Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING

PRELIMINARY HYDROLOGY CALCULATIONS

FOR

BRIDGE POINT RANCHO CUCAMONGA – 2 BUILDINGS
4th STREET
RANCHO CUCAMONGA, CA

PREPARED FOR

BRIDGE DEVELOPMENT PARTNERS, LLC
11100 SANTA MONICA BLVD., SUITE 700
LOS ANGELES, CA 90025
(213) 519-3132
(310) 853-8423

OCTOBER 31, 2019
REVISED JANUARY 21, 2020
REVISED APRIL 8, 2020
REVISED AUGUST 12, 2020
REVISED JANUARY 20, 2021

JOB NO. 3819

PREPARED BY

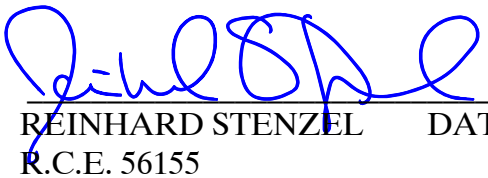
THIENES ENGINEERING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
P. (714) 521-4811
FAX. (714) 521-4173

PRELIMINARY HYDROLOGY CALCULATIONS

FOR

BRIDGE POINT RANCHO CUCAMONGA – 2 BUILDINGS

PREPARED UNDER
THE SUPERVISION OF:



REINHARD STENZEL DATE:
R.C.E. 56155
EXP. 12/31/2022

INTRODUCTION

A: PROJECT LOCATION

The project site is located at 12434 4th Street, along the north side of Fourth Street between Etiwanda Avenue and Santa Anita Avenue, in the City of Rancho Cucamonga, California. Please see next page for vicinity map.

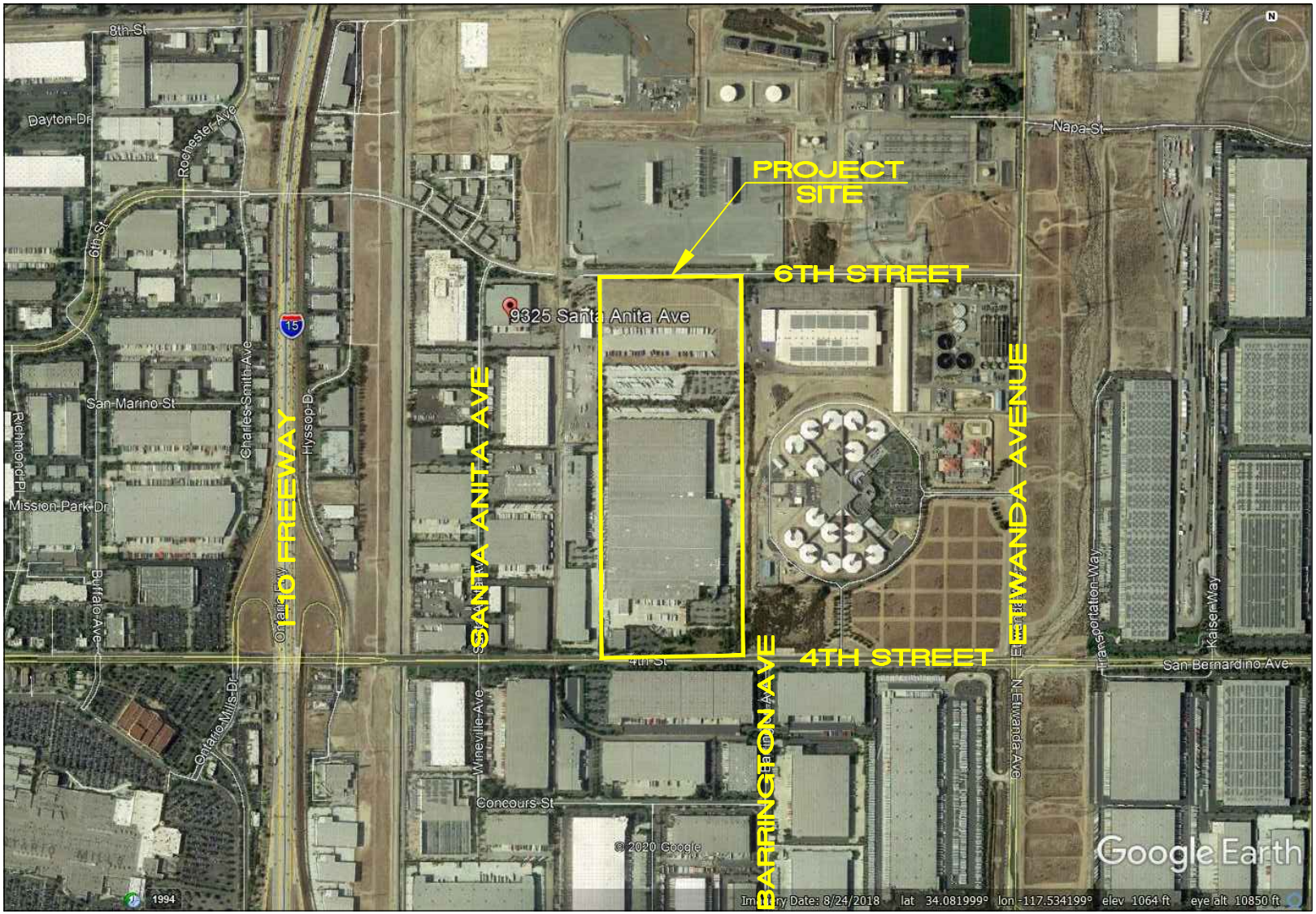
B: STUDY PURPOSE

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
Matthew Cruz



Last Update: 3/31/20
O:\3800-3899\3819\3819VicMap.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

12434 4TH STREET
RANCHO CUCAMONGA, CA

N

NTS

DISCUSSION

The project gross area is approximately 91.40 acres. The project net area is approximately 85.05 acres. The project drainage boundary is approximately 90.05 acres. This includes the project net area (85.05 acres) plus the area from propoed lot "A" and from proposed street "A" (4.90 acres). Proposed improvements to the site include two industrial warehouse buildings. Building 1 has a footprint of 1,403,500 square feet and Building 2 has a footprint of 738,270 square feet. The northerly building (Building 2) has truck yards on the north and south of it. There is vehicle parking located throughout. The southerly building (Building 1) has truck yards on the west and east of it. There is vehicle parking located throughout. There is a public street proposed along the easterly property line that will connect 6th Street (north of site) and 4th Street (south of site). There is landscaping located throughout the site.

Existing Public Storm Drains

There is an existing public storm drain that conveys runoff from the project site and other sites located on the northerly side of 4th Street to the southerly side of the street to an existing City of Ontario storm drain system south of 4th Street. Recent survey and reference plans indicate the facility under 4th Street as a double 7' wide by 3' high reinforced concrete box (R.C.B.). The City of Rancho Cucamonga did not have a plan for this facility. However, the City of Ontario provided a storm drain plan for the downstream facility. This plan references the double R.C.B. and indicates a 100-year peak flow rate of 714 cfs coming in from the double R.C.B.

Also, partial storm drain plans for the project site under existing conditions were available. This plan indicates that the site does currently drain to the existing double R.C.B via a connection to the back of the catch basin on the northerly side of 4th Street. The plan does not indicate any peak flow rates or design criteria.

See Appendix "A" for available reference storm drain plans.

Existing Condition

The site is currently developed with several different land use types. The northerly portion of the site, along 6th Street, appears to be agricultural usage (vineyards). Then there is an existing gravel lot used for trailer parking south of the vineyard. The trailer parking yard, vineyards and other open space (nodes 100-111 on existing condition hydrology map) drains southerly to a gutter and ultimately to a C.M.P. riser located near the southeast corner of the gravel parking lot (at node 112). Here, an existing storm drain system conveys runoff southerly through the easterly portion of the existing commercial development to the south.

Flow from the easterly half of the existing building, parking lots and truck yard drain to several catch basin along the easterly portion of the project site (nodes 120-128). Runoff to these catch basins appear to drain to the previously mentioned storm drain. The storm

drain system continues south then west around the existing building. Here, portions of the southerly parking lot are tributary to the storm drain system (at node 129). The storm drain continues westerly and confluences with another existing storm drain (described below).

Runoff from existing parking lots north of the building, the westerly half of the building and existing westerly drive aisle (nodes 140-149) are collected in catch basins north and west of the existing building. An existing storm drain system conveys this runoff southerly to the previously mentioned storm drain system (at node 149). An additional parking area is tributary at an existing catch basin at this location. The storm drain continues southerly and collects runoff from the smaller building located at the southwest corner of the project site. The total 100-year existing condition 100-year peak flow rate in the existing storm drain system is approximately 178.9 cfs.

The landscaped areas adjacent to 4th Street, an existing parking lot and the easterly drive aisle (nodes 160-161, 170-171 and 180-181) discharge to the street via sheet flow or a parkway culvert. The total 100-year peak flow rate for these individual areas is approximately 18.5 cfs (3.3 + 6.8 + 8.4 cfs).

The existing onsite storm drain system connects to the back of an existing catch basin on 4th Street. Runoff continues southerly under 4th Street in a double 7'wide by 3' high R.C.B. ultimately to an existing City of Ontario storm drain system. The overall 100-year peak flow rate from the project site to the double box culvert is approximately 197.4 cfs (direct sum of 178.9 cfs and 18.5 cfs).

See table for a summary of peak flow rates for the existing condition.

Existing Condition Q Summary			
AES filename	node	acreage (ac)	peak q (cfs)
exa	100-150	84.2	178.93
exb	160-161	0.8	3.33
exc	170-171	2.4	6.81
exd	180-181	1.85	8.44

Note that only portions of the existing storm drain plans were available through the City. The hydrologic model is based on available plans and recent survey that estimates the location, confluence points, distances and elevations in the existing storm drain system between nodes.

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

Proposed Condition

Overall, runoff from the site as a whole will continue to drain to 4th Street. There will be two proposed connections to the existing storm drain system in 4th Street. An onsite storm

drain system will intercept and convey runoff from all vehicle parking lots and truckyard and convey all flows southerly. The majority of the sites runoff will drain to the proposed connection at the southwesterly portion of the site (nodes 100-202, 82.60 acres).

The onsite storm drain system and the Q100 from the site will be discussed from the most upstream point to the downstream connection at 4th Street. Runoff from the northerly half of building 2 will all drain to the northerly truckyard (Node 100-112). Flows are intercepted by multiple catch basins located in the truckyard.

The onsite storm drain conveys flows from the aforementioned truckyard along the westerly drive aisle where it will pick up additional flows from the drive aisle, the northwesterly vehicle parking, and from a small portion of the Building 2 roof (Node 113-116).

The storm drain continues south where it will confluence with flows from the southerly truckyard of Building 2 (Node 138). Flows tributary to the southerly truckyard will drain to multiple catch basins (Node 130-137).

The onsite storm drain continues southerly through the Building 1 lot (Node 138-164) where it will confluence with runoff from the westerly half of the Building 1 roof, the westerly adjacent truckyard, and the northerly vehicle parking (Node 140-163). Another onsite storm drain system will intercept flows and convey them southerly, where it will confluence with the storm drain for Building 2.

Runoff from the easterly half of the Building 1 roof and easterly truckyard will drain to multiple catch basins located in the Building 1 easterly truckyard (180-189). This storm drain also receives some runoff from the Building 2 easterly vehicle parking lot (Node 170-172). The storm drain will carry flows southerly then westerly through the vehicle parking lot south of Building 1 (Node 195-200). Flows will confluence with the rest of the site and discharge at the proposed connection southwest of the site (Node 201-202). Landscaped area fronting 4th street along the southerly property line will drain directly to the street (0.95 acres, Node 202). The relocated catch basin adjacent to the southwesterly property line will intercept flows. The Q100 at this proposed connection is approximately 275.6 cfs.

Runoff from the easterly proposed A Street (nodes 200-205, 6.90 acres) will drain southerly to 4th Street. A proposed storm drain system with multiple catch basins along ‘A’ Street will connect to the existing 4th Street storm drain located southeast of the project. The 100-year peak flow rate from the site is approximately 20.6 cfs.

The total 100-year peak flow rate from the proposed project site is approximately 296.2 cfs (275.6 cfs + 20.6 cfs). This is a direct sum of the two individual storm drain systems that are tributary to the existing double 7’ x 3’ R.C.B.

Some runoff from areas along the northerly property line of the site will sheet flow to 6th Street (0.55 acres).

See Appendix "B" for proposed condition hydrology calculations and Appendix “C” for proposed condition hydrology map.

Detention

The 100-year peak flow rate for the proposed condition (296.2 cfs) is higher than that in the existing condition (197.4 cfs). This is primarily due to the development of a few areas that were previously undeveloped. In addition, the proposed site plan has smaller drainage areas and more catch basins and storm drain which yielded shorter times of concentration and thus higher peak flow rates.

To mitigate the additional 100-year peak flow rates, detention will be utilized in the truck yard areas. Hydrographs were established for Building 2 north truckyard, Building 2 south truckyard, Building 1 west truckyard, and the Building 1 east truckyard. . Preliminary discharge rates are calculated using the orifice equation. The Q at different elevations varies with the amount of head above the truckyards respective storm drain outlets. Sizing of the storm drain system and the hydraulics will be determined in final design.

See table below for a summary of the Q discharging from truckyards before and after detention.

truckyard	node	Acreage (ac)	peak Q (cfs)	tc (min)	discharge Q (cfs)	depth (ft)	Ponding elevation	volume ac-ft
bldg 2 north	100-112	11.25	46.67	7.95	8.9	0.91	1076.46	0.587
bldg 2 south	130-137	12.4	55.17	6.8	15	1.1	1073.64	0.449
bldg 1 west	160-162	6.55	23.32	9.91	15.7	1.79	1050.07	0.197
bldg 1 east	170-189	23.8	23.8	8.31	9.57	56.8	0.45	1051.94
			Σ 208.26*		Σ 96.4			

Areas onsite that are not tributary to any of the truckyards will continue to drain undetained. “A” Street will also drain undetained. These Peak Q’s are provided in table below.

undetained areas	node	Acreage (ac)	peak Q (cfs)
northwest area	113-116	3.05	5.13
bldg 1 west (north)	140-157	16.3	62.5
bldg 1 southwest corner	163-164	3.75	2.97
bldg 1 southside	195-200	4.55	2.82
bldg 1 southside landscaped frontage	202	0.95	-
east street	200-205	6.9	20.61
		Σ	94.03*

*See next page

*The sum Peak Q between truckyard areas and undetained areas (94.03 cfs + 208.26 cfs) 302.3 cfs will not and does not equate to 296.2 cfs per the rational method Q100. This is due to differing time of concentrations. The summed peak Q from the truckyard is only used to compare discharge from all truckyards after detention.

As previously mentioned, the peak Q100 is approximately 296.2 cfs. The estimated Q with detention is approximately 190.4 cfs (96.4 + 94.0 cfs). This is less than the existing condition Q100 of 197.4 cfs, therefore downstream facilities will not be affected by the development of the site.

Note that final grading and storm drain design will require an update to the detention analysis. However, there is plenty of additional discharge allowed from the truck yards that may result with any changes in parameters due to final design.

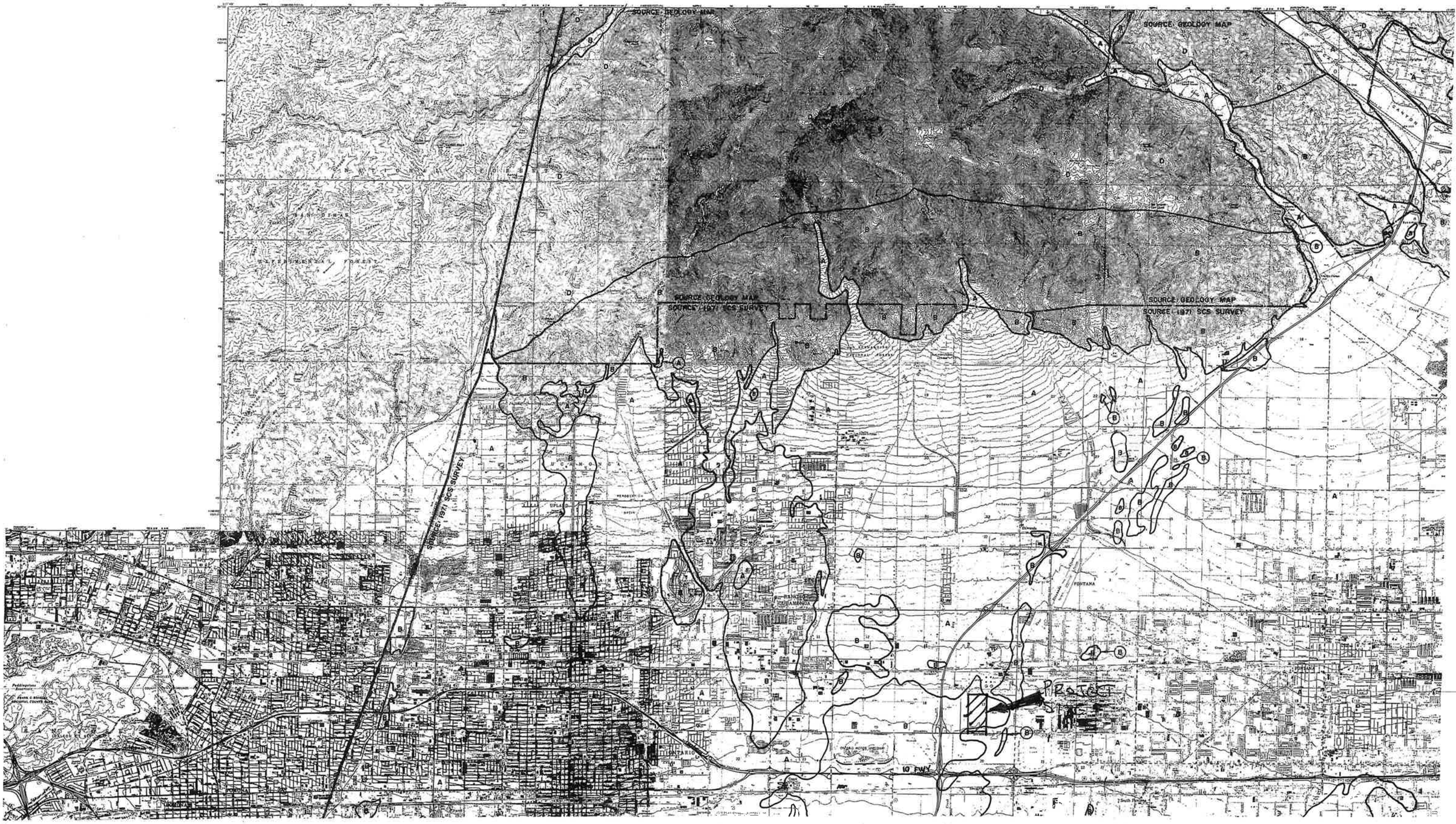
See Appendix "C" for detention calculations.

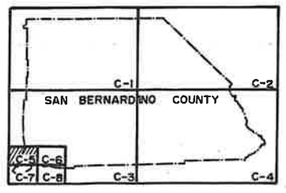
Methodology

Hydrology calculations were computed using San Bernardino County Rational Method program (by AES Software). Hydrographs and basin routing were calculated using AES Software's FLOOD program. The soil type is "B" per the San Bernardino County Hydrology Manual. See Appendix "A" for reference materials.

APPENDIX A

REFERENCE MATERIALS





INDEX MAP

LEGEND

SOIL GROUP BOUNDARY

A SOIL GROUP DESIGNATION

BOUNDARY OF INDICATED SOURCE

SCALE 1:48,000

SCALE REDUCED BY 1/2

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

HYDROLOGIC SOILS GROUP MAP
FOR
SOUTHWEST-A AREA

FIGURE C-13

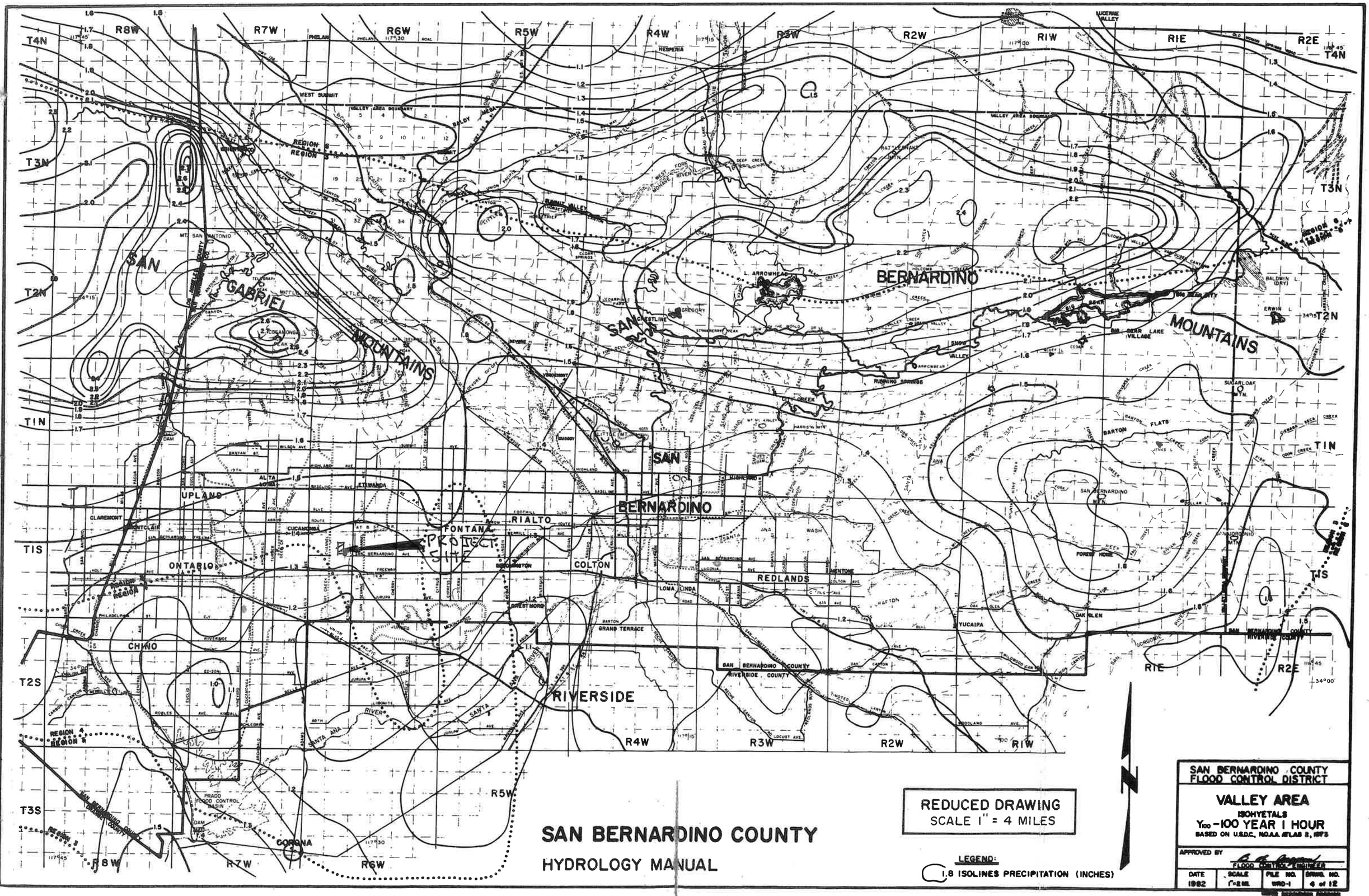
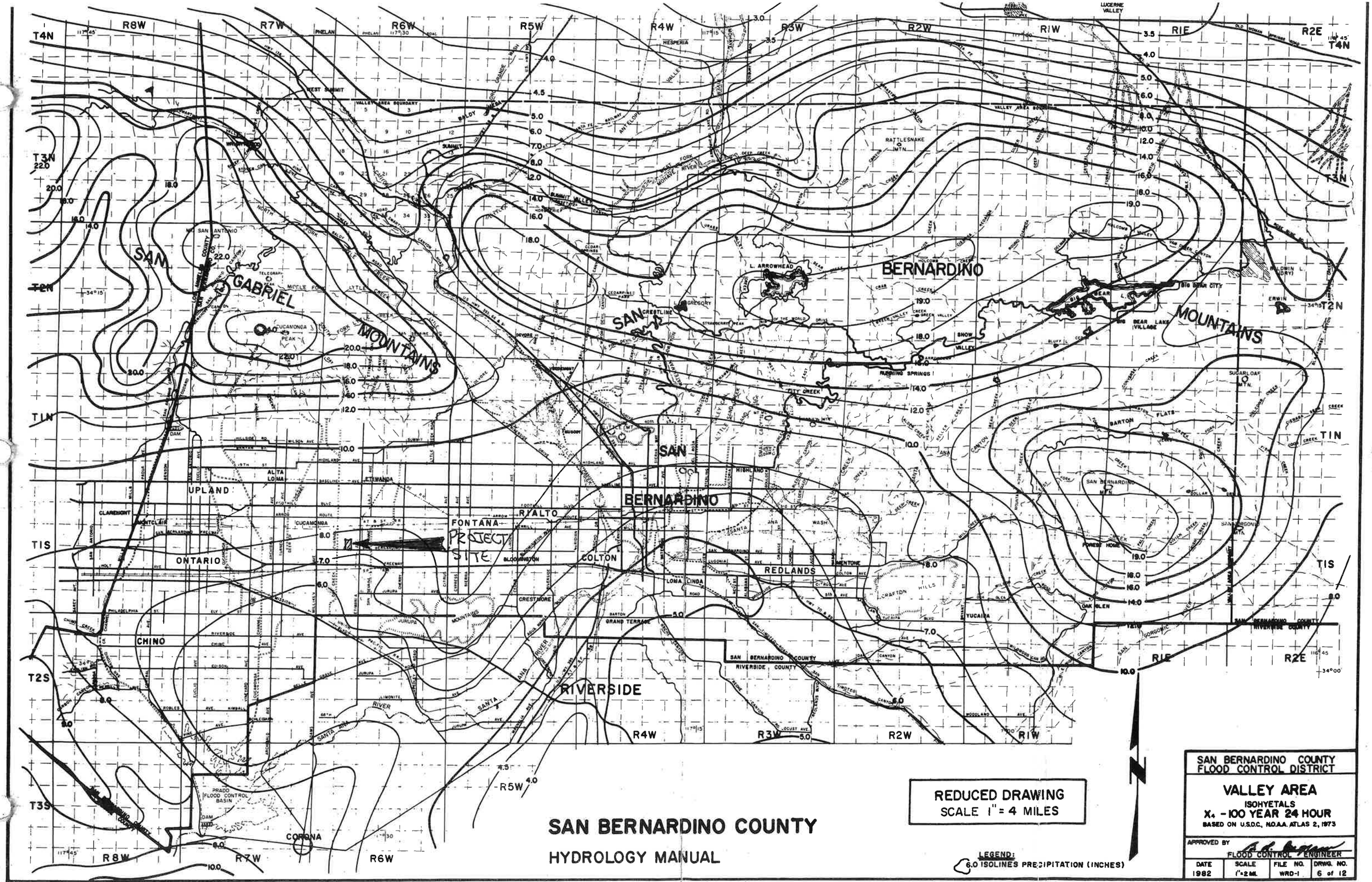

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL
REDUCED DRAWING
SCALE 1" = 4 MILES
LEGEND:
1.8 ISOLINES PRECIPITATION (INCHES)
SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT
VALLEY AREA
ISOHYETALS
Y100 - 100 YEAR 1 HOUR
BASED ON U.S.D.C., NOAA ATLAS 2, 1973
APPROVED BY
FLOOD CONTROL ENGINEER
DATE 1982
SCALE 1"=2 MI.
FILE NO. WRD-1
DRWG. NO. 4 of 12
PROJECT SITE
SAN GABRIEL MOUNTAINS
SAN BERNARDINO MOUNTAINS
BERNARDINO
SAN BERNARDINO
RIVERSIDE
UPLAND
ONTARIO
CHINO
CLAREMONT
FONTANA
RIALTO
COLTON
REDLANDS
LOMA LINDA
GRAND TERRACE
YUCAIPA
CORONA
PRADO FLOOD CONTROL BASIN
BIG BEAR LAKE VILLAGE
SNOW VALLEY
ARROWBEAR
RUNNING SPRINGS
BARTON FLATS
SUGARLOAF MTN.
BALDWIN L. (DRY)
ERWIN L.
L. ARROWHEAD
L. GREGORY
T4N
T3N
T2N
T1N
T1S
T2S
T3S
R8W
R7W
R6W
R5W
R4W
R3W
R2W
R1W
R1E
R2E
REGION 5
REGION 4
REGION 3
REGION 2
REGION 1

FIGURE B-4



REDUCED DRAWING
SCALE 1" = 4 MILES

LEGEND:
6.0 ISOLINES PRECIPITATION (INCHES)

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

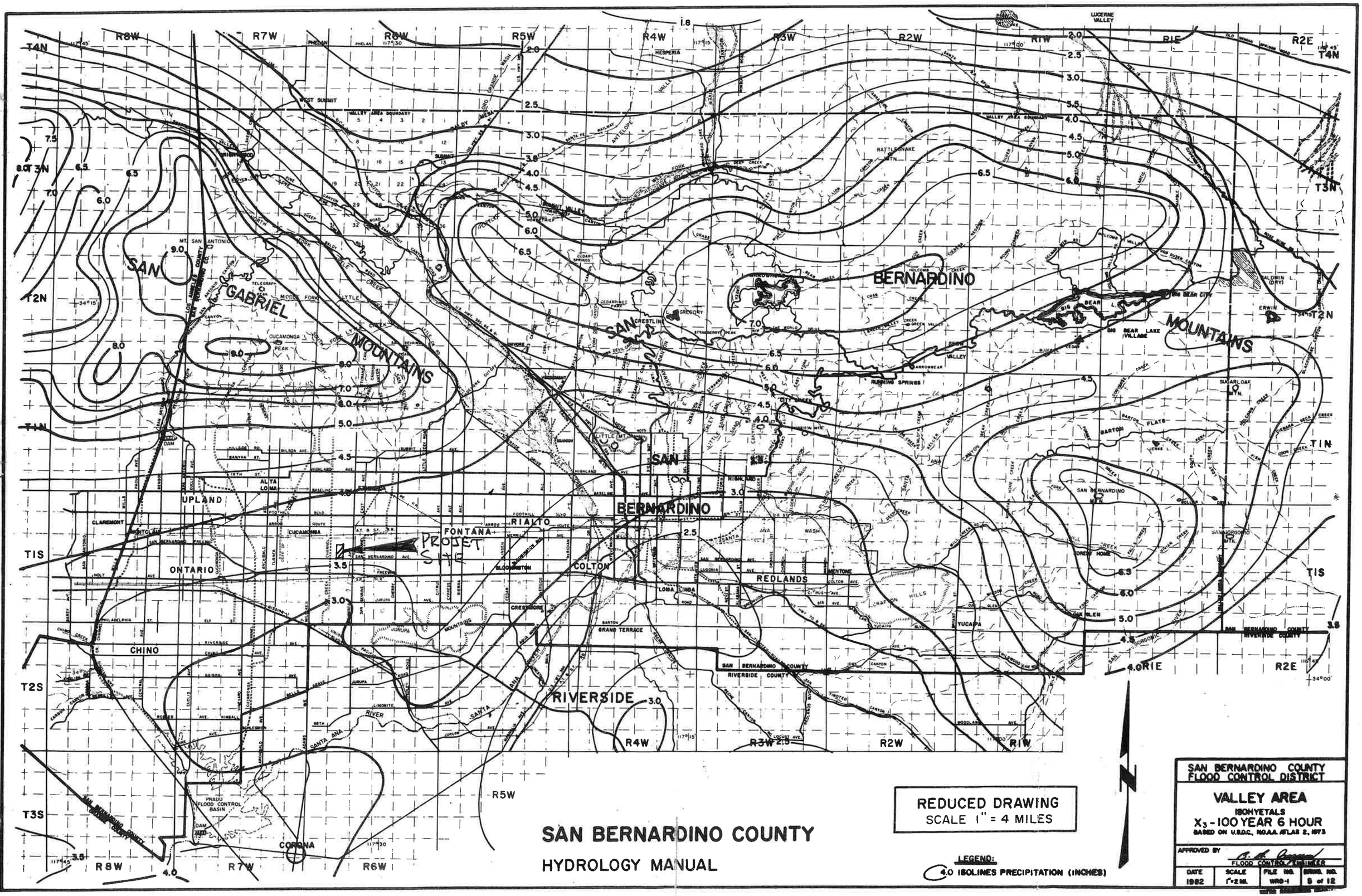
SAN BERNARDINO COUNTY
FLOOD CONTROL DISTRICT

VALLEY AREA
ISOHYETALS
X_4 - 100 YEAR 24 HOUR
BASED ON U.S.D.C., N.O.A.A. ATLAS 2, 1973

APPROVED BY _____ FLOOD CONTROL ENGINEER

DATE	SCALE	FILE NO.	DRWG. NO.
1982	1"=2 MI.	WRD-1	6 of 12

FIGURE B-6



SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

REDUCED DRAWING
SCALE 1" = 4 MILES

LEGEND:
4.0 ISOLINES PRECIPITATION (INCHES)

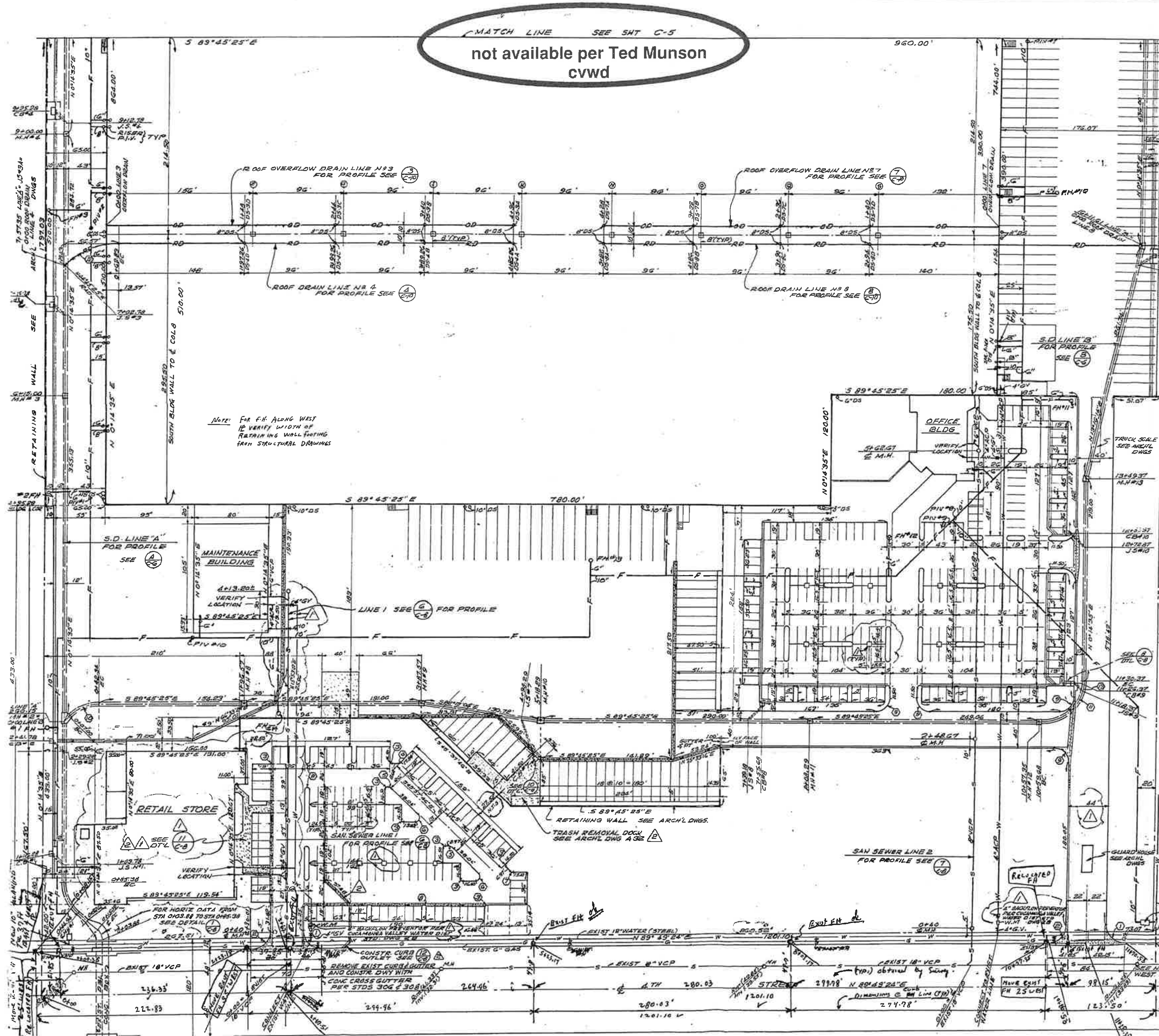
SAN BERNARDINO COUNTY
FLOOD CONTROL DISTRICT

VALLEY AREA
ISOHYETALS
X_3 - 100 YEAR 6 HOUR
BASED ON U.S.D.C., NOAA ATLAS 2, 1973

APPROVED BY _____ FLOOD CONTROL ENGINEER

DATE	SCALE	FILE NO.	DRWG. NO.
1982	1"=2 MI.	WRD-1	5 of 12

FIGURE B-5



NOTE:~

1. SEE ALLEN AUTOMATIC SPRINKLER DRAWINGS FP-1 & FP-2 FOR DETAILS OF FIRE LINES AND HYDRANTS
2. SEWER MANHOLES & WATER VALVES TO BE IN ACCORDANCE WITH STANDARDS OF CITY OF RANCHO CUCAMONGA.
3. FOR PROFILES OF CATCH BASIN CONNECTOR PIPES SEE SHT. C-7
4. FOR JUNCTION STRUCTURE DATA SEE TABLE ON SHT. C-7
5. FOR LIST OF STD DWGS SEE SHT C-1

CURVE DATA

NO.	Δ	R	L	T
1	90°25'11"	20.00	31.56	20.15
2	89°34'49"	20.00	31.27	19.85
3	90°00'00"	2.50		2.50
4	45°52'21"	2.50	2.00	1.06
5	44°07'39"	10.36	7.98	4.20
6	135°52'21"	5.00	11.86	12.34
7	44°07'39"	2.50	1.93	1.01
8	180°00'00"	2.50		—
9	90°00'00"	15.00		15.00
10	45°00'00"	45.00	35.34	18.64
11	90°00'00"	45.00	70.69	45.00
12	45°00'00"	80.00	62.83	33.14
13	15°16'44"	45.00	12.00	6.04

NOTE

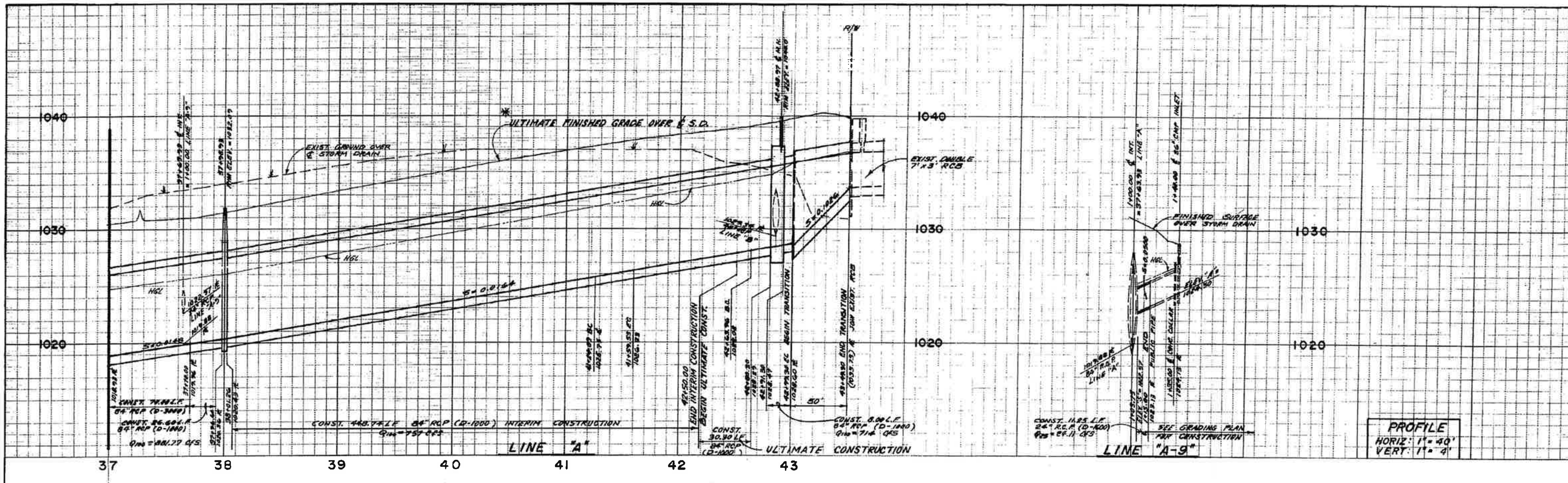
LOCATE FIRE LINES AND APPURTENCES FROM ALLEN AUTOMATIC SPRINKLER DWGS. FP-1, FP-2 & FP-3.

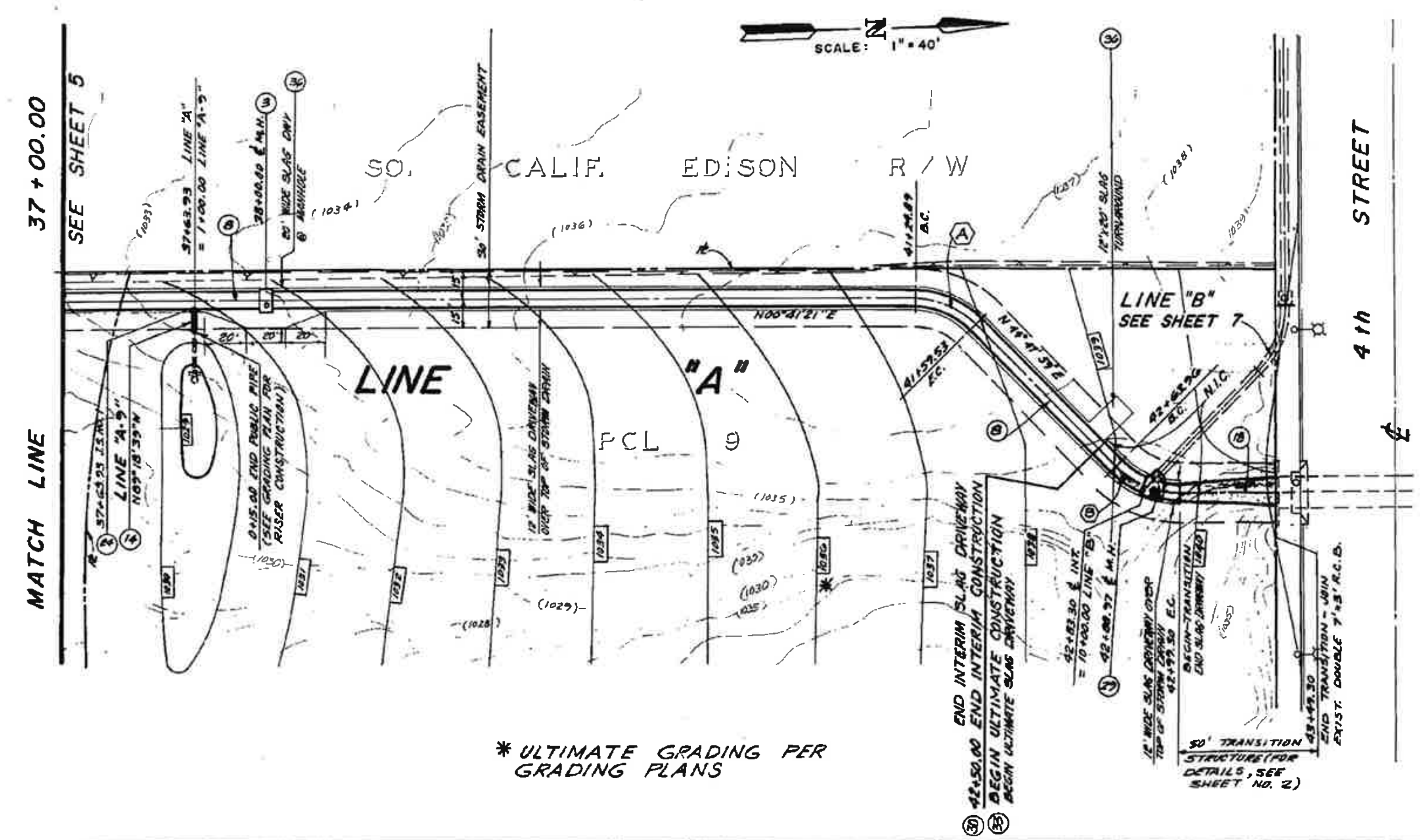
Black = Exist FH Location
Red = Proposed FH Location

BASIS OF BEARINGS

CENTER LINE OF 4TH STREET AS SHOWN PER P.M. 6658, M.B. 64, PAGES 51 & 52, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA.

HORIZONTAL CONTROL PLAN





* ULTIMATE GRADING PER GRADING PLANS

CONSTRUCTION NOTES

- (3) CONSTRUCT MANHOLE NO. 2 PER CITY OF ONTARIO STD. 306.
- (8) CONSTRUCT 84" RCP (D LOAD PER PLAN)
- (14) CONSTRUCT 24" RCP (D LOAD PER PLAN)
- (24) CONSTRUCT JUNCTION STRUCTURE NO. 1 PER CITY OF ONTARIO STD. NO. 307
- (18) CONSTRUCT TRANSITION STRUCTURE PER DETAILS, SHT. 2
- (29) CONSTRUCT MANHOLE NO. 4 PER LACFCD STD. NO. 2-0113
- (30) CONSTRUCT BRICK AND MORTAR PLUG
- (33) REMOVE BRICK AND MORTAR PLUG (ULTIMATE CONSTRUCTION)
- (36) CONSTRUCT 4" THICK CLASS II SLAG AT 90% COMPACTION OVER 90% COMPACTED NATIVE MATERIAL

CURVE DATA				
	Δ	R	L	T
(A)	44°06'37"	45.00'	34.64'	18.28'
(B)	45°00'00"	45.00'	35.34'	18.64'

D10269

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY RLS/TPV DATE 8/18/89
DRAWN BY LWF/JSB DATE 8/18/89
CHECKED BY F.Z. DATE 2/14/90

CITY OF ONTARIO
REVIEWED BY [signature] 2-14-90 DATE
ACCEPTED BY [signature] CITY ENGINEER 2-15-90 DATE

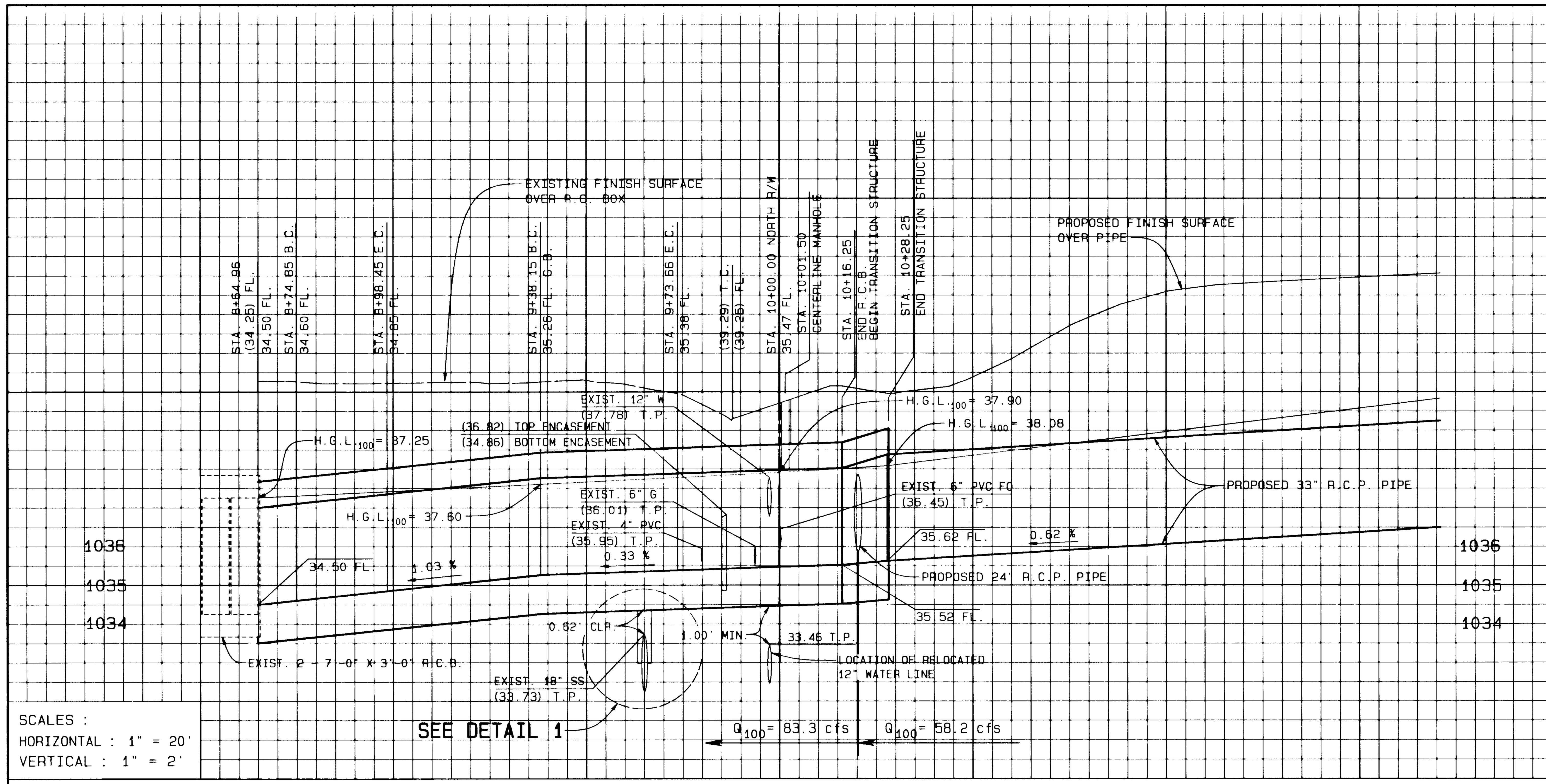
BENCH MARK No. SPS 01084 ELEV. 1013.469
LOCATION: S.B. Co. B.M. SPBN 01084 1" BOLT TOP OF CURB N. SIDE "G" ST. 300' E. OF C.L. DAY CREEK CHANNEL; 1' E. OF E. END W'LY. DR. TO 5125 "G" ST., 0.9 MI. W. OF ETIWANDA

WILLIAMSON and SCHMID
CONSULTING CIVIL ENGINEERS AND LAND SURVEYORS
1101 So. MILLIKEN AVE., Ste. B • ONTARIO, CA. 91761 • (714) 969-7880
APPROVED BY: MAURICE H. MURAD R.C.E. 33366 EXPIRES 6/30/90 DATE 8/18/89

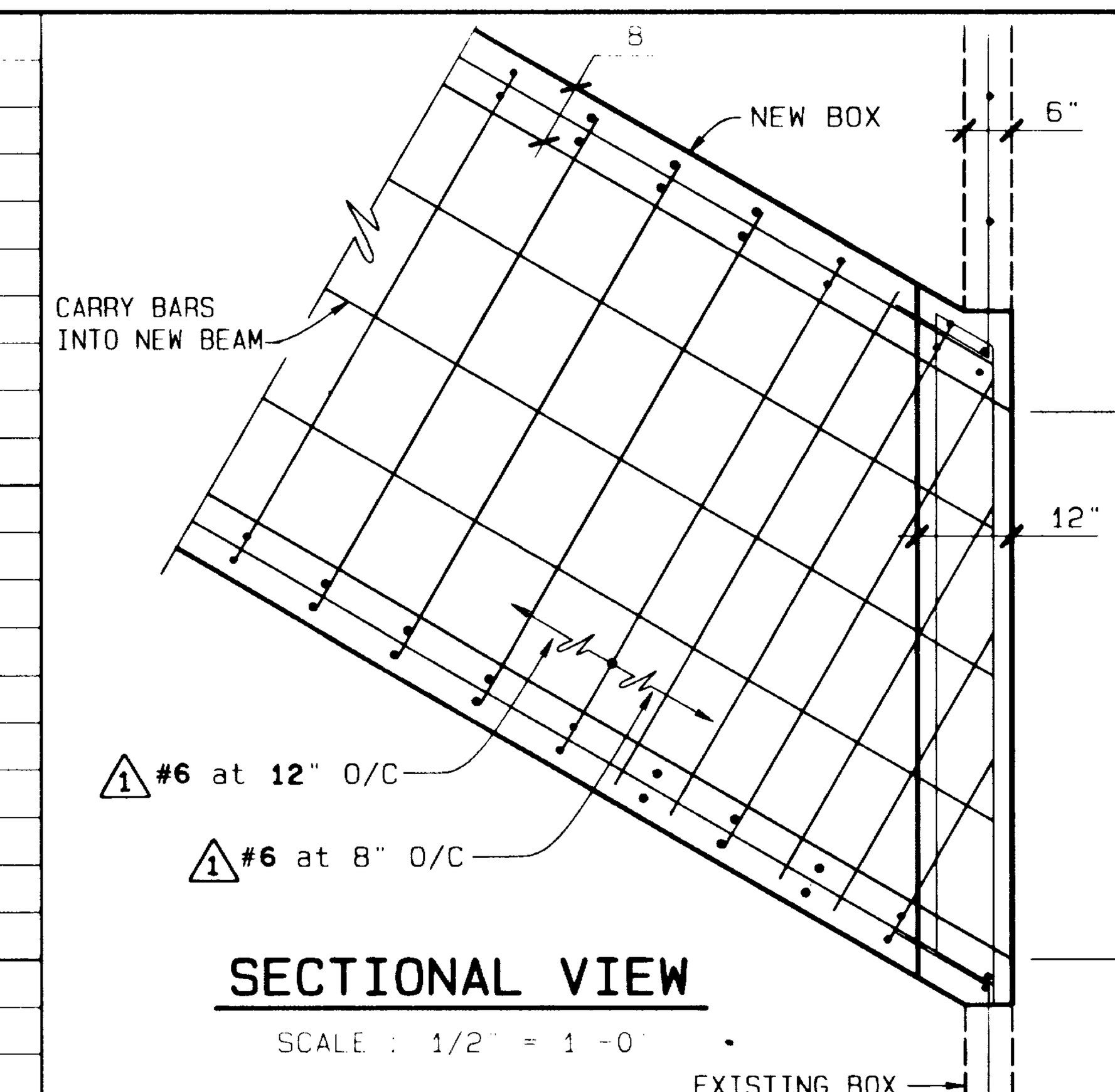
STORM DRAIN PLAN
LINE "A"
STA. 37+00.00 TO STA. 43+44.37

P. M. 10835

SHEET 6 OF 14
CONTRACT
ACCOUNT
DWG. NO. D-1060

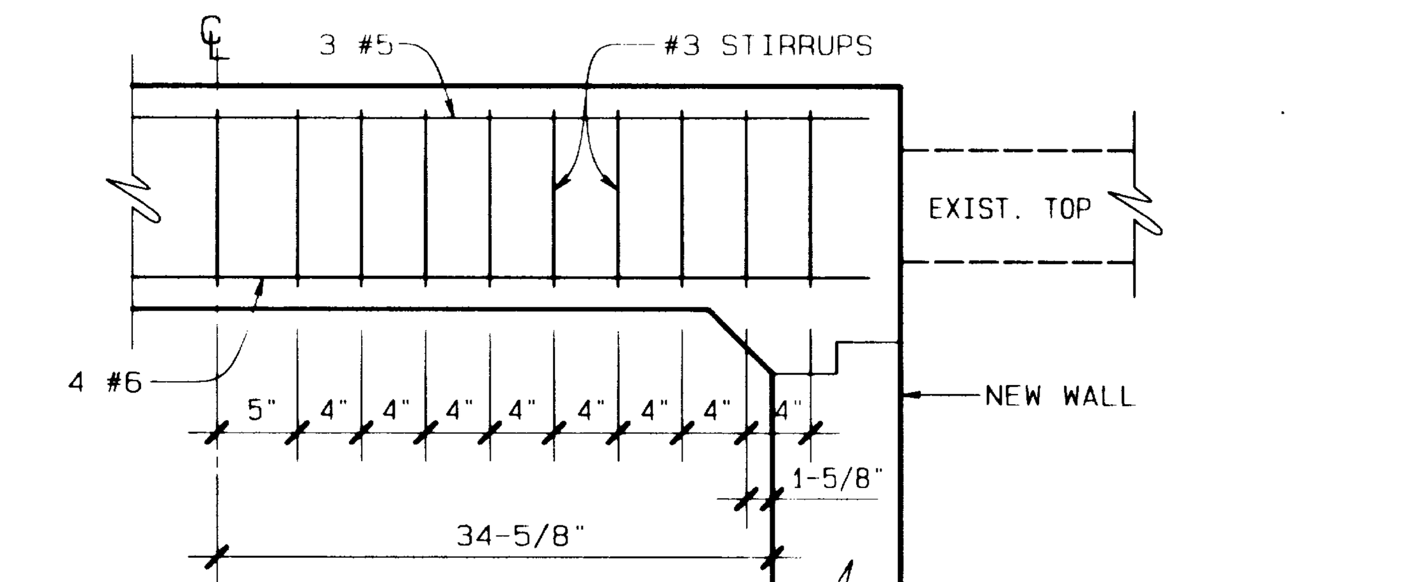


SCALES :
HORIZONTAL : 1" = 20'
VERTICAL : 1" = 2'



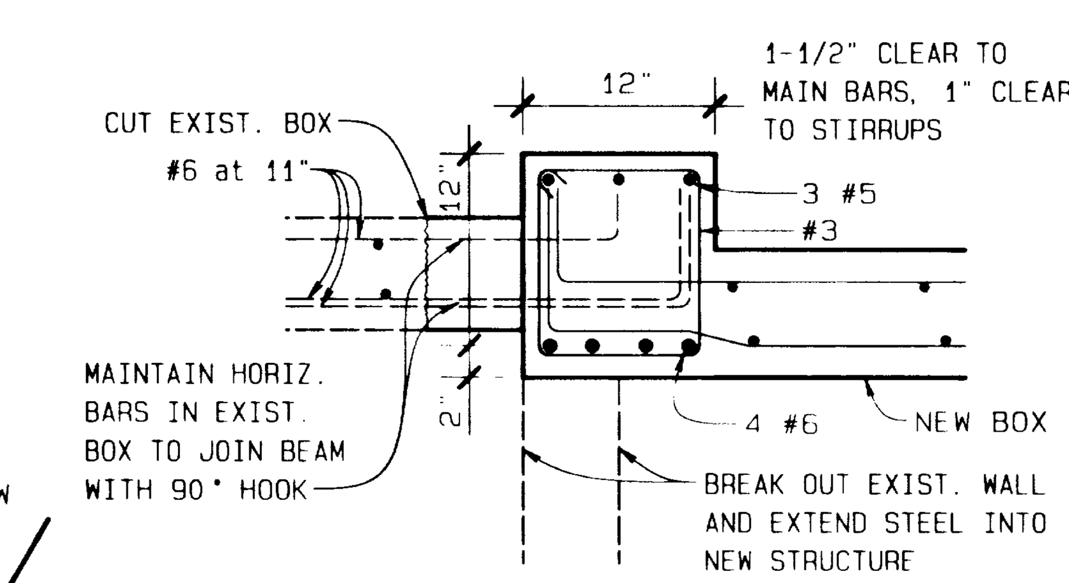
SECTIONAL VIEW

SCALE : 1/2" = 1'-0"



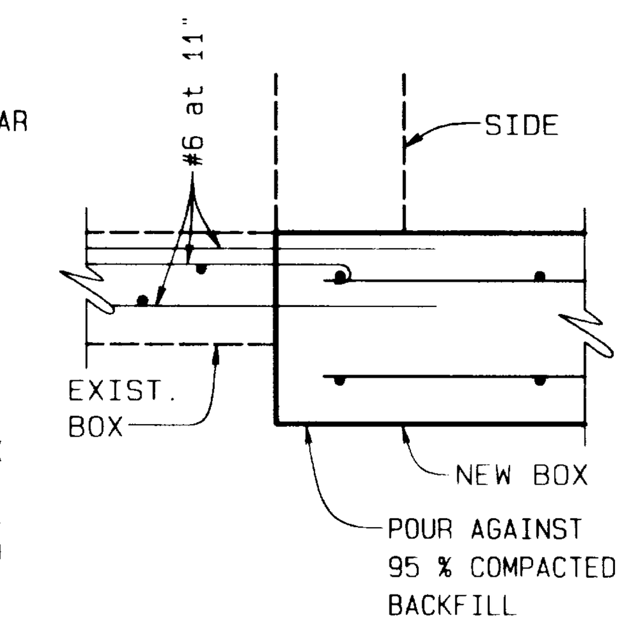
HALF BEAM

SCALE : 1" = 1'-0"



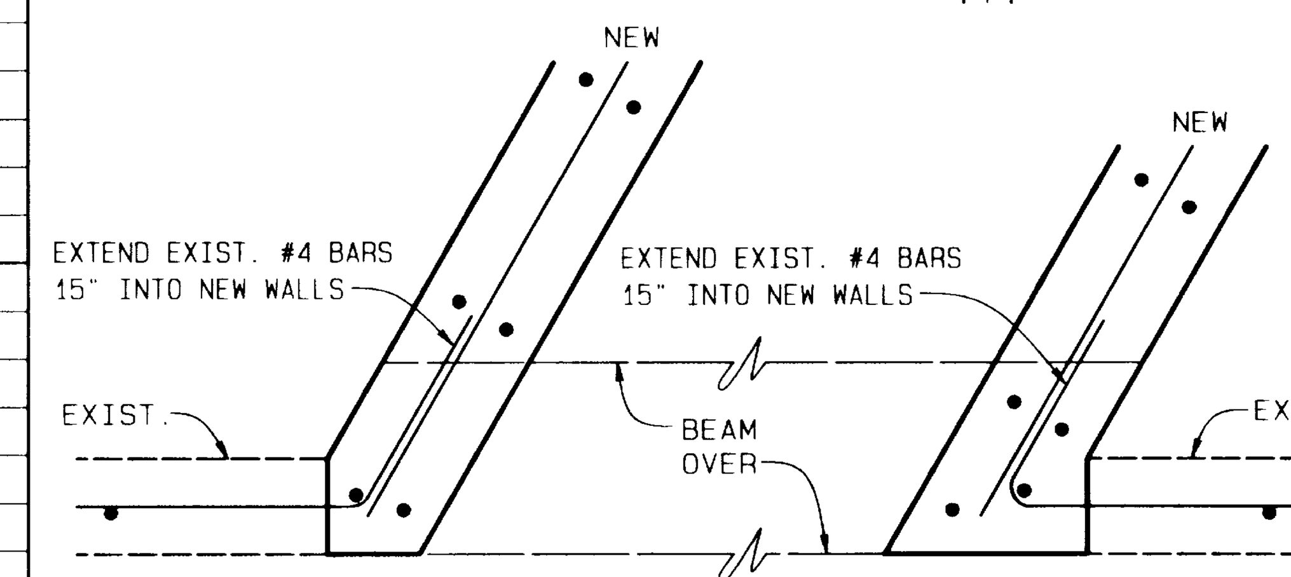
BEAM SECTION

SCALE : 1" = 1'-0"



INVERT

NO SCALE



SIDES

NO SCALE

NOTE :

MAINTAIN 1-1/2" CLEAR DISTANCE FROM NO. 6 BARS TO BOTTOM OF BEAM. BEND BARS ENTERING SIDE OF BEAM UP TO AVOID NO. 6'S. IF THIS IS IMPRACTICAL, RUN SMALLER BARS UNDER NO. 6'S AND DROP SOFFIT TO PROVIDE 1-1/2" CLEAR DISTANCE TO BOTTOM OF BEAM.

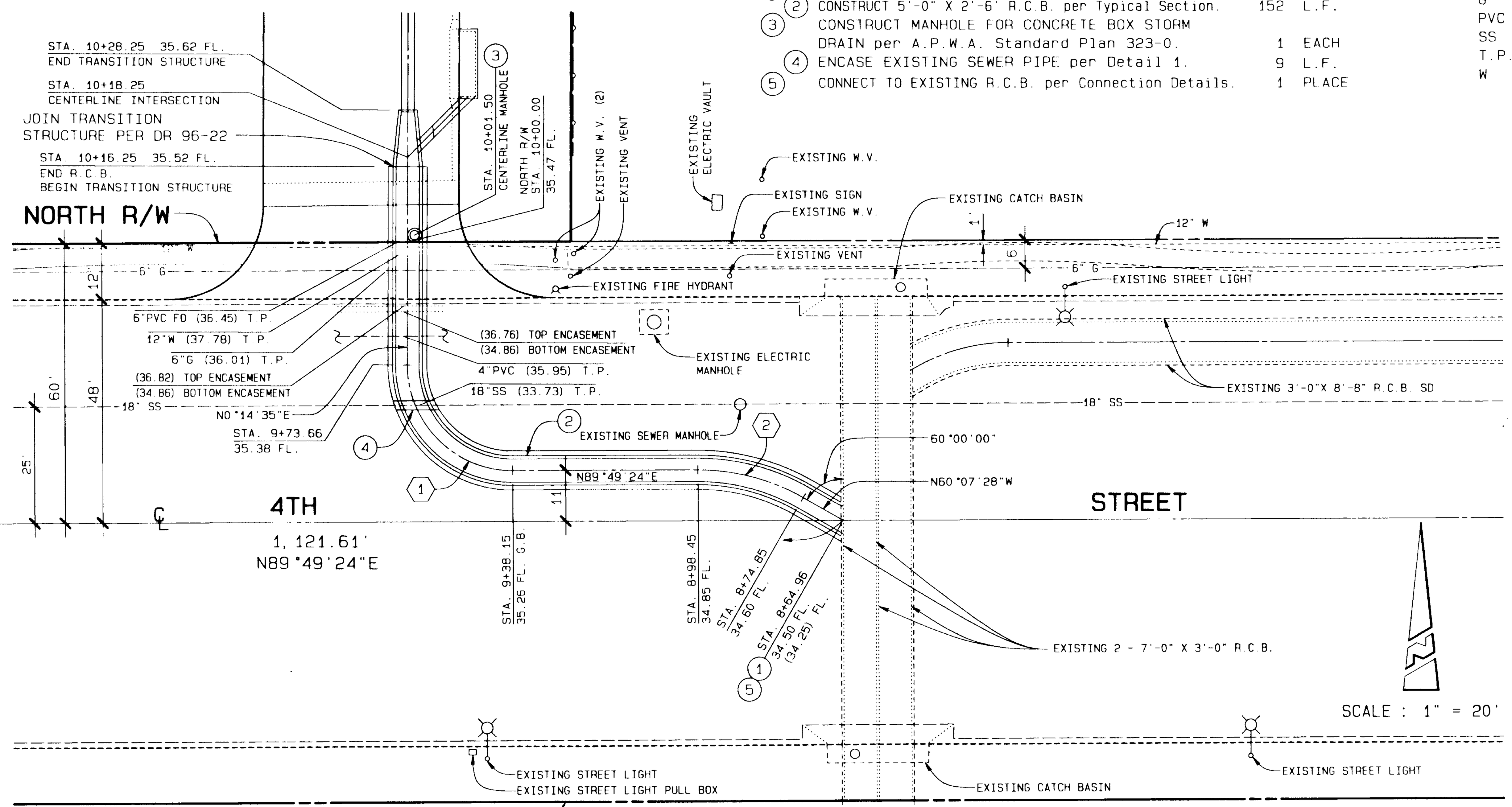
CONNECTION DETAILS

VICINITY MAP

NO SCALE

NOTE:

RELOCATION OF ALL INTERFERING UNDERGROUND UTILITY INSTALLATIONS SHALL BE COORDINATED WITH AFFECTED UTILITY COMPANIES.

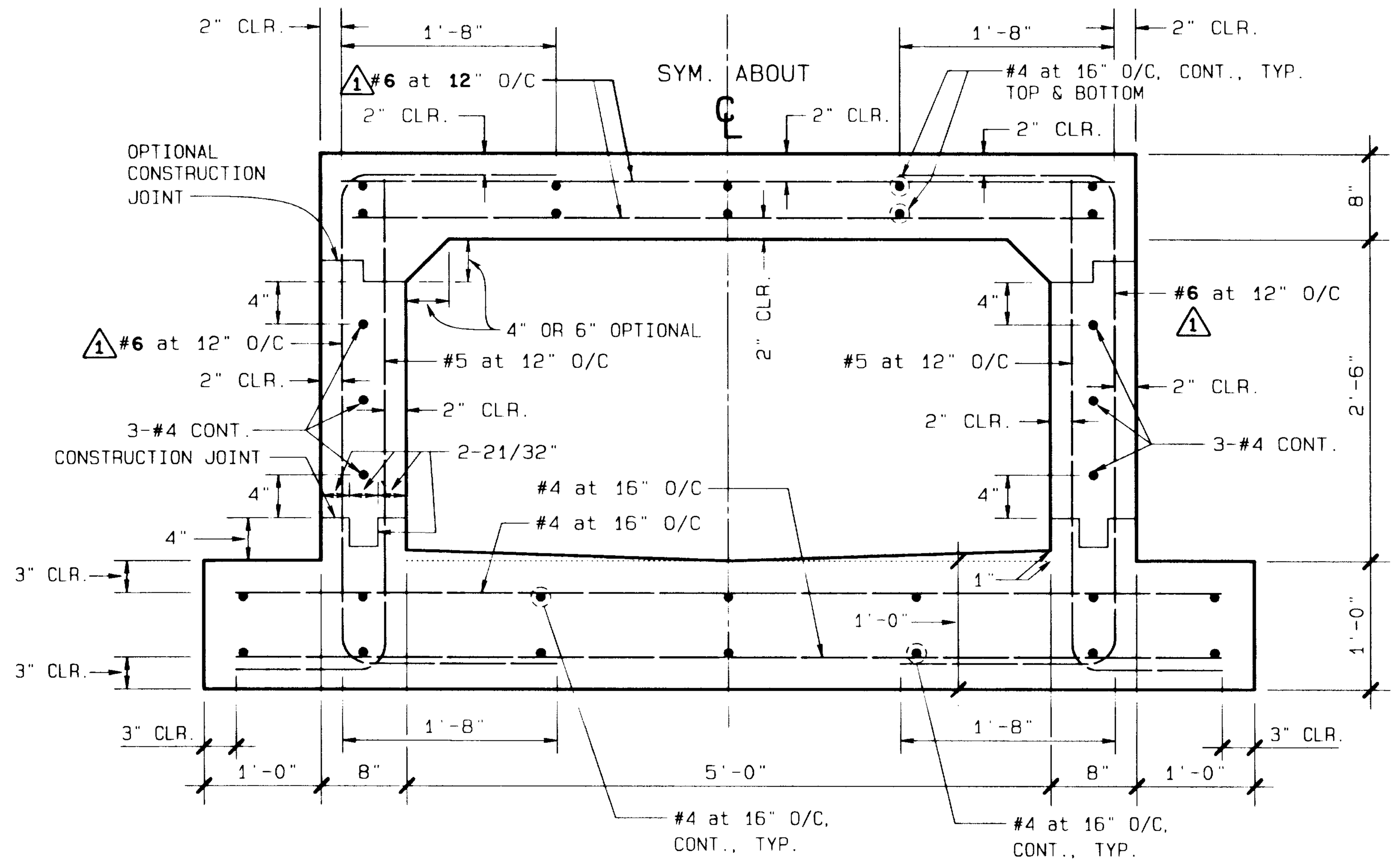


CONSTRUCTION NOTES

	CONSTRUCTION NOTES	QUANTITIES
1	REMOVE INTERFERING PORTION OF EXISTING R.C.B.	LUMP SUM
2	CONSTRUCT 5'-0" X 2'-6' R.C.B. per Typical Section.	152 L.F.
3	CONSTRUCT MANHOLE FOR CONCRETE BOX STORM DRAIN per A.P.W.A. Standard Plan 323-0.	1 EACH
4	ENCASE EXISTING SEWER PIPE per Detail 1.	9 L.F.
5	CONNECT TO EXISTING R.C.B. per Connection Details.	1 PLACE

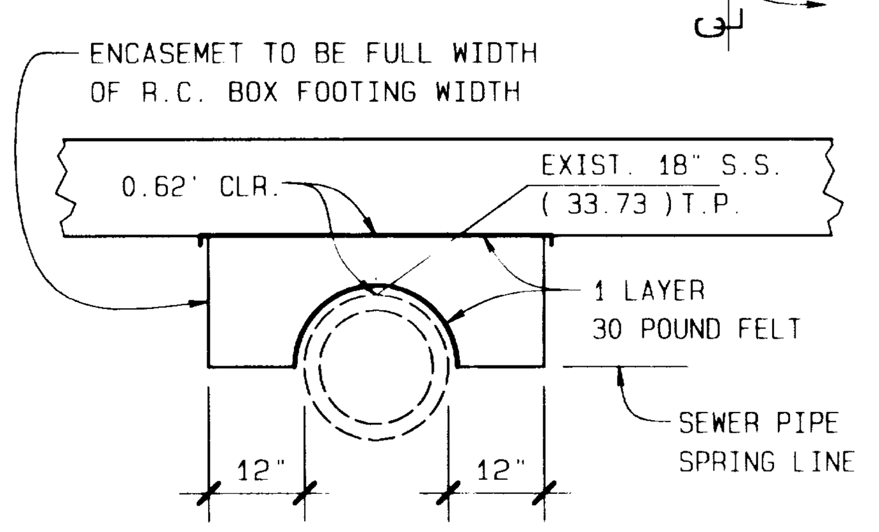
LEGEND

FL.	FLOWLINE
FO	FIBER OPTIC
G	GAS
PVC	POLYVINYLCHLORIDE
SS	SANITARY SEWER
T.P.	TOP OF PIPE
W	WATER



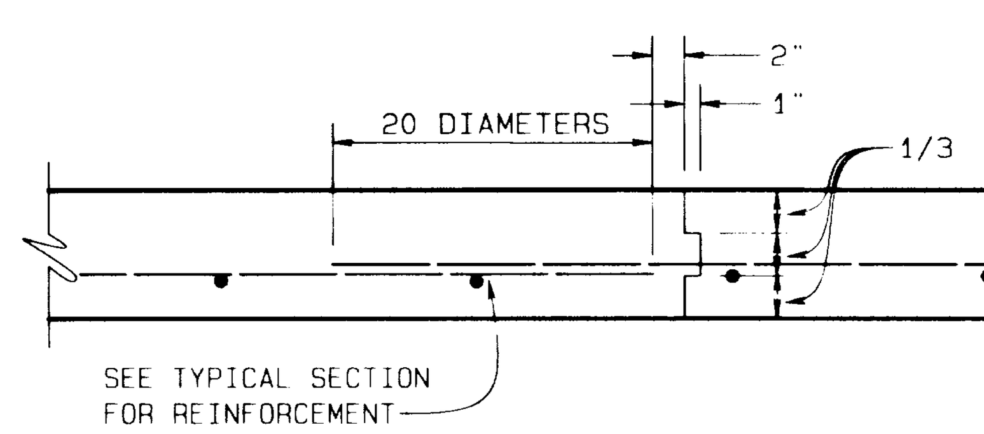
TYPICAL SECTION

SCALE : 1" = 1'-0"



DETAIL 1

SCALE : 1" = 2'



TRANSVERSE JOINT

SCALE : 1" = 1'-0"

STORM DRAIN NOTES

1. ALL WORK SHALL BE DONE IN STRICT CONFORMANCE WITH THESE PLANS, THE CITY OF RANCHO CUCAMONGA STANDARDS AND THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION-CURRENT EDITION. CONTRACTOR SHALL BE FAMILIAR WITH AND SHALL BE RESPONSIBLE FOR ADHERENCE TO THESE STANDARDS AND SPECIFICATIONS.
2. ANY CONTRACTOR PERFORMING WORK ON THIS PROJECT SHALL FAMILIARIZE HIMSELF WITH THE SITE AND SHALL BE SOLELY RESPONSIBLE FOR ANY DAMAGE TO EXISTING FACILITIES RESULTING DIRECTLY OR INDIRECTLY FROM HIS OPERATIONS, WHETHER OR NOT SHOWN ON THESE PLANS.
3. ALL PIPELINES OR SUBSTRUCTURES OF ANY KIND, TELEPHONE OR POWER POLES, WATER METERS, VALVES, FIRE HYDRANTS, ETC., SHOWN OR NOT SHOWN ON THESE PLANS WITHIN THE R.O.W. LIMITS OR IN ADJACENT AREAS WHERE IMPROVEMENT WORK IS TO BE DONE SHALL BE REMOVED, RELOCATED OR PROTECTED IN PLACE AS REQUIRED AT NO COST TO THE CITY OF RANCHO CUCAMONGA.
4. A PERMIT SHALL BE OBTAINED FROM THE CITY OF RANCHO CUCAMONGA ENGINEERING DIVISION PRIOR TO ANY ENCROACHMENT OR CONSTRUCTION WITHIN THE CITY OF RANCHO CUCAMONGA EASEMENT OR RIGHT-OF-WAY.
5. NOTES CONTAINED IN A.P.W.A. STANDARD PLAN 342-0 SHALL APPLY TO BOTH THE CONSTRUCTION OF THE TRANSITION STRUCTURE AND THE REINFORCED CONCRETE BOX.

CURVE DATA

⬡	Δ	R	L	T
1	90°25'11"	22.50'	35.51'	22.67'
2	30°03'08"	45.00'	23.60'	12.08'

BENCH MARK NO. 10001

Found 2" brass disk in concrete curb stamped "City of Rancho Cucamonga Bench Mark 10001 1987" north side of 4th Street 0.5 miles west of Etiwanda Avenue, easterly end of catch basin, 40 feet east of P.P. #1733768E.

ELEVATION : 1039.709

MARK	DESCRIPTION OF REVISION	DATE	CITY APPROVED
1	MODIFIED TOP DECK TRANSVERSE STEEL AND SIDE WALL STEEL. BY RGB 3/3/97	3-4-97	DZJ

CITY OF RANCHO CUCAMONGA

PRIVATE STORM DRAIN PLAN
HERITAGE BAG COMPANY
12320 4TH STREET

DR 96-22

APPROVED BY CITY ENGINEER William J. O'Neil DATE 2-25-97 R.C.E. 24953

REGISTERED PROFESSIONAL ENGINEER ROBERT A. BEBENSEE No. 22877 CIVIL STATE OF CALIFORNIA

DESIGN R.A.B. | DRAWN R.P.B. | CHECKED CITY

ROBERT A. BEBENSEE, R.C.E.
10373 Trademark Street-Ste.A
P.O.Box 1614
Rancho Cucamonga, CA.91730
(909) 945-2119
Robert A. Bebensee R.C.E. 22877 Exp. 12-31-97
DATE 2-18-97 FILE NO.

RECOMMENDED DZJ 2-18-97
SHEET 1 OF 1
DRWG. NO. 1596-D

Sheet 1 of 2

PLOT DATE 2-18-97 JOB NO. 062796

CITY OF RANCHO CUCAMONGA

4TH STREET STORM DRAIN

GENERAL NOTES

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION - CURRENT EDITION. CONTRACTOR SHALL BE FAMILIAR WITH AND SHALL BE RESPONSIBLE FOR ADHERANCE TO THESE STANDARDS AND SPECIFICATIONS.
2. ALL PIPELINES OR SUBSTRUCTURES OF ANY KIND, TELEPHONE OR POWER POLES, WATER METERS, VALVES, FIRE HYDRANTS, ETC. SHOWN ON THESE PLANS WITHIN THE RIGHT-OF-WAY LIMITS SHALL BE REMOVED, RELOCATED OR PROTECTED IN PLACE AS REQUIRED AT NO COST TO THE CITY OF RANCHO CUCAMONGA.
3. A PERMIT SHALL BE OBTAINED FROM THE CITY OF RANCHO CUCAMONGA ENGINEERING DEPARTMENT PRIOR TO ANY ENCROACHMENT OR CONSTRUCTION WITH CITY OF RANCHO CUCAMONGA EASEMENT OR RIGHT-OF-WAY.
4. CITY APPROVAL OF PLANS DOES NOT RELIEVE THE DEVELOPER FROM RESPONSIBILITY FOR THE CORRECTION OF ERROR AND OMISSION DISCOVERED DURING CONSTRUCTION. UPON REQUEST THE REQUIRED PLAN REVISIONS SHALL BE PROMPTLY SUBMITTED TO THE CITY ENGINEER FOR APPROVAL.
5. WORK SITE SHALL BE IN A NEAT, CLEAN, HAZARD FREE, ORDERLY STATE, THROUGHOUT CONSTRUCTION. SITE SHALL BE CLEANED UPON REQUEST OF THE INSPECTOR.

CONSTRUCTION NOTES

1. DIMENSIONS FROM FACE OF CONCRETE TO STEEL ARE TO CENTER AND SHALL BE TWO INCHES UNLESS OTHERWISE SHOWN.
2. CONCRETE DIMENSIONS SHALL BE MEASURED HORIZONTALLY OR VERTICALLY ON THE PROFILE, AND PARALLEL TO OR AT RIGHT ANGLES (OR RADIALLY) TO CENTER LINE OF CONDUIT ON THE PLAN EXCEPT AS OTHERWISE SHOWN.
3. NO SPLICES IN TRANSVERSE STEEL REINFORCEMENT WILL BE PERMITTED OTHER THAN SHOWN ON THE DRAWING WITHOUT APPROVAL OF THE ENGINEER.
4. THE TRANSVERSE REINFORCING STEEL SHALL TERMINATE ONE AND ONE-HALF INCHES FROM THE CONCRETE SURFACES UNLESS OTHERWISE SHOWN ON THE STRUCTURAL DETAILS.
5. D-BARS MAY BE SPLICED 20 DIAMETERS AT THE LOWER CONSTRUCTION JOINT.
6. IN ALL SECTIONS LAP C AND C_2 BARS. THE VERTICAL LENGTH OF THE C AND C_2 BARS HAS BEEN CALCULATED FOR A FOUR-INCH STARTER WALL. IF THE HEIGHT OF THE STARTER WALL IS VARIED, THE VERTICAL LENGTH OF THE C AND C_2 BARS SHALL BE VARIED CORRESPONDINGLY SO AS TO MAINTAIN A 30 DIAMETER LAP BETWEEN THE TWO BARS. THE LAPS SHALL BE BASED ON THE SMALLER BAR. THIS ALSO APPLIES TO C_1 AND C_3 BARS IF VERTICAL LENGTH OF $C_1 = C$. THE C_1 BAR SHALL LAP 30 DIAMETERS WITH THE C_3 BAR.
7. ALL LONGITUDINAL BARS SHALL BE NO. 4 BARS. SPACING SHALL BE 18 INCHES UNLESS OTHERWISE SHOWN. BARS IN TOP AND BOTTOM SLABS SHALL BE SPACED SYMMETRICALLY ABOUT THE CENTER LINE. BARS IN WALLS SHALL BE SPACED SYMMETRICALLY ABOUT MID-HEIGHT OF THE WALLS.
8. CONCRETE QUANTITIES ARE BASED ON A SIX-BY-SIX INCH FILLET AND THE STEEL QUANTITIES DO NOT INCLUDE ANY OPTIONAL SPLICE.

LIST OF DRAWINGS

SHEET NO.	TITLE
1.	TITLE SHEET, VICINITY MAP, CONSTRUCTION NOTES, GENERAL NOTES, BENCH MARK, TYPICAL SECTION AND LIST OF DRAWINGS.
2.	4TH STREET STORM DRAIN PLAN AND PROFILE.
3.	4TH STREET STORM DRAIN DETAILS

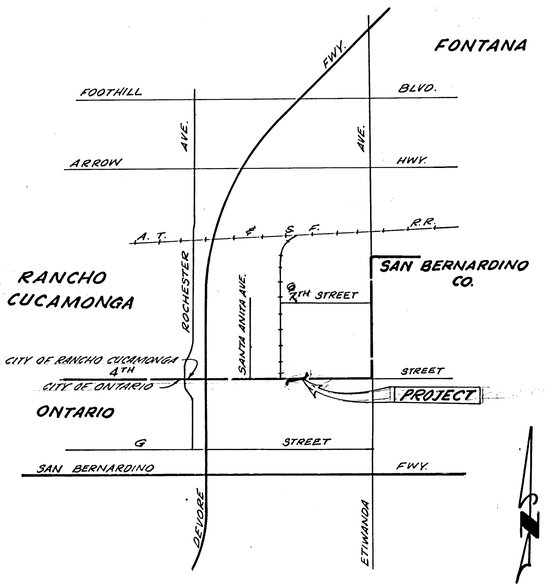
BENCH MARK NO. 1-22

SAN BERNARDINO COUNTY SURVEYOR

BRASS DISK IN CONCRETE BASE OF S.E. LEG OF SOUTHERN CALIFORNIA EDISON COMPANY TOWER NO. 0/5. 103 FEET EAST OF ℄ ETIWANDA AVE., 0.1 MILE SOUTH OF ENTRANCE GATES TO KAISER STEEL PLANT.

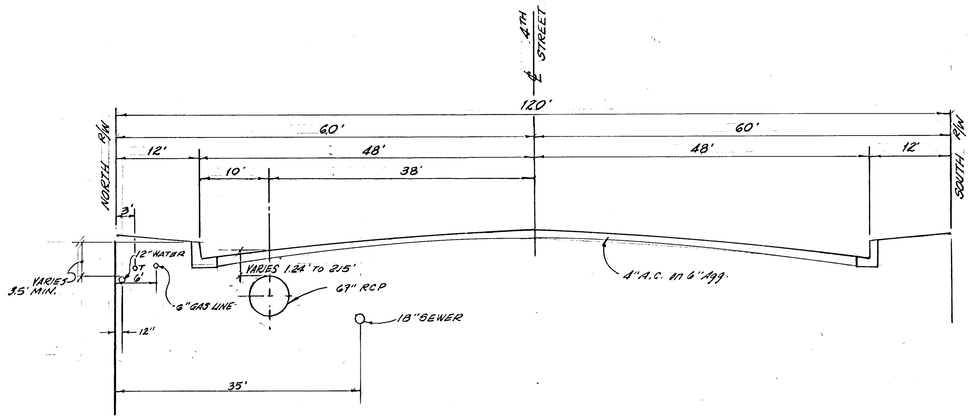
1971 ELEV. 1065.559

NOTE: SUBTRACT 0.12' FROM ELEVATIONS SHOWN ON THESE PLANS TO OBTAIN CITY OF RANCHO CUCAMONGA DATUM.



VICINITY MAP

NOT TO SCALE

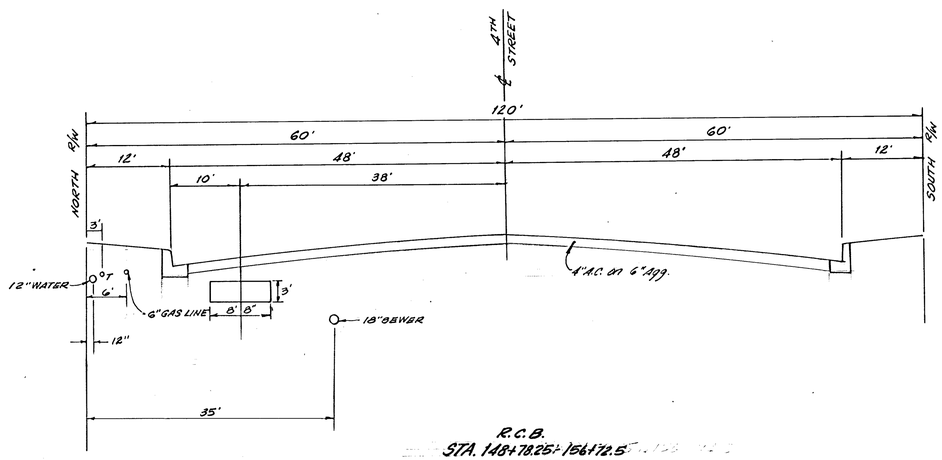


R.C.P.

STA. 157+00 ± 153+79.48

TYPICAL SECTION

NO SCALE



R.C.B.

STA. 148+78.25 ± 156+72.5

TYPICAL SECTION

NO SCALE

LIST OF STANDARD DRAWINGS USED IN THESE PLANS

PRESSURE MANHOLE FRAME AND COVER: L.A.C.F.C.D. STD. 2-0197

PRESSURE MANHOLE SHAFT: L.A.C.F.C.D. STD. 2-0210

TRANSITION STRUCTURE NO.1: L.A.C.F.C.D. STD. 2-0235

PROTECTION FOR MAIN LINE AND HOUSE CONNECTION SEWERS L.A.C.F.C.D. STD. 2-0251

DESCRIPTION OF REVISION	DATE	APP'D.

CITY OF RANCHO CUCAMONGA

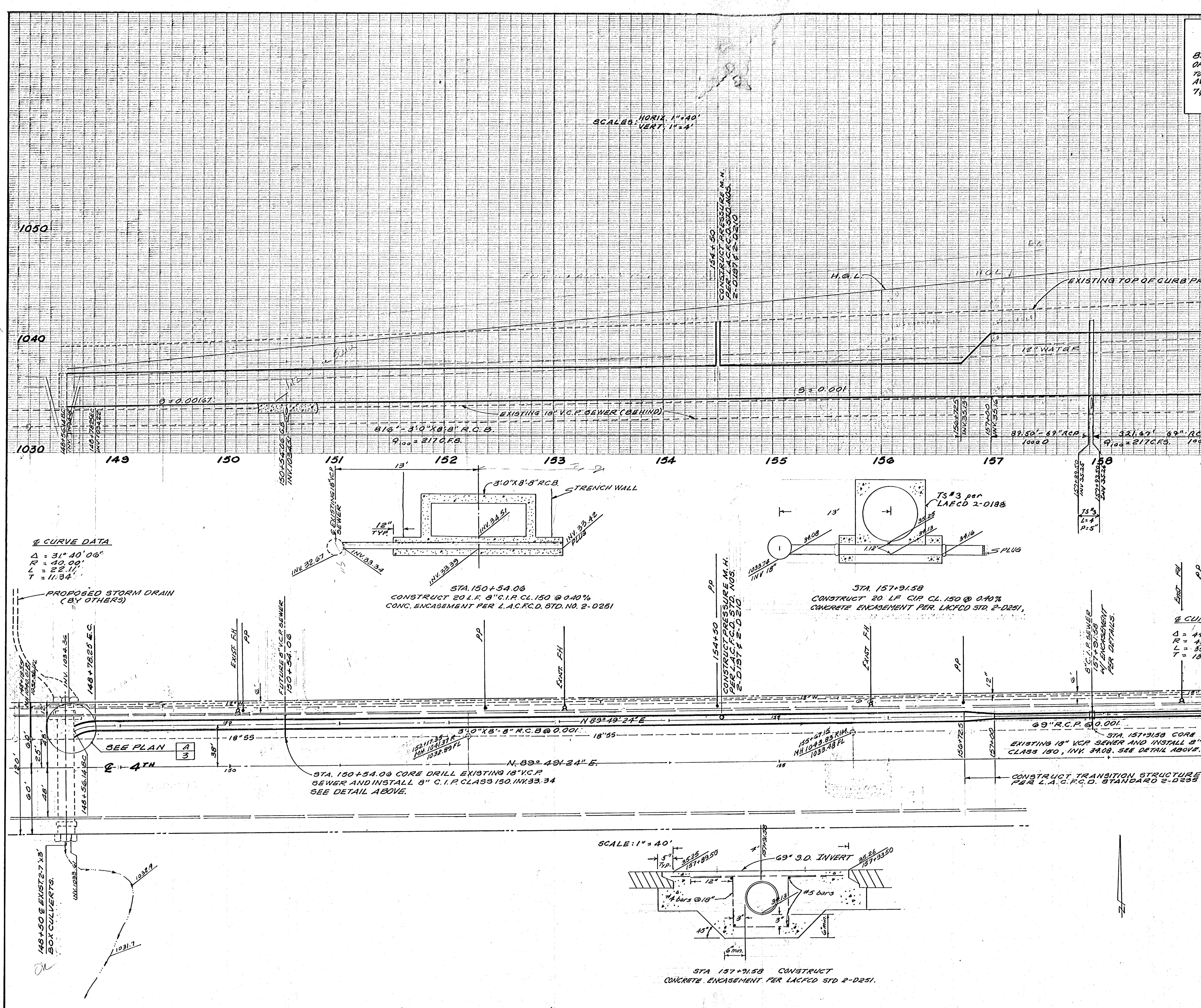
4TH STREET STORM DRAIN

TITLE SHEET

CUP 82-01

APPROVED BY CITY ENGINEER Lloyd Hubbs DATE 6-9-83 RCE 23889

DESIGN E.D.C.	ADAMS & ELLS CIVIL ENGINEERS 3236 NORTH PECK ROAD EL MONTE, CA. 213-448-7674 WILLIAM C. ELLS RCE 10880	RECOMMENDED Bob B. for City Engineering
DRAWN M.J.G.		SHEET 1
CHECKED E.D.C.	DATE FILE NO.	DRAWING NO. 783-D



BENCH MARK NO. 1-22
SAN BERNARDINO COUNTY SURVEYOR
BRASS DISK IN CONCRETE BASE OF S.E. LEG OF SOUTHERN CALIFORNIA EDISION COMPANY TOWER NO. 0/6, 103' EAST OF THE ℄ ETIWANDA AVE, 0.1 MILES SOUTH OF ENTRANCE GATES 7 & 9 KAISER STEEL PLANT.
1971 ELEV. 1065.559
SCALES: HORIZ. 1"=40' VERT. 1"=4'
1050
1040
1030
50
40
30
H.G.L.
EXISTING TOP OF CURB PROFILE
12" WATER
S = 0.00167
S = 0.001
EXISTING 18" V.C.P. SEWER (BEHIND)
816' - 3'0"X8'8" R.C.B.
Q100 = 2170 C.F.S.
154+50 CONSTRUCT PRESSURE M.H. PER L.A.C.F.C.D. STD. NOS. 2-D197 & 2-D210
149
150
151
152
153
154
155
156
157
158
159
160
161
8'0"X8'8" R.C.B.
TRENCH WALL
STA. 150+54.06
CONSTRUCT 20 L.F. 8" C.I.P. CL.150 @ 0.40%
CONC. ENCASEMENT PER L.A.C.F.C.D. STD. NO. 2-D251
TS #3 per LACFCD 2-D188
STA. 157+91.58
CONSTRUCT 20 LF C.I.P. CL. 150 @ 0.40%
CONCRETE ENCASEMENT PER LACFCD STD. 2-D251.
℄ CURVE DATA
Δ = 31° 40' 06"
R = 40.00'
L = 22.11'
T = 11.34'
PROPOSED STORM DRAIN (BY OTHERS)
℄ CURVE DATA
Δ = 44° 39' 45"
R = 45.00'
L = 35.01'
T = 18.45'
SEE PLAN A/3
℄ 4TH
N 89° 49' 24" E
3'0"X8'-8" R.C.B. @ 0.001
69" R.C.P. @ 0.001
STA. 150+54.06 CORE DRILL EXISTING 18" V.C.P. SEWER AND INSTALL 8" C.I.P. CLASS 150. INV. 33.34 SEE DETAIL ABOVE.
STA. 157+91.58 CORE DRILL EXISTING 18" V.C.P. SEWER AND INSTALL 8" C.I.P. CLASS 150, INV. 34.08. SEE DETAIL ABOVE.
CONSTRUCT TRANSITION STRUCTURE PER L.A.C.F.C.D. STANDARD 2-D235
STREET
TOP OF LEVEE
6' CL. Fence
161+15.17 OUTLET STRUCTURE
148+50 ℄ EXIST. 2-7'x3' BOX CULVERTS.
SCALE: 1" = 40'
69" S.D. INVERT
#4 bars @ 18"
#5 bars
STA 157+91.58 CONSTRUCT CONCRETE ENCASEMENT PER LACFCD STD 2-D251.

DESCRIPTION OF REVISION	DATE	APPROVED

CITY OF RANCHO CUCAMONGA

4TH STREET
STORM DRAIN
PLAN AND PROFILE
STA. 148+50 TO STA. 161+16.54

CUP 82-01

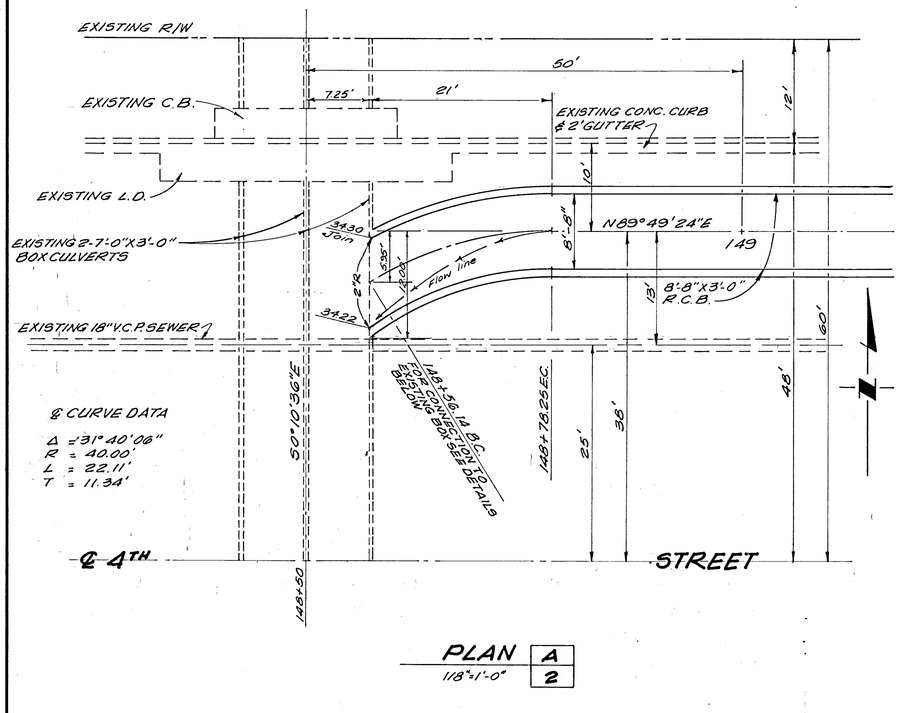
APPROVED BY CITY ENGINEER — DATE 6-9-83, R.C.E. NO. 23889

DESIGN E.D.C. · DRAWN E.D.C. · CHECKED W.C.E

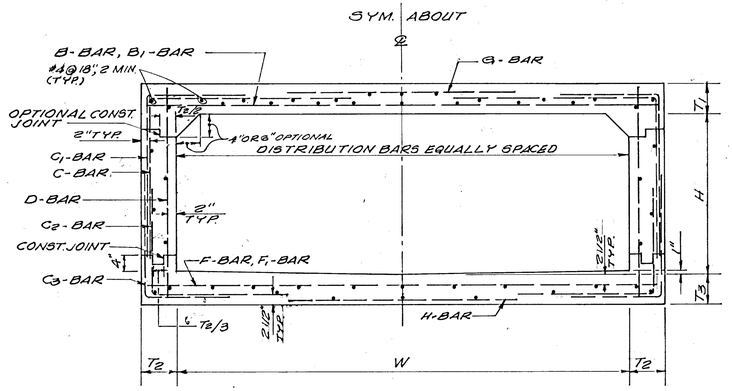
ADAMS & ELLS
CIVIL ENGINEERS
3234 NORTH PECK ROAD
EL MONTE, CA 91734

WILLIAM C. ELLS RCE 10880

RECOMMENDED — SHEET 2 — DRAWING NO. 783-D

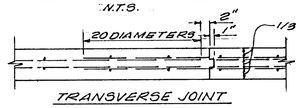


PLAN A 2
1/8"=1'-0"



SINGLE R.C. BOX

N.T.S.



TRANSVERSE JOINT

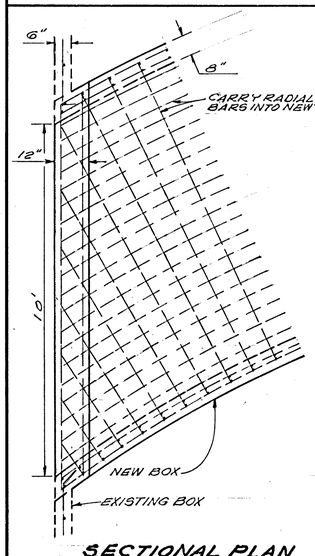
BOX SECTION NO.		1	2	3
FROM STA. TO STA.		148+56.14-150+00.00	150+00.00-154+60.00	154+60-156+72.50
DESIGN COVER		1'	2'	3'
BOX WIDTH W		8'-8"	8'-8"	8'-8"
BOX HEIGHT H		3'-1"	3'-1"	3'-1"
TYPE OF INSTALLATION		TRENCH	TRENCH	TRENCH
TOP SLAB THICKNESS T1		7"	7 1/4"	8 1/2"
SIDE WALL THICKNESS T2		8"	8"	8"
BOTTOM SLAB THICKNESS T3		7"	7"	7"
B BARS	BAR NO. & SPACING	4 @ 17"	4@ 9"	6 @ 19"
	LENGTH	9'-9 1/2"	9'-9 1/2"	9'-9 1/2"
B1 BARS	BAR NO. & SPACING	3 @ 17"	6 @ 9"	6 @ 19"
	LENGTH	9'-9 1/2"	9'-9 1/2"	5'-9"
C BARS	BAR NO. & SPACING	4 @ 10"	4 @ 10"	4 @ 11"
	HORIZ. LENGTH	3'-10 1/2"	3'-10 1/2"	3'-10 1/2"
	VERT. LENGTH	3'-1"	3'-1 1/2"	3'-0 1/2"
C1 BARS	BAR NO. & SPACING	3 @ 10"	5 @ 10"	5 @ 11"
	HORIZ. LENGTH	1'-10 1/2"	1'-10 1/2"	1'-9"
	VERT. LENGTH	3'-1"	3'-1 1/2"	3'-0 1/2"
C2 BARS	BAR NO. & SPACING	5 @ 10"	5 @ 10"	4 @ 11"
	HORIZ. LENGTH	2'-7"	2'-7 1/2"	3'-10 1/2"
	VERT. LENGTH	2'-0"	2'-0"	2'-0"
C3 BARS	BAR NO. & SPACING	—	—	5 @ 11"
	HORIZ. LENGTH	—	—	1'-7 1/2"
	VERT. LENGTH	—	—	2'-4"
D BARS	BAR NO. & SPACING	4 @ 18"	4 @ 18"	4 @ 18"
	HORIZ. LENGTH	—	—	—
	VERT. LENGTH	4'-0"	4'-0"	3'-11 1/2"
F BARS	BAR NO. & SPACING	4 @ 17"	4 @ 18"	4 @ 9"
	HORIZ. LENGTH	9'-9 1/2"	9'-9 1/2"	9'-9 1/2"
F1 BARS	BAR NO. & SPACING	5 @ 17"	6 @ 18"	4 @ 9"
	HORIZ. LENGTH	6'-10"	7'-1"	6'-5"
G BARS	BAR NO. & SPACING	4 @ 10"	4 @ 10"	4 @ 11"
	HORIZ. LENGTH	4'-4 1/2"	4'-4 1/2"	4'-4 1/2"
H BARS	BAR NO. & SPACING	—	—	4 @ 11"
	HORIZ. LENGTH	—	—	4'-4 1/2"
NO. 4 LONGIT. REINF. BARS	TOP SLAB	20	21	19
	WALLS	8	8	8
	BOTTOM SLAB	14	14	13
	TOTAL	42	43	40
CONC.	CU. YDS/FT.	0.61	0.61	0.59
REINF. STEEL	LBS./FT.	107.6	110.6	103.7

SINGLE R.C. BOX STRUCTURAL DESIGN

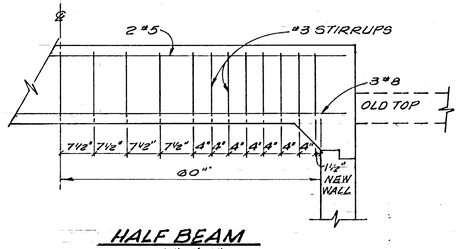
LIVE LOAD
H 20-S10-44 UNLESS OTHERWISE NOTED

DEAD LOAD
EARTH LOAD W = 110 PCF

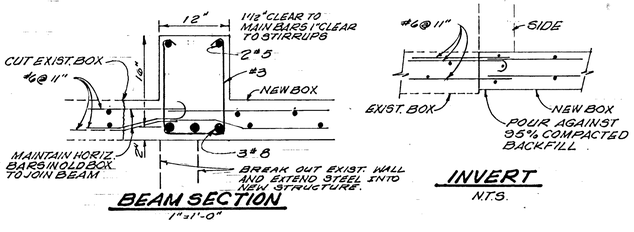
ALLOWABLE STRESSES
fc' = 4000 P.S.I.
fc = 1800 P.S.I.
fs = 24000 P.S.I.
n = 8



SECTIONAL PLAN
1/2"=1'-0"

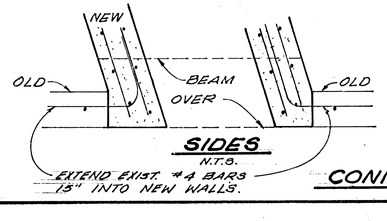


HALF BEAM
3/4"=1'-0"



BEAM SECTION
1"=1'-0"

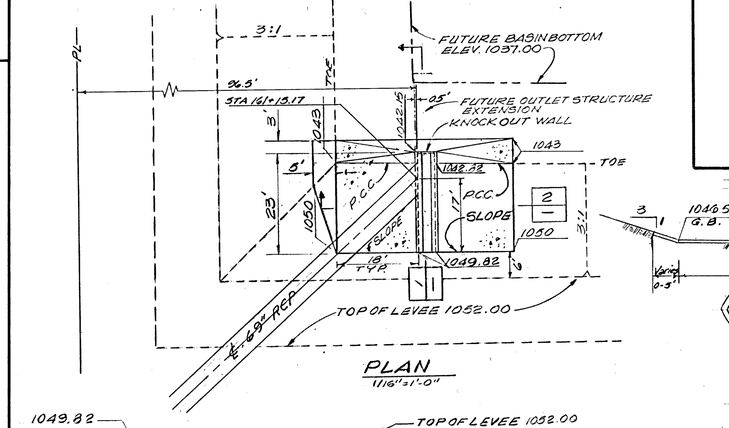
INVERT
N.T.S.



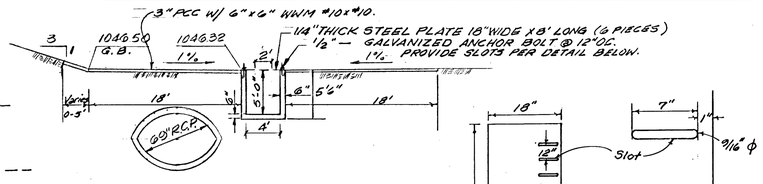
SIDES
N.T.S.

CONNECTION DETAILS

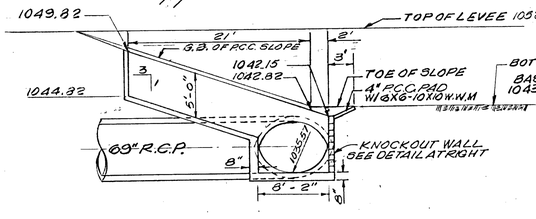
NOTES
MAINTAIN 1½" CLEAR DISTANCE FROM NO. 8 BARS TO BOTTOM OF BEAM. BEND BARS ENTERING SIDE OF BEAM UP TO AVOID NO. 8'S. IF THIS IS IMPRACTICAL, RUN SMALLER BARS UNDER NO. 8'S AND DROP SOFFIT TO PROVIDE 1½" CLEAR DISTANCE TO BOTTOM OF BEAM.



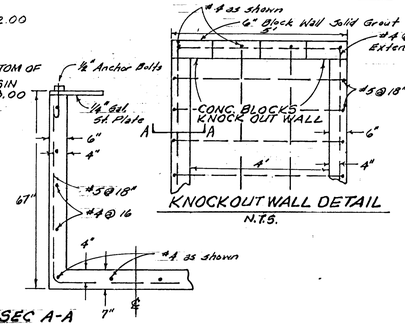
PLAN
1/16"=1'-0"



SECTION 2
1/2"=1'-0"



SECTION 1
1/8"=1'-0"



KNOCKOUT WALL DETAIL
N.T.S.

OUTLET STRUCTURE DETAIL 8 2
SCALE: AS SHOWN

DESCRIPTION OF REVISION	DATE	APP'VD.

CITY OF RANCHO CUCAMONGA

4TH STREET STORM DRAIN

DETAILS

CUP 82-01

APPROVED BY CITY ENGINEER — DATE 6-9-83 — R.C.E. 23889

DESIGN E.D.C.	ADAMS & ELLS CIVIL ENGINEERS 3236 NORTH PECK ROAD EL MONTE, CA. 213-448-7878 WILLIAM C. ELLS R.C.E. 10880	RECOMMENDED for: C.O. Engineering
DRAWN E.D.C.		SHEET 3
CHECKED W.C.E.	DATE — FILE NO. 38-1100	DRAWING NO. 783-D

APPENDIX B

HYDROLOGY CALCULATIONS

EXISTING CONDITION

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

                          Analysis prepared by:

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

 ************************** DESCRIPTION OF STUDY **************************
* BRIDGE 4TH STREET INDUSTRIAL BUILDINGS                                 *
* EXISTING CONDITION NODES 100-150                                       *
* 100-YEAR                                                               *
 **************************************************************************

  FILE NAME: C:\XDRIVE\3819\EXA.DAT
  TIME/DATE OF STUDY: 08:46 10/02/2019
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

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

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

  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*


**************************************************************************
  FLOW PROCESS FROM NODE    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) =   954.00
  ELEVATION DATA: UPSTREAM(FEET) =   1091.10  DOWNSTREAM(FEET) =   1078.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   19.250
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.670
  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.)
  NATURAL POOR COVER
  "BARREN"                    B        3.10      0.03       1.00    97   19.25
  AGRICULTURAL POOR COVER
  "ROW CROPS,STRAIGHT ROW"    B        4.40      0.10       1.00    95   19.25
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.07
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA RUNOFF(CFS) =     17.54
  TOTAL AREA(ACRES) =      7.50   PEAK FLOW RATE(CFS) =     17.54

**************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1078.00  DOWNSTREAM(FEET) =   1073.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =    40.00   CHANNEL SLOPE =  0.1198
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     17.54
  FLOW VELOCITY(FEET/SEC) =  16.79   FLOW DEPTH(FEET) =   0.83
  TRAVEL TIME(MIN.) =   0.04   Tc(MIN.) =  19.29
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =   994.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  MAINLINE Tc(MIN) =  19.29
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.667
  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"              B        0.85      0.16       1.00    92
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.16
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =    0.85      SUBAREA RUNOFF(CFS) =    1.92
  EFFECTIVE AREA(ACRES) =     8.35   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.08  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     8.35       PEAK FLOW RATE(CFS) =      19.43

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    112.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1073.21  DOWNSTREAM(FEET) =   1068.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =   506.00   CHANNEL SLOPE =  0.0085
  CHANNEL FLOW THRU SUBAREA(CFS) =     19.43
  FLOW VELOCITY(FEET/SEC) =   2.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.07   Tc(MIN.) =  22.36
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    112.00 =  1500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  22.36
  RAINFALL INTENSITY(INCH/HR) =   2.44
  AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.08
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =    8.35
  TOTAL STREAM AREA(ACRES) =    8.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.43

****************************************************************************
  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) =  1000.00
  ELEVATION DATA: UPSTREAM(FEET) =   1089.10  DOWNSTREAM(FEET) =   1076.21

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   19.866
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.620
  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.)
  NATURAL POOR COVER
  "BARREN"                    B        2.95      0.03       1.00    97   19.87
  AGRICULTURAL POOR COVER
  "ROW CROPS,STRAIGHT ROW"    B        4.20      0.10       1.00    95   19.87
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.07
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA RUNOFF(CFS) =     16.40
  TOTAL AREA(ACRES) =      7.15   PEAK FLOW RATE(CFS) =     16.40

****************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    112.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1076.21  DOWNSTREAM(FEET) =   1068.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =    90.00   CHANNEL SLOPE =  0.0812
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     16.40
  FLOW VELOCITY(FEET/SEC) =  14.35   FLOW DEPTH(FEET) =   0.87
  TRAVEL TIME(MIN.) =   0.10   Tc(MIN.) =  19.97
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    112.00 =  1090.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    112.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  19.97
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.612
  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"                B        3.50      0.16       1.00    92
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.16
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =    3.50      SUBAREA RUNOFF(CFS) =    7.72
  EFFECTIVE AREA(ACRES) =    10.65   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.10  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    10.65       PEAK FLOW RATE(CFS) =      24.07

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 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.) =  19.97
  RAINFALL INTENSITY(INCH/HR) =   2.61
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.10
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =   10.65
  TOTAL STREAM AREA(ACRES) =   10.65
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     24.07

  ** CONFLUENCE DATA **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
      1     19.43  22.36    2.441  0.08( 0.08) 1.00     8.4     100.00
      2     24.07  19.97    2.612  0.10( 0.10) 1.00    10.6     110.00

  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     41.85  22.36    2.441  0.09( 0.09) 1.00    19.0     100.00
      2     42.68  19.97    2.612  0.09( 0.09) 1.00    18.1     110.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     42.68    Tc(MIN.) =    19.97
  EFFECTIVE AREA(ACRES) =    18.11   AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.09  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     19.00
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    112.00 =  1500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    113.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1062.84  DOWNSTREAM(FEET) =  1060.00
  FLOW LENGTH(FEET) =   325.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  24.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.16
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     42.68
  PIPE TRAVEL TIME(MIN.) =   0.59    Tc(MIN.) =  20.56
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    113.00 =  1825.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    113.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  20.56
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.567
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        2.35      0.45       0.10    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.45
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    2.35      SUBAREA RUNOFF(CFS) =    5.33
  EFFECTIVE AREA(ACRES) =    20.46   AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.10  AREA-AVERAGED Ap =  0.90
  TOTAL AREA(ACRES) =    21.35       PEAK FLOW RATE(CFS) =      45.64

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    114.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1060.00  DOWNSTREAM(FEET) =  1050.00
  FLOW LENGTH(FEET) =    52.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  30.22
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     45.64
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =  20.59
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    114.00 =  1877.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    114.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  20.59
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.565
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        1.25      0.45       0.10    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.45
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.25      SUBAREA RUNOFF(CFS) =    2.83
  EFFECTIVE AREA(ACRES) =    21.71   AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.10  AREA-AVERAGED Ap =  0.85
  TOTAL AREA(ACRES) =    22.60       PEAK FLOW RATE(CFS) =      48.44

****************************************************************************
  FLOW PROCESS FROM NODE    114.00 TO NODE    123.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1050.00  DOWNSTREAM(FEET) =  1048.00
  FLOW LENGTH(FEET) =   162.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.82
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     48.44
  PIPE TRAVEL TIME(MIN.) =   0.25    Tc(MIN.) =  20.84
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    123.00 =  2039.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    123.00 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.) =  20.84
  RAINFALL INTENSITY(INCH/HR) =   2.55
  AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.10
  AREA-AVERAGED Ap =  0.85
  EFFECTIVE STREAM AREA(ACRES) =   21.71
  TOTAL STREAM AREA(ACRES) =   22.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     48.44

****************************************************************************
  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) =   860.00
  ELEVATION DATA: UPSTREAM(FEET) =   1083.58  DOWNSTREAM(FEET) =   1070.90

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.543
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.832
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        1.85      0.45       0.10    76   10.54
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.45
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =      6.31
  TOTAL AREA(ACRES) =      1.85   PEAK FLOW RATE(CFS) =      6.31

****************************************************************************
  FLOW PROCESS FROM NODE    121.00 TO NODE    122.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>(STANDARD CURB SECTION USED)<<<<<
==========================================================================
  UPSTREAM ELEVATION(FEET) = 1070.90  DOWNSTREAM ELEVATION(FEET) = 1054.75
  STREET LENGTH(FEET) =   467.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 20.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  15.00
  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) =       7.63
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.40
    HALFSTREET FLOOD WIDTH(FEET) =   11.88
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.77
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.89
  STREET FLOW TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =  12.17
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.515
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp          Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        0.85      0.45       0.10    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.45
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    0.85      SUBAREA RUNOFF(CFS) =    2.65
  EFFECTIVE AREA(ACRES) =    2.70    AREA-AVERAGED Fm(INCH/HR) =  0.05
  AREA-AVERAGED Fp(INCH/HR) =  0.45  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    2.70        PEAK FLOW RATE(CFS) =       8.43

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.41   HALFSTREET FLOOD WIDTH(FEET) =  12.37
  FLOW VELOCITY(FEET/SEC.) =  4.90   DEPTH*VELOCITY(FT*FT/SEC.) =   1.99
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    122.00 =  1327.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    123.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1051.48  DOWNSTREAM(FEET) =  1048.00
  FLOW LENGTH(FEET) =    32.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.94
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.43
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =  12.21
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    123.00 =  1359.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    123.00 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.) =  12.21
  RAINFALL INTENSITY(INCH/HR) =   3.51
  AREA-AVERAGED Fm(INCH/HR) =  0.05
  AREA-AVERAGED Fp(INCH/HR) =  0.45
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =    2.70
  TOTAL STREAM AREA(ACRES) =    2.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.43

  ** CONFLUENCE DATA **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
      1     47.10  23.24    2.385  0.10( 0.08) 0.86    22.6     100.00
      1     48.44  20.84    2.546  0.10( 0.09) 0.85    21.7     110.00
      2      8.43  12.21    3.509  0.45( 0.05) 0.10     2.7     120.00

  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     54.53  20.84    2.546  0.11( 0.08) 0.77    24.4     110.00
      2     52.80  23.24    2.385  0.10( 0.08) 0.78    25.3     100.00
      3     47.91  12.21    3.509  0.11( 0.08) 0.72    15.4     120.00
```

```
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     54.53    Tc(MIN.) =    20.84
 EFFECTIVE AREA(ACRES) =    24.41   AREA-AVERAGED Fm(INCH/HR) =  0.08
 AREA-AVERAGED Fp(INCH/HR) =  0.11  AREA-AVERAGED Ap =  0.77
 TOTAL AREA(ACRES) =     25.30
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    123.00 =  2039.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    123.00 TO NODE    124.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1048.00  DOWNSTREAM(FEET) =  1046.68
 FLOW LENGTH(FEET) =   127.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  36.0 INCH PIPE IS  24.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.47
 ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     54.53
 PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =  21.04
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    124.00 =  2166.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    123.00 TO NODE    124.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN) =  21.04
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.531
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp          Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  B        3.15      0.45       0.10    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
 SUBAREA AREA(ACRES) =    3.15      SUBAREA RUNOFF(CFS) =    7.05
 EFFECTIVE AREA(ACRES) =    27.56   AREA-AVERAGED Fm(INCH/HR) =  0.08
 AREA-AVERAGED Fp(INCH/HR) =  0.11  AREA-AVERAGED Ap =  0.69
 TOTAL AREA(ACRES) =    28.45       PEAK FLOW RATE(CFS) =      60.88

****************************************************************************
 FLOW PROCESS FROM NODE    124.00 TO NODE    125.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1046.68  DOWNSTREAM(FEET) =  1044.26
 FLOW LENGTH(FEET) =   440.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  42.0 INCH PIPE IS  29.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.46
 ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     60.88
 PIPE TRAVEL TIME(MIN.) =   0.87    Tc(MIN.) =  21.91
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    125.00 =  2606.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    124.00 TO NODE    125.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN) =  21.91
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.471
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp          Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  B        5.35      0.45       0.10    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
 SUBAREA AREA(ACRES) =    5.35      SUBAREA RUNOFF(CFS) =   11.68
 EFFECTIVE AREA(ACRES) =    32.91   AREA-AVERAGED Fm(INCH/HR) =  0.07
 AREA-AVERAGED Fp(INCH/HR) =  0.12  AREA-AVERAGED Ap =  0.60
 TOTAL AREA(ACRES) =    33.80       PEAK FLOW RATE(CFS) =      71.06

****************************************************************************
 FLOW PROCESS FROM NODE    125.00 TO NODE    126.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1044.26  DOWNSTREAM(FEET) =  1043.61
 FLOW LENGTH(FEET) =   308.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  51.0 INCH PIPE IS  39.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.06
 ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     71.06
 PIPE TRAVEL TIME(MIN.) =   0.85    Tc(MIN.) =  22.76
```

```
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    126.00 =  2914.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    125.00 TO NODE    126.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN) =  22.76
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.415
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp          Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  B        6.00      0.45       0.10    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
 SUBAREA AREA(ACRES) =    6.00      SUBAREA RUNOFF(CFS) =   12.80
 EFFECTIVE AREA(ACRES) =    38.91   AREA-AVERAGED Fm(INCH/HR) =  0.07
 AREA-AVERAGED Fp(INCH/HR) =  0.13  AREA-AVERAGED Ap =  0.52
 TOTAL AREA(ACRES) =    39.80       PEAK FLOW RATE(CFS) =      82.21

 ** PEAK FLOW RATE TABLE **
  STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
  NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
     1     82.21  22.76    2.415  0.13( 0.07) 0.52    38.9     110.00
     2     78.98  25.18    2.273  0.13( 0.07) 0.53    39.8     100.00
     3     84.76  14.16    3.210  0.15( 0.06) 0.42    29.9     120.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     84.76  Tc(MIN.) =  14.16
 AREA-AVERAGED Fm(INCH/HR) =  0.06  AREA-AVERAGED Fp(INCH/HR) =  0.15
 AREA-AVERAGED Ap =  0.42  EFFECTIVE AREA(ACRES) =     29.92

****************************************************************************
 FLOW PROCESS FROM NODE    126.00 TO NODE    127.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1043.61  DOWNSTREAM(FEET) =  1042.40
 FLOW LENGTH(FEET) =   434.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  51.0 INCH PIPE IS  40.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.98
 ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     84.76
 PIPE TRAVEL TIME(MIN.) =   1.04    Tc(MIN.) =  15.20
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    127.00 =  3348.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    126.00 TO NODE    127.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN) =  15.20
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.077
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp          Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  B        8.55      0.45       0.10    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
 SUBAREA AREA(ACRES) =    8.55      SUBAREA RUNOFF(CFS) =   23.33
 EFFECTIVE AREA(ACRES) =    38.47   AREA-AVERAGED Fm(INCH/HR) =  0.06
 AREA-AVERAGED Fp(INCH/HR) =  0.17  AREA-AVERAGED Ap =  0.35
 TOTAL AREA(ACRES) =    48.35       PEAK FLOW RATE(CFS) =     104.50

****************************************************************************
 FLOW PROCESS FROM NODE    127.00 TO NODE    128.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1042.40  DOWNSTREAM(FEET) =  1039.00
 FLOW LENGTH(FEET) =   483.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  48.0 INCH PIPE IS  35.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.56
 ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    104.50
 PIPE TRAVEL TIME(MIN.) =   0.76    Tc(MIN.) =  15.96
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    128.00 =  3831.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    127.00 TO NODE    128.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN) =  15.96
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.988
```

```
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        1.95      0.45       0.10    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.45
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.95      SUBAREA RUNOFF(CFS) =    5.16
  EFFECTIVE AREA(ACRES) =    40.42   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.17  AREA-AVERAGED Ap =  0.34
  TOTAL AREA(ACRES) =    50.30       PEAK FLOW RATE(CFS) =     106.59

****************************************************************************
  FLOW PROCESS FROM NODE    128.00 TO NODE    129.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1039.00  DOWNSTREAM(FEET) =  1036.81
  FLOW LENGTH(FEET) =   605.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  54.0 INCH PIPE IS  41.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.23
  ESTIMATED PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    106.59
  PIPE TRAVEL TIME(MIN.) =   1.23    Tc(MIN.) =  17.19
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    129.00 =  4436.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    128.00 TO NODE    129.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  17.19
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.858
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        5.25      0.45       0.10    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.45
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    5.25      SUBAREA RUNOFF(CFS) =   13.29
  EFFECTIVE AREA(ACRES) =    45.67   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.18  AREA-AVERAGED Ap =  0.31
  TOTAL AREA(ACRES) =    55.55       PEAK FLOW RATE(CFS) =     115.16

****************************************************************************
  FLOW PROCESS FROM NODE    129.00 TO NODE    149.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1036.81  DOWNSTREAM(FEET) =  1036.44
  FLOW LENGTH(FEET) =   516.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  75.0 INCH PIPE IS  57.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.57
  ESTIMATED PIPE DIAMETER(INCH) =  75.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    115.16
  PIPE TRAVEL TIME(MIN.) =   1.88    Tc(MIN.) =  19.07
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    149.00 =  4952.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    149.00 TO NODE    149.00 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.) =  19.07
  RAINFALL INTENSITY(INCH/HR) =   2.69
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.18
  AREA-AVERAGED Ap =  0.31
  EFFECTIVE STREAM AREA(ACRES) =   45.67
  TOTAL STREAM AREA(ACRES) =   55.55
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    115.16

****************************************************************************
  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) =   627.00
  ELEVATION DATA: UPSTREAM(FEET) =   1075.07  DOWNSTREAM(FEET) =   1069.54

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.297
```

```
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.887
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                  B        5.00      0.45       0.10    76   10.30
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
 SUBAREA RUNOFF(CFS) =     17.29
 TOTAL AREA(ACRES) =      5.00   PEAK FLOW RATE(CFS) =     17.29

****************************************************************************
 FLOW PROCESS FROM NODE    141.00 TO NODE    142.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1065.54  DOWNSTREAM(FEET) =  1048.49
 FLOW LENGTH(FEET) =    73.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  25.59
 ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     17.29
 PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =  10.34
 LONGEST FLOWPATH FROM NODE    140.00 TO NODE    142.00 =   700.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    141.00 TO NODE    142.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN) =  10.34
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.876
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  B        2.95      0.45       0.10    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
 SUBAREA AREA(ACRES) =     2.95      SUBAREA RUNOFF(CFS) =   10.17
 EFFECTIVE AREA(ACRES) =     7.95   AREA-AVERAGED Fm(INCH/HR) =  0.05
 AREA-AVERAGED Fp(INCH/HR) =  0.45  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =     7.95       PEAK FLOW RATE(CFS) =      27.41

****************************************************************************
 FLOW PROCESS FROM NODE    142.00 TO NODE    143.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1048.49  DOWNSTREAM(FEET) =  1047.00
 FLOW LENGTH(FEET) =   401.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.96
 ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     27.41
 PIPE TRAVEL TIME(MIN.) =   1.12    Tc(MIN.) =  11.47
 LONGEST FLOWPATH FROM NODE    140.00 TO NODE    143.00 =  1101.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    142.00 TO NODE    143.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN) =  11.47
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.644
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  B        2.40      0.45       0.10    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
 SUBAREA AREA(ACRES) =     2.40      SUBAREA RUNOFF(CFS) =    7.77
 EFFECTIVE AREA(ACRES) =    10.35   AREA-AVERAGED Fm(INCH/HR) =  0.05
 AREA-AVERAGED Fp(INCH/HR) =  0.45  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =    10.35       PEAK FLOW RATE(CFS) =      33.52

****************************************************************************
 FLOW PROCESS FROM NODE    143.00 TO NODE    144.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1047.00  DOWNSTREAM(FEET) =  1046.00
 FLOW LENGTH(FEET) =   189.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  33.0 INCH PIPE IS  24.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.14
```

```
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     33.52
  PIPE TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =  11.91
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    144.00 =  1290.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    143.00 TO NODE    144.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  11.91
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.563
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        2.70      0.45       0.10    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.45
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    2.70      SUBAREA RUNOFF(CFS) =    8.55
  EFFECTIVE AREA(ACRES) =    13.05   AREA-AVERAGED Fm(INCH/HR) =  0.05
  AREA-AVERAGED Fp(INCH/HR) =  0.45  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    13.05       PEAK FLOW RATE(CFS) =      41.31

****************************************************************************
  FLOW PROCESS FROM NODE    144.00 TO NODE    145.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1046.00  DOWNSTREAM(FEET) =  1045.00
  FLOW LENGTH(FEET) =   250.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  26.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.83
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     41.31
  PIPE TRAVEL TIME(MIN.) =   0.61    Tc(MIN.) =  12.52
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    145.00 =  1540.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    144.00 TO NODE    145.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  12.52
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.457
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        2.50      0.45       0.10    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.45
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    2.50      SUBAREA RUNOFF(CFS) =    7.68
  EFFECTIVE AREA(ACRES) =    15.55   AREA-AVERAGED Fm(INCH/HR) =  0.05
  AREA-AVERAGED Fp(INCH/HR) =  0.45  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    15.55       PEAK FLOW RATE(CFS) =      47.75

****************************************************************************
  FLOW PROCESS FROM NODE    145.00 TO NODE    146.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1045.00  DOWNSTREAM(FEET) =  1043.40
  FLOW LENGTH(FEET) =   321.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.67
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     47.75
  PIPE TRAVEL TIME(MIN.) =   0.70    Tc(MIN.) =  13.21
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    146.00 =  1861.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    145.00 TO NODE    146.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  13.21
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.347
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        2.95      0.45       0.10    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.45
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    2.95      SUBAREA RUNOFF(CFS) =    8.77
  EFFECTIVE AREA(ACRES) =    18.50   AREA-AVERAGED Fm(INCH/HR) =  0.05
```

```
  AREA-AVERAGED Fp(INCH/HR) =  0.45  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    18.50       PEAK FLOW RATE(CFS) =      54.97

****************************************************************************
  FLOW PROCESS FROM NODE    146.00 TO NODE    147.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1043.40  DOWNSTREAM(FEET) =  1042.20
  FLOW LENGTH(FEET) =   197.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  28.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.54
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     54.97
  PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =  13.60
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    147.00 =  2058.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    146.00 TO NODE    147.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  13.60
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.290
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        2.45      0.45       0.10    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.45
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    2.45      SUBAREA RUNOFF(CFS) =    7.15
  EFFECTIVE AREA(ACRES) =    20.95   AREA-AVERAGED Fm(INCH/HR) =  0.05
  AREA-AVERAGED Fp(INCH/HR) =  0.45  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    20.95       PEAK FLOW RATE(CFS) =      61.17

****************************************************************************
  FLOW PROCESS FROM NODE    147.00 TO NODE    148.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1042.20  DOWNSTREAM(FEET) =  1040.20
  FLOW LENGTH(FEET) =   215.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  28.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.11
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     61.17
  PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =  13.95
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    148.00 =  2273.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    147.00 TO NODE    148.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  13.95
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.239
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        5.10      0.45       0.10    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.45
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    5.10      SUBAREA RUNOFF(CFS) =   14.66
  EFFECTIVE AREA(ACRES) =    26.05   AREA-AVERAGED Fm(INCH/HR) =  0.05
  AREA-AVERAGED Fp(INCH/HR) =  0.45  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    26.05       PEAK FLOW RATE(CFS) =      74.88

****************************************************************************
  FLOW PROCESS FROM NODE    148.00 TO NODE    149.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1040.20  DOWNSTREAM(FEET) =  1036.27
  FLOW LENGTH(FEET) =   439.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  31.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.46
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     74.88
  PIPE TRAVEL TIME(MIN.) =   0.70    Tc(MIN.) =  14.65
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    149.00 =  2712.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    149.00 TO NODE    149.00 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.) =  14.65
  RAINFALL INTENSITY(INCH/HR) =   3.15
  AREA-AVERAGED Fm(INCH/HR) =  0.05
  AREA-AVERAGED Fp(INCH/HR) =  0.45
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =   26.05
  TOTAL STREAM AREA(ACRES) =   26.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     74.88

  ** CONFLUENCE DATA **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
      1    107.14  27.75    2.144  0.15( 0.06) 0.40    54.7     110.00
      1    102.91  30.22    2.037  0.15( 0.06) 0.41    55.5     100.00
      1    115.16  19.07    2.685  0.18( 0.06) 0.31    45.7     120.00
      2     74.88  14.65    3.146  0.45( 0.05) 0.10    26.1     140.00

  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    178.93  19.07    2.685  0.22( 0.05) 0.23    71.7     120.00
      2    157.84  27.75    2.144  0.19( 0.06) 0.30    80.7     110.00
      3    151.02  30.22    2.037  0.18( 0.06) 0.31    81.6     100.00
      4    178.85  14.65    3.146  0.23( 0.05) 0.22    61.1     140.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    178.93    Tc(MIN.) =    19.07
  EFFECTIVE AREA(ACRES) =    71.72   AREA-AVERAGED Fm(INCH/HR) =  0.05
  AREA-AVERAGED Fp(INCH/HR) =  0.22  AREA-AVERAGED Ap =  0.23
  TOTAL AREA(ACRES) =     81.60
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    149.00 =  4952.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    149.00 TO NODE    149.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  19.07
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.685
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        1.85      0.45       0.10    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.45
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.85      SUBAREA RUNOFF(CFS) =    4.40
  EFFECTIVE AREA(ACRES) =    73.57   AREA-AVERAGED Fm(INCH/HR) =  0.05
  AREA-AVERAGED Fp(INCH/HR) =  0.23  AREA-AVERAGED Ap =  0.23
  TOTAL AREA(ACRES) =    83.45       PEAK FLOW RATE(CFS) =     178.93
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    149.00 TO NODE    150.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1036.22  DOWNSTREAM(FEET) =  1035.00
  FLOW LENGTH(FEET) =   159.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  57.0 INCH PIPE IS  43.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.42
  ESTIMATED PIPE DIAMETER(INCH) =  57.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    178.93
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =  19.28
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    150.00 =  5111.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    149.00 TO NODE    150.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  19.28
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.668
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.75      0.45       0.10    76
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.45
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    0.75      SUBAREA RUNOFF(CFS) =    1.77
  EFFECTIVE AREA(ACRES) =    74.32   AREA-AVERAGED Fm(INCH/HR) =  0.05
  AREA-AVERAGED Fp(INCH/HR) =  0.23  AREA-AVERAGED Ap =  0.23
  TOTAL AREA(ACRES) =    84.20       PEAK FLOW RATE(CFS) =     178.93
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     84.20  TC(MIN.) =     19.28
  EFFECTIVE AREA(ACRES) =     74.32  AREA-AVERAGED Fm(INCH/HR)=  0.05
  AREA-AVERAGED Fp(INCH/HR) =  0.23  AREA-AVERAGED Ap =  0.23
  PEAK FLOW RATE(CFS)   =    178.93

  ** PEAK FLOW RATE TABLE **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
      1    178.85  14.86    3.118  0.24( 0.05) 0.22    63.7     140.00
      2    178.93  19.28    2.668  0.23( 0.05) 0.23    74.3     120.00
      3    157.84  27.97    2.134  0.19( 0.06) 0.30    83.3     110.00
      4    151.02  30.44    2.028  0.18( 0.06) 0.30    84.2     100.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS

1
```

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

                          Analysis prepared by:

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

 ************************** DESCRIPTION OF STUDY **************************
* BRIDGE 4TH STREET BUILDINGS                                             *
* EXISTING CONDITON NODES 160-161                                         *
* 100-YEAR                                                                *
 **************************************************************************

  FILE NAME: C:\XDRIVE\3819\EXB.DAT
  TIME/DATE OF STUDY: 08:19 10/02/2019
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

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

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

  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*


**************************************************************************
  FLOW PROCESS FROM NODE    160.00 TO NODE    161.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   380.00
  ELEVATION DATA: UPSTREAM(FEET) =   1049.59  DOWNSTREAM(FEET) =   1043.89

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.578
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.672
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.80      0.45       0.10    76    7.58
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.45
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =      3.33
  TOTAL AREA(ACRES) =      0.80   PEAK FLOW RATE(CFS) =      3.33
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =      0.80  TC(MIN.) =      7.58
  EFFECTIVE AREA(ACRES) =      0.80  AREA-AVERAGED Fm(INCH/HR)=  0.05
  AREA-AVERAGED Fp(INCH/HR) =  0.45  AREA-AVERAGED Ap =  0.10
  PEAK FLOW RATE(CFS)    =      3.33
==========================================================================
==========================================================================
  END OF RATIONAL METHOD ANALYSIS

1
```

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

                          Analysis prepared by:

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

 ************************** DESCRIPTION OF STUDY **************************
* BRIDGE  4TH STREET BUILDINGS                                            *
* EXISTING CONDITON NODES 170-171                                         *
* 100-YEAR                                                                *
 ************************************************************************

  FILE NAME: C:\XDRIVE\3819\EXC.DAT
  TIME/DATE OF STUDY: 08:21 10/02/2019
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

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

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

  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*


************************************************************************
  FLOW PROCESS FROM NODE    170.00 TO NODE    171.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   193.00
  ELEVATION DATA: UPSTREAM(FEET) =   1048.50  DOWNSTREAM(FEET) =   1042.90

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.763
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.589
  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.)
  URBAN GOOD COVER
  "TURF"                     B        2.40      0.43      1.00    77   11.76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.43
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA RUNOFF(CFS) =      6.81
  TOTAL AREA(ACRES) =      2.40   PEAK FLOW RATE(CFS) =      6.81
========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      2.40  TC(MIN.) =     11.76
  EFFECTIVE AREA(ACRES) =      2.40  AREA-AVERAGED Fm(INCH/HR)=  0.43
  AREA-AVERAGED Fp(INCH/HR) =  0.43  AREA-AVERAGED Ap =  1.00
  PEAK FLOW RATE(CFS)   =      6.81
========================================================================
========================================================================
  END OF RATIONAL METHOD ANALYSIS
```

1

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

                          Analysis prepared by:

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

 ************************** DESCRIPTION OF STUDY **************************
* BRIDGE 4TH STREET BUILDINGS                                             *
* EXISTING CONDITION NODES 180-181                                        *
* 100-YEAR                                                                *
 **************************************************************************

  FILE NAME: C:\XDRIVE\3819\EXD.DAT
  TIME/DATE OF STUDY: 08:23 10/02/2019
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

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

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

  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*


**************************************************************************
  FLOW PROCESS FROM NODE    180.00 TO NODE    181.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   270.00
  ELEVATION DATA: UPSTREAM(FEET) =   1045.12  DOWNSTREAM(FEET) =   1040.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.332
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.203
  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        1.55      0.80       0.10    52    6.33
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.80
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =      7.15
  TOTAL AREA(ACRES) =      1.55   PEAK FLOW RATE(CFS) =      7.15

**************************************************************************
  FLOW PROCESS FROM NODE    180.00 TO NODE    181.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  MAINLINE Tc(MIN) =   6.33
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.203
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  URBAN GOOD COVER
  "TURF"                      B        0.30      0.43       1.00    77
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.43
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =    0.30      SUBAREA RUNOFF(CFS) =    1.29
  EFFECTIVE AREA(ACRES) =     1.85   AREA-AVERAGED Fm(INCH/HR) =  0.14
  AREA-AVERAGED Fp(INCH/HR) =  0.56  AREA-AVERAGED Ap =  0.25
  TOTAL AREA(ACRES) =     1.85       PEAK FLOW RATE(CFS) =       8.44
==========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      1.85  TC(MIN.) =      6.33
  EFFECTIVE AREA(ACRES) =      1.85  AREA-AVERAGED Fm(INCH/HR)=  0.14
  AREA-AVERAGED Fp(INCH/HR) =  0.56  AREA-AVERAGED Ap =  0.25
  PEAK FLOW RATE(CFS)   =      8.44
==========================================================================
==========================================================================
  END OF RATIONAL METHOD ANALYSIS
```

PROPOSED CONDITION

```
******************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
         (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
        (c) Copyright 1983-2016 Advanced Engineering Software (aes)
            Ver. 23.0  Release Date: 07/01/2016  License ID 1435

                        Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* TEI JOB NO 3819                                                        *
* PROPOSED CONDITION                                                     *
* 100 YEAR STORM EVENT                                                   *
 ************************************************************************

  FILE NAME: W:\3819\100P.DAT
  TIME/DATE OF STUDY: 13:33 01/20/2021
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

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

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

  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *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 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *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) =   343.00
  ELEVATION DATA: UPSTREAM(FEET) =   1083.67  DOWNSTREAM(FEET) =   1075.55

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.640
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.058
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        3.40      0.42      0.100    76    6.64
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     15.35
  TOTAL AREA(ACRES) =      3.40   PEAK FLOW RATE(CFS) =     15.35

******************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  MAINLINE Tc(MIN.) =    6.64
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.058
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        1.55      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
```

```
  SUBAREA AREA(ACRES) =    1.55      SUBAREA RUNOFF(CFS) =    7.00
  EFFECTIVE AREA(ACRES) =      4.95   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        4.9       PEAK FLOW RATE(CFS) =      22.34

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1071.55  DOWNSTREAM(FEET) =  1071.09
  FLOW LENGTH(FEET) =   156.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  23.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.45
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      22.34
  PIPE TRAVEL TIME(MIN.) =   0.48    Tc(MIN.) =    7.12
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =     499.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.12
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.851
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        1.95      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.95      SUBAREA RUNOFF(CFS) =    8.44
  EFFECTIVE AREA(ACRES) =      6.90   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        6.9       PEAK FLOW RATE(CFS) =      29.86

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1071.09  DOWNSTREAM(FEET) =  1070.64
  FLOW LENGTH(FEET) =   148.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  26.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.91
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      29.86
  PIPE TRAVEL TIME(MIN.) =   0.42    Tc(MIN.) =    7.53
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =     647.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.53
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.688
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        1.50      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.50      SUBAREA RUNOFF(CFS) =    6.27
  EFFECTIVE AREA(ACRES) =      8.40   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        8.4       PEAK FLOW RATE(CFS) =      35.12

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    112.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1070.64  DOWNSTREAM(FEET) =  1070.17
  FLOW LENGTH(FEET) =   156.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  26.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.20
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      35.12
  PIPE TRAVEL TIME(MIN.) =   0.42    Tc(MIN.) =    7.95
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    112.00 =     803.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.95
  RAINFALL INTENSITY(INCH/HR) =   4.54
  AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       8.40
  TOTAL STREAM AREA(ACRES) =       8.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      35.12

****************************************************************************
  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) =   370.00
  ELEVATION DATA: UPSTREAM(FEET) =   1090.93  DOWNSTREAM(FEET) =   1075.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.111
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.316
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                  B        2.85      0.42      0.100    76    6.11
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     13.53
  TOTAL AREA(ACRES) =      2.85   PEAK FLOW RATE(CFS) =     13.53

****************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    112.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1072.00  DOWNSTREAM(FEET) =  1070.17
  FLOW LENGTH(FEET) =    12.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   9.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.22
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.53
  PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =    6.12
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    112.00 =     382.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 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.) =    6.12
  RAINFALL INTENSITY(INCH/HR) =   5.31
  AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       2.85
  TOTAL STREAM AREA(ACRES) =       2.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      13.53

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       35.12    7.95    4.538  0.42( 0.04) 0.10       8.4     100.00
      2       13.53    6.12    5.311  0.42( 0.04) 0.10       2.8     110.00

  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       45.20    6.12    5.311  0.42( 0.04) 0.10       9.3     110.00
      2       46.67    7.95    4.538  0.42( 0.04) 0.10      11.2     100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      46.67    Tc(MIN.) =     7.95
```

```
  EFFECTIVE AREA(ACRES) =      11.25   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       11.2
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    112.00 =     803.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    113.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1070.17  DOWNSTREAM(FEET) =  1069.80
  FLOW LENGTH(FEET) =    99.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  28.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.24
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      46.67
  PIPE TRAVEL TIME(MIN.) =   0.23    Tc(MIN.) =    8.18
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    113.00 =     902.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    113.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    8.18
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.462
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.65      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.65      SUBAREA RUNOFF(CFS) =    2.59
  EFFECTIVE AREA(ACRES) =     11.90   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       11.9       PEAK FLOW RATE(CFS) =      47.33

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    114.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1069.80  DOWNSTREAM(FEET) =  1068.12
  FLOW LENGTH(FEET) =   331.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  27.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.07
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      47.33
  PIPE TRAVEL TIME(MIN.) =   0.68    Tc(MIN.) =    8.86
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    114.00 =    1233.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    114.00 TO NODE    114.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    8.86
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.252
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        1.45      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.45      SUBAREA RUNOFF(CFS) =    5.49
  EFFECTIVE AREA(ACRES) =     13.35   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       13.3       PEAK FLOW RATE(CFS) =      50.58

****************************************************************************
  FLOW PROCESS FROM NODE    114.00 TO NODE    115.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1068.12  DOWNSTREAM(FEET) =  1067.37
  FLOW LENGTH(FEET) =   148.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  26.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.34
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      50.58
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =    9.16
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    115.00 =    1381.00 FEET.
```

```
**************************************************************************
 FLOW PROCESS FROM NODE    115.00 TO NODE    115.00 IS CODE =  81
--------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
 MAINLINE Tc(MIN.) =    9.16
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.169
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        0.60      0.42      0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    0.60      SUBAREA RUNOFF(CFS) =    2.23
 EFFECTIVE AREA(ACRES) =     13.95   AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       13.9       PEAK FLOW RATE(CFS) =      51.82

**************************************************************************
 FLOW PROCESS FROM NODE    115.00 TO NODE    116.00 IS CODE =  31
--------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1067.37  DOWNSTREAM(FEET) =  1065.97
 FLOW LENGTH(FEET) =   278.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.35
 ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      51.82
 PIPE TRAVEL TIME(MIN.) =   0.55    Tc(MIN.) =    9.72
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    116.00 =    1659.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE    116.00 TO NODE    116.00 IS CODE =  81
--------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
 MAINLINE Tc(MIN.) =    9.72
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.025
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        0.35      0.42      0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    0.35      SUBAREA RUNOFF(CFS) =    1.25
 EFFECTIVE AREA(ACRES) =     14.30   AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       14.3       PEAK FLOW RATE(CFS) =      51.82
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

**************************************************************************
 FLOW PROCESS FROM NODE    116.00 TO NODE    138.00 IS CODE =  31
--------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1065.97  DOWNSTREAM(FEET) =  1056.47
 FLOW LENGTH(FEET) =   336.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  15.73
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      51.82
 PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =   10.07
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    138.00 =    1995.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE    138.00 TO NODE    138.00 IS CODE =  10
--------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
==========================================================================

**************************************************************************
 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) =   197.00
 ELEVATION DATA: UPSTREAM(FEET) =   1076.17  DOWNSTREAM(FEET) =   1072.54

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.592
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.606
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
```

```
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                  B        3.55      0.42      0.100    76    5.59
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     17.78
  TOTAL AREA(ACRES) =      3.55   PEAK FLOW RATE(CFS) =     17.78

****************************************************************************
  FLOW PROCESS FROM NODE    131.00 TO NODE    133.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1069.61  DOWNSTREAM(FEET) =  1067.37
  FLOW LENGTH(FEET) =   169.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.09
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      17.78
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =    5.90
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    133.00 =     366.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    133.00 TO NODE    133.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    5.90
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.428
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        1.90      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.90      SUBAREA RUNOFF(CFS) =    9.21
  EFFECTIVE AREA(ACRES) =      5.45   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        5.4       PEAK FLOW RATE(CFS) =      26.42

****************************************************************************
  FLOW PROCESS FROM NODE    133.00 TO NODE    134.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1067.37  DOWNSTREAM(FEET) =  1065.48
  FLOW LENGTH(FEET) =   151.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  19.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.70
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      26.42
  PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =    6.16
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    134.00 =     517.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    134.00 TO NODE    134.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    6.16
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.289
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        1.55      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.55      SUBAREA RUNOFF(CFS) =    7.32
  EFFECTIVE AREA(ACRES) =      7.00   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.0       PEAK FLOW RATE(CFS) =      33.06

****************************************************************************
  FLOW PROCESS FROM NODE    134.00 TO NODE    135.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1065.48  DOWNSTREAM(FEET) =  1063.60
  FLOW LENGTH(FEET) =   151.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.39
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      33.06
```

```
 PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =    6.40
 LONGEST FLOWPATH FROM NODE    130.00 TO NODE    135.00 =     668.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    135.00 TO NODE    135.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    6.40
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.169
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  B        1.95      0.42      0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    1.95      SUBAREA RUNOFF(CFS) =    9.00
 EFFECTIVE AREA(ACRES) =      8.95   AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        8.9       PEAK FLOW RATE(CFS) =      41.29

****************************************************************************
 FLOW PROCESS FROM NODE    135.00 TO NODE    136.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1063.60  DOWNSTREAM(FEET) =  1061.71
 FLOW LENGTH(FEET) =   152.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  21.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.05
 ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      41.29
 PIPE TRAVEL TIME(MIN.) =   0.23    Tc(MIN.) =    6.63
 LONGEST FLOWPATH FROM NODE    130.00 TO NODE    136.00 =     820.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    136.00 TO NODE    136.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    6.63
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.061
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  B        2.00      0.42      0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    2.00      SUBAREA RUNOFF(CFS) =    9.03
 EFFECTIVE AREA(ACRES) =     10.95   AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       10.9       PEAK FLOW RATE(CFS) =      49.46

****************************************************************************
 FLOW PROCESS FROM NODE    136.00 TO NODE    137.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1061.71  DOWNSTREAM(FEET) =  1057.00
 FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  15.93
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      49.46
 PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =    6.80
 LONGEST FLOWPATH FROM NODE    130.00 TO NODE    137.00 =     980.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    137.00 TO NODE    137.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    6.80
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.986
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  B        1.45      0.42      0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    1.45      SUBAREA RUNOFF(CFS) =    6.45
 EFFECTIVE AREA(ACRES) =     12.40   AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       12.4       PEAK FLOW RATE(CFS) =      55.17
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    137.00 TO NODE    138.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1057.00  DOWNSTREAM(FEET) =  1056.47
  FLOW LENGTH(FEET) =    10.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.68
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      55.17
  PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =    6.81
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    138.00 =     990.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    138.00 TO NODE    138.00 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       55.17    6.81    4.982  0.42( 0.04) 0.10      12.4     130.00
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    138.00 =     990.00 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       51.04    8.25    4.439  0.42( 0.04) 0.10      12.4     110.00
      2       51.82   10.07    3.939  0.42( 0.04) 0.10      14.3     100.00
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    138.00 =    1995.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      102.47    6.81    4.982  0.42( 0.04) 0.10      22.6     130.00
      2      100.14    8.25    4.439  0.42( 0.04) 0.10      24.8     110.00
      3       95.33   10.07    3.939  0.42( 0.04) 0.10      26.7     100.00
    TOTAL AREA(ACRES) =        26.7

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      102.47  Tc(MIN.) =    6.808
  EFFECTIVE AREA(ACRES) =     22.60  AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       26.7
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    138.00 =    1995.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    138.00 TO NODE    164.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1056.47  DOWNSTREAM(FEET) =  1034.50
  FLOW LENGTH(FEET) =  2130.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  32.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.76
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     102.47
  PIPE TRAVEL TIME(MIN.) =   2.78    Tc(MIN.) =    9.59
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    164.00 =    4125.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    164.00 TO NODE    164.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    9.59
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.056
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        1.15      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.15      SUBAREA RUNOFF(CFS) =    4.15
  EFFECTIVE AREA(ACRES) =     23.75   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       27.9       PEAK FLOW RATE(CFS) =     102.47
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    164.00 TO NODE    164.00 IS CODE =  10
```

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

********************************************************************************
  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) =   290.00
  ELEVATION DATA: UPSTREAM(FEET) =   1060.23  DOWNSTREAM(FEET) =   1051.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.852
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.456
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                  B        0.95      0.42      0.100    76    5.85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      4.63
  TOTAL AREA(ACRES) =      0.95   PEAK FLOW RATE(CFS) =      4.63

********************************************************************************
  FLOW PROCESS FROM NODE    141.00 TO NODE    142.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1051.00  DOWNSTREAM(FEET) =  1048.24
  FLOW LENGTH(FEET) =   429.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.00
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.63
  PIPE TRAVEL TIME(MIN.) =   1.43    Tc(MIN.) =    7.28
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    142.00 =     719.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    142.00 TO NODE    142.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  MAINLINE Tc(MIN.) =    7.28
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.785
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        1.10      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.10      SUBAREA RUNOFF(CFS) =    4.70
  EFFECTIVE AREA(ACRES) =      2.05   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        2.0       PEAK FLOW RATE(CFS) =       8.75

********************************************************************************
  FLOW PROCESS FROM NODE    142.00 TO NODE    152.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1048.24  DOWNSTREAM(FEET) =  1045.24
  FLOW LENGTH(FEET) =   461.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.77
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.75
  PIPE TRAVEL TIME(MIN.) =   1.33    Tc(MIN.) =    8.61
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    152.00 =    1180.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    152.00 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.) =    8.61
  RAINFALL INTENSITY(INCH/HR) =   4.33
  AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       2.05
```

```
  TOTAL STREAM AREA(ACRES) =       2.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       8.75

****************************************************************************
  FLOW PROCESS FROM NODE    150.00 TO NODE    151.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   340.00
  ELEVATION DATA: UPSTREAM(FEET) =   1058.02  DOWNSTREAM(FEET) =   1051.52

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.905
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.940
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                  B        4.60      0.42       0.100    76    6.91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     20.28
  TOTAL AREA(ACRES) =      4.60   PEAK FLOW RATE(CFS) =     20.28

****************************************************************************
  FLOW PROCESS FROM NODE    151.00 TO NODE    152.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1048.00  DOWNSTREAM(FEET) =  1045.24
  FLOW LENGTH(FEET) =    10.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  30.10
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      20.28
  PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =    6.91
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    152.00 =     350.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    152.00 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.) =    6.91
  RAINFALL INTENSITY(INCH/HR) =   4.94
  AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       4.60
  TOTAL STREAM AREA(ACRES) =       4.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      20.28

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        8.75    8.61    4.326  0.42( 0.04) 0.10       2.0     140.00
      2       20.28    6.91    4.938  0.42( 0.04) 0.10       4.6     150.00

  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       28.30    6.91    4.938  0.42( 0.04) 0.10       6.2     150.00
      2       26.50    8.61    4.326  0.42( 0.04) 0.10       6.6     140.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      28.30    Tc(MIN.) =     6.91
  EFFECTIVE AREA(ACRES) =       6.24   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        6.6
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    152.00 =    1180.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    153.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1045.24  DOWNSTREAM(FEET) =  1044.52
  FLOW LENGTH(FEET) =   113.00   MANNING'S N =  0.012
```

```
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  20.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.86
 ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      28.30
 PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =    7.15
 LONGEST FLOWPATH FROM NODE    140.00 TO NODE    153.00 =    1293.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    153.00 TO NODE    153.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    7.15
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.838
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  B        1.40      0.42     0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    1.40      SUBAREA RUNOFF(CFS) =    6.04
 EFFECTIVE AREA(ACRES) =      7.64   AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        8.0       PEAK FLOW RATE(CFS) =      32.99

****************************************************************************
 FLOW PROCESS FROM NODE    153.00 TO NODE    154.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1044.52  DOWNSTREAM(FEET) =  1043.63
 FLOW LENGTH(FEET) =   139.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  23.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.04
 ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      32.99
 PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =    7.44
 LONGEST FLOWPATH FROM NODE    140.00 TO NODE    154.00 =    1432.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    154.00 TO NODE    154.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    7.44
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.724
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  B        2.10      0.42     0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    2.10      SUBAREA RUNOFF(CFS) =    8.85
 EFFECTIVE AREA(ACRES) =      9.74   AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       10.1       PEAK FLOW RATE(CFS) =      41.06

****************************************************************************
 FLOW PROCESS FROM NODE    154.00 TO NODE    155.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1043.63  DOWNSTREAM(FEET) =  1042.59
 FLOW LENGTH(FEET) =   158.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  33.0 INCH PIPE IS  24.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.64
 ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      41.06
 PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =    7.74
 LONGEST FLOWPATH FROM NODE    140.00 TO NODE    155.00 =    1590.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    155.00 TO NODE    155.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    7.74
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.612
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  B        2.10      0.42     0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
```

```
  SUBAREA AREA(ACRES) =    2.10      SUBAREA RUNOFF(CFS) =    8.64
  EFFECTIVE AREA(ACRES) =     11.84   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       12.2       PEAK FLOW RATE(CFS) =      48.71

****************************************************************************
  FLOW PROCESS FROM NODE    155.00 TO NODE    156.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1042.59  DOWNSTREAM(FEET) =  1041.55
  FLOW LENGTH(FEET) =   162.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  25.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.98
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      48.71
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =    8.04
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    156.00 =    1752.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    156.00 TO NODE    156.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    8.04
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.508
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        2.10      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.10      SUBAREA RUNOFF(CFS) =    8.44
  EFFECTIVE AREA(ACRES) =     13.94   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       14.4       PEAK FLOW RATE(CFS) =      56.04

****************************************************************************
  FLOW PROCESS FROM NODE    156.00 TO NODE    157.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1041.55  DOWNSTREAM(FEET) =  1040.50
  FLOW LENGTH(FEET) =   162.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  29.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.14
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      56.04
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =    8.34
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    157.00 =    1914.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    157.00 TO NODE    157.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    8.34
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.411
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        1.95      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.95      SUBAREA RUNOFF(CFS) =    7.67
  EFFECTIVE AREA(ACRES) =     15.89   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       16.3       PEAK FLOW RATE(CFS) =      62.50

****************************************************************************
  FLOW PROCESS FROM NODE    157.00 TO NODE    162.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1040.50  DOWNSTREAM(FEET) =  1037.05
  FLOW LENGTH(FEET) =   536.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  28.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.53
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      62.50
  PIPE TRAVEL TIME(MIN.) =   0.94    Tc(MIN.) =    9.28
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    162.00 =    2450.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    162.00 TO NODE    162.00 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.) =    9.28
  RAINFALL INTENSITY(INCH/HR) =   4.14
  AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =      15.89
  TOTAL STREAM AREA(ACRES) =      16.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      62.50

****************************************************************************
  FLOW PROCESS FROM NODE    160.00 TO NODE    161.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   510.00
  ELEVATION DATA: UPSTREAM(FEET) =   1052.05  DOWNSTREAM(FEET) =   1048.28

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.821
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.999
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                  B        6.55      0.42      0.100    76    9.82
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     23.32
  TOTAL AREA(ACRES) =      6.55   PEAK FLOW RATE(CFS) =     23.32

****************************************************************************
  FLOW PROCESS FROM NODE    161.00 TO NODE    162.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1045.00  DOWNSTREAM(FEET) =  1037.05
  FLOW LENGTH(FEET) =    99.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.48
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      23.32
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    9.91
  LONGEST FLOWPATH FROM NODE    160.00 TO NODE    162.00 =     609.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    162.00 TO NODE    162.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.91
  RAINFALL INTENSITY(INCH/HR) =   3.98
  AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       6.55
  TOTAL STREAM AREA(ACRES) =       6.55
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      23.32

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       62.50    9.28    4.138  0.42( 0.04) 0.10      15.9     150.00
      1       57.18   11.02    3.732  0.42( 0.04) 0.10      16.3     140.00
      2       23.32    9.91    3.978  0.42( 0.04) 0.10       6.6     160.00

  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       85.23    9.28    4.138  0.42( 0.04) 0.10      22.0     150.00
      2       83.90    9.91    3.978  0.42( 0.04) 0.10      22.6     160.00
      3       79.05   11.02    3.732  0.42( 0.04) 0.10      22.9     140.00
```

```
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      85.23    Tc(MIN.) =     9.28
 EFFECTIVE AREA(ACRES) =      22.03   AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       22.9
 LONGEST FLOWPATH FROM NODE    140.00 TO NODE    162.00 =    2450.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    162.00 TO NODE    163.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1037.05  DOWNSTREAM(FEET) =  1035.29
 FLOW LENGTH(FEET) =   273.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  42.0 INCH PIPE IS  34.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.11
 ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      85.23
 PIPE TRAVEL TIME(MIN.) =   0.45    Tc(MIN.) =    9.73
 LONGEST FLOWPATH FROM NODE    140.00 TO NODE    163.00 =    2723.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    163.00 TO NODE    163.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    9.73
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.022
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp          Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  B        2.60      0.42      0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    2.60      SUBAREA RUNOFF(CFS) =    9.31
 EFFECTIVE AREA(ACRES) =     24.63   AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       25.5       PEAK FLOW RATE(CFS) =      88.21

****************************************************************************
 FLOW PROCESS FROM NODE    163.00 TO NODE    164.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1035.29  DOWNSTREAM(FEET) =  1034.62
 FLOW LENGTH(FEET) =   104.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  45.0 INCH PIPE IS  32.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.44
 ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      88.21
 PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =    9.89
 LONGEST FLOWPATH FROM NODE    140.00 TO NODE    164.00 =    2827.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    164.00 TO NODE    164.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 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       88.21    9.89    3.981  0.42( 0.04) 0.10      24.6     150.00
     2       86.86   10.52    3.837  0.42( 0.04) 0.10      25.2     160.00
     3       82.49   11.64    3.611  0.42( 0.04) 0.10      25.5     140.00
 LONGEST FLOWPATH FROM NODE    140.00 TO NODE    164.00 =    2827.00 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)     NODE
     1      102.47    9.59    4.056  0.42( 0.04) 0.10      23.8     130.00
     2      100.14   11.04    3.728  0.42( 0.04) 0.10      25.9     110.00
     3       95.33   12.88    3.399  0.42( 0.04) 0.10      27.9     100.00
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    164.00 =    4125.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)     NODE
     1      189.62    9.59    4.056  0.42( 0.04) 0.10      47.6     130.00
     2      190.20    9.89    3.981  0.42( 0.04) 0.10      48.8     150.00
     3      187.84   10.52    3.837  0.42( 0.04) 0.10      50.3     160.00
     4      184.98   11.04    3.728  0.42( 0.04) 0.10      51.2     110.00
     5      181.05   11.64    3.611  0.42( 0.04) 0.10      52.0     140.00
     6      172.92   12.88    3.399  0.42( 0.04) 0.10      53.3     100.00
```

```
    TOTAL AREA(ACRES) =        53.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      190.20  Tc(MIN.) =    9.893
  EFFECTIVE AREA(ACRES) =     48.83  AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       53.3
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    164.00 =    4125.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    164.00 TO NODE    201.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1034.62  DOWNSTREAM(FEET) =  1034.37
  FLOW LENGTH(FEET) =    36.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  57.0 INCH PIPE IS  44.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.84
  ESTIMATED PIPE DIAMETER(INCH) =  57.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     190.20
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    9.94
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    201.00 =    4161.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    201.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    170.00 TO NODE    171.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   741.00
  ELEVATION DATA: UPSTREAM(FEET) =   1079.65  DOWNSTREAM(FEET) =   1067.37

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.703
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.028
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                  B        1.65      0.42      0.100    76    9.70
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      5.92
  TOTAL AREA(ACRES) =      1.65   PEAK FLOW RATE(CFS) =      5.92

****************************************************************************
  FLOW PROCESS FROM NODE    171.00 TO NODE    172.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1063.91  DOWNSTREAM(FEET) =  1062.81
  FLOW LENGTH(FEET) =    55.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.26
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.92
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    9.81
  LONGEST FLOWPATH FROM NODE    170.00 TO NODE    172.00 =     796.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    172.00 TO NODE    172.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    9.81
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.000
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        0.50      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =     0.50      SUBAREA RUNOFF(CFS) =     1.78
  EFFECTIVE AREA(ACRES) =      2.15   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        2.2       PEAK FLOW RATE(CFS) =       7.66

****************************************************************************
  FLOW PROCESS FROM NODE    172.00 TO NODE    181.00 IS CODE =  31
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1062.81  DOWNSTREAM(FEET) =  1047.28
  FLOW LENGTH(FEET) =   542.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.06
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.66
  PIPE TRAVEL TIME(MIN.) =   0.90    Tc(MIN.) =   10.71
  LONGEST FLOWPATH FROM NODE    170.00 TO NODE    181.00 =    1338.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    181.00 TO NODE    181.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.71
  RAINFALL INTENSITY(INCH/HR) =   3.80
  AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       2.15
  TOTAL STREAM AREA(ACRES) =       2.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       7.66

****************************************************************************
  FLOW PROCESS FROM NODE    180.00 TO NODE    181.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   401.00
  ELEVATION DATA: UPSTREAM(FEET) =   1064.95  DOWNSTREAM(FEET) =   1051.49

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.591
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.080
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                  B        4.80      0.42      0.100    76    6.59
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     21.76
  TOTAL AREA(ACRES) =      4.80   PEAK FLOW RATE(CFS) =     21.76

****************************************************************************
  FLOW PROCESS FROM NODE    181.00 TO NODE    181.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =    6.59
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.080
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        0.35      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =     0.35      SUBAREA RUNOFF(CFS) =     1.59
  EFFECTIVE AREA(ACRES) =      5.15   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        5.2       PEAK FLOW RATE(CFS) =      23.35

****************************************************************************
  FLOW PROCESS FROM NODE    181.00 TO NODE    181.00 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.) =    6.59
  RAINFALL INTENSITY(INCH/HR) =   5.08
  AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       5.15
  TOTAL STREAM AREA(ACRES) =       5.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      23.35

  ** CONFLUENCE DATA **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7.66	10.71	3.796	0.42(0.04)	0.10	2.2	170.00
2	23.35	6.59	5.080	0.42(0.04)	0.10	5.2	180.00

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	29.67	6.59	5.080	0.42(0.04)	0.10	6.5	180.00
2	25.06	10.71	3.796	0.42(0.04)	0.10	7.3	170.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 29.67 Tc(MIN.) = 6.59
EFFECTIVE AREA(ACRES) = 6.47 AREA-AVERAGED Fm(INCH/HR) = 0.04
AREA-AVERAGED Fp(INCH/HR) = 0.42 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 7.3
LONGEST FLOWPATH FROM NODE 170.00 TO NODE 181.00 = 1338.00 FEET.

****
FLOW PROCESS FROM NODE 181.00 TO NODE 182.00 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 1047.28 DOWNSTREAM(FEET) = 1046.89
FLOW LENGTH(FEET) = 131.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 33.0 INCH PIPE IS 26.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.85
ESTIMATED PIPE DIAMETER(INCH) = 33.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 29.67
PIPE TRAVEL TIME(MIN.) = 0.37 Tc(MIN.) = 6.96
LONGEST FLOWPATH FROM NODE 170.00 TO NODE 182.00 = 1469.00 FEET.

****
FLOW PROCESS FROM NODE 182.00 TO NODE 182.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==
MAINLINE Tc(MIN.) = 6.96
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.915
SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	2.15	0.42	0.100	76

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.42
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA AREA(ACRES) = 2.15 SUBAREA RUNOFF(CFS) = 9.43
EFFECTIVE AREA(ACRES) = 8.62 AREA-AVERAGED Fm(INCH/HR) = 0.04
AREA-AVERAGED Fp(INCH/HR) = 0.42 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 9.5 PEAK FLOW RATE(CFS) = 37.81

****
FLOW PROCESS FROM NODE 182.00 TO NODE 183.00 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 1046.89 DOWNSTREAM(FEET) = 1046.46
FLOW LENGTH(FEET) = 143.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 36.0 INCH PIPE IS 28.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.23
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 37.81
PIPE TRAVEL TIME(MIN.) = 0.38 Tc(MIN.) = 7.35
LONGEST FLOWPATH FROM NODE 170.00 TO NODE 183.00 = 1612.00 FEET.

****
FLOW PROCESS FROM NODE 183.00 TO NODE 183.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==
MAINLINE Tc(MIN.) = 7.35
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.759
SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	2.15	0.42	0.100	76

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.42
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA AREA(ACRES) = 2.15 SUBAREA RUNOFF(CFS) = 9.13
EFFECTIVE AREA(ACRES) = 10.77 AREA-AVERAGED Fm(INCH/HR) = 0.04
AREA-AVERAGED Fp(INCH/HR) = 0.42 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 11.6 PEAK FLOW RATE(CFS) = 45.73

```
****************************************************************************
  FLOW PROCESS FROM NODE    183.00 TO NODE    184.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1046.46  DOWNSTREAM(FEET) =  1045.98
  FLOW LENGTH(FEET) =   159.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  30.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.57
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      45.73
  PIPE TRAVEL TIME(MIN.) =   0.40    Tc(MIN.) =    7.75
  LONGEST FLOWPATH FROM NODE    170.00 TO NODE    184.00 =    1771.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    184.00 TO NODE    184.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.75
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.609
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        2.15      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.15      SUBAREA RUNOFF(CFS) =    8.84
  EFFECTIVE AREA(ACRES) =     12.92   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       13.8       PEAK FLOW RATE(CFS) =      53.12

****************************************************************************
  FLOW PROCESS FROM NODE    184.00 TO NODE    185.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1045.98  DOWNSTREAM(FEET) =  1045.51
  FLOW LENGTH(FEET) =   159.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  31.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.81
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      53.12
  PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =    8.14
  LONGEST FLOWPATH FROM NODE    170.00 TO NODE    185.00 =    1930.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    185.00 TO NODE    185.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    8.14
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.476
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        2.00      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.00      SUBAREA RUNOFF(CFS) =    7.98
  EFFECTIVE AREA(ACRES) =     14.92   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       15.8       PEAK FLOW RATE(CFS) =      59.54

****************************************************************************
  FLOW PROCESS FROM NODE    185.00 TO NODE    186.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1045.51  DOWNSTREAM(FEET) =  1045.04
  FLOW LENGTH(FEET) =   156.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  31.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.12
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      59.54
  PIPE TRAVEL TIME(MIN.) =   0.37    Tc(MIN.) =    8.50
  LONGEST FLOWPATH FROM NODE    170.00 TO NODE    186.00 =    2086.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    186.00 TO NODE    186.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

```
==========================================================================
  MAINLINE Tc(MIN.) =    8.50
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.360
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        1.65      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.65      SUBAREA RUNOFF(CFS) =    6.41
  EFFECTIVE AREA(ACRES) =     16.57   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       17.4       PEAK FLOW RATE(CFS) =      64.39

**************************************************************************
  FLOW PROCESS FROM NODE    186.00 TO NODE    187.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1045.04  DOWNSTREAM(FEET) =  1044.56
  FLOW LENGTH(FEET) =   158.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  33.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.23
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      64.39
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =    8.87
  LONGEST FLOWPATH FROM NODE    170.00 TO NODE    187.00 =    2244.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    187.00 TO NODE    187.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  MAINLINE Tc(MIN.) =    8.87
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.251
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        2.15      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.15      SUBAREA RUNOFF(CFS) =    8.14
  EFFECTIVE AREA(ACRES) =     18.72   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       19.5       PEAK FLOW RATE(CFS) =      70.92

**************************************************************************
  FLOW PROCESS FROM NODE    187.00 TO NODE    188.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1044.56  DOWNSTREAM(FEET) =  1044.08
  FLOW LENGTH(FEET) =   158.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  33.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.47
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      70.92
  PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =    9.22
  LONGEST FLOWPATH FROM NODE    170.00 TO NODE    188.00 =    2402.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    188.00 TO NODE    188.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  MAINLINE Tc(MIN.) =    9.22
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.153
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        2.05      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.05      SUBAREA RUNOFF(CFS) =    7.58
  EFFECTIVE AREA(ACRES) =     20.77   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       21.6       PEAK FLOW RATE(CFS) =      76.85

**************************************************************************
  FLOW PROCESS FROM NODE    188.00 TO NODE    189.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =  1044.08  DOWNSTREAM(FEET) =  1043.61
 FLOW LENGTH(FEET) =   158.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  48.0 INCH PIPE IS  36.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.48
 ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      76.85
 PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =    9.57
 LONGEST FLOWPATH FROM NODE    170.00 TO NODE    189.00 =    2560.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    189.00 TO NODE    189.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    9.57
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.061
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  B        2.20      0.42      0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    2.20      SUBAREA RUNOFF(CFS) =    7.96
 EFFECTIVE AREA(ACRES) =     22.97   AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       23.8       PEAK FLOW RATE(CFS) =      83.08

****************************************************************************
 FLOW PROCESS FROM NODE    189.00 TO NODE    195.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1043.61  DOWNSTREAM(FEET) =  1043.02
 FLOW LENGTH(FEET) =   225.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  51.0 INCH PIPE IS  38.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.29
 ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      83.08
 PIPE TRAVEL TIME(MIN.) =   0.51    Tc(MIN.) =   10.09
 LONGEST FLOWPATH FROM NODE    170.00 TO NODE    195.00 =    2785.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    195.00 TO NODE    195.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   10.09
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.935
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  B        2.55      0.42      0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    2.55      SUBAREA RUNOFF(CFS) =    8.93
 EFFECTIVE AREA(ACRES) =     25.52   AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       26.3       PEAK FLOW RATE(CFS) =      89.42

****************************************************************************
 FLOW PROCESS FROM NODE    195.00 TO NODE    196.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1043.02  DOWNSTREAM(FEET) =  1042.30
 FLOW LENGTH(FEET) =    78.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  42.0 INCH PIPE IS  30.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.96
 ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      89.42
 PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =   10.20
 LONGEST FLOWPATH FROM NODE    170.00 TO NODE    196.00 =    2863.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    196.00 TO NODE    196.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   10.20
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.910
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  B        0.55      0.42      0.100    76
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.55      SUBAREA RUNOFF(CFS) =    1.91
  EFFECTIVE AREA(ACRES) =     26.07   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       26.9       PEAK FLOW RATE(CFS) =      90.75

****************************************************************************
  FLOW PROCESS FROM NODE    196.00 TO NODE    197.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1042.30  DOWNSTREAM(FEET) =  1041.56
  FLOW LENGTH(FEET) =    85.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  31.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.68
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      90.75
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =   10.32
  LONGEST FLOWPATH FROM NODE    170.00 TO NODE    197.00 =    2948.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    197.00 TO NODE    197.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   10.32
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.882
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        0.30      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.30      SUBAREA RUNOFF(CFS) =    1.04
  EFFECTIVE AREA(ACRES) =     26.37   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       27.2       PEAK FLOW RATE(CFS) =      91.14

****************************************************************************
  FLOW PROCESS FROM NODE    197.00 TO NODE    198.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1041.56  DOWNSTREAM(FEET) =  1040.16
  FLOW LENGTH(FEET) =   256.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  35.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.74
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      91.14
  PIPE TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =   10.76
  LONGEST FLOWPATH FROM NODE    170.00 TO NODE    198.00 =    3204.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    198.00 TO NODE    198.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   10.76
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.787
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        0.15      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.15      SUBAREA RUNOFF(CFS) =    0.51
  EFFECTIVE AREA(ACRES) =     26.52   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       27.3       PEAK FLOW RATE(CFS) =      91.14
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    198.00 TO NODE    199.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1040.16  DOWNSTREAM(FEET) =  1038.21
  FLOW LENGTH(FEET) =   241.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  32.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.31
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      91.14
```

```
 PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =   11.11
 LONGEST FLOWPATH FROM NODE    170.00 TO NODE    199.00 =    3445.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    199.00 TO NODE    199.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   11.11
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.713
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                B        0.50      0.42      0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    0.50      SUBAREA RUNOFF(CFS) =    1.65
 EFFECTIVE AREA(ACRES) =     27.02   AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       27.8       PEAK FLOW RATE(CFS) =      91.14
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE    199.00 TO NODE    200.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1038.21  DOWNSTREAM(FEET) =  1036.90
 FLOW LENGTH(FEET) =   164.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  42.0 INCH PIPE IS  33.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.24
 ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      91.14
 PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =   11.35
 LONGEST FLOWPATH FROM NODE    170.00 TO NODE    200.00 =    3609.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    200.00 TO NODE    200.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   11.35
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.665
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                B        0.50      0.42      0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    0.50      SUBAREA RUNOFF(CFS) =    1.63
 EFFECTIVE AREA(ACRES) =     27.52   AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       28.3       PEAK FLOW RATE(CFS) =      91.14
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1036.90  DOWNSTREAM(FEET) =  1034.37
 FLOW LENGTH(FEET) =   278.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  42.0 INCH PIPE IS  31.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.92
 ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      91.14
 PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =   11.74
 LONGEST FLOWPATH FROM NODE    170.00 TO NODE    201.00 =    3887.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    201.00 TO NODE    201.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 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       91.14   11.74    3.592  0.42( 0.04) 0.10      27.5     180.00
     2       76.10   16.10    2.972  0.42( 0.04) 0.10      28.3     170.00
 LONGEST FLOWPATH FROM NODE    170.00 TO NODE    201.00 =    3887.00 FEET.

 ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

```
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      189.62    9.64    4.044  0.42( 0.04) 0.10      47.6     130.00
    2      190.20    9.94    3.970  0.42( 0.04) 0.10      48.8     150.00
    3      187.84   10.57    3.827  0.42( 0.04) 0.10      50.3     160.00
    4      184.98   11.09    3.718  0.42( 0.04) 0.10      51.2     110.00
    5      181.05   11.69    3.602  0.42( 0.04) 0.10      52.0     140.00
    6      172.92   12.92    3.391  0.42( 0.04) 0.10      53.3     100.00
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    201.00 =    4161.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      273.94    9.64    4.044  0.42( 0.04) 0.10      70.2     130.00
    2      275.56    9.94    3.970  0.42( 0.04) 0.10      72.1     150.00
    3      275.28   10.57    3.827  0.42( 0.04) 0.10      75.1     160.00
    4      274.08   11.09    3.718  0.42( 0.04) 0.10      77.2     110.00
    5      272.02   11.69    3.602  0.42( 0.04) 0.10      79.4     140.00
    6      271.83   11.74    3.592  0.42( 0.04) 0.10      79.6     180.00
    7      259.99   12.92    3.391  0.42( 0.04) 0.10      81.0     100.00
    8      227.36   16.10    2.972  0.42( 0.04) 0.10      81.7     170.00
   TOTAL AREA(ACRES) =        81.7

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      275.56  Tc(MIN.) =    9.940
  EFFECTIVE AREA(ACRES) =     72.13  AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       81.7
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    201.00 =    4161.00 FEET.

****************************************************************************
  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) =  1034.37  DOWNSTREAM(FEET) =  1034.22
  FLOW LENGTH(FEET) =    43.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  75.0 INCH PIPE IS  57.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.91
  ESTIMATED PIPE DIAMETER(INCH) =  75.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     275.56
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =   10.01
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    202.00 =    4204.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   10.01
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.954
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.95      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.95      SUBAREA RUNOFF(CFS) =    3.34
  EFFECTIVE AREA(ACRES) =     73.08   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       82.6       PEAK FLOW RATE(CFS) =     275.56
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       82.6  TC(MIN.) =     10.01
  EFFECTIVE AREA(ACRES) =     73.08  AREA-AVERAGED Fm(INCH/HR)=  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =     275.56

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      273.94    9.70    4.028  0.42( 0.04) 0.10      71.2     130.00
    2      275.56   10.01    3.954  0.42( 0.04) 0.10      73.1     150.00
    3      275.28   10.63    3.812  0.42( 0.04) 0.10      76.1     160.00
    4      274.08   11.15    3.705  0.42( 0.04) 0.10      78.2     110.00
    5      272.02   11.75    3.590  0.42( 0.04) 0.10      80.3     140.00
    6      271.83   11.81    3.580  0.42( 0.04) 0.10      80.5     180.00
    7      259.99   12.99    3.381  0.42( 0.04) 0.10      82.0     100.00
    8      227.36   16.17    2.964  0.42( 0.04) 0.10      82.6     170.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

♀

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
         (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
        (c) Copyright 1983-2016 Advanced Engineering Software (aes)
            Ver. 23.0  Release Date: 07/01/2016  License ID 1435

                          Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* TEI JOB NO 3819                                                      *
* PROPOSED CONDITION                                                   *
* 100 YEAR STORM EVENT                                                 *
 ************************************************************************

  FILE NAME: W:\3819\200P.DAT
  TIME/DATE OF STUDY: 12:52 12/31/2020
========================================================================
  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
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

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

  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *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)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *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) =   236.00
  ELEVATION DATA: UPSTREAM(FEET) =   1084.80  DOWNSTREAM(FEET) =   1080.78

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.106
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.318
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp          Ap      SCS   Tc
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                  B        1.10      0.42      0.100    76    6.11
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      5.22
  TOTAL AREA(ACRES) =      1.10   PEAK FLOW RATE(CFS) =      5.22

************************************************************************
  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) =  1073.92  DOWNSTREAM(FEET) =  1063.07
  FLOW LENGTH(FEET) =   695.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.86
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      5.22
  PIPE TRAVEL TIME(MIN.) =   1.69    Tc(MIN.) =    7.79
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =     931.00 FEET.

************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 IS CODE =  81
------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
========================================================================
  MAINLINE Tc(MIN.) =    7.79
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.593
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp          Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        0.45      0.42      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.45      SUBAREA RUNOFF(CFS) =    1.84
  EFFECTIVE AREA(ACRES) =      1.55   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.5       PEAK FLOW RATE(CFS) =       6.35

************************************************************************
  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) =  1063.07  DOWNSTREAM(FEET) =  1050.92
  FLOW LENGTH(FEET) =  1066.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  11.6 INCHES
```

```
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.23
 ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       6.35
 PIPE TRAVEL TIME(MIN.) =   2.85    Tc(MIN.) =   10.65
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    203.00 =    1997.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   10.65
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.810
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL    AREA       Fp          Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  B         2.30      0.42      0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =     2.30      SUBAREA RUNOFF(CFS) =     7.80
 EFFECTIVE AREA(ACRES) =      3.85   AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =         3.8       PEAK FLOW RATE(CFS) =      13.06

****************************************************************************
 FLOW PROCESS FROM NODE    203.00 TO NODE    204.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1050.92  DOWNSTREAM(FEET) =  1041.20
 FLOW LENGTH(FEET) =   851.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.12
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      13.06
 PIPE TRAVEL TIME(MIN.) =   1.75    Tc(MIN.) =   12.39
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    204.00 =    2848.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    204.00 TO NODE    204.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   12.39
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.478
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL    AREA       Fp          Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  B         1.95      0.42      0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =     1.95      SUBAREA RUNOFF(CFS) =     6.03
 EFFECTIVE AREA(ACRES) =      5.80   AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =         5.8       PEAK FLOW RATE(CFS) =      17.93

****************************************************************************
 FLOW PROCESS FROM NODE    204.00 TO NODE    205.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1041.20  DOWNSTREAM(FEET) =  1037.14
 FLOW LENGTH(FEET) =   357.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.24
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      17.93
 PIPE TRAVEL TIME(MIN.) =   0.72    Tc(MIN.) =   13.11
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    205.00 =    3205.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    205.00 TO NODE    205.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   13.11
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.362
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/       SCS SOIL    AREA       Fp          Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  B         1.10      0.42      0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =     1.10      SUBAREA RUNOFF(CFS) =     3.29
 EFFECTIVE AREA(ACRES) =      6.90   AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =         6.9       PEAK FLOW RATE(CFS) =      20.61
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =         6.9  TC(MIN.) =     13.11
 EFFECTIVE AREA(ACRES) =      6.90  AREA-AVERAGED Fm(INCH/HR)=  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap = 0.100
 PEAK FLOW RATE(CFS)   =      20.61
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

♀

APPENDIX C

DETENTION CALCULATIONS

PONDING EXHIBIT

BLDG 2 NORTHERLY TRUCKYARD
11.25 ACRES TRIBUTARY
PEAK Q100=46.67 CFS
Q(OUT)=8.9 CFS
0.91' DEPTH, 1076.45 WSE,
0.587 AC-FT

BLDG 2

BLDG 2

BLDG 2 SOUTHERLY TRUCKYARD
12.4 ACRES TRIBUTARY
PEAK Q100=55.17 CFS
Q(OUT)=15.0 CFS
1.1' DEPTH, 1073.64 WSE,
0.45 AC-FT

BLDG 1

BLDG 1 EASTERLY TRUCKYARD
23.8 ACRES TRIBUTARY
PEAK Q100= 83.1 CFS
Q(OUT)= 56.8 CFS
0.45' DEPTH, 1051.94 WSE,
0.268 AC-FT

BLDG 1

BLDG 1 WESTERLY TRUCKYARD
6.55 ACRES TRIBUTARY
PEAK Q100=23.32 CFS
Q(OUT)= 15.7 CFS
1.79' DEPTH, 1050.07 WSE,
0.20 AC-FT

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

0 60 250 500 750

SCALE: 1"=250'

truckyard	node	acreage	peak Q	tc (min)	discharge Q c	depth ft	wse	volume ac-ft
bldg 2 north	100-112	11.25	46.67	7.95	8.9	0.91	1076.46	0.587
bldg 2 south	130-137	12.4	55.17	6.8	15	1.1	1073.64	0.449
bldg 1 west	160-162	6.55	23.32	9.91	15.7	1.79	1050.07	0.197
bldg 1 east	170-189	23.8	83.1	9.57	56.8	0.45	1051.94	0.268

Building #2
VOLUME AT NORTHERLY TRUCK YARD

Elevation	Depth (feet)	Area (sq. ft.)	Volume (c.f.)	∑ Volume (c.f.)	∑ Volume (ac-ft)	Q discharge (cfs)
1075.55	0.00	0				
			1152	1152	0.03	8.3
1075.80	0.25	9212				
			3762	4914	0.11	8.5
1076.00	0.45	28412				
			751	12430	0.29	8.7
1076.20	0.65	46746				
			9991	22420	0.51	8.80
1076.40	0.85	53161				
			11190	33611	0.77	9.00
1076.60	1.05	58743				
			12328	45939	1.05	9.20
1076.80	1.25	64538				
			13508	59447	1.36	9.3
1077.00	1.45	70545				
			14731	74178	1.70	9.5
1077.20	1.65	76764				
			15989	90167	2.07	9.6
1077.40	1.85	83127				
			17267	107434	2.47	9.8
1077.60	2.05	89540				
			18547	125981	2.89	9.9
1077.80	2.25	95929				
			19824	145805	3.35	10.1
1078.00	2.45	102308				

```
**************************************************************************

          F L O O D    R O U T I N G    A N A L Y S I S
         USING COUNTY HYDROLOGY MANUAL OF SAN BERNARDINO(1986)
        (c) Copyright 1989-2016 Advanced Engineering Software (aes)
            Ver. 23.0  Release Date: 07/01/2016  License ID 1435

                        Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* tei 3819                                                                *
* bldg 2                                                                  *
* north truckyard                                                         *
 **************************************************************************

  FILE NAME: W:\3819\BLDG2N.DAT
  TIME/DATE OF STUDY: 10:16 01/04/2021


**************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
==========================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      11.250 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY(DEVELOPED) S-GRAPH SELECTED
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.042
         LOW LOSS FRACTION = 0.065
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.49
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  1.00
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.35
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  2.45
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  3.60
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  7.60

         PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 0.999
          30-MINUTE FACTOR = 0.999
           1-HOUR FACTOR = 0.999
           3-HOUR FACTOR = 1.000
           6-HOUR FACTOR = 1.000
          24-HOUR FACTOR = 1.000

         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333



==========================================================================
                    UNIT HYDROGRAPH DETERMINATION

--------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
--------------------------------------------------------------------------
        1               12.091               16.450
        2               66.357               73.832
        3               94.973               38.934
        4               99.026                5.514
        5               99.610                0.795
        6               99.903                0.397
        7              100.000                0.132


--------------------------------------------------------------------------
    TOTAL SOIL-LOSS VOLUME(ACRE-FEET) =       0.4192
    TOTAL STORM RUNOFF VOLUME(ACRE-FEET) =       6.7022
--------------------------------------------------------------------------
♀
==========================================================================
```

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

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

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 12.5 25.0 37.5 50.0
0.083	0.0015	0.22	Q . . . .
0.167	0.0098	1.20	Q . . . .
0.250	0.0216	1.72	VQ . . . .
0.333	0.0340	1.80	VQ . . . .
0.417	0.0465	1.81	VQ . . . .
0.500	0.0591	1.82	VQ . . . .
0.583	0.0717	1.83	VQ . . . .
0.667	0.0844	1.84	VQ . . . .
0.750	0.0970	1.84	VQ . . . .
0.833	0.1097	1.84	VQ . . . .
0.917	0.1225	1.85	VQ . . . .
1.000	0.1352	1.85	VQ . . . .
1.083	0.1481	1.86	VQ . . . .
1.167	0.1609	1.86	VQ . . . .
1.250	0.1738	1.87	.Q . . . .
1.333	0.1867	1.87	.Q . . . .
1.417	0.1996	1.88	.Q . . . .
1.500	0.2126	1.88	.Q . . . .
1.583	0.2256	1.89	.Q . . . .
1.667	0.2386	1.89	.Q . . . .
1.750	0.2517	1.90	.Q . . . .
1.833	0.2648	1.90	.Q . . . .
1.917	0.2779	1.91	.Q . . . .
2.000	0.2911	1.91	.Q . . . .
2.083	0.3043	1.92	.Q . . . .
2.167	0.3175	1.92	.Q . . . .
2.250	0.3308	1.93	.Q . . . .
2.333	0.3442	1.93	.QV . . . .
2.417	0.3575	1.94	.QV . . . .
2.500	0.3709	1.95	.QV . . . .
2.583	0.3843	1.95	.QV . . . .
2.667	0.3978	1.96	.QV . . . .
2.750	0.4113	1.96	.QV . . . .
2.833	0.4249	1.97	.QV . . . .
2.917	0.4385	1.97	.QV . . . .
3.000	0.4521	1.98	.QV . . . .
3.083	0.4658	1.98	.QV . . . .
3.167	0.4795	1.99	.QV . . . .
3.250	0.4932	2.00	.QV . . . .
3.333	0.5070	2.00	.Q V . . . .
3.417	0.5208	2.01	.Q V . . . .
3.500	0.5347	2.01	.Q V . . . .
3.583	0.5486	2.02	.Q V . . . .
3.667	0.5626	2.03	.Q V . . . .
3.750	0.5766	2.03	.Q V . . . .
3.833	0.5906	2.04	.Q V . . . .
3.917	0.6047	2.05	.Q V . . . .
4.000	0.6189	2.05	.Q V . . . .
4.083	0.6330	2.06	.Q V . . . .
4.167	0.6473	2.07	.Q V . . . .
4.250	0.6615	2.07	.Q V . . . .
4.333	0.6759	2.08	.Q V . . . .
4.417	0.6902	2.09	.Q V . . . .
4.500	0.7046	2.09	.Q V . . . .
4.583	0.7191	2.10	.Q V . . . .
4.667	0.7336	2.11	.Q V . . . .
4.750	0.7481	2.11	.Q V . . . .
4.833	0.7627	2.12	.Q V . . . .
4.917	0.7774	2.13	.Q V . . . .
5.000	0.7921	2.14	.Q V . . . .
5.083	0.8069	2.14	.Q V . . . .
5.167	0.8217	2.15	.Q V . . . .
5.250	0.8365	2.16	.Q V . . . .
5.333	0.8514	2.17	.Q V . . . .
5.417	0.8664	2.17	.Q V . . . .
5.500	0.8814	2.18	.Q V . . . .
5.583	0.8965	2.19	.Q V . . . .
5.667	0.9116	2.20	.Q V . . . .
5.750	0.9268	2.20	.Q V . . . .
5.833	0.9420	2.21	.Q V . . . .
5.917	0.9573	2.22	.Q V . . . .
6.000	0.9727	2.23	.Q V . . . .
6.083	0.9881	2.24	.Q V . . . .
6.167	1.0036	2.25	.Q V . . . .
6.250	1.0191	2.25	.Q V . . . .
6.333	1.0347	2.26	.Q V . . . .

6.417	1.0503	2.27	.Q	V	.	.	.	.
6.500	1.0660	2.28	.Q	V	.	.	.	.
6.583	1.0818	2.29	.Q	V	.	.	.	.
6.667	1.0976	2.30	.Q	V	.	.	.	.
6.750	1.1136	2.31	.Q	V	.	.	.	.
6.833	1.1295	2.32	.Q	V	.	.	.	.
6.917	1.1456	2.33	.Q	V	.	.	.	.
7.000	1.1617	2.34	.Q	V	.	.	.	.
7.083	1.1778	2.35	.Q	V	.	.	.	.
7.167	1.1941	2.36	.Q	V	.	.	.	.
7.250	1.2104	2.37	.Q	V	.	.	.	.
7.333	1.2268	2.38	.Q	V	.	.	.	.
7.417	1.2432	2.39	.Q	V	.	.	.	.
7.500	1.2597	2.40	.Q	V	.	.	.	.
7.583	1.2763	2.41	.Q	V	.	.	.	.
7.667	1.2930	2.42	.Q	V	.	.	.	.
7.750	1.3097	2.43	.Q	V	.	.	.	.
7.833	1.3266	2.44	.Q	V	.	.	.	.
7.917	1.3435	2.45	.Q	V	.	.	.	.
8.000	1.3605	2.47	.Q	V	.	.	.	.
8.083	1.3775	2.48	.Q	V	.	.	.	.
8.167	1.3947	2.49	.Q	V	.	.	.	.
8.250	1.4119	2.50	. Q	V	.	.	.	.
8.333	1.4292	2.51	. Q	V	.	.	.	.
8.417	1.4466	2.53	. Q	V	.	.	.	.
8.500	1.4641	2.54	. Q	V	.	.	.	.
8.583	1.4817	2.55	. Q	V	.	.	.	.
8.667	1.4993	2.56	. Q	V	.	.	.	.
8.750	1.5171	2.58	. Q	V	.	.	.	.
8.833	1.5349	2.59	. Q	V	.	.	.	.
8.917	1.5528	2.60	. Q	V	.	.	.	.
9.000	1.5709	2.62	. Q	V	.	.	.	.
9.083	1.5890	2.63	. Q	V	.	.	.	.
9.167	1.6072	2.65	. Q	V	.	.	.	.
9.250	1.6256	2.66	. Q	V	.	.	.	.
9.333	1.6440	2.68	. Q	V	.	.	.	.
9.417	1.6626	2.69	. Q	V	.	.	.	.
9.500	1.6812	2.71	. Q	V	.	.	.	.
9.583	1.7000	2.72	. Q	V	.	.	.	.
9.667	1.7188	2.74	. Q	V	.	.	.	.
9.750	1.7378	2.75	. Q	V	.	.	.	.
9.833	1.7569	2.77	. Q	V	.	.	.	.
9.917	1.7761	2.79	. Q	V	.	.	.	.
10.000	1.7954	2.81	. Q	V	.	.	.	.
10.083	1.8149	2.82	. Q	V	.	.	.	.
10.167	1.8344	2.84	. Q	V	.	.	.	.
10.250	1.8541	2.86	. Q	.V	.	.	.	.
10.333	1.8740	2.88	. Q	.V	.	.	.	.
10.417	1.8939	2.90	. Q	.V	.	.	.	.
10.500	1.9140	2.92	. Q	.V	.	.	.	.
10.583	1.9342	2.94	. Q	.V	.	.	.	.
10.667	1.9546	2.96	. Q	.V	.	.	.	.
10.750	1.9751	2.98	. Q	.V	.	.	.	.
10.833	1.9958	3.00	. Q	.V	.	.	.	.
10.917	2.0166	3.02	. Q	. V	.	.	.	.
11.000	2.0376	3.05	. Q	. V	.	.	.	.
11.083	2.0587	3.07	. Q	. V	.	.	.	.
11.167	2.0800	3.09	. Q	. V	.	.	.	.
11.250	2.1014	3.11	. Q	. V	.	.	.	.
11.333	2.1231	3.14	. Q	. V	.	.	.	.
11.417	2.1449	3.16	. Q	. V	.	.	.	.
11.500	2.1668	3.19	. Q	. V	.	.	.	.
11.583	2.1890	3.22	. Q	. V	.	.	.	.
11.667	2.2113	3.25	. Q	. V	.	.	.	.
11.750	2.2339	3.27	. Q	. V	.	.	.	.
11.833	2.2566	3.30	. Q	. V	.	.	.	.
11.917	2.2795	3.33	. Q	. V	.	.	.	.
12.000	2.3027	3.36	. Q	. V	.	.	.	.
12.083	2.3261	3.40	. Q	. V	.	.	.	.
12.167	2.3502	3.49	. Q	. V	.	.	.	.
12.250	2.3747	3.56	. Q	. V	.	.	.	.
12.333	2.3994	3.60	. Q	. V	.	.	.	.
12.417	2.4244	3.63	. Q	. V	.	.	.	.
12.500	2.4497	3.67	. Q	. V	.	.	.	.
12.583	2.4752	3.70	. Q	. V	.	.	.	.
12.667	2.5010	3.74	. Q	. V	.	.	.	.
12.750	2.5271	3.78	. Q	. V	.	.	.	.
12.833	2.5534	3.83	. Q	. V	.	.	.	.
12.917	2.5800	3.87	. Q	. V	.	.	.	.
13.000	2.6070	3.92	. Q	. V	.	.	.	.
13.083	2.6343	3.96	. Q	. V	.	.	.	.
13.167	2.6619	4.01	. Q	. V	.	.	.	.
13.250	2.6898	4.06	. Q	. V	.	.	.	.
13.333	2.7182	4.11	. Q	. V	.	.	.	.
13.417	2.7469	4.16	. Q	. V	.	.	.	.
13.500	2.7760	4.23	. Q	. V	.	.	.	.

13.583	2.8054	4.28	. Q . V . . .
13.667	2.8354	4.35	. Q . V . . .
13.750	2.8658	4.41	. Q . V . . .
13.833	2.8966	4.48	. Q . V . . .
13.917	2.9280	4.55	. Q . V . . .
14.000	2.9599	4.63	. Q . V . . .
14.083	2.9923	4.70	. Q . V . . .
14.167	3.0248	4.73	. Q . V . . .
14.250	3.0578	4.79	. Q . V . . .
14.333	3.0914	4.89	. Q . V . . .
14.417	3.1257	4.98	. Q . V . . .
14.500	3.1609	5.10	. Q . V . . .
14.583	3.1968	5.21	. Q . V. . .
14.667	3.2337	5.35	. Q . V. . .
14.750	3.2714	5.48	. Q . V. . .
14.833	3.3103	5.65	. Q . V. . .
14.917	3.3503	5.81	. Q . V. . .
15.000	3.3917	6.00	. Q . V . . .
15.083	3.4343	6.20	. Q . V . . .
15.167	3.4787	6.44	. Q . V . . .
15.250	3.5247	6.69	. Q . .V . . .
15.333	3.5731	7.02	. Q . .V . . .
15.417	3.6224	7.16	. Q . .V . . .
15.500	3.6686	6.72	. Q . .V . . .
15.583	3.7150	6.73	. Q . . V . . .
15.667	3.7656	7.34	. Q . . V . . .
15.750	3.8209	8.04	. Q . . V . . .
15.833	3.8820	8.86	. Q . . V . . .
15.917	3.9534	10.37	. Q . . V . . .
16.000	4.0496	13.97	. .Q . . V . . .
16.083	4.2149	24.00	. . . Q. V . . .
16.167	4.5178	43.98	. . . V . Q .
16.250	4.7073	27.51	. . . Q V . . .
16.333	4.7899	11.99	. Q. . V . . .
16.417	4.8468	8.27	. Q . . V . . .
16.500	4.8997	7.67	. Q . . V. . .
16.583	4.9490	7.16	. Q . . V. . .
16.667	4.9940	6.55	. Q . . V. . .
16.750	5.0359	6.08	. Q . . V . . .
16.833	5.0753	5.71	. Q . . V . . .
16.917	5.1125	5.41	. Q . . V . . .
17.000	5.1480	5.15	. Q . . V . . .
17.083	5.1820	4.94	. Q . . V . . .
17.167	5.2150	4.80	. Q . . .V . . .
17.250	5.2471	4.66	. Q . . .V . . .
17.333	5.2781	4.51	. Q . . .V . . .
17.417	5.3083	4.37	. Q . . .V . . .
17.500	5.3375	4.25	. Q . . .V . . .
17.583	5.3660	4.13	. Q . . . V . . .
17.667	5.3937	4.03	. Q . . . V . . .
17.750	5.4208	3.93	. Q . . . V . . .
17.833	5.4472	3.84	. Q . . . V . . .
17.917	5.4731	3.76	. Q . . . V . . .
18.000	5.4985	3.68	. Q . . . V . . .
18.083	5.5232	3.60	. Q . . . V . . .
18.167	5.5471	3.47	. Q . . . V . . .
18.250	5.5704	3.38	. Q . . . V . . .
18.333	5.5932	3.31	. Q . . . V . . .
18.417	5.6156	3.25	. Q . . . V . . .
18.500	5.6377	3.20	. Q . . . V . . .
18.583	5.6594	3.15	. Q . . . V . . .
18.667	5.6807	3.10	. Q . . . V . . .
18.750	5.7017	3.05	. Q . . . V . . .
18.833	5.7224	3.01	. Q . . . V . . .
18.917	5.7429	2.97	. Q . . . V . . .
19.000	5.7630	2.92	. Q . . . V . . .
19.083	5.7829	2.89	. Q . . . V . . .
19.167	5.8025	2.85	. Q . . . V . . .
19.250	5.8219	2.81	. Q . . . V . . .
19.333	5.8410	2.78	. Q . . . V . . .
19.417	5.8599	2.74	. Q . . . V . . .
19.500	5.8786	2.71	. Q . . . V . . .
19.583	5.8971	2.68	. Q . . . V . . .
19.667	5.9153	2.65	. Q . . . V . . .
19.750	5.9334	2.62	. Q . . . V . . .
19.833	5.9513	2.60	. Q . . . V . . .
19.917	5.9690	2.57	. Q . . . V . . .
20.000	5.9865	2.54	. Q . . . V . . .
20.083	6.0038	2.52	. Q . . . V . . .
20.167	6.0210	2.49	.Q . . . V . . .
20.250	6.0380	2.47	.Q . . . V . . .
20.333	6.0549	2.45	.Q . . . V . . .
20.417	6.0716	2.42	.Q . . . V . . .
20.500	6.0881	2.40	.Q . . . V . . .
20.583	6.1045	2.38	.Q . . . V . . .
20.667	6.1208	2.36	.Q . . . V . . .

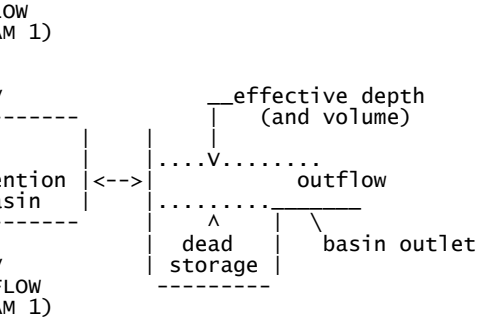
20.750	6.1369	2.34	.Q	.	.	.	V .
20.833	6.1529	2.32	.Q	.	.	.	V .
20.917	6.1688	2.30	.Q	.	.	.	V .
21.000	6.1845	2.28	.Q	.	.	.	V .
21.083	6.2001	2.27	.Q	.	.	.	V .
21.167	6.2156	2.25	.Q	.	.	.	V .
21.250	6.2310	2.23	.Q	.	.	.	V .
21.333	6.2462	2.22	.Q	.	.	.	V .
21.417	6.2614	2.20	.Q	.	.	.	V .
21.500	6.2764	2.18	.Q	.	.	.	V .
21.583	6.2913	2.17	.Q	.	.	.	V .
21.667	6.3062	2.15	.Q	.	.	.	V .
21.750	6.3209	2.14	.Q	.	.	.	V .
21.833	6.3355	2.12	.Q	.	.	.	V .
21.917	6.3500	2.11	.Q	.	.	.	V .
22.000	6.3645	2.09	.Q	.	.	.	V .
22.083	6.3788	2.08	.Q	.	.	.	V .
22.167	6.3930	2.07	.Q	.	.	.	V .
22.250	6.4072	2.05	.Q	.	.	.	V .
22.333	6.4212	2.04	.Q	.	.	.	V .
22.417	6.4352	2.03	.Q	.	.	.	V .
22.500	6.4491	2.02	.Q	.	.	.	V .
22.583	6.4629	2.00	.Q	.	.	.	V .
22.667	6.4766	1.99	.Q	.	.	.	V .
22.750	6.4903	1.98	.Q	.	.	.	V .
22.833	6.5038	1.97	.Q	.	.	.	V .
22.917	6.5173	1.96	.Q	.	.	.	V .
23.000	6.5307	1.95	.Q	.	.	.	V .
23.083	6.5441	1.94	.Q	.	.	.	V.
23.167	6.5573	1.93	.Q	.	.	.	V.
23.250	6.5705	1.91	.Q	.	.	.	V.
23.333	6.5836	1.90	.Q	.	.	.	V.
23.417	6.5967	1.89	.Q	.	.	.	V.
23.500	6.6097	1.88	.Q	.	.	.	V.
23.583	6.6226	1.87	.Q	.	.	.	V.
23.667	6.6354	1.87	.Q	.	.	.	V.
23.750	6.6482	1.86	.Q	.	.	.	V.
23.833	6.6609	1.85	.Q	.	.	.	V.
23.917	6.6736	1.84	.Q	.	.	.	V.
24.000	6.6862	1.83	.Q	.	.	.	V.
24.083	6.6972	1.60	.Q	.	.	.	V.
24.167	6.7014	0.61	Q	.	.	.	V.
24.250	6.7020	0.09	Q	.	.	.	V.
24.333	6.7021	0.02	Q	.	.	.	V.
24.417	6.7022	0.01	Q	.	.	.	V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1465.0
10%	220.0
20%	35.0
30%	20.0
40%	15.0
50%	15.0
60%	10.0
70%	5.0
80%	5.0
90%	5.0

****
FLOW PROCESS FROM NODE 104.00 TO NODE 104.00 IS CODE = 3.1

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



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

BASIN DEPTH VERSUS OUTFLOW AND STORAGE INFORMATION:

INTERVAL NUMBER	DEPTH (FT)	OUTFLOW (CFS)	STORAGE (AF)
1	0.00	0.00	0.000
2	0.25	8.30	0.030
3	0.45	8.50	0.110
4	0.65	8.70	0.290
5	0.85	8.80	0.510
6	1.05	9.00	0.770
7	1.25	9.20	1.050
8	1.45	9.30	1.360
9	1.65	9.50	1.700
10	1.85	9.60	2.070
11	2.05	9.80	2.470
12	2.25	9.90	2.890
13	2.45	10.10	3.350

==========

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

CLOCK TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	LOSS (CFS)	EFFECTIVE DEPTH(FT)	MEAN OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
10.083	0.000	2.82	0.00	0.09	2.8	0.010
10.167	0.000	2.84	0.00	0.09	2.8	0.010
10.250	0.000	2.86	0.00	0.09	2.9	0.010
10.333	0.000	2.88	0.00	0.09	2.9	0.010
10.417	0.000	2.90	0.00	0.09	2.9	0.010
10.500	0.000	2.92	0.00	0.09	2.9	0.011
10.583	0.000	2.94	0.00	0.09	2.9	0.011
10.667	0.000	2.96	0.00	0.09	2.9	0.011
10.750	0.000	2.98	0.00	0.09	3.0	0.011
10.833	0.000	3.00	0.00	0.09	3.0	0.011
10.917	0.000	3.02	0.00	0.09	3.0	0.011
11.000	0.000	3.05	0.00	0.09	3.0	0.011
11.083	0.000	3.07	0.00	0.09	3.1	0.011
11.167	0.000	3.09	0.00	0.09	3.1	0.011
11.250	0.000	3.11	0.00	0.09	3.1	0.011
11.333	0.000	3.14	0.00	0.09	3.1	0.011
11.417	0.000	3.16	0.00	0.10	3.2	0.011
11.500	0.000	3.19	0.00	0.10	3.2	0.012
11.583	0.000	3.22	0.00	0.10	3.2	0.012
11.667	0.000	3.25	0.00	0.10	3.2	0.012
11.750	0.000	3.27	0.00	0.10	3.3	0.012
11.833	0.000	3.30	0.00	0.10	3.3	0.012
11.917	0.000	3.33	0.00	0.10	3.3	0.012
12.000	0.000	3.36	0.00	0.10	3.3	0.012
12.083	0.000	3.40	0.00	0.10	3.4	0.012
12.167	0.000	3.49	0.00	0.11	3.4	0.013
12.250	0.000	3.56	0.00	0.11	3.5	0.013
12.333	0.000	3.60	0.00	0.11	3.6	0.013
12.417	0.000	3.63	0.00	0.11	3.6	0.013
12.500	0.000	3.67	0.00	0.11	3.6	0.013
12.583	0.000	3.70	0.00	0.11	3.7	0.013
12.667	0.000	3.74	0.00	0.11	3.7	0.014
12.750	0.000	3.78	0.00	0.11	3.8	0.014
12.833	0.000	3.83	0.00	0.12	3.8	0.014
12.917	0.000	3.87	0.00	0.12	3.8	0.014
13.000	0.000	3.92	0.00	0.12	3.9	0.014
13.083	0.000	3.96	0.00	0.12	3.9	0.014
13.167	0.000	4.01	0.00	0.12	4.0	0.014
13.250	0.000	4.06	0.00	0.12	4.0	0.015
13.333	0.000	4.11	0.00	0.12	4.1	0.015
13.417	0.000	4.16	0.00	0.13	4.1	0.015
13.500	0.000	4.23	0.00	0.13	4.2	0.015
13.583	0.000	4.28	0.00	0.13	4.3	0.015
13.667	0.000	4.35	0.00	0.13	4.3	0.016
13.750	0.000	4.41	0.00	0.13	4.4	0.016
13.833	0.000	4.48	0.00	0.13	4.4	0.016

13.917	0.000	4.55	0.00	0.14	4.5	0.016
14.000	0.000	4.63	0.00	0.14	4.6	0.017
14.083	0.000	4.70	0.00	0.14	4.7	0.017
14.167	0.000	4.73	0.00	0.14	4.7	0.017
14.250	0.000	4.79	0.00	0.14	4.8	0.017
14.333	0.000	4.89	0.00	0.15	4.8	0.018
14.417	0.000	4.98	0.00	0.15	4.9	0.018
14.500	0.000	5.10	0.00	0.15	5.0	0.018
14.583	0.000	5.21	0.00	0.16	5.2	0.019
14.667	0.000	5.35	0.00	0.16	5.3	0.019
14.750	0.000	5.48	0.00	0.17	5.4	0.020
14.833	0.000	5.65	0.00	0.17	5.6	0.020
14.917	0.000	5.81	0.00	0.17	5.7	0.021
15.000	0.000	6.00	0.00	0.18	5.9	0.022
15.083	0.000	6.20	0.00	0.19	6.1	0.022
15.167	0.000	6.44	0.00	0.19	6.3	0.023
15.250	0.000	6.69	0.00	0.20	6.6	0.024
15.333	0.000	7.02	0.00	0.21	6.8	0.025
15.417	0.000	7.16	0.00	0.22	7.1	0.026
15.500	0.000	6.72	0.00	0.20	6.9	0.024
15.583	0.000	6.73	0.00	0.20	6.7	0.024
15.667	0.000	7.34	0.00	0.22	7.0	0.026
15.750	0.000	8.04	0.00	0.24	7.7	0.029
15.833	0.000	8.86	0.00	0.26	8.2	0.034
15.917	0.000	10.37	0.00	0.29	8.3	0.048
16.000	0.000	13.97	0.00	0.39	8.4	0.086
16.083	0.000	24.00	0.00	0.54	8.5	0.193
16.167	0.000	43.98	0.00	0.78	8.7	0.436
16.250	0.000	27.51	0.00	0.89	8.8	0.565
16.333	0.000	11.99	0.00	0.91	8.9	0.587
16.417	0.000	8.27	0.00	0.91	8.9	0.582
16.500	0.000	7.67	0.00	0.90	8.9	0.574
16.583	0.000	7.16	0.00	0.89	8.8	0.563
16.667	0.000	6.55	0.00	0.88	8.8	0.547
16.750	0.000	6.08	0.00	0.86	8.8	0.528
16.833	0.000	5.71	0.00	0.85	8.8	0.507
16.917	0.000	5.41	0.00	0.83	8.8	0.484
17.000	0.000	5.15	0.00	0.80	8.8	0.458
17.083	0.000	4.94	0.00	0.78	8.8	0.432
17.167	0.000	4.80	0.00	0.75	8.8	0.405
17.250	0.000	4.66	0.00	0.73	8.7	0.377
17.333	0.000	4.51	0.00	0.70	8.7	0.348
17.417	0.000	4.37	0.00	0.68	8.7	0.318
17.500	0.000	4.25	0.00	0.65	8.7	0.287
17.583	0.000	4.13	0.00	0.61	8.7	0.256
17.667	0.000	4.03	0.00	0.58	8.6	0.224
17.750	0.000	3.93	0.00	0.54	8.6	0.192
17.833	0.000	3.84	0.00	0.50	8.6	0.159
17.917	0.000	3.76	0.00	0.47	8.5	0.126
18.000	0.000	3.68	0.00	0.41	8.5	0.093
18.083	0.000	3.60	0.00	0.32	8.4	0.060
18.167	0.000	3.47	0.00	0.23	8.1	0.028
18.250	0.000	3.38	0.00	0.10	5.6	0.013
18.333	0.000	3.31	0.00	0.10	3.4	0.012
18.417	0.000	3.25	0.00	0.10	3.3	0.012
18.500	0.000	3.20	0.00	0.10	3.2	0.012
18.583	0.000	3.15	0.00	0.09	3.2	0.011
18.667	0.000	3.10	0.00	0.09	3.1	0.011
18.750	0.000	3.05	0.00	0.09	3.1	0.011
18.833	0.000	3.01	0.00	0.09	3.0	0.011
18.917	0.000	2.97	0.00	0.09	3.0	0.011
19.000	0.000	2.92	0.00	0.09	2.9	0.011
19.083	0.000	2.89	0.00	0.09	2.9	0.010
19.167	0.000	2.85	0.00	0.09	2.9	0.010
19.250	0.000	2.81	0.00	0.08	2.8	0.010
19.333	0.000	2.78	0.00	0.08	2.8	0.010
19.417	0.000	2.74	0.00	0.08	2.8	0.010
19.500	0.000	2.71	0.00	0.08	2.7	0.010
19.583	0.000	2.68	0.00	0.08	2.7	0.010
19.667	0.000	2.65	0.00	0.08	2.7	0.010
19.750	0.000	2.62	0.00	0.08	2.6	0.009
19.833	0.000	2.60	0.00	0.08	2.6	0.009
19.917	0.000	2.57	0.00	0.08	2.6	0.009
20.000	0.000	2.54	0.00	0.08	2.6	0.009
20.083	0.000	2.52	0.00	0.08	2.5	0.009
20.167	0.000	2.49	0.00	0.08	2.5	0.009
20.250	0.000	2.47	0.00	0.07	2.5	0.009
20.333	0.000	2.45	0.00	0.07	2.5	0.009
20.417	0.000	2.42	0.00	0.07	2.4	0.009
20.500	0.000	2.40	0.00	0.07	2.4	0.009
20.583	0.000	2.38	0.00	0.07	2.4	0.009
20.667	0.000	2.36	0.00	0.07	2.4	0.009
20.750	0.000	2.34	0.00	0.07	2.4	0.008
20.833	0.000	2.32	0.00	0.07	2.3	0.008
20.917	0.000	2.30	0.00	0.07	2.3	0.008
21.000	0.000	2.28	0.00	0.07	2.3	0.008

8.9 CFS
0.91' DEPTH
0.587 ac-ft

21.083	0.000	2.27	0.00	0.07	2.3	0.008
21.167	0.000	2.25	0.00	0.07	2.3	0.008
21.250	0.000	2.23	0.00	0.07	2.2	0.008
21.333	0.000	2.22	0.00	0.07	2.2	0.008
21.417	0.000	2.20	0.00	0.07	2.2	0.008
21.500	0.000	2.18	0.00	0.07	2.2	0.008
21.583	0.000	2.17	0.00	0.07	2.2	0.008
21.667	0.000	2.15	0.00	0.06	2.2	0.008
21.750	0.000	2.14	0.00	0.06	2.1	0.008
21.833	0.000	2.12	0.00	0.06	2.1	0.008
21.917	0.000	2.11	0.00	0.06	2.1	0.008
22.000	0.000	2.09	0.00	0.06	2.1	0.008
22.083	0.000	2.08	0.00	0.06	2.1	0.008
22.167	0.000	2.07	0.00	0.06	2.1	0.007
22.250	0.000	2.05	0.00	0.06	2.1	0.007
22.333	0.000	2.04	0.00	0.06	2.0	0.007
22.417	0.000	2.03	0.00	0.06	2.0	0.007
22.500	0.000	2.02	0.00	0.06	2.0	0.007
22.583	0.000	2.00	0.00	0.06	2.0	0.007
22.667	0.000	1.99	0.00	0.06	2.0	0.007
22.750	0.000	1.98	0.00	0.06	2.0	0.007
22.833	0.000	1.97	0.00	0.06	2.0	0.007
22.917	0.000	1.96	0.00	0.06	2.0	0.007
23.000	0.000	1.95	0.00	0.06	2.0	0.007
23.083	0.000	1.94	0.00	0.06	1.9	0.007
23.167	0.000	1.93	0.00	0.06	1.9	0.007
23.250	0.000	1.91	0.00	0.06	1.9	0.007
23.333	0.000	1.90	0.00	0.06	1.9	0.007
23.417	0.000	1.89	0.00	0.06	1.9	0.007
23.500	0.000	1.88	0.00	0.06	1.9	0.007
23.583	0.000	1.87	0.00	0.06	1.9	0.007
23.667	0.000	1.87	0.00	0.06	1.9	0.007
23.750	0.000	1.86	0.00	0.06	1.9	0.007
23.833	0.000	1.85	0.00	0.06	1.9	0.007
23.917	0.000	1.84	0.00	0.06	1.8	0.007

PROCESS SUMMARY OF STORAGE:
INFLOW VOLUME = 6.702 AF
BASIN STORAGE = 0.000 AF (WITH 0.000 AF INITIALLY FILLED)
OUTFLOW VOLUME = 6.702 AF
LOSS VOLUME = 0.000 AF

==========

END OF FLOODSCx ROUTING ANALYSIS

♀

Building #2
southerly truckyard

Elevation	Depth (feet)	Area (sq. ft.)	Volume (c.f.)	∑ Volume (c.f.)	∑ Volume (ac-ft)	Q discharge (cfs)
1072.54	0.00	0				
			800	800	0.02	14.6
1072.80	0.26	6152.99				
			2044	2844	0.07	14.7
1073.00	0.46	14285				
			3589	6433	0.15	14.8
1073.20	0.66	21609				
			5067	11500	0.26	14.9
1073.40	0.86	29064				
			6565	18065	0.41	15.0
1073.60	1.06	36587				
			8066	26132	0.60	15.1
1073.80	1.26	44076				
			9864	35995	0.83	15.2
1074.00	1.46	54559				

```
**************************************************************************

          F L O O D    R O U T I N G    A N A L Y S I S
         USING COUNTY HYDROLOGY MANUAL OF SAN BERNARDINO(1986)
        (c) Copyright 1989-2016 Advanced Engineering Software (aes)
            Ver. 23.0  Release Date: 07/01/2016  License ID 1435

                        Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* tei 3819                                                                *
* building 2                                                              *
* southerly truckyard                                                     *
 **************************************************************************

  FILE NAME: W:\3819\BLDG2S.DAT
  TIME/DATE OF STUDY: 10:26 01/04/2021


**************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    137.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
==========================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      12.400 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY(DEVELOPED) S-GRAPH SELECTED
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.042
         LOW LOSS FRACTION = 0.065
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.49
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  1.00
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.35
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  2.45
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  3.60
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  7.60

         PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 0.999
          30-MINUTE FACTOR = 0.999
           1-HOUR FACTOR = 0.999
           3-HOUR FACTOR = 1.000
           6-HOUR FACTOR = 1.000
          24-HOUR FACTOR = 1.000

         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333



==========================================================================
                    UNIT HYDROGRAPH DETERMINATION

--------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
--------------------------------------------------------------------------
        1               12.091               18.132
        2               66.357               81.379
        3               94.973               42.914
        4               99.026                6.078
        5               99.610                0.876
        6               99.903                0.438
        7              100.000                0.146


--------------------------------------------------------------------------
    TOTAL SOIL-LOSS VOLUME(ACRE-FEET) =       0.4620
    TOTAL STORM RUNOFF VOLUME(ACRE-FEET) =       7.3873
--------------------------------------------------------------------------
♀
==========================================================================
```

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

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

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 12.5 25.0 37.5 50.0
0.083	0.0017	0.24	Q . . . .
0.167	0.0108	1.32	VQ . . . .
0.250	0.0239	1.90	VQ . . . .
0.333	0.0375	1.98	VQ . . . .
0.417	0.0513	2.00	VQ . . . .
0.500	0.0652	2.01	VQ . . . .
0.583	0.0791	2.02	VQ . . . .
0.667	0.0930	2.02	VQ . . . .
0.750	0.1070	2.03	VQ . . . .
0.833	0.1210	2.03	VQ . . . .
0.917	0.1350	2.04	VQ . . . .
1.000	0.1491	2.04	VQ . . . .
1.083	0.1632	2.05	VQ . . . .
1.167	0.1773	2.05	VQ . . . .
1.250	0.1915	2.06	.Q . . . .
1.333	0.2057	2.06	.Q . . . .
1.417	0.2200	2.07	.Q . . . .
1.500	0.2343	2.08	.Q . . . .
1.583	0.2486	2.08	.Q . . . .
1.667	0.2630	2.09	.Q . . . .
1.750	0.2774	2.09	.Q . . . .
1.833	0.2918	2.10	.Q . . . .
1.917	0.3063	2.10	.Q . . . .
2.000	0.3208	2.11	.Q . . . .
2.083	0.3354	2.11	.Q . . . .
2.167	0.3500	2.12	.Q . . . .
2.250	0.3647	2.13	.Q . . . .
2.333	0.3793	2.13	.QV . . . .
2.417	0.3941	2.14	.QV . . . .
2.500	0.4088	2.14	.QV . . . .
2.583	0.4236	2.15	.QV . . . .
2.667	0.4385	2.16	.QV . . . .
2.750	0.4534	2.16	.QV . . . .
2.833	0.4683	2.17	.QV . . . .
2.917	0.4833	2.17	.QV . . . .
3.000	0.4983	2.18	.QV . . . .
3.083	0.5134	2.19	.QV . . . .
3.167	0.5285	2.19	.QV . . . .
3.250	0.5436	2.20	.QV . . . .
3.333	0.5588	2.21	.Q V . . . .
3.417	0.5741	2.21	.Q V . . . .
3.500	0.5894	2.22	.Q V . . . .
3.583	0.6047	2.23	.Q V . . . .
3.667	0.6201	2.23	.Q V . . . .
3.750	0.6355	2.24	.Q V . . . .
3.833	0.6510	2.25	.Q V . . . .
3.917	0.6665	2.25	.Q V . . . .
4.000	0.6821	2.26	.Q V . . . .
4.083	0.6978	2.27	.Q V . . . .
4.167	0.7134	2.28	.Q V . . . .
4.250	0.7292	2.28	.Q V . . . .
4.333	0.7449	2.29	.Q V . . . .
4.417	0.7608	2.30	.Q V . . . .
4.500	0.7767	2.31	.Q V . . . .
4.583	0.7926	2.31	.Q V . . . .
4.667	0.8086	2.32	.Q V . . . .
4.750	0.8246	2.33	.Q V . . . .
4.833	0.8407	2.34	.Q V . . . .
4.917	0.8569	2.34	.Q V . . . .
5.000	0.8731	2.35	.Q V . . . .
5.083	0.8893	2.36	.Q V . . . .
5.167	0.9056	2.37	.Q V . . . .
5.250	0.9220	2.38	.Q V . . . .
5.333	0.9385	2.39	.Q V . . . .
5.417	0.9550	2.39	.Q V . . . .
5.500	0.9715	2.40	.Q V . . . .
5.583	0.9881	2.41	.Q V . . . .
5.667	1.0048	2.42	.Q V . . . .
5.750	1.0215	2.43	.Q V . . . .
5.833	1.0383	2.44	.Q V . . . .
5.917	1.0552	2.45	.Q V . . . .
6.000	1.0721	2.46	.Q V . . . .
6.083	1.0891	2.47	.Q V . . . .
6.167	1.1061	2.48	.Q V . . . .
6.250	1.1232	2.49	.Q V . . . .
6.333	1.1404	2.50	.Q V . . . .

```
 6.417      1.1577      2.50  . Q   V   .         .         .         .
 6.500      1.1750      2.52  . Q   V   .         .         .         .
 6.583      1.1924      2.52  . Q   V   .         .         .         .
 6.667      1.2099      2.54  . Q   V   .         .         .         .
 6.750      1.2274      2.54  . Q   V   .         .         .         .
 6.833      1.2450      2.56  . Q   V   .         .         .         .
 6.917      1.2627      2.57  . Q   V   .         .         .         .
 7.000      1.2804      2.58  . Q   V   .         .         .         .
 7.083      1.2982      2.59  . Q    V  .         .         .         .
 7.167      1.3161      2.60  . Q    V  .         .         .         .
 7.250      1.3341      2.61  . Q    V  .         .         .         .
 7.333      1.3522      2.62  . Q    V  .         .         .         .
 7.417      1.3703      2.63  . Q    V  .         .         .         .
 7.500      1.3885      2.64  . Q    V  .         .         .         .
 7.583      1.4068      2.66  . Q    V  .         .         .         .
 7.667      1.4252      2.67  . Q    V  .         .         .         .
 7.750      1.4436      2.68  . Q    V  .         .         .         .
 7.833      1.4622      2.69  . Q    V  .         .         .         .
 7.917      1.4808      2.70  . Q     V .         .         .         .
 8.000      1.4995      2.72  . Q     V .         .         .         .
 8.083      1.5183      2.73  . Q     V .         .         .         .
 8.167      1.5372      2.74  . Q     V .         .         .         .
 8.250      1.5562      2.76  . Q     V .         .         .         .
 8.333      1.5753      2.77  . Q     V .         .         .         .
 8.417      1.5945      2.78  . Q     V .         .         .         .
 8.500      1.6137      2.80  . Q     V .         .         .         .
 8.583      1.6331      2.81  . Q     V .         .         .         .
 8.667      1.6526      2.83  . Q     V .         .         .         .
 8.750      1.6721      2.84  . Q      V.         .         .         .
 8.833      1.6918      2.86  . Q      V.         .         .         .
 8.917      1.7116      2.87  . Q      V.         .         .         .
 9.000      1.7315      2.89  . Q      V.         .         .         .
 9.083      1.7514      2.90  . Q      V.         .         .         .
 9.167      1.7715      2.92  . Q      V.         .         .         .
 9.250      1.7917      2.93  . Q      V.         .         .         .
 9.333      1.8121      2.95  . Q      V.         .         .         .
 9.417      1.8325      2.97  . Q      V.         .         .         .
 9.500      1.8531      2.98  . Q       V         .         .         .
 9.583      1.8737      3.00  . Q       V         .         .         .
 9.667      1.8945      3.02  . Q       V         .         .         .
 9.750      1.9154      3.04  . Q       V         .         .         .
 9.833      1.9365      3.06  . Q       V         .         .         .
 9.917      1.9576      3.07  . Q       V         .         .         .
10.000      1.9789      3.09  . Q       V         .         .         .
10.083      2.0004      3.11  . Q       V         .         .         .
10.167      2.0220      3.13  . Q       V         .         .         .
10.250      2.0437      3.15  . Q       .V        .         .         .
10.333      2.0655      3.17  . Q       .V        .         .         .
10.417      2.0875      3.19  . Q       .V        .         .         .
10.500      2.1097      3.22  . Q       .V        .         .         .
10.583      2.1320      3.24  . Q       .V        .         .         .
10.667      2.1544      3.26  . Q       .V        .         .         .
10.750      2.1770      3.28  . Q       .V        .         .         .
10.833      2.1998      3.31  . Q       .V        .         .         .
10.917      2.2227      3.33  . Q       . V       .         .         .
11.000      2.2459      3.36  . Q       . V       .         .         .
11.083      2.2691      3.38  . Q       . V       .         .         .
11.167      2.2926      3.41  . Q       . V       .         .         .
11.250      2.3162      3.43  . Q       . V       .         .         .
11.333      2.3401      3.46  . Q       . V       .         .         .
11.417      2.3641      3.49  . Q       . V       .         .         .
11.500      2.3883      3.52  . Q       . V       .         .         .
11.583      2.4127      3.54  . Q       .  V      .         .         .
11.667      2.4374      3.58  . Q       .  V      .         .         .
11.750      2.4622      3.61  . Q       .  V      .         .         .
11.833      2.4873      3.64  . Q       .  V      .         .         .
11.917      2.5125      3.67  . Q       .  V      .         .         .
12.000      2.5381      3.71  . Q       .  V      .         .         .
12.083      2.5639      3.75  .  Q       .  V      .         .         .
12.167      2.5904      3.85  .  Q       .   V     .         .         .
12.250      2.6174      3.92  .  Q       .   V     .         .         .
12.333      2.6447      3.96  .  Q       .   V     .         .         .
12.417      2.6723      4.00  .  Q       .   V     .         .         .
12.500      2.7001      4.04  .  Q       .   V     .         .         .
12.583      2.7282      4.08  .  Q       .   V     .         .         .
12.667      2.7567      4.13  .  Q       .   V     .         .         .
12.750      2.7854      4.17  .  Q       .    V    .         .         .
12.833      2.8144      4.22  .  Q       .    V    .         .         .
12.917      2.8438      4.26  .  Q       .    V    .         .         .
13.000      2.8735      4.32  .  Q       .    V    .         .         .
13.083      2.9036      4.36  .  Q       .    V    .         .         .
13.167      2.9340      4.42  .  Q       .    V    .         .         .
13.250      2.9648      4.47  .  Q       .     V   .         .         .
13.333      2.9960      4.53  .  Q       .     V   .         .         .
13.417      3.0276      4.59  .  Q       .     V   .         .         .
13.500      3.0597      4.66  .  Q       .     V   .         .         .
```

```
13.583      3.0922      4.72  .  Q      .     V   .         .         .
13.667      3.1252      4.79  .  Q      .     V   .         .         .
13.750      3.1587      4.86  .  Q      .      V  .         .         .
13.833      3.1927      4.94  .  Q      .      V  .         .         .
13.917      3.2273      5.02  .   Q     .      V  .         .         .
14.000      3.2625      5.11  .   Q     .      V  .         .         .
14.083      3.2981      5.18  .   Q     .      V  .         .         .
14.167      3.3340      5.21  .   Q     .       V .         .         .
14.250      3.3704      5.28  .   Q     .       V .         .         .
14.333      3.4074      5.38  .   Q     .       V .         .         .
14.417      3.4453      5.49  .   Q     .       V .         .         .
14.500      3.4840      5.62  .   Q     .       V .         .         .
14.583      3.5236      5.75  .   Q     .        V.         .         .
14.667      3.5642      5.90  .   Q     .        V.         .         .
14.750      3.6059      6.05  .   Q     .        V.         .         .
14.833      3.6487      6.23  .   Q     .        V.         .         .
14.917      3.6928      6.40  .    Q    .        V.         .         .
15.000      3.7384      6.62  .    Q    .         V         .         .
15.083      3.7854      6.83  .    Q    .         V         .         .
15.167      3.8343      7.10  .    Q    .         V         .         .
15.250      3.8851      7.37  .    Q    .         .V        .         .
15.333      3.9383      7.73  .     Q   .         .V        .         .
15.417      3.9927      7.89  .     Q   .         .V        .         .
15.500      4.0437      7.41  .    Q    .         .V        .         .
15.583      4.0948      7.42  .    Q    .         . V       .         .
15.667      4.1505      8.09  .     Q   .         . V       .         .
15.750      4.2115      8.86  .      Q  .         . V       .         .
15.833      4.2788      9.77  .      Q  .         .  V      .         .
15.917      4.3575     11.43  .        Q.         .  V      .         .
16.000      4.4636     15.40  .         . Q       .   V     .         .
16.083      4.6458     26.46  .         .         .Q   V    .         .
16.167      4.9796     48.48  .         .         .     V   .       Q .
16.250      5.1884     30.32  .         .         .   Q   V .         .
16.333      5.2795     13.22  .         Q         .       V .         .
16.417      5.3422      9.12  .      Q  .         .       V .         .
16.500      5.4005      8.46  .     Q   .         .        V.         .
16.583      5.4548      7.89  .     Q   .         .        V.         .
16.667      5.5045      7.21  .    Q    .         .        V.         .
16.750      5.5507      6.71  .    Q    .         .         V         .
16.833      5.5941      6.30  .    Q    .         .         V         .
16.917      5.6351      5.96  .   Q     .         .         V         .
17.000      5.6742      5.67  .   Q     .         .         V         .
17.083      5.7117      5.44  .   Q     .         .         V         .
17.167      5.7481      5.29  .   Q     .         .         .V        .
17.250      5.7834      5.13  .   Q     .         .         .V        .
17.333      5.8177      4.97  .  Q      .         .         .V        .
17.417      5.8509      4.82  .  Q      .         .         .V        .
17.500      5.8831      4.68  .  Q      .         .         .V        .
17.583      5.9145      4.55  .  Q      .         .         . V       .
17.667      5.9450      4.44  .  Q      .         .         . V       .
17.750      5.9749      4.33  .  Q      .         .         . V       .
17.833      6.0040      4.23  .  Q      .         .         . V       .
17.917      6.0326      4.14  .  Q      .         .         . V       .
18.000      6.0605      4.06  .  Q      .         .         . V       .
18.083      6.0878      3.96  .  Q      .         .         . V       .
18.167      6.1142      3.83  .  Q      .         .         .  V      .
18.250      6.1398      3.72  . Q       .         .         .  V      .
18.333      6.1650      3.65  . Q       .         .         .  V      .
18.417      6.1897      3.59  . Q       .         .         .  V      .
18.500      6.2140      3.53  . Q       .         .         .  V      .
18.583      6.2379      3.47  . Q       .         .         .  V      .
18.667      6.2614      3.42  . Q       .         .         .  V      .
18.750      6.2846      3.36  . Q       .         .         .   V     .
18.833      6.3074      3.32  . Q       .         .         .   V     .
18.917      6.3299      3.27  . Q       .         .         .   V     .
19.000      6.3521      3.22  . Q       .         .         .   V     .
19.083      6.3740      3.18  . Q       .         .         .   V     .
19.167      6.3956      3.14  . Q       .         .         .   V     .
19.250      6.4170      3.10  . Q       .         .         .   V     .
19.333      6.4381      3.06  . Q       .         .         .   V     .
19.417      6.4589      3.03  . Q       .         .         .   V     .
19.500      6.4795      2.99  . Q       .         .         .    V    .
19.583      6.4999      2.96  . Q       .         .         .    V    .
19.667      6.5200      2.92  . Q       .         .         .    V    .
19.750      6.5399      2.89  . Q       .         .         .    V    .
19.833      6.5596      2.86  . Q       .         .         .    V    .
19.917      6.5791      2.83  . Q       .         .         .    V    .
20.000      6.5984      2.80  . Q       .         .         .    V    .
20.083      6.6175      2.78  . Q       .         .         .    V    .
20.167      6.6365      2.75  . Q       .         .         .    V    .
20.250      6.6552      2.72  . Q       .         .         .     V   .
20.333      6.6738      2.70  . Q       .         .         .     V   .
20.417      6.6922      2.67  . Q       .         .         .     V   .
20.500      6.7104      2.65  . Q       .         .         .     V   .
20.583      6.7285      2.63  . Q       .         .         .     V   .
20.667      6.7464      2.60  . Q       .         .         .     V   .
```

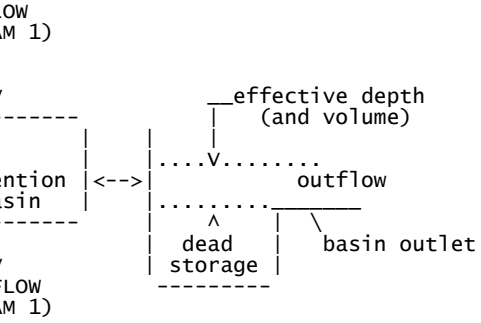
20.750	6.7642	2.58	. Q	.	.	.	V .
20.833	6.7818	2.56	. Q	.	.	.	V .
20.917	6.7993	2.54	. Q	.	.	.	V .
21.000	6.8167	2.52	. Q	.	.	.	V .
21.083	6.8339	2.50	.Q	.	.	.	V .
21.167	6.8510	2.48	.Q	.	.	.	V .
21.250	6.8679	2.46	.Q	.	.	.	V .
21.333	6.8847	2.44	.Q	.	.	.	V .
21.417	6.9014	2.42	.Q	.	.	.	V .
21.500	6.9180	2.41	.Q	.	.	.	V .
21.583	6.9344	2.39	.Q	.	.	.	V .
21.667	6.9508	2.37	.Q	.	.	.	V .
21.750	6.9670	2.36	.Q	.	.	.	V .
21.833	6.9831	2.34	.Q	.	.	.	V .
21.917	6.9991	2.32	.Q	.	.	.	V .
22.000	7.0150	2.31	.Q	.	.	.	V .
22.083	7.0308	2.29	.Q	.	.	.	V .
22.167	7.0465	2.28	.Q	.	.	.	V .
22.250	7.0621	2.26	.Q	.	.	.	V .
22.333	7.0776	2.25	.Q	.	.	.	V .
22.417	7.0930	2.24	.Q	.	.	.	V .
22.500	7.1083	2.22	.Q	.	.	.	V .
22.583	7.1235	2.21	.Q	.	.	.	V .
22.667	7.1387	2.20	.Q	.	.	.	V .
22.750	7.1537	2.18	.Q	.	.	.	V .
22.833	7.1686	2.17	.Q	.	.	.	V .
22.917	7.1835	2.16	.Q	.	.	.	V .
23.000	7.1983	2.15	.Q	.	.	.	V .
23.083	7.2130	2.13	.Q	.	.	.	V.
23.167	7.2276	2.12	.Q	.	.	.	V.
23.250	7.2421	2.11	.Q	.	.	.	V.
23.333	7.2566	2.10	.Q	.	.	.	V.
23.417	7.2710	2.09	.Q	.	.	.	V.
23.500	7.2853	2.08	.Q	.	.	.	V.
23.583	7.2995	2.07	.Q	.	.	.	V.
23.667	7.3137	2.06	.Q	.	.	.	V.
23.750	7.3278	2.05	.Q	.	.	.	V.
23.833	7.3418	2.04	.Q	.	.	.	V.
23.917	7.3557	2.02	.Q	.	.	.	V.
24.000	7.3696	2.01	.Q	.	.	.	V.
24.083	7.3818	1.76	.Q	.	.	.	V.
24.167	7.3864	0.67	Q	.	.	.	V.
24.250	7.3871	0.10	Q	.	.	.	V.
24.333	7.3872	0.02	Q	.	.	.	V.
24.417	7.3873	0.01	Q	.	.	.	V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1465.0
10%	220.0
20%	35.0
30%	20.0
40%	15.0
50%	15.0
60%	10.0
70%	5.0
80%	5.0
90%	5.0

****
FLOW PROCESS FROM NODE 130.00 TO NODE 137.00 IS CODE = 3.1

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



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

BASIN DEPTH VERSUS OUTFLOW AND STORAGE INFORMATION:

INTERVAL NUMBER	DEPTH (FT)	OUTFLOW (CFS)	STORAGE (AF)
1	0.00	0.00	0.000
2	0.26	14.60	0.020
3	0.46	14.70	0.070
4	0.66	14.80	0.150
5	0.86	14.90	0.260
6	1.06	15.00	0.410
7	1.26	15.10	0.600
8	1.46	15.20	0.830

==========

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

CLOCK TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	LOSS (CFS)	EFFECTIVE DEPTH(FT)	MEAN OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
10.083	0.000	3.11	0.00	0.06	3.1	0.004
10.167	0.000	3.13	0.00	0.06	3.1	0.004
10.250	0.000	3.15	0.00	0.06	3.1	0.004
10.333	0.000	3.17	0.00	0.06	3.2	0.004
10.417	0.000	3.19	0.00	0.06	3.2	0.004
10.500	0.000	3.22	0.00	0.06	3.2	0.004
10.583	0.000	3.24	0.00	0.06	3.2	0.004
10.667	0.000	3.26	0.00	0.06	3.3	0.004
10.750	0.000	3.28	0.00	0.06	3.3	0.005
10.833	0.000	3.31	0.00	0.06	3.3	0.005
10.917	0.000	3.33	0.00	0.06	3.3	0.005
11.000	0.000	3.36	0.00	0.06	3.4	0.005
11.083	0.000	3.38	0.00	0.06	3.4	0.005
11.167	0.000	3.41	0.00	0.06	3.4	0.005
11.250	0.000	3.43	0.00	0.06	3.4	0.005
11.333	0.000	3.46	0.00	0.06	3.5	0.005
11.417	0.000	3.49	0.00	0.06	3.5	0.005
11.500	0.000	3.52	0.00	0.06	3.5	0.005
11.583	0.000	3.54	0.00	0.06	3.5	0.005
11.667	0.000	3.58	0.00	0.06	3.6	0.005
11.750	0.000	3.61	0.00	0.06	3.6	0.005
11.833	0.000	3.64	0.00	0.07	3.6	0.005
11.917	0.000	3.67	0.00	0.07	3.7	0.005
12.000	0.000	3.71	0.00	0.07	3.7	0.005
12.083	0.000	3.75	0.00	0.07	3.7	0.005
12.167	0.000	3.85	0.00	0.07	3.8	0.005
12.250	0.000	3.92	0.00	0.07	3.9	0.005
12.333	0.000	3.96	0.00	0.07	4.0	0.005
12.417	0.000	4.00	0.00	0.07	4.0	0.005
12.500	0.000	4.04	0.00	0.07	4.0	0.006
12.583	0.000	4.08	0.00	0.07	4.1	0.006
12.667	0.000	4.13	0.00	0.07	4.1	0.006
12.750	0.000	4.17	0.00	0.07	4.2	0.006
12.833	0.000	4.22	0.00	0.08	4.2	0.006
12.917	0.000	4.26	0.00	0.08	4.3	0.006
13.000	0.000	4.32	0.00	0.08	4.3	0.006
13.083	0.000	4.36	0.00	0.08	4.4	0.006
13.167	0.000	4.42	0.00	0.08	4.4	0.006
13.250	0.000	4.47	0.00	0.08	4.5	0.006
13.333	0.000	4.53	0.00	0.08	4.5	0.006
13.417	0.000	4.59	0.00	0.08	4.6	0.006
13.500	0.000	4.66	0.00	0.08	4.6	0.006
13.583	0.000	4.72	0.00	0.08	4.7	0.006
13.667	0.000	4.79	0.00	0.09	4.8	0.007
13.750	0.000	4.86	0.00	0.09	4.8	0.007
13.833	0.000	4.94	0.00	0.09	4.9	0.007
13.917	0.000	5.02	0.00	0.09	5.0	0.007
14.000	0.000	5.11	0.00	0.09	5.1	0.007
14.083	0.000	5.18	0.00	0.09	5.2	0.007
14.167	0.000	5.21	0.00	0.09	5.2	0.007
14.250	0.000	5.28	0.00	0.09	5.3	0.007

14.333	0.000	5.38	0.00	0.10	5.4	0.007
14.417	0.000	5.49	0.00	0.10	5.5	0.008
14.500	0.000	5.62	0.00	0.10	5.6	0.008
14.583	0.000	5.75	0.00	0.10	5.7	0.008
14.667	0.000	5.90	0.00	0.11	5.9	0.008
14.750	0.000	6.05	0.00	0.11	6.0	0.008
14.833	0.000	6.23	0.00	0.11	6.2	0.009
14.917	0.000	6.40	0.00	0.11	6.4	0.009
15.000	0.000	6.62	0.00	0.12	6.6	0.009
15.083	0.000	6.83	0.00	0.12	6.8	0.009
15.167	0.000	7.10	0.00	0.13	7.0	0.010
15.250	0.000	7.37	0.00	0.13	7.3	0.010
15.333	0.000	7.73	0.00	0.14	7.7	0.011
15.417	0.000	7.89	0.00	0.14	7.9	0.011
15.500	0.000	7.41	0.00	0.13	7.5	0.010
15.583	0.000	7.42	0.00	0.13	7.4	0.010
15.667	0.000	8.09	0.00	0.15	7.9	0.011
15.750	0.000	8.86	0.00	0.16	8.7	0.012
15.833	0.000	9.77	0.00	0.18	9.6	0.014
15.917	0.000	11.43	0.00	0.21	11.0	0.016
16.000	0.000	15.40	0.00	0.30	13.3	0.031
16.083	0.000	26.46	0.00	0.56	14.7	0.112
16.167	0.000	48.48	0.00	0.97	14.9	0.343
16.250	0.000	30.32	0.00	1.10	15.0	0.449
16.333	0.000	13.22	0.00	1.09	15.0	0.437
16.417	0.000	9.12	0.00	1.04	15.0	0.396
16.500	0.000	8.46	0.00	0.98	15.0	0.351
16.583	0.000	7.89	0.00	0.92	14.9	0.303
16.667	0.000	7.21	0.00	0.84	14.9	0.250
16.750	0.000	6.71	0.00	0.74	14.9	0.193
16.833	0.000	6.30	0.00	0.62	14.8	0.135
16.917	0.000	5.96	0.00	0.47	14.7	0.074
17.000	0.000	5.67	0.00	0.23	13.9	0.018
17.083	0.000	5.44	0.00	0.04	7.6	0.003
17.167	0.000	5.29	0.00	0.12	4.4	0.009
17.250	0.000	5.13	0.00	0.08	5.6	0.006
17.333	0.000	4.97	0.00	0.09	4.8	0.007
17.417	0.000	4.82	0.00	0.08	4.9	0.006
17.500	0.000	4.68	0.00	0.08	4.7	0.006
17.583	0.000	4.55	0.00	0.08	4.6	0.006
17.667	0.000	4.44	0.00	0.08	4.5	0.006
17.750	0.000	4.33	0.00	0.08	4.4	0.006
17.833	0.000	4.23	0.00	0.07	4.3	0.006
17.917	0.000	4.14	0.00	0.07	4.2	0.006
18.000	0.000	4.06	0.00	0.07	4.1	0.006
18.083	0.000	3.96	0.00	0.07	4.0	0.005
18.167	0.000	3.83	0.00	0.07	3.9	0.005
18.250	0.000	3.72	0.00	0.07	3.7	0.005
18.333	0.000	3.65	0.00	0.06	3.7	0.005
18.417	0.000	3.59	0.00	0.06	3.6	0.005
18.500	0.000	3.53	0.00	0.06	3.5	0.005
18.583	0.000	3.47	0.00	0.06	3.5	0.005
18.667	0.000	3.42	0.00	0.06	3.4	0.005
18.750	0.000	3.36	0.00	0.06	3.4	0.005
18.833	0.000	3.32	0.00	0.06	3.3	0.005
18.917	0.000	3.27	0.00	0.06	3.3	0.004
19.000	0.000	3.22	0.00	0.06	3.2	0.004
19.083	0.000	3.18	0.00	0.06	3.2	0.004
19.167	0.000	3.14	0.00	0.06	3.1	0.004
19.250	0.000	3.10	0.00	0.05	3.1	0.004
19.333	0.000	3.06	0.00	0.05	3.1	0.004
19.417	0.000	3.03	0.00	0.05	3.0	0.004
19.500	0.000	2.99	0.00	0.05	3.0	0.004
19.583	0.000	2.96	0.00	0.05	3.0	0.004
19.667	0.000	2.92	0.00	0.05	2.9	0.004
19.750	0.000	2.89	0.00	0.05	2.9	0.004
19.833	0.000	2.86	0.00	0.05	2.9	0.004
19.917	0.000	2.83	0.00	0.05	2.8	0.004
20.000	0.000	2.80	0.00	0.05	2.8	0.004
20.083	0.000	2.78	0.00	0.05	2.8	0.004
20.167	0.000	2.75	0.00	0.05	2.8	0.004
20.250	0.000	2.72	0.00	0.05	2.7	0.004
20.333	0.000	2.70	0.00	0.05	2.7	0.004
20.417	0.000	2.67	0.00	0.05	2.7	0.004
20.500	0.000	2.65	0.00	0.05	2.7	0.004
20.583	0.000	2.63	0.00	0.05	2.6	0.004
20.667	0.000	2.60	0.00	0.05	2.6	0.004
20.750	0.000	2.58	0.00	0.05	2.6	0.004
20.833	0.000	2.56	0.00	0.05	2.6	0.003
20.917	0.000	2.54	0.00	0.05	2.5	0.003
21.000	0.000	2.52	0.00	0.04	2.5	0.003
21.083	0.000	2.50	0.00	0.04	2.5	0.003
21.167	0.000	2.48	0.00	0.04	2.5	0.003
21.250	0.000	2.46	0.00	0.04	2.5	0.003
21.333	0.000	2.44	0.00	0.04	2.4	0.003
21.417	0.000	2.42	0.00	0.04	2.4	0.003

15.0 CFS
1.1' DEPTH
0.449 ac-ft

21.500	0.000	2.41	0.00	0.04	2.4	0.003
21.583	0.000	2.39	0.00	0.04	2.4	0.003
21.667	0.000	2.37	0.00	0.04	2.4	0.003
21.750	0.000	2.36	0.00	0.04	2.4	0.003
21.833	0.000	2.34	0.00	0.04	2.3	0.003
21.917	0.000	2.32	0.00	0.04	2.3	0.003
22.000	0.000	2.31	0.00	0.04	2.3	0.003
22.083	0.000	2.29	0.00	0.04	2.3	0.003
22.167	0.000	2.28	0.00	0.04	2.3	0.003
22.250	0.000	2.26	0.00	0.04	2.3	0.003
22.333	0.000	2.25	0.00	0.04	2.3	0.003
22.417	0.000	2.24	0.00	0.04	2.2	0.003
22.500	0.000	2.22	0.00	0.04	2.2	0.003
22.583	0.000	2.21	0.00	0.04	2.2	0.003
22.667	0.000	2.20	0.00	0.04	2.2	0.003
22.750	0.000	2.18	0.00	0.04	2.2	0.003
22.833	0.000	2.17	0.00	0.04	2.2	0.003
22.917	0.000	2.16	0.00	0.04	2.2	0.003
23.000	0.000	2.15	0.00	0.04	2.1	0.003
23.083	0.000	2.13	0.00	0.04	2.1	0.003
23.167	0.000	2.12	0.00	0.04	2.1	0.003
23.250	0.000	2.11	0.00	0.04	2.1	0.003
23.333	0.000	2.10	0.00	0.04	2.1	0.003
23.417	0.000	2.09	0.00	0.04	2.1	0.003
23.500	0.000	2.08	0.00	0.04	2.1	0.003
23.583	0.000	2.07	0.00	0.04	2.1	0.003
23.667	0.000	2.06	0.00	0.04	2.1	0.003
23.750	0.000	2.05	0.00	0.04	2.0	0.003
23.833	0.000	2.04	0.00	0.04	2.0	0.003
23.917	0.000	2.02	0.00	0.04	2.0	0.003

PROCESS SUMMARY OF STORAGE:
INFLOW VOLUME = 7.387 AF
BASIN STORAGE = 0.000 AF (WITH 0.000 AF INITIALLY FILLED)
OUTFLOW VOLUME = 7.387 AF
LOSS VOLUME = 0.000 AF

==========

END OF FLOODSCx ROUTING ANALYSIS

♀

Building #1
westerly truckyard - lower

Elevation	Depth (feet)	Area (sq. ft.)	Volume (c.f.)	∑ Volume (c.f.)	∑ Volume (ac-ft)	Q discharge (cfs)
1048.28	0.00	0				
			5	5	0.00	5.5
1048.40	0.12	75				
			60	64	0.00	5.8
1048.60	0.32	525				
			191	255	0.01	6.0
1048.80	0.52	1380				
			402	657	0.02	6.3
1049.00	0.72	2640				
			678	1335	0.03	6.5
1049.20	0.92	4143				
			1010	2345	0.05	6.7
1049.40	1.12	5953				
			1391	3736	0.09	
1049.60	1.32	7960				
			1820	5556	0.13	
1049.80	1.52	10238				
			2296	7852	0.18	
1050.00	1.72	12720				
			2303	10155	0.23	
1050.20	1.92	10312				

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


Ver. 23.0 Release Date: 07/01/2016 License ID 1435

Analysis prepared by:

```
******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  tei 3819
  bldg 1 southwest truckyard

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

    TOTAL 24-HOUR DURATION RAINFALL DEPTH =     7.60 (inches)

    SOIL-COVER     AREA      PERCENT OF    SCS CURVE    LOSS RATE
       TYPE      (Acres)   PERVIOUS AREA     NUMBER    Fp(in./hr.)    YIELD
         1          6.55       10.00       56.(AMC II)     0.423       0.935

    TOTAL AREA (Acres) =      6.55

    AREA-AVERAGED LOSS RATE, Fm (in./hr.) =  0.042

    AREA-AVERAGED LOW LOSS FRACTION, Y = 0.065
==============================================================================

 Problem Descriptions:
  tei 3819
  bldg 1 southwest truckyard

------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =    6.55
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.042
    LOW LOSS FRACTION = 0.066
    TIME OF CONCENTRATION(MIN.) =  9.91
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.49
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  1.00
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.35
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.45
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.60
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  7.60

------------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     3.49
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     0.66

******************************************************************************
  TIME     VOLUME       Q    0.        7.5      15.0      22.5      30.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.14      0.0064      0.94  .Q        .         .         .         .
  0.31      0.0193      0.95  .Q        .         .         .         .
  0.47      0.0322      0.95  .Q        .         .         .         .
  0.64      0.0452      0.95  .Q        .         .         .         .
  0.80      0.0582      0.96  .Q        .         .         .         .
  0.97      0.0714      0.96  .Q        .         .         .         .
  1.14      0.0845      0.97  .Q        .         .         .         .
  1.30      0.0978      0.97  .Q        .         .         .         .
  1.47      0.1111      0.98  .Q        .         .         .         .
  1.63      0.1245      0.98  .Q        .         .         .         .
  1.80      0.1379      0.99  .Q        .         .         .         .
  1.96      0.1515      0.99  .Q        .         .         .         .
  2.13      0.1651      1.00  .Q        .         .         .         .
  2.29      0.1788      1.01  .Q        .         .         .         .
  2.46      0.1925      1.01  .Q        .         .         .         .
  2.62      0.2063      1.02  .Q        .         .         .         .
```

2.79	0.2202	1.02	.Q . . . .
2.95	0.2342	1.03	.Q . . . .
3.12	0.2483	1.03	.Q . . . .
3.28	0.2624	1.04	.Q . . . .
3.45	0.2767	1.04	.Q . . . .
3.61	0.2910	1.05	.Q . . . .
3.78	0.3054	1.06	.Q . . . .
3.94	0.3199	1.07	.Q . . . .
4.11	0.3345	1.07	.Q . . . .
4.27	0.3491	1.08	.Q . . . .
4.44	0.3639	1.08	.Q . . . .
4.60	0.3788	1.09	.Q . . . .
4.77	0.3938	1.10	.Q . . . .
4.93	0.4088	1.11	.Q . . . .
5.10	0.4240	1.11	.Q . . . .
5.26	0.4393	1.12	.Q . . . .
5.43	0.4546	1.13	.Q . . . .
5.59	0.4701	1.14	.Q . . . .
5.76	0.4857	1.15	.Q . . . .
5.92	0.5015	1.16	.Q . . . .
6.09	0.5173	1.16	.Q . . . .
6.26	0.5333	1.18	.Q . . . .
6.42	0.5493	1.18	.Q . . . .
6.59	0.5655	1.19	.Q . . . .
6.75	0.5819	1.20	.Q . . . .
6.92	0.5984	1.21	.Q . . . .
7.08	0.6150	1.22	.Q . . . .
7.25	0.6317	1.23	.Q . . . .
7.41	0.6486	1.24	.Q . . . .
7.58	0.6656	1.26	.Q . . . .
7.74	0.6828	1.26	.Q . . . .
7.91	0.7002	1.28	.Q . . . .
8.07	0.7177	1.29	.Q . . . .
8.24	0.7354	1.30	.Q . . . .
8.40	0.7532	1.31	.Q . . . .
8.57	0.7712	1.33	.Q . . . .
8.73	0.7894	1.34	.Q . . . .
8.90	0.8078	1.36	.Q . . . .
9.06	0.8264	1.37	.Q . . . .
9.23	0.8452	1.39	.Q . . . .
9.39	0.8642	1.40	.Q . . . .
9.56	0.8834	1.42	.Q . . . .
9.72	0.9029	1.43	.Q . . . .
9.89	0.9225	1.45	.Q . . . .
10.05	0.9424	1.46	.Q . . . .
10.22	0.9626	1.49	.Q . . . .
10.38	0.9830	1.50	. Q . . . .
10.55	1.0037	1.53	. Q . . . .
10.71	1.0247	1.54	. Q . . . .
10.88	1.0460	1.57	. Q . . . .
11.05	1.0676	1.59	. Q . . . .
11.21	1.0895	1.62	. Q . . . .
11.38	1.1117	1.64	. Q . . . .
11.54	1.1343	1.67	. Q . . . .
11.71	1.1573	1.69	. Q . . . .
11.87	1.1807	1.73	. Q . . . .
12.04	1.2045	1.75	. Q . . . .
12.20	1.2292	1.85	. Q . . . .
12.37	1.2546	1.88	. Q . . . .
12.53	1.2806	1.93	. Q . . . .
12.70	1.3071	1.95	. Q . . . .
12.86	1.3341	2.01	. Q . . . .
13.03	1.3618	2.04	. Q . . . .
13.19	1.3902	2.11	. Q . . . .
13.36	1.4192	2.15	. Q . . . .
13.52	1.4491	2.23	. Q . . . .
13.69	1.4798	2.27	. Q . . . .
13.85	1.5114	2.37	. Q . . . .
14.02	1.5441	2.42	. Q . . . .
14.18	1.5775	2.48	. Q . . . .
14.35	1.6118	2.55	. Q . . . .
14.51	1.6477	2.70	. Q . . . .
14.68	1.6852	2.79	. Q . . . .
14.84	1.7248	3.01	. Q . . . .
15.01	1.7667	3.14	. Q . . . .
15.17	1.8117	3.45	. Q . . . .
15.34	1.8603	3.67	. Q . . . .
15.50	1.9086	3.40	. Q . . . .
15.67	1.9580	3.84	. Q . . . .
15.83	2.0187	5.05	. Q . . . .
16.00	2.1013	7.05	. Q. . . .
16.17	2.3045	22.72	. . . Q .
16.33	2.4899	4.46	. Q . . . .
16.50	2.5469	3.89	. Q . . . .
16.66	2.5958	3.28	. Q . . . .
16.83	2.6379	2.89	. Q . . . .

16.99	2.6756	2.62	. Q	.	.	.	.
17.16	2.7103	2.47	. Q	.	.	.	.
17.32	2.7430	2.32	. Q	.	.	.	.
17.49	2.7737	2.19	. Q	.	.	.	.
17.65	2.8028	2.08	. Q	.	.	.	.
17.82	2.8305	1.98	. Q	.	.	.	.
17.98	2.8570	1.90	. Q	.	.	.	.
18.15	2.8822	1.79	. Q	.	.	.	.
18.31	2.9062	1.71	. Q	.	.	.	.
18.48	2.9292	1.66	. Q	.	.	.	.
18.64	2.9514	1.61	. Q	.	.	.	.
18.81	2.9730	1.56	. Q	.	.	.	.
18.97	2.9940	1.52	. Q	.	.	.	.
19.14	3.0144	1.48	.Q	.	.	.	.
19.30	3.0343	1.44	.Q	.	.	.	.
19.47	3.0538	1.41	.Q	.	.	.	.
19.63	3.0728	1.38	.Q	.	.	.	.
19.80	3.0914	1.35	.Q	.	.	.	.
19.96	3.1096	1.32	.Q	.	.	.	.
20.13	3.1274	1.29	.Q	.	.	.	.
20.29	3.1449	1.27	.Q	.	.	.	.
20.46	3.1621	1.25	.Q	.	.	.	.
20.62	3.1790	1.23	.Q	.	.	.	.
20.79	3.1956	1.21	.Q	.	.	.	.
20.95	3.2120	1.19	.Q	.	.	.	.
21.12	3.2281	1.17	.Q	.	.	.	.
21.29	3.2439	1.15	.Q	.	.	.	.
21.45	3.2595	1.13	.Q	.	.	.	.
21.62	3.2749	1.12	.Q	.	.	.	.
21.78	3.2901	1.10	.Q	.	.	.	.
21.95	3.3050	1.09	.Q	.	.	.	.
22.11	3.3198	1.08	.Q	.	.	.	.
22.28	3.3344	1.06	.Q	.	.	.	.
22.44	3.3488	1.05	.Q	.	.	.	.
22.61	3.3630	1.04	.Q	.	.	.	.
22.77	3.3771	1.02	.Q	.	.	.	.
22.94	3.3910	1.01	.Q	.	.	.	.
23.10	3.4047	1.00	.Q	.	.	.	.
23.27	3.4183	0.99	.Q	.	.	.	.
23.43	3.4318	0.98	.Q	.	.	.	.
23.60	3.4451	0.97	.Q	.	.	.	.
23.76	3.4583	0.96	.Q	.	.	.	.
23.93	3.4714	0.95	.Q	.	.	.	.
24.09	3.4843	0.94	.Q	.	.	.	.
24.26	3.4907	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

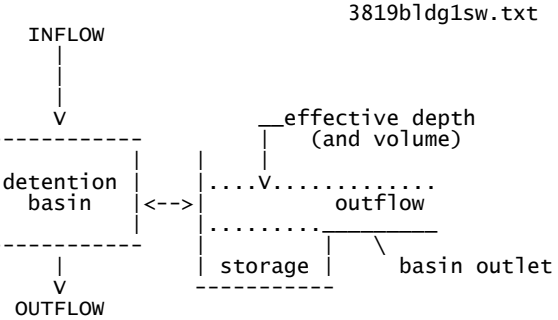
Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1446.9
10%	218.0
20%	29.7
30%	19.8
40%	9.9
50%	9.9
60%	9.9
70%	9.9
80%	9.9
90%	9.9

Problem Descriptions:
tei 3819
bldg 1 southwest truckyard

==========

FLOW-THROUGH DETENTION BASIN MODEL

SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
CONSTANT HYDROGRAPH TIME UNIT(MINUTES) = 9.910
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 = 11

*BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS)	**	BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS)	*
0.000	0.000	0.000	**	0.120	0.001	12.400	*
0.320	0.010	12.900	**	0.520	0.011	13.500	*
0.720	0.020	14.000	**	0.920	0.030	14.500	*
1.120	0.050	15.000	**	1.320	0.090	15.500	*
1.520	0.130	15.900	**	1.720	0.180	16.400	*
1.920	0.230	16.800	**				

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	0.12	-0.08363	0.08563
3	0.32	-0.07804	0.09804
4	0.52	-0.08114	0.10314
5	0.72	-0.07555	0.11555
6	0.92	-0.06896	0.12896
7	1.12	-0.05238	0.15238
8	1.32	-0.01579	0.19579
9	1.52	0.02148	0.23852
10	1.72	0.06807	0.29193
11	1.92	0.11534	0.34466

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)
0.144	0.000	0.94	0.02	0.93	0.000
0.309	0.000	0.95	0.02	1.86	0.000
0.474	0.000	0.95	0.02	1.87	0.000
0.640	0.000	0.95	0.02	1.88	0.000
0.805	0.000	0.96	0.02	1.89	0.000
0.970	0.000	0.96	0.02	1.90	0.000
1.135	0.000	0.97	0.02	1.91	0.000
1.300	0.000	0.97	0.02	1.92	0.000
1.465	0.000	0.98	0.02	1.93	0.000
1.631	0.000	0.98	0.02	1.94	0.000
1.796	0.000	0.99	0.02	1.95	0.000
1.961	0.000	0.99	0.02	1.96	0.000
2.126	0.000	1.00	0.02	1.97	0.000
2.291	0.000	1.01	0.02	1.98	0.000
2.456	0.000	1.01	0.02	1.99	0.000
2.622	0.000	1.02	0.02	2.00	0.000
2.787	0.000	1.02	0.02	2.01	0.000
2.952	0.000	1.03	0.02	2.03	0.000
3.117	0.000	1.03	0.02	2.04	0.000
3.282	0.000	1.04	0.02	2.05	0.000
3.447	0.000	1.04	0.02	2.06	0.000
3.613	0.000	1.05	0.02	2.07	0.000
3.778	0.000	1.06	0.02	2.09	0.000
3.943	0.000	1.07	0.02	2.10	0.000
4.108	0.000	1.07	0.02	2.11	0.000
4.273	0.000	1.08	0.02	2.13	0.000
4.438	0.000	1.08	0.02	2.14	0.000
4.604	0.000	1.09	0.02	2.15	0.000
4.769	0.000	1.10	0.02	2.17	0.000
4.934	0.000	1.11	0.02	2.18	0.000
5.099	0.000	1.11	0.02	2.20	0.000
5.264	0.000	1.12	0.02	2.21	0.000
5.429	0.000	1.13	0.02	2.23	0.000
5.595	0.000	1.14	0.02	2.24	0.000
5.760	0.000	1.15	0.02	2.26	0.000

5.925	0.000	1.16	0.02	2.28	0.000
6.090	0.000	1.16	0.02	2.29	0.000
6.255	0.000	1.18	0.02	2.31	0.000
6.420	0.000	1.18	0.02	2.33	0.000
6.586	0.000	1.19	0.02	2.35	0.000
6.751	0.000	1.20	0.02	2.37	0.000
6.916	0.000	1.21	0.02	2.39	0.000
7.081	0.000	1.22	0.02	2.40	0.000
7.246	0.000	1.23	0.02	2.43	0.000
7.411	0.000	1.24	0.02	2.45	0.000
7.576	0.000	1.26	0.02	2.47	0.000
7.742	0.000	1.26	0.02	2.49	0.000
7.907	0.000	1.28	0.02	2.51	0.000
8.072	0.000	1.29	0.02	2.54	0.000
8.237	0.000	1.30	0.02	2.56	0.000
8.402	0.000	1.31	0.03	2.58	0.000
8.568	0.000	1.33	0.03	2.61	0.000
8.733	0.000	1.34	0.03	2.64	0.000
8.898	0.000	1.36	0.03	2.66	0.000
9.063	0.000	1.37	0.03	2.69	0.000
9.228	0.000	1.39	0.03	2.72	0.000
9.393	0.000	1.40	0.03	2.75	0.000
9.559	0.000	1.42	0.03	2.78	0.000
9.724	0.000	1.43	0.03	2.81	0.000
9.889	0.000	1.45	0.03	2.85	0.000
10.054	0.000	1.46	0.03	2.88	0.000
10.219	0.000	1.49	0.03	2.92	0.000
10.384	0.000	1.50	0.03	2.96	0.000
10.550	0.000	1.53	0.03	3.00	0.000
10.715	0.000	1.54	0.03	3.04	0.000
10.880	0.000	1.57	0.03	3.08	0.000
11.045	0.000	1.59	0.03	3.13	0.000
11.210	0.000	1.62	0.03	3.17	0.000
11.375	0.000	1.64	0.03	3.22	0.000
11.540	0.000	1.67	0.03	3.27	0.000
11.706	0.000	1.69	0.03	3.33	0.000
11.871	0.000	1.73	0.03	3.39	0.000
12.036	0.000	1.75	0.03	3.45	0.000
12.201	0.000	1.85	0.04	3.57	0.000
12.366	0.000	1.88	0.04	3.69	0.000
12.531	0.000	1.93	0.04	3.76	0.000
12.697	0.000	1.95	0.04	3.84	0.000
12.862	0.000	2.01	0.04	3.92	0.000
13.027	0.000	2.04	0.04	4.01	0.000
13.192	0.000	2.11	0.04	4.11	0.000
13.357	0.000	2.15	0.04	4.21	0.000
13.523	0.000	2.23	0.04	4.32	0.000
13.688	0.000	2.27	0.04	4.44	0.000
13.853	0.000	2.37	0.05	4.58	0.000
14.018	0.000	2.42	0.05	4.73	0.000
14.183	0.000	2.48	0.05	4.84	0.000
14.348	0.000	2.55	0.05	4.97	0.000
14.514	0.000	2.70	0.05	5.19	0.000
14.679	0.000	2.79	0.05	5.43	0.000
14.844	0.000	3.01	0.06	5.73	0.000
15.009	0.000	3.14	0.06	6.07	0.000
15.174	0.000	3.45	0.07	6.51	0.001
15.339	0.000	3.67	0.07	7.04	0.001
15.505	0.000	3.40	0.07	6.99	0.001
15.670	0.000	3.84	0.07	7.15	0.001
15.835	0.000	5.05	0.10	8.79	0.001
16.000	0.000	7.05	0.29	11.41	0.009
16.165	0.000	22.72	1.79	14.68	0.197
16.330	0.000	4.46	1.06	15.69	0.044
16.496	0.000	3.89	0.07	11.26	0.001
16.661	0.000	3.28	0.06	7.09	0.001
16.826	0.000	2.89	0.06	6.10	0.000
16.991	0.000	2.62	0.05	5.45	0.000
17.156	0.000	2.47	0.05	5.03	0.000
17.321	0.000	2.32	0.04	4.73	0.000
17.486	0.000	2.19	0.04	4.45	0.000
17.652	0.000	2.08	0.04	4.21	0.000
17.817	0.000	1.98	0.04	4.01	0.000
17.982	0.000	1.90	0.04	3.84	0.000
18.147	0.000	1.79	0.03	3.65	0.000
18.312	0.000	1.71	0.03	3.47	0.000
18.478	0.000	1.66	0.03	3.33	0.000
18.643	0.000	1.61	0.03	3.22	0.000
18.808	0.000	1.56	0.03	3.13	0.000
18.973	0.000	1.52	0.03	3.04	0.000
19.138	0.000	1.48	0.03	2.96	0.000
19.303	0.000	1.44	0.03	2.88	0.000
19.469	0.000	1.41	0.03	2.82	0.000
19.634	0.000	1.38	0.03	2.75	0.000
19.799	0.000	1.35	0.03	2.69	0.000
19.964	0.000	1.32	0.03	2.64	0.000

15.7 CFS
1.79' DEPTH
0.197 ac-ft

20.129	0.000	1.29	0.02	2.58	0.000
20.294	0.000	1.27	0.02	2.54	0.000
20.459	0.000	1.25	0.02	2.49	0.000
20.625	0.000	1.23	0.02	2.45	0.000
20.790	0.000	1.21	0.02	2.40	0.000
20.955	0.000	1.19	0.02	2.37	0.000
21.120	0.000	1.17	0.02	2.33	0.000
21.285	0.000	1.15	0.02	2.29	0.000
21.451	0.000	1.13	0.02	2.26	0.000
21.616	0.000	1.12	0.02	2.23	0.000
21.781	0.000	1.10	0.02	2.20	0.000
21.946	0.000	1.09	0.02	2.17	0.000
22.111	0.000	1.08	0.02	2.14	0.000
22.276	0.000	1.06	0.02	2.11	0.000
22.441	0.000	1.05	0.02	2.09	0.000
22.607	0.000	1.04	0.02	2.06	0.000
22.772	0.000	1.02	0.02	2.04	0.000
22.937	0.000	1.01	0.02	2.01	0.000
23.102	0.000	1.00	0.02	1.99	0.000
23.267	0.000	0.99	0.02	1.97	0.000
23.432	0.000	0.98	0.02	1.95	0.000
23.598	0.000	0.97	0.02	1.93	0.000
23.763	0.000	0.96	0.02	1.91	0.000
23.928	0.000	0.95	0.02	1.89	0.000
24.093	0.000	0.94	0.02	1.87	0.000
24.258	0.000	0.00	0.00	0.93	0.000
24.424	0.000	0.00	0.00	0.00	0.000

Building #1
easterly truckyard - lower

Elevation	Depth (feet)	Area (sq. ft.)	Volume (c.f.)	∑ Volume (c.f.)	∑ Volume (ac-ft)	Q discharge (cfs)
1051.49	0.00	0				
			555	555	0.01	55.4
1051.60	0.11	10100				
			5628	6184	0.14	59.3
1051.80	0.31	46183				
			13931	13931	0.32	60.3
1052.00	0.51	93125				
			21370	21370	0.49	61.2
1052.20	0.71	120575				

```
****************************************************************************

          F L O O D    R O U T I N G    A N A L Y S I S
        USING COUNTY HYDROLOGY MANUAL OF SAN BERNARDINO(1986)
       (c) Copyright 1989-2016 Advanced Engineering Software (aes)
           Ver. 23.0  Release Date: 07/01/2016  License ID 1435

                       Analysis prepared by:




 ************************ DESCRIPTION OF STUDY *************************
* tei 3819                                                             *
* building 1 east truckyard                                            *
* 30" pipe                                                             *
 ************************************************************************

  FILE NAME: W:\3819\BLDG1E.DAT
  TIME/DATE OF STUDY: 11:43 01/20/2021


****************************************************************************
  FLOW PROCESS FROM NODE    170.00 TO NODE    194.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      23.800 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.130 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY(DEVELOPED) S-GRAPH SELECTED
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.042
         LOW LOSS FRACTION = 0.065
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.49
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  1.00
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.35
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  2.45
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  3.60
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  7.60

         PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 0.999
          30-MINUTE FACTOR = 0.999
           1-HOUR FACTOR = 0.999
           3-HOUR FACTOR = 1.000
           6-HOUR FACTOR = 1.000
          24-HOUR FACTOR = 1.000

         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  64.103



============================================================================
                     UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER         MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
       1                7.295                20.998
       2               46.095               111.676
       3               85.053               112.136
       4               96.839                33.923
       5               98.998                 6.215
       6               99.527                 1.523
       7               99.811                 0.816
       8               99.953                 0.408
       9              100.000                 0.136


----------------------------------------------------------------------------
    TOTAL SOIL-LOSS VOLUME(ACRE-FEET) =       0.8868
    TOTAL STORM RUNOFF VOLUME(ACRE-FEET) =      14.1785
----------------------------------------------------------------------------
♀
============================================================================

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

============================================================================
              HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.       20.0      40.0      60.0      80.0
----------------------------------------------------------------------------
   0.083      0.0019      0.28  Q         .         .         .         .
   0.167      0.0141      1.77  Q         .         .         .         .
   0.250      0.0366      3.26  VQ        .         .         .         .
   0.333      0.0622      3.72  VQ        .         .         .         .
   0.417      0.0884      3.81  VQ        .         .         .         .
   0.500      0.1149      3.84  VQ        .         .         .         .
   0.583      0.1415      3.86  VQ        .         .         .         .
   0.667      0.1682      3.88  VQ        .         .         .         .
   0.750      0.1950      3.89  VQ        .         .         .         .
   0.833      0.2219      3.90  VQ        .         .         .         .
   0.917      0.2488      3.91  VQ        .         .         .         .
   1.000      0.2758      3.92  VQ        .         .         .         .
   1.083      0.3028      3.93  VQ        .         .         .         .
   1.167      0.3299      3.94  VQ        .         .         .         .
   1.250      0.3571      3.95  .Q        .         .         .         .
   1.333      0.3844      3.96  .Q        .         .         .         .
   1.417      0.4117      3.97  .Q        .         .         .         .
```

1.500	0.4391	3.98	.Q	.	.	.	.
1.583	0.4666	3.99	.Q	.	.	.	.
1.667	0.4942	4.00	.VQ	.	.	.	.
1.750	0.5218	4.01	.VQ	.	.	.	.
1.833	0.5495	4.02	.VQ	.	.	.	.
1.917	0.5773	4.03	.VQ	.	.	.	.
2.000	0.6051	4.04	.VQ	.	.	.	.
2.083	0.6330	4.05	.VQ	.	.	.	.
2.167	0.6610	4.07	.VQ	.	.	.	.
2.250	0.6891	4.08	.VQ	.	.	.	.
2.333	0.7173	4.09	. Q	.	.	.	.
2.417	0.7455	4.10	. Q	.	.	.	.
2.500	0.7738	4.11	. Q	.	.	.	.
2.583	0.8022	4.12	. Q	.	.	.	.
2.667	0.8307	4.13	. Q	.	.	.	.
2.750	0.8592	4.15	. Q	.	.	.	.
2.833	0.8878	4.16	. Q	.	.	.	.
2.917	0.9166	4.17	. Q	.	.	.	.
3.000	0.9454	4.18	. Q	.	.	.	.
3.083	0.9742	4.19	. Q	.	.	.	.
3.167	1.0032	4.21	. Q	.	.	.	.
3.250	1.0323	4.22	. Q	.	.	.	.
3.333	1.0614	4.23	. Q	.	.	.	.
3.417	1.0906	4.24	. QV	.	.	.	.
3.500	1.1200	4.26	. QV	.	.	.	.
3.583	1.1494	4.27	. QV	.	.	.	.
3.667	1.1789	4.28	. QV	.	.	.	.
3.750	1.2084	4.30	. QV	.	.	.	.
3.833	1.2381	4.31	. QV	.	.	.	.
3.917	1.2679	4.32	. QV	.	.	.	.
4.000	1.2978	4.34	. QV	.	.	.	.
4.083	1.3277	4.35	. QV	.	.	.	.
4.167	1.3578	4.36	. QV	.	.	.	.
4.250	1.3879	4.38	. QV	.	.	.	.
4.333	1.4182	4.39	. Q V	.	.	.	.
4.417	1.4485	4.41	. Q V	.	.	.	.
4.500	1.4790	4.42	. Q V	.	.	.	.
4.583	1.5095	4.44	. Q V	.	.	.	.
4.667	1.5402	4.45	. Q V	.	.	.	.
4.750	1.5709	4.46	. Q V	.	.	.	.
4.833	1.6018	4.48	. Q V	.	.	.	.
4.917	1.6327	4.50	. Q V	.	.	.	.
5.000	1.6638	4.51	. Q V	.	.	.	.
5.083	1.6950	4.53	. Q V	.	.	.	.
5.167	1.7262	4.54	. Q V	.	.	.	.
5.250	1.7576	4.56	. Q V	.	.	.	.
5.333	1.7891	4.57	. Q V	.	.	.	.
5.417	1.8207	4.59	. Q V	.	.	.	.
5.500	1.8525	4.61	. Q V	.	.	.	.
5.583	1.8843	4.62	. Q V	.	.	.	.
5.667	1.9163	4.64	. Q V	.	.	.	.
5.750	1.9483	4.66	. Q V	.	.	.	.
5.833	1.9805	4.67	. Q V	.	.	.	.
5.917	2.0128	4.69	. Q V	.	.	.	.
6.000	2.0453	4.71	. Q V	.	.	.	.
6.083	2.0778	4.73	. Q V	.	.	.	.
6.167	2.1105	4.75	. Q V	.	.	.	.
6.250	2.1433	4.76	. Q V	.	.	.	.
6.333	2.1762	4.78	. Q V	.	.	.	.
6.417	2.2093	4.80	. Q V	.	.	.	.
6.500	2.2425	4.82	. Q V	.	.	.	.
6.583	2.2758	4.84	. Q V	.	.	.	.
6.667	2.3093	4.86	. Q V	.	.	.	.
6.750	2.3429	4.88	. Q V	.	.	.	.
6.833	2.3766	4.90	. Q V	.	.	.	.
6.917	2.4105	4.92	. Q V	.	.	.	.
7.000	2.4445	4.94	. Q V	.	.	.	.
7.083	2.4786	4.96	. Q V	.	.	.	.
7.167	2.5129	4.98	. Q V	.	.	.	.
7.250	2.5474	5.00	. Q V	.	.	.	.
7.333	2.5820	5.02	. Q V	.	.	.	.
7.417	2.6167	5.04	. Q V	.	.	.	.
7.500	2.6516	5.07	. Q V	.	.	.	.
7.583	2.6867	5.09	. Q V	.	.	.	.
7.667	2.7219	5.11	. Q V	.	.	.	.
7.750	2.7572	5.14	. Q V	.	.	.	.
7.833	2.7928	5.16	. Q V	.	.	.	.
7.917	2.8285	5.18	. Q V	.	.	.	.
8.000	2.8643	5.21	. Q V	.	.	.	.
8.083	2.9004	5.23	. Q V	.	.	.	.
8.167	2.9366	5.26	. Q V	.	.	.	.
8.250	2.9729	5.28	. Q V	.	.	.	.
8.333	3.0095	5.31	. Q V	.	.	.	.
8.417	3.0462	5.33	. Q V	.	.	.	.
8.500	3.0831	5.36	. Q V	.	.	.	.
8.583	3.1202	5.39	. Q V	.	.	.	.
8.667	3.1575	5.41	. Q V	.	.	.	.
8.750	3.1950	5.44	. Q V	.	.	.	.
8.833	3.2327	5.47	. Q V	.	.	.	.
8.917	3.2706	5.50	. Q V	.	.	.	.
9.000	3.3086	5.53	. Q V	.	.	.	.
9.083	3.3469	5.56	. Q V	.	.	.	.
9.167	3.3854	5.59	. Q V	.	.	.	.
9.250	3.4241	5.62	. Q V	.	.	.	.
9.333	3.4630	5.65	. Q V	.	.	.	.
9.417	3.5021	5.68	. Q V	.	.	.	.
9.500	3.5415	5.71	. Q V	.	.	.	.
9.583	3.5811	5.75	. Q V	.	.	.	.
9.667	3.6209	5.78	. Q V	.	.	.	.
9.750	3.6610	5.82	. Q V	.	.	.	.
9.833	3.7013	5.85	. Q V	.	.	.	.
9.917	3.7418	5.89	. Q V	.	.	.	.
10.000	3.7826	5.92	. Q V	.	.	.	.
10.083	3.8236	5.96	. Q V	.	.	.	.
10.167	3.8649	6.00	. Q V	.	.	.	.
10.250	3.9065	6.04	. Q .V	.	.	.	.
10.333	3.9484	6.08	. Q .V	.	.	.	.
10.417	3.9905	6.12	. Q .V	.	.	.	.
10.500	4.0329	6.16	. Q .V	.	.	.	.
10.583	4.0756	6.20	. Q .V	.	.	.	.
10.667	4.1185	6.24	. Q .V	.	.	.	.
10.750	4.1618	6.28	. Q .V	.	.	.	.
10.833	4.2054	6.33	. Q .V	.	.	.	.
10.917	4.2493	6.38	. Q .V	.	.	.	.
11.000	4.2936	6.42	. Q . V	.	.	.	.

```
11.083      4.3381      6.47  .  Q      . V       .         .         .
11.167      4.3830      6.52  .  Q      . V       .         .         .
11.250      4.4283      6.57  .  Q      . V       .         .         .
11.333      4.4739      6.62  .  Q      . V       .         .         .
11.417      4.5198      6.67  .  Q      . V       .         .         .
11.500      4.5662      6.73  .  Q      . V       .         .         .
11.583      4.6129      6.78  .  Q      .  V      .         .         .
11.667      4.6600      6.84  .  Q      .  V      .         .         .
11.750      4.7075      6.90  .  Q      .  V      .         .         .
11.833      4.7555      6.96  .  Q      .  V      .         .         .
11.917      4.8038      7.02  .  Q      .  V      .         .         .
12.000      4.8526      7.09  .  Q      .  V      .         .         .
12.083      4.9020      7.17  .  Q      .  V      .         .         .
12.167      4.9524      7.32  .  Q      .  V      .         .         .
12.250      5.0039      7.47  .  Q      .   V     .         .         .
12.333      5.0560      7.57  .  Q      .   V     .         .         .
12.417      5.1087      7.65  .  Q      .   V     .         .         .
12.500      5.1620      7.73  .  Q      .   V     .         .         .
12.583      5.2157      7.81  .  Q      .   V     .         .         .
12.667      5.2701      7.89  .  Q      .   V     .         .         .
12.750      5.3250      7.97  .  Q      .    V    .         .         .
12.833      5.3805      8.06  .   Q     .    V    .         .         .
12.917      5.4366      8.15  .   Q     .    V    .         .         .
13.000      5.4934      8.24  .   Q     .    V    .         .         .
13.083      5.5508      8.34  .   Q     .    V    .         .         .
13.167      5.6090      8.44  .   Q     .    V    .         .         .
13.250      5.6678      8.55  .   Q     .    V    .         .         .
13.333      5.7274      8.66  .   Q     .     V   .         .         .
13.417      5.7878      8.77  .   Q     .     V   .         .         .
13.500      5.8491      8.89  .   Q     .     V   .         .         .
13.583      5.9112      9.01  .   Q     .     V   .         .         .
13.667      5.9741      9.15  .   Q     .     V   .         .         .
13.750      6.0381      9.28  .   Q     .      V  .         .         .
13.833      6.1030      9.43  .   Q     .      V  .         .         .
13.917      6.1689      9.58  .   Q     .      V  .         .         .
14.000      6.2360      9.74  .   Q     .      V  .         .         .
14.083      6.3041      9.89  .   Q     .      V  .         .         .
14.167      6.3728      9.98  .   Q     .      V  .         .         .
14.250      6.4423     10.08  .    Q    .       V .         .         .
14.333      6.5129     10.26  .    Q    .       V .         .         .
14.417      6.5850     10.47  .    Q    .       V .         .         .
14.500      6.6588     10.70  .    Q    .       V .         .         .
14.583      6.7342     10.95  .    Q    .       V .         .         .
14.667      6.8114     11.22  .    Q    .        V.         .         .
14.750      6.8906     11.50  .    Q    .        V.         .         .
14.833      6.9721     11.82  .    Q    .        V.         .         .
14.917      7.0558     12.16  .     Q   .        V.         .         .
15.000      7.1422     12.55  .     Q   .         V         .         .
15.083      7.2315     12.96  .     Q   .         V         .         .
15.167      7.3240     13.43  .     Q   .         V         .         .
15.250      7.4201     13.96  .     Q   .         V         .         .
15.333      7.5205     14.58  .      Q  .         .V        .         .
15.417      7.6241     15.04  .      Q  .         .V        .         .
15.500      7.7244     14.55  .      Q  .         .V        .         .
15.583      7.8221     14.19  .      Q  .         . V       .         .
15.667      7.9258     15.05  .      Q  .         . V       .         .
15.750      8.0391     16.46  .       Q .         . V       .         .
15.833      8.1636     18.08  .        Q.         .  V      .         .
15.917      8.3062     20.70  .         Q         .  V      .         .
16.000      8.4898     26.66  .          .  Q     .  V      .         .
16.083      8.7833     42.61  .          .        .Q  V     .         .
16.167      9.3174     77.55  .          .        .    V    .        Q .
16.250      9.8118     71.79  .          .        .     V   .    Q    .
16.333     10.0598     36.01  .          .      Q .      V  .         .
16.417     10.2025     20.71  .         Q         .      V  .         .
16.500     10.3188     16.90  .       Q .         .       V.         .
16.583     10.4275     15.77  .      Q  .         .       V.         .
16.667     10.5272     14.48  .      Q  .         .       V.         .
16.750     10.6189     13.31  .    Q    .         .       V.         .
16.833     10.7043     12.40  .    Q    .         .        V         .
16.917     10.7848     11.70  .   Q     .         .        V         .
17.000     10.8614     11.11  .   Q     .         .        V         .
17.083     10.9345     10.62  .   Q     .         .        V         .
17.167     11.0053     10.27  .   Q     .         .        .V        .
17.250     11.0740      9.97  .  Q      .         .        .V        .
17.333     11.1405      9.66  .  Q      .         .        .V        .
17.417     11.2050      9.36  .  Q      .         .        .V        .
17.500     11.2675      9.09  .  Q      .         .        .V        .
17.583     11.3284      8.84  .  Q      .         .        .V        .
17.667     11.3877      8.61  .  Q      .         .        . V       .
17.750     11.4455      8.40  .  Q      .         .        . V       .
17.833     11.5020      8.20  .  Q      .         .        . V       .
17.917     11.5572      8.02  .  Q      .         .        . V       .
18.000     11.6113      7.85  . Q       .         .        . V       .
18.083     11.6641      7.68  . Q       .         .        . V       .
18.167     11.7154      7.44  . Q       .         .        .  V      .
18.250     11.7651      7.22  . Q       .         .        .  V      .
18.333     11.8138      7.06  . Q       .         .        .  V      .
18.417     11.8615      6.93  . Q       .         .        .  V      .
18.500     11.9085      6.82  . Q       .         .        .  V      .
18.583     11.9546      6.70  . Q       .         .        .  V      .
18.667     12.0001      6.60  . Q       .         .        .  V      .
18.750     12.0448      6.50  . Q       .         .        .  V      .
18.833     12.0889      6.40  . Q       .         .        .   V     .
18.917     12.1323      6.31  . Q       .         .        .   V     .
19.000     12.1752      6.22  . Q       .         .        .   V     .
19.083     12.2174      6.14  . Q       .         .        .   V     .
19.167     12.2592      6.06  . Q       .         .        .   V     .
19.250     12.3003      5.98  . Q       .         .        .   V     .
19.333     12.3410      5.91  . Q       .         .        .   V     .
19.417     12.3812      5.83  . Q       .         .        .   V     .
19.500     12.4209      5.77  . Q       .         .        .    V    .
19.583     12.4601      5.70  . Q       .         .        .    V    .
19.667     12.4990      5.64  . Q       .         .        .    V    .
19.750     12.5373      5.57  . Q       .         .        .    V    .
19.833     12.5753      5.51  . Q       .         .        .    V    .
19.917     12.6129      5.46  . Q       .         .        .    V    .
20.000     12.6501      5.40  . Q       .         .        .    V    .
20.083     12.6869      5.35  . Q       .         .        .    V    .
20.167     12.7234      5.30  . Q       .         .        .    V    .
20.250     12.7595      5.24  . Q       .         .        .    V    .
20.333     12.7953      5.20  . Q       .         .        .     V   .
20.417     12.8307      5.15  . Q       .         .        .     V   .
20.500     12.8659      5.10  . Q       .         .        .     V   .
20.583     12.9007      5.06  . Q       .         .        .     V   .
```

```
  20.667     12.9352      5.01  . Q       .         .         .     V   .
  20.750     12.9694      4.97  . Q       .         .         .     V   .
  20.833     13.0034      4.93  . Q       .         .         .     V   .
  20.917     13.0371      4.89  . Q       .         .         .     V   .
  21.000     13.0704      4.85  . Q       .         .         .     V   .
  21.083     13.1036      4.81  . Q       .         .         .     V   .
  21.167     13.1364      4.77  . Q       .         .         .      V  .
  21.250     13.1691      4.74  . Q       .         .         .      V  .
  21.333     13.2014      4.70  . Q       .         .         .      V  .
  21.417     13.2336      4.67  . Q       .         .         .      V  .
  21.500     13.2655      4.63  . Q       .         .         .      V  .
  21.583     13.2971      4.60  . Q       .         .         .      V  .
  21.667     13.3286      4.57  . Q       .         .         .      V  .
  21.750     13.3598      4.53  . Q       .         .         .      V  .
  21.833     13.3908      4.50  . Q       .         .         .      V  .
  21.917     13.4216      4.47  . Q       .         .         .      V  .
  22.000     13.4522      4.44  . Q       .         .         .      V  .
  22.083     13.4826      4.41  . Q       .         .         .       V .
  22.167     13.5128      4.38  . Q       .         .         .       V .
  22.250     13.5428      4.36  . Q       .         .         .       V .
  22.333     13.5726      4.33  . Q       .         .         .       V .
  22.417     13.6023      4.30  . Q       .         .         .       V .
  22.500     13.6317      4.28  . Q       .         .         .       V .
  22.583     13.6610      4.25  . Q       .         .         .       V .
  22.667     13.6901      4.22  . Q       .         .         .       V .
  22.750     13.7190      4.20  . Q       .         .         .       V .
  22.833     13.7478      4.18  . Q       .         .         .       V .
  22.917     13.7764      4.15  . Q       .         .         .       V .
  23.000     13.8048      4.13  . Q       .         .         .       V .
  23.083     13.8331      4.10  . Q       .         .         .        V.
  23.167     13.8612      4.08  . Q       .         .         .        V.
  23.250     13.8891      4.06  . Q       .         .         .        V.
  23.333     13.9169      4.04  . Q       .         .         .        V.
  23.417     13.9446      4.02  . Q       .         .         .        V.
  23.500     13.9721      4.00  .Q        .         .         .        V.
  23.583     13.9995      3.97  .Q        .         .         .        V.
  23.667     14.0267      3.95  .Q        .         .         .        V.
  23.750     14.0538      3.93  .Q        .         .         .        V.
  23.833     14.0808      3.91  .Q        .         .         .        V.
  23.917     14.1076      3.89  .Q        .         .         .        V.
  24.000     14.1343      3.87  .Q        .         .         .        V.
  24.083     14.1589      3.58  .Q        .         .         .        V.
  24.167     14.1732      2.08  .Q        .         .         .        V.
  24.250     14.1772      0.58  Q         .         .         .        V.
  24.333     14.1780      0.12  Q         .         .         .        V.
  24.417     14.1783      0.04  Q         .         .         .        V.
  24.500     14.1784      0.02  Q         .         .         .        V.
  24.583     14.1784      0.01  Q         .         .         .        V.
--------------------------------------------------------------------------------
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                Duration
        Peak Flow Rate                     (minutes)
    ======================                 =========
               0%                           1475.0
              10%                            330.0
              20%                             55.0
              30%                             25.0
              40%                             20.0
              50%                             15.0
              60%                             10.0
              70%                             10.0
              80%                             10.0
              90%                             10.0


********************************************************************************
  FLOW PROCESS FROM NODE    170.00 TO NODE    194.00 IS CODE = 3.1
--------------------------------------------------------------------------------
  >>>>>FLOW-THROUGH DETENTION BASIN ROUTING MODEL APPLIED TO STREAM #1<<<<<
================================================================================

                    INFLOW
                  (STREAM 1)
                       |
                       |
                       V                 __effective depth
                   ------------          |   (and volume)
                  |            |    |    |
                  |            |    |....V........
                  | detention  |<-->|             outflow
                  |   basin    |    |.........._______
                   ------------     |     ^     |   \
                       |            |  dead     |    basin outlet
                       V            | storage   |
                    OUTFLOW          ---------
                  (STREAM 1)


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


          BASIN DEPTH VERSUS OUTFLOW AND STORAGE INFORMATION:

           INTERVAL    DEPTH      OUTFLOW     STORAGE
            NUMBER      (FT)       (CFS)       (AF)
                1        0.00        0.00       0.000
                2        0.11       55.40       0.010
                3        0.31       56.40       0.140
                4        0.51       57.40       0.320
                5        0.71       58.40       0.490


================================================================================
 MODIFIED-PULS BASIN ROUTING MODEL RESULTS(5-MINUTE COMPUTATION INTERVALS):
 (Note: Computed EFFECTIVE DEPTH and VOLUME are estimated at the clock time;
```

MEAN OUTFLOW is the average value during the unit interval.)

CLOCK TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	LOSS (CFS)	EFFECTIVE DEPTH(FT)	MEAN OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
10.083	0.000	5.96	0.00	0.01	6.0	0.001
10.167	0.000	6.00	0.00	0.01	6.0	0.001
10.250	0.000	6.04	0.00	0.01	6.0	0.001
10.333	0.000	6.08	0.00	0.01	6.1	0.001
10.417	0.000	6.12	0.00	0.01	6.1	0.001
10.500	0.000	6.16	0.00	0.01	6.2	0.001
10.583	0.000	6.20	0.00	0.01	6.2	0.001
10.667	0.000	6.24	0.00	0.01	6.2	0.001
10.750	0.000	6.28	0.00	0.01	6.3	0.001
10.833	0.000	6.33	0.00	0.01	6.3	0.001
10.917	0.000	6.38	0.00	0.01	6.4	0.001
11.000	0.000	6.42	0.00	0.01	6.4	0.001
11.083	0.000	6.47	0.00	0.01	6.5	0.001
11.167	0.000	6.52	0.00	0.01	6.5	0.001
11.250	0.000	6.57	0.00	0.01	6.6	0.001
11.333	0.000	6.62	0.00	0.01	6.6	0.001
11.417	0.000	6.67	0.00	0.01	6.7	0.001
11.500	0.000	6.73	0.00	0.01	6.7	0.001
11.583	0.000	6.78	0.00	0.01	6.8	0.001
11.667	0.000	6.84	0.00	0.01	6.8	0.001
11.750	0.000	6.90	0.00	0.01	6.9	0.001
11.833	0.000	6.96	0.00	0.01	7.0	0.001
11.917	0.000	7.02	0.00	0.01	7.0	0.001
12.000	0.000	7.09	0.00	0.01	7.1	0.001
12.083	0.000	7.17	0.00	0.01	7.2	0.001
12.167	0.000	7.32	0.00	0.01	7.3	0.001
12.250	0.000	7.47	0.00	0.01	7.5	0.001
12.333	0.000	7.57	0.00	0.02	7.6	0.001
12.417	0.000	7.65	0.00	0.02	7.6	0.001
12.500	0.000	7.73	0.00	0.02	7.7	0.001
12.583	0.000	7.81	0.00	0.02	7.8	0.001
12.667	0.000	7.89	0.00	0.02	7.9	0.001
12.750	0.000	7.97	0.00	0.02	8.0	0.001
12.833	0.000	8.06	0.00	0.02	8.1	0.001
12.917	0.000	8.15	0.00	0.02	8.1	0.001
13.000	0.000	8.24	0.00	0.02	8.2	0.001
13.083	0.000	8.34	0.00	0.02	8.3	0.002
13.167	0.000	8.44	0.00	0.02	8.4	0.002
13.250	0.000	8.55	0.00	0.02	8.5	0.002
13.333	0.000	8.66	0.00	0.02	8.7	0.002
13.417	0.000	8.77	0.00	0.02	8.8	0.002
13.500	0.000	8.89	0.00	0.02	8.9	0.002
13.583	0.000	9.01	0.00	0.02	9.0	0.002
13.667	0.000	9.15	0.00	0.02	9.1	0.002
13.750	0.000	9.28	0.00	0.02	9.3	0.002
13.833	0.000	9.43	0.00	0.02	9.4	0.002
13.917	0.000	9.58	0.00	0.02	9.6	0.002
14.000	0.000	9.74	0.00	0.02	9.7	0.002
14.083	0.000	9.89	0.00	0.02	9.9	0.002
14.167	0.000	9.98	0.00	0.02	10.0	0.002
14.250	0.000	10.08	0.00	0.02	10.1	0.002
14.333	0.000	10.26	0.00	0.02	10.3	0.002
14.417	0.000	10.47	0.00	0.02	10.5	0.002
14.500	0.000	10.70	0.00	0.02	10.7	0.002
14.583	0.000	10.95	0.00	0.02	10.9	0.002
14.667	0.000	11.22	0.00	0.02	11.2	0.002
14.750	0.000	11.50	0.00	0.02	11.5	0.002
14.833	0.000	11.82	0.00	0.02	11.8	0.002
14.917	0.000	12.16	0.00	0.02	12.2	0.002
15.000	0.000	12.55	0.00	0.03	12.5	0.002
15.083	0.000	12.96	0.00	0.03	12.9	0.002
15.167	0.000	13.43	0.00	0.03	13.4	0.002
15.250	0.000	13.96	0.00	0.03	13.9	0.003
15.333	0.000	14.58	0.00	0.03	14.6	0.003
15.417	0.000	15.04	0.00	0.03	15.0	0.003
15.500	0.000	14.55	0.00	0.03	14.6	0.003
15.583	0.000	14.19	0.00	0.03	14.2	0.003
15.667	0.000	15.05	0.00	0.03	15.0	0.003
15.750	0.000	16.46	0.00	0.03	16.4	0.003
15.833	0.000	18.08	0.00	0.04	18.0	0.003
15.917	0.000	20.70	0.00	0.04	20.6	0.004
16.000	0.000	26.66	0.00	0.06	26.4	0.006
16.083	0.000	42.61	0.00	0.11	42.0	0.010
16.167	0.000	77.55	0.00	0.34	55.0	0.165
16.250	0.000	71.79	0.00	0.45	56.8	0.268
16.333	0.000	36.01	0.00	0.29	56.7	0.126
16.417	0.000	20.71	0.00	0.04	38.4	0.004
16.500	0.000	16.90	0.00	0.03	17.1	0.002
16.583	0.000	15.77	0.00	0.04	15.7	0.003
16.667	0.000	14.48	0.00	0.02	14.6	0.002
16.750	0.000	13.31	0.00	0.03	13.2	0.003
16.833	0.000	12.40	0.00	0.02	12.5	0.002
16.917	0.000	11.70	0.00	0.03	11.6	0.002
17.000	0.000	11.11	0.00	0.02	11.2	0.002
17.083	0.000	10.62	0.00	0.02	10.6	0.002
17.167	0.000	10.27	0.00	0.02	10.3	0.002
17.250	0.000	9.97	0.00	0.02	9.9	0.002
17.333	0.000	9.66	0.00	0.02	9.7	0.002
17.417	0.000	9.36	0.00	0.02	9.3	0.002
17.500	0.000	9.09	0.00	0.02	9.1	0.001
17.583	0.000	8.84	0.00	0.02	8.8	0.002
17.667	0.000	8.61	0.00	0.02	8.6	0.001
17.750	0.000	8.40	0.00	0.02	8.4	0.002
17.833	0.000	8.20	0.00	0.02	8.2	0.001
17.917	0.000	8.02	0.00	0.02	8.0	0.002
18.000	0.000	7.85	0.00	0.01	7.9	0.001
18.083	0.000	7.68	0.00	0.02	7.7	0.001
18.167	0.000	7.44	0.00	0.01	7.5	0.001
18.250	0.000	7.22	0.00	0.01	7.2	0.001
18.333	0.000	7.06	0.00	0.01	7.1	0.001
18.417	0.000	6.93	0.00	0.01	6.9	0.001
18.500	0.000	6.82	0.00	0.01	6.8	0.001
18.583	0.000	6.70	0.00	0.01	6.7	0.001
18.667	0.000	6.60	0.00	0.01	6.6	0.001
18.750	0.000	6.50	0.00	0.01	6.5	0.001
18.833	0.000	6.40	0.00	0.01	6.4	0.001
18.917	0.000	6.31	0.00	0.01	6.3	0.001
19.000	0.000	6.22	0.00	0.01	6.2	0.001
19.083	0.000	6.14	0.00	0.01	6.1	0.001

56.8 CFS
0.45' DEPTH
0.268 ac-ft

19.167	0.000	6.06	0.00	0.01	6.1	0.001
19.250	0.000	5.98	0.00	0.01	6.0	0.001
19.333	0.000	5.91	0.00	0.01	5.9	0.001
19.417	0.000	5.83	0.00	0.01	5.8	0.001
19.500	0.000	5.77	0.00	0.01	5.8	0.001
19.583	0.000	5.70	0.00	0.01	5.7	0.001
19.667	0.000	5.64	0.00	0.01	5.6	0.001
19.750	0.000	5.57	0.00	0.01	5.6	0.001
19.833	0.000	5.51	0.00	0.01	5.5	0.001
19.917	0.000	5.46	0.00	0.01	5.5	0.001
20.000	0.000	5.40	0.00	0.01	5.4	0.001
20.083	0.000	5.35	0.00	0.01	5.3	0.001
20.167	0.000	5.30	0.00	0.01	5.3	0.001
20.250	0.000	5.24	0.00	0.01	5.2	0.001
20.333	0.000	5.20	0.00	0.01	5.2	0.001
20.417	0.000	5.15	0.00	0.01	5.1	0.001
20.500	0.000	5.10	0.00	0.01	5.1	0.001
20.583	0.000	5.06	0.00	0.01	5.1	0.001
20.667	0.000	5.01	0.00	0.01	5.0	0.001
20.750	0.000	4.97	0.00	0.01	5.0	0.001
20.833	0.000	4.93	0.00	0.01	4.9	0.001
20.917	0.000	4.89	0.00	0.01	4.9	0.001
21.000	0.000	4.85	0.00	0.01	4.9	0.001
21.083	0.000	4.81	0.00	0.01	4.8	0.001
21.167	0.000	4.77	0.00	0.01	4.8	0.001
21.250	0.000	4.74	0.00	0.01	4.7	0.001
21.333	0.000	4.70	0.00	0.01	4.7	0.001
21.417	0.000	4.67	0.00	0.01	4.7	0.001
21.500	0.000	4.63	0.00	0.01	4.6	0.001
21.583	0.000	4.60	0.00	0.01	4.6	0.001
21.667	0.000	4.57	0.00	0.01	4.6	0.001
21.750	0.000	4.53	0.00	0.01	4.5	0.001
21.833	0.000	4.50	0.00	0.01	4.5	0.001
21.917	0.000	4.47	0.00	0.01	4.5	0.001
22.000	0.000	4.44	0.00	0.01	4.4	0.001
22.083	0.000	4.41	0.00	0.01	4.4	0.001
22.167	0.000	4.38	0.00	0.01	4.4	0.001
22.250	0.000	4.36	0.00	0.01	4.4	0.001
22.333	0.000	4.33	0.00	0.01	4.3	0.001
22.417	0.000	4.30	0.00	0.01	4.3	0.001
22.500	0.000	4.28	0.00	0.01	4.3	0.001
22.583	0.000	4.25	0.00	0.01	4.3	0.001
22.667	0.000	4.22	0.00	0.01	4.2	0.001
22.750	0.000	4.20	0.00	0.01	4.2	0.001
22.833	0.000	4.18	0.00	0.01	4.2	0.001
22.917	0.000	4.15	0.00	0.01	4.2	0.001
23.000	0.000	4.13	0.00	0.01	4.1	0.001
23.083	0.000	4.10	0.00	0.01	4.1	0.001
23.167	0.000	4.08	0.00	0.01	4.1	0.001
23.250	0.000	4.06	0.00	0.01	4.1	0.001
23.333	0.000	4.04	0.00	0.01	4.0	0.001
23.417	0.000	4.02	0.00	0.01	4.0	0.001
23.500	0.000	4.00	0.00	0.01	4.0	0.001
23.583	0.000	3.97	0.00	0.01	4.0	0.001
23.667	0.000	3.95	0.00	0.01	4.0	0.001
23.750	0.000	3.93	0.00	0.01	3.9	0.001
23.833	0.000	3.91	0.00	0.01	3.9	0.001
23.917	0.000	3.89	0.00	0.01	3.9	0.001

PROCESS SUMMARY OF STORAGE:
INFLOW VOLUME = 14.178 AF
BASIN STORAGE = 0.000 AF (WITH 0.000 AF INITIALLY FILLED)
OUTFLOW VOLUME = 14.179 AF
LOSS VOLUME = 0.000 AF

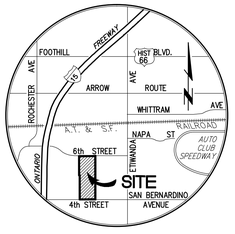
==========

END OF FLOODSCx ROUTING ANALYSIS

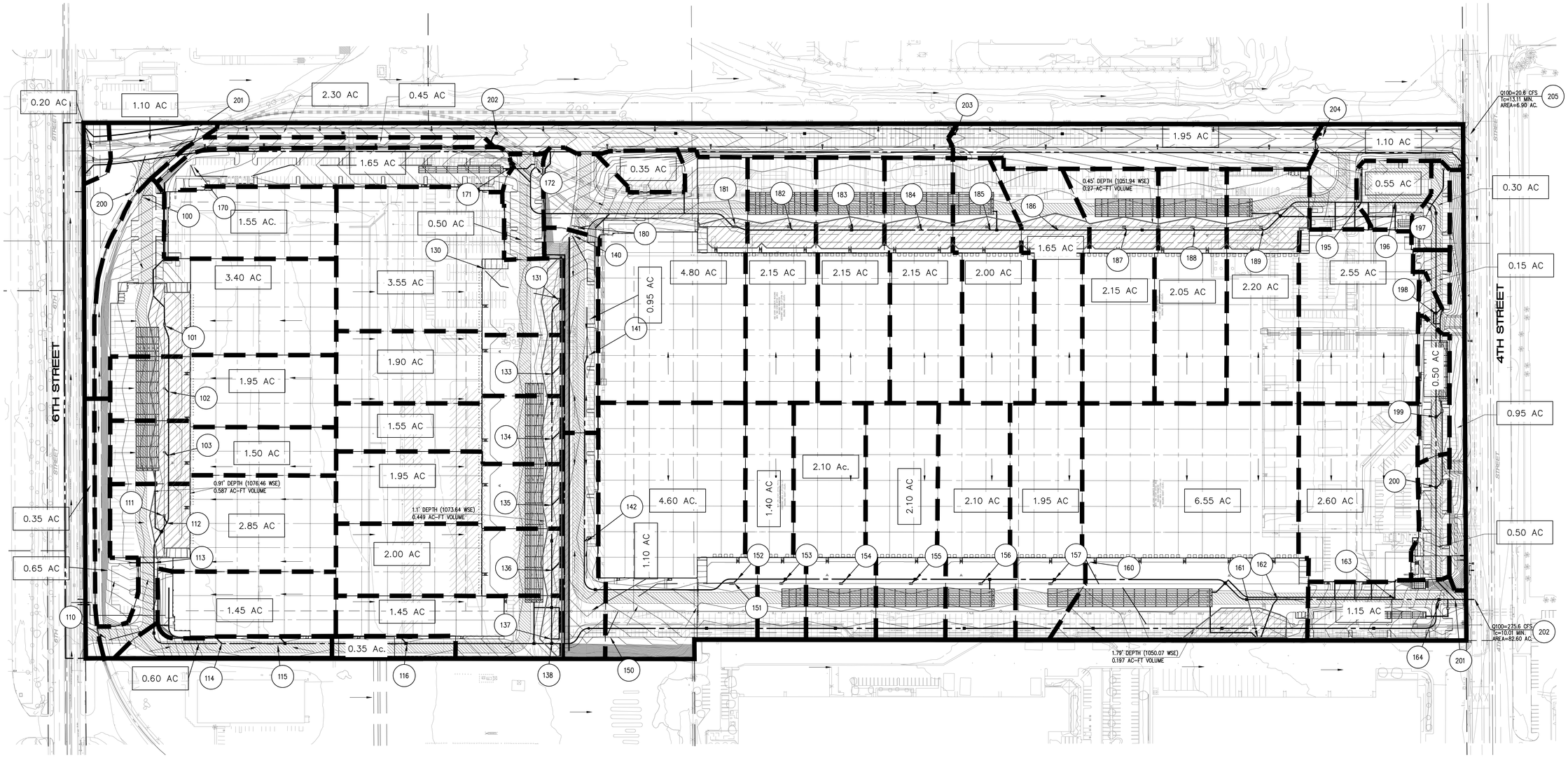
♀

APPENDIX D

HYDROLOGY MAP



VICINITY MAP
N.T.S.



LEGEND

- PROJECT BOUNDARY
- SUBAREA BOUNDARY
- FLOW LINE
- 9.10 AC. — SUBAREA AREA
- 100 — NODE NUMBER
- PONDING LIMITS

0 50 100 200 300
SCALE: 1"=100'

CITY OF RANCHO CUCAMONGA
PUBLIC WORKS DEPARTMENT

PROPOSED CONDITION HYDROLOGY MAP

BRIDGE POINT RANCO CUCAMONGA 4TH STREET

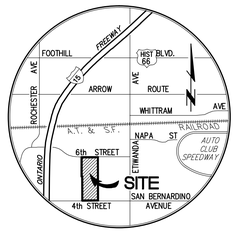
PREPARED FOR:

BRIDGE DEVELOPMENT PARTNERS, LLC
11100 SANTA MONICA BLVD., SUITE 700
LOS ANGELES, CA 90025
(213)-805-6667 PHONE
(310)-853-8423 FAX

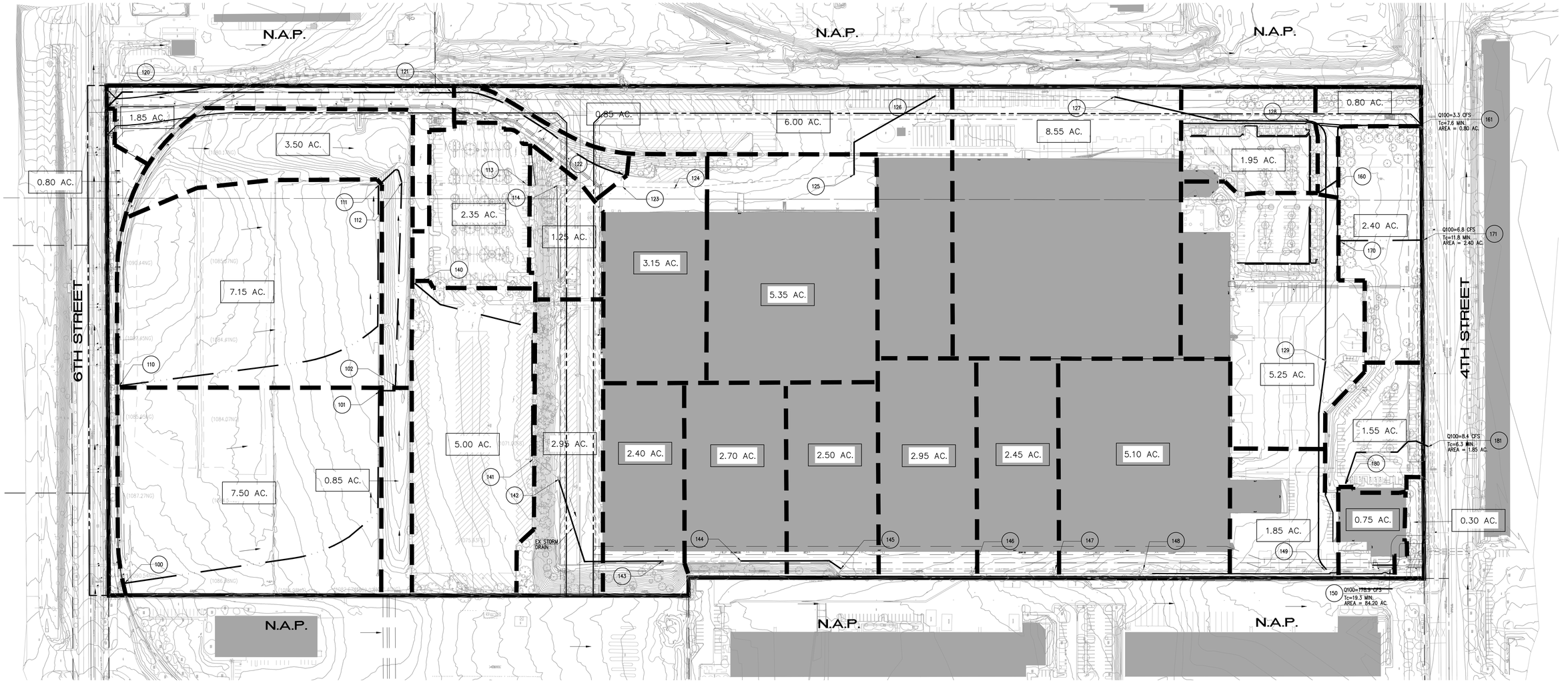
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

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

Last Update:1/20/21
O:\3600-3699\3619\361BHYD-2 BUILDING.dwg



VICINITY MAP
N.T.S.



LEGEND

- PROJECT BOUNDARY
- SUBAREA BOUNDARY
- FLOW LINE
- 9.10 AC. — SUBAREA AREA
- 100 — NODE NUMBER
- FLOW DIRECTION

0 50 100 200 300
SCALE: 1"=100'

PREPARED FOR:
BRIDGE DEVELOPMENT PARTNERS, LLC
11100 SANTA MONICA BLVD., SUITE 700
LOS ANGELES, CA 90025
(213)-805-6667 PHONE
(310)-853-8423 FAX

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

CITY OF RANCHO CUCAMONGA
PUBLIC WORKS DEPARTMENT

EXISTING CONDITION HYDROLOGY MAP

BRIDGE POINT RANCO CUCAMONGA 4TH 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

Last Update:12/14/20
O:\3800-3899\3819\3819HYD-EX.dwg