

TENTATIVE PARCEL MAP 37890
THE SHOPS AT JURUPA VALLEY

IN THE
CITY OF JURUPA VALLEY, CA

PRELIMINARY DRAINAGE
STUDY

AUGUST 11, 2020



Reference: 795-2849

PREPARED BY:
Madole & Associates, Inc.

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PREPARED FOR:
PANORAMA DEVELOPMENT

2005 WINSTON COURT
UPLAND, CA 91784



Reference: 795-2849

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Date: _____

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SECTION A DISCUSSION

THE SHOPS AT JURUPA VALLEY

DISCUSSION

INTRODUCTION

The following preliminary report was prepared for the purpose of providing hydrologic and hydraulic design information for the proposed onsite storm drain system. The project site is located north of the Mission Boulevard, south of the 60 Freeway, and east of Pyrite Street in the City of Jurupa Valley, CA.

EXISTING CONDITIONS

The aerial topographic contours for this area indicate that the general terrain falls from the north to the south. The project unmitigated storm water runoff sheet flows across the existing, poorly covered surface towards an existing concrete channel that bisects the development. The existing channel, referenced as Line B (see Jurupa MPSD Exhibit in Section R), carries an existing 100-year peak flow of 1040 cfs during a peak storm event. The channel then drains into an existing 12'x5' RCB that runs underneath Mission Boulevard before draining into another open concrete channel to the south.

To the east of the project site, an existing earthen channel runs from the northwest to the southeast towards Mission Boulevard. The outlet culvert from the channel into Mission Boulevard is filled with debris. Therefore, flows bubbling up and exiting into Mission Boulevard then flow east along a drainage swale in the northern parkway towards Tentative Tract 37890.

On the west side of the project, there is a large 28 ft wide inlet with an open side at the northeast corner of Pyrite Street and Mission Boulevard. The inlet accepts flows from the undeveloped areas west of the channel and Pyrite Street up to the 60 Freeway eastbound onramp. Due to drainage developments, on, and north of the freeway the inlet in Pyrite Street is currently oversized. It will be resized and relocated based on this hydrologic analysis.

PROPOSED DRAINAGE

Stormwater runoff and nuisance flows from the project site will sheetflow and gutterflow to various curb opening and drop inlets throughout the site. Underground storm drain will then route flows to Line B. Due to the commercial nature of the proposed project, the existing open concrete channel will be converted into a 12'x6' RCB and placed underground. Due to the size of the proposed underground culvert, the site will maintain the two drainage areas. One to the east of the proposed RCB and one to the west. See following Table A.1 for Hydrologic Summary Table.

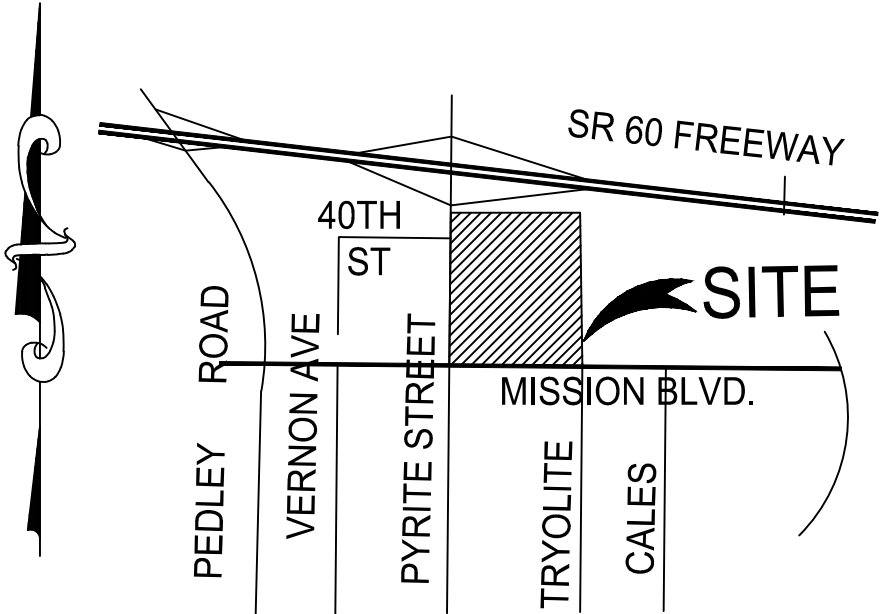
MPSD Line 'B-1', a proposed 39" RCP storm drain, will be partially built along the frontage of the property within Mission Boulevard that will route any offsite flows from

the east of the property to the RCB Line 'B'. It will confluence with the onsite flows in Line 'B1-a' before connecting to the underground RCB in Mission Boulevard.

A rational method analysis was performed on the MPD subareas for MPSD Line 'B-1' in order to determine if the 100-year flows for the adjacent areas could be contained within Mission Boulevard until the future MPSD Line 'B-1' is built to contain the flows. In the interim, flows from the surrounding areas will enter Mission Boulevard and travel west to a sump inlet in Mission Boulevard and the southern project boundary (CB #2 – See Hydrology Map in Section C and Hydraulic Calculations in Section D). These flows will confluence with the onsite developed flows from Subarea B (east of channel) in order to determine the combined flow rate in Line 'B1-a' – a proposed 36" lateral connecting to Line 'B-1' from the project site.

Flows from the northern boundary that would, under undeveloped conditions, flow through the project site will be directed to various drop inlets along the northern project boundary with the CalTrans right of way. The proposed Line 'D' storm drain will run along the northern project boundary within the CalTrans right of way and connect to the proposed RCB before traveling south through the project site (See Hydrology Map in Section C and Storm Drain plans in Section R). Partial flows from the northern boundary will drain into Pyrite Street. The existing inlet at the southwest corner of TTM 37890 will be removed and relocated. Based on this hydrologic study, the catch basin to replace it will be 14 ft in width. The exist 30" lateral from the inlet will be removed and replaced to meet the new inlet in Pyrite Street. These flows from Pyrite Street and the existing 30" storm drain will confluence with the western subareas of the onsite developed stormflows before connecting to the RCB under Mission Boulevard.

THE SHOPS AT JURUPA VALLEY
VICINITY MAP



VICINITY MAP
NO SCALE

THE SHOPS AT JURUPA VALLEY
EXISTING CONDITIONS EXHIBIT

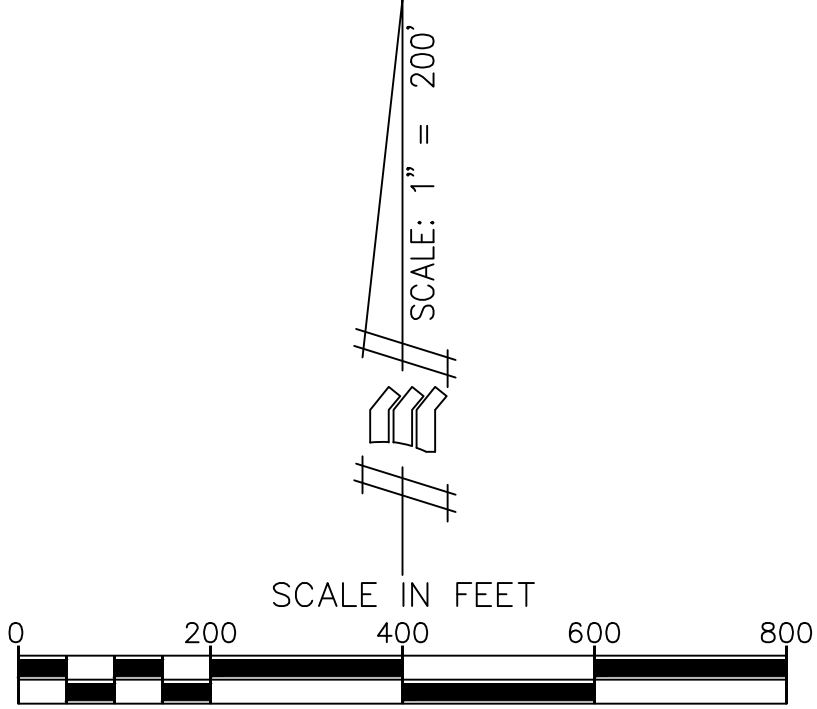
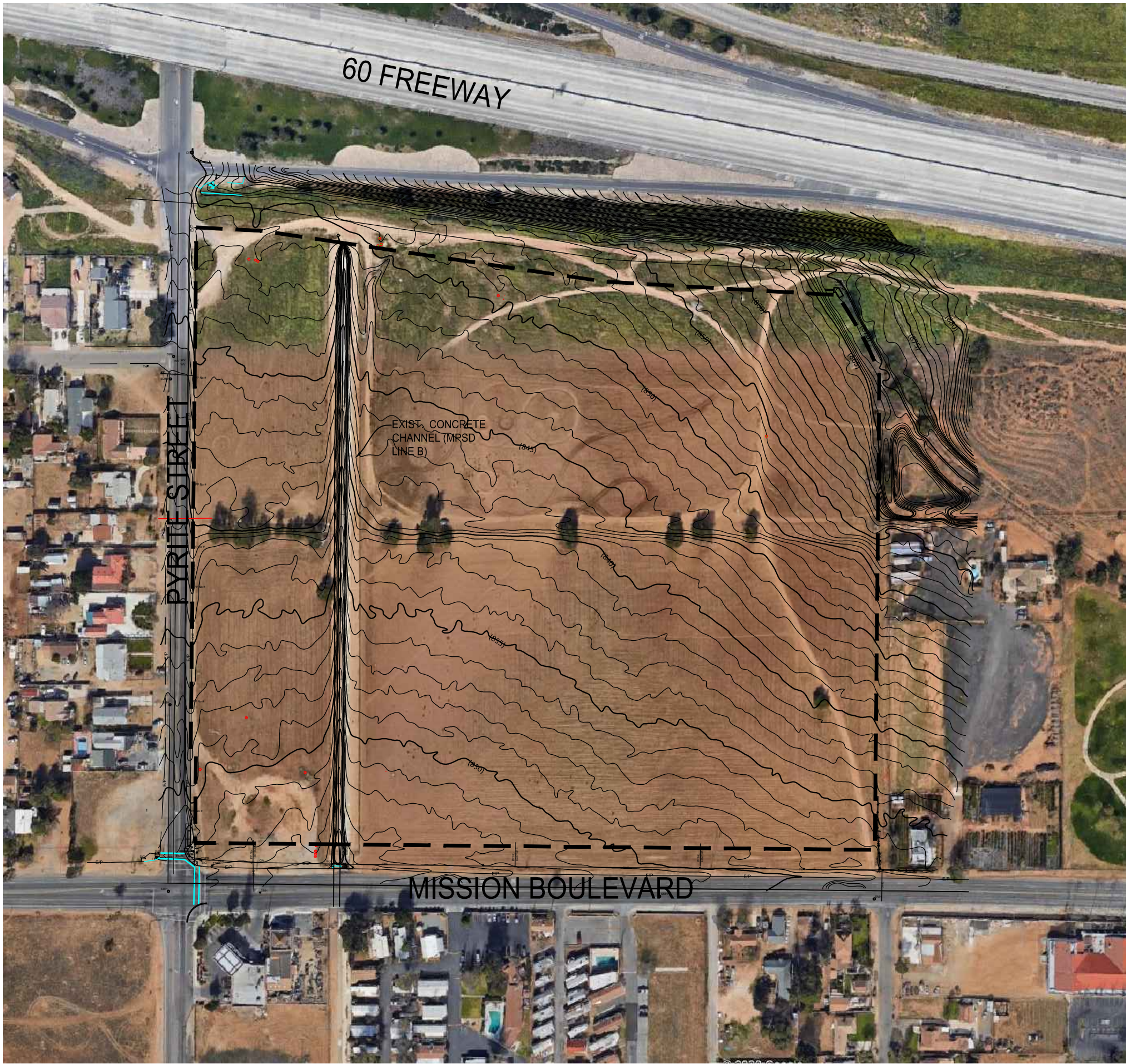


TABLE A.1 – HYDROLOGIC ANALYSIS SUMMARY TABLE

SUBAREAS	AREA	ULTIMATE NODE	TIME OF CONCENTRATION	100-YR. PEAK FLOW-RATIONAL
	ACRES		MIN.	C.F.S.
B-1 THROUGH B-22	23.9	206	13.06	61.6
MP B4; MP B5; MP B7; O1-1 AND O1-2	35.3	407	37.78	50.2
CONFLUENCE	59.2	408	13.14	78.9
MP B-6; MP B-7; O2-04	16.3	104	11.96	37.7
O5 THROUGH O6	2.0	107	11.15	4.5
C1 THROUGH C-5	7.7	305	14.05	19.3
CONFLUENCE	9.7	305.1	13.98	22.9

METHOD OF STUDY: HYDROLOGIC AND HYDRAULIC CALCULATIONS

Rational Method

The Rational Method of Hydrologic Modeling, as defined by the County of Riverside Manual, 1978, was performed in the determination of the storm water runoff peak flow rates (See Section B).

The Rational Method results were determined using the AES 2016 Software.

Given Data

The Hydrologic Soil Group Map and the Isohyetal Maps are attached in Section R. For this project:

Soil Group: D (soils on site range from A, C, and D).

Rainfall Intensity (Plate D-4.1 Rubidoux):

10-yr-10 min:	2.17
10-yr-60 min:	0.81
100-yr-10 min:	3.21
100-yr-60 min:	1.20

Antecedent Moisture Condition

For this project, AMC II was used in the study to determine maximum runoff potential.

Proposed Land Use

The proposed development: COMMERCIAL ($A_p = 0.90$)

RESULTS OF HYDROLOGIC ANALYSIS

A hydrologic analysis was performed on the subject project site. The results may be found in the following Section B and the following results summary table.

SECTION B
HYDROLOGY – 100 YEAR RATIONAL

THE SHOPS AT JURUPA VALLEY

ONSITE (EAST)

THE SHOPS AT JURUPA VALLEY

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 1251

Analysis prepared by:

MADOLE & ASSOCIATES, INC.
9302 PITTSBURGH AVENUE, SUITE 230
RANCHO CUCAMONGA, CA 91730

***** DESCRIPTION OF STUDY *****
* TTM 37890 - SHOPS AT JURUPA VALLEY 100 YEAR RATIONAL METHOD ANALYSIS *
* MPSD LINE B-1 AND LINES B1-a AND b1-b *
* *

FILE NAME: 37890.DAT
TIME/DATE OF STUDY: 14:12 08/11/2020

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 2.170
10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 0.800
100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 3.210
100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 1.200
SLOPE OF 10-YEAR INTENSITY-DURATION CURVE = 0.5569221
SLOPE OF 100-YEAR INTENSITY-DURATION CURVE = 0.5491524
COMPUTED RAINFALL INTENSITY DATA:

STORM EVENT = 100.00 1-HOUR INTENSITY(INCH/HOUR) = 1.200
SLOPE OF INTENSITY DURATION CURVE = 0.5492

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-	CROWN TO	STREET-CROSSFALL:			CURB	GUTTER-GEOMETRIES:			MANNING		
	WIDTH	CROSSFALL	IN-	/	OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR		
	(FT)	(FT)	SIDE	/	SIDE/	WAY	(FT)	(FT)	(FT)	(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 100.00 TO NODE 101.00 IS CODE = 21

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

=====

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS COMMERCIAL

TC = $K * [(LENGTH ** 3) / (ELEVATION CHANGE)] ** .2$
INITIAL SUBAREA FLOW-LENGTH(FEET) = 677.00
UPSTREAM ELEVATION(FEET) = 860.00
DOWNSTREAM ELEVATION(FEET) = 834.10
ELEVATION DIFFERENCE(FEET) = 25.90
TC = $0.303 * [(677.00 ** 3) / (25.90)] ** .2 = 7.894$
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.655
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8902
SOIL CLASSIFICATION IS "D"
SUBAREA RUNOFF(CFS) = 7.61
TOTAL AREA(ACRES) = 2.34 TOTAL RUNOFF(CFS) = 7.61

FLOW PROCESS FROM NODE 101.00 TO NODE 207.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 827.60 DOWNSTREAM(FEET) = 820.00
FLOW LENGTH(FEET) = 1037.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 13.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.59
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 7.61
PIPE TRAVEL TIME(MIN.) = 3.09 Tc(MIN.) = 10.99
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 207.00 = 1714.00 FEET.

FLOW PROCESS FROM NODE 207.00 TO NODE 207.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

FLOW PROCESS FROM NODE 200.00 TO NODE 202.00 IS CODE = 21

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

=====

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS COMMERCIAL

TC = $K * [(LENGTH ** 3) / (ELEVATION CHANGE)] ** .2$
INITIAL SUBAREA FLOW-LENGTH(FEET) = 996.00
UPSTREAM ELEVATION(FEET) = 851.80
DOWNSTREAM ELEVATION(FEET) = 833.80
ELEVATION DIFFERENCE(FEET) = 18.00
TC = $0.303 * [(996.00 ** 3) / (18.00)] ** .2 = 10.703$
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.093
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8887
SOIL CLASSIFICATION IS "D"
SUBAREA RUNOFF(CFS) = 5.30
TOTAL AREA(ACRES) = 1.93 TOTAL RUNOFF(CFS) = 5.30

```

*****
FLOW PROCESS FROM NODE      202.00 TO NODE      203.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 827.30 DOWNSTREAM(FEET) = 826.30
FLOW LENGTH(FEET) = 174.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 10.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.73
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 5.30
PIPE TRAVEL TIME(MIN.) = 0.61 Tc(MIN.) = 11.32
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 203.00 = 1170.00 FEET.

*****
FLOW PROCESS FROM NODE      203.00 TO NODE      203.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.999
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8884
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 0.51 SUBAREA RUNOFF(CFS) = 1.36
TOTAL AREA(ACRES) = 2.4 TOTAL RUNOFF(CFS) = 6.66
TC(MIN.) = 11.32

*****
FLOW PROCESS FROM NODE      203.00 TO NODE      204.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 826.30 DOWNSTREAM(FEET) = 825.60
FLOW LENGTH(FEET) = 140.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 13.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.65
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 6.66
PIPE TRAVEL TIME(MIN.) = 0.50 Tc(MIN.) = 11.82
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 204.00 = 1310.00 FEET.

*****
FLOW PROCESS FROM NODE      204.00 TO NODE      204.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 11.82
RAINFALL INTENSITY(INCH/HR) = 2.93
TOTAL STREAM AREA(ACRES) = 2.44
PEAK FLOW RATE(CFS) AT CONFLUENCE = 6.66

*****
FLOW PROCESS FROM NODE      200.00 TO NODE      204.10 IS CODE = 21

```

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

=====

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS COMMERCIAL

TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH(FEET) = 429.00
UPSTREAM ELEVATION(FEET) = 851.80
DOWNSTREAM ELEVATION(FEET) = 849.60
ELEVATION DIFFERENCE(FEET) = 2.20
TC = 0.303*[(429.00**3)/(2.20)]**.2 = 9.830
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.240
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8891
SOIL CLASSIFICATION IS "D"
SUBAREA RUNOFF(CFS) = 4.81
TOTAL AREA(ACRES) = 1.67 TOTAL RUNOFF(CFS) = 4.81

FLOW PROCESS FROM NODE 204.10 TO NODE 204.20 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 843.10 DOWNSTREAM(FEET) = 841.60
FLOW LENGTH(FEET) = 154.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 8.7 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.65
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 4.81
PIPE TRAVEL TIME(MIN.) = 0.45 Tc(MIN.) = 10.28
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 204.20 = 583.00 FEET.

FLOW PROCESS FROM NODE 204.20 TO NODE 204.20 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.161
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8889
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 1.04 SUBAREA RUNOFF(CFS) = 2.92
TOTAL AREA(ACRES) = 2.7 TOTAL RUNOFF(CFS) = 7.73
TC(MIN.) = 10.28

FLOW PROCESS FROM NODE 204.20 TO NODE 204.30 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 841.60 DOWNSTREAM(FEET) = 834.80
FLOW LENGTH(FEET) = 317.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 9.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 8.55
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 7.73
PIPE TRAVEL TIME(MIN.) = 0.62 Tc(MIN.) = 10.90
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 204.30 = 900.00 FEET.

FLOW PROCESS FROM NODE 204.30 TO NODE 204.30 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=====

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.061
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8886
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 1.41 SUBAREA RUNOFF(CFS) = 3.84
TOTAL AREA(ACRES) = 4.1 TOTAL RUNOFF(CFS) = 11.57
TC(MIN.) = 10.90

FLOW PROCESS FROM NODE 204.30 TO NODE 204.40 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====

ELEVATION DATA: UPSTREAM(FEET) = 834.80 DOWNSTREAM(FEET) = 833.30
FLOW LENGTH(FEET) = 90.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 13.1 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 8.43
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 11.57
PIPE TRAVEL TIME(MIN.) = 0.18 Tc(MIN.) = 11.08
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 204.40 = 990.00 FEET.

FLOW PROCESS FROM NODE 204.40 TO NODE 204.40 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=====

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.034
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8885
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 1.50 SUBAREA RUNOFF(CFS) = 4.04
TOTAL AREA(ACRES) = 5.6 TOTAL RUNOFF(CFS) = 15.61
TC(MIN.) = 11.08

FLOW PROCESS FROM NODE 204.40 TO NODE 204.50 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====

ELEVATION DATA: UPSTREAM(FEET) = 833.30 DOWNSTREAM(FEET) = 829.10
FLOW LENGTH(FEET) = 175.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 14.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 10.23
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 15.61
PIPE TRAVEL TIME(MIN.) = 0.29 Tc(MIN.) = 11.37
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 204.50 = 1165.00 FEET.

```

*****
FLOW PROCESS FROM NODE      204.50 TO NODE      204.50 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.992
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8884
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 1.73 SUBAREA RUNOFF(CFS) = 4.60
TOTAL AREA(ACRES) = 7.3 TOTAL RUNOFF(CFS) = 20.21
TC(MIN.) = 11.37

*****
FLOW PROCESS FROM NODE      204.50 TO NODE      204.60 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 829.10 DOWNSTREAM(FEET) = 827.30
FLOW LENGTH(FEET) = 77.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 21.0 INCH PIPE IS 15.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 11.03
ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 20.21
PIPE TRAVEL TIME(MIN.) = 0.12 Tc(MIN.) = 11.48
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 204.60 = 1242.00 FEET.

*****
FLOW PROCESS FROM NODE      204.60 TO NODE      204.60 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.975
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8883
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 1.36 SUBAREA RUNOFF(CFS) = 3.59
TOTAL AREA(ACRES) = 8.7 TOTAL RUNOFF(CFS) = 23.81
TC(MIN.) = 11.48

*****
FLOW PROCESS FROM NODE      204.60 TO NODE      204.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 827.30 DOWNSTREAM(FEET) = 825.60
FLOW LENGTH(FEET) = 104.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 24.0 INCH PIPE IS 16.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 10.06
ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 23.81
PIPE TRAVEL TIME(MIN.) = 0.17 Tc(MIN.) = 11.65
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 204.00 = 1346.00 FEET.

*****
FLOW PROCESS FROM NODE      204.00 TO NODE      204.00 IS CODE = 81

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-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.951
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8882
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 0.35 SUBAREA RUNOFF(CFS) = 0.92
TOTAL AREA(ACRES) = 9.1 TOTAL RUNOFF(CFS) = 24.72
TC(MIN.) = 11.65

*****
FLOW PROCESS FROM NODE 204.00 TO NODE 204.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 11.65
RAINFALL INTENSITY(INCH/HR) = 2.95
TOTAL STREAM AREA(ACRES) = 9.06
PEAK FLOW RATE(CFS) AT CONFLUENCE = 24.72

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 6.66 11.82 2.929 2.44
2 24.72 11.65 2.951 9.06

*****WARNING*****
IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
*****

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 31.29 11.65 2.951
2 31.20 11.82 2.929

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 31.29 Tc(MIN.) = 11.65
TOTAL AREA(ACRES) = 11.5
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 204.00 = 1346.00 FEET.

*****
FLOW PROCESS FROM NODE 204.00 TO NODE 205.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 825.60 DOWNSTREAM(FEET) = 824.00
FLOW LENGTH(FEET) = 329.00 MANNING'S N = 0.013

```

DEPTH OF FLOW IN 33.0 INCH PIPE IS 23.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.82
ESTIMATED PIPE DIAMETER(INCH) = 33.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 31.29
PIPE TRAVEL TIME(MIN.) = 0.80 Tc(MIN.) = 12.46
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 205.00 = 1675.00 FEET.

FLOW PROCESS FROM NODE 205.00 TO NODE 205.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.845
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8878
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 0.95 SUBAREA RUNOFF(CFS) = 2.40
TOTAL AREA(ACRES) = 12.4 TOTAL RUNOFF(CFS) = 33.69
TC(MIN.) = 12.46

FLOW PROCESS FROM NODE 205.00 TO NODE 205.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.845
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8878
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 1.28 SUBAREA RUNOFF(CFS) = 3.23
TOTAL AREA(ACRES) = 13.7 TOTAL RUNOFF(CFS) = 36.93
TC(MIN.) = 12.46

FLOW PROCESS FROM NODE 205.00 TO NODE 206.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 824.00 DOWNSTREAM(FEET) = 822.70
FLOW LENGTH(FEET) = 257.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 36.0 INCH PIPE IS 24.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 7.27
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 36.93
PIPE TRAVEL TIME(MIN.) = 0.59 Tc(MIN.) = 13.05
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 206.00 = 1932.00 FEET.

FLOW PROCESS FROM NODE 206.00 TO NODE 206.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<

FLOW PROCESS FROM NODE 206.10 TO NODE 206.20 IS CODE = 21

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

=====

ASSUMED INITIAL SUBAREA UNIFORM
 DEVELOPMENT IS COMMERCIAL
 $TC = K * [(LENGTH ** 3) / (ELEVATION CHANGE)] ** .2$
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 285.00
 UPSTREAM ELEVATION(FEET) = 851.90
 DOWNSTREAM ELEVATION(FEET) = 849.90
 ELEVATION DIFFERENCE(FEET) = 2.00
 $TC = 0.303 * [(285.00 ** 3) / (2.00)] ** .2 = 7.839$
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.669
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8903
 SOIL CLASSIFICATION IS "D"
 SUBAREA RUNOFF(CFS) = 1.08
 TOTAL AREA(ACRES) = 0.33 TOTAL RUNOFF(CFS) = 1.08

 FLOW PROCESS FROM NODE 206.20 TO NODE 206.30 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====
 ELEVATION DATA: UPSTREAM(FEET) = 843.40 DOWNSTREAM(FEET) = 839.90
 FLOW LENGTH(FEET) = 208.00 MANNING'S N = 0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN 18.0 INCH PIPE IS 3.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.52
 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 1.08
 PIPE TRAVEL TIME(MIN.) = 0.77 Tc(MIN.) = 8.61
 LONGEST FLOWPATH FROM NODE 206.10 TO NODE 206.30 = 493.00 FEET.

 FLOW PROCESS FROM NODE 206.30 TO NODE 206.30 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.486
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8898
 SOIL CLASSIFICATION IS "D"
 SUBAREA AREA(ACRES) = 1.15 SUBAREA RUNOFF(CFS) = 3.57
 TOTAL AREA(ACRES) = 1.5 TOTAL RUNOFF(CFS) = 4.64
 TC(MIN.) = 8.61

 FLOW PROCESS FROM NODE 206.30 TO NODE 206.40 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====
 ELEVATION DATA: UPSTREAM(FEET) = 839.90 DOWNSTREAM(FEET) = 836.90
 FLOW LENGTH(FEET) = 211.00 MANNING'S N = 0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN 18.0 INCH PIPE IS 7.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.44
 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 4.64
 PIPE TRAVEL TIME(MIN.) = 0.55 Tc(MIN.) = 9.15
 LONGEST FLOWPATH FROM NODE 206.10 TO NODE 206.40 = 704.00 FEET.

FLOW PROCESS FROM NODE 206.40 TO NODE 206.40 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

100 YEAR RAINFALL INTENSITY(INCH/HOUR) =	3.370		
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT =	.8895		
SOIL CLASSIFICATION IS "D"			
SUBAREA AREA(ACRES) =	1.23	SUBAREA RUNOFF(CFS) =	3.69
TOTAL AREA(ACRES) =	2.7	TOTAL RUNOFF(CFS) =	8.33
TC(MIN.) =	9.15		

FLOW PROCESS FROM NODE 206.40 TO NODE 206.50 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	836.90	DOWNSTREAM(FEET) =	833.00
FLOW LENGTH(FEET) =	141.00	MANNING'S N =	0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO	18.000		
DEPTH OF FLOW IN 18.0 INCH PIPE IS	8.9 INCHES		
PIPE-FLOW VELOCITY(FEET/SEC.) =	9.58		
ESTIMATED PIPE DIAMETER(INCH) =	18.00	NUMBER OF PIPES =	1
PIPE-FLOW(CFS) =	8.33		
PIPE TRAVEL TIME(MIN.) =	0.25	Tc(MIN.) =	9.40
LONGEST FLOWPATH FROM NODE 206.10 TO NODE 206.50 =	845.00 FEET.		

FLOW PROCESS FROM NODE 206.50 TO NODE 206.50 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

100 YEAR RAINFALL INTENSITY(INCH/HOUR) =	3.321		
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT =	.8894		
SOIL CLASSIFICATION IS "D"			
SUBAREA AREA(ACRES) =	0.45	SUBAREA RUNOFF(CFS) =	1.33
TOTAL AREA(ACRES) =	3.2	TOTAL RUNOFF(CFS) =	9.66
TC(MIN.) =	9.40		

FLOW PROCESS FROM NODE 206.50 TO NODE 206.50 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS =	2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:	
TIME OF CONCENTRATION(MIN.) =	9.40
RAINFALL INTENSITY(INCH/HR) =	3.32
TOTAL STREAM AREA(ACRES) =	3.16
PEAK FLOW RATE(CFS) AT CONFLUENCE =	9.66

FLOW PROCESS FROM NODE 206.51 TO NODE 206.52 IS CODE = 21

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

```

=====
      ASSUMED INITIAL SUBAREA UNIFORM
      DEVELOPMENT IS COMMERCIAL
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH(FEET) = 309.00
UPSTREAM ELEVATION(FEET) = 851.80
DOWNSTREAM ELEVATION(FEET) = 843.80
ELEVATION DIFFERENCE(FEET) = 8.00
TC = 0.303*[(309.00**3)/(8.00)]**.2 = 6.237
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.160
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8913
SOIL CLASSIFICATION IS "D"
SUBAREA RUNOFF(CFS) = 3.78
TOTAL AREA(ACRES) = 1.02 TOTAL RUNOFF(CFS) = 3.78

```

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*****
FLOW PROCESS FROM NODE 206.52 TO NODE 206.53 IS CODE = 31

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-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

```

```

=====
ELEVATION DATA: UPSTREAM(FEET) = 837.30 DOWNSTREAM(FEET) = 835.00
FLOW LENGTH(FEET) = 84.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 5.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 7.72
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 3.78
PIPE TRAVEL TIME(MIN.) = 0.18 Tc(MIN.) = 6.42
LONGEST FLOWPATH FROM NODE 206.51 TO NODE 206.53 = 393.00 FEET.

```

```

*****
FLOW PROCESS FROM NODE 206.53 TO NODE 206.53 IS CODE = 81

```

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-----
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

```

```

=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.095
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8912
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 1.12 SUBAREA RUNOFF(CFS) = 4.09
TOTAL AREA(ACRES) = 2.1 TOTAL RUNOFF(CFS) = 7.87
TC(MIN.) = 6.42

```

```

*****
FLOW PROCESS FROM NODE 206.53 TO NODE 206.54 IS CODE = 31

```

```

-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

```

```

=====
ELEVATION DATA: UPSTREAM(FEET) = 835.00 DOWNSTREAM(FEET) = 834.50
FLOW LENGTH(FEET) = 75.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 13.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.38
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 7.87
PIPE TRAVEL TIME(MIN.) = 0.23 Tc(MIN.) = 6.65
LONGEST FLOWPATH FROM NODE 206.51 TO NODE 206.54 = 468.00 FEET.

```

FLOW PROCESS FROM NODE 206.54 TO NODE 206.54 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

100 YEAR RAINFALL INTENSITY(INCH/HOUR) =	4.016
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT =	.8910
SOIL CLASSIFICATION IS "D"	
SUBAREA AREA(ACRES) =	1.41
SUBAREA RUNOFF(CFS) =	5.05
TOTAL AREA(ACRES) =	3.5
TOTAL RUNOFF(CFS) =	12.92
TC(MIN.) =	6.65

FLOW PROCESS FROM NODE 206.54 TO NODE 206.50 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	834.50	DOWNSTREAM(FEET) =	833.00
FLOW LENGTH(FEET) =	254.00	MANNING'S N =	0.013
DEPTH OF FLOW IN 24.0 INCH PIPE IS	15.7 INCHES		
PIPE-FLOW VELOCITY(FEET/SEC.) =	5.94		
ESTIMATED PIPE DIAMETER(INCH) =	24.00	NUMBER OF PIPES =	1
PIPE-FLOW(CFS) =	12.92		
PIPE TRAVEL TIME(MIN.) =	0.71	Tc(MIN.) =	7.36
LONGEST FLOWPATH FROM NODE 206.51 TO NODE 206.50 =	722.00 FEET.		

FLOW PROCESS FROM NODE 206.50 TO NODE 206.50 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

100 YEAR RAINFALL INTENSITY(INCH/HOUR) =	3.798
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT =	.8906
SOIL CLASSIFICATION IS "D"	
SUBAREA AREA(ACRES) =	0.29
SUBAREA RUNOFF(CFS) =	0.98
TOTAL AREA(ACRES) =	3.8
TOTAL RUNOFF(CFS) =	13.90
TC(MIN.) =	7.36

FLOW PROCESS FROM NODE 206.50 TO NODE 206.50 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS =	2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:	
TIME OF CONCENTRATION(MIN.) =	7.36
RAINFALL INTENSITY(INCH/HR) =	3.80
TOTAL STREAM AREA(ACRES) =	3.84
PEAK FLOW RATE(CFS) AT CONFLUENCE =	13.90

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	9.66	9.40	3.321	3.16

2 13.90 7.36 3.798 3.84

*****WARNING*****
IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 21.47 7.36 3.798
2 21.81 9.40 3.321

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 21.47 Tc(MIN.) = 7.36
TOTAL AREA(ACRES) = 7.0
LONGEST FLOWPATH FROM NODE 206.10 TO NODE 206.50 = 845.00 FEET.

FLOW PROCESS FROM NODE 206.50 TO NODE 206.60 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 833.00 DOWNSTREAM(FEET) = 827.10
FLOW LENGTH(FEET) = 241.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 21.0 INCH PIPE IS 15.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 11.35
ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 21.47
PIPE TRAVEL TIME(MIN.) = 0.35 Tc(MIN.) = 7.72
LONGEST FLOWPATH FROM NODE 206.10 TO NODE 206.60 = 1086.00 FEET.

FLOW PROCESS FROM NODE 206.60 TO NODE 206.60 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.701
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8904
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 1.54 SUBAREA RUNOFF(CFS) = 5.07
TOTAL AREA(ACRES) = 8.5 TOTAL RUNOFF(CFS) = 26.54
TC(MIN.) = 7.72

FLOW PROCESS FROM NODE 206.60 TO NODE 206.70 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 827.10 DOWNSTREAM(FEET) = 824.90
FLOW LENGTH(FEET) = 135.00 MANNING'S N = 0.013

DEPTH OF FLOW IN 24.0 INCH PIPE IS 18.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 10.19
ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 26.54
PIPE TRAVEL TIME(MIN.) = 0.22 Tc(MIN.) = 7.94
LONGEST FLOWPATH FROM NODE 206.10 TO NODE 206.70 = 1221.00 FEET.

FLOW PROCESS FROM NODE 206.70 TO NODE 206.70 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.644
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8902
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 0.83 SUBAREA RUNOFF(CFS) = 2.69
TOTAL AREA(ACRES) = 9.4 TOTAL RUNOFF(CFS) = 29.23
TC(MIN.) = 7.94

FLOW PROCESS FROM NODE 206.70 TO NODE 206.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 824.90 DOWNSTREAM(FEET) = 822.70
FLOW LENGTH(FEET) = 139.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 27.0 INCH PIPE IS 17.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 10.54
ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 29.23
PIPE TRAVEL TIME(MIN.) = 0.22 Tc(MIN.) = 8.16
LONGEST FLOWPATH FROM NODE 206.10 TO NODE 206.00 = 1360.00 FEET.

FLOW PROCESS FROM NODE 206.00 TO NODE 206.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.590
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8901
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 0.83 SUBAREA RUNOFF(CFS) = 2.65
TOTAL AREA(ACRES) = 10.2 TOTAL RUNOFF(CFS) = 31.88
TC(MIN.) = 8.16

FLOW PROCESS FROM NODE 206.00 TO NODE 206.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)	
1	31.88	8.16	3.590	10.20	
LONGEST FLOWPATH FROM NODE 206.10 TO NODE 206.00 =					1360.00 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	36.93	13.05	2.774	13.73

LONGEST FLOWPATH FROM NODE 200.00 TO NODE 206.00 = 1932.00 FEET.

*****WARNING*****
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	54.97	8.16	3.590
2	61.56	13.05	2.774

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 61.56 Tc(MIN.) = 13.05
 TOTAL AREA(ACRES) = 23.9

 FLOW PROCESS FROM NODE 206.00 TO NODE 206.10 IS CODE = 41

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 822.70 DOWNSTREAM(FEET) = 819.50
 FLOW LENGTH(FEET) = 24.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 12.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 28.20
 GIVEN PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 61.56 >> Line B1-a (out of TTM 37890)
 PIPE TRAVEL TIME(MIN.) = 0.01 Tc(MIN.) = 13.06
 LONGEST FLOWPATH FROM NODE 200.00 TO NODE 206.10 = 1956.00 FEET.

 FLOW PROCESS FROM NODE 206.10 TO NODE 206.10 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<

 FLOW PROCESS FROM NODE 400.00 TO NODE 401.00 IS CODE = 21

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

=====

ASSUMED INITIAL SUBAREA UNIFORM DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
 $TC = K * [(LENGTH**3) / (ELEVATION CHANGE)] ** .2$
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 818.00
 UPSTREAM ELEVATION(FEET) = 882.00
 DOWNSTREAM ELEVATION(FEET) = 875.00
 ELEVATION DIFFERENCE(FEET) = 7.00
 $TC = 0.533 * [(818.00**3) / (7.00)] ** .2 = 20.185$

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.183
UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7477
SOIL CLASSIFICATION IS "D"
SUBAREA RUNOFF(CFS) = 9.14
TOTAL AREA(ACRES) = 5.60 TOTAL RUNOFF(CFS) = 9.14

FLOW PROCESS FROM NODE 401.00 TO NODE 403.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 875.00 DOWNSTREAM(FEET) = 871.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 647.00 CHANNEL SLOPE = 0.0062
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 2.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 5.00
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.000
UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7363
SOIL CLASSIFICATION IS "D"
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 15.33
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.09
AVERAGE FLOW DEPTH(FEET) = 1.35 TRAVEL TIME(MIN.) = 3.49
Tc(MIN.) = 23.68
SUBAREA AREA(ACRES) = 8.40 SUBAREA RUNOFF(CFS) = 12.37
TOTAL AREA(ACRES) = 14.0 PEAK FLOW RATE(CFS) = 21.51

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.55 FLOW VELOCITY(FEET/SEC.) = 3.37
LONGEST FLOWPATH FROM NODE 400.00 TO NODE 403.00 = 1465.00 FEET.

FLOW PROCESS FROM NODE 403.00 TO NODE 404.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 871.00 DOWNSTREAM(FEET) = 868.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 689.00 CHANNEL SLOPE = 0.0044
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 2.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 5.00
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 1.846
UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7254
SOIL CLASSIFICATION IS "D"
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 26.20
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.10
AVERAGE FLOW DEPTH(FEET) = 1.82 TRAVEL TIME(MIN.) = 3.70
Tc(MIN.) = 27.38
SUBAREA AREA(ACRES) = 7.00 SUBAREA RUNOFF(CFS) = 9.37
TOTAL AREA(ACRES) = 21.0 PEAK FLOW RATE(CFS) = 30.88

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.95 FLOW VELOCITY(FEET/SEC.) = 3.23
LONGEST FLOWPATH FROM NODE 400.00 TO NODE 404.00 = 2154.00 FEET.

FLOW PROCESS FROM NODE 404.00 TO NODE 405.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	868.00	DOWNSTREAM(FEET) =	854.00
CHANNEL LENGTH THRU SUBAREA(FEET) =	673.00	CHANNEL SLOPE =	0.0208
CHANNEL BASE(FEET) =	1.00	"Z" FACTOR =	2.000
MANNING'S FACTOR =	0.030	MAXIMUM DEPTH(FEET) =	5.00
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =	1.779		
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT =	.8820		
SOIL CLASSIFICATION IS "D"			
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =	31.82		
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =	5.86		
AVERAGE FLOW DEPTH(FEET) =	1.42	TRAVEL TIME(MIN.) =	1.91
Tc(MIN.) =	29.30		
SUBAREA AREA(ACRES) =	1.20	SUBAREA RUNOFF(CFS) =	1.88
TOTAL AREA(ACRES) =	22.2	PEAK FLOW RATE(CFS) =	32.76

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.44 FLOW VELOCITY(FEET/SEC.) = 5.88
LONGEST FLOWPATH FROM NODE 400.00 TO NODE 405.00 = 2827.00 FEET.

FLOW PROCESS FROM NODE 405.00 TO NODE 406.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	854.00	DOWNSTREAM(FEET) =	833.00
CHANNEL LENGTH THRU SUBAREA(FEET) =	654.00	CHANNEL SLOPE =	0.0321
CHANNEL BASE(FEET) =	1.00	"Z" FACTOR =	2.000
MANNING'S FACTOR =	0.030	MAXIMUM DEPTH(FEET) =	5.00
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =	1.729		
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT =	.8816		
SOIL CLASSIFICATION IS "D"			
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =	33.68		
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =	6.98		
AVERAGE FLOW DEPTH(FEET) =	1.32	TRAVEL TIME(MIN.) =	1.56
Tc(MIN.) =	30.86		
SUBAREA AREA(ACRES) =	1.20	SUBAREA RUNOFF(CFS) =	1.83
TOTAL AREA(ACRES) =	23.4	PEAK FLOW RATE(CFS) =	34.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.34 FLOW VELOCITY(FEET/SEC.) = 7.03
LONGEST FLOWPATH FROM NODE 400.00 TO NODE 406.00 = 3481.00 FEET.

FLOW PROCESS FROM NODE 406.00 TO NODE 406.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

100 YEAR RAINFALL INTENSITY(INCH/HOUR) =	1.729		
SINGLE-FAMILY(1-ACRE LOT) RUNOFF COEFFICIENT =	.7528		
SOIL CLASSIFICATION IS "D"			
SUBAREA AREA(ACRES) =	4.00	SUBAREA RUNOFF(CFS) =	5.21
TOTAL AREA(ACRES) =	27.4	TOTAL RUNOFF(CFS) =	39.80
TC(MIN.) =	30.86		

FLOW PROCESS FROM NODE 406.00 TO NODE 407.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	833.00	DOWNSTREAM(FEET) =	828.00
CHANNEL LENGTH THRU SUBAREA(FEET) =	324.00	CHANNEL SLOPE =	0.0154
CHANNEL BASE(FEET) =	1.00	"Z" FACTOR =	2.000
MANNING'S FACTOR =	0.030	MAXIMUM DEPTH(FEET) =	5.00
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =	1.700		
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT =	.8813		
SOIL CLASSIFICATION IS	"D"		
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =	40.22		
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =	5.56		
AVERAGE FLOW DEPTH(FEET) =	1.67	TRAVEL TIME(MIN.) =	0.97
Tc(MIN.) =	31.83		
SUBAREA AREA(ACRES) =	0.56	SUBAREA RUNOFF(CFS) =	0.84
TOTAL AREA(ACRES) =	28.0	PEAK FLOW RATE(CFS) =	40.64

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.68 FLOW VELOCITY(FEET/SEC.) = 5.57
LONGEST FLOWPATH FROM NODE 400.00 TO NODE 407.00 = 3805.00 FEET.

FLOW PROCESS FROM NODE 407.00 TO NODE 407.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

100 YEAR RAINFALL INTENSITY(INCH/HOUR) =	1.700		
SINGLE-FAMILY(1-ACRE LOT) RUNOFF COEFFICIENT =	.7508		
SOIL CLASSIFICATION IS	"D"		
SUBAREA AREA(ACRES) =	5.10	SUBAREA RUNOFF(CFS) =	6.51
TOTAL AREA(ACRES) =	33.1	TOTAL RUNOFF(CFS) =	47.15
TC(MIN.) =	31.83		

FLOW PROCESS FROM NODE 407.00 TO NODE 408.00 IS CODE = 61

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STANDARD CURB SECTION USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) =	828.00	DOWNSTREAM ELEVATION(FEET) =	824.80
STREET LENGTH(FEET) =	995.00	CURB HEIGHT(INCHES) =	8.0
STREET HALFWIDTH(FEET) =	76.00		

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 53.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 48.27
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.94
 HALFSTREET FLOOD WIDTH(FEET) = 52.72
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.79
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.62
 STREET FLOW TRAVEL TIME(MIN.) = 5.95 Tc(MIN.) = 37.78
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 1.547
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8799
 SOIL CLASSIFICATION IS "D"
 SUBAREA AREA(ACRES) = 1.65 SUBAREA RUNOFF(CFS) = 2.25
 TOTAL AREA(ACRES) = 34.7 PEAK FLOW RATE(CFS) = 49.39

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.95 HALFSTREET FLOOD WIDTH(FEET) = 53.34
 FLOW VELOCITY(FEET/SEC.) = 2.80 DEPTH*VELOCITY(FT*FT/SEC.) = 2.65
 LONGEST FLOWPATH FROM NODE 400.00 TO NODE 408.00 = 4800.00 FEET.

 FLOW PROCESS FROM NODE 408.00 TO NODE 408.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 1.547
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8799
 SOIL CLASSIFICATION IS "D"
 SUBAREA AREA(ACRES) = 0.58 SUBAREA RUNOFF(CFS) = 0.79
 TOTAL AREA(ACRES) = 35.3 **TOTAL RUNOFF(CFS) = 50.18 >> Line B1-b**
 TC(MIN.) = 37.78

 FLOW PROCESS FROM NODE 408.00 TO NODE 206.10 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====
 ELEVATION DATA: UPSTREAM(FEET) = 820.97 DOWNSTREAM(FEET) = 819.50
 FLOW LENGTH(FEET) = 36.50 MANNING'S N = 0.013
 DEPTH OF FLOW IN 27.0 INCH PIPE IS 18.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 17.03
 ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 50.18
 PIPE TRAVEL TIME(MIN.) = 0.04 Tc(MIN.) = 37.81
 LONGEST FLOWPATH FROM NODE 400.00 TO NODE 206.10 = 4836.50 FEET.

 FLOW PROCESS FROM NODE 206.10 TO NODE 206.10 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	50.18	37.81	1.546	35.29

LONGEST FLOWPATH FROM NODE 400.00 TO NODE 206.10 = 4836.50 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM	RUNOFF	Tc	INTENSITY	AREA
--------	--------	----	-----------	------

NUMBER	(CFS)	(MIN.)	(INCH/HOUR)	(ACRE)
1	61.56	13.06	2.772	23.93

LONGEST FLOWPATH FROM NODE 200.00 TO NODE 206.10 = 1956.00 FEET.

*****WARNING*****
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	78.90	13.06	2.772
2	84.52	37.81	1.546

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 78.90 Tc(MIN.) = 13.06
 TOTAL AREA(ACRES) = 59.2

 FLOW PROCESS FROM NODE 206.10 TO NODE 207.00 IS CODE = 41

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 819.50 DOWNSTREAM(FEET) = 819.00
 FLOW LENGTH(FEET) = 55.00 MANNING'S N = 0.013
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 11.16
 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
 GIVEN PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 78.90
 PIPE TRAVEL TIME(MIN.) = 0.08 Tc(MIN.) = 13.14
 LONGEST FLOWPATH FROM NODE 400.00 TO NODE 207.00 = 4891.50 FEET.

=====

END OF STUDY SUMMARY:
 TOTAL AREA(ACRES) = 59.2 TC(MIN.) = 13.14
PEAK FLOW RATE(CFS) = 78.90 >> Line B1-a Confluence

=====

END OF RATIONAL METHOD ANALYSIS

ONSITE (WEST)

THE SHOPS AT JURUPA VALLEY

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 1251

Analysis prepared by:

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***** DESCRIPTION OF STUDY *****
* TTM 37890 - 100 YEAR RATIONAL METHOD ANALYSIS *
* CALTRANS R/W; LINE 'D' AND PYRITE STREET EX. 30" LAT 'B' *
* *

FILE NAME: 37890CT.DAT
TIME/DATE OF STUDY: 15:17 08/11/2020

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 2.170
10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 0.810
100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 3.210
100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 1.200
SLOPE OF 10-YEAR INTENSITY-DURATION CURVE = 0.5499890
SLOPE OF 100-YEAR INTENSITY-DURATION CURVE = 0.5491524
COMPUTED RAINFALL INTENSITY DATA:

STORM EVENT = 100.00 1-HOUR INTENSITY(INCH/HOUR) = 1.200
SLOPE OF INTENSITY DURATION CURVE = 0.5492

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-	CROWN TO	STREET-CROSSFALL:			CURB	GUTTER-GEOMETRIES:			MANNING
	WIDTH	CROSSFALL	IN-	/	OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
	(FT)	(FT)	SIDE	/	SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
1	30.0	20.0	0.018	/	0.018/0.020	0.67	2.00	0.0313	0.167	0.0150
2	76.0	53.0	0.020	/	0.020/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- Relative Flow-Depth = 1.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- (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 100.00 TO NODE 101.00 IS CODE = 21

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

=====

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
TC = $K * [(LENGTH**3)/(ELEVATION CHANGE)]**.2$
INITIAL SUBAREA FLOW-LENGTH(FEET) = 862.00
UPSTREAM ELEVATION(FEET) = 932.00
DOWNSTREAM ELEVATION(FEET) = 877.50
ELEVATION DIFFERENCE(FEET) = 54.50
TC = $0.533 * [(862.00**3)/(54.50)]**.2 = 13.817$
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.688
UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7723
SOIL CLASSIFICATION IS "D"
SUBAREA RUNOFF(CFS) = 6.02
TOTAL AREA(ACRES) = 2.90 TOTAL RUNOFF(CFS) = 6.02

FLOW PROCESS FROM NODE 101.00 TO NODE 101.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 13.82
RAINFALL INTENSITY(INCH/HR) = 2.69
TOTAL STREAM AREA(ACRES) = 2.90
PEAK FLOW RATE(CFS) AT CONFLUENCE = 6.02

FLOW PROCESS FROM NODE 101.10 TO NODE 101.20 IS CODE = 21

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

=====

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
TC = $K * [(LENGTH**3)/(ELEVATION CHANGE)]**.2$
INITIAL SUBAREA FLOW-LENGTH(FEET) = 792.00
UPSTREAM ELEVATION(FEET) = 1340.00
DOWNSTREAM ELEVATION(FEET) = 940.00
ELEVATION DIFFERENCE(FEET) = 400.00
TC = $0.533 * [(792.00**3)/(400.00)]**.2 = 8.815$
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.440
UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7970
SOIL CLASSIFICATION IS "D"
SUBAREA RUNOFF(CFS) = 13.13
TOTAL AREA(ACRES) = 4.79 TOTAL RUNOFF(CFS) = 13.13

FLOW PROCESS FROM NODE 101.20 TO NODE 101.30 IS CODE = 41

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 940.00 DOWNSTREAM(FEET) = 890.00

FLOW LENGTH(FEET) = 462.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 24.0 INCH PIPE IS 6.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 17.52
 GIVEN PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 13.13
 PIPE TRAVEL TIME(MIN.) = 0.44 Tc(MIN.) = 9.25
 LONGEST FLOWPATH FROM NODE 101.10 TO NODE 101.30 = 1254.00 FEET.

 FLOW PROCESS FROM NODE 101.30 TO NODE 101.40 IS CODE = 52

>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<<
 >>>>TRAVELTIME THRU SUBAREA<<<<<<

=====
 ELEVATION DATA: UPSTREAM(FEET) = 890.00 DOWNSTREAM(FEET) = 877.50
 CHANNEL LENGTH THRU SUBAREA(FEET) = 110.00 CHANNEL SLOPE = 0.1136
 NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) = 13.13
 FLOW VELOCITY(FEET/SEC) = 8.48 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) = 0.22 Tc(MIN.) = 9.47
 LONGEST FLOWPATH FROM NODE 101.10 TO NODE 101.40 = 1364.00 FEET.

 FLOW PROCESS FROM NODE 101.30 TO NODE 101.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<<

=====
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 9.47
 RAINFALL INTENSITY(INCH/HR) = 3.31
 TOTAL STREAM AREA(ACRES) = 4.79
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 13.13

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	6.02	13.82	2.688	2.90
2	13.13	9.47	3.307	4.79

*****WARNING*****
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	17.26	9.47	3.307
2	16.69	13.82	2.688

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 17.26 Tc(MIN.) = 9.47
TOTAL AREA(ACRES) = 7.7
LONGEST FLOWPATH FROM NODE 101.10 TO NODE 101.00 = 1364.00 FEET.

FLOW PROCESS FROM NODE 101.00 TO NODE 102.00 IS CODE = 52

>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	877.50	DOWNSTREAM(FEET) =	854.00
CHANNEL LENGTH THRU SUBAREA(FEET) =	521.00	CHANNEL SLOPE =	0.0451
CHANNEL FLOW THRU SUBAREA(CFS) =	17.26		
FLOW VELOCITY(FEET/SEC) =	6.12	(PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)	
TRAVEL TIME(MIN.) =	1.42	Tc(MIN.) =	10.89
LONGEST FLOWPATH FROM NODE	101.10 TO NODE	102.00 =	1885.00 FEET.

FLOW PROCESS FROM NODE 102.00 TO NODE 102.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS =	2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:	
TIME OF CONCENTRATION(MIN.) =	10.89
RAINFALL INTENSITY(INCH/HR) =	3.06
TOTAL STREAM AREA(ACRES) =	7.69
PEAK FLOW RATE(CFS) AT CONFLUENCE =	17.26

FLOW PROCESS FROM NODE 101.10 TO NODE 102.10 IS CODE = 21

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

=====

ASSUMED INITIAL SUBAREA UNIFORM	
DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER	
TC = $K * [(LENGTH ** 3) / (ELEVATION CHANGE)] ** .2$	
INITIAL SUBAREA FLOW-LENGTH(FEET) =	968.00
UPSTREAM ELEVATION(FEET) =	1340.00
DOWNSTREAM ELEVATION(FEET) =	910.10
ELEVATION DIFFERENCE(FEET) =	429.90
TC = $0.533 * [(968.00 ** 3) / (429.90)] ** .2 =$	9.801
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =	3.246
UNDEVELOPED WATERSHED RUNOFF COEFFICIENT =	.7916
SOIL CLASSIFICATION IS "D"	
SUBAREA RUNOFF(CFS) =	10.79
TOTAL AREA(ACRES) =	4.20
TOTAL RUNOFF(CFS) =	10.79

FLOW PROCESS FROM NODE 102.10 TO NODE 102.20 IS CODE = 41

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	910.10	DOWNSTREAM(FEET) =	875.00
FLOW LENGTH(FEET) =	362.00	MANNING'S N =	0.013
DEPTH OF FLOW IN	24.0 INCH PIPE IS	6.4 INCHES	

PIPE-FLOW VELOCITY(FEET/SEC.) = 15.94
 GIVEN PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 10.79
 PIPE TRAVEL TIME(MIN.) = 0.38 Tc(MIN.) = 10.18
 LONGEST FLOWPATH FROM NODE 101.10 TO NODE 102.20 = 1330.00 FEET.

 FLOW PROCESS FROM NODE 102.20 TO NODE 102.00 IS CODE = 52

>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 875.00 DOWNSTREAM(FEET) = 854.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 421.00 CHANNEL SLOPE = 0.0499
 CHANNEL FLOW THRU SUBAREA(CFS) = 10.79
 FLOW VELOCITY(FEET/SEC) = 5.69 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) = 1.23 Tc(MIN.) = 11.41
 LONGEST FLOWPATH FROM NODE 101.10 TO NODE 102.00 = 1751.00 FEET.

 FLOW PROCESS FROM NODE 102.00 TO NODE 102.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.985
 UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7834
 SOIL CLASSIFICATION IS "D"
 SUBAREA AREA(ACRES) = 2.50 SUBAREA RUNOFF(CFS) = 5.85
 TOTAL AREA(ACRES) = 6.7 TOTAL RUNOFF(CFS) = 16.64
 TC(MIN.) = 11.41

 FLOW PROCESS FROM NODE 102.00 TO NODE 102.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 11.41
 RAINFALL INTENSITY(INCH/HR) = 2.99
 TOTAL STREAM AREA(ACRES) = 6.70
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 16.64

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	17.26	10.89	3.063	7.69
2	16.64	11.41	2.985	6.70

*****WARNING*****
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	33.14	10.89	3.063
2	33.46	11.41	2.985

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 33.14 Tc(MIN.) = 10.89
TOTAL AREA(ACRES) = 14.4
LONGEST FLOWPATH FROM NODE 101.10 TO NODE 102.00 = 1885.00 FEET.

FLOW PROCESS FROM NODE 102.00 TO NODE 103.00 IS CODE = 52

>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 854.00 DOWNSTREAM(FEET) = 852.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 112.00 CHANNEL SLOPE = 0.0179
CHANNEL FLOW THRU SUBAREA(CFS) = 33.14
FLOW VELOCITY(FEET/SEC) = 4.60 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 0.41 Tc(MIN.) = 11.30
LONGEST FLOWPATH FROM NODE 101.10 TO NODE 103.00 = 1997.00 FEET.

FLOW PROCESS FROM NODE 103.00 TO NODE 103.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.002
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8884
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 0.50 SUBAREA RUNOFF(CFS) = 1.33
TOTAL AREA(ACRES) = 14.9 TOTAL RUNOFF(CFS) = 34.47
TC(MIN.) = 11.30

FLOW PROCESS FROM NODE 103.00 TO NODE 104.00 IS CODE = 41

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 846.50 DOWNSTREAM(FEET) = 843.00
FLOW LENGTH(FEET) = 337.00 MANNING'S N = 0.013
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) = 10.97
PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
GIVEN PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 34.47
PIPE TRAVEL TIME(MIN.) = 0.51 Tc(MIN.) = 11.81
LONGEST FLOWPATH FROM NODE 101.10 TO NODE 104.00 = 2334.00 FEET.

FLOW PROCESS FROM NODE 104.00 TO NODE 104.00 IS CODE = 81

```

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.930
UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7815
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 1.40 SUBAREA RUNOFF(CFS) = 3.21
TOTAL AREA(ACRES) = 16.3 TOTAL RUNOFF(CFS) = 37.68
TC(MIN.) = 11.81

*****
FLOW PROCESS FROM NODE 104.00 TO NODE 105.00 IS CODE = 41
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 843.00 DOWNSTREAM(FEET) = 841.20
FLOW LENGTH(FEET) = 112.00 MANNING'S N = 0.013
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) = 11.99
PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
GIVEN PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 37.68 >>> Line 'D'
PIPE TRAVEL TIME(MIN.) = 0.16 Tc(MIN.) = 11.96
LONGEST FLOWPATH FROM NODE 101.10 TO NODE 105.00 = 2446.00 FEET.

*****
FLOW PROCESS FROM NODE 105.00 TO NODE 105.00 IS CODE = 10
-----
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
=====
*****
FLOW PROCESS FROM NODE 105.00 TO NODE 106.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=====
ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH(FEET) = 378.00
UPSTREAM ELEVATION(FEET) = 866.00
DOWNSTREAM ELEVATION(FEET) = 849.00
ELEVATION DIFFERENCE(FEET) = 17.00
TC = 0.533*[( 378.00**3)/( 17.00)]**.2 = 10.637
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.103
UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7872
SOIL CLASSIFICATION IS "D"
SUBAREA RUNOFF(CFS) = 1.78
TOTAL AREA(ACRES) = 0.73 TOTAL RUNOFF(CFS) = 1.78

*****
FLOW PROCESS FROM NODE 106.00 TO NODE 107.00 IS CODE = 61
-----
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STANDARD CURB SECTION USED)<<<<<
=====
UPSTREAM ELEVATION(FEET) = 849.00 DOWNSTREAM ELEVATION(FEET) = 827.90

```

STREET LENGTH(FEET) = 1128.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 40.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 18.50
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.12
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.32
HALFSTREET FLOOD WIDTH(FEET) = 9.59
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.01
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.96
STREET FLOW TRAVEL TIME(MIN.) = 6.25 Tc(MIN.) = 16.88
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.408
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8860
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 1.25 SUBAREA RUNOFF(CFS) = 2.67
TOTAL AREA(ACRES) = 2.0 **PEAK FLOW RATE(CFS) = 4.45**

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.35 HALFSTREET FLOOD WIDTH(FEET) = 11.15 >> Pyrite Street
FLOW VELOCITY(FEET/SEC.) = 3.27 DEPTH*VELOCITY(FT*FT/SEC.) = 1.14
LONGEST FLOWPATH FROM NODE 105.00 TO NODE 107.00 = 1506.00 FEET.

FLOW PROCESS FROM NODE 107.00 TO NODE 305.10 IS CODE = 41

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 823.10 DOWNSTREAM(FEET) = 819.20
FLOW LENGTH(FEET) = 295.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 30.0 INCH PIPE IS 6.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.93
GIVEN PIPE DIAMETER(INCH) = 30.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 4.45
PIPE TRAVEL TIME(MIN.) = 0.83 Tc(MIN.) = 17.71
LONGEST FLOWPATH FROM NODE 105.00 TO NODE 305.10 = 1801.00 FEET.

FLOW PROCESS FROM NODE 305.10 TO NODE 305.10 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<

FLOW PROCESS FROM NODE 301.00 TO NODE 302.00 IS CODE = 21

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

=====

ASSUMED INITIAL SUBAREA UNIFORM

DEVELOPMENT IS COMMERCIAL
TC = $K * [(LENGTH ** 3) / (ELEVATION CHANGE)] ** .2$
INITIAL SUBAREA FLOW-LENGTH(FEET) = 569.00
UPSTREAM ELEVATION(FEET) = 849.60
DOWNSTREAM ELEVATION(FEET) = 846.80
ELEVATION DIFFERENCE(FEET) = 2.80
TC = $0.303 * [(569.00 ** 3) / (2.80)] ** .2 = 11.097$
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.032
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8885
SOIL CLASSIFICATION IS "D"
SUBAREA RUNOFF(CFS) = 3.10
TOTAL AREA(ACRES) = 1.15 TOTAL RUNOFF(CFS) = 3.10

FLOW PROCESS FROM NODE 302.00 TO NODE 303.00 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 840.30 DOWNSTREAM(FEET) = 826.80
FLOW LENGTH(FEET) = 376.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 4.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 8.03
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 3.10
PIPE TRAVEL TIME(MIN.) = 0.78 Tc(MIN.) = 11.88
LONGEST FLOWPATH FROM NODE 301.00 TO NODE 303.00 = 945.00 FEET.

FLOW PROCESS FROM NODE 303.00 TO NODE 303.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.921
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8881
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 2.10 SUBAREA RUNOFF(CFS) = 5.45
TOTAL AREA(ACRES) = 3.2 TOTAL RUNOFF(CFS) = 8.54
TC(MIN.) = 11.88

FLOW PROCESS FROM NODE 303.00 TO NODE 304.00 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 826.80 DOWNSTREAM(FEET) = 824.70
FLOW LENGTH(FEET) = 250.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 13.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.02
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 8.54
PIPE TRAVEL TIME(MIN.) = 0.69 Tc(MIN.) = 12.57
LONGEST FLOWPATH FROM NODE 301.00 TO NODE 304.00 = 1195.00 FEET.

FLOW PROCESS FROM NODE 304.00 TO NODE 304.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.831
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8878
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 1.44 SUBAREA RUNOFF(CFS) = 3.62
TOTAL AREA(ACRES) = 4.7 TOTAL RUNOFF(CFS) = 12.16
TC(MIN.) = 12.57

FLOW PROCESS FROM NODE 304.00 TO NODE 304.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.831
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8878
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 1.25 SUBAREA RUNOFF(CFS) = 3.14
TOTAL AREA(ACRES) = 5.9 TOTAL RUNOFF(CFS) = 15.31
TC(MIN.) = 12.57

FLOW PROCESS FROM NODE 304.00 TO NODE 305.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 824.70 DOWNSTREAM(FEET) = 823.00
FLOW LENGTH(FEET) = 429.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 27.0 INCH PIPE IS 18.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.31
ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 15.31
PIPE TRAVEL TIME(MIN.) = 1.35 Tc(MIN.) = 13.91
LONGEST FLOWPATH FROM NODE 301.00 TO NODE 305.00 = 1624.00 FEET.

FLOW PROCESS FROM NODE 305.00 TO NODE 305.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.677
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8872
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 1.71 SUBAREA RUNOFF(CFS) = 4.06
TOTAL AREA(ACRES) = 7.7 TOTAL RUNOFF(CFS) = 19.37
TC(MIN.) = 13.91

FLOW PROCESS FROM NODE 305.00 TO NODE 305.10 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 823.00 DOWNSTREAM(FEET) = 819.20

FLOW LENGTH(FEET) = 60.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 18.0 INCH PIPE IS 11.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 16.01
 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 19.37
 PIPE TRAVEL TIME(MIN.) = 0.06 Tc(MIN.) = 13.98
 LONGEST FLOWPATH FROM NODE 301.00 TO NODE 305.10 = 1684.00 FEET.

 FLOW PROCESS FROM NODE 305.10 TO NODE 305.10 IS CODE = 11

 >>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
 =====

**** MAIN STREAM CONFLUENCE DATA ****

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	19.37	13.98	2.671	7.65

 LONGEST FLOWPATH FROM NODE 301.00 TO NODE 305.10 = 1684.00 FEET.

**** MEMORY BANK # 2 CONFLUENCE DATA ****

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	4.45	17.71	2.345	1.98

 LONGEST FLOWPATH FROM NODE 105.00 TO NODE 305.10 = 1801.00 FEET.

*****WARNING*****
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.

**** PEAK FLOW RATE TABLE ****

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	22.88	13.98	2.671
2	21.46	17.71	2.345

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 22.88 Tc(MIN.) = 13.98
 TOTAL AREA(ACRES) = 9.6

=====
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES) = 9.6 TC(MIN.) = 13.98
PEAK FLOW RATE(CFS) = 22.88
 =====

=====
 END OF RATIONAL METHOD ANALYSIS

SECTION C
100 YEAR RATIONAL METHOD HYDROLOGY MAP

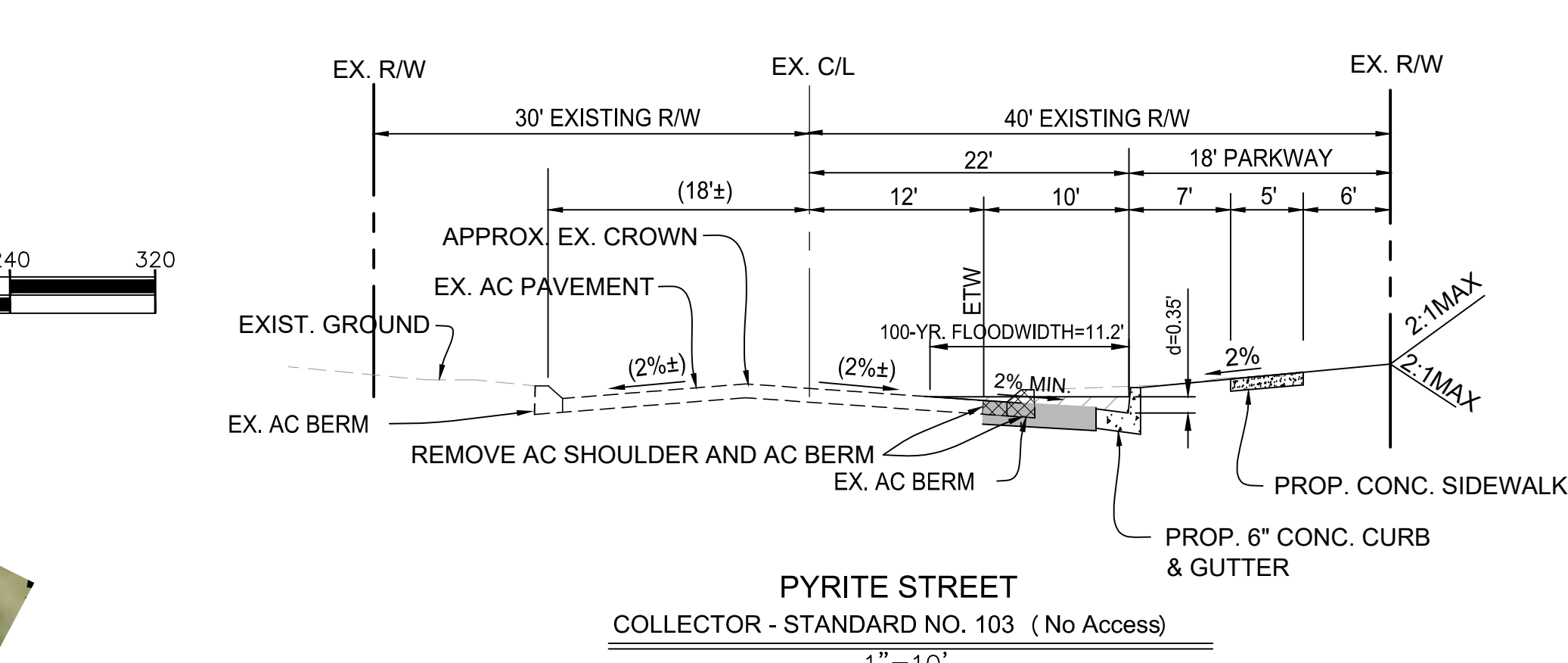
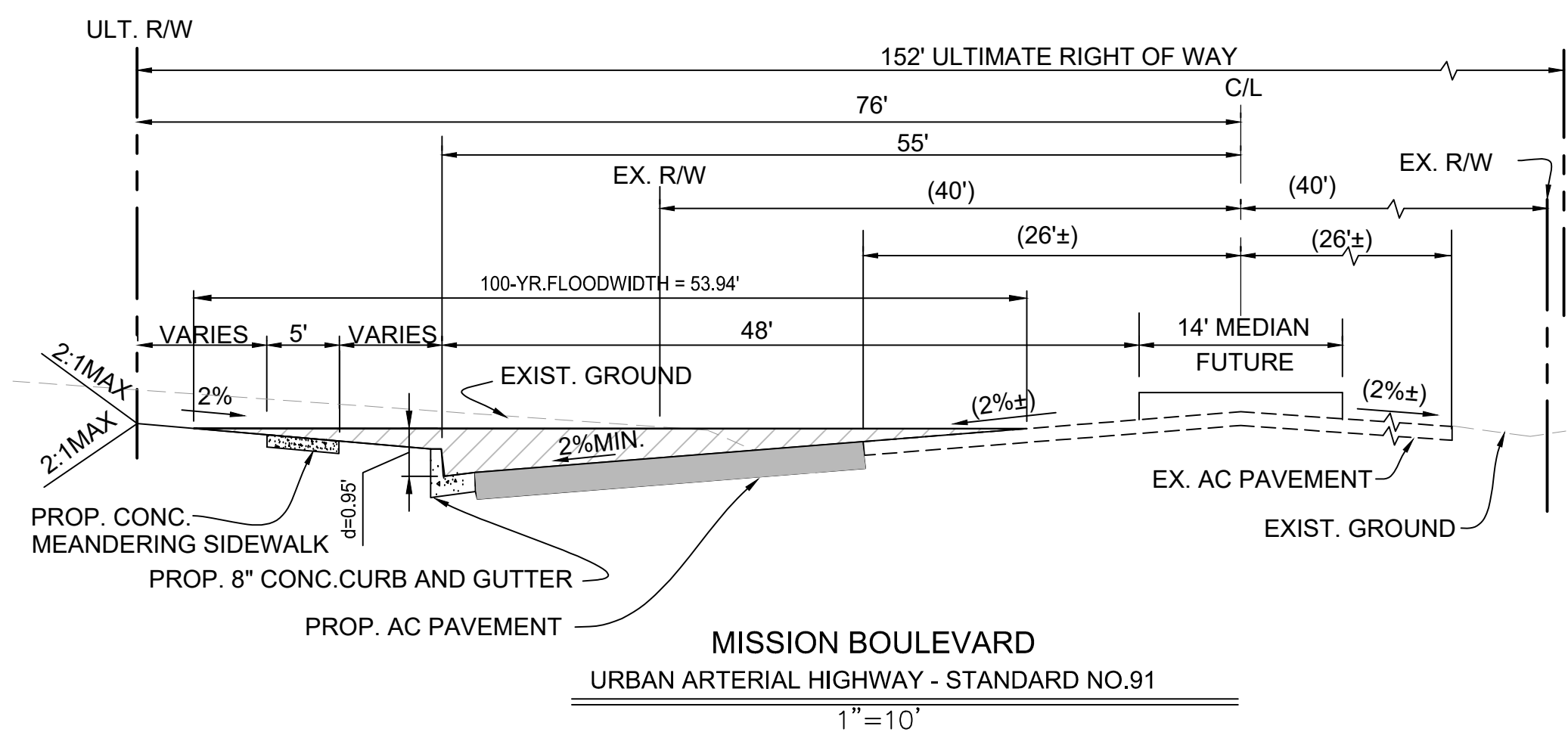
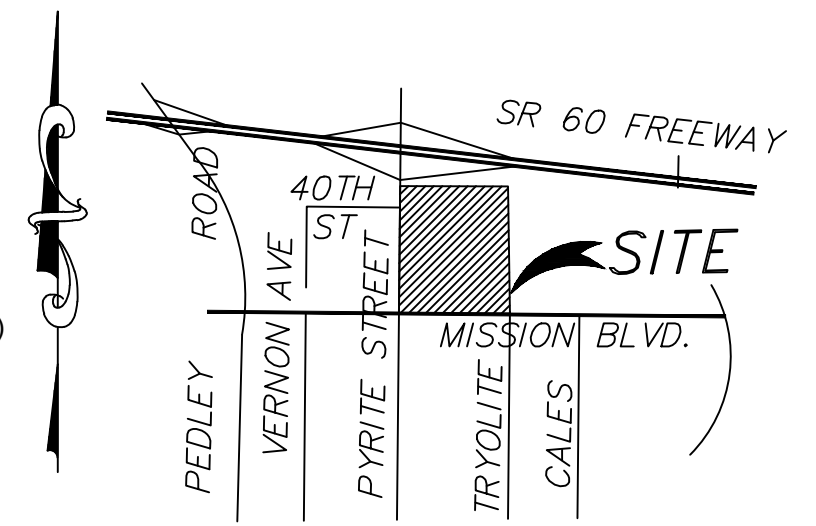
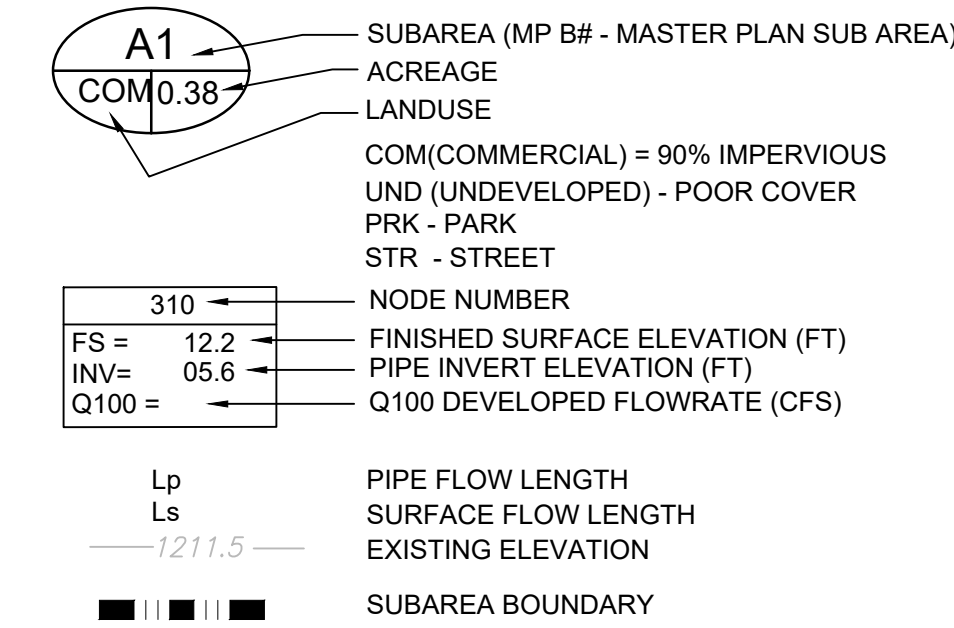
THE SHOPS AT JURUPA VALLEY

PRELIMINARY DRAINAGE MAP FOR TPM 37890 CITY OF JURUPA VALLEY, IN THE COUNTY OF RIVERSIDE STATE OF CALIFORNIA

NOTE: FLOWS FROM NORTH OF PROJECT SITE BOUNDARY INCLUDED IN EXISTING CHANNEL FLOW PER MASTER PLAN DRAINAGE STUDY FOR JURUPA/PYRITE. (SEE SECTION R FOR MASTER PLAN DRAINAGE MAP). RATIONAL METHOD SHOWN TO SIZE INLETS AND STORM DRAIN.

- NOTES:**
- SOILS ONSITE RANGE FROM A, C AND D. D CHOSEN FOR RATIONAL METHOD ANALYSIS.
 - AREA SHOWN CONTAINED WITHIN JURUPA/PYRITE MASTER PLAN OF DRAINAGE.
 - LAND USE: COMMERCIAL

LEGEND:



OWNER/DEVELOPER
PANORAMA DEVELOPMENT
2005 WINSTON COURT
UPLAND, CA 91784
CONTACT: WES FIFIELD
NUMBER: 909.931.3363

CIVIL ENGINEER
MADOLE & ASSOCIATES, INC.
9302 PITTSBURGH AVENUE, SUITE 230
RANCHO CUCAMONGA, CA 91730
CONTACT: JEFFREY RUPP
NUMBER: 909.481.6322

CITY OF JURUPA VALLEY TENTATIVE MAP 37890 THE SHOPS AT JURUPA VALLEY 100 YEAR DEVELOPED RATIONAL METHOD

PRELIMINARY DRAINAGE MAP

FOR TPM 37890

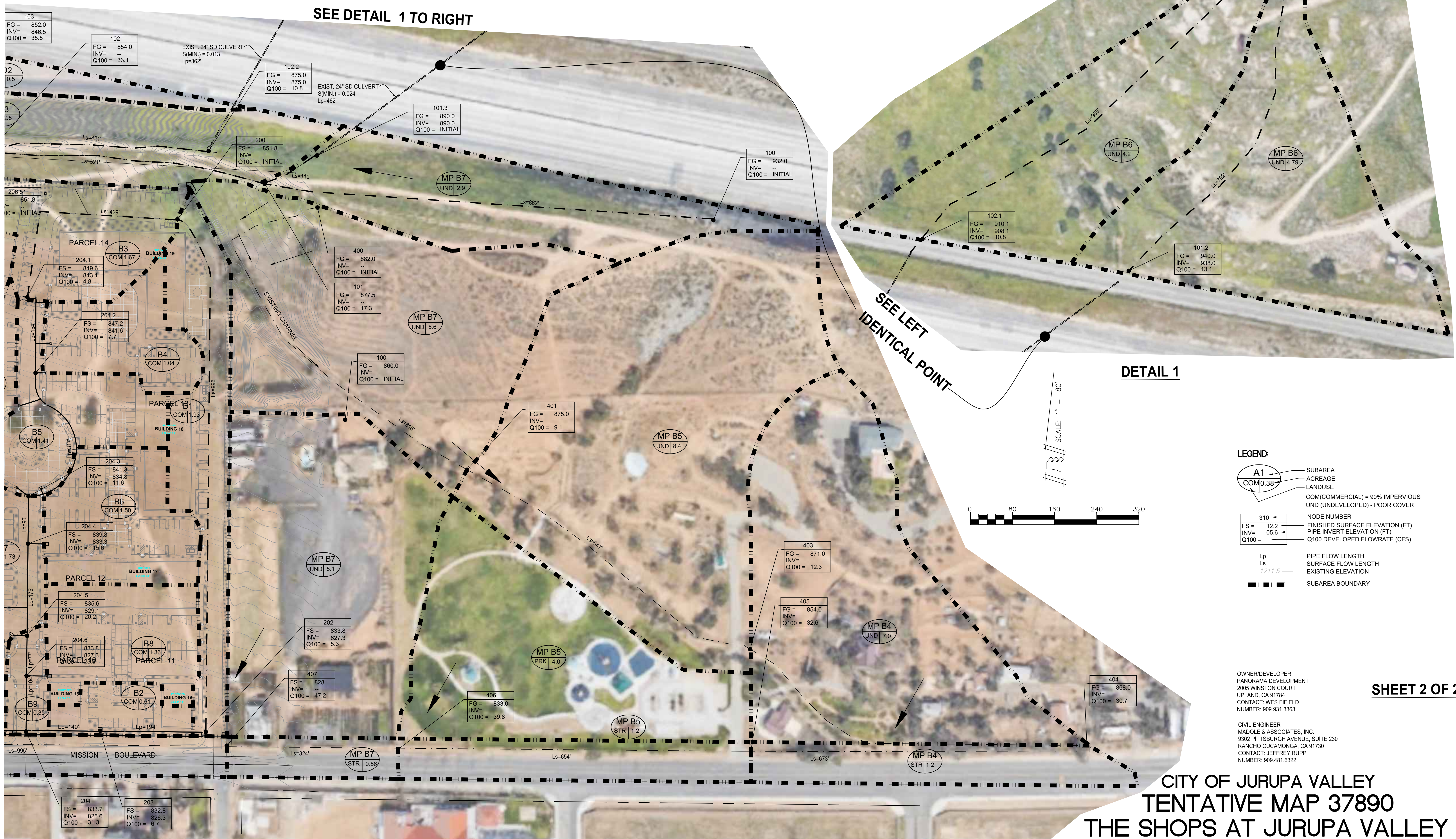
CITY OF JURUPA VALLEY, IN THE COUNTY OF RIVERSIDE STATE OF CALIFORNIA

- NOTES:**
- SOILS ONSITE RANGE FROM A, C AND D. D CHOSEN FOR RATIONAL METHOD ANALYSIS.
 - AREA SHOWN CONTAINED WITHIN JURUPA/PYRITE MASTER PLAN OF DRAINAGE.
 - LAND USE: COMMERCIAL

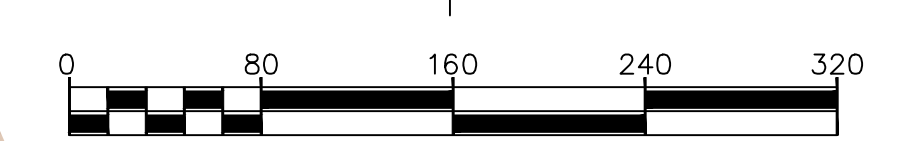
SEE DETAIL 1 TO RIGHT

SEE LEFT IDENTICAL POINT

DETAIL 1



- LEGEND:**
- A1 SUBAREA
 - COM 0.38 ACREAGE
 - LANDUSE
 - COM (COMMERCIAL) = 90% IMPERVIOUS
 - UND (UNDEVELOPED) - POOR COVER
 - 310 NODE NUMBER
 - FS = 12.2 FINISHED SURFACE ELEVATION (FT)
 - INV = 05.6 PIPE INVERT ELEVATION (FT)
 - Q100 = 0.5 Q100 DEVELOPED FLOWRATE (CFS)
 - Lp PIPE FLOW LENGTH
 - Ls SURFACE FLOW LENGTH
 - EXISTING ELEVATION
 - Subarea Boundary



OWNER/DEVELOPER
 PANORAMA DEVELOPMENT
 2005 WINSTON COURT
 UPLAND, CA 91784
 CONTACT: WES FIFIELD
 NUMBER: 909.931.3363

CIVIL ENGINEER
 MADOLE & ASSOCIATES, INC.
 9302 PITTSBURGH AVENUE, SUITE 230
 RANCHO CUCAMONGA, CA 91730
 CONTACT: JEFFREY RUPP
 NUMBER: 909.481.6322

SHEET 2 OF 2

**CITY OF JURUPA VALLEY
 TENTATIVE MAP 37890
 THE SHOPS AT JURUPA VALLEY
 100 YEAR DEVELOPED RATIONAL METHOD**

SECTION D
HYDRAULICS

THE SHOPS AT JURUPA VALLEY

12'X5' RCB IN MISSION BOULEVARD – ASSUME MINIMUM SLOPE OF S=0.010 (1%)
Friction slope to be field determined during final design.

>>>>CHANNEL INPUT INFORMATION<<<<

CHANNEL Z1(HORIZONTAL/VERTICAL) = 0.00
Z2(HORIZONTAL/VERTICAL) = 0.00
BASEWIDTH(FEET) = 12.00
CONSTANT CHANNEL SLOPE(FEET/FEET) = 0.010000
UNIFORM FLOW(CFS) = 1131.00
MANNINGS FRICTION FACTOR = 0.0130

=====

NORMAL-DEPTH FLOW INFORMATION:

>>>> NORMAL DEPTH(FEET) = 4.42
FLOW TOP-WIDTH(FEET) = 12.00
FLOW AREA(SQUARE FEET) = 53.08
HYDRAULIC DEPTH(FEET) = 4.42
FLOW AVERAGE VELOCITY(FEET/SEC.) = 21.31
UNIFORM FROUDE NUMBER = 1.785
PRESSURE + MOMENTUM(POUNDS) = 54027.52
AVERAGED VELOCITY HEAD(FEET) = 7.050
SPECIFIC ENERGY(FEET) = 11.474

=====

CRITICAL-DEPTH FLOW INFORMATION:

CRITICAL FLOW TOP-WIDTH(FEET) = 12.00
CRITICAL FLOW AREA(SQUARE FEET) = 78.12
CRITICAL FLOW HYDRAULIC DEPTH(FEET) = 6.51
CRITICAL FLOW AVERAGE VELOCITY(FEET/SEC.) = 14.48
CRITICAL DEPTH(FEET) = 6.51
CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) = 47598.69
AVERAGED CRITICAL FLOW VELOCITY HEAD(FEET) = 3.255
CRITICAL FLOW SPECIFIC ENERGY(FEET) = 9.765

=====

Note: Final site design hydraulics, including pipe sizing and inlet sizing, will be included in final report.

PYRITE STREET FLOW ANALYSIS

FLOW PROCESS FROM NODE 106.00 TO NODE 107.00 IS CODE = 61

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STANDARD CURB SECTION USED)<<<<<
=====

UPSTREAM ELEVATION(FEET) = 849.00 DOWNSTREAM ELEVATION(FEET) = 827.90
STREET LENGTH(FEET) = 1128.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 40.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 18.50
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.12
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.32
HALFSTREET FLOOD WIDTH(FEET) = 9.59
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.01
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.96
STREET FLOW TRAVEL TIME(MIN.) = 6.25 Tc(MIN.) = 16.88
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.408
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8860
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 1.25 SUBAREA RUNOFF(CFS) = 2.67
TOTAL AREA(ACRES) = 2.0 PEAK FLOW RATE(CFS) = 4.45

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.35 HALFSTREET FLOOD WIDTH(FEET) = 11.15
FLOW VELOCITY(FEET/SEC.) = 3.27 DEPTH*VELOCITY(FT*FT/SEC.) = 1.14
LONGEST FLOWPATH FROM NODE 105.00 TO NODE 107.00 = 1506.00 FEET.

PYRITE STREET CB #1

>>>>FLOWBY CATCH BASIN INLET CAPACITY INPUT INFORMATION<<<<<

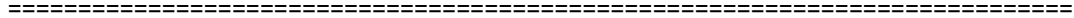
Curb Inlet Capacities are approximated based on the Bureau of
Public Roads nomograph plots for flowby basins and sump basins.

STREETFLOW(CFS) = 4.50
GUTTER FLOWDEPTH(FEET) = 0.35
BASIN LOCAL DEPRESSION(FEET) = 0.33

FLOWBY BASIN ANALYSIS RESULTS:

BASIN WIDTH FLOW INTERCEPTION

1.35	0.65
1.50	0.71
2.00	0.94
2.50	1.16
3.00	1.39
3.50	1.61
4.00	1.83
4.50	2.04
5.00	2.23
5.50	2.41
6.00	2.58
6.50	2.75
7.00	2.91
7.50	3.07
8.00	3.23
8.50	3.37
9.00	3.49
9.50	3.61
10.00	3.73
10.50	3.85
11.00	3.96
11.50	4.07
12.00	4.18
12.50	4.29
13.00	4.39
13.50	4.49
13.53	4.50 >>>> Design Width = 14'



MISSION BOULEVARD STREET FLOW ANALYSIS

```
*****
FLOW PROCESS FROM NODE      407.00 TO NODE      408.00 IS CODE = 61
-----
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STANDARD CURB SECTION USED)<<<<<
=====
UPSTREAM ELEVATION(FEET) = 828.00  DOWNSTREAM ELEVATION(FEET) = 824.80
STREET LENGTH(FEET) = 995.00  CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 76.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 53.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 48.27
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.94
HALFSTREET FLOOD WIDTH(FEET) = 52.72
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.79
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.62
STREET FLOW TRAVEL TIME(MIN.) = 5.95  Tc(MIN.) = 37.78
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 1.547
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8799
SOIL CLASSIFICATION IS "D"
SUBAREA AREA(ACRES) = 1.65  SUBAREA RUNOFF(CFS) = 2.25
TOTAL AREA(ACRES) = 34.7  PEAK FLOW RATE(CFS) = 49.39

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.95  HALFSTREET FLOOD WIDTH(FEET) = 53.34
FLOW VELOCITY(FEET/SEC.) = 2.80  DEPTH*VELOCITY(FT*FT/SEC.) = 2.65
LONGEST FLOWPATH FROM NODE 400.00 TO NODE 408.00 = 4800.00 FEET.
```

MISSION BOULEVARD CB#2

```
*****
>>>>>SUMP TYPE BASIN INPUT INFORMATION<<<<<
-----
```

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

BASIN INFLOW(CFS) = 49.40
BASIN OPENING(FEET) = 1.00
DEPTH OF WATER(FEET) = 0.95

>>>>CALCULATED ESTIMATED SUMP BASIN WIDTH(FEET) = 17.28 >> W=18'

=====

SECTION R
REFERENCES



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Properties and Qualities Ratings

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Soil Chemical Properties

Soil Erosion Factors

Soil Health Properties

Soil Physical Properties

Soil Qualities and Features

AASHTO Group Classification (Surface)

AASHTO Group Index

Depth to a Selected Soil Restrictive Layer

Depth to Any Soil Restrictive Layer

Drainage Class

Frost Action

Frost-Free Days

Hydrologic Soil Group

View Description | View Rating

View Options

Map

Table

Description of Rating

Rating Options

Detailed Description

Advanced Options

Aggregation Method: Dominant Condition

Component Percent Cutoff

Tie-break Rule: Lower | Higher

View Description | View Rating

Map Unit Name

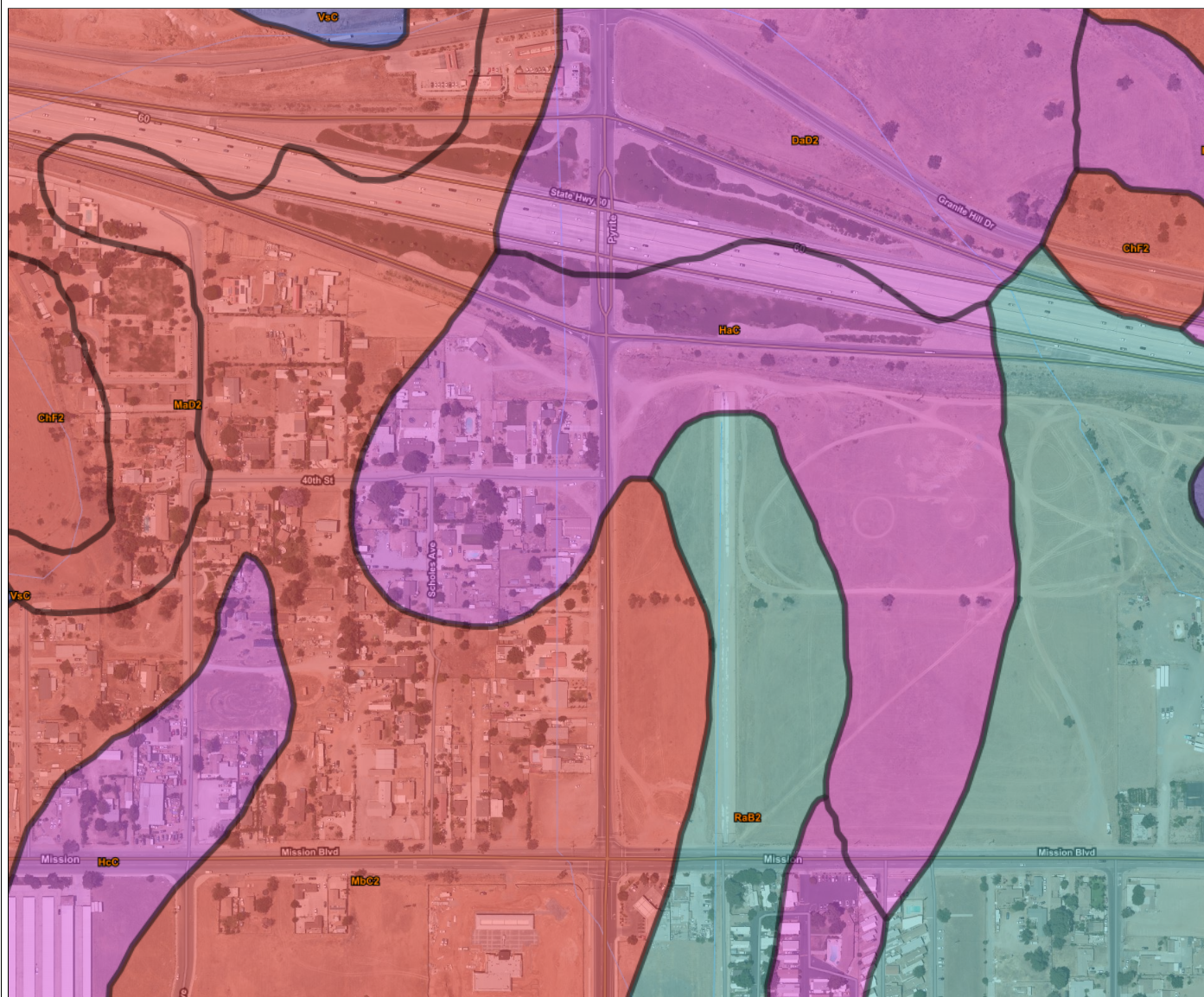
Parent Material Name

Representative Slope

Soil Slippage Potential

Map - Hydrologic Soil Group

Scale (not to scale)



Unified Soil Classification (Surface)
Water Features



Warning: Soil Ratings Map may not be valid at this scale.

You have zoomed in beyond the scale at which the soil map for this area is intended to be used. Mapping of soils is done at a particular scale. The soil survey level of detail shown in the resulting soil map are dependent on that map scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show detail at this scale.

Tables — Hydrologic Soil Group — Summary By Map Unit

Summary by Map Unit — Western Riverside Area, California (CA679)				
Summary by Map Unit — Western Riverside Area, California (CA679)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
ChF2	Cieneba sandy loam, 15 to 50 percent slopes, eroded	D	9.3	1.7%
CkF2	Cieneba rocky sandy loam, 15 to 50 percent slopes, eroded	D	89.8	16.6%
DaD2	Delhi fine sand, 2 to 15 percent slopes, wind-eroded	A	40.6	7.5%
GyC2	Greenfield sandy loam, 2 to 8 percent slopes, eroded	A	14.7	2.7%
HaC	Hanford loamy fine sand, 0 to 8 percent slopes	A	31.8	5.9%
HcC	Hanford coarse sandy loam, 2 to 8 percent slopes	A	42.8	7.9%
HcD2	Hanford coarse sandy loam, 8 to 15 percent slopes, eroded	A	7.3	1.3%
MaD2	Madera fine sandy loam, 5 to 15 percent slopes, eroded	D	29.6	5.5%
Mbc2	Madera fine sandy loam, shallow, 2 to 8 percent slopes, eroded	D	105.5	19.5%
MmB	Monserate sandy loam, 0 to 5 percent slopes	C	24.9	4.6%
RaB2	Ramona sandy loam, 2 to 5 percent slopes, eroded	C	17.1	3.2%
RaB3	Ramona sandy loam, 0 to 5 percent slopes, severely eroded	C	76.5	14.1%
VsC	Vista coarse sandy loam, 2 to 8 percent slopes	B	14.7	2.7%
VsD2	Vista coarse sandy loam, 8 to 15 percent slopes, eroded	B	20.9	3.9%
VsF2	Vista coarse sandy loam, 15 to 35 percent slopes, eroded	B	15.4	2.9%
Totals for Area of Interest			541.0	100.0%

Description — Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options — Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

RAINFALL INTENSITY—INCHES PER HOUR

RIVERSIDE			RIVERSIDE (FOOTHILL AREAS)			RUBIDOUX			SAN JACINTO			SUN CITY		
DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR
5	2.75	3.92	5	3.14	4.71	5	3.18	4.71	5	2.81	4.16	5	3.25	4.85
6	2.48	3.55	6	2.84	4.26	6	2.87	4.26	6	2.56	3.79	6	2.95	4.40
7	2.28	3.26	7	2.61	3.91	7	2.64	3.91	7	2.37	3.51	7	2.72	4.06
8	2.12	3.03	8	2.42	3.63	8	2.45	3.63	8	2.22	3.29	8	2.53	3.78
9	1.99	2.84	9	2.27	3.41	9	2.30	3.41	9	2.09	3.10	9	2.38	3.55
10	1.88	2.68	10	2.14	3.21	10	2.17	3.21	10	1.98	2.94	10	2.25	3.36
11	1.78	2.54	11	2.03	3.05	11	2.06	3.05	11	1.89	2.80	11	2.14	3.19
12	1.70	2.42	12	1.94	2.91	12	1.96	2.91	12	1.81	2.68	12	2.04	3.05
13	1.62	2.32	13	1.86	2.78	13	1.88	2.78	13	1.74	2.58	13	1.96	2.92
14	1.56	2.23	14	1.78	2.67	14	1.80	2.67	14	1.68	2.48	14	1.88	2.81
15	1.50	2.14	15	1.71	2.57	15	1.74	2.57	15	1.62	2.40	15	1.81	2.71
16	1.45	2.07	16	1.66	2.48	16	1.68	2.48	16	1.57	2.32	16	1.75	2.62
17	1.40	2.00	17	1.60	2.40	17	1.62	2.40	17	1.52	2.25	17	1.70	2.54
18	1.36	1.94	18	1.55	2.33	18	1.57	2.33	18	1.48	2.19	18	1.65	2.46
19	1.32	1.88	19	1.51	2.26	19	1.52	2.26	19	1.44	2.13	19	1.60	2.39
20	1.28	1.83	20	1.46	2.20	20	1.48	2.20	20	1.40	2.08	20	1.56	2.33
22	1.22	1.74	22	1.39	2.08	22	1.41	2.08	22	1.34	1.98	22	1.48	2.21
24	1.16	1.66	24	1.32	1.99	24	1.34	1.99	24	1.28	1.90	24	1.41	2.11
26	1.11	1.58	26	1.27	1.90	26	1.28	1.90	26	1.23	1.82	26	1.36	2.03
28	1.06	1.52	28	1.22	1.82	28	1.23	1.82	28	1.19	1.76	28	1.30	1.95
30	1.02	1.46	30	1.17	1.76	30	1.19	1.76	30	1.15	1.70	30	1.26	1.88
32	.99	1.41	32	1.13	1.70	32	1.14	1.70	32	1.11	1.64	32	1.21	1.81
34	.96	1.37	34	1.09	1.64	34	1.11	1.64	34	1.08	1.59	34	1.18	1.76
36	.93	1.32	36	1.06	1.59	36	1.07	1.59	36	1.05	1.55	36	1.14	1.70
38	.90	1.29	38	1.03	1.54	38	1.04	1.54	38	1.02	1.51	38	1.11	1.66
40	.87	1.25	40	1.00	1.50	40	1.01	1.50	40	.99	1.47	40	1.08	1.61
45	.82	1.17	45	.94	1.41	45	.95	1.41	45	.94	1.39	45	1.01	1.51
50	.77	1.11	50	.88	1.33	50	.90	1.33	50	.89	1.31	50	.96	1.43
55	.73	1.05	55	.84	1.26	55	.85	1.26	55	.85	1.25	55	.91	1.36
60	.70	1.00	60	.80	1.20	60	.81	1.20	60	.81	1.20	60	.87	1.30
65	.67	.96	65	.77	1.15	65	.78	1.15	65	.78	1.15	65	.83	1.25
70	.64	.92	70	.73	1.10	70	.74	1.10	70	.75	1.11	70	.80	1.20
75	.62	.88	75	.71	1.06	75	.72	1.06	75	.72	1.07	75	.77	1.15
80	.60	.85	80	.68	1.02	80	.69	1.02	80	.70	1.04	80	.75	1.12
85	.58	.83	85	.66	.99	85	.67	.99	85	.68	1.01	85	.72	1.08

SLOPE = .550

SLOPE = .550

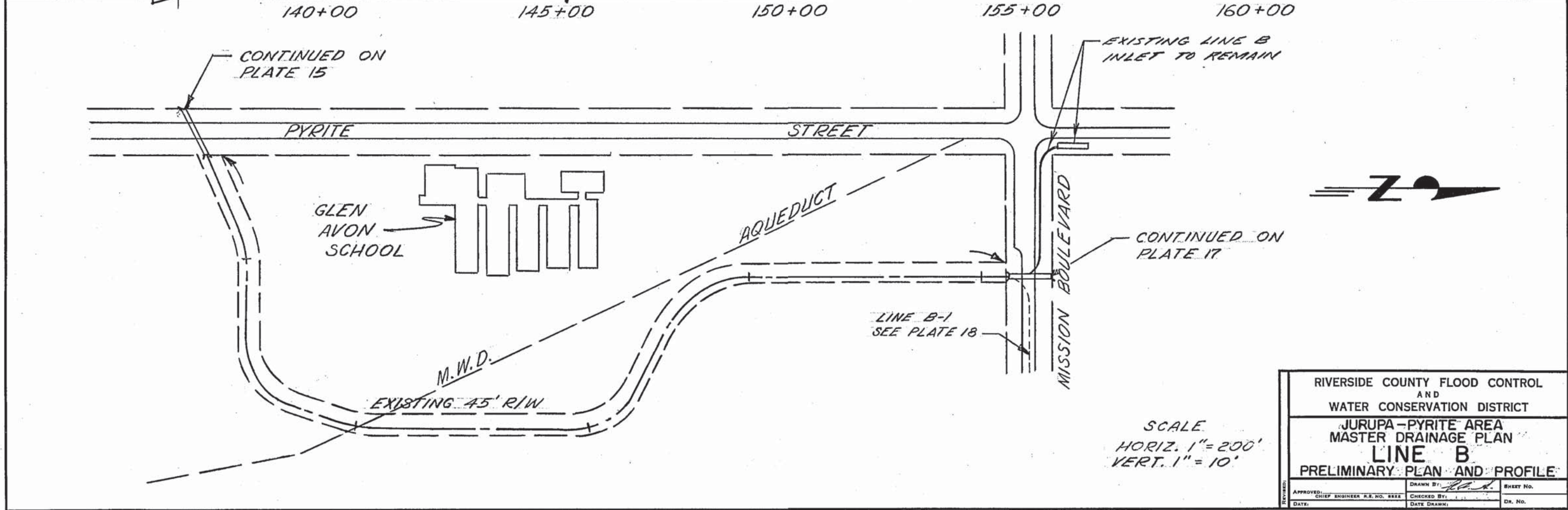
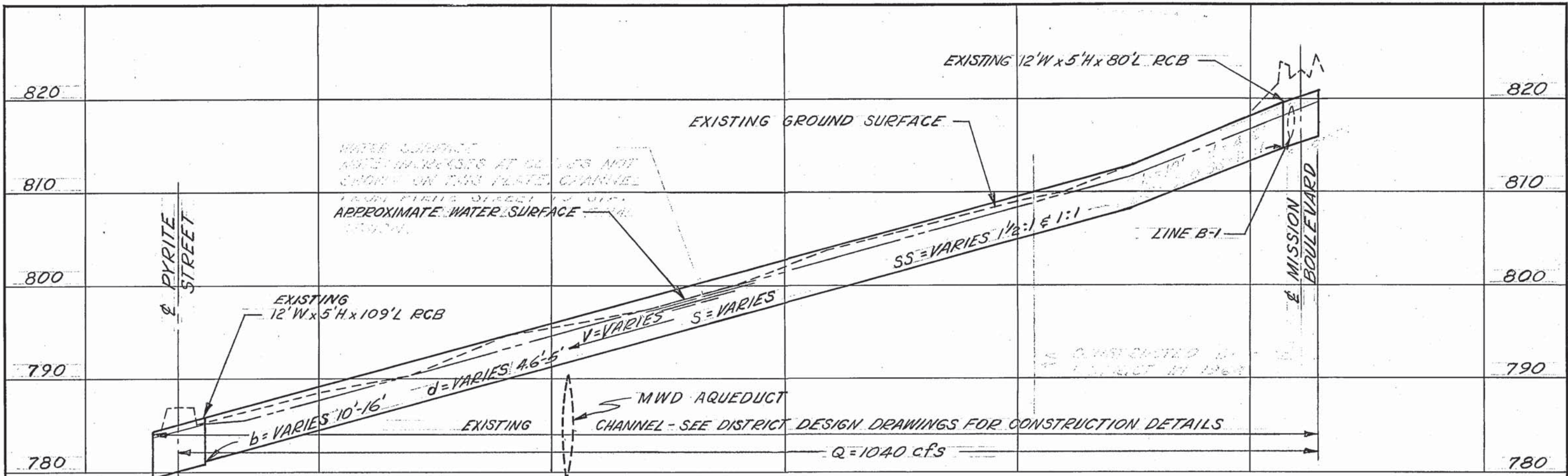
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SLOPE = .500

SLOPE = .530

RCFC & WCD
HYDROLOGY MANUAL

STANDARD
INTENSITY—DURATION
CURVES DATA



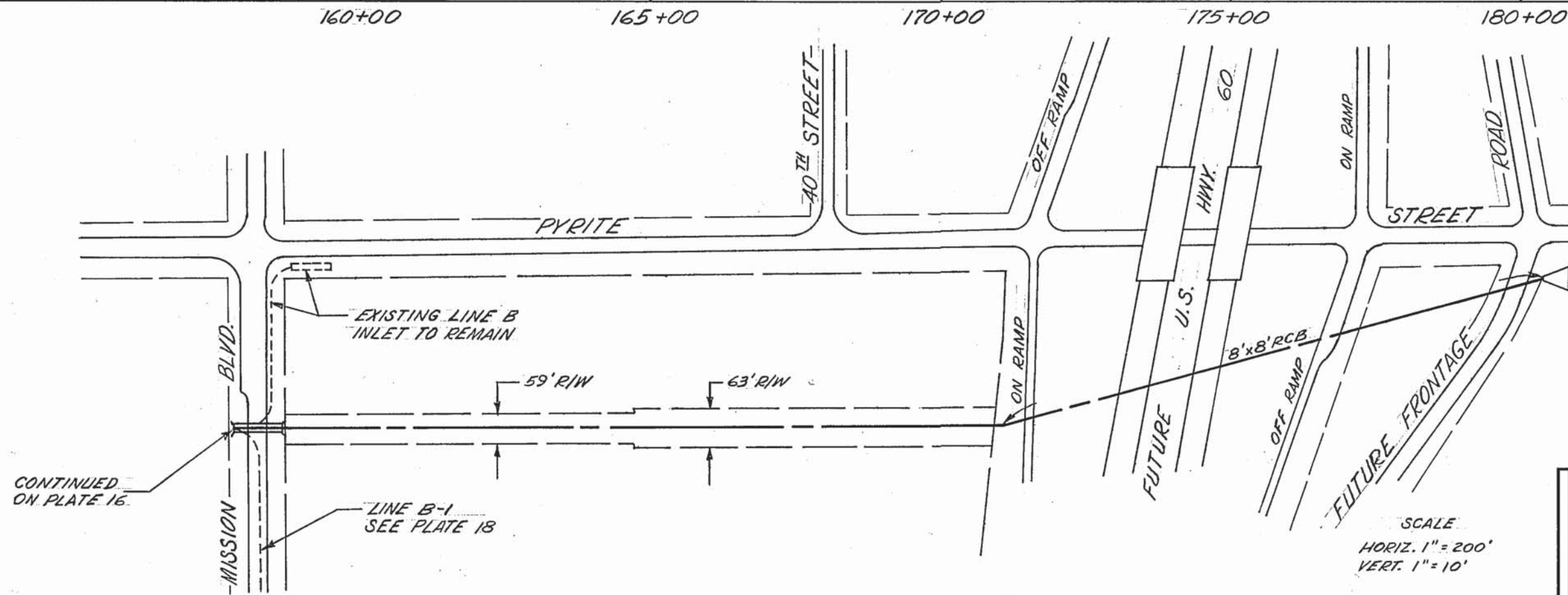
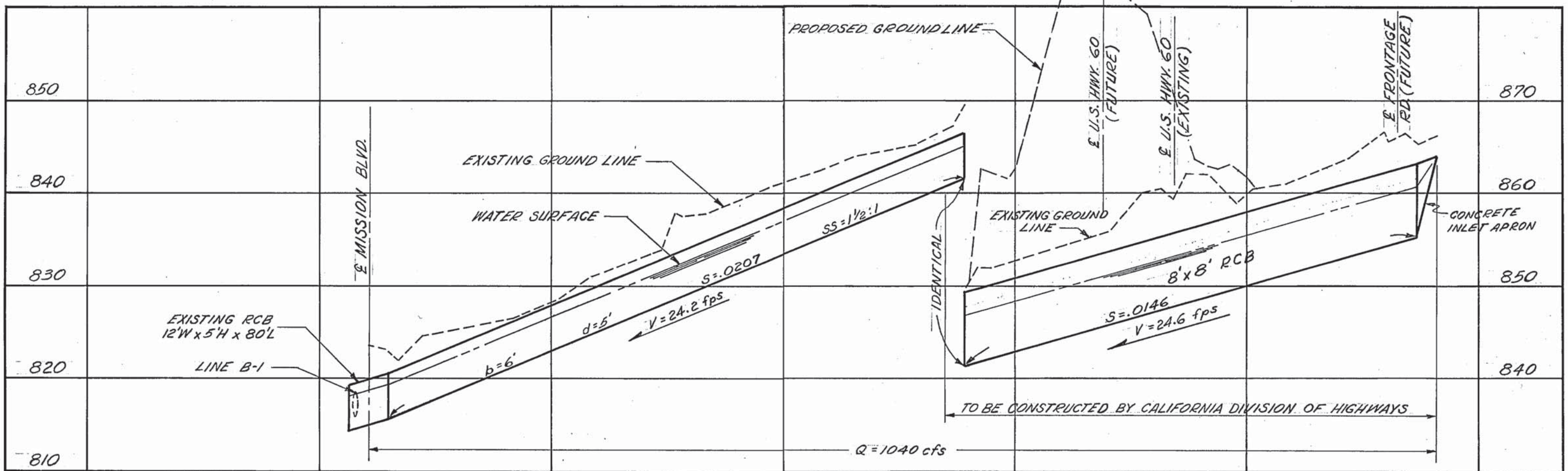
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

JURUPA-PYRITE AREA
MASTER DRAINAGE PLAN
LINE B
PRELIMINARY PLAN AND PROFILE

APPROVED: _____ CHIEF ENGINEER R.C.F.C. DISTRICT	DRAWN BY: <i>R.A.</i> DATE DRAWN: _____	SHEET NO. _____ DR. NO. _____
---	--	----------------------------------

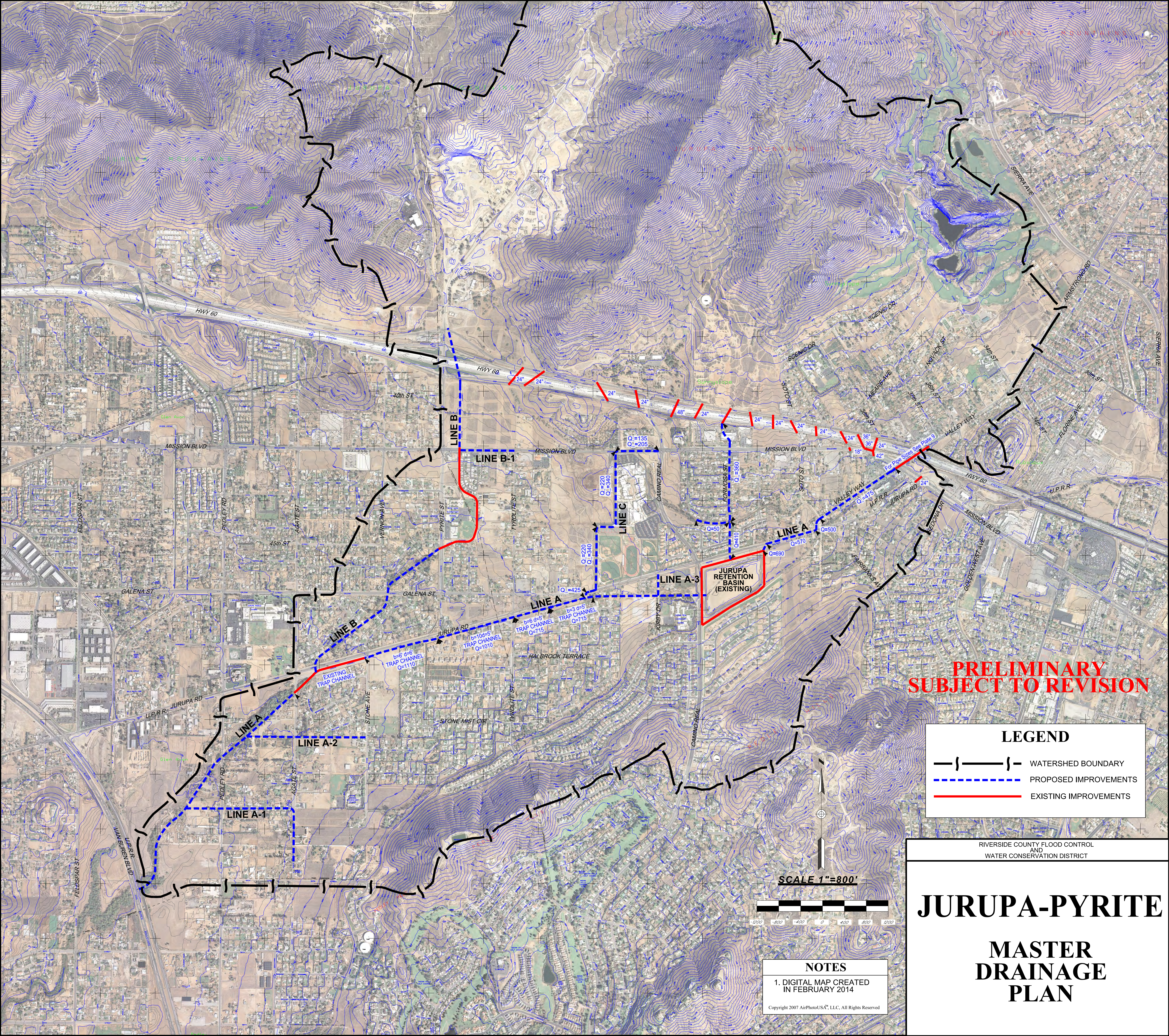
SCALE
HORIZ. 1" = 200'
VERT. 1" = 10'

PLATE 16



SCALE
 HORIZ. 1" = 200'
 VERT. 1" = 10'

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT		
JURUPA-PYRITE AREA MASTER DRAINAGE PLAN		
LINE B		
PRELIMINARY PLAN AND PROFILE		
APPROVED:	DRAWN BY: R.A.S.	SHEET NO.
CHIEF ENGINEER R.E. NO. 8887	CHECKED BY:	DATE DRAWN:
DATE:		DR. NO.



**PRELIMINARY
SUBJECT TO REVISION**

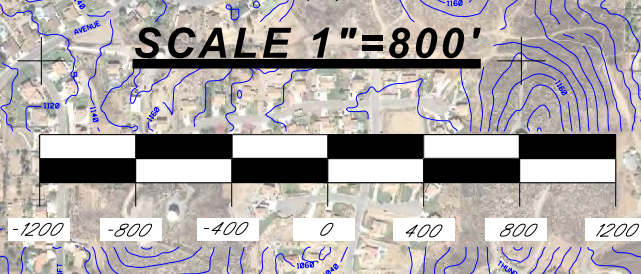
LEGEND

- WATERSHED BOUNDARY
- PROPOSED IMPROVEMENTS
- EXISTING IMPROVEMENTS

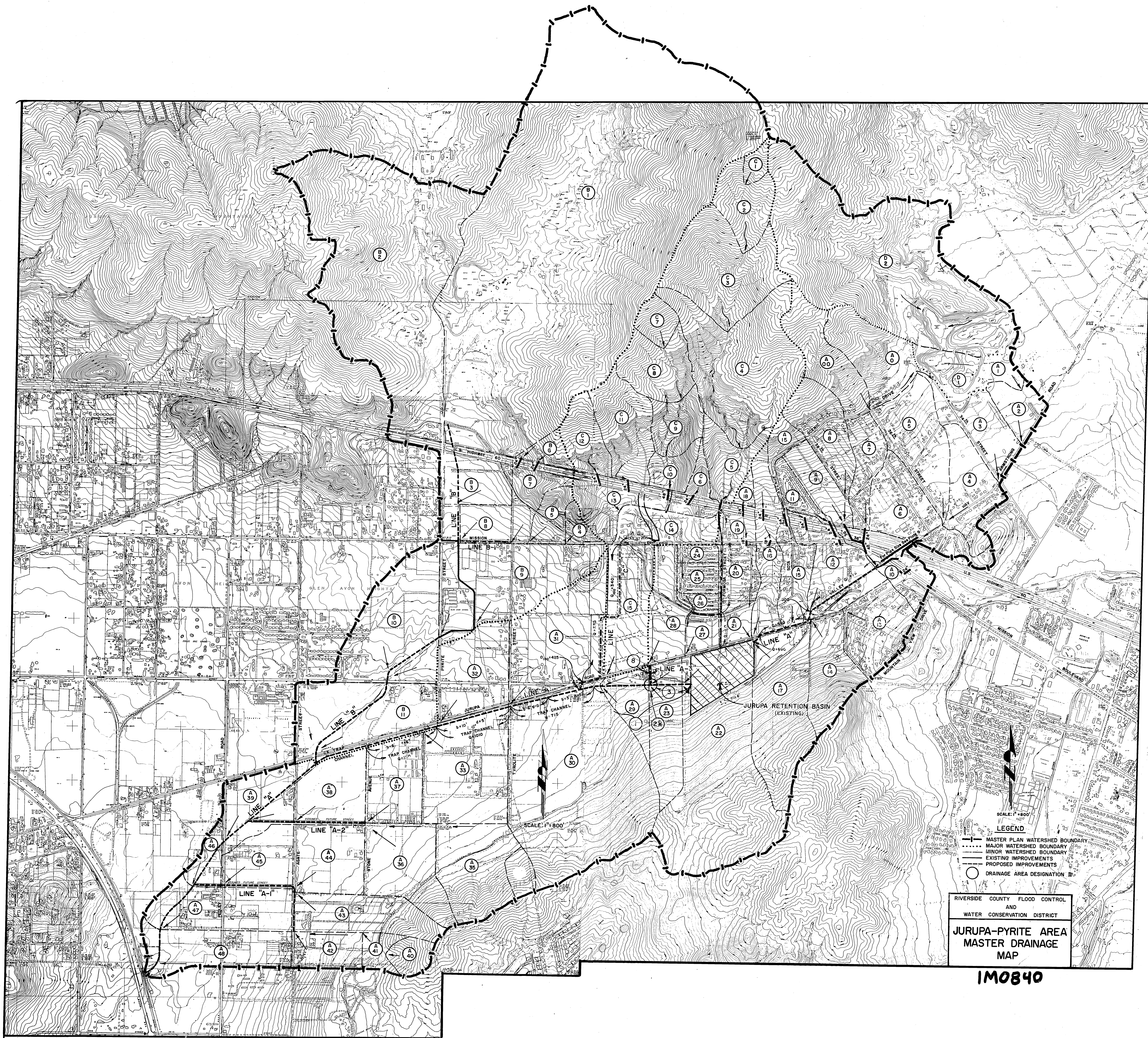
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

JURUPA-PYRITE

MASTER DRAINAGE PLAN



NOTES
1. DIGITAL MAP CREATED
IN FEBRUARY 2014
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- LEGEND**
- MASTER PLAN WATERSHED BOUNDARY
 - MAJOR WATERSHED BOUNDARY
 - MINOR WATERSHED BOUNDARY
 - EXISTING IMPROVEMENTS
 - PROPOSED IMPROVEMENTS
 - DRAINAGE AREA DESIGNATION

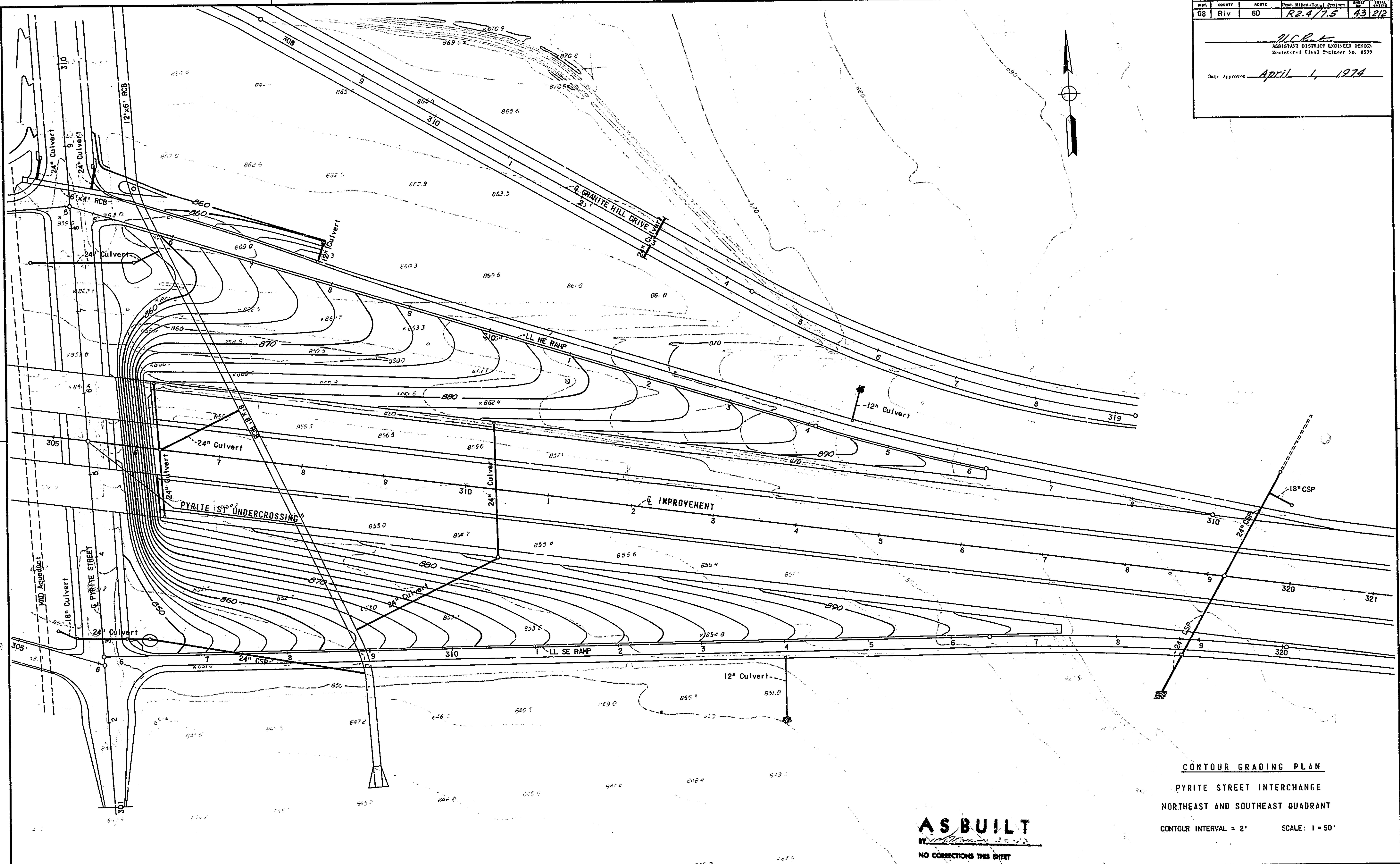
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
**JURUPA-PYRITE AREA
MASTER DRAINAGE
MAP**

1M0840

1M0840

DIST.	COUNTY	ROUTE	Post Miles - Total Project	SHEET NO.	TOTAL SHEETS
08	Riv	60	R2.4/7.5	43	212

H.C. R. E.
 ASSISTANT DISTRICT ENGINEER DESIGN
 Registered Civil Engineer No. 8399
 Date Approved April 1, 1974



CONTOUR GRADING PLAN
 PYRITE STREET INTERCHANGE
 NORTHEAST AND SOUTHEAST QUADRANT
 CONTOUR INTERVAL = 2' SCALE: 1" = 50'

AS BUILT
 BY *[Signature]*
 NO CORRECTIONS THIS SHEET

Project Engineer	Date	Design Engineer
<i>R. J. Anderson</i>	3-73	<i>John Johnson</i>

AS BUILT PLANS
 Contract No. SR-051624
 Date Completed 1-16-74
 Document No. 5111 3351

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF TRANSPORTATION.
 DATE 2/9/76 BY *[Signature]* *[Signature]*

