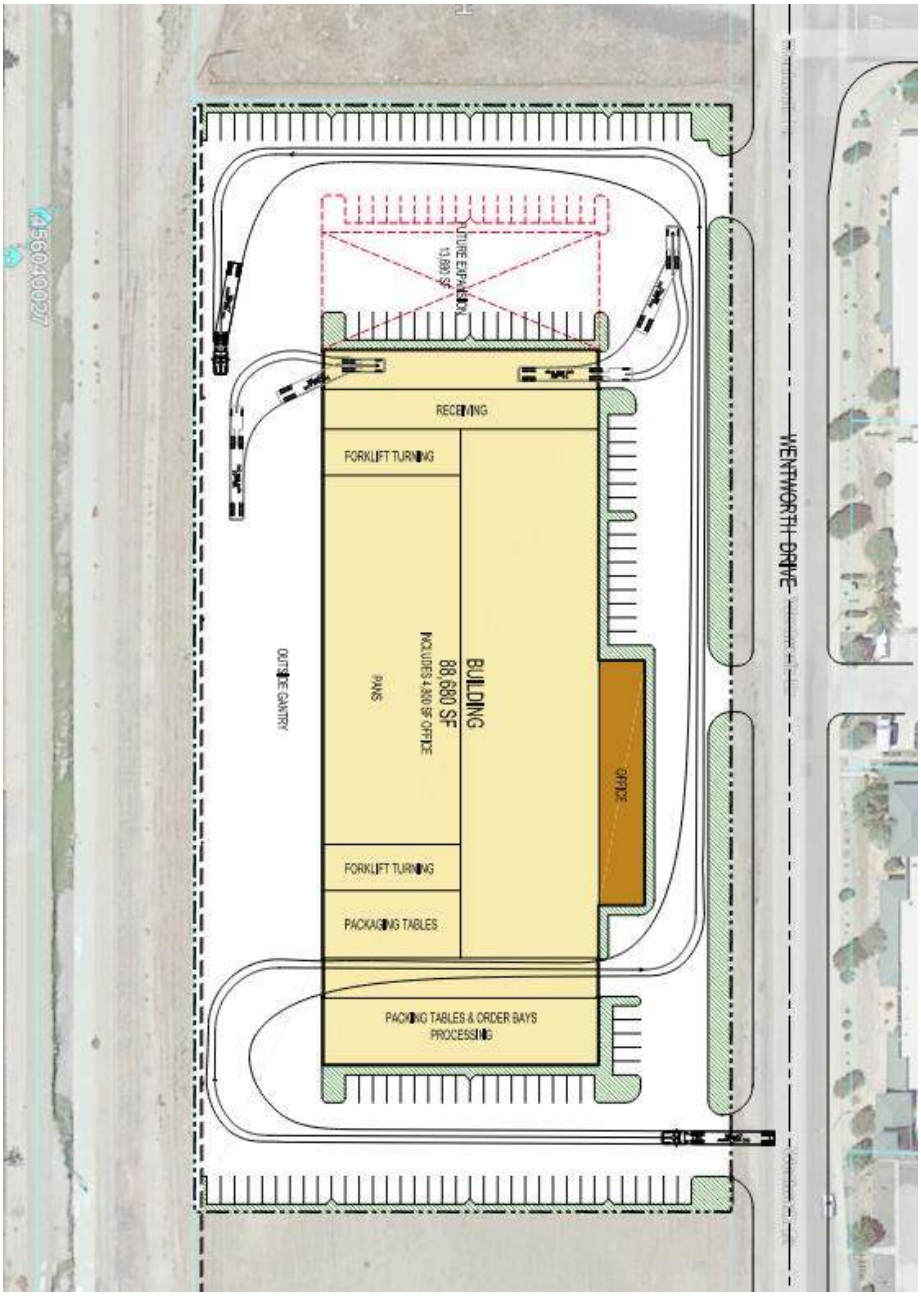


Preliminary Hydrology Report

National Tube Supply Industrial Building, Hemet, CA

January 24, 2023

DAVID EVANS AND ASSOCIATES INC.

National Tube Supply Industrial Building, Hemet, CA

Preliminary Hydrology Report

Prepared for
City of Hemet
Public Works Engineering

Prepared By
Nicholas Zamarripa, P.E.

Reviewed By
Rebecca Kinney, P.E.

David Evans and Associates, Inc.

17542 E. 17th Street
Tustin, CA 92780

January 24, 2023

Table of Contents

1. Introduction

David Evans and Associates is providing professional design services as part of entitlements for a 5.76 acre property in the City of Hemet. The project site is being developed by National Tube Supply. The site is located at the southwest corner of Wentworth Drive and Sanderson Avenue, in the City of Hemet, Riverside, California. The project proposes commercial and industrial development of two vacant parcels of land (APN 456-040-028 & APN 456-040-029). One building is proposed along with an underground infiltration basin to mitigate for on-site hydrology and water quality flows. See Figure 1, Vicinity Map for the project site and location.

National Tube Supply
Industrial Building Project

Figure 1
Vicinity Map

Document Path: P:\MNT\SH000000\Z6000M-DRS\WQMP Exhibits\Vicinity Map.mxd
Date: 1/24/2023 Time: 9:32:51 AM User Name: Nitz

2. Methodology

2.1. General Methodology

To validate the design of the permanent underground storage basin and water quality Best Management Practices (BMPs) proposed for this project, this hydrology report and calculations use unit hydrographs developed using the Riverside County Flood Control and Water Conservation District's Hydrology Manual (April 1978). Hydrographs were developed for the 2-year, 5-year, 10-year recurrent, 1-hour, 3-hour, 6-hour, and 24-hour duration storm events using the Civil Design software. A hydrograph for the 100-year, 1-hour duration storm event was also included for the basin spillway design, per requirements of Riverside County Flood Control District. The basin has been designed to retain the peak flow and volume of runoff from the 100-year, 3-hour duration storm event per City of Hemet Detention/Retention guidelines of the Storm Drain Criteria and Drainage Design Manual.

2.2. Sources of Topography

Topography for the site was completed by Inland Aerial Surveys, Inc. for CL Surveying in October 2022 and 1-foot surface contours were generated from the aerial survey.

2.3. Soil Classification & Rainfall Intensity Values

The soil classification values used in this study are displayed in Exhibit A. Since the site and surrounding properties are either barren vacant land or fully developed, no bulking factor was considered in the calculated volumes and flow rates.

Rainfall values for the project site was taken from the Riverside County Hydrology Manual.

2.4. Unit Hydrograph Calculations

Unit hydrograph values for both existing and proposed drainage areas were calculated using the Civil Design (CivilD) software which is software accepted by the County. For existing and proposed conditions areas, separate watercourses from the most hydrologically remote point of each area to the outlet of each subarea were delineated per County requirements and shown on Exhibits "B" and "C".

For this study, peak flow rates and runoff volumes of the Civil Design software were used for the sizing and design of the infiltration basin. For basin sizing specifically, the 100-year, 3-hour storm event was used to size the flood control capacity required to retain the difference in volume of runoff on the site between the existing and proposed conditions. This approach follows guidance from the City of Hemet's design manual. The spillway has been designed using the 100-year 1-hour storm event.

3. FEMA Floodplain Identification and Considerations

Per FEMA Map No. 0606C2085G (Effective Date – August 28, 2008), the project site is not currently impacted by any FEMA Zone "A" floodplains. The project site is located in an unshaded Zone "X" area which is identified by FEMA as areas determined to be outside the 0.2% annual chance floodplain. Refer to Exhibit "E" for the applicable FEMA FIRM Map.

4. Existing Hydrologic Conditions Discussion

Drainage characteristics of the site and surrounding area were determined using site topography and aerial photos obtained from Google Earth. The site is vacant land that is not seeded or plowed. Flow moves from the east of the site to the west and continues west on Wentworth Drive. The vacant parcels located to the west and east of the project site also drain directly to Wentworth Avenue. The area of land located to the south of the project drains south to the Hemet Storm Channel. A percent impervious value of 0% was given to the existing site and curve numbers of 78, 86, and 93 for the soil A, soil B, and soil D areas respectively based off of the observed characteristics from Google Earth imagery and the land use in the Riverside County Hydrology Manual.

Exhibit "B" illustrates the existing conditions hydrology map for the site.

5. Existing Conditions Unit Hydrograph Calculations and Summary

Calculations were performed using the Civil Design software for the existing conditions. Refer to Appendix A for existing condition input and output data for the unit hydrographs. Due to the size of the watershed, the calculated values for volume and peak flow were used and no other calculations were needed. See Table 1 for a summary of the existing conditions input data for the 100-year, 3-hour duration storm event. See Table 2 for a summary of the existing conditions results data for both the 1- and 3-hour duration 100-year storm events.

Table 1 – Existing Conditions Unit Hydrograph Input Data – 100-Year Events

Duration of 100-Year Event	Area (acres)	Flow Length (ft)	Slope (ft/mi)	2-Yr, Rainfall Depth (in)	100-Year, Rainfall Depth (in)	Soils	Area Avg. Mean Soil Loss (F)
3-Hour	5.76	800	13.2	0.8	1.8	A, B, D	0.046
1-Hour	5.76	800	13.2	0.5	1.2	A, B, D	0.046

Table 2 – Existing Conditions Unit Hydrograph Calculations Summary – 100-Year Events

Storm Event	Q_{100} (cfs)	V_{100}(acre-ft)
100-Year, 3-Hour	8.69	0.8
100-Year, 1-Hour	15.70	0.6

6. Proposed Hydrologic Conditions Discussion

The site has been graded to maintain the existing flow paths. The site will consist of commercial and industrial land uses. One building with an office at the front is proposed and storm drain systems around the building collect storm water and convey it to the proposed underground infiltration basins at the north of the site. The building rooftops and asphalt parking lots make up the impervious areas of the site. An impervious factor of 0.89 was used in accordance with Riverside County BMP guidance. The remaining area consists of landscaped areas. An impervious factor of 0.11 was applied to those areas.

Drainage characteristics offsite of the project site will remain similar to the existing condition with the overall subarea boundary and flow paths unchanged as a result of the project. Runoff from the surrounding areas will continue to drain to Wentworth Drive and at the south of the project towards the Hemet Storm Channel.

Exhibit "C" illustrates the proposed conditions unit hydrograph hydrology map for the site. The project will be retaining the difference in runoff between the existing and proposed conditions for the 100-year, 3-hour storm events. This captured flow be infiltrated via an underground infiltration basin. There will be no increases in the peak flows and/or runoff volumes from the project site. This project will increase the impervious area of the site.

7. Proposed Conditions Unit Hydrograph Calculations and Summary

Calculations were performed using the Civil Design software for all proposed conditions. Refer to Appendix B for proposed condition input and output data for the project site. See Table 3 for a summary of the proposed conditions input data. See Table 4 for a summary of the proposed conditions results data.

Table 3 – Proposed Conditions Unit Hydrograph Input Data – 100-Year Events

Area No.	Duration of 100-Year Event	Area (acres)	Flow Length (ft)	Slope (ft/mi)	2-Yr, Rainfall Depth (in)	100-Year, Rainfall Depth (in)	Soils	Area Avg. Mean Soil Loss (F)
A1	3-Hour	3.13	586	25.77	0.8	1.8	A, B, D	0.002
A1	1-Hour	3.13	586	25.77	0.5	1.2	A, B, D	0.002
A2	3-Hour	2.63	473	25.90	0.8	1.8	A, B, D	0.002
A2	1-Hour	2.63	473	25.90	0.5	1.2	A, B, D	0.002

Table 4 – Proposed Conditions Unit Hydrograph Calculations Summary – 100-Year Events

Area No.	Storm Event	Q_{100} (cfs)	V_{100}(acre-ft)
A1	100-Year, 3-Hour	5.23	0.5
A1	100-Year, 1-Hour	9.75	0.3
A2	100-Year, 3-Hour	4.46	0.4
A2	100-Year, 1-Hour	8.6	0.3

The proposed condition 100-year flowrates and volumes are higher than the existing condition values. With the elongation of the longest flowpath in the proposed condition, the runoff values were not as high as one would expect with an increase in impervious area.

The proposed underground infiltration basin will act as a flood and water quality control basin and will be sized to retain the difference of the existing and proposed 100-year, 3-hour storm event volumes. The two basins have been sized to retain a total of 25,120 cubic feet of water which exceeds the 2,768 cubic feet of volume difference. The sizing of the basin was not driven by the flood control runoff volume but rather the volume difference from the water quality hydromodification calculations covered in this project's WQMP document. The total available storage in the underground basin to the west is 13,565 cubic feet and the east basin can store 11,555 cubic feet. Each storage basin's overflow spillway will be designed to convey 9.75 cubic feet per second and 8.6 cubic feet per second of flow from the west and east basins respectively in an emergency event where the storage basins are filled to capacity. Details for the Low Impact Development (LID) calculations and mitigation are detailed in the following section.

8. Low Impact Development Calculations and Mitigation

8.1. Low Impact Development Calculations

The project will be designed to retain 100 percent of the Design Capture Volume (DCV, V_{BMP}) on-site. LID calculations for on-site post development conditions were performed for improvements shown on Exhibit "D". The LID volume for the proposed/post development condition was calculated using the County's LID BMP Sizing Spreadsheet. A copy of the spreadsheet can be found in the project's WQMP report. A summary of the DCV can be found in Table 5 below.

Per the Riverside County Design Handbook for Low Impact Development BMP (September 2011), in order to meet the Regional Water Quality Control Board (RWCCB) requirements, in the Santa Ana River Watershed the design capture volume is based on capturing the volume of runoff generated from an 85th percentile, 24-hour storm event.

Referencing the of 85th Percentile 24-hour rainfall depths within Riverside County, the 85th percentile, 24-hour rain event was determined to be 0.69-inches.

Table 5 – DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Infiltration Basin*		
	[A]		[B]	[C]	[A] x [C]			
D1	*146,382*	*Asphalt*	*1*	*0.89*	*130,573*	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
D2	*85,080*	*Roofs*	*1*	*0.89*	*75,891*			
D3	*19,614*	*Landscape*	*0.1*	*0.11*	*2,167*			
	251,076				208,631	0.69	11,996	***25,120***

In accordance with County requirements, the DCV of 11,996 ft^3 will be retained on site to mitigate the LID requirements for the developed condition. Refer to Appendix "C" for the LID calculations.

8.2. Mitigation

As the project is designed to treat the 85th percentile, 24-hour rain event volume, the treatment will be provided by the construction of an infiltration basin. Following the DCV calculations, the infiltration basin was designed in accordance with the Infiltration Basin – Design Procedure Worksheet provided by Riverside County. The Worksheet can be found in Appendix C.

Design infiltration rates were obtained from the Geotechnical Engineering Investigation report dated September 2, 2022. The testing results recommended that an infiltration rate of 7.3 inches per hour should be used in the design. A copy of the report, prepared by NorCal Engineering can be found in Appendix D.

8.3. Proposed Source Control Best Management Practices (BMPs)

The Best Management Practices (BMPs) in the following table are proposed for the project in accordance with LID requirements.

Table 6 – Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
Landscape/Outdoor Pesticide Use	Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. Consider using pest-resistant plants, especially adjacent to hardscape. To ensure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	Maintain landscaping using minimum or no pesticides. Provide IPM information to new owners, lessees, and operators.
Plazas, sidewalks, parking lots, and trash receptacle areas.		Sweep plazas, sidewalks, parking lots, and trash receptacle areas regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect wash water containing any cleaning agent or degreaser and discharge to the sanitary sewer, not a storm drain pipe or inlet.

8.4. Post-Construction BMP Operations & Maintenance (O&M)

The BMPs identified in this section will require post-construction Operations and Maintenance to ensure their continued effectiveness throughout the life of the project. It is anticipated that all BMP O&M will commence immediately following construction of the project.

Fact Sheet 3.1: Infiltration Basin from the Riverside County LID Manual (see Appendix C) contains maintenance requirements and a troubleshooting summary to aid in extending the life and performance of the infiltration basin. General recommendations of maintenance include upkeep of the landscaping, debris and trash removal from the surface of the basin, and tending to problems associated with standing water (vectors, odors, etc.). Significant ponding, especially more than 72 hours after an event, may indicate that the basin surface is no longer providing sufficient infiltration and requires aeration.

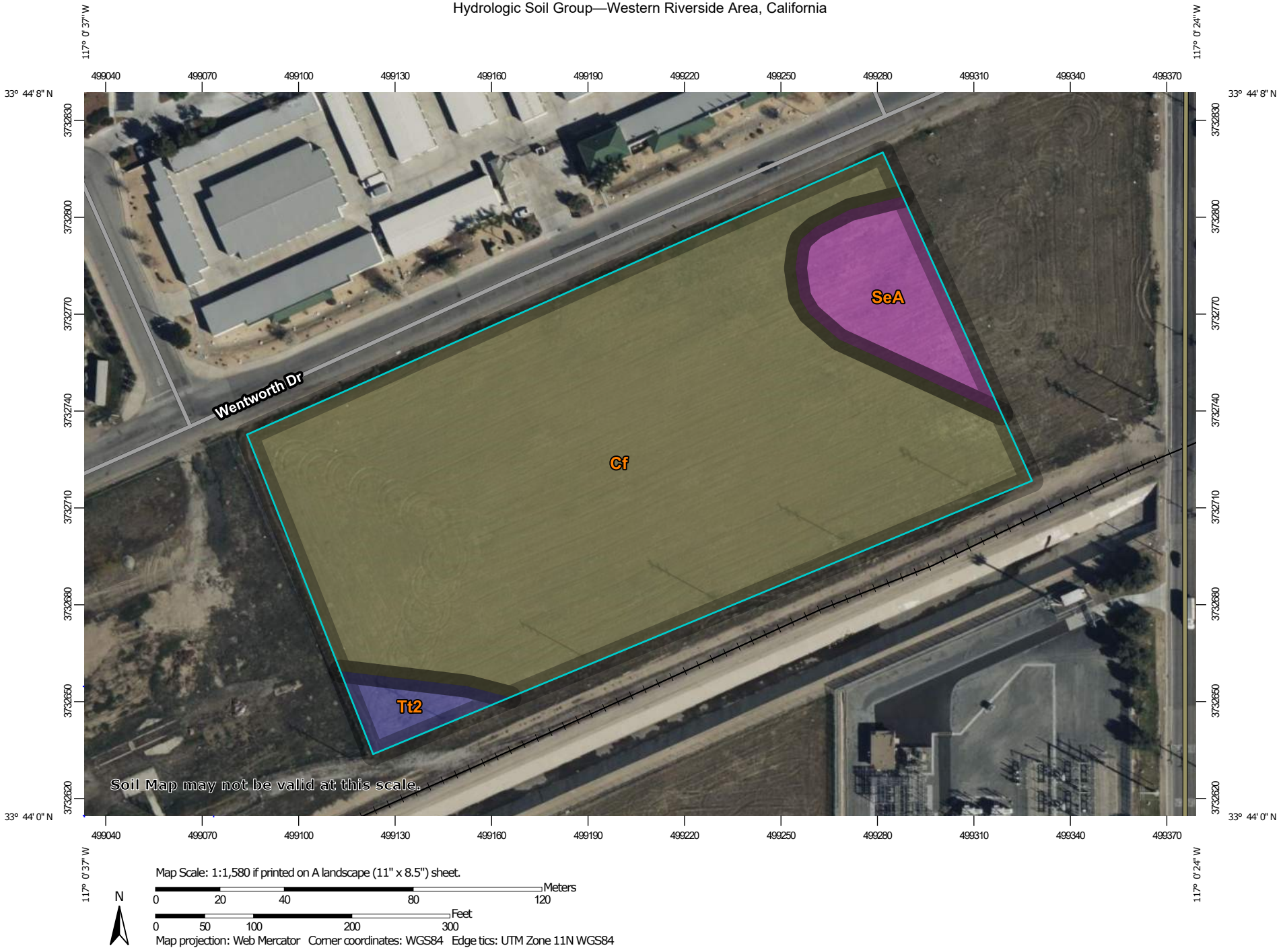
9. Summary and Conclusion

The proposed project will maintain similar drainage patterns for runoff in and around the project site. Flows generated on-site will be captured and treated in two on-site underground infiltration basins large enough to provide both water quality treatment and flood control protection. With the absence of existing drainage systems, runoff from the project will be captured, infiltrated into the ground, and only flows exceeding the design volumes will be released back out on to Wentworth Drive as it the current hydrologic nature of the project site. With regular operation and maintenance procedures in and around the basins, drawdown of stormwater in the basin will be accomplished in less than 72 hours. Should the emergency overflows be needed in a historic flood event, excessive floodwaters will be released at the north end of the property at Wentworth Drive, which is currently where the existing runoff is concentrated.

In accordance with the City of Hemet flood control design criteria, the basin has been designed retain the difference between the existing and proposed condition 100-year, 3-hour storm events, the difference in the 2-year, 24-hour storm events (per hydromodification criteria), and the calculated water quality Design Capture Volume. The required hydromodification volume of 25,109 cubic feet was the determining factor for the sizing of the underground storage basins. The provided volume of the two basins totals 25,120 cubic feet, which exceeds the flood control mitigation volume of 2,768 cubic feet.

To meet the LID requirements, the basin has been designed to capture and treat the calculated DCV volume of 11,996 cubic feet and infiltrate it in less than 72 hours. The proposed basins' total storage volume of 25,120 cubic feet far exceeds the required water quality DCV.

Exhibit A – Project Site NRCS Soils



Map Scale: 1:1,580 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 15, Sep 6, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 15, 2022—May 28, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Cf	Chino silt loam, drained, saline-alkali	C/D	5.2	88.3%
SeA	San Emigdio fine sandy loam, 0 to 2 percent slopes, occassional frost	A	0.5	8.8%
Tt2	Traver fine sandy loam, strongly saline-alkali, eroded	B	0.2	2.8%
Totals for Area of Interest			**5.9**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Exhibit B – Existing Conditions Hydrology Map

COMMERCIAL

COMMERCIAL

COMMERCIAL

WENTWORTH DRIVE

N 66°26'51" E 899.89' {N 66°27'16" E 900.25'}

2 EL. 1521.2
Q_{10} = 5.40 cfs
Q_{100} = 8.69 cfs

360.03' {360.18'}

N 66°26'51" E 719.88' {N 66°27'16" E 720.18'}

359.85' {360.00'}

VACANT LAND
APN: 456-040-024

N 23°34'02" W 406.98' {N 23°34'31" W 407.35'}

348.87' {348.96'}

A1
5.76

N 23°32'56" W 348.79' {N 23°32'44" W 348.90'}

VACANT LAND
APN: 456-040-030

N 23°32'56" W 348.79' {N 23°32'44" W 348.84'}

359.92' {360.00'}

359.91' {360.00'}

719.83' 720.00'

N 66°26'04" E 894.54' N 66°26'42" E 895.75'

EL. 1523.2 1

A.T. & S.F. RAILROAD
APN: 456-040-005

Legend

A1 / 5.76	Subarea Name and Acreage
EL. 1521.2 Q_{10} = 5.40 cfs Q_{100} = 8.69 cfs 3	Hydrology Node, Elevation, and Peak Flow Rates (3-hour storm durations)
	Flow Path
	Drainage Boundary
	Subarea Boundary
A	USDA-NRCS Hydrologic Soil Group B
B	USDA-NRCS Hydrologic Soil Group B
D	USDA-NRCS Hydrologic Soil Group D

SCALE
30 0 15 30 60
(FEET)
1 INCH = 30 FT.

DAVID EVANS AND ASSOCIATES INC.
17542 E. 17th Street, Suite 150
Tustin, CA 92780
Phone: 714.665.4500

Existing Conditions Hydrology Map
National Tube Supply Industrial Building, APN 456-040-028 & 456-040-029

Drawing Name: P:\NTSN\00000010400\CAD\EIE\EXHIBITS\Hydrology Maps\Existing Condition Hydrology Map.dwg Tab Name: LAYOUT1
Last Opened: Jan 24, 2023 - 10:17pm by: Noz

Exhibit C – Proposed Conditions Hydrology Map

WENTWORTH DRIVE

N 66°26'51" E 899.89' {N 66°27'16" E 900.25'}

INV. EL. 1515.45
Q_{10} = 3.51 cfs
Q_{100} = 5.23 cfs

INV. EL. 1515.99
Q_{10} = 3.00 cfs
Q_{100} = 4.46 cfs

360.03' {360.18'}

N 66°26'51" E 719.88' {N 66°27'16" E 720.18'}

359.85' {360.00'}

VACANT LAND
APN: 456-040-024

N 23°34'02" W 406.98' {N 23°34'31" W 407.35'}

348.87' {348.96'}

VACANT LAND
APN: 456-040-030

N 23°32'56" W 348.79' {N 23°32'44" W 348.90'}

N 23°32'56" W 348.79' {N 23°32'44" W 348.84'}

OFFICE

A1 3.13

A2 2.63

BUILDING
080 SF
INCLUDES 4,800 SF OFFICE

FUTURE EXPANSION
17,280 SF

RECEIVING

FORKLIFT TURNING

PANS

FORKLIFT TURNING

PACKAGING TABLES

PACKING TABLES & ORDER BAY
PROCESSING

OUTSIDE GANTRY

INV. EL. 1518.31

359.92' {360.00'}

359.91' {360.00'}

719.83' 720.00'
N 66°26'04" E 894.54' N 66°26'42" E 895.75'

INV. EL. 1518.31

A.T. & S.F. RAILROAD
APN: 456-040-005

Legend

A2 / 3.00	Subarea Name and Acreage
EL. 1509.50 Q_{10} = 4.81 cfs Q_{100} = 8.58 cfs 3	Hydrology Node, Elevation, and Peak Flow Rates (3-hour storm durations)
	Flow Path
	Drainage Boundary
	Subarea Boundary
A	USDA-NRCS Hydrologic Soil Group B
B	USDA-NRCS Hydrologic Soil Group B
D	USDA-NRCS Hydrologic Soil Group D

SCALE
30 0 15 30 60
(FEET)
1 INCH = 30 FT.

DAVID EVANS AND ASSOCIATES INC.
17542 E. 17th Street, Suite 150
Tustin, CA 92780
Phone: 714.665.4500

Proposed Conditions Hydrology Map
National Tube Supply Industrial Building, APN 456-040-028 & 456-040-029

Drawing Name: P:\NYTS\00000001\040\CAD\EEC\EXHIBITS\Hydrology Maps\Proposed Condition Hydrology Map.dwg Tab Name: LAYOUT1
Last Opened: Jan 24, 2023 - 10:57pm By: Nitz

Exhibit D – WQMP Site Map

COMMERCIAL

COMMERCIAL

COMMERCIAL

WENTWORTH DRIVE

76'

38'

UNDERGROUND
INFILTRATION BASIN
V_{BMP} = 6,480 CF
$V_{PROVIDED}$ = 13,565 CF

UNDERGROUND
INFILTRATION BASIN
V_{BMP} = 5,520 CF
$V_{PROVIDED}$ = 11,555 CF

VACANT LAND
APN: 456-040-024

VACANT LAND
APN: 456-040-030

FUTURE EXPANSION
17,280 SF

OFFICE

BUILDING
85,080 SF
INCLUDES 4,800 SF OFFICE

RECEIVING

FORKLIFT TURNING

PANS

FORKLIFT TURNING

PACKAGING TABLES

PACKING TABLES & ORDER BAYS
PROCESSING

OUTSIDE GANTRY

A.T. & S.F. RAILROAD
APN: 456-040-005

50'

100'

50'

NORTH

0 30 60 Feet

LEGEND

- INDICATES ASPHALT SURFACE - DRAINS TO BMP
- INDICATES ROOF SURFACE - DRAINS TO BMP
- INDICATES LANDSCAPE SURFACE - DRAINS TO BMP
- INDICATES UNDERGROUND INFILTRATION BASIN

DMA SUMMARY

IDENTIFIER	AREA (SF)	PROPOSED SURFACE	TREATMENT
D1	146,382	ASPHALT	DRAINS TO INFILTRATION BASIN
D2	85,080	ROOFS	DRAINS TO INFILTRATION BASIN
D3	19,614	LANDSCAPE	DRAINS TO INFILTRATION BASIN

PREPARED BY:
DAVID EVANS AND ASSOCIATES INC.
4141 Inland Empire Blvd Suite 205
Ontario California 91764-5004
Phone: 909.481.57550

CITY OF HEMET
PUBLIC WORKS DEPARTMENT

CONCEPTUAL PLANS

WQMP SITE PLAN

PROJECT NO. NTSH00000001

DATE: 01/24/2023

SHEET: 1 OF 1

★ PRELIMINARY ★
SUBJECT TO REVISION

FILE PATH: P:\NTS\H00000001\0400CAD\EC\EXHIBITS\WQMP\WQMP Site Plan.dwg - DATE: Jan 24, 2023, 5:58pm

Exhibit E – FEMA FIRM Map 06037C1345F

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles produced at a scale of 1:12,000 from photography dated 1994 or later.

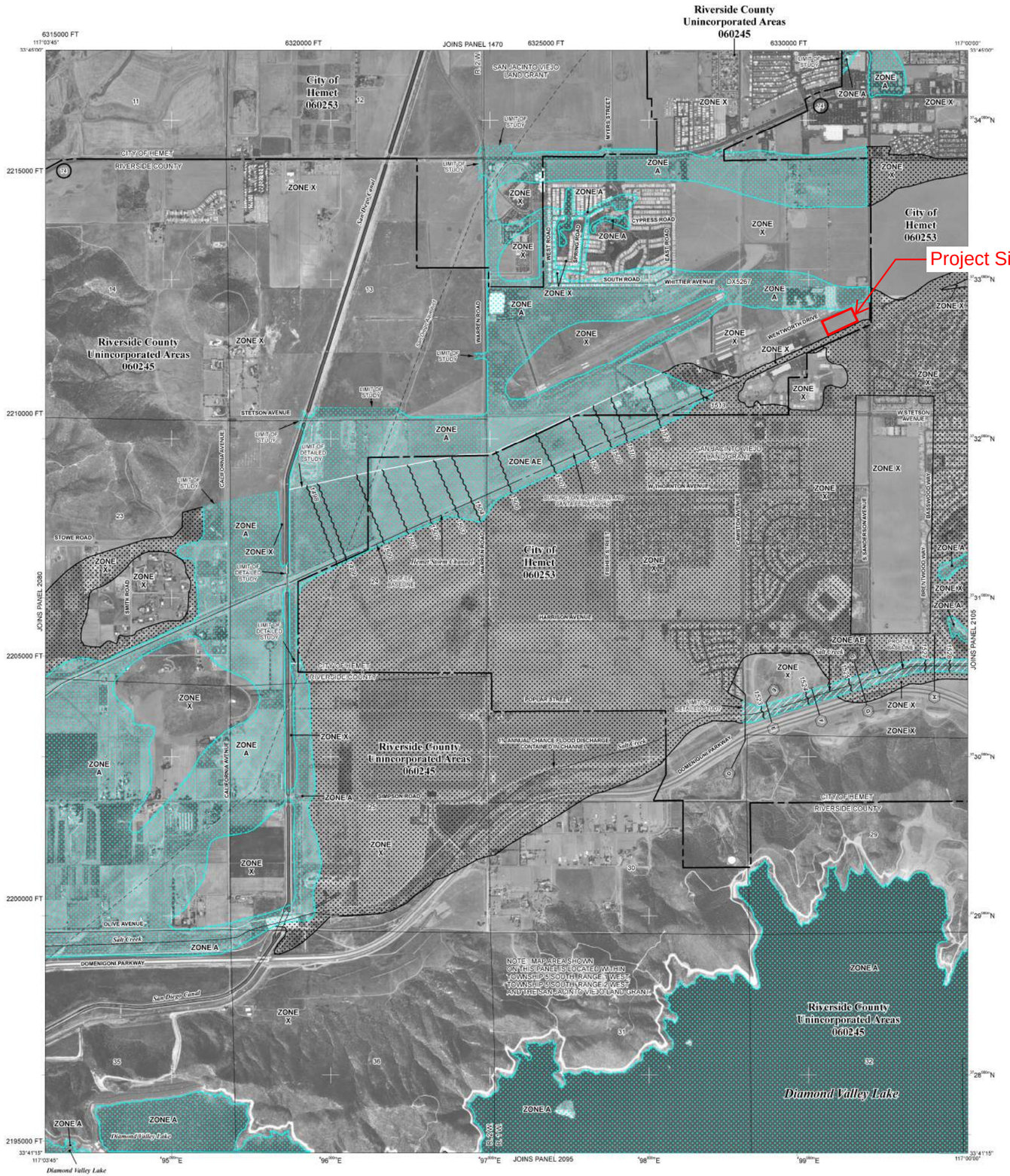
This map may reflect more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513 — Base Flood Elevation line and value; elevation in feet*

(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

A — A — Cross section line

23 — 23 — Transect line

87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

4376000 mN — 1000-meter Universal Transverse Mercator grid values, zone 11N

600000 FT — 5000-foot grid ticks: California State Plane coordinate system, zone VI (FIPSZONE 0406), Lambert Conformal Conic projection

DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)

● M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 28, 2008

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2085G

FIRM

FLOOD INSURANCE RATE MAP

RIVERSIDE COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 2085 OF 3805
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HEMET, CITY OF	060253	2085	G
RIVERSIDE COUNTY	060245	2085	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06065C2085G

EFFECTIVE DATE
AUGUST 28, 2008

Federal Emergency Management Agency

Appendix A – Existing Conditions Civil Design Calculations

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

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
Study date 01/24/23 File: NTSHemetUH10310.out

++

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

Program License Serial Number 6385

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

English Units used in output format

National Tube Supply - Hemet
Existing Condition 10-Year Unit Hydrographs
N Zamarripa 01-24-2023

Drainage Area = 5.76(Ac.) = 0.009 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 5.76(Ac.) = 0.009 Sq. Mi.
Length along longest watercourse = 800.00(Ft.)
Length along longest watercourse measured to centroid = 400.00(Ft.)
Length along longest watercourse = 0.152 Mi.
Length along longest watercourse measured to centroid = 0.076 Mi.
Difference in elevation = 2.00(Ft.)
Slope along watercourse = 13.2000 Ft./Mi.
Average Manning's 'N' = 0.025
Lag time = 0.067 Hr.
Lag time = 4.04 Min.
25% of lag time = 1.01 Min.
40% of lag time = 1.62 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]
5.76	0.80	4.61

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
5.76	1.80	10.37

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.800(In)
Area Averaged 100-Year Rainfall = 1.800(In)

Point rain (area averaged) = 1.211(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.211(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.170	86.00	0.000
5.100	93.00	0.000
0.490	78.00	0.000

Total Area Entered = 5.76(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area (Dec.)	F (In/Hr)
86.0	86.0	0.176	0.000	0.176	0.030	0.005
93.0	93.0	0.091	0.000	0.091	0.885	0.081
78.0	78.0	0.268	0.000	0.268	0.085	0.023

Sum (F) = 0.109

Area averaged mean soil loss (F) (In/Hr) = 0.109
Minimum soil loss rate ((In/Hr)) = 0.054
(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	123.829	26.298	1.527
2	0.167	247.657	48.582	2.820
3	0.250	371.486	12.983	0.754
4	0.333	495.315	5.850	0.340
5	0.417	619.144	3.262	0.189
6	0.500	742.972	1.820	0.106
7	0.583	866.801	1.205	0.070

Sum = 100.000 Sum= 5.805

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	0.189	0.109	(0.170)	0.080
2	0.17	1.30	0.189	0.109	(0.170)	0.080
3	0.25	1.10	0.160	0.109	(0.144)	0.051
4	0.33	1.50	0.218	0.109	(0.196)	0.110
5	0.42	1.50	0.218	0.109	(0.196)	0.110
6	0.50	1.80	0.262	0.109	(0.235)	0.153
7	0.58	1.50	0.218	0.109	(0.196)	0.110
8	0.67	1.80	0.262	0.109	(0.235)	0.153
9	0.75	1.80	0.262	0.109	(0.235)	0.153
10	0.83	1.50	0.218	0.109	(0.196)	0.110
11	0.92	1.60	0.233	0.109	(0.209)	0.124
12	1.00	1.80	0.262	0.109	(0.235)	0.153
13	1.08	2.20	0.320	0.109	(0.288)	0.211
14	1.17	2.20	0.320	0.109	(0.288)	0.211
15	1.25	2.20	0.320	0.109	(0.288)	0.211
16	1.33	2.00	0.291	0.109	(0.262)	0.182
17	1.42	2.60	0.378	0.109	(0.340)	0.269
18	1.50	2.70	0.392	0.109	(0.353)	0.284
19	1.58	2.40	0.349	0.109	(0.314)	0.240
20	1.67	2.70	0.392	0.109	(0.353)	0.284
21	1.75	3.30	0.480	0.109	(0.432)	0.371
22	1.83	3.10	0.451	0.109	(0.406)	0.342
23	1.92	2.90	0.422	0.109	(0.379)	0.313
24	2.00	3.00	0.436	0.109	(0.392)	0.328
25	2.08	3.10	0.451	0.109	(0.406)	0.342
26	2.17	4.20	0.611	0.109	(0.549)	0.502
27	2.25	5.00	0.727	0.109	(0.654)	0.618
28	2.33	3.50	0.509	0.109	(0.458)	0.400
29	2.42	6.80	0.988	0.109	(0.890)	0.880
30	2.50	7.30	1.061	0.109	(0.955)	0.953
31	2.58	8.20	1.192	0.109	(1.073)	1.083
32	2.67	5.90	0.858	0.109	(0.772)	0.749
33	2.75	2.00	0.291	0.109	(0.262)	0.182
34	2.83	1.80	0.262	0.109	(0.235)	0.153
35	2.92	1.80	0.262	0.109	(0.235)	0.153
36	3.00	0.60	0.087	(0.109)	0.078	0.009

(Loss Rate Not Used)

Sum = 100.0 Sum = 10.7

Flood volume = Effective rainfall 0.89(In)
times area 5.8(Ac.)/[(In)/(Ft.)] = 0.4(Ac.Ft)
Total soil loss = 0.32(In)
Total soil loss = 0.155(Ac.Ft)
Total rainfall = 1.21(In)
Flood volume = 18573.7 Cubic Feet
Total soil loss = 6754.8 Cubic Feet

Peak flow rate of this hydrograph = 5.395(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	2.5	5.0	7.5	10.0
0+ 5	0.0008	0.12	Q				
0+10	0.0033	0.35	VQ				
0+15	0.0058	0.37	VQ				
0+20	0.0085	0.40	VQ				
0+25	0.0124	0.56	VQ				
0+30	0.0170	0.67	VQ				
0+35	0.0221	0.74	Q				
0+40	0.0271	0.73	Q				
0+45	0.0329	0.84	Q				
0+50	0.0384	0.80	Q				
0+55	0.0433	0.71	Q V				
1+ 0	0.0486	0.77	QV				
1+ 5	0.0550	0.94	Q V				
1+10	0.0628	1.12	QV				
1+15	0.0709	1.18	Q V				
1+20	0.0788	1.16	Q V				
1+25	0.0872	1.22	Q V				
1+30	0.0974	1.48	Q V				
1+35	0.1078	1.51	Q V				
1+40	0.1181	1.49	Q V				
1+45	0.1300	1.73	Q V				
1+50	0.1435	1.96	Q V				
1+55	0.1567	1.91	Q V				
2+ 0	0.1695	1.87	Q V				
2+ 5	0.1827	1.92	Q V				
2+10	0.1979	2.21	Q V				
2+15	0.2176	2.85	Q V				
2+20	0.2380	2.97	Q V				
2+25	0.2603	3.23	Q V				
2+30	0.2920	4.60	Q V				

```
   2+35       0.3288      5.34  |         |         |Q        V         |
   2+40       0.3659      5.40  |         |         |Q        |   V     |
   2+45       0.3920      3.79  |         |    Q    |         |     V   |
   2+50       0.4056      1.98  |       Q |         |         |       V |
   2+55       0.4155      1.43  |     Q   |         |         |       V |
   3+ 0       0.4220      0.95  |  Q      |         |         |        V|
   3+ 5       0.4246      0.38  |Q        |         |         |        V|
   3+10       0.4257      0.16  Q         |         |         |        V|
   3+15       0.4261      0.06  Q         |         |         |        V|
   3+20       0.4263      0.03  Q         |         |         |        V|
   3+25       0.4264      0.01  Q         |         |         |        V|
   3+30       0.4264      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

         Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
                  Study date  01/12/23 File: NTSHemetUH1001100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
------------------------------------------------------------------------

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


Program License Serial Number 6385

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

 English Units used in output format



------------------------------------------------------------------------
National Tube Supply - Hemet
Existing Condition 100-Year Unit Hydrographs
N Zamarripa   01-12-2023

------------------------------------------------------------------------
Drainage Area =       5.76(Ac.)  =      0.009 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       5.76(Ac.)  =      0.009 Sq. Mi.
Length along longest watercourse =     800.00(Ft.)
Length along longest watercourse measured to centroid =     400.00(Ft.)
Length along longest watercourse =      0.152 Mi.
Length along longest watercourse measured to centroid =      0.076 Mi.
Difference in elevation =       2.00(Ft.)
Slope along watercourse =     13.2000 Ft./Mi.
Average Manning's 'N' = 0.025
Lag time =     0.067 Hr.
Lag time =     4.04 Min.
25% of lag time =     1.01 Min.
40% of lag time =     1.62 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]
        5.76               0.50                        2.88

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        5.76               1.20                        6.91

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 =   99.99 %
Adjusted average point rain =    1.200(In)

Sub-Area Data:
Area(Ac.)          Runoff Index   Impervious %
     0.170            86.00          0.000
     5.100            93.00          0.000
     0.490            78.00          0.000
 Total Area Entered =      5.76(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-3      (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
86.0  94.4      0.073     0.000        0.073       0.030      0.002
93.0  97.2      0.036     0.000        0.036       0.885      0.032
78.0  89.8      0.132     0.000        0.132       0.085      0.011
                                                Sum (F) =   0.046
Area averaged mean soil loss (F) (In/Hr) =  0.046
Minimum soil loss rate ((In/Hr)) =  0.023
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
------------------------------------------------------------------------
Slope of intensity-duration curve for a 1 hour storm =0.5300
------------------------------------------------------------------------

                  U n i t   H y d r o g r a p h
                         VALLEY S-Curve
------------------------------------------------------------------
                  Unit Hydrograph Data
------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %           (CFS)
------------------------------------------------------------------
    1   0.083        123.829         26.298              1.527
    2   0.167        247.657         48.582              2.820
```



```
    3   0.250        371.486         12.983              0.754
    4   0.333        495.315          5.850              0.340
    5   0.417        619.144          3.262              0.189
    6   0.500        742.972          1.820              0.106
    7   0.583        866.801          1.205              0.070
                              Sum = 100.000    Sum=       5.805
------------------------------------------------------------------


 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   Pattern   Storm Rain     Loss rate(In./Hr)      Effective
       (Hr.)  Percent   (In/Hr)          Max    |   Low         (In/Hr)
   1   0.08     3.40      0.490          0.046    (  0.441)        0.444
   2   0.17     4.70      0.677          0.046    (  0.609)        0.631
   3   0.25     4.70      0.677          0.046    (  0.609)        0.631
   4   0.33     5.10      0.734          0.046    (  0.661)        0.689
   5   0.42     5.80      0.835          0.046    (  0.752)        0.790
   6   0.50     5.90      0.850          0.046    (  0.765)        0.804
   7   0.58     7.10      1.022          0.046    (  0.920)        0.977
   8   0.67     8.70      1.253          0.046    (  1.127)        1.207
   9   0.75    13.20      1.901          0.046    (  1.711)        1.855
  10   0.83    29.70      4.277          0.046    (  3.849)        4.231
  11   0.92     7.70      1.109          0.046    (  0.998)        1.063
  12   1.00     4.00      0.576          0.046    (  0.518)        0.530
                  (Loss Rate Not Used)
     Sum =     100.0                                 Sum =    13.9
         Flood volume = Effective rainfall      1.15(In)
          times area       5.8(Ac.)/[(In)/(Ft.)] =       0.6(Ac.Ft)
         Total soil loss =      0.05(In)
         Total soil loss =      0.022(Ac.Ft)
         Total rainfall =      1.20(In)
         Flood volume =       24135.2 Cubic Feet
         Total soil loss =         954.1 Cubic Feet
         ---------------------------------------------------------------
          Peak flow rate of this hydrograph =     15.696(CFS)
         ---------------------------------------------------------------
         +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          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        5.0       10.0      15.0      20.0
 ---------------------------------------------------------------------------
   0+ 5       0.0047      0.68  VQ        |         |         |         |
   0+10       0.0199      2.22  |V  Q     |         |         |         |
   0+15       0.0411      3.08  | V   Q   |         |         |         |
   0+20       0.0650      3.46  |   V Q   |         |         |         |
   0+25       0.0920      3.92  |     VQ  |         |         |         |
   0+30       0.1220      4.36  |       Q |         |         |         |
   0+35       0.1551      4.81  |        Q|V        |         |         |
   0+40       0.1945      5.72  |         |Q  V     |         |         |
   0+45       0.2462      7.52  |         |    Q V  |         |         |
   0+50       0.3373     13.22  |         |         |   V Q   |         |
   0+55       0.4454     15.70  |         |         |         |QV       |
   1+ 0       0.5006      8.02  |         |     Q   |         |     V   |
   1+ 5       0.5301      4.28  |       Q |         |         |       V |
   1+10       0.5428      1.84  |  Q      |         |         |        V|
   1+15       0.5494      0.96  |Q        |         |         |        V|
   1+20       0.5529      0.51  |Q        |         |         |        V|
   1+25       0.5538      0.13  Q         |         |         |        V|
   1+30       0.5541      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

         Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
                  Study date  01/12/23 File: NTSHemetUH1003100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
------------------------------------------------------------------------

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


Program License Serial Number 6385

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

 English Units used in output format



------------------------------------------------------------------------
National Tube Supply - Hemet
Existing Condition 100-Year Unit Hydrographs
N Zamarripa   01-12-2023

------------------------------------------------------------------------
Drainage Area =       5.76(Ac.)  =      0.009 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       5.76(Ac.)  =      0.009 Sq. Mi.
Length along longest watercourse =     800.00(Ft.)
Length along longest watercourse measured to centroid =     400.00(Ft.)
Length along longest watercourse =      0.152 Mi.
Length along longest watercourse measured to centroid =      0.076 Mi.
Difference in elevation =       2.00(Ft.)
Slope along watercourse =     13.2000 Ft./Mi.
Average Manning's 'N' = 0.025
Lag time =     0.067 Hr.
Lag time =     4.04 Min.
25% of lag time =     1.01 Min.
40% of lag time =     1.62 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]
        5.76               0.80                    4.61

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        5.76               1.80                   10.37

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.800(In)
Area Averaged 100-Year Rainfall =    1.800(In)

Point rain (area averaged) =    1.800(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    1.800(In)

Sub-Area Data:
Area(Ac.)          Runoff Index   Impervious %
     0.170            86.00          0.000
     5.100            93.00          0.000
     0.490            78.00          0.000
 Total Area Entered =      5.76(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-3     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
86.0  94.4      0.073     0.000        0.073       0.030      0.002
93.0  97.2      0.036     0.000        0.036       0.885      0.032
78.0  89.8      0.132     0.000        0.132       0.085      0.011
                                              Sum (F) =   0.046
Area averaged mean soil loss (F) (In/Hr) =  0.046
Minimum soil loss rate ((In/Hr)) =  0.023
(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   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %           (CFS)
------------------------------------------------------------------------
    1   0.083        123.829         26.298             1.527
    2   0.167        247.657         48.582             2.820
    3   0.250        371.486         12.983             0.754
    4   0.333        495.315          5.850             0.340
```



```
    5   0.417        619.144          3.262             0.189
    6   0.500        742.972          1.820             0.106
    7   0.583        866.801          1.205             0.070
                                Sum = 100.000   Sum=      5.805
------------------------------------------------------------------------


 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   Pattern   Storm Rain     Loss rate(In./Hr)      Effective
      (Hr.)  Percent   (In/Hr)          Max   |   Low         (In/Hr)
  1   0.08     1.30      0.281          0.046    (  0.253)        0.235
  2   0.17     1.30      0.281          0.046    (  0.253)        0.235
  3   0.25     1.10      0.238          0.046    (  0.214)        0.192
  4   0.33     1.50      0.324          0.046    (  0.292)        0.278
  5   0.42     1.50      0.324          0.046    (  0.292)        0.278
  6   0.50     1.80      0.389          0.046    (  0.350)        0.343
  7   0.58     1.50      0.324          0.046    (  0.292)        0.278
  8   0.67     1.80      0.389          0.046    (  0.350)        0.343
  9   0.75     1.80      0.389          0.046    (  0.350)        0.343
 10   0.83     1.50      0.324          0.046    (  0.292)        0.278
 11   0.92     1.60      0.346          0.046    (  0.311)        0.300
 12   1.00     1.80      0.389          0.046    (  0.350)        0.343
 13   1.08     2.20      0.475          0.046    (  0.428)        0.430
 14   1.17     2.20      0.475          0.046    (  0.428)        0.430
 15   1.25     2.20      0.475          0.046    (  0.428)        0.430
 16   1.33     2.00      0.432          0.046    (  0.389)        0.386
 17   1.42     2.60      0.562          0.046    (  0.505)        0.516
 18   1.50     2.70      0.583          0.046    (  0.525)        0.538
 19   1.58     2.40      0.518          0.046    (  0.467)        0.473
 20   1.67     2.70      0.583          0.046    (  0.525)        0.538
 21   1.75     3.30      0.713          0.046    (  0.642)        0.667
 22   1.83     3.10      0.670          0.046    (  0.603)        0.624
 23   1.92     2.90      0.626          0.046    (  0.564)        0.581
 24   2.00     3.00      0.648          0.046    (  0.583)        0.602
 25   2.08     3.10      0.670          0.046    (  0.603)        0.624
 26   2.17     4.20      0.907          0.046    (  0.816)        0.862
 27   2.25     5.00      1.080          0.046    (  0.972)        1.034
 28   2.33     3.50      0.756          0.046    (  0.680)        0.710
 29   2.42     6.80      1.469          0.046    (  1.322)        1.423
 30   2.50     7.30      1.577          0.046    (  1.419)        1.531
 31   2.58     8.20      1.771          0.046    (  1.594)        1.726
 32   2.67     5.90      1.274          0.046    (  1.147)        1.229
 33   2.75     2.00      0.432          0.046    (  0.389)        0.386
 34   2.83     1.80      0.389          0.046    (  0.350)        0.343
 35   2.92     1.80      0.389          0.046    (  0.350)        0.343
 36   3.00     0.60      0.130          0.046    (  0.117)        0.084
                  (Loss Rate Not Used)
    Sum =     100.0                                Sum =    20.0
        Flood volume = Effective rainfall      1.66(In)
         times area       5.8(Ac.)/[(In)/(Ft.)] =       0.8(Ac.Ft)
        Total soil loss =      0.14(In)
        Total soil loss =     0.066(Ac.Ft)
        Total rainfall =      1.80(In)
        Flood volume =       34772.6 Cubic Feet
        Total soil loss =        2862.3 Cubic Feet
        ---------------------------------------------------------------------
         Peak flow rate of this hydrograph =      8.688(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        2.5       5.0       7.5       10.0
------------------------------------------------------------------------------
  0+ 5       0.0025      0.36  VQ        |         |         |         |
  0+10       0.0095      1.02  V   Q     |         |         |         |
  0+15       0.0173      1.13  V   Q     |         |         |         |
  0+20       0.0258      1.22  |V  Q     |         |         |         |
  0+25       0.0359      1.48  |V   Q    |         |         |         |
  0+30       0.0473      1.65  | V   Q   |         |         |         |
  0+35       0.0596      1.78  | V    Q  |         |         |         |
  0+40       0.0716      1.75  |  V   Q  |         |         |         |
  0+45       0.0848      1.91  |   V  Q  |         |         |         |
  0+50       0.0976      1.86  |   V  Q  |         |         |         |
  0+55       0.1095      1.73  |    VQ   |         |         |         |
  1+ 0       0.1220      1.82  |     VQ  |         |         |         |
  1+ 5       0.1363      2.07  |     V Q |         |         |         |
  1+10       0.1524      2.34  |      V Q|         |         |         |
  1+15       0.1691      2.42  |       VQ|         |         |         |
  1+20       0.1855      2.39  |        Q|         |         |         |
  1+25       0.2026      2.49  |        QV         |         |         |
  1+30       0.2224      2.86  |         |Q        |         |         |
  1+35       0.2424      2.92  |         |QV       |         |         |
  1+40       0.2623      2.88  |         |Q V      |         |         |
  1+45       0.2846      3.24  |         | Q V     |         |         |
  1+50       0.3093      3.58  |         |  QV     |         |         |
  1+55       0.3335      3.52  |         |  Q V    |         |         |
  2+ 0       0.3573      3.45  |         |  Q   V  |         |         |
  2+ 5       0.3815      3.52  |         |   Q    V|         |         |
  2+10       0.4087      3.95  |         |    Q    V         |         |
  2+15       0.4426      4.91  |         |        Q| V       |         |
  2+20       0.4776      5.08  |         |         Q  V      |         |
  2+25       0.5153      5.47  |         |         |Q   V    |         |
  2+30       0.5670      7.51  |         |         |      V Q|         |
```

```
   2+35       0.6262      8.60  |         |         |         |V  Q     |
   2+40       0.6861      8.69  |         |         |         |   Q     |
   2+45       0.7294      6.30  |         |         |    Q    |     V   |
   2+50       0.7543      3.62  |         |    Q    |         |      V  |
   2+55       0.7736      2.79  |         |Q        |         |       V |
   3+ 0       0.7874      2.01  |         Q         |         |        V|
   3+ 5       0.7938      0.94  |  Q      |         |         |        V|
   3+10       0.7964      0.37  |Q        |         |         |        V|
   3+15       0.7975      0.16  Q         |         |         |        V|
   3+20       0.7980      0.08  Q         |         |         |        V|
   3+25       0.7982      0.03  Q         |         |         |        V|
   3+30       0.7983      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 01/24/23 File: NTSHemetUHEx2242.out

++

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

Program License Serial Number 6385

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

English Units used in output format

National Tube Supply - Hemet
Existing Condition 2-Year, 24-Hour Unit Hydrograph
N Zamarripa 01-24-2023

Drainage Area = 5.76(Ac.) = 0.009 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 5.76(Ac.) = 0.009 Sq. Mi.
Length along longest watercourse = 800.00(Ft.)
Length along longest watercourse measured to centroid = 400.00(Ft.)
Length along longest watercourse = 0.152 Mi.
Length along longest watercourse measured to centroid = 0.076 Mi.
Difference in elevation = 2.00(Ft.)
Slope along watercourse = 13.2000 Ft./Mi.
Average Manning's 'N' = 0.025
Lag time = 0.067 Hr.
Lag time = 4.04 Min.
25% of lag time = 1.01 Min.
40% of lag time = 1.62 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]
5.76	1.80	10.37

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
5.76	4.50	25.92

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 1.800(In)
Area Averaged 100-Year Rainfall = 4.500(In)

Point rain (area averaged) = 1.800(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.800(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.170	86.00	0.000
5.100	93.00	0.000
0.490	78.00	0.000

Total Area Entered = 5.76(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Adj. Infil. Rate (Dec.)	Area%	F (In/Hr)
86.0	86.0	0.176	0.000	0.176	0.030		0.005
93.0	93.0	0.091	0.000	0.091	0.885		0.081
78.0	78.0	0.268	0.000	0.268	0.085		0.023
					Sum (F) =		0.109

Area averaged mean soil loss (F) (In/Hr) = 0.109
Minimum soil loss rate ((In/Hr)) = 0.054
(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	123.829	26.298	1.527
2	0.167	247.657	48.582	2.820
3	0.250	371.486	12.983	0.754
4	0.333	495.315	5.850	0.340
5	0.417	619.144	3.262	0.189
6	0.500	742.972	1.820	0.106
7	0.583	866.801	1.205	0.070
			Sum = 100.000	Sum= 5.805

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 (Hr.)	Time Percent	Pattern (In/Hr)	Storm Rain Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.014	(0.192)	0.013	0.001
2	0.17	0.07	0.014	(0.192)	0.013	0.001
3	0.25	0.07	0.014	(0.191)	0.013	0.001
4	0.33	0.10	0.022	(0.190)	0.019	0.002
5	0.42	0.10	0.022	(0.189)	0.019	0.002
6	0.50	0.10	0.022	(0.189)	0.019	0.002
7	0.58	0.10	0.022	(0.188)	0.019	0.002
8	0.67	0.10	0.022	(0.187)	0.019	0.002
9	0.75	0.10	0.022	(0.186)	0.019	0.002
10	0.83	0.13	0.029	(0.186)	0.026	0.003
11	0.92	0.13	0.029	(0.185)	0.026	0.003
12	1.00	0.13	0.029	(0.184)	0.026	0.003
13	1.08	0.10	0.022	(0.184)	0.019	0.002
14	1.17	0.10	0.022	(0.183)	0.019	0.002
15	1.25	0.10	0.022	(0.182)	0.019	0.002
16	1.33	0.10	0.022	(0.181)	0.019	0.002
17	1.42	0.10	0.022	(0.181)	0.019	0.002
18	1.50	0.10	0.022	(0.180)	0.019	0.002
19	1.58	0.10	0.022	(0.179)	0.019	0.002
20	1.67	0.10	0.022	(0.178)	0.019	0.002
21	1.75	0.10	0.022	(0.178)	0.019	0.002
22	1.83	0.13	0.029	(0.177)	0.026	0.003
23	1.92	0.13	0.029	(0.176)	0.026	0.003
24	2.00	0.13	0.029	(0.176)	0.026	0.003
25	2.08	0.13	0.029	(0.175)	0.026	0.003
26	2.17	0.13	0.029	(0.174)	0.026	0.003
27	2.25	0.13	0.029	(0.174)	0.026	0.003
28	2.33	0.13	0.029	(0.173)	0.026	0.003
29	2.42	0.13	0.029	(0.172)	0.026	0.003
30	2.50	0.13	0.029	(0.171)	0.026	0.003
31	2.58	0.17	0.036	(0.171)	0.032	0.004
32	2.67	0.17	0.036	(0.170)	0.032	0.004
33	2.75	0.17	0.036	(0.169)	0.032	0.004
34	2.83	0.17	0.036	(0.169)	0.032	0.004
35	2.92	0.17	0.036	(0.168)	0.032	0.004
36	3.00	0.17	0.036	(0.167)	0.032	0.004
37	3.08	0.17	0.036	(0.167)	0.032	0.004
38	3.17	0.17	0.036	(0.166)	0.032	0.004
39	3.25	0.17	0.036	(0.165)	0.032	0.004
40	3.33	0.17	0.036	(0.164)	0.032	0.004
41	3.42	0.17	0.036	(0.164)	0.032	0.004
42	3.50	0.17	0.036	(0.163)	0.032	0.004
43	3.58	0.17	0.036	(0.162)	0.032	0.004
44	3.67	0.17	0.036	(0.162)	0.032	0.004
45	3.75	0.17	0.036	(0.161)	0.032	0.004
46	3.83	0.20	0.043	(0.160)	0.039	0.004
47	3.92	0.20	0.043	(0.160)	0.039	0.004
48	4.00	0.20	0.043	(0.159)	0.039	0.004
49	4.08	0.20	0.043	(0.158)	0.039	0.004
50	4.17	0.20	0.043	(0.158)	0.039	0.004
51	4.25	0.20	0.043	(0.157)	0.039	0.004
52	4.33	0.23	0.050	(0.156)	0.045	0.005
53	4.42	0.23	0.050	(0.156)	0.045	0.005
54	4.50	0.23	0.050	(0.155)	0.045	0.005
55	4.58	0.23	0.050	(0.154)	0.045	0.005
56	4.67	0.23	0.050	(0.154)	0.045	0.005
57	4.75	0.23	0.050	(0.153)	0.045	0.005
58	4.83	0.27	0.058	(0.152)	0.052	0.006
59	4.92	0.27	0.058	(0.152)	0.052	0.006
60	5.00	0.27	0.058	(0.151)	0.052	0.006
61	5.08	0.20	0.043	(0.150)	0.039	0.004
62	5.17	0.20	0.043	(0.150)	0.039	0.004
63	5.25	0.20	0.043	(0.149)	0.039	0.004
64	5.33	0.23	0.050	(0.148)	0.045	0.005
65	5.42	0.23	0.050	(0.148)	0.045	0.005
66	5.50	0.23	0.050	(0.147)	0.045	0.005
67	5.58	0.27	0.058	(0.146)	0.052	0.006
68	5.67	0.27	0.058	(0.146)	0.052	0.006
69	5.75	0.27	0.058	(0.145)	0.052	0.006
70	5.83	0.27	0.058	(0.145)	0.052	0.006
71	5.92	0.27	0.058	(0.144)	0.052	0.006
72	6.00	0.27	0.058	(0.143)	0.052	0.006
73	6.08	0.30	0.065	(0.143)	0.058	0.006
74	6.17	0.30	0.065	(0.142)	0.058	0.006
75	6.25	0.30	0.065	(0.141)	0.058	0.006
76	6.33	0.30	0.065	(0.141)	0.058	0.006
77	6.42	0.30	0.065	(0.140)	0.058	0.006
78	6.50	0.30	0.065	(0.139)	0.058	0.006
79	6.58	0.33	0.072	(0.139)	0.065	0.007
80	6.67	0.33	0.072	(0.138)	0.065	0.007
81	6.75	0.33	0.072	(0.138)	0.065	0.007
82	6.83	0.33	0.072	(0.137)	0.065	0.007
83	6.92	0.33	0.072	(0.136)	0.065	0.007
84	7.00	0.33	0.072	(0.136)	0.065	0.007
85	7.08	0.33	0.072	(0.135)	0.065	0.007
86	7.17	0.33	0.072	(0.134)	0.065	0.007
87	7.25	0.33	0.072	(0.134)	0.065	0.007

88	7.33	0.37	0.079	(0.133)	0.071	0.008
89	7.42	0.37	0.079	(0.133)	0.071	0.008
90	7.50	0.37	0.079	(0.132)	0.071	0.008
91	7.58	0.40	0.086	(0.131)	0.078	0.009
92	7.67	0.40	0.086	(0.131)	0.078	0.009
93	7.75	0.40	0.086	(0.130)	0.078	0.009
94	7.83	0.43	0.094	(0.130)	0.084	0.009
95	7.92	0.43	0.094	(0.129)	0.084	0.009
96	8.00	0.43	0.094	(0.128)	0.084	0.009
97	8.08	0.50	0.108	(0.128)	0.097	0.011
98	8.17	0.50	0.108	(0.127)	0.097	0.011
99	8.25	0.50	0.108	(0.127)	0.097	0.011
100	8.33	0.50	0.108	(0.126)	0.097	0.011
101	8.42	0.50	0.108	(0.125)	0.097	0.011
102	8.50	0.50	0.108	(0.125)	0.097	0.011
103	8.58	0.53	0.115	(0.124)	0.104	0.012
104	8.67	0.53	0.115	(0.124)	0.104	0.012
105	8.75	0.53	0.115	(0.123)	0.104	0.012
106	8.83	0.57	0.122	(0.123)	0.110	0.012
107	8.92	0.57	0.122	(0.122)	0.110	0.012
108	9.00	0.57	0.122	(0.121)	0.110	0.012
109	9.08	0.63	0.137	0.121	(0.123)	0.016
110	9.17	0.63	0.137	0.120	(0.123)	0.017
111	9.25	0.63	0.137	0.120	(0.123)	0.017
112	9.33	0.67	0.144	0.119	(0.130)	0.025
113	9.42	0.67	0.144	0.119	(0.130)	0.025
114	9.50	0.67	0.144	0.118	(0.130)	0.026
115	9.58	0.70	0.151	0.117	(0.136)	0.034
116	9.67	0.70	0.151	0.117	(0.136)	0.034
117	9.75	0.70	0.151	0.116	(0.136)	0.035
118	9.83	0.73	0.158	0.116	(0.143)	0.043
119	9.92	0.73	0.158	0.115	(0.143)	0.043
120	10.00	0.73	0.158	0.115	(0.143)	0.044
121	10.08	0.50	0.108	(0.114)	0.097	0.011
122	10.17	0.50	0.108	(0.113)	0.097	0.011
123	10.25	0.50	0.108	(0.113)	0.097	0.011
124	10.33	0.50	0.108	(0.112)	0.097	0.011
125	10.42	0.50	0.108	(0.112)	0.097	0.011
126	10.50	0.50	0.108	(0.111)	0.097	0.011
127	10.58	0.67	0.144	0.111	(0.130)	0.033
128	10.67	0.67	0.144	0.110	(0.130)	0.034
129	10.75	0.67	0.144	0.110	(0.130)	0.034
130	10.83	0.67	0.144	0.109	(0.130)	0.035
131	10.92	0.67	0.144	0.109	(0.130)	0.035
132	11.00	0.67	0.144	0.108	(0.130)	0.036
133	11.08	0.63	0.137	0.108	(0.123)	0.029
134	11.17	0.63	0.137	0.107	(0.123)	0.030
135	11.25	0.63	0.137	0.106	(0.123)	0.030
136	11.33	0.63	0.137	0.106	(0.123)	0.031
137	11.42	0.63	0.137	0.105	(0.123)	0.031
138	11.50	0.63	0.137	0.105	(0.123)	0.032
139	11.58	0.57	0.122	0.104	(0.110)	0.018
140	11.67	0.57	0.122	0.104	(0.110)	0.019
141	11.75	0.57	0.122	0.103	(0.110)	0.019
142	11.83	0.60	0.130	0.103	(0.117)	0.027
143	11.92	0.60	0.130	0.102	(0.117)	0.027
144	12.00	0.60	0.130	0.102	(0.117)	0.028
145	12.08	0.83	0.180	0.101	(0.162)	0.079
146	12.17	0.83	0.180	0.101	(0.162)	0.079
147	12.25	0.83	0.180	0.100	(0.162)	0.080
148	12.33	0.87	0.187	0.100	(0.168)	0.087
149	12.42	0.87	0.187	0.099	(0.168)	0.088
150	12.50	0.87	0.187	0.099	(0.168)	0.088
151	12.58	0.93	0.202	0.098	(0.181)	0.103
152	12.67	0.93	0.202	0.098	(0.181)	0.104
153	12.75	0.93	0.202	0.097	(0.181)	0.104
154	12.83	0.97	0.209	0.097	(0.188)	0.112
155	12.92	0.97	0.209	0.096	(0.188)	0.112
156	13.00	0.97	0.209	0.096	(0.188)	0.113
157	13.08	1.13	0.245	0.095	(0.220)	0.149
158	13.17	1.13	0.245	0.095	(0.220)	0.150
159	13.25	1.13	0.245	0.094	(0.220)	0.150
160	13.33	1.13	0.245	0.094	(0.220)	0.151
161	13.42	1.13	0.245	0.093	(0.220)	0.151
162	13.50	1.13	0.245	0.093	(0.220)	0.152
163	13.58	0.77	0.166	0.092	(0.149)	0.073
164	13.67	0.77	0.166	0.092	(0.149)	0.074
165	13.75	0.77	0.166	0.092	(0.149)	0.074
166	13.83	0.77	0.166	0.091	(0.149)	0.075
167	13.92	0.77	0.166	0.091	(0.149)	0.075
168	14.00	0.77	0.166	0.090	(0.149)	0.075
169	14.08	0.90	0.194	0.090	(0.175)	0.105
170	14.17	0.90	0.194	0.089	(0.175)	0.105
171	14.25	0.90	0.194	0.089	(0.175)	0.106
172	14.33	0.87	0.187	0.088	(0.168)	0.099
173	14.42	0.87	0.187	0.088	(0.168)	0.099
174	14.50	0.87	0.187	0.087	(0.168)	0.100
175	14.58	0.87	0.187	0.087	(0.168)	0.100
176	14.67	0.87	0.187	0.087	(0.168)	0.101
177	14.75	0.87	0.187	0.086	(0.168)	0.101
178	14.83	0.83	0.180	0.086	(0.162)	0.094
179	14.92	0.83	0.180	0.085	(0.162)	0.095
180	15.00	0.83	0.180	0.085	(0.162)	0.095
181	15.08	0.80	0.173	0.084	(0.156)	0.088
182	15.17	0.80	0.173	0.084	(0.156)	0.089
183	15.25	0.80	0.173	0.083	(0.156)	0.089
184	15.33	0.77	0.166	0.083	(0.149)	0.083
185	15.42	0.77	0.166	0.083	(0.149)	0.083
186	15.50	0.77	0.166	0.082	(0.149)	0.083

187	15.58	0.63	0.137	0.082	(0.123)	0.055
188	15.67	0.63	0.137	0.081	(0.123)	0.055
189	15.75	0.63	0.137	0.081	(0.123)	0.056
190	15.83	0.63	0.137	0.081	(0.123)	0.056
191	15.92	0.63	0.137	0.080	(0.123)	0.057
192	16.00	0.63	0.137	0.080	(0.123)	0.057
193	16.08	0.13	0.029	(0.079)	0.026	0.003
194	16.17	0.13	0.029	(0.079)	0.026	0.003
195	16.25	0.13	0.029	(0.078)	0.026	0.003
196	16.33	0.13	0.029	(0.078)	0.026	0.003
197	16.42	0.13	0.029	(0.078)	0.026	0.003
198	16.50	0.13	0.029	(0.077)	0.026	0.003
199	16.58	0.10	0.022	(0.077)	0.019	0.002
200	16.67	0.10	0.022	(0.076)	0.019	0.002
201	16.75	0.10	0.022	(0.076)	0.019	0.002
202	16.83	0.10	0.022	(0.076)	0.019	0.002
203	16.92	0.10	0.022	(0.075)	0.019	0.002
204	17.00	0.10	0.022	(0.075)	0.019	0.002
205	17.08	0.17	0.036	(0.075)	0.032	0.004
206	17.17	0.17	0.036	(0.074)	0.032	0.004
207	17.25	0.17	0.036	(0.074)	0.032	0.004
208	17.33	0.17	0.036	(0.073)	0.032	0.004
209	17.42	0.17	0.036	(0.073)	0.032	0.004
210	17.50	0.17	0.036	(0.073)	0.032	0.004
211	17.58	0.17	0.036	(0.072)	0.032	0.004
212	17.67	0.17	0.036	(0.072)	0.032	0.004
213	17.75	0.17	0.036	(0.072)	0.032	0.004
214	17.83	0.13	0.029	(0.071)	0.026	0.003
215	17.92	0.13	0.029	(0.071)	0.026	0.003
216	18.00	0.13	0.029	(0.071)	0.026	0.003
217	18.08	0.13	0.029	(0.070)	0.026	0.003
218	18.17	0.13	0.029	(0.070)	0.026	0.003
219	18.25	0.13	0.029	(0.070)	0.026	0.003
220	18.33	0.13	0.029	(0.069)	0.026	0.003
221	18.42	0.13	0.029	(0.069)	0.026	0.003
222	18.50	0.13	0.029	(0.069)	0.026	0.003
223	18.58	0.10	0.022	(0.068)	0.019	0.002
224	18.67	0.10	0.022	(0.068)	0.019	0.002
225	18.75	0.10	0.022	(0.068)	0.019	0.002
226	18.83	0.07	0.014	(0.067)	0.013	0.001
227	18.92	0.07	0.014	(0.067)	0.013	0.001
228	19.00	0.07	0.014	(0.067)	0.013	0.001
229	19.08	0.10	0.022	(0.066)	0.019	0.002
230	19.17	0.10	0.022	(0.066)	0.019	0.002
231	19.25	0.10	0.022	(0.066)	0.019	0.002
232	19.33	0.13	0.029	(0.065)	0.026	0.003
233	19.42	0.13	0.029	(0.065)	0.026	0.003
234	19.50	0.13	0.029	(0.065)	0.026	0.003
235	19.58	0.10	0.022	(0.064)	0.019	0.002
236	19.67	0.10	0.022	(0.064)	0.019	0.002
237	19.75	0.10	0.022	(0.064)	0.019	0.002
238	19.83	0.07	0.014	(0.064)	0.013	0.001
239	19.92	0.07	0.014	(0.063)	0.013	0.001
240	20.00	0.07	0.014	(0.063)	0.013	0.001
241	20.08	0.10	0.022	(0.063)	0.019	0.002
242	20.17	0.10	0.022	(0.062)	0.019	0.002
243	20.25	0.10	0.022	(0.062)	0.019	0.002
244	20.33	0.10	0.022	(0.062)	0.019	0.002
245	20.42	0.10	0.022	(0.062)	0.019	0.002
246	20.50	0.10	0.022	(0.061)	0.019	0.002
247	20.58	0.10	0.022	(0.061)	0.019	0.002
248	20.67	0.10	0.022	(0.061)	0.019	0.002
249	20.75	0.10	0.022	(0.061)	0.019	0.002
250	20.83	0.07	0.014	(0.060)	0.013	0.001
251	20.92	0.07	0.014	(0.060)	0.013	0.001
252	21.00	0.07	0.014	(0.060)	0.013	0.001
253	21.08	0.10	0.022	(0.060)	0.019	0.002
254	21.17	0.10	0.022	(0.059)	0.019	0.002
255	21.25	0.10	0.022	(0.059)	0.019	0.002
256	21.33	0.07	0.014	(0.059)	0.013	0.001
257	21.42	0.07	0.014	(0.059)	0.013	0.001
258	21.50	0.07	0.014	(0.059)	0.013	0.001
259	21.58	0.10	0.022	(0.058)	0.019	0.002
260	21.67	0.10	0.022	(0.058)	0.019	0.002
261	21.75	0.10	0.022	(0.058)	0.019	0.002
262	21.83	0.07	0.014	(0.058)	0.013	0.001
263	21.92	0.07	0.014	(0.057)	0.013	0.001
264	22.00	0.07	0.014	(0.057)	0.013	0.001
265	22.08	0.10	0.022	(0.057)	0.019	0.002
266	22.17	0.10	0.022	(0.057)	0.019	0.002
267	22.25	0.10	0.022	(0.057)	0.019	0.002
268	22.33	0.07	0.014	(0.057)	0.013	0.001
269	22.42	0.07	0.014	(0.056)	0.013	0.001
270	22.50	0.07	0.014	(0.056)	0.013	0.001
271	22.58	0.07	0.014	(0.056)	0.013	0.001
272	22.67	0.07	0.014	(0.056)	0.013	0.001
273	22.75	0.07	0.014	(0.056)	0.013	0.001
274	22.83	0.07	0.014	(0.056)	0.013	0.001
275	22.92	0.07	0.014	(0.055)	0.013	0.001
276	23.00	0.07	0.014	(0.055)	0.013	0.001
277	23.08	0.07	0.014	(0.055)	0.013	0.001
278	23.17	0.07	0.014	(0.055)	0.013	0.001
279	23.25	0.07	0.014	(0.055)	0.013	0.001
280	23.33	0.07	0.014	(0.055)	0.013	0.001
281	23.42	0.07	0.014	(0.055)	0.013	0.001
282	23.50	0.07	0.014	(0.055)	0.013	0.001
283	23.58	0.07	0.014	(0.055)	0.013	0.001
284	23.67	0.07	0.014	(0.054)	0.013	0.001
285	23.75	0.07	0.014	(0.054)	0.013	0.001

```
286  23.83     0.07      0.014       (  0.054)       0.013        0.001
287  23.92     0.07      0.014       (  0.054)       0.013        0.001
288  24.00     0.07      0.014       (  0.054)       0.013        0.001
                 (Loss Rate Not Used)
    Sum =     100.0                                  Sum =     6.3
        Flood volume = Effective rainfall      0.52(In)
         times area       5.8(Ac.)/[(In)/(Ft.)] =       0.3(Ac.Ft)
        Total soil loss =      1.28(In)
        Total soil loss =     0.612(Ac.Ft)
        Total rainfall =      1.80(In)
        Flood volume =       10960.3 Cubic Feet
        Total soil loss =       26675.1 Cubic Feet
        ---------------------------------------------------------------------
         Peak flow rate of this hydrograph =      0.876(CFS)
        ---------------------------------------------------------------------
        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                              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      0.00  Q         |         |         |         |
   0+10       0.0001      0.01  Q         |         |         |         |
   0+15       0.0001      0.01  Q         |         |         |         |
   0+20       0.0002      0.01  Q         |         |         |         |
   0+25       0.0002      0.01  Q         |         |         |         |
   0+30       0.0003      0.01  Q         |         |         |         |
   0+35       0.0004      0.01  Q         |         |         |         |
   0+40       0.0005      0.01  Q         |         |         |         |
   0+45       0.0006      0.01  Q         |         |         |         |
   0+50       0.0007      0.01  Q         |         |         |         |
   0+55       0.0008      0.02  Q         |         |         |         |
   1+ 0       0.0009      0.02  Q         |         |         |         |
   1+ 5       0.0010      0.02  Q         |         |         |         |
   1+10       0.0011      0.01  Q         |         |         |         |
   1+15       0.0012      0.01  Q         |         |         |         |
   1+20       0.0013      0.01  Q         |         |         |         |
   1+25       0.0014      0.01  Q         |         |         |         |
   1+30       0.0015      0.01  Q         |         |         |         |
   1+35       0.0015      0.01  Q         |         |         |         |
   1+40       0.0016      0.01  Q         |         |         |         |
   1+45       0.0017      0.01  Q         |         |         |         |
   1+50       0.0018      0.01  Q         |         |         |         |
   1+55       0.0019      0.02  Q         |         |         |         |
   2+ 0       0.0020      0.02  Q         |         |         |         |
   2+ 5       0.0021      0.02  Q         |         |         |         |
   2+10       0.0023      0.02  Q         |         |         |         |
   2+15       0.0024      0.02  Q         |         |         |         |
   2+20       0.0025      0.02  Q         |         |         |         |
   2+25       0.0026      0.02  Q         |         |         |         |
   2+30       0.0027      0.02  Q         |         |         |         |
   2+35       0.0028      0.02  Q         |         |         |         |
   2+40       0.0030      0.02  Q         |         |         |         |
   2+45       0.0031      0.02  Q         |         |         |         |
   2+50       0.0033      0.02  Q         |         |         |         |
   2+55       0.0034      0.02  Q         |         |         |         |
   3+ 0       0.0035      0.02  Q         |         |         |         |
   3+ 5       0.0037      0.02  Q         |         |         |         |
   3+10       0.0038      0.02  Q         |         |         |         |
   3+15       0.0040      0.02  Q         |         |         |         |
   3+20       0.0041      0.02  Q         |         |         |         |
   3+25       0.0043      0.02  Q         |         |         |         |
   3+30       0.0044      0.02  Q         |         |         |         |
   3+35       0.0045      0.02  Q         |         |         |         |
   3+40       0.0047      0.02  Q         |         |         |         |
   3+45       0.0048      0.02  Q         |         |         |         |
   3+50       0.0050      0.02  Q         |         |         |         |
   3+55       0.0052      0.02  Q         |         |         |         |
   4+ 0       0.0053      0.02  Q         |         |         |         |
   4+ 5       0.0055      0.02  Q         |         |         |         |
   4+10       0.0057      0.02  Q         |         |         |         |
   4+15       0.0058      0.03  Q         |         |         |         |
   4+20       0.0060      0.03  Q         |         |         |         |
   4+25       0.0062      0.03  Q         |         |         |         |
   4+30       0.0064      0.03  QV        |         |         |         |
   4+35       0.0066      0.03  QV        |         |         |         |
   4+40       0.0068      0.03  QV        |         |         |         |
   4+45       0.0070      0.03  QV        |         |         |         |
   4+50       0.0072      0.03  QV        |         |         |         |
   4+55       0.0074      0.03  QV        |         |         |         |
   5+ 0       0.0077      0.03  QV        |         |         |         |
   5+ 5       0.0079      0.03  QV        |         |         |         |
   5+10       0.0081      0.03  QV        |         |         |         |
   5+15       0.0083      0.03  QV        |         |         |         |
   5+20       0.0084      0.03  QV        |         |         |         |
   5+25       0.0086      0.03  QV        |         |         |         |
   5+30       0.0088      0.03  QV        |         |         |         |
   5+35       0.0090      0.03  QV        |         |         |         |
   5+40       0.0093      0.03  QV        |         |         |         |
   5+45       0.0095      0.03  QV        |         |         |         |
   5+50       0.0097      0.03  QV        |         |         |         |
   5+55       0.0099      0.03  QV        |         |         |         |
   6+ 0       0.0102      0.03  QV        |         |         |         |
   6+ 5       0.0104      0.03  QV        |         |         |         |
   6+10       0.0107      0.04  QV        |         |         |         |
   6+15       0.0109      0.04  QV        |         |         |         |
```



```
   6+20       0.0112      0.04  QV        |         |         |         |
   6+25       0.0114      0.04  QV        |         |         |         |
   6+30       0.0117      0.04  QV        |         |         |         |
   6+35       0.0120      0.04  QV        |         |         |         |
   6+40       0.0122      0.04  QV        |         |         |         |
   6+45       0.0125      0.04  QV        |         |         |         |
   6+50       0.0128      0.04  Q V       |         |         |         |
   6+55       0.0131      0.04  Q V       |         |         |         |
   7+ 0       0.0134      0.04  Q V       |         |         |         |
   7+ 5       0.0137      0.04  Q V       |         |         |         |
   7+10       0.0140      0.04  Q V       |         |         |         |
   7+15       0.0143      0.04  Q V       |         |         |         |
   7+20       0.0145      0.04  Q V       |         |         |         |
   7+25       0.0149      0.04  Q V       |         |         |         |
   7+30       0.0152      0.05  Q V       |         |         |         |
   7+35       0.0155      0.05  Q V       |         |         |         |
   7+40       0.0158      0.05  Q V       |         |         |         |
   7+45       0.0162      0.05  Q V       |         |         |         |
   7+50       0.0165      0.05  Q V       |         |         |         |
   7+55       0.0169      0.05  Q V       |         |         |         |
   8+ 0       0.0173      0.05  Q V       |         |         |         |
   8+ 5       0.0176      0.06  Q V       |         |         |         |
   8+10       0.0181      0.06  Q V       |         |         |         |
   8+15       0.0185      0.06  Q V       |         |         |         |
   8+20       0.0189      0.06  Q  V      |         |         |         |
   8+25       0.0193      0.06  Q  V      |         |         |         |
   8+30       0.0198      0.06  Q  V      |         |         |         |
   8+35       0.0202      0.06  Q  V      |         |         |         |
   8+40       0.0207      0.07  Q  V      |         |         |         |
   8+45       0.0211      0.07  Q  V      |         |         |         |
   8+50       0.0216      0.07  Q  V      |         |         |         |
   8+55       0.0221      0.07  Q  V      |         |         |         |
   9+ 0       0.0226      0.07  Q  V      |         |         |         |
   9+ 5       0.0231      0.08  Q  V      |         |         |         |
   9+10       0.0237      0.09  Q  V      |         |         |         |
   9+15       0.0243      0.09  Q  V      |         |         |         |
   9+20       0.0251      0.11  Q  V      |         |         |         |
   9+25       0.0260      0.13  Q   V     |         |         |         |
   9+30       0.0270      0.14  Q   V     |         |         |         |
   9+35       0.0281      0.16  Q   V     |         |         |         |
   9+40       0.0293      0.18  Q   V     |         |         |         |
   9+45       0.0307      0.19  Q   V     |         |         |         |
   9+50       0.0321      0.21  Q    V    |         |         |         |
   9+55       0.0337      0.24  Q    V    |         |         |         |
  10+ 0       0.0354      0.24  Q    V    |         |         |         |
  10+ 5       0.0368      0.20  Q    V    |         |         |         |
  10+10       0.0376      0.11  Q    V    |         |         |         |
  10+15       0.0381      0.09  Q     V   |         |         |         |
  10+20       0.0387      0.07  Q     V   |         |         |         |
  10+25       0.0391      0.07  Q     V   |         |         |         |
  10+30       0.0396      0.07  Q     V   |         |         |         |
  10+35       0.0402      0.10  Q     V   |         |         |         |
  10+40       0.0414      0.16  Q     V   |         |         |         |
  10+45       0.0426      0.18  Q     V   |         |         |         |
  10+50       0.0439      0.19  Q     V   |         |         |         |
  10+55       0.0453      0.20  Q      V  |         |         |         |
  11+ 0       0.0467      0.20  Q      V  |         |         |         |
  11+ 5       0.0480      0.20  Q      V  |         |         |         |
  11+10       0.0493      0.18  Q      V  |         |         |         |
  11+15       0.0505      0.18  Q       V |         |         |         |
  11+20       0.0517      0.18  Q       V |         |         |         |
  11+25       0.0530      0.18  Q       V |         |         |         |
  11+30       0.0542      0.18  Q       V |         |         |         |
  11+35       0.0553      0.16  Q       V |         |         |         |
  11+40       0.0562      0.12  Q       V |         |         |         |
  11+45       0.0570      0.12  Q        V|         |         |         |
  11+50       0.0579      0.13  Q        V|         |         |         |
  11+55       0.0589      0.15  Q        V|         |         |         |
  12+ 0       0.0599      0.15  Q        V|         |         |         |
  12+ 5       0.0616      0.24  Q        V|         |         |         |
  12+10       0.0642      0.38  |Q        V         |         |         |
  12+15       0.0671      0.42  |Q        V         |         |         |
  12+20       0.0702      0.45  |Q        |V        |         |         |
  12+25       0.0736      0.49  |Q        |V        |         |         |
  12+30       0.0770      0.50  | Q       | V       |         |         |
  12+35       0.0807      0.53  | Q       | V       |         |         |
  12+40       0.0847      0.58  | Q       |  V      |         |         |
  12+45       0.0888      0.59  | Q       |  V      |         |         |
  12+50       0.0930      0.61  | Q       |  V      |         |         |
  12+55       0.0974      0.64  | Q       |   V     |         |         |
  13+ 0       0.1018      0.65  | Q       |    V    |         |         |
  13+ 5       0.1067      0.71  | Q       |    V    |         |         |
  13+10       0.1123      0.81  |  Q      |     V   |         |         |
  13+15       0.1181      0.84  |  Q      |      V  |         |         |
  13+20       0.1240      0.86  |  Q      |      V| |         |         |
  13+25       0.1300      0.87  |  Q      |       V |         |         |
  13+30       0.1360      0.88  |  Q      |       |V         |         |
  13+35       0.1413      0.76  |  Q      |       | V        |         |
  13+40       0.1450      0.54  | Q       |       |  V       |         |
  13+45       0.1483      0.48  |Q        |       |  V       |         |
  13+50       0.1515      0.46  |Q        |       |   V      |         |
  13+55       0.1546      0.45  |Q        |       |   V      |         |
  14+ 0       0.1576      0.44  |Q        |       |    V     |         |
  14+ 5       0.1609      0.48  |Q        |       |    V     |         |
  14+10       0.1648      0.57  | Q       |       |     V    |         |
  14+15       0.1689      0.59  | Q       |       |     V    |         |
  14+20       0.1729      0.59  | Q       |       |      V   |         |
  14+25       0.1769      0.58  | Q       |       |      V   |         |
  14+30       0.1809      0.58  | Q       |       |       V  |         |
```

```
14+35      0.1849     0.58  | Q      |        |       V|        |
14+40      0.1889     0.58  | Q      |        |        V        |
14+45      0.1930     0.58  | Q      |        |        V        |
14+50      0.1969     0.58  | Q      |        |        |V       |
14+55      0.2008     0.56  | Q      |        |        |V       |
15+ 0      0.2046     0.56  | Q      |        |        | V      |
15+ 5      0.2083     0.54  | Q      |        |        |  V     |
15+10      0.2120     0.53  | Q      |        |        |  V     |
15+15      0.2155     0.52  | Q      |        |        |   V    |
15+20      0.2191     0.51  | Q      |        |        |   V    |
15+25      0.2224     0.49  |Q       |        |        |    V   |
15+30      0.2258     0.49  |Q       |        |        |    V   |
15+35      0.2288     0.44  |Q       |        |        |     V  |
15+40      0.2313     0.36  |Q       |        |        |     V  |
15+45      0.2337     0.34  |Q       |        |        |      V |
15+50      0.2360     0.33  |Q       |        |        |      V |
15+55      0.2383     0.33  |Q       |        |        |      V |
16+ 0      0.2406     0.33  |Q       |        |        |       V|
16+ 5      0.2423     0.25  Q       |        |        |       V|
16+10      0.2429     0.10  Q       |        |        |       V|
16+15      0.2433     0.05  Q       |        |        |       V|
16+20      0.2435     0.04  Q       |        |        |       V|
16+25      0.2437     0.03  Q       |        |        |       V|
16+30      0.2439     0.02  Q       |        |        |       V|
16+35      0.2440     0.02  Q       |        |        |       V|
16+40      0.2441     0.01  Q       |        |        |       V|
16+45      0.2442     0.01  Q       |        |        |       V|
16+50      0.2443     0.01  Q       |        |        |       V|
16+55      0.2443     0.01  Q       |        |        |       V|
17+ 0      0.2444     0.01  Q       |        |        |       V|
17+ 5      0.2445     0.01  Q       |        |        |       V|
17+10      0.2447     0.02  Q       |        |        |       V|
17+15      0.2448     0.02  Q       |        |        |       V|
17+20      0.2449     0.02  Q       |        |        |       V|
17+25      0.2451     0.02  Q       |        |        |       V|
17+30      0.2452     0.02  Q       |        |        |       V|
17+35      0.2454     0.02  Q       |        |        |        V|
17+40      0.2455     0.02  Q       |        |        |        V|
17+45      0.2457     0.02  Q       |        |        |        V|
17+50      0.2458     0.02  Q       |        |        |        V|
17+55      0.2459     0.02  Q       |        |        |        V|
18+ 0      0.2460     0.02  Q       |        |        |        V|
18+ 5      0.2461     0.02  Q       |        |        |        V|
18+10      0.2463     0.02  Q       |        |        |        V|
18+15      0.2464     0.02  Q       |        |        |        V|
18+20      0.2465     0.02  Q       |        |        |        V|
18+25      0.2466     0.02  Q       |        |        |        V|
18+30      0.2467     0.02  Q       |        |        |        V|
18+35      0.2468     0.02  Q       |        |        |        V|
18+40      0.2469     0.01  Q       |        |        |        V|
18+45      0.2470     0.01  Q       |        |        |        V|
18+50      0.2471     0.01  Q       |        |        |        V|
18+55      0.2472     0.01  Q       |        |        |        V|
19+ 0      0.2472     0.01  Q       |        |        |        V|
19+ 5      0.2473     0.01  Q       |        |        |        V|
19+10      0.2474     0.01  Q       |        |        |        V|
19+15      0.2475     0.01  Q       |        |        |        V|
19+20      0.2475     0.01  Q       |        |        |        V|
19+25      0.2477     0.02  Q       |        |        |        V|
19+30      0.2478     0.02  Q       |        |        |        V|
19+35      0.2479     0.02  Q       |        |        |        V|
19+40      0.2480     0.01  Q       |        |        |        V|
19+45      0.2481     0.01  Q       |        |        |        V|
19+50      0.2481     0.01  Q       |        |        |        V|
19+55      0.2482     0.01  Q       |        |        |        V|
20+ 0      0.2483     0.01  Q       |        |        |        V|
20+ 5      0.2483     0.01  Q       |        |        |        V|
20+10      0.2484     0.01  Q       |        |        |        V|
20+15      0.2485     0.01  Q       |        |        |        V|
20+20      0.2486     0.01  Q       |        |        |        V|
20+25      0.2487     0.01  Q       |        |        |        V|
20+30      0.2487     0.01  Q       |        |        |        V|
20+35      0.2488     0.01  Q       |        |        |        V|
20+40      0.2489     0.01  Q       |        |        |        V|
20+45      0.2490     0.01  Q       |        |        |        V|
20+50      0.2491     0.01  Q       |        |        |        V|
20+55      0.2491     0.01  Q       |        |        |        V|
21+ 0      0.2492     0.01  Q       |        |        |        V|
21+ 5      0.2493     0.01  Q       |        |        |        V|
21+10      0.2494     0.01  Q       |        |        |        V|
21+15      0.2494     0.01  Q       |        |        |        V|
21+20      0.2495     0.01  Q       |        |        |        V|
21+25      0.2496     0.01  Q       |        |        |        V|
21+30      0.2496     0.01  Q       |        |        |        V|
21+35      0.2497     0.01  Q       |        |        |        V|
21+40      0.2498     0.01  Q       |        |        |        V|
21+45      0.2499     0.01  Q       |        |        |        V|
21+50      0.2499     0.01  Q       |        |        |        V|
21+55      0.2500     0.01  Q       |        |        |        V|
22+ 0      0.2501     0.01  Q       |        |        |        V|
22+ 5      0.2501     0.01  Q       |        |        |        V|
22+10      0.2502     0.01  Q       |        |        |        V|
22+15      0.2503     0.01  Q       |        |        |        V|
22+20      0.2504     0.01  Q       |        |        |        V|
22+25      0.2504     0.01  Q       |        |        |        V|
22+30      0.2505     0.01  Q       |        |        |        V|
22+35      0.2506     0.01  Q       |        |        |        V|
22+40      0.2506     0.01  Q       |        |        |        V|
22+45      0.2507     0.01  Q       |        |        |        V|
```



```
22+50      0.2507     0.01  Q       |        |        |        V|
22+55      0.2508     0.01  Q       |        |        |        V|
23+ 0      0.2509     0.01  Q       |        |        |        V|
23+ 5      0.2509     0.01  Q       |        |        |        V|
23+10      0.2510     0.01  Q       |        |        |        V|
23+15      0.2510     0.01  Q       |        |        |        V|
23+20      0.2511     0.01  Q       |        |        |        V|
23+25      0.2511     0.01  Q       |        |        |        V|
23+30      0.2512     0.01  Q       |        |        |        V|
23+35      0.2513     0.01  Q       |        |        |        V|
23+40      0.2513     0.01  Q       |        |        |        V|
23+45      0.2514     0.01  Q       |        |        |        V|
23+50      0.2514     0.01  Q       |        |        |        V|
23+55      0.2515     0.01  Q       |        |        |        V|
24+ 0      0.2515     0.01  Q       |        |        |        V|
24+ 5      0.2516     0.01  Q       |        |        |        V|
24+10      0.2516     0.00  Q       |        |        |        V|
24+15      0.2516     0.00  Q       |        |        |        V|
24+20      0.2516     0.00  Q       |        |        |        V|
24+25      0.2516     0.00  Q       |        |        |        V|
24+30      0.2516     0.00  Q       |        |        |        V|
-------------------------------------------------------------------
```

Appendix B – Proposed Conditions Civil Design Calculations

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

          Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
                   Study date  01/24/23 File: NTSHemetUHPr10310.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
------------------------------------------------------------------------------

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


Program License Serial Number 6385

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

 English Units used in output format



------------------------------------------------------------------------
National Tube Supply - Hemet (Area 1)
Proposed Condition 10-Year Unit Hydrographs
N Zamarripa   01-24-2023

------------------------------------------------------------------------
Drainage Area =       3.13(Ac.)  =      0.005 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       3.13(Ac.)  =      0.005 Sq. Mi.
Length along longest watercourse =     586.00(Ft.)
Length along longest watercourse measured to centroid =     404.00(Ft.)
Length along longest watercourse =      0.111 Mi.
Length along longest watercourse measured to centroid =      0.077 Mi.
Difference in elevation =       2.86(Ft.)
Slope along watercourse =     25.7693 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =     0.032 Hr.
Lag time =     1.90 Min.
25% of lag time =     0.48 Min.
40% of lag time =     0.76 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]
        3.13               0.80                        2.50

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        3.13               1.80                        5.63

STORM EVENT (YEAR) =   10.00
Area Averaged 2-Year Rainfall =    0.800(In)
Area Averaged 100-Year Rainfall =    1.800(In)

Point rain (area averaged) =    1.211(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    1.211(In)

Sub-Area Data:
Area(Ac.)          Runoff Index   Impervious %
     0.170            98.00          0.950
     2.960            98.00          0.950
 Total Area Entered =      3.13(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
98.0  98.0      0.026     0.950        0.004       0.054      0.000
98.0  98.0      0.026     0.950        0.004       0.946      0.004
                                              Sum (F) =   0.004
Area averaged mean soil loss (F) (In/Hr) =  0.004
Minimum soil loss rate ((In/Hr)) =  0.002
(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   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %          (CFS)
------------------------------------------------------------------------
    1   0.083        262.786         52.510             1.656
    2   0.167        525.571         39.275             1.239
    3   0.250        788.357          6.621             0.209
    4   0.333       1051.142          1.595             0.050
                               Sum = 100.000   Sum=       3.154
------------------------------------------------------------------------
```


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	0.189	0.004	(0.019)	0.185
2	0.17	1.30	0.189	0.004	(0.019)	0.185
3	0.25	1.10	0.160	0.004	(0.016)	0.156
4	0.33	1.50	0.218	0.004	(0.022)	0.214
5	0.42	1.50	0.218	0.004	(0.022)	0.214
6	0.50	1.80	0.262	0.004	(0.026)	0.258
7	0.58	1.50	0.218	0.004	(0.022)	0.214
8	0.67	1.80	0.262	0.004	(0.026)	0.258
9	0.75	1.80	0.262	0.004	(0.026)	0.258
10	0.83	1.50	0.218	0.004	(0.022)	0.214
11	0.92	1.60	0.233	0.004	(0.023)	0.229
12	1.00	1.80	0.262	0.004	(0.026)	0.258
13	1.08	2.20	0.320	0.004	(0.032)	0.316
14	1.17	2.20	0.320	0.004	(0.032)	0.316
15	1.25	2.20	0.320	0.004	(0.032)	0.316
16	1.33	2.00	0.291	0.004	(0.029)	0.287
17	1.42	2.60	0.378	0.004	(0.038)	0.374
18	1.50	2.70	0.392	0.004	(0.039)	0.389
19	1.58	2.40	0.349	0.004	(0.035)	0.345
20	1.67	2.70	0.392	0.004	(0.039)	0.389
21	1.75	3.30	0.480	0.004	(0.048)	0.476
22	1.83	3.10	0.451	0.004	(0.045)	0.447
23	1.92	2.90	0.422	0.004	(0.042)	0.418
24	2.00	3.00	0.436	0.004	(0.044)	0.432
25	2.08	3.10	0.451	0.004	(0.045)	0.447
26	2.17	4.20	0.611	0.004	(0.061)	0.607
27	2.25	5.00	0.727	0.004	(0.073)	0.723
28	2.33	3.50	0.509	0.004	(0.051)	0.505
29	2.42	6.80	0.988	0.004	(0.099)	0.985
30	2.50	7.30	1.061	0.004	(0.106)	1.057
31	2.58	8.20	1.192	0.004	(0.119)	1.188
32	2.67	5.90	0.858	0.004	(0.086)	0.854
33	2.75	2.00	0.291	0.004	(0.029)	0.287
34	2.83	1.80	0.262	0.004	(0.026)	0.258
35	2.92	1.80	0.262	0.004	(0.026)	0.258
36	3.00	0.60	0.087	0.004	(0.009)	0.083

(Loss Rate Not Used)
Sum = 100.0 Sum = 14.4

```
      Flood volume = Effective rainfall      1.20(In)
       times area       3.1(Ac.)/[(In)/(Ft.)] =       0.3(Ac.Ft)
      Total soil loss =      0.01(In)
      Total soil loss =     0.003(Ac.Ft)
      Total rainfall =      1.21(In)
      Flood volume =       13635.2 Cubic Feet
      Total soil loss =         128.5 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =      3.511(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        2.5       5.0       7.5      10.0
---------------------------------------------------------------------------
  0+ 5       0.0021      0.31  VQ        |         |         |         |
  0+10       0.0058      0.54  V Q       |         |         |         |
  0+15       0.0094      0.53  |VQ       |         |         |         |
  0+20       0.0135      0.60  |VQ       |         |         |         |
  0+25       0.0181      0.66  | Q       |         |         |         |
  0+30       0.0232      0.75  | Q       |         |         |         |
  0+35       0.0283      0.73  | QV      |         |         |         |
  0+40       0.0335      0.76  |  QV     |         |         |         |
  0+45       0.0390      0.80  |  QV     |         |         |         |
  0+50       0.0441      0.74  | Q  V    |         |         |         |
  0+55       0.0490      0.71  | Q   V   |         |         |         |
  1+ 0       0.0543      0.77  |  Q  V   |         |         |         |
  1+ 5       0.0605      0.90  |  Q   V  |         |         |         |
  1+10       0.0673      0.98  |  Q    V |         |         |         |
  1+15       0.0741      0.99  |  Q     V|         |         |         |
  1+20       0.0807      0.95  |  Q      V         |         |         |
  1+25       0.0880      1.06  |   Q     |V        |         |         |
  1+30       0.0961      1.18  |   Q     | V       |         |         |
  1+35       0.1040      1.15  |   Q     |  V      |         |         |
  1+40       0.1121      1.17  |   Q     |   V     |         |         |
  1+45       0.1215      1.36  |    Q    |    V    |         |         |
  1+50       0.1313      1.43  |    Q    |     V   |         |         |
  1+55       0.1407      1.37  |    Q    |      V  |         |         |
  2+ 0       0.1500      1.35  |    Q    |       V|         |         |
  2+ 5       0.1596      1.39  |    Q    |        V|         |         |
  2+10       0.1711      1.67  |     Q   |         |V        |         |
  2+15       0.1853      2.07  |      Q  |         | V       |         |
  2+20       0.1983      1.88  |      Q  |         |  V      |         |
  2+25       0.2151      2.44  |       Q |         |   V     |         |
  2+30       0.2365      3.11  |         | Q       |        V|         |
  2+35       0.2607      3.51  |         |  Q      |         | V       |
  2+40       0.2825      3.16  |         | Q       |         |  V      |
  2+45       0.2951      1.84  |      Q  |         |         |   V     |
  2+50       0.3021      1.02  |   Q     |         |         |    V    |
  2+55       0.3080      0.85  |  Q      |         |         |     V   |
```

```
    3+ 0       0.3116      0.53  | Q       |         |         |        V|
    3+ 5       0.3128      0.17  Q         |         |         |        V|
    3+10       0.3130      0.03  Q         |         |         |        V|
    3+15       0.3130      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

          Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
                   Study date  01/24/23 File: NTSHemetUHPr210310.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
--------------------------------------------------------------------------------

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


Program License Serial Number 6385

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

 English Units used in output format



------------------------------------------------------------------------
National Tube Supply - Hemet (Area 2)
Proposed Condition 10-Year Unit Hydrographs
N Zamarripa   01-24-2023

------------------------------------------------------------------------
Drainage Area =       2.63(Ac.)  =      0.004 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       2.63(Ac.)  =      0.004 Sq. Mi.
Length along longest watercourse =     473.00(Ft.)
Length along longest watercourse measured to centroid =     314.00(Ft.)
Length along longest watercourse =      0.090 Mi.
Length along longest watercourse measured to centroid =      0.059 Mi.
Difference in elevation =       2.32(Ft.)
Slope along watercourse =     25.8977 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =     0.027 Hr.
Lag time =     1.59 Min.
25% of lag time =     0.40 Min.
40% of lag time =     0.64 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]
        2.63               0.80                2.10

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        2.63               1.80                4.73

STORM EVENT (YEAR) =   10.00
Area Averaged 2-Year Rainfall =     0.800(In)
Area Averaged 100-Year Rainfall =     1.800(In)

Point rain (area averaged) =     1.211(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =     1.211(In)

Sub-Area Data:
Area(Ac.)          Runoff Index   Impervious %
     0.490            98.00          0.950
     2.140            98.00          0.950
 Total Area Entered =      2.63(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
98.0  98.0      0.026     0.950        0.004       0.186      0.001
98.0  98.0      0.026     0.950        0.004       0.814      0.003
                                              Sum (F) =   0.004
Area averaged mean soil loss (F) (In/Hr) =  0.004
Minimum soil loss rate ((In/Hr)) =  0.002
(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   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %          (CFS)
------------------------------------------------------------------------
    1   0.083        314.020         58.075             1.539
    2   0.167        628.040         36.370             0.964
    3   0.250        942.060          5.555             0.147
                              Sum = 100.000   Sum=       2.651
------------------------------------------------------------------------
```


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	0.189	0.004	(0.019)	0.185
2	0.17	1.30	0.189	0.004	(0.019)	0.185
3	0.25	1.10	0.160	0.004	(0.016)	0.156
4	0.33	1.50	0.218	0.004	(0.022)	0.214
5	0.42	1.50	0.218	0.004	(0.022)	0.214
6	0.50	1.80	0.262	0.004	(0.026)	0.258
7	0.58	1.50	0.218	0.004	(0.022)	0.214
8	0.67	1.80	0.262	0.004	(0.026)	0.258
9	0.75	1.80	0.262	0.004	(0.026)	0.258
10	0.83	1.50	0.218	0.004	(0.022)	0.214
11	0.92	1.60	0.233	0.004	(0.023)	0.229
12	1.00	1.80	0.262	0.004	(0.026)	0.258
13	1.08	2.20	0.320	0.004	(0.032)	0.316
14	1.17	2.20	0.320	0.004	(0.032)	0.316
15	1.25	2.20	0.320	0.004	(0.032)	0.316
16	1.33	2.00	0.291	0.004	(0.029)	0.287
17	1.42	2.60	0.378	0.004	(0.038)	0.374
18	1.50	2.70	0.392	0.004	(0.039)	0.389
19	1.58	2.40	0.349	0.004	(0.035)	0.345
20	1.67	2.70	0.392	0.004	(0.039)	0.389
21	1.75	3.30	0.480	0.004	(0.048)	0.476
22	1.83	3.10	0.451	0.004	(0.045)	0.447
23	1.92	2.90	0.422	0.004	(0.042)	0.418
24	2.00	3.00	0.436	0.004	(0.044)	0.432
25	2.08	3.10	0.451	0.004	(0.045)	0.447
26	2.17	4.20	0.611	0.004	(0.061)	0.607
27	2.25	5.00	0.727	0.004	(0.073)	0.723
28	2.33	3.50	0.509	0.004	(0.051)	0.505
29	2.42	6.80	0.988	0.004	(0.099)	0.985
30	2.50	7.30	1.061	0.004	(0.106)	1.057
31	2.58	8.20	1.192	0.004	(0.119)	1.188
32	2.67	5.90	0.858	0.004	(0.086)	0.854
33	2.75	2.00	0.291	0.004	(0.029)	0.287
34	2.83	1.80	0.262	0.004	(0.026)	0.258
35	2.92	1.80	0.262	0.004	(0.026)	0.258
36	3.00	0.60	0.087	0.004	(0.009)	0.083

(Loss Rate Not Used)

Sum = 100.0 Sum = 14.4

```
      Flood volume = Effective rainfall      1.20(In)
       times area       2.6(Ac.)/[(In)/(Ft.)] =       0.3(Ac.Ft)
      Total soil loss =      0.01(In)
      Total soil loss =     0.002(Ac.Ft)
      Total rainfall =      1.21(In)
      Flood volume =       11457.1 Cubic Feet
      Total soil loss =          108.0 Cubic Feet
      ---------------------------------------------------------------
       Peak flow rate of this hydrograph =      2.995(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        2.5       5.0       7.5      10.0
------------------------------------------------------------------------
  0+ 5       0.0020      0.29  VQ        |         |         |         |
  0+10       0.0052      0.46  VQ        |         |         |         |
  0+15       0.0082      0.45  |Q        |         |         |         |
  0+20       0.0117      0.51  |VQ       |         |         |         |
  0+25       0.0156      0.56  | Q       |         |         |         |
  0+30       0.0200      0.64  | QV      |         |         |         |
  0+35       0.0242      0.61  | QV      |         |         |         |
  0+40       0.0286      0.64  | Q V     |         |         |         |
  0+45       0.0333      0.68  | Q  V    |         |         |         |
  0+50       0.0375      0.62  | Q  V    |         |         |         |
  0+55       0.0416      0.60  | Q   V   |         |         |         |
  1+ 0       0.0461      0.65  | Q    V  |         |         |         |
  1+ 5       0.0514      0.77  |  Q   V  |         |         |         |
  1+10       0.0571      0.83  |  Q    V |         |         |         |
  1+15       0.0629      0.84  |  Q     V|         |         |         |
  1+20       0.0683      0.79  |  Q      V         |         |         |
  1+25       0.0745      0.90  |  Q      |V        |         |         |
  1+30       0.0814      1.00  |   Q     | V       |         |         |
  1+35       0.0880      0.96  |  Q      |  V      |         |         |
  1+40       0.0949      0.99  |  Q      |   V     |         |         |
  1+45       0.1028      1.16  |   Q     |    V    |         |         |
  1+50       0.1111      1.20  |   Q     |     V   |         |         |
  1+55       0.1190      1.14  |   Q     |      V  |         |         |
  2+ 0       0.1268      1.13  |   Q     |       V |         |         |
  2+ 5       0.1349      1.17  |   Q     |        V|         |         |
  2+10       0.1447      1.43  |    Q    |         | V       |         |
  2+15       0.1569      1.76  |      Q  |         |  V      |         |
  2+20       0.1676      1.56  |     Q   |         |   V     |         |
  2+25       0.1822      2.11  |      Q  |         |    V    |         |
  2+30       0.2004      2.65  |       Q |         |     V   |         |
  2+35       0.2211      2.99  |        |Q         |      V  |         |
  2+40       0.2391      2.62  |        Q         |         |     V   |
  2+45       0.2490      1.44  |    Q    |        |         |      V  |
  2+50       0.2545      0.80  |  Q      |        |         |       V |
  2+55       0.2593      0.69  | Q       |        |         |        V|
  3+ 0       0.2621      0.42  |Q        |        |         |        V|
```

```
    3+ 5       0.2629      0.12  Q        |         |         |        V|
    3+10       0.2630      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

         Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
                  Study date  01/23/23 File: NTSHemetUHPr1001100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
------------------------------------------------------------------------------

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


Program License Serial Number 6385

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

 English Units used in output format



------------------------------------------------------------------------
National Tube Supply - Hemet (Area 1)
Proposed Condition 100-Year Unit Hydrographs
N Zamarripa   01-23-2023

------------------------------------------------------------------------
Drainage Area =       3.13(Ac.)  =      0.005 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       3.13(Ac.)  =      0.005 Sq. Mi.
Length along longest watercourse =     586.00(Ft.)
Length along longest watercourse measured to centroid =     404.00(Ft.)
Length along longest watercourse =      0.111 Mi.
Length along longest watercourse measured to centroid =      0.077 Mi.
Difference in elevation =       2.86(Ft.)
Slope along watercourse =     25.7693 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =     0.032 Hr.
Lag time =     1.90 Min.
25% of lag time =     0.48 Min.
40% of lag time =     0.76 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]
        3.13               0.50                        1.56

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        3.13               1.20                        3.76

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 =  100.00 %
Adjusted average point rain =    1.200(In)

Sub-Area Data:
Area(Ac.)          Runoff Index   Impervious %
     0.170            98.00          0.950
     2.960            98.00          0.950
 Total Area Entered =      3.13(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-3     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
98.0  99.2      0.010     0.950        0.002       0.054      0.000
98.0  99.2      0.010     0.950        0.002       0.946      0.001
                                                 Sum (F) =   0.002
Area averaged mean soil loss (F) (In/Hr) =  0.002
Minimum soil loss rate ((In/Hr)) =  0.000
(for 24 hour storm duration)
Note: User entry of the fm value
Soil low loss rate (decimal) =   0.100
------------------------------------------------------------------------
Slope of intensity-duration curve for a 1 hour storm =0.5300
------------------------------------------------------------------------

                  U n i t   H y d r o g r a p h
                         VALLEY S-Curve
------------------------------------------------------------------------
                  Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %           (CFS)
------------------------------------------------------------------------
    1   0.083        262.786         52.510              1.656
    2   0.167        525.571         39.275              1.239
    3   0.250        788.357          6.621              0.209
```



```
    4   0.333       1051.142          1.595              0.050
                                  Sum = 100.000   Sum=       3.154
------------------------------------------------------------------------


 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   Pattern   Storm Rain     Loss rate(In./Hr)      Effective
      (Hr.)  Percent   (In/Hr)          Max   |   Low        (In/Hr)
  1   0.08     3.40       0.490          0.002    (  0.049)         0.488
  2   0.17     4.70       0.677          0.002    (  0.068)         0.675
  3   0.25     4.70       0.677          0.002    (  0.068)         0.675
  4   0.33     5.10       0.734          0.002    (  0.073)         0.733
  5   0.42     5.80       0.835          0.002    (  0.084)         0.834
  6   0.50     5.90       0.850          0.002    (  0.085)         0.848
  7   0.58     7.10       1.022          0.002    (  0.102)         1.021
  8   0.67     8.70       1.253          0.002    (  0.125)         1.251
  9   0.75    13.20       1.901          0.002    (  0.190)         1.899
 10   0.83    29.70       4.277          0.002    (  0.428)         4.275
 11   0.92     7.70       1.109          0.002    (  0.111)         1.107
 12   1.00     4.00       0.576          0.002    (  0.058)         0.574
                  (Loss Rate Not Used)
    Sum =     100.0                                 Sum =    14.4
        Flood volume = Effective rainfall      1.20(In)
         times area       3.1(Ac.)/[(In)/(Ft.)] =       0.3(Ac.Ft)
        Total soil loss =      0.00(In)
        Total soil loss =     0.000(Ac.Ft)
        Total rainfall =      1.20(In)
        Flood volume =       13616.8 Cubic Feet
        Total soil loss =          17.1 Cubic Feet
        ------------------------------------------------------------------------
         Peak flow rate of this hydrograph =      9.752(CFS)
        ------------------------------------------------------------------------
        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                              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        2.5       5.0       7.5      10.0
 ------------------------------------------------------------------------
   0+ 5       0.0056      0.81  V  Q      |         |         |         |
   0+10       0.0174      1.72  | V   Q   |         |         |         |
   0+15       0.0316      2.06  |   V   Q |         |         |         |
   0+20       0.0469      2.22  |     V  Q|         |         |         |
   0+25       0.0639      2.47  |        VQ|         |         |         |
   0+30       0.0820      2.63  |         Q         |         |         |
   0+35       0.1023      2.95  |         |Q V      |         |         |
   0+40       0.1268      3.56  |         |   Q V   |         |         |
   0+45       0.1609      4.95  |         |        QV         |         |
   0+50       0.2281      9.75  |         |         |        V|        Q|
   0+55       0.2804      7.59  |         |         |         Q    V    |
   1+ 0       0.3032      3.31  |         | Q       |         |       V |
   1+ 5       0.3112      1.16  |   Q     |         |         |        V|
   1+10       0.3124      0.18  Q         |         |         |        V|
   1+15       0.3126      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 01/23/23 File: NTSHemetUHPr1003100.out

++

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

Program License Serial Number 6385

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

English Units used in output format

National Tube Supply - Hemet (Area 1)
Proposed Condition 100-Year Unit Hydrographs
N Zamarripa 01-23-2023

Drainage Area = 3.13(Ac.) = 0.005 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 3.13(Ac.) = 0.005 Sq. Mi.
Length along longest watercourse = 586.00(Ft.)
Length along longest watercourse measured to centroid = 404.00(Ft.)
Length along longest watercourse = 0.111 Mi.
Length along longest watercourse measured to centroid = 0.077 Mi.
Difference in elevation = 2.86(Ft.)
Slope along watercourse = 25.7693 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.032 Hr.
Lag time = 1.90 Min.
25% of lag time = 0.48 Min.
40% of lag time = 0.76 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]
3.13	0.80	2.50

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
3.13	1.80	5.63

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.800(In)
Area Averaged 100-Year Rainfall = 1.800(In)

Point rain (area averaged) = 1.800(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.800(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.170	98.00	0.950
2.960	98.00	0.950

Total Area Entered = 3.13(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
98.0	99.2	0.010	0.950	0.002	0.054	0.000
98.0	99.2	0.010	0.950	0.002	0.946	0.001
					Sum (F) =	0.002

Area averaged mean soil loss (F) (In/Hr) = 0.002
Minimum soil loss rate ((In/Hr)) = 0.000
(for 24 hour storm duration)
Note: User entry of the fm value
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	262.786	52.510	1.656
2	0.167	525.571	39.275	1.239
3	0.250	788.357	6.621	0.209
4	0.333	1051.142	1.595	0.050
		Sum = 100.000	Sum=	3.154

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	0.281	0.002	(0.028)	0.279
2	0.17	1.30	0.281	0.002	(0.028)	0.279
3	0.25	1.10	0.238	0.002	(0.024)	0.236
4	0.33	1.50	0.324	0.002	(0.032)	0.322
5	0.42	1.50	0.324	0.002	(0.032)	0.322
6	0.50	1.80	0.389	0.002	(0.039)	0.387
7	0.58	1.50	0.324	0.002	(0.032)	0.322
8	0.67	1.80	0.389	0.002	(0.039)	0.387
9	0.75	1.80	0.389	0.002	(0.039)	0.387
10	0.83	1.50	0.324	0.002	(0.032)	0.322
11	0.92	1.60	0.346	0.002	(0.035)	0.344
12	1.00	1.80	0.389	0.002	(0.039)	0.387
13	1.08	2.20	0.475	0.002	(0.048)	0.474
14	1.17	2.20	0.475	0.002	(0.048)	0.474
15	1.25	2.20	0.475	0.002	(0.048)	0.474
16	1.33	2.00	0.432	0.002	(0.043)	0.430
17	1.42	2.60	0.562	0.002	(0.056)	0.560
18	1.50	2.70	0.583	0.002	(0.058)	0.582
19	1.58	2.40	0.518	0.002	(0.052)	0.517
20	1.67	2.70	0.583	0.002	(0.058)	0.582
21	1.75	3.30	0.713	0.002	(0.071)	0.711
22	1.83	3.10	0.670	0.002	(0.067)	0.668
23	1.92	2.90	0.626	0.002	(0.063)	0.625
24	2.00	3.00	0.648	0.002	(0.065)	0.646
25	2.08	3.10	0.670	0.002	(0.067)	0.668
26	2.17	4.20	0.907	0.002	(0.091)	0.906
27	2.25	5.00	1.080	0.002	(0.108)	1.078
28	2.33	3.50	0.756	0.002	(0.076)	0.754
29	2.42	6.80	1.469	0.002	(0.147)	1.467
30	2.50	7.30	1.577	0.002	(0.158)	1.575
31	2.58	8.20	1.771	0.002	(0.177)	1.770
32	2.67	5.90	1.274	0.002	(0.127)	1.273
33	2.75	2.00	0.432	0.002	(0.043)	0.430
34	2.83	1.80	0.389	0.002	(0.039)	0.387
35	2.92	1.80	0.389	0.002	(0.039)	0.387
36	3.00	0.60	0.130	0.002	(0.013)	0.128
		(Loss Rate Not Used)			
Sum =		100.0			Sum = 21.5

Flood volume = Effective rainfall 1.80(In)
times area 3.1(Ac.)/[(In)/(Ft.)] = 0.5(Ac.Ft)
Total soil loss = 0.00(In)
Total soil loss = 0.001(Ac.Ft)
Total rainfall = 1.80(In)
Flood volume = 20399.7 Cubic Feet
Total soil loss = 51.4 Cubic Feet

Peak flow rate of this hydrograph = 5.230(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	2.5	5.0	7.5	10.0
0+ 5	0.0032	0.46	VQ				
0+10	0.0088	0.81	V Q				
0+15	0.0142	0.80	V Q				
0+20	0.0204	0.90	V Q				
0+25	0.0273	1.00	VQ				
0+30	0.0350	1.12	V Q				
0+35	0.0426	1.10	VQ				
0+40	0.0504	1.14	Q				
0+45	0.0588	1.21	QV				
0+50	0.0664	1.11	QV				
0+55	0.0738	1.07	Q V				
1+ 0	0.0817	1.16	Q V				
1+ 5	0.0911	1.35	Q V				
1+10	0.1012	1.47	Q V				
1+15	0.1115	1.49	Q V				
1+20	0.1213	1.42	Q V				
1+25	0.1322	1.58	Q V				
1+30	0.1444	1.77	Q V				
1+35	0.1562	1.72	Q V				
1+40	0.1683	1.75	Q V				
1+45	0.1823	2.04	Q V				
1+50	0.1970	2.14	Q V				
1+55	0.2111	2.04	Q V				
2+ 0	0.2250	2.02	Q V				
2+ 5	0.2393	2.07	Q V				
2+10	0.2565	2.50	Q V				
2+15	0.2777	3.08	Q V				
2+20	0.2970	2.81	Q V				
2+25	0.3221	3.64	Q V				
2+30	0.3541	4.64	Q V				
2+35	0.3901	5.23	Q V				
2+40	0.4225	4.71	Q V				
2+45	0.4414	2.74	Q V				
2+50	0.4519	1.53	Q V				

```
    2+55       0.4607      1.28  |    Q    |         |         |        V|
    3+ 0       0.4662      0.79  |  Q      |         |         |        V|
    3+ 5       0.4680      0.26  |Q        |         |         |        V|
    3+10       0.4683      0.05  Q         |         |         |        V|
    3+15       0.4683      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

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
Study date 01/23/23 File: NTSHemetUHPr21001100.out

++

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

Program License Serial Number 6385

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

English Units used in output format

National Tube Supply - Hemet (Area 2)
Proposed Condition 100-Year Unit Hydrographs
N Zamarripa 01-23-2023

Drainage Area = 2.63(Ac.) = 0.004 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 2.63(Ac.) = 0.004 Sq. Mi.
Length along longest watercourse = 473.00(Ft.)
Length along longest watercourse measured to centroid = 314.00(Ft.)
Length along longest watercourse = 0.090 Mi.
Length along longest watercourse measured to centroid = 0.059 Mi.
Difference in elevation = 2.32(Ft.)
Slope along watercourse = 25.8977 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.027 Hr.
Lag time = 1.59 Min.
25% of lag time = 0.40 Min.
40% of lag time = 0.64 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]
2.63	0.50	1.31

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
2.63	1.20	3.16

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 = 100.00 %
Adjusted average point rain = 1.200(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.490	98.00	0.950
2.140	98.00	0.950

Total Area Entered = 2.63(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area (Dec.)	F (In/Hr)
98.0	99.2	0.010	0.950	0.002	0.186	0.000
98.0	99.2	0.010	0.950	0.002	0.814	0.001
					Sum (F) =	0.002

Area averaged mean soil loss (F) (In/Hr) = 0.002
Minimum soil loss rate ((In/Hr)) = 0.000
(for 24 hour storm duration)
Note: User entry of the fm value
Soil low loss rate (decimal) = 0.100

Slope of intensity-duration curve for a 1 hour storm =0.5300

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	314.020	58.075	1.539
2 0.167	628.040	36.370	0.964
3 0.250	942.060	5.555	0.147

Sum = 100.000 Sum= 2.651

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	3.40	0.490	0.002	(0.049)	0.488
2	0.17	4.70	0.677	0.002	(0.068)	0.675
3	0.25	4.70	0.677	0.002	(0.068)	0.675
4	0.33	5.10	0.734	0.002	(0.073)	0.733
5	0.42	5.80	0.835	0.002	(0.084)	0.834
6	0.50	5.90	0.850	0.002	(0.085)	0.848
7	0.58	7.10	1.022	0.002	(0.102)	1.021
8	0.67	8.70	1.253	0.002	(0.125)	1.251
9	0.75	13.20	1.901	0.002	(0.190)	1.899
10	0.83	29.70	4.277	0.002	(0.428)	4.275
11	0.92	7.70	1.109	0.002	(0.111)	1.107
12	1.00	4.00	0.576	0.002	(0.058)	0.574

(Loss Rate Not Used)

Sum = 100.0 Sum = 14.4

Flood volume = Effective rainfall 1.20(In)
times area 2.6(Ac.)/[(In)/(Ft.)] = 0.3(Ac.Ft)
Total soil loss = 0.00(In)
Total soil loss = 0.000(Ac.Ft)
Total rainfall = 1.20(In)
Flood volume = 11441.6 Cubic Feet
Total soil loss = 14.4 Cubic Feet

Peak flow rate of this hydrograph = 8.600(CFS)

++
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	2.5	5.0	7.5	10.0
0+ 5	0.0052	0.75	V Q				
0+10	0.0156	1.51	V Q				
0+15	0.0277	1.76	V Q				
0+20	0.0407	1.88	VQ				
0+25	0.0551	2.09	Q				
0+30	0.0703	2.22	Q V				
0+35	0.0876	2.51	Q V				
0+40	0.1086	3.04	Q V				
0+45	0.1381	4.28	Q V				
0+50	0.1973	8.60			V Q		
0+55	0.2394	6.11		Q	V		
1+ 0	0.2571	2.58	Q			V	
1+ 5	0.2621	0.72	Q			V	
1+10	0.2627	0.08	Q			V	

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

          Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
                   Study date  01/23/23 File: NTSHemetUHPr21003100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
------------------------------------------------------------------------------

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


Program License Serial Number 6385

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

 English Units used in output format



------------------------------------------------------------------------
National Tube Supply - Hemet (Area 2)
Proposed Condition 100-Year Unit Hydrographs
N Zamarripa   01-23-2023

------------------------------------------------------------------------
Drainage Area =       2.63(Ac.)  =      0.004 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       2.63(Ac.)  =      0.004 Sq. Mi.
Length along longest watercourse =     473.00(Ft.)
Length along longest watercourse measured to centroid =     314.00(Ft.)
Length along longest watercourse =      0.090 Mi.
Length along longest watercourse measured to centroid =      0.059 Mi.
Difference in elevation =       2.32(Ft.)
Slope along watercourse =     25.8977 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =     0.027 Hr.
Lag time =     1.59 Min.
25% of lag time =     0.40 Min.
40% of lag time =     0.64 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]
        2.63               0.80                        2.10

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        2.63               1.80                        4.73

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.800(In)
Area Averaged 100-Year Rainfall =    1.800(In)

Point rain (area averaged) =    1.800(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    1.800(In)

Sub-Area Data:
Area(Ac.)          Runoff Index   Impervious %
     0.490            98.00          0.950
     2.140            98.00          0.950
 Total Area Entered =      2.63(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-3     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
98.0  99.2      0.010     0.950        0.002       0.186      0.000
98.0  99.2      0.010     0.950        0.002       0.814      0.001
                                              Sum (F) =   0.002
Area averaged mean soil loss (F) (In/Hr) =  0.002
Minimum soil loss rate ((In/Hr)) =  0.000
(for 24 hour storm duration)
Note: User entry of the fm value
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   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %           (CFS)
------------------------------------------------------------------------
    1   0.083        314.020         58.075              1.539
    2   0.167        628.040         36.370              0.964
    3   0.250        942.060          5.555              0.147
                              Sum = 100.000   Sum=       2.651
------------------------------------------------------------------------
```


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	0.281	0.002	(0.028)	0.279
2	0.17	1.30	0.281	0.002	(0.028)	0.279
3	0.25	1.10	0.238	0.002	(0.024)	0.236
4	0.33	1.50	0.324	0.002	(0.032)	0.322
5	0.42	1.50	0.324	0.002	(0.032)	0.322
6	0.50	1.80	0.389	0.002	(0.039)	0.387
7	0.58	1.50	0.324	0.002	(0.032)	0.322
8	0.67	1.80	0.389	0.002	(0.039)	0.387
9	0.75	1.80	0.389	0.002	(0.039)	0.387
10	0.83	1.50	0.324	0.002	(0.032)	0.322
11	0.92	1.60	0.346	0.002	(0.035)	0.344
12	1.00	1.80	0.389	0.002	(0.039)	0.387
13	1.08	2.20	0.475	0.002	(0.048)	0.474
14	1.17	2.20	0.475	0.002	(0.048)	0.474
15	1.25	2.20	0.475	0.002	(0.048)	0.474
16	1.33	2.00	0.432	0.002	(0.043)	0.430
17	1.42	2.60	0.562	0.002	(0.056)	0.560
18	1.50	2.70	0.583	0.002	(0.058)	0.582
19	1.58	2.40	0.518	0.002	(0.052)	0.517
20	1.67	2.70	0.583	0.002	(0.058)	0.582
21	1.75	3.30	0.713	0.002	(0.071)	0.711
22	1.83	3.10	0.670	0.002	(0.067)	0.668
23	1.92	2.90	0.626	0.002	(0.063)	0.625
24	2.00	3.00	0.648	0.002	(0.065)	0.646
25	2.08	3.10	0.670	0.002	(0.067)	0.668
26	2.17	4.20	0.907	0.002	(0.091)	0.906
27	2.25	5.00	1.080	0.002	(0.108)	1.078
28	2.33	3.50	0.756	0.002	(0.076)	0.754
29	2.42	6.80	1.469	0.002	(0.147)	1.467
30	2.50	7.30	1.577	0.002	(0.158)	1.575
31	2.58	8.20	1.771	0.002	(0.177)	1.770
32	2.67	5.90	1.274	0.002	(0.127)	1.273
33	2.75	2.00	0.432	0.002	(0.043)	0.430
34	2.83	1.80	0.389	0.002	(0.039)	0.387
35	2.92	1.80	0.389	0.002	(0.039)	0.387
36	3.00	0.60	0.130	0.002	(0.013)	0.128

(Loss Rate Not Used)

Sum = 100.0 Sum = 21.5

```
      Flood volume = Effective rainfall      1.80(In)
       times area       2.6(Ac.)/[(In)/(Ft.)] =       0.4(Ac.Ft)
      Total soil loss =      0.00(In)
      Total soil loss =     0.001(Ac.Ft)
      Total rainfall =      1.80(In)
      Flood volume =       17141.0 Cubic Feet
      Total soil loss =          43.2 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =      4.461(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        2.5       5.0       7.5      10.0
---------------------------------------------------------------------------
  0+ 5       0.0030      0.43  VQ        |         |         |         |
  0+10       0.0078      0.70  V Q       |         |         |         |
  0+15       0.0124      0.67  |VQ       |         |         |         |
  0+20       0.0177      0.77  |V Q      |         |         |         |
  0+25       0.0235      0.84  | VQ      |         |         |         |
  0+30       0.0301      0.96  |  Q      |         |         |         |
  0+35       0.0364      0.92  |  Q      |         |         |         |
  0+40       0.0430      0.96  |  QV     |         |         |         |
  0+45       0.0500      1.02  |   QV    |         |         |         |
  0+50       0.0564      0.93  |  Q V    |         |         |         |
  0+55       0.0626      0.90  |  Q  V   |         |         |         |
  1+ 0       0.0693      0.98  |  Q   V  |         |         |         |
  1+ 5       0.0773      1.15  |   Q  V  |         |         |         |
  1+10       0.0858      1.24  |   Q   V |         |         |         |
  1+15       0.0945      1.26  |    Q   V|         |         |         |
  1+20       0.1027      1.19  |   Q     V         |         |         |
  1+25       0.1120      1.35  |    Q    |V        |         |         |
  1+30       0.1223      1.50  |    Q    | V       |         |         |
  1+35       0.1322      1.44  |    Q    |  V      |         |         |
  1+40       0.1424      1.48  |    Q    |   V     |         |         |
  1+45       0.1543      1.73  |     Q   |    V    |         |         |
  1+50       0.1667      1.80  |      Q  |     V   |         |         |
  1+55       0.1785      1.71  |     Q   |      V  |         |         |
  2+ 0       0.1902      1.70  |     Q   |       V |         |         |
  2+ 5       0.2022      1.74  |     Q   |         V         |         |
  2+10       0.2169      2.13  |       Q |         | V       |         |
  2+15       0.2351      2.63  |         Q         |  V      |         |
  2+20       0.2511      2.34  |        Q|         |   V     |         |
  2+25       0.2728      3.15  |         | Q       |     V   |         |
  2+30       0.3000      3.95  |         |   Q     |         V         |
  2+35       0.3308      4.46  |         |     Q   |         |  V      |
  2+40       0.3576      3.90  |         |   Q     |         |     V   |
  2+45       0.3724      2.15  |       Q |         |         |      V  |
  2+50       0.3807      1.20  |   Q     |         |         |       V |
  2+55       0.3878      1.03  |   Q     |         |         |        V|
```

```
    3+ 0       0.3921      0.63  | Q       |         |         |        V|
    3+ 5       0.3934      0.18  Q         |         |         |        V|
    3+10       0.3935      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 01/24/23 File: NTSHemetUHPr2242.out

++

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

Program License Serial Number 6385

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

English Units used in output format

National Tube Supply - Hemet
Proposed Condition 2-Year, 24-Hour UH (Area 1)
N Zamarripa 01-24-2023

Drainage Area = 3.13(Ac.) = 0.005 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 3.13(Ac.) = 0.005 Sq. Mi.
Length along longest watercourse = 586.00(Ft.)
Length along longest watercourse measured to centroid = 404.00(Ft.)
Length along longest watercourse = 0.111 Mi.
Length along longest watercourse measured to centroid = 0.077 Mi.
Difference in elevation = 2.86(Ft.)
Slope along watercourse = 25.7693 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.032 Hr.
Lag time = 1.90 Min.
25% of lag time = 0.48 Min.
40% of lag time = 0.76 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]
3.13	1.80	5.63

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
3.13	4.50	14.08

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 1.800(In)
Area Averaged 100-Year Rainfall = 4.500(In)

Point rain (area averaged) = 1.800(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.800(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.170	98.00	0.950
2.960	98.00	0.950

Total Area Entered = 3.13(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
98.0	98.0	0.026	0.950	0.004	0.054	0.000
98.0	98.0	0.026	0.950	0.004	0.946	0.004
					Sum (F) =	0.004

Area averaged mean soil loss (F) (In/Hr) = 0.004
Minimum soil loss rate ((In/Hr)) = 0.002
(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	262.786	52.510	1.656
2	0.167	525.571	39.275	1.239
3	0.250	788.357	6.621	0.209
4	0.333	1051.142	1.595	0.050
		Sum = 100.000	Sum=	3.154

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	(0.007)	0.001	0.013
2	0.17	0.07	0.014	(0.007)	0.001	0.013
3	0.25	0.07	0.014	(0.007)	0.001	0.013
4	0.33	0.10	0.022	(0.007)	0.002	0.019
5	0.42	0.10	0.022	(0.007)	0.002	0.019
6	0.50	0.10	0.022	(0.007)	0.002	0.019
7	0.58	0.10	0.022	(0.007)	0.002	0.019
8	0.67	0.10	0.022	(0.007)	0.002	0.019
9	0.75	0.10	0.022	(0.006)	0.002	0.019
10	0.83	0.13	0.029	(0.006)	0.003	0.026
11	0.92	0.13	0.029	(0.006)	0.003	0.026
12	1.00	0.13	0.029	(0.006)	0.003	0.026
13	1.08	0.10	0.022	(0.006)	0.002	0.019
14	1.17	0.10	0.022	(0.006)	0.002	0.019
15	1.25	0.10	0.022	(0.006)	0.002	0.019
16	1.33	0.10	0.022	(0.006)	0.002	0.019
17	1.42	0.10	0.022	(0.006)	0.002	0.019
18	1.50	0.10	0.022	(0.006)	0.002	0.019
19	1.58	0.10	0.022	(0.006)	0.002	0.019
20	1.67	0.10	0.022	(0.006)	0.002	0.019
21	1.75	0.10	0.022	(0.006)	0.002	0.019
22	1.83	0.13	0.029	(0.006)	0.003	0.026
23	1.92	0.13	0.029	(0.006)	0.003	0.026
24	2.00	0.13	0.029	(0.006)	0.003	0.026
25	2.08	0.13	0.029	(0.006)	0.003	0.026
26	2.17	0.13	0.029	(0.006)	0.003	0.026
27	2.25	0.13	0.029	(0.006)	0.003	0.026
28	2.33	0.13	0.029	(0.006)	0.003	0.026
29	2.42	0.13	0.029	(0.006)	0.003	0.026
30	2.50	0.13	0.029	(0.006)	0.003	0.026
31	2.58	0.17	0.036	(0.006)	0.004	0.032
32	2.67	0.17	0.036	(0.006)	0.004	0.032
33	2.75	0.17	0.036	(0.006)	0.004	0.032
34	2.83	0.17	0.036	(0.006)	0.004	0.032
35	2.92	0.17	0.036	(0.006)	0.004	0.032
36	3.00	0.17	0.036	(0.006)	0.004	0.032
37	3.08	0.17	0.036	(0.006)	0.004	0.032
38	3.17	0.17	0.036	(0.006)	0.004	0.032
39	3.25	0.17	0.036	(0.006)	0.004	0.032
40	3.33	0.17	0.036	(0.006)	0.004	0.032
41	3.42	0.17	0.036	(0.006)	0.004	0.032
42	3.50	0.17	0.036	(0.006)	0.004	0.032
43	3.58	0.17	0.036	(0.006)	0.004	0.032
44	3.67	0.17	0.036	(0.006)	0.004	0.032
45	3.75	0.17	0.036	(0.006)	0.004	0.032
46	3.83	0.20	0.043	(0.006)	0.004	0.039
47	3.92	0.20	0.043	(0.006)	0.004	0.039
48	4.00	0.20	0.043	(0.006)	0.004	0.039
49	4.08	0.20	0.043	(0.006)	0.004	0.039
50	4.17	0.20	0.043	(0.005)	0.004	0.039
51	4.25	0.20	0.043	(0.005)	0.004	0.039
52	4.33	0.23	0.050	(0.005)	0.005	0.045
53	4.42	0.23	0.050	(0.005)	0.005	0.045
54	4.50	0.23	0.050	(0.005)	0.005	0.045
55	4.58	0.23	0.050	(0.005)	0.005	0.045
56	4.67	0.23	0.050	(0.005)	0.005	0.045
57	4.75	0.23	0.050	(0.005)	0.005	0.045
58	4.83	0.27	0.058	0.005	(0.006)	0.052
59	4.92	0.27	0.058	0.005	(0.006)	0.052
60	5.00	0.27	0.058	0.005	(0.006)	0.052
61	5.08	0.20	0.043	(0.005)	0.004	0.039
62	5.17	0.20	0.043	(0.005)	0.004	0.039
63	5.25	0.20	0.043	(0.005)	0.004	0.039
64	5.33	0.23	0.050	(0.005)	0.005	0.045
65	5.42	0.23	0.050	(0.005)	0.005	0.045
66	5.50	0.23	0.050	(0.005)	0.005	0.045
67	5.58	0.27	0.058	0.005	(0.006)	0.053
68	5.67	0.27	0.058	0.005	(0.006)	0.053
69	5.75	0.27	0.058	0.005	(0.006)	0.053
70	5.83	0.27	0.058	0.005	(0.006)	0.053
71	5.92	0.27	0.058	0.005	(0.006)	0.053
72	6.00	0.27	0.058	0.005	(0.006)	0.053
73	6.08	0.30	0.065	0.005	(0.006)	0.060
74	6.17	0.30	0.065	0.005	(0.006)	0.060
75	6.25	0.30	0.065	0.005	(0.006)	0.060
76	6.33	0.30	0.065	0.005	(0.006)	0.060
77	6.42	0.30	0.065	0.005	(0.006)	0.060
78	6.50	0.30	0.065	0.005	(0.006)	0.060
79	6.58	0.33	0.072	0.005	(0.007)	0.067
80	6.67	0.33	0.072	0.005	(0.007)	0.067
81	6.75	0.33	0.072	0.005	(0.007)	0.067
82	6.83	0.33	0.072	0.005	(0.007)	0.067
83	6.92	0.33	0.072	0.005	(0.007)	0.067
84	7.00	0.33	0.072	0.005	(0.007)	0.067
85	7.08	0.33	0.072	0.005	(0.007)	0.067
86	7.17	0.33	0.072	0.005	(0.007)	0.067
87	7.25	0.33	0.072	0.005	(0.007)	0.067
88	7.33	0.37	0.079	0.005	(0.008)	0.075
89	7.42	0.37	0.079	0.005	(0.008)	0.075
90	7.50	0.37	0.079	0.005	(0.008)	0.075
91	7.58	0.40	0.086	0.005	(0.009)	0.082
92	7.67	0.40	0.086	0.005	(0.009)	0.082

93	7.75	0.40	0.086	0.005	(0.009)	0.082
94	7.83	0.43	0.094	0.005	(0.009)	0.089
95	7.92	0.43	0.094	0.004	(0.009)	0.089
96	8.00	0.43	0.094	0.004	(0.009)	0.089
97	8.08	0.50	0.108	0.004	(0.011)	0.104
98	8.17	0.50	0.108	0.004	(0.011)	0.104
99	8.25	0.50	0.108	0.004	(0.011)	0.104
100	8.33	0.50	0.108	0.004	(0.011)	0.104
101	8.42	0.50	0.108	0.004	(0.011)	0.104
102	8.50	0.50	0.108	0.004	(0.011)	0.104
103	8.58	0.53	0.115	0.004	(0.012)	0.111
104	8.67	0.53	0.115	0.004	(0.012)	0.111
105	8.75	0.53	0.115	0.004	(0.012)	0.111
106	8.83	0.57	0.122	0.004	(0.012)	0.118
107	8.92	0.57	0.122	0.004	(0.012)	0.118
108	9.00	0.57	0.122	0.004	(0.012)	0.118
109	9.08	0.63	0.137	0.004	(0.014)	0.133
110	9.17	0.63	0.137	0.004	(0.014)	0.133
111	9.25	0.63	0.137	0.004	(0.014)	0.133
112	9.33	0.67	0.144	0.004	(0.014)	0.140
113	9.42	0.67	0.144	0.004	(0.014)	0.140
114	9.50	0.67	0.144	0.004	(0.014)	0.140
115	9.58	0.70	0.151	0.004	(0.015)	0.147
116	9.67	0.70	0.151	0.004	(0.015)	0.147
117	9.75	0.70	0.151	0.004	(0.015)	0.147
118	9.83	0.73	0.158	0.004	(0.016)	0.154
119	9.92	0.73	0.158	0.004	(0.016)	0.154
120	10.00	0.73	0.158	0.004	(0.016)	0.154
121	10.08	0.50	0.108	0.004	(0.011)	0.104
122	10.17	0.50	0.108	0.004	(0.011)	0.104
123	10.25	0.50	0.108	0.004	(0.011)	0.104
124	10.33	0.50	0.108	0.004	(0.011)	0.104
125	10.42	0.50	0.108	0.004	(0.011)	0.104
126	10.50	0.50	0.108	0.004	(0.011)	0.104
127	10.58	0.67	0.144	0.004	(0.014)	0.140
128	10.67	0.67	0.144	0.004	(0.014)	0.140
129	10.75	0.67	0.144	0.004	(0.014)	0.140
130	10.83	0.67	0.144	0.004	(0.014)	0.140
131	10.92	0.67	0.144	0.004	(0.014)	0.140
132	11.00	0.67	0.144	0.004	(0.014)	0.140
133	11.08	0.63	0.137	0.004	(0.014)	0.133
134	11.17	0.63	0.137	0.004	(0.014)	0.133
135	11.25	0.63	0.137	0.004	(0.014)	0.133
136	11.33	0.63	0.137	0.004	(0.014)	0.133
137	11.42	0.63	0.137	0.004	(0.014)	0.133
138	11.50	0.63	0.137	0.004	(0.014)	0.133
139	11.58	0.57	0.122	0.004	(0.012)	0.119
140	11.67	0.57	0.122	0.004	(0.012)	0.119
141	11.75	0.57	0.122	0.004	(0.012)	0.119
142	11.83	0.60	0.130	0.004	(0.013)	0.126
143	11.92	0.60	0.130	0.004	(0.013)	0.126
144	12.00	0.60	0.130	0.004	(0.013)	0.126
145	12.08	0.83	0.180	0.004	(0.018)	0.176
146	12.17	0.83	0.180	0.004	(0.018)	0.176
147	12.25	0.83	0.180	0.003	(0.018)	0.177
148	12.33	0.87	0.187	0.003	(0.019)	0.184
149	12.42	0.87	0.187	0.003	(0.019)	0.184
150	12.50	0.87	0.187	0.003	(0.019)	0.184
151	12.58	0.93	0.202	0.003	(0.020)	0.198
152	12.67	0.93	0.202	0.003	(0.020)	0.198
153	12.75	0.93	0.202	0.003	(0.020)	0.198
154	12.83	0.97	0.209	0.003	(0.021)	0.205
155	12.92	0.97	0.209	0.003	(0.021)	0.205
156	13.00	0.97	0.209	0.003	(0.021)	0.205
157	13.08	1.13	0.245	0.003	(0.024)	0.241
158	13.17	1.13	0.245	0.003	(0.024)	0.242
159	13.25	1.13	0.245	0.003	(0.024)	0.242
160	13.33	1.13	0.245	0.003	(0.024)	0.242
161	13.42	1.13	0.245	0.003	(0.024)	0.242
162	13.50	1.13	0.245	0.003	(0.024)	0.242
163	13.58	0.77	0.166	0.003	(0.017)	0.162
164	13.67	0.77	0.166	0.003	(0.017)	0.162
165	13.75	0.77	0.166	0.003	(0.017)	0.162
166	13.83	0.77	0.166	0.003	(0.017)	0.162
167	13.92	0.77	0.166	0.003	(0.017)	0.162
168	14.00	0.77	0.166	0.003	(0.017)	0.162
169	14.08	0.90	0.194	0.003	(0.019)	0.191
170	14.17	0.90	0.194	0.003	(0.019)	0.191
171	14.25	0.90	0.194	0.003	(0.019)	0.191
172	14.33	0.87	0.187	0.003	(0.019)	0.184
173	14.42	0.87	0.187	0.003	(0.019)	0.184
174	14.50	0.87	0.187	0.003	(0.019)	0.184
175	14.58	0.87	0.187	0.003	(0.019)	0.184
176	14.67	0.87	0.187	0.003	(0.019)	0.184
177	14.75	0.87	0.187	0.003	(0.019)	0.184
178	14.83	0.83	0.180	0.003	(0.018)	0.177
179	14.92	0.83	0.180	0.003	(0.018)	0.177
180	15.00	0.83	0.180	0.003	(0.018)	0.177
181	15.08	0.80	0.173	0.003	(0.017)	0.170
182	15.17	0.80	0.173	0.003	(0.017)	0.170
183	15.25	0.80	0.173	0.003	(0.017)	0.170
184	15.33	0.77	0.166	0.003	(0.017)	0.163
185	15.42	0.77	0.166	0.003	(0.017)	0.163
186	15.50	0.77	0.166	0.003	(0.017)	0.163
187	15.58	0.63	0.137	0.003	(0.014)	0.134
188	15.67	0.63	0.137	0.003	(0.014)	0.134
189	15.75	0.63	0.137	0.003	(0.014)	0.134
190	15.83	0.63	0.137	0.003	(0.014)	0.134
191	15.92	0.63	0.137	0.003	(0.014)	0.134

192	16.00	0.63	0.137	0.003	(0.014)	0.134
193	16.08	0.13	0.029	0.003	(0.003)	0.026
194	16.17	0.13	0.029	0.003	(0.003)	0.026
195	16.25	0.13	0.029	0.003	(0.003)	0.026
196	16.33	0.13	0.029	0.003	(0.003)	0.026
197	16.42	0.13	0.029	0.003	(0.003)	0.026
198	16.50	0.13	0.029	0.003	(0.003)	0.026
199	16.58	0.10	0.022	(0.003)	0.002	0.019
200	16.67	0.10	0.022	(0.003)	0.002	0.019
201	16.75	0.10	0.022	(0.003)	0.002	0.019
202	16.83	0.10	0.022	(0.003)	0.002	0.019
203	16.92	0.10	0.022	(0.003)	0.002	0.019
204	17.00	0.10	0.022	(0.003)	0.002	0.019
205	17.08	0.17	0.036	0.003	(0.004)	0.033
206	17.17	0.17	0.036	0.003	(0.004)	0.033
207	17.25	0.17	0.036	0.003	(0.004)	0.033
208	17.33	0.17	0.036	0.003	(0.004)	0.033
209	17.42	0.17	0.036	0.003	(0.004)	0.033
210	17.50	0.17	0.036	0.003	(0.004)	0.033
211	17.58	0.17	0.036	0.003	(0.004)	0.033
212	17.67	0.17	0.036	0.003	(0.004)	0.033
213	17.75	0.17	0.036	0.002	(0.004)	0.034
214	17.83	0.13	0.029	0.002	(0.003)	0.026
215	17.92	0.13	0.029	0.002	(0.003)	0.026
216	18.00	0.13	0.029	0.002	(0.003)	0.026
217	18.08	0.13	0.029	0.002	(0.003)	0.026
218	18.17	0.13	0.029	0.002	(0.003)	0.026
219	18.25	0.13	0.029	0.002	(0.003)	0.026
220	18.33	0.13	0.029	0.002	(0.003)	0.026
221	18.42	0.13	0.029	0.002	(0.003)	0.026
222	18.50	0.13	0.029	0.002	(0.003)	0.026
223	18.58	0.10	0.022	(0.002)	0.002	0.019
224	18.67	0.10	0.022	(0.002)	0.002	0.019
225	18.75	0.10	0.022	(0.002)	0.002	0.019
226	18.83	0.07	0.014	(0.002)	0.001	0.013
227	18.92	0.07	0.014	(0.002)	0.001	0.013
228	19.00	0.07	0.014	(0.002)	0.001	0.013
229	19.08	0.10	0.022	(0.002)	0.002	0.019
230	19.17	0.10	0.022	(0.002)	0.002	0.019
231	19.25	0.10	0.022	(0.002)	0.002	0.019
232	19.33	0.13	0.029	0.002	(0.003)	0.027
233	19.42	0.13	0.029	0.002	(0.003)	0.027
234	19.50	0.13	0.029	0.002	(0.003)	0.027
235	19.58	0.10	0.022	(0.002)	0.002	0.019
236	19.67	0.10	0.022	(0.002)	0.002	0.019
237	19.75	0.10	0.022	(0.002)	0.002	0.019
238	19.83	0.07	0.014	(0.002)	0.001	0.013
239	19.92	0.07	0.014	(0.002)	0.001	0.013
240	20.00	0.07	0.014	(0.002)	0.001	0.013
241	20.08	0.10	0.022	(0.002)	0.002	0.019
242	20.17	0.10	0.022	(0.002)	0.002	0.019
243	20.25	0.10	0.022	(0.002)	0.002	0.019
244	20.33	0.10	0.022	0.002	(0.002)	0.019
245	20.42	0.10	0.022	0.002	(0.002)	0.019
246	20.50	0.10	0.022	0.002	(0.002)	0.019
247	20.58	0.10	0.022	0.002	(0.002)	0.019
248	20.67	0.10	0.022	0.002	(0.002)	0.019
249	20.75	0.10	0.022	0.002	(0.002)	0.019
250	20.83	0.07	0.014	(0.002)	0.001	0.013
251	20.92	0.07	0.014	(0.002)	0.001	0.013
252	21.00	0.07	0.014	(0.002)	0.001	0.013
253	21.08	0.10	0.022	0.002	(0.002)	0.020
254	21.17	0.10	0.022	0.002	(0.002)	0.020
255	21.25	0.10	0.022	0.002	(0.002)	0.020
256	21.33	0.07	0.014	(0.002)	0.001	0.013
257	21.42	0.07	0.014	(0.002)	0.001	0.013
258	21.50	0.07	0.014	(0.002)	0.001	0.013
259	21.58	0.10	0.022	0.002	(0.002)	0.020
260	21.67	0.10	0.022	0.002	(0.002)	0.020
261	21.75	0.10	0.022	0.002	(0.002)	0.020
262	21.83	0.07	0.014	(0.002)	0.001	0.013
263	21.92	0.07	0.014	(0.002)	0.001	0.013
264	22.00	0.07	0.014	(0.002)	0.001	0.013
265	22.08	0.10	0.022	0.002	(0.002)	0.020
266	22.17	0.10	0.022	0.002	(0.002)	0.020
267	22.25	0.10	0.022	0.002	(0.002)	0.020
268	22.33	0.07	0.014	(0.002)	0.001	0.013
269	22.42	0.07	0.014	(0.002)	0.001	0.013
270	22.50	0.07	0.014	(0.002)	0.001	0.013
271	22.58	0.07	0.014	(0.002)	0.001	0.013
272	22.67	0.07	0.014	(0.002)	0.001	0.013
273	22.75	0.07	0.014	(0.002)	0.001	0.013
274	22.83	0.07	0.014	(0.002)	0.001	0.013
275	22.92	0.07	0.014	(0.002)	0.001	0.013
276	23.00	0.07	0.014	(0.002)	0.001	0.013
277	23.08	0.07	0.014	(0.002)	0.001	0.013
278	23.17	0.07	0.014	(0.002)	0.001	0.013
279	23.25	0.07	0.014	(0.002)	0.001	0.013
280	23.33	0.07	0.014	(0.002)	0.001	0.013
281	23.42	0.07	0.014	(0.002)	0.001	0.013
282	23.50	0.07	0.014	(0.002)	0.001	0.013
283	23.58	0.07	0.014	(0.002)	0.001	0.013
284	23.67	0.07	0.014	(0.002)	0.001	0.013
285	23.75	0.07	0.014	(0.002)	0.001	0.013
286	23.83	0.07	0.014	(0.002)	0.001	0.013
287	23.92	0.07	0.014	(0.002)	0.001	0.013
288	24.00	0.07	0.014	(0.002)	0.001	0.013

(Loss Rate Not Used)

Sum = 100.0 Sum = 20.7

```
      Flood volume = Effective rainfall      1.73(In)
       times area      3.1(Ac.)/[(In)/(Ft.)] =       0.4(Ac.Ft)
      Total soil loss =      0.07(In)
      Total soil loss =     0.020(Ac.Ft)
      Total rainfall =      1.80(In)
      Flood volume =       19600.0 Cubic Feet
      Total soil loss =         851.3 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =      0.762(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          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      0.02  Q         |         |         |         |
  0+10       0.0004      0.04  Q         |         |         |         |
  0+15       0.0007      0.04  Q         |         |         |         |
  0+20       0.0010      0.05  Q         |         |         |         |
  0+25       0.0015      0.06  Q         |         |         |         |
  0+30       0.0019      0.06  Q         |         |         |         |
  0+35       0.0023      0.06  Q         |         |         |         |
  0+40       0.0027      0.06  Q         |         |         |         |
  0+45       0.0031      0.06  Q         |         |         |         |
  0+50       0.0036      0.07  Q         |         |         |         |
  0+55       0.0042      0.08  Q         |         |         |         |
  1+ 0       0.0047      0.08  Q         |         |         |         |
  1+ 5       0.0052      0.07  Q         |         |         |         |
  1+10       0.0057      0.06  Q         |         |         |         |
  1+15       0.0061      0.06  Q         |         |         |         |
  1+20       0.0065      0.06  Q         |         |         |         |
  1+25       0.0069      0.06  Q         |         |         |         |
  1+30       0.0074      0.06  Q         |         |         |         |
  1+35       0.0078      0.06  Q         |         |         |         |
  1+40       0.0082      0.06  Q         |         |         |         |
  1+45       0.0086      0.06  Q         |         |         |         |
  1+50       0.0091      0.07  Q         |         |         |         |
  1+55       0.0097      0.08  Q         |         |         |         |
  2+ 0       0.0102      0.08  Q         |         |         |         |
  2+ 5       0.0108      0.08  Q         |         |         |         |
  2+10       0.0114      0.08  QV        |         |         |         |
  2+15       0.0119      0.08  QV        |         |         |         |
  2+20       0.0125      0.08  QV        |         |         |         |
  2+25       0.0131      0.08  QV        |         |         |         |
  2+30       0.0136      0.08  QV        |         |         |         |
  2+35       0.0143      0.09  QV        |         |         |         |
  2+40       0.0150      0.10  QV        |         |         |         |
  2+45       0.0157      0.10  QV        |         |         |         |
  2+50       0.0164      0.10  QV        |         |         |         |
  2+55       0.0171      0.10  QV        |         |         |         |
  3+ 0       0.0178      0.10  QV        |         |         |         |
  3+ 5       0.0185      0.10  QV        |         |         |         |
  3+10       0.0192      0.10  QV        |         |         |         |
  3+15       0.0199      0.10  QV        |         |         |         |
  3+20       0.0206      0.10  QV        |         |         |         |
  3+25       0.0213      0.10  QV        |         |         |         |
  3+30       0.0220      0.10  QV        |         |         |         |
  3+35       0.0227      0.10  Q V       |         |         |         |
  3+40       0.0234      0.10  Q V       |         |         |         |
  3+45       0.0241      0.10  Q V       |         |         |         |
  3+50       0.0249      0.11  Q V       |         |         |         |
  3+55       0.0257      0.12  Q V       |         |         |         |
  4+ 0       0.0266      0.12  Q V       |         |         |         |
  4+ 5       0.0274      0.12  Q V       |         |         |         |
  4+10       0.0282      0.12  Q V       |         |         |         |
  4+15       0.0291      0.12  Q V       |         |         |         |
  4+20       0.0300      0.13  Q V       |         |         |         |
  4+25       0.0310      0.14  Q V       |         |         |         |
  4+30       0.0320      0.14  Q V       |         |         |         |
  4+35       0.0330      0.14  Q V       |         |         |         |
  4+40       0.0339      0.14  Q  V      |         |         |         |
  4+45       0.0349      0.14  Q  V      |         |         |         |
  4+50       0.0360      0.15  Q  V      |         |         |         |
  4+55       0.0371      0.16  Q  V      |         |         |         |
  5+ 0       0.0383      0.16  Q  V      |         |         |         |
  5+ 5       0.0392      0.14  Q  V      |         |         |         |
  5+10       0.0401      0.13  Q  V      |         |         |         |
  5+15       0.0410      0.12  Q  V      |         |         |         |
  5+20       0.0419      0.13  Q  V      |         |         |         |
  5+25       0.0429      0.14  Q  V      |         |         |         |
  5+30       0.0438      0.14  Q  V      |         |         |         |
  5+35       0.0449      0.16  Q  V      |         |         |         |
  5+40       0.0460      0.16  Q   V     |         |         |         |
  5+45       0.0472      0.17  Q   V     |         |         |         |
  5+50       0.0483      0.17  Q   V     |         |         |         |
  5+55       0.0495      0.17  Q   V     |         |         |         |
  6+ 0       0.0506      0.17  Q   V     |         |         |         |
  6+ 5       0.0518      0.18  Q   V     |         |         |         |
  6+10       0.0531      0.19  Q   V     |         |         |         |
  6+15       0.0544      0.19  Q   V     |         |         |         |
  6+20       0.0557      0.19  Q   V     |         |         |         |
  6+25       0.0570      0.19  Q    V    |         |         |         |
  6+30       0.0583      0.19  Q    V    |         |         |         |
  6+35       0.0597      0.20  Q    V    |         |         |         |
  6+40       0.0612      0.21  Q    V    |         |         |         |
```



```
  6+45       0.0626      0.21  Q    V    |         |         |         |
  6+50       0.0641      0.21  Q    V    |         |         |         |
  6+55       0.0655      0.21  Q    V    |         |         |         |
  7+ 0       0.0670      0.21  Q    V    |         |         |         |
  7+ 5       0.0685      0.21  Q     V   |         |         |         |
  7+10       0.0699      0.21  Q     V   |         |         |         |
  7+15       0.0714      0.21  Q     V   |         |         |         |
  7+20       0.0729      0.22  Q     V   |         |         |         |
  7+25       0.0745      0.23  Q     V   |         |         |         |
  7+30       0.0762      0.24  Q     V   |         |         |         |
  7+35       0.0779      0.25  Q     V   |         |         |         |
  7+40       0.0796      0.26  |Q     V   |         |         |         |
  7+45       0.0814      0.26  |Q     V   |         |         |         |
  7+50       0.0833      0.27  |Q     V   |         |         |         |
  7+55       0.0852      0.28  |Q     V   |         |         |         |
  8+ 0       0.0871      0.28  |Q     V   |         |         |         |
  8+ 5       0.0892      0.31  |Q     V   |         |         |         |
  8+10       0.0915      0.32  |Q      V  |         |         |         |
  8+15       0.0937      0.33  |Q      V  |         |         |         |
  8+20       0.0960      0.33  |Q      V  |         |         |         |
  8+25       0.0982      0.33  |Q      V  |         |         |         |
  8+30       0.1005      0.33  |Q      V  |         |         |         |
  8+35       0.1028      0.34  |Q       V|         |         |         |
  8+40       0.1052      0.35  |Q       V|         |         |         |
  8+45       0.1076      0.35  |Q       V|         |         |         |
  8+50       0.1101      0.36  |Q       V|         |         |         |
  8+55       0.1126      0.37  |Q        V         |         |         |
  9+ 0       0.1152      0.37  |Q        V         |         |         |
  9+ 5       0.1179      0.40  |Q        V         |         |         |
  9+10       0.1208      0.41  |Q        V         |         |         |
  9+15       0.1237      0.42  |Q        V         |         |         |
  9+20       0.1266      0.43  |Q        |V        |         |         |
  9+25       0.1297      0.44  |Q        |V        |         |         |
  9+30       0.1327      0.44  |Q        |V        |         |         |
  9+35       0.1358      0.45  |Q        | V       |         |         |
  9+40       0.1390      0.46  |Q        | V       |         |         |
  9+45       0.1422      0.46  |Q        | V       |         |         |
  9+50       0.1455      0.48  |Q        | V       |         |         |
  9+55       0.1488      0.49  |Q        |  V      |         |         |
 10+ 0       0.1522      0.49  |Q        |  V      |         |         |
 10+ 5       0.1550      0.40  |Q        |  V      |         |         |
 10+10       0.1573      0.34  |Q        |  V      |         |         |
 10+15       0.1596      0.33  |Q        |   V     |         |         |
 10+20       0.1619      0.33  |Q        |   V     |         |         |
 10+25       0.1641      0.33  |Q        |   V     |         |         |
 10+30       0.1664      0.33  |Q        |   V     |         |         |
 10+35       0.1691      0.39  |Q        |    V    |         |         |
 10+40       0.1721      0.43  |Q        |    V    |         |         |
 10+45       0.1751      0.44  |Q        |    V    |         |         |
 10+50       0.1781      0.44  |Q        |    V    |         |         |
 10+55       0.1812      0.44  |Q        |     V   |         |         |
 11+ 0       0.1842      0.44  |Q        |     V   |         |         |
 11+ 5       0.1872      0.43  |Q        |     V   |         |         |
 11+10       0.1901      0.42  |Q        |     V   |         |         |
 11+15       0.1930      0.42  |Q        |      V  |         |         |
 11+20       0.1959      0.42  |Q        |      V  |         |         |
 11+25       0.1988      0.42  |Q        |      V  |         |         |
 11+30       0.2017      0.42  |Q        |      V  |         |         |
 11+35       0.2044      0.40  |Q        |       V |         |         |
 11+40       0.2070      0.38  |Q        |       V |         |         |
 11+45       0.2096      0.38  |Q        |       V |         |         |
 11+50       0.2123      0.39  |Q        |       V |         |         |
 11+55       0.2150      0.40  |Q        |        V|         |         |
 12+ 0       0.2177      0.40  |Q        |        V|         |         |
 12+ 5       0.2210      0.48  |Q        |        V|         |         |
 12+10       0.2248      0.54  | Q       |        V|         |         |
 12+15       0.2286      0.55  | Q       |         V         |         |
 12+20       0.2325      0.57  | Q       |         V         |         |
 12+25       0.2365      0.58  | Q       |         |V        |         |
 12+30       0.2405      0.58  | Q       |         |V        |         |
 12+35       0.2447      0.60  | Q       |         |V        |         |
 12+40       0.2489      0.62  | Q       |         | V       |         |
 12+45       0.2533      0.62  | Q       |         | V       |         |
 12+50       0.2576      0.64  | Q       |         | V       |         |
 12+55       0.2621      0.65  | Q       |         |  V      |         |
 13+ 0       0.2666      0.65  | Q       |         |  V      |         |
 13+ 5       0.2714      0.71  | Q       |         |   V     |         |
 13+10       0.2766      0.75  |  Q      |         |   V     |         |
 13+15       0.2819      0.76  |  Q      |         |    V    |         |
 13+20       0.2871      0.76  |  Q      |         |    V    |         |
 13+25       0.2924      0.76  |  Q      |         |    V    |         |
 13+30       0.2976      0.76  |  Q      |         |     V   |         |
 13+35       0.3020      0.63  | Q       |         |     V   |         |
 13+40       0.3056      0.53  | Q       |         |      V  |         |
 13+45       0.3092      0.52  | Q       |         |      V  |         |
 13+50       0.3127      0.51  | Q       |         |      V  |         |
 13+55       0.3162      0.51  | Q       |         |       V |         |
 14+ 0       0.3198      0.51  | Q       |         |       V |         |
 14+ 5       0.3236      0.56  | Q       |         |       V |         |
 14+10       0.3277      0.60  | Q       |         |        V|         |
 14+15       0.3319      0.60  | Q       |         |        V|         |
 14+20       0.3360      0.59  | Q       |         |        V|         |
 14+25       0.3400      0.58  | Q       |         |         V         |
 14+30       0.3440      0.58  | Q       |         |         V         |
 14+35       0.3480      0.58  | Q       |         |         V         |
 14+40       0.3520      0.58  | Q       |         |         |V        |
 14+45       0.3560      0.58  | Q       |         |         |V        |
 14+50       0.3599      0.57  | Q       |         |         |V        |
 14+55       0.3638      0.56  | Q       |         |         | V       |
```

```
15+ 0       0.3676      0.56  | Q       |         |         | V       |
15+ 5       0.3714      0.55  | Q       |         |         |  V      |
15+10       0.3751      0.54  | Q       |         |         |  V      |
15+15       0.3788      0.54  | Q       |         |         |  V      |
15+20       0.3824      0.52  | Q       |         |         |  V      |
15+25       0.3860      0.52  | Q       |         |         |   V     |
15+30       0.3895      0.51  | Q       |         |         |   V     |
15+35       0.3927      0.47  |Q        |         |         |   V     |
15+40       0.3957      0.43  |Q        |         |         |    V    |
15+45       0.3986      0.42  |Q        |         |         |    V    |
15+50       0.4015      0.42  |Q        |         |         |    V    |
15+55       0.4044      0.42  |Q        |         |         |    V    |
16+ 0       0.4073      0.42  |Q        |         |         |     V   |
16+ 5       0.4090      0.24  Q         |         |         |     V   |
16+10       0.4098      0.11  Q         |         |         |     V   |
16+15       0.4104      0.09  Q         |         |         |     V   |
16+20       0.4109      0.08  Q         |         |         |     V   |
16+25       0.4115      0.08  Q         |         |         |     V   |
16+30       0.4121      0.08  Q         |         |         |     V   |
16+35       0.4126      0.07  Q         |         |         |     V   |
16+40       0.4130      0.06  Q         |         |         |     V   |
16+45       0.4134      0.06  Q         |         |         |     V   |
16+50       0.4138      0.06  Q         |         |         |     V   |
16+55       0.4143      0.06  Q         |         |         |     V   |
17+ 0       0.4147      0.06  Q         |         |         |     V   |
17+ 5       0.4153      0.08  Q         |         |         |     V   |
17+10       0.4160      0.10  Q         |         |         |     V   |
17+15       0.4167      0.10  Q         |         |         |      V  |
17+20       0.4174      0.11  Q         |         |         |      V  |
17+25       0.4182      0.11  Q         |         |         |      V  |
17+30       0.4189      0.11  Q         |         |         |      V  |
17+35       0.4196      0.11  Q         |         |         |      V  |
17+40       0.4203      0.11  Q         |         |         |      V  |
17+45       0.4211      0.11  Q         |         |         |      V  |
17+50       0.4217      0.09  Q         |         |         |      V  |
17+55       0.4223      0.08  Q         |         |         |      V  |
18+ 0       0.4229      0.08  Q         |         |         |      V  |
18+ 5       0.4234      0.08  Q         |         |         |      V  |
18+10       0.4240      0.08  Q         |         |         |      V  |
18+15       0.4246      0.08  Q         |         |         |      V  |
18+20       0.4252      0.08  Q         |         |         |      V  |
18+25       0.4257      0.08  Q         |         |         |      V  |
18+30       0.4263      0.08  Q         |         |         |      V  |
18+35       0.4268      0.07  Q         |         |         |      V  |
18+40       0.4272      0.06  Q         |         |         |      V  |
18+45       0.4277      0.06  Q         |         |         |       V |
18+50       0.4280      0.05  Q         |         |         |       V |
18+55       0.4283      0.04  Q         |         |         |       V |
19+ 0       0.4286      0.04  Q         |         |         |       V |
19+ 5       0.4289      0.05  Q         |         |         |       V |
19+10       0.4294      0.06  Q         |         |         |       V |
19+15       0.4298      0.06  Q         |         |         |       V |
19+20       0.4303      0.07  Q         |         |         |       V |
19+25       0.4308      0.08  Q         |         |         |       V |
19+30       0.4314      0.08  Q         |         |         |       V |
19+35       0.4319      0.07  Q         |         |         |       V |
19+40       0.4324      0.06  Q         |         |         |       V |
19+45       0.4328      0.06  Q         |         |         |       V |
19+50       0.4331      0.05  Q         |         |         |       V |
19+55       0.4334      0.04  Q         |         |         |       V |
20+ 0       0.4337      0.04  Q         |         |         |       V |
20+ 5       0.4341      0.05  Q         |         |         |       V |
20+10       0.4345      0.06  Q         |         |         |       V |
20+15       0.4349      0.06  Q         |         |         |       V |
20+20       0.4353      0.06  Q         |         |         |       V |
20+25       0.4357      0.06  Q         |         |         |       V |
20+30       0.4362      0.06  Q         |         |         |       V |
20+35       0.4366      0.06  Q         |         |         |       V |
20+40       0.4370      0.06  Q         |         |         |       V |
20+45       0.4374      0.06  Q         |         |         |       V |
20+50       0.4378      0.05  Q         |         |         |       V |
20+55       0.4381      0.04  Q         |         |         |       V |
21+ 0       0.4384      0.04  Q         |         |         |       V |
21+ 5       0.4387      0.05  Q         |         |         |        V|
21+10       0.4391      0.06  Q         |         |         |        V|
21+15       0.4395      0.06  Q         |         |         |        V|
21+20       0.4399      0.05  Q         |         |         |        V|
21+25       0.4402      0.04  Q         |         |         |        V|
21+30       0.4405      0.04  Q         |         |         |        V|
21+35       0.4408      0.05  Q         |         |         |        V|
21+40       0.4412      0.06  Q         |         |         |        V|
21+45       0.4417      0.06  Q         |         |         |        V|
21+50       0.4420      0.05  Q         |         |         |        V|
21+55       0.4423      0.04  Q         |         |         |        V|
22+ 0       0.4426      0.04  Q         |         |         |        V|
22+ 5       0.4430      0.05  Q         |         |         |        V|
22+10       0.4434      0.06  Q         |         |         |        V|
22+15       0.4438      0.06  Q         |         |         |        V|
22+20       0.4441      0.05  Q         |         |         |        V|
22+25       0.4444      0.04  Q         |         |         |        V|
22+30       0.4447      0.04  Q         |         |         |        V|
22+35       0.4450      0.04  Q         |         |         |        V|
22+40       0.4453      0.04  Q         |         |         |        V|
22+45       0.4456      0.04  Q         |         |         |        V|
22+50       0.4458      0.04  Q         |         |         |        V|
22+55       0.4461      0.04  Q         |         |         |        V|
23+ 0       0.4464      0.04  Q         |         |         |        V|
23+ 5       0.4467      0.04  Q         |         |         |        V|
23+10       0.4470      0.04  Q         |         |         |        V|
```



```
23+15       0.4473      0.04  Q         |         |         |        V|
23+20       0.4475      0.04  Q         |         |         |        V|
23+25       0.4478      0.04  Q         |         |         |        V|
23+30       0.4481      0.04  Q         |         |         |        V|
23+35       0.4484      0.04  Q         |         |         |        V|
23+40       0.4487      0.04  Q         |         |         |        V|
23+45       0.4489      0.04  Q         |         |         |        V|
23+50       0.4492      0.04  Q         |         |         |        V|
23+55       0.4495      0.04  Q         |         |         |        V|
24+ 0       0.4498      0.04  Q         |         |         |        V|
24+ 5       0.4499      0.02  Q         |         |         |        V|
24+10       0.4499      0.00  Q         |         |         |        V|
24+15       0.4500      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

          Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
                   Study date  01/24/23 File: NTSHemetUHPr22242.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
--------------------------------------------------------------------------------

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


Program License Serial Number 6385

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

 English Units used in output format



--------------------------------------------------------------------------
National Tube Supply - Hemet
Proposed Condition 2-Year, 24-Hour UH (Area 2)
N Zamarripa   01-24-2023

--------------------------------------------------------------------------
Drainage Area =       2.63(Ac.)  =      0.004 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       2.63(Ac.)  =      0.004 Sq. Mi.
Length along longest watercourse =     473.00(Ft.)
Length along longest watercourse measured to centroid =     314.00(Ft.)
Length along longest watercourse =      0.090 Mi.
Length along longest watercourse measured to centroid =      0.059 Mi.
Difference in elevation =       2.32(Ft.)
Slope along watercourse =     25.8977 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =     0.027 Hr.
Lag time =     1.59 Min.
25% of lag time =     0.40 Min.
40% of lag time =     0.64 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]
        2.63              1.80                          4.73

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        2.63              4.50                         11.83

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    1.800(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    1.800(In)

Sub-Area Data:
Area(Ac.)          Runoff Index   Impervious %
     0.490           98.00         0.950
     2.140           98.00         0.950
 Total Area Entered =      2.63(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
98.0  98.0      0.026     0.950        0.004       0.186      0.001
98.0  98.0      0.026     0.950        0.004       0.814      0.003
                                              Sum (F) =   0.004
Area averaged mean soil loss (F) (In/Hr) =  0.004
Minimum soil loss rate ((In/Hr)) =  0.002
(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   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %          (CFS)
--------------------------------------------------------------------------
    1   0.083        314.020         58.075             1.539
    2   0.167        628.040         36.370             0.964
    3   0.250        942.060          5.555             0.147
                              Sum = 100.000   Sum=       2.651
-------------------------------------------------------------------
```


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 (Hr.)	Time Percent	Pattern	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.014	(0.007)	0.001	0.013
2	0.17	0.07	0.014	(0.007)	0.001	0.013
3	0.25	0.07	0.014	(0.007)	0.001	0.013
4	0.33	0.10	0.022	(0.007)	0.002	0.019
5	0.42	0.10	0.022	(0.007)	0.002	0.019
6	0.50	0.10	0.022	(0.007)	0.002	0.019
7	0.58	0.10	0.022	(0.007)	0.002	0.019
8	0.67	0.10	0.022	(0.007)	0.002	0.019
9	0.75	0.10	0.022	(0.006)	0.002	0.019
10	0.83	0.13	0.029	(0.006)	0.003	0.026
11	0.92	0.13	0.029	(0.006)	0.003	0.026
12	1.00	0.13	0.029	(0.006)	0.003	0.026
13	1.08	0.10	0.022	(0.006)	0.002	0.019
14	1.17	0.10	0.022	(0.006)	0.002	0.019
15	1.25	0.10	0.022	(0.006)	0.002	0.019
16	1.33	0.10	0.022	(0.006)	0.002	0.019
17	1.42	0.10	0.022	(0.006)	0.002	0.019
18	1.50	0.10	0.022	(0.006)	0.002	0.019
19	1.58	0.10	0.022	(0.006)	0.002	0.019
20	1.67	0.10	0.022	(0.006)	0.002	0.019
21	1.75	0.10	0.022	(0.006)	0.002	0.019
22	1.83	0.13	0.029	(0.006)	0.003	0.026
23	1.92	0.13	0.029	(0.006)	0.003	0.026
24	2.00	0.13	0.029	(0.006)	0.003	0.026
25	2.08	0.13	0.029	(0.006)	0.003	0.026
26	2.17	0.13	0.029	(0.006)	0.003	0.026
27	2.25	0.13	0.029	(0.006)	0.003	0.026
28	2.33	0.13	0.029	(0.006)	0.003	0.026
29	2.42	0.13	0.029	(0.006)	0.003	0.026
30	2.50	0.13	0.029	(0.006)	0.003	0.026
31	2.58	0.17	0.036	(0.006)	0.004	0.032
32	2.67	0.17	0.036	(0.006)	0.004	0.032
33	2.75	0.17	0.036	(0.006)	0.004	0.032
34	2.83	0.17	0.036	(0.006)	0.004	0.032
35	2.92	0.17	0.036	(0.006)	0.004	0.032
36	3.00	0.17	0.036	(0.006)	0.004	0.032
37	3.08	0.17	0.036	(0.006)	0.004	0.032
38	3.17	0.17	0.036	(0.006)	0.004	0.032
39	3.25	0.17	0.036	(0.006)	0.004	0.032
40	3.33	0.17	0.036	(0.006)	0.004	0.032
41	3.42	0.17	0.036	(0.006)	0.004	0.032
42	3.50	0.17	0.036	(0.006)	0.004	0.032
43	3.58	0.17	0.036	(0.006)	0.004	0.032
44	3.67	0.17	0.036	(0.006)	0.004	0.032
45	3.75	0.17	0.036	(0.006)	0.004	0.032
46	3.83	0.20	0.043	(0.006)	0.004	0.039
47	3.92	0.20	0.043	(0.006)	0.004	0.039
48	4.00	0.20	0.043	(0.006)	0.004	0.039
49	4.08	0.20	0.043	(0.006)	0.004	0.039
50	4.17	0.20	0.043	(0.005)	0.004	0.039
51	4.25	0.20	0.043	(0.005)	0.004	0.039
52	4.33	0.23	0.050	(0.005)	0.005	0.045
53	4.42	0.23	0.050	(0.005)	0.005	0.045
54	4.50	0.23	0.050	(0.005)	0.005	0.045
55	4.58	0.23	0.050	(0.005)	0.005	0.045
56	4.67	0.23	0.050	(0.005)	0.005	0.045
57	4.75	0.23	0.050	(0.005)	0.005	0.045
58	4.83	0.27	0.058	0.005	(0.006)	0.052
59	4.92	0.27	0.058	0.005	(0.006)	0.052
60	5.00	0.27	0.058	0.005	(0.006)	0.052
61	5.08	0.20	0.043	(0.005)	0.004	0.039
62	5.17	0.20	0.043	(0.005)	0.004	0.039
63	5.25	0.20	0.043	(0.005)	0.004	0.039
64	5.33	0.23	0.050	(0.005)	0.005	0.045
65	5.42	0.23	0.050	(0.005)	0.005	0.045
66	5.50	0.23	0.050	(0.005)	0.005	0.045
67	5.58	0.27	0.058	0.005	(0.006)	0.053
68	5.67	0.27	0.058	0.005	(0.006)	0.053
69	5.75	0.27	0.058	0.005	(0.006)	0.053
70	5.83	0.27	0.058	0.005	(0.006)	0.053
71	5.92	0.27	0.058	0.005	(0.006)	0.053
72	6.00	0.27	0.058	0.005	(0.006)	0.053
73	6.08	0.30	0.065	0.005	(0.006)	0.060
74	6.17	0.30	0.065	0.005	(0.006)	0.060
75	6.25	0.30	0.065	0.005	(0.006)	0.060
76	6.33	0.30	0.065	0.005	(0.006)	0.060
77	6.42	0.30	0.065	0.005	(0.006)	0.060
78	6.50	0.30	0.065	0.005	(0.006)	0.060
79	6.58	0.33	0.072	0.005	(0.007)	0.067
80	6.67	0.33	0.072	0.005	(0.007)	0.067
81	6.75	0.33	0.072	0.005	(0.007)	0.067
82	6.83	0.33	0.072	0.005	(0.007)	0.067
83	6.92	0.33	0.072	0.005	(0.007)	0.067
84	7.00	0.33	0.072	0.005	(0.007)	0.067
85	7.08	0.33	0.072	0.005	(0.007)	0.067
86	7.17	0.33	0.072	0.005	(0.007)	0.067
87	7.25	0.33	0.072	0.005	(0.007)	0.067
88	7.33	0.37	0.079	0.005	(0.008)	0.075
89	7.42	0.37	0.079	0.005	(0.008)	0.075
90	7.50	0.37	0.079	0.005	(0.008)	0.075
91	7.58	0.40	0.086	0.005	(0.009)	0.082
92	7.67	0.40	0.086	0.005	(0.009)	0.082
93	7.75	0.40	0.086	0.005	(0.009)	0.082

94	7.83	0.43	0.094	0.005	(0.009)	0.089
95	7.92	0.43	0.094	0.004	(0.009)	0.089
96	8.00	0.43	0.094	0.004	(0.009)	0.089
97	8.08	0.50	0.108	0.004	(0.011)	0.104
98	8.17	0.50	0.108	0.004	(0.011)	0.104
99	8.25	0.50	0.108	0.004	(0.011)	0.104
100	8.33	0.50	0.108	0.004	(0.011)	0.104
101	8.42	0.50	0.108	0.004	(0.011)	0.104
102	8.50	0.50	0.108	0.004	(0.011)	0.104
103	8.58	0.53	0.115	0.004	(0.012)	0.111
104	8.67	0.53	0.115	0.004	(0.012)	0.111
105	8.75	0.53	0.115	0.004	(0.012)	0.111
106	8.83	0.57	0.122	0.004	(0.012)	0.118
107	8.92	0.57	0.122	0.004	(0.012)	0.118
108	9.00	0.57	0.122	0.004	(0.012)	0.118
109	9.08	0.63	0.137	0.004	(0.014)	0.133
110	9.17	0.63	0.137	0.004	(0.014)	0.133
111	9.25	0.63	0.137	0.004	(0.014)	0.133
112	9.33	0.67	0.144	0.004	(0.014)	0.140
113	9.42	0.67	0.144	0.004	(0.014)	0.140
114	9.50	0.67	0.144	0.004	(0.014)	0.140
115	9.58	0.70	0.151	0.004	(0.015)	0.147
116	9.67	0.70	0.151	0.004	(0.015)	0.147
117	9.75	0.70	0.151	0.004	(0.015)	0.147
118	9.83	0.73	0.158	0.004	(0.016)	0.154
119	9.92	0.73	0.158	0.004	(0.016)	0.154
120	10.00	0.73	0.158	0.004	(0.016)	0.154
121	10.08	0.50	0.108	0.004	(0.011)	0.104
122	10.17	0.50	0.108	0.004	(0.011)	0.104
123	10.25	0.50	0.108	0.004	(0.011)	0.104
124	10.33	0.50	0.108	0.004	(0.011)	0.104
125	10.42	0.50	0.108	0.004	(0.011)	0.104
126	10.50	0.50	0.108	0.004	(0.011)	0.104
127	10.58	0.67	0.144	0.004	(0.014)	0.140
128	10.67	0.67	0.144	0.004	(0.014)	0.140
129	10.75	0.67	0.144	0.004	(0.014)	0.140
130	10.83	0.67	0.144	0.004	(0.014)	0.140
131	10.92	0.67	0.144	0.004	(0.014)	0.140
132	11.00	0.67	0.144	0.004	(0.014)	0.140
133	11.08	0.63	0.137	0.004	(0.014)	0.133
134	11.17	0.63	0.137	0.004	(0.014)	0.133
135	11.25	0.63	0.137	0.004	(0.014)	0.133
136	11.33	0.63	0.137	0.004	(0.014)	0.133
137	11.42	0.63	0.137	0.004	(0.014)	0.133
138	11.50	0.63	0.137	0.004	(0.014)	0.133
139	11.58	0.57	0.122	0.004	(0.012)	0.119
140	11.67	0.57	0.122	0.004	(0.012)	0.119
141	11.75	0.57	0.122	0.004	(0.012)	0.119
142	11.83	0.60	0.130	0.004	(0.013)	0.126
143	11.92	0.60	0.130	0.004	(0.013)	0.126
144	12.00	0.60	0.130	0.004	(0.013)	0.126
145	12.08	0.83	0.180	0.004	(0.018)	0.176
146	12.17	0.83	0.180	0.004	(0.018)	0.176
147	12.25	0.83	0.180	0.003	(0.018)	0.177
148	12.33	0.87	0.187	0.003	(0.019)	0.184
149	12.42	0.87	0.187	0.003	(0.019)	0.184
150	12.50	0.87	0.187	0.003	(0.019)	0.184
151	12.58	0.93	0.202	0.003	(0.020)	0.198
152	12.67	0.93	0.202	0.003	(0.020)	0.198
153	12.75	0.93	0.202	0.003	(0.020)	0.198
154	12.83	0.97	0.209	0.003	(0.021)	0.205
155	12.92	0.97	0.209	0.003	(0.021)	0.205
156	13.00	0.97	0.209	0.003	(0.021)	0.205
157	13.08	1.13	0.245	0.003	(0.024)	0.241
158	13.17	1.13	0.245	0.003	(0.024)	0.242
159	13.25	1.13	0.245	0.003	(0.024)	0.242
160	13.33	1.13	0.245	0.003	(0.024)	0.242
161	13.42	1.13	0.245	0.003	(0.024)	0.242
162	13.50	1.13	0.245	0.003	(0.024)	0.242
163	13.58	0.77	0.166	0.003	(0.017)	0.162
164	13.67	0.77	0.166	0.003	(0.017)	0.162
165	13.75	0.77	0.166	0.003	(0.017)	0.162
166	13.83	0.77	0.166	0.003	(0.017)	0.162
167	13.92	0.77	0.166	0.003	(0.017)	0.162
168	14.00	0.77	0.166	0.003	(0.017)	0.162
169	14.08	0.90	0.194	0.003	(0.019)	0.191
170	14.17	0.90	0.194	0.003	(0.019)	0.191
171	14.25	0.90	0.194	0.003	(0.019)	0.191
172	14.33	0.87	0.187	0.003	(0.019)	0.184
173	14.42	0.87	0.187	0.003	(0.019)	0.184
174	14.50	0.87	0.187	0.003	(0.019)	0.184
175	14.58	0.87	0.187	0.003	(0.019)	0.184
176	14.67	0.87	0.187	0.003	(0.019)	0.184
177	14.75	0.87	0.187	0.003	(0.019)	0.184
178	14.83	0.83	0.180	0.003	(0.018)	0.177
179	14.92	0.83	0.180	0.003	(0.018)	0.177
180	15.00	0.83	0.180	0.003	(0.018)	0.177
181	15.08	0.80	0.173	0.003	(0.017)	0.170
182	15.17	0.80	0.173	0.003	(0.017)	0.170
183	15.25	0.80	0.173	0.003	(0.017)	0.170
184	15.33	0.77	0.166	0.003	(0.017)	0.163
185	15.42	0.77	0.166	0.003	(0.017)	0.163
186	15.50	0.77	0.166	0.003	(0.017)	0.163
187	15.58	0.63	0.137	0.003	(0.014)	0.134
188	15.67	0.63	0.137	0.003	(0.014)	0.134
189	15.75	0.63	0.137	0.003	(0.014)	0.134
190	15.83	0.63	0.137	0.003	(0.014)	0.134
191	15.92	0.63	0.137	0.003	(0.014)	0.134
192	16.00	0.63	0.137	0.003	(0.014)	0.134

193	16.08	0.13	0.029	0.003	(0.003)	0.026
194	16.17	0.13	0.029	0.003	(0.003)	0.026
195	16.25	0.13	0.029	0.003	(0.003)	0.026
196	16.33	0.13	0.029	0.003	(0.003)	0.026
197	16.42	0.13	0.029	0.003	(0.003)	0.026
198	16.50	0.13	0.029	0.003	(0.003)	0.026
199	16.58	0.10	0.022	(0.003)	0.002	0.019
200	16.67	0.10	0.022	(0.003)	0.002	0.019
201	16.75	0.10	0.022	(0.003)	0.002	0.019
202	16.83	0.10	0.022	(0.003)	0.002	0.019
203	16.92	0.10	0.022	(0.003)	0.002	0.019
204	17.00	0.10	0.022	(0.003)	0.002	0.019
205	17.08	0.17	0.036	0.003	(0.004)	0.033
206	17.17	0.17	0.036	0.003	(0.004)	0.033
207	17.25	0.17	0.036	0.003	(0.004)	0.033
208	17.33	0.17	0.036	0.003	(0.004)	0.033
209	17.42	0.17	0.036	0.003	(0.004)	0.033
210	17.50	0.17	0.036	0.003	(0.004)	0.033
211	17.58	0.17	0.036	0.003	(0.004)	0.033
212	17.67	0.17	0.036	0.003	(0.004)	0.033
213	17.75	0.17	0.036	0.002	(0.004)	0.034
214	17.83	0.13	0.029	0.002	(0.003)	0.026
215	17.92	0.13	0.029	0.002	(0.003)	0.026
216	18.00	0.13	0.029	0.002	(0.003)	0.026
217	18.08	0.13	0.029	0.002	(0.003)	0.026
218	18.17	0.13	0.029	0.002	(0.003)	0.026
219	18.25	0.13	0.029	0.002	(0.003)	0.026
220	18.33	0.13	0.029	0.002	(0.003)	0.026
221	18.42	0.13	0.029	0.002	(0.003)	0.026
222	18.50	0.13	0.029	0.002	(0.003)	0.026
223	18.58	0.10	0.022	(0.002)	0.002	0.019
224	18.67	0.10	0.022	(0.002)	0.002	0.019
225	18.75	0.10	0.022	(0.002)	0.002	0.019
226	18.83	0.07	0.014	(0.002)	0.001	0.013
227	18.92	0.07	0.014	(0.002)	0.001	0.013
228	19.00	0.07	0.014	(0.002)	0.001	0.013
229	19.08	0.10	0.022	(0.002)	0.002	0.019
230	19.17	0.10	0.022	(0.002)	0.002	0.019
231	19.25	0.10	0.022	(0.002)	0.002	0.019
232	19.33	0.13	0.029	0.002	(0.003)	0.027
233	19.42	0.13	0.029	0.002	(0.003)	0.027
234	19.50	0.13	0.029	0.002	(0.003)	0.027
235	19.58	0.10	0.022	(0.002)	0.002	0.019
236	19.67	0.10	0.022	(0.002)	0.002	0.019
237	19.75	0.10	0.022	(0.002)	0.002	0.019
238	19.83	0.07	0.014	(0.002)	0.001	0.013
239	19.92	0.07	0.014	(0.002)	0.001	0.013
240	20.00	0.07	0.014	(0.002)	0.001	0.013
241	20.08	0.10	0.022	(0.002)	0.002	0.019
242	20.17	0.10	0.022	(0.002)	0.002	0.019
243	20.25	0.10	0.022	(0.002)	0.002	0.019
244	20.33	0.10	0.022	0.002	(0.002)	0.019
245	20.42	0.10	0.022	0.002	(0.002)	0.019
246	20.50	0.10	0.022	0.002	(0.002)	0.019
247	20.58	0.10	0.022	0.002	(0.002)	0.019
248	20.67	0.10	0.022	0.002	(0.002)	0.019
249	20.75	0.10	0.022	0.002	(0.002)	0.019
250	20.83	0.07	0.014	(0.002)	0.001	0.013
251	20.92	0.07	0.014	(0.002)	0.001	0.013
252	21.00	0.07	0.014	(0.002)	0.001	0.013
253	21.08	0.10	0.022	0.002	(0.002)	0.020
254	21.17	0.10	0.022	0.002	(0.002)	0.020
255	21.25	0.10	0.022	0.002	(0.002)	0.020
256	21.33	0.07	0.014	(0.002)	0.001	0.013
257	21.42	0.07	0.014	(0.002)	0.001	0.013
258	21.50	0.07	0.014	(0.002)	0.001	0.013
259	21.58	0.10	0.022	0.002	(0.002)	0.020
260	21.67	0.10	0.022	0.002	(0.002)	0.020
261	21.75	0.10	0.022	0.002	(0.002)	0.020
262	21.83	0.07	0.014	(0.002)	0.001	0.013
263	21.92	0.07	0.014	(0.002)	0.001	0.013
264	22.00	0.07	0.014	(0.002)	0.001	0.013
265	22.08	0.10	0.022	0.002	(0.002)	0.020
266	22.17	0.10	0.022	0.002	(0.002)	0.020
267	22.25	0.10	0.022	0.002	(0.002)	0.020
268	22.33	0.07	0.014	(0.002)	0.001	0.013
269	22.42	0.07	0.014	(0.002)	0.001	0.013
270	22.50	0.07	0.014	(0.002)	0.001	0.013
271	22.58	0.07	0.014	(0.002)	0.001	0.013
272	22.67	0.07	0.014	(0.002)	0.001	0.013
273	22.75	0.07	0.014	(0.002)	0.001	0.013
274	22.83	0.07	0.014	(0.002)	0.001	0.013
275	22.92	0.07	0.014	(0.002)	0.001	0.013
276	23.00	0.07	0.014	(0.002)	0.001	0.013
277	23.08	0.07	0.014	(0.002)	0.001	0.013
278	23.17	0.07	0.014	(0.002)	0.001	0.013
279	23.25	0.07	0.014	(0.002)	0.001	0.013
280	23.33	0.07	0.014	(0.002)	0.001	0.013
281	23.42	0.07	0.014	(0.002)	0.001	0.013
282	23.50	0.07	0.014	(0.002)	0.001	0.013
283	23.58	0.07	0.014	(0.002)	0.001	0.013
284	23.67	0.07	0.014	(0.002)	0.001	0.013
285	23.75	0.07	0.014	(0.002)	0.001	0.013
286	23.83	0.07	0.014	(0.002)	0.001	0.013
287	23.92	0.07	0.014	(0.002)	0.001	0.013
288	24.00	0.07	0.014	(0.002)	0.001	0.013

(Loss Rate Not Used)

Sum = 100.0 Sum = 20.7

Flood volume = Effective rainfall 1.73(In)

```
 times area      2.6(Ac.)/[(In)/(Ft.)] =       0.4(Ac.Ft)
Total soil loss =      0.07(In)
Total soil loss =     0.016(Ac.Ft)
Total rainfall =      1.80(In)
Flood volume =       16469.0 Cubic Feet
Total soil loss =         715.3 Cubic Feet
------------------------------------------------------------------------
 Peak flow rate of this hydrograph =      0.641(CFS)
------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    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      0.02  Q         |         |         |         |
  0+10       0.0004      0.03  Q         |         |         |         |
  0+15       0.0006      0.03  Q         |         |         |         |
  0+20       0.0009      0.04  Q         |         |         |         |
  0+25       0.0013      0.05  Q         |         |         |         |
  0+30       0.0016      0.05  Q         |         |         |         |
  0+35       0.0020      0.05  Q         |         |         |         |
  0+40       0.0023      0.05  Q         |         |         |         |
  0+45       0.0027      0.05  Q         |         |         |         |
  0+50       0.0031      0.06  Q         |         |         |         |
  0+55       0.0036      0.07  Q         |         |         |         |
  1+ 0       0.0040      0.07  Q         |         |         |         |
  1+ 5       0.0044      0.06  Q         |         |         |         |
  1+10       0.0048      0.05  Q         |         |         |         |
  1+15       0.0052      0.05  Q         |         |         |         |
  1+20       0.0055      0.05  Q         |         |         |         |
  1+25       0.0059      0.05  Q         |         |         |         |
  1+30       0.0062      0.05  Q         |         |         |         |
  1+35       0.0066      0.05  Q         |         |         |         |
  1+40       0.0069      0.05  Q         |         |         |         |
  1+45       0.0073      0.05  Q         |         |         |         |
  1+50       0.0077      0.06  Q         |         |         |         |
  1+55       0.0082      0.07  Q         |         |         |         |
  2+ 0       0.0087      0.07  Q         |         |         |         |
  2+ 5       0.0091      0.07  Q         |         |         |         |
  2+10       0.0096      0.07  QV        |         |         |         |
  2+15       0.0101      0.07  QV        |         |         |         |
  2+20       0.0105      0.07  QV        |         |         |         |
  2+25       0.0110      0.07  QV        |         |         |         |
  2+30       0.0115      0.07  QV        |         |         |         |
  2+35       0.0120      0.08  QV        |         |         |         |
  2+40       0.0126      0.08  QV        |         |         |         |
  2+45       0.0132      0.09  QV        |         |         |         |
  2+50       0.0138      0.09  QV        |         |         |         |
  2+55       0.0144      0.09  QV        |         |         |         |
  3+ 0       0.0150      0.09  QV        |         |         |         |
  3+ 5       0.0156      0.09  QV        |         |         |         |
  3+10       0.0162      0.09  QV        |         |         |         |
  3+15       0.0168      0.09  QV        |         |         |         |
  3+20       0.0174      0.09  QV        |         |         |         |
  3+25       0.0179      0.09  QV        |         |         |         |
  3+30       0.0185      0.09  QV        |         |         |         |
  3+35       0.0191      0.09  Q V       |         |         |         |
  3+40       0.0197      0.09  Q V       |         |         |         |
  3+45       0.0203      0.09  Q V       |         |         |         |
  3+50       0.0210      0.10  Q V       |         |         |         |
  3+55       0.0217      0.10  Q V       |         |         |         |
  4+ 0       0.0224      0.10  Q V       |         |         |         |
  4+ 5       0.0231      0.10  Q V       |         |         |         |
  4+10       0.0238      0.10  Q V       |         |         |         |
  4+15       0.0245      0.10  Q V       |         |         |         |
  4+20       0.0253      0.11  Q V       |         |         |         |
  4+25       0.0261      0.12  Q V       |         |         |         |
  4+30       0.0269      0.12  Q V       |         |         |         |
  4+35       0.0278      0.12  Q V       |         |         |         |
  4+40       0.0286      0.12  Q  V      |         |         |         |
  4+45       0.0294      0.12  Q  V      |         |         |         |
  4+50       0.0303      0.13  Q  V      |         |         |         |
  4+55       0.0313      0.14  Q  V      |         |         |         |
  5+ 0       0.0322      0.14  Q  V      |         |         |         |
  5+ 5       0.0331      0.12  Q  V      |         |         |         |
  5+10       0.0338      0.11  Q  V      |         |         |         |
  5+15       0.0345      0.10  Q  V      |         |         |         |
  5+20       0.0353      0.11  Q  V      |         |         |         |
  5+25       0.0361      0.12  Q  V      |         |         |         |
  5+30       0.0369      0.12  Q  V      |         |         |         |
  5+35       0.0378      0.13  Q   V     |         |         |         |
  5+40       0.0388      0.14  Q   V     |         |         |         |
  5+45       0.0397      0.14  Q   V     |         |         |         |
  5+50       0.0407      0.14  Q   V     |         |         |         |
  5+55       0.0417      0.14  Q   V     |         |         |         |
  6+ 0       0.0426      0.14  Q   V     |         |         |         |
  6+ 5       0.0436      0.15  Q   V     |         |         |         |
  6+10       0.0447      0.16  Q   V     |         |         |         |
  6+15       0.0458      0.16  Q   V     |         |         |         |
  6+20       0.0469      0.16  Q   V     |         |         |         |
  6+25       0.0480      0.16  Q    V    |         |         |         |
  6+30       0.0491      0.16  Q    V    |         |         |         |
  6+35       0.0503      0.17  Q    V    |         |         |         |
  6+40       0.0515      0.18  Q    V    |         |         |         |
  6+45       0.0527      0.18  Q    V    |         |         |         |
```



```
  6+50       0.0540      0.18  Q    V    |         |         |         |
  6+55       0.0552      0.18  Q    V    |         |         |         |
  7+ 0       0.0564      0.18  Q    V    |         |         |         |
  7+ 5       0.0576      0.18  Q     V   |         |         |         |
  7+10       0.0589      0.18  Q     V   |         |         |         |
  7+15       0.0601      0.18  Q     V   |         |         |         |
  7+20       0.0614      0.19  Q     V   |         |         |         |
  7+25       0.0628      0.20  Q     V   |         |         |         |
  7+30       0.0641      0.20  Q     V   |         |         |         |
  7+35       0.0656      0.21  Q     V   |         |         |         |
  7+40       0.0671      0.22  Q      V  |         |         |         |
  7+45       0.0685      0.22  Q      V  |         |         |         |
  7+50       0.0701      0.23  Q      V  |         |         |         |
  7+55       0.0717      0.24  Q      V  |         |         |         |
  8+ 0       0.0734      0.24  Q      V  |         |         |         |
  8+ 5       0.0752      0.26  |Q     V  |         |         |         |
  8+10       0.0770      0.27  |Q      V |         |         |         |
  8+15       0.0789      0.27  |Q      V |         |         |         |
  8+20       0.0808      0.27  |Q      V |         |         |         |
  8+25       0.0827      0.27  |Q      V |         |         |         |
  8+30       0.0846      0.27  |Q      V |         |         |         |
  8+35       0.0866      0.29  |Q       V|         |         |         |
  8+40       0.0886      0.29  |Q       V|         |         |         |
  8+45       0.0906      0.29  |Q       V|         |         |         |
  8+50       0.0927      0.31  |Q       V|         |         |         |
  8+55       0.0949      0.31  |Q        V         |         |         |
  9+ 0       0.0970      0.31  |Q        V         |         |         |
  9+ 5       0.0993      0.34  |Q        V         |         |         |
  9+10       0.1017      0.35  |Q        V         |         |         |
  9+15       0.1042      0.35  |Q        |V        |         |         |
  9+20       0.1067      0.36  |Q        |V        |         |         |
  9+25       0.1092      0.37  |Q        |V        |         |         |
  9+30       0.1118      0.37  |Q        |V        |         |         |
  9+35       0.1144      0.38  |Q        | V       |         |         |
  9+40       0.1171      0.39  |Q        | V       |         |         |
  9+45       0.1198      0.39  |Q        | V       |         |         |
  9+50       0.1225      0.40  |Q        | V       |         |         |
  9+55       0.1253      0.41  |Q        |  V      |         |         |
 10+ 0       0.1282      0.41  |Q        |  V      |         |         |
 10+ 5       0.1304      0.33  |Q        |  V      |         |         |
 10+10       0.1324      0.28  |Q        |   V     |         |         |
 10+15       0.1343      0.28  |Q        |   V     |         |         |
 10+20       0.1362      0.28  |Q        |   V     |         |         |
 10+25       0.1381      0.28  |Q        |   V     |         |         |
 10+30       0.1400      0.28  |Q        |   V     |         |         |
 10+35       0.1423      0.33  |Q        |    V    |         |         |
 10+40       0.1448      0.37  |Q        |    V    |         |         |
 10+45       0.1474      0.37  |Q        |    V    |         |         |
 10+50       0.1499      0.37  |Q        |    V    |         |         |
 10+55       0.1525      0.37  |Q        |     V   |         |         |
 11+ 0       0.1551      0.37  |Q        |     V   |         |         |
 11+ 5       0.1575      0.36  |Q        |     V   |         |         |
 11+10       0.1600      0.35  |Q        |     V   |         |         |
 11+15       0.1624      0.35  |Q        |      V  |         |         |
 11+20       0.1648      0.35  |Q        |      V  |         |         |
 11+25       0.1673      0.35  |Q        |      V  |         |         |
 11+30       0.1697      0.35  |Q        |      V  |         |         |
 11+35       0.1720      0.33  |Q        |       V |         |         |
 11+40       0.1742      0.32  |Q        |       V |         |         |
 11+45       0.1763      0.32  |Q        |       V |         |         |
 11+50       0.1786      0.33  |Q        |       V |         |         |
 11+55       0.1809      0.33  |Q        |        V|         |         |
 12+ 0       0.1832      0.33  |Q        |        V|         |         |
 12+ 5       0.1860      0.41  |Q        |        V|         |         |
 12+10       0.1892      0.46  |Q        |         V         |         |
 12+15       0.1924      0.47  |Q        |         V         |         |
 12+20       0.1957      0.48  |Q        |         V         |         |
 12+25       0.1991      0.49  |Q        |          V        |         |
 12+30       0.2024      0.49  |Q        |          V        |         |
 12+35       0.2059      0.51  | Q       |          V        |         |
 12+40       0.2095      0.52  | Q       |          | V      |         |
 12+45       0.2132      0.53  | Q       |          | V      |         |
 12+50       0.2168      0.54  | Q       |          | V      |         |
 12+55       0.2206      0.54  | Q       |          |  V     |         |
 13+ 0       0.2243      0.54  | Q       |          |  V     |         |
 13+ 5       0.2285      0.60  | Q       |          |   V    |         |
 13+10       0.2329      0.64  | Q       |          |   V    |         |
 13+15       0.2373      0.64  | Q       |          |    V   |         |
 13+20       0.2417      0.64  | Q       |          |    V   |         |
 13+25       0.2461      0.64  | Q       |          |     V  |         |
 13+30       0.2505      0.64  | Q       |          |     V  |         |
 13+35       0.2541      0.52  | Q       |          |     V  |         |
 13+40       0.2571      0.44  |Q        |          |      V |         |
 13+45       0.2601      0.43  |Q        |          |      V |         |
 13+50       0.2631      0.43  |Q        |          |      V |         |
 13+55       0.2660      0.43  |Q        |          |       V|         |
 14+ 0       0.2690      0.43  |Q        |          |       V|         |
 14+ 5       0.2723      0.48  |Q        |          |       V|         |
 14+10       0.2757      0.50  | Q       |          |        V|        |
 14+15       0.2792      0.51  | Q       |          |        V|        |
 14+20       0.2826      0.50  |Q        |          |        V|        |
 14+25       0.2860      0.49  |Q        |          |         V        |
 14+30       0.2894      0.49  |Q        |          |         V        |
 14+35       0.2927      0.49  |Q        |          |         V        |
 14+40       0.2961      0.49  |Q        |          |         |V       |
 14+45       0.2995      0.49  |Q        |          |         |V       |
 14+50       0.3027      0.48  |Q        |          |         | V      |
 14+55       0.3060      0.47  |Q        |          |         | V      |
 15+ 0       0.3092      0.47  |Q        |          |         | V      |
```

```
15+ 5       0.3124      0.46  |Q        |         |         |  V      |
15+10       0.3155      0.45  |Q        |         |         |  V      |
15+15       0.3186      0.45  |Q        |         |         |  V      |
15+20       0.3216      0.44  |Q        |         |         |   V     |
15+25       0.3246      0.43  |Q        |         |         |   V     |
15+30       0.3276      0.43  |Q        |         |         |   V     |
15+35       0.3302      0.39  |Q        |         |         |   V     |
15+40       0.3327      0.36  |Q        |         |         |    V    |
15+45       0.3352      0.36  |Q        |         |         |    V    |
15+50       0.3376      0.36  |Q        |         |         |    V    |
15+55       0.3401      0.36  |Q        |         |         |    V    |
16+ 0       0.3425      0.36  |Q        |         |         |     V   |
16+ 5       0.3438      0.19  Q         |         |         |     V   |
16+10       0.3444      0.08  Q         |         |         |     V   |
16+15       0.3449      0.07  Q         |         |         |     V   |
16+20       0.3453      0.07  Q         |         |         |     V   |
16+25       0.3458      0.07  Q         |         |         |     V   |
16+30       0.3463      0.07  Q         |         |         |     V   |
16+35       0.3467      0.06  Q         |         |         |     V   |
16+40       0.3471      0.05  Q         |         |         |     V   |
16+45       0.3474      0.05  Q         |         |         |     V   |
16+50       0.3478      0.05  Q         |         |         |     V   |
16+55       0.3481      0.05  Q         |         |         |     V   |
17+ 0       0.3485      0.05  Q         |         |         |     V   |
17+ 5       0.3490      0.07  Q         |         |         |     V   |
17+10       0.3496      0.09  Q         |         |         |     V   |
17+15       0.3502      0.09  Q         |         |         |      V  |
17+20       0.3508      0.09  Q         |         |         |      V  |
17+25       0.3514      0.09  Q         |         |         |      V  |
17+30       0.3520      0.09  Q         |         |         |      V  |
17+35       0.3526      0.09  Q         |         |         |      V  |
17+40       0.3533      0.09  Q         |         |         |      V  |
17+45       0.3539      0.09  Q         |         |         |      V  |
17+50       0.3544      0.08  Q         |         |         |      V  |
17+55       0.3549      0.07  Q         |         |         |      V  |
18+ 0       0.3554      0.07  Q         |         |         |      V  |
18+ 5       0.3558      0.07  Q         |         |         |      V  |
18+10       0.3563      0.07  Q         |         |         |      V  |
18+15       0.3568      0.07  Q         |         |         |      V  |
18+20       0.3573      0.07  Q         |         |         |      V  |
18+25       0.3578      0.07  Q         |         |         |      V  |
18+30       0.3583      0.07  Q         |         |         |      V  |
18+35       0.3587      0.06  Q         |         |         |      V  |
18+40       0.3590      0.05  Q         |         |         |      V  |
18+45       0.3594      0.05  Q         |         |         |       V |
18+50       0.3597      0.04  Q         |         |         |       V |
18+55       0.3599      0.04  Q         |         |         |       V |
19+ 0       0.3602      0.03  Q         |         |         |       V |
19+ 5       0.3605      0.04  Q         |         |         |       V |
19+10       0.3608      0.05  Q         |         |         |       V |
19+15       0.3612      0.05  Q         |         |         |       V |
19+20       0.3616      0.06  Q         |         |         |       V |
19+25       0.3621      0.07  Q         |         |         |       V |
19+30       0.3626      0.07  Q         |         |         |       V |
19+35       0.3630      0.06  Q         |         |         |       V |
19+40       0.3633      0.05  Q         |         |         |       V |
19+45       0.3637      0.05  Q         |         |         |       V |
19+50       0.3640      0.04  Q         |         |         |       V |
19+55       0.3642      0.04  Q         |         |         |       V |
20+ 0       0.3644      0.03  Q         |         |         |       V |
20+ 5       0.3648      0.04  Q         |         |         |       V |
20+10       0.3651      0.05  Q         |         |         |       V |
20+15       0.3655      0.05  Q         |         |         |       V |
20+20       0.3658      0.05  Q         |         |         |       V |
20+25       0.3662      0.05  Q         |         |         |       V |
20+30       0.3665      0.05  Q         |         |         |       V |
20+35       0.3669      0.05  Q         |         |         |       V |
20+40       0.3672      0.05  Q         |         |         |       V |
20+45       0.3676      0.05  Q         |         |         |       V |
20+50       0.3679      0.04  Q         |         |         |       V |
20+55       0.3681      0.04  Q         |         |         |       V |
21+ 0       0.3684      0.03  Q         |         |         |       V |
21+ 5       0.3687      0.04  Q         |         |         |        V|
21+10       0.3690      0.05  Q         |         |         |        V|
21+15       0.3694      0.05  Q         |         |         |        V|
21+20       0.3697      0.04  Q         |         |         |        V|
21+25       0.3699      0.04  Q         |         |         |        V|
21+30       0.3701      0.03  Q         |         |         |        V|
21+35       0.3704      0.04  Q         |         |         |        V|
21+40       0.3708      0.05  Q         |         |         |        V|
21+45       0.3712      0.05  Q         |         |         |        V|
21+50       0.3714      0.04  Q         |         |         |        V|
21+55       0.3717      0.04  Q         |         |         |        V|
22+ 0       0.3719      0.03  Q         |         |         |        V|
22+ 5       0.3722      0.04  Q         |         |         |        V|
22+10       0.3726      0.05  Q         |         |         |        V|
22+15       0.3729      0.05  Q         |         |         |        V|
22+20       0.3732      0.04  Q         |         |         |        V|
22+25       0.3735      0.04  Q         |         |         |        V|
22+30       0.3737      0.03  Q         |         |         |        V|
22+35       0.3739      0.03  Q         |         |         |        V|
22+40       0.3742      0.03  Q         |         |         |        V|
22+45       0.3744      0.03  Q         |         |         |        V|
22+50       0.3747      0.03  Q         |         |         |        V|
22+55       0.3749      0.03  Q         |         |         |        V|
23+ 0       0.3751      0.03  Q         |         |         |        V|
23+ 5       0.3754      0.03  Q         |         |         |        V|
23+10       0.3756      0.03  Q         |         |         |        V|
23+15       0.3758      0.03  Q         |         |         |        V|
```



```
23+20       0.3761      0.03  Q         |         |         |        V|
23+25       0.3763      0.03  Q         |         |         |        V|
23+30       0.3765      0.03  Q         |         |         |        V|
23+35       0.3768      0.03  Q         |         |         |        V|
23+40       0.3770      0.03  Q         |         |         |        V|
23+45       0.3773      0.03  Q         |         |         |        V|
23+50       0.3775      0.03  Q         |         |         |        V|
23+55       0.3777      0.03  Q         |         |         |        V|
24+ 0       0.3780      0.03  Q         |         |         |        V|
24+ 5       0.3781      0.01  Q         |         |         |        V|
24+10       0.3781      0.00  Q         |         |         |         V
-------------------------------------------------------------------
```

Appendix C – Low Impact Development Calculations, BMP

Information, & Infiltration Basin Fact Sheet

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	David Evans and Associates	Date	1/24/2023
Designed by	N Zamarripa	Case No	
Company Project Number/Name	National Tube Supply Industrial Building		

BMP Identification

BMP NAME / ID: Infiltration Basin

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.69 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
D1	*146382*	*Concrete or Asphalt*	*1*	*0.89*	*130572.7*			
D2	*85080*	*Roofs*	*1*	*0.89*	*75891.4*			
D3	*19614*	*Ornamental Landscaping*	*0.1*	*0.11*	*2166.5*			
	251076	***Total***			**208630.6**	**0.69**	***11996.3***	***25120***

Notes:

Infiltration Basin - Design Procedure (Rev. 03-2012)	BMP ID	Legend:	Required Entries / Calculated Cells

Company Name: DEA — Date: 1/24/2023

Designed by: N. Zamarripa — County/City Case No.:

Design Volume

a) Tributary area (BMP subarea)	A_T =	5.76	acres
b) Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP}=	11,996	ft^3

Maximum Depth

a) Infiltration rate	I =	7.3	in/hr
b) Factor of Safety (See Table 1, Appendix A: "Infiltration Testing" from this BMP Handbook)	FS =	3	
c) Calculate D_1 $D_1 = \frac{I\ (in/hr) \times 72\ hrs}{12\ (in/ft) \times FS}$	D_1 =	14.6	ft
d) Enter the depth of freeboard (at least 1 ft)		1	ft
e) Enter depth to historic high ground water (measured from **top** of basin)		100	ft
f) Enter depth to top of bedrock or impermeable layer (measured from **top** of basin)		200	ft
g) D_2 is the smaller of: Depth to groundwater - (10 ft + freeboard) and Depth to impermeable layer - (5 ft + freeboard)	D_2 =	89.0	ft
h) D_{MAX} is the smaller value of D_1 and D_2 but shall not exceed 5 feet	D_{MAX} =	14.6	ft

Basin Geometry

a) Basin side slopes (no steeper than 4:1)	z =	4	:1
b) Proposed basin depth (excluding freeboard)	d_B =	8	ft
c) Minimum bottom surface area of basin ($A_S = V_{BMP}/d_B$)	A_S =	1500	ft^2
d) Proposed Design Surface Area	A_D =	1500	ft^2

Forebay

a) Forebay volume (minimum 0.5% V_{BMP})	Volume =	60	ft^3
b) Forebay depth (height of berm/splashwall. 1 foot min.)	Depth =	1	ft
c) Forebay surface area (minimum)	Area =	60	ft^2
d) Full height notch-type weir	Width (W) =	2.0	in

Notes: This spreadsheet has been used as a reference to determine the minimum bottom surface area that would be needed to infiltrate the DCV volume. The underground basins will be designed to drain the HydroMod volume of 25,109 cubic feet. This volume is calculated from the difference of the existing and proposed 2-year, 24-hour storm events. The existing 2-year, 24-hour volume totaled 10,960 cf and the proposed volume totaled 36,069 cf.

Appendix D – Geotechnical Report

Geotechnical Engineering Investigation
Proposed Industrial Warehouse Development
Southwest Corner of S. Sanderson Avenue and
Wentworth Drive
Hemet, California

National Tube Supply
925 Central Avenue
University Park, Illinois 60484

Attn: Mr. Brain Kluge

Project Number 23487-22
September 2, 2022

NorCal Engineering

TABLE OF CONTENTS

NorCal Engineering

Soils and Geotechnical Consultants
10641 Humbolt Street Los Alamitos, CA 90720
(562) 799-9469 Fax (562) 799-9459

September 2, 2022 Project Number 23487-22

National Tube Supply
925 Central Avenue
University Park, Illinois 60484

Attn: Mr. Brian Kluge

RE: **Geotechnical Engineering Investigation** - Proposed Industrial Warehouse Development - Located near the Southwest Corner of S. Sanderson Avenue and Wentworth Drive, in the City of Hemet, California

Dear Mr. Kluge:

Pursuant to your request, this firm has performed a Geotechnical Engineering Investigation for the above referenced project in accordance with your approval of our proposal dated August 9, 2022. The purpose of this investigation is to evaluate the geotechnical conditions of the subject site and to provide recommendations for the proposed industrial warehouse development.

The scope of work included the following: 1) site reconnaissance; 2) subsurface geotechnical exploration and sampling; 3) laboratory testing; 4) soil infiltration testing; 5) engineering analysis of field and laboratory data; 6) preparation of a geotechnical engineering report. It is the opinion of this firm that the proposed development is feasible from a geotechnical standpoint provided that the recommendations presented in this report are followed in the design and construction of the project.

1.0 Project Description

It is proposed to construct an industrial warehouse development consisting of 120,000 square feet building as shown on the attached Site Plan. The proposed concrete tilt-up building will be supported by a conventional slab-on-grade foundation system with perimeter-spread footings and isolated interior footings. Other improvements will include asphalt and concrete pavement areas, hardscape and landscaping. It is assumed that the proposed grading for the development will include cut and fill procedures on the order of a few feet to achieve finished grade elevations. Final building plans shall be reviewed by this firm prior to submittal for city approval to determine the need for any additional study and revised recommendations pertinent to the proposed development, if necessary.

2.0 Site Description

The 5.8-acre subject property is located approximately 300 feet west from the southwest corner of S. Sanderson Avenue and Wentworth Drive, in the City of Riverside. The generally rectangular-shaped parcel is elongated in an east to west direction with topography of the relatively level descending gradually from a front to back direction on the order of a few feet. The site is currently an undeveloped parcel of land covered with a light vegetation growth of natural grasses and weeds.

3.0 Site Exploration

The investigation consisted of the placement of seven (7) subsurface exploratory borings by a truck mounted hollow stem auger to depths ranging between 5 and 20 feet below current ground elevations. The explorations were visually classified and logged by a field engineer with locations of the subsurface explorations shown on the attached plan. The exploratory borings revealed the existing earth materials to consist of fill and natural soil. Detailed descriptions of the subsurface conditions are listed on the boring logs in Appendix A. It should be noted that the transition from one soil type to another as shown on the boring logs is approximate and may in fact be a gradual transition. The soils encountered are described as follows:

Fill: A fill soil classifying as a brown, sandy SILT with occasional gravel was encountered across the site to depth of 1 to 1.5 feet below ground surface. These soils were noted to be soft and dry.

Natural: A natural undisturbed soil classifying as a brown, sandy SILT was encountered beneath the fill soils. The native soils were observed to be medium stiff and damp. Deeper soils encountered consisted of a fine to coarse grained, silty SAND which were noted to be medium dense to dense and moist.

The overall engineering characteristics of the earth material were relatively uniform with each excavation. Groundwater was not encountered to the depth of our borings and no caving occurred.

4.0 Laboratory Tests

Relatively undisturbed samples of the subsurface soils were obtained to perform laboratory testing and analysis for direct shear, consolidation tests, and to determine in-place moisture/densities. These relatively undisturbed ring samples were obtained by driving a thin-walled steel sampler lined with one-inch long brass rings with an inside diameter of 2.42 inches into the undisturbed soils. Bulk bag samples were obtained in the upper soils for expansion index tests and maximum density tests. All test results are included in Appendix B, unless otherwise noted.

4.1 **Field Moisture Content** (ASTM: D 2216) and the dry density of the ring samples were determined in the laboratory. This data is listed on the logs of explorations.

4.2 **Maximum Density tests** (ASTM: D 1557) were performed on typical samples of the upper soils. Results of these tests are shown on Table I.

4.3 **Expansion Index tests** (ASTM: D 4829) were performed on remolded samples of the upper soils to determine expansive characteristics. Results of these tests are provided on Table II.

4.4 **Atterberg Limits** (ASTM: D 4318) consisting of liquid limit, plastic limit and plasticity index were performed on representative soil samples. Results are shown on Table III.

4.5 **Corrosion tests** consisting of sulfate, pH, resistivity and chloride analysis to determine potential corrosive effects of soils on concrete and underground utilities. Test results are provided on Table IV.

4.6 **R-Value test** per California Test Method 301 was performed on a representative sample, which may be anticipated to be near subgrade to determine pavement design. Results are provided within the pavement design section of the report.

4.7 **Direct Shear tests** (ASTM: D 3080) were performed on undisturbed and/or remolded samples of the subsurface soils. The test is performed under saturated conditions at loads of 1,000 lbs./sq.ft., 2,000 lbs./sq.ft., and 3,000 lbs./sq.ft. with results shown on Plate A.

4.8 **Consolidation tests** (ASTM: D 2435) were performed on undisturbed samples to determine the differential and total settlement which may be anticipated based upon the proposed loads. Water was added to the samples at a surcharge of one KSF and the settlement curves are plotted on Plates B and C.

5.0 Seismicity Evaluation

The proposed development lies outside of any Alquist Priolo Special Studies Zone and the potential for damage due to direct fault rupture is considered unlikely. The site is situated in an area of high regional seismicity and the San Jacinto fault (Anza) is located about 5 kilometers from the site. Ground shaking originating from earthquakes along other active faults in the region is expected to induce lower horizontal accelerations due to smaller anticipated earthquakes and/or greater distances to other faults.

The seismic design acceleration parameters for the project site are provided below based on the ASCE/SEI 7-22 American Society of Civil Engineers (ASCE) website, https://asce7hazardtool.online/. The ASCE/SEI 7-22 report is attached is Appendix C

Seismic Design Acceleration Parameters

Latitude	33.734
Longitude	-117.009
Site Class	D
Risk Category	II
Peak Ground Acceleration	$PGA_M = 0.75$
Adjusted Maximum Acceleration	$S_{MS} = 2.14$ $S_{M1} = 1.87$
Design Spectral Response Acceleration Parameters	$S_{DS} = 1.43$ $S_{D1} = 1.25$
Mapped Spectral Response Acceleration	$S_S = 2.04$ $S_1 = 0.71$

Use of these values is dependent on the latest requirements of the ASCE, 11-4.8, Exception 2 that requires the value of the seismic response coefficient C_s be determined by Equation 12.8.2 for values of $T \leq 1.5T_s$ and taken as equal to 1.5 times the value computed in accordance with either 12.8-3 for $T_L \geq T \geq 1.5T_s$ or Equation 12.8-4 for $T > T_L$. Computations and verification of these conditions is referred to the structural engineer.

6.0 Liquefaction Evaluation

The site is expected to experience ground shaking and earthquake activity that is typical of the Southern California area. It is during severe shaking that loose, granular soils below the groundwater table can liquefy. Based on review of the *County of Riverside– Liquefaction Zone Map (September 2019)*, the site is situated in an area of moderate liquefaction susceptibility. Our analysis indicates the potential for liquefaction at this site to be very low due to the dense subsurface soils and depth of groundwater in excess of 150 feet based on review of nearby monitoring wells. Thus, design of the proposed construction in conformance with the latest Building Code provisions for earthquake design is expected to provide mitigation of ground shaking hazards that are typical in Southern California.

7.0 Infiltration Characteristics

Infiltration tests within the site were performed to provide preliminary infiltration rates for the purpose of planning and design of an on-site water disposal system field testing in accordance with the Riverside County – Low Impact Development BMP Design Handbook Appendix A – Infiltration Testing Manual. A truck mounted Simco 2800 Drill Rig equipped with a hollow stem auger was used to excavate the exploratory borings (B-1 and B-2) to depths of 5 and 10 feet below existing ground surface within the proposed infiltration areas.

The borings consisted of six-inch diameter test holes. A three-inch diameter perforated PVC casing with solid end cap was installed in the borings and then surrounded with gravel materials to prevent caving. The infiltration holes were carefully filled with clean water and refilled after two initial readings. Based upon the initial rates of infiltration at each location, test measurements were measured at selected maximum intervals thereafter. Measurements were obtained by using an electronic tape measure with 1/16-inch divisions and timed with a stopwatch. Field data sheets are provided in Appendix D.

Based upon the results of our testing, the soils encountered in the planned on-site drainage disposal system area exhibit the following field infiltration rates calculated using the Porchet Method (aka Inverse Borehole Method). The drainage disposal system shall utilize design infiltration rates based on the safety factor required by the county standard.

Boring/Test No.	Depth	Soil Classification	Field Infiltration Rate
B-1/TH-1	5'	Silty SAND	7.3 in/hr
B-2/TH-2	10'	Silty SAND	12.5 in/hr

Groundwater was not encountered to a depth of 20 feet below existing ground surface based on the logs of our exploratory borings. A nearby groundwater monitoring well located approximately 500 feet south from the subject site noted a groundwater depth of 173 feet below ground surface last measured in April 2022.

All systems must meet the latest county specifications and the California Regional Water Quality Control Board (CRWQCB) requirements. It is recommended that foundations shall be setback a minimum distance of 10 feet from the drainage disposal system and the bottom of footing shall be a minimum of 10 feet from the expected zone of saturation. The boundary of the zone of saturation may be assumed to project downward from the top of the permeable portion of the disposal system at an inclination of 1 to 1 or flatter, as determined by the geotechnical engineer.

8.0 Conclusions and Recommendations

Based upon our evaluations, the proposed development is acceptable from a geotechnical engineering standpoint. By following the recommendations and guidelines set forth in our report, the structures will be safe from excessive settlements under the anticipated design loadings and conditions. The proposed development shall meet all requirements of the City Building Ordinance and will not impose any adverse effect on existing adjacent structures.

The following recommendations are based upon soil conditions encountered in our field investigation; these near-surface soil conditions could vary across the site. Variations in the soil conditions may not become evident until the commencement of grading operations for the proposed development and revised recommendations from the soils engineer may be necessary based upon the conditions encountered.

It is recommended that site inspections be performed by a representative of this firm during all grading and construction of the development to verify the findings and recommendations documented in this report. Any unusual conditions which may be encountered in the course of the project development may require the need for additional study and revised recommendations.

8.1 Site Grading Recommendations

Any vegetation and/or demolition debris shall be removed and hauled from proposed grading areas prior to the start of grading operations. Existing vegetation shall not be mixed or disced into the soils. Any removed soils may be reutilized as compacted fill once any deleterious material or oversized materials (in excess of eight inches) is removed. Grading operations shall be performed in accordance with the attached *Specifications for Placement of Compacted Fill.*

8.1.1 Removal and Recompaction Recommendations

All disturbed soils and/or fill (about 1 to 1.5 feet below ground surface) shall be removed to competent native material, the exposed surface scarified to a depth of 12 inches, brought to within 2% of optimum moisture content and compacted to a minimum of 90% of the laboratory standard (ASTM: D 1557) prior to placement of any additional compacted fill soils, foundations, slabs-on-grade and pavement. Grading shall extend a minimum of five horizontal feet outside the edges of foundations or equidistant to the depth of fill placed, whichever is greater.

It is possible that isolated areas of undiscovered fill not described in this report are present on site; if found, these areas should be treated as discussed earlier. A diligent search shall also be conducted during grading operations in an effort to uncover any underground structures, irrigation or utility lines. If encountered, these structures and lines shall be either removed or properly abandoned prior to the proposed construction.

Any imported fill material should be preferably soil similar to the upper soils encountered at the subject site. All soils shall be approved by this firm prior to importing at the site and will be subjected to additional laboratory testing to assure concurrence with the recommendations stated in this report.

If placement of slabs-on-grade and pavement is not completed immediately upon completion of grading operations, additional testing and grading of the areas may be necessary prior to continuation of construction operations. Likewise, if adverse weather conditions occur which may damage the subgrade soils, additional assessment by the soils engineer as to the suitability of the supporting soils may be needed.

Care should be taken to provide or maintain adequate lateral support for all adjacent improvements and structures at all times during the grading operations and construction phase. Adequate drainage away from the structures, pavement and slopes should be provided at all times.

8.1.2 Fill Blanket Recommendations

Due to the potential for differential settlement of foundations placed on compacted fill and native materials, it is recommended that all foundations including floor slab areas be underlain by a uniform compacted fill blanket at least two feet in thickness. This fill blanket shall extend a minimum of five horizontal feet outside the edges of foundations or equidistant to the depth of fill placed, whichever is greater.

8.2 Shrinkage and Subsidence

Results of our in-place density tests reveal that the soil shrinkage will be less than 5 to 15% due to excavation and recompaction, based upon the assumption that the fill is compacted to 92% of the maximum dry density per ASTM standards. Subsidence should be 0.2 feet die to earthwork operations. The volume change does not include any allowance for vegetation or organic stripping, removal of subsurface improvements, or topographic approximations. Although these values are only approximate, they represent our best estimate of lost yardage, which will likely occur during grading. If more accurate shrinkage and subsidence factors are needed, it is recommended that field testing the actual equipment and grading techniques should be conducted.

8.3 Temporary Excavations

Temporary unsurcharged excavations in the existing site materials may be made at vertical inclinations up to 4 feet in height unless cohesionless soils are encountered. In areas where soils with little or no binder are encountered, where adverse geological conditions are exposed, or where excavations are adjacent to existing structures, shoring or flatter excavations may be required. The temporary cut slope gradients given above do not preclude local raveling and sloughing. Additional recommendations regarding specific excavations may be provided once typical detail sections are made available.

All excavations shall be made in accordance with the requirements of the soils engineer, CAL-OSHA and other public agencies having jurisdiction. Care should be taken to provide or maintain adequate lateral support for all adjacent improvements and structures at all times during the grading operations and construction phase. Additional recommendations regarding specific excavations may be calculated once typical detail sections are made available.

8.4 Foundation Design

All foundations may be designed utilizing the following allowable bearing capacities for an embedded depth of 18 inches into approved engineered fill with the corresponding widths:

Allowable Bearing Capacity (psf)		
Width (feet)	Continuous Foundation	Isolated Foundation
1.5	2000	2500
2.0	2075	2575
4.0	2375	2875
6.0	2500	3000

The bearing value may be increased by 500 psf for each additional foot of depth in excess of the 18-inch minimum depth, up to a maximum of 4,000 psf. A one-third increase may be used when considering short-term loading and seismic forces.

All foundations for minor structures (site walls, trash enclosure, etc) may be designed utilizing an allowable bearing capacity of 1,500 psf and embedded into competent native soils. A modulus of subgrade reaction (k) of 150 pci may be used for design of slabs placed on engineered fill soils supporting sustained concentrated loads. A representative of this firm shall inspect all foundation excavations prior to pouring concrete.

8.5 Settlement Analysis

Resultant pressure curves for the consolidation tests are shown on Plates B and C. Computations utilizing these curves and the recommended allowable soil bearing capacities reveal that the foundations will experience settlements on the order of ¾ inch and differential settlements of less than ¼ inch.

8.6 **Lateral Resistance**

The following values may be utilized in resisting lateral loads imposed on the structure. Requirements of the California Building Code should be adhered to when the coefficient of friction and passive pressures are combined.

Coefficient of Friction - 0.40

Equivalent Passive Fluid Pressure = 250 lbs./cu.ft.

Maximum Passive Pressure = 2,500 lbs./cu.ft.

The passive pressure recommendations are valid only for approved compacted fill soils or competent native materials.

8.7 **Retaining Wall Design Parameters**

Active earth pressures against retaining walls will be equal to the pressures developed by the following fluid densities. These values are for **approved granular backfill material** placed behind the walls at various ground slopes above the walls.

Surface Slope of Retained Materials (Horizontal to Vertical	Equivalent Fluid Density (lb./cu.ft.)
Level	30
5 to 1	35
4 to 1	38
3 to 1	40
2 to 1	45

Any applicable short-term construction surcharges and seismic forces should be added to the above lateral pressure values. An equivalent fluid pressure of 45 pcf may be utilized for the restrained wall condition with a level grade behind the wall.

The seismic-induced lateral soil pressure for walls greater than 6 feet may be computed using a triangular pressure distribution with the maximum value at the top of the wall. The maximum lateral pressure of (20 pcf) H where H is the height of the retained soils above the wall footing should be used in final design of retaining walls. Sliding resistance values and passive fluid pressure values may be increased by 1/3 during short-term wind and seismic loading conditions.

All walls shall be waterproofed as needed and protected from hydrostatic pressure by a reliable permanent subdrain system. The granular backfill to be utilized immediately adjacent to retaining walls shall consist of an approved select granular soil with a sand equivalency greater than 30. This backfill zone of free draining material shall consist of a wedge beginning a minimum of one horizontal foot from the base of the wall extending upward at an inclination of no less than ¾ to 1 (horizontal to vertical).

8.8 **Slab Design**

All concrete slabs shall be a minimum of six inches in thickness in the proposed warehouse areas and four inches in office and hardscape and placed on approved subgrade soils. Additional reinforcement requirements and an increase in thickness of the slabs-on-grade may be necessary based upon proposed loading conditions in the structures and should be evaluated further by the project engineers and/or architect. All subgrade soils shall be moisture conditioned to over optimum moisture content to a depth one foot.

A vapor retarder (10-mil minimum thickness) should be utilized in areas which would be sensitive to the infiltration of moisture. This retarder shall meet requirements of ASTM E 96, *Water Vapor Transmission of Materials* and ASTM E 1745, *Standard Specification for Water Vapor Retarders used in Contact with Soil or Granular Fill Under Concrete Slabs.* The vapor retarder shall be installed in accordance with procedures stated in ASTM E 1643, *Standard practice for Installation of Water Vapor Retarders used in Contact with Earth or Granular Fill Under Concrete Slabs.*

The moisture retarder may be placed directly upon compacted subgrade soils conditioned to near optimum moisture levels, although one to two inches of sand beneath the membrane is desirable. The subgrade upon which the retarder is placed shall be smooth and free of rocks, gravel or other protrusions which may damage the retarder. Use of sand above the retarder is under the purview of the structural engineer; if sand is used over the retarder, it should be placed in a dry condition.

8.9 **Pavement Section Design**

The table on the following page provides a preliminary pavement design based upon an R-Value of 30 for the subgrade soils for the proposed pavement areas. Final pavement design may need to be based on R-Value testing of the subgrade soils near the conclusion of site grading to assure that these soils are consistent with those assumed in this preliminary design.

The recommendations are based upon estimated traffic loads. Client should submit any other anticipated traffic loadings to the geotechnical engineer, if necessary, so that pavement sections may be reviewed to determine adequacy to support the proposed loadings.

Type of Traffic	Traffic Index	Asphalt (in.)	Base Material (in.)
Automobile Parking Stalls	4.0	3.0	4.0
Light Vehicle Circulation Areas	6.0	3.5	8.5
Heavy Truck Access Areas	7.0	4.0	11.0

Any concrete slab-on-grade in pavement areas shall be a minimum of seven inches in thickness and may be placed on approved subgrade soils. All pavement areas shall have positive drainage toward an approved outlet from the site. Drain lines behind curbs and/or adjacent to landscape areas should be considered by client and the appropriate design engineers to prevent water from infiltrating beneath pavement. If such infiltration occurs, damage to pavement, curbs and flow lines, especially on sites with expansive soils, may occur during the life of the project.

Any approved base material shall consist of a Class II aggregate or equivalent and should be compacted to a minimum of 95% relative compaction. All pavement materials shall conform to the requirements set forth by the City of Hemet. The base material; and asphaltic concrete should be tested prior to delivery to the site and during placement to determine conformance with the project specifications. A pavement engineer shall designate the specific asphalt mix design to meet the required project specifications.

8.10 **Utility Trench and Excavation Backfill**

Trenches from installation of utility lines and other excavations may be backfilled with on-site soils or approved imported soils compacted to a minimum of 90% relative compaction. All utility lines shall be properly bedded with clean sand having a sand equivalency rating of 30 or more. This bedding material shall be thoroughly water jetted around the pipe structure prior to placement of compacted backfill soils.

8.11 **Corrosion Design Criteria**

Representative samples of the surficial soils, typical of the subgrade soils expected to be encountered within foundation excavations and underground utilities were tested for corrosion potential. The minimum resistivity value obtained for the samples tested is representative of an environment that may be severely corrosive to metals. The soil pH value was considered mildly alkaline and may not have a significant effect on soil corrosivity. Consideration should be given to corrosion protection systems for buried metal such as protective coatings, wrappings or the use of PVC where permitted by local building codes.

According to Table 4.3.1 of ACI 318 Building Code and Commentary, these contents revealed negligible sulfate concentrations. Therefore, a Type II cement according to latest CBC specifications may be utilized for building foundations at this time. It is recommended that additional sulfate tests be performed at the completion of site grading to assure that the as graded conditions are consistent with the recommendations stated in this design. Corrosion test results may be found on the attached Table IV.

8.12 **Expansive Soil**

If expansive soils are encountered, special attention should be given to the project design and maintenance. The attached *Expansive Soil Guidelines* should be reviewed by the engineers, architects, owner, maintenance personnel and other interested parties and considered during the design of the project and future property maintenance.

9.0 Closure

The recommendations and conclusions contained in this report are based upon the soil conditions uncovered in our test excavations. No warranty of the soil condition between our excavations is implied. NorCal Engineering should be notified for possible further recommendations if unexpected to unfavorable conditions are encountered during construction phase.

It is the responsibility of the owner to ensure that all information within this report is submitted to the Architect and appropriate Engineers for the project. A preconstruction conference should be held between the developer, general contractor, grading contractor, city inspector, architect, and geotechnical engineer to clarify any questions relating to the grading operations and subsequent construction. Our representative should be present during the grading operations and construction phase to certify that such recommendations are complied within the field.

This geotechnical investigation has been conducted in a manner consistent with the level of care and skill exercised by members of our profession currently practicing under similar conditions in the Southern California area. No other warranty, expressed or implied is made.

We appreciate this opportunity to be of service to you. If you have any further questions, please do not hesitate to contact the undersigned.

Respectfully submitted,
NORCAL ENGINEERING

Keith D. Tucker
Project Engineer
R.G.E. 841

REGISTERED PROFESSIONAL ENGINEER
KEITH D. TUCKER
No. 841
Exp. 12/31/2022
GEOTECHNICAL
STATE OF CALIFORNIA

Scott D. Spensiero
Project Manager

References

1. American Society of Civil Engineers (ASCE) website, https://asce7hazardtool.online/

2. California Building Code, 2019.

3. California Department of Conservation, California Geological Survey, 2007, Fault-Rupture Hazard Zones in California; Special Publication 42.

4. California Department of Water Resources, Internet Website, http://www.water.ca.gov/waterdatalibrary/index.cfm.

5. California Division of Mines and Geology, 2008, Guidelines for Evaluating and Mitigating Seismic Hazards in California: Special Publication 117A.

6. California Geological Survey, 2001 Preliminary Geologic Map of the Winchester 7.5 Quadrangle, Riverside County, California by Douglas M. Morton, Open File Report 3-188.

7. Riverside County Mapping and Spatial Data Portal – Liquefaction Zones September 2019.

8. Riverside County – Low Impact Development BMP Design Handbook (revised 9/2011) Appendix A – Infiltration Testing Manual.

SPECIFICATIONS FOR PLACEMENT OF COMPACTED FILL

Excavation

Any existing low-density soils and/or saturated soils shall be removed to competent natural soil under the inspection of the Geotechnical Engineering Firm. After the exposed surface has been cleansed of debris and/or vegetation, it shall be scarified until it is uniform in consistency, brought to the proper moisture content and compacted to a minimum of 90% relative compaction (in accordance with ASTM: D 1557).

In any area where a transition between fill and native soil or between bedrock and soil are encountered, additional excavation beneath foundations and slabs will be necessary in order to provide uniform support and avoid differential settlement of the structure.

Material for Fill

The on-site soils or approved import soils may be utilized for the compacted fill provided they are free of any deleterious materials and shall not contain any rocks, brick, asphaltic concrete, concrete or other hard materials greater than eight inches in maximum dimensions. Any import soil must be approved by the Geotechnical Engineering firm a minimum of 72 hours prior to importation of site.

Placement of Compacted Fill Soils

The approved fill soils shall be placed in layers not excess of six inches in thickness. Each lift shall be uniform in thickness and thoroughly blended. The fill soils shall be brought to within 2% of the optimum moisture content, unless otherwise specified by the Soils Engineering firm. Each lift shall be compacted to a minimum of 90% relative compaction (in accordance with ASTM: D 1557) and approved prior to the placement of the next layer of soil. Compaction tests shall be obtained at the discretion of the Geotechnical Engineering firm but to a minimum of one test for every 500 cubic yards placed and/or for every 2 feet of compacted fill placed.

The minimum relative compaction shall be obtained in accordance with accepted methods in the construction industry. The final grade of the structural areas shall be in a dense and smooth condition prior to placement of slabs-on-grade or pavement areas. No fill soils shall be placed, spread or compacted during unfavorable weather conditions. When the grading is interrupted by heavy rains, compaction operations shall not be resumed until approved by the Geotechnical Engineering firm.

Grading Observations

The controlling governmental agencies should be notified prior to commencement of any grading operations. This firm recommends that the grading operations be conducted under the observation of a Soils Engineering firm as deemed necessary. A 24-hour notice must be provided to this firm prior to the time of our initial inspection.

Observation shall include the clearing and grubbing operations to assure that all unsuitable materials have been properly removed; approve the exposed subgrade in areas to receive fill and in areas where excavation has resulted in the desired finished grade and designate areas of overexcavation; and perform field compaction tests to determine relative compaction achieved during fill placement. In addition, all foundation excavations shall be observed by the Geotechnical Engineering firm to confirm that appropriate bearing materials are present at the design grades and recommend any modifications to construct footings.

EXPANSIVE SOIL GUIDELINES

The following expansive soil guidelines are provided for your project. The intent of these guidelines is to inform you, the client, of the importance of proper design and maintenance of projects supported on expansive soils. ***You, as the owner or other interested party, should be warned that you have a duty to provide the information contained in the soil report including these guidelines to your design engineers, architects, landscapers and other design parties in order to enable them to provide a design that takes into consideration expansive soils.***

In addition, you should provide the soil report with these guidelines to any property manager, lessee, property purchaser or other interested party that will have or assume the responsibility of maintaining the development in the future.

Expansive soils are fine-grained silts and clays which are subject to swelling and contracting. The amount of this swelling and contracting is subject to the amount of fine-grained clay materials present in the soils and the amount of moisture either introduced or extracted from the soils. Expansive soils are divided into five categories ranging from "very low" to "very high". Expansion indices are assigned to each classification and are included in the laboratory testing section of this report. *If the expansion index of the soils on your site, as stated in this report, is 21 or higher, you have expansive soils.* The classifications of expansive soils are as follows:

Classification of Expansive Soil*

Expansion Index	Potential Expansion
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
Above 130	Very High

*From Table 18A-I-B of California Building Code (1988)

When expansive soils are compacted during site grading operations, care is taken to place the materials at or slightly above optimum moisture levels and perform proper compaction operations. Any subsequent excessive wetting and/or drying of expansive soils will cause the soil materials to expand and/or contract. These actions are likely to cause distress of foundations, structures, slabs-on-grade, sidewalks and pavement over the life of the structure. ***It is therefore imperative that even after construction of improvements, the moisture contents are maintained at relatively constant levels, allowing neither excessive wetting or drying of soils.***

Evidence of excessive wetting of expansive soils may be seen in concrete slabs, both interior and exterior. Slabs may lift at construction joints producing a trip hazard or may crack from the pressure of soil expansion. Wet clays in foundation areas may result in lifting of the structure causing difficulty in the opening and closing of doors and windows, as well as cracking in exterior and interior wall surfaces. In extreme wetting of soils to depth, settlement of the structure may eventually result. Excessive wetting of soils in landscape areas adjacent to concrete or asphaltic pavement areas may also result in expansion of soils beneath pavement and resultant distress to the pavement surface.

Excessive drying of expansive soils is initially evidenced by cracking in the surface of the soils due to contraction. Settlement of structures and on-grade slabs may also eventually result along with problems in the operation of doors and windows.

Projects located in areas of expansive clay soils will be subject to more movement and "hairline" cracking of walls and slabs than similar projects situated on non-expansive sandy soils. There are, however, measures that developers and property owners may take to reduce the amount of movement over the life the development. The following guidelines are provided to assist you in both design and maintenance of projects on expansive soils:

- Drainage away from structures and pavement is essential to prevent excessive wetting of expansive soils. Grades should be designed to the latest building code and maintained to allow flow of irrigation and rain water to approved drainage devices or to the street. Any "ponding" of water adjacent to buildings, slabs and pavement after rains is evidence of poor drainage; the installation of drainage devices or regrading of the area may be required to assure proper drainage. Installation of rain gutters is also recommended to control the introduction of moisture next to buildings. Gutters should discharge into a drainage device or onto pavement which drains to roadways.

- Irrigation should be strictly controlled around building foundations, slabs and pavement and may need to be adjusted depending upon season. This control is essential to maintain a relatively uniform moisture content in the expansive soils and to prevent swelling and contracting. Over-watering adjacent to improvements may result in damage to those improvements. NorCal Engineering makes no specific recommendations regarding landscape irrigation schedules.

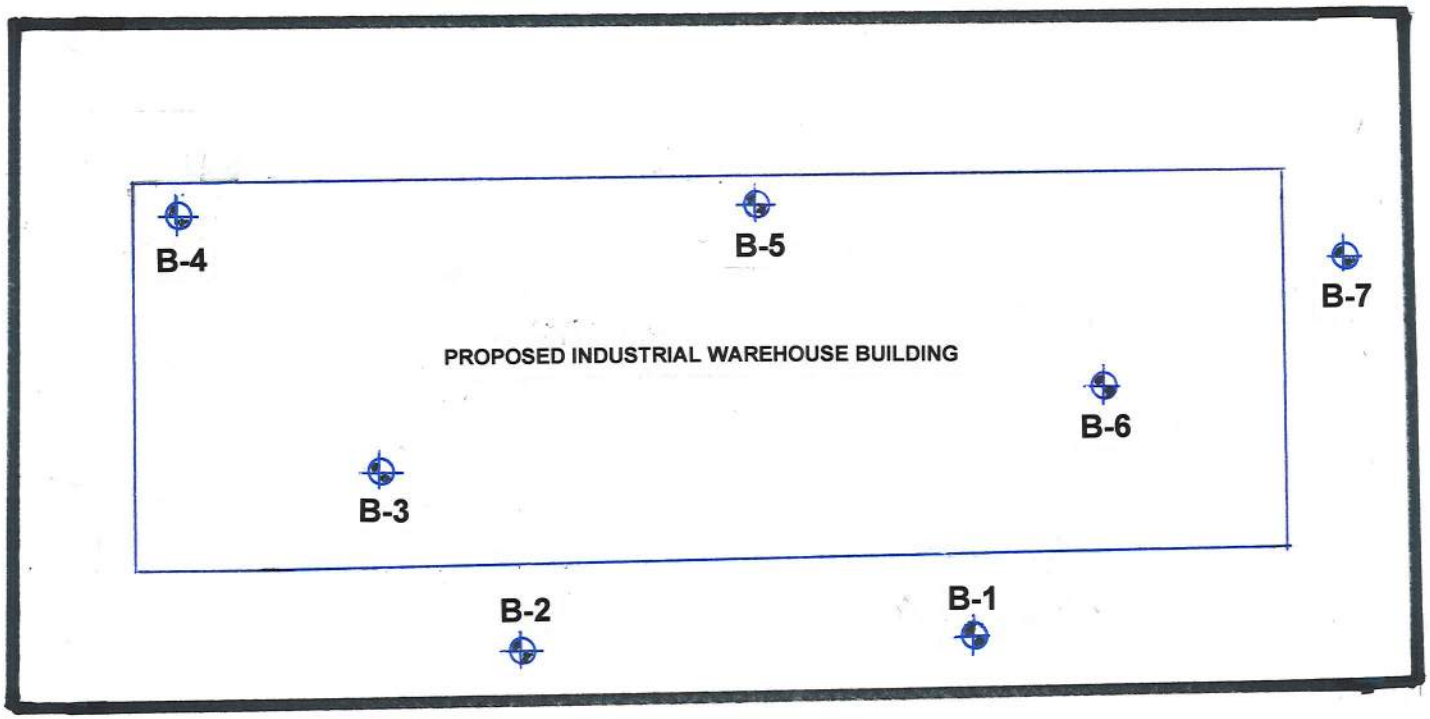
- Planting schemes for landscaping around structures and pavement should be analyzed carefully. Plants (including sod) requiring high amounts of water may result in excessive wetting of soils. Trees and large shrubs may actually extract moisture from the expansive soils, thus causing contraction of the fine-grained soils.

- Thickened edges on exterior slabs will assist in keeping excessive moisture from entering directly beneath the concrete. A six-inch thick or greater deepened edge on slabs may be considered. Underlying interior and exterior slabs with 6 to 12 inches or more of non-expansive soils and providing presaturation of the underlying clayey soils as recommended in the soil report will improve the overall performance of on-grade slabs.

- Increase the amount of steel reinforcing in concrete slabs, foundations and other structures to resist the forces of expansive soils. The precise amount of reinforcing should be determined by the appropriate design engineers and/or architects.

- Recommendations of the soil report should always be followed in the development of the project. Any recommendations regarding presaturation of the upper subgrade soils in slab areas should be performed in the field and verified by the Soil Engineer.

WENTWORTH DRIVE



NORTH

1 INCH = 100 FEET

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

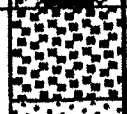
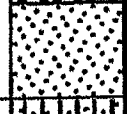
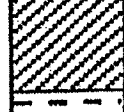
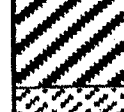
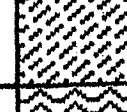
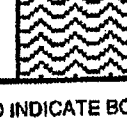
PROJECT: 23487-22

DATE: SEPTEMBER 2022

SITE PLAN

List of Appendices
(in order of appearance)

Appendix A
Log of Excavations

MAJOR DIVISION			GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL, SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SAND (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINE (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

UNIFIED SOIL CLASSIFICATION SYSTEM

KEY:

 Indicates 2.5-inch Inside Diameter. Ring Sample.

 Indicates 2-inch OD Split Spoon Sample (SPT).

 Indicates Shelby Tube Sample.

 Indicates No Recovery.

 Indicates SPT with 140# Hammer 30 in. Drop.

 Indicates Bulk Sample.

 Indicates Small Bag Sample.

 Indicates Non-Standard

 Indicates Core Run.

COMPONENT PROPORTIONS

DESCRIPTIVE TERMS	RANGE OF PROPORTION
Trace	1 - 5%
Few	5 - 10%
Little	10 - 20%
Some	20 - 35%
And	35 - 50%

COMPONENT DEFINITIONS

COMPONENT	SIZE RANGE
Boulders	Larger than 12 in
Cobbles	3 in to 12 in
Gravel	3 in to No 4 (4.5mm)
Coarse gravel	3 in to 3/4 in
Fine gravel	3/4 in to No 4 (4.5mm)
Sand	No. 4 (4.5mm) to No. 200 (0.074mm)
Coarse sand	No. 4 (4.5 mm) to No. 10 (2.0 mm)
Medium sand	No. 10 (2.0 mm) to No. 40 (0.42 mm)
Fine sand	No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt and Clay	Smaller than No. 200 (0.074 mm)

MOISTURE CONTENT

DRY	Absence of moisture, dusty, dry to the touch.
DAMP	Some perceptible moisture; below optimum
MOIST	No visible water; near optimum moisture content
WET	Visible free water, usually soil is below water table.

RELATIVE DENSITY OR CONSISTENCY VERSUS SPT N -VALUE

COHESIONLESS SOILS		COHESIVE SOILS		
Density	N (blows/ft)	Consistency	N (blows/ft)	Approximate Undrained Shear Strength (psf)
Very Loose	0 to 4	Very Soft	0 to 2	< 250
Loose	4 to 10	Soft	2 to 4	250 - 500
Medium Dense	10 to 30	Medium Stiff	4 to 8	500 - 1000
Dense	30 to 50	Stiff	8 to 15	1000 - 2000
Very Dense	over 50	Very Stiff	15 to 30	2000 - 4000
		Hard	over 30	> 4000

National Tube Supply
23487-22

Log of Boring B-1

Boring Location: SWC of S. Sanderson & Wentworth, Hemet

Date of Drilling: 8/23/2022 | Groundwater Depth: None Encountered

Drilling Method: Simco 2800 HS

Hammer Weight: 140 lbs. | Drop: 30"

Surface Elevation:

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL Sandy SILT Brown, soft, dry					
		NATURAL Sandy SILT Brown, medium stiff, damp					
5		Silty (fine to medium grained) SAND Brown, medium dense to dense, moist					
		Boring completed at depth of 5'					
10							
15							
20							
25							
30							
35							

GWT not encountered

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\123487-22.log Date: 8/30/2022

NorCal Engineering

National Tube Supply
23487-22

Log of Boring B-2

Boring Location: SWC of S. Sanderson & Wentworth, Hemet

Date of Drilling: 8/23/2022 | **Groundwater Depth:** None Encountered

Drilling Method: Simco 2800 HS

Hammer Weight: 140 lbs. | **Drop:** 30"

Surface Elevation:

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL Sandy SILT Brown, soft, dry					
		NATURAL Sandy SILT Brown, medium stiff, damp					
5		GWT not encountered					
		Silty (fine to coarse grained) SAND Brown, medium dense to dense, damp					
10		Boring completed at depth of 10'					
15							
20							
25							
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\23487-22.log Date: 8/30/2022

NorCal Engineering

National Tube Supply
23487-22

Log of Boring B-3

Boring Location: SWC of S. Sanderson & Wentworth, Hemet

Date of Drilling: 8/23/2022 | Groundwater Depth: None Encountered

Drilling Method: Simco 2800 HS

Hammer Weight: 140 lbs. | Drop: 30"

Surface Elevation:

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL Sandy SILT Brown, soft, dry					
		NATURAL Sandy SILT Brown, stiff to medium stiff, damp		9/13	5.1	99.2	
5				4/5	5.8	96.1	
		Silty (fine to coarse grained) SAND Brown, medium dense to dense, damp; with occasional gravel					
10				7/11	3.9	107.7	
15				22/32	3.6	111.9	
20				12/15	2.2	105.9	
		Boring completed at depth of 21'					
25							
30							
35							

GWT not encountered

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\23487-22.log Date: 8/30/2022

NorCal Engineering

National Tube Supply
23487-22

Log of Boring B-4

Boring Location: SWC of S. Sanderson & Wentworth, Hemet

Date of Drilling: 8/23/2022 | Groundwater Depth: None Encountered

Drilling Method: Simco 2800 HS

Hammer Weight: 140 lbs. | Drop: 30"

Surface Elevation:

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL Sandy SILT Brown, soft, dry					
		NATURAL Sandy SILT Brown, medium stiff, damp	■	6/6	6.9	98.1	
5		Silty (fine to coarse grained) SAND Brown, medium dense to dense, moist; with occasional gravel	■	7/10	6.1	105.1	
10		Boring completed at depth of 10'					
15							
20							
25							
30							
35							

GWT not encountered

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\23487-22.log Date: 8/30/2022

NorCal Engineering

National Tube Supply
23487-22

Log of Boring B-5

Boring Location: SWC of S. Sanderson & Wentworth, Hemet

Date of Drilling: 8/23/2022 | **Groundwater Depth:** None Encountered

Drilling Method: Simco 2800 HS

Hammer Weight: 140 lbs. | **Drop:** 30"

Surface Elevation:

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL Sandy SILT Brown, soft, dry; with concrete and asphalt fragments and gravel					
		NATURAL Sandy SILT Brown, medium stiff, damp to moist	■	7/7	7.9	97.7	
5		Silty (fine to medium grained) SAND Brown, medium dense to dense, moist to damp	■	8/10	8.6	105.1	
10			■	12/15	2.6	109.3	
15			■	14/16	2.1	108.1	
20		Boring completed at depth of 20'					
25							
30							
35							

GWT not encountered

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\23487-22.log Date: 8/30/2022

NorCal Engineering

National Tube Supply
23487-22

Log of Boring B-6

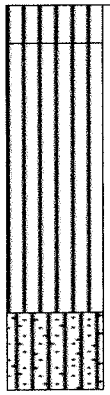
Boring Location: SWC of S. Sanderson & Wentworth, Hemet

Date of Drilling: 8/23/2022 | Groundwater Depth: None Encountered

Drilling Method: Simco 2800 HS

Hammer Weight: 140 lbs. | Drop: 30"

Surface Elevation:



Depth (feet)	Lithology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL Sandy SILT Brown, soft, dry					
		NATURAL Sandy SILT Brown, medium stiff, damp	■	10/11	4.9	101.7	
5			■	4/8	2.7	99.8	
		Silty (fine to medium grained) SAND Brown, medium dense to dense, moist					
10		Boring completed at depth of 10'					
15							
20							
25							
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\23487-22.log Date: 8/30/2022

NorCal Engineering

National Tube Supply
23487-22

Log of Boring B-7

Boring Location: SWC of S. Sanderson & Wentworth, Hemet

Date of Drilling: 8/23/2022 | Groundwater Depth: None Encountered

Drilling Method: Simco 2800 HS

Hammer Weight: 140 lbs. | Drop: 30"

Surface Elevation:

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL Sandy SILT Brown, soft, dry NATURAL Sandy SILT Brown, medium stiff, damp					
5		Silty (fine to medium grained) SAND Brown, medium dense to dense, damp; with occasional gravel	■	5/7	5.0	98.1	
10		Boring completed at depth of 10'	■	7/11	2.6	106.5	
15							
20							
25							
30							
35							

GWT not encountered

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\23487-22.log Date: 8/30/2022

NorCal Engineering

Appendix B
Laboratory Tests

TABLE I
MAXIMUM DENSITY TESTS

Sample	Classification	Optimum Moisture (%)	Maximum Dry Density (lbs/cu.ft)
B-3 @ 2'	Sandy SILT	11.0	124.0

TABLE II
EXPANSION TESTS

Sample	Classification	Expansion Index
B-3 @ 2'	Sandy SILT	7

TABLE III
ATTERBERG LIMITS

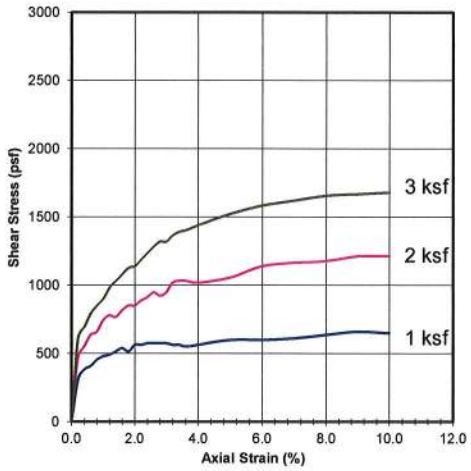
Sample	Liquid Limit	Plastic Limit	Plasticity Index
B-3 @ 5'	21	18	3

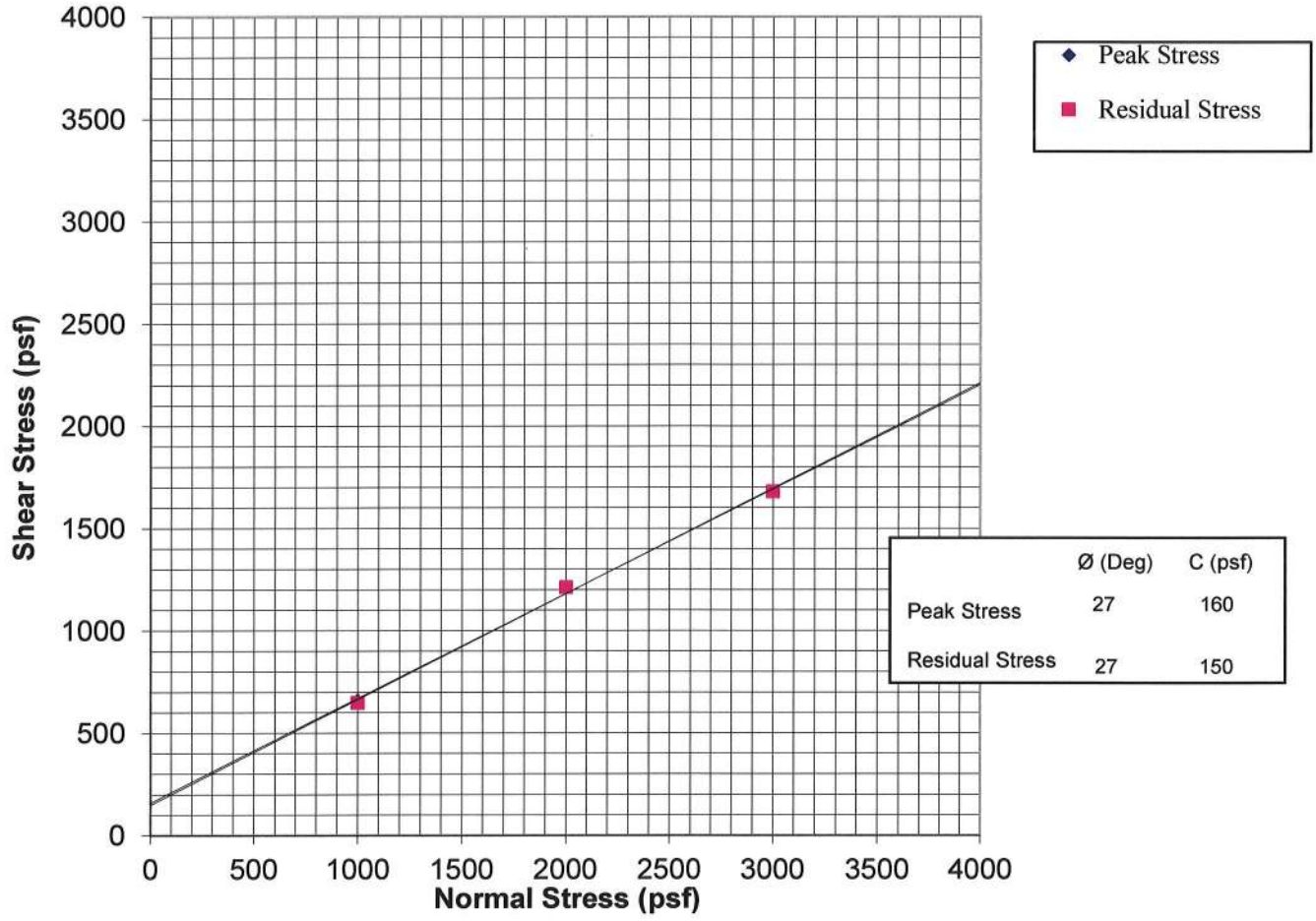
TABLE IV
CORROSION TESTS

Sample	pH	Electrical Resistivity	Sulfate (%)	Chloride (ppm)
B-3 @ 2'	7.2	2,855	0.006	190

% by weight
ppm – mg/kg

Sample No.		B3@2'		
Sample Type:		Undisturbed-Saturated		
Soil Description:		Sandy Silt		
		1	2	3
Normal Stress	(psf)	1000	2000	3000
Peak Stress	(psf)	660	1212	1680
Displacement	(in.)	0.225	0.225	0.250
Residual Stress	(psf)	648	1212	1680
Displacement	(in.)	0.250	0.250	0.250
Initial Dry Density	(pcf)	99.2	99.2	99.2
Initial Water Content	(%)	5.1	5.1	5.1
Strain Rate	(in./min.)	0.020	0.020	0.020





NorCal Engineering

SOILS AND GEOTECHNICAL CONSULTANTS

National Tube Supply

PROJECT NUMBER: 23487-22 DATE: 9/2/2022

DIRECT SHEAR TEST

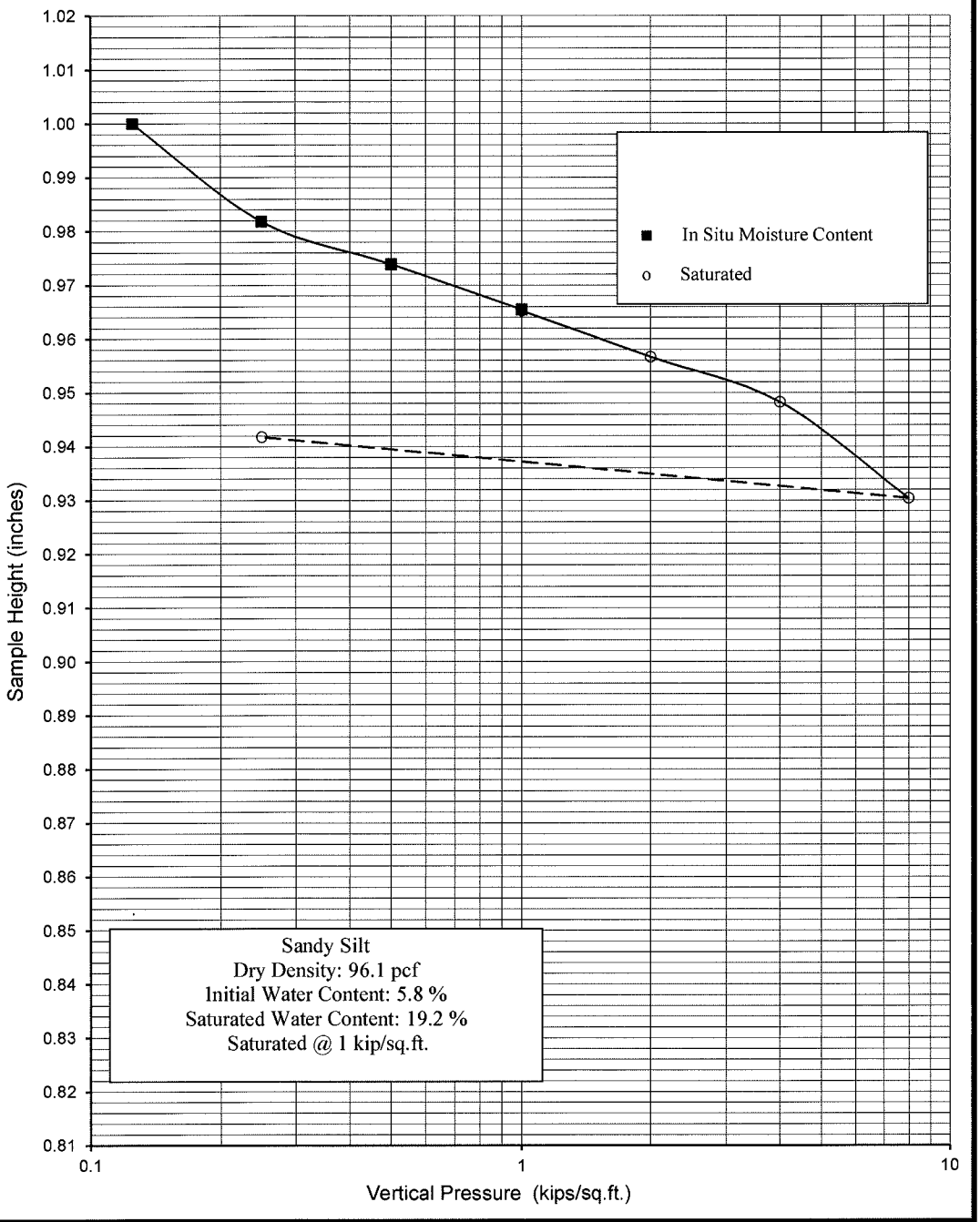
ASTM D3080

Plate A

Vertical Pressure (kips/sq.ft.)	Sample Height (inches)	Consolidation (percent)	Saturated
0.125	**1.0000**	**0.0**	
0.25	**0.9818**	**1.8**	
0.5	**0.9739**	**2.6**	
1	**0.9655**	**3.5**	
1	**0.9653**	**3.5**	S
2	**0.9567**	**4.3**	
4	**0.9483**	**5.2**	
8	**0.9304**	**7.0**	
0.25	**0.9418**	**5.8**	

Date Tested: **8/29/2022**
Sample No.: **B3**
Depth: **5'**

Sample No.	B3	Depth	5'	Date	9/2/2022



NorCal Engineering

SOILS AND GEOTECHNICAL CONSULTANTS

National Tube Supply

PROJECT NUMBER: 23487-22 DATE: 9/2/2022

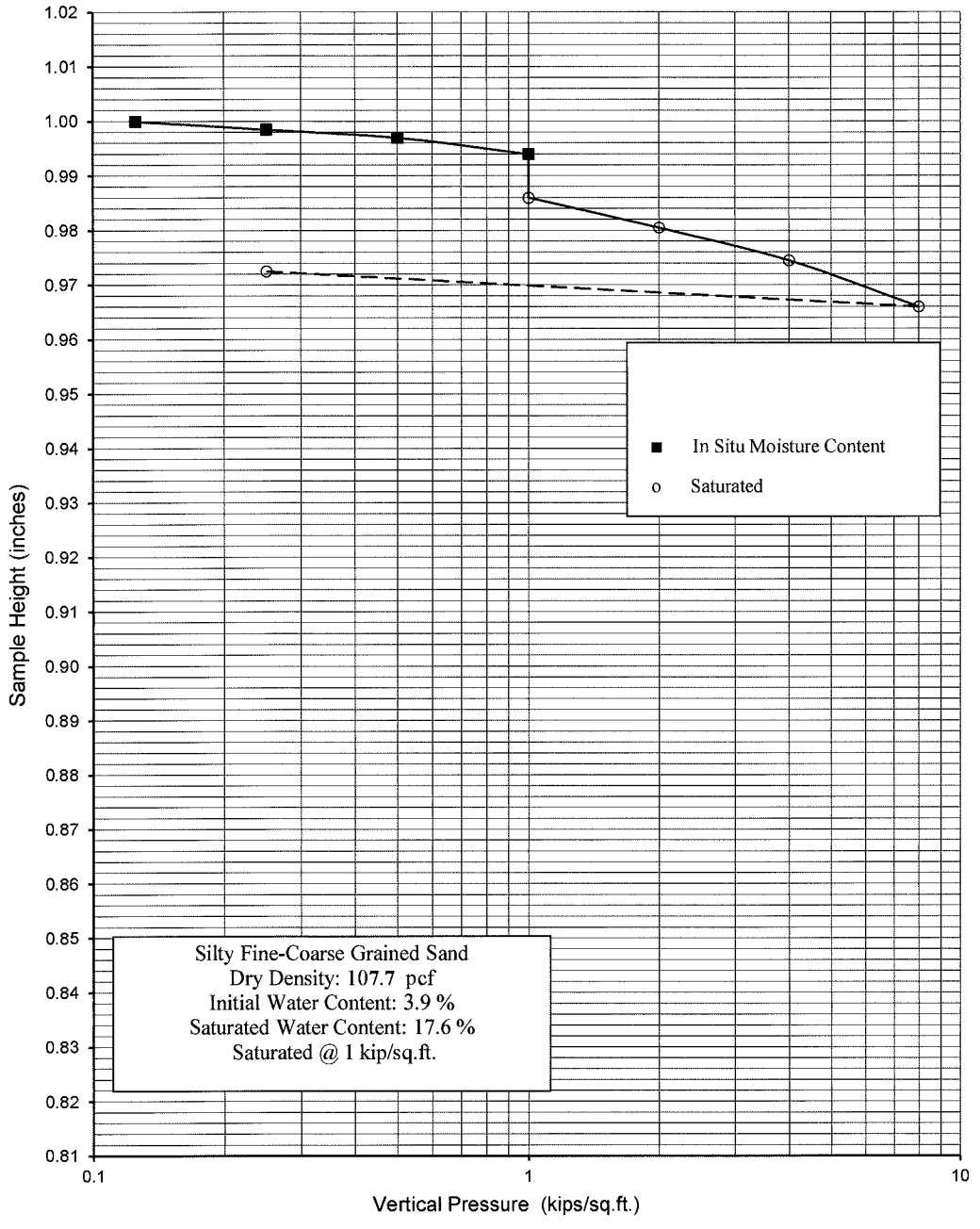
CONSOLIDATION TEST

ASTM D2435

Plate B

Vertical Pressure (kips/sq.ft.)	Sample Height (inches)	Consolidation (percent)		Sample No. B3	Depth 10'	Date 9/2/2022
0.125	1.0000	0.0				
0.25	0.9985	0.2				
0.5	0.9970	0.3				
1	0.9940	0.6				
1	0.9860	1.4				
2	0.9805	2.0				
4	0.9745	2.6				
8	0.9660	3.4				
0.25	0.9725	2.8	Saturated			

Date Tested: 8/29/2022
Sample: B3
Depth: 10'



NorCal Engineering

SOILS AND GEOTECHNICAL CONSULTANTS

National Tube Supply

PROJECT NUMBER: 23487-22 DATE: 9/2/2022

CONSOLIDATION TEST

ASTM D2435

Plate C

Appendix C
Seismic Design Report

NorCal Engineering

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-22
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 1522.49 ft (NAVD 88)
Latitude: 33.73426
Longitude: -117.009117

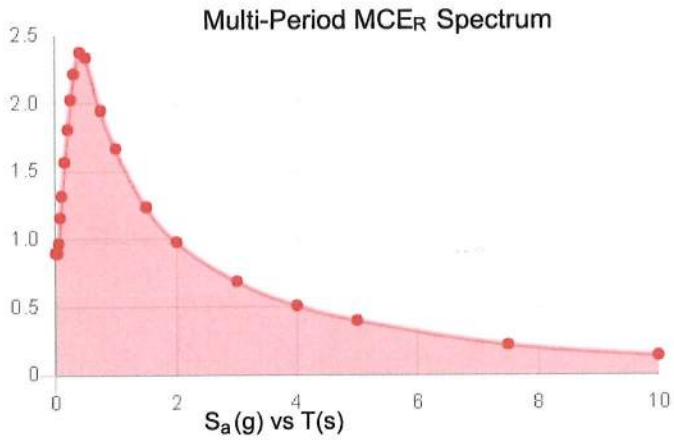
ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

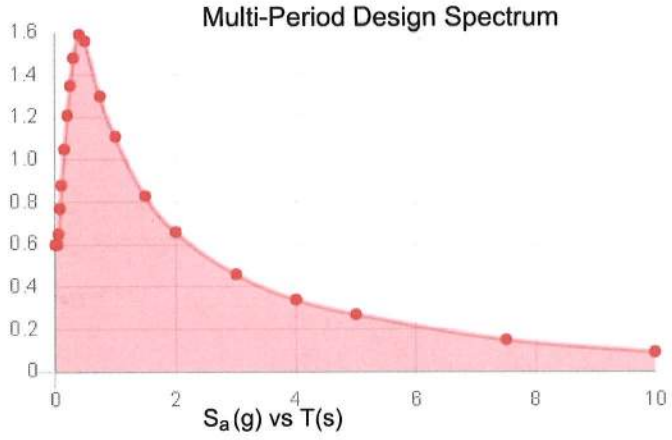
Seismic

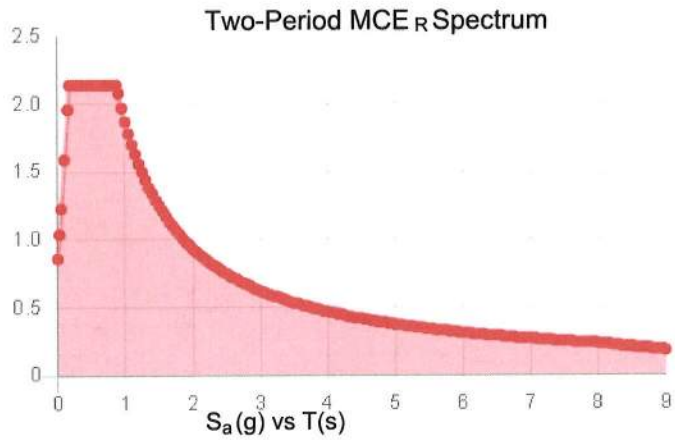
Site Soil Class:

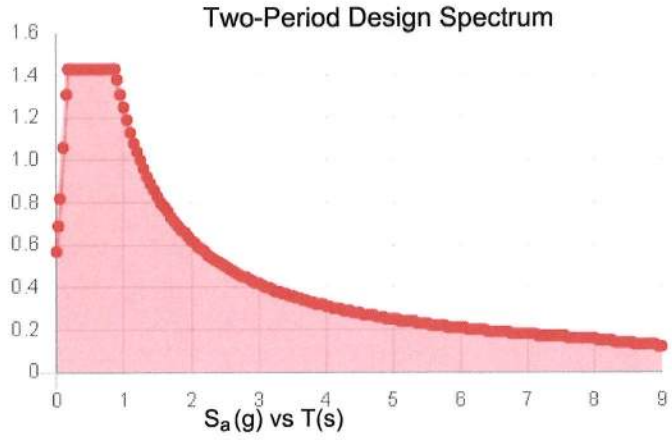
Results:

PGA_M :	0.75	T_L :	8
S_{MS} :	2.14	S_S :	2.04
S_{M1} :	1.87	S_1 :	0.71
S_{DS} :	1.43	S_{DC} :	
S_{D1} :	1.25	V_{S30} :	260









MCER Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

Design Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

Data Accessed: Thu Aug 25 2022

Date Source:
USGS Seismic Design Maps based on ASCE/SEI 7-22 and ASCE/SEI 7-22 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-22 Ch. 21 are available from USGS.

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

Appendix D
Soil Infiltration Data

NORCAL ENGINEERING

SOILS AND GEOTECHNICAL CONSULTANTS

PERCOLATION TEST DATA

Client: Kluge Consulting LLC	**Date:** 8/23/2022
Project No.: 23487-22	**Tested By:** J.S.
Test Hole: 1	**USCS Soil Classification:**
Depth of Test Hole: 5' (60")	**Sides (if rectangular):**
Diameter of Test Hole: 6"	**Length:**
Sandy Soil Criteria Test*:	**Width:**

TRIAL NO.	START TIME	STOP TIME	TIME INTERVAL (MIN)	INITIAL DEPTH TO WATER (IN)	FINAL DEPTH TO WATER (IN)	CHANGE IN WATER LEVEL (IN)	GREATER THAN OR EQUAL TO 6"
1	7:54	8:10	16.0	44.0	60.0	16.0	Y
2	8:10	8:31	21.0	44.0	60.0	16.0	Y

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30-minute intervals) with a precision of at least 0.25".

TRIAL NO	START TIME	STOP TIME	ΔT TIME INTERVAL (MIN)	Do INITIAL DEPTH TO WATER (IN)	Df FINAL DEPTH TO WATER (IN)	ΔD CHANGE IN WATER LEVEL (IN)	PERCOLATION RATE (MIN/IN)
1	8:31	8:41	10	45.0	55.0	10.0	
2	8:41	8:51	10	45.0	55.5	10.5	
3	8:51	9:01	10	45.0	54.5	9.5	
4	9:01	9:11	10	45.0	54.5	9.5	
5	9:11	9:21	10	45.0	54.5	9.5	
6	9:21	9:31	10	45.0	54.5	9.5	

COMMENTS:

NORCAL ENGINEERING

SOILS AND GEOTECHNICAL CONSULTANTS

PERCOLATION TEST DATA

Client: Kluge Consulting LLC	**Date:** 8/23/2022
Project No.: 23487-22	**Tested By:** J.S.
Test Hole: 2	**USCS Soil Classification:**
Depth of Test Hole: 10' (120")	**Sides (if rectangular):**
Diameter of Test Hole: 6"	**Length:**
Sandy Soil Criteria Test*:	**Width:**

TRIAL NO.	START TIME	STOP TIME	TIME INTERVAL (MIN)	INITIAL DEPTH TO WATER (IN)	FINAL DEPTH TO WATER (IN)	CHANGE IN WATER LEVEL (IN)	GREATER THAN OR EQUAL TO 6"
1	8:15	8:18	3	103.0	120.0	17.0	Y
2	8:18	8:27	9	103.0	120.0	17.0	Y

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30-minute intervals) with a precision of at least 0.25".

TRIAL NO	START TIME	STOP TIME	ΔT TIME INTERVAL (MIN)	Do INITIAL DEPTH TO WATER (IN)	Df FINAL DEPTH TO WATER (IN)	ΔD CHANGE IN WATER LEVEL (IN)	PERCOLATION RATE (MIN/IN)
1	8:27	8:37	10	105.0	119.0	14.0	
2	8:37	8:47	10	105.0	119.0	14.0	
3	8:47	8:57	10	105.0	118.5	13.5	
4	8:57	9:07	10	105.0	118.0	13.0	
5	9:07	9:17	10	105.0	118.5	13.5	
6	9:17	9:27	10	105.0	118.5	13.5	
COMMENTS:							

SOIL PERMEABILITY CALCS ⇒ PORCHET METHOD

Location:	B-1	B-2
• Depth =	5.0'	10.0'
• Hole Dia. =	6"	6"
• Drop = ΔH	9.5"	13.5"
• Time = Δt Interval	10 min	10 min
• Average Head = H_{ave}	10.25"	8.25"
• Infiltration Rate = I_t	7.3 in/hr	12.5 in/hr

$$\text{Infiltration Rate} = I_t = \frac{\Delta H}{\Delta t} \frac{(60 r)}{(r + 2 H_{ave})}$$ where r = hole radius

r = 3 in

KEITH D. TUCKER
Consulting Engineer

DATE 2022