ALLARD ENGINEERING
civil engineering land surveying land planning

APN No. 0472-181-16

Preliminary Drainage Report

July 9, 2024

Prepared For:
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Discussion

Introduction

APN 0472-181-16 is the proposed commercial re-development located in the City of Victorville, County of San Bernardino, California, located northwest corner of Bimini Street and Abbey Ln. Site is 6.0 acres mostly vacant land with a single existing building structure and the site is proposed to be developed into a Burrtec Facility for commercial use which consist of Office Bldg, Facility Bldg., loading area, storage area, parking area of the entire site area of 6.0 acres. In existing condition, the site consist of a single building structure and barren dirt area. The natural terrain of the site flows in Southwesterly direction at a slope of approximately 1 to 2%.

The site is not located within the Victorville Master Plan of Drainage System (Comprehensive Storm Drain Plan). Only available comprehensive storm drain system which run on the west of the Mojave River (Line C-01-02. The entire site will drain to the proposed infiltration/retention basin (Basin-1 through 4) and the chamber system (Chamber-1) at the site. The proposed retention/infiltration basin/chamber system are sized to qualify for WQMP volume as well as detention volume for the 10-year storm event from the site. The proposed infiltration/retention basin/chamber system will drain out to the existing drainage course at Bimini Street on surface at the driveway at the southwest corner when it reaches capacity. The site is close proximity to the east of Mojave River and is tabled to drain to the River through existing natural streams.

Purpose

The purpose of this Drainage Report is to determine storm water runoff for onsite area. Also to show that the proposed retention/infiltration basin/chamber system (Storm-Tech system) is adequately sized to retain the onsite runoff volume increase in developed condition for 10-yr storm event from 90% of the runoff volume in existing condition. to 90%. The overflow from the onsite retention system will be drain out on surface when they reaches the capacity in a safe manner into the street gutter. Detailed hydrology analysis and calculations are provided with this report for the onsite developed condition.

Criteria

The criteria utilized for hydrologic analysis is the San Bernardino County Hydrology Manual, AES rational method hydrology analysis and the City of Victorville Master Plan of Drainage. AES software (Rational Method Hydrology) was used to quantify onsite flow and CivilDesign software was used to perform Unit Hydrograph Analysis for calculating detention volume. AES software were used for the proposed storm drain system onsite and the street capacity calculation to convey the flow on surface into the existing drainage course at Bimini Street.

Findings

The proposed site development (APN: 0472-181-16) which will be 90% impervious and its drainage system will comprise of storm drain pipes, concrete swale, onsite grate inlets with filtration device, and the below surface infiltration chamber system and an infiltration basin. The infiltration/retention system is sized to qualify for WQMP volume as well as the detention volume (10-yr storm event) for the proposed developed site.

The onsite runoff of 16.3 CFS generated from the proposed site in developed condition which is 6.0 acres. The onsite runoff (16.3 cfs) will be drained into the proposed retention/infiltration basin-1 through 4 and the below surface retention/infiltration chamber system for WQ volume (15,387 CF) for infiltration and the retention/infiltration of the detention volume (31,552 CF for 10-yr storm event) to mitigate HCOC condition.

The site in existing condition, comprise of an existing building, and rest of the area is in barren condition. Overall the existing condition is considered 10% impervious.

We calculated the onsite runoff quantities of 16.3 CFS in proposed developed condition and 5.4 CFS in existing condition using the rational method hydrology analysis for the 100-yr storm event. Also calculated the onsite runoff quantities of 9.0 CFS in proposed developed condition and 1.7 CFS in existing condition for 10-yr storm event. The increase in runoff volume will be mitigated with onsite below surface retention/infiltration chamber system and infiltration/retention basin-1 through 4 by full retention and infiltration of the detention water volume upto 10-yr storm event.

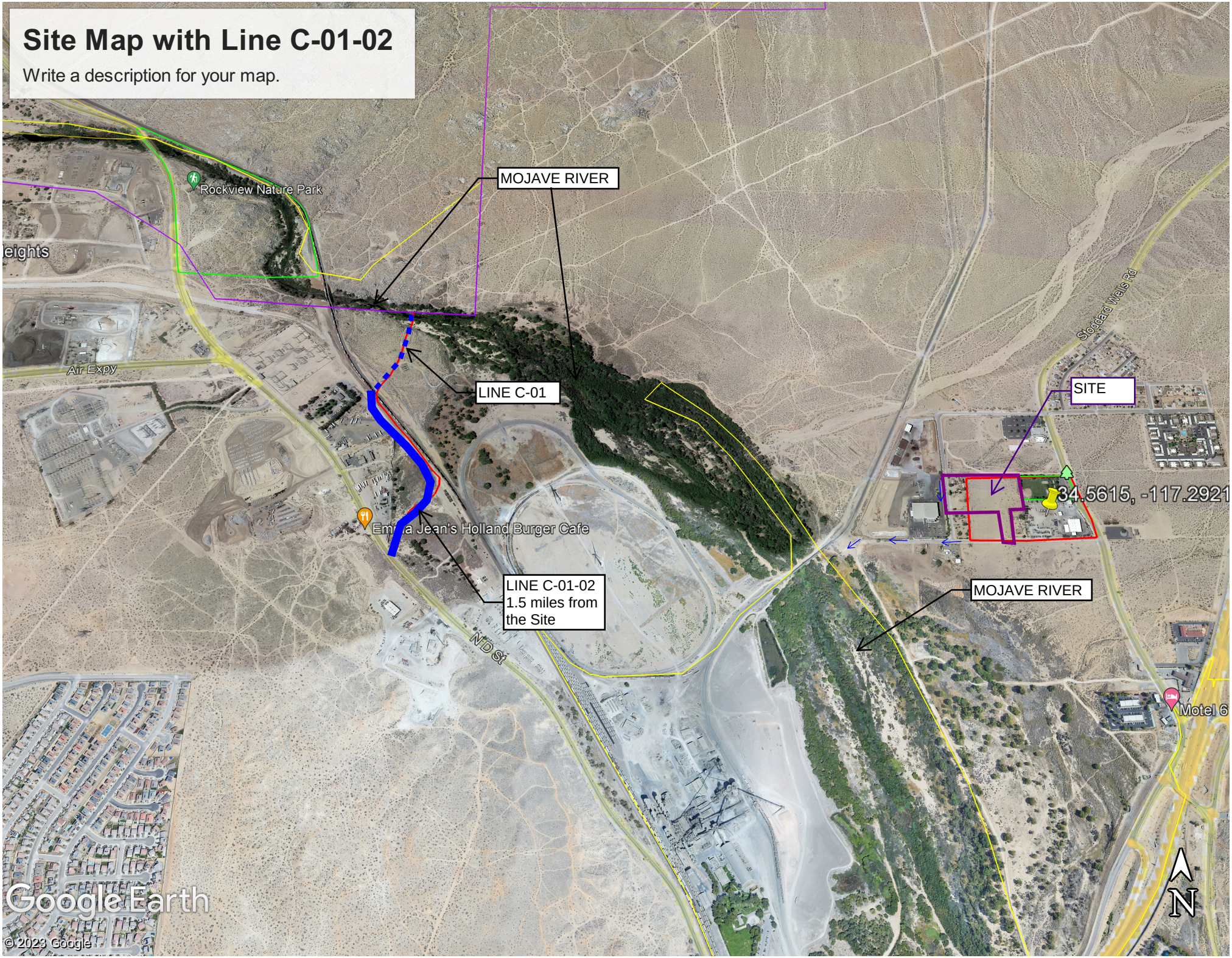
Once the retention/infiltration basin/chamber system reaches their capacity, the storm water will stop entering the proposed basins / underground chamber, and surface drain on the driveway at the southwest corner of the site to the existing gutter in Bimini Street. The runoff will follow the existing natural channel and ultimately drain to Mojave River which is the closest receiving water.

The increase in onsite runoff rate due to the proposed development will be partly mitigated via flow attenuation and the detention of the water volume in the proposed basins/chamber. Also the site is close proximity (1/3 of a mile) to its final receiving channel the Mojave River and the streets/the existing natural stream leading to the channel has the capacity to handle the increase runoff from the site. Therefore there will be no HCOC condition upon developing the proposed site.

Reference plans/documents, calculations and the exhibits are attached to support these findings.

Reference Material


BURRTEC-VICTORVILLE
APN: 0472-181-16,23,65
EX, IMPERVIOUS AREA:
8,850 SF0 (0.2 AC)
96% PERVIOUS
SITE (6 AC)
GPS COORD:
34.56210, -117.29390
Grady Trammel Park
Stoddard Wells Rd
E. ABBEY LN
E Abbey L
Burrtec Waste
ABBEY LN
Abbey Ln
Google Earth
Image © 2024 Airbus
© 2023 Google
N
500 ft


Site Map with Line C-01-02
Write a description for your map.
MOJAVE RIVER
Rockview Nature Park
LINE C-01
SITE
34.5615, -117.2921
Emma Jean's Holland Burger Cafe
LINE C-01-02
1.5 miles from
the Site
MOJAVE RIVER
Motel 6
Google Earth
© 2023 Google
N

NOAA Atlas 14, Volume 6, Version 2
Location name: Victorville, California, USA*
Latitude: 34.5621°, Longitude: -117.2939°
Elevation: 2720 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.102 (0.084-0.125)	0.139 (0.114-0.170)	0.191 (0.157-0.234)	0.236 (0.192-0.292)	0.302 (0.238-0.387)	0.357 (0.276-0.467)	0.416 (0.314-0.558)	0.482 (0.353-0.663)	0.577 (0.406-0.827)	0.656 (0.446-0.974)
10-min	0.146 (0.121-0.179)	0.199 (0.164-0.244)	0.273 (0.225-0.336)	0.338 (0.276-0.419)	0.433 (0.342-0.555)	0.512 (0.395-0.669)	0.597 (0.450-0.799)	0.690 (0.506-0.950)	0.826 (0.582-1.19)	0.940 (0.640-1.40)
15-min	0.177 (0.146-0.217)	0.241 (0.198-0.295)	0.331 (0.272-0.406)	0.409 (0.333-0.507)	0.524 (0.413-0.671)	0.619 (0.478-0.809)	0.722 (0.544-0.967)	0.835 (0.612-1.15)	0.999 (0.704-1.43)	1.14 (0.773-1.69)
30-min	0.234 (0.193-0.286)	0.318 (0.262-0.390)	0.437 (0.359-0.537)	0.540 (0.440-0.670)	0.692 (0.546-0.886)	0.818 (0.632-1.07)	0.954 (0.719-1.28)	1.10 (0.809-1.52)	1.32 (0.930-1.90)	1.50 (1.02-2.23)
60-min	0.267 (0.221-0.327)	0.363 (0.299-0.445)	0.499 (0.410-0.614)	0.617 (0.503-0.765)	0.791 (0.624-1.01)	0.934 (0.722-1.22)	1.09 (0.822-1.46)	1.26 (0.925-1.74)	1.51 (1.06-2.16)	1.72 (1.17-2.55)
2-hr	0.371 (0.306-0.455)	0.496 (0.409-0.608)	0.669 (0.550-0.823)	0.818 (0.667-1.01)	1.03 (0.815-1.32)	1.21 (0.933-1.58)	1.40 (1.05-1.87)	1.60 (1.17-2.20)	1.88 (1.33-2.70)	2.12 (1.44-3.15)
3-hr	0.438 (0.361-0.536)	0.582 (0.479-0.713)	0.780 (0.641-0.959)	0.949 (0.774-1.18)	1.19 (0.939-1.52)	1.38 (1.07-1.81)	1.59 (1.20-2.13)	1.81 (1.33-2.49)	2.12 (1.49-3.04)	2.38 (1.62-3.53)
6-hr	0.586 (0.484-0.718)	0.779 (0.642-0.955)	1.04 (0.854-1.28)	1.26 (1.02-1.56)	1.56 (1.23-2.00)	1.80 (1.40-2.36)	2.06 (1.55-2.76)	2.32 (1.71-3.20)	2.70 (1.90-3.87)	3.00 (2.04-4.45)
12-hr	0.747 (0.616-0.914)	1.00 (0.825-1.23)	1.34 (1.10-1.65)	1.62 (1.32-2.00)	2.00 (1.58-2.56)	2.30 (1.77-3.00)	2.60 (1.96-3.48)	2.92 (2.14-4.01)	3.35 (2.36-4.80)	3.68 (2.51-5.47)
24-hr	0.949 (0.842-1.09)	1.29 (1.14-1.49)	1.74 (1.54-2.01)	2.10 (1.84-2.45)	2.59 (2.20-3.12)	2.97 (2.47-3.65)	3.35 (2.72-4.22)	3.74 (2.95-4.85)	4.27 (3.23-5.77)	4.68 (3.42-6.54)
2-day	1.09 (0.968-1.26)	1.51 (1.34-1.74)	2.06 (1.82-2.38)	2.51 (2.20-2.92)	3.12 (2.64-3.75)	3.59 (2.98-4.41)	4.07 (3.29-5.12)	4.56 (3.59-5.91)	5.23 (3.95-7.06)	5.75 (4.20-8.04)
3-day	1.19 (1.06-1.37)	1.66 (1.47-1.91)	2.28 (2.02-2.64)	2.79 (2.44-3.25)	3.48 (2.95-4.19)	4.02 (3.34-4.94)	4.57 (3.70-5.75)	5.14 (4.05-6.65)	5.91 (4.47-7.98)	6.52 (4.76-9.11)
4-day	1.27 (1.12-1.46)	1.77 (1.57-2.04)	2.43 (2.15-2.81)	2.97 (2.60-3.46)	3.71 (3.14-4.46)	4.27 (3.55-5.25)	4.85 (3.93-6.11)	5.45 (4.29-7.06)	6.26 (4.73-8.46)	6.90 (5.04-9.63)
7-day	1.37 (1.22-1.58)	1.89 (1.67-2.18)	2.57 (2.27-2.97)	3.12 (2.73-3.64)	3.86 (3.28-4.65)	4.43 (3.68-5.45)	5.01 (4.06-6.31)	5.59 (4.41-7.24)	6.38 (4.82-8.61)	6.98 (5.10-9.76)
10-day	1.44 (1.28-1.66)	1.98 (1.76-2.28)	2.68 (2.37-3.10)	3.25 (2.85-3.78)	4.01 (3.40-4.82)	4.58 (3.80-5.63)	5.16 (4.18-6.50)	5.75 (4.53-7.44)	6.53 (4.94-8.82)	7.13 (5.20-9.96)
20-day	1.64 (1.46-1.89)	2.28 (2.02-2.62)	3.11 (2.75-3.59)	3.79 (3.32-4.41)	4.70 (3.98-5.66)	5.40 (4.48-6.64)	6.10 (4.95-7.69)	6.82 (5.38-8.84)	7.79 (5.89-10.5)	8.52 (6.22-11.9)
30-day	1.84 (1.63-2.12)	2.58 (2.29-2.98)	3.58 (3.16-4.13)	4.40 (3.86-5.13)	5.54 (4.70-6.67)	6.42 (5.33-7.90)	7.33 (5.94-9.23)	8.27 (6.51-10.7)	9.55 (7.22-12.9)	10.5 (7.70-14.7)
45-day	2.12 (1.88-2.44)	3.02 (2.68-3.48)	4.26 (3.76-4.92)	5.31 (4.65-6.18)	6.81 (5.77-8.20)	8.01 (6.65-9.85)	9.27 (7.51-11.7)	10.6 (8.36-13.7)	12.5 (9.44-16.9)	14.0 (10.2-19.6)
60-day	2.29 (2.03-2.64)	3.28 (2.91-3.78)	4.69 (4.15-5.42)	5.92 (5.19-6.90)	7.72 (6.55-9.30)	9.21 (7.64-11.3)	10.8 (8.76-13.6)	12.5 (9.88-16.2)	15.0 (11.4-20.3)	17.1 (12.5-23.9)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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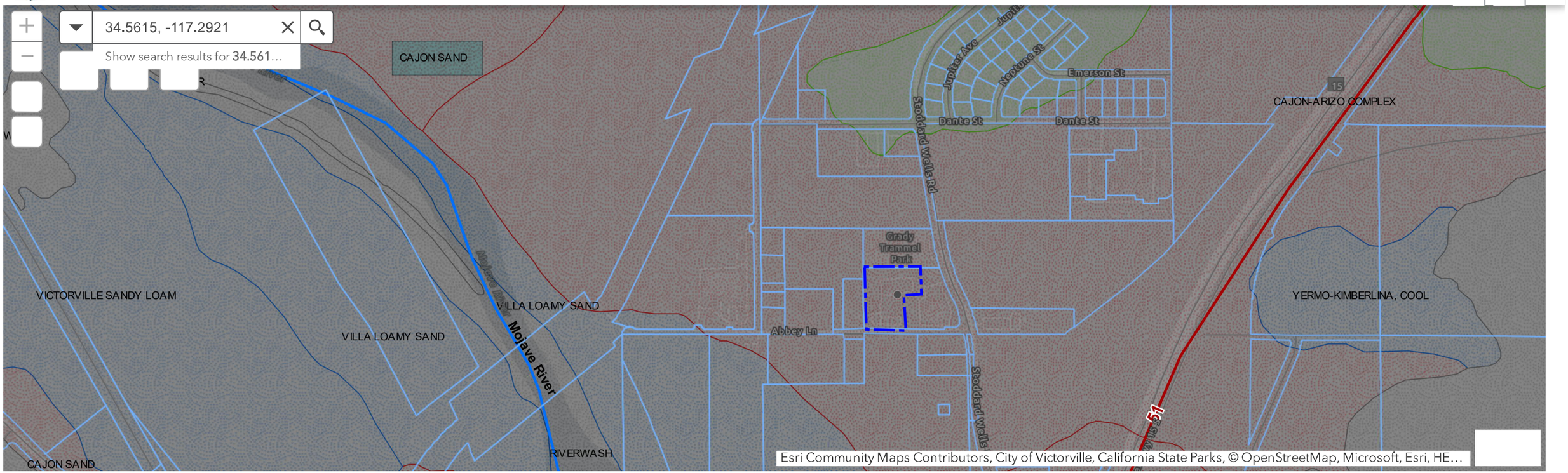
PF graphical

Stormwater Facility Mapping Tool



600ft

34.5650 -117.2865 Degrees

Parcels | Highways | Roads | County Boundaries | Drainage Facilities | 303d Streams | Water Storage Facility | HCOC Exempt Areas (Original) | City Storm Drain | Soils

Options | Filter by map extent | Zoom to | Clear selection | Refresh

AREASYMBOL	SPATIALVER	MUSYM	MUKEY	Soil_Type	HYDGRP	ABV
CA671	1.000000	149	463968	MIRAGE-JOSHUA COMPLEX, 2 TO 5 PERCENT SLOPES*	Soils - Hydro Group C	MIRAGE-JOSHUA
CA671	1.000000	113	463932	CAJON SAND, 2 TO 9 PERCENT SLOPES	Soils - Hydro Group A	CAJON SAND
CA671	1.000000	171	463990	VILLA LOAMY SAND	Soils - Hydro Group B	VILLA LOAMY SAND

14 features 0 selected

Curve (1) Numbers of Hydrologic Soil-Cover Complexes For Pervious Areas-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparral, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparral, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	71	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent.)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	25	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		77	86	91	94

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

CURVE NUMBERS FOR PERVIOUS AREAS

Figure C-3 (1 of 2)

Curve (1) Numbers of Hydrologic Soil-Cover Complexes For Pervious Areas-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
AGRICULTURAL COVERS (Continued)					
Legumes, Close Seeded (Alfalfa, sweetclover, timothy, etc.)	Poor	66	77	85	89
	Good	58	72	81	85
Orchards, Evergreen (Citrus, avocados, etc.)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
Pasture, Dryland (Annual grasses)	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Pasture, Irrigated (Legumes and perennial grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
Row Crops (Field crops - tomatoes, sugar beets, etc.)	Poor	72	81	88	91
	Good	67	78	85	89
Small grain (Wheat, oats, barley, etc.)	Poor	65	76	84	88
	Good	63	75	83	87

Notes:

1. All curve numbers are for Antecedent Moisture Condition (AMC) II.
2. Quality of cover definitions:

   Poor-Heavily grazed, regularly burned areas, or areas of high burn potential. Less than 50 percent of the ground surface is protected by plant cover or brush and tree canopy.

   Fair-Moderate cover with 50 percent to 75 percent of the ground surface protected.

   Good-Heavy or dense cover with more than 75 percent of the ground surface protected.
3. See Figure C-2 for definition of cover types.

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

CURVE NUMBERS FOR PERVIOUS AREAS

Figure C-3 (2 of 2)

ACTUAL IMPERVIOUS COVER

Land Use (1)	Range-Percent	Recommended Value For Average Conditions-Percent (2)
Natural or Agriculture	0 - 0	0
Public Park	10 - 25	15
School	30 - 50	40
Single Family Residential: (3)		
2.5 acre lots	5 - 15	10
1 acre lots	10 - 25	20
2 dwellings/acre	20 - 40	30
3-4 dwellings/acre	30 - 50	40
5-7 dwellings/acre	35 - 55	50
8-10 dwellings/acre	50 - 70	60
More than 10 dwellings/acre	65 - 90	80
Multiple Family Residential:		
Condominiums	45 - 70	65
Apartments	65 - 90	80
Mobile Home Park	60 - 85	75
Commercial, Downtown Business or Industrial	80 - 100	90

Notes:

1. Land use should be based on ultimate development of the watershed. Long range master plans for the County and incorporated cities should be reviewed to insure reasonable land use assumptions.

2. Recommended values are based on average conditions which may not apply to a particular study area. The percentage impervious may vary greatly even on comparable sized lots due to differences in dwelling size, improvements, etc. Landscape practices should also be considered as it is common in some areas to use ornamental gravels underlain by impervious plastic materials in place of lawns and shrubs. A field investigation of a study area shall always be made, and a review of aerial photos, where available, may assist in estimating the percentage of impervious cover in developed areas.

3. For typical equestrian subdivisions increase impervious area 5 percent over the values recommended in the table above.

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

ACTUAL IMPERVIOUS COVER FOR DEVELOPED AREAS

Figure C-4

Soil Map—San Bernardino County, California, Mojave River Area



Map Scale: 1:1,210 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 15 30 60 90

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 Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 1:24,000.

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: San Bernardino County, California, Mojave River Area
Survey Area Data: Version 15, Aug 30, 2023

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

Date(s) aerial images were photographed: Mar 17, 2022—Jun 12, 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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
118	CAJON-ARIZO COMPLEX, 2 TO 15 PERCENT SLOPES*	4.6	100.0%
Totals for Area of Interest		**4.6**	**100.0%**

San Bernardino County, California, Mojave River Area

118—CAJON-ARIZO COMPLEX, 2 TO 15 PERCENT SLOPES*

Map Unit Setting

National map unit symbol: hkrq
Elevation: 2,800 to 3,300 feet
Mean annual precipitation: 3 to 6 inches
Mean annual air temperature: 59 to 66 degrees F
Frost-free period: 180 to 290 days
Farmland classification: Not prime farmland

Map Unit Composition

Cajon, gravelly surface, and similar soils: 55 percent
Arizo and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cajon, Gravelly Surface

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite sources

Typical profile

H1 - 0 to 6 inches: gravelly sand
H2 - 6 to 60 inches: gravelly sand

Properties and qualities

Slope: 2 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R030XF028CA - COBBLY SANDY
Hydric soil rating: No

Description of Arizo

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite sources

Typical profile

H1 - 0 to 6 inches: gravelly loamy sand
H2 - 6 to 60 inches: extremely gravelly loamy coarse sand

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A
Ecological site: R030XF025CA - GRAVELLY COARSE LOAMY
Hydric soil rating: No

Minor Components

Helendale

Percent of map unit: 4 percent
Hydric soil rating: No

Joshua

Percent of map unit: 4 percent
Hydric soil rating: No

Bryman

Percent of map unit: 4 percent
Hydric soil rating: No

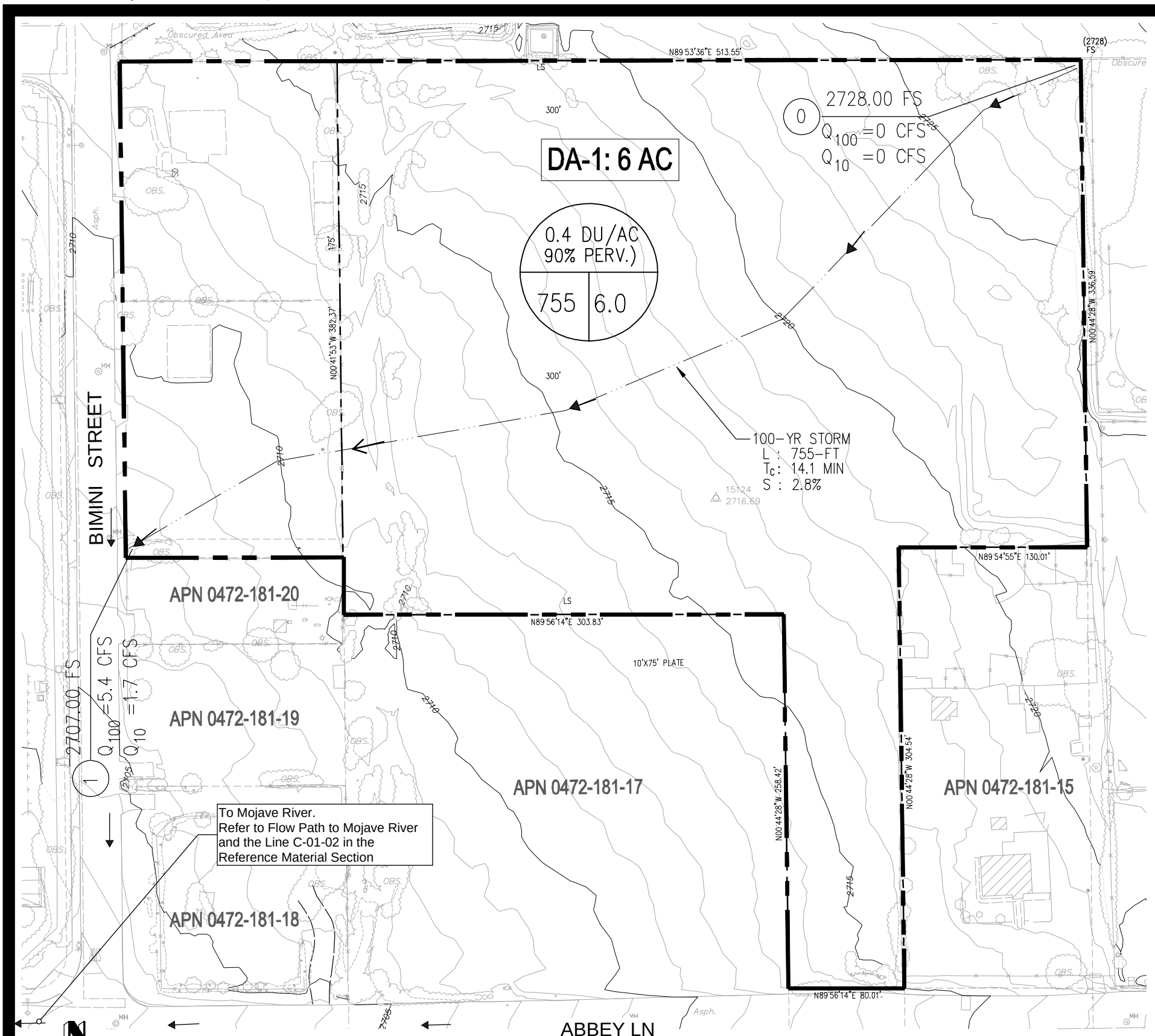
Cajon, clayey substratum
Percent of map unit: 3 percent

Data Source Information

Soil Survey Area: San Bernardino County, California, Mojave River Area
Survey Area Data: Version 15, Aug 30, 2023

ONSITE RATIONAL METHOD HYDROLOGY ANALYSIS (100-YR & 10-YR STORM EVENT)

PLOT DATE: July 09, 2024 ashafiq



LEGEND

SITE DRAINAGE SUB-AREA

ELEVATION

NODE

2715

0

Q_{100}=0 CFS

RUNOFF

1 DU/2.5 AC
95% PERVIOUS

0.4 DU/AC
90% PERV.)

531 | 2.00

DRAINAGE (AC) SUB-AREA

FLOW LENGTH (FT)

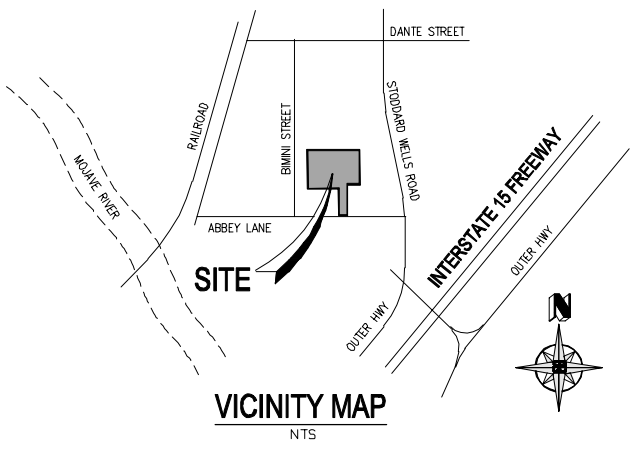
L – FLOW LENGTH

T_c – TIME OF CONCENTRATION

DA-1: DRAINAGE SUB-AREA

S-SUB-AREA FLOW PATH SLOPE

2% FLOW DIRECTION



VICINITY MAP
NTS

Prepared By:

ALLARD ENGINEERING

Civil Engineering - Land Surveying - Land Planning

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PHONE (909) 356-1815 Fax (909) 356-1795

Prepared For:

BURRTEC WASTE INDUSTRIES

17080 STODDARD WELLS ROAD
VICTORVILLE, CA 92394
PHONE (760) 245-8607

CITY OF VICTORVILLE, CALIFORNIA

HYDROLOGY MAP
EXISTING CONDITION
APN 0472-181-16

RATIONAL METHOD HYDROLOGY-EXISTING CONDITION-100 YR STORM EVENT

```
**************************************************************************
           RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
        (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
       (c) Copyright 1983-2016 Advanced Engineering Software (aes)
           Ver. 23.0  Release Date: 07/01/2016  License ID 1400

                        Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* BURRTEC ABBEY LN, VICTORVILLE                                          *
* EX. CONDITION HYDROLOGY                                                *
* 100-YR STORM                                                           *
 ************************************************************************

  FILE NAME: BURR.DAT
  TIME/DATE OF STUDY: 17:42 07/08/2024
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  24.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.7910

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

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      1.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   755.00
  ELEVATION DATA: UPSTREAM(FEET) =   2728.00  DOWNSTREAM(FEET) =   2707.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.121
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.884
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  ".4 DWELLING/ACRE"         A        6.00      0.98     0.900    32   14.12
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
```

25-yr storm depth

```
  SUBAREA RUNOFF(CFS) =      5.44
  TOTAL AREA(ACRES) =      6.00   PEAK FLOW RATE(CFS) =      5.44
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        6.0  TC(MIN.) =     14.12
  EFFECTIVE AREA(ACRES) =      6.00  AREA-AVERAGED Fm(INCH/HR)=  0.88
  AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap = 0.900
  PEAK FLOW RATE(CFS)   =       5.44
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

RATIONAL METHOD HYDROLOGY-EXISTING CONDITION-10 YR STORM EVENT

```
**************************************************************************
           RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
        (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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           Ver. 23.0  Release Date: 07/01/2016  License ID 1400

                        Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* BURRTEC ABBEY LN, VICTORVILLE                                          *
* EX. CONDITION HYDROLOGY                                                *
* 10-YR STORM EVENT                                                      *
 ************************************************************************

  FILE NAME: BURR.DAT
  TIME/DATE OF STUDY: 17:46 07/08/2024
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  24.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.4990

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

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

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

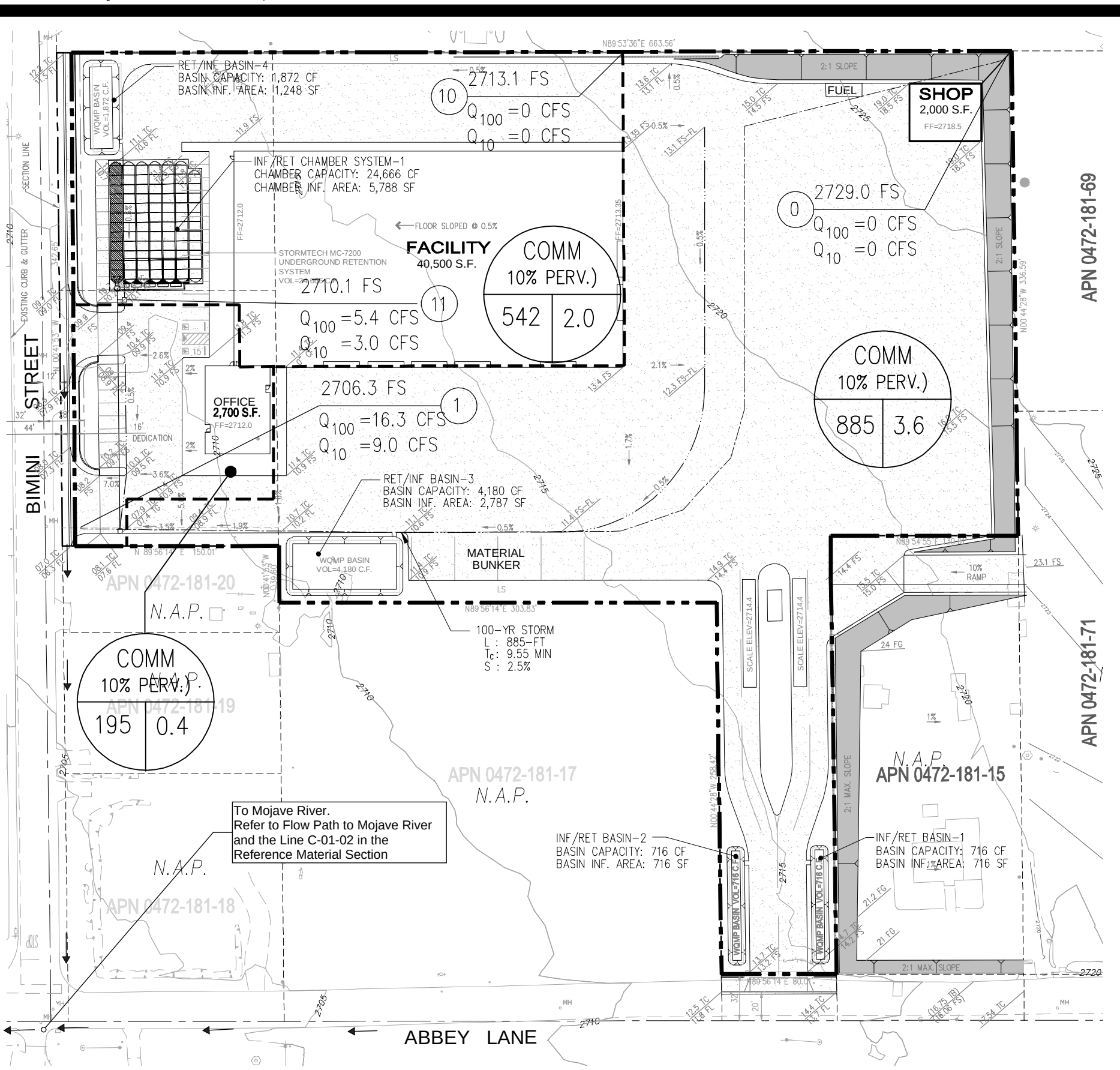
**************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      1.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   755.00
  ELEVATION DATA: UPSTREAM(FEET) =   2728.00  DOWNSTREAM(FEET) =   2707.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.121
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.189
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  ".4 DWELLING/ACRE"         A        6.00      0.98     0.900    32   14.12
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
```

5-yr storm depth

```
  SUBAREA RUNOFF(CFS) =      1.68
  TOTAL AREA(ACRES) =      6.00   PEAK FLOW RATE(CFS) =      1.68
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        6.0  TC(MIN.) =     14.12
  EFFECTIVE AREA(ACRES) =      6.00  AREA-AVERAGED Fm(INCH/HR)=  0.88
  AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap = 0.900
  PEAK FLOW RATE(CFS)   =       1.68
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

PLOT DATE: August 27, 2024 ashafiq



GRAPHIC SCALE
80 40 0 40 80
(IN FEET)
1 inch = 80 ft.

LEGEND

SITE DRAINAGE SUB-AREA

COMMERCIAL 10% PERVIOUS

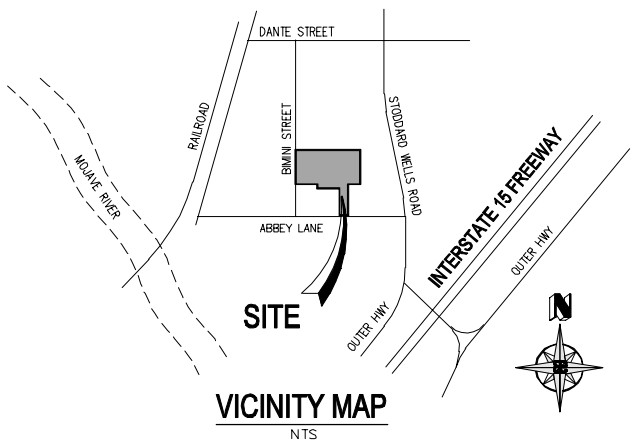
COMM 10% PERV.)
855 | 3.6

DRAINAGE SUB-AREA

FLOW LENGTH (FT)

ELEVATION
NODE
2710
0
Q_{100}=0 CFS
RUNOFF

L - FLOW LENGTH
T_c - TIME OF CONCENTRATION
DA-1: DRAINAGE SUB-AREA
S-SUB-AREA FLOW PATH SLOPE
1% FLOW DIRECTION



VICINITY MAP
NTS

Prepared By:
ALLARD ENGINEERING
Civil Engineering - Land Surveying - Land Planning
16866 Seville Avenue
Fontana, California 92335
PHONE (909) 356-1815 Fax (909) 356-1795

Prepared For:
BURRTEC WASTE INDUSTRIES
17080 STODDARD WELLS ROAD
VICTORVILLE, CA 92394
PHONE (760) 245-8607

CITY OF VICTORVILLE, CALIFORNIA

HYDROLOGY MAP DEVELOPED CONDITION

APN 0472-181-16

Filename: \\ae-dc-8\EngData\Engineering\Burrtec\Victorville Abbey Lane\DWG's\ENTITLEMENT\EXHIBIT

CITY OF VICTORVILLE

CONCEPTUAL GRADING PLAN

LEGAL DESCRIPTION:

PORTION OF THE NW 1/4 OF THE SW 1/4 OF SECTION 34, T6N, R4W, S.B.M.

UTILITIES :

ELECTRICITY: SOUTHERN CALIFORNIA EDISON CO.
12353 HESPERIA ROAD
VICTORVILLE, CA 92392
(800) 442-4950

GAS: SOUTHWEST GAS CO.
13471 MARIPOSA ROAD
VICTORVILLE, CA 92392
(760) 241-9321

TELEPHONE: VERIZON
15168 LA PAZ ROAD
VICTORVILLE, CA 92392
(800) 772-5153

WATER: CITY OF VICTORVILLE
14343 CIVIC DRIVE
VICTORVILLE, CA 92392
(760) 955-5000

SEWER: CITY OF VICTORVILLE
14343 CIVIC DRIVE
VICTORVILLE, CA 92392
(760) 955-5000

ASSESSOR'S PARCEL NO:

0472-181-16, 0472-181-23 & 0472-181-65

OWNER / DEVELOPER:

BURRTEC WASTE INDUSTRIES
17080 STODDARD WELLS ROAD
VICTORVILLE, CA 92394
PH (760) 245-8607

ENGINEER:

ALLARD ENGINEERING
16866 SEVILLE AVENUE
FONTANA, CALIFORNIA 92335
PHONE (909) 356-1815
FAX (909) 356-1795

ACREAGE:

GROSS: 6.09 ACRES
NET: 5.85 ACRES

BENCHMARK:

V-112

LOCATED AT THE NORTHWEST CORNER OF VENUS STREET & DANTE STREET AT THE ECR, SET IN TOP OF CURB

ELEVATION = 2793.07

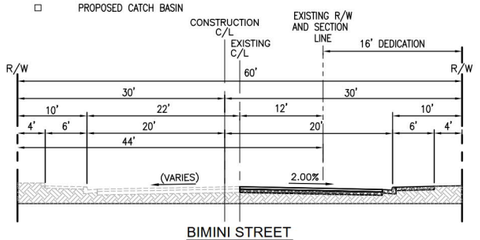
BASIS OF BEARINGS:

TAKEN FROM THE CENTERLINE OF ABBEY LANE AS SHOWN ON PARCEL MAP NO. 15030, P.M.B. 183/93-95

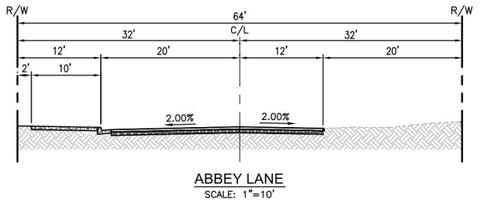
BEING: N89°56'04"E

LEGEND:

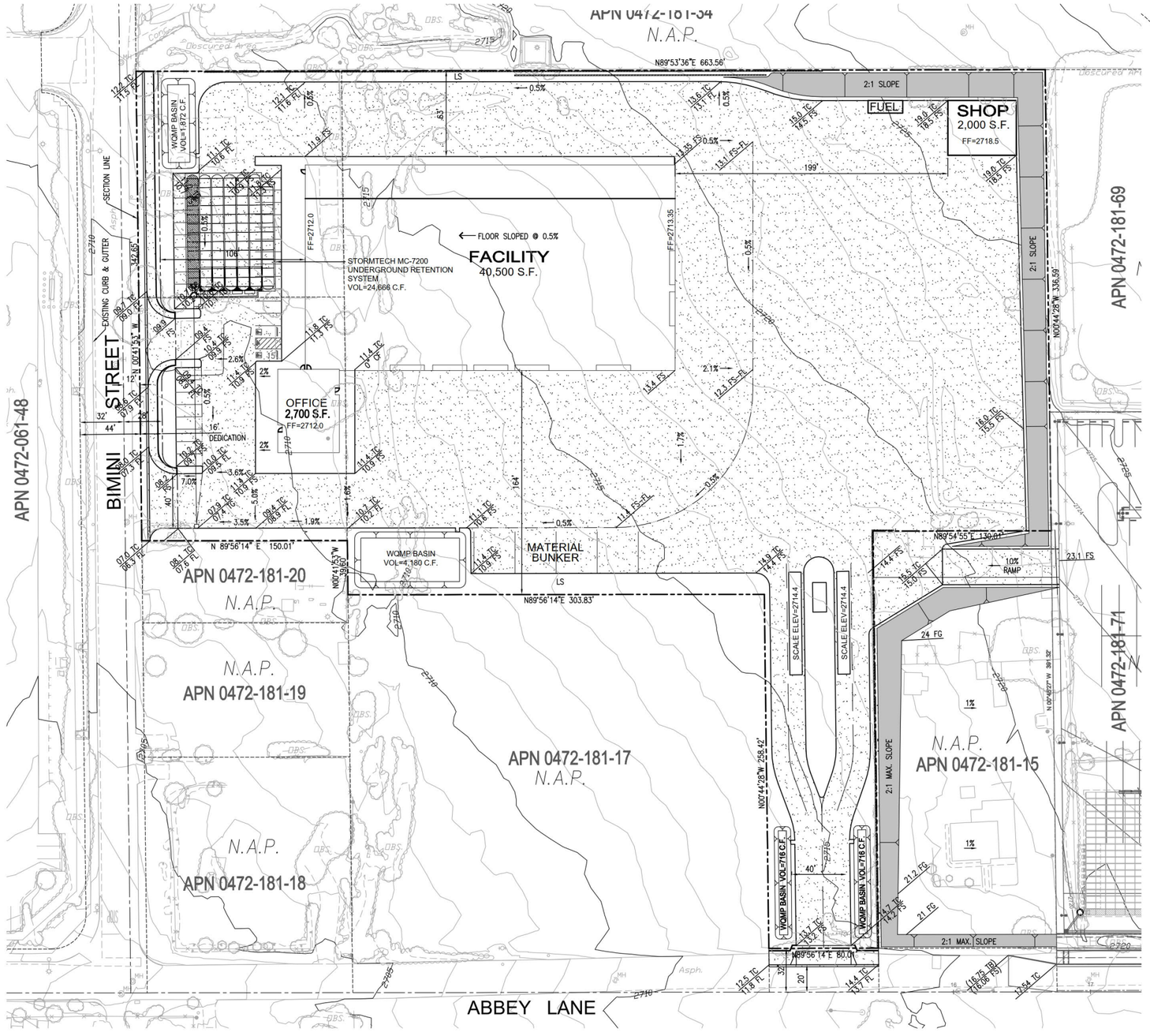
- PROPOSED CONCRETE PAVEMENT
- 1% DRAINAGE FLOW
- —2710— EXISTING CONTOURS
- —S— SEWER LINE
- —W— WATER LINE
- STORM DRAIN
- □ PROPOSED CATCH BASIN

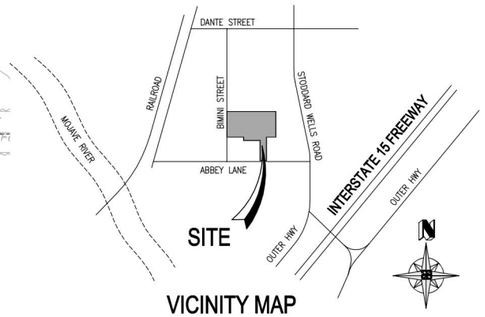


BIMINI STREET
SCALE: 1"=10'



ABBEY LANE
SCALE: 1"=10'





VICINITY MAP
NTS

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 INCH = 40 FT.

CITY OF VICTORVILLE
CONCEPTUAL GRADING PLAN
APN 0472-181-16

Prepared For:
BURRTEC WASTE INDUSTRIES
17080 STODDARD WELLS ROAD
VICTORVILLE, CA 92394
PH: (760) 245-8607

Prepared By:

ALLARD ENGINEERING
Civil Engineering - Land Surveying - Land Planning
16866 Seville Avenue
Fontana, California 92335
Phone (909) 356-1815

1/1

PLOT DATE: August 27, 2024 hgable

Filename: I:\Burrtec\Victorville Abbey Lane\DWG's\ENTITLEMENT\CONCEPT GRADING\Concept-Grading_01.dwg

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

INFILTRATION/RETENTION CHAMBER SYSTEM-1

Advanced Drainage Systems, Inc.

ADS SiteAssist™
FOR STORMTECH
INSTALLATION INSTRUCTIONS
VISIT OUR APP

BURRTEC ABBEY LANE

VICTORVILLE, CA, USA

MC-7200 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-7200.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101.
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-7200 CHAMBER SYSTEM

1. STORMTECH MC-7200 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 12" (300 mm) BETWEEN ADJACENT CHAMBER ROWS.
10. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
11. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIAL BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
12. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-7200 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-7200 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

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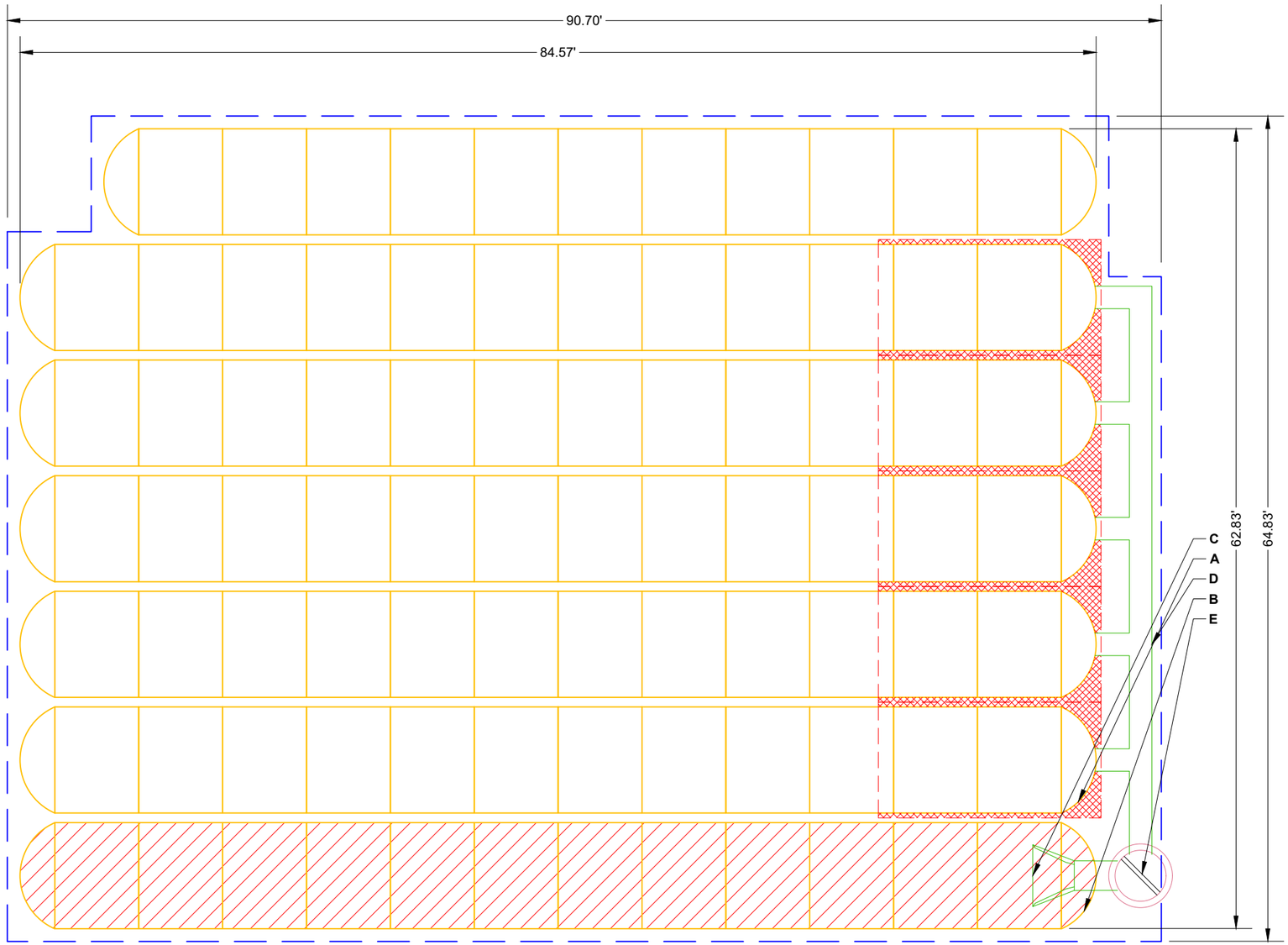
PROPOSED LAYOUT		CONCEPTUAL ELEVATIONS:	
83	STORMTECH MC-7200 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	12.75
14	STORMTECH MC-7200 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	8.25
12	STONE ABOVE (in)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	7.75
9	STONE BELOW (in)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	7.75
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	7.75
24667	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	6.75
		TOP OF MC-7200 CHAMBER:	5.75
		24" ISOLATOR ROW PLUS INVERT:	0.94
		18" x 18" BOTTOM MANIFOLD INVERT:	0.91
5768	SYSTEM AREA (SF)	BOTTOM OF MC-7200 CHAMBER:	0.75
311.1	SYSTEM PERIMETER (ft)	BOTTOM OF STONE:	0.00

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED END CAP	A	18" BOTTOM PARTIAL CUT END CAP, PART#: MC7200IEPP18B / TYP OF ALL 18" BOTTOM CONNECTIONS	1.97"	
PREFABRICATED END CAP	B	24" BOTTOM PARTIAL CUT END CAP, PART#: MC7200IEPP24B / TYP OF ALL 24" BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	2.26"	
FLAMP	C	INSTALL FLAMP ON 24" ACCESS PIPE / PART#: MCFLAMP		
MANIFOLD	D	18" x 18" BOTTOM MANIFOLD, ADS N-12	1.97"	
CONCRETE STRUCTURE W/WEIR	E	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		24.0 CFS IN



ISOLATOR ROW PLUS
(SEE DETAIL)

PLACE MINIMUM 17.50' OF ADSPLUS125 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE #6.32 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.
- **NOT FOR CONSTRUCTION:** THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

BURRTEC ABBEY LANE
VICTORVILLE, CA, USA

DATE:
DRAWN: DW
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PROJECT #:

DESCRIPTION	CHK	DRW	DATE

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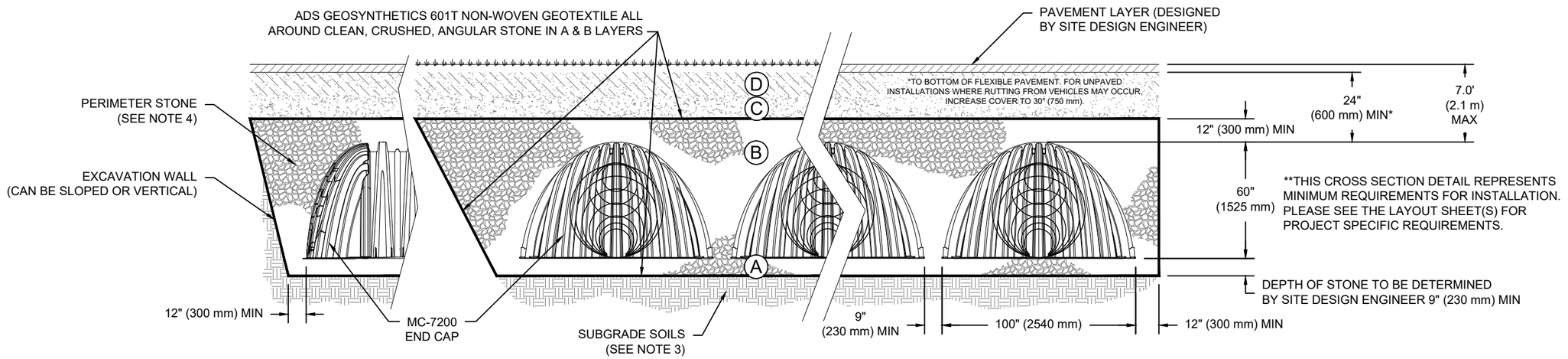
ACCEPTABLE FILL MATERIALS: STORMTECH MC-7200 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
5. WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101
2. MC-7200 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

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VICTORVILLE, CA, USA
DATE: DRAWN: DW CHECKED: N/A
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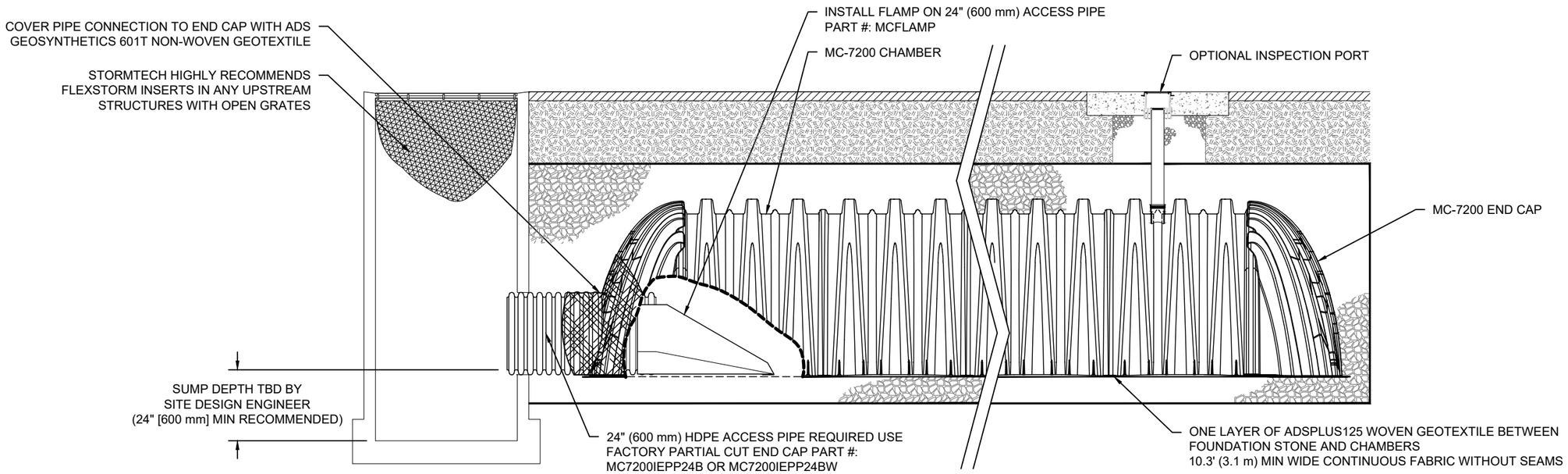

MC-7200 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.

2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

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VICTORVILLE, CA, USA
DATE:
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PROJECT #:
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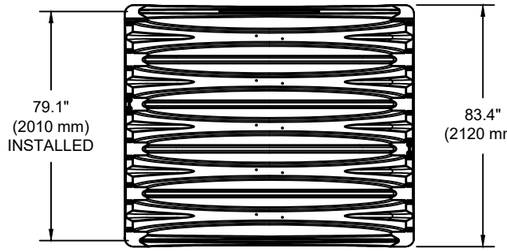
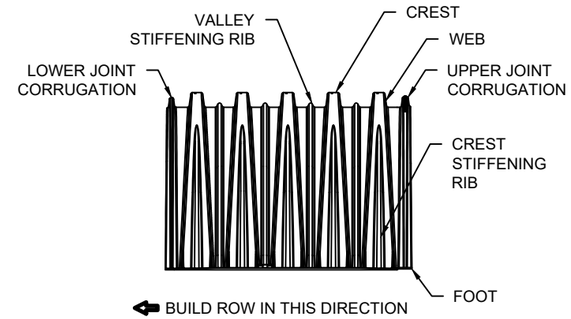
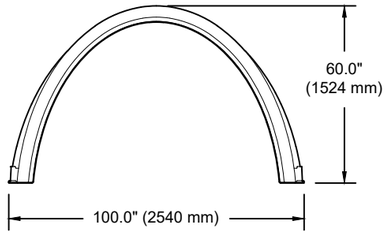
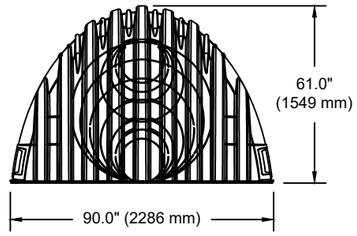
MC-7200 TECHNICAL SPECIFICATION

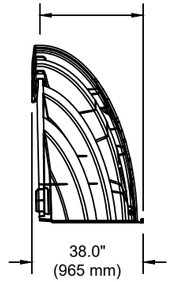
NTS











NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	100.0" X 60.0" X 79.1"	(2540 mm X 1524 mm X 2010 mm)
CHAMBER STORAGE	175.9 CUBIC FEET	(4.98 m³)
MINIMUM INSTALLED STORAGE*	267.3 CUBIC FEET	(7.56 m³)
WEIGHT (NOMINAL)	205 lbs.	(92.9 kg)

NOMINAL END CAP SPECIFICATIONS

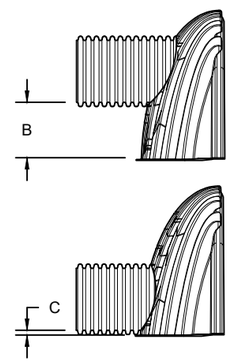
SIZE (W X H X INSTALLED LENGTH)	90.0" X 61.0" X 32.8"	(2286 mm X 1549 mm X 833 mm)
END CAP STORAGE	39.5 CUBIC FEET	(1.12 m³)
MINIMUM INSTALLED STORAGE*	115.3 CUBIC FEET	(3.26 m³)
WEIGHT (NOMINAL)	90 lbs.	(40.8 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC7200IEPP06T	6" (150 mm)	42.54" (1081 mm)	---
MC7200IEPP06B		---	0.86" (22 mm)
MC7200IEPP08T	8" (200 mm)	40.50" (1029 mm)	---
MC7200IEPP08B		---	1.01" (26 mm)
MC7200IEPP10T	10" (250 mm)	38.37" (975 mm)	---
MC7200IEPP10B		---	1.33" (34 mm)
MC7200IEPP12T	12" (300 mm)	35.69" (907 mm)	---
MC7200IEPP12B		---	1.55" (39 mm)
MC7200IEPP15T	15" (375 mm)	32.72" (831 mm)	---
MC7200IEPP15B		---	1.70" (43 mm)
MC7200IEPP18T	18" (450 mm)	29.36" (746 mm)	---
MC7200IEPP18TW			
MC7200IEPP18B		---	1.97" (50 mm)
MC7200IEPP18BW			
MC7200IEPP24T	24" (600 mm)	23.05" (585 mm)	---
MC7200IEPP24TW			
MC7200IEPP24B		---	2.26" (57 mm)
MC7200IEPP24BW			
MC7200IEPP30BW	30" (750 mm)	---	2.95" (75 mm)
MC7200IEPP36BW	36" (900 mm)	---	3.25" (83 mm)
MC7200IEPP42BW	42" (1050 mm)	---	3.55" (90 mm)

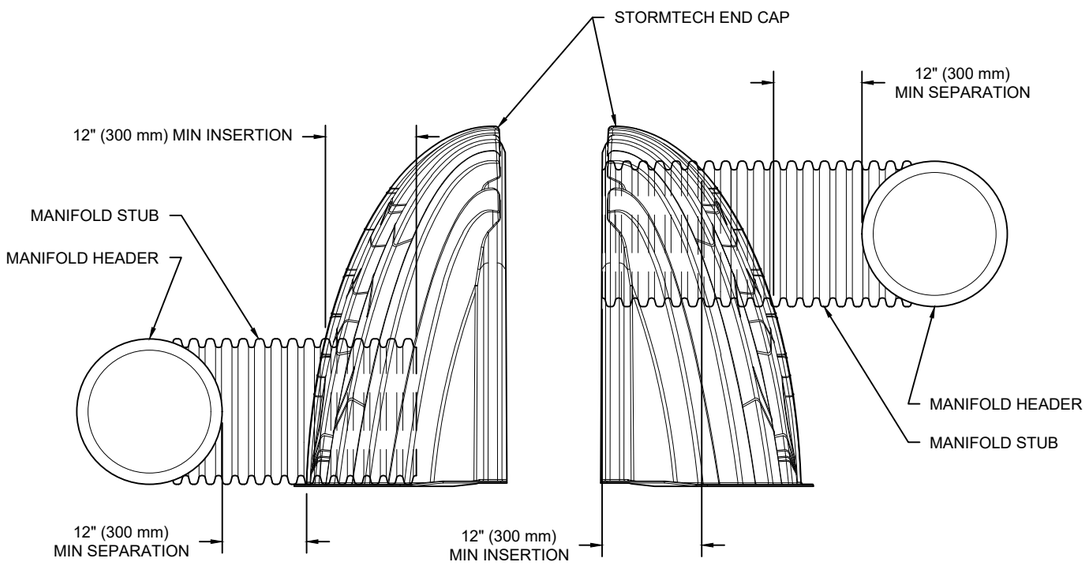
NOTE: ALL DIMENSIONS ARE NONINAL



CUSTOM PREFABRICATED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-7200 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

MC-SERIES END CAP INSERTION DETAIL

NTS



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

BURRTEC ABBEY LANE
VICTORVILLE, CA, USA

DATE: | DRAWN: DW | CHECKED: N/A
PROJECT #:

DATE	DRW	CHK	DESCRIPTION

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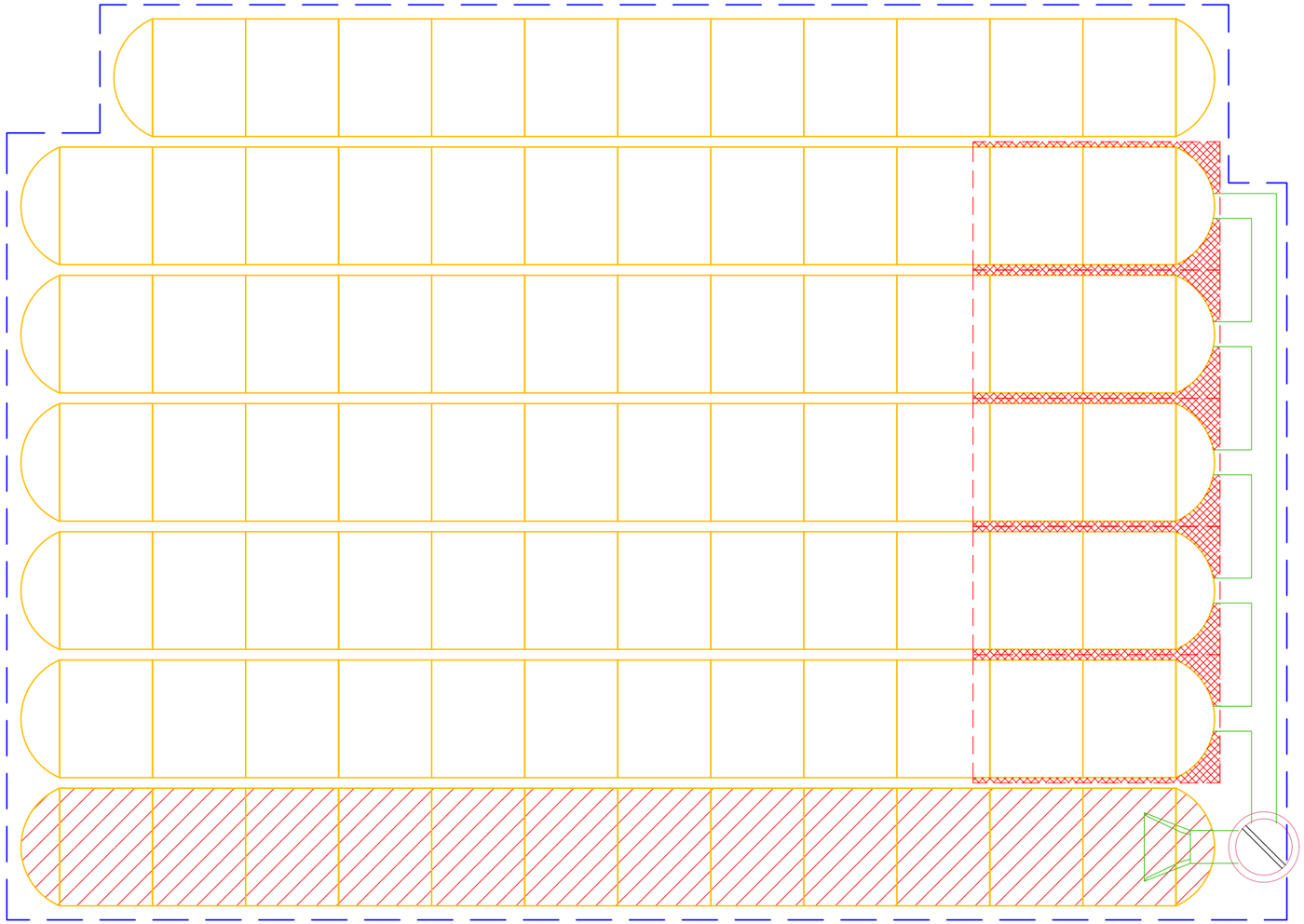

Infiltration Basin Capacity Calculation: Basin-1,2

Surface Area	716	SF
Rock Depth	0	FT
Surface Depth	1	FT

Volume Provided	716	CF

Infiltration Basin Capacity Calculation: Basin-3

Surface Area	2787	SF
Rock Depth	0	FT
Surface Depth	1.5	FT

Volume Provided	4181	CF

Infiltration Basin Capacity Calculation: Basin-4

Surface Area	1248	SF
Rock Depth	0	FT
Surface Depth	1.5	FT

Volume Provided	1872	CF

RATIONAL METHOD HYDROLOGY-DEVELOPED CONDITION
100-YR STORM EVENT

```
**************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
       (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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          Ver. 23.0  Release Date: 07/01/2016  License ID 1400

                        Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* BURRTEC, ABBEY DR, VICTORVILLE                                         *
* DEV. CONDITION HYDROLOGY                                               *
* 100-YR STORM EVENT                                                     *
 ************************************************************************

  FILE NAME: BURR.DAT
  TIME/DATE OF STUDY: 09:59 07/18/2024
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  24.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.0900

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

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      1.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   885.00
  ELEVATION DATA: UPSTREAM(FEET) =   2729.00  DOWNSTREAM(FEET) =   2706.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.546
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.284
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        3.60      0.74     0.100    52    9.55
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     10.40
```

```
  TOTAL AREA(ACRES) =      3.60   PEAK FLOW RATE(CFS) =     10.40

****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      1.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE     11.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   542.00
  ELEVATION DATA: UPSTREAM(FEET) =   2713.10  DOWNSTREAM(FEET) =   2710.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.662
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.073
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        2.00      0.74     0.100    52   10.66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      5.40
  TOTAL AREA(ACRES) =      2.00   PEAK FLOW RATE(CFS) =      5.40

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE      1.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2710.10  DOWNSTREAM(FEET) =   2706.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =   195.00   CHANNEL SLOPE =  0.0195
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.971
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.40      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.23
  AVERAGE FLOW DEPTH(FEET) =   0.48   TRAVEL TIME(MIN.) =   0.62
  Tc(MIN.) =   11.28
  SUBAREA AREA(ACRES) =     0.40       SUBAREA RUNOFF(CFS) =    1.04
  EFFECTIVE AREA(ACRES) =      2.40     AREA-AVERAGED Fm(INCH/HR) =   0.07
  AREA-AVERAGED Fp(INCH/HR) =   0.74  AREA-AVERAGED Ap =   0.10
  TOTAL AREA(ACRES) =        2.4         PEAK FLOW RATE(CFS) =       6.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.49   FLOW VELOCITY(FEET/SEC.) =   5.31
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE      1.00 =     737.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      1.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        6.26   11.28    2.971  0.74( 0.07) 0.10       2.4      10.00
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE      1.00 =     737.00 FEET.
```

```
  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       10.40    9.55    3.284  0.74( 0.07) 0.10       3.6       0.00
  LONGEST FLOWPATH FROM NODE      0.00 TO NODE      1.00 =     885.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       16.27    9.55    3.284  0.74( 0.07) 0.10       5.6       0.00
      2       15.64   11.28    2.971  0.74( 0.07) 0.10       6.0      10.00
    TOTAL AREA(ACRES) =         6.0

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       16.27  Tc(MIN.) =    9.546
  EFFECTIVE AREA(ACRES) =      5.63  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        6.0
  LONGEST FLOWPATH FROM NODE      0.00 TO NODE      1.00 =     885.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        6.0  TC(MIN.) =      9.55
  EFFECTIVE AREA(ACRES) =      5.63  AREA-AVERAGED Fm(INCH/HR)=  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =      16.27

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       16.27    9.55    3.284  0.74( 0.07) 0.10       5.6       0.00
      2       15.64   11.28    2.971  0.74( 0.07) 0.10       6.0      10.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

RATIONAL METHOD HYDROLOGY-DEVELOPED CONDITION
10-YR STORM EVENT

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
        (c) Copyright 1983-2016 Advanced Engineering Software (aes)
            Ver. 23.0  Release Date: 07/01/2016  License ID 1400

                          Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* BURRTEC, ABBEY DR, VICTORVILLE                                         *
* DEV. CONDITION HYDROLOGY                                               *
* 10-YR STORM EVENT                                                      *
 ************************************************************************

  FILE NAME: BURR.DAT
  TIME/DATE OF STUDY: 10:17 07/18/2024
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  24.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.6170

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

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

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      1.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   885.00
  ELEVATION DATA: UPSTREAM(FEET) =   2729.00  DOWNSTREAM(FEET) =   2706.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.546
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.859
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        3.60      0.74     0.100    52    9.55
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      5.78
```

```
  TOTAL AREA(ACRES) =      3.60   PEAK FLOW RATE(CFS) =      5.78

****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      1.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE     11.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   542.00
  ELEVATION DATA: UPSTREAM(FEET) =   2713.10  DOWNSTREAM(FEET) =   2710.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.662
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.740
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        2.00      0.74     0.100    52   10.66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      3.00
  TOTAL AREA(ACRES) =      2.00   PEAK FLOW RATE(CFS) =      3.00

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE      1.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2710.10  DOWNSTREAM(FEET) =   2706.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =   195.00   CHANNEL SLOPE =  0.0195
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.674
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.40      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.58
  AVERAGE FLOW DEPTH(FEET) =   0.38   TRAVEL TIME(MIN.) =   0.71
  Tc(MIN.) =   11.37
  SUBAREA AREA(ACRES) =     0.40       SUBAREA RUNOFF(CFS) =    0.58
  EFFECTIVE AREA(ACRES) =      2.40     AREA-AVERAGED Fm(INCH/HR) =   0.07
  AREA-AVERAGED Fp(INCH/HR) =   0.74  AREA-AVERAGED Ap =   0.10
  TOTAL AREA(ACRES) =        2.4         PEAK FLOW RATE(CFS) =       3.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.39   FLOW VELOCITY(FEET/SEC.) =   4.63
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE      1.00 =     737.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      1.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        3.46   11.37    1.674  0.74( 0.07) 0.10       2.4      10.00
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE      1.00 =     737.00 FEET.
```

```
  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        5.78    9.55    1.859  0.74( 0.07) 0.10       3.6       0.00
  LONGEST FLOWPATH FROM NODE      0.00 TO NODE      1.00 =     885.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        9.02    9.55    1.859  0.74( 0.07) 0.10       5.6       0.00
      2        8.64   11.37    1.674  0.74( 0.07) 0.10       6.0      10.00
    TOTAL AREA(ACRES) =         6.0

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =        9.02  Tc(MIN.) =    9.546
  EFFECTIVE AREA(ACRES) =      5.61  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        6.0
  LONGEST FLOWPATH FROM NODE      0.00 TO NODE      1.00 =     885.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        6.0  TC(MIN.) =      9.55
  EFFECTIVE AREA(ACRES) =      5.61  AREA-AVERAGED Fm(INCH/HR)=  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =       9.02

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        9.02    9.55    1.859  0.74( 0.07) 0.10       5.6       0.00
      2        8.64   11.37    1.674  0.74( 0.07) 0.10       6.0      10.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

ONSITE UNIT HYDROGRAPH ANALYSIS FOR DETENTION WATER VOLUME (10-YR STORM EVENT)

UNIT HYDROGRAPH ANALYSIS-EXISTING CONDITION
10-YR STORM EVENT

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

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                Study date  07/09/24

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

San Bernardino County Synthetic Unit Hydrology Method
                Manual date - August 1986


Program License Serial Number 6484

------------------------------------------------------------------------
BURRTEC, ABBEY LN, VICTORVILLE
EX CONDITION
10YR STORM EVENT

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

        Storm Event Year = 10

        Antecedent Moisture Condition = 2

 English (in-lb) Input Units Used

 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



Area averaged rainfall intensity isohyetal data:
        Sub-Area        Duration        Isohyetal
        (Ac.)            (hours)         (In)
Rainfall data for year 10
             6.00            1           0.62
------------------------------------------------------------------------
Rainfall data for year 10
             6.00            6           1.26
------------------------------------------------------------------------
Rainfall data for year 10
             6.00           24           2.10
------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 2)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 32.0      32.0          6.00      1.000     0.978    0.900    0.880

Area-averaged adjusted loss rate Fm (In/Hr) =  0.880

********* Area-Averaged low loss rate fraction, Yb **********

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     5.40   0.900         32.0      32.0      10.50     0.000
     0.60   0.100         98.0      98.0       0.20     0.892

Area-averaged catchment yield fraction, Y =  0.089
Area-averaged low loss fraction, Yb =  0.911
Direct entry of lag time by user
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Watershed area = 6.00(Ac.)
Catchment Lag time = 0.188 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 44.3262
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.880(In/Hr)
Average low loss rate fraction (Yb) = 0.911 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.229(In)
Computed peak 30-minute rainfall = 0.470(In)
Specified peak 1-hour rainfall = 0.620(In)
Computed peak 3-hour rainfall = 0.958(In)
Specified peak 6-hour rainfall = 1.260(In)
Specified peak 24-hour rainfall = 2.100(In)

Rainfall depth area reduction factors:
Using a total area of 6.00(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.229(In)
30-minute factor = 1.000 Adjusted rainfall = 0.470(In)
1-hour factor = 1.000 Adjusted rainfall = 0.620(In)
3-hour factor = 1.000 Adjusted rainfall = 0.958(In)
6-hour factor = 1.000 Adjusted rainfall = 1.260(In)
24-hour factor = 1.000 Adjusted rainfall = 2.100(In)

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

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 72.56 (CFS))	
1	5.092	3.695
2	26.469	15.512
3	54.925	20.649
4	70.264	11.130
5	77.773	5.449
6	82.842	3.678
7	86.616	2.738
8	89.443	2.052
9	91.678	1.622
10	93.375	1.231
11	94.762	1.006
12	96.001	0.899
13	96.959	0.695
14	97.752	0.576
15	98.388	0.462
16	98.871	0.350
17	99.314	0.322
18	99.757	0.322
19	100.000	0.176

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2294	0.2294
2	0.3027	0.0733
3	0.3560	0.0533
4	0.3994	0.0434
5	0.4367	0.0373
6	0.4697	0.0330
7	0.4996	0.0299
8	0.5270	0.0274
9	0.5525	0.0254
10	0.5762	0.0238
11	0.5986	0.0224
12	0.6198	0.0212
13	0.6398	0.0200
14	0.6588	0.0191
15	0.6771	0.0182

16	0.6946	0.0175
17	0.7115	0.0169
18	0.7278	0.0163
19	0.7435	0.0158
20	0.7588	0.0153
21	0.7736	0.0148
22	0.7880	0.0144
23	0.8020	0.0140
24	0.8156	0.0136
25	0.8289	0.0133
26	0.8419	0.0130
27	0.8545	0.0127
28	0.8669	0.0124
29	0.8791	0.0121
30	0.8910	0.0119
31	0.9026	0.0116
32	0.9140	0.0114
33	0.9252	0.0112
34	0.9362	0.0110
35	0.9470	0.0108
36	0.9577	0.0106
37	0.9681	0.0104
38	0.9784	0.0103
39	0.9885	0.0101
40	0.9984	0.0100
41	1.0083	0.0098
42	1.0179	0.0097
43	1.0274	0.0095
44	1.0368	0.0094
45	1.0461	0.0093
46	1.0552	0.0091
47	1.0643	0.0090
48	1.0732	0.0089
49	1.0820	0.0088
50	1.0906	0.0087
51	1.0992	0.0086
52	1.1077	0.0085
53	1.1161	0.0084
54	1.1244	0.0083
55	1.1326	0.0082
56	1.1407	0.0081
57	1.1487	0.0080
58	1.1566	0.0079
59	1.1645	0.0079
60	1.1723	0.0078
61	1.1799	0.0077
62	1.1876	0.0076
63	1.1951	0.0075
64	1.2026	0.0075
65	1.2100	0.0074
66	1.2173	0.0073
67	1.2246	0.0073
68	1.2318	0.0072
69	1.2389	0.0071
70	1.2460	0.0071
71	1.2530	0.0070
72	1.2600	0.0070
73	1.2664	0.0064
74	1.2728	0.0064
75	1.2791	0.0063
76	1.2853	0.0063
77	1.2915	0.0062
78	1.2977	0.0062
79	1.3038	0.0061
80	1.3099	0.0061
81	1.3159	0.0060
82	1.3218	0.0060
83	1.3277	0.0059
84	1.3336	0.0059
85	1.3394	0.0058
86	1.3452	0.0058

87	1.3510	0.0057
88	1.3567	0.0057
89	1.3623	0.0057
90	1.3680	0.0056
91	1.3735	0.0056
92	1.3791	0.0055
93	1.3846	0.0055
94	1.3901	0.0055
95	1.3955	0.0054
96	1.4009	0.0054
97	1.4062	0.0054
98	1.4116	0.0053
99	1.4169	0.0053
100	1.4221	0.0053
101	1.4273	0.0052
102	1.4325	0.0052
103	1.4377	0.0052
104	1.4428	0.0051
105	1.4479	0.0051
106	1.4530	0.0051
107	1.4580	0.0050
108	1.4630	0.0050
109	1.4680	0.0050
110	1.4729	0.0049
111	1.4779	0.0049
112	1.4828	0.0049
113	1.4876	0.0049
114	1.4925	0.0048
115	1.4973	0.0048
116	1.5021	0.0048
117	1.5068	0.0048
118	1.5115	0.0047
119	1.5163	0.0047
120	1.5209	0.0047
121	1.5256	0.0047
122	1.5302	0.0046
123	1.5348	0.0046
124	1.5394	0.0046
125	1.5440	0.0046
126	1.5485	0.0045
127	1.5530	0.0045
128	1.5575	0.0045
129	1.5620	0.0045
130	1.5665	0.0045
131	1.5709	0.0044
132	1.5753	0.0044
133	1.5797	0.0044
134	1.5841	0.0044
135	1.5884	0.0043
136	1.5927	0.0043
137	1.5970	0.0043
138	1.6013	0.0043
139	1.6056	0.0043
140	1.6098	0.0042
141	1.6141	0.0042
142	1.6183	0.0042
143	1.6225	0.0042
144	1.6266	0.0042
145	1.6308	0.0042
146	1.6349	0.0041
147	1.6390	0.0041
148	1.6431	0.0041
149	1.6472	0.0041
150	1.6513	0.0041
151	1.6553	0.0040
152	1.6594	0.0040
153	1.6634	0.0040
154	1.6674	0.0040
155	1.6714	0.0040
156	1.6753	0.0040
157	1.6793	0.0039

158	1.6832	0.0039
159	1.6871	0.0039
160	1.6910	0.0039
161	1.6949	0.0039
162	1.6988	0.0039
163	1.7026	0.0039
164	1.7065	0.0038
165	1.7103	0.0038
166	1.7141	0.0038
167	1.7179	0.0038
168	1.7217	0.0038
169	1.7255	0.0038
170	1.7292	0.0038
171	1.7330	0.0037
172	1.7367	0.0037
173	1.7404	0.0037
174	1.7441	0.0037
175	1.7478	0.0037
176	1.7515	0.0037
177	1.7551	0.0037
178	1.7588	0.0036
179	1.7624	0.0036
180	1.7660	0.0036
181	1.7696	0.0036
182	1.7732	0.0036
183	1.7768	0.0036
184	1.7804	0.0036
185	1.7840	0.0036
186	1.7875	0.0035
187	1.7910	0.0035
188	1.7946	0.0035
189	1.7981	0.0035
190	1.8016	0.0035
191	1.8051	0.0035
192	1.8085	0.0035
193	1.8120	0.0035
194	1.8155	0.0035
195	1.8189	0.0034
196	1.8223	0.0034
197	1.8258	0.0034
198	1.8292	0.0034
199	1.8326	0.0034
200	1.8360	0.0034
201	1.8393	0.0034
202	1.8427	0.0034
203	1.8461	0.0034
204	1.8494	0.0033
205	1.8527	0.0033
206	1.8561	0.0033
207	1.8594	0.0033
208	1.8627	0.0033
209	1.8660	0.0033
210	1.8693	0.0033
211	1.8725	0.0033
212	1.8758	0.0033
213	1.8791	0.0033
214	1.8823	0.0032
215	1.8855	0.0032
216	1.8888	0.0032
217	1.8920	0.0032
218	1.8952	0.0032
219	1.8984	0.0032
220	1.9016	0.0032
221	1.9048	0.0032
222	1.9079	0.0032
223	1.9111	0.0032
224	1.9142	0.0032
225	1.9174	0.0031
226	1.9205	0.0031
227	1.9237	0.0031
228	1.9268	0.0031

229	1.9299	0.0031
230	1.9330	0.0031
231	1.9361	0.0031
232	1.9392	0.0031
233	1.9422	0.0031
234	1.9453	0.0031
235	1.9484	0.0031
236	1.9514	0.0031
237	1.9545	0.0030
238	1.9575	0.0030
239	1.9605	0.0030
240	1.9635	0.0030
241	1.9665	0.0030
242	1.9695	0.0030
243	1.9725	0.0030
244	1.9755	0.0030
245	1.9785	0.0030
246	1.9815	0.0030
247	1.9844	0.0030
248	1.9874	0.0030
249	1.9904	0.0029
250	1.9933	0.0029
251	1.9962	0.0029
252	1.9992	0.0029
253	2.0021	0.0029
254	2.0050	0.0029
255	2.0079	0.0029
256	2.0108	0.0029
257	2.0137	0.0029
258	2.0166	0.0029
259	2.0194	0.0029
260	2.0223	0.0029
261	2.0252	0.0029
262	2.0280	0.0029
263	2.0309	0.0028
264	2.0337	0.0028
265	2.0366	0.0028
266	2.0394	0.0028
267	2.0422	0.0028
268	2.0450	0.0028
269	2.0478	0.0028
270	2.0506	0.0028
271	2.0534	0.0028
272	2.0562	0.0028
273	2.0590	0.0028
274	2.0618	0.0028
275	2.0645	0.0028
276	2.0673	0.0028
277	2.0701	0.0028
278	2.0728	0.0028
279	2.0756	0.0027
280	2.0783	0.0027
281	2.0810	0.0027
282	2.0838	0.0027
283	2.0865	0.0027
284	2.0892	0.0027
285	2.0919	0.0027
286	2.0946	0.0027
287	2.0973	0.0027
288	2.1000	0.0027

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0027	0.0024	0.0002
2	0.0027	0.0025	0.0002
3	0.0027	0.0025	0.0002
4	0.0027	0.0025	0.0002
5	0.0027	0.0025	0.0002
6	0.0027	0.0025	0.0002

7	0.0027	0.0025	0.0002
8	0.0028	0.0025	0.0002
9	0.0028	0.0025	0.0002
10	0.0028	0.0025	0.0002
11	0.0028	0.0025	0.0002
12	0.0028	0.0025	0.0002
13	0.0028	0.0026	0.0002
14	0.0028	0.0026	0.0003
15	0.0028	0.0026	0.0003
16	0.0028	0.0026	0.0003
17	0.0028	0.0026	0.0003
18	0.0028	0.0026	0.0003
19	0.0029	0.0026	0.0003
20	0.0029	0.0026	0.0003
21	0.0029	0.0026	0.0003
22	0.0029	0.0026	0.0003
23	0.0029	0.0026	0.0003
24	0.0029	0.0027	0.0003
25	0.0029	0.0027	0.0003
26	0.0029	0.0027	0.0003
27	0.0029	0.0027	0.0003
28	0.0030	0.0027	0.0003
29	0.0030	0.0027	0.0003
30	0.0030	0.0027	0.0003
31	0.0030	0.0027	0.0003
32	0.0030	0.0027	0.0003
33	0.0030	0.0027	0.0003
34	0.0030	0.0028	0.0003
35	0.0030	0.0028	0.0003
36	0.0031	0.0028	0.0003
37	0.0031	0.0028	0.0003
38	0.0031	0.0028	0.0003
39	0.0031	0.0028	0.0003
40	0.0031	0.0028	0.0003
41	0.0031	0.0028	0.0003
42	0.0031	0.0028	0.0003
43	0.0031	0.0029	0.0003
44	0.0032	0.0029	0.0003
45	0.0032	0.0029	0.0003
46	0.0032	0.0029	0.0003
47	0.0032	0.0029	0.0003
48	0.0032	0.0029	0.0003
49	0.0032	0.0029	0.0003
50	0.0032	0.0029	0.0003
51	0.0033	0.0030	0.0003
52	0.0033	0.0030	0.0003
53	0.0033	0.0030	0.0003
54	0.0033	0.0030	0.0003
55	0.0033	0.0030	0.0003
56	0.0033	0.0030	0.0003
57	0.0033	0.0030	0.0003
58	0.0034	0.0031	0.0003
59	0.0034	0.0031	0.0003
60	0.0034	0.0031	0.0003
61	0.0034	0.0031	0.0003
62	0.0034	0.0031	0.0003
63	0.0034	0.0031	0.0003
64	0.0035	0.0031	0.0003
65	0.0035	0.0032	0.0003
66	0.0035	0.0032	0.0003
67	0.0035	0.0032	0.0003
68	0.0035	0.0032	0.0003
69	0.0035	0.0032	0.0003
70	0.0036	0.0032	0.0003
71	0.0036	0.0033	0.0003
72	0.0036	0.0033	0.0003
73	0.0036	0.0033	0.0003
74	0.0036	0.0033	0.0003
75	0.0037	0.0033	0.0003
76	0.0037	0.0033	0.0003
77	0.0037	0.0034	0.0003

78	0.0037	0.0034	0.0003
79	0.0037	0.0034	0.0003
80	0.0038	0.0034	0.0003
81	0.0038	0.0034	0.0003
82	0.0038	0.0035	0.0003
83	0.0038	0.0035	0.0003
84	0.0038	0.0035	0.0003
85	0.0039	0.0035	0.0003
86	0.0039	0.0035	0.0003
87	0.0039	0.0036	0.0003
88	0.0039	0.0036	0.0004
89	0.0040	0.0036	0.0004
90	0.0040	0.0036	0.0004
91	0.0040	0.0037	0.0004
92	0.0040	0.0037	0.0004
93	0.0041	0.0037	0.0004
94	0.0041	0.0037	0.0004
95	0.0041	0.0038	0.0004
96	0.0041	0.0038	0.0004
97	0.0042	0.0038	0.0004
98	0.0042	0.0038	0.0004
99	0.0042	0.0039	0.0004
100	0.0042	0.0039	0.0004
101	0.0043	0.0039	0.0004
102	0.0043	0.0039	0.0004
103	0.0043	0.0040	0.0004
104	0.0044	0.0040	0.0004
105	0.0044	0.0040	0.0004
106	0.0044	0.0040	0.0004
107	0.0045	0.0041	0.0004
108	0.0045	0.0041	0.0004
109	0.0045	0.0041	0.0004
110	0.0046	0.0042	0.0004
111	0.0046	0.0042	0.0004
112	0.0046	0.0042	0.0004
113	0.0047	0.0043	0.0004
114	0.0047	0.0043	0.0004
115	0.0048	0.0043	0.0004
116	0.0048	0.0044	0.0004
117	0.0048	0.0044	0.0004
118	0.0049	0.0044	0.0004
119	0.0049	0.0045	0.0004
120	0.0049	0.0045	0.0004
121	0.0050	0.0046	0.0004
122	0.0050	0.0046	0.0004
123	0.0051	0.0046	0.0005
124	0.0051	0.0047	0.0005
125	0.0052	0.0047	0.0005
126	0.0052	0.0048	0.0005
127	0.0053	0.0048	0.0005
128	0.0053	0.0048	0.0005
129	0.0054	0.0049	0.0005
130	0.0054	0.0049	0.0005
131	0.0055	0.0050	0.0005
132	0.0055	0.0050	0.0005
133	0.0056	0.0051	0.0005
134	0.0057	0.0052	0.0005
135	0.0057	0.0052	0.0005
136	0.0058	0.0053	0.0005
137	0.0059	0.0053	0.0005
138	0.0059	0.0054	0.0005
139	0.0060	0.0055	0.0005
140	0.0061	0.0055	0.0005
141	0.0062	0.0056	0.0005
142	0.0062	0.0057	0.0006
143	0.0063	0.0057	0.0006
144	0.0064	0.0058	0.0006
145	0.0070	0.0063	0.0006
146	0.0070	0.0064	0.0006
147	0.0071	0.0065	0.0006
148	0.0072	0.0066	0.0006

149	0.0073	0.0067	0.0007
150	0.0074	0.0067	0.0007
151	0.0075	0.0069	0.0007
152	0.0076	0.0069	0.0007
153	0.0078	0.0071	0.0007
154	0.0079	0.0072	0.0007
155	0.0080	0.0073	0.0007
156	0.0081	0.0074	0.0007
157	0.0083	0.0075	0.0007
158	0.0084	0.0076	0.0007
159	0.0086	0.0078	0.0008
160	0.0087	0.0079	0.0008
161	0.0089	0.0081	0.0008
162	0.0090	0.0082	0.0008
163	0.0093	0.0084	0.0008
164	0.0094	0.0086	0.0008
165	0.0097	0.0088	0.0009
166	0.0098	0.0089	0.0009
167	0.0101	0.0092	0.0009
168	0.0103	0.0094	0.0009
169	0.0106	0.0097	0.0009
170	0.0108	0.0098	0.0010
171	0.0112	0.0102	0.0010
172	0.0114	0.0104	0.0010
173	0.0119	0.0108	0.0011
174	0.0121	0.0110	0.0011
175	0.0127	0.0115	0.0011
176	0.0130	0.0118	0.0012
177	0.0136	0.0124	0.0012
178	0.0140	0.0127	0.0012
179	0.0148	0.0135	0.0013
180	0.0153	0.0139	0.0014
181	0.0163	0.0148	0.0015
182	0.0169	0.0154	0.0015
183	0.0182	0.0166	0.0016
184	0.0191	0.0174	0.0017
185	0.0212	0.0193	0.0019
186	0.0224	0.0204	0.0020
187	0.0254	0.0232	0.0023
188	0.0274	0.0250	0.0024
189	0.0330	0.0301	0.0029
190	0.0373	0.0340	0.0033
191	0.0533	0.0485	0.0048
192	0.0733	0.0668	0.0065
193	0.2294	0.0733	0.1561
194	0.0434	0.0395	0.0039
195	0.0299	0.0272	0.0027
196	0.0238	0.0217	0.0021
197	0.0200	0.0182	0.0018
198	0.0175	0.0160	0.0016
199	0.0158	0.0143	0.0014
200	0.0144	0.0131	0.0013
201	0.0133	0.0121	0.0012
202	0.0124	0.0113	0.0011
203	0.0116	0.0106	0.0010
204	0.0110	0.0100	0.0010
205	0.0104	0.0095	0.0009
206	0.0100	0.0091	0.0009
207	0.0095	0.0087	0.0008
208	0.0091	0.0083	0.0008
209	0.0088	0.0080	0.0008
210	0.0085	0.0077	0.0008
211	0.0082	0.0075	0.0007
212	0.0079	0.0072	0.0007
213	0.0077	0.0070	0.0007
214	0.0075	0.0068	0.0007
215	0.0073	0.0066	0.0006
216	0.0071	0.0064	0.0006
217	0.0064	0.0058	0.0006
218	0.0063	0.0057	0.0006
219	0.0061	0.0056	0.0005

220	0.0060	0.0054	0.0005
221	0.0058	0.0053	0.0005
222	0.0057	0.0052	0.0005
223	0.0056	0.0051	0.0005
224	0.0055	0.0050	0.0005
225	0.0054	0.0049	0.0005
226	0.0053	0.0048	0.0005
227	0.0052	0.0047	0.0005
228	0.0051	0.0046	0.0005
229	0.0050	0.0045	0.0004
230	0.0049	0.0045	0.0004
231	0.0048	0.0044	0.0004
232	0.0047	0.0043	0.0004
233	0.0047	0.0042	0.0004
234	0.0046	0.0042	0.0004
235	0.0045	0.0041	0.0004
236	0.0045	0.0041	0.0004
237	0.0044	0.0040	0.0004
238	0.0043	0.0039	0.0004
239	0.0043	0.0039	0.0004
240	0.0042	0.0038	0.0004
241	0.0042	0.0038	0.0004
242	0.0041	0.0037	0.0004
243	0.0040	0.0037	0.0004
244	0.0040	0.0036	0.0004
245	0.0039	0.0036	0.0004
246	0.0039	0.0036	0.0003
247	0.0039	0.0035	0.0003
248	0.0038	0.0035	0.0003
249	0.0038	0.0034	0.0003
250	0.0037	0.0034	0.0003
251	0.0037	0.0034	0.0003
252	0.0036	0.0033	0.0003
253	0.0036	0.0033	0.0003
254	0.0036	0.0033	0.0003
255	0.0035	0.0032	0.0003
256	0.0035	0.0032	0.0003
257	0.0035	0.0032	0.0003
258	0.0034	0.0031	0.0003
259	0.0034	0.0031	0.0003
260	0.0034	0.0031	0.0003
261	0.0033	0.0030	0.0003
262	0.0033	0.0030	0.0003
263	0.0033	0.0030	0.0003
264	0.0032	0.0030	0.0003
265	0.0032	0.0029	0.0003
266	0.0032	0.0029	0.0003
267	0.0032	0.0029	0.0003
268	0.0031	0.0029	0.0003
269	0.0031	0.0028	0.0003
270	0.0031	0.0028	0.0003
271	0.0031	0.0028	0.0003
272	0.0030	0.0028	0.0003
273	0.0030	0.0027	0.0003
274	0.0030	0.0027	0.0003
275	0.0030	0.0027	0.0003
276	0.0029	0.0027	0.0003
277	0.0029	0.0027	0.0003
278	0.0029	0.0026	0.0003
279	0.0029	0.0026	0.0003
280	0.0029	0.0026	0.0003
281	0.0028	0.0026	0.0003
282	0.0028	0.0026	0.0003
283	0.0028	0.0025	0.0002
284	0.0028	0.0025	0.0002
285	0.0028	0.0025	0.0002
286	0.0027	0.0025	0.0002
287	0.0027	0.0025	0.0002
288	0.0027	0.0025	0.0002

Total soil rain loss = 1.78(In)
Total effective rainfall = 0.32(In)
Peak flow rate in flood hydrograph = 3.43(CFS)

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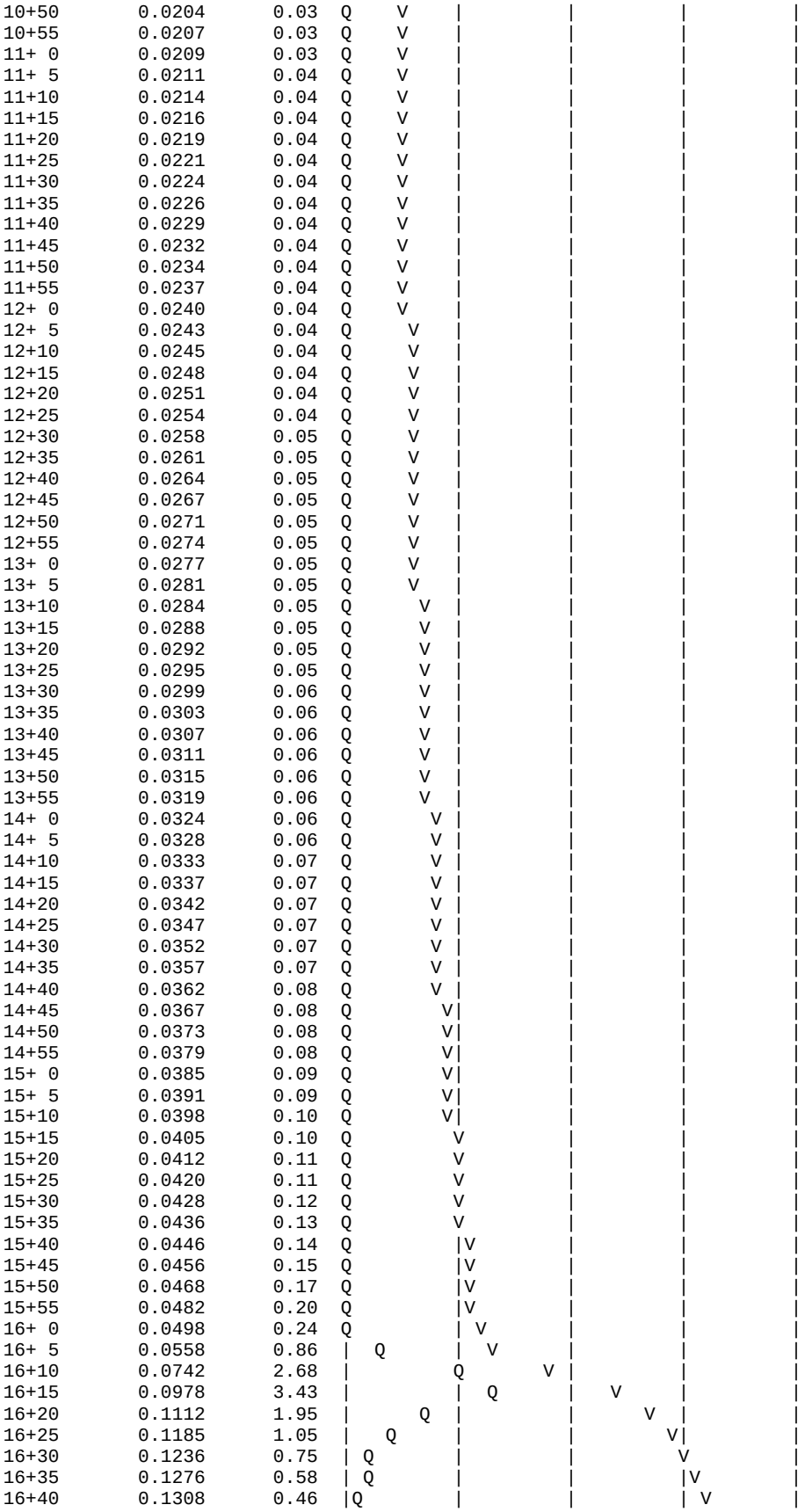
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q				
0+10	0.0000	0.00	Q				
0+15	0.0001	0.01	Q				
0+20	0.0002	0.01	Q				
0+25	0.0003	0.01	Q				
0+30	0.0004	0.01	Q				
0+35	0.0005	0.02	Q				
0+40	0.0006	0.02	Q				
0+45	0.0007	0.02	Q				
0+50	0.0008	0.02	Q				
0+55	0.0009	0.02	Q				
1+ 0	0.0011	0.02	Q				
1+ 5	0.0012	0.02	Q				
1+10	0.0013	0.02	Q				
1+15	0.0014	0.02	Q				
1+20	0.0015	0.02	Q				
1+25	0.0017	0.02	Q				
1+30	0.0018	0.02	Q				
1+35	0.0019	0.02	Q				
1+40	0.0020	0.02	Q				
1+45	0.0022	0.02	Q				
1+50	0.0023	0.02	Q				
1+55	0.0024	0.02	Q				
2+ 0	0.0026	0.02	Q				
2+ 5	0.0027	0.02	Q				
2+10	0.0028	0.02	Q				
2+15	0.0029	0.02	Q				
2+20	0.0031	0.02	Q				
2+25	0.0032	0.02	Q				
2+30	0.0033	0.02	Q				
2+35	0.0035	0.02	Q				
2+40	0.0036	0.02	Q				
2+45	0.0037	0.02	Q				
2+50	0.0039	0.02	Q				
2+55	0.0040	0.02	Q				
3+ 0	0.0041	0.02	QV				
3+ 5	0.0043	0.02	QV				
3+10	0.0044	0.02	QV				
3+15	0.0045	0.02	QV				
3+20	0.0047	0.02	QV				
3+25	0.0048	0.02	QV				
3+30	0.0050	0.02	QV				
3+35	0.0051	0.02	QV				
3+40	0.0052	0.02	QV				
3+45	0.0054	0.02	QV				
3+50	0.0055	0.02	QV				
3+55	0.0056	0.02	QV				
4+ 0	0.0058	0.02	QV				
4+ 5	0.0059	0.02	QV				
4+10	0.0061	0.02	QV				
4+15	0.0062	0.02	QV				
4+20	0.0064	0.02	QV				
4+25	0.0065	0.02	QV				
4+30	0.0066	0.02	QV				
4+35	0.0068	0.02	QV				
4+40	0.0069	0.02	QV				
4+45	0.0071	0.02	QV				
4+50	0.0072	0.02	QV				

4+55	0.0074	0.02	QV	|	|	|	|
5+ 0	0.0075	0.02	QV	|	|	|	|
5+ 5	0.0077	0.02	QV	|	|	|	|
5+10	0.0078	0.02	QV	|	|	|	|
5+15	0.0080	0.02	QV	|	|	|	|
5+20	0.0081	0.02	Q V	|	|	|	|
5+25	0.0083	0.02	Q V	|	|	|	|
5+30	0.0084	0.02	Q V	|	|	|	|
5+35	0.0086	0.02	Q V	|	|	|	|
5+40	0.0087	0.02	Q V	|	|	|	|
5+45	0.0089	0.02	Q V	|	|	|	|
5+50	0.0091	0.02	Q V	|	|	|	|
5+55	0.0092	0.02	Q V	|	|	|	|
6+ 0	0.0094	0.02	Q V	|	|	|	|
6+ 5	0.0095	0.02	Q V	|	|	|	|
6+10	0.0097	0.02	Q V	|	|	|	|
6+15	0.0099	0.02	Q V	|	|	|	|
6+20	0.0100	0.02	Q V	|	|	|	|
6+25	0.0102	0.02	Q V	|	|	|	|
6+30	0.0103	0.02	Q V	|	|	|	|
6+35	0.0105	0.02	Q V	|	|	|	|
6+40	0.0107	0.02	Q V	|	|	|	|
6+45	0.0108	0.02	Q V	|	|	|	|
6+50	0.0110	0.02	Q V	|	|	|	|
6+55	0.0112	0.02	Q V	|	|	|	|
7+ 0	0.0113	0.02	Q V	|	|	|	|
7+ 5	0.0115	0.02	Q V	|	|	|	|
7+10	0.0117	0.02	Q V	|	|	|	|
7+15	0.0118	0.02	Q V	|	|	|	|
7+20	0.0120	0.02	Q V	|	|	|	|
7+25	0.0122	0.03	Q V	|	|	|	|
7+30	0.0124	0.03	Q V	|	|	|	|
7+35	0.0125	0.03	Q V	|	|	|	|
7+40	0.0127	0.03	Q V	|	|	|	|
7+45	0.0129	0.03	Q V	|	|	|	|
7+50	0.0131	0.03	Q V	|	|	|	|
7+55	0.0133	0.03	Q V	|	|	|	|
8+ 0	0.0134	0.03	Q V	|	|	|	|
8+ 5	0.0136	0.03	Q V	|	|	|	|
8+10	0.0138	0.03	Q V	|	|	|	|
8+15	0.0140	0.03	Q V	|	|	|	|
8+20	0.0142	0.03	Q V	|	|	|	|
8+25	0.0144	0.03	Q V	|	|	|	|
8+30	0.0145	0.03	Q V	|	|	|	|
8+35	0.0147	0.03	Q V	|	|	|	|
8+40	0.0149	0.03	Q V	|	|	|	|
8+45	0.0151	0.03	Q V	|	|	|	|
8+50	0.0153	0.03	Q V	|	|	|	|
8+55	0.0155	0.03	Q V	|	|	|	|
9+ 0	0.0157	0.03	Q V	|	|	|	|
9+ 5	0.0159	0.03	Q V	|	|	|	|
9+10	0.0161	0.03	Q V	|	|	|	|
9+15	0.0163	0.03	Q V	|	|	|	|
9+20	0.0165	0.03	Q V	|	|	|	|
9+25	0.0167	0.03	Q V	|	|	|	|
9+30	0.0169	0.03	Q V	|	|	|	|
9+35	0.0171	0.03	Q V	|	|	|	|
9+40	0.0173	0.03	Q V	|	|	|	|
9+45	0.0175	0.03	Q V	|	|	|	|
9+50	0.0177	0.03	Q V	|	|	|	|
9+55	0.0179	0.03	Q V	|	|	|	|
10+ 0	0.0182	0.03	Q V	|	|	|	|
10+ 5	0.0184	0.03	Q V	|	|	|	|
10+10	0.0186	0.03	Q V	|	|	|	|
10+15	0.0188	0.03	Q V	|	|	|	|
10+20	0.0190	0.03	Q V	|	|	|	|
10+25	0.0193	0.03	Q V	|	|	|	|
10+30	0.0195	0.03	Q V	|	|	|	|
10+35	0.0197	0.03	Q V	|	|	|	|
10+40	0.0200	0.03	Q V	|	|	|	|
10+45	0.0202	0.03	Q V	|	|	|	|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10+55 0.0207 0.03
11+ 0 0.0209 0.03
11+ 5 0.0211 0.04
11+10 0.0214 0.04
11+15 0.0216 0.04
11+20 0.0219 0.04
11+25 0.0221 0.04
11+30 0.0224 0.04
11+35 0.0226 0.04
11+40 0.0229 0.04
11+45 0.0232 0.04
11+50 0.0234 0.04
11+55 0.0237 0.04
12+ 0 0.0240 0.04
12+ 5 0.0243 0.04
12+10 0.0245 0.04
12+15 0.0248 0.04
12+20 0.0251 0.04
12+25 0.0254 0.04
12+30 0.0258 0.05
12+35 0.0261 0.05
12+40 0.0264 0.05
12+45 0.0267 0.05
12+50 0.0271 0.05
12+55 0.0274 0.05
13+ 0 0.0277 0.05
13+ 5 0.0281 0.05
13+10 0.0284 0.05
13+15 0.0288 0.05
13+20 0.0292 0.05
13+25 0.0295 0.05
13+30 0.0299 0.06
13+35 0.0303 0.06
13+40 0.0307 0.06
13+45 0.0311 0.06
13+50 0.0315 0.06
13+55 0.0319 0.06
14+ 0 0.0324 0.06
14+ 5 0.0328 0.06
14+10 0.0333 0.07
14+15 0.0337 0.07
14+20 0.0342 0.07
14+25 0.0347 0.07
14+30 0.0352 0.07
14+35 0.0357 0.07
14+40 0.0362 0.08
14+45 0.0367 0.08
14+50 0.0373 0.08
14+55 0.0379 0.08
15+ 0 0.0385 0.09
15+ 5 0.0391 0.09
15+10 0.0398 0.10
15+15 0.0405 0.10
15+20 0.0412 0.11
15+25 0.0420 0.11
15+30 0.0428 0.12
15+35 0.0436 0.13
15+40 0.0446 0.14
15+45 0.0456 0.15
15+50 0.0468 0.17
15+55 0.0482 0.20
16+ 0 0.0498 0.24
16+ 5 0.0558 0.86
16+10 0.0742 2.68
16+15 0.0978 3.43
16+20 0.1112 1.95
16+25 0.1185 1.05
16+30 0.1236 0.75
16+35 0.1276 0.58
16+40 0.1308 0.46

```
16+45       0.1334      0.38  |Q        |         |         |  V      |
16+50       0.1355      0.31  |Q        |         |         |  V      |
16+55       0.1373      0.26  |Q        |         |         |   V     |
17+ 0       0.1390      0.24  Q         |         |         |   V     |
17+ 5       0.1403      0.20  Q         |         |         |   V     |
17+10       0.1416      0.18  Q         |         |         |    V    |
17+15       0.1426      0.15  Q         |         |         |    V    |
17+20       0.1435      0.13  Q         |         |         |    V    |
17+25       0.1443      0.12  Q         |         |         |    V    |
17+30       0.1451      0.12  Q         |         |         |    V    |
17+35       0.1458      0.09  Q         |         |         |     V   |
17+40       0.1462      0.06  Q         |         |         |     V   |
17+45       0.1466      0.06  Q         |         |         |     V   |
17+50       0.1470      0.06  Q         |         |         |     V   |
17+55       0.1473      0.05  Q         |         |         |     V   |
18+ 0       0.1477      0.05  Q         |         |         |     V   |
18+ 5       0.1480      0.05  Q         |         |         |     V   |
18+10       0.1483      0.05  Q         |         |         |     V   |
18+15       0.1487      0.05  Q         |         |         |     V   |
18+20       0.1490      0.04  Q         |         |         |     V   |
18+25       0.1492      0.04  Q         |         |         |     V   |
18+30       0.1495      0.04  Q         |         |         |      V  |
18+35       0.1498      0.04  Q         |         |         |      V  |
18+40       0.1501      0.04  Q         |         |         |      V  |
18+45       0.1503      0.04  Q         |         |         |      V  |
18+50       0.1506      0.04  Q         |         |         |      V  |
18+55       0.1508      0.04  Q         |         |         |      V  |
19+ 0       0.1511      0.04  Q         |         |         |      V  |
19+ 5       0.1513      0.03  Q         |         |         |      V  |
19+10       0.1515      0.03  Q         |         |         |      V  |
19+15       0.1518      0.03  Q         |         |         |      V  |
19+20       0.1520      0.03  Q         |         |         |      V  |
19+25       0.1522      0.03  Q         |         |         |      V  |
19+30       0.1524      0.03  Q         |         |         |      V  |
19+35       0.1527      0.03  Q         |         |         |      V  |
19+40       0.1529      0.03  Q         |         |         |      V  |
19+45       0.1531      0.03  Q         |         |         |      V  |
19+50       0.1533      0.03  Q         |         |         |      V  |
19+55       0.1535      0.03  Q         |         |         |       V |
20+ 0       0.1537      0.03  Q         |         |         |       V |
20+ 5       0.1539      0.03  Q         |         |         |       V |
20+10       0.1541      0.03  Q         |         |         |       V |
20+15       0.1542      0.03  Q         |         |         |       V |
20+20       0.1544      0.03  Q         |         |         |       V |
20+25       0.1546      0.03  Q         |         |         |       V |
20+30       0.1548      0.03  Q         |         |         |       V |
20+35       0.1550      0.03  Q         |         |         |       V |
20+40       0.1552      0.03  Q         |         |         |       V |
20+45       0.1553      0.03  Q         |         |         |       V |
20+50       0.1555      0.03  Q         |         |         |       V |
20+55       0.1557      0.02  Q         |         |         |       V |
21+ 0       0.1558      0.02  Q         |         |         |       V |
21+ 5       0.1560      0.02  Q         |         |         |       V |
21+10       0.1562      0.02  Q         |         |         |       V |
21+15       0.1563      0.02  Q         |         |         |       V |
21+20       0.1565      0.02  Q         |         |         |       V |
21+25       0.1567      0.02  Q         |         |         |       V |
21+30       0.1568      0.02  Q         |         |         |       V |
21+35       0.1570      0.02  Q         |         |         |       V |
21+40       0.1571      0.02  Q         |         |         |       V |
21+45       0.1573      0.02  Q         |         |         |       V |
21+50       0.1574      0.02  Q         |         |         |        V|
21+55       0.1576      0.02  Q         |         |         |        V|
22+ 0       0.1577      0.02  Q         |         |         |        V|
22+ 5       0.1579      0.02  Q         |         |         |        V|
22+10       0.1580      0.02  Q         |         |         |        V|
22+15       0.1582      0.02  Q         |         |         |        V|
22+20       0.1583      0.02  Q         |         |         |        V|
22+25       0.1585      0.02  Q         |         |         |        V|
22+30       0.1586      0.02  Q         |         |         |        V|
22+35       0.1587      0.02  Q         |         |         |        V|
```

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  22+40       0.1589      0.02  Q        |         |         |        V|
  22+45       0.1590      0.02  Q        |         |         |        V|
  22+50       0.1592      0.02  Q        |         |         |        V|
  22+55       0.1593      0.02  Q        |         |         |        V|
  23+ 0       0.1594      0.02  Q        |         |         |        V|
  23+ 5       0.1596      0.02  Q        |         |         |        V|
  23+10       0.1597      0.02  Q        |         |         |        V|
  23+15       0.1598      0.02  Q        |         |         |        V|
  23+20       0.1600      0.02  Q        |         |         |        V|
  23+25       0.1601      0.02  Q        |         |         |        V|
  23+30       0.1602      0.02  Q        |         |         |        V|
  23+35       0.1603      0.02  Q        |         |         |        V|
  23+40       0.1605      0.02  Q        |         |         |        V|
  23+45       0.1606      0.02  Q        |         |         |        V|
  23+50       0.1607      0.02  Q        |         |         |        V|
  23+55       0.1609      0.02  Q        |         |         |        V|
  24+ 0       0.1610      0.02  Q        |         |         |        V|
  24+ 5       0.1611      0.02  Q        |         |         |        V|
  24+10       0.1612      0.01  Q        |         |         |        V|
  24+15       0.1612      0.01  Q        |         |         |        V|
  24+20       0.1613      0.01  Q        |         |         |        V|
  24+25       0.1613      0.00  Q        |         |         |        V|
  24+30       0.1613      0.00  Q        |         |         |        V|
  24+35       0.1613      0.00  Q        |         |         |        V|
  24+40       0.1614      0.00  Q        |         |         |        V|
  24+45       0.1614      0.00  Q        |         |         |        V|
  24+50       0.1614      0.00  Q        |         |         |        V|
  24+55       0.1614      0.00  Q        |         |         |        V|
  25+ 0       0.1614      0.00  Q        |         |         |        V|
  25+ 5       0.1614      0.00  Q        |         |         |        V|
  25+10       0.1614      0.00  Q        |         |         |        V|
  25+15       0.1614      0.00  Q        |         |         |        V|
  25+20       0.1614      0.00  Q        |         |         |        V|
  25+25       0.1614      0.00  Q        |         |         |        V|
  25+30       0.1614      0.00  Q        |         |         |        V|
-------------------------------------------------------------------------
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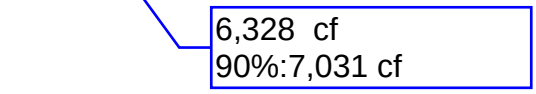

UNIT HYDROGRAPH ANALYSIS-DEVELOPED CONDITION
10-YR STORM EVENT

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 - 2018, Version 9.0

Study date 07/18/24

++

San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6484

BURRTEC, ABBEY LN, VICTORVILLE
DEV CONDITION
10YR STORM EVENT

Storm Event Year = 10

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
6.00	1	0.62
Rainfall data for year 10		
6.00	6	1.26
Rainfall data for year 10		
6.00	24	2.10

++

******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	52.0	6.00	1.000	0.785	0.100	0.079

Area-averaged adjusted loss rate Fm (In/Hr) = 0.079

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
0.60	0.100	32.0	52.0	9.23	0.003
5.40	0.900	98.0	98.0	0.20	0.892

Area-averaged catchment yield fraction, Y = 0.803
Area-averaged low loss fraction, Yb = 0.197
Direct entry of lag time by user
++

Watershed area = 6.00(Ac.)
Catchment Lag time = 0.127 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 65.6168
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.079(In/Hr)
Average low loss rate fraction (Yb) = 0.197 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.229(In)
Computed peak 30-minute rainfall = 0.470(In)
Specified peak 1-hour rainfall = 0.620(In)
Computed peak 3-hour rainfall = 0.958(In)
Specified peak 6-hour rainfall = 1.260(In)
Specified peak 24-hour rainfall = 2.100(In)

Rainfall depth area reduction factors:
Using a total area of 6.00(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.229(In)
30-minute factor = 1.000 Adjusted rainfall = 0.470(In)
1-hour factor = 1.000 Adjusted rainfall = 0.620(In)
3-hour factor = 1.000 Adjusted rainfall = 0.958(In)
6-hour factor = 1.000 Adjusted rainfall = 1.260(In)
24-hour factor = 1.000 Adjusted rainfall = 2.100(In)

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

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 72.56 (CFS))	
1	7.750	5.624
2	48.488	29.560
3	86.372	27.490
4	97.161	7.828
5	99.115	1.418
6	100.000	0.642

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2294	0.2294
2	0.3027	0.0733
3	0.3560	0.0533
4	0.3994	0.0434
5	0.4367	0.0373
6	0.4697	0.0330
7	0.4996	0.0299
8	0.5270	0.0274
9	0.5525	0.0254
10	0.5762	0.0238
11	0.5986	0.0224
12	0.6198	0.0212
13	0.6398	0.0200
14	0.6588	0.0191
15	0.6771	0.0182
16	0.6946	0.0175
17	0.7115	0.0169
18	0.7278	0.0163
19	0.7435	0.0158
20	0.7588	0.0153
21	0.7736	0.0148
22	0.7880	0.0144
23	0.8020	0.0140
24	0.8156	0.0136
25	0.8289	0.0133
26	0.8419	0.0130
27	0.8545	0.0127
28	0.8669	0.0124

29	0.8791	0.0121
30	0.8910	0.0119
31	0.9026	0.0116
32	0.9140	0.0114
33	0.9252	0.0112
34	0.9362	0.0110
35	0.9470	0.0108
36	0.9577	0.0106
37	0.9681	0.0104
38	0.9784	0.0103
39	0.9885	0.0101
40	0.9984	0.0100
41	1.0083	0.0098
42	1.0179	0.0097
43	1.0274	0.0095
44	1.0368	0.0094
45	1.0461	0.0093
46	1.0552	0.0091
47	1.0643	0.0090
48	1.0732	0.0089
49	1.0820	0.0088
50	1.0906	0.0087
51	1.0992	0.0086
52	1.1077	0.0085
53	1.1161	0.0084
54	1.1244	0.0083
55	1.1326	0.0082
56	1.1407	0.0081
57	1.1487	0.0080
58	1.1566	0.0079
59	1.1645	0.0079
60	1.1723	0.0078
61	1.1799	0.0077
62	1.1876	0.0076
63	1.1951	0.0075
64	1.2026	0.0075
65	1.2100	0.0074
66	1.2173	0.0073
67	1.2246	0.0073
68	1.2318	0.0072
69	1.2389	0.0071
70	1.2460	0.0071
71	1.2530	0.0070
72	1.2600	0.0070
73	1.2664	0.0064
74	1.2728	0.0064
75	1.2791	0.0063
76	1.2853	0.0063
77	1.2915	0.0062
78	1.2977	0.0062
79	1.3038	0.0061
80	1.3099	0.0061
81	1.3159	0.0060
82	1.3218	0.0060
83	1.3277	0.0059
84	1.3336	0.0059
85	1.3394	0.0058
86	1.3452	0.0058
87	1.3510	0.0057
88	1.3567	0.0057
89	1.3623	0.0057
90	1.3680	0.0056
91	1.3735	0.0056
92	1.3791	0.0055
93	1.3846	0.0055
94	1.3901	0.0055
95	1.3955	0.0054
96	1.4009	0.0054
97	1.4062	0.0054
98	1.4116	0.0053
99	1.4169	0.0053

100	1.4221	0.0053
101	1.4273	0.0052
102	1.4325	0.0052
103	1.4377	0.0052
104	1.4428	0.0051
105	1.4479	0.0051
106	1.4530	0.0051
107	1.4580	0.0050
108	1.4630	0.0050
109	1.4680	0.0050
110	1.4729	0.0049
111	1.4779	0.0049
112	1.4828	0.0049
113	1.4876	0.0049
114	1.4925	0.0048
115	1.4973	0.0048
116	1.5021	0.0048
117	1.5068	0.0048
118	1.5115	0.0047
119	1.5163	0.0047
120	1.5209	0.0047
121	1.5256	0.0047
122	1.5302	0.0046
123	1.5348	0.0046
124	1.5394	0.0046
125	1.5440	0.0046
126	1.5485	0.0045
127	1.5530	0.0045
128	1.5575	0.0045
129	1.5620	0.0045
130	1.5665	0.0045
131	1.5709	0.0044
132	1.5753	0.0044
133	1.5797	0.0044
134	1.5841	0.0044
135	1.5884	0.0043
136	1.5927	0.0043
137	1.5970	0.0043
138	1.6013	0.0043
139	1.6056	0.0043
140	1.6098	0.0042
141	1.6141	0.0042
142	1.6183	0.0042
143	1.6225	0.0042
144	1.6266	0.0042
145	1.6308	0.0042
146	1.6349	0.0041
147	1.6390	0.0041
148	1.6431	0.0041
149	1.6472	0.0041
150	1.6513	0.0041
151	1.6553	0.0040
152	1.6594	0.0040
153	1.6634	0.0040
154	1.6674	0.0040
155	1.6714	0.0040
156	1.6753	0.0040
157	1.6793	0.0039
158	1.6832	0.0039
159	1.6871	0.0039
160	1.6910	0.0039
161	1.6949	0.0039
162	1.6988	0.0039
163	1.7026	0.0039
164	1.7065	0.0038
165	1.7103	0.0038
166	1.7141	0.0038
167	1.7179	0.0038
168	1.7217	0.0038
169	1.7255	0.0038
170	1.7292	0.0038

171	1.7330	0.0037
172	1.7367	0.0037
173	1.7404	0.0037
174	1.7441	0.0037
175	1.7478	0.0037
176	1.7515	0.0037
177	1.7551	0.0037
178	1.7588	0.0036
179	1.7624	0.0036
180	1.7660	0.0036
181	1.7696	0.0036
182	1.7732	0.0036
183	1.7768	0.0036
184	1.7804	0.0036
185	1.7840	0.0036
186	1.7875	0.0035
187	1.7910	0.0035
188	1.7946	0.0035
189	1.7981	0.0035
190	1.8016	0.0035
191	1.8051	0.0035
192	1.8085	0.0035
193	1.8120	0.0035
194	1.8155	0.0035
195	1.8189	0.0034
196	1.8223	0.0034
197	1.8258	0.0034
198	1.8292	0.0034
199	1.8326	0.0034
200	1.8360	0.0034
201	1.8393	0.0034
202	1.8427	0.0034
203	1.8461	0.0034
204	1.8494	0.0033
205	1.8527	0.0033
206	1.8561	0.0033
207	1.8594	0.0033
208	1.8627	0.0033
209	1.8660	0.0033
210	1.8693	0.0033
211	1.8725	0.0033
212	1.8758	0.0033
213	1.8791	0.0033
214	1.8823	0.0032
215	1.8855	0.0032
216	1.8888	0.0032
217	1.8920	0.0032
218	1.8952	0.0032
219	1.8984	0.0032
220	1.9016	0.0032
221	1.9048	0.0032
222	1.9079	0.0032
223	1.9111	0.0032
224	1.9142	0.0032
225	1.9174	0.0031
226	1.9205	0.0031
227	1.9237	0.0031
228	1.9268	0.0031
229	1.9299	0.0031
230	1.9330	0.0031
231	1.9361	0.0031
232	1.9392	0.0031
233	1.9422	0.0031
234	1.9453	0.0031
235	1.9484	0.0031
236	1.9514	0.0031
237	1.9545	0.0030
238	1.9575	0.0030
239	1.9605	0.0030
240	1.9635	0.0030
241	1.9665	0.0030

242	1.9695	0.0030
243	1.9725	0.0030
244	1.9755	0.0030
245	1.9785	0.0030
246	1.9815	0.0030
247	1.9844	0.0030
248	1.9874	0.0030
249	1.9904	0.0029
250	1.9933	0.0029
251	1.9962	0.0029
252	1.9992	0.0029
253	2.0021	0.0029
254	2.0050	0.0029
255	2.0079	0.0029
256	2.0108	0.0029
257	2.0137	0.0029
258	2.0166	0.0029
259	2.0194	0.0029
260	2.0223	0.0029
261	2.0252	0.0029
262	2.0280	0.0029
263	2.0309	0.0028
264	2.0337	0.0028
265	2.0366	0.0028
266	2.0394	0.0028
267	2.0422	0.0028
268	2.0450	0.0028
269	2.0478	0.0028
270	2.0506	0.0028
271	2.0534	0.0028
272	2.0562	0.0028
273	2.0590	0.0028
274	2.0618	0.0028
275	2.0645	0.0028
276	2.0673	0.0028
277	2.0701	0.0028
278	2.0728	0.0028
279	2.0756	0.0027
280	2.0783	0.0027
281	2.0810	0.0027
282	2.0838	0.0027
283	2.0865	0.0027
284	2.0892	0.0027
285	2.0919	0.0027
286	2.0946	0.0027
287	2.0973	0.0027
288	2.1000	0.0027

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0027	0.0005	0.0022
2	0.0027	0.0005	0.0022
3	0.0027	0.0005	0.0022
4	0.0027	0.0005	0.0022
5	0.0027	0.0005	0.0022
6	0.0027	0.0005	0.0022
7	0.0027	0.0005	0.0022
8	0.0028	0.0005	0.0022
9	0.0028	0.0005	0.0022
10	0.0028	0.0005	0.0022
11	0.0028	0.0005	0.0022
12	0.0028	0.0005	0.0022
13	0.0028	0.0006	0.0023
14	0.0028	0.0006	0.0023
15	0.0028	0.0006	0.0023
16	0.0028	0.0006	0.0023
17	0.0028	0.0006	0.0023
18	0.0028	0.0006	0.0023
19	0.0029	0.0006	0.0023

20	0.0029	0.0006	0.0023
21	0.0029	0.0006	0.0023
22	0.0029	0.0006	0.0023
23	0.0029	0.0006	0.0023
24	0.0029	0.0006	0.0023
25	0.0029	0.0006	0.0024
26	0.0029	0.0006	0.0024
27	0.0029	0.0006	0.0024
28	0.0030	0.0006	0.0024
29	0.0030	0.0006	0.0024
30	0.0030	0.0006	0.0024
31	0.0030	0.0006	0.0024
32	0.0030	0.0006	0.0024
33	0.0030	0.0006	0.0024
34	0.0030	0.0006	0.0024
35	0.0030	0.0006	0.0024
36	0.0031	0.0006	0.0025
37	0.0031	0.0006	0.0025
38	0.0031	0.0006	0.0025
39	0.0031	0.0006	0.0025
40	0.0031	0.0006	0.0025
41	0.0031	0.0006	0.0025
42	0.0031	0.0006	0.0025
43	0.0031	0.0006	0.0025
44	0.0032	0.0006	0.0025
45	0.0032	0.0006	0.0025
46	0.0032	0.0006	0.0026
47	0.0032	0.0006	0.0026
48	0.0032	0.0006	0.0026
49	0.0032	0.0006	0.0026
50	0.0032	0.0006	0.0026
51	0.0033	0.0006	0.0026
52	0.0033	0.0006	0.0026
53	0.0033	0.0006	0.0026
54	0.0033	0.0006	0.0026
55	0.0033	0.0007	0.0027
56	0.0033	0.0007	0.0027
57	0.0033	0.0007	0.0027
58	0.0034	0.0007	0.0027
59	0.0034	0.0007	0.0027
60	0.0034	0.0007	0.0027
61	0.0034	0.0007	0.0027
62	0.0034	0.0007	0.0027
63	0.0034	0.0007	0.0028
64	0.0035	0.0007	0.0028
65	0.0035	0.0007	0.0028
66	0.0035	0.0007	0.0028
67	0.0035	0.0007	0.0028
68	0.0035	0.0007	0.0028
69	0.0035	0.0007	0.0028
70	0.0036	0.0007	0.0029
71	0.0036	0.0007	0.0029
72	0.0036	0.0007	0.0029
73	0.0036	0.0007	0.0029
74	0.0036	0.0007	0.0029
75	0.0037	0.0007	0.0029
76	0.0037	0.0007	0.0030
77	0.0037	0.0007	0.0030
78	0.0037	0.0007	0.0030
79	0.0037	0.0007	0.0030
80	0.0038	0.0007	0.0030
81	0.0038	0.0007	0.0030
82	0.0038	0.0007	0.0031
83	0.0038	0.0008	0.0031
84	0.0038	0.0008	0.0031
85	0.0039	0.0008	0.0031
86	0.0039	0.0008	0.0031
87	0.0039	0.0008	0.0031
88	0.0039	0.0008	0.0032
89	0.0040	0.0008	0.0032
90	0.0040	0.0008	0.0032

91	0.0040	0.0008	0.0032
92	0.0040	0.0008	0.0032
93	0.0041	0.0008	0.0033
94	0.0041	0.0008	0.0033
95	0.0041	0.0008	0.0033
96	0.0041	0.0008	0.0033
97	0.0042	0.0008	0.0034
98	0.0042	0.0008	0.0034
99	0.0042	0.0008	0.0034
100	0.0042	0.0008	0.0034
101	0.0043	0.0008	0.0034
102	0.0043	0.0008	0.0035
103	0.0043	0.0009	0.0035
104	0.0044	0.0009	0.0035
105	0.0044	0.0009	0.0035
106	0.0044	0.0009	0.0036
107	0.0045	0.0009	0.0036
108	0.0045	0.0009	0.0036
109	0.0045	0.0009	0.0036
110	0.0046	0.0009	0.0037
111	0.0046	0.0009	0.0037
112	0.0046	0.0009	0.0037
113	0.0047	0.0009	0.0038
114	0.0047	0.0009	0.0038
115	0.0048	0.0009	0.0038
116	0.0048	0.0009	0.0038
117	0.0048	0.0010	0.0039
118	0.0049	0.0010	0.0039
119	0.0049	0.0010	0.0040
120	0.0049	0.0010	0.0040
121	0.0050	0.0010	0.0040
122	0.0050	0.0010	0.0040
123	0.0051	0.0010	0.0041
124	0.0051	0.0010	0.0041
125	0.0052	0.0010	0.0042
126	0.0052	0.0010	0.0042
127	0.0053	0.0010	0.0042
128	0.0053	0.0010	0.0043
129	0.0054	0.0011	0.0043
130	0.0054	0.0011	0.0044
131	0.0055	0.0011	0.0044
132	0.0055	0.0011	0.0045
133	0.0056	0.0011	0.0045
134	0.0057	0.0011	0.0045
135	0.0057	0.0011	0.0046
136	0.0058	0.0011	0.0046
137	0.0059	0.0012	0.0047
138	0.0059	0.0012	0.0048
139	0.0060	0.0012	0.0048
140	0.0061	0.0012	0.0049
141	0.0062	0.0012	0.0049
142	0.0062	0.0012	0.0050
143	0.0063	0.0012	0.0051
144	0.0064	0.0013	0.0051
145	0.0070	0.0014	0.0056
146	0.0070	0.0014	0.0056
147	0.0071	0.0014	0.0057
148	0.0072	0.0014	0.0058
149	0.0073	0.0014	0.0059
150	0.0074	0.0015	0.0059
151	0.0075	0.0015	0.0061
152	0.0076	0.0015	0.0061
153	0.0078	0.0015	0.0062
154	0.0079	0.0015	0.0063
155	0.0080	0.0016	0.0064
156	0.0081	0.0016	0.0065
157	0.0083	0.0016	0.0067
158	0.0084	0.0016	0.0067
159	0.0086	0.0017	0.0069
160	0.0087	0.0017	0.0070
161	0.0089	0.0018	0.0072

162	0.0090	0.0018	0.0072
163	0.0093	0.0018	0.0074
164	0.0094	0.0018	0.0075
165	0.0097	0.0019	0.0078
166	0.0098	0.0019	0.0079
167	0.0101	0.0020	0.0081
168	0.0103	0.0020	0.0083
169	0.0106	0.0021	0.0085
170	0.0108	0.0021	0.0087
171	0.0112	0.0022	0.0090
172	0.0114	0.0022	0.0092
173	0.0119	0.0023	0.0095
174	0.0121	0.0024	0.0097
175	0.0127	0.0025	0.0102
176	0.0130	0.0026	0.0104
177	0.0136	0.0027	0.0109
178	0.0140	0.0028	0.0112
179	0.0148	0.0029	0.0119
180	0.0153	0.0030	0.0123
181	0.0163	0.0032	0.0131
182	0.0169	0.0033	0.0136
183	0.0182	0.0036	0.0147
184	0.0191	0.0037	0.0153
185	0.0212	0.0042	0.0170
186	0.0224	0.0044	0.0180
187	0.0254	0.0050	0.0204
188	0.0274	0.0054	0.0220
189	0.0330	0.0065	0.0265
190	0.0373	0.0065	0.0307
191	0.0533	0.0065	0.0468
192	0.0733	0.0065	0.0668
193	0.2294	0.0065	0.2229
194	0.0434	0.0065	0.0369
195	0.0299	0.0059	0.0240
196	0.0238	0.0047	0.0191
197	0.0200	0.0039	0.0160
198	0.0175	0.0034	0.0141
199	0.0158	0.0031	0.0127
200	0.0144	0.0028	0.0116
201	0.0133	0.0026	0.0107
202	0.0124	0.0024	0.0100
203	0.0116	0.0023	0.0094
204	0.0110	0.0022	0.0088
205	0.0104	0.0021	0.0084
206	0.0100	0.0020	0.0080
207	0.0095	0.0019	0.0077
208	0.0091	0.0018	0.0073
209	0.0088	0.0017	0.0071
210	0.0085	0.0017	0.0068
211	0.0082	0.0016	0.0066
212	0.0079	0.0016	0.0064
213	0.0077	0.0015	0.0062
214	0.0075	0.0015	0.0060
215	0.0073	0.0014	0.0058
216	0.0071	0.0014	0.0057
217	0.0064	0.0013	0.0052
218	0.0063	0.0012	0.0050
219	0.0061	0.0012	0.0049
220	0.0060	0.0012	0.0048
221	0.0058	0.0011	0.0047
222	0.0057	0.0011	0.0046
223	0.0056	0.0011	0.0045
224	0.0055	0.0011	0.0044
225	0.0054	0.0011	0.0043
226	0.0053	0.0010	0.0042
227	0.0052	0.0010	0.0041
228	0.0051	0.0010	0.0041
229	0.0050	0.0010	0.0040
230	0.0049	0.0010	0.0039
231	0.0048	0.0009	0.0039
232	0.0047	0.0009	0.0038

233	0.0047	0.0009	0.0037
234	0.0046	0.0009	0.0037
235	0.0045	0.0009	0.0036
236	0.0045	0.0009	0.0036
237	0.0044	0.0009	0.0035
238	0.0043	0.0009	0.0035
239	0.0043	0.0008	0.0034
240	0.0042	0.0008	0.0034
241	0.0042	0.0008	0.0033
242	0.0041	0.0008	0.0033
243	0.0040	0.0008	0.0033
244	0.0040	0.0008	0.0032
245	0.0039	0.0008	0.0032
246	0.0039	0.0008	0.0031
247	0.0039	0.0008	0.0031
248	0.0038	0.0008	0.0031
249	0.0038	0.0007	0.0030
250	0.0037	0.0007	0.0030
251	0.0037	0.0007	0.0030
252	0.0036	0.0007	0.0029
253	0.0036	0.0007	0.0029
254	0.0036	0.0007	0.0029
255	0.0035	0.0007	0.0028
256	0.0035	0.0007	0.0028
257	0.0035	0.0007	0.0028
258	0.0034	0.0007	0.0028
259	0.0034	0.0007	0.0027
260	0.0034	0.0007	0.0027
261	0.0033	0.0007	0.0027
262	0.0033	0.0007	0.0027
263	0.0033	0.0006	0.0026
264	0.0032	0.0006	0.0026
265	0.0032	0.0006	0.0026
266	0.0032	0.0006	0.0026
267	0.0032	0.0006	0.0025
268	0.0031	0.0006	0.0025
269	0.0031	0.0006	0.0025
270	0.0031	0.0006	0.0025
271	0.0031	0.0006	0.0025
272	0.0030	0.0006	0.0024
273	0.0030	0.0006	0.0024
274	0.0030	0.0006	0.0024
275	0.0030	0.0006	0.0024
276	0.0029	0.0006	0.0024
277	0.0029	0.0006	0.0023
278	0.0029	0.0006	0.0023
279	0.0029	0.0006	0.0023
280	0.0029	0.0006	0.0023
281	0.0028	0.0006	0.0023
282	0.0028	0.0006	0.0023
283	0.0028	0.0005	0.0022
284	0.0028	0.0005	0.0022
285	0.0028	0.0005	0.0022
286	0.0027	0.0005	0.0022
287	0.0027	0.0005	0.0022
288	0.0027	0.0005	0.0022

Total soil rain loss = 0.36(In)
Total effective rainfall = 1.74(In)
Peak flow rate in flood hydrograph = 9.06(CFS)

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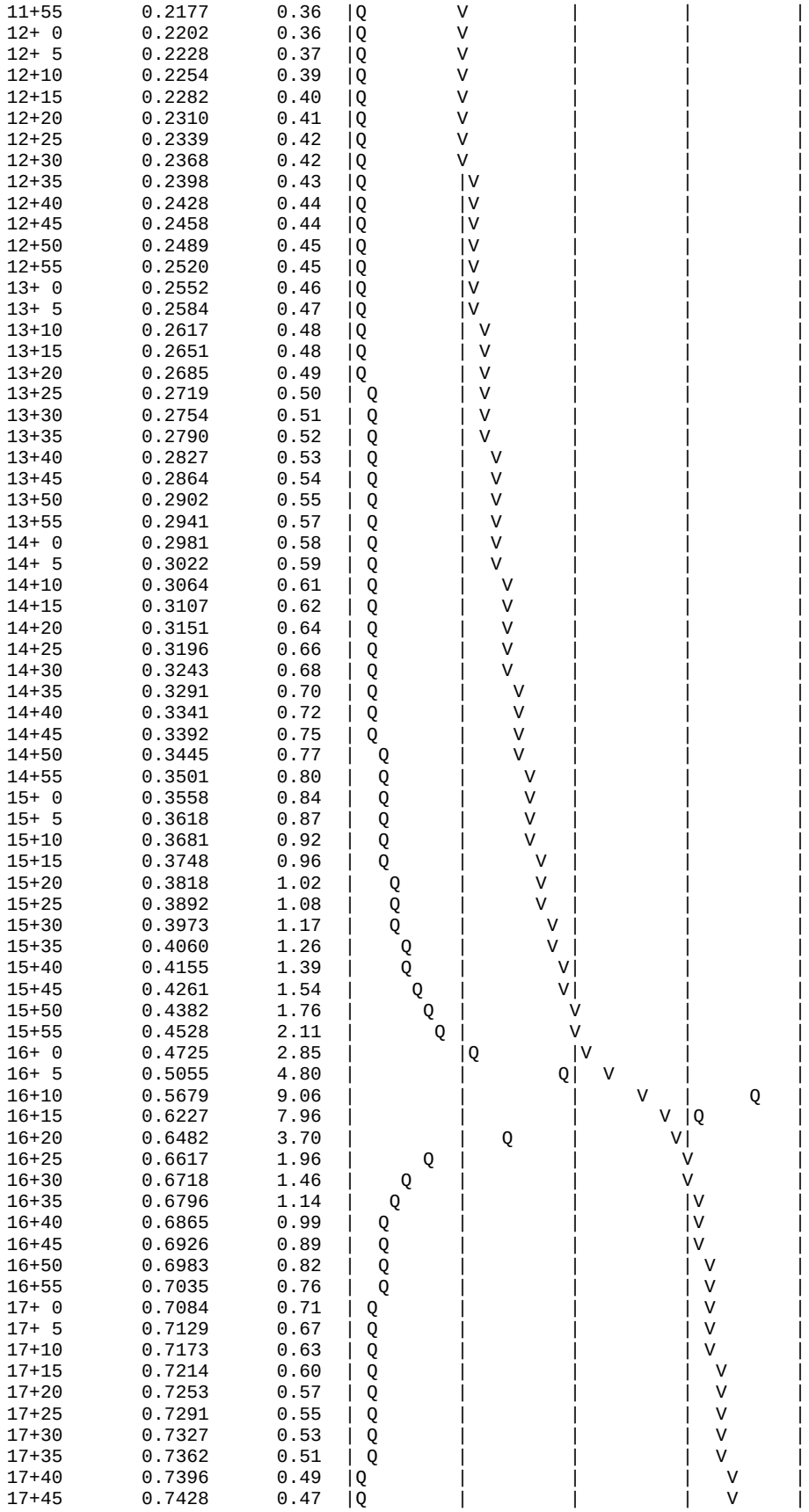
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m) Volume Ac.Ft Q(CFS) 0 2.5 5.0 7.5 10.0

0+ 5	0.0001	0.01	Q	|	|	|	|
0+10	0.0006	0.08	Q	|	|	|	|
0+15	0.0015	0.14	Q	|	|	|	|
0+20	0.0026	0.15	Q	|	|	|	|
0+25	0.0037	0.16	Q	|	|	|	|
0+30	0.0048	0.16	Q	|	|	|	|
0+35	0.0059	0.16	Q	|	|	|	|
0+40	0.0070	0.16	Q	|	|	|	|
0+45	0.0081	0.16	Q	|	|	|	|
0+50	0.0092	0.16	Q	|	|	|	|
0+55	0.0103	0.16	Q	|	|	|	|
1+ 0	0.0114	0.16	Q	|	|	|	|
1+ 5	0.0125	0.16	Q	|	|	|	|
1+10	0.0136	0.16	Q	|	|	|	|
1+15	0.0148	0.16	Q	|	|	|	|
1+20	0.0159	0.16	Q	|	|	|	|
1+25	0.0170	0.16	Q	|	|	|	|
1+30	0.0182	0.17	Q	|	|	|	|
1+35	0.0193	0.17	Q	|	|	|	|
1+40	0.0204	0.17	Q	|	|	|	|
1+45	0.0216	0.17	Q	|	|	|	|
1+50	0.0227	0.17	QV	|	|	|	|
1+55	0.0239	0.17	QV	|	|	|	|
2+ 0	0.0251	0.17	QV	|	|	|	|
2+ 5	0.0262	0.17	QV	|	|	|	|
2+10	0.0274	0.17	QV	|	|	|	|
2+15	0.0286	0.17	QV	|	|	|	|
2+20	0.0298	0.17	QV	|	|	|	|
2+25	0.0310	0.17	QV	|	|	|	|
2+30	0.0321	0.17	QV	|	|	|	|
2+35	0.0333	0.17	QV	|	|	|	|
2+40	0.0345	0.17	QV	|	|	|	|
2+45	0.0357	0.17	QV	|	|	|	|
2+50	0.0369	0.18	QV	|	|	|	|
2+55	0.0382	0.18	QV	|	|	|	|
3+ 0	0.0394	0.18	QV	|	|	|	|
3+ 5	0.0406	0.18	QV	|	|	|	|
3+10	0.0418	0.18	QV	|	|	|	|
3+15	0.0431	0.18	QV	|	|	|	|
3+20	0.0443	0.18	Q V	|	|	|	|
3+25	0.0455	0.18	Q V	|	|	|	|
3+30	0.0468	0.18	Q V	|	|	|	|
3+35	0.0480	0.18	Q V	|	|	|	|
3+40	0.0493	0.18	Q V	|	|	|	|
3+45	0.0506	0.18	Q V	|	|	|	|
3+50	0.0518	0.18	Q V	|	|	|	|
3+55	0.0531	0.19	Q V	|	|	|	|
4+ 0	0.0544	0.19	Q V	|	|	|	|
4+ 5	0.0557	0.19	Q V	|	|	|	|
4+10	0.0570	0.19	Q V	|	|	|	|
4+15	0.0583	0.19	Q V	|	|	|	|
4+20	0.0596	0.19	Q V	|	|	|	|
4+25	0.0609	0.19	Q V	|	|	|	|
4+30	0.0622	0.19	Q V	|	|	|	|
4+35	0.0635	0.19	Q V	|	|	|	|
4+40	0.0648	0.19	Q V	|	|	|	|
4+45	0.0662	0.19	Q V	|	|	|	|
4+50	0.0675	0.19	Q V	|	|	|	|
4+55	0.0688	0.20	Q V	|	|	|	|
5+ 0	0.0702	0.20	Q V	|	|	|	|
5+ 5	0.0715	0.20	Q V	|	|	|	|
5+10	0.0729	0.20	Q V	|	|	|	|
5+15	0.0743	0.20	Q V	|	|	|	|
5+20	0.0757	0.20	Q V	|	|	|	|
5+25	0.0770	0.20	Q V	|	|	|	|
5+30	0.0784	0.20	Q V	|	|	|	|
5+35	0.0798	0.20	Q V	|	|	|	|
5+40	0.0812	0.20	Q V	|	|	|	|
5+45	0.0826	0.20	Q V	|	|	|	|
5+50	0.0841	0.21	Q V	|	|	|	|
5+55	0.0855	0.21	Q V	|	|	|	|

6+ 0	0.0869	0.21	Q V	|	|	|	|
6+ 5	0.0884	0.21	Q V	|	|	|	|
6+10	0.0898	0.21	Q V	|	|	|	|
6+15	0.0913	0.21	Q V	|	|	|	|
6+20	0.0927	0.21	Q V	|	|	|	|
6+25	0.0942	0.21	Q V	|	|	|	|
6+30	0.0957	0.21	Q V	|	|	|	|
6+35	0.0972	0.22	Q V	|	|	|	|
6+40	0.0987	0.22	Q V	|	|	|	|
6+45	0.1002	0.22	Q V	|	|	|	|
6+50	0.1017	0.22	Q V	|	|	|	|
6+55	0.1032	0.22	Q V	|	|	|	|
7+ 0	0.1047	0.22	Q V	|	|	|	|
7+ 5	0.1063	0.22	Q V	|	|	|	|
7+10	0.1078	0.22	Q V	|	|	|	|
7+15	0.1094	0.23	Q V	|	|	|	|
7+20	0.1109	0.23	Q V	|	|	|	|
7+25	0.1125	0.23	Q V	|	|	|	|
7+30	0.1141	0.23	Q V	|	|	|	|
7+35	0.1157	0.23	Q V	|	|	|	|
7+40	0.1173	0.23	Q V	|	|	|	|
7+45	0.1189	0.23	Q V	|	|	|	|
7+50	0.1205	0.24	Q V	|	|	|	|
7+55	0.1222	0.24	Q V	|	|	|	|
8+ 0	0.1238	0.24	Q V	|	|	|	|
8+ 5	0.1255	0.24	Q V	|	|	|	|
8+10	0.1271	0.24	Q V	|	|	|	|
8+15	0.1288	0.24	Q V	|	|	|	|
8+20	0.1305	0.25	Q V	|	|	|	|
8+25	0.1322	0.25	Q V	|	|	|	|
8+30	0.1339	0.25	Q V	|	|	|	|
8+35	0.1356	0.25	|Q V	|	|	|	|
8+40	0.1374	0.25	|Q V	|	|	|	|
8+45	0.1391	0.25	|Q V	|	|	|	|
8+50	0.1409	0.26	|Q V	|	|	|	|
8+55	0.1426	0.26	|Q V	|	|	|	|
9+ 0	0.1444	0.26	|Q V	|	|	|	|
9+ 5	0.1462	0.26	|Q V	|	|	|	|
9+10	0.1480	0.26	|Q V	|	|	|	|
9+15	0.1499	0.27	|Q V	|	|	|	|
9+20	0.1517	0.27	|Q V	|	|	|	|
9+25	0.1536	0.27	|Q V	|	|	|	|
9+30	0.1554	0.27	|Q V	|	|	|	|
9+35	0.1573	0.27	|Q V	|	|	|	|
9+40	0.1592	0.28	|Q V	|	|	|	|
9+45	0.1611	0.28	|Q V	|	|	|	|
9+50	0.1631	0.28	|Q V	|	|	|	|
9+55	0.1650	0.28	|Q V	|	|	|	|
10+ 0	0.1670	0.28	|Q V	|	|	|	|
10+ 5	0.1689	0.29	|Q V	|	|	|	|
10+10	0.1709	0.29	|Q V	|	|	|	|
10+15	0.1730	0.29	|Q V	|	|	|	|
10+20	0.1750	0.30	|Q V	|	|	|	|
10+25	0.1770	0.30	|Q V	|	|	|	|
10+30	0.1791	0.30	|Q V	|	|	|	|
10+35	0.1812	0.30	|Q V	|	|	|	|
10+40	0.1833	0.31	|Q V	|	|	|	|
10+45	0.1854	0.31	|Q V	|	|	|	|
10+50	0.1876	0.31	|Q V	|	|	|	|
10+55	0.1897	0.32	|Q V	|	|	|	|
11+ 0	0.1919	0.32	|Q V	|	|	|	|
11+ 5	0.1942	0.32	|Q V	|	|	|	|
11+10	0.1964	0.33	|Q V	|	|	|	|
11+15	0.1987	0.33	|Q V	|	|	|	|
11+20	0.2009	0.33	|Q V	|	|	|	|
11+25	0.2033	0.34	|Q V	|	|	|	|
11+30	0.2056	0.34	|Q V	|	|	|	|
11+35	0.2080	0.34	|Q V	|	|	|	|
11+40	0.2103	0.35	|Q V	|	|	|	|
11+45	0.2128	0.35	|Q V	|	|	|	|
11+50	0.2152	0.36	|Q V	|	|	|	|



```
17+50       0.7460      0.46  |Q        |         |         |   V     |
17+55       0.7490      0.44  |Q        |         |         |   V     |
18+ 0       0.7520      0.43  |Q        |         |         |   V     |
18+ 5       0.7549      0.42  |Q        |         |         |   V     |
18+10       0.7576      0.40  |Q        |         |         |   V     |
18+15       0.7602      0.37  |Q        |         |         |   V     |
18+20       0.7627      0.36  |Q        |         |         |    V    |
18+25       0.7651      0.35  |Q        |         |         |    V    |
18+30       0.7675      0.34  |Q        |         |         |    V    |
18+35       0.7698      0.34  |Q        |         |         |    V    |
18+40       0.7721      0.33  |Q        |         |         |    V    |
18+45       0.7743      0.32  |Q        |         |         |    V    |
18+50       0.7765      0.32  |Q        |         |         |    V    |
18+55       0.7786      0.31  |Q        |         |         |    V    |
19+ 0       0.7807      0.30  |Q        |         |         |    V    |
19+ 5       0.7828      0.30  |Q        |         |         |     V   |
19+10       0.7848      0.29  |Q        |         |         |     V   |
19+15       0.7868      0.29  |Q        |         |         |     V   |
19+20       0.7887      0.28  |Q        |         |         |     V   |
19+25       0.7906      0.28  |Q        |         |         |     V   |
19+30       0.7925      0.27  |Q        |         |         |     V   |
19+35       0.7944      0.27  |Q        |         |         |     V   |
19+40       0.7962      0.27  |Q        |         |         |     V   |
19+45       0.7980      0.26  |Q        |         |         |     V   |
19+50       0.7998      0.26  |Q        |         |         |     V   |
19+55       0.8016      0.25  |Q        |         |         |     V   |
20+ 0       0.8033      0.25  |Q        |         |         |     V   |
20+ 5       0.8050      0.25  Q         |         |         |      V  |
20+10       0.8067      0.24  Q         |         |         |      V  |
20+15       0.8083      0.24  Q         |         |         |      V  |
20+20       0.8100      0.24  Q         |         |         |      V  |
20+25       0.8116      0.23  Q         |         |         |      V  |
20+30       0.8132      0.23  Q         |         |         |      V  |
20+35       0.8148      0.23  Q         |         |         |      V  |
20+40       0.8163      0.23  Q         |         |         |      V  |
20+45       0.8179      0.22  Q         |         |         |      V  |
20+50       0.8194      0.22  Q         |         |         |      V  |
20+55       0.8209      0.22  Q         |         |         |      V  |
21+ 0       0.8224      0.22  Q         |         |         |      V  |
21+ 5       0.8239      0.21  Q         |         |         |      V  |
21+10       0.8253      0.21  Q         |         |         |      V  |
21+15       0.8268      0.21  Q         |         |         |       V |
21+20       0.8282      0.21  Q         |         |         |       V |
21+25       0.8296      0.21  Q         |         |         |       V |
21+30       0.8310      0.20  Q         |         |         |       V |
21+35       0.8324      0.20  Q         |         |         |       V |
21+40       0.8338      0.20  Q         |         |         |       V |
21+45       0.8351      0.20  Q         |         |         |       V |
21+50       0.8365      0.20  Q         |         |         |       V |
21+55       0.8378      0.19  Q         |         |         |       V |
22+ 0       0.8391      0.19  Q         |         |         |       V |
22+ 5       0.8404      0.19  Q         |         |         |       V |
22+10       0.8417      0.19  Q         |         |         |       V |
22+15       0.8430      0.19  Q         |         |         |       V |
22+20       0.8443      0.19  Q         |         |         |       V |
22+25       0.8456      0.18  Q         |         |         |       V |
22+30       0.8468      0.18  Q         |         |         |       V |
22+35       0.8481      0.18  Q         |         |         |        V|
22+40       0.8493      0.18  Q         |         |         |        V|
22+45       0.8505      0.18  Q         |         |         |        V|
22+50       0.8517      0.18  Q         |         |         |        V|
22+55       0.8529      0.17  Q         |         |         |        V|
23+ 0       0.8541      0.17  Q         |         |         |        V|
23+ 5       0.8553      0.17  Q         |         |         |        V|
23+10       0.8565      0.17  Q         |         |         |        V|
23+15       0.8577      0.17  Q         |         |         |        V|
23+20       0.8588      0.17  Q         |         |         |        V|
23+25       0.8600      0.17  Q         |         |         |        V|
23+30       0.8611      0.17  Q         |         |         |        V|
23+35       0.8623      0.16  Q         |         |         |        V|
23+40       0.8634      0.16  Q         |         |         |        V|
```

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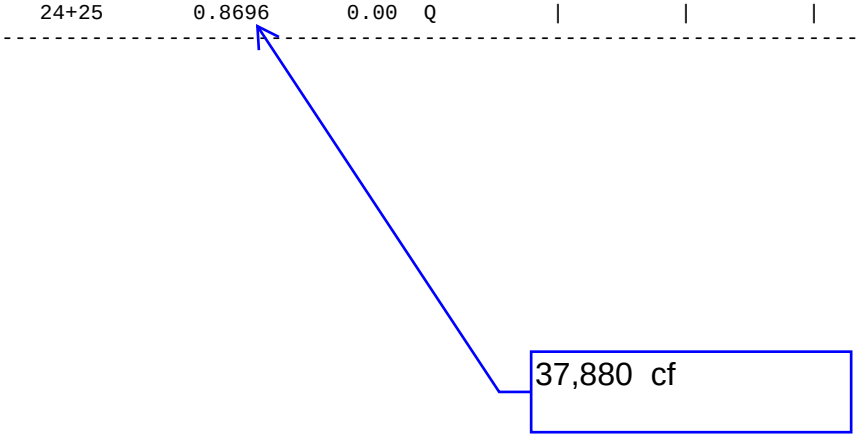
  23+45       0.8645      0.16  Q         |         |         |        V|
  23+50       0.8656      0.16  Q         |         |         |        V|
  23+55       0.8667      0.16  Q         |         |         |        V|
  24+ 0       0.8678      0.16  Q         |         |         |        V|
  24+ 5       0.8688      0.15  Q         |         |         |        V|
  24+10       0.8694      0.08  Q         |         |         |        V|
  24+15       0.8695      0.02  Q         |         |         |        V|
  24+20       0.8696      0.00  Q         |         |         |        V|
  24+25       0.8696      0.00  Q         |         |         |         V
--------------------------------------------------------------------------
```



REQUIRED RETENTION VOL.(HCOC MITIGATION-LID REQUIREMENT FOR 10-YR STORM EVENT):
VOL. IN DEV CONDITION - 90%VOL. IN EX. CONDITION
(37,880 - 0.9*7,031) = 31,552 CF
RET. VOLUME PROVIDED IN BASIN-1 THROUGH 4 AND THE CHAMBER SYSTEM-1: 32,150 CF

REQUIRED RETENTION VOL (10-YR STORM EVENT) ACHEVIED UTILIZING RET. VOL CAPACITY OF THE BASIN-1 THROUGH 4 AND THE STORMTECH CHAMBER SYSTEM-1.

THEREFORE HCOC CONDITION MITIGATED

HYDRAULIC CALCULATION

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




------------------------------------------------------------------------
  TIME/DATE OF STUDY: 21:45 07/10/2024
========================================================================
 Problem Descriptions:
  24" RCP capacity calc


************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   2.000
    FLOWDEPTH(FEET) =   1.900
    PIPE SLOPE(FEET/FEET) =  0.0050
    MANNINGS FRICTION FACTOR = 0.013000
    >>>>> NORMAL DEPTH FLOW(CFS) =     17.19
========================================================================
    NORMAL-DEPTH FLOW INFORMATION:
------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =      1.90
    FLOW AREA(SQUARE FEET) =      3.08
    FLOW TOP-WIDTH(FEET) =     0.872
    FLOW PRESSURE + MOMENTUM(POUNDS) =          362.61
    FLOW VELOCITY(FEET/SEC.) =           5.575
    FLOW VELOCITY HEAD(FEET) =           0.483
    HYDRAULIC DEPTH(FEET) =      3.54
    FROUDE NUMBER =     0.522
    SPECIFIC ENERGY(FEET) =            2.38
========================================================================
```

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



----------------------------------------------------------------------------
 TIME/DATE OF STUDY: 14:24 07/10/2024
============================================================================
 Problem Descriptions:
  BIMINI STREET CAPACITY CALC
  STREET DEPTH AT RIGHT OF WAY

*****************************************************************************
>>>>STREETFLOW MODEL INPUT INFORMATION<<<<
----------------------------------------------------------------------------
   CONSTANT STREET GRADE(FEET/FEET) = 0.020000
   CONSTANT STREET FLOW DEPTH(FEET) =    0.74
   AVERAGE STREETFLOW FRICTION FACTOR(MANNING) = 0.015000
   CONSTANT SYMMETRICAL STREET HALF-WIDTH(FEET) =   13.00
   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   12.00
   INTERIOR STREET CROSSFALL(DECIMAL) = 0.020000
   OUTSIDE  STREET CROSSFALL(DECIMAL) = 0.020000
   CONSTANT SYMMETRICAL CURB HEIGHT(FEET) =   0.50
   CONSTANT SYMMETRICAL GUTTER-WIDTH(FEET) =   1.50
   CONSTANT SYMMETRICAL GUTTER-LIP(FEET) =  0.03125
   CONSTANT SYMMETRICAL GUTTER-HIKE(FEET) =  0.12500
   FLOW ASSUMED TO FILL STREET EVENLY ON BOTH SIDES
============================================================================
   STREET FLOW MODEL RESULTS:
----------------------------------------------------------------------------
   NOTE: STREET FLOW EXCEEDS TOP OF CURB.
       THE FOLLOWING STREET FLOW RESULTS ARE BASED ON THE ASSUMPTION
       THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
       THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
   STREET FLOW DEPTH(FEET) =  0.74
   HALFSTREET FLOOD WIDTH(FEET) =   13.00
   HALFSTREET FLOW(CFS) =   56.18
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.77
   PRODUCT OF DEPTH&VELOCITY =    6.49
============================================================================
```

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



------------------------------------------------------------------------
  TIME/DATE OF STUDY: 22:11 07/10/2024
========================================================================
 Problem Descriptions:
  Ribbon Gutter Capacity Calc


************************************************************************
>>>>CHANNEL INPUT INFORMATION<<<<
------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =   0.33
    CHANNEL Z1(HORIZONTAL/VERTICAL) =    5.00
            Z2(HORIZONTAL/VERTICAL) =    5.00
    BASEWIDTH(FEET) =     0.00
    CONSTANT CHANNEL SLOPE(FEET/FEET) = 0.010000
    MANNINGS FRICTION FACTOR = 0.0150
========================================================================
    NORMAL-DEPTH FLOW INFORMATION:
------------------------------------------------------------------------
    >>>>> NORMAL DEPTH FLOW(CFS) =      1.60
    FLOW TOP-WIDTH(FEET) =         3.30
    FLOW AREA(SQUARE FEET) =           0.54
    HYDRAULIC DEPTH(FEET) =     0.17
    FLOW AVERAGE VELOCITY(FEET/SEC.) =     2.94
    UNIFORM FROUDE NUMBER =    1.276
    PRESSURE + MOMENTUM(POUNDS) =           12.87
    AVERAGED VELOCITY HEAD(FEET) =      0.134
    SPECIFIC ENERGY(FEET) =      0.464
========================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
------------------------------------------------------------------------
    CRITICAL FLOW TOP-WIDTH(FEET) =         3.64
    CRITICAL FLOW AREA(SQUARE FEET) =           0.66
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =     0.18
    CRITICAL FLOW AVERAGE VELOCITY(FEET/SEC.) =     2.42
    CRITICAL DEPTH(FEET) =     0.36
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =           12.52
    AVERAGED CRITICAL FLOW VELOCITY HEAD(FEET) =      0.091
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =      0.455
========================================================================
```