Community & Economic
Development Department
www.adcogov.org

ADAMS COUNTY
COLORADO

4430 South Adams County Parkway
1st Floor, Suite W2000
Brighton, CO 80601-8204
PHONE 720.523.6800
FAX 720.523.6998

Re-submittal Form

Case Name/ Number: PRC2023-00007

Case Manager: David DeBoskey

Re-submitted Items:

- [ ] Development Plan/ Site Plan
- [ ] Plat
- [ ] Parking/ Landscape Plan
- [x] Engineering Documents
- [ ] Subdivision Improvements Agreement (Microsoft Word version)
- [ ] Other: _____

*** All re-submittals must have this cover sheet and a cover letter addressing review comments.**

Please note the re-submittal review period is 21 days.

The cover letter must include the following information:

- Restate each comment that requires a response
- Provide a response below the comment with a description of the revisions
- Identify any additional changes made to the original document

For County Use Only:

Date Accepted:

Staff (accepting intake):

Resubmittal Active: Engineering; Planner; Right-of-Way; Addressing; Building Safety;

Neighborhood Services; Environmental; Parks; Attorney; Finance; Plan Coordination

Aperio
Property Consultants, llc

November 20, 2023

Adams County Community & Economic Development
4430 S. Adams County Pkwy., 1st Fl., Suite W2000
Brighton, CO 80601-8204

Re: 49900 Old Victory Road – REZONING AND PRELMIINARY PLAT
Response to Comments 3 – 11/03/23 (v2)

PLN1: Please see attached review comment from the Department of Natural Resources. Proof of water is provided.
Noted, proof of water has been provided.

PLN2: Depending on what the case engineer comments indicate concerning drainage, a drainage tract might be required on the plat upon resubmittal. Therefore until that is resolved with the Engineer this will be put into resubmittal so that it remains a comment if a tract is needed.
Drainage comments have been addressed as discussed. See responses below.

ENG10: Applicant will need to provide a example site plan within the drainage report to demonstrate how the estimates for total impervious area were achieved to satisfy the request for exemption to detention.
Sample site layouts have been provided on the drainage plan.

ENG11: Regarding the proposed water quality buffer areas proposed in the drainage report, applicant will need to provide and call out non-buildable easements along the western property boundaries for water quality. The minimum length (direction in which water will flow) must be determined from the Mile High Flood District standards, regardless of total buffer area.
Easements have been added for each of the three grass buffer designs per the MHFCD design form data.

If you should have any questions, or need any additional information, please don't hesitate to call me at 303-317-300 or email me at Aaron@aperiopc.com .

Sincerely,

Aaron Thompson
Aperio Property Consultants, LLC

Cc: Dan Fahey

LEVEL III DRAINAGE REPORT

Oak Park Road Estates

Adams County, CO

PREPARED FOR:

F & C Realty
56321 E. Colfax Ave.
Strasburg, CO 80136
Phone: 303-916-4155
Contact: Dan Fahey
Email: dan@fancrealty.com

PREPARED BY:

KELLY DEVELOPMENT SERVICES, LLC
9301 Scrub Oak Drive
Lone Tree, Colorado 80124
Phone: 303-888-6338
Contact: Greg Kelly, PE
Email: greg@kellydev.com

November 14, 2023

ENGINEER CERTIFICATION OF DRAINAGE REPORT

I hereby certify that this report for the Final Drainage design of the Oak Park Road Estates project was prepared by me or under my direct supervision in accordance with the provisions of Adams County Storm Drainage Design and Technical Criteria for the owners thereof. I understand that Adams County does not and will not assume liability for drainage facilities designed by others.

Registered Professional Engineer
State of Colorado No. 15813

Date 11-14-2023

PREPARED UNDER THE DIRECT SUPERVISION OF
GREGORY S. KELLY, PE COLORADO LIC. #15813
FOR AND ON BEHALF OF KELLY DEVELOPMENT SERVICES, LLC

DEVELOPER CERTIFICATION OF DRAINAGE FACILITIES

Dan Fahey of F & C Realty hereby certifies that the drainage facilities for the Oak Park Road Estates project shall be constructed according to the design presented in this report. I understand that Adams County does not and will not assume liability for the drainage facilities designed and/ or certified by my engineer. I understand that Adams County reviews drainage plans pursuant to Colorado Revised Statues Title 30, Article 28; but cannot, on behalf of the Oak Park Road Estates project, guarantee that final drainage design review will absolve Dan Fahey/F&C Realty and/ or their successors and/ or assigns the future liability for improper design. I further understand that approval of the Final Plat and/ or Final Development Plan does not imply approval of my engineer's drainage design.

Date 11-14-2023

Daniel C Fahey
Name of Developer

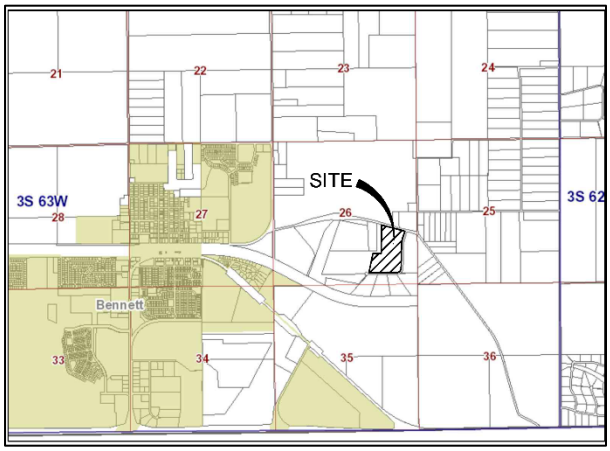
Daniel C Fahey
Authorized Signature

LEVEL III DRAINAGE REPORT
OAK PARK ROAD ESTATES

A. INTRODUCTION

1. Location

The Oak Park Road Estates project is an uplatted 35-acre site located at the northwest corner of the intersection of Old Victory Road and Oak Park Road, along the northern ROW of Oak Park Road, in unincorporated Adams County, CO. It is in the Southeast One-Quarter of Section 26, Township 3 South, Range 63 West of the 6th P. M., County of Adams, State of Colorado. The project is not located within the Adams County MS-4 area.



The site is bounded on the north and west by unplatted, rural agricultural ground, by Oak Park Road on the south, and Old Victory Road on the east. The property is undeveloped rural agricultural ground.

2. Proposed Development

The proposed development includes subdividing the parcel into three rural residential lots for single family home construction. The remainder of the property is anticipated to remain undeveloped agricultural ground.

From the NRCS soils report included in the Appendix of this report, the in-situ soil is a mixture of sandy loams, classified as Hydrologic Soil Types A and B. The soils consist of sandy loams and loamy sand with a low swell potential and well drained with low runoff characteristics. The existing ground surface slopes to the north and northeast at varying slopes from approximately 2% to 4% slope. Runoff generally flows north and northeasterly. The pre-development condition, as it currently exists, is that runoff flows to existing drainageways north of the subject property toward Kiowa Creek . The developed condition will not modify the existing drainage patterns as the project is for single family rural residential use with minimal land

disturbance.

There are no major drainageways crossing the site; however, Kiowa Creek is located approximately 800 feet to the west of the site. The site is located within the Zone X floodplain area for Kiowa Creek as shown on the FEMA FIRM Map No. 08001C0720H dated March 5, 2007. A copy of this map is included in the Appendix of this report.

The property is not located within any Master Drainage Plan or Outfall Systems Plan study areas, nor is it located within the Adams County MS-4 area.

B. DESIGN CRITERIA

References

This drainage report is based upon information from the August 15, 2017 Adams County Development Standards and Regulations Chapter 9 *Storm Drainage Design and Stormwater Quality Regulations* and Mile High Flood District Storm Drainage Criteria Manual Volumes 1- 3 (MHFD).

Hydrologic Criteria

The Rational Method was used to calculate runoff from this site in accordance with the Adams County Regulations and Mile High Flood District Manuals. The 1-Hour Design Point Rainfall Values from the Adams County Regulations used for this report are:

P1, 2-Yr = 1.00 P1, 5-Yr = 1.42 P1, 100-Yr = 2.71

Detention calculations were based upon Adams County requirements in accordance with the Manual using the simplified V=KA formulas. These volumes were input into MHFD's UD_Detention_v3.07 spreadsheet for calculation of ponding depth and outlet structure details.

Hydraulic Criteria

No on-site storm drainage improvements are proposed.

Minimum Design Standards

Because the project is not located within the MS-4 area, and due to the negligible change in developed drainage flows as compared to historic values, no water quality or detention facilities are proposed.

C. DRAINAGE PLAN

General Concept

The general drainage concept for the property will remain unchanged from the existing condition as no major site improvements are proposed that would affect the existing drainage patterns.

An exemption from stormwater detention is requested and justified according to the following criteria of Section 9-01-11 of the Adams County Development Standards and Regulations:

1. The total change in developed impervious area is less than 5% of the total site. Actual developed impervious area is approximately 0.9% of the total property area.

The percent increase in imperviousness (I) for the overall site is 0.3%, a negligible increase as further demonstrated by the minute increases in overall stormwater flow.

Water quality for the site will be accommodated via grass buffer areas adjacent to the future home locations. Due to the minimal flows generated on the site, the buffers are also of minimal size and in reality, will exceed the design requirements per the design form by nature of the natural adjoining areas adjacent to the future homes. Lot 1 should have an 11'x15' grass buffer, lot 2 a 4'x15' buffer, and lot 3 a 6'x15' buffer. Design forms for each are included in the appendix of this report.

Specific Details

No overlot or major grading improvements are proposed; therefore, no change to the existing drainage patterns is anticipated. The site has been divided into seven onsite basins.

The Basins are further described as follows:

Basin A is a small basin at the corner of Old Victory Road and Oak Park Road, 0.45-acres in size that flows to Old Victory Road. No improvements will be made to this basin.

Basin B is the largest basin on the property, 17.94-acres in size. This basin flows to an existing drainage at the northeast corner of the site and is anticipated to have a proposed single-family homes constructed within.

Basin C is a small basin located at the north-central portion of the property and is 0.21-acres in size that flows to the north. No improvements will be made to this basin.

Basin D is another small basin located in the center of the site, 1.70-acres in size that also flows north. No improvements will be made to this basin.

Basin E is a 4.37 acre basin at the southwest portion of the site that flows to the north. No improvements will be made to this basin. The second of three single family homes is anticipated to be constructed in this basin.

Basin F is a small 1.08-acre basin at the very southwest corner of the property along Oak Park Road. This basin flows to Oak Park Road. No improvements will be made to this basin.

Basin G is a 9.27-acre basin at the western end of the property that flows to the north. The third single-family home is anticipated to be constructed in this basin.

Basin Summary Data including areas, historic, and developed flows are in the two following tables:

HISTORIC BASIN RUNOFF SUMMARY TABLE							
Basin Designation	**Basin Area (ac)**	**C_5**	**C_{100}**	**Impervious %**	**T_c (min)**	**Q_5 (cfs)**	**Q_{100} (cfs)**
A	0.45	0.01	0.13	2.0%	11.7	0.02	0.40
B	17.94	0.01	0.13	2.0%	17.9	0.53	13.15
C	0.21	0.01	0.13	2.0%	10.8	0.01	0.20
D	1.70	0.01	0.13	2.0%	13.3	0.06	1.44
E	4.37	0.01	0.13	2.0%	16.0	0.14	3.39
F	1.08	0.01	0.13	2.0%	11.4	0.04	0.98
G	9.27	0.01	0.13	2.0%	15.4	0.30	7.33

BASIN RUNOFF SUMMARY TABLE							
Basin Designation	**Basin Area (ac)**	**C_5**	**C_{100}**	**Impervious %**	**T_c (min)**	**Q_5 (cfs)**	**Q_{100} (cfs)**
A	0.45	0.01	0.13	2.0%	11.7	0.99	0.40
B	18.02	0.02	0.14	3.0%	17.9	0.01	13.99
C	0.21	0.01	0.13	2.0%	10.8	0.06	0.20
D	1.70	0.01	0.13	2.0%	16.0	0.62	1.44
E	4.45	0.04	0.16	6.0%	11.4	0.04	4.28
F	1.08	0.01	0.13	2.0%	15.4	0.79	0.98
G	9.35	0.03	0.14	3.9%	0.0	0.00	8.24

Post-Construction BMP and Stormwater Detention

No detention facilities are required with the project as the property is not located within the MS-4 boundary area, and post-developed impacts will be negligible as demonstrated in the comparative tables above. Grass Buffer areas have been calculated and designated for the property as shown on the Drainage Plan and as contained in this report Appendix to provide water quality treatment.

E. LOW IMPACT DEVELOPMENT STANDARDS AND REQUIREMENTS

The project is not located with the Adams County MS-4 area.

F. SUSTAINANBLE DEVELOPMENT PRACTICES

The project is not located with the Adams County MS-4 area and development impacts are minimal.

G. POTENTIAL EROSION AND SEDIMENT IMPACTS

Construction of the Oak Park Road Estates will likely disturb less than an acre of land on the three lots as is typical of a rural residential single-family project. Erosion and sediment impacts will be negligible.

H. CONCLUSIONS

This project will have little to no impact upon the existing conditions and surrounding area as disturbance and variance from the existing, pre-developed condition is minimal. It is my professional opinion that the design will be equivalent in quality, effectiveness, durability, and safety to the requirements prescribed in the Adams County Development Manual.

G. Appendices

1. Hydrologic Computations
   a. Land use assumptions, composite “C” and % Impervious calculations
   b. Initial and major storm runoff computations for developed runoff conditions

2. Graphs, tables, SCS Soils Data, floodplain map, and other relevant data

3. Grass Buffer Design Forms

APPENDIX 1

HYDROLOGIC COMPUTATIONS

COMPOSITE 'C' FACTORS (HISTORIC)

LOCATION: Oak Park Road Estates | Adams County | Soil Type: A/B | Final Drainage Report | BY: AWT | DATE: 2/10/2023

SUB-BASIN	Acreage				PAVED				ROOFS				LAWNS				COMPOSITE C FACTOR				PERCENT IMPERVIOUS
DESIGNATION	PAVED	ROOFS	LAWNS	TOTAL	2YR	5 YR	10 YR	100 YR	2YR	5 YR	10 YR	100 YR	2YR	5 YR	10 YR	100 YR	2YR	5 YR	10 YR	100 YR	
			Imperviousness =		100				90				2								
A	0.00	0.00	0.45	0.45	0.84	0.86	0.87	0.89	0.73	0.75	0.77	0.81	0.01	0.01	0.01	0.13	0.01	0.01	0.01	0.13	2.0%
B	0.00	0.00	17.94	17.94	0.84	0.86	0.87	0.89	0.73	0.75	0.77	0.81	0.01	0.01	0.01	0.13	0.01	0.01	0.01	0.13	2.0%
C	0.00	0.00	0.21	0.21	0.84	0.86	0.87	0.89	0.73	0.75	0.77	0.81	0.01	0.01	0.01	0.13	0.01	0.01	0.01	0.13	2.0%
D	0.00	0.00	1.70	1.70	0.84	0.86	0.87	0.89	0.73	0.75	0.77	0.81	0.01	0.01	0.01	0.13	0.01	0.01	0.01	0.13	2.0%
E	0.00	0.00	4.37	4.37	0.84	0.86	0.87	0.89	0.73	0.75	0.77	0.81	0.01	0.01	0.01	0.13	0.01	0.01	0.01	0.13	2.0%
F	0.00	0.00	1.08	1.08	0.84	0.86	0.87	0.89	0.73	0.75	0.77	0.81	0.01	0.01	0.01	0.13	0.01	0.01	0.01	0.13	2.0%
G	0.00	0.00	9.27	9.27	0.84	0.86	0.87	0.89	0.73	0.75	0.77	0.81	0.01	0.01	0.01	0.13	0.01	0.01	0.01	0.13	2.0%
Overall Site	0.00	0.00	35.03	35.03	0.84	0.86	0.87	0.89	0.80	0.85	0.90	0.90	0.01	0.01	0.01	0.13	0.01	0.01	0.01	0.13	2.0%

COMPOSITE 'C' FACTORS (DEVELOPED)

LOCATION: Oak Park Road Estates | Adams County | Soil Type: A/B | Final Drainage Report | BY: AWT | DATE: 2/10/2023

SUB-BASIN	Acreage				PAVED				ROOFS				LAWNS				COMPOSITE C FACTOR				PERCENT IMPERVIOUS
DESIGNATION	PAVED	ROOFS	LAWNS	TOTAL	2YR	5 YR	10 YR	100 YR	2YR	5 YR	10 YR	100 YR	2YR	5 YR	10 YR	100 YR	2YR	5 YR	10 YR	100 YR	
			Imperviousness =		100				90				2								
A	0.00	0.00	0.45	0.45	0.84	0.86	0.87	0.89	0.73	0.75	0.77	0.81	0.01	0.01	0.01	0.13	0.01	0.01	0.01	0.13	2.0%
B	0.08	0.11	17.83	18.02	0.84	0.86	0.87	0.89	0.73	0.75	0.77	0.81	0.01	0.01	0.01	0.13	0.02	0.02	0.02	0.14	3.0%
C	0.00	0.00	0.21	0.21	0.84	0.86	0.87	0.89	0.73	0.75	0.77	0.81	0.01	0.01	0.01	0.13	0.01	0.01	0.01	0.13	2.0%
D	0.00	0.00	1.70	1.70	0.84	0.86	0.87	0.89	0.73	0.75	0.77	0.81	0.01	0.01	0.01	0.13	0.01	0.01	0.01	0.13	2.0%
E	0.08	0.11	4.25	4.45	0.84	0.86	0.87	0.89	0.73	0.75	0.77	0.81	0.01	0.01	0.01	0.13	0.04	0.04	0.05	0.16	6.0%
F	0.00	0.00	1.08	1.08	0.84	0.86	0.87	0.89	0.73	0.75	0.77	0.81	0.01	0.01	0.01	0.13	0.01	0.01	0.01	0.13	2.0%
G	0.08	0.11	9.15	9.35	0.84	0.86	0.87	0.89	0.73	0.75	0.77	0.81	0.01	0.01	0.01	0.13	0.03	0.03	0.03	0.14	3.9%
Overall Site	0.24	0.34	34.68	35.27	0.84	0.86	0.87	0.89	0.80	0.85	0.90	0.90	0.01	0.01	0.01	0.13	0.02	0.02	0.02	0.14	3.0%

TIME OF CONCENTRATION (DEVELOPED)

LOCATION: Oak Park Road Estates | **Final Drainage Report** | **BY: AWT** | **DATE: 11/14/2023**

SUB-BASIN DATA			INIT./OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					TOTAL	Tc Check (Urbanized Basins)		FINAL Tc
DESIGNATION	C_5	AREA (AC)	LENGTH (FT)	SLOPE %	Ti (Min.)*	GRASS/ PAVED	LENGTH (FT)	SLOPE %	VEL (FPS)**	Tt (Min.)	Ti+Tt (Min.)	LGTH. (FT)	Tc = (L/180) + 10	(minutes)
A	0.01	0.45	100	3.50	13.16	GRASS	210	2.60	1.13	3.10	16.3	310	11.7	11.7
B	0.02	18.02	500	4.50	26.86	GRASS	929	3.70	1.35	11.50	38.4	1429	17.9	17.9
C	0.01	0.21	136	3.80	14.93	GRASS	0	3.80	1.36	0.00	14.9	136	10.8	10.8
D	0.01	1.70	500	4.00	28.15	GRASS	90	4.00	1.40	1.07	29.2	590	13.3	13.3
E	0.04	4.45	285	1.80	26.86	GRASS	790	3.10	1.23	10.68	37.5	1075	16.0	16.0
F	0.01	1.08	260	3.50	21.22	GRASS	0	3.50	1.31	0.00	21.2	260	11.4	11.4
G	0.03	9.35	500	3.90	27.96	GRASS	465	3.90	1.38	5.61	33.6	965	15.4	15.4

REMARKS

FORMULAS:

*** Ti = 0.395 (1.1-C5)L^0.5/S/100^1/3**

**** V=Cv*(S/100)^0.5**

TIME OF CONCENTRATION (DEVELOPED)

LOCATION: Oak Park Road Estates | **Final Drainage Report** | **BY: AWT** | **DATE: 11/14/2023**

SUB-BASIN DATA			INIT./OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					TOTAL	Tc Check (Urbanized Basins)		FINAL Tc
DESIGNATION	C_5	AREA (AC)	LENGTH (FT)	SLOPE %	Ti (Min.)*	GRASS/ PAVED	LENGTH (FT)	SLOPE %	VEL (FPS)**	Tt (Min.)	Ti+Tt (Min.)	LGTH. (FT)	Tc = (L/180) + 10	(minutes)
A	0.01	0.45	100	3.50	13.16	GRASS	210	2.60	1.13	3.10	16.3	310	11.7	11.7
B	0.02	18.02	500	4.50	26.86	GRASS	929	3.70	1.35	11.50	38.4	1429	17.9	17.9
C	0.01	0.21	136	3.80	14.93	GRASS	0	3.80	1.36	0.00	14.9	136	10.8	10.8
D	0.01	1.70	500	4.00	28.15	GRASS	90	4.00	1.40	1.07	29.2	590	13.3	13.3
E	0.04	4.45	285	1.80	26.86	GRASS	790	3.10	1.23	10.68	37.5	1075	16.0	16.0
F	0.01	1.08	260	3.50	21.22	GRASS	0	3.50	1.31	0.00	21.2	260	11.4	11.4
G	0.03	9.35	500	3.90	27.96	GRASS	465	3.90	1.38	5.61	33.6	965	15.4	15.4

REMARKS

FORMULAS:

*** Ti = 0.395 (1.1-C5)L^0.5/S/100^1/3**

**** V=Cv*(S/100)^0.5**

Storm Drainage System Design
(Rational Method Procedure)

Subdivision: Oak Park Road Estates
Designer: AWT
Date: 11/14/2023
Design Storm: 5 -YR HISTORIC

$$I = \frac{28.5 * P_1}{(10+T_C)^{0.786}}$$

Where: P_1 = 1.42

Design Point	Direct Runoff							Total Runoff				Comment
	Subbasin Designation	Area	Runoff Coeffecient	t_c	C x A	I	Q	t_c	C x A	I	Q	
		ac.		min.	ac.	in/hr	cfs	min.	ac.	in/hr	cfs	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
1	A	0.45	0.01	11.7	0.00	3.60	0.02					
2	B	17.94	0.01	17.9	0.18	2.95	0.53					
3	C	0.21	0.01	10.8	0.00	3.73	0.01					
4	D	1.70	0.01	13.3	0.02	3.41	0.06					
5	E	4.37	0.01	16.0	0.04	3.13	0.14					
6	F	1.08	0.01	11.4	0.01	3.64	0.04					
7	G	9.27	0.01	15.4	0.09	3.19	0.30					

Storm Drainage System Design
(Rational Method Procedure)

Subdivision: Oak Park Road Estates
Designer: AWT
Date: 11/14/2023
Design Storm: 5 -YR DEVELOPED

$$I = \frac{28.5 * P_1}{(10+T_C)^{0.786}}$$

Where: P_1 = 1.42

Design Point	Direct Runoff							Total Runoff				Comment
	Subbasin Designation	Area	Runoff Coeffecient	t_c	C x A	I	Q	t_c	C x A	I	Q	
		ac.		min.	ac.	in/hr	cfs	min.	ac.	in/hr	cfs	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
1	A	0.45	0.01	11.7	0.00	3.60	0.02					
2	B	18.02	0.02	17.9	0.33	2.95	0.99					
3	C	0.21	0.01	10.8	0.00	3.73	0.01					
4	D	1.70	0.01	13.3	0.02	3.41	0.06					
5	E	4.45	0.04	16.0	0.20	3.13	0.62					
6	F	1.08	0.01	11.4	0.01	3.64	0.04					
7	G	9.35	0.03	15.4	0.25	3.19	0.79					

Storm Drainage System Design
(Rational Method Procedure)

Subdivision: Oak Park Road Estates
Designer: AWT
Date: 11/14/2023
Design Storm: 100-YR HISTORIC

$$I = \frac{28.5 * P_1}{(10+T_C)^{0.786}}$$

Where: P_1 = 2.71

Design Point	Direct Runoff							Total Runoff				Comment
	Subbasin Designation	Area	Runoff Coeffecient	t_c	C x A	I	Q	t_c	C x A	I	Q	
		ac.		min.	ac.	in/hr	cfs	min.	ac.	in/hr	cfs	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
1	A	0.45	0.13	11.7	0.06	6.87	0.40					
2	B	17.94	0.13	17.9	2.33	5.64	13.15					
3	C	0.21	0.13	10.8	0.03	7.12	0.20					
4	D	1.70	0.13	13.3	0.22	6.51	1.44					
5	E	4.37	0.13	16.0	0.57	5.97	3.39					
6	F	1.08	0.13	11.4	0.14	6.94	0.98					
7	G	9.27	0.13	15.4	1.21	6.08	7.33					

Storm Drainage System Design
(Rational Method Procedure)

Subdivision: Oak Park Road Estates
Designer: AWT
Date: 11/14/2023
Design Storm: 100-YR DEVELOPED

$$I = \frac{28.5 * P_1}{(10+T_C)^{0.786}}$$

Where: P_1 = 2.71

Design Point	Direct Runoff							Total Runoff				Comment
	Subbasin Designation	Area	Runoff Coeffecient	t_c	C x A	I	Q	t_c	C x A	I	Q	
		ac.		min.	ac.	in/hr	cfs	min.	ac.	in/hr	cfs	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
1	A	0.45	0.13	11.7	0.06	6.87	0.40					
2	B	18.02	0.14	17.9	2.48	5.64	13.99					
3	C	0.21	0.13	10.8	0.03	7.12	0.20					
4	D	1.70	0.13	13.3	0.22	6.51	1.44					
5	E	4.45	0.16	16.0	0.72	5.97	4.28					
6	F	1.08	0.13	11.4	0.14	6.94	0.98					
7	G	9.35	0.14	15.4	1.35	6.08	8.24					

BASIN RUNOFF SUMMARY TABLE							
Basin Designation	**Basin Area (ac)**	**C_5**	**C_{100}**	**Impervious %**	**T_c (min)**	**Q_5 (cfs)**	**Q_{100} (cfs)**
A	0.45	0.01	0.13	2.0%	11.7	0.99	0.40
B	18.02	0.02	0.14	3.0%	17.9	0.01	13.99
C	0.21	0.01	0.13	2.0%	10.8	0.06	0.20
D	1.70	0.01	0.13	2.0%	16.0	0.62	1.44
E	4.45	0.04	0.16	6.0%	11.4	0.04	4.28
F	1.08	0.01	0.13	2.0%	15.4	0.79	0.98
G	9.35	0.03	0.14	3.9%	0.0	0.00	8.24

DESIGN POINT RUNOFF SUMMARY TABLE					
Design Point	**Contributing Basins**	**Contributing Area (acres)**	**T_c (min)**	**Q_5 (cfs)**	**Q_{100} (cfs)**
1	A	0.45	11.7	0.02	0.40
2	B	18.02	17.9	0.99	13.99
3	C	0.21	10.8	0.01	0.20
4	D	1.70	13.3	0.06	1.44
5	E	4.45	16.0	0.62	4.28
6	F	1.08	11.4	0.04	0.98
7	G	9.35	15.4	0.79	8.24

HISTORIC DESIGN POINT RUNOFF SUMMARY TABLE					
Design Point	**Contributing Basins**	**Contributing Area (acres)**	**T_c (min)**	**Q_5 (cfs)**	**Q_{100} (cfs)**
1	A	0.45	11.7	0.02	0.40
2	B	17.94	17.9	0.99	13.15
3	C	0.21	10.8	0.01	0.20
4	D	1.70	13.3	0.06	1.44
5	E	4.37	16.0	0.62	3.39
6	F	1.08	11.4	0.04	0.98
7	G	9.27	15.4	0.79	7.33

APPENDIX 2

GRAPHS, TABLES, SCS SOILS DATA, FLOODPLAN MAPS,
AND OTHER RELEVANT DATA

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Adams County Area, Parts of Adams and Denver Counties, Colorado

February 10, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:3,380 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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: Adams County Area, Parts of Adams and Denver Counties, Colorado
Survey Area Data: Version 19, Sep 1, 2022

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

MAP LEGEND

MAP INFORMATION

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
AsC	Ascalon sandy loam, 3 to 5 percent slopes	12.9	35.7%
AsD	Ascalon sandy loam, 5 to 9 percent slopes	7.9	21.8%
BoD	Blakeland loamy sand, 3 to 9 percent slopes	0.6	1.7%
Bt	Blakeland-Truckton association	10.6	29.2%
TtD	Truckton loamy sand, 3 to 9 percent slopes	4.2	11.6%
Totals for Area of Interest		**36.3**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Adams County Area, Parts of Adams and Denver Counties, Colorado

AsC—Ascalon sandy loam, 3 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2tlnt
Elevation: 3,550 to 5,970 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 46 to 57 degrees F
Frost-free period: 135 to 160 days
Farmland classification: Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

Map Unit Composition

Ascalon and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ascalon

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Wind-reworked alluvium and/or calcareous sandy eolian deposits

Typical profile

Ap - 0 to 6 inches: sandy loam
Bt1 - 6 to 12 inches: sandy clay loam
Bt2 - 12 to 19 inches: sandy clay loam
Bk - 19 to 35 inches: sandy clay loam
C - 35 to 80 inches: sandy loam

Properties and qualities

Slope: 3 to 5 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 (0.60 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: 10 percent
Maximum salinity: Nonsaline (0.1 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R067BY024CO - Sandy Plains, R072XY111KS - Sandy Plains

Hydric soil rating: No

Minor Components

Stoneham

Percent of map unit: 10 percent
Landform: Interfluves
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R067BY002CO - Loamy Plains, R072XY100KS - Loamy Tableland
Hydric soil rating: No

Vona

Percent of map unit: 8 percent
Landform: Interfluves
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R067BY024CO - Sandy Plains, R072XY111KS - Sandy Plains
Hydric soil rating: No

Platner

Percent of map unit: 2 percent
Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R067BY002CO - Loamy Plains, R072XY100KS - Loamy Tableland
Hydric soil rating: No

AsD—Ascalon sandy loam, 5 to 9 percent slopes

Map Unit Setting

National map unit symbol: 2tlmx
Elevation: 3,870 to 6,070 feet
Mean annual precipitation: 13 to 16 inches
Mean annual air temperature: 46 to 57 degrees F
Frost-free period: 135 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Ascalon and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ascalon

Setting

Landform: Interfluves
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Wind-reworked alluvium and/or calcareous sandy eolian deposits

Typical profile

Ap - 0 to 6 inches: sandy loam
Bt1 - 6 to 12 inches: sandy clay loam
Bt2 - 12 to 19 inches: sandy clay loam
Bk - 19 to 35 inches: sandy clay loam
C - 35 to 80 inches: sandy loam

Properties and qualities

Slope: 5 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 to high (0.60 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 (0.1 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R067BY024CO - Sandy Plains
Hydric soil rating: No

Minor Components

Stoneham

Percent of map unit: 10 percent
Landform: Interfluves
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R067BY002CO - Loamy Plains
Hydric soil rating: No

Manter

Percent of map unit: 5 percent
Landform: Interfluves
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R067BY024CO - Sandy Plains
Hydric soil rating: No

BoD—Blakeland loamy sand, 3 to 9 percent slopes

Map Unit Setting

National map unit symbol: 34vs
Elevation: 4,600 to 5,800 feet
Mean annual precipitation: 13 to 15 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 135 to 155 days

Map Unit Composition

Blakeland and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blakeland

Setting

Landform: Plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed and/or eolian deposits derived from mixed

Typical profile

H1 - 0 to 9 inches: loamy sand
H2 - 9 to 60 inches: sand

Properties and qualities

Slope: 3 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R067BY015CO - Deep Sand
Hydric soil rating: No

Minor Components

Truckton

Percent of map unit: 5 percent
Hydric soil rating: No

Bt—Blakeland-Truckton association

Map Unit Setting

National map unit symbol: 34vt
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 13 to 15 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 125 to 155 days
Farmland classification: Not prime farmland

Map Unit Composition

Blakeland and similar soils: 60 percent
Truckton and similar soils: 20 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blakeland

Setting

Landform: Plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed and/or eolian deposits derived from mixed

Typical profile

H1 - 0 to 9 inches: loamy sand
H2 - 9 to 60 inches: sand

Properties and qualities

Slope: 3 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R067BY015CO - Deep Sand
Hydric soil rating: No

Description of Truckton

Setting

Landform: Plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits derived from mixed

Typical profile

H1 - 0 to 9 inches: loamy sand
H2 - 9 to 21 inches: sandy loam
H3 - 21 to 32 inches: loamy sand
H4 - 32 to 60 inches: coarse sand

Properties and qualities

Slope: 3 to 9 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 4.3 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R067BY015CO - Deep Sand
Hydric soil rating: No

Minor Components

Valent

Percent of map unit: 10 percent
Hydric soil rating: No

Vona

Percent of map unit: 10 percent
Hydric soil rating: No

TtD—Truckton loamy sand, 3 to 9 percent slopes

Map Unit Setting

National map unit symbol: 34wz
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 13 to 15 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 125 to 155 days
Farmland classification: Not prime farmland

Map Unit Composition

Truckton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Truckton

Setting

Landform: Plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits derived from mixed

Typical profile

H1 - 0 to 9 inches: loamy sand
H2 - 9 to 21 inches: sandy loam
H3 - 21 to 32 inches: loamy sand
H4 - 32 to 60 inches: coarse sand

Properties and qualities

Slope: 3 to 9 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 4.3 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R067BY024CO - Sandy Plains
Hydric soil rating: No

Minor Components

Vona

Percent of map unit: 8 percent
Hydric soil rating: No

Blakeland

Percent of map unit: 5 percent
Hydric soil rating: No

Loup

Percent of map unit: 1 percent
Landform: Swales
Ecological site: R067BY029CO - Sandy Meadow
Hydric soil rating: Yes

Tryon

Percent of map unit: 1 percent
Landform: Swales
Ecological site: R067BY024CO - Sandy Plains
Hydric soil rating: Yes

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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 (NAVD 88). 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, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM 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. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

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

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

Base map information shown on this FIRM was provided by the Adams County and Commerce City GIS departments. The coordinate system used for the production of the digital FIRM is Universal Transverse Mercator, Zone 13N, referenced to North American Datum of 1983 and the GRS 80 spheroid, Western Hemisphere.

This map reflects more detailed and up- to- date **stream channel configurations** 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.

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.

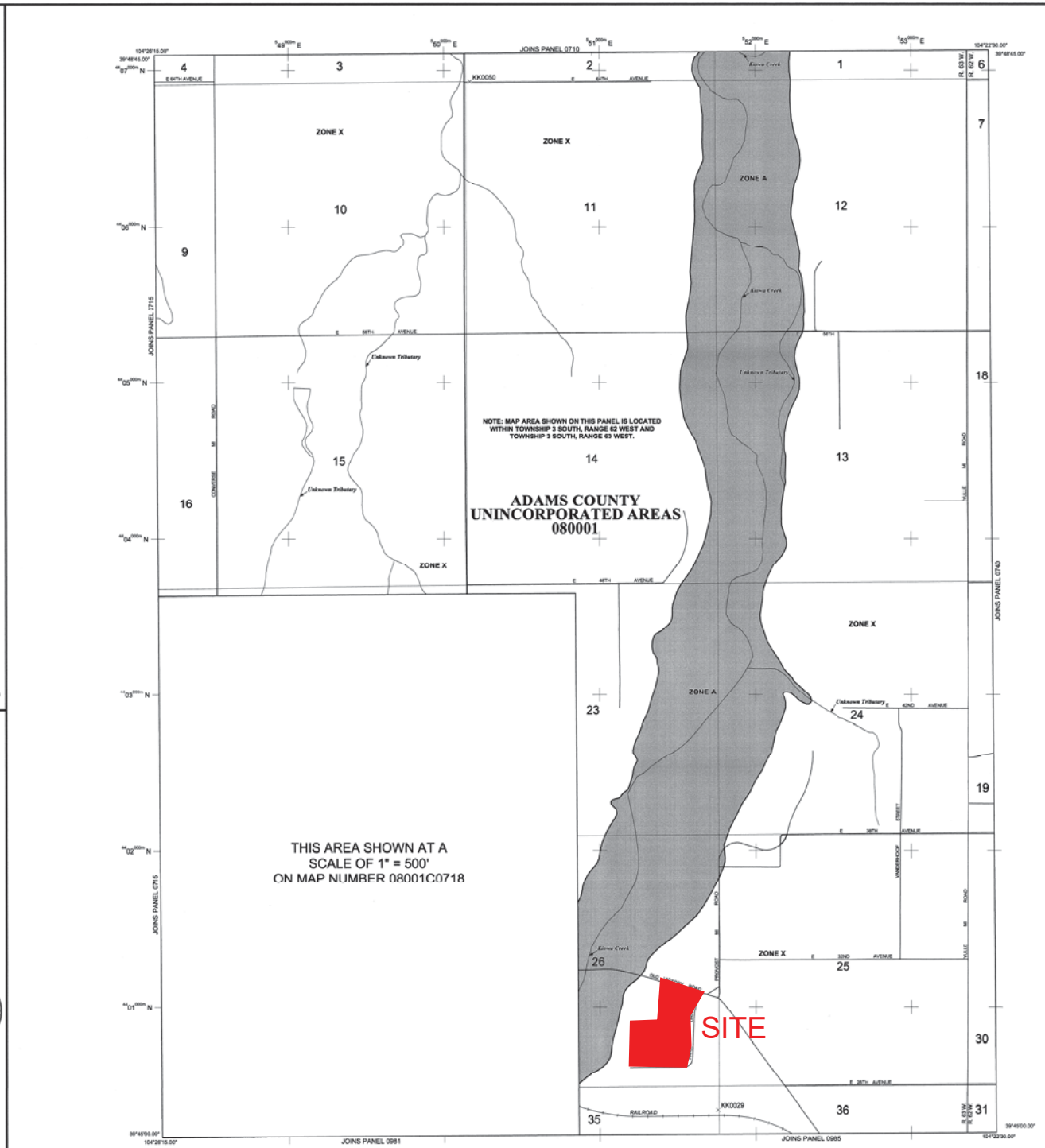
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which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

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 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 FEMA Map Service Center 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/.

This digital Flood Insurance Rate Map (FIRM) was produced through a cooperative partnership between the State of Colorado Water Conservation Board, the Urban Drainage and Flood Control District, and the Federal Emergency Management Agency (FEMA). The State of Colorado Water Conservation Board and the Urban Drainage and Flood Control District have implemented a long-term approach of floodplain management to reduce the costs associated with flooding. As part of this effort, both the State of Colorado and the Urban Drainage and Flood Control District have joined in Cooperating Technical Partner agreements with FEMA to produce this digital FIRM.

Additional flood hazard information and resources are available from local communities, the Colorado Water Conservation Board, and the Urban Drainage and Flood Control District.



LEGEND

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

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

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

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

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

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

OTHER FLOOD AREAS

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

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

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

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

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

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000 N — 1000-meter Universal Transverse Mercator grid ticks, zone 13
- 6000000 M — 5000-foot grid ticks: Alabama State Plane coordinate system, east zone (FIPSZONE 0101), Transverse Mercator
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 16, 1999
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
March 5, 2007 - to update map format.

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

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

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0720H

FIRM
FLOOD INSURANCE RATE MAP
ADAMS COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 720 OF 1150
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ADAMS COUNTY	080001	0720	H

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
08001C0720H
MAP REVISED
MARCH 5, 2007

Federal Emergency Management Agency

APPENDIX 3

GRASS BUFFER DESIGN FORMS

Design Procedure Form: Grass Buffer (GB)

UD-BMP (Version 3.07, March 2018)

Designer: AT
Company: Kelly Development Services
Date: November 14, 2023
Project: Oak Park Drive
Location: Design Point 2

1. Design Discharge A) 2-Year Peak Flow Rate of the Area Draining to the Grass Buffer	Q_2 = 1.0 cfs
2. Minimum Width of Grass Buffer	W_G = 20 ft
3. Length of Grass Buffer (14' or greater recommended)	L_G = 14 ft
4. Buffer Slope (in the direction of flow, not to exceed 0.1 ft / ft)	S_G = 0.005 ft / ft
5. Flow Characteristics (sheet or concentrated) A) Does runoff flow into the grass buffer across the entire width of the buffer?	Choose One: (•) Yes ( ) No
B) Watershed Flow Length	F_L = 700 ft
C) Interface Slope (normal to flow)	S_I = 0.035 ft / ft
D) Type of Flow Sheet Flow: $F_L * S_I \leq 1$ Concentrated Flow: $F_L * S_I > 1$	CONCENTRATED FLOW
6. Flow Distribution for Concentrated Flows	Choose One: ( ) None (sheet flow) ( ) Slotted Curbing ( ) Level Spreader (•) Other (Explain): Historic gentle slope left undisturbed.
7 Soil Preparation (Describe soil amendment)	None - minimal disturbance
8 Vegetation (Check the type used or describe "Other")	Choose One: (•) Existing Xeric Turf Grass ( ) Irrigated Turf Grass ( ) Other (Explain):
9. Irrigation (*Select None if existing buffer area has 80% vegetation AND will not be disturbed during construction.)	Choose One: ( ) Temporary ( ) Permanent (•) None*
10. Outflow Collection (Check the type used or describe "Other")	Choose One: ( ) Grass Swale ( ) Street Gutter ( ) Storm Sewer Inlet (•) Other (Explain): Sheet flow in historic pattern

Notes:
Watershed length based upon future home site

Design Procedure Form: Grass Buffer (GB)

UD-BMP (Version 3.07, March 2018)

Designer: AT
Company: Kelly Development Services
Date: November 14, 2023
Project: Oak Park Drive
Location: Design Point 4

1. Design Discharge A) 2-Year Peak Flow Rate of the Area Draining to the Grass Buffer	Q_2 = 0.1 cfs
2. Minimum Width of Grass Buffer	W_G = 1 ft
3. Length of Grass Buffer (14' or greater recommended)	L_G = 14 ft
4. Buffer Slope (in the direction of flow, not to exceed 0.1 ft / ft)	S_G = 0.005 ft / ft
5. Flow Characteristics (sheet or concentrated) A) Does runoff flow into the grass buffer across the entire width of the buffer?	Choose One: (•) Yes ( ) No
B) Watershed Flow Length	F_L = 350 ft
C) Interface Slope (normal to flow)	S_I = 0.030 ft / ft
D) Type of Flow Sheet Flow: $F_L * S_I \leq 1$ Concentrated Flow: $F_L * S_I > 1$	CONCENTRATED FLOW
6. Flow Distribution for Concentrated Flows	Choose One: ( ) None (sheet flow); ( ) Slotted Curbing; ( ) Level Spreader; (•) Other (Explain): Historic gentle slope left undisturbed.
7 Soil Preparation (Describe soil amendment)	None - minimal disturbance
8 Vegetation (Check the type used or describe "Other")	Choose One: (•) Existing Xeric Turf Grass; ( ) Irrigated Turf Grass; ( ) Other (Explain):
9. Irrigation (*Select None if existing buffer area has 80% vegetation AND will not be disturbed during construction.)	Choose One: ( ) Temporary; ( ) Permanent; (•) None*
10. Outflow Collection (Check the type used or describe "Other")	Choose One: ( ) Grass Swale; ( ) Street Gutter; ( ) Storm Sewer Inlet; (•) Other (Explain): Sheet flow in historic pattern

Notes:
Watershed length based upon future home site

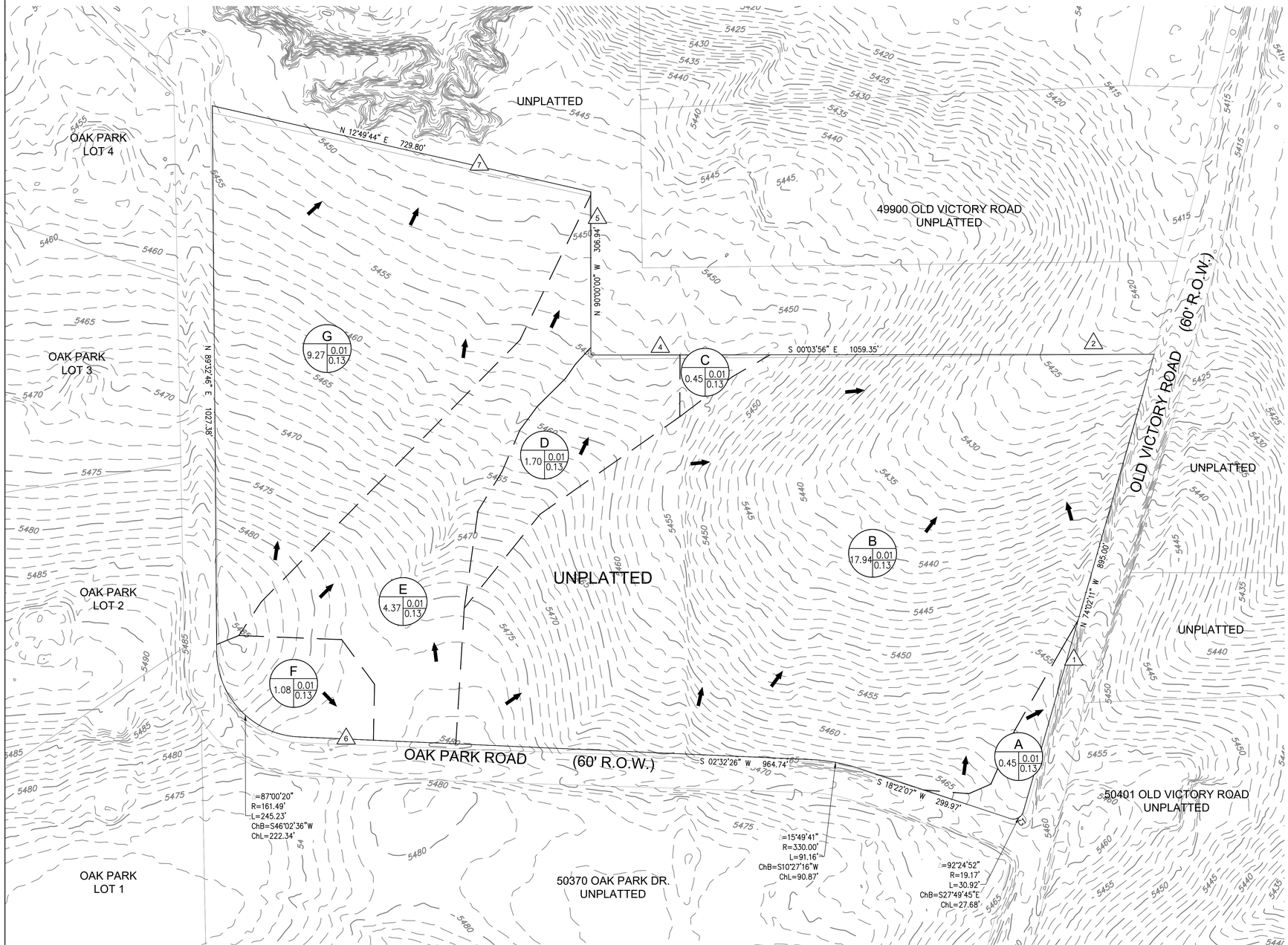
Design Procedure Form: Grass Buffer (GB)

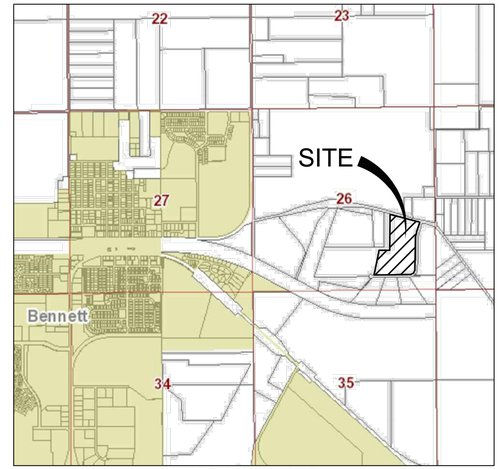
UD-BMP (Version 3.07, March 2018)

Designer: AT
Company: Kelly Development Services
Date: November 14, 2023
Project: Oak Park Drive
Location: Design Point 7

1. Design Discharge A) 2-Year Peak Flow Rate of the Area Draining to the Grass Buffer	Q_2 = 0.8 cfs
2. Minimum Width of Grass Buffer	W_G = 16 ft
3. Length of Grass Buffer (14' or greater recommended)	L_G = 14 ft
4. Buffer Slope (in the direction of flow, not to exceed 0.1 ft / ft)	S_G = 0.005 ft / ft
5. Flow Characteristics (sheet or concentrated) A) Does runoff flow into the grass buffer across the entire width of the buffer?	Choose One: (•) Yes ( ) No
B) Watershed Flow Length	F_L = 450 ft
C) Interface Slope (normal to flow)	S_I = 0.030 ft / ft
D) Type of Flow Sheet Flow: $F_L * S_I \leq 1$ Concentrated Flow: $F_L * S_I > 1$	CONCENTRATED FLOW
6. Flow Distribution for Concentrated Flows	Choose One: ( ) None (sheet flow) ( ) Slotted Curbing ( ) Level Spreader (•) Other (Explain): Historic gentle slope left undisturbed.
7 Soil Preparation (Describe soil amendment)	None - minimal disturbance
8 Vegetation (Check the type used or describe "Other")	Choose One: (•) Existing Xeric Turf Grass ( ) Irrigated Turf Grass ( ) Other (Explain):
9. Irrigation (*Select None if existing buffer area has 80% vegetation AND will not be disturbed during construction.)	Choose One: ( ) Temporary ( ) Permanent (•) None*
10. Outflow Collection (Check the type used or describe "Other")	Choose One: ( ) Grass Swale ( ) Street Gutter ( ) Storm Sewer Inlet (•) Other (Explain): Sheet flow in historic pattern

Notes:
Watershed length based upon future home site





VICINITY MAP
1"=3000'

SUB-BASIN ID
A
0.34 | 0.93 | 0.85
100 YR. 'C'
AREA (AC)
5 YR. 'C'
1 DESIGN PT
SUB-BASIN BOUNDARY
FLOW ARROW

HISTORIC BASIN RUNOFF SUMMARY TABLE

Basin Designation	Basin Area (ac)	C_5	C_{100}	Impervious %	T (min)	Q_5 (cfs)	Q_{100} (cfs)
A	0.45	0.01	0.13	2.0%	11.7	0.02	0.40
B	17.94	0.01	0.13	2.0%	17.9	0.53	13.15
C	0.21	0.01	0.13	2.0%	10.8	0.01	0.20
D	1.70	0.01	0.13	2.0%	13.3	0.06	1.44
E	4.37	0.01	0.13	2.0%	16.0	0.14	3.39
F	1.08	0.01	0.13	2.0%	11.4	0.04	0.98
G	9.27	0.01	0.13	2.0%	15.4	0.30	7.33

HISTORIC DESIGN POINT RUNOFF SUMMARY TABLE

Design Point	Contributing Basins	Contributing Area (acres)	T (min)	Q_5 (cfs)	Q_{100} (cfs)
1	A	0.45	11.7	0.02	0.40
2	B	17.94	17.9	0.78	13.15
3	C	0.21	10.8	0.01	0.20
4	D	1.70	13.3	0.06	1.44
5	E	4.37	16.0	0.14	3.39
6	F	1.08	11.4	0.04	0.98
7	G	9.27	15.4	0.43	7.33

NORTH
GRAPHIC SCALE
100 0 50 100
1 INCH = 100 FEET

CAUTION NOTICE TO CONTRACTORS
THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUCH CALL 811 AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATIONS OF THE UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATED ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THESE PLANS.

PREPARED FOR:
F & C REALTY
DAN FAHEY
56321 E. COLFAX AVE.
STRASBURG, CO 80136
PH: 303-916-4155
FAX:

#	DATE	REVISION DESCRIPTION	BY
1			
2			
3			
4			
5			

project no.	2109.01	drawn by	
date	11/14/2023 – 12:52 pm	designed by	
dwg.	HDR.dwg	approved by	

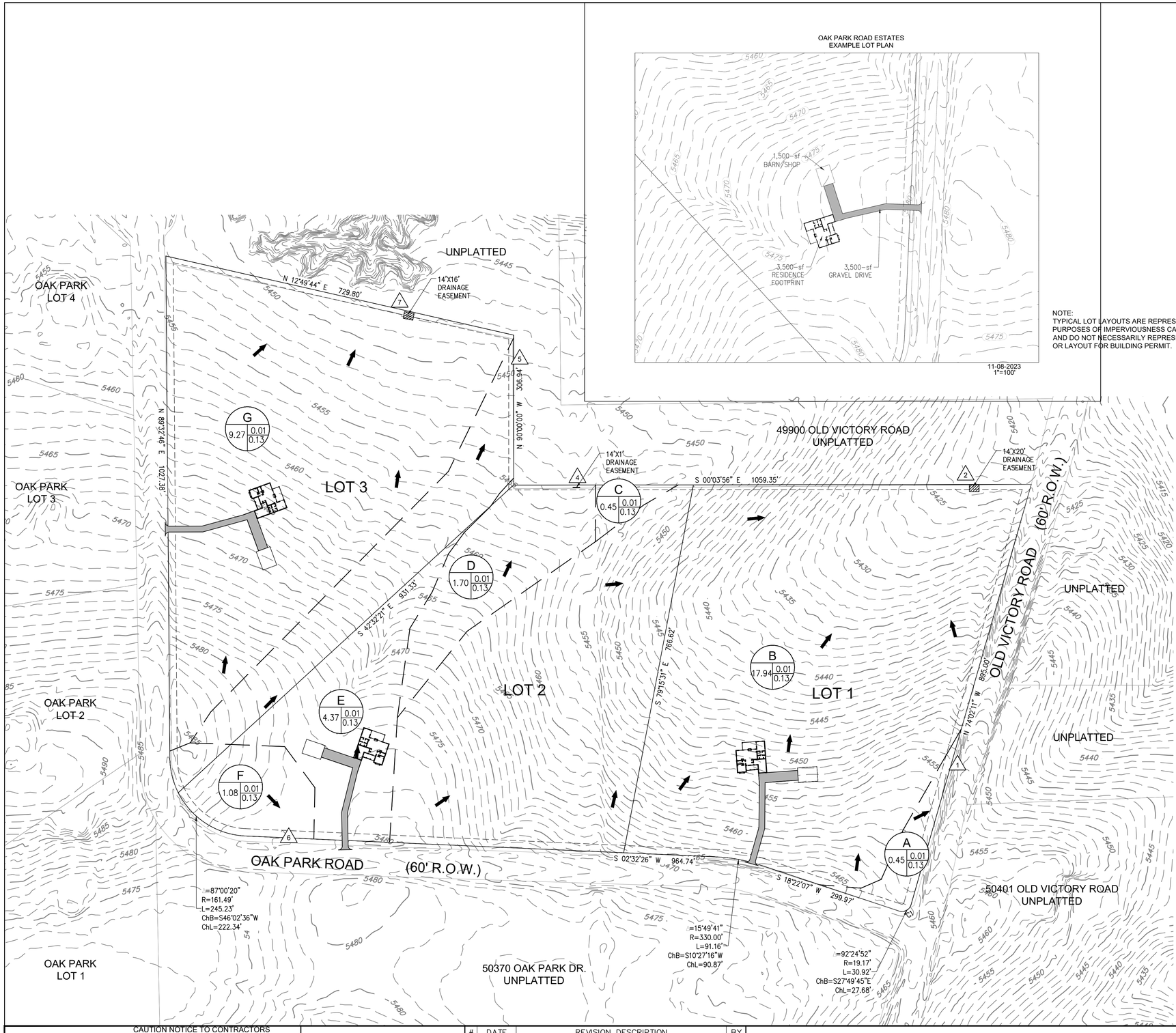
OAK PARK ROAD ESTATES

LEVEL III DRAINAGE REPORT
PRE-DEVELOPED CONDITION

KELLY DEVELOPMENT SERVICES, LLC
9301 SCRUB OAK DR
LONE TREE, CO 80124
303-888-6338
greg@kellydev.com

SHEET NUMBER
DR1
SHEET 1
PROJECT NUMBER
2209.01

[V-TO.dwg] [V-MA.dwg] [EXMA.dwg] [TBh.dwg]
Drawing name: D:\Projects\2209 OAR\C3D\Sheet\Drainage\HDR.dwg Nov 14, 2023 - 12:52pm



BASIN RUNOFF SUMMARY TABLE

Basin Designation	Basin Area (ac)	C_5	C_{100}	Impervious %	T (min)	Q_5 (cfs)	Q_{100} (cfs)
A	0.45	0.01	0.13	2.0%	11.7	0.99	0.40
B	18.02	0.02	0.14	3.0%	17.9	0.01	13.99
C	0.21	0.01	0.13	2.0%	10.8	0.06	0.20
D	1.70	0.01	0.13	2.0%	16.0	0.62	1.44
E	4.45	0.04	0.16	6.0%	11.4	0.04	4.28
F	1.08	0.01	0.13	2.0%	15.4	0.79	0.98
G	9.35	0.03	0.14	3.9%	0.0	0.00	8.24

DESIGN POINT RUNOFF SUMMARY TABLE

Design Point	Contributing Basins	Contributing Area (acres)	T (min)	Q_5 (cfs)	Q_{100} (cfs)
1	A	0.45	11.7	0.02	0.40
2	B	18.02	17.9	0.99	13.99
3	C	0.21	10.8	0.01	0.20
4	D	1.70	13.3	0.06	1.44
5	E	4.45	16.0	0.62	4.28
6	F	1.08	11.4	0.04	0.98
7	G	9.35	15.4	0.79	8.24

GRASS BUFFER DESIGN SUMMARY

Design Point	Q_5 (cfs)	Length (ft)	Width (ft)
2	0.99	14	20
4	0.06	14	1
7	0.79	14	16

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#	DATE	REVISION DESCRIPTION	BY
1			
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3			
4			

project no.	2109.01	drawn by	
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OAK PARK ROAD ESTATES

LEVEL III DRAINAGE PLAN

KELLY DEVELOPMENT SERVICES, LLC
9301 SCRUB OAK DR
LONE TREE, CO 80124
303-888-6338
greg@kellydev.com

SHEET NUMBER
DR2
SHEET 1
PROJECT NUMBER
2209.01