

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

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Phone (801) 718-5993*

January 31, 2019



- I. GENERAL LOCATION AND DESCRIPTION
- II. DRAINAGE BASIN
- III. ANALYSIS
- IV. CONCLUSIONS

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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 D 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.

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. 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%. 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*.

IV. 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).

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.



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



1-31-19

Date

Developer's Statement:

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



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

1/31/2019

Date

EL PASO COUNTY:

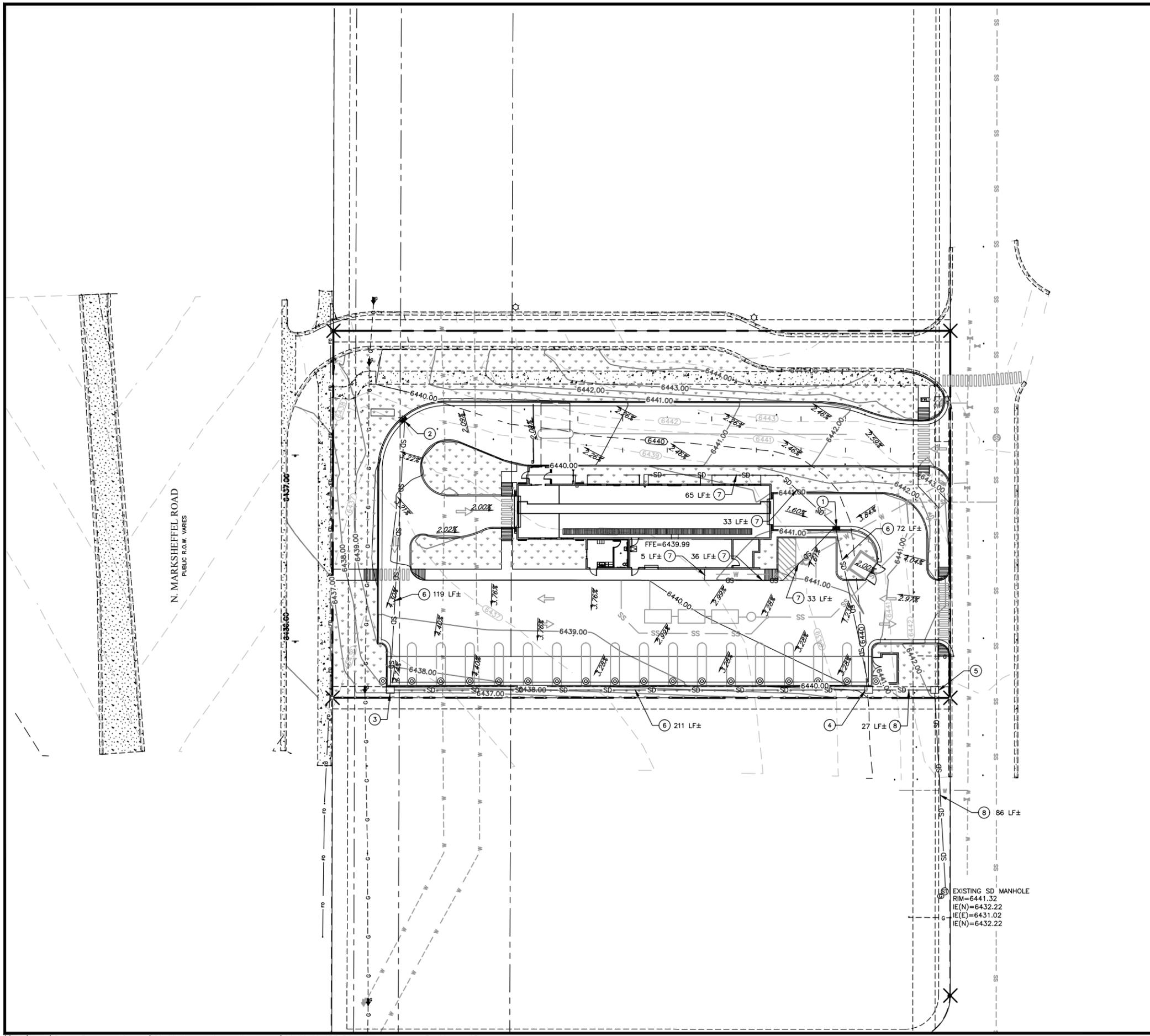
Filed in accordance with the requirements of the Drainage Criteria Manual, Volumes 1 & 2, El Paso County Engineering Criteria Manual and Land Development Code as amended.

Jennifer Irvine, PE
County Engineer/ECM Administrator

Date

APPENDIX B

DRAINAGE & DRAINAGE BASIN PLAN



LEGEND

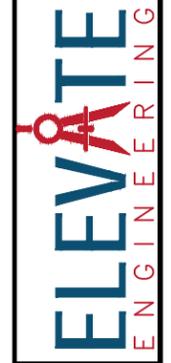
LOT LINES (PROPERTY)	
EXISTING CURB AND GUTTER	
PROPOSED CURB AND GUTTER	
PROPOSED STORM DRAIN LINE	
EXISTING STORM DRAIN LINE	
EXISTING FENCE	
GRADE BREAK	
FINISH GRADE CONTOUR LINES	
EXISTING GRADE CONTOUR LINES	
FINISH GRADE SLOPE	
GRADE BREAK	GB
INVERT ELEVATION	IE
TOP OF GRATE	TOG
TOP OF ASPHALT	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

Scale in Feet

NO.	REVISIONS	BY	DATE

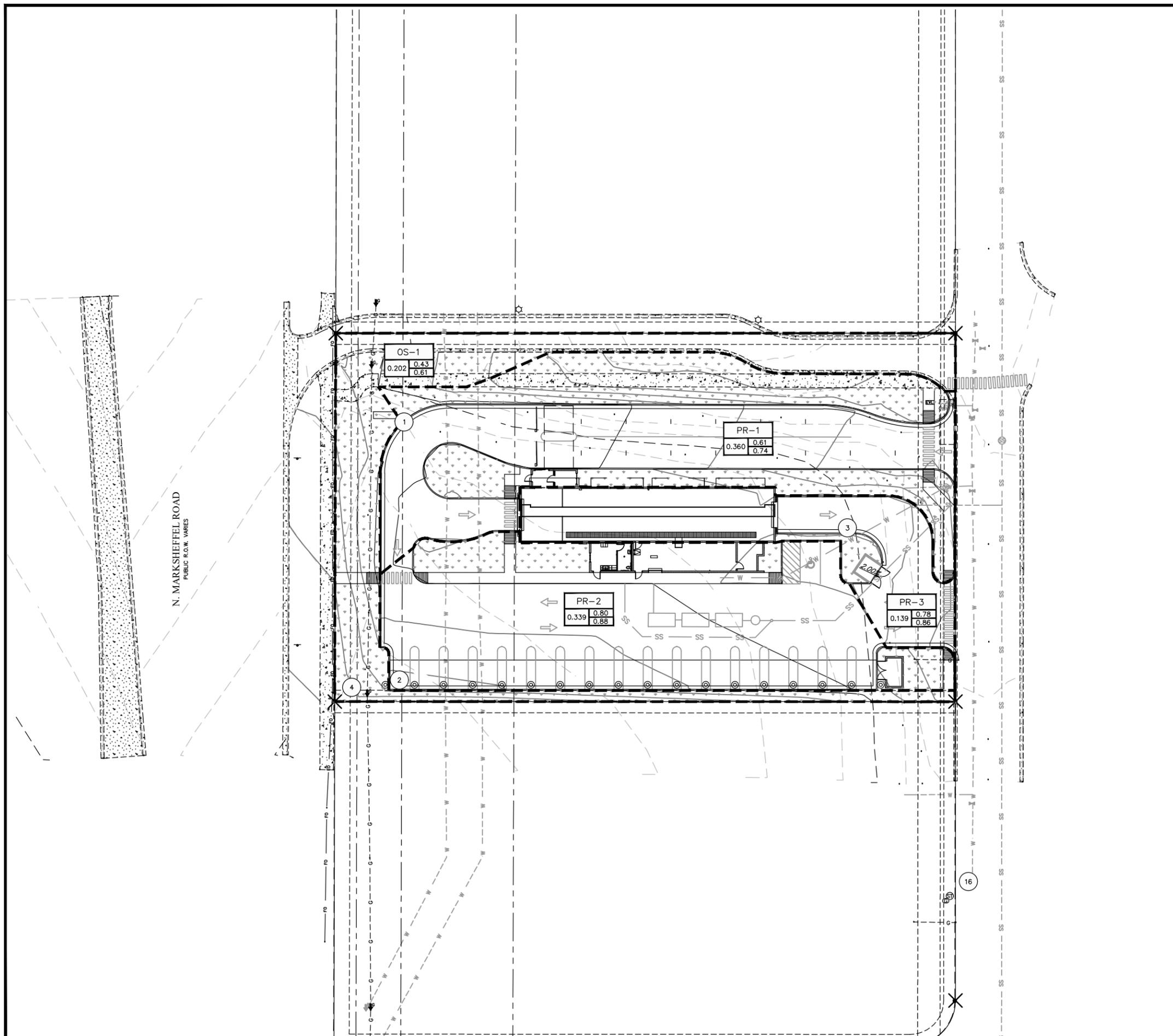
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 info@elevateeng.com



**QUICK QUACK CONSTITUTION
 DRAINAGE PLAN**
 2437 MARKSHEFFEL ROAD COLORADO SPRINGS, CO 80951



SHEET: **C-2.1**
 DATE: Jan 31, 2019



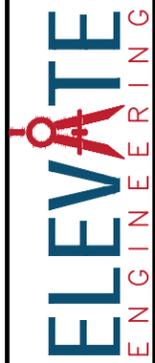
LEGEND

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

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

NO.	REVISIONS	BY	DATE

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**QUICK QUACK CONSTITUTION
 DRAINAGE BASIN PLAN**
 2437 MARKSHEFFEL ROAD COLORADO SPRINGS, CO 80951



SHEET:
C-2.2
 DATE:
 Jan 31, 2019

APPENDIX C

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)	ΣC 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)	ΣC 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

VICINITY MAP

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



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