

# DRAINAGE REPORT

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## **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***

**January 31, 2019**



Add "PCD File No. PPR-19-004"

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

APPENDICES

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DRAINAGE & DRAINAGE BASIN PLAN .....	APPENDIX B
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MAPS .....	APPENDIX D

## I. GENERAL LOCATION AND DESCRIPTION

ESQCP noted disturbance of 1.04 ac.

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

Provide a paragraph regarding general existing drainage characteristics.

Identify if the existing pond was designed for both water quality and flood control detention or just flood control.

Identify what the Gallow Report assumed for percent impervious.

Basins PR-1, 2 & 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*.

State whether or not the pond was sized to accommodate developed flow from this lot.

## 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).

1. Add a paragraph regarding drainage and bridge fees.
2. Add a section regarding the 4-step process (see ECM Appendix I Section I.7.2). List each step and provide a narrative under each step regarding how each step was considered or implemented in the design process.

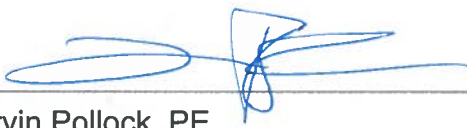
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## APPENDIX A

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### **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

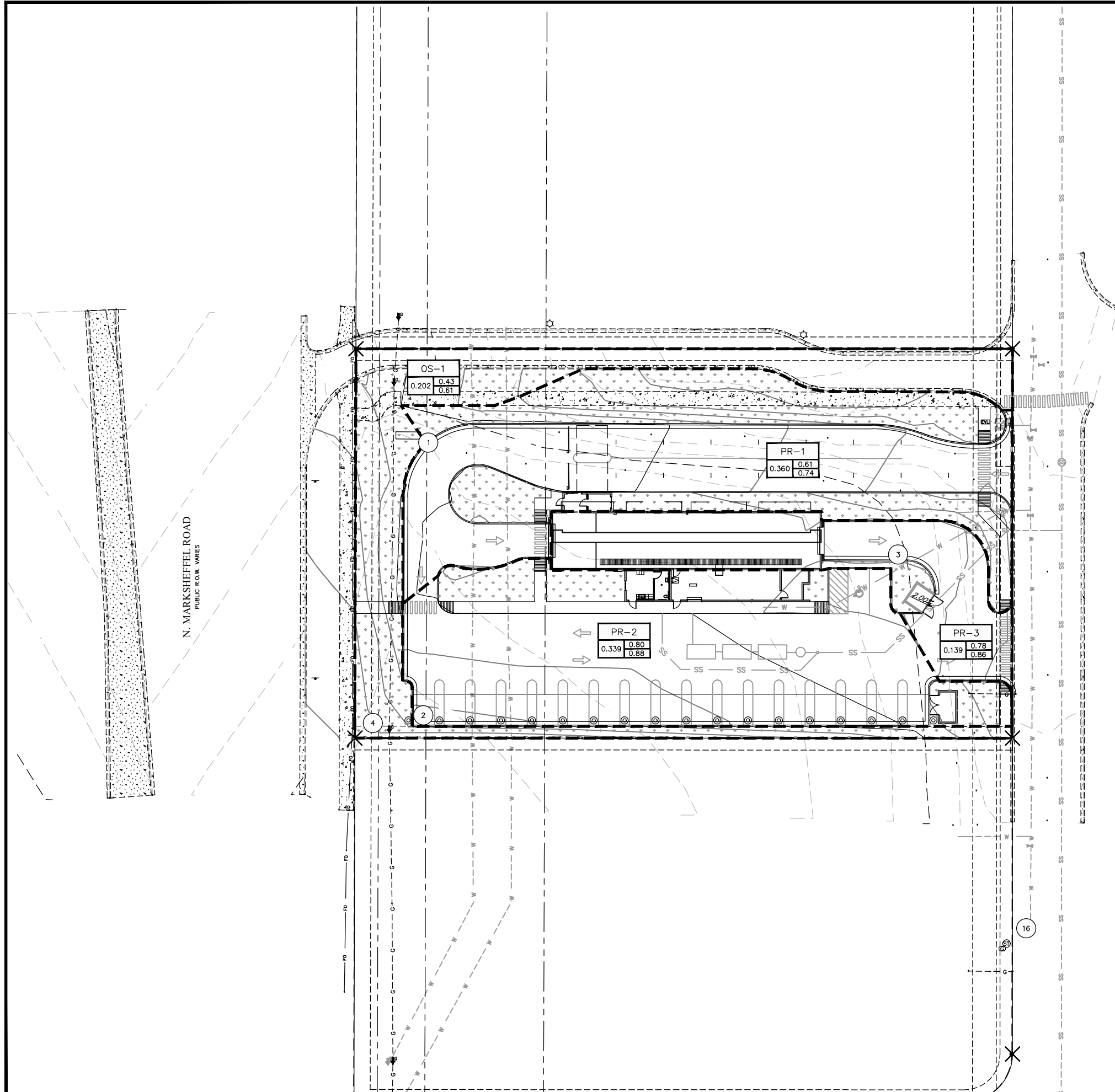
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# APPENDIX B

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## DRAINAGE & DRAINAGE BASIN PLAN





# 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%
<b>TOTAL PR</b>	<b>36,249</b>	<b>7,525</b>	<b>25,044</b>	<b>3,680</b>					<b>83%</b>
OS-1	8,804	5,086	3,718	0	0.39	0.43	0.48	0.61	42%
<b>TOTAL LOT 3</b>	<b>45,053</b>	<b>12,611</b>	<b>28,762</b>	<b>3,680</b>					<b>73%</b>

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				
<b>TOTAL</b>								<b>6.59</b>	<b>0.59</b>	<b>4.75</b>	<b>2.82</b>
4	OS-1	0.20	0.43	6.02	0.09	4.89	0.42				
<b>TOTAL LOT 3</b>								<b>6.59</b>	<b>0.68</b>	<b>4.75</b>	<b>3.23</b>
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				
<b>TOTAL</b>								<b>6.59</b>	<b>0.68</b>	<b>8.68</b>	<b>5.91</b>
4	OS-1	0.20	0.61	6.02	0.12	8.21	1.01				
<b>TOTAL LOT 3</b>								<b>6.59</b>	<b>0.80</b>	<b>8.68</b>	<b>6.97</b>
Use minimum Time of Concentration = 5 minutes											
Use composite coefficients											



**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

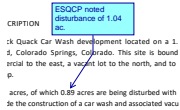
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Add "PCD File No. PPR-19-004"



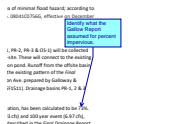
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ESQCP noted disturbance of 1.04 ac.



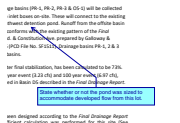
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Provide a paragraph regarding general existing drainage characteristics. Identify if the existing pond was designed for both water quality and flood control detention or just flood control.



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Identify what the Gallow Report assumed for percent impervious.



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State whether or not the pond was sized to accommodate developed flow from this lot.



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1. Add a paragraph regarding drainage and bridge fees.  
2. Add a section regarding the 4-step process (see ECM Appendix I Section I.7.2). List each step and provide a narrative under each step regarding how each step was considered or implemented in the design process.



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Move the drainage map to the end of the report.

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Move the drainage map to the end of the report.



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Delineate the property location on the firm map.