

# **Appendix 9A**

## **Hydrology Study**

**Magnolia Ranch Residential Project**  
**Initial Study**



# ALLARD ENGINEERING

civil engineering land surveying land planning

APN No. 152-040-003

Riverside County

13175 Orange Street  
(Magnolia Ranch)

## Preliminary Drainage Report

July 12, 2023

Prepared For:

Woodside 05S, LP  
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Prepared By:

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(909) 356-1815

Prepared under the supervision of:

Raymond J. Allard



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Raymond J. Allard, P.E. RCE 36052 Exp. 06-30-24

## DISCUSSION

### **Purpose:**

The purpose of this report is to provide hydraulic and hydraulic calculations for the proposed APN# 152-040-003 and provide the design of the onsite storm drain systems for the proposed SFR development. The project site is located in the city of Eastvale, County of Riverside. The site is north of Orange Street, south of Schleisman Road, and existing residential/commercial development to the east/west.

### ***Purpose***

The purpose of this report is to demonstrate how the developed runoff for the proposed tract of SFR development retained and mitigated water quality volume, and sizing of onsite storm drain system for 100-yr storm event. The retention/infiltration basin overflow into the proposed onsite storm drain system and drains to the existing City storm drain (48" RCP) in Orange Road.

### ***Criteria***

The criteria utilized for hydrologic and Hydraulic analysis is the Riverside County Hydrology Manual and Rational Method Hydrology Analysis utilizing AES software to perform computations. 100-yr storm analysis was performed for the developed & un-developed condition.

### ***Findings***

Due the preliminary nature of this report, only the 100-yr storm event for the developed hydrology has been analyzed.

In pre-developed condition, the site consist of a single structure residential development and drain out to the south to the existing City Storm Drain System in Orange Street via proposed lateral.

In the proposed developed (Tract of single family residential development) site will drain to the proposed two below surface retention/infiltration chamber system-1,2 for low flow infiltration. Once the retention/infiltration chamber system-1,2 reach its capacity, it will overflow into the onsite storm drain system and finally drains to the existing City Storm Drain System in Orange Street via the proposed 30" RCP lateral. It was calculated in proposed condition the site will generate a peak runoff flowrate of 22.8 from 100-yr storm event. All the proposed onsite storm drainage system are sized based the flow rate for 100-yr storm event. The proposed onsite drainage system conveys runoff to the existing storm drain system south of the site which is also consistence with the existing drainage pattern.

In pre-developed condition the runoff rate calculated as 15.5 CFS and in developed condition the runoff rate calculated as 22.8 CFS. There will be an increase of 7.3 CFS in developed condition. By implementing the Retention/Infiltration Chamber System-1,2 onsite, and by attenuation of runoff in the Retention/Infiltration Chamber System-1,2, the outflow from the site in developed

condition will substantially reduce and will be at or below the pre-developed condition runoff rate.

There is an existing storm drain system in Orange Street across the sites frontage which begins as a 42" and transitions to a 48" part way through the site. This storm drain had a lateral A-2 which was bulk headed off at the front of our site for this development to tie into. Lateral A-2 was estimated to carry 24.7 CFS, which is greater than the 22.8 CFS the project generates. Therefore, this project is consistent with the anticipated flows of the existing City storm drain system, and will not affect the HGL found on the city reference drawings. These plans are included as reference.

## **Hydrology Reference Material**



Bashkir St

Criolla Cir

Nordland Dr

Cheju Cir

Meadow

Schleisman Rd

Quarter Horse D

SITE: 8.28 AC

@ale Ln

Paul St

Calina St

Orange St

Orange St

N33.9588°

Ex City Storm Drain System (48" RCP)

age Grove Cir

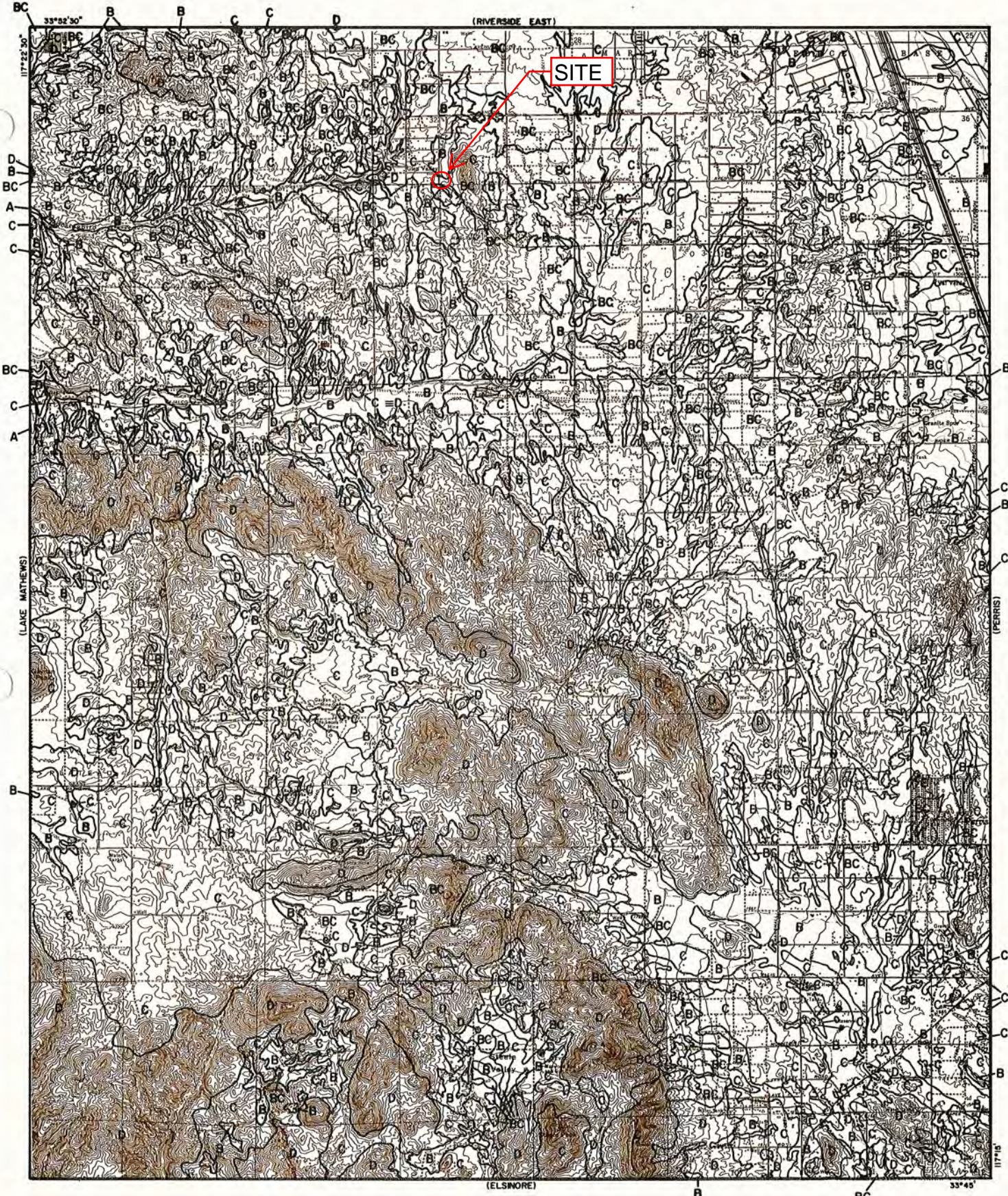
Midnight Rose Cir

Scholar Way

Brass Ring Ln  
Google Earth

© 2021 Google

700 ft



**LEGEND**

— SOILS GROUP BOUNDARY  
 A SOILS GROUP DESIGNATION

**RCFC & WCD**  
 Hydrology Manual

0 FEET 5000

**HYDROLOGIC SOILS GROUP MAP**  
**FOR**  
**STEELE PEAK**

0.50 in/hr

NOTES:  
Isobars based on NOAA Chart  
No. 11, Coastal, 1974

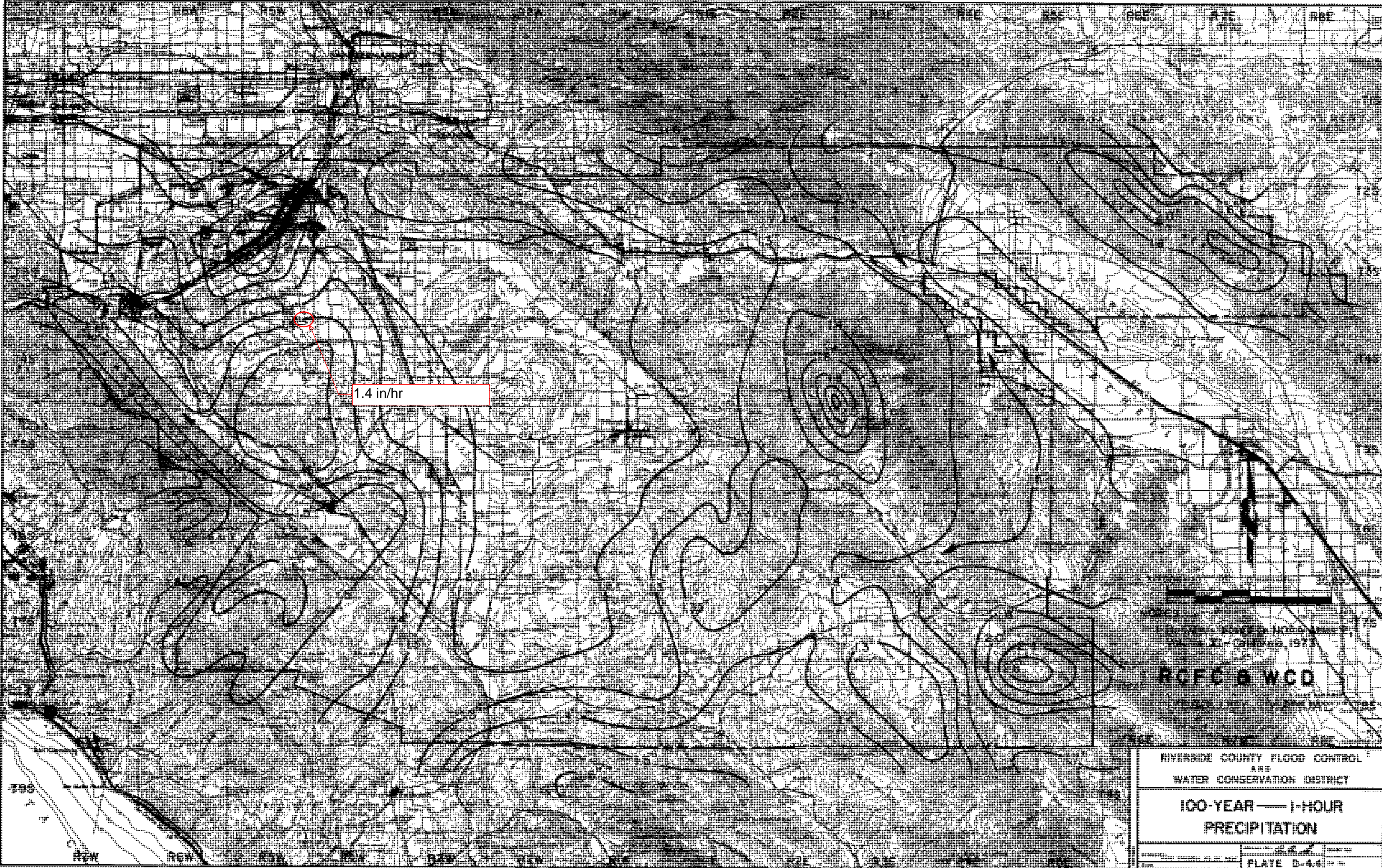
**RCFC & WCD**

RIVERSIDE COUNTY FLOOD CONTROL  
AND  
WATER CONSERVATION DISTRICT

**2-YEAR — 1-HOUR  
PRECIPITATION**

PLATE D-43





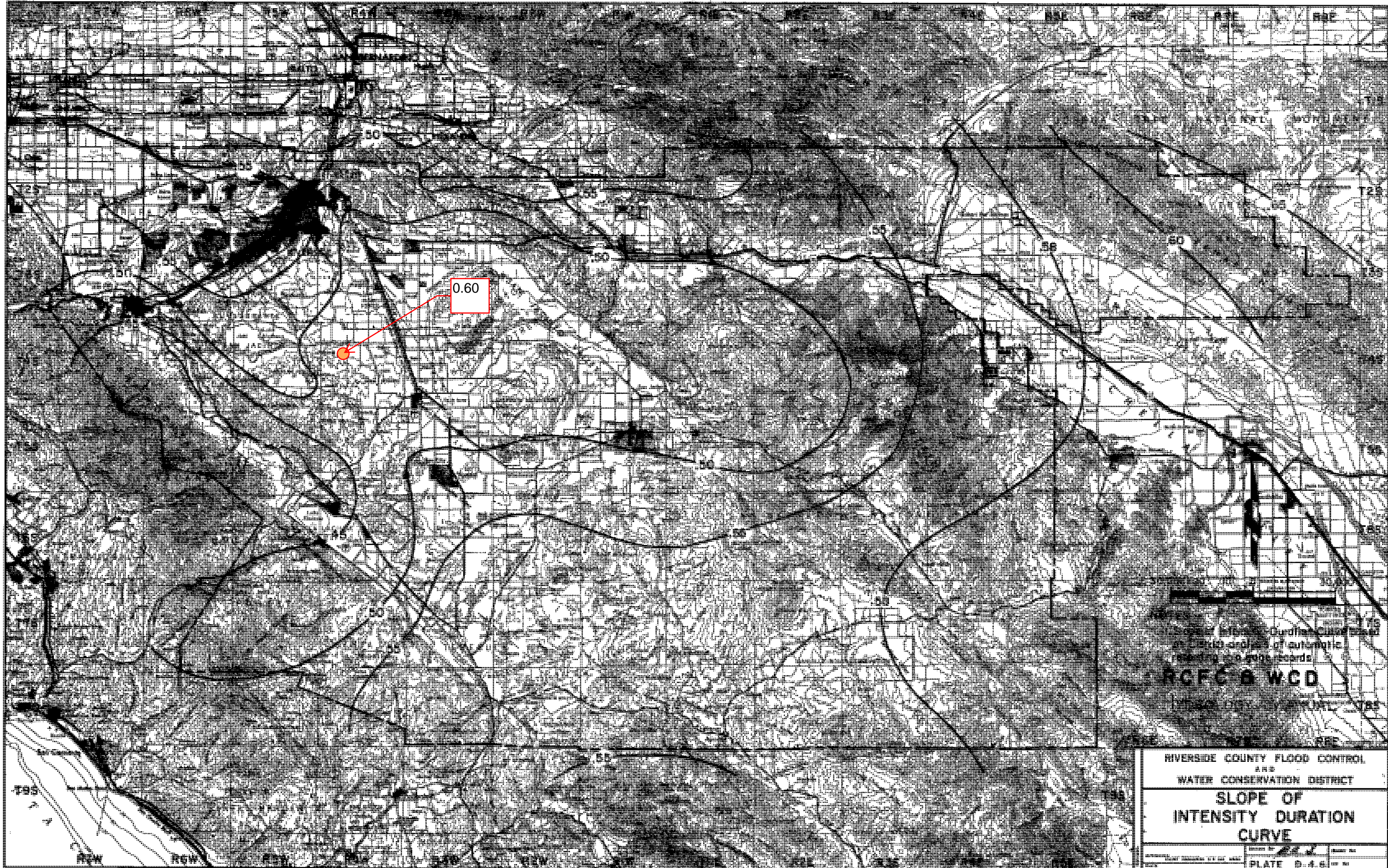
1.4 in/hr

RCFC & WCD

RIVERSIDE COUNTY FLOOD CONTROL  
AND  
WATER CONSERVATION DISTRICT

100-YEAR — 1-HOUR  
PRECIPITATION

PLATE D-4.4



0.60

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**RCFC & WCD**

RIVERSIDE COUNTY FLOOD CONTROL  
AND  
WATER CONSERVATION DISTRICT

**SLOPE OF  
INTENSITY DURATION  
CURVE**

PLATE D-4.4

**Rational Method Hydrology Analysis  
100-yr Storm Event  
(Developed Condition)**

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON  
RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT  
(RCFC&WCD) 1978 HYDROLOGY MANUAL  
(c) Copyright 1982-2016 Advanced Engineering Software (aes)  
(Rational Tabling Version 23.0)  
Release Date: 07/01/2016 License ID 1400

Analysis prepared by:

\*\*\*\*\* DESCRIPTION OF STUDY \*\*\*\*\*  
\* MLC EASTVALE, DEVELOPED CONDITION \*  
\* Peak Runoff Calculation \*  
\* 100yr storm event \*  
\*\*\*\*\*

FILE NAME: MLC.DAT  
TIME/DATE OF STUDY: 11:02 07/25/2022

-----  
USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
-----

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 12.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.60  
2-YEAR, 1-HOUR PRECIPITATION(INCH) = 0.550  
100-YEAR, 1-HOUR PRECIPITATION(INCH) = 1.400

COMPUTED RAINFALL INTENSITY DATA:  
STORM EVENT = 100.00 1-HOUR INTENSITY(INCH/HOUR) = 1.400

SLOPE OF INTENSITY DURATION CURVE = 0.5500  
RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD

NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL  
AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	HALF- WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT- / PARK- SIDE / SIDE / WAY	CURB GUTTER-GEOMETRIES: HEIGHT (FT)	MANNING WIDTH LIP (FT) (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00 0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:  
1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)  
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)  
\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 0.00 TO NODE 1.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
=====

ASSUMED INITIAL SUBAREA UNIFORM  
DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)  
TC = K\*[(LENGTH\*\*3)/(ELEVATION CHANGE)]\*\*.2  
INITIAL SUBAREA FLOW-LENGTH(FEET) = 448.00  
UPSTREAM ELEVATION(FEET) = 618.90  
DOWNSTREAM ELEVATION(FEET) = 613.00  
ELEVATION DIFFERENCE(FEET) = 5.90  
TC = 0.393\*[( 448.00\*\*3)/( 5.90)]\*\*.2 = 10.729  
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.608  
USER-SPECIFIED RUNOFF COEFFICIENT = .7987  
SOIL CLASSIFICATION IS "B"  
SUBAREA RUNOFF(CFS) = 10.72  
TOTAL AREA(ACRES) = 3.72 TOTAL RUNOFF(CFS) = 10.72

```

*****
FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 604.80 DOWNSTREAM(FEET) = 602.50
FLOW LENGTH(FEET) = 446.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 24.0 INCH PIPE IS 17.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.50
ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 10.72
PIPE TRAVEL TIME(MIN.) = 1.65 Tc(MIN.) = 12.38
LONGEST FLOWPATH FROM NODE 0.00 TO NODE 2.00 = 894.00 FEET.

*****
FLOW PROCESS FROM NODE      2.00 TO NODE      2.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.335
USER-SPECIFIED RUNOFF COEFFICIENT = .7924
SOIL CLASSIFICATION IS "B"
SUBAREA AREA(ACRES) = 4.56 SUBAREA RUNOFF(CFS) = 12.05
TOTAL AREA(ACRES) = 8.3 TOTAL RUNOFF(CFS) = 22.77
TC(MIN.) = 12.38

*****
FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 602.50 DOWNSTREAM(FEET) = 601.90
FLOW LENGTH(FEET) = 118.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 33.0 INCH PIPE IS 21.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.44
ESTIMATED PIPE DIAMETER(INCH) = 33.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 22.77
PIPE TRAVEL TIME(MIN.) = 0.36 Tc(MIN.) = 12.74
LONGEST FLOWPATH FROM NODE 0.00 TO NODE 3.00 = 1012.00 FEET.
=====
END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 8.3 TC(MIN.) = 12.74
PEAK FLOW RATE(CFS) = 22.77
=====
END OF RATIONAL METHOD ANALYSIS

```

**Rational Method Hydrology Analysis  
100-yr Storm Event  
(Existing Condition)**

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON  
RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT  
(RCFC&WCD) 1978 HYDROLOGY MANUAL  
(c) Copyright 1982-2016 Advanced Engineering Software (aes)  
(Rational Tabling Version 23.0)  
Release Date: 07/01/2016 License ID 1400

Analysis prepared by:

\*\*\*\*\* DESCRIPTION OF STUDY \*\*\*\*\*  
\* MLC ONTARION, EXISTING CONDITION \*  
\* Peak Runoff Calculation \*  
\* 100yr storm event \*  
\*\*\*\*\*

FILE NAME: MLC.DAT  
TIME/DATE OF STUDY: 11:58 07/25/2022

-----  
USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
-----

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 12.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.60  
2-YEAR, 1-HOUR PRECIPITATION(INCH) = 0.550  
100-YEAR, 1-HOUR PRECIPITATION(INCH) = 1.400

COMPUTED RAINFALL INTENSITY DATA:  
STORM EVENT = 100.00 1-HOUR INTENSITY(INCH/HOUR) = 1.400  
SLOPE OF INTENSITY DURATION CURVE = 0.5500

RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD  
NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL  
AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES

*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*									
NO.	HALF- WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)	
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150	

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:  
1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)  
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)  
\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 0.00 TO NODE 1.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

=====

ASSUMED INITIAL SUBAREA UNIFORM  
DEVELOPMENT IS SINGLE FAMILY(1-ACRE LOTS)  
TC = K\*[(LENGTH\*\*3)/(ELEVATION CHANGE)]\*\*.2  
INITIAL SUBAREA FLOW-LENGTH(FEET) = 775.00  
UPSTREAM ELEVATION(FEET) = 618.90  
DOWNSTREAM ELEVATION(FEET) = 613.90

ELEVATION DIFFERENCE(FEET) = 5.00  
TC = 0.469\*[( 775.00\*\*3)/( 5.00)]\*\*.2 = 18.418  
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.681  
USER-SPECIFIED RUNOFF COEFFICIENT = .6977  
SOIL CLASSIFICATION IS "B"  
SUBAREA RUNOFF(CFS) = 15.49  
TOTAL AREA(ACRES) = 8.28 TOTAL RUNOFF(CFS) = 15.49

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 8.3 TC(MIN.) = 18.42  
PEAK FLOW RATE(CFS) = 15.49

=====  
END OF RATIONAL METHOD ANALYSIS



## **Hydraulic Calculations Developed Condition**

## 12" SD Capacity Calc

```
*****
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Ver. 23.0 Release Date: 07/01/2016 License ID 1400
```

Analysis prepared by:

```
-----
TIME/DATE OF STUDY: 16:35 02/25/2021
=====
```

```
Problem Descriptions:
12" sd caPACITY
```

```
*****
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
```

```
-----
PIPE DIAMETER(FEET) = 1.000
FLOWDEPTH(FEET) = 0.950
PIPE SLOPE(FEET/FEET) = 0.0050
MANNINGS FRICTION FACTOR = 0.013000
>>>> NORMAL DEPTH FLOW(CFS) = 2.71
=====
```

```
NORMAL-DEPTH FLOW INFORMATION:
```

```
-----
NORMAL DEPTH(FEET) = 0.95
FLOW AREA(SQUARE FEET) = 0.77
FLOW TOP-WIDTH(FEET) = 0.436
FLOW PRESSURE + MOMENTUM(POUNDS) = 40.54
FLOW VELOCITY(FEET/SEC.) = 3.512
FLOW VELOCITY HEAD(FEET) = 0.192
HYDRAULIC DEPTH(FEET) = 1.77
FROUDE NUMBER = 0.465
SPECIFIC ENERGY(FEET) = 1.14
=====
```

## 24" SD Capacity Calc

```
*****
HYDRAULIC ELEMENTS - I PROGRAM PACKAGE
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```

Analysis prepared by:

```
-----
TIME/DATE OF STUDY: 11:07 07/25/2022
=====
```

```
Problem Descriptions:
24" SD CAPACITY CALC
S=0.005
```

```
*****
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
```

```
-----
PIPE DIAMETER(FEET) = 2.000
FLOWDEPTH(FEET) = 1.900
PIPE SLOPE(FEET/FEET) = 0.0050
MANNINGS FRICTION FACTOR = 0.013000
>>>> NORMAL DEPTH FLOW(CFS) = 17.19
=====
```

```
NORMAL-DEPTH FLOW INFORMATION:
```

```
-----
NORMAL DEPTH(FEET) = 1.90
FLOW AREA(SQUARE FEET) = 3.08
FLOW TOP-WIDTH(FEET) = 0.872
FLOW PRESSURE + MOMENTUM(POUNDS) = 362.61
FLOW VELOCITY(FEET/SEC.) = 5.575
FLOW VELOCITY HEAD(FEET) = 0.483
HYDRAULIC DEPTH(FEET) = 3.54
FROUDE NUMBER = 0.522
SPECIFIC ENERGY(FEET) = 2.38
=====
```

# 30" SD Capacity Calc

\*\*\*\*\*  
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Ver. 23.0 Release Date: 07/01/2016 License ID 1400

Analysis prepared by:

-----  
TIME/DATE OF STUDY: 10:57 07/25/2022  
=====

Problem Descriptions:  
30" SD CAPACITY CALC  
S=0.005

\*\*\*\*\*  
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<  
-----

PIPE DIAMETER(FEET) = 2.500  
FLOWDEPTH(FEET) = 2.450  
PIPE SLOPE(FEET/FEET) = 0.0050  
MANNINGS FRICTION FACTOR = 0.013000  
>>>> NORMAL DEPTH FLOW(CFS) = 30.65

=====

NORMAL-DEPTH FLOW INFORMATION:

-----

NORMAL DEPTH(FEET) =	2.45	
FLOW AREA(SQUARE FEET) =	4.89	
FLOW TOP-WIDTH(FEET) =	0.700	
FLOW PRESSURE + MOMENTUM(POUNDS) =		740.44
FLOW VELOCITY(FEET/SEC.) =	6.273	
FLOW VELOCITY HEAD(FEET) =	0.611	
HYDRAULIC DEPTH(FEET) =	6.98	> 22.1 CFS (Developed Condition Peak Runoff Rate)
FROUDE NUMBER =	0.418	
SPECIFIC ENERGY(FEET) =	3.06	

=====

\*Q100: 22.8 cfs<30.65 cfs  
\*Developed Condition  
Peak Runoff Rate

## Street Capacity Calc

\*\*\*\*\*  
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Analysis prepared by:

-----  
TIME/DATE OF STUDY: 12:31 07/25/2022  
=====

Problem Descriptions:  
STREET CAPACITY CALCULATION  
DEV. CONDITION  
MLC, EASTVALE

\*\*\*\*\*  
>>>STREETFLOW MODEL INPUT INFORMATION<<<

-----  
CONSTANT STREET GRADE(FEET/FEET) = 0.005000  
CONSTANT STREET FLOW(CFS) = 11.00  
AVERAGE STREETFLOW FRICTION FACTOR(MANNING) = 0.015000  
CONSTANT SYMMETRICAL STREET HALF-WIDTH(FEET) = 18.00  
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 8.00  
INTERIOR STREET CROSSFALL(DECIMAL) = 0.020000  
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020000  
CONSTANT SYMMETRICAL CURB HEIGHT(FEET) = 0.50  
CONSTANT SYMMETRICAL GUTTER-WIDTH(FEET) = 1.50  
CONSTANT SYMMETRICAL GUTTER-LIP(FEET) = 0.03125  
CONSTANT SYMMETRICAL GUTTER-HIKE(FEET) = 0.12500  
FLOW ASSUMED TO FILL STREET EVENLY ON BOTH SIDES  
=====

STREET FLOW MODEL RESULTS: <0.5' OK  
-----  
STREET FLOW DEPTH(FEET) = 0.44 ←  
HALFSTREET FLOOD WIDTH(FEET) = 15.68  
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.13  
PRODUCT OF DEPTH&VELOCITY = 0.94  
=====

# Catch Basin Sizing Calc

\*\*\*\*\*  
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Ver. 23.0 Release Date: 07/01/2016 License ID 1400

Analysis prepared by:

-----  
TIME/DATE OF STUDY: 17:57 03/24/2022  
=====

Problem Descriptions:  
CATCH BASIN SIZING CALC

\*\*\*\*\*  
>>>>FLOWBY CATCH BASIN INLET CAPACITY INPUT INFORMATION<<<<  
-----

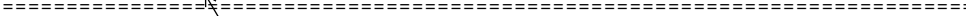
Curb Inlet Capacities are approximated based on the Bureau of  
Public Roads nomograph plots for flowby basins and sump basins.

STREETFLOW(CFS) = 10.00  
GUTTER FLOWDEPTH(FEET) = 0.50  
BASIN LOCAL DEPRESSION(FEET) = 0.18

-----  
FLOWBY BASIN ANALYSIS RESULTS:

BASIN WIDTH	FLOW INTERCEPTION
2.56	1.82
3.00	2.11
3.50	2.43
4.00	2.74
4.50	3.05
5.00	3.36
5.50	3.66
6.00	3.96
6.50	4.26
7.00	4.52
7.50	4.78
8.00	5.03
8.50	5.27
9.00	5.51
9.50	5.75
10.00	5.98
10.50	6.21
11.00	6.44
11.50	6.67
12.00	6.89
12.50	7.10
13.00	7.30
13.50	7.49
14.00	7.67
14.50	7.84
15.00	8.00
15.50	8.16
16.00	8.31
16.50	8.45
17.00	8.58
17.50	8.70
18.00	8.82
18.50	8.94
19.00	9.04
19.50	9.15
20.00	9.24

20.50	9.33
21.00	9.42
21.50	9.50
22.00	9.57
22.50	9.65
23.00	9.71
23.50	9.78
24.00	9.84
24.50	9.89
25.00	9.94
25.50	9.99
25.57	10.00

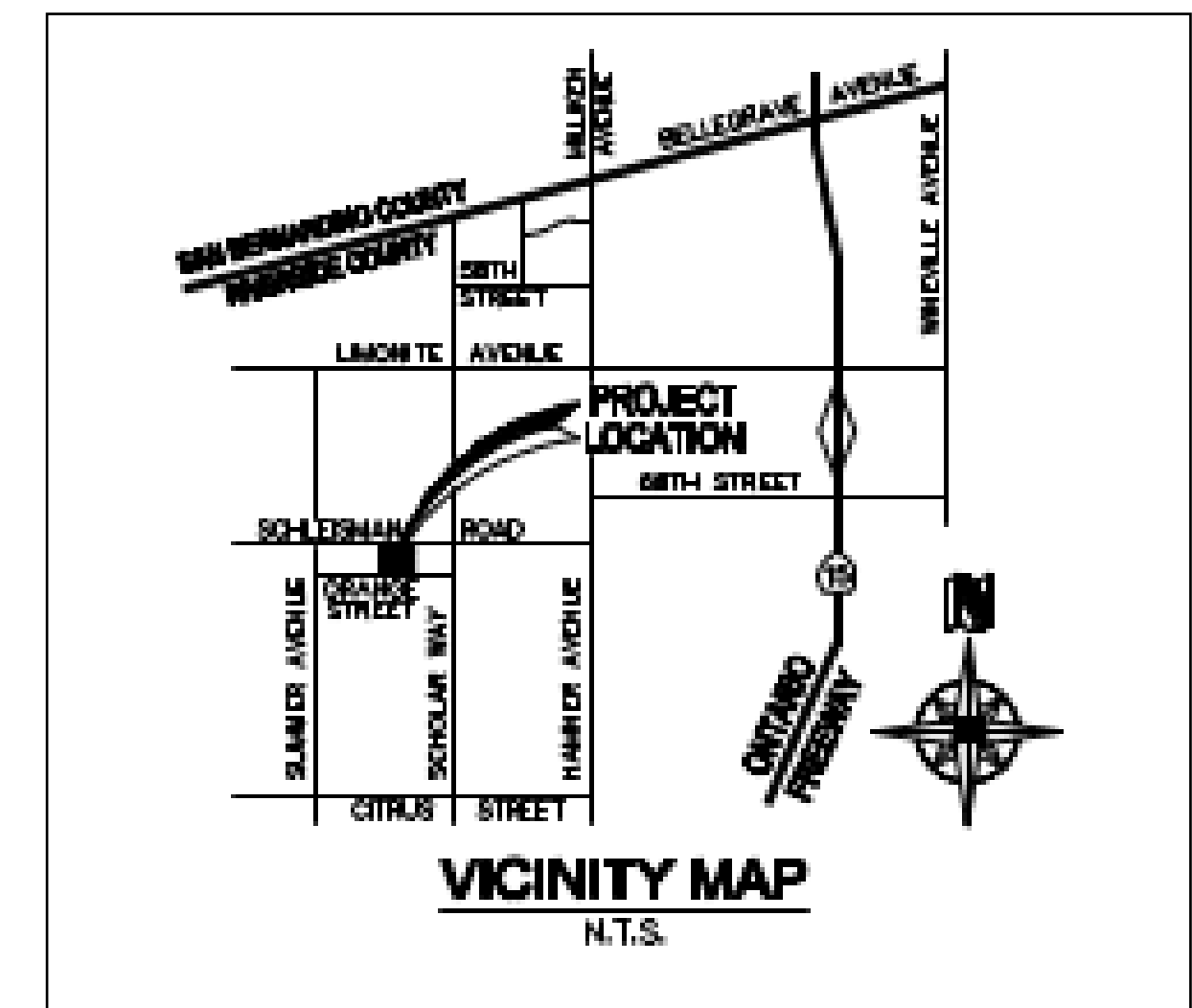
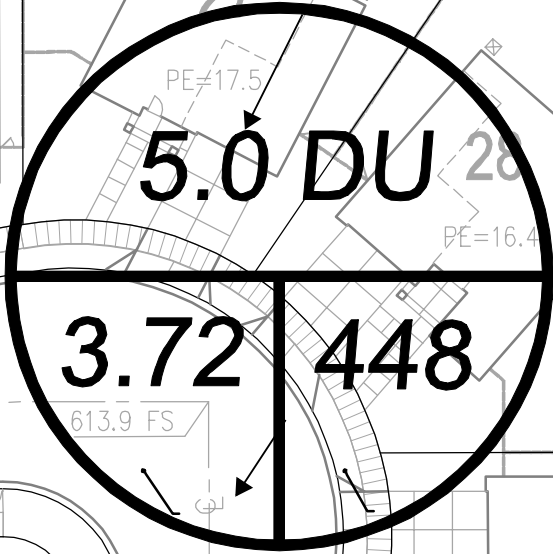
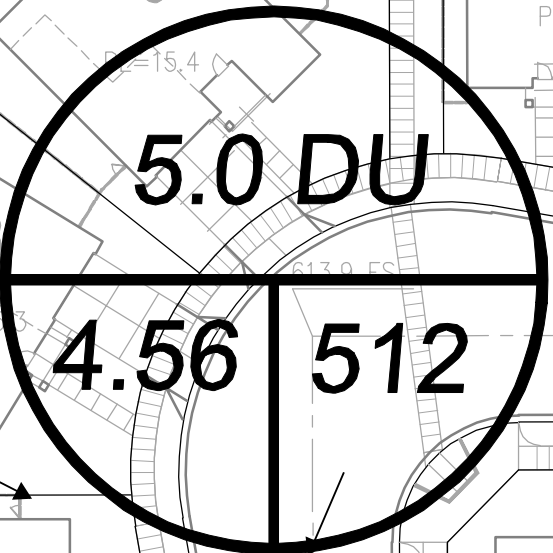
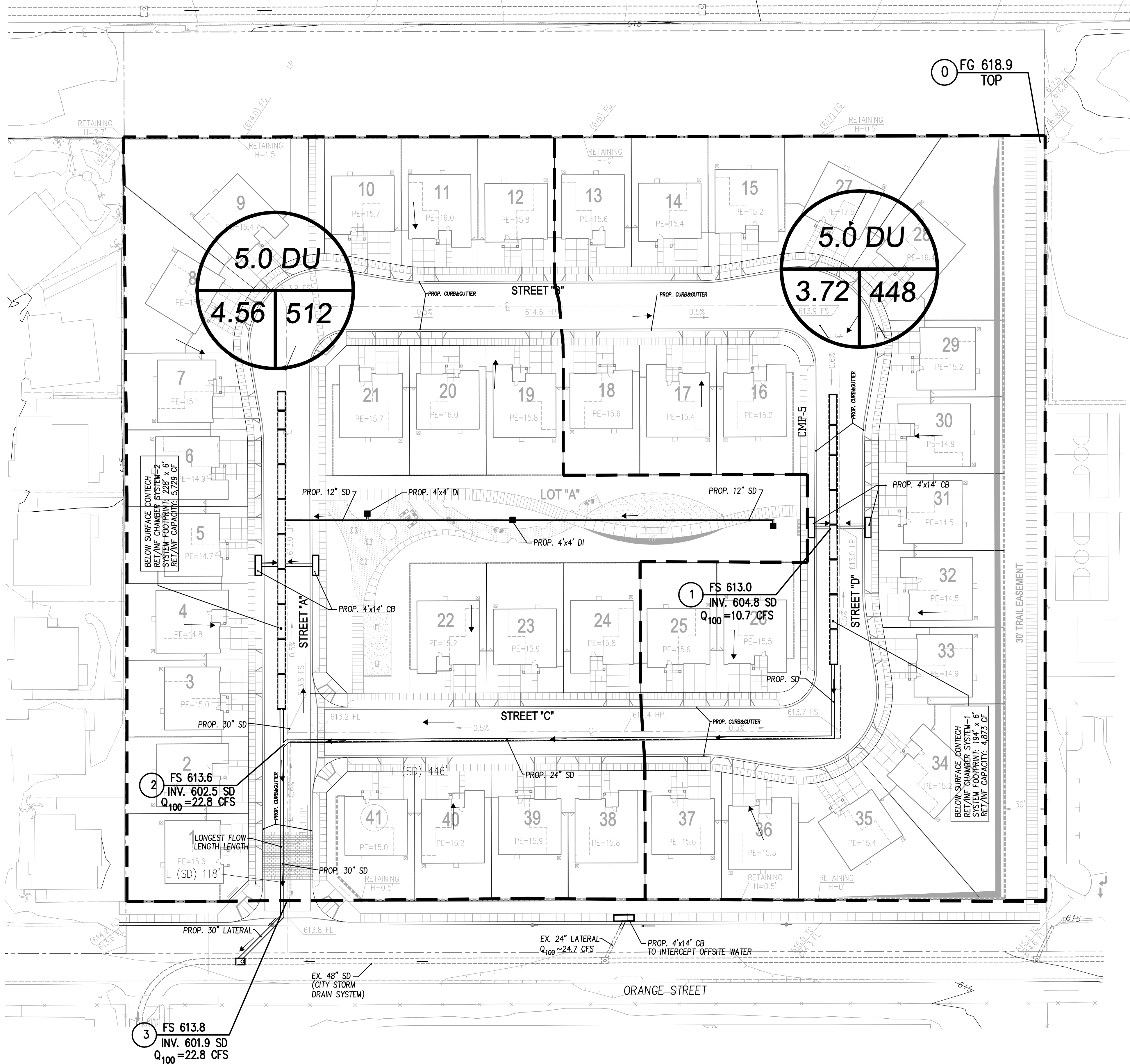


USE 2-14' WIDE CB

**Drainage Exhibit**  
**Developed Condition**  
**Existing Condition**



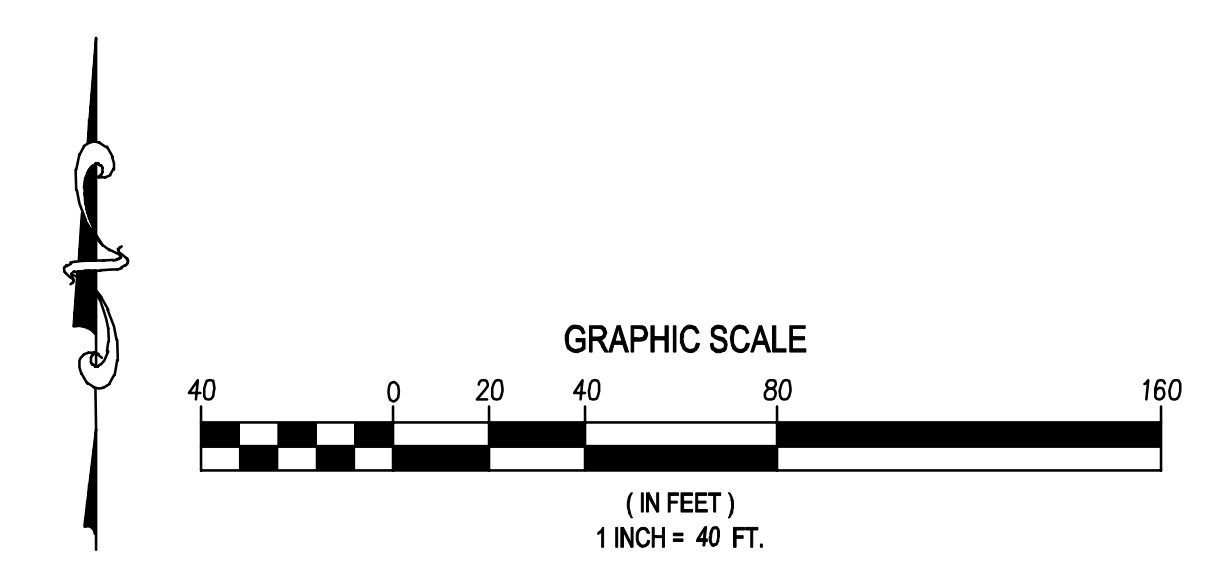
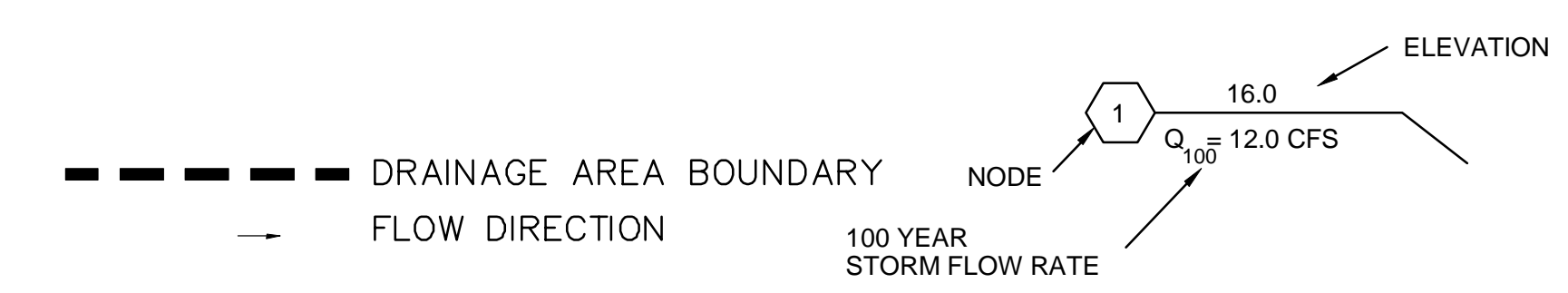
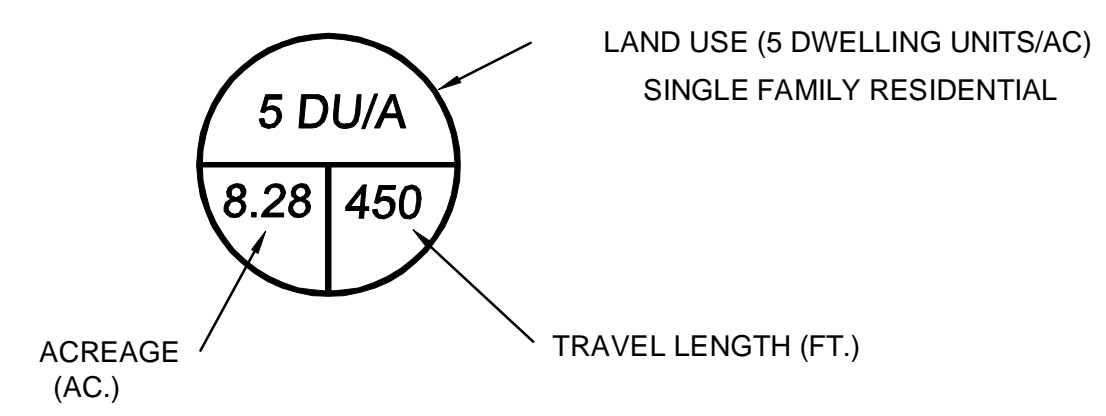
SCHLEISMAN ROAD



FEMA FLOOD ZONE: "X", MAP NO. 06065C0679G

THE SITE IS NOT TRIBUTARY TO OFFSITE DRAINAGE AREA.  
PROPO. CONSTRUCTION OF TWO CATCH BASIN'S AND LATERALS (NORTH & SOUTH OF THE SITE) TO CONTAIN OFFSITE WATER AND CONVEYS TO THE EX. STORM DRAIN.

LEGEND:



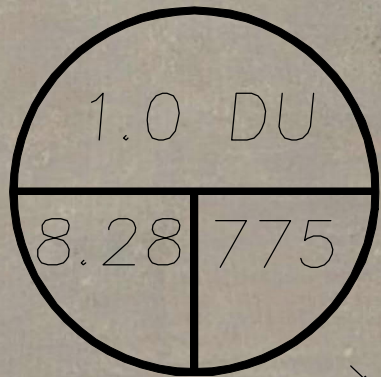
PLOT DATE: July 13, 2023 ashafiq

Prepared By:  
**ALLARD ENGINEERING**  
Civil Engineering - Land Surveying - Land Planning  
16866 Seville Avenue  
Fontana, California 92335  
(909) 356-1815 Fax (909) 356-1795

Prepared For:  
**WOODSIDE 05S, LP**  
1250 CORONA POINTE, SUITE 500  
CORONA, CA 92879  
PH: (951) 710-1900

**CITY OF EASTVALE, CALIFORNIA**  
**DRAINAGE EXHIBIT**  
**DEVELOPED CONDITION**  
**APN: 152-040-003**

0 FG 618.9  
TOP



EX. 48" SD  
(CITY STORM  
DRAIN SYSTEM)

1 FS 613.9  
Q<sub>100</sub> = 15.5 CFS



Know what's below.  
Call before you dig.

ORANGE ST

APN: 152-04-0003  
RIVERSIDE COUNTY

PLOT DATE: April 05, 2021 ashafiq

Prepared By:



**ALLARD ENGINEERING**  
Civil Engineering - Land Surveying - Land Planning  
16866 Seville Avenue  
Fontana, California 92335  
(909) 356-1815 Fax (909) 356-1795

**INDEX MAP**

SCALE: 1" = 100'



**DRAINAGE EXHIBIT: PRE-DEVELOPED**

**Eastvale Master Drainage Plan  
Lateral D-7 (As-built)**

# RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

## INDEX

SHEET NO.:

TITLE SHEET 1  
 PLAN & PROFILE 2-5

### R.C.F.C. & W.C.D. STANDARD DRAWINGS

CB 110 CONCRETE DROP INLET  
 MH 252 MANHOLE NO. 2  
 MH 254 MANHOLE NO. 4  
 M 804 BULKHEAD

### COUNTY OF RIVERSIDE STANDARD DRAWINGS

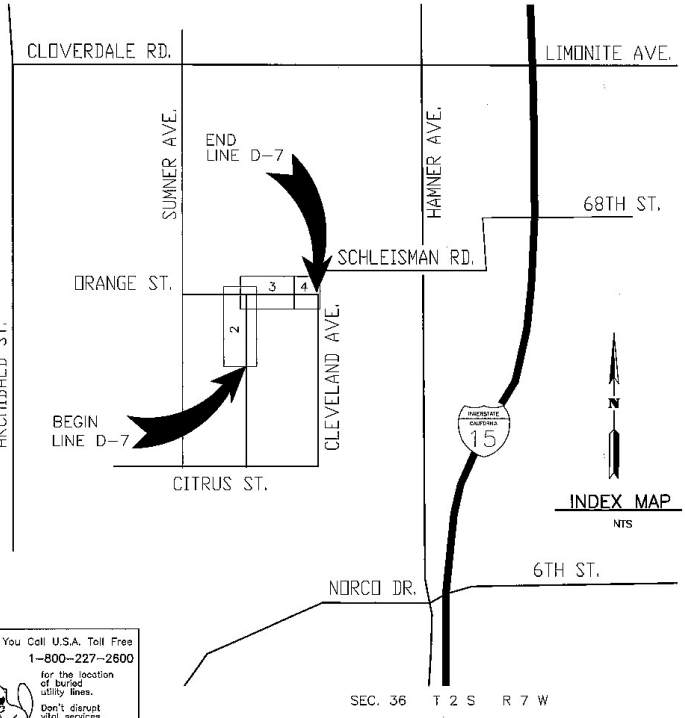
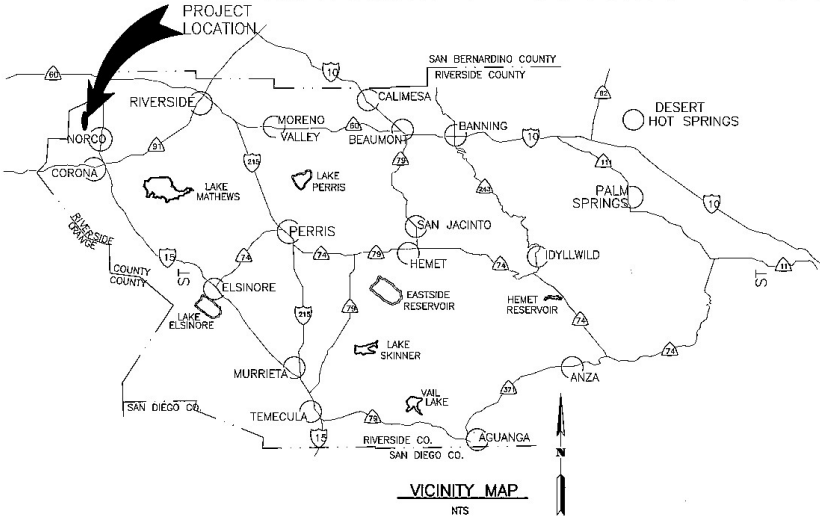
300 CURB INLET BASIN  
 311 LOCAL DEPRESSION

### CONSTRUCTION NOTES

- ① INSTALL 48" R.C.P. (1000-D MIN.)
- ② INSTALL 42" R.C.P. (1000-D) MIN.
- ③ INSTALL 24" R.C.P. CLASS IV
- ④ INSTALL 18" R.C.P. CLASS IV
- ⑤ CONSTRUCT MANHOLE NO. 2 PER R.C.F.D. & W.C.D. STD. DWG. NO. M.H. 252.
- ⑥ CONSTRUCT MANHOLE NO. 4 PER R.C.F.D. & W.C.D. STD. DWG. NO. M.H. 254.
- ⑦ CONSTRUCT CURB INLET CATCH BASIN PER RIVERSIDE COUNTY STD. DWG. NO. 300.
- ⑧ CONSTRUCT LOCAL DEPRESSION (CASE C) PER RIVERSIDE COUNTY STD. DWG. NO. 311.
- ⑨ CONSTRUCT INLET PER R.C.F.C.D. & W.C.D. STD. DWG. NO. CB110.
- ⑩ CONSTRUCT TIMBER BULKHEAD PER R.C.F.C. & W.C.D. STD. DWG. NO. MB04.

### GENERAL NOTES

1. THE CONTRACTOR SHALL CONSTRUCT THE FLOOD CONTROL IMPROVEMENTS SHOWN ON THE DRAWINGS IN CONFORMANCE WITH THE REQUIREMENTS OF THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT'S M.O.U. STANDARD SPECIFICATIONS DATED SEPTEMBER 1984, AND DESIGN MANUAL STANDARD DRAWINGS DATED MAY 1971.
2. AN ENCROACHMENT PERMIT IS REQUIRED FROM RIVERSIDE COUNTY FLOOD CONTROL. CONTACT ED LOTZ AT 909/955-1266. AFTER THE PERMIT IS ISSUED THE DISTRICT MUST BE NOTIFIED ONE WEEK PRIOR TO CONSTRUCTION.
3. CONSTRUCTION INSPECTION WILL BE PERFORMED BY RIVERSIDE COUNTY FLOOD CONTROL. CONTACT DALE ANDERSON AT 909/955-1288. THE DISTRICT MUST BE NOTIFIED TWENTY DAYS (20) PRIOR TO CONSTRUCTION.
4. ALL STATIONING REFERS TO CENTERLINE OF CONSTRUCTION UNLESS OTHERWISE NOTED.
5. STATIONING FOR LATERALS AND CONNECTOR PIPE REFER TO THE CENTERLINE INTERSECTION STATIONS.
6. FORTY-EIGHT HOURS BEFORE EXCAVATION, CALL UNDERGROUND SERVICE ALERT 1-800-227-2600.
7. ALL ELEVATIONS SHOWN ARE IN FEET AND DECIMALS THEREOF BASED ON U.S.C. & G.S DATUM.
8. ALL CROSS SECTIONS ARE TAKEN LOOKING DOWNSTREAM.
9. ELEVATIONS OF UTILITIES ARE APPROXIMATE UNLESS OTHERWISE NOTED.
10. OPENINGS RESULTING FROM THE CUTTING OR PARTIAL REMOVAL OF EXISTING CULVERTS, PIPES OR SIMILAR STRUCTURES TO BE ABANDONED SHALL BE SEALED WITH 6" OF CLASS "B" CONCRETE.
11. PIPE CONNECTED TO THE MAINLINE PIPE SHALL CONFORM TO JUNCTION STRUCTURE NO. 4 (JS 229) UNLESS OTHERWISE NOTED.
12. PIPE BEDDING SHALL CONFORM TO RCF&WCD STD. DWG. NO. MB15 EXCEPT FOR COVER <2 FEET. FOR COVER <2 FEET, CONCRETE SLURRY (2000 PSI - 2 SACK) SHALL BE USED. THE ENTIRE TRENCH SHALL BE SLURRY EXTENDING 4 INCHES MINIMUM AND 12 INCHES MAXIMUM ABOVE THE TOP OF PIPE.
13. BH-1 INDICATES SOIL BORING LOCATIONS BASED ON THE SOILS REPORT DATED MARCH 13, 2001. LOCATIONS SHOWN ARE APPROXIMATE.
14. "V" IS THE DEPTH OF CATCH BASINS MEASURED FROM THE TOP OF CURB TO INVERT OF CONNECTOR PIPE.
15. CATCH BASINS SHALL BE LOCATED SO THAT LOCAL DEPRESSION SHALL BEGIN AT EXISTING CURB RETURN JOINT, UNLESS SPECIFIED.
16. ALL CURBS, GUTTERS, SIDEWALKS, DRIVEWAYS AND OTHER EXISTING IMPROVEMENTS TO BE RECONSTRUCTED IN KIND AND AT THE SAME ELEVATION AND LOCATION AS THE EXISTING IMPROVEMENTS UNLESS OTHERWISE NOTED.
17. STANDARD DRAWINGS CALLED FOR ON THE PLAN AND PROFILE SHALL CONFORM TO DISTRICT STANDARD DRAWINGS UNLESS NOTED OTHERWISE.
18. THE CONTRACTOR IS REQUIRED TO CALL ALL UTILITY AGENCIES REGARDING TEMPORARY SHORING AND SUPPORT REQUIREMENTS FOR THE VARIOUS UTILITY LINES SHOWN ON THESE PLANS.
19. DURING ROUGH GRADING OPERATIONS AND PRIOR TO CONSTRUCTION OF PERMANENT DRAINAGE STRUCTURES, TEMPORARY DRAINAGE CONTROL SHOULD BE PROVIDED TO PREVENT PONDING WATER AND DAMAGE TO ADJACENT PROPERTIES.
20. APPROVAL OF THESE PLANS BY THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT DOES NOT RELIEVE THE DEVELOPER'S ENGINEER OF RESPONSIBILITY FOR THE ENGINEERING DESIGN. IF FIELD CHANGES ARE REQUIRED, IT WILL BE THE RESPONSIBILITY OF THE DESIGN ENGINEER TO MAKE THE NECESSARY CORRECTIONS.
21. THE CONTRACTOR OR DEVELOPER SHALL SECURE ALL REQUIRED ENCROACHMENT AND/OR STATE AND FEDERAL REGULATORY PERMITS PRIOR TO THE COMMENCEMENT OF ANY WORK.



Don't Dig...Until You Call U.S.A. Toll Free  
 1-800-227-2600  
 for the location of buried utility lines.  
 Don't disrupt vital services.  
 TWO WORKING DAYS BEFORE YOU DIG

BENCH MARK  
 RIVERSIDE COUNTY B.M. M.L.  
 54-1-64 A BRASS DISK SET IN THE  
 TOP OF A CONCRETE POST LOCATED  
 AT THE N.E. COR. OF THE "T" INT.  
 OF ORANGE ST. AND SUMMER AVE.  
 35.0 FT. E. OF SUMMER AVE., 21.0  
 FT. N. OF ORANGE ST., 2.5 FT. W.  
 OF P.P.#375282, 1.0 FT. E. OF A  
 MARKER POST. EL.=606.913

REVISIONS	ENGINEER	RCFC/	DESIGNED BY:
			RW
			DRAWN BY:
			JM
			DATE DRAWN:
			DECEMBER 2002

APPROVED BY:  
**RHA Engineering, Inc.**  
 6974 BROCKTON AVENUE • SUITE 100  
 RIVERSIDE, CA 92506  
 (909) 683-8088 FAX (909) 683-6915  
 DATE: 3-12-04  
 STEVEN L. RAY, RCE 35334  
 EXP. 9/30/05

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT  
 RECOMMENDED FOR APPROVAL BY:  
**Stuart E. T. Kell**  
 PLANNING ENGINEER  
 DATE: 8-25-2004

COUNTY OF RIVERSIDE TRANSPORTATION DEPARTMENT  
 APPROVED BY:  
**William D. ...**  
 CHIEF ENGINEER  
 DATE: 8/22/04

MS 3916  
 EASTVALE MASTER DRAINAGE PLAN  
 LATERAL D-7  
 TITLE SHEET

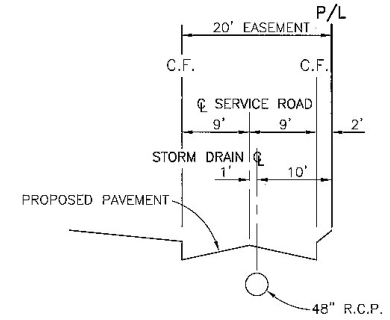
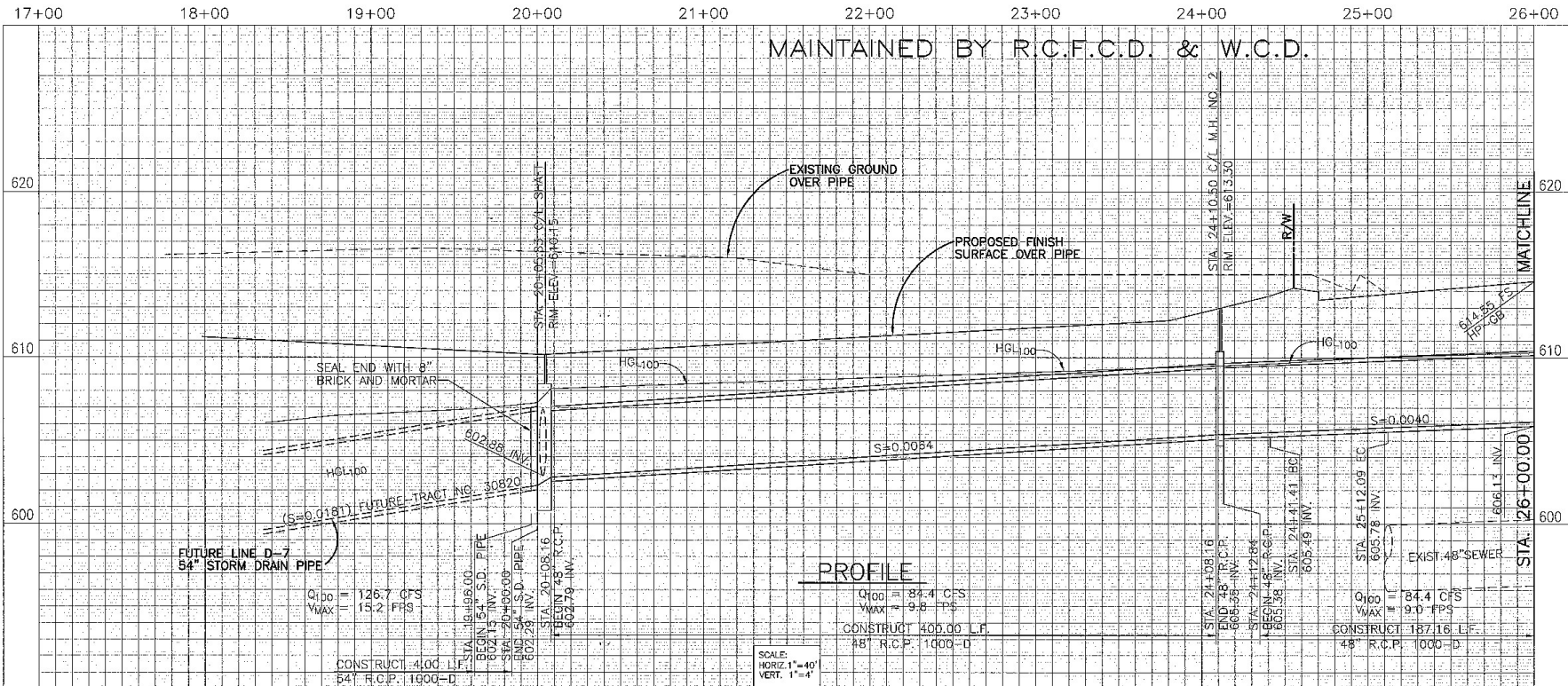
PROJECT NO. 2-0-0326  
 DRAWING NO. 2-346  
 SHEET NO. 1 OF 5



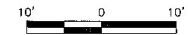
AS BUILT  
 APPROVED BY: *[Signature]*  
 DATE: 2-3-06

229

File Name: J:\2002\MS 3916\MS 3916\MS 3916.dwg Plot Date: 02/03/06 11:23:10



SECTION AT STA. 22+50  
TYPICAL FROM STA. 20+00 TO STA. 24+41.41



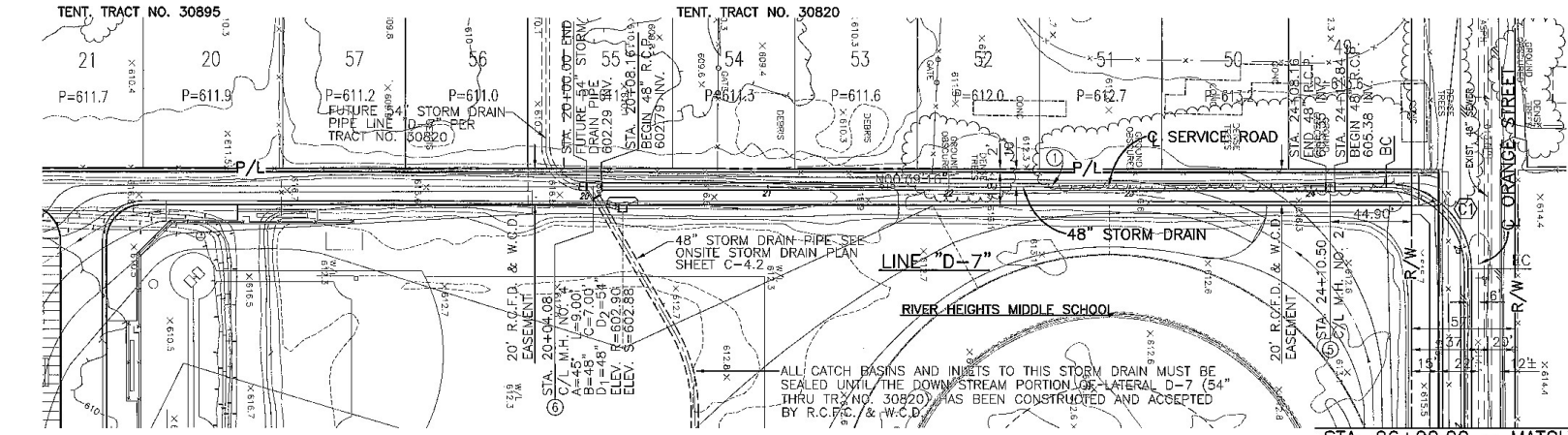
**CONSTRUCTION NOTES**

- ① INSTALL 48" R.C.P. (1000-D MIN.)
- ⑤ CONSTRUCT MANHOLE NO. 2 PER R.C.F.C. & W.C.D. STD. DWG. NO. M.H. 252
- ⑥ CONSTRUCT MANHOLE NO. 4 PER R.C.F.C. & W.C.D. STD. DWG. NO. M.H. 254

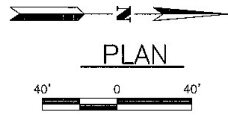
**⑥ CURVE DATA**

Δ	89°59'50"
TR	45.00'
T	45.00'
L	70.65'
PC	STA. 24+41.41
PT	STA. 25+12.09
N	2295104.29
E	6160923.88

**AS BUILT**  
APPROVED BY: *[Signature]*  
DATE: 2-3-06



STA. 26+00.00 - MATCHLINE  
SEE SHEET NO. 3



**PLAN**

Don't Dig...Until You Call U.S.A. Toll Free  
1-800-227-2600  
for the location of utility lines.  
Don't disrupt vital services.  
THE WORKING DAYS BEFORE YOU DIG

THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER COUNTY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE COUNTY.

BENCH MARK  
RIVERSIDE COUNTY B.M. N.L.  
34-1-64 A BRASS DISK SET IN THE TOP OF A CONCRETE POST LOCATED AT THE N.E. COR. OF THE "T" INT. OF ORANGE ST. AND SUMNER AVE., 35.0 FT. E. OF SUMNER AVE., 21.0 FT. N. OF ORANGE ST., 2.5 FT. W. OF P.P.#375282, 1.0 FT. E. OF A MARKER POST.  
EL. = 606.913

REF.	DESCRIPTION	APPR.	DATE	APPR.	DATE

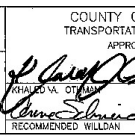
DESIGNED BY: RW  
DRAWN BY: JM  
DATE DRAWN: DECEMBER 2002

APPROVED BY: *[Signature]*  
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT  
DATE: 8/24/04

APPROVED BY: *[Signature]*  
COUNTY OF RIVERSIDE TRANSPORTATION DEPARTMENT  
DATE: 8-25-2004

REGISTERED PROFESSIONAL ENGINEER  
35334  
9-30-05  
CIVIL  
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER  
33950  
6-30-06  
CIVIL  
STATE OF CALIFORNIA

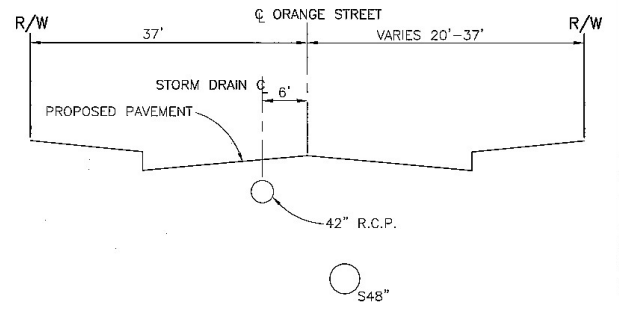
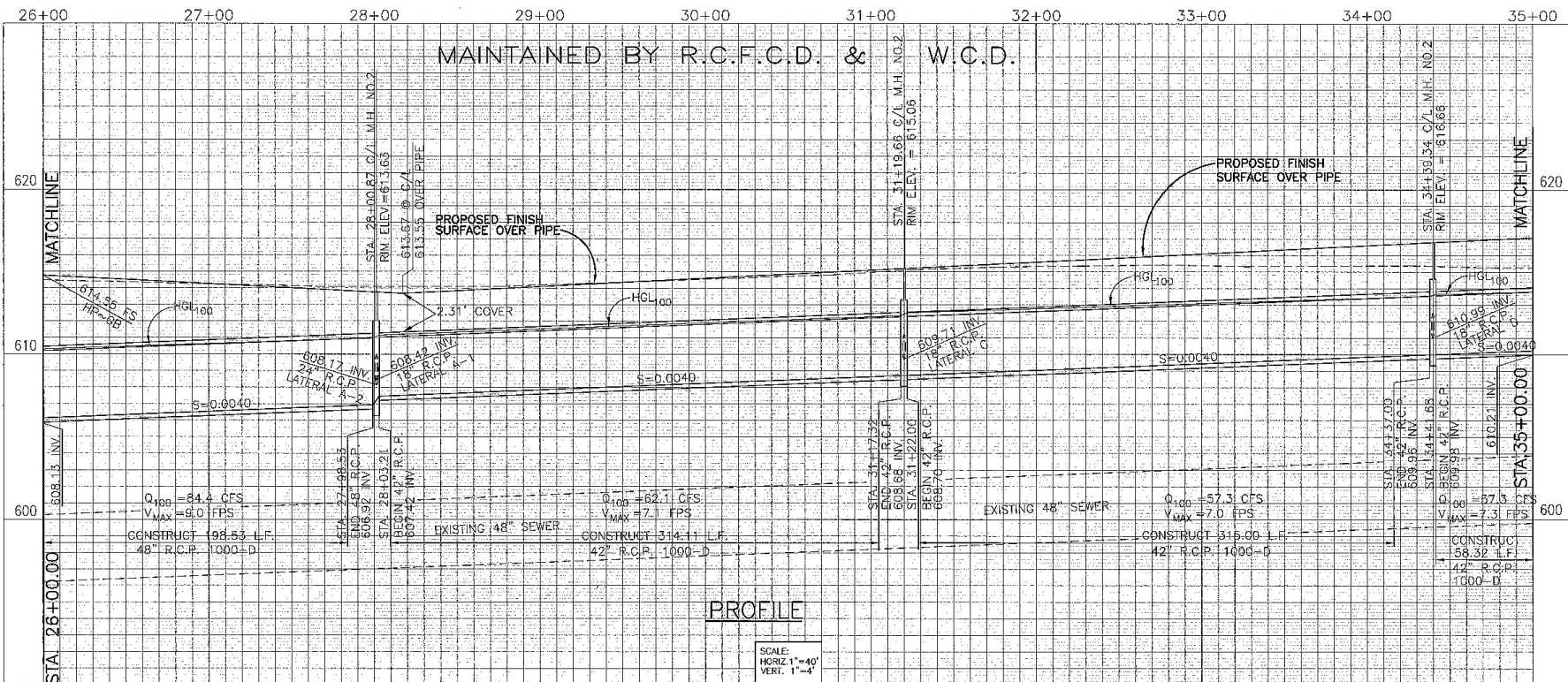


APPROVED BY: *[Signature]*  
DATE: 3/3/04

RECOMMENDED WILLARD  
DATE: 3/6/04

MS 3916  
EASTVALE MASTER DRAINAGE PLAN  
LATERAL D-7  
STA. 20+00.00 TO STA 26+00.00

IP NO. 030086  
PROJECT NO. 2-0-0326  
DRAWING NO. 2-346  
SHEET NO. 2 OF 5

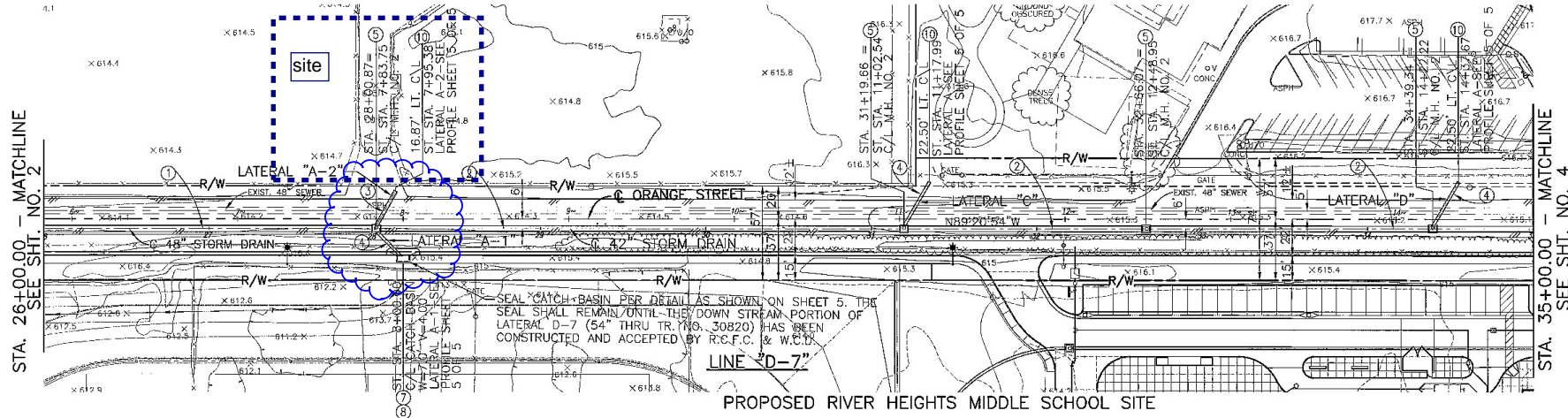


SECTION AT STA. 32+50  
TYPICAL FROM STA. 28+00 TO STA. 35+00

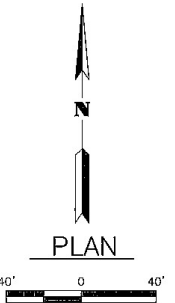


**CONSTRUCTION NOTES**

- ① INSTALL 48" R.C.P. (1000-D MIN.)
- ② INSTALL 42" R.C.P. (1000-D MIN.)
- ③ INSTALL 24" R.C.P. CLASS IV
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- ⑧ CONSTRUCT LOCAL DEPRESSION (CASE C) PER RIVERSIDE COUNTY STD. NO. 311
- ⑩ CONSTRUCT TIMBER BULKHEAD PER R.C.F.C. & W.C.D. STD. DWG. NO. M804



**AS BUILT**  
APPROVED BY: *[Signature]*  
DATE: 2-3-06



Don't Dig...Until You Call U.S.A. Toll Free  
1-800-227-2600  
for the location of buried utility lines.  
Don't disrupt vital services.  
TWO WORKING DAYS BEFORE YOU DIG

THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER COUNTY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE COUNTY.

REF.	DESCRIPTION	APPR.	DATE	APPR.	DATE

DESIGNED BY: RW  
DRAWN BY: JM  
DATE DRAWN: DECEMBER 2002

APPROVED BY: **RHA Engineering, Inc.**  
6974 BROCKTON AVENUE • SUITE 100  
RIVERSIDE, CA 92506  
(909) 683-8088 FAX (909) 683-6915

STEVEN L. RAY, RCH 35334  
EXP. 9/30/05

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

RECOMMENDED FOR APPROVAL BY: *[Signature]*  
DATE: 8/24/04

APPROVED BY: *[Signature]*  
DATE: 8-25-2004



COUNTY OF RIVERSIDE TRANSPORTATION DEPARTMENT

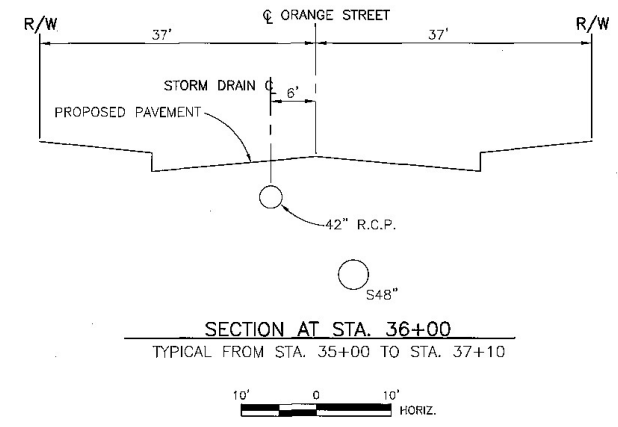
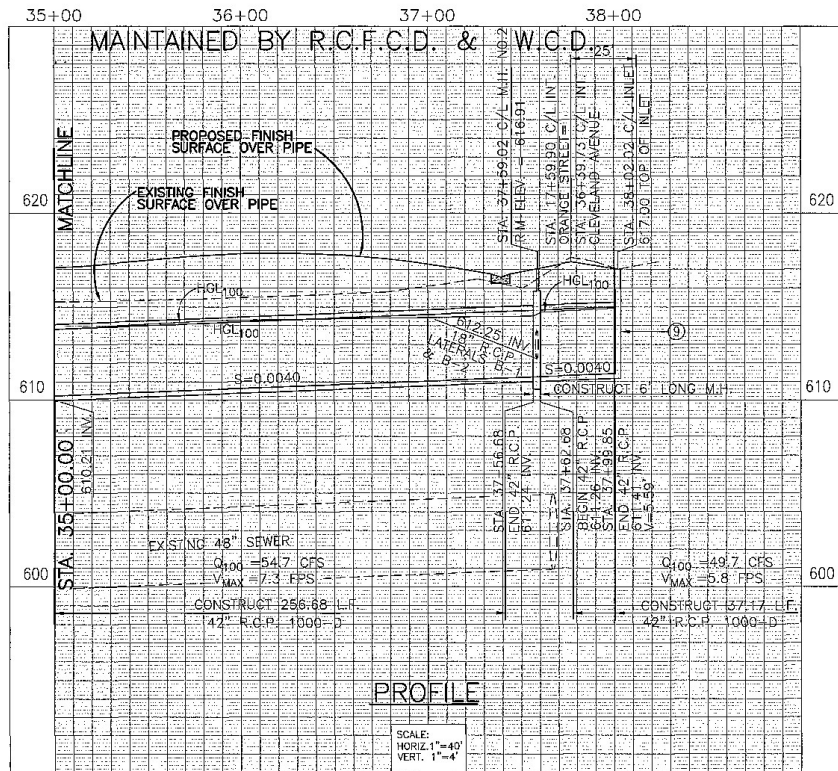
APPROVED BY: *[Signature]*  
DATE: 3/31/04

RECOMMENDED WILLIAM: *[Signature]*  
DATE: 3/29/04

MS 3916  
**EASTVALE MASTER DRAINAGE PLAN**  
LATERAL D-7  
STA. 26+00.00 TO STA. 35+00.00

IP NO. 030086  
PROJECT NO. 2-0-0326  
DRAWING NO. 2-346  
SHEET NO. 3 OF 5

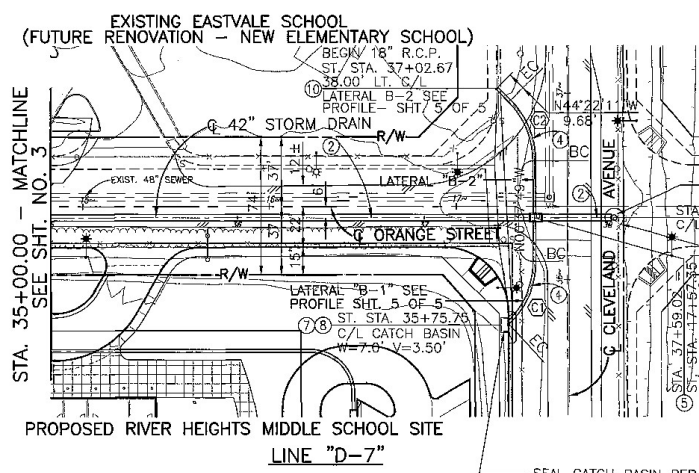
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SECTION AT STA. 36+00  
TYPICAL FROM STA. 35+00 TO STA. 37+10

**CONSTRUCTION NOTES**

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- ⑤ CONSTRUCT MANHOLE NO. 2 PER R.C.F.C. & W.C.D. STD. DWG. NO. M.H. 252
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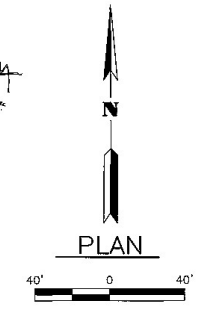


**② CURVE DATA**  
 $\Delta = 40'00''00''$   
 $R = 45.00'$   
 $T = 18.64'$   
 $L = 35.34'$   
 $BC = STA. 9+34.39$   
 $EC = STA. 9+69.73$   
 $PI = N 2295138.5087$   
 $E 6162216.2674$

**CATCH BASIN TO BE MAINTAINED BY RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT**  
 SEAL CATCH BASIN PER DETAIL AS SHOWN ON SHEET 5 THE SEAL SHALL REMAIN UNTIL THE DOWN STREAM PORTION OF LATERAL D-7 (54" THRU TR. NO. 30820) HAS BEEN CONSTRUCTED AND ACCEPTED BY R.C.F.C. & W.C.D.

**③ CURVE DATA**  
 $\Delta = 47'19'47''$   
 $R = 45.00'$   
 $T = 19.72'$   
 $L = 37.17'$   
 $BC = STA. 10+23.84$   
 $EC = STA. 10+61.01$   
 $PI = N 2295046.0394$   
 $E 6162215.2502$

**AS BUILT**  
 APPROVED BY: *[Signature]*  
 DATE: 2-3-06



Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600  
 for the location of buried utility lines. Don't disrupt vital services.  
 TWO WORKING DAYS BEFORE YOU DIG

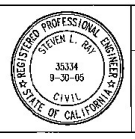
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REF.	DESCRIPTION	APPR. DATE	APPR. DATE

DESIGNED BY: RW  
 DRAWN BY: JM  
 DATE DRAWN: DECEMBER 2002

APPROVED BY: **RHA Engineering, Inc.**  
 6974 BROCKTON AVENUE • SUITE 100  
 RIVERSIDE, CA 92506  
 (909) 683-8086 FAX (909) 683-6915  
 STEVEN L. RAY, P.E. 35334 EXP. 9/30/05  
 DATE: 2-12-04



RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT  
 RECOMMENDED FOR APPROVAL BY: *[Signature]* DATE: 8/24/04  
 APPROVED BY: *[Signature]* DATE: 8-25-2004

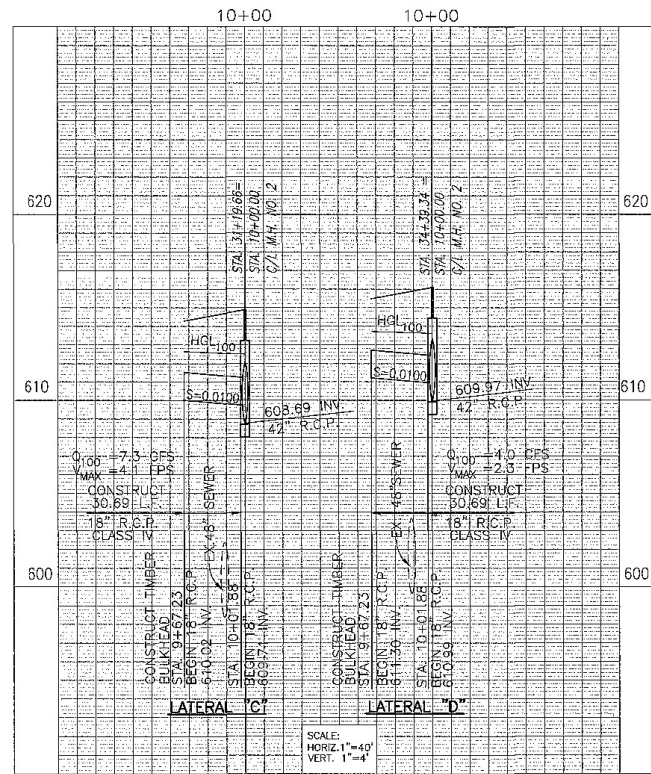
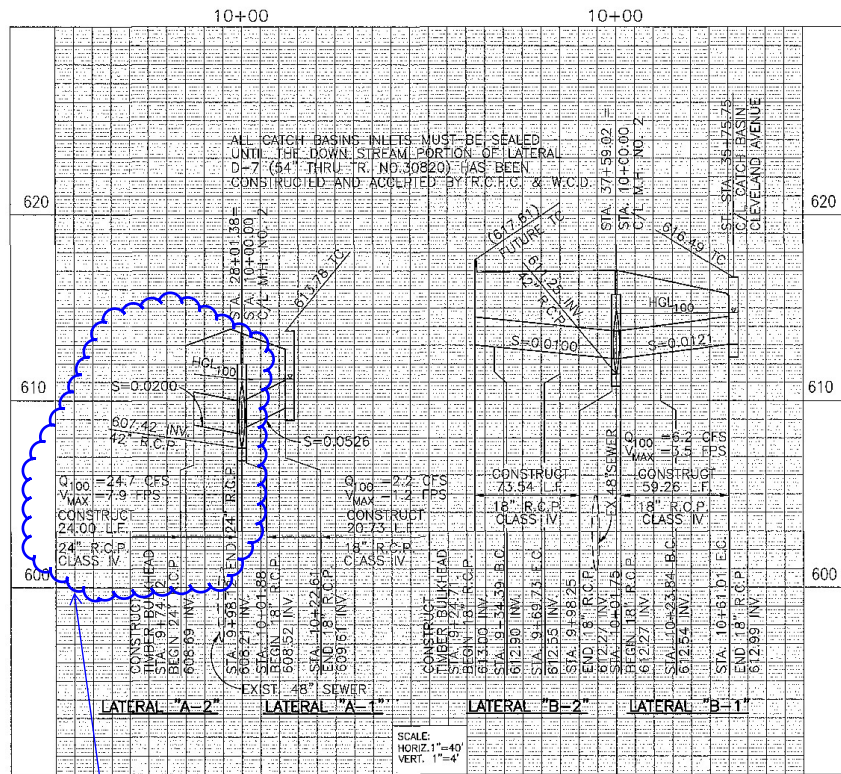


COUNTY OF RIVERSIDE TRANSPORTATION DEPARTMENT  
 APPROVED BY: *[Signature]* DATE: 3/31/04  
 RECOMMENDED WILLIAM: *[Signature]* DATE: 3/24/04

MS 3916  
**EASTVALE MASTER DRAINAGE PLAN**  
 LATERAL D-7  
 STA 35+00.00 TO STA. 38+02.02

IP NO. Q30086  
 PROJECT NO. 2-0-0326  
 DRAWING NO. 2-346  
 SHEET NO. 4 of 5

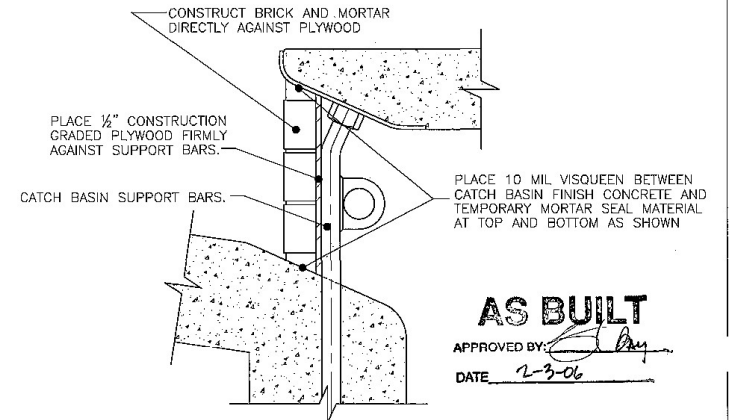
File made in AutoCAD 2004. Plotted in AutoCAD 2004. Plot date: 03/11/04 of 1/30



PROFILE

Q100: 22.8 CFS from the site in proposed condition < 24.7 CFS design capacity of Lat A-2.

LATERALS "A-1", "A-2", "B-1", "B-2", "C" & "D" ARE MAINTAINED BY RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT



**AS BUILT**  
 APPROVED BY: *[Signature]*  
 DATE: 2-3-06

CATCH BASIN SEAL DETAIL  
 N.T.S.

Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services. TWO WORKING DAYS BEFORE YOU DIG

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REF.	DESCRIPTION	APPR.	DATE	APPR.	DATE

DESIGNED BY: RW  
 DRAWN BY: JM  
 DATE DRAWN: DECEMBER 2002

APPROVED BY: *[Signature]*  
**RHA Engineering, Inc.**  
 6974 BROCKTON AVENUE • SUITE 100  
 RIVERSIDE, CA 92506  
 (909) 683-8088 FAX (909) 683-6915  
 STEVEN L. RAY, RCE 35334 EXP. 9/30/05 DATE: 2-12-04



RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT  
 RECOMMENDED FOR APPROVAL BY: *[Signature]*  
 DATE: 8/24/04

COUNTY OF RIVERSIDE TRANSPORTATION DEPARTMENT  
 APPROVED BY: *[Signature]*  
 DATE: 3/13/04  
 RECOMMENDED WILLDAN DATE: 3/29/04



MS 3915  
**EASTVALE MASTER DRAINAGE PLAN**  
 LATERAL D-7  
 COLLECTOR PIPES

IP NO. 030086  
 PROJECT NO. 2-0-0326  
 DRAWING NO. 2-346  
 SHEET NO. 5 OF 5

*[Signature]*