



INNOVATIVE DESIGN. CLASSIC RESULTS.

**PRELIMINARY DRAINAGE REPORT
FOR
VINEYARDS RESEARCH PARK SUBDIVISION**

JULY 2026

Prepared for:
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STM-REV26-0695
STM-MP26-0301

Prepared By:



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Engineer's Statement

This report and plan for the drainage design of **Vineyards Research Park Subdivision** was prepared by me (or under my direct supervision) and is correct to the best of my knowledge and belief. Said report has been prepared in accordance with the City of Colorado Springs Drainage Criteria Manual and is in conformity with the master plan of the drainage basin. I understand that the City of Colorado Springs does not and will not assume liability for drainage facilities designed by others. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this letter.

SIGNATURE (Affix Seal): _____
Kyle R. Campbell, Colorado P.E. No. 29794 Date

Developer's Statement

ERCOR Janitell Road, LLC hereby certifies that the drainage facilities for **Vineyards Research Park Subdivision** shall be constructed according to the design presented in this report. I understand that the City of Colorado Springs does not and will not assume liability for the drainage facilities designed and/or certified by my engineer and that are submitted to the City of Colorado Springs pursuant to section 7.4.701 of the City Code; and cannot, on behalf of **Vineyards Research Park Subdivision** guarantee that final drainage design review will absolve **ERCOR Janitell Road, LLC** and/or their successors and/or assigns of future liability for improper design. I further understand that approval of the final plat does not imply approval of my engineer's drainage design.

ERCOR Janitell Road, LLC _____
Name of Developer

Authorized Signature Date

Mike Coleman
Printed Name

CTO
Title

207 High Point Drive, Suite 300 Victor, NY 14564
Address

City of Colorado Springs Statement:

Filed in accordance with Section 7.4.701 of the Code of the City of Colorado Springs, 2023, as amended.

For SWENT Manager Date

Conditions:



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INTRODUCTION / SITE DESCRIPTION

This document is the Preliminary Drainage Report for Vineyards Research Park Subdivision. The purpose of this report is to identify onsite and offsite drainage patterns, locate and identify tributary or downstream drainage facilities and establish a design for the required drainage facility meeting all applicable criteria. Prior to ultimately releasing developed flows to the proposed downstream private facility, the proposed site is to provide Green Infrastructure treatment of the developed runoff, as defined in this report.

This drainage report is in conformance with the City of Colorado Springs Drainage Criteria Manual Volume 1 dated May 2014 (and updated January 2021) and Volume 2 dated May 2014 (and updated December 2020) as included in the reference section of this report.

Creekbend Subdivision is a proposed 31.159-acre parcel located in the center of Section 33, Township 14 South, Range 66 West of the 6th P.M., in the City of Colorado Springs, El Paso County, Colorado. The proposed site consists of a proposed 2-lot industrial development including drive aisles, proposed tracts, and landscape slope. This site is bound to the north by Stookes Subdivision, Tranex Subdivision Filing No. 1, Harrison Park Filing No. 11, Harrison Park Filing No. 8, and Colorado Springs Youth Sports Complex, to the east by Hassler & Bates Subdivision Filing No. 3, to the south by Hassler & Bates Subdivision Filing No. 3, and to the west by Vineyard Park Drive, T5 @ Colorado Springs Filing No. 2, Sipilovic Subdivision, E.M.F. Subdivision, and Harrison Park Filing No. 17. Land disturbance associated with this project is 31.20 acres.

A portion of this site was previously overlot graded and has been re-seeded and established. The site is approximately 80% vegetated with native grasses as determined by aerial photos.

The on-site soils are 24.0% Hydrologic Soil Group "A" (Schamber-Razor complex), 55.6% Hydrologic Soil Group "B" (Ustic Torrifluvents, loamy), 20.1% Hydrologic Soil Group "C" (Nunn clay cloam), and 0.3% Hydrologic Soil Group D (Fluvaquentic Haplaquolls) as determined by the "Web Soil Survey National Cooperative Soil Survey", prepared by the Natural Resources Conservation Service (see map in Appendix). Therefore, the Hydrologic Soil Group "B" was chosen to be representative of the site as a whole.

No portion of this site lies within a Streamside Overlay. The site is not within a Hillside Overlay Zone.



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PREVIOUS STUDIES

This site, or a portion of this site, was previously analyzed in the following reports as further described in the existing Drainage Conditions section below, arranged from most recent to oldest.

Campbell, K.R. (2015). (rep.). *Final Drainage Report for T5 @ Colorado Springs Filing No. 1 Amendment to MDDP for Vineyard Commerce Park*. Colorado Springs, Colorado: Classic Consulting Engineers & Surveyors, LLC.

Campbell, K. R. (2008). (rep.). *Master Development Drainage Plan for Vineyards Commerce Park*. Colorado Springs, Colorado: Classic Consulting Engineers & Surveyors, LLC.

EXISTING DRAINAGE CONDITIONS

The site is located within the Stratton Drainage Basin. The overall site was most recently studied in the “Final Drainage Report for T5 @ Colorado Springs Filing No. 1 Amendment to MDDP for Vineyard Commerce Park” by Classic Consulting Engineers & Surveyors, LLC, approved June 2015.

The site generally drains west to east toward Fountain Creek.

There are several offsite basins which flow onto the study area, some of which is proposed to be treated by the proposed extended detention basin, and some of which is directed in a grassed swale at the north side of the property toward Fountain Creek, in conformance with the applicable MDDP.

BASIN	AREA (AC)	Q ₅ (cfs)	Q ₁₀₀ (cfs)	Land Use Description	Routing	Discussion	Emergency Overflow
EXA	35.12	10.8	68.2	UNDEVELOPED	FOUNTAIN CREEK	SHEET FLOW OVER UNDEVELOPED AREA TO FOUNTAIN CREEK	N/A
EXB	0.03	0.01	0.1	LANDSCAPE	EX TEMP PVT POND	SHEET FLOW OVER LANDSCAPE AREA TO EX POND	EDB SPILLWAY
EOA	9.99	33.7	64.8	N/A - FROM MDDP	FOUNTAIN CREEK	SHEET FLOW OVER PAVED, LANDSCAPE, AND UNDEVELOPED AREAS TO FOUNTAIN CREEK	N/A
EOB	3.96	4.6	13.7	N/A - FROM MDDP	FOUNTAIN CREEK	SHEET FLOW OVER PAVED, LANDSCAPE, AND UNDEVELOPED AREAS TO FOUNTAIN CREEK	N/A

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EOC	0.69	0.8	2.1	N/A - FROM MDDP	FOUNTAIN CREEK	SHEET FLOW OVER PAVED, LANDSCAPE, AND UNDEVELOPED AREAS TO FOUNTAIN CREEK	N/A
EOD	2.60	3.4	12.1	N/A - FROM MDDP	FOUNTAIN CREEK	SHEET FLOW OVER PAVED, LANDSCAPE, AND UNDEVELOPED AREAS TO FOUNTAIN CREEK	N/A
EOE	0.15	0.7	1.2	PAVEMENT	FOUNTAIN CREEK	SHEET FLOW OVER PAVED, LANDSCAPE, AND UNDEVELOPED AREAS TO FOUNTAIN CREEK	N/A
EOF	4.22	7.4	17.8	PAVEMENT	FOUNTAIN CREEK	SHEET FLOW OVER LANDSCAPE AND UNDEVELOPED AREAS TO FOUNTAIN CREEK	N/A
EOG	0.89	4.2	7.4	PAVEMENT	FOUNTAIN CREEK	SHEET FLOW OVER PAVED AND UNDEVELOPED AREAS TO FOUNTAIN CREEK	N/A
EOH	0.05	0.02	0.2	PAVEMTN	FOUNTAIN CREEK	SHEET FLOW OVER LANDSCAPE AND UNDEVELOPED AREAS TO FOUNTAIN CREEK	N/A

PROPOSED DRAINAGE CONDITIONS

On-site flows in the proposed condition are described as follows:

BASIN	AREA (AC)	Q ₅ (cfs)	Q ₁₀₀ (cfs)	Land Use Description	Routing	Discussion	Emergency Overflow
A	0.09	0.2	0.4	LIGHT INDUSTRIAL	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER LANDSCAPE AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
B	0.10	0.2	0.5	LIGHT INDUSTRIAL	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER LANDSCAPE AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
C	0.10	0.2	0.5	LIGHT INDUSTRIAL	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER LANDSCAPE AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET

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D	0.11	0.2	0.5	LIGHT INDUSTRIAL	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER LANDSCAPE AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
E	0.10	0.2	0.5	LIGHT INDUSTRIAL	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER LANDSCAPE AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
F	0.18	0.2	0.7	LIGHT INDUSTRIAL	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER LANDSCAPE AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
G	0.73	2.9	5.4	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
H	0.23	0.9	1.7	ROOF	PR PVT ROOF DRAIN	SHEET FLOW TO ROOF DRAIN	OVERTOP ADJACENT HIGHPOINT TO NEXT ROOF DRAIN
J	0.83	3.3	6.2	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
K	0.23	0.9	1.7	ROOF	PR PVT ROOF DRAIN	SHEET FLOW TO ROOF DRAIN	OVERTOP ADJACENT HIGHPOINT TO NEXT ROOF DRAIN
L	0.94	3.7	6.9	PAVEMENT	PR PVT 10' TYPE R SUMP	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
M	0.18	0.7	1.3	ROOF	PR PVT ROOF DRAIN	SHEET FLOW TO ROOF DRAIN	OVERTOP ADJACENT HIGHPOINT TO NEXT ROOF DRAIN
N	0.18	0.7	1.3	ROOF	PR PVT ROOF DRAIN	SHEET FLOW TO ROOF DRAIN	OVERTOP ADJACENT HIGHPOINT TO NEXT ROOF DRAIN
P	0.38	1.2	2.2	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER LANDSCAPE AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
Q	0.78	0.3	1.9	PAVEMENT	PR PVT SINGLE TYPE C SUMP	SHEET FLOW OVER LANDSCAPE AREA TO GRASSED SWALE,	OVERTOP ADJACENT CURB TO INLET AT DP 14

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						CONCENTRATED FLOW TO INLET	
R	0.25	1.2	2.1	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
S	0.22	1.0	1.8	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
T	1.53	4.7	8.7	PAVEMENT	PR PVT 10' TYPE R SUMP	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
U	0.23	0.9	1.7	ROOF	PR PVT ROOF DRAIN	SHEET FLOW TO ROOF DRAIN	OVERTOP ADJACENT HIGHPOINT TO NEXT ROOF DRAIN
V	0.24	0.9	1.7	ROOF	PR PVT ROOF DRAIN	SHEET FLOW TO ROOF DRAIN	OVERTOP ADJACENT HIGHPOINT TO NEXT ROOF DRAIN
W	0.63	1.9	3.8	LIGHT INDUSTRIAL	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER LANDSCAPE AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
X	0.23	1.1	1.9	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
Y	0.47	1.8	3.4	ROOF	PR PVT ROOF DRAIN	SHEET FLOW TO ROOF DRAIN	OVERTOP ADJACENT HIGHPOINT TO NEXT ROOF DRAIN
Z	0.20	0.8	1.5	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP CROWN TO ADJACENT INLET
AA	0.47	1.8	3.4	ROOF	PR PVT ROOF DRAIN	SHEET FLOW TO ROOF DRAIN	OVERTOP ADJACENT HIGHPOINT TO NEXT ROOF DRAIN
AB	0.20	0.8	1.5	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP CROWN TO ADJACENT INLET
AC	0.23	0.9	1.7	ROOF	PR PVT ROOF DRAIN	SHEET FLOW TO ROOF DRAIN	OVERTOP ADJACENT HIGHPOINT TO NEXT ROOF DRAIN

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AD	0.22	0.9	1.7	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP CROWN TO ADJACENT INLET
AE	0.23	0.9	1.7	ROOF	PR PVT ROOF DRAIN	SHEET FLOW TO ROOF DRAIN	OVERTOP ADJACENT HIGHPOINT TO NEXT ROOF DRAIN
AF	0.22	0.9	1.7	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP CROWN TO ADJACENT INLET
AG	0.59	2.3	4.2	ROOF	PR PVT ROOF DRAIN	SHEET FLOW TO ROOF DRAIN	OVERTOP ADJACENT HIGHPOINT TO NEXT ROOF DRAIN
AH	0.55	2.2	4.0	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP CROWN TO ADJACENT INLET
AJ	0.59	2.3	4.2	ROOF	PR PVT ROOF DRAIN	SHEET FLOW TO ROOF DRAIN	OVERTOP ADJACENT HIGHPOINT TO NEXT ROOF DRAIN
AK	0.55	2.2	4.0	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP CROWN TO ADJACENT INLET
AL	0.09	0.4	0.8	PAVEMENT	PR PVT TRENCH DRAIN	SHEET FLOW TO PRIVATE TRENCH DRAIN	N/A
AM	0.09	0.4	0.8	PAVEMENT	PR PVT TRENCH DRAIN	SHEET FLOW TO PRIVATE TRENCH DRAIN	N/A
AN	0.25	1.2	2.1	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
AP	0.28	1.3	2.3	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
AQ	0.62	2.0	4.0	LIGHT INDUSTRIAL	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER LANDSCAPE AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP CROWN TO ADJACENT INLET
AR	0.37	1.1	2.3	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER LANDSCAPE AREA TO PRIVATE CURB AND GUTTER,	OVERTOP CROWN TO ADJACENT INLET

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						CONCENTRATED FLOW TO INLET	
AS	1.57	5.1	10.1	LIGHT INDUSTRIAL	PR PVT 18" FES	SHEET FLOW OVER PLANNED INDUSTRIAL AREA, CONCENTRATED FLOW IN GRASSED SWALE TO PRIVATE FES	OVERTOP ADJACENT CURB TO INLET AT DP 39
AT	1.66	5.4	10.7	LIGHT INDUSTRIAL	PR PVT 15' TYPE R SUMP	SHEET FLOW OVER PLANNED INDUSTRIAL AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT CURB AND SHEET FLOW TO DP 61
AU	0.74	3.5	6.2	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER LANDSCAPE AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP CROWN TO ADJACENT INLET
AV	0.85	3.4	6.3	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP CROWN TO ADJACENT INLET
AW	0.14	0.4	0.9	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER LANDSCAPE AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP CROWN TO ADJACENT INLET
AX	0.34	1.6	2.9	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP CROWN TO ADJACENT INLET
AY	0.24	0.9	1.7	ROOF	PR PVT ROOF DRAIN	SHEET FLOW TO ROOF DRAIN	OVERTOP ADJACENT HIGHPOINT TO NEXT ROOF DRAIN
AZ	0.23	0.9	1.7	ROOF	PR PVT ROOF DRAIN	SHEET FLOW TO ROOF DRAIN	OVERTOP ADJACENT HIGHPOINT TO NEXT ROOF DRAIN
BA	0.10	0.5	0.9	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
BB	0.23	0.9	1.7	ROOF	PR PVT ROOF DRAIN	SHEET FLOW TO ROOF DRAIN	OVERTOP ADJACENT HIGHPOINT TO NEXT ROOF DRAIN

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BC	0.09	0.4	0.7	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
BD	0.59	2.3	4.2	ROOF	PR PVT ROOF DRAIN	SHEET FLOW TO ROOF DRAIN	OVERTOP ADJACENT HIGHPOINT TO NEXT ROOF DRAIN
BE	0.78	3.1	5.8	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
BF	0.42	1.7	3.1	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
BG	0.78	3.1	5.8	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
BH	0.25	1.0	1.8	PAVEMENT	PR PVT 24" DIA. AREA DRAIN	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE AREA DRAIN	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
BJ	0.28	1.1	2.1	PAVEMENT	PR PVT 24" DIA. AREA DRAIN	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE AREA DRAIN	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
BK	1.41	5.8	10.7	PAVEMENT	PR PVT 15' TYPE R SUMP	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
BL	0.69	2.7	5.1	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
BM	1.21	4.8	8.9	PAVEMENT	PR PVT 10' TYPE R SUMP	SHEET FLOW OVER INDUSTRIAL AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET
BN	3.79	3.8	10.7	LIGHT INDUSTRIAL	PR PVT FSD EDB "POND A"	SHEET FLOW OVER LANDSCAPE AREA TO PRIVATE FSD EDB "POND A"	EDB SPILLWAY
BP	1.05	0.3	2.2	LANDSCAPE	PR PVT X" CULVERT	SHEET FLOW OVER LANDSCAPE AREA TO PRIVATE GRASSED CHANNEL,	OVERTOP ADJACENT CURB TO DP 43

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						CONCENTRATED FLOW TO CULVERT	
BQ	0.73	0.2	1.7	LANDSCAPE	FOUNTAIN CREEK	SHEET FLOW OVER LANDSCAPE AREA TO PRIVATE GRASSED CHANNEL, SHEET FLOW TO FOUNTAIN CREEK	OVERTOP ADJACENT CURB TO DP 45
BR	2.20	0.7	5.2	UNDEVELOPED	FOUNTAIN CREEK	SHEET FLOW OVER UNDEVELOPED AREA TO FOUNTAIN CREEK	N/A
BS	0.03	0.01	0.1	LANDSCAPE	EX. PVT TEMP. FSD EDB @ T5	SHEET FLOW OVER LANDSCAPE AREA TO EX. PRIVATE TEMP. FSD EDB @ T5	EDB SPILLWAY
OS-A	9.99	33.7	64.8	N/A - FROM MDDP	PR PVT X" CULVERT	SHEET FLOW OVER LANDSCAPE AND HARDSCAPE AREA TO PRIVATE GRASSED CHANNEL	OVERTOP ADJACENT CURB TO DP 43
OS-B	3.96	4.6	13.7	N/A - FROM MDDP	PR PVT X" CULVERT	SHEET FLOW OVER LANDSCAPE AND HARDSCAPE AREA TO PRIVATE GRASSED CHANNEL	OVERTOP ADJACENT CURB TO DP 43
OS-C	0.69	0.8	2.1	N/A - FROM MDDP	FOUNTAIN CREEK	SHEET FLOW OVER LANDSCAPE AND HARDSCAPE AREA TO PRIVATE GRASSED CHANNEL, SHEET FLOW TO FOUNTAIN CREEK AFTER OUTLET OF GRASSED CHANNEL	OVERTOP ADJACENT CURB TO DP 45
OS-D	2.60	3.4	12.1	N/A - FROM MDDP	FOUNTAIN CREEK	SHEET FLOW OVER LANDSCAPE AND HARDSCAPE AREA TO PRIVATE GRASSED CHANNEL, SHEET FLOW TO FOUNTAIN CREEK AFTER OUTLET OF GRASSED CHANNEL	OVERTOP ADJACENT CURB TO DP 45
OS-E	0.15	0.7	1.2	PAVEMENT	PR PVT 5' TYPE R SUMP	SHEET FLOW OVER LANDSCAPE AREA TO PRIVATE CURB AND GUTTER, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT HIGHPOINT TO NEXT INLET

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OS-F	4.22	7.4	17.8	PAVEMENT	PR PVT SINGLE TYPE C SUMP	SHEET FLOW OVER LANDSCAPE AREA TO GRASSED SWALE, CONCENTRATED FLOW TO INLET	OVERTOP ADJACENT CURB TO INLET AT DP 14
OS-G	0.89	4.2	7.4	PAVEMENT	PR PVT 15' TYPE R SUMP	CONCENTRATED FLOW IN PRIVATE CURB AND GUTTER TO INLET	OVERTOP ADJACENT CURB AND SHEET FLOW TO DP 61
OS-H	0.05	0.02	0.2	PAVEMENT	PR PVT FSD EDB "POND A"	SHEET FLOW OVER LANDSCAPE AREA TO PRIVATE FSD EDB "POND A"	EDB SPILLWAY

Proposed grass-lined channel "SW-1", as shown on the developed drainage map, is a proposed 10' bottom width grass-lined trapezoidal swale with a minimum longitudinal slope of 1.0% and 4:1 side slopes. This is the same design as shown in the approved MDDP applicable to this site. Calculations can be found in the appendix.

A comparison of flows leaving the site for the existing, and proposed conditions has been provided below.

SITE CONDITION EXIT FLOWS COMPARISON

CONDITION	Q ₅ (cfs) LEAVING SITE	Q ₁₀₀ (cfs) LEAVING SITE	ASSOCIATED BASINS/PIPE RUNS
EXISTING	50.9	152.1	DP E1
PROPOSED	36.8	130.3	DP 66
REDUCTION	27.7%	14.3%	

PRIVATE FULL SPECTRUM DETENTION POND (TRACT C)

All drainage facilities, including inlets, pipes, forebays, outlet boxes, etc. have been sized to meet the developed conditions. The proposed private pond is located in Tract C of Vineyards Research Park Subdivision. The pond will be privately owned and maintained by the owner of Vineyards Research Park Subdivision.

The MHFD-Detention worksheet was used to calculate the required Full Spectrum EDB volume to accommodate the proposed condition of Vineyards Research Park Subdivision. Tributary areas for the developed condition total 36.45 acres at 75.96% imperviousness. A proposed 4'x4' outlet box will be installed with an orifice plate to control

PRELIMINARY DRAINAGE REPORT FOR VINEYARDS RESEARCH PARK SUBDIVISION

the storage events. A proposed 36" private storm pipe with a restrictor plate set 22.0 inches above the invert will be installed to route the stormwater into the Fountain Creek storm system in accordance with previously approved reports. Total storage provided will be 5.129 ac-ft. A 53' wide overflow weir will be installed in the pond berm with Type VL rip-rap (see appendix for calculation). Trickle channel width is 6' wide in accordance with City standards for private ponds. The width exceeds the 1% minimum flow sizing requirements, sizing calculations provided in Appendix. The 100-year water surface elevation is 5798.32. In an emergency event, flow will overtop the embankment and travel east toward Fountain Creek. Calculations can be found in the Appendix.

FOUR STEP PROCESS/DETENTION

Discussion of the Four Step Process will be included with a future submittal of this drainage report.

Based upon the pre-application meeting, SWENT requested an on-site meeting to discuss the Fountain Creek corridor, which lies approximately 1,000 feet to the east of our proposed easterly boundary. Based upon that site walk and observation of the corridor and adjacent banks, SWENT is requesting a single grade control structure along our development frontage as well as possible bank toe riprap reinforcement along certain portions of the corridor as well. This will be covered in specific detail under Step 3 of the four step process. As these improvements are public, they would be used to offset any applicable, miscellaneous drainage basin fees for this proposal.

FLOODPLAIN STATEMENT

Portions of this site lie within Zone X, representing areas that have a 0.2% annual chance flood hazard and areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile. A portion of this site lies within Zone AE, representing areas that are within special flood hazard areas with BFE or depth. This was determined by the Flood Insurance Rate Maps (F.I.R.M.) Map Number 08041C0741G effective date, December 7, 2018 (See Appendix).

DRAINAGE AND BRIDGE FEES (2026)

This area lies within the Stratton Drainage Basin.

As this is a closed drainage basin, no fees are due.

HYDRAULIC CALCULATIONS

The Rational method was used to perform calculations for this project, as included in the Appendix of this report. All calculations provided in the Appendix of this report are referenced from DCM and/or MHFD required charts, tables, and graphs. All hydrologic and hydraulic criteria have been met and conform with the requirements of the



PRELIMINARY DRAINAGE REPORT FOR VINEYARDS RESEARCH PARK SUBDIVISION

current City of Colorado Springs DCM. Required HGL calculations will be provided with the Final Drainage Report. All proposed streets associated with this development are private, non-standard street sections. See appendix for private street capacity calculations which reflect these non-standard sections.

VARIANCES

A variance is being sought to allow for the use of ADS Inserta Tees on private storm pipes associated with this project.

SUMMARY

The proposed Vineyards Research Park Subdivision will continue to direct drainage flows as previously approved in prior reports and generally as anticipated in the "Master Development Drainage Plan for Vineyards Commerce Park" by Classic Consulting Engineers & Surveyors, LLC, approved September 2008. The current proposal will not adversely affect any downstream or surrounding developments or drainage patterns. The Rational method was used to perform calculations for this project, as included in the Appendix of this report. All hydrologic and hydraulic criteria have been met and conform with the requirements of the current City of Colorado Springs DCM. This report is in conformance with the previously approved Final Drainage Report(s) for this area and site. Site runoff, storm drains and appurtenances will not adversely affect the downstream and surrounding developments.

PREPARED BY:

Classic Consulting Engineers & Surveyors, LLC



Kyle R. Campbell, P.E.
Managing Partner

N:\220470\REPORTS\FINAL DRAINAGE REPORT\220470 Preliminary Drainage Report.docx



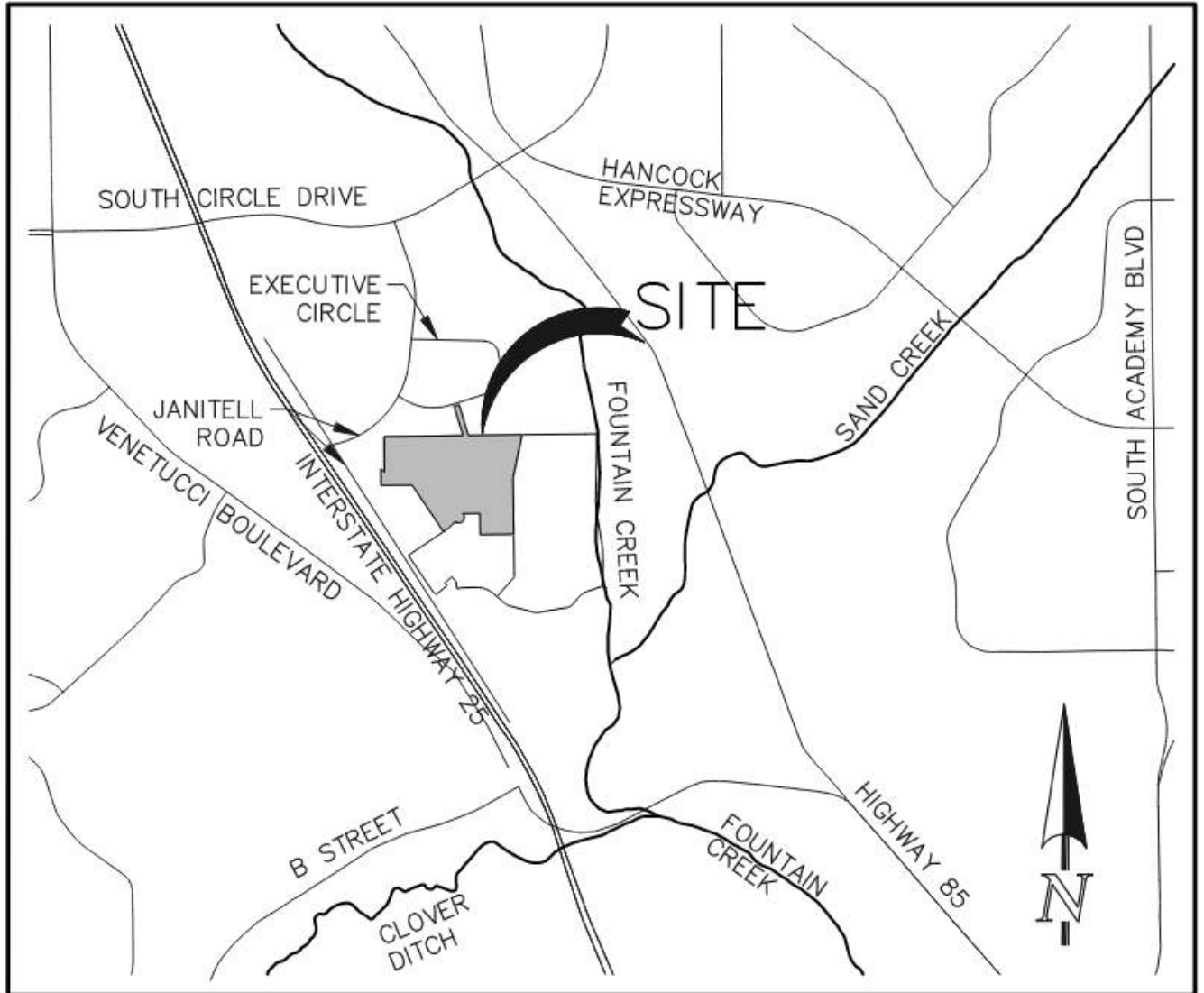
PRELIMINARY DRAINAGE REPORT FOR VINEYARDS RESEARCH PARK SUBDIVISION

REFERENCES

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- Campbell, K. R. (2008). (rep.). *Master Development Drainage Plan for Vineyards Commerce Park*. Colorado Springs, Colorado: Classic Consulting Engineers & Surveyors, LLC.
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- City of Colorado Springs Drainage Criteria Manual* (Rev. 2020). (2014). (Vol. 2).
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- Mile High Flood District Urban Storm Drainage Criteria Manual* (Rev. 2024). (1969). (Vol. 1).
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APPENDIX

VICINITY MAP



VICINITY MAP

NTS

SOILS MAP (S.C.S. SURVEY)

Soil Map—El Paso County Area, Colorado



**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

7/6/2026
Page 1 of 3

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: El Paso County Area, Colorado

Survey Area Data: Version 23, Aug 29, 2025

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

Date(s) aerial images were photographed: Jul 23, 2024—Aug 4, 2024

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
29	Fluvaquentic Haplaquolls, nearly level	0.1	0.3%
59	Nunn clay loam, 0 to 3 percent slopes	7.6	20.1%
82	Schamber-Razor complex, 8 to 50 percent slopes	9.1	24.0%
101	Ustic Torrifluvents, loamy	21.1	55.6%
Totals for Area of Interest		37.9	100.0%

El Paso County Area, Colorado

29—Fluvaquentic Haplaquolls, nearly level

Map Unit Setting

National map unit symbol: 3681

Elevation: 5,000 to 7,800 feet

Mean annual precipitation: 13 to 15 inches

Mean annual air temperature: 46 to 52 degrees F

Frost-free period: 110 to 165 days

Farmland classification: Not prime farmland

Map Unit Composition

Fluvaquentic haplaquolls and similar soils: 98 percent

Minor components: 2 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fluvaquentic Haplaquolls

Setting

Landform: Marshes, Flood plains, Swales

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

A - 0 to 12 inches: variable

C - 12 to 60 inches: stratified very gravelly sand to loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat):

Moderately high to high (0.20 to 6.00 in/hr)

Depth to water table: About 0 to 24 inches

Frequency of flooding: Frequent

Frequency of ponding: None

Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)

Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: D

Ecological site: R067BY029CO - Sandy Meadow

Hydric soil rating: Yes

Minor Components

Haplaquolls

Percent of map unit: 1 percent

Landform: Domes

Hydric soil rating: Yes

Other soils

Percent of map unit: 1 percent

Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado

Survey Area Data: Version 23, Aug 29, 2025

El Paso County Area, Colorado

59—Nunn clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 3693

Landscape: Uplands

Elevation: 5,400 to 6,500 feet

Mean annual precipitation: 13 to 15 inches

Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 135 to 155 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Nunn and similar soils: 95 percent

Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nunn

Setting

Landscape: Uplands

Landform: Terraces, Fans

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Mixed alluvium

Typical profile

A - 0 to 12 inches: clay loam

Bt - 12 to 26 inches: clay loam

BC - 26 to 30 inches: clay loam

Bk - 30 to 58 inches: sandy clay loam

C - 58 to 72 inches: clay

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat):

Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Gypsum, maximum content: 2 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 2e

Land capability classification (nonirrigated): 3c

Hydrologic Soil Group: C

Ecological site: R069XY042CO - Clayey Plains

Other vegetative classification: CLAYEY PLAINS (069AY042CO)

Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 4 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 23, Aug 29, 2025

El Paso County Area, Colorado

82—Schamber-Razor complex, 8 to 50 percent slopes

Map Unit Setting

National map unit symbol: 369y

Elevation: 5,500 to 6,500 feet

Mean annual precipitation: 12 to 14 inches

Mean annual air temperature: 48 to 52 degrees F

Frost-free period: 135 to 170 days

Farmland classification: Not prime farmland

Map Unit Composition

Schamber and similar soils: 55 percent

Razor and similar soils: 43 percent

Minor components: 2 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Schamber

Setting

Landform: Breaks

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium derived from granite and/or colluvium
derived from granite and/or eolian deposits derived from granite

Typical profile

A - 0 to 5 inches: gravelly loam

AC - 5 to 15 inches: very gravelly loam

C - 15 to 60 inches: very gravelly sand

Properties and qualities

Slope: 8 to 50 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): High
(2.00 to 6.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0
mmhos/cm)

Available water supply, 0 to 60 inches: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: A

Ecological site: R069XY064CO - Gravel Breaks
Hydric soil rating: No

Description of Razor

Setting

Landform: Breaks
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey slope alluvium over residuum weathered from shale

Typical profile

A - 0 to 3 inches: clay loam
Bw - 3 to 9 inches: clay loam
Bk - 9 to 31 inches: clay
Cr - 31 to 35 inches: weathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat):
Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 15.0
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R069XY047CO - Alkaline Plains
Other vegetative classification: ALKALINE PLAINS (069AY047CO)
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 23, Aug 29, 2025

El Paso County Area, Colorado

101—Ustic Torrfluvents, loamy

Map Unit Setting

National map unit symbol: 3673

Elevation: 5,500 to 7,000 feet

Mean annual precipitation: 13 to 16 inches

Mean annual air temperature: 47 to 52 degrees F

Frost-free period: 125 to 155 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Ustic torrfluvents and similar soils: 95 percent

Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ustic Torrfluvents

Setting

Landform: Stream terraces, Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Sandy, clayey, stratified loamy

Typical profile

A - 0 to 6 inches: variable

C - 6 to 60 inches: stratified loamy sand to clay loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat):

Moderately high to high (0.20 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): 2e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Ecological site: R069XY037CO - Saline Overflow

Other vegetative classification: OVERFLOW (069BY036CO)

Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 4 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 23, Aug 29, 2025

F.E.M.A. MAP

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

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

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

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

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

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

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

NGS Information Services
NGA, NNGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

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

Base Map information shown on this FIRM was provided in digital format by El Paso County, Colorado Springs Utilities, City of Fountain, Bureau of Land Management, National Oceanic and Atmospheric Administration, United States Geological Survey, and Anderson Consulting Engineers, Inc. These data are current as of 2006.

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

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

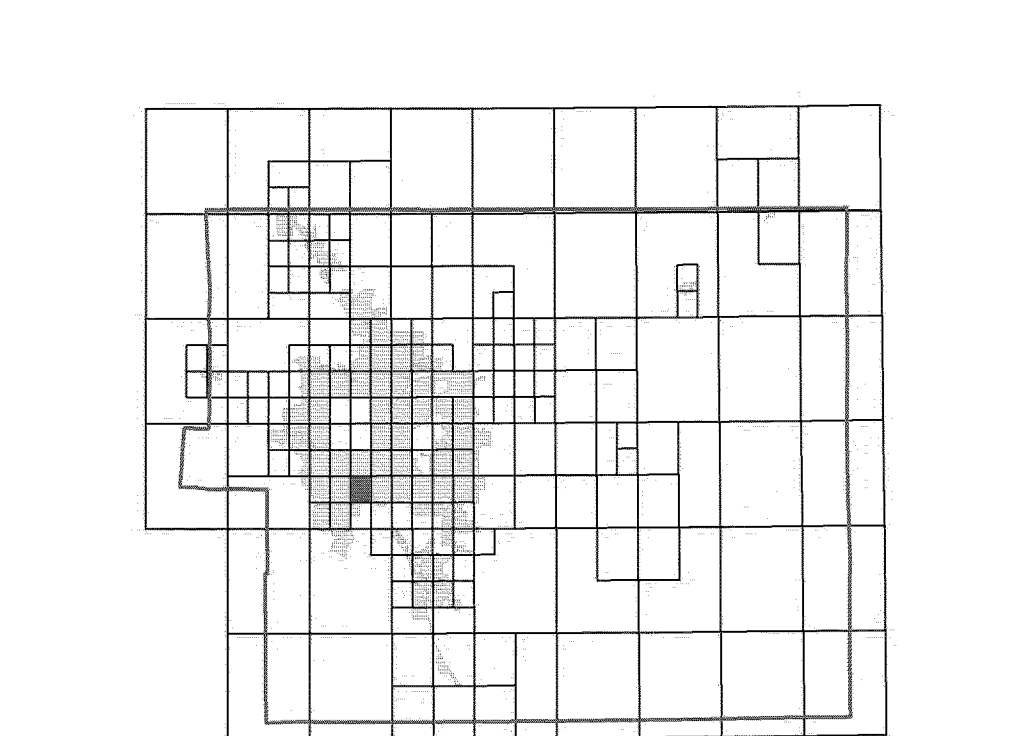
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels, community map repository addresses, and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which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

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

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

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

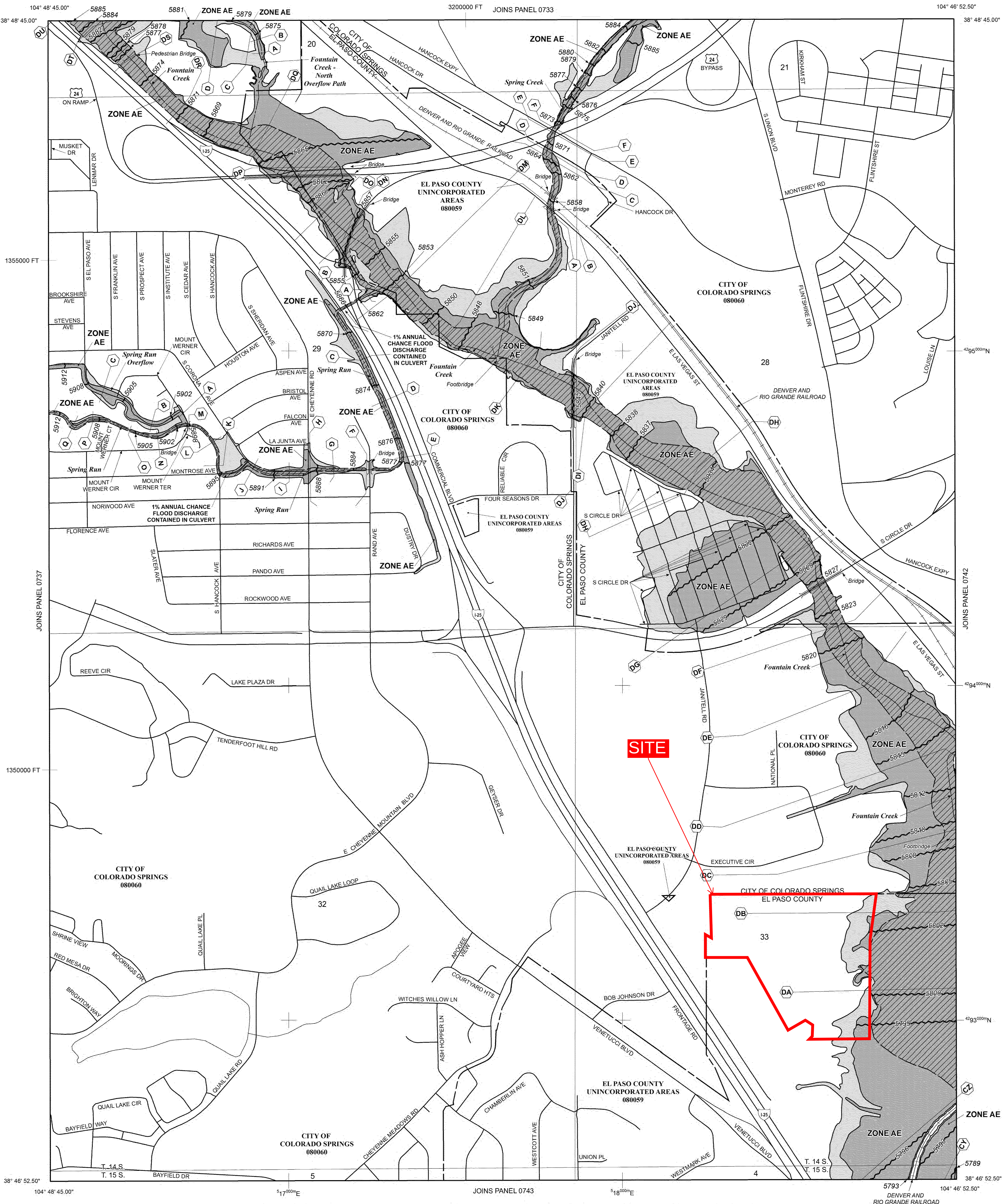
Panel Location Map



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



Additional Flood Hazard information and resources are available from local communities and the Colorado Water Conservation Board.



NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 14 SOUTH, RANGE 66 WEST, AND TOWNSHIP 15 SOUTH, RANGE 66 WEST.

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 equalled 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.

Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
Base Flood Elevation line and value; elevation in feet*
Base Flood Elevation value where uniform within zone; elevation in feet*

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

Cross section line
Transect line

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
1000-meter Universal Transverse Mercator grid ticks, zone 13
5000-foot grid ticks: Colorado State Plane coordinate system, central zone (TPSZONE 0902), Lambert Conformal Conic Projection

Bench mark (see explanation in Notes to Users section of this FIRM panel)
River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

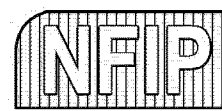
EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
MARCH 17, 1997

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

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

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

MAP SCALE 1" = 500'
250 0 500 1000
150 0 150 300
FEET
METERS



PANEL 0741G

FIRM

FLOOD INSURANCE RATE MAP

EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 741 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLORADO SPRINGS, CITY OF	080060	0741	G
EL PASO COUNTY	080059	0741	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
08041C0741G

MAP REVISED
DECEMBER 7, 2018

Federal Emergency Management Agency

EXISTING CONDITION HYDROLOGIC CALCULATIONS

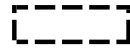
BASIN RUNOFF COEFFICIENT SUMMARY - EXISTING CONDITION

BASIN	TOTAL AREA (AC)	C VALUE DCM TABLE 6-6						C VALUE DCM TABLE 6-6						WEIGHTED "C" VALUE			WEIGHTED CA			WEIGHTED IMP.
		LAND USE	% IMP.	AREA (AC)	C ₂	C ₅	C ₁₀₀	LAND USE	% IMP.	AREA (AC)	C ₂	C ₅	C ₁₀₀	C ₂	C ₅	C ₁₀₀	CA ₂	CA ₅	CA ₁₀₀	%
EXA	35.12	PAVEMENT	100%	0.68	0.89	0.90	0.96	UNDEVELOPED	2%	34.43	0.02	0.08	0.35	0.04	0.10	0.36	1.30	3.37	12.71	3.9%
EXB	0.03			0.00				LANDSCAPE	7%	0.03	0.02	0.08	0.35	0.02	0.08	0.35	0.001	0.003	0.01	7.0%
EOA	9.99	N/A - FROM MDDP	100%	8.08	N/A	0.90	0.95	N/A - FROM MDDP	2%	1.91	N/A	0.26	0.376	N/A	0.78	0.84	N/A	7.77	8.39	81.3%
EOB	3.96	N/A - FROM MDDP	40%	3.96	N/A	0.27	0.46	N/A - FROM MDDP	2%	0.00	N/A	0.25	0.35	N/A	0.27	0.46	N/A	1.07	1.82	40.0%
EOC	0.69	N/A - FROM MDDP	20%	0.69	N/A	0.30	0.45	N/A - FROM MDDP	2%	0.00	N/A	0.25	0.35	N/A	0.30	0.45	N/A	0.21	0.31	20.0%
EOD	2.60	N/A - FROM MDDP	20%	2.60	N/A	0.30	0.60	N/A - FROM MDDP	2%	0.00	N/A	0.25	0.35	N/A	0.30	0.60	N/A	0.78	1.56	20.0%
EOE	0.15	PAVEMENT	100%	0.15	0.89	0.90	0.96	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.89	0.90	0.96	0.13	0.13	0.14	100.0%
EOF	4.22	PAVEMENT	100%	1.77	0.89	0.90	0.96	LANDSCAPE	7%	2.45	0.02	0.08	0.35	0.38	0.42	0.61	1.62	1.79	2.56	46.0%
EOG	0.89	PAVEMENT	100%	0.89	0.89	0.90	0.96	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.89	0.90	0.96	0.80	0.80	0.86	100.0%
EOH	0.05	PAVEMENT	100%	0.00	0.89	0.90	0.96	LANDSCAPE	7%	0.05	0.02	0.08	0.35	0.03	0.09	0.36	0.001	0.005	0.02	8.0%
TOTAL AREA	57.70																JOB NAME: Vineyard Sub No. 1			
																	JOB NO.: 2204.70			
																	DATE: 7/7/2026			
																	CALC: JHS			

 Indicates value taken directly from Vineyard Commerce Park MDDP

AREA DRAINAGE SUMMARY - EXISTING CONDITION

BASIN	WEIGHTED			OVERLAND				STREET/CHANNEL FLOW				Tc	INTENSITY			TOTAL FLOWS		
	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)
EXA	1.30	3.37	12.71	0.08	100	14	7.7	1496	1.3%	2.3	10.9	18.6	2.55	3.19	5.36	3.3	10.8	68.2
EXB	0.001	0.003	0.01	0.08								5.0	4.12	5.17	8.68	0.003	0.01	0.1
EOA	N/A	7.77	8.39	0.90	75	1.1	2.9	1200	1.0%	3.5	5.7	8.6	N/A	4.34	7.72	N/A	33.7	64.8
EOB	N/A	1.09	1.84	0.60	60	1	6.1	875	1.6%	4.4	3.3	9.4	N/A	4.20	7.46	N/A	4.6	13.7
EOC	N/A	0.21	0.31	0.30	100	2	11.9	75	1.0%	3.5	0.4	12.3	N/A	3.78	6.72	N/A	0.8	2.1
EOD	N/A	0.99	1.97	0.30	100	1.5	13.1	550	1.5%	4.3	2.1	15.2	N/A	3.44	6.11	N/A	3.4	12.1
EOE	0.13	0.13	0.14	0.08								5.0	4.12	5.17	8.68	0.5	0.7	1.2
EOF	1.62	1.79	2.56	0.08	100	11	8.3	318	2.7%	3.3	1.6	10.0	3.30	4.14	6.94	5.4	7.4	17.8
EOG	0.80	0.80	0.86	0.08								5.0	4.12	5.17	8.68	3.3	4.2	7.4
EOH	0.001	0.005	0.02	0.08								5.0	4.12	5.17	8.68	0.01	0.02	0.2



Indicates value taken directly from Vineyard Commerce Park MDDP

JOB NAME:	Vineyard Sub No. 1
JOB NO.:	2204.70
DATE:	7/7/2026
CALC:	JHS

SURFACE ROUTING SUMMARY - EXISTING CONDITION

Design Point(s)	Contributing Basins/ Design Point	Equivalent CA ₅	Equivalent CA ₁₀₀	Maximum T _C	Intensity		Flow		Facility/Inlet Size*
					I ₅	I ₁₀₀	Q ₅	Q ₁₀₀	
E1	EXA, EOA, EOB, EOC, EOD, EOE, EOF, EOG, & EOH	15.93	28.37	18.6	3.19	5.36	50.9	152.1	FOUNTAIN CREEK
E2	EXB	0.003	0.01	5.0	5.17	8.68	0.01	0.1	EX TEMP PVT POND

*All proposed facilities are private unless otherwise specified.

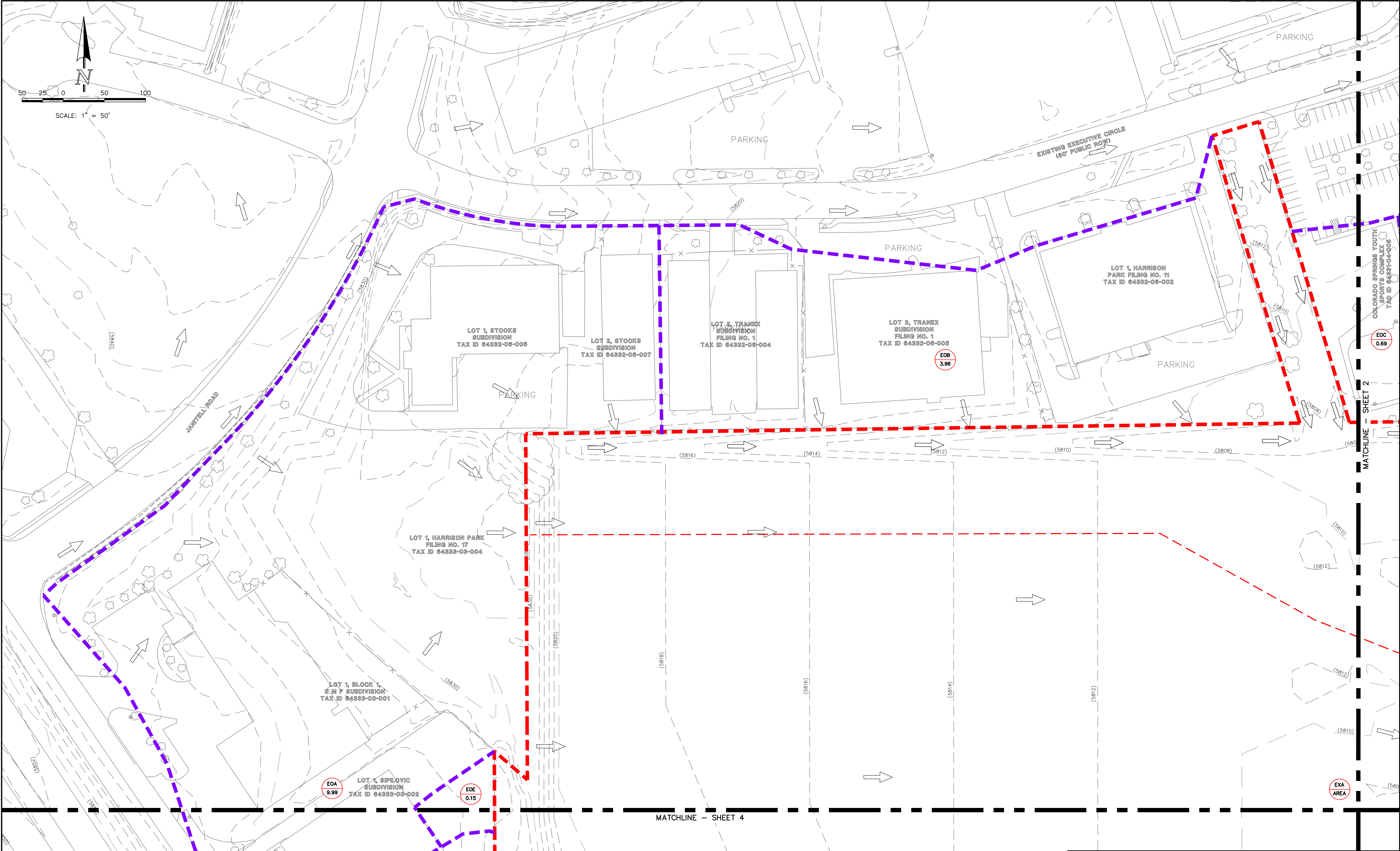
JOB NAME:	Vineyard Sub No. 1
JOB NO.:	2204.70
DATE:	7/7/2026
CALC:	JHS

PIPE ROUTING SUMMARY - EXISTING CONDITION

Pipe Run	Contributing Basin / Design Point / Pipe Run	Equivalent CA ₅	Equivalent CA ₁₀₀	Maximum T _C	Intensity		Flow		Pipe Size*
					I ₅	I ₁₀₀	Q ₅	Q ₁₀₀	
NO UNDERGROUND CONVEYANCE IN HISTORIC CONDITION									
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					JOB NAME:		Vineyard Sub No. 1		
					JOB NO.:		2204.70		
					DATE:		7/7/2026		
					CALC:		JHS		

EXISTING CONDITION DRAINAGE MAP

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DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL
EXISTING MINOR CONTOUR	(5859)	DIRECTION OF FLOW (HISTORIC)	
EXISTING MAJOR CONTOUR	(5860)	DIRECTION OF FLOW (DEVELOPED)	
PROPERTY LINE/LOT LINE	---	EXISTING STORM SEWER	
ON-SITE BASIN BOUNDARY	---	EXISTING STORM INLET	
OFF-SITE BASIN BOUNDARY	---	PROPOSED STORM SEWER	
LIMITS OF DISTURBANCE	---	EXISTING STORM INLET	

DESCRIPTION	SYMBOL
BASIN IDENTIFIER	
AREA IN ACRES	
DESIGN POINT	
PIPE RUN	
PATH OF TIME OF CONCENTRATION	

SCALE: 1" = 50'

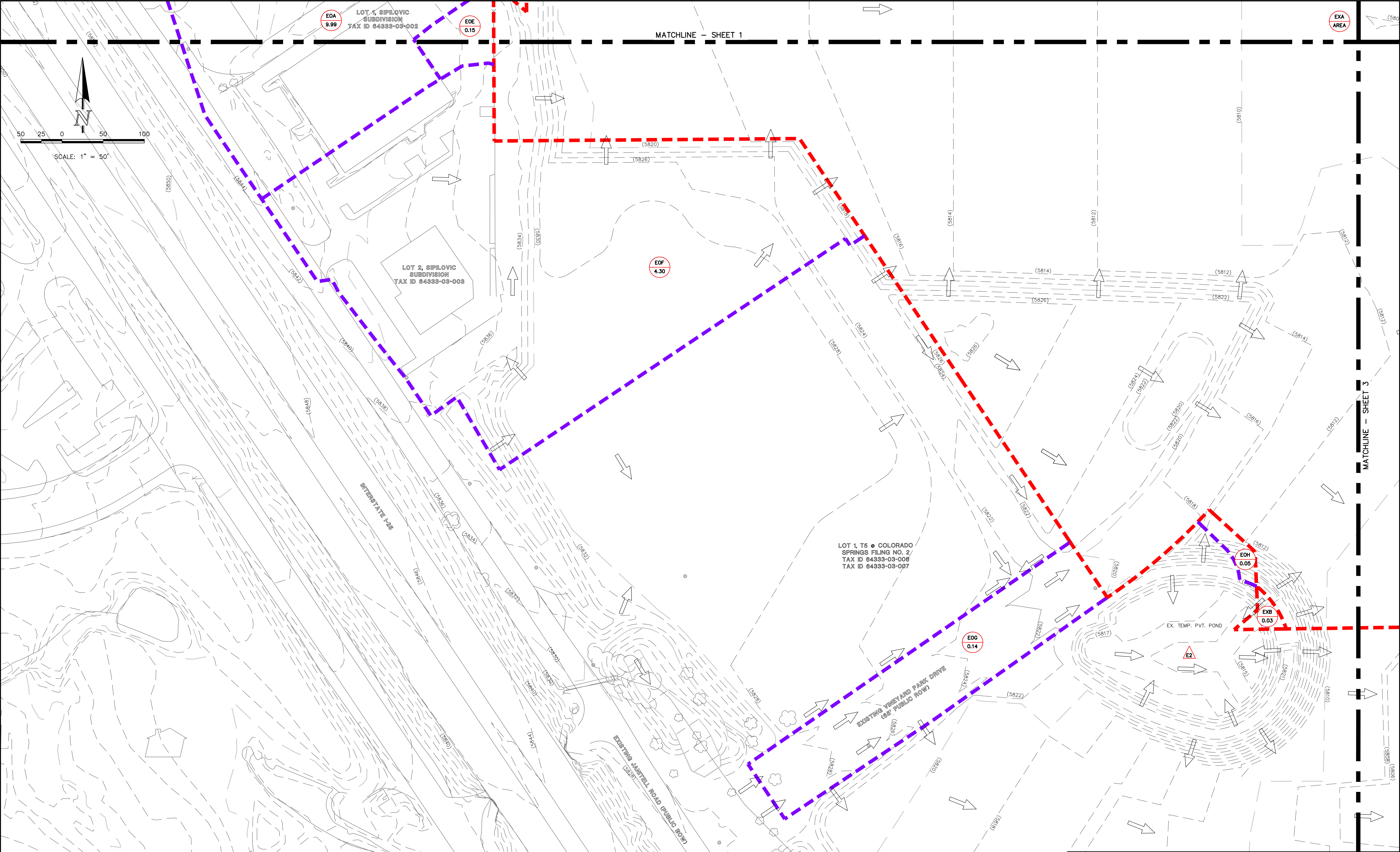
VINEYARDS RESEARCH PARK SUBDIVISION
PRELIMINARY DRAINAGE REPORT
HISTORIC DRAINAGE MAP
NORTHWEST

DESIGNED BY	JHS	SCALE	DATE	07/07/2026
DRAWN BY	JHS	(H) 1" = 50'	SHEET	1 OF 4
CHECKED BY		(V) 1" = N/A	JOB NO.	2204.70

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



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LEGEND	
DESCRIPTION	SYMBOL
EXISTING MINOR CONTOUR	(5859)
EXISTING MAJOR CONTOUR	(5860)
PROPERTY LINE/LOT LINE	---
ON-SITE BASIN BOUNDARY	---
OFF-SITE BASIN BOUNDARY	---
LIMITS OF DISTURBANCE	---
DESCRIPTION	SYMBOL
DIRECTION OF FLOW (HISTORIC)	→
DIRECTION OF FLOW (DEVELOPED)	→
EXISTING STORM SEWER	---
EXISTING STORM INLET	□
PROPOSED STORM SEWER	---
EXISTING STORM INLET	□
DESCRIPTION	SYMBOL
BASIN IDENTIFIER	1
AREA IN ACRES	1.00
DESIGN POINT	1
PIPE RUN	1
PATH OF TIME OF CONCENTRATION	---

CLASSIC CONSULTING

VINEYARDS RESEARCH PARK SUBDIVISION
PRELIMINARY DRAINAGE REPORT
HISTORIC
SOUTHWEST

DESIGNED BY	JHS	SCALE	DATE	07/07/2026
DRAWN BY	JHS	(H) 1"= 50'	SHEET	4 OF 4
CHECKED BY		(V) 1"= N/A	JOB NO.	2204.70

619 N. Cascade Avenue, Suite 200
Colorado Springs, Colorado 80903

(719) 785-0790
(719) 785-0799 (Fax)

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PROPOSED CONDITION HYDROLOGIC CALCULATIONS

BASIN RUNOFF COEFFICIENT SUMMARY - DEVELOPED CONDITION

BASIN	TOTAL AREA (AC)	C VALUE DCM TABLE 6-6						C VALUE DCM TABLE 6-6						WEIGHTED "C" VALUE			WEIGHTED CA			WEIGHTED IMP.
		LAND USE	% IMP.	AREA (AC)	C ₂	C ₅	C ₁₀₀	LAND USE	% IMP.	AREA (AC)	C ₂	C ₅	C ₁₀₀	C ₂	C ₅	C ₁₀₀	CA ₂	CA ₅	CA ₁₀₀	%
A	0.09	LIGHT INDUSTRIAL	80%	0.05	0.60	0.63	0.74	LANDSCAPE	7%	0.04	0.02	0.08	0.35	0.32	0.37	0.55	0.03	0.03	0.05	45.3%
B	0.10	LIGHT INDUSTRIAL	80%	0.05	0.60	0.63	0.74	LANDSCAPE	7%	0.05	0.02	0.08	0.35	0.32	0.37	0.55	0.03	0.04	0.06	45.3%
C	0.10	LIGHT INDUSTRIAL	80%	0.05	0.60	0.63	0.74	LANDSCAPE	7%	0.05	0.02	0.08	0.35	0.32	0.36	0.55	0.03	0.04	0.06	44.7%
D	0.11	LIGHT INDUSTRIAL	80%	0.05	0.60	0.63	0.74	LANDSCAPE	7%	0.05	0.02	0.08	0.35	0.32	0.36	0.55	0.03	0.04	0.06	44.5%
E	0.10	LIGHT INDUSTRIAL	80%	0.05	0.60	0.63	0.74	LANDSCAPE	7%	0.05	0.02	0.08	0.35	0.31	0.36	0.55	0.03	0.04	0.06	43.8%
F	0.18	LIGHT INDUSTRIAL	80%	0.05	0.60	0.63	0.74	LANDSCAPE	7%	0.13	0.02	0.08	0.35	0.19	0.24	0.47	0.03	0.04	0.08	28.8%
G	0.73	PAVEMENT	100%	0.37	0.89	0.90	0.96	GRAVEL	80%	0.37	0.60	0.63	0.74	0.75	0.77	0.85	0.55	0.56	0.62	90.0%
H	0.23	ROOF	90%	0.23	0.73	0.75	0.83	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.73	0.75	0.83	0.17	0.17	0.19	90.0%
J	0.83	PAVEMENT	100%	0.42	0.89	0.90	0.96	GRAVEL	80%	0.42	0.60	0.63	0.74	0.75	0.77	0.85	0.62	0.64	0.71	90.0%
K	0.23	ROOF	90%	0.23	0.73	0.75	0.83	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.73	0.75	0.83	0.17	0.17	0.19	90.0%
L	0.94	PAVEMENT	100%	0.47	0.89	0.90	0.96	GRAVEL	80%	0.47	0.60	0.63	0.74	0.75	0.77	0.85	0.70	0.72	0.80	90.0%
M	0.18	ROOF	90%	0.18	0.73	0.75	0.83	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.73	0.75	0.83	0.13	0.13	0.15	90.0%
N	0.18	ROOF	90%	0.18	0.73	0.75	0.83	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.73	0.75	0.83	0.13	0.13	0.15	90.0%
P	0.38	PAVEMENT	100%	0.30	0.89	0.90	0.96	LANDSCAPE	7%	0.08	0.02	0.08	0.35	0.71	0.73	0.83	0.27	0.28	0.32	80.4%
Q	0.78	PAVEMENT	100%	0.00	0.89	0.90	0.96	LANDSCAPE	7%	0.78	0.02	0.08	0.35	0.02	0.08	0.35	0.02	0.06	0.27	7.0%
R	0.25	PAVEMENT	100%	0.25	0.89	0.90	0.96	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.89	0.90	0.96	0.22	0.23	0.24	100.0%
S	0.22	PAVEMENT	100%	0.22	0.89	0.90	0.96	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.89	0.90	0.96	0.19	0.20	0.21	100.0%
T	1.53	PAVEMENT	100%	0.77	0.89	0.90	0.96	GRAVEL	80%	0.77	0.60	0.63	0.74	0.75	0.77	0.85	1.14	1.17	1.30	90.0%
U	0.23	ROOF	90%	0.23	0.73	0.75	0.83	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.73	0.75	0.83	0.17	0.17	0.19	90.0%
V	0.24	ROOF	90%	0.24	0.73	0.75	0.83	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.73	0.75	0.83	0.17	0.18	0.20	90.0%
W	0.63	LIGHT INDUSTRIAL	80%	0.63	0.60	0.63	0.74	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.60	0.63	0.74	0.38	0.40	0.47	80.0%
X	0.23	PAVEMENT	100%	0.23	0.89	0.90	0.96	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.89	0.90	0.96	0.20	0.21	0.22	100.0%
Y	0.47	ROOF	90%	0.47	0.73	0.75	0.83	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.73	0.75	0.83	0.34	0.35	0.39	90.0%
Z	0.20	PAVEMENT	100%	0.10	0.89	0.90	0.96	GRAVEL	80%	0.10	0.60	0.63	0.74	0.75	0.77	0.85	0.15	0.15	0.17	90.0%
AA	0.47	ROOF	90%	0.47	0.73	0.75	0.83	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.73	0.75	0.83	0.34	0.35	0.39	90.0%
AB	0.20	PAVEMENT	100%	0.10	0.89	0.90	0.96	GRAVEL	80%	0.10	0.60	0.63	0.74	0.75	0.77	0.85	0.15	0.15	0.17	90.0%
AC	0.23	ROOF	90%	0.23	0.73	0.75	0.83	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.73	0.75	0.83	0.17	0.18	0.19	90.0%
AD	0.22	PAVEMENT	100%	0.11	0.89	0.90	0.96	GRAVEL	80%	0.11	0.60	0.63	0.74	0.75	0.77	0.85	0.17	0.17	0.19	90.0%
AE	0.23	ROOF	90%	0.23	0.73	0.75	0.83	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.73	0.75	0.83	0.17	0.17	0.19	90.0%
AF	0.22	PAVEMENT	100%	0.11	0.89	0.90	0.96	GRAVEL	80%	0.11	0.60	0.63	0.74	0.75	0.77	0.85	0.17	0.17	0.19	90.0%
AG	0.59	ROOF	90%	0.59	0.73	0.75	0.83	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.73	0.75	0.83	0.43	0.44	0.49	90.0%
AH	0.55	PAVEMENT	100%	0.27	0.89	0.90	0.96	GRAVEL	80%	0.27	0.60	0.63	0.74	0.75	0.77	0.85	0.41	0.42	0.46	90.0%
AJ	0.59	ROOF	90%	0.59	0.73	0.75	0.83	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.73	0.75	0.83	0.43	0.44	0.49	90.0%
AK	0.55	PAVEMENET	100%	0.27	0.89	0.90	0.96	GRAVEL	80%	0.27	0.60	0.63	0.74	0.75	0.77	0.85	0.41	0.42	0.46	90.0%
AL	0.09	PAVEMENT	100%	0.09	0.89	0.90	0.96	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.89	0.90	0.96	0.08	0.08	0.09	100.0%
AM	0.09	PAVEMENT	100%	0.09	0.89	0.90	0.96	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.89	0.90	0.96	0.08	0.08	0.09	100.0%
AN	0.25	PAVEMENT	100%	0.25	0.89	0.90	0.96	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.89	0.90	0.96	0.22	0.22	0.24	100.0%

AP	0.28	PAVEMENT	100%	0.28	0.89	0.90	0.96	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.89	0.90	0.96	0.25	0.25	0.27	100.0%
AQ	0.62	LIGHT INDUSTRIAL	80%	0.62	0.60	0.63	0.74	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.60	0.63	0.74	0.37	0.39	0.46	80.0%
AR	0.37	PAVEMENT	100%	0.21	0.89	0.90	0.96	LANDSCAPE	7%	0.16	0.02	0.08	0.35	0.52	0.55	0.70	0.19	0.21	0.26	60.7%
AS	1.57	LIGHT INDUSTRIAL	80%	1.57	0.60	0.63	0.74	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.60	0.63	0.74	0.94	0.99	1.16	80.0%
AT	1.66	LIGHT INDUSTRIAL	80%	1.66	0.60	0.63	0.74	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.60	0.63	0.74	1.00	1.05	1.23	80.0%
AU	0.74	PAVEMENT	100%	0.74	0.89	0.90	0.96	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.89	0.90	0.96	0.66	0.67	0.71	100.0%
AV	0.85	PAVEMENT	100%	0.43	0.89	0.90	0.96	GRAVEL	80%	0.43	0.60	0.63	0.74	0.75	0.77	0.85	0.64	0.65	0.73	90.0%
AW	0.14	PAVEMENT	100%	0.09	0.89	0.90	0.96	LANDSCAPE	7%	0.05	0.02	0.08	0.35	0.57	0.60	0.74	0.08	0.08	0.10	66.2%
AX	0.34	PAVEMENT	100%	0.34	0.89	0.90	0.96	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.89	0.90	0.96	0.30	0.31	0.33	100.0%
AY	0.24	ROOF	90%	0.24	0.73	0.75	0.83	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.73	0.75	0.83	0.17	0.18	0.20	90.0%
AZ	0.23	ROOF	90%	0.23	0.73	0.75	0.83	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.73	0.75	0.83	0.17	0.17	0.19	90.0%
BA	0.10	PAVEMENT	100%	0.10	0.89	0.90	0.96	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.89	0.90	0.96	0.09	0.09	0.10	100.0%
BB	0.23	ROOF	90%	0.23	0.73	0.75	0.83	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.73	0.75	0.83	0.17	0.17	0.19	90.0%
BC	0.09	PAVEMENT	100%	0.09	0.89	0.90	0.96	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.89	0.90	0.96	0.08	0.08	0.08	100.0%
BD	0.59	ROOF	90%	0.59	0.73	0.75	0.83	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.73	0.75	0.83	0.43	0.44	0.49	90.0%
BE	0.78	PAVEMENT	100%	0.39	0.89	0.90	0.96	GRAVEL	80%	0.39	0.60	0.63	0.74	0.75	0.77	0.85	0.58	0.60	0.66	90.0%
BF	0.42	PAVEMENT	100%	0.21	0.89	0.90	0.96	GRAVEL	80%	0.21	0.60	0.63	0.74	0.75	0.77	0.85	0.32	0.32	0.36	90.0%
BG	0.78	PAVEMENT	100%	0.39	0.89	0.90	0.96	GRAVEL	80%	0.39	0.60	0.63	0.74	0.75	0.77	0.85	0.58	0.60	0.67	90.0%
BH	0.25	PAVEMENT	100%	0.12	0.89	0.90	0.96	GRAVEL	80%	0.12	0.60	0.63	0.74	0.75	0.77	0.85	0.19	0.19	0.21	90.0%
BJ	0.28	PAVEMENT	100%	0.14	0.89	0.90	0.96	GRAVEL	80%	0.14	0.60	0.63	0.74	0.75	0.77	0.85	0.21	0.22	0.24	90.0%
BK	1.41	PAVEMENT	100%	0.85	0.89	0.90	0.96	GRAVEL	80%	0.57	0.60	0.63	0.74	0.77	0.79	0.87	1.09	1.12	1.23	92.0%
BL	0.69	PAVEMENT	100%	0.35	0.89	0.90	0.96	GRAVEL	80%	0.35	0.60	0.63	0.74	0.75	0.77	0.85	0.52	0.53	0.59	90.0%
BM	1.21	PAVEMENT	100%	0.61	0.89	0.90	0.96	GRAVEL	80%	0.61	0.60	0.63	0.74	0.75	0.77	0.85	0.90	0.93	1.03	90.0%
BN	3.79	LIGHT INDUSTRIAL	80%	1.56	0.60	0.63	0.74	LANDSCAPE	7%	2.23	0.02	0.08	0.35	0.26	0.31	0.51	0.98	1.16	1.93	37.0%
BP	1.05			0.00				LANDSCAPE	7%	1.05	0.02	0.08	0.35	0.02	0.08	0.35	0.02	0.08	0.37	7.0%
BQ	0.73			0.00				LANDSCAPE	7%	0.73	0.02	0.08	0.35	0.02	0.08	0.35	0.01	0.06	0.26	7.0%
BR	2.20			0.00				UNDEVELOPED	2%	2.20	0.02	0.08	0.35	0.02	0.08	0.35	0.04	0.18	0.77	2.0%
BS	0.03			0.00				LANDSCAPE	7%	0.03	0.02	0.08	0.35	0.02	0.08	0.35	0.001	0.003	0.01	7.0%
OS-A	9.99	N/A - FROM MDDP	100%	8.08	N/A	0.90	0.95	N/A - FROM MDDP	2%	1.91	N/A	0.26	0.376	N/A	0.78	0.84	N/A	7.77	8.39	81.3%
OS-B	3.96	N/A - FROM MDDP	40%	3.96	N/A	0.27	0.46	N/A - FROM MDDP	2%	0.00	N/A	0.25	0.35	N/A	0.27	0.46	N/A	1.07	1.82	40.0%
OS-C	0.69	N/A - FROM MDDP	20%	0.69	N/A	0.30	0.45	N/A - FROM MDDP	2%	0.00	N/A	0.25	0.35	N/A	0.30	0.45	N/A	0.21	0.31	20.0%
OS-D	2.60	N/A - FROM MDDP	20%	2.60	N/A	0.30	0.60	N/A - FROM MDDP	2%	0.00	N/A	0.25	0.35	N/A	0.30	0.60	N/A	0.78	1.56	20.0%
OS-E	0.15	PAVEMENT	100%	0.15	0.89	0.90	0.96	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.89	0.90	0.96	0.13	0.13	0.14	100.0%
OS-F	4.22	PAVEMENT	100%	1.77	0.89	0.90	0.96	LANDSCAPE	7%	2.45	0.02	0.08	0.35	0.38	0.42	0.61	1.62	1.79	2.56	46.0%
OS-G	0.89	PAVEMENT	100%	0.89	0.89	0.90	0.96	LANDSCAPE	7%	0.00	0.02	0.08	0.35	0.89	0.90	0.96	0.80	0.80	0.86	100.0%
OS-H	0.05	PAVEMENT	100%	0.00	0.89	0.90	0.96	LANDSCAPE	7%	0.05	0.02	0.08	0.35	0.03	0.09	0.36	0.001	0.005	0.02	8.0%
TOTAL AREA		57.70																		

 Indicates value taken directly from Vineyard Commerce Park MDDP

JOB NAME:	Vineyard Sub No. 1
JOB NO.:	2204.70
DATE:	7/7/2026
CALC:	JHS

AREA DRAINAGE SUMMARY - DEVELOPED CONDITION

BASIN	WEIGHTED			OVERLAND				STREET/CHANNEL FLOW				Tc	INTENSITY			TOTAL FLOWS		
	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	0.03	0.03	0.05	0.08								5.0	4.12	5.17	8.68	0.1	0.2	0.4
B	0.03	0.04	0.06	0.08								5.0	4.12	5.17	8.68	0.1	0.2	0.5
C	0.03	0.04	0.06	0.08								5.0	4.12	5.17	8.68	0.1	0.2	0.5
D	0.03	0.04	0.06	0.08								5.0	4.12	5.17	8.68	0.1	0.2	0.5
E	0.03	0.04	0.06	0.08								5.0	4.12	5.17	8.68	0.1	0.2	0.5
F	0.03	0.04	0.08	0.08	73	15	5.8	20	4.7%	4.3	0.1	5.9	3.93	4.93	8.27	0.1	0.2	0.7
G	0.55	0.56	0.62	0.63								5.0	4.12	5.17	8.68	2.2	2.9	5.4
H	0.17	0.17	0.19	0.08								5.0	4.12	5.17	8.68	0.7	0.9	1.7
J	0.62	0.64	0.71	0.63								5.0	4.12	5.17	8.68	2.6	3.3	6.2
K	0.17	0.17	0.19	0.08								5.0	4.12	5.17	8.68	0.7	0.9	1.7
L	0.70	0.72	0.80	0.63								5.0	4.12	5.17	8.68	2.9	3.7	6.9
M	0.13	0.13	0.15	0.08								5.0	4.12	5.17	8.68	0.5	0.7	1.3
N	0.13	0.13	0.15	0.08								5.0	4.12	5.17	8.68	0.5	0.7	1.3
P	0.27	0.28	0.32	0.08	72	14	5.9	522	1.4%	2.4	3.7	9.5	3.35	4.20	7.05	0.9	1.2	2.2
Q	0.02	0.06	0.27	0.08	100	14	7.7	441	2.2%	3.0	2.5	10.2	3.27	4.10	6.89	0.1	0.3	1.9
R	0.22	0.23	0.24	0.08								5.0	4.12	5.17	8.68	0.9	1.2	2.1
S	0.19	0.20	0.21	0.08								5.0	4.12	5.17	8.68	0.8	1.0	1.8
T	1.14	1.17	1.30	0.63	100	1	8.5	387	1.5%	2.4	2.6	11.1	3.17	3.97	6.67	3.6	4.7	8.7
U	0.17	0.17	0.19	0.08								5.0	4.12	5.17	8.68	0.7	0.9	1.7
V	0.17	0.18	0.20	0.08								5.0	4.12	5.17	8.68	0.7	0.9	1.7
W	0.38	0.40	0.47	0.08	31	8.5	3.4	462	2.2%	3.0	2.6	6.0	3.90	4.89	8.21	1.5	1.9	3.8
X	0.20	0.21	0.22	0.08								5.0	4.12	5.17	8.68	0.8	1.1	1.9
Y	0.34	0.35	0.39	0.08								5.0	4.12	5.17	8.68	1.4	1.8	3.4
Z	0.15	0.15	0.17	0.63								5.0	4.12	5.17	8.68	0.6	0.8	1.5
AA	0.34	0.35	0.39	0.08								5.0	4.12	5.17	8.68	1.4	1.8	3.4
AB	0.15	0.15	0.17	0.63								5.0	4.12	5.17	8.68	0.6	0.8	1.5
AC	0.17	0.18	0.19	0.08								5.0	4.12	5.17	8.68	0.7	0.9	1.7

AD	0.17	0.17	0.19	0.63								5.0	4.12	5.17	8.68	0.7	0.9	1.7
AE	0.17	0.17	0.19	0.08								5.0	4.12	5.17	8.68	0.7	0.9	1.7
AF	0.17	0.17	0.19	0.63								5.0	4.12	5.17	8.68	0.7	0.9	1.7
AG	0.43	0.44	0.49	0.08								5.0	4.12	5.17	8.68	1.8	2.3	4.2
AH	0.41	0.42	0.46	0.63								5.0	4.12	5.17	8.68	1.7	2.2	4.0
AJ	0.43	0.44	0.49	0.08								5.0	4.12	5.17	8.68	1.8	2.3	4.2
AK	0.41	0.42	0.46	0.63								5.0	4.12	5.17	8.68	1.7	2.2	4.0
AL	0.08	0.08	0.09	0.08								5.0	4.12	5.17	8.68	0.3	0.4	0.8
AM	0.08	0.08	0.09	0.08								5.0	4.12	5.17	8.68	0.3	0.4	0.8
AN	0.22	0.22	0.24	0.08								5.0	4.12	5.17	8.68	0.9	1.2	2.1
AP	0.25	0.25	0.27	0.08								5.0	4.12	5.17	8.68	1.0	1.3	2.3
AQ	0.37	0.39	0.46	0.08								5.0	4.12	5.17	8.68	1.5	2.0	4.0
AR	0.19	0.21	0.26	0.08								5.0	4.12	5.17	8.68	0.8	1.1	2.3
AS	0.94	0.99	1.16	0.08								5.0	4.12	5.17	8.68	3.9	5.1	10.1
AT	1.00	1.05	1.23	0.08								5.0	4.12	5.17	8.68	4.1	5.4	10.7
AU	0.66	0.67	0.71	0.08								5.0	4.12	5.17	8.68	2.7	3.5	6.2
AV	0.64	0.65	0.73	0.63								5.0	4.12	5.17	8.68	2.6	3.4	6.3
AW	0.08	0.08	0.10	0.08								5.0	4.12	5.17	8.68	0.3	0.4	0.9
AX	0.30	0.31	0.33	0.08								5.0	4.12	5.17	8.68	1.3	1.6	2.9
AY	0.17	0.18	0.20	0.08								5.0	4.12	5.17	8.68	0.7	0.9	1.7
AZ	0.17	0.17	0.19	0.08								5.0	4.12	5.17	8.68	0.7	0.9	1.7
BA	0.09	0.09	0.10	0.08								5.0	4.12	5.17	8.68	0.4	0.5	0.9
BB	0.17	0.17	0.19	0.08								5.0	4.12	5.17	8.68	0.7	0.9	1.7
BC	0.08	0.08	0.08	0.08								5.0	4.12	5.17	8.68	0.3	0.4	0.7
BD	0.43	0.44	0.49	0.08								5.0	4.12	5.17	8.68	1.8	2.3	4.2
BE	0.58	0.60	0.66	0.63								5.0	4.12	5.17	8.68	2.4	3.1	5.8
BF	0.32	0.32	0.36	0.63								5.0	4.12	5.17	8.68	1.3	1.7	3.1
BG	0.58	0.60	0.67	0.63								5.0	4.12	5.17	8.68	2.4	3.1	5.8
BH	0.19	0.19	0.21	0.63								5.0	4.12	5.17	8.68	0.8	1.0	1.8
BJ	0.21	0.22	0.24	0.63								5.0	4.12	5.17	8.68	0.9	1.1	2.1

BK	1.09	1.12	1.23	0.63								5.0	4.12	5.17	8.68	4.5	5.8	10.7
BL	0.52	0.53	0.59	0.63								5.0	4.12	5.17	8.68	2.1	2.7	5.1
BM	0.90	0.93	1.03	0.63								5.0	4.12	5.17	8.68	3.7	4.8	8.9
BN	0.98	1.16	1.93	0.08	100	3	12.8	548	1.0%	2.0	4.6	17.4	2.64	3.30	5.54	2.6	3.8	10.7
BP	0.02	0.08	0.37	0.08	73	9	6.9	855	1.0%	2.0	7.1	14.0	2.90	3.63	6.09	0.1	0.3	2.2
BQ	0.01	0.06	0.26	0.08	27	1	6.2	588	1.1%	2.1	4.7	10.9	3.19	4.00	6.72	0.05	0.2	1.7
BR	0.04	0.18	0.77	0.08	100	5	10.8	57	7.9%	5.6	0.2	11.0	3.18	3.99	6.69	0.1	0.7	5.2
BS	0.00	0.00	0.01	0.08								5.0	4.12	5.17	8.68	0.003	0.01	0.1
OS-A	N/A	7.77	8.39	0.90	75	1.1	2.9	1200	1.0%	3.5	5.7	8.6	N/A	4.34	7.72	N/A	33.7	64.8
OS-B	N/A	1.09	1.84	0.60	60	1	6.1	875	1.6%	4.4	3.3	9.4	N/A	4.20	7.46	N/A	4.6	13.7
OS-C	N/A	0.21	0.31	0.30	100	2	11.9	75	1.0%	3.5	0.4	12.3	N/A	3.78	6.72	N/A	0.8	2.1
OS-D	N/A	0.99	1.97	0.30	100	1.5	13.1	550	1.5%	4.3	2.1	15.2	N/A	3.44	6.11	N/A	3.4	12.1
OS-E	0.13	0.13	0.14	0.08								5.0	4.12	5.17	8.68	0.5	0.7	1.2
OS-F	1.62	1.79	2.56	0.08	100	11	8.3	318	2.7%	3.3	1.6	10.0	3.30	4.14	6.94	5.4	7.4	17.8
OS-G	0.80	0.80	0.86	0.08								5.0	4.12	5.17	8.68	3.3	4.2	7.4
OS-H	0.001	0.005	0.02	0.08								5.0	4.12	5.17	8.68	0.01	0.02	0.2



Indicates value taken directly from Vineyard Commerce Park MDDP

JOB NAME:	Vineyard Sub No. 1
JOB NO.:	2204.70
DATE:	7/7/2026
CALC:	JHS

SURFACE ROUTING SUMMARY - DEVELOPED CONDITION

Design Point(s)	Contributing Basins/ Design Point	Equivalent CA ₅	Equivalent CA ₁₀₀	Maximum T _C	Intensity		Flow		Facility/Inlet Size*
					I ₅	I ₁₀₀	Q ₅	Q ₁₀₀	
1	A	0.03	0.05	5.0	5.17	8.68	0.2	0.4	PVT 5' TYPE R SUMP
2	B	0.04	0.06	5.0	5.17	8.68	0.2	0.5	PVT 5' TYPE R SUMP
3	C	0.04	0.06	5.0	5.17	8.68	0.2	0.5	PVT 5' TYPE R SUMP
4	D	0.04	0.06	5.0	5.17	8.68	0.2	0.5	PVT 5' TYPE R SUMP
5	E	0.04	0.06	5.0	5.17	8.68	0.2	0.5	PVT 5' TYPE R SUMP
6	F & OS-E	0.18	0.22	5.9	4.93	8.27	0.9	1.9	PVT 5' TYPE R SUMP
7	G	0.56	0.62	5.0	5.17	8.68	2.9	5.4	PVT 5' TYPE R SUMP
8	H	0.17	0.19	5.0	5.17	8.68	0.9	1.7	N/A
9	J	0.64	0.71	5.0	5.17	8.68	3.3	6.2	PVT 5' TYPE R SUMP
10	K	0.17	0.19	5.0	5.17	8.68	0.9	1.7	N/A
11	L	0.72	0.80	5.0	5.17	8.68	3.7	6.9	PVT 10' TYPE R SUMP
12	M	0.13	0.15	5.0	5.17	8.68	0.7	1.3	N/A
13	N	0.13	0.15	5.0	5.17	8.68	0.7	1.3	N/A
14	P	0.28	0.32	9.5	4.20	7.05	1.2	2.2	PVT 5' TYPE R SUMP
15	Q & OS-F	1.85	2.83	10.2	4.10	6.89	7.6	19.5	PVT TYPE C INLET
16	R	0.23	0.24	5.0	5.17	8.68	1.2	2.1	PVT 5' TYPE R SUMP
17	S	0.20	0.21	5.0	5.17	8.68	1.0	1.8	PVT 5' TYPE R SUMP
18	T	1.17	1.30	11.1	3.97	6.67	4.7	8.7	PVT 10' TYPE R SUMP
19	U	0.17	0.19	5.0	5.17	8.68	0.9	1.7	N/A
20	V	0.18	0.20	5.0	5.17	8.68	0.9	1.7	N/A
21	W	0.40	0.47	6.0	4.89	8.21	1.9	3.8	PVT 5' TYPE R SUMP
22	X	0.21	0.22	5.0	5.17	8.68	1.1	1.9	PVT 5' TYPE R SUMP
23	Y	0.35	0.39	5.0	5.17	8.68	1.8	3.4	N/A

24	Z	0.15	0.17	5.0	5.17	8.68	0.8	1.5	PVT 5' TYPE R SUMP
25	AA	0.35	0.39	5.0	5.17	8.68	1.8	3.4	N/A
26	AB	0.15	0.17	5.0	5.17	8.68	0.8	1.5	PVT 5' TYPE R SUMP
27	AC	0.18	0.19	5.0	5.17	8.68	0.9	1.7	N/A
28	AD	0.17	0.19	5.0	5.17	8.68	0.9	1.7	PVT 5' TYPE R SUMP
29	AE	0.17	0.19	5.0	5.17	8.68	0.9	1.7	N/A
30	AF	0.17	0.19	5.0	5.17	8.68	0.9	1.7	PVT 5' TYPE R SUMP
31	AG	0.44	0.49	5.0	5.17	8.68	2.3	4.2	N/A
32	AH	0.42	0.46	5.0	5.17	8.68	2.2	4.0	PVT 5' TYPE R SUMP
33	AJ	0.44	0.49	5.0	5.17	8.68	2.3	4.2	N/A
34	AK	0.42	0.46	5.0	5.17	8.68	2.2	4.0	PVT 5' TYPE R SUMP
35	AL	0.08	0.09	5.0	5.17	8.68	0.4	0.8	PVT TRENCH DRAIN
36	AM	0.08	0.09	5.0	5.17	8.68	0.4	0.8	PVT TRENCH DRAIN
37	AN	0.22	0.24	5.0	5.17	8.68	1.2	2.1	PVT 5' TYPE R SUMP
38	AP	0.25	0.27	5.0	5.17	8.68	1.3	2.3	PVT 5' TYPE R SUMP
39	AQ	0.39	0.46	5.0	5.17	8.68	2.0	4.0	PVT 5' TYPE R SUMP
40	AR	0.21	0.26	5.0	5.17	8.68	1.1	2.3	PVT 5' TYPE R SUMP
41	AS	0.99	1.16	5.0	5.17	8.68	5.1	10.1	PVT 18" FES
42	AT & OS-G	1.85	2.09	5.0	5.17	8.68	9.6	18.1	PVT 15' TYPE R SUMP
43	AU	0.67	0.71	5.0	5.17	8.68	3.5	6.2	PVT 5' TYPE R SUMP
44	AV	0.65	0.73	5.0	5.17	8.68	3.4	6.3	PVT 5' TYPE R SUMP
45	AW	0.08	0.10	5.0	5.17	8.68	0.4	0.9	PVT 5' TYPE R SUMP
46	AX	0.31	0.33	5.0	5.17	8.68	1.6	2.9	PVT 5' TYPE R SUMP
47	AY	0.18	0.20	5.0	5.17	8.68	0.9	1.7	N/A
48	AZ	0.17	0.19	5.0	5.17	8.68	0.9	1.7	N/A
49	BA	0.09	0.10	5.0	5.17	8.68	0.5	0.9	PVT 5' TYPE R SUMP
50	BB	0.17	0.19	5.0	5.17	8.68	0.9	1.7	N/A

51	BC	0.08	0.08	5.0	5.17	8.68	0.4	0.7	PVT 5' TYPE R SUMP
52	BD	0.44	0.49	5.0	5.17	8.68	2.3	4.2	N/A
53	BE	0.60	0.66	5.0	5.17	8.68	3.1	5.8	PVT 5' TYPE R SUMP
54	BF	0.32	0.36	5.0	5.17	8.68	1.7	3.1	PVT 5' TYPE R SUMP
55	BG	0.60	0.67	5.0	5.17	8.68	3.1	5.8	PVT 5' TYPE R SUMP
56	BH	0.19	0.21	5.0	5.17	8.68	1.0	1.8	PVT 24" DOME AREA INLET
57	BJ	0.22	0.24	5.0	5.17	8.68	1.1	2.1	PVT 24" DOME AREA INLET
58	BK	1.12	1.23	5.0	5.17	8.68	5.8	10.7	PVT 15' TYPE R SUMP
59	BL	0.53	0.59	5.0	5.17	8.68	2.7	5.1	PVT 5' TYPE R SUMP
60	BM	0.93	1.03	5.0	5.17	8.68	4.8	8.9	PVT 10' TYPE R SUMP
61	BN, OS-H, PR 63, & PR 95	23.58	27.79	17.4	3.30	5.54	77.8	154.0	PVT FSD EDB "POND A"
62	OS-A	7.77	8.39	8.6	4.34	7.72	33.7	64.8	CHANNEL "SW-1"
63	BP, OS-B, & DP 62	8.92	10.58	14.0	3.63	6.09	32.3	64.4	CHANNEL "SW-1"
64	BQ, OS-C, OS-D, & DP 63	9.97	12.71	15.2	3.50	5.88	34.9	74.7	N/A
65	BR & DP 64	10.14	13.48	15.2	3.50	5.88	35.5	79.2	FOUNTAIN CREEK
66	DP 65 & PR 96						36.8	130.5	FOUNTAIN CREEK
67	BS	0.003	0.01	5.0	5.17	8.68	0.01	0.1	EX TEMP PVT POND

*All proposed facilities are private unless otherwise specified.

 Indicates value taken directly from Vineyard Commerce Park MDDP

JOB NAME:	Vineyard Sub No. 1
JOB NO.:	2204.70
DATE:	7/7/2026
CALC:	JHS

PIPE ROUTING SUMMARY - DEVELOPED CONDITION

Pipe Run	Contributing Basin / Design Point / Pipe Run	Equivalent CA ₅	Equivalent CA ₁₀₀	Maximum T _C	Intensity		Flow		Pipe Size*
					I ₅	I ₁₀₀	Q ₅	Q ₁₀₀	
1	DP 1	0.03	0.05	5.0	5.17	8.68	0.2	0.4	PVT 12" PVC/RCP/DWPP
2	DP 2 & PR 1	0.07	0.11	5.0	5.17	8.68	0.4	0.9	PVT 12" PVC/RCP/DWPP
3	DP 3 & PR 2	0.11	0.17	5.0	5.17	8.68	0.6	1.4	PVT 12" PVC/RCP/DWPP
4	DP 4 & PR 3	0.15	0.22	5.0	5.17	8.68	0.8	1.9	PVT 12" PVC/RCP/DWPP
5	DP 5 & PR 4	0.19	0.28	5.0	5.17	8.68	1.0	2.4	PVT 12" PVC/RCP/DWPP
6	DP 6 & PR 5	0.36	0.51	5.9	4.93	8.27	1.8	4.2	PVT 18" RCP/DWPP
7	DP 7	0.56	0.62	5.0	5.17	8.68	2.9	5.4	PVT 18" RCP/DWPP
8	DP 8	0.17	0.19	5.0	5.17	8.68	0.9	1.7	PVT 12" PVC/RCP/DWPP
9	PR 7 & 8	0.73	0.82	5.0	5.17	8.68	3.8	7.1	PVT 18" RCP/DWPP
10	DP 9	0.64	0.71	5.0	5.17	8.68	3.3	6.2	PVT 12" PVC/RCP/DWPP
11	PR 9 & 10	1.37	1.53	5.0	5.17	8.68	7.1	13.2	PVT 24" RCP/DWPP
12	DP 10	0.17	0.19	5.0	5.17	8.68	0.9	1.7	PVT 12" PVC/RCP/DWPP
13	PR 11 & 12	1.55	1.72	5.0	5.17	8.68	8.0	14.9	PVT 24" RCP/DWPP
14	DP 11	0.72	0.80	5.0	5.17	8.68	3.7	6.9	PVT 12" PVC/RCP/DWPP
15	PR 13 & 14	2.26	2.51	5.0	5.17	8.68	11.7	21.8	PVT 30" RCP/DWPP
16	DP 12	0.13	0.15	5.0	5.17	8.68	0.7	1.3	PVT 12" PVC/RCP/DWPP
17	PR 15 & 16	2.40	2.66	5.0	5.17	8.68	12.4	23.1	PVT 30" RCP/DWPP
18	DP 13	0.13	0.15	5.0	5.17	8.68	0.7	1.3	PVT 12" PVC/RCP/DWPP
19	PR 6, 17, & 18	2.89	3.31	5.9	4.93	8.27	14.2	27.4	PVT 30" RCP/DWPP
20	DP 14	0.28	0.32	9.5	4.20	7.05	1.2	2.2	PVT 12" PVC/RCP/DWPP
21	DP 15	1.85	2.83	10.2	4.10	6.89	7.6	19.5	PVT 18" RCP/DWPP
22	PR 19, 20, & 21	5.02	6.46	10.2	4.10	6.89	20.6	44.5	PVT 36" RCP/DWPP
23	DP 16	0.23	0.24	5.0	5.17	8.68	1.2	2.1	PVT 12" PVC/RCP/DWPP
24	PR 22 & 23	5.24	6.70	10.2	4.10	6.89	21.5	46.1	PVT 36" RCP/DWPP

25	DP 17	0.20	0.21	5.0	5.17	8.68	1.0	1.8	PVT 12" PVC/RCP/DWPP
26	PR 24 & 25	5.44	6.91	10.2	4.10	6.89	22.3	47.6	PVT 36" RCP/DWPP
27	DP 18	1.17	1.30	11.1	3.97	6.67	4.7	8.7	PVT 18" RCP/DWPP
28	DP 19	0.17	0.19	5.0	5.17	8.68	0.9	1.7	PVT 12" PVC/RCP/DWPP
29	PR 27 & 28	1.35	1.50	11.1	3.97	6.67	5.4	10.0	PVT 24" RCP/DWPP
30	DP 20	0.18	0.20	5.0	5.17	8.68	0.9	1.7	PVT 12" PVC/RCP/DWPP
31	PR 29 & 30	1.53	1.69	11.1	3.97	6.67	6.1	11.3	PVT 24" RCP/DWPP
32	DP 21	0.40	0.47	6.0	4.89	8.21	1.9	3.8	PVT 18" RCP/DWPP
33	PR 31 & 32	1.92	2.16	11.1	3.97	6.67	7.6	14.4	PVT 24" RCP/DWPP
34	DP 22	0.21	0.22	5.0	5.17	8.68	1.1	1.9	PVT 12" PVC/RCP/DWPP
35	PR 33 & 34	2.13	2.38	11.1	3.97	6.67	8.5	15.9	PVT 24" RCP/DWPP
36	DP 23	0.35	0.39	5.0	5.17	8.68	1.8	3.4	PVT 12" PVC/RCP/DWPP
37	DP 24 & PR 36	0.50	0.56	5.0	5.17	8.68	2.6	4.8	PVT 12" PVC/RCP/DWPP
38	DP 25	0.35	0.39	5.0	5.17	8.68	1.8	3.4	PVT 12" PVC/RCP/DWPP
39	DP 26 & PR 38	0.50	0.56	5.0	5.17	8.68	2.6	4.8	PVT 12" PVC/RCP/DWPP
40	PR 35, 37, & 39	3.14	3.50	11.1	3.97	6.67	12.5	23.3	PVT 30" RCP/DWPP
41	DP 27	0.18	0.19	5.0	5.17	8.68	0.9	1.7	PVT 12" PVC/RCP/DWPP
42	DP 28 & PR 41	0.35	0.38	5.0	5.17	8.68	1.8	3.3	PVT 12" PVC/RCP/DWPP
43	DP 29	0.17	0.19	5.0	5.17	8.68	0.9	1.7	PVT 12" PVC/RCP/DWPP
44	DP 30 & PR 43	0.35	0.38	5.0	5.17	8.68	1.8	3.3	PVT 12" PVC/RCP/DWPP
45	PR 40, 42, & 44	3.83	4.27	11.1	3.97	6.67	15.2	28.4	PVT 30" RCP/DWPP
46	DP 31	0.44	0.49	5.0	5.17	8.68	2.3	4.2	PVT 12" PVC/RCP/DWPP
47	DP 32 & PR 46	0.86	0.95	5.0	5.17	8.68	4.4	8.2	PVT 18" RCP/DWPP
48	DP 33	0.44	0.49	5.0	5.17	8.68	2.3	4.2	PVT 12" PVC/RCP/DWPP
49	DP 34 & PR 48	0.86	0.95	5.0	5.17	8.68	4.4	8.2	PVT 18" RCP/DWPP
50	PR 45, 47, & 49	5.54	6.17	11.1	3.97	6.67	22.0	41.1	PVT 36" RCP/DWPP
51	DP 35	0.08	0.09	5.0	5.17	8.68	0.4	0.8	PVT 12" PVC/RCP/DWPP

52	DP 36	0.08	0.09	5.0	5.17	8.68	0.4	0.8	PVT 12" PVC/RCP/DWPP
53	PR 50, 51, & 52	5.71	6.34	11.1	3.97	6.67	22.7	42.3	PVT 36" RCP/DWPP
54	DP 37	0.22	0.24	5.0	5.17	8.68	1.2	2.1	PVT 12" PVC/RCP/DWPP
55	DP 38 & PR 54	0.47	0.50	5.0	5.17	8.68	2.4	4.4	PVT 18" RCP/DWPP
56	PR 26, 53, & 55	11.62	13.76	11.1	3.97	6.67	46.1	91.7	PVT 42" RCP/DWPP
57	DP 39	0.39	0.46	5.0	5.17	8.68	2.0	4.0	PVT 12" PVC/RCP/DWPP
58	DP 40	0.21	0.26	5.0	5.17	8.68	1.1	2.3	PVT 12" PVC/RCP/DWPP
59	PR 56, 57, & 58	12.22	14.47	11.1	3.97	6.67	48.5	96.5	PVT 48" RCP/DWPP
60	DP 41	0.99	1.16	5.0	5.17	8.68	5.1	10.1	PVT 18" RCP/DWPP
61	PR 59 & 60	13.21	15.64	11.1	3.97	6.67	52.4	104.2	PVT 48" RCP/DWPP
62	DP 42	1.85	2.09	5.0	5.17	8.68	9.6	18.1	PVT 24" RCP/DWPP
63	PR 61 & 62	15.06	17.73	11.1	3.97	6.67	59.8	118.1	PVT 48" RCP/DWPP
64	DP 43	0.67	0.71	5.0	5.17	8.68	3.5	6.2	PVT 12" PVC/RCP/DWPP
65	DP 44	0.65	0.73	5.0	5.17	8.68	3.4	6.3	PVT 12" PVC/RCP/DWPP
66	PR 64 & 65	1.32	1.44	5.0	5.17	8.68	6.8	12.5	PVT 24" RCP/DWPP
67	DP 45	0.08	0.10	5.0	5.17	8.68	0.4	0.9	PVT 12" PVC/RCP/DWPP
68	DP 46	0.31	0.33	5.0	5.17	8.68	1.6	2.9	PVT 12" PVC/RCP/DWPP
69	PR 66, 67, & 68	1.71	1.87	5.0	5.17	8.68	8.9	16.2	PVT 30" RCP/DWPP
70	DP 47	0.18	0.20	5.0	5.17	8.68	0.9	1.7	PVT 12" PVC/RCP/DWPP
71	PR 69 & 70	1.89	2.07	5.0	5.17	8.68	9.8	17.9	PVT 30" RCP/DWPP
72	DP 48	0.17	0.19	5.0	5.17	8.68	0.9	1.7	PVT 12" PVC/RCP/DWPP
73	PR 71 & 72	2.07	2.26	5.0	5.17	8.68	10.7	19.6	PVT 30" RCP/DWPP
74	DP 49	0.09	0.10	5.0	5.17	8.68	0.5	0.9	PVT 12" PVC/RCP/DWPP
75	PR 73 & 74	2.16	2.36	5.0	5.17	8.68	11.2	20.5	PVT 30" RCP/DWPP
76	DP 50	0.17	0.19	5.0	5.17	8.68	0.9	1.7	PVT 12" PVC/RCP/DWPP
77	PR 75 & 76	2.33	2.55	5.0	5.17	8.68	12.1	22.2	PVT 30" RCP/DWPP
78	DP 51	0.08	0.08	5.0	5.17	8.68	0.4	0.7	PVT 12" PVC/RCP/DWPP

79	PR 77 & 78	2.41	2.64	5.0	5.17	8.68	12.5	22.9	PVT 30" RCP/DWPP
80	DP 52	0.44	0.49	5.0	5.17	8.68	2.3	4.2	PVT 12" PVC/RCP/DWPP
81	PR 79 & 80	2.85	3.12	5.0	5.17	8.68	14.7	27.1	PVT 30" RCP/DWPP
82	DP 53	0.60	0.66	5.0	5.17	8.68	3.1	5.8	PVT 18" RCP/DWPP
83	DP 54 & PR 82	0.92	1.02	5.0	5.17	8.68	4.8	8.9	PVT 18" RCP/DWPP
84	DP 55 & PR 83	1.52	1.69	5.0	5.17	8.68	7.9	14.7	PVT 24" RCP/DWPP
85	PR 81 & 84	4.37	4.81	5.0	5.17	8.68	22.6	41.8	PVT 36" RCP/DWPP
86	DP 56	0.19	0.21	5.0	5.17	8.68	1.0	1.8	PVT 12" PVC/RCP/DWPP
87	PR 85 & 86	4.56	5.02	5.0	5.17	8.68	23.6	43.6	PVT 36" RCP/DWPP
88	DP 57	0.22	0.24	5.0	5.17	8.68	1.1	2.1	PVT 12" PVC/RCP/DWPP
89	PR 87 & 88	4.78	5.27	5.0	5.17	8.68	24.7	45.7	PVT 36" RCP/DWPP
90	DP 58	1.12	1.23	5.0	5.17	8.68	5.8	10.7	PVT 12" PVC/RCP/DWPP
91	PR 89 & 90	5.90	6.50	5.0	5.17	8.68	30.5	56.4	PVT 42" RCP/DWPP
92	DP 59	0.53	0.59	5.0	5.17	8.68	2.7	5.1	PVT 12" PVC/RCP/DWPP
93	PR 91 & 92	6.43	7.09	5.0	5.17	8.68	33.2	61.5	PVT 42" RCP/DWPP
94	DP 60	0.93	1.03	5.0	5.17	8.68	4.8	8.9	PVT 12" PVC/RCP/DWPP
95	PR 93 & 94	7.36	8.12	5.0	5.17	8.68	38.0	70.5	PVT 42" RCP/DWPP
96	POND OUTFALL						1.3	51.3	PVT 36" RCP/DWPP
97	DP 63	8.92	10.58	14.0	3.63	6.09	32.3	64.4	

PIPES ARE LISTED AT MAXIMUM SIZE REQUIRED TO ACCOMMODATE Q100 FLOWS AT MINIMUM SLOPE.

REFER TO INDIVIDUAL PIPE SHEETS FOR HYDRAULIC INFORMATION.

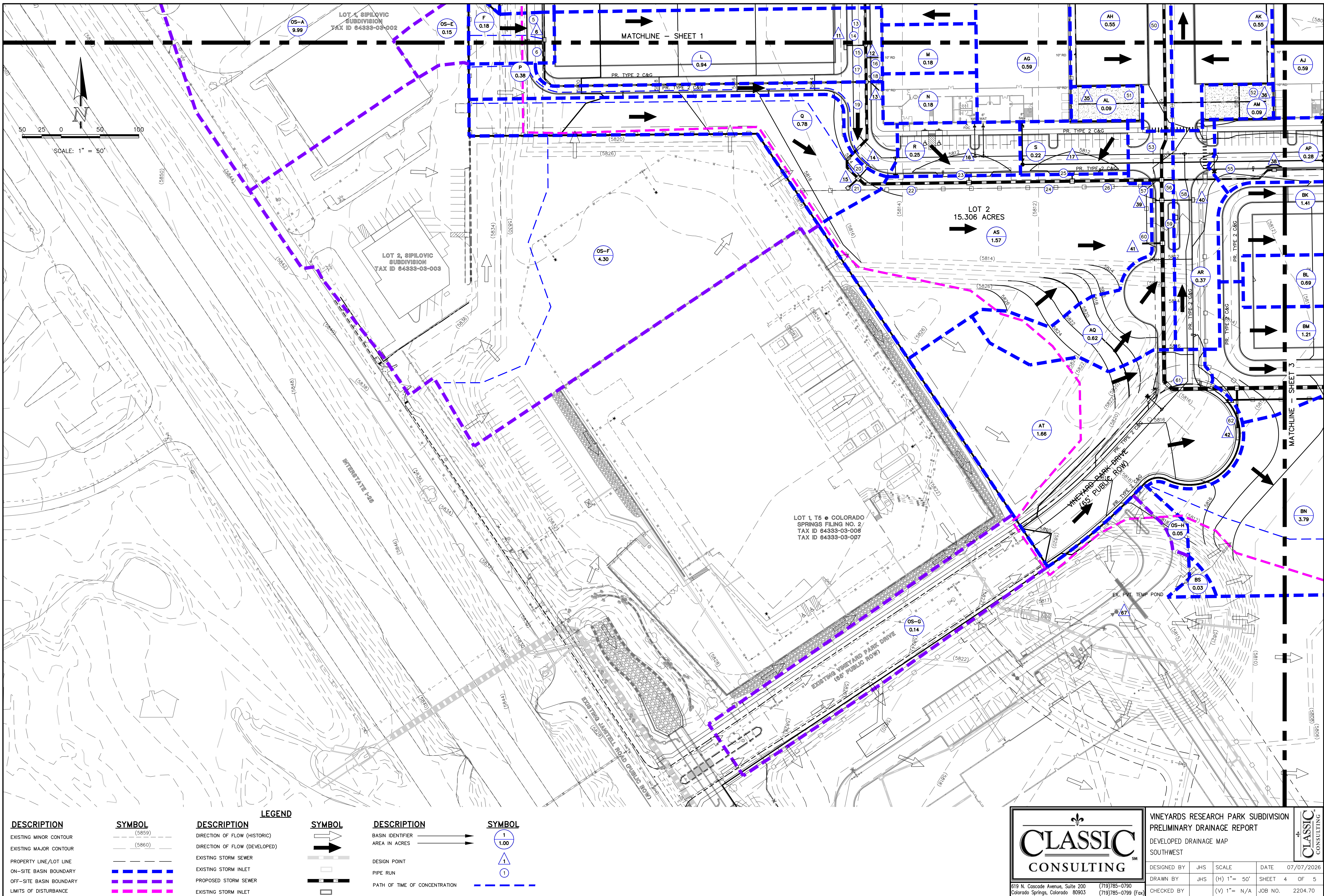
PIPES ARE TO BE PRIVATE UNLESS OTHERWISE NOTED.

PRIVATE STORM MATERIALS TO BE RCP OR DOUBLE WALL POLYPROPYLENE (DWPP) TO BE SELECTED BY CONTRACTOR

JOB NAME:	Vineyard Sub No. 1
JOB NO.:	2204.70
DATE:	7/7/2026
CALC:	JHS

PROPOSED CONDITION DRAINAGE MAP

N:\220470\REPORTS\FINAL DRAINAGE REPORT\220470 FDD03.dwg, 7/7/2026 11:37:26 AM, 1:1



DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL
EXISTING MINOR CONTOUR	(5859)	DIRECTION OF FLOW (HISTORIC)	
EXISTING MAJOR CONTOUR	(5860)	DIRECTION OF FLOW (DEVELOPED)	
PROPERTY LINE/LOT LINE	---	EXISTING STORM SEWER	
ON-SITE BASIN BOUNDARY	---	EXISTING STORM INLET	
OFF-SITE BASIN BOUNDARY	---	PROPOSED STORM SEWER	
LIMITS OF DISTURBANCE	---	EXISTING STORM INLET	

DESCRIPTION	SYMBOL
BASIN IDENTIFIER	
AREA IN ACRES	
DESIGN POINT	
PIPE RUN	
PATH OF TIME OF CONCENTRATION	

CLASSIC CONSULTING

VINEYARDS RESEARCH PARK SUBDIVISION
PRELIMINARY DRAINAGE REPORT
DEVELOPED DRAINAGE MAP
SOUTHWEST

DESIGNED BY	JHS	SCALE	DATE	07/07/2026
DRAWN BY	JHS	(H) 1" = 50'	SHEET	4 OF 5
CHECKED BY		(V) 1" = N/A	JOB NO.	2204-70

619 N. Cascade Avenue, Suite 200
Colorado Springs, Colorado 80903

(719) 785-0790
(719) 785-0799 (Fax)

AREA DRAINAGE SUMMARY - DEVELOPED CONDITION																			
BASIN	WEIGHTED			C5	OVERLAND			STREET/CHANNEL FLOW				Tc	INTENSITY			TOTAL FLOWS			
	CA2	CA5	CA100		Length	Height	Tc	Length	Slope	Velocity	Tc		TOTAL	I2	I5	I100	Q2	Q5	Q100
A	0.03	0.03	0.05	0.08								5.0	4.12	5.17	8.68	0.1	0.2	0.4	
B	0.03	0.04	0.06	0.08								5.0	4.12	5.17	8.68	0.1	0.2	0.5	
C	0.03	0.04	0.06	0.08								5.0	4.12	5.17	8.68	0.1	0.2	0.5	
D	0.03	0.04	0.06	0.08								5.0	4.12	5.17	8.68	0.1	0.2	0.5	
E	0.03	0.04	0.06	0.08								5.0	4.12	5.17	8.68	0.1	0.2	0.5	
F	0.03	0.04	0.08	0.08	73	15	5.8	20	4.7%	4.3	0.1	5.9	3.93	4.93	8.27	0.1	0.2	0.7	
G	0.55	0.56	0.62	0.63								5.0	4.12	5.17	8.68	2.2	2.9	5.4	
H	0.17	0.17	0.19	0.08								5.0	4.12	5.17	8.68	0.7	0.9	1.7	
J	0.62	0.64	0.71	0.63								5.0	4.12	5.17	8.68	2.6	3.3	6.2	
K	0.17	0.17	0.19	0.08								5.0	4.12	5.17	8.68	0.7	0.9	1.7	
L	0.70	0.72	0.80	0.63								5.0	4.12	5.17	8.68	2.9	3.7	6.9	
M	0.13	0.13	0.15	0.08								5.0	4.12	5.17	8.68	0.5	0.7	1.3	
N	0.13	0.13	0.15	0.08								5.0	4.12	5.17	8.68	0.5	0.7	1.3	
P	0.27	0.28	0.32	0.08	72	14	5.9	522	1.4%	2.4	3.7	9.5	3.35	4.20	7.05	0.9	1.2	2.2	
Q	0.02	0.06	0.27	0.08	100	14	7.7	441	2.2%	3.0	2.5	10.2	3.27	4.10	6.89	0.1	0.3	1.9	
R	0.22	0.23	0.24	0.08								5.0	4.12	5.17	8.68	0.9	1.2	2.1	
S	0.19	0.20	0.21	0.08								5.0	4.12	5.17	8.68	0.8	1.0	1.8	
T	1.14	1.17	1.30	0.63	100	1	8.5	387	1.5%	2.4	2.6	11.1	3.17	3.97	6.67	3.6	4.7	8.7	
U	0.17	0.17	0.19	0.08								5.0	4.12	5.17	8.68	0.7	0.9	1.7	
V	0.17	0.18	0.20	0.08								5.0	4.12	5.17	8.68	0.7	0.9	1.7	
W	0.38	0.40	0.47	0.08	31	8.5	3.4	462	2.2%	3.0	2.6	6.0	3.90	4.89	8.21	1.5	1.9	3.8	
X	0.20	0.21	0.22	0.08								5.0	4.12	5.17	8.68	0.8	1.1	1.9	
Y	0.34	0.35	0.39	0.08								5.0	4.12	5.17	8.68	1.4	1.8	3.4	
Z	0.15	0.15	0.17	0.63								5.0	4.12	5.17	8.68	0.6	0.8	1.5	
AA	0.34	0.35	0.39	0.08								5.0	4.12	5.17	8.68	1.4	1.8	3.4	
AB	0.15	0.15	0.17	0.63								5.0	4.12	5.17	8.68	0.6	0.8	1.5	
AC	0.17	0.18	0.19	0.08								5.0	4.12	5.17	8.68	0.7	0.9	1.7	
AD	0.17	0.17	0.19	0.63								5.0	4.12	5.17	8.68	0.7	0.9	1.7	
AE	0.17	0.17	0.19	0.08								5.0	4.12	5.17	8.68	0.7	0.9	1.7	
AF	0.17	0.17	0.19	0.63								5.0	4.12	5.17	8.68	0.7	0.9	1.7	
AG	0.43	0.44	0.49	0.08								5.0	4.12	5.17	8.68	1.8	2.3	4.2	
AH	0.41	0.42	0.46	0.63								5.0	4.12	5.17	8.68	1.7	2.2	4.0	
AJ	0.43	0.44	0.49	0.08								5.0	4.12	5.17	8.68	1.8	2.3	4.2	
AK	0.41	0.42	0.46	0.63								5.0	4.12	5.17	8.68	1.7	2.2	4.0	
AL	0.08	0.08	0.09	0.08								5.0	4.12	5.17	8.68	0.3	0.4	0.8	
AM	0.08	0.08	0.09	0.08								5.0	4.12	5.17	8.68	0.3	0.4	0.8	
AN	0.22	0.22	0.24	0.08								5.0	4.12	5.17	8.68	0.9	1.2	2.1	
AP	0.25	0.25	0.27	0.08								5.0	4.12	5.17	8.68	1.0	1.3	2.3	
AQ	0.37	0.39	0.46	0.08								5.0	4.12	5.17	8.68	1.5	2.0	4.0	
AR	0.19	0.21	0.26	0.08								5.0	4.12	5.17	8.68	0.8	1.1	2.3	
AS	0.94	0.99	1.16	0.08								5.0	4.12	5.17	8.68	3.9	5.1	10.1	
AT	1.00	1.05	1.23	0.08								5.0	4.12	5.17	8.68	4.1	5.4	10.7	
AU	0.66	0.67	0.71	0.08								5.0	4.12	5.17	8.68	2.7	3.5	6.2	
AV	0.64	0.65	0.73	0.63								5.0	4.12	5.17	8.68	2.6	3.4	6.3	
AW	0.08	0.08	0.10	0.08								5.0	4.12	5.17	8.68	0.3	0.4	0.9	
AX	0.30	0.31	0.33	0.08								5.0	4.12	5.17	8.68	1.3	1.6	2.9	
AY	0.17	0.18	0.20	0.08								5.0	4.12	5.17	8.68	0.7	0.9	1.7	
AZ	0.17	0.17	0.19	0.08								5.0	4.12	5.17	8.68	0.7	0.9	1.7	
BA	0.09	0.09	0.10	0.08								5.0	4.12	5.17	8.68	0.4	0.5	0.9	
BB	0.17	0.17	0.19	0.08								5.0	4.12	5.17	8.68	0.7	0.9	1.7	
BC	0.08	0.08	0.08	0.08								5.0	4.12	5.17	8.68	0.3	0.4	0.7	
BD	0.43	0.44	0.49	0.08								5.0	4.12	5.17	8.68	1.8	2.3	4.2	
BE	0.58	0.60	0.66	0.63								5.0	4.12	5.17	8.68	2.4	3.1	5.8	
BF	0.32	0.32	0.36	0.63								5.0	4.12	5.17	8.68	1.3	1.7	3.1	
BG	0.58	0.60	0.67	0.63								5.0	4.12	5.17	8.68	2.4	3.1	5.8	
BH	0.19	0.19	0.21	0.63								5.0	4.12	5.17	8.68	0.8	1.0	1.8	
BJ	0.21	0.22	0.24	0.63								5.0	4.12	5.17	8.68	0.9	1.1	2.1	
BK	1.09	1.12	1.23	0.63								5.0	4.12	5.17	8.68	4.5	5.8	10.7	
BL	0.52	0.53	0.59	0.63								5.0	4.12	5.17	8.68	2.1	2.7	5.1	
BM	0.90	0.93	1.03	0.63								5.0	4.12	5.17	8.68	3.7	4.8	8.9	
BN	0.98	1.16	1.93	0.08	100	3	12.8	548	1.0%	2.0	4.6	17.4	2.64	3.30	5.54	2.6	3.8	10.7	
BP	0.02	0.08	0.37	0.08	73	9	6.9	855	1.0%	2.0	7.1	14.0	2.90	3.63	6.09	0.1	0.3	2.2	
BQ	0.01	0.06	0.26	0.08	27	1	6.2	588	1.1%	2.1	4.7	10.9	3.19	4.00	6.72	0.05	0.2	1.7	
BR	0.04	0.18	0.77	0.08	100	5	10.8	57	7.9%	5.6	0.2	11.0	3.18	3.99	6.69	0.1	0.7	5.2	
BS	0.00	0.00	0.01	0.08								5.0	4.12	5.17	8.68	0.003	0.01	0.1	
OS-A	N/A	7.77	8.39	0.90	75	1.1	2.9	1200	1.0%	3.5	5.7	8.6	N/A	4.34	7.72	N/A	33.7	64.8	
OS-B	N/A	1.09	1.84	0.60	60	1	6.1	875	1.6%	4.4	3.3	9.4	N/A	4.20	7.46	N/A	4.6	13.7	
OS-C	N/A	0.21	0.31	0.30	100	2	11.9	75	1.0%	3.5	0.4	12.3	N/A	3.78	6.72	N/A	0.8	2.1	
OS-D	N/A	0.99	1.97	0.30	100	1.5	13.1	550	1.5%	4.3	2.1	15.2	N/A	3.44	6.11	N/A	3.4	12.1	
OS-E	0.13	0.13	0.14	0.08								5.0	4.12	5.17	8.68	0.5	0.7	1.2	
OS-F	1.62	1.79	2.56	0.08	100	11	8.3	318	2.7%	3.3	1.6	10.0	3.30	4.14	6.94	5.4	7.4	17.8	
OS-G	0.80	0.80	0.86	0.08								5.0	4.12	5.17	8.68	3.3	4.2	7.4	
OS-H	0.001	0.005	0.02	0.08								5.0	4.12	5.17	8.68	0.01	0.02	0.2	

SURFACE ROUTING SUMMARY - DEVELOPED CONDITION									
Design Point(s)	Contributing Basins/ Design Point	Equivalent CA5	Equivalent CA100	Maximum TC	Intensity		Flow		Facility/Inlet Size*
					I5	I100	Q5	Q100	
1	A	0.03	0.05	5.0	5.17	8.68	0.2	0.4	PVT 5' TYPE R SUMP
2	B	0.04	0.06	5.0	5.17	8.68	0.2	0.5	PVT 5' TYPE R SUMP
3	C	0.04	0.06	5.0	5.17	8.68	0.2	0.5	PVT 5' TYPE R SUMP
4	D	0.04	0.06	5.0	5.17	8.68	0.2	0.5	PVT 5' TYPE R SUMP
5	E	0.04	0.06	5.0	5.17	8.68	0.2	0.5	PVT 5' TYPE R SUMP
6	F & OS-E	0.18	0.22	5.9	4.93	8.27	0.9	1.9	PVT 5' TYPE R SUMP
7	G	0.56	0.62	5.0	5.17	8.68	2.9	5.4	PVT 5' TYPE R SUMP
8	H	0.17	0.19	5.0	5.17	8.68	0.9	1.7	N/A
9	J	0.64	0.71	5.0	5.17	8.68	3.3	6.2	PVT 5' TYPE R SUMP
10	K	0.17	0.19	5.0	5.17	8.68	0.9	1.7	N/A
11	L	0.72	0.80	5.0	5.17	8.68	3.7	6.9	PVT 10' TYPE R SUMP
12	M	0.13	0.15	5.0	5.17	8.68	0.7	1.3	N/A
13	N	0.13	0.15	5.0	5.17	8.68	0.7	1.3	N/A
14	P	0.28	0.32	9.5	4.20	7.05	1.2	2.2	PVT 5' TYPE R SUMP
15	Q & OS-F	1.85	2.83	10.2	4.10	6.89	7.6	19.5	PVT TYPE C INLET
16	R	0.23	0.24	5.0	5.17	8.68	1.2	2.1	PVT 5' TYPE R SUMP
17	S	0.20	0.21	5.0	5.17	8.68	1.0	1.8	PVT 5' TYPE R SUMP
18	T	1.17	1.30	11.1	3.97	6.67	4.7	8.7	PVT 10' TYPE R SUMP
19	U	0.17	0.19	5.0	5.17	8.68	0.9	1.7	N/A
20	V	0.18	0.20	5.0	5.17	8.68	0.9	1.7	N/A
21	W	0.40	0.47	6.0	4.89	8.21	1.9	3.8	PVT 5' TYPE R SUMP
22	X	0.21	0.22	5.0	5.17	8.68	1.1	1.9	PVT 5' TYPE R SUMP
23	Y	0.35	0.39	5.0	5.17	8.68	1.8	3.4	N/A
24	Z	0.15	0.17	5.0	5.17	8.68	0.8	1.5	PVT 5' TYPE R SUMP
25	AA	0.35	0.39	5.0	5.17	8.68	1.8	3.4	N/A
26	AB	0.15	0.17	5.0	5.17	8.68	0.8	1.5	PVT 5' TYPE R SUMP
27	AC	0.18	0.19	5.0	5.17	8.68	0.9	1.7	N/A
28	AD	0.17	0.19	5.0	5.17	8.68	0.9	1.7	PVT 5' TYPE R SUMP
29	AE	0.17	0.19	5.0	5.17	8.68	0.9	1.7	N/A
30	AF	0.17	0.19	5.0	5.17	8.68	0.9	1.7	PVT 5' TYPE R SUMP
31	AG	0.44	0.49	5.0	5.17	8.68	2.3	4.2	N/A
32	AH	0.42	0.46	5.0	5.17	8.68	2.2	4.0	PVT 5' TYPE R SUMP
33	AJ	0.44	0.49	5.0	5.17	8.68	2.3	4.2	N/A
34	AK	0.42	0.46	5.0	5.17	8.68	2.2	4.0	PVT 5' TYPE R SUMP
35	AL	0.08	0.09	5.0	5.17	8.68	0.4	0.8	PVT TRENCH DRAIN
36	AM	0.08	0.09	5.0	5.17	8.68	0.4	0.8	PVT TRENCH DRAIN
37	AN	0.22	0.24	5.0	5.17	8.68	1.2	2.1	PVT 5' TYPE R SUMP
38	AP	0.25	0.27	5.0	5.17	8.68	1.3	2.3	PVT 5' TYPE R SUMP
39	AQ	0.39	0.46	5.0	5.17	8.68	2.0	4.0	PVT 5' TYPE R SUMP
40	AR	0.21	0.26	5.0	5.17	8.68	1.1	2.3	PVT 5' TYPE R SUMP
41	AS	0.99	1.16	5.0	5.17	8.68	5.1	10.1	PVT 18" FES
42	AT & OS-G	1.85	2.09	5.0	5.17	8.68	9.6	18.1	PVT 15' TYPE R SUMP
43	AU	0.67	0.71	5.0	5.17	8.68	3.5	6.2	PVT 5' TYPE R SUMP
44	AV	0.65	0.73	5.0	5.17	8.68	3.4	6.3	PVT 5' TYPE R SUMP
45	AW	0.08	0.10	5.0	5.17	8.68	0.4	0.9	PVT 5' TYPE R SUMP
46	AX	0.31	0.33	5.0	5.17	8.68	1.6	2.9	PVT 5' TYPE R SUMP
47	AY	0.18	0.20	5.0	5.17	8.68	0.9	1.7	N/A
48	AZ	0.17	0.19	5.0	5.17	8.68	0.9	1.7	N/A
49	BA	0.09	0.10	5.0	5.17	8.68	0.5	0.9	PVT 5' TYPE R SUMP
50	BB	0.17	0.19	5.0	5.17	8.68	0.9	1.7	N/A
51	BC	0.08	0.08	5.0	5.17	8.68	0.4	0.7	PVT 5' TYPE R SUMP
52	BD	0.44	0.49	5.0	5.17	8.68	2.3	4.2	N/A
53	BE	0.60	0.66	5.0	5.17	8.68	3.1	5.8	PVT 5' TYPE R SUMP
54	BF	0.32	0.36	5.0	5.17	8.68	1.7	3.1	PVT 5' TYPE R SUMP
55	BG	0.60	0.67	5.0	5.17	8.68	3.1	5.8	PVT 5' TYPE R SUMP
56	BH	0.19	0.21	5.0	5.17	8.68	1.0	1.8	PVT 24" DOME AREA INLET
57	BJ	0.22	0.24	5.0	5.17	8.68	1.1	2.1	PVT 24" DOME AREA INLET
58	BK	1.12	1.23	5.0	5.17	8.68	5.8	10.7	PVT 15' TYPE R SUMP
59	BL	0.53	0.59	5.0	5.17	8.68	2.7	5.1	PVT 5' TYPE R SUMP
60	BM	0.93	1.03	5.0	5.17	8.68	4.8	8.9	PVT 10' TYPE R SUMP
61	BN, OS-H, PR 63, & PR 95	23.58	27.79	17.4	3.30	5.54	77.8	154.0	PVT FSD EDB "POND A"
62	OS-A	7.77	8.39	8.6	4.34	7.72	33.7	64.8	CHANNEL "SW-1"
63	BP, OS-B, & DP 62	8.92	10.58	14.0	3.63	6.09	32.3	64.4	CHANNEL "SW-1"
64	BQ, OS-C, OS-D, & DP 63	9.97	12.71	15.2	3.50	5.88	34.9	74.7	N/A
65	BR & DP 64	10.14	13.48	15.2	3.50	5.88	35.5	79.2	FOUNTAIN CREEK
66	DP 65 & PR 96						36.8	130.5	FOUNTAIN CREEK
67	BS	0.003	0.01	5.0	5.17	8.68	0.01	0.1	EX TRENCH PVT POND

GREEN INFRASTRUCTURE EXHIBIT AND CALCULATIONS

HYDRAULIC CALCULATIONS

Rating Table for 12"

Project Description						
Friction Method		Manning				
Solve For		Formula				
		Discharge				
Input Data						
Roughness Coefficient		0.013				
Channel Slope		0.005 ft/ft				
Normal Depth		11.4 in				
Diameter		12.0 in				
Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)	
0.005	2.71	3.51	0.8	2.7		0.44
0.010	3.83	4.97	0.8	2.7		0.44
0.015	4.69	6.08	0.8	2.7		0.44
0.020	5.41	7.02	0.8	2.7		0.44
0.025	6.05	7.85	0.8	2.7		0.44
0.030	6.63	8.60	0.8	2.7		0.44
0.035	7.16	9.29	0.8	2.7		0.44
0.040	7.66	9.93	0.8	2.7		0.44
0.045	8.12	10.54	0.8	2.7		0.44
0.050	8.56	11.11	0.8	2.7		0.44
0.055	8.98	11.65	0.8	2.7		0.44
0.060	9.38	12.17	0.8	2.7		0.44
0.065	9.76	12.66	0.8	2.7		0.44
0.070	10.13	13.14	0.8	2.7		0.44
0.075	10.48	13.60	0.8	2.7		0.44
0.080	10.83	14.05	0.8	2.7		0.44
0.085	11.16	14.48	0.8	2.7		0.44
0.090	11.48	14.90	0.8	2.7		0.44
0.095	11.80	15.31	0.8	2.7		0.44
0.100	12.11	15.71	0.8	2.7		0.44

Rating Table for 18"

Project Description						
Friction Method		Manning Formula				
Solve For		Discharge				
Input Data						
Roughness Coefficient		0.013				
Channel Slope		0.005 ft/ft				
Normal Depth		17.0 in				
Diameter		18.0 in				
Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)	
0.005	7.99	4.62	1.7	4.0		0.69
0.010	11.30	6.53	1.7	4.0		0.69
0.015	13.83	8.00	1.7	4.0		0.69
0.020	15.97	9.24	1.7	4.0		0.69
0.025	17.86	10.33	1.7	4.0		0.69
0.030	19.56	11.32	1.7	4.0		0.69

Rating Table for 24"

Project Description						
Friction Method		Manning Formula				
Solve For		Discharge				
Input Data						
Roughness Coefficient		0.013				
Channel Slope		0.005 ft/ft				
Normal Depth		22.6 in				
Diameter		24.0 in				
Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)	
0.005	17.20	5.61	3.1	5.3		0.94
0.010	24.33	7.93	3.1	5.3		0.94

Rating Table for 30"

Project Description						
Friction Method		Manning Formula				
Solve For		Discharge				
Input Data						
Roughness Coefficient		0.013				
Channel Slope		0.005 ft/ft				
Normal Depth		28.2 in				
Diameter		30.0 in				
Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)	
0.005	31.20	6.51	4.8	6.6	1.19	
0.010	44.12	9.21	4.8	6.6	1.19	

Rating Table for 36"

Project Description						
Friction Method		Manning				
		Formula				
Solve For		Discharge				
Input Data						
Roughness Coefficient		0.013				
Channel Slope		0.005 ft/ft				
Normal Depth		33.8 in				
Diameter		36.0 in				
Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)	
0.005	50.73	7.36	6.9	7.9		1.44
0.006	55.57	8.06	6.9	7.9		1.44

Rating Table for 42"

Project Description						
Friction Method		Manning Formula				
Solve For		Discharge				
Input Data						
Roughness Coefficient		0.013				
Channel Slope		0.005 ft/ft				
Normal Depth		39.5 in				
Diameter		42.0 in				
Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)	
0.005	76.52	8.15	9.4	9.3	1.66	
0.010	108.22	11.53	9.4	9.3	1.66	

Rating Table for 48"

Project Description						
Friction Method		Manning				
		Formula				
Solve For		Discharge				
Input Data						
Roughness Coefficient		0.013				
Channel Slope		0.005 ft/ft				
Normal Depth		45.1 in				
Diameter		48.0 in				
Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)	
0.005	109.25	8.91	12.3	10.6	1.91	
0.010	154.51	12.61	12.3	10.6	1.91	

INLET MANAGEMENT

Project:
 Minor:
 Major:

Worksheet Protected

INLET NAME	6-IN CURB SUMP - 5	6-IN CURB SUMP - 10	6-IN CURB SUMP - 15	8-IN CURB SUMP - 15
Inlet Application (Street or Area)	STREET	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
Number of Inlet Units		1	1	1

USER-DEFINED INPUT

User-Defined Peak Flows				
Minor Peak Flow, Q (cfs)	6.40	9.80	11.50	22.70
Major Peak Flow, Q (cfs)	6.40	9.80	11.50	22.70
Bypass (Carry-Over) Flow from Upstream <i>Inlets must be organized from upstream (left) to downstream (right) in order for bypass flows to be linked.</i>				
Receive Bypass Flow from:				
Bypass Flow Description (Optional):				
Minor Bypass Flow Received, Q _b (cfs)				
Major Bypass Flow Received, Q _b (cfs)				

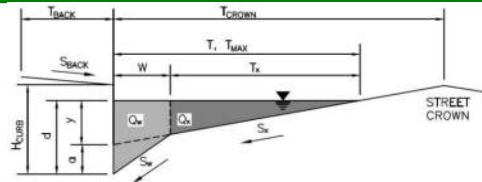
CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	6.40	9.80	11.50	22.70
Major Total Design Peak Flow, Q (cfs)	6.40	9.80	11.50	22.70
Minor Inlet Interception Capacity, Q _a (cfs)		9.81	11.53	22.73
Major Inlet Interception Capacity, Q _a (cfs)		9.81	11.53	22.73
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
Minor Flow Capture Percentage, C%		100%	100%	100%
Major Flow Capture Percentage, C%		100%	100%	100%

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

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

Project:

Inlet ID: **6-IN CURB SUMP - 5**

DP 1-6, 7, 9, 14, 16, 17, 21, 22, 24,
26, 28, 30, 32, 34, 37-40, 45, 46, 49,
51, 53-55, & 59

Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

Height of Curb at Gutter Flow Line

Distance from Curb Face to Street Crown

Gutter Width

Street Transverse Slope

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

Street Longitudinal Slope - Enter 0 for sump condition

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

Max. Allowable Spread for Minor & Major Storm

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

Check boxes are not applicable in SUMP conditions

MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

$T_{BACK} =$	0.0	ft
$S_{BACK} =$	0.020	ft/ft
$n_{BACK} =$	0.020	

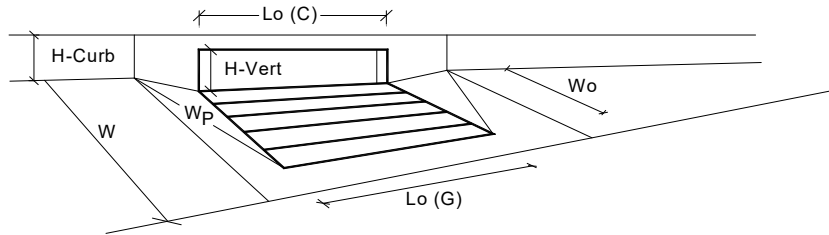
$H_{CURB} =$	6.00	inches
$T_{CROWN} =$	20.0	ft
$W =$	2.00	ft
$S_x =$	0.020	ft/ft
$S_w =$	0.063	ft/ft
$S_o =$	0.000	ft/ft
$n_{STREET} =$	0.020	

	Minor Storm	Major Storm	
$T_{MAX} =$	20.0	20.0	ft
$d_{MAX} =$	6.0	6.0	inches
	☐	☐	

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

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 6.00 (August 2025)



Design Information (Input)

Type of Inlet CDOT Type R Curb Opening

Local Depression (additional to continuous gutter depression 'a' from above)

Number of Unit Inlets (Grate or Curb Opening)

Water Depth at Flowline (outside of local depression)

Grate Information

Length of a Unit Grate

Width of a Unit Grate

Open Area Ratio for a Grate (typical values 0.15-0.90)

Clogging Factor for a Single Grate (typical value 0.50 - 0.70)

Grate Weir Coefficient (typical value 2.15 - 3.60)

Grate Orifice Coefficient (typical value 0.60 - 0.80)

Curb Opening Information

Length of a Unit Curb Opening

Height of Vertical Curb Opening in Inches

Height of Curb Orifice Throat in Inches

Angle of Throat

Side Width for Depression Pan (typically the gutter width of 2 feet)

Clogging Factor for a Single Curb Opening (typical value 0.10)

Curb Opening Weir Coefficient (typical value 2.3-3.7)

Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)

Low Head Performance Reduction (Calculated)

Depth for Grate Midwidth

Depth for Curb Opening Weir Equation

Grated Inlet Performance Reduction Factor for Long Inlets

Curb Opening Performance Reduction Factor for Long Inlets

Combination Inlet Performance Reduction Factor for Long Inlets

Total Inlet Interception Capacity (assumes clogged condition)

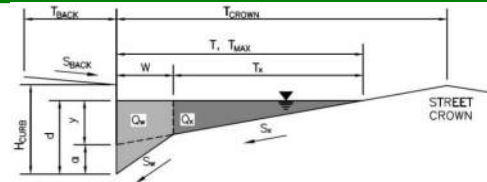
WARNING: Inlet Capacity < Q Peak for Minor and Major Storms

	MINOR	MAJOR	
Type =	CDOT Type R Curb Opening		
a_{local} =	3.00	3.00	inches
No =	1	1	
Ponding Depth =	6.0	6.0	inches
	MINOR	MAJOR	☒ Override Depths
L_o (G) =	N/A	N/A	feet
W_o =	N/A	N/A	feet
A_{ratio} =	N/A	N/A	
C_r (G) =	N/A	N/A	
C_w (G) =	N/A	N/A	
C_o (G) =	N/A	N/A	
	MINOR	MAJOR	
L_o (C) =	5.00	5.00	feet
H_{vert} =	6.00	6.00	inches
H_{throat} =	6.00	6.00	inches
Theta =	63.40	63.40	degrees
W_d =	2.00	2.00	feet
C_r (C) =	0.10	0.10	
C_w (C) =	3.60	3.60	
C_o (C) =	0.67	0.67	
	MINOR	MAJOR	
d_{Grate} =	N/A	N/A	ft
d_{Curb} =	0.37	0.37	ft
RF_{Grate} =	N/A	N/A	
RF_{Curb} =	1.00	1.00	
$RF_{Combination}$ =	N/A	N/A	
	MINOR	MAJOR	
Q_a =	6.4	6.4	cfs
$Q_{PEAK REQUIRED}$ =	6.4	6.4	cfs

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

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

Project:

Inlet ID: **6-IN CURB SUMP - 10**

DP 11, 18, & 60

Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

Height of Curb at Gutter Flow Line

Distance from Curb Face to Street Crown

Gutter Width

Street Transverse Slope

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

Street Longitudinal Slope - Enter 0 for sump condition

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

Max. Allowable Spread for Minor & Major Storm

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

Check boxes are not applicable in SUMP conditions

MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

$T_{BACK} = 0.0$ ft
 $S_{BACK} = 0.020$ ft/ft
 $n_{BACK} = 0.020$

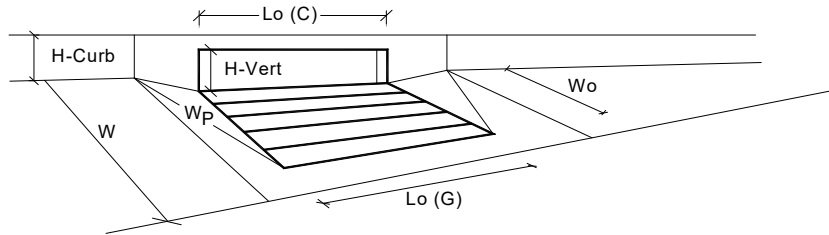
$H_{CURB} = 6.00$ inches
 $T_{CROWN} = 20.0$ ft
 $W = 2.00$ ft
 $S_X = 0.020$ ft/ft
 $S_W = 0.063$ ft/ft
 $S_0 = 0.000$ ft/ft
 $n_{STREET} = 0.020$

	Minor Storm	Major Storm	
$T_{MAX} =$	20.0	20.0	ft
$d_{MAX} =$	6.0	6.0	inches
	☐	☐	

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

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 6.00 (August 2025)



Design Information (Input)

Type of Inlet CDOT Type R Curb Opening

Local Depression (additional to continuous gutter depression 'a' from above)

Number of Unit Inlets (Grate or Curb Opening)

Water Depth at Flowline (outside of local depression)

Grate Information

Length of a Unit Grate

Width of a Unit Grate

Open Area Ratio for a Grate (typical values 0.15-0.90)

Clogging Factor for a Single Grate (typical value 0.50 - 0.70)

Grate Weir Coefficient (typical value 2.15 - 3.60)

Grate Orifice Coefficient (typical value 0.60 - 0.80)

Curb Opening Information

Length of a Unit Curb Opening

Height of Vertical Curb Opening in Inches

Height of Curb Orifice Throat in Inches

Angle of Throat

Side Width for Depression Pan (typically the gutter width of 2 feet)

Clogging Factor for a Single Curb Opening (typical value 0.10)

Curb Opening Weir Coefficient (typical value 2.3-3.7)

Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)

Low Head Performance Reduction (Calculated)

Depth for Grate Midwidth

Depth for Curb Opening Weir Equation

Grated Inlet Performance Reduction Factor for Long Inlets

Curb Opening Performance Reduction Factor for Long Inlets

Combination Inlet Performance Reduction Factor for Long Inlets

Total Inlet Interception Capacity (assumes clogged condition)

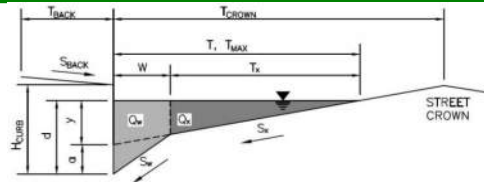
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)

	MINOR	MAJOR	
Type =	CDOT Type R Curb Opening		
a_{local} =	3.00	3.00	inches
No =	1	1	
Ponding Depth =	6.0	6.0	inches
	MINOR	MAJOR	☒ Override Depths
L_o (G) =	N/A	N/A	feet
W_o =	N/A	N/A	feet
A_{ratio} =	N/A	N/A	
C_r (G) =	N/A	N/A	
C_w (G) =	N/A	N/A	
C_o (G) =	N/A	N/A	
	MINOR	MAJOR	
L_o (C) =	10.00	10.00	feet
H_{vert} =	6.00	6.00	inches
H_{throat} =	6.00	6.00	inches
Theta =	63.40	63.40	degrees
W_p =	2.00	2.00	feet
C_r (C) =	0.10	0.10	
C_w (C) =	3.60	3.60	
C_o (C) =	0.67	0.67	
	MINOR	MAJOR	
d_{Grate} =	N/A	N/A	ft
d_{Curb} =	0.37	0.37	ft
RF_{Grate} =	N/A	N/A	
RF_{Curb} =	0.93	0.93	
$RF_{Combination}$ =	N/A	N/A	
	MINOR	MAJOR	
Q_a =	9.8	9.8	cfs
$Q_{PEAK REQUIRED}$ =	9.8	9.8	cfs

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

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

Project:

Inlet ID: **6-IN CURB SUMP - 15****DP 58****Gutter Geometry:**

Maximum Allowable Width for Spread Behind Curb

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

Height of Curb at Gutter Flow Line

Distance from Curb Face to Street Crown

Gutter Width

Street Transverse Slope

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

Street Longitudinal Slope - Enter 0 for sump condition

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

Max. Allowable Spread for Minor & Major Storm

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

Check boxes are not applicable in SUMP conditions

MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

$T_{BACK} =$	0.0	ft
$S_{BACK} =$	0.020	ft/ft
$n_{BACK} =$	0.020	

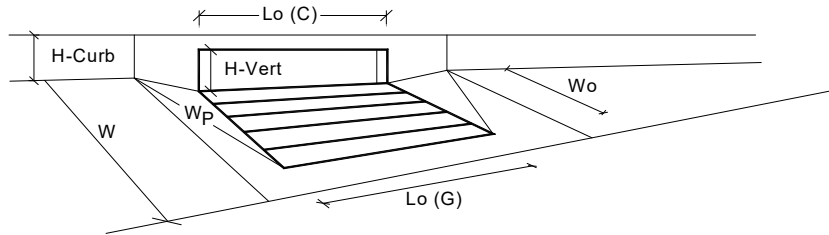
$H_{CURB} =$	6.00	inches
$T_{CROWN} =$	20.0	ft
$W =$	2.00	ft
$S_X =$	0.020	ft/ft
$S_W =$	0.063	ft/ft
$S_0 =$	0.000	ft/ft
$n_{STREET} =$	0.020	

	Minor Storm	Major Storm	
$T_{MAX} =$	20.0	20.0	ft
$d_{MAX} =$	6.0	6.0	inches
	☐	☐	

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

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 6.00 (August 2025)



Design Information (Input)

Type of Inlet CDOT Type R Curb Opening

Local Depression (additional to continuous gutter depression 'a' from above)

Number of Unit Inlets (Grate or Curb Opening)

Water Depth at Flowline (outside of local depression)

Grate Information

Length of a Unit Grate

Width of a Unit Grate

Open Area Ratio for a Grate (typical values 0.15-0.90)

Clogging Factor for a Single Grate (typical value 0.50 - 0.70)

Grate Weir Coefficient (typical value 2.15 - 3.60)

Grate Orifice Coefficient (typical value 0.60 - 0.80)

Curb Opening Information

Length of a Unit Curb Opening

Height of Vertical Curb Opening in Inches

Height of Curb Orifice Throat in Inches

Angle of Throat

Side Width for Depression Pan (typically the gutter width of 2 feet)

Clogging Factor for a Single Curb Opening (typical value 0.10)

Curb Opening Weir Coefficient (typical value 2.3-3.7)

Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)

Low Head Performance Reduction (Calculated)

Depth for Grate Midwidth

Depth for Curb Opening Weir Equation

Grated Inlet Performance Reduction Factor for Long Inlets

Curb Opening Performance Reduction Factor for Long Inlets

Combination Inlet Performance Reduction Factor for Long Inlets

Total Inlet Interception Capacity (assumes clogged condition)

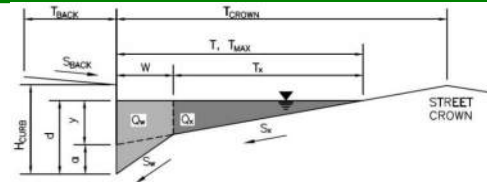
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)

	MINOR	MAJOR	
Type =	CDOT Type R Curb Opening		
a_{local} =	3.00	3.00	inches
No =	1	1	
Ponding Depth =	6.0	6.0	inches
	MINOR	MAJOR	☒ Override Depths
L_o (G) =	N/A	N/A	feet
W_o =	N/A	N/A	feet
A_{ratio} =	N/A	N/A	
C_r (G) =	N/A	N/A	
C_w (G) =	N/A	N/A	
C_o (G) =	N/A	N/A	
	MINOR	MAJOR	
L_o (C) =	15.00	15.00	feet
H_{vert} =	6.00	6.00	inches
H_{throat} =	6.00	6.00	inches
Theta =	63.40	63.40	degrees
W_d =	2.00	2.00	feet
C_r (C) =	0.10	0.10	
C_w (C) =	3.60	3.60	
C_o (C) =	0.67	0.67	
	MINOR	MAJOR	
d_{Grate} =	N/A	N/A	ft
d_{Curb} =	0.37	0.37	ft
RF_{Grate} =	N/A	N/A	
RF_{Curb} =	0.79	0.79	
$RF_{Combination}$ =	N/A	N/A	
	MINOR	MAJOR	
Q_a =	11.5	11.5	cfs
$Q_{PEAK REQUIRED}$ =	11.5	11.5	cfs

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

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

Project:

Inlet ID: **8-IN CURB SUMP - 15****DP 42****Gutter Geometry:**

Maximum Allowable Width for Spread Behind Curb

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

Height of Curb at Gutter Flow Line

Distance from Curb Face to Street Crown

Gutter Width

Street Transverse Slope

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

Street Longitudinal Slope - Enter 0 for sump condition

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

Max. Allowable Spread for Minor & Major Storm

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

Check boxes are not applicable in SUMP conditions

MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

$T_{BACK} =$	0.0	ft
$S_{BACK} =$	0.020	ft/ft
$n_{BACK} =$	0.020	

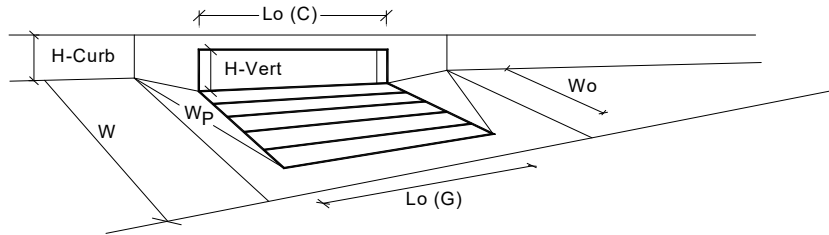
$H_{CURB} =$	8.00	inches
$T_{CROWN} =$	60.5	ft
$W =$	2.00	ft
$S_x =$	0.020	ft/ft
$S_w =$	0.063	ft/ft
$S_o =$	0.000	ft/ft
$n_{STREET} =$	0.020	

	Minor Storm	Major Storm	
$T_{MAX} =$	60.5	60.5	ft
$d_{MAX} =$	8.0	8.0	inches
	☐	☐	

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

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 6.00 (August 2025)



Design Information (Input)

Type of Inlet CDOT Type R Curb Opening

Local Depression (additional to continuous gutter depression 'a' from above)

Number of Unit Inlets (Grate or Curb Opening)

Water Depth at Flowline (outside of local depression)

Grate Information

Length of a Unit Grate

Width of a Unit Grate

Open Area Ratio for a Grate (typical values 0.15-0.90)

Clogging Factor for a Single Grate (typical value 0.50 - 0.70)

Grate Weir Coefficient (typical value 2.15 - 3.60)

Grate Orifice Coefficient (typical value 0.60 - 0.80)

Curb Opening Information

Length of a Unit Curb Opening

Height of Vertical Curb Opening in Inches

Height of Curb Orifice Throat in Inches

Angle of Throat

Side Width for Depression Pan (typically the gutter width of 2 feet)

Clogging Factor for a Single Curb Opening (typical value 0.10)

Curb Opening Weir Coefficient (typical value 2.3-3.7)

Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)

Low Head Performance Reduction (Calculated)

Depth for Grate Midwidth

Depth for Curb Opening Weir Equation

Grated Inlet Performance Reduction Factor for Long Inlets

Curb Opening Performance Reduction Factor for Long Inlets

Combination Inlet Performance Reduction Factor for Long Inlets

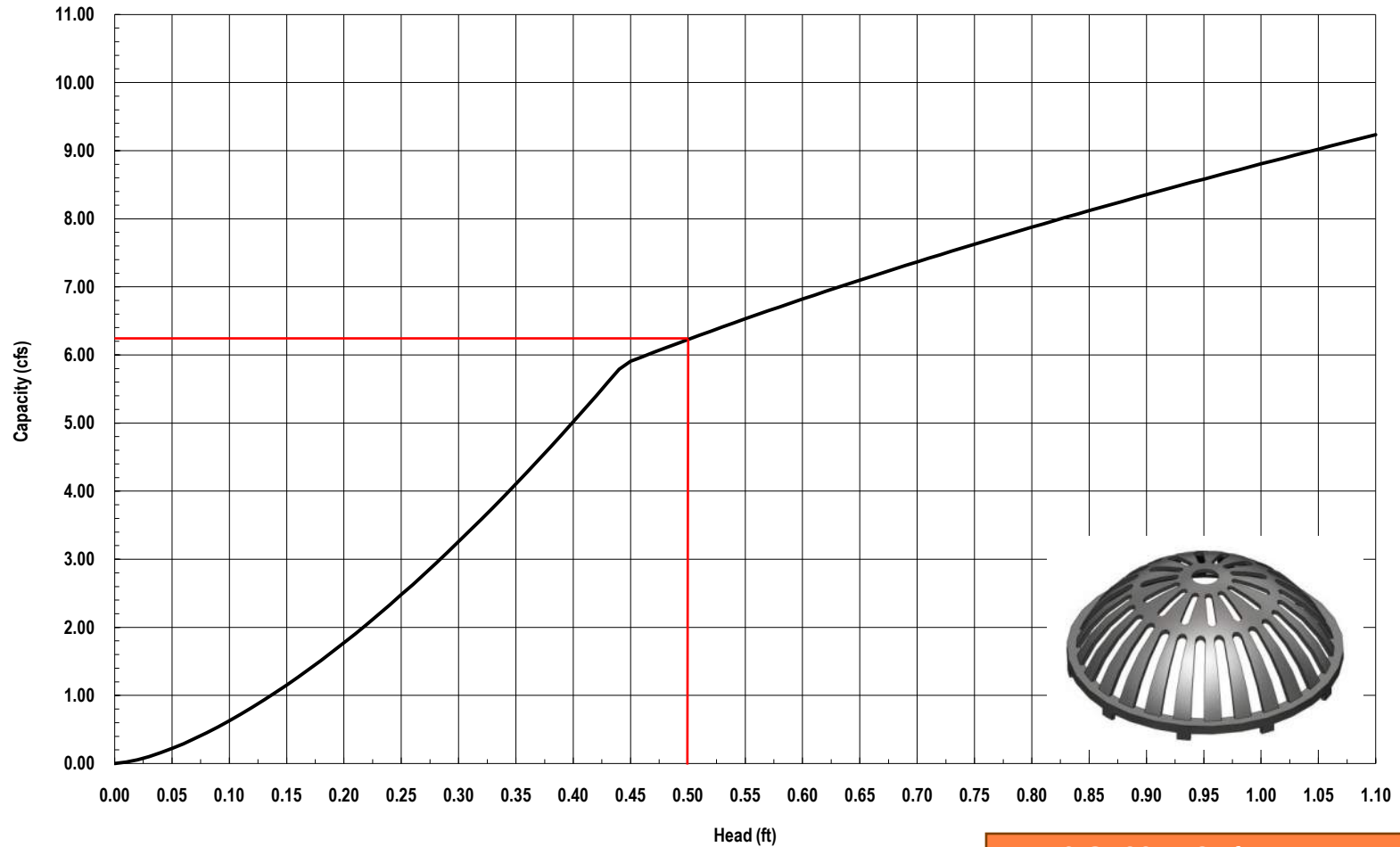
Total Inlet Interception Capacity (assumes clogged condition)

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

	MINOR	MAJOR	
Type =	CDOT Type R Curb Opening		
a_{local} =	1.00	1.00	inches
No =	1	1	
Ponding Depth =	8.0	8.0	inches
	MINOR	MAJOR	
L_o (G) =	N/A	N/A	feet
W_o =	N/A	N/A	feet
A_{ratio} =	N/A	N/A	
C_r (G) =	N/A	N/A	
C_w (G) =	N/A	N/A	
C_o (G) =	N/A	N/A	
	MINOR	MAJOR	
L_o (C) =	15.00	15.00	feet
H_{vert} =	6.00	6.00	inches
H_{throat} =	6.00	6.00	inches
Theta =	63.40	63.40	degrees
W_d =	2.00	2.00	feet
C_r (C) =	0.10	0.10	
C_w (C) =	3.60	3.60	
C_o (C) =	0.67	0.67	
	MINOR	MAJOR	
d_{Grate} =	N/A	N/A	ft
d_{Curb} =	0.54	0.54	ft
RF_{Grate} =	N/A	N/A	
RF_{Curb} =	0.89	0.89	
$RF_{Combination}$ =	N/A	N/A	
	MINOR	MAJOR	
Q_a =	22.7	22.7	cfs
$Q_{PEAK REQUIRED}$ =	22.7	22.7	cfs

☐ Override Depths

Nyloplast 24" Dome Grate Inlet Capacity Chart



DP 56 Q100=1.8 cfs
 DP 57 Q100=2.1 cfs
 Capacity @ 0.50' head: 6.2 cfs

CALC: JHS
 DATE: 7/7/2026



3130 Verona Avenue • Buford, GA 30518
 (866) 888-8479 / (770) 932-2443 • Fax: (770) 932-2490
 © Nyloplast Inlet Capacity Charts June 2012

Channel "SW-1"

Project Description	
Friction Method	Manning
	Formula
Solve For	Discharge
Input Data	
Roughness Coefficient	0.030
Channel Slope	0.010 ft/ft
Normal Depth	24.0 in
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Bottom Width	10.00 ft
Results	
Discharge	218.76 cfs
Flow Area	36.0 ft ²
Wetted Perimeter	26.5 ft
Hydraulic Radius	16.3 in
Top Width	26.00 ft
Critical Depth	22.8 in
Critical Slope	0.012 ft/ft
Velocity	6.08 ft/s
Velocity Head	0.57 ft
Specific Energy	2.57 ft
Froude Number	0.910
Flow Type	Subcritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	24.0 in
Critical Depth	22.8 in
Channel Slope	0.010 ft/ft
Critical Slope	0.012 ft/ft



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aeries](#)

PF tabular

JOB: CREEKBEND SUBDIVISION
JOB NO.: 2646.00
CALC: JHS
DATE: 03/24/2026

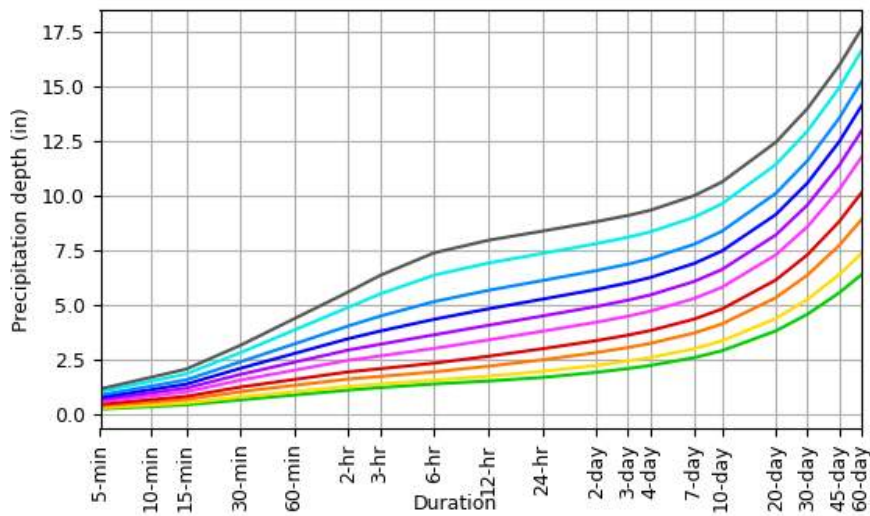
PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.239 (0.202-0.286)	0.289 (0.244-0.346)	0.377 (0.317-0.453)	0.456 (0.380-0.549)	0.572 (0.462-0.723)	0.668 (0.525-0.854)	0.770 (0.581-1.01)	0.879 (0.633-1.18)	1.03 (0.711-1.43)	1.16 (0.770-1.62)
10-min	0.350 (0.295-0.419)	0.424 (0.357-0.507)	0.552 (0.464-0.663)	0.667 (0.557-0.804)	0.837 (0.677-1.06)	0.978 (0.768-1.25)	1.13 (0.851-1.48)	1.29 (0.927-1.74)	1.51 (1.04-2.10)	1.69 (1.13-2.37)
15-min	0.427 (0.360-0.510)	0.516 (0.435-0.618)	0.673 (0.566-0.808)	0.814 (0.679-0.981)	1.02 (0.826-1.29)	1.19 (0.937-1.53)	1.38 (1.04-1.80)	1.57 (1.13-2.12)	1.84 (1.27-2.56)	2.06 (1.38-2.89)
30-min	0.656 (0.554-0.784)	0.791 (0.667-0.947)	1.03 (0.864-1.24)	1.24 (1.04-1.50)	1.56 (1.26-1.97)	1.82 (1.43-2.32)	2.09 (1.58-2.75)	2.39 (1.72-3.22)	2.81 (1.94-3.90)	3.14 (2.10-4.40)
60-min	0.878 (0.741-1.05)	1.03 (0.870-1.24)	1.32 (1.11-1.58)	1.59 (1.32-1.92)	2.01 (1.64-2.57)	2.38 (1.87-3.06)	2.77 (2.10-3.66)	3.21 (2.32-4.36)	3.84 (2.66-5.36)	4.36 (2.91-6.11)
2-hr	1.10 (0.937-1.31)	1.27 (1.08-1.51)	1.61 (1.36-1.92)	1.94 (1.63-2.32)	2.46 (2.03-3.14)	2.93 (2.34-3.77)	3.45 (2.64-4.54)	4.03 (2.94-5.45)	4.88 (3.40-6.78)	5.59 (3.75-7.78)
3-hr	1.22 (1.04-1.44)	1.38 (1.18-1.64)	1.72 (1.47-2.05)	2.08 (1.76-2.48)	2.66 (2.22-3.41)	3.20 (2.57-4.11)	3.80 (2.93-5.00)	4.48 (3.29-6.05)	5.49 (3.85-7.61)	6.34 (4.28-8.79)
6-hr	1.38 (1.19-1.63)	1.56 (1.34-1.83)	1.93 (1.66-2.28)	2.33 (1.99-2.76)	3.00 (2.53-3.84)	3.63 (2.94-4.65)	4.34 (3.37-5.69)	5.14 (3.81-6.92)	6.35 (4.49-8.76)	7.37 (5.01-10.2)
12-hr	1.52 (1.32-1.77)	1.74 (1.51-2.04)	2.19 (1.90-2.57)	2.65 (2.28-3.12)	3.39 (2.86-4.27)	4.06 (3.31-5.15)	4.81 (3.76-6.24)	5.66 (4.21-7.54)	6.90 (4.91-9.43)	7.94 (5.44-10.9)
24-hr	1.68 (1.47-1.95)	1.96 (1.71-2.27)	2.48 (2.16-2.89)	2.99 (2.59-3.50)	3.79 (3.21-4.70)	4.48 (3.67-5.62)	5.25 (4.13-6.74)	6.10 (4.57-8.05)	7.34 (5.25-9.94)	8.36 (5.76-11.4)
2-day	1.91 (1.69-2.20)	2.23 (1.97-2.57)	2.81 (2.48-3.26)	3.36 (2.94-3.90)	4.20 (3.57-5.15)	4.92 (4.06-6.10)	5.70 (4.51-7.24)	6.56 (4.94-8.56)	7.79 (5.60-10.4)	8.79 (6.11-11.9)
3-day	2.08 (1.85-2.39)	2.43 (2.15-2.79)	3.04 (2.69-3.51)	3.61 (3.17-4.18)	4.48 (3.82-5.45)	5.21 (4.31-6.41)	6.00 (4.76-7.57)	6.86 (5.18-8.90)	8.08 (5.84-10.8)	9.07 (6.33-12.2)
4-day	2.23 (1.99-2.55)	2.59 (2.31-2.97)	3.23 (2.87-3.72)	3.82 (3.37-4.41)	4.70 (4.02-5.70)	5.45 (4.52-6.68)	6.24 (4.97-7.85)	7.10 (5.39-9.19)	8.33 (6.03-11.1)	9.31 (6.52-12.5)
7-day	2.58 (2.32-2.94)	2.99 (2.68-3.41)	3.70 (3.31-4.23)	4.34 (3.86-4.98)	5.28 (4.54-6.34)	6.06 (5.05-7.36)	6.88 (5.51-8.58)	7.76 (5.91-9.95)	8.99 (6.55-11.9)	9.98 (7.03-13.3)
10-day	2.90 (2.61-3.28)	3.34 (3.02-3.80)	4.12 (3.70-4.69)	4.80 (4.28-5.49)	5.79 (4.99-6.91)	6.60 (5.52-7.98)	7.45 (5.98-9.24)	8.35 (6.39-10.7)	9.60 (7.02-12.6)	10.6 (7.49-14.1)
20-day	3.80 (3.46-4.29)	4.37 (3.98-4.93)	5.32 (4.82-6.02)	6.13 (5.52-6.97)	7.28 (6.30-8.57)	8.19 (6.89-9.78)	9.12 (7.37-11.2)	10.1 (7.76-12.7)	11.4 (8.38-14.8)	12.4 (8.85-16.4)
30-day	4.57 (4.18-5.13)	5.24 (4.79-5.89)	6.36 (5.79-7.16)	7.28 (6.59-8.24)	8.56 (7.44-10.0)	9.56 (8.08-11.3)	10.6 (8.56-12.9)	11.6 (8.94-14.5)	12.9 (9.54-16.7)	14.0 (9.99-18.4)
45-day	5.54 (5.10-6.19)	6.37 (5.85-7.13)	7.70 (7.05-8.64)	8.79 (7.99-9.91)	10.3 (8.92-11.9)	11.4 (9.63-13.4)	12.4 (10.1-15.0)	13.5 (10.5-16.8)	14.9 (11.0-19.1)	15.9 (11.4-20.9)
60-day	6.37 (5.88-7.10)	7.34 (6.77-8.19)	8.88 (8.16-9.94)	10.1 (9.23-11.4)	11.7 (10.2-13.5)	12.9 (11.0-15.2)	14.1 (11.5-16.9)	15.2 (11.8-18.8)	16.6 (12.3-21.2)	17.6 (12.7-23.0)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.
Please refer to NOAA Atlas 14 document for more information.

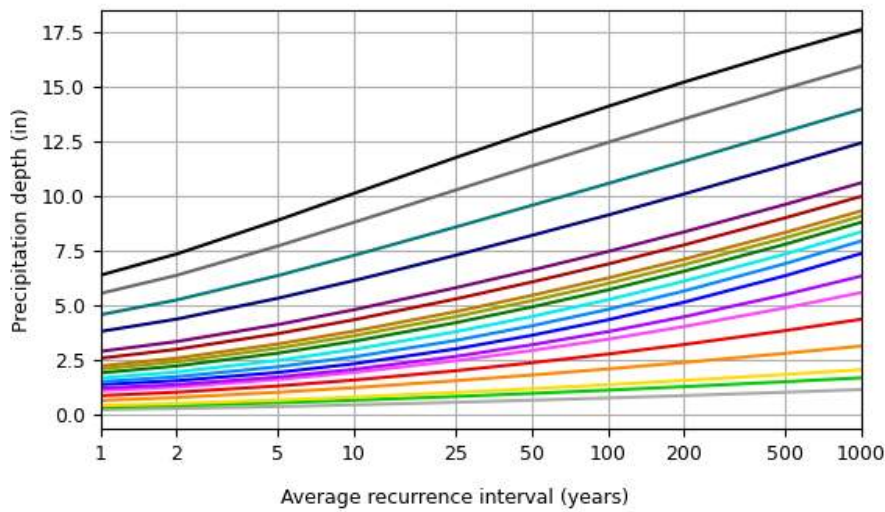
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PF graphical

PDS-based depth-duration-frequency (DDF) curves
 Latitude: 38.8100°, Longitude: -104.6883°



Average recurrence interval (years)
1
2
5
10
25
50
100
200
500
1000



Duration
5-min
10-min
15-min
30-min
60-min
2-hr
3-hr
6-hr
12-hr
24-hr
2-day
3-day
4-day
7-day
10-day
20-day
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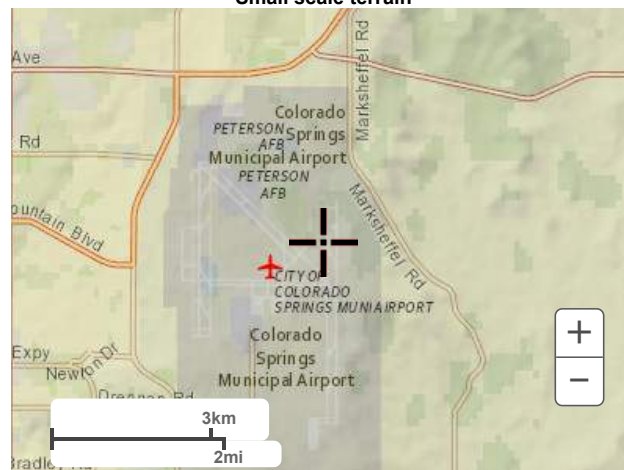
NOAA Atlas 14, Volume 8, Version 2

Created (GMT): Wed May 1 18:42:43 2024

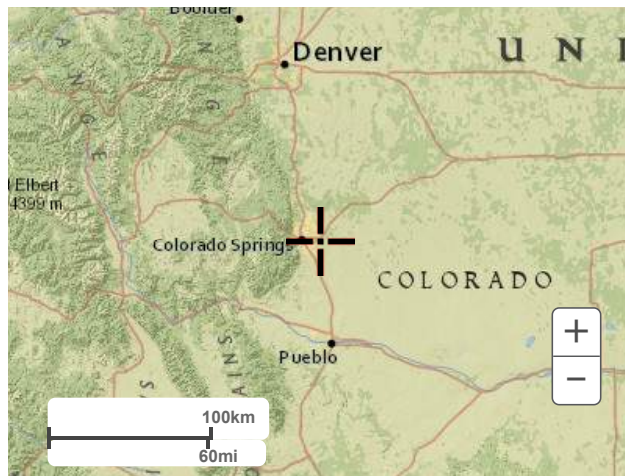
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Maps & aerials

Small scale terrain



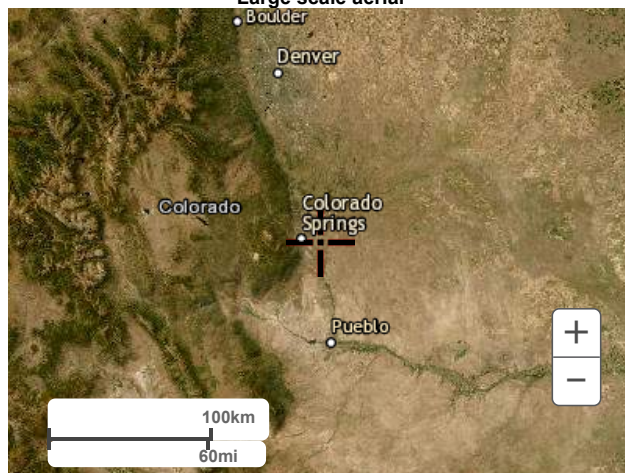
Large scale terrain



Large scale map



Large scale aerial



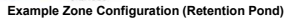
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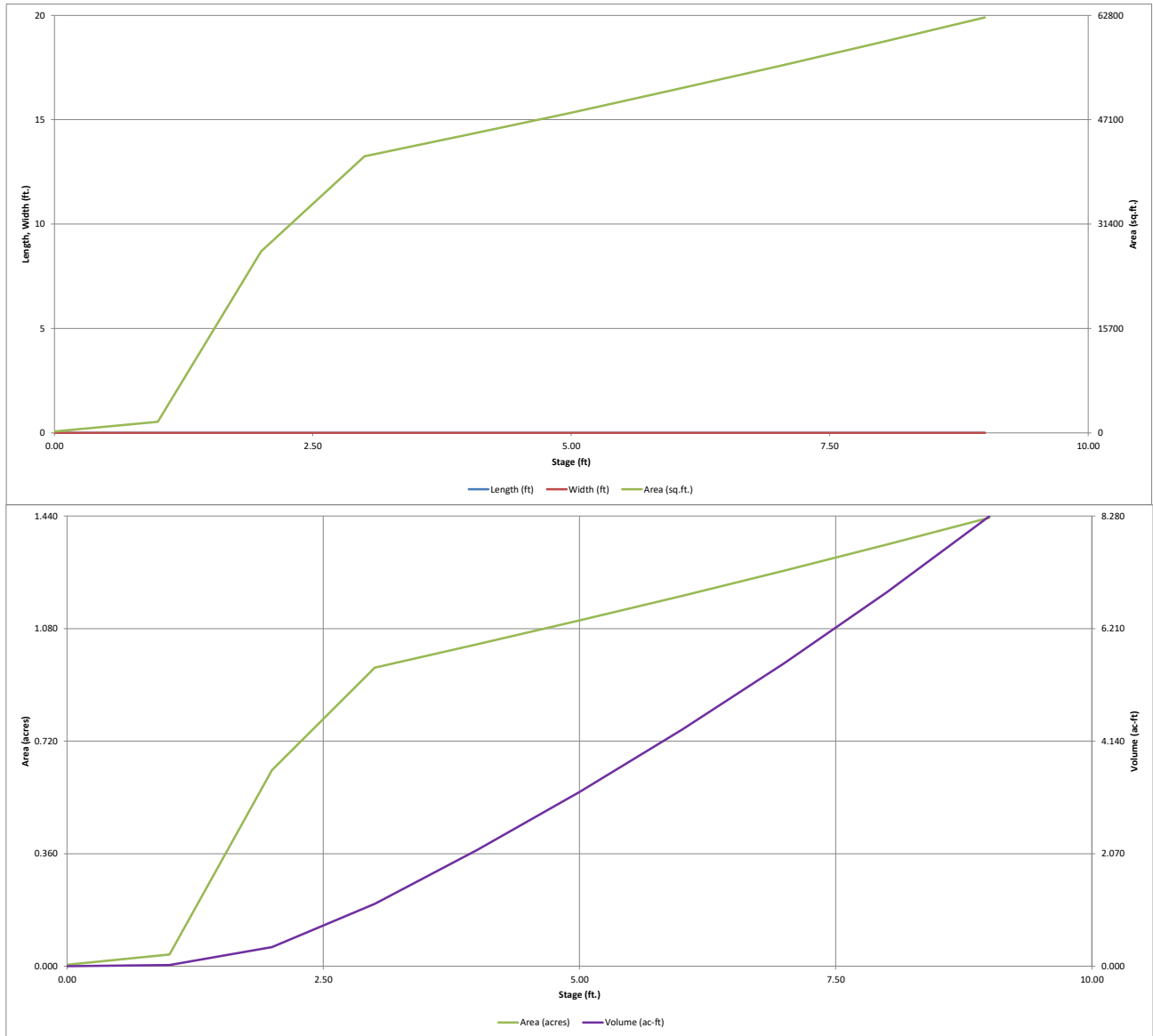
MHFD-Detention, Version 4.08 (April 2026)

Basin ID: POND A



DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.08 (April 2026)

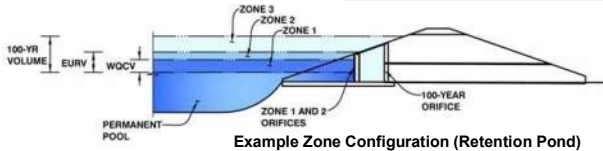


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.08 (April 2026)

Project: **VINEYARDS RESEARCH PARK SUBDIVISION**

Basin ID: **POND A**



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	2.77	0.926	Orifice Plate
Zone 2 (EURV)	4.81	2.063	Orifice Plate
Zone 3 (100-year)	6.65	2.140	Weir&Pipe (Restrict)
Total (all zones)		5.129	

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

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

Calculated Parameters for Underdrain

Underdrain Orifice Area = ft²
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 SCM)

Calculated Parameters for Plate

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

WQ Orifice Area per Row = ft²
Elliptical Half-Width = feet
Elliptical Slot Centroid = feet
Elliptical Slot Area = ft²

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

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	1.60	3.10					
Orifice Area (sq. inches)	4.30	4.30	16.00					

	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)

Calculated Parameters for Vertical Orifice

Invert of Vertical Orifice = ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice = ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter = inches

Vertical Orifice Area = ft²
Vertical Orifice Centroid = feet

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

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected		Zone 3 Weir	Not Selected
Overflow Weir Front Edge Height, H _o	4.85	N/A	ft (relative to basin bottom at Stage = 0 ft)	5.85	N/A
Overflow Weir Front Edge Length	43.00	N/A	feet	4.12	N/A
Overflow Weir Grate Slope	4.00	N/A	H:V	27.26	N/A
Horiz. Length of Weir Sides	4.00	N/A	feet	123.40	N/A
Overflow Grate Type	Type C Grate	N/A		61.70	N/A
Debris Clogging %	50%	N/A	%		

Height of Grate Upper Edge, H_u = feet
Overflow Weir Slope Length = feet
Grate Open Area / 100-yr Orifice Area = ft²
Overflow Grate Open Area w/o Debris = ft²
Overflow Grate Open Area w/ Debris = ft²

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

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Restrictor	Not Selected		Zone 3 Restrictor	Not Selected
Depth to Invert of Outlet Pipe	0.25	N/A	ft (distance below basin bottom at Stage = 0 ft)	4.53	N/A
Outlet Pipe Diameter	36.00	N/A	inches	1.04	N/A
Restrictor Plate Height Above Pipe Invert	22.00		inches	1.79	N/A

Outlet Orifice Area = ft²
Outlet Orifice Centroid = feet
Half-Central Angle of Restrictor Plate on Pipe = radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Calculated Parameters for Spillway

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

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

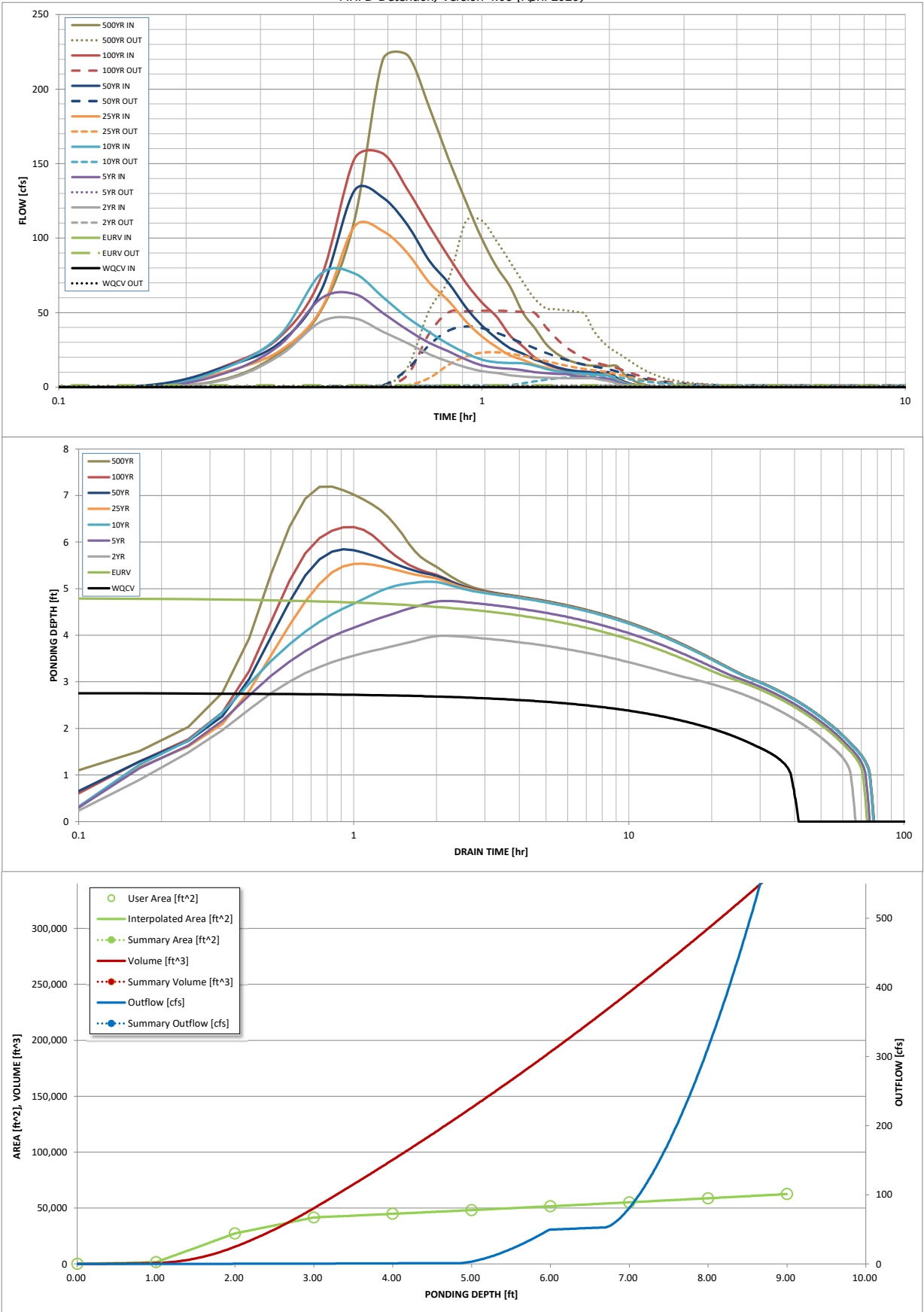
Routed Hydrograph Results

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

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period =	N/A	N/A	1.03	1.32	1.59	2.01	2.38	2.77	3.84
One-Hour Rainfall Depth (in) =	N/A	N/A	1.03	1.32	1.59	2.01	2.38	2.77	3.84
CUHP Runoff Volume (acre-ft) =	0.926	2.989	2.261	3.089	3.886	5.267	6.430	7.717	11.132
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	2.261	3.089	3.886	5.267	6.430	7.717	11.132
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	1.6	9.8	17.3	38.7	52.2	67.8	108.0
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.05	0.27	0.47	1.06	1.43	1.86	2.96
Peak Inflow Q (cfs) =	N/A	N/A	46.2	62.5	76.2	107.9	131.9	156.7	222.9
Peak Outflow Q (cfs) =	0.4	1.3	1.0	1.3	7.6	23.4	40.7	51.3	111.7
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.1	0.4	0.6	0.8	0.8	1.0
Structure Controlling Flow =	Plate	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	0.1	0.2	0.3	0.4	0.4
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	38	66	61	67	68	65	64	62	57
Time to Drain 99% of Inflow Volume (hours) =	40	70	64	72	74	73	72	71	69
Maximum Ponding Depth (ft) =	2.77	4.81	3.99	4.74	5.15	5.53	5.84	6.32	7.19
Area at Maximum Ponding Depth (acres) =	0.88	1.09	1.03	1.09	1.12	1.15	1.17	1.21	1.28
Maximum Volume Stored (acre-ft) =	0.934	2.997	2.117	2.910	3.372	3.803	4.162	4.734	5.818

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.08 (April 2026)



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	1.56	1.18	5.87
	0:15:00	0.00	0.00	5.25	9.81	13.20	10.59	14.02	14.70	23.14
	0:20:00	0.00	0.00	21.31	28.35	34.86	24.41	29.87	33.74	51.31
	0:25:00	0.00	0.00	43.92	59.47	76.12	52.07	64.49	73.48	111.82
	0:30:00	0.00	0.00	46.17	62.54	76.24	107.87	131.93	153.02	219.66
	0:35:00	0.00	0.00	37.22	49.72	60.41	104.79	127.20	156.73	222.93
	0:40:00	0.00	0.00	29.56	38.40	46.69	90.02	108.90	132.70	188.18
	0:45:00	0.00	0.00	22.13	29.79	36.94	70.35	85.04	108.34	153.47
	0:50:00	0.00	0.00	17.16	24.01	28.89	57.97	70.09	87.82	124.55
	0:55:00	0.00	0.00	13.31	18.54	22.80	44.12	53.47	70.04	99.38
	1:00:00	0.00	0.00	10.61	14.60	18.38	33.98	41.25	56.76	80.60
	1:05:00	0.00	0.00	9.46	12.88	16.70	26.79	32.64	47.25	67.43
	1:10:00	0.00	0.00	7.95	12.33	16.21	21.25	26.07	34.53	49.78
	1:15:00	0.00	0.00	7.07	11.24	16.02	18.25	22.51	27.30	39.76
	1:20:00	0.00	0.00	6.59	10.08	14.45	15.05	18.49	19.92	29.02
	1:25:00	0.00	0.00	6.30	9.35	12.25	13.12	16.06	15.56	22.66
	1:30:00	0.00	0.00	6.12	8.93	10.83	11.05	13.48	12.89	18.75
	1:35:00	0.00	0.00	5.99	8.66	9.93	9.74	11.84	11.20	16.29
	1:40:00	0.00	0.00	5.93	7.48	9.38	8.93	10.84	10.26	14.91
	1:45:00	0.00	0.00	5.93	6.73	9.02	8.51	10.31	9.93	14.40
	1:50:00	0.00	0.00	5.93	6.28	8.80	8.26	10.00	9.78	14.16
	1:55:00	0.00	0.00	4.81	6.03	8.38	8.15	9.87	9.78	14.16
	2:00:00	0.00	0.00	4.08	5.57	7.45	8.10	9.80	9.78	14.16
	2:05:00	0.00	0.00	2.50	3.41	4.59	5.03	6.08	6.06	8.77
	2:10:00	0.00	0.00	1.48	2.03	2.75	3.04	3.68	3.66	5.30
	2:15:00	0.00	0.00	0.83	1.17	1.58	1.76	2.13	2.12	3.06
	2:20:00	0.00	0.00	0.43	0.65	0.86	0.99	1.19	1.19	1.72
	2:25:00	0.00	0.00	0.18	0.32	0.40	0.49	0.59	0.59	0.85
	2:30:00	0.00	0.00	0.06	0.10	0.12	0.16	0.19	0.19	0.28
	2:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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	2:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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	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
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	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
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	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

IRREGULAR FOREBAY SECTION VOLUME

PROJ NAME VINEYARDS RESEARCH PARK SUBDIVISION
JOB NO. 2204.70
CALC JHS
DATE 7/7/2026

AREA HEIGHT VOL
873.63 0.5 436.815

TOTAL	0 CUFT	PROVIDED BY FOREBAY
WQCV	0.925542 AC-FT	
WQCV	40316.6 CUFT	
1% WQCV	403.166 CUFT	REQUIRED FOR FOREBAY
436.815	> 403.166	FOREBAY HAS ADEQUATE CAPACITY

Weir Report

Vineyards Research Park Subdivision Forebay Notch

Rectangular Weir

Crest = Sharp
Bottom Length (ft) = 1.10
Total Depth (ft) = 0.50

Highlighted

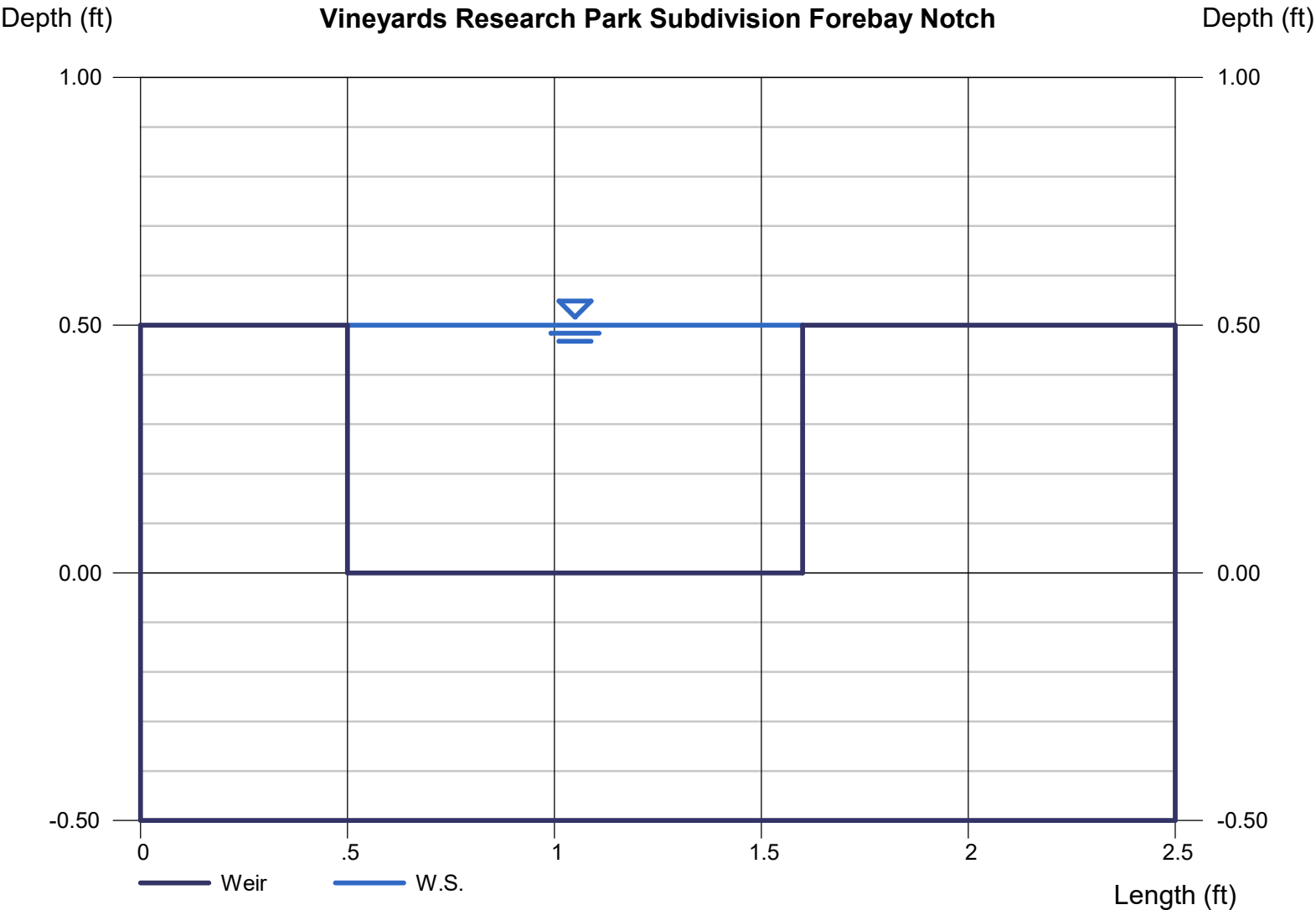
Depth (ft) = 0.50
Q (cfs) = 1.295
Area (sqft) = 0.55
Velocity (ft/s) = 2.35
Top Width (ft) = 1.10

Calculations

Weir Coeff. Cw = 3.33
Compute by: Q vs Depth
No. Increments = 10

Forebay notch required to pass 2% of 100-year inflow
Maximum 100-year inflow: 64.4 cfs
 $64.4 \text{ cfs} \times 2\% = 1.29 \text{ cfs}$
Design shown @ depth = 0.50': Q=1.295 cfs ✓

CALC: JHS
DATE: 7/7/2026



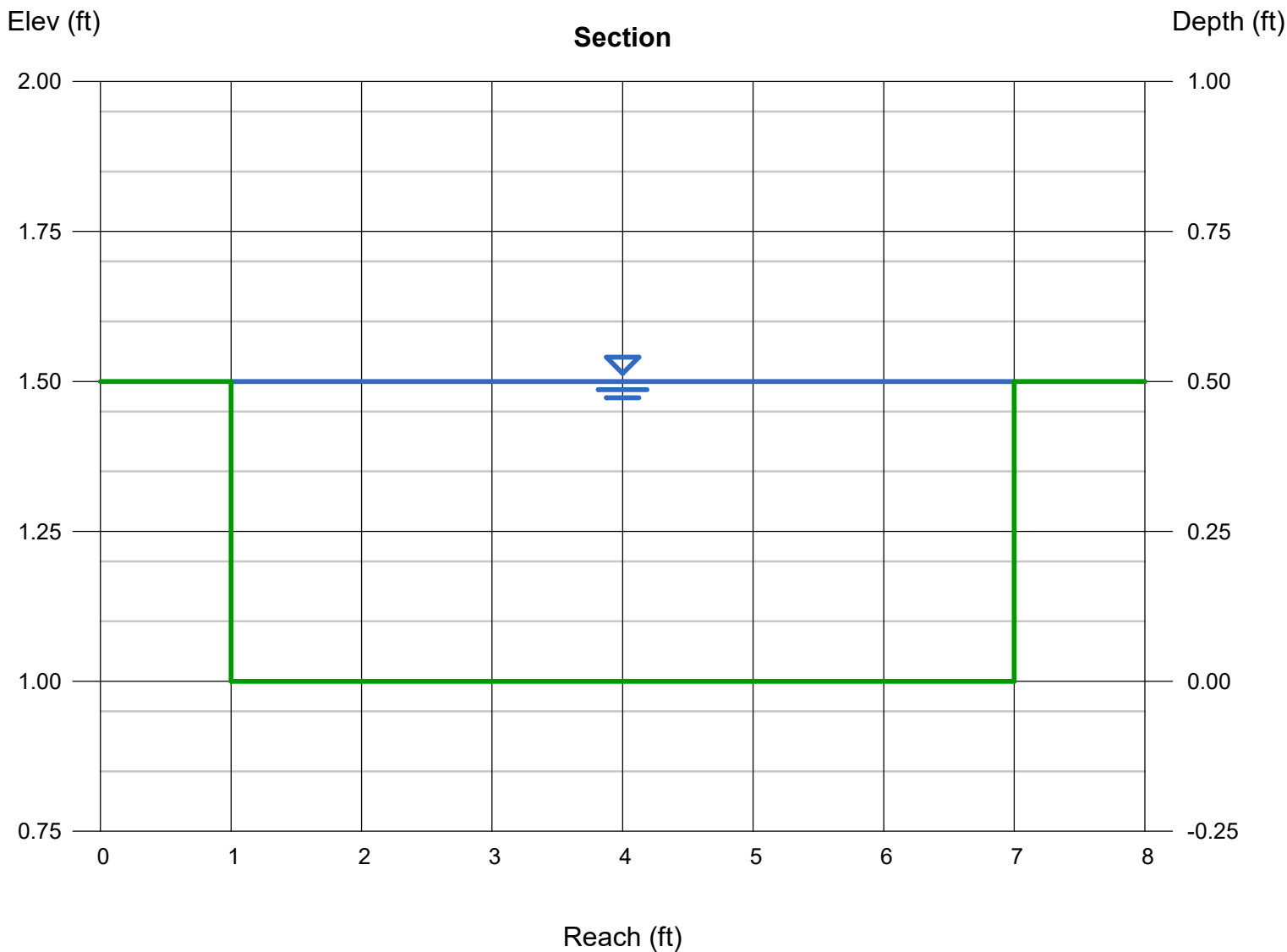
Channel Report

Vineyards Research Park Subdivision Trickle Channel

Rectangular		Highlighted	
Bottom Width (ft)	= 6.00	Depth (ft)	= 0.50
Total Depth (ft)	= 0.50	Q (cfs)	= 13.78
		Area (sqft)	= 3.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 4.59
Slope (%)	= 0.50	Wetted Perim (ft)	= 7.00
N-Value	= 0.013	Crit Depth, Yc (ft)	= 0.50
		Top Width (ft)	= 6.00
		EGL (ft)	= 0.83
Calculations			
Compute by:	Q vs Depth		
No. Increments	= 10		

100-YR PEAK INFLOW: 154.0 cfs
1% * 154.0 cfs = 1.54 cfs
13.78 cfs > 1.54 cfs ✓

CALC: JHS
DATE: 7/7/2026



TITLE: SPILLWAY RIPRAP CALCULATION
 PROJECT: VINEYARDS RESEARCH PARK
 SUBDIVISION
 JOB: 2204.70
 CALC: JHS
 DATE: 07/07/2026

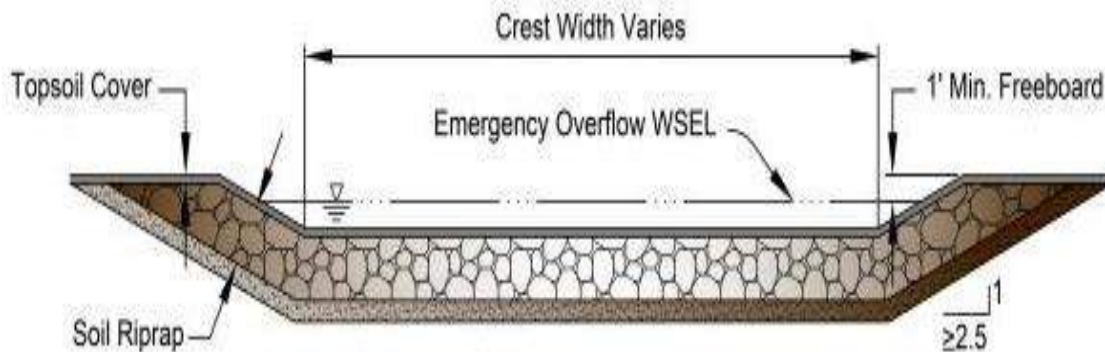
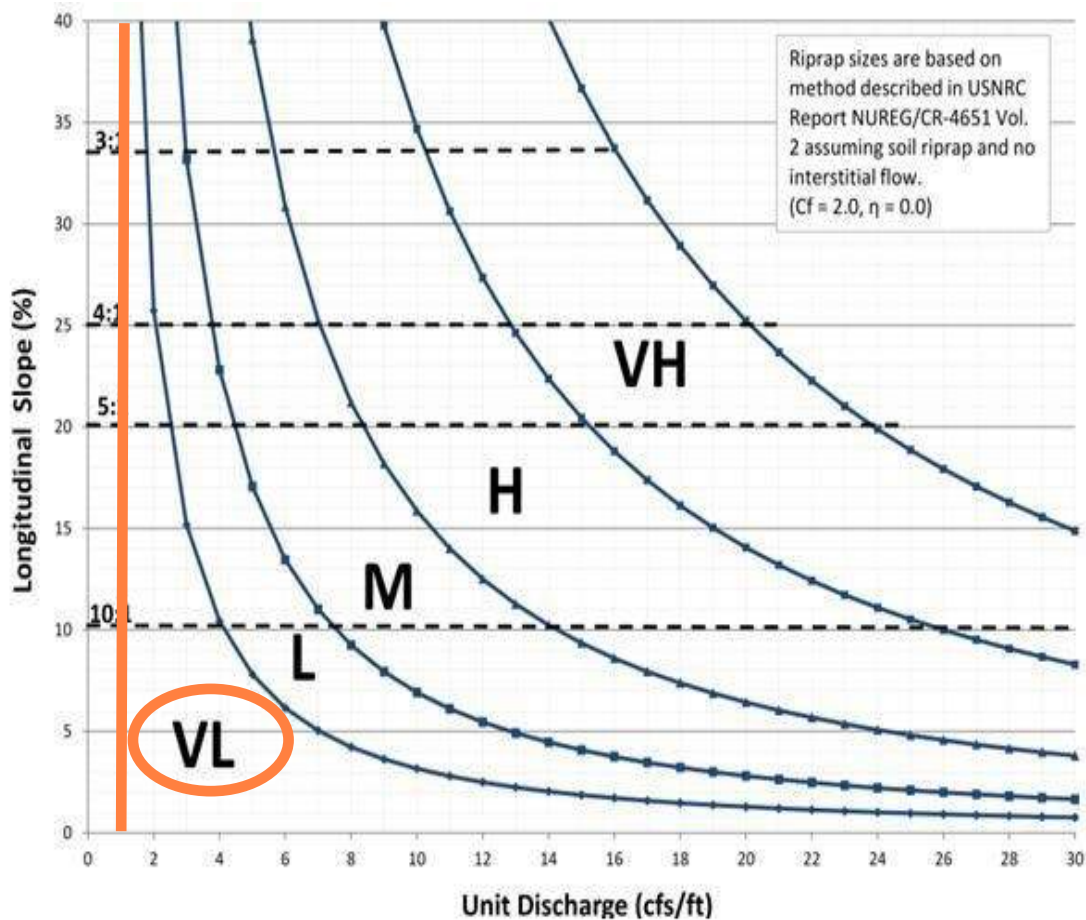


Figure 13-12d. Riprap Types for Emergency Spillway Protection



Q100,OUT = 51.3 cfs
 Spillway length = 53'
 Unit discharge = 0.96 cfs/ft

REFERENCE MATERIAL FROM PRIOR STUDIES



**MASTER DEVELOPMENT DRAINAGE PLAN
FOR
VINEYARDS COMMERCE PARK**

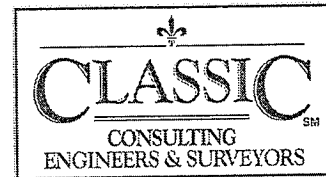
AUGUST 2008

**PREPARED FOR:
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(719) 475-7997**

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CLASSIC CONSULTING ENGINEERS & SURVEYORS, LLC
6385 CORPORATE DRIVE, SUITE 101
COLORADO SPRINGS, CO 80919**

2204.00

17672-16



Design Point 1/A ($Q_5 = 34/22$ cfs, $Q_{100} = 65/46$ cfs) consists of runoff from offsite Basins OS-A. Basin OS-A, a 9.99-acre basin, is composed of light industrial and commercial/office buildings with some minor landscaping and grass. Runoff reaching Design Point 1 will enter the north west corner of the proposed Vineyards via proposed 10' wide x 3.0' deep trapezoidal swale with 4:1 side slopes. A small amount of riprap should be placed at the beginning of the swale to aid in the prevention of erosion. The proposed swale will be constructed within a minimum 30' wide public drainage easement. Runoff upon entering the channel will continue eastward swale to Design Point 2.

Design Point 2/B ($Q_5 = 43/32$ cfs, $Q_{100} = 89/71$ cfs) consists of storm runoff from Design Point 1, Basin OS-B, and Basin A. Basin OS-B is a 3.96-acre site consisting of a storage unit site, a warehouse building, and a small industrial or commercial building. Runoff from these sites reach the on-site proposed swale as sheet flow totaling ($Q_5 = 5$ cfs, $Q_{100} = 14$ cfs). Basin A consists of the rear lot portions of proposed lots 8-11. Runoff from this basin will be intercepted by the proposed swale. It should be noted, if runoff from the individual sites of Basin OS-B and A reach the swale as channelized flow some additional riprap or erosion control blanket maybe at these discharge point to protect the swale embankments. Runoff reaching Design Point 2 is directed under the proposed northern entrance via a proposed public 2'x 7' reinforced concrete box culvert (Pipe 1). The recommendation of a box culvert lies in the relatively low allowable headwater and relatively low amount of cover between the proposed roadway and the invert of the swale. Runoff with the RCB continues eastward to Design Point 4.

Design Point 3 ($Q_5 = 3$ cfs, $Q_{100} = 6$ cfs) consists of storm runoff from Basin B. Basin B is a 0.78-acre basin primarily composed of a section of the northern portion of Road 1. Runoff developed within this basin will be conveyed via curb and gutter to a low point within the street, where flows will be intercepted by a pair of proposed public 4' D-10-R sump inlets. Runoff collected by the proposed sump inlets will be conveyed to the RCBC via two public 18" RCP storm drains (Pipes 2 and 3).

Design Point 4/C ($Q_5 = 45/34$ cfs, $Q_{100} = 93/75$ cfs) was developed to aid in determining the runoff reaching outlet side of the proposed box culvert (a.k.a Pipe 4) as it transitions to a 48" RCP. Runoff continues downstream to Design Point 5.

JOB NAME: VINEYARD COMMERCE PARK
 JOB NUMBER: 2204.00
 DATE: 06/07/07
 CALCULATED BY: DLM

FINAL DRAINAGE REPORT ~ BASIN RUNOFF COEFFICIENT SUMMARY

BASIN	TOTAL AREA (AC)	SUB-AREA 1 - DEVELOPED			SUB-AREA 2 - DEVELOPED			UNDEVELOPED/LANDSCAPED 1			UNDEVELOPED/LANDSCAPED 2			WEIGHTED		WEIGHTED CA	
		AREA (AC)	C(5)	C(100)	AREA (AC)	C(5)	C(100)	AREA (AC)	C(5)	C(100)	AREA (AC)	C(5)	C(100)	C(5)	C(100)	CA(5)	CA(100)
A	4.78	1.95	0.75	0.85	0.45	0.75	0.85	1.93	0.25	0.35	0.45	0.30	0.45	0.51	0.61	2.42	2.92
B	0.78	0.70	0.90	0.95	0.00	0.75	0.85	0.08	0.25	0.35	0.00	0.30	0.45	0.83	0.89	0.65	0.69
C	0.32	0.13	0.75	0.85	0.00	0.75	0.85	0.19	0.25	0.35	0.00	0.30	0.45	0.45	0.55	0.14	0.18
D	5.81	4.10	0.75	0.85	1.13	0.75	0.85	0.46	0.25	0.35	0.13	0.30	0.45	0.70	0.80	4.07	4.66
E	2.15	1.75	0.90	0.95	0.00	0.75	0.85	0.40	0.25	0.35	0.00	0.30	0.45	0.78	0.84	1.68	1.80
F	4.90	4.90	0.75	0.95	0.00	0.90	0.95	0.00	0.25	0.35	0.00	0.30	0.45	0.75	0.95	3.68	4.66
G	4.02	3.16	0.75	0.85	0.25	0.75	0.85	0.36	0.25	0.35	0.25	0.30	0.45	0.68	0.78	2.72	3.14
H	3.55	3.30	0.75	0.85	0.00	0.75	0.85	0.00	0.25	0.35	0.25	0.30	0.45	0.72	0.82	2.55	2.92
I	6.22	2.21	0.75	0.85	3.47	0.75	0.85	0.16	0.25	0.35	0.39	0.30	0.45	0.71	0.81	4.41	5.05
J	7.92	0.68	0.75	0.85	6.48	0.75	0.85	0.06	0.25	0.35	0.70	0.30	0.45	0.71	0.81	5.60	6.42
K	4.30	3.78	0.75	0.85	0.00	0.75	0.85	0.00	0.25	0.35	0.52	0.30	0.45	0.70	0.80	2.99	3.45
L	1.69	1.57	0.75	0.85	0.00	0.75	0.85	0.00	0.25	0.35	0.12	0.30	0.45	0.72	0.82	1.21	1.39
M	3.68	1.48	0.75	0.85	2.09	0.90	0.95	0.00	0.25	0.35	0.11	0.30	0.45	0.82	0.89	3.02	3.29
N	2.94	2.79	0.75	0.85	0.00	0.75	0.85	0.00	0.25	0.35	0.15	0.30	0.45	0.73	0.83	2.14	2.44
O	6.14	5.40	0.75	0.85	0.00	0.75	0.85	0.00	0.25	0.35	0.74	0.30	0.45	0.70	0.80	4.27	4.92
P	1.23	0.63	0.75	0.85	0.60	0.90	0.95	0.00	0.25	0.35	0.00	0.30	0.45	0.82	0.90	1.01	1.11
Q	47.56	0.00	0.75	0.85	0.00	0.75	0.85	47.56	0.25	0.35	0.00	0.30	0.45	0.25	0.35	11.89	16.65
R	0.55	0.00	0.75	0.85	0.00	0.75	0.85	0.55	0.25	0.35	0.00	0.30	0.45	0.25	0.35	0.14	0.19
S	0.48	0.00	0.75	0.85	0.00	0.75	0.85	0.48	0.25	0.35	0.00	0.30	0.45	0.25	0.35	0.12	0.17
T	7.51	0.00	0.75	0.85	0.00	0.75	0.85	7.51	0.25	0.35	0.00	0.30	0.45	0.25	0.35	1.88	2.63
OS-A	9.99	8.08	0.90	0.95	1.16	0.25	0.35	0.25	0.25	0.35	0.50	0.30	0.45	0.78	0.84	7.77	8.39
OS-A1	7.47	RESTRICTED FLOW RATE)															
OS-A2	2.52	2.27	0.90	0.95	0.00	0.25	0.35	0.00	0.25	0.35	0.25	0.30	0.45	0.84	0.90	2.12	2.27
OS-B	3.96	1.70	0.30	0.60	1.16	0.25	0.35	0.85	0.25	0.35	0.25	0.30	0.45	0.27	0.46	1.09	1.84
OS-C	0.69	0.00	0.90	0.95	0.00	0.25	0.35	0.00	0.25	0.35	0.69	0.30	0.45	0.30	0.45	0.21	0.31
OS-D	3.29	3.29	0.30	0.60	0.00	0.35	0.45	0.00	0.35	0.45	0.00	0.30	0.45	0.30	0.60	0.99	1.97
OS-E	3.10	3.10	0.30	0.60	0.00	0.35	0.45	0.00	0.35	0.45	0.00	0.30	0.45	0.30	0.60	0.93	1.86
OS-F	3.27	3.27	0.30	0.60	0.00	0.35	0.45	0.00	0.35	0.45	0.00	0.30	0.45	0.30	0.60	0.98	1.96
EX-1	7.98	0.00	0.30	0.60	0.00	0.35	0.45	0.00	0.35	0.45	7.98	0.30	0.45	0.30	0.45	2.39	3.59
EX-2	86.60	0.00	0.30	0.60	0.00	0.35	0.45	0.00	0.35	0.45	86.60	0.30	0.45	0.30	0.45	25.98	38.97
EX-3	6.16	0.00	0.30	0.60	0.00	0.35	0.45	0.00	0.35	0.45	6.16	0.30	0.45	0.30	0.45	1.85	2.77
EX-4	7.78	0.00	0.30	0.60	0.00	0.35	0.45	7.78	0.25	0.35	0.00	0.30	0.45	0.25	0.35	1.95	2.72

JOB NAME: VINEYARD COMMERCE PARK
 JOB NUMBER: 2204.00
 DATE: 06/07/07
 CALC'D BY: DLM

FINAL DRAINAGE REPORT ~ BASIN RUNOFF SUMMARY

BASIN	WEIGHTED		OVERLAND				STREET / CHANNEL FLOW				Tc	INTENSITY		TOTAL FLOWS	
	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)
O	4.27	4.92	0.9	60	1.2	2.3	650	1.5%	4.3	2.5	5.0	5.10	9.07	22	45
P	1.01	1.11	0.9	60	1.2	2.3	0	2.0%	4.9	0.0	5.0	5.10	9.07	5	10
Q	11.89	16.65	0.25	200	2.5	20.9	1900	2.0%	4.9	6.4	27.3	2.56	4.54	30	76
R	0.14	0.19	0.3	50	1	8.4	400	0.9%	3.3	2.0	10.4	4.04	7.18	1	1
S	0.12	0.17	0.3	50	1	8.4	350	0.9%	3.3	1.8	10.2	4.08	7.25	0	1
T	1.88	2.63	0.25	100	1	15.9	0	0.9%	3.3	0.0	15.9	3.37	5.99	6	16
OS-A	7.77	8.39	0.9	75	1.1	2.9	1200	1.0%	3.5	5.7	8.6	4.34	7.72	34	65
OS-A1	3.31	4.14	TC TAKEN FROM HARRISON PARK FILING NO 17 FDR								9.8	4.13	7.35	13.7	30.4
OS-A2	2.12	2.27	0.9	50	1	2.1	350	1.6%	4.4	1.3	5.0	5.10	9.07	11	21
OS-B	1.09	1.84	0.6	60	1	6.1	875	1.6%	4.4	3.3	9.4	4.20	7.46	5	14
OS-C	0.21	0.31	0.3	100	2	11.9	75	1.0%	3.5	0.4	12.3	3.78	6.72	1	2
OS-D	0.99	1.97	0.3	100	1.5	13.1	550	1.5%	4.3	2.1	15.2	3.44	6.11	3	12
OS-E	0.93	1.86	0.3	100	1.5	13.1	450	1.5%	4.3	1.7	14.8	3.48	6.19	3	12
OS-F	0.98	1.96	0.3	100	1.5	13.1	1185	1.0%	3.5	5.6	18.7	3.12	5.54	3	11
EX-1	2.39	3.59	0.25	150	3	15.5	1800	1.1%	3.7	8.2	23.7	2.76	4.91	7	18
EX-2	25.98	38.97	0.25	200	4	17.9	3100	1.5%	4.3	12.1	29.9	2.43	4.31	63	168
EX-3	1.85	2.77	0.25	150	5.5	12.7	900	2.0%	4.9	3.0	15.7	3.39	6.03	6	17
EX-4	1.95	2.72	0.25	100	1	15.9	0	5.3%	8.0	0.0	15.9	3.37	5.99	6.6	16.3

JOB NAME: VINEYARD COMMERCE PARK
 JOB NUMBER: 2204.00
 DATE: 06/07/07
 CALCULATED BY: DLM

FINAL DRAINAGE REPORT ~ SURFACE ROUTING SUMMARY

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 OS-A	7.77	8.39	8.6	4.34	7.72	34	65	
A*	BASIN OS-A1, BASIN OS-A2	5.43	6.41	10.6	4.01	7.13	22	46	
2	DP-1, BASIN A & OS-B	11.28	13.15	12.1	3.80	6.76	43	89	2X7RCBC
B*	DP-A, BASIN A & OS-B	8.93	11.16	14.1	3.56	6.33	32	71	2X7 RCBC
3	BASIN B	0.65	0.69	5.0	5.10	9.07	3	6	(2) 4' SUMP
4	DP-2, DP-3	11.93	13.84	12.2	3.79	6.74	45	93	RCBC to 48" RCP
C*	DP-B, DP-3	9.58	11.86	14.2	3.55	6.31	34	75	RCBC to 48" RCP
5	DP-4, BASIN C, OS-C	12.28	14.33	12.5	3.75	6.67	46	96	2X2 AREA DRAIN
D*	DP-C, BASIN C, OS-C	9.93	12.17	14.5	3.52	6.25	35	76	2X2 AREA DRAIN
6	DP-5, BASIN R & OS-E	13.35	16.38	15.5	3.41	6.06	46	99	TRAP GRASS CHNL
E*	DP-D, BASIN R & OS-E	11.00	14.22	17.5	3.22	5.73	35	81	GRASS CHNL
7	DP-6, BASIN S & OS-F	14.81	18.34	17.0	3.27	5.61	48	106	TRAP GRASS CHNL
F*	DP-E, BASIN S & OS-F	12.10	16.35	19.0	3.09	5.50	37	90	GRASS CHNL
8	BASIN D	4.07	4.66	5.1	5.08	9.03	21	42	36" PIPE
9	BASIN E	1.68	1.80	6.8	4.68	8.32	8	15	(2) 12' AT-GRADE
10	BASIN F & G, FB DP-9	6.74	8.30	8.1	4.43	7.87	30	65	24' SUMP
11	1/3 BASIN H + OS-D	1.84	2.95	20.0	3.01	5.36	6	16	SURFACE
12	2/3 BASIN H	1.70	1.94	5.2	5.04	8.97	9	17	SURFACE

JUNE 2007

