DRAINAGE REPORT

Quick Quack Marksheffel & Constitution

2437 Marksheffel Road
Colorado Springs, CO 80951

Submitted To: El Paso County

Prepared For: QQ Colorado LLC

492 W 1200 N
Springville, UT 84663
Phone (801) 400-1944

Prepared By: Elevate Engineering

492 W 1200 N
Springville, UT 84663
Phone (801) 718-5993

March 1, 2019

PCD File No. PPR-19-004

ELEVATE
ENGINEERING

APPENDIX A

Design Engineer's Statement:

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

1-31-19

Larvin Pollock, PE
Licensed Professional Engineer
State of Colorado No. 54520

Date

COLORADO LICENSED
LARVIN POLLOCK
1-31-19
0054520
PROFESSIONAL ENGINEER

Developer's Statement:

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

1/31/2019

Joseph Earnest, Developer
Lonestar Builders Inc.
492 West 1200 North
Springville, UT 84663

Date

EL PASO COUNTY:

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.

Approved
by Elizabeth Nijkamp
El Paso County Planning and Community Development
on behalf of Jennifer Irvine, County Engineer, ECM Administrator
04/23/2019 11:44:40 AM

Jennifer Irvine, PE
County Engineer/ECM Administrator

Date

APPENDICES

I. GENERAL LOCATION AND DESCRIPTION

This report is prepared for the Quick Quack Car Wash development located on a 1.04-acre site at 2437 Marksheffel Road, Colorado Springs, Colorado. This site is bound by Marksheffel Road to the west, commercial to the east, a vacant lot to the north, and to the south. See Appendix C for a vicinity map.

The total site area consists of 1.04 +/- acres, of which 0.89 acres are being disturbed with the project. Proposed improvements include the construction of a car wash and associated vacuum stalls, parking, sidewalks and landscaping.

Runoff from this site was designed to be captured by a future storm sewer pipe system within the future development (Lot 3) which is to connect to the existing storm system which outfalls to the existing pond immediately west of the King Soopers building, as identified in the *Final Drainage Report*.

No surface waters are within 1,000 feet of the site.

II. DRAINAGE BASINS

This site shall consist of four drainage basins: PR-1, 2, & 3 with one offsite basin (OS-1).

The site lies within FEMA zone "AE" described as an area of minimal flood hazard; according to the flood insurance rate map with community panel no. 08041C0756G, effective on December 7, 2018. See Appendix D for the FEMA FIRM.

III. 4 STEP PROCESS

STEP 1: Runoff Reduction Practices

It is not practical, because of the size of this site, to implement grass buffers or swales. Quick Quack sites typically require a 30 foot drive aisle between vacuum stalls and the drive aisle on this site has been reduced to 28 feet. This and other measures have been taken to minimize impervious areas on this site.

Step 2: Stabilize Drainageways

This step is not applicable as there are no drainage ways located at this site.

Step 3: Provide Water Quality Capture Volume (WQCV)

The runoff from this site will be directed to an existing water quality pond just southeast of the site. This pond has been sized to accommodate runoff from this development.

Step 4:

This site is considered a new development and specialized BMPs, where necessary, will be implemented.

IV. ANALYSIS

The proposed runoff from the four drainage basins (PR-1, PR-2, PR-3 & OS-1) will be collected into two new catch basins and three curb inlet boxes on-site. These will connect to the existing storm sewer system that flows to the southwest detention pond. Runoff from the offsite basin (OS-1) will be directed southwest, which conforms with the existing pattern of the *Final Drainage Report* for SEC of Marksheffel Rd. & Constitution Ave. prepared by Galloway & Company, Inc. dated September 14, 2015 (PCD File No. SF1511). Drainage basins PR-1, 2 & 3 will be directed to their respective catch basins.

The overall imperviousness of the site, after final stabilization, has been calculated to be 73%. The assumed overall imperviousness of the site, in Basin D5 (flowing to SE pond), is 95%, as shown in the *Final Drainage Report*. Flowrates have been calculated for the 5 year event (3.23 cfs) and 100 year event (6.97 cfs), which is consistent with what was expected in Basin D5 described in the *Final Drainage Report*.

V. CONCLUSIONS

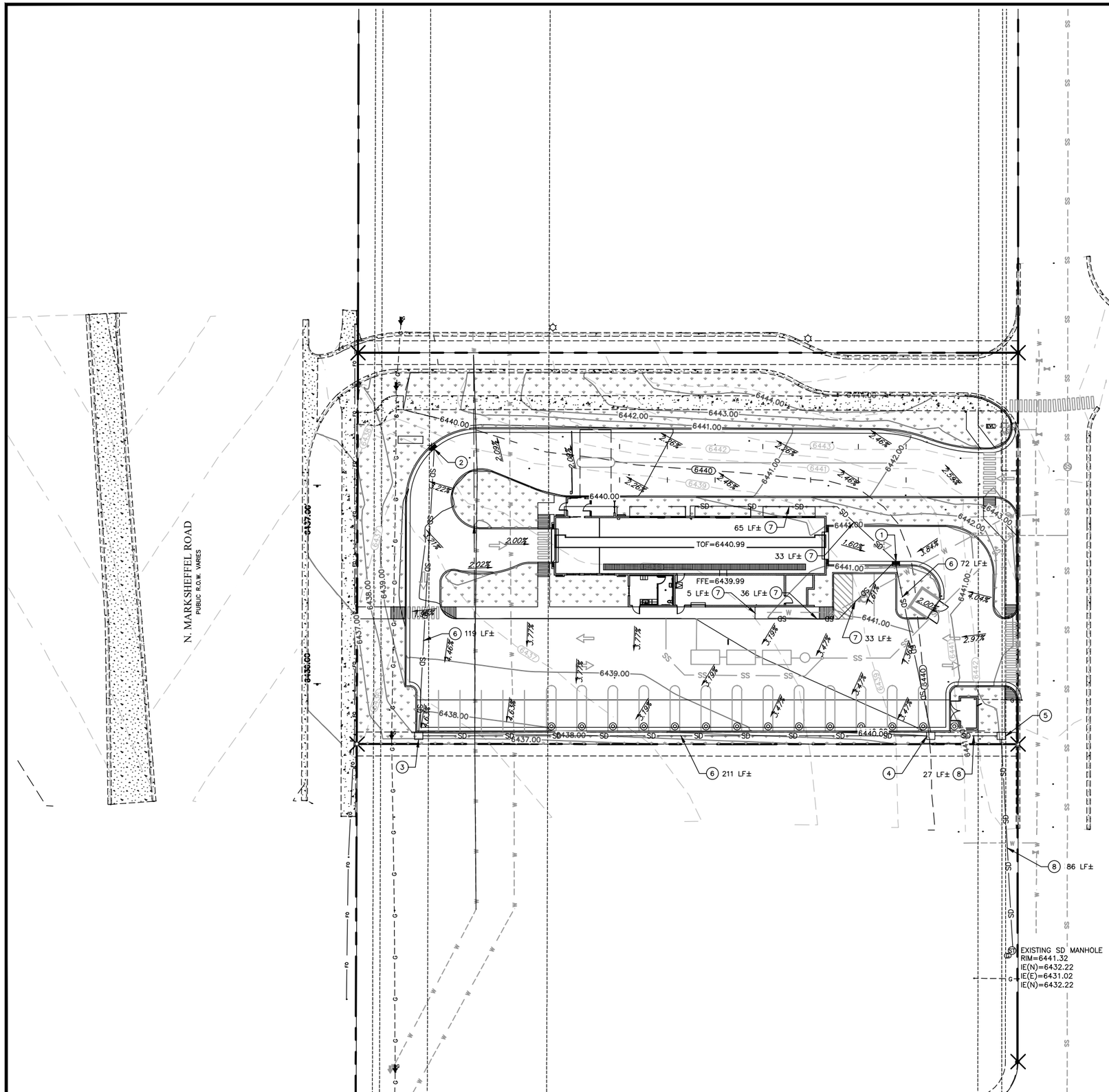
The Quick Quack car wash project has been designed according to the *Final Drainage Report* requirements. A composite runoff coefficient calculation was performed for this site (See Appendix B).

Drainage Fee Note:

Typically, drainage fees are paid with the final plat with no additional fees due with site plan applications. The drainage fees for this project have been paid under the submission of the original plat for the development of which the project is located within.

APPENDIX A

DRAINAGE PLAN



LEGEND

LOT LINES (PROPERTY)	
EXISTING CURB AND GUTTER	
PROPOSED CURB AND GUTTER	
PROPOSED STORM DRAIN LINE	SD
EXISTING STORM DRAIN LINE	SD
EASEMENT	
EXISTING FENCE	
GRADE BREAK	GRADE BREAK
FINISH GRADE CONTOUR LINES	4960
EXISTING GRADE CONTOUR LINES	4960
FINISH GRADE SLOPE	SLOPE
GRADE BREAK	GB
INVERT ELEVATION	IE
TOP OF GRATE	TOG
TOP OF ASPHALT	TA
TOP BACK OF CURB	TBC
PROPOSED	PROP
EXISTING	EX
FINISHED GRADE	FG
FINISHED FLOOR ELEVATION	FFE
BACK OF SIDEWALK	BOW
JUNCTION BOX	
CURB INLET BOX	

DESIGN NOTES:

1. INSTALL CURB INLET BOX PER APWA PLAN 315. SEE SHEET C-5 FOR DETAILS. RIM=6440.20 IE=6437.20
2. INSTALL CURB INLET BOX PER APWA PLAN 315. SEE SHEET C-5 FOR DETAILS. RIM=6439.29 IE=6436.29
3. INSTALL STANDARD INLET PER CITY OF COLORADO SPRINGS STANDARD INLET DETAIL. SEE SHEET C-5 FOR DETAILS. RIM=6437.42 IE=6435.69
4. INSTALL STANDARD INLET PER CITY OF COLORADO SPRINGS STANDARD INLET DETAIL. SEE SHEET C-5 FOR DETAILS. RIM=6442.39 IE=6434.63
5. INSTALL CLEANOUT BOX PER APWA PLAN 331. SEE SHEET C-5 FOR DETAILS. RIM=6440.39 IE=6434.55
6. INSTALL 12" ADS PIPE @ 0.5% MINIMUM SLOPE
7. ROOF DRAINS TO CONNECT TO STORM DRAIN SYSTEM WITH 6" ROOF DRAIN PIPE.
8. INSTALL 18" ADS PIPE @ 0.3% MINIMUM SLOPE

Know what's below. Call before you dig.

N

Scale In Feet

FILE # PPR-19-004

NO.	REVISIONS	BY	DATE

PROJECT ENGINEER: LP
DESIGNER: DL

ELEVATE ENGINEERING
492 WEST 1200 NORTH
SPRINGVILLE, UT 84663
PHONE: (801) 376-5983
taylor@elevateeng.com

ELEVATE ENGINEERING

QUICK QUACK CONSTITUTION DRAINAGE PLAN

2437 MARKSHEFFEL ROAD COLORADO SPRINGS, CO 80951

COLORADO LICENSED
TAYLOR POPPEN
4/17/2019
00364820
PROFESSIONAL ENGINEER

SHEET: C-2.1

DATE: Apr 17, 2019

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APPENDIX B

CALCULATIONS

* RUNOFF COEFFICIENTS USED				
	2-YEAR	5-YEAR	10-YEAR	100-YEAR
LANDSCAPE	0.02	0.08	0.15	0.35
PAVING	0.89	0.90	0.92	0.96
ROOFING	0.71	0.73	0.75	0.81
* Table 6-6 in CO Springs, Drainage Criteria Manual Updated				

RUNOFF COEFFICIENTS AND IMPERVIOUSNESS CALCS FOR PROPOSED DRAINAGE BASINS

BASIN DESIGN	TOTAL AREA (SF)	LANDSCAPE AREA (SF)	PAVED AREA (SF)	ROOF AREA (SF)	2-YEAR (C)	5-YEAR (C)	10-YEAR. (C)	100-YEAR. (C)	PERCENT IMPERVIOUS
PR-1	15,725	5,607	9,953	165	0.58	0.61	0.64	0.74	64%
PR-2	14,767	1,592	12,153	1,022	0.78	0.80	0.83	0.88	89%
PR-3	5,757	326	2,938	2,493	0.76	0.78	0.80	0.86	94%
TOTAL PR	**36,249**	**7,525**	**25,044**	**3,680**					**83%**
OS-1	8,804	5,086	3,718	0	0.39	0.43	0.48	0.61	42%
TOTAL LOT 3	**45,053**	**12,611**	**28,762**	**3,680**					**73%**

5-YR RUNOFF CALCS (RATIONAL METHOD)

BASIN INFORMATION				DIRECT RUNOFF				TOTAL RUNOFF			
DESIGN POINT	BASIN	AREA (acres)	RUNOFF (C)	Tc. (min)	C x A. (acres)	I (in/hr)	Q (cfs)	Tc. (min)	∑C x A (acres)	I (in/hr)	Q (cfs)
1	PR-1	0.36	0.61	6.59	0.22	4.75	1.04				
2	PR-2	0.34	0.80	5.00	0.27	5.17	1.40				
3	PR-3	0.13	0.78	5.00	0.10	5.17	0.53				
TOTAL								**6.59**	**0.59**	**4.75**	**2.82**
4	OS-1	0.20	0.43	6.02	0.09	4.89	0.42				
TOTAL LOT 3								**6.59**	**0.68**	**4.75**	**3.23**

Use minimum Time of Concentration = 5 minutes
Use composite coefficients

Rational Method: Q = CIA

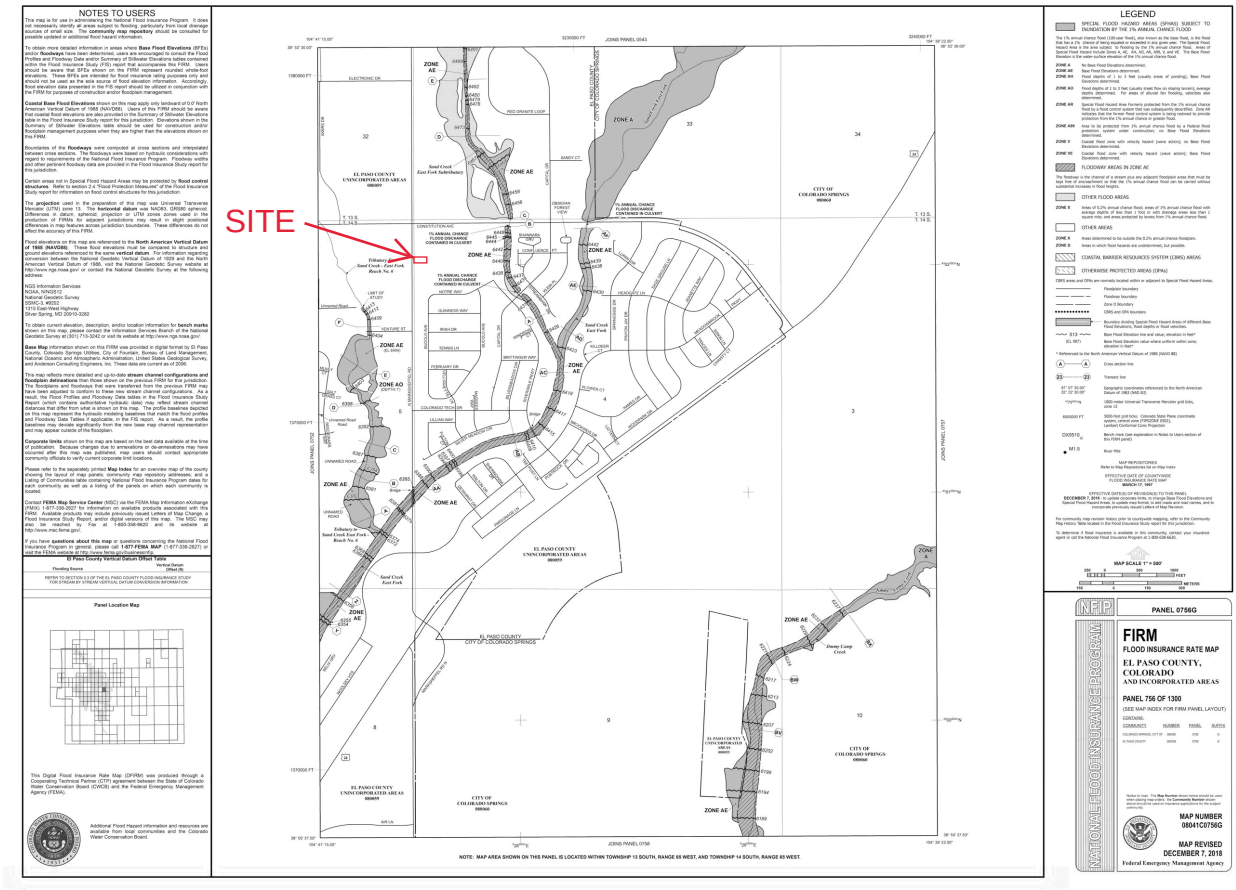
100-YR RUNOFF CALCS (RATIONAL METHOD)

BASIN INFORMATION				DIRECT RUNOFF				TOTAL RUNOFF			
DESIGN POINT	BASIN	AREA (acres)	RUNOFF (C)	Tc (min)	C x A (acres)	I (in/hr)	Q (cfs)	Tc (min)	∑C x A (acres)	I (in/hr)	Q (cfs)
1	PR-1	0.36	0.74	6.59	0.27	7.98	2.13				
2	PR-2	0.34	0.88	5.00	0.30	8.68	2.60				
3	PR-3	0.13	0.86	5.00	0.11	8.68	0.99				
TOTAL								**6.59**	**0.68**	**8.68**	**5.91**
4	OS-1	0.20	0.61	6.02	0.12	8.21	1.01				
TOTAL LOT 3								**6.59**	**0.80**	**8.68**	**6.97**

Use minimum Time of Concentration = 5 minutes
Use composite coefficients

APPENDIX C

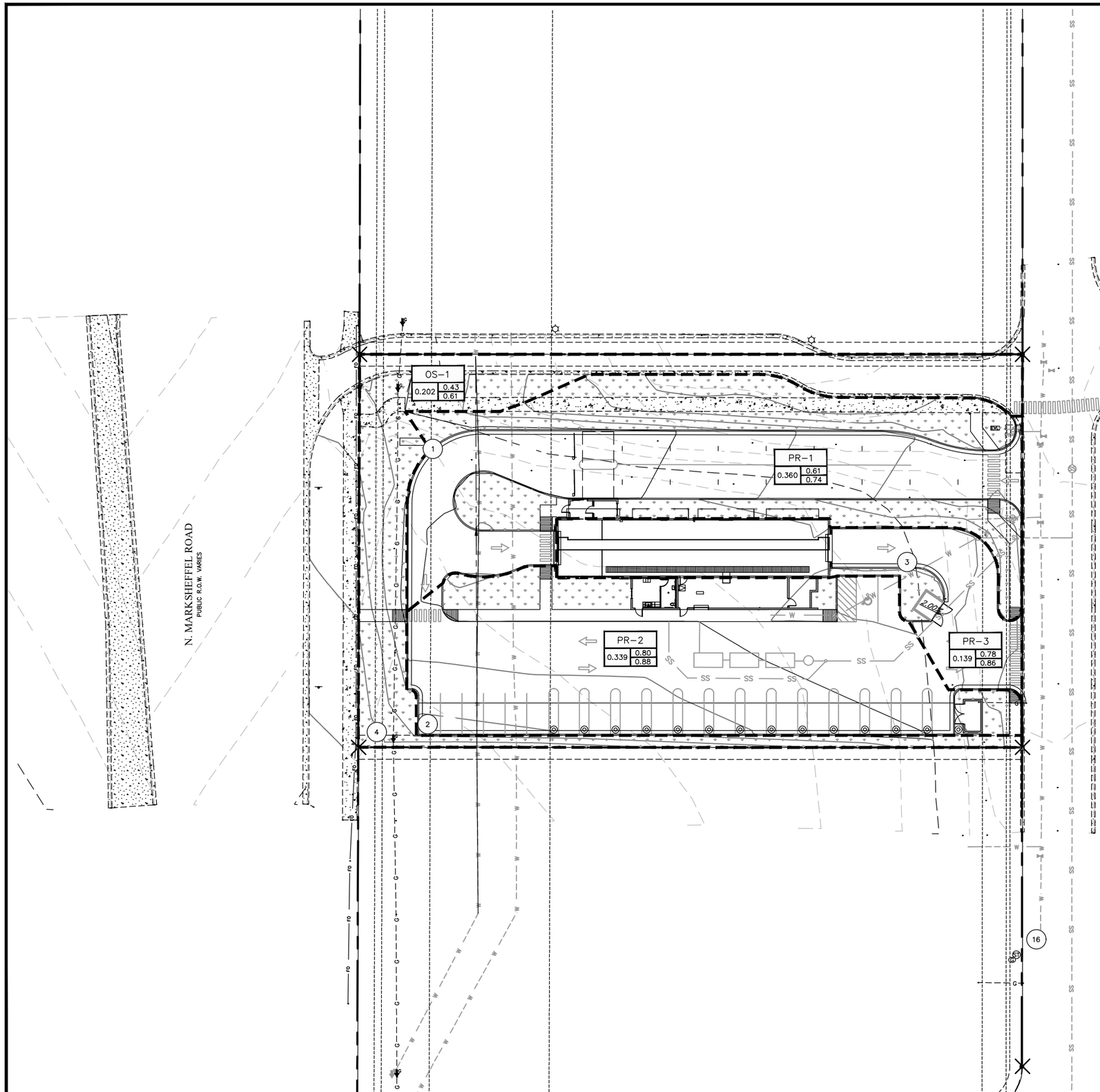
FEMA FIRM



VICINITY MAP

Lot 3 Claremont Ranch Filing No. 9B
El Paso County, State of Colorado

492 W 1200 N, Springville, Utah 84663 ▪ Phone (801) 718-5993



LEGEND

LOT LINES (PROPERTY)	
EXISTING CURB AND GUTTER	
PROPOSED CURB AND GUTTER	
EASEMENT	
DRAINAGE BASIN BOUNDARY	
FINISH GRADE CONTOUR LINES	4960
EXISTING GRADE CONTOUR LINES	4960
PROPOSED DRAINAGE BASIN	PR-#
OFFSITE DRAINAGE BASIN	OS-#
DESIGN POINTS	##

PR-1 | 0.339 | 0.61 | 0.74

- PROPOSED BASIN DESIGNATION
- 5-YEAR RUNOFF COEFFICIENT
- 100-YEAR RUNOFF COEFFICIENT
- BASIN AREA IN ACRES

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N

0 20 40 60
Scale In Feet

FILE # PPR-19-004

NO.	REVISIONS	BY	DATE

PROJECT ENGINEER: LP
DESIGNER: DL

ELEVATE ENGINEERING
492 WEST 1200 NORTH
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ELEVATE ENGINEERING

QUICK QUACK CONSTITUTION DRAINAGE BASIN PLAN

2437 MARKSHEFFEL ROAD COLORADO SPRINGS, CO 80951

COLORADO LICENSED
KEVIN POLLOCK
4/17/2019
0004820
PROFESSIONAL ENGINEER

SHEET:
C-2.2

DATE:
Apr 17, 2019

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