

STORM DRAINAGE CALCULATIONS

Double R Ranch
19292 El Toro Road
Silverado, California

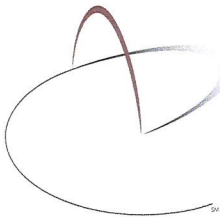
Prepared for:

Orange County Rescue Missions

1 Hope Drive
Tustin, California 92782

Orange County Permit Number:
PA23-0145

Prepared by:



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Date: December 4, 2023



Storm Drainage Design Narrative

PA23-0145

DESIGN NARRATIVE

Pursuant to meetings with the Orange County Director of Public Works, representatives of the County Attorney's office, Code Enforcement personnel and County Planning Department, our client, the Orange county Rescue Mission has reduced the scope of work for the immediate construction on the site to only those facilities that are required to support a total of 13 horses. The construction of a new fire road and the any remediation of a 'borrow area' created in the fall of 2021 will be the subject of further activity outside the scope of this project.

That means we will be erecting the two round pens for training, arena fencing and stalls for only 13 horses the property along with a hay storage facility adjacent to the stables We will also be constructing a new access road that will be permeable paving.. That is a considerable reduction in the scope of the project from that covered in grading permit GRD21-0178.

As agreed in our June meeting, there will be no site grading associated with this phase of the project. We will also not be altering any of the site drainage patterns. There is no storm drain construction contemplated as a part of this project.

The scope of work will increase the impermiable area as follows:

Hay Storage Facility	1,000 SF
13 Stalls	
@ 296 SF per stall =	<u>3,848 SF</u>
Increase in Impermiable Area	4,848 SF

As a part of the prior Grading Permit Application, we developed comprehensive drainage analysis for the entire property. We are including that study here for reference.

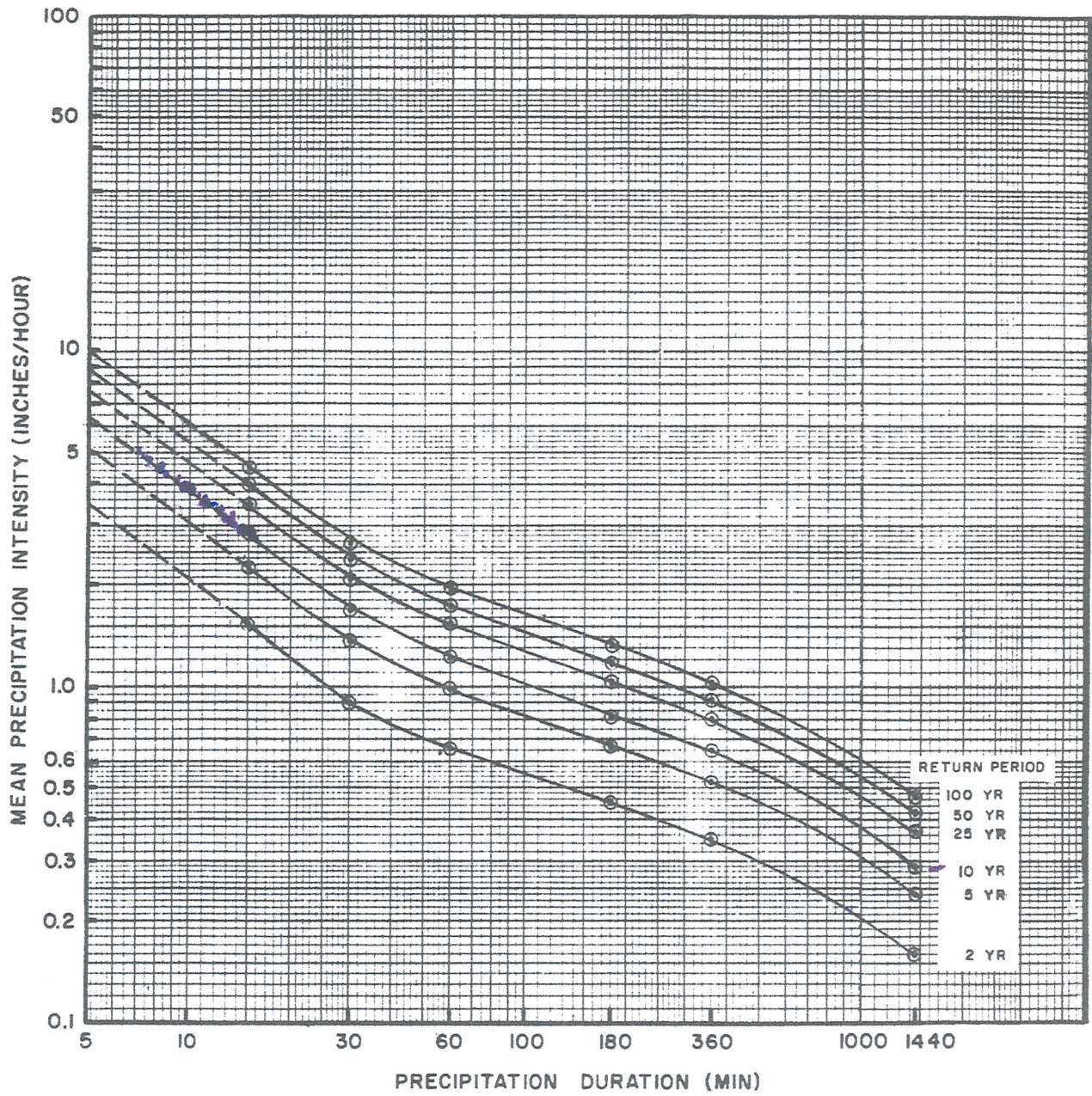
We are also including a drainage study that is centered on the Project Limits for this project. Again, the intent of our agreement reached in June of this year is to erect only the prefabricated stalls, the round pens, the arena fencing and the hay storage slab. There is to be no grading. We

are to site the stables and arena so that we take advantage of the site topography. It is our intent to not alter any of the existing drainage patterns on the site. The Hydrology Study for the Existing Conditions will also represent the conditions on site at the end of this project.

The drainage calculations included herein are accomplished in accordance with the requirements of the Orange County Hydrology Manual. They are provided herewith.

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Hydrology



**ORANGE COUNTY
HYDROLOGY MANUAL**

**MEAN PRECIPITATION
INTENSITIES FOR
MOUNTAINOUS AREA**

RATIONAL METHOD STUDY FORM

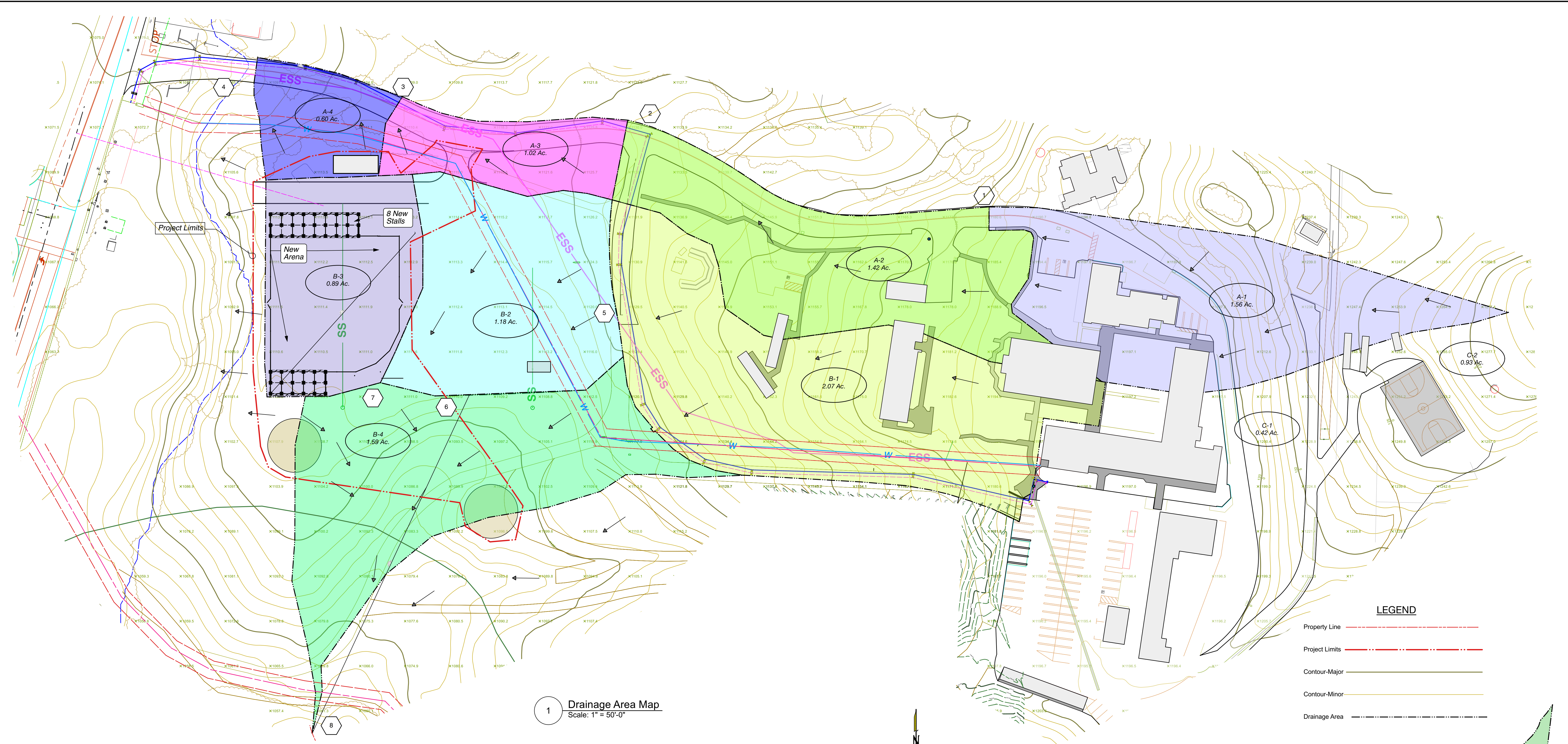
ORANGE COUNTY
HYDROLOGY MANUAL

STUDY NAME: Double R Ranch
16-YEAR STORM RATIONAL METHOD STUDY

System B - After Construction

Calculated by LIB Date 12/3/88
Checked by _____ Date _____
Page _____ of _____

Concentration Point	Area (Acres)		Soil Type	Dev. Type	T _f min.	T _c min.	I in/hr	F _m in/hr	F _m avg.	Q Total	Flow Path Length ft.	Slope ft./ft.	V ft./sec.	Hydraulics and Notes
	Subarea	Total												
5	2.07	2.07	D		1.2	7	5.0	0.2	0.2	8.94	220		3.84 / sec	
6	1.18	3.25	D	Poor Parking	1.38	8.2	4.4	0.2	0.2	12.28	241		3.44 / sec	
7	0.89	4.14	D	Poor Parking	1.9	9.6	3.9	0.2	0.2	13.78	450		4.64 / sec	
8	1.59	5.73	D	Poor Parking		11.5	3.4	0.2	0.2	16.5				

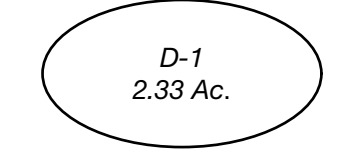


1 Drainage Area Map
Scale: 1" = 50'-0"

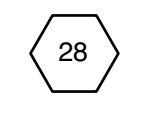
HYDROLOGY - DRAINAGE AREAS

POINT OF CONCENTRATION	AREA NUMBER	AREA (Ac.)	TIME OF CONCENTRATION (min)	RAINFALL INTENSITY 10 yr (in/hr)	Q (Before Construction) (cfs)	Q (After Construction) (cfs)
①	A-1	1.55	7	5.2	7.11	7.11
②	A-2	1.43	8	4.5	11.8	11.8
③	A-3	0.47	9	4.0	12.0	12.0
④	A-4	0.39	9.5	3.9	15.0	15.0
⑤	B-1	2.07	7	5.0	8.9	8.9
⑥	B-2	1.18	8.2	4.4	12.3	12.3
⑦	B-3	0.89	9.6	3.3	13.8	13.8
⑧	B-4	1.59	11.5	3.4	16.5	16.5

Drainage Area Label Name & Area



Concentration Point



(Color Varies)

PA23-0145

No.	DATE	REVISION	APPROVED

PROJECT: **Orange County Rescue Mission**
19292 El Toro Road
Silverado, CA

APPROVED:
County of Orange
Department of Public Works

J. T. Yeon
Civil Engineer
DATE: 07 05 23

DESIGNED:
JJB, Jr.

DRAWN:
JJB, Jr.

CHECKED:
JJB, JR.


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DRAINAGE AREA MAP

Department of Public Works
DRAWING
SHEET DA-1 OF 10

Hydraulic Calculations

HYDRAULIC CALCULATIONS

There are no hydraulic calculations submitted in the section because there is no storm drainage to be constructed in this project.