.0	4.14	6.94	**0.8**	**4.3**
CH-1	2.17	9.49	0.08	100	18	7.1	3050	1.6%	4.4	11.5	18.6	3.20	5.37	**6.9**	**51.0**
CH-2	0.85	3.72	0.08	100	25	6.4	475	0.5%	2.5	3.2	9.6	4.20	7.04	**3.6**	**26.2**
P1-A1	2.91	3.46	0.08	10	0.5	3.4	2350	0.9%	3.3	11.8	15.2	3.50	5.87	**10.2**	**20.3**
P1-A2	4.11	4.96	0.08	10	0.5	3.4	2350	0.9%	3.3	11.8	15.2	3.50	5.87	**14.4**	**29.1**
P1-A3	1.27	1.48	0.08	10	0.5	3.4	780	0.9%	3.3	3.9	7.3	4.59	7.71	**5.8**	**11.4**
P1-A4	1.13	1.32	0.08	10	0.5	3.4	780	0.9%	3.3	3.9	7.3	4.59	7.71	**5.2**	**10.2**
P1-A5	0.98	1.27	0.08	10	0.5	3.4	600	1.0%	3.5	2.9	6.3	4.83	8.10	**4.7**	**10.3**
P1-A6	1.90	2.44	0.08	10	0.5	3.4	1250	1.0%	3.5	6.0	9.4	4.23	7.09	**8.0**	**17.3**
P1-A7	1.47	1.96	0.08	10	0.5	3.4	650	1.0%	3.5	3.1	6.5	4.77	8.01	**7.0**	**15.7**
P2-B1	1.12	1.36	0.08	10	0.5	3.4	1100	2.2%	5.2	3.5	7.0	4.67	7.85	**5.2**	**10.7**
P2-B2	1.11	1.37	0.08	10	0.5	3.4	1100	2.2%	5.2	3.5	7.0	4.67	7.85	**5.2**	**10.7**

JOB NAME: **Sterling Ranch East Filing No. 1**
JOB NUMBER: **1183.30**
DATE: **8/4/2022**
CALC'D BY: **MAL**

FINAL DRAINAGE REPORT ~ BASIN RUNOFF SUMMARY (DEVELOPED CONDITIONS)

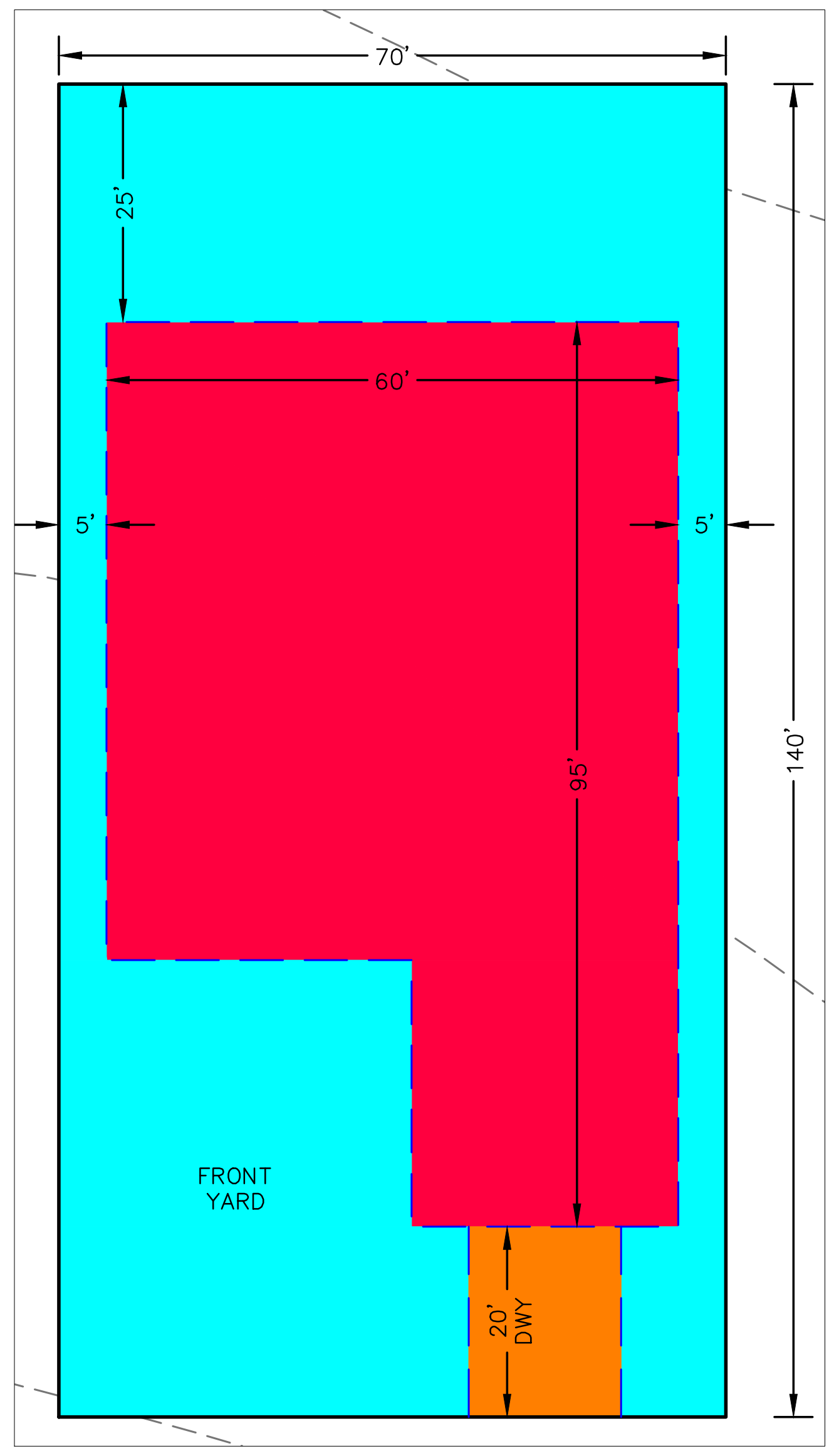
	WEIGHTED		OVERLAND				STREET / CHANNEL FLOW				Tc	INTENSITY		TOTAL FLOWS	
BASIN	CA(5)	CA(100)	C(5)	Length *(ft)*	Height *(ft)*	Tc *(min)*	Length *(ft)*	Slope *(%)*	Velocity *(fps)*	Tc *(min)*	TOTAL *(min)*	I(5) (in/hr)	I(100) (in/hr)	Q(5) *(cfs)*	Q(100) *(cfs)*
P2-B3	0.93	1.14	0.08	10	0.5	3.4	980	1.6%	4.4	3.7	7.1	4.64	7.79	**4.3**	**8.9**
P2-B4	0.95	1.18	0.08	10	0.5	3.4	980	1.6%	4.4	3.7	7.1	4.64	7.79	**4.4**	**9.2**
P2-B5	0.62	0.74	0.08	10	0.5	3.4	615	1.6%	4.4	2.3	5.7	4.96	8.33	**3.1**	**6.2**
P2-B6	0.64	0.78	0.08	10	0.5	3.4	615	1.6%	4.4	2.3	5.7	4.96	8.33	**3.2**	**6.5**
P2-B7	0.79	1.06	0.08	10	0.5	3.4	760	1.6%	4.4	2.9	6.3	4.83	8.10	**3.8**	**8.5**
P2-B8	0.75	0.91	0.08	10	0.5	3.4	760	1.6%	4.4	2.9	6.3	4.83	8.10	**3.6**	**7.4**
P2-B9	1.48	1.70	0.08	10	0.5	3.4	770	2.3%	5.3	2.4	5.8	4.94	8.29	**7.3**	**14.1**
P2-B10	1.53	1.81	0.08	10	0.5	3.4	770	2.3%	5.3	2.4	5.8	4.94	8.29	**7.5**	**15.0**
P2-C2	1.17	1.37	0.08	10	0.5	3.4	610	3.4%	6.5	1.6	5.0	5.17	8.68	**6.1**	**11.9**
P2-S1	15.37	22.32									16.5	3.38	5.67	**51.9**	**126.6**
P2-S1 (UNDEV)	2.93	12.81	0.08	300	8	23.1	1760	1.4%	4.1	7.1	30.2	2.47	4.15	**7.2**	**53.2**

JOB NAME: *Sterling Ranch East Filing No. 1*
JOB NUMBER: *1183.30*
DATE: *08/04/22*
CALCULATED BY: *MAL*

FINAL DRAINAGE REPORT ~ SURFACE ROUTING SUMMARY (DEVELOPED CONDITIONS)

Design Point(s)	Contributing Basins	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		Inlet Size
					I(5)	I(100)	Q(5)	Q(100)	
1	BASIN P1-A1	2.91	3.46	15.2	3.50	5.87	10.2	20.3	EX. 20' AT-GRADE
2	BASIN P1-A2	4.11	4.96	15.2	3.50	5.87	14.4	29.1	EX. 20' AT-GRADE
3	BASIN P1-A4 + Flow-By DP-1	1.13	1.90	7.3	4.59	7.71	5.2	14.7	EX. 15' AT-GRADE
4	BASIN P1-A3 + Flow-By DP-2	1.61	3.08	15.2	3.50	5.87	5.6	18.1	EX. 15' AT-GRADE
5	BASIN P1-A7	1.47	1.96	6.5	4.77	8.01	7.0	15.7	FUT. 15' AT-GRADE
6	BASIN P1-A5 + BASIN P1-C2 + Flow-By DP-4 + Flow-By DP-5	2.15	3.94	6.5	4.77	8.01	10.3	31.6	20' SUMP
7	BASIN P1-A6	1.90	2.44	9.4	4.23	7.09	8.0	17.3	15' SUMP
8	BASIN P2-B2	1.11	1.37	7.0	4.67	7.85	5.2	10.7	EX. 10' AT-GRADE
9	BASIN P2-B1 + Flow-By DP-3	1.12	1.75	7.0	4.67	7.85	5.2	13.7	EX. 10' AT-GRADE
10	BASIN X	1.54	1.91	11.7	3.90	6.54	6.0	12.5	15' SUMP

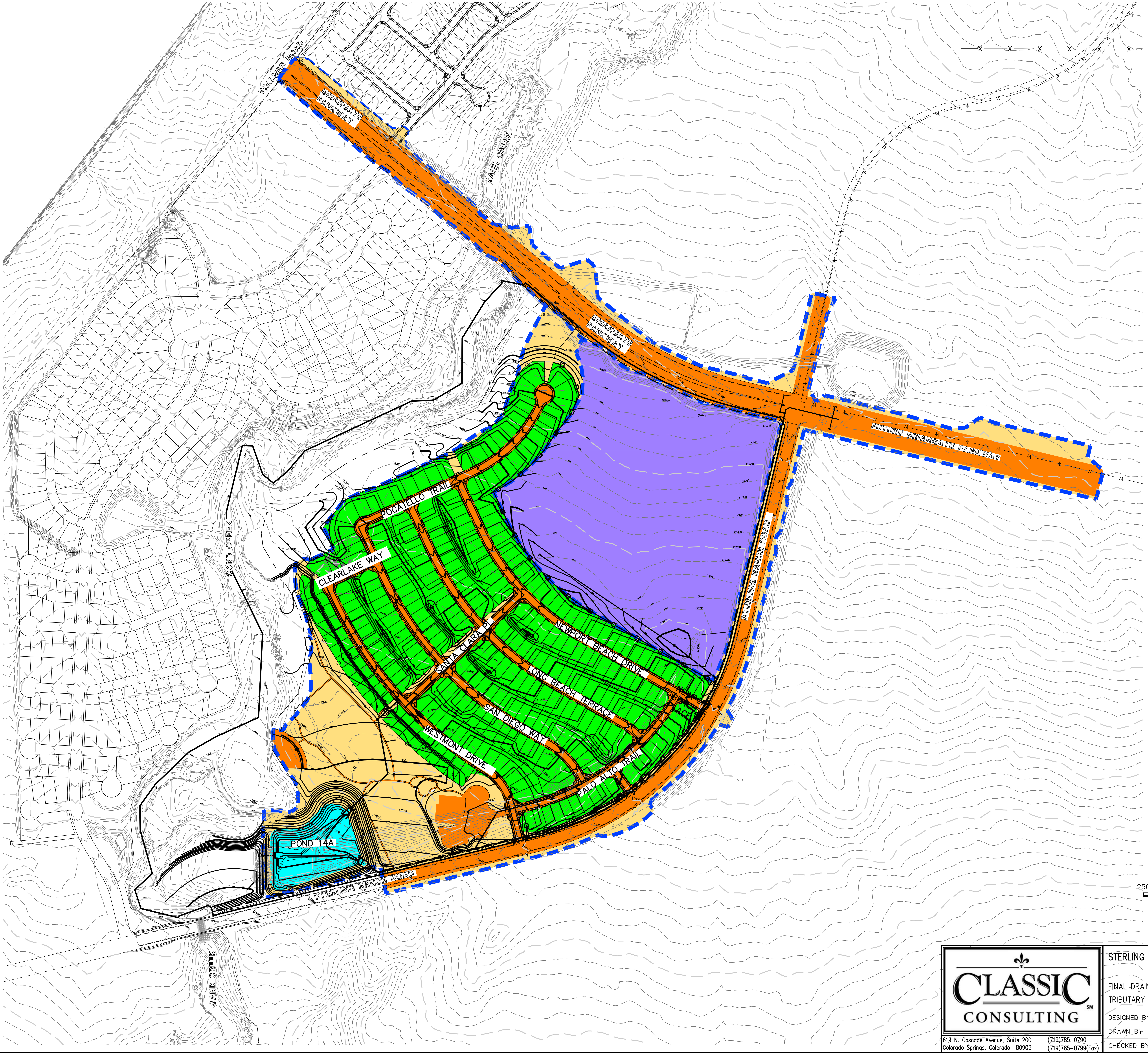
DRAINAGE MAPS



TYPICAL HOME LOT

UIA = 55% OF LOT AREA
DCIA = 0.72% OF LOT AREA
RPA = 44.28% OF LOT AREA

🟪	FUTURE SCHOOL SITE – ESTIMATED 13.94 AC. DCIA, 1.51 AC. UIA, 3.46 AC. RPA, 17.68 AC. SPA
🟩	HOME LOTS (SEE BREAKDOWN ABOVE)
🟨	SPA – SEPARATE PERVIOUS AREA
🟥	UIA – UNCONNECTED IMPERVIOUS AREA
🟧	DCIA – DIRECTLY CONNECTED IMPERVIOUS AREA
🟦	RPA – RECEIVING PERVIOUS AREA



250 125 0 250 500

SCALE: 1" = 250'

CLASSIC CONSULTING

619 N. Cascade Avenue, Suite 200
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(719)785-0790
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STERLING RANCH EAST FILING NO. 1

FINAL DRAINAGE REPORT
TRIBUTARY AREA TO PROPOSED POND 14A

DESIGNED BY	MAL	SCALE	DATE 10/27/22
DRAWN BY	MAL	(H) 1"= 250'	SHEET 1 OF 1
CHECKED BY		(V) 1"= N/A	JOB NO. 1183.30

N:\118330\DRAWINGS\DEVELOPMENT\TRIB-AREA-IMPERVIOUS.dwg, 4/5/2023 10:28:26 AM, 1:1

LEGEND

DESCRIPTION	SYMBOL
EXISTING GROUND CONTOUR	6910
PROPOSED FINISHED CONTOUR	6910
SUB–BASIN BOUNDARY	▬ ▬ ▬
SAND CREEK EAST FORK BASIN LINE	▬ ▬
DESIGN POINT	△4
BASIN IDENTIFIER	BB
AREA IN ACRES	10.0
EXISTING DIRECTION OF FLOW	⇨
EXISTING STORM SEWER	▬
FEMA 100–YR FLOODPLAIN	▬ ▬ ▬

STERLING RANCH EAST PRELIMINARY PLAN NO. 1
Pre-Developed Subcatchment Runoff

Subcatchment	Area (Ac.)	SWMM Imperv. (%)	Peak Runoff 5 yr. (CFS)	Peak Runoff 100 yr. (CFS)
EX-10	265.9	7%	105	222
EX10A	153.5	5%	46	103
EX-11	214.3	4%	54	129
EX-13	94.8	6%	36	85
EX-4A	44.2	8%	19	50
EX-5	26.2	8%	12	32
EX-7	152.8	5%	46	105
EX-7A	2.4	2%	1	5
EX-8	32.2	2%	5	23
EX-8A	6.6	2%	2	9
EX-9	139.3	8%	59	122
EX-9A	21.8	5%	7	19
TR-12	4.7	5%	2	9
TR-20	23.2	7%	10	32
TR-4	4.4	5%	2	9
TR-5	13.7	5%	5	17
TR-6	1.5	5%	1	4
TR-7	2.6	5%	1	5

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STERLING RANCH EAST
PRELIMINARY PLAN NO. 1
PRELIMINARY DRAINAGE REPORT
PRE–DEVELOPMENT DRAINAGE MAP

DESIGNED BY	MAW	SCALE	DATE 4–1–22
DRAWN BY	MAW	(H) 1"= 200'	SHEET 2 OF 6
CHECKED BY		(V) 1"= N/A	JOB NO. 1183.22

STERLING RANCH EAST PRELIMINARY PLAN NO. 1

Pre-Developed Subcatchment Runoff

Subcatchment	Area (Ac.)	SWMM Imperv. (%)	Peak Runoff 5 yr. (CFS)	Peak Runoff 100 yr. (CFS)
EX-10	265.9	7%	105	222
EX10A	153.5	5%	46	103
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EX-4A	44.2	8%	19	50
EX-5	26.2	8%	12	32
EX-7	152.8	5%	46	105
EX-7A	2.4	2%	1	5
EX-8	32.2	2%	5	23
EX-8A	6.6	2%	2	9
EX-9	139.3	8%	59	122
EX-9A	21.8	5%	7	19
TR-12	4.7	5%	2	9
TR-20	23.2	7%	10	32
TR-4	4.4	5%	2	9
TR-5	13.7	5%	5	17
TR-6	1.5	5%	1	4
TR-7	2.6	5%	1	5

STERLING RANCH EAST PRELIMINARY PLAN NO. 1

Pre-Developed Surface Routing

Design Point	Peak Runoff 5 yr. (CFS)	Peak Runoff 100 yr. (CFS)
DP4	46	105
DP4A	1	5
DP5	5	23
DP5A	2	9
DP6	59	122
DP6A	7	19
DP7	110	249
DP56	60	160
DPEX-4A	19	50
DPEX-5	12	32

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STERLING RANCH EAST
PRELIMINARY PLAN NO. 1
PRELIMINARY DRAINAGE REPORT
PRE-DEVELOPMENT DRAINAGE MAP

DESIGNED BY	MAW	SCALE	DATE 4-1-22
DRAWN BY	MAW	(H) 1"= 200'	SHEET 3 OF 6
CHECKED BY		(V) 1"= N/A	JOB NO. 1183.22

LEGEND

EXISTING GROUND CONTOUR	(7000)	PROPOSED BASIN BOUNDARY	▬ ▬ ▬
PROPOSED FINISHED GRADE CONTOURS	7000	BASIN IDENTIFIER AREA IN ACRES	D 1.41
SUBDIVISION BOUNDARY	▬ ▪ ▪ ▬	DIRECTION OF DRAINAGE	⇨
100-YR FLOODPLAIN LIMITS	▬ ▪ ▪ ▬	DESIGN POINT	①
EXISTING STORM SEWER	▬▭▬▭▬	PIPE RUN	△1
EXISTING STORM INLET	▭	EXISTING RIPRAP	▨
PROPOSED STORM SEWER	▬▭▬▭▬	PROPOSED RIPRAP	▨
PROPOSED STORM INLET	▭		
FUTURE STORM SEWER	▬ ▬ ▬		

100 50 0 100 200

SCALE: 1" = 100'

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NO.	REVISION	DATE

REVIEW:

PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF CLASSIC CONSULTING ENGINEERS AND SURVEYORS, LLC

KYLE R. CAMPBELL, COLORADO P.E. #29794 DATE

CLASSIC CONSULTING SM

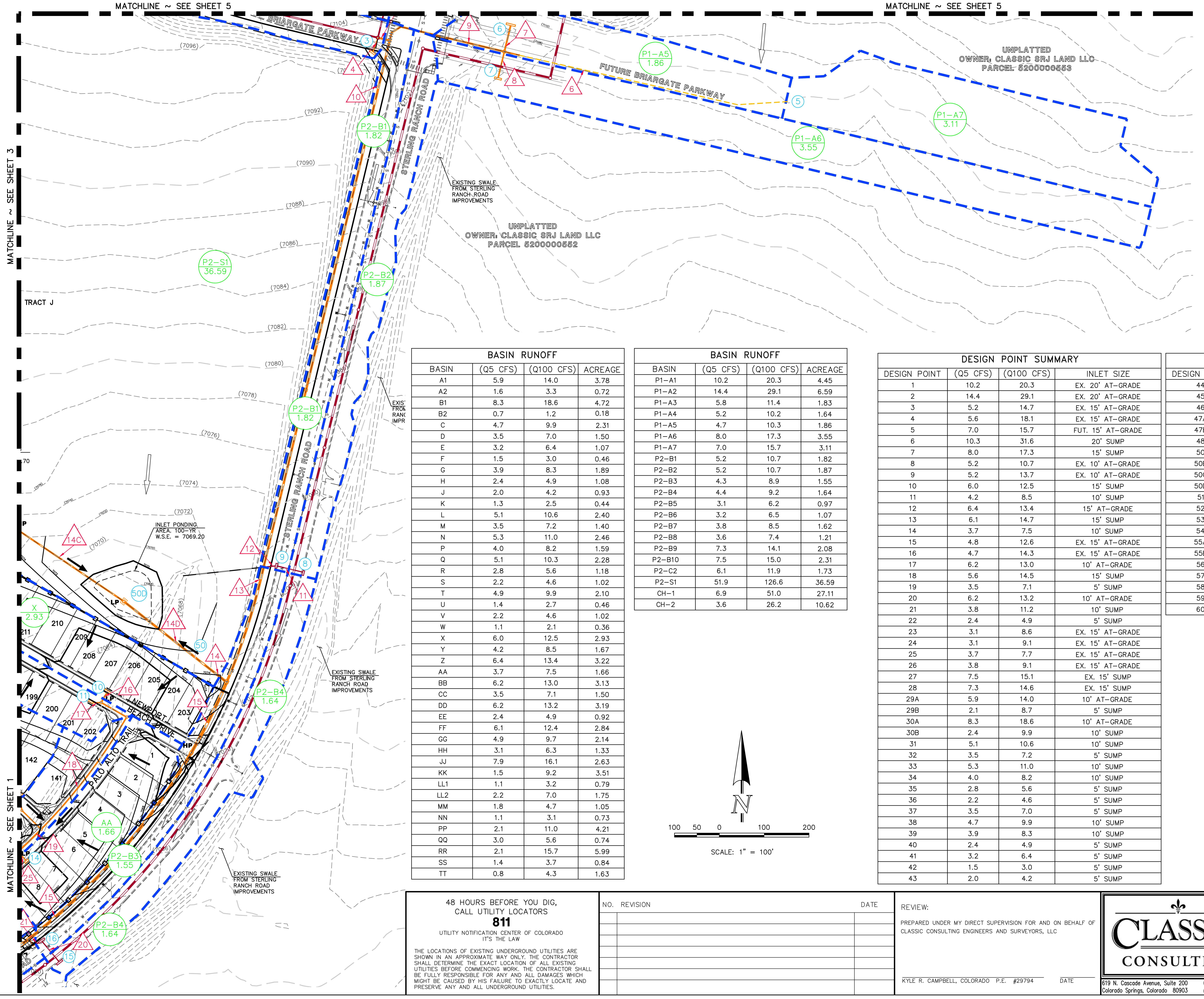
619 N. Cascade Avenue, Suite 200 (719)785-0790
Colorado Springs, Colorado 80903 (719)785-0799(Fax)

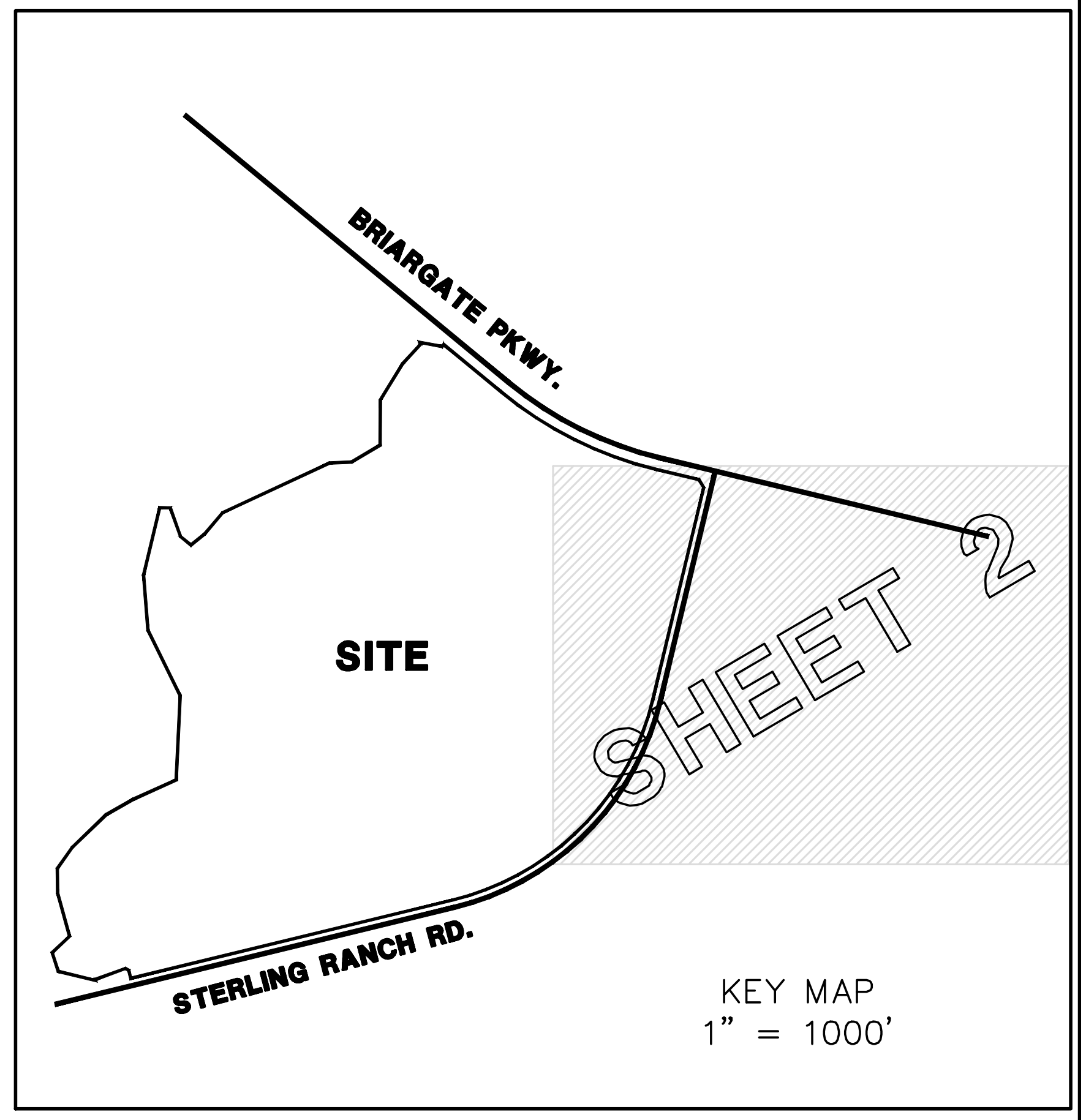
STERLING RANCH EAST FILING NO. 1

FINAL DRAINAGE REPORT
DEVELOPED CONDITIONS DRAINAGE MAP

DESIGNED BY	MAL	SCALE	DATE	11/04/22
DRAWN BY	MAL	(H) 1"= 100'	SHEET 1 OF 5	
CHECKED BY		(V) 1"= N/A	JOB NO.	1183.30

CLASSIC CONSULTING





KEY MAP
1" = 1000'

BASIN RUNOFF

BASIN	(Q5 CFS)	(Q100 CFS)	ACREAGE
A1	5.9	14.0	3.78
A2	1.6	3.3	0.72
B1	8.3	18.6	4.72
B2	0.7	1.2	0.18
C	4.7	9.9	2.31
D	3.5	7.0	1.50
E	3.2	6.4	1.07
F	1.5	3.0	0.46
G	3.9	8.3	1.89
H	2.4	4.9	1.08
J	2.0	4.2	0.93
K	1.3	2.5	0.44
L	5.1	10.6	2.40
M	3.5	7.2	1.40
N	5.3	11.0	2.46
P	4.0	8.2	1.59
Q	5.1	10.3	2.28
R	2.8	5.6	1.18
S	2.2	4.6	1.02
T	4.9	9.9	2.10
U	1.4	2.7	0.46
V	2.2	4.6	1.02
W	1.1	2.1	0.36
X	6.0	12.5	2.93
Y	4.2	8.5	1.67
Z	6.4	13.4	3.22
AA	3.7	7.5	1.66
BB	6.2	13.0	3.13
CC	3.5	7.1	1.50
DD	6.2	13.2	3.19
EE	2.4	4.9	0.92
FF	6.1	12.4	2.84
GG	4.9	9.7	2.14
HH	3.1	6.3	1.33
JJ	7.9	16.1	2.63
KK	1.5	9.2	3.51
LL1	1.1	3.2	0.79
LL2	2.2	7.0	1.75
MM	1.8	4.7	1.05
NN	1.1	3.1	0.73
PP	2.1	11.0	4.21
QQ	3.0	5.6	0.74
RR	2.1	15.7	5.99
SS	1.4	3.7	0.84
TT	0.8	4.3	1.63

BASIN RUNOFF

BASIN	(Q5 CFS)	(Q100 CFS)	ACREAGE
P1–A1	10.2	20.3	4.45
P1–A2	14.4	29.1	6.59
P1–A3	5.8	11.4	1.83
P1–A4	5.2	10.2	1.64
P1–A5	4.7	10.3	1.86
P1–A6	8.0	17.3	3.55
P1–A7	7.0	15.7	3.11
P2–B1	5.2	10.7	1.82
P2–B2	5.2	10.7	1.87
P2–B3	4.3	8.9	1.55
P2–B4	4.4	9.2	1.64
P2–B5	3.1	6.2	0.97
P2–B6	3.2	6.5	1.07
P2–B7	3.8	8.5	1.62
P2–B8	3.6	7.4	1.21
P2–B9	7.3	14.1	2.08
P2–B10	7.5	15.0	2.31
P2–C2	6.1	11.9	1.73
P2–S1	51.9	126.6	36.59
CH–1	6.9	51.0	27.11
CH–2	3.6	26.2	10.62

DESIGN POINT SUMMARY

DESIGN POINT	(Q5 CFS)	(Q100 CFS)	INLET SIZE
1	10.2	20.3	EX. 20' AT–GRADE
2	14.4	29.1	EX. 20' AT–GRADE
3	5.2	14.7	EX. 15' AT–GRADE
4	5.6	18.1	EX. 15' AT–GRADE
5	7.0	15.7	FUT. 15' AT–GRADE
6	10.3	31.6	20' SUMP
7	8.0	17.3	15' SUMP
8	5.2	10.7	EX. 10' AT–GRADE
9	5.2	13.7	EX. 10' AT–GRADE
10	6.0	12.5	15' SUMP
11	4.2	8.5	10' SUMP
12	6.4	13.4	15' AT–GRADE
13	6.1	14.7	15' SUMP
14	3.7	7.5	10' SUMP
15	4.8	12.6	EX. 15' AT–GRADE
16	4.7	14.3	EX. 15' AT–GRADE
17	6.2	13.0	10' AT–GRADE
18	5.6	14.5	15' SUMP
19	3.5	7.1	5' SUMP
20	6.2	13.2	10' AT–GRADE
21	3.8	11.2	10' SUMP
22	2.4	4.9	5' SUMP
23	3.1	8.6	EX. 15' AT–GRADE
24	3.1	9.1	EX. 15' AT–GRADE
25	3.7	7.7	EX. 15' AT–GRADE
26	3.8	9.1	EX. 15' AT–GRADE
27	7.5	15.1	EX. 15' SUMP
28	7.3	14.6	EX. 15' SUMP
29A	5.9	14.0	10' AT–GRADE
29B	2.1	8.7	5' SUMP
30A	8.3	18.6	10' AT–GRADE
30B	2.4	9.9	10' SUMP
31	5.1	10.6	10' SUMP
32	3.5	7.2	5' SUMP
33	5.3	11.0	10' SUMP
34	4.0	8.2	10' SUMP
35	2.8	5.6	5' SUMP
36	2.2	4.6	5' SUMP
37	3.5	7.0	5' SUMP
38	4.7	9.9	10' SUMP
39	3.9	8.3	10' SUMP
40	2.4	4.9	5' SUMP
41	3.2	6.4	5' SUMP
42	1.5	3.0	5' SUMP
43	2.0	4.2	5' SUMP

DESIGN POINT SUMMARY

DESIGN POINT	(Q5 CFS)	(Q100 CFS)	INLET SIZE
44	1.3	2.5	5' SUMP
45	2.2	4.6	5' SUMP
46	1.4	2.7	5' SUMP
47A	5.1	10.3	10' AT–GRADE
47B	5.3	13.0	10' SUMP
48	1.1	2.1	5' SUMP
50	51.9	126.6	FUTURE STORM
50B	2.4	17.5	TYPE D INLET
50C	2.4	17.5	TYPE D INLET
50D	2.4	17.5	TYPE D INLET
51	7.9	16.1	FUTURE STORM
52	1.8	4.7	TYPE C INLET
53	1.1	3.1	TYPE C INLET
54	1.4	3.7	TYPE C INLET
55A	1.1	3.2	TYPE C INLET
55B	2.2	7.0	TYPE C INLET
56	0.8	4.3	FUTURE STORM
57	2.1	11.0	FUTURE STORM
58	3.0	5.6	FUTURE STORM
59	1.5	9.2	FUTURE STORM
60	232.0	520.5	PROPOSED POND 14A

LEGEND

EXISTING GROUND CONTOUR	(7000)
PROPOSED FINISHED GRADE CONTOURS	7000
SUBDIVISION BOUNDARY	▬ ▪ ▬
100-YR FLOODPLAIN LIMITS	— · —
EXISTING STORM SEWER	▬
EXISTING STORM INLET	▭
PROPOSED STORM SEWER	▬
PROPOSED STORM INLET	▭
FUTURE STORM SEWER	- - -
PROPOSED BASIN BOUNDARY	▬ ▬
BASIN IDENTIFIER AREA IN ACRES	D 1.41
DIRECTION OF DRAINAGE	⇨
DESIGN POINT	①
PIPE RUN	△1
EXISTING RIPRAP	▨
PROPOSED RIPRAP	▨

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NO.	REVISION	DATE

REVIEW:

PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF CLASSIC CONSULTING ENGINEERS AND SURVEYORS, LLC

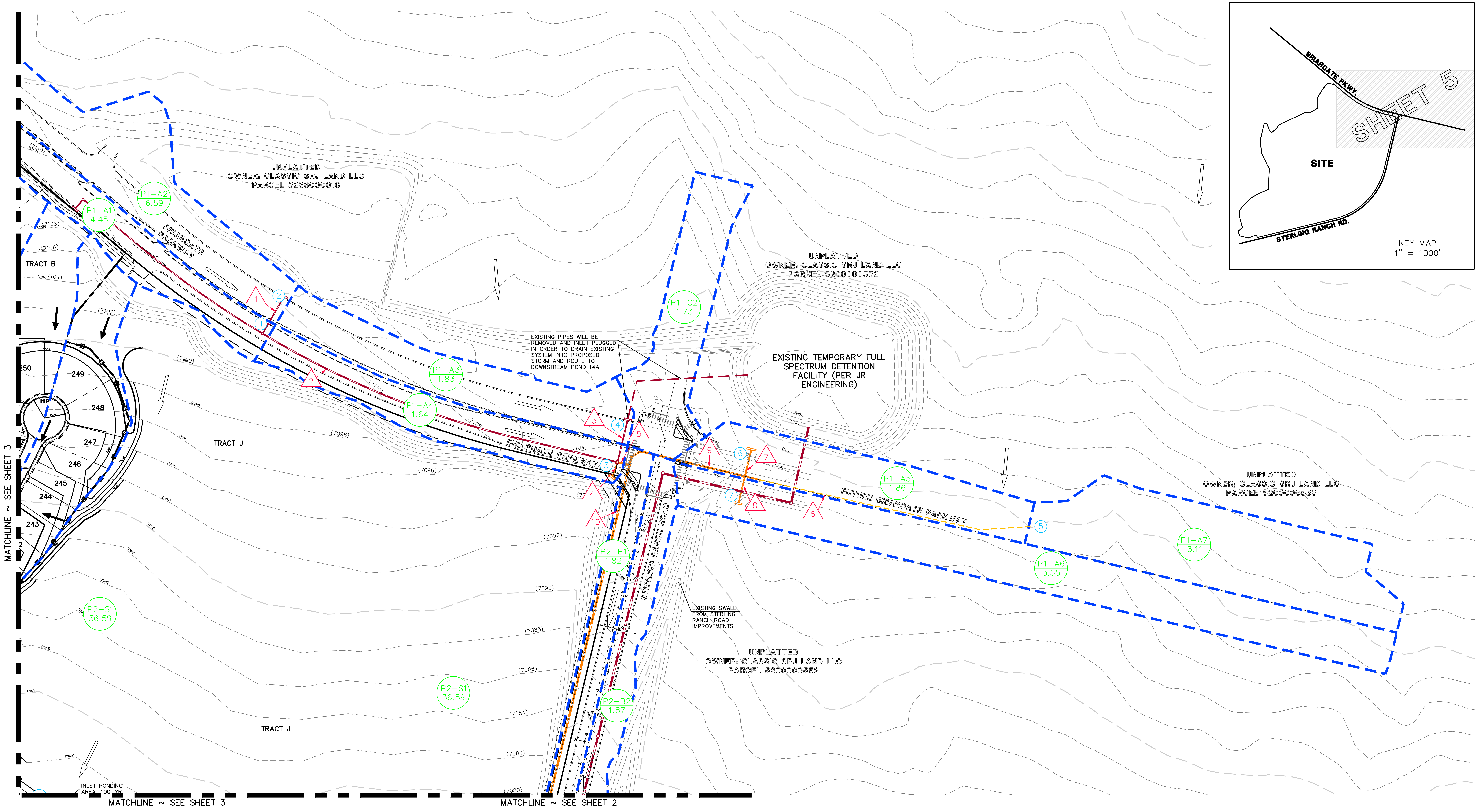
KYLE R. CAMPBELL, COLORADO P.E. #29794 DATE

CLASSIC CONSULTING
619 N. Cascade Avenue, Suite 200
Colorado Springs, Colorado 80903
(719)785-0790
(719)785-0799(Fax)

STERLING RANCH EAST FILING NO. 1

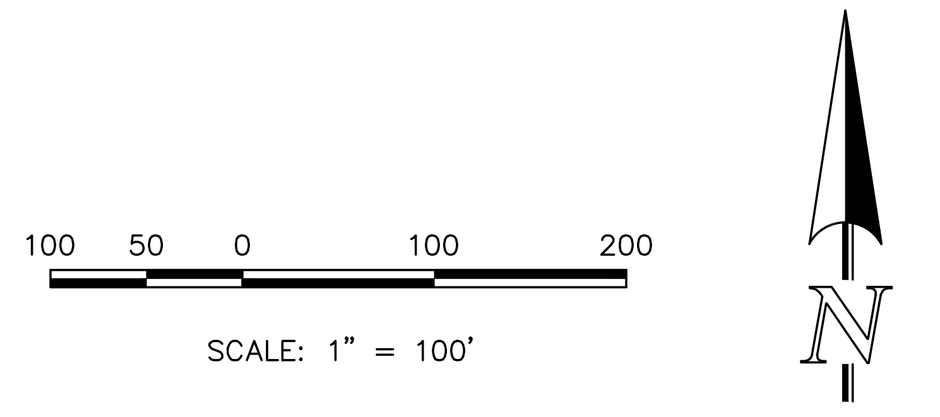
FINAL DRAINAGE REPORT
DEVELOPED CONDITIONS DRAINAGE MAP

DESIGNED BY	MAL	SCALE	DATE 11/04/22
DRAWN BY	MAL	(H) 1"= 100'	SHEET 2 OF 5
CHECKED BY		(V) 1"= N/A	JOB NO. 1183.30



LEGEND

		PROPOSED BASIN BOUNDARY	▬ ▬ ▬
EXISTING GROUND CONTOUR	(7000)	BASIN IDENTIFIER AREA IN ACRES	D 1.41
PROPOSED FINISHED GRADE CONTOURS	7000	DIRECTION OF DRAINAGE	⇨
SUBDIVISION BOUNDARY	▬ ▪ ▪ ▬	DESIGN POINT	①
100–YR FLOODPLAIN LIMITS	▬ ▪ ▪ ▬	PIPE RUN	△1
EXISTING STORM SEWER	▬▭▬▭▬	EXISTING RIPRAP	▨
EXISTING STORM INLET	▭	PROPOSED RIPRAP	▨
PROPOSED STORM SEWER	▬▭▬▭▬		
PROPOSED STORM INLET	▭		
FUTURE STORM SEWER	‐ ‐ ‐ ‐ ‐		



SCALE: 1" = 100'

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NO.	REVISION	DATE

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KYLE R. CAMPBELL, COLORADO P.E. #29794 DATE

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STERLING RANCH EAST FILING NO. 1

FINAL DRAINAGE REPORT
DEVELOPED CONDITIONS DRAINAGE MAP

DESIGNED BY	MAL	SCALE		DATE	11/04/22
DRAWN BY	MAL	(H) 1"= 100'		SHEET 5	OF 5
CHECKED BY		(V) 1"= N/A		JOB NO.	1183.30

CLASSIC CONSULTING

REFERENCE FINAL DRAINAGE REPORT FOR

STERLING RANCH EAST FILING NO. 5

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CONSULTING
ENGINEERS & SURVEYORS

FINAL DRAINAGE REPORT
FOR
STERLING RANCH EAST
FILING NO. 5

Prepared for:
CLASSIC SRJ LAND, LLC
2138 FLYING HORSE CLUB DRIVE
COLORADO SPRINGS CO 80921
(719) 592-9333

Prepared by:
CLASSIC CONSULTING
619 N. CASCADE AVE SUITE 200
COLORADO SPRINGS CO 80903
(719) 785-0790

Job No. 1183.25

PCD Project No. SF-24xx

FINAL DRAINAGE REPORT FOR STERLING RANCH EAST FILING NO. 5

ENGINEER'S STATEMENT:

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

Marc A. Whorton Colorado P.E. #37155 Date

OWNER'S/DEVELOPER'S STATEMENT:

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

Business Name: CLASSIC SRJ LAND, LLC

By:

Title:

Address: 2138 Flying Horse Club Drive
Colorado Springs, CO 80921

EL PASO COUNTY:

Filed in accordance with the requirements of the Drainage Criteria Manual, Volumes 1 and 2, El Paso County Engineering Criteria Manual and Land Development Code as amended.

Joshua Palmer, P.E. Date
County Engineer, / ECM Administrator

Conditions:

required to provide Water Quality Capture Volume (WQCV). Thus, the proposed FSD facility within this development will provide WQCV along with an Excess Urban Runoff Volume (EURV) in the lower portion of the facility storage volume with an outlet control device. Frequent and infrequent inflows are released at rates approximating undeveloped conditions. This concept provides some mitigation of increased runoff volume by releasing a portion of the increased runoff at a low rate over an extended period of time, up to 72 hours. This means that frequent storms, smaller than the 2-year event, will be reduced to very low flows near or below the sediment carrying threshold value for downstream drainage ways. Also, by incorporating an outlet structure that limits the 100-year runoff to the undeveloped condition rate, the discharge hydrograph for storms between the 2 year and the 100-year event will approximate the hydrograph for the undeveloped conditions and will help effectively mitigate the effects of development. As reasonably possible, WQCV will be provided for all new roads and urban lots.

This report will describe each developed basin tributary to the proposed FSD-14B facility. This final design will include sizing of all inlets, storm systems and FSD facilities including all required appurtenances.

The following developed basin descriptions will start at the north end of the project and move south and describe how this development proposes to handle both the off-site and on-site drainage conditions both from an interim standpoint based on adjacent construction phasing and the ultimate buildout scenario:

Off-site Basin P4-B (Q_5 = 48 cfs, Q_{100} = 106 cfs) represents the total developed flows from The Villages at Sterling Ranch East development (32.2 ac.) tributary to the proposed 48” RCP public storm system stubbed into Oak Park Dr as **Pipe Run 1**. (Reference Preliminary Drainage Report for Villages at Sterling Ranch Filing No. 1, prepared by Classic Consulting – PUDSP226) The development of this property represents the ultimate developed flow condition.

outlet pipe also daylights within this basin and directly into the existing Mohawk Road public ROW. As previously described in the existing conditions section, this pre-development location is **Design Point 6 (Q_5 = 59 cfs, Q_{100} = 122 cfs).** As described below, the designed pond release equals **(Q_5 = 2.4 cfs, Q_{100} = 43.4 cfs).** This flow combined with the Basin Y1 sheet flows is consistent with the previous reports and less than the pre-development flows values. **Basin Y2 (Q_5 = 0.9 cfs, Q_{100} = 5.2 cfs)** is also a 1.7 ac. basin consisting of the back side of the pond embankment and the buffer corridor/trail/existing easements along the south boundary. This area will continue to sheet flow in a southerly direction off-site. As previously described in the existing conditions section, this pre-development location is **Design Point 6A (Q_5 = 7 cfs, Q_{100} = 19 cfs).** This flow release remains consistent with the previous reports and less than the pre-development flows values. The Preliminary Drainage Report showed a concrete level spreader at the outfall of this pond. After further evaluation of the current immediate downstream corridor, existing gravel access and proposed trail along south boundary, it was determined that A more appropriate design for the pond outlet was to connect the outfall pipe directly into the Mohawk Road easterly sideroad ditch. This along with some public roadway ditch improvements including two culvert replacements will provide a better design to handle the proposed pond release.

DETENTION / STORMWATER QUALITY FACILITES

As required, storm water quality measures will be utilized in order to reduce the amount of sediment, debris and pollutants that are allowed to enter Sand Creek. These features include but are not limited to two Ponds (FSD-11B and FSD-14B), temporary sediment basin and runoff reduction RPA's (All owned and maintained by Sterling Ranch Metro District). All of these permanent BMPs have final design data provided within. All urban areas require detention and will provide a Water Quality Capture Volume (WQCV) and Excess Urban Runoff Volume (EURV) in the lower portion of the facility storage volume that will release the more frequent storms at a slower rate to help minimize the effects of development of the property. The proposed facilities are to be private facilities with ownership and maintenance by the Sterling Ranch Metropolitan

District. After completion of construction and upon the Board of County Commissioners acceptance, all the drainage facilities within the public Right-of-Way will be owned and maintained by El Paso County.

The following represents the proposed **Pond FSD 14-B design**:
(See MHFD-Detention Design Sheets in Appendix)

Total Tributary acreage: 68.07 Ac.
1.26 Ac.-ft. WQCV required
2.82 Ac.-ft. EURV required
2.81 Ac.-ft. 100-yr. Storage
6.89 Ac.-ft. Total
Total In-flow: $Q_5 = 78$ cfs, $Q_{100} = 185$ cfs
Pond Design Release: $Q_5 = 2.4$ cfs, $Q_{100} = 43.4$ cfs
(Ownership and maintenance by the Sterling Ranch Metro District)

DRAINAGE CRITERIA

Hydrologic calculations were performed using the City of Colorado Springs/El Paso County Drainage Criteria Manual, as revised in November 1991 and October 1994 with County adopted Chapter 6 and Section 3.2.1 of Chapter 13 of the City of Colorado Springs/El Paso County Drainage Criteria Manual as revised in May 2014. Individual on-site developed basin design used for detention/SWQ basin sizing, inlet sizing and storm system routing was calculated using the Rational Method. Runoff Coefficients are based on the imperviousness of the particular land use and the hydrologic soil type in accordance with Table 6-6. The average rainfall intensity, by recurrence interval found in the Intensity-Duration-Frequency (IDF) curves in Figure 6-5. (See Appendix)

STERLING RANCH EAST PRELIMINARY PLAN NO. 1

Pre-Developed Surface Routing

Design Point (South Bndy.)	Peak Runoff 5 yr. (CFS)	Peak Runoff 100 yr. (CFS)
4	46	105
4A	1	5
5	5	23
5A	2	9
6	59	122
6A	7	19
7	110	249
56	60	160

STERLING RANCH EAST PRELIMINARY PLAN NO. 1

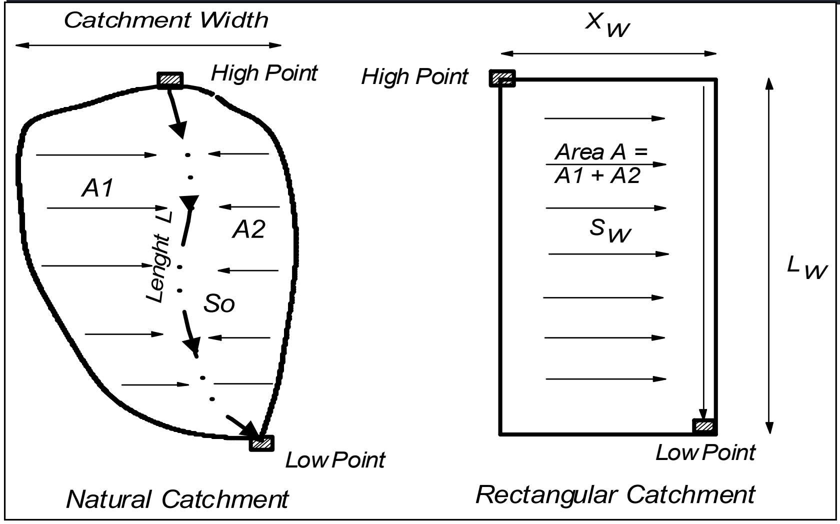
Pre-Developed Subcatchment Runoff

Subcatchment	Area (Ac.)	SWMM Imperv. (%)	*SWMM Width (Lw) (ft.)	*SWMM Slope (Sw) (%)	Peak Runoff 5 yr. (CFS)	Peak Runoff 100 yr. (CFS)
EX-10	265.9	7%	3365	3.41%	105	222
EX10A	153.5	5%	1857	4.05%	46	103
EX-11 +	214.3	4%	3255	3.01%	54	129
EX-13 +	94.8	6%	1877	3.97%	36	85
EX-4A	44.2	8%	3355	1.09%	19	50
EX-5	26.2	8%	1959	1.65%	12	32
EX-7	152.8	5%	2234	3.13%	46	105
EX-7A	2.4	2%	416	2.70%	1	5
EX-8	32.2	2%	1679	1.47%	5	23
EX-8A	6.6	2%	698	1.80%	2	9
EX-9	139.3	8%	1837	3.19%	59	122
EX-9A	21.8	5%	786	3.01%	7	19
TR-12 +	4.7	5%	544	4.13%	2	9
TR-20 +	23.2	7%	1388	3.21%	10	32
TR-4 +	4.4	5%	645	2.76%	2	9
TR-5 +	13.7	5%	990	2.70%	5	17
TR-6 +	1.5	5%	519	1.55%	1	4
TR-7 +	2.6	5%	233	5.84%	1	5

* Reference SWMM Catchment Shape Parameter Finder for calculations

CATCHMENT SHAPE PARAMETER FINDER

Convert Natural Catchment to a Rectangular Shape



Subcatchment Center	Z=0.5
Side Collector	Z=1
Skewed Location	0.5<Z<1

Dimensionless Variables

$Y = \frac{L}{L_w}$; $X = \frac{A}{L^2}$

$$Y = (1.5 - Z)(2.286X - 0.286X^2)$$

$$\frac{Lw}{L} = (1.5 - Z)[2.286(\frac{A}{L^2}) - 0.286(\frac{A}{L^2})^2]$$

$$S_o/S_w = A/(LL_w) + L_w/L$$

$$X_w = A/L_w$$

Subarea ID	Area acre	A1 acre	A2 acre	L ft	High Pt Elev. ft	Low Pt Elev. ft	Z=Am/A	$X=A/L^2$	Y=Lw/L	Lw ft	Xw ft	So %	So/Sw	Sw %
EX-7	152.80	82.00	70.80	6,430	7160.0	6997.0	0.54	0.16	0.35	2,234	2,980	2.53	0.81	3.13
EX-9	139.30	65.00	74.30	7,190	7190.0	7026.0	0.53	0.12	0.26	1,837	3,302	2.28	0.71	3.19
EX10A	153.50	75.00	78.50	8,030	7,236	7,015	0.51	0.10	0.23	1,857	3,600	2.75	0.68	4.05
EX10	265.90	120.00	145.90	7,280	7,380	7,148	0.55	0.22	0.46	3,365	3,442	3.19	0.94	3.41
EX-11	214.30	100.00	114.30	6,140	7,192	7,008	0.53	0.25	0.53	3,255	2,867	3.00	1.00	3.01
EX-13	94.80	47.00	47.80	4,900	7,232	7,070	0.50	0.17	0.38	1,877	2,200	3.31	0.83	3.97
TR-4	4.40	2.20	2.20	640	7,270	7,244	0.50	0.47	1.01	645	297	4.06	1.47	2.76
TR-5	13.70	7.50	6.20	1,250	7,273	7,230	0.55	0.38	0.79	990	603	3.44	1.27	2.70
TR-6	1.50	0.75	0.75	250	7,238	7,228	0.50	1.05	2.08	519	126	4.00	2.58	1.55
TR-7	2.60	1.30	1.30	1,100	7,234	7,192	0.50	0.09	0.21	233	487	3.82	0.65	5.84
TR-12	4.70	2.50	2.20	800	7,300	7,262	0.53	0.32	0.68	544	377	4.75	1.15	4.13
TR-20	23.20	12.00	11.20	1,550	7,314	7,246	0.52	0.42	0.90	1,388	728	4.39	1.37	3.21
EX-4A	44.20	22.10	22.10	750	7,044	7,001	0.50	3.42	4.47	3,355	574	5.73	5.24	1.09
EX-5	26.20	13.10	13.10	1,200	7,186	7,144	0.50	0.79	1.63	1,959	583	3.50	2.12	1.65
EX-7A	2.40	1.20	1.20	550	7,039	7,021	0.50	0.35	0.76	416	251	3.27	1.21	2.70
EX-8A	6.60	3.30	3.30	900	7,045	7,025	0.50	0.35	0.78	698	412	2.22	1.23	1.80
EX-8A	32.20	17.00	15.20	1,750	7,062	7,025	0.53	0.46	0.96	1,679	835	2.11	1.44	1.47
EX-9A	21.80	11.80	10.00	2,600	7,082	7,022	0.54	0.14	0.30	786	1,208	2.31	0.77	3.01

JOB NAME: *STERLING RANCH EAST FILING NO. 5 - FDR*
JOB NUMBER: *1183.25*
DATE: *10/17/24*
CALCULATED BY: *MAW*

FINAL DRAINAGE REPORT ~ BASIN RUNOFF COEFFICIENT SUMMARY

BASIN	TOTAL AREA (AC)	C VALUE DCM TABLE 6-6					C VALUE DCM TABLE 6-6					WEIGHTED "C" VALUE		WEIGHTED CA		DCM TABLE 6-6
		LAND USE	PERCENT IMPERVIOUS	AREA (AC)	C(5)	C(100)	LAND USE	PERCENT IMPERVIOUS	AREA (AC)	C(5)	C(100)	C(5)	C(100)	CA(5)	CA(100)	WEIGHTED % IMPERVIOUS
OS-1	2.60	RES 1/8 AC.	65.0%	1.30	0.45	0.59	STREET	100%	1.30	0.90	0.96	0.68	0.78	**1.76**	**2.02**	82.5%
OS-2	0.68	STREET	100%	0.34	0.90	0.96	OPEN SPACE	7.0%	0.34	0.12	0.39	0.51	0.68	**0.35**	**0.46**	53.5%
OS-3	0.25	STREET	100%	0.25	0.90	0.96			0.00	0.08	0.35	0.90	0.96	**0.23**	**0.24**	100.0%
OS-4	1.40	RES 1/6 AC.	52.5%	1.40	**0.38**	**0.55**			0.00	0.08	0.35	0.38	0.55	**0.53**	**0.76**	52.5%
OS-5	0.87	STREET	100%	0.49	0.90	0.96	OPEN SPACE	7.0%	0.38	0.12	0.39	0.56	0.71	**0.49**	**0.62**	59.4%
OS-6	530.0%	UNDEV.	2.0%	530.0%	9.0%	36.0%			0.0%	12.0%	39.0%	9.0%	36.0%	47.7%	190.8%	2.0%
OS-7	720.0%	UNDEV.	2.0%	720.0%	9.0%	36.0%			0.0%	12.0%	39.0%	9.0%	36.0%	64.8%	259.2%	2.0%
P4-B Villages at Sterling Ranch East PP	32.20	RES 1/8 AC.	67.6%	32.20	0.46	0.61			0.00	0.08	0.35	0.46	0.61	**14.94**	**19.77**	67.6%
TOTAL	**99.23**															
TOTAL TRIB. AREA TO POND FSD-14B	**68.07**															55.6%

🟦	Basins tributaty to Pond FSD-14B
🟧	Basins tributaty to Pond FSD-11B
🟩	Basin w/ Runoff Reduction Treatment
🟪	Basins treated in Temp. Sediment Pond

JOB NAME: *STERLING RANCH EAST FILING NO. 5 - FDR*
JOB NUMBER: *1183.25*
DATE: *10/17/24*
CALC'D BY: *MAW*

Return Period	1-Hour Depth
2	1.19
5	1.50
10	1.75
25	2.00
50	2.25
100	2.52

$$t_i = \frac{0.395(1.1 - C_5)\sqrt{L}}{S^{0.33}}$$

$$V = C_v S_w^{0.5}$$

Tc=L/V

Table 6-7. Conveyance Coefficient, C_v

Type of Land Surface	C_v
Heavy meadow	2.5
Tillage/field	5
Riprap (not buried)*	6.5
Short pasture and lawns	7
Nearly bare ground	10
Grassed waterway	15
Paved areas and shallow paved swales	20

$$t_c = \frac{L}{180} + 10$$

* For buried riprap, select C_v value based on type of vegetative cover.

FINAL DRAINAGE REPORT ~ BASIN RUNOFF SUMMARY

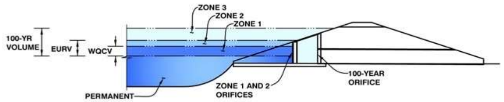
BASIN	WEIGHTED CA(2)	CA(5)	CA(100)	OVERLAND C(5)	Length (ft)	Height (ft)	Tc (min)	STREET / CHANNEL FLOW Length (ft)	Slope (%)	Velocity (fps)	Tc (min)	Tc TOTAL (min)	INTENSITY I(2) (in/hr)	I(5) (in/hr)	I(100) (in/hr)	TOTAL FLOWS Q(2) (cfs)	Q(5) (cfs)	Q(100) (cfs)
OS-1	1.69	1.76	2.02	0.08	40	0.8	9.3	900	2.5%	3.2	4.7	14.0	2.89	3.62	6.08	5	**6**	**12**
OS-2	0.32	0.35	0.46	0.12	50	1	10.0	400	1.6%	2.5	2.6	12.6	3.02	3.78	6.35	1.0	**1.3**	**2.9**
OS-3	0.22	0.23	0.24									5.0	4.12	5.17	8.68	0.9	**1.2**	**2.1**
OS-4	0.45	0.53	0.76	0.08	50	1	10.4	500	1.5%	2.4	3.4	13.8	2.91	3.65	6.13	1	**2**	**5**
OS-5	0.46	0.49	0.62	0.12	25	0.75	6.2	450	1.5%	2.4	3.1	9.2	3.39	4.25	7.14	2	**2**	**4**
OS-6	0.16	0.48	1.91	0.12	300	7	23.2					23.2	2.29	2.87	4.81	0.4	**1**	**9**
OS-7	0.22	0.65	2.59	0.12	300	7	23.2					23.2	2.29	2.87	4.81	0.5	**2**	**12**
P4-B Villages at Sterling Ranch East PP	13.52	14.94	19.77	0.08	100	2	14.7	600	1.5%	2.4	4.1	18.7	2.55	3.19	5.35	34	**48**	**106**

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)

Project: **STERLING RANCH EAST FILING NO. 5 - FDR**

Basin ID: **POND FSD-14B**



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type = **EDB**
Watershed Area = 68.07 acres
Watershed Length = 3,200 ft
Watershed Length to Centroid = 1,600 ft
Watershed Slope = 0.040 ft/ft
Watershed Imperviousness = 55.60% percent
Percentage Hydrologic Soil Group A = 0.0% percent
Percentage Hydrologic Soil Group B = 100.0% percent
Percentage Hydrologic Soil Groups C/D = 0.0% percent
Target WQCV Drain Time = 40.0 hours
Location for 1-hr Rainfall Depths = User Input

After providing required inputs above including 1-hour rainfall depths, click 'Run CUHP' to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

			Optional User Overrides	
Water Quality Capture Volume (WQCV) =	1.261	acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	4.081	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	3.833	acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.5 in.) =	5.369	acre-feet	1.50	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	6.703	acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	8.433	acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	9.867	acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	11.660	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 3.48 in.) =	17.390	acre-feet	3.48	inches
Approximate 2-yr Detention Volume =	3.113	acre-feet		
Approximate 5-yr Detention Volume =	4.229	acre-feet		
Approximate 10-yr Detention Volume =	5.511	acre-feet		
Approximate 25-yr Detention Volume =	5.987	acre-feet		
Approximate 50-yr Detention Volume =	6.248	acre-feet		
Approximate 100-yr Detention Volume =	6.885	acre-feet		

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) = 1.261 acre-feet
Zone 2 Volume (EURV - Zone 1) = 2.820 acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) = 2.805 acre-feet
Total Detention Basin Volume = 6.885 acre-feet
Initial Surcharge Volume (ISV) = user ft^3
Initial Surcharge Depth (ISD) = user ft
Total Available Detention Depth (H_{total}) = user ft
Depth of Trickle Channel (H_{TC}) = user ft
Slope of Trickle Channel (S_{TC}) = user ft/ft
Slopes of Main Basin Sides (S_{main}) = user H:V
Basin Length-to-Width Ratio ($R_{L/W}$) = user

Initial Surcharge Area (A_{ISV}) = user ft^2
Surcharge Volume Length (L_{ISV}) = user ft
Surcharge Volume Width (W_{ISV}) = user ft
Depth of Basin Floor (H_{FLOOR}) = user ft
Length of Basin Floor (L_{FLOOR}) = user ft
Width of Basin Floor (W_{FLOOR}) = user ft
Area of Basin Floor (A_{FLOOR}) = user ft^2
Volume of Basin Floor (V_{FLOOR}) = user ft^3
Depth of Main Basin (H_{MAIN}) = user ft
Length of Main Basin (L_{MAIN}) = user ft
Width of Main Basin (W_{MAIN}) = user ft
Area of Main Basin (A_{MAIN}) = user ft^2
Volume of Main Basin (V_{MAIN}) = user ft^3
Calculated Total Basin Volume (V_{total}) = **user** acre-feet

Depth Increment = 1.00 ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	372	0.009		
7032	--	0.50	--	--	--	372	0.009	186	0.004
7034	--	2.50	--	--	--	18,682	0.429	19,240	0.442
7036	--	4.50	--	--	--	53,436	1.227	91,358	2.097
7038	--	6.50	--	--	--	86,379	1.983	231,173	5.307
7040	--	8.50	--	--	--	98,212	2.255	415,764	9.545
7042	--	10.50	--	--	--	110,196	2.530	624,172	14.329
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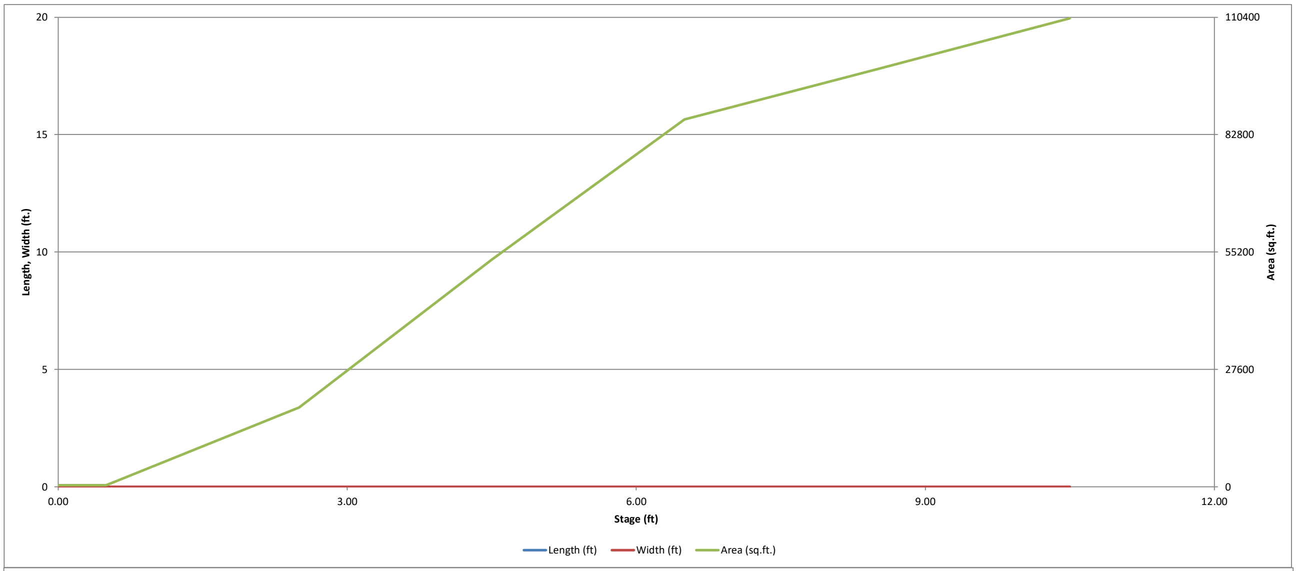
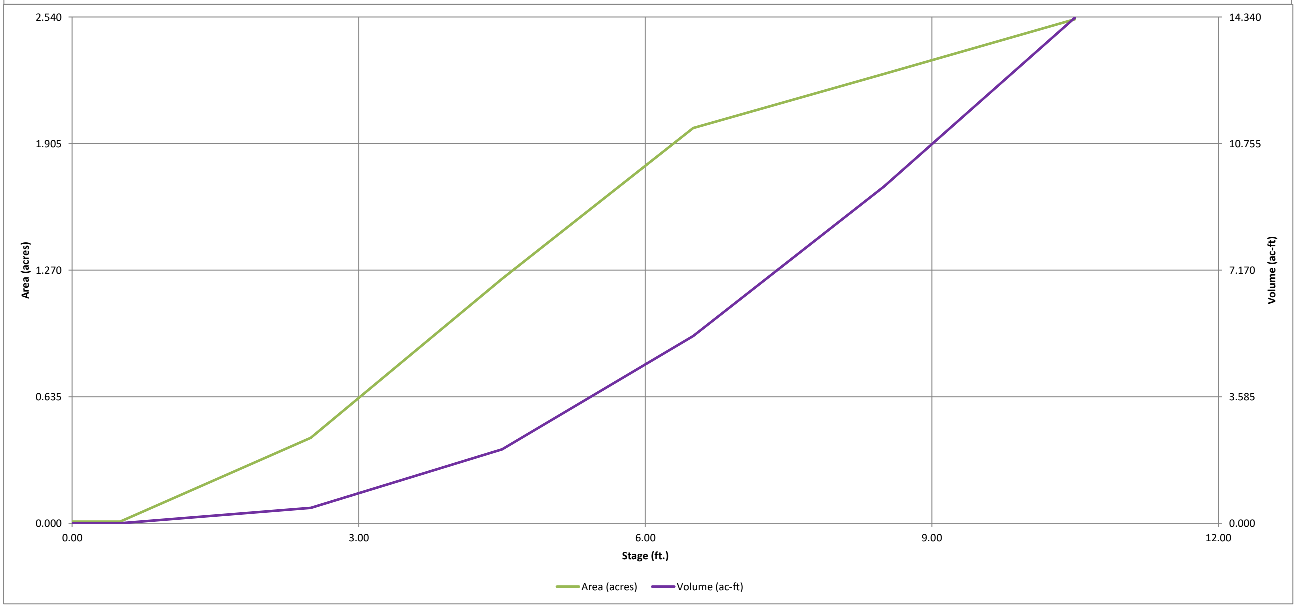
DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)



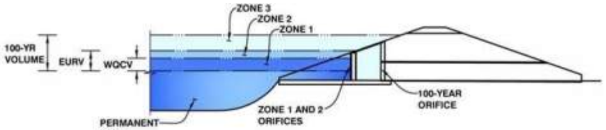


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Project: STERLING RANCH EAST FILING NO. 5 - FDR

Basin ID: POND FSD-14B



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	3.72	1.261	Orifice Plate
Zone 2 (EURV)	5.84	2.820	Orifice Plate
Zone 3 (100-year)	7.28	2.805	Weir&Pipe (Restrict)
Total (all zones)		6.885	

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

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

Calculated Parameters for Underdrain

Underdrain Orifice Area =		ft^2
Underdrain Orifice Centroid =		feet

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

Centroid of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =	6.25	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	25.00	inches
Orifice Plate: Orifice Area per Row =	N/A	sq. inches

Calculated Parameters for Plate

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

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

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	2.10	4.20					
Orifice Area (sq. inches)	4.91	5.94	24.00					

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

User Input: Vertical Orifice (Circular or Rectangular)

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

Calculated Parameters for Vertical Orifice

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

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir and No Outlet Pipe)

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	6.25	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	8.00	N/A	feet
Overflow Weir Grate Slope =	4.00	N/A	H:V
Horiz. Length of Weir Sides =	4.00	N/A	feet
Overflow Grate Type =	Close Mesh Grate	N/A	
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H_t =	7.25	N/A	feet
Overflow Weir Slope Length =	4.12	N/A	feet
Grate Open Area / 100-yr Orifice Area =	5.32	N/A	
Overflow Grate Open Area w/o Debris =	26.09	N/A	ft^2
Overflow Grate Open Area w/ Debris =	13.05	N/A	ft^2

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

	Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	0.50	N/A	ft (distance below basin bottom at Stage = 0 ft)
Outlet Pipe Diameter =	30.00	N/A	inches
Restrictor Plate Height Above Pipe Invert =	30.00		inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Restrictor	Not Selected	
Outlet Orifice Area =	4.91	N/A	ft^2
Outlet Orifice Centroid =	1.25	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	3.14	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	8.50	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	50.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.10	feet

Calculated Parameters for Spillway

Spillway Design Flow Depth=	1.08	feet
Stage at Top of Freeboard =	10.68	feet
Basin Area at Top of Freeboard =	2.53	acres
Basin Volume at Top of Freeboard =	14.33	acre-ft

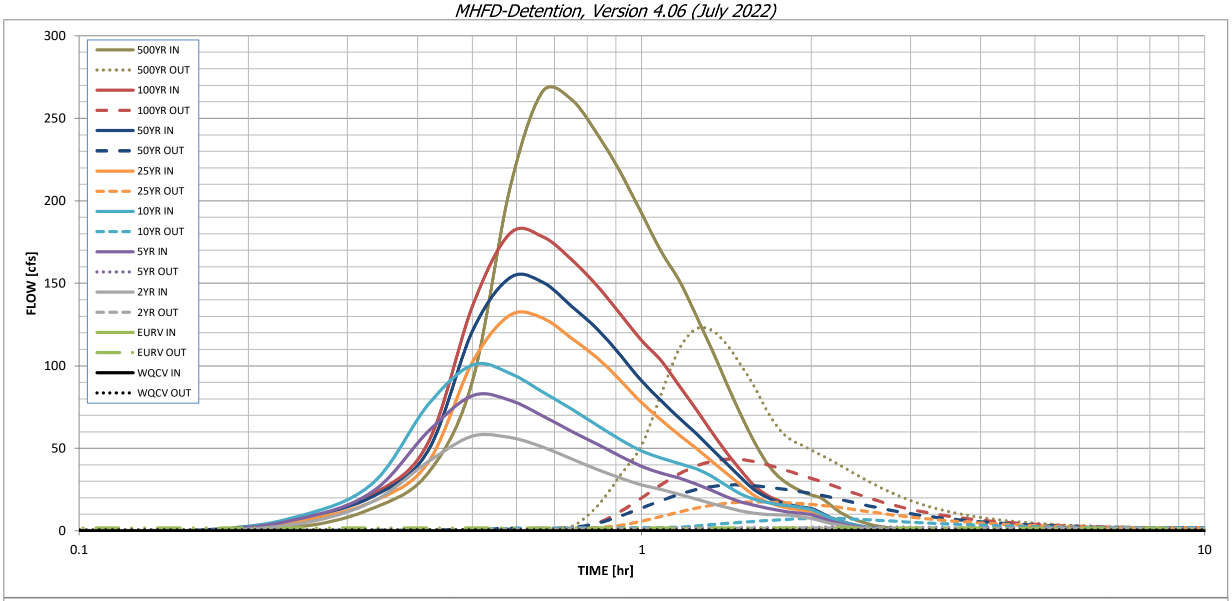
Routed Hydrograph Results

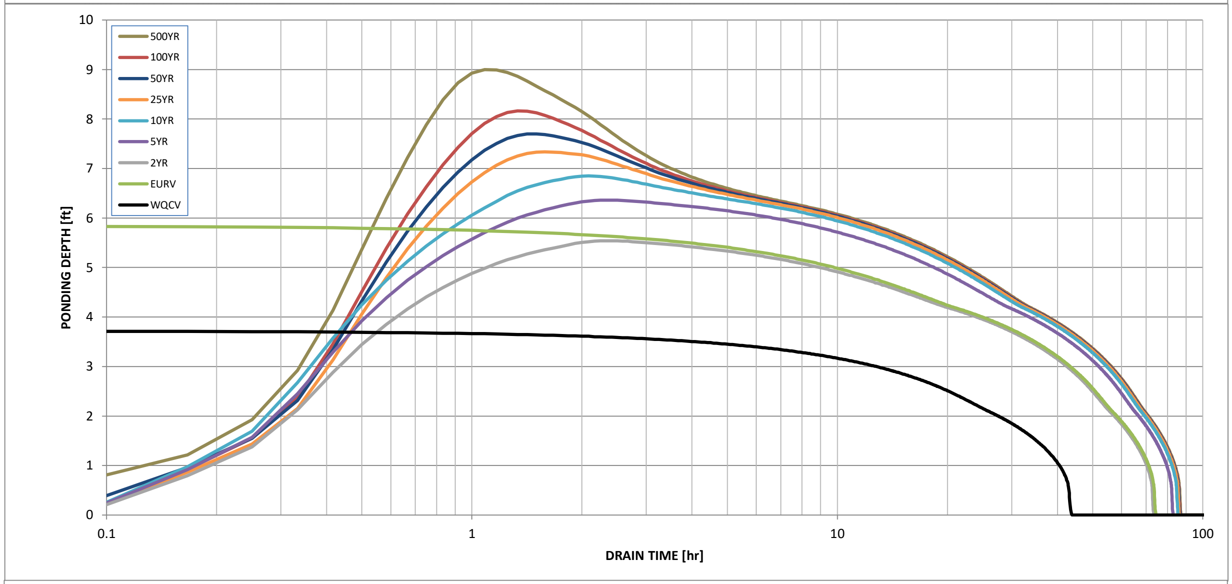
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

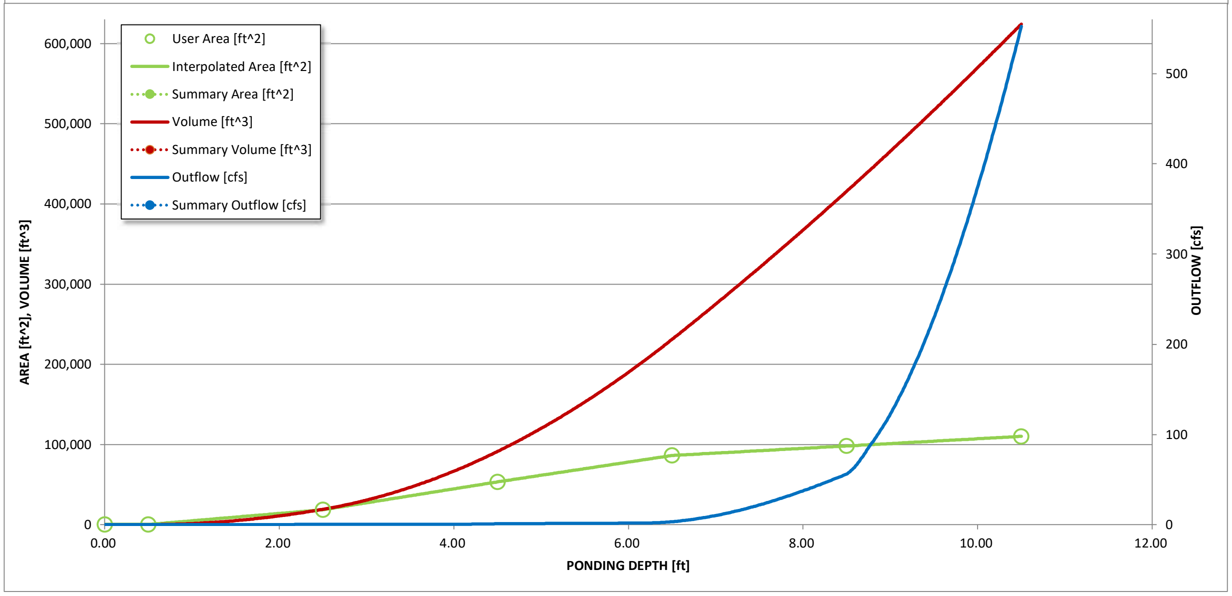
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.48
CUHP Runoff Volume (acre-ft) =	1.261	4.081	3.833	5.369	6.703	8.433	9.867	11.660	17.390
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	3.833	5.369	6.703	8.433	9.867	11.660	17.390
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	6.6	18.7	28.4	50.9	63.9	81.9	132.6
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.10	0.27	0.42	0.75	0.94	1.20	1.95
Peak Inflow Q (cfs) =	N/A	N/A	57.4	81.9	100.5	130.6	153.4	180.2	266.3
Peak Outflow Q (cfs) =	0.6	1.8	1.7	2.4	7.6	17.5	27.8	43.3	122.4
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.1	0.3	0.3	0.4	0.5	0.9
Structure Controlling Flow =	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	0.0	0.2	0.6	1.0	1.6	2.5
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	40	66	65	72	72	70	68	66	61
Time to Drain 99% of Inflow Volume (hours) =	**42**	71	70	78	80	80	79	78	75
Maximum Ponding Depth (ft) =	3.72	5.85	5.54	6.36	6.85	7.33	7.70	8.16	9.00
Area at Maximum Ponding Depth (acres) =	0.92	1.74	1.62	1.93	2.03	2.10	2.15	2.21	2.32
Maximum Volume Stored (acre-ft) =	1.262	4.098	3.561	5.033	6.009	7.000	7.784	8.786	10.666

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)







S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

DETENTION BASIN OUTLET STRUCTURE DESIGN

Outflow Hydrograph Workbook Filename:

Inflow Hydrographs

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.00 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.05	2.63
	0:15:00	0.00	0.00	4.70	7.69	9.53	6.40	8.12	7.82	13.74
	0:20:00	0.00	0.00	17.91	23.96	29.10	17.94	21.01	22.34	34.78
	0:25:00	0.00	0.00	41.77	59.94	76.12	40.96	48.16	52.93	90.20
	0:30:00	0.00	0.00	57.35	81.94	100.54	102.08	120.79	135.81	207.63
	0:35:00	0.00	0.00	56.57	79.11	95.49	130.62	153.39	180.21	266.28
	0:40:00	0.00	0.00	50.73	69.58	84.08	129.02	150.63	178.31	261.48
	0:45:00	0.00	0.00	43.64	60.33	73.83	116.71	136.08	164.40	240.61
	0:50:00	0.00	0.00	37.24	52.62	64.00	105.00	122.44	148.47	217.34
	0:55:00	0.00	0.00	31.99	45.25	55.20	91.13	106.40	131.22	192.11
	1:00:00	0.00	0.00	27.83	39.04	48.36	77.54	90.68	115.29	169.06
	1:05:00	0.00	0.00	25.03	34.97	44.05	67.12	78.69	102.98	151.65
	1:10:00	0.00	0.00	22.08	31.93	40.72	58.04	68.20	87.87	130.27
	1:15:00	0.00	0.00	19.18	28.40	37.53	50.06	58.92	73.47	109.79
	1:20:00	0.00	0.00	16.55	24.39	32.92	42.11	49.53	59.70	89.24
	1:25:00	0.00	0.00	14.10	20.64	27.29	34.72	40.77	47.29	70.46
	1:30:00	0.00	0.00	12.03	17.53	22.31	27.68	32.36	36.58	54.32
	1:35:00	0.00	0.00	10.64	15.51	19.11	21.50	24.99	27.57	41.15
	1:40:00	0.00	0.00	9.94	13.74	17.23	17.55	20.34	21.80	32.82
	1:45:00	0.00	0.00	9.61	12.33	15.97	15.17	17.51	18.33	27.69
	1:50:00	0.00	0.00	9.41	11.34	15.08	13.63	15.66	15.96	24.16
	1:55:00	0.00	0.00	8.49	10.60	14.20	12.58	14.38	14.31	21.69
	2:00:00	0.00	0.00	7.49	9.83	12.95	11.89	13.53	13.13	19.90
	2:05:00	0.00	0.00	5.96	7.86	10.28	9.54	10.83	10.27	15.55
	2:10:00	0.00	0.00	4.50	5.89	7.68	7.08	8.01	7.46	11.28
	2:15:00	0.00	0.00	3.41	4.43	5.71	5.29	5.97	5.55	8.36
	2:20:00	0.00	0.00	2.56	3.30	4.22	3.93	4.43	4.14	6.21
	2:25:00	0.00	0.00	1.90	2.43	3.09	2.90	3.26	3.08	4.61
	2:30:00	0.00	0.00	1.39	1.74	2.25	2.10	2.35	2.24	3.36
	2:35:00	0.00	0.00	0.99	1.23	1.63	1.52	1.70	1.63	2.43
	2:40:00	0.00	0.00	0.69	0.87	1.16	1.10	1.23	1.18	1.76
	2:45:00	0.00	0.00	0.45	0.59	0.77	0.75	0.84	0.80	1.19
	2:50:00	0.00	0.00	0.26	0.36	0.46	0.47	0.52	0.50	0.73
	2:55:00	0.00	0.00	0.13	0.19	0.24	0.25	0.28	0.26	0.38
	3:00:00	0.00	0.00	0.05	0.08	0.09	0.10	0.11	0.10	0.14
	3:05:00	0.00	0.00	0.01	0.01	0.02	0.02	0.02	0.02	0.02
	3:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Summary Stage-Area-Volume-Discharge Relationships

The user can create a summary S-A-V-D by entering the desired stage increments and the remainder of the table will populate automatically.

The user should graphically compare the summary S-A-V-D table to the full S-A-V-D table in the chart to confirm it captures all key transition points.

Stage - Storage Description	**Stage** [ft]	**Area** [ft ^{2}]	**Area** [acres]	**Volume** [ft ^{3}]	**Volume** [ac-ft]	**Total Outflow** [cfs]

For best results, include the stages of all grade slope changes (e.g. ISV and Floor) from the S-A-V table on Sheet 'Basin'.

Also include the inverts of all outlets (e.g. vertical orifice, overflow grate, and spillway, where applicable).

DRAINAGE MAPS

STERLING RANCH EAST PRELIMINARY PLAN NO. 1
Pre-Developed Subcatchment Runoff

Subcatchment	Area (Ac.)	SWMM Imperv. (%)	Peak Runoff 5 yr. (CFS)	Peak Runoff 100 yr. (CFS)
EX-10	265.9	7%	105	222
EX10A	153.5	5%	46	103
EX-11 *	214.3	4%	54	129
EX-13 *	94.8	6%	36	85
EX-4A	44.2	8%	19	50
EX-5	26.2	8%	12	32
EX-7	152.8	5%	46	105
EX-7A	2.4	2%	1	5
EX-8	32.2	2%	5	23
EX-8A	6.6	2%	2	9
EX-9	139.3	8%	59	122
EX-9A	21.8	5%	7	19
TR-12 *	4.7	5%	2	9
TR-20 *	23.2	7%	10	32
TR-4 *	4.4	5%	2	9
TR-5 *	13.7	5%	5	17
TR-6 *	1.5	5%	1	4
TR-7 *	2.6	5%	1	5

* Basins with no change upon developed condition

STERLING RANCH EAST PRELIMINARY PLAN NO. 1
Pre-Developed Surface Routing

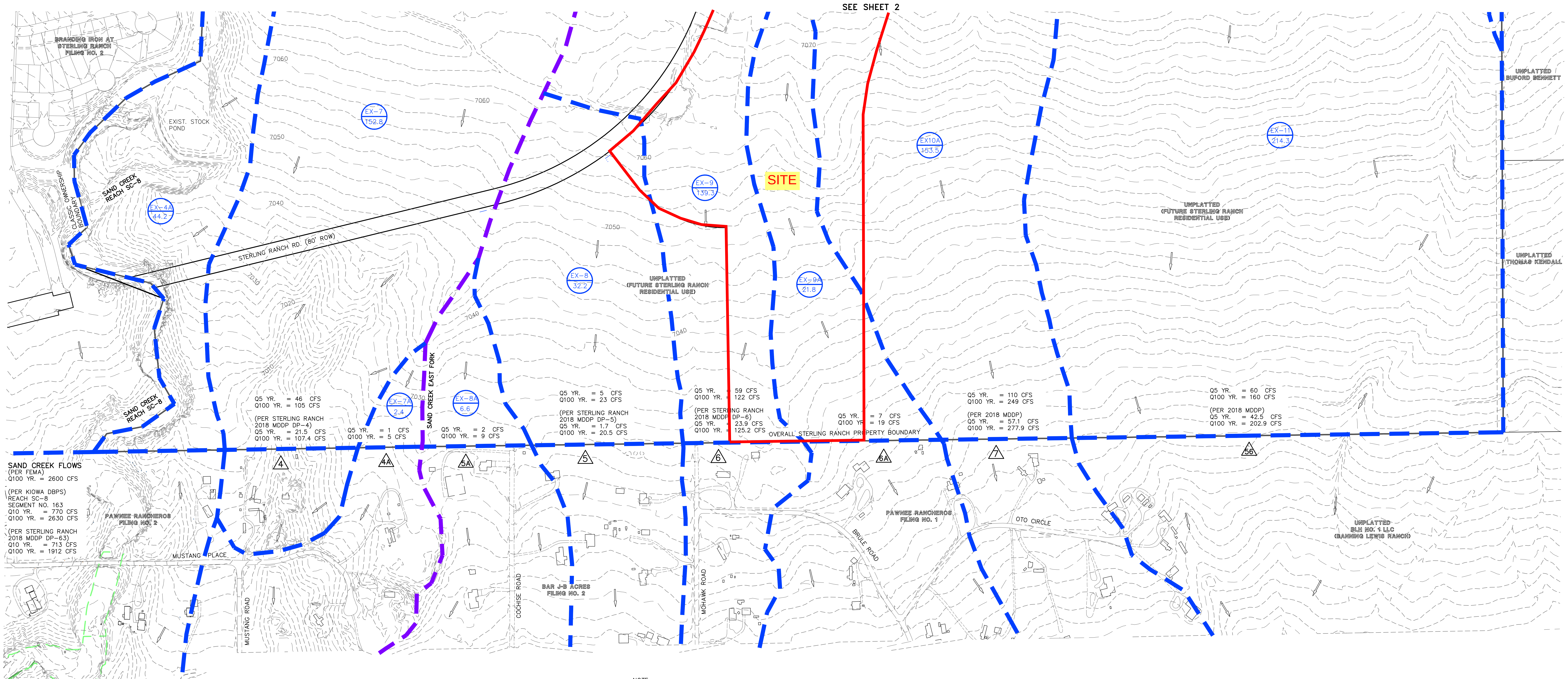
Design Point (South Bndy.)	Peak Runoff 5 yr. (CFS)	Peak Runoff 100 yr. (CFS)
4	46	105
4A	1	5
5	5	23
5A	2	9
6	59	122
6A	7	19
7	110	249
56	60	160

CLASSIC CONSULTING

619 N. Cascade Avenue, Suite 200
Colorado Springs, Colorado 80903
(719)785-0790
(719)785-0799 (Fax)

STERLING RANCH EAST
PRELIMINARY PLAN NO. 1
PRELIMINARY DRAINAGE REPORT
PRE-DEVELOPMENT DRAINAGE MAP

DESIGNED BY MAW	SCALE	DATE	4-1-22
DRAWN BY MAW	(H) 1"= 200'	SHEET 2	OF 6
CHECKED BY	(V) 1"= N/A	JOB NO.	1183.22



NOTE:

THE FOLLOWING LABELS AS SHOWN ALONG THE SOUTH BOUNDARY REPRESENT PRE-DEVELOPED FLOWS AS PRESENTED IN THE 2018 STERLING RANCH MDDP. SEE REFERENCE MATERIAL IN APPENDIX FOR ORIGINAL MAP.

(PER STERLING RANCH
2018 MDDP DP-5)
Q5 YR. = 1.7 CFS
Q100 YR. = 20.5 CFS

STERLING RANCH EAST PRELIMINARY PLAN NO. 1

Pre-Developed Subcatchment Runoff

Subcatchment	Area (Ac.)	SWMM Imperv. (%)	Peak Runoff 5 yr. (CFS)	Peak Runoff 100 yr. (CFS)
EX-10	265.9	7%	105	222
EX10A	153.5	5%	46	103
EX-11 *	214.3	4%	54	129
EX-13 *	94.8	6%	36	85
EX-4A	44.2	8%	19	50
EX-5	26.2	8%	12	32
EX-7	152.8	5%	46	105
EX-7A	2.4	2%	1	5
EX-8	32.2	2%	5	23
EX-8A	6.6	2%	2	9
EX-9	139.3	8%	59	122
EX-9A	21.8	5%	7	19
TR-12 *	4.7	5%	2	9
TR-20 *	23.2	7%	10	32
TR-4 *	4.4	5%	2	9
TR-5 *	13.7	5%	5	17
TR-6 *	1.5	5%	1	4
TR-7 *	2.6	5%	1	5

* Basins with no change upon developed condition

STERLING RANCH EAST PRELIMINARY PLAN NO. 1

Pre-Developed Surface Routing

Design Point (South Bndy.)	Peak Runoff 5 yr. (CFS)	Peak Runoff 100 yr. (CFS)
4	46	105
4A	1	5
5	5	23
5A	2	9
6	59	122
6A	7	19
7	110	249
56	60	160

LEGEND

DESCRIPTION	SYMBOL
EXISTING GROUND CONTOUR	6910
PROPOSED FINISHED CONTOUR	— 6910 —
SUB-BASIN BOUNDARY	▬ ▬ ▬
SAND CREEK EAST FORK BASIN LINE	▬ ▬
DESIGN POINT	△4
BASIN IDENTIFIER AREA IN ACRES	BB 10.0
EXISTING DIRECTION OF FLOW	⇨
EXISTING STORM SEWER	━━

N

200 100 0 200 400

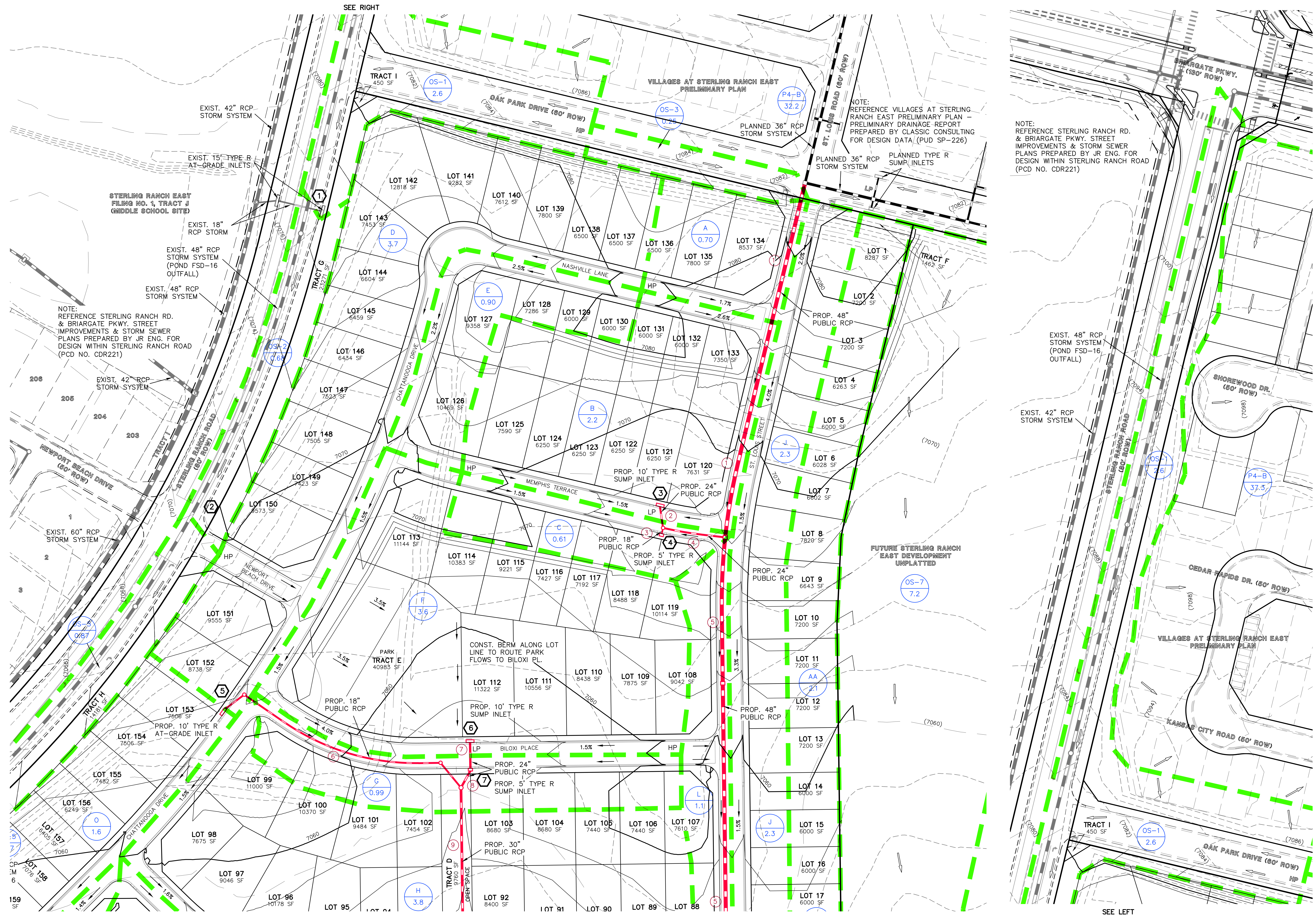
SCALE: 1" = 200'

CLASSIC CONSULTING

619 N. Cascade Avenue, Suite 200
Colorado Springs, Colorado 80903
(719)785-0790
(719)785-0799 (Fax)

STERLING RANCH EAST
PRELIMINARY PLAN NO. 1
PRELIMINARY DRAINAGE REPORT
PRE-DEVELOPMENT DRAINAGE MAP

DESIGNED BY	MAW	SCALE	DATE 4-1-22
DRAWN BY	MAW	(H) 1"= 200'	SHEET 3 OF 6
CHECKED BY		(V) 1"= N/A	JOB NO. 1183.22



NOTE:
REFERENCE STERLING RANCH RD. & BRIARGATE PKWY. STREET IMPROVEMENTS & STORM SEWER PLANS PREPARED BY JR ENG. FOR DESIGN WITHIN STERLING RANCH ROAD (PCD NO. CDR221)

NOTE:
REFERENCE VILLAGES AT STERLING RANCH EAST PRELIMINARY PLAN – PRELIMINARY DRAINAGE REPORT PREPARED BY CLASSIC CONSULTING FOR DESIGN DATA (PUD SP-226)

NOTE:
REFERENCE STERLING RANCH RD. & BRIARGATE PKWY. STREET IMPROVEMENTS & STORM SEWER PLANS PREPARED BY JR ENG. FOR DESIGN WITHIN STERLING RANCH ROAD (PCD NO. CDR221)

LEGEND

EXISTING GROUND CONTOUR	5910
PROPOSED FINISHED CONTOUR	— 5910 —
SUBDIVISION BOUNDARY	━━━
LOT LINE	───
PROPOSED BASIN BOUNDARY	🟩 🟩 🟩
DIRECTION OF DRAINAGE	→
EXISTING STORM SEWER	▬
EXISTING STORM INLET	▭
PROPOSED STORM SEWER	🟥
PROPOSED STORM INLET	▭
BASIN IDENTIFIER AREA IN ACRES	D 1.41
DESIGN POINT	⬡ 2
PIPE RUN	②

NOTE:
SEE SHEET 2 AND 3 FOR HYDROLOGIC AND HYDRAULIC CALCULATIONS.

48 HOURS BEFORE YOU DIG,
CALL UTILITY LOCATORS
811
UTILITY NOTIFICATION CENTER OF COLORADO
IT'S THE LAW

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NO.	REVISION	DATE

REVIEW:

PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF CLASSIC CONSULTING ENGINEERS AND SURVEYORS, LLC

MARC A. WHORTON, COLORADO P.E. #37155 DATE

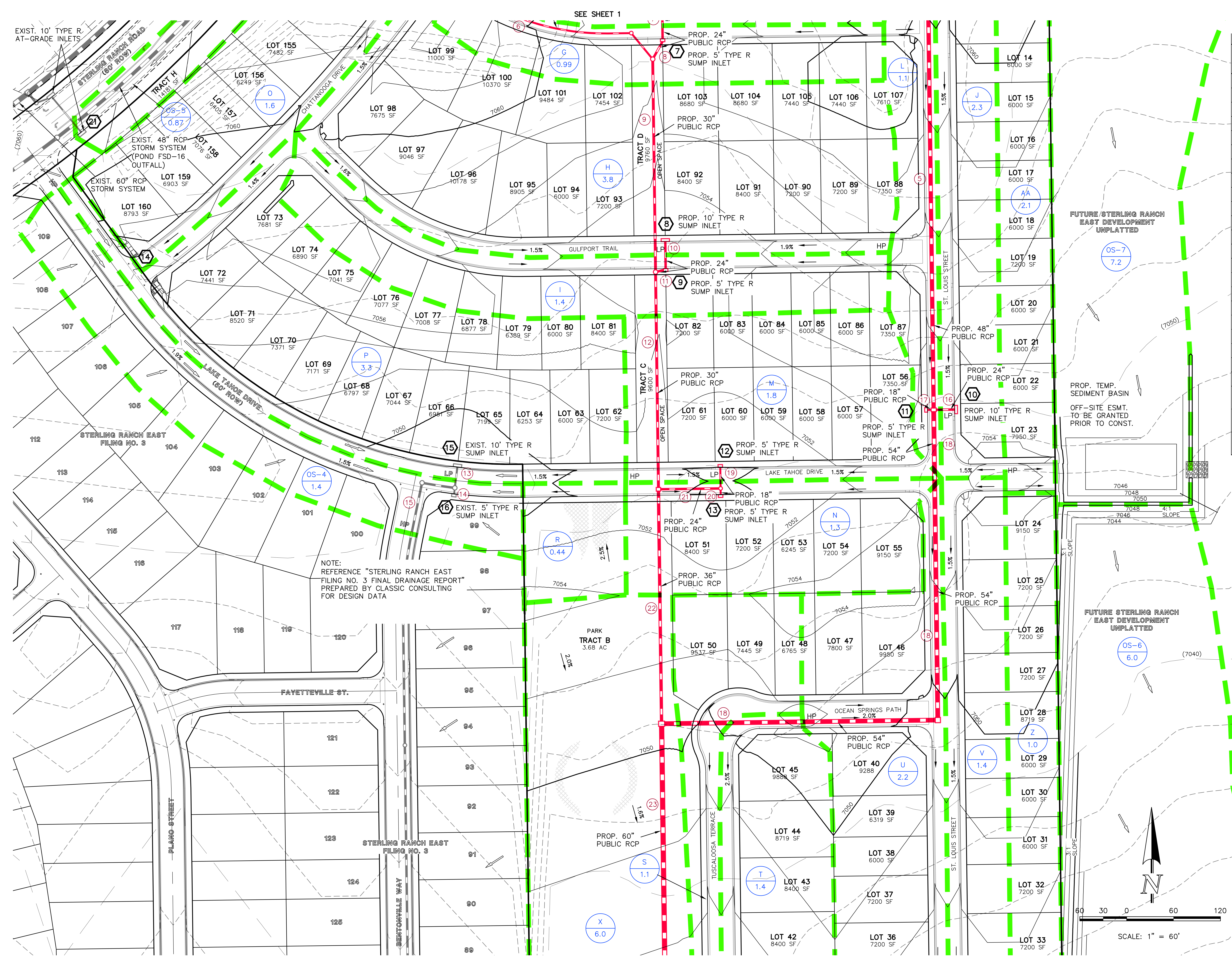
CLASSIC CONSULTING℠

619 N. Cascade Avenue, Suite 200
Colorado Springs, Colorado 80903
(719)785-0790
(719)785-0799(Fax)

STERLING RANCH EAST FILING NO. 5
FINAL PLAT
FINAL DRAINAGE REPORT
DEVELOPED DRAINAGE MAP

DESIGNED BY	MAW	SCALE		DATE	7/22/24
DRAWN BY	MAW	(H) 1"= 60'		SHEET	1 OF 3
CHECKED BY		(V) 1"= N/A		JOB NO.	1183.25

N:\118325\REPORTS\FDR\118325 FDM.dwg, 10/17/2024 9:10:29 AM, 1:1



FINAL DRAINAGE REPORT ~ SURFACE ROUTING SUMMARY

Design Point(s)	Contributing Basins / Design Point	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity I(5)	Intensity I(100)	Flow Q(5)	Flow Q(100)	Facility/ Inlet Size*
1	OS-1	1.76	2.02	14.0	3.62	6.08	6	12	Exist. 15' Type R At-Grade Inlet
2	OS-2, Flow-By from DP-1	0.35	0.72	16.6	3.37	5.65	1	4	Exist. Crosspan
3	OS-3, A, B	1.31	1.82	16.4	3.39	5.68	4	10	Prop. 10' Type R Sump Inlet
4	C	0.23	0.33	12.1	3.84	6.45	0.9	2.1	Prop. 5' Type R Sump Inlet
5	D	1.39	2.02	20.2	3.07	5.16	4	10	Prop. 10' Type R At-Grade Inlet
6	E, F	1.45	2.31	15.9	3.43	5.76	5	13	Prop. 10' Type R Sump Inlet
7	G	0.36	0.53	11.8	3.88	6.52	1.4	3.5	Prop. 5' Type R Sump Inlet
8	H	1.38	2.04	17.1	3.32	5.57	5	11	Prop. 10' Type R Sump Inlet
9	I	0.51	0.75	13.4	3.69	6.19	2	5	Prop. 5' Type R Sump Inlet
10	J	0.86	1.25	13.2	3.72	6.24	3	8	Prop. 10' Type R Sump Inlet
11	L	0.41	0.60	18.1	3.24	5.44	1.3	3.3	Prop. 5' Type R Sump Inlet
12	M	0.63	0.95	15.4	3.48	5.84	2	6	Prop. 5' Type R Sump Inlet
13	N	0.45	0.69	15.4	3.48	5.84	2	4	Prop. 5' Type R Sump Inlet
14	O and DP-5 Flow-By	0.61	1.46	21.2	3.00	5.03	2	7	Prop. 6' Crosspan
15	P and DP-14	1.85	3.26	22.2	2.93	4.92	5	16	Exist. 10' Type R Sump Inlet
16	OS-4, R	0.63	0.97	14.4	3.58	6.01	2	6	Exist. 5' Type R Sump Inlet
17	S	0.41	0.60	18.1	3.24	5.44	1.3	3.3	Prop. 5' Type R Sump Inlet
18	T	0.53	0.76	16.7	3.36	5.64	2	4	Prop. 5' Type R Sump Inlet
19	U, V	1.35	1.96	18.1	3.24	5.44	4	11	Prop. 10' Type R Sump Inlet
20	W	0.15	0.17	5.0	5.17	8.68	0.8	1.4	Prop. 5' Type R Sump Inlet
21	OS-5, Flow-by from DP-2	0.83	1.34	19.7	3.11	5.22	3	7	Exist. 10' Type R At-Grade Inlet
	TOTAL BASINS TRIBUTARY TO POND FSD-14B	**27.06**	**38.31**	**23.1**	**2.88**	**4.83**	**78**	**185**	
	TOTAL BASINS TRIBUTARY TO POND FSD-14B (VILLAGES NOT DEV.)	**12.12**	**18.54**	**23.1**	**2.88**	**4.83**	**35**	**89**	
6 (MDDP) SOUTH BNDY.	**POND FSD-14B RELEASE AND BASIN Y1**	**REF. MHFD-DETENTION SPREADSHEET FOR CALCULATIONS**					**2.4**	**43.4**	Sheet flow from Level Spreader & Basin Y1
6A (MDDP) SOUTH BNDY.	**BASIN Y2**	**0.20**	**0.66**	**7.1**	**4.65**	**7.81**	**0.9**	**5.2**	Sheet flow

FINAL DRAINAGE REPORT ~ PIPE ROUTING SUMMARY

Pipe Run	Contributing Basin / Design Point / Pipe Run	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity I(5)	Intensity I(100)	Flow Q(5)	Flow Q(100)	Pipe Size*
1	**P4-B FUTURE VILLAGES AT STERLING RANCH PP**	**14.94**	**19.77**	**18.7**	**3.19**	**5.35**	**48**	**106**	**PROP. 48" RCP**
2	DP-3	1.31	1.82	16.4	3.39	5.68	4	10	PROP. 24" RCP
3	DP-4	0.23	0.33	12.1	3.84	6.45	0.9	2.1	PROP. 18" RCP
4	PR-2, PR-3	1.54	2.15	16.6	3.37	5.65	5	12	PROP. 24" RCP
5	**PR-1, PR-4**	**16.48**	**21.92**	**19.5**	**3.12**	**5.25**	**52**	**115**	**PROP. 48" RCP**
6	DP-5 COLLECTION	1.37	1.43	20.5	3.05	5.12	4	7	PROP. 18" RCP
7	DP-6	1.45	2.31	15.9	3.43	5.76	5	13	PROP. 24" RCP
8	PR-7, DP-7	1.81	2.84	15.9	3.43	5.76	6	16	PROP. 24" RCP
9	PR-6, PR-8	3.18	4.27	20.9	3.02	5.07	10	22	PROP. 30" RCP
10	DP-8	1.38	2.04	17.1	3.32	5.57	5	11	PROP. 24" RCP
11	PR-10, DP-9	1.89	2.80	17.1	3.32	5.57	6	16	PROP. 24" RCP
12	PR-9, PR-11	5.07	7.07	21.3	2.99	5.02	15	35	PROP. 30" RCP
13	**DP-15 (To Pond FSD-11B)**	**1.85**	**3.26**	**22.2**	**2.93**	**4.92**	**5**	**16**	**EXIST. 24" RCP**
14	**DP-16 (To Pond FSD-11B)**	**0.63**	**0.97**	**14.4**	**3.58**	**6.01**	**2**	**6**	**EXIST. 18" RCP**
15	**PR-13, PR-14 (To FSD-11B)**	**2.48**	**4.23**	**23.4**	**2.85**	**4.79**	**7**	**20**	**EXIST. 30" RCP**
16	DP-10	0.86	1.25	13.2	3.72	6.24	3	8	PROP. 24" RCP
17	DP-11	0.41	0.60	18.1	3.24	5.44	1.3	3.3	PROP. 18" RCP
18	**PR-5, PR-13, PR-14**	**17.76**	**23.78**	**19.7**	**3.11**	**5.22**	**55**	**124**	**PROP. 54" RCP**
19	DP-12	0.63	0.95	15.4	3.48	5.84	2	6	PROP. 18" RCP
20	DP-13	0.45	0.69	15.4	3.48	5.84	2	4	PROP. 18" RCP
21	PR-19, PR-20	1.08	1.64	15.5	3.47	5.82	4	10	PROP. 24" RCP
22	PR-12, PR-21	6.15	8.71	21.7	2.96	4.98	18	43	PROP. 36" RCP
23	**PR-18, PR-22**	**23.91**	**32.48**	**22.2**	**2.93**	**4.92**	**70**	**160**	**PROP. 60" RCP**
24	DP-17	0.41	0.60	18.1	3.24	5.44	1.3	3.3	PROP. 18" RCP
25	DP-18	0.53	0.76	16.7	3.36	5.64	2	4	PROP. 18" RCP
26	PR-24, PR-25	0.94	1.36	18.1	3.24	5.44	3	7	PROP. 24" RCP
27	**PR-23, PR-26 (IN-FLOW ULTIMATE CONDITION)**	**24.85**	**33.85**	**22.3**	**2.92**	**4.91**	**73**	**166**	**PROP. 60" RCP**
27	**PR-20, PR-23 (IN-FLOW INTERIM CONDITION - VILLAGES NOT DEVELOPED)**	**9.91**	**14.08**	**20.3**	**3.06**	**5.14**	**30**	**72**	**PROP. 60" RCP**
28	DP-19	1.35	1.96	18.1	3.24	5.44	4	11	PROP. 24" RCP
29	**DP-20, PR-28**	**1.50**	**2.13**	**18.2**	**3.23**	**5.43**	**5**	**12**	**PROP. 24" RCP**

LEGEND

EXISTING GROUND CONTOUR	5910
PROPOSED FINISHED CONTOUR	5910
SUBDIVISION BOUNDARY	━━
LOT LINE	──
PROPOSED BASIN BOUNDARY	🟩 🟩 🟩
DIRECTION OF DRAINAGE	→
EXISTING STORM SEWER	▬
EXISTING STORM INLET	▭
PROPOSED STORM SEWER	🟥
PROPOSED STORM INLET	▭
BASIN IDENTIFIER AREA IN ACRES	D 1.41
DESIGN POINT	⬡2
PIPE RUN	②

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NO.	REVISION	DATE

REVIEW:

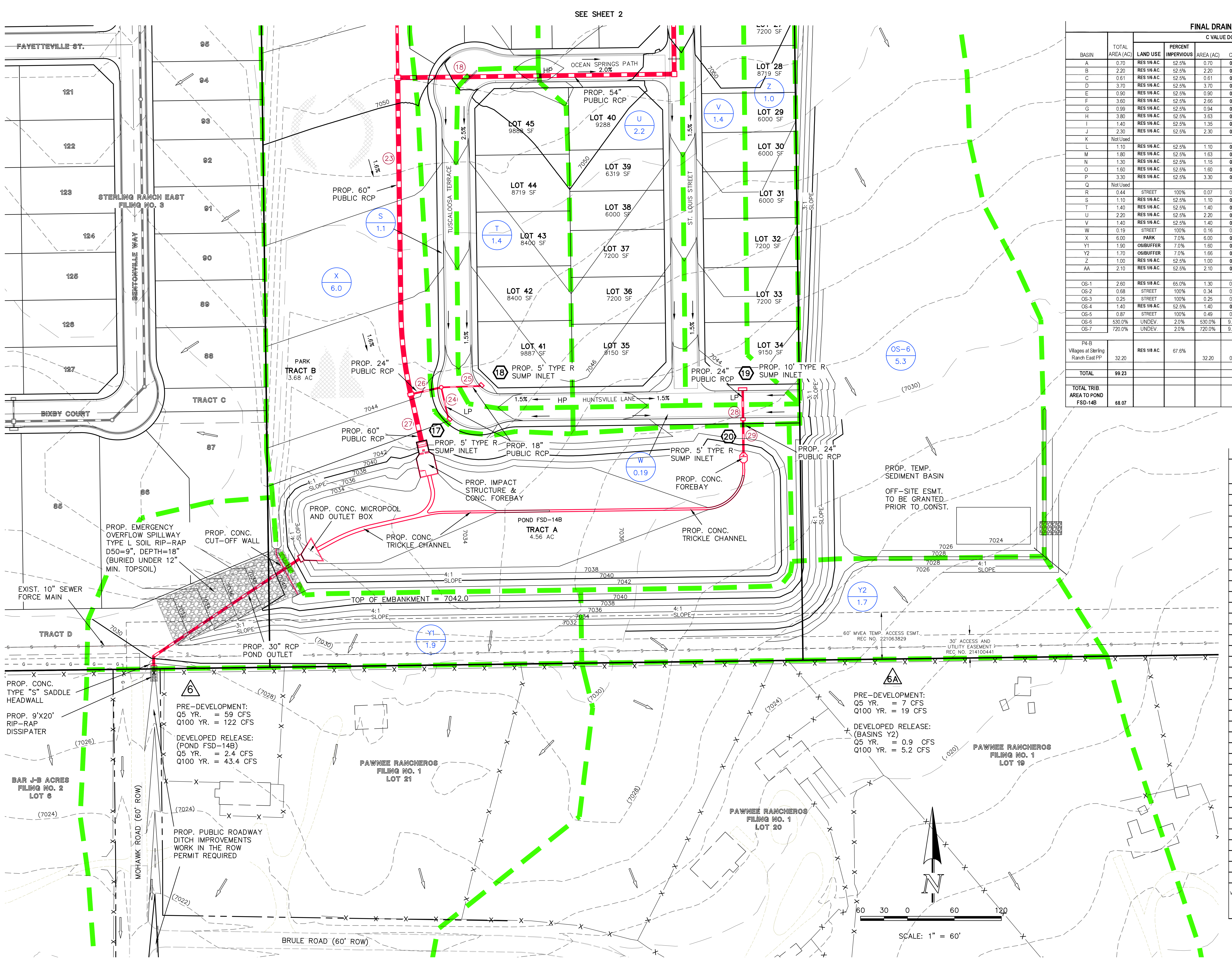
PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF CLASSIC CONSULTING ENGINEERS AND SURVEYORS, LLC

MARC A. WHORTON, COLORADO P.E. #37155 DATE

CLASSIC CONSULTING
619 N. Cascade Avenue, Suite 200
Colorado Springs, Colorado 80903
(719)785-0790
(719)785-0799(Fax)

STERLING RANCH EAST FILING NO. 5
FINAL PLAT
FINAL DRAINAGE REPORT
DEVELOPED DRAINAGE MAP

DESIGNED BY	MAW	SCALE	DATE 7/22/24
DRAWN BY	MAW	(H) 1"= 60'	SHEET 2 OF 3
CHECKED BY		(V) 1"= N/A	JOB NO. 1183.25



FINAL DRAINAGE REPORT ~ BASIN RUNOFF COEFFICIENT SUMMARY

		C VALUE DCM TABLE 6-6					C VALUE DCM TABLE 6-6					WEIGHTED "C" VALUE		WEIGHTED CA		DCM TABLE 6-6
BASIN	TOTAL AREA (AC)	LAND USE	PERCENT IMPERVIOUS	AREA (AC)	C(5)	C(100)	LAND USE	PERCENT IMPERVIOUS	AREA (AC)	C(5)	C(100)	C(5)	C(100)	CA(5)	CA(100)	WEIGHTED % IMPERVIOUS
A	0.70	RES 1/6 AC.	52.5%	0.70	0.38	0.55			0.00	0.08	0.35	0.38	0.55	0.26	0.38	52.5%
B	2.20	RES 1/6 AC.	52.5%	2.20	0.38	0.55			0.00	0.08	0.35	0.38	0.55	0.83	1.20	52.5%
C	0.61	RES 1/6 AC.	52.5%	0.61	0.38	0.55			0.00	0.08	0.35	0.38	0.55	0.23	0.33	52.5%
D	3.70	RES 1/6 AC.	52.5%	3.70	0.38	0.55			0.00	0.08	0.35	0.38	0.55	1.39	2.02	52.5%
E	0.90	RES 1/6 AC.	52.5%	0.90	0.38	0.55			0.00	0.08	0.35	0.38	0.55	0.34	0.49	52.5%
F	3.60	RES 1/6 AC.	52.5%	2.66	0.38	0.55	PARK	7.0%	0.94	0.12	0.39	0.31	0.50	1.11	1.82	40.6%
G	0.99	RES 1/6 AC.	52.5%	0.94	0.38	0.55	OPEN SPACE	7.0%	0.05	0.12	0.39	0.36	0.54	0.36	0.53	50.2%
H	3.80	RES 1/6 AC.	52.5%	3.63	0.38	0.55	OPEN SPACE	7.0%	0.17	0.12	0.39	0.36	0.54	1.38	2.04	50.5%
I	1.40	RES 1/6 AC.	52.5%	1.35	0.38	0.55	OPEN SPACE	7.0%	0.05	0.08	0.35	0.36	0.54	0.51	0.75	50.9%
J	2.30	RES 1/6 AC.	52.5%	2.30	0.38	0.55			0.00	0.08	0.35	0.38	0.55	0.86	1.25	52.5%
K	Not Used															
L	1.10	RES 1/6 AC.	52.5%	1.10	0.38	0.55			0.00	0.08	0.35	0.38	0.55	0.41	0.60	52.5%
M	1.80	RES 1/6 AC.	52.5%	1.63	0.38	0.55	OPEN SPACE	7.0%	0.17	0.12	0.39	0.35	0.53	0.63	0.95	48.2%
N	1.30	RES 1/6 AC.	52.5%	1.15	0.38	0.55	PARK	7.0%	0.15	0.12	0.39	0.35	0.53	0.45	0.69	47.3%
O	1.60	RES 1/6 AC.	52.5%	1.60	0.38	0.55			0.00	0.08	0.35	0.38	0.55	0.60	0.87	52.5%
P	3.30	RES 1/6 AC.	52.5%	3.30	0.38	0.55			0.00	0.08	0.35	0.38	0.55	1.24	1.80	52.5%
Q	Not Used															
R	0.44	STREET	100%	0.07	0.90	0.96	PARK	7.0%	0.37	0.12	0.39	0.24	0.48	0.11	0.21	21.8%
S	1.10	RES 1/6 AC.	52.5%	1.10	0.38	0.55			0.00	0.08	0.35	0.38	0.55	0.41	0.60	52.5%
T	1.40	RES 1/6 AC.	52.5%	1.40	0.38	0.55			0.00	0.08	0.35	0.38	0.55	0.53	0.76	52.5%
U	2.20	RES 1/6 AC.	52.5%	2.20	0.38	0.55			0.00	0.08	0.35	0.38	0.55	0.83	1.20	52.5%
V	1.40	RES 1/6 AC.	52.5%	1.40	0.38	0.55			0.00	0.08	0.35	0.38	0.55	0.53	0.76	52.5%
W	0.19	STREET	100%	0.16	0.90	0.96	OPEN SPACE	7.0%	0.03	0.12	0.39	0.78	0.87	0.15	0.17	85.3%
X	6.00	PARK	7.0%	6.00	0.12	0.39			0.00	0.08	0.35	0.12	0.39	0.72	2.34	7.0%
Y1	1.90	OS/BUFFER	7.0%	1.60	0.12	0.39	SIDEWALK	100.0%	0.30	0.90	0.96	0.24	0.48	0.46	0.91	21.7%
Y2	1.70	OS/BUFFER	7.0%	1.66	0.12	0.39	SIDEWALK	100.0%	0.04	0.08	0.35	0.12	0.39	0.20	0.66	9.2%
Z	1.00	RES 1/6 AC.	52.5%	1.00	0.38	0.55			0.00	0.08	0.35	0.38	0.55	0.38	0.55	52.5%
AA	2.10	RES 1/6 AC.	52.5%	2.10	0.38	0.55			0.00	0.08	0.35	0.38	0.55	0.79	1.14	52.5%
OS-1	2.60	RES 1/8 AC.	65.0%	1.30	0.45	0.59	STREET	100%	1.30	0.90	0.96	0.68	0.78	1.76	2.02	82.5%
OS-2	0.68	STREET	100%	0.34	0.90	0.96	OPEN SPACE	7.0%	0.34	0.12	0.39	0.51	0.68	0.35	0.46	53.5%
OS-3	0.25	STREET	100%	0.25	0.90	0.96			0.00	0.08	0.35	0.90	0.96	0.23	0.24	100.0%
OS-4	1.40	RES 1/6 AC.	52.5%	1.40	0.38	0.55			0.00	0.08	0.35	0.38	0.55	0.53	0.76	52.5%
OS-5	0.87	STREET	100%	0.49	0.90	0.96	OPEN SPACE	7.0%	0.38	0.12	0.39	0.56	0.71	0.49	0.62	59.4%
OS-6	530.0%	UNDEV.	2.0%	530.0%	9.0%	36.0%			0.0%	12.0%	39.0%	9.0%	36.0%	47.7%	190.8%	2.0%
OS-7	720.0%	UNDEV.	2.0%	720.0%	9.0%	36.0%			0.0%	12.0%	39.0%	9.0%	36.0%	64.8%	259.2%	2.0%
P4-B Villages at Sterling Ranch East PP	32.20	RES 1/8 AC.	67.6%	32.20	0.46	0.61			0.00	0.08	0.35	0.46	0.61	14.94	19.77	67.6%
TOTAL	99.23															
TOTAL TRIB. AREA TO POND FSD-14B	68.07															55.6%

FINAL DRAINAGE REPORT ~ BASIN RUNOFF SUMMARY

	WEIGHTED			OVERLAND				STREET / CHANNEL FLOW				Tc	INTENSITY			TOTAL FLOWS		
BASIN	CA(2)	CA(5)	CA(100)	C(5)	Length (ft)	Height (ft)	Tc (min)	Length (ft)	Slope (%)	Velocity (fps)	Tc (min)	TOTAL (min)	I(2) (in/hr)	I(5) (in/hr)	I(100) (in/hr)	Q(2) (cfs)	Q(5) (cfs)	Q(100) (cfs)
A	0.22	0.26	0.38	0.08	100	2	14.7	135	2.0%	2.8	0.8	15.4	2.78	3.48	5.84	0.6	0.9	2.2
B	0.70	0.83	1.20	0.08	100	2	14.7	260	1.5%	2.4	1.8	16.4	2.70	3.39	5.68	2	3	7
C	0.20	0.23	0.33	0.08	50	1	10.4	260	1.5%	2.4	1.8	12.1	3.07	3.84	6.45	0.6	0.9	2.1
D	1.18	1.39	2.02	0.08	100	2	14.7	900	1.8%	2.7	5.6	20.2	2.46	3.07	5.16	3	4	10
E	0.29	0.34	0.49	0.08	50	1	10.4	470	2.5%	3.2	2.5	12.8	3.00	3.75	6.30	0.9	1.3	3.1
F	0.90	1.11	1.82	0.12	100	2	14.1	270	1.5%	2.4	1.8	15.9	2.74	3.43	5.76	2	4	10
G	0.30	0.36	0.53	0.12	50	1	10.0	270	1.5%	2.4	1.8	11.8	3.10	3.88	6.52	0.9	1.4	3.5
H	1.17	1.38	2.04	0.12	100	2	14.1	450	1.5%	2.4	3.1	17.1	2.65	3.32	5.57	3	5	11
I	0.43	0.51	0.75	0.08	50	1	10.4	450	1.5%	2.4	3.1	13.4	2.94	3.69	6.19	1	2	5
J	0.74	0.86	1.25	0.08	50	1	10.4	630	3.5%	3.7	2.8	13.2	2.97	3.72	6.24	2	3	8
K	Not Used																	
L	0.35	0.41	0.60	0.08	100	2	14.7	500	1.5%	2.4	3.4	18.1	2.59	3.24	5.44	0.9	1.3	3.3
M	0.53	0.63	0.95	0.12	100	2	14.1	200	1.5%	2.4	1.4	15.4	2.78	3.48	5.84	1	2	6
N	0.38	0.45	0.69	0.12	100	2	14.1	200	1.5%	2.4	1.4	15.4	2.78	3.48	5.84	1	2	4
O	0.51	0.60	0.87	0.08	100	2	14.7	300	1.5%	2.4	2.0	16.7	2.69	3.36	5.64	1	2	5
P	1.06	1.24	1.80	0.08	100	2	14.7	420	1.5%	2.4	2.9	17.5	2.63	3.29	5.52	3	4	10
Q	Not Used																	
R	0.08	0.11	0.21	0.12	100	2	14.1	50	1.5%	2.4	0.3	14.4	2.86	3.58	6.01	0.2	0.4	1.3
S	0.35	0.41	0.60	0.08	100	2	14.7	500	1.5%	2.4	3.4	18.1	2.59	3.24	5.44	0.9	1.3	3.3
T	0.45	0.53	0.76	0.08	100	2	14.7	300	1.5%	2.4	2.0	16.7	2.69	3.36	5.64	1	2	4
U	0.70	0.83	1.20	0.08	100	2	14.7	500	1.5%	2.4	3.4	18.1	2.59	3.24	5.44	2	3	7
V	0.45	0.53	0.76	0.08	50	1	10.4	650	1.5%	2.4	4.4	14.8	2.83	3.54	5.95	1	2	5
W	0.14	0.15	0.17									5.0	4.12	5.17	8.68	0.6	0.8	1.4
X	0.30	0.72	2.34	0.08	100	2	14.7	500	2.0%	1.0	8.4	23.1	2.30	2.88	4.83	1	2	11
Y1	0.35	0.46	0.91	0.90	250	10	3.6					5.0	4.12	5.17	8.68	1.4	2	8
Y2	0.08	0.20	0.66	0.08	90	14	7.1					7.1	3.71	4.65	7.81	0.3	0.9	5.2
Z	0.32	0.38	0.55	0.08	65	2	10.2					10.2	3.27	4.09	6.87	1	2	4
AA	0.67	0.79	1.14	0.08	65	2	10.2					10.2	3.27	4.09	6.87	2	3	8
OS-1	1.69	1.76	2.02	0.08	40	0.8	9.3	900	2.5%	3.2	4.7	14.0	2.89	3.62	6.08	5	6	12
OS-2	0.32	0.35	0.46	0.12	50	1	10.0	400	1.6%	2.5	2.6	12.6	3.02	3.78	6.35	1.0	1.3	2.9
OS-3	0.22	0.23	0.24									5.0	4.12	5.17	8.68	0.9	1.2	2.1
OS-4	0.45	0.53	0.76	0.08	50	1	10.4	500	1.5%	2.4	3.4	13.8	2.91	3.65	6.13	1	2	5
OS-5	0.46	0.49	0.62	0.12	25	0.75	6.2	450	1.5%	2.4	3.1	9.2	3.39	4.25	7.14	2	2	4
OS-6	0.16	0.48	1.91	0.12	300	7	23.2					23.2	2.29	2.87	4.81	0.4	1	9
OS-7	0.22	0.65	2.59	0.12	300	7	23.2					23.2	2.29	2.87	4.81	0.5	2	12
P4-B Villages at Sterling Ranch East PP	13.52	14.94	19.77	0.08	100	2	14.7	600	1.5%	2.4	4.1	18.7	2.55	3.19	5.35	34	48	106

LEGEND

EXISTING GROUND CONTOUR	5910
PROPOSED FINISHED CONTOUR	5910
SUBDIVISION BOUNDARY	━━━
LOT LINE	───
PROPOSED BASIN BOUNDARY	🟩 🟩 🟩
DIRECTION OF DRAINAGE	→
EXISTING STORM SEWER	▬
EXISTING STORM INLET	▭
PROPOSED STORM SEWER	🟥
PROPOSED STORM INLET	▭
BASIN IDENTIFIER	D
AREA IN ACRES	1.41
DESIGN POINT	⬡ 2
PIPE RUN	②

48 HOURS BEFORE YOU DIG,
CALL UTILITY LOCATORS
811
UTILITY NOTIFICATION CENTER OF COLORADO
IT'S THE LAW

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NO.	REVISION	DATE

REVIEW:

PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF CLASSIC CONSULTING ENGINEERS AND SURVEYORS, LLC

MARC A. WHORTON, COLORADO P.E. #37155 DATE

CLASSIC CONSULTING

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Colorado Springs, Colorado 80903
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(719)785-0799(Fax)

STERLING RANCH EAST FILING NO. 5
FINAL PLAT
FINAL DRAINAGE REPORT
DEVELOPED DRAINAGE MAP

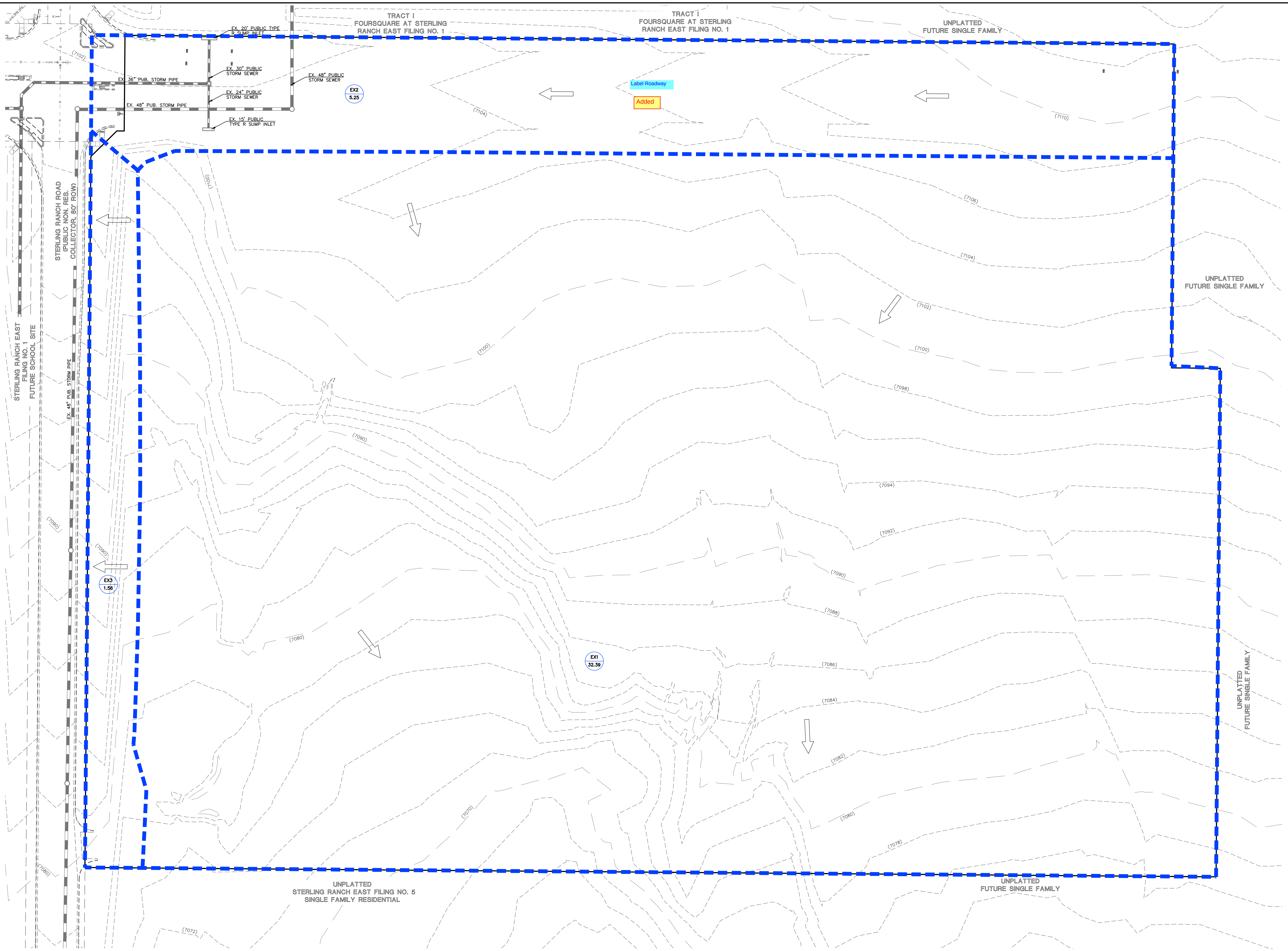
DESIGNED BY	MAW	SCALE	DATE 7/22/24
DRAWN BY	MAW	(H) 1"= 60'	SHEET 3 OF 3
CHECKED BY		(V) 1"= N/A	JOB NO. 1183.25

VILLAGES AT STERLING RANCH EAST

EXISTING CONDITIONS DRAINAGE MAP AND DEVELOPED CONDITIONS

FINAL DRAINAGE MAPS

CLASSIC
CONSULTING
ENGINEERS & SURVEYORS



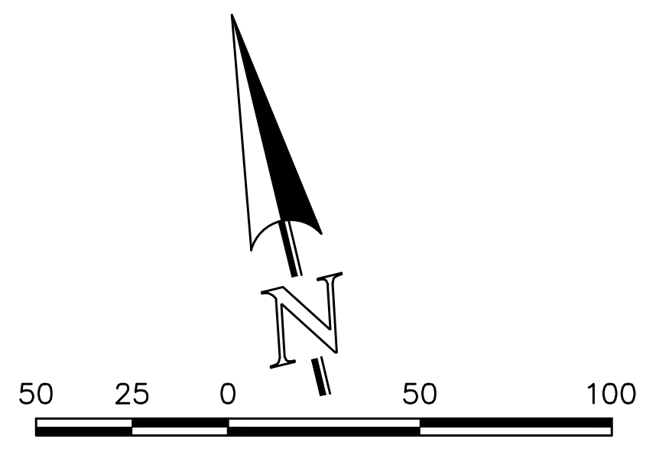
LEGEND

EXISTING GROUND CONTOUR	5910
PROPOSED FINISHED CONTOUR	5910
SUBDIVISION BOUNDARY	▬
LOT LINE	—
EXISTING BASIN BOUNDARY	▬ ▬ ▬
OVERFLOW ROUTE	⇉
DIRECTION OF DRAINAGE	→
EXISTING STORM SEWER	▬ ▭ ▬
EXISTING STORM INLET	▭
PROPOSED STORM SEWER	▬ ▭ ▬
PROPOSED STORM INLET	▭
BASIN IDENTIFIER AREA IN ACRES	D 1.41
DESIGN POINT	⬡ 2
PIPE RUN	②

BASIN	TOTAL AREA (AC)
EX1	32.39
EX2	5.25
EX3	1.56

BASIN RUNOFF SUMMARY

	WEIGHTED			OVERLAND				STREET / CHANNEL FLOW				Tc	INTENSITY			TOTAL FLOWS		
BASIN	CA(2)	CA(5)	CA(100)	C(5)	Length *(ft)*	Height *(ft)*	Tc *(min)*	Length *(ft)*	Slope *(%)*	Velocity *(fps)*	Tc *(min)*	TOTAL *(min)*	I(2) *(in/hr)*	I(5) (in/hr)	I(100) (in/hr)	Q(2) *(cfs)*	Q(5) *(cfs)*	Q(100) *(cfs)*
EX1	0.65	2.59	11.34	0.08	300	10	21.4	300	4.2%	4.1	1.2	22.7	2.32	2.90	4.87	1.5	**7.5**	**55.2**
EX2	0.11	0.42	1.84	0.08	300	10	21.4	700	1.5%	2.4	4.8	26.2	2.15	2.68	4.51	0.2	**1.1**	**8.3**
EX3	0.03	0.12	0.55	0.08	55	2	8.9	930	2.0%	2.8	5.5	14.4	2.86	3.58	6.01	0.1	**0.4**	**3.3**



SCALE: 1" = 50'

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VILLAGES AT STERLING RANCH
FILING NO. 1
FINAL DRAINAGE REPORT
DEVELOPED CONDITIONS

DESIGNED BY	CMT	SCALE	DATE 11/11/24
DRAWN BY	CMT	(H) 1"= 50'	SHEET 1 OF 2
CHECKED BY		(V) 1"= N/A	JOB NO. 2505.13

N:\118326\REPORTS\FINAL DRAINAGE REPORT\118326 FDR EX MAP.dwg, 12/17/2024 4:29:44 PM, 1:1

Low Points/Area Inlets? Please label

Now labeled

Wall? Please label line or turn off

Added

Add proposed contour labels

Added

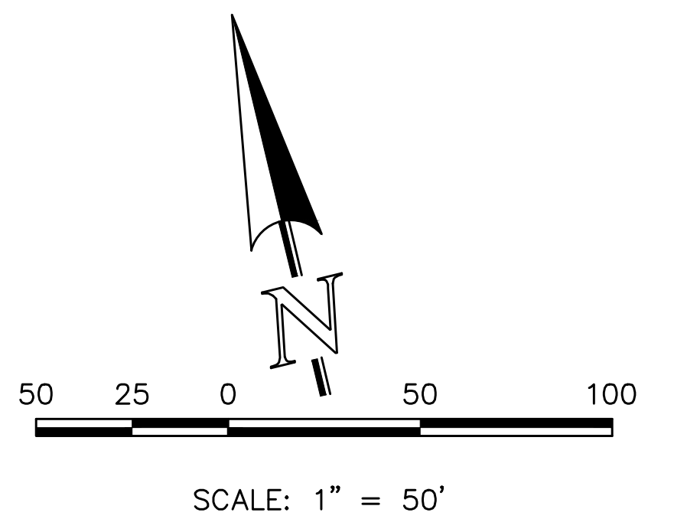
Report calls out (2) 5' inlets. Verify and revise report, spreadsheet & map as needed.

Revised

LEGEND

EXISTING GROUND CONTOUR	5910
PROPOSED FINISHED CONTOUR	5910
SUBDIVISION BOUNDARY	▬
LOT LINE	—
PROPOSED BASIN BOUNDARY	🟦
ADJACENT BASIN BOUNDARY	🟥
OVERFLOW ROUTE	⇉
DIRECTION OF DRAINAGE	→
EXISTING STORM SEWER	▬
EXISTING STORM INLET	☐
PROPOSED STORM SEWER	🟧
PROPOSED STORM INLET	☐
BASIN IDENTIFIER AREA IN ACRES	D 1.41
DESIGN POINT	2
PIPE RUN	②

NOTE: SEE SHEET 2 FOR CALCULATIONS SHEETS WITH FACILITY SIZES



SCALE: 1" = 50'

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VILLAGES AT STERLING RANCH
FILING NO. 1

FINAL DRAINAGE REPORT
DEVELOPED CONDITIONS

DESIGNED BY	CMT	SCALE	DATE 11/11/24
DRAWN BY	CMT	(H) 1"= 50'	SHEET 1 OF 2
CHECKED BY		(V) 1"= N/A	JOB NO. 2505.13

BASIN	TOTAL AREA (AC)
A	3.04
B	0.17
C	1.50
D	0.15
E	5.44
F	0.68
G	0.87
I	1.05
J	2.11
K	3.86
L	2.06
M	2.98
N	3.01
O	2.73
P	1.39
Q	0.36
R	0.28
S	0.65
T	0.21
U	0.21
V	1.77
W	0.59
X	4.39
BASIN TOTAL	**39.50**

BASIN RUNOFF SUMMARY

	WEIGHTED			OVERLAND				STREET / CHANNEL FLOW				Tc	INTENSITY			TOTAL FLOWS		
BASIN	CA(2)	CA(5)	CA(100)	C(5)	Length *(ft)*	Height *(ft)*	Tc *(min)*	Length *(ft)*	Slope *(%)*	Velocity *(fps)*	Tc *(min)*	TOTAL *(min)*	I(2) *(in/hr)*	I(5) (in/hr)	I(100) (in/hr)	Q(2) *(cfs)*	Q(5) *(cfs)*	Q(100) *(cfs)*
A	1.55	1.64	1.98	0.08	40	1	8.6	300	1.5%	2.4	2.0	10.6	3.22	4.03	6.77	5.0	**6.6**	**13.4**
B	0.14	0.14	0.15	0.08	10	0.2	4.6	300	1.5%	2.4	2.0	6.7	3.78	4.74	7.95	0.5	**0.7**	**1.2**
C	0.77	0.81	0.98	0.08	40	1	8.6	300	1.5%	2.4	2.0	10.6	3.22	4.03	6.77	2.5	**3.3**	**6.6**
D	0.11	0.12	0.13	0.08	10	0.5	3.4	100	1.0%	2.0	0.8	5.0	4.12	5.17	8.68	0.5	**0.6**	**1.1**
E	2.18	2.38	3.17	0.08	40	1	8.6	750	1.5%	2.4	5.1	13.7	2.92	3.66	6.14	6.4	**8.7**	**19.5**
F	0.35	0.37	0.44	0.08	100	2	14.7	75	1.5%	2.4	0.5	15.2	2.80	3.50	5.88	1.0	**1.3**	**2.6**
G	0.38	0.41	0.53	0.08	40	2	6.8	1400	2.0%	2.8	8.2	15.1	2.80	3.51	5.89	1.1	**1.4**	**3.1**
I	0.54	0.57	0.68	0.08	100	2	14.7	225	1.5%	2.4	1.5	16.2	2.72	3.41	5.72	1.5	**1.9**	**3.9**
J	0.69	0.78	1.13	0.08	100	2	14.7	450	1.5%	2.4	3.1	17.7	2.61	3.27	5.49	1.8	**2.5**	**6.2**
K	1.97	2.08	2.51	0.08	100	2	14.7	630	1.5%	2.4	4.3	18.9	2.54	3.17	5.32	5.0	**6.6**	**13.4**
L	0.54	0.63	1.03	0.08	100	2	14.7	610	1.5%	2.4	4.2	18.8	2.54	3.18	5.34	1.4	**2.0**	**5.5**
M	1.52	1.61	1.94	0.08	100	2	14.7	600	1.5%	2.4	4.1	18.7	2.55	3.19	5.35	3.9	**5.1**	**10.4**
N	1.54	1.63	1.96	0.08	100	2	14.7	600	1.5%	2.4	4.1	18.7	2.55	3.19	5.35	3.9	**5.2**	**10.5**
O	1.39	1.47	1.77	0.08	100	2	14.7	600	1.5%	2.4	4.1	18.7	2.55	3.19	5.35	3.5	**4.7**	**9.5**
P	1.00	1.02	1.16	0.08	40	1	8.6	600	1.5%	2.4	4.1	12.7	3.01	3.77	6.33	3.0	**3.9**	**7.4**
Q	0.32	0.32	0.35	0.08	15	0.3	5.7	400	1.5%	2.4	2.7	8.4	3.50	4.39	7.37	1.1	**1.4**	**2.5**
R	0.25	0.25	0.27	0.08	15	0.3	5.7	400	1.5%	2.4	2.7	8.4	3.50	4.39	7.37	0.9	**1.1**	**2.0**
S	0.33	0.35	0.42	0.08	40	1	8.6	300	1.5%	2.4	2.0	10.6	3.22	4.03	6.77	1.1	**1.4**	**2.9**
T	0.19	0.19	0.20	0.08	15	0.3	5.7	150	1.5%	2.4	1.0	6.7	3.77	4.73	7.94	0.7	**0.9**	**1.6**
U	0.16	0.16	0.18	0.08	15	0.3	5.7	150	1.5%	2.4	1.0	6.7	3.77	4.73	7.94	0.6	**0.8**	**1.4**
V	0.04	0.14	0.62	0.08	40	1	8.6	580	1.5%	2.4	3.9	12.6	3.02	3.79	6.36	0.1	**0.5**	**3.9**
W	0.30	0.32	0.38	0.08	100	2	14.7	160	2.0%	2.8	0.9	15.6	2.77	3.46	5.81	0.8	**1.1**	**2.2**
X	3.33	3.41	3.81	0.08	25	1	5.8	1200	1.5%	2.4	8.2	14.0	2.90	3.63	6.09	9.7	**12.4**	**23.2**

SURFACE ROUTING SUMMARY

					Intensity		Flow		
Design Point(s)	**Contributing Basins / Design Point**	**Equivalent CA(5)**	**Equivalent CA(100)**	**Maximum Tc**	**I(5)**	**I(100)**	**Q(5)**	**Q(100)**	**Facility/ Inlet Size***
1	BASIN A	1.64	1.98	10.6	4.03	6.77	6.6	13.4	10' INLET
2	BASIN B	0.14	0.15	6.7	4.74	7.95	0.7	1.2	5' INLET
3A	BASIN E	2.38	3.17	13.7	3.66	6.14	8.7	19.5	10' AT-GRADE INLET
3	BASIN C + DP3A FLOWBY	1.33	2.50	13.7	3.66	6.14	4.9	15.3	10' INLET
4	BASIN D	0.12	0.13	5.0	5.17	8.68	0.6	1.1	10' INLET
5	BASIN I, J, K	3.43	4.33	18.9	3.17	5.32	10.9	23.0	(2) 10' INLETS
6	BASIN L & S	0.99	1.45	18.8	3.18	5.34	3.1	7.7	10' INLET
6A	BASIN F	1.80	2.14	18.7	3.19	5.35	5.7	11.4	10' INLET
7	BASIN O	1.47	1.77	18.7	3.19	5.35	4.7	9.5	(2) 5' INLETS
8	BASIN P	1.02	1.16	12.7	3.77	6.33	3.9	7.4	5' INLET
9	BASIN Q	0.32	0.35	8.4	4.39	7.37	1.4	2.5	5' INLET
10	BASIN N	1.63	1.96	18.7	3.19	5.35	5.2	10.5	(2) 5' INLETS
11	BASIN M	1.61	1.94	18.7	3.19	5.35	5.1	10.4	(2) 5' INLETS
12	BASIN R	0.25	0.27	8.4	4.39	7.37	1.1	2.0	5' INLET

PIPE ROUTING SUMMARY

					Intensity		Flow		
Pipe Run	**Contributing Basin / Design Point / Pipe Run**	**Equivalent CA(5)**	**Equivalent CA(100)**	**Maximum Tc**	**I(5)**	**I(100)**	**Q(5)**	**Q(100)**	**Pipe Size***
1	DP1	1.64	1.98	10.6	4.03	6.77	6.6	13.4	24" RCP
2	DP2	0.14	0.15	6.7	4.74	7.95	0.7	1.2	18" RCP
3	PIPE 1 + 2	1.78	2.13	10.6	4.03	6.77	7.2	14.4	24" RCP
4A	DP3A INTERCEPTED	1.86	1.65	13.7	3.66	6.14	6.8	10.1	18" RCP
4	DP3	1.33	2.50	13.71	3.66	6.14	4.9	15.3	30" RCP
5	DP4	0.12	0.13	5.00	5.17	8.68	0.6	1.1	18" RCP
6	PIPE 3 + 4 + 5	3.23	4.76	13.7	3.66	6.14	11.8	29.2	36" RCP
7	DP5	3.43	4.33	18.94	3.17	5.32	10.9	23.0	30" RCP
8	DP6	0.49	0.72	18.8	3.18	5.34	1.6	3.9	18" RCP
9	PIPE 6 + 7 + 8	7.15	9.81	18.9	3.17	5.32	22.7	52.2	36" RCP @ 0.8%
10	DP7	1.47	1.77	18.73	3.19	5.35	4.7	9.5	24" RCP @ 0.5%
11	DP8	1.02	1.16	12.69	3.77	6.33	3.9	7.4	18" RCP @ 0.5%
12	DP9	0.32	0.35	8.40	4.39	7.37	1.4	2.5	18" RCP @ 0.5%
13	PIPE 10+ 11 + 12	2.82	3.28	18.7	3.19	5.35	9.0	17.6	30" RCP @ 0.5%
14	DP10	1.63	1.96	18.73	3.19	5.35	5.2	10.5	24" RCP @ 0.5%
15	PIPE 13 + 14	4.45	5.24	18.7	3.19	5.35	14.2	28.0	30" RCP @ 0.5%
16	DP11	1.61	1.94	18.73	3.19	5.35	5.1	10.4	24" RCP @ 0.5%
17	PIPE 15 + 16	6.06	7.18	18.7	3.19	5.35	19.3	38.4	36" RCP @ 0.5%
18	DP6A	1.80	2.14	18.73	3.19	5.35	5.7	11.4	18" RCP @ 0.5%
19	DP12	0.25	0.27	8.40	4.39	7.37	1.1	2.0	18" RCP @ 0.5%
20	PIPE 17 + 18 + 19	8.11	9.59	18.7	3.19	5.35	25.8	51.3	36" RCP @ 0.5%
21	PIPE 9 + 20	15.26	19.39	18.9	3.17	5.32	48.4	103.2	48" RCP

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VILLAGES AT STERLING RANCH
FILING NO. 1
FINAL DRAINAGE REPORT
DEVELOPED CONDITIONS

DESIGNED BY	CMT	SCALE	DATE 11/11/24
DRAWN BY	CMT	(H) 1"= 50'	SHEET 2 OF 2
CHECKED BY		(V) 1"= N/A	JOB NO. 2505.13

N:\118326\REPORTS\FINAL DRAINAGE REPORT\118326 FDR MAP.dwg, 12/17/2024 4:32:10 PM, 1:1