Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING

PRELIMINARY HYDROLOGY CALCULATIONS

FOR

PEN19-0193/LST20-0008
MORENO VALLEY TRADE CENTER
OPTION 2-E COMMERCE/FULFILLMENT CENTER SITE PLAN
EUCALYPTUS AVENUE AND REDLANDS BLVD.
MORENO VALLEY, CALIFORNIA

PREPARED FOR

HILLWOOD INVESTMENTS
901 VIA PIEMONTE, STE 1775
ONTARIO, CA 91764

PHONE: (909) 382-0033

JANUARY 24, 2020
REVISED: JULY 17, 2020
REVISED: OCTOBER 27, 2020
REVISED MARCH 24, 2021

JOB NO. 3828

PREPARED BY

THIENES ENGINEERING
14349 FIRESTONE BLVD.
LA MIRADA, CALIFORNIA 90638
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FOR
PEN19-0193/LST20-0008
MORENO VALLEY TRADE CENTER
OPTION 2-E COMMERCE/FULFILLMENT CENTER SITE PLAN

PREPARED UNDER
THE SUPERVISION OF:

_____

REINHARD STENZEL DATE:
R.C.E. 56155
EXP. 12/31/2020

TABLE OF CONTENTS

INTRODUCTION

A: PROJECT LOCATION

The project site is located at southwest corner of Eucalyptus Avenue and Redlands Boulevard in the City of Moreno Valley. Encelia Avenue is adjacent to the southerly property line. Please see the next page for vicinity map.

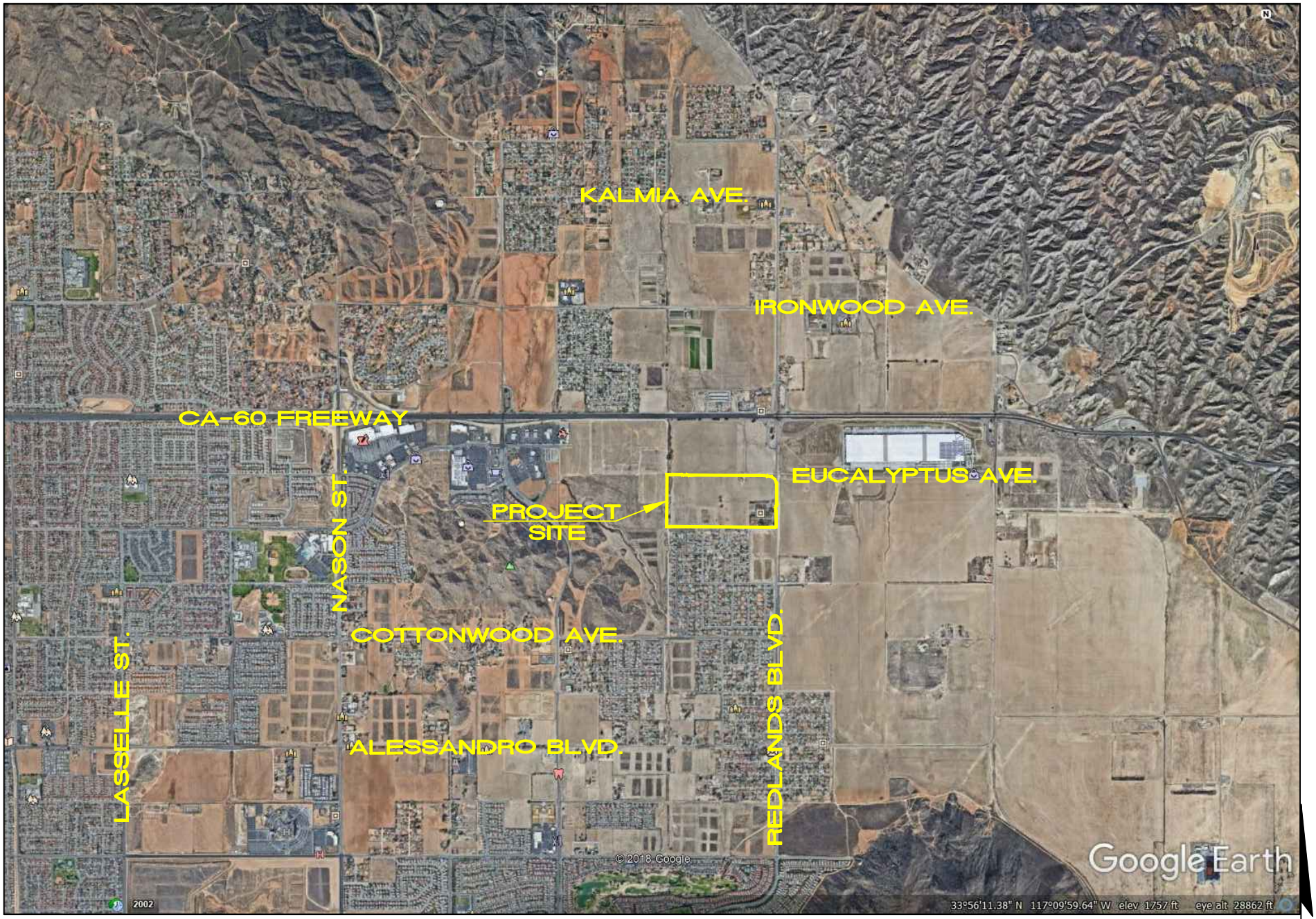
B: STUDY PURPOSE

The purpose of this study is to determine the existing and proposed condition peak flow rates for various storm events for the site. Discharge from the project site ultimately drains to an existing storm drain in Redlands Boulevard.

C: PROJECT STAFF:

Thienes Engineering staff involved in this study include:

Reinhard Stenzel
Kristie Ferronato
Brian Weil



Last Update:11/6/19
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Thienes Engineering, Inc.
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"VICINITY MAP"

FOR

EUCALYPTUS AVE. AND REDLANDS BLVD.

N

NOT TO SCALE

DISCUSSION

The project site encompasses approximately 72.73 acres. However, several acres along the westerly property line are within an existing drainage channel (Quincy Wash) and will not be disturbed. Here, sheet piles will be constructed within the property site to protect the site from the Wash. Proposed improvements include one warehouse type building with approximately 1,328,853 square feet. There are truck yard areas on the northerly and southerly sides of the building. Vehicle parking is primarily on the easterly side of the property with some additional parking areas along the westerly drive aisle. There is a water quality/detention basin located along the southerly side of the side adjacent to Encelia Avenue. Additional landscaped areas are located adjacent to the streets and smaller areas throughout the project site.

Master Plan of Drainage

The project site is tabled to a storm drain system in Redlands Boulevard (Moreno MDP Line F-2). At this time, only portions of the Master Plan Storm Drain system are constructed. Recent improvements to the north of the project site (Aldi Foods) constructed a portion of the ultimate storm drain in Redlands Boulevard. This is a 60"-72" storm drain (plans prepared by Huitt-Zollars) that connects to an existing 51" storm drain in Redlands Boulevard approximately 200' north of Eucalyptus Avenue and continues approximately 350' south of Eucalyptus Avenue to where it daylights into an existing unimproved earthen channel. This storm drain and channel is located at the easterly portion of the project site.

Runoff continues southerly in the unimproved earthen channel to an existing headwall located northerly of Dracaea Avenue. This is the upstream portion of Riverside County Flood Control and Water Conservation District storm drain Line "F-2". This is an existing 42" storm drain system that does not appear to be adequately sized for the peak flow rates specified in the recently constructed upstream storm drain system. The existing storm drain continues southerly past Brodiaea Avenue and discharges into an existing earthen channel (Line "F").

The Master Drainage Plan indicates a storm drain system in Eucalyptus Avenue (Lateral F-16). The necessary portions of this storm drain system was constructed with the Aldi Foods development to the north. In a memo dated December 23, 2020, Riverside County Flood Control and Water Conservation District (R.C.F.C.& W.C.D.) acknowledges that the "existing facility is functionally equivalent to Line F-16, and the remaining unconstructed portion is not necessary to provide flood protection." See Appendix "A" for a copy of this memo.

The Master Drainage Plan also indicates a storm drain system in Encelia Avenue (Lateral F-17) ranging from 42" to 60". The development of the project site will utilize a detention basin and onsite storm drain systems that will greatly reduce flow to Encelia Avenue such

that only a shorter and smaller storm drain will be necessary in the street. In the same memo, R.C.F.C.& W.C.D. states "Since these facilities together collect and convey the same area that was tabled to Line F-17, it is our opinion that the existing facility is functionally equivalent to Line F-17".

See Appendix "A" for reference existing storm drain plans and a portion of the Master Drainage Plan.

Existing Condition

The project site is generally a vacant lot with natural grasses and weeds. The southeasterly portion of the site is an existing plant nursery. The nursery has a few small structures and appears unpaved. The westerly portion of the property is an unimproved drainage channel (Quincy Wash) and is not tributary to the project site.

Runoff from the site generally drains from north to south to Encelia Avenue at several locations (nodes 103, 105, 106, and 107 on existing condition hydrology map). Encelia Avenue drains from west to east to Redlands Boulevard ultimately to the existing channel adjacent to Redlands Boulevard.

Runoff from Redlands Boulevard flows southerly towards the intersection with Encilia Avenue and node 107. The 100-year Rational Method peak flow rate from the project site and adjacent streets approximately 109.2 cfs.

Runoff in Eucalyptus flows west to east and is intercepted by several riser inlet structures (nodes 112, 121, and 131). The respective 100-year Rational Method flow rates to each risers are approximately 4.2 cfs, 1.6 cfs, and 0.90 cfs.

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

Existing condition hydrographs were established for various storm events. These peak flow rates and volumes are summarized below in the Detention discussion.

Proposed Condition Hydrology

Runoff from the westerly drive isle and auto parking area (nodes 100-112) is collected in a catch basin in the drive isle and conveyed south in a private storm drain to the series of detention basins. The auto parking lot adjacent to the building (nodes 110-111) drains to a catch basin and into a storm drain system that travels south and east through the truck yard to the catch basins at node 112. The roof drains for the southwesterly portion of the building will be hard-lined to the storm drain system at node 112 and the combined flow will discharge to Basin 1. Basin 1 does not have sufficient volume to detain peak flows, so

runoff will pond to a certain height then overflow into Basin 2. The peak 100-year flow rate to Basin 1 is approximately 17.9 cfs.

The majority of the southern truck yard and southerly portion of the building (nodes 200-222) will drain southerly to a series of catch basins and flow through a short storm drain into detention Basin 2. Overall, the total 100-year Rational Method peak flow rate to the detention area is approximately 56.0 cfs.

Runoff from the northerly half of the proposed building and the northerly truck yard (nodes 300-309 on hydrology map) will drain to a series of catch basins located in the truck yard area. A proposed storm drain will convey runoff easterly around the building then southerly to the Basin 3. Basin 3 does not have sufficient volume to detain peak flows, so a portion of the runoff to the basin will be detained in an underground storage system. The peak 100-year flow rate to Basin 3 is approximately 58.0 cfs.

The easterly portion of the site consisting of a portion of the truck yard and roof, auto parking, and a drive isle will drain southerly to Basin 4 (nodes 400-432). Runoff will enter the storm drain via catch basins in each parking lot and discharge into the basin. This basin does not have sufficient storage to detain peak flow, so a majority of high-flows will flow into the underground storage system. The 100-year peak flow rate to Basin 4 is approximately 50.1 cfs.

Discharge from the above and below ground storage basins will be conveyed easterly through the project site in a proposed storm drain and connect to the proposed extension of the public storm drain system in Redlands Boulevard. This will eliminate runoff to Encelia Avenue as well as the need for Master Drainage Plan Lateral "F-17", as previously mentioned in R.C.F.C.& W.C.D. memo dated December 23, 2020. The proposed public storm drain will be sized to include the ultimate peak flow rates upstream as well as the discharge from the detention basin. Final design will dictate exact pipe sizes. The public storm drain will continue south in place of the open earth channel to the existing 42" storm drain near Dracaea Avenue. The existing headwall will be removed and the proposed drain will connect to the existing system.

The existing 42" downstream storm drain system does not have the same capacity as the proposed 78" storm drain system. To avoid overburdening the existing 42" storm drain, a relief system will be designed to ensure that flow not allowed into the existing facility can discharge to the street. This will emulate existing conditions where runoff that is not currently allowed into the storm drain (via existing headwall adjacent to the Redlands Avenue) can then drain to the street. Regardless of how the storm drain systems connect, runoff exceeding the capacity of the 42" storm drain system remains on westerly surface of Redlands Avenue. The final design shall be to the satisfaction of the City Manager or City Engineer.

The landscaped areas adjacent to Encelia Avenue will sheet flow to the street and join the street runoff flowing easterly towards the intersection with Redlands Boulevard (nodes 600-603). The runoff will be intercepted by a catch basin in Encilia Avenue and will enter

the proposed public storm drain in Redlands Boulevard. The 100-year Rational Method peak runoff from these areas is approximately 6.1 cfs. With the proposed onsite improvements, this is the only drainage system required in Encilia Avenue.

The landscaped frontage along Eucalyptus Avenue will also drain to the street. Catch Basins at nodes 502 and 511 will intercept street and landscape runoff and convey it to the existing 54" storm drain in Eucalyptus Avenue. The 100-year Rational Method peak runoff to these nodes will be approximately 4.4 cfs and 2.8 cfs respectively.

Runoff from Redlands Boulevard and the adjacent project frontage will flow southerly within Redlands Boulevard to a catch basin near the intersection with Encilia Avenue (nodes 520-522). The 100-year Rational Method peak runoff to node 522 will be approximately 4.9 cfs.

Approximately 2.80 acres of area adjacent to the Quincy Wash at the westerly portion of the site will remain undisturbed. Landscaped areas adjacent to Redlands Boulevard and Encelia Avenue will sheet flow to the respective streets.

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

Detention

Since downstream facilities do not appear to have capacity for the increase in peak flow and volume from the proposed commercial project, detention will be required to limit runoff to no more than that under existing conditions. Detention analysis is considered for the 2-, 5-, 10- and 100-year storm events. Riverside County allows "preliminary sizing of the increased runoff basin may be based on the difference in volume between the developed condition and the pre-developed condition for the 24-hour duration event for the 10-year return frequency."

1-, 3-, 6-, and 24-hour hydrographs were established for all areas tributary to the detention basin for the 2-, 5-, 10- and 100-year events for both existing (undeveloped) and proposed conditions. For existing conditions, the land use is considered "open brush, poor cover". Proposed conditions assume all commercial development. Rainfall values are taken from the Riverside County Hydrology Manual. For the 2- and 5-year events, the loss rate is determined using an AMC I condition. For the 10-year event, AMC II was used and for the 100-year event AMC III was used.

The following table summarizes existing and proposed condition peak flow rates and volumes associated with the area to the detention basins. From the table, the largest difference in volume is approximately 12.71 acre-feet (10-year 24-hour event). This volume corresponds to the Riverside County's preliminary sizing difference stated above. The largest difference in peak flow rate is about 48.1 cfs (5-year 1-hour event).

There are four distinct detention basins. They are located on the southerly side of the site adjacent to Encelia Avenue. The two westerly basins will be connected and the two easterly basins will be connected to work together. To determine the required volumes at each detention area, the largest difference in volume will be prorated based on the tributary area to each detention basin. The westerly two basins will receive approximately 28.8 acres of tributary area (41.3% of the project site) while the easterly two basins basin will receive approximately 39.3 acres of tributary area (56.4% of the project site). The remaining 1.55 acres (2.3%) is generally landscaping and driveways that surface drain to the adjacent streets.

Based on the prorated volumes, the westerly basins required volume is approximately 5.25 acre-feet (41.3% of 12.71 acre-feet) and the easterly basins required volume is approximately 7.17 acre-feet (56.4% of 12.71 acre-feet). The available volume in the westerly$_2$ and easterly$_2$ basins is approximately 11.10 acre-feet and 3.62 acre-feet respectively. Additional storage is necessary for the easterly portion of the site. Here, additional volume is provided in underground pipe system located in the truck yard. A minimum of 3.55 acre-feet is required (7.17 - 3.62). The basins also meet the surface area and volume requirements necessary for water quality purposes per separate Water Quality Management Plan.

Final design will dictate the outlet features that will limit runoff from all of the above events to less than existing conditions. The landscaped areas tributary to the street would yield peak flow rates similar to existing condition and are not included in the hydrographs.

See Appendix "C" for existing and proposed condition hydrographs.

BASIN SUMMARY TABLE

Return Event (year)	Storm Duration (hour)	Existing Total Flow (cfs)	Existing Total Volume (ac-ft)	Proposed Total Flow (cfs)	Proposed Total Volume (ac-ft)	Peak Flow Difference (cfs)	Volume Difference (ac-ft)
100	1	131.5	5.89	177.0	6.38	45.5	0.49
100	3	88.3	7.96	103.5	9.62	15.2	1.66
100	6	77.8	9.16	89.8	12.81	12.0	3.65
100	24	31.9	12.27	37.9	22.68	6.0	10.41
10	1	73.5	2.78	113.0	4.06	39.5	1.28
10	3	45.5	2.67	65.2	6.24	19.7	3.57
10	6	40.1	2.93	57.8	8.59	17.7	5.66
10	24	8.8	2.25	23.8	14.50	15.0	12.25
5	1	47.0	1.38	93.3	3.38	46.3	2.00
5	3	23.8	1.20	54.5	5.27	30.7	4.07
5	6	19.9	1.31	49.5	7.38	29.6	6.07
5	24	2.2	1.34	19.7	12.05	17.5	10.71
2	1	29.8	0.87	69.2	2.53	39.4	1.66
2	3	12.1	0.67	41.6	4.02	29.5	3.35
2	6	10.1	0.80	38.8	5.79	28.7	4.99
2	24	1.6	0.98	14.4	8.81	12.8	7.83

Methodology

Hydrology calculations were computed using Riverside County Rational Method program (by AES software). Hydrograph were computed using CIVILD software. The soil type is "B" per Riverside County Hydrology Manual. See Appendix "A" for reference material from the Riverside County Hydrology Manual.

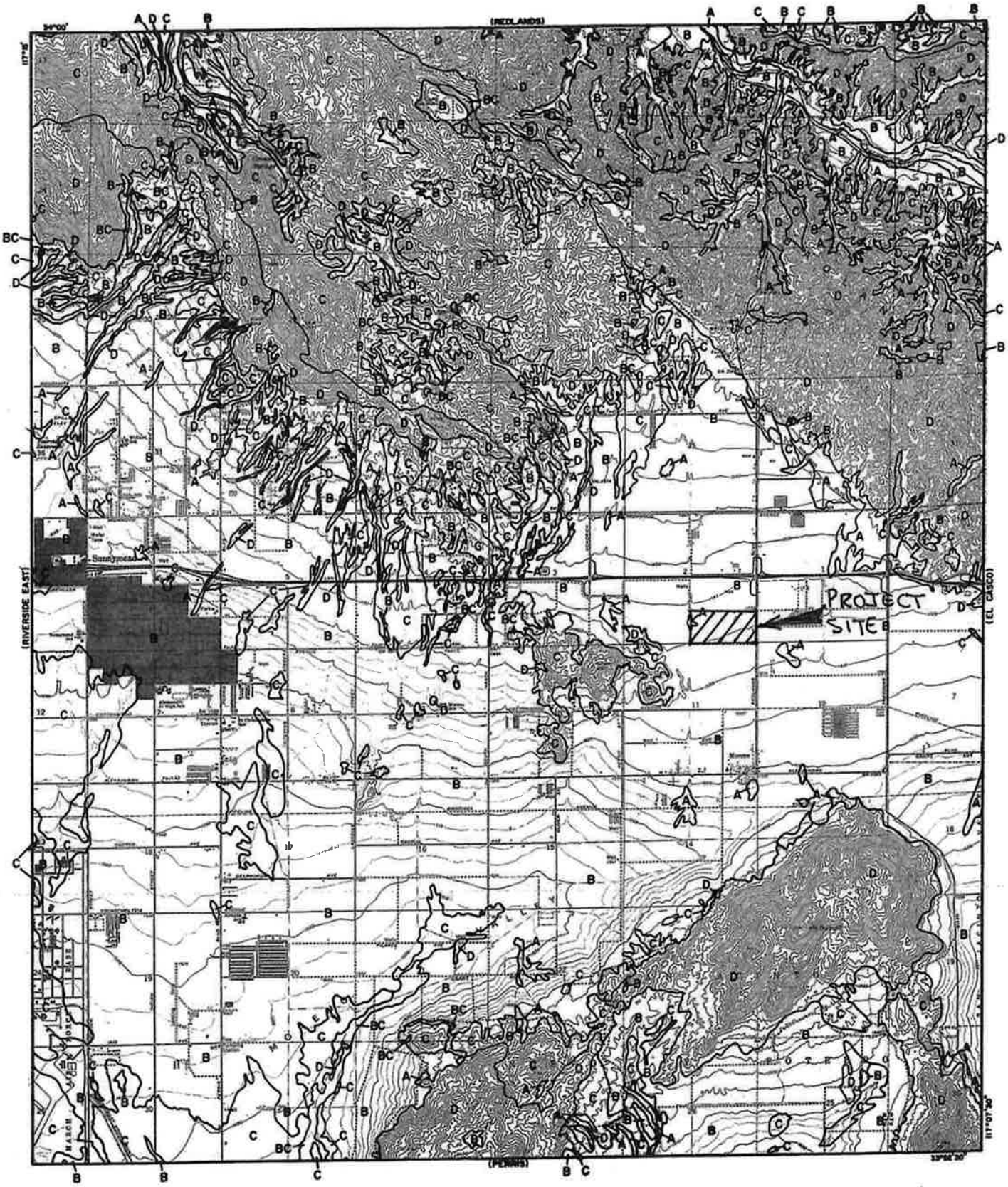
Summary

The project site will utilize onsite detention to reduce flow from the above mentioned storm events to less than or equal to existing conditions. The Master Drainage Plan facility in Eucalyptus Avenue was constructed with the project site to the north. The design of the project site will eliminate almost all runoff to Encilia Avenue, thus not requiring the 42"-60" Master Drainage Plan facility at this location. However, a storm drain system is proposed to intercept what runoff does drain to Encilia Avenue. Quincy Wash is an existing earthen channel at the westerly portion of the property. The Quincy Wash will remain natural and sheet piles will be constructed within the property site to protect the site from flow in the Wash.

All onsite and public storm drain facilities will be sized with precise grading plans. Final hydrology study will include basin routing and hydraulic calculations to support basin and storm drain sizing.

APPENDIX A

REFERENCE MATERIAL



LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

RCFC & WCD

HYDROLOGY MANUAL

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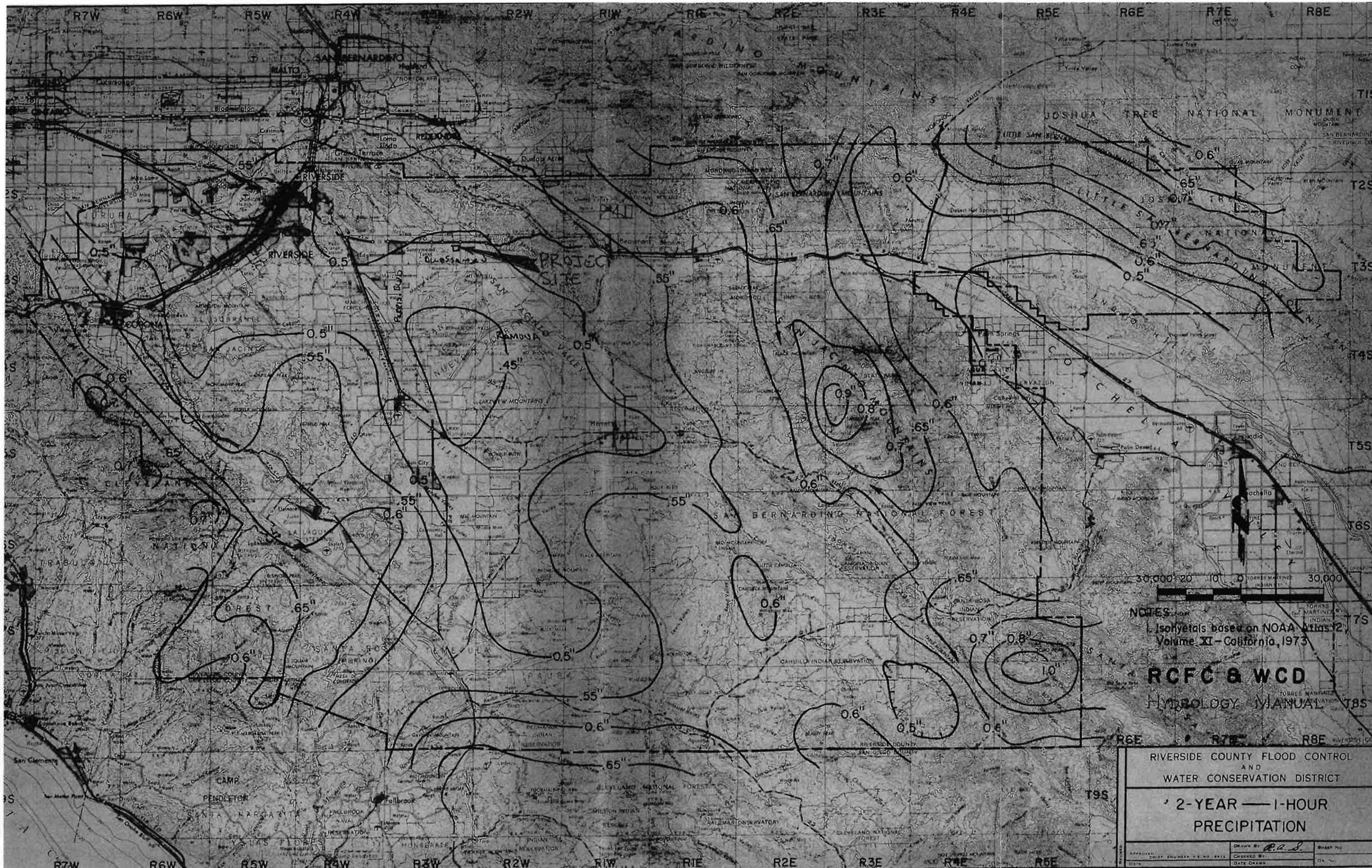
HYDROLOGIC SOILS GROUP MAP FOR SUNNYMEAD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RCFC & WCD
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AND
WATER CONSERVATION DISTRICT
2-YEAR — 1-HOUR
PRECIPITATION
PROJECT SITE
JOSHUA TREE NATIONAL MONUMENT
SAN BERNARDINO NATIONAL FOREST
CLEVELAND NATIONAL FOREST
COACHELLA VALLEY
SAN JACINTO MOUNTAINS
RIVERSIDE
SAN BERNARDINO
CORONA
Palm Springs
Indio
Coachella
San Clemente
CAMP PENDLETON
Fallbrook
TEMECULA
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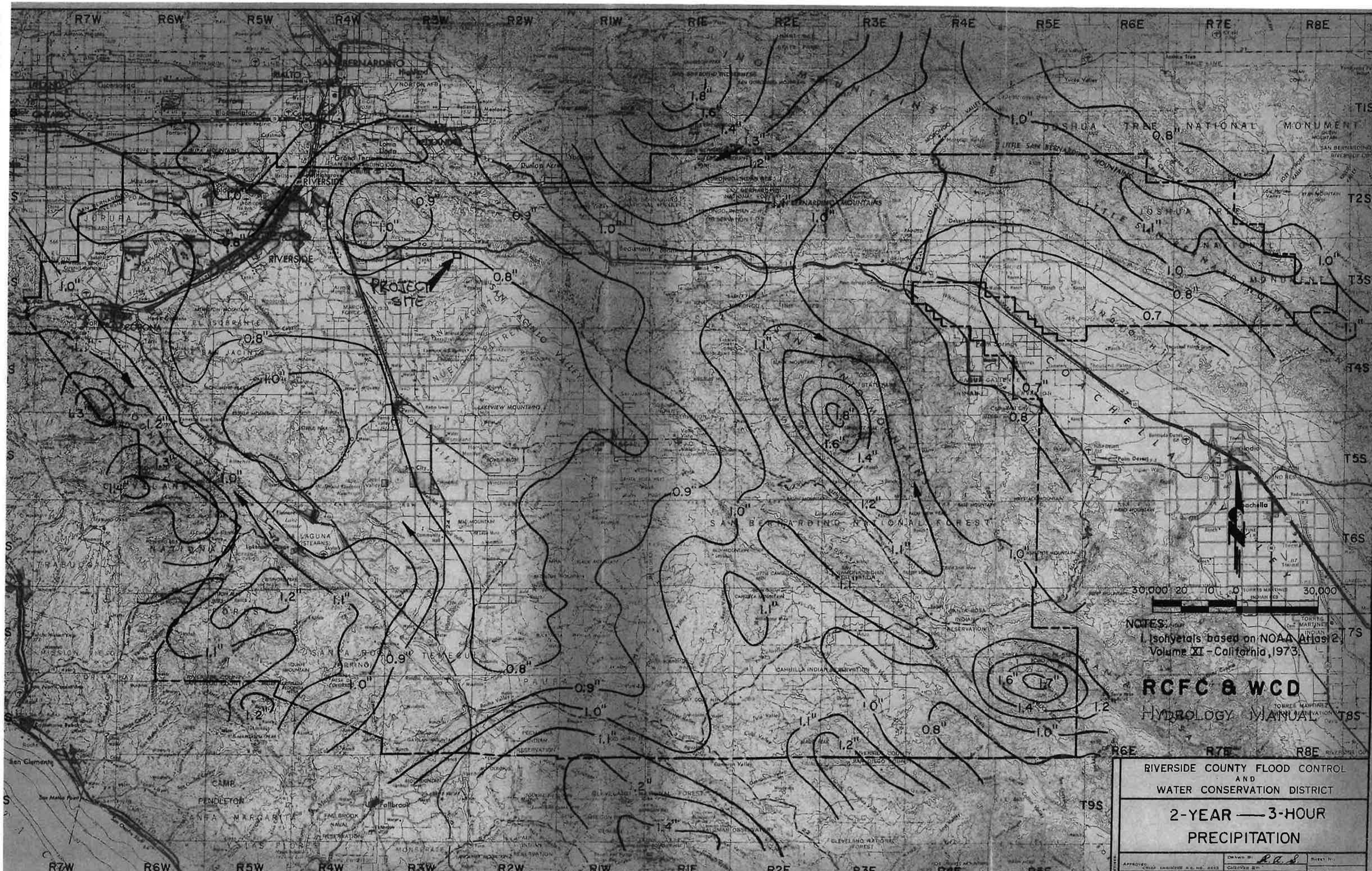
PLATE D-4,3



RIVERSIDE COUNTY FLOOD CONTROL
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WATER CONSERVATION DISTRICT
2-YEAR —— 3-HOUR
PRECIPITATION
RCFC & WCD
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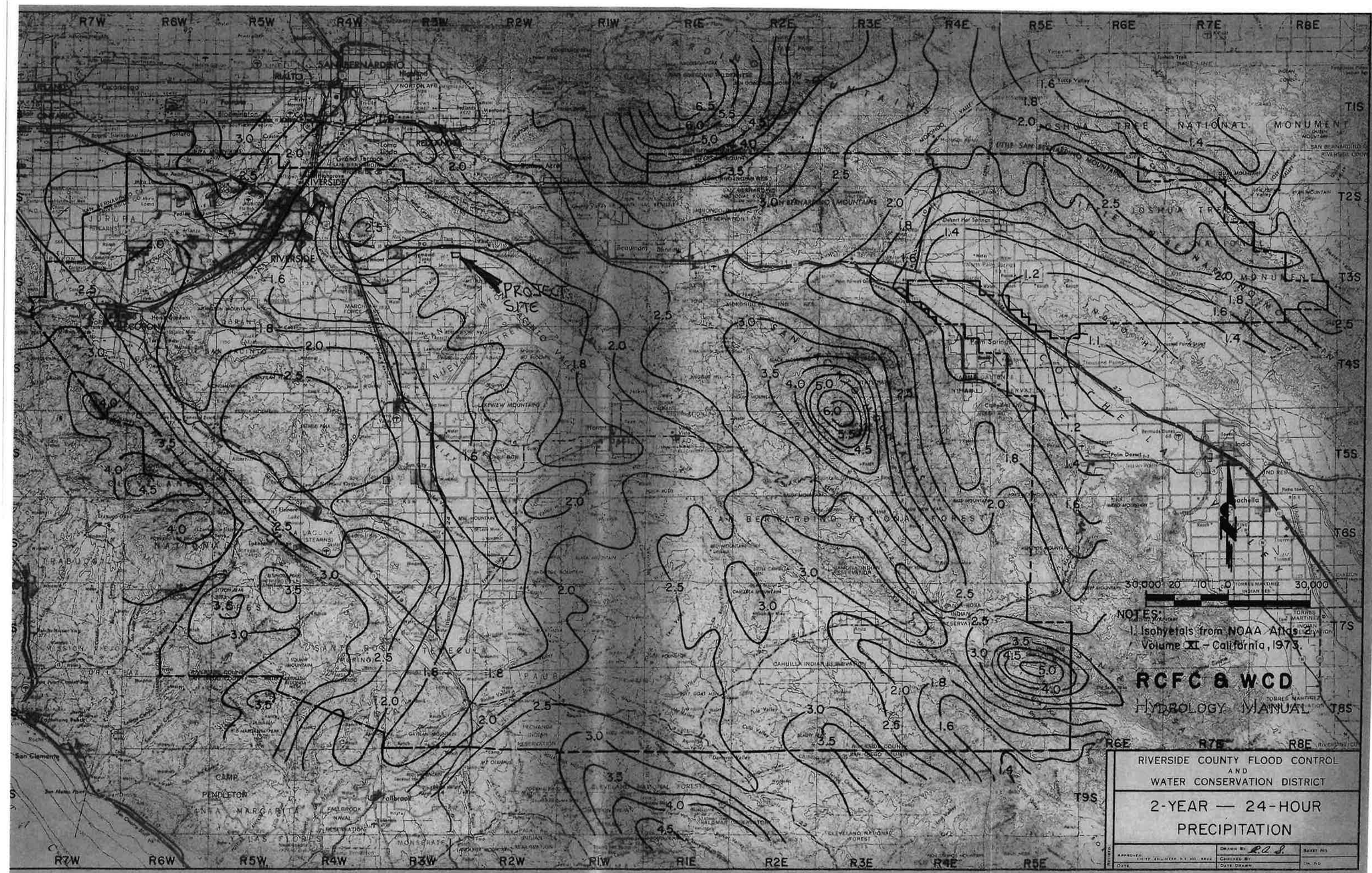
SAN BERNARDINO
RIVERSIDE
CORONA
JOSHUA TREE NATIONAL MONUMENT
SAN BERNARDINO NATIONAL FOREST
CAMP PENDLETON
Fallbrook
San Clemente

PLATE E-5.1


PROJECT SITE
NOTES:
1. Isohyetals from NOAA Atlas 2 Volume XI - California, 1973
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 6-HOUR
PRECIPITATION

PLATE E-5.3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RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
2-YEAR — 24-HOUR PRECIPITATION
DRAWN BY R.A.S.
CHECKED BY
DATE DRAWN
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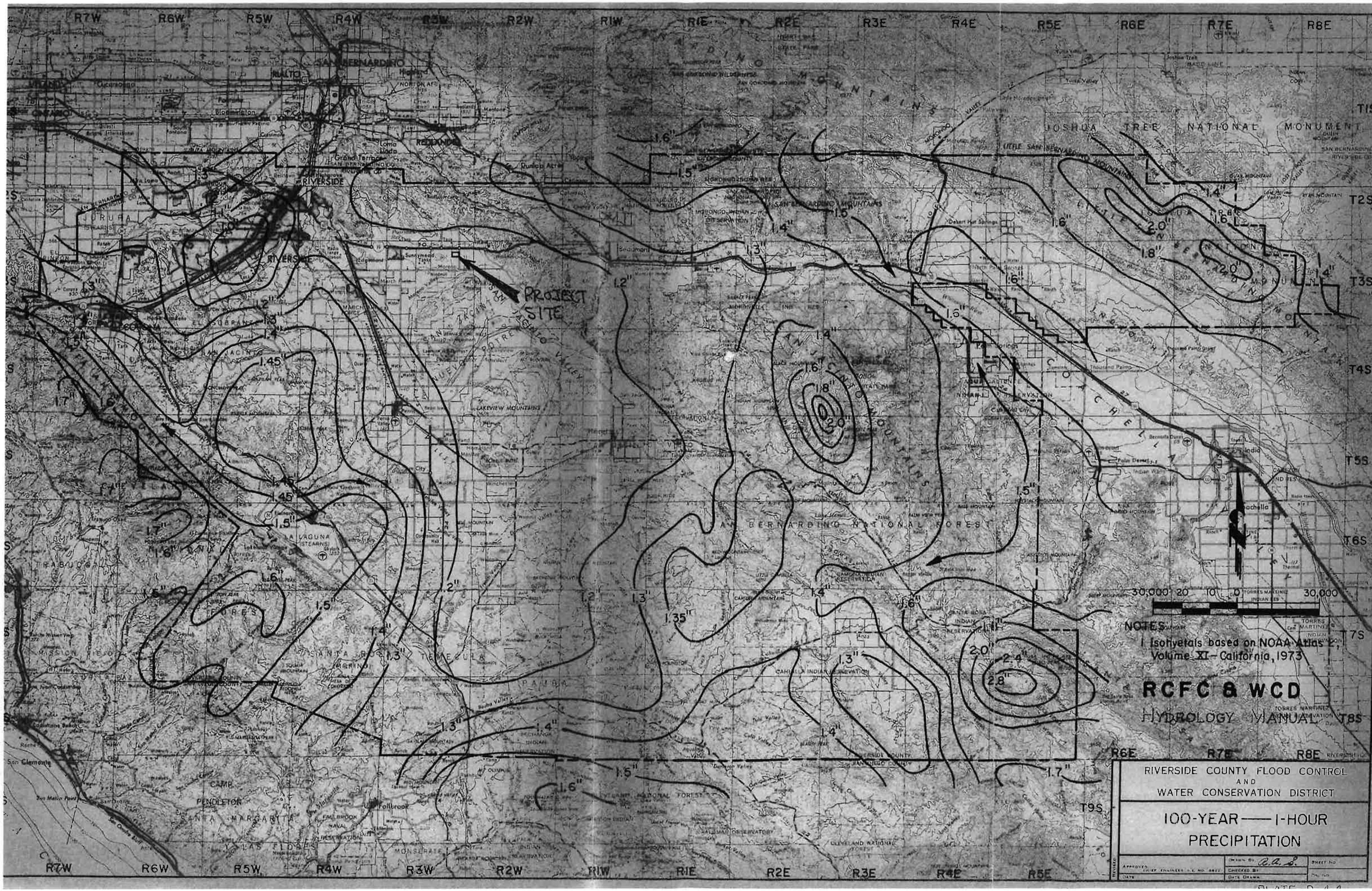
DR. NO

PLATE E-5.5


RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR —— 1-HOUR
PRECIPITATION
RCFC & WCD
HYDROLOGY MANUAL
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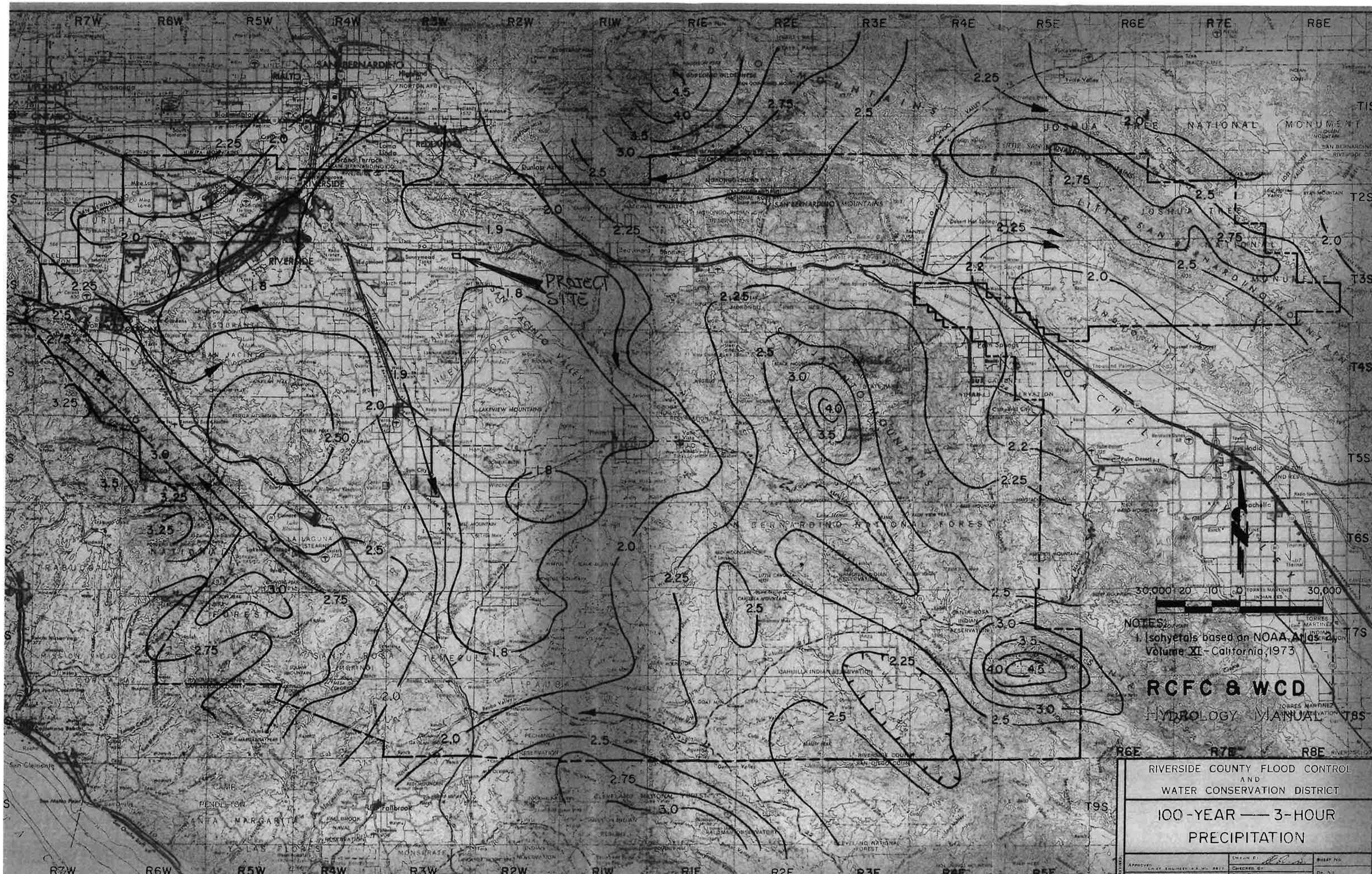
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100-YEAR — 3-HOUR PRECIPITATION
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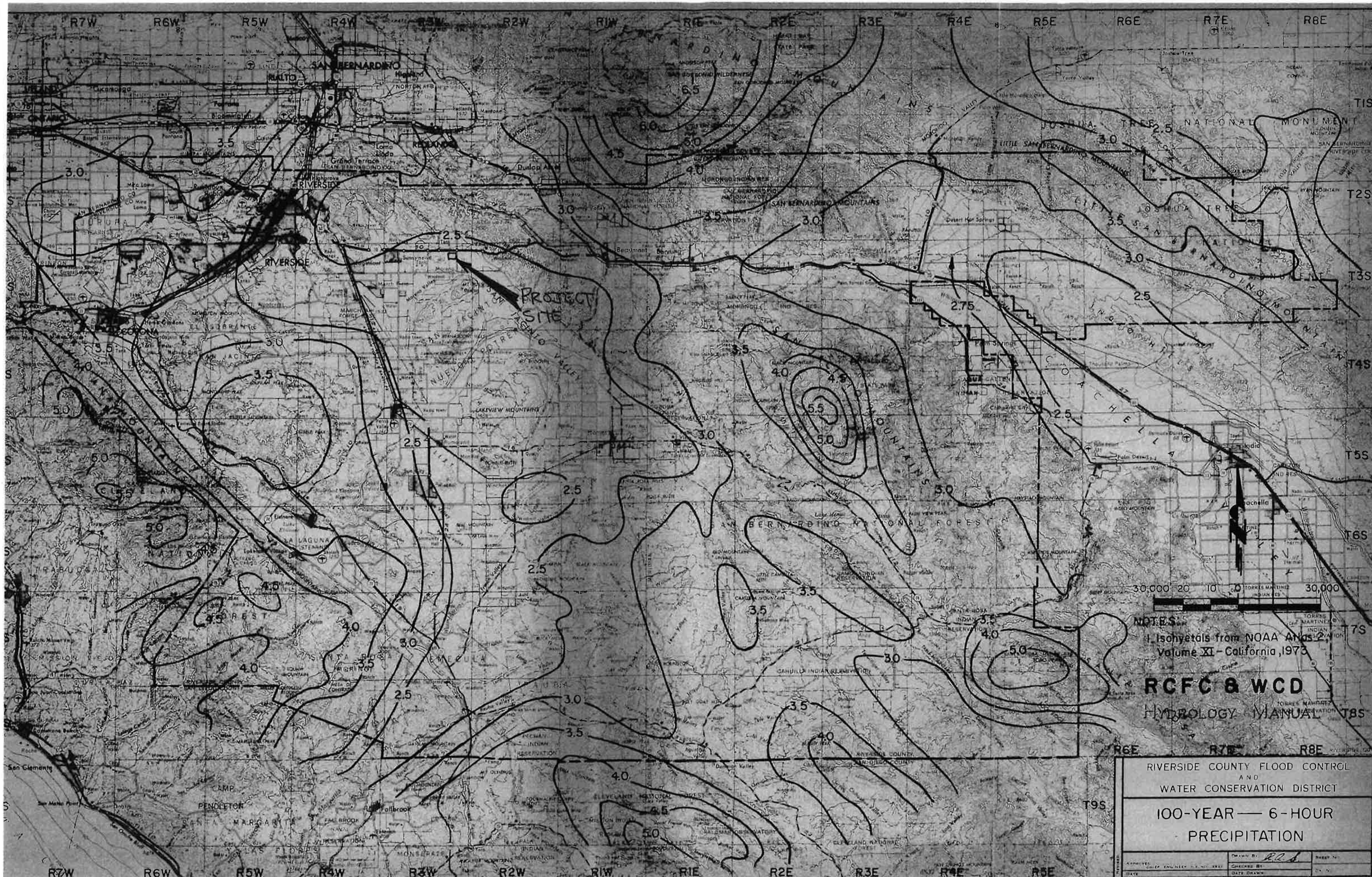
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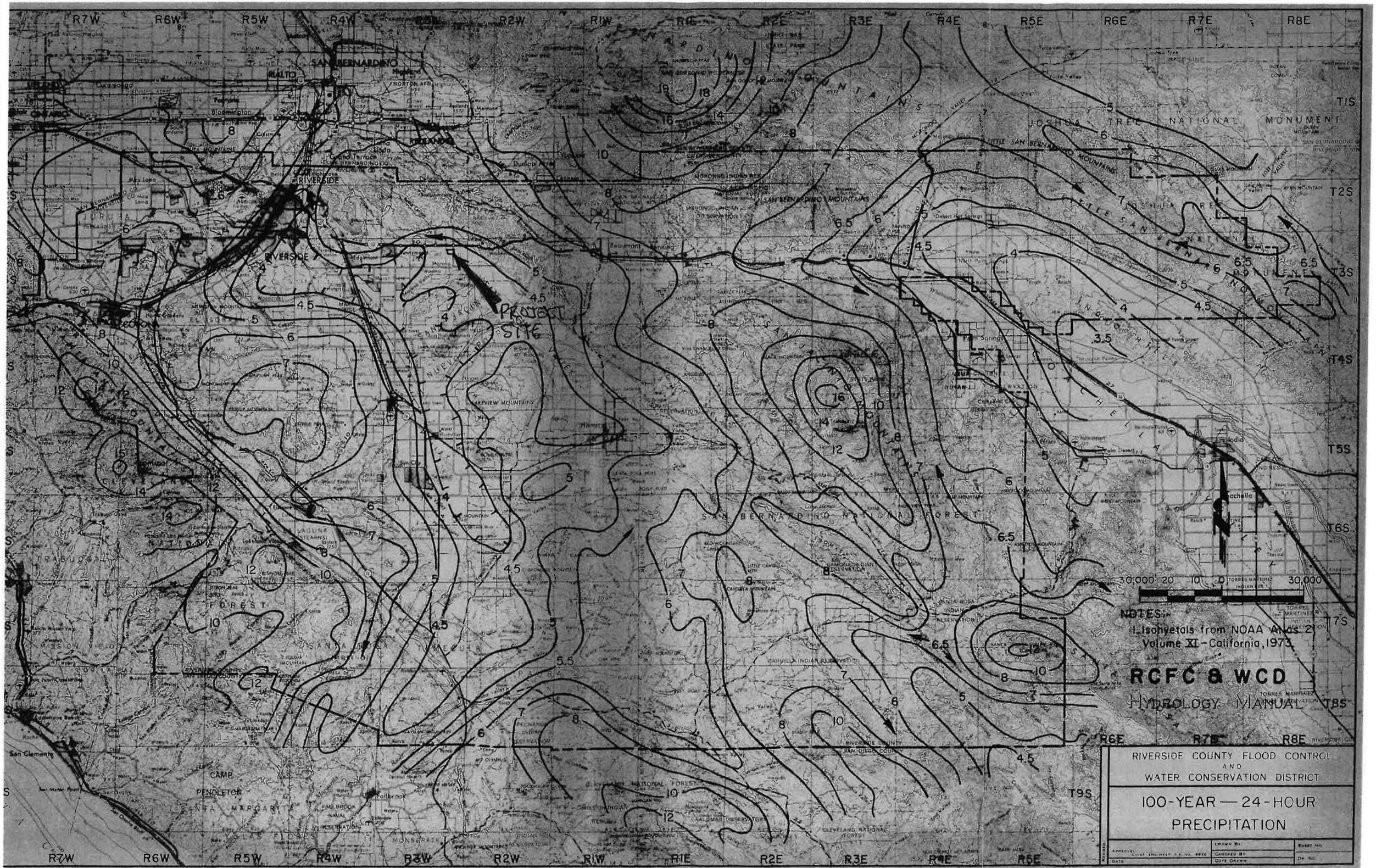
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
100-YEAR — 6-HOUR PRECIPITATION

PLATE E-5.4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Indio
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NOTES:
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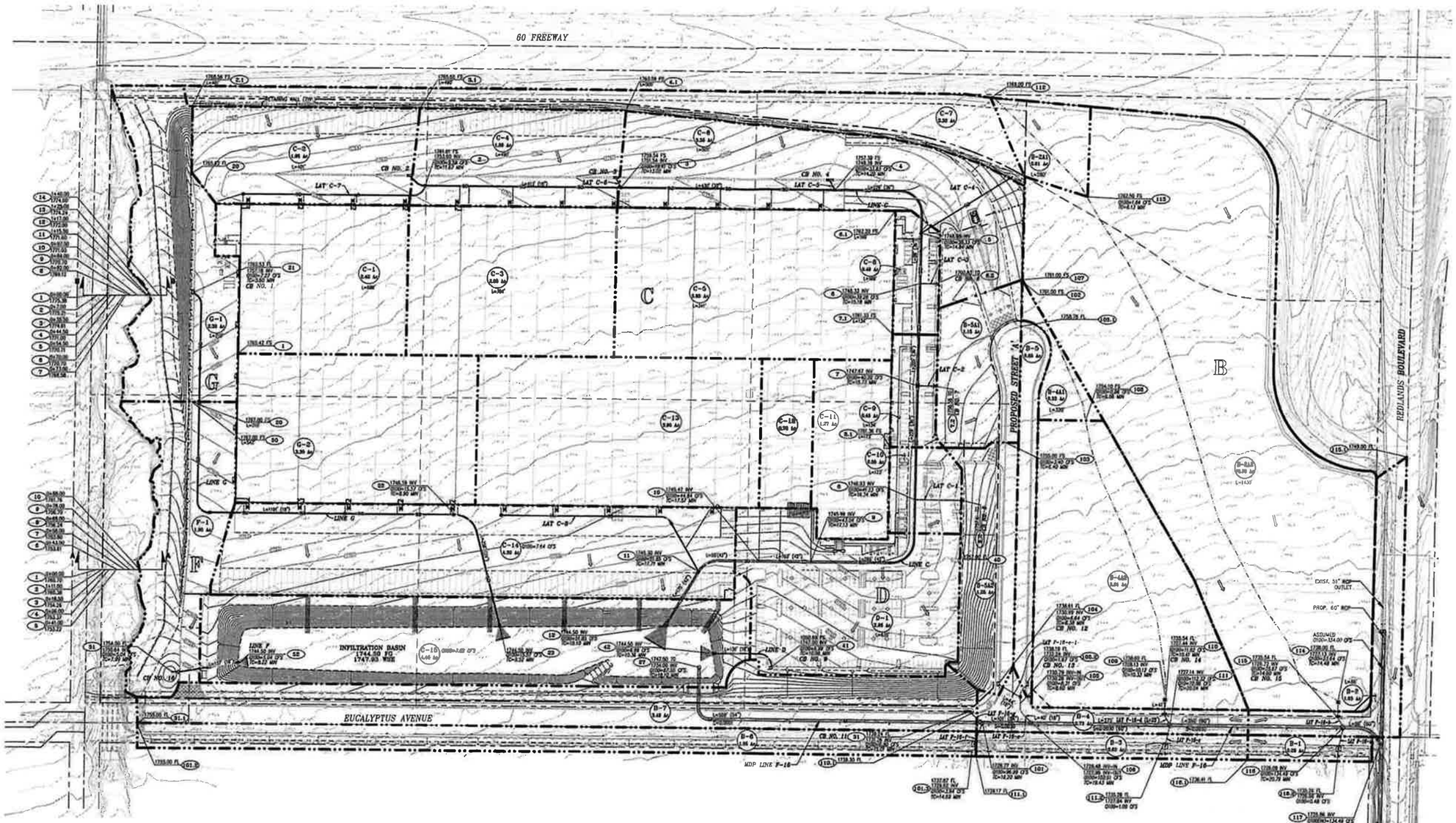
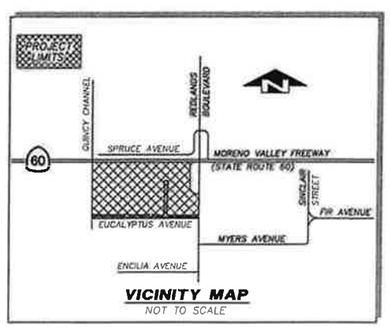
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
100-YEAR — 24-HOUR PRECIPITATION

PLATE E-5.6





VICINITY MAP
NOT TO SCALE

LEGEND

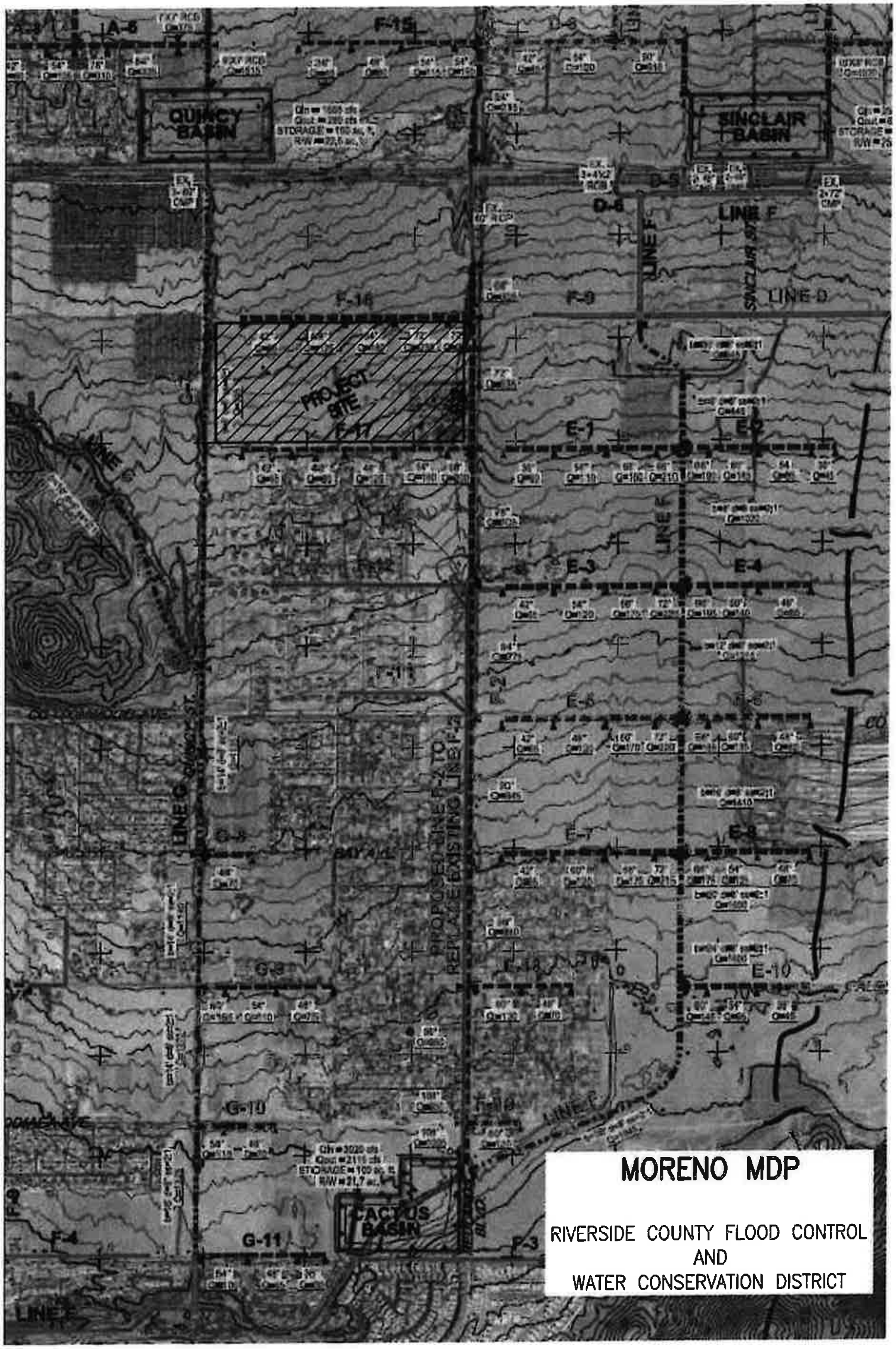
- 10 (65.50 FL) — HYDROLOGY MODEL NODE NUMBER / ELEVATION AT NODE
- A-1 — HYDROLOGIC DRAINAGE AREA #
- 1.00 Ac — TRIBUTARY AREA IN ACRES
- L=926' — LENGTH OF FLOW PATH
- DRAINAGE BOUNDARY
- FLOW PATH
- DIRECTION OF FLOW

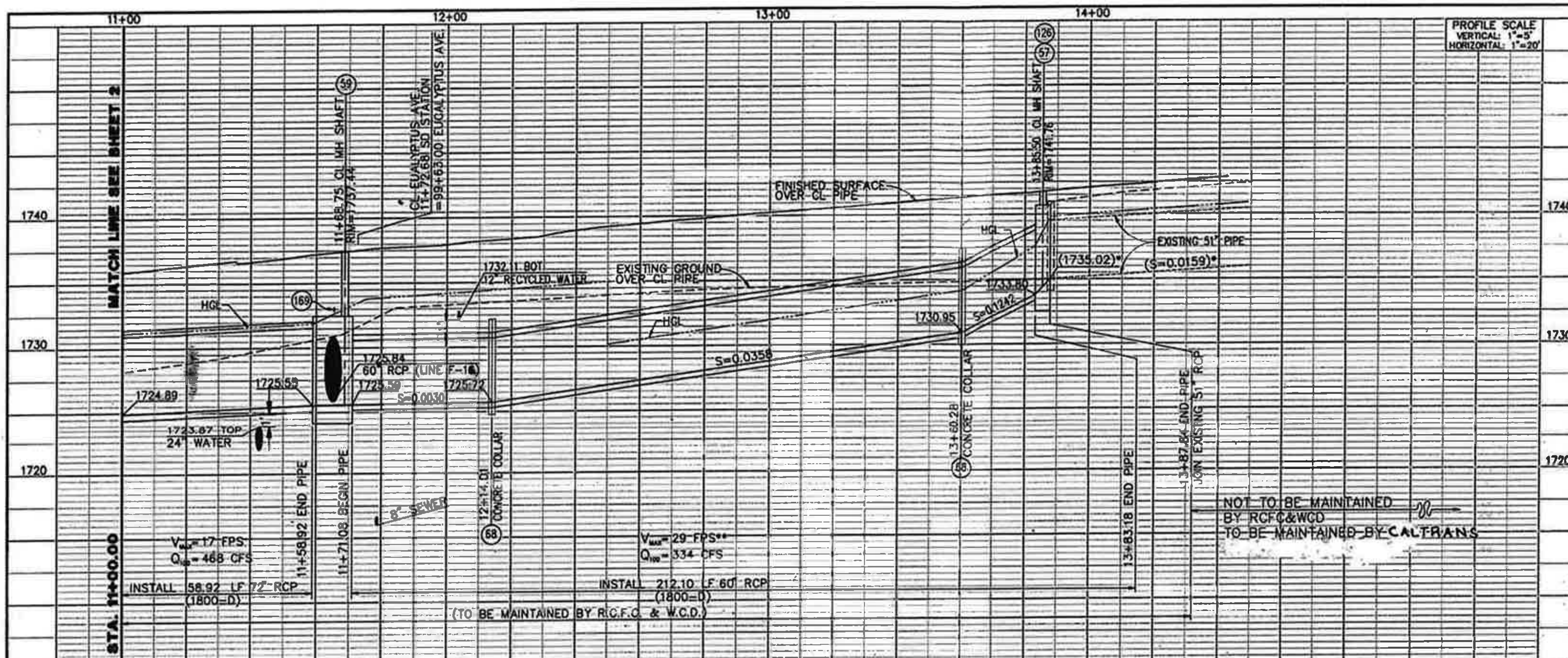
GRAPHIC SCALE
80 40 0 40 80 160 320
(IN FEET)
1"=80'

HYDROLOGY MAP
FOR
ALDI INDUSTRIAL WAREHOUSE
REDLANDS BOULEVARD & EUCALYPTUS AVENUE
CITY OF MORENO VALLEY

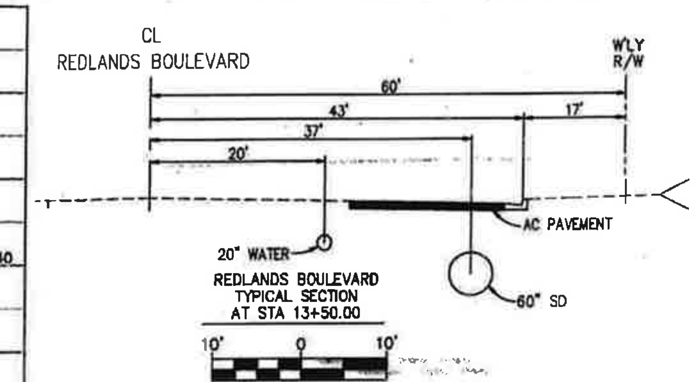
HUITT-ZOLLARS
Huitt-Zollars, Inc. Ontario

DESIGNED BY	M.H.M.
DRAWN BY	H-Z STAFF
CHECKED BY	M.H.M.
FIELD BOOK	
APPROVED BY	MAURICE H. MURAD
R.C.E.	33386
EXPIRES	6-30-14
DATE	
SHEET	1 OF 1 SHEETS
JOB NO.	


QUINCY BASIN
SINCLAIR BASIN
PROJECT SITE
CACTUS BASIN
LINE F
LINE G
E-1
E-2
E-3
E-4
E-7
E-8
E-10
F-16
F-17
G-11
MORENO MDP
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

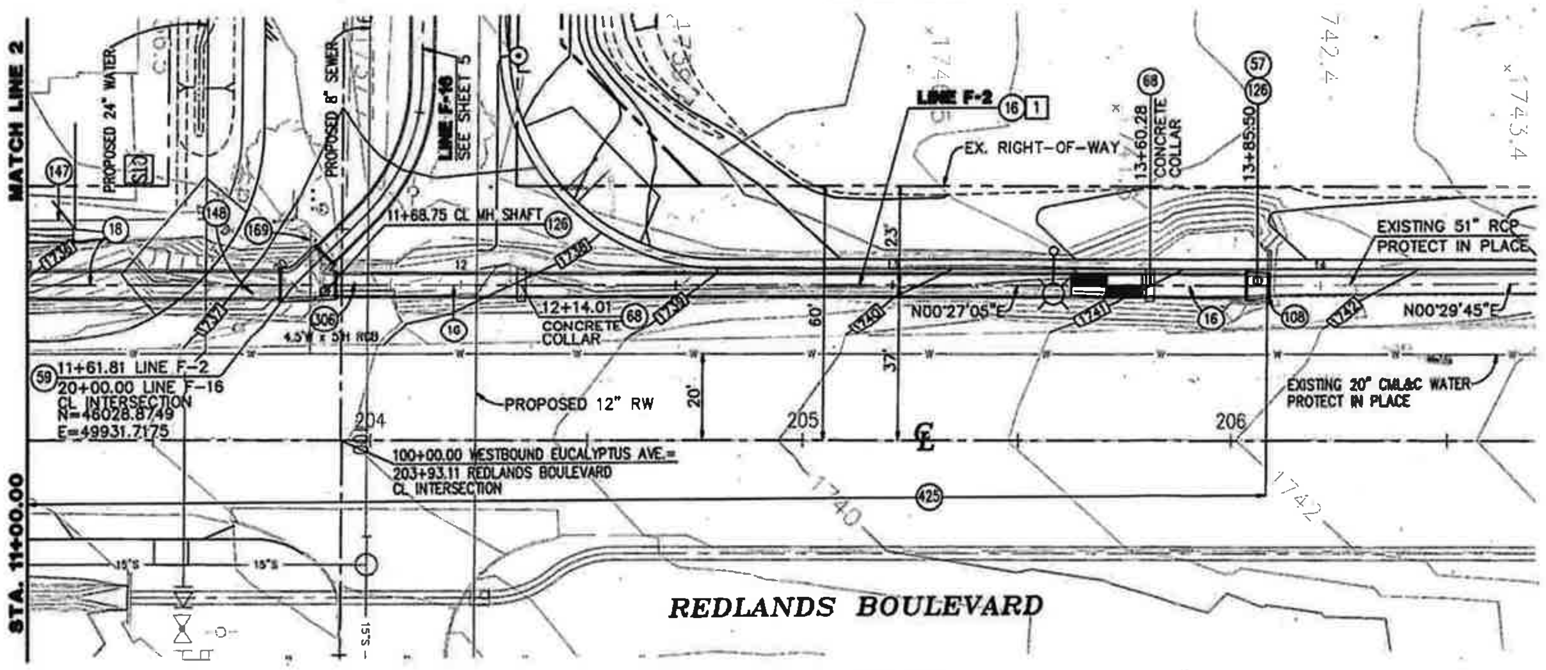


PROFILE



**** NOTE:**
THE CONCRETE COATING ON THE INSIDE OF ALL REINFORCED CONCRETE PIPES MUST BE INCREASED TO PROVIDE A MINIMUM OF 1-1/2 INCHES OVER THE REINFORCING AND INCREASED TO A MINIMUM OF 3-1/2 INCHES **OVER** REINFORCING FOR BOX CULVERT, WHEN DESIGN **VELOCITIES** EXCEED 20 FEET PER SECOND. THE CONCRETE DESIGN STRENGTH IN THESE REACHES SHALL BE F'C=5,000 PSI FOR VELOCITIES EXCEEDING 20 FEET PER SECOND AND F'C=6,000 PSI FOR VELOCITIES EXCEEDING 30 FEET PER SECOND.

NOTE:
CONTRACTOR SHALL PROTECT IN PLACE ALL UTILITIES CROSSING OR PARALLELING THE STORM DRAIN UNLESS OTHERWISE NOTED



PLAN

CONSTRUCTION NOTES

- (16) INSTALL 60" RCP (D-LOAD AND PROFILE AS SHOWN ON PLANS)
- (18) INSTALL 72" RCP (D-LOAD AND PROFILE AS SHOWN ON PLANS)
- (57) CONSTRUCT MANHOLE No.2 PER R.C.F.C. & WCD STD. PLAN MH252
- (59) CONSTRUCT MANHOLE No.4 PER R.C.F.C. & WCD STD. PLAN MH254
- (68) CONSTRUCT CONCRETE COLLAR FOR RCP PER R.C.F.C. & WCD STD. PLAN M803
- (108) REMOVE EXISTING HEADWALL STRUCTURE
- (126) ADJUST MANHOLE RIM TO GRADE AFTER FINAL SURFACE HAS BEEN INSTALLED
- (147) PROTECT OR RELOCATE EXISTING IRRIGATION PIPE AS NECESSARY TO CONSTRUCT STORM DRAIN
- (148) PLUG EXISTING UTILITY AT LOCATION SHOWN (COORDINATE WITH OWNER OF UTILITY)
- (169) LOWER OR RAISE EXISTING WATER LINE TO EMWD STANDARD SPECIFICATION TO CLEAR PROPOSED STORM DRAIN PIPING
- (306) REMOVE EXISTING CULVERT
- (425) REMOVE ANY EXISTING DEBRIS OR CONCRETE PIPE FROM EXISTING CHANNEL

MANHOLE DATA TABLE

S.D. MAINLINE STA.	STRUCTURE TYPE	LINE	ANGLE "A"	B	C	D1	D2	EL. S	EL. R
11+61.8	MH NO. 4	F-16	45°00'00"	60"	5.5'	66"	72"	1725.84	1725.86

PA06-0097 (PLOT PLAN)
P13-111 (AMENDED PLOT PLAN)
PA09-0022 (TENTATIVE PARCEL MAP)

COURSE DATA

	BEARING	DISTANCE
1	N00°27'05"E	553.17'

20 0 20

✱ NOTE:
HORIZONTAL AND VERTICAL LOCATIONS TO BE VERIFIED IN THE FIELD AND ENGINEER NOTIFIED OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

CITY OF MORENO VALLEY APPROVALS
PA09-0022 CITY ID# 4896
RECOMMENDED BY: [signature] 3/3/14 DATE
DEPT. PUBLIC WORKS DIR./ASST. CITY ENGINEER R.C.E. NO. C52463
APPROVED BY: [signature] 3/4/14 DATE
AHMAD R. ANSARI
PUBLIC WORKS DIRECTOR/CITY ENGINEER R.C.E. NO. C51316

MDC

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

BASIS OF BEARINGS:
BEARINGS SHOWN HEREON ARE BASED ON THE BEARING BETWEEN THE CALIFORNIA SPATIAL REFERENCE CENTER (CSRC) CONTINUOUS OPERATING REFERENCE STATIONS (CORS) PPBF AND MLFP BEING NORTH 53°20'17.88" WEST PER RECORDS ON FILE WITH THE CSRC.
BENCH MARK: IVF55 ELEVATION 1785.67
LOCATION
BRASS DISK IN TOP OF HEADWALL, NORTHWEST CORNER REDLANDS BOULEVARD AND SPRUCE AVENUE. (NGVD29 DATUM)

REF.	REVISIONS / DESCRIPTION	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE

DESIGNED BY: M.H.M.
DRAWN BY: H-Z STAFF
DATE DRAWN: 03-2013
CHECKED BY: M.H.M.

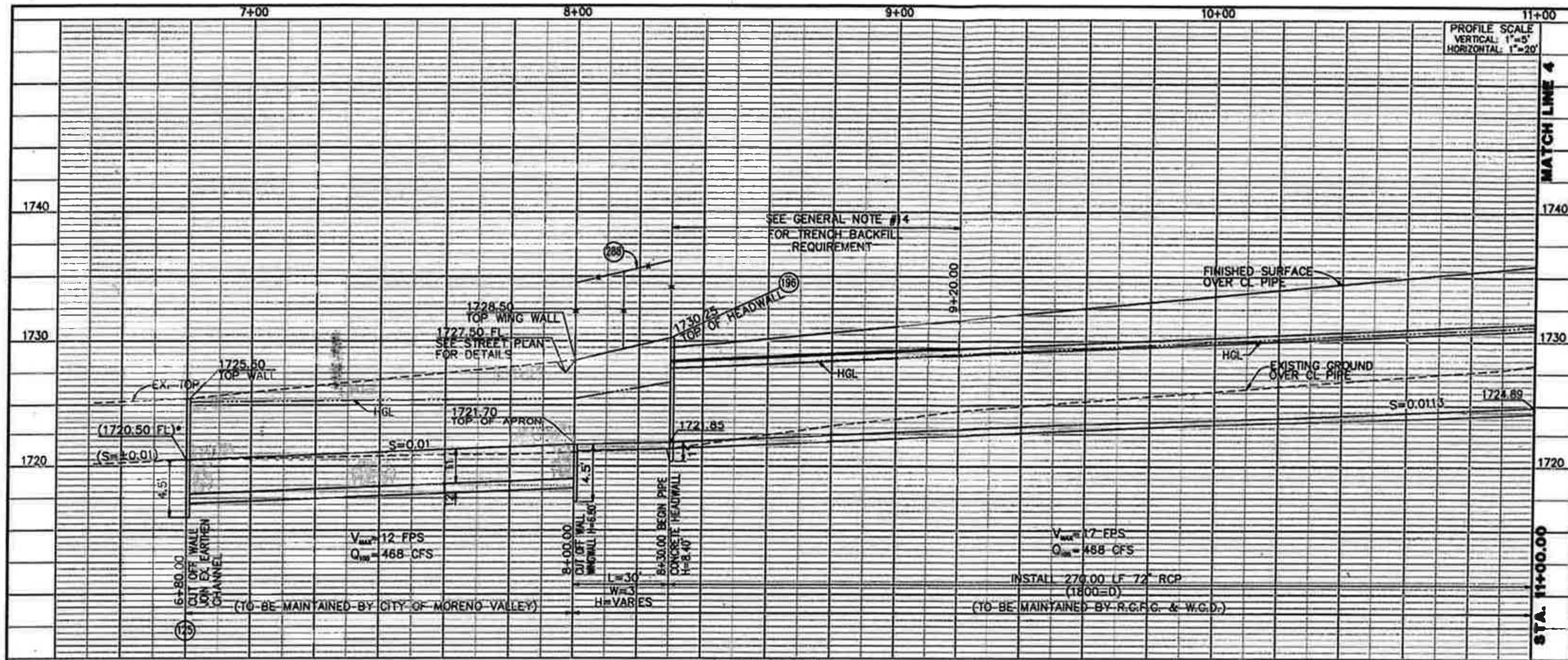
REGISTERED PROFESSIONAL ENGINEER MAURICE H. MURAD NO. 33366 EXPIRATION 6-30-2014 CIVIL STATE OF CALIFORNIA

HUITT-ZOLLARS
Huitt-Zollars, Inc. Ontario
3990 CONCOURS, SUITE 330 • ONTARIO, CALIFORNIA 91764 • (909) 941-7799
PREPARED UNDER THE SUPERVISION OF: MAURICE H. MURAD
R.C.E. 33366 EXPIRES 6-30-14 DATE 3/14/14

RIVERSIDE COU[redacted]OOD CONTROL
WATER CONS[redacted] DISTRICT
RECOMMENDED FOR APPROVAL BY: [signature] DATE: 5/7/14
APPROVED BY: [signature] DATE: 5/8/2014

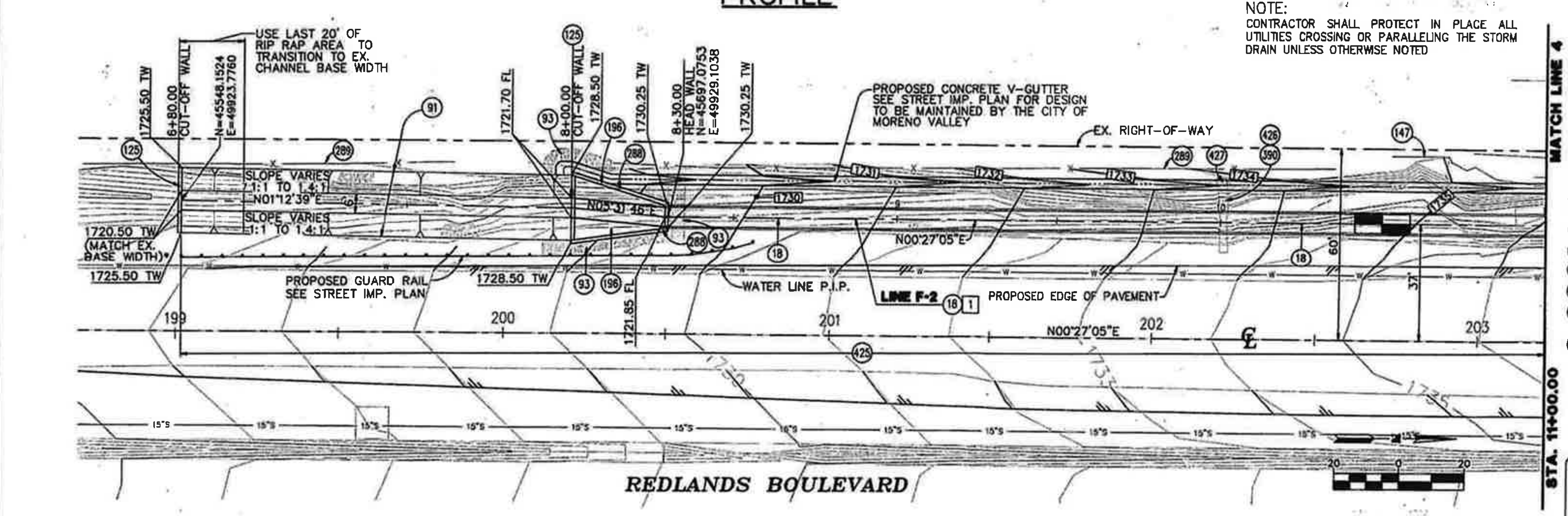
MORENO MDP LINE F-2
11+00.00 TO 13+87.83

PROJECT NO. 4-0-00400
DRAWING NO. 4-1068
SHEET NO. 4 OF 11

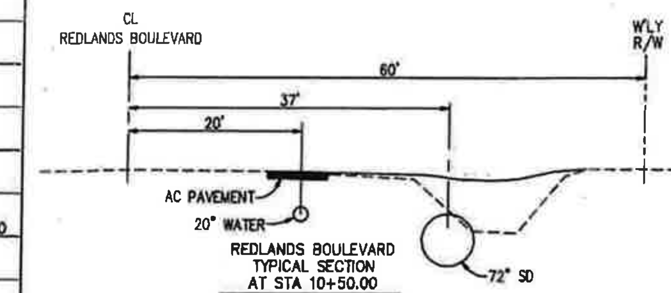


PROFILE

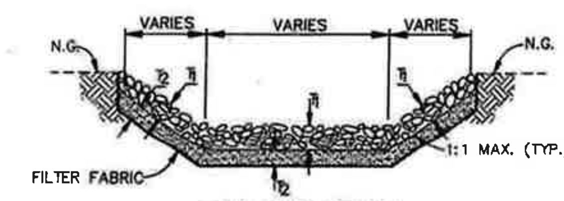
NOTE:
CONTRACTOR SHALL PROTECT IN PLACE ALL UTILITIES CROSSING OR PARALLELING THE STORM DRAIN UNLESS OTHERWISE NOTED



PLAN



REDLANDS BOULEVARD TYPICAL SECTION AT STA 10+50.00



(91) **RIP-RAP DETAIL**
NOT TO SCALE

RIP-RAP DATA				
LOCATION	V_{AVG} (FPS)	T_1 (FT)	T_2 (FT)	CUTOFF WALL
LINE F-2 OUTLET	10-12	32" 1/4 TON	9" NO. 2 BACKING	54"

NOTES:
1. USE CALTRANS SPECIFICATIONS, SECTION 72-2.02 FOR ROCK SIZE BY RSP-CLASS AND MATERIAL PROPERTIES.
2. USE MIRAFI 1100N OR APPROVED EQUAL PER CALTRANS SECTION 88-1.04.
3. PLACEMENT METHOD TYPE B PER CALTRANS SPECIFICATIONS.
4. RIP-RAP LAYERING PER CALTRANS HIGHWAY DESIGN MANUAL TABLE 873.3 B.

CONSTRUCTION NOTES

- (18) INSTALL 72" RCP (D-LOAD AND PROFILE AS SHOWN ON PLANS)
- (91) INSTALL GROUTED RIP-RAP PER CALTRANS SPECIFICATIONS AND RIP-RAP DATA TABLE ON THIS SHEET
- (93) INSTALL GROUTED RIP RAP PER DETAIL ON SHEET 6 TO BE MAINTAINED BY CITY OF MORENO VALLEY
- (125) CONSTRUCT RIP RAP PCC CUT-OFF WALL PER DETAIL ON SHEET 2
- (147) PROTECT OR RELOCATE EXISTING IRRIGATION PIPE AS NECESSARY TO CONSTRUCT STORM DRAIN
- (196) INSTALL PIPE CULVERT HEADWALL, WINGWALL & APRON PER CALTRANS STANDARD PLAN D86-B (SEE SHEET 2 FOR LAYOUT DETAIL)
- (288) INSTALL CHAIN LINK FENCE PER R.C.F.C. & W.C.D. STD. PLAN NO. M801
- (289) REMOVE, SALVAGE & RE-INSTALL EXISTING FENCE ON R/W AFTER PROPOSED IMPROVEMENTS HAVE BEEN INSTALLED
- (390) EXISTING CONCRETE APRON/ENCASEMENT TO BE REMOVED
- (425) REMOVE ANY EXISTING DEBRIS OR CONCRETE PIPE FROM EXISTING CHANNEL
- (426) RELOCATE, LOWER OR RAISE EXISTING UTILITY TO CLEAR PROPOSED STORM DRAIN (CONTRACTOR TO FIELD VERIFY & COORDINATE WITH OWNER OF UTILITY)
- (427) RELOCATE EXISTING UTILITY BOX AND APPURTENANCES (CONTRACTOR TO FIELD VERIFY & COORDINATE WITH OWNER OF UTILITY)

PA08-0097 (PLOT PLAN)
P13-111 (AMENDED PLOT PLAN)
PA09-0022 (TENTATIVE PARCEL MAP)

COURSE DATA		
	BEARING	DISTANCE
1	N00°27'05"E	553.17'

* NOTE:
HORIZONTAL AND VERTICAL LOCATIONS TO BE VERIFIED IN THE FIELD AND ENGINEER NOTIFIED OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

CITY OF MORENO VALLEY APPROVALS
PA09-0022 CITY ID# 4596
RECOMMEND BY: C 58570 2/3/14 DATE
for PREM KUMAR
DEPT. PUBLIC WORKS DIR./ASST. CITY ENGINEER
APPROVED BY: 3/4/14 DATE
AHMAD R. ANSARI
PUBLIC WORKS DIRECTOR/CITY ENGINEER
R.C.E. NO. C51316

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

BASIS OF BEARINGS:
BEARINGS SHOWN HEREON ARE BASED ON THE BEARING BETWEEN THE CALIFORNIA SPATIAL REFERENCE CENTER (CSRC) CONTINUOUS OPERATING REFERENCE STATIONS (CORS) PPBF AND MLFP BEING NORTH 53°20'17.66" WEST PER RECORDS ON FILE WITH THE CSRC.
BENCH MARK: IVF55 ELEVATION 1785.67
LOCATION
BRASS DISK IN TOP OF HEADWALL, NORTHWEST CORNER REDLANDS BOULEVARD AND SPRUCE AVENUE. (NGVD29 DATUM)

REF.	REVISIONS / DESCRIPTION	ENGINEER APPR.	DATE	RCFC/ APPR.	DATE

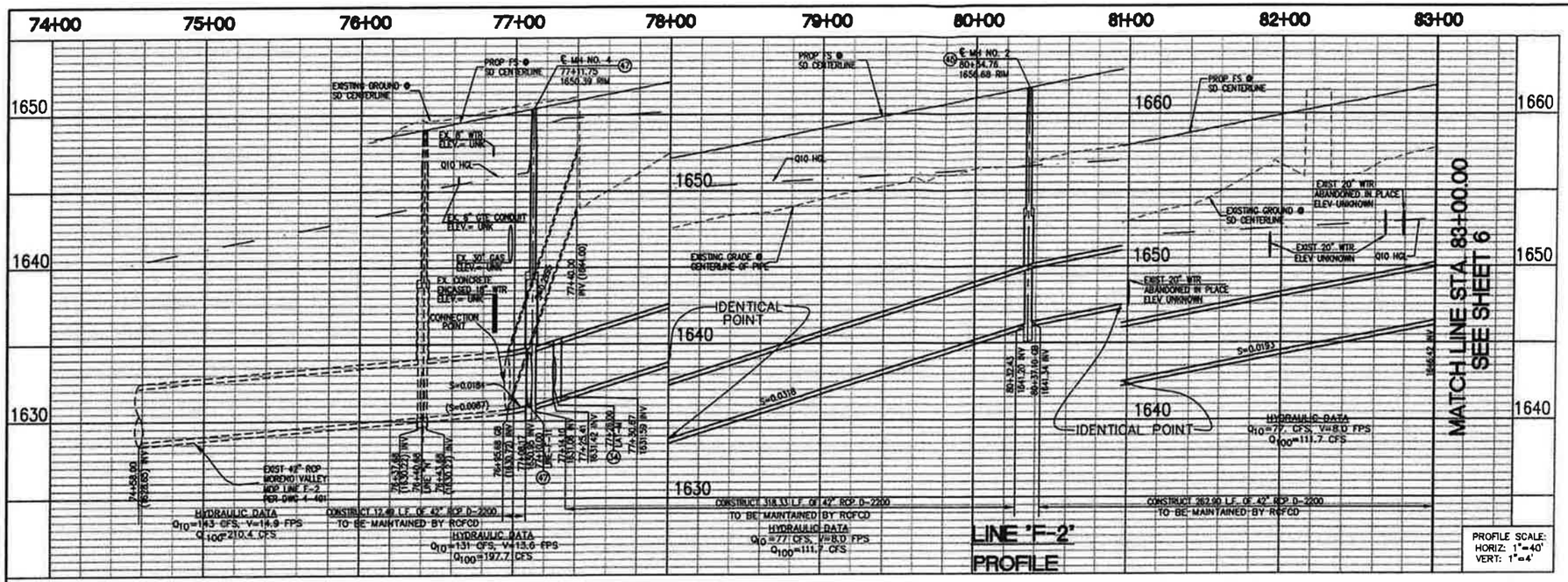
DESIGNED BY: M.H.M.
DRAWN BY: H-Z STAFF
DATE DRAWN: 03-2013
CHECKED BY: M.H.M.

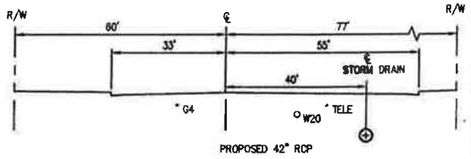
HUITT-ZOLLARS
Huitt-Zollars, Inc. Ontario
PREPARED UNDER THE SUPERVISION OF: MAURICE H. MURAD
R.C.E. 33386 EXPIRES 6-30-14 DATE 2/14/14

RIVERSIDE COUN D CONTROL
WATER CONSER DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 5/7/14
APPROVED BY: Mark H. Wills DATE: 5/8/2014

MORENO MDP LINE F-2
6+80.00 TO 11+00.00

PROJECT NO. 4-0-00400
DRAWING NO. 4-1068
SHEET NO. 3 OF 11





SECTION AT STATION 79+00.00

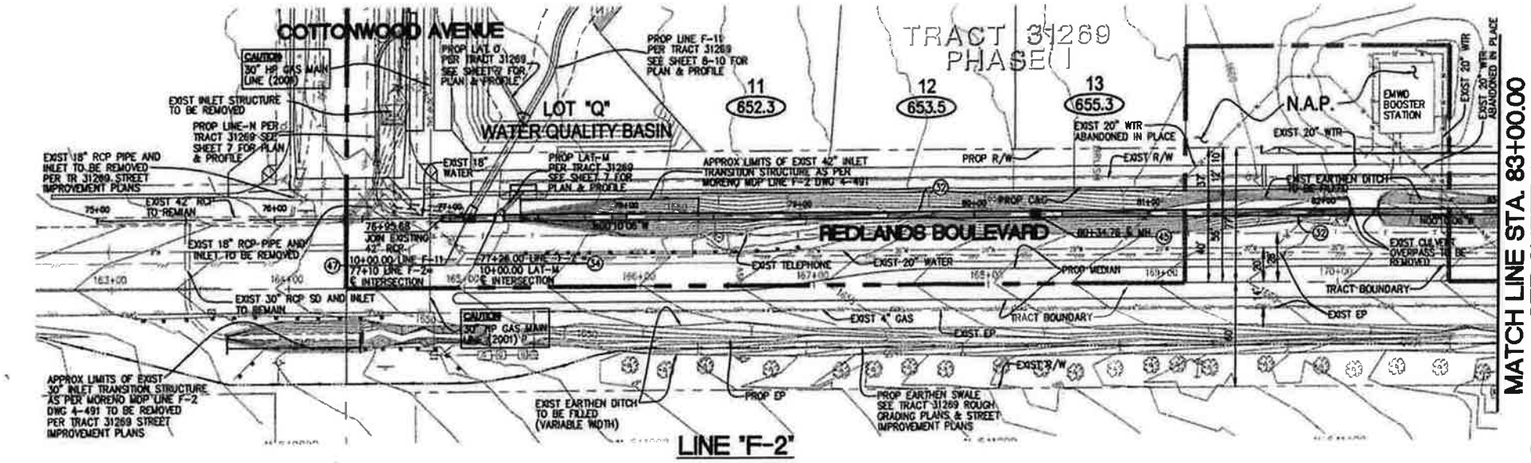
TYPICAL FROM STA. 76+95.68 TO STA. 91+10.00

20' 0 20'

INFORMATIONAL NOTE

ALL X-SECTION TAKEN LOOKING DOWNSTREAM

DRACAEA AVE



LINE "F-2" PLAN

GRAPHIC SCALE

0 20 40 80 120 160

SCALE 1" = 40'

AS BUILT

APPROVED BY: [signature]

DATE 4-24-08

STORM DRAIN NOTES:

1. EXISTING MORENO VALLEY MDP LINE-F2 IS DESIGNED-TO-CONVEY ONLY THE 10-YR STORM EVENT. THEREFORE THE HGL FOR THE 10-YR STORM EVENT IS SHOWN FOR MDP LINE F-11, MDP LINE F-12, AND AND ALL IN-TRACT STORM DRAIN. THE 100-YR STORM EVENT IS CONTAINED WITH-IN THE STREET R/W
2. FOR ALL STREET CATCH BASIN(S) AND DEPRESSION(S) SEE TRACT 31269 STREET IMPROVEMENT PLANS .

CONSTRUCTION NOTES

(32) CONSTRUCT 42" RCP (SEE PROFILE FOR D-LOAD)
(34) CONSTRUCT JUNCTION STRUCTURE NO.2 PER RCFCD STD DWG JS 227
(45) CONSTRUCT MANHOLE NO. 2 PER RCFCD STD DWG MH 252
(47) CONSTRUCT MANHOLE NO. 4 PER RCFCD STD DWG MH 254

Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2800 for the location of buried utility lines. Don't disrupt vital services. TWO WORKING DAYS BEFORE YOU DIG

BENCH MARK

F.D BRASS DISK SET IN CONCRETE "M-40-4 RESET 1976" PER RIVERSIDE COUNTY RECORDS. LOCATED ON THE SOUTHEAST CORNER OF ALESSANDRO BLVD. AND NASON STREET AND IT IS 3 FEET WESTERLY OF POWER POLE NUMBER GT70306. ELEVATION: 1588.421

REF.	REVISIONS	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE

DESIGNED BY: F.M.
DRAWN BY: P.B.
DATE DRAWN: 05/04

REGISTERED PROFESSIONAL ENGINEER RANDALL L. STREETER No. 23083 EXP. 12/31/05 CIVIL STATE OF CALIFORNIA

ADAMS • STREETER CIVIL ENGINEERS, INC. 3602 Inland Empire Blvd., Suite A-355 Ontario, Ca. 91764 Ph:(909) 483-2452 Fax:(909) 483-2899

PREPARED UNDER THE SUPERVISION OF: RANDAL L. STREETER EXP. 12/31/05 R.C.E. NO. 23083 DATE: 2/6/05

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 8/3/05
APPROVED BY: DATE: 8-4-2005

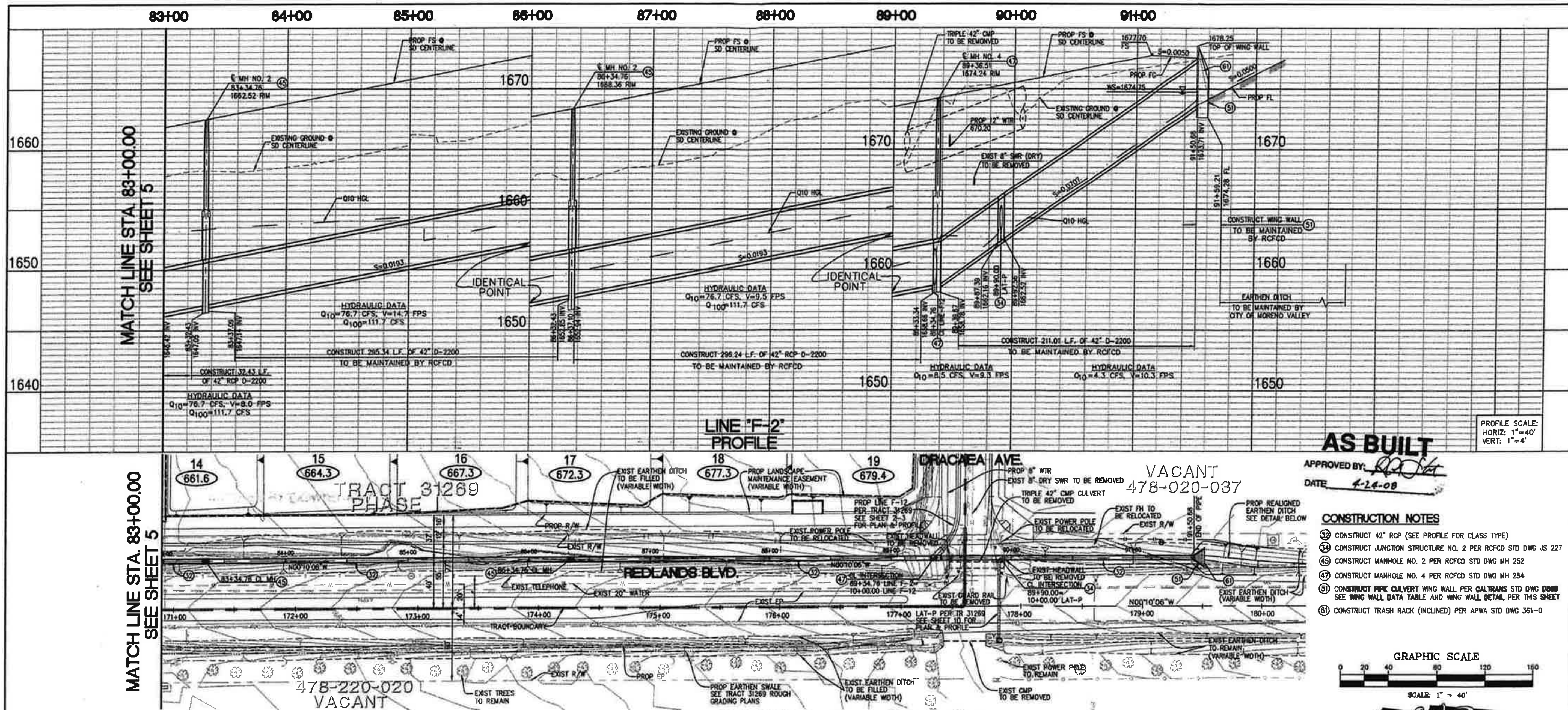
CITY OF MORENO VALLEY PUBLIC WORKS DEPARTMENT
APPROVED BY: TRENT D. PULLIAM DATE: 8/5/05
RECOMMENDED DATE:

MORENO MASTER DRAINAGE PLAN

LINE "F-2"

STA. 75+00.00 TO 83+00.00

PROJECT NO. 4-0-00400
DRAWING NO. 04-847
SHEET NO. 5 OF 14



AS BUILT

APPROVED BY: [signature]

DATE 4-24-08

CONSTRUCTION NOTES

- (32) CONSTRUCT 42" RCP (SEE PROFILE FOR CLASS TYPE)
- (34) CONSTRUCT JUNCTION STRUCTURE NO. 2 PER RCFCD STD DWG JS 227
- (45) CONSTRUCT MANHOLE NO. 2 PER RCFCD STD DWG MH 252
- (47) CONSTRUCT MANHOLE NO. 4 PER RCFCD STD DWG MH 254
- (51) CONSTRUCT PIPE CULVERT WING WALL PER CALTRANS STD DWG D86B SEE WING WALL DATA TABLE AND WING WALL DETAIL PER THIS SHEET
- (61) CONSTRUCT TRASH RACK (INCLINED) PER APWA STD DWG 361-0

GRAPHIC SCALE

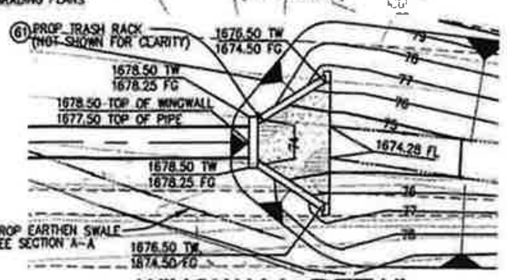
SCALE: 1" = 40'

STORM DRAIN NOTES:

1. EXISTING MORENO VALLEY MDP LINE-F2 IS DESIGNED TO CONVEY ONLY THE 10-YR STORM EVENT. THEREFORE THE HGL FOR THE 10-YR STORM EVENT IS SHOWN FOR MDP LINE F-11, MDP LINE F-12 AND AND ALL IN-TRACT STORM DRAIN. THE 100-YR STORM EVENT IS CONTAINED WITH-IN THE STREET R/W
2. FOR ALL STREET CATCH BASIN(S) AND DEPRESSION(S) SEE TRACT 31269 STREET IMPROVEMENT PLANS .

SECTION A-A

NTS

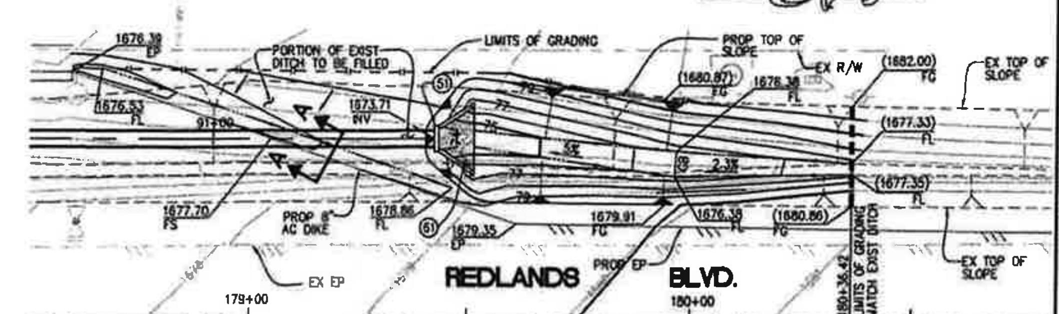


WINGWALL DETAIL

SCALE: 1" = 10'

WING WALL DATA TABLE

TYPE	L	W	H	ELEV "a"	FLARE ANG.
CALTRANS D86B	9'	1.75'	2.25	1678.5'	33°



REALIGNED EARTHEN DITCH DETAIL

SCALE: 1" = 20'

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

BENCH MARK

F.D BRASS DISK SET IN CONCRETE "M-40-4 RESET 1976" PER RIVERSIDE COUNTY RECORDS. LOCATED ON THE SOUTHEAST CORNER OF ALESSANDRO BLVD. AND MASON STREET AND IT IS 3 FEET WESTERLY OF POWER POLE NUMBER G170306.
ELEVATION: 1588.421

REF.	REVISIONS DESCRIPTION	ENGINEER APPR.	DATE	RCFC/ APPR.	DATE

DESIGNED BY: F.M.
DRAWN BY: P.B.
DATE DRAWN: 05/04

REGISTERED PROFESSIONAL ENGINEER RANDAL L. STREETER No. 25083 EXP. 12/31/05 CIVIL STATE OF CALIFORNIA

ADAMS · STREETER CIVIL ENGINEERS, INC.

PREPARED UNDER THE SUPERVISION OF: [signature] RANDAL L. STREETER EXP. 12/31/05 R.C.E. NO. 25083 DATE: 2/5/05

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: [signature] DATE: 8/3/05
APPROVED BY: [signature] DATE: 8-4-2005

CITY OF MORENO VALLEY PUBLIC WORKS DEPARTMENT APPROVED BY: [signature] TRENT D. PULLIAM DATE: 3/25/05
RECOMMENDED DATE

MORENO MASTER DRAINAGE PLAN
STORM DRAIN LINE F-2
STA. 83+00.00 TO 91+10.00

PROJECT NO. 4-0-00400
DRAWING NO. 04-847
SHEET NO. 6 OF 14

JASON E. UHLEY
General Manager-Chief Engineer

1995 MARKET STREET
RIVERSIDE, CA 92501
951.955.1200
951.788.9965 FAX
www.rcflood.org

RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT
December 23, 2020

Mr. Michael D Lloyd
Assistant City Engineer
Engineering Division
City of Moreno Valley
14177 Frederick Street
Moreno Valley, CA 92552-0805

Dear Mr. Lloyd:

Re: Thienes Engineering PEN 19-0193
Account No. 137-0-3-75325

As requested by the City of Moreno Valley (City), the Riverside County Flood Control District (District) received the following for review on December 1, 2020:

1. Letter from Moreno Valley, dated November 12, 2020
2. Preliminary Hydrology Calculations, dated October 27, 2020
3. Preliminary Grading Plan (13 sheets, with different dates)
4. PWQMP Report, dated March 5, 2020

The District has reviewed these documents as requested in the City's letter, and has also tried to identify potential areas of concern, and has the following comments:

Line-16

The City stated in their request that the developer wished to "eliminate the proposed westerly portion of Moreno Master Drainage Plan (MMDP) Line F-16 based on the premise that it is unnecessary to construct due to the existing development to the north of the MMDP line." The existing development (PM36207 on APN 488-330-040) constructed a basin which outlets to a pipe in Eucalyptus Avenue which connect to Line F-2 in Redland Boulevard. The pipe was previously accepted for maintenance by the District. Since the pipe and basin together collect and convey the same area that was tabled to Line F-16, it is our opinion that, so long as the basin is in place, the existing facility is functionally equivalent to Line F-16, and the remaining unconstructed portion is not necessary to provide flood protection.

Line F-17

The City stated in their request that the developer wished to "eliminate the proposed MMDP Line F-17, based on the premise that it is unnecessary to construct due to the proposed developer's water quality and detention facilities." The Moreno MDP proposed Line F-17 as a 42 to 60 inch RCP conveying 200 cfs to Line F-2. The developer proposed an onsite basin and a 42" HDPE within the development conveying on site flows to Line F-2, and a catch basin in Encelia conveying street runoff to Line F-2. Since these facilities together collect and convey the same area that was tabled to Line F-17, it is our opinion that the existing facility is functionally equivalent to Line F-17.

It should be noted that since the proposed pipe is within private right of way and is proposed as HDPE, the District will not maintain it. The basin and storm drain facility will be developer maintained. However, if the design is modified to meet District standards, a public agency could maintain the storm drain and/or basin. At a minimum, the storm drain would need to be moved to the street and constructing with RCP instead of HDPE, and the basin would need to handle water quality and the 100-year route down separately and otherwise be designed to meet out meet District requirements for Operation and Maintenance. See increased runoff criteria and the LID BMP handbook for basin design requirements. Link: http://rcflood.org/npdes/LIDBMP.aspx

City of Moreno Valley
Re: Thienes Engineering PEN 19-0193, Account No. 137-0-3-7535 235845

Also note that Line F-17 is not part of the Moreno Area Drainage Plan (ADP) and therefore is not eligible for ADP credit.

Line F-2
The developer is proposing to build a portion of Line F-2 in Redlands Avenue. The MMDP proposed Line F-2 between Eucalyptus and Encelia as a 72" RCP conveying 100-year flowrate of 535 cfs. The developer's plans don't provide details for their proposed segment of Line F-2, or even the limits of what they will be constructing, but the hydrology map identifies it as a 72" RCP. The District has not received enough information to comment on this facility. It should be noted that the existing portion of Line F-2 downstream of this project is not sized to convey the 100 year flowrate, and the MMDP proposes that it will be improved or replaced in the future to increase the current 10-year capacity to the 100 year storm.

Quincy Channel / Line G-7
The developer is proposing vinyl sheetpile along the natural Quincy wash, which the MMDP proposes as a trapezoidal channel called Line G-7. The sheetpile is proposed some distance outside of the limits of the MMDP proposed channel. While the sheetpile may protect the site from erosion, the capacity of the existing wash is unknown. The site may not be protected from the 100-year storm until the ultimate channel is constructed or erosion occurs, and therefore may not be functionally equivalent in the interim. Additionally, it should be noted that the District will not maintain the proposed sheet piles.

Hydrology Report
The City should be aware of the following District comments on the developer's hydrology study dated October 27, 2020.

1. The rainfall used should be consistent with those used in the Moreno MDP, which were based on the version of NOAA Atlas 14 that was available when the MMDP was updated. The MMDP report provides a table of rainfall values used.
2. The cover type used for node 200-204 "proposed" hydrology should be commercial cover or some other type with a high impervious percentage, since this area is proposed as a street.
3. AMC 3 was used for the 100-year basin hydrology. This is not typically recommended per the District's hydrology manual. This should be explained or corrected.

Any questions pertaining to this project may be directed to Kelly O'Sullivan of this office at 951-955-8851 or kosulliv@rivco.org.

Very truly yours,

Deborah de Chambeau

DEBORAH DE CHAMBEAU
Engineering Project Manager

cc: Kelly O'Sullivan, RCFC&WCD
Duke Aghaian, Thienes Engineering

SLJ:se

APPENDIX B

HYDROLOGY CALCULATIONS

EXISTING CONDITION

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******************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                     (RCFC&WCD)  1978 HYDROLOGY MANUAL
         (c) Copyright 1982-2016 Advanced Engineering Software (aes)
                     (Rational Tabling Version 23.0)
                  Release Date: 07/01/2016  License ID 1435

                           Analysis prepared by:

                         THIENES ENGINEERING, INC.
                            14349 FIRESTONE BLVD
                            LA MIRADA, CA 90638
                                714-521-4811

 ************************ DESCRIPTION OF STUDY ************************
* TEI JOB 3828                                                        *
* 100-YEAR STORM EVENT                                                *
* EXISTING CONDITION (NODES 100-107)                                  *
 **********************************************************************

  FILE NAME: W:\3828\100XX.DAT
  TIME/DATE OF STUDY: 08:36 03/25/2021
------------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.010
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.820
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.940
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.200
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.5003939
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.5001161
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.200
  SLOPE OF INTENSITY DURATION CURVE = 0.5001
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *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.*

******************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   410.00
  UPSTREAM ELEVATION(FEET) =   1752.00
  DOWNSTREAM ELEVATION(FEET) =   1741.50
  ELEVATION DIFFERENCE(FEET) =     10.50
  TC = 0.533*[(  410.00**3)/(    10.50)]**.2 =   12.298
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.651
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6451
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      4.87
  TOTAL AREA(ACRES) =      2.85   TOTAL RUNOFF(CFS) =      4.87

******************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  51
```

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--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1741.50  DOWNSTREAM(FEET) =   1732.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   400.00   CHANNEL SLOPE =  0.0237
  CHANNEL BASE(FEET) =  100.00   "Z" FACTOR =  99.990
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.186
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6085
  SOIL CLASSIFICATION IS "B"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.15
  AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =   5.78
  Tc(MIN.) =   18.08
  SUBAREA AREA(ACRES) =     4.40       SUBAREA RUNOFF(CFS) =    5.85
  TOTAL AREA(ACRES) =        7.2         PEAK FLOW RATE(CFS) =      10.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.07   FLOW VELOCITY(FEET/SEC.) =   1.36
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =     810.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1732.00  DOWNSTREAM(FEET) =   1722.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =   410.00   CHANNEL SLOPE =  0.0229
  CHANNEL BASE(FEET) =  100.00   "Z" FACTOR =  99.900
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.957
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .5862
  SOIL CLASSIFICATION IS "B"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.52
  AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =   4.50
  Tc(MIN.) =   22.57
  SUBAREA AREA(ACRES) =     9.25       SUBAREA RUNOFF(CFS) =   10.61
  TOTAL AREA(ACRES) =       16.5         PEAK FLOW RATE(CFS) =      21.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.12   FLOW VELOCITY(FEET/SEC.) =   1.63
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =    1220.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1723.00  DOWNSTREAM ELEVATION(FEET) = 1722.00
  STREET LENGTH(FEET) =   275.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 32.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  16.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.87
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
         NOTE: STREET FLOW EXCEEDS TOP OF CURB.
         THE FOLLOWING STREET FLOW RESULTS ARE BASED ON THE ASSUMPTION
         THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
         THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
    STREET FLOW DEPTH(FEET) =  0.73
    HALFSTREET FLOOD WIDTH(FEET) =   28.63
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.61
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.91
  STREET FLOW TRAVEL TIME(MIN.) =   1.76   Tc(MIN.) =   24.33
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.885
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8678
  SOIL CLASSIFICATION IS "B"
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  SUBAREA AREA(ACRES) =    0.65      SUBAREA RUNOFF(CFS) =    1.06
  TOTAL AREA(ACRES) =       17.1        PEAK FLOW RATE(CFS) =      22.40

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.74   HALFSTREET FLOOD WIDTH(FEET) =  28.87
  FLOW VELOCITY(FEET/SEC.) =  2.63   DEPTH*VELOCITY(FT*FT/SEC.) =   1.93
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =    1495.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1722.00  DOWNSTREAM ELEVATION(FEET) = 1715.80
  STREET LENGTH(FEET) =   755.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 32.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  16.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.93
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.66
    HALFSTREET FLOOD WIDTH(FEET) =   24.94
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.58
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.35
  STREET FLOW TRAVEL TIME(MIN.) =   3.52   Tc(MIN.) =   27.85
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.762
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8664
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    0.70      SUBAREA RUNOFF(CFS) =    1.07
  TOTAL AREA(ACRES) =       17.9        PEAK FLOW RATE(CFS) =      23.47

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.66   HALFSTREET FLOOD WIDTH(FEET) =  25.12
  FLOW VELOCITY(FEET/SEC.) =  3.61   DEPTH*VELOCITY(FT*FT/SEC.) =   2.39
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    105.00 =    2250.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.762
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8664
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =   17.25   SUBAREA RUNOFF(CFS) =   26.33
  TOTAL AREA(ACRES) =       35.1   TOTAL RUNOFF(CFS) =      49.80
  TC(MIN.) =   27.85

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    106.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1715.80  DOWNSTREAM ELEVATION(FEET) = 1709.80
  STREET LENGTH(FEET) =   620.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 32.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  16.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      50.24
    ***STREET FLOW SPLITS OVER STREET-CROWN***
    FULL DEPTH(FEET) =    0.80   FLOOD WIDTH(FEET) =   32.00
    FULL HALF-STREET VELOCITY(FEET/SEC.) =    4.58
    SPLIT DEPTH(FEET) =    0.35   SPLIT FLOOD WIDTH(FEET) =    9.53
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    SPLIT FLOW(CFS) =    2.48   SPLIT VELOCITY(FEET/SEC.) =    2.26
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
         NOTE: STREET FLOW EXCEEDS TOP OF CURB.
         THE FOLLOWING STREET FLOW RESULTS ARE BASED ON THE ASSUMPTION
         THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
         THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
    STREET FLOW DEPTH(FEET) =  0.80
    HALFSTREET FLOOD WIDTH(FEET) =   32.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.58
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.65
  STREET FLOW TRAVEL TIME(MIN.) =   2.26   Tc(MIN.) =   30.10
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.694
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8656
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    0.60      SUBAREA RUNOFF(CFS) =    0.88
  TOTAL AREA(ACRES) =       35.7        PEAK FLOW RATE(CFS) =      50.68

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.80   HALFSTREET FLOOD WIDTH(FEET) =  32.00
  FLOW VELOCITY(FEET/SEC.) =  4.58   DEPTH*VELOCITY(FT*FT/SEC.) =   3.65
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    106.00 =    2870.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.694
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8656
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =   21.50   SUBAREA RUNOFF(CFS) =   31.53
  TOTAL AREA(ACRES) =       57.2   TOTAL RUNOFF(CFS) =      82.21
  TC(MIN.) =   30.10

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    107.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1709.80  DOWNSTREAM ELEVATION(FEET) = 1706.00
  STREET LENGTH(FEET) =   445.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 32.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  16.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      82.64
    ***STREET FLOW SPLITS OVER STREET-CROWN***
    FULL DEPTH(FEET) =    0.80   FLOOD WIDTH(FEET) =   32.00
    FULL HALF-STREET VELOCITY(FEET/SEC.) =    4.30
    SPLIT DEPTH(FEET) =    0.76   SPLIT FLOOD WIDTH(FEET) =   29.98
    SPLIT FLOW(CFS) =   37.78   SPLIT VELOCITY(FEET/SEC.) =    4.12
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
         NOTE: STREET FLOW EXCEEDS TOP OF CURB.
         THE FOLLOWING STREET FLOW RESULTS ARE BASED ON THE ASSUMPTION
         THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
         THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
    STREET FLOW DEPTH(FEET) =  0.80
    HALFSTREET FLOOD WIDTH(FEET) =   32.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.30
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.43
  STREET FLOW TRAVEL TIME(MIN.) =   1.72   Tc(MIN.) =   31.83
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.648
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8650
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    0.60      SUBAREA RUNOFF(CFS) =    0.86
  TOTAL AREA(ACRES) =       57.8        PEAK FLOW RATE(CFS) =      83.06

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.80   HALFSTREET FLOOD WIDTH(FEET) =  32.00
  FLOW VELOCITY(FEET/SEC.) =  4.30   DEPTH*VELOCITY(FT*FT/SEC.) =   3.43
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    107.00 =    3315.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    107.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.648
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8650
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =   16.00   SUBAREA RUNOFF(CFS) =   22.80
  TOTAL AREA(ACRES) =       73.8   TOTAL RUNOFF(CFS) =     105.87
  TC(MIN.) =   31.83

****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    107.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.648
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8650
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    1.80   SUBAREA RUNOFF(CFS) =    2.57
  TOTAL AREA(ACRES) =       75.6   TOTAL RUNOFF(CFS) =     108.43
  TC(MIN.) =   31.83
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       75.6  TC(MIN.) =     31.83
  PEAK FLOW RATE(CFS)   =     108.43
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                      (RCFC&WCD)  1978 HYDROLOGY MANUAL
         (c) Copyright 1982-2016 Advanced Engineering Software (aes)
                      (Rational Tabling Version 23.0)
                  Release Date: 07/01/2016  License ID 1435

                           Analysis prepared by:

                         THIENES ENGINEERING, INC.
                            14349 FIRESTONE BLVD
                            LA MIRADA, CA 90638
                                714-521-4811

 ************************* DESCRIPTION OF STUDY *************************
* TEI JOB 3828                                                          *
* 100-YEAR STORM EVENT                                                  *
* EXISTING CONDITION (NODES 110-112)                                    *
 ************************************************************************

  FILE NAME: W:\3828\110XX.DAT
  TIME/DATE OF STUDY: 09:40 03/25/2021
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.010
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.820
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.940
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.200
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.5003939
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.5001161
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.200
  SLOPE OF INTENSITY DURATION CURVE = 0.5001
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *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.*

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    111.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   875.00
  UPSTREAM ELEVATION(FEET) =   1755.15
  DOWNSTREAM ELEVATION(FEET) =   1747.00
  ELEVATION DIFFERENCE(FEET) =      8.15
  TC = 0.303*[(  875.00**3)/(     8.15)]**.2 =   11.603
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.729
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8750
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      2.39
  TOTAL AREA(ACRES) =      1.00   TOTAL RUNOFF(CFS) =      2.39

****************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    112.00 IS CODE =  61
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1747.00  DOWNSTREAM ELEVATION(FEET) = 1737.88
  STREET LENGTH(FEET) =   875.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 38.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  19.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.31
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.37
    HALFSTREET FLOOD WIDTH(FEET) =   10.68
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.49
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.92
  STREET FLOW TRAVEL TIME(MIN.) =   5.86   Tc(MIN.) =   17.47
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.224
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8712
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    0.95      SUBAREA RUNOFF(CFS) =    1.84
  TOTAL AREA(ACRES) =        2.0        PEAK FLOW RATE(CFS) =       4.23

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.40   HALFSTREET FLOOD WIDTH(FEET) =  11.95
  FLOW VELOCITY(FEET/SEC.) =  2.61   DEPTH*VELOCITY(FT*FT/SEC.) =   1.04
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    112.00 =    1750.00 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        2.0  TC(MIN.) =     17.47
  PEAK FLOW RATE(CFS)   =       4.23
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
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                  Release Date: 07/01/2016  License ID 1435

                           Analysis prepared by:

                         THIENES ENGINEERING, INC.
                            14349 FIRESTONE BLVD
                            LA MIRADA, CA 90638
                                714-521-4811

 ************************* DESCRIPTION OF STUDY *************************
* TEI JOB 3828                                                         *
* 100-YEAR STORM EVENT                                                 *
* EXISTING CONDITION (NODES 120-121)                                   *
 ************************************************************************

  FILE NAME: W:\3828\120XX.DAT
  TIME/DATE OF STUDY: 10:39 03/25/2021
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.010
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.820
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.940
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.200
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.5003939
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.5001161
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.200
  SLOPE OF INTENSITY DURATION CURVE = 0.5001
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *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.*

************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    121.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   390.00
  UPSTREAM ELEVATION(FEET) =   1740.00
  DOWNSTREAM ELEVATION(FEET) =   1734.82
  ELEVATION DIFFERENCE(FEET) =      5.18
  TC = 0.303*[(  390.00**3)/(     5.18)]**.2 =    7.823
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.324
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8784
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      1.61
  TOTAL AREA(ACRES) =      0.55   TOTAL RUNOFF(CFS) =      1.61
========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.6  TC(MIN.) =      7.82
```

```
  PEAK FLOW RATE(CFS)   =       1.61
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
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                           Analysis prepared by:

                         THIENES ENGINEERING, INC.
                            14349 FIRESTONE BLVD
                            LA MIRADA, CA 90638
                                714-521-4811

 ************************* DESCRIPTION OF STUDY *************************
* TEI JOB 3828                                                          *
* 100-YEAR STORM EVENT                                                  *
* EXISTING CONDITION (NODES 130-131)                                    *
 ************************************************************************

  FILE NAME: W:\3828\130XX.DAT
  TIME/DATE OF STUDY: 11:50 03/25/2021
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.010
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.820
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.940
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.200
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.5003939
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.5001161
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.200
  SLOPE OF INTENSITY DURATION CURVE = 0.5001
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *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.*

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    131.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   175.00
  UPSTREAM ELEVATION(FEET) =   1737.80
  DOWNSTREAM ELEVATION(FEET) =   1734.83
  ELEVATION DIFFERENCE(FEET) =      2.97
  TC = 0.303*[(  175.00**3)/(     2.97)]**.2 =    5.406
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.999
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8813
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      0.88
  TOTAL AREA(ACRES) =      0.25   TOTAL RUNOFF(CFS) =      0.88
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.2  TC(MIN.) =      5.41
```

```
  PEAK FLOW RATE(CFS)   =       0.88
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

PROPOSED CONDITION

```
**************************************************************************
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        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
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                Release Date: 07/01/2016  License ID 1435

                        Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* TEI 3828 - OPTION 2                                                   *
* 100-YEAR STORM EVENT                                                  *
* PROPOSED CONDITION NODES 100-112                                      *
 *************************************************************************

  FILE NAME: W:\3828\100P2.DAT
  TIME/DATE OF STUDY: 08:55 11/17/2020
-------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
-------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.010
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.820
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.940
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.200
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.5003939
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.5001161
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.200
  SLOPE OF INTENSITY DURATION CURVE = 0.5001
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *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.*

**************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
-------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1000.00
  UPSTREAM ELEVATION(FEET) =   1755.00
  DOWNSTREAM ELEVATION(FEET) =   1730.50
  ELEVATION DIFFERENCE(FEET) =     24.50
  TC = 0.303*[( 1000.00**3)/(    24.50)]**.2 =   10.087
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.927
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8763
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      4.62
  TOTAL AREA(ACRES) =      1.80   TOTAL RUNOFF(CFS) =      4.62

**************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    112.00 IS CODE =  51
-------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1730.50  DOWNSTREAM(FEET) =   1726.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   345.00   CHANNEL SLOPE =  0.0130
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.012   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.590
```

```
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8741
  SOIL CLASSIFICATION IS "B"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.06
  AVERAGE FLOW DEPTH(FEET) =   0.05   TRAVEL TIME(MIN.) =   2.80
  Tc(MIN.) =   12.88
  SUBAREA AREA(ACRES) =     0.75       SUBAREA RUNOFF(CFS) =    1.70
  TOTAL AREA(ACRES) =        2.5         PEAK FLOW RATE(CFS) =       6.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.06   FLOW VELOCITY(FEET/SEC.) =   2.05
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    112.00 =    1345.00 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.) =   12.88
  RAINFALL INTENSITY(INCH/HR) =   2.59
  TOTAL STREAM AREA(ACRES) =     2.55
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.32

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    111.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  UPSTREAM ELEVATION(FEET) =   1735.20
  DOWNSTREAM ELEVATION(FEET) =   1732.75
  ELEVATION DIFFERENCE(FEET) =      2.45
  TC = 0.303*[(  300.00**3)/(     2.45)]**.2 =    7.763
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.337
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8785
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =     10.85
  TOTAL AREA(ACRES) =      3.70   TOTAL RUNOFF(CFS) =     10.85

****************************************************************************
  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) =  1729.75  DOWNSTREAM(FEET) =  1722.25
  FLOW LENGTH(FEET) =   990.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.64
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.85
  PIPE TRAVEL TIME(MIN.) =   2.49    Tc(MIN.) =   10.25
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    112.00 =    1290.00 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.) =   10.25
  RAINFALL INTENSITY(INCH/HR) =   2.90
  TOTAL STREAM AREA(ACRES) =     3.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.85

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.32    12.88        2.590          2.55
      2       10.85    10.25        2.904          3.70

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       15.87    10.25       2.904
      2       15.99    12.88       2.590
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      15.99   Tc(MIN.) =   12.88
  TOTAL AREA(ACRES) =        6.2
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    112.00 =    1345.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.590
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .4298
  SOIL CLASSIFICATION IS "A"
  SUBAREA AREA(ACRES) =    0.65   SUBAREA RUNOFF(CFS) =    0.72
  TOTAL AREA(ACRES) =        6.9   TOTAL RUNOFF(CFS) =      16.71
  TC(MIN.) =   12.88
  ** PEAK FLOW RATE TABLE **
  STREAM   RUNOFF       Tc
  NUMBER    (CFS)     (MIN.)
     1       16.73      10.25
     2       16.71      12.88
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      16.73  Tc(MIN.) =   10.25
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        6.9  TC(MIN.) =     10.25
  PEAK FLOW RATE(CFS)   =      16.73
  *** PEAK FLOW RATE TABLE ***
         Q(CFS)   Tc(MIN.)
  1       16.73      10.25
  2       16.71      12.88
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

♀

```
******************************************************************************
           RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
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                    (Rational Tabling Version 23.0)
                Release Date: 07/01/2016  License ID 1435

                        Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* TEI JOB 3828 - OPTION 2                                                 *
* 100-YEAR STORM CONDITION                                                *
* PROPOSED CONDITION NODES 200-222                                        *
 ****************************************************************************

  FILE NAME: W:\3828\200P2.DAT
  TIME/DATE OF STUDY: 11:49 11/17/2020
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.010
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.820
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.940
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.200
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.5003939
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.5001161
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.200
  SLOPE OF INTENSITY DURATION CURVE = 0.5001
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *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.*

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   340.00
  UPSTREAM ELEVATION(FEET) =   1731.46
  DOWNSTREAM ELEVATION(FEET) =   1725.97
  ELEVATION DIFFERENCE(FEET) =      5.49
  TC = 0.303*[(  340.00**3)/(     5.49)]**.2 =    7.121
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.484
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8792
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =     10.72
  TOTAL AREA(ACRES) =      3.50   TOTAL RUNOFF(CFS) =     10.72

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    211.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1722.97  DOWNSTREAM(FEET) =  1720.97
  FLOW LENGTH(FEET) =   440.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.34
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =      10.72
  PIPE TRAVEL TIME(MIN.) =   1.37    Tc(MIN.) =    8.49
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    211.00 =     780.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    211.00 TO NODE    211.00 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.) =    8.49
  RAINFALL INTENSITY(INCH/HR) =   3.19
  TOTAL STREAM AREA(ACRES) =     3.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.72

****************************************************************************
  FLOW PROCESS FROM NODE    210.00 TO NODE    211.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   480.00
  UPSTREAM ELEVATION(FEET) =   1731.46
  DOWNSTREAM ELEVATION(FEET) =   1725.21
  ELEVATION DIFFERENCE(FEET) =      6.25
  TC = 0.303*[(  480.00**3)/(     6.25)]**.2 =    8.534
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.183
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8777
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =     23.05
  TOTAL AREA(ACRES) =      8.25   TOTAL RUNOFF(CFS) =     23.05

****************************************************************************
  FLOW PROCESS FROM NODE    211.00 TO NODE    211.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.53
  RAINFALL INTENSITY(INCH/HR) =   3.18
  TOTAL STREAM AREA(ACRES) =     8.25
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     23.05

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       10.72     8.49        3.190          3.50
      2       23.05     8.53        3.183          8.25

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       33.66     8.49       3.190
      2       33.74     8.53       3.183

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      33.74   Tc(MIN.) =    8.53
  TOTAL AREA(ACRES) =       11.8
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    211.00 =     780.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    211.00 TO NODE    222.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1722.97  DOWNSTREAM(FEET) =  1709.50
  FLOW LENGTH(FEET) =    69.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  29.91
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      33.74
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    8.57
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    222.00 =     849.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    222.00 TO NODE    222.00 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.) =    8.57
  RAINFALL INTENSITY(INCH/HR) =   3.18
  TOTAL STREAM AREA(ACRES) =    11.75
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     33.74

****************************************************************************
  FLOW PROCESS FROM NODE    220.00 TO NODE    221.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   560.00
  UPSTREAM ELEVATION(FEET) =   1731.93
  DOWNSTREAM ELEVATION(FEET) =   1725.21
  ELEVATION DIFFERENCE(FEET) =      6.72
  TC = 0.303*[(  560.00**3)/(     6.72)]**.2 =    9.226
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.061
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8771
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =     20.80
  TOTAL AREA(ACRES) =      7.75   TOTAL RUNOFF(CFS) =     20.80

****************************************************************************
  FLOW PROCESS FROM NODE    221.00 TO NODE    222.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1722.21  DOWNSTREAM(FEET) =  1709.50
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  29.36
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      20.80
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    9.25
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    222.00 =     610.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    222.00 TO NODE    222.00 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.) =    9.25
  RAINFALL INTENSITY(INCH/HR) =   3.06
  TOTAL STREAM AREA(ACRES) =     7.75
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.80

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       33.66     8.53        3.183         11.75
      1       33.74     8.57        3.175         11.75
      2       20.80     9.25        3.056          7.75

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)
      1       52.84     8.53        3.183
      2       53.01     8.57        3.175
      3       53.28     9.25        3.056

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      53.28   Tc(MIN.) =    9.25
  TOTAL AREA(ACRES) =       19.5
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    222.00 =     849.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    222.00 TO NODE    222.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.056
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6702
  SOIL CLASSIFICATION IS "B"
```

```
  SUBAREA AREA(ACRES) =    2.45   SUBAREA RUNOFF(CFS) =    5.02
  TOTAL AREA(ACRES) =       22.0   TOTAL RUNOFF(CFS) =      58.30
  TC(MIN.) =    9.25
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       22.0  TC(MIN.) =      9.25
  PEAK FLOW RATE(CFS)   =      58.30
  *** PEAK FLOW RATE TABLE ***
         Q(CFS)   Tc(MIN.)
  1       58.12       8.53
  2       58.28       8.57
  3       58.30       9.25
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

♀

```
**************************************************************************
           RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                    (RCFC&WCD)  1978 HYDROLOGY MANUAL
         (c) Copyright 1982-2016 Advanced Engineering Software (aes)
                    (Rational Tabling Version 23.0)
                Release Date: 07/01/2016  License ID 1435

                        Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* TEI 3828 - OPTION 2                                                    *
* 100-YEAR STORM EVENT                                                   *
* PROPOSED CONDITION NODES 300-309                                       *
 **************************************************************************

  FILE NAME: W:\3828\300P2.DAT
  TIME/DATE OF STUDY: 09:32 11/17/2020
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.010
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.820
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.940
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.200
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.5003939
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.5001161
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.200
  SLOPE OF INTENSITY DURATION CURVE = 0.5001
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *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.*

**************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    301.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   471.00
  UPSTREAM ELEVATION(FEET) =   1748.97
  DOWNSTREAM ELEVATION(FEET) =   1730.73
  ELEVATION DIFFERENCE(FEET) =     18.24
  TC = 0.303*[(  471.00**3)/(    18.24)]**.2 =    6.811
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.563
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8795
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =     18.02
  TOTAL AREA(ACRES) =      5.75   TOTAL RUNOFF(CFS) =     18.02

**************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1726.07  DOWNSTREAM(FEET) =  1725.05
  FLOW LENGTH(FEET) =   204.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.43
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =      18.02
  PIPE TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =    7.34
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    302.00 =     675.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.432
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8790
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    1.95   SUBAREA RUNOFF(CFS) =    5.88
  TOTAL AREA(ACRES) =        7.7   TOTAL RUNOFF(CFS) =      23.90
  TC(MIN.) =    7.34

****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    303.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1725.05  DOWNSTREAM(FEET) =  1724.17
  FLOW LENGTH(FEET) =   176.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  19.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.90
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      23.90
  PIPE TRAVEL TIME(MIN.) =   0.43    Tc(MIN.) =    7.76
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    303.00 =     851.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.337
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8785
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    1.95   SUBAREA RUNOFF(CFS) =    5.72
  TOTAL AREA(ACRES) =        9.6   TOTAL RUNOFF(CFS) =      29.62
  TC(MIN.) =    7.76

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    304.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1724.17  DOWNSTREAM(FEET) =  1723.29
  FLOW LENGTH(FEET) =   176.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  23.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.11
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      29.62
  PIPE TRAVEL TIME(MIN.) =   0.41    Tc(MIN.) =    8.18
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    304.00 =    1027.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    304.00 TO NODE    304.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.251
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8781
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    2.30   SUBAREA RUNOFF(CFS) =    6.57
  TOTAL AREA(ACRES) =       11.9   TOTAL RUNOFF(CFS) =      36.18
  TC(MIN.) =    8.18

****************************************************************************
  FLOW PROCESS FROM NODE    304.00 TO NODE    305.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1723.29  DOWNSTREAM(FEET) =  1722.41
  FLOW LENGTH(FEET) =   176.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  24.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.54
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      36.18
  PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =    8.57
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    305.00 =    1203.00 FEET.

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

```
  FLOW PROCESS FROM NODE    305.00 TO NODE    305.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.177
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8777
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    1.60   SUBAREA RUNOFF(CFS) =    4.46
  TOTAL AREA(ACRES) =       13.6   TOTAL RUNOFF(CFS) =      40.64
  TC(MIN.) =    8.57

****************************************************************************
  FLOW PROCESS FROM NODE    305.00 TO NODE    306.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1722.41  DOWNSTREAM(FEET) =  1721.53
  FLOW LENGTH(FEET) =   176.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  24.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.85
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      40.64
  PIPE TRAVEL TIME(MIN.) =   0.37    Tc(MIN.) =    8.94
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    306.00 =    1379.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    306.00 TO NODE    306.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.109
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8773
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    2.30   SUBAREA RUNOFF(CFS) =    6.27
  TOTAL AREA(ACRES) =       15.9   TOTAL RUNOFF(CFS) =      46.92
  TC(MIN.) =    8.94

****************************************************************************
  FLOW PROCESS FROM NODE    306.00 TO NODE    307.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1721.53  DOWNSTREAM(FEET) =  1720.65
  FLOW LENGTH(FEET) =   176.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  27.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.01
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      46.92
  PIPE TRAVEL TIME(MIN.) =   0.37    Tc(MIN.) =    9.31
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    307.00 =    1555.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    307.00 TO NODE    307.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.048
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8770
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    1.95   SUBAREA RUNOFF(CFS) =    5.21
  TOTAL AREA(ACRES) =       17.8   TOTAL RUNOFF(CFS) =      52.13
  TC(MIN.) =    9.31

****************************************************************************
  FLOW PROCESS FROM NODE    307.00 TO NODE    308.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1720.65  DOWNSTREAM(FEET) =  1719.77
  FLOW LENGTH(FEET) =   176.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.33
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      52.13
  PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =    9.66
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    308.00 =    1731.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    308.00 TO NODE    308.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.992
```

```
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8767
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    1.95   SUBAREA RUNOFF(CFS) =    5.11
  TOTAL AREA(ACRES) =       19.8   TOTAL RUNOFF(CFS) =      57.24
  TC(MIN.) =    9.66

****************************************************************************
  FLOW PROCESS FROM NODE    308.00 TO NODE    309.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1719.77  DOWNSTREAM(FEET) =  1709.50
  FLOW LENGTH(FEET) =  1885.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  28.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.77
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      57.24
  PIPE TRAVEL TIME(MIN.) =   3.58    Tc(MIN.) =   13.24
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    309.00 =    3616.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    309.00 TO NODE    309.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.555
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6383
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    1.85   SUBAREA RUNOFF(CFS) =    3.02
  TOTAL AREA(ACRES) =       21.6   TOTAL RUNOFF(CFS) =      60.26
  TC(MIN.) =   13.24
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       21.6  TC(MIN.) =     13.24
  PEAK FLOW RATE(CFS)   =      60.26
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

♀

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******************************************************************************
           RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                    (RCFC&WCD)  1978 HYDROLOGY MANUAL
         (c) Copyright 1982-2016 Advanced Engineering Software (aes)
                    (Rational Tabling Version 23.0)
                Release Date: 07/01/2016  License ID 1435

                        Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* TEI 3828 - OPTION 2                                                    *
* 100-YEAR STORM EVENT                                                   *
* PROPOSED CONDITION NODES 400-432                                       *
 ****************************************************************************

  FILE NAME: W:\3828\400P2.DAT
  TIME/DATE OF STUDY: 11:52 11/17/2020
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.010
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.820
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.940
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.200
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.5003939
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.5001161
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.200
  SLOPE OF INTENSITY DURATION CURVE = 0.5001
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *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.*

****************************************************************************
  FLOW PROCESS FROM NODE    400.00 TO NODE    401.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   230.00
  UPSTREAM ELEVATION(FEET) =   1734.97
  DOWNSTREAM ELEVATION(FEET) =   1730.74
  ELEVATION DIFFERENCE(FEET) =      4.23
  TC = 0.303*[(  230.00**3)/(     4.23)]**.2 =    5.934
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.817
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8806
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =     12.60
  TOTAL AREA(ACRES) =      3.75   TOTAL RUNOFF(CFS) =     12.60

****************************************************************************
  FLOW PROCESS FROM NODE    401.00 TO NODE    412.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1730.74  DOWNSTREAM(FEET) =  1724.80
  FLOW LENGTH(FEET) =   710.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.11
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =      12.60
  PIPE TRAVEL TIME(MIN.) =   1.66    Tc(MIN.) =    7.60
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    412.00 =     940.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    412.00 TO NODE    412.00 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.) =    7.60
  RAINFALL INTENSITY(INCH/HR) =   3.37
  TOTAL STREAM AREA(ACRES) =     3.75
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.60

****************************************************************************
  FLOW PROCESS FROM NODE    410.00 TO NODE    411.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   329.00
  UPSTREAM ELEVATION(FEET) =   1732.60
  DOWNSTREAM ELEVATION(FEET) =   1727.21
  ELEVATION DIFFERENCE(FEET) =      5.39
  TC = 0.303*[(  329.00**3)/(     5.39)]**.2 =    7.008
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.512
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8793
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      5.25
  TOTAL AREA(ACRES) =      1.70   TOTAL RUNOFF(CFS) =      5.25

****************************************************************************
  FLOW PROCESS FROM NODE    411.00 TO NODE    412.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1723.21  DOWNSTREAM(FEET) =  1723.04
  FLOW LENGTH(FEET) =    28.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  12.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.93
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      5.25
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    7.10
  LONGEST FLOWPATH FROM NODE    410.00 TO NODE    412.00 =     357.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    412.00 TO NODE    412.00 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.) =    7.10
  RAINFALL INTENSITY(INCH/HR) =   3.49
  TOTAL STREAM AREA(ACRES) =     1.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.25

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       12.60     7.60        3.373          3.75
      2        5.25     7.10        3.489          1.70

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       17.03     7.10        3.489
      2       17.68     7.60        3.373

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      17.68   Tc(MIN.) =    7.60
  TOTAL AREA(ACRES) =        5.4
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    412.00 =     940.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    412.00 TO NODE    412.00 IS CODE =  81
----------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.373
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8787
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    0.65   SUBAREA RUNOFF(CFS) =    1.93
  TOTAL AREA(ACRES) =        6.1   TOTAL RUNOFF(CFS) =      19.61
  TC(MIN.) =    7.60

****************************************************************************
  FLOW PROCESS FROM NODE    412.00 TO NODE    422.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1723.04  DOWNSTREAM(FEET) =  1716.80
  FLOW LENGTH(FEET) =   560.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.87
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      19.61
  PIPE TRAVEL TIME(MIN.) =   1.05    Tc(MIN.) =    8.65
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    422.00 =    1500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    422.00 TO NODE    422.00 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.) =    8.65
  RAINFALL INTENSITY(INCH/HR) =   3.16
  TOTAL STREAM AREA(ACRES) =     6.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.61

****************************************************************************
  FLOW PROCESS FROM NODE    420.00 TO NODE    421.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   620.00
  UPSTREAM ELEVATION(FEET) =   1729.28
  DOWNSTREAM ELEVATION(FEET) =   1720.29
  ELEVATION DIFFERENCE(FEET) =      8.99
  TC = 0.303*[(  620.00**3)/(     8.99)]**.2 =    9.253
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.056
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8770
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      6.03
  TOTAL AREA(ACRES) =      2.25   TOTAL RUNOFF(CFS) =      6.03

****************************************************************************
  FLOW PROCESS FROM NODE    421.00 TO NODE    422.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1717.00  DOWNSTREAM(FEET) =  1716.80
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.48
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.03
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    9.34
  LONGEST FLOWPATH FROM NODE    420.00 TO NODE    422.00 =     650.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    422.00 TO NODE    422.00 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.) =    9.34
  RAINFALL INTENSITY(INCH/HR) =   3.04
  TOTAL STREAM AREA(ACRES) =     2.25
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.03

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
```

```
     1       19.03     8.16        3.255          6.10
     1       19.61     8.65        3.161          6.10
     2        6.03     9.34        3.041          2.25

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       24.29     8.16        3.255
     2       25.19     8.65        3.161
     3       24.90     9.34        3.041

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      25.19   Tc(MIN.) =    8.65
  TOTAL AREA(ACRES) =        8.4
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    422.00 =    1500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    422.00 TO NODE    423.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1716.80  DOWNSTREAM(FEET) =  1716.70
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  21.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.01
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      25.19
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    8.73
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    423.00 =    1530.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    423.00 TO NODE    423.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.146
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8775
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    1.05   SUBAREA RUNOFF(CFS) =    2.90
  TOTAL AREA(ACRES) =        9.4   TOTAL RUNOFF(CFS) =      28.09
  TC(MIN.) =    8.73

****************************************************************************
  FLOW PROCESS FROM NODE    423.00 TO NODE    424.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1716.70  DOWNSTREAM(FEET) =  1716.00
  FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  24.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.66
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      28.09
  PIPE TRAVEL TIME(MIN.) =   0.40    Tc(MIN.) =    9.13
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    424.00 =    1690.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    424.00 TO NODE    424.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.076
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8771
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    1.00   SUBAREA RUNOFF(CFS) =    2.70
  TOTAL AREA(ACRES) =       10.4   TOTAL RUNOFF(CFS) =      30.79
  TC(MIN.) =    9.13

****************************************************************************
  FLOW PROCESS FROM NODE    424.00 TO NODE    432.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1716.00  DOWNSTREAM(FEET) =  1715.00
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  14.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.05
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      30.79
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    9.17
```

 LONGEST FLOWPATH FROM NODE   400.00 TO NODE   432.00 =   1720.00 FEET.

****
 FLOW PROCESS FROM NODE   432.00 TO NODE   432.00 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.) =   9.17
 RAINFALL INTENSITY(INCH/HR) =   3.07
 TOTAL STREAM AREA(ACRES) =   10.40
 PEAK FLOW RATE(CFS) AT CONFLUENCE =   30.79

****
 FLOW PROCESS FROM NODE   430.00 TO NODE   431.00 IS CODE = 21

 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   325.00
 UPSTREAM ELEVATION(FEET) =   1731.44
 DOWNSTREAM ELEVATION(FEET) =   1725.22
 ELEVATION DIFFERENCE(FEET) =   6.22
 TC = 0.303*[(325.00**3)/(6.22)]**.2 =   6.760
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.576
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8796
 SOIL CLASSIFICATION IS "B"
 SUBAREA RUNOFF(CFS) =   17.30
 TOTAL AREA(ACRES) =   5.50   TOTAL RUNOFF(CFS) =   17.30

****
 FLOW PROCESS FROM NODE   431.00 TO NODE   432.00 IS CODE = 31

 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==
 ELEVATION DATA: UPSTREAM(FEET) = 1722.22 DOWNSTREAM(FEET) = 1715.66
 FLOW LENGTH(FEET) =   160.00   MANNING'S N = 0.012
 DEPTH OF FLOW IN 18.0 INCH PIPE IS 11.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 14.03
 ESTIMATED PIPE DIAMETER(INCH) = 18.00   NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =   17.30
 PIPE TRAVEL TIME(MIN.) =   0.19   Tc(MIN.) =   6.95
 LONGEST FLOWPATH FROM NODE   430.00 TO NODE   432.00 =   485.00 FEET.

****
 FLOW PROCESS FROM NODE   432.00 TO NODE   432.00 IS CODE = 81

 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.527
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8794
 SOIL CLASSIFICATION IS "B"
 SUBAREA AREA(ACRES) =   0.60   SUBAREA RUNOFF(CFS) =   1.86
 TOTAL AREA(ACRES) =   6.1   TOTAL RUNOFF(CFS) =   19.16
 TC(MIN.) =   6.95

****
 FLOW PROCESS FROM NODE   432.00 TO NODE   432.00 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.) =   6.95
 RAINFALL INTENSITY(INCH/HR) =   3.53
 TOTAL STREAM AREA(ACRES) =   6.10
 PEAK FLOW RATE(CFS) AT CONFLUENCE =   19.16

 ** CONFLUENCE DATA **
 STREAM   RUNOFF   Tc   INTENSITY   AREA
 NUMBER   (CFS)   (MIN.)   (INCH/HOUR)   (ACRE)
     1   30.05   8.68   3.155   10.40
     1   30.79   9.17   3.071   10.40
     1   30.28   9.87   2.960   10.40
     2   19.16   6.95   3.527   6.10

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

 ** PEAK FLOW RATE TABLE **
 STREAM   RUNOFF   Tc   INTENSITY

```
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       43.22     6.95       3.527
      2       47.19     8.68       3.155
      3       47.47     9.17       3.071
      4       46.36     9.87       2.960

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      47.47   Tc(MIN.) =    9.17
  TOTAL AREA(ACRES) =       16.5
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    432.00 =    1720.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    432.00 TO NODE    432.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.071
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6711
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    1.30   SUBAREA RUNOFF(CFS) =    2.68
  TOTAL AREA(ACRES) =       17.8   TOTAL RUNOFF(CFS) =      50.15
  TC(MIN.) =    9.17
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       17.8  TC(MIN.) =      9.17
  PEAK FLOW RATE(CFS)   =      50.15
  *** PEAK FLOW RATE TABLE ***
         Q(CFS)   Tc(MIN.)
  1       46.40       6.95
  2       49.97       8.68
  3       50.15       9.17
  4       48.92       9.87
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

♀

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************************************************************************
           RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                    (RCFC&WCD)  1978 HYDROLOGY MANUAL
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                    (Rational Tabling Version 23.0)
                Release Date: 07/01/2016  License ID 1435

                         Analysis prepared by:

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                          LA MIRADA, CA 90638
                              714-521-4811

 ************************* DESCRIPTION OF STUDY *************************
* TEI JOB 3828                                                          *
* 100-YEAR STORM EVENT                                                  *
* STREET FLOW (NODES 500-502)                                           *
 ************************************************************************

  FILE NAME: W:\3828\500P.DAT
  TIME/DATE OF STUDY: 08:59 03/22/2021
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.010
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.820
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.940
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.200
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.5003939
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.5001161
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.200
  SLOPE OF INTENSITY DURATION CURVE = 0.5001
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *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.*

************************************************************************
  FLOW PROCESS FROM NODE    500.00 TO NODE    501.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   860.00
  UPSTREAM ELEVATION(FEET) =   1754.80
  DOWNSTREAM ELEVATION(FEET) =   1749.00
  ELEVATION DIFFERENCE(FEET) =      5.80
  TC = 0.303*[(  860.00**3)/(     5.80)]**.2 =   12.291
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.652
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8745
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      2.43
  TOTAL AREA(ACRES) =      1.05   TOTAL RUNOFF(CFS) =      2.43

************************************************************************
  FLOW PROCESS FROM NODE    501.00 TO NODE    502.00 IS CODE =  61
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1748.80  DOWNSTREAM ELEVATION(FEET) = 1739.70
  STREET LENGTH(FEET) =   885.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 38.00

  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) =   0.0149

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.43
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.38
    HALFSTREET FLOOD WIDTH(FEET) =   10.89
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.49
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.94
  STREET FLOW TRAVEL TIME(MIN.) =   5.92   Tc(MIN.) =   18.21
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.179
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8708
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    1.05      SUBAREA RUNOFF(CFS) =    1.99
  TOTAL AREA(ACRES) =        2.1        PEAK FLOW RATE(CFS) =       4.43

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.40   HALFSTREET FLOOD WIDTH(FEET) =  12.23
  FLOW VELOCITY(FEET/SEC.) =  2.63   DEPTH*VELOCITY(FT*FT/SEC.) =   1.06
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    502.00 =    1745.00 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        2.1  TC(MIN.) =     18.21
  PEAK FLOW RATE(CFS)   =       4.43
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                      (RCFC&WCD)  1978 HYDROLOGY MANUAL
         (c) Copyright 1982-2016 Advanced Engineering Software (aes)
                      (Rational Tabling Version 23.0)
                  Release Date: 07/01/2016  License ID 1435

                           Analysis prepared by:

                         THIENES ENGINEERING, INC.
                            14349 FIRESTONE BLVD
                            LA MIRADA, CA 90638
                                714-521-4811

 ************************ DESCRIPTION OF STUDY ************************
* TEI JOB 3828                                                        *
* 100-YEAR STORM EVENT                                                *
* STREET FLOW (NODES 510-511)                                         *
 ************************************************************************

  FILE NAME: W:\3828\510P.DAT
  TIME/DATE OF STUDY: 09:09 03/22/2021
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.010
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.820
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.940
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.200
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.5003939
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.5001161
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.200
  SLOPE OF INTENSITY DURATION CURVE = 0.5001
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *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.*

****************************************************************************
  FLOW PROCESS FROM NODE    510.00 TO NODE    511.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   395.00
  UPSTREAM ELEVATION(FEET) =   1740.00
  DOWNSTREAM ELEVATION(FEET) =   1736.25
  ELEVATION DIFFERENCE(FEET) =      3.75
  TC = 0.303*[(  395.00**3)/(     3.75)]**.2 =    8.409
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.206
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8778
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      2.81
  TOTAL AREA(ACRES) =      1.00   TOTAL RUNOFF(CFS) =      2.81
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        1.0  TC(MIN.) =      8.41
```

510P

PEAK FLOW RATE(CFS) = 2.81

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END OF RATIONAL METHOD ANALYSIS

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****************************************************************************
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        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
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                  Release Date: 07/01/2016  License ID 1435

                           Analysis prepared by:

                         THIENES ENGINEERING, INC.
                            14349 FIRESTONE BLVD
                            LA MIRADA, CA 90638
                                714-521-4811

 ************************* DESCRIPTION OF STUDY *************************
* TEI JOB 3828                                                          *
* 100-YEAR STORM EVENT                                                  *
* STREET FLOW (NODES 520-522)                                           *
 ************************************************************************

  FILE NAME: W:\3828\520P.DAT
  TIME/DATE OF STUDY: 09:29 03/22/2021
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.010
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.820
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.940
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.200
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.5003939
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.5001161
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.200
  SLOPE OF INTENSITY DURATION CURVE = 0.5001
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *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.*

****************************************************************************
  FLOW PROCESS FROM NODE    520.00 TO NODE    521.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   755.00
  UPSTREAM ELEVATION(FEET) =   1737.10
  DOWNSTREAM ELEVATION(FEET) =   1724.20
  ELEVATION DIFFERENCE(FEET) =     12.90
  TC = 0.303*[(  755.00**3)/(    12.90)]**.2 =    9.688
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.987
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8766
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      2.49
  TOTAL AREA(ACRES) =      0.95   TOTAL RUNOFF(CFS) =      2.49

****************************************************************************
  FLOW PROCESS FROM NODE    521.00 TO NODE    522.00 IS CODE =  61
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1724.20  DOWNSTREAM ELEVATION(FEET) = 1696.30
  STREET LENGTH(FEET) =   755.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 43.00

  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) =   0.0149

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.69
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.33
    HALFSTREET FLOOD WIDTH(FEET) =    8.37
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.14
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.35
  STREET FLOW TRAVEL TIME(MIN.) =   3.04   Tc(MIN.) =   12.72
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.606
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8742
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    1.05      SUBAREA RUNOFF(CFS) =    2.39
  TOTAL AREA(ACRES) =        2.0        PEAK FLOW RATE(CFS) =       4.88

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.35   HALFSTREET FLOOD WIDTH(FEET) =   9.57
  FLOW VELOCITY(FEET/SEC.) =  4.42   DEPTH*VELOCITY(FT*FT/SEC.) =   1.54
  LONGEST FLOWPATH FROM NODE    520.00 TO NODE    522.00 =    1510.00 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        2.0  TC(MIN.) =     12.72
  PEAK FLOW RATE(CFS)   =       4.88
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
           RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                    (RCFC&WCD)  1978 HYDROLOGY MANUAL
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                    (Rational Tabling Version 23.0)
                Release Date: 07/01/2016  License ID 1435

                         Analysis prepared by:

                       THIENES ENGINEERING, INC.
                          14349 FIRESTONE BLVD
                          LA MIRADA, CA 90638
                              714-521-4811

 ************************* DESCRIPTION OF STUDY *************************
* TEI JOB 3828                                                         *
* 100-YEAR STORM EVENT                                                 *
* PROPOSED CONDITION (NODES 600-603)                                   *
 ************************************************************************

  FILE NAME: W:\3828\600P2.DAT
  TIME/DATE OF STUDY: 11:29 03/23/2021
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.010
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.820
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.940
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.200
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.5003939
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.5001161
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.200
  SLOPE OF INTENSITY DURATION CURVE = 0.5001
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *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.*

************************************************************************
  FLOW PROCESS FROM NODE    600.00 TO NODE    601.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   975.00
  UPSTREAM ELEVATION(FEET) =   1731.20
  DOWNSTREAM ELEVATION(FEET) =   1718.00
  ELEVATION DIFFERENCE(FEET) =     13.20
  TC = 0.303*[(  975.00**3)/(    13.20)]**.2 =   11.243
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.773
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8753
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      2.31
  TOTAL AREA(ACRES) =      0.95   TOTAL RUNOFF(CFS) =      2.31

************************************************************************
  FLOW PROCESS FROM NODE    601.00 TO NODE    602.00 IS CODE =  61
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1718.00  DOWNSTREAM ELEVATION(FEET) = 1712.50
  STREET LENGTH(FEET) =   840.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 32.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.02
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.39
    HALFSTREET FLOOD WIDTH(FEET) =   11.40
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.03
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.78
  STREET FLOW TRAVEL TIME(MIN.) =   6.91   Tc(MIN.) =   18.15
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.182
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8708
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    0.75      SUBAREA RUNOFF(CFS) =    1.43
  TOTAL AREA(ACRES) =        1.7        PEAK FLOW RATE(CFS) =       3.73

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.41   HALFSTREET FLOOD WIDTH(FEET) =  12.52
  FLOW VELOCITY(FEET/SEC.) =  2.12   DEPTH*VELOCITY(FT*FT/SEC.) =   0.87
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    602.00 =    1815.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    602.00 TO NODE    602.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.182
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8708
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    0.55   SUBAREA RUNOFF(CFS) =    1.05
  TOTAL AREA(ACRES) =        2.2   TOTAL RUNOFF(CFS) =       4.78
  TC(MIN.) =   18.15

****************************************************************************
  FLOW PROCESS FROM NODE    602.00 TO NODE    603.00 IS CODE =  61
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1712.50  DOWNSTREAM ELEVATION(FEET) = 1706.00
  STREET LENGTH(FEET) =   840.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 32.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.44
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.44
    HALFSTREET FLOOD WIDTH(FEET) =   14.16
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.48
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.09
  STREET FLOW TRAVEL TIME(MIN.) =   5.65   Tc(MIN.) =   23.80
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.906
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8681
  SOIL CLASSIFICATION IS "B"
  SUBAREA AREA(ACRES) =    0.80      SUBAREA RUNOFF(CFS) =    1.32
  TOTAL AREA(ACRES) =        3.0        PEAK FLOW RATE(CFS) =       6.10

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.46   HALFSTREET FLOOD WIDTH(FEET) =  14.86
```

```
  FLOW VELOCITY(FEET/SEC.) =  2.54   DEPTH*VELOCITY(FT*FT/SEC.) =   1.16
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    603.00 =    2655.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        3.0  TC(MIN.) =     23.80
  PEAK FLOW RATE(CFS)   =       6.10
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

APPENDIX C

DETENTION CALCULATIONS

BASIN SUMMARY TABLE

Return Event (year)	Storm Duration (hour)	Existing Total Flow (cfs)	Existing Total Volume (ac-ft)	Proposed Total Flow (cfs)	Proposed Total Volume (ac-ft)	Peak Flow Difference (cfs)	Volume Difference (ac-ft)
100	1	136.5	6.11	183.7	6.62	47.2	0.51
100	3	91.6	8.26	107.5	9.99	15.9	1.73
100	6	80.7	9.51	93.2	13.30	12.5	3.79
100	24	33.1	12.73	39.3	23.54	6.2	10.81
10	1	76.3	2.88	117.3	4.21	41.0	1.33
10	3	47.3	2.77	67.7	6.47	20.4	3.70
10	6	41.6	3.04	60.0	8.91	18.4	5.87
10	24	9.1	2.34	24.7	15.05	15.6	12.71
5	1	48.8	1.43	96.9	3.51	48.1	2.08
5	3	24.7	1.24	56.6	5.47	31.9	4.23
5	6	20.7	1.36	51.3	7.66	30.6	6.30
5	24	2.2	1.39	20.5	12.50	18.3	11.11
2	1	31.0	0.90	71.8	2.63	40.8	1.73
2	3	12.5	0.70	43.2	4.18	30.7	3.48
2	6	10.5	0.83	40.3	6.01	29.8	5.18
2	24	1.6	1.02	15.0	9.14	13.4	8.12

EXISTING CONDITION

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/12/20 File: 3828EX212.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.159 Hr.
Lag time = 9.56 Min.
25% of lag time = 2.39 Min.
40% of lag time = 3.82 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	0.50	34.83

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.20	83.58

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 0.500(In)
Area Averaged 100-Year Rainfall = 1.200(In)

Point rain (area averaged) = 0.500(In)
Areal adjustment factor = 99.94 %
Adjusted average point rain = 0.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	76.00	0.000

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	58.2	0.488	0.000	0.488	1.000	0.488
					Sum (F) =	0.488

Area averaged mean soil loss (F) (In/Hr) = 0.488
Minimum soil loss rate ((In/Hr)) = 0.244
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

Slope of intensity-duration curve for a 1 hour storm =0.5000

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	52.307	6.571	4.612
2	0.167	104.614	28.083	19.712
3	0.250	156.922	28.549	20.039
4	0.333	209.229	12.179	8.549
5	0.417	261.536	6.595	4.629
6	0.500	313.843	4.589	3.221
7	0.583	366.151	3.296	2.314
8	0.667	418.458	2.462	1.728
9	0.750	470.765	1.797	1.261
10	0.833	523.072	1.548	1.086

11	0.917	575.380	1.191	0.836
12	1.000	627.687	0.940	0.660
13	1.083	679.994	0.721	0.506
14	1.167	732.301	0.542	0.381
15	1.250	784.608	0.523	0.367
16	1.333	836.916	0.415	0.292
			Sum = 100.000	Sum= 70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	4.20	0.252	(0.488)	0.227	0.025
2	0.17	4.30	0.258	(0.488)	0.232	0.026
3	0.25	5.00	0.300	(0.488)	0.270	0.030
4	0.33	5.00	0.300	(0.488)	0.270	0.030
5	0.42	5.80	0.348	(0.488)	0.313	0.035
6	0.50	6.50	0.390	(0.488)	0.351	0.039
7	0.58	7.40	0.444	(0.488)	0.399	0.044
8	0.67	8.60	0.516	(0.488)	0.464	0.052
9	0.75	12.30	0.738	0.488	(0.664)	0.249
10	0.83	29.10	1.745	0.488	(1.570)	1.257
11	0.92	6.80	0.408	(0.488)	0.367	0.041
12	1.00	5.00	0.300	(0.488)	0.270	0.030

(Loss Rate Not Used)

Sum = 100.0 Sum = 1.9

Flood volume = Effective rainfall 0.15(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 0.9(Ac.Ft)
Total soil loss = 0.34(In)
Total soil loss = 2.002(Ac.Ft)
Total rainfall = 0.50(In)
Flood volume = 39127.3 Cubic Feet
Total soil loss = 87207.7 Cubic Feet

Peak flow rate of this hydrograph = 30.958(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 10.0 20.0 30.0 40.0
0+ 5	0.0008	0.12	Q
0+10	0.0050	0.62	Q
0+15	0.0130	1.15	VQ
0+20	0.0230	1.46	|Q
0+25	0.0347	1.69	|Q
0+30	0.0479	1.92	|QV
0+35	0.0631	2.21	| Q
0+40	0.0806	2.53	| QV
0+45	0.1067	3.79	| QV
0+50	0.1935	12.60	| V Q
0+55	0.4067	30.96	| V Q
1+ 0	0.6058	28.91	| V Q
1+ 5	0.7007	13.78	| Q V
1+10	0.7552	7.92	| Q V
1+15	0.7920	5.34	| Q V
1+20	0.8183	3.82	| Q V
1+25	0.8379	2.84	| Q V
1+30	0.8525	2.12	| Q V
1+35	0.8647	1.77	|Q V
1+40	0.8741	1.37	|Q V
1+45	0.8815	1.07	|Q V
1+50	0.8871	0.82	Q V
1+55	0.8914	0.63	Q V
2+ 0	0.8953	0.57	Q V
2+ 5	0.8980	0.39	Q V
2+10	0.8982	0.02	Q V
2+15	0.8982	0.01	Q V

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/12/20 File: 3828EX232.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.159 Hr.
Lag time = 9.56 Min.
25% of lag time = 2.39 Min.
40% of lag time = 3.82 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	0.80	55.72

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.86	129.55

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 0.800(In)
Area Averaged 100-Year Rainfall = 1.860(In)

Point rain (area averaged) = 0.800(In)
Areal adjustment factor = 99.97 %
Adjusted average point rain = 0.800(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	76.00	0.000

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	58.2	0.488	0.000	0.488	1.000	0.488
					Sum (F) =	0.488

Area averaged mean soil loss (F) (In/Hr) = 0.488
Minimum soil loss rate ((In/Hr)) = 0.244
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	52.307	6.571	4.612
2	0.167	104.614	28.083	19.712
3	0.250	156.922	28.549	20.039
4	0.333	209.229	12.179	8.549
5	0.417	261.536	6.595	4.629
6	0.500	313.843	4.589	3.221
7	0.583	366.151	3.296	2.314
8	0.667	418.458	2.462	1.728
9	0.750	470.765	1.797	1.261
10	0.833	523.072	1.548	1.086
11	0.917	575.380	1.191	0.836
12	1.000	627.687	0.940	0.660

13	1.083	679.994	0.721	0.506
14	1.167	732.301	0.542	0.381
15	1.250	784.608	0.523	0.367
16	1.333	836.916	0.415	0.292
			Sum = 100.000	Sum= 70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.125	(0.488)	0.112	0.012
2	0.17	1.30	0.125	(0.488)	0.112	0.012
3	0.25	1.10	0.106	(0.488)	0.095	0.011
4	0.33	1.50	0.144	(0.488)	0.130	0.014
5	0.42	1.50	0.144	(0.488)	0.130	0.014
6	0.50	1.80	0.173	(0.488)	0.155	0.017
7	0.58	1.50	0.144	(0.488)	0.130	0.014
8	0.67	1.80	0.173	(0.488)	0.155	0.017
9	0.75	1.80	0.173	(0.488)	0.155	0.017
10	0.83	1.50	0.144	(0.488)	0.130	0.014
11	0.92	1.60	0.154	(0.488)	0.138	0.015
12	1.00	1.80	0.173	(0.488)	0.155	0.017
13	1.08	2.20	0.211	(0.488)	0.190	0.021
14	1.17	2.20	0.211	(0.488)	0.190	0.021
15	1.25	2.20	0.211	(0.488)	0.190	0.021
16	1.33	2.00	0.192	(0.488)	0.173	0.019
17	1.42	2.60	0.250	(0.488)	0.225	0.025
18	1.50	2.70	0.259	(0.488)	0.233	0.026
19	1.58	2.40	0.230	(0.488)	0.207	0.023
20	1.67	2.70	0.259	(0.488)	0.233	0.026
21	1.75	3.30	0.317	(0.488)	0.285	0.032
22	1.83	3.10	0.298	(0.488)	0.268	0.030
23	1.92	2.90	0.278	(0.488)	0.250	0.028
24	2.00	3.00	0.288	(0.488)	0.259	0.029
25	2.08	3.10	0.298	(0.488)	0.268	0.030
26	2.17	4.20	0.403	(0.488)	0.363	0.040
27	2.25	5.00	0.480	(0.488)	0.432	0.048
28	2.33	3.50	0.336	(0.488)	0.302	0.034
29	2.42	6.80	0.653	0.488	(0.587)	0.164
30	2.50	7.30	0.701	0.488	(0.631)	0.212
31	2.58	8.20	0.787	0.488	(0.708)	0.299
32	2.67	5.90	0.566	0.488	(0.510)	0.078
33	2.75	2.00	0.192	(0.488)	0.173	0.019
34	2.83	1.80	0.173	(0.488)	0.155	0.017
35	2.92	1.80	0.173	(0.488)	0.155	0.017
36	3.00	0.60	0.058	(0.488)	0.052	0.006

(Loss Rate Not Used)

Sum = 100.0 Sum = 1.4

Flood volume = Effective rainfall 0.12(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 0.7(Ac.Ft)
Total soil loss = 0.68(In)
Total soil loss = 3.944(Ac.Ft)
Total rainfall = 0.80(In)
Flood volume = 30381.8 Cubic Feet
Total soil loss = 171820.2 Cubic Feet

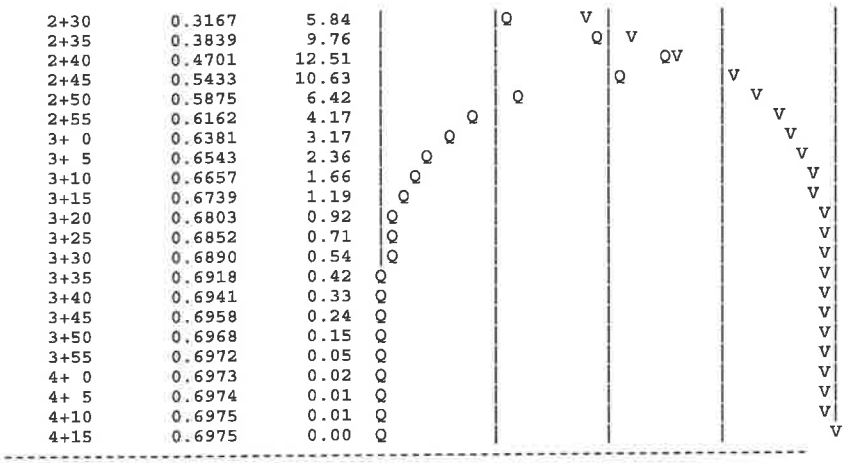
Peak flow rate of this hydrograph = 12.514(CFS)

++

3 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 5.0 10.0 15.0 20.0
0+ 5	0.0004	0.06	Q
0+10	0.0025	0.30	Q
0+15	0.0062	0.54	VQ
0+20	0.0106	0.63	VQ
0+25	0.0156	0.73	VQ
0+30	0.0214	0.84	|Q
0+35	0.0278	0.94	|Q
0+40	0.0346	0.98	|Q
0+45	0.0417	1.03	Q
0+50	0.0492	1.08	Q
0+55	0.0565	1.07	QV
1+ 0	0.0638	1.06	QV
1+ 5	0.0716	1.13	Q V
1+10	0.0802	1.25	Q V
1+15	0.0894	1.35	Q V
1+20	0.0989	1.38	Q V
1+25	0.1086	1.40	Q V
1+30	0.1188	1.49	Q V
1+35	0.1299	1.61	Q V
1+40	0.1412	1.64	Q V
1+45	0.1529	1.70	Q V
1+50	0.1657	1.86	Q V
1+55	0.1792	1.96	Q V
2+ 0	0.1926	1.95	Q V
2+ 5	0.2061	1.96	Q V
2+10	0.2202	2.05	Q V
2+15	0.2362	2.32	Q V
2+20	0.2543	2.64	Q V
2+25	0.2765	3.21	Q V



2+30	0.3167	5.84	
2+35	0.3839	9.76	
2+40	0.4701	12.51	
2+45	0.5433	10.63	
2+50	0.5875	6.42	
2+55	0.6162	4.17	
3+ 0	0.6381	3.17	
3+ 5	0.6543	2.36	
3+10	0.6657	1.66	
3+15	0.6739	1.19	
3+20	0.6803	0.92	
3+25	0.6852	0.71	
3+30	0.6890	0.54	
3+35	0.6918	0.42	
3+40	0.6941	0.33	
3+45	0.6958	0.24	
3+50	0.6968	0.15	
3+55	0.6972	0.05	
4+ 0	0.6973	0.02	
4+ 5	0.6974	0.01	
4+10	0.6975	0.01	
4+15	0.6975	0.00	

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/12/20 File: 3828EX262.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
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Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.159 Hr.
Lag time = 9.56 Min.
25% of lag time = 2.39 Min.
40% of lag time = 3.82 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.15	80.10

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	2.50	174.13

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 1.150(In)
Area Averaged 100-Year Rainfall = 2.500(In)

Point rain (area averaged) = 1.150(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 1.150(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	76.00	0.000

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	58.2	0.488	0.000	0.488	1.000	0.488
					Sum (F) =	0.488

Area averaged mean soil loss (F) (In/Hr) = 0.488
Minimum soil loss rate ((In/Hr)) = 0.244
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	52.307	6.571	4.612
2	0.167	104.614	28.083	19.712
3	0.250	156.922	28.549	20.039
4	0.333	209.229	12.179	8.549
5	0.417	261.536	6.595	4.629
6	0.500	313.843	4.589	3.221
7	0.583	366.151	3.296	2.314
8	0.667	418.458	2.462	1.728
9	0.750	470.765	1.797	1.261
10	0.833	523.072	1.548	1.086
11	0.917	575.380	1.191	0.836
12	1.000	627.687	0.940	0.660

13	1.083	679.994	0.721	0.506
14	1.167	732.301	0.542	0.381
15	1.250	784.608	0.523	0.367
16	1.333	836.916	0.415	0.292
			Sum = 100.000	Sum= 70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.069	(0.488)	0.062	0.007
2	0.17	0.60	0.083	(0.488)	0.075	0.008
3	0.25	0.60	0.083	(0.488)	0.075	0.008
4	0.33	0.60	0.083	(0.488)	0.075	0.008
5	0.42	0.60	0.083	(0.488)	0.075	0.008
6	0.50	0.70	0.097	(0.488)	0.087	0.010
7	0.58	0.70	0.097	(0.488)	0.087	0.010
8	0.67	0.70	0.097	(0.488)	0.087	0.010
9	0.75	0.70	0.097	(0.488)	0.087	0.010
10	0.83	0.70	0.097	(0.488)	0.087	0.010
11	0.92	0.70	0.097	(0.488)	0.087	0.010
12	1.00	0.80	0.110	(0.488)	0.099	0.011
13	1.08	0.80	0.110	(0.488)	0.099	0.011
14	1.17	0.80	0.110	(0.488)	0.099	0.011
15	1.25	0.80	0.110	(0.488)	0.099	0.011
16	1.33	0.80	0.110	(0.488)	0.099	0.011
17	1.42	0.80	0.110	(0.488)	0.099	0.011
18	1.50	0.80	0.110	(0.488)	0.099	0.011
19	1.58	0.80	0.110	(0.488)	0.099	0.011
20	1.67	0.80	0.110	(0.488)	0.099	0.011
21	1.75	0.80	0.110	(0.488)	0.099	0.011
22	1.83	0.80	0.110	(0.488)	0.099	0.011
23	1.92	0.80	0.110	(0.488)	0.099	0.011
24	2.00	0.90	0.124	(0.488)	0.112	0.012
25	2.08	0.80	0.110	(0.488)	0.099	0.011
26	2.17	0.90	0.124	(0.488)	0.112	0.012
27	2.25	0.90	0.124	(0.488)	0.112	0.012
28	2.33	0.90	0.124	(0.488)	0.112	0.012
29	2.42	0.90	0.124	(0.488)	0.112	0.012
30	2.50	0.90	0.124	(0.488)	0.112	0.012
31	2.58	0.90	0.124	(0.488)	0.112	0.012
32	2.67	0.90	0.124	(0.488)	0.112	0.012
33	2.75	1.00	0.138	(0.488)	0.124	0.014
34	2.83	1.00	0.138	(0.488)	0.124	0.014
35	2.92	1.00	0.138	(0.488)	0.124	0.014
36	3.00	1.00	0.138	(0.488)	0.124	0.014
37	3.08	1.00	0.138	(0.488)	0.124	0.014
38	3.17	1.10	0.152	(0.488)	0.137	0.015
39	3.25	1.10	0.152	(0.488)	0.137	0.015
40	3.33	1.10	0.152	(0.488)	0.137	0.015
41	3.42	1.20	0.166	(0.488)	0.149	0.017
42	3.50	1.30	0.179	(0.488)	0.161	0.018
43	3.58	1.40	0.193	(0.488)	0.174	0.019
44	3.67	1.40	0.193	(0.488)	0.174	0.019
45	3.75	1.50	0.207	(0.488)	0.186	0.021
46	3.83	1.50	0.207	(0.488)	0.186	0.021
47	3.92	1.60	0.221	(0.488)	0.199	0.022
48	4.00	1.60	0.221	(0.488)	0.199	0.022
49	4.08	1.70	0.235	(0.488)	0.211	0.023
50	4.17	1.80	0.248	(0.488)	0.224	0.025
51	4.25	1.90	0.262	(0.488)	0.236	0.026
52	4.33	2.00	0.276	(0.488)	0.248	0.028
53	4.42	2.10	0.290	(0.488)	0.261	0.029
54	4.50	2.10	0.290	(0.488)	0.261	0.029
55	4.58	2.20	0.304	(0.488)	0.273	0.030
56	4.67	2.30	0.317	(0.488)	0.286	0.032
57	4.75	2.40	0.331	(0.488)	0.298	0.033
58	4.83	2.40	0.331	(0.488)	0.298	0.033
59	4.92	2.50	0.345	(0.488)	0.310	0.034
60	5.00	2.60	0.359	(0.488)	0.323	0.036
61	5.08	3.10	0.428	(0.488)	0.385	0.043
62	5.17	3.60	0.497	(0.488)	0.447	0.050
63	5.25	3.90	0.538	(0.488)	0.484	0.054
64	5.33	4.20	0.579	0.488	(0.522)	0.091
65	5.42	4.70	0.648	0.488	(0.584)	0.160
66	5.50	5.60	0.773	0.488	(0.695)	0.284
67	5.58	1.90	0.262	(0.488)	0.236	0.026
68	5.67	0.90	0.124	(0.488)	0.112	0.012
69	5.75	0.60	0.083	(0.488)	0.075	0.008
70	5.83	0.50	0.069	(0.488)	0.062	0.007
71	5.92	0.30	0.041	(0.488)	0.037	0.004
72	6.00	0.20	0.028	(0.488)	0.025	0.003

(Loss Rate Not Used)

Sum = 100.0 Sum = 1.7

Flood volume = Effective rainfall 0.14(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 0.8(Ac.Ft)
Total soil loss = 1.01(In)
Total soil loss = 5.844(Ac.Ft)
Total rainfall = 1.15(In)
Flood volume = 36134.8 Cubic Feet
Total soil loss = 254549.5 Cubic Feet

Peak flow rate of this hydrograph = 10.460(CFS)

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6 - H O U R S T O R M

Runoff Hydrograph

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 5.0 10.0 15.0 20.0
0+ 5	0.0002	0.03	Q
0+10	0.0014	0.17	Q
0+15	0.0038	0.34	Q
0+20	0.0067	0.43	Q
0+25	0.0099	0.47	Q
0+30	0.0134	0.51	VQ
0+35	0.0172	0.55	VQ
0+40	0.0213	0.60	|Q
0+45	0.0256	0.62	|Q
0+50	0.0299	0.63	|Q
0+55	0.0344	0.65	|Q
1+ 0	0.0390	0.66	|Q
1+ 5	0.0437	0.70	|QV
1+10	0.0487	0.73	|QV
1+15	0.0539	0.74	|QV
1+20	0.0591	0.75	|QV
1+25	0.0643	0.76	|Q V
1+30	0.0696	0.76	|Q V
1+35	0.0748	0.77	|Q V
1+40	0.0801	0.77	|Q V
1+45	0.0855	0.77	|Q V
1+50	0.0908	0.77	|Q V
1+55	0.0961	0.77	|Q V
2+ 0	0.1015	0.78	|Q V
2+ 5	0.1070	0.80	|Q V
2+10	0.1126	0.81	|Q V
2+15	0.1182	0.82	|Q V
2+20	0.1240	0.84	|Q V
2+25	0.1299	0.85	|Q V
2+30	0.1358	0.86	|Q V
2+35	0.1417	0.86	|Q V
2+40	0.1477	0.86	|Q V
2+45	0.1537	0.87	|Q V
2+50	0.1599	0.90	|Q V
2+55	0.1663	0.93	|Q V
3+ 0	0.1728	0.94	|Q V
3+ 5	0.1793	0.95	|Q V
3+10	0.1859	0.96	|Q V
3+15	0.1928	0.99	|Q V
3+20	0.1998	1.02	| Q V
3+25	0.2070	1.04	| Q V
3+30	0.2145	1.08	| Q V
3+35	0.2224	1.15	| Q V
3+40	0.2308	1.22	| Q V
3+45	0.2396	1.28	| Q V
3+50	0.2488	1.33	| Q V
3+55	0.2583	1.38	| Q V
4+ 0	0.2681	1.43	| Q V
4+ 5	0.2783	1.48	| Q V
4+10	0.2889	1.53	| Q V
4+15	0.2999	1.61	| Q V
4+20	0.3116	1.69	| Q V
4+25	0.3239	1.78	| Q V
4+30	0.3367	1.87	| Q V
4+35	0.3500	1.93	| Q V
4+40	0.3638	2.00	| Q V
4+45	0.3781	2.08	| Q V
4+50	0.3930	2.16	| Q V
4+55	0.4083	2.22	| Q V
5+ 0	0.4240	2.29	| Q V
5+ 5	0.4405	2.39	| Q V
5+10	0.4585	2.62	| Q V
5+15	0.4788	2.94	| Q V
5+20	0.5023	3.41	| Q V
5+25	0.5343	4.65	| Q V
5+30	0.5855	7.43	| Q V
5+35	0.6576	10.46	| Q V
5+40	0.7168	8.61	| Q V
5+45	0.7490	4.68	| Q V
5+50	0.7698	3.02	| Q V
5+55	0.7851	2.23	| Q V
6+ 0	0.7967	1.68	| Q V
6+ 5	0.8054	1.26	| Q V
6+10	0.8118	0.93	|Q V
6+15	0.8167	0.71	|Q V
6+20	0.8205	0.54	|Q V
6+25	0.8233	0.41	Q V
6+30	0.8255	0.31	Q V
6+35	0.8271	0.24	Q V
6+40	0.8284	0.19	Q V
6+45	0.8292	0.11	Q V
6+50	0.8293	0.02	Q V
6+55	0.8294	0.01	Q V
7+ 0	0.8295	0.01	Q V
7+ 5	0.8295	0.00	Q V
7+10	0.8295	0.00	Q V
7+15	0.8295	0.00	Q V

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/12/20 File: 3828EX2242.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.159 Hr.
Lag time = 9.56 Min.
25% of lag time = 2.39 Min.
40% of lag time = 3.82 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.75	121.89

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	4.50	313.43

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 1.750(In)
Area Averaged 100-Year Rainfall = 4.500(In)

Point rain (area averaged) = 1.750(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.750(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	76.00	0.000

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	58.2	0.488	0.000	0.488	1.000	0.488
					Sum (F) =	0.488

Area averaged mean soil loss (F) (In/Hr) = 0.488
Minimum soil loss rate ((In/Hr)) = 0.244
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	52.307	6.571	4.612
2	0.167	104.614	28.083	19.712
3	0.250	156.922	28.549	20.039
4	0.333	209.229	12.179	8.549
5	0.417	261.536	6.595	4.629
6	0.500	313.843	4.589	3.221
7	0.583	366.151	3.296	2.314
8	0.667	418.458	2.462	1.728
9	0.750	470.765	1.797	1.261
10	0.833	523.072	1.548	1.086
11	0.917	575.380	1.191	0.836
12	1.000	627.687	0.940	0.660

13	1.083	679.994	0.721		0.506
14	1.167	732.301	0.542		0.381
15	1.250	784.608	0.523		0.367
16	1.333	836.916	0.415		0.292
			Sum = 100.000	Sum=	70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.014	(0.866)	0.013	0.001
2	0.17	0.07	0.014	(0.862)	0.013	0.001
3	0.25	0.07	0.014	(0.859)	0.013	0.001
4	0.33	0.10	0.021	(0.856)	0.019	0.002
5	0.42	0.10	0.021	(0.852)	0.019	0.002
6	0.50	0.10	0.021	(0.849)	0.019	0.002
7	0.58	0.10	0.021	(0.846)	0.019	0.002
8	0.67	0.10	0.021	(0.842)	0.019	0.002
9	0.75	0.10	0.021	(0.839)	0.019	0.002
10	0.83	0.13	0.028	(0.836)	0.025	0.003
11	0.92	0.13	0.028	(0.833)	0.025	0.003
12	1.00	0.13	0.028	(0.829)	0.025	0.003
13	1.08	0.10	0.021	(0.826)	0.019	0.002
14	1.17	0.10	0.021	(0.823)	0.019	0.002
15	1.25	0.10	0.021	(0.819)	0.019	0.002
16	1.33	0.10	0.021	(0.816)	0.019	0.002
17	1.42	0.10	0.021	(0.813)	0.019	0.002
18	1.50	0.10	0.021	(0.810)	0.019	0.002
19	1.58	0.10	0.021	(0.806)	0.019	0.002
20	1.67	0.10	0.021	(0.803)	0.019	0.002
21	1.75	0.10	0.021	(0.800)	0.019	0.002
22	1.83	0.13	0.028	(0.797)	0.025	0.003
23	1.92	0.13	0.028	(0.794)	0.025	0.003
24	2.00	0.13	0.028	(0.790)	0.025	0.003
25	2.08	0.13	0.028	(0.787)	0.025	0.003
26	2.17	0.13	0.028	(0.784)	0.025	0.003
27	2.25	0.13	0.028	(0.781)	0.025	0.003
28	2.33	0.13	0.028	(0.778)	0.025	0.003
29	2.42	0.13	0.028	(0.774)	0.025	0.003
30	2.50	0.13	0.028	(0.771)	0.025	0.003
31	2.58	0.17	0.035	(0.768)	0.031	0.003
32	2.67	0.17	0.035	(0.765)	0.031	0.003
33	2.75	0.17	0.035	(0.762)	0.031	0.003
34	2.83	0.17	0.035	(0.759)	0.031	0.003
35	2.92	0.17	0.035	(0.756)	0.031	0.003
36	3.00	0.17	0.035	(0.752)	0.031	0.003
37	3.08	0.17	0.035	(0.749)	0.031	0.003
38	3.17	0.17	0.035	(0.746)	0.031	0.003
39	3.25	0.17	0.035	(0.743)	0.031	0.003
40	3.33	0.17	0.035	(0.740)	0.031	0.003
41	3.42	0.17	0.035	(0.737)	0.031	0.003
42	3.50	0.17	0.035	(0.734)	0.031	0.003
43	3.58	0.17	0.035	(0.731)	0.031	0.003
44	3.67	0.17	0.035	(0.728)	0.031	0.003
45	3.75	0.17	0.035	(0.725)	0.031	0.003
46	3.83	0.20	0.042	(0.722)	0.038	0.004
47	3.92	0.20	0.042	(0.719)	0.038	0.004
48	4.00	0.20	0.042	(0.715)	0.038	0.004
49	4.08	0.20	0.042	(0.712)	0.038	0.004
50	4.17	0.20	0.042	(0.709)	0.038	0.004
51	4.25	0.20	0.042	(0.706)	0.038	0.004
52	4.33	0.23	0.049	(0.703)	0.044	0.005
53	4.42	0.23	0.049	(0.700)	0.044	0.005
54	4.50	0.23	0.049	(0.697)	0.044	0.005
55	4.58	0.23	0.049	(0.694)	0.044	0.005
56	4.67	0.23	0.049	(0.691)	0.044	0.005
57	4.75	0.23	0.049	(0.688)	0.044	0.005
58	4.83	0.27	0.056	(0.685)	0.050	0.006
59	4.92	0.27	0.056	(0.683)	0.050	0.006
60	5.00	0.27	0.056	(0.680)	0.050	0.006
61	5.08	0.20	0.042	(0.677)	0.038	0.004
62	5.17	0.20	0.042	(0.674)	0.038	0.004
63	5.25	0.20	0.042	(0.671)	0.038	0.004
64	5.33	0.23	0.049	(0.668)	0.044	0.005
65	5.42	0.23	0.049	(0.665)	0.044	0.005
66	5.50	0.23	0.049	(0.662)	0.044	0.005
67	5.58	0.27	0.056	(0.659)	0.050	0.006
68	5.67	0.27	0.056	(0.656)	0.050	0.006
69	5.75	0.27	0.056	(0.653)	0.050	0.006
70	5.83	0.27	0.056	(0.650)	0.050	0.006
71	5.92	0.27	0.056	(0.647)	0.050	0.006
72	6.00	0.27	0.056	(0.645)	0.050	0.006
73	6.08	0.30	0.063	(0.642)	0.057	0.006
74	6.17	0.30	0.063	(0.639)	0.057	0.006
75	6.25	0.30	0.063	(0.636)	0.057	0.006
76	6.33	0.30	0.063	(0.633)	0.057	0.006
77	6.42	0.30	0.063	(0.630)	0.057	0.006
78	6.50	0.30	0.063	(0.628)	0.057	0.006
79	6.58	0.33	0.070	(0.625)	0.063	0.007
80	6.67	0.33	0.070	(0.622)	0.063	0.007
81	6.75	0.33	0.070	(0.619)	0.063	0.007
82	6.83	0.33	0.070	(0.616)	0.063	0.007
83	6.92	0.33	0.070	(0.614)	0.063	0.007
84	7.00	0.33	0.070	(0.611)	0.063	0.007
85	7.08	0.33	0.070	(0.608)	0.063	0.007
86	7.17	0.33	0.070	(0.605)	0.063	0.007

87	7.25	0.33	0.070	(0.602)	0.063	0.007
88	7.33	0.37	0.077	(0.600)	0.069	0.008
89	7.42	0.37	0.077	(0.597)	0.069	0.008
90	7.50	0.37	0.077	(0.594)	0.069	0.008
91	7.58	0.40	0.084	(0.591)	0.076	0.008
92	7.67	0.40	0.084	(0.589)	0.076	0.008
93	7.75	0.40	0.084	(0.586)	0.076	0.008
94	7.83	0.43	0.091	(0.583)	0.082	0.009
95	7.92	0.43	0.091	(0.581)	0.082	0.009
96	8.00	0.43	0.091	(0.578)	0.082	0.009
97	8.08	0.50	0.105	(0.575)	0.094	0.010
98	8.17	0.50	0.105	(0.573)	0.094	0.010
99	8.25	0.50	0.105	(0.570)	0.094	0.010
100	8.33	0.50	0.105	(0.567)	0.094	0.010
101	8.42	0.50	0.105	(0.565)	0.094	0.010
102	8.50	0.50	0.105	(0.562)	0.094	0.010
103	8.58	0.53	0.112	(0.559)	0.101	0.011
104	8.67	0.53	0.112	(0.557)	0.101	0.011
105	8.75	0.53	0.112	(0.554)	0.101	0.011
106	8.83	0.57	0.119	(0.551)	0.107	0.012
107	8.92	0.57	0.119	(0.549)	0.107	0.012
108	9.00	0.57	0.119	(0.546)	0.107	0.012
109	9.08	0.63	0.133	(0.544)	0.120	0.013
110	9.17	0.63	0.133	(0.541)	0.120	0.013
111	9.25	0.63	0.133	(0.539)	0.120	0.013
112	9.33	0.67	0.140	(0.536)	0.126	0.014
113	9.42	0.67	0.140	(0.533)	0.126	0.014
114	9.50	0.67	0.140	(0.531)	0.126	0.014
115	9.58	0.70	0.147	(0.528)	0.132	0.015
116	9.67	0.70	0.147	(0.526)	0.132	0.015
117	9.75	0.70	0.147	(0.523)	0.132	0.015
118	9.83	0.73	0.154	(0.521)	0.139	0.015
119	9.92	0.73	0.154	(0.518)	0.139	0.015
120	10.00	0.73	0.154	(0.516)	0.139	0.015
121	10.08	0.50	0.105	(0.513)	0.094	0.010
122	10.17	0.50	0.105	(0.511)	0.094	0.010
123	10.25	0.50	0.105	(0.508)	0.094	0.010
124	10.33	0.50	0.105	(0.506)	0.094	0.010
125	10.42	0.50	0.105	(0.503)	0.094	0.010
126	10.50	0.50	0.105	(0.501)	0.094	0.010
127	10.58	0.67	0.140	(0.498)	0.126	0.014
128	10.67	0.67	0.140	(0.496)	0.126	0.014
129	10.75	0.67	0.140	(0.494)	0.126	0.014
130	10.83	0.67	0.140	(0.491)	0.126	0.014
131	10.92	0.67	0.140	(0.489)	0.126	0.014
132	11.00	0.67	0.140	(0.486)	0.126	0.014
133	11.08	0.63	0.133	(0.484)	0.120	0.013
134	11.17	0.63	0.133	(0.482)	0.120	0.013
135	11.25	0.63	0.133	(0.479)	0.120	0.013
136	11.33	0.63	0.133	(0.477)	0.120	0.013
137	11.42	0.63	0.133	(0.474)	0.120	0.013
138	11.50	0.63	0.133	(0.472)	0.120	0.013
139	11.58	0.57	0.119	(0.470)	0.107	0.012
140	11.67	0.57	0.119	(0.467)	0.107	0.012
141	11.75	0.57	0.119	(0.465)	0.107	0.012
142	11.83	0.60	0.126	(0.463)	0.113	0.013
143	11.92	0.60	0.126	(0.460)	0.113	0.013
144	12.00	0.60	0.126	(0.458)	0.113	0.013
145	12.08	0.83	0.175	(0.456)	0.157	0.017
146	12.17	0.83	0.175	(0.454)	0.157	0.017
147	12.25	0.83	0.175	(0.451)	0.157	0.017
148	12.33	0.87	0.182	(0.449)	0.164	0.018
149	12.42	0.87	0.182	(0.447)	0.164	0.018
150	12.50	0.87	0.182	(0.445)	0.164	0.018
151	12.58	0.93	0.196	(0.442)	0.176	0.020
152	12.67	0.93	0.196	(0.440)	0.176	0.020
153	12.75	0.93	0.196	(0.438)	0.176	0.020
154	12.83	0.97	0.203	(0.436)	0.183	0.020
155	12.92	0.97	0.203	(0.433)	0.183	0.020
156	13.00	0.97	0.203	(0.431)	0.183	0.020
157	13.08	1.13	0.238	(0.429)	0.214	0.024
158	13.17	1.13	0.238	(0.427)	0.214	0.024
159	13.25	1.13	0.238	(0.425)	0.214	0.024
160	13.33	1.13	0.238	(0.423)	0.214	0.024
161	13.42	1.13	0.238	(0.420)	0.214	0.024
162	13.50	1.13	0.238	(0.418)	0.214	0.024
163	13.58	0.77	0.161	(0.416)	0.145	0.016
164	13.67	0.77	0.161	(0.414)	0.145	0.016
165	13.75	0.77	0.161	(0.412)	0.145	0.016
166	13.83	0.77	0.161	(0.410)	0.145	0.016
167	13.92	0.77	0.161	(0.408)	0.145	0.016
168	14.00	0.77	0.161	(0.406)	0.145	0.016
169	14.08	0.90	0.189	(0.404)	0.170	0.019
170	14.17	0.90	0.189	(0.402)	0.170	0.019
171	14.25	0.90	0.189	(0.399)	0.170	0.019
172	14.33	0.87	0.182	(0.397)	0.164	0.018
173	14.42	0.87	0.182	(0.395)	0.164	0.018
174	14.50	0.87	0.182	(0.393)	0.164	0.018
175	14.58	0.87	0.182	(0.391)	0.164	0.018
176	14.67	0.87	0.182	(0.389)	0.164	0.018
177	14.75	0.87	0.182	(0.387)	0.164	0.018
178	14.83	0.83	0.175	(0.385)	0.157	0.017
179	14.92	0.83	0.175	(0.383)	0.157	0.017
180	15.00	0.83	0.175	(0.381)	0.157	0.017
181	15.08	0.80	0.168	(0.379)	0.151	0.017
182	15.17	0.80	0.168	(0.378)	0.151	0.017
183	15.25	0.80	0.168	(0.376)	0.151	0.017
184	15.33	0.77	0.161	(0.374)	0.145	0.016
185	15.42	0.77	0.161	(0.372)	0.145	0.016

186	15.50	0.77	0.161	(0.370)	0.145	0.016
187	15.58	0.63	0.133	(0.368)	0.120	0.013
188	15.67	0.63	0.133	(0.366)	0.120	0.013
189	15.75	0.63	0.133	(0.364)	0.120	0.013
190	15.83	0.63	0.133	(0.362)	0.120	0.013
191	15.92	0.63	0.133	(0.360)	0.120	0.013
192	16.00	0.63	0.133	(0.359)	0.120	0.013
193	16.08	0.13	0.028	(0.357)	0.025	0.003
194	16.17	0.13	0.028	(0.355)	0.025	0.003
195	16.25	0.13	0.028	(0.353)	0.025	0.003
196	16.33	0.13	0.028	(0.351)	0.025	0.003
197	16.42	0.13	0.028	(0.350)	0.025	0.003
198	16.50	0.13	0.028	(0.348)	0.025	0.003
199	16.58	0.10	0.021	(0.346)	0.019	0.002
200	16.67	0.10	0.021	(0.344)	0.019	0.002
201	16.75	0.10	0.021	(0.343)	0.019	0.002
202	16.83	0.10	0.021	(0.341)	0.019	0.002
203	16.92	0.10	0.021	(0.339)	0.019	0.002
204	17.00	0.10	0.021	(0.337)	0.019	0.002
205	17.08	0.17	0.035	(0.336)	0.031	0.003
206	17.17	0.17	0.035	(0.334)	0.031	0.003
207	17.25	0.17	0.035	(0.332)	0.031	0.003
208	17.33	0.17	0.035	(0.331)	0.031	0.003
209	17.42	0.17	0.035	(0.329)	0.031	0.003
210	17.50	0.17	0.035	(0.327)	0.031	0.003
211	17.58	0.17	0.035	(0.326)	0.031	0.003
212	17.67	0.17	0.035	(0.324)	0.031	0.003
213	17.75	0.17	0.035	(0.322)	0.031	0.003
214	17.83	0.13	0.028	(0.321)	0.025	0.003
215	17.92	0.13	0.028	(0.319)	0.025	0.003
216	18.00	0.13	0.028	(0.318)	0.025	0.003
217	18.08	0.13	0.028	(0.316)	0.025	0.003
218	18.17	0.13	0.028	(0.315)	0.025	0.003
219	18.25	0.13	0.028	(0.313)	0.025	0.003
220	18.33	0.13	0.028	(0.311)	0.025	0.003
221	18.42	0.13	0.028	(0.310)	0.025	0.003
222	18.50	0.13	0.028	(0.308)	0.025	0.003
223	18.58	0.10	0.021	(0.307)	0.019	0.002
224	18.67	0.10	0.021	(0.305)	0.019	0.002
225	18.75	0.10	0.021	(0.304)	0.019	0.002
226	18.83	0.07	0.014	(0.303)	0.013	0.001
227	18.92	0.07	0.014	(0.301)	0.013	0.001
228	19.00	0.07	0.014	(0.300)	0.013	0.001
229	19.08	0.10	0.021	(0.298)	0.019	0.002
230	19.17	0.10	0.021	(0.297)	0.019	0.002
231	19.25	0.10	0.021	(0.295)	0.019	0.002
232	19.33	0.13	0.028	(0.294)	0.025	0.003
233	19.42	0.13	0.028	(0.293)	0.025	0.003
234	19.50	0.13	0.028	(0.291)	0.025	0.003
235	19.58	0.10	0.021	(0.290)	0.019	0.002
236	19.67	0.10	0.021	(0.289)	0.019	0.002
237	19.75	0.10	0.021	(0.287)	0.019	0.002
238	19.83	0.07	0.014	(0.286)	0.013	0.001
239	19.92	0.07	0.014	(0.285)	0.013	0.001
240	20.00	0.07	0.014	(0.284)	0.013	0.001
241	20.08	0.10	0.021	(0.282)	0.019	0.002
242	20.17	0.10	0.021	(0.281)	0.019	0.002
243	20.25	0.10	0.021	(0.280)	0.019	0.002
244	20.33	0.10	0.021	(0.279)	0.019	0.002
245	20.42	0.10	0.021	(0.277)	0.019	0.002
246	20.50	0.10	0.021	(0.276)	0.019	0.002
247	20.58	0.10	0.021	(0.275)	0.019	0.002
248	20.67	0.10	0.021	(0.274)	0.019	0.002
249	20.75	0.10	0.021	(0.273)	0.019	0.002
250	20.83	0.07	0.014	(0.272)	0.013	0.001
251	20.92	0.07	0.014	(0.271)	0.013	0.001
252	21.00	0.07	0.014	(0.270)	0.013	0.001
253	21.08	0.10	0.021	(0.268)	0.019	0.002
254	21.17	0.10	0.021	(0.267)	0.019	0.002
255	21.25	0.10	0.021	(0.266)	0.019	0.002
256	21.33	0.07	0.014	(0.265)	0.013	0.001
257	21.42	0.07	0.014	(0.264)	0.013	0.001
258	21.50	0.07	0.014	(0.263)	0.013	0.001
259	21.58	0.10	0.021	(0.262)	0.019	0.002
260	21.67	0.10	0.021	(0.261)	0.019	0.002
261	21.75	0.10	0.021	(0.261)	0.019	0.002
262	21.83	0.07	0.014	(0.260)	0.013	0.001
263	21.92	0.07	0.014	(0.259)	0.013	0.001
264	22.00	0.07	0.014	(0.258)	0.013	0.001
265	22.08	0.10	0.021	(0.257)	0.019	0.002
266	22.17	0.10	0.021	(0.256)	0.019	0.002
267	22.25	0.10	0.021	(0.255)	0.019	0.002
268	22.33	0.07	0.014	(0.255)	0.013	0.001
269	22.42	0.07	0.014	(0.254)	0.013	0.001
270	22.50	0.07	0.014	(0.253)	0.013	0.001
271	22.58	0.07	0.014	(0.252)	0.013	0.001
272	22.67	0.07	0.014	(0.252)	0.013	0.001
273	22.75	0.07	0.014	(0.251)	0.013	0.001
274	22.83	0.07	0.014	(0.250)	0.013	0.001
275	22.92	0.07	0.014	(0.250)	0.013	0.001
276	23.00	0.07	0.014	(0.249)	0.013	0.001
277	23.08	0.07	0.014	(0.248)	0.013	0.001
278	23.17	0.07	0.014	(0.248)	0.013	0.001
279	23.25	0.07	0.014	(0.247)	0.013	0.001
280	23.33	0.07	0.014	(0.247)	0.013	0.001
281	23.42	0.07	0.014	(0.246)	0.013	0.001
282	23.50	0.07	0.014	(0.246)	0.013	0.001
283	23.58	0.07	0.014	(0.246)	0.013	0.001
284	23.67	0.07	0.014	(0.245)	0.013	0.001

285	23.75	0.07	0.014	(0.245)	0.013	0.001
286	23.83	0.07	0.014	(0.245)	0.013	0.001
287	23.92	0.07	0.014	(0.244)	0.013	0.001
288	24.00	0.07	0.014	(0.244)	0.013	0.001

(Loss Rate Not Used)

Sum = 100.0 Sum = 2.1

Flood volume = Effective rainfall 0.17(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 1.0(Ac.Ft)
Total soil loss = 1.57(In)
Total soil loss = 9.140(Ac.Ft)
Total rainfall = 1.75(In)
Flood volume = 44239.1 Cubic Feet
Total soil loss = 398152.3 Cubic Feet

Peak flow rate of this hydrograph = 1.633(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.01	Q				
0+10	0.0003	0.03	Q				
0+15	0.0007	0.06	Q				
0+20	0.0012	0.08	Q				
0+25	0.0019	0.10	Q				
0+30	0.0027	0.12	Q				
0+35	0.0036	0.13	Q				
0+40	0.0045	0.13	Q				
0+45	0.0054	0.14	Q				
0+50	0.0064	0.14	Q				
0+55	0.0075	0.16	Q				
1+ 0	0.0087	0.17	Q				
1+ 5	0.0099	0.18	Q				
1+10	0.0110	0.17	Q				
1+15	0.0121	0.16	Q				
1+20	0.0132	0.15	Q				
1+25	0.0142	0.15	Q				
1+30	0.0153	0.15	Q				
1+35	0.0163	0.15	Q				
1+40	0.0173	0.15	Q				
1+45	0.0184	0.15	Q				
1+50	0.0194	0.15	Q				
1+55	0.0206	0.17	Q				
2+ 0	0.0218	0.18	Q				
2+ 5	0.0231	0.19	Q				
2+10	0.0244	0.19	Q				
2+15	0.0257	0.19	QV				
2+20	0.0270	0.19	QV				
2+25	0.0283	0.19	QV				
2+30	0.0297	0.19	QV				
2+35	0.0310	0.20	QV				
2+40	0.0325	0.21	QV				
2+45	0.0340	0.23	QV				
2+50	0.0356	0.23	QV				
2+55	0.0373	0.24	QV				
3+ 0	0.0389	0.24	QV				
3+ 5	0.0406	0.24	QV				
3+10	0.0422	0.24	QV				
3+15	0.0439	0.24	QV				
3+20	0.0456	0.24	QV				
3+25	0.0473	0.24	QV				
3+30	0.0490	0.24	QV				
3+35	0.0507	0.25	QV				
3+40	0.0523	0.25	Q V				
3+45	0.0540	0.25	Q V				
3+50	0.0557	0.25	Q V				
3+55	0.0576	0.26	QV				
4+ 0	0.0595	0.28	QV				
4+ 5	0.0614	0.28	QV				
4+10	0.0634	0.29	QV				
4+15	0.0654	0.29	QV				
4+20	0.0674	0.29	QV				
4+25	0.0695	0.31	QV				
4+30	0.0717	0.32	QV				
4+35	0.0740	0.33	QV				
4+40	0.0763	0.33	Q V				
4+45	0.0786	0.34	Q V				
4+50	0.0810	0.34	Q V				
4+55	0.0834	0.36	Q V				
5+ 0	0.0860	0.37	Q V				
5+ 5	0.0886	0.37	Q V				
5+10	0.0910	0.35	Q V				
5+15	0.0932	0.32	Q V				
5+20	0.0954	0.32	Q V				
5+25	0.0976	0.33	Q V				
5+30	0.0999	0.34	Q V				
5+35	0.1023	0.34	Q V				
5+40	0.1048	0.36	Q V				
5+45	0.1073	0.37	Q V				
5+50	0.1099	0.38	Q V				
5+55	0.1126	0.38	Q V				
6+ 0	0.1152	0.39	Q V				
6+ 5	0.1179	0.39	Q V				
6+10	0.1207	0.41	Q V				

6+15	0.1236	0.42	Q V
6+20	0.1266	0.43	Q V
6+25	0.1295	0.43	Q V
6+30	0.1325	0.43	Q V
6+35	0.1356	0.44	Q V
6+40	0.1387	0.46	Q V
6+45	0.1419	0.47	Q V
6+50	0.1452	0.48	Q V
6+55	0.1485	0.48	Q V
7+ 0	0.1519	0.48	Q V
7+ 5	0.1552	0.49	Q V
7+10	0.1586	0.49	Q V
7+15	0.1619	0.49	Q V
7+20	0.1653	0.49	Q V
7+25	0.1688	0.51	Q V
7+30	0.1724	0.52	Q V
7+35	0.1761	0.53	Q V
7+40	0.1798	0.55	Q V
7+45	0.1837	0.56	Q V
7+50	0.1877	0.58	Q V
7+55	0.1918	0.59	Q V
8+ 0	0.1960	0.61	Q V
8+ 5	0.2003	0.63	Q V
8+10	0.2049	0.66	Q V
8+15	0.2096	0.69	Q V
8+20	0.2145	0.71	Q V
8+25	0.2194	0.71	Q V
8+30	0.2243	0.72	Q V
8+35	0.2294	0.73	Q V
8+40	0.2345	0.74	Q V
8+45	0.2397	0.76	Q V
8+50	0.2450	0.77	Q V
8+55	0.2505	0.79	Q V
9+ 0	0.2561	0.81	Q V
9+ 5	0.2617	0.82	Q V
9+10	0.2676	0.86	Q V
9+15	0.2737	0.89	Q V
9+20	0.2800	0.91	Q V
9+25	0.2864	0.93	Q V
9+30	0.2929	0.95	Q V
9+35	0.2995	0.96	Q V
9+40	0.3063	0.98	Q V
9+45	0.3132	1.00	Q V
9+50	0.3202	1.01	Q V
9+55	0.3273	1.03	Q V
10+ 0	0.3345	1.05	Q V
10+ 5	0.3417	1.04	Q V
10+10	0.3482	0.95	Q V
10+15	0.3541	0.85	Q V
10+20	0.3597	0.81	Q V
10+25	0.3651	0.79	Q V
10+30	0.3705	0.78	Q V
10+35	0.3759	0.79	Q V
10+40	0.3817	0.85	Q V
10+45	0.3880	0.91	Q V
10+50	0.3945	0.94	Q V
10+55	0.4010	0.95	Q V
11+ 0	0.4076	0.96	Q V
11+ 5	0.4142	0.96	Q V
11+10	0.4208	0.95	Q V
11+15	0.4272	0.94	Q V
11+20	0.4337	0.94	Q V
11+25	0.4401	0.94	Q V
11+30	0.4466	0.94	Q V
11+35	0.4529	0.93	Q V
11+40	0.4592	0.90	Q V
11+45	0.4652	0.87	Q V
11+50	0.4711	0.87	Q V
11+55	0.4771	0.87	Q V
12+ 0	0.4832	0.88	Q V
12+ 5	0.4894	0.91	Q V
12+10	0.4964	1.00	Q V
12+15	0.5039	1.10	Q V
12+20	0.5118	1.15	Q V
12+25	0.5200	1.18	Q V
12+30	0.5283	1.21	Q V
12+35	0.5369	1.24	Q V
12+40	0.5456	1.28	Q V
12+45	0.5547	1.31	Q V
12+50	0.5639	1.33	Q V
12+55	0.5732	1.36	Q V
13+ 0	0.5828	1.38	Q V
13+ 5	0.5925	1.41	Q V
13+10	0.6028	1.49	Q V
13+15	0.6135	1.57	Q V
13+20	0.6246	1.60	Q V
13+25	0.6357	1.62	Q V
13+30	0.6470	1.63	Q V
13+35	0.6580	1.61	Q V
13+40	0.6681	1.46	Q V
13+45	0.6772	1.31	Q V
13+50	0.6858	1.25	Q V
13+55	0.6942	1.22	Q V
14+ 0	0.7024	1.20	Q V
14+ 5	0.7107	1.19	Q V
14+10	0.7192	1.24	Q V
14+15	0.7280	1.29	Q V
14+20	0.7370	1.30	Q V
14+25	0.7459	1.29	Q V

14+30	0.7547	1.28	Q	V		
14+35	0.7635	1.28	Q	V		
14+40	0.7723	1.28	Q	V		
14+45	0.7811	1.28	Q	V		
14+50	0.7898	1.27	Q	V		
14+55	0.7985	1.26	Q	V		
15+ 0	0.8071	1.25	Q	V		
15+ 5	0.8156	1.24	Q	V		
15+10	0.8240	1.22	Q	V		
15+15	0.8323	1.20	Q	V		
15+20	0.8405	1.19	Q	V		
15+25	0.8486	1.18	Q	V		
15+30	0.8566	1.16	Q	V		
15+35	0.8644	1.14	Q	V		
15+40	0.8719	1.08	Q	V		
15+45	0.8789	1.02	Q	V		
15+50	0.8857	0.99	Q	V		
15+55	0.8924	0.98	Q	V		
16+ 0	0.8990	0.96	Q	V		
16+ 5	0.9053	0.91	Q	V		
16+10	0.9101	0.70	Q	V		
16+15	0.9134	0.48	Q	V		
16+20	0.9161	0.39	Q	V		
16+25	0.9184	0.34	Q	V		
16+30	0.9204	0.30	Q	V		
16+35	0.9223	0.27	Q	V		
16+40	0.9240	0.24	Q	V		
16+45	0.9254	0.21	Q	V		
16+50	0.9267	0.19	Q	V		
16+55	0.9279	0.18	Q	V		
17+ 0	0.9291	0.17	Q	V		
17+ 5	0.9303	0.17	Q	V		
17+10	0.9316	0.19	Q	V		
17+15	0.9331	0.22	Q	V		
17+20	0.9346	0.22	Q	V		
17+25	0.9362	0.23	Q	V		
17+30	0.9378	0.23	Q	V		
17+35	0.9395	0.24	Q	V		
17+40	0.9411	0.24	Q	V		
17+45	0.9428	0.24	Q	V		
17+50	0.9444	0.24	Q	V		
17+55	0.9460	0.23	Q	V		
18+ 0	0.9474	0.21	Q	V		
18+ 5	0.9488	0.21	Q	V		
18+10	0.9503	0.20	Q	V		
18+15	0.9517	0.20	Q	V		
18+20	0.9530	0.20	Q	V		
18+25	0.9544	0.20	Q	V		
18+30	0.9558	0.20	Q	V		
18+35	0.9571	0.20	Q	V		
18+40	0.9584	0.18	Q	V		
18+45	0.9595	0.17	Q	V		
18+50	0.9606	0.16	Q	V		
18+55	0.9616	0.14	Q	V		
19+ 0	0.9624	0.12	Q	V		
19+ 5	0.9632	0.12	Q	V		
19+10	0.9641	0.13	Q	V		
19+15	0.9651	0.14	Q	V		
19+20	0.9661	0.15	Q	V		
19+25	0.9672	0.16	Q	V		
19+30	0.9684	0.18	Q	V		
19+35	0.9696	0.18	Q	V		
19+40	0.9708	0.17	Q	V		
19+45	0.9719	0.16	Q	V		
19+50	0.9729	0.15	Q	V		
19+55	0.9738	0.13	Q	V		
20+ 0	0.9747	0.12	Q	V		
20+ 5	0.9755	0.12	Q	V		
20+10	0.9763	0.13	Q	V		
20+15	0.9773	0.14	Q	V		
20+20	0.9783	0.14	Q	V		
20+25	0.9792	0.14	Q	V		
20+30	0.9802	0.14	Q	V		
20+35	0.9812	0.15	Q	V		
20+40	0.9822	0.15	Q	V		
20+45	0.9832	0.15	Q	V		
20+50	0.9842	0.14	Q	V		
20+55	0.9851	0.13	Q	V		
21+ 0	0.9859	0.12	Q	V		
21+ 5	0.9867	0.11	Q	V		
21+10	0.9875	0.12	Q	V		
21+15	0.9885	0.14	Q	V		
21+20	0.9894	0.14	Q	V		
21+25	0.9903	0.13	Q	V		
21+30	0.9911	0.11	Q	V		
21+35	0.9918	0.11	Q	V		
21+40	0.9927	0.12	Q	V		
21+45	0.9936	0.13	Q	V		
21+50	0.9945	0.14	Q	V		
21+55	0.9954	0.12	Q	V		
22+ 0	0.9962	0.11	Q	V		
22+ 5	0.9969	0.11	Q	V		
22+10	0.9977	0.12	Q	V		
22+15	0.9987	0.13	Q	V		
22+20	0.9996	0.14	Q	V		
22+25	1.0005	0.12	Q	V		
22+30	1.0012	0.11	Q	V		
22+35	1.0020	0.11	Q	V		
22+40	1.0027	0.10	Q	V		

22+45	1.0034	0.10	Q	|	|	|	V|
22+50	1.0041	0.10	Q	|	|	|	V|
22+55	1.0048	0.10	Q	|	|	|	V|
23+ 0	1.0055	0.10	Q	|	|	|	V|
23+ 5	1.0062	0.10	Q	|	|	|	V|
23+10	1.0069	0.10	Q	|	|	|	V|
23+15	1.0075	0.10	Q	|	|	|	V|
23+20	1.0082	0.10	Q	|	|	|	V|
23+25	1.0089	0.10	Q	|	|	|	V|
23+30	1.0096	0.10	Q	|	|	|	V|
23+35	1.0103	0.10	Q	|	|	|	V|
23+40	1.0109	0.10	Q	|	|	|	V|
23+45	1.0116	0.10	Q	|	|	|	V|
23+50	1.0123	0.10	Q	|	|	|	V|
23+55	1.0130	0.10	Q	|	|	|	V|
24+ 0	1.0136	0.10	Q	|	|	|	V|
24+ 5	1.0143	0.09	Q	|	|	|	V|
24+10	1.0147	0.06	Q	|	|	|	V|
24+15	1.0150	0.04	Q	|	|	|	V|
24+20	1.0151	0.02	Q	|	|	|	V|
24+25	1.0153	0.02	Q	|	|	|	V|
24+30	1.0153	0.01	Q	|	|	|	V|
24+35	1.0154	0.01	Q	|	|	|	V|
24+40	1.0155	0.01	Q	|	|	|	V|
24+45	1.0155	0.01	Q	|	|	|	V|
24+50	1.0155	0.00	Q	|	|	|	V|
24+55	1.0156	0.00	Q	|	|	|	V|
25+ 0	1.0156	0.00	Q	|	|	|	V|
25+ 5	1.0156	0.00	Q	|	|	|	V|
25+10	1.0156	0.00	Q	|	|	|	V|
25+15	1.0156	0.00	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/12/20 File: 3828EX515.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.159 Hr.
Lag time = 9.56 Min.
25% of lag time = 2.39 Min.
40% of lag time = 3.82 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	0.50	34.83

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.20	83.58

STORM EVENT (YEAR) = 5.00
Area Averaged 2-Year Rainfall = 0.500(In)
Area Averaged 100-Year Rainfall = 1.200(In)

Point rain (area averaged) = 0.664(In)
Areal adjustment factor = 99.94 %
Adjusted average point rain = 0.664(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	76.00	0.000

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	58.2	0.488	0.000	0.488	1.000	0.488
					Sum (F) =	0.488

Area averaged mean soil loss (F) (In/Hr) = 0.488
Minimum soil loss rate ((In/Hr)) = 0.244
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

Slope of intensity-duration curve for a 1 hour storm =0.5000

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	52.307	6.571	4.612
2	0.167	104.614	28.083	19.712
3	0.250	156.922	28.549	20.039
4	0.333	209.229	12.179	8.549
5	0.417	261.536	6.595	4.629
6	0.500	313.843	4.589	3.221
7	0.583	366.151	3.296	2.314
8	0.667	418.458	2.462	1.728
9	0.750	470.765	1.797	1.261
10	0.833	523.072	1.548	1.086

11	0.917	575.380	1.191	0.836
12	1.000	627.687	0.940	0.660
13	1.083	679.994	0.721	0.506
14	1.167	732.301	0.542	0.381
15	1.250	784.608	0.523	0.367
16	1.333	836.916	0.415	0.292
		Sum = 100.000	Sum=	70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	4.20	0.334	(0.488)	0.301	0.033
2	0.17	4.30	0.342	(0.488)	0.308	0.034
3	0.25	5.00	0.398	(0.488)	0.358	0.040
4	0.33	5.00	0.398	(0.488)	0.358	0.040
5	0.42	5.80	0.462	(0.488)	0.416	0.046
6	0.50	6.50	0.518	(0.488)	0.466	0.052
7	0.58	7.40	0.589	0.488	(0.530)	0.101
8	0.67	8.60	0.685	0.488	(0.616)	0.196
9	0.75	12.30	0.979	0.488	(0.881)	0.491
10	0.83	29.10	2.317	0.488	(2.085)	1.829
11	0.92	6.80	0.541	(0.488)	0.487	0.054
12	1.00	5.00	0.398	(0.488)	0.358	0.040
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	3.0

Flood volume = Effective rainfall 0.25(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 1.4(Ac.Ft)
Total soil loss = 0.42(In)
Total soil loss = 2.421(Ac.Ft)
Total rainfall = 0.66(In)
Flood volume = 62284.7 Cubic Feet
Total soil loss = 105477.2 Cubic Feet

Peak flow rate of this hydrograph = 48.767(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	12.5	25.0	37.5	50.0
0+ 5	0.0011	0.15	Q				
0+10	0.0067	0.82	Q				
0+15	0.0172	1.53	VQ				
0+20	0.0306	1.94	VQ				
0+25	0.0461	2.24	|Q				
0+30	0.0636	2.55	|VQ				
0+35	0.0852	3.12	| Q				
0+40	0.1181	4.78	| Q				
0+45	0.1810	9.14	| V Q				
0+50	0.3432	23.55	| V	Q			
0+55	0.6791	48.77	|	V			Q
1+ 0	0.9800	43.70	|		V	Q	
1+ 5	1.1241	20.92	|	Q		V	
1+10	1.2077	12.15	| Q			V	
1+15	1.2646	8.25	| Q			V	
1+20	1.3054	5.93	| Q			V	
1+25	1.3359	4.43	| Q			V	
1+30	1.3589	3.33	| Q			V	
1+35	1.3779	2.76	| Q			V	
1+40	1.3926	2.13	|Q			V	
1+45	1.4041	1.67	|Q			V	
1+50	1.4130	1.28	|Q			V	
1+55	1.4198	0.99	Q			V	
2+ 0	1.4257	0.86	Q			V	
2+ 5	1.4296	0.57	Q			V	
2+10	1.4298	0.03	Q			V	
2+15	1.4299	0.01	Q				V

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/12/20 File: 3828EX535.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.159 Hr.
Lag time = 9.56 Min.
25% of lag time = 2.39 Min.
40% of lag time = 3.82 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	0.80	55.72

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.86	129.55

STORM EVENT (YEAR) = 5.00
Area Averaged 2-Year Rainfall = 0.800(In)
Area Averaged 100-Year Rainfall = 1.860(In)

Point rain (area averaged) = 1.048(In)
Areal adjustment factor = 99.97 %
Adjusted average point rain = 1.048(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	76.00	0.000

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	58.2	0.488	0.000	0.488	1.000	0.488
					Sum (F) =	0.488

Area averaged mean soil loss (F) (In/Hr) = 0.488
Minimum soil loss rate ((In/Hr)) = 0.244
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	52.307	6.571	4.612
2	0.167	104.614	28.083	19.712
3	0.250	156.922	28.549	20.039
4	0.333	209.229	12.179	8.549
5	0.417	261.536	6.595	4.629
6	0.500	313.843	4.589	3.221
7	0.583	366.151	3.296	2.314
8	0.667	418.458	2.462	1.728
9	0.750	470.765	1.797	1.261
10	0.833	523.072	1.548	1.086
11	0.917	575.380	1.191	0.836
12	1.000	627.687	0.940	0.660

13	1.083	679.994	0.721	0.506
14	1.167	732.301	0.542	0.381
15	1.250	784.608	0.523	0.367
16	1.333	836.916	0.415	0.292
			Sum = 100.000	Sum= 70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.163	(0.488)	0.147	0.016
2	0.17	1.30	0.163	(0.488)	0.147	0.016
3	0.25	1.10	0.138	(0.488)	0.124	0.014
4	0.33	1.50	0.189	(0.488)	0.170	0.019
5	0.42	1.50	0.189	(0.488)	0.170	0.019
6	0.50	1.80	0.226	(0.488)	0.204	0.023
7	0.58	1.50	0.189	(0.488)	0.170	0.019
8	0.67	1.80	0.226	(0.488)	0.204	0.023
9	0.75	1.80	0.226	(0.488)	0.204	0.023
10	0.83	1.50	0.189	(0.488)	0.170	0.019
11	0.92	1.60	0.201	(0.488)	0.181	0.020
12	1.00	1.80	0.226	(0.488)	0.204	0.023
13	1.08	2.20	0.277	(0.488)	0.249	0.028
14	1.17	2.20	0.277	(0.488)	0.249	0.028
15	1.25	2.20	0.277	(0.488)	0.249	0.028
16	1.33	2.00	0.252	(0.488)	0.226	0.025
17	1.42	2.60	0.327	(0.488)	0.294	0.033
18	1.50	2.70	0.340	(0.488)	0.306	0.034
19	1.58	2.40	0.302	(0.488)	0.272	0.030
20	1.67	2.70	0.340	(0.488)	0.306	0.034
21	1.75	3.30	0.415	(0.488)	0.373	0.041
22	1.83	3.10	0.390	(0.488)	0.351	0.039
23	1.92	2.90	0.365	(0.488)	0.328	0.036
24	2.00	3.00	0.377	(0.488)	0.340	0.038
25	2.08	3.10	0.390	(0.488)	0.351	0.039
26	2.17	4.20	0.528	(0.488)	0.475	0.053
27	2.25	5.00	0.629	0.488	(0.566)	0.140
28	2.33	3.50	0.440	(0.488)	0.396	0.044
29	2.42	6.80	0.855	0.488	(0.770)	0.367
30	2.50	7.30	0.918	0.488	(0.826)	0.430
31	2.58	8.20	1.031	0.488	(0.928)	0.543
32	2.67	5.90	0.742	0.488	(0.668)	0.254
33	2.75	2.00	0.252	(0.488)	0.226	0.025
34	2.83	1.80	0.226	(0.488)	0.204	0.023
35	2.92	1.80	0.226	(0.488)	0.204	0.023
36	3.00	0.60	0.075	(0.488)	0.068	0.008
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	2.6

Flood volume = Effective rainfall 0.21(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 1.2(Ac.Ft)
Total soil loss = 0.83(In)
Total soil loss = 4.838(Ac.Ft)
Total rainfall = 1.05(In)
Flood volume = 54217.4 Cubic Feet
Total soil loss = 210737.4 Cubic Feet

Peak flow rate of this hydrograph = 24.672(CFS)

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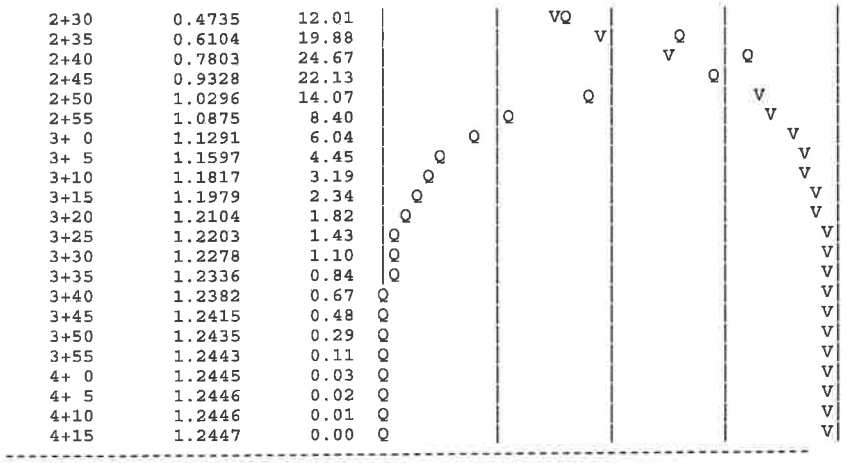
3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 7.5 15.0 22.5 30.0
0+ 5	0.0005	0.08	Q
0+10	0.0033	0.40	Q
0+15	0.0082	0.71	Q
0+20	0.0139	0.83	VQ
0+25	0.0204	0.95	VQ
0+30	0.0280	1.10	VQ
0+35	0.0365	1.23	Q
0+40	0.0454	1.29	Q
0+45	0.0547	1.35	Q
0+50	0.0644	1.42	QV
0+55	0.0741	1.40	QV
1+ 0	0.0836	1.39	QV
1+ 5	0.0938	1.47	Q V
1+10	0.1050	1.63	QV
1+15	0.1172	1.76	QV
1+20	0.1296	1.81	Q V
1+25	0.1422	1.83	Q V
1+30	0.1557	1.96	Q V
1+35	0.1703	2.11	Q V
1+40	0.1850	2.14	Q V
1+45	0.2003	2.22	Q V
1+50	0.2171	2.44	Q V
1+55	0.2348	2.56	Q V
2+ 0	0.2524	2.56	Q V
2+ 5	0.2700	2.56	Q V
2+10	0.2885	2.68	Q V
2+15	0.3119	3.40	Q V
2+20	0.3463	4.99	Q V
2+25	0.3908	6.46	Q V



2+30	0.4735	12.01	
2+35	0.6104	19.88	
2+40	0.7803	24.67	
2+45	0.9328	22.13	
2+50	1.0296	14.07	
2+55	1.0875	8.40	
3+ 0	1.1291	6.04	
3+ 5	1.1597	4.45	
3+10	1.1817	3.19	
3+15	1.1979	2.34	
3+20	1.2104	1.82	
3+25	1.2203	1.43	
3+30	1.2278	1.10	
3+35	1.2336	0.84	
3+40	1.2382	0.67	
3+45	1.2415	0.48	
3+50	1.2435	0.29	
3+55	1.2443	0.11	
4+ 0	1.2445	0.03	
4+ 5	1.2446	0.02	
4+10	1.2446	0.01	
4+15	1.2447	0.00	

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/12/20 File: 3828EX565.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.159 Hr.
Lag time = 9.56 Min.
25% of lag time = 2.39 Min.
40% of lag time = 3.82 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.15	80.10

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	2.50	174.13

STORM EVENT (YEAR) = 5.00
Area Averaged 2-Year Rainfall = 1.150(In)
Area Averaged 100-Year Rainfall = 2.500(In)

Point rain (area averaged) = 1.466(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 1.466(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	76.00	0.000

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	58.2	0.488	0.000	0.488	1.000	0.488
					Sum (F) =	0.488

Area averaged mean soil loss (F) (In/Hr) = 0.488
Minimum soil loss rate ((In/Hr)) = 0.244
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	52.307	6.571	4.612
2	0.167	104.614	28.083	19.712
3	0.250	156.922	28.549	20.039
4	0.333	209.229	12.179	8.549
5	0.417	261.536	6.595	4.629
6	0.500	313.843	4.589	3.221
7	0.583	366.151	3.296	2.314
8	0.667	418.458	2.462	1.728
9	0.750	470.765	1.797	1.261
10	0.833	523.072	1.548	1.086
11	0.917	575.380	1.191	0.836
12	1.000	627.687	0.940	0.660

13	1.083	679.994	0.721	0.506
14	1.167	732.301	0.542	0.381
15	1.250	784.608	0.523	0.367
16	1.333	836.916	0.415	0.292
		Sum = 100.000	Sum=	70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.088	(0.488)	0.079	0.009
2	0.17	0.60	0.106	(0.488)	0.095	0.011
3	0.25	0.60	0.106	(0.488)	0.095	0.011
4	0.33	0.60	0.106	(0.488)	0.095	0.011
5	0.42	0.60	0.106	(0.488)	0.095	0.011
6	0.50	0.70	0.123	(0.488)	0.111	0.012
7	0.58	0.70	0.123	(0.488)	0.111	0.012
8	0.67	0.70	0.123	(0.488)	0.111	0.012
9	0.75	0.70	0.123	(0.488)	0.111	0.012
10	0.83	0.70	0.123	(0.488)	0.111	0.012
11	0.92	0.70	0.123	(0.488)	0.111	0.012
12	1.00	0.80	0.141	(0.488)	0.127	0.014
13	1.08	0.80	0.141	(0.488)	0.127	0.014
14	1.17	0.80	0.141	(0.488)	0.127	0.014
15	1.25	0.80	0.141	(0.488)	0.127	0.014
16	1.33	0.80	0.141	(0.488)	0.127	0.014
17	1.42	0.80	0.141	(0.488)	0.127	0.014
18	1.50	0.80	0.141	(0.488)	0.127	0.014
19	1.58	0.80	0.141	(0.488)	0.127	0.014
20	1.67	0.80	0.141	(0.488)	0.127	0.014
21	1.75	0.80	0.141	(0.488)	0.127	0.014
22	1.83	0.80	0.141	(0.488)	0.127	0.014
23	1.92	0.80	0.141	(0.488)	0.127	0.014
24	2.00	0.90	0.158	(0.488)	0.142	0.016
25	2.08	0.80	0.141	(0.488)	0.127	0.014
26	2.17	0.90	0.158	(0.488)	0.142	0.016
27	2.25	0.90	0.158	(0.488)	0.142	0.016
28	2.33	0.90	0.158	(0.488)	0.142	0.016
29	2.42	0.90	0.158	(0.488)	0.142	0.016
30	2.50	0.90	0.158	(0.488)	0.142	0.016
31	2.58	0.90	0.158	(0.488)	0.142	0.016
32	2.67	0.90	0.158	(0.488)	0.142	0.016
33	2.75	1.00	0.176	(0.488)	0.158	0.018
34	2.83	1.00	0.176	(0.488)	0.158	0.018
35	2.92	1.00	0.176	(0.488)	0.158	0.018
36	3.00	1.00	0.176	(0.488)	0.158	0.018
37	3.08	1.00	0.176	(0.488)	0.158	0.018
38	3.17	1.10	0.193	(0.488)	0.174	0.019
39	3.25	1.10	0.193	(0.488)	0.174	0.019
40	3.33	1.10	0.193	(0.488)	0.174	0.019
41	3.42	1.20	0.211	(0.488)	0.190	0.021
42	3.50	1.30	0.229	(0.488)	0.206	0.023
43	3.58	1.40	0.246	(0.488)	0.222	0.025
44	3.67	1.40	0.246	(0.488)	0.222	0.025
45	3.75	1.50	0.264	(0.488)	0.237	0.026
46	3.83	1.50	0.264	(0.488)	0.237	0.026
47	3.92	1.60	0.281	(0.488)	0.253	0.028
48	4.00	1.60	0.281	(0.488)	0.253	0.028
49	4.08	1.70	0.299	(0.488)	0.269	0.030
50	4.17	1.80	0.317	(0.488)	0.285	0.032
51	4.25	1.90	0.334	(0.488)	0.301	0.033
52	4.33	2.00	0.352	(0.488)	0.317	0.035
53	4.42	2.10	0.369	(0.488)	0.332	0.037
54	4.50	2.10	0.369	(0.488)	0.332	0.037
55	4.58	2.20	0.387	(0.488)	0.348	0.039
56	4.67	2.30	0.405	(0.488)	0.364	0.040
57	4.75	2.40	0.422	(0.488)	0.380	0.042
58	4.83	2.40	0.422	(0.488)	0.380	0.042
59	4.92	2.50	0.440	(0.488)	0.396	0.044
60	5.00	2.60	0.457	(0.488)	0.412	0.046
61	5.08	3.10	0.545	0.488	(0.491)	0.057
62	5.17	3.60	0.633	0.488	(0.570)	0.145
63	5.25	3.90	0.686	0.488	(0.617)	0.198
64	5.33	4.20	0.739	0.488	(0.665)	0.250
65	5.42	4.70	0.827	0.488	(0.744)	0.338
66	5.50	5.60	0.985	0.488	(0.887)	0.497
67	5.58	1.90	0.334	(0.488)	0.301	0.033
68	5.67	0.90	0.158	(0.488)	0.142	0.016
69	5.75	0.60	0.106	(0.488)	0.095	0.011
70	5.83	0.50	0.088	(0.488)	0.079	0.009
71	5.92	0.30	0.053	(0.488)	0.047	0.005
72	6.00	0.20	0.035	(0.488)	0.032	0.004
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	2.8

Flood volume = Effective rainfall 0.23(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 1.4(Ac.Ft)
Total soil loss = 1.23(In)
Total soil loss = 7.153(Ac.Ft)
Total rainfall = 1.47(In)
Flood volume = 59046.1 Cubic Feet
Total soil loss = 311564.5 Cubic Feet

Peak flow rate of this hydrograph = 20.691(CFS)

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6 - H O U R S T O R M

Runoff Hydrograph

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0003	0.04	Q				
0+10	0.0018	0.22	Q				
0+15	0.0048	0.43	Q				
0+20	0.0085	0.54	Q				
0+25	0.0127	0.60	Q				
0+30	0.0171	0.64	Q				
0+35	0.0220	0.70	Q				
0+40	0.0272	0.76	VQ				
0+45	0.0326	0.79	VQ				
0+50	0.0382	0.81	|Q				
0+55	0.0439	0.82	|Q				
1+ 0	0.0497	0.84	|Q				
1+ 5	0.0558	0.89	|Q				
1+10	0.0622	0.93	|Q				
1+15	0.0687	0.95	|QV				
1+20	0.0753	0.96	|QV				
1+25	0.0820	0.97	|QV				
1+30	0.0887	0.97	|QV				
1+35	0.0954	0.98	|QV				
1+40	0.1022	0.98	|Q V				
1+45	0.1089	0.98	|Q V				
1+50	0.1157	0.98	|Q V				
1+55	0.1225	0.99	|Q V				
2+ 0	0.1294	0.99	|Q V				
2+ 5	0.1364	1.02	|Q V				
2+10	0.1435	1.03	|Q V				
2+15	0.1507	1.05	|Q V				
2+20	0.1581	1.07	|Q V				
2+25	0.1656	1.09	|Q V				
2+30	0.1731	1.09	|Q V				
2+35	0.1807	1.10	|Q V				
2+40	0.1883	1.10	|Q V				
2+45	0.1959	1.11	|Q V				
2+50	0.2039	1.15	|Q V				
2+55	0.2120	1.19	|Q V				
3+ 0	0.2203	1.20	|Q V				
3+ 5	0.2286	1.21	|Q V				
3+10	0.2371	1.23	|Q V				
3+15	0.2458	1.27	|Q V				
3+20	0.2548	1.30	|Q V				
3+25	0.2639	1.33	|Q V				
3+30	0.2734	1.38	|Q V				
3+35	0.2835	1.47	|Q V				
3+40	0.2943	1.56	| Q V				
3+45	0.3055	1.63	| Q V				
3+50	0.3172	1.69	| Q V				
3+55	0.3293	1.76	| Q V				
4+ 0	0.3418	1.82	| Q V				
4+ 5	0.3548	1.88	| Q V				
4+10	0.3683	1.96	| Q V				
4+15	0.3824	2.05	| Q V				
4+20	0.3973	2.16	| Q V				
4+25	0.4129	2.27	| Q V				
4+30	0.4293	2.38	| Q V				
4+35	0.4463	2.46	| Q V				
4+40	0.4638	2.54	| Q V				
4+45	0.4820	2.65	| Q V				
4+50	0.5010	2.75	| Q V				
4+55	0.5205	2.83	| Q V				
5+ 0	0.5406	2.92	| Q V				
5+ 5	0.5617	3.06	| Q V				
5+10	0.5876	3.76	| Q V				
5+15	0.6289	6.00	| Q V				
5+20	0.6921	9.17	| Q V				
5+25	0.7782	12.50	| Q V				
5+30	0.8947	16.93	| Q V				
5+35	1.0372	20.69	| Q V				
5+40	1.1477	16.04	| Q V				
5+45	1.2070	8.61	| Q V				
5+50	1.2452	5.54	| Q V				
5+55	1.2732	4.07	| Q V				
6+ 0	1.2943	3.06	| Q V				
6+ 5	1.3103	2.32	| Q V				
6+10	1.3223	1.74	| Q V				
6+15	1.3316	1.35	|Q V				
6+20	1.3388	1.04	|Q V				
6+25	1.3443	0.81	|Q V				
6+30	1.3485	0.61	Q V				
6+35	1.3515	0.44	Q V				
6+40	1.3538	0.33	Q V				
6+45	1.3550	0.18	Q V				
6+50	1.3553	0.03	Q V				
6+55	1.3554	0.02	Q V				
7+ 0	1.3554	0.01	Q V				
7+ 5	1.3555	0.01	Q V				
7+10	1.3555	0.00	Q V				
7+15	1.3555	0.00	Q				V

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/12/20 File: 3828EX5245.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.159 Hr.
Lag time = 9.56 Min.
25% of lag time = 2.39 Min.
40% of lag time = 3.82 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.75	121.89

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	4.50	313.43

STORM EVENT (YEAR) = 5.00
Area Averaged 2-Year Rainfall = 1.750(In)
Area Averaged 100-Year Rainfall = 4.500(In)

Point rain (area averaged) = 2.394(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 2.394(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	76.00	0.000

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	58.2	0.488	0.000	0.488	1.000	0.488
					Sum (F) =	0.488

Area averaged mean soil loss (F) (In/Hr) = 0.488
Minimum soil loss rate ((In/Hr)) = 0.244
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	52.307	6.571	4.612
2	0.167	104.614	28.083	19.712
3	0.250	156.922	28.549	20.039
4	0.333	209.229	12.179	8.549
5	0.417	261.536	6.595	4.629
6	0.500	313.843	4.589	3.221
7	0.583	366.151	3.296	2.314
8	0.667	418.458	2.462	1.728
9	0.750	470.765	1.797	1.261
10	0.833	523.072	1.548	1.086
11	0.917	575.380	1.191	0.836
12	1.000	627.687	0.940	0.660

13	1.083	679.994	0.721		0.506
14	1.167	732.301	0.542		0.381
15	1.250	784.608	0.523		0.367
16	1.333	836.916	0.415		0.292
			Sum = 100.000	Sum=	70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.019	(0.866)	0.017	0.002
2	0.17	0.07	0.019	(0.862)	0.017	0.002
3	0.25	0.07	0.019	(0.859)	0.017	0.002
4	0.33	0.10	0.029	(0.856)	0.026	0.003
5	0.42	0.10	0.029	(0.852)	0.026	0.003
6	0.50	0.10	0.029	(0.849)	0.026	0.003
7	0.58	0.10	0.029	(0.846)	0.026	0.003
8	0.67	0.10	0.029	(0.842)	0.026	0.003
9	0.75	0.10	0.029	(0.839)	0.026	0.003
10	0.83	0.13	0.038	(0.836)	0.034	0.004
11	0.92	0.13	0.038	(0.833)	0.034	0.004
12	1.00	0.13	0.038	(0.829)	0.034	0.004
13	1.08	0.10	0.029	(0.826)	0.026	0.003
14	1.17	0.10	0.029	(0.823)	0.026	0.003
15	1.25	0.10	0.029	(0.819)	0.026	0.003
16	1.33	0.10	0.029	(0.816)	0.026	0.003
17	1.42	0.10	0.029	(0.813)	0.026	0.003
18	1.50	0.10	0.029	(0.810)	0.026	0.003
19	1.58	0.10	0.029	(0.806)	0.026	0.003
20	1.67	0.10	0.029	(0.803)	0.026	0.003
21	1.75	0.10	0.029	(0.800)	0.026	0.003
22	1.83	0.13	0.038	(0.797)	0.034	0.004
23	1.92	0.13	0.038	(0.794)	0.034	0.004
24	2.00	0.13	0.038	(0.790)	0.034	0.004
25	2.08	0.13	0.038	(0.787)	0.034	0.004
26	2.17	0.13	0.038	(0.784)	0.034	0.004
27	2.25	0.13	0.038	(0.781)	0.034	0.004
28	2.33	0.13	0.038	(0.778)	0.034	0.004
29	2.42	0.13	0.038	(0.774)	0.034	0.004
30	2.50	0.13	0.038	(0.771)	0.034	0.004
31	2.58	0.17	0.048	(0.768)	0.043	0.005
32	2.67	0.17	0.048	(0.765)	0.043	0.005
33	2.75	0.17	0.048	(0.762)	0.043	0.005
34	2.83	0.17	0.048	(0.759)	0.043	0.005
35	2.92	0.17	0.048	(0.756)	0.043	0.005
36	3.00	0.17	0.048	(0.752)	0.043	0.005
37	3.08	0.17	0.048	(0.749)	0.043	0.005
38	3.17	0.17	0.048	(0.746)	0.043	0.005
39	3.25	0.17	0.048	(0.743)	0.043	0.005
40	3.33	0.17	0.048	(0.740)	0.043	0.005
41	3.42	0.17	0.048	(0.737)	0.043	0.005
42	3.50	0.17	0.048	(0.734)	0.043	0.005
43	3.58	0.17	0.048	(0.731)	0.043	0.005
44	3.67	0.17	0.048	(0.728)	0.043	0.005
45	3.75	0.17	0.048	(0.725)	0.043	0.005
46	3.83	0.20	0.057	(0.722)	0.052	0.006
47	3.92	0.20	0.057	(0.719)	0.052	0.006
48	4.00	0.20	0.057	(0.715)	0.052	0.006
49	4.08	0.20	0.057	(0.712)	0.052	0.006
50	4.17	0.20	0.057	(0.709)	0.052	0.006
51	4.25	0.20	0.057	(0.706)	0.052	0.006
52	4.33	0.23	0.067	(0.703)	0.060	0.007
53	4.42	0.23	0.067	(0.700)	0.060	0.007
54	4.50	0.23	0.067	(0.697)	0.060	0.007
55	4.58	0.23	0.067	(0.694)	0.060	0.007
56	4.67	0.23	0.067	(0.691)	0.060	0.007
57	4.75	0.23	0.067	(0.688)	0.060	0.007
58	4.83	0.27	0.077	(0.685)	0.069	0.008
59	4.92	0.27	0.077	(0.683)	0.069	0.008
60	5.00	0.27	0.077	(0.680)	0.069	0.008
61	5.08	0.20	0.057	(0.677)	0.052	0.006
62	5.17	0.20	0.057	(0.674)	0.052	0.006
63	5.25	0.20	0.057	(0.671)	0.052	0.006
64	5.33	0.23	0.067	(0.668)	0.060	0.007
65	5.42	0.23	0.067	(0.665)	0.060	0.007
66	5.50	0.23	0.067	(0.662)	0.060	0.007
67	5.58	0.27	0.077	(0.659)	0.069	0.008
68	5.67	0.27	0.077	(0.656)	0.069	0.008
69	5.75	0.27	0.077	(0.653)	0.069	0.008
70	5.83	0.27	0.077	(0.650)	0.069	0.008
71	5.92	0.27	0.077	(0.647)	0.069	0.008
72	6.00	0.27	0.077	(0.645)	0.069	0.008
73	6.08	0.30	0.086	(0.642)	0.078	0.009
74	6.17	0.30	0.086	(0.639)	0.078	0.009
75	6.25	0.30	0.086	(0.636)	0.078	0.009
76	6.33	0.30	0.086	(0.633)	0.078	0.009
77	6.42	0.30	0.086	(0.630)	0.078	0.009
78	6.50	0.30	0.086	(0.628)	0.078	0.009
79	6.58	0.33	0.096	(0.625)	0.086	0.010
80	6.67	0.33	0.096	(0.622)	0.086	0.010
81	6.75	0.33	0.096	(0.619)	0.086	0.010
82	6.83	0.33	0.096	(0.616)	0.086	0.010
83	6.92	0.33	0.096	(0.614)	0.086	0.010
84	7.00	0.33	0.096	(0.611)	0.086	0.010
85	7.08	0.33	0.096	(0.608)	0.086	0.010
86	7.17	0.33	0.096	(0.605)	0.086	0.010

87	7.25	0.33	0.096	(0.602)	0.086	0.010
88	7.33	0.37	0.105	(0.600)	0.095	0.011
89	7.42	0.37	0.105	(0.597)	0.095	0.011
90	7.50	0.37	0.105	(0.594)	0.095	0.011
91	7.58	0.40	0.115	(0.591)	0.103	0.011
92	7.67	0.40	0.115	(0.589)	0.103	0.011
93	7.75	0.40	0.115	(0.586)	0.103	0.011
94	7.83	0.43	0.124	(0.583)	0.112	0.012
95	7.92	0.43	0.124	(0.581)	0.112	0.012
96	8.00	0.43	0.124	(0.578)	0.112	0.012
97	8.08	0.50	0.144	(0.575)	0.129	0.014
98	8.17	0.50	0.144	(0.573)	0.129	0.014
99	8.25	0.50	0.144	(0.570)	0.129	0.014
100	8.33	0.50	0.144	(0.567)	0.129	0.014
101	8.42	0.50	0.144	(0.565)	0.129	0.014
102	8.50	0.50	0.144	(0.562)	0.129	0.014
103	8.58	0.53	0.153	(0.559)	0.138	0.015
104	8.67	0.53	0.153	(0.557)	0.138	0.015
105	8.75	0.53	0.153	(0.554)	0.138	0.015
106	8.83	0.57	0.163	(0.551)	0.147	0.016
107	8.92	0.57	0.163	(0.549)	0.147	0.016
108	9.00	0.57	0.163	(0.546)	0.147	0.016
109	9.08	0.63	0.182	(0.544)	0.164	0.018
110	9.17	0.63	0.182	(0.541)	0.164	0.018
111	9.25	0.63	0.182	(0.539)	0.164	0.018
112	9.33	0.67	0.192	(0.536)	0.172	0.019
113	9.42	0.67	0.192	(0.533)	0.172	0.019
114	9.50	0.67	0.192	(0.531)	0.172	0.019
115	9.58	0.70	0.201	(0.528)	0.181	0.020
116	9.67	0.70	0.201	(0.526)	0.181	0.020
117	9.75	0.70	0.201	(0.523)	0.181	0.020
118	9.83	0.73	0.211	(0.521)	0.190	0.021
119	9.92	0.73	0.211	(0.518)	0.190	0.021
120	10.00	0.73	0.211	(0.516)	0.190	0.021
121	10.08	0.50	0.144	(0.513)	0.129	0.014
122	10.17	0.50	0.144	(0.511)	0.129	0.014
123	10.25	0.50	0.144	(0.508)	0.129	0.014
124	10.33	0.50	0.144	(0.506)	0.129	0.014
125	10.42	0.50	0.144	(0.503)	0.129	0.014
126	10.50	0.50	0.144	(0.501)	0.129	0.014
127	10.58	0.67	0.192	(0.498)	0.172	0.019
128	10.67	0.67	0.192	(0.496)	0.172	0.019
129	10.75	0.67	0.192	(0.494)	0.172	0.019
130	10.83	0.67	0.192	(0.491)	0.172	0.019
131	10.92	0.67	0.192	(0.489)	0.172	0.019
132	11.00	0.67	0.192	(0.486)	0.172	0.019
133	11.08	0.63	0.182	(0.484)	0.164	0.018
134	11.17	0.63	0.182	(0.482)	0.164	0.018
135	11.25	0.63	0.182	(0.479)	0.164	0.018
136	11.33	0.63	0.182	(0.477)	0.164	0.018
137	11.42	0.63	0.182	(0.474)	0.164	0.018
138	11.50	0.63	0.182	(0.472)	0.164	0.018
139	11.58	0.57	0.163	(0.470)	0.147	0.016
140	11.67	0.57	0.163	(0.467)	0.147	0.016
141	11.75	0.57	0.163	(0.465)	0.147	0.016
142	11.83	0.60	0.172	(0.463)	0.155	0.017
143	11.92	0.60	0.172	(0.460)	0.155	0.017
144	12.00	0.60	0.172	(0.458)	0.155	0.017
145	12.08	0.83	0.239	(0.456)	0.215	0.024
146	12.17	0.83	0.239	(0.454)	0.215	0.024
147	12.25	0.83	0.239	(0.451)	0.215	0.024
148	12.33	0.87	0.249	(0.449)	0.224	0.025
149	12.42	0.87	0.249	(0.447)	0.224	0.025
150	12.50	0.87	0.249	(0.445)	0.224	0.025
151	12.58	0.93	0.268	(0.442)	0.241	0.027
152	12.67	0.93	0.268	(0.440)	0.241	0.027
153	12.75	0.93	0.268	(0.438)	0.241	0.027
154	12.83	0.97	0.278	(0.436)	0.250	0.028
155	12.92	0.97	0.278	(0.433)	0.250	0.028
156	13.00	0.97	0.278	(0.431)	0.250	0.028
157	13.08	1.13	0.326	(0.429)	0.293	0.033
158	13.17	1.13	0.326	(0.427)	0.293	0.033
159	13.25	1.13	0.326	(0.425)	0.293	0.033
160	13.33	1.13	0.326	(0.423)	0.293	0.033
161	13.42	1.13	0.326	(0.420)	0.293	0.033
162	13.50	1.13	0.326	(0.418)	0.293	0.033
163	13.58	0.77	0.220	(0.416)	0.198	0.022
164	13.67	0.77	0.220	(0.414)	0.198	0.022
165	13.75	0.77	0.220	(0.412)	0.198	0.022
166	13.83	0.77	0.220	(0.410)	0.198	0.022
167	13.92	0.77	0.220	(0.408)	0.198	0.022
168	14.00	0.77	0.220	(0.406)	0.198	0.022
169	14.08	0.90	0.259	(0.404)	0.233	0.026
170	14.17	0.90	0.259	(0.402)	0.233	0.026
171	14.25	0.90	0.259	(0.399)	0.233	0.026
172	14.33	0.87	0.249	(0.397)	0.224	0.025
173	14.42	0.87	0.249	(0.395)	0.224	0.025
174	14.50	0.87	0.249	(0.393)	0.224	0.025
175	14.58	0.87	0.249	(0.391)	0.224	0.025
176	14.67	0.87	0.249	(0.389)	0.224	0.025
177	14.75	0.87	0.249	(0.387)	0.224	0.025
178	14.83	0.83	0.239	(0.385)	0.215	0.024
179	14.92	0.83	0.239	(0.383)	0.215	0.024
180	15.00	0.83	0.239	(0.381)	0.215	0.024
181	15.08	0.80	0.230	(0.379)	0.207	0.023
182	15.17	0.80	0.230	(0.378)	0.207	0.023
183	15.25	0.80	0.230	(0.376)	0.207	0.023
184	15.33	0.77	0.220	(0.374)	0.198	0.022
185	15.42	0.77	0.220	(0.372)	0.198	0.022

186	15.50	0.77	0.220	(0.370)	0.198	0.022
187	15.58	0.63	0.182	(0.368)	0.164	0.018
188	15.67	0.63	0.182	(0.366)	0.164	0.018
189	15.75	0.63	0.182	(0.364)	0.164	0.018
190	15.83	0.63	0.182	(0.362)	0.164	0.018
191	15.92	0.63	0.182	(0.360)	0.164	0.018
192	16.00	0.63	0.182	(0.359)	0.164	0.018
193	16.08	0.13	0.038	(0.357)	0.034	0.004
194	16.17	0.13	0.038	(0.355)	0.034	0.004
195	16.25	0.13	0.038	(0.353)	0.034	0.004
196	16.33	0.13	0.038	(0.351)	0.034	0.004
197	16.42	0.13	0.038	(0.350)	0.034	0.004
198	16.50	0.13	0.038	(0.348)	0.034	0.004
199	16.58	0.10	0.029	(0.346)	0.026	0.003
200	16.67	0.10	0.029	(0.344)	0.026	0.003
201	16.75	0.10	0.029	(0.343)	0.026	0.003
202	16.83	0.10	0.029	(0.341)	0.026	0.003
203	16.92	0.10	0.029	(0.339)	0.026	0.003
204	17.00	0.10	0.029	(0.337)	0.026	0.003
205	17.08	0.17	0.048	(0.336)	0.043	0.005
206	17.17	0.17	0.048	(0.334)	0.043	0.005
207	17.25	0.17	0.048	(0.332)	0.043	0.005
208	17.33	0.17	0.048	(0.331)	0.043	0.005
209	17.42	0.17	0.048	(0.329)	0.043	0.005
210	17.50	0.17	0.048	(0.327)	0.043	0.005
211	17.58	0.17	0.048	(0.326)	0.043	0.005
212	17.67	0.17	0.048	(0.324)	0.043	0.005
213	17.75	0.17	0.048	(0.322)	0.043	0.005
214	17.83	0.13	0.038	(0.321)	0.034	0.004
215	17.92	0.13	0.038	(0.319)	0.034	0.004
216	18.00	0.13	0.038	(0.318)	0.034	0.004
217	18.08	0.13	0.038	(0.316)	0.034	0.004
218	18.17	0.13	0.038	(0.315)	0.034	0.004
219	18.25	0.13	0.038	(0.313)	0.034	0.004
220	18.33	0.13	0.038	(0.311)	0.034	0.004
221	18.42	0.13	0.038	(0.310)	0.034	0.004
222	18.50	0.13	0.038	(0.308)	0.034	0.004
223	18.58	0.10	0.029	(0.307)	0.026	0.003
224	18.67	0.10	0.029	(0.305)	0.026	0.003
225	18.75	0.10	0.029	(0.304)	0.026	0.003
226	18.83	0.07	0.019	(0.303)	0.017	0.002
227	18.92	0.07	0.019	(0.301)	0.017	0.002
228	19.00	0.07	0.019	(0.300)	0.017	0.002
229	19.08	0.10	0.029	(0.298)	0.026	0.003
230	19.17	0.10	0.029	(0.297)	0.026	0.003
231	19.25	0.10	0.029	(0.295)	0.026	0.003
232	19.33	0.13	0.038	(0.294)	0.034	0.004
233	19.42	0.13	0.038	(0.293)	0.034	0.004
234	19.50	0.13	0.038	(0.291)	0.034	0.004
235	19.58	0.10	0.029	(0.290)	0.026	0.003
236	19.67	0.10	0.029	(0.289)	0.026	0.003
237	19.75	0.10	0.029	(0.287)	0.026	0.003
238	19.83	0.07	0.019	(0.286)	0.017	0.002
239	19.92	0.07	0.019	(0.285)	0.017	0.002
240	20.00	0.07	0.019	(0.284)	0.017	0.002
241	20.08	0.10	0.029	(0.282)	0.026	0.003
242	20.17	0.10	0.029	(0.281)	0.026	0.003
243	20.25	0.10	0.029	(0.280)	0.026	0.003
244	20.33	0.10	0.029	(0.279)	0.026	0.003
245	20.42	0.10	0.029	(0.277)	0.026	0.003
246	20.50	0.10	0.029	(0.276)	0.026	0.003
247	20.58	0.10	0.029	(0.275)	0.026	0.003
248	20.67	0.10	0.029	(0.274)	0.026	0.003
249	20.75	0.10	0.029	(0.273)	0.026	0.003
250	20.83	0.07	0.019	(0.272)	0.017	0.002
251	20.92	0.07	0.019	(0.271)	0.017	0.002
252	21.00	0.07	0.019	(0.270)	0.017	0.002
253	21.08	0.10	0.029	(0.268)	0.026	0.003
254	21.17	0.10	0.029	(0.267)	0.026	0.003
255	21.25	0.10	0.029	(0.266)	0.026	0.003
256	21.33	0.07	0.019	(0.265)	0.017	0.002
257	21.42	0.07	0.019	(0.264)	0.017	0.002
258	21.50	0.07	0.019	(0.263)	0.017	0.002
259	21.58	0.10	0.029	(0.262)	0.026	0.003
260	21.67	0.10	0.029	(0.261)	0.026	0.003
261	21.75	0.10	0.029	(0.261)	0.026	0.003
262	21.83	0.07	0.019	(0.260)	0.017	0.002
263	21.92	0.07	0.019	(0.259)	0.017	0.002
264	22.00	0.07	0.019	(0.258)	0.017	0.002
265	22.08	0.10	0.029	(0.257)	0.026	0.003
266	22.17	0.10	0.029	(0.256)	0.026	0.003
267	22.25	0.10	0.029	(0.255)	0.026	0.003
268	22.33	0.07	0.019	(0.255)	0.017	0.002
269	22.42	0.07	0.019	(0.254)	0.017	0.002
270	22.50	0.07	0.019	(0.253)	0.017	0.002
271	22.58	0.07	0.019	(0.252)	0.017	0.002
272	22.67	0.07	0.019	(0.252)	0.017	0.002
273	22.75	0.07	0.019	(0.251)	0.017	0.002
274	22.83	0.07	0.019	(0.250)	0.017	0.002
275	22.92	0.07	0.019	(0.250)	0.017	0.002
276	23.00	0.07	0.019	(0.249)	0.017	0.002
277	23.08	0.07	0.019	(0.248)	0.017	0.002
278	23.17	0.07	0.019	(0.248)	0.017	0.002
279	23.25	0.07	0.019	(0.247)	0.017	0.002
280	23.33	0.07	0.019	(0.247)	0.017	0.002
281	23.42	0.07	0.019	(0.246)	0.017	0.002
282	23.50	0.07	0.019	(0.246)	0.017	0.002
283	23.58	0.07	0.019	(0.246)	0.017	0.002
284	23.67	0.07	0.019	(0.245)	0.017	0.002

285	23.75	0.07	0.019	(0.245)	0.017	0.002
286	23.83	0.07	0.019	(0.245)	0.017	0.002
287	23.92	0.07	0.019	(0.244)	0.017	0.002
288	24.00	0.07	0.019	(0.244)	0.017	0.002

(Loss Rate Not Used)

Sum = 100.0 Sum = 2.9

Flood volume = Effective rainfall 0.24(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 1.4(Ac.Ft)
Total soil loss = 2.15(In)
Total soil loss = 12.505(Ac.Ft)
Total rainfall = 2.39(In)
Flood volume = 60522.1 Cubic Feet
Total soil loss = 544698.9 Cubic Feet

Peak flow rate of this hydrograph = 2.234(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 2.5 5.0 7.5 10.0
0+ 5	0.0001	0.01	Q
0+10	0.0004	0.05	Q
0+15	0.0010	0.09	Q
0+20	0.0017	0.11	Q
0+25	0.0026	0.13	Q
0+30	0.0037	0.16	Q
0+35	0.0049	0.17	Q
0+40	0.0061	0.18	Q
0+45	0.0074	0.18	Q
0+50	0.0087	0.19	Q
0+55	0.0102	0.22	Q
1+ 0	0.0119	0.24	Q
1+ 5	0.0135	0.24	Q
1+10	0.0151	0.23	Q
1+15	0.0166	0.22	Q
1+20	0.0180	0.21	Q
1+25	0.0195	0.21	Q
1+30	0.0209	0.21	Q
1+35	0.0223	0.21	Q
1+40	0.0237	0.20	Q
1+45	0.0251	0.20	Q
1+50	0.0266	0.21	Q
1+55	0.0281	0.23	Q
2+ 0	0.0298	0.25	Q
2+ 5	0.0316	0.25	VQ
2+10	0.0333	0.26	VQ
2+15	0.0351	0.26	|Q
2+20	0.0369	0.26	|Q
2+25	0.0387	0.26	|Q
2+30	0.0406	0.27	|Q
2+35	0.0424	0.27	|Q
2+40	0.0444	0.29	|Q
2+45	0.0466	0.31	|Q
2+50	0.0488	0.32	|Q
2+55	0.0510	0.32	|Q
3+ 0	0.0532	0.33	|Q
3+ 5	0.0555	0.33	|Q
3+10	0.0578	0.33	|Q
3+15	0.0601	0.33	|Q
3+20	0.0624	0.33	|Q
3+25	0.0647	0.33	|Q
3+30	0.0670	0.33	|Q
3+35	0.0693	0.34	|Q
3+40	0.0716	0.34	|QV
3+45	0.0739	0.34	|QV
3+50	0.0763	0.34	|QV
3+55	0.0787	0.36	|QV
4+ 0	0.0813	0.38	|QV
4+ 5	0.0840	0.39	|QV
4+10	0.0867	0.39	|QV
4+15	0.0894	0.39	|QV
4+20	0.0922	0.40	|QV
4+25	0.0951	0.42	|QV
4+30	0.0981	0.44	|QV
4+35	0.1012	0.45	|QV
4+40	0.1044	0.46	|Q V
4+45	0.1076	0.46	|Q V
4+50	0.1108	0.47	|Q V
4+55	0.1141	0.49	|Q V
5+ 0	0.1176	0.51	| QV
5+ 5	0.1212	0.51	| QV
5+10	0.1244	0.48	|Q V
5+15	0.1275	0.44	|Q V
5+20	0.1305	0.43	|Q V
5+25	0.1335	0.45	|Q V
5+30	0.1367	0.46	|Q V
5+35	0.1399	0.47	|Q V
5+40	0.1433	0.49	|Q V
5+45	0.1468	0.51	| Q V
5+50	0.1504	0.52	| Q V
5+55	0.1540	0.52	| Q V
6+ 0	0.1577	0.53	| Q V
6+ 5	0.1613	0.53	| Q V
6+10	0.1652	0.56	| Q V

6+15	0.1691	0.58	Q V	|	|	|	|
6+20	0.1731	0.58	Q V	|	|	|	|
6+25	0.1772	0.59	Q V	|	|	|	|
6+30	0.1813	0.59	Q V	|	|	|	|
6+35	0.1855	0.60	Q V	|	|	|	|
6+40	0.1897	0.62	Q V	|	|	|	|
6+45	0.1942	0.64	Q V	|	|	|	|
6+50	0.1987	0.65	Q V	|	|	|	|
6+55	0.2032	0.66	Q V	|	|	|	|
7+ 0	0.2078	0.66	Q V	|	|	|	|
7+ 5	0.2123	0.66	Q V	|	|	|	|
7+10	0.2169	0.67	Q V	|	|	|	|
7+15	0.2215	0.67	Q V	|	|	|	|
7+20	0.2262	0.67	Q V	|	|	|	|
7+25	0.2310	0.69	Q V	|	|	|	|
7+30	0.2359	0.71	Q V	|	|	|	|
7+35	0.2409	0.73	Q V	|	|	|	|
7+40	0.2460	0.75	Q V	|	|	|	|
7+45	0.2514	0.77	Q V	|	|	|	|
7+50	0.2568	0.79	Q V	|	|	|	|
7+55	0.2624	0.81	Q V	|	|	|	|
8+ 0	0.2681	0.84	Q V	|	|	|	|
8+ 5	0.2740	0.86	Q V	|	|	|	|
8+10	0.2803	0.90	Q V	|	|	|	|
8+15	0.2868	0.94	Q V	|	|	|	|
8+20	0.2934	0.96	Q V	|	|	|	|
8+25	0.3001	0.98	Q V	|	|	|	|
8+30	0.3069	0.98	Q V	|	|	|	|
8+35	0.3138	1.00	Q V	|	|	|	|
8+40	0.3208	1.02	Q V	|	|	|	|
8+45	0.3280	1.04	Q V	|	|	|	|
8+50	0.3352	1.06	Q V	|	|	|	|
8+55	0.3427	1.08	Q V	|	|	|	|
9+ 0	0.3503	1.11	Q V	|	|	|	|
9+ 5	0.3581	1.13	Q V	|	|	|	|
9+10	0.3661	1.17	Q V	|	|	|	|
9+15	0.3745	1.21	Q V	|	|	|	|
9+20	0.3830	1.24	Q V	|	|	|	|
9+25	0.3918	1.27	Q V	|	|	|	|
9+30	0.4007	1.30	Q V	|	|	|	|
9+35	0.4098	1.32	Q V	|	|	|	|
9+40	0.4190	1.34	Q V	|	|	|	|
9+45	0.4284	1.37	Q V	|	|	|	|
9+50	0.4380	1.39	Q V	|	|	|	|
9+55	0.4477	1.41	Q V	|	|	|	|
10+ 0	0.4576	1.44	Q V	|	|	|	|
10+ 5	0.4674	1.42	Q V	|	|	|	|
10+10	0.4763	1.30	Q V	|	|	|	|
10+15	0.4844	1.17	Q V	|	|	|	|
10+20	0.4920	1.11	Q V	|	|	|	|
10+25	0.4995	1.09	Q V	|	|	|	|
10+30	0.5069	1.07	Q V	|	|	|	|
10+35	0.5143	1.07	Q V	|	|	|	|
10+40	0.5223	1.16	Q V	|	|	|	|
10+45	0.5308	1.25	Q V	|	|	|	|
10+50	0.5397	1.28	Q V	|	|	|	|
10+55	0.5486	1.30	Q V	|	|	|	|
11+ 0	0.5576	1.31	Q V	|	|	|	|
11+ 5	0.5667	1.31	Q V	|	|	|	|
11+10	0.5756	1.30	Q V	|	|	|	|
11+15	0.5845	1.28	Q V	|	|	|	|
11+20	0.5933	1.28	Q V	|	|	|	|
11+25	0.6021	1.28	Q V	|	|	|	|
11+30	0.6109	1.28	Q V	|	|	|	|
11+35	0.6197	1.27	Q V	|	|	|	|
11+40	0.6282	1.23	Q V	|	|	|	|
11+45	0.6364	1.20	Q V	|	|	|	|
11+50	0.6445	1.18	Q V	|	|	|	|
11+55	0.6528	1.19	Q V	|	|	|	|
12+ 0	0.6611	1.21	Q V	|	|	|	|
12+ 5	0.6696	1.24	Q V	|	|	|	|
12+10	0.6790	1.37	Q V	|	|	|	|
12+15	0.6894	1.51	Q V	|	|	|	|
12+20	0.7002	1.57	Q V	|	|	|	|
12+25	0.7114	1.62	Q V	|	|	|	|
12+30	0.7228	1.66	Q V	|	|	|	|
12+35	0.7345	1.69	Q V	|	|	|	|
12+40	0.7465	1.75	Q V	|	|	|	|
12+45	0.7588	1.80	Q V	|	|	|	|
12+50	0.7714	1.83	Q V	|	|	|	|
12+55	0.7842	1.86	Q V	|	|	|	|
13+ 0	0.7973	1.89	Q V	|	|	|	|
13+ 5	0.8106	1.93	Q V	|	|	|	|
13+10	0.8246	2.04	Q V	|	|	|	|
13+15	0.8394	2.14	Q V	|	|	|	|
13+20	0.8545	2.19	Q V	|	|	|	|
13+25	0.8697	2.22	Q V	|	|	|	|
13+30	0.8851	2.23	Q V	|	|	|	|
13+35	0.9002	2.20	Q V	|	|	|	|
13+40	0.9140	2.00	Q V	|	|	|	|
13+45	0.9264	1.80	Q V	|	|	|	|
13+50	0.9382	1.71	Q V	|	|	|	|
13+55	0.9497	1.67	Q V	|	|	|	|
14+ 0	0.9610	1.64	Q V	|	|	|	|
14+ 5	0.9722	1.63	Q V	|	|	|	|
14+10	0.9839	1.69	Q V	|	|	|	|
14+15	0.9960	1.76	Q V	|	|	|	|
14+20	1.0082	1.78	Q V	|	|	|	|
14+25	1.0204	1.77	Q V	|	|	|	|

14+30	1.0325	1.75	
14+35	1.0445	1.75	
14+40	1.0566	1.75	
14+45	1.0686	1.74	
14+50	1.0806	1.74	
14+55	1.0924	1.72	
15+ 0	1.1042	1.70	
15+ 5	1.1158	1.69	
15+10	1.1273	1.67	
15+15	1.1387	1.65	
15+20	1.1499	1.63	
15+25	1.1610	1.61	
15+30	1.1719	1.58	
15+35	1.1826	1.56	
15+40	1.1928	1.47	
15+45	1.2023	1.39	
15+50	1.2117	1.35	
15+55	1.2209	1.33	
16+ 0	1.2299	1.32	
16+ 5	1.2385	1.24	
16+10	1.2451	0.95	
16+15	1.2496	0.66	
16+20	1.2532	0.53	
16+25	1.2564	0.46	
16+30	1.2592	0.41	
16+35	1.2618	0.37	
16+40	1.2640	0.33	
16+45	1.2660	0.29	
16+50	1.2678	0.26	
16+55	1.2695	0.25	
17+ 0	1.2711	0.23	
17+ 5	1.2727	0.23	
17+10	1.2745	0.26	
17+15	1.2765	0.29	
17+20	1.2787	0.31	
17+25	1.2808	0.31	
17+30	1.2830	0.32	
17+35	1.2852	0.32	
17+40	1.2875	0.33	
17+45	1.2898	0.33	
17+50	1.2920	0.33	
17+55	1.2941	0.31	
18+ 0	1.2961	0.29	
18+ 5	1.2981	0.28	
18+10	1.3000	0.28	
18+15	1.3019	0.28	
18+20	1.3038	0.28	
18+25	1.3057	0.27	
18+30	1.3076	0.27	
18+35	1.3094	0.27	
18+40	1.3111	0.25	
18+45	1.3127	0.23	
18+50	1.3142	0.21	
18+55	1.3155	0.19	
19+ 0	1.3167	0.17	
19+ 5	1.3178	0.16	
19+10	1.3190	0.18	
19+15	1.3203	0.19	
19+20	1.3217	0.20	
19+25	1.3232	0.22	
19+30	1.3248	0.24	
19+35	1.3265	0.25	
19+40	1.3281	0.23	
19+45	1.3296	0.22	
19+50	1.3310	0.21	
19+55	1.3323	0.18	
20+ 0	1.3334	0.16	
20+ 5	1.3345	0.16	
20+10	1.3357	0.17	
20+15	1.3370	0.19	
20+20	1.3383	0.19	
20+25	1.3397	0.20	
20+30	1.3410	0.20	
20+35	1.3424	0.20	
20+40	1.3438	0.20	
20+45	1.3451	0.20	
20+50	1.3465	0.20	
20+55	1.3477	0.18	
21+ 0	1.3488	0.16	
21+ 5	1.3499	0.15	
21+10	1.3510	0.17	
21+15	1.3523	0.19	
21+20	1.3536	0.19	
21+25	1.3548	0.17	
21+30	1.3558	0.15	
21+35	1.3569	0.15	
21+40	1.3580	0.17	
21+45	1.3593	0.18	
21+50	1.3606	0.19	
21+55	1.3618	0.17	
22+ 0	1.3628	0.15	
22+ 5	1.3638	0.15	
22+10	1.3650	0.17	
22+15	1.3662	0.18	
22+20	1.3675	0.19	
22+25	1.3687	0.17	
22+30	1.3698	0.15	
22+35	1.3708	0.15	
22+40	1.3717	0.14	

22+45	1.3727	0.14	Q				V
22+50	1.3737	0.14	Q				V
22+55	1.3746	0.14	Q				V
23+ 0	1.3756	0.14	Q				V
23+ 5	1.3765	0.14	Q				V
23+10	1.3774	0.14	Q				V
23+15	1.3784	0.14	Q				V
23+20	1.3793	0.14	Q				V
23+25	1.3802	0.14	Q				V
23+30	1.3812	0.13	Q				V
23+35	1.3821	0.13	Q				V
23+40	1.3830	0.13	Q				V
23+45	1.3840	0.13	Q				V
23+50	1.3849	0.13	Q				V
23+55	1.3858	0.13	Q				V
24+ 0	1.3867	0.13	Q				V
24+ 5	1.3876	0.13	Q				V
24+10	1.3882	0.09	Q				V
24+15	1.3885	0.05	Q				V
24+20	1.3888	0.03	Q				V
24+25	1.3889	0.02	Q				V
24+30	1.3891	0.02	Q				V
24+35	1.3892	0.01	Q				V
24+40	1.3892	0.01	Q				V
24+45	1.3893	0.01	Q				V
24+50	1.3893	0.01	Q				V
24+55	1.3893	0.00	Q				V
25+ 0	1.3894	0.00	Q				V
25+ 5	1.3894	0.00	Q				V
25+10	1.3894	0.00	Q				V
25+15	1.3894	0.00	Q				V

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/12/20 File: 3828EX10110.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.159 Hr.
Lag time = 9.56 Min.
25% of lag time = 2.39 Min.
40% of lag time = 3.82 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	0.50	34.83

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.20	83.58

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.500(In)
Area Averaged 100-Year Rainfall = 1.200(In)

Point rain (area averaged) = 0.788(In)
Areal adjustment factor = 99.94 %
Adjusted average point rain = 0.787(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	76.00	0.000

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	76.0	0.291	0.000	0.291	1.000	0.291
					Sum (F) =	0.291

Area averaged mean soil loss (F) (In/Hr) = 0.291
Minimum soil loss rate ((In/Hr)) = 0.146
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

Slope of intensity-duration curve for a 1 hour storm =0.5000

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	52.307	6.571	4.612
2	0.167	104.614	28.083	19.712
3	0.250	156.922	28.549	20.039
4	0.333	209.229	12.179	8.549
5	0.417	261.536	6.595	4.629
6	0.500	313.843	4.589	3.221
7	0.583	366.151	3.296	2.314
8	0.667	418.458	2.462	1.728
9	0.750	470.765	1.797	1.261
10	0.833	523.072	1.548	1.086

11	0.917	575.380	1.191	0.836
12	1.000	627.687	0.940	0.660
13	1.083	679.994	0.721	0.506
14	1.167	732.301	0.542	0.381
15	1.250	784.608	0.523	0.367
16	1.333	836.916	0.415	0.292
			Sum = 100.000	Sum= 70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	4.20	0.397	0.291	(0.357)	0.106
2	0.17	4.30	0.406	0.291	(0.366)	0.115
3	0.25	5.00	0.472	0.291	(0.425)	0.181
4	0.33	5.00	0.472	0.291	(0.425)	0.181
5	0.42	5.80	0.548	0.291	(0.493)	0.257
6	0.50	6.50	0.614	0.291	(0.553)	0.323
7	0.58	7.40	0.699	0.291	(0.629)	0.408
8	0.67	8.60	0.813	0.291	(0.731)	0.521
9	0.75	12.30	1.162	0.291	(1.046)	0.871
10	0.83	29.10	2.750	0.291	(2.475)	2.459
11	0.92	6.80	0.643	0.291	(0.578)	0.351
12	1.00	5.00	0.472	0.291	(0.425)	0.181
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	6.0

Flood volume = Effective rainfall 0.50(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 2.9(Ac.Ft)
Total soil loss = 0.29(In)
Total soil loss = 1.690(Ac.Ft)
Total rainfall = 0.79(In)
Flood volume = 125476.3 Cubic Feet
Total soil loss = 73624.0 Cubic Feet

Peak flow rate of this hydrograph = 76.322(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 20.0 40.0 60.0 80.0
0+ 5	0.0034	0.49	Q
0+10	0.0214	2.62	VQ
0+15	0.0574	5.23	V Q
0+20	0.1099	7.62	V Q
0+25	0.1779	9.87	V Q
0+30	0.2648	12.62	V Q
0+35	0.3778	16.41	V Q
0+40	0.5224	21.00	V Q
0+45	0.7137	27.78	V Q
0+50	1.0291	45.79	V Q
0+55	1.5547	76.32	V Q
1+ 0	2.0370	70.03	V Q
1+ 5	2.3102	39.67	Q V
1+10	2.4742	23.80	Q V
1+15	2.5802	15.39	Q V
1+20	2.6556	10.95	Q V
1+25	2.7118	8.17	Q V
1+30	2.7543	6.16	Q V
1+35	2.7886	4.98	Q V
1+40	2.8151	3.86	Q V
1+45	2.8358	3.00	Q V
1+50	2.8514	2.27	Q V
1+55	2.8632	1.71	Q V
2+ 0	2.8727	1.38	Q V
2+ 5	2.8790	0.92	Q V
2+10	2.8802	0.17	Q V
2+15	2.8805	0.05	Q V

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/12/20 File: 3828EX10310.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.159 Hr.
Lag time = 9.56 Min.
25% of lag time = 2.39 Min.
40% of lag time = 3.82 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	0.80	55.72

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.86	129.55

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.800(In)
Area Averaged 100-Year Rainfall = 1.860(In)

Point rain (area averaged) = 1.236(In)
Areal adjustment factor = 99.97 %
Adjusted average point rain = 1.236(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	76.00	0.000

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	76.0	0.291	0.000	0.291	1.000	0.291
					Sum (F) =	0.291

Area averaged mean soil loss (F) (In/Hr) = 0.291
Minimum soil loss rate ((In/Hr)) = 0.146
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	52.307	6.571	4.612
2	0.167	104.614	28.083	19.712
3	0.250	156.922	28.549	20.039
4	0.333	209.229	12.179	8.549
5	0.417	261.536	6.595	4.629
6	0.500	313.843	4.589	3.221
7	0.583	366.151	3.296	2.314
8	0.667	418.458	2.462	1.728
9	0.750	470.765	1.797	1.261
10	0.833	523.072	1.548	1.086
11	0.917	575.380	1.191	0.836
12	1.000	627.687	0.940	0.660

13	1.083	679.994	0.721	0.506
14	1.167	732.301	0.542	0.381
15	1.250	784.608	0.523	0.367
16	1.333	836.916	0.415	0.292
			Sum = 100.000 Sum=	70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.193	(0.291)	0.173	0.019
2	0.17	1.30	0.193	(0.291)	0.173	0.019
3	0.25	1.10	0.163	(0.291)	0.147	0.016
4	0.33	1.50	0.222	(0.291)	0.200	0.022
5	0.42	1.50	0.222	(0.291)	0.200	0.022
6	0.50	1.80	0.267	(0.291)	0.240	0.027
7	0.58	1.50	0.222	(0.291)	0.200	0.022
8	0.67	1.80	0.267	(0.291)	0.240	0.027
9	0.75	1.80	0.267	(0.291)	0.240	0.027
10	0.83	1.50	0.222	(0.291)	0.200	0.022
11	0.92	1.60	0.237	(0.291)	0.214	0.024
12	1.00	1.80	0.267	(0.291)	0.240	0.027
13	1.08	2.20	0.326	0.291 (	0.294)	0.035
14	1.17	2.20	0.326	0.291 (	0.294)	0.035
15	1.25	2.20	0.326	0.291 (	0.294)	0.035
16	1.33	2.00	0.297	(0.291)	0.267	0.030
17	1.42	2.60	0.386	0.291 (	0.347)	0.094
18	1.50	2.70	0.400	0.291 (	0.360)	0.109
19	1.58	2.40	0.356	0.291 (	0.320)	0.065
20	1.67	2.70	0.400	0.291 (	0.360)	0.109
21	1.75	3.30	0.489	0.291 (	0.440)	0.198
22	1.83	3.10	0.460	0.291 (	0.414)	0.168
23	1.92	2.90	0.430	0.291 (	0.387)	0.139
24	2.00	3.00	0.445	0.291 (	0.400)	0.154
25	2.08	3.10	0.460	0.291 (	0.414)	0.168
26	2.17	4.20	0.623	0.291 (	0.561)	0.332
27	2.25	5.00	0.741	0.291 (	0.667)	0.450
28	2.33	3.50	0.519	0.291 (	0.467)	0.228
29	2.42	6.80	1.008	0.291 (	0.908)	0.717
30	2.50	7.30	1.082	0.291 (	0.974)	0.791
31	2.58	8.20	1.216	0.291 (	1.094)	0.925
32	2.67	5.90	0.875	0.291 (	0.787)	0.584
33	2.75	2.00	0.297	(0.291)	0.267	0.030
34	2.83	1.80	0.267	(0.291)	0.240	0.027
35	2.92	1.80	0.267	(0.291)	0.240	0.027
36	3.00	0.60	0.089	(0.291)	0.080	0.009

(Loss Rate Not Used)

Sum = 100.0 Sum = 5.7

Flood volume = Effective rainfall 0.48(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 2.8(Ac.Ft)
Total soil loss = 0.76(In)
Total soil loss = 4.400(Ac.Ft)
Total rainfall = 1.24(In)
Flood volume = 120778.3 Cubic Feet
Total soil loss = 191647.1 Cubic Feet

Peak flow rate of this hydrograph = 47.260(CFS)

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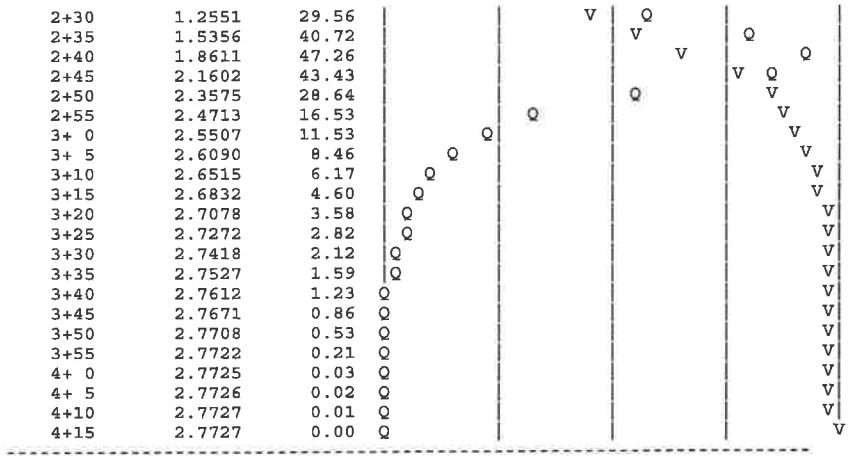
3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 12.5 25.0 37.5 50.0
0+ 5	0.0006	0.09	Q
0+10	0.0038	0.47	Q
0+15	0.0096	0.84	Q
0+20	0.0164	0.98	Q
0+25	0.0241	1.12	Q
0+30	0.0330	1.30	VQ
0+35	0.0430	1.45	VQ
0+40	0.0535	1.52	VQ
0+45	0.0645	1.59	VQ
0+50	0.0760	1.67	Q
0+55	0.0873	1.65	Q
1+ 0	0.0986	1.64	Q
1+ 5	0.1107	1.75	Q
1+10	0.1243	1.98	Q
1+15	0.1394	2.19	QV
1+20	0.1549	2.25	QV
1+25	0.1721	2.49	QV
1+30	0.1900	3.77	VQ
1+35	0.2333	5.13	VQ
1+40	0.2698	5.30	VQ
1+45	0.3120	6.12	Q
1+50	0.3707	8.52	VQ
1+55	0.4393	9.96	VQ
2+ 0	0.5069	9.82	Q
2+ 5	0.5750	9.89	QV
2+10	0.6524	11.24	QV
2+15	0.7591	15.49	V Q
2+20	0.8991	20.33	V Q
2+25	1.0515	22.13	V Q



2+30	1.2551	29.56	
2+35	1.5356	40.72	
2+40	1.8611	47.26	
2+45	2.1602	43.43	
2+50	2.3575	28.64	
2+55	2.4713	16.53	
3+ 0	2.5507	11.53	
3+ 5	2.6090	8.46	
3+10	2.6515	6.17	
3+15	2.6832	4.60	
3+20	2.7078	3.58	
3+25	2.7272	2.82	
3+30	2.7418	2.12	
3+35	2.7527	1.59	
3+40	2.7612	1.23	
3+45	2.7671	0.86	
3+50	2.7708	0.53	
3+55	2.7722	0.21	
4+ 0	2.7725	0.03	
4+ 5	2.7726	0.02	
4+10	2.7727	0.01	
4+15	2.7727	0.00	

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/12/20 File: 3828EX10610.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.159 Hr.
Lag time = 9.56 Min.
25% of lag time = 2.39 Min.
40% of lag time = 3.82 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.15	80.10

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	2.50	174.13

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 1.150(In)
Area Averaged 100-Year Rainfall = 2.500(In)

Point rain (area averaged) = 1.705(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 1.705(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	76.00	0.000

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	76.0	0.291	0.000	0.291	1.000	0.291
					Sum (F) =	0.291

Area averaged mean soil loss (F) (In/Hr) = 0.291
Minimum soil loss rate ((In/Hr)) = 0.146
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period	(hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	52.307	6.571	4.612
2	0.167	104.614	28.083	19.712
3	0.250	156.922	28.549	20.039
4	0.333	209.229	12.179	8.549
5	0.417	261.536	6.595	4.629
6	0.500	313.843	4.589	3.221
7	0.583	366.151	3.296	2.314
8	0.667	418.458	2.462	1.728
9	0.750	470.765	1.797	1.261
10	0.833	523.072	1.548	1.086
11	0.917	575.380	1.191	0.836
12	1.000	627.687	0.940	0.660

13	1.083	679.994	0.721	0.506
14	1.167	732.301	0.542	0.381
15	1.250	784.608	0.523	0.367
16	1.333	836.916	0.415	0.292
		Sum = 100.000	Sum=	70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.102	(0.291)	0.092	0.010
2	0.17	0.60	0.123	(0.291)	0.110	0.012
3	0.25	0.60	0.123	(0.291)	0.110	0.012
4	0.33	0.60	0.123	(0.291)	0.110	0.012
5	0.42	0.60	0.123	(0.291)	0.110	0.012
6	0.50	0.70	0.143	(0.291)	0.129	0.014
7	0.58	0.70	0.143	(0.291)	0.129	0.014
8	0.67	0.70	0.143	(0.291)	0.129	0.014
9	0.75	0.70	0.143	(0.291)	0.129	0.014
10	0.83	0.70	0.143	(0.291)	0.129	0.014
11	0.92	0.70	0.143	(0.291)	0.129	0.014
12	1.00	0.80	0.164	(0.291)	0.147	0.016
13	1.08	0.80	0.164	(0.291)	0.147	0.016
14	1.17	0.80	0.164	(0.291)	0.147	0.016
15	1.25	0.80	0.164	(0.291)	0.147	0.016
16	1.33	0.80	0.164	(0.291)	0.147	0.016
17	1.42	0.80	0.164	(0.291)	0.147	0.016
18	1.50	0.80	0.164	(0.291)	0.147	0.016
19	1.58	0.80	0.164	(0.291)	0.147	0.016
20	1.67	0.80	0.164	(0.291)	0.147	0.016
21	1.75	0.80	0.164	(0.291)	0.147	0.016
22	1.83	0.80	0.164	(0.291)	0.147	0.016
23	1.92	0.80	0.164	(0.291)	0.147	0.016
24	2.00	0.90	0.184	(0.291)	0.166	0.018
25	2.08	0.80	0.164	(0.291)	0.147	0.016
26	2.17	0.90	0.184	(0.291)	0.166	0.018
27	2.25	0.90	0.184	(0.291)	0.166	0.018
28	2.33	0.90	0.184	(0.291)	0.166	0.018
29	2.42	0.90	0.184	(0.291)	0.166	0.018
30	2.50	0.90	0.184	(0.291)	0.166	0.018
31	2.58	0.90	0.184	(0.291)	0.166	0.018
32	2.67	0.90	0.184	(0.291)	0.166	0.018
33	2.75	1.00	0.205	(0.291)	0.184	0.020
34	2.83	1.00	0.205	(0.291)	0.184	0.020
35	2.92	1.00	0.205	(0.291)	0.184	0.020
36	3.00	1.00	0.205	(0.291)	0.184	0.020
37	3.08	1.00	0.205	(0.291)	0.184	0.020
38	3.17	1.10	0.225	(0.291)	0.203	0.023
39	3.25	1.10	0.225	(0.291)	0.203	0.023
40	3.33	1.10	0.225	(0.291)	0.203	0.023
41	3.42	1.20	0.246	(0.291)	0.221	0.025
42	3.50	1.30	0.266	(0.291)	0.239	0.027
43	3.58	1.40	0.286	(0.291)	0.258	0.029
44	3.67	1.40	0.286	(0.291)	0.258	0.029
45	3.75	1.50	0.307	(0.291)	0.276	0.031
46	3.83	1.50	0.307	(0.291)	0.276	0.031
47	3.92	1.60	0.327	0.291	(0.295)	0.036
48	4.00	1.60	0.327	0.291	(0.295)	0.036
49	4.08	1.70	0.348	0.291	(0.313)	0.057
50	4.17	1.80	0.368	0.291	(0.331)	0.077
51	4.25	1.90	0.389	0.291	(0.350)	0.098
52	4.33	2.00	0.409	0.291	(0.368)	0.118
53	4.42	2.10	0.430	0.291	(0.387)	0.138
54	4.50	2.10	0.430	0.291	(0.387)	0.138
55	4.58	2.20	0.450	0.291	(0.405)	0.159
56	4.67	2.30	0.471	0.291	(0.424)	0.179
57	4.75	2.40	0.491	0.291	(0.442)	0.200
58	4.83	2.40	0.491	0.291	(0.442)	0.200
59	4.92	2.50	0.511	0.291	(0.460)	0.220
60	5.00	2.60	0.532	0.291	(0.479)	0.241
61	5.08	3.10	0.634	0.291	(0.571)	0.343
62	5.17	3.60	0.737	0.291	(0.663)	0.445
63	5.25	3.90	0.798	0.291	(0.718)	0.507
64	5.33	4.20	0.859	0.291	(0.773)	0.568
65	5.42	4.70	0.962	0.291	(0.865)	0.670
66	5.50	5.60	1.146	0.291	(1.031)	0.855
67	5.58	1.90	0.389	0.291	(0.350)	0.098
68	5.67	0.90	0.184	(0.291)	0.166	0.018
69	5.75	0.60	0.123	(0.291)	0.110	0.012
70	5.83	0.50	0.102	(0.291)	0.092	0.010
71	5.92	0.30	0.061	(0.291)	0.055	0.006
72	6.00	0.20	0.041	(0.291)	0.037	0.004
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	6.3

Flood volume = Effective rainfall 0.52(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 3.0(Ac.Ft)
Total soil loss = 1.18(In)
Total soil loss = 6.859(Ac.Ft)
Total rainfall = 1.70(In)
Flood volume = 132301.8 Cubic Feet
Total soil loss = 298770.7 Cubic Feet

Peak flow rate of this hydrograph = 41.597(CFS)

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6 - H O U R S T O R M

Runoff Hydrograph

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 12.5 25.0 37.5 50.0
0+ 5	0.0003	0.05	Q
0+10	0.0021	0.26	Q
0+15	0.0056	0.50	Q
0+20	0.0099	0.63	Q
0+25	0.0147	0.70	Q
0+30	0.0199	0.75	Q
0+35	0.0255	0.82	Q
0+40	0.0316	0.88	Q
0+45	0.0379	0.92	Q
0+50	0.0444	0.94	Q
0+55	0.0510	0.96	Q
1+ 0	0.0578	0.98	Q
1+ 5	0.0649	1.03	Q
1+10	0.0723	1.08	Q
1+15	0.0799	1.10	QV
1+20	0.0876	1.12	QV
1+25	0.0954	1.13	QV
1+30	0.1032	1.13	QV
1+35	0.1110	1.14	QV
1+40	0.1188	1.14	QV
1+45	0.1267	1.14	QV
1+50	0.1346	1.15	QV
1+55	0.1425	1.15	QV
2+ 0	0.1505	1.16	QV
2+ 5	0.1587	1.19	Q V
2+10	0.1669	1.20	Q V
2+15	0.1753	1.22	Q V
2+20	0.1839	1.25	Q V
2+25	0.1926	1.26	QV
2+30	0.2014	1.27	QV
2+35	0.2102	1.28	QV
2+40	0.2190	1.28	QV
2+45	0.2279	1.29	Q V
2+50	0.2371	1.34	Q V
2+55	0.2466	1.38	Q V
3+ 0	0.2562	1.40	Q V
3+ 5	0.2659	1.41	Q V
3+10	0.2758	1.43	Q V
3+15	0.2859	1.47	Q V
3+20	0.2963	1.52	Q V
3+25	0.3070	1.55	Q V
3+30	0.3181	1.61	Q V
3+35	0.3298	1.71	Q V
3+40	0.3423	1.81	Q V
3+45	0.3553	1.89	Q V
3+50	0.3689	1.97	Q V
3+55	0.3831	2.06	Q V
4+ 0	0.3983	2.20	Q V
4+ 5	0.4150	2.43	Q V
4+10	0.4356	2.99	Q V
4+15	0.4627	3.94	Q V
4+20	0.4975	5.05	Q V
4+25	0.5405	6.24	Q V
4+30	0.5915	7.41	Q V
4+35	0.6487	8.31	Q V
4+40	0.7123	9.23	Q V
4+45	0.7840	10.42	Q V
4+50	0.8640	11.61	Q V
4+55	0.9503	12.53	Q V
5+ 0	1.0431	13.48	Q V
5+ 5	1.1469	15.07	Q V
5+10	1.2734	18.36	Q V
5+15	1.4328	23.15	Q
5+20	1.6247	27.86	VQ
5+25	1.8474	32.33	VQ
5+30	2.1085	37.92	V Q
5+35	2.3950	41.60	V Q
5+40	2.6144	31.85	Q V
5+45	2.7372	17.84	Q V
5+50	2.8156	11.37	Q V
5+55	2.8724	8.26	Q V
6+ 0	2.9151	6.19	Q V
6+ 5	2.9474	4.70	Q V
6+10	2.9719	3.56	Q V
6+15	2.9910	2.77	Q V
6+20	3.0056	2.11	Q V
6+25	3.0166	1.60	Q V
6+30	3.0246	1.17	Q V
6+35	3.0304	0.84	Q V
6+40	3.0344	0.58	Q V
6+45	3.0366	0.31	Q V
6+50	3.0369	0.05	Q V
6+55	3.0371	0.02	Q V
7+ 0	3.0372	0.01	Q V
7+ 5	3.0372	0.01	Q V
7+10	3.0372	0.00	Q V
7+15	3.0372	0.00	Q V

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/12/20 File: 3828EX102410.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.159 Hr.
Lag time = 9.56 Min.
25% of lag time = 2.39 Min.
40% of lag time = 3.82 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.75	121.89

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	4.50	313.43

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 1.750(In)
Area Averaged 100-Year Rainfall = 4.500(In)

Point rain (area averaged) = 2.881(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 2.881(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	76.00	0.000

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	76.0	0.291	0.000	0.291	1.000	0.291
					Sum (F) =	0.291

Area averaged mean soil loss (F) (In/Hr) = 0.291
Minimum soil loss rate ((In/Hr)) = 0.146
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	52.307	6.571	4.612
2	0.167	104.614	28.083	19.712
3	0.250	156.922	28.549	20.039
4	0.333	209.229	12.179	8.549
5	0.417	261.536	6.595	4.629
6	0.500	313.843	4.589	3.221
7	0.583	366.151	3.296	2.314
8	0.667	418.458	2.462	1.728
9	0.750	470.765	1.797	1.261
10	0.833	523.072	1.548	1.086
11	0.917	575.380	1.191	0.836
12	1.000	627.687	0.940	0.660

13	1.083	679.994	0.721		0.506
14	1.167	732.301	0.542		0.381
15	1.250	784.608	0.523		0.367
16	1.333	836.916	0.415		0.292
			Sum = 100.000	Sum=	70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.023	(0.516)	0.021	0.002
2	0.17	0.07	0.023	(0.514)	0.021	0.002
3	0.25	0.07	0.023	(0.512)	0.021	0.002
4	0.33	0.10	0.035	(0.510)	0.031	0.003
5	0.42	0.10	0.035	(0.508)	0.031	0.003
6	0.50	0.10	0.035	(0.506)	0.031	0.003
7	0.58	0.10	0.035	(0.504)	0.031	0.003
8	0.67	0.10	0.035	(0.502)	0.031	0.003
9	0.75	0.10	0.035	(0.500)	0.031	0.003
10	0.83	0.13	0.046	(0.498)	0.041	0.005
11	0.92	0.13	0.046	(0.496)	0.041	0.005
12	1.00	0.13	0.046	(0.494)	0.041	0.005
13	1.08	0.10	0.035	(0.493)	0.031	0.003
14	1.17	0.10	0.035	(0.491)	0.031	0.003
15	1.25	0.10	0.035	(0.489)	0.031	0.003
16	1.33	0.10	0.035	(0.487)	0.031	0.003
17	1.42	0.10	0.035	(0.485)	0.031	0.003
18	1.50	0.10	0.035	(0.483)	0.031	0.003
19	1.58	0.10	0.035	(0.481)	0.031	0.003
20	1.67	0.10	0.035	(0.479)	0.031	0.003
21	1.75	0.10	0.035	(0.477)	0.031	0.003
22	1.83	0.13	0.046	(0.475)	0.041	0.005
23	1.92	0.13	0.046	(0.473)	0.041	0.005
24	2.00	0.13	0.046	(0.471)	0.041	0.005
25	2.08	0.13	0.046	(0.469)	0.041	0.005
26	2.17	0.13	0.046	(0.467)	0.041	0.005
27	2.25	0.13	0.046	(0.466)	0.041	0.005
28	2.33	0.13	0.046	(0.464)	0.041	0.005
29	2.42	0.13	0.046	(0.462)	0.041	0.005
30	2.50	0.13	0.046	(0.460)	0.041	0.005
31	2.58	0.17	0.058	(0.458)	0.052	0.006
32	2.67	0.17	0.058	(0.456)	0.052	0.006
33	2.75	0.17	0.058	(0.454)	0.052	0.006
34	2.83	0.17	0.058	(0.452)	0.052	0.006
35	2.92	0.17	0.058	(0.451)	0.052	0.006
36	3.00	0.17	0.058	(0.449)	0.052	0.006
37	3.08	0.17	0.058	(0.447)	0.052	0.006
38	3.17	0.17	0.058	(0.445)	0.052	0.006
39	3.25	0.17	0.058	(0.443)	0.052	0.006
40	3.33	0.17	0.058	(0.441)	0.052	0.006
41	3.42	0.17	0.058	(0.439)	0.052	0.006
42	3.50	0.17	0.058	(0.438)	0.052	0.006
43	3.58	0.17	0.058	(0.436)	0.052	0.006
44	3.67	0.17	0.058	(0.434)	0.052	0.006
45	3.75	0.17	0.058	(0.432)	0.052	0.006
46	3.83	0.20	0.069	(0.430)	0.062	0.007
47	3.92	0.20	0.069	(0.428)	0.062	0.007
48	4.00	0.20	0.069	(0.427)	0.062	0.007
49	4.08	0.20	0.069	(0.425)	0.062	0.007
50	4.17	0.20	0.069	(0.423)	0.062	0.007
51	4.25	0.20	0.069	(0.421)	0.062	0.007
52	4.33	0.23	0.081	(0.419)	0.073	0.008
53	4.42	0.23	0.081	(0.418)	0.073	0.008
54	4.50	0.23	0.081	(0.416)	0.073	0.008
55	4.58	0.23	0.081	(0.414)	0.073	0.008
56	4.67	0.23	0.081	(0.412)	0.073	0.008
57	4.75	0.23	0.081	(0.411)	0.073	0.008
58	4.83	0.27	0.092	(0.409)	0.083	0.009
59	4.92	0.27	0.092	(0.407)	0.083	0.009
60	5.00	0.27	0.092	(0.405)	0.083	0.009
61	5.08	0.20	0.069	(0.403)	0.062	0.007
62	5.17	0.20	0.069	(0.402)	0.062	0.007
63	5.25	0.20	0.069	(0.400)	0.062	0.007
64	5.33	0.23	0.081	(0.398)	0.073	0.008
65	5.42	0.23	0.081	(0.396)	0.073	0.008
66	5.50	0.23	0.081	(0.395)	0.073	0.008
67	5.58	0.27	0.092	(0.393)	0.083	0.009
68	5.67	0.27	0.092	(0.391)	0.083	0.009
69	5.75	0.27	0.092	(0.390)	0.083	0.009
70	5.83	0.27	0.092	(0.388)	0.083	0.009
71	5.92	0.27	0.092	(0.386)	0.083	0.009
72	6.00	0.27	0.092	(0.384)	0.083	0.009
73	6.08	0.30	0.104	(0.383)	0.093	0.010
74	6.17	0.30	0.104	(0.381)	0.093	0.010
75	6.25	0.30	0.104	(0.379)	0.093	0.010
76	6.33	0.30	0.104	(0.378)	0.093	0.010
77	6.42	0.30	0.104	(0.376)	0.093	0.010
78	6.50	0.30	0.104	(0.374)	0.093	0.010
79	6.58	0.33	0.115	(0.373)	0.104	0.012
80	6.67	0.33	0.115	(0.371)	0.104	0.012
81	6.75	0.33	0.115	(0.369)	0.104	0.012
82	6.83	0.33	0.115	(0.368)	0.104	0.012
83	6.92	0.33	0.115	(0.366)	0.104	0.012
84	7.00	0.33	0.115	(0.364)	0.104	0.012
85	7.08	0.33	0.115	(0.363)	0.104	0.012
86	7.17	0.33	0.115	(0.361)	0.104	0.012

87	7.25	0.33	0.115	(0.359)	0.104	0.012
88	7.33	0.37	0.127	(0.358)	0.114	0.013
89	7.42	0.37	0.127	(0.356)	0.114	0.013
90	7.50	0.37	0.127	(0.354)	0.114	0.013
91	7.58	0.40	0.138	(0.353)	0.124	0.014
92	7.67	0.40	0.138	(0.351)	0.124	0.014
93	7.75	0.40	0.138	(0.349)	0.124	0.014
94	7.83	0.43	0.150	(0.348)	0.135	0.015
95	7.92	0.43	0.150	(0.346)	0.135	0.015
96	8.00	0.43	0.150	(0.345)	0.135	0.015
97	8.08	0.50	0.173	(0.343)	0.156	0.017
98	8.17	0.50	0.173	(0.341)	0.156	0.017
99	8.25	0.50	0.173	(0.340)	0.156	0.017
100	8.33	0.50	0.173	(0.338)	0.156	0.017
101	8.42	0.50	0.173	(0.337)	0.156	0.017
102	8.50	0.50	0.173	(0.335)	0.156	0.017
103	8.58	0.53	0.184	(0.334)	0.166	0.018
104	8.67	0.53	0.184	(0.332)	0.166	0.018
105	8.75	0.53	0.184	(0.330)	0.166	0.018
106	8.83	0.57	0.196	(0.329)	0.176	0.020
107	8.92	0.57	0.196	(0.327)	0.176	0.020
108	9.00	0.57	0.196	(0.326)	0.176	0.020
109	9.08	0.63	0.219	(0.324)	0.197	0.022
110	9.17	0.63	0.219	(0.323)	0.197	0.022
111	9.25	0.63	0.219	(0.321)	0.197	0.022
112	9.33	0.67	0.230	(0.320)	0.207	0.023
113	9.42	0.67	0.230	(0.318)	0.207	0.023
114	9.50	0.67	0.230	(0.317)	0.207	0.023
115	9.58	0.70	0.242	(0.315)	0.218	0.024
116	9.67	0.70	0.242	(0.314)	0.218	0.024
117	9.75	0.70	0.242	(0.312)	0.218	0.024
118	9.83	0.73	0.254	(0.310)	0.228	0.025
119	9.92	0.73	0.254	(0.309)	0.228	0.025
120	10.00	0.73	0.254	(0.308)	0.228	0.025
121	10.08	0.50	0.173	(0.306)	0.156	0.017
122	10.17	0.50	0.173	(0.305)	0.156	0.017
123	10.25	0.50	0.173	(0.303)	0.156	0.017
124	10.33	0.50	0.173	(0.302)	0.156	0.017
125	10.42	0.50	0.173	(0.300)	0.156	0.017
126	10.50	0.50	0.173	(0.299)	0.156	0.017
127	10.58	0.67	0.230	(0.297)	0.207	0.023
128	10.67	0.67	0.230	(0.296)	0.207	0.023
129	10.75	0.67	0.230	(0.294)	0.207	0.023
130	10.83	0.67	0.230	(0.293)	0.207	0.023
131	10.92	0.67	0.230	(0.291)	0.207	0.023
132	11.00	0.67	0.230	(0.290)	0.207	0.023
133	11.08	0.63	0.219	(0.289)	0.197	0.022
134	11.17	0.63	0.219	(0.287)	0.197	0.022
135	11.25	0.63	0.219	(0.286)	0.197	0.022
136	11.33	0.63	0.219	(0.284)	0.197	0.022
137	11.42	0.63	0.219	(0.283)	0.197	0.022
138	11.50	0.63	0.219	(0.281)	0.197	0.022
139	11.58	0.57	0.196	(0.280)	0.176	0.020
140	11.67	0.57	0.196	(0.279)	0.176	0.020
141	11.75	0.57	0.196	(0.277)	0.176	0.020
142	11.83	0.60	0.207	(0.276)	0.187	0.021
143	11.92	0.60	0.207	(0.275)	0.187	0.021
144	12.00	0.60	0.207	(0.273)	0.187	0.021
145	12.08	0.83	0.288	(0.272)	0.259	0.029
146	12.17	0.83	0.288	(0.270)	0.259	0.029
147	12.25	0.83	0.288	(0.269)	0.259	0.029
148	12.33	0.87	0.300	0.268	(0.270)	0.032
149	12.42	0.87	0.300	0.266	(0.270)	0.033
150	12.50	0.87	0.300	0.265	(0.270)	0.035
151	12.58	0.93	0.323	0.264	(0.290)	0.059
152	12.67	0.93	0.323	0.262	(0.290)	0.060
153	12.75	0.93	0.323	0.261	(0.290)	0.062
154	12.83	0.97	0.334	0.260	(0.301)	0.074
155	12.92	0.97	0.334	0.258	(0.301)	0.076
156	13.00	0.97	0.334	0.257	(0.301)	0.077
157	13.08	1.13	0.392	0.256	(0.353)	0.136
158	13.17	1.13	0.392	0.255	(0.353)	0.137
159	13.25	1.13	0.392	0.253	(0.353)	0.139
160	13.33	1.13	0.392	0.252	(0.353)	0.140
161	13.42	1.13	0.392	0.251	(0.353)	0.141
162	13.50	1.13	0.392	0.249	(0.353)	0.142
163	13.58	0.77	0.265	(0.248)	0.239	0.027
164	13.67	0.77	0.265	(0.247)	0.239	0.027
165	13.75	0.77	0.265	(0.246)	0.239	0.027
166	13.83	0.77	0.265	(0.244)	0.239	0.027
167	13.92	0.77	0.265	(0.243)	0.239	0.027
168	14.00	0.77	0.265	(0.242)	0.239	0.027
169	14.08	0.90	0.311	0.241	(0.280)	0.070
170	14.17	0.90	0.311	0.239	(0.280)	0.072
171	14.25	0.90	0.311	0.238	(0.280)	0.073
172	14.33	0.87	0.300	0.237	(0.270)	0.063
173	14.42	0.87	0.300	0.236	(0.270)	0.064
174	14.50	0.87	0.300	0.235	(0.270)	0.065
175	14.58	0.87	0.300	0.233	(0.270)	0.066
176	14.67	0.87	0.300	0.232	(0.270)	0.067
177	14.75	0.87	0.300	0.231	(0.270)	0.069
178	14.83	0.83	0.288	0.230	(0.259)	0.058
179	14.92	0.83	0.288	0.229	(0.259)	0.059
180	15.00	0.83	0.288	0.227	(0.259)	0.061
181	15.08	0.80	0.277	0.226	(0.249)	0.050
182	15.17	0.80	0.277	0.225	(0.249)	0.051
183	15.25	0.80	0.277	0.224	(0.249)	0.053
184	15.33	0.77	0.265	0.223	(0.239)	0.042
185	15.42	0.77	0.265	0.222	(0.239)	0.043

186	15.50	0.77	0.265	0.221	(0.239)	0.045
187	15.58	0.63	0.219	(0.219)	0.197	0.022
188	15.67	0.63	0.219	(0.218)	0.197	0.022
189	15.75	0.63	0.219	(0.217)	0.197	0.022
190	15.83	0.63	0.219	(0.216)	0.197	0.022
191	15.92	0.63	0.219	(0.215)	0.197	0.022
192	16.00	0.63	0.219	(0.214)	0.197	0.022
193	16.08	0.13	0.046	(0.213)	0.041	0.005
194	16.17	0.13	0.046	(0.212)	0.041	0.005
195	16.25	0.13	0.046	(0.211)	0.041	0.005
196	16.33	0.13	0.046	(0.210)	0.041	0.005
197	16.42	0.13	0.046	(0.208)	0.041	0.005
198	16.50	0.13	0.046	(0.207)	0.041	0.005
199	16.58	0.10	0.035	(0.206)	0.031	0.003
200	16.67	0.10	0.035	(0.205)	0.031	0.003
201	16.75	0.10	0.035	(0.204)	0.031	0.003
202	16.83	0.10	0.035	(0.203)	0.031	0.003
203	16.92	0.10	0.035	(0.202)	0.031	0.003
204	17.00	0.10	0.035	(0.201)	0.031	0.003
205	17.08	0.17	0.058	(0.200)	0.052	0.006
206	17.17	0.17	0.058	(0.199)	0.052	0.006
207	17.25	0.17	0.058	(0.198)	0.052	0.006
208	17.33	0.17	0.058	(0.197)	0.052	0.006
209	17.42	0.17	0.058	(0.196)	0.052	0.006
210	17.50	0.17	0.058	(0.195)	0.052	0.006
211	17.58	0.17	0.058	(0.194)	0.052	0.006
212	17.67	0.17	0.058	(0.193)	0.052	0.006
213	17.75	0.17	0.058	(0.192)	0.052	0.006
214	17.83	0.13	0.046	(0.191)	0.041	0.005
215	17.92	0.13	0.046	(0.190)	0.041	0.005
216	18.00	0.13	0.046	(0.189)	0.041	0.005
217	18.08	0.13	0.046	(0.188)	0.041	0.005
218	18.17	0.13	0.046	(0.188)	0.041	0.005
219	18.25	0.13	0.046	(0.187)	0.041	0.005
220	18.33	0.13	0.046	(0.186)	0.041	0.005
221	18.42	0.13	0.046	(0.185)	0.041	0.005
222	18.50	0.13	0.046	(0.184)	0.041	0.005
223	18.58	0.10	0.035	(0.183)	0.031	0.003
224	18.67	0.10	0.035	(0.182)	0.031	0.003
225	18.75	0.10	0.035	(0.181)	0.031	0.003
226	18.83	0.07	0.023	(0.180)	0.021	0.002
227	18.92	0.07	0.023	(0.180)	0.021	0.002
228	19.00	0.07	0.023	(0.179)	0.021	0.002
229	19.08	0.10	0.035	(0.178)	0.031	0.003
230	19.17	0.10	0.035	(0.177)	0.031	0.003
231	19.25	0.10	0.035	(0.176)	0.031	0.003
232	19.33	0.13	0.046	(0.175)	0.041	0.005
233	19.42	0.13	0.046	(0.175)	0.041	0.005
234	19.50	0.13	0.046	(0.174)	0.041	0.005
235	19.58	0.10	0.035	(0.173)	0.031	0.003
236	19.67	0.10	0.035	(0.172)	0.031	0.003
237	19.75	0.10	0.035	(0.171)	0.031	0.003
238	19.83	0.07	0.023	(0.171)	0.021	0.002
239	19.92	0.07	0.023	(0.170)	0.021	0.002
240	20.00	0.07	0.023	(0.169)	0.021	0.002
241	20.08	0.10	0.035	(0.168)	0.031	0.003
242	20.17	0.10	0.035	(0.168)	0.031	0.003
243	20.25	0.10	0.035	(0.167)	0.031	0.003
244	20.33	0.10	0.035	(0.166)	0.031	0.003
245	20.42	0.10	0.035	(0.165)	0.031	0.003
246	20.50	0.10	0.035	(0.165)	0.031	0.003
247	20.58	0.10	0.035	(0.164)	0.031	0.003
248	20.67	0.10	0.035	(0.163)	0.031	0.003
249	20.75	0.10	0.035	(0.163)	0.031	0.003
250	20.83	0.07	0.023	(0.162)	0.021	0.002
251	20.92	0.07	0.023	(0.161)	0.021	0.002
252	21.00	0.07	0.023	(0.161)	0.021	0.002
253	21.08	0.10	0.035	(0.160)	0.031	0.003
254	21.17	0.10	0.035	(0.159)	0.031	0.003
255	21.25	0.10	0.035	(0.159)	0.031	0.003
256	21.33	0.07	0.023	(0.158)	0.021	0.002
257	21.42	0.07	0.023	(0.158)	0.021	0.002
258	21.50	0.07	0.023	(0.157)	0.021	0.002
259	21.58	0.10	0.035	(0.156)	0.031	0.003
260	21.67	0.10	0.035	(0.156)	0.031	0.003
261	21.75	0.10	0.035	(0.155)	0.031	0.003
262	21.83	0.07	0.023	(0.155)	0.021	0.002
263	21.92	0.07	0.023	(0.154)	0.021	0.002
264	22.00	0.07	0.023	(0.154)	0.021	0.002
265	22.08	0.10	0.035	(0.153)	0.031	0.003
266	22.17	0.10	0.035	(0.153)	0.031	0.003
267	22.25	0.10	0.035	(0.152)	0.031	0.003
268	22.33	0.07	0.023	(0.152)	0.021	0.002
269	22.42	0.07	0.023	(0.151)	0.021	0.002
270	22.50	0.07	0.023	(0.151)	0.021	0.002
271	22.58	0.07	0.023	(0.150)	0.021	0.002
272	22.67	0.07	0.023	(0.150)	0.021	0.002
273	22.75	0.07	0.023	(0.150)	0.021	0.002
274	22.83	0.07	0.023	(0.149)	0.021	0.002
275	22.92	0.07	0.023	(0.149)	0.021	0.002
276	23.00	0.07	0.023	(0.148)	0.021	0.002
277	23.08	0.07	0.023	(0.148)	0.021	0.002
278	23.17	0.07	0.023	(0.148)	0.021	0.002
279	23.25	0.07	0.023	(0.147)	0.021	0.002
280	23.33	0.07	0.023	(0.147)	0.021	0.002
281	23.42	0.07	0.023	(0.147)	0.021	0.002
282	23.50	0.07	0.023	(0.147)	0.021	0.002
283	23.58	0.07	0.023	(0.146)	0.021	0.002
284	23.67	0.07	0.023	(0.146)	0.021	0.002

285	23.75	0.07	0.023	(0.146)	0.021	0.002
286	23.83	0.07	0.023	(0.146)	0.021	0.002
287	23.92	0.07	0.023	(0.146)	0.021	0.002
288	24.00	0.07	0.023	(0.146)	0.021	0.002

(Loss Rate Not Used)

Sum = 100.0 Sum = 4.8

Flood volume = Effective rainfall 0.40(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 2.3(Ac.Ft)
Total soil loss = 2.48(In)
Total soil loss = 14.387(Ac.Ft)
Total rainfall = 2.88(In)
Flood volume = 101719.9 Cubic Feet
Total soil loss = 626676.9 Cubic Feet

Peak flow rate of this hydrograph = 9.113(CFS)

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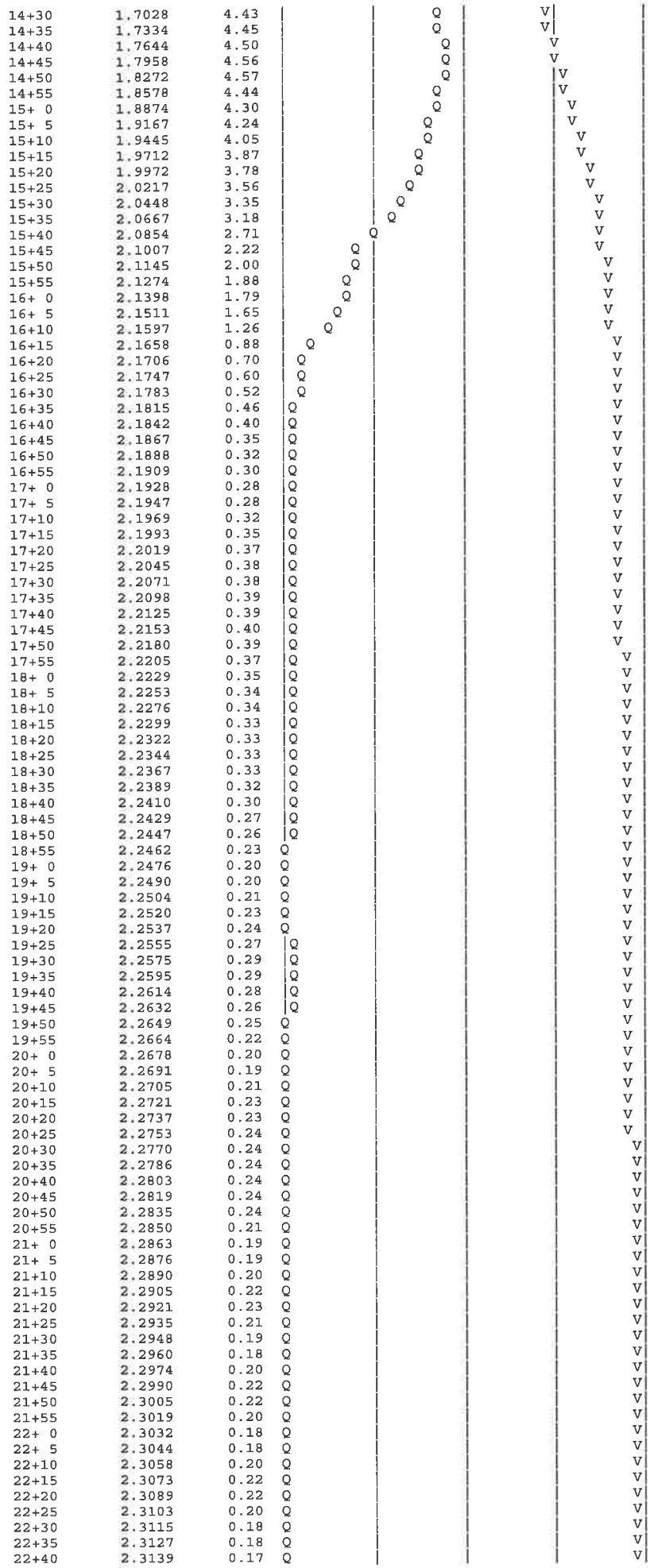
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0001	0.01	Q				
0+10	0.0005	0.06	Q				
0+15	0.0012	0.10	Q				
0+20	0.0020	0.13	Q				
0+25	0.0031	0.16	Q				
0+30	0.0045	0.19	Q				
0+35	0.0059	0.21	Q				
0+40	0.0074	0.22	Q				
0+45	0.0089	0.22	Q				
0+50	0.0105	0.23	Q				
0+55	0.0123	0.26	VQ				
1+ 0	0.0143	0.29	VQ				
1+ 5	0.0163	0.29	VQ				
1+10	0.0182	0.28	VQ				
1+15	0.0200	0.26	VQ				
1+20	0.0217	0.25	VQ				
1+25	0.0234	0.25	VQ				
1+30	0.0252	0.25	Q				
1+35	0.0269	0.25	Q				
1+40	0.0286	0.25	Q				
1+45	0.0302	0.25	Q				
1+50	0.0320	0.25	VQ				
1+55	0.0339	0.27	VQ				
2+ 0	0.0359	0.30	VQ				
2+ 5	0.0380	0.31	VQ				
2+10	0.0401	0.31	VQ				
2+15	0.0423	0.31	VQ				
2+20	0.0444	0.32	VQ				
2+25	0.0466	0.32	VQ				
2+30	0.0488	0.32	VQ				
2+35	0.0511	0.33	VQ				
2+40	0.0535	0.35	VQ				
2+45	0.0561	0.37	VQ				
2+50	0.0587	0.38	Q				
2+55	0.0614	0.39	Q				
3+ 0	0.0641	0.39	Q				
3+ 5	0.0668	0.40	Q				
3+10	0.0696	0.40	Q				
3+15	0.0723	0.40	Q				
3+20	0.0751	0.40	Q				
3+25	0.0778	0.40	Q				
3+30	0.0806	0.40	Q				
3+35	0.0834	0.40	Q				
3+40	0.0862	0.40	Q				
3+45	0.0890	0.40	Q				
3+50	0.0918	0.41	Q				
3+55	0.0948	0.43	Q				
4+ 0	0.0979	0.46	Q				
4+ 5	0.1011	0.47	Q				
4+10	0.1044	0.47	Q				
4+15	0.1076	0.47	Q				
4+20	0.1110	0.48	Q				
4+25	0.1144	0.51	VQ				
4+30	0.1181	0.53	Q				
4+35	0.1218	0.54	Q				
4+40	0.1256	0.55	Q				
4+45	0.1294	0.55	Q				
4+50	0.1333	0.56	Q				
4+55	0.1374	0.59	Q				
5+ 0	0.1416	0.61	Q				
5+ 5	0.1458	0.61	Q				
5+10	0.1498	0.57	Q				
5+15	0.1534	0.53	Q				
5+20	0.1570	0.52	Q				
5+25	0.1607	0.54	Q				
5+30	0.1645	0.55	Q				
5+35	0.1684	0.56	Q				
5+40	0.1725	0.59	Q				
5+45	0.1767	0.61	QV				
5+50	0.1810	0.63	QV				
5+55	0.1854	0.63	QV				
6+ 0	0.1897	0.64	QV				
6+ 5	0.1942	0.64	QV				
6+10	0.1988	0.67	QV				

6+15	0.2035	0.69	QV
6+20	0.2084	0.70	QV
6+25	0.2133	0.71	QV
6+30	0.2182	0.72	QV
6+35	0.2232	0.72	QV
6+40	0.2284	0.75	QV
6+45	0.2337	0.77	QV
6+50	0.2391	0.79	QV
6+55	0.2446	0.79	QV
7+ 0	0.2500	0.80	QV
7+ 5	0.2556	0.80	QV
7+10	0.2611	0.80	QV
7+15	0.2666	0.80	QV
7+20	0.2722	0.81	QV
7+25	0.2780	0.83	QV
7+30	0.2839	0.86	QV
7+35	0.2899	0.87	QV
7+40	0.2961	0.90	Q V
7+45	0.3025	0.93	Q V
7+50	0.3091	0.95	Q V
7+55	0.3158	0.98	Q V
8+ 0	0.3227	1.01	QV
8+ 5	0.3298	1.03	QV
8+10	0.3373	1.08	QV
8+15	0.3451	1.14	QV
8+20	0.3531	1.16	Q V
8+25	0.3612	1.18	Q V
8+30	0.3694	1.19	Q V
8+35	0.3776	1.20	Q V
8+40	0.3861	1.23	Q V
8+45	0.3947	1.25	QV
8+50	0.4035	1.27	QV
8+55	0.4124	1.30	Q V
9+ 0	0.4216	1.33	Q V
9+ 5	0.4310	1.36	Q V
9+10	0.4407	1.41	Q V
9+15	0.4507	1.46	Q V
9+20	0.4610	1.49	Q V
9+25	0.4715	1.53	Q V
9+30	0.4823	1.56	Q V
9+35	0.4932	1.58	Q V
9+40	0.5043	1.62	Q V
9+45	0.5156	1.65	Q V
9+50	0.5271	1.67	Q V
9+55	0.5389	1.70	Q V
10+ 0	0.5508	1.73	Q V
10+ 5	0.5625	1.71	Q V
10+10	0.5733	1.56	Q V
10+15	0.5830	1.40	Q V
10+20	0.5922	1.34	Q V
10+25	0.6012	1.31	Q V
10+30	0.6100	1.28	Q V
10+35	0.6189	1.29	Q V
10+40	0.6285	1.39	Q V
10+45	0.6389	1.50	Q V
10+50	0.6495	1.54	Q V
10+55	0.6603	1.56	Q V
11+ 0	0.6711	1.58	Q V
11+ 5	0.6820	1.58	Q V
11+10	0.6928	1.56	Q V
11+15	0.7034	1.55	Q V
11+20	0.7140	1.54	Q V
11+25	0.7246	1.54	Q V
11+30	0.7352	1.54	Q V
11+35	0.7458	1.53	Q V
11+40	0.7560	1.48	Q V
11+45	0.7659	1.44	Q V
11+50	0.7757	1.42	Q V
11+55	0.7856	1.44	Q V
12+ 0	0.7956	1.45	Q V
12+ 5	0.8059	1.49	Q V
12+10	0.8172	1.65	Q V
12+15	0.8297	1.81	Q V
12+20	0.8428	1.90	Q V
12+25	0.8566	2.00	Q V
12+30	0.8712	2.12	Q V
12+35	0.8872	2.33	Q V
12+40	0.9071	2.88	Q V
12+45	0.9308	3.44	Q V
12+50	0.9569	3.79	QV
12+55	0.9860	4.22	Q
13+ 0	1.0178	4.62	VQ
13+ 5	1.0532	5.13	V Q
13+10	1.0976	6.46	V Q
13+15	1.1512	7.77	V Q
13+20	1.2091	8.41	V Q
13+25	1.2697	8.81	V Q
13+30	1.3325	9.11	V Q
13+35	1.3932	8.82	V Q
13+40	1.4395	6.71	V Q
13+45	1.4705	4.51	Q V
13+50	1.4954	3.62	Q V
13+55	1.5171	3.15	Q V
14+ 0	1.5366	2.83	Q V
14+ 5	1.5559	2.81	Q V
14+10	1.5801	3.51	Q V
14+15	1.6097	4.30	Q V
14+20	1.6412	4.57	Q V
14+25	1.6723	4.52	Q V



14+30	1.7028	4.43	
14+35	1.7334	4.45	
14+40	1.7644	4.50	
14+45	1.7958	4.56	
14+50	1.8272	4.57	
14+55	1.8578	4.44	
15+ 0	1.8874	4.30	
15+ 5	1.9167	4.24	
15+10	1.9445	4.05	
15+15	1.9712	3.87	
15+20	1.9972	3.78	
15+25	2.0217	3.56	
15+30	2.0448	3.35	
15+35	2.0667	3.18	
15+40	2.0854	2.71	
15+45	2.1007	2.22	
15+50	2.1145	2.00	
15+55	2.1274	1.88	
16+ 0	2.1398	1.79	
16+ 5	2.1511	1.65	
16+10	2.1597	1.26	
16+15	2.1658	0.88	
16+20	2.1706	0.70	
16+25	2.1747	0.60	
16+30	2.1783	0.52	
16+35	2.1815	0.46	
16+40	2.1842	0.40	
16+45	2.1867	0.35	
16+50	2.1888	0.32	
16+55	2.1909	0.30	
17+ 0	2.1928	0.28	
17+ 5	2.1947	0.28	
17+10	2.1969	0.32	
17+15	2.1993	0.35	
17+20	2.2019	0.37	
17+25	2.2045	0.38	
17+30	2.2071	0.38	
17+35	2.2098	0.39	
17+40	2.2125	0.39	
17+45	2.2153	0.40	
17+50	2.2180	0.39	
17+55	2.2205	0.37	
18+ 0	2.2229	0.35	
18+ 5	2.2253	0.34	
18+10	2.2276	0.34	
18+15	2.2299	0.33	
18+20	2.2322	0.33	
18+25	2.2344	0.33	
18+30	2.2367	0.33	
18+35	2.2389	0.32	
18+40	2.2410	0.30	
18+45	2.2429	0.27	
18+50	2.2447	0.26	
18+55	2.2462	0.23	
19+ 0	2.2476	0.20	
19+ 5	2.2490	0.20	
19+10	2.2504	0.21	
19+15	2.2520	0.23	
19+20	2.2537	0.24	
19+25	2.2555	0.27	
19+30	2.2575	0.29	
19+35	2.2595	0.29	
19+40	2.2614	0.28	
19+45	2.2632	0.26	
19+50	2.2649	0.25	
19+55	2.2664	0.22	
20+ 0	2.2678	0.20	
20+ 5	2.2691	0.19	
20+10	2.2705	0.21	
20+15	2.2721	0.23	
20+20	2.2737	0.23	
20+25	2.2753	0.24	
20+30	2.2770	0.24	
20+35	2.2786	0.24	
20+40	2.2803	0.24	
20+45	2.2819	0.24	
20+50	2.2835	0.24	
20+55	2.2850	0.21	
21+ 0	2.2863	0.19	
21+ 5	2.2876	0.19	
21+10	2.2890	0.20	
21+15	2.2905	0.22	
21+20	2.2921	0.23	
21+25	2.2935	0.21	
21+30	2.2948	0.19	
21+35	2.2960	0.18	
21+40	2.2974	0.20	
21+45	2.2990	0.22	
21+50	2.3005	0.22	
21+55	2.3019	0.20	
22+ 0	2.3032	0.18	
22+ 5	2.3044	0.18	
22+10	2.3058	0.20	
22+15	2.3073	0.22	
22+20	2.3089	0.22	
22+25	2.3103	0.20	
22+30	2.3115	0.18	
22+35	2.3127	0.18	
22+40	2.3139	0.17	

22+45	2.3151	0.17	Q	|	|	|	V|
22+50	2.3162	0.17	Q	|	|	|	V|
22+55	2.3174	0.17	Q	|	|	|	V|
23+ 0	2.3185	0.17	Q	|	|	|	V|
23+ 5	2.3197	0.16	Q	|	|	|	V|
23+10	2.3208	0.16	Q	|	|	|	V|
23+15	2.3219	0.16	Q	|	|	|	V|
23+20	2.3230	0.16	Q	|	|	|	V|
23+25	2.3242	0.16	Q	|	|	|	V|
23+30	2.3253	0.16	Q	|	|	|	V|
23+35	2.3264	0.16	Q	|	|	|	V|
23+40	2.3275	0.16	Q	|	|	|	V|
23+45	2.3286	0.16	Q	|	|	|	V|
23+50	2.3297	0.16	Q	|	|	|	V|
23+55	2.3308	0.16	Q	|	|	|	V|
24+ 0	2.3320	0.16	Q	|	|	|	V|
24+ 5	2.3330	0.15	Q	|	|	|	V|
24+10	2.3337	0.11	Q	|	|	|	V|
24+15	2.3341	0.06	Q	|	|	|	V|
24+20	2.3344	0.04	Q	|	|	|	V|
24+25	2.3346	0.03	Q	|	|	|	V|
24+30	2.3348	0.02	Q	|	|	|	V|
24+35	2.3349	0.02	Q	|	|	|	V|
24+40	2.3350	0.01	Q	|	|	|	V|
24+45	2.3350	0.01	Q	|	|	|	V|
24+50	2.3351	0.01	Q	|	|	|	V|
24+55	2.3351	0.01	Q	|	|	|	V|
25+ 0	2.3351	0.00	Q	|	|	|	V|
25+ 5	2.3352	0.00	Q	|	|	|	V|
25+10	2.3352	0.00	Q	|	|	|	V|
25+15	2.3352	0.00	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/12/20 File: 3828EX1001100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.159 Hr.
Lag time = 9.56 Min.
25% of lag time = 2.39 Min.
40% of lag time = 3.82 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	0.50	34.83

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.20	83.58

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.500(In)
Area Averaged 100-Year Rainfall = 1.200(In)

Point rain (area averaged) = 1.200(In)
Areal adjustment factor = 99.94 %
Adjusted average point rain = 1.199(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	76.00	0.000

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	88.6	0.146	0.000	0.146	1.000	0.146
					Sum (F) =	0.146

Area averaged mean soil loss (F) (In/Hr) = 0.146
Minimum soil loss rate ((In/Hr)) = 0.073
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

Slope of intensity-duration curve for a 1 hour storm =0.5000

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	52.307	6.571	4.612
2	0.167	104.614	28.083	19.712
3	0.250	156.922	28.549	20.039
4	0.333	209.229	12.179	8.549
5	0.417	261.536	6.595	4.629
6	0.500	313.843	4.589	3.221
7	0.583	366.151	3.296	2.314
8	0.667	418.458	2.462	1.728
9	0.750	470.765	1.797	1.261
10	0.833	523.072	1.548	1.086

11	0.917	575.380	1.191	0.836
12	1.000	627.687	0.940	0.660
13	1.083	679.994	0.721	0.506
14	1.167	732.301	0.542	0.381
15	1.250	784.608	0.523	0.367
16	1.333	836.916	0.415	0.292
			Sum = 100.000 Sum=	70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	4.20	0.604	0.146	(0.544)	0.458
2	0.17	4.30	0.619	0.146	(0.557)	0.473
3	0.25	5.00	0.720	0.146	(0.648)	0.574
4	0.33	5.00	0.720	0.146	(0.648)	0.574
5	0.42	5.80	0.835	0.146	(0.751)	0.689
6	0.50	6.50	0.935	0.146	(0.842)	0.789
7	0.58	7.40	1.065	0.146	(0.958)	0.919
8	0.67	8.60	1.238	0.146	(1.114)	1.092
9	0.75	12.30	1.770	0.146	(1.593)	1.624
10	0.83	29.10	4.188	0.146	(3.769)	4.042
11	0.92	6.80	0.979	0.146	(0.881)	0.833
12	1.00	5.00	0.720	0.146	(0.648)	0.574
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	12.6

Flood volume = Effective rainfall 1.05(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 6.1(Ac.Ft)
Total soil loss = 0.15(In)
Total soil loss = 0.847(Ac.Ft)
Total rainfall = 1.20(In)
Flood volume = 266300.9 Cubic Feet
Total soil loss = 36903.0 Cubic Feet

Peak flow rate of this hydrograph = 136.465(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0146	2.12	Q				
0+10	0.0919	11.22	V Q				
0+15	0.2376	21.16	V Q				
0+20	0.4261	27.36	V Q				
0+25	0.6476	32.16	V Q				
0+30	0.9044	37.30	V Q				
0+35	1.2059	43.77	VQ				
0+40	1.5590	51.27	Q				
0+45	1.9857	61.96	Q				
0+50	2.6037	89.72	Q				
0+55	3.5435	136.47	V Q				
1+ 0	4.4187	127.08	Q V				
1+ 5	4.9671	79.63	Q			V	
1+10	5.3094	49.71	Q			V	
1+15	5.5232	31.05	Q			V	
1+20	5.6735	21.81	Q			V	
1+25	5.7851	16.21	Q			V	
1+30	5.8691	12.19	Q			V	
1+35	5.9359	9.70	Q			V	
1+40	5.9874	7.48	Q			V	
1+45	6.0273	5.79	Q			V	
1+50	6.0573	4.36	Q			V	
1+55	6.0797	3.25	Q			V	
2+ 0	6.0974	2.57	Q			V	
2+ 5	6.1092	1.70	Q			V	
2+10	6.1123	0.45	Q			V	
2+15	6.1134	0.17	Q			V	

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/12/20 File: 3828EX1003100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.159 Hr.
Lag time = 9.56 Min.
25% of lag time = 2.39 Min.
40% of lag time = 3.82 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	0.80	55.72

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.86	129.55

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.800(In)
Area Averaged 100-Year Rainfall = 1.860(In)

Point rain (area averaged) = 1.860(In)
Areal adjustment factor = 99.97 %
Adjusted average point rain = 1.859(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	76.00	0.000

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	88.6	0.146	0.000	0.146	1.000	0.146
					Sum (F) =	0.146

Area averaged mean soil loss (F) (In/Hr) = 0.146
Minimum soil loss rate ((In/Hr)) = 0.073
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	52.307	6.571	4.612
2	0.167	104.614	28.083	19.712
3	0.250	156.922	28.549	20.039
4	0.333	209.229	12.179	8.549
5	0.417	261.536	6.595	4.629
6	0.500	313.843	4.589	3.221
7	0.583	366.151	3.296	2.314
8	0.667	418.458	2.462	1.728
9	0.750	470.765	1.797	1.261
10	0.833	523.072	1.548	1.086
11	0.917	575.380	1.191	0.836
12	1.000	627.687	0.940	0.660

13	1.083	679.994	0.721	0.506
14	1.167	732.301	0.542	0.381
15	1.250	784.608	0.523	0.367
16	1.333	836.916	0.415	0.292
		Sum = 100.000	Sum=	70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.290	0.146	(0.261)	0.144
2	0.17	1.30	0.290	0.146	(0.261)	0.144
3	0.25	1.10	0.245	0.146	(0.221)	0.099
4	0.33	1.50	0.335	0.146	(0.301)	0.189
5	0.42	1.50	0.335	0.146	(0.301)	0.189
6	0.50	1.80	0.402	0.146	(0.361)	0.256
7	0.58	1.50	0.335	0.146	(0.301)	0.189
8	0.67	1.80	0.402	0.146	(0.361)	0.256
9	0.75	1.80	0.402	0.146	(0.361)	0.256
10	0.83	1.50	0.335	0.146	(0.301)	0.189
11	0.92	1.60	0.357	0.146	(0.321)	0.211
12	1.00	1.80	0.402	0.146	(0.361)	0.256
13	1.08	2.20	0.491	0.146	(0.442)	0.345
14	1.17	2.20	0.491	0.146	(0.442)	0.345
15	1.25	2.20	0.491	0.146	(0.442)	0.345
16	1.33	2.00	0.446	0.146	(0.402)	0.300
17	1.42	2.60	0.580	0.146	(0.522)	0.434
18	1.50	2.70	0.602	0.146	(0.542)	0.456
19	1.58	2.40	0.536	0.146	(0.482)	0.390
20	1.67	2.70	0.602	0.146	(0.542)	0.456
21	1.75	3.30	0.736	0.146	(0.663)	0.590
22	1.83	3.10	0.692	0.146	(0.623)	0.546
23	1.92	2.90	0.647	0.146	(0.582)	0.501
24	2.00	3.00	0.669	0.146	(0.602)	0.523
25	2.08	3.10	0.692	0.146	(0.623)	0.546
26	2.17	4.20	0.937	0.146	(0.843)	0.791
27	2.25	5.00	1.116	0.146	(1.004)	0.970
28	2.33	3.50	0.781	0.146	(0.703)	0.635
29	2.42	6.80	1.517	0.146	(1.366)	1.371
30	2.50	7.30	1.629	0.146	(1.466)	1.483
31	2.58	8.20	1.830	0.146	(1.647)	1.684
32	2.67	5.90	1.316	0.146	(1.185)	1.171
33	2.75	2.00	0.446	0.146	(0.402)	0.300
34	2.83	1.80	0.402	0.146	(0.361)	0.256
35	2.92	1.80	0.402	0.146	(0.361)	0.256
36	3.00	0.60	0.134	(0.146)	0.120	0.013

(Loss Rate Not Used)

Sum = 100.0 Sum = 17.1

Flood volume = Effective rainfall 1.42(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 8.3(Ac.Ft)
Total soil loss = 0.44(In)
Total soil loss = 2.529(Ac.Ft)
Total rainfall = 1.86(In)
Flood volume = 359947.2 Cubic Feet
Total soil loss = 110172.4 Cubic Feet

Peak flow rate of this hydrograph = 91.637(CFS)

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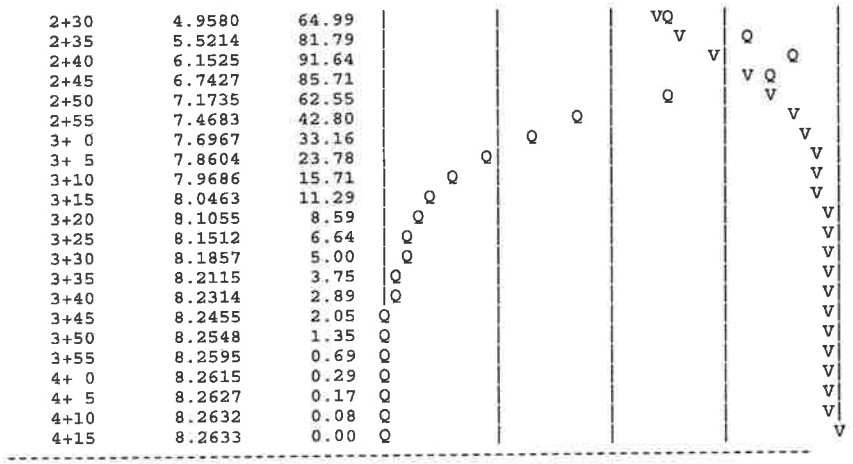
3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 25.0 50.0 75.0 100.0
0+ 5	0.0046	0.67	Q
0+10	0.0287	3.51	VQ
0+15	0.0714	6.19	V Q
0+20	0.1193	6.96	V Q
0+25	0.1777	8.49	V Q
0+30	0.2512	10.67	V Q
0+35	0.3378	12.57	V Q
0+40	0.4302	13.42	V Q
0+45	0.5290	14.34	V Q
0+50	0.6350	15.39	V Q
0+55	0.7374	14.87	V Q
1+ 0	0.8379	14.59	VQ
1+ 5	0.9485	16.06	V Q
1+10	1.0781	18.82	V Q
1+15	1.2232	21.07	V Q
1+20	1.3740	21.89	V Q
1+25	1.5269	22.20	VQ
1+30	1.6954	24.46	VQ
1+35	1.8827	27.20	VQ
1+40	2.0740	27.78	VQ
1+45	2.2751	29.20	Q
1+50	2.5021	32.96	VQ
1+55	2.7448	35.23	VQ
2+ 0	2.9864	35.09	Q
2+ 5	3.2292	35.25	QV
2+10	3.4864	37.34	Q V
2+15	3.7880	43.79	QV
2+20	4.1398	51.09	Q
2+25	4.5104	53.81	Q



2+30	4.9580	64.99	
2+35	5.5214	81.79	
2+40	6.1525	91.64	
2+45	6.7427	85.71	
2+50	7.1735	62.55	
2+55	7.4683	42.80	
3+ 0	7.6967	33.16	
3+ 5	7.8604	23.78	
3+10	7.9686	15.71	
3+15	8.0463	11.29	
3+20	8.1055	8.59	
3+25	8.1512	6.64	
3+30	8.1857	5.00	
3+35	8.2115	3.75	
3+40	8.2314	2.89	
3+45	8.2455	2.05	
3+50	8.2548	1.35	
3+55	8.2595	0.69	
4+ 0	8.2615	0.29	
4+ 5	8.2627	0.17	
4+10	8.2632	0.08	
4+15	8.2633	0.00	

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/12/20 File: 3828EX1006100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.159 Hr.
Lag time = 9.56 Min.
25% of lag time = 2.39 Min.
40% of lag time = 3.82 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.15	80.10

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	2.50	174.13

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.150(In)
Area Averaged 100-Year Rainfall = 2.500(In)

Point rain (area averaged) = 2.500(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 2.499(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	76.00	0.000

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	88.6	0.146	0.000	0.146	1.000	0.146
					Sum (F) =	0.146

Area averaged mean soil loss (F) (In/Hr) = 0.146
Minimum soil loss rate ((In/Hr)) = 0.073
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	52.307	6.571	4.612
2	0.167	104.614	28.083	19.712
3	0.250	156.922	28.549	20.039
4	0.333	209.229	12.179	8.549
5	0.417	261.536	6.595	4.629
6	0.500	313.843	4.589	3.221
7	0.583	366.151	3.296	2.314
8	0.667	418.458	2.462	1.728
9	0.750	470.765	1.797	1.261
10	0.833	523.072	1.548	1.086
11	0.917	575.380	1.191	0.836
12	1.000	627.687	0.940	0.660

13	1.083	679.994	0.721		0.506
14	1.167	732.301	0.542		0.381
15	1.250	784.608	0.523		0.367
16	1.333	836.916	0.415		0.292
			Sum = 100.000	Sum=	70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.150	(0.146)	0.135	0.015
2	0.17	0.60	0.180	0.146	(0.162)	0.034
3	0.25	0.60	0.180	0.146	(0.162)	0.034
4	0.33	0.60	0.180	0.146	(0.162)	0.034
5	0.42	0.60	0.180	0.146	(0.162)	0.034
6	0.50	0.70	0.210	0.146	(0.189)	0.064
7	0.58	0.70	0.210	0.146	(0.189)	0.064
8	0.67	0.70	0.210	0.146	(0.189)	0.064
9	0.75	0.70	0.210	0.146	(0.189)	0.064
10	0.83	0.70	0.210	0.146	(0.189)	0.064
11	0.92	0.70	0.210	0.146	(0.189)	0.064
12	1.00	0.80	0.240	0.146	(0.216)	0.094
13	1.08	0.80	0.240	0.146	(0.216)	0.094
14	1.17	0.80	0.240	0.146	(0.216)	0.094
15	1.25	0.80	0.240	0.146	(0.216)	0.094
16	1.33	0.80	0.240	0.146	(0.216)	0.094
17	1.42	0.80	0.240	0.146	(0.216)	0.094
18	1.50	0.80	0.240	0.146	(0.216)	0.094
19	1.58	0.80	0.240	0.146	(0.216)	0.094
20	1.67	0.80	0.240	0.146	(0.216)	0.094
21	1.75	0.80	0.240	0.146	(0.216)	0.094
22	1.83	0.80	0.240	0.146	(0.216)	0.094
23	1.92	0.80	0.240	0.146	(0.216)	0.094
24	2.00	0.90	0.270	0.146	(0.243)	0.124
25	2.08	0.80	0.240	0.146	(0.216)	0.094
26	2.17	0.90	0.270	0.146	(0.243)	0.124
27	2.25	0.90	0.270	0.146	(0.243)	0.124
28	2.33	0.90	0.270	0.146	(0.243)	0.124
29	2.42	0.90	0.270	0.146	(0.243)	0.124
30	2.50	0.90	0.270	0.146	(0.243)	0.124
31	2.58	0.90	0.270	0.146	(0.243)	0.124
32	2.67	0.90	0.270	0.146	(0.243)	0.124
33	2.75	1.00	0.300	0.146	(0.270)	0.154
34	2.83	1.00	0.300	0.146	(0.270)	0.154
35	2.92	1.00	0.300	0.146	(0.270)	0.154
36	3.00	1.00	0.300	0.146	(0.270)	0.154
37	3.08	1.00	0.300	0.146	(0.270)	0.154
38	3.17	1.10	0.330	0.146	(0.297)	0.184
39	3.25	1.10	0.330	0.146	(0.297)	0.184
40	3.33	1.10	0.330	0.146	(0.297)	0.184
41	3.42	1.20	0.360	0.146	(0.324)	0.214
42	3.50	1.30	0.390	0.146	(0.351)	0.244
43	3.58	1.40	0.420	0.146	(0.378)	0.274
44	3.67	1.40	0.420	0.146	(0.378)	0.274
45	3.75	1.50	0.450	0.146	(0.405)	0.304
46	3.83	1.50	0.450	0.146	(0.405)	0.304
47	3.92	1.60	0.480	0.146	(0.432)	0.334
48	4.00	1.60	0.480	0.146	(0.432)	0.334
49	4.08	1.70	0.510	0.146	(0.459)	0.364
50	4.17	1.80	0.540	0.146	(0.486)	0.394
51	4.25	1.90	0.570	0.146	(0.513)	0.424
52	4.33	2.00	0.600	0.146	(0.540)	0.454
53	4.42	2.10	0.630	0.146	(0.567)	0.484
54	4.50	2.10	0.630	0.146	(0.567)	0.484
55	4.58	2.20	0.660	0.146	(0.594)	0.514
56	4.67	2.30	0.690	0.146	(0.621)	0.544
57	4.75	2.40	0.720	0.146	(0.648)	0.574
58	4.83	2.40	0.720	0.146	(0.648)	0.574
59	4.92	2.50	0.750	0.146	(0.675)	0.604
60	5.00	2.60	0.780	0.146	(0.702)	0.634
61	5.08	3.10	0.930	0.146	(0.837)	0.784
62	5.17	3.60	1.080	0.146	(0.972)	0.934
63	5.25	3.90	1.170	0.146	(1.053)	1.024
64	5.33	4.20	1.260	0.146	(1.134)	1.114
65	5.42	4.70	1.410	0.146	(1.269)	1.264
66	5.50	5.60	1.680	0.146	(1.512)	1.534
67	5.58	1.90	0.570	0.146	(0.513)	0.424
68	5.67	0.90	0.270	0.146	(0.243)	0.124
69	5.75	0.60	0.180	0.146	(0.162)	0.034
70	5.83	0.50	0.150	(0.146)	0.135	0.015
71	5.92	0.30	0.090	(0.146)	0.081	0.009
72	6.00	0.20	0.060	(0.146)	0.054	0.006

(Loss Rate Not Used)

Sum = 100.0 Sum = 19.7

Flood volume = Effective rainfall 1.64(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 9.5(Ac.Ft)
Total soil loss = 0.86(In)
Total soil loss = 4.997(Ac.Ft)
Total rainfall = 2.50(In)
Flood volume = 414274.5 Cubic Feet
Total soil loss = 217647.9 Cubic Feet

Peak flow rate of this hydrograph = 80.707(CFS)

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6 - H O U R S T O R M

Runoff Hydrograph

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 22.5 45.0 67.5 90.0
0+ 5	0.0005	0.07	Q
0+10	0.0036	0.45	Q
0+15	0.0114	1.13	Q
0+20	0.0226	1.64	Q
0+25	0.0355	1.87	Q
0+30	0.0503	2.14	Q
0+35	0.0698	2.83	VQ
0+40	0.0939	3.50	VQ
0+45	0.1201	3.81	VQ
0+50	0.1476	3.99	VQ
0+55	0.1760	4.12	VQ
1+ 0	0.2060	4.35	VQ
1+ 5	0.2405	5.02	VQ
1+10	0.2796	5.67	VQ
1+15	0.3207	5.97	VQ
1+20	0.3631	6.15	VQ
1+25	0.4063	6.27	VQ
1+30	0.4501	6.36	VQ
1+35	0.4943	6.42	Q
1+40	0.5388	6.47	Q
1+45	0.5836	6.51	Q
1+50	0.6286	6.53	Q
1+55	0.6738	6.55	Q
2+ 0	0.7200	6.71	QV
2+ 5	0.7694	7.17	Q
2+10	0.8199	7.33	Q
2+15	0.8721	7.59	Q
2+20	0.9277	8.07	Q
2+25	0.9848	8.28	QV
2+30	1.0426	8.40	QV
2+35	1.1010	8.48	QV
2+40	1.1597	8.53	QV
2+45	1.2197	8.72	Q V
2+50	1.2840	9.34	QV
2+55	1.3527	9.97	QV
3+ 0	1.4232	10.24	QV
3+ 5	1.4949	10.40	Q V
3+10	1.5682	10.65	Q V
3+15	1.6461	11.32	QV
3+20	1.7286	11.97	Q V
3+25	1.8141	12.42	Q V
3+30	1.9058	13.32	Q V
3+35	2.0076	14.77	Q V
3+40	2.1199	16.31	QV
3+45	2.2405	17.51	Q V
3+50	2.3689	18.64	QV
3+55	2.5048	19.73	Q V
4+ 0	2.6482	20.83	Q V
4+ 5	2.7990	21.89	Q V
4+10	2.9582	23.11	Q V
4+15	3.1287	24.76	Q V
4+20	3.3117	26.58	Q V
4+25	3.5079	28.48	Q V
4+30	3.7166	30.30	Q V
4+35	3.9349	31.70	Q V
4+40	4.1631	33.13	Q V
4+45	4.4036	34.92	Q V
4+50	4.6563	36.69	Q V
4+55	4.9185	38.07	Q V
5+ 0	5.1904	39.48	Q V
5+ 5	5.4783	41.81	Q V
5+10	5.7996	46.65	Q V
5+15	6.1692	53.67	Q V
5+20	6.5864	60.57	QV
5+25	7.0487	67.13	Q
5+30	7.5674	75.31	V Q
5+35	8.1232	80.71	VQ
5+40	8.5748	65.57	Q V
5+45	8.8574	41.03	Q V
5+50	9.0378	26.19	Q V
5+55	9.1625	18.11	Q V
6+ 0	9.2536	13.22	Q V
6+ 5	9.3219	9.92	Q V
6+10	9.3735	7.49	Q V
6+15	9.4133	5.78	Q V
6+20	9.4437	4.41	Q V
6+25	9.4665	3.32	Q V
6+30	9.4833	2.43	Q V
6+35	9.4953	1.74	Q V
6+40	9.5036	1.21	Q V
6+45	9.5084	0.69	Q V
6+50	9.5097	0.20	Q V
6+55	9.5102	0.06	Q V
7+ 0	9.5103	0.02	Q V
7+ 5	9.5104	0.01	Q V
7+10	9.5104	0.00	Q V
7+15	9.5104	0.00	Q V

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/12/20 File: 3828EX10024100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.159 Hr.
Lag time = 9.56 Min.
25% of lag time = 2.39 Min.
40% of lag time = 3.82 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.75	121.89

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	4.50	313.43

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.750(In)
Area Averaged 100-Year Rainfall = 4.500(In)

Point rain (area averaged) = 4.500(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 4.499(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	76.00	0.000

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	88.6	0.146	0.000	0.146	1.000	0.146
					Sum (F) =	0.146

Area averaged mean soil loss (F) (In/Hr) = 0.146
Minimum soil loss rate ((In/Hr)) = 0.073
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	52.307	6.571	4.612
2	0.167	104.614	28.083	19.712
3	0.250	156.922	28.549	20.039
4	0.333	209.229	12.179	8.549
5	0.417	261.536	6.595	4.629
6	0.500	313.843	4.589	3.221
7	0.583	366.151	3.296	2.314
8	0.667	418.458	2.462	1.728
9	0.750	470.765	1.797	1.261
10	0.833	523.072	1.548	1.086
11	0.917	575.380	1.191	0.836
12	1.000	627.687	0.940	0.660

13	1.083	679.994	0.721		0.506
14	1.167	732.301	0.542		0.381
15	1.250	784.608	0.523		0.367
16	1.333	836.916	0.415		0.292
			Sum = 100.000	Sum=	70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.036	(0.259)	0.032	0.004
2	0.17	0.07	0.036	(0.258)	0.032	0.004
3	0.25	0.07	0.036	(0.257)	0.032	0.004
4	0.33	0.10	0.054	(0.256)	0.049	0.005
5	0.42	0.10	0.054	(0.255)	0.049	0.005
6	0.50	0.10	0.054	(0.254)	0.049	0.005
7	0.58	0.10	0.054	(0.253)	0.049	0.005
8	0.67	0.10	0.054	(0.252)	0.049	0.005
9	0.75	0.10	0.054	(0.251)	0.049	0.005
10	0.83	0.13	0.072	(0.250)	0.065	0.007
11	0.92	0.13	0.072	(0.249)	0.065	0.007
12	1.00	0.13	0.072	(0.248)	0.065	0.007
13	1.08	0.10	0.054	(0.247)	0.049	0.005
14	1.17	0.10	0.054	(0.246)	0.049	0.005
15	1.25	0.10	0.054	(0.245)	0.049	0.005
16	1.33	0.10	0.054	(0.244)	0.049	0.005
17	1.42	0.10	0.054	(0.243)	0.049	0.005
18	1.50	0.10	0.054	(0.242)	0.049	0.005
19	1.58	0.10	0.054	(0.241)	0.049	0.005
20	1.67	0.10	0.054	(0.240)	0.049	0.005
21	1.75	0.10	0.054	(0.239)	0.049	0.005
22	1.83	0.13	0.072	(0.238)	0.065	0.007
23	1.92	0.13	0.072	(0.237)	0.065	0.007
24	2.00	0.13	0.072	(0.236)	0.065	0.007
25	2.08	0.13	0.072	(0.235)	0.065	0.007
26	2.17	0.13	0.072	(0.234)	0.065	0.007
27	2.25	0.13	0.072	(0.233)	0.065	0.007
28	2.33	0.13	0.072	(0.232)	0.065	0.007
29	2.42	0.13	0.072	(0.231)	0.065	0.007
30	2.50	0.13	0.072	(0.231)	0.065	0.007
31	2.58	0.17	0.090	(0.230)	0.081	0.009
32	2.67	0.17	0.090	(0.229)	0.081	0.009
33	2.75	0.17	0.090	(0.228)	0.081	0.009
34	2.83	0.17	0.090	(0.227)	0.081	0.009
35	2.92	0.17	0.090	(0.226)	0.081	0.009
36	3.00	0.17	0.090	(0.225)	0.081	0.009
37	3.08	0.17	0.090	(0.224)	0.081	0.009
38	3.17	0.17	0.090	(0.223)	0.081	0.009
39	3.25	0.17	0.090	(0.222)	0.081	0.009
40	3.33	0.17	0.090	(0.221)	0.081	0.009
41	3.42	0.17	0.090	(0.220)	0.081	0.009
42	3.50	0.17	0.090	(0.219)	0.081	0.009
43	3.58	0.17	0.090	(0.218)	0.081	0.009
44	3.67	0.17	0.090	(0.217)	0.081	0.009
45	3.75	0.17	0.090	(0.217)	0.081	0.009
46	3.83	0.20	0.108	(0.216)	0.097	0.011
47	3.92	0.20	0.108	(0.215)	0.097	0.011
48	4.00	0.20	0.108	(0.214)	0.097	0.011
49	4.08	0.20	0.108	(0.213)	0.097	0.011
50	4.17	0.20	0.108	(0.212)	0.097	0.011
51	4.25	0.20	0.108	(0.211)	0.097	0.011
52	4.33	0.23	0.126	(0.210)	0.113	0.013
53	4.42	0.23	0.126	(0.209)	0.113	0.013
54	4.50	0.23	0.126	(0.208)	0.113	0.013
55	4.58	0.23	0.126	(0.208)	0.113	0.013
56	4.67	0.23	0.126	(0.207)	0.113	0.013
57	4.75	0.23	0.126	(0.206)	0.113	0.013
58	4.83	0.27	0.144	(0.205)	0.130	0.014
59	4.92	0.27	0.144	(0.204)	0.130	0.014
60	5.00	0.27	0.144	(0.203)	0.130	0.014
61	5.08	0.20	0.108	(0.202)	0.097	0.011
62	5.17	0.20	0.108	(0.201)	0.097	0.011
63	5.25	0.20	0.108	(0.200)	0.097	0.011
64	5.33	0.23	0.126	(0.200)	0.113	0.013
65	5.42	0.23	0.126	(0.199)	0.113	0.013
66	5.50	0.23	0.126	(0.198)	0.113	0.013
67	5.58	0.27	0.144	(0.197)	0.130	0.014
68	5.67	0.27	0.144	(0.196)	0.130	0.014
69	5.75	0.27	0.144	(0.195)	0.130	0.014
70	5.83	0.27	0.144	(0.194)	0.130	0.014
71	5.92	0.27	0.144	(0.194)	0.130	0.014
72	6.00	0.27	0.144	(0.193)	0.130	0.014
73	6.08	0.30	0.162	(0.192)	0.146	0.016
74	6.17	0.30	0.162	(0.191)	0.146	0.016
75	6.25	0.30	0.162	(0.190)	0.146	0.016
76	6.33	0.30	0.162	(0.189)	0.146	0.016
77	6.42	0.30	0.162	(0.188)	0.146	0.016
78	6.50	0.30	0.162	(0.188)	0.146	0.016
79	6.58	0.33	0.180	(0.187)	0.162	0.018
80	6.67	0.33	0.180	(0.186)	0.162	0.018
81	6.75	0.33	0.180	(0.185)	0.162	0.018
82	6.83	0.33	0.180	(0.184)	0.162	0.018
83	6.92	0.33	0.180	(0.183)	0.162	0.018
84	7.00	0.33	0.180	(0.183)	0.162	0.018
85	7.08	0.33	0.180	(0.182)	0.162	0.018
86	7.17	0.33	0.180	(0.181)	0.162	0.018

87	7.25	0.33	0.180	(	0.180)	0.162		0.018
88	7.33	0.37	0.198	(	0.179)	0.178		0.020
89	7.42	0.37	0.198	(	0.178)	0.178		0.020
90	7.50	0.37	0.198		0.178	(0.178)		0.020
91	7.58	0.40	0.216		0.177	(0.194)		0.039
92	7.67	0.40	0.216		0.176	(0.194)		0.040
93	7.75	0.40	0.216		0.175	(0.194)		0.041
94	7.83	0.43	0.234		0.174	(0.211)		0.060
95	7.92	0.43	0.234		0.174	(0.211)		0.060
96	8.00	0.43	0.234		0.173	(0.211)		0.061
97	8.08	0.50	0.270		0.172	(0.243)		0.098
98	8.17	0.50	0.270		0.171	(0.243)		0.099
99	8.25	0.50	0.270		0.170	(0.243)		0.100
100	8.33	0.50	0.270		0.170	(0.243)		0.100
101	8.42	0.50	0.270		0.169	(0.243)		0.101
102	8.50	0.50	0.270		0.168	(0.243)		0.102
103	8.58	0.53	0.288		0.167	(0.259)		0.121
104	8.67	0.53	0.288		0.166	(0.259)		0.122
105	8.75	0.53	0.288		0.166	(0.259)		0.122
106	8.83	0.57	0.306		0.165	(0.275)		0.141
107	8.92	0.57	0.306		0.164	(0.275)		0.142
108	9.00	0.57	0.306		0.163	(0.275)		0.143
109	9.08	0.63	0.342		0.162	(0.308)		0.179
110	9.17	0.63	0.342		0.162	(0.308)		0.180
111	9.25	0.63	0.342		0.161	(0.308)		0.181
112	9.33	0.67	0.360		0.160	(0.324)		0.200
113	9.42	0.67	0.360		0.159	(0.324)		0.201
114	9.50	0.67	0.360		0.159	(0.324)		0.201
115	9.58	0.70	0.378		0.158	(0.340)		0.220
116	9.67	0.70	0.378		0.157	(0.340)		0.221
117	9.75	0.70	0.378		0.156	(0.340)		0.222
118	9.83	0.73	0.396		0.156	(0.356)		0.240
119	9.92	0.73	0.396		0.155	(0.356)		0.241
120	10.00	0.73	0.396		0.154	(0.356)		0.242
121	10.08	0.50	0.270		0.153	(0.243)		0.117
122	10.17	0.50	0.270		0.153	(0.243)		0.117
123	10.25	0.50	0.270		0.152	(0.243)		0.118
124	10.33	0.50	0.270		0.151	(0.243)		0.119
125	10.42	0.50	0.270		0.150	(0.243)		0.120
126	10.50	0.50	0.270		0.150	(0.243)		0.120
127	10.58	0.67	0.360		0.149	(0.324)		0.211
128	10.67	0.67	0.360		0.148	(0.324)		0.212
129	10.75	0.67	0.360		0.148	(0.324)		0.212
130	10.83	0.67	0.360		0.147	(0.324)		0.213
131	10.92	0.67	0.360		0.146	(0.324)		0.214
132	11.00	0.67	0.360		0.145	(0.324)		0.215
133	11.08	0.63	0.342		0.145	(0.308)		0.197
134	11.17	0.63	0.342		0.144	(0.308)		0.198
135	11.25	0.63	0.342		0.143	(0.308)		0.199
136	11.33	0.63	0.342		0.143	(0.308)		0.199
137	11.42	0.63	0.342		0.142	(0.308)		0.200
138	11.50	0.63	0.342		0.141	(0.308)		0.201
139	11.58	0.57	0.306		0.140	(0.275)		0.166
140	11.67	0.57	0.306		0.140	(0.275)		0.166
141	11.75	0.57	0.306		0.139	(0.275)		0.167
142	11.83	0.60	0.324		0.138	(0.292)		0.186
143	11.92	0.60	0.324		0.138	(0.292)		0.186
144	12.00	0.60	0.324		0.137	(0.292)		0.187
145	12.08	0.83	0.450		0.136	(0.405)		0.314
146	12.17	0.83	0.450		0.136	(0.405)		0.314
147	12.25	0.83	0.450		0.135	(0.405)		0.315
148	12.33	0.87	0.468		0.134	(0.421)		0.334
149	12.42	0.87	0.468		0.134	(0.421)		0.334
150	12.50	0.87	0.468		0.133	(0.421)		0.335
151	12.58	0.93	0.504		0.132	(0.454)		0.372
152	12.67	0.93	0.504		0.132	(0.454)		0.372
153	12.75	0.93	0.504		0.131	(0.454)		0.373
154	12.83	0.97	0.522		0.130	(0.470)		0.392
155	12.92	0.97	0.522		0.130	(0.470)		0.392
156	13.00	0.97	0.522		0.129	(0.470)		0.393
157	13.08	1.13	0.612		0.128	(0.551)		0.484
158	13.17	1.13	0.612		0.128	(0.551)		0.484
159	13.25	1.13	0.612		0.127	(0.551)		0.485
160	13.33	1.13	0.612		0.126	(0.551)		0.486
161	13.42	1.13	0.612		0.126	(0.551)		0.486
162	13.50	1.13	0.612		0.125	(0.551)		0.487
163	13.58	0.77	0.414		0.124	(0.373)		0.290
164	13.67	0.77	0.414		0.124	(0.373)		0.290
165	13.75	0.77	0.414		0.123	(0.373)		0.291
166	13.83	0.77	0.414		0.122	(0.373)		0.291
167	13.92	0.77	0.414		0.122	(0.373)		0.292
168	14.00	0.77	0.414		0.121	(0.373)		0.293
169	14.08	0.90	0.486		0.121	(0.437)		0.365
170	14.17	0.90	0.486		0.120	(0.437)		0.366
171	14.25	0.90	0.486		0.119	(0.437)		0.367
172	14.33	0.87	0.468		0.119	(0.421)		0.349
173	14.42	0.87	0.468		0.118	(0.421)		0.350
174	14.50	0.87	0.468		0.118	(0.421)		0.350
175	14.58	0.87	0.468		0.117	(0.421)		0.351
176	14.67	0.87	0.468		0.116	(0.421)		0.352
177	14.75	0.87	0.468		0.116	(0.421)		0.352
178	14.83	0.83	0.450		0.115	(0.405)		0.335
179	14.92	0.83	0.450		0.115	(0.405)		0.335
180	15.00	0.83	0.450		0.114	(0.405)		0.336
181	15.08	0.80	0.432		0.113	(0.389)		0.319
182	15.17	0.80	0.432		0.113	(0.389)		0.319
183	15.25	0.80	0.432		0.112	(0.389)		0.320
184	15.33	0.77	0.414		0.112	(0.373)		0.302
185	15.42	0.77	0.414		0.111	(0.373)		0.303

186	15.50	0.77	0.414	0.111	(0.373)	0.303
187	15.58	0.63	0.342	0.110	(0.308)	0.232
188	15.67	0.63	0.342	0.109	(0.308)	0.233
189	15.75	0.63	0.342	0.109	(0.308)	0.233
190	15.83	0.63	0.342	0.108	(0.308)	0.234
191	15.92	0.63	0.342	0.108	(0.308)	0.234
192	16.00	0.63	0.342	0.107	(0.308)	0.235
193	16.08	0.13	0.072	(0.107)	0.065	0.007
194	16.17	0.13	0.072	(0.106)	0.065	0.007
195	16.25	0.13	0.072	(0.106)	0.065	0.007
196	16.33	0.13	0.072	(0.105)	0.065	0.007
197	16.42	0.13	0.072	(0.104)	0.065	0.007
198	16.50	0.13	0.072	(0.104)	0.065	0.007
199	16.58	0.10	0.054	(0.103)	0.049	0.005
200	16.67	0.10	0.054	(0.103)	0.049	0.005
201	16.75	0.10	0.054	(0.102)	0.049	0.005
202	16.83	0.10	0.054	(0.102)	0.049	0.005
203	16.92	0.10	0.054	(0.101)	0.049	0.005
204	17.00	0.10	0.054	(0.101)	0.049	0.005
205	17.08	0.17	0.090	(0.100)	0.081	0.009
206	17.17	0.17	0.090	(0.100)	0.081	0.009
207	17.25	0.17	0.090	(0.099)	0.081	0.009
208	17.33	0.17	0.090	(0.099)	0.081	0.009
209	17.42	0.17	0.090	(0.098)	0.081	0.009
210	17.50	0.17	0.090	(0.098)	0.081	0.009
211	17.58	0.17	0.090	(0.097)	0.081	0.009
212	17.67	0.17	0.090	(0.097)	0.081	0.009
213	17.75	0.17	0.090	(0.096)	0.081	0.009
214	17.83	0.13	0.072	(0.096)	0.065	0.007
215	17.92	0.13	0.072	(0.095)	0.065	0.007
216	18.00	0.13	0.072	(0.095)	0.065	0.007
217	18.08	0.13	0.072	(0.094)	0.065	0.007
218	18.17	0.13	0.072	(0.094)	0.065	0.007
219	18.25	0.13	0.072	(0.094)	0.065	0.007
220	18.33	0.13	0.072	(0.093)	0.065	0.007
221	18.42	0.13	0.072	(0.093)	0.065	0.007
222	18.50	0.13	0.072	(0.092)	0.065	0.007
223	18.58	0.10	0.054	(0.092)	0.049	0.005
224	18.67	0.10	0.054	(0.091)	0.049	0.005
225	18.75	0.10	0.054	(0.091)	0.049	0.005
226	18.83	0.07	0.036	(0.090)	0.032	0.004
227	18.92	0.07	0.036	(0.090)	0.032	0.004
228	19.00	0.07	0.036	(0.090)	0.032	0.004
229	19.08	0.10	0.054	(0.089)	0.049	0.005
230	19.17	0.10	0.054	(0.089)	0.049	0.005
231	19.25	0.10	0.054	(0.088)	0.049	0.005
232	19.33	0.13	0.072	(0.088)	0.065	0.007
233	19.42	0.13	0.072	(0.087)	0.065	0.007
234	19.50	0.13	0.072	(0.087)	0.065	0.007
235	19.58	0.10	0.054	(0.087)	0.049	0.005
236	19.67	0.10	0.054	(0.086)	0.049	0.005
237	19.75	0.10	0.054	(0.086)	0.049	0.005
238	19.83	0.07	0.036	(0.086)	0.032	0.004
239	19.92	0.07	0.036	(0.085)	0.032	0.004
240	20.00	0.07	0.036	(0.085)	0.032	0.004
241	20.08	0.10	0.054	(0.084)	0.049	0.005
242	20.17	0.10	0.054	(0.084)	0.049	0.005
243	20.25	0.10	0.054	(0.084)	0.049	0.005
244	20.33	0.10	0.054	(0.083)	0.049	0.005
245	20.42	0.10	0.054	(0.083)	0.049	0.005
246	20.50	0.10	0.054	(0.083)	0.049	0.005
247	20.58	0.10	0.054	(0.082)	0.049	0.005
248	20.67	0.10	0.054	(0.082)	0.049	0.005
249	20.75	0.10	0.054	(0.082)	0.049	0.005
250	20.83	0.07	0.036	(0.081)	0.032	0.004
251	20.92	0.07	0.036	(0.081)	0.032	0.004
252	21.00	0.07	0.036	(0.081)	0.032	0.004
253	21.08	0.10	0.054	(0.080)	0.049	0.005
254	21.17	0.10	0.054	(0.080)	0.049	0.005
255	21.25	0.10	0.054	(0.080)	0.049	0.005
256	21.33	0.07	0.036	(0.079)	0.032	0.004
257	21.42	0.07	0.036	(0.079)	0.032	0.004
258	21.50	0.07	0.036	(0.079)	0.032	0.004
259	21.58	0.10	0.054	(0.078)	0.049	0.005
260	21.67	0.10	0.054	(0.078)	0.049	0.005
261	21.75	0.10	0.054	(0.078)	0.049	0.005
262	21.83	0.07	0.036	(0.078)	0.032	0.004
263	21.92	0.07	0.036	(0.077)	0.032	0.004
264	22.00	0.07	0.036	(0.077)	0.032	0.004
265	22.08	0.10	0.054	(0.077)	0.049	0.005
266	22.17	0.10	0.054	(0.077)	0.049	0.005
267	22.25	0.10	0.054	(0.076)	0.049	0.005
268	22.33	0.07	0.036	(0.076)	0.032	0.004
269	22.42	0.07	0.036	(0.076)	0.032	0.004
270	22.50	0.07	0.036	(0.076)	0.032	0.004
271	22.58	0.07	0.036	(0.075)	0.032	0.004
272	22.67	0.07	0.036	(0.075)	0.032	0.004
273	22.75	0.07	0.036	(0.075)	0.032	0.004
274	22.83	0.07	0.036	(0.075)	0.032	0.004
275	22.92	0.07	0.036	(0.075)	0.032	0.004
276	23.00	0.07	0.036	(0.074)	0.032	0.004
277	23.08	0.07	0.036	(0.074)	0.032	0.004
278	23.17	0.07	0.036	(0.074)	0.032	0.004
279	23.25	0.07	0.036	(0.074)	0.032	0.004
280	23.33	0.07	0.036	(0.074)	0.032	0.004
281	23.42	0.07	0.036	(0.074)	0.032	0.004
282	23.50	0.07	0.036	(0.074)	0.032	0.004
283	23.58	0.07	0.036	(0.073)	0.032	0.004
284	23.67	0.07	0.036	(0.073)	0.032	0.004

285	23.75	0.07	0.036	(0.073)	0.032	0.004
286	23.83	0.07	0.036	(0.073)	0.032	0.004
287	23.92	0.07	0.036	(0.073)	0.032	0.004
288	24.00	0.07	0.036	(0.073)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 26.3

Flood volume = Effective rainfall 2.19(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 12.7(Ac.Ft)
Total soil loss = 2.31(In)
Total soil loss = 13.383(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 554609.0 Cubic Feet
Total soil loss = 582969.0 Cubic Feet

Peak flow rate of this hydrograph = 33.080(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0001	0.02	Q				
0+10	0.0007	0.09	Q				
0+15	0.0018	0.16	Q				
0+20	0.0032	0.20	Q				
0+25	0.0049	0.25	Q				
0+30	0.0070	0.30	Q				
0+35	0.0092	0.32	Q				
0+40	0.0115	0.34	Q				
0+45	0.0139	0.35	Q				
0+50	0.0164	0.36	Q				
0+55	0.0192	0.41	Q				
1+ 0	0.0223	0.45	Q				
1+ 5	0.0254	0.46	Q				
1+10	0.0284	0.43	Q				
1+15	0.0312	0.40	Q				
1+20	0.0339	0.40	Q				
1+25	0.0366	0.39	Q				
1+30	0.0393	0.39	Q				
1+35	0.0419	0.39	Q				
1+40	0.0446	0.38	Q				
1+45	0.0472	0.38	Q				
1+50	0.0499	0.39	Q				
1+55	0.0529	0.43	Q				
2+ 0	0.0560	0.46	Q				
2+ 5	0.0593	0.48	Q				
2+10	0.0627	0.48	Q				
2+15	0.0660	0.49	Q				
2+20	0.0694	0.49	Q				
2+25	0.0728	0.50	Q				
2+30	0.0763	0.50	Q				
2+35	0.0798	0.51	Q				
2+40	0.0835	0.55	Q				
2+45	0.0875	0.58	Q				
2+50	0.0917	0.60	Q				
2+55	0.0958	0.61	Q				
3+ 0	0.1001	0.61	Q				
3+ 5	0.1043	0.62	Q				
3+10	0.1086	0.62	Q				
3+15	0.1129	0.62	Q				
3+20	0.1172	0.63	Q				
3+25	0.1216	0.63	Q				
3+30	0.1259	0.63	Q				
3+35	0.1302	0.63	Q				
3+40	0.1346	0.63	Q				
3+45	0.1389	0.63	Q				
3+50	0.1433	0.64	Q				
3+55	0.1480	0.68	Q				
4+ 0	0.1529	0.71	Q				
4+ 5	0.1579	0.73	Q				
4+10	0.1630	0.74	Q				
4+15	0.1681	0.74	Q				
4+20	0.1733	0.75	Q				
4+25	0.1787	0.79	Q				
4+30	0.1845	0.83	Q				
4+35	0.1903	0.85	Q				
4+40	0.1962	0.86	Q				
4+45	0.2022	0.87	Q				
4+50	0.2082	0.88	Q				
4+55	0.2145	0.92	Q				
5+ 0	0.2211	0.96	Q				
5+ 5	0.2277	0.96	Q				
5+10	0.2339	0.90	Q				
5+15	0.2396	0.83	Q				
5+20	0.2452	0.81	Q				
5+25	0.2510	0.84	Q				
5+30	0.2570	0.86	Q				
5+35	0.2630	0.88	Q				
5+40	0.2694	0.92	Q				
5+45	0.2760	0.96	Q				
5+50	0.2827	0.98	Q				
5+55	0.2895	0.99	Q				
6+ 0	0.2963	0.99	Q				
6+ 5	0.3032	1.00	VQ				
6+10	0.3104	1.04	VQ				

6+15	0.3179	1.08	VQ
6+20	0.3255	1.10	Q
6+25	0.3331	1.11	Q
6+30	0.3408	1.12	Q
6+35	0.3486	1.13	Q
6+40	0.3566	1.17	Q
6+45	0.3650	1.21	Q
6+50	0.3734	1.23	Q
6+55	0.3819	1.24	Q
7+ 0	0.3905	1.24	Q
7+ 5	0.3991	1.25	Q
7+10	0.4077	1.25	Q
7+15	0.4164	1.26	Q
7+20	0.4251	1.27	Q
7+25	0.4341	1.30	Q
7+30	0.4434	1.34	Q
7+35	0.4534	1.46	Q
7+40	0.4662	1.85	Q
7+45	0.4817	2.26	VQ
7+50	0.4993	2.55	VQ
7+55	0.5202	3.04	V Q
8+ 0	0.5444	3.51	V Q
8+ 5	0.5715	3.93	V Q
8+10	0.6046	4.81	V Q
8+15	0.6436	5.66	V Q
8+20	0.6855	6.09	V Q
8+25	0.7292	6.36	V Q
8+30	0.7744	6.56	V Q
8+35	0.8213	6.81	V Q
8+40	0.8717	7.31	V Q
8+45	0.9253	7.79	V Q
8+50	0.9813	8.13	V Q
8+55	1.0410	8.66	V Q
9+ 0	1.1041	9.17	V Q
9+ 5	1.1703	9.61	V Q
9+10	1.2426	10.50	V Q
9+15	1.3209	11.37	V Q
9+20	1.4028	11.89	V Q
9+25	1.4889	12.51	V Q
9+30	1.5790	13.07	V Q
9+35	1.6718	13.48	V Q
9+40	1.7686	14.05	V Q
9+45	1.8691	14.59	V Q
9+50	1.9722	14.98	V Q
9+55	2.0792	15.54	V Q
10+ 0	2.1898	16.06	V Q
10+ 5	2.2984	15.77	V Q
10+10	2.3913	13.48	V Q
10+15	2.4678	11.11	V Q
10+20	2.5378	10.17	V Q
10+25	2.6046	9.69	VQ
10+30	2.6692	9.38	VQ
10+35	2.7352	9.59	VQ
10+40	2.8125	11.22	V Q
10+45	2.9015	12.93	V Q
10+50	2.9954	13.63	V Q
10+55	3.0918	14.00	V Q
11+ 0	3.1901	14.27	V Q
11+ 5	3.2891	14.38	V Q
11+10	3.3868	14.19	V Q
11+15	3.4829	13.94	V Q
11+20	3.5786	13.90	V Q
11+25	3.6746	13.94	V Q
11+30	3.7710	13.99	V Q
11+35	3.8666	13.88	VQ
11+40	3.9577	13.22	VQ
11+45	4.0442	12.56	Q
11+50	4.1295	12.39	Q
11+55	4.2164	12.62	QV
12+ 0	4.3052	12.90	QV
12+ 5	4.3988	13.59	Q
12+10	4.5100	16.14	V Q
12+15	4.6389	18.72	V Q
12+20	4.7761	19.92	V Q
12+25	4.9201	20.91	V Q
12+30	5.0697	21.72	V Q
12+35	5.2238	22.38	V Q
12+40	5.3853	23.44	V Q
12+45	5.5535	24.43	V Q
12+50	5.7260	25.04	V Q
12+55	5.9033	25.75	V Q
13+ 0	6.0851	26.39	V Q
13+ 5	6.2723	27.18	V Q
13+10	6.4734	29.21	V Q
13+15	6.6884	31.22	V Q
13+20	6.9099	32.16	V Q
13+25	7.1351	32.69	V Q
13+30	7.3629	33.08	V Q
13+35	7.5865	32.46	V Q
13+40	7.7847	28.79	V Q
13+45	7.9569	25.00	VQ
13+50	8.1186	23.47	Q V
13+55	8.2748	22.68	Q V
14+ 0	8.4274	22.15	Q V
14+ 5	8.5797	22.12	Q V
14+10	8.7400	23.28	Q V
14+15	8.9091	24.55	Q V
14+20	9.0808	24.94	Q V
14+25	9.2516	24.79	Q V

14+30	9.4208	24.57	
14+35	9.5897	24.53	
14+40	9.7587	24.54	
14+45	9.9278	24.54	
14+50	10.0963	24.48	
14+55	10.2630	24.20	
15+ 0	10.4276	23.90	
15+ 5	10.5910	23.72	
15+10	10.7517	23.34	
15+15	10.9099	22.98	
15+20	11.0666	22.75	
15+25	11.2203	22.31	
15+30	11.3712	21.91	
15+35	11.5185	21.39	
15+40	11.6554	19.88	
15+45	11.7821	18.39	
15+50	11.9043	17.74	
15+55	12.0241	17.40	
16+ 0	12.1423	17.16	
16+ 5	12.2521	15.95	
16+10	12.3302	11.34	
16+15	12.3762	6.68	
16+20	12.4083	4.65	
16+25	12.4326	3.54	
16+30	12.4516	2.76	
16+35	12.4666	2.18	
16+40	12.4785	1.73	
16+45	12.4880	1.38	
16+50	12.4956	1.10	
16+55	12.5018	0.90	
17+ 0	12.5070	0.75	
17+ 5	12.5114	0.64	
17+10	12.5157	0.63	
17+15	12.5200	0.61	
17+20	12.5239	0.58	
17+25	12.5280	0.59	
17+30	12.5321	0.60	
17+35	12.5363	0.61	
17+40	12.5405	0.61	
17+45	12.5448	0.62	
17+50	12.5490	0.61	
17+55	12.5530	0.58	
18+ 0	12.5568	0.55	
18+ 5	12.5604	0.53	
18+10	12.5641	0.53	
18+15	12.5677	0.52	
18+20	12.5712	0.52	
18+25	12.5748	0.52	
18+30	12.5783	0.51	
18+35	12.5818	0.50	
18+40	12.5850	0.47	
18+45	12.5879	0.43	
18+50	12.5907	0.40	
18+55	12.5932	0.36	
19+ 0	12.5954	0.32	
19+ 5	12.5975	0.31	
19+10	12.5997	0.33	
19+15	12.6022	0.36	
19+20	12.6048	0.37	
19+25	12.6076	0.41	
19+30	12.6107	0.45	
19+35	12.6139	0.46	
19+40	12.6169	0.43	
19+45	12.6197	0.40	
19+50	12.6223	0.39	
19+55	12.6247	0.35	
20+ 0	12.6268	0.31	
20+ 5	12.6289	0.30	
20+10	12.6311	0.32	
20+15	12.6336	0.35	
20+20	12.6361	0.36	
20+25	12.6386	0.37	
20+30	12.6412	0.37	
20+35	12.6437	0.37	
20+40	12.6463	0.37	
20+45	12.6489	0.38	
20+50	12.6514	0.37	
20+55	12.6537	0.33	
21+ 0	12.6558	0.30	
21+ 5	12.6578	0.29	
21+10	12.6600	0.32	
21+15	12.6624	0.35	
21+20	12.6648	0.35	
21+25	12.6670	0.32	
21+30	12.6690	0.29	
21+35	12.6710	0.28	
21+40	12.6731	0.31	
21+45	12.6755	0.35	
21+50	12.6779	0.35	
21+55	12.6801	0.32	
22+ 0	12.6821	0.29	
22+ 5	12.6840	0.28	
22+10	12.6862	0.31	
22+15	12.6886	0.34	
22+20	12.6910	0.35	
22+25	12.6932	0.32	
22+30	12.6951	0.29	
22+35	12.6970	0.27	
22+40	12.6989	0.27	

22+45	12.7007	0.26	Q	|	|	|	V|
22+50	12.7025	0.26	Q	|	|	|	V|
22+55	12.7043	0.26	Q	|	|	|	V|
23+ 0	12.7061	0.26	Q	|	|	|	V|
23+ 5	12.7078	0.26	Q	|	|	|	V|
23+10	12.7096	0.26	Q	|	|	|	V|
23+15	12.7114	0.26	Q	|	|	|	V|
23+20	12.7131	0.25	Q	|	|	|	V|
23+25	12.7149	0.25	Q	|	|	|	V|
23+30	12.7166	0.25	Q	|	|	|	V|
23+35	12.7184	0.25	Q	|	|	|	V|
23+40	12.7201	0.25	Q	|	|	|	V|
23+45	12.7218	0.25	Q	|	|	|	V|
23+50	12.7236	0.25	Q	|	|	|	V|
23+55	12.7253	0.25	Q	|	|	|	V|
24+ 0	12.7271	0.25	Q	|	|	|	V|
24+ 5	12.7287	0.24	Q	|	|	|	V|
24+10	12.7298	0.17	Q	|	|	|	V|
24+15	12.7305	0.09	Q	|	|	|	V|
24+20	12.7309	0.06	Q	|	|	|	V|
24+25	12.7312	0.05	Q	|	|	|	V|
24+30	12.7314	0.03	Q	|	|	|	V|
24+35	12.7316	0.03	Q	|	|	|	V|
24+40	12.7317	0.02	Q	|	|	|	V|
24+45	12.7319	0.01	Q	|	|	|	V|
24+50	12.7319	0.01	Q	|	|	|	V|
24+55	12.7320	0.01	Q	|	|	|	V|
25+ 0	12.7320	0.01	Q	|	|	|	V|
25+ 5	12.7320	0.00	Q	|	|	|	V|
25+10	12.7321	0.00	Q	|	|	|	V|
25+15	12.7321	0.00	Q	|	|	|	V|

PROPOSED CONDITION

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/13/20 File: 3828PR212.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.080 Hr.
Lag time = 4.78 Min.
25% of lag time = 1.19 Min.
40% of lag time = 1.91 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	0.50	34.83

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.20	83.58

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 0.500(In)
Area Averaged 100-Year Rainfall = 1.200(In)

Point rain (area averaged) = 0.500(In)
Areal adjustment factor = 99.94 %
Adjusted average point rain = 0.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	56.00	0.900

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	36.0	0.706	0.900	0.134	1.000	0.134
					Sum (F) =	0.134

Area averaged mean soil loss (F) (In/Hr) = 0.134
Minimum soil loss rate ((In/Hr)) = 0.067
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.100

Slope of intensity-duration curve for a 1 hour storm =0.5000

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	104.614	20.612	14.469
2	0.167	209.229	48.679	34.170
3	0.250	313.843	14.978	10.514
4	0.333	418.458	6.821	4.788
5	0.417	523.072	3.802	2.669
6	0.500	627.687	2.435	1.709
7	0.583	732.301	1.462	1.026
8	0.667	836.916	1.210	0.849
		Sum =	100.000 Sum=	70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	4.20	0.252	(0.134)	0.025	0.227
2	0.17	4.30	0.258	(0.134)	0.026	0.232
3	0.25	5.00	0.300	(0.134)	0.030	0.270
4	0.33	5.00	0.300	(0.134)	0.030	0.270
5	0.42	5.80	0.348	(0.134)	0.035	0.313
6	0.50	6.50	0.390	(0.134)	0.039	0.351
7	0.58	7.40	0.444	(0.134)	0.044	0.399
8	0.67	8.60	0.516	(0.134)	0.052	0.464
9	0.75	12.30	0.738	(0.134)	0.074	0.664
10	0.83	29.10	1.745	0.134	(0.174)	1.611
11	0.92	6.80	0.408	(0.134)	0.041	0.367
12	1.00	5.00	0.300	(0.134)	0.030	0.270
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	5.4

Flood volume = Effective rainfall 0.45(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 2.6(Ac.Ft)
Total soil loss = 0.05(In)
Total soil loss = 0.271(Ac.Ft)
Total rainfall = 0.50(In)
Flood volume = 114551.6 Cubic Feet
Total soil loss = 11783.4 Cubic Feet

Peak flow rate of this hydrograph = 71.803(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 20.0 40.0 60.0 80.0
0+ 5	0.0226	3.28	VQ
0+10	0.0991	11.11	V Q
0+15	0.1971	14.22	V Q
0+20	0.3118	16.66	V Q
0+25	0.4379	18.31	V Q
0+30	0.5819	20.92	V Q
0+35	0.7452	23.71	Q
0+40	0.9324	27.17	QV
0+45	1.1605	33.13	QV
0+50	1.5378	54.78	V Q
0+55	2.0323	71.80	V Q
1+ 0	2.3018	39.12	Q V
1+ 5	2.4676	24.08	Q V
1+10	2.5423	10.85	Q V
1+15	2.5844	6.10	Q V
1+20	2.6089	3.57	Q V
1+25	2.6241	2.21	Q V
1+30	2.6282	0.59	Q V
1+35	2.6297	0.23	Q V

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/13/20 File: 3828PR232.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.080 Hr.
Lag time = 4.78 Min.
25% of lag time = 1.19 Min.
40% of lag time = 1.91 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	0.80	55.72

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.86	129.55

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 0.800(In)
Area Averaged 100-Year Rainfall = 1.860(In)

Point rain (area averaged) = 0.800(In)
Areal adjustment factor = 99.97 %
Adjusted average point rain = 0.800(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	56.00	0.900

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	36.0	0.706	0.900	0.134	1.000	0.134
					Sum (F) =	0.134

Area averaged mean soil loss (F) (In/Hr) = 0.134
Minimum soil loss rate ((In/Hr)) = 0.067
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.100

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	104.614	20.612	14.469
2	0.167	209.229	48.679	34.170
3	0.250	313.843	14.978	10.514
4	0.333	418.458	6.821	4.788
5	0.417	523.072	3.802	2.669
6	0.500	627.687	2.435	1.709
7	0.583	732.301	1.462	1.026
8	0.667	836.916	1.210	0.849
			Sum = 100.000	Sum= 70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.125	(0.134)	0.012	0.112
2	0.17	1.30	0.125	(0.134)	0.012	0.112
3	0.25	1.10	0.106	(0.134)	0.011	0.095
4	0.33	1.50	0.144	(0.134)	0.014	0.130
5	0.42	1.50	0.144	(0.134)	0.014	0.130
6	0.50	1.80	0.173	(0.134)	0.017	0.155
7	0.58	1.50	0.144	(0.134)	0.014	0.130
8	0.67	1.80	0.173	(0.134)	0.017	0.155
9	0.75	1.80	0.173	(0.134)	0.017	0.155
10	0.83	1.50	0.144	(0.134)	0.014	0.130
11	0.92	1.60	0.154	(0.134)	0.015	0.138
12	1.00	1.80	0.173	(0.134)	0.017	0.155
13	1.08	2.20	0.211	(0.134)	0.021	0.190
14	1.17	2.20	0.211	(0.134)	0.021	0.190
15	1.25	2.20	0.211	(0.134)	0.021	0.190
16	1.33	2.00	0.192	(0.134)	0.019	0.173
17	1.42	2.60	0.250	(0.134)	0.025	0.225
18	1.50	2.70	0.259	(0.134)	0.026	0.233
19	1.58	2.40	0.230	(0.134)	0.023	0.207
20	1.67	2.70	0.259	(0.134)	0.026	0.233
21	1.75	3.30	0.317	(0.134)	0.032	0.285
22	1.83	3.10	0.298	(0.134)	0.030	0.268
23	1.92	2.90	0.278	(0.134)	0.028	0.250
24	2.00	3.00	0.288	(0.134)	0.029	0.259
25	2.08	3.10	0.298	(0.134)	0.030	0.268
26	2.17	4.20	0.403	(0.134)	0.040	0.363
27	2.25	5.00	0.480	(0.134)	0.048	0.432
28	2.33	3.50	0.336	(0.134)	0.034	0.302
29	2.42	6.80	0.653	(0.134)	0.065	0.587
30	2.50	7.30	0.701	(0.134)	0.070	0.631
31	2.58	8.20	0.787	(0.134)	0.079	0.708
32	2.67	5.90	0.566	(0.134)	0.057	0.510
33	2.75	2.00	0.192	(0.134)	0.019	0.173
34	2.83	1.80	0.173	(0.134)	0.017	0.155
35	2.92	1.80	0.173	(0.134)	0.017	0.155
36	3.00	0.60	0.058	(0.134)	0.006	0.052
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	8.6

Flood volume = Effective rainfall 0.72(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 4.2(Ac.Ft)
Total soil loss = 0.08(In)
Total soil loss = 0.464(Ac.Ft)
Total rainfall = 0.80(In)
Flood volume = 181981.8 Cubic Feet
Total soil loss = 20220.2 Cubic Feet

Peak flow rate of this hydrograph = 43.183(CFS)

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3 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 12.5 25.0 37.5 50.0
0+ 5	0.0112	1.63	VQ
0+10	0.0488	5.46	V Q
0+15	0.0929	6.40	V Q
0+20	0.1400	6.84	V Q
0+25	0.1961	8.14	V Q
0+30	0.2580	8.99	V Q
0+35	0.3250	9.74	V Q
0+40	0.3915	9.66	V Q
0+45	0.4634	10.43	V Q
0+50	0.5343	10.30	V Q
0+55	0.6009	9.67	V Q
1+ 0	0.6697	9.99	VQ
1+ 5	0.7460	11.09	VQ
1+10	0.8316	12.43	V Q
1+15	0.9203	12.87	V Q
1+20	1.0086	12.82	VQ
1+25	1.0987	13.09	Q
1+30	1.2013	14.89	Q
1+35	1.3068	15.32	Q
1+40	1.4111	15.13	QV
1+45	1.5257	16.65	QV
1+50	1.6525	18.41	QV
1+55	1.7780	18.23	Q V
2+ 0	1.9013	17.90	Q V
2+ 5	2.0269	18.22	Q V
2+10	2.1642	19.95	Q V
2+15	2.3318	24.33	Q V
2+20	2.5100	25.88	Q V
2+25	2.6943	26.76	Q V
2+30	2.9447	36.36	VQ
2+35	3.2320	41.70	V Q
2+40	3.5294	43.18	VQ
2+45	3.7582	33.23	Q V
2+50	3.8979	20.28	Q V
2+55	4.0057	15.65	Q V
3+ 0	4.0900	12.25	Q V
3+ 5	4.1365	6.75	Q V

3+10	4.1580	3.13	| Q	|	|	|	V|
3+15	4.1686	1.54	|Q	|	|	|	V|
3+20	4.1735	0.71	Q	|	|	|	V|
3+25	4.1761	0.38	Q	|	|	|	V|
3+30	4.1774	0.19	Q	|	|	|	V|
3+35	4.1777	0.04	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/13/20 File: 3828PR262.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.080 Hr.
Lag time = 4.78 Min.
25% of lag time = 1.19 Min.
40% of lag time = 1.91 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.15	80.10

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	2.50	174.13

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 1.150(In)
Area Averaged 100-Year Rainfall = 2.500(In)

Point rain (area averaged) = 1.150(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 1.150(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	56.00	0.900

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	36.0	0.706	0.900	0.134	1.000	0.134
					Sum (F) =	0.134

Area averaged mean soil loss (F) (In/Hr) = 0.134
Minimum soil loss rate ((In/Hr)) = 0.067
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.100

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	104.614	20.612	14.469
2	0.167	209.229	48.679	34.170
3	0.250	313.843	14.978	10.514
4	0.333	418.458	6.821	4.788
5	0.417	523.072	3.802	2.669
6	0.500	627.687	2.435	1.709
7	0.583	732.301	1.462	1.026
8	0.667	836.916	1.210	0.849
		Sum = 100.000	Sum=	70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.069	(0.134)	0.007	0.062
2	0.17	0.60	0.083	(0.134)	0.008	0.075
3	0.25	0.60	0.083	(0.134)	0.008	0.075
4	0.33	0.60	0.083	(0.134)	0.008	0.075
5	0.42	0.60	0.083	(0.134)	0.008	0.075
6	0.50	0.70	0.097	(0.134)	0.010	0.087
7	0.58	0.70	0.097	(0.134)	0.010	0.087
8	0.67	0.70	0.097	(0.134)	0.010	0.087
9	0.75	0.70	0.097	(0.134)	0.010	0.087
10	0.83	0.70	0.097	(0.134)	0.010	0.087
11	0.92	0.70	0.097	(0.134)	0.010	0.087
12	1.00	0.80	0.110	(0.134)	0.011	0.099
13	1.08	0.80	0.110	(0.134)	0.011	0.099
14	1.17	0.80	0.110	(0.134)	0.011	0.099
15	1.25	0.80	0.110	(0.134)	0.011	0.099
16	1.33	0.80	0.110	(0.134)	0.011	0.099
17	1.42	0.80	0.110	(0.134)	0.011	0.099
18	1.50	0.80	0.110	(0.134)	0.011	0.099
19	1.58	0.80	0.110	(0.134)	0.011	0.099
20	1.67	0.80	0.110	(0.134)	0.011	0.099
21	1.75	0.80	0.110	(0.134)	0.011	0.099
22	1.83	0.80	0.110	(0.134)	0.011	0.099
23	1.92	0.80	0.110	(0.134)	0.011	0.099
24	2.00	0.90	0.124	(0.134)	0.012	0.112
25	2.08	0.80	0.110	(0.134)	0.011	0.099
26	2.17	0.90	0.124	(0.134)	0.012	0.112
27	2.25	0.90	0.124	(0.134)	0.012	0.112
28	2.33	0.90	0.124	(0.134)	0.012	0.112
29	2.42	0.90	0.124	(0.134)	0.012	0.112
30	2.50	0.90	0.124	(0.134)	0.012	0.112
31	2.58	0.90	0.124	(0.134)	0.012	0.112
32	2.67	0.90	0.124	(0.134)	0.012	0.112
33	2.75	1.00	0.138	(0.134)	0.014	0.124
34	2.83	1.00	0.138	(0.134)	0.014	0.124
35	2.92	1.00	0.138	(0.134)	0.014	0.124
36	3.00	1.00	0.138	(0.134)	0.014	0.124
37	3.08	1.00	0.138	(0.134)	0.014	0.124
38	3.17	1.10	0.152	(0.134)	0.015	0.137
39	3.25	1.10	0.152	(0.134)	0.015	0.137
40	3.33	1.10	0.152	(0.134)	0.015	0.137
41	3.42	1.20	0.166	(0.134)	0.017	0.149
42	3.50	1.30	0.179	(0.134)	0.018	0.161
43	3.58	1.40	0.193	(0.134)	0.019	0.174
44	3.67	1.40	0.193	(0.134)	0.019	0.174
45	3.75	1.50	0.207	(0.134)	0.021	0.186
46	3.83	1.50	0.207	(0.134)	0.021	0.186
47	3.92	1.60	0.221	(0.134)	0.022	0.199
48	4.00	1.60	0.221	(0.134)	0.022	0.199
49	4.08	1.70	0.235	(0.134)	0.023	0.211
50	4.17	1.80	0.248	(0.134)	0.025	0.224
51	4.25	1.90	0.262	(0.134)	0.026	0.236
52	4.33	2.00	0.276	(0.134)	0.028	0.248
53	4.42	2.10	0.290	(0.134)	0.029	0.261
54	4.50	2.10	0.290	(0.134)	0.029	0.261
55	4.58	2.20	0.304	(0.134)	0.030	0.273
56	4.67	2.30	0.317	(0.134)	0.032	0.286
57	4.75	2.40	0.331	(0.134)	0.033	0.298
58	4.83	2.40	0.331	(0.134)	0.033	0.298
59	4.92	2.50	0.345	(0.134)	0.034	0.310
60	5.00	2.60	0.359	(0.134)	0.036	0.323
61	5.08	3.10	0.428	(0.134)	0.043	0.385
62	5.17	3.60	0.497	(0.134)	0.050	0.447
63	5.25	3.90	0.538	(0.134)	0.054	0.484
64	5.33	4.20	0.579	(0.134)	0.058	0.522
65	5.42	4.70	0.648	(0.134)	0.065	0.584
66	5.50	5.60	0.773	(0.134)	0.077	0.695
67	5.58	1.90	0.262	(0.134)	0.026	0.236
68	5.67	0.90	0.124	(0.134)	0.012	0.112
69	5.75	0.60	0.083	(0.134)	0.008	0.075
70	5.83	0.50	0.069	(0.134)	0.007	0.062
71	5.92	0.30	0.041	(0.134)	0.004	0.037
72	6.00	0.20	0.028	(0.134)	0.003	0.025

(Loss Rate Not Used)

Sum = 100.0 Sum = 12.4

Flood volume = Effective rainfall 1.03(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 6.0(Ac.Ft)
Total soil loss = 0.11(In)
Total soil loss = 0.667(Ac.Ft)
Total rainfall = 1.15(In)
Flood volume = 261615.9 Cubic Feet
Total soil loss = 29068.4 Cubic Feet

Peak flow rate of this hydrograph = 40.271(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	12.5	25.0	37.5	50.0
0+ 5	0.0062	0.90	Q	|	|	|	|

0+10	0.0282	3.20	V Q
0+15	0.0577	4.28	V Q
0+20	0.0901	4.71	V Q
0+25	0.1241	4.93	V Q
0+30	0.1602	5.25	V Q
0+35	0.1999	5.76	V Q
0+40	0.2409	5.96	V Q
0+45	0.2825	6.03	V Q
0+50	0.3242	6.06	V Q
0+55	0.3661	6.08	V Q
1+ 0	0.4093	6.27	V Q
1+ 5	0.4555	6.71	V Q
1+10	0.5026	6.84	V Q
1+15	0.5501	6.90	V Q
1+20	0.5978	6.93	V Q
1+25	0.6457	6.95	VQ
1+30	0.6937	6.97	VQ
1+35	0.7417	6.98	VQ
1+40	0.7898	6.98	Q
1+45	0.8378	6.98	Q
1+50	0.8859	6.98	Q
1+55	0.9339	6.98	QV
2+ 0	0.9832	7.16	QV
2+ 5	1.0342	7.40	QV
2+10	1.0844	7.29	Q V
2+15	1.1370	7.64	QV
2+20	1.1903	7.74	QV
2+25	1.2440	7.79	Q V
2+30	1.2978	7.82	Q V
2+35	1.3518	7.84	Q V
2+40	1.4058	7.84	Q V
2+45	1.4611	8.03	Q V
2+50	1.5193	8.45	Q V
2+55	1.5784	8.58	Q V
3+ 0	1.6379	8.64	Q V
3+ 5	1.6977	8.68	Q V
3+10	1.7588	8.88	Q V
3+15	1.8229	9.31	Q V
3+20	1.8881	9.46	Q V
3+25	1.9548	9.69	Q V
3+30	2.0260	10.33	Q V
3+35	2.1024	11.09	Q V
3+40	2.1830	11.72	Q V
3+45	2.2666	12.13	Q V
3+50	2.3538	12.67	Q V
3+55	2.4437	13.04	Q V
4+ 0	2.5371	13.57	Q V
4+ 5	2.6331	13.94	Q V
4+10	2.7339	14.64	Q V
4+15	2.8401	15.42	Q V
4+20	2.9520	16.24	Q V
4+25	3.0696	17.08	Q V
4+30	3.1920	17.76	Q V
4+35	3.3173	18.20	Q V
4+40	3.4478	18.94	Q V
4+45	3.5838	19.75	Q V
4+50	3.7244	20.41	Q V
4+55	3.8679	20.84	Q V
5+ 0	4.0164	21.57	Q V
5+ 5	4.1755	23.09	Q V
5+10	4.3569	26.34	Q V
5+15	4.5620	29.78	Q V
5+20	4.7865	32.60	Q V
5+25	5.0321	35.67	Q V
5+30	5.3095	40.27	Q V
5+35	5.5750	38.55	Q V
5+40	5.7320	22.80	Q V
5+45	5.8287	14.04	Q V
5+50	5.8945	9.55	Q V
5+55	5.9416	6.84	Q V
6+ 0	5.9730	4.55	Q V
6+ 5	5.9920	2.76	Q V
6+10	5.9992	1.05	Q V
6+15	6.0026	0.50	Q V
6+20	6.0044	0.26	Q V
6+25	6.0053	0.13	Q V
6+30	6.0057	0.06	Q V
6+35	6.0059	0.02	Q V

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/13/20 File: 3828PR2242.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.080 Hr.
Lag time = 4.78 Min.
25% of lag time = 1.19 Min.
40% of lag time = 1.91 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.75	121.89

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	4.50	313.43

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 1.750(In)
Area Averaged 100-Year Rainfall = 4.500(In)

Point rain (area averaged) = 1.750(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.750(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	56.00	0.900

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	36.0	0.706	0.900	0.134	1.000	0.134
					Sum (F) =	0.134

Area averaged mean soil loss (F) (In/Hr) = 0.134
Minimum soil loss rate ((In/Hr)) = 0.067
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.100

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	104.614	20.612	14.469
2	0.167	209.229	48.679	34.170
3	0.250	313.843	14.978	10.514
4	0.333	418.458	6.821	4.788
5	0.417	523.072	3.802	2.669
6	0.500	627.687	2.435	1.709
7	0.583	732.301	1.462	1.026
8	0.667	836.916	1.210	0.849
			Sum = 100.000	Sum= 70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.014	(0.238)	0.001	0.013
2	0.17	0.07	0.014	(0.237)	0.001	0.013
3	0.25	0.07	0.014	(0.236)	0.001	0.013
4	0.33	0.10	0.021	(0.235)	0.002	0.019
5	0.42	0.10	0.021	(0.234)	0.002	0.019
6	0.50	0.10	0.021	(0.233)	0.002	0.019
7	0.58	0.10	0.021	(0.232)	0.002	0.019
8	0.67	0.10	0.021	(0.231)	0.002	0.019
9	0.75	0.10	0.021	(0.230)	0.002	0.019
10	0.83	0.13	0.028	(0.230)	0.003	0.025
11	0.92	0.13	0.028	(0.229)	0.003	0.025
12	1.00	0.13	0.028	(0.228)	0.003	0.025
13	1.08	0.10	0.021	(0.227)	0.002	0.019
14	1.17	0.10	0.021	(0.226)	0.002	0.019
15	1.25	0.10	0.021	(0.225)	0.002	0.019
16	1.33	0.10	0.021	(0.224)	0.002	0.019
17	1.42	0.10	0.021	(0.223)	0.002	0.019
18	1.50	0.10	0.021	(0.222)	0.002	0.019
19	1.58	0.10	0.021	(0.222)	0.002	0.019
20	1.67	0.10	0.021	(0.221)	0.002	0.019
21	1.75	0.10	0.021	(0.220)	0.002	0.019
22	1.83	0.13	0.028	(0.219)	0.003	0.025
23	1.92	0.13	0.028	(0.218)	0.003	0.025
24	2.00	0.13	0.028	(0.217)	0.003	0.025
25	2.08	0.13	0.028	(0.216)	0.003	0.025
26	2.17	0.13	0.028	(0.215)	0.003	0.025
27	2.25	0.13	0.028	(0.214)	0.003	0.025
28	2.33	0.13	0.028	(0.214)	0.003	0.025
29	2.42	0.13	0.028	(0.213)	0.003	0.025
30	2.50	0.13	0.028	(0.212)	0.003	0.025
31	2.58	0.17	0.035	(0.211)	0.003	0.031
32	2.67	0.17	0.035	(0.210)	0.003	0.031
33	2.75	0.17	0.035	(0.209)	0.003	0.031
34	2.83	0.17	0.035	(0.208)	0.003	0.031
35	2.92	0.17	0.035	(0.208)	0.003	0.031
36	3.00	0.17	0.035	(0.207)	0.003	0.031
37	3.08	0.17	0.035	(0.206)	0.003	0.031
38	3.17	0.17	0.035	(0.205)	0.003	0.031
39	3.25	0.17	0.035	(0.204)	0.003	0.031
40	3.33	0.17	0.035	(0.203)	0.003	0.031
41	3.42	0.17	0.035	(0.202)	0.003	0.031
42	3.50	0.17	0.035	(0.202)	0.003	0.031
43	3.58	0.17	0.035	(0.201)	0.003	0.031
44	3.67	0.17	0.035	(0.200)	0.003	0.031
45	3.75	0.17	0.035	(0.199)	0.003	0.031
46	3.83	0.20	0.042	(0.198)	0.004	0.038
47	3.92	0.20	0.042	(0.197)	0.004	0.038
48	4.00	0.20	0.042	(0.197)	0.004	0.038
49	4.08	0.20	0.042	(0.196)	0.004	0.038
50	4.17	0.20	0.042	(0.195)	0.004	0.038
51	4.25	0.20	0.042	(0.194)	0.004	0.038
52	4.33	0.23	0.049	(0.193)	0.005	0.044
53	4.42	0.23	0.049	(0.192)	0.005	0.044
54	4.50	0.23	0.049	(0.192)	0.005	0.044
55	4.58	0.23	0.049	(0.191)	0.005	0.044
56	4.67	0.23	0.049	(0.190)	0.005	0.044
57	4.75	0.23	0.049	(0.189)	0.005	0.044
58	4.83	0.27	0.056	(0.188)	0.006	0.050
59	4.92	0.27	0.056	(0.187)	0.006	0.050
60	5.00	0.27	0.056	(0.187)	0.006	0.050
61	5.08	0.20	0.042	(0.186)	0.004	0.038
62	5.17	0.20	0.042	(0.185)	0.004	0.038
63	5.25	0.20	0.042	(0.184)	0.004	0.038
64	5.33	0.23	0.049	(0.183)	0.005	0.044
65	5.42	0.23	0.049	(0.183)	0.005	0.044
66	5.50	0.23	0.049	(0.182)	0.005	0.044
67	5.58	0.27	0.056	(0.181)	0.006	0.050
68	5.67	0.27	0.056	(0.180)	0.006	0.050
69	5.75	0.27	0.056	(0.179)	0.006	0.050
70	5.83	0.27	0.056	(0.179)	0.006	0.050
71	5.92	0.27	0.056	(0.178)	0.006	0.050
72	6.00	0.27	0.056	(0.177)	0.006	0.050
73	6.08	0.30	0.063	(0.176)	0.006	0.057
74	6.17	0.30	0.063	(0.175)	0.006	0.057
75	6.25	0.30	0.063	(0.175)	0.006	0.057
76	6.33	0.30	0.063	(0.174)	0.006	0.057
77	6.42	0.30	0.063	(0.173)	0.006	0.057
78	6.50	0.30	0.063	(0.172)	0.006	0.057
79	6.58	0.33	0.070	(0.172)	0.007	0.063
80	6.67	0.33	0.070	(0.171)	0.007	0.063
81	6.75	0.33	0.070	(0.170)	0.007	0.063
82	6.83	0.33	0.070	(0.169)	0.007	0.063
83	6.92	0.33	0.070	(0.169)	0.007	0.063
84	7.00	0.33	0.070	(0.168)	0.007	0.063
85	7.08	0.33	0.070	(0.167)	0.007	0.063
86	7.17	0.33	0.070	(0.166)	0.007	0.063
87	7.25	0.33	0.070	(0.165)	0.007	0.063
88	7.33	0.37	0.077	(0.165)	0.008	0.069
89	7.42	0.37	0.077	(0.164)	0.008	0.069
90	7.50	0.37	0.077	(0.163)	0.008	0.069
91	7.58	0.40	0.084	(0.162)	0.008	0.076
92	7.67	0.40	0.084	(0.162)	0.008	0.076
93	7.75	0.40	0.084	(0.161)	0.008	0.076
94	7.83	0.43	0.091	(0.160)	0.009	0.082

95	7.92	0.43	0.091	(0.159)	0.009	0.082
96	8.00	0.43	0.091	(0.159)	0.009	0.082
97	8.08	0.50	0.105	(0.158)	0.010	0.094
98	8.17	0.50	0.105	(0.157)	0.010	0.094
99	8.25	0.50	0.105	(0.157)	0.010	0.094
100	8.33	0.50	0.105	(0.156)	0.010	0.094
101	8.42	0.50	0.105	(0.155)	0.010	0.094
102	8.50	0.50	0.105	(0.154)	0.010	0.094
103	8.58	0.53	0.112	(0.154)	0.011	0.101
104	8.67	0.53	0.112	(0.153)	0.011	0.101
105	8.75	0.53	0.112	(0.152)	0.011	0.101
106	8.83	0.57	0.119	(0.151)	0.012	0.107
107	8.92	0.57	0.119	(0.151)	0.012	0.107
108	9.00	0.57	0.119	(0.150)	0.012	0.107
109	9.08	0.63	0.133	(0.149)	0.013	0.120
110	9.17	0.63	0.133	(0.149)	0.013	0.120
111	9.25	0.63	0.133	(0.148)	0.013	0.120
112	9.33	0.67	0.140	(0.147)	0.014	0.126
113	9.42	0.67	0.140	(0.147)	0.014	0.126
114	9.50	0.67	0.140	(0.146)	0.014	0.126
115	9.58	0.70	0.147	(0.145)	0.015	0.132
116	9.67	0.70	0.147	(0.144)	0.015	0.132
117	9.75	0.70	0.147	(0.144)	0.015	0.132
118	9.83	0.73	0.154	(0.143)	0.015	0.139
119	9.92	0.73	0.154	(0.142)	0.015	0.139
120	10.00	0.73	0.154	(0.142)	0.015	0.139
121	10.08	0.50	0.105	(0.141)	0.010	0.094
122	10.17	0.50	0.105	(0.140)	0.010	0.094
123	10.25	0.50	0.105	(0.140)	0.010	0.094
124	10.33	0.50	0.105	(0.139)	0.010	0.094
125	10.42	0.50	0.105	(0.138)	0.010	0.094
126	10.50	0.50	0.105	(0.138)	0.010	0.094
127	10.58	0.67	0.140	(0.137)	0.014	0.126
128	10.67	0.67	0.140	(0.136)	0.014	0.126
129	10.75	0.67	0.140	(0.136)	0.014	0.126
130	10.83	0.67	0.140	(0.135)	0.014	0.126
131	10.92	0.67	0.140	(0.134)	0.014	0.126
132	11.00	0.67	0.140	(0.134)	0.014	0.126
133	11.08	0.63	0.133	(0.133)	0.013	0.120
134	11.17	0.63	0.133	(0.132)	0.013	0.120
135	11.25	0.63	0.133	(0.132)	0.013	0.120
136	11.33	0.63	0.133	(0.131)	0.013	0.120
137	11.42	0.63	0.133	(0.130)	0.013	0.120
138	11.50	0.63	0.133	(0.130)	0.013	0.120
139	11.58	0.57	0.119	(0.129)	0.012	0.107
140	11.67	0.57	0.119	(0.128)	0.012	0.107
141	11.75	0.57	0.119	(0.128)	0.012	0.107
142	11.83	0.60	0.126	(0.127)	0.013	0.113
143	11.92	0.60	0.126	(0.126)	0.013	0.113
144	12.00	0.60	0.126	(0.126)	0.013	0.113
145	12.08	0.83	0.175	(0.125)	0.017	0.157
146	12.17	0.83	0.175	(0.125)	0.017	0.157
147	12.25	0.83	0.175	(0.124)	0.017	0.157
148	12.33	0.87	0.182	(0.123)	0.018	0.164
149	12.42	0.87	0.182	(0.123)	0.018	0.164
150	12.50	0.87	0.182	(0.122)	0.018	0.164
151	12.58	0.93	0.196	(0.121)	0.020	0.176
152	12.67	0.93	0.196	(0.121)	0.020	0.176
153	12.75	0.93	0.196	(0.120)	0.020	0.176
154	12.83	0.97	0.203	(0.120)	0.020	0.183
155	12.92	0.97	0.203	(0.119)	0.020	0.183
156	13.00	0.97	0.203	(0.118)	0.020	0.183
157	13.08	1.13	0.238	(0.118)	0.024	0.214
158	13.17	1.13	0.238	(0.117)	0.024	0.214
159	13.25	1.13	0.238	(0.117)	0.024	0.214
160	13.33	1.13	0.238	(0.116)	0.024	0.214
161	13.42	1.13	0.238	(0.115)	0.024	0.214
162	13.50	1.13	0.238	(0.115)	0.024	0.214
163	13.58	0.77	0.161	(0.114)	0.016	0.145
164	13.67	0.77	0.161	(0.114)	0.016	0.145
165	13.75	0.77	0.161	(0.113)	0.016	0.145
166	13.83	0.77	0.161	(0.113)	0.016	0.145
167	13.92	0.77	0.161	(0.112)	0.016	0.145
168	14.00	0.77	0.161	(0.111)	0.016	0.145
169	14.08	0.90	0.189	(0.111)	0.019	0.170
170	14.17	0.90	0.189	(0.110)	0.019	0.170
171	14.25	0.90	0.189	(0.110)	0.019	0.170
172	14.33	0.87	0.182	(0.109)	0.018	0.164
173	14.42	0.87	0.182	(0.109)	0.018	0.164
174	14.50	0.87	0.182	(0.108)	0.018	0.164
175	14.58	0.87	0.182	(0.107)	0.018	0.164
176	14.67	0.87	0.182	(0.107)	0.018	0.164
177	14.75	0.87	0.182	(0.106)	0.018	0.164
178	14.83	0.83	0.175	(0.106)	0.017	0.157
179	14.92	0.83	0.175	(0.105)	0.017	0.157
180	15.00	0.83	0.175	(0.105)	0.017	0.157
181	15.08	0.80	0.168	(0.104)	0.017	0.151
182	15.17	0.80	0.168	(0.104)	0.017	0.151
183	15.25	0.80	0.168	(0.103)	0.017	0.151
184	15.33	0.77	0.161	(0.103)	0.016	0.145
185	15.42	0.77	0.161	(0.102)	0.016	0.145
186	15.50	0.77	0.161	(0.102)	0.016	0.145
187	15.58	0.63	0.133	(0.101)	0.013	0.120
188	15.67	0.63	0.133	(0.101)	0.013	0.120
189	15.75	0.63	0.133	(0.100)	0.013	0.120
190	15.83	0.63	0.133	(0.100)	0.013	0.120
191	15.92	0.63	0.133	(0.099)	0.013	0.120
192	16.00	0.63	0.133	(0.099)	0.013	0.120
193	16.08	0.13	0.028	(0.098)	0.003	0.025

194	16.17	0.13	0.028	(0.098)	0.003	0.025
195	16.25	0.13	0.028	(0.097)	0.003	0.025
196	16.33	0.13	0.028	(0.097)	0.003	0.025
197	16.42	0.13	0.028	(0.096)	0.003	0.025
198	16.50	0.13	0.028	(0.096)	0.003	0.025
199	16.58	0.10	0.021	(0.095)	0.002	0.019
200	16.67	0.10	0.021	(0.095)	0.002	0.019
201	16.75	0.10	0.021	(0.094)	0.002	0.019
202	16.83	0.10	0.021	(0.094)	0.002	0.019
203	16.92	0.10	0.021	(0.093)	0.002	0.019
204	17.00	0.10	0.021	(0.093)	0.002	0.019
205	17.08	0.17	0.035	(0.092)	0.003	0.031
206	17.17	0.17	0.035	(0.092)	0.003	0.031
207	17.25	0.17	0.035	(0.091)	0.003	0.031
208	17.33	0.17	0.035	(0.091)	0.003	0.031
209	17.42	0.17	0.035	(0.090)	0.003	0.031
210	17.50	0.17	0.035	(0.090)	0.003	0.031
211	17.58	0.17	0.035	(0.089)	0.003	0.031
212	17.67	0.17	0.035	(0.089)	0.003	0.031
213	17.75	0.17	0.035	(0.089)	0.003	0.031
214	17.83	0.13	0.028	(0.088)	0.003	0.025
215	17.92	0.13	0.028	(0.088)	0.003	0.025
216	18.00	0.13	0.028	(0.087)	0.003	0.025
217	18.08	0.13	0.028	(0.087)	0.003	0.025
218	18.17	0.13	0.028	(0.086)	0.003	0.025
219	18.25	0.13	0.028	(0.086)	0.003	0.025
220	18.33	0.13	0.028	(0.086)	0.003	0.025
221	18.42	0.13	0.028	(0.085)	0.003	0.025
222	18.50	0.13	0.028	(0.085)	0.003	0.025
223	18.58	0.10	0.021	(0.084)	0.002	0.019
224	18.67	0.10	0.021	(0.084)	0.002	0.019
225	18.75	0.10	0.021	(0.084)	0.002	0.019
226	18.83	0.07	0.014	(0.083)	0.001	0.013
227	18.92	0.07	0.014	(0.083)	0.001	0.013
228	19.00	0.07	0.014	(0.082)	0.001	0.013
229	19.08	0.10	0.021	(0.082)	0.002	0.019
230	19.17	0.10	0.021	(0.082)	0.002	0.019
231	19.25	0.10	0.021	(0.081)	0.002	0.019
232	19.33	0.13	0.028	(0.081)	0.003	0.025
233	19.42	0.13	0.028	(0.080)	0.003	0.025
234	19.50	0.13	0.028	(0.080)	0.003	0.025
235	19.58	0.10	0.021	(0.080)	0.002	0.019
236	19.67	0.10	0.021	(0.079)	0.002	0.019
237	19.75	0.10	0.021	(0.079)	0.002	0.019
238	19.83	0.07	0.014	(0.079)	0.001	0.013
239	19.92	0.07	0.014	(0.078)	0.001	0.013
240	20.00	0.07	0.014	(0.078)	0.001	0.013
241	20.08	0.10	0.021	(0.078)	0.002	0.019
242	20.17	0.10	0.021	(0.077)	0.002	0.019
243	20.25	0.10	0.021	(0.077)	0.002	0.019
244	20.33	0.10	0.021	(0.077)	0.002	0.019
245	20.42	0.10	0.021	(0.076)	0.002	0.019
246	20.50	0.10	0.021	(0.076)	0.002	0.019
247	20.58	0.10	0.021	(0.076)	0.002	0.019
248	20.67	0.10	0.021	(0.075)	0.002	0.019
249	20.75	0.10	0.021	(0.075)	0.002	0.019
250	20.83	0.07	0.014	(0.075)	0.001	0.013
251	20.92	0.07	0.014	(0.074)	0.001	0.013
252	21.00	0.07	0.014	(0.074)	0.001	0.013
253	21.08	0.10	0.021	(0.074)	0.002	0.019
254	21.17	0.10	0.021	(0.073)	0.002	0.019
255	21.25	0.10	0.021	(0.073)	0.002	0.019
256	21.33	0.07	0.014	(0.073)	0.001	0.013
257	21.42	0.07	0.014	(0.073)	0.001	0.013
258	21.50	0.07	0.014	(0.072)	0.001	0.013
259	21.58	0.10	0.021	(0.072)	0.002	0.019
260	21.67	0.10	0.021	(0.072)	0.002	0.019
261	21.75	0.10	0.021	(0.072)	0.002	0.019
262	21.83	0.07	0.014	(0.071)	0.001	0.013
263	21.92	0.07	0.014	(0.071)	0.001	0.013
264	22.00	0.07	0.014	(0.071)	0.001	0.013
265	22.08	0.10	0.021	(0.071)	0.002	0.019
266	22.17	0.10	0.021	(0.070)	0.002	0.019
267	22.25	0.10	0.021	(0.070)	0.002	0.019
268	22.33	0.07	0.014	(0.070)	0.001	0.013
269	22.42	0.07	0.014	(0.070)	0.001	0.013
270	22.50	0.07	0.014	(0.069)	0.001	0.013
271	22.58	0.07	0.014	(0.069)	0.001	0.013
272	22.67	0.07	0.014	(0.069)	0.001	0.013
273	22.75	0.07	0.014	(0.069)	0.001	0.013
274	22.83	0.07	0.014	(0.069)	0.001	0.013
275	22.92	0.07	0.014	(0.069)	0.001	0.013
276	23.00	0.07	0.014	(0.068)	0.001	0.013
277	23.08	0.07	0.014	(0.068)	0.001	0.013
278	23.17	0.07	0.014	(0.068)	0.001	0.013
279	23.25	0.07	0.014	(0.068)	0.001	0.013
280	23.33	0.07	0.014	(0.068)	0.001	0.013
281	23.42	0.07	0.014	(0.068)	0.001	0.013
282	23.50	0.07	0.014	(0.068)	0.001	0.013
283	23.58	0.07	0.014	(0.067)	0.001	0.013
284	23.67	0.07	0.014	(0.067)	0.001	0.013
285	23.75	0.07	0.014	(0.067)	0.001	0.013
286	23.83	0.07	0.014	(0.067)	0.001	0.013
287	23.92	0.07	0.014	(0.067)	0.001	0.013
288	24.00	0.07	0.014	(0.067)	0.001	0.013

(Loss Rate Not Used)

Sum = 100.0 Sum = 18.9

Flood volume = Effective rainfall 1.57(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 9.1(Ac.Ft)

Total soil loss = 0.17(In)
Total soil loss = 1.016(Ac.Ft)
Total rainfall = 1.75(In)
Flood volume = 398152.3 Cubic Feet
Total soil loss = 44239.1 Cubic Feet

Peak flow rate of this hydrograph = 14.982(CFS)

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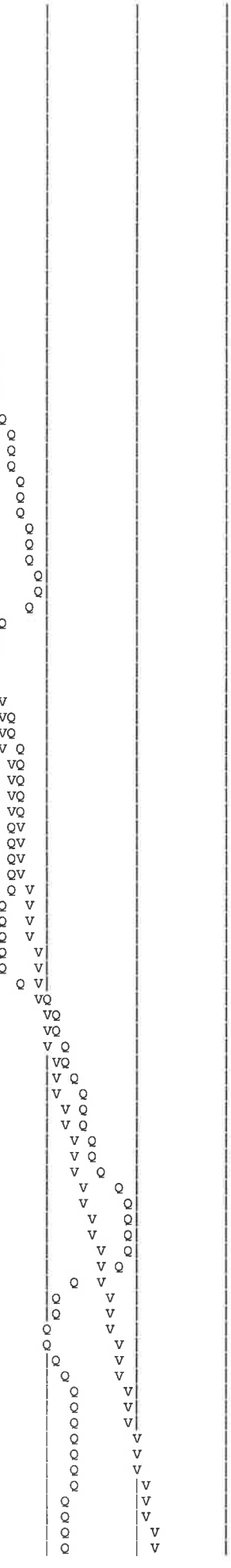
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 5.0 10.0 15.0 20.0
0+ 5	0.0013	0.18	Q
0+10	0.0055	0.61	VQ
0+15	0.0106	0.75	VQ
0+20	0.0168	0.90	VQ
0+25	0.0247	1.15	V Q
0+30	0.0332	1.23	V Q
0+35	0.0420	1.28	V Q
0+40	0.0510	1.30	V Q
0+45	0.0600	1.32	V Q
0+50	0.0698	1.41	V Q
0+55	0.0810	1.63	V Q
1+ 0	0.0927	1.70	V Q
1+ 5	0.1040	1.64	V Q
1+10	0.1139	1.44	V Q
1+15	0.1235	1.38	V Q
1+20	0.1328	1.36	V Q
1+25	0.1421	1.35	V Q
1+30	0.1514	1.34	V Q
1+35	0.1605	1.33	V Q
1+40	0.1697	1.33	V Q
1+45	0.1788	1.33	V Q
1+50	0.1886	1.42	V Q
1+55	0.1998	1.63	V Q
2+ 0	0.2115	1.70	V Q
2+ 5	0.2235	1.73	V Q
2+10	0.2355	1.75	V Q
2+15	0.2476	1.76	V Q
2+20	0.2597	1.76	V Q
2+25	0.2719	1.77	V Q
2+30	0.2841	1.77	V Q
2+35	0.2969	1.86	V Q
2+40	0.3112	2.08	V Q
2+45	0.3260	2.14	V Q
2+50	0.3409	2.17	V Q
2+55	0.3560	2.19	V Q
3+ 0	0.3712	2.20	V Q
3+ 5	0.3864	2.21	V Q
3+10	0.4016	2.21	V Q
3+15	0.4168	2.21	V Q
3+20	0.4321	2.21	V Q
3+25	0.4473	2.21	V Q
3+30	0.4625	2.21	V Q
3+35	0.4778	2.21	V Q
3+40	0.4930	2.21	V Q
3+45	0.5082	2.21	V Q
3+50	0.5241	2.30	V Q
3+55	0.5415	2.52	V Q
4+ 0	0.5593	2.58	V Q
4+ 5	0.5773	2.61	V Q
4+10	0.5954	2.63	V Q
4+15	0.6136	2.64	V Q
4+20	0.6325	2.74	V Q
4+25	0.6528	2.96	V Q
4+30	0.6737	3.03	V Q
4+35	0.6948	3.06	V Q
4+40	0.7159	3.07	V Q
4+45	0.7372	3.08	V Q
4+50	0.7591	3.18	V Q
4+55	0.7825	3.40	V Q
5+ 0	0.8064	3.47	V Q
5+ 5	0.8293	3.32	V Q
5+10	0.8493	2.90	V Q
5+15	0.8684	2.78	V Q
5+20	0.8878	2.82	V Q
5+25	0.9085	3.01	V Q
5+30	0.9296	3.05	V Q
5+35	0.9513	3.16	V Q
5+40	0.9746	3.38	V Q
5+45	0.9984	3.46	V Q
5+50	1.0225	3.49	V Q
5+55	1.0467	3.52	V Q
6+ 0	1.0710	3.53	V Q
6+ 5	1.0959	3.62	V Q
6+10	1.1224	3.85	V Q
6+15	1.1494	3.91	V Q
6+20	1.1765	3.94	V Q
6+25	1.2038	3.96	V Q
6+30	1.2311	3.97	V Q
6+35	1.2591	4.07	V Q
6+40	1.2887	4.29	V Q
6+45	1.3187	4.35	V Q
6+50	1.3489	4.38	V Q

6+55	1.3792	4.40	
7+ 0	1.4096	4.41	
7+ 5	1.4400	4.42	
7+10	1.4705	4.42	
7+15	1.5009	4.42	
7+20	1.5320	4.52	
7+25	1.5646	4.73	
7+30	1.5976	4.80	
7+35	1.6315	4.92	
7+40	1.6670	5.15	
7+45	1.7030	5.23	
7+50	1.7399	5.36	
7+55	1.7784	5.59	
8+ 0	1.8174	5.67	
8+ 5	1.8580	5.89	
8+10	1.9017	6.34	
8+15	1.9463	6.48	
8+20	1.9914	6.55	
8+25	2.0368	6.59	
8+30	2.0824	6.61	
8+35	2.1286	6.72	
8+40	2.1764	6.94	
8+45	2.2247	7.01	
8+50	2.2738	7.13	
8+55	2.3245	7.36	
9+ 0	2.3757	7.44	
9+ 5	2.4285	7.66	
9+10	2.4844	8.11	
9+15	2.5412	8.25	
9+20	2.5991	8.41	
9+25	2.6588	8.67	
9+30	2.7191	8.75	
9+35	2.7803	8.89	
9+40	2.8432	9.13	
9+45	2.9066	9.21	
9+50	2.9710	9.34	
9+55	3.0369	9.57	
10+ 0	3.1034	9.65	
10+ 5	3.1657	9.05	
10+10	3.2178	7.56	
10+15	3.2668	7.11	
10+20	3.3143	6.91	
10+25	3.3611	6.79	
10+30	3.4074	6.72	
10+35	3.4565	7.13	
10+40	3.5127	8.17	
10+45	3.5713	8.50	
10+50	3.6309	8.65	
10+55	3.6910	8.73	
11+ 0	3.7515	8.79	
11+ 5	3.8117	8.73	
11+10	3.8705	8.54	
11+15	3.9289	8.48	
11+20	3.9870	8.44	
11+25	4.0451	8.43	
11+30	4.1030	8.42	
11+35	4.1597	8.23	
11+40	4.2134	7.79	
11+45	4.2661	7.66	
11+50	4.3191	7.69	
11+55	4.3733	7.87	
12+ 0	4.4278	7.92	
12+ 5	4.4869	8.57	
12+10	4.5563	10.09	
12+15	4.6291	10.56	
12+20	4.7039	10.87	
12+25	4.7811	11.21	
12+30	4.8593	11.35	
12+35	4.9392	11.61	
12+40	5.0225	12.09	
12+45	5.1068	12.24	
12+50	5.1921	12.39	
12+55	5.2792	12.65	
13+ 0	5.3670	12.74	
13+ 5	5.4581	13.24	
13+10	5.5569	14.34	
13+15	5.6580	14.68	
13+20	5.7602	14.84	
13+25	5.8630	14.93	
13+30	5.9662	14.98	
13+35	6.0627	14.01	
13+40	6.1430	11.67	
13+45	6.2184	10.94	
13+50	6.2914	10.61	
13+55	6.3632	10.42	
14+ 0	6.4342	10.31	
14+ 5	6.5072	10.60	
14+10	6.5857	11.40	
14+15	6.6661	11.67	
14+20	6.7466	11.70	
14+25	6.8261	11.55	
14+30	6.9055	11.52	
14+35	6.9849	11.52	
14+40	7.0642	11.52	
14+45	7.1435	11.51	
14+50	7.2221	11.42	
14+55	7.2993	11.20	
15+ 0	7.3759	11.13	
15+ 5	7.4517	11.01	

15+10	7.5259	10.78		Q	V
15+15	7.5996	10.70		Q	V
15+20	7.6724	10.57		Q	V
15+25	7.7436	10.33		Q	V
15+30	7.8142	10.26		Q	V
15+35	7.8821	9.86		Q	V
15+40	7.9439	8.97		Q	V
15+45	8.0038	8.70		Q	V
15+50	8.0628	8.57		Q	V
15+55	8.1213	8.50		Q	V
16+ 0	8.1795	8.45		Q	V
16+ 5	8.2281	7.06		Q	V
16+10	8.2543	3.81		Q	V
16+15	8.2737	2.81		Q	V
16+20	8.2900	2.36		Q	V
16+25	8.3045	2.11		Q	V
16+30	8.3179	1.95		Q	V
16+35	8.3300	1.76		Q	V
16+40	8.3401	1.46		Q	V
16+45	8.3497	1.40		Q	V
16+50	8.3591	1.37		Q	V
16+55	8.3684	1.35		Q	V
17+ 0	8.3776	1.34		Q	V
17+ 5	8.3881	1.51		Q	V
17+10	8.4014	1.94		Q	V
17+15	8.4157	2.07		Q	V
17+20	8.4304	2.13		Q	V
17+25	8.4453	2.17		Q	V
17+30	8.4604	2.19		Q	V
17+35	8.4756	2.20		Q	V
17+40	8.4908	2.21		Q	V
17+45	8.5060	2.21		Q	V
17+50	8.5206	2.12		Q	V
17+55	8.5338	1.91		Q	V
18+ 0	8.5464	1.84		Q	V
18+ 5	8.5589	1.81		Q	V
18+10	8.5712	1.79		Q	V
18+15	8.5835	1.78		Q	V
18+20	8.5957	1.77		Q	V
18+25	8.6079	1.77		Q	V
18+30	8.6201	1.77		Q	V
18+35	8.6316	1.68		Q	V
18+40	8.6417	1.46		Q	V
18+45	8.6513	1.40		Q	V
18+50	8.6601	1.28		Q	V
18+55	8.6673	1.04		Q	V
19+ 0	8.6740	0.97		Q	V
19+ 5	8.6810	1.02		Q	V
19+10	8.6894	1.21		Q	V
19+15	8.6981	1.27		Q	V
19+20	8.7076	1.38		Q	V
19+25	8.7187	1.61		Q	V
19+30	8.7304	1.69		Q	V
19+35	8.7416	1.63		Q	V
19+40	8.7515	1.44		Q	V
19+45	8.7611	1.38		Q	V
19+50	8.7698	1.27		Q	V
19+55	8.7770	1.04		Q	V
20+ 0	8.7836	0.97		Q	V
20+ 5	8.7907	1.02		Q	V
20+10	8.7990	1.21		Q	V
20+15	8.8078	1.27		Q	V
20+20	8.8167	1.29		Q	V
20+25	8.8257	1.30		Q	V
20+30	8.8347	1.32		Q	V
20+35	8.8438	1.32		Q	V
20+40	8.8530	1.33		Q	V
20+45	8.8621	1.33		Q	V
20+50	8.8706	1.24		Q	V
20+55	8.8777	1.02		Q	V
21+ 0	8.8842	0.95		Q	V
21+ 5	8.8912	1.02		Q	V
21+10	8.8996	1.21		Q	V
21+15	8.9083	1.27		Q	V
21+20	8.9166	1.20		Q	V
21+25	8.9235	1.00		Q	V
21+30	8.9300	0.94		Q	V
21+35	8.9369	1.01		Q	V
21+40	8.9453	1.21		Q	V
21+45	8.9540	1.27		Q	V
21+50	8.9623	1.20		Q	V
21+55	8.9692	1.00		Q	V
22+ 0	8.9757	0.94		Q	V
22+ 5	8.9826	1.01		Q	V
22+10	8.9910	1.21		Q	V
22+15	8.9997	1.27		Q	V
22+20	9.0080	1.20		Q	V
22+25	9.0149	1.00		Q	V
22+30	9.0214	0.94		Q	V
22+35	9.0277	0.92		Q	V
22+40	9.0339	0.91		Q	V
22+45	9.0401	0.90		Q	V
22+50	9.0463	0.89		Q	V
22+55	9.0523	0.88		Q	V
23+ 0	9.0584	0.88		Q	V
23+ 5	9.0645	0.88		Q	V
23+10	9.0706	0.88		Q	V
23+15	9.0767	0.88		Q	V
23+20	9.0828	0.88		Q	V

23+25	9.0889	0.88	Q				V
23+30	9.0950	0.88	Q				V
23+35	9.1011	0.88	Q				V
23+40	9.1072	0.88	Q				V
23+45	9.1133	0.88	Q				V
23+50	9.1194	0.88	Q				V
23+55	9.1255	0.88	Q				V
24+ 0	9.1316	0.88	Q				V
24+ 5	9.1364	0.70	Q				V
24+10	9.1383	0.27	Q				V
24+15	9.1392	0.14	Q				V
24+20	9.1398	0.08	Q				V
24+25	9.1401	0.05	Q				V
24+30	9.1402	0.02	Q				V
24+35	9.1403	0.01	Q				V

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/13/20 File: 3828PR515.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.080 Hr.
Lag time = 4.78 Min.
25% of lag time = 1.19 Min.
40% of lag time = 1.91 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	0.50	34.83

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.20	83.58

STORM EVENT (YEAR) = 5.00
Area Averaged 2-Year Rainfall = 0.500(In)
Area Averaged 100-Year Rainfall = 1.200(In)

Point rain (area averaged) = 0.664(In)
Areal adjustment factor = 99.94 %
Adjusted average point rain = 0.664(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	56.00	0.900

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	36.0	0.706	0.900	0.134	1.000	0.134
					Sum (F) =	0.134

Area averaged mean soil loss (F) (In/Hr) = 0.134
Minimum soil loss rate ((In/Hr)) = 0.067
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.100

Slope of intensity-duration curve for a 1 hour storm =0.5000

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	104.614	20.612	14.469
2	0.167	209.229	48.679	34.170
3	0.250	313.843	14.978	10.514
4	0.333	418.458	6.821	4.788
5	0.417	523.072	3.802	2.669
6	0.500	627.687	2.435	1.709
7	0.583	732.301	1.462	1.026
8	0.667	836.916	1.210	0.849
		Sum =	100.000 Sum=	70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate (In./Hr) Max	Low	Effective (In/Hr)
1	0.08	4.20	0.334	(0.134)	0.033	0.301
2	0.17	4.30	0.342	(0.134)	0.034	0.308
3	0.25	5.00	0.398	(0.134)	0.040	0.358
4	0.33	5.00	0.398	(0.134)	0.040	0.358
5	0.42	5.80	0.462	(0.134)	0.046	0.416
6	0.50	6.50	0.518	(0.134)	0.052	0.466
7	0.58	7.40	0.589	(0.134)	0.059	0.530
8	0.67	8.60	0.685	(0.134)	0.068	0.616
9	0.75	12.30	0.979	(0.134)	0.098	0.881
10	0.83	29.10	2.317	0.134	(0.232)	2.183
11	0.92	6.80	0.541	(0.134)	0.054	0.487
12	1.00	5.00	0.398	(0.134)	0.040	0.358
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	7.3

Flood volume = Effective rainfall 0.61(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 3.5(Ac.Ft)
Total soil loss = 0.06(In)
Total soil loss = 0.338(Ac.Ft)
Total rainfall = 0.66(In)
Flood volume = 153041.4 Cubic Feet
Total soil loss = 14720.5 Cubic Feet

Peak flow rate of this hydrograph = 96.852(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 25.0 50.0 75.0 100.0
0+ 5	0.0300	4.36	VQ
0+10	0.1316	14.75	V Q
0+15	0.2617	18.89	V Q
0+20	0.4140	22.12	V Q
0+25	0.5815	24.32	V Q
0+30	0.7728	27.78	V Q
0+35	0.9896	31.48	VQ
0+40	1.2381	36.08	Q
0+45	1.5411	43.99	Q
0+50	2.0465	73.39	V Q
0+55	2.7135	96.85	V Q
1+ 0	3.0745	52.42	Q V
1+ 5	3.2961	32.18	Q V
1+10	3.3962	14.52	Q V
1+15	3.4525	8.18	Q V
1+20	3.4854	4.78	Q V
1+25	3.5059	2.97	Q V
1+30	3.5113	0.78	Q V
1+35	3.5133	0.30	Q V

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/13/20 File: 3828PR535.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.080 Hr.
Lag time = 4.78 Min.
25% of lag time = 1.19 Min.
40% of lag time = 1.91 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	0.80	55.72

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.86	129.55

STORM EVENT (YEAR) = 5.00
Area Averaged 2-Year Rainfall = 0.800(In)
Area Averaged 100-Year Rainfall = 1.860(In)

Point rain (area averaged) = 1.048(In)
Areal adjustment factor = 99.97 %
Adjusted average point rain = 1.048(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	56.00	0.900

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	36.0	0.706	0.900	0.134	1.000	0.134
					Sum (F) =	0.134

Area averaged mean soil loss (F) (In/Hr) = 0.134
Minimum soil loss rate ((In/Hr)) = 0.067
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.100

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	104.614	20.612	14.469
2	0.167	209.229	48.679	34.170
3	0.250	313.843	14.978	10.514
4	0.333	418.458	6.821	4.788
5	0.417	523.072	3.802	2.669
6	0.500	627.687	2.435	1.709
7	0.583	732.301	1.462	1.026
8	0.667	836.916	1.210	0.849
			Sum = 100.000	Sum= 70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.163	(0.134)	0.016	0.147
2	0.17	1.30	0.163	(0.134)	0.016	0.147
3	0.25	1.10	0.138	(0.134)	0.014	0.124
4	0.33	1.50	0.189	(0.134)	0.019	0.170
5	0.42	1.50	0.189	(0.134)	0.019	0.170
6	0.50	1.80	0.226	(0.134)	0.023	0.204
7	0.58	1.50	0.189	(0.134)	0.019	0.170
8	0.67	1.80	0.226	(0.134)	0.023	0.204
9	0.75	1.80	0.226	(0.134)	0.023	0.204
10	0.83	1.50	0.189	(0.134)	0.019	0.170
11	0.92	1.60	0.201	(0.134)	0.020	0.181
12	1.00	1.80	0.226	(0.134)	0.023	0.204
13	1.08	2.20	0.277	(0.134)	0.028	0.249
14	1.17	2.20	0.277	(0.134)	0.028	0.249
15	1.25	2.20	0.277	(0.134)	0.028	0.249
16	1.33	2.00	0.252	(0.134)	0.025	0.226
17	1.42	2.60	0.327	(0.134)	0.033	0.294
18	1.50	2.70	0.340	(0.134)	0.034	0.306
19	1.58	2.40	0.302	(0.134)	0.030	0.272
20	1.67	2.70	0.340	(0.134)	0.034	0.306
21	1.75	3.30	0.415	(0.134)	0.041	0.373
22	1.83	3.10	0.390	(0.134)	0.039	0.351
23	1.92	2.90	0.365	(0.134)	0.036	0.328
24	2.00	3.00	0.377	(0.134)	0.038	0.340
25	2.08	3.10	0.390	(0.134)	0.039	0.351
26	2.17	4.20	0.528	(0.134)	0.053	0.475
27	2.25	5.00	0.629	(0.134)	0.063	0.566
28	2.33	3.50	0.440	(0.134)	0.044	0.396
29	2.42	6.80	0.855	(0.134)	0.086	0.770
30	2.50	7.30	0.918	(0.134)	0.092	0.826
31	2.58	8.20	1.031	(0.134)	0.103	0.928
32	2.67	5.90	0.742	(0.134)	0.074	0.668
33	2.75	2.00	0.252	(0.134)	0.025	0.226
34	2.83	1.80	0.226	(0.134)	0.023	0.204
35	2.92	1.80	0.226	(0.134)	0.023	0.204
36	3.00	0.60	0.075	(0.134)	0.008	0.068

(Loss Rate Not Used)

Sum = 100.0 Sum = 11.3

Flood volume = Effective rainfall 0.94(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 5.5(Ac.Ft)
Total soil loss = 0.10(In)
Total soil loss = 0.608(Ac.Ft)
Total rainfall = 1.05(In)
Flood volume = 238459.3 Cubic Feet
Total soil loss = 26495.5 Cubic Feet

Peak flow rate of this hydrograph = 56.585(CFS)

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3 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 15.0 30.0 45.0 60.0
0+ 5	0.0147	2.13	VQ
0+10	0.0640	7.16	V Q
0+15	0.1217	8.38	V Q
0+20	0.1834	8.97	V Q
0+25	0.2569	10.67	V Q
0+30	0.3381	11.78	V Q
0+35	0.4259	12.76	V Q
0+40	0.5130	12.65	V Q
0+45	0.6072	13.67	V Q
0+50	0.7001	13.49	V Q
0+55	0.7874	12.66	V Q
1+ 0	0.8775	13.09	V Q
1+ 5	0.9776	14.53	V Q
1+10	1.0897	16.28	V Q
1+15	1.2059	16.87	V Q
1+20	1.3216	16.80	V Q
1+25	1.4397	17.15	VQ
1+30	1.5741	19.51	V Q
1+35	1.7124	20.08	VQ
1+40	1.8490	19.83	Q
1+45	1.9992	21.82	Q
1+50	2.1654	24.13	VQ
1+55	2.3299	23.88	Q V
2+ 0	2.4914	23.46	Q V
2+ 5	2.6559	23.88	Q V
2+10	2.8359	26.14	Q V
2+15	3.0555	31.88	QV
2+20	3.2890	33.91	Q V
2+25	3.5305	35.07	Q V
2+30	3.8586	47.65	V Q
2+35	4.2350	54.65	V Q
2+40	4.6247	56.58	V Q
2+45	4.9246	43.54	Q V
2+50	5.1076	26.57	Q V
2+55	5.2488	20.51	Q V
3+ 0	5.3594	16.05	Q V
3+ 5	5.4203	8.84	Q V

3+10	5.4485	4.10	| Q	|	|	|	V|
3+15	5.4624	2.02	|Q	|	|	|	V|
3+20	5.4688	0.93	Q	|	|	|	V|
3+25	5.4722	0.50	Q	|	|	|	V|
3+30	5.4739	0.24	Q	|	|	|	V|
3+35	5.4743	0.06	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/13/20 File: 3828PR565.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.080 Hr.
Lag time = 4.78 Min.
25% of lag time = 1.19 Min.
40% of lag time = 1.91 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.15	80.10

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	2.50	174.13

STORM EVENT (YEAR) = 5.00
Area Averaged 2-Year Rainfall = 1.150(In)
Area Averaged 100-Year Rainfall = 2.500(In)

Point rain (area averaged) = 1.466(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 1.466(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	56.00	0.900

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	36.0	0.706	0.900	0.134	1.000	0.134
					Sum (F) =	0.134

Area averaged mean soil loss (F) (In/Hr) = 0.134
Minimum soil loss rate ((In/Hr)) = 0.067
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.100

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	104.614	20.612	14.469
2	0.167	209.229	48.679	34.170
3	0.250	313.843	14.978	10.514
4	0.333	418.458	6.821	4.788
5	0.417	523.072	3.802	2.669
6	0.500	627.687	2.435	1.709
7	0.583	732.301	1.462	1.026
8	0.667	836.916	1.210	0.849
			Sum = 100.000	Sum= 70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.088	(0.134)	0.009	0.079
2	0.17	0.60	0.106	(0.134)	0.011	0.095
3	0.25	0.60	0.106	(0.134)	0.011	0.095
4	0.33	0.60	0.106	(0.134)	0.011	0.095
5	0.42	0.60	0.106	(0.134)	0.011	0.095
6	0.50	0.70	0.123	(0.134)	0.012	0.111
7	0.58	0.70	0.123	(0.134)	0.012	0.111
8	0.67	0.70	0.123	(0.134)	0.012	0.111
9	0.75	0.70	0.123	(0.134)	0.012	0.111
10	0.83	0.70	0.123	(0.134)	0.012	0.111
11	0.92	0.70	0.123	(0.134)	0.012	0.111
12	1.00	0.80	0.141	(0.134)	0.014	0.127
13	1.08	0.80	0.141	(0.134)	0.014	0.127
14	1.17	0.80	0.141	(0.134)	0.014	0.127
15	1.25	0.80	0.141	(0.134)	0.014	0.127
16	1.33	0.80	0.141	(0.134)	0.014	0.127
17	1.42	0.80	0.141	(0.134)	0.014	0.127
18	1.50	0.80	0.141	(0.134)	0.014	0.127
19	1.58	0.80	0.141	(0.134)	0.014	0.127
20	1.67	0.80	0.141	(0.134)	0.014	0.127
21	1.75	0.80	0.141	(0.134)	0.014	0.127
22	1.83	0.80	0.141	(0.134)	0.014	0.127
23	1.92	0.80	0.141	(0.134)	0.014	0.127
24	2.00	0.90	0.158	(0.134)	0.016	0.142
25	2.08	0.80	0.141	(0.134)	0.014	0.127
26	2.17	0.90	0.158	(0.134)	0.016	0.142
27	2.25	0.90	0.158	(0.134)	0.016	0.142
28	2.33	0.90	0.158	(0.134)	0.016	0.142
29	2.42	0.90	0.158	(0.134)	0.016	0.142
30	2.50	0.90	0.158	(0.134)	0.016	0.142
31	2.58	0.90	0.158	(0.134)	0.016	0.142
32	2.67	0.90	0.158	(0.134)	0.016	0.142
33	2.75	1.00	0.176	(0.134)	0.018	0.158
34	2.83	1.00	0.176	(0.134)	0.018	0.158
35	2.92	1.00	0.176	(0.134)	0.018	0.158
36	3.00	1.00	0.176	(0.134)	0.018	0.158
37	3.08	1.00	0.176	(0.134)	0.018	0.158
38	3.17	1.10	0.193	(0.134)	0.019	0.174
39	3.25	1.10	0.193	(0.134)	0.019	0.174
40	3.33	1.10	0.193	(0.134)	0.019	0.174
41	3.42	1.20	0.211	(0.134)	0.021	0.190
42	3.50	1.30	0.229	(0.134)	0.023	0.206
43	3.58	1.40	0.246	(0.134)	0.025	0.222
44	3.67	1.40	0.246	(0.134)	0.025	0.222
45	3.75	1.50	0.264	(0.134)	0.026	0.237
46	3.83	1.50	0.264	(0.134)	0.026	0.237
47	3.92	1.60	0.281	(0.134)	0.028	0.253
48	4.00	1.60	0.281	(0.134)	0.028	0.253
49	4.08	1.70	0.299	(0.134)	0.030	0.269
50	4.17	1.80	0.317	(0.134)	0.032	0.285
51	4.25	1.90	0.334	(0.134)	0.033	0.301
52	4.33	2.00	0.352	(0.134)	0.035	0.317
53	4.42	2.10	0.369	(0.134)	0.037	0.332
54	4.50	2.10	0.369	(0.134)	0.037	0.332
55	4.58	2.20	0.387	(0.134)	0.039	0.348
56	4.67	2.30	0.405	(0.134)	0.040	0.364
57	4.75	2.40	0.422	(0.134)	0.042	0.380
58	4.83	2.40	0.422	(0.134)	0.042	0.380
59	4.92	2.50	0.440	(0.134)	0.044	0.396
60	5.00	2.60	0.457	(0.134)	0.046	0.412
61	5.08	3.10	0.545	(0.134)	0.055	0.491
62	5.17	3.60	0.633	(0.134)	0.063	0.570
63	5.25	3.90	0.686	(0.134)	0.069	0.617
64	5.33	4.20	0.739	(0.134)	0.074	0.665
65	5.42	4.70	0.827	(0.134)	0.083	0.744
66	5.50	5.60	0.985	(0.134)	0.099	0.887
67	5.58	1.90	0.334	(0.134)	0.033	0.301
68	5.67	0.90	0.158	(0.134)	0.016	0.142
69	5.75	0.60	0.106	(0.134)	0.011	0.095
70	5.83	0.50	0.088	(0.134)	0.009	0.079
71	5.92	0.30	0.053	(0.134)	0.005	0.047
72	6.00	0.20	0.035	(0.134)	0.004	0.032

(Loss Rate Not Used)

Sum = 100.0 Sum = 15.8

Flood volume = Effective rainfall 1.32(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 7.7(Ac.Ft)
Total soil loss = 0.15(In)
Total soil loss = 0.851(Ac.Ft)
Total rainfall = 1.47(In)
Flood volume = 333549.5 Cubic Feet
Total soil loss = 37061.1 Cubic Feet

Peak flow rate of this hydrograph = 51.344(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	15.0	30.0	45.0	60.0
0+ 5	0.0079	1.15	Q	|	|	|	|

0+10	0.0360	4.08	V Q
0+15	0.0736	5.46	V Q
0+20	0.1149	6.00	V Q
0+25	0.1582	6.29	V Q
0+30	0.2043	6.69	V Q
0+35	0.2549	7.34	V Q
0+40	0.3072	7.59	V Q
0+45	0.3601	7.68	V Q
0+50	0.4133	7.73	V Q
0+55	0.4667	7.75	V Q
1+ 0	0.5218	8.00	V Q
1+ 5	0.5807	8.55	V Q
1+10	0.6408	8.72	V Q
1+15	0.7013	8.80	V Q
1+20	0.7622	8.84	V Q
1+25	0.8233	8.86	VQ
1+30	0.8844	8.88	VQ
1+35	0.9457	8.89	VQ
1+40	1.0069	8.89	Q
1+45	1.0682	8.89	Q
1+50	1.1295	8.89	Q
1+55	1.1907	8.89	QV
2+ 0	1.2536	9.12	Q
2+ 5	1.3185	9.44	Q
2+10	1.3825	9.29	QV
2+15	1.4496	9.74	QV
2+20	1.5176	9.87	QV
2+25	1.5860	9.93	Q V
2+30	1.6547	9.97	Q V
2+35	1.7235	9.99	Q V
2+40	1.7923	9.99	Q V
2+45	1.8628	10.24	Q V
2+50	1.9370	10.78	Q V
2+55	2.0124	10.94	Q V
3+ 0	2.0883	11.02	Q V
3+ 5	2.1644	11.06	Q V
3+10	2.2424	11.32	Q V
3+15	2.3242	11.88	Q V
3+20	2.4072	12.06	Q V
3+25	2.4923	12.36	Q V
3+30	2.5831	13.17	Q V
3+35	2.6804	14.14	Q V
3+40	2.7833	14.94	Q V
3+45	2.8898	15.46	Q V
3+50	3.0010	16.15	Q V
3+55	3.1156	16.63	Q V
4+ 0	3.2347	17.31	Q V
4+ 5	3.3572	17.77	Q V
4+10	3.4857	18.66	Q V
4+15	3.6210	19.66	Q V
4+20	3.7637	20.71	Q V
4+25	3.9137	21.78	Q V
4+30	4.0696	22.65	Q V
4+35	4.2294	23.20	Q V
4+40	4.3957	24.15	Q V
4+45	4.5692	25.19	Q V
4+50	4.7484	26.03	Q V
4+55	4.9314	26.57	Q V
5+ 0	5.1208	27.50	Q V
5+ 5	5.3235	29.44	Q V
5+10	5.5549	33.59	Q V
5+15	5.8163	37.96	Q V
5+20	6.1026	41.57	Q V
5+25	6.4158	45.47	Q V
5+30	6.7694	51.34	QV
5+35	7.1079	49.15	Q V
5+40	7.3081	29.07	Q V
5+45	7.4314	17.90	Q V
5+50	7.5152	12.18	Q V
5+55	7.5753	8.72	Q V
6+ 0	7.6153	5.81	Q V
6+ 5	7.6396	3.52	Q V
6+10	7.6488	1.34	Q V
6+15	7.6531	0.63	Q V
6+20	7.6554	0.33	Q V
6+25	7.6566	0.17	Q V
6+30	7.6571	0.07	Q V
6+35	7.6572	0.03	Q V

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/13/20 File: 3828PR5245.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.080 Hr.
Lag time = 4.78 Min.
25% of lag time = 1.19 Min.
40% of lag time = 1.91 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.75	121.89

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	4.50	313.43

STORM EVENT (YEAR) = 5.00
Area Averaged 2-Year Rainfall = 1.750(In)
Area Averaged 100-Year Rainfall = 4.500(In)

Point rain (area averaged) = 2.394(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 2.394(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	56.00	0.900

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	36.0	0.706	0.900	0.134	1.000	0.134
					Sum (F) =	0.134

Area averaged mean soil loss (F) (In/Hr) = 0.134
Minimum soil loss rate ((In/Hr)) = 0.067
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.100

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	104.614	20.612	14.469
2	0.167	209.229	48.679	34.170
3	0.250	313.843	14.978	10.514
4	0.333	418.458	6.821	4.788
5	0.417	523.072	3.802	2.669
6	0.500	627.687	2.435	1.709
7	0.583	732.301	1.462	1.026
8	0.667	836.916	1.210	0.849
		Sum =	100.000 Sum=	70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.019	(0.238)	0.002	0.017
2	0.17	0.07	0.019	(0.237)	0.002	0.017
3	0.25	0.07	0.019	(0.236)	0.002	0.017
4	0.33	0.10	0.029	(0.235)	0.003	0.026
5	0.42	0.10	0.029	(0.234)	0.003	0.026
6	0.50	0.10	0.029	(0.233)	0.003	0.026
7	0.58	0.10	0.029	(0.232)	0.003	0.026
8	0.67	0.10	0.029	(0.231)	0.003	0.026
9	0.75	0.10	0.029	(0.230)	0.003	0.026
10	0.83	0.13	0.038	(0.230)	0.004	0.034
11	0.92	0.13	0.038	(0.229)	0.004	0.034
12	1.00	0.13	0.038	(0.228)	0.004	0.034
13	1.08	0.10	0.029	(0.227)	0.003	0.026
14	1.17	0.10	0.029	(0.226)	0.003	0.026
15	1.25	0.10	0.029	(0.225)	0.003	0.026
16	1.33	0.10	0.029	(0.224)	0.003	0.026
17	1.42	0.10	0.029	(0.223)	0.003	0.026
18	1.50	0.10	0.029	(0.222)	0.003	0.026
19	1.58	0.10	0.029	(0.222)	0.003	0.026
20	1.67	0.10	0.029	(0.221)	0.003	0.026
21	1.75	0.10	0.029	(0.220)	0.003	0.026
22	1.83	0.13	0.038	(0.219)	0.004	0.034
23	1.92	0.13	0.038	(0.218)	0.004	0.034
24	2.00	0.13	0.038	(0.217)	0.004	0.034
25	2.08	0.13	0.038	(0.216)	0.004	0.034
26	2.17	0.13	0.038	(0.215)	0.004	0.034
27	2.25	0.13	0.038	(0.214)	0.004	0.034
28	2.33	0.13	0.038	(0.214)	0.004	0.034
29	2.42	0.13	0.038	(0.213)	0.004	0.034
30	2.50	0.13	0.038	(0.212)	0.004	0.034
31	2.58	0.17	0.048	(0.211)	0.005	0.043
32	2.67	0.17	0.048	(0.210)	0.005	0.043
33	2.75	0.17	0.048	(0.209)	0.005	0.043
34	2.83	0.17	0.048	(0.208)	0.005	0.043
35	2.92	0.17	0.048	(0.208)	0.005	0.043
36	3.00	0.17	0.048	(0.207)	0.005	0.043
37	3.08	0.17	0.048	(0.206)	0.005	0.043
38	3.17	0.17	0.048	(0.205)	0.005	0.043
39	3.25	0.17	0.048	(0.204)	0.005	0.043
40	3.33	0.17	0.048	(0.203)	0.005	0.043
41	3.42	0.17	0.048	(0.202)	0.005	0.043
42	3.50	0.17	0.048	(0.202)	0.005	0.043
43	3.58	0.17	0.048	(0.201)	0.005	0.043
44	3.67	0.17	0.048	(0.200)	0.005	0.043
45	3.75	0.17	0.048	(0.199)	0.005	0.043
46	3.83	0.20	0.057	(0.198)	0.006	0.052
47	3.92	0.20	0.057	(0.197)	0.006	0.052
48	4.00	0.20	0.057	(0.197)	0.006	0.052
49	4.08	0.20	0.057	(0.196)	0.006	0.052
50	4.17	0.20	0.057	(0.195)	0.006	0.052
51	4.25	0.20	0.057	(0.194)	0.006	0.052
52	4.33	0.23	0.067	(0.193)	0.007	0.060
53	4.42	0.23	0.067	(0.192)	0.007	0.060
54	4.50	0.23	0.067	(0.192)	0.007	0.060
55	4.58	0.23	0.067	(0.191)	0.007	0.060
56	4.67	0.23	0.067	(0.190)	0.007	0.060
57	4.75	0.23	0.067	(0.189)	0.007	0.060
58	4.83	0.27	0.077	(0.188)	0.008	0.069
59	4.92	0.27	0.077	(0.187)	0.008	0.069
60	5.00	0.27	0.077	(0.187)	0.008	0.069
61	5.08	0.20	0.057	(0.186)	0.006	0.052
62	5.17	0.20	0.057	(0.185)	0.006	0.052
63	5.25	0.20	0.057	(0.184)	0.006	0.052
64	5.33	0.23	0.067	(0.183)	0.007	0.060
65	5.42	0.23	0.067	(0.183)	0.007	0.060
66	5.50	0.23	0.067	(0.182)	0.007	0.060
67	5.58	0.27	0.077	(0.181)	0.008	0.069
68	5.67	0.27	0.077	(0.180)	0.008	0.069
69	5.75	0.27	0.077	(0.179)	0.008	0.069
70	5.83	0.27	0.077	(0.179)	0.008	0.069
71	5.92	0.27	0.077	(0.178)	0.008	0.069
72	6.00	0.27	0.077	(0.177)	0.008	0.069
73	6.08	0.30	0.086	(0.176)	0.009	0.078
74	6.17	0.30	0.086	(0.175)	0.009	0.078
75	6.25	0.30	0.086	(0.175)	0.009	0.078
76	6.33	0.30	0.086	(0.174)	0.009	0.078
77	6.42	0.30	0.086	(0.173)	0.009	0.078
78	6.50	0.30	0.086	(0.172)	0.009	0.078
79	6.58	0.33	0.096	(0.172)	0.010	0.086
80	6.67	0.33	0.096	(0.171)	0.010	0.086
81	6.75	0.33	0.096	(0.170)	0.010	0.086
82	6.83	0.33	0.096	(0.169)	0.010	0.086
83	6.92	0.33	0.096	(0.169)	0.010	0.086
84	7.00	0.33	0.096	(0.168)	0.010	0.086
85	7.08	0.33	0.096	(0.167)	0.010	0.086
86	7.17	0.33	0.096	(0.166)	0.010	0.086
87	7.25	0.33	0.096	(0.165)	0.010	0.086
88	7.33	0.37	0.105	(0.165)	0.011	0.095
89	7.42	0.37	0.105	(0.164)	0.011	0.095
90	7.50	0.37	0.105	(0.163)	0.011	0.095
91	7.58	0.40	0.115	(0.162)	0.011	0.103
92	7.67	0.40	0.115	(0.162)	0.011	0.103
93	7.75	0.40	0.115	(0.161)	0.011	0.103
94	7.83	0.43	0.124	(0.160)	0.012	0.112

95	7.92	0.43	0.124	(0.159)	0.012	0.112
96	8.00	0.43	0.124	(0.159)	0.012	0.112
97	8.08	0.50	0.144	(0.158)	0.014	0.129
98	8.17	0.50	0.144	(0.157)	0.014	0.129
99	8.25	0.50	0.144	(0.157)	0.014	0.129
100	8.33	0.50	0.144	(0.156)	0.014	0.129
101	8.42	0.50	0.144	(0.155)	0.014	0.129
102	8.50	0.50	0.144	(0.154)	0.014	0.129
103	8.58	0.53	0.153	(0.154)	0.015	0.138
104	8.67	0.53	0.153	(0.153)	0.015	0.138
105	8.75	0.53	0.153	(0.152)	0.015	0.138
106	8.83	0.57	0.163	(0.151)	0.016	0.147
107	8.92	0.57	0.163	(0.151)	0.016	0.147
108	9.00	0.57	0.163	(0.150)	0.016	0.147
109	9.08	0.63	0.182	(0.149)	0.018	0.164
110	9.17	0.63	0.182	(0.149)	0.018	0.164
111	9.25	0.63	0.182	(0.148)	0.018	0.164
112	9.33	0.67	0.192	(0.147)	0.019	0.172
113	9.42	0.67	0.192	(0.147)	0.019	0.172
114	9.50	0.67	0.192	(0.146)	0.019	0.172
115	9.58	0.70	0.201	(0.145)	0.020	0.181
116	9.67	0.70	0.201	(0.144)	0.020	0.181
117	9.75	0.70	0.201	(0.144)	0.020	0.181
118	9.83	0.73	0.211	(0.143)	0.021	0.190
119	9.92	0.73	0.211	(0.142)	0.021	0.190
120	10.00	0.73	0.211	(0.142)	0.021	0.190
121	10.08	0.50	0.144	(0.141)	0.014	0.129
122	10.17	0.50	0.144	(0.140)	0.014	0.129
123	10.25	0.50	0.144	(0.140)	0.014	0.129
124	10.33	0.50	0.144	(0.139)	0.014	0.129
125	10.42	0.50	0.144	(0.138)	0.014	0.129
126	10.50	0.50	0.144	(0.138)	0.014	0.129
127	10.58	0.67	0.192	(0.137)	0.019	0.172
128	10.67	0.67	0.192	(0.136)	0.019	0.172
129	10.75	0.67	0.192	(0.136)	0.019	0.172
130	10.83	0.67	0.192	(0.135)	0.019	0.172
131	10.92	0.67	0.192	(0.134)	0.019	0.172
132	11.00	0.67	0.192	(0.134)	0.019	0.172
133	11.08	0.63	0.182	(0.133)	0.018	0.164
134	11.17	0.63	0.182	(0.132)	0.018	0.164
135	11.25	0.63	0.182	(0.132)	0.018	0.164
136	11.33	0.63	0.182	(0.131)	0.018	0.164
137	11.42	0.63	0.182	(0.130)	0.018	0.164
138	11.50	0.63	0.182	(0.130)	0.018	0.164
139	11.58	0.57	0.163	(0.129)	0.016	0.147
140	11.67	0.57	0.163	(0.128)	0.016	0.147
141	11.75	0.57	0.163	(0.128)	0.016	0.147
142	11.83	0.60	0.172	(0.127)	0.017	0.155
143	11.92	0.60	0.172	(0.126)	0.017	0.155
144	12.00	0.60	0.172	(0.126)	0.017	0.155
145	12.08	0.83	0.239	(0.125)	0.024	0.215
146	12.17	0.83	0.239	(0.125)	0.024	0.215
147	12.25	0.83	0.239	(0.124)	0.024	0.215
148	12.33	0.87	0.249	(0.123)	0.025	0.224
149	12.42	0.87	0.249	(0.123)	0.025	0.224
150	12.50	0.87	0.249	(0.122)	0.025	0.224
151	12.58	0.93	0.268	(0.121)	0.027	0.241
152	12.67	0.93	0.268	(0.121)	0.027	0.241
153	12.75	0.93	0.268	(0.120)	0.027	0.241
154	12.83	0.97	0.278	(0.120)	0.028	0.250
155	12.92	0.97	0.278	(0.119)	0.028	0.250
156	13.00	0.97	0.278	(0.118)	0.028	0.250
157	13.08	1.13	0.326	(0.118)	0.033	0.293
158	13.17	1.13	0.326	(0.117)	0.033	0.293
159	13.25	1.13	0.326	(0.117)	0.033	0.293
160	13.33	1.13	0.326	(0.116)	0.033	0.293
161	13.42	1.13	0.326	(0.115)	0.033	0.293
162	13.50	1.13	0.326	(0.115)	0.033	0.293
163	13.58	0.77	0.220	(0.114)	0.022	0.198
164	13.67	0.77	0.220	(0.114)	0.022	0.198
165	13.75	0.77	0.220	(0.113)	0.022	0.198
166	13.83	0.77	0.220	(0.113)	0.022	0.198
167	13.92	0.77	0.220	(0.112)	0.022	0.198
168	14.00	0.77	0.220	(0.111)	0.022	0.198
169	14.08	0.90	0.259	(0.111)	0.026	0.233
170	14.17	0.90	0.259	(0.110)	0.026	0.233
171	14.25	0.90	0.259	(0.110)	0.026	0.233
172	14.33	0.87	0.249	(0.109)	0.025	0.224
173	14.42	0.87	0.249	(0.109)	0.025	0.224
174	14.50	0.87	0.249	(0.108)	0.025	0.224
175	14.58	0.87	0.249	(0.107)	0.025	0.224
176	14.67	0.87	0.249	(0.107)	0.025	0.224
177	14.75	0.87	0.249	(0.106)	0.025	0.224
178	14.83	0.83	0.239	(0.106)	0.024	0.215
179	14.92	0.83	0.239	(0.105)	0.024	0.215
180	15.00	0.83	0.239	(0.105)	0.024	0.215
181	15.08	0.80	0.230	(0.104)	0.023	0.207
182	15.17	0.80	0.230	(0.104)	0.023	0.207
183	15.25	0.80	0.230	(0.103)	0.023	0.207
184	15.33	0.77	0.220	(0.103)	0.022	0.198
185	15.42	0.77	0.220	(0.102)	0.022	0.198
186	15.50	0.77	0.220	(0.102)	0.022	0.198
187	15.58	0.63	0.182	(0.101)	0.018	0.164
188	15.67	0.63	0.182	(0.101)	0.018	0.164
189	15.75	0.63	0.182	(0.100)	0.018	0.164
190	15.83	0.63	0.182	(0.100)	0.018	0.164
191	15.92	0.63	0.182	(0.099)	0.018	0.164
192	16.00	0.63	0.182	(0.099)	0.018	0.164
193	16.08	0.13	0.038	(0.098)	0.004	0.034

194	16.17	0.13	0.038	(0.098)	0.004	0.034
195	16.25	0.13	0.038	(0.097)	0.004	0.034
196	16.33	0.13	0.038	(0.097)	0.004	0.034
197	16.42	0.13	0.038	(0.096)	0.004	0.034
198	16.50	0.13	0.038	(0.096)	0.004	0.034
199	16.58	0.10	0.029	(0.095)	0.003	0.026
200	16.67	0.10	0.029	(0.095)	0.003	0.026
201	16.75	0.10	0.029	(0.094)	0.003	0.026
202	16.83	0.10	0.029	(0.094)	0.003	0.026
203	16.92	0.10	0.029	(0.093)	0.003	0.026
204	17.00	0.10	0.029	(0.093)	0.003	0.026
205	17.08	0.17	0.048	(0.092)	0.005	0.043
206	17.17	0.17	0.048	(0.092)	0.005	0.043
207	17.25	0.17	0.048	(0.091)	0.005	0.043
208	17.33	0.17	0.048	(0.091)	0.005	0.043
209	17.42	0.17	0.048	(0.090)	0.005	0.043
210	17.50	0.17	0.048	(0.090)	0.005	0.043
211	17.58	0.17	0.048	(0.089)	0.005	0.043
212	17.67	0.17	0.048	(0.089)	0.005	0.043
213	17.75	0.17	0.048	(0.089)	0.005	0.043
214	17.83	0.13	0.038	(0.088)	0.004	0.034
215	17.92	0.13	0.038	(0.088)	0.004	0.034
216	18.00	0.13	0.038	(0.087)	0.004	0.034
217	18.08	0.13	0.038	(0.087)	0.004	0.034
218	18.17	0.13	0.038	(0.086)	0.004	0.034
219	18.25	0.13	0.038	(0.086)	0.004	0.034
220	18.33	0.13	0.038	(0.086)	0.004	0.034
221	18.42	0.13	0.038	(0.085)	0.004	0.034
222	18.50	0.13	0.038	(0.085)	0.004	0.034
223	18.58	0.10	0.029	(0.084)	0.003	0.026
224	18.67	0.10	0.029	(0.084)	0.003	0.026
225	18.75	0.10	0.029	(0.084)	0.003	0.026
226	18.83	0.07	0.019	(0.083)	0.002	0.017
227	18.92	0.07	0.019	(0.083)	0.002	0.017
228	19.00	0.07	0.019	(0.082)	0.002	0.017
229	19.08	0.10	0.029	(0.082)	0.003	0.026
230	19.17	0.10	0.029	(0.082)	0.003	0.026
231	19.25	0.10	0.029	(0.081)	0.003	0.026
232	19.33	0.13	0.038	(0.081)	0.004	0.034
233	19.42	0.13	0.038	(0.080)	0.004	0.034
234	19.50	0.13	0.038	(0.080)	0.004	0.034
235	19.58	0.10	0.029	(0.080)	0.003	0.026
236	19.67	0.10	0.029	(0.079)	0.003	0.026
237	19.75	0.10	0.029	(0.079)	0.003	0.026
238	19.83	0.07	0.019	(0.079)	0.002	0.017
239	19.92	0.07	0.019	(0.078)	0.002	0.017
240	20.00	0.07	0.019	(0.078)	0.002	0.017
241	20.08	0.10	0.029	(0.078)	0.003	0.026
242	20.17	0.10	0.029	(0.077)	0.003	0.026
243	20.25	0.10	0.029	(0.077)	0.003	0.026
244	20.33	0.10	0.029	(0.077)	0.003	0.026
245	20.42	0.10	0.029	(0.076)	0.003	0.026
246	20.50	0.10	0.029	(0.076)	0.003	0.026
247	20.58	0.10	0.029	(0.076)	0.003	0.026
248	20.67	0.10	0.029	(0.075)	0.003	0.026
249	20.75	0.10	0.029	(0.075)	0.003	0.026
250	20.83	0.07	0.019	(0.075)	0.002	0.017
251	20.92	0.07	0.019	(0.074)	0.002	0.017
252	21.00	0.07	0.019	(0.074)	0.002	0.017
253	21.08	0.10	0.029	(0.074)	0.003	0.026
254	21.17	0.10	0.029	(0.073)	0.003	0.026
255	21.25	0.10	0.029	(0.073)	0.003	0.026
256	21.33	0.07	0.019	(0.073)	0.002	0.017
257	21.42	0.07	0.019	(0.073)	0.002	0.017
258	21.50	0.07	0.019	(0.072)	0.002	0.017
259	21.58	0.10	0.029	(0.072)	0.003	0.026
260	21.67	0.10	0.029	(0.072)	0.003	0.026
261	21.75	0.10	0.029	(0.072)	0.003	0.026
262	21.83	0.07	0.019	(0.071)	0.002	0.017
263	21.92	0.07	0.019	(0.071)	0.002	0.017
264	22.00	0.07	0.019	(0.071)	0.002	0.017
265	22.08	0.10	0.029	(0.071)	0.003	0.026
266	22.17	0.10	0.029	(0.070)	0.003	0.026
267	22.25	0.10	0.029	(0.070)	0.003	0.026
268	22.33	0.07	0.019	(0.070)	0.002	0.017
269	22.42	0.07	0.019	(0.070)	0.002	0.017
270	22.50	0.07	0.019	(0.069)	0.002	0.017
271	22.58	0.07	0.019	(0.069)	0.002	0.017
272	22.67	0.07	0.019	(0.069)	0.002	0.017
273	22.75	0.07	0.019	(0.069)	0.002	0.017
274	22.83	0.07	0.019	(0.069)	0.002	0.017
275	22.92	0.07	0.019	(0.069)	0.002	0.017
276	23.00	0.07	0.019	(0.068)	0.002	0.017
277	23.08	0.07	0.019	(0.068)	0.002	0.017
278	23.17	0.07	0.019	(0.068)	0.002	0.017
279	23.25	0.07	0.019	(0.068)	0.002	0.017
280	23.33	0.07	0.019	(0.068)	0.002	0.017
281	23.42	0.07	0.019	(0.068)	0.002	0.017
282	23.50	0.07	0.019	(0.068)	0.002	0.017
283	23.58	0.07	0.019	(0.067)	0.002	0.017
284	23.67	0.07	0.019	(0.067)	0.002	0.017
285	23.75	0.07	0.019	(0.067)	0.002	0.017
286	23.83	0.07	0.019	(0.067)	0.002	0.017
287	23.92	0.07	0.019	(0.067)	0.002	0.017
288	24.00	0.07	0.019	(0.067)	0.002	0.017

(Loss Rate Not Used)

Sum = 100.0 Sum = 25.9

Flood volume = Effective rainfall 2.15(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 12.5(Ac.Ft)

Total soil loss = 0.24(In)
Total soil loss = 1.389(Ac.Ft)
Total rainfall = 2.39(In)
Flood volume = 544698.9 Cubic Feet
Total soil loss = 60522.1 Cubic Feet

Peak flow rate of this hydrograph = 20.497(CFS)

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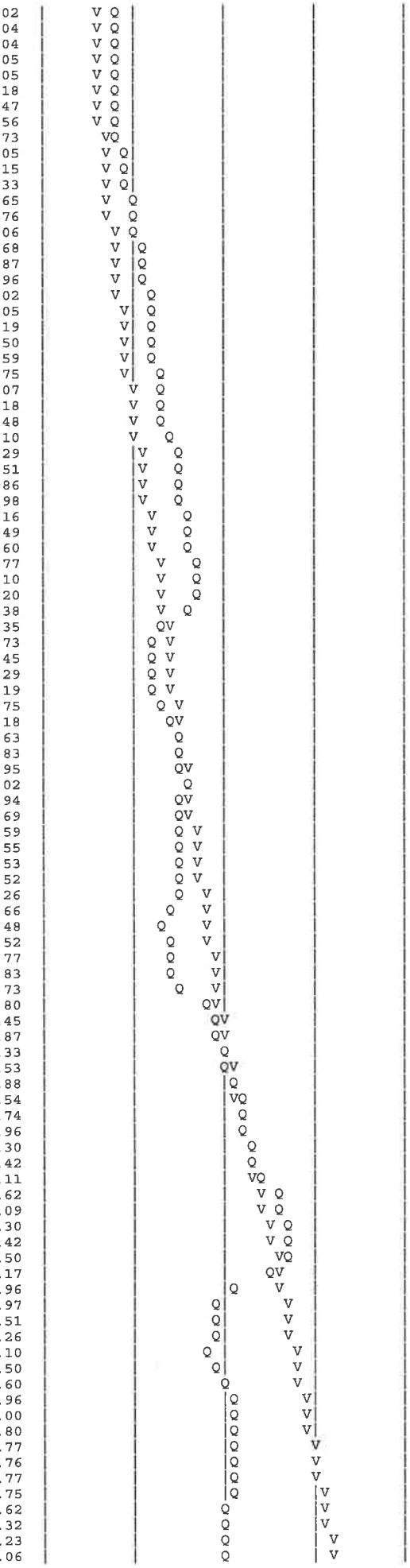
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 7.5 15.0 22.5 30.0
0+ 5	0.0017	0.25	Q
0+10	0.0075	0.84	VQ
0+15	0.0145	1.02	VQ
0+20	0.0230	1.23	VQ
0+25	0.0338	1.57	V Q
0+30	0.0454	1.69	V Q
0+35	0.0574	1.75	V Q
0+40	0.0697	1.78	V Q
0+45	0.0821	1.80	V Q
0+50	0.0954	1.93	V Q
0+55	0.1108	2.24	V Q
1+ 0	0.1268	2.33	V Q
1+ 5	0.1423	2.24	V Q
1+10	0.1559	1.97	V Q
1+15	0.1689	1.89	V Q
1+20	0.1817	1.86	V Q
1+25	0.1944	1.85	V Q
1+30	0.2071	1.83	V Q
1+35	0.2196	1.82	V Q
1+40	0.2321	1.82	V Q
1+45	0.2446	1.82	V Q
1+50	0.2580	1.94	V Q
1+55	0.2734	2.24	V Q
2+ 0	0.2894	2.33	V Q
2+ 5	0.3057	2.37	V Q
2+10	0.3222	2.39	V Q
2+15	0.3387	2.40	V Q
2+20	0.3553	2.41	V Q
2+25	0.3720	2.42	V Q
2+30	0.3887	2.42	V Q
2+35	0.4062	2.55	V Q
2+40	0.4258	2.84	V Q
2+45	0.4460	2.93	V Q
2+50	0.4664	2.97	V Q
2+55	0.4871	3.00	V Q
3+ 0	0.5078	3.01	V Q
3+ 5	0.5286	3.02	V Q
3+10	0.5494	3.03	V Q
3+15	0.5703	3.03	V Q
3+20	0.5911	3.03	V Q
3+25	0.6119	3.03	V Q
3+30	0.6328	3.03	V Q
3+35	0.6536	3.03	V Q
3+40	0.6745	3.03	V Q
3+45	0.6953	3.03	V Q
3+50	0.7170	3.15	V Q
3+55	0.7407	3.45	V Q
4+ 0	0.7651	3.54	V Q
4+ 5	0.7897	3.58	V Q
4+10	0.8145	3.60	V Q
4+15	0.8394	3.62	V Q
4+20	0.8652	3.75	V Q
4+25	0.8931	4.05	V Q
4+30	0.9217	4.14	V Q
4+35	0.9505	4.18	V Q
4+40	0.9794	4.21	V Q
4+45	1.0085	4.22	V Q
4+50	1.0385	4.35	V Q
4+55	1.0706	4.66	V Q
5+ 0	1.1032	4.75	V Q
5+ 5	1.1345	4.54	V Q
5+10	1.1619	3.97	V Q
5+15	1.1881	3.81	V Q
5+20	1.2146	3.86	V Q
5+25	1.2429	4.11	V Q
5+30	1.2717	4.17	VQ
5+35	1.3015	4.32	VQ
5+40	1.3333	4.63	V Q
5+45	1.3659	4.73	V Q
5+50	1.3988	4.78	V Q
5+55	1.4319	4.81	V Q
6+ 0	1.4652	4.83	V Q
6+ 5	1.4993	4.96	V Q
6+10	1.5356	5.26	V Q
6+15	1.5724	5.35	V Q
6+20	1.6096	5.39	V Q
6+25	1.6469	5.42	V Q
6+30	1.6843	5.43	V Q
6+35	1.7226	5.56	V Q
6+40	1.7630	5.87	V Q
6+45	1.8040	5.96	V Q
6+50	1.8453	6.00	V Q

6+55	1.8868	6.02	
7+ 0	1.9284	6.04	
7+ 5	1.9700	6.04	
7+10	2.0117	6.05	
7+15	2.0534	6.05	
7+20	2.0959	6.18	
7+25	2.1405	6.47	
7+30	2.1857	6.56	
7+35	2.2320	6.73	
7+40	2.2805	7.05	
7+45	2.3298	7.15	
7+50	2.3802	7.33	
7+55	2.4329	7.65	
8+ 0	2.4864	7.76	
8+ 5	2.5418	8.06	
8+10	2.6016	8.68	
8+15	2.6627	8.87	
8+20	2.7244	8.96	
8+25	2.7865	9.02	
8+30	2.8488	9.05	
8+35	2.9121	9.19	
8+40	2.9775	9.50	
8+45	3.0435	9.59	
8+50	3.1107	9.75	
8+55	3.1801	10.07	
9+ 0	3.2502	10.18	
9+ 5	3.3223	10.48	
9+10	3.3988	11.10	
9+15	3.4765	11.29	
9+20	3.5558	11.51	
9+25	3.6374	11.86	
9+30	3.7199	11.98	
9+35	3.8037	12.16	
9+40	3.8897	12.49	
9+45	3.9765	12.60	
9+50	4.0645	12.77	
9+55	4.1547	13.10	
10+ 0	4.2456	13.20	
10+ 5	4.3309	12.38	
10+10	4.4021	10.35	
10+15	4.4691	9.73	
10+20	4.5342	9.45	
10+25	4.5982	9.29	
10+30	4.6615	9.19	
10+35	4.7287	9.75	
10+40	4.8057	11.18	
10+45	4.8857	11.63	
10+50	4.9672	11.83	
10+55	5.0495	11.95	
11+ 0	5.1324	12.02	
11+ 5	5.2146	11.94	
11+10	5.2951	11.69	
11+15	5.3749	11.59	
11+20	5.4545	11.55	
11+25	5.5339	11.53	
11+30	5.6132	11.52	
11+35	5.6907	11.26	
11+40	5.7642	10.66	
11+45	5.8363	10.48	
11+50	5.9088	10.52	
11+55	5.9830	10.77	
12+ 0	6.0576	10.83	
12+ 5	6.1383	11.73	
12+10	6.2334	13.80	
12+15	6.3329	14.45	
12+20	6.4353	14.87	
12+25	6.5409	15.33	
12+30	6.6478	15.53	
12+35	6.7572	15.88	
12+40	6.8711	16.54	
12+45	6.9864	16.74	
12+50	7.1032	16.96	
12+55	7.2224	17.30	
13+ 0	7.3424	17.42	
13+ 5	7.4671	18.11	
13+10	7.6022	19.62	
13+15	7.7405	20.09	
13+20	7.8803	20.30	
13+25	8.0210	20.42	
13+30	8.1621	20.50	
13+35	8.2941	19.17	
13+40	8.4041	15.96	
13+45	8.5072	14.97	
13+50	8.6071	14.51	
13+55	8.7053	14.26	
14+ 0	8.8024	14.10	
14+ 5	8.9023	14.50	
14+10	9.0097	15.60	
14+15	9.1196	15.96	
14+20	9.2298	16.00	
14+25	9.3386	15.80	
14+30	9.4472	15.77	
14+35	9.5557	15.76	
14+40	9.6643	15.77	
14+45	9.7728	15.75	
14+50	9.8804	15.62	
14+55	9.9859	15.32	
15+ 0	10.0907	15.23	
15+ 5	10.1944	15.06	

15+10	10.2960	14.74			Q	V
15+15	10.3968	14.64			Q	V
15+20	10.4964	14.46			Q	V
15+25	10.5937	14.14			Q	V
15+30	10.6904	14.03			Q	V
15+35	10.7832	13.48			Q	V
15+40	10.8678	12.27			Q	V
15+45	10.9497	11.90			Q	V
15+50	11.0304	11.72			Q	V
15+55	11.1105	11.62			Q	V
16+ 0	11.1901	11.56			Q	V
16+ 5	11.2566	9.66		Q		V
16+10	11.2925	5.21		Q		V
16+15	11.3190	3.85		Q		V
16+20	11.3412	3.23		Q		V
16+25	11.3611	2.88		Q		V
16+30	11.3794	2.66		Q		V
16+35	11.3960	2.41		Q		V
16+40	11.4098	2.00		Q		V
16+45	11.4230	1.91		Q		V
16+50	11.4358	1.87		Q		V
16+55	11.4486	1.85		Q		V
17+ 0	11.4612	1.83		Q		V
17+ 5	11.4754	2.07		Q		V
17+10	11.4937	2.65		Q		V
17+15	11.5133	2.84		Q		V
17+20	11.5334	2.92		Q		V
17+25	11.5538	2.96		Q		V
17+30	11.5744	2.99		Q		V
17+35	11.5951	3.01		Q		V
17+40	11.6160	3.03		Q		V
17+45	11.6368	3.03		Q		V
17+50	11.6568	2.90		Q		V
17+55	11.6747	2.61		Q		V
18+ 0	11.6921	2.52		Q		V
18+ 5	11.7091	2.47		Q		V
18+10	11.7260	2.45		Q		V
18+15	11.7428	2.44		Q		V
18+20	11.7595	2.43		Q		V
18+25	11.7762	2.42		Q		V
18+30	11.7929	2.42		Q		V
18+35	11.8087	2.30		Q		V
18+40	11.8225	2.00		Q		V
18+45	11.8356	1.91		Q		V
18+50	11.8476	1.74		Q		V
18+55	11.8575	1.43		Q		V
19+ 0	11.8666	1.32		Q		V
19+ 5	11.8762	1.40		Q		V
19+10	11.8876	1.66		Q		V
19+15	11.8996	1.74		Q		V
19+20	11.9126	1.89		Q		V
19+25	11.9278	2.20		Q		V
19+30	11.9437	2.31		Q		V
19+35	11.9591	2.23		Q		V
19+40	11.9727	1.97		Q		V
19+45	11.9857	1.89		Q		V
19+50	11.9977	1.74		Q		V
19+55	12.0075	1.43		Q		V
20+ 0	12.0166	1.32		Q		V
20+ 5	12.0262	1.40		Q		V
20+10	12.0377	1.66		Q		V
20+15	12.0496	1.74		Q		V
20+20	12.0618	1.77		Q		V
20+25	12.0741	1.78		Q		V
20+30	12.0865	1.80		Q		V
20+35	12.0990	1.81		Q		V
20+40	12.1115	1.82		Q		V
20+45	12.1240	1.82		Q		V
20+50	12.1356	1.69		Q		V
20+55	12.1452	1.40		Q		V
21+ 0	12.1542	1.31		Q		V
21+ 5	12.1638	1.39		Q		V
21+10	12.1752	1.66		Q		V
21+15	12.1872	1.74		Q		V
21+20	12.1985	1.64		Q		V
21+25	12.2079	1.37		Q		V
21+30	12.2168	1.29		Q		V
21+35	12.2263	1.38		Q		V
21+40	12.2377	1.66		Q		V
21+45	12.2497	1.74		Q		V
21+50	12.2610	1.64		Q		V
21+55	12.2704	1.37		Q		V
22+ 0	12.2793	1.29		Q		V
22+ 5	12.2888	1.38		Q		V
22+10	12.3003	1.66		Q		V
22+15	12.3122	1.74		Q		V
22+20	12.3236	1.64		Q		V
22+25	12.3330	1.37		Q		V
22+30	12.3418	1.29		Q		V
22+35	12.3505	1.26		Q		V
22+40	12.3590	1.24		Q		V
22+45	12.3675	1.23		Q		V
22+50	12.3759	1.22		Q		V
22+55	12.3842	1.21		Q		V
23+ 0	12.3925	1.21		Q		V
23+ 5	12.4009	1.21		Q		V
23+10	12.4092	1.21		Q		V
23+15	12.4176	1.21		Q		V
23+20	12.4259	1.21		Q		V

23+25	12.4342	1.21	Q				V
23+30	12.4426	1.21	Q				V
23+35	12.4509	1.21	Q				V
23+40	12.4592	1.21	Q				V
23+45	12.4676	1.21	Q				V
23+50	12.4759	1.21	Q				V
23+55	12.4842	1.21	Q				V
24+ 0	12.4926	1.21	Q				V
24+ 5	12.4992	0.96	Q				V
24+10	12.5018	0.37	Q				V
24+15	12.5031	0.19	Q				V
24+20	12.5038	0.11	Q				V
24+25	12.5042	0.06	Q				V
24+30	12.5045	0.03	Q				V
24+35	12.5046	0.01	Q				V

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/13/20 File: 3828PR10110.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.080 Hr.
Lag time = 4.78 Min.
25% of lag time = 1.19 Min.
40% of lag time = 1.91 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	0.50	34.83

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.20	83.58

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.500(In)
Area Averaged 100-Year Rainfall = 1.200(In)

Point rain (area averaged) = 0.788(In)
Areal adjustment factor = 99.94 %
Adjusted average point rain = 0.787(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	56.00	0.900

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	56.0	0.511	0.900	0.097	1.000	0.097
					Sum (F) =	0.097

Area averaged mean soil loss (F) (In/Hr) = 0.097
Minimum soil loss rate ((In/Hr)) = 0.049
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.100

Slope of intensity-duration curve for a 1 hour storm =0.5000

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	104.614	20.612	14.469
2	0.167	209.229	48.679	34.170
3	0.250	313.843	14.978	10.514
4	0.333	418.458	6.821	4.788
5	0.417	523.072	3.802	2.669
6	0.500	627.687	2.435	1.709
7	0.583	732.301	1.462	1.026
8	0.667	836.916	1.210	0.849
			Sum = 100.000	Sum= 70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate (In./Hr) Max	Low	Effective (In/Hr)
1	0.08	4.20	0.397	(0.097)	0.040	0.357
2	0.17	4.30	0.406	(0.097)	0.041	0.366
3	0.25	5.00	0.472	(0.097)	0.047	0.425
4	0.33	5.00	0.472	(0.097)	0.047	0.425
5	0.42	5.80	0.548	(0.097)	0.055	0.493
6	0.50	6.50	0.614	(0.097)	0.061	0.553
7	0.58	7.40	0.699	(0.097)	0.070	0.629
8	0.67	8.60	0.813	(0.097)	0.081	0.731
9	0.75	12.30	1.162	0.097	(0.116)	1.065
10	0.83	29.10	2.750	0.097	(0.275)	2.653
11	0.92	6.80	0.643	(0.097)	0.064	0.578
12	1.00	5.00	0.472	(0.097)	0.047	0.425

(Loss Rate Not Used)

Sum = 100.0 Sum = 8.7

Flood volume = Effective rainfall 0.73(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 4.2(Ac.Ft)
Total soil loss = 0.06(In)
Total soil loss = 0.362(Ac.Ft)
Total rainfall = 0.79(In)
Flood volume = 183343.4 Cubic Feet
Total soil loss = 15756.9 Cubic Feet

Peak flow rate of this hydrograph = 117.271(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0356	5.17	VQ				
0+10	0.1562	17.51	V Q				
0+15	0.3106	22.42	V Q				
0+20	0.4914	26.25	VQ				
0+25	0.6901	28.86	QV				
0+30	0.9171	32.96	Q V				
0+35	1.1745	37.36	Q V				
0+40	1.4694	42.82	Q V				
0+45	1.8309	52.49	Q V				
0+50	2.4414	88.65	Q V				
0+55	3.2491	117.27	Q V				
1+ 0	3.6826	62.95	Q V				
1+ 5	3.9481	38.54	Q V				
1+10	4.0681	17.43	Q V				
1+15	4.1359	9.83	Q V				
1+20	4.1755	5.75	Q V				
1+25	4.2001	3.57	Q V				
1+30	4.2065	0.93	Q V				
1+35	4.2090	0.36	Q V				

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/13/20 File: 3828PR10310.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.080 Hr.
Lag time = 4.78 Min.
25% of lag time = 1.19 Min.
40% of lag time = 1.91 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	0.80	55.72

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.86	129.55

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.800(In)
Area Averaged 100-Year Rainfall = 1.860(In)

Point rain (area averaged) = 1.236(In)
Areal adjustment factor = 99.97 %
Adjusted average point rain = 1.236(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	56.00	0.900

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	56.0	0.511	0.900	0.097	1.000	0.097
					Sum (F) =	0.097

Area averaged mean soil loss (F) (In/Hr) = 0.097
Minimum soil loss rate ((In/Hr)) = 0.049
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.100

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	104.614	20.612	14.469
2	0.167	209.229	48.679	34.170
3	0.250	313.843	14.978	10.514
4	0.333	418.458	6.821	4.788
5	0.417	523.072	3.802	2.669
6	0.500	627.687	2.435	1.709
7	0.583	732.301	1.462	1.026
8	0.667	836.916	1.210	0.849
			Sum = 100.000 Sum=	70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.193	(0.097)	0.019	0.173
2	0.17	1.30	0.193	(0.097)	0.019	0.173
3	0.25	1.10	0.163	(0.097)	0.016	0.147
4	0.33	1.50	0.222	(0.097)	0.022	0.200
5	0.42	1.50	0.222	(0.097)	0.022	0.200
6	0.50	1.80	0.267	(0.097)	0.027	0.240
7	0.58	1.50	0.222	(0.097)	0.022	0.200
8	0.67	1.80	0.267	(0.097)	0.027	0.240
9	0.75	1.80	0.267	(0.097)	0.027	0.240
10	0.83	1.50	0.222	(0.097)	0.022	0.200
11	0.92	1.60	0.237	(0.097)	0.024	0.214
12	1.00	1.80	0.267	(0.097)	0.027	0.240
13	1.08	2.20	0.326	(0.097)	0.033	0.294
14	1.17	2.20	0.326	(0.097)	0.033	0.294
15	1.25	2.20	0.326	(0.097)	0.033	0.294
16	1.33	2.00	0.297	(0.097)	0.030	0.267
17	1.42	2.60	0.386	(0.097)	0.039	0.347
18	1.50	2.70	0.400	(0.097)	0.040	0.360
19	1.58	2.40	0.356	(0.097)	0.036	0.320
20	1.67	2.70	0.400	(0.097)	0.040	0.360
21	1.75	3.30	0.489	(0.097)	0.049	0.440
22	1.83	3.10	0.460	(0.097)	0.046	0.414
23	1.92	2.90	0.430	(0.097)	0.043	0.387
24	2.00	3.00	0.445	(0.097)	0.044	0.400
25	2.08	3.10	0.460	(0.097)	0.046	0.414
26	2.17	4.20	0.623	(0.097)	0.062	0.561
27	2.25	5.00	0.741	(0.097)	0.074	0.667
28	2.33	3.50	0.519	(0.097)	0.052	0.467
29	2.42	6.80	1.008	0.097	(0.101)	0.911
30	2.50	7.30	1.082	0.097	(0.108)	0.985
31	2.58	8.20	1.216	0.097	(0.122)	1.119
32	2.67	5.90	0.875	(0.097)	0.087	0.787
33	2.75	2.00	0.297	(0.097)	0.030	0.267
34	2.83	1.80	0.267	(0.097)	0.027	0.240
35	2.92	1.80	0.267	(0.097)	0.027	0.240
36	3.00	0.60	0.089	(0.097)	0.009	0.080

(Loss Rate Not Used)

Sum = 100.0 Sum = 13.4

Flood volume = Effective rainfall 1.12(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 6.5(Ac.Ft)
Total soil loss = 0.12(In)
Total soil loss = 0.698(Ac.Ft)
Total rainfall = 1.24(In)
Flood volume = 282015.6 Cubic Feet
Total soil loss = 30409.9 Cubic Feet

Peak flow rate of this hydrograph = 67.698(CFS)

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3 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 17.5 35.0 52.5 70.0
0+ 5	0.0173	2.51	VQ
0+10	0.0754	8.44	V Q
0+15	0.1435	9.88	V Q
0+20	0.2163	10.57	V Q
0+25	0.3030	12.58	V Q
0+30	0.3986	13.89	V Q
0+35	0.5022	15.04	V Q
0+40	0.6050	14.92	V Q
0+45	0.7160	16.12	V Q
0+50	0.8256	15.91	V Q
0+55	0.9284	14.93	V Q
1+ 0	1.0347	15.43	V Q
1+ 5	1.1527	17.13	V Q
1+10	1.2849	19.20	V Q
1+15	1.4219	19.89	V Q
1+20	1.5584	19.81	V Q
1+25	1.6977	20.23	VQ
1+30	1.8561	23.01	V Q
1+35	2.0192	23.68	VQ
1+40	2.1802	23.38	Q
1+45	2.3574	25.72	Q
1+50	2.5533	28.45	VQ
1+55	2.7473	28.16	Q
2+ 0	2.9378	27.66	Q V
2+ 5	3.1317	28.16	Q V
2+10	3.3440	30.82	Q V
2+15	3.6029	37.59	QV
2+20	3.8783	39.98	QV
2+25	4.1634	41.40	Q V
2+30	4.5524	56.47	V Q
2+35	5.0015	65.22	V Q
2+40	5.4677	67.70	V Q
2+45	5.8236	51.67	Q V
2+50	6.0404	31.48	Q V
2+55	6.2076	24.28	Q V
3+ 0	6.3383	18.98	Q V
3+ 5	6.4104	10.46	Q V

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  3+10      6.4438      4.85   | Q        |         |         |       V|
  3+15      6.4601      2.38   |Q         |         |         |       V|
  3+20      6.4677      1.10   Q          |         |         |       V|
  3+25      6.4717      0.59   Q          |         |         |       V|
  3+30      6.4737      0.29   Q          |         |         |       V|
  3+35      6.4742      0.07   Q          |         |         |        V
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U n i t H y d r o g r a p h A n a l y s i s

Study date 02/13/20 File: 3828PR10610.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.080 Hr.
Lag time = 4.78 Min.
25% of lag time = 1.19 Min.
40% of lag time = 1.91 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.15	80.10

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	2.50	174.13

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 1.150(In)
Area Averaged 100-Year Rainfall = 2.500(In)

Point rain (area averaged) = 1.705(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 1.705(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	56.00	0.900

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	56.0	0.511	0.900	0.097	1.000	0.097
					Sum (F) =	0.097

Area averaged mean soil loss (F) (In/Hr) = 0.097
Minimum soil loss rate ((In/Hr)) = 0.049
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.100

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	104.614	20.612	14.469
2	0.167	209.229	48.679	34.170
3	0.250	313.843	14.978	10.514
4	0.333	418.458	6.821	4.788
5	0.417	523.072	3.802	2.669
6	0.500	627.687	2.435	1.709
7	0.583	732.301	1.462	1.026
8	0.667	836.916	1.210	0.849
			Sum = 100.000	Sum= 70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.102	(0.097)	0.010	0.092
2	0.17	0.60	0.123	(0.097)	0.012	0.110
3	0.25	0.60	0.123	(0.097)	0.012	0.110
4	0.33	0.60	0.123	(0.097)	0.012	0.110
5	0.42	0.60	0.123	(0.097)	0.012	0.110
6	0.50	0.70	0.143	(0.097)	0.014	0.129
7	0.58	0.70	0.143	(0.097)	0.014	0.129
8	0.67	0.70	0.143	(0.097)	0.014	0.129
9	0.75	0.70	0.143	(0.097)	0.014	0.129
10	0.83	0.70	0.143	(0.097)	0.014	0.129
11	0.92	0.70	0.143	(0.097)	0.014	0.129
12	1.00	0.80	0.164	(0.097)	0.016	0.147
13	1.08	0.80	0.164	(0.097)	0.016	0.147
14	1.17	0.80	0.164	(0.097)	0.016	0.147
15	1.25	0.80	0.164	(0.097)	0.016	0.147
16	1.33	0.80	0.164	(0.097)	0.016	0.147
17	1.42	0.80	0.164	(0.097)	0.016	0.147
18	1.50	0.80	0.164	(0.097)	0.016	0.147
19	1.58	0.80	0.164	(0.097)	0.016	0.147
20	1.67	0.80	0.164	(0.097)	0.016	0.147
21	1.75	0.80	0.164	(0.097)	0.016	0.147
22	1.83	0.80	0.164	(0.097)	0.016	0.147
23	1.92	0.80	0.164	(0.097)	0.016	0.147
24	2.00	0.90	0.184	(0.097)	0.018	0.166
25	2.08	0.80	0.164	(0.097)	0.016	0.147
26	2.17	0.90	0.184	(0.097)	0.018	0.166
27	2.25	0.90	0.184	(0.097)	0.018	0.166
28	2.33	0.90	0.184	(0.097)	0.018	0.166
29	2.42	0.90	0.184	(0.097)	0.018	0.166
30	2.50	0.90	0.184	(0.097)	0.018	0.166
31	2.58	0.90	0.184	(0.097)	0.018	0.166
32	2.67	0.90	0.184	(0.097)	0.018	0.166
33	2.75	1.00	0.205	(0.097)	0.020	0.184
34	2.83	1.00	0.205	(0.097)	0.020	0.184
35	2.92	1.00	0.205	(0.097)	0.020	0.184
36	3.00	1.00	0.205	(0.097)	0.020	0.184
37	3.08	1.00	0.205	(0.097)	0.020	0.184
38	3.17	1.10	0.225	(0.097)	0.023	0.203
39	3.25	1.10	0.225	(0.097)	0.023	0.203
40	3.33	1.10	0.225	(0.097)	0.023	0.203
41	3.42	1.20	0.246	(0.097)	0.025	0.221
42	3.50	1.30	0.266	(0.097)	0.027	0.239
43	3.58	1.40	0.286	(0.097)	0.029	0.258
44	3.67	1.40	0.286	(0.097)	0.029	0.258
45	3.75	1.50	0.307	(0.097)	0.031	0.276
46	3.83	1.50	0.307	(0.097)	0.031	0.276
47	3.92	1.60	0.327	(0.097)	0.033	0.295
48	4.00	1.60	0.327	(0.097)	0.033	0.295
49	4.08	1.70	0.348	(0.097)	0.035	0.313
50	4.17	1.80	0.368	(0.097)	0.037	0.331
51	4.25	1.90	0.389	(0.097)	0.039	0.350
52	4.33	2.00	0.409	(0.097)	0.041	0.368
53	4.42	2.10	0.430	(0.097)	0.043	0.387
54	4.50	2.10	0.430	(0.097)	0.043	0.387
55	4.58	2.20	0.450	(0.097)	0.045	0.405
56	4.67	2.30	0.471	(0.097)	0.047	0.424
57	4.75	2.40	0.491	(0.097)	0.049	0.442
58	4.83	2.40	0.491	(0.097)	0.049	0.442
59	4.92	2.50	0.511	(0.097)	0.051	0.460
60	5.00	2.60	0.532	(0.097)	0.053	0.479
61	5.08	3.10	0.634	(0.097)	0.063	0.571
62	5.17	3.60	0.737	(0.097)	0.074	0.663
63	5.25	3.90	0.798	(0.097)	0.080	0.718
64	5.33	4.20	0.859	(0.097)	0.086	0.773
65	5.42	4.70	0.962	(0.097)	0.096	0.865
66	5.50	5.60	1.146	0.097	(0.115)	1.049
67	5.58	1.90	0.389	(0.097)	0.039	0.350
68	5.67	0.90	0.184	(0.097)	0.018	0.166
69	5.75	0.60	0.123	(0.097)	0.012	0.110
70	5.83	0.50	0.102	(0.097)	0.010	0.092
71	5.92	0.30	0.061	(0.097)	0.006	0.055
72	6.00	0.20	0.041	(0.097)	0.004	0.037

(Loss Rate Not Used)

Sum = 100.0 Sum = 18.4

Flood volume = Effective rainfall 1.54(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 8.9(Ac.Ft)
Total soil loss = 0.17(In)
Total soil loss = 0.981(Ac.Ft)
Total rainfall = 1.70(In)
Flood volume = 388334.4 Cubic Feet
Total soil loss = 42738.0 Cubic Feet

Peak flow rate of this hydrograph = 59.974(CFS)

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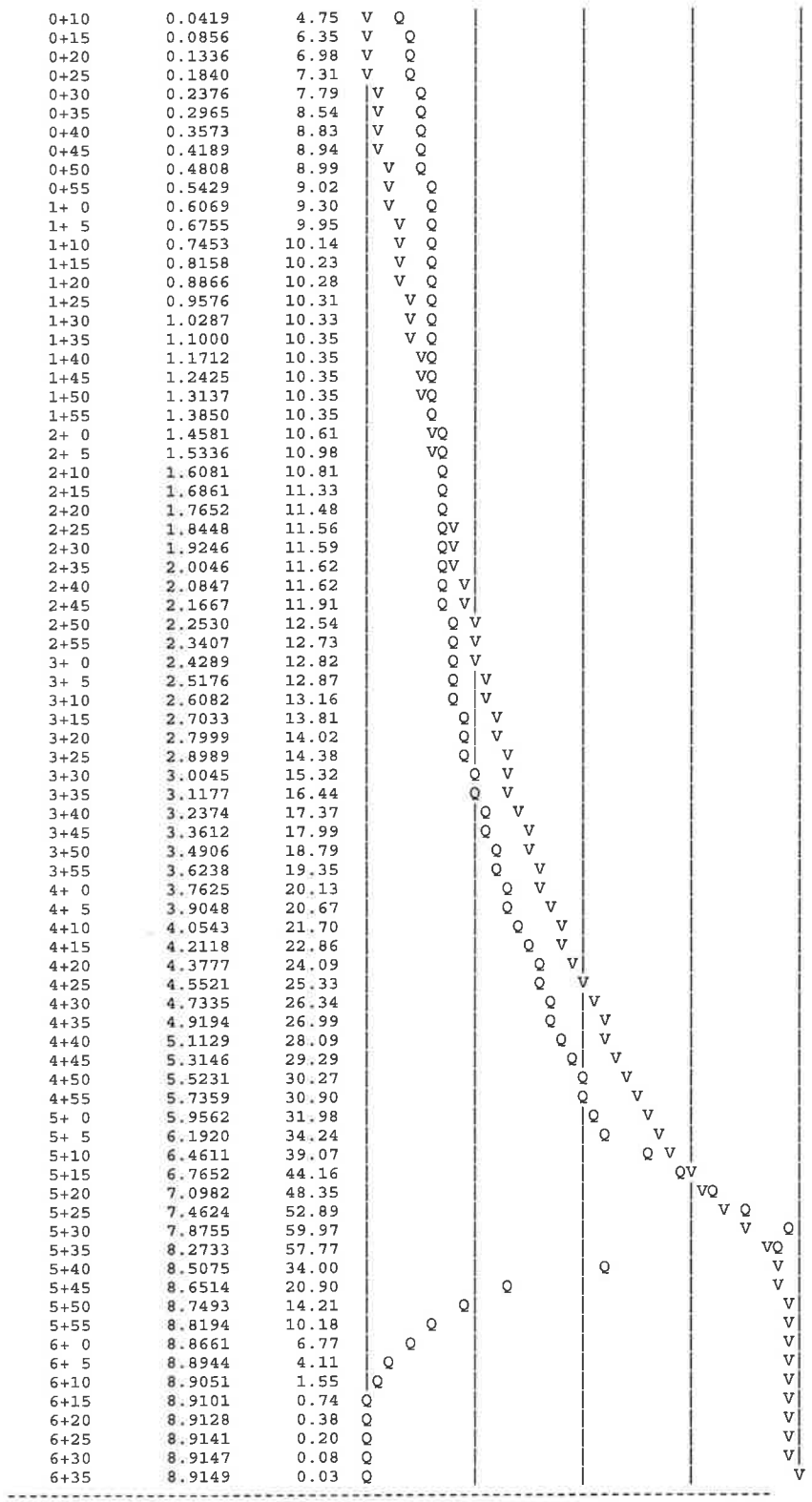
6 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	15.0	30.0	45.0	60.0
0+ 5	0.0092	1.33	Q	|	|	|	|



0+10	0.0419	4.75	V Q
0+15	0.0856	6.35	V Q
0+20	0.1336	6.98	V Q
0+25	0.1840	7.31	V Q
0+30	0.2376	7.79	V Q
0+35	0.2965	8.54	V Q
0+40	0.3573	8.83	V Q
0+45	0.4189	8.94	V Q
0+50	0.4808	8.99	V Q
0+55	0.5429	9.02	V Q
1+ 0	0.6069	9.30	V Q
1+ 5	0.6755	9.95	V Q
1+10	0.7453	10.14	V Q
1+15	0.8158	10.23	V Q
1+20	0.8866	10.28	V Q
1+25	0.9576	10.31	V Q
1+30	1.0287	10.33	V Q
1+35	1.1000	10.35	V Q
1+40	1.1712	10.35	VQ
1+45	1.2425	10.35	VQ
1+50	1.3137	10.35	VQ
1+55	1.3850	10.35	Q
2+ 0	1.4581	10.61	VQ
2+ 5	1.5336	10.98	VQ
2+10	1.6081	10.81	Q
2+15	1.6861	11.33	Q
2+20	1.7652	11.48	Q
2+25	1.8448	11.56	QV
2+30	1.9246	11.59	QV
2+35	2.0046	11.62	QV
2+40	2.0847	11.62	Q V
2+45	2.1667	11.91	Q V
2+50	2.2530	12.54	Q V
2+55	2.3407	12.73	Q V
3+ 0	2.4289	12.82	Q V
3+ 5	2.5176	12.87	Q V
3+10	2.6082	13.16	Q V
3+15	2.7033	13.81	Q V
3+20	2.7999	14.02	Q V
3+25	2.8989	14.38	Q V
3+30	3.0045	15.32	Q V
3+35	3.1177	16.44	Q V
3+40	3.2374	17.37	Q V
3+45	3.3612	17.99	Q V
3+50	3.4906	18.79	Q V
3+55	3.6238	19.35	Q V
4+ 0	3.7625	20.13	Q V
4+ 5	3.9048	20.67	Q V
4+10	4.0543	21.70	Q V
4+15	4.2118	22.86	Q V
4+20	4.3777	24.09	Q V
4+25	4.5521	25.33	Q V
4+30	4.7335	26.34	Q V
4+35	4.9194	26.99	Q V
4+40	5.1129	28.09	Q V
4+45	5.3146	29.29	Q V
4+50	5.5231	30.27	Q V
4+55	5.7359	30.90	Q V
5+ 0	5.9562	31.98	Q V
5+ 5	6.1920	34.24	Q V
5+10	6.4611	39.07	Q V
5+15	6.7652	44.16	QV
5+20	7.0982	48.35	VQ
5+25	7.4624	52.89	V Q
5+30	7.8755	59.97	V Q
5+35	8.2733	57.77	VQ
5+40	8.5075	34.00	Q V
5+45	8.6514	20.90	Q V
5+50	8.7493	14.21	Q V
5+55	8.8194	10.18	Q V
6+ 0	8.8661	6.77	Q V
6+ 5	8.8944	4.11	Q V
6+10	8.9051	1.55	Q V
6+15	8.9101	0.74	Q V
6+20	8.9128	0.38	Q V
6+25	8.9141	0.20	Q V
6+30	8.9147	0.08	Q V
6+35	8.9149	0.03	Q V

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/13/20 File: 3828PR102410.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.080 Hr.
Lag time = 4.78 Min.
25% of lag time = 1.19 Min.
40% of lag time = 1.91 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.75	121.89

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	4.50	313.43

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 1.750(In)
Area Averaged 100-Year Rainfall = 4.500(In)

Point rain (area averaged) = 2.881(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 2.881(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	56.00	0.900

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	56.0	0.511	0.900	0.097	1.000	0.097
					Sum (F) =	0.097

Area averaged mean soil loss (F) (In/Hr) = 0.097
Minimum soil loss rate ((In/Hr)) = 0.049
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.100

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	104.614	20.612	14.469
2	0.167	209.229	48.679	34.170
3	0.250	313.843	14.978	10.514
4	0.333	418.458	6.821	4.788
5	0.417	523.072	3.802	2.669
6	0.500	627.687	2.435	1.709
7	0.583	732.301	1.462	1.026
8	0.667	836.916	1.210	0.849
		Sum = 100.000	Sum=	70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.023	(0.172)	0.002	0.021
2	0.17	0.07	0.023	(0.171)	0.002	0.021
3	0.25	0.07	0.023	(0.171)	0.002	0.021
4	0.33	0.10	0.035	(0.170)	0.003	0.031
5	0.42	0.10	0.035	(0.169)	0.003	0.031
6	0.50	0.10	0.035	(0.169)	0.003	0.031
7	0.58	0.10	0.035	(0.168)	0.003	0.031
8	0.67	0.10	0.035	(0.167)	0.003	0.031
9	0.75	0.10	0.035	(0.167)	0.003	0.031
10	0.83	0.13	0.046	(0.166)	0.005	0.041
11	0.92	0.13	0.046	(0.165)	0.005	0.041
12	1.00	0.13	0.046	(0.165)	0.005	0.041
13	1.08	0.10	0.035	(0.164)	0.003	0.031
14	1.17	0.10	0.035	(0.163)	0.003	0.031
15	1.25	0.10	0.035	(0.163)	0.003	0.031
16	1.33	0.10	0.035	(0.162)	0.003	0.031
17	1.42	0.10	0.035	(0.162)	0.003	0.031
18	1.50	0.10	0.035	(0.161)	0.003	0.031
19	1.58	0.10	0.035	(0.160)	0.003	0.031
20	1.67	0.10	0.035	(0.160)	0.003	0.031
21	1.75	0.10	0.035	(0.159)	0.003	0.031
22	1.83	0.13	0.046	(0.158)	0.005	0.041
23	1.92	0.13	0.046	(0.158)	0.005	0.041
24	2.00	0.13	0.046	(0.157)	0.005	0.041
25	2.08	0.13	0.046	(0.156)	0.005	0.041
26	2.17	0.13	0.046	(0.156)	0.005	0.041
27	2.25	0.13	0.046	(0.155)	0.005	0.041
28	2.33	0.13	0.046	(0.155)	0.005	0.041
29	2.42	0.13	0.046	(0.154)	0.005	0.041
30	2.50	0.13	0.046	(0.153)	0.005	0.041
31	2.58	0.17	0.058	(0.153)	0.006	0.052
32	2.67	0.17	0.058	(0.152)	0.006	0.052
33	2.75	0.17	0.058	(0.151)	0.006	0.052
34	2.83	0.17	0.058	(0.151)	0.006	0.052
35	2.92	0.17	0.058	(0.150)	0.006	0.052
36	3.00	0.17	0.058	(0.150)	0.006	0.052
37	3.08	0.17	0.058	(0.149)	0.006	0.052
38	3.17	0.17	0.058	(0.148)	0.006	0.052
39	3.25	0.17	0.058	(0.148)	0.006	0.052
40	3.33	0.17	0.058	(0.147)	0.006	0.052
41	3.42	0.17	0.058	(0.146)	0.006	0.052
42	3.50	0.17	0.058	(0.146)	0.006	0.052
43	3.58	0.17	0.058	(0.145)	0.006	0.052
44	3.67	0.17	0.058	(0.145)	0.006	0.052
45	3.75	0.17	0.058	(0.144)	0.006	0.052
46	3.83	0.20	0.069	(0.143)	0.007	0.062
47	3.92	0.20	0.069	(0.143)	0.007	0.062
48	4.00	0.20	0.069	(0.142)	0.007	0.062
49	4.08	0.20	0.069	(0.142)	0.007	0.062
50	4.17	0.20	0.069	(0.141)	0.007	0.062
51	4.25	0.20	0.069	(0.140)	0.007	0.062
52	4.33	0.23	0.081	(0.140)	0.008	0.073
53	4.42	0.23	0.081	(0.139)	0.008	0.073
54	4.50	0.23	0.081	(0.139)	0.008	0.073
55	4.58	0.23	0.081	(0.138)	0.008	0.073
56	4.67	0.23	0.081	(0.137)	0.008	0.073
57	4.75	0.23	0.081	(0.137)	0.008	0.073
58	4.83	0.27	0.092	(0.136)	0.009	0.083
59	4.92	0.27	0.092	(0.136)	0.009	0.083
60	5.00	0.27	0.092	(0.135)	0.009	0.083
61	5.08	0.20	0.069	(0.134)	0.007	0.062
62	5.17	0.20	0.069	(0.134)	0.007	0.062
63	5.25	0.20	0.069	(0.133)	0.007	0.062
64	5.33	0.23	0.081	(0.133)	0.008	0.073
65	5.42	0.23	0.081	(0.132)	0.008	0.073
66	5.50	0.23	0.081	(0.132)	0.008	0.073
67	5.58	0.27	0.092	(0.131)	0.009	0.083
68	5.67	0.27	0.092	(0.130)	0.009	0.083
69	5.75	0.27	0.092	(0.130)	0.009	0.083
70	5.83	0.27	0.092	(0.129)	0.009	0.083
71	5.92	0.27	0.092	(0.129)	0.009	0.083
72	6.00	0.27	0.092	(0.128)	0.009	0.083
73	6.08	0.30	0.104	(0.128)	0.010	0.093
74	6.17	0.30	0.104	(0.127)	0.010	0.093
75	6.25	0.30	0.104	(0.126)	0.010	0.093
76	6.33	0.30	0.104	(0.126)	0.010	0.093
77	6.42	0.30	0.104	(0.125)	0.010	0.093
78	6.50	0.30	0.104	(0.125)	0.010	0.093
79	6.58	0.33	0.115	(0.124)	0.012	0.104
80	6.67	0.33	0.115	(0.124)	0.012	0.104
81	6.75	0.33	0.115	(0.123)	0.012	0.104
82	6.83	0.33	0.115	(0.122)	0.012	0.104
83	6.92	0.33	0.115	(0.122)	0.012	0.104
84	7.00	0.33	0.115	(0.121)	0.012	0.104
85	7.08	0.33	0.115	(0.121)	0.012	0.104
86	7.17	0.33	0.115	(0.120)	0.012	0.104
87	7.25	0.33	0.115	(0.120)	0.012	0.104
88	7.33	0.37	0.127	(0.119)	0.013	0.114
89	7.42	0.37	0.127	(0.119)	0.013	0.114
90	7.50	0.37	0.127	(0.118)	0.013	0.114
91	7.58	0.40	0.138	(0.118)	0.014	0.124
92	7.67	0.40	0.138	(0.117)	0.014	0.124
93	7.75	0.40	0.138	(0.116)	0.014	0.124
94	7.83	0.43	0.150	(0.116)	0.015	0.135

95	7.92	0.43	0.150	(0.115)	0.015	0.135
96	8.00	0.43	0.150	(0.115)	0.015	0.135
97	8.08	0.50	0.173	(0.114)	0.017	0.156
98	8.17	0.50	0.173	(0.114)	0.017	0.156
99	8.25	0.50	0.173	(0.113)	0.017	0.156
100	8.33	0.50	0.173	(0.113)	0.017	0.156
101	8.42	0.50	0.173	(0.112)	0.017	0.156
102	8.50	0.50	0.173	(0.112)	0.017	0.156
103	8.58	0.53	0.184	(0.111)	0.018	0.166
104	8.67	0.53	0.184	(0.111)	0.018	0.166
105	8.75	0.53	0.184	(0.110)	0.018	0.166
106	8.83	0.57	0.196	(0.110)	0.020	0.176
107	8.92	0.57	0.196	(0.109)	0.020	0.176
108	9.00	0.57	0.196	(0.109)	0.020	0.176
109	9.08	0.63	0.219	(0.108)	0.022	0.197
110	9.17	0.63	0.219	(0.108)	0.022	0.197
111	9.25	0.63	0.219	(0.107)	0.022	0.197
112	9.33	0.67	0.230	(0.107)	0.023	0.207
113	9.42	0.67	0.230	(0.106)	0.023	0.207
114	9.50	0.67	0.230	(0.105)	0.023	0.207
115	9.58	0.70	0.242	(0.105)	0.024	0.218
116	9.67	0.70	0.242	(0.104)	0.024	0.218
117	9.75	0.70	0.242	(0.104)	0.024	0.218
118	9.83	0.73	0.254	(0.103)	0.025	0.228
119	9.92	0.73	0.254	(0.103)	0.025	0.228
120	10.00	0.73	0.254	(0.102)	0.025	0.228
121	10.08	0.50	0.173	(0.102)	0.017	0.156
122	10.17	0.50	0.173	(0.101)	0.017	0.156
123	10.25	0.50	0.173	(0.101)	0.017	0.156
124	10.33	0.50	0.173	(0.101)	0.017	0.156
125	10.42	0.50	0.173	(0.100)	0.017	0.156
126	10.50	0.50	0.173	(0.100)	0.017	0.156
127	10.58	0.67	0.230	(0.099)	0.023	0.207
128	10.67	0.67	0.230	(0.099)	0.023	0.207
129	10.75	0.67	0.230	(0.098)	0.023	0.207
130	10.83	0.67	0.230	(0.098)	0.023	0.207
131	10.92	0.67	0.230	(0.097)	0.023	0.207
132	11.00	0.67	0.230	(0.097)	0.023	0.207
133	11.08	0.63	0.219	(0.096)	0.022	0.197
134	11.17	0.63	0.219	(0.096)	0.022	0.197
135	11.25	0.63	0.219	(0.095)	0.022	0.197
136	11.33	0.63	0.219	(0.095)	0.022	0.197
137	11.42	0.63	0.219	(0.094)	0.022	0.197
138	11.50	0.63	0.219	(0.094)	0.022	0.197
139	11.58	0.57	0.196	(0.093)	0.020	0.176
140	11.67	0.57	0.196	(0.093)	0.020	0.176
141	11.75	0.57	0.196	(0.092)	0.020	0.176
142	11.83	0.60	0.207	(0.092)	0.021	0.187
143	11.92	0.60	0.207	(0.092)	0.021	0.187
144	12.00	0.60	0.207	(0.091)	0.021	0.187
145	12.08	0.83	0.288	(0.091)	0.029	0.259
146	12.17	0.83	0.288	(0.090)	0.029	0.259
147	12.25	0.83	0.288	(0.090)	0.029	0.259
148	12.33	0.87	0.300	(0.089)	0.030	0.270
149	12.42	0.87	0.300	(0.089)	0.030	0.270
150	12.50	0.87	0.300	(0.088)	0.030	0.270
151	12.58	0.93	0.323	(0.088)	0.032	0.290
152	12.67	0.93	0.323	(0.087)	0.032	0.290
153	12.75	0.93	0.323	(0.087)	0.032	0.290
154	12.83	0.97	0.334	(0.087)	0.033	0.301
155	12.92	0.97	0.334	(0.086)	0.033	0.301
156	13.00	0.97	0.334	(0.086)	0.033	0.301
157	13.08	1.13	0.392	(0.085)	0.039	0.353
158	13.17	1.13	0.392	(0.085)	0.039	0.353
159	13.25	1.13	0.392	(0.084)	0.039	0.353
160	13.33	1.13	0.392	(0.084)	0.039	0.353
161	13.42	1.13	0.392	(0.084)	0.039	0.353
162	13.50	1.13	0.392	(0.083)	0.039	0.353
163	13.58	0.77	0.265	(0.083)	0.027	0.239
164	13.67	0.77	0.265	(0.082)	0.027	0.239
165	13.75	0.77	0.265	(0.082)	0.027	0.239
166	13.83	0.77	0.265	(0.081)	0.027	0.239
167	13.92	0.77	0.265	(0.081)	0.027	0.239
168	14.00	0.77	0.265	(0.081)	0.027	0.239
169	14.08	0.90	0.311	(0.080)	0.031	0.280
170	14.17	0.90	0.311	(0.080)	0.031	0.280
171	14.25	0.90	0.311	(0.079)	0.031	0.280
172	14.33	0.87	0.300	(0.079)	0.030	0.270
173	14.42	0.87	0.300	(0.079)	0.030	0.270
174	14.50	0.87	0.300	(0.078)	0.030	0.270
175	14.58	0.87	0.300	(0.078)	0.030	0.270
176	14.67	0.87	0.300	(0.077)	0.030	0.270
177	14.75	0.87	0.300	(0.077)	0.030	0.270
178	14.83	0.83	0.288	(0.077)	0.029	0.259
179	14.92	0.83	0.288	(0.076)	0.029	0.259
180	15.00	0.83	0.288	(0.076)	0.029	0.259
181	15.08	0.80	0.277	(0.075)	0.028	0.249
182	15.17	0.80	0.277	(0.075)	0.028	0.249
183	15.25	0.80	0.277	(0.075)	0.028	0.249
184	15.33	0.77	0.265	(0.074)	0.027	0.239
185	15.42	0.77	0.265	(0.074)	0.027	0.239
186	15.50	0.77	0.265	(0.073)	0.027	0.239
187	15.58	0.63	0.219	(0.073)	0.022	0.197
188	15.67	0.63	0.219	(0.073)	0.022	0.197
189	15.75	0.63	0.219	(0.072)	0.022	0.197
190	15.83	0.63	0.219	(0.072)	0.022	0.197
191	15.92	0.63	0.219	(0.072)	0.022	0.197
192	16.00	0.63	0.219	(0.071)	0.022	0.197
193	16.08	0.13	0.046	(0.071)	0.005	0.041

194	16.17	0.13	0.046	(0.071)	0.005	0.041
195	16.25	0.13	0.046	(0.070)	0.005	0.041
196	16.33	0.13	0.046	(0.070)	0.005	0.041
197	16.42	0.13	0.046	(0.069)	0.005	0.041
198	16.50	0.13	0.046	(0.069)	0.005	0.041
199	16.58	0.10	0.035	(0.069)	0.003	0.031
200	16.67	0.10	0.035	(0.068)	0.003	0.031
201	16.75	0.10	0.035	(0.068)	0.003	0.031
202	16.83	0.10	0.035	(0.068)	0.003	0.031
203	16.92	0.10	0.035	(0.067)	0.003	0.031
204	17.00	0.10	0.035	(0.067)	0.003	0.031
205	17.08	0.17	0.058	(0.067)	0.006	0.052
206	17.17	0.17	0.058	(0.066)	0.006	0.052
207	17.25	0.17	0.058	(0.066)	0.006	0.052
208	17.33	0.17	0.058	(0.066)	0.006	0.052
209	17.42	0.17	0.058	(0.065)	0.006	0.052
210	17.50	0.17	0.058	(0.065)	0.006	0.052
211	17.58	0.17	0.058	(0.065)	0.006	0.052
212	17.67	0.17	0.058	(0.064)	0.006	0.052
213	17.75	0.17	0.058	(0.064)	0.006	0.052
214	17.83	0.13	0.046	(0.064)	0.005	0.041
215	17.92	0.13	0.046	(0.063)	0.005	0.041
216	18.00	0.13	0.046	(0.063)	0.005	0.041
217	18.08	0.13	0.046	(0.063)	0.005	0.041
218	18.17	0.13	0.046	(0.063)	0.005	0.041
219	18.25	0.13	0.046	(0.062)	0.005	0.041
220	18.33	0.13	0.046	(0.062)	0.005	0.041
221	18.42	0.13	0.046	(0.062)	0.005	0.041
222	18.50	0.13	0.046	(0.061)	0.005	0.041
223	18.58	0.10	0.035	(0.061)	0.003	0.031
224	18.67	0.10	0.035	(0.061)	0.003	0.031
225	18.75	0.10	0.035	(0.060)	0.003	0.031
226	18.83	0.07	0.023	(0.060)	0.002	0.021
227	18.92	0.07	0.023	(0.060)	0.002	0.021
228	19.00	0.07	0.023	(0.060)	0.002	0.021
229	19.08	0.10	0.035	(0.059)	0.003	0.031
230	19.17	0.10	0.035	(0.059)	0.003	0.031
231	19.25	0.10	0.035	(0.059)	0.003	0.031
232	19.33	0.13	0.046	(0.058)	0.005	0.041
233	19.42	0.13	0.046	(0.058)	0.005	0.041
234	19.50	0.13	0.046	(0.058)	0.005	0.041
235	19.58	0.10	0.035	(0.058)	0.003	0.031
236	19.67	0.10	0.035	(0.057)	0.003	0.031
237	19.75	0.10	0.035	(0.057)	0.003	0.031
238	19.83	0.07	0.023	(0.057)	0.002	0.021
239	19.92	0.07	0.023	(0.057)	0.002	0.021
240	20.00	0.07	0.023	(0.056)	0.002	0.021
241	20.08	0.10	0.035	(0.056)	0.003	0.031
242	20.17	0.10	0.035	(0.056)	0.003	0.031
243	20.25	0.10	0.035	(0.056)	0.003	0.031
244	20.33	0.10	0.035	(0.055)	0.003	0.031
245	20.42	0.10	0.035	(0.055)	0.003	0.031
246	20.50	0.10	0.035	(0.055)	0.003	0.031
247	20.58	0.10	0.035	(0.055)	0.003	0.031
248	20.67	0.10	0.035	(0.054)	0.003	0.031
249	20.75	0.10	0.035	(0.054)	0.003	0.031
250	20.83	0.07	0.023	(0.054)	0.002	0.021
251	20.92	0.07	0.023	(0.054)	0.002	0.021
252	21.00	0.07	0.023	(0.054)	0.002	0.021
253	21.08	0.10	0.035	(0.053)	0.003	0.031
254	21.17	0.10	0.035	(0.053)	0.003	0.031
255	21.25	0.10	0.035	(0.053)	0.003	0.031
256	21.33	0.07	0.023	(0.053)	0.002	0.021
257	21.42	0.07	0.023	(0.053)	0.002	0.021
258	21.50	0.07	0.023	(0.052)	0.002	0.021
259	21.58	0.10	0.035	(0.052)	0.003	0.031
260	21.67	0.10	0.035	(0.052)	0.003	0.031
261	21.75	0.10	0.035	(0.052)	0.003	0.031
262	21.83	0.07	0.023	(0.052)	0.002	0.021
263	21.92	0.07	0.023	(0.051)	0.002	0.021
264	22.00	0.07	0.023	(0.051)	0.002	0.021
265	22.08	0.10	0.035	(0.051)	0.003	0.031
266	22.17	0.10	0.035	(0.051)	0.003	0.031
267	22.25	0.10	0.035	(0.051)	0.003	0.031
268	22.33	0.07	0.023	(0.051)	0.002	0.021
269	22.42	0.07	0.023	(0.050)	0.002	0.021
270	22.50	0.07	0.023	(0.050)	0.002	0.021
271	22.58	0.07	0.023	(0.050)	0.002	0.021
272	22.67	0.07	0.023	(0.050)	0.002	0.021
273	22.75	0.07	0.023	(0.050)	0.002	0.021
274	22.83	0.07	0.023	(0.050)	0.002	0.021
275	22.92	0.07	0.023	(0.050)	0.002	0.021
276	23.00	0.07	0.023	(0.049)	0.002	0.021
277	23.08	0.07	0.023	(0.049)	0.002	0.021
278	23.17	0.07	0.023	(0.049)	0.002	0.021
279	23.25	0.07	0.023	(0.049)	0.002	0.021
280	23.33	0.07	0.023	(0.049)	0.002	0.021
281	23.42	0.07	0.023	(0.049)	0.002	0.021
282	23.50	0.07	0.023	(0.049)	0.002	0.021
283	23.58	0.07	0.023	(0.049)	0.002	0.021
284	23.67	0.07	0.023	(0.049)	0.002	0.021
285	23.75	0.07	0.023	(0.049)	0.002	0.021
286	23.83	0.07	0.023	(0.049)	0.002	0.021
287	23.92	0.07	0.023	(0.049)	0.002	0.021
288	24.00	0.07	0.023	(0.049)	0.002	0.021

(Loss Rate Not Used)

Sum = 100.0 Sum = 31.1

Flood volume = Effective rainfall 2.59(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 15.0(Ac.Ft)

Total soil loss = 0.29(In)
Total soil loss = 1.672(Ac.Ft)
Total rainfall = 2.88(In)
Flood volume = 655557.1 Cubic Feet
Total soil loss = 72839.7 Cubic Feet

Peak flow rate of this hydrograph = 24.668(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0021	0.30	Q				
0+10	0.0090	1.01	VQ				
0+15	0.0175	1.23	VQ				
0+20	0.0276	1.48	VQ				
0+25	0.0406	1.89	V Q				
0+30	0.0546	2.03	V Q				
0+35	0.0691	2.10	V Q				
0+40	0.0839	2.15	V Q				
0+45	0.0988	2.17	V Q				
0+50	0.1148	2.33	V Q				
0+55	0.1334	2.69	V Q				
1+ 0	0.1527	2.80	V Q				
1+ 5	0.1712	2.70	V Q				
1+10	0.1876	2.37	V Q				
1+15	0.2033	2.28	V Q				
1+20	0.2187	2.24	V Q				
1+25	0.2340	2.22	V Q				
1+30	0.2492	2.20	V Q				
1+35	0.2643	2.19	V Q				
1+40	0.2794	2.19	V Q				
1+45	0.2944	2.19	V Q				
1+50	0.3105	2.34	V Q				
1+55	0.3290	2.69	V Q				
2+ 0	0.3483	2.80	V Q				
2+ 5	0.3679	2.85	V Q				
2+10	0.3877	2.88	V Q				
2+15	0.4077	2.89	V Q				
2+20	0.4277	2.90	V Q				
2+25	0.4477	2.91	V Q				
2+30	0.4678	2.91	V Q				
2+35	0.4889	3.06	V Q				
2+40	0.5124	3.42	V Q				
2+45	0.5367	3.53	V Q				
2+50	0.5614	3.58	V Q				
2+55	0.5862	3.60	V Q				
3+ 0	0.6111	3.62	V Q				
3+ 5	0.6362	3.63	V Q				
3+10	0.6612	3.64	V Q				
3+15	0.6863	3.64	V Q				
3+20	0.7114	3.64	V Q				
3+25	0.7365	3.64	V Q				
3+30	0.7616	3.64	V Q				
3+35	0.7867	3.64	V Q				
3+40	0.8117	3.64	V Q				
3+45	0.8368	3.64	V Q				
3+50	0.8629	3.79	V Q				
3+55	0.8915	4.15	V Q				
4+ 0	0.9208	4.26	V Q				
4+ 5	0.9505	4.31	V Q				
4+10	0.9803	4.33	V Q				
4+15	1.0103	4.35	V Q				
4+20	1.0413	4.51	V Q				
4+25	1.0749	4.88	V Q				
4+30	1.1092	4.98	V Q				
4+35	1.1439	5.03	V Q				
4+40	1.1788	5.06	V Q				
4+45	1.2138	5.08	V Q				
4+50	1.2498	5.24	V Q				
4+55	1.2884	5.60	V Q				
5+ 0	1.3278	5.71	V Q				
5+ 5	1.3654	5.46	V Q				
5+10	1.3983	4.78	V Q				
5+15	1.4299	4.58	V Q				
5+20	1.4618	4.64	V Q				
5+25	1.4959	4.95	V Q				
5+30	1.5305	5.02	V Q				
5+35	1.5663	5.20	V Q				
5+40	1.6047	5.57	V Q				
5+45	1.6439	5.69	V Q				
5+50	1.6835	5.75	V Q				
5+55	1.7234	5.79	V Q				
6+ 0	1.7634	5.81	V Q				
6+ 5	1.8045	5.97	V Q				
6+10	1.8481	6.33	V Q				
6+15	1.8924	6.44	V Q				
6+20	1.9371	6.49	V Q				
6+25	1.9820	6.52	V Q				
6+30	2.0271	6.54	V Q				
6+35	2.0732	6.70	V Q				
6+40	2.1218	7.06	V Q				
6+45	2.1712	7.17	V Q				
6+50	2.2209	7.22	V Q				

6+55	2.2708	7.25	
7+ 0	2.3208	7.26	
7+ 5	2.3709	7.28	
7+10	2.4211	7.28	
7+15	2.4713	7.28	
7+20	2.5225	7.43	
7+25	2.5761	7.79	
7+30	2.6305	7.90	
7+35	2.6863	8.10	
7+40	2.7447	8.48	
7+45	2.8039	8.61	
7+50	2.8647	8.82	
7+55	2.9281	9.21	
8+ 0	2.9924	9.34	
8+ 5	3.0592	9.70	
8+10	3.1311	10.44	
8+15	3.2046	10.68	
8+20	3.2789	10.79	
8+25	3.3536	10.85	
8+30	3.4286	10.89	
8+35	3.5048	11.06	
8+40	3.5835	11.43	
8+45	3.6630	11.54	
8+50	3.7438	11.74	
8+55	3.8273	12.12	
9+ 0	3.9117	12.25	
9+ 5	3.9985	12.61	
9+10	4.0905	13.35	
9+15	4.1841	13.59	
9+20	4.2795	13.85	
9+25	4.3778	14.27	
9+30	4.4770	14.41	
9+35	4.5778	14.64	
9+40	4.6814	15.04	
9+45	4.7858	15.16	
9+50	4.8917	15.37	
9+55	5.0002	15.76	
10+ 0	5.1097	15.89	
10+ 5	5.2123	14.90	
10+10	5.2981	12.45	
10+15	5.3787	11.71	
10+20	5.4570	11.37	
10+25	5.5341	11.19	
10+30	5.6102	11.06	
10+35	5.6911	11.74	
10+40	5.7837	13.45	
10+45	5.8801	14.00	
10+50	5.9782	14.24	
10+55	6.0772	14.38	
11+ 0	6.1769	14.47	
11+ 5	6.2759	14.37	
11+10	6.3728	14.06	
11+15	6.4689	13.95	
11+20	6.5646	13.90	
11+25	6.6602	13.88	
11+30	6.7556	13.86	
11+35	6.8489	13.55	
11+40	6.9373	12.83	
11+45	7.0242	12.61	
11+50	7.1114	12.66	
11+55	7.2006	12.96	
12+ 0	7.2904	13.04	
12+ 5	7.3876	14.11	
12+10	7.5020	16.61	
12+15	7.6217	17.39	
12+20	7.7450	17.90	
12+25	7.8721	18.45	
12+30	8.0008	18.69	
12+35	8.1324	19.11	
12+40	8.2696	19.91	
12+45	8.4083	20.15	
12+50	8.5488	20.41	
12+55	8.6923	20.83	
13+ 0	8.8367	20.97	
13+ 5	8.9868	21.79	
13+10	9.1494	23.61	
13+15	9.3159	24.17	
13+20	9.4841	24.43	
13+25	9.6534	24.58	
13+30	9.8233	24.67	
13+35	9.9822	23.07	
13+40	10.1145	19.21	
13+45	10.2386	18.01	
13+50	10.3589	17.47	
13+55	10.4771	17.16	
14+ 0	10.5939	16.97	
14+ 5	10.7141	17.45	
14+10	10.8434	18.77	
14+15	10.9757	19.21	
14+20	11.1083	19.26	
14+25	11.2392	19.01	
14+30	11.3699	18.98	
14+35	11.5006	18.97	
14+40	11.6312	18.98	
14+45	11.7618	18.96	
14+50	11.8913	18.80	
14+55	12.0182	18.43	
15+ 0	12.1444	18.32	
15+ 5	12.2692	18.12	

15+10	12.3914	17.74
15+15	12.5127	17.62
15+20	12.6326	17.41
15+25	12.7498	17.01
15+30	12.8661	16.89
15+35	12.9778	16.23
15+40	13.0796	14.77
15+45	13.1782	14.32
15+50	13.2753	14.11
15+55	13.3717	13.99
16+ 0	13.4675	13.92
16+ 5	13.5476	11.62
16+10	13.5908	6.27
16+15	13.6227	4.63
16+20	13.6494	3.89
16+25	13.6733	3.47
16+30	13.6954	3.21
16+35	13.7154	2.90
16+40	13.7319	2.41
16+45	13.7478	2.30
16+50	13.7633	2.25
16+55	13.7786	2.22
17+ 0	13.7938	2.20
17+ 5	13.8109	2.49
17+10	13.8329	3.19
17+15	13.8565	3.41
17+20	13.8806	3.51
17+25	13.9052	3.57
17+30	13.9300	3.60
17+35	13.9550	3.62
17+40	13.9801	3.64
17+45	14.0052	3.64
17+50	14.0292	3.49
17+55	14.0508	3.14
18+ 0	14.0717	3.03
18+ 5	14.0922	2.98
18+10	14.1125	2.95
18+15	14.1327	2.93
18+20	14.1528	2.92
18+25	14.1729	2.91
18+30	14.1930	2.91
18+35	14.2120	2.76
18+40	14.2286	2.41
18+45	14.2444	2.30
18+50	14.2589	2.10
18+55	14.2707	1.72
19+ 0	14.2817	1.59
19+ 5	14.2932	1.68
19+10	14.3070	2.00
19+15	14.3214	2.09
19+20	14.3371	2.28
19+25	14.3554	2.65
19+30	14.3745	2.78
19+35	14.3930	2.69
19+40	14.4094	2.37
19+45	14.4251	2.28
19+50	14.4395	2.09
19+55	14.4513	1.72
20+ 0	14.4623	1.59
20+ 5	14.4738	1.68
20+10	14.4876	2.00
20+15	14.5020	2.09
20+20	14.5167	2.13
20+25	14.5315	2.15
20+30	14.5464	2.17
20+35	14.5614	2.18
20+40	14.5764	2.19
20+45	14.5915	2.19
20+50	14.6055	2.04
20+55	14.6170	1.68
21+ 0	14.6279	1.57
21+ 5	14.6394	1.67
21+10	14.6531	2.00
21+15	14.6675	2.09
21+20	14.6812	1.98
21+25	14.6925	1.64
21+30	14.7032	1.55
21+35	14.7146	1.66
21+40	14.7284	2.00
21+45	14.7428	2.09
21+50	14.7564	1.98
21+55	14.7677	1.64
22+ 0	14.7784	1.55
22+ 5	14.7899	1.66
22+10	14.8036	2.00
22+15	14.8180	2.09
22+20	14.8317	1.98
22+25	14.8430	1.64
22+30	14.8537	1.55
22+35	14.8641	1.51
22+40	14.8744	1.49
22+45	14.8845	1.48
22+50	14.8946	1.47
22+55	14.9047	1.46
23+ 0	14.9147	1.46
23+ 5	14.9247	1.46
23+10	14.9348	1.46
23+15	14.9448	1.46
23+20	14.9548	1.46

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  23+25      14.9649      1.46  |Q        |        |        |        V|
  23+30      14.9749      1.46  |Q        |        |        |        V|
  23+35      14.9849      1.46  |Q        |        |        |        V|
  23+40      14.9950      1.46  |Q        |        |        |        V|
  23+45      15.0050      1.46  |Q        |        |        |        V|
  23+50      15.0150      1.46  |Q        |        |        |        V|
  23+55      15.0251      1.46  |Q        |        |        |        V|
  24+ 0      15.0351      1.46  |Q        |        |        |        V|
  24+ 5      15.0431      1.16  |Q        |        |        |        V|
  24+10      15.0461      0.45  Q         |        |        |        V|
  24+15      15.0477      0.23  Q         |        |        |        V|
  24+20      15.0486      0.13  Q         |        |        |        V|
  24+25      15.0491      0.07  Q         |        |        |        V|
  24+30      15.0494      0.04  Q         |        |        |        V|
  24+35      15.0495      0.02  Q         |        |        |         V
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U n i t H y d r o g r a p h A n a l y s i s

Study date 02/13/20 File: 3828PR1001100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.080 Hr.
Lag time = 4.78 Min.
25% of lag time = 1.19 Min.
40% of lag time = 1.91 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	0.50	34.83

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.20	83.58

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.500(In)
Area Averaged 100-Year Rainfall = 1.200(In)

Point rain (area averaged) = 1.200(In)
Areal adjustment factor = 99.94 %
Adjusted average point rain = 1.199(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	56.00	0.900

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	74.8	0.305	0.900	0.058	1.000	0.058
					Sum (F) =	0.058

Area averaged mean soil loss (F) (In/Hr) = 0.058
Minimum soil loss rate ((In/Hr)) = 0.029
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.100

Slope of intensity-duration curve for a 1 hour storm =0.5000

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	104.614	20.612	14.469
2	0.167	209.229	48.679	34.170
3	0.250	313.843	14.978	10.514
4	0.333	418.458	6.821	4.788
5	0.417	523.072	3.802	2.669
6	0.500	627.687	2.435	1.709
7	0.583	732.301	1.462	1.026
8	0.667	836.916	1.210	0.849
		Sum = 100.000	Sum=	70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	4.20	0.604	0.058	(0.060)	0.546
2	0.17	4.30	0.619	0.058	(0.062)	0.561
3	0.25	5.00	0.720	0.058	(0.072)	0.662
4	0.33	5.00	0.720	0.058	(0.072)	0.662
5	0.42	5.80	0.835	0.058	(0.083)	0.777
6	0.50	6.50	0.935	0.058	(0.094)	0.877
7	0.58	7.40	1.065	0.058	(0.106)	1.007
8	0.67	8.60	1.238	0.058	(0.124)	1.180
9	0.75	12.30	1.770	0.058	(0.177)	1.712
10	0.83	29.10	4.188	0.058	(0.419)	4.130
11	0.92	6.80	0.979	0.058	(0.098)	0.921
12	1.00	5.00	0.720	0.058	(0.072)	0.662
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	13.7

Flood volume = Effective rainfall 1.14(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 6.6(Ac.Ft)
Total soil loss = 0.06(In)
Total soil loss = 0.337(Ac.Ft)
Total rainfall = 1.20(In)
Flood volume = 288535.1 Cubic Feet
Total soil loss = 14668.8 Cubic Feet

Peak flow rate of this hydrograph = 183.722(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0545	7.91	VQ				
0+10	0.2390	26.80	V Q				
0+15	0.4766	34.50	V Q				
0+20	0.7570	40.71	V Q				
0+25	1.0666	44.96	V Q				
0+30	1.4235	51.81	V Q				
0+35	1.8312	59.20	Q				
0+40	2.3022	68.39	Q				
0+45	2.8825	84.27	QV				
0+50	3.8499	140.46	V Q				
0+55	5.1152	183.72	V Q				
1+ 0	5.7978	99.12	Q V				
1+ 5	6.2142	60.45	Q V				
1+10	6.4028	27.39	Q V				
1+15	6.5092	15.45	Q V				
1+20	6.5715	9.04	Q V				
1+25	6.6099	5.58	Q V				
1+30	6.6200	1.46	Q V				
1+35	6.6239	0.56	Q V				

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/13/20 File: 3828PR1003100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.080 Hr.
Lag time = 4.78 Min.
25% of lag time = 1.19 Min.
40% of lag time = 1.91 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	0.80	55.72

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.86	129.55

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.800(In)
Area Averaged 100-Year Rainfall = 1.860(In)

Point rain (area averaged) = 1.860(In)
Areal adjustment factor = 99.97 %
Adjusted average point rain = 1.859(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	56.00	0.900

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	74.8	0.305	0.900	0.058	1.000	0.058
					Sum (F) =	0.058

Area averaged mean soil loss (F) (In/Hr) = 0.058
Minimum soil loss rate ((In/Hr)) = 0.029
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.100

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	104.614	20.612	14.469
2	0.167	209.229	48.679	34.170
3	0.250	313.843	14.978	10.514
4	0.333	418.458	6.821	4.788
5	0.417	523.072	3.802	2.669
6	0.500	627.687	2.435	1.709
7	0.583	732.301	1.462	1.026
8	0.667	836.916	1.210	0.849
		Sum = 100.000	Sum=	70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.290	(0.058)	0.029	0.261
2	0.17	1.30	0.290	(0.058)	0.029	0.261
3	0.25	1.10	0.245	(0.058)	0.025	0.221
4	0.33	1.50	0.335	(0.058)	0.033	0.301
5	0.42	1.50	0.335	(0.058)	0.033	0.301
6	0.50	1.80	0.402	(0.058)	0.040	0.361
7	0.58	1.50	0.335	(0.058)	0.033	0.301
8	0.67	1.80	0.402	(0.058)	0.040	0.361
9	0.75	1.80	0.402	(0.058)	0.040	0.361
10	0.83	1.50	0.335	(0.058)	0.033	0.301
11	0.92	1.60	0.357	(0.058)	0.036	0.321
12	1.00	1.80	0.402	(0.058)	0.040	0.361
13	1.08	2.20	0.491	(0.058)	0.049	0.442
14	1.17	2.20	0.491	(0.058)	0.049	0.442
15	1.25	2.20	0.491	(0.058)	0.049	0.442
16	1.33	2.00	0.446	(0.058)	0.045	0.402
17	1.42	2.60	0.580	(0.058)	0.058	0.522
18	1.50	2.70	0.602	0.058	(0.060)	0.544
19	1.58	2.40	0.536	(0.058)	0.054	0.482
20	1.67	2.70	0.602	0.058	(0.060)	0.544
21	1.75	3.30	0.736	0.058	(0.074)	0.678
22	1.83	3.10	0.692	0.058	(0.069)	0.634
23	1.92	2.90	0.647	0.058	(0.065)	0.589
24	2.00	3.00	0.669	0.058	(0.067)	0.611
25	2.08	3.10	0.692	0.058	(0.069)	0.634
26	2.17	4.20	0.937	0.058	(0.094)	0.879
27	2.25	5.00	1.116	0.058	(0.112)	1.058
28	2.33	3.50	0.781	0.058	(0.078)	0.723
29	2.42	6.80	1.517	0.058	(0.152)	1.459
30	2.50	7.30	1.629	0.058	(0.163)	1.571
31	2.58	8.20	1.830	0.058	(0.183)	1.772
32	2.67	5.90	1.316	0.058	(0.132)	1.258
33	2.75	2.00	0.446	(0.058)	0.045	0.402
34	2.83	1.80	0.402	(0.058)	0.040	0.361
35	2.92	1.80	0.402	(0.058)	0.040	0.361
36	3.00	0.60	0.134	(0.058)	0.013	0.120
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	20.6

Flood volume = Effective rainfall 1.72(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 10.0(Ac.Ft)
Total soil loss = 0.14(In)
Total soil loss = 0.806(Ac.Ft)
Total rainfall = 1.86(In)
Flood volume = 435000.4 Cubic Feet
Total soil loss = 35119.1 Cubic Feet

Peak flow rate of this hydrograph = 107.482(CFS)

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3 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 50.0 100.0 150.0 200.0
0+ 5	0.0260	3.78	Q
0+10	0.1135	12.70	V Q
0+15	0.2159	14.87	V Q
0+20	0.3255	15.91	V Q
0+25	0.4559	18.93	V Q
0+30	0.5998	20.90	V Q
0+35	0.7557	22.63	VQ
0+40	0.9103	22.45	VQ
0+45	1.0774	24.26	Q
0+50	1.2423	23.94	Q
0+55	1.3970	22.47	QV
1+ 0	1.5570	23.23	Q V
1+ 5	1.7345	25.78	QV
1+10	1.9335	28.89	Q V
1+15	2.1396	29.93	Q V
1+20	2.3449	29.81	Q V
1+25	2.5546	30.44	Q V
1+30	2.7932	34.65	Q V
1+35	3.0391	35.70	Q V
1+40	3.2818	35.24	Q V
1+45	3.5506	39.02	Q V
1+50	3.8504	43.53	Q V
1+55	4.1467	43.03	Q V
2+ 0	4.4373	42.19	Q V
2+ 5	4.7335	43.01	Q V
2+10	5.0604	47.46	Q V
2+15	5.4652	58.78	Q V
2+20	5.8975	62.77	Q V
2+25	6.3455	65.06	Q V
2+30	6.9644	89.86	Q V
2+35	7.6783	103.66	Q V
2+40	8.4186	107.48	Q V
2+45	8.9831	81.97	Q V
2+50	9.3207	49.02	Q V
2+55	9.5781	37.37	Q V
3+ 0	9.7783	29.07	Q V
3+ 5	9.8887	16.03	Q V

3+10	9.9400	7.45	|Q	|	|	|	V|
3+15	9.9651	3.64	Q	|	|	|	V|
3+20	9.9765	1.65	Q	|	|	|	V|
3+25	9.9826	0.88	Q	|	|	|	V|
3+30	9.9855	0.43	Q	|	|	|	V|
3+35	9.9862	0.10	Q	|	|	|	V

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/13/20 File: 3828PR1006100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.080 Hr.
Lag time = 4.78 Min.
25% of lag time = 1.19 Min.
40% of lag time = 1.91 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.15	80.10

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	2.50	174.13

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.150(In)
Area Averaged 100-Year Rainfall = 2.500(In)

Point rain (area averaged) = 2.500(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 2.499(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	56.00	0.900

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	74.8	0.305	0.900	0.058	1.000	0.058
					Sum (F) =	0.058

Area averaged mean soil loss (F) (In/Hr) = 0.058
Minimum soil loss rate ((In/Hr)) = 0.029
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.100

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	104.614	20.612	14.469
2	0.167	209.229	48.679	34.170
3	0.250	313.843	14.978	10.514
4	0.333	418.458	6.821	4.788
5	0.417	523.072	3.802	2.669
6	0.500	627.687	2.435	1.709
7	0.583	732.301	1.462	1.026
8	0.667	836.916	1.210	0.849
			Sum = 100.000	Sum= 70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.150	(0.058)	0.015	0.135
2	0.17	0.60	0.180	(0.058)	0.018	0.162
3	0.25	0.60	0.180	(0.058)	0.018	0.162
4	0.33	0.60	0.180	(0.058)	0.018	0.162
5	0.42	0.60	0.180	(0.058)	0.018	0.162
6	0.50	0.70	0.210	(0.058)	0.021	0.189
7	0.58	0.70	0.210	(0.058)	0.021	0.189
8	0.67	0.70	0.210	(0.058)	0.021	0.189
9	0.75	0.70	0.210	(0.058)	0.021	0.189
10	0.83	0.70	0.210	(0.058)	0.021	0.189
11	0.92	0.70	0.210	(0.058)	0.021	0.189
12	1.00	0.80	0.240	(0.058)	0.024	0.216
13	1.08	0.80	0.240	(0.058)	0.024	0.216
14	1.17	0.80	0.240	(0.058)	0.024	0.216
15	1.25	0.80	0.240	(0.058)	0.024	0.216
16	1.33	0.80	0.240	(0.058)	0.024	0.216
17	1.42	0.80	0.240	(0.058)	0.024	0.216
18	1.50	0.80	0.240	(0.058)	0.024	0.216
19	1.58	0.80	0.240	(0.058)	0.024	0.216
20	1.67	0.80	0.240	(0.058)	0.024	0.216
21	1.75	0.80	0.240	(0.058)	0.024	0.216
22	1.83	0.80	0.240	(0.058)	0.024	0.216
23	1.92	0.80	0.240	(0.058)	0.024	0.216
24	2.00	0.90	0.270	(0.058)	0.027	0.243
25	2.08	0.80	0.240	(0.058)	0.024	0.216
26	2.17	0.90	0.270	(0.058)	0.027	0.243
27	2.25	0.90	0.270	(0.058)	0.027	0.243
28	2.33	0.90	0.270	(0.058)	0.027	0.243
29	2.42	0.90	0.270	(0.058)	0.027	0.243
30	2.50	0.90	0.270	(0.058)	0.027	0.243
31	2.58	0.90	0.270	(0.058)	0.027	0.243
32	2.67	0.90	0.270	(0.058)	0.027	0.243
33	2.75	1.00	0.300	(0.058)	0.030	0.270
34	2.83	1.00	0.300	(0.058)	0.030	0.270
35	2.92	1.00	0.300	(0.058)	0.030	0.270
36	3.00	1.00	0.300	(0.058)	0.030	0.270
37	3.08	1.00	0.300	(0.058)	0.030	0.270
38	3.17	1.10	0.330	(0.058)	0.033	0.297
39	3.25	1.10	0.330	(0.058)	0.033	0.297
40	3.33	1.10	0.330	(0.058)	0.033	0.297
41	3.42	1.20	0.360	(0.058)	0.036	0.324
42	3.50	1.30	0.390	(0.058)	0.039	0.351
43	3.58	1.40	0.420	(0.058)	0.042	0.378
44	3.67	1.40	0.420	(0.058)	0.042	0.378
45	3.75	1.50	0.450	(0.058)	0.045	0.405
46	3.83	1.50	0.450	(0.058)	0.045	0.405
47	3.92	1.60	0.480	(0.058)	0.048	0.432
48	4.00	1.60	0.480	(0.058)	0.048	0.432
49	4.08	1.70	0.510	(0.058)	0.051	0.459
50	4.17	1.80	0.540	(0.058)	0.054	0.486
51	4.25	1.90	0.570	(0.058)	0.057	0.513
52	4.33	2.00	0.600	0.058	(0.060)	0.542
53	4.42	2.10	0.630	0.058	(0.063)	0.572
54	4.50	2.10	0.630	0.058	(0.063)	0.572
55	4.58	2.20	0.660	0.058	(0.066)	0.602
56	4.67	2.30	0.690	0.058	(0.069)	0.632
57	4.75	2.40	0.720	0.058	(0.072)	0.662
58	4.83	2.40	0.720	0.058	(0.072)	0.662
59	4.92	2.50	0.750	0.058	(0.075)	0.692
60	5.00	2.60	0.780	0.058	(0.078)	0.722
61	5.08	3.10	0.930	0.058	(0.093)	0.872
62	5.17	3.60	1.080	0.058	(0.108)	1.022
63	5.25	3.90	1.170	0.058	(0.117)	1.112
64	5.33	4.20	1.260	0.058	(0.126)	1.202
65	5.42	4.70	1.410	0.058	(0.141)	1.352
66	5.50	5.60	1.680	0.058	(0.168)	1.622
67	5.58	1.90	0.570	(0.058)	0.057	0.513
68	5.67	0.90	0.270	(0.058)	0.027	0.243
69	5.75	0.60	0.180	(0.058)	0.018	0.162
70	5.83	0.50	0.150	(0.058)	0.015	0.135
71	5.92	0.30	0.090	(0.058)	0.009	0.081
72	6.00	0.20	0.060	(0.058)	0.006	0.054

(Loss Rate Not Used)

Sum = 100.0 Sum = 27.5

Flood volume = Effective rainfall 2.29(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 13.3(Ac.Ft)
Total soil loss = 0.21(In)
Total soil loss = 1.209(Ac.Ft)
Total rainfall = 2.50(In)
Flood volume = 579273.1 Cubic Feet
Total soil loss = 52649.3 Cubic Feet

Peak flow rate of this hydrograph = 93.198(CFS)

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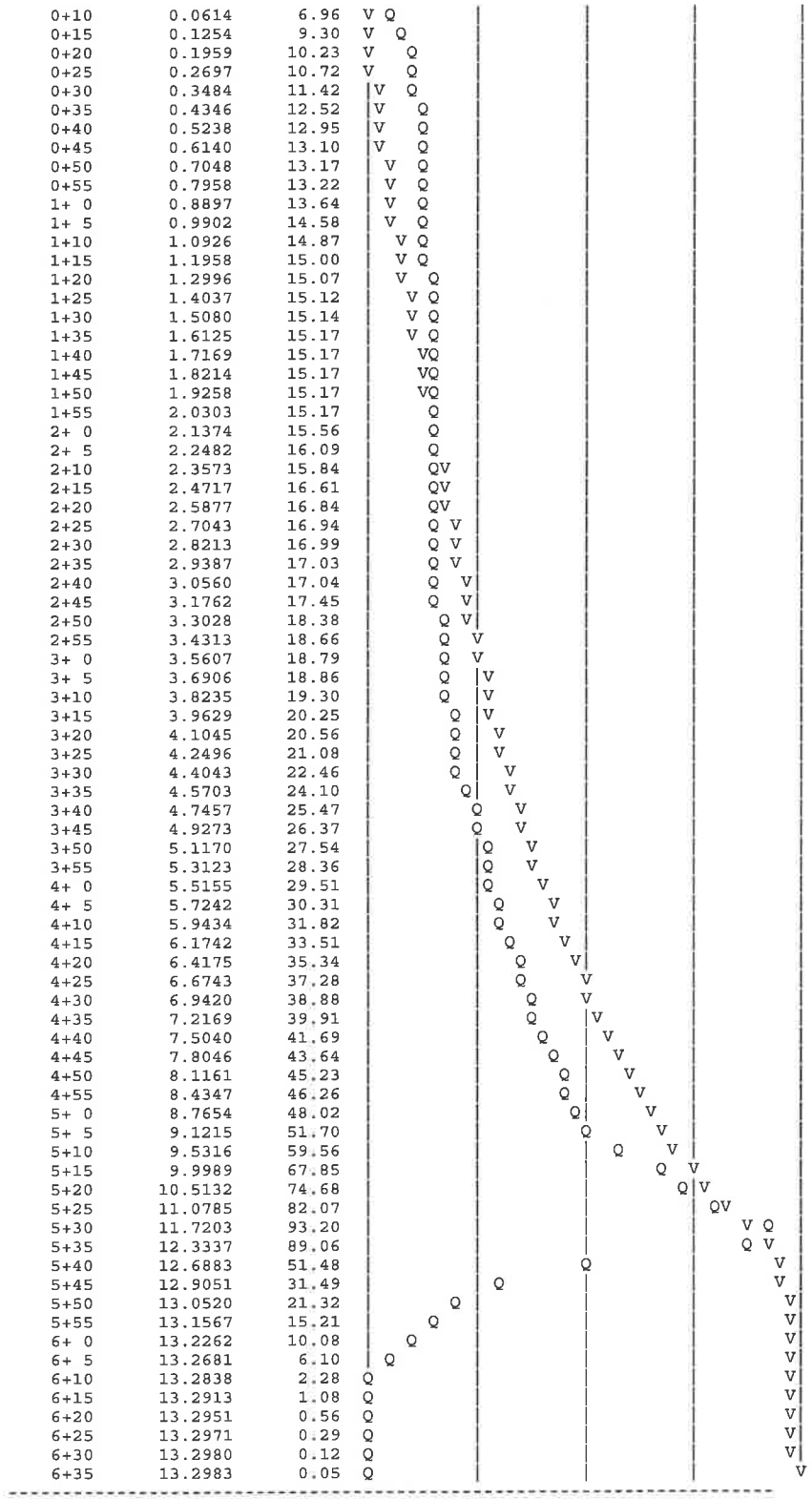
6 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	25.0	50.0	75.0	100.0
0+ 5	0.0135	1.95	Q	|	|	|	|



0+10	0.0614	6.96	V Q
0+15	0.1254	9.30	V Q
0+20	0.1959	10.23	V Q
0+25	0.2697	10.72	V Q
0+30	0.3484	11.42	V Q
0+35	0.4346	12.52	V Q
0+40	0.5238	12.95	V Q
0+45	0.6140	13.10	V Q
0+50	0.7048	13.17	V Q
0+55	0.7958	13.22	V Q
1+ 0	0.8897	13.64	V Q
1+ 5	0.9902	14.58	V Q
1+10	1.0926	14.87	V Q
1+15	1.1958	15.00	V Q
1+20	1.2996	15.07	V Q
1+25	1.4037	15.12	V Q
1+30	1.5080	15.14	V Q
1+35	1.6125	15.17	V Q
1+40	1.7169	15.17	VQ
1+45	1.8214	15.17	VQ
1+50	1.9258	15.17	VQ
1+55	2.0303	15.17	Q
2+ 0	2.1374	15.56	Q
2+ 5	2.2482	16.09	Q
2+10	2.3573	15.84	QV
2+15	2.4717	16.61	QV
2+20	2.5877	16.84	QV
2+25	2.7043	16.94	Q V
2+30	2.8213	16.99	Q V
2+35	2.9387	17.03	Q V
2+40	3.0560	17.04	Q V
2+45	3.1762	17.45	Q V
2+50	3.3028	18.38	Q V
2+55	3.4313	18.66	Q V
3+ 0	3.5607	18.79	Q V
3+ 5	3.6906	18.86	Q V
3+10	3.8235	19.30	Q V
3+15	3.9629	20.25	Q V
3+20	4.1045	20.56	Q V
3+25	4.2496	21.08	Q V
3+30	4.4043	22.46	Q V
3+35	4.5703	24.10	Q V
3+40	4.7457	25.47	Q V
3+45	4.9273	26.37	Q V
3+50	5.1170	27.54	Q V
3+55	5.3123	28.36	Q V
4+ 0	5.5155	29.51	Q V
4+ 5	5.7242	30.31	Q V
4+10	5.9434	31.82	Q V
4+15	6.1742	33.51	Q V
4+20	6.4175	35.34	Q V
4+25	6.6743	37.28	Q V
4+30	6.9420	38.88	Q V
4+35	7.2169	39.91	Q V
4+40	7.5040	41.69	Q V
4+45	7.8046	43.64	Q V
4+50	8.1161	45.23	Q V
4+55	8.4347	46.26	Q V
5+ 0	8.7654	48.02	Q V
5+ 5	9.1215	51.70	Q V
5+10	9.5316	59.56	Q V
5+15	9.9989	67.85	Q V
5+20	10.5132	74.68	Q V
5+25	11.0785	82.07	QV
5+30	11.7203	93.20	V Q
5+35	12.3337	89.06	Q V
5+40	12.6883	51.48	Q V
5+45	12.9051	31.49	Q V
5+50	13.0520	21.32	Q V
5+55	13.1567	15.21	Q V
6+ 0	13.2262	10.08	Q V
6+ 5	13.2681	6.10	Q V
6+10	13.2838	2.28	Q V
6+15	13.2913	1.08	Q V
6+20	13.2951	0.56	Q V
6+25	13.2971	0.29	Q V
6+30	13.2980	0.12	Q V
6+35	13.2983	0.05	Q V

U n i t H y d r o g r a p h A n a l y s i s

Study date 02/13/20 File: 3828PR10024100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Drainage Area = 69.65(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.65(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3400.00(Ft.)
Length along longest watercourse measured to centroid = 1280.00(Ft.)
Length along longest watercourse = 0.644 Mi.
Length along longest watercourse measured to centroid = 0.242 Mi.
Difference in elevation = 44.00(Ft.)
Slope along watercourse = 68.3294 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.080 Hr.
Lag time = 4.78 Min.
25% of lag time = 1.19 Min.
40% of lag time = 1.91 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	1.75	121.89

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.65	4.50	313.43

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.750(In)
Area Averaged 100-Year Rainfall = 4.500(In)

Point rain (area averaged) = 4.500(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 4.499(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
69.650	56.00	0.900

Total Area Entered = 69.65(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	74.8	0.305	0.900	0.058	1.000	0.058
					Sum (F) =	0.058

Area averaged mean soil loss (F) (In/Hr) = 0.058
Minimum soil loss rate ((In/Hr)) = 0.029
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.100

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	104.614	20.612	14.469
2	0.167	209.229	48.679	34.170
3	0.250	313.843	14.978	10.514
4	0.333	418.458	6.821	4.788
5	0.417	523.072	3.802	2.669
6	0.500	627.687	2.435	1.709
7	0.583	732.301	1.462	1.026
8	0.667	836.916	1.210	0.849
		Sum = 100.000	Sum=	70.194

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate (In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.036	(0.103)	0.004	0.032
2	0.17	0.07	0.036	(0.102)	0.004	0.032
3	0.25	0.07	0.036	(0.102)	0.004	0.032
4	0.33	0.10	0.054	(0.102)	0.005	0.049
5	0.42	0.10	0.054	(0.101)	0.005	0.049
6	0.50	0.10	0.054	(0.101)	0.005	0.049
7	0.58	0.10	0.054	(0.100)	0.005	0.049
8	0.67	0.10	0.054	(0.100)	0.005	0.049
9	0.75	0.10	0.054	(0.100)	0.005	0.049
10	0.83	0.13	0.072	(0.099)	0.007	0.065
11	0.92	0.13	0.072	(0.099)	0.007	0.065
12	1.00	0.13	0.072	(0.099)	0.007	0.065
13	1.08	0.10	0.054	(0.098)	0.005	0.049
14	1.17	0.10	0.054	(0.098)	0.005	0.049
15	1.25	0.10	0.054	(0.097)	0.005	0.049
16	1.33	0.10	0.054	(0.097)	0.005	0.049
17	1.42	0.10	0.054	(0.097)	0.005	0.049
18	1.50	0.10	0.054	(0.096)	0.005	0.049
19	1.58	0.10	0.054	(0.096)	0.005	0.049
20	1.67	0.10	0.054	(0.095)	0.005	0.049
21	1.75	0.10	0.054	(0.095)	0.005	0.049
22	1.83	0.13	0.072	(0.095)	0.007	0.065
23	1.92	0.13	0.072	(0.094)	0.007	0.065
24	2.00	0.13	0.072	(0.094)	0.007	0.065
25	2.08	0.13	0.072	(0.094)	0.007	0.065
26	2.17	0.13	0.072	(0.093)	0.007	0.065
27	2.25	0.13	0.072	(0.093)	0.007	0.065
28	2.33	0.13	0.072	(0.092)	0.007	0.065
29	2.42	0.13	0.072	(0.092)	0.007	0.065
30	2.50	0.13	0.072	(0.092)	0.007	0.065
31	2.58	0.17	0.090	(0.091)	0.009	0.081
32	2.67	0.17	0.090	(0.091)	0.009	0.081
33	2.75	0.17	0.090	(0.091)	0.009	0.081
34	2.83	0.17	0.090	(0.090)	0.009	0.081
35	2.92	0.17	0.090	(0.090)	0.009	0.081
36	3.00	0.17	0.090	(0.089)	0.009	0.081
37	3.08	0.17	0.090	(0.089)	0.009	0.081
38	3.17	0.17	0.090	(0.089)	0.009	0.081
39	3.25	0.17	0.090	(0.088)	0.009	0.081
40	3.33	0.17	0.090	(0.088)	0.009	0.081
41	3.42	0.17	0.090	(0.088)	0.009	0.081
42	3.50	0.17	0.090	(0.087)	0.009	0.081
43	3.58	0.17	0.090	(0.087)	0.009	0.081
44	3.67	0.17	0.090	(0.086)	0.009	0.081
45	3.75	0.17	0.090	(0.086)	0.009	0.081
46	3.83	0.20	0.108	(0.086)	0.011	0.097
47	3.92	0.20	0.108	(0.085)	0.011	0.097
48	4.00	0.20	0.108	(0.085)	0.011	0.097
49	4.08	0.20	0.108	(0.085)	0.011	0.097
50	4.17	0.20	0.108	(0.084)	0.011	0.097
51	4.25	0.20	0.108	(0.084)	0.011	0.097
52	4.33	0.23	0.126	(0.084)	0.013	0.113
53	4.42	0.23	0.126	(0.083)	0.013	0.113
54	4.50	0.23	0.126	(0.083)	0.013	0.113
55	4.58	0.23	0.126	(0.082)	0.013	0.113
56	4.67	0.23	0.126	(0.082)	0.013	0.113
57	4.75	0.23	0.126	(0.082)	0.013	0.113
58	4.83	0.27	0.144	(0.081)	0.014	0.130
59	4.92	0.27	0.144	(0.081)	0.014	0.130
60	5.00	0.27	0.144	(0.081)	0.014	0.130
61	5.08	0.20	0.108	(0.080)	0.011	0.097
62	5.17	0.20	0.108	(0.080)	0.011	0.097
63	5.25	0.20	0.108	(0.080)	0.011	0.097
64	5.33	0.23	0.126	(0.079)	0.013	0.113
65	5.42	0.23	0.126	(0.079)	0.013	0.113
66	5.50	0.23	0.126	(0.079)	0.013	0.113
67	5.58	0.27	0.144	(0.078)	0.014	0.130
68	5.67	0.27	0.144	(0.078)	0.014	0.130
69	5.75	0.27	0.144	(0.078)	0.014	0.130
70	5.83	0.27	0.144	(0.077)	0.014	0.130
71	5.92	0.27	0.144	(0.077)	0.014	0.130
72	6.00	0.27	0.144	(0.077)	0.014	0.130
73	6.08	0.30	0.162	(0.076)	0.016	0.146
74	6.17	0.30	0.162	(0.076)	0.016	0.146
75	6.25	0.30	0.162	(0.076)	0.016	0.146
76	6.33	0.30	0.162	(0.075)	0.016	0.146
77	6.42	0.30	0.162	(0.075)	0.016	0.146
78	6.50	0.30	0.162	(0.075)	0.016	0.146
79	6.58	0.33	0.180	(0.074)	0.018	0.162
80	6.67	0.33	0.180	(0.074)	0.018	0.162
81	6.75	0.33	0.180	(0.074)	0.018	0.162
82	6.83	0.33	0.180	(0.073)	0.018	0.162
83	6.92	0.33	0.180	(0.073)	0.018	0.162
84	7.00	0.33	0.180	(0.073)	0.018	0.162
85	7.08	0.33	0.180	(0.072)	0.018	0.162
86	7.17	0.33	0.180	(0.072)	0.018	0.162
87	7.25	0.33	0.180	(0.072)	0.018	0.162
88	7.33	0.37	0.198	(0.071)	0.020	0.178
89	7.42	0.37	0.198	(0.071)	0.020	0.178
90	7.50	0.37	0.198	(0.071)	0.020	0.178
91	7.58	0.40	0.216	(0.070)	0.022	0.194
92	7.67	0.40	0.216	(0.070)	0.022	0.194
93	7.75	0.40	0.216	(0.070)	0.022	0.194
94	7.83	0.43	0.234	(0.069)	0.023	0.211

95	7.92	0.43	0.234	(0.069)	0.023	0.211
96	8.00	0.43	0.234	(0.069)	0.023	0.211
97	8.08	0.50	0.270	(0.068)	0.027	0.243
98	8.17	0.50	0.270	(0.068)	0.027	0.243
99	8.25	0.50	0.270	(0.068)	0.027	0.243
100	8.33	0.50	0.270	(0.067)	0.027	0.243
101	8.42	0.50	0.270	(0.067)	0.027	0.243
102	8.50	0.50	0.270	(0.067)	0.027	0.243
103	8.58	0.53	0.288	(0.066)	0.029	0.259
104	8.67	0.53	0.288	(0.066)	0.029	0.259
105	8.75	0.53	0.288	(0.066)	0.029	0.259
106	8.83	0.57	0.306	(0.066)	0.031	0.275
107	8.92	0.57	0.306	(0.065)	0.031	0.275
108	9.00	0.57	0.306	(0.065)	0.031	0.275
109	9.08	0.63	0.342	(0.065)	0.034	0.308
110	9.17	0.63	0.342	(0.064)	0.034	0.308
111	9.25	0.63	0.342	(0.064)	0.034	0.308
112	9.33	0.67	0.360	(0.064)	0.036	0.324
113	9.42	0.67	0.360	(0.063)	0.036	0.324
114	9.50	0.67	0.360	(0.063)	0.036	0.324
115	9.58	0.70	0.378	(0.063)	0.038	0.340
116	9.67	0.70	0.378	(0.062)	0.038	0.340
117	9.75	0.70	0.378	(0.062)	0.038	0.340
118	9.83	0.73	0.396	(0.062)	0.040	0.356
119	9.92	0.73	0.396	(0.062)	0.040	0.356
120	10.00	0.73	0.396	(0.061)	0.040	0.356
121	10.08	0.50	0.270	(0.061)	0.027	0.243
122	10.17	0.50	0.270	(0.061)	0.027	0.243
123	10.25	0.50	0.270	(0.060)	0.027	0.243
124	10.33	0.50	0.270	(0.060)	0.027	0.243
125	10.42	0.50	0.270	(0.060)	0.027	0.243
126	10.50	0.50	0.270	(0.060)	0.027	0.243
127	10.58	0.67	0.360	(0.059)	0.036	0.324
128	10.67	0.67	0.360	(0.059)	0.036	0.324
129	10.75	0.67	0.360	(0.059)	0.036	0.324
130	10.83	0.67	0.360	(0.058)	0.036	0.324
131	10.92	0.67	0.360	(0.058)	0.036	0.324
132	11.00	0.67	0.360	(0.058)	0.036	0.324
133	11.08	0.63	0.342	(0.057)	0.034	0.308
134	11.17	0.63	0.342	(0.057)	0.034	0.308
135	11.25	0.63	0.342	(0.057)	0.034	0.308
136	11.33	0.63	0.342	(0.057)	0.034	0.308
137	11.42	0.63	0.342	(0.056)	0.034	0.308
138	11.50	0.63	0.342	(0.056)	0.034	0.308
139	11.58	0.57	0.306	(0.056)	0.031	0.275
140	11.67	0.57	0.306	(0.056)	0.031	0.275
141	11.75	0.57	0.306	(0.055)	0.031	0.275
142	11.83	0.60	0.324	(0.055)	0.032	0.292
143	11.92	0.60	0.324	(0.055)	0.032	0.292
144	12.00	0.60	0.324	(0.054)	0.032	0.292
145	12.08	0.83	0.450	(0.054)	0.045	0.405
146	12.17	0.83	0.450	(0.054)	0.045	0.405
147	12.25	0.83	0.450	(0.054)	0.045	0.405
148	12.33	0.87	0.468	(0.053)	0.047	0.421
149	12.42	0.87	0.468	(0.053)	0.047	0.421
150	12.50	0.87	0.468	(0.053)	0.047	0.421
151	12.58	0.93	0.504	(0.053)	0.050	0.454
152	12.67	0.93	0.504	(0.052)	0.050	0.454
153	12.75	0.93	0.504	(0.052)	0.050	0.454
154	12.83	0.97	0.522	0.052	(0.052)	0.470
155	12.92	0.97	0.522	0.051	(0.052)	0.470
156	13.00	0.97	0.522	0.051	(0.052)	0.471
157	13.08	1.13	0.612	0.051	(0.061)	0.561
158	13.17	1.13	0.612	0.051	(0.061)	0.561
159	13.25	1.13	0.612	0.050	(0.061)	0.561
160	13.33	1.13	0.612	0.050	(0.061)	0.562
161	13.42	1.13	0.612	0.050	(0.061)	0.562
162	13.50	1.13	0.612	0.050	(0.061)	0.562
163	13.58	0.77	0.414	(0.049)	0.041	0.373
164	13.67	0.77	0.414	(0.049)	0.041	0.373
165	13.75	0.77	0.414	(0.049)	0.041	0.373
166	13.83	0.77	0.414	(0.049)	0.041	0.373
167	13.92	0.77	0.414	(0.048)	0.041	0.373
168	14.00	0.77	0.414	(0.048)	0.041	0.373
169	14.08	0.90	0.486	0.048	(0.049)	0.438
170	14.17	0.90	0.486	0.048	(0.049)	0.438
171	14.25	0.90	0.486	0.047	(0.049)	0.438
172	14.33	0.87	0.468	(0.047)	0.047	0.421
173	14.42	0.87	0.468	(0.047)	0.047	0.421
174	14.50	0.87	0.468	0.047	(0.047)	0.421
175	14.58	0.87	0.468	0.046	(0.047)	0.421
176	14.67	0.87	0.468	0.046	(0.047)	0.422
177	14.75	0.87	0.468	0.046	(0.047)	0.422
178	14.83	0.83	0.450	(0.046)	0.045	0.405
179	14.92	0.83	0.450	(0.046)	0.045	0.405
180	15.00	0.83	0.450	(0.045)	0.045	0.405
181	15.08	0.80	0.432	(0.045)	0.043	0.389
182	15.17	0.80	0.432	(0.045)	0.043	0.389
183	15.25	0.80	0.432	(0.045)	0.043	0.389
184	15.33	0.77	0.414	(0.044)	0.041	0.373
185	15.42	0.77	0.414	(0.044)	0.041	0.373
186	15.50	0.77	0.414	(0.044)	0.041	0.373
187	15.58	0.63	0.342	(0.044)	0.034	0.308
188	15.67	0.63	0.342	(0.043)	0.034	0.308
189	15.75	0.63	0.342	(0.043)	0.034	0.308
190	15.83	0.63	0.342	(0.043)	0.034	0.308
191	15.92	0.63	0.342	(0.043)	0.034	0.308
192	16.00	0.63	0.342	(0.043)	0.034	0.308
193	16.08	0.13	0.072	(0.042)	0.007	0.065

194	16.17	0.13	0.072	(0.042)	0.007	0.065
195	16.25	0.13	0.072	(0.042)	0.007	0.065
196	16.33	0.13	0.072	(0.042)	0.007	0.065
197	16.42	0.13	0.072	(0.042)	0.007	0.065
198	16.50	0.13	0.072	(0.041)	0.007	0.065
199	16.58	0.10	0.054	(0.041)	0.005	0.049
200	16.67	0.10	0.054	(0.041)	0.005	0.049
201	16.75	0.10	0.054	(0.041)	0.005	0.049
202	16.83	0.10	0.054	(0.040)	0.005	0.049
203	16.92	0.10	0.054	(0.040)	0.005	0.049
204	17.00	0.10	0.054	(0.040)	0.005	0.049
205	17.08	0.17	0.090	(0.040)	0.009	0.081
206	17.17	0.17	0.090	(0.040)	0.009	0.081
207	17.25	0.17	0.090	(0.039)	0.009	0.081
208	17.33	0.17	0.090	(0.039)	0.009	0.081
209	17.42	0.17	0.090	(0.039)	0.009	0.081
210	17.50	0.17	0.090	(0.039)	0.009	0.081
211	17.58	0.17	0.090	(0.039)	0.009	0.081
212	17.67	0.17	0.090	(0.038)	0.009	0.081
213	17.75	0.17	0.090	(0.038)	0.009	0.081
214	17.83	0.13	0.072	(0.038)	0.007	0.065
215	17.92	0.13	0.072	(0.038)	0.007	0.065
216	18.00	0.13	0.072	(0.038)	0.007	0.065
217	18.08	0.13	0.072	(0.038)	0.007	0.065
218	18.17	0.13	0.072	(0.037)	0.007	0.065
219	18.25	0.13	0.072	(0.037)	0.007	0.065
220	18.33	0.13	0.072	(0.037)	0.007	0.065
221	18.42	0.13	0.072	(0.037)	0.007	0.065
222	18.50	0.13	0.072	(0.037)	0.007	0.065
223	18.58	0.10	0.054	(0.036)	0.005	0.049
224	18.67	0.10	0.054	(0.036)	0.005	0.049
225	18.75	0.10	0.054	(0.036)	0.005	0.049
226	18.83	0.07	0.036	(0.036)	0.004	0.032
227	18.92	0.07	0.036	(0.036)	0.004	0.032
228	19.00	0.07	0.036	(0.036)	0.004	0.032
229	19.08	0.10	0.054	(0.035)	0.005	0.049
230	19.17	0.10	0.054	(0.035)	0.005	0.049
231	19.25	0.10	0.054	(0.035)	0.005	0.049
232	19.33	0.13	0.072	(0.035)	0.007	0.065
233	19.42	0.13	0.072	(0.035)	0.007	0.065
234	19.50	0.13	0.072	(0.035)	0.007	0.065
235	19.58	0.10	0.054	(0.034)	0.005	0.049
236	19.67	0.10	0.054	(0.034)	0.005	0.049
237	19.75	0.10	0.054	(0.034)	0.005	0.049
238	19.83	0.07	0.036	(0.034)	0.004	0.032
239	19.92	0.07	0.036	(0.034)	0.004	0.032
240	20.00	0.07	0.036	(0.034)	0.004	0.032
241	20.08	0.10	0.054	(0.034)	0.005	0.049
242	20.17	0.10	0.054	(0.033)	0.005	0.049
243	20.25	0.10	0.054	(0.033)	0.005	0.049
244	20.33	0.10	0.054	(0.033)	0.005	0.049
245	20.42	0.10	0.054	(0.033)	0.005	0.049
246	20.50	0.10	0.054	(0.033)	0.005	0.049
247	20.58	0.10	0.054	(0.033)	0.005	0.049
248	20.67	0.10	0.054	(0.033)	0.005	0.049
249	20.75	0.10	0.054	(0.032)	0.005	0.049
250	20.83	0.07	0.036	(0.032)	0.004	0.032
251	20.92	0.07	0.036	(0.032)	0.004	0.032
252	21.00	0.07	0.036	(0.032)	0.004	0.032
253	21.08	0.10	0.054	(0.032)	0.005	0.049
254	21.17	0.10	0.054	(0.032)	0.005	0.049
255	21.25	0.10	0.054	(0.032)	0.005	0.049
256	21.33	0.07	0.036	(0.032)	0.004	0.032
257	21.42	0.07	0.036	(0.031)	0.004	0.032
258	21.50	0.07	0.036	(0.031)	0.004	0.032
259	21.58	0.10	0.054	(0.031)	0.005	0.049
260	21.67	0.10	0.054	(0.031)	0.005	0.049
261	21.75	0.10	0.054	(0.031)	0.005	0.049
262	21.83	0.07	0.036	(0.031)	0.004	0.032
263	21.92	0.07	0.036	(0.031)	0.004	0.032
264	22.00	0.07	0.036	(0.031)	0.004	0.032
265	22.08	0.10	0.054	(0.031)	0.005	0.049
266	22.17	0.10	0.054	(0.030)	0.005	0.049
267	22.25	0.10	0.054	(0.030)	0.005	0.049
268	22.33	0.07	0.036	(0.030)	0.004	0.032
269	22.42	0.07	0.036	(0.030)	0.004	0.032
270	22.50	0.07	0.036	(0.030)	0.004	0.032
271	22.58	0.07	0.036	(0.030)	0.004	0.032
272	22.67	0.07	0.036	(0.030)	0.004	0.032
273	22.75	0.07	0.036	(0.030)	0.004	0.032
274	22.83	0.07	0.036	(0.030)	0.004	0.032
275	22.92	0.07	0.036	(0.030)	0.004	0.032
276	23.00	0.07	0.036	(0.030)	0.004	0.032
277	23.08	0.07	0.036	(0.030)	0.004	0.032
278	23.17	0.07	0.036	(0.029)	0.004	0.032
279	23.25	0.07	0.036	(0.029)	0.004	0.032
280	23.33	0.07	0.036	(0.029)	0.004	0.032
281	23.42	0.07	0.036	(0.029)	0.004	0.032
282	23.50	0.07	0.036	(0.029)	0.004	0.032
283	23.58	0.07	0.036	(0.029)	0.004	0.032
284	23.67	0.07	0.036	(0.029)	0.004	0.032
285	23.75	0.07	0.036	(0.029)	0.004	0.032
286	23.83	0.07	0.036	(0.029)	0.004	0.032
287	23.92	0.07	0.036	(0.029)	0.004	0.032
288	24.00	0.07	0.036	(0.029)	0.004	0.032

(Loss Rate Not Used)

Sum = 100.0 Sum = 48.7

Flood volume = Effective rainfall 4.06(In)
times area 69.7(Ac.)/[(In)/(Ft.)] = 23.5(Ac.Ft)

Total soil loss = 0.44(In)
Total soil loss = 2.577(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 1025328.6 Cubic Feet
Total soil loss = 112249.4 Cubic Feet

Peak flow rate of this hydrograph = 39.291(CFS)

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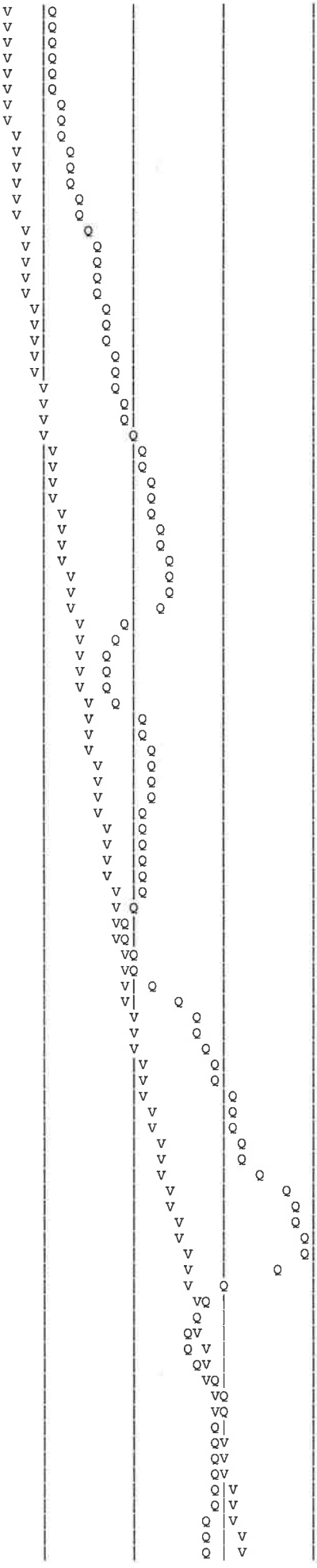
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0032	0.47	Q				
0+10	0.0141	1.58	VQ				
0+15	0.0273	1.92	VQ				
0+20	0.0432	2.31	V Q				
0+25	0.0635	2.95	V Q				
0+30	0.0853	3.17	V Q				
0+35	0.1079	3.28	V Q				
0+40	0.1310	3.35	V Q				
0+45	0.1543	3.38	V Q				
0+50	0.1794	3.63	V Q				
0+55	0.2083	4.20	V Q				
1+ 0	0.2384	4.37	V Q				
1+ 5	0.2674	4.21	V Q				
1+10	0.2929	3.70	V Q				
1+15	0.3175	3.56	V Q				
1+20	0.3416	3.50	V Q				
1+25	0.3655	3.47	V Q				
1+30	0.3892	3.44	V Q				
1+35	0.4128	3.43	V Q				
1+40	0.4363	3.41	V Q				
1+45	0.4598	3.41	V Q				
1+50	0.4849	3.65	V Q				
1+55	0.5138	4.20	V Q				
2+ 0	0.5440	4.37	V Q				
2+ 5	0.5746	4.45	V Q				
2+10	0.6055	4.49	V Q				
2+15	0.6367	4.52	V Q				
2+20	0.6679	4.54	V Q				
2+25	0.6992	4.55	V Q				
2+30	0.7306	4.55	V Q				
2+35	0.7635	4.78	V Q				
2+40	0.8003	5.34	V Q				
2+45	0.8382	5.51	V Q				
2+50	0.8767	5.59	V Q				
2+55	0.9155	5.63	V Q				
3+ 0	0.9545	5.66	V Q				
3+ 5	0.9935	5.67	V Q				
3+10	1.0327	5.69	V Q				
3+15	1.0719	5.69	V Q				
3+20	1.1110	5.69	V Q				
3+25	1.1502	5.69	V Q				
3+30	1.1894	5.69	V Q				
3+35	1.2286	5.69	V Q				
3+40	1.2677	5.69	V Q				
3+45	1.3069	5.69	V Q				
3+50	1.3477	5.92	V Q				
3+55	1.3923	6.48	V Q				
4+ 0	1.4381	6.65	V Q				
4+ 5	1.4844	6.72	V Q				
4+10	1.5310	6.77	V Q				
4+15	1.5778	6.80	V Q				
4+20	1.6263	7.05	V Q				
4+25	1.6788	7.61	V Q				
4+30	1.7324	7.78	V Q				
4+35	1.7865	7.86	V Q				
4+40	1.8410	7.90	V Q				
4+45	1.8956	7.93	V Q				
4+50	1.9519	8.18	V Q				
4+55	2.0122	8.75	V Q				
5+ 0	2.0737	8.92	V Q				
5+ 5	2.1324	8.53	V Q				
5+10	2.1838	7.47	V Q				
5+15	2.2331	7.15	V Q				
5+20	2.2830	7.25	V Q				
5+25	2.3362	7.73	V Q				
5+30	2.3903	7.84	V Q				
5+35	2.4462	8.12	V Q				
5+40	2.5061	8.69	V Q				
5+45	2.5673	8.89	V Q				
5+50	2.6292	8.99	V Q				
5+55	2.6915	9.04	V Q				
6+ 0	2.7540	9.07	V Q				
6+ 5	2.8182	9.32	V Q				
6+10	2.8863	9.89	V Q				
6+15	2.9555	10.06	V Q				
6+20	3.0254	10.14	V Q				
6+25	3.0955	10.18	V Q				
6+30	3.1658	10.21	V Q				
6+35	3.2378	10.46	V Q				
6+40	3.3137	11.03	V Q				
6+45	3.3908	11.20	V Q				
6+50	3.4685	11.27	V Q				

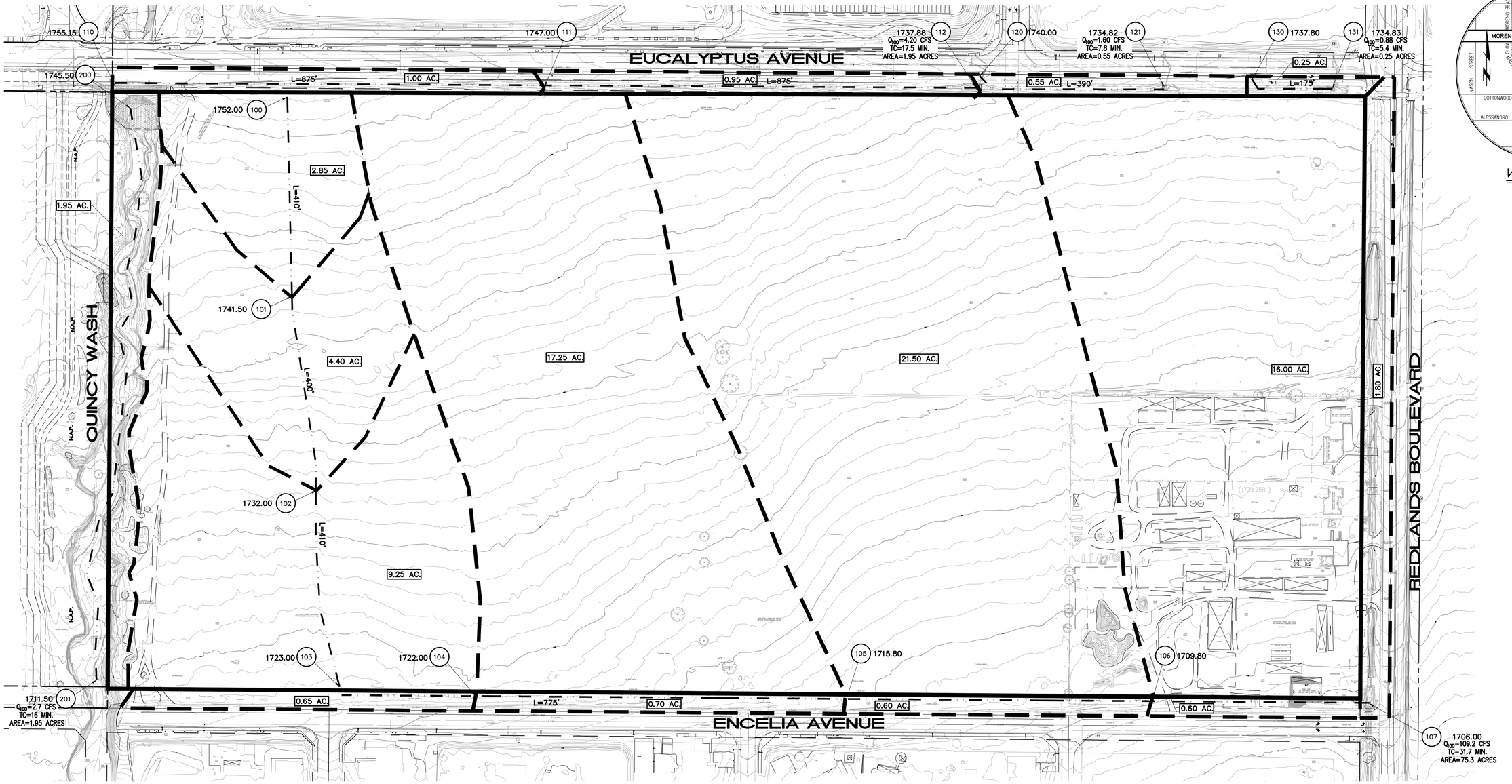
6+55	3.5464	11.32	
7+ 0	3.6246	11.35	
7+ 5	3.7028	11.36	
7+10	3.7812	11.38	
7+15	3.8595	11.38	
7+20	3.9395	11.61	
7+25	4.0233	12.16	
7+30	4.1082	12.33	
7+35	4.1953	12.65	
7+40	4.2865	13.24	
7+45	4.3791	13.44	
7+50	4.4739	13.77	
7+55	4.5730	14.38	
8+ 0	4.6734	14.58	
8+ 5	4.7777	15.14	
8+10	4.8900	16.31	
8+15	5.0048	16.68	
8+20	5.1208	16.85	
8+25	5.2376	16.95	
8+30	5.3547	17.00	
8+35	5.4736	17.27	
8+40	5.5965	17.85	
8+45	5.7207	18.02	
8+50	5.8469	18.33	
8+55	5.9773	18.93	
9+ 0	6.1091	19.13	
9+ 5	6.2447	19.69	
9+10	6.3883	20.86	
9+15	6.5345	21.23	
9+20	6.6835	21.63	
9+25	6.8370	22.29	
9+30	6.9920	22.51	
9+35	7.1494	22.86	
9+40	7.3112	23.48	
9+45	7.4742	23.68	
9+50	7.6396	24.01	
9+55	7.8091	24.62	
10+ 0	7.9801	24.82	
10+ 5	8.1403	23.27	
10+10	8.2743	19.45	
10+15	8.4002	18.29	
10+20	8.5225	17.76	
10+25	8.6428	17.47	
10+30	8.7618	17.28	
10+35	8.8881	18.33	
10+40	9.0328	21.00	
10+45	9.1833	21.86	
10+50	9.3365	22.24	
10+55	9.4912	22.46	
11+ 0	9.6468	22.60	
11+ 5	9.8014	22.45	
11+10	9.9527	21.96	
11+15	10.1028	21.79	
11+20	10.2523	21.72	
11+25	10.4016	21.67	
11+30	10.5506	21.64	
11+35	10.6964	21.16	
11+40	10.8344	20.04	
11+45	10.9700	19.70	
11+50	11.1062	19.78	
11+55	11.2456	20.24	
12+ 0	11.3858	20.36	
12+ 5	11.5377	22.04	
12+10	11.7163	25.94	
12+15	11.9033	27.16	
12+20	12.0958	27.95	
12+25	12.2943	28.82	
12+30	12.4953	29.19	
12+35	12.7009	29.85	
12+40	12.9150	31.10	
12+45	13.1317	31.46	
12+50	13.3513	31.88	
12+55	13.5754	32.55	
13+ 0	13.8013	32.79	
13+ 5	14.0370	34.22	
13+10	14.2945	37.39	
13+15	14.5588	38.38	
13+20	14.8263	38.85	
13+25	15.0957	39.12	
13+30	15.3663	39.29	
13+35	15.6188	36.65	
13+40	15.8271	30.25	
13+45	16.0217	28.26	
13+50	16.2100	27.35	
13+55	16.3949	26.84	
14+ 0	16.5776	26.52	
14+ 5	16.7654	27.27	
14+10	16.9675	29.35	
14+15	17.1745	30.05	
14+20	17.3820	30.13	
14+25	17.5866	29.71	
14+30	17.7908	29.64	
14+35	17.9949	29.63	
14+40	18.1991	29.66	
14+45	18.4033	29.64	
14+50	18.6057	29.39	
14+55	18.8040	28.80	
15+ 0	19.0012	28.62	
15+ 5	19.1962	28.31	

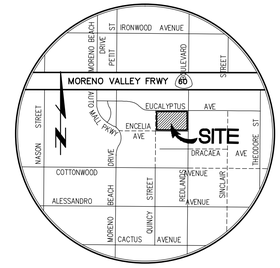
15+10	19.3870	27.71
15+15	19.5765	27.51
15+20	19.7637	27.18
15+25	19.9467	26.57
15+30	20.1283	26.37
15+35	20.3029	25.34
15+40	20.4617	23.07
15+45	20.6157	22.36
15+50	20.7675	22.03
15+55	20.9179	21.85
16+ 0	21.0676	21.74
16+ 5	21.1926	18.15
16+10	21.2601	9.79
16+15	21.3099	7.23
16+20	21.3517	6.07
16+25	21.3890	5.42
16+30	21.4235	5.01
16+35	21.4547	4.52
16+40	21.4806	3.76
16+45	21.5053	3.59
16+50	21.5295	3.51
16+55	21.5534	3.47
17+ 0	21.5771	3.44
17+ 5	21.6040	3.90
17+10	21.6383	4.99
17+15	21.6750	5.33
17+20	21.7128	5.49
17+25	21.7512	5.57
17+30	21.7899	5.63
17+35	21.8289	5.66
17+40	21.8681	5.69
17+45	21.9073	5.69
17+50	21.9448	5.45
17+55	21.9786	4.90
18+ 0	22.0111	4.73
18+ 5	22.0432	4.65
18+10	22.0749	4.61
18+15	22.1065	4.58
18+20	22.1379	4.56
18+25	22.1692	4.55
18+30	22.2006	4.55
18+35	22.2303	4.32
18+40	22.2562	3.76
18+45	22.2809	3.59
18+50	22.3035	3.28
18+55	22.3220	2.68
19+ 0	22.3391	2.48
19+ 5	22.3572	2.62
19+10	22.3787	3.12
19+15	22.4012	3.26
19+20	22.4257	3.56
19+25	22.4542	4.14
19+30	22.4841	4.34
19+35	22.5130	4.20
19+40	22.5385	3.70
19+45	22.5631	3.56
19+50	22.5856	3.27
19+55	22.6040	2.68
20+ 0	22.6211	2.48
20+ 5	22.6392	2.62
20+10	22.6607	3.12
20+15	22.6832	3.26
20+20	22.7061	3.33
20+25	22.7292	3.35
20+30	22.7525	3.38
20+35	22.7759	3.40
20+40	22.7994	3.41
20+45	22.8229	3.41
20+50	22.8448	3.18
20+55	22.8629	2.62
21+ 0	22.8798	2.45
21+ 5	22.8978	2.61
21+10	22.9193	3.12
21+15	22.9417	3.26
21+20	22.9630	3.09
21+25	22.9807	2.57
21+30	22.9974	2.42
21+35	23.0153	2.60
21+40	23.0368	3.12
21+45	23.0593	3.26
21+50	23.0805	3.09
21+55	23.0982	2.57
22+ 0	23.1149	2.42
22+ 5	23.1328	2.60
22+10	23.1543	3.12
22+15	23.1768	3.26
22+20	23.1981	3.09
22+25	23.2157	2.57
22+30	23.2324	2.42
22+35	23.2487	2.36
22+40	23.2648	2.33
22+45	23.2807	2.31
22+50	23.2964	2.29
22+55	23.3121	2.28
23+ 0	23.3278	2.28
23+ 5	23.3434	2.28
23+10	23.3591	2.28
23+15	23.3748	2.28
23+20	23.3904	2.28

23+25	23.4061	2.28	| Q	|	|	|	V|
23+30	23.4218	2.28	| Q	|	|	|	V|
23+35	23.4374	2.28	| Q	|	|	|	V|
23+40	23.4531	2.28	| Q	|	|	|	V|
23+45	23.4688	2.28	| Q	|	|	|	V|
23+50	23.4844	2.28	| Q	|	|	|	V|
23+55	23.5001	2.28	| Q	|	|	|	V|
24+ 0	23.5158	2.28	| Q	|	|	|	V|
24+ 5	23.5282	1.81	|Q	|	|	|	V|
24+10	23.5330	0.70	Q	|	|	|	V|
24+15	23.5355	0.36	Q	|	|	|	V|
24+20	23.5369	0.20	Q	|	|	|	V|
24+25	23.5377	0.12	Q	|	|	|	V|
24+30	23.5381	0.06	Q	|	|	|	V|
24+35	23.5383	0.03	Q	|	|	|	V|

APPENDIX D

HYDROLOGY MAP





VICINITY MAP

N.T.S.

LEGEND

- PROJECT BOUNDARY
- SUBAREA BOUNDARY
- SUBAREA FLOWLINE
- 9.1 AC. — SUBAREA AREA
- 100 — NODE NUMBER

NOTE:
SEE PROPOSED CONDITION RATIONAL METHOD CALCULATIONS FOR OFFSITE STREET RUNS

0 50 100 200 300

SCALE: 1"=100'

PEN19-0193/LST19-0044

Last Update: 3/23/21
O:\3800-3899\3828\3828HYD EX.dwg

PREPARED FOR:

HILLWOOD INVESTMENTS
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CITY OF MORENO VALLEY

EXISTING CONDITION HYDROLOGY MAP

MORENO VALLEY TRADE CENTER


EUCALYPTUS AVENUE
ENCELIA AVENUE
QUINCY WASH
REDLANDS BOULEVARD
L=885' 1.05 AC
L=885' 1.05 AC
1.00 AC L=395'
2.80 AC.
1.80 AC
5.75 AC.
1.95 AC
1.95 AC
2.30 AC
1.60 AC
2.30 AC
1.95 AC
1.95 AC
3.75 AC
3.70 AC.
7.75 AC.
8.25 AC.
3.50 AC
5.50 AC.
1.70 AC
0.95 AC
0.65 AC
1.05 AC
2.25 AC
L=755'
0.95 AC
1.00 AC
0.60 AC
1.30 AC
0.75 AC
0.65 AC
2.45 AC
1.85 AC
L=975' 0.75 AC
L=840' 0.75 AC
L=840' 0.80 AC
0.55 AC
0.20 AC
UNDERGROUND CHAMBER DETENTION SYSTEM
BASIN 1
TOP ELEVATION = 1722.00 FG
BOTTOM ELEVATION = 1721.00
BOT BOTTOM AREA = 13,020 SF
VOLUME @ 4.5' HIGH = 0.15 ACRE FEET
BASIN 2
TOP ELEVATION = 1717.20 FG
BOTTOM ELEVATION = 1707.23
BOT BOTTOM AREA = 24,680 SF
VOLUME @ 4.5' HIGH = 11.10 ACRE FEET
BASIN 3
TOP ELEVATION = 1711.73 FG
BOTTOM ELEVATION = 1706.23
BOT BOTTOM AREA = 26,680 SF
VOLUME @ 4.5' HIGH = 3.62 ACRE FEET
BASIN 4
TOP ELEVATION = 1706.80
FG BOTTOM ELEVATION = 1705.80
BOT BOTTOM AREA = 21,190 SF
VOLUME @ 0.5' HIGH = 0.24 ACRE FEET
EXISTING 72" S.D.
PROPOSED 72" S.D.
PROPOSED 78" S.D.
601 1718.00'
602 1712.50'
1706.00 603
LEGEND
PROJECT BOUNDARY
SUBAREA BOUNDARY
SUBAREA FLOWLINE
9.1 AC. SUBAREA AREA
100 NODE NUMBER
VICINITY MAP
N.T.S.
SITE
MORENO VALLEY FRWY
EUCALYPTUS AVE
IRONWOOD AVE
ALESSANDRO
COTTONWOOD
CACTUS AVENUE
SCALE:1"=80'
0 40 80 160 240
PEN19-0193 / LST20-0008
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CITY OF MORENO VALLEY
PRELIMINARY HYDROLOGY MAP
DEVELOPED CONDITION
MORENO VALLEY TRADE CENTER
Last Update: 3/31/21