

**PRELIMINARY HYDROLOGY
CALCULATIONS**

FOR

**GOODMAN FONTANA III
JUNIPER AVENUE AND JURUPA AVENUE
FONTANA, CALIFORNIA**

PREPARED FOR

**GLC FONTANA III, LLC
18201 VON KARMAN AVENUE, SUITE 1170
IRVINE, CA 92612
P. (949) 407-0142
FAX (949) 502-5505**

FEBRUARY 4, 2019

JOB NO. 3678

PREPARED BY

**THIENES ENGINEERING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
P. (714) 521-4811
FAX. (714) 521-4173**

**PRELIMINARY HYDROLOGY
CALCULATIONS**

FOR

GOODMAN FONTANA III

**PREPARED BY ED TOLEDANES
UNDER THE SUPERVISION OF**

**REINHARD STENZEL DATE:
R.C.E. 56155
EXP. 12/31/20**

INTRODUCTION

A: PROJECT LOCATION

The project site is located north of Jurupa Avenue between Juniper Avenue and Cypress Avenue in the City of Fontana, California. Please see next page for vicinity map.

B: STUDY PURPOSE

The purpose of this study is to determine the existing and proposed condition 100-year peak flow rates from the project site.

C: PROJECT STAFF:

Thienes Engineering staff involved in this study include:

Reinhard Stenzel
Brian Weil
Eduardo Toledanes



"VICINITY MAP"

FOR

CYPRESS AVE. AND JURUPA AVE.
FONTANA, CA 92337

Ti Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
Ph.(714)521-4811 FAX(714)521-4173

INTRODUCTION

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DISCUSSION

The project site encompasses approximately 47.50 acres. Proposed improvements to the site include construction of three commercial type building with an area of approximately 454,020 square feet for Building 3, 363,380 square feet for Building 4 (with a future expansion of 94,100 square feet) and 212,420 square feet for Building 5. A proposed storm drain system onsite to convey runoff to an existing storm drain line downstream at Jurupa Avenue and Cypress Avenue. Landscape areas will be fronting Jurupa Avenue, Juniper Avenue and Cypress Avenue. The remainder of the site will be paved vehicle parking areas.

Existing Facilities

There is an existing City of Fontana Public Works off-site storm drain line (14'x9' R.C.B.C. per Tract no. 13332 South Park) at Jurupa Avenue adjacent to the southerly portion of the site. There is another 48" RCP storm drain system (Per City of Fontana Public Works Tract no. 16678-1, -2, -3 and 16678) at Cypress Avenue that drains south to the existing 14'x9' R.C.B.C. at Jurupa Avenue.

Per City of Fontana Master Storm Drain Plan, the proposed site is tabled to the existing 14'x 9' R.C.B.C. at Jurupa Avenue. Runoff from the project site at proposed condition will be limited to existing conditions, such that there will be no adverse effects on the existing facilities downstream.

Existing Conditions

The project site is currently a residential area to the north with an open space backyard. The southerly portion of the site is developed with single family residential houses with large yards that appears to be used for commercial purposes.

The southerly portion of the site (Nodes 100-101, 9.80 acres) surface drains southeasterly to Jurupa Avenue and conveyed to an existing curb opening catch basin north of Jurupa Avenue. The existing condition 100-year peak flow rate from this area is approximately 21.5 cfs.

Runoff from the northerly half of the site (Nodes 200-212, 36.85 acres) surface drains southwesterly to Cypress Avenue and conveyed southerly to an existing curb opening catch basin at the intersection of Cypress Avenue and Jurupa Avenue. The existing condition 100-year peak flow rate for the north half of the site is approximately 65.6 cfs.

The remaining easterly portion of the site (nodes 300-311, 0.85 acres) will drain to an existing storm drain system at Juniper Avenue. The existing condition 100-year peak flow rate from this location is approximately 2.4 cfs. (1.6 cfs. + 0.8 cfs.).

Please see Appendix "B" for existing condition hydrology calculations and Appendix "D" for existing condition hydrology map.

Proposed Condition

Drainage pattern at proposed condition will maintain its drainage pattern at existing condition. Runoff from Building 3 (Nodes 300-313, 18.70 acres) will drain to catch basins and conveyed westerly via a proposed onsite storm drain system and ultimately discharged to an existing 48" RCP storm drain line at Cypress Avenue. The 100-year peak flow rate for Building 3 is approximately 49.9 cfs undetained. Runoff from Building 4 (Nodes 200-214 18.95 acres) will drain to catch basins and conveyed westerly via a proposed onsite storm drain system and ultimately discharged to an existing 48" RCP storm drain line at Cypress Avenue. The 100-year peak flow rate for Building 4 is approximately 55.0 cfs undetained. The combined 100 year peak flow rate from Building 3 and 4 is 104.9 cfs which is higher than the existing condition 65.6 cfs.

Runoff from Building 3 (Nodes 300-315, 18.35 acres) and Building 4 (Node 200-215, 18.35 acres) will drain to catch basins and conveyed westerly via a proposed onsite storm drain system and ultimately discharged to an existing 48" RCP storm drain line at Cypress Avenue. The 100-year peak flow rate for Building 3 and Building 4 are approximately 99.1 cfs undetained (48.8 cfs + 50.3 cfs) which is higher than the existing condition 65.6 cfs.

Runoff from Building 5 (Nodes 110-123, 9.85 acres) will drain to catch basin and conveyed southerly via a proposed onsite storm drain system and ultimately discharged to an existing 14'Wx9'H RCB in Jurupa Avenue. The 100-year peak flow rate for Building 5 is approximately 34.1 cfs which is higher than the existing condition 21.5 cfs.

See Appendix "B" for proposed condition hydrology calculations and Appendix "D" for proposed condition hydrology map.

Detention

In order to limit flows from the site to existing condition, onsite detention will be required. Detention is proposed in the truck yard areas. The onsite storm drain systems will be sized at the final design to limit runoff to the desired amount at the individual storage areas. The remaining volume will be temporarily stored in the surface of the truck yards.

Runoff at the truck yard for Building 3 will be limited to discharge an approximate peak flow of 16.9 cfs. This will require the storage volume in the truck yard to be approximately 0.40 ac-ft, with a depth of 2 feet.

Runoff at the truck yard for Building 4 will be limited to discharge an approximate peak flow of 11.7 cfs. This will require the storage volume in the truck yard to be approximately 0.67 ac-ft, with a depth of 1.6 feet.

Runoff at the truck yard for Building 5 will be limited to discharge an approximate peak flow of 9.0 cfs. This will require the storage volume in the truck yard to be approximately 0.72 ac-ft, with a depth of 1 foot.

Therefore, the new improvements to the project site at proposed condition will not have an adverse effect to the existing facilities downstream.

See Appendix "C" for detention calculations.

Water Quality

Runoff from Buildings 3, 4 and 5 will drain to proposed catch basins and conveyed to proposed underground chambers located at the truck yard via proposed onsite storm drain system. Here, initial runoff from the project site will drain to proposed CDS unit for water quality purposes and conveyed to underground chambers for infiltration. Runoff volume that exceeds water quality volume will be conveyed back to the main onsite storm drain line and ultimately discharged to an existing storm drain facilities downstream.

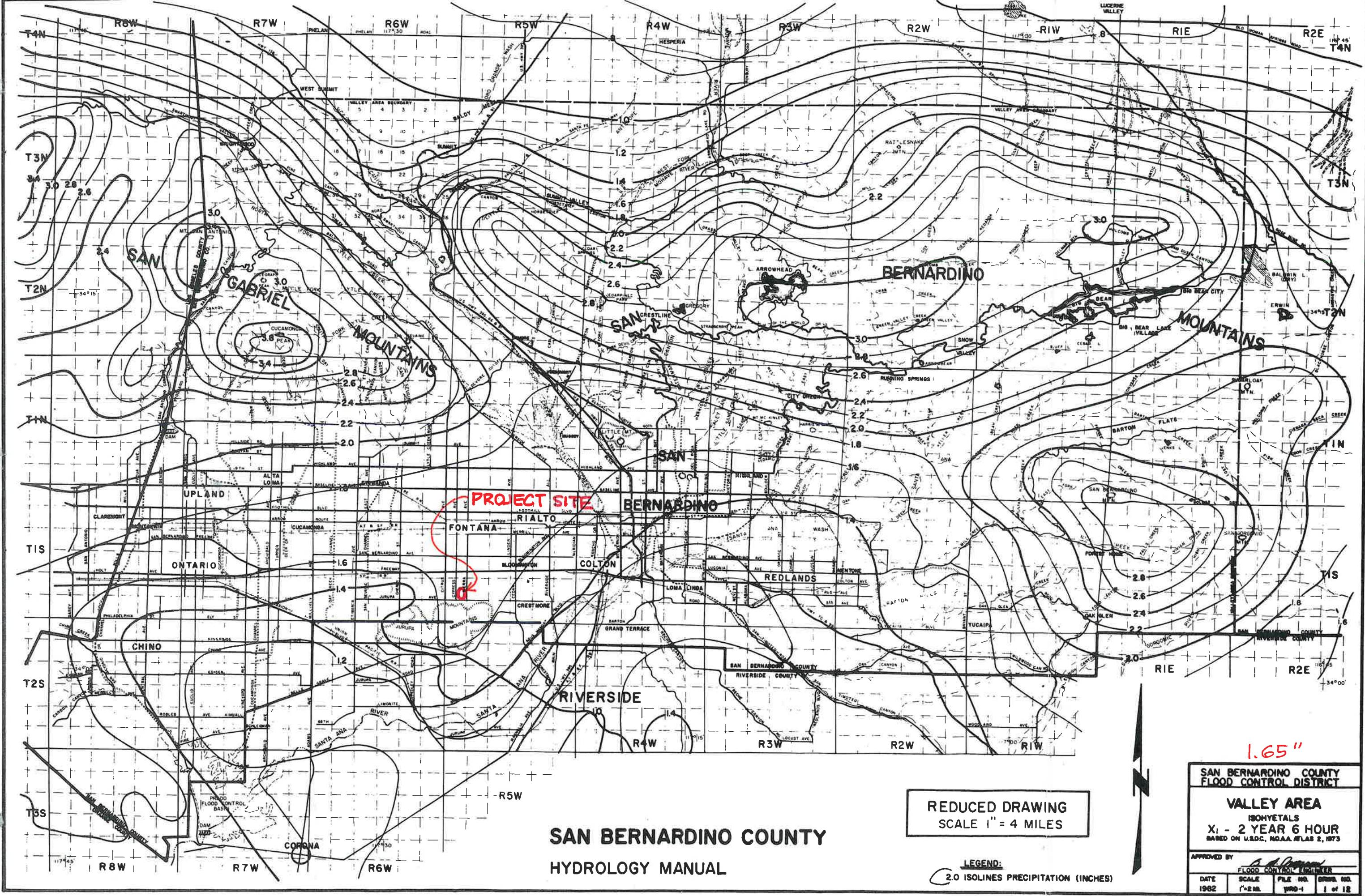
Methodology

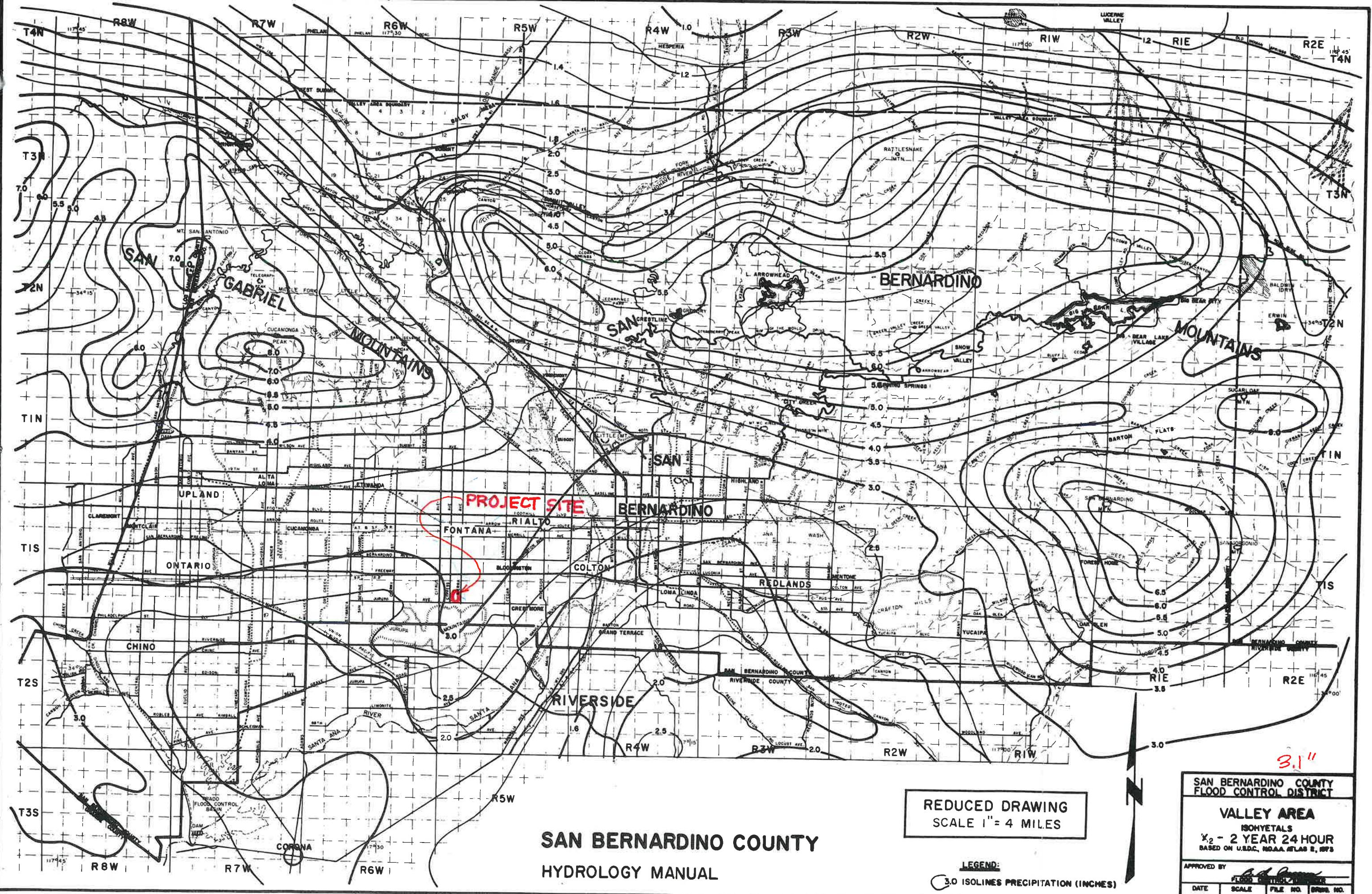
Hydrology calculations were computed using the San Bernardino County Rational Method Program by AES software. The soil type is "B" per San Bernardino County Hydrology Manual. See Appendix "A" for pertinent reference materials. The San Bernardino County Flood Routing Analysis (also by AES software) was used for detention calculations.

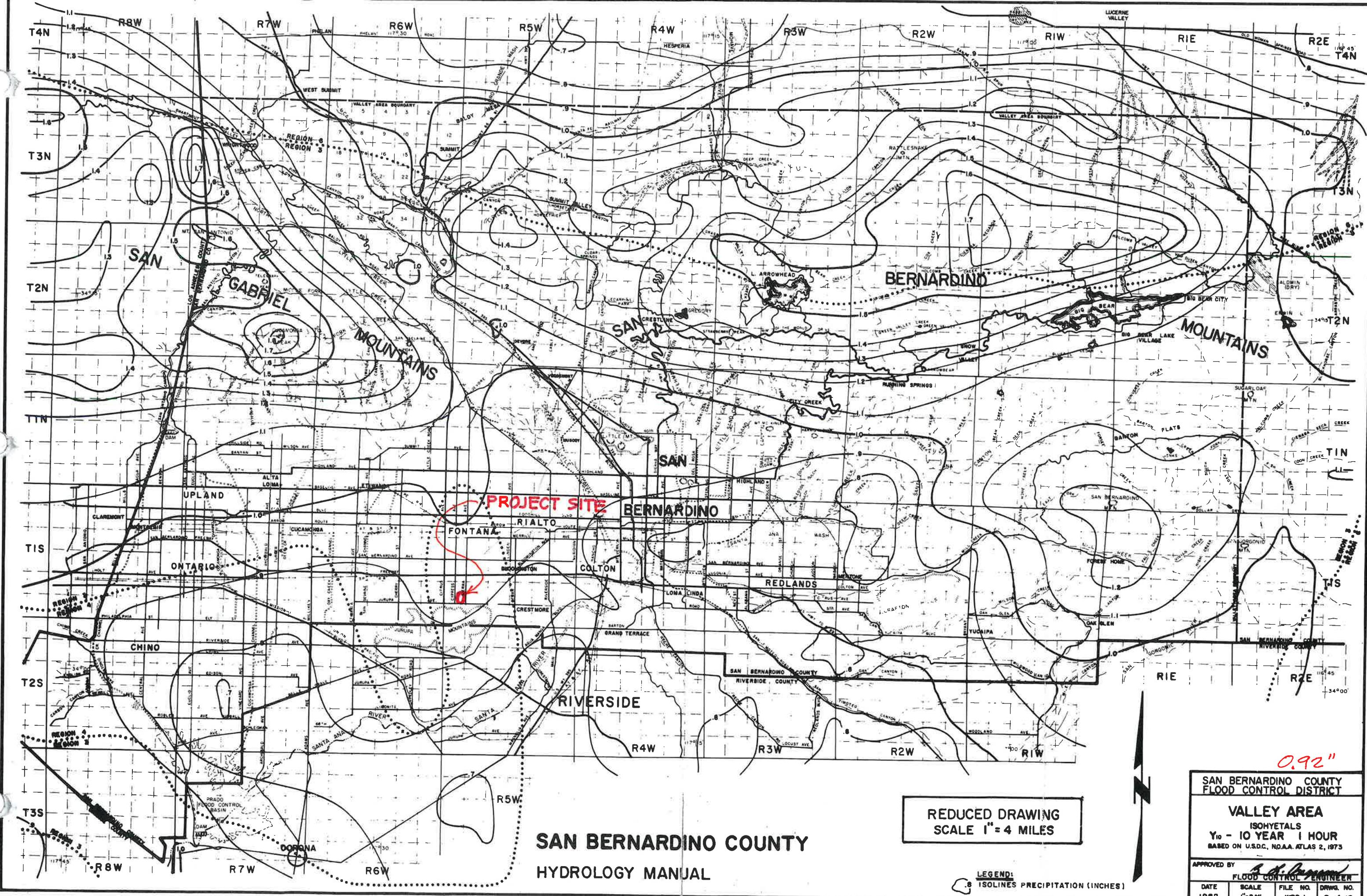
APPENDIX	DESCRIPTION
A	REFERENCE MATERIALS
B	HYDROLOGY CALCULATIONS
	EXISTING CONDITION PROPOSED CONDITION
C	DETENTION CALCULATIONS
D	HYDROLOGY MAP

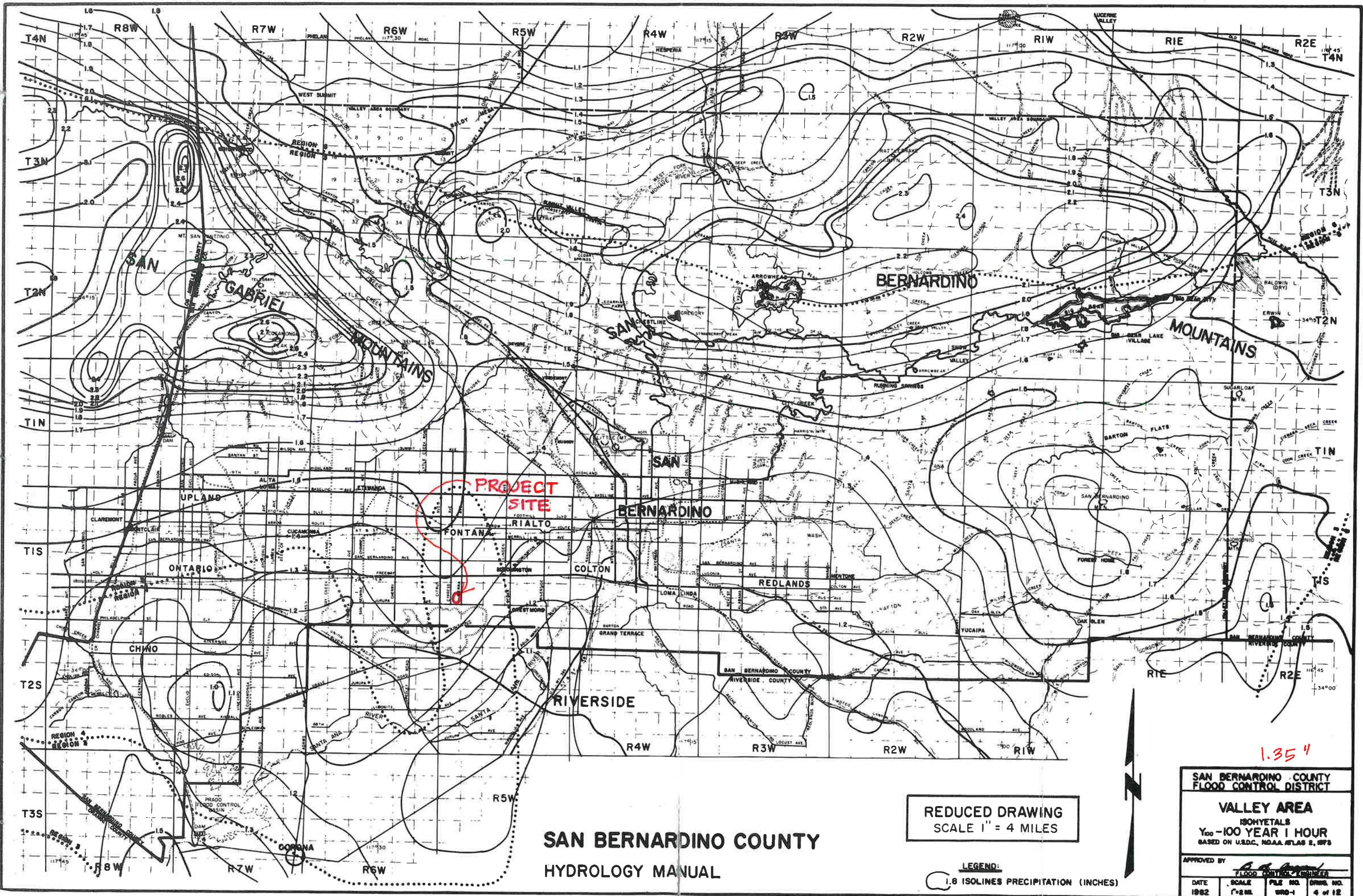
APPENDIX A

REFERENCE MATERIALS

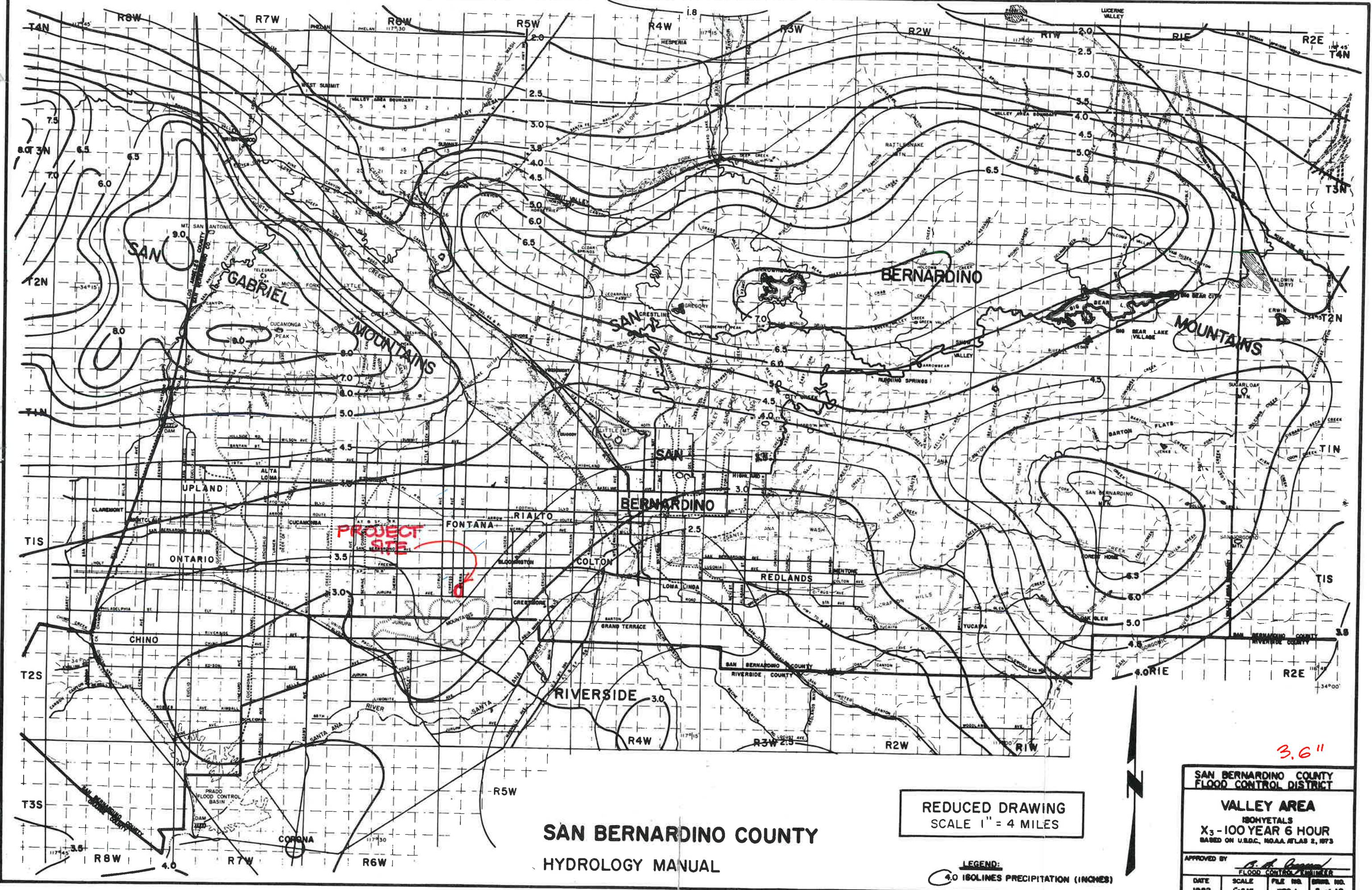


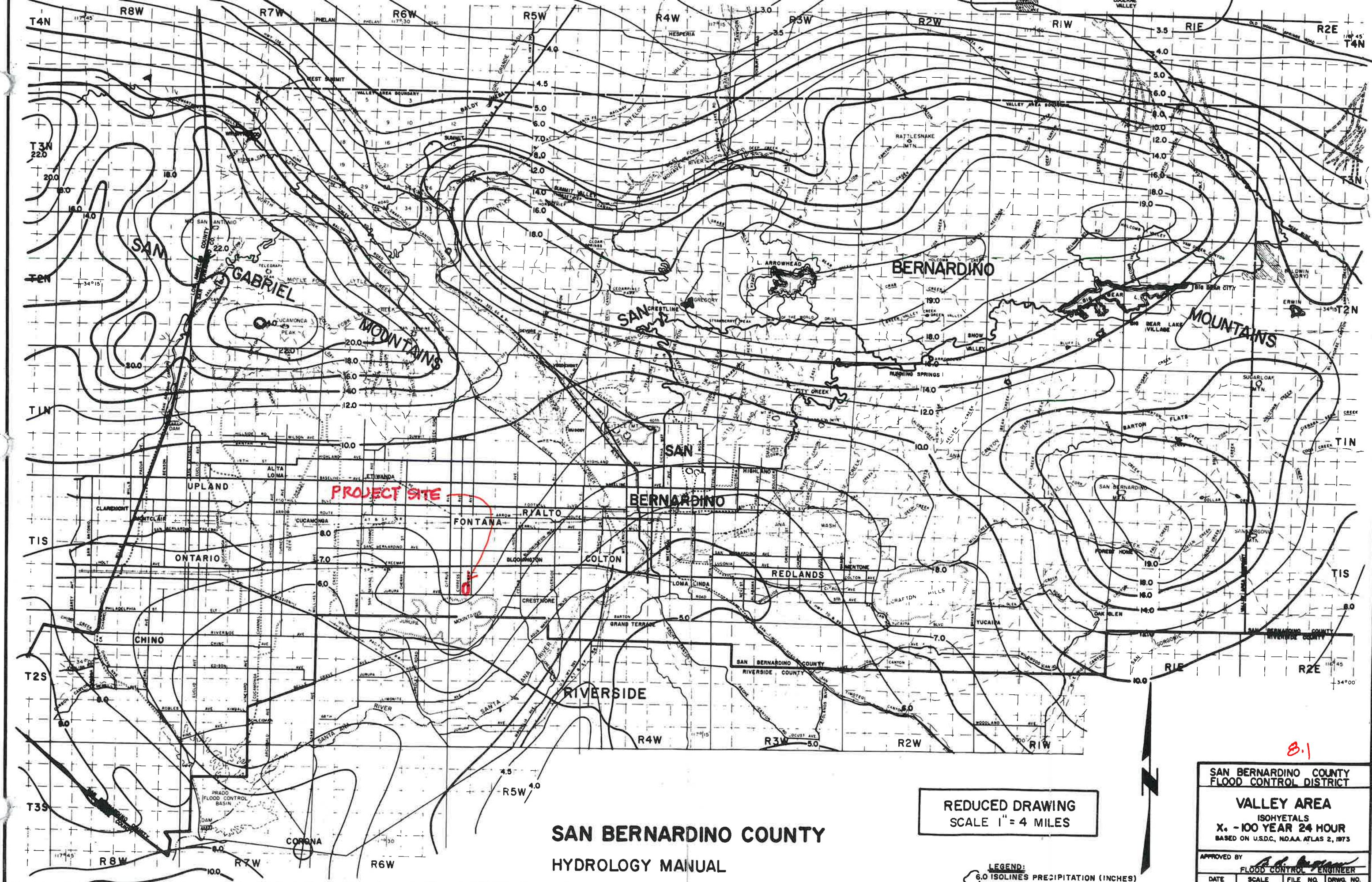


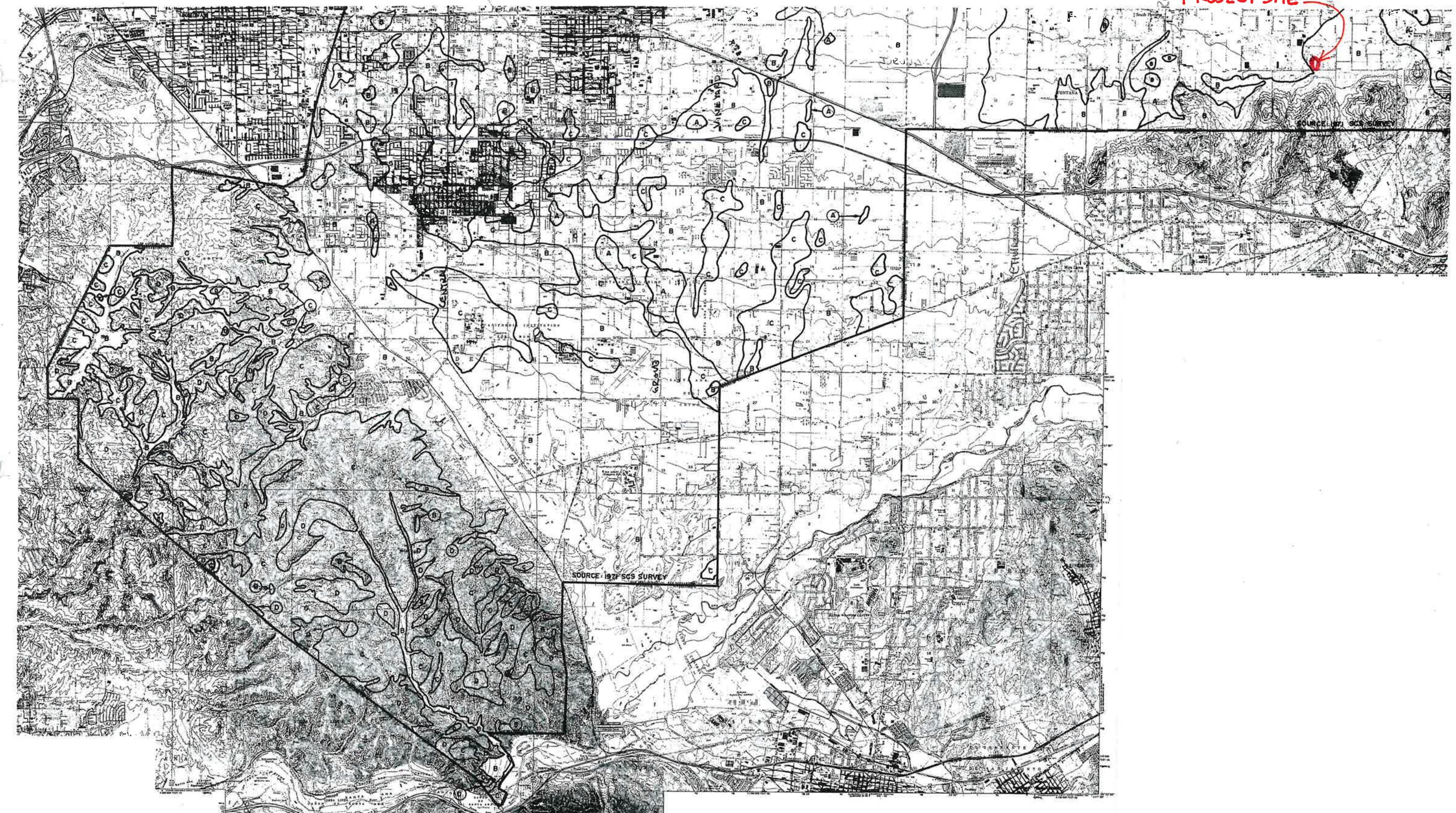




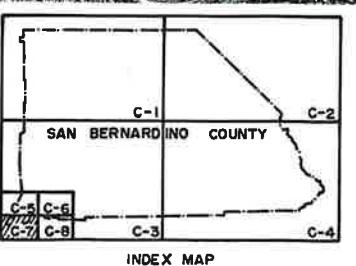
**SAN BERNARDINO COUNTY
HYDROLOGY MANUAL**







**SAN BERNARDINO COUNTY
HYDROLOGY MANUAL**



LEGEND
 — SOIL GROUP BOUNDARY
 — SOIL GROUP DESIGNATION
 - - - - - BOUNDARY OF INDICATED SOURCE

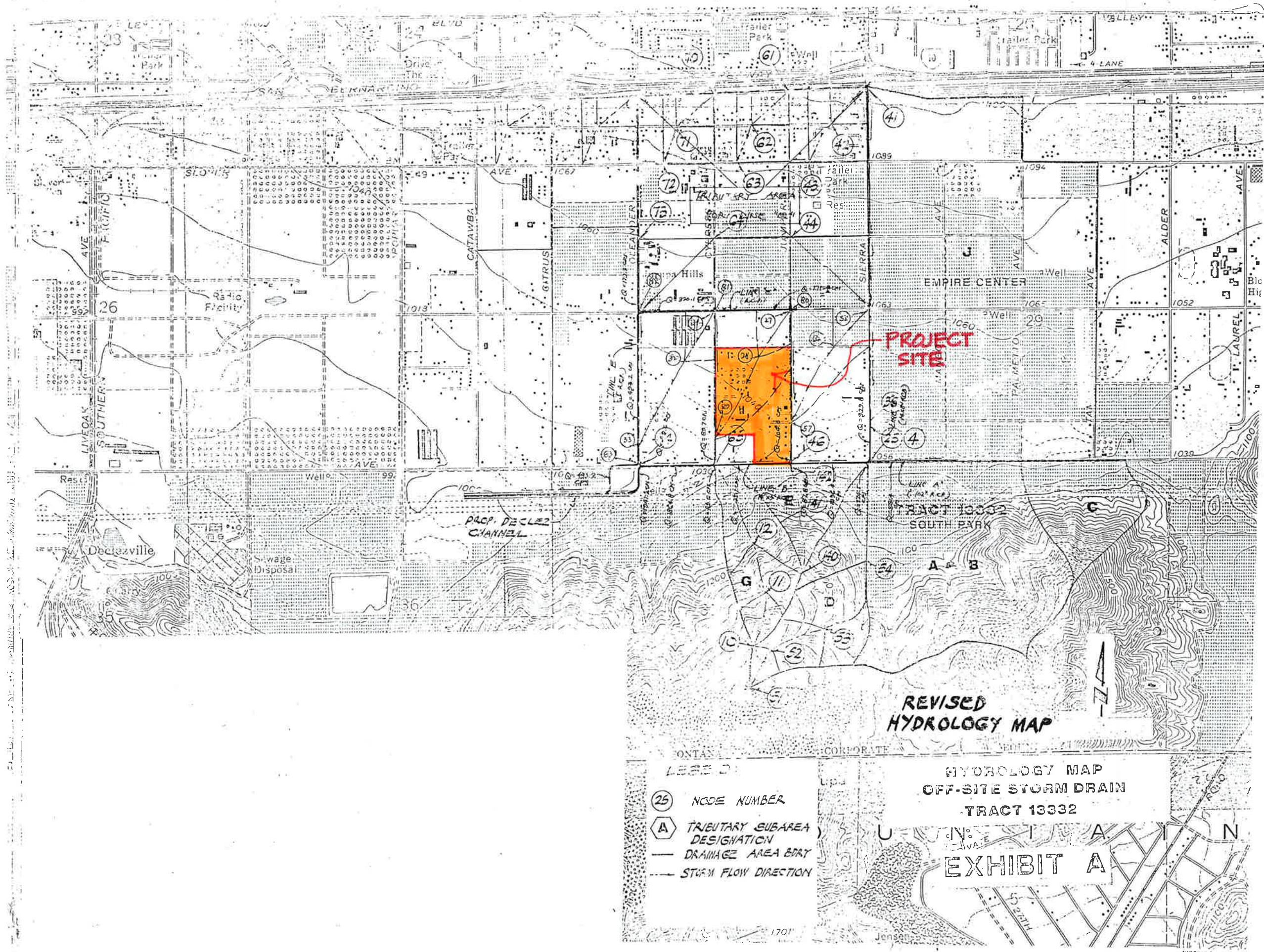
A

SCALE REDUCED BY 1/2

DEPTH INTERVAL IN FEET
 0 100 200 300 400 500 600 700 800 900 1000
 SCALE 1:48,000

FEET

SOIL "B"
**HYDROLOGIC SOILS GROUP MAP
FOR
SOUTHWEST-C AREA**



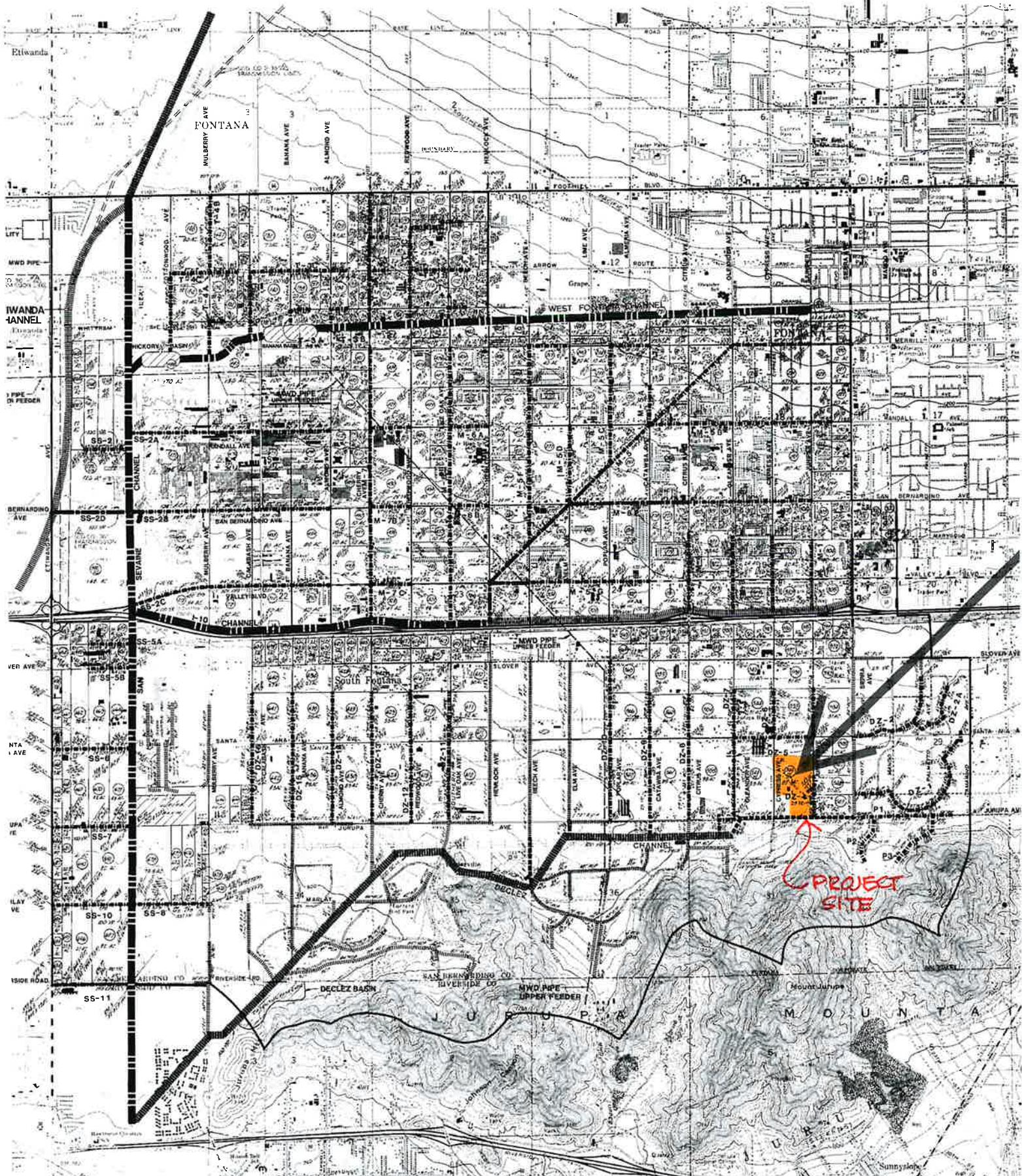
14

NORTH
NTS

PSOMAS & ASSOCIATES

WG. # 1774 - HYDGY

CITY OF FONTANA SOUTH FONTANA MASTER STORM DRAIN PLAN



Preliminary
NOT for Construction

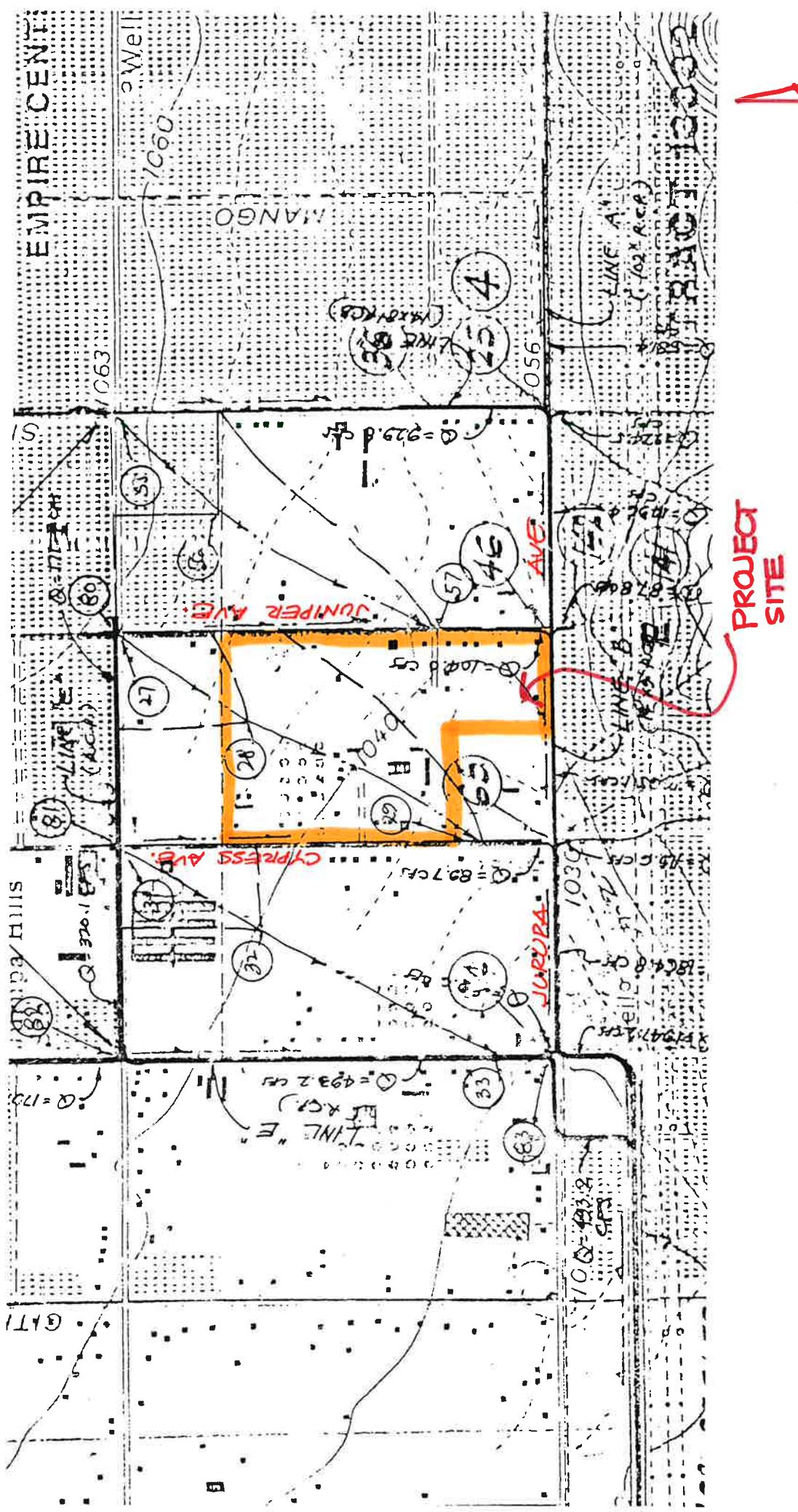


Hall & Foreman, Inc.
3010 BIRCH AVENUE • COTTAGE GROVE, OREGON 97112
LAND ENGINEERING • LAND PLANNING • LAND SURVEYING

**CITY OF FONTANA, CALIFORNIA
PUBLIC WORKS DEPARTMENT**

CITY OF FONTANA
SOUTH FONTANA
MASTER STORM DRAINAGE
PLAN

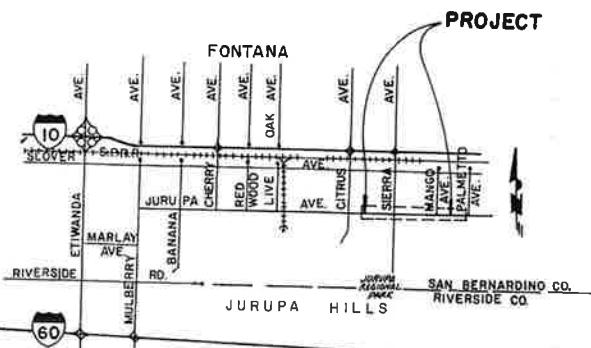
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OFF-SITE STORM DRAIN PLANS

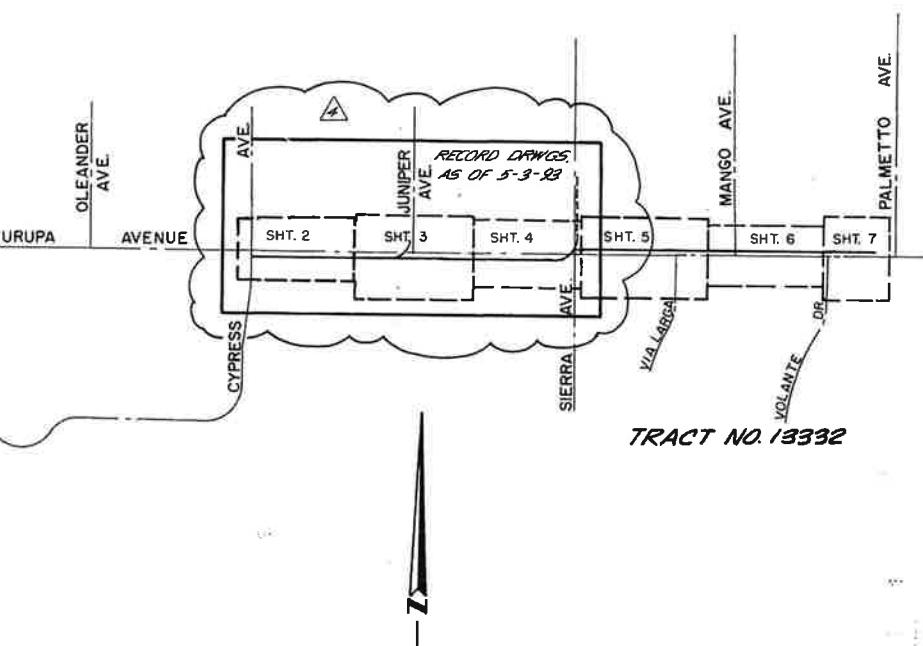
FOR TRACT NO. 13332

IN THE CITY OF FONTANA



VICINITY MAP
N.T.S.

CONSTRUCTION NOTES		QUANTITY
1	CONSTRUCT 96" R.C.P.	486 L.F. △
2	CONSTRUCT 90" R.C.P.	1395 L.F.
3	CONSTRUCT 54" R.C.P.	543 L.F. △
4	CONSTRUCT 48" R.C.P.	109 L.F. △
5	CONSTRUCT 18" R.C.P.	311 L.F.
6	CONSTRUCT 14" X 3' R.C.B. PER DETAIL ON SHEET 2-10	2703 L.F. △
7	CONSTRUCT 24" R.C.P.	2733 L.F. △
8	CONSTRUCT 66" RCP	51 L.F.
9	CONSTRUCT CATCH BASIN NO. 1 L=4' PER DETAIL ON SHEET 9.	2 EA.
10	CONSTRUCT CATCH BASIN NO. 1 L=8' PER DETAIL ON SHEET 9.	1 EA.
11	CONSTRUCT CATCH BASIN NO. 1 L=10' PER DETAIL ON SHEET 9.	1 EA.
12	CONSTRUCT JUNCTION STRUCTURE NO. 1 PER LACFCD STD. DWG. NO. 2-D189.	1 EA.
13	CONSTRUCT JUNCTION STRUCTURE TYPE III PER DETAIL ON SHEET 9.	2 EA.
14	CONSTRUCT JUNCTION STRUCTURE NO. 4 PER LACFCD STD. DWG. NO. 2-D193.	10 EA.
15	CONSTRUCT TRANSITION STRUCTURE NO. 1 PER LACFCD STD. DWG. NO. 2-D235	1 EA.
16	CONSTRUCT CONCRETE BULKHEAD PER DETAIL ON SHEET 9.	1 EA.
17	CONSTRUCT JUNCTION STRUCTURE TYPE II PER DETAIL 3 ON SHEET 9.	3 EA.
18	CONSTRUCT 10"x6" R.C.B. W/TRANS'S PER DETAIL ON SHEET 10A	1 EA.
19	REMOVE CONCRETE BULKHEAD	1 EA.
20	CONSTRUCT CATCH BASIN NO. 1 L=2' PER DETAIL ON SHEET 9.	1 EA.
21	CONSTRUCT CATCH BASIN NO. 1 L=2' PER DETAIL ON SHEET 9.	1 EA.
22	CONSTRUCT CATCH BASIN NO. 1 L=2' PER DETAIL ON SHEET 9.	1 EA.
23	INSTALL INLET TYPE II PER OCEMA STD. 1308 ON SHEET 10A	1 EA.
24	CONSTRUCT SLOPE ANCHOR PER OCEMA STD. PLAN 1333 ON SHEET 10A	7EA



INDEX MAP
SCALE: 1" = 700'

UTILITY NOTIFICATIONS

POWER

SOUTHERN CALIFORNIA EDISON CO.
300 N. PEPPER AVENUE
P.O. BOX 288
RIALTO, CA 92376
(714) 820-5148

TELEPHONE

PACIFIC BELL
3939 E. CORONADO STREET
ANAHUAC, CA 92807
(714) 999-5449

GAS

SOUTHERN CALIFORNIA GAS CO.
570 W. FOURTH STREET
P.O. BOX 6226
SAN BERNARDINO, CA 92417
(714) 894-9411

SEWER

CITY OF FONTANA
8353 SIERRA AVENUE
P.O. BOX 518
FONTANA, CA 92335
(714) 623-3411

WATER

WEST SAN BERNARDINO COUNTY
WATER DISTRICT
855 W. BASELINE
P.O. BOX 188
RIALTO, CA 92376
(714) 875-1804



ADDED NOTE SN 5-27-89
or BUR. AND R.C.B. SN 5-27-89

ADDED R.C.B. SN 5-27-89



CITY OF FONTANA CALIFORNIA			
PUBLIC WORKS DEPARTMENT			
TRACT NO. 13332 - SOUTH PARK			
OFF-SITE STORM DRAIN PLAN			
TITLE SHEET			
NO.	DESCRIPTION	FOR APPROVAL DATE	CITY APPROVAL DATE
REVISIONS	APPROVED BY:	DATE:	DATE:
SHEET NO.	APPROVED BY:	DATE:	DATE:

GENERAL NOTES

- THE CONSTRUCTION OF ALL PUBLIC IMPROVEMENTS SHALL CONFORM TO THESE PLANS AND TO THE REQUIREMENTS OF THE CITY STANDARD SPECIFICATION, PUBLIC WORKS DEPARTMENT, CITY OF FONTANA, AND STANDARD SPECIFICATIONS FOR THE PUBLIC WORKS CONSTRUCTION (GREEN BOOK).
- CONSTRUCTION PERMITS SHALL BE OBTAINED FROM FONTANA ENGINEERING DIVISION PRIOR TO START OF ANY WORK WITHIN THE CITY LIMITS. CONTACT MR. CARLOS NAVARO, AT LEAST 48 HOURS IN ADVANCE AT (909) 350-6632. PERMITS FROM SAN BERNARDINO COUNTY TRANSPORTATION DEPARTMENT SHALL ALSO BE OBTAINED FOR WORK WITHIN ITS JURISDICTION.
- STATIONING REFERS TO THE CENTERLINES OF STORM DRAINS EXCEPT WHERE OTHERWISE NOTED.
- ALL EXPOSED CONCRETE SURFACES SHALL CONFORM IN GRADE, COLOR AND FINISH TO ALL ADJOINING CURBS AND SIDEWALKS.
- NO CONCRETE SHALL BE PLACED UNTIL THE FORMS AND REINFORCING STEEL HAS BEEN PLACED, INSPECTED AND APPROVED.
- ALL UNDERGROUND WORK SHALL BE COMPLETED PRIOR TO PAVING OF STREETS.
- EXISTING UNDERGROUND UTILITIES ARE AS PER AVAILABLE RECORDS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATION AND ELEVATION IN THE FIELD.
- THE WALLS AND FACES OF ALL EXCAVATIONS GREATER THAN FIVE (5) FEET IN DEPTH SHALL BE EFFECTIVELY GUARDED BY A SHORING SYSTEM, SLOPING OR OTHER EQUIVALENT MEANS. TRENCHES LESS THAN FIVE (5) FEET IN DEPTH SHALL ALSO BE GUARDED WHEN EXAMINATION INDICATES HAZARDOUS GROUND MOVEMENT MAY BE EXPECTED.
- THE CONTRACTOR(S) SHALL ALSO OBTAIN A PERMIT TO PERFORM EXCAVATION OR TRENCH WORK AS DESCRIBED IN NOTE 6 ABOVE FROM CAL/OSHA.
- ALL MANHOLES SHALL BE CONSTRUCTED 6" BELOW PAVEMENT GRADE AND BROUGHT TO FINISH GRADE BY THE PAVING CONTRACTOR AFTER PAVEMENT IS IN PLACE.
- IMMEDIATELY FOLLOWING REMOVAL OF EXISTING PAVEMENT OR DIKE OR CURB AND/OR GUTTER THE CONTRACTOR SHALL DILIGENTLY PURSUE THAT PORTION OF WORK TO COMPLETION.
- ALL C.M.P. INSTALLATION AND CONNECTIONS SHALL BE MADE PER MANUFACTURER'S SUGGESTED METHOD UNLESS OTHERWISE SPECIFIED ON THE PLANS.
- IF DURING CONSTRUCTION, GROUND WATER IS ENCOUNTERED, A SYSTEM APPROVED BY THE CITY ENGINEER SHALL BE INSTALLED TO Dewater SAID AREA AT THE DIRECTION OF THE SOILS ENGINEER.
- NO TRUNCH BACKFILL SHALL TAKE PLACE WITHOUT PRIOR APPROVAL OF THE CITY'S INSPECTOR.
- ALL EXPOSED METAL SURFACES SHALL BE GALVANIZED IN ACCORDANCE WITH THE CITY STANDARD SPECIFICATION.
- AS BUILT PLANS SHALL BE PROVIDED TO THE CITY BY THE CONTRACTOR.
- THE PIPE IS TO BE MANUFACTURED WITH ADDITIONAL CONCRETE THICKNESS OVER THE INVERT REINFORCEMENT AS SPECIFIED ON THESE PLANS.
- THE CONTRACTOR SHALL NOT DISTURB EXISTING SURVEY MONUMENTS OR BENCHMARKS NOTED ON THE PLANS OR FOUND DURING CONSTRUCTION WITHOUT PRIOR NOTIFICATION TO THE CIVIL ENGINEER. REMOVAL AND REPLACEMENT SHALL BE DONE BY A REGISTERED CIVIL ENGINEER OR LICENSED LAND SURVEYOR. SURVEY MONUMENTS WHICH WILL BE DESTROYED AS A RESULT OF THIS CONSTRUCTION SHALL BE REPLACED. CONTRACTOR SHALL NOTIFY REGISTERED CIVIL ENGINEER OR LICENSED LAND SURVEYOR ONE WEEK PRIOR TO CONSTRUCTION SO THAT TIES TO MONUMENTS CAN BE ESTABLISHED FOR LATER REPLACEMENT OF SAID MONUMENTS BY SAID REGISTERED CIVIL ENGINEER OR LICENSED LAND SURVEYOR.

PRIVATE ENGINEERS NOTICE TO CONTRACTOR

- ALL UNDERGROUND UTILITIES OR STRUCTURES REPORTED BY THE OWNER OR OTHERS, AND THOSE SHOWN ON THE RECORDS EXAMINED ARE SHOWN WITH THEIR APPROXIMATE LOCATION AND EXTENT.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE NATURE OF EXISTING GROUND AND/OR THE FINISHED GRADE IN THE VICINITY OF THE PROPOSED CONSTRUCTION AREA IMMEDIATELY PRIOR TO CONSTRUCTION.
- THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES OR STRUCTURES FOUND AT THE SITE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE OWNERS OF THE UTILITIES OR STRUCTURES CONCERNED BEFORE STARTING WORK.
- THE CONTRACTOR SHALL UNCOVER ALL UTILITIES THAT HE MAY BE JOINING, CROSSING OR PARALLELING PRIOR TO ANY CONSTRUCTION TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS. ANY CONFLICT OR DISCREPANCY SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION PRIOR TO CONSTRUCTION, OTHERWISE THE CONTRACTOR ACCEPTS FULL RESPONSIBILITY FOR ANY COSTS OF RELOCATION OR ADDITIONAL COSTS OF CONSTRUCTION.

PARTIAL

RECORD DRAWING

The information on the drawing is obtained from others and must be verified in the field by anyone prior to use or construction. HALL & FOREMAN, INC. is not responsible for underground facility locations or directions. All above ground facilities can be readily seen and verified by the parties that intend to use same.

**B BOYLE
ENGINEERING
CORPORATION**
1501 Quail Street, P.O. Box 3030
Newport Beach, California 92658-0020
714 / 478-3200

BENCH MARK
CITY OF FONTANA BENCH MARK
NO. 536 R.R. SPIKE IN PP. IN N.E.
CORNER OF JUNIPER AVE. &
JURUPA AVE.

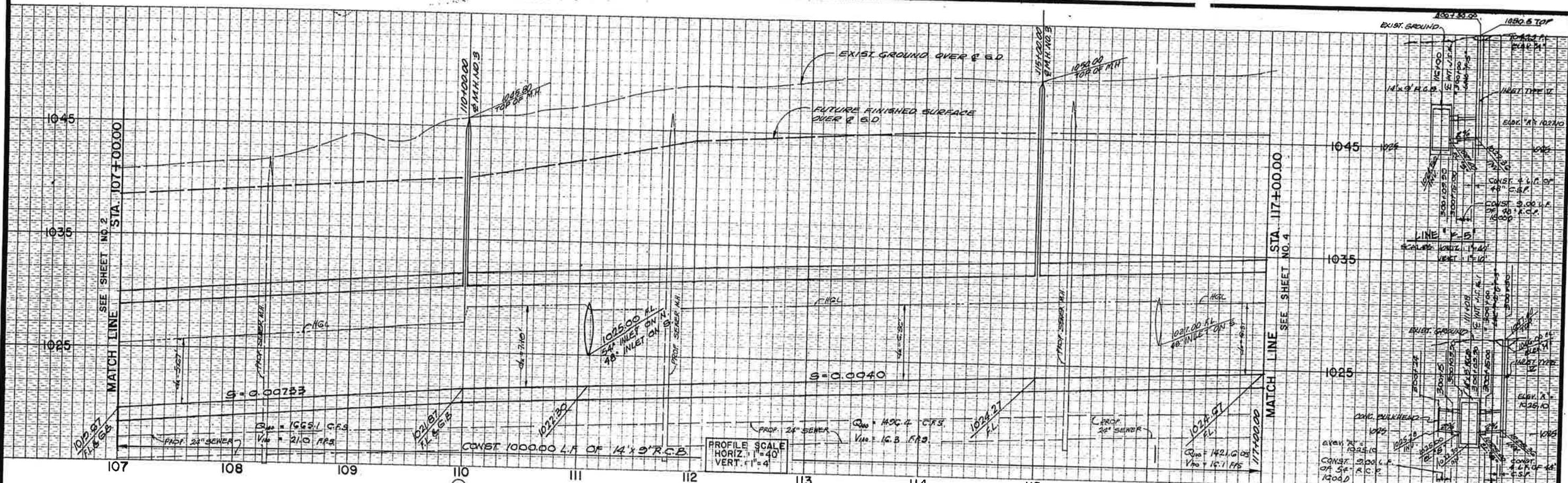
ELEV. = 1046.42'
DATE 12/73

PSOMAS
and Associates
Engineers Surveyors Planners
3901 Lime Street, Riverside, Ca 92501 714/787-6421
APPROVED BY:
J. Thomas Baine
J. THOMAS BAINE - RCE No. 15795
REGISTRATION EXPIRES 6-30-89
DATE: 3-27-89

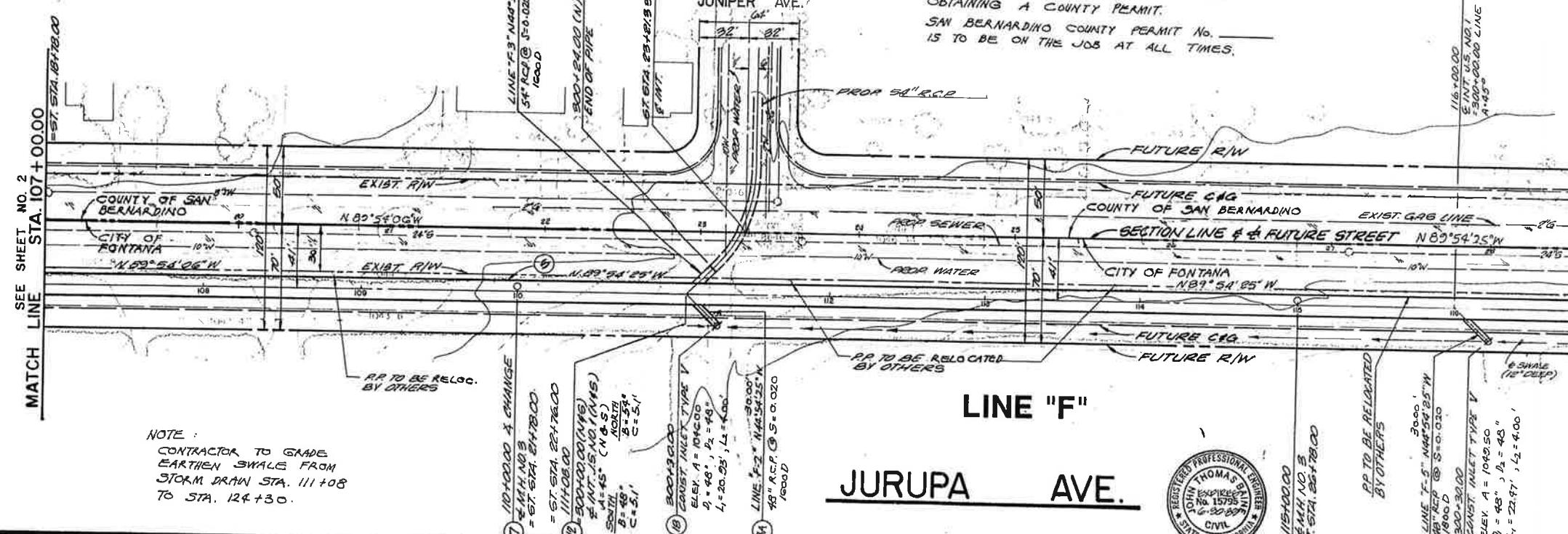
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CHANGED(S) DATE TO SUBD: 11-15-92
CHANGED TOTAL SHEET NO: 1
ADDED ONE NOTE: 6-14-92 REV. 6-11-92
ADDED RELEVEL LINE FOR: JUN 14-92 REV. 6-11-92
NO. DESCRIPTION FOR APPROVAL DATE CITY APPROVAL DATE
REVISIONS APPROVED BY: DATE: DATE:
CHECKED BY: S.D. APPROVED: City Engineer - RCE No. 15795
SHEET No. 1 OF 8 10

9-30-97

1774



NOTE :
NO WORK MAY BEGIN WITHIN THE COUNTY OF
SAN BERNARDINO RIGHT OF WAY PRIOR TO
OBTAINING A COUNTY PERMIT.
SAN BERNARDINO COUNTY PERMIT No. _____
IS TO BE ON THE JOB AT ALL TIMES.



JURUPA AVE.



BENCH MARK

CITY OF FONTANA B
NO. 535 R.R. SPIKE IN
CORNER OF JUNIPER &
JURUPA
AVE.

ELEV. = 1
DATE 1

PSOMAS
Engineers Surveyors
1991 U.S. 5

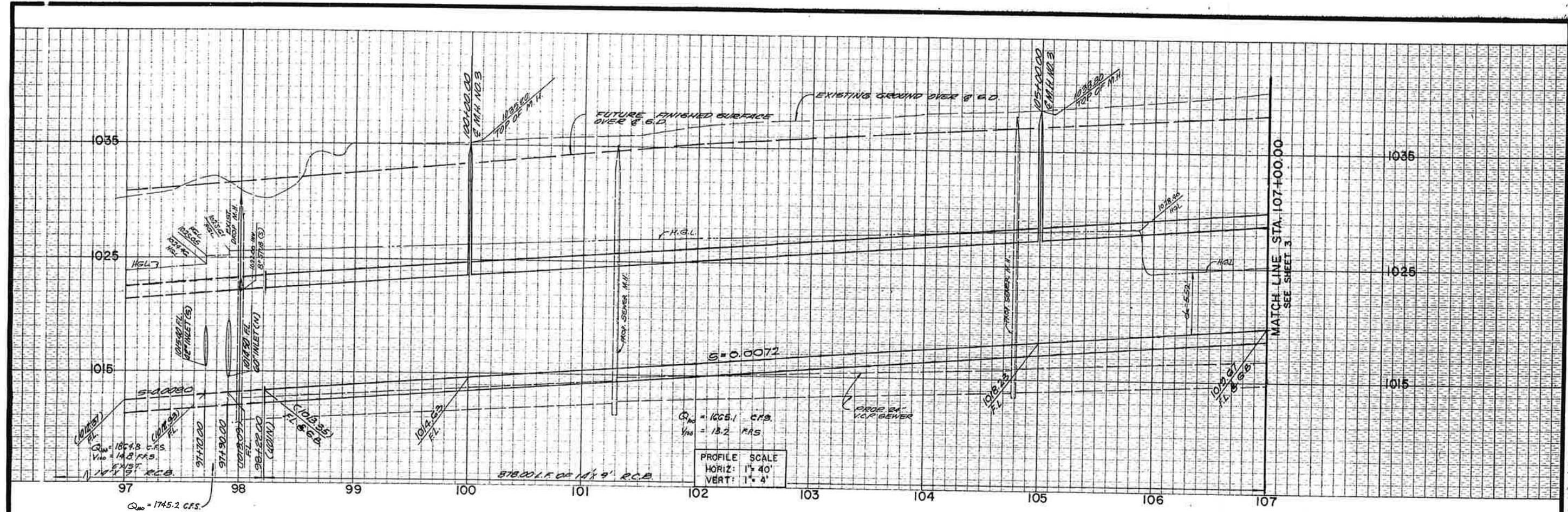
3901 Lime Street Riverside, Ca

FONTANA CALIFORNIA

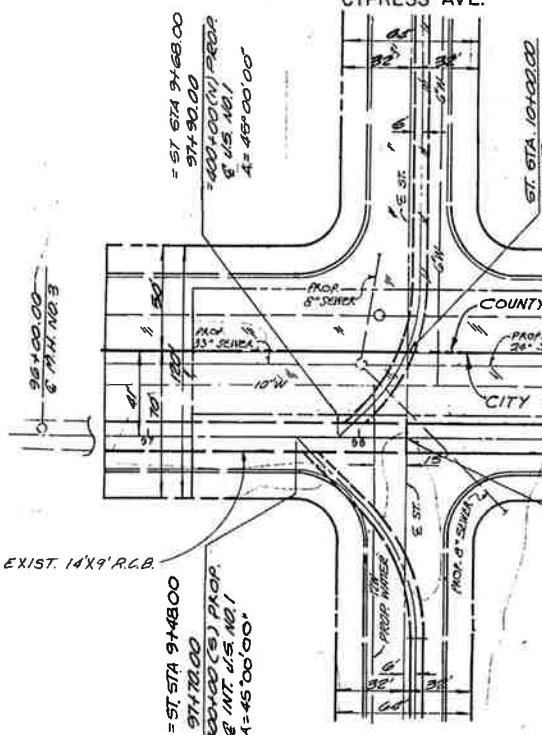
NOTE:
TREES WITHIN 20'
OF & R.C.B. TO BE
REMOVED

- CONSTRUCTION NOTES**

 - 3A CONSTRUCT 48" R.C.P.
 - 5 CONSTRUCT 14' X 9' R.C.B. - PER DETAIL ON SHEET 9.
 - 3 CONSTRUCT 54" R.C.P.
 - 7 CONSTRUCT MAN HOLE NO. 3 PER LACPFD STD. DWG. NO. 2-D104
 - 12 CONSTRUCT JUNCTION STRUCTURE NO. 1 PER LACPFD STD. DWG. NO. 2-D189.
 - 16 CONSTRUCT CONCRETE BULKHEAD PER DETAIL ON SHEET 9.
 - 18 CONSTRUCT INLET TYPE 2 PER DETAIL SHT. A



CYPRESS AVE



JURUPA AVE

LINE "F"

NOTE:
TREES WITHIN 20' OF
@ R.C.B. TO BE REMOVE



BENCH MARK

CITY OF FONTANA BENCH
NO. 535 R.R. SPIKE IN RR
CORNER OF JUNIPER AVE.
JURUPA AVE.

PSOMAS

Engineers Surveyors
3901 Lime Street Riverside, Ca

APPROVED BY: *J. Thomas*
J. THOMAS
REGISTRAR

CONSTRUCTION NOTES FOR STORM DRAIN IMPROVEMENT PLANS

- ALL WORK SHALL BE IN ACCORDANCE WITH THESE PLANS. THE CITY OF FONTANA STANDARD PLANS, THE CONTRACT PROVISIONS AND THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION ("GREEN BOOK"), ALL REFERENCE SPECIFICATIONS AND STANDARDS SHALL BE THE LATEST EDITION UNLESS OTHERWISE NOTED.
- WHEN A TECHNICAL CONFLICT IS FOUND TO EXIST IN THE CONTRACT DOCUMENTS THAT CANNOT BE RESOLVED BY REFERENCE TO PRECEDENCE PROVISIONS IN THE "GREEN BOOK", THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE CITY ENGINEER FOR RESOLUTION.
- ALL MATERIALS AND METHODS ARE SUBJECT TO THE APPROVAL OF THE CITY ENGINEER.
- ADVANCE CONSTRUCTION SIGNING INDICATION DURATION OF PROJECT SHALL BE IN PLACE ONE WEEK PRIOR TO IMPLEMENTING DETOURS.
- CONSTRUCTION PERMITS SHALL BE OBTAINED FROM THE CITY OF FONTANA COMMUNITY DEVELOPMENT DEPARTMENT, ENGINEERING DIVISION PRIOR TO THE START OF ANY WORK. INSPECTION COORDINATION SHALL BE REQUIRED AT LEAST TWO WORKING DAYS PRIOR TO THE START OF ANY WORK IN PUBLIC RIGHT OF WAY WITHIN THE CITY LIMITS. CALL 909-350-7610.
- THE CONTRACTOR SHALL CONFORM TO ALL TRAFFIC CONTROL POLICIES, METHODS AND PROCEDURES DESCRIBED IN THE STATE OF CALIFORNIA MANUAL OF TRAFFIC CONTROLS, LATEST NON-METRIC EDITION UNLESS OTHERWISE DIRECTED BY THE CITY TRAFFIC ENGINEER.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN BARRICADES, DELINEATORS OR OTHER TRAFFIC CONTROL DEVICES AT ALL TIMES.
- THE CONTRACTOR SHALL OBTAIN A PERMIT TO PERFORM EXCAVATION OR TRENCH WORK FOR TRENCHES 5 FEET OR GREATER IN DEPTH FROM THE CALIFORNIA STATE DIVISION OF INDUSTRIAL SAFETY.
- THE WALLS AND FACES OF ALL EXCAVATIONS GREATER THAN FIVE (5) FEET IN DEPTH SHALL BE GUARDED BY SHORING, SLOPING OF THE GROUND OR OTHER APPROVED MEANS OF PURSUANT TO THE REQUIREMENTS OF THE DIVISION OF INDUSTRIAL SAFETY OF THE STATE OF CALIFORNIA. TRENCHES LESS THAN FIVE (5) FEET SHALL ALSO BE GUARDED WHEN THE POTENTIAL EXISTS FOR GROUND MOVEMENT.
- NO MATERIAL OR EQUIPMENT SHALL BE STORED IN THE PUBLIC RIGHT OF WAY WITHOUT OBTAINING A SEPARATE PERMIT FOR THAT PURPOSE.
- THE LOCATIONS OF UTILITIES SHOWN HAVE BEEN DETERMINED FROM AVAILABLE INFORMATION, HOWEVER, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE, IN THE FIELD, THE TRUE LOCATION AND ELEVATION OF ANY EXISTING UTILITIES, AND TO EXERCISE PROPER PRECAUTION TO AVOID DAMAGE THERETO. THE CONTRACTOR SHALL CONTACT UNDERGROUND SERVICE ALERT AT 1-800-227-2600 TWO WORKING DAYS BEFORE EXCAVATION.
- THE CONTRACTOR SHALL COORDINATE CONSTRUCTION WITH ALL UTILITY COMPANIES INCLUDING, BUT NOT LIMITED TO, GAS, TELEPHONE, ELECTRIC, CABLE TELEVISION, LANDSCAPING, LANDSCAPE IRRIGATION, DOMESTIC WATER, RECLAIMED WATER, SEWER, STORM DRAIN, FLOOD CONTROL AND CALTANS. ALL UTILITY COMPANIES SHALL BE GIVEN TWO WORKING DAYS NOTICE PRIOR TO WORK AROUND THEIR FACILITIES.
- THE CONTRACTOR SHALL NOT OPERATE ANY FIRE HYDRANT OR WATER VALVE WITHOUT APPROPRIATE AGENCY AUTHORIZATION. CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE WATER COMPANY FOR VALVE OPERATION AND WATER REQUIREMENTS.
- STATIONING REFERS TO THE CENTERLINE OF STORM DRAIN EXCEPT WHERE OTHERWISE NOTED.
- ADEQUATE CONSTRUCTION CONTROL STAKES SHALL BE SET BY THE ENGINEER TO ENABLE THE CONTRACTOR TO CONSTRUCT THE WORK TO THE PLAN GRADES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PRESERVATION OF BENCHMARKS AND CONSTRUCTION CONTROL STAKING DURING CONSTRUCTION.
- THE CONTRACTOR SHALL NOT DISTURB EXISTING SURVEY MONUMENTS, MONUMENT TIES OR BENCH MARKS WITHOUT PRIOR NOTIFICATION TO THE CITY ENGINEER.
- REMOVAL AND REPLACEMENT OF EXISTING SURVEY CONTROL, INCLUDING SURVEY MONUMENTS, MONUMENT TIES AND BENCH MARKS, SHALL BE DONE BY A REGISTERED CIVIL ENGINEER OR LICENSED LAND SURVEYOR. SURVEY MONUMENTS THAT WILL BE DESTROYED AS A RESULT OF THIS CONSTRUCTION WILL BE REPLACED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER ONE WEEK PRIOR TO CONSTRUCTION SO THAT TIES TO MONUMENTS CAN BE ESTABLISHED FOR LATER REPLACEMENT OF THE MONUMENT.
- THE CONTRACTOR SHALL MAINTAIN ACCESS FOR LOCAL RESIDENTS AT ALL TIMES. A MINIMUM 12 FOOT LANE SHALL BE MAINTAINED AT ALL TIMES IN THE CONSTRUCTION AREA FOR THE RESIDENTS AND EMERGENCY VEHICLES.
- THE CONTRACTOR SHALL PROVIDE AND MAINTAIN AN EFFECTIVE MEANS OF DUST CONTROL, INCLUDING ADEQUATE WATERING, AT ALL TIMES.
- THE CONTRACTOR SHALL NOT CAUSE ANY EXCAVATED MATERIAL, MUD, SILT OR DEBRIS TO BE DEPOSITED ONTO PUBLIC OR PRIVATE PROPERTY ADJACENT TO THE RIGHT OF WAY DURING CONSTRUCTION WITHOUT PRIOR WRITTEN APPROVAL.
- NO TRENCH BACKFILL SHALL TAKE PLACE WITHOUT PRIOR APPROVAL OF THE CITY INSPECTOR.
- A GEOTECHNICAL ENGINEER SHALL CERTIFY ALL BACKFILL COMPACTION. FAILURE TO OBTAIN THE REQUIRED DENSITY SHALL REQUIRE RE-WORKING OF THAT PORTION OF THE WORK UNTIL THE SPECIFIED DENSITY IS OBTAINED.
- CARE SHOULD BE TAKEN TO PREVENT GRADES, DITCHES AND SWALES FROM UNDERMINING STREET IMPROVEMENTS. UPON INSPECTION OF THE SITE, THE CITY ENGINEER MAY REQUIRE TEMPORARY NON-ERODABLE SWALES ENTERING OR LEAVING IMPROVEMENTS.
- ALL EXPOSED CONCRETE SURFACES SHALL CONFORM IN GRADE, COLOR AND FINISH TO MATCH EXISTING CONCRETE.
- NO OPEN TRENCH SHALL BE ALLOWED AT THE END OF THE DAY WITHOUT PRIOR APPROVAL OF THE CITY ENGINEER.
- PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXPOSE EXISTING FACILITIES, AND VERIFY ELEVATION AND LOCATION OF CONNECTIONS. CITY APPROVAL OF CONNECTIONS TO EXISTING FACILITIES DOES NOT IMPLY CORRECTNESS OF ELEVATIONS OR LOCATIONS SHOWN ON THE PLANS.
- IF EXISTING UTILITIES OR ANY OTHER FACILITIES CONFLICT WITH THE PROPOSED IMPROVEMENTS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND ALL AFFECTED AGENCIES IMMEDIATELY.
- NO CONCRETE SHALL BE PLACED UNTIL THE FORMS AND REINFORCING STEEL HAVE BEEN PLACED, INSPECTED AND APPROVED.
- ALL UNDERGROUND UTILITIES SHALL BE INSTALLED, TESTED AND APPROVED PRIOR TO PAVING OF STREETS.
- APPROVED SOIL STERILANT IS REQUIRED UNDER ALL NEW ASPHALT PAVEMENT PRIOR TO PLACEMENT.
- ALL MANHOLES, CLEANOUT FRAMES, COVERS AND VALVE BOXES SHALL BE RAISED TO FINISHED GRADE BY THE PAVING CONTRACTOR UPON COMPLETION OF PAVING.
- UPON COMPLETION OF CONSTRUCTION, CONTRACTOR SHALL RESTORE ALL SIGNING, STRIPING, BARRICADES, AND OTHER TRAFFIC CONTROL DEVICES TO THE SATISFACTION OF THE CITY TRAFFIC ENGINEER.
- AS BUILT DRAWINGS SHALL BE PROVIDED BY THE CONTRACTOR TO THE ENGINEER OF RECORD, WHO SHALL PROVIDE RECORD DRAWINGS TO THE CITY ENGINEER.
- MINIMUM D-LOAD FOR ALL RCP (SD PIPE) IS 1350

STORM DRAIN IMPROVEMENT PLANS INTERIM CONDITION AND OFF-SITE CITY OF FONTANA COUNTY OF SAN BERNARDINO, CALIFORNIA TRACT 16678-1, -2, -3 & 16678

UTILITIES

WATER: FONTANA WATER COMPANY
TELEPHONE NO. (909)822-2201
SEWER: CITY OF FONTANA
TELEPHONE NO. (909)350-6632
ATT: BRIAN WREN

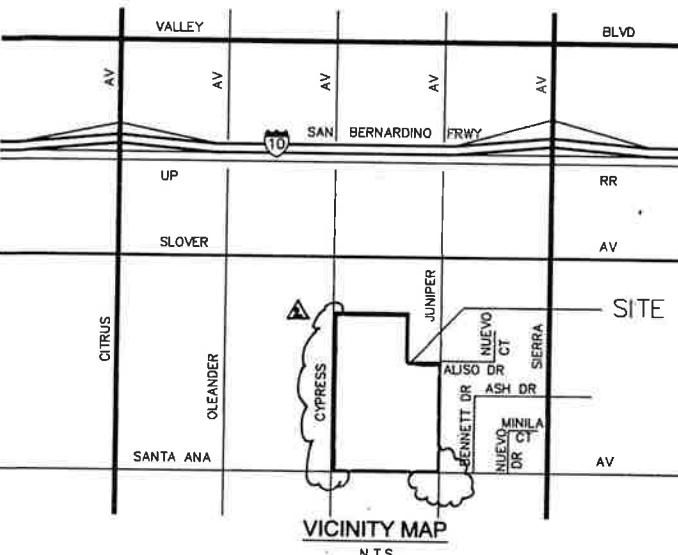
ELECTRIC: SOUTHERN CALIFORNIA EDISON COMPANY
TELEPHONE NO. (800)655-1555
GAS: SOUTHERN CALIFORNIA GAS COMPANY
TELEPHONE NO. (800)427-2200
TELEPHONE COMPANY: PACIFIC BELL CO.
TELEPHONE NO. (800)750-2355

OWNER

BRISTOLONE INVESTMENTS, LLC.
19 CORPORATEPLAZA DRIVE, SUITE 210
NEWPORT BEACH, CA 92660

LEGEND

MH
FL
INV.
R.C.P.
L.F.
D
MANHOLE
FLOW LINE
INVERT OF PIPE
REINFORCED CONCRETE PIPE
LINEAR FEET
D-LOAD

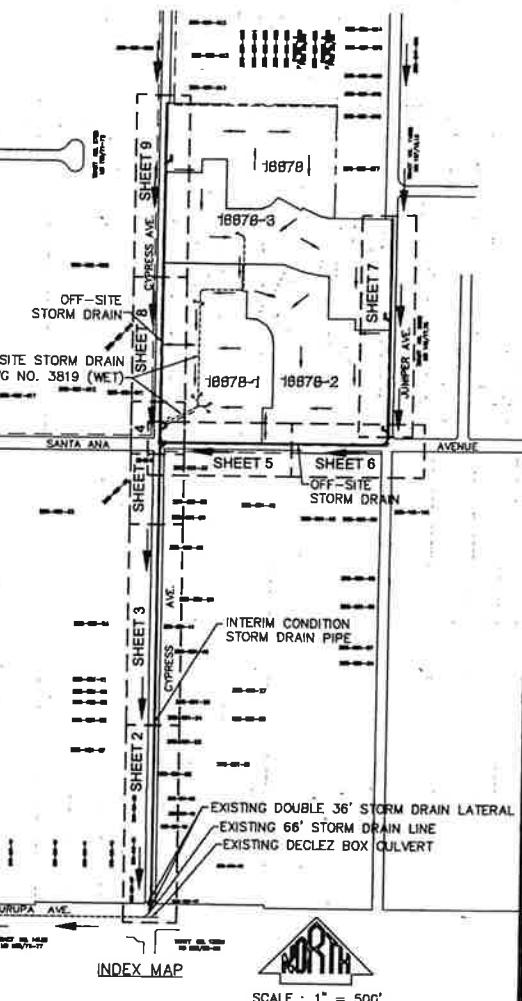


CONSTRUCTION NOTES

- CONSTRUCT MANHOLE PER A.P.W.A. STD. PLAN 320-1. SEE DETAIL ON SHT. 11 20 EA.
- TRENCH REPAIR PER CITY OF FONTANA STD. DETAIL 131 109,175 S.F.
- INSTALL 24" R.C.P. (D=1350) 203 LF.
- INSTALL 48" R.C.P. (D=1350) 2,655 LF.
- INSTALL 54" R.C.P. (D=1350) 85 LF.
- SAW-CUT AND REMOVE EXISTING A.C. PAVEMENT PER CITY OF FONTANA STD. DETAIL 131 109,175 S.F.
- CONSTRUCT JUNCTION STRUCTURE PER A.P.W.A. STD. PLAN 331-2. SEE DETAIL ON SHT. 10 7 EA.
- CONSTRUCT TRANSITION STRUCTURE PER A.P.W.A. STD. PLAN 340-1. SEE DETAIL ON SHT. 10 4 EA.
- CONSTRUCT MANHOLE PIPE TO PIPE PER A.P.W.A. STD. PLAN 322-2. SEE DETAIL ON SHT. 11 3 EA.
- CONSTRUCT CURB OPENING CATCH BASIN PER A.P.W.A. STD. PLAN 300-2. DETAIL ON SHEET 10 4 EA.
- INSTALL 42" R.C.P. (D=1350) 3,117 LF.
- INSTALL 60" R.C.P. (D=1350) 1,220 LF.
- INSTALL 36" R.C.P. (D=1350) 40 S.F.
- CONSTRUCT 4 1/2" MIN. AC. PAVEMENT OVER 12" MIN. OF 95% COMPACTED SUBGRADE 39,000 S.F.
- CONSTRUCT 6 1/2" MIN. AC. PAVEMENT OVER 12" MIN. OF 95% COMPACTED SUBGRADE 66,610 S.F.
- CONSTRUCT LOCAL DEPRESSION PER OFF SITE STREET IMPROVEMENT PLAN. 5 EA.
- CONSTRUCT DOUBLE BRICK AND MORTAR PIPE CLOSURE - TYPE "B" PER DETAIL ON SHEET 6 8 EA.
- INSTALL 84" R.C.P. (D=1350) 36 LF.

QUANTITY/UNIT

20 EA.
109,175 S.F.
203 LF.
2,655 LF.
85 LF.
109,175 S.F.
7 EA.
4 EA.
3 EA.
4 EA.
3,117 LF.
1,220 LF.
40 S.F.
39,000 S.F.
66,610 S.F.
5 EA.
8 EA.
36 LF.



SCALE : 1" = 500'

RIGHT-OF-WAY LEGEND

PROPOSED RIGHT-OF-WAY

FUTURE RIGHT-OF-WAY

EXISTING RIGHT-OF-WAY

RECORD DRAWINGS

CONTRACTORS RESPONSIBILITY FOR SAFETY

IN SUBMITTING A BID FOR THIS WORK, THE CONTRACTOR AGREES HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND THAT THE CONTRACTOR SHALL DEFEND, INSTITUTE AND HOLD THE OWNER, THE ENGINEER AND THE GOVERNMENTAL AGENCY HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER, THE ENGINEER OR THE GOVERNING AGENCY.

ALL CONTRACTORS AND SUBCONTRACTORS PERFORMING WORK SHOWN ON OR RELATED TO THESE PLANS SHALL CONDUCT THEIR OPERATIONS SO THAT EMPLOYEES ARE PROVIDED A SAFE PLACE TO WORK AND THE PUBLIC IS PROTECTED. THE CONTRACTORS AND SUBCONTRACTORS SHALL COMPLY WITH THE "OCCUPATIONAL SAFETY AND HEALTH REGULATIONS" OF THE U.S. DEPARTMENT OF LABOR WITH SUBCONTRACTORS COMPLIANCE WITH SAID REGULATIONS AND ORDERS.

ENGINEERS NOTICE TO CONTRACTORS

THE EXISTENCE AND APPROXIMATE LOCATION OF ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO EXISTING UTILITIES OR STRUCTURES EXCEPT AS SHOWN ON THESE PLANS. THE ENGINEER ASSUMES NO LIABILITY AS TO THE EXACT LOCATION NEITHER OF SAID LINES NOR FOR UTILITIES OR IRRIGATION UNITS WHOSE LOCATIONS ARE NOT SHOWN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING ALL UTILITY AND IRRIGATION COMPANIES PRIOR TO WORKING IN EXCAVATION TO DETERMINE THE EXACT LOCATION OF ALL LINES AFFECTING THIS WORK, WHETHER OR NOT SHOWN HEREON, AND FOR ANY DAMAGE OR PROTECTION OF THESE LINES.

THE CONTRACTOR SHALL CALL IN A LOCATION REQUEST TO UNDERGROUND SERVICE ALERT (USA) PHONE 800-227-2600 TWO WORKING DAYS PRIOR TO DIGGING. NO CONSTRUCTION PERMIT ISSUED BY PUBLIC WORKS DEPARTMENT SHALL BE VALID INVOLVING UNDERGROUND FACILITIES UNLESS THE APPLICANT HAS AN INQUIRY IDENTIFICATION NUMBER ISSUED BY USA.

BENCH MARK

A NAIL SET AT CYPRESS AVENUE AND SP.R.R., 26 FT. WEST OF CYPRESS, 0.5 FEET SOUTH OF SOUTH R/W FENCE OF I-10 FREEWAY, 1 POLE WEST OF MILEPOST 532, 47.5 FEET NORTH OF NORTH RAIL.

ELEV. = 1098.7770

SHEET INDEX

SHEET 1	TITLE SHEET AND NOTES
SHEET 2	LINE "DZ-A" PLAN AND PROFILE, LATURAL "1" AND "2" PLAN
SHEET 3	LINE "DZ-4A" PLAN AND PROFILE
SHEET 4	LINE "DZ-4A" PLAN AND PROFILE, LATURAL "1" AND "2" PROFILE
SHEET 5	LINE "A" PLAN AND PROFILE
SHEET 6	LINE "A" PLAN AND PROFILE, LATURAL "A-1", "A-2", "B-3" PROFILE, CALTRANS DETAIL
SHEET 7	LINE "A" PLAN AND PROFILE, LATURAL "A-1", "A-2" PLAN
SHEET 8	LINE "B" PLAN AND PROFILE, LATURAL "B-1"
SHEET 9	LINE "B" PLAN AND PROFILE, LATURAL "B-2" AND "B-3"
SHEET 10	A.P.W.A. STANDARDS SHEET
SHEET 11	A.P.W.A. STANDARDS SHEET

SHOULD CONSTRUCTION OF THE REQUIRED IMPROVEMENTS NOT COMMENCE WITHIN TWO YEARS OF THE DATE OF APPROVAL SHOWN HEREON AND CARRIED FORTH IN A DILIGENT MANNER, THE CITY ENGINEER MAY REQUIRE REVISIONS TO THE PLANS TO BRING THEM INTO CONFORMANCE WITH STANDARDS IN EFFECT.

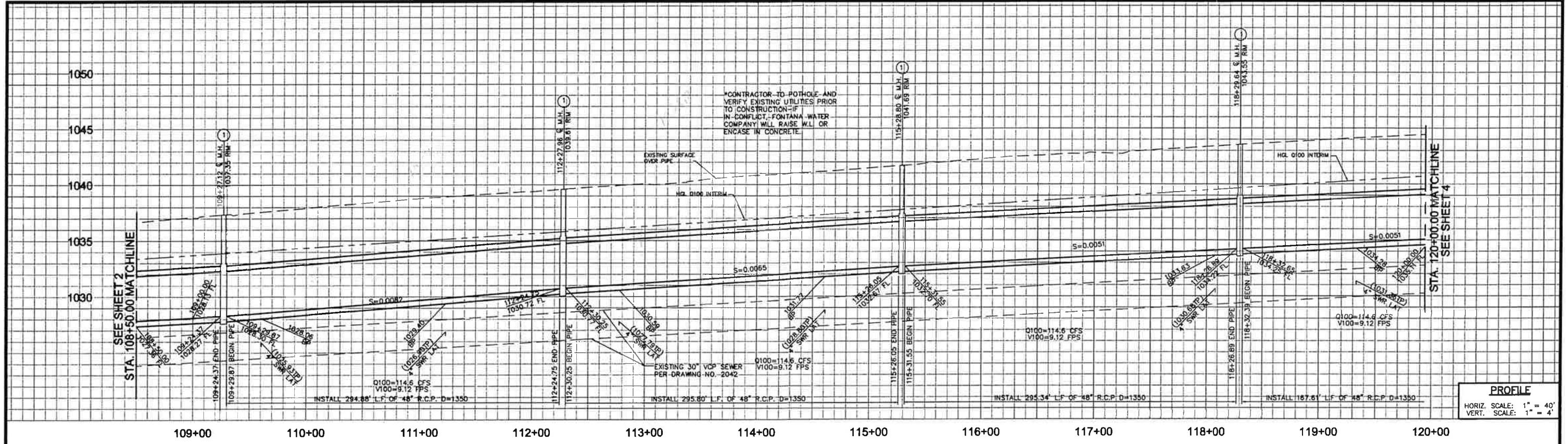


Prepared Under The Supervision Of:

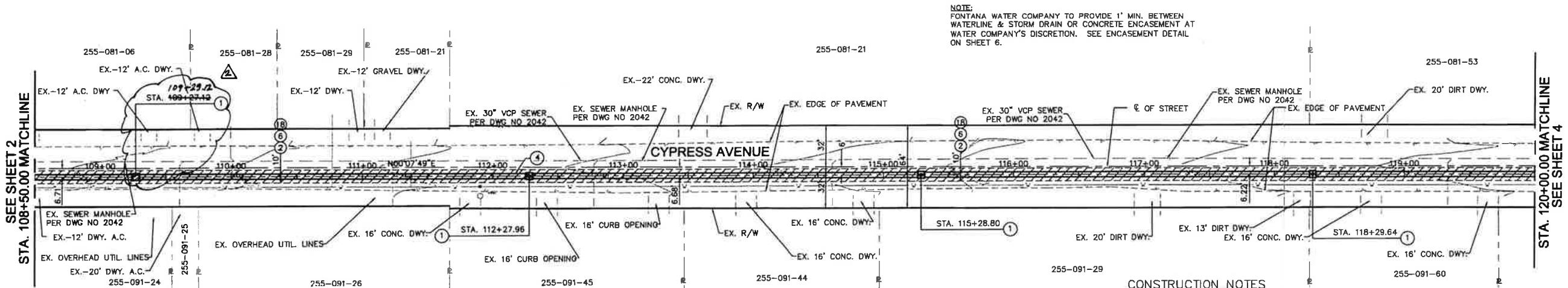
Crouse/Beers & Associates, Inc. 
 Engineering • Surveying • Planning • Construction Management
 2191 5th Street, Suite 200, Norco, Ca. 92860-1967
 Ph. (951) 736-2040 Fax (951) 736-5292
 Douglas N. Crouse R.C.E. No. 23796 Exp. 12/31/05 DATE
 9-2-2005
 Douglas N. Crouse R.C.E. No. 23796 Exp. 12/31/05 DATE
 9-2-2005

CITY OF FONTANA, CALIFORNIA

TRACT No. 16678-1, -2, -3 & 16678
 DRAWN BY: STORM DRAIN IMPROVEMENT PLAN
 DESIGNED BY: INTERIM CONDITION & OFF-SITE
 CHECKED BY: TITLE SHEET
 APPROVED BY: RICARDO SANDOVAL R.C.E. 51152 DATE
 9-7-05
 DRAWING NO: 1
 3817
 12



LINE "DZ - 4A"



NOTE:
FONTANA WATER COMPANY TO PROVIDE 1' MIN. BETWEEN
WATERLINE & STORM DRAIN OR CONCRETE ENCASEMENT AT
WATER COMPANY'S DISCRETION. SEE ENCASEMENT DETAIL
ON SHEET 6.

CONSTRUCTION NOTES

- ① CONSTRUCT MANHOLE PER A.P.W.A. STD. PLAN 320-1. SEE DETAIL ON SHT. 11
 - ② TRENCH REPAIR PER CITY OF FONTANA STD. DETAIL 131
 - ④ INSTALL 48" R.C.P (D=1350)
 - ⑥ SAW-CUT AND REMOVE EXISTING A.C. PAVEMENT PER CITY OF FONTANA STD. DETAIL 131
 - ⑧ CONSTRUCT JUNCTION STRUCTURE PER A.P.W.A. STD.331-2. SEE DETAIL ON SHEET 10
 - ⑩ CONSTRUCT MANHOLE PIPE TO PIPE PER A.P.W.A. STD PLAN 322-1. DETAIL ON SHEET 10
 - ⑯ CONSTRUCT 4 1/2" MIN. AC. PAVEMENT OVER 12" MIN. OF 95% COMPAKTED SUBGRADE.
 - ㉑ CONSTRUCT DOUBLE BRICK AND MORTAR PIPE CLOSURE - TYPE "B" PER DETAIL ON SHEET 6



REV.	RECORD DRAWINGS	4-28-05	JLD	B8
	REVISION DESCRIPTION	DATE	DOC#	CITY
				DATE

SHOULD CONSTRUCTION OF THE REQUIRED IMPROVEMENTS NOT COMMENCE WITHIN TWO YEARS OF THE DATE OF APPROVAL SHOWN HEREON AND CARRIED FORTH IN A DILIGENT MANNER, THE CITY ENGINEER MAY REQUIRE REVISIONS TO THE PLANS TO BRING THEM INTO CONFORMANCE WITH STANDARDS IN EFFECT.



Prepared Under The Supervision Of

Crouse/Beers & Associates, Inc. CBA
Engineering * Surveying * Planning * Construction Management
2191 5th Street, Suite 200, Norco, Ca. 92860-1967
Ph. (951) 736-2040 Fax (951) 736-5292

CITY OF FONTANA, CALIFORNIA		
TRACT No. 16678-1, -2, -3 & 16678		
DRAWN BY:	STORM DRAIN IMPROVEMENT PLAN INTERIM CONDITION PLAN AND PROFILE LINE "DZ-4A"	SCALE: 1"=40'
DESIGNED BY:		DATE: MAY, 2005
CHECKED BY:	APPROVED BY: <i>Ricardo Santamaria</i> RICARDO SANTAMARIA R.C.E. #11152	DRAWING NO.: 3 3817 12

APPENDIX B

HYDROLOGY CALCULATIONS

EXISTING CONDITION

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-99 Advanced Engineering Software (aes)
Ver. 8.0 Release Date: 01/01/99 License ID 1435

Analysis prepared by:

THIENES ENGINEERING
16800 VALLEY VIEW AVENUE
LA MIRADA CA 90638
PH: (714) 521-4811 FAX: (714) 521-4173

***** DESCRIPTION OF STUDY *****
* JOB #3678 GOODMAN FONTANA III, FONTANA *
* EXISTING CONDITION 100-YEAR *
* NODES 100-101 *

FILE NAME: C:\XDRIVE\3678\100X.DAT
TIME/DATE OF STUDY: 14:56 12/03/2018

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

--*TIME-OF-CONCENTRATION MODEL*-

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 12.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.3500

ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD

FLOW PROCESS FROM NODE 100.00 TO NODE 101.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 1024.00
ELEVATION DATA: UPSTREAM(FEET) = 1044.30 DOWNSTREAM(FEET) = 1038.91

Tc = K* [(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 20.014
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.609
SUBAREA Tc AND LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS GROUP	SOIL AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL "2 DWELLINGS/ACRE"	B	4.85	0.45	0.70	76	20.01
NATURAL POOR COVER "BARREN"	B	4.95	0.03	1.00	97	23.99

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.85
SUBAREA RUNOFF(CFS) = 21.48
TOTAL AREA(ACRES) = 9.80 PEAK FLOW RATE(CFS) = 21.48

=====

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 9.80 TC(MIN.) = 20.01
EFFECTIVE AREA(ACRES) = 9.80 AREA-AVERAGED Fm(INCH/HR) = 0.17
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.85
PEAK FLOW RATE(CFS) = 21.48

=====

END OF RATIONAL METHOD ANALYSIS

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-99 Advanced Engineering Software (aes)
Ver. 8.0 Release Date: 01/01/99 License ID 1435

Analysis prepared by:

THIENES ENGINEERING
16800 VALLEY VIEW AVENUE
LA MIRADA CA 90638
PH: (714) 521-4811 FAX: (714) 521-4173

***** DESCRIPTION OF STUDY *****
* JOB #3678 GOODMAN FONTANA III, FONTANA *
* EXISTING CONDITION 100-YEAR *
* NODES 200-212 *

FILE NAME: C:\XDRIVE\3678\200X.DAT
TIME/DATE OF STUDY: 14:55 12/03/2018

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

--**TIME-OF-CONCENTRATION MODEL**--

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 12.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.3500

ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD

FLOW PROCESS FROM NODE 200.00 TO NODE 201.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 916.00
ELEVATION DATA: UPSTREAM(FEET) = 1052.63 DOWNSTREAM(FEET) = 1045.00

Tc = K* [(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 17.463
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.831
SUBAREA Tc AND LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS GROUP	SOIL AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL "2 DWELLINGS/ACRE"	B	11.45	0.45	0.70	76	17.46
NATURAL POOR COVER		5.00	0.03	1.00	97	20.93
"BARREN"	B	5.00	0.03	1.00	97	20.93

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.29
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.79
SUBAREA RUNOFF(CFS) = 38.50
TOTAL AREA(ACRES) = 16.45 PEAK FLOW RATE(CFS) = 38.50

FLOW PROCESS FROM NODE 201.00 TO NODE 212.00 IS CODE = 51

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

=====
ELEVATION DATA: UPSTREAM(FEET) = 1045.00 DOWNSTREAM(FEET) = 1036.65
CHANNEL LENGTH THRU SUBAREA(FEET) = 1107.00 CHANNEL SLOPE = 0.0075
CHANNEL BASE(FEET) = 50.00 "% FACTOR = 50.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 1.00
CHANNEL FLOW THRU SUBAREA(CFS) = 38.50
FLOW VELOCITY(FEET/SEC) = 1.75 FLOW DEPTH(FEET) = 0.33
TRAVEL TIME(MIN.) = 10.55 Tc(MIN.) = 28.01
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 212.00 = 2023.00 FEET.

FLOW PROCESS FROM NODE 201.00 TO NODE 212.00 IS CODE = 81

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

=====
MAINLINE Tc(MIN) = 28.01
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.132
SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS GROUP	SOIL AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL "2 DWELLINGS/ACRE"	B	0.55	0.45	0.70	76
NATURAL POOR COVER		5.05	0.03	1.00	97
"BARREN"	B	5.05	0.03	1.00	97

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.06
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.97
SUBAREA AREA(ACRES) = 5.60 SUBAREA RUNOFF(CFS) = 10.44
EFFECTIVE AREA(ACRES) = 22.05 AREA-AVERAGED Fm(INCH/HR) = 0.19
AREA-AVERAGED Fp(INCH/HR) = 0.22 AREA-AVERAGED Ap = 0.84
TOTAL AREA(ACRES) = 22.05 PEAK FLOW RATE(CFS) = 38.59

FLOW PROCESS FROM NODE 212.00 TO NODE 212.00 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.) = 28.01
RAINFALL INTENSITY(INCH/HR) = 2.13
AREA-AVERAGED Fm(INCH/HR) = 0.19
AREA-AVERAGED Fp(INCH/HR) = 0.22
AREA-AVERAGED Ap = 0.84
EFFECTIVE STREAM AREA(ACRES) = 22.05
TOTAL STREAM AREA(ACRES) = 22.05
PEAK FLOW RATE(CFS) AT CONFLUENCE = 38.59

FLOW PROCESS FROM NODE 210.00 TO NODE 211.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 422.00
ELEVATION DATA: UPSTREAM(FEET) = 1051.77 DOWNSTREAM(FEET) = 1046.40

Tc = K* [(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.767
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.588
SUBAREA Tc AND LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
RESIDENTIAL
"2 DWELLINGS/ACRE" B 8.15 0.45 0.70 76 11.77
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.70
SUBAREA RUNOFF(CFS) = 24.00
TOTAL AREA(ACRES) = 8.15 PEAK FLOW RATE(CFS) = 24.00

FLOW PROCESS FROM NODE 211.00 TO NODE 212.00 IS CODE = 51

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

ELEVATION DATA: UPSTREAM(FEET) = 1046.40 DOWNSTREAM(FEET) = 1036.65
CHANNEL LENGTH THRU SUBAREA(FEET) = 1164.00 CHANNEL SLOPE = 0.0084
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 5.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 1.00
CHANNEL FLOW THRU SUBAREA(CFS) = 24.00
FLOW VELOCITY(FEET/SEC) = 2.89 FLOW DEPTH(FEET) = 0.63
TRAVEL TIME(MIN.) = 6.70 Tc(MIN.) = 18.47
LONGEST FLOWPATH FROM NODE 210.00 TO NODE 212.00 = 1586.00 FEET.

FLOW PROCESS FROM NODE 211.00 TO NODE 212.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 18.47
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.737
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"2 DWELLINGS/ACRE" B 6.65 0.45 0.70 76
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.70
SUBAREA AREA(ACRES) = 6.65 SUBAREA RUNOFF(CFS) = 14.49
EFFECTIVE AREA(ACRES) = 14.80 AREA-AVERAGED Fm(INCH/HR) = 0.32
AREA-AVERAGED Fp(INCH/HR) = 0.45 AREA-AVERAGED Ap = 0.70
TOTAL AREA(ACRES) = 14.80 PEAK FLOW RATE(CFS) = 32.25

FLOW PROCESS FROM NODE 212.00 TO NODE 212.00 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.) = 18.47
RAINFALL INTENSITY(INCH/HR) = 2.74
AREA-AVERAGED Fm(INCH/HR) = 0.32
AREA-AVERAGED Fp(INCH/HR) = 0.45
AREA-AVERAGED Ap = 0.70
EFFECTIVE STREAM AREA(ACRES) = 14.80
TOTAL STREAM AREA(ACRES) = 14.80
PEAK FLOW RATE(CFS) AT CONFLUENCE = 32.25

** CONFLUENCE DATA **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 38.59 28.01 2.132 0.22(0.19) 0.84 22.1 200.00
2 32.25 18.47 2.737 0.45(0.32) 0.70 14.8 210.00

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

** PEAK FLOW RATE TABLE **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	62.78	28.01	2.132	0.31(0.24)	0.78	36.8
2	65.61	18.47	2.737	0.33(0.25)	0.77	29.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 65.61 Tc(MIN.) = 18.47
 EFFECTIVE AREA(ACRES) = 29.34 AREA-AVERAGED Fm(INCH/HR) = 0.25
 AREA-AVERAGED Fp(INCH/HR) = 0.33 AREA-AVERAGED Ap = 0.77
 TOTAL AREA(ACRES) = 36.85
 LONGEST FLOWPATH FROM NODE 200.00 TO NODE 212.00 = 2023.00 FEET.

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 36.85 Tc(MIN.) = 18.47
 EFFECTIVE AREA(ACRES) = 29.34 AREA-AVERAGED Fm(INCH/HR) = 0.25
 AREA-AVERAGED Fp(INCH/HR) = 0.33 AREA-AVERAGED Ap = 0.77
 PEAK FLOW RATE(CFS) = 65.61

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	65.61	18.47	2.737	0.33(0.25)	0.77	29.3	210.00
2	62.78	28.01	2.132	0.31(0.24)	0.78	36.8	200.00

=====

=====

END OF RATIONAL METHOD ANALYSIS

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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Ver. 8.0 Release Date: 01/01/99 License ID 1435

Analysis prepared by:

THIENES ENGINEERING
16800 VALLEY VIEW AVENUE
LA MIRADA CA 90638
PH: (714) 521-4811 FAX: (714) 521-4173

***** DESCRIPTION OF STUDY *****
* JOB #3678 GOODMAN FONTANA III, FONTANA *
* EXISTING CONDITION 100-YEAR *
* NODES 300-301 *

FILE NAME: C:\XDRIVE\3678\300X.DAT
TIME/DATE OF STUDY: 14:25 12/03/2018

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

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 12.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL

SLOPE OF INTENSITY DURATION CURVE(LOG(I,IN/HR) vs. LOG(Tc,MIN)) = 0.6000
USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.3500

ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD

FLOW PROCESS FROM NODE 300.00 TO NODE 301.00 IS CODE = 21

>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

===== INITIAL SUBAREA FLOW-LENGTH(FEET) = 148.00
ELEVATION DATA: UPSTREAM(FEET) = 1048.43 DOWNSTREAM(FEET) = 1046.84

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.005
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.521
SUBAREA Tc AND LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS GROUP	SOIL AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL "2 DWELLINGS/ACRE"	B	0.20	0.45	0.70	76	8.00

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.70
SUBAREA RUNOFF(CFS) = 0.76
TOTAL AREA(ACRES) = 0.20 PEAK FLOW RATE(CFS) = 0.76

=====
END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 0.20 TC(MIN.) = 8.00
EFFECTIVE AREA(ACRES) = 0.20 AREA-AVERAGED Fm(INCH/HR) = 0.32
AREA-AVERAGED Fp(INCH/HR) = 0.45 AREA-AVERAGED Ap = 0.70
PEAK FLOW RATE(CFS) = 0.76

=====
END OF RATIONAL METHOD ANALYSIS

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Analysis prepared by:

THIENES ENGINEERING
16800 VALLEY VIEW AVENUE
LA MIRADA CA 90638
PH: (714) 521-4811 FAX: (714) 521-4173

***** DESCRIPTION OF STUDY *****
* JOB #3678 GOODMAN FONTANA III, FONTANA *
* EXISTING CONDITION 100-YEAR *
* NODES 310-311 *

FILE NAME: C:\XDRIVE\3678\310X.DAT
TIME/DATE OF STUDY: 14:28 12/03/2018

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

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 12.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL

SLOPE OF INTENSITY DURATION CURVE(LOG(I,IN/HR) vs. LOG(Tc;MIN)) = 0.6000
USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.3500

ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD

FLOW PROCESS FROM NODE 310.00 TO NODE 311.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 573.00
ELEVATION DATA: UPSTREAM(FEET) = 1045.02 DOWNSTREAM(FEET) = 1042.10

TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.969
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.987
SUBAREA Tc AND LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS GROUP	SOIL AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL "2 DWELLINGS/ACRE"	B	0.65	0.45	0.70	76	15.97

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.70
SUBAREA RUNOFF(CFS) = 1.56
TOTAL AREA(ACRES) = 0.65 PEAK FLOW RATE(CFS) = 1.56

=====
END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 0.65 TC(MIN.) = 15.97
EFFECTIVE AREA(ACRES) = 0.65 AREA-AVERAGED Fm(INCH/HR) = 0.32
AREA-AVERAGED Fp(INCH/HR) = 0.45 AREA-AVERAGED Ap = 0.70
PEAK FLOW RATE(CFS) = 1.56

=====
END OF RATIONAL METHOD ANALYSIS

PROPOSED CONDITION

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Analysis prepared by:

THIENES ENGINEERING
16800 VALLEY VIEW AVENUE
LA MIRADA CA 90638
PH: (714) 521-4811 FAX: (714) 521-4173

***** DESCRIPTION OF STUDY *****
* JOB #3678 GOODMAN FONTANA III, FONTANA *
* PROPOSED CONDITION *
* 100 YEAR EVENT *

FILE NAME: C:\XDRIVE\3678\110P.DAT
TIME/DATE OF STUDY: 10:18 02/02/2019

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

---TIME-OF-CONCENTRATION MODEL---

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 12.00
SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL

SLOPE OF INTENSITY DURATION CURVE (LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.3500

ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD

FLOW PROCESS FROM NODE 110.00 TO NODE 111.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 571.00
ELEVATION DATA: UPSTREAM(FEET) = 1042.93 DOWNSTREAM(FEET) = 1036.95

Tc = K* [(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.583
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.058
SUBAREA Tc AND LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS GROUP	SOIL AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	B	1.90	0.45	0.10	76	9.58

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.10
SUBAREA RUNOFF(CFS) = 6.86
TOTAL AREA(ACRES) = 1.90 PEAK FLOW RATE(CFS) = 6.86

FLOW PROCESS FROM NODE 111.00 TO NODE 112.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 1032.95 DOWNSTREAM(FEET) = 1032.45
FLOW LENGTH(FEET) = 173.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 21.0 INCH PIPE IS 13.7 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.12
ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 6.86
PIPE TRAVEL TIME(MIN.) = 0.70 Tc(MIN.) = 10.28
LONGEST FLOWPATH FROM NODE 110.00 TO NODE 112.00 = 744.00 FEET.

FLOW PROCESS FROM NODE 112.00 TO NODE 112.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 10.28
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.890
SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS GROUP	SOIL AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	1.85	0.45	0.10	76

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA(ACRES) = 1.85 SUBAREA RUNOFF(CFS) = 6.40
EFFECTIVE AREA(ACRES) = 3.75 AREA-AVERAGED Fm(INCH/HR) = 0.05
AREA-AVERAGED Fp(INCH/HR) = 0.45 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 3.75 PEAK FLOW RATE(CFS) = 12.98

FLOW PROCESS FROM NODE 112.00 TO NODE 113.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 1032.45 DOWNSTREAM(FEET) = 1031.95

FLOW LENGTH(FEET) = 159.00 MANNING'S N = 0.012
 DEPTH OF FLOW IN 24.0 INCH PIPE IS 19.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.86
 ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 12.98
 PIPE TRAVEL TIME(MIN.) = 0.55 Tc(MIN.) = 10.83
 LONGEST FLOWPATH FROM NODE 110.00 TO NODE 113.00 = 903.00 FEET.

FLOW PROCESS FROM NODE 113.00 TO NODE 113.00 IS CODE = 81

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

=====
MAINLINE Tc(MIN) = 10.83
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.771

SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL B 3.15 0.45 0.10 76
 SUBAREA AVERAGE PREVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
 SUBAREA AVERAGE PREVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA(ACRES) = 3.15 SUBAREA RUNOFF(CFS) = 10.56
 EFFECTIVE AREA(ACRES) = 6.90 AREA-AVERAGED Fm(INCH/HR) = 0.05
 AREA-AVERAGED Fp(INCH/HR) = 0.45 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 6.90 PEAK FLOW RATE(CFS) = 23.14

FLOW PROCESS FROM NODE 113.00 TO NODE 122.00 IS CODE = 31

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

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
 =====
 ELEVATION DATA: UPSTREAM(FEET) = 1031.95 DOWNSTREAM(FEET) = 1031.46
 FLOW LENGTH(FEET) = 166.00 MANNING'S N = 0.012
 DEPTH OF FLOW IN 30.0 INCH PIPE IS 24.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 5.47
 ESTIMATED PIPE DIAMETER(INCH) = 30.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 23.14
 PIPE TRAVEL TIME(MIN.) = 0.51 Tc(MIN.) = 11.34
 LONGEST FLOWPATH FROM NODE 110.00 TO NODE 122.00 = 1069.00 FEET.

FLOW PROCESS FROM NODE 122.00 TO NODE 112.00 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.) = 11.34
 RAINFALL INTENSITY(INCH/HR) = 3.67
 AREA-AVERAGED Fm(INCH/HR) = 0.05
 AREA-AVERAGED Fp(INCH/HR) = 0.45
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 6.90
 TOTAL STREAM AREA(ACRES) = 6.90
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 23.14

FLOW PROCESS FROM NODE 120.00 TO NODE 121.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 400.00
 ELEVATION DATA: UPSTREAM(FEET) = 1043.36 DOWNSTREAM(FEET) = 1040.66

Tc = K* [(LENGTH** 3.00) / (ELEVATION CHANGE)] **0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.075
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.193
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS TC
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 COMMERCIAL B 2.95 0.45 0.10 76 9.075
 SUBAREA AVERAGE PREVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
 SUBAREA AVERAGE PREVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA RUNOFF(CFS) = 11.01 PEAK FLOW RATE(CFS) = 11.01
 TOTAL AREA(ACRES) = 2.95

FLOW PROCESS FROM NODE 121.00 TO NODE 122.00 IS CODE = 31

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

=====
 ELEVATION DATA: UPSTREAM(FEET) = 1040.66 DOWNSTREAM(FEET) = 1031.46
 FLOW LENGTH(FEET) = 932.00 MANNING'S N = 0.012
 DEPTH OF FLOW IN 18.0 INCH PIPE IS 14.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 7.11
 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 11.01
 PIPE TRAVEL TIME(MIN.) = 2.18 Tc(MIN.) = 11.26
 LONGEST FLOWPATH FROM NODE 120.00 TO NODE 122.00 = 1332.00 FEET.

FLOW PROCESS FROM NODE 122.00 TO NODE 122.00 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.) = 11.26
 RAINFALL INTENSITY(INCH/HR) = 3.68
 AREA-AVERAGED Fm(INCH/HR) = 0.05
 AREA-AVERAGED Fp(INCH/HR) = 0.45
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 2.95
 TOTAL STREAM AREA(ACRES) = 2.95
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 11.01

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	23.14	11.34	3.669	0.45(0.05)	0.10	6.9	110.00
2	11.01	11.26	3.684	0.45(0.05)	0.10	3.0	120.00

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	34.11	11.34	3.669	0.45(0.05)	0.10	9.9	110.00
2	34.09	11.26	3.684	0.45(0.05)	0.10	9.8	120.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 34.11 Tc(MIN.) = 11.34
 EFFECTIVE AREA(ACRES) = 9.85 AREA-AVERAGED Fm(INCH/HR) = 0.05
 AREA-AVERAGED Fp(INCH/HR) = 0.45 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 9.85
 LONGEST FLOWPATH FROM NODE 120.00 TO NODE 122.00 = 1332.00 FEET.

FLOW PROCESS FROM NODE 122.00 TO NODE 123.00 IS CODE = 31

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

=====
 ELEVATION DATA: UPSTREAM(FEET) = 1031.46 DOWNSTREAM(FEET) = 1031.35
 FLOW LENGTH(FEET) = 35.00 MANNING'S N = 0.012
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 25.8 INCHES
 PIPE-FLOW VELOCITY(Feet/Sec.) = 6.29
 ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 34.11
 PIPE TRAVEL TIME(MIN.) = 0.09 Tc(MIN.) = 11.43
 LONGEST FLOWPATH FROM NODE 120.00 TO NODE 123.00 = 1367.00 FEET.

=====
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 9.85 TC(MIN.) = 11.43
 EFFECTIVE AREA(ACRES) = 9.85 AREA-AVERAGED Fm(INCH/HR) = 0.05
 AREA-AVERAGED Fp(INCH/HR) = 0.45 AREA-AVERAGED Ap = 0.10
 PEAK FLOW RATE(CFS) = 34.11

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	34.09	11.35	3.666	0.45(0.05)	0.10	9.8	120.00
2	34.11	11.43	3.651	0.45(0.05)	0.10	9.9	110.00

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END OF RATIONAL METHOD ANALYSIS

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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Ver. 8.0 Release Date: 01/01/99 License ID 1435

Analysis prepared by:

THIENES ENGINEERING
16800 VALLEY VIEW AVENUE
LA MIRADA CA 90638
PH: (714) 521-4811 FAX: (714) 521-4173

***** DESCRIPTION OF STUDY *****
* JOB #3678 GOODMAN FONTANA III, FONTANA *
* PROPOSED CONDITION *
* 100 YEAR EVENT *

FILE NAME: C:\XDRIVE\3678\200P.DAT
TIME/DATE OF STUDY: 12:58 02/02/2019

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

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--*TIME-OF-CONCENTRATION MODEL*-

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 12.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95

USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.3500

ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD

FLOW PROCESS FROM NODE 200.00 TO NODE 201.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 821.00
ELEVATION DATA: UPSTREAM(FEET) = 1045.92 DOWNSTREAM(FEET) = 1041.31

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.553
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.451
SUBAREA Tc AND LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
COMMERCIAL B 2.25 0.45 0.10 76 12.55
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.10
SUBAREA RUNOFF(CFS) = 6.90
TOTAL AREA(ACRES) = 2.25 PEAK FLOW RATE(CFS) = 6.90

FLOW PROCESS FROM NODE 201.00 TO NODE 202.00 IS CODE = 61

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

UPSTREAM ELEVATION(FEET) = 1041.31 DOWNSTREAM ELEVATION(FEET) = 1039.87
STREET LENGTH(FEET) = 254.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 25.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0149

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.95
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.53
HALFSTREET FLOOD WIDTH(FEET) = 18.49
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.48
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.31
STREET FLOW TRAVEL TIME(MIN.) = 1.71 Tc(MIN.) = 14.26
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.197
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL B 1.45 0.45 0.10 76
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA(ACRES) = 1.45 SUBAREA RUNOFF(CFS) = 4.11
EFFECTIVE AREA(ACRES) = 3.70 AREA-AVERAGED Fm(INCH/HR) = 0.05
AREA-AVERAGED Fp(INCH/HR) = 0.45 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 3.70 PEAK FLOW RATE(CFS) = 10.50

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 19.74
FLOW VELOCITY(FEET/SEC.) = 2.57 DEPTH*VELOCITY(FT*FT/SEC.) = 1.42
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 202.00 = 1075.00 FEET.

***** 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) = 1035.87 DOWNSTREAM(FEET) = 1034.98
FLOW LENGTH(FEET) = 296.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 24.0 INCH PIPE IS 16.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.63
ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 10.50
PIPE TRAVEL TIME(MIN.) = 1.06 Tc(MIN.) = 15.32
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 203.00 = 1371.00 FEET.

***** FLOW PROCESS FROM NODE 203.00 TO NODE 203.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 15.32
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.062
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL B 1.50 0.45 0.10 76
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA(ACRES) = 1.50 SUBAREA RUNOFF(CFS) = 4.07
EFFECTIVE AREA(ACRES) = 5.20 AREA-AVERAGED Fm(INCH/HR) = 0.05
AREA-AVERAGED Fp(INCH/HR) = 0.45 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 5.20 PEAK FLOW RATE(CFS) = 14.12

***** 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) = 1034.98 DOWNSTREAM(FEET) = 1034.87
FLOW LENGTH(FEET) = 56.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 27.0 INCH PIPE IS 21.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.15
ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 14.12
PIPE TRAVEL TIME(MIN.) = 0.22 Tc(MIN.) = 15.55
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 204.00 = 1427.00 FEET.

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

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

MAINLINE Tc(MIN) = 15.55
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.035
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL B 1.90 0.45 0.10 76
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA(ACRES) = 1.90 SUBAREA RUNOFF(CFS) = 5.11
EFFECTIVE AREA(ACRES) = 7.10 AREA-AVERAGED Fm(INCH/HR) = 0.05
AREA-AVERAGED Fp(INCH/HR) = 0.45 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 7.10 PEAK FLOW RATE(CFS) = 19.11

***** FLOW PROCESS FROM NODE 204.00 TO NODE 213.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 1034.98 DOWNSTREAM(FEET) = 1033.24
FLOW LENGTH(FEET) = 525.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 30.0 INCH PIPE IS 19.7 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.60
ESTIMATED PIPE DIAMETER(INCH) = 30.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 19.11
PIPE TRAVEL TIME(MIN.) = 1.56 Tc(MIN.) = 17.11
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 213.00 = 1952.00 FEET.

***** FLOW PROCESS FROM NODE 213.00 TO NODE 213.00 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.) = 17.11
RAINFALL INTENSITY(INCH/HR) = 2.87
AREA-AVERAGED Fm(INCH/HR) = 0.05
AREA-AVERAGED Fp(INCH/HR) = 0.45
AREA-AVERAGED Ap = 0.10
EFFECTIVE STREAM AREA(ACRES) = 7.10
TOTAL STREAM AREA(ACRES) = 7.10
PEAK FLOW RATE(CFS) AT CONFLUENCE = 19.11

FLOW PROCESS FROM NODE 210.00 TO NODE 211.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 651.00
ELEVATION DATA: UPSTREAM(FEET) = 1046.34 DOWNSTREAM(FEET) = 1039.50

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.093

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.934

SUBAREA Tc AND LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
LAND USE						
COMMERCIAL	B	5.45	0.45	0.10	76	10.09

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.45

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.10

SUBAREA RUNOFF(CFS) = 19.07

TOTAL AREA(ACRES) = 5.45 PEAK FLOW RATE(CFS) = 19.07

FLOW PROCESS FROM NODE 211.00 TO NODE 212.00 IS CODE = 9

>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<

UPSTREAM NODE ELEVATION(FEET) = 1039.50
DOWNSTREAM NODE ELEVATION(FEET) = 1038.66

CHANNEL LENGTH THRU SUBAREA(FEET) = 185.00

"V" GUTTER WIDTH(FEET) = 3.00 GUTTER HIKE(FEET) = 0.050

PAVEMENT LIP(FEET) = 0.010 MANNING'S N = .0150

PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000

MAXIMUM DEPTH(FEET) = 100.00

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.684

SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
LAND USE					
COMMERCIAL	B	6.40	0.45	0.10	76

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.45

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.10

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 29.55

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.64

AVERAGE FLOW DEPTH(FEET) = 0.50 FLOOD WIDTH(FEET) = 47.15

"V" GUTTER FLOW TRAVEL TIME(MIN.) = 1.17 Tc(MIN.) = 11.26

SUBAREA AREA(ACRES) = 6.40 SUBAREA RUNOFF(CFS) = 20.96

EFFECTIVE AREA(ACRES) = 11.85 AREA-AVERAGED Fm(INCH/HR) = 0.05

AREA-AVERAGED Fp(INCH/HR) = 0.45 AREA-AVERAGED Ap = 0.10

TOTAL AREA(ACRES) = 11.85 PEAK FLOW RATE(CFS) = 38.81

END OF SUBAREA "V" GUTTER HYDRAULICS:

DEPTH(FEET) = 0.55 FLOOD WIDTH(FEET) = 52.33

FLOW VELOCITY(FEET/SEC.) = 2.82 DEPTH*VELOCITY(FT*FT/SEC) = 1.56

LONGEST FLOWPATH FROM NODE 210.00 TO NODE 212.00 = 836.00 FEET.

FLOW PROCESS FROM NODE 212.00 TO NODE 213.00 IS CODE = 31

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

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

ELEVATION DATA: UPSTREAM(FEET) = 2034.66 DOWNSTREAM(FEET) = 1033.24

FLOW LENGTH(FEET) = 156.00 MANNING'S N = 0.012

ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000

DEPTH OF FLOW IN 12.0 INCH PIPE IS 5.3 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 115.19

ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 38.81

PIPE TRAVEL TIME(MIN.) = 0.02 TC(MIN.) = 11.28

LONGEST FLOWPATH FROM NODE 210.00 TO NODE 213.00 = 992.00 FEET.

FLOW PROCESS FROM NODE 213.00 TO NODE 213.00 IS CODE = 1

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

>>>>AND COMPUTE VARIOUS CONFLUENCE STREAM VALUES<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 11.28

RAINFALL INTENSITY(INCH/HR) = 3.68

AREA-AVERAGED Fm(INCH/HR) = 0.05

AREA-AVERAGED Fp(INCH/HR) = 0.45

AREA-AVERAGED Ap = 0.10

EFFECTIVE STREAM AREA(ACRES) = 11.85

TOTAL STREAM AREA(ACRES) = 11.85

PEAK FLOW RATE(CFS) AT CONFLUENCE = 38.81

** CONFLUENCE DATA **

STREAM	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (0.05)	Ae (ACRES)	HEADWATER NODE
1	19.11	17.11	2.866	0.45(0.05)	0.10	7.1	200.00
2	38.81	11.28	3.680	0.45(0.05)	0.10	11.9	210.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (0.05)	Ae (ACRES)	HEADWATER NODE
1	49.23	17.11	2.866	0.45(0.05)	0.10	19.0	200.00

2 55.04 11.28 3.680 0.45(0.05) 0.10 16.5 210.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 55.04 Tc(MIN.) = 11.28
EFFECTIVE AREA(ACRES) = 16.53 AREA-AVERAGED Fm(INCH/HR) = 0.05
AREA-AVERAGED Fp(INCH/HR) = 0.45 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 18.95
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 213.00 = 1952.00 FEET.

FLOW PROCESS FROM NODE 213.00 TO NODE 214.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1033.24 DOWNSTREAM(FEET) = 1032.44
FLOW LENGTH(FEET) = 265.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 42.0 INCH PIPE IS 32.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.90
ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 55.04
PIPE TRAVEL TIME(MIN.) = 0.64 Tc(MIN.) = 11.92
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 214.00 = 2217.00 FEET.

=====
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 18.95 Tc(MIN.) = 11.92
EFFECTIVE AREA(ACRES) = 16.53 AREA-AVERAGED Fm(INCH/HR) = 0.05
AREA-AVERAGED Fp(INCH/HR) = 0.45 AREA-AVERAGED Ap = 0.10
PEAK FLOW RATE(CFS) = 55.04

** PEAK FLOW RATE TABLE **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 55.04 11.92 3.560 0.45(0.05) 0.10 16.5 210.00
2 49.23 17.76 2.803 0.45(0.05) 0.10 19.0 200.00

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END OF RATIONAL METHOD ANALYSIS

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Analysis prepared by:

THIENES ENGINEERING
16800 VALLEY VIEW AVENUE
LA MIRADA CA 90638
PH: (714) 521-4811 FAX: (714) 521-4173

***** DESCRIPTION OF STUDY *****
* JOB #3678 GOODMAN FONTANA III, FONTANA *
* PROPOSED CONDITION *
* 100 YEAR STORM EVENT *

BUDG 3

FILE NAME: C:\XDRIVE\3678\300P.DAT
TIME/DATE OF STUDY: 10:11 02/02/2019

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 12.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/Hr) vs. LOG(Tc;MIN)) = 0.6000
USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.3500

ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD

FLOW PROCESS FROM NODE 300.00 TO NODE 301.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 966.00
ELEVATION DATA: UPSTREAM(FEET) = 1052.00 DOWNSTREAM(FEET) = 1043.90

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.364
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.483
SUBAREA Tc AND LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
COMMERCIAL B 3.80 0.45 0.10 76 12.36
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.10
SUBAREA RUNOFF(CFS) = 11.76
TOTAL AREA(ACRES) = 3.80 PEAK FLOW RATE(CFS) = 11.76

FLOW PROCESS FROM NODE 301.00 TO NODE 302.00 IS CODE = 61

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

UPSTREAM ELEVATION(FEET) = 1043.90 DOWNSTREAM ELEVATION(FEET) = 1042.19
STREET LENGTH(FEET) = 327.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 50.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 45.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0149

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.78
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.64
HALFSTREET FLOOD WIDTH(FEET) = 24.08
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.80
PRODUCT OF DEPTH*VELOCITY(FT*FT/SEC.) = 1.79
STREET FLOW TRAVEL TIME(MIN.) = 1.94 Tc(MIN.) = 14.31
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.191
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL B 3.55 0.45 0.10 76
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA(ACRES) = 3.55 SUBAREA RUNOFF(CFS) = 10.05
EFFECTIVE AREA(ACRES) = 7.35 AREA-AVERAGED Fm(INCH/HR) = 0.05
AREA-AVERAGED Fp(INCH/HR) = 0.45 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 7.35 PEAK FLOW RATE(CFS) = 20.81

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.68 HALFSTREET FLOOD WIDTH(FEET) = 26.14
FLOW VELOCITY(FEET/SEC.) = 2.96 DEPTH*VELOCITY(FT*FT/SEC.) = 2.02
LONGEST FLOWPATH FROM NODE 300.00 TO NODE 302.00 = 1293.00 FEET.

***** FLOW PROCESS FROM NODE 302.00 TO NODE 303.00 IS CODE = 61

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

UPSTREAM ELEVATION(FEET) = 1042.19 DOWNSTREAM ELEVATION(FEET) = 1040.28
STREET LENGTH(FEET) = 328.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 50.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 45.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0149

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 28.36
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
NOTE: STREET FLOW EXCEEDS TOP OF CURB.
THE FOLLOWING STREET FLOW RESULTS ARE BASED ON THE ASSUMPTION
THAT NEGLIGIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.

STREET FLOW DEPTH(FEET) = 0.74
HALFSTREET FLOOD WIDTH(FEET) = 28.86
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.33
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.45
STREET FLOW TRAVEL TIME(MIN.) = 1.64 Tc(MIN.) = 15.95
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.989

SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL B 5.70 0.45 0.10 76
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA(ACRES) = 5.70 SUBAREA RUNOFF(CFS) = 15.10
EFFECTIVE AREA(ACRES) = 13.05 AREA-AVERAGED Fm(INCH/HR) = 0.05
AREA-AVERAGED Fp(INCH/HR) = 0.45 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 13.05 PEAK FLOW RATE(CFS) = 34.58

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.78 HALFWAY FLOOD WIDTH(FEET) = 31.20
FLOW VELOCITY(FEET/SEC.) = 3.48 DEPTH*VELOCITY(FT*FT/SEC.) = 2.73
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 328.0 FT WITH ELEVATION-DROP = 1.9 FT, IS 21.9 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 303.00
LONGEST FLOWPATH FROM NODE 300.00 TO NODE 303.00 = 1621.00 FEET.

***** FLOW PROCESS FROM NODE 303.00 TO NODE 312.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 1036.28 DOWNSTREAM(FEET) = 1035.65
FLOW LENGTH(FEET) = 209.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 36.0 INCH PIPE IS 26.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.19
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 34.58
PIPE TRAVEL TIME(MIN.) = 0.56 Tc(MIN.) = 16.51
LONGEST FLOWPATH FROM NODE 300.00 TO NODE 312.00 = 1830.00 FEET.

***** FLOW PROCESS FROM NODE 312.00 TO NODE 312.00 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.) = 16.51
RAINFALL INTENSITY(INCH/HR) = 2.93
AREA-AVERAGED Fm(INCH/HR) = 0.05
AREA-AVERAGED Fp(INCH/HR) = 0.45
AREA-AVERAGED Ap = 0.10
EFFECTIVE STREAM AREA(ACRES) = 13.05
TOTAL STREAM AREA(ACRES) = 13.05
PEAK FLOW RATE(CFS) AT CONFLUENCE = 34.58

***** FLOW PROCESS FROM NODE 310.00 TO NODE 311.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 1000.00
ELEVATION DATA: UPSTREAM(FEET) = 1050.47 DOWNSTREAM(FEET) = 1045.73

Tc = K* [(LENGTH** 3.00) / (ELEVATION CHANGE)] **0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 14.051
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.225

SUBAREA TC AND LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
COMMERCIAL B 5.65 0.45 0.10 76 14.05
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.10
SUBAREA RUNOFF(CFS) = 16.17

TOTAL AREA(ACRES) = 5.65 PEAK FLOW RATE(CFS) = 16.17

FLOW PROCESS FROM NODE 311.00 TO NODE 312.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1041.73 DOWNSTREAM(FEET) = 1035.65
FLOW LENGTH(FEET) = 533.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 21.0 INCH PIPE IS 15.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 8.41
ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 16.17
PIPE TRAVEL TIME(MIN.) = 1.06 Tc(MIN.) = 15.11
LONGEST FLOWPATH FROM NODE 310.00 TO NODE 312.00 = 1533.00 FEET.

FLOW PROCESS FROM NODE 312.00 TO NODE 312.00 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.) = 15.11
RAINFALL INTENSITY(INCH/HR) = 3.09
AREA-AVERAGED Fm(INCH/HR) = 0.05
AREA-AVERAGED Fp(INCH/HR) = 0.45
AREA-AVERAGED Ap = 0.10
EFFECTIVE STREAM AREA(ACRES) = 5.65
TOTAL STREAM AREA(ACRES) = 5.65
PEAK FLOW RATE(CFS) AT CONFLUENCE = 16.17

** CONFLUENCE DATA **

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)		NODE
1	34.58	16.51	2.928	0.45(0.05)	0.10	13.0	300.00
2	16.17	15.11	3.088	0.45(0.05)	0.10	5.7	310.00

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

** PEAK FLOW RATE TABLE **

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)		NODE
1	49.90	16.51	2.928	0.45(0.05)	0.10	18.7	300.00
2	49.57	15.11	3.088	0.45(0.05)	0.10	17.6	310.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 49.90 Tc(MIN.) = 16.51
EFFECTIVE AREA(ACRES) = 18.70 AREA-AVERAGED Fm(INCH/HR) = 0.05
AREA-AVERAGED Fp(INCH/HR) = 0.45 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 18.70
LONGEST FLOWPATH FROM NODE 300.00 TO NODE 312.00 = 1830.00 FEET.

FLOW PROCESS FROM NODE 312.00 TO NODE 313.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1035.65 DOWNSTREAM(FEET) = 1035.52
FLOW LENGTH(FEET) = 45.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 42.0 INCH PIPE IS 30.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.69
ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 49.90
PIPE TRAVEL TIME(MIN.) = 0.11 Tc(MIN.) = 16.63
LONGEST FLOWPATH FROM NODE 300.00 TO NODE 313.00 = 1875.00 FEET.

=====
END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 18.70 TC(MIN.) = 16.63
EFFECTIVE AREA(ACRES) = 18.70 AREA-AVERAGED Fm(INCH/HR) = 0.05
AREA-AVERAGED Fp(INCH/HR) = 0.45 AREA-AVERAGED Ap = 0.10
PEAK FLOW RATE(CFS) = 49.90

** PEAK FLOW RATE TABLE **

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)		NODE
1	49.57	15.22	3.075	0.45(0.05)	0.10	17.6	310.00
2	49.90	16.63	2.916	0.45(0.05)	0.10	18.7	300.00

=====
END OF RATIONAL METHOD ANALYSIS

APPENDIX C

DETENTION CALCULATIONS

POINT RAINFALL - INCHES

50.0
40.0
30.0
20.0
10.0
5.0
4.0
3.0
2.0
1.0
0.5
0.4
0.3
0.2
0.1

0.1

5 10 20 30 40 50 100 200 300 400 500 1000

STORM DURATION - MINUTES

60 min

1 HR

180

SHRS.

360

CHRS

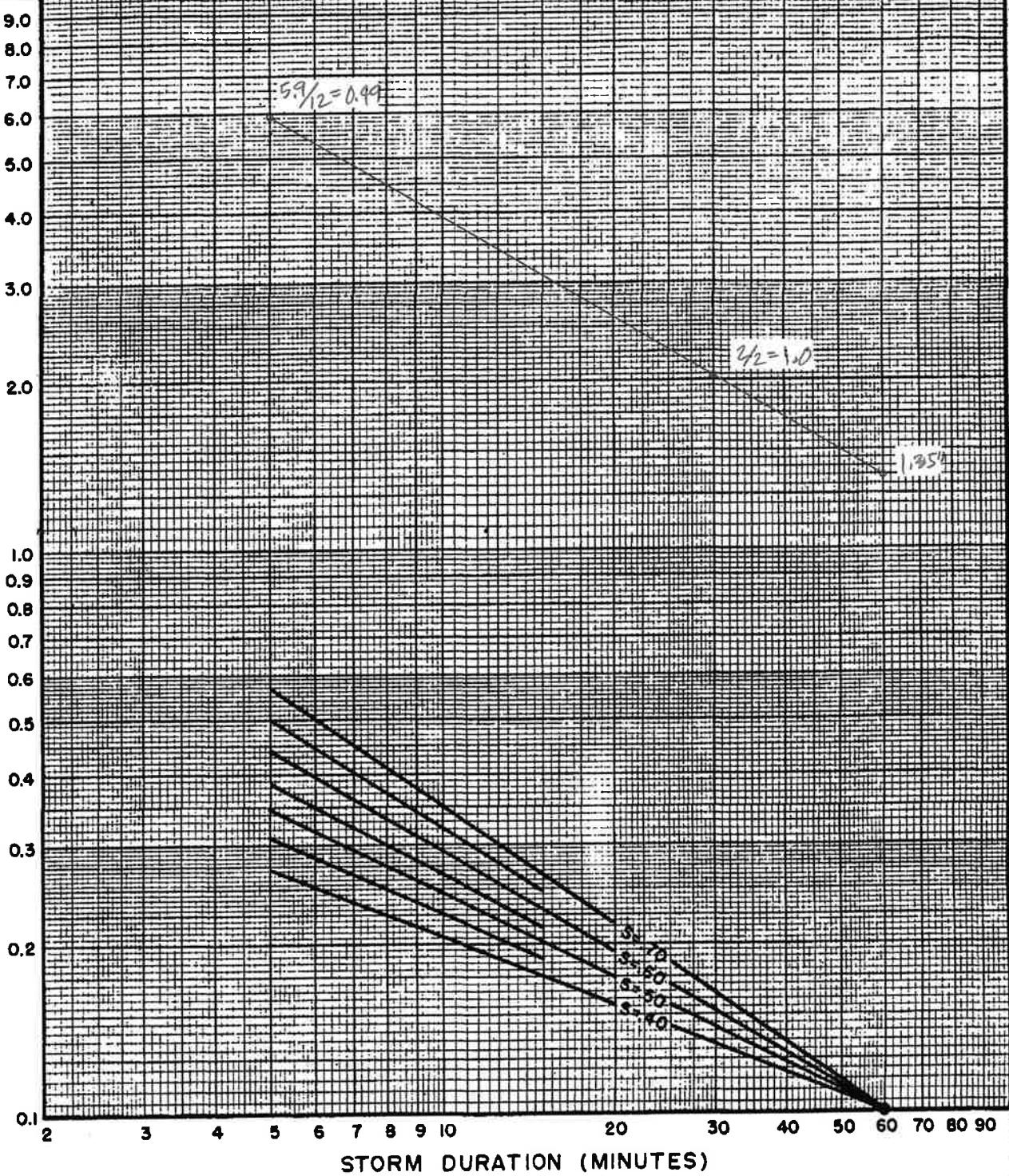
PROJECT LOCATION 3678 JURUPA AVE & JUNIPER AVE.

NOTES _____

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

AREA - AVERAGED
MASS RAINFALL
PLOTTING SHEET

RAINFALL INTENSITY (INCHES / HOUR)



DESIGN STORM FREQUENCY = ____ YEARS

ONE HOUR POINT RAINFALL = ____ INCHES

LOG-LOG SLOPE = ____

PROJECT LOCATION = _____

**SAN BERNARDINO COUNTY
HYDROLOGY MANUAL**

**INTENSITY - DURATION
CURVES
CALCULATION SHEET**

NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)
AND LOW LOSS FRACTION ESTIMATIONS

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Ver. 8.0 Release Date: 01/01/99 License ID 1435

Analysis prepared by:

THIENES ENGINEERING
16800 VALLEY VIEW AVENUE
LA MIRADA CA 90638
PH: (714) 521-4811 FAX: (714) 521-4173

*** NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)
AND LOW LOSS FRACTION ESTIMATIONS FOR AMC III:

TOTAL 24-HOUR DURATION RAINFALL DEPTH = 8.10 (inches)

SOIL-COVER TYPE	AREA (Acres)	PERCENT OF PERVIOUS AREA	SCS CURVE NUMBER	LOSS RATE Fp(in./hr.)	YIELD
1	12.60	10.00	76.(56.)	0.423	0.938

TOTAL AREA (Acres) = 12.60

AREA-AVERAGED LOSS RATE, \bar{F}_m (in./hr.) = 0.042

AREA-AVERAGED LOW LOSS FRACTION, \bar{Y} = 0.062

GOODMAN FONTANA III
PONDING AT BLDG 3 TRUCK YARD

Elevation	Depth (feet)	Area (sq. ft.)	Volume (c.f.)	Σ Volume (c.f.)	Σ Volume (ac-ft)	Q (discharge) (cfs)
1040.20	0.00	61	69	69	0.00	12.5
1040.40	0.20	631	242	312	0.01	13.0
1040.60	0.40	1793	502	813	0.02	13.5
1040.80	0.60	3222	812	1,625	0.04	14.0
1041.00	0.80	4900	1180	2,805	0.06	14.5
1041.20	1.00	6900	1612	4,417	0.10	15.0
1041.40	1.20	9215	2123	6,540	0.15	15.5
1041.60	1.40	12016	2768	9,308	0.21	16.0
1041.80	1.60	15665	3604	12,912	0.30	16.5
1042.00	1.80	20378	4661	17,574	0.40	17.0
1042.20	2.00	26235.00				

FLOOD ROUTING ANALYSIS
USING COUNTY HYDROLOGY MANUAL OF SAN BERNARDINO(1986)
(c) Copyright 1989-99 Advanced Engineering Software (aes)
Ver. 7.0 Release Date: 01/01/99 License ID 1435

Analysis prepared by:

THIENES ENGINEERING
16800 VALLEY VIEW AVENUE
LA MIRADA CA 90638
PH: (714) 521-4811 FAX: (714) 521-4173

***** DESCRIPTION OF STUDY *****
* JOB #3678 GOODMAN FONTANA III *
* BLDG 3 TRUCK YARD DETENTION *
* 100-YEAR *

FILE NAME: C:\XDRIVE\3678\BASINS.DAT
TIME/DATE OF STUDY: 07:49 02/04/2019

FLOW PROCESS FROM NODE 300.00 TO NODE 313.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<
=====

(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 13.050 ACRES
BASEFLOW = 0.000 CFS/SQUARE-MILE
*USER ENTERED "LAG" TIME = 0.220 HOURS
CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
VALLEY(DEVELOPED) S-GRAFH SELECTED
MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.042
LOW LOSS FRACTION = 0.062
HYDROGRAPH MODEL #1 SPECIFIED

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH) = 0.49
SPECIFIED PEAK 30-MINUTES RAINFALL(INCH) = 1.00
SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 1.35
SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 2.50
SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 3.60
SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 8.10

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:

5-MINUTE FACTOR = 0.999
30-MINUTE FACTOR = 0.999
1-HOUR FACTOR = 0.999
3-HOUR FACTOR = 1.000
6-HOUR FACTOR = 1.000
24-HOUR FACTOR = 1.000

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 37.879

=====

UNIT HYDROGRAPH DETERMINATION

=====

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES (CFS)
1	2.653	4.186
2	17.527	23.475
3	44.644	42.798
4	73.375	45.344
5	88.902	24.504
6	95.634	10.625
7	98.163	3.992
8	98.920	1.195
9	99.471	0.869
10	99.788	0.501
11	99.947	0.250
12	100.000	0.083

=====

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.4993
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 8.3049

=====

□

=====

24 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

=====

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

=====

TIME (HRS)	VOLUME (AF)	Q (CFS)	0.	10.0	20.0	30.0	40.0
0.083	0.0004	0.06	Q	.	.	.	.
0.167	0.0034	0.43	Q	.	.	.	.
0.250	0.0109	1.09	VQ	.	.	.	.
0.333	0.0232	1.79	VQ	.	.	.	.
0.417	0.0382	2.17	V Q	.	.	.	.
0.500	0.0543	2.34	V Q	.	.	.	.
0.583	0.0709	2.41	V Q	.	.	.	.
0.667	0.0877	2.43	V Q	.	.	.	.
0.750	0.1045	2.45	V Q	.	.	.	.
0.833	0.1215	2.46	V Q	.	.	.	.
0.917	0.1386	2.47	V Q	.	.	.	.
1.000	0.1556	2.48	V Q	.	.	.	.
1.083	0.1728	2.49	V Q	.	.	.	.
1.167	0.1899	2.49	V Q	.	.	.	.
1.250	0.2071	2.50	V Q	.	.	.	.
1.333	0.2244	2.50	.VQ	.	.	.	.
1.417	0.2417	2.51	.VQ	.	.	.	.
1.500	0.2590	2.52	.VQ	.	.	.	.
1.583	0.2764	2.52	.VQ	.	.	.	.
1.667	0.2938	2.53	.VQ	.	.	.	.
1.750	0.3112	2.53	.VQ	.	.	.	.
1.833	0.3287	2.54	.VQ	.	.	.	.
1.917	0.3462	2.55	.VQ	.	.	.	.
2.000	0.3638	2.55	.VQ	.	.	.	.
2.083	0.3814	2.56	.VQ	.	.	.	.
2.167	0.3991	2.56	.VQ	.	.	.	.
2.250	0.4168	2.57	. Q	.	.	.	.
2.333	0.4345	2.58	. Q	.	.	.	.
2.417	0.4523	2.58	. Q	.	.	.	.
2.500	0.4701	2.59	. Q	.	.	.	.
2.583	0.4880	2.60	. Q	.	.	.	.
2.667	0.5060	2.60	. Q	.	.	.	.
2.750	0.5239	2.61	. Q	.	.	.	.
2.833	0.5419	2.62	. Q	.	.	.	.
2.917	0.5600	2.62	. Q	.	.	.	.
3.000	0.5781	2.63	. Q	.	.	.	.
3.083	0.5963	2.64	. Q	.	.	.	.
3.167	0.6145	2.64	. Q	.	.	.	.
3.250	0.6327	2.65	. QV	.	.	.	.
3.333	0.6510	2.66	. QV	.	.	.	.
3.417	0.6694	2.66	. QV	.	.	.	.
3.500	0.6878	2.67	. QV	.	.	.	.
3.583	0.7062	2.68	. QV	.	.	.	.
3.667	0.7247	2.69	. QV	.	.	.	.
3.750	0.7433	2.69	. QV	.	.	.	.
3.833	0.7619	2.70	. QV	.	.	.	.
3.917	0.7805	2.71	. QV	.	.	.	.
4.000	0.7992	2.72	. QV	.	.	.	.
4.083	0.8180	2.72	. QV	.	.	.	.
4.167	0.8368	2.73	. Q V	.	.	.	.
4.250	0.8557	2.74	. Q V	.	.	.	.
4.333	0.8746	2.75	. Q V	.	.	.	.
4.417	0.8936	2.76	. Q V	.	.	.	.
4.500	0.9126	2.76	. Q V	.	.	.	.
4.583	0.9317	2.77	. Q V	.	.	.	.
4.667	0.9508	2.78	. Q V	.	.	.	.
4.750	0.9700	2.79	. Q V	.	.	.	.
4.833	0.9893	2.80	. Q V	.	.	.	.
4.917	1.0086	2.80	. Q V	.	.	.	.
5.000	1.0280	2.81	. Q V	.	.	.	.
5.083	1.0474	2.82	. Q V	.	.	.	.
5.167	1.0669	2.83	. Q V	.	.	.	.
5.250	1.0865	2.84	. Q V	.	.	.	.
5.333	1.1061	2.85	. Q V	.	.	.	.
5.417	1.1258	2.86	. Q V	.	.	.	.
5.500	1.1455	2.87	. Q V	.	.	.	.
5.583	1.1653	2.88	. Q V	.	.	.	.
5.667	1.1852	2.89	. Q V	.	.	.	.
5.750	1.2051	2.89	. Q V	.	.	.	.
5.833	1.2251	2.90	. Q V	.	.	.	.
5.917	1.2452	2.91	. Q V	.	.	.	.
6.000	1.2653	2.92	. Q V	.	.	.	.
6.083	1.2855	2.93	. Q V	.	.	.	.
6.167	1.3058	2.94	. Q V	.	.	.	.
6.250	1.3262	2.95	. Q V	.	.	.	.
6.333	1.3466	2.96	. Q V	.	.	.	.
6.417	1.3671	2.97	. Q V	.	.	.	.
6.500	1.3876	2.98	. Q V	.	.	.	.
6.583	1.4082	3.00	. Q V	.	.	.	.
6.667	1.4289	3.01	. Q V	.	.	.	.
6.750	1.4497	3.02	. Q V	.	.	.	.
6.833	1.4706	3.03	. Q V	.	.	.	.
6.917	1.4915	3.04	. Q V	.	.	.	.
7.000	1.5125	3.05	. Q V	.	.	.	.
7.083	1.5336	3.06	. Q V	.	.	.	.
7.167	1.5548	3.07	. Q V	.	.	.	.
7.250	1.5760	3.08	. Q V	.	.	.	.
7.333	1.5973	3.10	. Q V	.	.	.	.
7.417	1.6188	3.11	. Q V	.	.	.	.
7.500	1.6402	3.12	. Q V	.	.	.	.
7.583	1.6618	3.13	. Q V	.	.	.	.
7.667	1.6835	3.15	. Q V	.	.	.	.
7.750	1.7052	3.16	. Q V	.	.	.	.
7.833	1.7271	3.17	. Q V	.	.	.	.
7.917	1.7490	3.18	. Q V	.	.	.	.
8.000	1.7710	3.20	. Q V	.	.	.	.
8.083	1.7932	3.21	. Q V	.	.	.	.

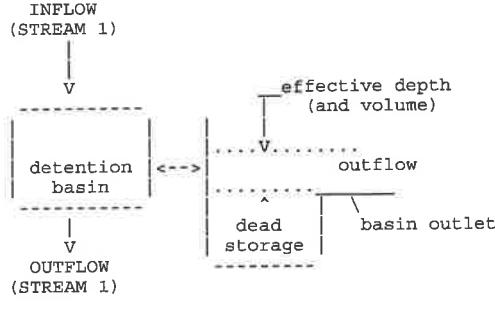
8.167	1.8154	3.22	*	Q	V	*	*
8.250	1.8377	3.24	*	Q	V	*	*
8.333	1.8601	3.25	*	Q	V	*	*
8.417	1.8826	3.27	*	Q	V	*	*
8.500	1.9052	3.28	*	Q	V	*	*
8.583	1.9279	3.30	*	Q	V	*	*
8.667	1.9507	3.31	*	Q	V	*	*
8.750	1.9736	3.33	*	Q	V	*	*
8.833	1.9966	3.34	*	Q	V	*	*
8.917	2.0197	3.36	*	Q	V	*	*
9.000	2.0429	3.37	*	Q	V	*	*
9.083	2.0663	3.39	*	Q	V	*	*
9.167	2.0897	3.41	*	Q	V	*	*
9.250	2.1133	3.42	*	Q	V	*	*
9.333	2.1370	3.44	*	Q	V	*	*
9.417	2.1608	3.46	*	Q	V	*	*
9.500	2.1847	3.47	*	Q	V	*	*
9.583	2.2087	3.49	*	Q	V	*	*
9.667	2.2329	3.51	*	Q	V	*	*
9.750	2.2572	3.53	*	Q	V	*	*
9.833	2.2816	3.55	*	Q	V	*	*
9.917	2.3062	3.57	*	Q	.V	*	*
10.000	2.3309	3.59	*	Q	.V	*	*
10.083	2.3557	3.61	*	Q	.V	*	*
10.167	2.3807	3.63	*	Q	.V	*	*
10.250	2.4058	3.65	*	Q	.V	*	*
10.333	2.4311	3.67	*	Q	.V	*	*
10.417	2.4565	3.69	*	Q	.V	*	*
10.500	2.4820	3.71	*	Q	.V	*	*
10.583	2.5077	3.73	*	Q	.V	*	*
10.667	2.5336	3.76	*	Q	.V	*	*
10.750	2.5596	3.78	*	Q	.V	*	*
10.833	2.5858	3.80	*	Q	.V	*	*
10.917	2.6122	3.83	*	Q	.V	*	*
11.000	2.6387	3.85	*	Q	.V	*	*
11.083	2.6654	3.88	*	Q	.V	*	*
11.167	2.6923	3.90	*	Q	.V	*	*
11.250	2.7193	3.93	*	Q	.V	*	*
11.333	2.7465	3.96	*	Q	.V	*	*
11.417	2.7740	3.99	*	Q	.V	*	*
11.500	2.8017	4.01	*	Q	.V	*	*
11.583	2.8295	4.04	*	Q	.V	*	*
11.667	2.8576	4.07	*	Q	.V	*	*
11.750	2.8858	4.10	*	Q	.V	*	*
11.833	2.9143	4.14	*	Q	.V	*	*
11.917	2.9430	4.17	*	Q	.V	*	*
12.000	2.9720	4.20	*	Q	.V	*	*
12.083	3.0011	4.22	*	Q	.V	*	*
12.167	3.0299	4.19	*	Q	.V	*	*
12.250	3.0583	4.11	*	Q	.V	*	*
12.333	3.0860	4.03	*	Q	.V	*	*
12.417	3.1135	4.00	*	Q	.V	*	*
12.500	3.1411	4.01	*	Q	.V	*	*
12.583	3.1690	4.04	*	Q	.V	*	*
12.667	3.1971	4.08	*	Q	.V	*	*
12.750	3.2255	4.12	*	Q	.V	*	*
12.833	3.2542	4.17	*	Q	.V	*	*
12.917	3.2832	4.22	*	Q	.V	*	*
13.000	3.3126	4.27	*	Q	.V	*	*
13.083	3.3423	4.32	*	Q	.V	*	*
13.167	3.3724	4.37	*	Q	.V	*	*
13.250	3.4029	4.43	*	Q	.V	*	*
13.333	3.4338	4.49	*	Q	.V	*	*
13.417	3.4651	4.55	*	Q	.V	*	*
13.500	3.4969	4.61	*	Q	.V	*	*
13.583	3.5291	4.68	*	Q	.V	*	*
13.667	3.5618	4.75	*	Q	.V	*	*
13.750	3.5950	4.82	*	Q	.V	*	*
13.833	3.6288	4.90	*	Q	.V	*	*
13.917	3.6630	4.98	*	Q	.V	*	*
14.000	3.6979	5.06	*	Q	.V	*	*
14.083	3.7335	5.16	*	Q	.V	*	*
14.167	3.7700	5.31	*	Q	.V	*	*
14.250	3.8080	5.51	*	Q	.V	*	*
14.333	3.8474	5.72	*	Q	.V	*	*
14.417	3.8879	5.89	*	Q	.V	*	*
14.500	3.9294	6.03	*	Q	.V	*	*
14.583	3.9719	6.17	*	Q	.V	*	*
14.667	4.0154	6.31	*	Q	.V	*	*
14.750	4.0598	6.46	*	Q	.V	*	*
14.833	4.1054	6.62	*	Q	.V	*	*
14.917	4.1522	6.79	*	Q	.V	*	*
15.000	4.2003	6.98	*	Q	.V	*	*
15.083	4.2498	7.19	*	Q	.V	*	*
15.167	4.3009	7.42	*	Q	.V	*	*
15.250	4.3537	7.68	*	Q	.V	*	*
15.333	4.4086	7.97	*	Q	.V	*	*
15.417	4.4654	8.24	*	Q	.V	*	*
15.500	4.5227	8.31	*	Q	.V	*	*
15.583	4.5789	8.17	*	Q	.V	*	*
15.667	4.6347	8.10	*	Q	.V	*	*
15.750	4.6927	8.42	*	Q	.V	*	*
15.833	4.7551	9.06	*	Q	.V	*	*
15.917	4.8242	10.04	*	Q	.V	*	*
16.000	4.9059	11.87	*	Q	.V	*	*
16.083	5.0185	16.36	*	Q	.V	*	*
16.167	5.1991	26.21	*	Q	.V	*	*
16.250	5.4331	33.98	*	Q	.V	*	*
16.333	5.6601	32.96	*	Q	.V	*	*

16.417	5.8147	22.45	.	.	.	Q	V	.
16.500	5.9179	14.99	.	.	.	Q	V	.
16.583	5.9946	11.14	.	.	.	Q	V	.
16.667	6.0591	9.38	.	.	.	Q	V	.
16.750	6.1186	8.64	.	.	.	Q	V	.
16.833	6.1733	7.94	.	.	.	Q	V	.
16.917	6.2240	7.36	.	.	.	Q	V	.
17.000	6.2713	6.87	.	.	.	Q	V	.
17.083	6.3160	6.48	.	.	.	Q	V	.
17.167	6.3582	6.14	.	.	.	Q	V	.
17.250	6.3981	5.79	.	.	.	Q	V	.
17.333	6.4357	5.46	.	.	.	Q	V	.
17.417	6.4716	5.21	.	.	.	Q	V	.
17.500	6.5060	5.00	.	.	.	Q	V	.
17.583	6.5393	4.84	.	.	.	Q	V	.
17.667	6.5716	4.69	.	.	.	Q	V	.
17.750	6.6030	4.56	.	.	.	Q	V	.
17.833	6.6335	4.43	.	.	.	Q	V	.
17.917	6.6633	4.32	.	.	.	Q	V	.
18.000	6.6924	4.22	.	.	.	Q	V	.
18.083	6.7208	4.13	.	.	.	Q	V	.
18.167	6.7491	4.11	.	.	.	Q	V	.
18.250	6.7777	4.15	.	.	.	Q	V	.
18.333	6.8066	4.19	.	.	.	Q	V	.
18.417	6.8354	4.19	.	.	.	Q	V	.
18.500	6.8640	4.15	.	.	.	Q	V	.
18.583	6.8922	4.10	.	.	.	Q	V	.
18.667	6.9200	4.04	.	.	.	Q	V	.
18.750	6.9475	3.98	.	.	.	Q	V	.
18.833	6.9745	3.93	.	.	.	Q	V	.
18.917	7.0012	3.88	.	.	.	Q	V	.
19.000	7.0276	3.83	.	.	.	Q	V	.
19.083	7.0536	3.78	.	.	.	Q	V	.
19.167	7.0793	3.73	.	.	.	Q	V	.
19.250	7.1047	3.69	.	.	.	Q	V	.
19.333	7.1298	3.65	.	.	.	Q	V	.
19.417	7.1547	3.61	.	.	.	Q	V	.
19.500	7.1792	3.57	.	.	.	Q	V	.
19.583	7.2035	3.53	.	.	.	Q	V	.
19.667	7.2276	3.49	.	.	.	Q	V	.
19.750	7.2514	3.46	.	.	.	Q	V	.
19.833	7.2749	3.42	.	.	.	Q	V	.
19.917	7.2983	3.39	.	.	.	Q	V	.
20.000	7.3214	3.36	.	.	.	Q	V	.
20.083	7.3443	3.33	.	.	.	Q	V	.
20.167	7.3670	3.30	.	.	.	Q	V	.
20.250	7.3895	3.27	.	.	.	Q	V	.
20.333	7.4118	3.24	.	.	.	Q	V	.
20.417	7.4339	3.21	.	.	.	Q	V	.
20.500	7.4558	3.18	.	.	.	Q	V	.
20.583	7.4776	3.16	.	.	.	Q	V	.
20.667	7.4992	3.13	.	.	.	Q	V	.
20.750	7.5206	3.11	.	.	.	Q	V	.
20.833	7.5418	3.08	.	.	.	Q	V	.
20.917	7.5629	3.06	.	.	.	Q	V	.
21.000	7.5838	3.04	.	.	.	Q	V	.
21.083	7.6046	3.02	.	.	.	Q	V	.
21.167	7.6252	2.99	.	.	.	Q	V	.
21.250	7.6457	2.97	.	.	.	Q	V	.
21.333	7.6660	2.95	.	.	.	Q	V	.
21.417	7.6862	2.93	.	.	.	Q	V	.
21.500	7.7063	2.91	.	.	.	Q	V	.
21.583	7.7262	2.89	.	.	.	Q	V	.
21.667	7.7461	2.88	.	.	.	Q	V	.
21.750	7.7657	2.86	.	.	.	Q	V	.
21.833	7.7853	2.84	.	.	.	Q	V	.
21.917	7.8047	2.82	.	.	.	Q	V	.
22.000	7.8240	2.80	.	.	.	Q	V	.
22.083	7.8432	2.79	.	.	.	Q	V	.
22.167	7.8623	2.77	.	.	.	Q	V	.
22.250	7.8813	2.75	.	.	.	Q	V	.
22.333	7.9002	2.74	.	.	.	Q	V	.
22.417	7.9189	2.72	.	.	.	Q	V	.
22.500	7.9376	2.71	.	.	.	Q	V	.
22.583	7.9561	2.69	.	.	.	Q	V	.
22.667	7.9746	2.68	.	.	.	Q	V	.
22.750	7.9929	2.66	.	.	.	Q	V	.
22.833	8.0112	2.65	.	.	.	Q	V	.
22.917	8.0293	2.64	.	.	.	Q	V	.
23.000	8.0474	2.62	.	.	.	Q	V	.
23.083	8.0653	2.61	.	.	.	Q	V	.
23.167	8.0832	2.60	.	.	.	Q	V	.
23.250	8.1010	2.58	.	.	.	Q	V	.
23.333	8.1187	2.57	.	.	.	Q	V	.
23.417	8.1363	2.56	.	.	.	Q	V	.
23.500	8.1538	2.55	.	.	.	Q	V	.
23.583	8.1713	2.53	.	.	.	Q	V	.
23.667	8.1887	2.52	.	.	.	Q	V	.
23.750	8.2059	2.51	.	.	.	Q	V	.
23.833	8.2231	2.50	.	.	.	Q	V	.
23.917	8.2403	2.49	.	.	.	Q	V	.
24.000	8.2573	2.48	.	.	.	Q	V	.
24.083	8.2738	2.40	.	.	.	Q	V	.
24.167	8.2878	2.03	.	.	.	Q	V	.
24.250	8.2971	1.36	.	.	.	Q	V	.
24.333	8.3016	0.65	Q	.	.	Q	V	.
24.417	8.3035	0.27	Q	.	.	Q	V	.
24.500	8.3043	0.11	Q	.	.	Q	V	.
24.583	8.3046	0.05	Q	.	.	Q	V	.

24.667 8.3047 0.03 Q * * * V.
 24.750 8.3048 0.01 Q * * * V.
 24.833 8.3049 0.01 Q * * * V.

 FLOW PROCESS FROM NODE 300.00 TO NODE 313.00 IS CODE = 3.1

>>>> FLOW-THROUGH DETENTION BASIN ROUTING MODEL APPLIED TO STREAM #1<<<<



ROUTE RUNOFF HYDROGRAPH FROM STREAM NUMBER 1
 THROUGH A FLOW-THROUGH DETENTION BASIN
 SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
 DEAD STORAGE(AF) = 0.000
 SPECIFIED DEAD STORAGE(AF) FILLED = 0.000
 SPECIFIED EFFECTIVE VOLUME(AF) FILLED ABOVE OUTLET = 0.000
 DETENTION BASIN CONSTANT LOSS RATE(CFS) = 0.00

BASIN DEPTH VERSUS OUTFLOW AND STORAGE INFORMATION:

INTERVAL NUMBER	DEPTH (FT)	OUTFLOW (CFS)	STORAGE (AF)
1	0.00	0.00	0.000
2	0.20	12.50	0.010
3	0.40	13.00	0.012
4	0.60	13.50	0.020
5	0.80	14.00	0.040
6	1.00	14.50	0.060
7	1.20	15.00	0.100
8	1.40	15.50	0.150
9	1.60	16.00	0.210
10	1.80	16.50	0.300
11	2.00	17.00	0.400

=====
 MODIFIED-PULS BASIN ROUTING MODEL RESULTS(5-MINUTE COMPUTATION INTERVALS):
 (Note: Computed EFFECTIVE DEPTH and VOLUME are estimated at the clock time;
 MEAN OUTFLOW is the average value during the unit interval.)

CLOCK TIME (HRS)	DEAD-STORAGE FILLED (AF)	INFLOW (CFS)	LOSS (CFS)	EFFECTIVE DEPTH (FT)	MEAN OUTFLOW (CFS)	EFFECTIVE VOLUME (AF)
0.083	0.000	0.06	0.00	0.00	0.1	0.000
0.167	0.000	0.43	0.00	0.01	0.4	0.001
0.250	0.000	1.09	0.00	0.02	1.0	0.001
0.333	0.000	1.79	0.00	0.03	1.7	0.002
0.417	0.000	2.17	0.00	0.04	2.2	0.002
0.500	0.000	2.34	0.00	0.04	2.3	0.002
0.583	0.000	2.41	0.00	0.04	2.4	0.002
0.667	0.000	2.43	0.00	0.04	2.4	0.002
0.750	0.000	2.45	0.00	0.04	2.5	0.002
0.833	0.000	2.46	0.00	0.04	2.5	0.002
0.917	0.000	2.47	0.00	0.04	2.5	0.002
1.000	0.000	2.48	0.00	0.04	2.5	0.002
1.083	0.000	2.49	0.00	0.04	2.5	0.002
1.167	0.000	2.49	0.00	0.04	2.5	0.002
1.250	0.000	2.50	0.00	0.04	2.5	0.002
1.333	0.000	2.50	0.00	0.04	2.5	0.002
1.417	0.000	2.51	0.00	0.04	2.5	0.002
1.500	0.000	2.52	0.00	0.04	2.5	0.002
1.583	0.000	2.52	0.00	0.04	2.5	0.002
1.667	0.000	2.53	0.00	0.04	2.5	0.002
1.750	0.000	2.53	0.00	0.04	2.5	0.002
1.833	0.000	2.54	0.00	0.04	2.5	0.002
1.917	0.000	2.55	0.00	0.04	2.5	0.002
2.000	0.000	2.55	0.00	0.04	2.6	0.002
2.083	0.000	2.56	0.00	0.04	2.6	0.002
2.167	0.000	2.56	0.00	0.04	2.6	0.002
2.250	0.000	2.57	0.00	0.04	2.6	0.002
2.333	0.000	2.58	0.00	0.04	2.6	0.002
2.417	0.000	2.58	0.00	0.04	2.6	0.002
2.500	0.000	2.59	0.00	0.04	2.6	0.002
2.583	0.000	2.60	0.00	0.04	2.6	0.002
2.667	0.000	2.60	0.00	0.04	2.6	0.002
2.750	0.000	2.61	0.00	0.04	2.6	0.002
2.833	0.000	2.62	0.00	0.04	2.6	0.002
2.917	0.000	2.62	0.00	0.04	2.6	0.002

3.000	0.000	2.63	0.00	0.04	2.6	0.002
3.083	0.000	2.64	0.00	0.04	2.6	0.002
3.167	0.000	2.64	0.00	0.04	2.6	0.002
3.250	0.000	2.65	0.00	0.04	2.6	0.002
3.333	0.000	2.66	0.00	0.04	2.7	0.002
3.417	0.000	2.66	0.00	0.04	2.7	0.002
3.500	0.000	2.67	0.00	0.04	2.7	0.002
3.583	0.000	2.68	0.00	0.04	2.7	0.002
3.667	0.000	2.69	0.00	0.04	2.7	0.002
3.750	0.000	2.69	0.00	0.04	2.7	0.002
3.833	0.000	2.70	0.00	0.04	2.7	0.002
3.917	0.000	2.71	0.00	0.04	2.7	0.002
4.000	0.000	2.72	0.00	0.04	2.7	0.002
4.083	0.000	2.72	0.00	0.04	2.7	0.002
4.167	0.000	2.73	0.00	0.04	2.7	0.002
4.250	0.000	2.74	0.00	0.04	2.7	0.002
4.333	0.000	2.75	0.00	0.04	2.7	0.002
4.417	0.000	2.76	0.00	0.04	2.8	0.002
4.500	0.000	2.76	0.00	0.04	2.8	0.002
4.583	0.000	2.77	0.00	0.04	2.8	0.002
4.667	0.000	2.78	0.00	0.04	2.8	0.002
4.750	0.000	2.79	0.00	0.04	2.8	0.002
4.833	0.000	2.80	0.00	0.04	2.8	0.002
4.917	0.000	2.80	0.00	0.04	2.8	0.002
5.000	0.000	2.81	0.00	0.05	2.8	0.002
5.083	0.000	2.82	0.00	0.05	2.8	0.002
5.167	0.000	2.83	0.00	0.05	2.8	0.002
5.250	0.000	2.84	0.00	0.05	2.8	0.002
5.333	0.000	2.85	0.00	0.05	2.8	0.002
5.417	0.000	2.86	0.00	0.05	2.9	0.002
5.500	0.000	2.87	0.00	0.05	2.9	0.002
5.583	0.000	2.88	0.00	0.05	2.9	0.002
5.667	0.000	2.89	0.00	0.05	2.9	0.002
5.750	0.000	2.89	0.00	0.05	2.9	0.002
5.833	0.000	2.90	0.00	0.05	2.9	0.002
5.917	0.000	2.91	0.00	0.05	2.9	0.002
6.000	0.000	2.92	0.00	0.05	2.9	0.002
6.083	0.000	2.93	0.00	0.05	2.9	0.002
6.167	0.000	2.94	0.00	0.05	2.9	0.002
6.250	0.000	2.95	0.00	0.05	3.0	0.002
6.333	0.000	2.96	0.00	0.05	3.0	0.002
6.417	0.000	2.97	0.00	0.05	3.0	0.002
6.500	0.000	2.98	0.00	0.05	3.0	0.002
6.583	0.000	3.00	0.00	0.05	3.0	0.002
6.667	0.000	3.01	0.00	0.05	3.0	0.002
6.750	0.000	3.02	0.00	0.05	3.0	0.002
6.833	0.000	3.03	0.00	0.05	3.0	0.002
6.917	0.000	3.04	0.00	0.05	3.0	0.002
7.000	0.000	3.05	0.00	0.05	3.0	0.002
7.083	0.000	3.06	0.00	0.05	3.1	0.002
7.167	0.000	3.07	0.00	0.05	3.1	0.002
7.250	0.000	3.08	0.00	0.05	3.1	0.002
7.333	0.000	3.10	0.00	0.05	3.1	0.002
7.417	0.000	3.11	0.00	0.05	3.1	0.002
7.500	0.000	3.12	0.00	0.05	3.1	0.003
7.583	0.000	3.13	0.00	0.05	3.1	0.003
7.667	0.000	3.15	0.00	0.05	3.1	0.003
7.750	0.000	3.16	0.00	0.05	3.2	0.003
7.833	0.000	3.17	0.00	0.05	3.2	0.003
7.917	0.000	3.18	0.00	0.05	3.2	0.003
8.000	0.000	3.20	0.00	0.05	3.2	0.003
8.083	0.000	3.21	0.00	0.05	3.2	0.003
8.167	0.000	3.22	0.00	0.05	3.2	0.003
8.250	0.000	3.24	0.00	0.05	3.2	0.003
8.333	0.000	3.25	0.00	0.05	3.3	0.003
8.417	0.000	3.27	0.00	0.05	3.3	0.003
8.500	0.000	3.28	0.00	0.05	3.3	0.003
8.583	0.000	3.30	0.00	0.05	3.3	0.003
8.667	0.000	3.31	0.00	0.05	3.3	0.003
8.750	0.000	3.33	0.00	0.05	3.3	0.003
8.833	0.000	3.34	0.00	0.05	3.3	0.003
8.917	0.000	3.36	0.00	0.05	3.4	0.003
9.000	0.000	3.37	0.00	0.05	3.4	0.003
9.083	0.000	3.39	0.00	0.05	3.4	0.003
9.167	0.000	3.41	0.00	0.05	3.4	0.003
9.250	0.000	3.42	0.00	0.05	3.4	0.003
9.333	0.000	3.44	0.00	0.06	3.4	0.003
9.417	0.000	3.46	0.00	0.06	3.5	0.003
9.500	0.000	3.47	0.00	0.06	3.5	0.003
9.583	0.000	3.49	0.00	0.06	3.5	0.003
9.667	0.000	3.51	0.00	0.06	3.5	0.003
9.750	0.000	3.53	0.00	0.06	3.5	0.003
9.833	0.000	3.55	0.00	0.06	3.5	0.003
9.917	0.000	3.57	0.00	0.06	3.6	0.003
10.000	0.000	3.59	0.00	0.06	3.6	0.003
10.083	0.000	3.61	0.00	0.06	3.6	0.003
10.167	0.000	3.63	0.00	0.06	3.6	0.003
10.250	0.000	3.65	0.00	0.06	3.6	0.003
10.333	0.000	3.67	0.00	0.06	3.7	0.003
10.417	0.000	3.69	0.00	0.06	3.7	0.003
10.500	0.000	3.71	0.00	0.06	3.7	0.003
10.583	0.000	3.73	0.00	0.06	3.7	0.003
10.667	0.000	3.76	0.00	0.06	3.8	0.003
10.750	0.000	3.78	0.00	0.06	3.8	0.003
10.833	0.000	3.80	0.00	0.06	3.8	0.003
10.917	0.000	3.83	0.00	0.06	3.8	0.003
11.000	0.000	3.85	0.00	0.06	3.8	0.003
11.083	0.000	3.88	0.00	0.06	3.9	0.003
11.167	0.000	3.90	0.00	0.06	3.9	0.003

11.250	0.000	3.93	0.00	0.06	3.9	0.003
11.333	0.000	3.96	0.00	0.06	4.0	0.003
11.417	0.000	3.99	0.00	0.06	4.0	0.003
11.500	0.000	4.01	0.00	0.06	4.0	0.003
11.583	0.000	4.04	0.00	0.06	4.0	0.003
11.667	0.000	4.07	0.00	0.07	4.1	0.003
11.750	0.000	4.10	0.00	0.07	4.1	0.003
11.833	0.000	4.14	0.00	0.07	4.1	0.003
11.917	0.000	4.17	0.00	0.07	4.2	0.003
12.000	0.000	4.20	0.00	0.07	4.2	0.003
12.083	0.000	4.22	0.00	0.07	4.2	0.003
12.167	0.000	4.19	0.00	0.07	4.2	0.003
12.250	0.000	4.11	0.00	0.07	4.1	0.003
12.333	0.000	4.03	0.00	0.06	4.0	0.003
12.417	0.000	4.00	0.00	0.06	4.0	0.003
12.500	0.000	4.01	0.00	0.06	4.0	0.003
12.583	0.000	4.04	0.00	0.06	4.0	0.003
12.667	0.000	4.08	0.00	0.07	4.1	0.003
12.750	0.000	4.12	0.00	0.07	4.1	0.003
12.833	0.000	4.17	0.00	0.07	4.2	0.003
12.917	0.000	4.22	0.00	0.07	4.2	0.003
13.000	0.000	4.27	0.00	0.07	4.3	0.003
13.083	0.000	4.32	0.00	0.07	4.3	0.003
13.167	0.000	4.37	0.00	0.07	4.4	0.004
13.250	0.000	4.43	0.00	0.07	4.4	0.004
13.333	0.000	4.49	0.00	0.07	4.5	0.004
13.417	0.000	4.55	0.00	0.07	4.5	0.004
13.500	0.000	4.61	0.00	0.07	4.6	0.004
13.583	0.000	4.68	0.00	0.08	4.7	0.004
13.667	0.000	4.75	0.00	0.08	4.7	0.004
13.750	0.000	4.82	0.00	0.08	4.8	0.004
13.833	0.000	4.90	0.00	0.08	4.9	0.004
13.917	0.000	4.98	0.00	0.08	5.0	0.004
14.000	0.000	5.06	0.00	0.08	5.1	0.004
14.083	0.000	5.16	0.00	0.08	5.1	0.004
14.167	0.000	5.31	0.00	0.09	5.3	0.004
14.250	0.000	5.51	0.00	0.09	5.5	0.004
14.333	0.000	5.72	0.00	0.09	5.7	0.005
14.417	0.000	5.89	0.00	0.10	5.9	0.005
14.500	0.000	6.03	0.00	0.10	6.0	0.005
14.583	0.000	6.17	0.00	0.10	6.2	0.005
14.667	0.000	6.31	0.00	0.10	6.3	0.005
14.750	0.000	6.46	0.00	0.10	6.4	0.005
14.833	0.000	6.62	0.00	0.11	6.6	0.005
14.917	0.000	6.79	0.00	0.11	6.8	0.005
15.000	0.000	6.98	0.00	0.11	7.0	0.006
15.083	0.000	7.19	0.00	0.12	7.2	0.006
15.167	0.000	7.42	0.00	0.12	7.4	0.006
15.250	0.000	7.68	0.00	0.12	7.6	0.006
15.333	0.000	7.97	0.00	0.13	7.9	0.006
15.417	0.000	8.24	0.00	0.13	8.2	0.007
15.500	0.000	8.31	0.00	0.13	8.3	0.007
15.583	0.000	8.17	0.00	0.13	8.2	0.006
15.667	0.000	8.10	0.00	0.13	8.1	0.006
15.750	0.000	8.42	0.00	0.14	8.4	0.007
15.833	0.000	9.06	0.00	0.15	9.0	0.007
15.917	0.000	10.04	0.00	0.17	9.9	0.008
16.000	0.000	11.87	0.00	0.25	11.6	0.011
16.083	0.000	16.36	0.00	0.72	13.2	0.032
16.167	0.000	26.21	0.00	1.25	14.5	0.113
16.250	0.000	33.98	0.00	1.67	15.6	0.239
16.333	0.000	32.96	0.00	1.91	16.5	0.353
16.417	0.000	22.45	0.00	1.98	16.9	0.391
16.500	0.000	14.99	0.00	1.96	16.9	0.378
16.583	0.000	11.14	0.00	1.88	16.8	0.339
16.667	0.000	9.38	0.00	1.78	16.6	0.290
16.750	0.000	8.64	0.00	1.66	16.3	0.237
16.833	0.000	7.94	0.00	1.51	16.0	0.182
16.917	0.000	7.36	0.00	1.30	15.5	0.125
17.000	0.000	6.87	0.00	1.05	14.9	0.070
17.083	0.000	6.48	0.00	0.55	14.0	0.018
17.167	0.000	6.14	0.00	0.05	8.4	0.003
17.250	0.000	5.79	0.00	0.12	5.3	0.006
17.333	0.000	5.46	0.00	0.07	5.8	0.003
17.417	0.000	5.21	0.00	0.09	5.0	0.005
17.500	0.000	5.00	0.00	0.07	5.1	0.004
17.583	0.000	4.84	0.00	0.08	4.8	0.004
17.667	0.000	4.69	0.00	0.07	4.8	0.004
17.750	0.000	4.56	0.00	0.07	4.5	0.004
17.833	0.000	4.43	0.00	0.07	4.5	0.003
17.917	0.000	4.32	0.00	0.07	4.3	0.003
18.000	0.000	4.22	0.00	0.07	4.2	0.003
18.083	0.000	4.13	0.00	0.07	4.1	0.003
18.167	0.000	4.11	0.00	0.07	4.1	0.003
18.250	0.000	4.15	0.00	0.07	4.1	0.003
18.333	0.000	4.19	0.00	0.07	4.2	0.003
18.417	0.000	4.19	0.00	0.07	4.2	0.003
18.500	0.000	4.15	0.00	0.07	4.2	0.003
18.583	0.000	4.10	0.00	0.07	4.1	0.003
18.667	0.000	4.04	0.00	0.06	4.0	0.003
18.750	0.000	3.98	0.00	0.06	4.0	0.003
18.833	0.000	3.93	0.00	0.06	3.9	0.003
18.917	0.000	3.88	0.00	0.06	3.9	0.003
19.000	0.000	3.83	0.00	0.06	3.8	0.003
19.083	0.000	3.78	0.00	0.06	3.8	0.003
19.167	0.000	3.73	0.00	0.06	3.7	0.003
19.250	0.000	3.69	0.00	0.06	3.7	0.003
19.333	0.000	3.65	0.00	0.06	3.7	0.003
19.417	0.000	3.61	0.00	0.06	3.6	0.003

← Peak Q

19.500	0.000	3.57	0.00	0.06	3.6	0.003
19.583	0.000	3.53	0.00	0.06	3.5	0.003
19.667	0.000	3.49	0.00	0.06	3.5	0.003
19.750	0.000	3.46	0.00	0.06	3.5	0.003
19.833	0.000	3.42	0.00	0.05	3.4	0.003
19.917	0.000	3.39	0.00	0.05	3.4	0.003
20.000	0.000	3.36	0.00	0.05	3.4	0.003
20.083	0.000	3.33	0.00	0.05	3.3	0.003
20.167	0.000	3.30	0.00	0.05	3.3	0.003
20.250	0.000	3.27	0.00	0.05	3.3	0.003
20.333	0.000	3.24	0.00	0.05	3.2	0.003
20.417	0.000	3.21	0.00	0.05	3.2	0.003
20.500	0.000	3.18	0.00	0.05	3.2	0.003
20.583	0.000	3.16	0.00	0.05	3.2	0.003
20.667	0.000	3.13	0.00	0.05	3.1	0.002
20.750	0.000	3.11	0.00	0.05	3.1	0.002
20.833	0.000	3.08	0.00	0.05	3.1	0.002
20.917	0.000	3.06	0.00	0.05	3.1	0.002
21.000	0.000	3.04	0.00	0.05	3.0	0.002
21.083	0.000	3.02	0.00	0.05	3.0	0.002
21.167	0.000	2.99	0.00	0.05	3.0	0.002
21.250	0.000	2.97	0.00	0.05	3.0	0.002
21.333	0.000	2.95	0.00	0.05	3.0	0.002
21.417	0.000	2.93	0.00	0.05	2.9	0.002
21.500	0.000	2.91	0.00	0.05	2.9	0.002
21.583	0.000	2.89	0.00	0.05	2.9	0.002
21.667	0.000	2.88	0.00	0.05	2.9	0.002
21.750	0.000	2.86	0.00	0.05	2.9	0.002
21.833	0.000	2.84	0.00	0.05	2.8	0.002
21.917	0.000	2.82	0.00	0.05	2.8	0.002
22.000	0.000	2.80	0.00	0.04	2.8	0.002
22.083	0.000	2.79	0.00	0.04	2.8	0.002
22.167	0.000	2.77	0.00	0.04	2.8	0.002
22.250	0.000	2.75	0.00	0.04	2.8	0.002
22.333	0.000	2.74	0.00	0.04	2.7	0.002
22.417	0.000	2.72	0.00	0.04	2.7	0.002
22.500	0.000	2.71	0.00	0.04	2.7	0.002
22.583	0.000	2.69	0.00	0.04	2.7	0.002
22.667	0.000	2.68	0.00	0.04	2.7	0.002
22.750	0.000	2.66	0.00	0.04	2.7	0.002
22.833	0.000	2.65	0.00	0.04	2.7	0.002
22.917	0.000	2.64	0.00	0.04	2.6	0.002
23.000	0.000	2.62	0.00	0.04	2.6	0.002
23.083	0.000	2.61	0.00	0.04	2.6	0.002
23.167	0.000	2.60	0.00	0.04	2.6	0.002
23.250	0.000	2.58	0.00	0.04	2.6	0.002
23.333	0.000	2.57	0.00	0.04	2.6	0.002
23.417	0.000	2.56	0.00	0.04	2.6	0.002
23.500	0.000	2.55	0.00	0.04	2.5	0.002
23.583	0.000	2.53	0.00	0.04	2.5	0.002
23.667	0.000	2.52	0.00	0.04	2.5	0.002
23.750	0.000	2.51	0.00	0.04	2.5	0.002
23.833	0.000	2.50	0.00	0.04	2.5	0.002
23.917	0.000	2.49	0.00	0.04	2.5	0.002

PROCESS SUMMARY OF STORAGE:

INFLOW VOLUME = 8.305 AF
 BASIN STORAGE = 0.000 AF (WITH 0.000 AF INITIALLY FILLED)
 OUTFLOW VOLUME = 8.305 AF
 LOSS VOLUME = 0.000 AF

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END OF FLOODSCx ROUTING ANALYSIS

GOODMAN FONTANA III
PONDING AT BLDG 4 TRUCK YARD

Elevation	Depth (feet)	Area (sq. ft.)	Volume (c.f.)	Σ Volume (c.f.)	Σ Volume (ac-ft)	Q (discharge) (cfs)
1038.70	0.00	25.22	158	158	0.00	5
1038.90	0.20	1558	609	768	0.02	6
1039.10	0.40	4536	1328	2,096	0.05	7
1039.30	0.60	8742	2280	4,376	0.10	8
1039.50	0.80	14060	3467	7,843	0.18	9
1039.70	1.00	20609	5011	12,853	0.30	10
1039.90	1.20	29497	6932	19,785	0.45	11
1040.10	1.40	39819	9466	29,251	0.67	12
1040.30	1.60	54842				

FLOOD ROUTING ANALYSIS
USING COUNTY HYDROLOGY MANUAL OF SAN BERNARDINO(1986)
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Ver. 7.0 Release Date: 01/01/99 License ID 1435

Analysis prepared by:

THIENES ENGINEERING
16800 VALLEY VIEW AVENUE
LA MIRADA CA 90638
PH: (714) 521-4811 FAX: (714) 521-4173

***** DESCRIPTION OF STUDY *****
* TEI JOB NO 3678 *
* BUILDING 4 *
* TRUCKYARD STORAGE *

FILE NAME: C:\XDRIVE\3678\BASIN4.DAT
TIME/DATE OF STUDY: 12:45 02/02/2019

FLOW PROCESS FROM NODE 210.00 TO NODE 212.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<

(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 11.850 ACRES
BASEFLOW = 0.000 CFS/SQUARE-MILE
*USER ENTERED "LAG" TIME = 0.150 HOURS
CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
VALLEY(DEVELOPED) S-GRAFH SELECTED
MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.042
LOW LOSS FRACTION = 0.062
HYDROGRAPH MODEL #1 SPECIFIED

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.49
SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 1.00
SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 1.35
SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 2.50
SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 3.60
SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 8.10

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:

5-MINUTE FACTOR = 0.999
30-MINUTE FACTOR = 0.999
1-HOUR FACTOR = 0.999
3-HOUR FACTOR = 1.000
6-HOUR FACTOR = 1.000
24-HOUR FACTOR = 1.000

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 55.556

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES (CFS)
1	5.492	7.870
2	36.014	43.742
3	76.167	57.543
4	93.537	24.894
5	98.194	6.673
6	99.268	1.541
7	99.707	0.629
8	99.927	0.314
9	100.000	0.105

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.4534
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 7.5412

□

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2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

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HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

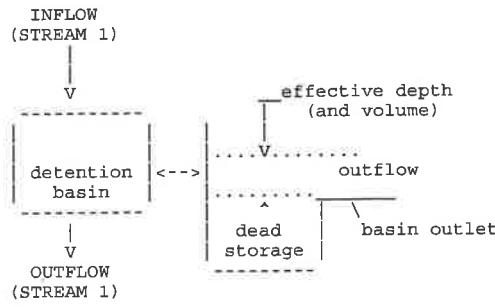
TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	10.0	20.0	30.0	40.0
0.083	0.0008	0.12	Q	.	.	.	.

0.167	0.0063	0.80	Q	.	.	.	.	.	.
0.250	0.0179	1.69	VQ	.	.	.	.	.	.
0.333	0.0322	2.08	V Q	.	.	.	.	.	.
0.417	0.0473	2.18	V Q	.	.	.	.	.	.
0.500	0.0625	2.21	V Q	.	.	.	.	.	.
0.583	0.0778	2.23	V Q	.	.	.	.	.	.
0.667	0.0932	2.24	V Q	.	.	.	.	.	.
0.750	0.1087	2.24	V Q	.	.	.	.	.	.
0.833	0.1241	2.25	V Q	.	.	.	.	.	.
0.917	0.1397	2.25	V Q	.	.	.	.	.	.
1.000	0.1552	2.26	V Q	.	.	.	.	.	.
1.083	0.1708	2.26	V Q	.	.	.	.	.	.
1.167	0.1864	2.27	V Q	.	.	.	.	.	.
1.250	0.2021	2.27	.VQ	.	.	.	.	.	.
1.333	0.2177	2.28	.VQ	.	.	.	.	.	.
1.417	0.2335	2.28	.VQ	.	.	.	.	.	.
1.500	0.2492	2.29	.VQ	.	.	.	.	.	.
1.583	0.2650	2.29	.VQ	.	.	.	.	.	.
1.667	0.2809	2.30	.VQ	.	.	.	.	.	.
1.750	0.2968	2.31	.VQ	.	.	.	.	.	.
1.833	0.3127	2.31	.VQ	.	.	.	.	.	.
1.917	0.3286	2.32	.VQ	.	.	.	.	.	.
2.000	0.3446	2.32	.VQ	.	.	.	.	.	.
2.083	0.3606	2.33	.VQ	.	.	.	.	.	.
2.167	0.3767	2.33	.VQ	.	.	.	.	.	.
2.250	0.3928	2.34	. Q	.	.	.	.	.	.
2.333	0.4090	2.34	. Q	.	.	.	.	.	.
2.417	0.4252	2.35	. Q	.	.	.	.	.	.
2.500	0.4414	2.36	. Q	.	.	.	.	.	.
2.583	0.4577	2.36	. Q	.	.	.	.	.	.
2.667	0.4740	2.37	. Q	.	.	.	.	.	.
2.750	0.4903	2.37	. Q	.	.	.	.	.	.
2.833	0.5067	2.38	. Q	.	.	.	.	.	.
2.917	0.5232	2.39	. Q	.	.	.	.	.	.
3.000	0.5396	2.39	. Q	.	.	.	.	.	.
3.083	0.5562	2.40	. Q	.	.	.	.	.	.
3.167	0.5727	2.41	. QV	.	.	.	.	.	.
3.250	0.5894	2.41	. QV	.	.	.	.	.	.
3.333	0.6060	2.42	. QV	.	.	.	.	.	.
3.417	0.6227	2.43	. QV	.	.	.	.	.	.
3.500	0.6395	2.43	. QV	.	.	.	.	.	.
3.583	0.6563	2.44	. QV	.	.	.	.	.	.
3.667	0.6731	2.45	. QV	.	.	.	.	.	.
3.750	0.6900	2.45	. QV	.	.	.	.	.	.
3.833	0.7069	2.46	. QV	.	.	.	.	.	.
3.917	0.7239	2.47	. QV	.	.	.	.	.	.
4.000	0.7409	2.47	. QV	.	.	.	.	.	.
4.083	0.7580	2.48	. Q V	.	.	.	.	.	.
4.167	0.7751	2.49	. Q V	.	.	.	.	.	.
4.250	0.7923	2.49	. Q V	.	.	.	.	.	.
4.333	0.8095	2.50	. Q V	.	.	.	.	.	.
4.417	0.8268	2.51	. Q V	.	.	.	.	.	.
4.500	0.8441	2.52	. Q V	.	.	.	.	.	.
4.583	0.8615	2.52	. Q V	.	.	.	.	.	.
4.667	0.8789	2.53	. Q V	.	.	.	.	.	.
4.750	0.8964	2.54	. Q V	.	.	.	.	.	.
4.833	0.9140	2.55	. Q V	.	.	.	.	.	.
4.917	0.9315	2.55	. Q V	.	.	.	.	.	.
5.000	0.9492	2.56	. Q V	.	.	.	.	.	.
5.083	0.9669	2.57	. Q V	.	.	.	.	.	.
5.167	0.9846	2.58	. Q V	.	.	.	.	.	.
5.250	1.0025	2.59	. Q V	.	.	.	.	.	.
5.333	1.0203	2.59	. Q V	.	.	.	.	.	.
5.417	1.0382	2.60	. Q V	.	.	.	.	.	.
5.500	1.0562	2.61	. Q V	.	.	.	.	.	.
5.583	1.0743	2.62	. Q V	.	.	.	.	.	.
5.667	1.0924	2.63	. Q V	.	.	.	.	.	.
5.750	1.1105	2.64	. Q V	.	.	.	.	.	.
5.833	1.1287	2.64	. Q V	.	.	.	.	.	.
5.917	1.1470	2.65	. Q V	.	.	.	.	.	.
6.000	1.1653	2.66	. Q V	.	.	.	.	.	.
6.083	1.1837	2.67	. Q V	.	.	.	.	.	.
6.167	1.2022	2.68	. Q V	.	.	.	.	.	.
6.250	1.2207	2.69	. Q V	.	.	.	.	.	.
6.333	1.2393	2.70	. Q V	.	.	.	.	.	.
6.417	1.2580	2.71	. Q V	.	.	.	.	.	.
6.500	1.2767	2.72	. Q V	.	.	.	.	.	.
6.583	1.2955	2.73	. Q V	.	.	.	.	.	.
6.667	1.3144	2.74	. Q V	.	.	.	.	.	.
6.750	1.3333	2.75	. Q V	.	.	.	.	.	.
6.833	1.3523	2.76	. Q V	.	.	.	.	.	.
6.917	1.3714	2.77	. Q V	.	.	.	.	.	.
7.000	1.3905	2.78	. Q V	.	.	.	.	.	.
7.083	1.4097	2.79	. Q V	.	.	.	.	.	.
7.167	1.4290	2.80	. Q V	.	.	.	.	.	.
7.250	1.4483	2.81	. Q V	.	.	.	.	.	.
7.333	1.4678	2.82	. Q V	.	.	.	.	.	.
7.417	1.4873	2.83	. Q V	.	.	.	.	.	.
7.500	1.5069	2.84	. Q V	.	.	.	.	.	.
7.583	1.5265	2.86	. Q V	.	.	.	.	.	.
7.667	1.5463	2.87	. Q V	.	.	.	.	.	.
7.750	1.5661	2.88	. Q V	.	.	.	.	.	.
7.833	1.5860	2.89	. Q V	.	.	.	.	.	.
7.917	1.6060	2.90	. Q V	.	.	.	.	.	.
8.000	1.6261	2.91	. Q V	.	.	.	.	.	.
8.083	1.6462	2.93	. Q V	.	.	.	.	.	.
8.167	1.6665	2.94	. Q V	.	.	.	.	.	.
8.250	1.6868	2.95	. Q V	.	.	.	.	.	.
8.333	1.7072	2.96	. Q V	.	.	.	.	.	.

8.417	1.7277	2.98	Q	V.	.	.	.	.
8.500	1.7483	2.99	Q	V.	.	.	.	.
8.583	1.7690	3.00	Q	V.	.	.	.	.
8.667	1.7898	3.02	Q	V.	.	.	.	.
8.750	1.8107	3.03	Q	V.	.	.	.	.
8.833	1.8317	3.05	Q	V.	.	.	.	.
8.917	1.8528	3.06	Q	V.	.	.	.	.
9.000	1.8739	3.08	Q	V.	.	.	.	.
9.083	1.8952	3.09	Q	V	.	.	.	.
9.167	1.9166	3.11	Q	V	.	.	.	.
9.250	1.9381	3.12	Q	V	.	.	.	.
9.333	1.9597	3.14	Q	V	.	.	.	.
9.417	1.9814	3.15	Q	V	.	.	.	.
9.500	2.0032	3.17	Q	V	.	.	.	.
9.583	2.0252	3.18	Q	V	.	.	.	.
9.667	2.0472	3.20	Q	V	.	.	.	.
9.750	2.0694	3.22	Q	V	.	.	.	.
9.833	2.0917	3.24	Q	.V	.	.	.	.
9.917	2.1141	3.25	Q	.V	.	.	.	.
10.000	2.1366	3.27	Q	.V	.	.	.	.
10.083	2.1593	3.29	Q	.V	.	.	.	.
10.167	2.1821	3.31	Q	.V	.	.	.	.
10.250	2.2050	3.33	Q	.V	.	.	.	.
10.333	2.2280	3.35	Q	.V	.	.	.	.
10.417	2.2512	3.37	Q	.V	.	.	.	.
10.500	2.2745	3.39	Q	.V	.	.	.	.
10.583	2.2980	3.41	Q	.V	.	.	.	.
10.667	2.3216	3.43	Q	.V	.	.	.	.
10.750	2.3454	3.45	Q	.V	.	.	.	.
10.833	2.3693	3.47	Q	.V	.	.	.	.
10.917	2.3934	3.50	Q	.V	.	.	.	.
11.000	2.4176	3.52	Q	.V	.	.	.	.
11.083	2.4420	3.54	Q	.V	.	.	.	.
11.167	2.4666	3.57	Q	.V	.	.	.	.
11.250	2.4913	3.59	Q	.V	.	.	.	.
11.333	2.5162	3.62	Q	.V	.	.	.	.
11.417	2.5413	3.64	Q	.V	.	.	.	.
11.500	2.5665	3.67	Q	.V	.	.	.	.
11.583	2.5920	3.70	Q	.V	.	.	.	.
11.667	2.6176	3.72	Q	.V	.	.	.	.
11.750	2.6435	3.75	Q	.V	.	.	.	.
11.833	2.6695	3.78	Q	.V	.	.	.	.
11.917	2.6957	3.81	Q	.V	.	.	.	.
12.000	2.7222	3.84	Q	.V	.	.	.	.
12.083	2.7487	3.85	Q	.V	.	.	.	.
12.167	2.7747	3.76	Q	.V	.	.	.	.
12.250	2.7997	3.64	Q	.V	.	.	.	.
12.333	2.8246	3.61	Q	.V	.	.	.	.
12.417	2.8495	3.63	Q	.V	.	.	.	.
12.500	2.8747	3.66	Q	.V	.	.	.	.
12.583	2.9002	3.70	Q	.V	.	.	.	.
12.667	2.9259	3.74	Q	.V	.	.	.	.
12.750	2.9520	3.78	Q	.V	.	.	.	.
12.833	2.9783	3.82	Q	.V	.	.	.	.
12.917	3.0049	3.87	Q	.V	.	.	.	.
13.000	3.0319	3.91	Q	.V	.	.	.	.
13.083	3.0592	3.96	Q	.V	.	.	.	.
13.167	3.0868	4.01	Q	.V	.	.	.	.
13.250	3.1148	4.07	Q	.V	.	.	.	.
13.333	3.1432	4.12	Q	.V	.	.	.	.
13.417	3.1720	4.18	Q	.V	.	.	.	.
13.500	3.2012	4.24	Q	.V	.	.	.	.
13.583	3.2309	4.30	Q	.V	.	.	.	.
13.667	3.2609	4.37	Q	.V	.	.	.	.
13.750	3.2915	4.44	Q	.V	.	.	.	.
13.833	3.3226	4.51	Q	.V	.	.	.	.
13.917	3.3542	4.59	Q	.V	.	.	.	.
14.000	3.3863	4.67	Q	.V	.	.	.	.
14.083	3.4192	4.77	Q	.V	.	.	.	.
14.167	3.4533	4.96	Q	.V	.	.	.	.
14.250	3.4891	5.19	Q	.V	.	.	.	.
14.333	3.5259	5.35	Q	.V	.	.	.	.
14.417	3.5636	5.47	Q	.V	.	.	.	.
14.500	3.6020	5.59	Q	.V	.	.	.	.
14.583	3.6414	5.71	Q	.V	.	.	.	.
14.667	3.6816	5.84	Q	.V	.	.	.	.
14.750	3.7228	5.99	Q	.V	.	.	.	.
14.833	3.7652	6.14	Q	.V	.	.	.	.
14.917	3.8086	6.31	Q	.V	.	.	.	.
15.000	3.8534	6.50	Q	.V	.	.	.	.
15.083	3.8995	6.70	Q	.V	.	.	.	.
15.167	3.9473	6.93	Q	.V	.	.	.	.
15.250	3.9968	7.19	Q	.V	.	.	.	.
15.333	4.0483	7.48	Q	.V	.	.	.	.
15.417	4.1014	7.72	Q	.V	.	.	.	.
15.500	4.1532	7.51	Q	.V	.	.	.	.
15.583	4.2027	7.19	Q	.V	.	.	.	.
15.667	4.2538	7.43	Q	.V	.	.	.	.
15.750	4.3092	8.04	Q	.V	.	.	.	.
15.833	4.3698	8.81	Q	.V	.	.	.	.
15.917	4.4386	9.99	Q	.V	.	.	.	.
16.000	4.5249	12.53	Q	.	.	.	.	.
16.083	4.6575	19.26	Q	.	.	.	.	.
16.167	4.8925	34.12	Q	V	.	.	.	.
16.250	5.1478	37.07	Q	V	.	.	.	.
16.333	5.2975	21.73	Q	V	.	.	.	.
16.417	5.3821	12.29	Q	V	.	.	.	.
16.500	5.4447	9.08	Q	V	.	.	.	.
16.583	5.5018	8.30	Q	V	.	.	.	.

16.667	5.5547	7.68	.	.	.	V.	.
16.750	5.6034	7.07	.	.	.	V.	.
16.833	5.6487	6.58	.	.	.	V.	.
16.917	5.6915	6.21	.	.	.	V	.
17.000	5.7321	5.90	.	.	.	V	.
17.083	5.7708	5.62	.	.	.	V	.
17.167	5.8072	5.29	.	.	.	V	.
17.250	5.8414	4.95	.	.	.	V	.
17.333	5.8739	4.72	.	.	.	.V	.
17.417	5.9051	4.54	.	.	.	.V	.
17.500	5.9354	4.39	.	.	.	.V	.
17.583	5.9648	4.26	.	.	.	.V	.
17.667	5.9933	4.14	.	.	.	.V	.
17.750	6.0210	4.03	.	.	.	.V	.
17.833	6.0481	3.93	.	.	.	.V	.
17.917	6.0745	3.84	.	.	.	.V	.
18.000	6.1004	3.75	.	.	.	.V	.
18.083	6.1258	3.69	.	.	.	.V	.
18.167	6.1515	3.74	.	.	.	.V	.
18.250	6.1778	3.82	.	.	.	.V	.
18.333	6.2042	3.83	.	.	.	.V	.
18.417	6.2302	3.78	.	.	.	.V	.
18.500	6.2559	3.73	.	.	.	.V	.
18.583	6.2812	3.67	.	.	.	.V	.
18.667	6.3062	3.62	.	.	.	.V	.
18.750	6.3308	3.57	.	.	.	.V	.
18.833	6.3550	3.52	.	.	.	.V	.
18.917	6.3790	3.48	.	.	.	.V	.
19.000	6.4027	3.44	.	.	.	.V	.
19.083	6.4260	3.39	.	.	.	.V	.
19.167	6.4491	3.35	.	.	.	.V	.
19.250	6.4720	3.31	.	.	.	.V	.
19.333	6.4945	3.28	.	.	.	.V	.
19.417	6.5168	3.24	.	.	.	.V	.
19.500	6.5389	3.21	.	.	.	.V	.
19.583	6.5608	3.17	.	.	.	.V	.
19.667	6.5824	3.14	.	.	.	.V	.
19.750	6.6038	3.11	.	.	.	.V	.
19.833	6.6250	3.08	.	.	.	.V	.
19.917	6.6460	3.05	.	.	.	.V	.
20.000	6.6669	3.02	.	.	.	.V	.
20.083	6.6875	3.00	.	.	.	.V	.
20.167	6.7079	2.97	.	.	.	.V	.
20.250	6.7282	2.94	.	.	.	.V	.
20.333	6.7483	2.92	.	.	.	.V	.
20.417	6.7682	2.89	.	.	.	.V	.
20.500	6.7880	2.87	.	.	.	.V	.
20.583	6.8076	2.85	.	.	.	.V	.
20.667	6.8270	2.82	.	.	.	.V	.
20.750	6.8464	2.80	.	.	.	.V	.
20.833	6.8655	2.78	.	.	.	.V	.
20.917	6.8845	2.76	.	.	.	.V	.
21.000	6.9034	2.74	.	.	.	.V	.
21.083	6.9221	2.72	.	.	.	.V	.
21.167	6.9408	2.70	.	.	.	.V	.
21.250	6.9592	2.68	.	.	.	.V	.
21.333	6.9776	2.67	.	.	.	.V	.
21.417	6.9958	2.65	.	.	.	.V	.
21.500	7.0139	2.63	.	.	.	.V	.
21.583	7.0319	2.61	.	.	.	.V	.
21.667	7.0498	2.60	.	.	.	.V	.
21.750	7.0676	2.58	.	.	.	.V	.
21.833	7.0852	2.56	.	.	.	.V	.
21.917	7.1028	2.55	.	.	.	.V	.
22.000	7.1202	2.53	.	.	.	.V	.
22.083	7.1376	2.52	.	.	.	.V	.
22.167	7.1548	2.50	.	.	.	.V	.
22.250	7.1719	2.49	.	.	.	.V	.
22.333	7.1890	2.47	.	.	.	.V	.
22.417	7.2059	2.46	.	.	.	.V	.
22.500	7.2228	2.45	.	.	.	.V	.
22.583	7.2395	2.43	.	.	.	.V	.
22.667	7.2562	2.42	.	.	.	.V	.
22.750	7.2728	2.41	.	.	.	.V	.
22.833	7.2893	2.39	.	.	.	.V	.
22.917	7.3057	2.38	.	.	.	.V	.
23.000	7.3220	2.37	.	.	.	.V	.
23.083	7.3383	2.36	.	.	.	.V	.
23.167	7.3544	2.35	.	.	.	.V	.
23.250	7.3705	2.33	.	.	.	.V	.
23.333	7.3865	2.32	.	.	.	.V	.
23.417	7.4024	2.31	.	.	.	.V	.
23.500	7.4183	2.30	.	.	.	.V	.
23.583	7.4341	2.29	.	.	.	.V	.
23.667	7.4498	2.28	.	.	.	.V	.
23.750	7.4654	2.27	.	.	.	.V	.
23.833	7.4809	2.26	.	.	.	.V	.
23.917	7.4964	2.25	.	.	.	.V	.
24.000	7.5118	2.24	.	.	.	.V	.
24.083	7.5263	2.11	.	.	.	.V	.
24.167	7.5362	1.42	.	.	.	.V	.
24.250	7.5398	0.53	Q	.	.	.V	.
24.333	7.5408	0.14	Q	.	.	.V	.
24.417	7.5411	0.04	Q	.	.	.V	.
24.500	7.5412	0.02	Q	.	.	.V	.
24.583	7.5412	0.01	Q	.	.	.V	.

>>>> FLOW-THROUGH DETENTION BASIN ROUTING MODEL APPLIED TO STREAM #1<<<<



ROUTE RUNOFF HYDROGRAPH FROM STREAM NUMBER 1
THROUGH A FLOW-THROUGH DETENTION BASIN

SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:

DEAD STORAGE (AF) = 0.000
SPECIFIED DEAD STORAGE (AF) FILLED = 0.000
SPECIFIED EFFECTIVE VOLUME (AF) FILLED ABOVE OUTLET = 0.000
DETENTION BASIN CONSTANT LOSS RATE (CFS) = 0.00

BASIN DEPTH VERSUS OUTFLOW AND STORAGE INFORMATION:

INTERVAL NUMBER	DEPTH (FT)	OUTFLOW (CFS)	STORAGE (AF)
1	0.00	0.00	0.000
2	0.20	5.00	0.010
3	0.40	6.00	0.020
4	0.60	7.00	0.050
5	0.80	8.00	0.100
6	1.00	9.00	0.180
7	1.20	10.00	0.300
8	1.40	11.00	0.450
9	1.60	12.00	0.670

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MODIFIED-PULS BASIN ROUTING MODEL RESULTS (5-MINUTE COMPUTATION INTERVALS):
(Note: Computed EFFECTIVE DEPTH and VOLUME are estimated at the clock time;
MEAN OUTFLOW is the average value during the unit interval.)

CLOCK TIME (HRS)	DEAD-STORAGE FILLED (AF)	INFLOW (CFS)	LOSS (CFS)	EFFECTIVE DEPTH (FT)	MEAN OUTFLOW (CFS)	EFFECTIVE VOLUME (AF)
10.083	0.000	3.29	0.00	0.13	3.3	0.007
10.167	0.000	3.31	0.00	0.13	3.3	0.007
10.250	0.000	3.33	0.00	0.13	3.3	0.007
10.333	0.000	3.35	0.00	0.13	3.3	0.007
10.417	0.000	3.37	0.00	0.13	3.4	0.007
10.500	0.000	3.39	0.00	0.14	3.4	0.007
10.583	0.000	3.41	0.00	0.14	3.4	0.007
10.667	0.000	3.43	0.00	0.14	3.4	0.007
10.750	0.000	3.45	0.00	0.14	3.4	0.007
10.833	0.000	3.47	0.00	0.14	3.5	0.007
10.917	0.000	3.50	0.00	0.14	3.5	0.007
11.000	0.000	3.52	0.00	0.14	3.5	0.007
11.083	0.000	3.54	0.00	0.14	3.5	0.007
11.167	0.000	3.57	0.00	0.14	3.6	0.007
11.250	0.000	3.59	0.00	0.14	3.6	0.007
11.333	0.000	3.62	0.00	0.14	3.6	0.007
11.417	0.000	3.64	0.00	0.15	3.6	0.007
11.500	0.000	3.67	0.00	0.15	3.7	0.007
11.583	0.000	3.70	0.00	0.15	3.7	0.007
11.667	0.000	3.72	0.00	0.15	3.7	0.007
11.750	0.000	3.75	0.00	0.15	3.7	0.008
11.833	0.000	3.78	0.00	0.15	3.8	0.008
11.917	0.000	3.81	0.00	0.15	3.8	0.008
12.000	0.000	3.84	0.00	0.15	3.8	0.008
12.083	0.000	3.85	0.00	0.15	3.9	0.008
12.167	0.000	3.76	0.00	0.15	3.8	0.007
12.250	0.000	3.64	0.00	0.14	3.7	0.007
12.333	0.000	3.61	0.00	0.14	3.6	0.007
12.417	0.000	3.63	0.00	0.15	3.6	0.007
12.500	0.000	3.66	0.00	0.15	3.6	0.007
12.583	0.000	3.70	0.00	0.15	3.7	0.007
12.667	0.000	3.74	0.00	0.15	3.7	0.007
12.750	0.000	3.78	0.00	0.15	3.8	0.008
12.833	0.000	3.82	0.00	0.15	3.8	0.008
12.917	0.000	3.87	0.00	0.16	3.9	0.008
13.000	0.000	3.91	0.00	0.16	3.9	0.008
13.083	0.000	3.96	0.00	0.16	3.9	0.008
13.167	0.000	4.01	0.00	0.16	4.0	0.008
13.250	0.000	4.07	0.00	0.16	4.1	0.008
13.333	0.000	4.12	0.00	0.17	4.1	0.008
13.417	0.000	4.18	0.00	0.17	4.2	0.008
13.500	0.000	4.24	0.00	0.17	4.2	0.009
13.583	0.000	4.30	0.00	0.17	4.3	0.009

13.667	0.000	4.37	0.00	0.18	4.3	0.009
13.750	0.000	4.44	0.00	0.18	4.4	0.009
13.833	0.000	4.51	0.00	0.18	4.5	0.009
13.917	0.000	4.59	0.00	0.18	4.6	0.009
14.000	0.000	4.67	0.00	0.19	4.6	0.009
14.083	0.000	4.77	0.00	0.19	4.7	0.010
14.167	0.000	4.96	0.00	0.20	4.9	0.010
14.250	0.000	5.19	0.00	0.22	5.0	0.011
14.333	0.000	5.35	0.00	0.24	5.2	0.012
14.417	0.000	5.47	0.00	0.27	5.3	0.013
14.500	0.000	5.59	0.00	0.29	5.4	0.015
14.583	0.000	5.71	0.00	0.32	5.5	0.016
14.667	0.000	5.84	0.00	0.34	5.7	0.017
14.750	0.000	5.99	0.00	0.37	5.8	0.019
14.833	0.000	6.14	0.00	0.40	5.9	0.020
14.917	0.000	6.31	0.00	0.41	6.0	0.022
15.000	0.000	6.50	0.00	0.43	6.1	0.025
15.083	0.000	6.70	0.00	0.45	6.2	0.028
15.167	0.000	6.93	0.00	0.48	6.3	0.032
15.250	0.000	7.19	0.00	0.51	6.5	0.037
15.333	0.000	7.48	0.00	0.55	6.7	0.043
15.417	0.000	7.72	0.00	0.59	6.9	0.049
15.500	0.000	7.51	0.00	0.61	7.0	0.052
15.583	0.000	7.19	0.00	0.61	7.1	0.053
15.667	0.000	7.43	0.00	0.62	7.1	0.055
15.750	0.000	8.04	0.00	0.65	7.2	0.061
15.833	0.000	8.81	0.00	0.69	7.3	0.072
15.917	0.000	9.99	0.00	0.75	7.6	0.088
16.000	0.000	12.53	0.00	0.85	8.0	0.119
16.083	0.000	19.26	0.00	1.02	8.7	0.192
16.167	0.000	34.12	0.00	1.28	9.8	0.360
16.250	0.000	37.07	0.00	1.48	10.9	0.540
16.333	0.000	21.73	0.00	1.55	11.6	0.610
16.417	0.000	12.29	0.00	1.55	11.7	0.614
16.500	0.000	9.08	0.00	1.53	11.7	0.596
16.583	0.000	8.30	0.00	1.51	11.6	0.573
16.667	0.000	7.68	0.00	1.49	11.5	0.547
16.750	0.000	7.07	0.00	1.46	11.4	0.517
16.833	0.000	6.58	0.00	1.43	11.2	0.485
16.917	0.000	6.21	0.00	1.40	11.1	0.452
17.000	0.000	5.90	0.00	1.36	10.9	0.417
17.083	0.000	5.62	0.00	1.31	10.7	0.382
17.167	0.000	5.29	0.00	1.26	10.4	0.347
17.250	0.000	4.95	0.00	1.21	10.2	0.311
17.333	0.000	4.72	0.00	1.16	9.9	0.275
17.417	0.000	4.54	0.00	1.10	9.6	0.240
17.500	0.000	4.39	0.00	1.04	9.4	0.206
17.583	0.000	4.26	0.00	0.98	9.1	0.173
17.667	0.000	4.14	0.00	0.90	8.7	0.141
17.750	0.000	4.03	0.00	0.83	8.3	0.112
17.833	0.000	3.93	0.00	0.74	7.9	0.084
17.917	0.000	3.84	0.00	0.64	7.4	0.059
18.000	0.000	3.75	0.00	0.52	6.9	0.038
18.083	0.000	3.69	0.00	0.40	6.3	0.020
18.167	0.000	3.74	0.00	0.18	5.3	0.009
18.250	0.000	3.82	0.00	0.14	4.1	0.007
18.333	0.000	3.83	0.00	0.16	3.8	0.008
18.417	0.000	3.78	0.00	0.15	3.8	0.008
18.500	0.000	3.73	0.00	0.15	3.7	0.007
18.583	0.000	3.67	0.00	0.15	3.7	0.007
18.667	0.000	3.62	0.00	0.14	3.6	0.007
18.750	0.000	3.57	0.00	0.14	3.6	0.007
18.833	0.000	3.52	0.00	0.14	3.5	0.007
18.917	0.000	3.48	0.00	0.14	3.5	0.007
19.000	0.000	3.44	0.00	0.14	3.4	0.007
19.083	0.000	3.39	0.00	0.14	3.4	0.007
19.167	0.000	3.35	0.00	0.13	3.4	0.007
19.250	0.000	3.31	0.00	0.13	3.3	0.007
19.333	0.000	3.28	0.00	0.13	3.3	0.007
19.417	0.000	3.24	0.00	0.13	3.3	0.006
19.500	0.000	3.21	0.00	0.13	3.2	0.006
19.583	0.000	3.17	0.00	0.13	3.2	0.006
19.667	0.000	3.14	0.00	0.13	3.2	0.006
19.750	0.000	3.11	0.00	0.12	3.1	0.006
19.833	0.000	3.08	0.00	0.12	3.1	0.006
19.917	0.000	3.05	0.00	0.12	3.1	0.006
20.000	0.000	3.02	0.00	0.12	3.0	0.006
20.083	0.000	3.00	0.00	0.12	3.0	0.006
20.167	0.000	2.97	0.00	0.12	3.0	0.006
20.250	0.000	2.94	0.00	0.12	3.0	0.006
20.333	0.000	2.92	0.00	0.12	2.9	0.006
20.417	0.000	2.89	0.00	0.12	2.9	0.006
20.500	0.000	2.87	0.00	0.11	2.9	0.006
20.583	0.000	2.85	0.00	0.11	2.9	0.006
20.667	0.000	2.82	0.00	0.11	2.8	0.006
20.750	0.000	2.80	0.00	0.11	2.8	0.006
20.833	0.000	2.78	0.00	0.11	2.8	0.006
20.917	0.000	2.76	0.00	0.11	2.8	0.006
21.000	0.000	2.74	0.00	0.11	2.7	0.005
21.083	0.000	2.72	0.00	0.11	2.7	0.005
21.167	0.000	2.70	0.00	0.11	2.7	0.005
21.250	0.000	2.68	0.00	0.11	2.7	0.005
21.333	0.000	2.67	0.00	0.11	2.7	0.005
21.417	0.000	2.65	0.00	0.11	2.7	0.005
21.500	0.000	2.63	0.00	0.11	2.6	0.005
21.583	0.000	2.61	0.00	0.10	2.6	0.005
21.667	0.000	2.60	0.00	0.10	2.6	0.005
21.750	0.000	2.58	0.00	0.10	2.6	0.005
21.833	0.000	2.56	0.00	0.10	2.6	0.005

← Peak Q

21.917	0.000	2.55	0.00	0.10	2.6	0.005
22.000	0.000	2.53	0.00	0.10	2.5	0.005
22.083	0.000	2.52	0.00	0.10	2.5	0.005
22.167	0.000	2.50	0.00	0.10	2.5	0.005
22.250	0.000	2.49	0.00	0.10	2.5	0.005
22.333	0.000	2.47	0.00	0.10	2.5	0.005
22.417	0.000	2.46	0.00	0.10	2.5	0.005
22.500	0.000	2.45	0.00	0.10	2.5	0.005
22.583	0.000	2.43	0.00	0.10	2.4	0.005
22.667	0.000	2.42	0.00	0.10	2.4	0.005
22.750	0.000	2.41	0.00	0.10	2.4	0.005
22.833	0.000	2.39	0.00	0.10	2.4	0.005
22.917	0.000	2.38	0.00	0.10	2.4	0.005
23.000	0.000	2.37	0.00	0.09	2.4	0.005
23.083	0.000	2.36	0.00	0.09	2.4	0.005
23.167	0.000	2.35	0.00	0.09	2.3	0.005
23.250	0.000	2.33	0.00	0.09	2.3	0.005
23.333	0.000	2.32	0.00	0.09	2.3	0.005
23.417	0.000	2.31	0.00	0.09	2.3	0.005
23.500	0.000	2.30	0.00	0.09	2.3	0.005
23.583	0.000	2.29	0.00	0.09	2.3	0.005
23.667	0.000	2.28	0.00	0.09	2.3	0.005
23.750	0.000	2.27	0.00	0.09	2.3	0.005
23.833	0.000	2.26	0.00	0.09	2.3	0.005
23.917	0.000	2.25	0.00	0.09	2.3	0.004

PROCESS SUMMARY OF STORAGE:

INFLOW VOLUME = 7.541 AF
 BASIN STORAGE = 0.000 AF (WITH 0.000 AF INITIALLY FILLED)
 OUTFLOW VOLUME = 7.541 AF
 LOSS VOLUME = 0.000 AF

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END OF FLOODSCx ROUTING ANALYSIS

□

GOODMAN FONTANA III
PONDING AT BLDG 5 TRUCK YARD

Elevation	Depth (feet)	Area (sq. ft.)	Volume (c.f.)	Σ Volume (c.f.)	Σ Volume (ac-ft)	Q (discharge) (cfs)
1037.00	0.00	265	634	634	0.01	8.7
1037.20	0.20	6077	2798	3,432	0.08	8.8
1037.40	0.40	21905	6352	9,784	0.22	9.0
1037.60	0.60	41616	9625	19,409	0.45	9.2
1037.80	0.80	54629	12120	31,529	0.72	9.3
1038.00	1.00	66571				

SMALL AREA UNIT HYDROGRAPH MODEL(C) Copyright 1989-99 Advanced Engineering Software (aes)
Ver. 8.0 Release Date: 01/01/99 License ID 1435

Analysis prepared by:

THIENES ENGINEERING
16800 VALLEY VIEW AVENUE
LA MIRADA CA 90638
PH: (714) 521-4811 FAX: (714) 521-4173

RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
TOTAL CATCHMENT AREA(ACRES) = 6.90
SOIL-LOSS RATE, Fm, (INCH/HR) = 0.042
LOW LOSS FRACTION = 0.062
TIME OF CONCENTRATION(MIN.) = 11.30
RATIONAL METHOD PEAK FLOW RATE (DEFINED BY USER)
IS USED FOR SMALL AREA PEAK Q
USER SPECIFIED RAINFALL VALUES ARE USED
RETURN FREQUENCY(YEARS) = 100
5-MINUTE POINT RAINFALL VALUE(INCHES) = 0.49
30-MINUTE POINT RAINFALL VALUE(INCHES) = 1.00
1-HOUR POINT RAINFALL VALUE(INCHES) = 1.35
3-HOUR POINT RAINFALL VALUE(INCHES) = 2.50
6-HOUR POINT RAINFALL VALUE(INCHES) = 3.60
24-HOUR POINT RAINFALL VALUE(INCHES) = 8.10

TOTAL CATCHMENT RUNOFF VOLUME(ACRE-FEET) = 3.95
TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) = 0.71

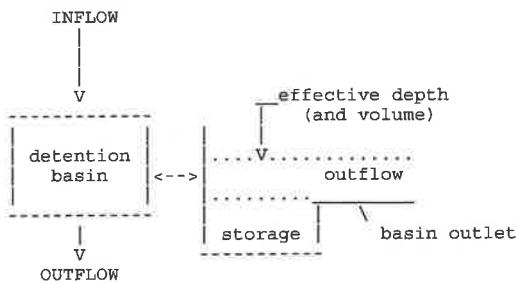
TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	7.5	15.0	22.5	30.0
0.18	0.0090	1.15	.Q	.	.	.	.
0.37	0.0269	1.16	.Q	.	.	.	.
0.56	0.0450	1.16	.Q	.	.	.	.
0.74	0.0631	1.17	.Q	.	.	.	.
0.93	0.0813	1.17	.Q	.	.	.	.
1.12	0.0996	1.18	.Q	.	.	.	.
1.31	0.1181	1.19	.Q	.	.	.	.
1.50	0.1366	1.19	.Q	.	.	.	.
1.69	0.1552	1.20	.Q	.	.	.	.
1.87	0.1739	1.21	.Q	.	.	.	.
2.06	0.1927	1.21	.Q	.	.	.	.
2.25	0.2116	1.22	.Q	.	.	.	.
2.44	0.2307	1.22	.Q	.	.	.	.
2.63	0.2498	1.23	.Q	.	.	.	.
2.82	0.2690	1.24	.Q	.	.	.	.
3.00	0.2884	1.25	.Q	.	.	.	.
3.19	0.3079	1.25	.Q	.	.	.	.
3.38	0.3275	1.26	.Q	.	.	.	.
3.57	0.3472	1.27	.Q	.	.	.	.
3.76	0.3670	1.28	.Q	.	.	.	.
3.95	0.3870	1.29	.Q	.	.	.	.
4.13	0.4071	1.30	.Q	.	.	.	.
4.32	0.4273	1.30	.Q	.	.	.	.
4.51	0.4476	1.31	.Q	.	.	.	.
4.70	0.4681	1.32	.Q	.	.	.	.
4.89	0.4888	1.33	.Q	.	.	.	.
5.08	0.5095	1.34	.Q	.	.	.	.
5.26	0.5305	1.35	.Q	.	.	.	.
5.45	0.5515	1.36	.Q	.	.	.	.
5.64	0.5728	1.37	.Q	.	.	.	.
5.83	0.5942	1.38	.Q	.	.	.	.
6.02	0.6157	1.39	.Q	.	.	.	.
6.21	0.6374	1.40	.Q	.	.	.	.
6.39	0.6593	1.41	.Q	.	.	.	.
6.58	0.6814	1.42	.Q	.	.	.	.
6.77	0.7036	1.44	.Q	.	.	.	.
6.96	0.7260	1.45	.Q	.	.	.	.
7.15	0.7487	1.46	.Q	.	.	.	.
7.34	0.7715	1.47	.Q	.	.	.	.
7.53	0.7945	1.49	.Q	.	.	.	.
7.71	0.8177	1.50	.Q	.	.	.	.
7.90	0.8412	1.52	.Q	.	.	.	.
8.09	0.8648	1.53	.Q	.	.	.	.
8.28	0.8887	1.55	.Q	.	.	.	.
8.47	0.9129	1.56	.Q	.	.	.	.
8.65	0.9373	1.58	.Q	.	.	.	.
8.84	0.9619	1.59	.Q	.	.	.	.
9.03	0.9868	1.61	.Q	.	.	.	.
9.22	1.0120	1.62	.Q	.	.	.	.
9.41	1.0375	1.65	.Q	.	.	.	.
9.60	1.0632	1.66	.Q	.	.	.	.
9.78	1.0893	1.69	.Q	.	.	.	.
9.97	1.1157	1.70	.Q	.	.	.	.
10.16	1.1424	1.73	.Q	.	.	.	.
10.35	1.1695	1.75	.Q	.	.	.	.
10.54	1.1970	1.78	.Q	.	.	.	.
10.73	1.2248	1.80	.Q	.	.	.	.
10.91	1.2530	1.83	.Q	.	.	.	.

11.10	1.2817	1.85	.	Q	.	.	.	.
11.29	1.3108	1.89	.	Q	.	*	*	*
11.48	1.3404	1.91	.	Q	*	*	*	*
11.67	1.3705	1.95	.	Q	*	*	*	*
11.86	1.4011	1.98	.	Q	*	*	*	*
12.05	1.4322	2.03	.	Q	*	*	*	*
12.23	1.4626	1.88	.	Q	*	*	*	*
12.42	1.4921	1.91	.	Q	*	*	*	*
12.61	1.5220	1.94	.	Q	*	*	*	*
12.80	1.5527	2.01	.	Q	*	*	*	*
12.99	1.5842	2.04	.	Q	*	*	*	*
13.18	1.6167	2.12	.	Q	*	*	*	*
13.36	1.6501	2.17	.	Q	*	*	*	*
13.55	1.6846	2.27	.	Q	*	*	*	*
13.74	1.7203	2.32	.	Q	*	*	*	*
13.93	1.7573	2.44	.	Q	*	*	*	*
14.12	1.7959	2.51	.	Q	*	*	*	*
14.30	1.8375	2.84	.	Q	*	*	*	*
14.49	1.8824	2.93	.	Q	*	*	*	*
14.68	1.9296	3.14	.	Q	*	*	*	*
14.87	1.9795	3.27	.	Q	*	*	*	*
15.06	2.0329	3.59	.	Q	*	*	*	*
15.25	2.0903	3.79	.	Q	*	*	*	*
15.43	2.1513	4.04	.	Q	*	*	*	*
15.62	2.2119	3.75	.	Q	*	*	*	*
15.81	2.2803	5.05	.	Q	*	*	*	*
16.00	2.3729	6.84	.	Q	*	*	*	*
16.19	2.6059	23.10	.	Q	*	*	*	*
16.38	2.8195	4.35	.	Q	*	*	*	*
16.57	2.8849	4.04	.	Q	*	*	*	*
16.75	2.9429	3.42	.	Q	*	*	*	*
16.94	2.9931	3.03	.	Q	*	*	*	*
17.13	3.0380	2.74	.	Q	*	*	*	*
17.32	3.0779	2.38	.	Q	*	*	*	*
17.51	3.1136	2.22	.	Q	*	*	*	*
17.69	3.1471	2.08	.	Q	*	*	*	*
17.88	3.1786	1.97	.	Q	*	*	*	*
18.07	3.2086	1.88	.	Q	*	*	*	*
18.26	3.2388	2.00	.	Q	*	*	*	*
18.45	3.2694	1.93	.	Q	*	*	*	*
18.64	3.2990	1.87	.	Q	*	*	*	*
18.83	3.3277	1.81	.	Q	*	*	*	*
19.01	3.3555	1.76	.	Q	*	*	*	*
19.20	3.3826	1.72	.	Q	*	*	*	*
19.39	3.4090	1.67	.	Q	*	*	*	*
19.58	3.4348	1.64	.	Q	*	*	*	*
19.77	3.4599	1.60	.	Q	*	*	*	*
19.95	3.4846	1.57	.	Q	*	*	*	*
20.14	3.5087	1.54	.	Q	*	*	*	*
20.33	3.5324	1.51	.	Q	*	*	*	*
20.52	3.5556	1.48	.	Q	*	*	*	*
20.71	3.5785	1.45	.	Q	*	*	*	*
20.90	3.6009	1.43	.	Q	*	*	*	*
21.08	3.6230	1.41	.	Q	*	*	*	*
21.27	3.6447	1.38	.	Q	*	*	*	*
21.46	3.6661	1.36	.	Q	*	*	*	*
21.65	3.6871	1.34	.	Q	*	*	*	*
21.84	3.7079	1.33	.	Q	*	*	*	*
22.03	3.7284	1.31	.	Q	*	*	*	*
22.22	3.7486	1.29	.	Q	*	*	*	*
22.40	3.7686	1.27	.	Q	*	*	*	*
22.59	3.7883	1.26	.	Q	*	*	*	*
22.78	3.8078	1.24	.	Q	*	*	*	*
22.97	3.8270	1.23	.	Q	*	*	*	*
23.16	3.8460	1.22	.	Q	*	*	*	*
23.34	3.8649	1.20	.	Q	*	*	*	*
23.53	3.8835	1.19	.	Q	*	*	*	*
23.72	3.9019	1.18	.	Q	*	*	*	*
23.91	3.9201	1.17	.	Q	*	*	*	*
24.10	3.9382	1.15	.	Q	*	*	*	*
24.29	3.9471	0.00	Q	*	*	*	*	*

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FLOW-THROUGH DETENTION BASIN MODEL

SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
 CONSTANT HYDROGRAPH TIME UNIT(MINUTES) = 11.300
 DEAD STORAGE(AF) = 0.00
 SPECIFIED DEAD STORAGE(AF) FILLED = 0.00
 ASSUMED INITIAL DEPTH(FEET) IN STORAGE BASIN = 0.00



DEPTH-VS.-STORAGE AND DEPTH-VS.-DISCHARGE INFORMATION:

TOTAL NUMBER OF BASIN DEPTH INFORMATION ENTRIES = 6

*BASIN-DEPTH STORAGE		OUTFLOW	**BASIN-DEPTH STORAGE		OUTFLOW	*
* (FEET)	(ACRE-FEET)	(CFS)	** (FEET)	(ACRE-FEET)	(CFS)	*
* 0.000	0.000	0.00000	0.200	0.010	8.700*	
* 0.400	0.080	8.800**	0.600	0.220	9.000*	
* 0.800	0.450	9.200**	1.000	0.720	9.300*	

BASIN STORAGE, OUTFLOW AND DEPTH ROUTING VALUES:

INTERVAL NUMBER	DEPTH (FEET)	{S-O*DT/2} (ACRE-FEET)	{S+O*DT/2} (ACRE-FEET)
1	0.00	0.00000	0.00000
2	0.20	-0.05771	0.07771
3	0.40	0.01152	0.14848
4	0.60	0.14996	0.29004
5	0.80	0.37840	0.52160
6	1.00	0.64762	0.79238

WHERE S=STORAGE (AF) ; O=OUTFLOW (AF/MIN.) ; DT=UNIT INTERVAL (MIN.)

DETENTION BASIN ROUTING RESULTS:

NOTE: COMPUTED BASIN DEPTH, OUTFLOW, AND STORAGE QUANTITIES OCCUR AT THE GIVEN TIME. BASIN INFLOW VALUES REPRESENT THE AVERAGE INFLOW DURING THE RECENT HYDROGRAPH UNIT INTERVAL.

TIME (HRS)	DEAD-STORAGE FILLED (AF)	INFLOW (CFS)	EFFECTIVE DEPTH (FT)	OUTFLOW (CFS)	EFFECTIVE VOLUME (AF)
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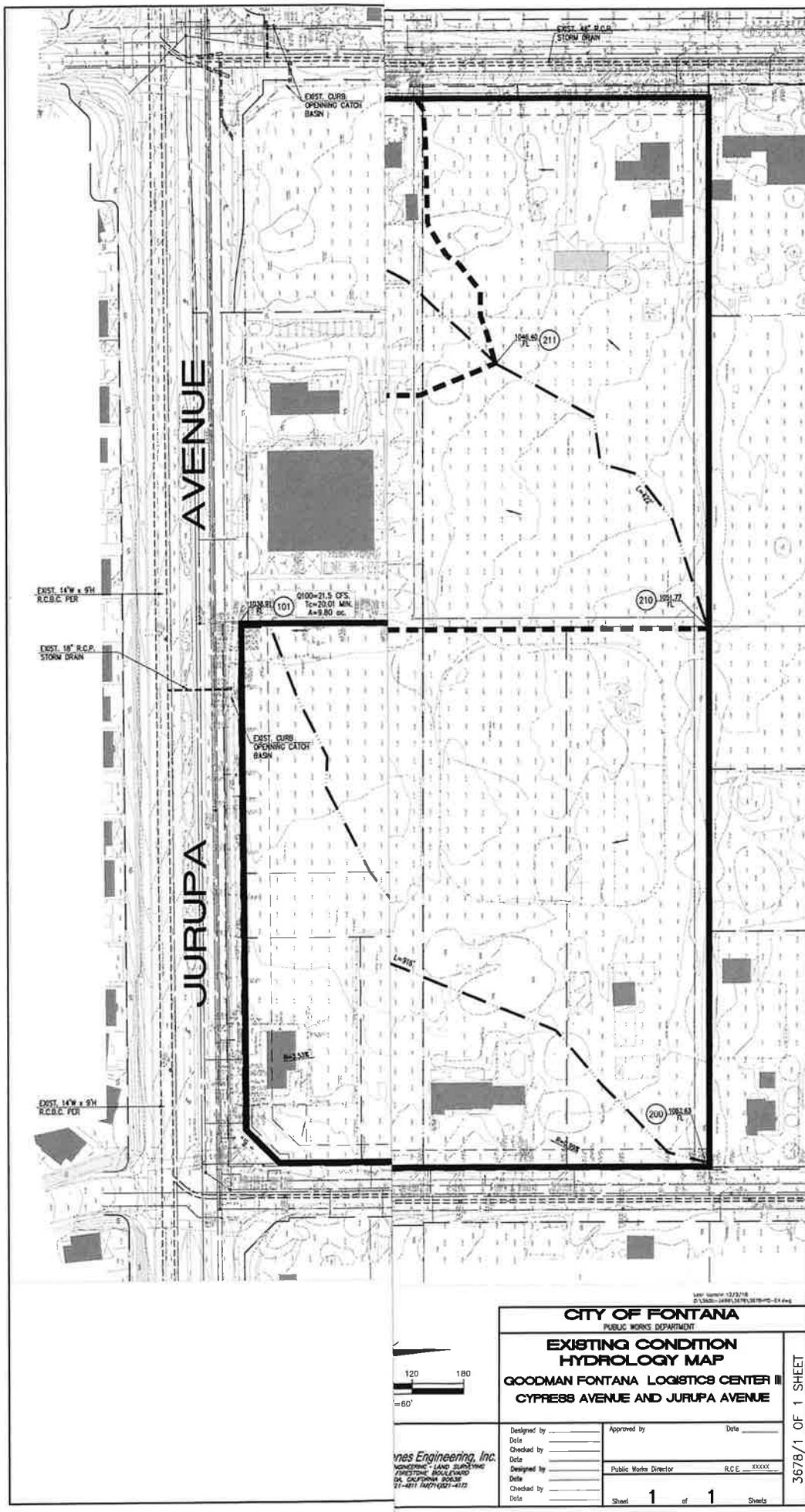
0.180	0.000	1.15	0.05	1.00	0.002
0.368	0.000	1.16	0.05	2.01	0.002
0.557	0.000	1.16	0.05	2.02	0.002
0.745	0.000	1.17	0.05	2.03	0.002
0.933	0.000	1.17	0.05	2.04	0.002
1.122	0.000	1.18	0.05	2.05	0.002
1.310	0.000	1.19	0.05	2.06	0.002
1.498	0.000	1.19	0.05	2.07	0.002
1.687	0.000	1.20	0.05	2.08	0.002
1.875	0.000	1.21	0.05	2.10	0.002
2.063	0.000	1.21	0.05	2.11	0.002
2.252	0.000	1.22	0.05	2.12	0.002
2.440	0.000	1.22	0.05	2.13	0.002
2.628	0.000	1.23	0.05	2.14	0.002
2.817	0.000	1.24	0.05	2.15	0.002
3.005	0.000	1.25	0.05	2.17	0.003
3.193	0.000	1.25	0.05	2.18	0.003
3.382	0.000	1.26	0.05	2.19	0.003
3.570	0.000	1.27	0.05	2.21	0.003
3.758	0.000	1.28	0.05	2.22	0.003
3.947	0.000	1.29	0.05	2.23	0.003
4.135	0.000	1.30	0.05	2.25	0.003
4.323	0.000	1.30	0.05	2.26	0.003
4.512	0.000	1.31	0.05	2.28	0.003
4.700	0.000	1.32	0.05	2.29	0.003
4.888	0.000	1.33	0.05	2.31	0.003
5.077	0.000	1.34	0.05	2.33	0.003
5.265	0.000	1.35	0.05	2.34	0.003
5.453	0.000	1.36	0.05	2.36	0.003
5.642	0.000	1.37	0.05	2.38	0.003
5.830	0.000	1.38	0.06	2.39	0.003
6.018	0.000	1.39	0.06	2.41	0.003
6.207	0.000	1.40	0.06	2.43	0.003
6.395	0.000	1.41	0.06	2.45	0.003
6.583	0.000	1.42	0.06	2.47	0.003
6.772	0.000	1.44	0.06	2.49	0.003
6.960	0.000	1.45	0.06	2.51	0.003
7.148	0.000	1.46	0.06	2.53	0.003
7.337	0.000	1.47	0.06	2.55	0.003
7.525	0.000	1.49	0.06	2.58	0.003
7.713	0.000	1.50	0.06	2.60	0.003
7.902	0.000	1.52	0.06	2.63	0.003
8.090	0.000	1.53	0.06	2.65	0.003
8.278	0.000	1.55	0.06	2.68	0.003
8.467	0.000	1.56	0.06	2.70	0.003
8.655	0.000	1.58	0.06	2.73	0.003
8.843	0.000	1.59	0.06	2.76	0.003
9.032	0.000	1.61	0.06	2.79	0.003
9.220	0.000	1.62	0.07	2.82	0.003
9.408	0.000	1.65	0.07	2.85	0.003
9.597	0.000	1.66	0.07	2.88	0.003
9.785	0.000	1.69	0.07	2.92	0.003
9.973	0.000	1.70	0.07	2.95	0.003
10.162	0.000	1.73	0.07	2.99	0.003
10.350	0.000	1.75	0.07	3.03	0.004
10.538	0.000	1.78	0.07	3.07	0.004
10.727	0.000	1.80	0.07	3.12	0.004
10.915	0.000	1.83	0.07	3.16	0.004
11.103	0.000	1.85	0.07	3.21	0.004
11.292	0.000	1.89	0.08	3.26	0.004
11.480	0.000	1.91	0.08	3.31	0.004
11.668	0.000	1.95	0.08	3.37	0.004
11.857	0.000	1.98	0.08	3.43	0.004
12.045	0.000	2.03	0.08	3.49	0.004
12.233	0.000	1.88	0.08	3.40	0.004
12.422	0.000	1.91	0.08	3.30	0.004
12.610	0.000	1.94	0.08	3.35	0.004
12.798	0.000	2.01	0.08	3.44	0.004
12.987	0.000	2.04	0.08	3.53	0.004
13.175	0.000	2.12	0.09	3.63	0.004

13.363	0.000	2.17	0.09	3.74	0.004
13.552	0.000	2.27	0.09	3.86	0.005
13.740	0.000	2.32	0.09	4.00	0.005
13.928	0.000	2.44	0.10	4.15	0.005
14.117	0.000	2.51	0.10	4.32	0.005
14.305	0.000	2.84	0.11	4.66	0.006
14.493	0.000	2.93	0.12	5.02	0.006
14.682	0.000	3.14	0.13	5.29	0.006
14.870	0.000	3.27	0.13	5.59	0.007
15.058	0.000	3.59	0.14	5.98	0.007
15.247	0.000	3.79	0.15	6.43	0.008
15.435	0.000	4.04	0.16	6.82	0.008
15.623	0.000	3.75	0.15	6.79	0.008
15.812	0.000	5.05	0.20	7.61	0.011
16.000	0.000	6.84	0.28	8.72	0.038
16.188	0.000	23.10	0.66	8.90	0.289
16.377	0.000	4.35	0.59	9.03	0.216
16.565	0.000	4.04	0.49	8.94	0.140
16.753	0.000	3.42	0.33	8.83	0.056
16.942	0.000	3.03	0.12	7.02	0.006
17.130	0.000	2.74	0.11	5.03	0.005
17.318	0.000	2.38	0.10	4.46	0.005
17.507	0.000	2.22	0.09	4.00	0.004
17.695	0.000	2.08	0.08	3.74	0.004
17.883	0.000	1.97	0.08	3.53	0.004
18.072	0.000	1.88	0.08	3.35	0.004
18.260	0.000	2.00	0.08	3.38	0.004
18.448	0.000	1.93	0.08	3.43	0.004
18.637	0.000	1.87	0.07	3.31	0.004
18.825	0.000	1.81	0.07	3.21	0.004
19.013	0.000	1.76	0.07	3.12	0.004
19.202	0.000	1.72	0.07	3.03	0.003
19.390	0.000	1.67	0.07	2.96	0.003
19.578	0.000	1.64	0.07	2.88	0.003
19.767	0.000	1.60	0.06	2.82	0.003
19.955	0.000	1.57	0.06	2.76	0.003
20.143	0.000	1.54	0.06	2.70	0.003
20.332	0.000	1.51	0.06	2.65	0.003
20.520	0.000	1.48	0.06	2.60	0.003
20.708	0.000	1.45	0.06	2.55	0.003
20.897	0.000	1.43	0.06	2.51	0.003
21.085	0.000	1.41	0.06	2.47	0.003
21.273	0.000	1.38	0.06	2.43	0.003
21.462	0.000	1.36	0.05	2.39	0.003
21.650	0.000	1.34	0.05	2.36	0.003
21.838	0.000	1.33	0.05	2.33	0.003
22.027	0.000	1.31	0.05	2.29	0.003
22.215	0.000	1.29	0.05	2.26	0.003
22.403	0.000	1.27	0.05	2.23	0.003
22.592	0.000	1.26	0.05	2.21	0.003
22.780	0.000	1.24	0.05	2.18	0.002
22.968	0.000	1.23	0.05	2.15	0.002
23.157	0.000	1.22	0.05	2.13	0.002
23.345	0.000	1.20	0.05	2.11	0.002
23.533	0.000	1.19	0.05	2.08	0.002
23.722	0.000	1.18	0.05	2.06	0.002
23.910	0.000	1.17	0.05	2.04	0.002
24.098	0.000	1.15	0.05	2.02	0.002
24.287	0.000	0.00	0.00	1.01	0.000

← Peak Q

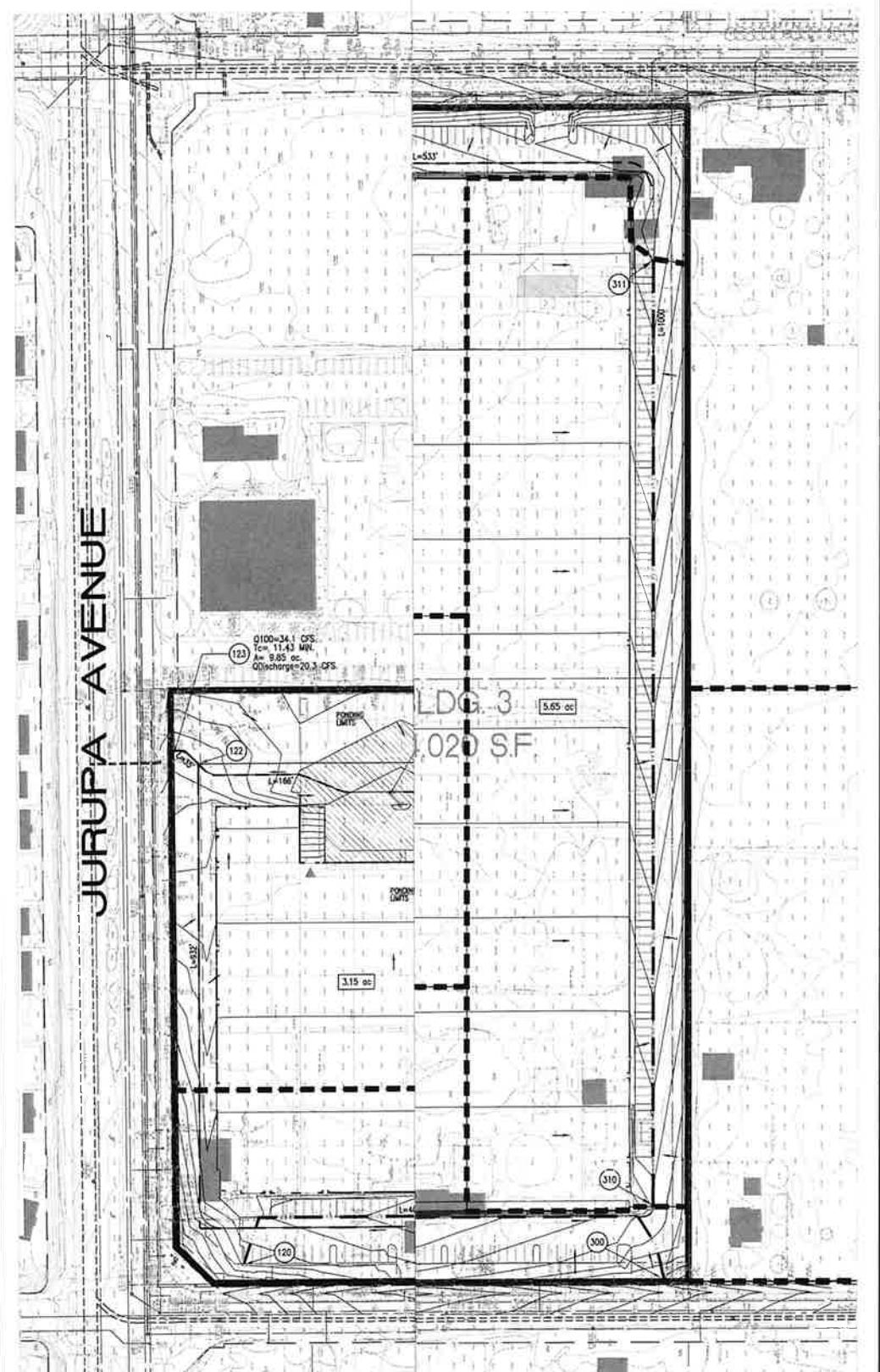
APPENDIX D

HYDROLOGY MAP

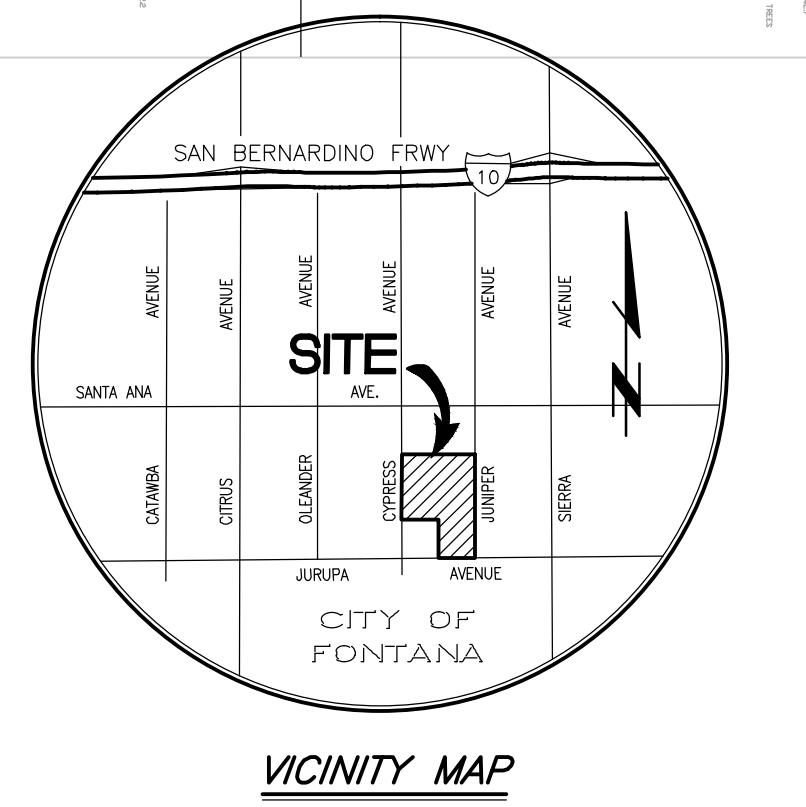
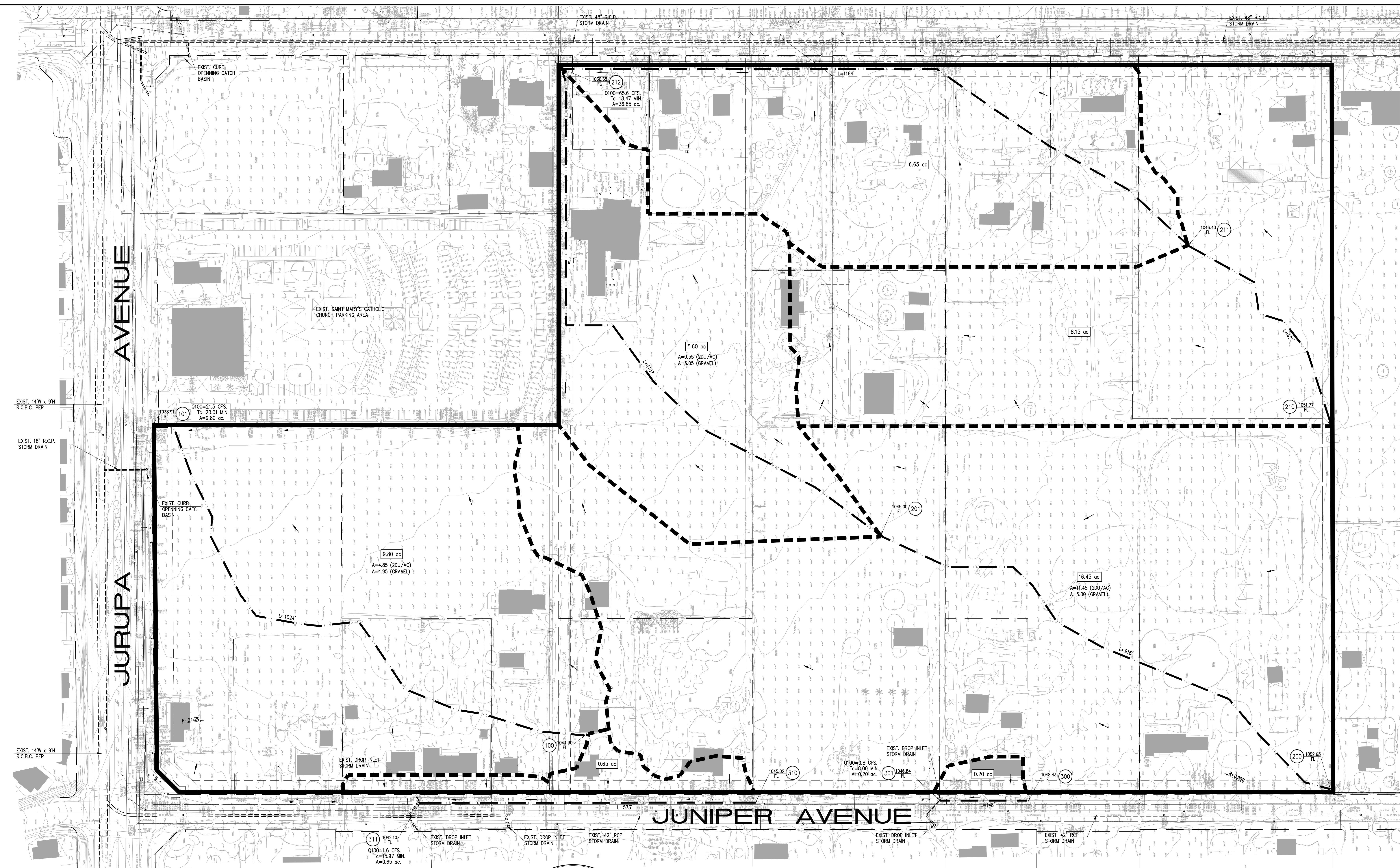


SHEET NUMBER 10/27/18
D:\\3D\\01-14913\\101\\101\\101\\101.dwg

CITY OF FONTANA PUBLIC WORKS DEPARTMENT		
EXISTING CONDITION HYDROLOGY MAP		
GOODMAN FONTANA LOGISTICS CENTER III CYPRESS AVENUE AND JURUPA AVENUE		
Jones Engineering, Inc. VISIONING • LAND SURVEYING FIRESTONE BOULEVARD DA CAZIER, CALIFORNIA 92321-4172 909-871-1407/8021-4172	Designed by _____ Date _____ Checked by _____ Date _____ Designed by _____ Date _____ Checked by _____ Date _____	Approved by _____ Date _____ Public Works Director R.C.E. _____
Sheet 1 of 1 Sheets		



CITY OF FONTANA PUBLIC WORKS DEPARTMENT		Last Updated 2/19 Fontana, CA 92335, 3400000000
PROPOSED CONDITION HYDROLOGY MAP		
GOODMAN FONTANA LOGISTICS CENTER #11 CYPRESS AVENUE AND JURUPA AVENUE		
Designed by _____ Date _____ Checked by _____ Date _____ Designed by _____ Date _____ Checked by _____ Date _____	Approved by _____ Public Works Director R.C.E. _____	Date _____
Sheet 1 of 1 Sheets		3638/1 OF 1 SHEET



LEGEND	
PROJECT BOUNDARY	SUBAREA BOUNDARY
SUBAREA AREA	
NODE NUMBER	
1.00 AC.	
100	

PREPARED FOR:
GNA
 18201 VON KARMAN #1170
 IRVINE, CA 92612
 PHONE: (949) 502-5500
 FAX: (949) 502-5505

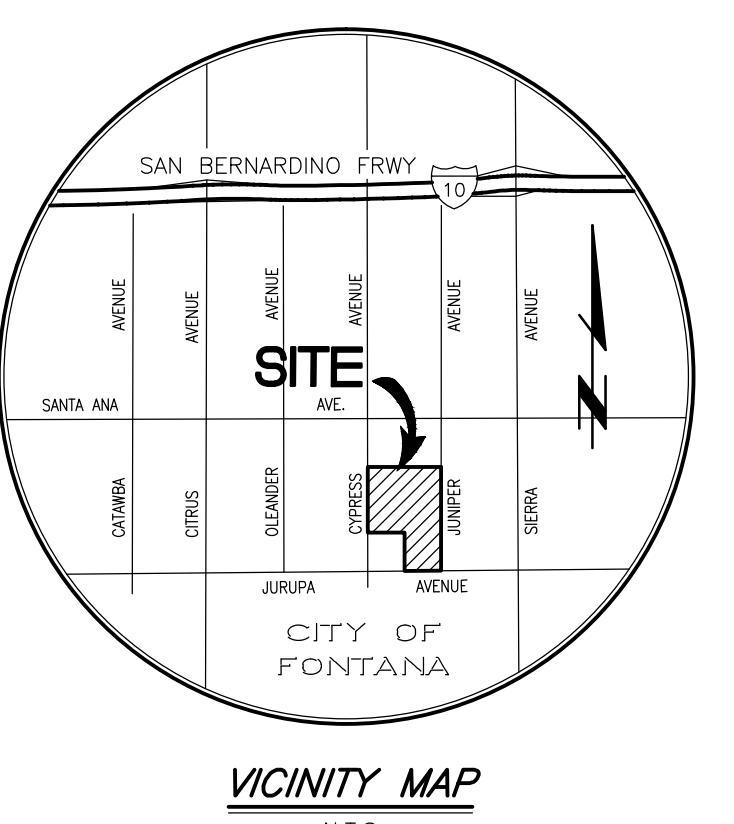
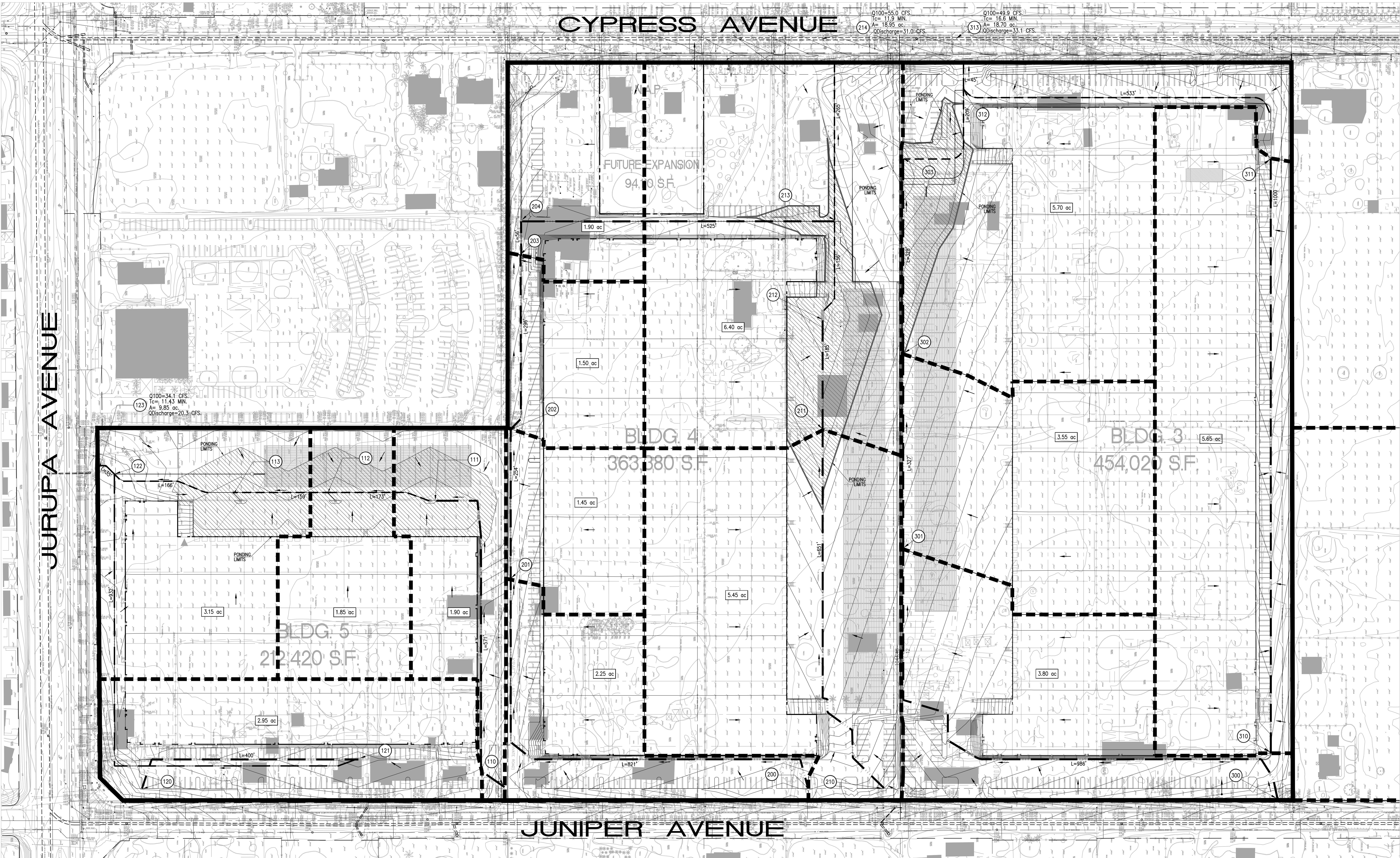
Thienes Engineering, Inc.
 CIVIL ENGINEERING • LAND SURVEYING
 LA MIRADA, CALIFORNIA 90638
 PH: (714) 521-4811 FAX: (714) 521-4173

Designed by _____	Approved by _____
Date _____	Date _____
Checked by _____	Date _____
Date _____	Design by _____
Designed by _____	Date _____
Date _____	Checked by _____
Public Works Director	R.C.E. XXXXX
Sheet 1 of 1 Sheets	

CYPRESS AVENUE

JURUPA AVENUE

JUNIPER AVENUE



LEGEND	
PROJECT BOUNDARY	SUBAREA BOUNDARY
—	- - -
1.00 AC.	SUBAREA AREA
100	NODE NUMBER

0 30 60 120 180
SCALE: 1" = 60'

PREPARED FOR:
GLC FONTANA III, LLC
18201 VON KARMAN #1170
IRVINE, CA 92612
PHONE: (949) 407-0142
FAX: (949) 502-5505

T**H****E**
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
LA MARINA, CALIFORNIA 92531
PA: (714) 521-4811 FAX: (714) 521-4173

CITY OF FONTANA PUBLIC WORKS DEPARTMENT	
PROPOSED CONDITION HYDROLOGY MAP	
GOODMAN FONTANA LOGISTICS CENTER III CYPRESS AVENUE AND JURUPA AVENUE	
Designed by Date	Approved by Date
Checked by Date	
Designed by Date	
Checked by Date	
Public Works Director R.C.E. XXXXX	
Sheet 1 of 1 Sheets	