

**FINAL DRAINAGE REPORT FOR  
DRIFTWOOD ESTATES FILING NO. 1  
3275 CENTER ICE VIEW  
COLORADO SPRINGS, COLORADO 80918**

October, 2023

Prepared For:

**Andrew C. Alm**  
2383 Collegiate Drive  
Colorado Springs, Colorado 80918

Prepared By:

**TERRA NOVA ENGINEERING, INC.**  
721 S. 23<sup>rd</sup> Street  
Colorado Springs, CO 80904  
(719) 635-6422

Job No. 2358.00  
PCD Filing No.: XXXXX

Added.

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**TABLE OF CONTENTS**

Engineer’s Statement .....	Page 3
Purpose.....	Page 4
General Description .....	Page 4
Soils Condition.....	Page 4
Drainage Criteria.....	Page 4
Existing Drainage Conditions .....	Page 4
Developed Drainage Conditions .....	Page 5
Floodplain Statement .....	Page 7
Drainage And Bridge Fees.....	Page 8
Maintenance .....	Page 8
Summary .....	Page 8
References.....	Page 8

**APPENDICIES**

- Vicinity Map
- Site Map
- Soils Map
- FEMA Floodplain Map
- Hydrologic Calculations
- Hydraulic Calculations
- Drainage Maps

**DRAINAGE REPORT STATEMENT**

**Design Engineer’s Statement**

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

\_\_\_\_\_

L DUCETT, P.E. 32339

Seal

**OWNER/DEVELOPER’S STATEMENT:**

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

\_\_\_\_\_

Authorized Signature

\_\_\_\_\_

Date

\_\_\_\_\_

Printed Name, Title

\_\_\_\_\_

Business Name

\_\_\_\_\_

Address

El Paso County Approval:

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

\_\_\_\_\_

Joshua Palmer, P.E.

\_\_\_\_\_

Date

County Engineer / ECM Administrator

Conditions:

## **Purpose**

The purpose of this Final Drainage Report is to identify and analyze the existing and proposed drainage patterns, determine proposed runoff quantities, size drainage structures to safely convey the developed runoff, and present solutions to drainage impacts on-site and off-site resulting from this development.

## **General Description**

This Final Drainage Report is an analysis of the development of “DRIFTWOOD ESTATES FILING NO. 1” (AKA “3275 Center Ice View”) owned by Andrew C. Alm. The site is located at 3275 Center Ice View, Colorado Springs, CO 80918 in Section 33, Township 11S, Range 67 West of the 6<sup>th</sup> Principal Meridian in El Paso County. The site is bounded on all sides, except the east, by unplatted lots zoned RR-5. The unplatted lot to the east is zoned A-35. The site is provided with an existing 30’ access easement through two lots west of the site owned by the Forest Lakes Metropolitan District out to the intersection of Plateau Drive and Haystack Road which both have 60’ public ROW’s. The site is currently unplatted. The site is currently zoned RR-5 and does not currently have any significant structures.

Proposed is the subdivision of this unplatted lot into two rural residential lots and the installation of a single family residence. A gravel access drive will be constructed will be constructed within the 30’ access easement extending from the intersection of Plateau Drive and Hay Creek Road to provide access to both lots in the subdivision. The access is extended through Lot 1 to provide access specifically to Lot 2.

The site lies within the upstream end of the Beaver Creek Drainage Basin, which is tributary to the Monument Creek.

## **Soils Condition**

The soil for this project is composed of about 75% Jarre-Tecolote complex (Type 38) and about 25% Perrypark gravelly sandy loam (Type 65) per the “Soils Survey of El Paso County Area, which are both in Hydrologic Soil Group B with moderately rapid permeability, slow to medium surface runoff characteristics, moderate hazard of erosion, and 3 to 65 percent slopes.

## **Drainage Criteria**

Hydrologic and Hydraulic calculations were performed using the El Paso County Storm Drainage Design Criteria Manual Volumes 1 & 2, latest editions. The Rational Method and the Soil Conservation Service Hydrograph Method were used to estimate storm water runoff.

## **Existing (Historic) Drainage Conditions**

This specific site has not been previously studied in an approved drainage report. A drainage map for the existing conditions is included in the Appendix of this report. The site lies within the Beaver Creek Drainage Basin. The existing topography varies from gently rolling to steeply

sloped with average grades ranging from 3 to 65 percent. The site is currently undeveloped and has vegetative cover of approximately 70%.

The existing drainage basins lying in and around the proposed development are depicted in the Appendix. The site is impacted by off-site drainage basins to the west and southwest which generally drain in an easterly direction towards and across the site. Five existing sub-basins have been delineated within the site.

Basin EOS-1 contributes to DP X6 and has an area of 5.66 acres consisting of gently sloped undeveloped land directly west of the site. Runoff calculations for this basin were performed using the Rational Method. The basin was calculated to generate runoff amounts of Q5= 0.87 cfs and Q100= 5.82 cfs.

Basin EOS-2 contributes to DP X7 and has a small area of 0.32 acres consisting of undeveloped land directly west of the site. Runoff calculations for this basin were performed using the Rational Method. The basin was calculated to generate runoff amounts of Q5= 0.09 cfs and Q100= 0.57 cfs.

Basin EOS-3 contributes to DP X8 and has an area of 11.18 acres consisting of undeveloped land draining onto the central portion of the site. Runoff calculations for this basin were performed using the Rational Method. The basin was calculated to generate runoff amounts of Q5= 1.75 cfs and Q100= 11.71 cfs.

Basin EOS-4 contributes to DP X9 and has a large area of 103.28 acres consisting of undeveloped land draining onto the southwest portion of the site. Runoff calculations for this basin were performed using the Soil Conservation Service Hydrograph Method due to the size of the basin. The basin was calculated to generate runoff amounts of Q5= 5.71 cfs and Q100= 39.22 cfs.

Basin EX-A contributes to DP X1 and has an area of 2.13 acres consisting of undeveloped land steeply draining to the north of the parcel. Runoff calculations for this basin were performed using the Rational Method. The basin was calculated to generate runoff amounts of Q5= 0.89 cfs and Q100= 5.95 cfs.

Basin EX-B contributes to DP X2 and encompasses the majority of the flat portions of the site. It has an area of 3.61 acres consisting of undeveloped land. This basin becomes channelized and steepens at the outfall of the basin east of the site. Runoff calculations for this basin were performed using the Rational Method. The basin was calculated to generate runoff amounts of Q5= 0.88 cfs and Q100= 5.93 cfs.

Basin EX-C contributes to DP X3 has an area of 1.08 acres consisting of mostly undeveloped land very similar to Basin EX-B. This basin also channelizes and steepens near its outfall which is slightly south of DP X2. Runoff calculations for this basin were performed using the Rational Method. The basin was calculated to generate runoff amounts of Q5= 0.30 cfs and Q100= 2.03 cfs.

Basin EX-D contributes to DP X4 has an area of 4.80 acres consisting of mostly undeveloped land very similar to Basin EX-B. This basin also channelizes and steepens near its outfall which is slightly south of DP X2. Runoff calculations for this basin were performed using the Rational Method. The basin was calculated to generate runoff amounts of Q5= 1.46 cfs and Q100= 9.79 cfs.

Basin EX-E contributes to DP X5 has an area of 1.10 acres consisting of a steep undeveloped area that mostly sheet flows to the southeast portion of the parcel. Runoff calculations for this basin were performed using the Rational Method. The basin was calculated to generate runoff amounts of  $Q_5 = 0.37$  cfs and  $Q_{100} = 2.46$  cfs.

Off-site flows from Basin EOS-1 combine with on-site drainage from Basin EX-B for combined flows calculated to be 1.75 cfs for the 5-year storm event and 11.75 cfs for the 100-year storm event at DP X2. Off-site flows from Basin EOS-2 combine with on-site drainage from Basin EX-C for combined flows calculated to be 0.39 cfs for the 5-year storm event and 2.60 cfs for the 100-year storm event at DP X3. Off-site flows from Basins EOS-3 and EOS-4 combine with on-site drainage from Basin EX-D for combined flows calculated to be 8.92 cfs for the 5-year storm event and 60.72 cfs for the 100-year storm event at DP X4.

### **Developed Drainage Conditions**

A drainage map for the proposed condition is included in the appendix of this report. The offsite basins remain the same.

In the developed conditions, Basin A, formerly Basin EX-A, has become very slightly smaller but still outfalls to the north of the site at DP 1. This basin will remain undeveloped and flows are projected to be  $Q_5 = 0.88$  cfs and  $Q_{100} = 5.91$  cfs.

Basin B, formerly Basin EX-B, has become very slightly larger but still outfalls to the east of the site at DP 2. This basin will also add a single family residence and gravel drive which will increase the runoff coefficients used to calculate drainage. The proposed grading is approximated on the proposed drainage map. The flows are now projected to be  $Q_5 = 1.47$  cfs and  $Q_{100} = 6.79$  cfs.

Basin C, Basin D, and Basin E will remain the same.

The combined flow at Design Points 3 and 4 will not change. The combined flow at Design Point 2 is now calculated to be  $Q_5 = 2.34$  cfs and  $Q_{100} = 12.61$  cfs.

### **Comparison of Developed to Historic Discharges**

Based on the hydrologic calculations in the appendix, the total developed flow from the site will not change significantly from the existing conditions. Design Points 3 through 9 will not change at all. At Design Point 1, where drainage exits onto open space to the north, flows will decrease from 0.89 cfs to 0.88 cfs in the 5-year storm and from 5.95 cfs to 5.91 cfs in the 100-year storm. At Design Point 2, where drainage exits onto unplatted land east of the site, flows will increase from 1.75 cfs to 2.34 cfs in the 5-year storm and from 11.75 cfs to 12.61 cfs in the 100-year storm. This is only an increase of 7.3% in the 100-year flow in the developed conditions. The proposed development will have a negligible downstream drainage impact. **Clarified.**

The proposed imperviousness will remain well under 10% and the area of disturbance will be under 1 acre so an ESQCP, SWMP and GEC plan will not be required.

The 10% imperviousness needs to include the driveway imperviousness as well - please clarify this.

### **Floodplain Statement**

According to FEMA's FIRM No. 08041CO267G (eff. 12/7/2018), the proposed development is within an area designated as Zone X, having minimal flood hazard.

## Drainage And Bridge Fees

This currently unplatted site is in the Beaver Creek Drainage Basin. The site is 12.72 acres. Appendix L of the Drainage Criteria Manual 1 Addendum states that for single-family 5-acre lots, an impervious percentage of 7% can be used. The combined Drainage Fees (2023) are due prior to final plat recordation.

Fee Type	% Imp.	Parcel Area (acre)	Imp. Area (acre)	Fee per Imp Acre	Mod %	Fee Cost
Drainage	7	12.72	0.89	\$13,797	75*	\$9,335.18
Bridge	7	12.72	0.89	\$0	100	\$0
				<b>Total</b>		\$9,335.18

\*25% reduction for low density lots per ECM Appendix L Section 3.10.2a

## Summary

This Final Drainage Report analyzed the development of Driftwood Estates Filing No. 1 owned by Andrew C. Alm, located at 3275 Center Ice View, Colorado Springs, CO 80918. Runoff from the development will not adversely affect the surrounding or downstream developments. Proposed flows, as detailed in this report, will follow existing drainage patterns and will not significantly increase. No public storm drainage modifications or design changes are necessary as a result of the development.

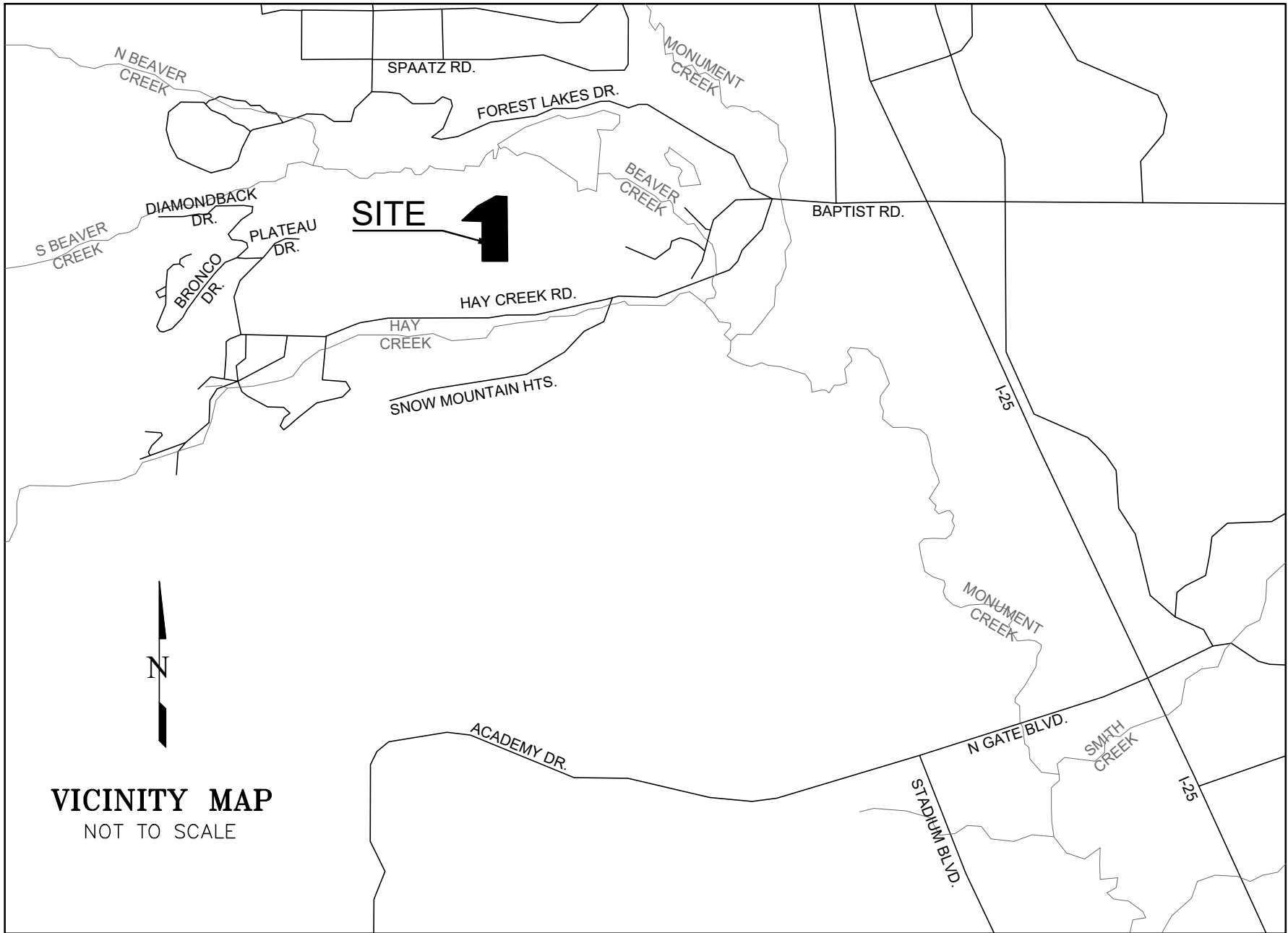
## References

- 1) *City of Colorado Springs/County of El Paso Drainage Criteria Manual, dated May 2014.*
- 2) *Soil survey of El Paso County Area, Colorado, Prepared by United States Department of Agriculture Soil Conservation Service, dated June 1981.*
- 3) *Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map Number 08041CO267G.*
- 4) *Mile High Flood District DCM*

## **APPENDICES**



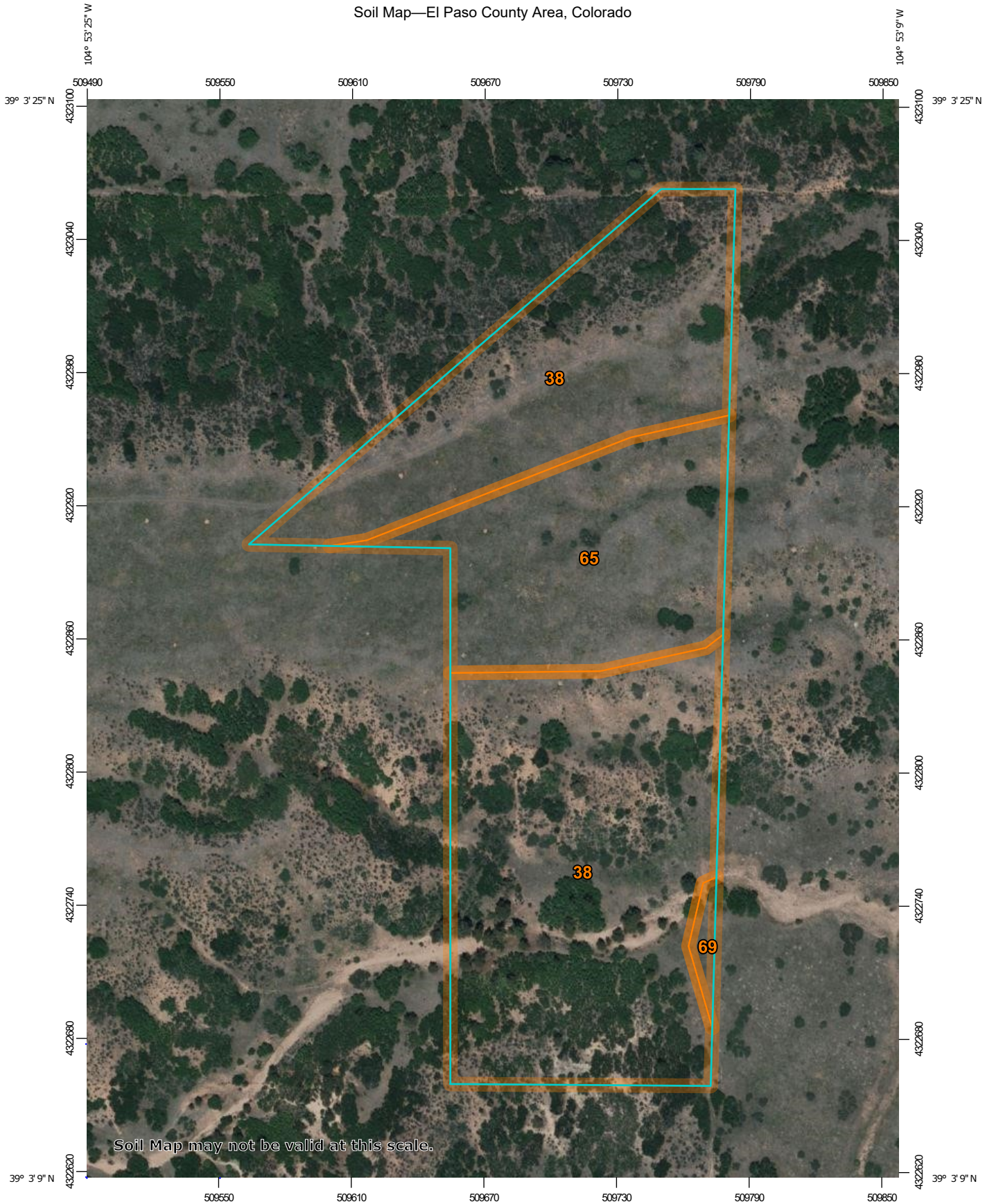
## **VICINITY MAP**



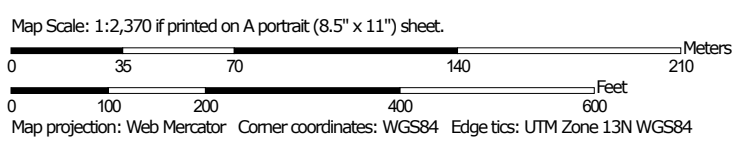
VICINITY MAP  
NOT TO SCALE

## **SOILS MAP**

Soil Map—El Paso County Area, Colorado




Soil Map may not be valid at this scale.



## 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 21, Aug 24, 2023

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

Date(s) aerial images were photographed: Jun 9, 2021—Jun 12, 2021

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
38	Jarre-Tecolote complex, 8 to 65 percent slopes	9.2	74.6%
65	Perrypark gravelly sandy loam, 3 to 9 percent slopes	3.0	24.5%
69	Peyton-Pring complex, 8 to 15 percent slopes	0.1	1.0%
<b>Totals for Area of Interest</b>		<b>12.3</b>	<b>100.0%</b>

## El Paso County Area, Colorado

### 38—Jarre-Tecolote complex, 8 to 65 percent slopes

#### Map Unit Setting

*National map unit symbol:* 368c  
*Elevation:* 6,700 to 7,500 feet  
*Frost-free period:* 90 to 125 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Jarre and similar soils:* 40 percent  
*Tecolote and similar soils:* 30 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Jarre

##### Setting

*Landform:* Alluvial fans  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Alluvium

##### Typical profile

*A - 0 to 5 inches:* gravelly sandy loam  
*Bt - 5 to 22 inches:* gravelly sandy clay loam  
*2C - 22 to 60 inches:* very gravelly sandy loam

##### Properties and qualities

*Slope:* 8 to 30 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):* Moderately high (0.20 to 0.60 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Low (about 5.3 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6e  
*Hydrologic Soil Group:* B  
*Ecological site:* R048AY222CO - Loamy Park  
*Hydric soil rating:* No

#### Description of Tecolote

##### Setting

*Landform:* Alluvial fans  
*Down-slope shape:* Linear

*Across-slope shape:* Linear  
*Parent material:* Alluvium

**Typical profile**

*A - 0 to 3 inches:* very stony loam  
*E - 3 to 12 inches:* very gravelly loamy sand  
*Bt - 12 to 45 inches:* extremely gravelly sandy clay loam  
*C - 45 to 60 inches:* extremely gravelly loamy sand

**Properties and qualities**

*Slope:* 8 to 65 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Well drained  
*Runoff class:* High  
*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  
*Available water supply, 0 to 60 inches:* Very low (about 2.7 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7e  
*Hydrologic Soil Group:* B  
*Ecological site:* R048AY255CO - Pine Grasslands  
*Hydric soil rating:* No

**Minor Components**

**Other soils**

*Percent of map unit:*  
*Hydric soil rating:* No

**Data Source Information**

Soil Survey Area: El Paso County Area, Colorado  
Survey Area Data: Version 21, Aug 24, 2023



## El Paso County Area, Colorado

### 65—Perrypark gravelly sandy loam, 3 to 9 percent slopes

#### Map Unit Setting

*National map unit symbol:* 369b

*Elevation:* 7,000 to 7,500 feet

*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Perrypark and similar soils:* 85 percent

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

#### Description of Perrypark

##### Setting

*Landform:* Hills, alluvial fans

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Arkosic alluvium derived from sedimentary rock and/or arkosic alluvium derived from granite

##### Typical profile

*A - 0 to 4 inches:* gravelly sandy loam

*Bt - 4 to 48 inches:* sandy clay loam

*C - 48 to 60 inches:* gravelly sandy loam

##### Properties and qualities

*Slope:* 3 to 9 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):* Moderately high (0.20 to 0.60 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Moderate (about 8.0 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 4e

*Hydrologic Soil Group:* B

*Ecological site:* R048AY222CO - Loamy Park

*Hydric soil rating:* No

#### Minor Components

##### Other soils

*Percent of map unit:*

*Hydric soil rating:* No

## **Data Source Information**

Soil Survey Area: El Paso County Area, Colorado

Survey Area Data: Version 21, Aug 24, 2023

## El Paso County Area, Colorado

### 69—Peyton-Pring complex, 8 to 15 percent slopes

#### Map Unit Setting

*National map unit symbol:* 369g

*Elevation:* 6,800 to 7,600 feet

*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Peyton and similar soils:* 40 percent

*Pring and similar soils:* 30 percent

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

#### Description of Peyton

##### Setting

*Landform:* Hills

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Arkosic alluvium derived from sedimentary rock and/or arkosic residuum weathered from sedimentary rock

##### Typical profile

*A - 0 to 12 inches:* sandy loam

*Bt - 12 to 25 inches:* sandy clay loam

*BC - 25 to 35 inches:* sandy clay loam

*C - 35 to 60 inches:* sandy loam

##### Properties and qualities

*Slope:* 8 to 9 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):* Moderately high (0.20 to 0.60 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Moderate (about 7.3 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 4e

*Hydrologic Soil Group:* B

*Ecological site:* R049XY216CO - Sandy Divide

*Hydric soil rating:* No

## Description of Pring

### Setting

*Landform:* Hills

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Arkosic alluvium derived from sedimentary rock

### Typical profile

*A - 0 to 14 inches:* coarse sandy loam

*C - 14 to 60 inches:* gravelly sandy loam

### Properties and qualities

*Slope:* 8 to 15 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):* High  
(2.00 to 6.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Low (about 6.0 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6e

*Hydrologic Soil Group:* B

*Ecological site:* R048AY222CO - Loamy Park

*Hydric soil rating:* No

### Minor Components

#### Other soils

*Percent of map unit:*

*Hydric soil rating:* No

#### Pleasant

*Percent of map unit:*

*Landform:* Depressions

*Hydric soil rating:* Yes

## Data Source Information

Soil Survey Area: El Paso County Area, Colorado

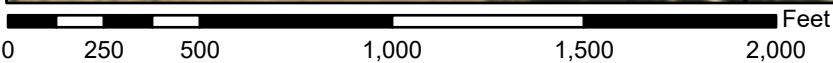
Survey Area Data: Version 21, Aug 24, 2023

**FEMA FLOODPLAIN MAP**

# National Flood Hazard Layer FIRMMette



104°53'33"W 39°3'32"N



1:6,000

104°52'55"W 39°3'4"N

Basemap Imagery Source: USGS National Map 2023

## Legend

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

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation 17.5
MAP PANELS		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped
		The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.



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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **10/13/2023 at 10:24 AM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

## **HYDROLOGIC CALCULATIONS**

## Driftwood Estates Filing No. 1 Area Runoff Coefficient (C) Summary

HSG - B

### EXISTING

		GREENBELT			ROOF			GRAVEL			WEIGHTED *		WEIGHTED CA	
BASIN	TOTAL AREA	AREA	C5	C100	AREA	C5	C100	AREA	C5	C100	C5	C100	CA5	CA100
	(Acres)	(Acres)			(Acres)			(Acres)						
EX-A	2.13	2.13	0.09	0.36	0.00	0.73	0.81	0.00	0.59	0.70	0.09	0.36	0.19	0.77
EX-B	3.61	3.61	0.09	0.36	0.00	0.73	0.81	0.00	0.59	0.70	0.09	0.36	0.32	1.30
EX-C	1.08	1.08	0.09	0.36	0.00	0.73	0.81	0.00	0.59	0.70	0.09	0.36	0.10	0.39
EX-D	4.80	4.80	0.09	0.36	0.00	0.73	0.81	0.00	0.59	0.70	0.09	0.36	0.43	1.73
EX-E	1.10	1.10	0.09	0.36	0.00	0.73	0.81	0.00	0.59	0.70	0.09	0.36	0.10	0.40
EOS-1	5.66	5.66	0.09	0.36	0.00	0.73	0.81	0.00	0.59	0.70	0.09	0.36	0.51	2.04
EOS-2	0.32	0.32	0.09	0.36	0.00	0.73	0.81	0.00	0.59	0.70	0.09	0.36	0.03	0.12
EOS-3	11.18	11.18	0.09	0.36	0.00	0.73	0.81	0.00	0.59	0.70	0.09	0.36	1.01	4.02
EOS-4	103.28	103.28	0.09	0.36	0.00	0.73	0.81	0.00	0.59	0.70	0.09	0.36	9.30	37.18

133.2

### DEVELOPED

		GREENBELT			ROOF			GRAVEL			WEIGHTED*		WEIGHTED CA	
BASIN	TOTAL AREA	AREA	C5	C100	AREA	C5	C100	AREA	C5	C100	C5	C100	CA5	CA100
	(Acres)	(Acres)			(Acres)			(Acres)						
EX-A	2.08	2.08	0.09	0.36	0.00	0.73	0.81	0.00	0.59	0.70	0.09	0.36	0.19	0.75
EX-B	3.66	3.29	0.09	0.36	0.09	0.73	0.81	0.28	0.59	0.70	0.14	0.40	0.53	1.45
EX-C	1.08	1.08	0.09	0.36	0.00	0.73	0.81	0.00	0.59	0.70	0.09	0.36	0.10	0.39
EX-D	4.80	4.80	0.09	0.36	0.00	0.73	0.81	0.00	0.59	0.70	0.09	0.36	0.43	1.73
EX-E	1.10	1.10	0.09	0.36	0.00	0.73	0.81	0.00	0.59	0.70	0.09	0.36	0.10	0.40
EOS-1	5.66	5.66	0.09	0.36	0.00	0.73	0.81	0.00	0.59	0.70	0.09	0.36	0.51	2.04
EOS-2	0.32	0.32	0.09	0.36	0.00	0.73	0.81	0.00	0.59	0.70	0.09	0.36	0.03	0.12
EOS-3	11.18	11.18	0.09	0.36	0.00	0.73	0.81	0.00	0.59	0.70	0.09	0.36	1.01	4.02
EOS-4	103.28	103.28	0.09	0.36	0.00	0.73	0.81	0.00	0.59	0.70	0.09	0.36	9.30	37.18

133.2

Date: \_\_\_\_\_ Checked by: \_\_\_\_\_



## Driftwood Estates Filing No. 1 Runoff Summary EXISTING

BASIN	AREA TOTAL (Acres)	WEIGHTED		OVERLAND				SHALLOW CONCENTRATED FLOW				T <sub>c</sub>	INTENSITY		TOTAL FLOWS	
		C <sub>5</sub>	C <sub>100</sub>	C <sub>5</sub>	Length (ft)	Slope (ft/ft)	T <sub>t</sub> (min)	Length (ft)	Slope (%)	Velocity (fps)	T <sub>t</sub> (min)	TOTAL (min)	I <sub>5</sub> (in/hr)	I <sub>100</sub> (in/hr)	Q <sub>5</sub> (c.f.s.)	Q <sub>100</sub> (c.f.s.)
		<i>* For Calcs See Runoff Summary</i>														
<b>EX-A</b>	2.13	0.09	0.36	0.09	150	0.347	6.9	55	45.5%	3.4	0.3	7.2	4.6	7.8	0.89	5.95
<b>EX-B</b>	3.61	0.09	0.36	0.09	300	0.040	20.0	410	5.9%	1.2	5.6	25.6	2.7	4.6	0.88	5.93
<b>EX-C</b>	1.08	0.09	0.36	0.09	300	0.050	18.6	115	12.2%	1.7	1.1	19.7	3.1	5.2	0.30	2.03
<b>EX-D</b>	4.80	0.09	0.36	0.09	300	0.210	11.6	415	7.7%	1.4	5.0	16.6	3.4	5.7	1.46	9.79
<b>EX-E</b>	1.10	0.09	0.36	0.09	300	0.160	12.7	80	15.0%	1.9	0.7	13.3	3.7	6.2	0.37	2.46
<b>EOS-1</b>	5.66	0.09	0.36	0.09	300	0.033	21.3	1515	3.0%	0.9	29.2	50.5	1.7	2.9	0.87	5.82
<b>EOS-2</b>	0.32	0.09	0.36	0.09	300	0.033	21.3	25	4.0%	1.0	0.4	21.7	3.0	5.0	0.09	0.57
<b>EOS-3</b>	11.18	0.09	0.36	0.09	300	0.037	20.5	1935	5.0%	1.1	28.8	49.4	1.7	2.9	1.75	11.71
<b>EOS-4</b>	103.28	0.09	0.36	0.09	300	0.060	17.5	5000	3.7%	1.0	86.6	104.1	0.6	1.0	5.71	38.22

## DEVELOPED

BASIN	AREA TOTAL (Acres)	WEIGHTED		OVERLAND				SHALLOW CONCENTRATED FLOW				T <sub>c</sub>	INTENSITY		TOTAL FLOWS	
		C <sub>5</sub>	C <sub>100</sub>	C <sub>5</sub>	Length (ft)	Slope (ft/ft)	T <sub>t</sub> (min)	Length (ft)	Slope (%)	Velocity (fps)	T <sub>t</sub> (min)	TOTAL (min)	I <sub>5</sub> (in/hr)	I <sub>100</sub> (in/hr)	Q <sub>5</sub> (c.f.s.)	Q <sub>100</sub> (c.f.s.)
		<i>* For Calcs See Runoff Summary</i>														
<b>EX-A</b>	2.08	0.09	0.36	0.09	135	0.347	6.6	55	45.5%	3.4	0.3	6.8	4.7	7.9	0.88	5.91
<b>EX-B</b>	3.66	0.14	0.40	0.14	300	0.040	18.9	410	5.9%	1.2	5.6	24.5	2.8	4.7	1.47	6.79
<b>EX-C</b>	1.08	0.09	0.36	0.09	300	0.050	18.6	115	12.2%	1.7	1.1	19.7	3.1	5.2	0.30	2.03
<b>EX-D</b>	4.80	0.09	0.36	0.09	300	0.210	11.6	415	7.7%	1.4	5.0	16.6	3.4	5.7	1.46	9.79
<b>EX-E</b>	1.10	0.09	0.36	0.09	300	0.160	12.7	80	15.0%	1.9	0.7	13.3	3.7	6.2	0.37	2.46
<b>EOS-1</b>	5.66	0.09	0.36	0.09	300	0.033	21.3	1515	3.0%	0.9	29.2	50.5	1.7	2.9	0.87	5.82
<b>EOS-2</b>	0.32	0.09	0.36	0.09	300	0.033	21.3	25	4.0%	1.0	0.4	21.7	3.0	5.0	0.09	0.57
<b>EOS-3</b>	11.18	0.09	0.36	0.09	300	0.037	20.5	1935	5.0%	1.1	28.8	49.4	1.7	2.9	1.75	11.71
<b>EOS-4</b>	103.28	0.09	0.36	0.09	300	0.060	17.5	5000	3.7%	1.0	86.6	104.1	0.6	1.0	5.71	39.22

Note: Due to its size, flow from Basin EOS-4 was determined using the SCS method. See next page.

## Surface Routing

<b>EXISTING CONDITIONS</b>				
<b>Design Point(s)</b>	<b>Contributing Basins</b>	<b>Area (Acres)</b>	<b>Flow</b>	
			<b><math>Q_5</math></b>	<b><math>Q_{100}</math></b>
X1	EX-A	2.13	0.89	5.95
X2	EX-B, EOS-1	9.27	1.75	11.75
X3	EX-C, EOS-2	1.40	0.39	2.60
X4	EX-D, EOS-3, EOS-4	119.26	8.92	60.72
X5	EX-E	1.10	0.37	2.46
X6	EOS-1	5.66	0.87	5.82
X7	EOS-2	0.32	0.09	0.57
X8	EOS-3	11.18	1.75	11.71
X9	EOS-4	103.28	5.71	39.22
<b>PROPOSED CONDITIONS</b>				
<b>Design Point(s)</b>	<b>Contributing Basins</b>	<b>Area (Acres)</b>	<b>Flow</b>	
			<b><math>Q_5</math></b>	<b><math>Q_{100}</math></b>
<b>1</b>	A	2.08	0.88	5.91
<b>2</b>	B, OS-1	9.32	2.34	12.61
<b>3</b>	C, OS-2	1.40	0.39	2.60
<b>4</b>	D, OS-3, OS-4	119.26	8.92	60.72
<b>5</b>	E	1.10	0.37	2.46
<b>6</b>	OS-1	5.66	0.87	5.82
<b>7</b>	OS-2	0.32	0.09	0.57
<b>8</b>	OS-3	11.18	1.75	11.71
<b>9</b>	OS-4	103.28	5.71	39.22

## **EXISTING AND DEVELOPED CONDITIONS**

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Site: Driftwood Estates Filing No. 1

Basin: EOS-4

Basin Area: 103.28 ac

Method: Soil Conservation Service Hydrograph

HSG: B, good condition

CN= 48

Tc= 104.1 min

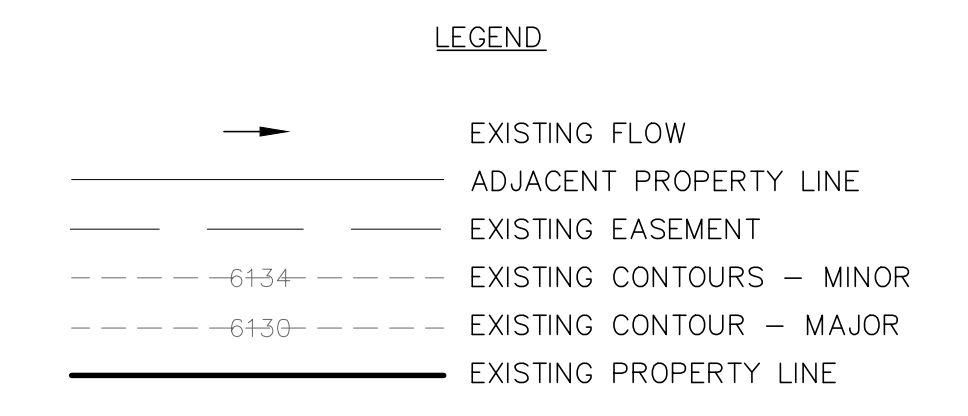
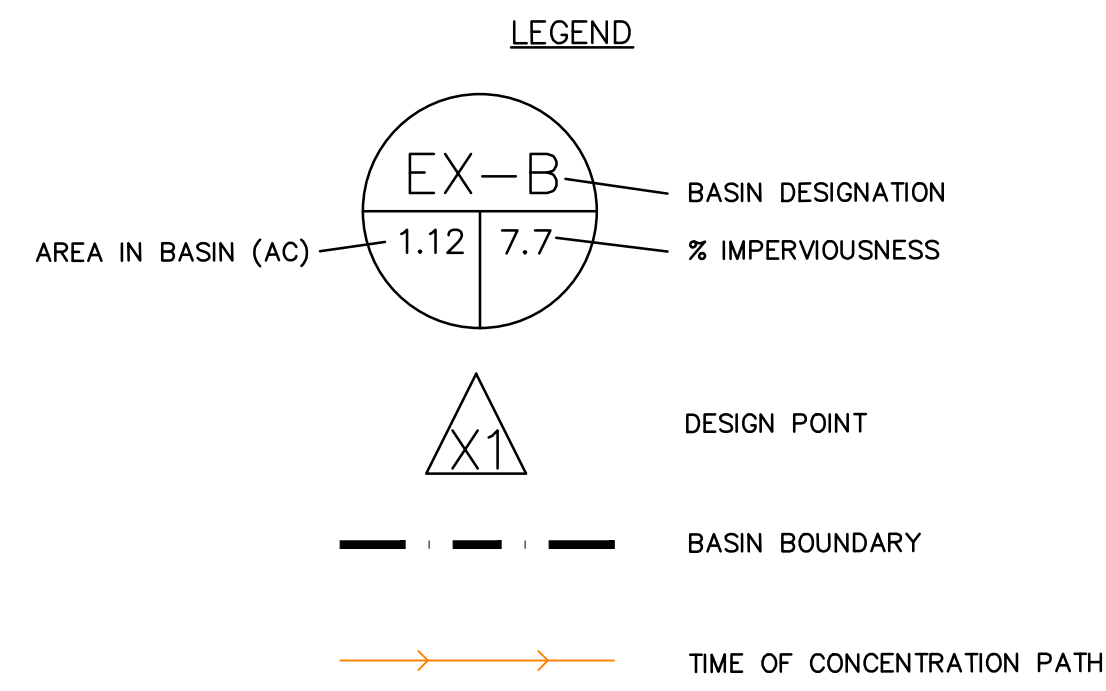
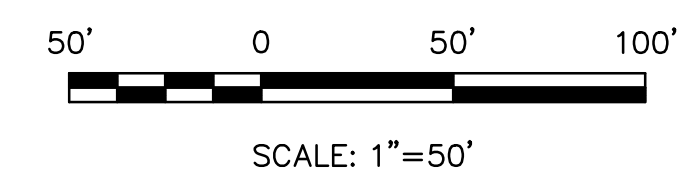
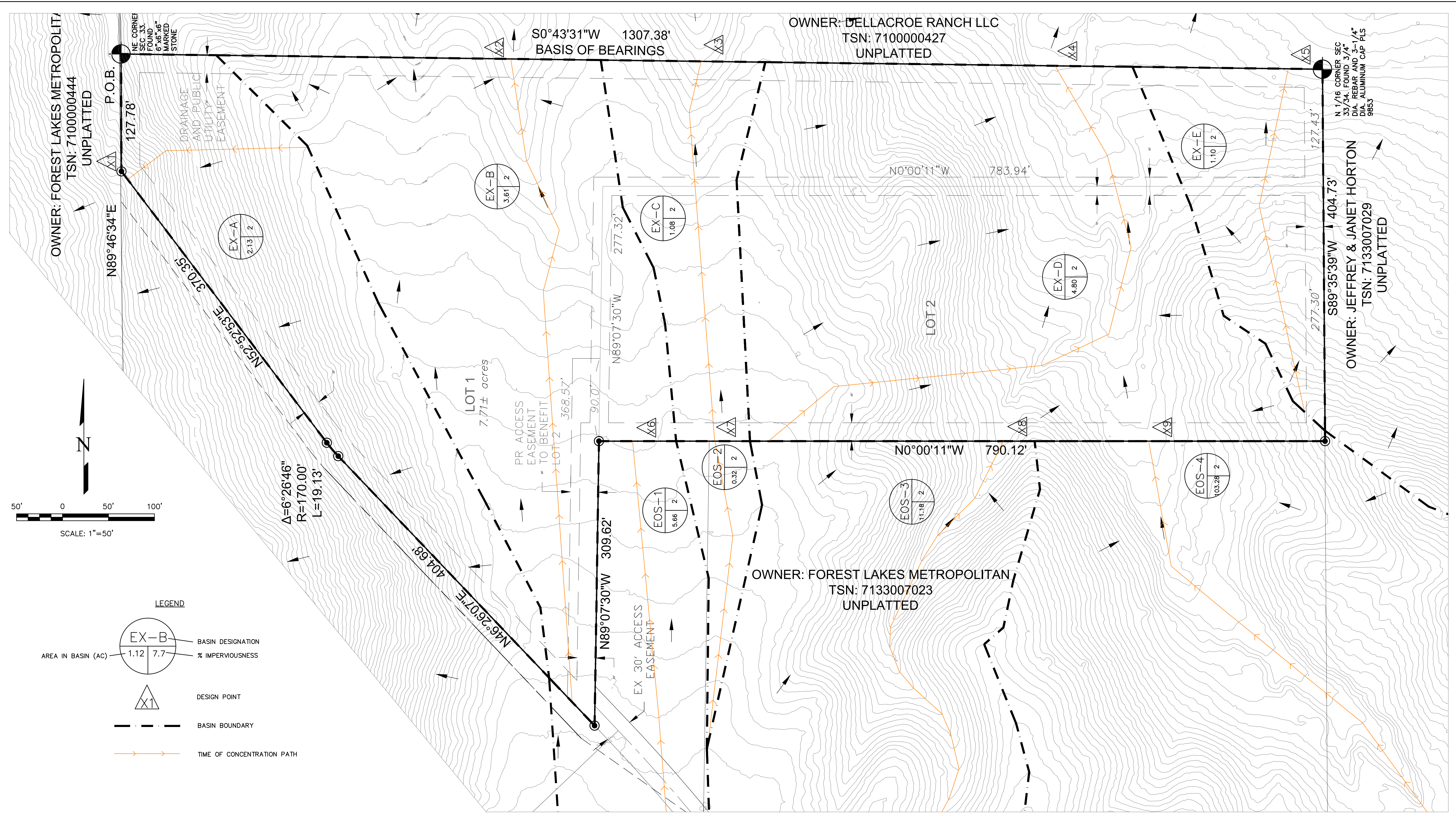
100-year

Rainfall= 6.76"

Qp100= 39.22 cfs

## **DRAINAGE MAPS**

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Show contour elevations on the maps  
Added.

**DRAINAGE SUMMARY**

BASIN NAME	AREA (ACRES)	FLOW	
		5 YR (cfs)	100 YR (cfs)
EX-A	2.13	0.89	5.95
EX-B	3.61	0.88	5.93
EX-C	1.08	0.30	2.03
EX-D	4.80	1.46	9.79
EX-E	1.10	0.37	2.46
EOS-1	5.66	0.87	5.82
EOS-2	0.32	0.09	0.57
EOS-3	11.18	1.75	11.71
EOS-4	103.28	5.71	39.22

**DESIGN POINT SUMMARY**

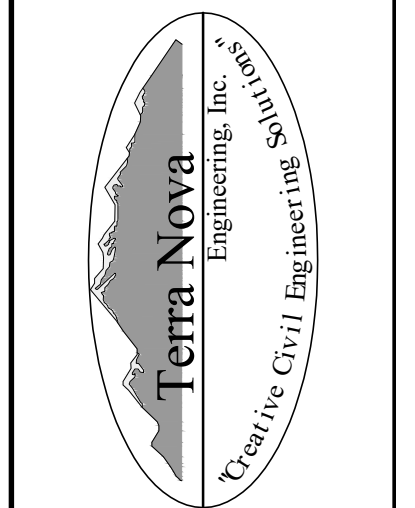
DP	CONTRIBUTING BASINS	AREA AC.	Q5 CFS	Q100 CFS
X1	EX-A	2.13	0.89	5.95
X2	EX-B, EOS-1	9.27	1.75	11.75
X3	EX-C, EOS-2	1.40	0.39	2.60
X4	EX-D, EOS-3, EOS-4	119.26	8.92	60.72
X5	EX-E	1.10	0.37	2.46
X6	EOS-1	5.66	0.87	5.82
X7	EOS-2	0.32	0.09	0.57
X8	EOS-3	11.18	1.75	11.71
X9	EOS-4	103.28	5.71	39.22

**REVISIONS**

NO.	DESCRIPTION	DATE

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, INCORPORATING THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR:  
**ANDREW C ALM**  
ATTN:  
2383 COLLEGIATE DRIVE  
COLORADO SPRINGS, CO 80918



721 S. 29RD STREET  
COLORADO SPRINGS, CO 80904  
OFFICE: 719-635-6422  
FAX: 719-635-6426  
www.tneng.com

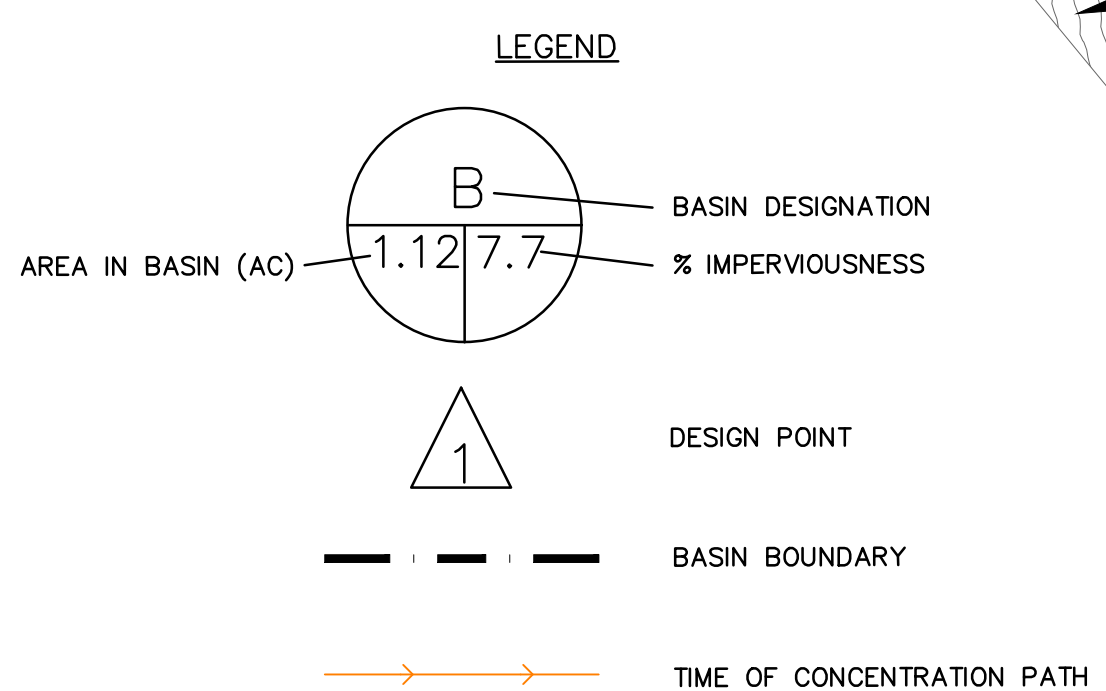
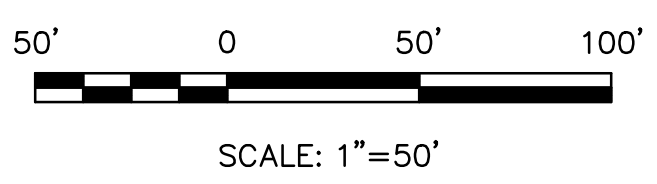
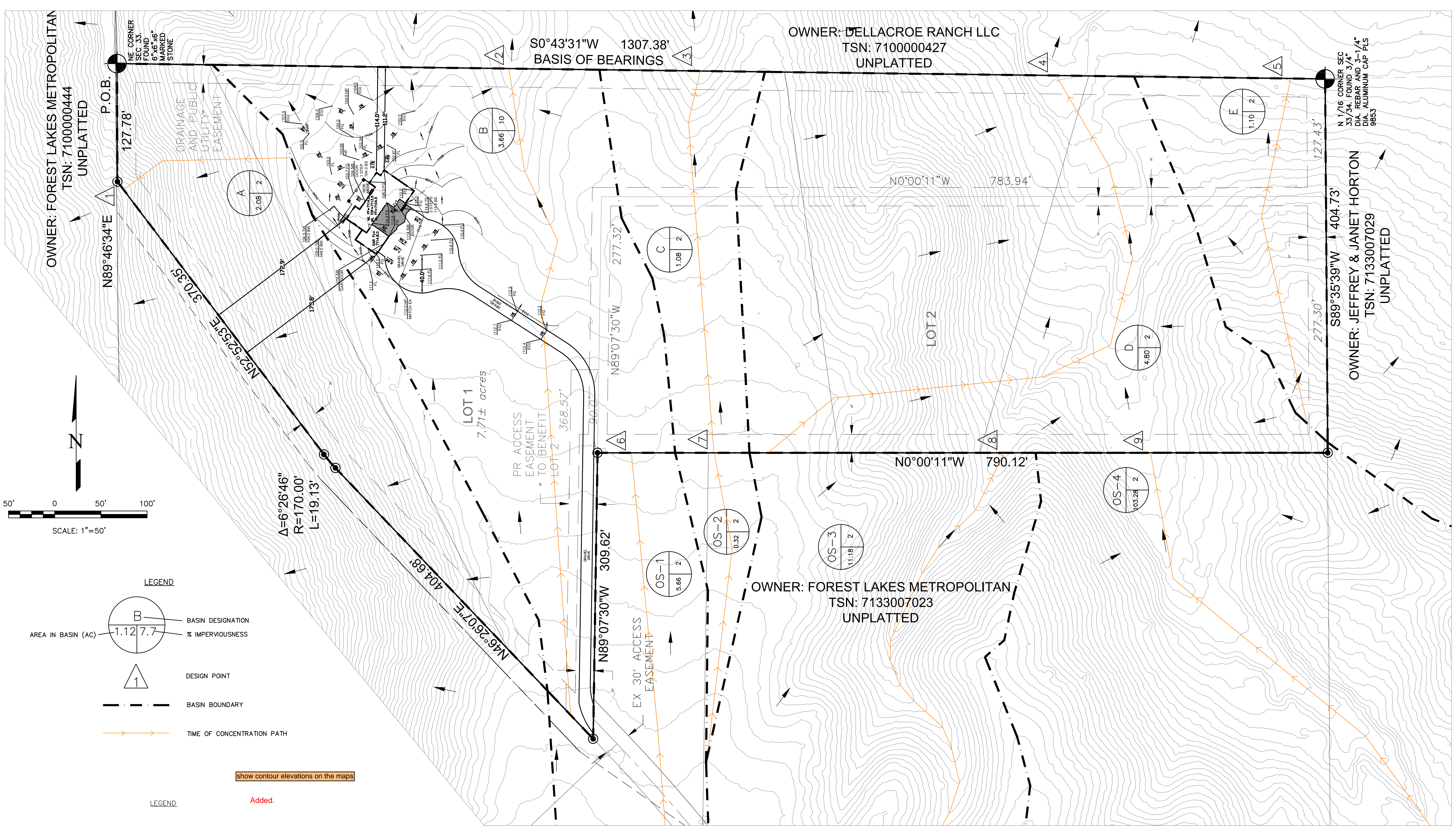
**DRIFTWOOD ESTATES FILING NO. 1**

EXISTING DRAINAGE PLAN

DESIGNED BY JF  
DRAWN BY JF  
CHECKED BY LD  
H-SCALE AS SHOWN  
V-SCALE N/A  
JOB NO. 2358.00  
DATE ISSUED 10/11/23  
SHEET NO. 1 OF 3

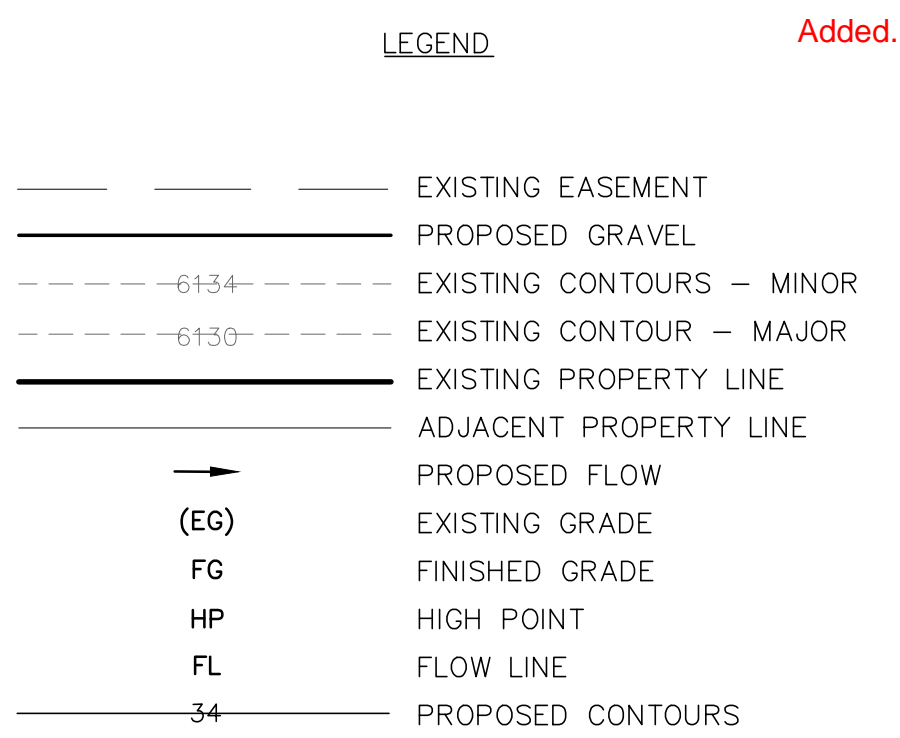


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show contour elevations on the maps

Added.



I think that 6.79 cfs is 114.5% of 5.93 cfs so we are slightly under a 15% increase. When taking that design point 2 as a whole the increase is from 11.75 cfs to 12.61 cfs which would be only a 7.3% increase from existing conditions. This increase is necessary to install a house and driveway but is not a significant impact to the area downstream.

In a narrative explain why the increase in flow is almost 1 cfs for basin B, which contains most of the development. How is a 17% increase considered negligible?

**DRAINAGE SUMMARY**

BASIN NAME	AREA (ACRES)	FLOW	
		5 YR (cfs)	100 YR (cfs)
A	2.08	0.88	5.91
B	3.66	1.47	6.79
C	1.08	0.30	2.03
D	4.80	1.46	9.79
E	1.10	0.37	2.46
OS-1	5.66	0.87	5.82
OS-2	0.32	0.09	0.57
OS-3	11.18	1.75	11.71
OS-4	103.28	5.71	39.22

**DESIGN POINT SUMMARY**

DP	CONTRIBUTING BASINS	AREA AC.	Q5 CFS	Q100 CFS
1	A	2.08	0.88	5.91
2	B, OS-1	9.32	2.34	12.61
3	C, OS-2	1.40	0.39	2.60
4	D, OS-3, OS-4	119.26	8.92	60.72
5	E	1.10	0.37	2.46
6	OS-1	5.66	0.87	5.82
7	OS-2	0.32	0.09	0.57
8	OS-3	11.18	1.75	11.71
9	OS-4	103.28	5.71	39.22

DRIFTWOOD ESTATES FILING NO. 1

PROPOSED DRAINAGE PLAN

DESIGNED BY JF  
 DRAWN BY JF  
 CHECKED BY LD  
 H-SCALE AS SHOWN  
 V-SCALE N/A  
 JOB NO. 2358.00  
 DATE ISSUED 10/11/23  
 SHEET NO. 3 OF 3

721 S. 29RD STREET  
 COLORADO SPRINGS, CO 80904  
 OFFICE: 719-635-6422  
 FAX: 719-635-6426  
 www.tetranova.com

**Terra Nova**  
 Engineering, Inc.  
 Creative City | Big Uncertainty

PREPARED FOR:  
**ANDREW C ALM**  
 ATTN:  
 2383 COLLEGIATE DRIVE  
 COLORADO SPRINGS, CO 80918

REVISIONS

NO.	DESCRIPTION	DATE

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, THIS DRAWING IS NOT TO BE USED FOR ANY PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

OWNER: DELLACROE RANCH LLC  
 TSN: 7100000427  
 UNPLATTED

OWNER: JEFFREY & JANET HORTON  
 TSN: 7133007029  
 UNPLATTED

OWNER: FOREST LAKES METROPOLITAN  
 TSN: 7133007023  
 UNPLATTED