Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING

PRELIMINARY HYDROLOGY CALCULATIONS

FOR

PROPOSED BUILDINGS
ECKOFF STREET AND POPLAR STREET
ORANGE, CALIFORNIA

PREPARED FOR

IDI ECKHOFF ORANGE LLC
840 APOLLO STREET, SUITE 343
EL SEGUNDO, CA 90245
P. (213) 330-8066

NOVEMBER 1, 2020
APRIL 14, 2021
AUGUST 23, 2021
MAY 26, 2022
NOVEMBER 2, 2022

JOB NO. 3910

PREPARED BY

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

PRELIMINARY HYDROLOGY CALCULATIONS

FOR

ECKOFF STREET AND POPLAR STREET

PREPARED UNDER
THE SUPERVISION OF

11 / 2 / 22

REINHARD STENZEL DATE:
R.C.E. 56155
EXP. 12/31/22

INTRODUCTION

A: PROJECT LOCATION

The project site is located on the easterly side of Eckoff Street south of the B.N.S.F Railroad in the City of Orange. Poplar Street is at the easterly portion of the project site. See follow page for vicinity map.

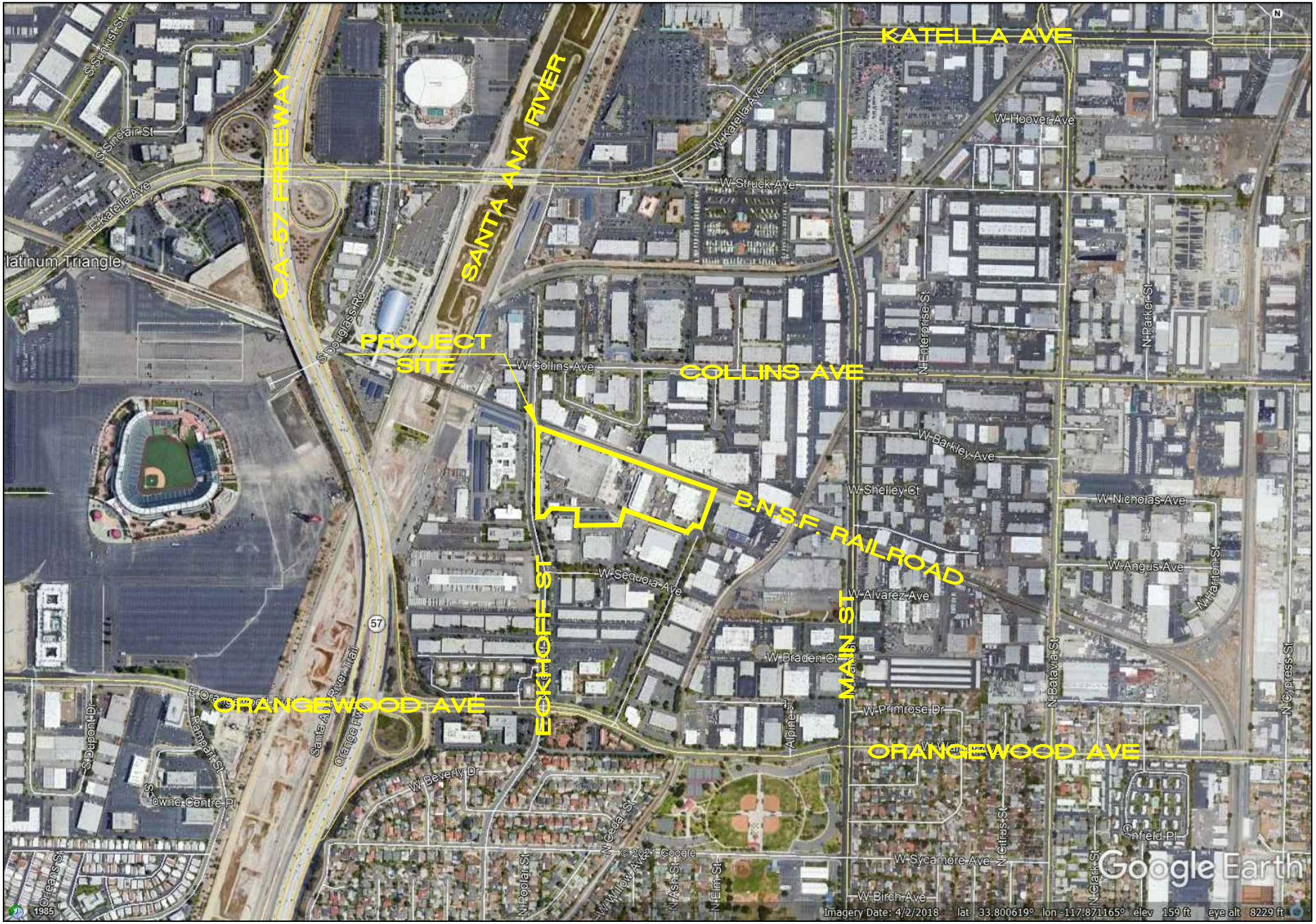
B: STUDY PURPOSE

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

C: PROJECT STAFF:

Thienes Engineering staff involved in this study include:

Reinhard Stenzel
Brian Weil



Last Update: 3/26/21
O:\3900-3999\3910\3910VicMap.dwg

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

VICINITY MAP

FOR

ECKHOFF STREET

DISCUSSION

The project site encompasses approximately 12.7 acres. Proposed improvements consists of two warehouse type buildings. Building 1 is the westerly building and is approximately 189,566 square feet while Building 2 is the easterly building with approximately 103,196 square feet. Each building has a truck yard area and vehicle parking around the site. This is landscaping adjacent to Eckoff Street and smaller areas throughout the project site.

Master Plan Hydrology

The City of Orange's Master Plan of Drainage tables the project site to two distinct drainage areas. Approximately 4.0 acres of the westerly portion of the project site is part of Watershed 14 and is tabled to a proposed public storm drain system in Eckoff Street near the southerly portion of the project site. The remaining 8.7 acres of the project site is part of Watershed 16 and is tabled to the Poplar Street cul-de-sac. Runoff in Poplar Street continues southerly to an existing storm drain system located at the corner of Poplar Street and Sequoia Avenue. This is a 54" storm drain that traverses easterly to the Bitterbush Channel. The existing storm drain plan does not indicate any hydrologic or hydraulic data.

Note that the Master Plan of Drainage boundary between the two watersheds is not consistent with the grading and drainage features of the commercial site under existing conditions. This is discussed in further detail below.

Please see Appendix "A" for the Master Plan of Drainage, as-built storm drain plans and other pertinent reference materials.

Existing Condition

The project site is an existing commercial/industrial development consisting of several large buildings and various smaller structures, sheds and storage areas. Existing drainage patterns differ from the City's Master Plan of Drainage as follows:

- Approximately 3.9 acres of the existing parking areas, storage areas and portions of the larger westerly building drain to Eckoff Street via parkway drains or simply flowing out the driveways. Here, the drainage area is consistent with the Master Plan area to Eckoff Street, although the drainage boundary is not.

- The northerly portion of the large westerly building, the center building, and parking areas around these buildings drain to an existing small concrete channel that traverses southerly through the center of the project site. Approximately 5.0 acres of the site drains to this channel. The channel appears to drain to an underground conduit that daylights into a rectangular channel on the adjacent site to the south. This channel continues southerly and discharges to Sequoia Avenue, ultimately to the existing 54" public storm drain. This is not consistent with the smaller localized areas of the Master Plan of Drainage, but is ultimately part to the same larger drainage area.

- A small portion of the westerly site (approximately 1.4 acres) drains to a grated inlet near the southeasterly corner of the larger building. It would appear that this flow drains to the existing channel described above.

- The easternmost building and surrounding parking areas currently drain to the Poplar Street cul-de-sac via parkway culverts or flow out the driveway. This accounts for approximately 4.45 acres of the site. This area is consistent with a portion of the Master Plan of Drainage.

Note that there is an existing commercial building and parking area near the southwesterly corner of the site that currently drains to the project site. This area is approximately 0.50 acres and drains to an existing "v"-gutter within the project site that sheet flows to Eckoff Street via the existing driveway.

Also included is runoff from the southerly half of the railroad right-of-way that is adjacent to the northerly property line (approximately 0.60 acres). In general, there is an onsite curb that blocks this flow from sheet flowing into the site. However, there appears to be a few areas where portions of this flow can enter the site. Conservatively, this entire area is added to both existing and proposed condition hydrology calculations.

The existing condition 100-year peak flow rate to Eckoff Street is approximately 18.2 cfs. this is a direct sum of the individual drainage areas, nodes 101, 111, 121 and 131 as shown on the existing condition hydrology map. The existing condition 100-year peak flow rate to Poplar Street is approximately 10.0. cfs (addition of flow from nodes 302 and 311). The existing condition 100-year peak flow rate to the existing channel is approximately 21.9 cfs (16.1 cfs at node 212 + 5.8 cfs at node 141). The total 100-year peak flow rate to the existing storm drain at Sequoia Street and Poplar Street is about 31.9 cfs.

See Appendix "A" for existing condition hydrology calculations and Appendix "D" for hydrology map.

Proposed Condition

Proposed conditions will alter the existing condition drainage patterns as well as drainage divides shown in the City's Master Plan of Drainage. The tributary runoff to Eckoff Street will be reduced, thus providing relief to the street and downstream facilities. An onsite storm drain system is proposed to direct the majority of the project site easterly to a proposed storm drain in Poplar Street. This storm drain will continue southerly and connect to the existing 54" storm drain system.

Runoff from the westerly portion of the Building 1 site and existing portions of the southwest corner of the site will continue to drain to Eckoff Street. Runoff from the existing building and parking area to the south will continue to drain to the existing "v"-gutter that will remain. The total 100-year peak flow rate to Eckoff Street under proposed conditions is approximately 4.6 cfs.

Runoff from the remainder of Building 1 will be collected in catch basins generally located in the truck yard and southerly parking areas. A storm drain system will collect and convey flows easterly through the Building 2 portion of the project site.

Runoff from the Building 2 portion of the project site will be collected in catch basins located in the truck yard area and the easterly parking lot. Onsite storm drain laterals will convey flows to the previously mentioned storm drain system. The total 100-year peak flow rate, undetained, is approximately 52.5 cfs, undetained.

The proposed storm drain system will continue southerly in Poplar Street approximately 400' to the existing 54" storm drain system.

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

Detention Analysis

Since there has been some redirection of runoff with additional area tributary to the existing storm drain at the corner of Poplar Street and Sequoia Avenue, detention will be utilized to reduce runoff to less than existing conditions and that from the City's Master Plan of Drainage.

Temporary detention areas are located in the northerly truck yard associated with Building 1 and the truck yard located on the southerly side of Building 2. For Building 1, storm drains are sized to discharge a limited amount of flow with the remainder of the volume to be temporarily stored on the surface of the truck yard areas. Detention analysis shows that approximately 6.4 cfs can discharge from this location with the remaining 20.0 cfs stored at a maximum depth of about 0.68'.

The Building 2 truck yard has less storage, but has some detention capabilities. Here, approximately 5.1 cfs can discharge with the remaining 2.6 cfs temporarily stored at a depth of about 0.54'.

With onsite detention, the overall 100-year peak flow rate to the existing storm drain is reduced to approximately 30.5 cfs (53.1 cfs – 20 cfs at Building 1 – 2.6 cfs at Buiding 2). This is slightly less than the existing condition peak flow rate that currently drains to the existing storm drain facility at Poplar Street and Sequoia Street (31.9 cfs).

See Appendix "C" for detention calculations.

Methodology

Hydrology calculations were computed using Orange County Rational Method program (by AES Software). The soil type is "A" per the Orange County Hydrology Manual. See Appendix "A" for reference materials. Orange County small area hydrograph program was

used (also by AES Software) was used for detention calculations. See Appendix "A" for soil type map.

Summary

The proposed improvements associated with the project site will redirect the majority of runoff to the existing storm drain system at Poplar Street. With onsite detention, the peak flow rate from the project site can be reduced to less than existing conditions and be consistent with discharge rates from the Master Plan of Drainage. In addition, the onsite drainage system improves localized drainage as follows:

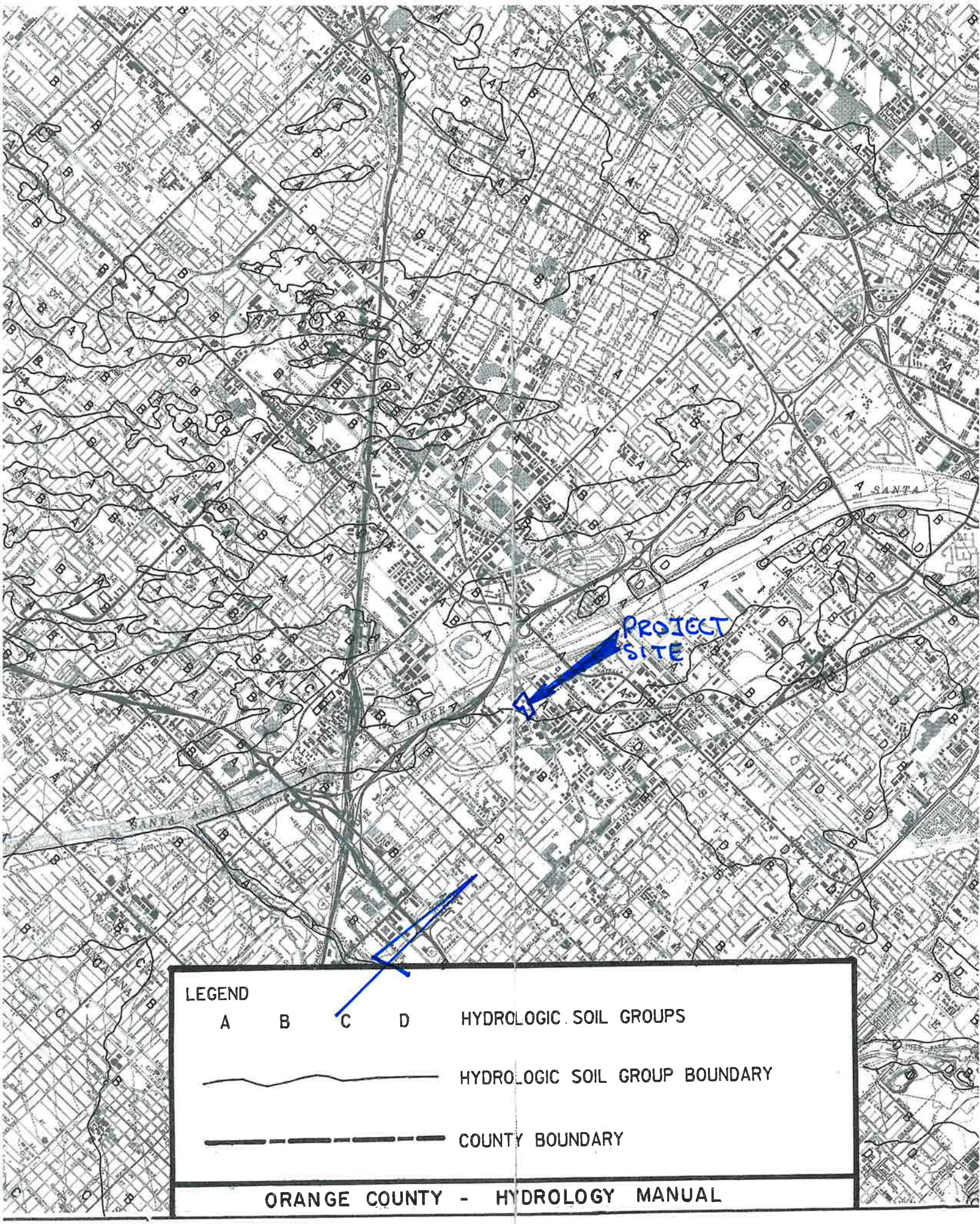
- Runoff to Eckoff Street is reduced, thus providing relief to the street and the existing downstream existing facility.
- Runoff to the existing development at the south is eliminated. This reduces flow to adjacent properties and Sequoia Avenue.
- Runoff to Poplar Street is eliminated.
- Runoff is conveyed to an existing facility in an amount that is less than existing conditions.

With onsite detention and the proposed storm drain improvements, discharge from the site will not adversely affect downstream facilities.

APPENDIX	DESCRIPTION
A	REFERENCE MATERIALS
B	HYDROLOGY CALCULATIONS
C	DETENTION CALCULATIONS
D	HYDROLOGY MAPS

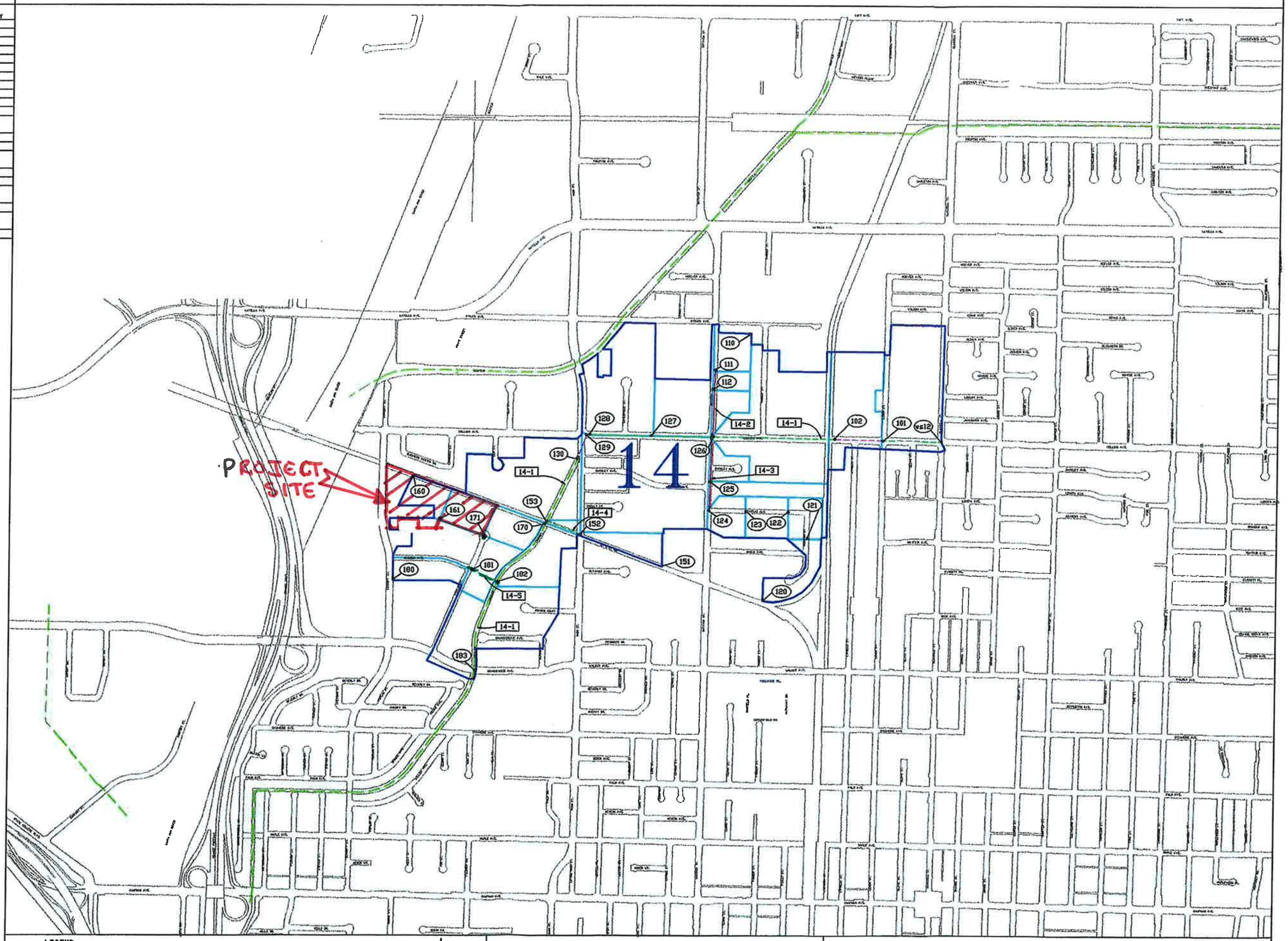
APPENDIX A

REFERENCE MATERIALS


PROJECT SITE
SANTA ANA
SANTA ANA
RIVER
LEGEND
A B C D
HYDROLOGIC SOIL GROUPS
HYDROLOGIC SOIL GROUP BOUNDARY
COUNTY BOUNDARY
ORANGE COUNTY - HYDROLOGY MANUAL

HYDROLOGIC DATA TABLE

LINE NO. & U/S NODE	D/S NODE	LENGTH	EXISTING FACILITY	RECOMMENDED FACILITY	LINE PRIORITY
LINE 14-1					3
WS12	101	680	48"	-	
101	102	600	48"	24"	
102	126	1400	48"	-	
126	127	690	8'x 3.5' RCB	-	
127	128	710	8'x 3.5' RCB	-	
128	129	50	7'x 4' RCB	-	
129	130	310	60"	39"	
130	153	800	6'x 9'x 1.5 E.C.	REGIONAL	
153	152	900	6'x 9'x 1.5 E.C.	REGIONAL	
152	151	1050	6'x 9'x 1.5 E.C.	REGIONAL	
LINE 14-2					-
111	112	250	-	24"	
112	126	550	-	24"	
LINE 14-3					3
124	125	280	-	33"	
125	126	570	-	30"	
LINE 14-4					-
152	153	430	EARTH DITCH	-	
LINE 14-5					-
181	182	300	54"	-	-



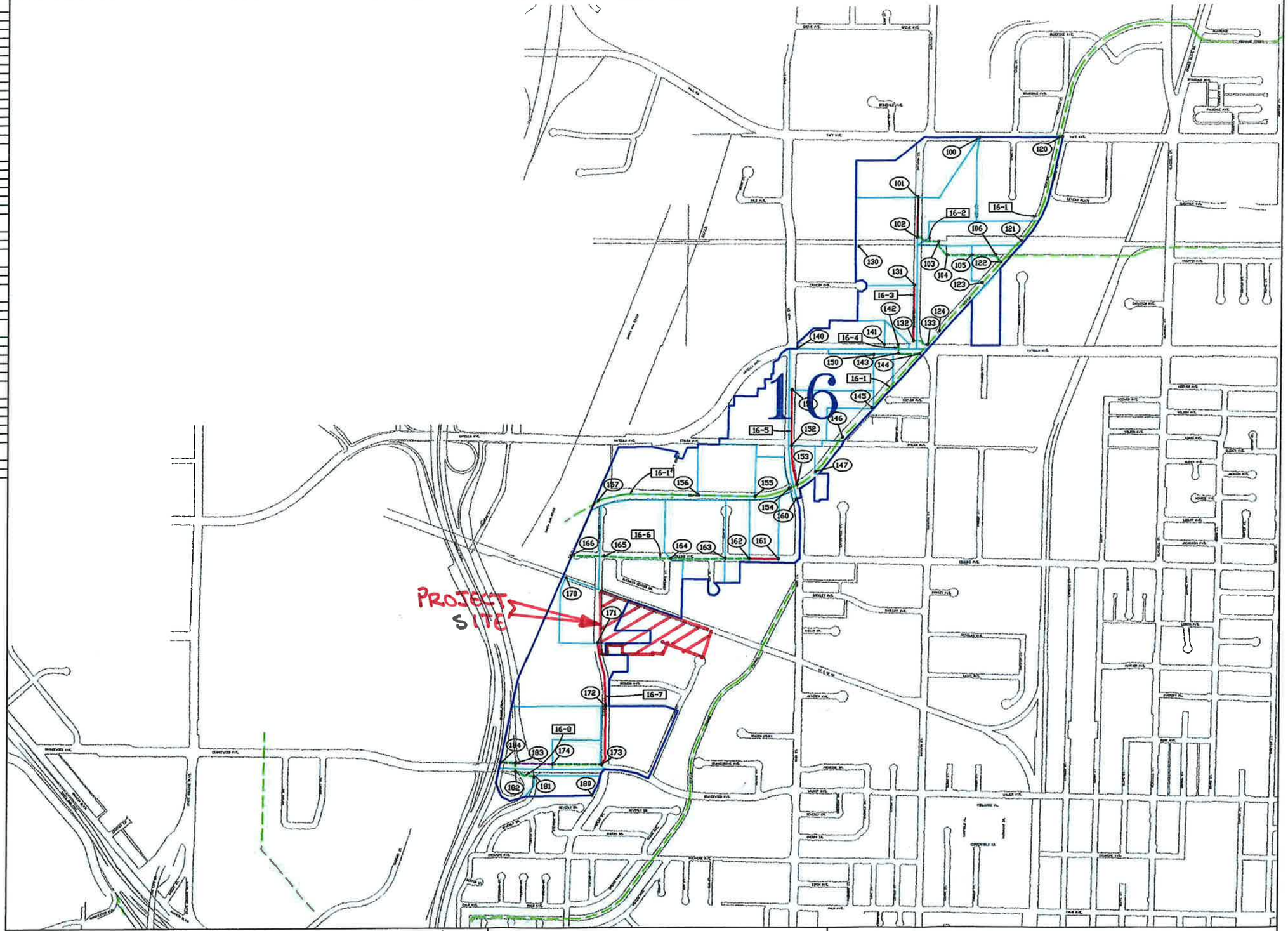
LEGEND:
- SUBAREA BOUNDARY
- EXISTING FACILITY
- EXISTING FACILITY TO BE IMPROVED
- PROPOSED FACILITY
- WATERSHED BOUNDARY
- REGIONAL FACILITY
- (101) - NODE NUMBER
- [10-1] - LINE NUMBER

WILLIAMSON & SCHMID
CONSULTING CIVIL ENGINEERS AND LAND SURVEYORS

CITY OF ORANGE
MASTER PLAN OF DRAINAGE
WATERSHED NO. 14

HYDROLOGIC DATA TABLE

LINE NO. & U/S NODE	D/S NODE	LENGTH	EXISTING FACILITY	RECOMMENDED FACILITY	LINE PRIORITY
LINE 16-1					-
120	121	1250	8'x 12'x 1 E.C.	REGIONAL	
121	122	300	8'x 12'x 1 E.C.	REGIONAL	
122	123	500	8'x 12'x 1 E.C.	REGIONAL	
123	124	670	8'x 12'x 1 E.C.	REGIONAL	
124	133	250	2- 10'x 10' RCB	REGIONAL	
133	144	100	2- 10'x 10' RCB	REGIONAL	
144	145	640	16'x11.5'x 1.5 E.C.	REGIONAL	
145	146	800	16'x11.5'x 1.5 E.C.	REGIONAL	
146	147	500	16'x 13'x 1.5 E.C.	REGIONAL	
147	153	170	16'x 13'x 1.5 E.C.	REGIONAL	
153	154	100	2- 10'x 10' RCB	REGIONAL	
154	155	450	16'x 13'x 1.5 E.C.	REGIONAL	
155	156	650	16'x 13'x 1.5 E.C.	REGIONAL	
156	157	1250	16'x 13'x 1.5 E.C.	REGIONAL	
LINE 16-2					3
101	102	530	-	33'	
102	103	250	V-DITCH	-	
103	104	200	48"	-	
104	105	300	42"	-	
105	106	260	V-DITCH	-	
106	122	80	48"	-	
LINE 16-3					3
131	132	640	-	27'	
132	133	100	24"	-	
LINE 16-4					-
142	143	110	24"	-	
143	144	230	24"	-	
LINE 16-5					3
151	152	550	-	24"	
152	153	500	-	30"	
LINE 16-6					3
161	162	340	-	24"	
162	163	290	30"	-	
163	164	620	36"	-	
164	165	760	45"	-	
165	166	590	48"	-	
LINE 16-7					3
171	172	730	-	27'	
172	173	650	-	36'	
173	174	550	42"	-	
174	183	400	42"	24"	
183	184	350	48"	-	
LINE 16-8					-
181	182	200	24"	-	
182	183	100	24"	-	



LEGEND:
- SUBAREA BOUNDARY
- EXISTING FACILITY
- EXISTING FACILITY TO BE IMPROVED
- PROPOSED FACILITY
- WATERSHED BOUNDARY
- REGIONAL FACILITY
- (106) – NODE NUMBER
- [16-1] – LINE NUMBER

WILLIAMSON & SCHMID
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CITY OF ORANGE
MASTER PLAN OF DRAINAGE
WATERSHED NO. 16

TOP OF NORTH CURB

NATURAL GROUND @ NORTH CURB

℄ PROFILE

NATURAL GROUND @ ℄

TOP OF SOUTH CURB

NATURAL GROUND @ SOUTH CURB

CONST. 850.00 L.F. 8" R.C.P. SEWER @ S=0.40%

CONST. 850.00 L.F. 8" R.C.P. SEWER @ S=0.40%

CONST. 109.98 L.F. 30" R.C.P. @ S=0.20% 1500-D

CONST. 279.68 L.F. 54" C.I.P. @ S=10.20%

CONST. 97.69 L.F. 30" R.C.P. @ S=0.20% 1500-D

CONST. 87' "L.F. 54" R.C.P. 1500-D @ S=0.20% SEE DETAILS ON SHEET NO.1 FOR THIS AREA

SEE CATCH BASIN BELOW

SEE CATCH BASIN ABOVE

SEE ABOVE & BELOW FOR 30" R.C.P.

FINISH GRADE ABOVE STORM DRAIN

8" V.C.P. SEWER MAIN

PROFILE SCALE
HORZ: 1"=40'
VERT: 1"=4'

0 1 2 3 4 5 6 7 8 9 10

1150 1150 150 150 150

30" R.C.P. 1500-D

6" SAND BEDDING MIN.

P.C.C. BACKFILL TO 6" ABOVE TOP OF PIPE

BEDDING DETAIL
30" R.C.P.
NO SCALE

SCALE 1"=40'

E 1137 SEWER

E 1137 10" C.I.P. WATER MAIN

10 X 10 TAP BY CITY CHARGED TO DEVELOPER

CURB RET. DATA
Δ = 39° 29'
R = 32.00'
L = 44.34'
T = 23.54'

10 X 10 TEE & 6" G.V. P.H.

CONST. 10" C.I.P. WATER MAIN

10 X 6 TEE 6" G.V. P.H. 10" G.V.

R.C.C. CHANNEL OUTLET (SEE LOADING PLAN FOR DETAILS)

CURB DATA
Δ = 18° 54' 22"
R = 424.00'
L = 139.91'
T = 70.60'

CONST. INLET TYPE OL CATCH BASIN PER STD PLAN 0-302A L=10' V=5.18' LOCAL DEPRESSION PER STD PLAN 0-307

CURB RET. DATA
Δ = 85° 05' 35"
R = 32.00'
L = 47.52'
T = 29.62'

10 X 6 TEE & 6" G.V. P.H.

CURB RET. DATA
Δ = 94° 51' 34"
R = 32.00'
L = 52.79'
T = 34.69'

CURB RET. DATA
Δ = 101° 07' 18"
R = 32.00'
L = 56.48'
T = 38.90'

CONST. INLET TYPE OL CATCH BASIN PER STD PLAN 0-302A L=10' V=5.11' LOCAL DEPRESSION PER STD PLAN 0-307

CURB DATA
Δ = 18° 54' 22"
R = 375.00'
L = 124.07'
T = 62.60'

E 1137 SEWER

ECKOFF STREET SEE SHEET 2

PACIFIC STREET SEE SHEET 6

SEQUOIA AVE. PACIFIC ST.

10 X 10 TEE & 10" G.V.

FOR CATCH BASIN CONST. SEE SHEET 6

SEE SHEET 6

10' EASEMENT FOR STORM DRAIN

SEE DETAIL ON SHEET 1

CONSTRUCTION NOTES

3. 5" R.E. OVER C.T.B. PAVEMENT W/ S.C.-70 PRIME COAT.
4. CONC. CURB & GUTTER PER STD PLAN 0-110
9. 6" R.C.P. SEWER MAIN
11. PRECAST CONC. M.H. PER STD PLAN 0-801
12. 30" R.C.P. 1500-D
13. 54" C.I.P. 1500-D
15. INLET TYPE OL CATCH BASIN PER STD PLAN 0-302A
16. CHANNEL ENTRANCE - SEE DET. ON SHEET 1
17. LOCAL DEPRESSION PER STD PLAN 0-307
18. INSTALL ST. LIGHT (BY OTHERS).

SEQUOIA AVENUE

SCALE 1"=40'

SHEET 7 OF SHEETS 7

SP 1978

Index Title
Re Grading Plan
O.W. 222

S.P. 1978
Sheet 7 of 7
Street Improvement Plan

APPENDIX B

HYDROLOGY CALCULATIONS

EXISTING CONDITION

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
               (Reference: 1986 OCEMA 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 **************************
* ECKOFF STREET                                                           *
* EXISTING CONDITION NODES 100-101                                        *
* 100-YEAR                                                                *
 **************************************************************************

  FILE NAME: C:\XDRIVE\3910\EXA.DAT
  TIME/DATE OF STUDY: 14:33 10/29/2020
==========================================================================
  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
  *DATA BANK RAINFALL USED*
  *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) =   107.00
  ELEVATION DATA: UPSTREAM(FEET) =    158.50  DOWNSTREAM(FEET) =    156.78

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.187
  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                  A        0.35      0.40       0.10     52    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =      1.94
  TOTAL AREA(ACRES) =      0.35   PEAK FLOW RATE(CFS) =      1.94
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =      0.35  TC(MIN.) =      5.00
  EFFECTIVE AREA(ACRES) =      0.35  AREA-AVERAGED Fm(INCH/HR)=  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.10
  PEAK FLOW RATE(CFS)    =      1.94
==========================================================================
==========================================================================
  END OF RATIONAL METHOD ANALYSIS

1
```

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**************************************************************************
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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 **************************
* ECKOFF STREET                                                           *
* EXISTING CONDITION NODES 110-111                                        *
* 100-YEAR                                                                *
 **************************************************************************

  FILE NAME: C:\XDRIVE\3910\EXB.DAT
  TIME/DATE OF STUDY: 14:36 10/29/2020
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  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
  *DATA BANK RAINFALL USED*
  *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) =   214.00
  ELEVATION DATA: UPSTREAM(FEET) =    159.25  DOWNSTREAM(FEET) =    157.66

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.932
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.131
  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                  A        0.10      0.40       0.10    52    6.93
  NATURAL GOOD COVER
  "GRASS"                     A        0.10      0.40       1.00    58   21.32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.55
  SUBAREA RUNOFF(CFS) =      0.88
  TOTAL AREA(ACRES) =      0.20   PEAK FLOW RATE(CFS) =      0.88
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =      0.20  TC(MIN.) =      6.93
  EFFECTIVE AREA(ACRES) =      0.20  AREA-AVERAGED Fm(INCH/HR)=  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.55
  PEAK FLOW RATE(CFS)    =      0.88
==========================================================================
**************************************************************************
  END OF RATIONAL METHOD ANALYSIS

1
```

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

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

 ************************** DESCRIPTION OF STUDY **************************
* ECKOFF STREET                                                           *
* EXISTING CONDITION NODES 120-121                                        *
* 100-YEAR                                                                *
 **************************************************************************

  FILE NAME: C:\XDRIVE\3910\EXC.DAT
  TIME/DATE OF STUDY: 14:38 10/29/2020
==========================================================================
  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
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*


**************************************************************************
  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) =   255.00
  ELEVATION DATA: UPSTREAM(FEET) =    159.00  DOWNSTREAM(FEET) =    156.60

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.092
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.064
  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                  A        2.10      0.40       0.10    52    7.09
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =      9.50
  TOTAL AREA(ACRES) =      2.10   PEAK FLOW RATE(CFS) =      9.50
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =      2.10  TC(MIN.) =      7.09
  EFFECTIVE AREA(ACRES) =      2.10  AREA-AVERAGED Fm(INCH/HR)=  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.10
  PEAK FLOW RATE(CFS)    =      9.50
==========================================================================
==========================================================================
  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 **************************
* ECKOFF STREET                                                           *
* EXISTING CONDITION NODES 130-131                                        *
* 100-YEAR                                                                *
 **************************************************************************

  FILE NAME: C:\XDRIVE\3910\EXD.DAT
  TIME/DATE OF STUDY: 14:41 10/29/2020
==========================================================================
  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
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*


**************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    131.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   646.00
  ELEVATION DATA: UPSTREAM(FEET) =    158.29  DOWNSTREAM(FEET) =    156.26

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.809
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.609
  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                  A        1.85      0.40        0.10    52   12.81
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =      5.94
  TOTAL AREA(ACRES) =      1.85   PEAK FLOW RATE(CFS) =      5.94
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =       1.85  TC(MIN.) =     12.81
  EFFECTIVE AREA(ACRES) =       1.85  AREA-AVERAGED Fm(INCH/HR)=  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.10
  PEAK FLOW RATE(CFS)    =       5.94
==========================================================================
==========================================================================
  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 **************************
* ECKOFF STREET                                                           *
* EXISTING CONDITION NODES 140-141                                        *
* 100-YEAR                                                                *
 **************************************************************************

  FILE NAME: C:\XDRIVE\3910\EXE.DAT
  TIME/DATE OF STUDY: 14:43 10/29/2020
==========================================================================
  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
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*


**************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    141.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   256.00
  ELEVATION DATA: UPSTREAM(FEET) =    159.00  DOWNSTREAM(FEET) =    157.87

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.264
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.639
  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                 A        1.40      0.40        0.10    52    8.26
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =      5.80
  TOTAL AREA(ACRES) =      1.40   PEAK FLOW RATE(CFS) =      5.80
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =      1.40  TC(MIN.) =      8.26
  EFFECTIVE AREA(ACRES) =      1.40  AREA-AVERAGED Fm(INCH/HR)=  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.10
  PEAK FLOW RATE(CFS)    =      5.80
==========================================================================
==========================================================================
  END OF RATIONAL METHOD ANALYSIS

1
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**************************************************************************
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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 **************************
* ECKOFF STREET                                                           *
* EXISTING CONDITION NODES 200-212                                        *
* 100-YEAR                                                                *
 **************************************************************************

  FILE NAME: C:\XDRIVE\3910\EXF.DAT
  TIME/DATE OF STUDY: 14:49 10/29/2020
==========================================================================
  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
  *DATA BANK RAINFALL USED*
  *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) =   300.00
  ELEVATION DATA: UPSTREAM(FEET) =    158.50  DOWNSTREAM(FEET) =    157.70

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.739
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.223
  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                  A        1.05      0.40        0.10    52    9.74
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =      3.95
  TOTAL AREA(ACRES) =      1.05   PEAK FLOW RATE(CFS) =      3.95

**************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  MAINLINE Tc(MIN) =   9.74
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.237
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp          Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "OPEN BRUSH"                A        0.35      0.40        1.00    81
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =     0.35      SUBAREA RUNOFF(CFS) =     1.21
  EFFECTIVE AREA(ACRES) =     1.40    AREA-AVERAGED Fm(INCH/HR) =  0.13
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.32
  TOTAL AREA(ACRES) =     1.40        PEAK FLOW RATE(CFS) =       5.18

**************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =   9
--------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
==========================================================================
  UPSTREAM NODE ELEVATION(FEET) =    157.70
  DOWNSTREAM NODE ELEVATION(FEET) =    157.18
  CHANNEL LENGTH THRU SUBAREA(FEET) =   257.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.170
  PAVEMENT LIP(FEET) =  0.013   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.623
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp          Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  A        0.80      0.40        0.10    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      6.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.42
  AVERAGE FLOW DEPTH(FEET) =   0.45   FLOOD WIDTH(FEET) =   29.35
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   3.02   Tc(MIN.) =  12.76
  SUBAREA AREA(ACRES) =     0.80      SUBAREA RUNOFF(CFS) =     2.58
  EFFECTIVE AREA(ACRES) =     2.20    AREA-AVERAGED Fm(INCH/HR) =   0.10
```

```
 AREA-AVERAGED Fp(INCH/HR) =   0.40  AREA-AVERAGED Ap =   0.24
 TOTAL AREA(ACRES) =    2.20          PEAK FLOW RATE(CFS) =       6.98

 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  0.46   FLOOD WIDTH(FEET) =   30.35
 FLOW VELOCITY(FEET/SEC.) =   1.44   DEPTH*VELOCITY(FT*FT/SEC) =   0.66
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =   557.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    202.00 TO NODE    212.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    157.18  DOWNSTREAM(FEET) =    156.10
 CHANNEL LENGTH THRU SUBAREA(FEET) =   386.00   CHANNEL SLOPE =  0.0028
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   0.000
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      6.98
 FLOW VELOCITY(FEET/SEC) =   3.23   FLOW DEPTH(FEET) =   0.72
 TRAVEL TIME(MIN.) =   1.99   Tc(MIN.) =  14.75
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    212.00 =   943.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    202.00 TO NODE    212.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN) =  14.75
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.336
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  A        1.10      0.40       0.10     52
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
 SUBAREA AREA(ACRES) =    1.10      SUBAREA RUNOFF(CFS) =     3.26
 EFFECTIVE AREA(ACRES) =     3.30   AREA-AVERAGED Fm(INCH/HR) =  0.08
 AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.20
 TOTAL AREA(ACRES) =     3.30       PEAK FLOW RATE(CFS) =       9.68

****************************************************************************
 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.) =  14.75
 RAINFALL INTENSITY(INCH/HR) =   3.34
 AREA-AVERAGED Fm(INCH/HR) =  0.08
 AREA-AVERAGED Fp(INCH/HR) =  0.40
 AREA-AVERAGED Ap =  0.20
 EFFECTIVE STREAM AREA(ACRES) =    3.30
 TOTAL STREAM AREA(ACRES) =    3.30
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.68

****************************************************************************
 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) =   235.00
 ELEVATION DATA: UPSTREAM(FEET) =    161.40  DOWNSTREAM(FEET) =    159.00

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.753
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.286
 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                  A        0.80      0.40       0.10     52    6.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
 SUBAREA RUNOFF(CFS) =      3.78
 TOTAL AREA(ACRES) =      0.80   PEAK FLOW RATE(CFS) =      3.78

****************************************************************************
 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) =    159.00
 DOWNSTREAM NODE ELEVATION(FEET) =    157.52
 CHANNEL LENGTH THRU SUBAREA(FEET) =   255.00
 "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.170
 PAVEMENT LIP(FEET) =  0.013   MANNING'S N = .0150
 PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
 MAXIMUM DEPTH(FEET) =   0.50
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.537
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  A        1.25      0.40       0.10     52
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      6.30
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.15
```

```
 AVERAGE FLOW DEPTH(FEET) =   0.38   FLOOD WIDTH(FEET) =   23.15
 "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.97   Tc(MIN.) =   8.73
 SUBAREA AREA(ACRES) =    1.25       SUBAREA RUNOFF(CFS) =    5.06
 EFFECTIVE AREA(ACRES) =    2.05     AREA-AVERAGED Fm(INCH/HR) =   0.04
 AREA-AVERAGED Fp(INCH/HR) =   0.40  AREA-AVERAGED Ap =   0.10
 TOTAL AREA(ACRES) =    2.05         PEAK FLOW RATE(CFS) =       8.30

 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  0.41   FLOOD WIDTH(FEET) =   26.13
 FLOW VELOCITY(FEET/SEC.) =   2.27   DEPTH*VELOCITY(FT*FT/SEC) =   0.94
 LONGEST FLOWPATH FROM NODE    210.00 TO NODE    212.00 =   490.00 FEET.

****************************************************************************
 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.) =   8.73
 RAINFALL INTENSITY(INCH/HR) =   4.54
 AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.40
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =    2.05
 TOTAL STREAM AREA(ACRES) =    2.05
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.30

 ** CONFLUENCE DATA **
  STREAM     Q     Tc   Intensity   Fp(Fm)      Ap   Ae      HEADWATER
  NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)        (ACRES)    NODE
     1      9.68  14.75    3.336  0.40( 0.08) 0.20     3.3      200.00
     2      8.30   8.73    4.537  0.40( 0.04) 0.10     2.0      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     15.76  14.75    3.336  0.40( 0.06) 0.16     5.4      200.00
     2     16.13   8.73    4.537  0.40( 0.06) 0.15     4.0      210.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     16.13    Tc(MIN.) =     8.73
 EFFECTIVE AREA(ACRES) =     4.00   AREA-AVERAGED Fm(INCH/HR) =  0.06
 AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.15
 TOTAL AREA(ACRES) =      5.35
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    212.00 =   943.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =      5.35  TC(MIN.) =      8.73
 EFFECTIVE AREA(ACRES) =       4.00  AREA-AVERAGED Fm(INCH/HR)=  0.06
 AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.15
 PEAK FLOW RATE(CFS)    =     16.13

 ** PEAK FLOW RATE TABLE **
  STREAM     Q     Tc   Intensity   Fp(Fm)      Ap   Ae      HEADWATER
  NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)        (ACRES)    NODE
     1     16.13   8.73    4.537  0.40( 0.06) 0.15     4.0      210.00
     2     15.76  14.75    3.336  0.40( 0.06) 0.16     5.4      200.00
============================================================================
============================================================================
 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 **************************
* ECKOFF STREET                                                           *
* EXISTING CONDITION NODES 300-302                                        *
* 100-YEAR                                                                *
 **************************************************************************

  FILE NAME: C:\XDRIVE\3910\EXG.DAT
  TIME/DATE OF STUDY: 14:52 10/29/2020
==========================================================================
  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
  *DATA BANK RAINFALL USED*
  *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) =   273.00
  ELEVATION DATA: UPSTREAM(FEET) =    161.07  DOWNSTREAM(FEET) =    156.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.584
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.285
  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                 A       0.60      0.40       0.10     52    6.58
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =      2.83
  TOTAL AREA(ACRES) =      0.60   PEAK FLOW RATE(CFS) =      2.83

**************************************************************************
  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) =  156.80  DOWNSTREAM ELEVATION(FEET) =  155.25
  STREET LENGTH(FEET) =   168.00   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) =   0.0148

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.67
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.41
    HALFSTREET FLOOD WIDTH(FEET) =   12.74
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.58
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.07
  STREET FLOW TRAVEL TIME(MIN.) =   1.09   Tc(MIN.) =   7.67
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.850
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A       0.85      0.40       0.10     52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    0.85      SUBAREA RUNOFF(CFS) =    3.68
  EFFECTIVE AREA(ACRES) =    1.45    AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    1.45        PEAK FLOW RATE(CFS) =       6.28

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  14.44
  FLOW VELOCITY(FEET/SEC.) =  2.76   DEPTH*VELOCITY(FT*FT/SEC.) =   1.23
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    302.00 =   441.00 FEET.
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =      1.45  TC(MIN.) =      7.67
  EFFECTIVE AREA(ACRES) =       1.45  AREA-AVERAGED Fm(INCH/HR)=  0.04
```

```
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.10
  PEAK FLOW RATE(CFS)    =      6.28
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS

1
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**************************************************************************
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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 **************************
* ECHOFF STREET                                                           *
* EXISTING CONDITION NODES 310-311                                        *
* 100-YEAR                                                                *
 **************************************************************************

  FILE NAME: C:\XDRIVE\3910\EXH.DAT
  TIME/DATE OF STUDY: 14:54 10/29/2020
==========================================================================
  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
  *DATA BANK RAINFALL USED*
  *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) =   500.00
  ELEVATION DATA: UPSTREAM(FEET) =    161.60  DOWNSTREAM(FEET) =    156.29

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.062
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.401
  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                  A        0.95      0.40        0.10    52    9.06
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =      3.73
  TOTAL AREA(ACRES) =      0.95   PEAK FLOW RATE(CFS) =      3.73
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =       0.95  TC(MIN.) =       9.06
  EFFECTIVE AREA(ACRES) =       0.95  AREA-AVERAGED Fm(INCH/HR)=  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.10
  PEAK FLOW RATE(CFS)    =       3.73
==========================================================================
==========================================================================
  END OF RATIONAL METHOD ANALYSIS

1
```

PROPOSED CONDITION

```
************************************************************************
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                          Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* ECKOFF STREET                                                        *
* PROPOSED CONDITION NODES 100-102                                     *
* 100-YEAR                                                             *
 ************************************************************************

  FILE NAME: W:\3910\PRA.DAT
  TIME/DATE OF STUDY: 22:30 11/02/2022
========================================================================
  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
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

************************************************************************
  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) =   280.00
  ELEVATION DATA: UPSTREAM(FEET) =    157.61  DOWNSTREAM(FEET) =    156.32

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.493
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.567
  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                 A        0.52      0.40     0.100    52    8.49
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      2.12
  TOTAL AREA(ACRES) =      0.52   PEAK FLOW RATE(CFS) =      2.12

************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 IS CODE =  81
------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
========================================================================
  MAINLINE Tc(MIN.) =    8.49
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.567
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL GOOD COVER
  "GRASS"                    A        0.18      0.40     1.000    58
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =    0.18      SUBAREA RUNOFF(CFS) =    0.68
  EFFECTIVE AREA(ACRES) =      0.70   AREA-AVERAGED Fm(INCH/HR) =  0.13
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.33
  TOTAL AREA(ACRES) =        0.7       PEAK FLOW RATE(CFS) =       2.79
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.7  TC(MIN.) =      8.49
  EFFECTIVE AREA(ACRES) =      0.70  AREA-AVERAGED Fm(INCH/HR)=  0.13
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap = 0.331
  PEAK FLOW RATE(CFS)   =       2.79
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
______________________________________________________________________________
******************************************************************************
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                           Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* ECKOFF STREET (TEI JOB NO 3910)                                       *
* PROPOSED CONDITION NODES 200-237                                      *
* 100 - YEAR                                                            *
 ************************************************************************

  FILE NAME: W:\3910\PRB.DAT
  TIME/DATE OF STUDY: 20:48 11/02/2022
==============================================================================
  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
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

******************************************************************************
  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) =   136.00
  ELEVATION DATA: UPSTREAM(FEET) =    157.75  DOWNSTREAM(FEET) =    156.61

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.644
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.772
  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                 A        1.26      0.40     0.100    52    5.64
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      6.50
  TOTAL AREA(ACRES) =      1.26   PEAK FLOW RATE(CFS) =      6.50

******************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    201.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =    5.64
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.772
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL GOOD COVER
  "GRASS"                    A        0.14      0.40     1.000    58
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =    0.14      SUBAREA RUNOFF(CFS) =    0.68
  EFFECTIVE AREA(ACRES) =      1.40   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.19
  TOTAL AREA(ACRES) =        1.4       PEAK FLOW RATE(CFS) =       7.18

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   152.61  DOWNSTREAM(FEET) =   151.34
  FLOW LENGTH(FEET) =   255.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.02
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.18
  PIPE TRAVEL TIME(MIN.) =   0.85    Tc(MIN.) =    6.49
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =     391.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    6.49
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.328
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.99      0.40     0.100    52
  COMMERCIAL                 A        0.21      0.40     0.100    52
  COMMERCIAL                 A        0.37      0.40     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.57      SUBAREA RUNOFF(CFS) =    7.47
  EFFECTIVE AREA(ACRES) =      2.97   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.14
  TOTAL AREA(ACRES) =        3.0       PEAK FLOW RATE(CFS) =      14.09

****************************************************************************
  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) =   151.34  DOWNSTREAM(FEET) =   150.03
  FLOW LENGTH(FEET) =   263.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.01
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      14.09
  PIPE TRAVEL TIME(MIN.) =   0.73    Tc(MIN.) =    7.22
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    203.00 =     654.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.22
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.013
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.35      0.40     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.35      SUBAREA RUNOFF(CFS) =    1.57
  EFFECTIVE AREA(ACRES) =      3.32   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.14
  TOTAL AREA(ACRES) =        3.3       PEAK FLOW RATE(CFS) =      14.81

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 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) =   151.03  DOWNSTREAM(FEET) =   150.85
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.79
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      14.81
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    7.34
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    214.00 =     694.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    214.00 TO NODE    214.00 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.) =    7.34
  RAINFALL INTENSITY(INCH/HR) =   4.97
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.40
  AREA-AVERAGED Ap =  0.14
  EFFECTIVE STREAM AREA(ACRES) =       3.32
  TOTAL STREAM AREA(ACRES) =       3.32
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      14.81

****************************************************************************
  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) =   305.00
  ELEVATION DATA: UPSTREAM(FEET) =    162.76  DOWNSTREAM(FEET) =    156.77

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.576
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.288
  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                 A        2.18      0.40     0.100    52    6.58
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     10.30
  TOTAL AREA(ACRES) =      2.18   PEAK FLOW RATE(CFS) =     10.30

****************************************************************************
  FLOW PROCESS FROM NODE    211.00 TO NODE    211.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  MAINLINE Tc(MIN.) =    6.58
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.288
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL GOOD COVER
  "GRASS"                    A        0.11      0.40     1.000    58
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =    0.11      SUBAREA RUNOFF(CFS) =    0.48
  EFFECTIVE AREA(ACRES) =      2.29   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.14
  TOTAL AREA(ACRES) =        2.3       PEAK FLOW RATE(CFS) =      10.78

****************************************************************************
  FLOW PROCESS FROM NODE    211.00 TO NODE    211.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  MAINLINE Tc(MIN.) =    6.58
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.288
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "OPEN BRUSH"               A        0.35      0.40     1.000    81
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =    0.35      SUBAREA RUNOFF(CFS) =    1.54
  EFFECTIVE AREA(ACRES) =      2.64   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.26
  TOTAL AREA(ACRES) =        2.6       PEAK FLOW RATE(CFS) =      12.32

****************************************************************************
  FLOW PROCESS FROM NODE    211.00 TO NODE    212.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   152.77  DOWNSTREAM(FEET) =   152.17
  FLOW LENGTH(FEET) =   120.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.87
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.32
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =    6.92
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    212.00 =     425.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    212.00 TO NODE    212.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    6.92
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.137
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.79      0.40     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.79      SUBAREA RUNOFF(CFS) =    3.62
  EFFECTIVE AREA(ACRES) =      3.43   AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.22
  TOTAL AREA(ACRES) =        3.4       PEAK FLOW RATE(CFS) =      15.59

****************************************************************************
  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) =   152.17  DOWNSTREAM(FEET) =   151.62
  FLOW LENGTH(FEET) =   120.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.86
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      15.59
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =    7.26
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    213.00 =     545.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    213.00 TO NODE    213.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.26
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.998
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.74      0.40     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.74      SUBAREA RUNOFF(CFS) =    7.76
  EFFECTIVE AREA(ACRES) =      5.17   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.18
  TOTAL AREA(ACRES) =        5.2       PEAK FLOW RATE(CFS) =      22.92

****************************************************************************
  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) =   153.00  DOWNSTREAM(FEET) =   150.85
  FLOW LENGTH(FEET) =   530.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  20.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.28
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      22.92
  PIPE TRAVEL TIME(MIN.) =   1.41    Tc(MIN.) =    8.66
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    214.00 =    1075.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    214.00 TO NODE    214.00 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.) =    8.66
  RAINFALL INTENSITY(INCH/HR) =   4.52
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.40
  AREA-AVERAGED Ap =  0.18
  EFFECTIVE STREAM AREA(ACRES) =       5.17
  TOTAL STREAM AREA(ACRES) =       5.17
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      22.92

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       14.81    7.34    4.967  0.40( 0.06) 0.14       3.3     200.00
      2       22.92    8.66    4.515  0.40( 0.07) 0.18       5.2     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       36.19    7.34    4.967  0.40( 0.06) 0.16       7.7     200.00
      2       36.37    8.66    4.515  0.40( 0.07) 0.16       8.5     210.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      36.37    Tc(MIN.) =     8.66
  EFFECTIVE AREA(ACRES) =       8.49   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.16
  TOTAL AREA(ACRES) =        8.5
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    214.00 =    1075.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    214.00 TO NODE    236.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   150.85  DOWNSTREAM(FEET) =   147.81
  FLOW LENGTH(FEET) =   312.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  21.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.78
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      36.37
  PIPE TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =    9.20
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    236.00 =    1387.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    236.00 TO NODE    236.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    220.00 TO NODE    221.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   440.00
  ELEVATION DATA: UPSTREAM(FEET) =    158.74  DOWNSTREAM(FEET) =    155.63

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

```
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.341
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.325
  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                 A        1.50      0.40     0.100    52    9.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      5.78
  TOTAL AREA(ACRES) =      1.50   PEAK FLOW RATE(CFS) =      5.78

****************************************************************************
  FLOW PROCESS FROM NODE    221.00 TO NODE    222.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   151.00  DOWNSTREAM(FEET) =   150.00
  FLOW LENGTH(FEET) =   116.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  11.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.85
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.78
  PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =    9.67
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    222.00 =     556.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    222.00 TO NODE    222.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    9.67
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.240
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.55      0.40     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.55      SUBAREA RUNOFF(CFS) =    2.08
  EFFECTIVE AREA(ACRES) =      2.05   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        2.0       PEAK FLOW RATE(CFS) =       7.75

****************************************************************************
  FLOW PROCESS FROM NODE    222.00 TO NODE    235.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   150.00  DOWNSTREAM(FEET) =   149.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.79
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.75
  PIPE TRAVEL TIME(MIN.) =   0.25    Tc(MIN.) =    9.92
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    235.00 =     656.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    235.00 TO NODE    235.00 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.) =    9.92
  RAINFALL INTENSITY(INCH/HR) =   4.18
  AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.40
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       2.05
  TOTAL STREAM AREA(ACRES) =       2.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       7.75

****************************************************************************
  FLOW PROCESS FROM NODE    230.00 TO NODE    231.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   269.00
  ELEVATION DATA: UPSTREAM(FEET) =    159.60  DOWNSTREAM(FEET) =    157.45

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.486
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.910
  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                 A        0.65      0.40     0.100    52    7.49
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      2.85
  TOTAL AREA(ACRES) =      0.65   PEAK FLOW RATE(CFS) =      2.85

********************************************************************************
  FLOW PROCESS FROM NODE    231.00 TO NODE    232.00 IS CODE =  61
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =  157.45  DOWNSTREAM ELEVATION(FEET) =  156.00
  STREET LENGTH(FEET) =   258.00   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) =   0.0148

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.62
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.44
    HALFSTREET FLOOD WIDTH(FEET) =   14.08
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.13
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.94
  STREET FLOW TRAVEL TIME(MIN.) =   2.02   Tc(MIN.) =    9.51
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.281
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.70      0.40     0.100    52
  NATURAL POOR COVER
  "OPEN BRUSH"               A        0.25      0.40     1.000    81
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.337
  SUBAREA AREA(ACRES) =    0.95      SUBAREA RUNOFF(CFS) =    3.55
  EFFECTIVE AREA(ACRES) =      1.60    AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.24
  TOTAL AREA(ACRES) =        1.6        PEAK FLOW RATE(CFS) =       6.03

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.47   HALFSTREET FLOOD WIDTH(FEET) =  15.79
  FLOW VELOCITY(FEET/SEC.) =  2.25   DEPTH*VELOCITY(FT*FT/SEC.) =   1.06
  LONGEST FLOWPATH FROM NODE    230.00 TO NODE    232.00 =     527.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    232.00 TO NODE    233.00 IS CODE =  91
--------------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
================================================================================
  UPSTREAM NODE ELEVATION(FEET) =    156.00
  DOWNSTREAM NODE ELEVATION(FEET) =    154.68
  CHANNEL LENGTH THRU SUBAREA(FEET) =   158.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.170
  PAVEMENT LIP(FEET) =  0.013   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.035
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.35      0.40     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      6.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.54
  AVERAGE FLOW DEPTH(FEET) =   0.37   FLOOD WIDTH(FEET) =   21.79
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.04   Tc(MIN.) =   10.54
  SUBAREA AREA(ACRES) =    0.35       SUBAREA RUNOFF(CFS) =    1.26
  EFFECTIVE AREA(ACRES) =    1.95     AREA-AVERAGED Fm(INCH/HR) =   0.09
  AREA-AVERAGED Fp(INCH/HR) =   0.40  AREA-AVERAGED Ap =   0.22
  TOTAL AREA(ACRES) =        1.9         PEAK FLOW RATE(CFS) =       6.93

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.38   FLOOD WIDTH(FEET) =   22.29
  FLOW VELOCITY(FEET/SEC.) =   2.54   DEPTH*VELOCITY(FT*FT/SEC) =   0.95
  LONGEST FLOWPATH FROM NODE    230.00 TO NODE    233.00 =     685.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    233.00 TO NODE    234.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   151.68  DOWNSTREAM(FEET) =   151.00
  FLOW LENGTH(FEET) =   110.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.48
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.93
  PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =   10.88
  LONGEST FLOWPATH FROM NODE    230.00 TO NODE    234.00 =     795.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    234.00 TO NODE    234.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   10.88
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.963
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.70      0.40     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.70      SUBAREA RUNOFF(CFS) =    2.47
  EFFECTIVE AREA(ACRES) =      2.65   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.18
  TOTAL AREA(ACRES) =        2.6       PEAK FLOW RATE(CFS) =       9.28

****************************************************************************
  FLOW PROCESS FROM NODE    234.00 TO NODE    235.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   151.00  DOWNSTREAM(FEET) =   149.00
  FLOW LENGTH(FEET) =    80.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.89
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.28
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =   11.01
  LONGEST FLOWPATH FROM NODE    230.00 TO NODE    235.00 =     875.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    235.00 TO NODE    235.00 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.) =   11.01
  RAINFALL INTENSITY(INCH/HR) =   3.94
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.40
  AREA-AVERAGED Ap =  0.18
  EFFECTIVE STREAM AREA(ACRES) =       2.65
  TOTAL STREAM AREA(ACRES) =       2.65
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       9.28
```

```
  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        7.75    9.92    4.179  0.40( 0.04) 0.10       2.0     220.00
      2        9.28   11.01    3.935  0.40( 0.07) 0.18       2.6     230.00

  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       16.63    9.92    4.179  0.40( 0.06) 0.15       4.4     220.00
      2       16.57   11.01    3.935  0.40( 0.06) 0.15       4.7     230.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      16.63    Tc(MIN.) =     9.92
  EFFECTIVE AREA(ACRES) =       4.44   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.15
  TOTAL AREA(ACRES) =        4.7
  LONGEST FLOWPATH FROM NODE    230.00 TO NODE    235.00 =     875.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    235.00 TO NODE    236.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   149.00  DOWNSTREAM(FEET) =   148.94
  FLOW LENGTH(FEET) =     8.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.32
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.63
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    9.94
  LONGEST FLOWPATH FROM NODE    230.00 TO NODE    236.00 =     883.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    236.00 TO NODE    236.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       16.63    9.94    4.175  0.40( 0.06) 0.15       4.4     220.00
      2       16.57   11.03    3.932  0.40( 0.06) 0.15       4.7     230.00
  LONGEST FLOWPATH FROM NODE    230.00 TO NODE    236.00 =     883.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       36.19    7.87    4.772  0.40( 0.06) 0.16       7.7     200.00
      2       36.37    9.20    4.364  0.40( 0.07) 0.16       8.5     210.00
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    236.00 =    1387.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       51.27    7.87    4.772  0.40( 0.06) 0.16      11.2     200.00
      2       52.47    9.20    4.364  0.40( 0.06) 0.16      12.6     210.00
      3       51.40    9.94    4.175  0.40( 0.06) 0.16      12.9     220.00
      4       49.28   11.03    3.932  0.40( 0.06) 0.16      13.2     230.00
    TOTAL AREA(ACRES) =        13.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       52.47  Tc(MIN.) =    9.196
  EFFECTIVE AREA(ACRES) =     12.60  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.16
  TOTAL AREA(ACRES) =       13.2
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    236.00 =    1387.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    236.00 TO NODE    236.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================
```

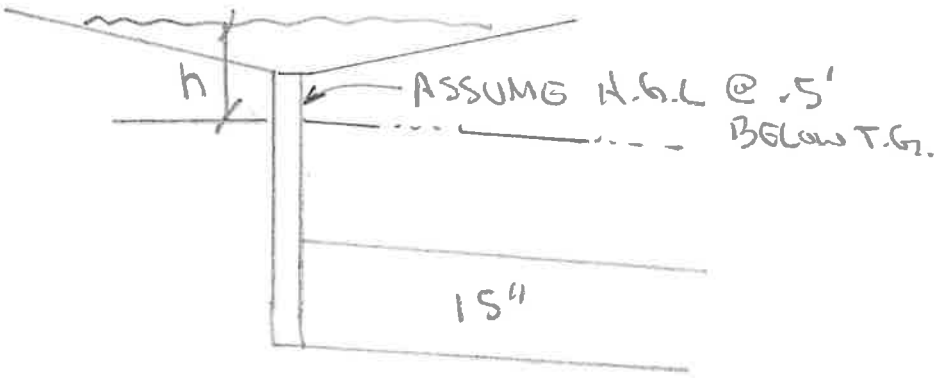
```
****************************************************************************
  FLOW PROCESS FROM NODE    236.00 TO NODE    237.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   148.94  DOWNSTREAM(FEET) =   148.35
  FLOW LENGTH(FEET) =   112.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.53
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      52.47
  PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =    9.41
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    237.00 =    1499.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       13.2  TC(MIN.) =      9.41
  EFFECTIVE AREA(ACRES) =     12.60  AREA-AVERAGED Fm(INCH/HR)=  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap = 0.158
  PEAK FLOW RATE(CFS)   =      52.47

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       51.27    8.09    4.697  0.40( 0.06) 0.16      11.2     200.00
      2       52.47    9.41    4.305  0.40( 0.06) 0.16      12.6     210.00
      3       51.40   10.15    4.123  0.40( 0.06) 0.16      12.9     220.00
      4       49.28   11.26    3.886  0.40( 0.06) 0.16      13.2     230.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

APPENDIX C

DETENTION CALCULATION

ECKOFF STREET
PONDING AT NORTHERLY TRUCK YARD BUILDING 1

Elevation	Depth (feet)	Area (sq. ft.)	Volume (c.f.)	Σ Volume (c.f.)	Σ Volume (ac-ft)	Q(discharge) (cfs)
156.77	0.00	0				
			528	528	0.01	5.10
157.00	0.23	4590				
			2484	3,012	0.07	5.70
157.20	0.43	20251				
			5278	8,290	0.19	6.30
157.40	0.63	32527				
			7142	15,432	0.35	6.80
157.60	0.83	38898				
			8309	23,742	0.55	7.3
157.80	1.03	44195				
			9327	33,069	0.76	7.8
158.00	1.23	49080				
			10241	43,311	0.99	8.2
158.20	1.43	53335				



$Q = .6(AREA)\sqrt{64.4(h)}$

$h = .73 \quad Q = .6(1.23)\sqrt{64.4(.73)} = 5.1$ cfs

$h = .93 \quad Q = .6(1.23)\sqrt{64.4(.93)} = 5.7$ cfs

$h = 1.93 \quad Q = .6(1.23)\sqrt{64.4(1.93)} = 8.2$ cfs

SMALL AREA UNIT HYDROGRAPH MODEL

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) = 5.25
SOIL-LOSS RATE, Fm,(INCH/HR) = 0.040
LOW LOSS FRACTION = 0.118
TIME OF CONCENTRATION(MIN.) = 6.00
RATIONAL METHOD PEAK FLOW RATE (DEFINED BY USER)
IS USED FOR SMALL AREA PEAK Q
ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
RETURN FREQUENCY(YEARS) = 100
5-MINUTE POINT RAINFALL VALUE(INCHES) = 0.52
30-MINUTE POINT RAINFALL VALUE(INCHES) = 1.09
1-HOUR POINT RAINFALL VALUE(INCHES) = 1.45
3-HOUR POINT RAINFALL VALUE(INCHES) = 2.43
6-HOUR POINT RAINFALL VALUE(INCHES) = 3.36
24-HOUR POINT RAINFALL VALUE(INCHES) = 5.63

TOTAL CATCHMENT RUNOFF VOLUME(ACRE-FEET) = 2.01
TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) = 0.46

TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	7.5	15.0	22.5	30.0
0.10	0.0015	0.36	Q	.	.	.	.
0.20	0.0045	0.37	Q	.	.	.	.
0.30	0.0076	0.37	Q	.	.	.	.
0.40	0.0106	0.37	Q	.	.	.	.
0.50	0.0136	0.37	Q	.	.	.	.
0.60	0.0167	0.37	Q	.	.	.	.
0.70	0.0198	0.37	Q	.	.	.	.
0.80	0.0229	0.37	Q	.	.	.	.
0.90	0.0260	0.38	Q	.	.	.	.
1.00	0.0291	0.38	Q	.	.	.	.
1.10	0.0322	0.38	Q	.	.	.	.
1.20	0.0354	0.38	Q	.	.	.	.
1.30	0.0385	0.38	Q	.	.	.	.
1.40	0.0417	0.38	Q	.	.	.	.
1.50	0.0449	0.39	Q	.	.	.	.
1.60	0.0481	0.39	Q	.	.	.	.
1.70	0.0513	0.39	Q	.	.	.	.
1.80	0.0545	0.39	Q	.	.	.	.
1.90	0.0577	0.39	Q	.	.	.	.
2.00	0.0610	0.39	Q	.	.	.	.
2.10	0.0643	0.40	Q	.	.	.	.
2.20	0.0675	0.40	Q	.	.	.	.
2.30	0.0708	0.40	Q	.	.	.	.
2.40	0.0741	0.40	Q	.	.	.	.
2.50	0.0775	0.40	Q	.	.	.	.
2.60	0.0808	0.40	Q	.	.	.	.
2.70	0.0842	0.41	Q	.	.	.	.
2.80	0.0875	0.41	Q	.	.	.	.
2.90	0.0909	0.41	Q	.	.	.	.
3.00	0.0943	0.41	Q	.	.	.	.
3.10	0.0978	0.42	Q	.	.	.	.
3.20	0.1012	0.42	Q	.	.	.	.
3.30	0.1046	0.42	Q	.	.	.	.
3.40	0.1081	0.42	Q	.	.	.	.
3.50	0.1116	0.42	Q	.	.	.	.
3.60	0.1151	0.43	Q	.	.	.	.
3.70	0.1186	0.43	Q	.	.	.	.
3.80	0.1222	0.43	Q	.	.	.	.
3.90	0.1257	0.43	Q	.	.	.	.
4.00	0.1293	0.43	Q	.	.	.	.
4.10	0.1329	0.44	Q	.	.	.	.
4.20	0.1365	0.44	Q	.	.	.	.
4.30	0.1402	0.44	Q	.	.	.	.
4.40	0.1438	0.44	Q	.	.	.	.
4.50	0.1475	0.45	Q	.	.	.	.
4.60	0.1512	0.45	Q	.	.	.	.
4.70	0.1549	0.45	Q	.	.	.	.
4.80	0.1586	0.45	Q	.	.	.	.
4.90	0.1624	0.46	Q	.	.	.	.
5.00	0.1662	0.46	Q	.	.	.	.
5.10	0.1700	0.46	Q	.	.	.	.
5.20	0.1738	0.46	Q	.	.	.	.
5.30	0.1776	0.47	Q	.	.	.	.
5.40	0.1815	0.47	Q	.	.	.	.
5.50	0.1854	0.47	Q	.	.	.	.
5.60	0.1893	0.47	Q	.	.	.	.
5.70	0.1932	0.48	Q	.	.	.	.
5.80	0.1972	0.48	Q	.	.	.	.

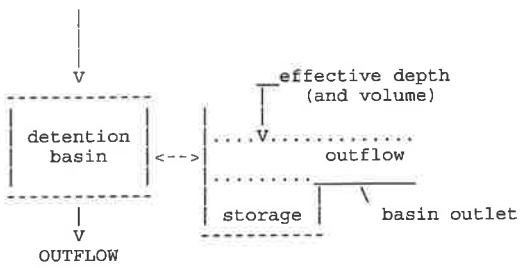
5.90	0.2012	0.48	Q	.	.	.	.
6.00	0.2052	0.49	Q	.	.	.	.
6.10	0.2092	0.49	Q	.	.	.	.
6.20	0.2133	0.49	Q	.	.	.	.
6.30	0.2174	0.50	Q	.	.	.	.
6.40	0.2215	0.50	Q	.	.	.	.
6.50	0.2256	0.50	Q	.	.	.	.
6.60	0.2298	0.50	Q	.	.	.	.
6.70	0.2340	0.51	Q	.	.	.	.
6.80	0.2382	0.51	Q	.	.	.	.
6.90	0.2424	0.52	Q	.	.	.	.
7.00	0.2467	0.52	Q	.	.	.	.
7.10	0.2510	0.52	Q	.	.	.	.
7.20	0.2553	0.53	Q	.	.	.	.
7.30	0.2597	0.53	Q	.	.	.	.
7.40	0.2641	0.53	Q	.	.	.	.
7.50	0.2685	0.54	Q	.	.	.	.
7.60	0.2730	0.54	Q	.	.	.	.
7.70	0.2775	0.55	Q	.	.	.	.
7.80	0.2820	0.55	Q	.	.	.	.
7.90	0.2866	0.56	Q	.	.	.	.
8.00	0.2912	0.56	Q	.	.	.	.
8.10	0.2958	0.56	Q	.	.	.	.
8.20	0.3005	0.57	Q	.	.	.	.
8.30	0.3052	0.57	Q	.	.	.	.
8.40	0.3100	0.58	Q	.	.	.	.
8.50	0.3148	0.58	Q	.	.	.	.
8.60	0.3196	0.59	Q	.	.	.	.
8.70	0.3244	0.59	Q	.	.	.	.
8.80	0.3294	0.60	Q	.	.	.	.
8.90	0.3343	0.60	Q	.	.	.	.
9.00	0.3393	0.61	Q	.	.	.	.
9.10	0.3443	0.61	Q	.	.	.	.
9.20	0.3494	0.62	Q	.	.	.	.
9.30	0.3546	0.62	Q	.	.	.	.
9.40	0.3597	0.63	Q	.	.	.	.
9.50	0.3650	0.64	Q	.	.	.	.
9.60	0.3702	0.64	Q	.	.	.	.
9.70	0.3756	0.65	Q	.	.	.	.
9.80	0.3810	0.65	Q	.	.	.	.
9.90	0.3864	0.66	Q	.	.	.	.
10.00	0.3919	0.67	Q	.	.	.	.
10.10	0.3974	0.68	Q	.	.	.	.
10.20	0.4030	0.68	Q	.	.	.	.
10.30	0.4087	0.69	Q	.	.	.	.
10.40	0.4144	0.70	Q	.	.	.	.
10.50	0.4202	0.71	Q	.	.	.	.
10.60	0.4261	0.71	Q	.	.	.	.
10.70	0.4320	0.72	Q	.	.	.	.
10.80	0.4380	0.73	Q	.	.	.	.
10.90	0.4441	0.74	Q	.	.	.	.
11.00	0.4502	0.75	Q	.	.	.	.
11.10	0.4564	0.76	.Q	.	.	.	.
11.20	0.4627	0.77	.Q	.	.	.	.
11.30	0.4691	0.78	.Q	.	.	.	.
11.40	0.4756	0.79	.Q	.	.	.	.
11.50	0.4821	0.80	.Q	.	.	.	.
11.60	0.4888	0.81	.Q	.	.	.	.
11.70	0.4955	0.82	.Q	.	.	.	.
11.80	0.5023	0.83	.Q	.	.	.	.
11.90	0.5093	0.85	.Q	.	.	.	.
12.00	0.5163	0.86	.Q	.	.	.	.
12.10	0.5244	1.10	.Q	.	.	.	.
12.20	0.5335	1.11	.Q	.	.	.	.
12.30	0.5427	1.13	.Q	.	.	.	.
12.40	0.5520	1.14	.Q	.	.	.	.
12.50	0.5615	1.16	.Q	.	.	.	.
12.60	0.5712	1.17	.Q	.	.	.	.
12.70	0.5809	1.20	.Q	.	.	.	.
12.80	0.5909	1.21	.Q	.	.	.	.
12.90	0.6010	1.24	.Q	.	.	.	.
13.00	0.6112	1.25	.Q	.	.	.	.
13.10	0.6217	1.28	.Q	.	.	.	.
13.20	0.6323	1.29	.Q	.	.	.	.
13.30	0.6432	1.33	.Q	.	.	.	.
13.40	0.6542	1.35	.Q	.	.	.	.
13.50	0.6655	1.38	.Q	.	.	.	.
13.60	0.6770	1.40	.Q	.	.	.	.
13.70	0.6888	1.45	.Q	.	.	.	.
13.80	0.7008	1.47	.Q	.	.	.	.
13.90	0.7132	1.53	. Q	.	.	.	.
14.00	0.7259	1.55	. Q	.	.	.	.
14.10	0.7391	1.63	. Q	.	.	.	.
14.20	0.7526	1.66	. Q	.	.	.	.
14.30	0.7667	1.73	. Q	.	.	.	.
14.40	0.7811	1.77	. Q	.	.	.	.
14.50	0.7961	1.86	. Q	.	.	.	.
14.60	0.8117	1.91	. Q	.	.	.	.
14.70	0.8279	2.01	. Q	.	.	.	.
14.80	0.8448	2.07	. Q	.	.	.	.
14.90	0.8624	2.20	. Q	.	.	.	.
15.00	0.8810	2.28	. Q	.	.	.	.
15.10	0.9005	2.46	. Q	.	.	.	.
15.20	0.9213	2.56	. Q	.	.	.	.
15.30	0.9434	2.80	. Q	.	.	.	.
15.40	0.9672	2.95	. Q	.	.	.	.
15.50	0.9914	2.92	. Q	.	.	.	.
15.60	1.0165	3.15	. Q	.	.	.	.
15.70	1.0453	3.83	. Q	.	.	.	.

15.80	1.0791	4.35	. Q	.	.	.	.
15.90	1.1229	6.24	. Q	.	.	.	.
16.00	1.1842	8.59	.	.Q	.	.	.
16.10	1.3288	26.40	.	.	.	. Q	.
16.20	1.4588	5.07	. Q	.	.	.	.
16.30	1.4940	3.45	. Q	.	.	.	.
16.40	1.5195	2.72	. Q	.	.	.	.
16.50	1.5418	2.67	. Q	.	.	.	.
16.60	1.5626	2.36	. Q	.	.	.	.
16.70	1.5812	2.14	. Q	.	.	.	.
16.80	1.5981	1.96	. Q	.	.	.	.
16.90	1.6137	1.81	. Q	.	.	.	.
17.00	1.6282	1.69	. Q	.	.	.	.
17.10	1.6418	1.58	. Q	.	.	.	.
17.20	1.6545	1.50	.Q	.	.	.	.
17.30	1.6666	1.42	.Q	.	.	.	.
17.40	1.6781	1.36	.Q	.	.	.	.
17.50	1.6891	1.31	.Q	.	.	.	.
17.60	1.6998	1.26	.Q	.	.	.	.
17.70	1.7100	1.22	.Q	.	.	.	.
17.80	1.7200	1.18	.Q	.	.	.	.
17.90	1.7296	1.15	.Q	.	.	.	.
18.00	1.7390	1.12	.Q	.	.	.	.
18.10	1.7472	0.86	.Q	.	.	.	.
18.20	1.7542	0.84	.Q	.	.	.	.
18.30	1.7610	0.81	.Q	.	.	.	.
18.40	1.7677	0.79	.Q	.	.	.	.
18.50	1.7741	0.77	.Q	.	.	.	.
18.60	1.7804	0.75	.Q	.	.	.	.
18.70	1.7866	0.73	Q	.	.	.	.
18.80	1.7926	0.72	Q	.	.	.	.
18.90	1.7984	0.70	Q	.	.	.	.
19.00	1.8042	0.69	Q	.	.	.	.
19.10	1.8098	0.67	Q	.	.	.	.
19.20	1.8153	0.66	Q	.	.	.	.
19.30	1.8206	0.64	Q	.	.	.	.
19.40	1.8259	0.63	Q	.	.	.	.
19.50	1.8311	0.62	Q	.	.	.	.
19.60	1.8362	0.61	Q	.	.	.	.
19.70	1.8412	0.60	Q	.	.	.	.
19.80	1.8461	0.59	Q	.	.	.	.
19.90	1.8509	0.58	Q	.	.	.	.
20.00	1.8557	0.57	Q	.	.	.	.
20.10	1.8603	0.56	Q	.	.	.	.
20.20	1.8649	0.55	Q	.	.	.	.
20.30	1.8695	0.54	Q	.	.	.	.
20.40	1.8739	0.54	Q	.	.	.	.
20.50	1.8783	0.53	Q	.	.	.	.
20.60	1.8827	0.52	Q	.	.	.	.
20.70	1.8869	0.51	Q	.	.	.	.
20.80	1.8912	0.51	Q	.	.	.	.
20.90	1.8953	0.50	Q	.	.	.	.
21.00	1.8994	0.49	Q	.	.	.	.
21.10	1.9035	0.49	Q	.	.	.	.
21.20	1.9075	0.48	Q	.	.	.	.
21.30	1.9115	0.48	Q	.	.	.	.
21.40	1.9154	0.47	Q	.	.	.	.
21.50	1.9192	0.46	Q	.	.	.	.
21.60	1.9231	0.46	Q	.	.	.	.
21.70	1.9268	0.45	Q	.	.	.	.
21.80	1.9306	0.45	Q	.	.	.	.
21.90	1.9343	0.44	Q	.	.	.	.
22.00	1.9379	0.44	Q	.	.	.	.
22.10	1.9415	0.44	Q	.	.	.	.
22.20	1.9451	0.43	Q	.	.	.	.
22.30	1.9487	0.43	Q	.	.	.	.
22.40	1.9522	0.42	Q	.	.	.	.
22.50	1.9556	0.42	Q	.	.	.	.
22.60	1.9591	0.41	Q	.	.	.	.
22.70	1.9625	0.41	Q	.	.	.	.
22.80	1.9658	0.41	Q	.	.	.	.
22.90	1.9692	0.40	Q	.	.	.	.
23.00	1.9725	0.40	Q	.	.	.	.
23.10	1.9758	0.40	Q	.	.	.	.
23.20	1.9790	0.39	Q	.	.	.	.
23.30	1.9823	0.39	Q	.	.	.	.
23.40	1.9855	0.38	Q	.	.	.	.
23.50	1.9886	0.38	Q	.	.	.	.
23.60	1.9918	0.38	Q	.	.	.	.
23.70	1.9949	0.38	Q	.	.	.	.
23.80	1.9980	0.37	Q	.	.	.	.
23.90	2.0010	0.37	Q	.	.	.	.
24.00	2.0041	0.37	Q	.	.	.	.
24.10	2.0056	0.00	Q	.	.	.	.

FLOW-THROUGH DETENTION BASIN MODEL

SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
CONSTANT HYDROGRAPH TIME UNIT(MINUTES) = 6.000
DEAD STORAGE(AF) = 0.00
SPECIFIED DEAD STORAGE(AF) FILLED = 0.00
ASSUMED INITIAL DEPTH(FEET) IN STORAGE BASIN = 0.00

INFLOW



DEPTH-VS.-STORAGE AND DEPTH-VS.-DISCHARGE INFORMATION:
TOTAL NUMBER OF BASIN DEPTH INFORMATION ENTRIES = 8

*BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS)	**	**BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS)	*
0.000	0.000	0.000**		0.230	0.010	5.100	*
0.430	0.070	5.700**		0.630	0.190	6.300	*
0.830	0.350	6.800**		1.030	0.550	7.300	*
1.230	0.760	7.800**		1.430	0.990	8.200	*

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	0.23	-0.01107	0.03107
3	0.43	0.04645	0.09355
4	0.63	0.16397	0.21603
5	0.83	0.32190	0.37810
6	1.03	0.51983	0.58017
7	1.23	0.72777	0.79223
8	1.43	0.95612	1.02388

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)
0.100	0.000	0.36	0.02	0.25	0.001
0.200	0.000	0.37	0.02	0.50	0.001
0.300	0.000	0.37	0.02	0.50	0.001
0.400	0.000	0.37	0.02	0.50	0.001
0.500	0.000	0.37	0.02	0.50	0.001
0.600	0.000	0.37	0.02	0.50	0.001
0.700	0.000	0.37	0.02	0.51	0.001
0.800	0.000	0.37	0.02	0.51	0.001
0.900	0.000	0.38	0.02	0.51	0.001
1.000	0.000	0.38	0.02	0.51	0.001
1.100	0.000	0.38	0.02	0.51	0.001
1.200	0.000	0.38	0.02	0.52	0.001
1.300	0.000	0.38	0.02	0.52	0.001
1.400	0.000	0.38	0.02	0.52	0.001
1.500	0.000	0.39	0.02	0.52	0.001
1.600	0.000	0.39	0.02	0.52	0.001
1.700	0.000	0.39	0.02	0.53	0.001
1.800	0.000	0.39	0.02	0.53	0.001
1.900	0.000	0.39	0.02	0.53	0.001
2.000	0.000	0.39	0.02	0.53	0.001
2.100	0.000	0.40	0.02	0.54	0.001
2.200	0.000	0.40	0.02	0.54	0.001
2.300	0.000	0.40	0.02	0.54	0.001
2.400	0.000	0.40	0.02	0.54	0.001
2.500	0.000	0.40	0.02	0.55	0.001
2.600	0.000	0.40	0.02	0.55	0.001
2.700	0.000	0.41	0.02	0.55	0.001
2.800	0.000	0.41	0.03	0.55	0.001
2.900	0.000	0.41	0.03	0.56	0.001
3.000	0.000	0.41	0.03	0.56	0.001
3.100	0.000	0.42	0.03	0.56	0.001
3.200	0.000	0.42	0.03	0.56	0.001
3.300	0.000	0.42	0.03	0.57	0.001
3.400	0.000	0.42	0.03	0.57	0.001
3.500	0.000	0.42	0.03	0.57	0.001
3.600	0.000	0.43	0.03	0.58	0.001
3.700	0.000	0.43	0.03	0.58	0.001
3.800	0.000	0.43	0.03	0.58	0.001
3.900	0.000	0.43	0.03	0.58	0.001
4.000	0.000	0.43	0.03	0.59	0.001
4.100	0.000	0.44	0.03	0.59	0.001
4.200	0.000	0.44	0.03	0.59	0.001
4.300	0.000	0.44	0.03	0.60	0.001
4.400	0.000	0.44	0.03	0.60	0.001
4.500	0.000	0.45	0.03	0.60	0.001
4.600	0.000	0.45	0.03	0.61	0.001
4.700	0.000	0.45	0.03	0.61	0.001
4.800	0.000	0.45	0.03	0.61	0.001
4.900	0.000	0.46	0.03	0.62	0.001
5.000	0.000	0.46	0.03	0.62	0.001
5.100	0.000	0.46	0.03	0.62	0.001
5.200	0.000	0.46	0.03	0.63	0.001
5.300	0.000	0.47	0.03	0.63	0.001
5.400	0.000	0.47	0.03	0.63	0.001

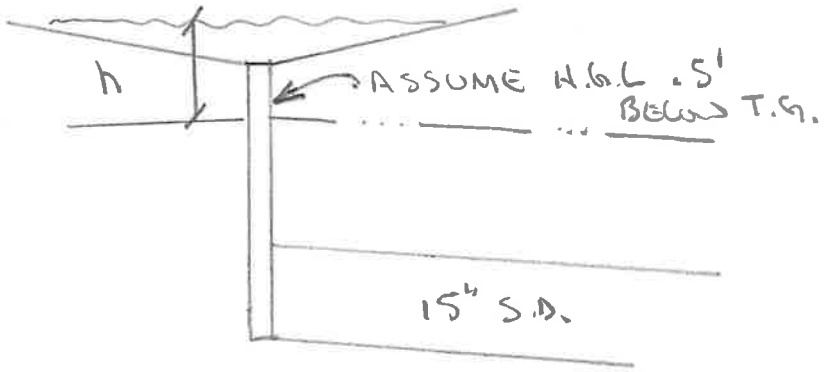
5.500	0.000	0.47	0.03	0.64	0.001
5.600	0.000	0.47	0.03	0.64	0.001
5.700	0.000	0.48	0.03	0.65	0.001
5.800	0.000	0.48	0.03	0.65	0.001
5.900	0.000	0.48	0.03	0.65	0.001
6.000	0.000	0.49	0.03	0.66	0.001
6.100	0.000	0.49	0.03	0.66	0.001
6.200	0.000	0.49	0.03	0.67	0.001
6.300	0.000	0.50	0.03	0.67	0.001
6.400	0.000	0.50	0.03	0.67	0.001
6.500	0.000	0.50	0.03	0.68	0.001
6.600	0.000	0.50	0.03	0.68	0.001
6.700	0.000	0.51	0.03	0.69	0.001
6.800	0.000	0.51	0.03	0.69	0.001
6.900	0.000	0.52	0.03	0.70	0.001
7.000	0.000	0.52	0.03	0.70	0.001
7.100	0.000	0.52	0.03	0.71	0.001
7.200	0.000	0.53	0.03	0.71	0.001
7.300	0.000	0.53	0.03	0.72	0.001
7.400	0.000	0.53	0.03	0.72	0.001
7.500	0.000	0.54	0.03	0.73	0.001
7.600	0.000	0.54	0.03	0.73	0.001
7.700	0.000	0.55	0.03	0.74	0.001
7.800	0.000	0.55	0.03	0.74	0.001
7.900	0.000	0.56	0.03	0.75	0.001
8.000	0.000	0.56	0.03	0.75	0.001
8.100	0.000	0.56	0.03	0.76	0.001
8.200	0.000	0.57	0.03	0.77	0.002
8.300	0.000	0.57	0.04	0.77	0.002
8.400	0.000	0.58	0.04	0.78	0.002
8.500	0.000	0.58	0.04	0.79	0.002
8.600	0.000	0.59	0.04	0.79	0.002
8.700	0.000	0.59	0.04	0.80	0.002
8.800	0.000	0.60	0.04	0.81	0.002
8.900	0.000	0.60	0.04	0.81	0.002
9.000	0.000	0.61	0.04	0.82	0.002
9.100	0.000	0.61	0.04	0.83	0.002
9.200	0.000	0.62	0.04	0.83	0.002
9.300	0.000	0.62	0.04	0.84	0.002
9.400	0.000	0.63	0.04	0.85	0.002
9.500	0.000	0.64	0.04	0.86	0.002
9.600	0.000	0.64	0.04	0.87	0.002
9.700	0.000	0.65	0.04	0.87	0.002
9.800	0.000	0.65	0.04	0.88	0.002
9.900	0.000	0.66	0.04	0.89	0.002
10.000	0.000	0.67	0.04	0.90	0.002
10.100	0.000	0.68	0.04	0.91	0.002
10.200	0.000	0.68	0.04	0.92	0.002
10.300	0.000	0.69	0.04	0.93	0.002
10.400	0.000	0.70	0.04	0.94	0.002
10.500	0.000	0.71	0.04	0.95	0.002
10.600	0.000	0.71	0.04	0.96	0.002
10.700	0.000	0.72	0.04	0.97	0.002
10.800	0.000	0.73	0.04	0.98	0.002
10.900	0.000	0.74	0.05	1.00	0.002
11.000	0.000	0.75	0.05	1.01	0.002
11.100	0.000	0.76	0.05	1.02	0.002
11.200	0.000	0.77	0.05	1.03	0.002
11.300	0.000	0.78	0.05	1.05	0.002
11.400	0.000	0.79	0.05	1.06	0.002
11.500	0.000	0.80	0.05	1.07	0.002
11.600	0.000	0.81	0.05	1.09	0.002
11.700	0.000	0.82	0.05	1.11	0.002
11.800	0.000	0.83	0.05	1.12	0.002
11.900	0.000	0.85	0.05	1.14	0.002
12.000	0.000	0.86	0.05	1.15	0.002
12.100	0.000	1.10	0.07	1.32	0.003
12.200	0.000	1.11	0.07	1.49	0.003
12.300	0.000	1.13	0.07	1.51	0.003
12.400	0.000	1.14	0.07	1.54	0.003
12.500	0.000	1.16	0.07	1.56	0.003
12.600	0.000	1.17	0.07	1.58	0.003
12.700	0.000	1.20	0.07	1.61	0.003
12.800	0.000	1.21	0.07	1.63	0.003
12.900	0.000	1.24	0.08	1.66	0.003
13.000	0.000	1.25	0.08	1.69	0.003
13.100	0.000	1.28	0.08	1.72	0.003
13.200	0.000	1.29	0.08	1.75	0.003
13.300	0.000	1.33	0.08	1.78	0.004
13.400	0.000	1.35	0.08	1.81	0.004
13.500	0.000	1.38	0.08	1.85	0.004
13.600	0.000	1.40	0.09	1.89	0.004
13.700	0.000	1.45	0.09	1.93	0.004
13.800	0.000	1.47	0.09	1.98	0.004
13.900	0.000	1.53	0.09	2.03	0.004
14.000	0.000	1.55	0.10	2.09	0.004
14.100	0.000	1.63	0.10	2.16	0.004
14.200	0.000	1.66	0.10	2.23	0.004
14.300	0.000	1.73	0.11	2.30	0.005
14.400	0.000	1.77	0.11	2.38	0.005
14.500	0.000	1.86	0.11	2.46	0.005
14.600	0.000	1.91	0.12	2.55	0.005
14.700	0.000	2.01	0.12	2.66	0.005
14.800	0.000	2.07	0.13	2.77	0.006
14.900	0.000	2.20	0.13	2.90	0.006
15.000	0.000	2.28	0.14	3.04	0.006
15.100	0.000	2.46	0.15	3.21	0.007
15.200	0.000	2.56	0.16	3.40	0.007
15.300	0.000	2.80	0.17	3.63	0.007

15.400	0.000	2.95	0.18	3.90	0.008
15.500	0.000	2.92	0.18	3.98	0.008
15.600	0.000	3.15	0.19	4.12	0.008
15.700	0.000	3.83	0.23	4.69	0.011
15.800	0.000	4.35	0.25	5.13	0.015
15.900	0.000	6.24	0.30	5.22	0.030
16.000	0.000	8.59	0.38	5.43	0.056
16.100	0.000	26.40	0.67	5.98	0.225
16.200	0.000	5.07	0.66	6.39	0.214
16.300	0.000	3.45	0.63	6.34	0.190
16.400	0.000	2.72	0.58	6.23	0.161
16.500	0.000	2.67	0.53	6.08	0.133
16.600	0.000	2.36	0.49	5.94	0.103
16.700	0.000	2.14	0.43	5.79	0.073
16.800	0.000	1.96	0.34	5.57	0.043
16.900	0.000	1.81	0.24	5.29	0.014
17.000	0.000	1.69	0.10	3.72	0.005
17.100	0.000	1.58	0.10	2.22	0.004
17.200	0.000	1.50	0.09	2.09	0.004
17.300	0.000	1.42	0.09	1.98	0.004
17.400	0.000	1.36	0.08	1.89	0.004
17.500	0.000	1.31	0.08	1.81	0.003
17.600	0.000	1.26	0.08	1.75	0.003
17.700	0.000	1.22	0.07	1.69	0.003
17.800	0.000	1.18	0.07	1.63	0.003
17.900	0.000	1.15	0.07	1.58	0.003
18.000	0.000	1.12	0.07	1.54	0.003
18.100	0.000	0.86	0.05	1.34	0.002
18.200	0.000	0.84	0.05	1.15	0.002
18.300	0.000	0.81	0.05	1.12	0.002
18.400	0.000	0.79	0.05	1.09	0.002
18.500	0.000	0.77	0.05	1.06	0.002
18.600	0.000	0.75	0.05	1.03	0.002
18.700	0.000	0.73	0.04	1.01	0.002
18.800	0.000	0.72	0.04	0.98	0.002
18.900	0.000	0.70	0.04	0.96	0.002
19.000	0.000	0.69	0.04	0.94	0.002
19.100	0.000	0.67	0.04	0.92	0.002
19.200	0.000	0.66	0.04	0.90	0.002
19.300	0.000	0.64	0.04	0.88	0.002
19.400	0.000	0.63	0.04	0.87	0.002
19.500	0.000	0.62	0.04	0.85	0.002
19.600	0.000	0.61	0.04	0.83	0.002
19.700	0.000	0.60	0.04	0.82	0.002
19.800	0.000	0.59	0.04	0.81	0.002
19.900	0.000	0.58	0.04	0.79	0.002
20.000	0.000	0.57	0.03	0.78	0.002
20.100	0.000	0.56	0.03	0.77	0.001
20.200	0.000	0.55	0.03	0.76	0.001
20.300	0.000	0.54	0.03	0.74	0.001
20.400	0.000	0.54	0.03	0.73	0.001
20.500	0.000	0.53	0.03	0.72	0.001
20.600	0.000	0.52	0.03	0.71	0.001
20.700	0.000	0.51	0.03	0.70	0.001
20.800	0.000	0.51	0.03	0.69	0.001
20.900	0.000	0.50	0.03	0.68	0.001
21.000	0.000	0.49	0.03	0.67	0.001
21.100	0.000	0.49	0.03	0.67	0.001
21.200	0.000	0.48	0.03	0.66	0.001
21.300	0.000	0.48	0.03	0.65	0.001
21.400	0.000	0.47	0.03	0.64	0.001
21.500	0.000	0.46	0.03	0.63	0.001
21.600	0.000	0.46	0.03	0.63	0.001
21.700	0.000	0.45	0.03	0.62	0.001
21.800	0.000	0.45	0.03	0.61	0.001
21.900	0.000	0.44	0.03	0.61	0.001
22.000	0.000	0.44	0.03	0.60	0.001
22.100	0.000	0.44	0.03	0.59	0.001
22.200	0.000	0.43	0.03	0.59	0.001
22.300	0.000	0.43	0.03	0.58	0.001
22.400	0.000	0.42	0.03	0.58	0.001
22.500	0.000	0.42	0.03	0.57	0.001
22.600	0.000	0.41	0.03	0.56	0.001
22.700	0.000	0.41	0.03	0.56	0.001
22.800	0.000	0.41	0.02	0.55	0.001
22.900	0.000	0.40	0.02	0.55	0.001
23.000	0.000	0.40	0.02	0.54	0.001
23.100	0.000	0.40	0.02	0.54	0.001
23.200	0.000	0.39	0.02	0.53	0.001
23.300	0.000	0.39	0.02	0.53	0.001
23.400	0.000	0.38	0.02	0.52	0.001
23.500	0.000	0.38	0.02	0.52	0.001
23.600	0.000	0.38	0.02	0.52	0.001
23.700	0.000	0.38	0.02	0.51	0.001
23.800	0.000	0.37	0.02	0.51	0.001
23.900	0.000	0.37	0.02	0.50	0.001
24.000	0.000	0.37	0.02	0.50	0.001
24.100	0.000	0.00	0.00	0.25	0.000

1

ECKOFF STREET
PONDING AT SOUTHERLY TRUCK YARD BUILDING 2

Elevation	Depth (feet)	Area (sq. ft.)	Volume (c.f.)	Σ Volume (c.f.)	Σ Volume (ac-ft)	Q (discharge) (cfs)
155.63	0.00	0				
			155	155	0.00	
155.80	0.17	1824				
			928	1,083	0.02	5.50
156.00	0.37	7456				
			905	1,988	0.05	5.80
156.10	0.47	10650				
			1137	3,126	0.07	6.10
156.20	0.57	12100				



$Q = .6(AREA)\sqrt{64.4(h)}$

$h = .87$ $Q = .6(1.23)\sqrt{64.4(.87)} = 5.5$ cfs

$h = .97$ $Q = .6(1.23)\sqrt{64.4(.97)} = 5.8$ cfs

$h = 1.07$ $Q = .6(1.23)\sqrt{64.4(1.07)} = 6.1$ cfs

****

SMALL AREA UNIT HYDROGRAPH MODEL

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) = 2.05
SOIL-LOSS RATE, Fm,(INCH/HR) = 0.040
LOW LOSS FRACTION = 0.118
TIME OF CONCENTRATION(MIN.) = 9.90
RATIONAL METHOD PEAK FLOW RATE (DEFINED BY USER)
IS USED FOR SMALL AREA PEAK Q
ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
RETURN FREQUENCY(YEARS) = 100
5-MINUTE POINT RAINFALL VALUE(INCHES) = 0.52
30-MINUTE POINT RAINFALL VALUE(INCHES) = 1.09
1-HOUR POINT RAINFALL VALUE(INCHES) = 1.45
3-HOUR POINT RAINFALL VALUE(INCHES) = 2.43
6-HOUR POINT RAINFALL VALUE(INCHES) = 3.36
24-HOUR POINT RAINFALL VALUE(INCHES) = 5.63

TOTAL CATCHMENT RUNOFF VOLUME(ACRE-FEET) = 0.78
TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) = 0.18

****

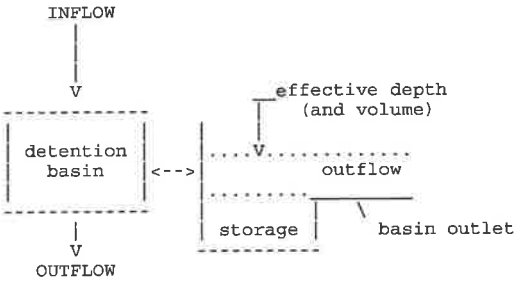
TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	2.5	5.0	7.5	10.0
0.16	0.0010	0.14	Q	.	.	.	.
0.33	0.0029	0.14	Q	.	.	.	.
0.49	0.0049	0.14	Q	.	.	.	.
0.66	0.0068	0.15	Q	.	.	.	.
0.82	0.0088	0.15	Q	.	.	.	.
0.99	0.0108	0.15	Q	.	.	.	.
1.15	0.0128	0.15	Q	.	.	.	.
1.32	0.0149	0.15	Q	.	.	.	.
1.48	0.0169	0.15	Q	.	.	.	.
1.65	0.0190	0.15	Q	.	.	.	.
1.81	0.0210	0.15	Q	.	.	.	.
1.98	0.0231	0.15	Q	.	.	.	.
2.14	0.0252	0.15	Q	.	.	.	.
2.31	0.0273	0.16	Q	.	.	.	.
2.47	0.0295	0.16	Q	.	.	.	.
2.64	0.0316	0.16	Q	.	.	.	.
2.80	0.0338	0.16	Q	.	.	.	.
2.97	0.0360	0.16	Q	.	.	.	.
3.13	0.0382	0.16	Q	.	.	.	.
3.30	0.0404	0.16	Q	.	.	.	.
3.46	0.0426	0.16	Q	.	.	.	.
3.63	0.0449	0.17	Q	.	.	.	.
3.79	0.0471	0.17	Q	.	.	.	.
3.96	0.0494	0.17	Q	.	.	.	.
4.12	0.0517	0.17	Q	.	.	.	.
4.29	0.0541	0.17	Q	.	.	.	.
4.45	0.0564	0.17	Q	.	.	.	.
4.62	0.0588	0.17	Q	.	.	.	.
4.78	0.0612	0.18	Q	.	.	.	.
4.95	0.0636	0.18	Q	.	.	.	.
5.11	0.0660	0.18	Q	.	.	.	.
5.28	0.0685	0.18	Q	.	.	.	.
5.44	0.0710	0.18	Q	.	.	.	.
5.61	0.0735	0.19	Q	.	.	.	.
5.77	0.0760	0.19	Q	.	.	.	.
5.94	0.0786	0.19	Q	.	.	.	.
6.10	0.0812	0.19	Q	.	.	.	.
6.27	0.0838	0.19	Q	.	.	.	.
6.43	0.0864	0.19	Q	.	.	.	.
6.60	0.0891	0.20	Q	.	.	.	.
6.76	0.0918	0.20	Q	.	.	.	.
6.93	0.0945	0.20	Q	.	.	.	.
7.09	0.0972	0.20	Q	.	.	.	.
7.26	0.1000	0.21	Q	.	.	.	.
7.42	0.1029	0.21	Q	.	.	.	.
7.59	0.1057	0.21	Q	.	.	.	.
7.75	0.1086	0.21	Q	.	.	.	.
7.92	0.1115	0.22	Q	.	.	.	.
8.08	0.1145	0.22	Q	.	.	.	.
8.24	0.1175	0.22	Q	.	.	.	.
8.41	0.1205	0.22	Q	.	.	.	.
8.57	0.1236	0.23	Q	.	.	.	.
8.74	0.1267	0.23	Q	.	.	.	.
8.90	0.1299	0.23	Q	.	.	.	.
9.07	0.1331	0.24	Q	.	.	.	.
9.24	0.1364	0.24	Q	.	.	.	.
9.40	0.1397	0.24	Q	.	.	.	.
9.57	0.1431	0.25	Q	.	.	.	.

```
 9.73    0.1465    0.25  .Q        .         .         .         .
 9.90    0.1499    0.26  .Q        .         .         .         .
10.06    0.1535    0.26  .Q        .         .         .         .
10.23    0.1571    0.27  .Q        .         .         .         .
10.39    0.1607    0.27  .Q        .         .         .         .
10.55    0.1644    0.28  .Q        .         .         .         .
10.72    0.1682    0.28  .Q        .         .         .         .
10.89    0.1721    0.29  .Q        .         .         .         .
11.05    0.1760    0.29  .Q        .         .         .         .
11.22    0.1800    0.30  .Q        .         .         .         .
11.38    0.1841    0.30  .Q        .         .         .         .
11.55    0.1883    0.31  .Q        .         .         .         .
11.71    0.1926    0.32  .Q        .         .         .         .
11.88    0.1970    0.33  .Q        .         .         .         .
12.04    0.2015    0.33  .Q        .         .         .         .
12.20    0.2067    0.43  .Q        .         .         .         .
12.37    0.2127    0.44  .Q        .         .         .         .
12.54    0.2187    0.45  .Q        .         .         .         .
12.70    0.2250    0.46  .Q        .         .         .         .
12.87    0.2313    0.48  .Q        .         .         .         .
13.03    0.2379    0.49  .Q        .         .         .         .
13.20    0.2446    0.50  . Q       .         .         .         .
13.36    0.2516    0.51  . Q       .         .         .         .
13.52    0.2588    0.54  . Q       .         .         .         .
13.69    0.2662    0.55  . Q       .         .         .         .
13.85    0.2739    0.58  . Q       .         .         .         .
14.02    0.2820    0.60  . Q       .         .         .         .
14.18    0.2904    0.64  . Q       .         .         .         .
14.35    0.2993    0.67  . Q       .         .         .         .
14.52    0.3088    0.72  . Q       .         .         .         .
14.68    0.3188    0.75  . Q       .         .         .         .
14.85    0.3295    0.82  .  Q      .         .         .         .
15.01    0.3410    0.87  .  Q      .         .         .         .
15.18    0.3536    0.98  .  Q      .         .         .         .
15.34    0.3674    1.05  .   Q     .         .         .         .
15.51    0.3820    1.09  .   Q     .         .         .         .
15.67    0.3979    1.24  .   Q     .         .         .         .
15.84    0.4187    1.80  .      Q  .         .         .         .
16.00    0.4478    2.48  .        Q.         .         .         .
16.17    0.5173    7.70  .         .         .         Q         .
16.33    0.5797    1.45  .    Q    .         .         .         .
16.50    0.5973    1.13  .   Q     .         .         .         .
16.66    0.6112    0.92  .  Q      .         .         .         .
16.83    0.6228    0.78  .  Q      .         .         .         .
16.99    0.6329    0.69  . Q       .         .         .         .
17.16    0.6418    0.62  . Q       .         .         .         .
17.32    0.6499    0.57  . Q       .         .         .         .
17.48    0.6573    0.53  . Q       .         .         .         .
17.65    0.6643    0.49  .Q        .         .         .         .
17.82    0.6708    0.47  .Q        .         .         .         .
17.98    0.6770    0.45  .Q        .         .         .         .
18.14    0.6826    0.37  .Q        .         .         .         .
18.31    0.6873    0.32  .Q        .         .         .         .
18.48    0.6916    0.31  .Q        .         .         .         .
18.64    0.6957    0.29  .Q        .         .         .         .
18.81    0.6997    0.28  .Q        .         .         .         .
18.97    0.7035    0.27  .Q        .         .         .         .
19.14    0.7071    0.26  .Q        .         .         .         .
19.30    0.7106    0.25  .Q        .         .         .         .
19.47    0.7141    0.25  Q         .         .         .         .
19.63    0.7174    0.24  Q         .         .         .         .
19.80    0.7206    0.23  Q         .         .         .         .
19.96    0.7237    0.23  Q         .         .         .         .
20.13    0.7267    0.22  Q         .         .         .         .
20.29    0.7297    0.21  Q         .         .         .         .
20.45    0.7326    0.21  Q         .         .         .         .
20.62    0.7354    0.20  Q         .         .         .         .
20.78    0.7382    0.20  Q         .         .         .         .
20.95    0.7409    0.20  Q         .         .         .         .
21.11    0.7435    0.19  Q         .         .         .         .
21.28    0.7461    0.19  Q         .         .         .         .
21.44    0.7486    0.18  Q         .         .         .         .
21.61    0.7511    0.18  Q         .         .         .         .
21.77    0.7536    0.18  Q         .         .         .         .
21.94    0.7559    0.17  Q         .         .         .         .
22.10    0.7583    0.17  Q         .         .         .         .
22.27    0.7606    0.17  Q         .         .         .         .
22.43    0.7629    0.17  Q         .         .         .         .
22.60    0.7651    0.16  Q         .         .         .         .
22.77    0.7673    0.16  Q         .         .         .         .
22.93    0.7695    0.16  Q         .         .         .         .
23.09    0.7716    0.16  Q         .         .         .         .
23.26    0.7737    0.15  Q         .         .         .         .
23.42    0.7758    0.15  Q         .         .         .         .
23.59    0.7778    0.15  Q         .         .         .         .
23.75    0.7798    0.15  Q         .         .         .         .
23.92    0.7818    0.14  Q         .         .         .         .
24.08    0.7838    0.14  Q         .         .         .         .
24.25    0.7847    0.00  Q         .         .         .         .
```

FLOW-THROUGH DETENTION BASIN MODEL

SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
CONSTANT HYDROGRAPH TIME UNIT(MINUTES) = 9.900
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 = 4

*BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS)	**	**BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS)	*
0.000	0.000	0.000	**	0.370	0.020	5.500	*
0.470	0.050	5.800	**	0.570	0.070	6.100	*

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	0.37	-0.01750	0.05750
3	0.47	0.01045	0.08955
4	0.57	0.02841	0.11159

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)
0.160	0.000	0.14	0.01	0.09	0.001
0.325	0.000	0.14	0.01	0.19	0.001
0.490	0.000	0.14	0.01	0.19	0.001
0.655	0.000	0.15	0.01	0.19	0.001
0.820	0.000	0.15	0.01	0.19	0.001
0.985	0.000	0.15	0.01	0.19	0.001
1.150	0.000	0.15	0.01	0.19	0.001
1.315	0.000	0.15	0.01	0.19	0.001
1.480	0.000	0.15	0.01	0.20	0.001
1.645	0.000	0.15	0.01	0.20	0.001
1.810	0.000	0.15	0.01	0.20	0.001
1.975	0.000	0.15	0.01	0.20	0.001
2.140	0.000	0.15	0.01	0.20	0.001
2.305	0.000	0.16	0.01	0.20	0.001
2.470	0.000	0.16	0.01	0.20	0.001
2.635	0.000	0.16	0.01	0.21	0.001
2.800	0.000	0.16	0.01	0.21	0.001
2.965	0.000	0.16	0.01	0.21	0.001
3.130	0.000	0.16	0.01	0.21	0.001
3.295	0.000	0.16	0.01	0.21	0.001
3.460	0.000	0.16	0.01	0.21	0.001
3.625	0.000	0.17	0.01	0.22	0.001
3.790	0.000	0.17	0.01	0.22	0.001
3.955	0.000	0.17	0.01	0.22	0.001
4.120	0.000	0.17	0.01	0.22	0.001
4.285	0.000	0.17	0.02	0.22	0.001
4.450	0.000	0.17	0.02	0.22	0.001
4.615	0.000	0.17	0.02	0.23	0.001
4.780	0.000	0.18	0.02	0.23	0.001
4.945	0.000	0.18	0.02	0.23	0.001
5.110	0.000	0.18	0.02	0.23	0.001
5.275	0.000	0.18	0.02	0.24	0.001
5.440	0.000	0.18	0.02	0.24	0.001
5.605	0.000	0.19	0.02	0.24	0.001
5.770	0.000	0.19	0.02	0.24	0.001
5.935	0.000	0.19	0.02	0.24	0.001
6.100	0.000	0.19	0.02	0.25	0.001
6.265	0.000	0.19	0.02	0.25	0.001
6.430	0.000	0.19	0.02	0.25	0.001
6.595	0.000	0.20	0.02	0.26	0.001
6.760	0.000	0.20	0.02	0.26	0.001
6.925	0.000	0.20	0.02	0.26	0.001
7.090	0.000	0.20	0.02	0.26	0.001
7.255	0.000	0.21	0.02	0.27	0.001
7.420	0.000	0.21	0.02	0.27	0.001
7.585	0.000	0.21	0.02	0.27	0.001
7.750	0.000	0.21	0.02	0.28	0.001
7.915	0.000	0.22	0.02	0.28	0.001
8.080	0.000	0.22	0.02	0.28	0.001
8.245	0.000	0.22	0.02	0.29	0.001
8.410	0.000	0.22	0.02	0.29	0.001
8.575	0.000	0.23	0.02	0.29	0.001
8.740	0.000	0.23	0.02	0.30	0.001
8.905	0.000	0.23	0.02	0.30	0.001
9.070	0.000	0.24	0.02	0.31	0.001

9.235	0.000	0.24	0.02	0.31	0.001
9.400	0.000	0.24	0.02	0.32	0.001
9.565	0.000	0.25	0.02	0.32	0.001
9.730	0.000	0.25	0.02	0.33	0.001
9.895	0.000	0.26	0.02	0.33	0.001
10.060	0.000	0.26	0.02	0.34	0.001
10.225	0.000	0.27	0.02	0.34	0.001
10.390	0.000	0.27	0.02	0.35	0.001
10.555	0.000	0.28	0.02	0.36	0.001
10.720	0.000	0.28	0.02	0.36	0.001
10.885	0.000	0.29	0.03	0.37	0.001
11.050	0.000	0.29	0.03	0.38	0.001
11.215	0.000	0.30	0.03	0.38	0.001
11.380	0.000	0.30	0.03	0.39	0.001
11.545	0.000	0.31	0.03	0.40	0.001
11.710	0.000	0.32	0.03	0.41	0.002
11.875	0.000	0.33	0.03	0.42	0.002
12.040	0.000	0.33	0.03	0.43	0.002
12.205	0.000	0.43	0.04	0.50	0.002
12.370	0.000	0.44	0.04	0.57	0.002
12.535	0.000	0.45	0.04	0.58	0.002
12.700	0.000	0.46	0.04	0.59	0.002
12.865	0.000	0.48	0.04	0.61	0.002
13.030	0.000	0.49	0.04	0.63	0.002
13.195	0.000	0.50	0.04	0.65	0.002
13.360	0.000	0.51	0.05	0.66	0.002
13.525	0.000	0.54	0.05	0.69	0.003
13.690	0.000	0.55	0.05	0.71	0.003
13.855	0.000	0.58	0.05	0.74	0.003
14.020	0.000	0.60	0.05	0.77	0.003
14.185	0.000	0.64	0.06	0.81	0.003
14.350	0.000	0.67	0.06	0.85	0.003
14.515	0.000	0.72	0.06	0.90	0.003
14.680	0.000	0.75	0.07	0.96	0.004
14.845	0.000	0.82	0.07	1.02	0.004
15.010	0.000	0.87	0.08	1.10	0.004
15.175	0.000	0.98	0.09	1.20	0.005
15.340	0.000	1.05	0.09	1.32	0.005
15.505	0.000	1.09	0.10	1.40	0.005
15.670	0.000	1.24	0.11	1.52	0.006
15.835	0.000	1.80	0.16	1.98	0.009
16.000	0.000	2.48	0.22	2.79	0.012
16.165	0.000	7.70	0.54	4.62	0.064
16.330	0.000	1.45	0.28	5.05	0.015
16.495	0.000	1.13	0.10	2.79	0.005
16.660	0.000	0.92	0.08	1.33	0.004
16.825	0.000	0.78	0.07	1.11	0.004
16.990	0.000	0.69	0.06	0.96	0.003
17.155	0.000	0.62	0.05	0.85	0.003
17.320	0.000	0.57	0.05	0.77	0.003
17.485	0.000	0.53	0.05	0.71	0.002
17.650	0.000	0.49	0.04	0.67	0.002
17.815	0.000	0.47	0.04	0.63	0.002
17.980	0.000	0.45	0.04	0.60	0.002
18.145	0.000	0.37	0.03	0.53	0.002
18.310	0.000	0.32	0.03	0.45	0.002
18.475	0.000	0.31	0.03	0.41	0.001
18.640	0.000	0.29	0.03	0.39	0.001
18.805	0.000	0.28	0.02	0.38	0.001
18.970	0.000	0.27	0.02	0.36	0.001
19.135	0.000	0.26	0.02	0.35	0.001
19.300	0.000	0.25	0.02	0.34	0.001
19.465	0.000	0.25	0.02	0.33	0.001
19.630	0.000	0.24	0.02	0.32	0.001
19.795	0.000	0.23	0.02	0.31	0.001
19.960	0.000	0.23	0.02	0.30	0.001
20.125	0.000	0.22	0.02	0.29	0.001
20.290	0.000	0.21	0.02	0.28	0.001
20.455	0.000	0.21	0.02	0.28	0.001
20.620	0.000	0.20	0.02	0.27	0.001
20.785	0.000	0.20	0.02	0.26	0.001
20.950	0.000	0.20	0.02	0.26	0.001
21.115	0.000	0.19	0.02	0.25	0.001
21.280	0.000	0.19	0.02	0.25	0.001
21.445	0.000	0.18	0.02	0.24	0.001
21.610	0.000	0.18	0.02	0.24	0.001
21.775	0.000	0.18	0.02	0.23	0.001
21.940	0.000	0.17	0.02	0.23	0.001
22.105	0.000	0.17	0.01	0.22	0.001
22.270	0.000	0.17	0.01	0.22	0.001
22.435	0.000	0.17	0.01	0.22	0.001
22.600	0.000	0.16	0.01	0.21	0.001
22.765	0.000	0.16	0.01	0.21	0.001
22.930	0.000	0.16	0.01	0.21	0.001
23.095	0.000	0.16	0.01	0.20	0.001
23.260	0.000	0.15	0.01	0.20	0.001
23.425	0.000	0.15	0.01	0.20	0.001
23.590	0.000	0.15	0.01	0.20	0.001
23.755	0.000	0.15	0.01	0.19	0.001
23.920	0.000	0.14	0.01	0.19	0.001
24.085	0.000	0.14	0.01	0.19	0.001
24.250	0.000	0.00	0.00	0.09	0.000

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APPENDIX D

HYDROLOGY MAPS

VICINITY MAP

N.T.S.

LEGEND

- PROJECT BOUNDARY
- SUBAREA BOUNDARY
- FLOWLINE
- 1.00 AC. — SUBAREA AREA
- APPROXIMATE LIMITS OF 100-YEAR PONDING

0 20 40 80 120

SCALE: 1"=40'

Last Update:11/2/22
O:\3900-3999\3910\3910hyd.dwg

CITY OF ORANGE

PUBLIC WORKS DEPARTMENT

PROPOSED CONDITION HYDROLOGY MAP

ECKHOFF STREET

PREPARED FOR:

IDI ECKHOFF ORANGE, LLC
840 APOLLO STREET, STE. 343
EL SEGUNDO, CA. 90245
PHONE: (213) 330-8066

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

Designed by _____ Date _____
Checked by _____ Date _____
Designed by _____ Date _____
Checked by _____ Date _____

Approved by _____ Date _____

Public Works Director _____ R.C.E. XXXXX

Sheet 1 of 1 Sheets

VICINITY MAP

N.T.S.

B.N.S.F. RAILROAD R/W

ECKHOFF STREET

POPLAR STREET

101 Q100=1.9 CFS TC=5.0 MIN.

110

100

200

0.35 AC.

0.35 AC.

0.20 AC.

201

1.05 AC.

0.80 AC.

202

0.15 AC.

111 Q100=0.9 CFS TC=6.9 MIN.

ONE STORY CONCRETE BUILDING FOOTPRINT AREA = 5,397± SQ.FT. BUILDING HEIGHT = 33.0±

EXISTING RECTANGULAR CHANNEL

120

1.25 AC.

210

0.10 AC.

310

2.10 AC.

1.40 AC.

1.10 AC.

0.80 AC.

121 Q100=9.5 CFS TC=7.1 MIN.

140

300

211

EXISTING RECTANGULAR CHANNEL

0.60 AC.

141 Q100=5.8 CFS TC=8.3 MIN.

0.95 AC.

0.85 AC.

212 Q100=16.1 CFS TC=8.7 MIN.

131 Q100=5.9 CFS TC=12.8 MIN.

1.25 AC.

0.60 AC.

130

301

311 Q100=3.7 CFS TC=9.1 MIN.

EXISTING RECTANGULAR CHANNEL

Q100=6.3 CFS TC=7.7 MIN.

302

Last Update: 4/14/21
G:\3900-3999\3910\3910hyd-ex.dwg

LEGEND

	PROJECT BOUNDARY
	SUBAREA BOUNDARY
	FLOWLINE
1.00 AC.	SUBAREA AREA

0 20 40 80 120

SCALE: 1"=40'

PREPARED FOR:

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PH.(714)521-4811 FAX(714)521-4173

CITY OF ORANGE
PUBLIC WORKS DEPARTMENT

EXISTING CONDITION HYDROLOGY MAP

ECKHOFF STREET

Designed by _____ Date _____
Checked by _____ Date _____
Designed by _____ Date _____
Checked by _____ Date _____

Approved by _____ Date _____

Public Works Director _____ R.C.E. XXXXX

Sheet 1 of 1 Sheets