FUSCOE
ENGINEERING

WEST 2ND APARTMENTS

APN: 118-270-053 & 118-270-055

PRELIMINARY DRAINAGE ANALYSIS

Prepared for:

C&C DEVELOPMENT CO., LLC

14211 YORBA STREET, SUITE 200

TUSTIN, CA 92780

Prepared by:

SHELBY SHIRLOCK, P.E.

Date Prepared: APRIL, 2024

Project Number: [1339-010&011]

FUSCOE ENGINEERING, INC.
600 Wilshire Blvd, Suite 1470
Los Angeles, California 90017

fuscoe.com

PRELIMINARY DRAINAGE REPORT

CORONA 2ND STREET APARTMENT

CORONA, CA – COUNTY OF RIVERSIDE

Date Prepared: April 2024

1339.010&0111

1339.010&011

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PRELIMINARY HYDROLOGY ANALYSIS

FOR

West 2nd Apartment & PSH

206 S. Buena Vista Avenue, Corona, CA
County of Riverside

Prepared By:

_____

Shelby Shirlock, PE   RCE C75912
Fuscoe Engineering, Irvine
600 Wilshire Blvd. #1470
Los Angeles, CA 90017

For

C&C DEVELOPMENT
14211 Yorba Street, Suite 200
Tustin, CA 92780

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1.0 INTRODUCTION

1.1 GEOGRAPHIC SETTING

The existing project site for the West 2nd Apartment project consist of 4.18 acres and located in the City of Corona, Riverside County, California. The project site is located south 91 freeway, west of Buena Vista, east of Lincoln Avenue, and north of 6th street. The project site is bounded by commercial property to the west and bounded by commercial and Orange Grove High School to the south and bounded by 2nd Street to the north and bounded by Buena Vista Avenue to the east. *See Section 1.4 for Location Map.*

The project site is located at FEMA flood zone 'X' per FEMA Flood Insurance Rate Map (FIRM) No. 06065C0689G, map revised August 28, 2008. Flood Zone 'X' represents areas of minimum flood hazard (See Appendix 1).

1.2 PURPOSE OF THIS REPORT

The purpose of this report is to identify and analyze the existing drainage conditions & post development impacts, in order to provide adequate drainage facilities for the proposed development located in the City of Corona, California.
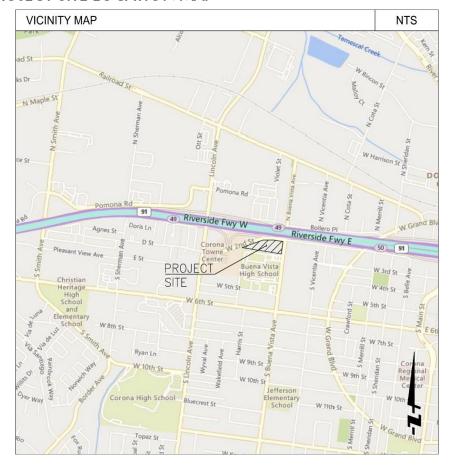
This drainage study will analyze and compare the 10-year & 100-year storm events for the existing and proposed conditions. Outcomes of the analysis will facilitate the conceptual layout of a drainage system to adequately convey storm runoff through the site without adversely impacting surrounding areas.

This analysis will also demonstrate that the storm water and flood protection goals as outlined in the Riverside County Design Manual have been met. See Section 5.0 for Design Criteria.

1.3 METHODOLOGY

This study was prepared in conformance with the Riverside County Hydrology Manual. A.E.S. Computer Software (Version 21) was utilized to compile the hydrologic data and to determine the peak discharges.

1.4   PROJECT SITE LOCATION MAP

The Project Site is identified in the location map shown below.

2.0 EXISTING TOPOGRAPHIC & HYDROLOGIC CONDITIONS

2.1   EXISTING TOPOGRAPHY

The approximate 4.18-acre project site area is vacant land consisting of vegetation, trees, and dirt. Most of the existing site is pervious. However, the project site was a former mobile home park until 2014. Therefore, the existing runoff coefficient was analyzed with the mobile home park factor.

The site's hydrologic soil group is 'B' per USDA Soil Map (See Appendix 7.1)

2.2   EXISTING DRAINAGE PATTERN AND STORM DRAIN FACILITIES

The existing site is currently divided into 3 drainage areas (A, B, and C)

Drainage area A, which is 0.72 acres of the site, is broken into 2 subareas that consists of existing dirt and wall (A1.1 and A1.2). The area drains along a 6-to-7-foot grade difference from southwest to northeast. Area A runoff is discharged to existing 2nd street.

Drainage area B, which is 2.75 acres of the site, is broken into 4 subareas that consists of existing dirt and wall (B1.1, B1.2, B2.1, and B2.2). The area drains along about 10-foot grade difference from southwest to northeast. Area B runoff is discharged to existing 2nd Street.

Drainage area C, which is 0.71 acres of the site, consists of existing dirt and wall. The area has 7-foot grade difference from southwest to northeast an over 250' travel length. This area drains towards the Buena Vista.

All existing Drainage area A, B, and C onsite runoff joins Buena Vista and 2nd Street runoff and conveyed northerly via traditional cross gutter, and curb and gutters. This runoff is captured by a catch basin at northwest corner of Buena Vista and 2nd Street intersection. However, this catch basin directs the flow to the existing 54" RCP (Reinforced Concrete Pipe) Buena Vista storm drain which runs from south to north. This storm drain is noted in the city Drainage Master Plan to be deficient for this reach.

Refer to ***Appendices 7.2 and 7.3*** for Existing Improvements, Hydrology Map and Calculations.

3.0 PROPOSED PROJECT & HYDROLOGIC CONDITIONS

3.1   PROPOSED PROJECT

The proposed project consists of 4 buildings in Family apartment parcel (3.46 AC) and 1 building in Permanent supportive housing parcel (0.72 AC) with paved parking lots, pool, and basketball court. The proposed project will be mostly impervious with some landscaped areas and will have project BMP's to mitigate the stormwater runoff.

3.2   PROPOSED DRAINAGE PATTERN AND STORM DRAIN FACILITIES

The proposed development will maintain the historic discharge point. Generally, onsite stormwater runoff will be captured by localized catch basins and drain inlets, and flows will be diverted into high and low flows. The low flows will be routed first to treatment points with Modular Wetlands Systems (MWS) to treat the proposed runoff. Once the runoff is treated by the MWS, the low water quality flows will be discharged into the existing underground 54-inch storm drain in Buena Vista. The 10-Yr (high) flows will be directed to a separate high flow storm drain pipe system and eventually to be discharged onto the streets via parkway culverts.

There are essentially three proposed drainage management areas delineated for the site.

Drainage Area A which is consists of the permanent supportive housing parcel apartment structure, parking lot, and landscape areas. Runoff will be conveyed via ribbon gutter and captured in catch basins that lead to an MWS system located at the northeast entrance. Runoff from the system discharges to 2nd Street through a proposed curb outlet.

Drainage Area B1 consists of the west side of building 1, landscape, and parking lot areas. Runoff will be conveyed via ribbon gutter and captured in a trench drain. The trench drain will have a low-flow outlet that leads to an MWS system located in the middle west of the parking lot. High flow will be diverted into a junction structure next to the trench drain. This junction structure connects to a curb outlet that discharges into the curb and gutter at 2nd Street.

Drainage Area B2.1, B2.2, and B3, consists of the majority of the northeast building 2, a minor portion of the northwest building 3, landscape, and pedestrian walkway. Runoff will be conveyed via swale and captured into open grate diversion structure at northeast corner of the project site. The diversion structure will have a low flow outlet that leads to a MWS system located in the northeast of building 3. The diversion structure high flow will be conveyed to curb outlet that discharge to the curb and gutter at 2nd street.

Drainage Area B4 consists of the east portion of Building 1, the west side of Building 2, the northwest side of Building 4, as well as landscape and pedestrian walkway areas. Runoff will be captured and conveyed by an area drain system that leads to a diversion structure. The diversion structure will have a low flow outlet leading to an MWS system located in the west median of the parking lot.

Drainage B5 consists of the south side of Building 2, the northeast side of Building 4, as well as landscape and pedestrian walkway areas. Runoff will be captured and conveyed via an area drain system that leads to a diversion structure at the west of Building 3. The diversion structure will have a low-flow outlet leading to an MWS system located in the west of Building 3.

Drainage B6.1 and B6.2 consist of the south side of Building 4, landscape, and parking lot areas. Runoff will be conveyed via a ribbon gutter and captured in a catch basin that leads to an MWS system located on the east side of the parking lot.

Drainage B7 consists of the west side of Building 3, landscape, pedestrian walkway, and pool areas. Runoff will be captured and conveyed via an area drain system that leads to a diversion structure at the west of Building 3. The diversion structure will have a low-flow outlet leading to an MWS system located in the west of Building 3.

The treated low flows from MWS units of drainage areas B4, B5, B6.1, B6.2 and B7 will be conveyed through a private low flow storm drain system. The 10-year flows from these areas will be conveyed through a separate private 10-year storm system.

This private low flow storm drain will connect to the existing 54" RCP storm drain system in Buena Vista. The 10-year flows storm drain system will be discharged towards a parkway culvert at 2nd Street.

Drainage C1 and C2 consist of the east side of Building 3, landscape, pedestrian walkway, and parking lot areas. Runoff will be captured and conveyed via an area drain system that leads to a diversion structure at the northeast corner of the property. The diversion structure will have a low-flow outlet that leads to an MWS system located in the northeast of the property. The 10-Year (high) flow from the diversion structure will be conveyed to a parkway culvert that discharges into the curb and gutter at Buena Vista.

The site will be graded as such to have overland runoff for severe storms and the finish floor is set at least a foot over the 100 year-storm.

Refer to **Appendices 7.2 and 7.4** *for* Proposed Hydrology maps and calculations.

4.0 STREET CAPACITY ANALYSIS

The City of Corona Drainage Master Plan, along with City staff, has stated that the storm drain on Buena Vista Avenue is in deficient conditions. Street capacity analysis analyzed in Appendix 7.5.

The street capacity analysis, detailed in Appendix 7.5, indicates that for Buena Vista, the Q100 is 602.98 cfs, as per hydrology backup calculations. However, the existing 54-inch storm drain pipe can handle only 278.09 cfs. Consequently, the street capacity calculations are based on 325 cfs.

For 2nd Street, the capacity analysis is conducted with Buena Vista's Q100 because the City of Corona Drainage Master Plan did not assess the flow on 2nd Street at that time.

Street	Finish Floor (ft)	Water Surface (ft)	Normal Depth (inch)	Clearance (ft)
Buena Vista - 1	639.6	638.0	11.7	1.6
Buena Vista - 2	638.1	635.7	12.8	2.4
Buena Vista - 3	636.6	633.3	12.2	3.3
2nd Street - 1	636.6	632.2	17.9	4.4

Refer to **Appendices 7.5** for Street capacity calculations.

5.0 DESIGN CRITERIA

- The proposed storm drain systems will be designed to be consistent with the following goals and guidelines:

- Onsite design storm is based on a 10-year frequency in sump conditions for catch basins and the connecting storm drains also use a 10-year frequency.

- Velocity should not exceed 20 FPS in a standard wall R.C.P.

- Where velocity exceeds 20 FPS, a special wall R.C.P. with a minimum of 1½-inch steel clearance on the inside surface shall be used.

- Maximum velocity in special cover R.C.P. shall be 45 FPS.

- On local streets one lane shall be free of storm water in a 10-year storm event.

- Maximum W.S. in CB's for design conditions shall be 0.5' below inlet (FL.) elevation.

- Once water is picked up in a storm drain, it should remain in the system.

- Pipe size may not be decreased downstream without the City's approval.

6.0 RESULTS AND CONCLUSIONS

A summary of the 10-year and 100-year peak flow analysis for existing and proposed conditions are provided in the table below. *See Tables 5.1 to 5.5*

As a result of the site development and improvements, the overall site proposed conditions flows will be comparable to slightly increasing from the existing conditions for the 10-year and 100-year events. The proposed overall site peak flows will slightly increase from the existing condition. The proposed overall site time of concentration (Tc) will slightly increase from the existing time of concentration.

The City of Corona Drainage Master Plan, along with City staff, has stated that the storm drain on Buena Vista Avenue is in deficient conditions. In Appendix 5, the street capacity analysis shows that during a 100-year storm event, the proposed building floors are at least 1 foot higher than the street's water. This data indicates that the system is doing well in preventing flooding and protecting the proposed buildings.

It is our opinion that the proposed storm drain system will not have an adverse effect on any of the existing or proposed improvements within the project or adjacent public streets. In addition, all design criteria outlined above will be met and provided in the final hydrology report.

Hydrology Calculations for Tables below are provided in Appendices 2, 3, 4 and 5.

Overall Project Impacts Downstream
Table 5.1

Peak Q Summary				
Event	Existing (CFS)	Proposed (CFS)	Δ (CFS)	Percentage Change
10-Year	8.3	8.5	0.2	1.0%
100-Year	13.2	13.4	0.2	0.8%

Overall Project Impacts to 2nd Street
Table 5.2

Peak Q Summary				
Event	Existing (CFS)	Proposed (CFS)	Δ (CFS)	Percentage Change
10-Year	6.8	7.9	1.1	16.2%
100-Year	10.8	12.3	1.5	13.9%

Table 5.3

Time of Concentration Summary				
Event	Existing (minutes)[1]	Proposed (minutes)	Δ (minutes)	Percentage Change
10-Year	7.8	8.0	0.2	-2.6%
100-Year	7.9	8.0	0.1	-1.3%

Overall Project Impacts to Buena Vista
Table 5.4

Peak Q Summary				
Event	Existing (CFS)	Proposed (CFS)	Δ (CFS)	Percentage Change
10-Year	1.5	0.7	-0.8	-53.3%
100-Year	2.3	1.1	-1.2	-52.2%

Table 5.5

Time of Concentration Summary				
Event	Existing (minutes)[1]	Proposed (minutes)	Δ (minutes)	Percentage Change
10-Year	6.2	5.2	-1.0	-19.3%
100-Year	6.2	5.2	-1.0	-19.3%

7.0 APPENDICES

APPENDIX 1 SUPPORTING MAPS AND PLANS

Soil Map, FEMA (FIRM) Map & Existing Improvement Plans

APPENDIX 2 HYDROLOGY MAPS

Existing and Proposed Conditions

APPENDIX 3 EXISTING HYDROLOGY CALCULATIONS

10 year & 100 year storm frequencies

APPENDIX 4 PROPOSED HYDROLOGY CALCULATIONS

10 year & 100 year storm frequencies

APPENDIX 5 PONDING EXHIBIT & STREET CAPACITY CROSS SECTIONS

APPENDIX 1

SUPPORTING MAPS AND PLANS

National Flood Hazard Layer FIRMette

FEMA

117°34'59"W 33°53'5"N

06065C0689G
eff. 8/28/2008

117°34'22"W 33°52'35"N

Feet
0   250   500   1,000   1,500   2,000

1:6,000

Basemap Imagery Source: USGS National Map 2023
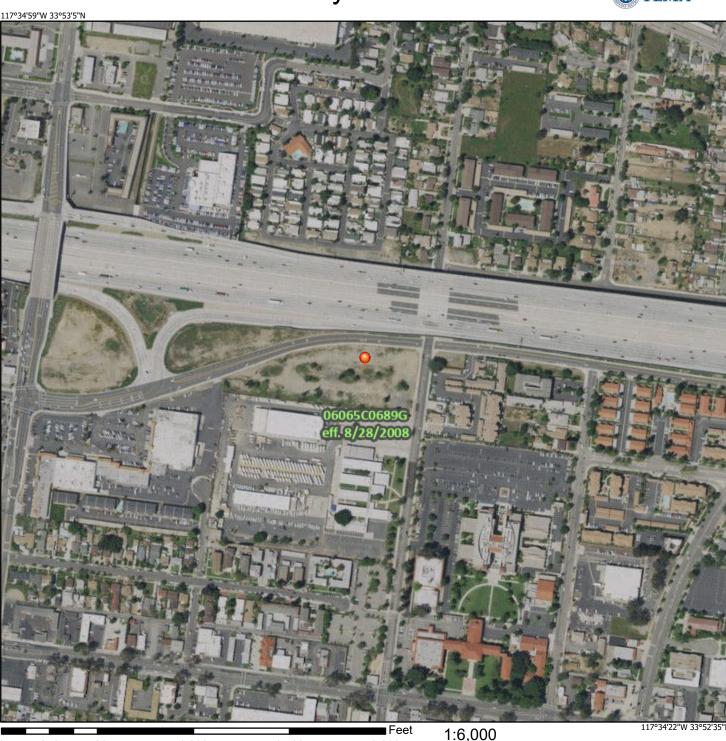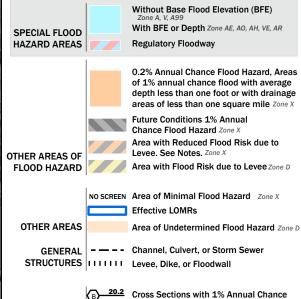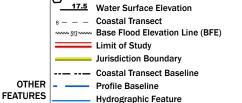
Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
Without Base Flood Elevation (BFE)
Zone A, V, A99
With BFE or Depth *Zone AE, AO, AH, VE, AR*
Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
Future Conditions 1% Annual Chance Flood Hazard *Zone X*
Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
NO SCREEN   Area of Minimal Flood Hazard   *Zone X*
Effective LOMRs
Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- - - -   Channel, Culvert, or Storm Sewer
|||||| Levee, Dike, or Floodwall
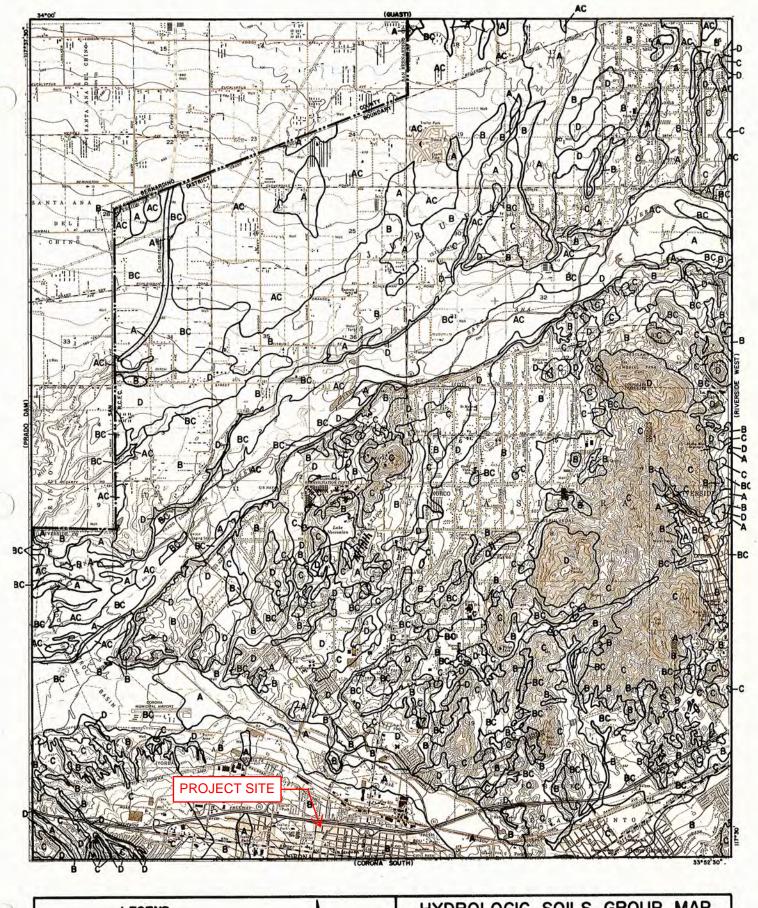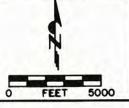
OTHER FEATURES
20.2   Cross Sections with 1% Annual Chance
17.5   Water Surface Elevation
8 - - -   Coastal Transect
~~~ 513 ~~~   Base Flood Elevation Line (BFE)
———   Limit of Study
———   Jurisdiction Boundary
- - - -   Coastal Transect Baseline
- -   Profile Baseline
———   Hydrographic Feature

MAP PANELS
Digital Data Available
No Digital Data Available
Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 8/10/2023 at 1:19 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

PROJECT SITE

GdC

Soil Map may not be valid at this scale.

Map Scale: 1:1,390 if printed on A landscape (11" x 8.5") sheet.

Meters
0   20   40   80   120

Feet
0   50   100   200   300

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

**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

8/10/2023
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USDA

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

Λ Lava Flow

⊥ Marsh or swamp

⚒ Mine or Quarry

◎ Miscellaneous Water

○ Perennial Water

ⱽ 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 1:15,800.

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

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

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

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

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

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

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

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

Date(s) aerial images were photographed: Mar 14, 2022—Mar 17, 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.

USDA **Natural Resources**
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

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Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
GdC	Garretson gravelly very fine sandy loam, 2 to 8 percent slopes	4.2	100.0%
Totals for Area of Interest		**4.2**	**100.0%**

Western Riverside Area, California

GdC—Garretson gravelly very fine sandy loam, 2 to 8 percent slopes

Map Unit Setting
National map unit symbol: hcv5
Elevation: 50 to 3,000 feet
Mean annual precipitation: 12 to 25 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 250 to 350 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Garretson and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Garretson

Setting
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from metasedimentary rock

Typical profile
H1 - 0 to 10 inches: gravelly very fine sandy loam
H2 - 10 to 53 inches: gravelly loam
H3 - 53 to 72 inches: loam

Properties and qualities
Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups
Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R019XD029CA - LOAMY
Hydric soil rating: No

Minor Components

Perkins

Percent of map unit: 5 percent
Hydric soil rating: No

Arbuckle

Percent of map unit: 5 percent
Hydric soil rating: No

Cortina

Percent of map unit: 5 percent
Hydric soil rating: No

Data Source Information

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

USDA **Natural Resources**
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

8/10/2023
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PLAN

SCALE: 1"=20'

PROJECT SITE

54" SD

BUENA VISTA AVENUE

Stand Pipe

Sidewalk

Plug curb outlet as directed by Engineer

4'x10' Box Culvert

Remove this portion of existing structure, plug end as directed by Engineer & back-fill to grade

22"x13" Arch C.M.P. To 5" 16" S.T. State HWY. Drain See F.B. PG. 28

Construct 30± lin.ft. of 18" concrete pipe to connect existing 22x13" Arch C.M.P. to 54" concrete pipe. See Sheet No. 14. for details

Remove existing outlet structure, back-fill to grade and construct 7 lin. ft.± of curb and gutter to match existing.

Construct 18 lin.ft.± of concrete pipe to connect existing 18" concrete pipe to 54" concrete pipe. See Sheet No. 14. for details

Existing 18" concrete pipe to Kimball School catch basins

Fire Hyd

PROFILE

SCALE: VERT: 1"=5'
HORZ: 1"=20'

Existing Ground - E Road

S = + 0.01988

S = + 0.03000

S = + 0.03076

d = 54"

d = 54"

S = 0.01998 12"SS

S = 0.01739 10"SS

RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

BUENA VISTA STORM DRAIN
PLAN & PROFILE

APPROVED: John W. Bryant CHIEF ENGINEER R.E. No. 8822

DATE: 4/23/59

DRAWN: J.H.
TRACED: K.R.B.
CHECKED: G.H.
DATE DRAWN: April 1959

SHEET No. 5 of 19

DWG. NO. 2-75

REVISED DATE

PLAN
SURVEYED
PLOTTED
NOTE BOOK
ALIGNMENT CHECKED
RT OF WAY CHECKED

PROFILE
SURVEYED
PLOTTED
NOTE BOOK
GRADES CHECKED
B. M. & NOTED
STRUCTURE NOTATNS CHK'D

CITY OF CORONA

SPECIFICATION No. 4-378

BUENA VISTA AVENUE FROM 500' S/o 91 FRWY. TO RAILROAD STREET

LOCATION MAP

CITY OF CORONA

GENERAL NOTES

1. ALL WORK AND MATERIALS SHALL COMPLY WITH THE SPECIFICATIONS NO. 4-378 AND STANDARD PLANS OF THE CITY OF CORONA, DEPARTMENT OF COMMUNITY DEVELOPMENT AND PUBLIC WORKS. THESE DRAWINGS AND THE DATA HEREIN ARE MADE A PART OF THE SPECIFICATIONS.
2. THE EXISTANCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OF STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. THESE LOCATIONS ARE APPROXIMATE AND SHALL BE CONFIRMED BY THE CONTRACTOR, SO THAT ANY NECESSARY ADJUSTMENT CAN BE MADE IN ALIGNMENT AND/OR GRADE OF THE PROPOSED IMPROVEMENT. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRE-CAUTIONARY MEASURES TO PROTECT ANY UTILITY LINES SHOWN AND ANY OTHER LINES NOT OF RECORD OR NOT SHOWN ON THESE PLANS.
3. ALL UTILITY COMPANIES TO BE GIVEN 48 HOURS NOTICE PRIOR TO WORKING AROUND THEIR FACILITIES. NOTICE BY CONTRACTOR.
4. INSPECTION TO BE CALLED FOR THROUGH THE CITY OF CORONA (736-2259) 24 HOURS PRIOR TO STARTING WORK.
5. BEFORE WORK CAN BE STARTED THE CONTRACTOR MUST OBTAIN A PERMIT TO EXCAVATE IN THE CITY STREETS FROM THE CITY OF CORONA.
6. AS-BUILT DRAWINGS TO BE FURNISHED TO THE CITY OF CORONA AFTER COMPLETION OF CONSTRUCTION FURNISHED BY CONTRACTOR
7. ALL MATERIALS AND METHODS TO BE SUBJECT TO APPROVAL OF THE CITY ENGINEER.
8. ALL BACKFILL TO BE CERTIFIED BY A SOILS ENGINEER.
9. ALL FIRE HYDRANTS WHICH HAVE NOT BEEN ACCEPTED FOR SERVICE SHALL BE COVERED WITH A SACK INDICATING THAT THE HYDRANTS ARE NOT IN SERVICE.
10. WATER METER BOXES SHALL BE CONSIDERED TO BE PART OF THE PROJECT AND SHALL BE BROUGHT TO GRADE AND LEVELED BY THE CONTRACTOR.
11. ALL NEW OR EXISTING VALVE BOXES AND MANHOLES SHALL BE ADJUSTED TO GRADE AFTER PAVING IS COMPLETED. ADJUSTMENT BY CONTRACTOR
12. TRENCHES SHALL HAVE SHAPED BEDDING.
13. BACKFILL MATERIAL TO HAVE AN S.E. OF 30 (MIN).
14. BACKFILL TO BE IN 8" LIFTS IF TRENCH BOTTOM AND SIDES HAVE AN S.E. OF LESS THAN 20.
15. STOMPING OF BACKFILL PERMITTED IN 3' LIFTS.
16. CONTRACTOR TO REMOVE AND OR INSTALL PAVEMENT MARKINGS AND STRIPING AS REQUIRED BY THE ENGINEER.
17. CONTRACTOR SHALL NOT OPERATE ANY MAIN LINE WATER VALVE.
18. IF ANY EXISTING UTILITIES OR ANY OTHER FACILITIES CONFLICT WITH THE PROPOSED IMPROVEMENTS THE CONTRACTOR SHALL NOTIFY THE ENGINEER FOR RELOCATION BY OTHERS OR ALTERNATE DESIGN.
19. ALL UTILITIES SHALL BE INSTALLED, TESTED AND APPROVED PRIOR TO STREET PAVING.
20. RELOCATION OF EXISTING PARKWAY SIGNS, METERS AND FIRE HYDRANTS AS REQUIRED BY THIS PROJECT SHALL BE RELOCATED BY THE CONTRACTOR IN ACCORDANCE WITH THE PROPOSAL FORM.
21. REMOVAL OF EXISTING PARKWAY TREES AS REQUIRED BY THIS PROJECT SHALL BE REMOVED BY THE CONTRACTOR IN ACCORDANCE WITH THE PROPOSAL FORM.
22. EXISTING UTILITY POLE AND GAS METER RELOCATION WILL BE PERFORMED BY THE UTILITY COMPANY AT NO COST TO THE CONTRACTOR. HOWEVER, THE CONTRACTORS WORK SHALL BE COORDINATED WITH SAID RELOCATION AND/OR ADJUSTMENT.

APPLICABLE STANDARD PLANS
CITY OF CORONA

103   CURB AND GUTTER
104   SIDEWALK DETAILS
107   DRIVEWAY APPROACH
108   DRIVEWAY APPROACH - SOLID SIDEWALK
116   WHEEL CHAIR RAMP
117   WHEEL CHAIR RAMP
201   CATCH BASIN TYPE "A"
202   CATCH BASIN TYPE "B"
203   CATCH BASIN DETAILS
204   CONC. COLLAR
301   SEWER MANHOLE
408   WATER SERVICE CONNECTION
412   FIRE HYDRANT- INSTALLATION

LOS ANGELES CO. FLOOD CONTROL

2-D112   JUNCTION STRUCTURE NO. 2
2-D393   CONCRETE COLLAR

CONSTRUCTION LEGEND

① CONSTRUCT .21 A.C. ON AGG. BASE FOG SEAL OVERALL.
② CONSTRUCT A.C. OVERLAY, FOG SEAL OVERALL.
④ CONSTRUCT TYPE 8 CURB & GUTTER PER STD. 103.
⑤ CONSTRUCT SIDEWALK PER STD. 104.
⑦ CONSTRUCT DRIVEWAY APPROACH PER STD. 107.
⑧ CONSTRUCT DRIVEWAY APPROACH PER STD. 108.
⑬ CONSTRUCT WHEEL CHAIR RAMP PER STD. 116.
⑭ CONSTRUCT WHEEL CHAIR RAMP PER STD. 117.
⑱ CATCH BASIN TYPE B.
⑲ PAINT TRAFFIC STRIPING - CENTERLINE, STOP BARS & WORDING.
⑳ INSTALL STOP SIGN.

TOPOGRAPHY LEGEND

CURB
CURB & GUTTER
ASPH. CONC. PAVEMENT
CONCRETE PAVEMENT
POWER POLE
TRAFFIC SIGNAL
STREET LIGHT
SIGN POST
DEADMAN OR DOWN GUY
SIGNAL OR PULL BOX
GAS METER
WATER METER
FIRE HYDRANT
VALVE
SPRINKLER
MANHOLE
TREES
PALM TREE
HEDGES
BUSHES
FENCE
CONC. BLOCK WALL
BUILDING
PUBLIC TELEPHONE
MAIL BOX
SIGN
VAULT

PROJECT SITE

CITY OF CORONA
VICINITY MAP
NO SCALE

RAILROAD ST.
SIXTH
SEVENTH
EIGHTH
NINTH
TENTH
OLIVE
LORNA
WESTRAIL
ONTARIO AVE.

N

STA 5+50 TO RAILROAD STREET
BUENA VISTA AVE.

Grade To Exist Walk or 1/4"/ft for new Walk Construction
Grade as shown in Profile
Grade To Exist Walk or 1/4"/ft for new walk Construction
Level   ⑲ 0.20' Line
where indicated ⑤
where indicated
60'
30'   30'
22'   22'
4' 4'
6" Typ
① 0.21' Asph Conc. Pav't
0.60 Agg Base
④
* TYPE 1C-AR 4000
AC. IN SINGLE LIFT

RAILROAD STREET

Remove Exist Pavement
Grade as Indicated on Plan
LEVEL   ⑲ 0.05' Line
Exist Pavement
0.21 Asph Conc. 0.45 Agg Base ①
30'
10'   20'
5'
4' 4'
6" Typ
6'
1/4"/ft
④ ⑤

NOT CONSTRUCTED

77-57

PROJECT SITE

BUENA VISTA

Exist. TC Grade Line 22' Left

−2.09 %

−2.00 %

Exist. Ground Line 34' Left

T.C. Grade Line 22' Left

−2.00 %

Centerline Grade Line

−2.17 %

Exist. Ground Line 34' Right

TC Grade Line 22' Right

−2.25 %

−2.00 %

Exist Ground Line 34' Right

−2.00 %

TC Grade Line 22' Right

IDENTICAL

C.B.

Variable

FREEWAY

AVENUE

STREET

SIXTH

Sta. 7+48.50 ℄
C B Type B
W=10' V= 5.5'
10' ~ 18" RCP
2000 D. Connect Exist.
Pipe to New Basin
See Sheet No. 4
For Detail

54" SD

Exist 54" S.D.

Sta 9+52.01 ℄ CB
Type B W=3.5' V=4'
35' ~ 18" RCP
2000 D See Sheet
No. 4 For Profile

Sta 7+48.50 ℄
C B Type B W=10' V=4.00
10' ~ 18" RCP 2000 D
Connect Exist Pipe
To New Basin
See Sheet No. 4
For Details

STOP

Curb Curve Data
Δ = 87°20'25"
R = 35
L = 53.35
T = 33.41

Curb Curve Data
Δ = 92°39'35"
R = 35
L = 56.60
T = 36.66

BOLLERO

PL.

SECTION A-A
SCALE: 1"=2'

EXIST. EDISON CO. UNDERGROUND TO BE SUBJECT TO RELOCATION AS
REQUIRED - CONTRACTOR TO COORDINATE WITH S.C.E. RELOCATION
WORK - ALL S.C.E. CHARGES TO BE PAID BY CITY.

NOT CONSTRUCTED

CONSTRUCTION LEGEND

① CONSTRUCT .21 A.C. ON 0.60 Agg. Base FOG SEAL OVERALL.
② CONSTRUCT A.C. OVERLAY, FOG SEAL OVERALL.
④ CONSTRUCT TYPE 8 CURB & GUTTER PER STD. 103.
⑤ CONSTRUCT SIDEWALK PER STD. 104.
⑧ CONSTRUCT DRIVEWAY APPROACH PER STD. 108. & DETAILS SHEET NO. 4
⑬ CONSTRUCT WHEEL CHAIR RAMP PER STD. 116.
⑱ CONSTRUCT CATCH BASIN TYPE B
⑲ PAINT TRAFFIC STIPRING - CENTERLINE, STOP BARS
& WORDING.
⑳ INSTALL STOP SIGN.

RAILROAD STREET

NOT CONSTRUCTED

Curb Curve Data
Δ = 87° 20' 25"
R = 18
L = 27.44
T = 17.18

Curb Curve Data
Δ = 92° 39' 35"
R = 18.00
L = 29.11
T = 18.86

98+37.10 Join
99+61.72 BCR
100+41.81 ECR
100+47.10

₵ 99+55.00
Const CB Type B
W = 5' V = 4'
40'~ 18" RCP 2000 D
10" CF
See Sheet Nº 4
For Profiles

23+77.50 ₵
Constr. CB Type B
W = 5' V = 4'
24'~ 18" RCP
2000 D
See Sheet No.4
For Profile

BUENA VISTA AVENUE

17+78.00 Begin Walk
20+72.20 End Walk
21+95.00 Begin Walk
16+12.67 End Walk
16+60 Begin Walk
17+20.3 End Walk

Exist Ground Line 34' Left
TC Grade Line 22' Left
−2.00 %

Exist Ground Line 34' Left
TC Grade Line 22' Left
−2.00 %

Exist Ground Line 30' Right
−0.50 %
TC Grade Line 20' Right

₵ Grade Line
2.00 %
2.85 %

Exist. Ground Line 34' Right
TC Grade Line 22' Right
−2.00 %

Exist. Ground Line 34' Right
TC Grade Line 22' Right
−2.00 %

−0.51 %

SEE SHEET 2

CONSTRUCTION LEGEND

(1)	CONSTRUCT .21 A.C. ON .60 A.B. FOG SEAL OVERALL.
(4)	CONSTRUCT TYPE 8 CURB & GUTTER PER STD. 103.
(5)	CONSTRUCT SIDEWALK PER STD. 104.
(8)	CONSTRUCT DRIVEWAY APPROACH PER STD. 108 & DETAILS on SHT. 4
(13)	CONSTRUCT WHEEL CHAIR RAMP PER STD. 116.
(18)	CATCH BASIN TYPE B.
(19)	PAINT TRAFFIC STRIPING − CENTERLINE, STOP BARS & WORDING.
(20)	INSTALL STOP SIGN.

627.38 TC

Proposed Surface over Lateral

625

623.38 FL

S = 0.1400

Verify Prior to Excavation

Tele

PCC Collar ⊗
Per Std. 2-D 393

620

620.80

S = 0.2485

54" S.D.

8" SS
Expose Prior
to Construction
of Lateral

615

616.70 FL
J.S. No.2

⊗ CONSTR. CONCRETE
PROTECTION AS REQ'D
BY THE ENGR IN THE FIELD.

9+65±
St. Stationing

35'~ 18" RCP 2000 D

LATERAL STA 9+52.01

560

560

598.88 TC

Proposed Surface over Lateral

595

594.88 FL

S = 0.1292

60" S.D.

12" SS
Expose Prior
to Construction
of Lateral

590

591.78 FL
J.S. No.2

24'~ 18" RCP 2000 D

23+82.42
St. Station

LATERAL STA 23+77.50

600

598.40 TC

Proposed Surface over Lateral

Verify Prior to Excavation

595

594.40

S = 0.0548

Gas

60" S.D.

590

592.10 FL
J.S. No.2

42'~ 18" RCP 2000 D

24+00
St. Stationing

LATERAL STA 99+55.00

0   25   50   0   25   50

7+48.50

Exist. 18" RCP

18" RCP per notes
on plan

Conc. Collar
Per Std. 2-D 393

Exist Curb Line

Remove 3 ft exist Connector
Pipe, Straight grade to
outlet new C.B.

REMOVE
Exist. Basin

625.15
Exist FL Pipe

PCC Apron per
Std. 203

625.96 FL.
Pipe

Curb   Gutter   Flow

Catch Basin Type B
W = 10' V = 5.5'
10'~18" RCP 2000D

Remove interfering portions of
Exist. Connector and join to
rear of new basin

Exist
CB

CATCH BASIN DETAIL

7+48.50   LEFT SIDE
SCALE 1"= 4'

7+48.50

Conc. Collar
Per Std. 2-D 393

18" RCP per notes
on plan

Exist. Curb Line

REMOVE
Exist Basin

±45°

Remove 3 ft. exist Connector
pipe, straight grade to outlet
new C.B.

PCC Apron
Per Std. 203

626.76 Exist F.L.
Pipe

Flow   627.46
F.L. Pipe

Curb   Gutter

Catch Basin Type B
W = 10'~ V = 4'
10'~ 18" RCP 2000D

Remove interfering portions
of Connector, join exist
Connector to rear wall basin

Exist
CB

CATCH BASIN DETAIL

7+48.50   RIGHT SIDE
SCALE 1" = 4'

Join at score
Line or as directed
by the Engineer

Ex. Drive

5' MIN. TRANS.

10' MAX. TYPICAL
BOTH SIDES

Ex. SIDEWALK

NEW
SIDEWALK
TRANS.

STRAIGHT GRADE
FROM BACK OF
SIDEWALK TO
CURB

NEW
SIDEWALK
TRANS.

Ex. SIDEWALK

PROPOSED CURB & GUTTER

**DETAIL OF TYPICAL DRIVEWAY
APPROACH PER STD. PLAN #108
MODIFIED AS SHOWN**

NOT CONSTRUCTED

Designed by	Drawn by	Checked by
GK	PD	JA

PLANS PREPARED UNDER SUPERVISION OF

Date 12-18-78   R.C.E. No. 9919

Reference Plans for
these Improvements

Date	By	REVISIONS	App'd

BENCH MARK
SEE SHEET 2

Scale
As Shown

Engineering J. Cook
Water Daw
Fire

Submitted
by
RCE 25267
Principal Engineer

Approved
by
RCE 18729
City Engineer

CITY OF CORONA Dept. of Community Development & Public Works
BUENA VISTA AVENUE
DETAILS & PROFILES

Drawing No.
1802

SH 4 of 4

77-57

APPENDIX 2

HYDROLOGY MAPS

2ND STREET (PUBLIC)

EX. CATCH BASIN (UNDER FREEWAY, ALONG BUENA VISTA)

FREEWAY ABOVE STREET

EX. CROSS GUTTER

EX. CURB & GUTTER

EX. CURB & GUTTER

R/W

ELEV=(633.1)
Q_{10}=3.28CFS
Q_{100}=5.18CFS
T_C=7.8MIN
90

ELEV=(636.2)
Q_{10}=2.81CFS
Q_{100}=4.46CFS
T_C=7.7MIN
60

PROPOSED RIGHT OF WAY DEDICATION

L=88'

B1.2
0.28AC

L=128'

ELEV=(637.8)
Q_{10}=1.55CFS
Q_{100}=2.43CFS
T_C=7.0MIN
80

ELEV=(635.0)
Q_{10}=1.49CFS
Q_{100}=2.34CFS
T_C=6.2MIN
110

4' DEDICATION

(30') (34')
8' (22') (22') (12')

BUENA VISTA AVENUE (PUBLIC)

EX. CURB & GUTTER

2ND STREET (PUBLIC)

R/W

PROPOSED P_L PER PROPOSED DEVELOPMENT

FORMER MOBILE HOME PARK

ELEV=(640.0)
Q_{10}=2.29CFS
Q_{100}=3.62CFS
T_C=7.1MIN
50

ELEV=(643.8)
Q_{10}=0.75CFS
Q_{100}=1.18CFS
T_C=6.7MIN
20

L=275'

A2
0.35AC

B1.1
0.75AC

L=226'

L=300'

B2.1
0.78AC

B2.2
0.94AC

PROPOSED RIGHT OF WAY DEDICATION

C1
0.71AC

L=250'

EX. CURB & GUTTER

EX. 54" RCP STORM DRAIN W/O C.B.

P_L

A1
0.37AC

L=74'

ELEV=(650.0)
10

30 ELEV=(647.3)

ELEV=(645.4)
Q_{10}=0.82CFS
Q_{100}=1.29CFS
T_C=5.0MIN
40

ELEV=(644.8)
70

ELEV=(642.2)
100

EX. WALL

EX PARKING LOT

P_L

EX PARKING LOT

EX. PARKING LOT

LEGEND

—··—··—	DRAINAGE STUDY LIMITS	
■ ■ ■ ■	DMA BOUNDARY	
■ ■ ■ ■	SUBAREA BOUNDARY	
— SD —	EXISTING STORM DRAIN	

A1 / 0.96 AC — AREA DESIGNATION / AREA (IN ACRES)

L=100' — FLOW DIRECTION / FLOW LENGTH

1.0 CFS / 10 MIN — FLOW RATE (CFS) / T_C (MIN)

100 — HYDROLOGY NODE

TRIBUTARY AREAS

DMA A (TRIBUTARY TO 2ND ST):
TOTAL AREA: 0.72 AC
Q_{10}=1.57 CFS
Q_{100}=2.47 CFS

DMA B (TRIBUTARY TO 2ND ST)
TOTAL AREA: 2.75 AC
Q_{10}=5.27 CFS
Q_{100}=8.35 CFS

DMA C (TRIBUTARY TO BUENA VISTA):
TOTAL AREA: 0.71 AC
Q_{10}=1.49 CFS
Q_{100}=2.34 CFS

OVERALL SUMMARY:
TOTAL AREA: 4.18 AC
Q_{10}=8.33 CFS
Q_{100}=13.16 CFS

SITE PARAMETERS

HYDROLOGY SOIL GROUP: B

TOTAL DRAINAGE STUDY ACREAGE: 4.18 ACRES
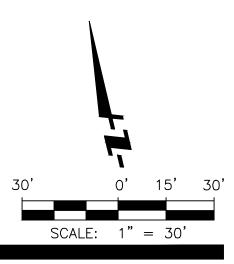(25% PERVIOUS USED FOR MOBILE HOME PARK)

FEMA FLOOD ZONE X PER FIRM MAP NO. 06065C0689G
ZONE X = AREA OF MINIMAL FLOOD HAZARD

EXISTING HYDROLOGY - OVERVIEW
WEST 2ND APARTMENT
CORONA, CALIFORNIA

SCALE: 1" = 30'
30'   0' 15' 30'

LEGEND

—·—·— (red dashed)	DRAINAGE STUDY LIMITS
▪▪▪▪▪▪	DMA BOUNDARY
▪ ▪ ▪ ▪	SUBAREA BOUNDARY
— SD —	EXISTING STORM DRAIN
— SD — (red)	PROPOSED STORM DRAIN
(A1)	AREA DESIGNATION
0.96 AC	AREA (IN ACRES)
L=100'	FLOW DIRECTION / FLOW LENGTH
1.0 CFS / 10 MIN	FLOW RATE (CFS) / Tc (MIN)
(100)	HYDROLOGY NODE

TRIBUTARY AREAS

DMA A (TOWARDS 2ND ST):
TOTAL AREA: 0.69 AC
Q_{10}=1.40 CFS
Q_{100}=2.20 CFS

DMA B (TOWARDS 2ND ST)
TOTAL AREA: 3.11 AC
Q_{10}=6.45 CFS
Q_{100}=10.14 CFS

DMA C (TOWARDS BUENA VISTA):
TOTAL AREA: 0.28 AC
Q_{10}=0.70 CFS
Q_{100}=1.09 CFS

RIGHT OF WAY DEDICAITON:
TOTAL AREA: 0.10 AC

OVERALL SUMMARY:
TOTAL AREA: 4.16 AC
Q_{10}=8.55 CFS
Q_{100}=13.43 CFS

SITE PARAMETERS

HYDROLOGY SOIL GROUP: B

TOTAL DRAINAGE STUDY ACREAGE: 4.18 ACRES
(20% PERVIOUSNESS USED FOR APARTMENTS)

FAMILY APARTMENT: 3.39 ACRES
PERMANENT SUPPORTIVE HOUSING: 0.69 ACRES
RIGHT OF WAY DEDICATION: 0.10 ACRES

FEMA FLOOD ZONE X PER FIRM MAP NO 06065C0689G
ZONE X = AREA OF MINIMAL FLOOD HAZARD

FUSCOE ENGINEERING
FULL CIRCLE THINKING®
600 Wilshire Blvd
Suite 1470
Los Angeles, Ca 90017
213.988.8802
fuscoe.com

PROPOSED HYDROLOGY - OVERVIEW
WEST 2ND APARTMENT
CORONA, CALIFORNIA

F:\Projects\1339\010_Support Files\Reports\Hydrology\EXHIBIT\1339-010xh-PROPOSED CONDITIONS.dwg (4/15/2024 3:48 PM) Plotted by: Youngsuk Lim

1339.010 & 1339.011

4/15/2024

SCALE: 1" = 30'
30'   0' 15' 30'

APPENDIX 3

EXISTING HYDROLOGY CALCULATIONS

```
 _____
 ************************************************************************
           RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
         RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                    (RCFC&WCD)  1978 HYDROLOGY MANUAL
            (c) Copyright 1982-2016 Advanced Engineering Software (aes)
                       (Rational Tabling Version 23.0)
                    Release Date: 07/01/2016  License ID 1355

                          Analysis prepared by:

   ************************* DESCRIPTION OF STUDY *************************
   *                       CORONA APARTMENTS                             *
   *                       EXISTING HYDROLOGY                            *
   *                         10 YEAR STORM                              *
   ************************************************************************

    FILE NAME: CRNAEX.DAT
    TIME/DATE OF STUDY: 09:36 02/15/2024
 --------------------------------------------------------------------------
    USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 --------------------------------------------------------------------------
    USER SPECIFIED STORM EVENT(YEAR) =   10.00
    SPECIFIED MINIMUM PIPE SIZE(INCH) =   3.00
    SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
    2-YEAR, 1-HOUR PRECIPITATION(INCH) =  0.520
    100-YEAR, 1-HOUR PRECIPITATION(INCH) =  1.320
    COMPUTED RAINFALL INTENSITY DATA:
    STORM EVENT =   10.00  1-HOUR INTENSITY(INCH/HOUR) =   0.858
    SLOPE OF INTENSITY DURATION CURVE = 0.4750
    RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
    NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
          AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
    *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
       HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES: MANNING
       WIDTH  CROSSFALL  IN- / OUT-/PARK- HEIGHT WIDTH  LIP  HIKE  FACTOR
   NO.  (FT)     (FT)    SIDE / SIDE/ WAY   (FT)   (FT)  (FT)  (FT)    (n)
   === =====  ========= ================= ====== ===== ====== ===== =======
    1  30.0     20.0    0.018/0.018/0.020  0.67   2.00 0.0312 0.167 0.0150

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


 **************************************************************************
    FLOW PROCESS FROM NODE    10.00 TO NODE    20.00 IS CODE =  21
 --------------------------------------------------------------------------
    >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 ==========================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS MOBILE HOME PARK
    TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
    INITIAL SUBAREA FLOW-LENGTH(FEET) =   275.00
    UPSTREAM ELEVATION(FEET) =    650.50
    DOWNSTREAM ELEVATION(FEET) =    643.80
    ELEVATION DIFFERENCE(FEET) =      6.70
    TC = 0.336*[(  275.00**3)/(     6.70)]**.2 =    6.677
      10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.434
    MOBILE HOME PARK DEVELOPMENT RUNOFF COEFFICIENT = .8323
    SOIL CLASSIFICATION IS "B"
```

```
      SUBAREA RUNOFF(CFS) =        0.75
      TOTAL AREA(ACRES) =        0.37    TOTAL RUNOFF(CFS) =        0.75


****************************************************************************
    FLOW PROCESS FROM NODE     30.00 TO NODE     40.00 IS CODE =   21
----------------------------------------------------------------------------
    >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS MOBILE HOME PARK
   TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
   INITIAL SUBAREA FLOW-LENGTH(FEET) =     74.00
   UPSTREAM ELEVATION(FEET) =     647.30
   DOWNSTREAM ELEVATION(FEET) =     645.40
   ELEVATION DIFFERENCE(FEET) =       1.90
   TC = 0.336*[(   74.00**3)/(     1.90)]**.2 =     3.908
   COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
     10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.792
   MOBILE HOME PARK DEVELOPMENT RUNOFF COEFFICIENT = .8386
   SOIL CLASSIFICATION IS "B"
   SUBAREA RUNOFF(CFS) =        0.82
   TOTAL AREA(ACRES) =        0.35    TOTAL RUNOFF(CFS) =        0.82


****************************************************************************
    FLOW PROCESS FROM NODE     40.00 TO NODE     50.00 IS CODE =   91
----------------------------------------------------------------------------
    >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
   UPSTREAM NODE ELEVATION(FEET) =     645.40
   DOWNSTREAM NODE ELEVATION(FEET) =      640.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =    226.00
   "V" GUTTER WIDTH(FEET) =    5.00    GUTTER HIKE(FEET) =  0.050
   PAVEMENT LIP(FEET) =  0.010    MANNING'S N = .0150
   PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.00300
   MAXIMUM DEPTH(FEET) =     5.00
     10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.357
   MOBILE HOME PARK DEVELOPMENT RUNOFF COEFFICIENT = .8308
   SOIL CLASSIFICATION IS "B"
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.55
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.76
   AVERAGE FLOW DEPTH(FEET) =    0.10    FLOOD WIDTH(FEET) =    31.13
   "V" GUTTER FLOW TRAVEL TIME(MIN.) =    2.14    Tc(MIN.) =    7.14
   SUBAREA AREA(ACRES) =     0.75       SUBAREA RUNOFF(CFS) =    1.47
   TOTAL AREA(ACRES) =         1.1        PEAK FLOW RATE(CFS) =       2.29

   END OF SUBAREA "V" GUTTER HYDRAULICS:
   DEPTH(FEET) =  0.11    FLOOD WIDTH(FEET) =    37.56
   FLOW VELOCITY(FEET/SEC.) =    1.88    DEPTH*VELOCITY(FT*FT/SEC) =   0.21
   LONGEST FLOWPATH FROM NODE     30.00 TO NODE     50.00 =    300.00 FEET.


****************************************************************************
    FLOW PROCESS FROM NODE     50.00 TO NODE     60.00 IS CODE =   91
----------------------------------------------------------------------------
    >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
   UPSTREAM NODE ELEVATION(FEET) =     640.00
   DOWNSTREAM NODE ELEVATION(FEET) =      636.20
   CHANNEL LENGTH THRU SUBAREA(FEET) =     86.00
   "V" GUTTER WIDTH(FEET) =    5.00    GUTTER HIKE(FEET) =  0.050
   PAVEMENT LIP(FEET) =  0.010    MANNING'S N = .0150
   PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.00200
   MAXIMUM DEPTH(FEET) =     5.00
     10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.263
```

```
     MOBILE HOME PARK DEVELOPMENT RUNOFF COEFFICIENT = .8288
     SOIL CLASSIFICATION IS "B"
     TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      2.55
     TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.24
     AVERAGE FLOW DEPTH(FEET) =   0.10    FLOOD WIDTH(FEET) =    44.20
     "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.64   Tc(MIN.) =    7.78
     SUBAREA AREA(ACRES) =     0.28      SUBAREA RUNOFF(CFS) =    0.53
     TOTAL AREA(ACRES) =           1.4       PEAK FLOW RATE(CFS) =      2.81

     END OF SUBAREA "V" GUTTER HYDRAULICS:
     DEPTH(FEET) =  0.10   FLOOD WIDTH(FEET) =    46.61
     FLOW VELOCITY(FEET/SEC.) =   2.25   DEPTH*VELOCITY(FT*FT/SEC) =   0.23
     LONGEST FLOWPATH FROM NODE     30.00 TO NODE     60.00 =    386.00 FEET.

****************************************************************************
     FLOW PROCESS FROM NODE     70.00 TO NODE     80.00 IS CODE =  21
--------------------------------------------------------------------------
     >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
             ASSUMED INITIAL SUBAREA UNIFORM
             DEVELOPMENT IS MOBILE HOME PARK
     TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
     INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
     UPSTREAM ELEVATION(FEET) =    644.80
     DOWNSTREAM ELEVATION(FEET) =    637.80
     ELEVATION DIFFERENCE(FEET) =      7.00
     TC = 0.336*[(  300.00**3)/(     7.00)]**.2 =    6.974
       10 YEAR RAINFALL INTENSITY(INCH/HOUR) =   2.384
     MOBILE HOME PARK DEVELOPMENT RUNOFF COEFFICIENT = .8313
     SOIL CLASSIFICATION IS "B"
     SUBAREA RUNOFF(CFS) =        1.55
     TOTAL AREA(ACRES) =        0.78   TOTAL RUNOFF(CFS) =       1.55

****************************************************************************
     FLOW PROCESS FROM NODE     80.00 TO NODE     90.00 IS CODE =  91
--------------------------------------------------------------------------
     >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
==========================================================================
     UPSTREAM NODE ELEVATION(FEET) =    637.80
     DOWNSTREAM NODE ELEVATION(FEET) =    633.10
     CHANNEL LENGTH THRU SUBAREA(FEET) =   128.00
     "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) = 0.050
     PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
     PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.00200
     MAXIMUM DEPTH(FEET) =    5.00
       10 YEAR RAINFALL INTENSITY(INCH/HOUR) =   2.230
     MOBILE HOME PARK DEVELOPMENT RUNOFF COEFFICIENT = .8281
     SOIL CLASSIFICATION IS "B"
     TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      2.41
     TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.02
     AVERAGE FLOW DEPTH(FEET) =   0.10    FLOOD WIDTH(FEET) =    45.40
     "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.05   Tc(MIN.) =    8.03
     SUBAREA AREA(ACRES) =     0.94      SUBAREA RUNOFF(CFS) =    1.74
     TOTAL AREA(ACRES) =           1.7       PEAK FLOW RATE(CFS) =      3.28

     END OF SUBAREA "V" GUTTER HYDRAULICS:
     DEPTH(FEET) =  0.11   FLOOD WIDTH(FEET) =    52.64
     FLOW VELOCITY(FEET/SEC.) =   2.12   DEPTH*VELOCITY(FT*FT/SEC) =   0.23
     LONGEST FLOWPATH FROM NODE     70.00 TO NODE     90.00 =    428.00 FEET.

****************************************************************************
     FLOW PROCESS FROM NODE    100.00 TO NODE    110.00 IS CODE =  21
--------------------------------------------------------------------------
```

```
    >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS MOBILE HOME PARK
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   250.00
 UPSTREAM ELEVATION(FEET) =    642.20
 DOWNSTREAM ELEVATION(FEET) =    635.00
 ELEVATION DIFFERENCE(FEET) =      7.20
 TC = 0.336*[(  250.00**3)/(     7.20)]**.2 =    6.216
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.518
 MOBILE HOME PARK DEVELOPMENT RUNOFF COEFFICIENT = .8339
 SOIL CLASSIFICATION IS "B"
 SUBAREA RUNOFF(CFS) =      1.49
 TOTAL AREA(ACRES) =      0.71   TOTAL RUNOFF(CFS) =      1.49
==============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =         0.7  TC(MIN.) =      6.22
 PEAK FLOW RATE(CFS)    =        1.49
==============================================================================
==============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
_____
*************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
          RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                    (RCFC&WCD)  1978 HYDROLOGY MANUAL
           (c) Copyright 1982-2016 Advanced Engineering Software (aes)
                       (Rational Tabling Version 23.0)
                   Release Date: 07/01/2016  License ID 1355


                           Analysis prepared by:


                           Fuscoe Engineering
                       16795 Von Karman Ave Ste100
                                Irvine CA
                                  92606


 ************************* DESCRIPTION OF STUDY *************************
 *                         CORONA APARTMENTS                           *
 *                        EXISTING HYDROLOGY                           *
 *                          100 YEAR STORM                             *
 ***********************************************************************


   FILE NAME: CRNAEX.DAT
   TIME/DATE OF STUDY: 11:18 11/09/2023
 -----------------------------------------------------------------------
   USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 -----------------------------------------------------------------------
   USER SPECIFIED STORM EVENT(YEAR) =  100.00
   SPECIFIED MINIMUM PIPE SIZE(INCH) =   3.00
   SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
   2-YEAR, 1-HOUR PRECIPITATION(INCH) =  0.520
   100-YEAR, 1-HOUR PRECIPITATION(INCH) =  1.320
   COMPUTED RAINFALL INTENSITY DATA:
   STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.320
   SLOPE OF INTENSITY DURATION CURVE = 0.4750
   RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
   NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
         AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
   *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
      HALF-   CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
      WIDTH   CROSSFALL  IN- / OUT-/PARK- HEIGHT WIDTH  LIP   HIKE   FACTOR
 NO.  (FT)     (FT)      SIDE / SIDE/ WAY   (FT)   (FT)  (FT)  (FT)    (n)
 === =====  =========  =================  ====== =====  ======  ===== =======
  1  30.0      20.0     0.018/0.018/0.020   0.67   2.00 0.0312 0.167 0.0150


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


 *************************************************************************
   FLOW PROCESS FROM NODE    10.00 TO NODE     20.00 IS CODE =  21
 -----------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 =======================================================================
           ASSUMED INITIAL SUBAREA UNIFORM
           DEVELOPMENT IS MOBILE HOME PARK
    TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
    INITIAL SUBAREA FLOW-LENGTH(FEET) =   275.00
    UPSTREAM ELEVATION(FEET) =    650.50
    DOWNSTREAM ELEVATION(FEET) =    643.80
```

```
ELEVATION DIFFERENCE(FEET) =      6.70
TC = 0.336*[(  275.00**3)/(      6.70)]**.2 =    6.677
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.746
MOBILE HOME PARK DEVELOPMENT RUNOFF COEFFICIENT = .8508
SOIL CLASSIFICATION IS "B"
SUBAREA RUNOFF(CFS) =      1.18
TOTAL AREA(ACRES) =       0.37   TOTAL RUNOFF(CFS) =       1.18

******************************************************************************
  FLOW PROCESS FROM NODE    30.00 TO NODE    40.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS MOBILE HOME PARK
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    74.00
 UPSTREAM ELEVATION(FEET) =    647.30
 DOWNSTREAM ELEVATION(FEET) =    645.40
 ELEVATION DIFFERENCE(FEET) =      1.90
 TC = 0.336*[(   74.00**3)/(     1.90)]**.2 =    3.908
 COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.297
 MOBILE HOME PARK DEVELOPMENT RUNOFF COEFFICIENT = .8559
 SOIL CLASSIFICATION IS "B"
 SUBAREA RUNOFF(CFS) =      1.29
 TOTAL AREA(ACRES) =       0.35   TOTAL RUNOFF(CFS) =       1.29

******************************************************************************
  FLOW PROCESS FROM NODE    40.00 TO NODE    50.00 IS CODE =  91
------------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
==============================================================================
  UPSTREAM NODE ELEVATION(FEET) =    645.40
  DOWNSTREAM NODE ELEVATION(FEET) =     640.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    226.00
  "V" GUTTER WIDTH(FEET) =    5.00   GUTTER HIKE(FEET) =  0.050
  PAVEMENT LIP(FEET) =   0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.00300
  MAXIMUM DEPTH(FEET) =    5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.661
  MOBILE HOME PARK DEVELOPMENT RUNOFF COEFFICIENT = .8499
  SOIL CLASSIFICATION IS "B"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     2.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.88
  AVERAGE FLOW DEPTH(FEET) =   0.11   FLOOD WIDTH(FEET) =    39.17
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.00   Tc(MIN.) =    7.00
  SUBAREA AREA(ACRES) =    0.75       SUBAREA RUNOFF(CFS) =    2.33
  TOTAL AREA(ACRES) =        1.1        PEAK FLOW RATE(CFS) =        3.62

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.12   FLOOD WIDTH(FEET) =    47.21
  FLOW VELOCITY(FEET/SEC.) =   1.98   DEPTH*VELOCITY(FT*FT/SEC) =   0.24
  LONGEST FLOWPATH FROM NODE    30.00 TO NODE    50.00 =    300.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    50.00 TO NODE    60.00 IS CODE =  91
------------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
==============================================================================
  UPSTREAM NODE ELEVATION(FEET) =    640.00
  DOWNSTREAM NODE ELEVATION(FEET) =    636.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =     86.00
```

```
"V" GUTTER WIDTH(FEET) =    5.00    GUTTER HIKE(FEET) =  0.050
PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.00200
MAXIMUM DEPTH(FEET) =    5.00
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.517
MOBILE HOME PARK DEVELOPMENT RUNOFF COEFFICIENT = .8484
SOIL CLASSIFICATION IS "B"
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      4.04
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.31
AVERAGE FLOW DEPTH(FEET) =   0.11    FLOOD WIDTH(FEET) =   56.26
"V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.62   Tc(MIN.) =    7.62
SUBAREA AREA(ACRES) =    0.28      SUBAREA RUNOFF(CFS) =    0.84
TOTAL AREA(ACRES) =         1.4       PEAK FLOW RATE(CFS) =      4.46

END OF SUBAREA "V" GUTTER HYDRAULICS:
DEPTH(FEET) =  0.11   FLOOD WIDTH(FEET) =   58.67
FLOW VELOCITY(FEET/SEC.) =   2.37   DEPTH*VELOCITY(FT*FT/SEC) =   0.27
LONGEST FLOWPATH FROM NODE     30.00 TO NODE     60.00 =    386.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    70.00 TO NODE    80.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS MOBILE HOME PARK
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
 UPSTREAM ELEVATION(FEET) =    644.80
 DOWNSTREAM ELEVATION(FEET) =    637.80
 ELEVATION DIFFERENCE(FEET) =      7.00
 TC = 0.336*[(  300.00**3)/(     7.00)]**.2 =    6.974
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.669
 MOBILE HOME PARK DEVELOPMENT RUNOFF COEFFICIENT = .8500
 SOIL CLASSIFICATION IS "B"
 SUBAREA RUNOFF(CFS) =      2.43
 TOTAL AREA(ACRES) =       0.78   TOTAL RUNOFF(CFS) =      2.43

****************************************************************************
  FLOW PROCESS FROM NODE    80.00 TO NODE    90.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
 UPSTREAM NODE ELEVATION(FEET) =    637.80
 DOWNSTREAM NODE ELEVATION(FEET) =     633.10
 CHANNEL LENGTH THRU SUBAREA(FEET) =   128.00
 "V" GUTTER WIDTH(FEET) =    5.00    GUTTER HIKE(FEET) =  0.050
 PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
 PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.00200
 MAXIMUM DEPTH(FEET) =    5.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.447
 MOBILE HOME PARK DEVELOPMENT RUNOFF COEFFICIENT = .8476
 SOIL CLASSIFICATION IS "B"
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      3.80
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.18
 AVERAGE FLOW DEPTH(FEET) =   0.11    FLOOD WIDTH(FEET) =   56.26
 "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.98   Tc(MIN.) =    7.95
 SUBAREA AREA(ACRES) =    0.94      SUBAREA RUNOFF(CFS) =    2.75
 TOTAL AREA(ACRES) =         1.7       PEAK FLOW RATE(CFS) =      5.18

 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  0.12   FLOOD WIDTH(FEET) =   64.70
 FLOW VELOCITY(FEET/SEC.) =   2.30   DEPTH*VELOCITY(FT*FT/SEC) =   0.27
```

```
   LONGEST FLOWPATH FROM NODE     70.00 TO NODE     90.00 =     428.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE     100.00 TO NODE     110.00 IS CODE =   21
----------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS MOBILE HOME PARK
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    250.00
 UPSTREAM ELEVATION(FEET) =    642.20
 DOWNSTREAM ELEVATION(FEET) =    635.00
 ELEVATION DIFFERENCE(FEET) =      7.20
 TC = 0.336*[(  250.00**3)/(     7.20)]**.2 =    6.216
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.875
 MOBILE HOME PARK DEVELOPMENT RUNOFF COEFFICIENT = .8521
 SOIL CLASSIFICATION IS "B"
 SUBAREA RUNOFF(CFS) =      2.34
 TOTAL AREA(ACRES) =      0.71   TOTAL RUNOFF(CFS) =      2.34
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =        0.7  TC(MIN.) =      6.22
 PEAK FLOW RATE(CFS)    =       2.34
============================================================================
============================================================================
   END OF RATIONAL METHOD ANALYSIS
```

APPENDIX 4

PROPOSED HYDROLOGY CALCULATIONS

```
_____
 *****************************************************************************
                RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
               RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                      (RCFC&WCD)  1978 HYDROLOGY MANUAL
               (c) Copyright 1982-2016 Advanced Engineering Software (aes)
                         (Rational Tabling Version 23.0)
                     Release Date: 07/01/2016  License ID 1355

                            Analysis prepared by:

  ************************** DESCRIPTION OF STUDY **************************
  *                         CORONA 2ND STREET                              *
  *                         PROPOSED CONDITIONS                            *
  *                         10 YEAR STORM                                  *
  **************************************************************************

   FILE NAME: CORONAPS.DAT
   TIME/DATE OF STUDY: 13:05 02/15/2024
  ---------------------------------------------------------------------------
   USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
  ---------------------------------------------------------------------------
   USER SPECIFIED STORM EVENT(YEAR) =   10.00
   SPECIFIED MINIMUM PIPE SIZE(INCH) =   3.00
   SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.01
   2-YEAR, 1-HOUR PRECIPITATION(INCH) =  0.520
   100-YEAR, 1-HOUR PRECIPITATION(INCH) =  1.320
   COMPUTED RAINFALL INTENSITY DATA:
   STORM EVENT =   10.00   1-HOUR INTENSITY(INCH/HOUR) =   0.858
   SLOPE OF INTENSITY DURATION CURVE = 0.4750
   RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
   NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
         AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
   *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
      HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES: MANNING
      WIDTH  CROSSFALL  IN- / OUT-/PARK-  HEIGHT WIDTH  LIP   HIKE  FACTOR
  NO.  (FT)    (FT)     SIDE / SIDE/ WAY   (FT)   (FT)  (FT)  (FT)    (n)
  === =====  ========= ================= ====== ===== ====== ===== =======
   1  30.0    20.0     0.018/0.018/0.020  0.67   2.00 0.0312 0.167 0.0150

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


  *****************************************************************************
   FLOW PROCESS FROM NODE    10.00 TO NODE    15.00 IS CODE =  21
  ---------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  ===========================================================================
           ASSUMED INITIAL SUBAREA UNIFORM
           DEVELOPMENT IS APARTMENT
   TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   356.00
   UPSTREAM ELEVATION(FEET) =    649.00
   DOWNSTREAM ELEVATION(FEET) =    642.10
   ELEVATION DIFFERENCE(FEET) =      6.90
   TC = 0.323*[(  356.00**3)/(     6.90)]**.2 =    7.446
     10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.311
   USER-SPECIFIED RUNOFF COEFFICIENT = .8439
   SOIL CLASSIFICATION IS "B"
```

```
  SUBAREA RUNOFF(CFS) =      1.40
  TOTAL AREA(ACRES) =       0.72   TOTAL RUNOFF(CFS) =       1.40


*****************************************************************************
  FLOW PROCESS FROM NODE    20.00 TO NODE    25.00 IS CODE =  21
-----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=============================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS APARTMENT
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   205.00
  UPSTREAM ELEVATION(FEET) =   645.50
  DOWNSTREAM ELEVATION(FEET) =    640.50
  ELEVATION DIFFERENCE(FEET) =      5.00
  TC = 0.323*[(  205.00**3)/(     5.00)]**.2 =    5.702
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.623
  USER-SPECIFIED RUNOFF COEFFICIENT = .8486
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      0.71
  TOTAL AREA(ACRES) =       0.32   TOTAL RUNOFF(CFS) =       0.71


*****************************************************************************
  FLOW PROCESS FROM NODE    30.00 TO NODE    31.00 IS CODE =  21
-----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=============================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS APARTMENT
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   176.00
  UPSTREAM ELEVATION(FEET) =   641.50
  DOWNSTREAM ELEVATION(FEET) =    638.50
  ELEVATION DIFFERENCE(FEET) =      3.00
  TC = 0.323*[(  176.00**3)/(     3.00)]**.2 =    5.763
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.610
  USER-SPECIFIED RUNOFF COEFFICIENT = .8484
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      0.18
  TOTAL AREA(ACRES) =       0.08   TOTAL RUNOFF(CFS) =       0.18


*****************************************************************************
  FLOW PROCESS FROM NODE    31.00 TO NODE    35.00 IS CODE =  91
-----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
=============================================================================
  UPSTREAM NODE ELEVATION(FEET) =    638.50
  DOWNSTREAM NODE ELEVATION(FEET) =     635.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   239.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) = 0.050
  PAVEMENT LIP(FEET) = 0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   5.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.200
  USER-SPECIFIED RUNOFF COEFFICIENT = .8419
  SOIL CLASSIFICATION IS "B"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     0.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  1.60
  AVERAGE FLOW DEPTH(FEET) =  0.08   FLOOD WIDTH(FEET) =    6.51
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =  2.49   Tc(MIN.) =    8.25
  SUBAREA AREA(ACRES) =   0.26        SUBAREA RUNOFF(CFS) =   0.48
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =        0.66
```

```
END OF SUBAREA "V" GUTTER HYDRAULICS:
DEPTH(FEET) =  0.09   FLOOD WIDTH(FEET) =    7.95
FLOW VELOCITY(FEET/SEC.) =   1.80   DEPTH*VELOCITY(FT*FT/SEC) =    0.16
LONGEST FLOWPATH FROM NODE    30.00 TO NODE    35.00 =     415.00 FEET.

***************************************************************************
   FLOW PROCESS FROM NODE    20.00 TO NODE    50.00 IS CODE =  21
---------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===========================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS APARTMENT
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   164.00
  UPSTREAM ELEVATION(FEET) =    645.50
  DOWNSTREAM ELEVATION(FEET) =    641.50
  ELEVATION DIFFERENCE(FEET) =      4.00
  TC = 0.323*[(  164.00**3)/(     4.00)]**.2 =    5.215
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.737
  USER-SPECIFIED RUNOFF COEFFICIENT = .8502
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      0.67
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      0.67

***************************************************************************
   FLOW PROCESS FROM NODE    40.00 TO NODE    45.00 IS CODE =  21
---------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===========================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS APARTMENT
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   216.00
  UPSTREAM ELEVATION(FEET) =    644.00
  DOWNSTREAM ELEVATION(FEET) =    642.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  TC = 0.323*[(  216.00**3)/(     2.00)]**.2 =    7.067
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.369
  USER-SPECIFIED RUNOFF COEFFICIENT = .8448
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      0.74
  TOTAL AREA(ACRES) =      0.37   TOTAL RUNOFF(CFS) =      0.74

***************************************************************************
   FLOW PROCESS FROM NODE    50.00 TO NODE    75.00 IS CODE =  91
---------------------------------------------------------------------------
   >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
===========================================================================
  UPSTREAM NODE ELEVATION(FEET) =    641.50
  DOWNSTREAM NODE ELEVATION(FEET) =    638.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   267.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.050
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   5.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.090
  USER-SPECIFIED RUNOFF COEFFICIENT = .8399
  SOIL CLASSIFICATION IS "B"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     1.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.09
  AVERAGE FLOW DEPTH(FEET) =   0.13   FLOOD WIDTH(FEET) =   12.18
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.13   Tc(MIN.) =    9.19
  SUBAREA AREA(ACRES) =    1.04        SUBAREA RUNOFF(CFS) =    1.83
```

```
   TOTAL AREA(ACRES) =         1.4        PEAK FLOW RATE(CFS) =         2.57

 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  0.16   FLOOD WIDTH(FEET) =   14.59
 FLOW VELOCITY(FEET/SEC.) =   2.30   DEPTH*VELOCITY(FT*FT/SEC) =   0.36
 LONGEST FLOWPATH FROM NODE    40.00 TO NODE    75.00 =    483.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    60.00 TO NODE    65.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS APARTMENT
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   216.00
 UPSTREAM ELEVATION(FEET) =    643.50
 DOWNSTREAM ELEVATION(FEET) =    639.50
 ELEVATION DIFFERENCE(FEET) =     4.00
 TC = 0.323*[(  216.00**3)/(    4.00)]**.2 =    6.153
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.530
 USER-SPECIFIED RUNOFF COEFFICIENT = .8473
 SOIL CLASSIFICATION IS "B"
 SUBAREA RUNOFF(CFS) =      0.77
 TOTAL AREA(ACRES) =      0.36   TOTAL RUNOFF(CFS) =      0.77

**************************************************************************
  FLOW PROCESS FROM NODE    80.00 TO NODE    90.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS APARTMENT
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    87.00
 UPSTREAM ELEVATION(FEET) =    640.20
 DOWNSTREAM ELEVATION(FEET) =    637.70
 ELEVATION DIFFERENCE(FEET) =     2.50
 TC = 0.323*[(   87.00**3)/(    2.50)]**.2 =    3.917
 COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.792
 USER-SPECIFIED RUNOFF COEFFICIENT = .8509
 SOIL CLASSIFICATION IS "B"
 SUBAREA RUNOFF(CFS) =      0.24
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.24

**************************************************************************
  FLOW PROCESS FROM NODE   100.00 TO NODE   110.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS APARTMENT
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   167.00
 UPSTREAM ELEVATION(FEET) =    638.50
 DOWNSTREAM ELEVATION(FEET) =    634.50
 ELEVATION DIFFERENCE(FEET) =     4.00
 TC = 0.323*[(  167.00**3)/(    4.00)]**.2 =    5.273
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.722
 USER-SPECIFIED RUNOFF COEFFICIENT = .8500
 SOIL CLASSIFICATION IS "B"
 SUBAREA RUNOFF(CFS) =      0.46
```

```
   TOTAL AREA(ACRES) =       0.20   TOTAL RUNOFF(CFS) =       0.46

**************************************************************************
   FLOW PROCESS FROM NODE    120.00 TO NODE    130.00 IS CODE =   21
--------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS APARTMENT
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   117.00
 UPSTREAM ELEVATION(FEET) =   639.50
 DOWNSTREAM ELEVATION(FEET) =   638.00
 ELEVATION DIFFERENCE(FEET) =     1.50
 TC = 0.323*[(  117.00**3)/(     1.50)]**.2 =    5.182
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.745
 USER-SPECIFIED RUNOFF COEFFICIENT = .8503
 SOIL CLASSIFICATION IS "B"
 SUBAREA RUNOFF(CFS) =      0.61
 TOTAL AREA(ACRES) =       0.26   TOTAL RUNOFF(CFS) =       0.61


**************************************************************************
   FLOW PROCESS FROM NODE    140.00 TO NODE    150.00 IS CODE =   21
--------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS APARTMENT
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   154.00
 UPSTREAM ELEVATION(FEET) =   637.00
 DOWNSTREAM ELEVATION(FEET) =   635.50
 ELEVATION DIFFERENCE(FEET) =     1.50
 TC = 0.323*[(  154.00**3)/(     1.50)]**.2 =    6.111
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.538
 USER-SPECIFIED RUNOFF COEFFICIENT = .8474
 SOIL CLASSIFICATION IS "B"
 SUBAREA RUNOFF(CFS) =      0.39
 TOTAL AREA(ACRES) =       0.18   TOTAL RUNOFF(CFS) =       0.39
==========================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =         0.2  TC(MIN.) =       6.11
 PEAK FLOW RATE(CFS)    =         0.39
==========================================================================
==========================================================================
   END OF RATIONAL METHOD ANALYSIS
```

```
     _____
     *****************************************************************************
                 RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
                 RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                          (RCFC&WCD)  1978 HYDROLOGY MANUAL
                 (c) Copyright 1982-2016 Advanced Engineering Software (aes)
                          (Rational Tabling Version 23.0)
                      Release Date: 07/01/2016  License ID 1355

                           Analysis prepared by:

      ************************* DESCRIPTION OF STUDY *************************
      *                      CORONA 2ND STREET                              *
      *                      PROPOSED CONDITIONS                            *
      *                      100 YEAR STORM                                 *
      ***********************************************************************

       FILE NAME: CORONAPS.DAT
       TIME/DATE OF STUDY: 13:06 02/15/2024
     ----------------------------------------------------------------------------
       USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
     ----------------------------------------------------------------------------
       USER SPECIFIED STORM EVENT(YEAR) =  100.00
       SPECIFIED MINIMUM PIPE SIZE(INCH) =   3.00
       SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.01
       2-YEAR, 1-HOUR PRECIPITATION(INCH) =  0.520
       100-YEAR, 1-HOUR PRECIPITATION(INCH) =  1.320
       COMPUTED RAINFALL INTENSITY DATA:
       STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.320
       SLOPE OF INTENSITY DURATION CURVE = 0.4750
       RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
       NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
             AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
       *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
           HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
           WIDTH  CROSSFALL  IN- / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE   FACTOR
     NO.   (FT)     (FT)     SIDE / SIDE/ WAY   (FT)    (FT)  (FT)  (FT)     (n)
     ===   =====  =========  ================  ======  =====  =====  =====  =======
      1    30.0     20.0     0.018/0.018/0.020  0.67    2.00  0.0312 0.167 0.0150

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


     *****************************************************************************
       FLOW PROCESS FROM NODE     10.00 TO NODE     15.00 IS CODE =  21
     ----------------------------------------------------------------------------
       >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
     ============================================================================
             ASSUMED INITIAL SUBAREA UNIFORM
             DEVELOPMENT IS APARTMENT
       TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
       INITIAL SUBAREA FLOW-LENGTH(FEET) =   356.00
       UPSTREAM ELEVATION(FEET) =    649.00
       DOWNSTREAM ELEVATION(FEET) =    642.10
       ELEVATION DIFFERENCE(FEET) =      6.90
       TC = 0.323*[(  356.00**3)/(     6.90)]**.2 =    7.446
        100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.557
       USER-SPECIFIED RUNOFF COEFFICIENT = .8590
       SOIL CLASSIFICATION IS "B"
```

```
   SUBAREA RUNOFF(CFS) =        2.20
   TOTAL AREA(ACRES) =        0.72   TOTAL RUNOFF(CFS) =        2.20


***************************************************************************
   FLOW PROCESS FROM NODE      20.00 TO NODE      25.00 IS CODE =   21
---------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===========================================================================
           ASSUMED INITIAL SUBAREA UNIFORM
           DEVELOPMENT IS APARTMENT
   TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   205.00
   UPSTREAM ELEVATION(FEET) =    645.50
   DOWNSTREAM ELEVATION(FEET) =    640.50
   ELEVATION DIFFERENCE(FEET) =      5.00
   TC = 0.323*[(  205.00**3)/(     5.00)]**.2 =    5.702
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.037
   USER-SPECIFIED RUNOFF COEFFICIENT = .8629
   SOIL CLASSIFICATION IS "B"
   SUBAREA RUNOFF(CFS) =        1.11
   TOTAL AREA(ACRES) =        0.32   TOTAL RUNOFF(CFS) =        1.11


***************************************************************************
   FLOW PROCESS FROM NODE      30.00 TO NODE      31.00 IS CODE =   21
---------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===========================================================================
           ASSUMED INITIAL SUBAREA UNIFORM
           DEVELOPMENT IS APARTMENT
   TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   176.00
   UPSTREAM ELEVATION(FEET) =    641.50
   DOWNSTREAM ELEVATION(FEET) =    638.50
   ELEVATION DIFFERENCE(FEET) =      3.00
   TC = 0.323*[(  176.00**3)/(     3.00)]**.2 =    5.763
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.017
   USER-SPECIFIED RUNOFF COEFFICIENT = .8628
   SOIL CLASSIFICATION IS "B"
   SUBAREA RUNOFF(CFS) =        0.28
   TOTAL AREA(ACRES) =        0.08   TOTAL RUNOFF(CFS) =        0.28


***************************************************************************
   FLOW PROCESS FROM NODE      31.00 TO NODE      35.00 IS CODE =   91
---------------------------------------------------------------------------
   >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
===========================================================================
   UPSTREAM NODE ELEVATION(FEET) =      638.50
   DOWNSTREAM NODE ELEVATION(FEET) =      635.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =    239.00
   "V" GUTTER WIDTH(FEET) =    5.00   GUTTER HIKE(FEET) = 0.050
   PAVEMENT LIP(FEET) = 0.010   MANNING'S N = .0150
   PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
   MAXIMUM DEPTH(FEET) =    5.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.444
   USER-SPECIFIED RUNOFF COEFFICIENT = .8580
   SOIL CLASSIFICATION IS "B"
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      0.66
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.81
   AVERAGE FLOW DEPTH(FEET) =   0.09   FLOOD WIDTH(FEET) =    7.95
   "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.20   Tc(MIN.) =    7.97
   SUBAREA AREA(ACRES) =    0.26       SUBAREA RUNOFF(CFS) =    0.77
   TOTAL AREA(ACRES) =        0.3       PEAK FLOW RATE(CFS) =       1.05
```

```
   END OF SUBAREA "V" GUTTER HYDRAULICS:
   DEPTH(FEET) =  0.11   FLOOD WIDTH(FEET) =    9.76
   FLOW VELOCITY(FEET/SEC.) =   1.99   DEPTH*VELOCITY(FT*FT/SEC) =   0.21
   LONGEST FLOWPATH FROM NODE    30.00 TO NODE    35.00 =    415.00 FEET.

   **************************************************************************
   FLOW PROCESS FROM NODE    20.00 TO NODE    50.00 IS CODE =  21
   --------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
   ==========================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS APARTMENT
   TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   164.00
   UPSTREAM ELEVATION(FEET) =    645.50
   DOWNSTREAM ELEVATION(FEET) =    641.50
   ELEVATION DIFFERENCE(FEET) =     4.00
   TC = 0.323*[(  164.00**3)/(    4.00)]**.2 =    5.215
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.212
   USER-SPECIFIED RUNOFF COEFFICIENT = .8641
   SOIL CLASSIFICATION IS "B"
   SUBAREA RUNOFF(CFS) =     1.06
   TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      1.06

   **************************************************************************
   FLOW PROCESS FROM NODE    40.00 TO NODE    45.00 IS CODE =  21
   --------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
   ==========================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS APARTMENT
   TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   216.00
   UPSTREAM ELEVATION(FEET) =    644.00
   DOWNSTREAM ELEVATION(FEET) =    642.00
   ELEVATION DIFFERENCE(FEET) =     2.00
   TC = 0.323*[(  216.00**3)/(    2.00)]**.2 =    7.067
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.646
   USER-SPECIFIED RUNOFF COEFFICIENT = .8598
   SOIL CLASSIFICATION IS "B"
   SUBAREA RUNOFF(CFS) =     1.16
   TOTAL AREA(ACRES) =      0.37   TOTAL RUNOFF(CFS) =      1.16

   **************************************************************************
   FLOW PROCESS FROM NODE    50.00 TO NODE    75.00 IS CODE =  91
   --------------------------------------------------------------------------
   >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
   ==========================================================================
   UPSTREAM NODE ELEVATION(FEET) =    641.50
   DOWNSTREAM NODE ELEVATION(FEET) =    638.10
   CHANNEL LENGTH THRU SUBAREA(FEET) =   267.00
   "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.050
   PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
   PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
   MAXIMUM DEPTH(FEET) =   5.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.251
   USER-SPECIFIED RUNOFF COEFFICIENT = .8561
   SOIL CLASSIFICATION IS "B"
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      2.61
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.31
   AVERAGE FLOW DEPTH(FEET) =   0.16   FLOOD WIDTH(FEET) =   14.71
   "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.93   Tc(MIN.) =    9.00
   SUBAREA AREA(ACRES) =    1.04       SUBAREA RUNOFF(CFS) =    2.89
```

```
    TOTAL AREA(ACRES) =        1.4      PEAK FLOW RATE(CFS) =        4.05

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.19   FLOOD WIDTH(FEET) =   17.60
  FLOW VELOCITY(FEET/SEC.) =   2.53   DEPTH*VELOCITY(FT*FT/SEC) =   0.47
  LONGEST FLOWPATH FROM NODE   40.00 TO NODE     75.00 =    483.00 FEET.

*************************************************************************
  FLOW PROCESS FROM NODE    60.00 TO NODE     65.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS APARTMENT
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   216.00
  UPSTREAM ELEVATION(FEET) =    643.50
  DOWNSTREAM ELEVATION(FEET) =    639.50
  ELEVATION DIFFERENCE(FEET) =     4.00
  TC = 0.323*[(  216.00**3)/(    4.00)]**.2 =    6.153
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.894
  USER-SPECIFIED RUNOFF COEFFICIENT = .8618
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      1.21
  TOTAL AREA(ACRES) =       0.36   TOTAL RUNOFF(CFS) =       1.21

*************************************************************************
  FLOW PROCESS FROM NODE    80.00 TO NODE     90.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS APARTMENT
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    87.00
  UPSTREAM ELEVATION(FEET) =    640.20
  DOWNSTREAM ELEVATION(FEET) =    637.70
  ELEVATION DIFFERENCE(FEET) =     2.50
  TC = 0.323*[(   87.00**3)/(    2.50)]**.2 =    3.917
  COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.297
  USER-SPECIFIED RUNOFF COEFFICIENT = .8647
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      0.37
  TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.37

*************************************************************************
  FLOW PROCESS FROM NODE   100.00 TO NODE    110.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS APARTMENT
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   167.00
  UPSTREAM ELEVATION(FEET) =    638.50
  DOWNSTREAM ELEVATION(FEET) =    634.50
  ELEVATION DIFFERENCE(FEET) =     4.00
  TC = 0.323*[(  167.00**3)/(    4.00)]**.2 =    5.273
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.190
  USER-SPECIFIED RUNOFF COEFFICIENT = .8640
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      0.72
```
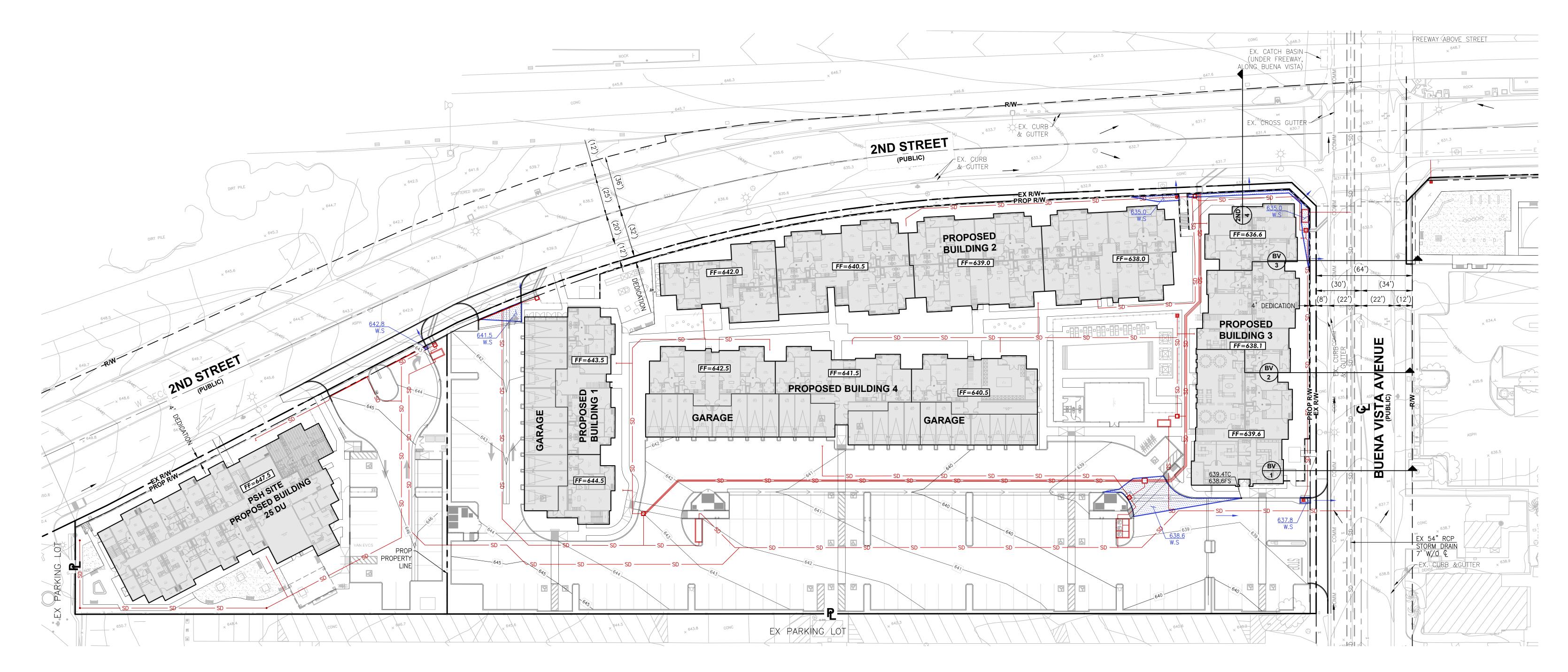
```
    TOTAL AREA(ACRES) =       0.20   TOTAL RUNOFF(CFS) =        0.72

**************************************************************************
   FLOW PROCESS FROM NODE    120.00 TO NODE    130.00 IS CODE =   21
--------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS APARTMENT
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   117.00
 UPSTREAM ELEVATION(FEET) =    639.50
 DOWNSTREAM ELEVATION(FEET) =    638.00
 ELEVATION DIFFERENCE(FEET) =      1.50
 TC = 0.323*[(  117.00**3)/(     1.50)]**.2 =    5.182
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.225
 USER-SPECIFIED RUNOFF COEFFICIENT = .8642
 SOIL CLASSIFICATION IS "B"
 SUBAREA RUNOFF(CFS) =      0.95
 TOTAL AREA(ACRES) =       0.26   TOTAL RUNOFF(CFS) =        0.95

**************************************************************************
   FLOW PROCESS FROM NODE    140.00 TO NODE    150.00 IS CODE =   21
--------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS APARTMENT
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   154.00
 UPSTREAM ELEVATION(FEET) =    637.00
 DOWNSTREAM ELEVATION(FEET) =    635.50
 ELEVATION DIFFERENCE(FEET) =      1.50
 TC = 0.323*[(  154.00**3)/(     1.50)]**.2 =    6.111
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.907
 USER-SPECIFIED RUNOFF COEFFICIENT = .8619
 SOIL CLASSIFICATION IS "B"
 SUBAREA RUNOFF(CFS) =      0.61
 TOTAL AREA(ACRES) =       0.18   TOTAL RUNOFF(CFS) =        0.61
==========================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =        0.2  TC(MIN.) =       6.11
 PEAK FLOW RATE(CFS)    =        0.61
==========================================================================
==========================================================================
   END OF RATIONAL METHOD ANALYSIS
```

APPENDIX 5

PONDING EXHIBIT & STREET CAPACITY CROSS SECTIONS

2ND STREET (PUBLIC)

2ND STREET (PUBLIC)

FREEWAY ABOVE STREET

EX. CATCH BASIN (UNDER FREEWAY, ALONG BUENA VISTA)

EX. CURB & GUTTER

EX. CROSS GUTTER

R/W

EX R/W PROP R/W

PROPOSED BUILDING 2
FF=642.0
FF=640.5
FF=639.0
FF=638.0

PROPOSED BUILDING 3
FF=636.6
FF=638.1
FF=639.6

PROPOSED BUILDING 1
FF=643.5
FF=644.5

PROPOSED BUILDING 4
FF=642.5
FF=641.5
FF=640.5

GARAGE
GARAGE
GARAGE

PSH SITE PROPOSED BUILDING 25 DU
FF=647.5

BUENA VISTA AVENUE (PUBLIC)

635.0 W.S
635.0 W.S
642.8 W.S
641.5 W.S
637.8 W.S
638.6 W.S
639.4TC 638.6FS

EX 54" RCP STORM DRAIN 7' W/O ₵

EX PARKING LOT

EX PARKING LOT

PROP PROPERTY LINE

4' DEDICATION

VAN EVCS

BV 1
BV 2
BV 3
2ND

LEGEND

	PONDED AREA
SD	PROPOSED STORM DRAIN
SD	EXISTING STORM DRAIN
XXX.XX W.S	WATER SURFACE ELEVATION (100 YEAR STORM)
→	SECONDARY OVERFLOW DIRECTION

PONDING EXHIBIT
WEST 2ND APARTMENT
CORONA, CALIFORNIA

F:\Projects\1339\010_Support Files\Reports\Hydrology\EXHIBIT\1339-010xh-Ponding.dwg (4/15/2024 3:54 PM) Plotted by: Youngsuk Lim

SCALE: 1" = 30'
30' 0' 15' 30'

4/15/2024

54 inch - Pipe

Project Description
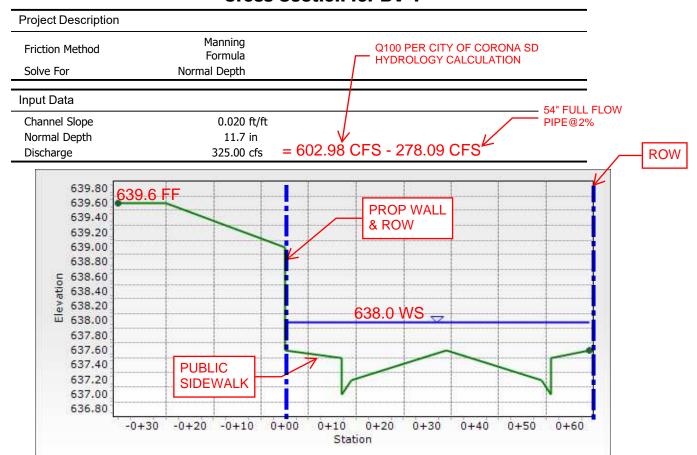
Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013
Channel Slope	0.020 ft/ft
Normal Depth	54.0 in
Diameter	54.0 in

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.005	139.04	8.74	15.9	14.1	0.00
0.006	152.32	9.58	15.9	14.1	0.00
0.007	164.52	10.34	15.9	14.1	0.00
0.008	175.88	11.06	15.9	14.1	0.00
0.009	186.55	11.73	15.9	14.1	0.00
0.010	196.64	12.36	15.9	14.1	0.00
0.011	206.24	12.97	15.9	14.1	0.00
0.012	215.41	13.54	15.9	14.1	0.00
0.013	224.20	14.10	15.9	14.1	0.00
0.014	232.67	14.63	15.9	14.1	0.00
0.015	240.83	15.14	15.9	14.1	0.00
0.016	248.73	15.64	15.9	14.1	0.00
0.017	256.39	16.12	15.9	14.1	0.00
0.018	263.82	16.59	15.9	14.1	0.00
0.019	271.05	17.04	15.9	14.1	0.00
0.020	278.09	17.49	15.9	14.1	0.00

Cross sections.fm8
2/22/2024

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FlowMaster
[10.03.00.03]
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Cross Section for BV-1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.020 ft/ft
Normal Depth	11.7 in
Discharge	325.00 cfs

54" FULL FLOW PIPE@2%

= 602.98 CFS - 278.09 CFS

ROW

639.6 FF

PROP WALL & ROW

638.0 WS

PUBLIC SIDEWALK

Cross sections.fm8
3/1/2024

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Cross Section for BV-2

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Q100 PER CITY OF CORONA SD
HYDROLOGY CALCULATION

Input Data

Channel Slope	0.020 ft/ft	
Normal Depth	12.8 in	54" FULL FLOW PIPE @ 2%
Discharge	325.00 cfs	= 602.98 CFS - 278.09 CFS

638.1 FF

PROP WALL & ROW

ROW

635.7 WS

PUBLIC SIDEWALK

Cross sections.fm8
3/1/2024

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Cross Section for BV-3

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Q100 PER CITY OF CORONA SD HYDROLOGY CALCULATION

Input Data

Channel Slope	0.020 ft/ft
Normal Depth	12.2 in
Discharge	325.00 cfs

54" FULL FLOW PIPE@2%

= 602.98 CFS - 278.09 CFS

636.6 FF

PROP WALL & ROW

ROW

633.3 WS

PUBLIC SIDEWALK

Cross sections.fm8
3/1/2024

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Cross Section for 2nd-4

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.020 ft/ft
Normal Depth	17.9 in
Discharge	602.98 cfs

Cross sections.fm8
3/1/2024

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