PRELIMINARY HYDROLOGY REPORT

FOR

VICTORVILLE CONNECTION PROJECT

LOCATED AT

NEC OF BEAR VALLEY ROAD AND 3ND AVENUE
VICTORVILLE, CA 92311

Prepared for

BEAR VALLEY ROAD & 2ND AVENUE, LLC
AND BEAR VALLEY DEVELOPMENT CO., LLC
12300 Wilshire Blvd #410
Los Angeles, CA 90025
Contact: Michael Asheghian

Prepared By:

DRC ENGINEERING, INC.
6840 Indiana Ave, Suite 215
Riverside, CA 92506
(714) 685-6860 x307, Ronald Sklepko, P.E.

DRC Project No. 20-523B

May 17, 2021

Ronald W. Sklepko

TABLE OF CONTENTS

List of Technical appendices

Technical Appendix A	***Vicinity Map and Drainage Criteria FEMA FIRM Panels***
Technical Appendix B	***Rational Method Analysis Existing Condition***
Technical Appendix C	***Rational Method Analysis Proposed Condition***
Technical Appendix D	***Pipe Hydraulic Calculations***
Technical Appendix E	***Reference Documents*** ***A. Previous Hydrology Study for the Project Site*** ***B. Mass Grading Plan for the Project Site*** ***C. Existing Storm Drain As-Built Plans***
Back Pocket	***Hydrology Map Existing Condition***
Back Pocket	***Hydrology Map Proposed Condition***

SECTION I Introduction

This hydrology report has been prepared for the proposed mixed-use Victorville Connection project. The project site is situated at NEC of Bear Valley Road and 3nd Avenue in Victorville, CA. It is bounded by vacant land and 3nd Avenue on the west, SF residential lots to the north, offices, hospital and 2nd Avenue on the east and Bear Valley Road on the south. The project site is located in the City of Victorville, County San Bernardino, State of California as shown on the location map in **Technical Appendix A.**

SECTION II Methodology

The hydrologic analysis was completed in accordance with the 1986 San Bernardino County Hydrology Manual and 2010 Hydrology Manual Addendum. The rational method has been used to calculate peak flows for both the existing and proposed site conditions.

The Hydrology Manual Addendum requires the use of NOAA Atlas 14 rainfall values when completing hydrologic analyses. The addendum also requires the use of the USDA Web Soil Survey for soil type groupings. The Web Soil Survey indicates the project site is situated within an area comprised of Bryman Loamy Fine Sand soils, which is identified as hydrologic soil type "C" in the Hydrology Manual. The project site is designated as Antecedent Moisture Condition (AMC) I per Figure ADD-1 based on the NOAA Atlas statistical data. AMC I is classified as lowest runoff potential. For the purpose of rational method hydrology, AMC I will be used for the 10-year storm event. To be conservative, AMC II (classified as moderate runoff potential) will be used for the 100-year storm event.

SECTION III Project Discussion

The project site will disturb approximately 36.0 acres with the development consisting of new retail buildings, medical/office buildings, a self-storage facility and a 376-unit apartment complex. Construction activities will include construction of a new buildings, paved access drives, parking lot pavement, ribbon gutters, driveways, walkways, landscaping planters and related utilities.

Existing Condition: The site is currently mass graded as part of Parcel Map No. 17603 and the entire site drains northeasterly toward 2nd Avenue. The flows are picked up by a 14' wide City standard drawing D-02 catch basin at a sump in 2nd Avenue near the northeast corner. The catch basin connects to the existing double 48" corrugated steel pipes across 2nd Avenue and flowing to the east. Refer to the "Existing Hydrology Map" for an illustration of the existing drainage patterns. Based on the referenced mass grading and storm drain improvement as-built plans in **Technical Appendix E**, there are two master-planned storm drain box culverts constructed to accept off-site flows and on-site flows. There is a 5'x4' RCB that is designed to accept the off-site flows from west of

3rd Avenue, that passes through the subject property with discharge to the north into the single-family subdivision. The second master-planned storm drain is an 8'x4' RCB culvert that is designed to accept off-site flows from south of Bear Valley Road and flows north through the subject property. The facility is designed to accept the runoff from the entire on-site 36.0 acres of Parcel Map No. 17603 including the car wash and drive-through restaurant corner parcels.

Table 1: Existing Drainage Summary

EXISTING DRAINAGE SUMMARY			
SUBAREA	**AREA**	**Q10 (cfs)**	**Q100 (cfs)**
A1 + A2	35.93	40.55	79.89
TOTAL	35.93	40.55	79.89

Proposed Condition: The proposed development will be consistent with the existing condition in terms of the overall drainage pattern. In the proposed condition, the site can break down into four distinctive drainage areas. **Drainage Area A** will pick up runoff from the proposed major and shops buildings, parking lots, gas station, three drive-thru fast-food restaurant, and landscaping planters. **Drainage Area B** will pick up runoff from the drive-thru fast-food restaurants, retail/office/medical buildings, a mediation garden, parking lots and landscaping planters. **Drainage Area C** will pick up runoff from the 3-story storage building and single story buildings, parking lot and landscaping planters. **Drainage Area D** will pick up runoff from the high-density residential area (apartments) access drives, parking stalls and landscaped areas. Each drainage area will discharge to a dual-function underground infiltration and detention basin for both stormwater treatment and hydromodification mitigation. Each basin will outlet to the existing 8'x4' concrete box culvert that passes through the site and crosses 2nd Avenue.

The following table summarizes the data and results for the 10-year and 100-year storm events in the proposed condition. All calculations can be found in **Technical Appendix C** of this report.

Table 2: Proposed Drainage Summary

PROPOSED DRAINAGE SUMMARY			
SUBAREA	**AREA**	**Q10 (cfs)**	**Q100 (cfs)**
A1+A2+A3+A4+A5	10.74	22.46	40.33
B1+B2	3.04	7.78	13.62
C1+C2	3.39	8.67	15.38
D1+D2+ D3+D4	18.04	33.24	61.30
TOTAL	**35.21**	**72.15**	**130.63**

As a result of the Rational Method calculations, the proposed developed condition for the analyzed areas produces 72.2 CFS of runoff for the 10-year storm event and 130.6 CFS for the 100-year storm event. The increased runoff will be mitigated by the four underground infiltration basins.

Hydromodification Mitigation

The project will have four (4) underground infiltration BMPs for the purpose of low impact development and the capture of the design capture volume for stormwater treatment. All the basins are designed to ensure that the post-development DMA will meet the Mojave River Watershed guidelines for both stormwater treatment and hydromodification criteria before leaving the site. Refer to "Preliminary Project Specific Water Quality Management Plan" (PWQMP) for detailed calculations of the proposed dual-purpose infiltration/detention basin system.

Phase II of the Mojave River Watershed requires that projects to demonstrate 10-year 24-hour 85th percentile storm event will not result in hydromodification. In addition, per City of Victorville's hydrology guideline, the proposed development must also show that the development does not increase the runoff for the 100-year 1-hour storm event. Unit hydrograph calculations for both existing and proposed conditions were prepared for the 10-year 24-hour storm event and 100-year 1-hour storm event demonstrate that the required detention volume (difference in the pre-developed and post-developed stormwater volume) is captured. The following table summarizes the data and results for the pre- and post- storm events in the proposed condition.

Table 3: Basin Summary

Drainage Area	Area (ac)	Vbmp* (CF)	10-Year 24-hour Peak Flow Rate Pre (CFS)	10-Year 24-hour Peak Flow Rate Post and Mitigated Flow Rate (CFS)	100-Year 1-hour Peak Flow Rate Pre (CFS)	100-Year 1-hour Peak Flow Rate Post and Mitigated Flow Rate (CFS)	Required Storage Volume ** Volume (CF)	Basin Volume Provided (CF)
A	10.74	20,137	15.67	15.21 Post 15.21 Mitigated	37.91	40.32 Post 21.91 Mitigated	28,000	28,150
B	3.04	7,122	5.66	8.50 Post 4.95 Mitigated	12.95	8.50 Post 5.57 Mitigated	9,900	10,450
C	3.39	7,888	5.82	9.82 Post 5.50 Mitigated	14.85	9.82 Post 7.51 Mitigated	10,666	10,779
D	18.04	35,739	32.05	36.13 Post 30.95 Mitigated	57.76	61.11 Post 56.94 Mitigated	46,534	46,845

**Refer to Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume per PWQMP Report.*
*** Difference Between 10-year 24-hour pre- and post- development volume. Refer to Form 4.2-2 Summary of Hydromodification Assessment per PWQMP Report.*

Flood Plain Mapping

The National Flood Insurance Act (1968) established the National Flood Insurance Program, which is based on the minimal requirements for floodplain management and is designed to minimize flood damage within Special Flood Hazard Areas. The Federal Emergency Management Agency (FEMA) is the agency that administrates the National Flood Insurance Program. Special Flood Hazard Areas (SFHA) are defined as areas that have a 1% chance of flooding within a given year. This is also referred to as the 100-year flood. Flood Insurance Rate Maps (FIRMs) were developed to identify areas of flood hazards within a community.

According to the Flood Insurance Rate Map (FIRM) catalog, there are FIRMs produced by FEMA for the project Site:

MAP Number: 06071C6485J
Map Revised: September 2, 2016

The entire project site is falls within the "Zone X" flood plain area. The "Zone X" is defined as area outside of the 100-year floodplain. Refer to **Technical Appendix A**.

Storm Drain Improvements

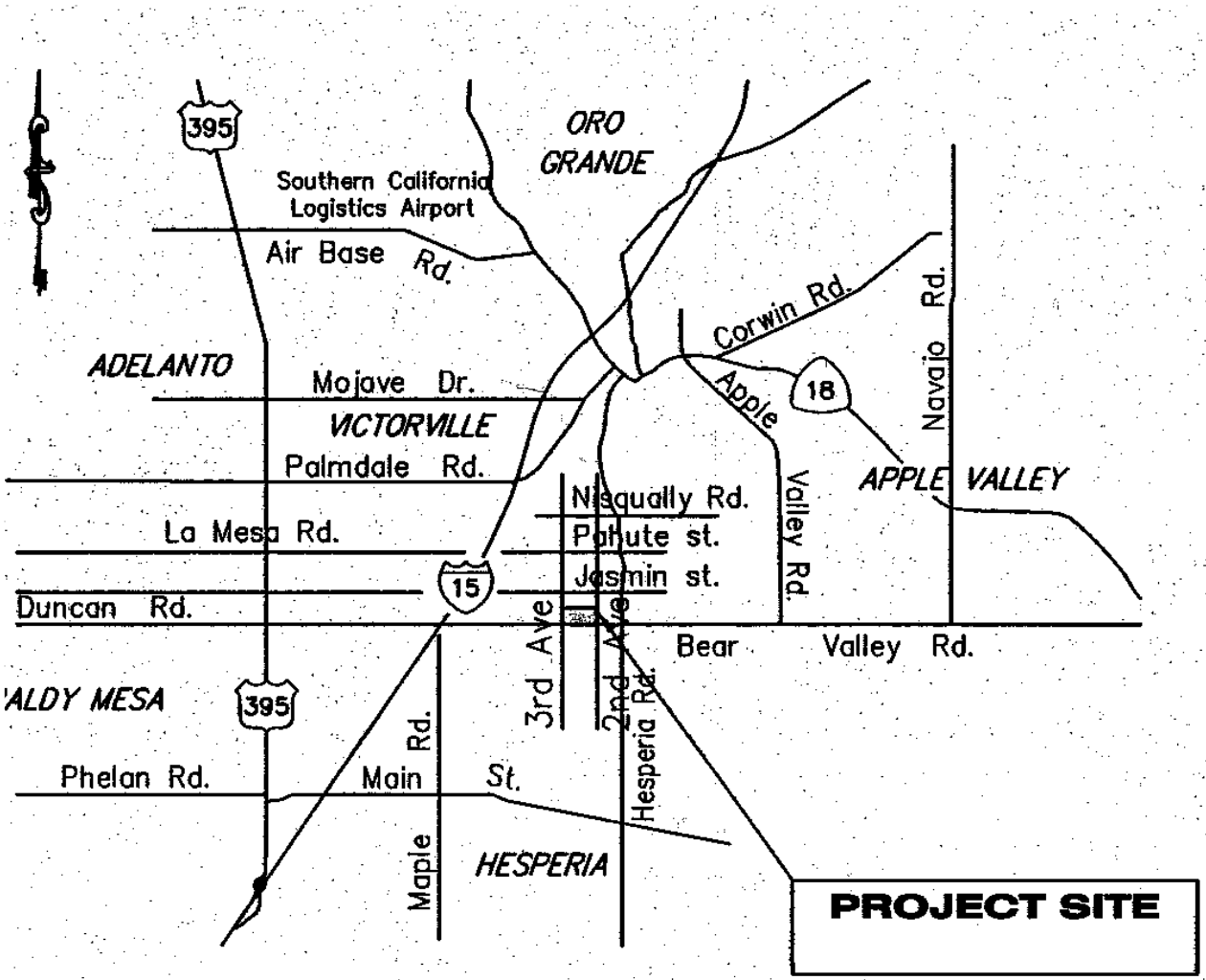
The proposed storm drain system is composed with 18" / 24" / 30" storm drain to pick up on-site inlets and conveyance to proposed infiltration basins. Refer to Technical **Appendix D** for supporting preliminary pipe hydraulic calculations and a diagram illustrating the emergency overflow route.

Conclusion

In conclusion, the proposed development will not adversely affect the existing drainage patterns in the area and will provide adequate protection for the proposed on-site improvements and structures. The combination infiltration / detention basin will capture and infiltrate the required treatment volumes and the outlet control manholes will mitigate the post-development runoff rates to match the pre-development runoff rates for the required storm events.

Technical Appendix A

Vicinity Map and
Drainage Criteria
FEMA FIRM Panels



VICINITY MAP

NOT TO SCALE

NOTES TO USERS

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

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

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

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

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

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11 North. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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

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

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

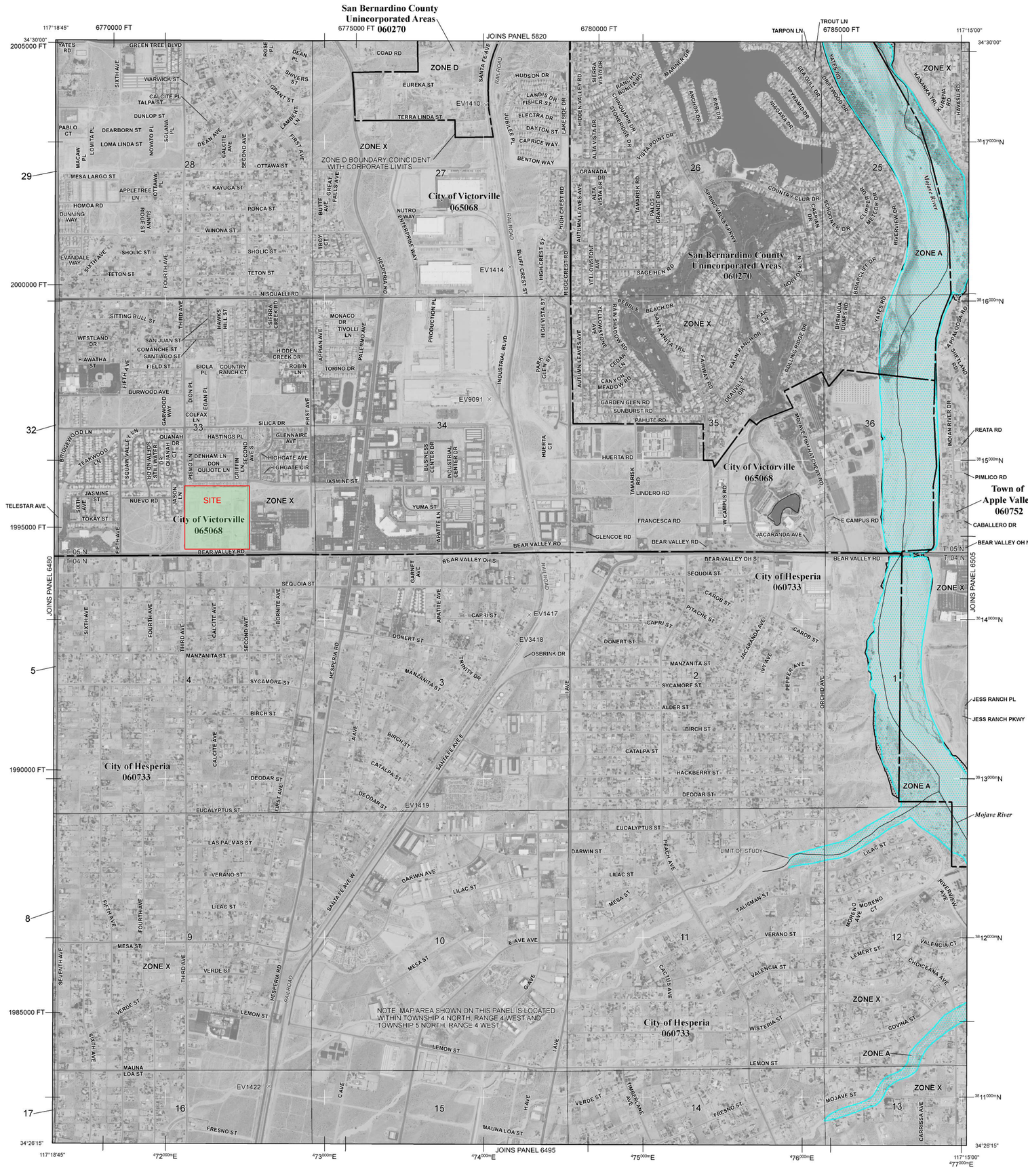
Base map information shown on this FIRM was provided in digital format by the San Bernardino County ISD.GIS Department, United States Geological Survey, the Bureau of Land Management, the United States Department of Agriculture, and the National Geodetic Survey. The imagery was flown by U.S. Department of Agriculture Farm Sevice Agency in 2012 and was produced with a 1-meter ground sampling distance.

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

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

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

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products, or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.



LEGEND

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

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

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

FLOODWAY AREAS IN ZONE AE

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

OTHER FLOOD AREAS

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

OTHER AREAS

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

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

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

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
513 — Base Flood Elevation line and value; elevation in feet*
(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*
* Referenced to the North American Vertical Datum of 1988
A — A — Cross section line
23 — 23 — Transect line
97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4°75000mE — 1000-meter Universal Transverse Mercator grid values, zone 11
6000000 FT — 5000-foot grid ticks: California State Plane coordinate system, Zone V (FIPSZONE = 405), Lambert projection
DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

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

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
September 2, 2016 – to change Base Flood Elevations, to add Base Flood Elevations, to change Special Flood Hazard Areas, to add Special Flood Hazard Areas, to change zone designations, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

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

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

MAP SCALE 1" = 1000'

500 0 500 1,000 1,500 2,000 FEET
300 0 300 600 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 6485J

FIRM

FLOOD INSURANCE RATE MAP

SAN BERNARDINO COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 6485 OF 9400

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
APPLE VALLEY, TOWN OF	060752	6485	J
HESPERIA, CITY OF	060733	6485	J
SAN BERNARDINO COUNTY	060270	6485	J
VICTORVILLE, CITY OF	065068	6485	J

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

MAP NUMBER
06071C6485J

MAP REVISED
SEPTEMBER 2, 2016

Federal Emergency Management Agency

NOAA Atlas 14, Volume 6, Version 2
Location name: Victorville, California, USA*
Latitude: 34.4709°, Longitude: -117.2992°
Elevation: 3039.38 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.089** (0.073-0.108)	**0.124** (0.102-0.152)	**0.172** (0.142-0.212)	**0.214** (0.174-0.264)	**0.272** (0.215-0.348)	**0.319** (0.247-0.417)	**0.369** (0.279-0.494)	**0.423** (0.310-0.582)	**0.499** (0.351-0.715)	**0.561** (0.381-0.832)
10-min	**0.127** (0.105-0.155)	**0.178** (0.147-0.217)	**0.247** (0.203-0.303)	**0.306** (0.250-0.379)	**0.390** (0.308-0.499)	**0.458** (0.354-0.598)	**0.529** (0.400-0.708)	**0.606** (0.445-0.834)	**0.715** (0.504-1.02)	**0.803** (0.547-1.19)
15-min	**0.153** (0.127-0.188)	**0.215** (0.177-0.263)	**0.299** (0.246-0.367)	**0.370** (0.302-0.458)	**0.472** (0.373-0.603)	**0.554** (0.428-0.723)	**0.640** (0.483-0.857)	**0.733** (0.538-1.01)	**0.865** (0.609-1.24)	**0.972** (0.661-1.44)
30-min	**0.214** (0.177-0.261)	**0.299** (0.247-0.366)	**0.416** (0.343-0.511)	**0.516** (0.421-0.638)	**0.657** (0.519-0.841)	**0.771** (0.596-1.01)	**0.892** (0.673-1.19)	**1.02** (0.749-1.41)	**1.20** (0.848-1.73)	**1.35** (0.921-2.01)
60-min	**0.268** (0.221-0.327)	**0.375** (0.309-0.459)	**0.522** (0.429-0.640)	**0.646** (0.527-0.799)	**0.823** (0.650-1.05)	**0.966** (0.747-1.26)	**1.12** (0.843-1.50)	**1.28** (0.939-1.76)	**1.51** (1.06-2.16)	**1.70** (1.15-2.52)
2-hr	**0.378** (0.313-0.463)	**0.509** (0.421-0.624)	**0.690** (0.568-0.847)	**0.843** (0.688-1.04)	**1.06** (0.838-1.36)	**1.24** (0.957-1.62)	**1.42** (1.07-1.91)	**1.62** (1.19-2.23)	**1.90** (1.34-2.73)	**2.13** (1.45-3.16)
3-hr	**0.462** (0.382-0.565)	**0.614** (0.507-0.752)	**0.824** (0.678-1.01)	**1.00** (0.818-1.24)	**1.25** (0.991-1.61)	**1.46** (1.13-1.91)	**1.68** (1.26-2.24)	**1.91** (1.40-2.62)	**2.23** (1.57-3.20)	**2.50** (1.70-3.70)
6-hr	**0.632** (0.522-0.773)	**0.834** (0.689-1.02)	**1.11** (0.914-1.36)	**1.35** (1.10-1.67)	**1.68** (1.33-2.15)	**1.95** (1.51-2.54)	**2.23** (1.68-2.98)	**2.53** (1.86-3.48)	**2.96** (2.08-4.24)	**3.30** (2.25-4.90)
12-hr	**0.810** (0.669-0.990)	**1.09** (0.897-1.33)	**1.46** (1.20-1.79)	**1.78** (1.45-2.20)	**2.22** (1.76-2.84)	**2.58** (1.99-3.36)	**2.95** (2.23-3.94)	**3.34** (2.45-4.60)	**3.89** (2.74-5.59)	**4.34** (2.95-6.44)
24-hr	**1.07** (0.952-1.24)	**1.47** (1.31-1.70)	**2.01** (1.78-2.33)	**2.46** (2.16-2.87)	**3.09** (2.62-3.72)	**3.59** (2.98-4.41)	**4.11** (3.33-5.17)	**4.66** (3.67-6.03)	**5.42** (4.10-7.32)	**6.04** (4.41-8.43)
2-day	**1.22** (1.08-1.40)	**1.69** (1.50-1.95)	**2.33** (2.06-2.70)	**2.87** (2.51-3.34)	**3.62** (3.07-4.36)	**4.22** (3.50-5.18)	**4.84** (3.92-6.10)	**5.50** (4.33-7.12)	**6.43** (4.86-8.68)	**7.17** (5.24-10.0)
3-day	**1.32** (1.17-1.52)	**1.84** (1.63-2.12)	**2.55** (2.25-2.94)	**3.14** (2.75-3.66)	**3.97** (3.36-4.78)	**4.63** (3.84-5.69)	**5.32** (4.31-6.70)	**6.06** (4.77-7.85)	**7.10** (5.36-9.58)	**7.93** (5.80-11.1)
4-day	**1.41** (1.25-1.62)	**1.97** (1.74-2.26)	**2.72** (2.40-3.15)	**3.36** (2.94-3.91)	**4.25** (3.60-5.11)	**4.95** (4.11-6.09)	**5.69** (4.61-7.17)	**6.48** (5.11-8.39)	**7.59** (5.74-10.2)	**8.48** (6.20-11.9)
7-day	**1.53** (1.36-1.76)	**2.12** (1.88-2.45)	**2.93** (2.59-3.38)	**3.60** (3.15-4.19)	**4.54** (3.85-5.47)	**5.29** (4.39-6.50)	**6.07** (4.92-7.64)	**6.89** (5.43-8.93)	**8.05** (6.09-10.9)	**8.98** (6.56-12.5)
10-day	**1.63** (1.44-1.87)	**2.25** (1.99-2.59)	**3.09** (2.73-3.57)	**3.79** (3.32-4.42)	**4.78** (4.05-5.75)	**5.56** (4.61-6.83)	**6.37** (5.16-8.03)	**7.23** (5.70-9.37)	**8.44** (6.38-11.4)	**9.41** (6.87-13.1)
20-day	**1.90** (1.68-2.18)	**2.63** (2.33-3.03)	**3.63** (3.20-4.19)	**4.47** (3.91-5.20)	**5.65** (4.79-6.80)	**6.59** (5.47-8.10)	**7.57** (6.13-9.54)	**8.61** (6.79-11.2)	**10.1** (7.61-13.6)	**11.2** (8.21-15.7)
30-day	**2.17** (1.92-2.50)	**3.01** (2.67-3.47)	**4.18** (3.69-4.82)	**5.16** (4.52-6.01)	**6.56** (5.56-7.90)	**7.68** (6.37-9.44)	**8.85** (7.17-11.1)	**10.1** (7.96-13.1)	**11.9** (8.96-16.0)	**13.3** (9.69-18.5)
45-day	**2.54** (2.26-2.93)	**3.53** (3.13-4.07)	**4.91** (4.34-5.67)	**6.09** (5.34-7.10)	**7.80** (6.61-9.39)	**9.18** (7.62-11.3)	**10.6** (8.62-13.4)	**12.2** (9.61-15.8)	**14.4** (10.9-19.5)	**16.2** (11.8-22.6)
60-day	**2.81** (2.49-3.24)	**3.89** (3.44-4.48)	**5.40** (4.77-6.24)	**6.72** (5.89-7.83)	**8.63** (7.32-10.4)	**10.2** (8.47-12.5)	**11.9** (9.63-15.0)	**13.7** (10.8-17.7)	**16.3** (12.3-22.0)	**18.4** (13.5-25.8)

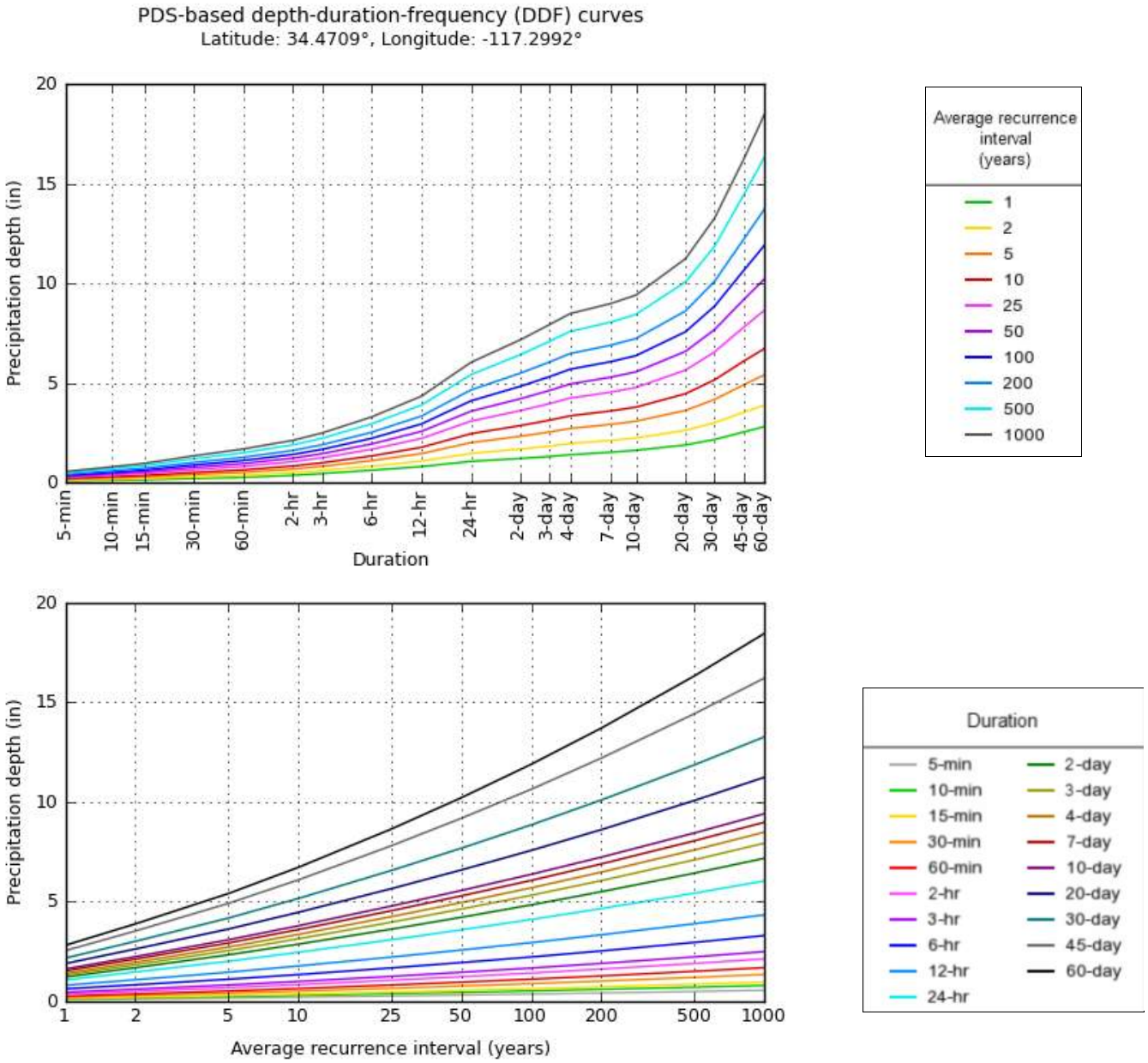
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

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

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical



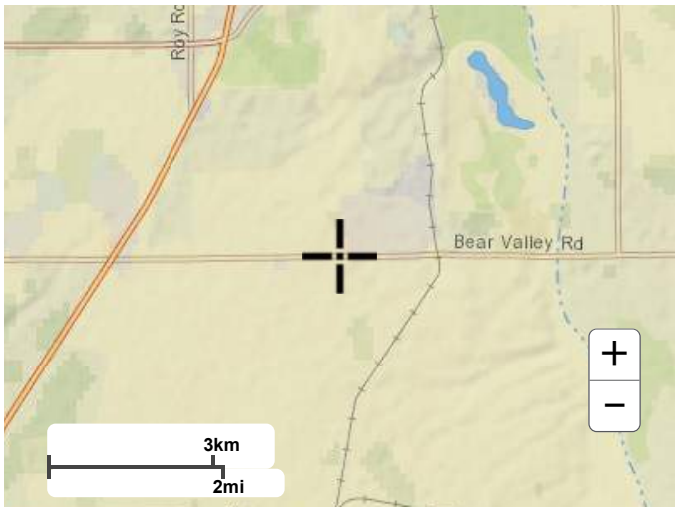
NOAA Atlas 14, Volume 6, Version 2

Created (GMT): Fri Mar 20 16:46:56 2020

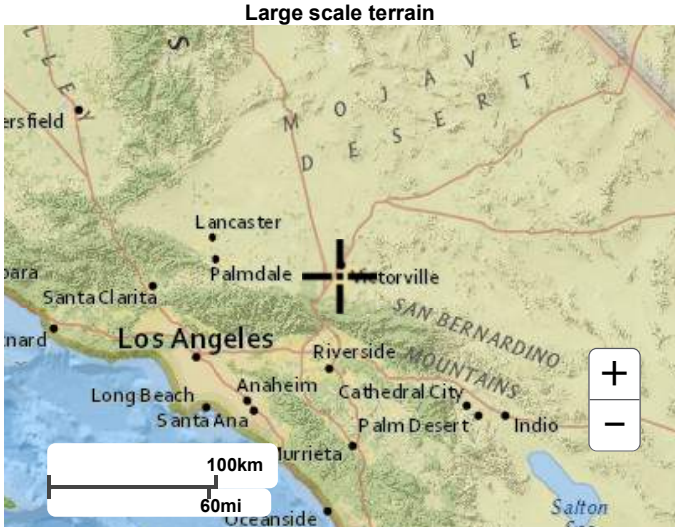
Back to Top

Maps & aerials

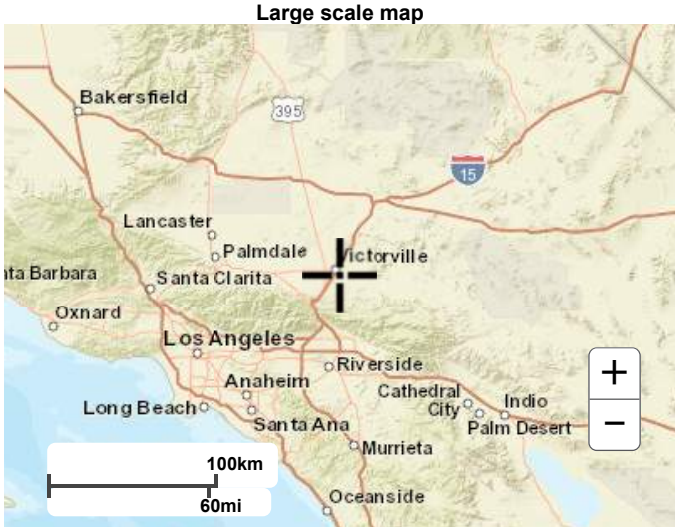
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial

Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Figure ADD-1
Antecedent Moisture Condition (AMC)

5-day Rainfall - NOAA Atlas 14
(50% of Total Rainfall Prior to Peak)*

*1/2 (11-day - 1-day) =
1/2 (([10-day] + (1/10 ([20-day] - [10-day]))) - [1-day])

5 0 5 10 15
Miles

N
W E
S

Growing Season
- AMC I
- AMC II
- AMC III

STATE HWY 127
I-15
US HWY 395
I-40
STATE HWY 247
STATE HWY 62
Death Valley
Ridgecrest
Barstow
Boron
Adelanto
George AFB
Victorville
Apple Valley
Mountain View Acres
Hesperia
Wrightwood
Crestline
Lake Arrowhead
Running Springs
Big Bear City
Big Bear Lake
Yucca Valley
Joshua Tree
Twentynine Palms
Morongo Valley
Needles
Parker
Blythe

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for San Bernardino County, California, Mojave River Area

Bear Valley Connection Project

March 20, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Map Scale: 1:2,940 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

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

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

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

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

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

Soil Survey Area: San Bernardino County, California, Mojave River Area
Survey Area Data: Version 11, Sep 17, 2019

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

Date(s) aerial images were photographed: Feb 1, 2015—Feb 4, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
107	BRYMAN LOAMY FINE SAND, 5 TO 9 PERCENT SLOPES	36.0	100.0%
Totals for Area of Interest		**36.0**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

San Bernardino County, California, Mojave River Area

107—BRYMAN LOAMY FINE SAND, 5 TO 9 PERCENT SLOPES

Map Unit Setting

National map unit symbol: hkrc
Elevation: 3,000 to 3,200 feet
Mean annual precipitation: 3 to 6 inches
Mean annual air temperature: 59 to 63 degrees F
Frost-free period: 180 to 280 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Bryman

Setting

Landform: Fan remnants
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite sources

Typical profile

H1 - 0 to 9 inches: loamy fine sand
H2 - 9 to 39 inches: sandy clay loam
H3 - 39 to 60 inches: loamy sand

Properties and qualities

Slope: 5 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: Sandy (R030XF012CA)
Hydric soil rating: No

Minor Components

Cajon

Percent of map unit: 5 percent

Hydric soil rating: No

Helendale

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

Bryman, sloping

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

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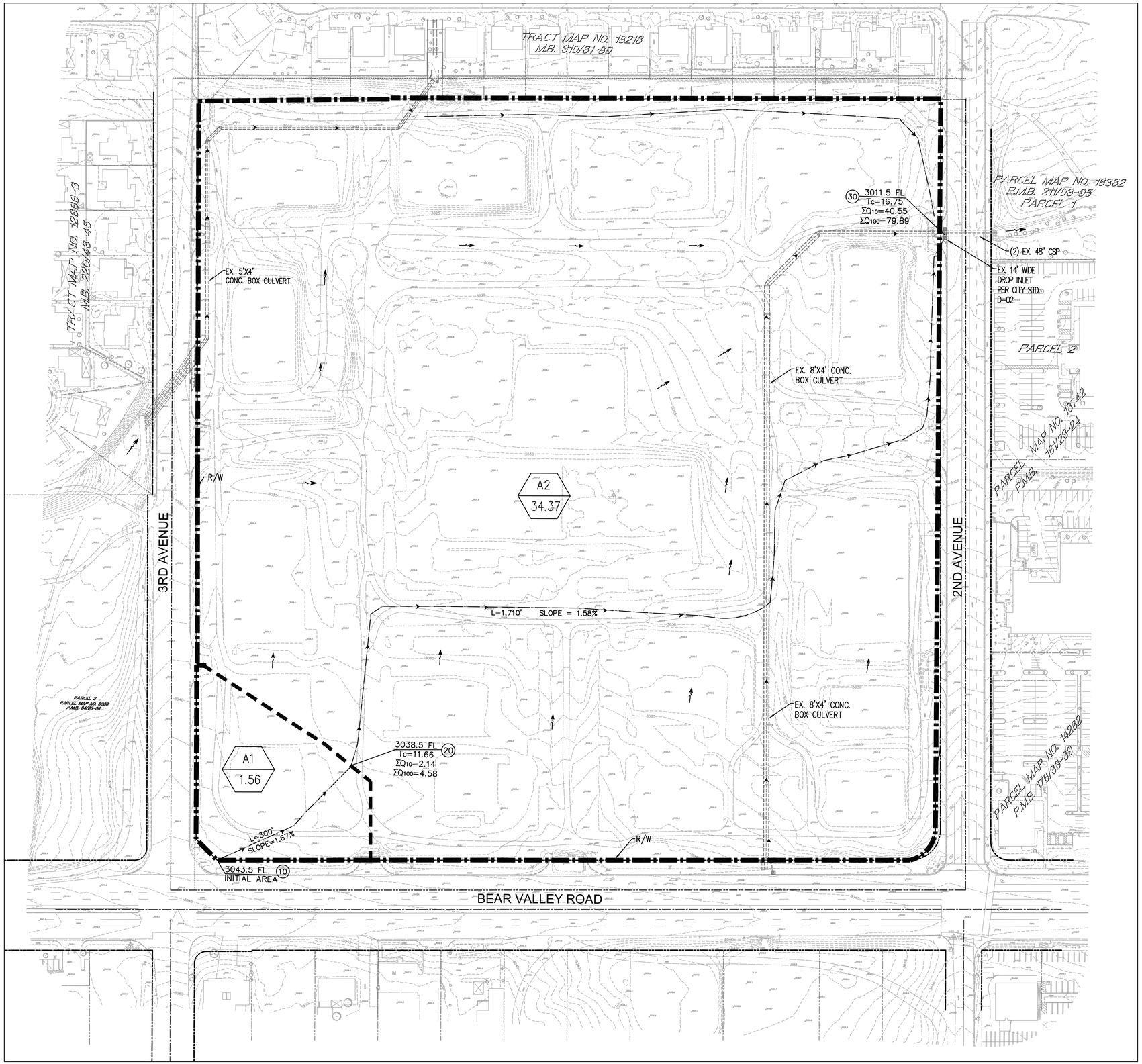
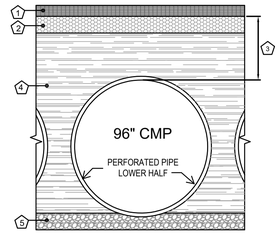
Technical Appendix B

Rational Method Analysis
Existing Condition



LEGEND:

- D1 / 0.73 AC — SUBAREA / ACREAGE
- 1 — NODE
- 1: T_c=10.21, Q_{10}=9.11, Q_{100}=15.21 — TIME OF CONCENTRATION IN MINUTES; RUNOFF FOR 10 YEAR STORM EVENT IN CFS; RUNOFF FOR 100 YEAR STORM EVENT IN CFS
- 849.0 FL — ELEVATION
- FLOW PATH
- SUBAREA BOUNDARY
- DRAINAGE AREA BOUNDARY



KEY

1. RIGID OR FLEXIBLE PAVEMENT
2. GRANULAR ROAD BASE
3. 12" MIN. FOR DIAMETERS THROUGH 96" 18" MIN. FOR DIAMETERS FROM 102" AND LARGER MEASURED TO TOP OF RIGID OR BOTTOM OF FLEXIBLE PAVEMENT.
4. SELECT GRANULAR FILL PER AASHTO M145 A1, A2 OR A3, OR APPROVED EQUAL. PLACED IN 8" LIFTS (COMPACTED TO MIN. 90% STANDARD DENSITY PER AASHTO T99.)
5. ¾" CLEAN GRAVEL OR #57 STONE , ROUGHLY SHAPED TO FIT THE BOTTOM OF PIPE, 12" IN DEPTH

UNDERGROUND INFILTRATION/DETENTION SYSTEM DETAIL

NOT TO SCALE

Drainage Area	Area (ac)	Vbmp* (CF)	10-Year 24-hour Peak Flow Rate Pre (CfS)	10-Year 24-hour Peak Flow Rate Post and Mitigated Flow Rate (CFS)	100-Year 1-hour Peak Flow Rate Pre (CFS)	100-Year 1-hour Peak Flow Rate Post and Mitigated Flow Rate (CFS)	Required Storage Volume ** Volume (CF)	Basin Volume Provided (CF)
A	10.74	20,137	15.67	15.21 Post 15.21 Mitigated	37.91	40.32 Post 21.91 Mitigated	28,000	28,150
B	3.04	7,122	5.66	8.50 Post 4.95 Mitigated	12.95	8.50 Post 5.57 Mitigated	9,900	10,450
C	3.39	7,888	5.82	9.82 Post 5.50 Mitigated	14.85	9.82 Post 7.51 Mitigated	10,666	10,779
D	18.04	35,739	32.05	36.13 Post 30.95 Mitigated	57.76	61.11 Post 56.94 Mitigated	46,534	46,845

*Refer to Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume per PWQMP Report.
**Difference Between 10-year 24-hour pre- and post- development volume. Refer to Form 4.2-2 Summary of Hydromodification Assessment per PWQMP Report.

30' 0' 30' 60' 90'

GRAPHIC SCALE: 1"=30'

PREPARED BY:
DRC Engineering, Inc.
Civil Engineering/Land Surveying/Land Planning
4649 Brockton Ave.
Riverside, CA 92506
714-685-6860
RONALD W. SKLEPKO R.C.E. 46216 DATE

REGISTERED PROFESSIONAL ENGINEER * RONALD W. SKLEPKO * No. C46216 * Exp. 12-31-2019 * CIVIL * STATE OF CALIFORNIA

NO.:	REVISION:	DATE:

PROJECT: VICTORVILLE CONNECTION
BEAR VALLEY ROAD & 3RD AVE.
VICTORVILLE, CA
DRAWING NAME: EXIST. CONDITION HYDROLOGY MAP

ISSUE:	PRELIMINARY
DATE:	04-02-21
CHECKED: RWS	DRAWN: YH
DRAWING FILE:	20523HMEX
PROJECT NO.:	20-523
SHEET NUMBER:	1
OF	1 SHEETS
SCALE:	AS SHOWN

EXTERNAL REFERENCES: 20523_ATG1 20523_pgmn101 20523_MA01 20-523_Bndy 20-523_Cf 01 20523 xf_A101-wxc-working
FILENAME: W:\2020\20-523 Western CRE Victorville Bear Vly Rd\HM\20523 EX MAP_Full Site.dwg, LAST SAVED ON: May 12 2021 11:08am PLOTTED BY: YANG, ON: May 17 2021 4:35pm, CFG:

10-YEAR STORM EVENT

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2012 Version 7.2
Rational Hydrology Study Date: 05/12/21

20-523 VICTORVILLE CONNECTION PROJECT
EXISTING CONDITION

Program License Serial Number 6310

********* Hydrology Study Control Information **********

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.646 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++
Process from Point/Station 10.000 to Point/Station 20.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 86.00
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.265(In/Hr)
Initial subarea data:
Initial area flow distance = 300.000(Ft.)
Top (of initial area) elevation = 3043.500(Ft.)
Bottom (of initial area) elevation = 3038.500(Ft.)
Difference in elevation = 5.000(Ft.)
Slope = 0.01667 s(%)= 1.67
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 11.658 min.
Rainfall intensity = 2.034(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.783
Subarea runoff = 2.483(CFS)
Total initial stream area = 1.560(Ac.)
Pervious area fraction = 1.000
Initial area Fm value = 0.265(In/Hr)

++
Process from Point/Station 20.000 to Point/Station 30.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 0.000(CFS)
Depth of flow = 1.350(Ft.), Average velocity = 4.727(Ft/s)
!!Warning: Water is above left or right bank elevations
******* Irregular Channel Data **********

Information entered for subchannel number 1 :

Point number	'X' coordinate	'Y' coordinate
1	0.00	0.00
2	10.00	2.00

Manning's 'N' friction factor = 0.030

Sub-Channel flow = 21.543(CFS)
' ' flow top width = 6.751(Ft.)
' ' velocity= 4.727(Ft/s)
' ' area = 4.557(Sq.Ft)
' ' Froude number = 1.014

Upstream point elevation = 3038.500(Ft.)
Downstream point elevation = 3011.500(Ft.)
Flow length = 1710.000(Ft.)

```
Travel time  =    6.03 min.
Time of concentration =   17.69 min.
Depth of flow =   1.350(Ft.)
Average velocity =   4.727(Ft/s)
Total irregular channel flow =    21.543(CFS)
Irregular channel normal depth above invert elev. =   1.350(Ft.)
Average velocity of channel(s) =   4.727(Ft/s)
!!Warning: Water is above left or right bank elevations
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.265(In/Hr)
Rainfall intensity =      1.519(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.743
Subarea runoff =     38.067(CFS) for   34.370(Ac.)
Total runoff =     40.550(CFS)
Effective area this stream =       35.93(Ac.)
Total Study Area (Main Stream No. 1) =       35.93(Ac.)
Area averaged Fm value =    0.265(In/Hr)
Depth of flow =   1.711(Ft.), Average velocity =   5.537(Ft/s)
!!Warning: Water is above left or right bank elevations
End of computations, Total Study Area =           35.93 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged SCS curve number =  86.0
```

100-YEAR STORM EVENT

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2012 Version 7.2
Rational Hydrology Study Date: 05/12/21

20-523 VICTORVILLE CONNECTION PROJECT
EXISTING CONDITION

Program License Serial Number 6310

********* Hydrology Study Control Information **********

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.120 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++
Process from Point/Station 10.000 to Point/Station 20.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 86.00
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.265(In/Hr)
Initial subarea data:
Initial area flow distance = 300.000(Ft.)
Top (of initial area) elevation = 3043.500(Ft.)
Bottom (of initial area) elevation = 3038.500(Ft.)
Difference in elevation = 5.000(Ft.)
Slope = 0.01667 s(%)= 1.67
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 11.658 min.
Rainfall intensity = 3.526(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.832
Subarea runoff = 4.578(CFS)
Total initial stream area = 1.560(Ac.)
Pervious area fraction = 1.000
Initial area Fm value = 0.265(In/Hr)

++
Process from Point/Station 20.000 to Point/Station 30.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 0.000(CFS)
Depth of flow = 1.738(Ft.), Average velocity = 5.595(Ft/s)
!!Warning: Water is above left or right bank elevations
******* Irregular Channel Data **********

Information entered for subchannel number 1 :

Point number	'X' coordinate	'Y' coordinate
1	0.00	0.00
2	10.00	2.00

Manning's 'N' friction factor = 0.030

Sub-Channel flow = 42.274(CFS)
' ' flow top width = 8.692(Ft.)
' ' velocity= 5.595(Ft/s)
' ' area = 7.555(Sq.Ft)
' ' Froude number = 1.058

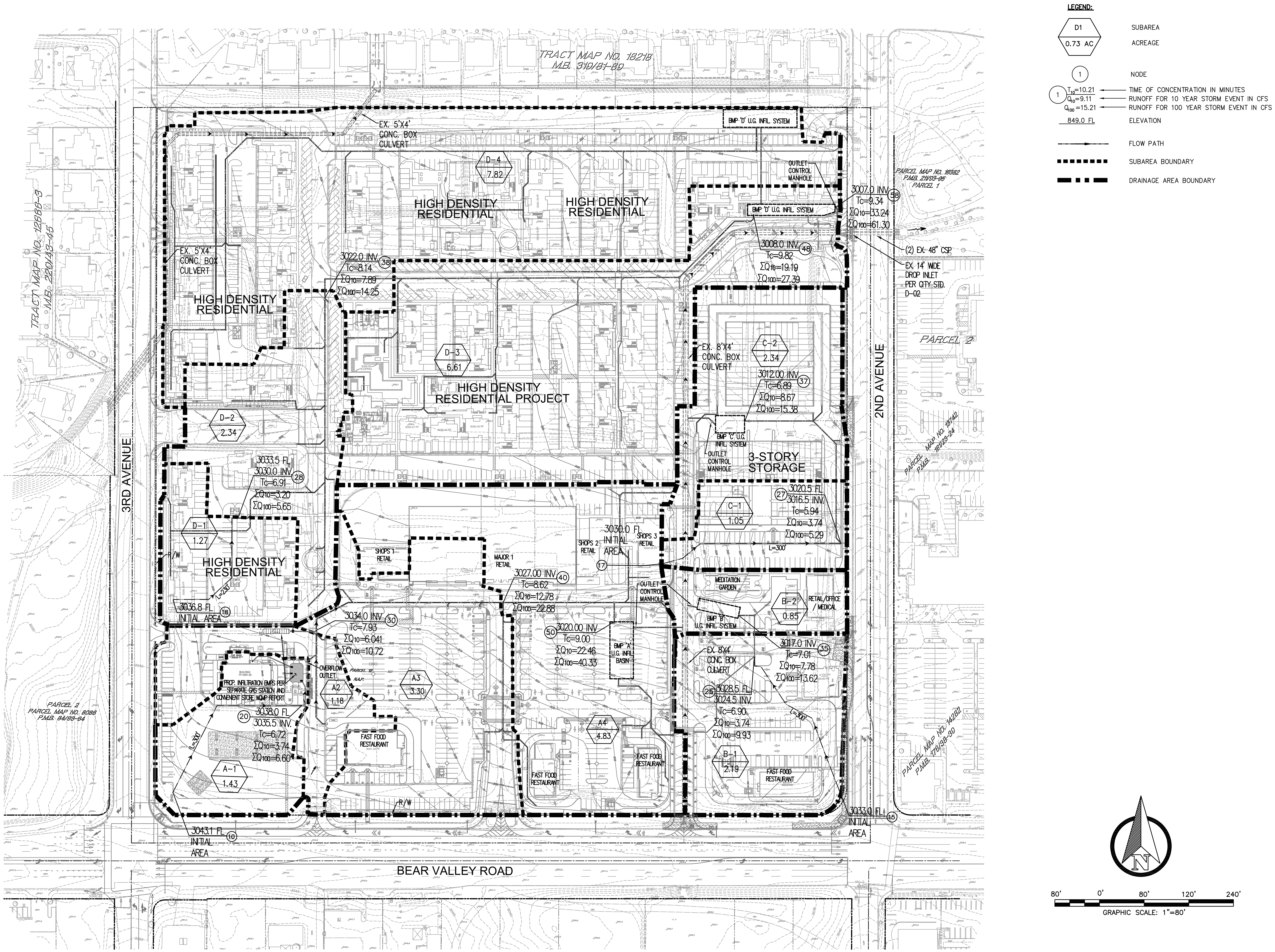
Upstream point elevation = 3038.500(Ft.)
Downstream point elevation = 3011.500(Ft.)
Flow length = 1710.000(Ft.)

```
Travel time  =    5.09 min.
Time of concentration =   16.75 min.
Depth of flow =   1.738(Ft.)
Average velocity =   5.595(Ft/s)
Total irregular channel flow =    42.274(CFS)
Irregular channel normal depth above invert elev. =   1.738(Ft.)
Average velocity of channel(s) =   5.595(Ft/s)
!!Warning: Water is above left or right bank elevations
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.265(In/Hr)
Rainfall intensity =      2.736(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.813
Subarea runoff =     75.316(CFS) for   34.370(Ac.)
Total runoff =     79.894(CFS)
Effective area this stream =       35.93(Ac.)
Total Study Area (Main Stream No. 1) =       35.93(Ac.)
Area averaged Fm value =    0.265(In/Hr)
Depth of flow =   2.171(Ft.), Average velocity =   6.824(Ft/s)
!!Warning: Water is above left or right bank elevations
End of computations, Total Study Area =           35.93 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged SCS curve number =  86.0
```

Technical Appendix C

Rational Method Analysis
Proposed Condition



PREPARED BY:

dRC Engineering, Inc.
Civil Engineering/Land Surveying/Land Planning
4649 Brockton Ave.
Riverside, CA 92506
714-685-6860

RONALD W. SKLEPKO R.C.E. 46216 DATE

REGISTERED PROFESSIONAL ENGINEER — RONALD SKLEPKO — No. C46216 — Exp. 12-31-2016 — CIVIL — STATE OF CALIFORNIA

NO.	REVISION:	DATE:

PROJECT:

VICTOR VALLEY CONNECTION
BEAR VALLEY ROAD & 3RD AVE.
VICTORVILLE, CA

DRAWING NAME: **PROP. CONDITION HYDROLOGY MAP**

ISSUE:	PRELIMINARY
DATE:	03-18-20
CHECKED: RWS	DRAWN: YH
DRAWING FILE:	20523HMPRO
PROJECT NO.:	20-523
SHEET NUMBER:	1
OF 1	SHEETS
SCALE:	AS SHOWN

10-YEAR STORM EVENT

```
                San Bernardino County Rational Hydrology Program

                    (Hydrology Manual Date - August 1986)

 CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1989-2012 Version 7.2
       Rational Hydrology Study        Date: 05/14/21
-----------------------------------------------------------------------
20-523 VICTORVILLE CONNECTION
PROPOSED CONDITION


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


Program License Serial Number 6310

-----------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

-----------------------------------------------------------------------
Rational hydrology study storm event year is    10.0
Computed rainfall intensity:
Storm year =    10.00   1 hour rainfall =     0.646 (In.)
Slope used for rainfall intensity curve b =  0.7000
Soil antecedent moisture condition (AMC) = 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       10.000 to Point/Station       20.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Initial subarea data:
Initial area flow distance =   300.000(Ft.)
Top (of initial area) elevation =  3043.100(Ft.)
Bottom (of initial area) elevation =  3038.000(Ft.)
Difference in elevation =     5.100(Ft.)
Slope =    0.01700  s(%)=       1.70
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.724 min.
Rainfall intensity =      2.989(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.884
Subarea runoff =      3.777(CFS)
Total initial stream area =        1.430(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       20.000 to Point/Station       30.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  3035.500(Ft.)
Downstream point/station elevation =  3034.000(Ft.)
Pipe length  =   330.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.777(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     3.777(CFS)
Normal flow depth in pipe =   10.79(In.)
Flow top width inside pipe =   13.48(In.)
Critical Depth =    9.43(In.)
Pipe flow velocity =      4.00(Ft/s)
Travel time through pipe =    1.38 min.
Time of concentration (TC) =     8.10 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       30.000 to Point/Station       30.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
```

```
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =     8.10 min.
Rainfall intensity =      2.624(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.881
Subarea runoff =      2.258(CFS) for    1.180(Ac.)
Total runoff =      6.035(CFS)
Effective area this stream =        2.61(Ac.)
Total Study Area (Main Stream No. 1) =        2.61(Ac.)
Area averaged Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       30.000 to Point/Station       40.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  3034.000(Ft.)
Downstream point/station elevation =  3027.000(Ft.)
Pipe length  =   370.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.035(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     6.035(CFS)
Normal flow depth in pipe =    9.07(In.)
Flow top width inside pipe =   14.67(In.)
Critical Depth =   11.92(In.)
Pipe flow velocity =      7.78(Ft/s)
Travel time through pipe =    0.79 min.
Time of concentration (TC) =     8.89 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       40.000 to Point/Station       40.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =     8.89 min.
Rainfall intensity =      2.458(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.880
Subarea runoff =      6.748(CFS) for    3.300(Ac.)
Total runoff =     12.784(CFS)
Effective area this stream =        5.91(Ac.)
Total Study Area (Main Stream No. 1) =        5.91(Ac.)
Area averaged Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       40.000 to Point/Station       50.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  3027.000(Ft.)
Downstream point/station elevation =  3020.000(Ft.)
Pipe length  =   270.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.784(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    12.784(CFS)
Normal flow depth in pipe =   11.70(In.)
Flow top width inside pipe =   17.17(In.)
Critical Depth =   16.13(In.)
Pipe flow velocity =     10.52(Ft/s)
Travel time through pipe =    0.43 min.
Time of concentration (TC) =     9.32 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       50.000 to Point/Station       50.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
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```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =     9.32 min.
Rainfall intensity =      2.379(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.879
Subarea runoff =      9.679(CFS) for    4.830(Ac.)
Total runoff =     22.463(CFS)
Effective area this stream =       10.74(Ac.)
Total Study Area (Main Stream No. 1) =       10.74(Ac.)
Area averaged Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       15.000 to Point/Station       25.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Initial subarea data:
Initial area flow distance =   300.000(Ft.)
Top (of initial area) elevation =  3033.000(Ft.)
Bottom (of initial area) elevation =  3028.500(Ft.)
Difference in elevation =     4.500(Ft.)
Slope =    0.01500  s(%)=       1.50
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.895 min.
Rainfall intensity =      2.938(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.883
Subarea runoff =      5.682(CFS)
Total initial stream area =        2.190(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       25.000 to Point/Station       35.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  3024.500(Ft.)
Downstream point/station elevation =  3017.000(Ft.)
Pipe length  =   105.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.682(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     5.682(CFS)
Normal flow depth in pipe =    6.68(In.)
Flow top width inside pipe =   11.92(In.)
Critical Depth =   11.35(In.)
Pipe flow velocity =     12.66(Ft/s)
Travel time through pipe =    0.14 min.
Time of concentration (TC) =     7.03 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       35.000 to Point/Station       35.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =     7.03 min.
Rainfall intensity =      2.897(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.883
Subarea runoff =      2.094(CFS) for    0.850(Ac.)
Total runoff =      7.776(CFS)
```

```
Effective area this stream =        3.04(Ac.)
Total Study Area (Main Stream No. 1) =       13.78(Ac.)
Area averaged Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       17.000 to Point/Station       27.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Initial subarea data:
Initial area flow distance =   300.000(Ft.)
Top (of initial area) elevation =  3030.000(Ft.)
Bottom (of initial area) elevation =  3020.500(Ft.)
Difference in elevation =     9.500(Ft.)
Slope =    0.03167  s(%)=       3.17
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    5.937 min.
Rainfall intensity =      3.261(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.885
Subarea runoff =      3.030(CFS)
Total initial stream area =        1.050(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       27.000 to Point/Station       37.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  3016.500(Ft.)
Downstream point/station elevation =  3012.000(Ft.)
Pipe length  =   365.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.030(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.030(CFS)
Normal flow depth in pipe =    7.88(In.)
Flow top width inside pipe =   11.40(In.)
Critical Depth =    8.95(In.)
Pipe flow velocity =      5.55(Ft/s)
Travel time through pipe =    1.10 min.
Time of concentration (TC) =     7.03 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       37.000 to Point/Station       37.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =     7.03 min.
Rainfall intensity =      2.897(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.883
Subarea runoff =      5.641(CFS) for    2.340(Ac.)
Total runoff =      8.671(CFS)
Effective area this stream =        3.39(Ac.)
Total Study Area (Main Stream No. 1) =       17.17(Ac.)
Area averaged Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       18.000 to Point/Station       28.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
MOBILE HOME PARK subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
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Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.2500     Max loss rate(Fm)=     0.137(In/Hr)
Initial subarea data:
Initial area flow distance =   230.000(Ft.)
Top (of initial area) elevation =  3036.800(Ft.)
Bottom (of initial area) elevation =  3033.500(Ft.)
Difference in elevation =     3.300(Ft.)
Slope =    0.01435  s(%)=       1.43
TC = k(0.336)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.913 min.
Rainfall intensity =      2.932(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.858
Subarea runoff =      3.195(CFS)
Total initial stream area =        1.270(Ac.)
Pervious area fraction = 0.250
Initial area Fm value =    0.137(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       28.000 to Point/Station       38.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  3030.000(Ft.)
Downstream point/station elevation =  3022.000(Ft.)
Pipe length  =   530.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.195(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.195(CFS)
Normal flow depth in pipe =    7.61(In.)
Flow top width inside pipe =   11.56(In.)
Critical Depth =    9.19(In.)
Pipe flow velocity =      6.08(Ft/s)
Travel time through pipe =    1.45 min.
Time of concentration (TC) =     8.37 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       38.000 to Point/Station       38.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
MOBILE HOME PARK subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.2500     Max loss rate(Fm)=     0.137(In/Hr)
Time of concentration =     8.37 min.
Rainfall intensity =      2.566(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.852
Subarea runoff =      4.696(CFS) for    2.340(Ac.)
Total runoff =      7.891(CFS)
Effective area this stream =        3.61(Ac.)
Total Study Area (Main Stream No. 1) =       20.78(Ac.)
Area averaged Fm value =    0.137(In/Hr)


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Process from Point/Station       38.000 to Point/Station       48.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  3020.000(Ft.)
Downstream point/station elevation =  3008.000(Ft.)
Pipe length  =   850.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.891(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     7.891(CFS)
Normal flow depth in pipe =   10.38(In.)
Flow top width inside pipe =   17.79(In.)
Critical Depth =   13.06(In.)
Pipe flow velocity =      7.47(Ft/s)
Travel time through pipe =    1.90 min.
Time of concentration (TC) =    10.26 min.


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Process from Point/Station       48.000 to Point/Station       48.000
**** SUBAREA FLOW ADDITION ****
____________________________________________________________________________
MOBILE HOME PARK subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.2500     Max loss rate(Fm)=     0.137(In/Hr)
Time of concentration =    10.26 min.
Rainfall intensity =      2.224(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.845
Subarea runoff =     11.303(CFS) for    6.610(Ac.)
Total runoff =     19.194(CFS)
Effective area this stream =       10.22(Ac.)
Total Study Area (Main Stream No. 1) =       27.39(Ac.)
Area averaged Fm value =    0.137(In/Hr)


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Process from Point/Station       48.000 to Point/Station       58.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
____________________________________________________________________________
Upstream point/station elevation =  3008.000(Ft.)
Downstream point/station elevation =  3007.000(Ft.)
Pipe length  =   120.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    19.194(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    19.194(CFS)
Normal flow depth in pipe =   18.30(In.)
Flow top width inside pipe =   20.42(In.)
Critical Depth =   18.92(In.)
Pipe flow velocity =      7.47(Ft/s)
Travel time through pipe =    0.27 min.
Time of concentration (TC) =    10.53 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       58.000 to Point/Station       58.000
**** SUBAREA FLOW ADDITION ****
____________________________________________________________________________
MOBILE HOME PARK subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.2500     Max loss rate(Fm)=     0.137(In/Hr)
Time of concentration =    10.53 min.
Rainfall intensity =      2.184(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.844
Subarea runoff =     14.041(CFS) for    7.820(Ac.)
Total runoff =     33.236(CFS)
Effective area this stream =       18.04(Ac.)
Total Study Area (Main Stream No. 1) =       35.21(Ac.)
Area averaged Fm value =    0.137(In/Hr)
End of computations, Total Study Area =           35.21 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.177
Area averaged SCS curve number =  69.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2012 Version 7.2
Rational Hydrology Study Date: 05/14/21

20-523 VICTORVILLE CONNECTION
PROPOSED CONDITION

Program License Serial Number 6310

********* Hydrology Study Control Information **********

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.120 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++
Process from Point/Station 10.000 to Point/Station 20.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 69.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.055(In/Hr)
Initial subarea data:
Initial area flow distance = 300.000(Ft.)
Top (of initial area) elevation = 3043.100(Ft.)
Bottom (of initial area) elevation = 3038.000(Ft.)
Difference in elevation = 5.100(Ft.)
Slope = 0.01700 s(%)= 1.70
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 6.724 min.
Rainfall intensity = 5.183(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.890
Subarea runoff = 6.600(CFS)
Total initial stream area = 1.430(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.055(In/Hr)

++
Process from Point/Station 20.000 to Point/Station 30.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 3035.500(Ft.)
Downstream point/station elevation = 3034.000(Ft.)
Pipe length = 330.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 6.600(CFS)
Nearest computed pipe diameter = 18.00(In.)
Calculated individual pipe flow = 6.600(CFS)
Normal flow depth in pipe = 13.76(In.)
Flow top width inside pipe = 15.28(In.)
Critical Depth = 11.92(In.)
Pipe flow velocity = 4.55(Ft/s)
Travel time through pipe = 1.21 min.
Time of concentration (TC) = 7.93 min.

++
Process from Point/Station 30.000 to Point/Station 30.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.000

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Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =     7.93 min.
Rainfall intensity =      4.617(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.889
Subarea runoff =      4.116(CFS) for    1.180(Ac.)
Total runoff =     10.716(CFS)
Effective area this stream =        2.61(Ac.)
Total Study Area (Main Stream No. 1) =        2.61(Ac.)
Area averaged Fm value =    0.055(In/Hr)


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Process from Point/Station       30.000 to Point/Station       40.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  3034.000(Ft.)
Downstream point/station elevation =  3027.000(Ft.)
Pipe length  =   370.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.716(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    10.716(CFS)
Normal flow depth in pipe =   11.54(In.)
Flow top width inside pipe =   17.27(In.)
Critical Depth =   15.07(In.)
Pipe flow velocity =      8.95(Ft/s)
Travel time through pipe =    0.69 min.
Time of concentration (TC) =     8.62 min.


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Process from Point/Station       40.000 to Point/Station       40.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =     8.62 min.
Rainfall intensity =      4.356(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.889
Subarea runoff =     12.159(CFS) for    3.300(Ac.)
Total runoff =     22.876(CFS)
Effective area this stream =        5.91(Ac.)
Total Study Area (Main Stream No. 1) =        5.91(Ac.)
Area averaged Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       40.000 to Point/Station       50.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  3027.000(Ft.)
Downstream point/station elevation =  3020.000(Ft.)
Pipe length  =   270.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    22.876(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    22.876(CFS)
Normal flow depth in pipe =   15.52(In.)
Flow top width inside pipe =   18.45(In.)
Critical Depth =   19.84(In.)
Pipe flow velocity =     12.00(Ft/s)
Travel time through pipe =    0.38 min.
Time of concentration (TC) =     9.00 min.


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Process from Point/Station       50.000 to Point/Station       50.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
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Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =     9.00 min.
Rainfall intensity =      4.228(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.888
Subarea runoff =     17.459(CFS) for    4.830(Ac.)
Total runoff =     40.334(CFS)
Effective area this stream =       10.74(Ac.)
Total Study Area (Main Stream No. 1) =       10.74(Ac.)
Area averaged Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       15.000 to Point/Station       25.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Initial subarea data:
Initial area flow distance =   300.000(Ft.)
Top (of initial area) elevation =  3033.000(Ft.)
Bottom (of initial area) elevation =  3028.500(Ft.)
Difference in elevation =     4.500(Ft.)
Slope =    0.01500  s(%)=       1.50
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.895 min.
Rainfall intensity =      5.093(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.890
Subarea runoff =      9.930(CFS)
Total initial stream area =        2.190(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.055(In/Hr)


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Process from Point/Station       25.000 to Point/Station       35.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  3024.500(Ft.)
Downstream point/station elevation =  3017.000(Ft.)
Pipe length  =   105.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.930(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     9.930(CFS)
Normal flow depth in pipe =    8.16(In.)
Flow top width inside pipe =   14.94(In.)
Critical Depth =   14.19(In.)
Pipe flow velocity =     14.56(Ft/s)
Travel time through pipe =    0.12 min.
Time of concentration (TC) =     7.01 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       35.000 to Point/Station       35.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =     7.01 min.
Rainfall intensity =      5.032(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.890
Subarea runoff =      3.687(CFS) for    0.850(Ac.)
Total runoff =     13.617(CFS)
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Effective area this stream =        3.04(Ac.)
Total Study Area (Main Stream No. 1) =       13.78(Ac.)
Area averaged Fm value =    0.055(In/Hr)


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Process from Point/Station       17.000 to Point/Station       27.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Initial subarea data:
Initial area flow distance =   300.000(Ft.)
Top (of initial area) elevation =  3030.000(Ft.)
Bottom (of initial area) elevation =  3020.500(Ft.)
Difference in elevation =     9.500(Ft.)
Slope =    0.03167  s(%)=       3.17
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    5.937 min.
Rainfall intensity =      5.655(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.891
Subarea runoff =      5.292(CFS)
Total initial stream area =        1.050(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       27.000 to Point/Station       37.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  3016.500(Ft.)
Downstream point/station elevation =  3012.000(Ft.)
Pipe length  =   365.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.292(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     5.292(CFS)
Normal flow depth in pipe =    9.59(In.)
Flow top width inside pipe =   14.41(In.)
Critical Depth =   11.19(In.)
Pipe flow velocity =      6.39(Ft/s)
Travel time through pipe =    0.95 min.
Time of concentration (TC) =     6.89 min.


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Process from Point/Station       37.000 to Point/Station       37.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =     6.89 min.
Rainfall intensity =      5.096(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.890
Subarea runoff =     10.089(CFS) for    2.340(Ac.)
Total runoff =     15.380(CFS)
Effective area this stream =        3.39(Ac.)
Total Study Area (Main Stream No. 1) =       17.17(Ac.)
Area averaged Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       18.000 to Point/Station       28.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
MOBILE HOME PARK subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
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Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.2500     Max loss rate(Fm)=     0.137(In/Hr)
Initial subarea data:
Initial area flow distance =   230.000(Ft.)
Top (of initial area) elevation =  3036.800(Ft.)
Bottom (of initial area) elevation =  3033.500(Ft.)
Difference in elevation =     3.300(Ft.)
Slope =    0.01435  s(%)=       1.43
TC = k(0.336)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.913 min.
Rainfall intensity =      5.083(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.876
Subarea runoff =      5.654(CFS)
Total initial stream area =        1.270(Ac.)
Pervious area fraction = 0.250
Initial area Fm value =    0.137(In/Hr)


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Process from Point/Station       28.000 to Point/Station       38.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  3030.000(Ft.)
Downstream point/station elevation =  3022.000(Ft.)
Pipe length  =   530.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.654(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     5.654(CFS)
Normal flow depth in pipe =    9.35(In.)
Flow top width inside pipe =   14.54(In.)
Critical Depth =   11.55(In.)
Pipe flow velocity =      7.02(Ft/s)
Travel time through pipe =    1.26 min.
Time of concentration (TC) =     8.17 min.


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Process from Point/Station       38.000 to Point/Station       38.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
MOBILE HOME PARK subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.2500     Max loss rate(Fm)=     0.137(In/Hr)
Time of concentration =     8.17 min.
Rainfall intensity =      4.522(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.873
Subarea runoff =      8.593(CFS) for    2.340(Ac.)
Total runoff =     14.247(CFS)
Effective area this stream =        3.61(Ac.)
Total Study Area (Main Stream No. 1) =       20.78(Ac.)
Area averaged Fm value =    0.137(In/Hr)


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Process from Point/Station       38.000 to Point/Station       48.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  3020.000(Ft.)
Downstream point/station elevation =  3008.000(Ft.)
Pipe length  =   850.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    14.247(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    14.247(CFS)
Normal flow depth in pipe =   13.65(In.)
Flow top width inside pipe =   20.03(In.)
Critical Depth =   16.82(In.)
Pipe flow velocity =      8.60(Ft/s)
Travel time through pipe =    1.65 min.
Time of concentration (TC) =     9.82 min.


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Process from Point/Station       48.000 to Point/Station       48.000
**** SUBAREA FLOW ADDITION ****
____________________________________________________________________________
MOBILE HOME PARK subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.2500     Max loss rate(Fm)=     0.137(In/Hr)
Time of concentration =     9.82 min.
Rainfall intensity =      3.977(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.869
Subarea runoff =     21.071(CFS) for    6.610(Ac.)
Total runoff =     35.318(CFS)
Effective area this stream =       10.22(Ac.)
Total Study Area (Main Stream No. 1) =       27.39(Ac.)
Area averaged Fm value =    0.137(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       48.000 to Point/Station       58.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
____________________________________________________________________________
Upstream point/station elevation =  3008.000(Ft.)
Downstream point/station elevation =  3007.000(Ft.)
Pipe length  =   120.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    35.318(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    35.318(CFS)
Normal flow depth in pipe =   23.20(In.)
Flow top width inside pipe =   25.12(In.)
Critical Depth =   24.21(In.)
Pipe flow velocity =      8.68(Ft/s)
Travel time through pipe =    0.23 min.
Time of concentration (TC) =    10.05 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       58.000 to Point/Station       58.000
**** SUBAREA FLOW ADDITION ****
____________________________________________________________________________
MOBILE HOME PARK subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.2500     Max loss rate(Fm)=     0.137(In/Hr)
Time of concentration =    10.05 min.
Rainfall intensity =      3.913(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.868
Subarea runoff =     25.984(CFS) for    7.820(Ac.)
Total runoff =     61.302(CFS)
Effective area this stream =       18.04(Ac.)
Total Study Area (Main Stream No. 1) =       35.21(Ac.)
Area averaged Fm value =    0.137(In/Hr)
End of computations, Total Study Area =           35.21 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.177
Area averaged SCS curve number =  69.0
```

100-YEAR STORM EVENT

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2012 Version 7.2
Rational Hydrology Study Date: 05/14/21

20-523 VICTORVILLE CONNECTION
PROPOSED CONDITION

Program License Serial Number 6310

********* Hydrology Study Control Information **********

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.120 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++
Process from Point/Station 10.000 to Point/Station 20.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 69.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.055(In/Hr)
Initial subarea data:
Initial area flow distance = 300.000(Ft.)
Top (of initial area) elevation = 3043.100(Ft.)
Bottom (of initial area) elevation = 3038.000(Ft.)
Difference in elevation = 5.100(Ft.)
Slope = 0.01700 s(%)= 1.70
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 6.724 min.
Rainfall intensity = 5.183(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.890
Subarea runoff = 6.600(CFS)
Total initial stream area = 1.430(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.055(In/Hr)

++
Process from Point/Station 20.000 to Point/Station 30.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 3035.500(Ft.)
Downstream point/station elevation = 3034.000(Ft.)
Pipe length = 330.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 6.600(CFS)
Nearest computed pipe diameter = 18.00(In.)
Calculated individual pipe flow = 6.600(CFS)
Normal flow depth in pipe = 13.76(In.)
Flow top width inside pipe = 15.28(In.)
Critical Depth = 11.92(In.)
Pipe flow velocity = 4.55(Ft/s)
Travel time through pipe = 1.21 min.
Time of concentration (TC) = 7.93 min.

++
Process from Point/Station 30.000 to Point/Station 30.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.000

```
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =     7.93 min.
Rainfall intensity =      4.617(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.889
Subarea runoff =      4.116(CFS) for    1.180(Ac.)
Total runoff =     10.716(CFS)
Effective area this stream =        2.61(Ac.)
Total Study Area (Main Stream No. 1) =        2.61(Ac.)
Area averaged Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       30.000 to Point/Station       40.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  3034.000(Ft.)
Downstream point/station elevation =  3027.000(Ft.)
Pipe length  =   370.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.716(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    10.716(CFS)
Normal flow depth in pipe =   11.54(In.)
Flow top width inside pipe =   17.27(In.)
Critical Depth =   15.07(In.)
Pipe flow velocity =      8.95(Ft/s)
Travel time through pipe =    0.69 min.
Time of concentration (TC) =     8.62 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       40.000 to Point/Station       40.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =     8.62 min.
Rainfall intensity =      4.356(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.889
Subarea runoff =     12.159(CFS) for    3.300(Ac.)
Total runoff =     22.876(CFS)
Effective area this stream =        5.91(Ac.)
Total Study Area (Main Stream No. 1) =        5.91(Ac.)
Area averaged Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       40.000 to Point/Station       50.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  3027.000(Ft.)
Downstream point/station elevation =  3020.000(Ft.)
Pipe length  =   270.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    22.876(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    22.876(CFS)
Normal flow depth in pipe =   15.52(In.)
Flow top width inside pipe =   18.45(In.)
Critical Depth =   19.84(In.)
Pipe flow velocity =     12.00(Ft/s)
Travel time through pipe =    0.38 min.
Time of concentration (TC) =     9.00 min.


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Process from Point/Station       50.000 to Point/Station       50.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
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Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =     9.00 min.
Rainfall intensity =      4.228(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.888
Subarea runoff =     17.459(CFS) for    4.830(Ac.)
Total runoff =     40.334(CFS)
Effective area this stream =       10.74(Ac.)
Total Study Area (Main Stream No. 1) =       10.74(Ac.)
Area averaged Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       15.000 to Point/Station       25.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Initial subarea data:
Initial area flow distance =   300.000(Ft.)
Top (of initial area) elevation =  3033.000(Ft.)
Bottom (of initial area) elevation =  3028.500(Ft.)
Difference in elevation =     4.500(Ft.)
Slope =    0.01500  s(%)=       1.50
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.895 min.
Rainfall intensity =      5.093(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.890
Subarea runoff =      9.930(CFS)
Total initial stream area =        2.190(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.055(In/Hr)


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Process from Point/Station       25.000 to Point/Station       35.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  3024.500(Ft.)
Downstream point/station elevation =  3017.000(Ft.)
Pipe length  =   105.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.930(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     9.930(CFS)
Normal flow depth in pipe =    8.16(In.)
Flow top width inside pipe =   14.94(In.)
Critical Depth =   14.19(In.)
Pipe flow velocity =     14.56(Ft/s)
Travel time through pipe =    0.12 min.
Time of concentration (TC) =     7.01 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       35.000 to Point/Station       35.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =     7.01 min.
Rainfall intensity =      5.032(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.890
Subarea runoff =      3.687(CFS) for    0.850(Ac.)
Total runoff =     13.617(CFS)
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Effective area this stream =        3.04(Ac.)
Total Study Area (Main Stream No. 1) =       13.78(Ac.)
Area averaged Fm value =    0.055(In/Hr)


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Process from Point/Station       17.000 to Point/Station       27.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Initial subarea data:
Initial area flow distance =   300.000(Ft.)
Top (of initial area) elevation =  3030.000(Ft.)
Bottom (of initial area) elevation =  3020.500(Ft.)
Difference in elevation =     9.500(Ft.)
Slope =    0.03167  s(%)=       3.17
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    5.937 min.
Rainfall intensity =      5.655(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.891
Subarea runoff =      5.292(CFS)
Total initial stream area =        1.050(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       27.000 to Point/Station       37.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  3016.500(Ft.)
Downstream point/station elevation =  3012.000(Ft.)
Pipe length  =   365.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.292(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     5.292(CFS)
Normal flow depth in pipe =    9.59(In.)
Flow top width inside pipe =   14.41(In.)
Critical Depth =   11.19(In.)
Pipe flow velocity =      6.39(Ft/s)
Travel time through pipe =    0.95 min.
Time of concentration (TC) =     6.89 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       37.000 to Point/Station       37.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =     6.89 min.
Rainfall intensity =      5.096(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.890
Subarea runoff =     10.089(CFS) for    2.340(Ac.)
Total runoff =     15.380(CFS)
Effective area this stream =        3.39(Ac.)
Total Study Area (Main Stream No. 1) =       17.17(Ac.)
Area averaged Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       18.000 to Point/Station       28.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
MOBILE HOME PARK subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
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Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.2500     Max loss rate(Fm)=     0.137(In/Hr)
Initial subarea data:
Initial area flow distance =   230.000(Ft.)
Top (of initial area) elevation =  3036.800(Ft.)
Bottom (of initial area) elevation =  3033.500(Ft.)
Difference in elevation =     3.300(Ft.)
Slope =    0.01435  s(%)=       1.43
TC = k(0.336)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.913 min.
Rainfall intensity =      5.083(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.876
Subarea runoff =      5.654(CFS)
Total initial stream area =        1.270(Ac.)
Pervious area fraction = 0.250
Initial area Fm value =    0.137(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       28.000 to Point/Station       38.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  3030.000(Ft.)
Downstream point/station elevation =  3022.000(Ft.)
Pipe length  =   530.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.654(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     5.654(CFS)
Normal flow depth in pipe =    9.35(In.)
Flow top width inside pipe =   14.54(In.)
Critical Depth =   11.55(In.)
Pipe flow velocity =      7.02(Ft/s)
Travel time through pipe =    1.26 min.
Time of concentration (TC) =     8.17 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       38.000 to Point/Station       38.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
MOBILE HOME PARK subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.2500     Max loss rate(Fm)=     0.137(In/Hr)
Time of concentration =     8.17 min.
Rainfall intensity =      4.522(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.873
Subarea runoff =      8.593(CFS) for    2.340(Ac.)
Total runoff =     14.247(CFS)
Effective area this stream =        3.61(Ac.)
Total Study Area (Main Stream No. 1) =       20.78(Ac.)
Area averaged Fm value =    0.137(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       38.000 to Point/Station       48.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  3020.000(Ft.)
Downstream point/station elevation =  3008.000(Ft.)
Pipe length  =   850.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    14.247(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    14.247(CFS)
Normal flow depth in pipe =   13.65(In.)
Flow top width inside pipe =   20.03(In.)
Critical Depth =   16.82(In.)
Pipe flow velocity =      8.60(Ft/s)
Travel time through pipe =    1.65 min.
Time of concentration (TC) =     9.82 min.


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Process from Point/Station       48.000 to Point/Station       48.000
**** SUBAREA FLOW ADDITION ****
____________________________________________________________________________
MOBILE HOME PARK subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.2500     Max loss rate(Fm)=     0.137(In/Hr)
Time of concentration =     9.82 min.
Rainfall intensity =      3.977(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.869
Subarea runoff =     21.071(CFS) for    6.610(Ac.)
Total runoff =     35.318(CFS)
Effective area this stream =       10.22(Ac.)
Total Study Area (Main Stream No. 1) =       27.39(Ac.)
Area averaged Fm value =    0.137(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       48.000 to Point/Station       58.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
____________________________________________________________________________
Upstream point/station elevation =  3008.000(Ft.)
Downstream point/station elevation =  3007.000(Ft.)
Pipe length  =   120.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    35.318(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    35.318(CFS)
Normal flow depth in pipe =   23.20(In.)
Flow top width inside pipe =   25.12(In.)
Critical Depth =   24.21(In.)
Pipe flow velocity =      8.68(Ft/s)
Travel time through pipe =    0.23 min.
Time of concentration (TC) =    10.05 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       58.000 to Point/Station       58.000
**** SUBAREA FLOW ADDITION ****
____________________________________________________________________________
MOBILE HOME PARK subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.2500     Max loss rate(Fm)=     0.137(In/Hr)
Time of concentration =    10.05 min.
Rainfall intensity =      3.913(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.868
Subarea runoff =     25.984(CFS) for    7.820(Ac.)
Total runoff =     61.302(CFS)
Effective area this stream =       18.04(Ac.)
Total Study Area (Main Stream No. 1) =       35.21(Ac.)
Area averaged Fm value =    0.137(In/Hr)
End of computations, Total Study Area =           35.21 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.177
Area averaged SCS curve number =  69.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2012 Version 7.2
Rational Hydrology Study Date: 05/14/21

20-523 VICTORVILLE CONNECTION
PROPOSED CONDITION

Program License Serial Number 6310

********* Hydrology Study Control Information **********

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.646 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++
Process from Point/Station 10.000 to Point/Station 20.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 69.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.055(In/Hr)
Initial subarea data:
Initial area flow distance = 300.000(Ft.)
Top (of initial area) elevation = 3043.100(Ft.)
Bottom (of initial area) elevation = 3038.000(Ft.)
Difference in elevation = 5.100(Ft.)
Slope = 0.01700 s(%)= 1.70
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 6.724 min.
Rainfall intensity = 2.989(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.884
Subarea runoff = 3.777(CFS)
Total initial stream area = 1.430(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.055(In/Hr)

++
Process from Point/Station 20.000 to Point/Station 30.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 3035.500(Ft.)
Downstream point/station elevation = 3034.000(Ft.)
Pipe length = 330.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 3.777(CFS)
Nearest computed pipe diameter = 15.00(In.)
Calculated individual pipe flow = 3.777(CFS)
Normal flow depth in pipe = 10.79(In.)
Flow top width inside pipe = 13.48(In.)
Critical Depth = 9.43(In.)
Pipe flow velocity = 4.00(Ft/s)
Travel time through pipe = 1.38 min.
Time of concentration (TC) = 8.10 min.

++
Process from Point/Station 30.000 to Point/Station 30.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.000

```
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =     8.10 min.
Rainfall intensity =      2.624(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.881
Subarea runoff =      2.258(CFS) for    1.180(Ac.)
Total runoff =      6.035(CFS)
Effective area this stream =        2.61(Ac.)
Total Study Area (Main Stream No. 1) =        2.61(Ac.)
Area averaged Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       30.000 to Point/Station       40.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  3034.000(Ft.)
Downstream point/station elevation =  3027.000(Ft.)
Pipe length  =   370.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.035(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     6.035(CFS)
Normal flow depth in pipe =    9.07(In.)
Flow top width inside pipe =   14.67(In.)
Critical Depth =   11.92(In.)
Pipe flow velocity =      7.78(Ft/s)
Travel time through pipe =    0.79 min.
Time of concentration (TC) =     8.89 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       40.000 to Point/Station       40.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =     8.89 min.
Rainfall intensity =      2.458(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.880
Subarea runoff =      6.748(CFS) for    3.300(Ac.)
Total runoff =     12.784(CFS)
Effective area this stream =        5.91(Ac.)
Total Study Area (Main Stream No. 1) =        5.91(Ac.)
Area averaged Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       40.000 to Point/Station       50.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  3027.000(Ft.)
Downstream point/station elevation =  3020.000(Ft.)
Pipe length  =   270.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.784(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    12.784(CFS)
Normal flow depth in pipe =   11.70(In.)
Flow top width inside pipe =   17.17(In.)
Critical Depth =   16.13(In.)
Pipe flow velocity =     10.52(Ft/s)
Travel time through pipe =    0.43 min.
Time of concentration (TC) =     9.32 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       50.000 to Point/Station       50.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =     9.32 min.
Rainfall intensity =      2.379(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.879
Subarea runoff =      9.679(CFS) for    4.830(Ac.)
Total runoff =     22.463(CFS)
Effective area this stream =       10.74(Ac.)
Total Study Area (Main Stream No. 1) =       10.74(Ac.)
Area averaged Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       15.000 to Point/Station       25.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Initial subarea data:
Initial area flow distance =   300.000(Ft.)
Top (of initial area) elevation =  3033.000(Ft.)
Bottom (of initial area) elevation =  3028.500(Ft.)
Difference in elevation =     4.500(Ft.)
Slope =    0.01500  s(%)=       1.50
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.895 min.
Rainfall intensity =      2.938(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.883
Subarea runoff =      5.682(CFS)
Total initial stream area =        2.190(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       25.000 to Point/Station       35.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  3024.500(Ft.)
Downstream point/station elevation =  3017.000(Ft.)
Pipe length  =   105.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.682(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     5.682(CFS)
Normal flow depth in pipe =    6.68(In.)
Flow top width inside pipe =   11.92(In.)
Critical Depth =   11.35(In.)
Pipe flow velocity =     12.66(Ft/s)
Travel time through pipe =    0.14 min.
Time of concentration (TC) =     7.03 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       35.000 to Point/Station       35.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =     7.03 min.
Rainfall intensity =      2.897(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.883
Subarea runoff =      2.094(CFS) for    0.850(Ac.)
Total runoff =      7.776(CFS)
```

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Effective area this stream =        3.04(Ac.)
Total Study Area (Main Stream No. 1) =       13.78(Ac.)
Area averaged Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       17.000 to Point/Station       27.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Initial subarea data:
Initial area flow distance =   300.000(Ft.)
Top (of initial area) elevation =  3030.000(Ft.)
Bottom (of initial area) elevation =  3020.500(Ft.)
Difference in elevation =     9.500(Ft.)
Slope =    0.03167  s(%)=       3.17
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    5.937 min.
Rainfall intensity =      3.261(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.885
Subarea runoff =      3.030(CFS)
Total initial stream area =        1.050(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       27.000 to Point/Station       37.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  3016.500(Ft.)
Downstream point/station elevation =  3012.000(Ft.)
Pipe length  =   365.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.030(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.030(CFS)
Normal flow depth in pipe =    7.88(In.)
Flow top width inside pipe =   11.40(In.)
Critical Depth =    8.95(In.)
Pipe flow velocity =      5.55(Ft/s)
Travel time through pipe =    1.10 min.
Time of concentration (TC) =     7.03 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       37.000 to Point/Station       37.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =     7.03 min.
Rainfall intensity =      2.897(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.883
Subarea runoff =      5.641(CFS) for    2.340(Ac.)
Total runoff =      8.671(CFS)
Effective area this stream =        3.39(Ac.)
Total Study Area (Main Stream No. 1) =       17.17(Ac.)
Area averaged Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       18.000 to Point/Station       28.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
MOBILE HOME PARK subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
```

```
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.2500     Max loss rate(Fm)=     0.137(In/Hr)
Initial subarea data:
Initial area flow distance =   230.000(Ft.)
Top (of initial area) elevation =  3036.800(Ft.)
Bottom (of initial area) elevation =  3033.500(Ft.)
Difference in elevation =     3.300(Ft.)
Slope =    0.01435  s(%)=       1.43
TC = k(0.336)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.913 min.
Rainfall intensity =      2.932(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.858
Subarea runoff =      3.195(CFS)
Total initial stream area =        1.270(Ac.)
Pervious area fraction = 0.250
Initial area Fm value =    0.137(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       28.000 to Point/Station       38.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  3030.000(Ft.)
Downstream point/station elevation =  3022.000(Ft.)
Pipe length  =   530.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.195(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.195(CFS)
Normal flow depth in pipe =    7.61(In.)
Flow top width inside pipe =   11.56(In.)
Critical Depth =    9.19(In.)
Pipe flow velocity =      6.08(Ft/s)
Travel time through pipe =    1.45 min.
Time of concentration (TC) =     8.37 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       38.000 to Point/Station       38.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
MOBILE HOME PARK subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.2500     Max loss rate(Fm)=     0.137(In/Hr)
Time of concentration =     8.37 min.
Rainfall intensity =      2.566(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.852
Subarea runoff =      4.696(CFS) for    2.340(Ac.)
Total runoff =      7.891(CFS)
Effective area this stream =        3.61(Ac.)
Total Study Area (Main Stream No. 1) =       20.78(Ac.)
Area averaged Fm value =    0.137(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       38.000 to Point/Station       48.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  3020.000(Ft.)
Downstream point/station elevation =  3008.000(Ft.)
Pipe length  =   850.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.891(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     7.891(CFS)
Normal flow depth in pipe =   10.38(In.)
Flow top width inside pipe =   17.79(In.)
Critical Depth =   13.06(In.)
Pipe flow velocity =      7.47(Ft/s)
Travel time through pipe =    1.90 min.
Time of concentration (TC) =    10.26 min.


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Process from Point/Station       48.000 to Point/Station       48.000
**** SUBAREA FLOW ADDITION ****
____________________________________________________________________________
MOBILE HOME PARK subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.2500     Max loss rate(Fm)=     0.137(In/Hr)
Time of concentration =    10.26 min.
Rainfall intensity =      2.224(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.845
Subarea runoff =     11.303(CFS) for    6.610(Ac.)
Total runoff =     19.194(CFS)
Effective area this stream =       10.22(Ac.)
Total Study Area (Main Stream No. 1) =       27.39(Ac.)
Area averaged Fm value =    0.137(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       48.000 to Point/Station       58.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
____________________________________________________________________________
Upstream point/station elevation =  3008.000(Ft.)
Downstream point/station elevation =  3007.000(Ft.)
Pipe length  =   120.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    19.194(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    19.194(CFS)
Normal flow depth in pipe =   18.30(In.)
Flow top width inside pipe =   20.42(In.)
Critical Depth =   18.92(In.)
Pipe flow velocity =      7.47(Ft/s)
Travel time through pipe =    0.27 min.
Time of concentration (TC) =    10.53 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       58.000 to Point/Station       58.000
**** SUBAREA FLOW ADDITION ****
____________________________________________________________________________
MOBILE HOME PARK subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.2500     Max loss rate(Fm)=     0.137(In/Hr)
Time of concentration =    10.53 min.
Rainfall intensity =      2.184(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.844
Subarea runoff =     14.041(CFS) for    7.820(Ac.)
Total runoff =     33.236(CFS)
Effective area this stream =       18.04(Ac.)
Total Study Area (Main Stream No. 1) =       35.21(Ac.)
Area averaged Fm value =    0.137(In/Hr)
End of computations, Total Study Area =           35.21 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.177
Area averaged SCS curve number =  69.0
```

Technical Appendix D

Pipe Hydraulic Calculations

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Monday, May 17 2021

18-inch Storm Drain FULL FLOW ANALYSIS

Circular

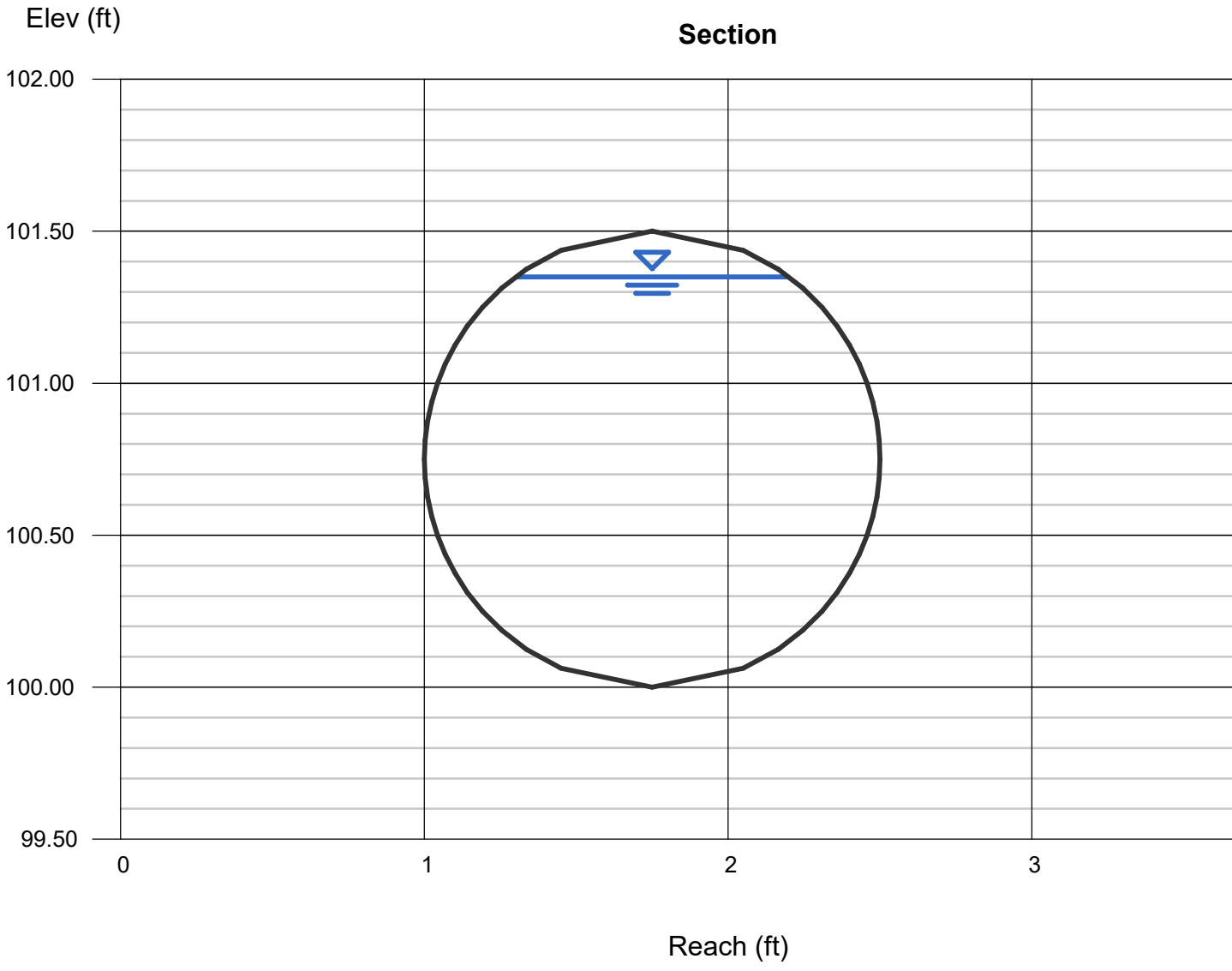
Diameter (ft)	= 1.50
Invert Elev (ft)	= 100.00
Slope (%)	= 1.00
N-Value	= 0.012

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

Depth (ft)	= 1.35
Q (cfs)	= 12.13
Area (sqft)	= 1.68
Velocity (ft/s)	= 7.24
Wetted Perim (ft)	= 3.75
Crit Depth, Yc (ft)	= 1.32
Top Width (ft)	= 0.90
EGL (ft)	= 2.16



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Monday, May 17 2021

24-inch Storm Drain FULL FLOW ANALYSIS

Circular

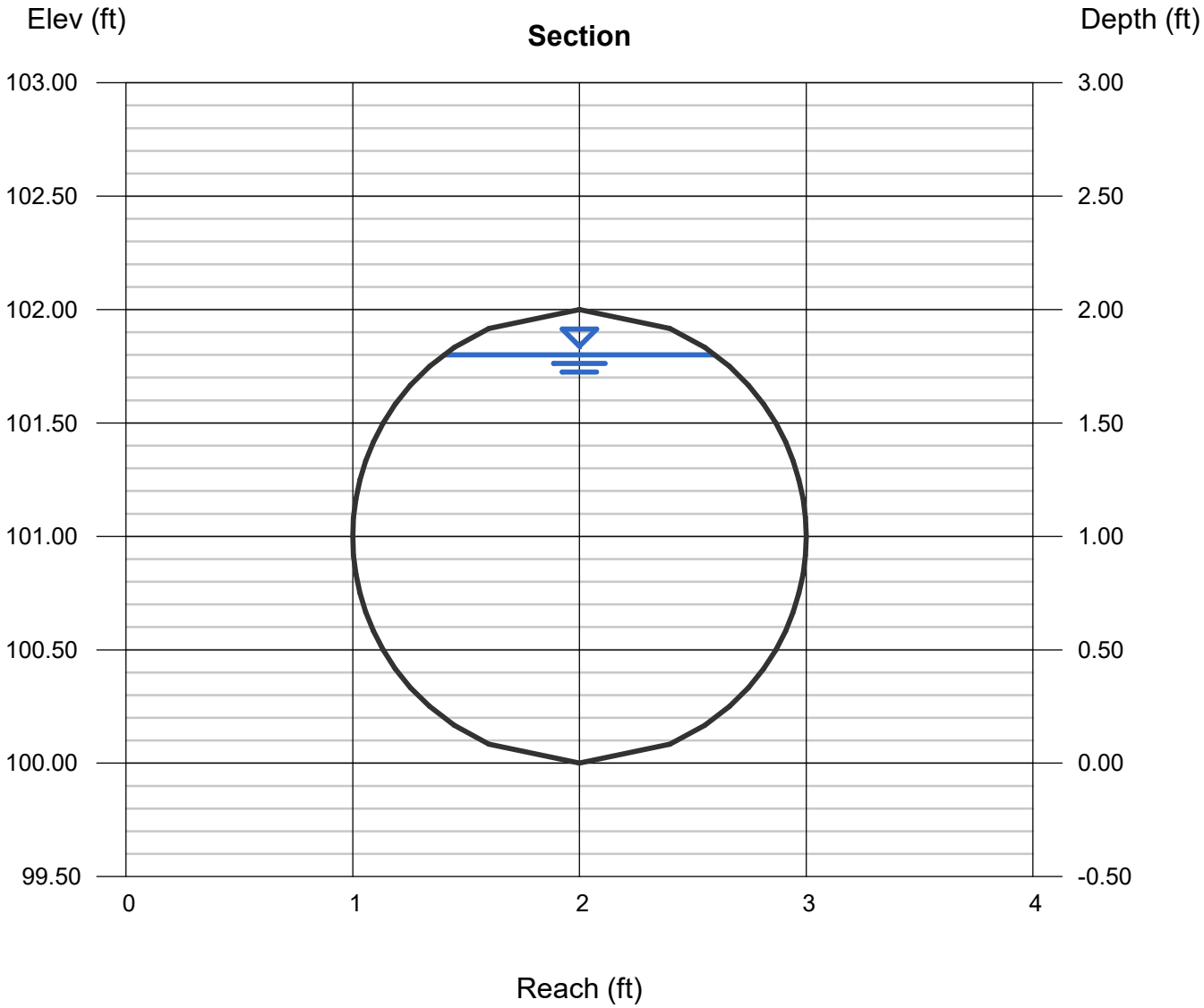
Diameter (ft)	= 2.00
Invert Elev (ft)	= 100.00
Slope (%)	= 1.00
N-Value	= 0.012

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

Depth (ft)	= 1.80
Q (cfs)	= 26.12
Area (sqft)	= 2.98
Velocity (ft/s)	= 8.77
Wetted Perim (ft)	= 5.00
Crit Depth, Yc (ft)	= 1.79
Top Width (ft)	= 1.20
EGL (ft)	= 3.00



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Monday, May 17 2021

30-inch Storm Drain FULL FLOW ANALYSIS

Circular

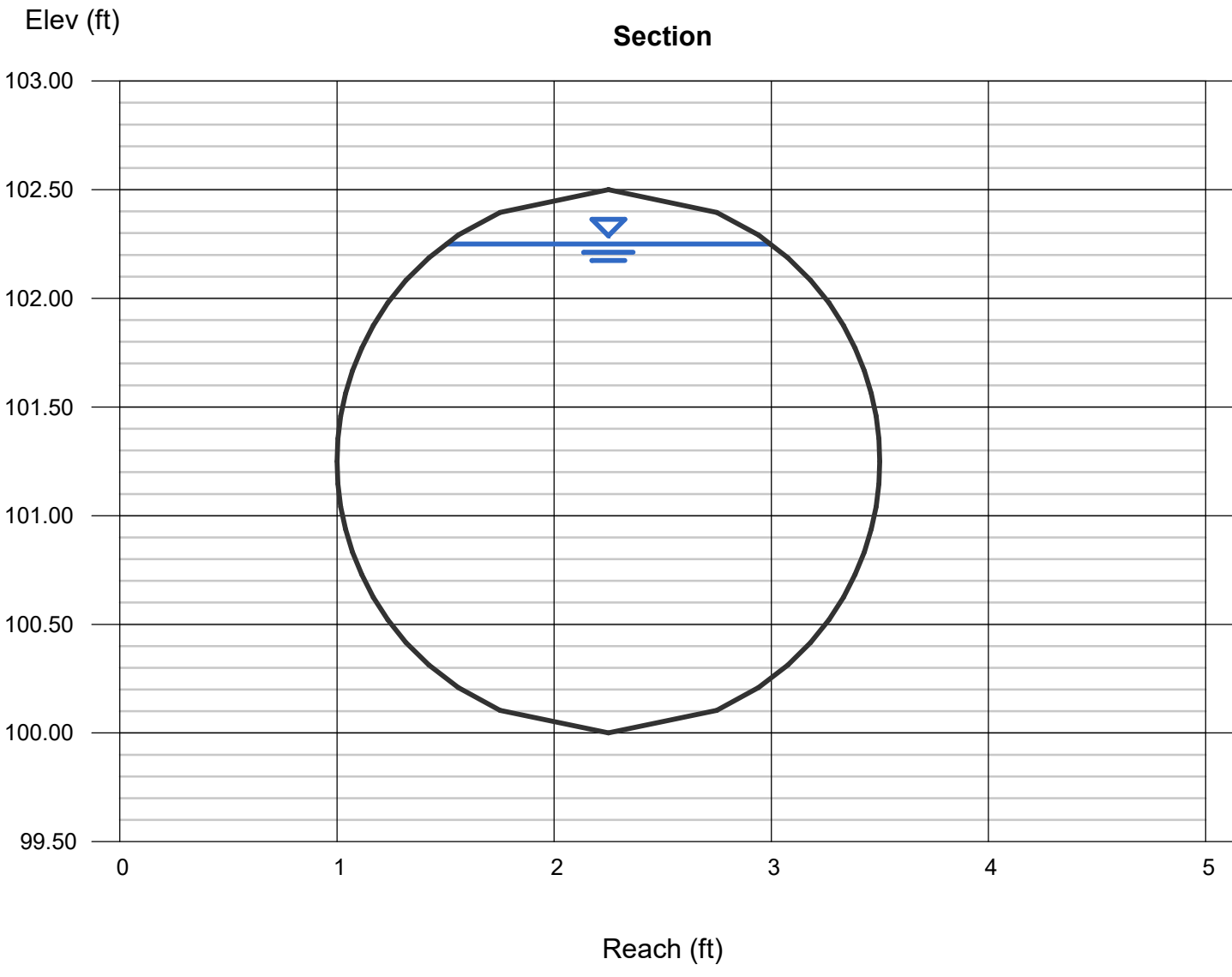
Diameter (ft)	= 2.50
Invert Elev (ft)	= 100.00
Slope (%)	= 2.00
N-Value	= 0.012

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

Depth (ft)	= 2.25
Q (cfs)	= 66.99
Area (sqft)	= 4.66
Velocity (ft/s)	= 14.39
Wetted Perim (ft)	= 6.25
Crit Depth, Yc (ft)	= 2.43
Top Width (ft)	= 1.50
EGL (ft)	= 5.47



Technical Appendix E

Reference Documents

- ***Previous Hydrology Study for the Project Site***
- ***Mass Grading Plan for the Project Site***
- ***Existing Storm Drain As-Built Plans***

Merrell-Johnson Engineering, Inc.

CIVIL ENGINEERING ♦ SURVEYING

HYDROLOGY STUDY

For

CENTERPOINT BUSINESS PARK
C/O J.W. FAHERTY, INC.
12490 Business Center Drive, #4
Victorville, CA 92305

Tentative Parcel Map No. 17603

December 4, 2006

Prepared by:

Merrell-Johnson Engineering, Inc.

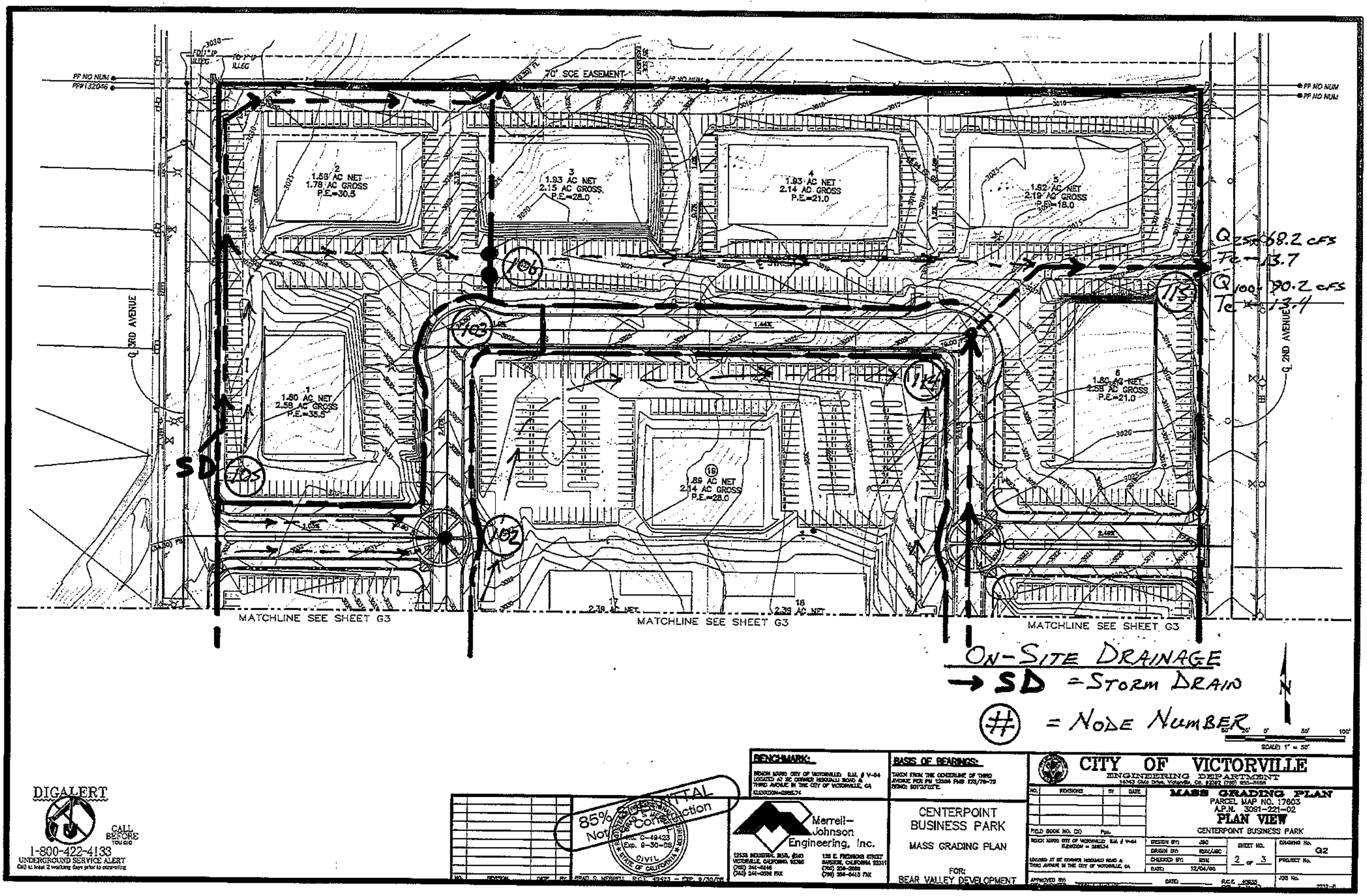
12138 Industrial Blvd., Suite 240
Victorville, CA 92395
(760) 241-6146

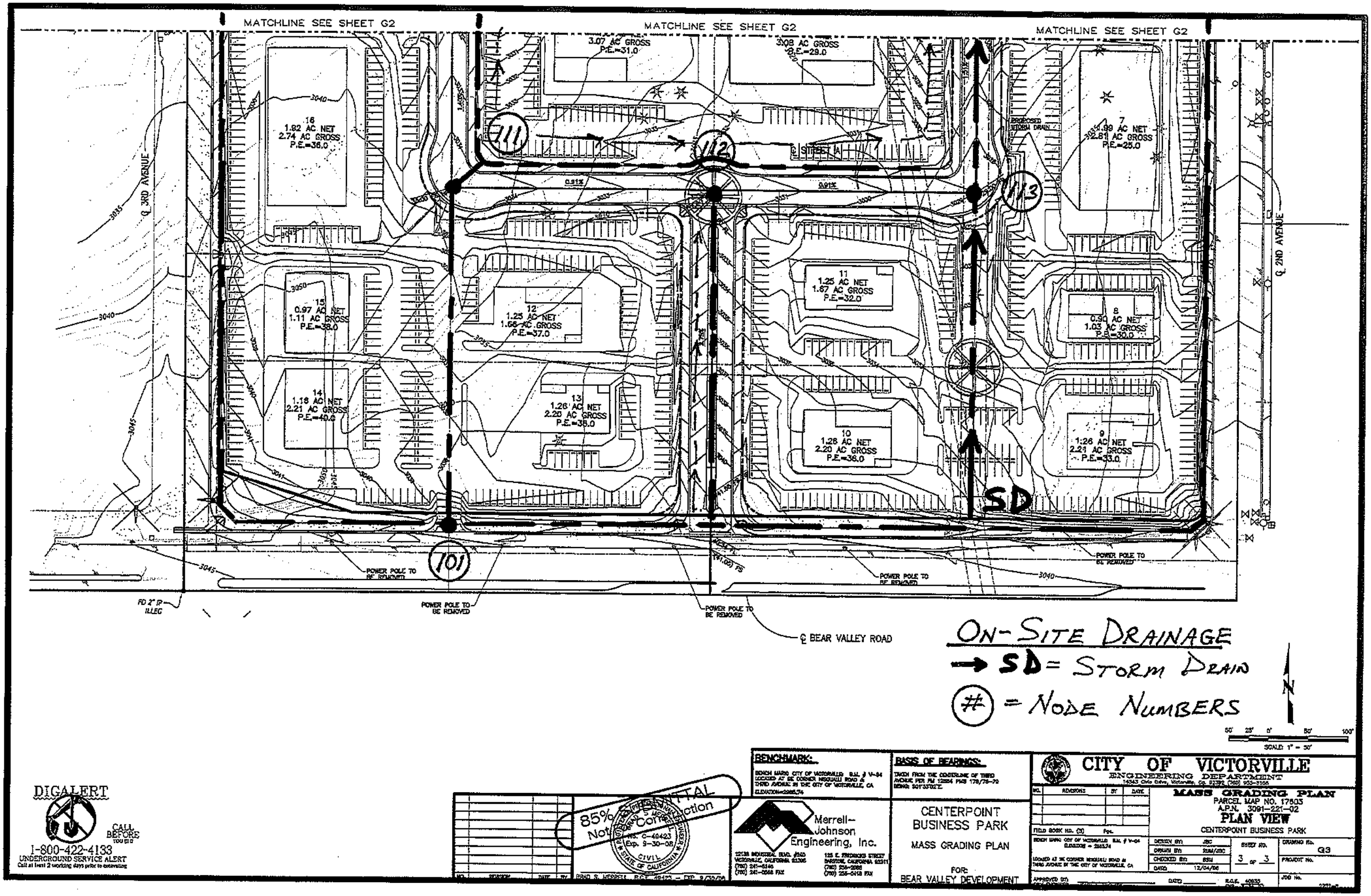
Job No. 2232-6

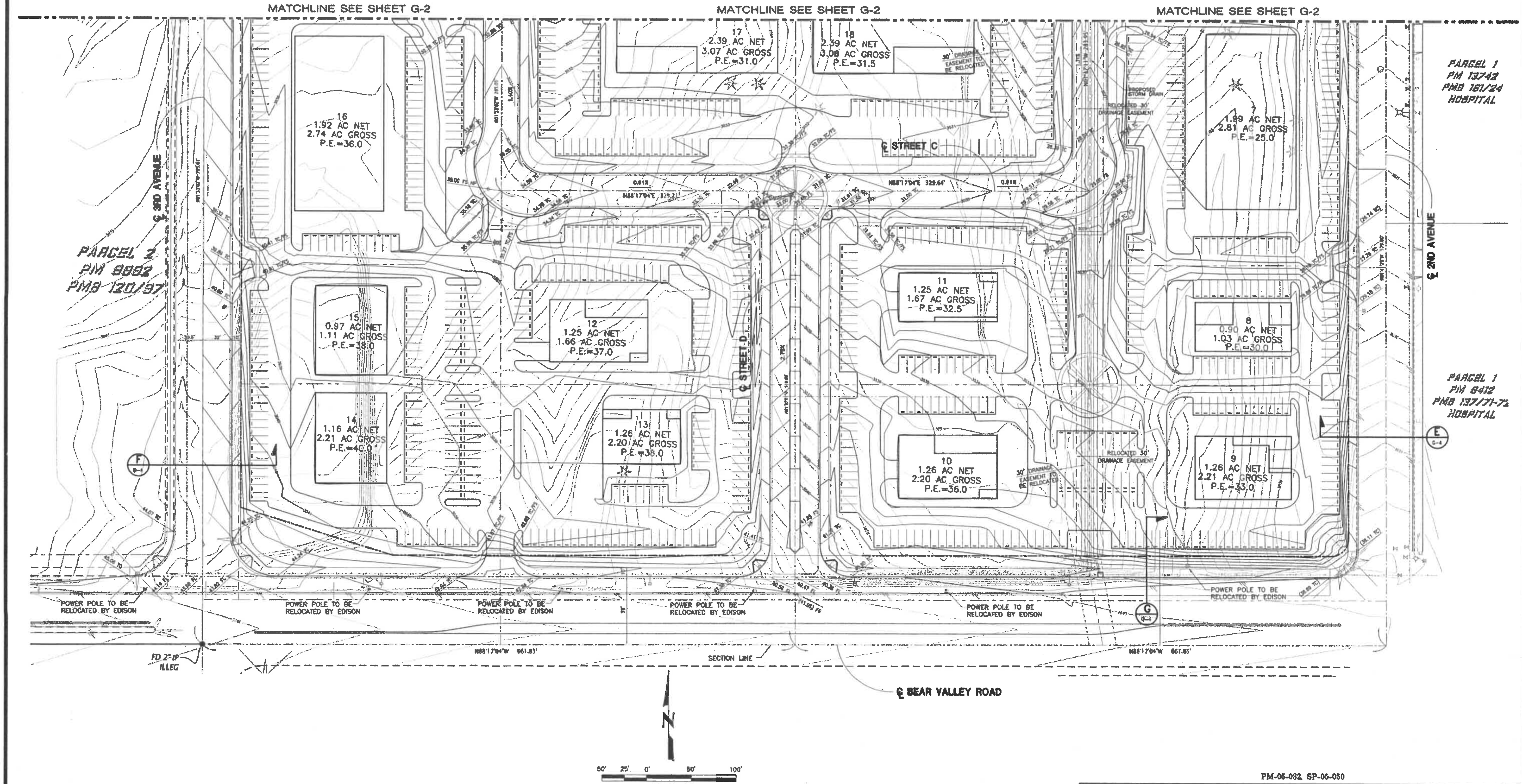
REGISTERED PROFESSIONAL ENGINEER
BRAD S. MERRELL
NO. C-49423
EXP. 9/30/08
CIVIL
STATE OF CALIFORNIA

Brad S. Merrell
Principal Engineer
R.C.E. 49423 Exp. 9/30/08

Mark D. Rowan
Project Manager


70' SCE EASEMENT
PP NO NUM
PP#132046
1.58 AC NET
1.78 AC GROSS
P.E.=30.5
1.93 AC NET
2.15 AC GROSS
P.E.=28.0
1.93 AC NET
2.14 AC GROSS
P.E.=21.0
1.92 AC NET
2.19 AC GROSS
P.E.=18.0
1.80 AC NET
2.58 AC GROSS
P.E.=35.5
1.89 AC NET
2.14 AC GROSS
P.E.=28.0
1.80 AC NET
2.59 AC GROSS
P.E.=21.0
2.39 AC NET
2.39 AC NET
℄ 3RD AVENUE
℄ 2ND AVENUE
Q_{25} = 68.2 cfs
Tc = 13.7
Q_{100} = 90.2 cfs
Tc = 13.4
SD
105
106
103
102
114
115
MATCHLINE SEE SHEET G3
MATCHLINE SEE SHEET G3
MATCHLINE SEE SHEET G3
ON-SITE DRAINAGE
→ SD = STORM DRAIN
= NODE NUMBER
SCALE: 1" = 50'
DIGALERT
CALL BEFORE YOU DIG
1-800-422-4133
UNDERGROUND SERVICE ALERT
85% SUBMITTAL
Not for Construction
BENCHMARK:
BASIS OF BEARINGS:
Merrell-Johnson Engineering, Inc.
CENTERPOINT BUSINESS PARK
MASS GRADING PLAN
FOR: BEAR VALLEY DEVELOPMENT
CITY OF VICTORVILLE
ENGINEERING DEPARTMENT
MASS GRADING PLAN
PARCEL MAP NO. 17603
A.P.N. 3091-221-02
PLAN VIEW
CENTERPOINT BUSINESS PARK
SHEET NO. 2 of 3
DRAWING No. G2
DATE: 12/04/06


MATCHLINE SEE SHEET G2
MATCHLINE SEE SHEET G2
MATCHLINE SEE SHEET G2
3.07 AC GROSS
P.E.=31.0
3.08 AC GROSS
P.E.=29.0
16
1.82 AC NET
2.74 AC GROSS
P.E.=36.0
7
1.99 AC NET
2.81 AC GROSS
P.E.=25.0
111
112
113
101
STREET A
PROPOSED STORM DRAIN
15
0.97 AC NET
1.11 AC GROSS
P.E.=38.0
12
1.25 AC NET
1.66 AC GROSS
P.E.=37.0
11
1.25 AC NET
1.67 AC GROSS
P.E.=32.0
8
0.90 AC NET
1.03 AC GROSS
P.E.=30.0
14
1.16 AC NET
2.21 AC GROSS
P.E.=40.0
13
1.26 AC NET
2.20 AC GROSS
P.E.=36.0
10
1.26 AC NET
2.20 AC GROSS
P.E.=36.0
9
1.26 AC NET
2.21 AC GROSS
P.E.=33.0
SD
℄ 3RD AVENUE
℄ 2ND AVENUE
POWER POLE TO BE REMOVED
℄ BEAR VALLEY ROAD
FD 2" IP ILLEG
ON-SITE DRAINAGE
SD = STORM DRAIN
# = NODE NUMBERS
SCALE: 1" = 50'
DIGALERT
CALL BEFORE YOU DIG
1-800-422-4133
UNDERGROUND SERVICE ALERT
Call at least 2 working days prior to excavating
85% SUBMITTAL
Not for Construction
BRAD S. MERRELL R.C.E. 40423 EXP. 9/30/08
Merrell-Johnson Engineering, Inc.
BENCHMARK:
BASIS OF BEARINGS:
CENTERPOINT BUSINESS PARK
MASS GRADING PLAN
FOR: BEAR VALLEY DEVELOPMENT
CITY OF VICTORVILLE
ENGINEERING DEPARTMENT
MASS GRADING PLAN
PARCEL MAP NO. 17603
A.P.N. 3091-221-02
PLAN VIEW
CENTERPOINT BUSINESS PARK
SHEET NO. 3 OF 3
G3



PM-05-032, SP-05-050

DIGALERT

CALL BEFORE YOU DIG

1-800-422-4133

UNDERGROUND SERVICE ALERT

Call at least 2 working days prior to excavating

811 Know what's below. Call before you dig.

REGISTERED PROFESSIONAL ENGINEER BRAD S. MERRELL No. C-49423 Exp. 9-30-10 CIVIL STATE OF CALIFORNIA

10-15-08

BRAD S. MERRELL R.C.E. 49423 - EXP. 9/30/10

BENCHMARK:

BENCH MARK: CITY OF VICTORVILLE: B.M. # V-54 LOCATED AT SE CORNER NISQUALLI ROAD & THIRD AVENUE IN THE CITY OF VICTORVILLE, CA ELEVATION=2985.74

BASIS OF BEARINGS:

TAKEN FROM THE CENTERLINE OF THIRD AVENUE PER TRACT MAP NO. 18218, M.B. 319/81-89 BEING: N01°33'02"W

Merrell-Johnson Engineering, Inc.

12138 INDUSTRIAL BLVD. #240 VICTORVILLE, CALIFORNIA 92395 (760) 241-8146 (760) 241-0586 FAX

128 E. FREDRICKS STREET BARSTOW, CALIFORNIA 92311 (760) 256-2068 (760) 256-0418 FAX

CENTERPOINT BUSINESS PARK

MASS GRADING PLAN

FOR: BEAR VALLEY DEVELOPMENT

CENTER POINT BUSINESS PARK MASS GRADING PLAN

PARCEL MAP NO. 17603

A.P.N. 3091-221-02

PLAN VIEW

BENCH MARK: CITY OF VICTORVILLE: B.M. # V-54 ELEVATION = 2985.74

LOCATED AT SE CORNER NISQUALLI ROAD & THIRD AVENUE IN THE CITY OF VICTORVILLE, CA

DESIGN BY:	JBC	SHEET NO. 3 OF 4	DRAWING No. G-3
DRAWN BY:	RUM/JBC		
CHECKED BY:	BSM		JOB No. 2232-6
DATE:	10/14/08		

NO.	REVISIONS	BY	DATE

CITY OF VICTORVILLE ENGINEERING DEPARTMENT

APPROVED BY: [signature] DATE: 10/20/08

JOHN A. McGLADE CITY ENGINEER RCE 40935 EXP 3-31-09

GP-1458

CITY OF VICTORVILLE

CENTERPOINT BUSINESS PARK

STORM DRAIN PLANS

BEAR VALLEY DEVELOPMENT

GENERAL STORM DRAIN NOTES:

1. UNLESS OTHER WISE NOTED, ALL CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH THESE PLANS AND SHALL CONFORM TO THE APPLICABLE PROVISIONS OF THE CITY OF VICTORVILLE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, LATEST REVISIONS, AND STANDARD DRAWINGS ON FILE WITH THE CITY OF VICTORVILLE.
2. CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUALLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER, THE ENGINEER, AND THE CITY HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER.
3. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN ANY PERMITS REQUIRED BY THE CITY OF VICTORVILLE ENGINEERING DEPARTMENT IN ORDER TO DO THE WORK SHOWN ON THESE PLANS.
4. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROTECT SURVEYING MONUMENTS IN PLACE AND THE CONTRACTOR SHALL BE FINANCIALLY RESPONSIBLE FOR RESETTING DAMAGED OR DESTROYED MONUMENTS.
5. JOSHUA TREES SHALL BE PROTECTED IN PLACE OR RELOCATED AS APPROVED BY THE PARKS DIVISION OF THE CITY OF VICTORVILLE DEPARTMENT OF COMMUNITY SERVICES, AT OWNER'S EXPENSE
6. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE HIMSELF/HERSELF WITH THE JOB SITE AND ANY UNDERGROUND UTILITIES SHOWN OR NOT SHOWN ON THESE PLANS. CONTRACTOR SHALL CALL UNDERGROUND SERVICE ALERT AT 1-800-227-2600 TO LOCATE UTILITIES AT LEAST TWO WORKING DAYS BEFORE DOING ANY EXCAVATION. ALL PIPELINES, SUBSTRUCTURES, OR UTILITIES OF ANY KIND, WHETHER SHOWN ON THESE PLANS OR NOT, SHALL BE PROTECTED IN PLACE OR, IF REQUIRED, BE REMOVED, RELOCATED OR REINFORCED TO THE SATISFACTION OF THE CITY ENGINEER AND THE COMPANY OWING THE FACILITY, AT THE EXPENSE OF THE CONTRACTOR.
7. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY FIELD CHANGES MADE WITHOUT PRIOR WRITTEN AUTHORIZATION FROM THE ENGINEER AND THE CITY OF VICTORVILLE.
8. THE CONTRACTOR SHALL GIVE THE CITY OF VICTORVILLE ENGINEERING DEPARTMENT AT LEASE TWO (2) WORKING DAYS NOTICE TO SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE INSPECTOR PRIOR TO START OF WORK.
9. THE CONTRACTOR SHALL NOTIFY THE CITY OF VICTORVILLE ENGINEERING DEPARTMENT AT LEAST 1 WORKING DAY PRIOR TO NECESSARY INSPECTIONS AT (760)955-5158. A RE-INSPECTION FEE WILL BE RENDERED ON EACH OCCASION WHEN THE CONTRACTOR IS NOT READY FOR THE INSPECTION AT THE SCHEDULED TIME. NO FURTHER INSPECTIONS WILL BE PERFORMED UNTIL SAID RE-INSPECTION FEE IS PAID.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SOIL TESTING AND COMPACTION TESTING. A CERTIFICATE OF COMPACTIONS SIGNED BY A REGISTERED ENGINEER SHALL BE SUBMITTED FOR ALL TRENCH BACKFILLS.
11. EXISTING UTILITIES SHALL BE MAINTAINED IN PLACE AND IN OPERATION DURING CONSTRUCTION.
12. ALL EXCAVATIONS SHALL BE BACKFILLED AT THE END OF EACH WORKING DAY AND ROADS OPEN TO VEHICULAR TRAFFIC.
13. ANY RELOCATION OF EXISTING MAILBOXES, POWER POLES, STREET LIGHTS, FIRE HYDRANTS, SIGN POSTS, CONTEL TELEPHONE PEDESTALS, ETC., SHALL BE RELOCATED OR REMOVED AND REINSTALLED BY AND AT THE EXPENSE OF THE CONTRACTOR.
14. MANHOLE RIM ELEVATIONS SHALL BE STAKED IN THE FIELD AT TIME OF CONSTRUCTION.
15. STATIONS SHOWN ON PROFILE ARE ON CENTERLINE OF THE CONDUIT.
16. ADEQUATE STAKES SHALL BE SET BY THE ENGINEER TO ENABLE THE CONTRACTOR TO CONSTRUCT THE WORK TO PLAN AND GRADE.
17. INSTALL HOLD-DOWN BOLTS ON ALL MANHOLE COVERS.
18. IF AC OR PC IS TO BE PLACED DIRECTLY ON SUBSURFACE OF DRAINAGE FACILITIES, A SOIL STERILANT REGISTERED BY THE EPA FOR USE UNDER AC AND PC SHALL BE UNIFORMLY APPLIED AT THE MANUFACTURER'S RECOMMENDED RATE FOR THE FULL PAVEMENT WIDTH PRIOR TO PAVING.

ESTIMATED QUANTITIES

ESTIMATE OF QUANTITIES INCLUDED ON THESE PLANS ARE APPROXIMATE QUANTITIES AND IS INTENDED ONLY FOR PLANNING PURPOSES. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING HIS OWN QUANTITIES.

CONSTRUCTION NOTES:

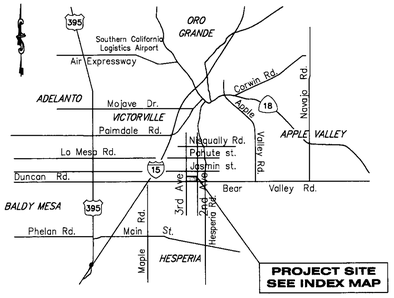
(1)	CAST-IN-PLACE 5' X 21' JUNCTION STRUCTURE PER 2006 SPPWC STD PLAN 309-1 ON SHEET SD-5 (USE FRONT WALL REINFORCEMENT FOR FRONT AND REAR WALLS).	4 EA.
(2)	CONSTRUCT MANHOLE-CONCRETE BOX STORM DRAIN PER 2006 SPPWC STD PLAN 323-1 ON SHEET SD-5.	9 EA.
(3)	CONSTRUCT 8'x4' BOX CULVERT PER CALTRANS 2006 STD PLAN D80 ON SHEET SD-5.	3,885 L.F.
(4)	CAST-IN-PLACE JUNCTION STRUCTURE (SEE PLAN VIEW FOR DIMENSIONS) PER 2006 SPPWC STD PLAN 309-1 ON SHEET SD-5 (USE FRONT WALL REINFORCEMENT FOR ALL WALLS).	6 EA.
(5)	CONSTRUCT STANDARD DROP INLET W=14' PER CITY OF VICTORVILLE STD DWG D-02.	1 EA.
(6)	CONSTRUCT LOCAL DEPRESSION AT CATCH BASIN (JUNCTION STRUCTURE) PER 2006 SPPWC STD PLAN 313-2 CASE G WITH (2) GRATING AND DEBRIS SKIMMER ON SHEET SD-5.	2 EA.
(7)	CAST-IN-PLACE 10.5' X 35' JUNCTION STRUCTURE (SEE PLAN VIEW) PER 2006 SPPWC STD PLAN 309-1 ON SHEET SD-5 (NO INLET) (USE FRONT WALL REINFORCEMENT FOR FRONT AND REAR WALLS).	1 L.F.
(8)	CONSTRUCT 5'x4' BOX CULVERT PER CALTRANS 2006 STD PLAN D80 ON SHEET SD-5.	1,530 L.F.
(9)	CONSTRUCT STORM DRAIN MANHOLE PIPE TO PIPE PER 2006 SPPWC STD PLAN 321-1. ON SHEET SD-5.	1 EA.
(10)	CONSTRUCT CONCRETE ROOF AND FLAT INVERT FOR 10' X 5' BOX CULVERT PER 2006 CALTRANS STD PLAN D80.	1 EA.
(11)	CONSTRUCT CATCH BASIN PER CITY OF VICTORVILLE STD DWG D-02.	5 EA.
(12)	INSTALL 24" 2000D RCP (STORM DRAIN PIPE).	685 L.F.
(13)	CONSTRUCT JUNCTION STRUCTURE-PIPE TO PIPE INLET PER 2006 SPPWC STD PLAN 331-2. ON SHEET SD-5.	2 EA.
(14)	CONSTRUCT STANDARD DROP INLET W=20' PER CITY OF VICTORVILLE STD DWG D-02.	1 EA.
(15)	INSTALL MANHOLE COVER PER CITY OF VICTORVILLE STD D-04.	2 EA.
(16)	REMOVE EXISTING TRASH RACK.	1 EA.
(17)	CONSTRUCT GRATING CATCH BASIN PER 2006 SPPWC STD PLAN 304-2.	2 EA.
(18)	INSTALL 18" 2000D RCP (STORM DRAIN PIPE).	84 L.F.
(19)	CONSTRUCT JUNCTION STRUCTURE - PIPE TO RCB PER 2006 SPPWC "GREEN BOOK" STD. PLAN 333-1.	1 EA.
(20)	INSTALL 48" 2000D RCP (STORM DRAIN PIPE).	21 L.F.

811 Know what's below. Call before you dig.

NOTE:
IF THIS PLAN IS NOT SIGNED AND DATED BY THE ENGINEER OF RECORD AND ALSO BY THE CITY ENGINEER OR UTILITY COMPANY OFFICIAL IN THE APPROVAL BLOCKS OF THIS PLAN THEN THIS PLAN IS PRELIMINARY AND NOT FOR CONSTRUCTION.

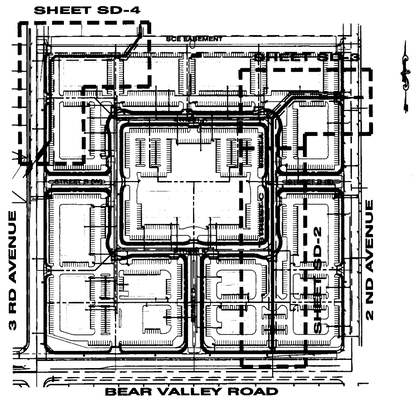
LEGEND

FL	INDICATES FLOWLINE
R/W	INDICATES RIGHT-OF-WAY
CL	INDICATES CENTER LINE
SMH	INDICATES SEWER MANHOLE
(xx)	INDICATES SPOT ELEVATIONS
GB	INDICATES GRADE BREAK
-xx-	INDICATES EXISTING CONTOUR
	INDICATES EDGE OF PAVEMENT
G	INDICATES GAS
W	INDICATES WATER
CB	INDICATES CATCH BASIN
S	INDICATES SEWER
SD	INDICATES STORM DRAIN
TG	INDICATES TOP OF GRATE
INV	INDICATES INVERT



VICINITY MAP

NOT TO SCALE



INDEX MAP

NOT TO SCALE

OWNER/APPLICANT:

BEAR VALLEY DEVELOPMENT
17189 YUMA STREET
VICTORVILLE, CA 92395
(760) 245-5130
CONTACT PERSON: TOM COURTNEY
(760) 245-6947

SHEET INDEX

SITE LOCATION:

A.P.N. 3091-221-02

ADDRESS:

AT NORTHWEST CORNER OF BEAR VALLEY ROAD/2ND AVENUE
VICTORVILLE, CA. 92395

UTILITY ADDRESSES

ELECTRIC:	SOUTHERN CALIFORNIA EDISON COMPANY 12353 HESPERIA ROAD VICTORVILLE, CALIFORNIA 92392 (760) 241-3805
TELEPHONE:	VERIZON 15168 LA PAZ DRIVE VICTORVILLE, CALIFORNIA 92392 (760) 245-4251
WATER:	VICTOR VALLEY WATER DISTRICT 17185 YUMA RD. VICTORVILLE, CALIFORNIA 92392 (760) 245-5424
SEWER TREATMENT:	VVWRA 20111 SHAY RD. ADELANTO, CALIFORNIA 92301 (760) 246-8638
SEWER	CITY OF VICTORVILLE ATTN: JOE FLORES VICTORVILLE, CALIFORNIA 92392 (760) 955-5000
GAS:	SOUTHWEST GAS 13471 MARIPOSA RD. VICTORVILLE, CALIFORNIA 92392 (760) 951-4050
CABLE:	CHARTER COMMUNICATIONS 12490 BUSINESS CRNTER DR. VICTORVILLE, CALIFORNIA 92392 (760) 843-3000
GARBAGE COLLECTION:	VICTORVILLE DISPOSAL INC 17080 STODDARD WELLS RD. VICTORVILLE, CALIFORNIA 92392 (760) 245-8607

NOTICE TO CONTRACTOR FROM ENGINEER:

UPON LEARNING OF THE EXISTENCE OF ANY UTILITY OMITTED FROM OR SHOWN INCORRECTLY ON THE PLANS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER.

THE CONTRACTOR SHALL ASCERTAIN THE EXISTENCE OF ANY CONDITIONS AFFECTING THE COST OF THE WORK WHICH WOULD HAVE BEEN DISCLOSED BY REASONABLE EXAMINATION OF THE SITE.

CONTRACTOR SHALL IMMEDIATELY BRING ANY ERRORS OR OMISSIONS DISCOVERED IN THE PLANS TO THE ATTENTION OF THE ENGINEER.

CONTRACTOR SHALL REPAIR OR REPLACE ALL EXISTING IMPROVEMENTS WITHIN THE CONSTRUCTION AREA THAT ARE NOT DESIGNATED FOR REMOVAL, REPAIRS AND REPLACEMENTS SHALL BE AT LEAST EQUAL TO EXISTING IMPROVEMENTS AND SHALL MATCH THEM IN FINISH AND DIMENSION.

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THIS PLAN ARE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THESE PLANS. THESE PLANS ARE NOT INTENDED TO SHOW LOCATIONS OF ELECTRICAL LINES, LANDSCAPE IRRIGATION LINES, ETC. THE CONTRACTOR SHALL TAKE DUE PRECAUTIONARY MEASURES TO PROTECT ALL UTILITIES AND STRUCTURES SHOWN ON THESE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFICATION OF THE LOCATION AND DEPTH OF EXISTING UNDERGROUND UTILITIES AND SHALL PERFORM POTHOLING AS NECESSARY AT ALL CROSSING PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TAKING ALL PRECAUTIONS NECESSARY TO PROTECT ALL EXISTING UTILITIES AND STRUCTURES FROM DAMAGE DURING THE COURSE OF THE WORK, AND SHALL BE RESPONSIBLE FOR REPAIRING OR REPLACING ANY UTILITIES OR STRUCTURE DAMAGED DURING THE COURSE OF THE WORK.

ALL CONTRACTORS AND SUBCONTRACTORS PERFORMING WORK SHOWN ON OR RELATED TO THESE PLANS SHALL CONDUCT THEIR OPERATIONS SO THAT ALL EMPLOYEES ARE PROVIDED A SAFE PLACE TO WORK AND THE PUBLIC IS PROTECTED. ALL CONTRACTORS AND SUBCONTRACTORS SHALL COMPLY WITH THE "OCCUPATIONAL SAFETY AND HEALTH REGULATION" OF THE DEPARTMENT OF U.S. LABOR, AND WITH THE STATE OF CALIFORNIA DEPARTMENT OF INDUSTRIAL RELATIONS "CONSTRUCTION SAFETY ORDERS".

THE ARCHITECT/CIVIL ENGINEER SHALL NOT BE RESPONSIBLE IN ANY WAY FOR THE CONTRACTOR'S AND SUBCONTRACTORS' COMPLIANCE WITH THE "OCCUPATIONAL HEALTH AND SAFETY REGULATIONS" OF U.S. DEPARTMENT OF LABOR OR WITH THE STATE OF CALIFORNIA DEPARTMENT OF INDUSTRIAL RELATIONS "CONSTRUCTION SAFETY ORDERS".

THE CONTRACTOR IS HEREBY NOTIFIED THAT DURING THE ENTIRE TERM OF CONSTRUCTION, HE OR SHE SHALL ADHERE TO N.P.D.E.S. GUIDELINES AND REQUIREMENTS RELATED TO BUT NOT LIMITED TO DUST CONTROL, ENVIRONMENTAL CONSIDERATIONS, ETC. IN ADDITION, THE CONTRACTOR SHALL PREPARE AND HAVE APPROVED BY THE PROJECT CIVIL ENGINEER AND COUNTY INSPECTOR, AND IMPLEMENT AN EROSION CONTROL PLAN AND SWPPP.

ALL WORK SHALL BE CONSTRUCTED ACCORDING TO THE VERTICAL AND HORIZONTAL MEASUREMENTS OF THESES PLANS AND EXISTING DESIGN STANDARDS. ADEQUATE STAKES SHALL BE SET UNDER THE DIRECTION OF A LICENSED SURVEYOR/ENGINEER FOR THE CONSTRUCTOR. ALL CONSTRUCTION SURVEYING SHALL BE PERFORMED IN ACCORDANCE TO THE SURVEYING PROCEDURES OF THE SURVEYOR/ENGINEER OF RECORD. IF THIRD PARTY SUBCONTRACTORS PERFORM THE CONSTRUCTION LAYOUT AND SURVEYING FOR THIS PROJECT WITH OUT THE COORDINATION OF THE SURVEYOR/ENGINEER OF RECORD, THEY HAVE ASSUMED THE POSITION OF SURVEYOR/ENGINEER OF RECORD. THE FINAL CHECK OF THIS DESIGN IS TO BE THE CONSTRUCTION STAKING AS THE DESIGN MEETS THE EXISTING CONTROL AND ELEVATIONS. ALL EXISTING STREET CROSS SECTIONS SHALL BE VERIFIED FOR MINIMUM CROSS FALL AT TIME OF STAKING. ANY DISCREPANCIES TO THE STANDARD DESIGN CRITERIA SHALL BE BROUGHT TO THE SURVEYOR/ENGINEER OF RECORD ATTENTION PRIOR TO PROCEEDING WITH CONSTRUCTION. IF CONSTRUCTION CONTINUES WITHOUT VERIFICATION THE CONSTRUCTOR ASSUMES THE RESPONSIBILITY OF THE CORRECTNESS OF THE INTENDED DESIGN.

THE CONTRACTOR IS REQUIRED BY GOVERNMENT CODE 4216 "CALIFORNIA ONE CALL LAW" TO CALL DIG ALERT AT LEAST TWO (2) WORKING DAYS BEFORE DIGGING. CONTRACTOR IS REQUIRED BY SAME CODE TO HAND-EXPOSE TO THE POINT OF NO CONFLICT 24" ON EITHER SIDE OF THE UNDERGROUND FACILITY SO YOU CAN DETERMINE ITS EXACT LOCATION BEFORE USING POWER EQUIPMENT.

BASIS OF BEARINGS:

TAKEN FROM THE CENTERLINE OF THIRD AVENUE PER TRACT MAP NO. 18218, M.B. 319/81-89 BEING: N01°33'02"W.

REGISTERED PROFESSIONAL ENGINEER BRAD S MERRELL No. C-49423 Exp. 9-30-10 CIVIL STATE OF CALIFORNIA

11-20-08

BRAD S. MERRELL R.C.E. 49423 - EXP. 9/30/10

Merrell-Johnson Engineering, Inc.

12138 INDUSTRIAL BLVD. #240
VICTORVILLE, CALIFORNIA 92395
(760) 241-6146
(760) 241-0566 FAX

128 E. FREDRICKS STREET
BARSTOW, CALIFORNIA 92311
(760) 256-2068
(760) 256-0418 FAX

CENTERPOINT BUSINESS PARK
PARCEL MAP No. 17603
APN: 3091-221-02

FOR:
BEAR VALLEY DEVELOPMENT

PM-05-032, SP-05-050

CENTER POINT BUSINESS PARK
STORM DRAIN IMPROVEMENT PLANS

TITLE SHEET

BENCH MARK: CITY OF VICTORVILLE: B.M. # V-54
ELEVATION = 2985.74

LOCATED AT SE CORNER NISQUALLI ROAD & THIRD AVENUE IN THE CITY OF VICTORVILLE, CA

DESIGN BY:	MDR/JMF
DRAWN BY:	JMS
CHECKED BY:	BSM
DATE:	11/20/08
SHEET NO.	1 OF 5
DRAWING No.	SD-1
JOB No.	2232-6

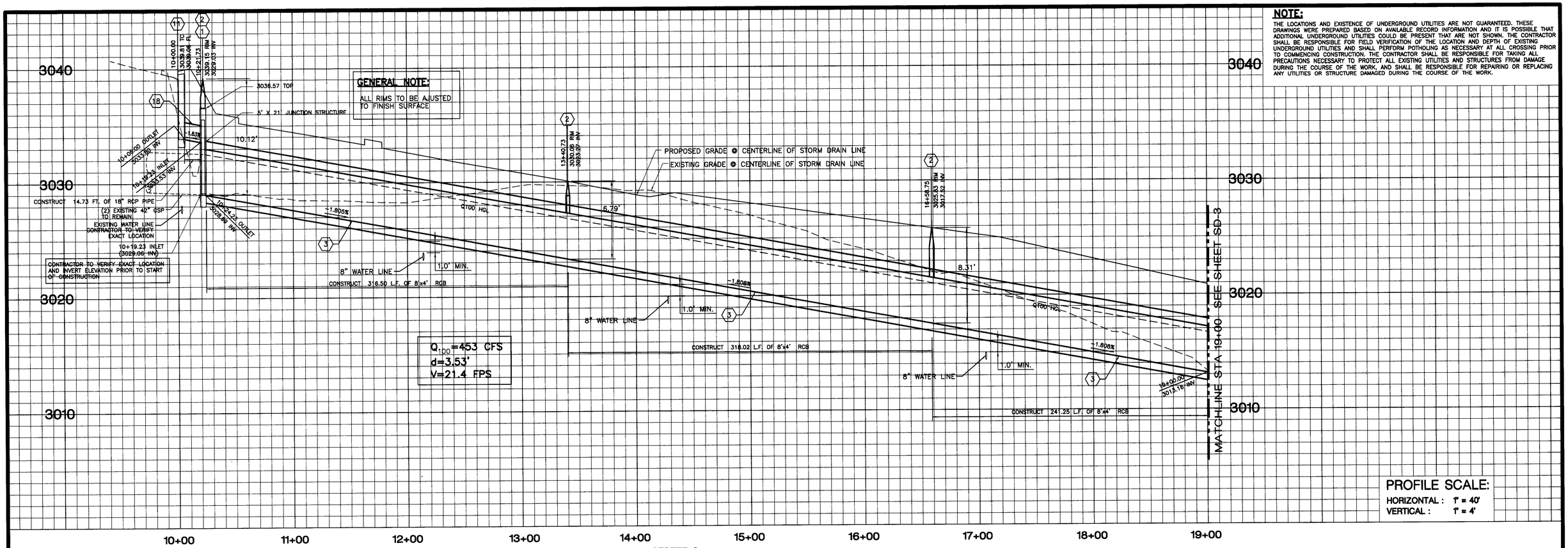
NO.	REVISIONS	BY	DATE
1	CHANGED RCP TO RCB	JBC	11/03/08

CITY OF VICTORVILLE
ENGINEERING DEPARTMENT

APPROVED
BY: John A. McGlade DATE: 12/3/08
JOHN A. McGLADE, CITY ENGINEER
RCE 40935 EXP. 3-31-09

P-919

jcumming 8:44am 20 November 2008 P:\2232-6 Third TPM\STORM DRAIN-2232-6.dwg — TITLE SHEET SD1 Merrell-Johnson Engineering, Inc.



GENERAL NOTE:

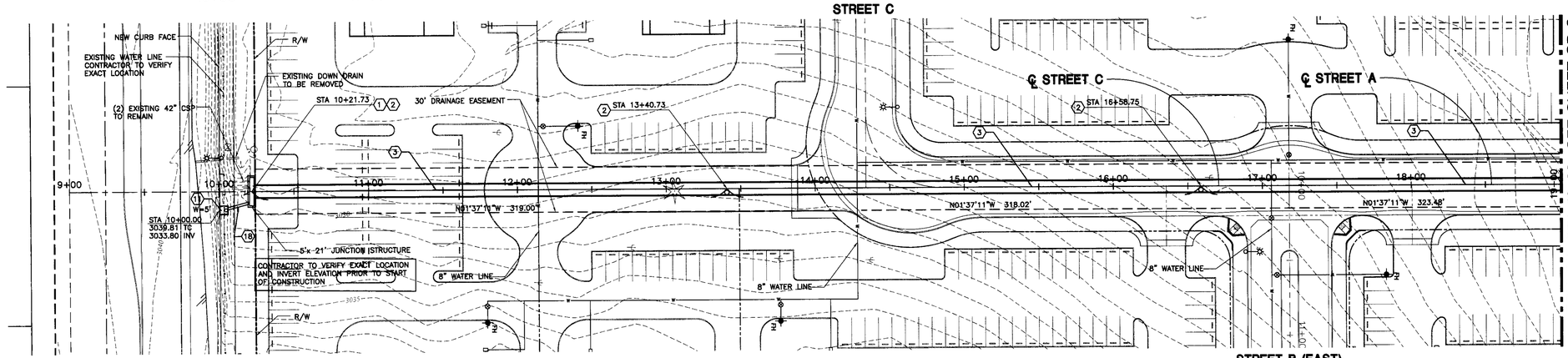
ALL RIMS TO BE AJUSTED TO FINISH SURFACE

NOTE:

THE LOCATIONS AND EXISTENCE OF UNDERGROUND UTILITIES ARE NOT GUARANTEED. THESE DRAWINGS WERE PREPARED BASED ON AVAILABLE RECORD INFORMATION AND IT IS POSSIBLE THAT ADDITIONAL UNDERGROUND UTILITIES COULD BE PRESENT THAT ARE NOT SHOWN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFICATION OF THE LOCATION AND DEPTH OF EXISTING UNDERGROUND UTILITIES AND SHALL PERFORM POTHOLING AS NECESSARY AT ALL CROSSING PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TAKING ALL PRECAUTIONS NECESSARY TO PROTECT ALL EXISTING UTILITIES AND STRUCTURES FROM DAMAGE DURING THE COURSE OF THE WORK, AND SHALL BE RESPONSIBLE FOR REPAIRING OR REPLACING ANY UTILITIES OR STRUCTURE DAMAGED DURING THE COURSE OF THE WORK.

PROFILE SCALE:

HORIZONTAL : 1" = 40'
VERTICAL : 1" = 4'



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STREETS A AND C

40' 20' 0' 40' 80'
SCALE: 1" = 40'

PM-05-032, SP-05-050

CENTER POINT BUSINESS PARK
STORM DRAIN IMPROVEMENT PLANS

EAST STORM DRAIN SYSTEM

STA 10+19.23 TO STA 19+00

BENCH MARK: CITY OF VICTORVILLE: B.M. # V-54
ELEVATION = 2985.74
LOCATED AT SE CORNER N'SQUALI ROAD & THIRD AVENUE IN THE CITY OF VICTORVILLE, CA

DESIGN BY: MDR/JMF
DRAWN BY: JMS
CHECKED BY: BSM
DATE: 11/20/08

SHEET NO. 2 OF 5

DRAWING No. SD-2

JOB No. 2232-6

NO.	REVISIONS	BY	DATE
1	CHANGED RCP TO RCB	JBC	11/03/08

CITY OF VICTORVILLE
ENGINEERING DEPARTMENT

APPROVED
BY: John A. McGlade
JOHN A. McGLADE CITY ENGINEER
RCE 40935 EXP. 3-31-09
DATE: 12/3/08

BASIS OF BEARINGS:

TAKEN FROM THE CENTERLINE OF THIRD AVENUE PER TRACT MAP NO. 18218, M.B. 319/81-89 BEING: N01°33'02"W.

811 Know what's below. Call before you dig.

NOTE:

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11-20-08
BRAD S. MERRELL R.C.E. 49423 – EXP. 9/30/10

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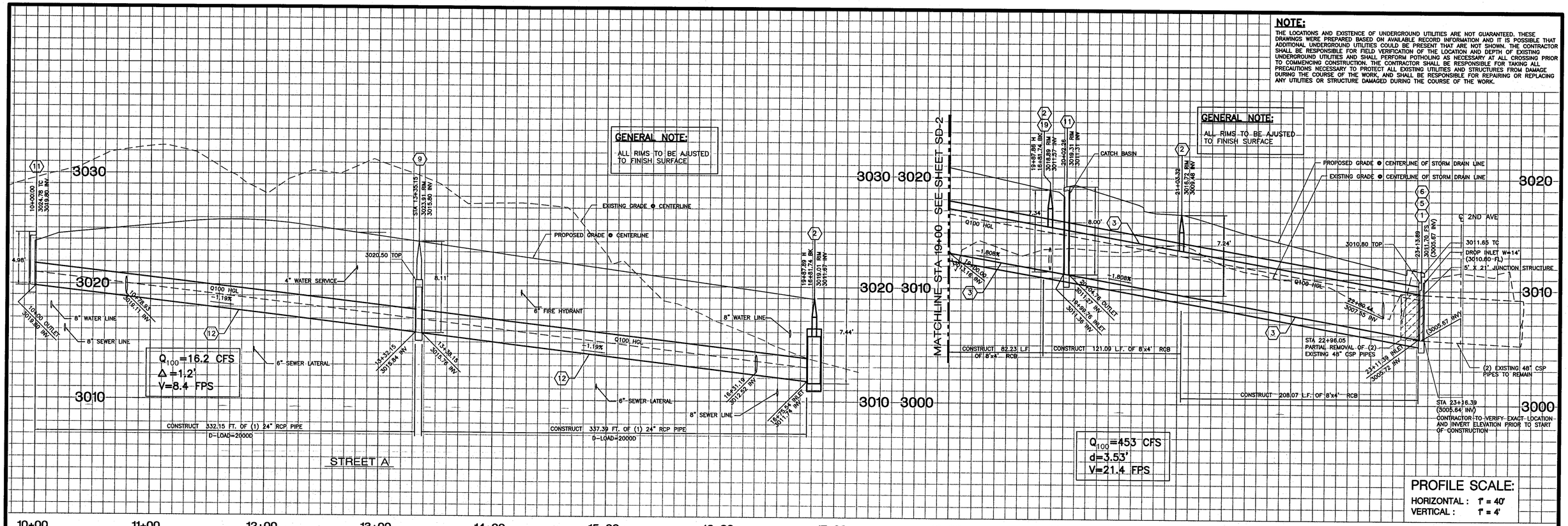
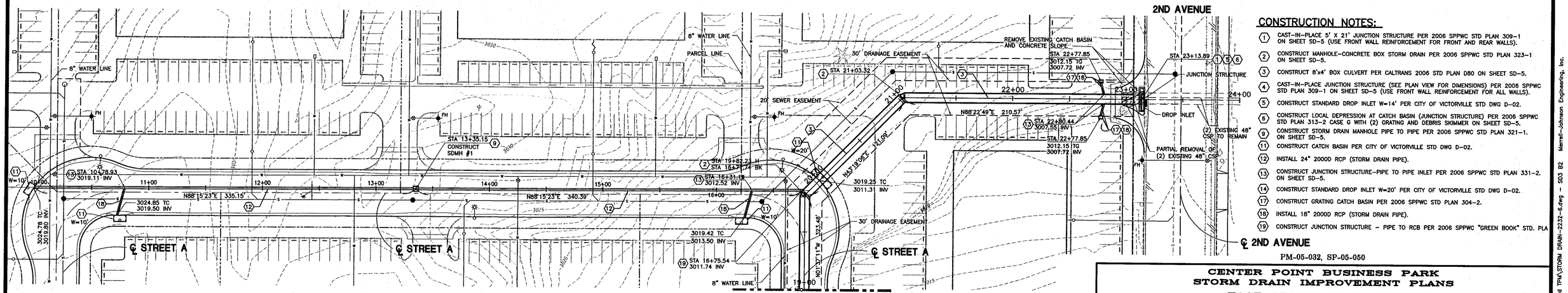
CENTERPOINT BUSINESS PARK
PARCEL MAP No. 17603
APN: 3091-221-02

FOR:
BEAR VALLEY DEVELOPMENT

P-919

jcumming 8:47am 20 November 2008 P:\2232-6 Third TPM\STORM DRAIN-2232-6.dwg — SD2 B1 Merrell-Johnson Engineering, Inc.





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Know what's below. Call before you dig. 811

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REGISTERED PROFESSIONAL ENGINEER BRAD S. MERRELL No. C-49423 Exp. 9-30-10 CIVIL STATE OF CALIFORNIA
11-20-08
BRAD S. MERRELL R.C.E. 49423 - EXP. 9/30/10

Merrell-Johnson Engineering, Inc.
12138 INDUSTRIAL BLVD. #240
VICTORVILLE, CALIFORNIA 92395
(760) 241-6146
(760) 241-0566 FAX
128 E. FREDRICKS STREET
BARSTOW, CALIFORNIA 92311
(760) 256-2068
(760) 256-0418 FAX

CENTERPOINT BUSINESS PARK
PARCEL MAP No. 17603
APN: 3091-221-02
FOR:
BEAR VALLEY DEVELOPMENT

CENTER POINT BUSINESS PARK
STORM DRAIN IMPROVEMENT PLANS
EAST STORM DRAIN SYSTEM
STA 10+00.00 TO STA 23+16.39

BENCH MARK: CITY OF VICTORVILLE: B.M. # V-54
ELEVATION = 2985.74
LOCATED AT SE CORNER NISQUALI ROAD & THIRD AVENUE IN THE CITY OF VICTORVILLE, CA

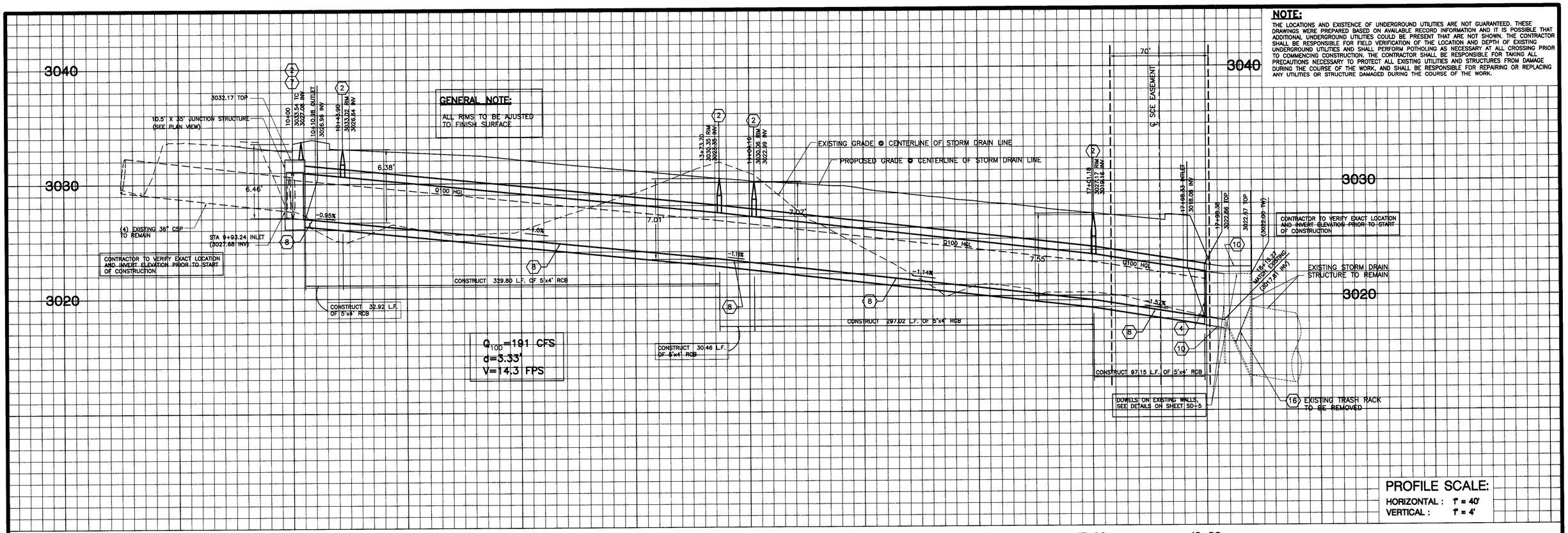
DESIGN BY:	MDR/JMF
DRAWN BY:	JMS
CHECKED BY:	BSM
DATE:	11/20/08
SHEET NO.	3 OF 5
DRAWING No.	SD-3
JOB No.	2232-6

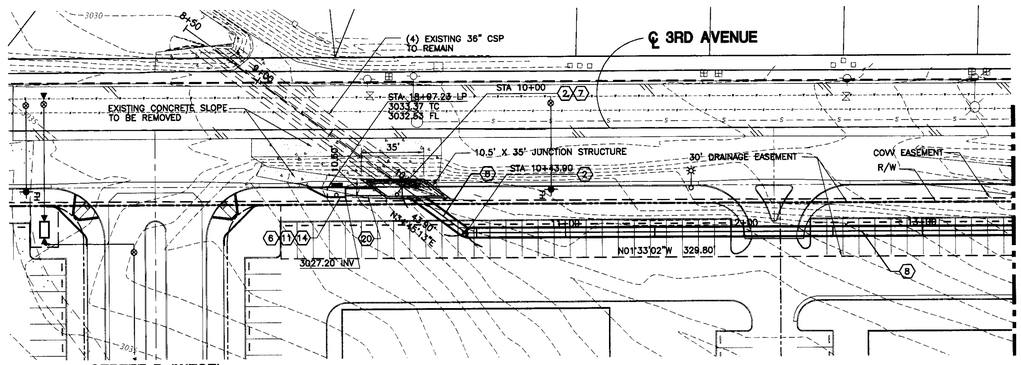
NO.	REVISIONS	BY	DATE
1	CHANGED RCP TO RCB	JBC	11/03/08

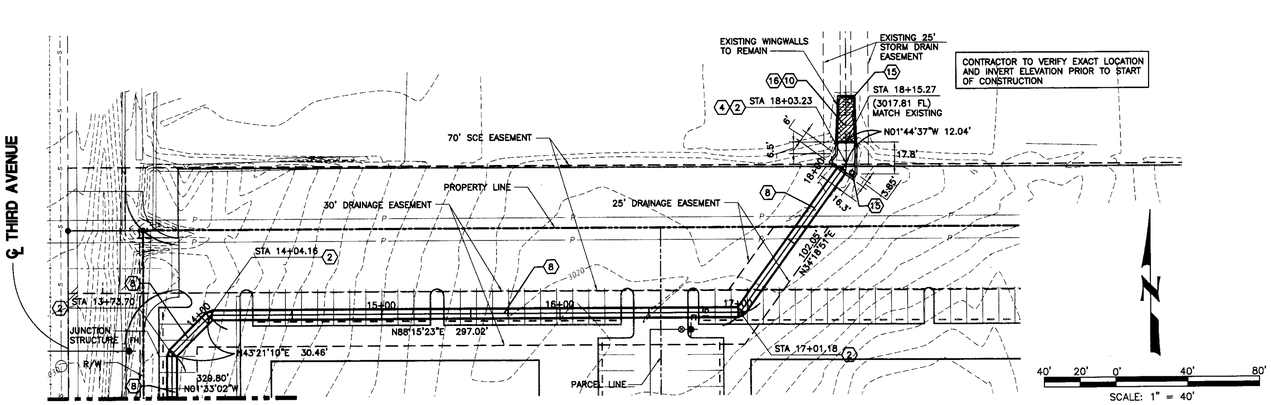
CITY OF VICTORVILLE
ENGINEERING DEPARTMENT
APPROVED
BY: John A. McGlade DATE: 12/3/08
JOHN A. McGLADE CITY ENGINEER
RCE 49935 EXP 3-31-09

P-919

cshintatsu 11:30am 20 November 2008 P:\2232-6 Third TPM\STORM DRAIN-2232-6.dwg - SD3 B2 Merrell-Johnson Engineering, Inc.







PM-05-032, SP-05-050

CONSTRUCTION NOTES:

(2) CONSTRUCT MANHOLE-CONCRETE BOX STORM DRAIN PER 2006 SPPWC STD PLAN 323-1 ON SHEET SD-5.

(4) CAST-IN-PLACE JUNCTION STRUCTURE (SEE PLAN VIEW FOR DIMENSIONS) PER 2006 SPPWC STD PLAN 309-1 ON SHEET SD-5 (USE FRONT WALL REINFORCEMENT FOR ALL WALLS).

(6) CONSTRUCT LOCAL DEPRESSION AT CATCH BASIN (JUNCTION STRUCTURE) PER 2006 SPPWC STD PLAN 313-2 CASE G WITH (2) GRATING AND DEBRIS SKIMMER ON SHEET SD-5.

(7) CAST-IN-PLACE 10.5' X 35' JUNCTION STRUCTURE (SEE PLAN VIEW) PER 2006 SPPWC STD PLAN 309-1 ON SHEET SD-5 (NO INLET) (USE FRONT WALL REINFORCEMENT FOR FRONT AND REAR WALLS).

(8) CONSTRUCT 5'x4' BOX CULVERT PER CALTRANS 2006 STD PLAN D80 ON SHEET SD-5.

(10) CONSTRUCT CONCRETE ROOF AND FLAT INVERT FOR 10' X 5' BOX CULVERT PER 2006 CALTRANS STD PLAN D80.

(11) CONSTRUCT CATCH BASIN PER CITY OF VICTORVILLE STD DWG D-02.

(14) CONSTRUCT STANDARD DROP INLET W=20' PER CITY OF VICTORVILLE STD DWG D-02.

(15) INSTALL MANHOLE COVER PER CITY OF VICTORVILLE STD D-04.

(16) REMOVE EXISTING TRASH RACK.

(20) INSTALL 48" 2000D RCP (STORM DRAIN PIPE).

811 Know what's below. Call before you dig.

REGISTERED PROFESSIONAL ENGINEER BRAD S. MERRELL No. C-49423 Exp. 9-30-10 CIVIL STATE OF CALIFORNIA

11-20-08

BRAD S. MERRELL R.C.E. 49423 – EXP. 9/30/10

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BASIS OF BEARINGS:
TAKEN FROM THE CENTERLINE OF THIRD AVENUE PER TRACT MAP NO. 18218, M.B. 319/81-89 BEING: N01°33'02"W.

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CENTERPOINT BUSINESS PARK
PARCEL MAP No. 17603
APN: 3091-221-02
FOR: BEAR VALLEY DEVELOPMENT

CENTER POINT BUSINESS PARK
STORM DRAIN IMPROVEMENT PLANS
WEST STORM DRAIN SYSTEM
STA 9+93.24 TO STA 18+15.27

BENCH MARK: CITY OF VICTORVILLE: B.M. # V-54 ELEVATION = 2985.74

LOCATED AT SE CORNER NISQUALLI ROAD & THIRD AVENUE IN THE CITY OF VICTORVILLE, CA

DESIGN BY:	MDR/JMF
DRAWN BY:	JMS
CHECKED BY:	BSM
DATE:	11/20/08

SHEET NO. 4 OF 5

DRAWING No. SD-4

JOB No. 2232-6

NO.	REVISIONS	BY	DATE
1	CHANGED RCP TO RCB	JBC	11/03/08

CITY OF VICTORVILLE
ENGINEERING DEPARTMENT

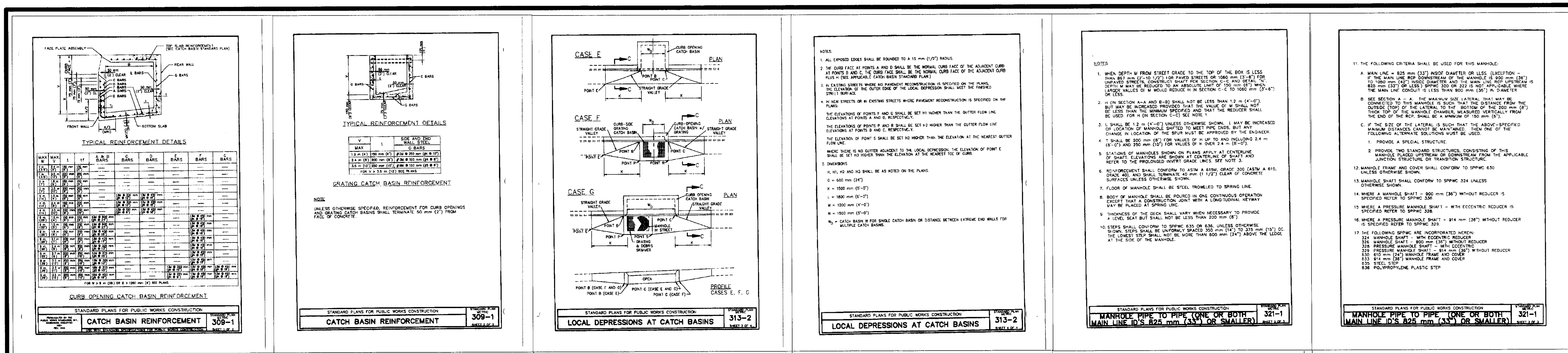
APPROVED

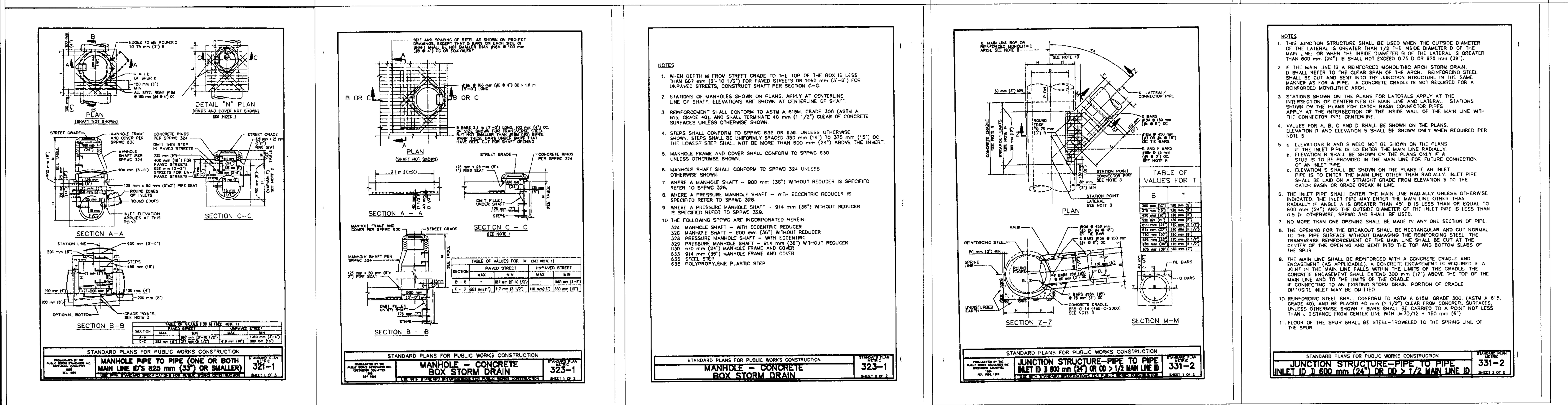
BY: John A. McGlade DATE: 12/3/08

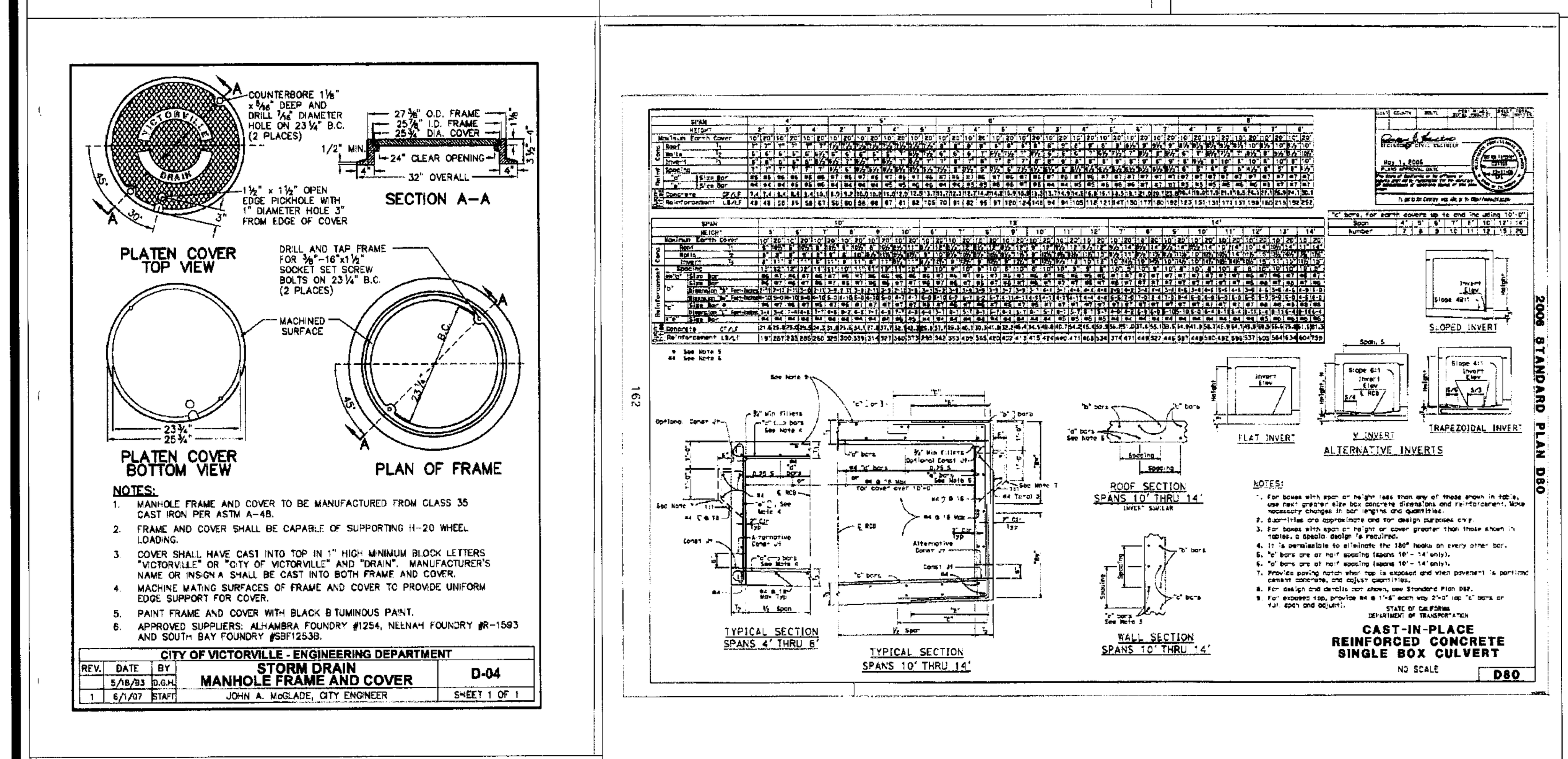
JOHN A. McGLADE CITY ENGINEER RCE 49835 EXP. 3-31-09

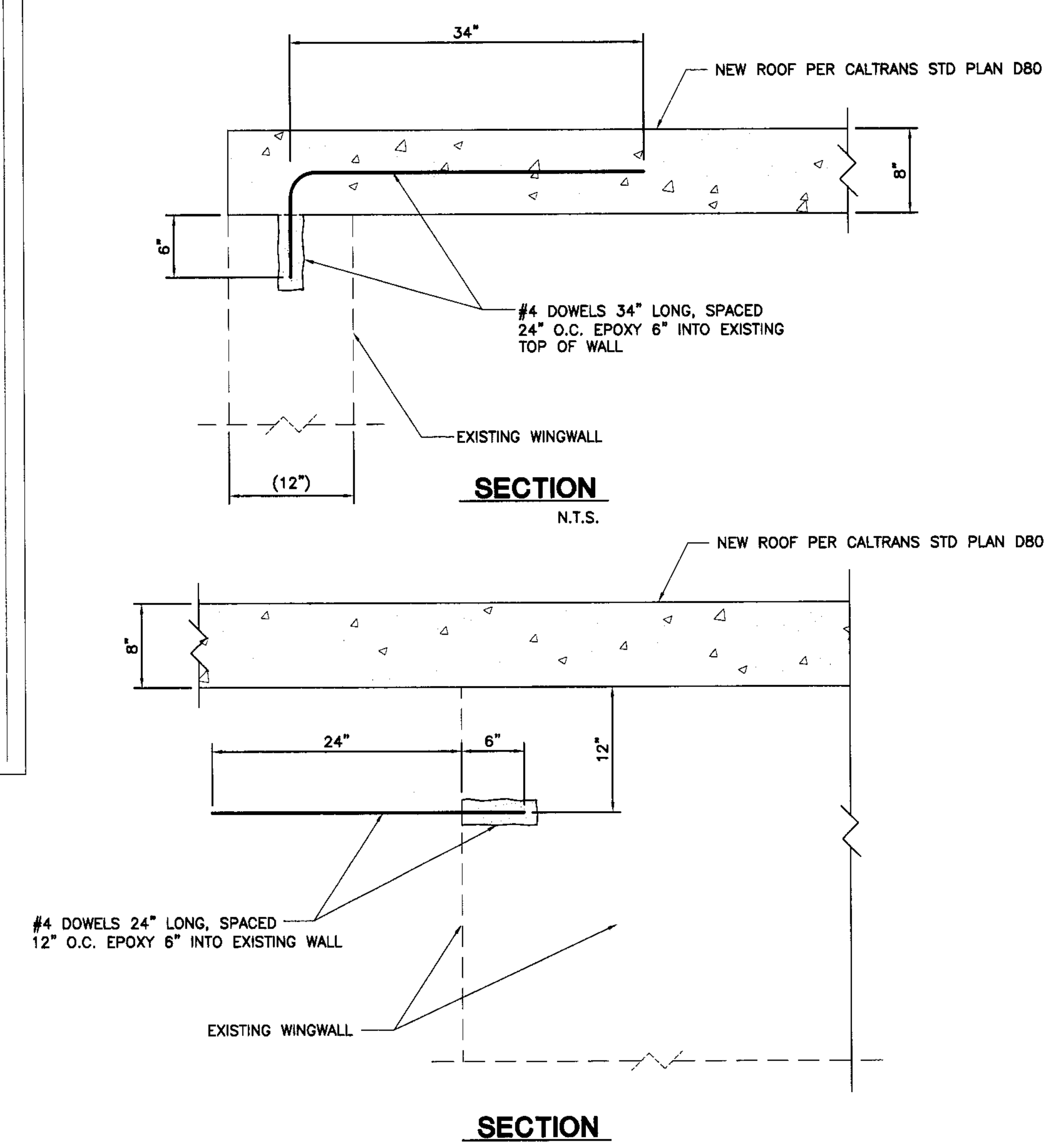
P-919

jcumming 8:54am 20 November 2008 P:\2232-6 Third TPM\STORM DRAIN-2232-6.dwg - SD4 A Merrell-Johnson Engineering, Inc.









DOWEL DETAILS

N.T.S.

PM-05-032, SP-05-050

811 Know what's **below.** **Call** before you dig.

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CENTERPOINT BUSINESS PARK
PARCEL MAP No. 17603
APN: 3091-221-02

FOR:
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DETAILS

BENCH MARK: CITY OF VICTORVILLE: B.M. # V-54
ELEVATION = 2985.74

LOCATED AT SE CORNER NISQUALLI ROAD & THIRD AVENUE IN THE CITY OF VICTORVILLE, CA

DESIGN BY:	MDR/JMF	SHEET NO. 5 OF 5	DRAWING No. SD-5
DRAWN BY:	JMS		
CHECKED BY:	BSM		JOB No. 2232-6
DATE:	11/20/08		

NO.	REVISIONS	BY	DATE
1	CHANGED RCP TO RCB	JBC	11/03/08

CITY OF VICTORVILLE
ENGINEERING DEPARTMENT

APPROVED
BY: [signature] DATE: 12/3/08
JOHN A. McGLADE CITY ENGINEER
RCE 40935 EXP 3-31-09

jcumming 8:57am 20 November 2008 P:\2232-6 Third TPM\STORM DRAIN-2232-6.dwg — DETAILS SD5 Merrell-Johnson Engineering, Inc.

P-919